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Generalized simulation system for water resources management under climate change

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Abstract: In Thailand, water resources crises are drought, flood and water pollution due to variability of precipitation and lack of integrated water resources management. There is no systematical tool to address these problems and no regulation to guide on flood safety, security of water use, and water for environment. Moreover, with climate change impacts in future, water resources availability and conflicts will be worse than the existing condition and may affect to water resources management for benefit area. It is necessary to develop a simulation system as an End-to-End model for water resources management under climate change scenarios for Thailand. However, various integrated water resources model require a large scale computation and basic data that could not be directly applied for water resources management for Thailand, which are necessary to be developed as a generalized simulation system before use for Thailand. Generalized simulation system with future climate data module, runoff prediction module, demand projection module and economic impact evaluation module were developed and applied in the study area, Rayong Province, Thailand. There was a conflict between farmers and industry caused by low rainfall and unsystematic water resources management which nowadays, there is no simulation system to support integrated water resources management. For this reason, a simulation system for water resources management under climate change as End-to-End-model was developed as a case study in Rayong and expected that this system development technique can be implemented to other areas.

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Acknowledgement

After an intensive period of five years, three years in Japan and two years in Thailand, today is the day for writing this note of thanks is the finishing touch on my dissertation. It has been a period of intense learning for me, not only in the research, but also on a personal level. Writing this dissertation has had a big impact on me. I would like to reflect on the people who have supported and helped me so much throughout this period.

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Jampanil Danai

1. Introduction

In Thailand, water resources crises are drought, flood and water pollution due to variability of precipitation and lack of integrated water resources management. There is no systematical tool to address these problems and no regulation to guide on flood safety, security of water use, and water for environment. It is difficult to share and manage water resources among water users in benefit area since there are unclear relations among areas on benefit from using water. However, with national or provincial development plan, government and economic policy will increase provincial GDP that may lead to increasing water resources problem. Moreover, with climate change impacts in future, water resources availability and conflicts will be worse than the existing condition and may affect to water resources management for benefit area. It is necessary to develop a simulation system for water resources management under climate change scenarios for Thailand. An integrated water resources model for Yoshino river basin has been developed including climate change model, water resources prediction model, and benefit evaluation model that can evaluate impacts on water resources availability and can develop adaptation plan to climate change. However, this integrated water resources model require a large scale computation and basic data that could not be directly applied for water resources management for Thailand, which are necessary to be developed as a generalized simulation model as an End-to-End model before use for Thailand. Generalized simulation system contains future climate data module, runoff prediction module, demand projection module and economic impact evaluation module, which was developed and applied in the study area, Rayong Province, Thailand. Rayong Province is located in the eastern part of Thailand facing water crises such as flood and drought which can occur in the same year and for several consecutive years. Rayong is similar to Shikoku in term of inter-regional water use for provinces and basins, which industrial water and agricultural water use are main water users and water use for industrial can produce GPP of around 14.1 percent of Thailand GDP (NESDB, 2011). There was a conflict between farmers and industry in 2003 caused by low rainfall

and unsystematic water resources management which nowadays there is no simulation system to support integrated water resources management. This caused increasing conflicts between industrial and agriculture sectors and will affect to national scale. In the future with climate change impacts, if Rayong does not have simulation system to support integrated water management, the water situation and conflicts will be worse than the existing condition. From this reason, a generalized simulation system for water resources management under climate change was developed to address the main issues in Rayong and can be extended to other areas.

2. Objective and scope

The objective of this research is to develop simulation system for water resources management under climate change as the following steps;

- Develop future climate data module using GCMs model output for future precipitation projection
- Develop runoff prediction module using hydrological tank model and network tank model for water supply prediction.
- Develop demand projection module using water usage calculation and input-output model for future water demand prediction for future on the basis of present growth rate and climate change affected to agricultural water.
- Develop economic impact evaluation module using water shortage from water demand from economic growth rate and water supply under climate change impact.

We develop and apply simulation system in Rayong Province, Thailand as a case study. The climate data for the study area is collected from observed station and GCM models outputs.

Precipitation data from observed station covered Rayong from 1980-2010 and precipitation data from GCM models outputs covered Rayong and Thailand region from 1980-2000 and 2046-2065 for developing future climate data module and hydrological tank model and network tank model.

Hydrological Tank model is developed using sub basin in Rayong. We have only 6 single tank models to develop runoff coefficient and 5 reservoirs for developing Network tank model from 2007-2010. Network tank is verified using data from 2 observed station at the downstream. Water demand projection module is applied Input-out table in 2009 as base year for future water demand prediction from 1981-2000 and 2046-2065. Irrigation area and Non-Irrigation are also applied for Water demand projection module. Impact assessment of climate change scenario is applied in agriculture water demand. GPP growth rate from 2001-2009 and Provincial economic strategy in 2017 are applied for water demand projection module for future economic scenarios. Economic impact assessment is performed on scenarios of past year (2000), GPP growth rate (2065) and Provincial economic strategy in 2017.

3. Methodology

A generalized simulation system for water resources management was developed under climate change as following figure 3-1 below.

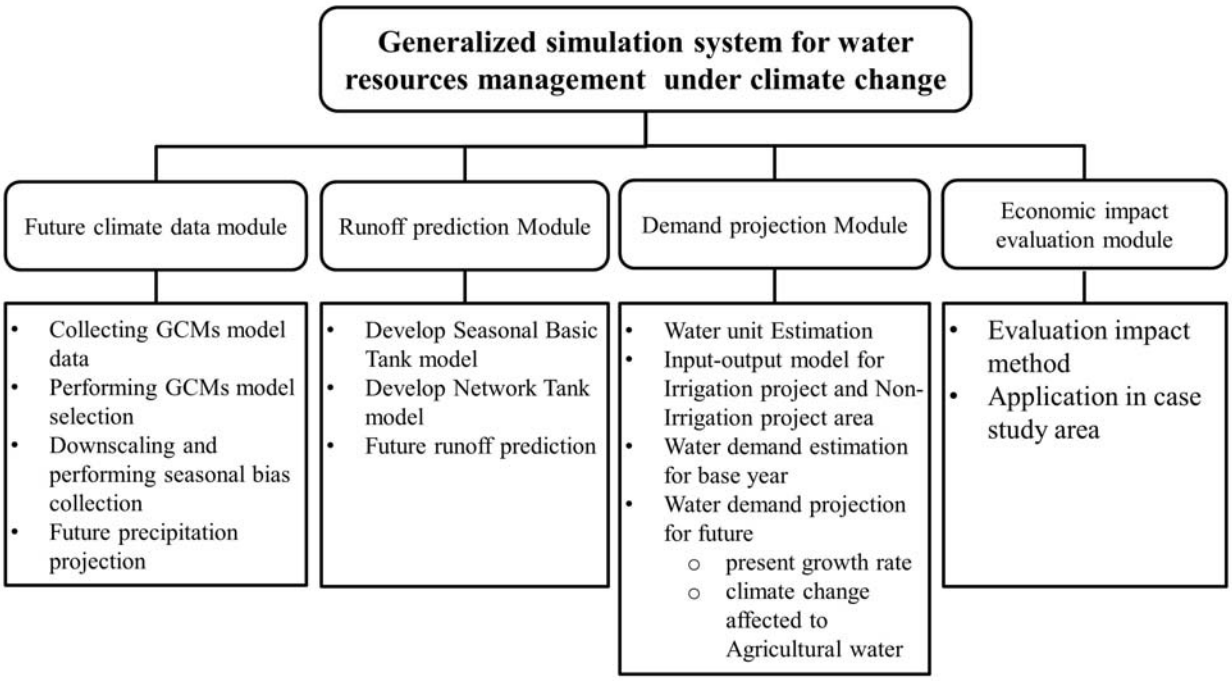


Fig. 3-1 System development for water resources management under climate change

In generalized simulation system for water resources management was integrated with future climate module, Runoff prediction module, Demand projection module and Economic impact evaluation module.

We started to develop future climate data module by collecting GCMs model data and then performing GCMs model selection for the region. Downscaling and Seasonal bias correction were performed with past precipitation data. We used a transfer function from past precipitation data to be used for future precipitation projection. In Runoff prediction module, we developed seasonal basic tank model using past precipitation data to generate runoff parameters for runoff calculation. Network tank model was developed using runoff at sub basin and reservoir operation rule. By using past data for calibration at considered runoff station, developed network tank models were

used for future runoff prediction. Development of demand projection module was performed with water unit Estimation, Input-output model for Irrigation area and Non-Irrigation area, water demand estimation for base year and water demand projection for future present growth rate and climate change affected to Agricultural water demand. Economic impact evaluation module was performed for impact assessment from water shortage and application in case study area.

4. Input and output of simulation system development for water resources management under climate change

Table 4-1 Input and output of simulation system modules (1/5)

Simulation system Modules	Input	Output
1) Develop Future climate data module		
- Collecting GCMs model data	- Past precipitation from GCMs model outputs	- Precipitation from 23 GCMs model outputs from 95^{o} to 109^{o} east longitude and from 2^{o} to 25^{o} north latitude
	- GPCP observed grid data	- GPCP observed grid data from 95^{o} to 109^{o} east longitude and from 2^{o} to 25^{o} north latitude
- Performing GCMs model selection	- Observed precipitation data	- Selected GCMs model
- Downscaling and performing seasonal bias collection	- Selected GCMs model outputs grid data	- Seasonal bias corrected precipitation data at station
- Future precipitation projection	- Future precipitation from GCMs model outputs	- Predicted Future Precipitation data
2) Develop Runoff prediction Module		
- Develop Seasonal Basic Tank model	- Climate data at station - Crop coefficient	Evapotranspiration at sub basin
	- Land use classification - Precipitation at centroid of sub basin - Evapotranspiration at sub basin	- Runoff parameters
	- Precipitation observed data station	- Reliable precipitation data at centroid of sub basin
	- Precipitation at centroid of sub basin - Reliable precipitation data centroid of sub basin - Runoff parameters	- Runoff at sub basin in past

Table 4-1 Input and output of simulation system modules (2/5)

Simulation system Modules	Input	Output
- Develop Network Tank model	- Runoff at sub basin in past	- Water supply in Irrigation area and Non-Irrigation area of sub basin for sub basin in base year - Water shortage in Irrigation area and Non-Irrigation area of sub basin in base year
	- Reservoir operation rule	
	- Agricultural water demand in Irrigation area and Non-Irrigation area in base year	
	- Industrial water demand Irrigation area and Non-Irrigation area in base year	
	- Service water demand Irrigation area and Non-Irrigation area in base year	
	- Domestics use in base year	
- Future runoff prediction	- Runoff at sub basin in future	- Water supply in Irrigation area and Non-Irrigation area of sub basin for sub basin in future year - Water shortage in Irrigation area and Non-Irrigation area of sub basin in future year
	- Reservoir operation rule	
	- Agricultural water demand in Irrigation area and Non-Irrigation area in future year	
	- Industrial water demand Irrigation area and Non-Irrigation area in future year	
	- Service water demand Irrigation area and Non-Irrigation area in future year	
	- Domestics water demand in future year	

Table 4-1 Input and output of simulation system modules (3/5)

Simulation system Modules	Input	Output
3) Develop Demand projection module agricultural water.		
- Water unit Estimation	- Forestry, Rubber, Livestock and Fishery data	- Water unit for agricultural sectors
	- Forestry, Rubber, Livestock and Fishery data	
	- Industrial data	- Water unit for industrial sectors adjusted
	- Industrial Water use unit	
	- Agricultural water use in base year	- Water unit for Input-Output table
	- Industrial Water use in base year	
	- Service Water use in base year	
	- Domestics use in base year	
	- Input-Output table for Rayong	
- Input-output model for Irrigation area and Non-Irrigation area	- Agricultural area	- Input-output model for Irrigation area
	- Irrigation area	
	- Industrial data	
	- Tab water data	
	- Input-Output table for Rayong	
	- Agricultural area - Non-Irrigation area - Input-Output table for Rayong	- Input-output model for Non-Irrigation area

Table 4-1 Input and output of simulation system modules (4/5)

Simulation system Modules	Input	Output
- Water demand estimation in base year	- Agricultural area in Irrigation area	- Agricultural water demand in Irrigation area in base year
	- Agricultural area in Non-Irrigation area	- Agricultural water demand in Non-Irrigation area in base year
	- Evapotranspiration at sub basin	
	- Industrial data	
	- Industrial data	- Industrial Water use in Irrigation area and Non-Irrigation area
	- Water unit for industrial sectors adjusted	
	- Tab water data	- Service water use in base year - Domestics use in base year
	- Population at Municipal area	- Domestics use in base year
	- Water unit for Municipal area	
- Water demand projection for future		
o Using present growth rate	- Agricultural growth rate	- Agricultural water demand for Irrigation area and Non-Irrigation area in future year
	- Industrial growth rate	- Industrial water demand Irrigation area and Non-Irrigation area in future year
	- Service growth rate	- Service water demand Irrigation area and Non-Irrigation area in future year
	- Input-Output table for Irrigation area and Non-Irrigation area for Rayong	
	- Population growth rate	- Domestics water demand in future year

Table 4-1 Input and output of simulation system modules (5/5)

Simulation system Modules	Input	Output
- Water demand projection for future		
o Using climate change affected to Agricultural water	- Future climate parameter	Evapotranspiration at sub basin for future
	- Agricultural area	- Agricultural water demand for Irrigation area and Non-Irrigation area in future year
o Using Provincial economic plan	- Agricultural growth rate	- Agricultural water demand for Irrigation area and Non-Irrigation area in Irrigation area in future year
	- Industrial growth rate	- Industrial water demand Irrigation area and Non-Irrigation area in Irrigation area in future year
	- Services growth rate	- Service water demand Irrigation area and Non-Irrigation area in Irrigation area in future year
4) Develop Economic impact evaluation module		
- Evaluation impact method	- Water shortage in Irrigation area and Non-Irrigation area of sub basin in base year	- Impact in Irrigation area and Non-Irrigation area of sub basin in base year
	- Water shortage in Irrigation area and Non-Irrigation area of sub basin in future year	- Impact in Irrigation area and Non-Irrigation area of sub basin in future year
- Application in case study area	- Example of a case study in past year	- Impact in Irrigation area and Non-Irrigation area of sub basin in base year
	- Example of a case study in future year	- Impact in Irrigation area and Non-Irrigation area of sub basin in future year

5. Future climate data module

Development of climate data module was performed in the following steps: 1) collecting GCMs model data 2) performing GCMs model selection 3) downscaling and performing seasonal bias collection and 4) Future precipitation projection

- ***Collecting GCMs model data***

The unavoidable impacts of climate change are likely to affect the world's natural and socio-economic systems in the next several decades. The Fourth Assessment Report (AR4) of the Intergovernmental Panel on Climate Change (IPCC) reported that Current global climate warming will impact future water resources availability (Susan et al., 2007), especially future precipitation, reflected in uncertainty of precipitation such as an increase of rainless days and extreme events. Precipitation is the key component of water resources, and is likely to generate runoff for an area; therefore reliable current precipitation data is essential to predict future runoff.

Lawrence (1962) reported that the climate in Thailand is directly affected by the Southern Local Wind, the Tropical Monsoon, and the Southern West Monsoon, and thus can be characterized as 3 seasons: dry season, first rainy season, and second rainy season, which can also reflect water resources availability in terms of precipitation since high precipitation usually generates high runoff in the rainy season, especially in September and October (Jampanil D. et al., 2013).

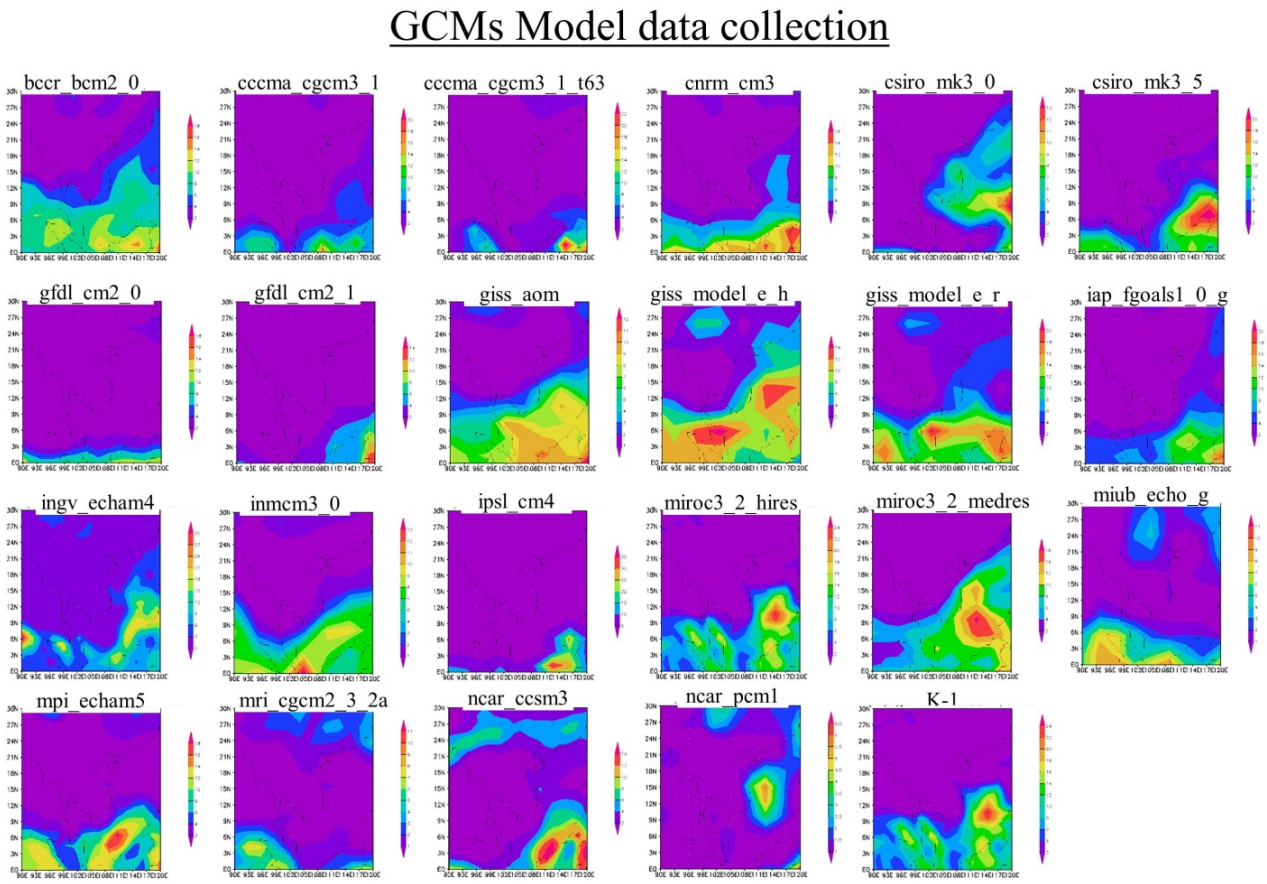
Precipitation data from global climate model simulations (GCMs), which are simulated future climate datasets, can be used for future runoff prediction. GCMs are a mathematical model of the general circulation of a planetary atmosphere or ocean and a key component of global climate models along with sea ice and land-surface components. GCMs are widely applied for weather forecasting, understanding the climate, and projecting climate change and GCMs was designed for decade to century time scale climate applications. Coarse spatial resolution of GCMs could express unrealistic parameters for a regional area (Henrik F. and Uffe A., 2005) (Sharma D., 2007) (Kazi Farzan

A. et al., 2013) (Hironori I. et al., 2011), so assessment should be performed carefully for model selection to ensure that the GCMs are reliable before applying them to a regional area (Jampanil D. et al, 2014).

This chapter, we started to study climate change data analysis from collecting GCMs model from IPCC climate change report that are widely applied for weather forecasting, understanding the climate, and projecting climate change and contains scenarios of population growth and socio-economic development. GCMs model data is necessary to be used for future runoff prediction from hydrological tank model. We collected the time series of 23 GCMs models for daily and monthly precipitation data from 1981-2000 and 2046-2065 from DIAS system, which covers Thailand region. All of 23 GCMs model data covered Thailand region are from 95^{o} to 109^{o} east longitude and from 2^{o} to 25^{o} north latitude. For this study, Global Climate Models (GCMs) were collected, as shown in Fig.5-1, with annual average precipitation during 1981 to 2000 on 23 GCMs model data; i.e., bcc_bcm2, cccma_cgcm3_1, cccma_cgcm3_1_t63, cnrm_cm3, csiro_mk3_0, csiro_mk3_5, gfdl_cm2_0, gfdl_cm2_1, giss_aom, giss_model_e_h, giss_model_e_r, iap_fgoals1_0_g, ingv_echam4, inmcm3_0, ipsl_cm4, k-1, miroc3_2_hires, miroc3_2_medres, miub_echo_g, mpi_echam5, mri_cgcm2_3_2a, ncar_ccsm3_0, and ncar_pcm1. Duration for GCMs model selection analysis (1981-2000) was selected to be same as coupled Model Inter-comparison Project phase 3 (CMIP3) (Patricia Ann J. et al., 2012), (Mohamed R. et al., 2013). Atmosphere-Ocean General Circulation Models (AOGCMs) provide credible quantitative estimates of future climate change. The future climate data (SRESA1B scenario) can be downloaded from this website, http://dias.tkl.iis.u-tokyo.ac.jp/model-eval/. GPCP, Global precipitation is developed from over 6,000 rain gauge stations, and satellite geostationary and low-orbit infrared, passive microwave, and sounding observations, have been merged to estimate monthly rainfall on a 2.5-degree global grid from 1979 to the present, (http://www.gewex.org/gpcp.html).

All of 23 GCMs model data would be performed spatial analysis based on the best correlation and the least root mean square error (RSME) method at

following GCMs model selection step. For GCMs model data, precipitation parameter from 1981 to 2000 can be used to evaluate relationship by spatial correlation and root mean square error (RSME) method mapping to precipitation observed data. GPCP data from the Asian precipitation-highly resolved observational data integration toward the evaluation of water resources management data for Asia has been estimated monthly rainfall from 1979 to the present.



SOURCE : GCM model : Atmosphere-Ocean General Circulation Models (AOGCMs) provide credible quantitative estimates of future climate change. The future climate data (SRESA1B scenario) can be downloaded from this website, http://dias.tkl.iis.u-tokyo.ac.jp/model-eval/.

Fig. 5-1 GCMs model outputs from IPCC collected for study climate change data analysis

This observed global grid (0.25^{o}x0.25^{o}) precipitation dataset can be used to evaluate relationship by spatial correlation (Scorr) and spatial root mean square error (RSME) method (Patricia Ann J., 2012), (Mohamed R., 2013)

with GCMs model. Both monthly spatial correlation and monthly spatial root mean square error (RSME) were compared with each average value of monthly precipitation parameter as score for model selection by using followed equation:

- ***Performing GCMs model selection***

This study presents a model selection technique for assessing the reliability of precipitation data of GCM outputs. This technique uses spatial analysis of the historical observed monthly precipitation data from GPCP which is mapped onto monthly precipitation data from 23 GCM model outputs. In this study, spatial analysis of the relationship between monthly precipitation data from 23 GCM models and GPCP was expressed as a score based on criteria including spatial correlation and root mean square error (RMSE). Model selection was based on assessment of the past precipitation data of 23 GCM model outputs distributed in the IPCC Fourth Assessment Report (AR4) (Rajendra and Andy, 2007). With GCM model selection approach, spatial analysis of the historical observed monthly precipitation data from GPCP was performed by mapping it onto monthly precipitation data of 23 GCM model outputs and then using criteria such as score of spatial correlation and RMSE to assess GCM models for model selection (Patricia Ann J., 2012) (Jampanil D. et al., 2014). The best GCM models were selected according to the criteria and were then proposed as the suitable GCM models for the Thailand region.

Model selection was performed in precipitation for study of the area in the Thailand region from 95^{o} to 109^{o} east longitude and from 2^{o} to 25^{o} north latitude, an area directly affected by Southern Local Wind, Tropical Monsoon, and Southern West Monsoon. The effect of the wind and monsoons can be characterized as 3 seasons: dry season (Dec to Feb), first rainy season (Mar to Jul) and second rainy season (Aug to Nov), and the two rainy season can generate an average annual rainfall around 1,500 mm/year. For several years, both flood and drought have been experienced in the same year. These instances of uncertainty of rainfall in the region suggest that current rainfall patterns should be considered carefully for future precipitation prediction for

handling possible future crises. As well, outputs from precipitation predictions should be reliable for application in future water resources managements and disaster mitigation for the Thailand region. Global Climate Models (GCMs) are a source of future simulated climate grid data. Their outputs contain precipitation consisting of both past data and future data. For application of precipitation data to climate change impact assessments, model selection should be implemented carefully since the model should be appropriate for past observed rainfall pattern to ensure the reliability of the GCM models before they are applied to a regional area. In this study, model selection was based on assessment of the historical precipitation data of 23 GCM model outputs from 1981 to 2000, i.e., bcc_bcm2, cccma_cgcm3_1, cccma_cgcm3_1_t63, cnrm_cm3, csiro_mk3_0, csiro_mk3_5, gfdl_cm2_0, gfdl_cm2_1, giss_aom, giss_model_e_h, giss_model_e_r, iap_fgoals1_0_g, ingv_echam4, inmcm3_0, ipsl_cm4, k-1, miroc3_2_hires, miroc3_2_medres, miub_echo_g, mpi_echam5, mri_cgcm2_3_2a, ncar_ccsm3_0, and ncar_pcm1, published in the IPCC Fourth Assessment Report (AR4). Fig. 5-2 shows annual average precipitation of GPCP and 23 GCM model outputs from 1981 to 2000**.** GPCP is a database of precipitation data providing reliable global precipitation grid data that have been developed by careful combination of rainfall gauge stations, satellite-based rainfall and sounding observations over land and over global oceans from 1979 to the present. Model selection was performed by mapping monthly precipitation data from GPCP onto monthly precipitation data from 23 GCM model outputs from 1981 to 2000, and then using criteria such as spatial correlation and RMSE score to assess those GCM models as candidates for application to water resources management in the regional area. Fig. 5-3 shows the framework for model selection. The main steps of model selection are: 1) collecting precipitation from the 23 GCM outputs and GPCP, covering the Thailand region from 95^{o} to 109^{o} east longitude and from 2^{o} to 25^{o} north latitude; 2) performing spatial analysis of that precipitation data by mapping the 23 GCM outputs onto precipitation data from GPCP from 1981 to 2000; and 3) using criteria such as

scores of spatial correlation and RMSE for assessment of GCM models for suitability.

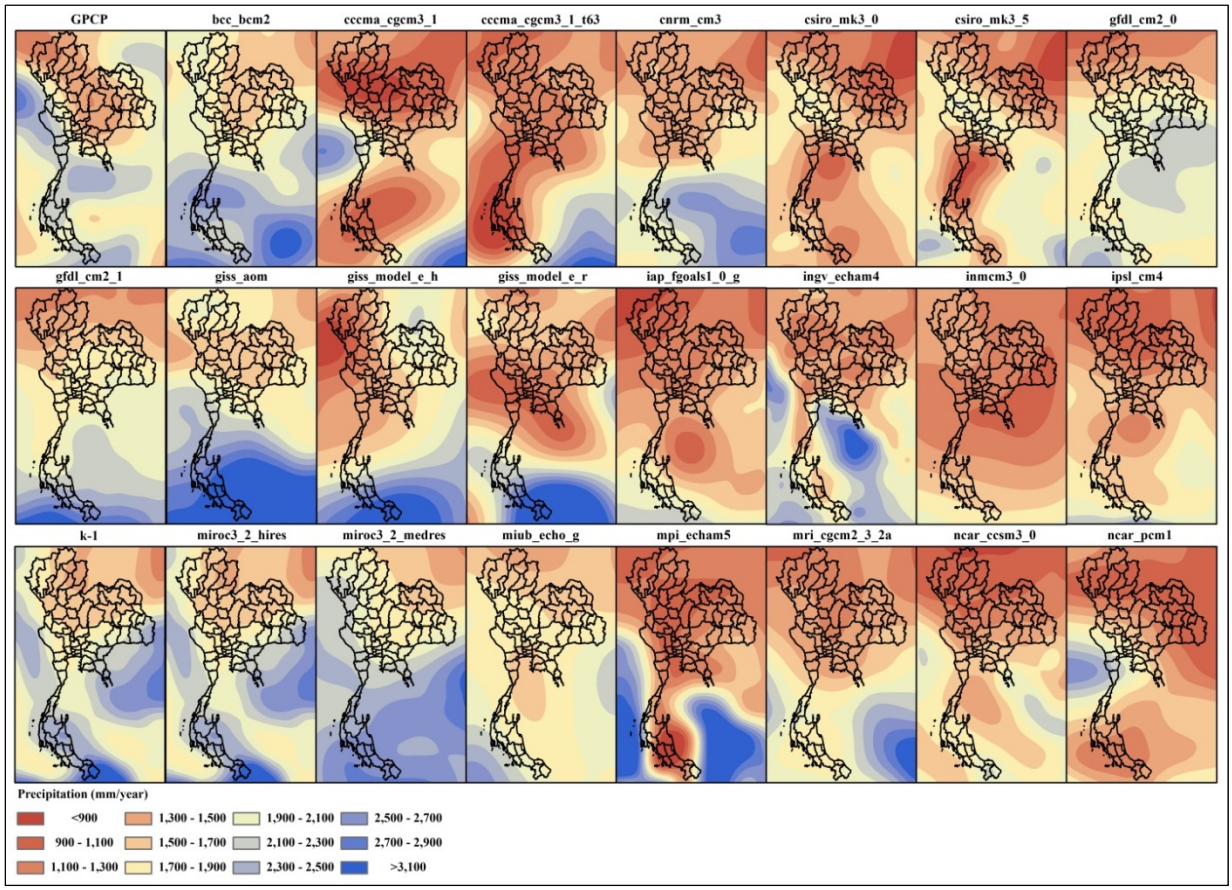


Fig. 5-2 Annual average precipitation of GPCP and 23 GCM model outputs from 1981 to 2000

Equation 5-1 and Equation 5-2 below represent the spatial correlation and RMSE respectively. The score criteria are evaluated by using rules based on values for spatial correlation (Scorr) and spatial root mean square error (RSME) of monthly precipitation data. The rules reflecting the score criteria below were applied to evaluate monthly values of Scorr and RSME on relationship with the 23 GCM models and GPCP, and were compared to average monthly values of Scorr and RSME from 1981 to 2000.

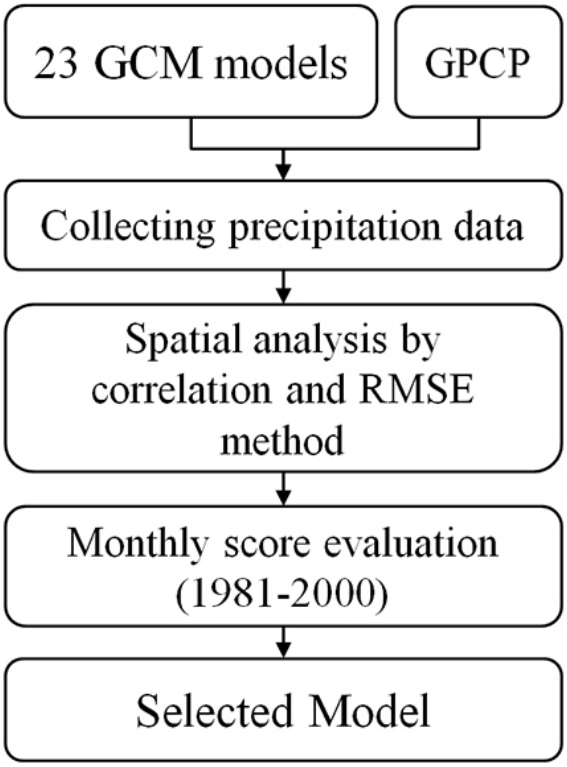


Fig. 5-3 The framework for model selection

The rules are;

if monthly Scorr $\geq$ avg. monthly Scorr, index is 1,
if monthly Scorr < avg. monthly Scorr., index is 0,
if monthly RMSE $\geq$ avg. monthly RMSE, index is 0,
monthly RMSE < avg. monthly RMSE, index is 1.

Then if both Scorr index and RMSE index are 1 then score is 1. If Scorr index and RMSE index are different, score is 0. Finally, if both Scorr index and RMSE index are 0 then score is (-1).These score criteria were assessed separately using the Scorr and RSME values for each month, and then aggregated as a score for each GCM model. With the score criteria defined, the aggregated score from each model ranged from minimum to maximum value, and then the scores for each model were considered by comparing them to the 3rd quartile of the range order. The GCM models with best scores according to the 3rd quartile criteria were then proposed as suitable GCM models for application to the Thailand region.

$$Scorr = \frac{\sum_{i=1}^{n}(X_{obs,i} - \overline{X_{obs}}) \cdot (X_{model,i} - \overline{X_{model}})}{\sqrt{\sum_{i=1}^{n}(X_{obs,i} - \overline{X_{obs}})^2 \cdot \sum_{i=1}^{n}(X_{model,i} - \overline{X_{model}})^2}} \quad (5\text{-}1)$$

$$RMSE = \sqrt{\frac{\sum_{i=1}^{n}(X_{obs,i} - X_{model,i})^2}{n}} \quad (5\text{-}2)$$

- ***Downscaling and performing seasonal bias correction***

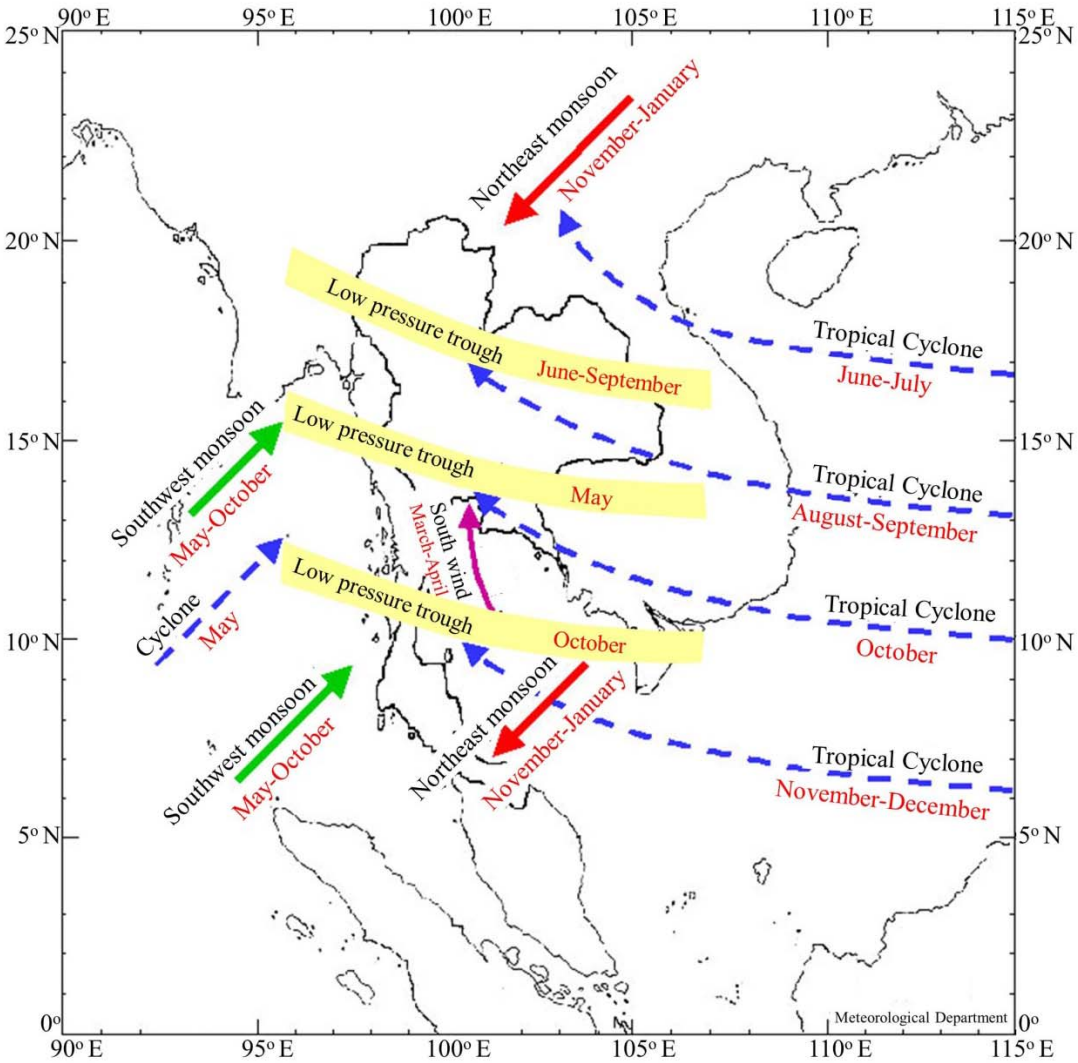
In past decades, observed daily climate data have usually been sufficiently available to perform such impact studies at fine resolution effectively; therefore this study applies daily precipitation data for the climate change impact assessment at fine scale. Global Climate Models (GCMs) are sources of future simulated climate grid data and their outputs reflect uncertainties and bias corrections of climate data, which can be used for the impact assessments of climate change. However, all GCM models require a large scale bias correction that can discard significant errors, which are necessary to be performed before use in regional impact analysis. Use of GCM Models at coarse resolution is restricted to the analysis of climate change impact; downscaling of GCM outputs at fine scale is necessary (Henrik F. et al., 2005), (Sharma D. et al., 2007), (Kazi Farzan A et al., 2013). For regional area climate pattern analysis, there are two approaches to the downscaling of GCM outputs: dynamic downscaling using a Regional Climate Model (RCM); and statistical downscaling. Coarse resolution GCM outputs are performed using dynamical downscaling, which requires large scale computation (Cho Thanda N. et al., 2012), (Mohamed R. et al., 2013), (D´ıez E. et al., 2005), so it may not be practicable for daily climate data and spatial grid data of various GCM models. However the downscaling effectiveness can be improved by statistical downscaling of GCM at fine scale, in which case regional climate data is especially useful since it can reveal the real seasonal climate pattern, which can be used to improve the accuracy of future predictions also as well.

Global Climate Models (GCMs) are sources of future simulation climate grid data and their outputs can be used for assessments of the impact of

climate change. These GCM model outputs still have a bias problem, but if this problem is solved with bias correction using past observed rainfall data, these GCM model outputs should be reliable for use in future predictions. Most studies of this type usually do bias correction for daily data and monthly data while in this study performs bias correction based on seasonal climate characteristics using statistical downscaling of daily precipitation data of six GCM models for Rayong Province in Eastern Coastal Thailand to improve the climate data resolution. Seasonal bias correction was performed on monthly precipitation data which is accumulated from daily precipitation data classified on the basis of the rainy types, i.e. rainless, normal rainy day, and extreme rainy day. The monthly CDF of that GCM output was mapped onto the monthly CDF of observed station data and the inverse of monthly Gamma CDF then yields bias corrected precipitation. However here, seasonal bias correction between selected GCM models and past observed station data was performed with best fitting on a large number of correlations.

Figure 5-4 shows the Southern Local Wind, Tropical Monsoon, and Southern West Monsoon affect to the Thailand region. Seasonal precipitation data analysis was performed here, for the Thailand region from 95^{o} to 109^{o} east longitude and from 2^{o} to 25^{o} north latitude. That area, Rayong province in Eastern coastal Thailand, is directly affected by Southern Local Wind, Tropical Monsoon, and Southern West Monsoon, so the climate can be classified into 3 seasons: dry season (December to February), first rainy season (March to July) and second rainy season (August to November).

For analysis of past observed rainfall patterns for Rayong province, observed daily rainfall data from eight essential metrological gauge stations, 459201-Muang, 459202-Ko Sichang, 459203-Phatthaya Meteorological Observation, 459204-Sattahip, 459205-Laem Chabang, Chon buri province, and 478201-Rayong Meteorological Observation, 478301-Huai Phong Agrometeorological station, Rayong province, and 480201- Muang Chanthaburi province, were acquired for bias correction with GCM model outputs from 1981 to 2000. Figure 5-5 shows essential metrological gauge stations for Rayong province.



Source: Lawrence S. The Rainfall of Thailand: The U.S. Army Quartermaster Corps, Research and Engineering Command; 1962. Project No.: 7-83-01-006.

Fig. 5-4 The Southern Local Wind, Tropical Monsoon, and Southern West Monsoon affect to the Thailand region.

Bias correction was performed on the GCM model outputs analyzed in this study, six GCM models selected from among 23 GCM models provided in the Data Integration and Analysis System (DIAS). The six models are gfdl_cm2_0, gfdl_cm2_1, ingv_echam4, inmcm3_0, k-1, miroc3_2_hires and ncar_ccsm3_0, all had been compared to GPCP past data from 1981 to 2000. All of the six GCM model outputs selected were then used as daily precipitation data for static downscaling and bias correction. Figure 5-6 shows six models and GPCP covering the Thailand region. For this study, all of the

six selected GCM models were used as daily precipitation data for statistical downscaling and bias correction steps. Figure 5-7 shows the framework of this study.

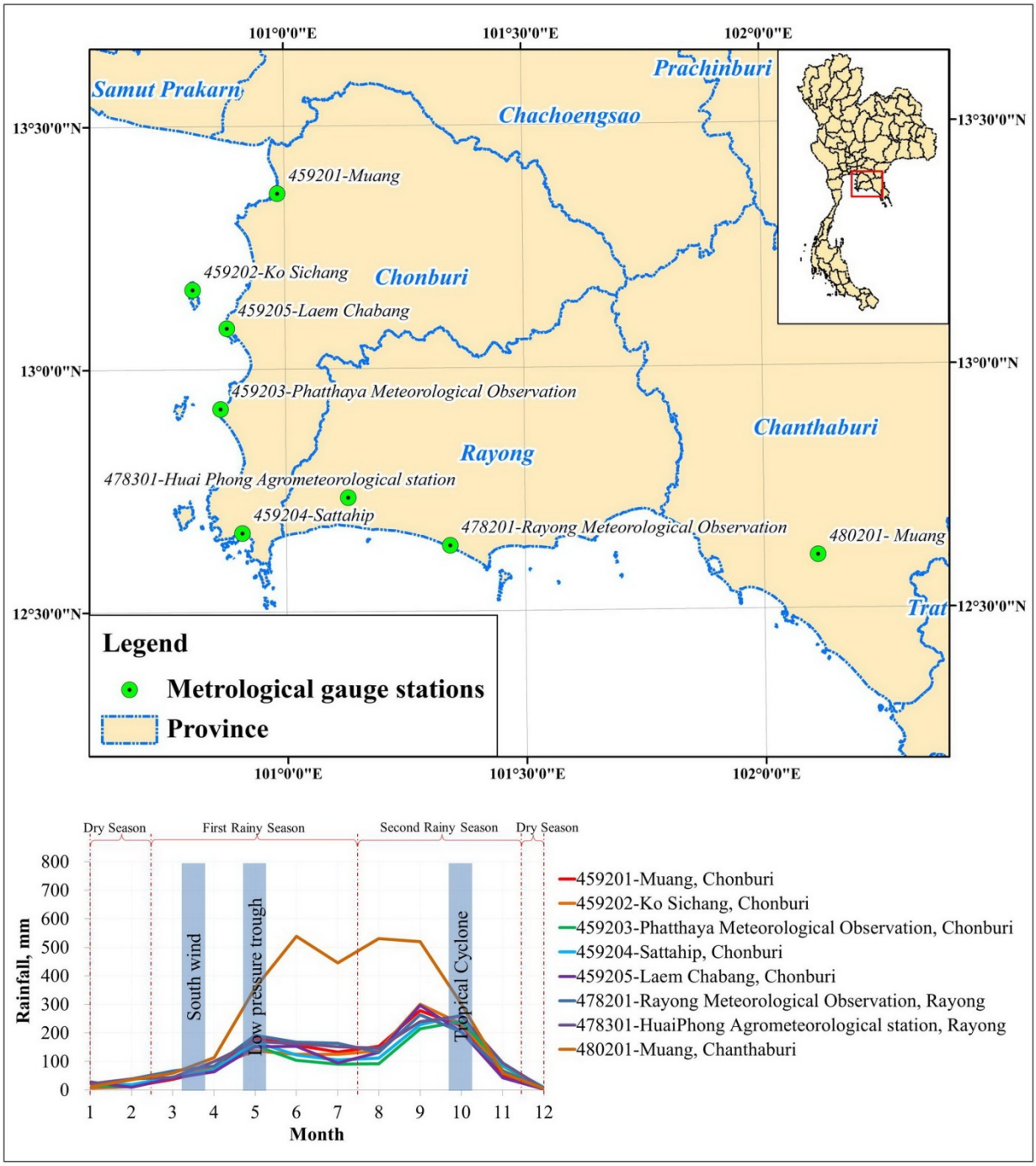
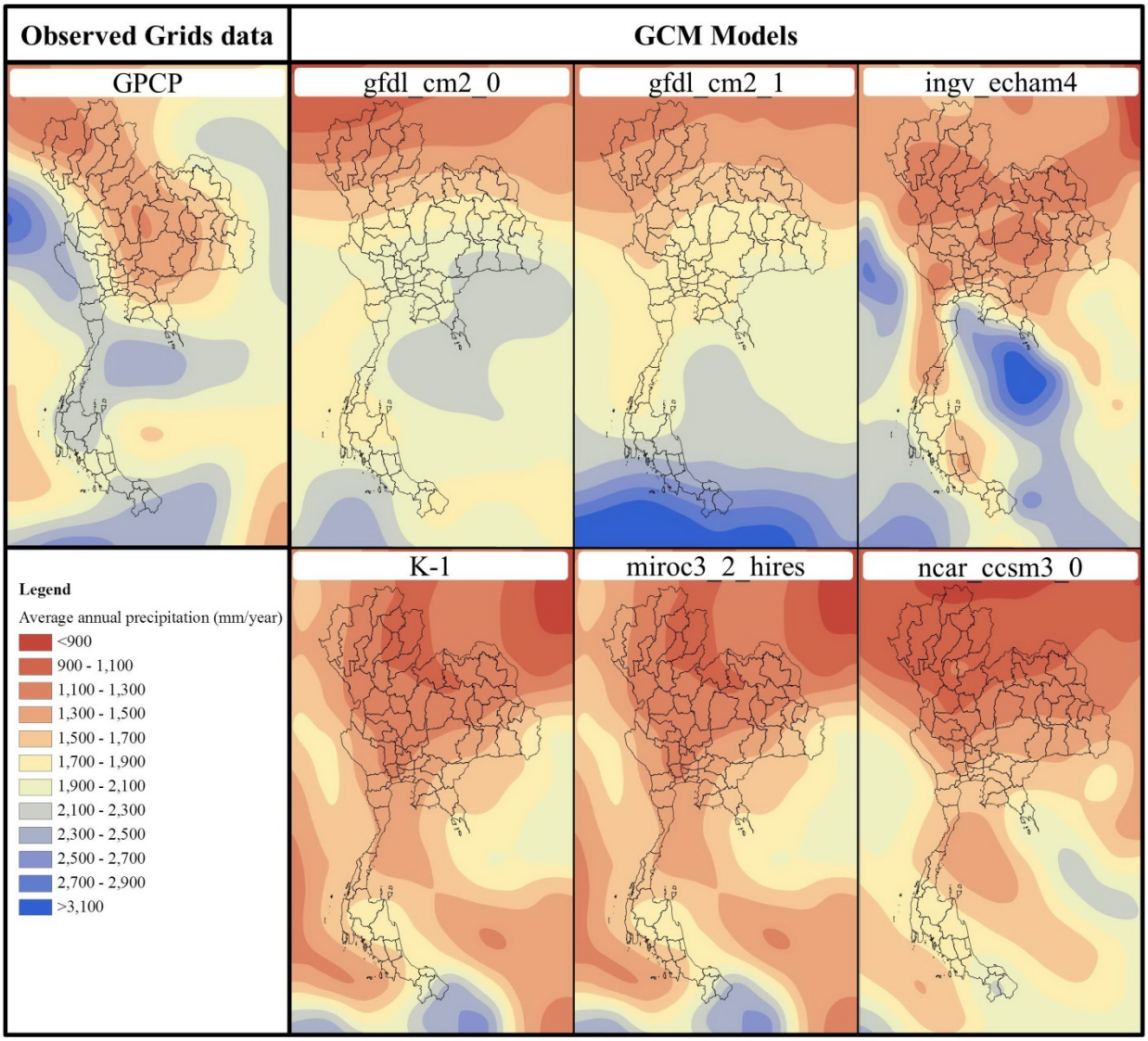


Fig. 5-5 Essential meteorological gauge stations for Rayong Province.



Source : Jampanil D, Seigo N, Bongochgetsakul N, Suttinon P. Assessment on current global climate model simulations based on precipitation data by model selection for Thailand. IJAST 2014, Feb 15; (Special Issue):184-7.

Fig. 5-6 Six selected GCMs models and GPCP covering the Thailand

The main steps of GCM output analysis are: collecting the six selected GCM outputs, downscaling coarse resolution onto observed station data and bias correcting the downscaled GCMs outputs. The daily precipitation data of the GCM outputs was collected and then analysed as follows: statistical downscaling using Inverse distance method, followed by seasonal bias correction of GCM precipitation outputs with the GDF parameters of observed data.

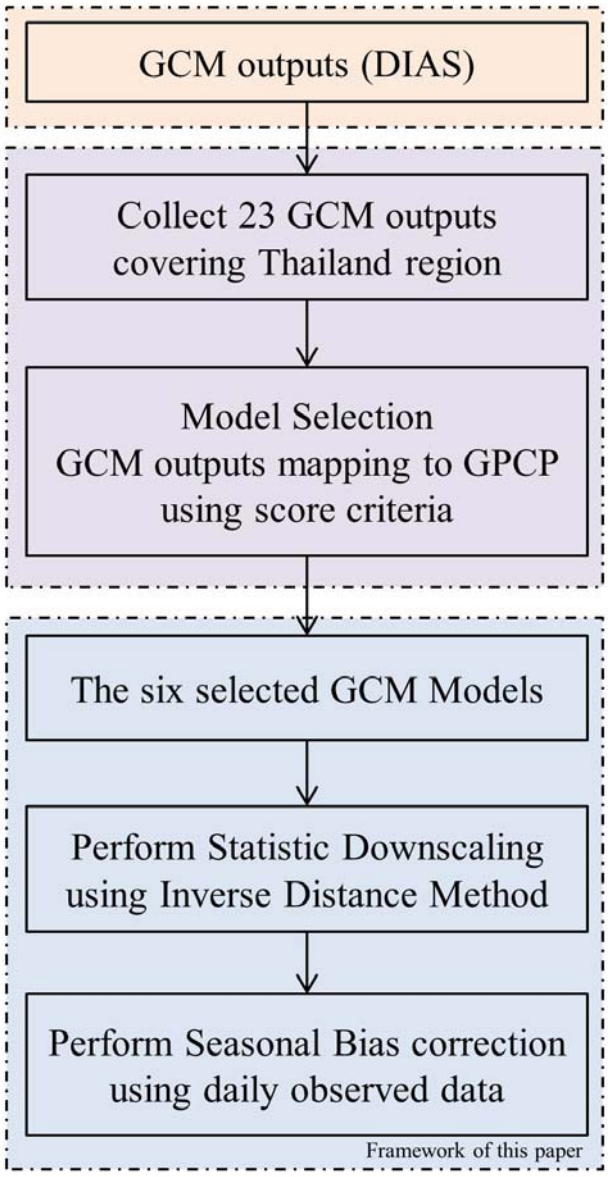


Fig.5-7 The procedure of this study.

Coarse resolution GCM outputs can be effectively downscaled by statistical downscaling of GCM at fine scale using the Inverse distance method, as shown in equation 5-3 and Fig. 5-8 below, where p is an arbitrary positive real number called the power parameter (typically, p is 2), (x,y) are the coordinates of the downscaling point and (x_i, y_i) are the coordinates of GCMs grid points.

$$F(x,y) = \sum_{i=1}^{n} w_i h_i \quad (5\text{-}3)$$

$$w_i = \frac{{h_i}^{-p}}{\sum_{i=1}^{n} {h_i}^{-p}}$$

$$h_i = \sqrt{(x - x_i)^2 + (y - y_i)^2}$$

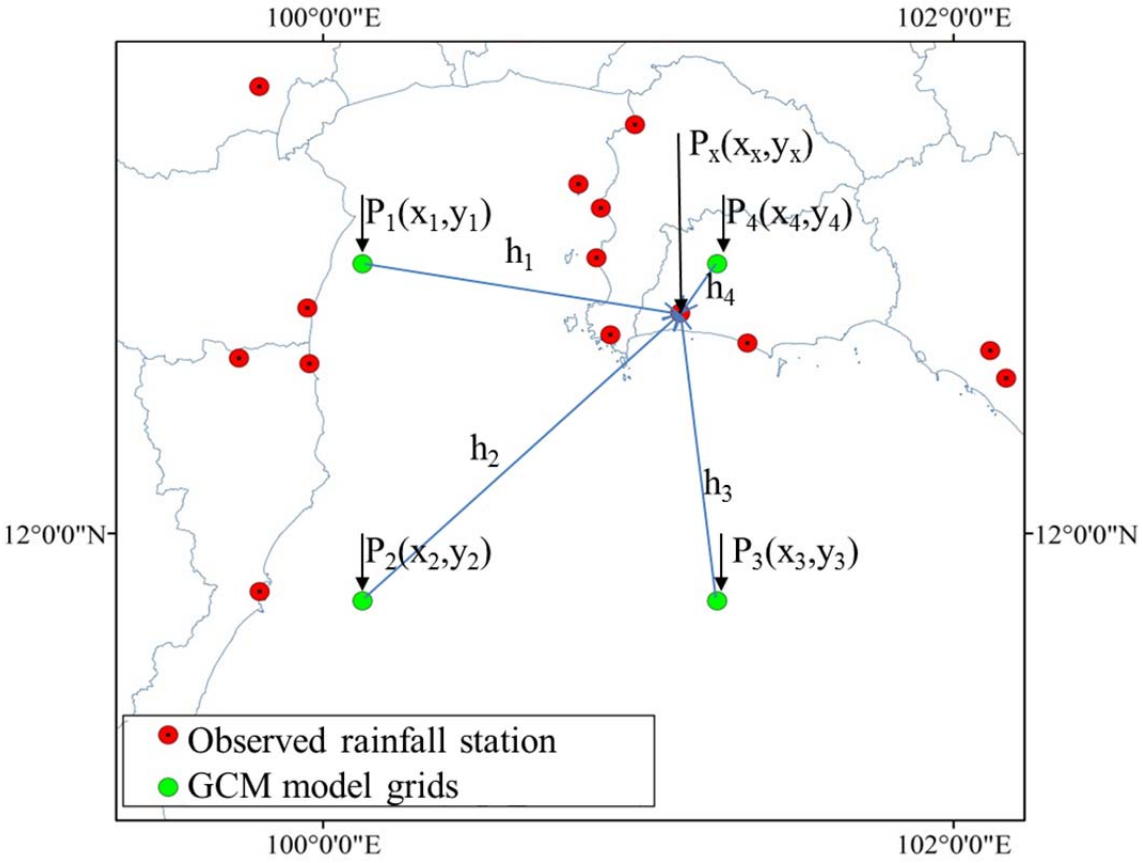


Fig. 5-8 The statistical downscaling method of this study.

For seasonal bias correction, the daily precipitation data of the selected GCM outputs are defined corresponding to the seasonal rainfall characteristics of Rayong province: dry season (December to February), first rainy season (March to July) and second rainy season (August to November). To achieve reliable bias correction of precipitation data characteristics, the daily precipitation data was separated into rainless days, normal rainy days, and extreme rainy days. Due to the fact that GCM outputs were performed with a combined microphysics scheme that includes failures in the simulations, GCM

outputs are displayed as large scale wet days and thus cannot characterize actual rainy events and extreme events such monsoon season. Separation into these three types of precipitation event is necessary for performing seasonal bias correction, which should be performed with consideration for local distinct seasons, e.g. dry and wet seasons, for the Rayong region. Fig. 5-9 shows this study's approach to seasonal bias correction, consisting of a three step processing of rainless days, normal rainy days and extreme rainy days of GCMs outputs (Jampanil D. et al., 2013), as follows.

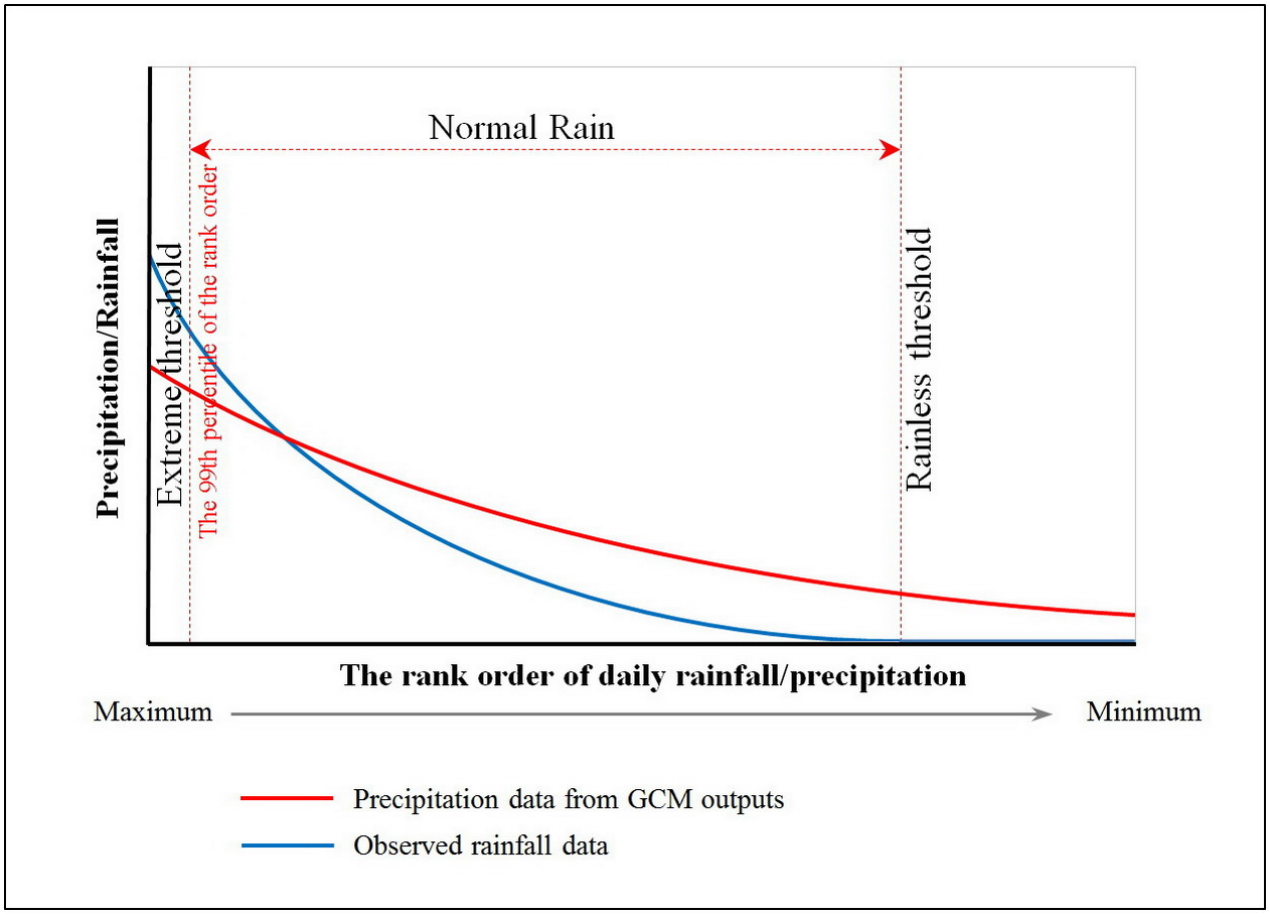


Fig. 5-9 Study's approach to seasonal bias correction

a. Step 1 : Rainless days correction

If there are a large number of wet days, GCM outputs cannot reasonably represent the common characteristics of rainless days. Most wet days are represented as drizzle, which can result in unrealistic parameterization. To

handle this problem, a rank order approach can be used in the bias correction of rainless data, as follows.

i) Values of daily precipitation data of both observed stations and GCM outputs are ranked in descending order.

ii) In observed daily precipitation data, rainless days are defined by a threshold value of 0 mm/day. This is then used to define the corresponding values of rainless day in all GCM outputs.

In the daily precipitation data in GCM outputs, all values equal to or less than this rank order are then set to zero. This threshold value is also used for correcting rainless days of future GCM outputs.

b. Step 2 : Extreme rainy days correction

Most of the daily precipitation data of GCM outputs undervalue extreme rainfall to daily observed data. To compensate for this, suitable bias correction should be done to adjust for the fact that these GCM outputs values equal daily observed data. Then GCM outputs should be mapped onto the probability distribution of observed rainfall data. In the same rank order, the threshold value of extreme events is determined by considering the extreme values, i.e. the 99^{th} percentile of the rank order of daily observed rainfall. Values above or equal to this threshold are defined as extreme events. We set the number of extreme events in GCM outputs to equal the number of extreme events of observed rainfall data. This definition is necessary for adjusting precipitation value by the same days of the rank order of extreme events of daily observed rainfall data. The extreme events of GCM outputs with values greater than or equal to the threshold value were fitted to the extreme events of daily observed rainfall data using the General Parieto Distribution (GPD). The parameters GPD (Anna M. S. et al. 2012), shape (k), scale (α) and location (μ), were used for correcting GCM extreme events. The probability distribution of an extreme event (x) is defined by equation (5-4) below, where all values of the extreme events are greater than or equal to the extreme threshold (u). Equations (5-5) and (5-6) below are the General Parieto Distribution and the Cumulative General Parieto Distribution respectively. The parameters of the distribution were calculated using the mean (μ) and

variance (σ^2) of the extreme events. The shape, scale and location parameters of the extreme events of observed rainfall data were used as the fitting parameters for the GPD of extreme events in GCM precipitation outputs. The best fit of the GPD of extreme events in GCM precipitation outputs was applied to the calculation of the corrected values of extreme events for GCM precipitation outputs by means of the inverse GPD method. This bias correction step for past extreme events of GCM outputs can be applied to all future extreme events in GCM precipitation outputs.

$$\mathrm{F}_u(\mathrm{y}) = Pr\{X - u \le x | X \ge u\} = \frac{F(x)-F(u)}{1-F(u)} \tag{5-4}$$

$$\mathrm{f}(\mathrm{x};\mathrm{k},\alpha,\mu) = \begin{cases} \frac{1}{\alpha}\left(1 + k\frac{(x-\mu)}{\alpha}\right)^{-1-\frac{1}{k}} & if \;\; k \neq 0 \\ \frac{1}{\alpha} exp\left(-\frac{(x-\mu)}{\alpha}\right) & if \;\; k = 0 \end{cases} \tag{5-5}$$

$$\alpha = \frac{1}{2}\mu\left(\frac{\mu^2}{\sigma^2}\right) + 1$$

$$k = \frac{1}{2}\left(\frac{\mu^2}{\sigma^2} - 1\right)$$

$$\mathrm{F}(\mathrm{x};\mathrm{k},\alpha,u) = \begin{cases} 1 - \left(1 + k\frac{(x-\mu)}{\alpha}\right)^{-\frac{1}{k}} & if \;\; k \neq 0 \\ 1 - exp\left(-\frac{(x-\mu)}{\alpha}\right) & if \;\; k = 0 \end{cases} \tag{5-6}$$

c. Step 3 : Normal rainy days correction

A normal rainy days correction accumulates the range of rainless and extreme rainfall of observed data, and the range of corrected zero and extreme precipitation of GCM outputs. Monthly data was accumulated from this range and normal rainy data and was expressed using the gamma distribution function (GDF) and the cumulative gamma distribution function (CGDF), as shown in Eq. (5-7) and Eq. (5-8) respectively. The parameters of GD (Singh P. V. et al., 1995), shape (α) and scale (β), were calculated using the mean (μ) and variance (σ^2) of monthly data. Using these parameters, bias correction was performed by mapping the cumulative gamma distribution of monthly GCM precipitation outputs onto observed data on the basis of seasonal

characteristics, e.g. dry season (December to February), first rainy season (March to July) and second rainy season (August to November). With this seasonal bias correction defined, the inverse of the cumulative gamma distribution of the past monthly GCM precipitation outputs was applied to the calculation of the corrected values of the past monthly GCM precipitation outputs with the GDF parameters of observed data. This bias correction step for GCM outputs can be used as a transfer function for future normal precipitation of GCM outputs.

$$f(x;\alpha,\beta) = \begin{cases} \frac{x^{\alpha-1}e^{-\frac{x}{\beta}}}{\beta^{\alpha}\Gamma(\alpha)} & if\ \ x > 0 \\ 0 & if\ \ otherwhise \end{cases} \tag{5-7}$$

$$\alpha = \frac{\mu}{\sigma^2}$$

$$\beta = \frac{\mu^2}{\sigma^2}$$

$$F(x;\alpha,\beta,t) = \begin{cases} \frac{\frac{1}{\beta^{\alpha}\Gamma(\alpha)}\int_0^x t^{\alpha-1}e^{-\frac{t}{\beta}}dt}{\beta^{\alpha}\Gamma(\alpha)} & if\ \ x > 0 \\ 0 & if\ \ otherwhise \end{cases} \tag{5-8}$$

- ***Future precipitation projection***

We used the transfer function for future precipitation of GCM outputs with the GDF parameters of corrected past GCM data outputs that are shown in following Eq. (5-9).

$$P_{cor} = CDFp^{-1}(P_p ;\alpha obs, \beta_{obs}) \tag{5-9}$$

Where;

Pcor = Corrected precipitation parameter

P_p = GCMs precipitation parameter in past year

$CDFp^{-1}$ = Inverse cumulative gamma distribution function (CGDF) on past precipitation parameter of selected GCMs model with α_{obs} and β_{obs}

Future representative time period of precipitation parameter was determined in 2046-2065 by using selected GCM model with good correlation

on monthly pattern in past year. With the future seasonal projection defined, the inverse of the cumulative gamma distribution function of the past monthly GCM precipitation outputswas applied to the calculation of the predicted values of the future monthly GCM precipitation outputs with the GDF parameters of corrected past GCM data For future precipitation prediction, monthly CGDF of future GCMs model data was performed mapping to monthly CGDF of corrected GCMs model data as following Eq. (5-10).

$$Pf_{cor} = CDF_f^{-1}(P_f;\alpha cor, \beta cor) \quad (5\text{-}10)$$

Where

Pf_{cor} = Predicted precipitation parameter

P_f = GCMs precipitation parameter in future year

CDF_f^{-1} = Inverse cumulative gamma distribution function (CGDF) on future precipitation parameter of selected GCMs model with α_{cor} and β_{cor}

- ***Results and discussion***

For climate model selection, GCM analysis suggests that coarse spatial resolution of GCMs could generate unrealistic parameters for a regional area since precipitation data from some GCM outputs would not reliable represent regional precipitation pattern for the Thailand region. Model selection was performed carefully to ensure that the precipitation data from GCM outputs were reliable before applying them to water resources management in the regional area.

The results of this study suggest that the selected GCM models best reflect the relationship among the 23 GCM models and GPCP, which were evaluated in terms on the basis of score criteria from monthly Scorr and RSME values.

In Table 5-1 and Table 5-2, it can be seen that the spatial analysis of monthly data from the 23 GCM models reflects a strong correlation (0.77-0.84) and low root mean square error (1.8-2.8) with GPCP for assessment of precipitation during the dry season (Dec-Feb). This result indicates that most GCM models can be used effectively to simulate outputs such as precipitation data in Thailand region for dry season.

At the beginning of the first rainy season seasons (Mar-Apr), most of the monthly precipitation data from GCM outputs reflects a strong correlation among the 23 GCM models and GPCP in the first rainy season (Mar-Jul). Among the results of spatial analysis, there was a weak correlation and high root mean square error around the middle of the first rainy season (May-June) since the climate in that season was influenced by the Southern Local Wind and Low pressure trough. This was a transition period leading to the first rainy season for the region. Most of the monthly precipitation data of GCM outputs for the end of the first rainy season (June-Jul) reflect a strong correlation and low root mean square error among the 23 GCM models and GPCP. The Scorr and RSME for the first rainy season results were in ranges (0.48-0.80) and (2.1-4.8) respectively. It can be seen that tropical Monsoon and Southern West Monsoon could affect the precipitation during the second rainy season (Aug-Nov). The result of assessment of precipitation for this season expresses a relatively low Scorr and high RMSE compared to the Scorr and RMSE values for the dry season. Assessment of monthly precipitation data using our score criteria yielded a Scorr in the range (0.64-0.79) and RMSE in the acceptable range of (2.7-3.9) for the second rainy season.

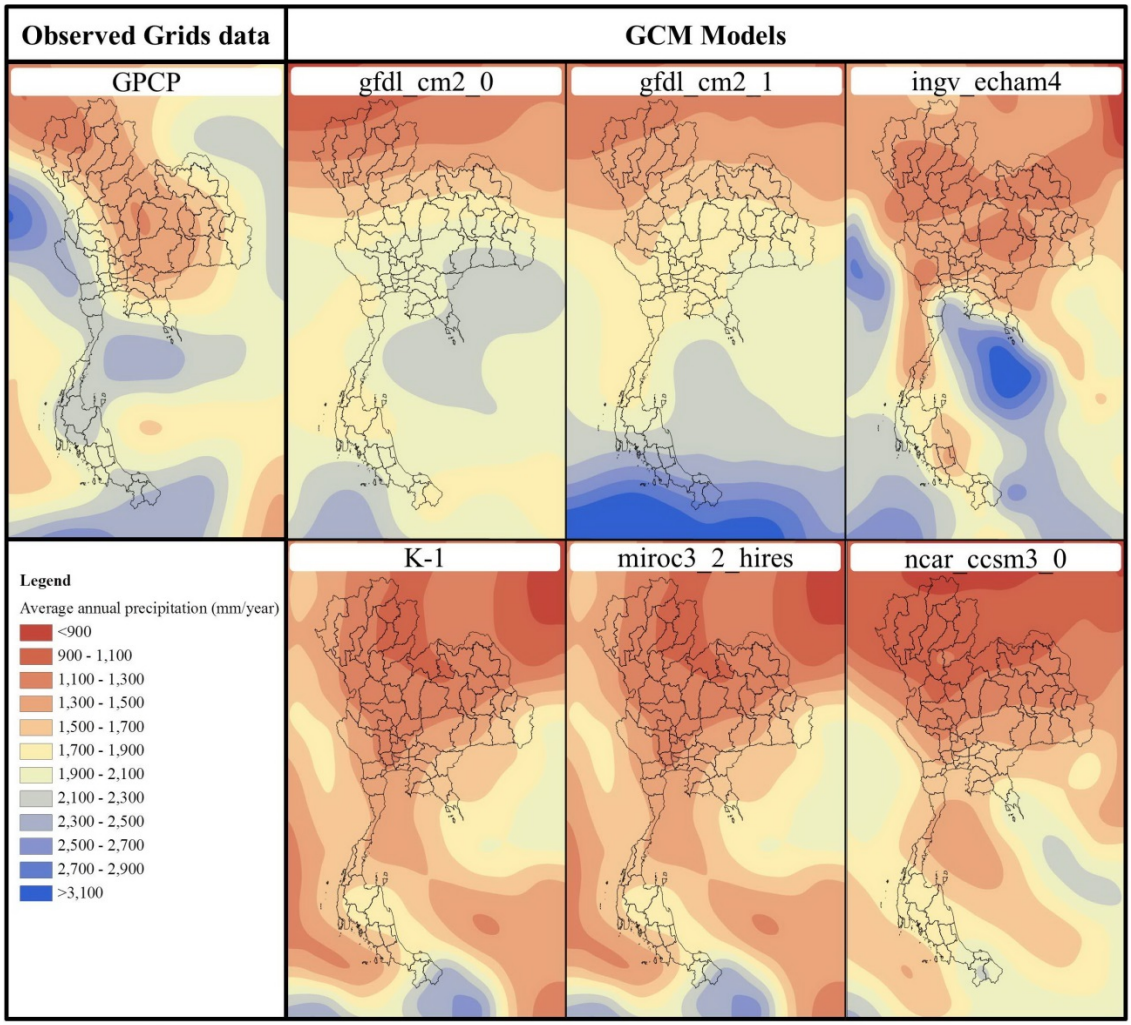
Table 5-3 and Table 5-4 show all of both Scorr and RSME indexes. Rules reflecting the score criteria were applied to evaluate the Scorr and RSME index for the relationship among the 23 GCM models and GPCP for each month. The total monthly Scorr indexes are in the range of (12-17). This indicates that at least 12 out of 23 models best reflect the relationship with GPCP above average Scorr indexes. This in turn means that these GCM model outputs express realistic patterns of precipitation data with observed data such as GPCP. The total RMSE are in the range of (10-18). This means that at least 10 models from the 23 models with above average RMSE expressed realistic precipitation outputs with small errors compared to GPCP.

With the rules of the score criteria applied, the best total scores are expressed in the dry season and at the beginning of the first rainy season. Neither Scorr indexes nor RMSE indexes could yield best total scores in the second rainy season since most of the GCM models reflect unrealistic precipitation data during the monsoon season. GCM models express higher RMSE values than GPCP in the second rainy season.

The aggregate monthly scores from each GCM model represent their ability to select the best relationship with GPCP based on score criteria. In Table 5-5 and Fig.5-10, with the score criteria defined, the aggregated

monthly score form each GCM model above or equal the 3rd quartile of their range order were considered, six likely GCM models were selected for the Thailand region; i.e., gfdl_cm2_0, gfdl_cm2_1, ingv_echam4, k-1, miroc3_2_hires and ncar_ccsm3_0. The aggregate monthly scores of the six selected GCM models resulted in the range of (7-12). It is clear that the precipitation data from these models are reliable for at least a 7 month period for application in water resources management. Though some of the selected GCM models will reflect unrealistic precipitation in the second rainy season, seasonal bias correction can effectively compensate for their unrealistic precipitation data and increase the reliability of precipitation data from selected GCM outputs, and can accurately reflect the precipitation characteristics of Thailand.

Finally, the results suggest that model selection using Scorr and RMSE index can accurately reflect the characteristics of seasonal precipitation data from GCM model outputs, and using our score criteria ensures that the selected GCM models are feasible for application to the Thailand region. In addition, the reliability of precipitation data can be effectively enhanced by seasonal bias correction using rainfall gauge station data for application to a regional area.



Source : Jampanil D, Seigo N, Bongochgetsakul N, Suttinon P. Assessment on current global climate model simulations based on precipitation data by model selection for Thailand. IJAST 2014, Feb 15; (Special Issue):184-7.

Fig. 5-10 Six GCMs models selected with the best relationship to GPCP based on score criteria.

Table 5-1. Spatial correlation of monthly precipitation data

No	Climate Model	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	BCC_BCM2	0.90	0.98	0.97	0.96	0.87	0.64	0.43	0.02	0.34	0.87	0.93	0.89
2	CCCMA_CGCM3_1	0.94	0.91	0.90	0.77	-0.01	0.67	0.66	0.65	0.66	0.60	0.63	0.71
3	CCCMA_CGCM3_1_T63	0.93	0.94	0.89	0.42	-0.02	0.74	0.69	0.77	0.74	0.58	0.73	0.69
4	CNRM_CM3	0.92	0.96	0.92	0.80	0.26	0.42	0.55	0.40	0.10	0.59	0.73	0.85
5	CSIRO_MK3_0	0.56	0.42	0.44	0.30	0.61	0.86	0.86	0.89	0.87	0.81	0.77	0.66
6	CSIRO_MK3_5	0.56	0.23	0.18	0.36	0.79	0.85	0.86	0.88	0.87	0.74	0.73	0.63
7	GFDL_CM2_0	0.86	0.75	0.75	0.37	0.83	0.93	0.94	0.92	0.84	0.74	0.83	0.82
8	GFDL_CM2_1	0.90	0.92	0.95	0.90	0.45	0.71	0.74	0.71	0.68	0.64	0.87	0.89
9	GISS_AOM	0.88	0.88	0.91	0.87	0.44	-	0.20	0.24	0.10	0.71	0.86	0.88
10	GISS_MODEL_E_H	0.82	0.86	0.66	0.30	0.06	0.56	0.76	0.67	0.62	0.53	0.80	0.83
11	GISS_MODEL_E_R	0.78	0.82	0.60	0.31	0.16	0.56	0.69	0.58	0.53	0.48	0.73	0.82
12	IAP_FGOALS1_0_G	0.89	0.96	0.95	0.90	0.18	-	-	0.63	0.68	0.72	0.87	0.84
13	INGV_ECHAM4	0.93	0.92	0.81	0.50	0.79	0.93	0.81	0.85	0.91	0.74	0.83	0.82
14	INMCM3_0	0.87	0.78	0.67	0.47	0.81	0.83	0.86	0.73	0.58	0.57	0.65	0.48
15	IPSL_CM4	0.86	0.84	0.88	0.83	-0.13	-	0.69	0.74	0.42	0.57	0.77	0.76
16	K-1	0.91	0.97	0.97	0.93	0.56	0.80	0.77	0.81	0.78	0.76	0.91	0.88
17	MIROC3_2_HIRES	0.91	0.97	0.97	0.93	0.56	0.80	0.77	0.81	0.78	0.76	0.91	0.88
18	MIROC3_2_MEDRES	0.85	0.91	0.94	0.95	0.52	0.50	0.53	0.36	0.31	0.75	0.88	0.82
19	MIUB_ECHO_G	0.71	0.88	0.74	0.44	0.02	0.81	0.75	0.72	0.66	0.36	0.54	0.63
20	MPI_ECHAM5	0.88	0.83	0.75	0.69	0.83	0.78	0.73	0.76	0.74	0.61	0.76	0.80
21	MRI_CGCM2_3_2A	0.77	0.82	0.84	0.66	0.77	0.70	0.59	0.62	0.74	0.75	0.72	0.62
22	NCAR_CCSM3_0	0.75	0.75	0.80	0.78	0.91	0.92	0.92	0.88	0.85	0.74	0.89	0.78
23	NCAR_PCM1	0.88	0.26	0.87	0.96	0.82	0.73	0.73	0.73	0.83	0.83	0.80	0.73
	Average	0.84	0.81	0.80	0.67	0.48	0.61	0.67	0.67	0.64	0.67	0.79	0.77

Table 5-2. Spatial RMSE of monthly precipitation data

No	Climate Model	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	BCC_BCM2	3.50	1.84	1.84	1.67	1.84	3.23	3.21	3.97	2.95	2.16	2.02	3.23
2	CCCMA_CGCM3_1	1.24	1.48	1.44	1.60	3.35	3.82	3.82	4.21	3.73	3.20	3.26	3.02
3	CCCMA_CGCM3_1_T63	1.17	0.99	1.29	2.42	3.61	3.16	3.46	3.60	3.62	3.53	2.80	2.80
4	CNRM_CM3	2.05	1.45	1.88	2.55	3.04	2.92	2.75	3.48	3.22	2.78	2.97	2.51
5	CSIRO_MK3_0	1.44	1.29	1.31	1.99	3.78	3.65	3.84	3.65	3.36	3.29	2.88	2.54
6	CSIRO_MK3_5	1.37	1.32	1.57	2.30	3.32	4.19	4.17	4.10	4.20	4.29	3.33	2.79
7	GFDL_CM2_0	0.96	1.22	1.19	1.97	2.40	2.64	2.49	2.92	4.10	3.77	2.51	1.96
8	GFDL_CM2_1	1.90	1.60	1.20	1.35	1.97	3.22	3.44	3.69	3.72	4.08	2.43	2.21
9	GISS_AOM	2.88	2.81	2.30	2.22	2.80	4.58	4.19	4.13	3.10	2.21	2.20	2.57
10	GISS_MODEL_E_H	4.62	4.28	5.84	8.65	9.76	7.82	4.53	4.07	4.88	4.71	3.57	4.13
11	GISS_MODEL_E_R	4.52	4.19	5.79	8.32	10.13	7.40	5.19	4.02	4.30	3.94	3.68	3.74
12	IAP_FGOALS1_0_G	2.20	1.29	1.37	1.73	3.62	5.41	4.02	3.17	2.33	2.74	2.16	2.68
13	INGV_ECHAM4	1.08	1.01	1.45	1.90	2.09	2.85	3.93	3.65	2.27	2.81	2.35	2.26
14	INMCM3_0	1.16	1.25	1.43	1.68	2.33	4.34	4.25	5.41	4.98	4.30	3.23	2.68
15	IPSL_CM4	2.46	2.66	2.25	2.56	3.52	5.69	3.68	3.47	3.82	3.19	3.34	4.03
16	K-1	1.73	1.03	0.92	1.49	2.11	3.09	3.16	2.98	2.43	2.28	1.50	2.06
17	MIROC3_2_HIRES	1.73	1.03	0.92	1.49	2.11	3.09	3.16	2.98	2.43	2.28	1.50	2.06
18	MIROC3_2_MEDRES	3.28	2.59	1.97	1.52	2.51	3.97	2.79	3.14	2.68	2.15	2.19	3.30
19	MIUB_ECHO_G	3.43	2.20	2.81	2.95	2.75	4.29	4.54	5.03	3.23	3.16	3.37	3.64
20	MPI_ECHAM5	0.93	0.98	1.02	1.45	2.74	4.30	4.84	4.87	4.24	4.08	2.73	1.97
21	MRI_CGCM2_3_2A	1.62	1.25	1.25	2.20	3.23	4.31	5.05	5.25	3.89	3.34	3.25	3.00
22	NCAR_CCSM3_0	1.57	1.39	1.31	1.48	1.98	2.88	2.52	3.34	3.41	3.40	2.07	2.32
23	NCAR_PCM1	0.51	1.92	5.11	1.98	3.49	3.23	5.18	5.28	3.91	3.36	3.28	3.02
	Average	2.06	1.79	2.06	2.50	3.41	4.09	3.84	3.93	3.51	3.26	2.72	2.81

Table 5-3. Scorr indexes of monthly precipitation data

No	Climate Model	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	BCC_BCM2	1	1	1	1	1	1	0	0	0	1	1	1
2	CCCMA_CGCM3_1	1	1	1	1	0	1	0	0	1	0	0	0
3	CCCMA_CGCM3_1_T63	1	1	1	0	0	1	1	1	1	0	0	0
4	CNRM_CM3	1	1	1	1	0	0	0	0	0	0	0	1
5	CSIRO_MK3_0	0	0	0	0	1	1	1	1	1	1	0	0
6	CSIRO_MK3_5	0	0	0	0	1	1	1	1	1	1	0	0
7	GFDL_CM2_0	1	0	0	0	1	1	1	1	1	1	1	1
8	GFDL_CM2_1	1	1	1	1	0	1	1	1	1	0	1	1
9	GISS_AOM	1	1	1	1	0	0	0	0	0	1	1	1
10	GISS_MODEL_E_H	0	1	0	0	0	0	1	0	0	0	1	1
11	GISS_MODEL_E_R	0	1	0	0	0	0	1	0	0	0	0	1
12	IAP_FGOALS1_0_G	1	1	1	1	0	0	0	0	1	1	1	1
13	INGV_ECHAM4	1	1	1	0	1	1	1	1	1	1	1	1
14	INMCM3_0	1	0	0	0	1	1	1	1	0	0	0	0
15	IPSL_CM4	1	1	1	1	0	0	1	1	0	0	0	0
16	K-1	1	1	1	1	1	1	1	1	1	1	1	1
17	MIROC3_2_HIRES	1	1	1	1	1	1	1	1	1	1	1	1
18	MIROC3_2_MEDRES	1	1	1	1	1	0	0	0	0	1	1	1
19	MIUB_ECHO_G	0	1	0	0	0	1	1	1	1	0	0	0
20	MPI_ECHAM5	1	1	0	1	1	1	1	1	1	0	0	1
21	MRI_CGCM2_3_2A	0	1	1	0	1	1	0	0	1	1	0	0
22	NCAR_CCSM3_0	0	0	1	1	1	1	1	1	1	1	1	1
23	NCAR_PCM1	1	0	1	1	1	1	1	1	1	1	1	0
	Average	16	17	15	13	13	16	16	14	15	13	12	14

Table 5-4. RSME indexes of monthly precipitation data

No	Climate Model	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	BCC_BCM2	0	0	1	1	1	1	1	0	1	1	1	0
2	CCCMA_CGCM3_1	1	1	1	1	1	1	1	0	0	1	0	0
3	CCCMA_CGCM3_1_T63	1	1	1	1	0	1	1	1	0	0	0	1
4	CNRM_CM3	1	1	1	0	1	1	1	1	1	1	0	1
5	CSIRO_MK3_0	1	1	1	1	0	1	0	1	1	0	0	1
6	CSIRO_MK3_5	1	1	1	1	1	0	0	0	0	0	0	1
7	GFDL_CM2_0	1	1	1	1	1	1	1	1	0	0	1	1
8	GFDL_CM2_1	1	1	1	1	1	1	1	1	0	0	1	1
9	GISS_AOM	0	0	0	1	1	0	0	0	1	1	1	1
10	GISS_MODEL_E_H	0	0	0	0	0	0	0	0	0	0	0	0
11	GISS_MODEL_E_R	0	0	0	0	0	0	0	0	0	0	0	0
12	IAP_FGOALS1_0_G	0	1	1	1	0	0	0	1	1	1	1	1
13	INGV_ECHAM4	1	1	1	1	1	1	0	1	1	1	1	1
14	INMCM3_0	1	1	1	1	1	0	0	0	0	0	0	1
15	IPSL_CM4	0	0	0	0	0	0	1	1	0	1	0	0
16	K-1	1	1	1	1	1	1	1	1	1	1	1	1
17	MIROC3_2_HIRES	1	1	1	1	1	1	1	1	1	1	1	1
18	MIROC3_2_MEDRES	0	0	1	1	1	1	1	1	1	1	1	0
19	MIUB_ECHO_G	0	0	0	0	1	0	0	0	1	1	0	0
20	MPI_ECHAM5	1	1	1	1	1	0	0	0	0	0	0	1
21	MRI_CGCM2_3_2A	1	1	1	1	1	0	0	0	0	0	0	0
22	NCAR_CCSM3_0	1	1	1	1	1	1	1	1	1	0	1	1
23	NCAR_PCM1	1	0	0	1	0	1	0	0	0	0	0	0
	Average	15	15	17	18	16	13	11	12	11	11	10	14

Table 5-5 GCM model selection from the aggregate monthly scores

N	Climate Model	Ja	Fe	Ma	Ap	Ma	Ju	Ju	Au	Se	Oc	No	De	Su	Selec
1	BCC_BCM2	0	0	1	1	1	1	0	-1	0	1	1	0	5	No
2	CCCMA_CGCM3_1	1	1	1	1	0	1	0	-1	0	0	-1	-1	2	No
3	CCCMA_CGCM3_1_T6	1	1	1	0	-1	1	1	1	0	-1	-1	0	3	No
4	CNRM_CM3	1	1	1	0	0	0	0	0	0	0	-1	1	3	No
5	CSIRO_MK3_0	0	0	0	0	0	1	0	1	1	0	-1	0	2	No
6	CSIRO_MK3_5	0	0	0	0	1	0	0	0	0	0	-1	0	0	No
7	GFDL_CM2_0	1	0	0	0	1	1	1	1	0	0	1	1	7	Yes
8	GFDL_CM2_1	1	1	1	1	0	1	1	1	0	-1	1	1	8	Yes
9	GISS_AOM	0	0	0	1	0	-1	-1	-1	0	1	1	1	1	No
10	GISS_MODEL_E_H	-1	0	-1	-1	-1	-1	0	-1	-1	-1	0	0	-8	No
11	GISS_MODEL_E_R	-1	0	-1	-1	-1	-1	0	-1	-1	-1	-1	0	-9	No
12	IAP_FGOALS1_0_G	0	1	1	1	-1	-1	-1	0	1	1	1	1	4	No
13	INGV_ECHAM4	1	1	1	0	1	1	0	1	1	1	1	1	10	Yes
14	INMCM3_0	1	0	0	0	1	0	0	0	-1	-1	-1	0	-1	No
15	IPSL_CM4	0	0	0	0	-1	-1	1	1	-1	0	-1	-1	-3	No
16	K-1	1	1	1	1	1	1	1	1	1	1	1	1	12	Yes
17	MIROC3_2_HIRES	1	1	1	1	1	1	1	1	1	1	1	1	12	Yes
18	MIROC3_2_MEDRES	0	0	1	1	1	0	0	0	0	1	1	0	5	No
19	MIUB_ECHO_G	-1	0	-1	-1	0	0	0	0	1	0	-1	-1	-4	No
20	MPI_ECHAM5	1	1	0	1	1	0	0	0	0	-1	-1	1	3	No
21	MRI_CGCM2_3_2A	0	1	1	0	1	0	-1	-1	0	0	-1	-1	-1	No
22	NCAR_CCSM3_0	0	0	1	1	1	1	1	1	1	0	1	1	9	Yes
23	NCAR_PCM1	1	-1	0	1	0	1	0	0	0	0	0	-1	1	No

For seasonal bias correction, since GCM outputs are generally characterized as a large resolution of precipitation data, monthly downscaled precipitation data cannot be represented by regional precipitation data either, especially in the cases of rainless days and extreme rainy days. It has long been apparent that the monthly downscaled precipitation data from selected GCM outputs would not be best fit for monthly observed rainfall data at a considered station. In our study, daily downscaling of precipitation data from the selected GCM outputs was performed using seasonal bias correction corresponding to the seasonal rainfall characteristics: dry season (Dec-Feb), first rainy season (Mar-Jul) and second rainy season (Aug-Nov).

As can be seen in Fig. 5-11 and Fig.5-12, during the dry season (Dec-Feb), there are mostly wet days among the daily precipitation data of the selected GCM output, which can result in unrealistic parameterization. This was effectively handled by using bias correction of rainless data with daily observed rainfall data at the considered station. The results of seasonal bias correction of daily rainless data performed on monthly downscaled precipitation data of the selected GCM outputs was expressed as best fit for the realistic parameter of monthly observed rainfall data at the considered station in the dry season (Dec-Feb). Most of the daily precipitation data from GCM outputs undervalues extreme rainfall among daily observed data. To

compensate for this, suitable bias correction should be performed to compensate for the fact that these GCM outputs values equal daily observed data. Therefore, GCM outputs were mapped onto the probability distribution of observed rainfall data. Extreme values of daily precipitation data of the selected GCM output were effectively handled by bias correction of extreme rainy data with daily observed rainfall data at the considered station for the first rainy season (Mar-Jul) and the second rainy season (Aug-Nov). During the rainy season, the monthly downscaled precipitation data of the selected GCM outputs was expressed as best fit for monthly extreme values of observed rainfall data. Since monthly downscaled precipitation data accumulated normal rainy days and the range of corrected zero and corrected extreme precipitation of GCM outputs, we then performed seasonal bias correction corresponding to the defined seasonal rainfall characteristics of Rayong province. The monthly downscaled precipitation data of the selected GCM outputs was expressed as best fit for observed rainfall data in each month. Finally, the results suggest that the monthly downscaled precipitation data of the selected GCM outputs can be corrected for seasonal bias and expressed as best fit for the realistic parameter. This can increase the reliability of precipitation data from GCM outputs for application in water resources management.

As can be seen in Table 5-6 for example at rain gauge station No.478201-Rayong Meteorological Observation, daily precipitation from GCM outputs were performed using the three steps processing of rainless days, normal rainy days and extreme rainy days. The result shows Mean absolute error, Standard deviation, Root mean square error (RMSE), correlation, Sum of absolute error, Nash index and percentage improve from original precipitation data from GCM outputs for each step including zero defined threshold for rainless days (P_0), threshold value of extreme event, i.e. the 99^{th} percentile of the rank order of daily observed rainfall (P_{99}) and corrected normal precipitation data. It indicates that the three steps processing can improve daily precipitation data from GCM outputs reflect the lowest error and reflect best percentage improve in the range of 79.7-81.9 compared to original precipitation data from GCM outputs. This three steps processing reflect best value of Nash index in the range of 0.79-0.85.

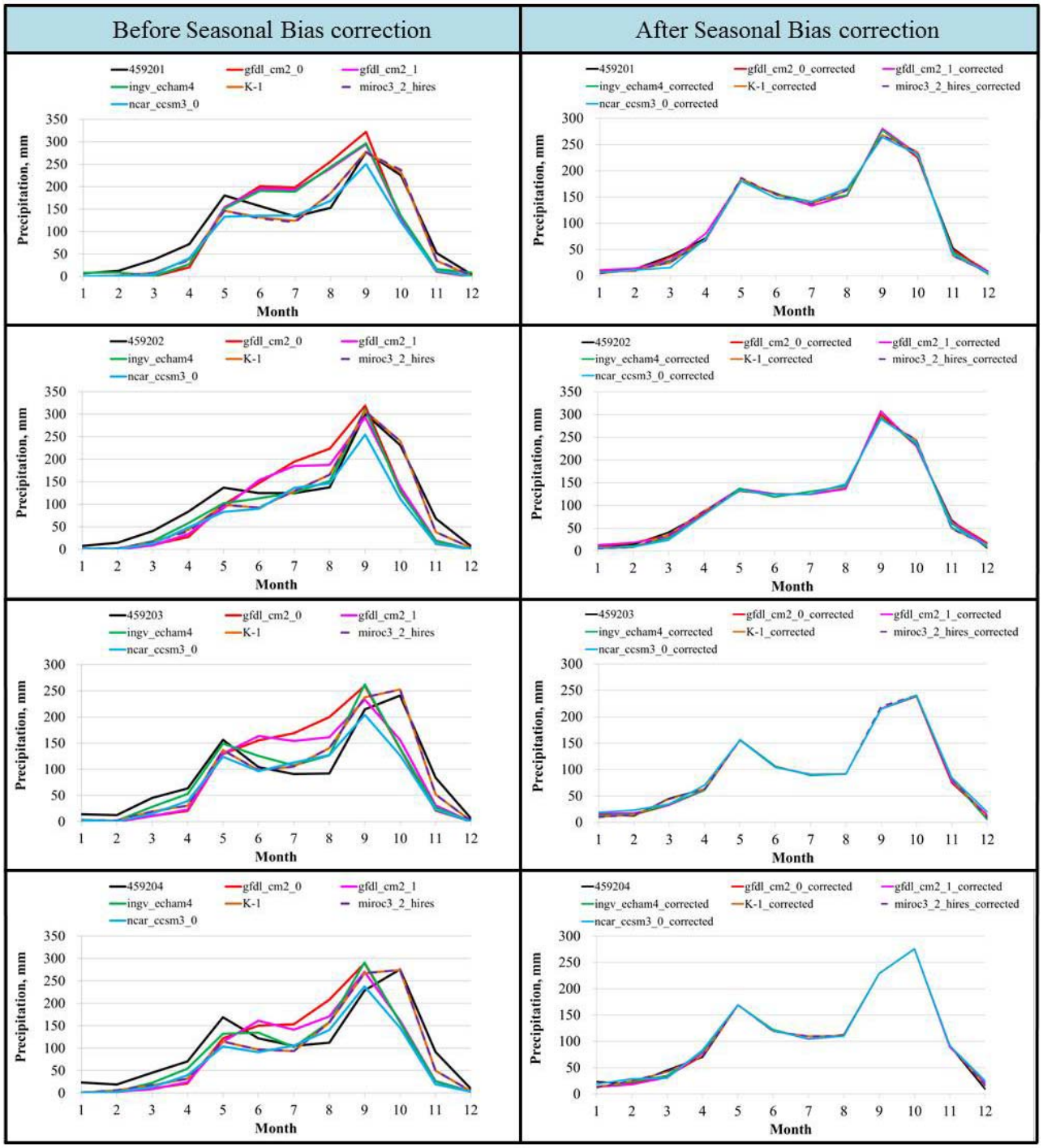


Fig. 5-11 The monthly downscaled precipitation data of the selected GCM outputs was expressed as best fit for monthly extreme values of observed rainfall data, 459201,459202, 459203 and 459204

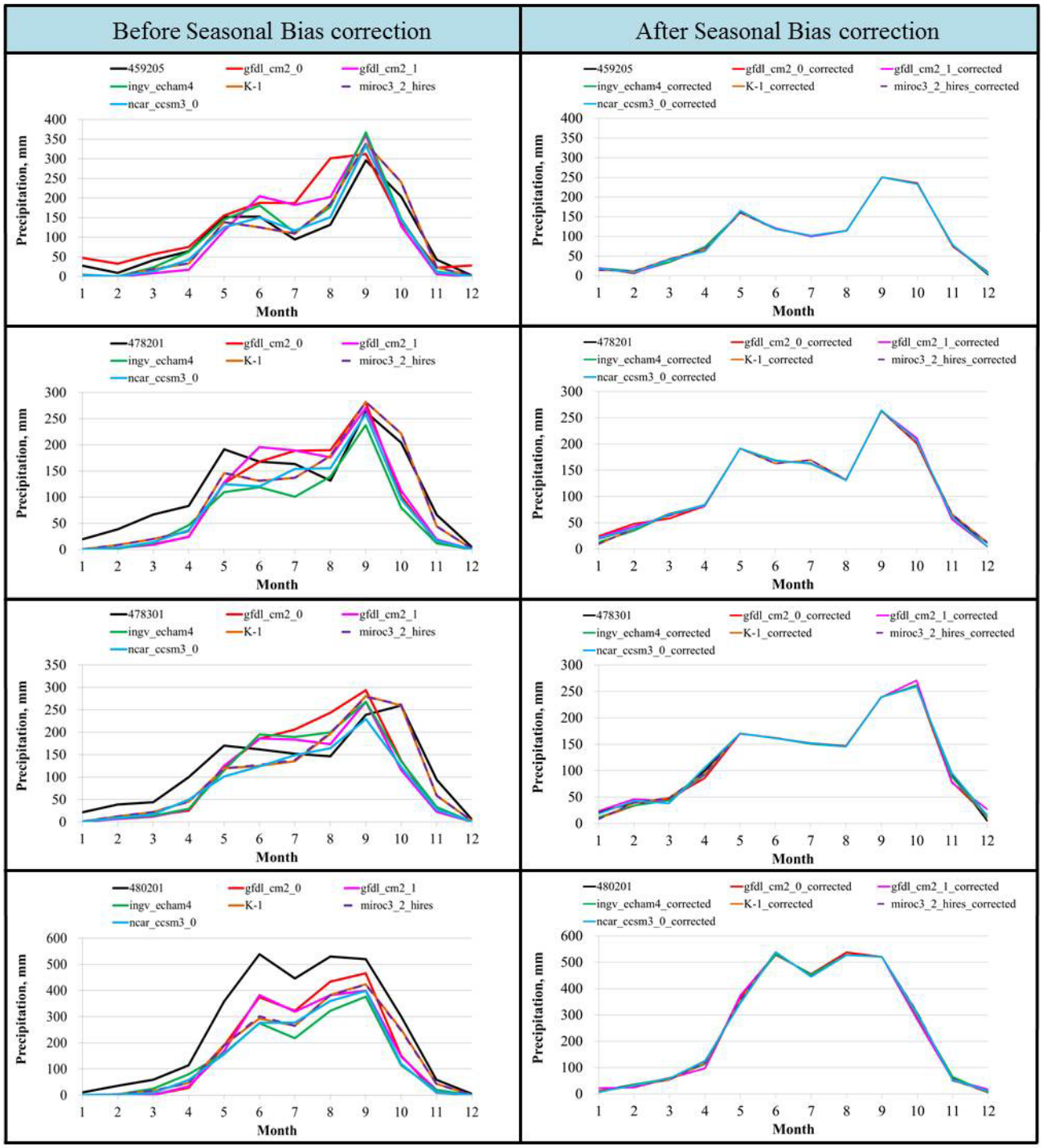


Fig. 5-12 The monthly downscaled precipitation data of the selected GCM outputs was expressed as best fit for monthly extreme values of observed rainfall data, 459205,478201, 478301 and 480201

As can be seen in Fig.5-13 for example, the distribution of precipitation data from GCMs and corrected precipitation data of six GCMs compared to distribution of precipitation data at rain gauge station No.478201 shows best fit for observed rainfall data in dry season. Fig.5-14 shows the distribution of precipitation data from GCMs and corrected precipitation data of six GCMs compared to distribution of precipitation data at rain gauge station No.478201 in first rainy season and Fig.5-15 shows the distribution of precipitation data from GCMs and corrected precipitation data of six GCMs compared to distribution of precipitation data at rain gauge station No.478201 in second rainy season. As can be seen in Fig.5-16 for example, the distribution of precipitation data from GCMs and corrected precipitation data in year including dry season, first rainy season and second rainy season expressed as best fit for observed rainfall data in each GCMs.

Finally, the results suggest that the monthly downscaled precipitation data of the selected GCM outputs can be corrected for seasonal bias and expressed as best fit for the realistic parameter. This can increase the reliability of precipitation data from GCM outputs for application in water resources management.

Table 5-6 The results of seasonal bias correction of precipitation data from three steps processing of rainless days, normal rainy days and extreme rainy days for the selected GCM output compared to original precipitation data at rain gauge station No.478201-Rayong Meteorological Observation. (For example)

GCMs	original	Threshold of rainless -P_0	Threshold extreme event-P_{99}	**Corrected including normal precipitation**
(a) gfdl_cm2_0				
Mean	6.8	3.9	3.5	**1.4**
STDV	11.2	10.6	10.6	**4.9**
RMSE	13.2	11.3	11.1	**5.1**
Correlation	0.1	0.3	0.3	**0.7**
Sum error	50,023	28,637	25,384	**10,170**
% improve error	-	42.8	49.3	**79.7**
Nash	-0.30	0.05	0.39	**0.80**
(b) gfdl_cm2_0				
Mean	6.6	3.8	3.4	**1.4**
STDV	11.0	10.4	10.4	**5.1**
RMSE	12.8	11.1	10.9	**5.3**
Correlation	0.1	0.3	0.3	**0.7**
Sum error	47,910	27,889	24,493	**10,566**
% improve error	-	41.8	48.9	**77.9**
Nash	-0.24	0.08	0.43	**0.79**
(c) ingv_echam4				
Mean	7.1	4.0	3.4	**1.4**
STDV	12.2	11.1	11.1	**4.9**
RMSE	14.1	11.8	11.6	**5.1**
Correlation	0.1	0.3	0.3	**0.7**
Sum error	51,511	28,969	24,797	**9,907**
% improve error	-	43.8	51.9	**80.8**
Nash	-0.49	-0.05	0.32	**0.81**
(d) K-1				
Mean	7.3	4.2	3.7	**1.3**
STDV	12.3	11.2	11.2	**4.7**
RMSE	14.3	11.9	11.8	**4.9**
Correlation	0.1	0.3	0.3	**0.7**
Sum error	53,415	30,325	26,866	**9,668**
% improve error	-	43.2	49.7	**81.9**
Nash	-0.53	-0.07	0.28	**0.82**
(e) miroc3_2				
Mean	7.3	4.2	3.7	**1.3**
STDV	12.3	11.2	11.2	**4.7**
RMSE	14.3	11.9	11.8	**4.9**
Correlation	0.1	0.3	0.3	**0.7**
Sum error	53,415	30,325	26,866	**9,668**
% improve error	-	43.2	49.7	**81.9**
Nash	-0.53	-0.07	0.28	**0.82**
(f) ncar_ccsm3_0				
Mean	6.2	3.7	3.2	**1.2**
STDV	10.6	10.5	10.5	**4.3**
RMSE	12.3	11.1	10.9	**4.5**
Correlation	0.1	0.3	0.3	**0.7**
Sum error	45,325	26,919	23,336	**8,903**
% improve error	-	40.6	48.5	**80.4**
Nash	-0.13	0.08	0.43	**0.85**

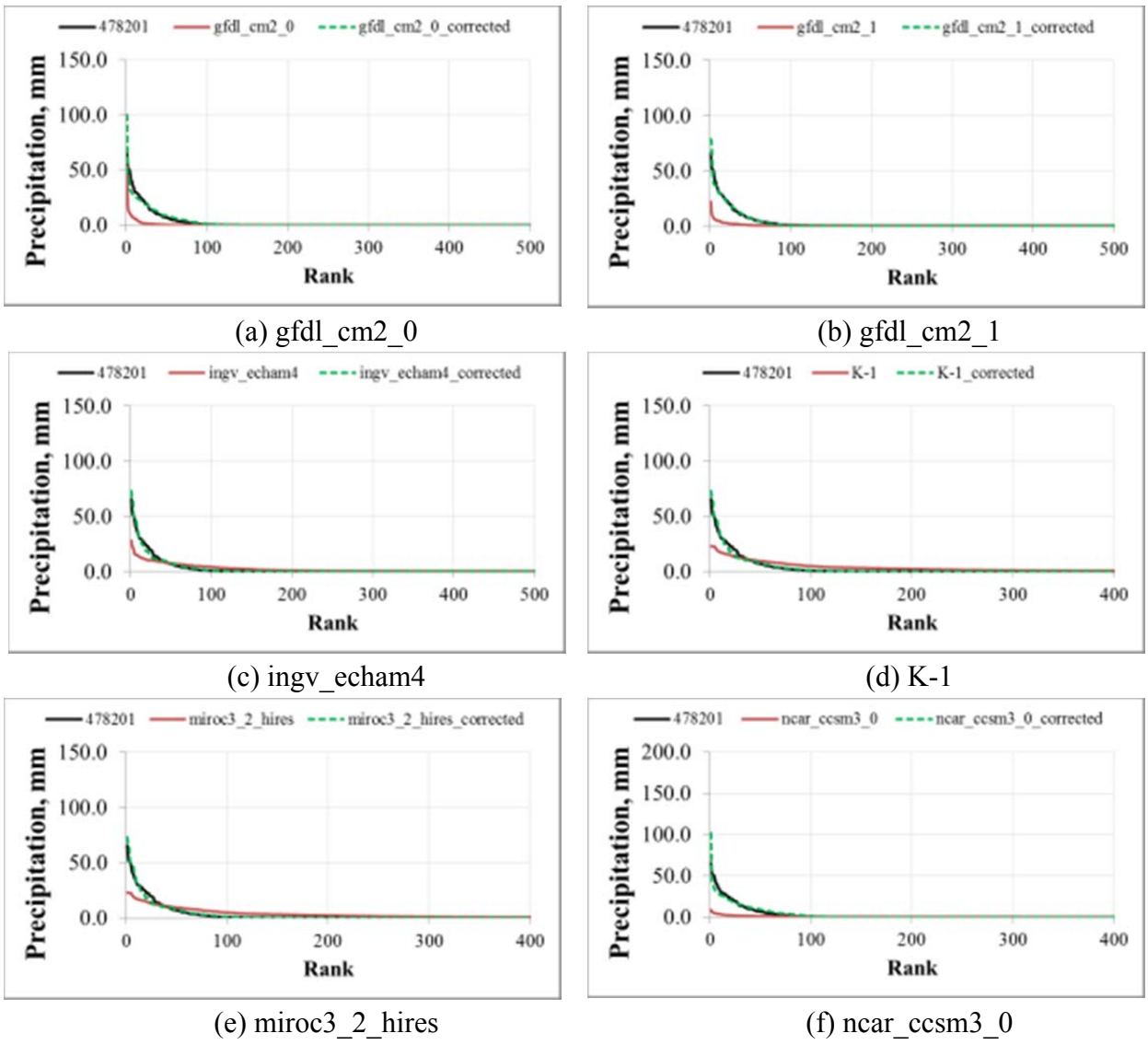
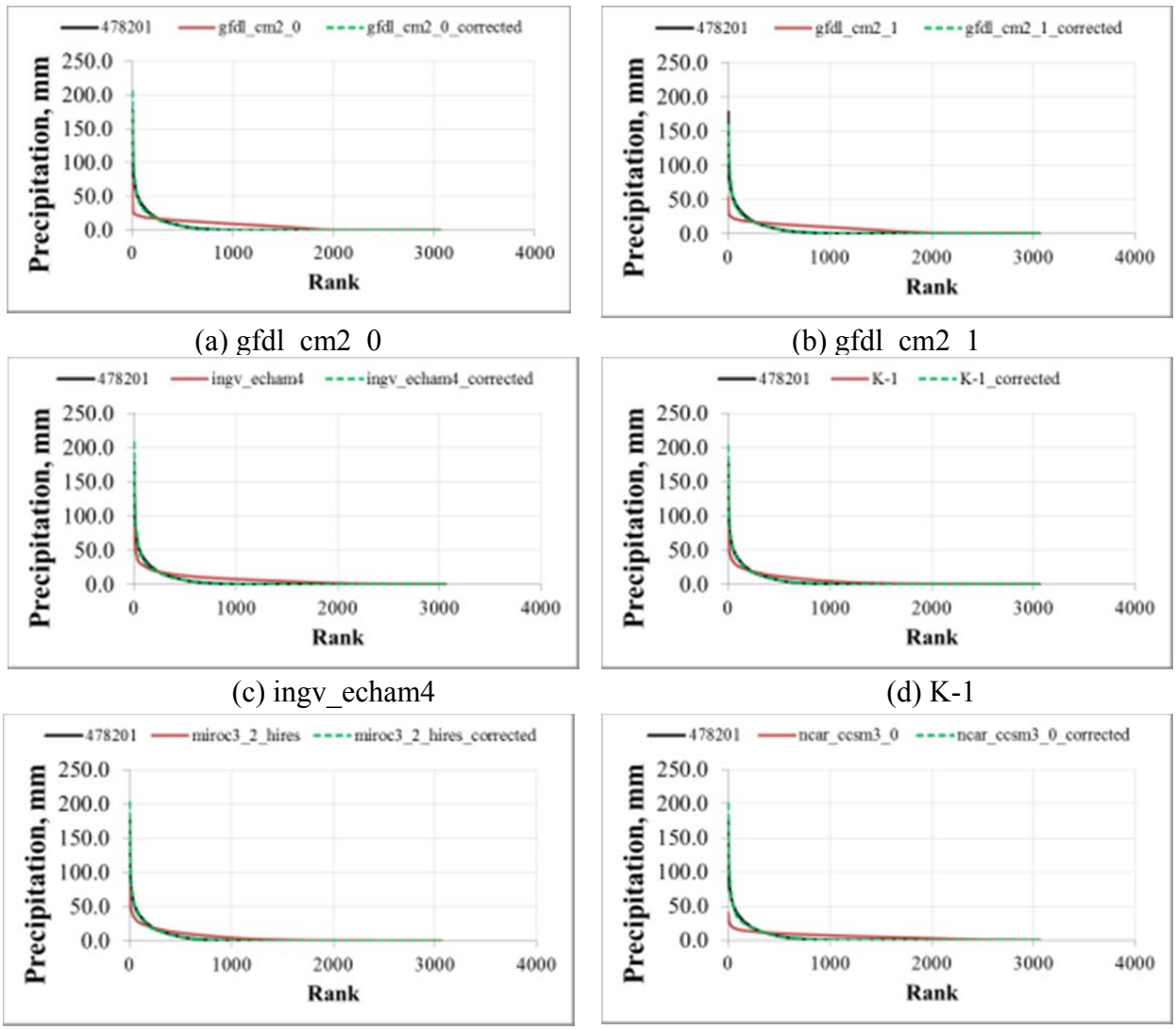


Fig. 5-13 The distribution of precipitation data from GCMs and corrected precipitation data of six GCMs compared to distribution of precipitation data at rain gauge station No.478201 in dry season (For example)

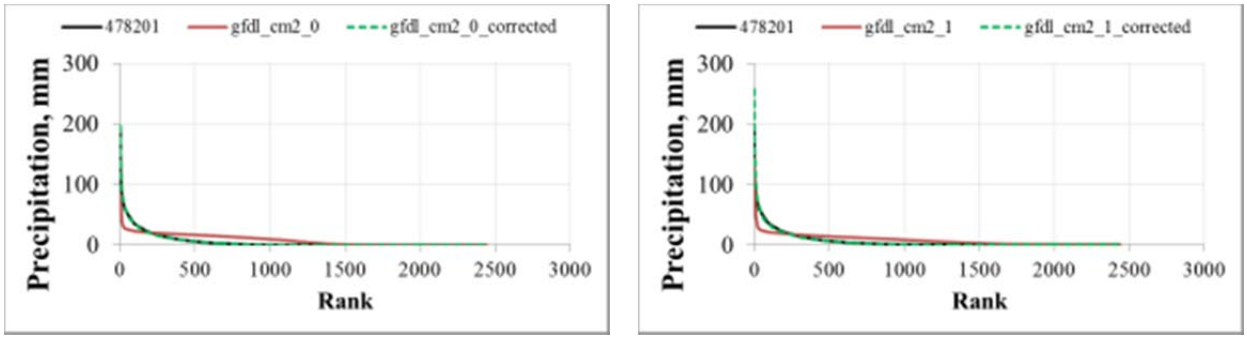


(a) gfdl_cm2_0 (b) gfdl_cm2_1

(c) ingv_echam4 (d) K-1

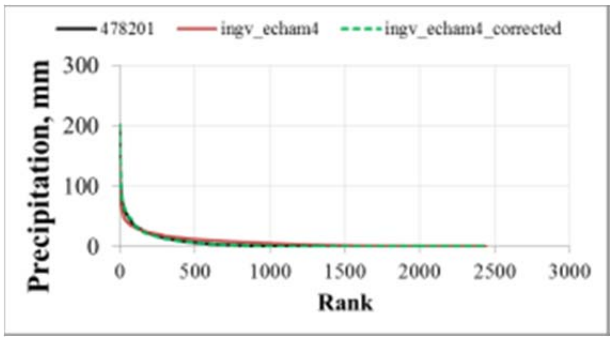
(e) miroc3_2_hires (f) ncar_ccsm3_0

Fig. 5-14 The distribution of precipitation data from GCMs and corrected precipitation data of six GCMs compared to distribution of precipitation data at rain gauge station No.478201 in first rainy season (For example)

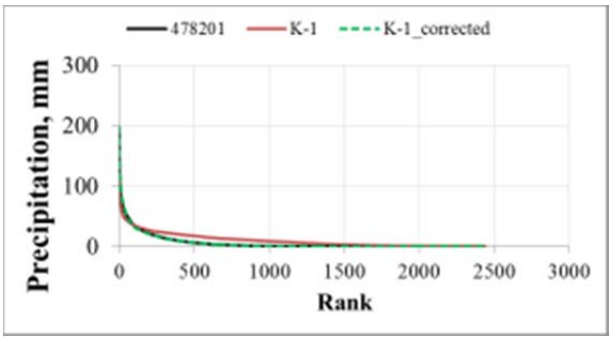


(a) gfdl_cm2_0

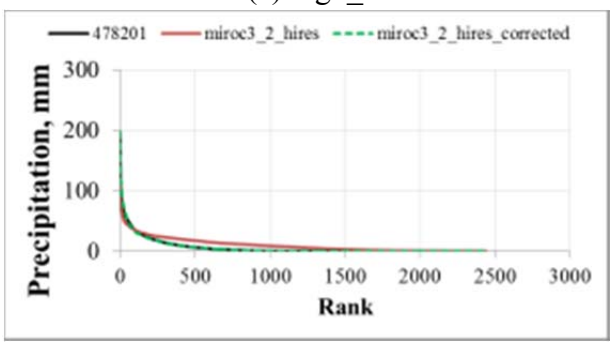
(b) gfdl_cm2_1



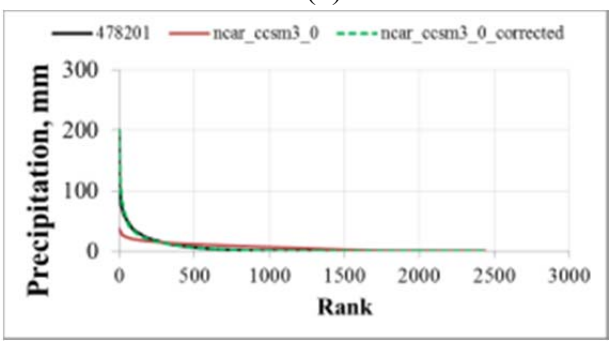
(c) ingv_echam4



(d) K-1

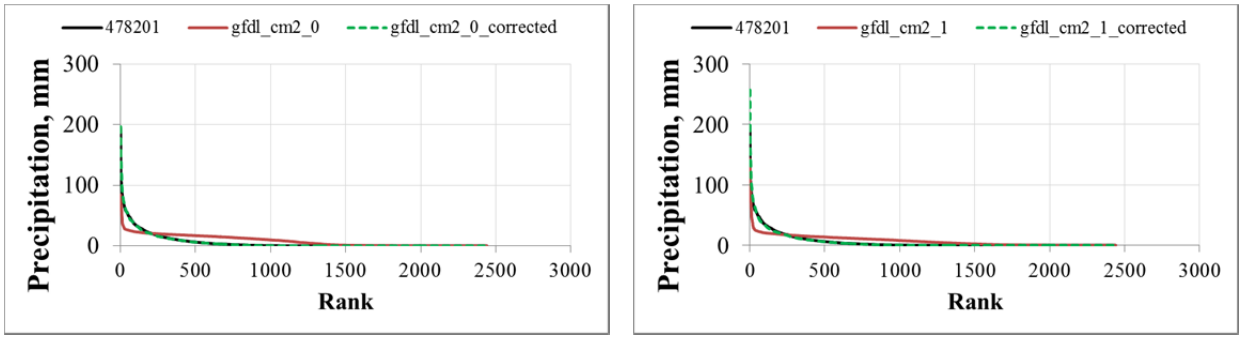


(e) miroc3_2_hires



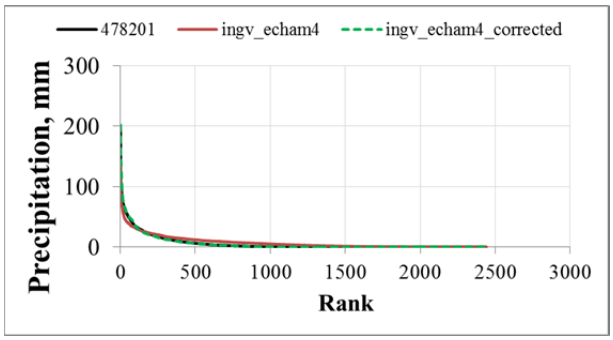
(f) ncar_ccsm3_0

Fig. 5-15 The distribution of precipitation data from GCMs and corrected precipitation data of six GCMs compared to distribution of precipitation data at rain gauge station No.478201 in second rainy season (For example)

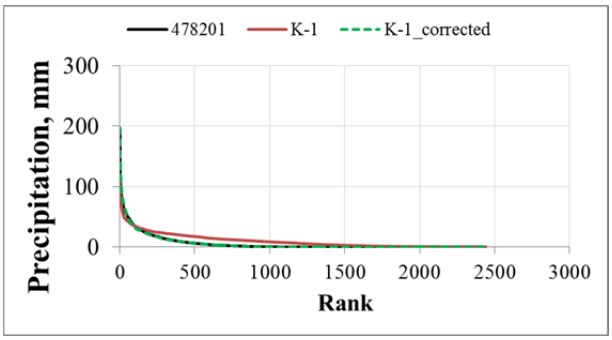


(a) gfdl_cm2_0

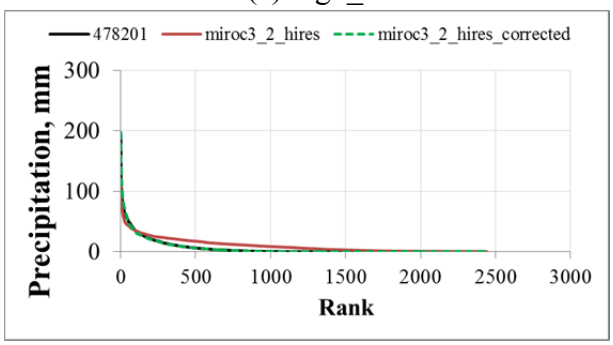
(b) gfdl_cm2_1



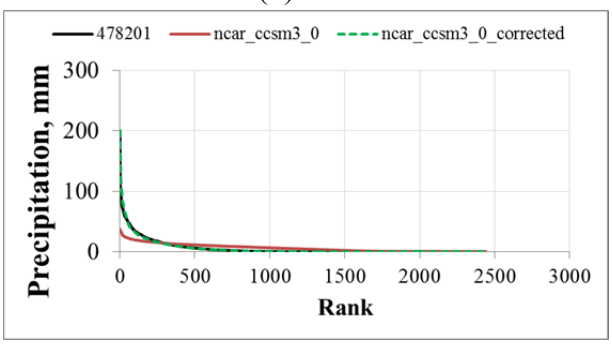
(c) ingv_echam4



(d) K-1



(e) miroc3_2_hires



(f) ncar_ccsm3_0

Fig. 5-16 The distribution of precipitation data from GCMs and corrected precipitation data of six GCMs compared to distribution of precipitation data at rain gauge station No.478201 in year (For example)

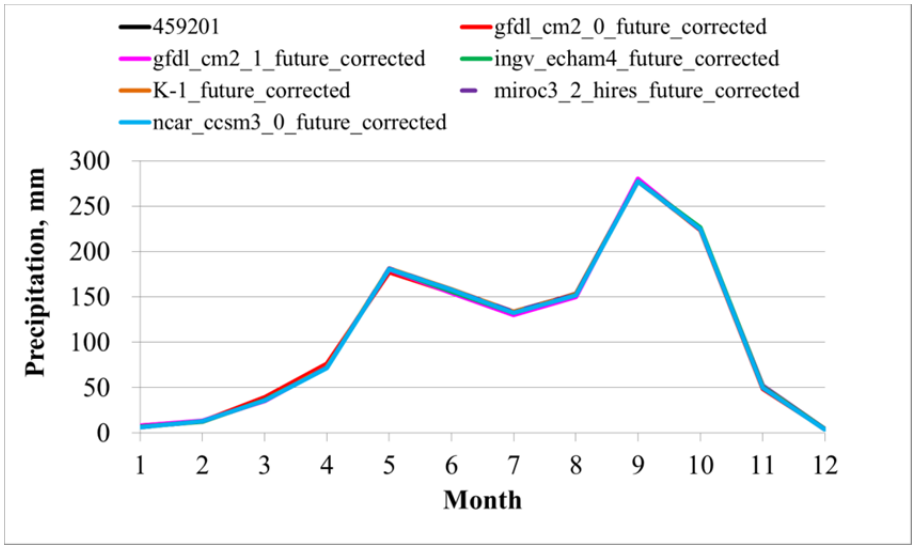
For Future precipitation projection, we use the transfer function for future precipitation of GCM outputs with the GDF parameters of observed data. With the future seasonal protection defined, the inverse of the cumulative gamma distribution of the past monthly GCM precipitation outputs was applied to the calculation of the predicted values of the past monthly GCM precipitation outputs with the GDF parameters of GCM corrected past data.

In our study, Future precipitation data from the selected GCM outputs was performed using the transfer function for future precipitation of GCM outputs with the GDF parameters corresponding to the seasonal rainfall characteristics: dry season (Dec-Feb), first rainy season (Mar-Jul) and second rainy season (Aug-Nov).

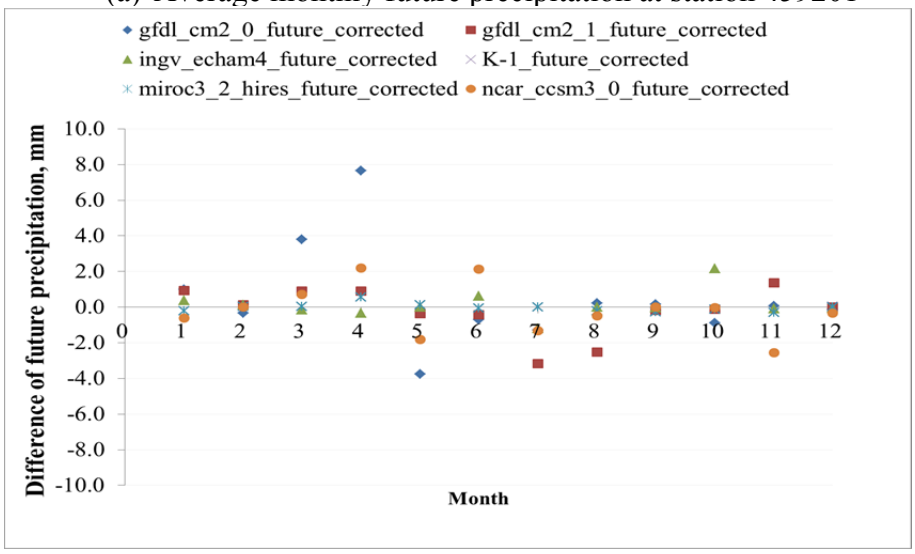
The results shows that there are mostly wet days among the future precipitation data of the selected GCM output, which expressed difference of precipitation compared to past precipitation higher than past precipitation data. The results of future rainless data expressed difference of precipitation compared to past precipitation lower than past precipitation data from corrected GCMs output.

As can be seen in Fig. 5-17 below, at station 459201, The difference of future precipitation compared to past precipitation data from corrected GCMs output in the dry season (Dec-Feb) in the range of (-0.62-1.0) mm/month. For the first rainy season (Mar-Jul) and the second rainy season (Aug-Nov), the difference of future precipitation compared to past precipitation data from corrected GCMs output in the range of (-3.75-7.64) mm/month and (-2.55-2.17) mm/month respectively.

As can be seen in Fig. 5-18 below, at station 459202, the difference of future precipitation compared to past precipitation data from corrected GCMs output in the dry season (Dec-Feb) in the range of (-0.92-6.29) mm/month. For the first rainy season (Mar-Jul) and the second rainy season (Aug-Nov), the difference of future precipitation compared to past precipitation data from corrected GCMs output in the range of (-2.54-8.10) mm/month and (-3.21-2.50) mm/month respectively.

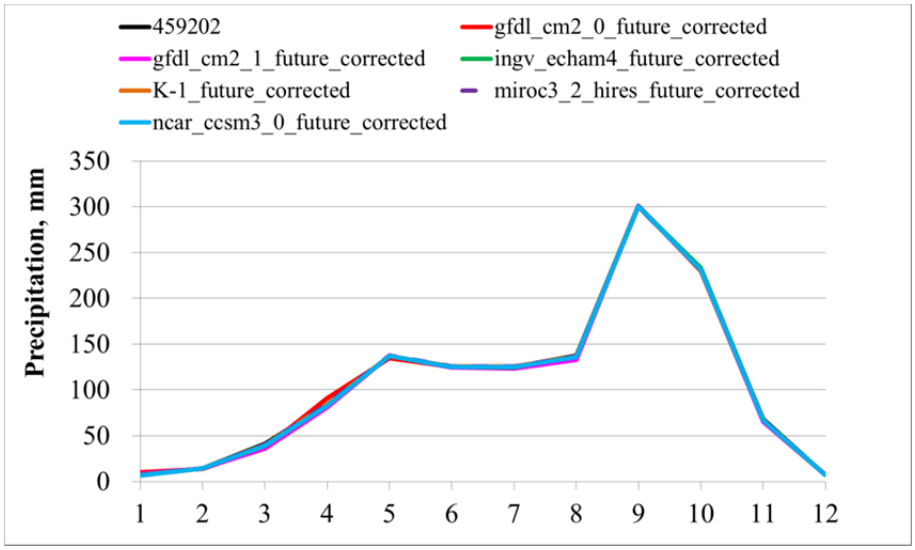


(a) Average monthly future precipitation at station 459201

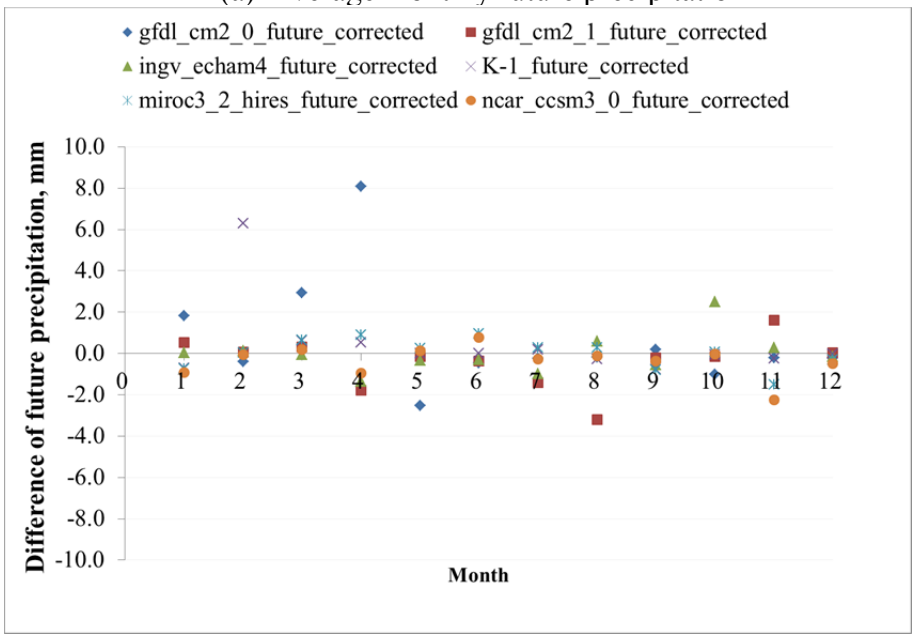


(b) Difference of future precipitation corrected and past precipitation corrected

Fig. 5-17 The average monthly future precipitation projection at station 459201



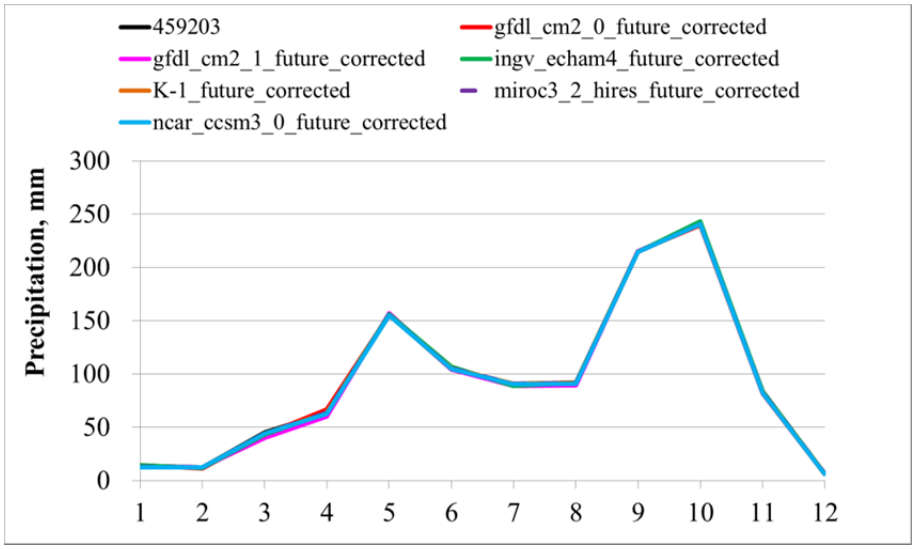
(a) Average monthly future precipitation



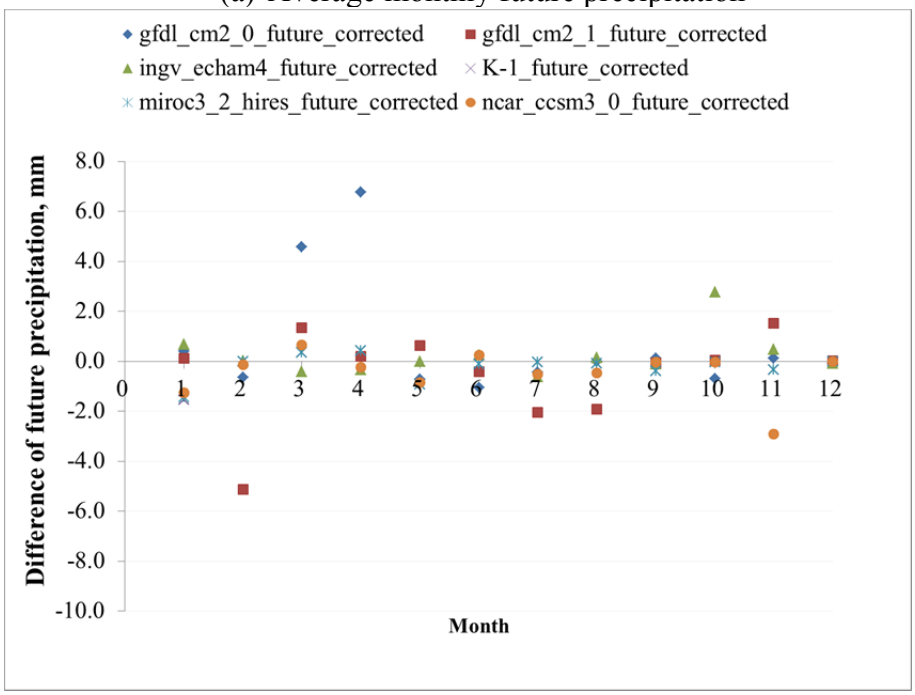
(b) Difference of future precipitation corrected and past precipitation corrected

Fig. 5-18 The average monthly future precipitation projection at station 459202

As can be seen in Fig. 5-19 below, at station 459203, the difference of future precipitation compared to past precipitation data from corrected GCMs output in the dry season (Dec-Feb) in the range of (-5.13-0.68) mm/month. For the first rainy season (Mar-Jul) and the second rainy season (Aug-Nov), the difference of future precipitation compared to past precipitation data from corrected GCMs output in the range of (-2.06-6.76) mm/month and (-2.92-2.77) mm/month respectively.



(a) Average monthly future precipitation

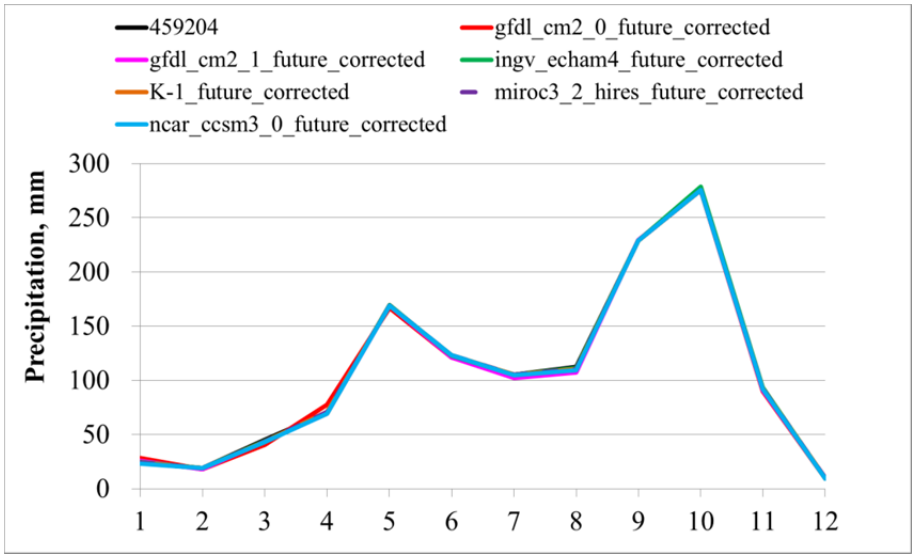


(b) Difference of future precipitation corrected and past precipitation corrected

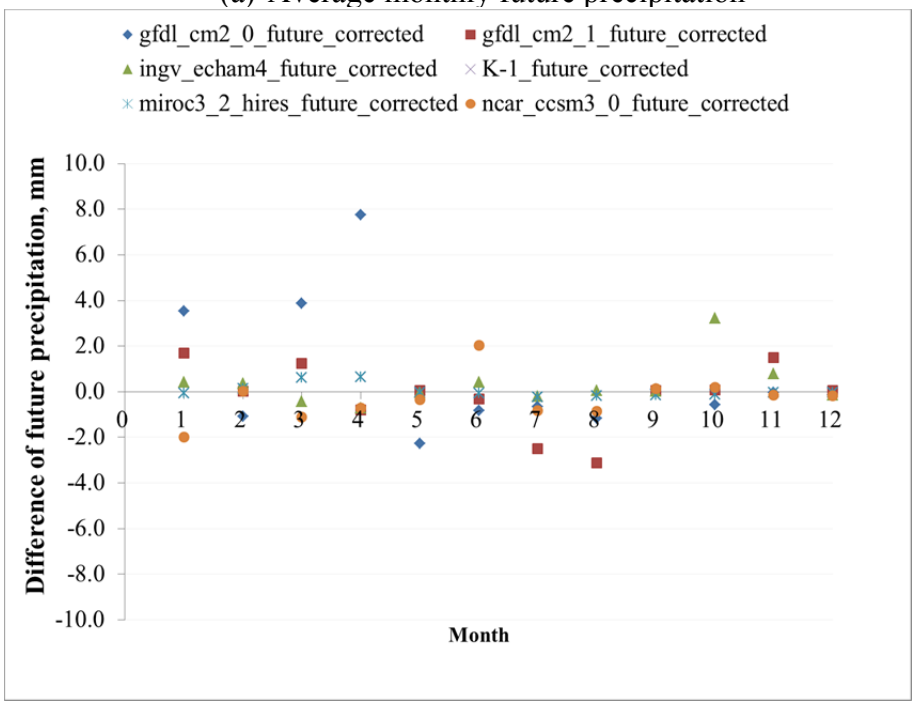
Fig. 5-19 The average monthly future precipitation projection at station 459203

As can be seen in Fig. 5-20 below, at station 459204, the difference of future precipitation compared to past precipitation data from corrected GCMs output in the dry season (Dec-Feb) in the range of (-1.99-3.52) mm/month. For the first rainy season (Mar-Jul) and the second rainy season (Aug-Nov), the difference of future precipitation compared to past precipitation data from

corrected GCMs output in the range of (-2.50-7.76) mm/month and (-3.12-3.23) mm/month respectively.



(a) Average monthly future precipitation

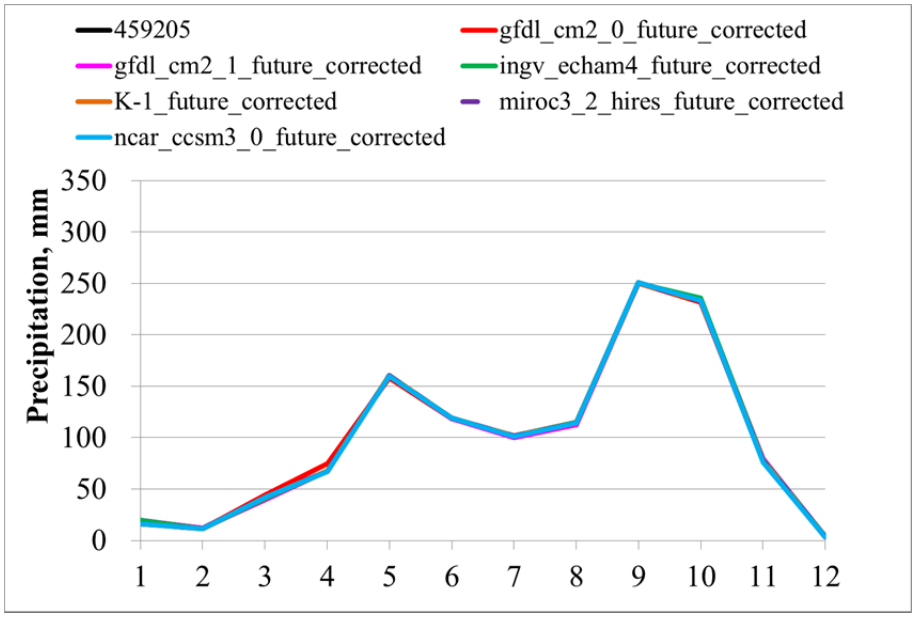


(b) Difference of future precipitation corrected and past precipitation corrected

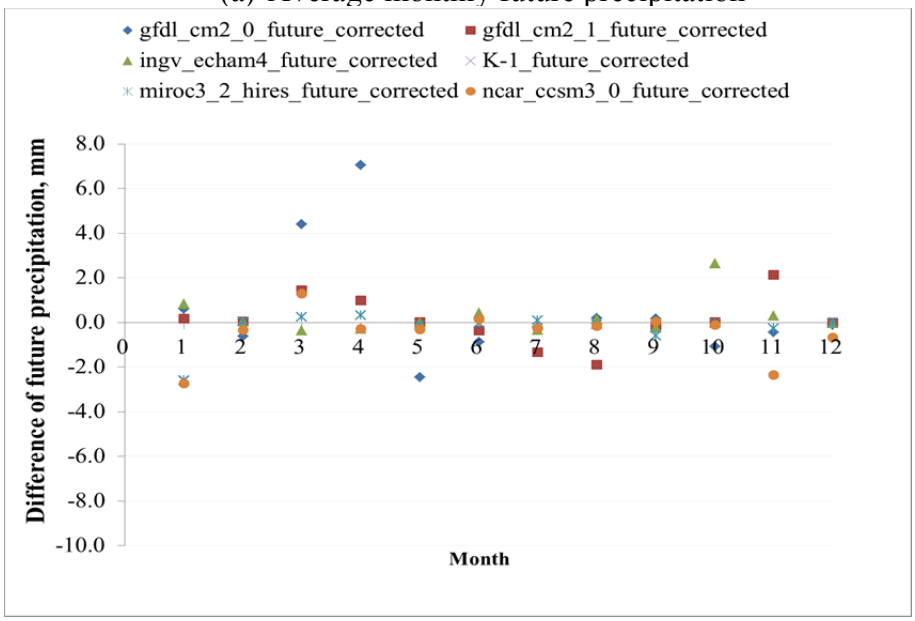
Fig. 5-20 The average monthly future precipitation projection at station 459204

As can be seen in Fig. 5-21 below, at station 459205, the difference of future precipitation compared to past precipitation data from corrected GCMs

output in the dry season (Dec-Feb) in the range of (-2.72-0.84) mm/month. For the first rainy season (Mar-Jul) and the second rainy season (Aug-Nov), the difference of future precipitation compared to past precipitation data from corrected GCMs output in the range of (-2.44-7.06) mm/month and (-2.35-2.65) mm/month respectively.



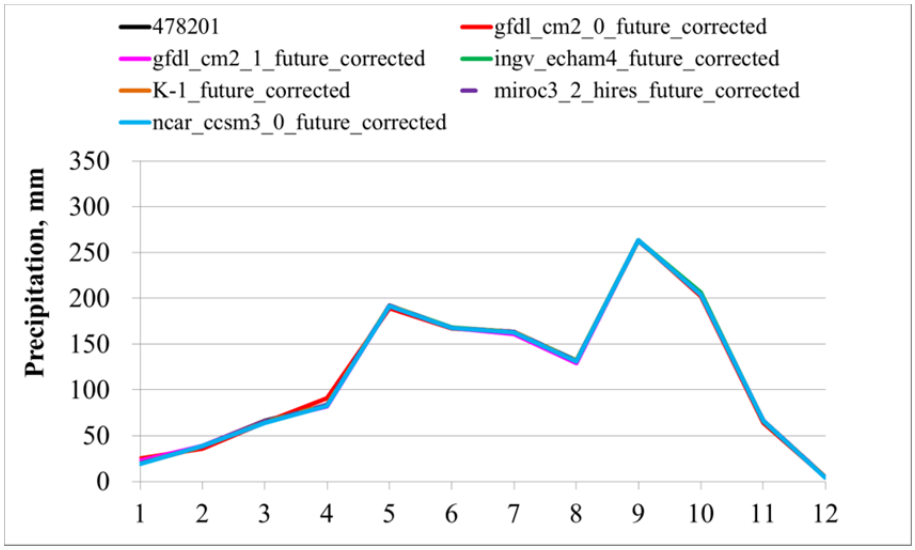
(a) Average monthly future precipitation



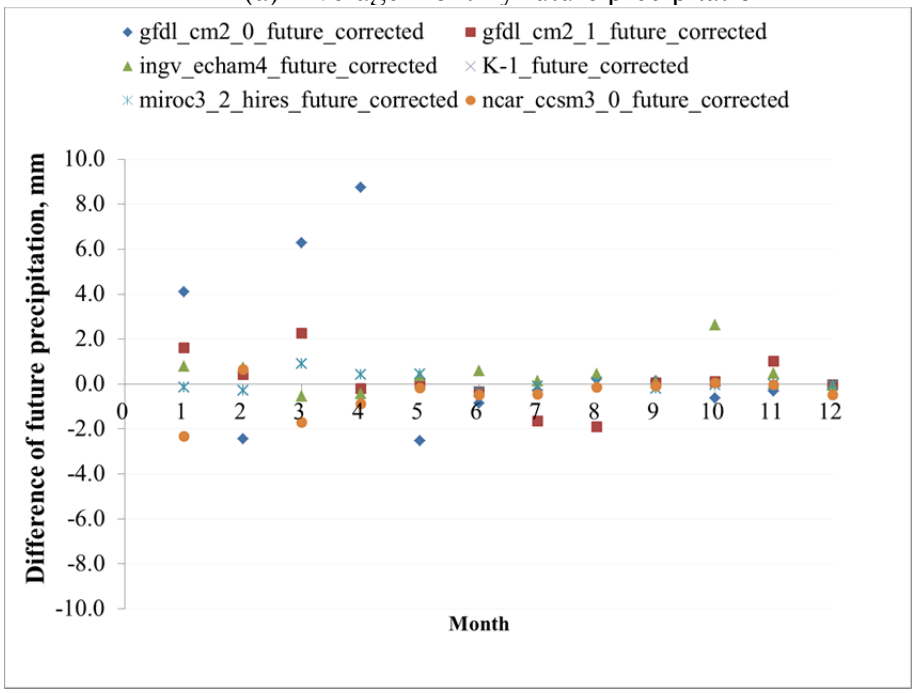
(b) Difference of future precipitation corrected and past precipitation corrected

Fig. 5-21 The average monthly future precipitation projection at station 459205

As can be seen in Fig. 5-22 below, at station 478201, the difference of future precipitation compared to past precipitation data from corrected GCMs output in the dry season (Dec-Feb) in the range of (-2.43-4.10) mm/month. For the first rainy season (Mar-Jul) and the second rainy season (Aug-Nov), the difference of future precipitation compared to past precipitation data from corrected GCMs output in the range of (-2.51-8.73) mm/month and (-1.90-2.63) mm/month respectively.



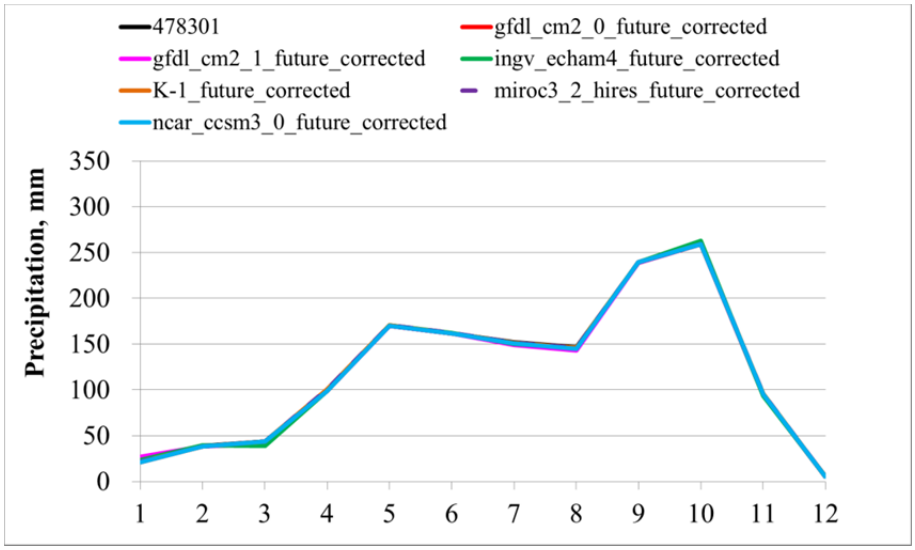
(a) Average monthly future precipitation



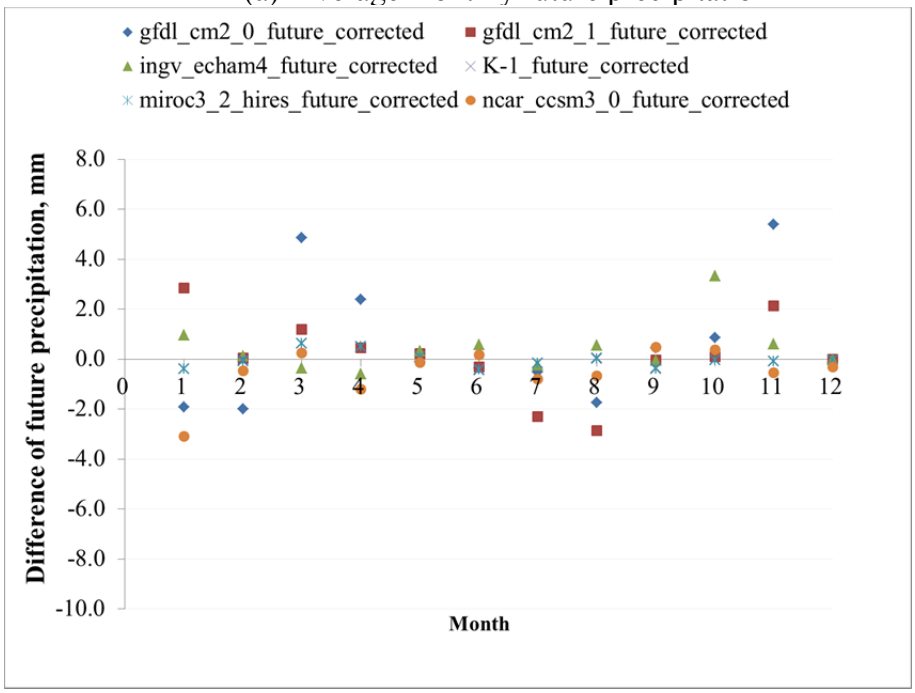
(b) Difference of future precipitation corrected and past precipitation corrected

Fig. 5-22 The average monthly future precipitation projection at station 478201

As can be seen in Fig. 5-23 below, at station 478301, the difference of future precipitation compared to past precipitation data from corrected GCMs output in the dry season (Dec-Feb) in the range of (-3.10-2.85) mm/month. For the first rainy season (Mar-Jul) and the second rainy season (Aug-Nov), the difference of future precipitation compared to past precipitation data from corrected GCMs output in the range of (-2.30-4.86) mm/month and (-2.87-5.39) mm/month respectively.



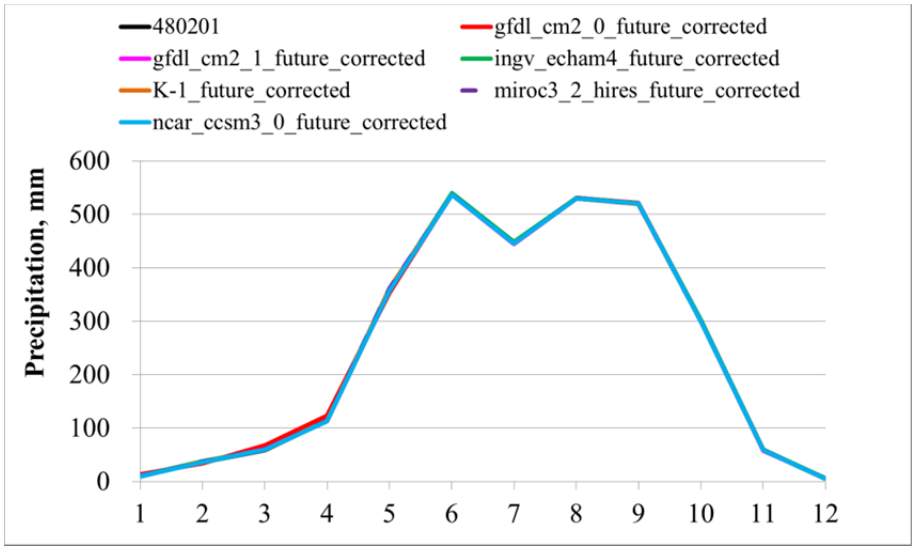
(a) Average monthly future precipitation



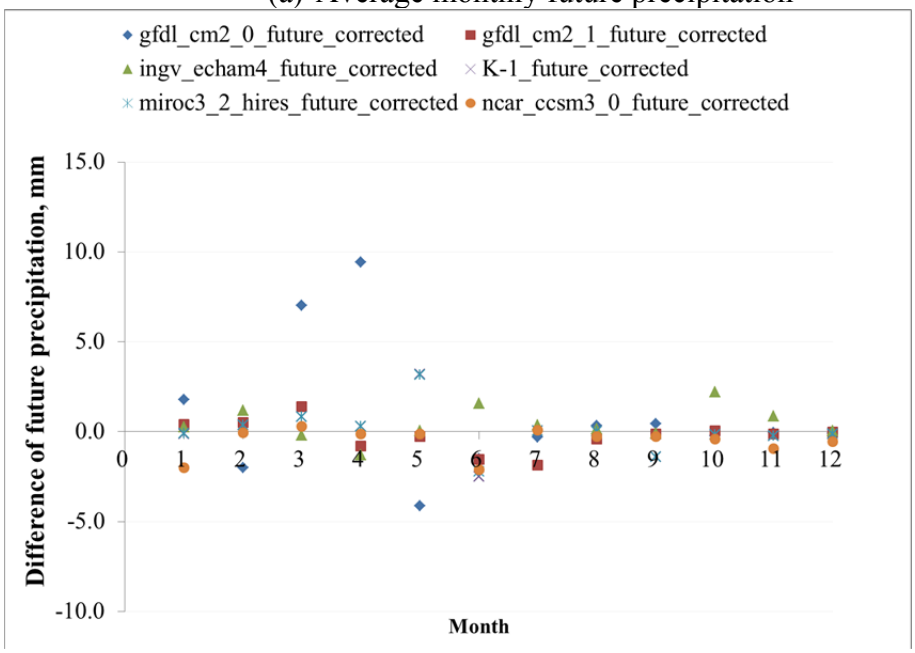
(b) Difference of future precipitation corrected and past precipitation corrected

Fig. 5-23 The average monthly future precipitation projection at station 478301

As can be seen in Fig. 5-24 below, at station 480201, the difference of future precipitation compared to past precipitation data from corrected GCMs output in the dry season (Dec-Feb) in the range of (-2.00-1.77) mm/month. For the first rainy season (Mar-Jul) and the second rainy season (Aug-Nov), the difference of future precipitation compared to past precipitation data from corrected GCMs output in the range of (-4.11-9.44) mm/month and (-1.40-2.22) mm/month respectively.



(a) Average monthly future precipitation



(2) Difference of future precipitation corrected and past precipitation corrected

Fig. 5-24 The average monthly future precipitation projection at station 480201

6. Runoff prediction module

Development of Runoff prediction Module was performed in the following steps: 1) Develop Seasonal Basic Tank model 2) Develop Network Tank model 3) Future runoff prediction

- ***Develop Seasonal Basic Tank model***

Seasonal Basic Tank model Runoff prediction Module was developed using following steps as shown in Fig. 6-1 below.

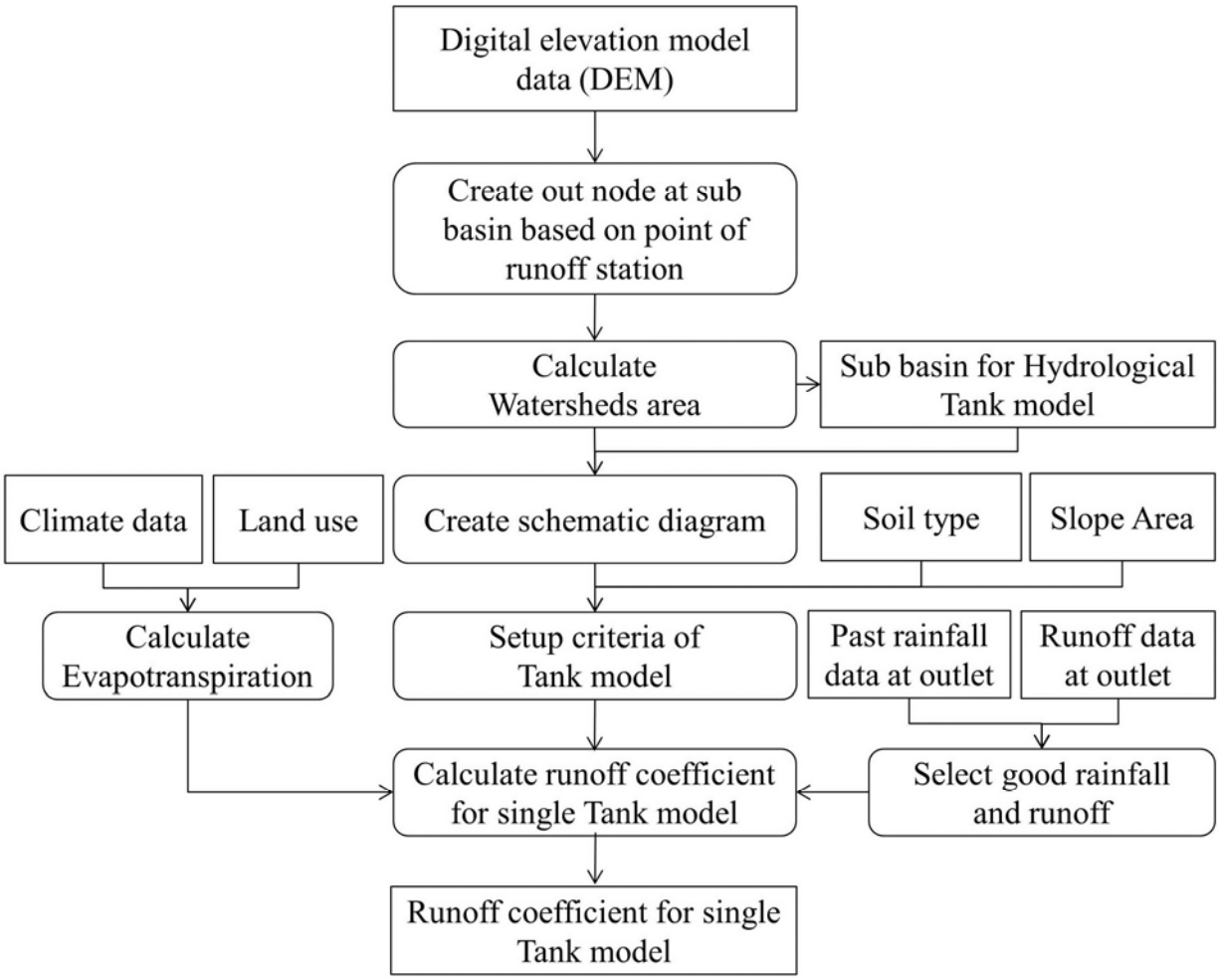


Fig. 6-1 Development of Seasonal Basic Tank model

We started to study hydrological tank model from collecting digital elevation model data, land use data, slope area data and soil type data and

runoff data collected from observed gauge station. We collected the time series of one observed runoff gauge station from 1983-2000 and inflow data to 5 reservoirs from 2005-2008 from RID of Thailand, which are located in Rayong region. We also used the time series of daily rainfall data from rain gauge station from 8 rain gauge station in Rayong from 1981-2010. With limitation of collecting runoff data and observed runoff gauge station, digital elevation model data, land use data and soil type data are necessary to be used for classifying sub basin type for calculating typical hydrological tank model parameters since limitation of collecting data from observed gauge stations. Digital elevation model data is shown in Fig.6-2.

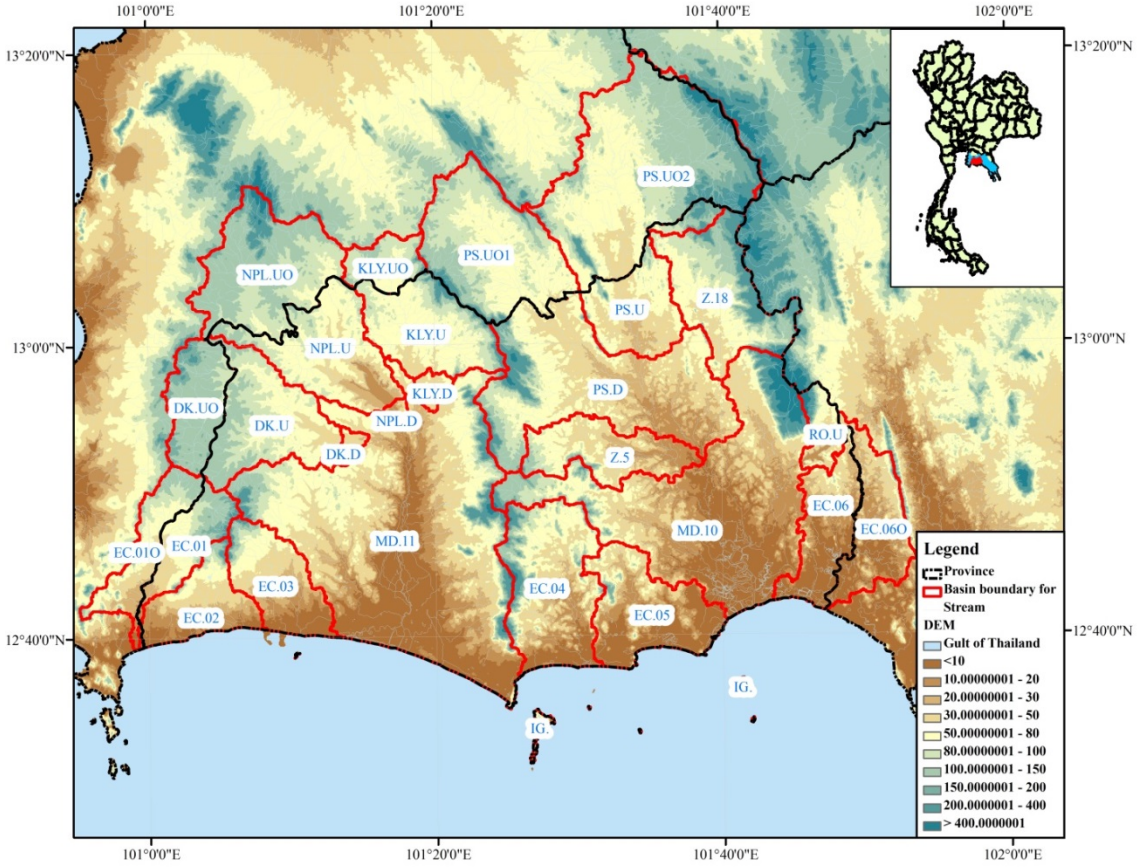


Fig. 6-2 Digital elevation model data covered Rayong province boundary.

The time series of daily rainfall data were also collected for developing hydrological network tank model. We developed 5 single tank models; Z.18, DK.U&DK.UO, KLY.U&KLY.UO, NPL.U&NPL.UO, PS.U&PS.UO2 with available rainfall and runoff. The single hydrological tank models for Z.18 and 5 reservoirs are shown in Fig.6-3. Table 6-1 shows time period of available data for calculating runoff parameters for single tank model.

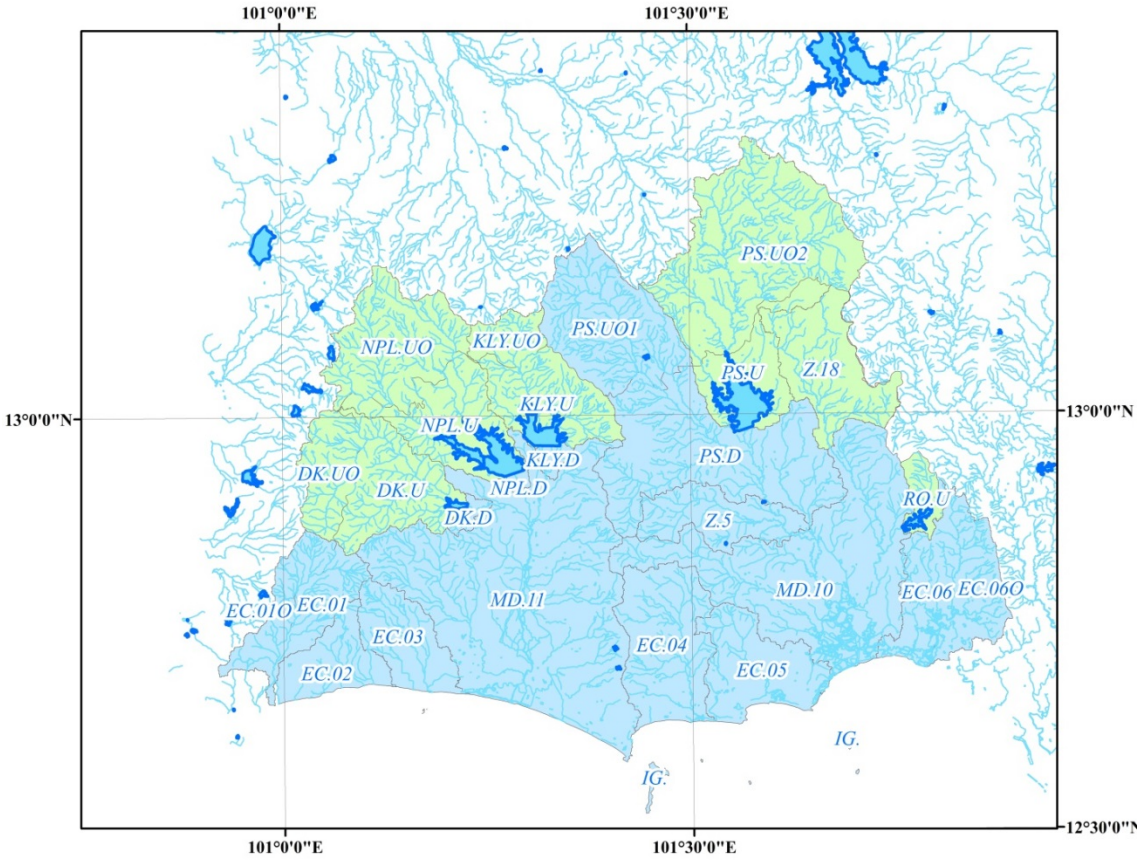


Fig. 6-3 5 Single tank models were developed for calculating runoff coefficient

For estimation precipitation for 5 single tank model, we assure that Inverse distance weighting method can estimate precipitation for basin since this method are widely used for interpolation of missing rainfall at observed station in following Eq. 6-1. Precipitation from 8 rain gauge station in Rayong from 1981-2010 were performed estimating into centroid of basin as precipitation data for each tank. Centroid of basin is shown in Fig. 6-4

Table 6-1 Period of available data for calculating runoff parameters for single tank model

Sub basin	year	Data
Z18	Apr 1999- Dec 2003	P, Q at Z.18
KLY.U	Jan 2007- Dec-2010	P, inflow
NPL.U	Jan 2007- Dec-2010	P, inflow
PS.U	Jan 2007- Dec-2010	P, inflow
RO.U	Jan 2007- Dec-2010	P, inflow

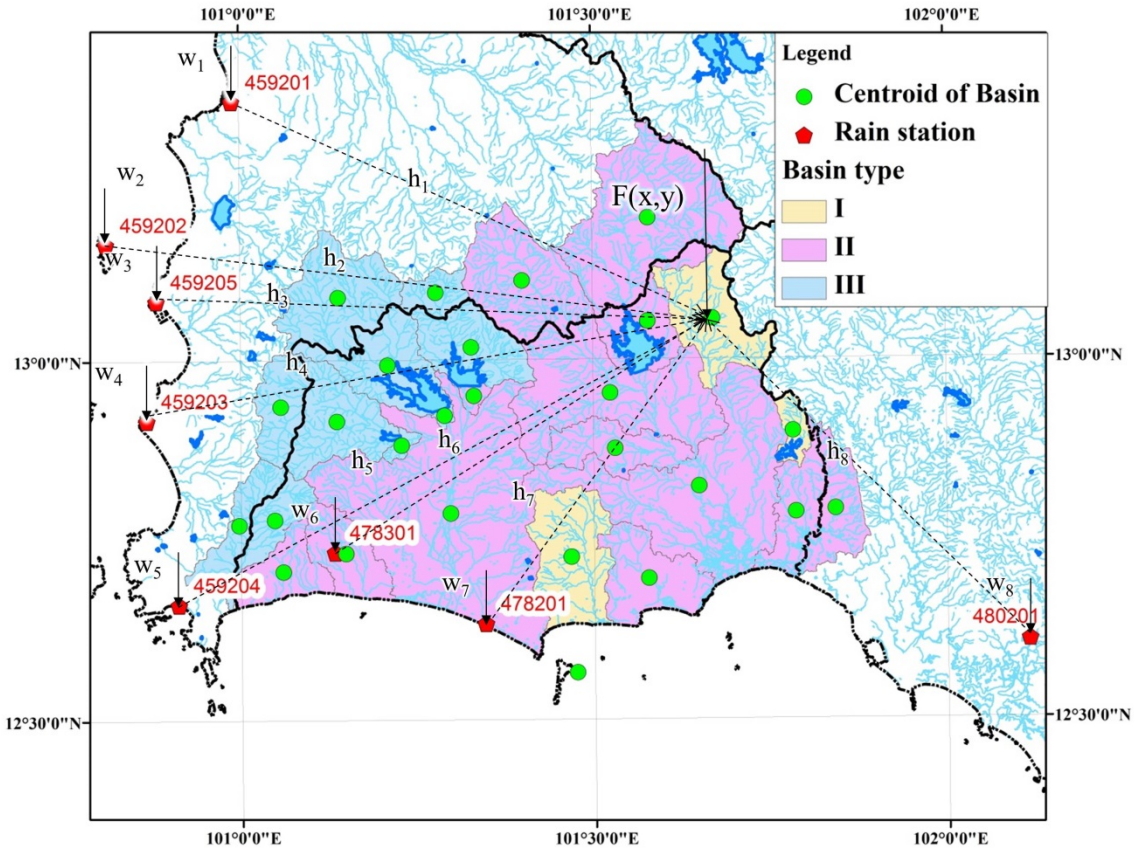


Fig. 6-4 Centroid of basins using for precipitation estimation

$$F(x,y) = \sum_{i=1}^{n} w_i h_i \quad (6\text{-}1)$$

$$w_i = \frac{{h_i}^{-p}}{\sum_{i=1}^{n} {h_i}^{-p}}$$

$$h_i = \sqrt{(x - x_i)^2 + (y - y_i)^2}$$

Hydrological rainfall-runoff model are widely used such as RRI, WEB-DHM, IFAS and Hydrological tank model. Since limitation of data and capability of computation, hydrological tank model could be applied in Rayong. With benefits of hydrological tank model, it can be used for calculating water balance and reservoir release at each Tank, however it cannot provide flood volume to estimate flood area.

For this research, hydrological tank model was generated using the conceptual hydrological tank model, which was created based on a 4-layer defined as: surface and sub-surface flow, intermediate flow, sub-base flow and

base flow for analyzing runoff characteristics as shown in Fig.6-5 and hydrological tank model is calculated using Eq. 6-2

$$Input(t) - Output(t) = Storage(t)$$

$$P(t) - E(t) + q_{in}(t) - q_{out}(t) = \frac{dh(t)}{dt} \quad (6\text{-}2)$$

With limitation of runoff station data, we are necessity to define basin group into same characteristics. We considered in Physical characteristic in basin area. It is widely used for classifying basin area for runoff estimation with using slope, land use type and soil type parameters. Average slope level of basin, land use type and soil type were used to classify for typical hydrological tank model in this study. We can classify using physical characteristic of sub basin as shows in Fig.6-6.

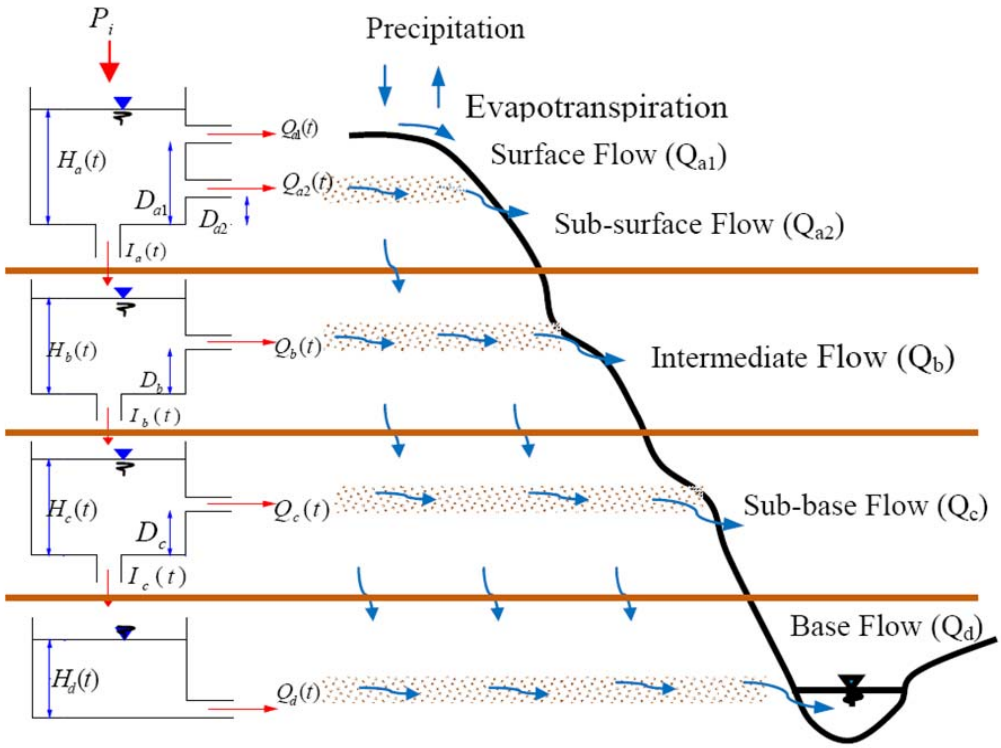


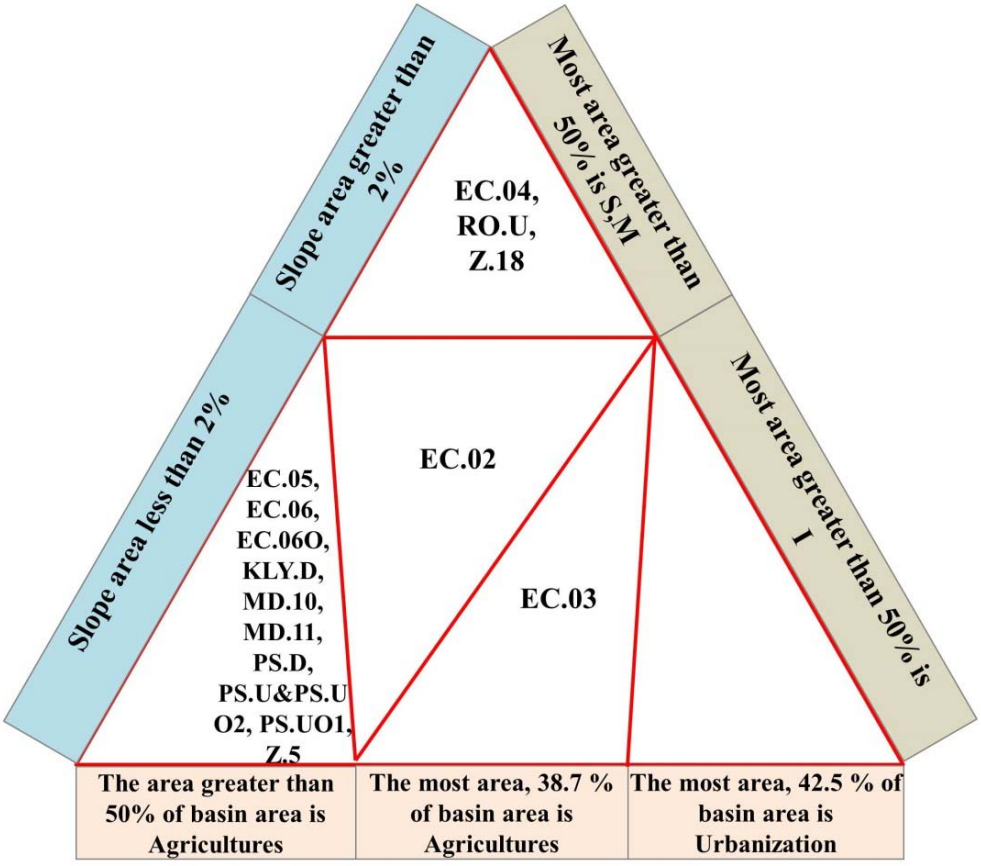
Fig. 6-5 Hydrological tank model, which was created based on a 4-layer

For the simulation of runoff, if precipitation volume is greater than that of evapotranspiration, the excess precipitation water can flow down to lower layers and will be discharged as runoff through horizontal outlets from the each layer. Evapotranspiration for hydrological tank model was calculated from land use and meteorological data from stations is calculated using

Eq. 6-3 and Eq. 6-4 and Fig. 6-7. Calculated Evapotranspiration is shown in Table 6-2. Runoff can be calculated using calibrated and validated optimal flow parameters of the 4-layer hydrological tank model through an optimization process based on seasonal characteristics. Parameters were calculated using the following steps;

a. Vertical flow parameters based on layers and layer property parameters were accurately calculated on best selected rainless day data periods in the dry season, which were then applied as constants to the calculation of the horizontal outlet parameters for rainy seasons.

b. The horizontal outlet parameters were accurately calculated on best selected wet day data periods through an optimization process based on seasonal characteristics.



Note: I Granite, granodiorite, and diorite
S,M gravel, sand, silt, and clay

Fig. 6-6 Hydrological tank model classified using average slope level of basin, land use type and soil type

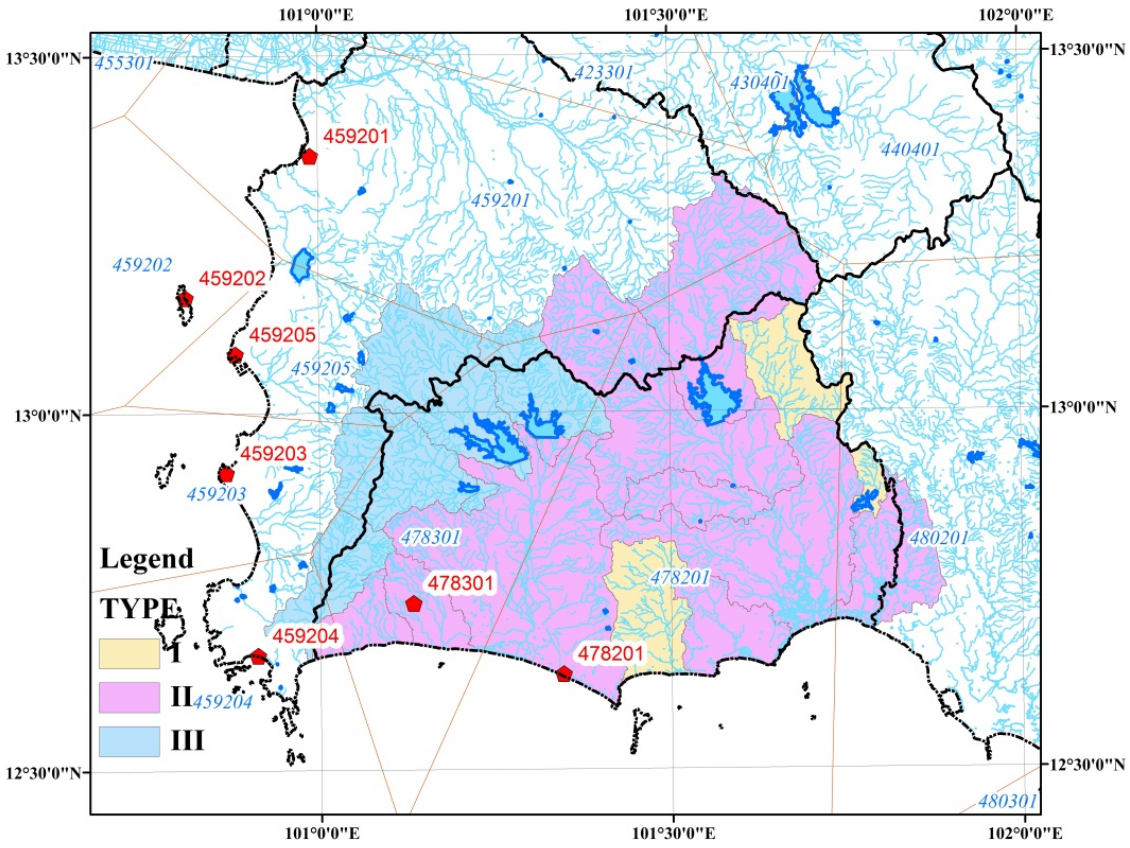


Fig. 6-7 Evapotranspiration for hydrological tank model

$$ETo_j = \frac{\sum_{k=1}^{n} A_k ETo_k}{\sum_{k=1}^{n} A_k} \quad (6\text{-}3)$$

Where;

ETo_j= reference crop evapotranspiration for basin j

A_k= Area of Thiessen polygon for ETo_k calculated from station k

ETo_k= reference crop evapotranspiration from station k

$$ET_j = Kc_j * ETo j = \frac{\sum_{i=1}^{n} Kc_i A_i}{\sum_{i=1}^{n} A_i} * ETo_j \quad (6\text{-}4)$$

Where;

ET_j = evapotranspiration for basin j

Kc_J = average crop coefficient for basin j

Kc_i = crop coefficient for plant i

Ai = Area for plant i

Table 6-2 Evapotranspiration for hydrological tank model

Unit : mm/day

Sub basin	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
DK.D	4.09	4.48	4.67	4.15	4.05	3.88	3.78	3.50	3.45	3.91	3.91	3.91
DK.U	4.08	4.48	4.66	4.13	4.04	3.86	3.77	3.50	3.45	3.91	3.91	3.91
DK.UO	4.21	4.63	4.78	4.23	4.15	4.02	3.90	3.59	3.49	4.05	4.05	4.05
EC.01	4.34	4.65	4.96	4.26	4.24	4.15	3.70	3.70	3.39	4.07	4.07	4.07
EC.01O	4.34	4.65	4.96	4.26	4.24	4.15	3.70	3.70	3.39	4.07	4.07	4.07
EC.02	4.03	4.42	4.64	4.08	4.04	3.84	3.63	3.51	3.39	3.88	3.88	3.88
EC.03	3.84	4.27	4.44	3.98	3.92	3.64	3.59	3.39	3.39	3.74	3.74	3.74
EC.04	4.23	4.51	4.76	4.22	4.06	3.95	3.88	3.50	3.48	3.84	3.84	3.84
EC.05	4.17	4.48	4.72	4.15	3.96	3.86	3.78	3.44	3.46	3.87	3.87	3.87
EC.06	4.01	4.36	4.60	3.90	3.58	3.51	3.44	3.18	3.42	3.89	3.89	3.89
EC.06O	4.01	4.36	4.60	3.90	3.58	3.51	3.44	3.18	3.42	3.89	3.89	3.89
IG	4.26	4.52	4.78	4.26	4.09	4.00	3.93	3.52	3.49	3.81	3.81	3.81
KLY.D	4.15	4.53	4.72	4.18	4.07	3.92	3.82	3.51	3.46	3.94	3.94	3.94
KLY.U	4.18	4.55	4.75	4.20	4.08	3.94	3.83	3.52	3.47	3.97	3.97	3.97
KLY.UO	4.25	4.63	4.81	4.25	4.12	4.01	3.88	3.55	3.49	4.04	4.04	4.04
MD.10	4.10	4.43	4.67	4.03	3.78	3.70	3.62	3.32	3.44	3.89	3.89	3.89
MD.11	4.11	4.43	4.66	4.16	4.04	3.88	3.81	3.48	3.45	3.79	3.79	3.79
NPL.D	4.13	4.51	4.70	4.17	4.06	3.90	3.80	3.51	3.46	3.93	3.93	3.93
NPL.U	4.14	4.53	4.72	4.18	4.07	3.92	3.81	3.52	3.46	3.95	3.95	3.95
NPL.UO	4.28	4.69	4.84	4.28	4.18	4.07	3.95	3.61	3.50	4.10	4.10	4.10
PS.D	4.15	4.49	4.71	4.11	3.91	3.81	3.72	3.41	3.46	3.92	3.92	3.92
PS.U	4.18	4.54	4.75	4.17	3.99	3.89	3.78	3.46	3.47	3.96	3.96	3.96
PS.UO1	4.22	4.59	4.79	4.22	4.07	3.96	3.84	3.51	3.48	4.00	4.00	4.00
PS.UO2	4.21	4.57	4.78	4.19	4.02	3.92	3.80	3.48	3.47	3.99	3.99	3.99
RO.U	4.08	4.43	4.66	4.01	3.74	3.66	3.58	3.29	3.44	3.92	3.92	3.92
Z.18	4.15	4.50	4.72	4.11	3.91	3.81	3.71	3.40	3.46	3.94	3.94	3.94
Z.5	4.15	4.49	4.71	4.11	3.91	3.81	3.72	3.41	3.46	3.92	3.92	3.92

The calculated Evapotranspiration from Table 6-2 was applied to single tank model simulation as constrain for evaporation data. With this condition, it can result realistic daily evapotranspiration for basin that using monthly average data from station data.

With this approach, the optimized vertical outlet parameters and the horizontal outlet parameters are calculated based on seasonal characteristics, could be effectively applied to the calculation of the total runoff in a way that accurately simulates the physical reality of the layer parameters for the basin area and can be effectively applied to hydrological tank model runoff simulation for other areas.

- ***Develop Network Tank model***

Network Tank model was developed using following steps as shown in Fig. 6-8 below.

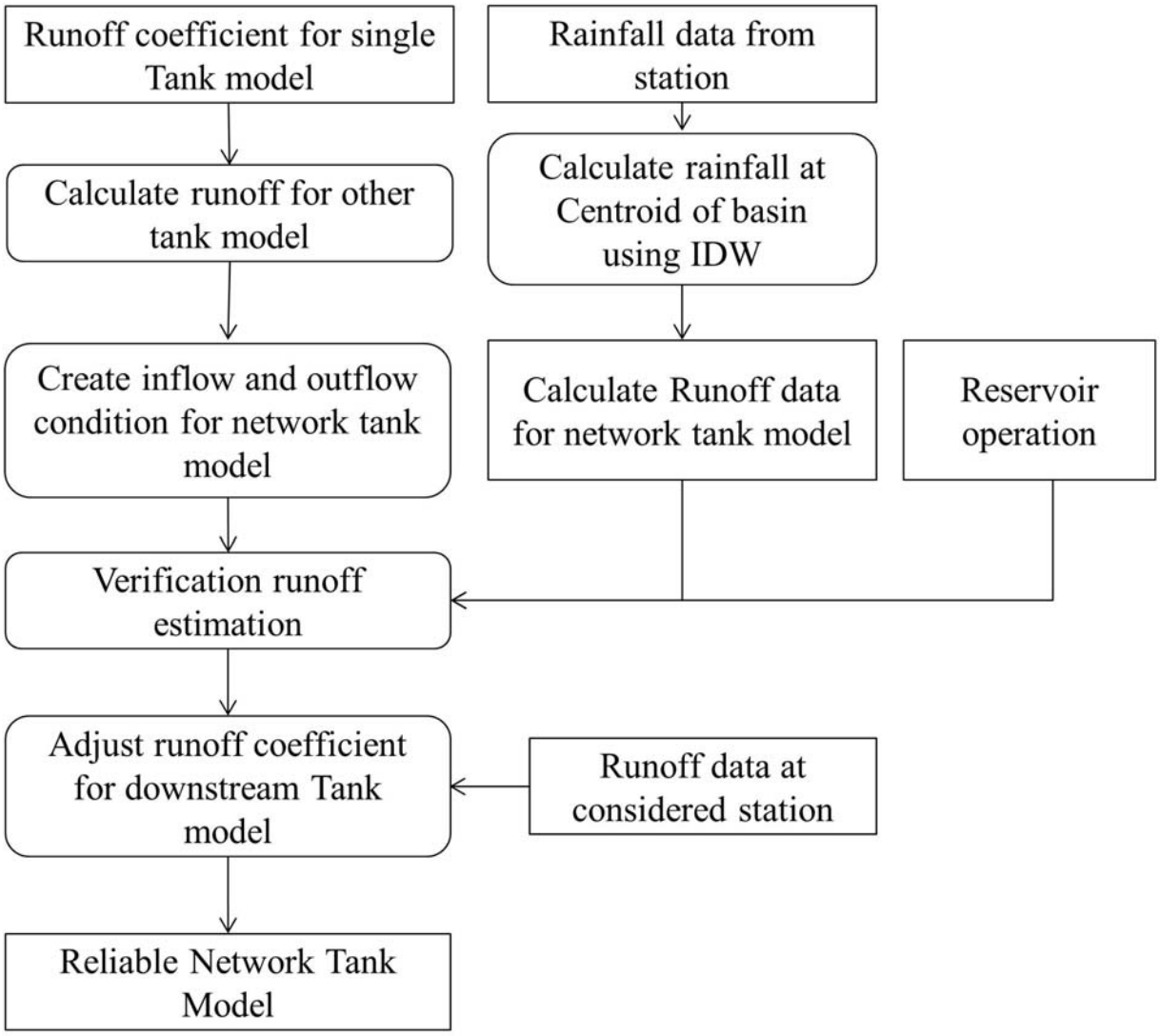


Fig. 6-8 Development of Network Tank model

We started to create network tank model following schematic diagram of water resources system for Rayong, which contains sub-basin and reservoir operations as shown in Fig.6-9. Hydrological network tank model were used for calculating runoff for Rayong. Calculating runoff for sub basin was performed using precipitation calculated from Inverse Distance Weighting Method at Centroid of basein. We assure that this approach can estimate precipitation with best with best fitting on rainfall from observed data. Water balance was calculated and verified using past reservoir operation data including inflow, reservoir volume and actual water release. Past daily runoff was calculated from past daily rainfall from 8 rainfall stations and past daily runoff for GCMs model were calculated from daily bias corrected precipitation data from GCMs. Runoff or Inflow for sub basin was calculated using precipitation from IDW method and then were verified to observed runoff station data.

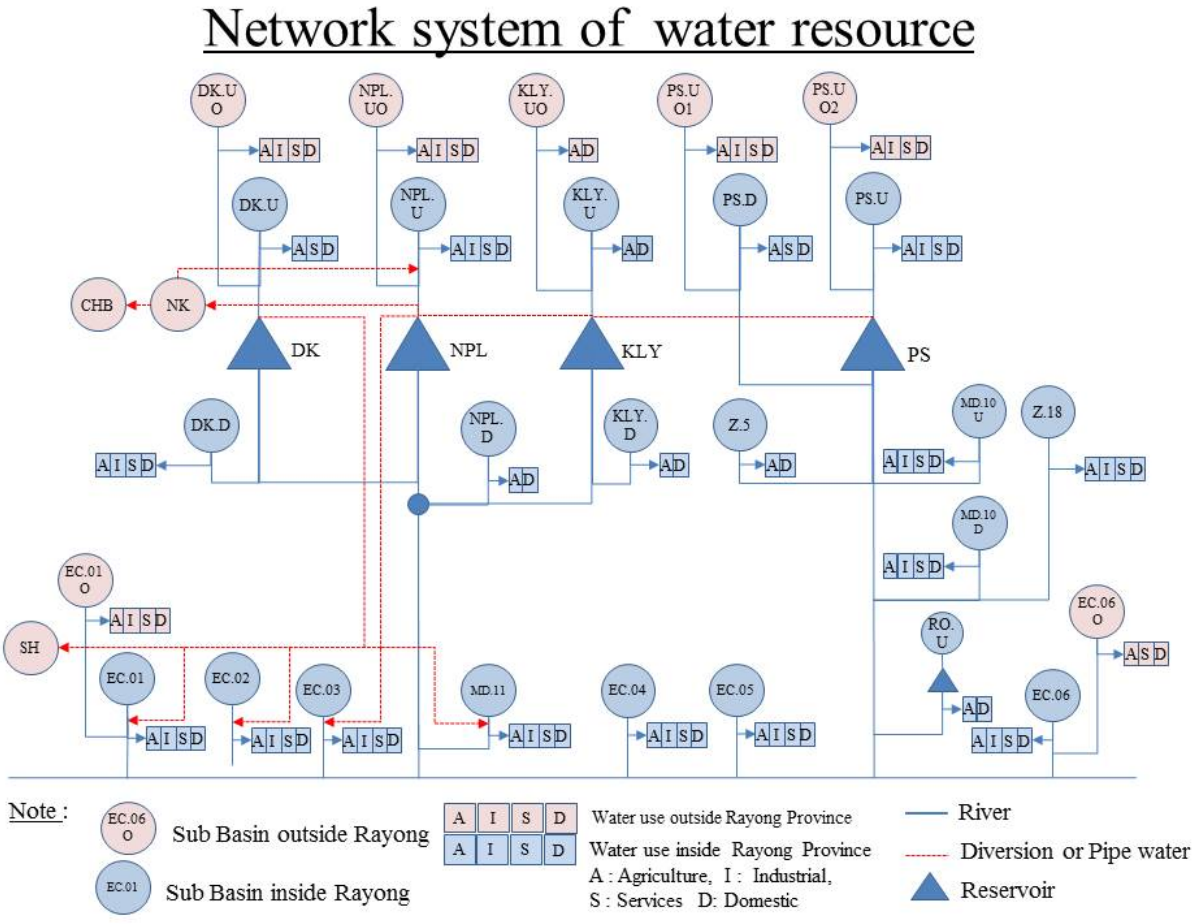


Fig. 6-9 Network Tank model was developed with Rayong water user diagram

Since runoff coefficients were calculated and verified using data at the upstream, difference of calculated runoff compared to runoff from observed station data has a large number for network tank model. To perform for reliable runoff calculation for network tank model, runoff coefficient is necessity to adjust for sub basin at downstream.

- ***Future runoff prediction***

Future runoff was calculated from daily predicted future precipitation data from bias corrected GCMs model data using runoff coefficients from past data. Future daily runoff was calculated from future daily corrected precipitation from 6 GCMs model output. Future precipitation for basins was calculated using IDW method at centroid of each basin from future precipitation data at station. Daily future daily runoff was calculated from future precipitation data at centroid of each basin with runoff coefficient from single tank model from 2046-2065.

- ***Results and discussion***

Seasonal Basic Tank model was developed using from precipitation estimated at sub basin scale for single tank model. The calculated evapotranspiration was applied as constrain of single tank model to calculate single tank parameters. Table 6-3 shows that the result of calculated single tank parameters using for runoff calculation at sub basin.

Table 6-3 single tank parameters for runoff calculation at sub basin

TYPE	C_{a1}	C_{a2}	C_{b1}	C_{c1}	D_{a1}	D_{a2}	D_b	D_c	H_a	H_b	H_c	H_d	C_{a0}	C_{b0}	C_{c0}	C_d
I	0.001	0.001	0.790	0.013	0	0	8	8,834	3,435	11	9	0	0.005	1.000	0.011	0.011
II	0.006	0.102	0.501	0.002	0	0	15,811	7,757	0	0	0	51	0.302	0.040	0.041	0.041
III	0.001	0.007	0.060	0.012	150	0	2,745	476	0	0	0	0	0.011	0.543	0.906	0.001

Table 6-4 shows that evapotranspiration parameters were resulted from single tank model simulation comparing to evapotranspiration from constrain calculated from Eg. 6-4.

Table 6-4 Evapotranspiration parameters for runoff calculation at sub basin

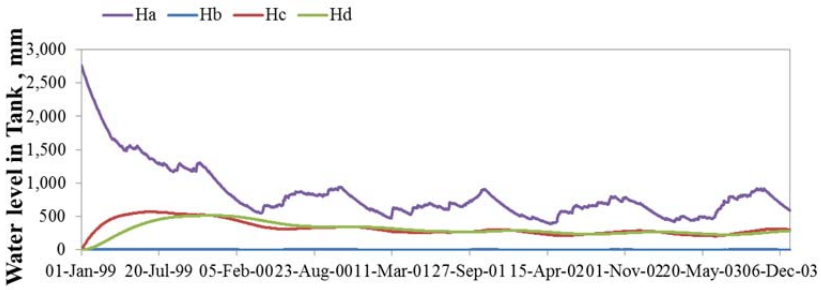
Unit : mm/day

Sub basin	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
DK.U basin												
Constrain	4.15	4.56	4.72	4.18	4.10	3.94	3.84	3.55	3.47	3.98	3.98	3.98
Simulated	3.53	3.31	3.12	3.13	2.75	2.68	3.13	3.49	3.34	3.48	2.80	3.60
NPL.U basin												
Constrain	4.21	4.61	4.78	4.23	4.13	4.00	3.88	3.57	3.48	4.03	4.03	4.03
Simulated	2.71	2.60	2.36	2.34	2.34	2.66	3.24	3.39	3.11	3.07	3.13	3.28
KLY.U basin												
Constrain	4.22	4.59	4.78	4.23	4.10	3.98	3.86	3.54	3.48	4.01	4.01	4.01
Simulated	3.75	3.65	3.40	3.68	3.63	2.73	2.86	3.00	2.37	3.03	3.83	4.00
PS.U basin												
Constrain	4.20	4.56	4.77	4.18	4.01	3.91	3.79	3.47	3.47	3.98	3.98	3.98
Simulated	3.17	3.30	3.12	3.35	3.27	3.40	3.51	3.43	2.90	3.75	3.74	3.92
Z.18 basin												
Constrain	4.15	4.50	4.72	4.11	3.91	3.81	3.71	3.40	3.46	3.94	3.94	3.94
Simulated	4.59	4.61	4.95	3.52	3.73	3.67	3.21	3.13	3.38	3.10	3.35	4.00
RO.U basin												
Constrain	4.08	4.43	4.66	4.01	3.74	3.66	3.58	3.29	3.44	3.92	3.92	3.92
Simulated	3.59	3.81	4.16	3.71	3.71	2.76	3.12	2.95	2.54	3.34	3.70	4.07

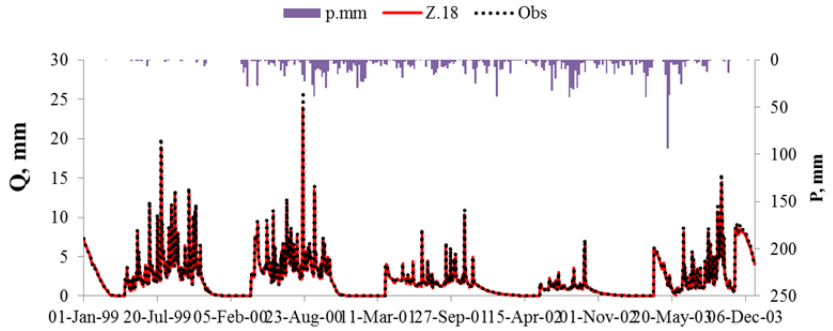
These simulated tank parameters and evapotranspiration parameters were applied to runoff calculation for sub basins.

Figure 6-10 to Figure 6-15 show relationship between Runoff calculation and observed runoff data for 5 single tank models. The result indicates that runoff calculation reflects best fit with observed runoff. The result shows runoff coefficient for sub basin type classified using soil type, slope area and land use in Table 6-4. Type I is classified for sub basin Z.18, and RO. Type II is classified for sub basin PS and TYPE III is classified for sub basin DK, NPL and KLY.

With calculated past runoff data from 2007-2010, we verified reservoir volume for 5 reservoirs to confirm that runoff data can be reliable to applied for basin from 1981-2000. The result shows the reservoir volumes calculated for 5 reservoirs reflect best fitting with actual reservoir volumes recorded in past year from 2007-2009 as shown in Fig. 6-16.

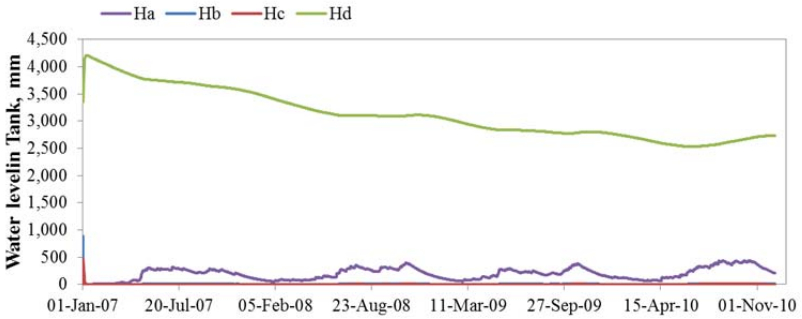


(a) Water level in Tank model of Z.18 basin

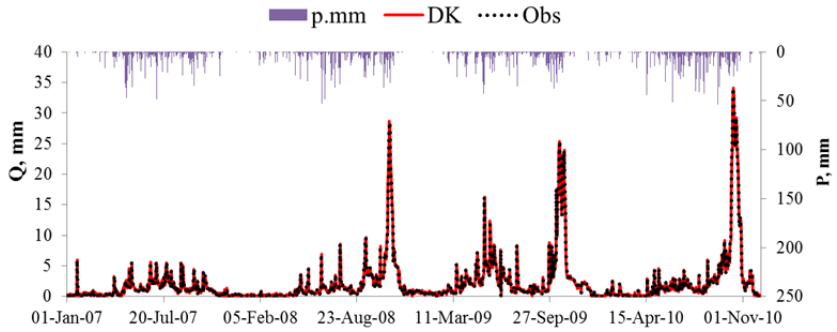


(b) Runoff calculated at Z.18 basin

Fig. 6-10 Water level and runoff calculation at Z.18 basin

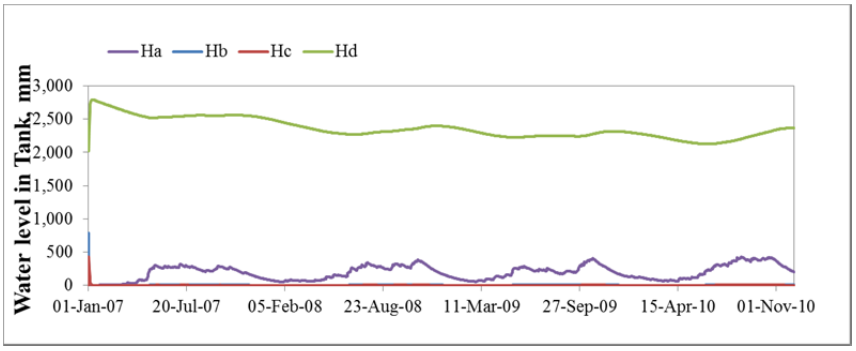


(a) Water level in Tank model at DK basin

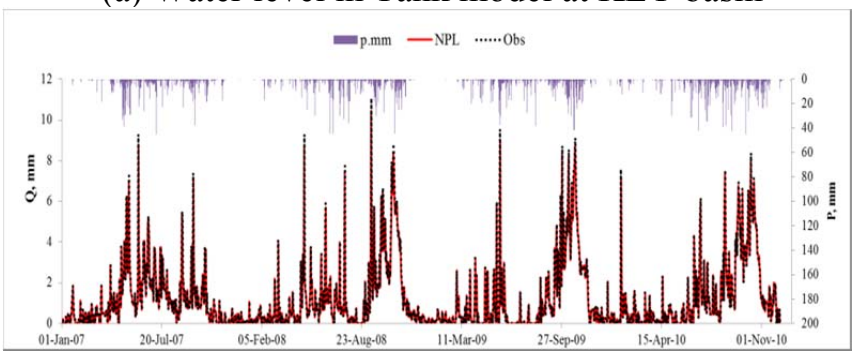


(b) Runoff calculated at DK basin

Fig. 6-11 Water level and runoff calculation at DK basin

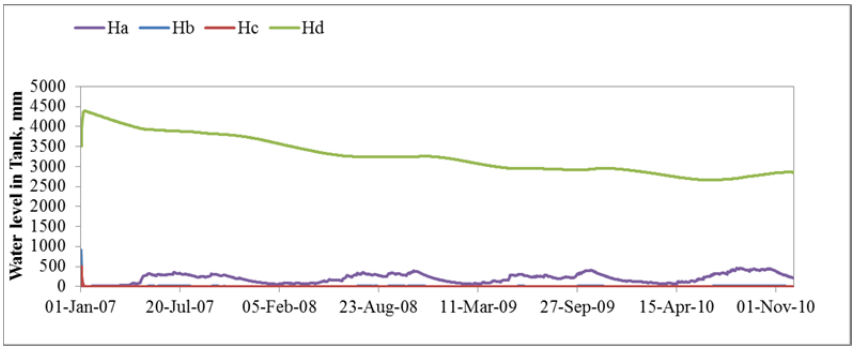


(a) Water level in Tank model at KLY basin

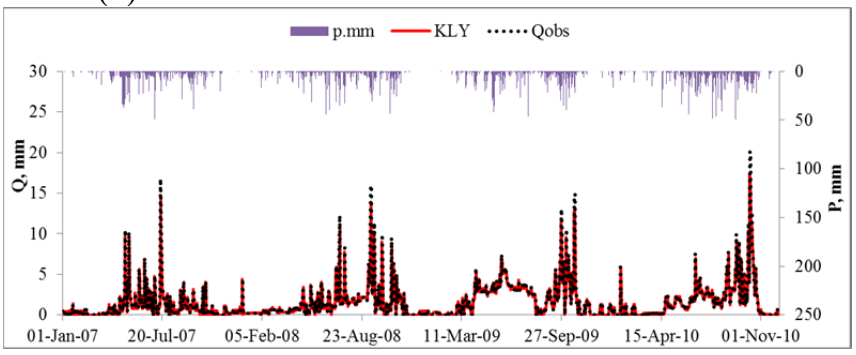


(b) Runoff calculated at NPL basin

Fig. 6-12 Water level and runoff calculation at NPL basin

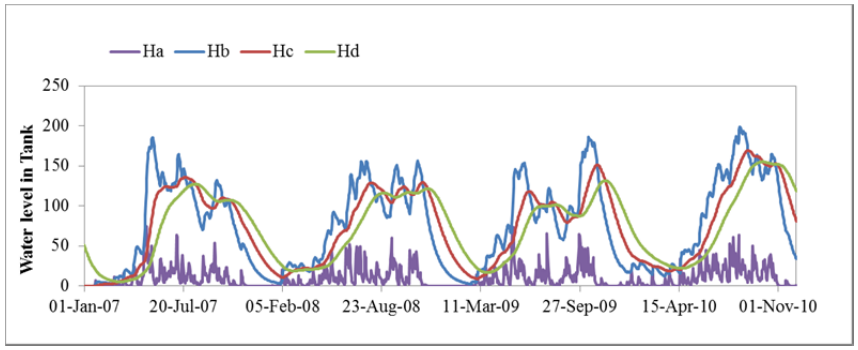


(a) Water level in Tank model at KLY basin

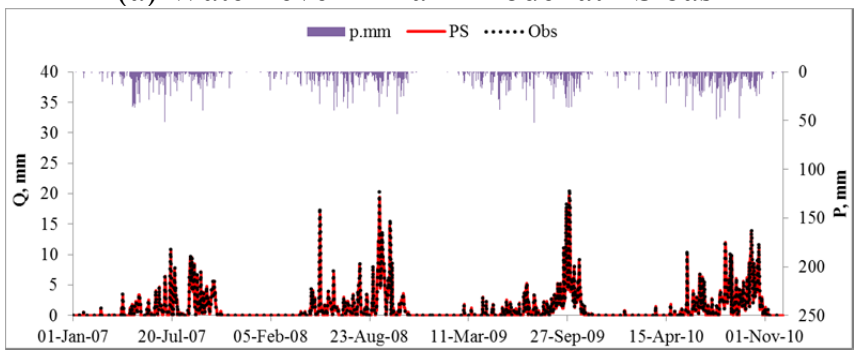


(b) Runoff calculated at KLY basin

Fig. 6-13 Water level and runoff calculation at KLY basin

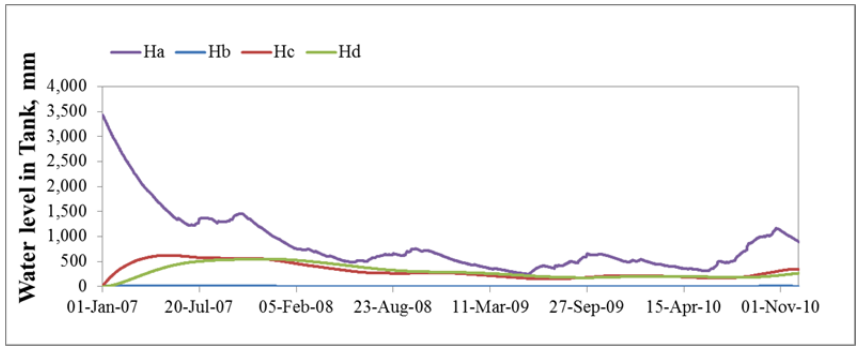


(a) Water level in Tank model at PS basin

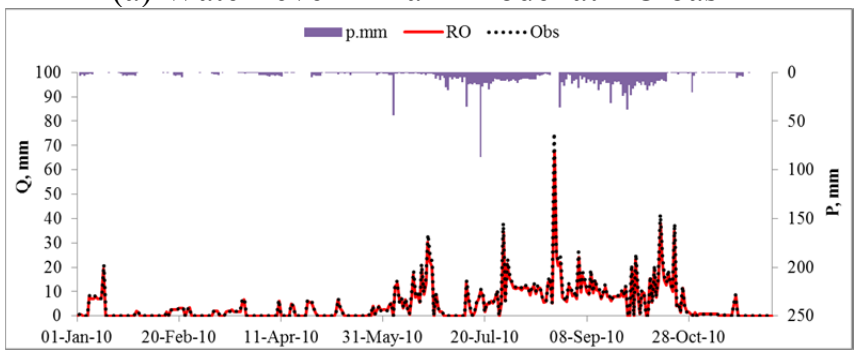


(b) Runoff calculated at PS basin

Fig. 6-14 Water level and runoff calculation at PS basin

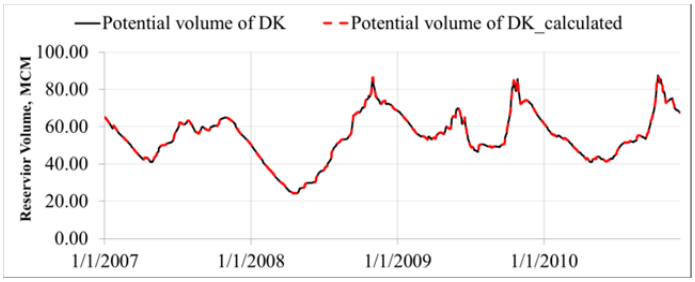


(a) Water level in Tank model at RO basin

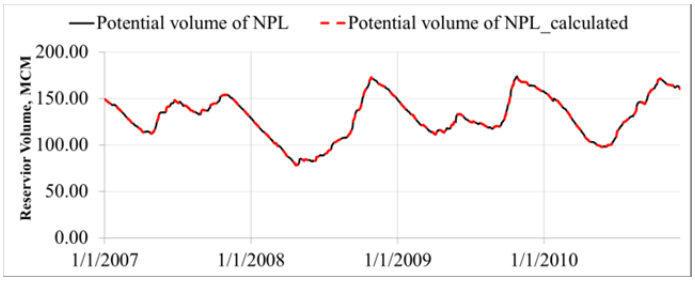


(b) Runoff calculated at RO basin

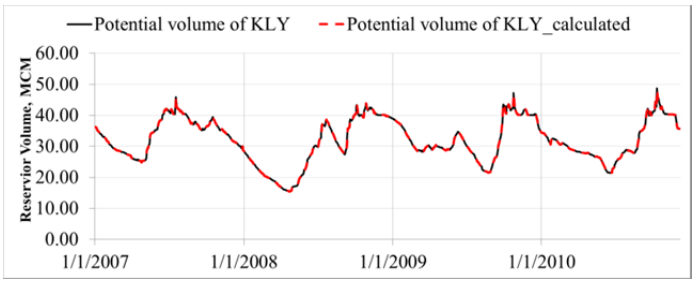
Fig. 6-15 Water level and runoff calculation at RO basin



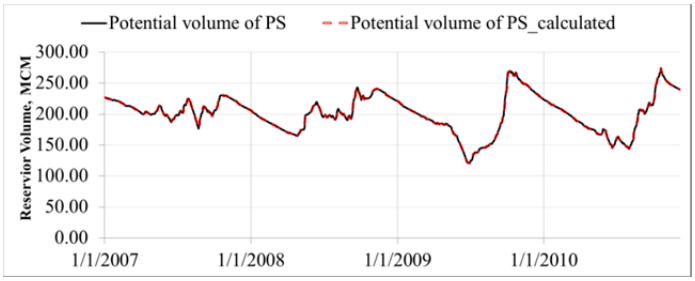
(a) Reservoir volumes of calculated and recorded data at DK



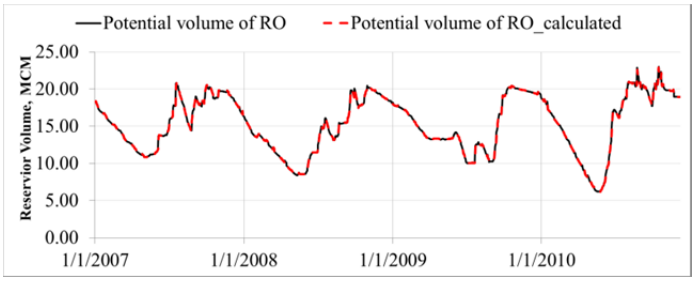
(b) Reservoir volumes of calculated and recorded data at NPL



(c) Reservoir volumes of calculated and recorded data at KLY



(d) Reservoir volumes of calculated and recorded data at PS



(e) Reservoir volumes of calculated and recorded data at RO

Fig. 6-16 Reservoir volumes of calculated and recorded data at DK, NPL, KLY, PS and RO reservoir

The result of calculated reservoir volumes for 5 reservoirs reflects best fitting with actual reservoir volumes since this calculation related to the combination calculated runoff resulted in Fig.6-10 to Fig.6-15 and actual volume from recorded data.

For runoff calculation verification for Network tank model, we have only 2 observed runoff gauge station. Outflow or actual runoff at gauge station of Network Tank model can be considered at Bankai Irrigation project (Z.1) and Pasae River (MD.11) as shown in Fig.6-17. We used daily observed station data from 2007-2010 for runoff calculation verification. The Network tank model was verified using observed station data at Bankai Irrigation project (Z.1) and Pasae River (MD.11) as shown in Fig. 6-18 and Fig. 6-19. The result of runoff verification shows calculated runoff reflects good fitting with observed data, however we found some data is not reflect best fitting with observed data. To validate this unrealistic runoff, we adjusted tank parameter to confirm that this Network tank model can be applied for other basin.

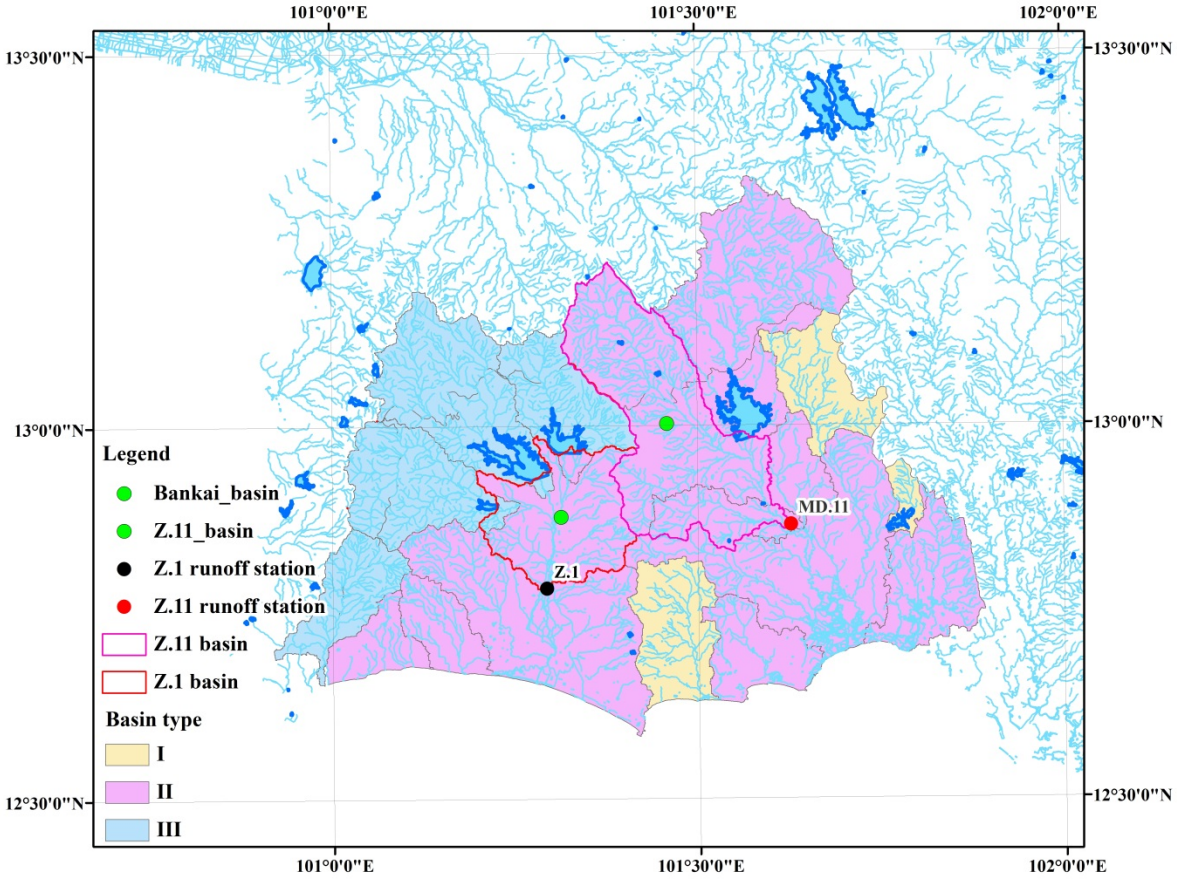
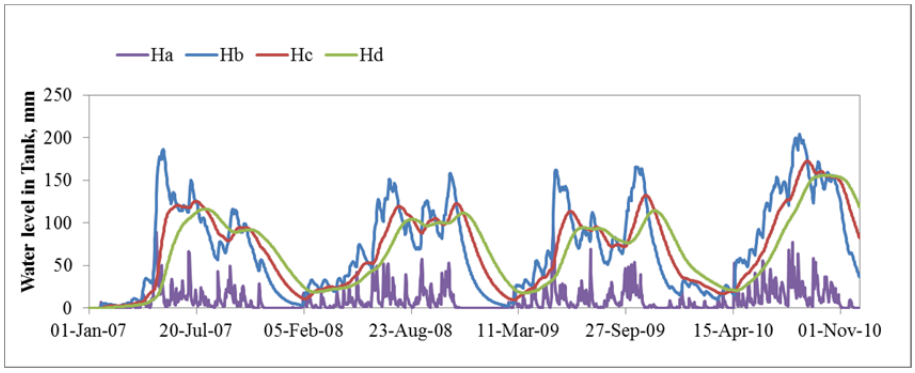
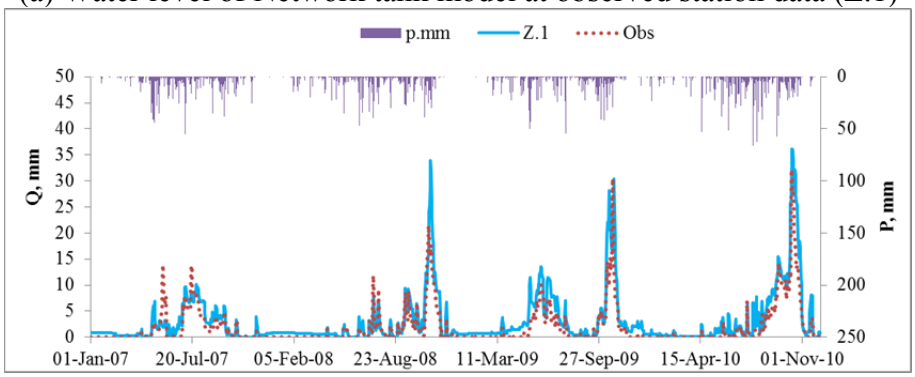


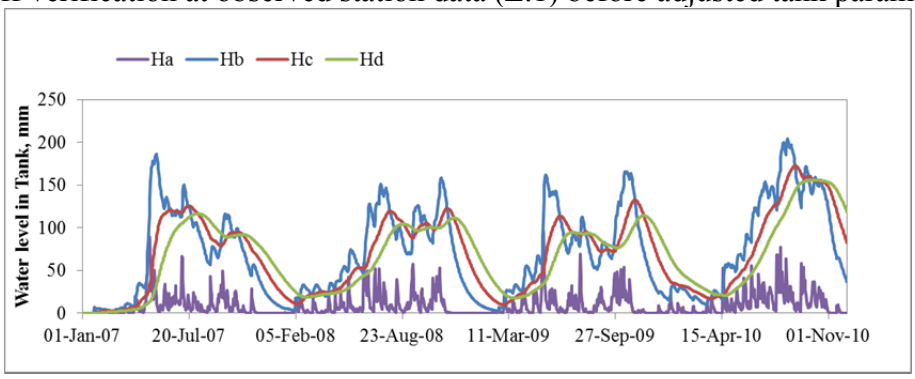
Fig. 6-17 Runoff verification point at the downstream of Network tank model



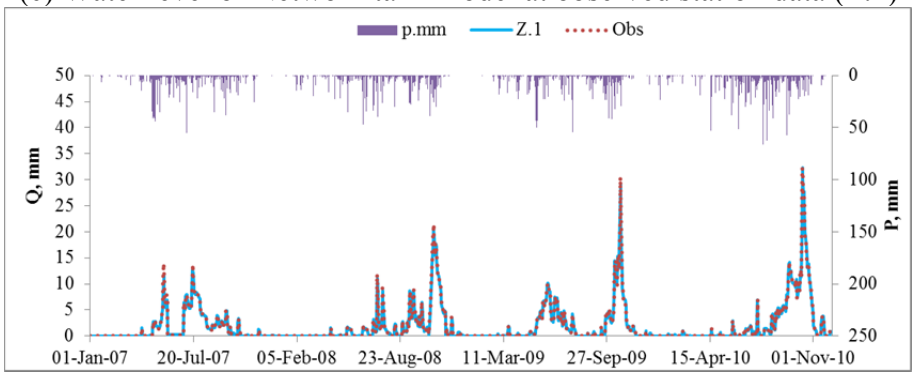
(a) Water level of Network tank model at observed station data (Z.1)



(b) Daily runoff verification at observed station data (Z.1) before adjusted tank parameter

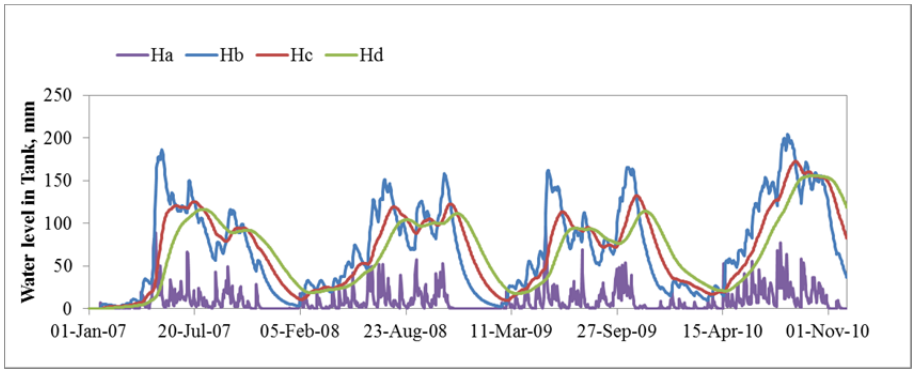


(c) Water level of Network tank model at observed station data (Z.1)

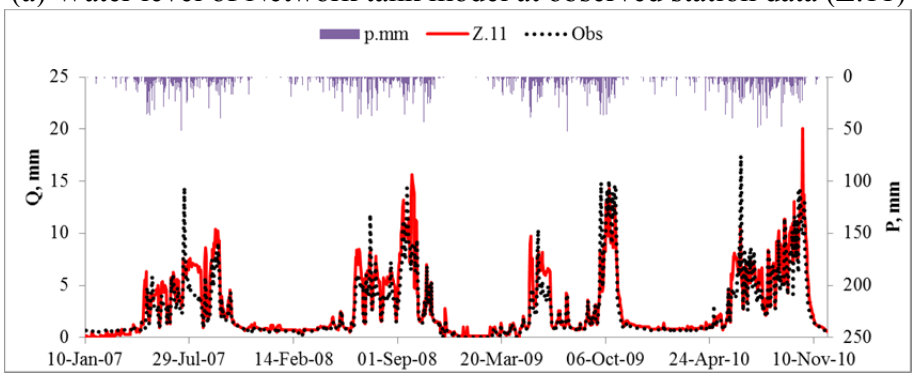


(d) Daily runoff verification at observed station data (Z.1) after adjusted tank parameters

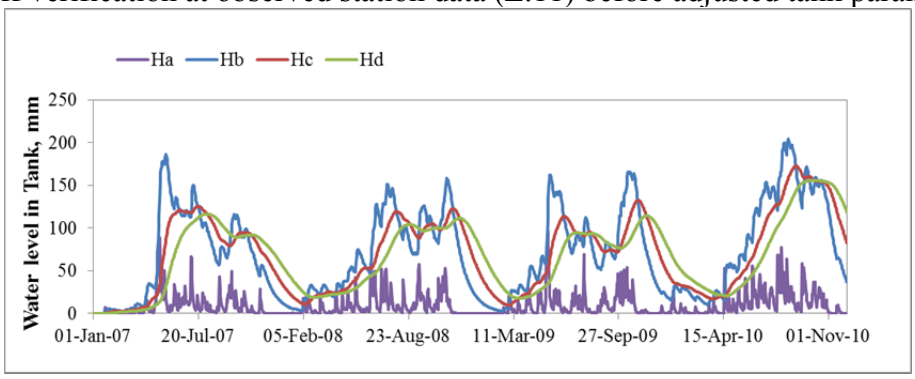
Fig. 6-18 Runoff verification at Bankai Irrigation project (Z.1)



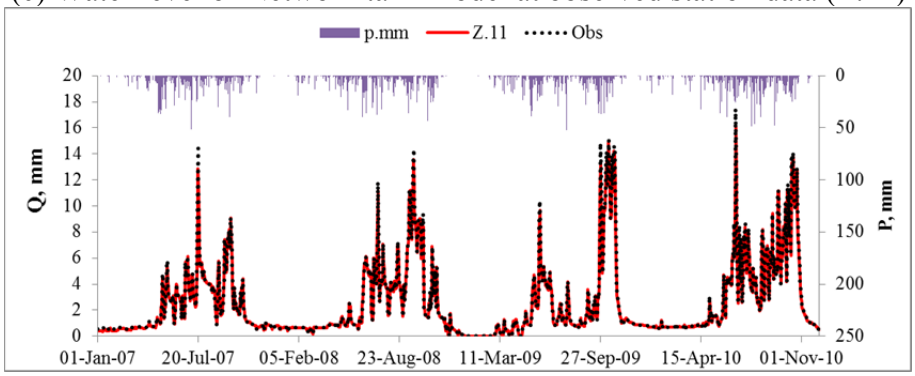
(a) Water level of Network tank model at observed station data (Z.11)



(b) Daily runoff verification at observed station data (Z.11) before adjusted tank parameter



(c) Water level of Network tank model at observed station data (Z.11)



(d) Daily runoff verification at observed station data (Z.11) after adjusted tank parameters

Fig. 6-19 Runoff verification at Pasae river (Z.11)

For past runoff calculation, we estimated past runoff as shown in Table 6-5. Past runoff was calculated using daily precipitation data of each basin resulted from corrected precipitation data estimated from observed station data and 6 GCM model outputs resulted from past precipitation in chapter 5. The result shows that total monthly runoff expresses a large number of runoff in the middle of 2rd rainy season (Aug-Nov) especially in October. There is decreasing runoff from the end of 2rd rainy season during dry season. The result reflects low runoff in the beginning of 1st rainy season in March. Average monthly runoff calculated from corrected daily past precipitation data from GCMs outputs in the dry season (Dec-Feb) is in the range of (57.8-111.5) MCM/month. For the 1st rainy season (Mar-Jul) and the 2nd rainy season (Aug-Nov), average monthly past runoff is in the range of (47.9-186.0) MCM/month and (182.0-581.3) MCM/month respectively. Total past runoff calculated is in the range of (2,240.9-2,284.4) MCM/year.

Table 6-5 Total calculated monthly past runoff

Unit: MCM

Month	Station	gfdl_cm2_0	gfdl_cm2_1	ingv_echam4	K-1	miroc3_2_hires	ncar_ccsm3_0
1	105.2	105.8	102.3	100.8	108.6	108.2	101.7
2	59.8	60.7	59.7	57.8	61.6	61.5	58.7
3	53.0	47.9	49.5	51.2	50.1	50.0	48.8
4	66.8	63.0	66.4	64.1	65.0	65.0	65.6
5	139.3	136.2	138.1	135.6	140.1	140.0	137.8
6	150.6	141.0	145.9	144.1	146.1	146.4	145.0
7	186.0	181.1	182.9	176.7	180.3	180.3	180.5
8	200.8	197.0	195.9	192.8	194.3	194.1	194.1
9	459.1	460.0	457.5	456.1	457.8	457.4	456.2
10	577.0	579.3	581.3	579.3	577.9	577.3	577.0
11	182.7	188.3	188.1	182.0	189.4	188.5	182.1
12	104.1	109.9	108.1	100.5	111.5	110.7	108.8
Total	**2,284.4**	**2,270.4**	**2,275.6**	**2,240.9**	**2,282.7**	**2,279.3**	**2,256.3**

Figure 6-20 shows monthly past runoff calculated from January 1981-December 2000. Figure 6-21 shows average calculated monthly past runoff. The distribution of monthly runoff calculated is shown in Fig. 6-22.

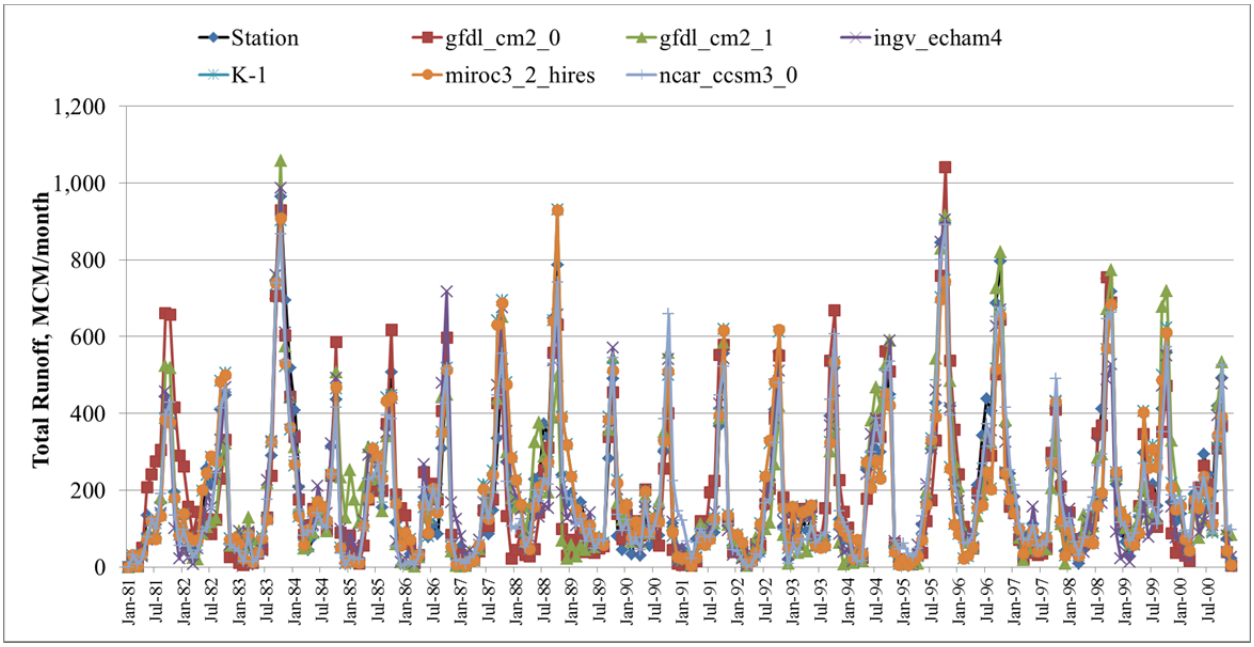


Fig. 6-20 Calculated monthly past runoff

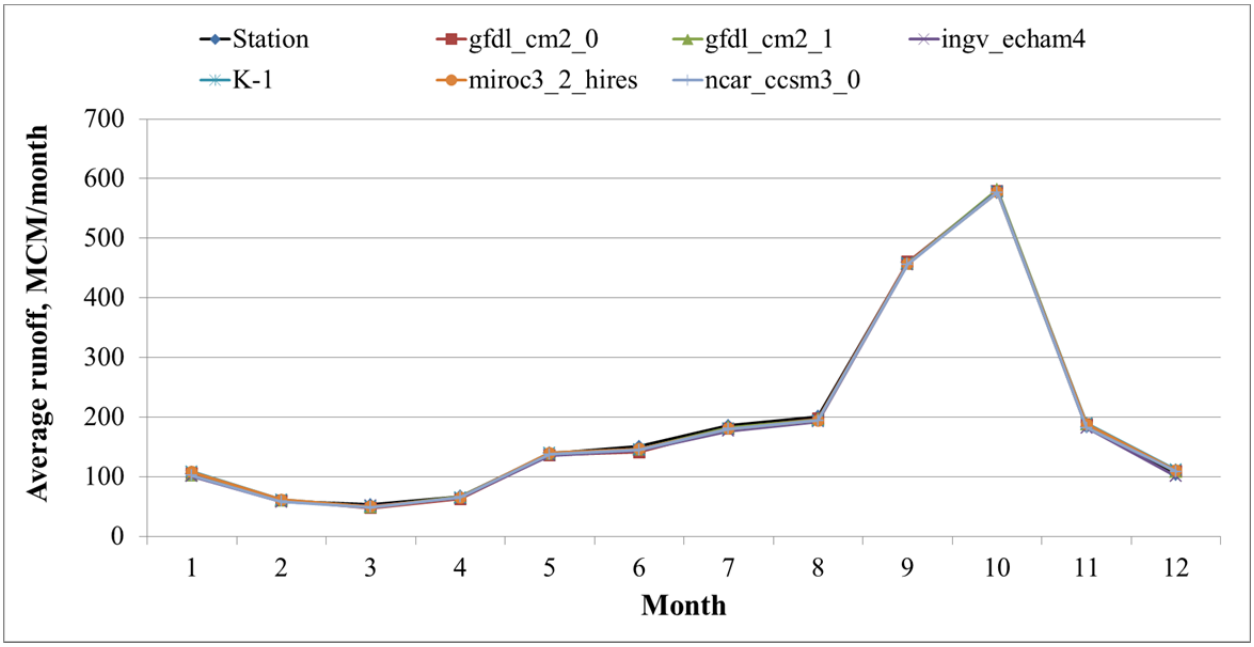
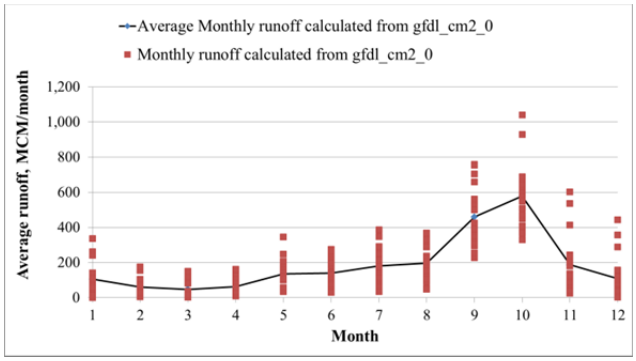
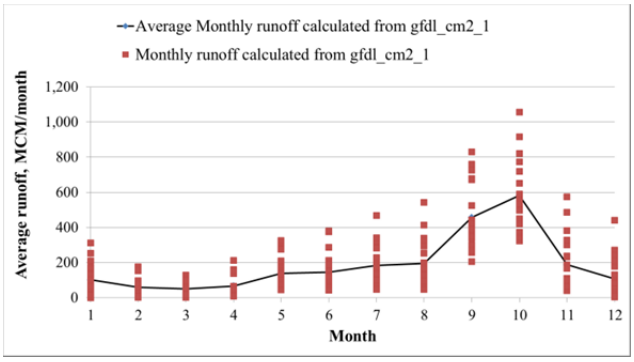


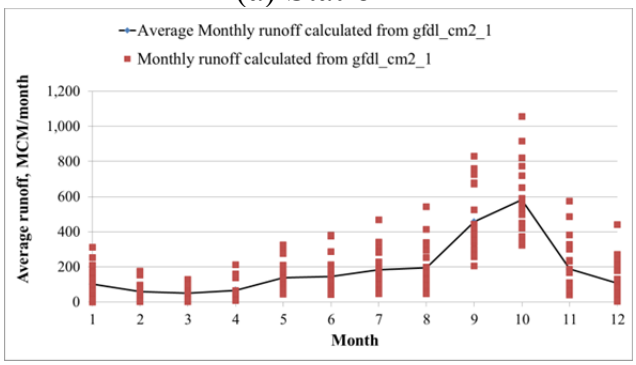
Fig. 6-21 Average calculated monthly past runoff



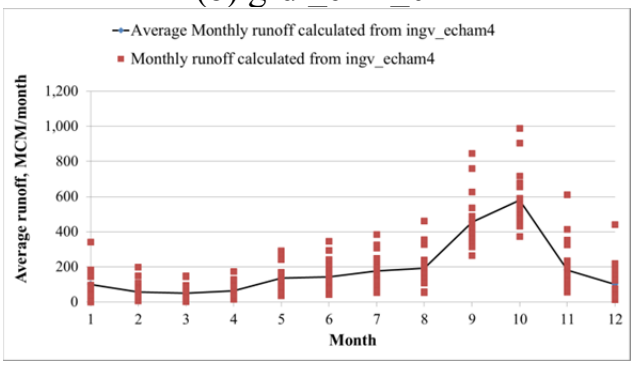
(a) Station



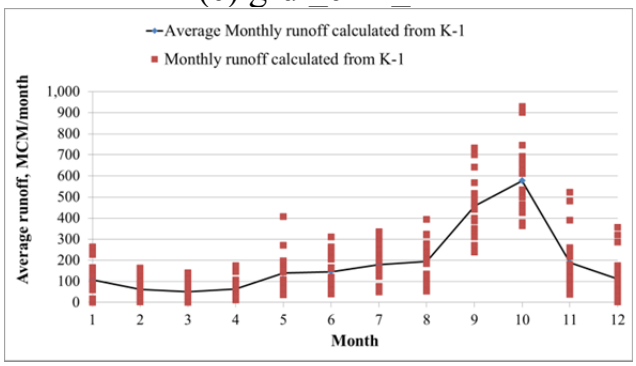
(b) gfdl_cm2_0



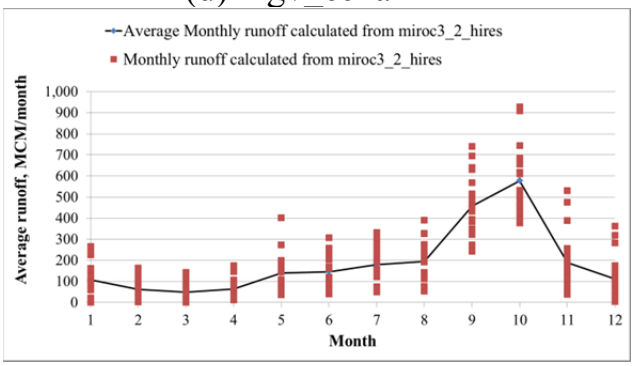
(c) gfdl_cm2_1



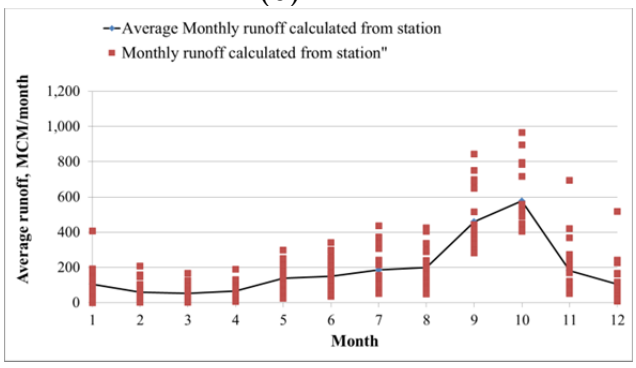
(d) ingv_echam4



(e) K-1



(f) ncar_ccsm3_0



(g) Station

Fig. 6-22 The distribution of calculated monthly past runoff

For future runoff prediction, we calculated future runoff as shown in Table 6-6. Future runoff was calculated using daily precipitation data of each basin resulted from corrected future precipitation data of 6 GCM model outputs from 2046-2065 in chapter 5. The results shows total monthly future runoff expresses a large number of runoff in the middle of the 2nd rainy season (Aug-Nov) especially in October. There is decreasing runoff from the end of the 2nd rainy season during dry season. The result reflects low runoff in the beginning of the 1st rainy season in March. Average monthly runoff calculated from corrected daily future precipitation data of 6 GCMs outputs in the dry season (Dec-Feb) is in the range of (53.6-117.0) MCM/month. For the 1st rainy season (Mar-Jul) and the 2nd rainy season (Aug-Nov), average monthly past runoff is in the range of (41.3-180.0) MCM/month and (171.7-577.3) MCM/month respectively. Total future runoff calculated is in the range of (2,184.9-2,210.9) MCM/year.

Table 6-6 Total calculated monthly future runoff

Unit: MCM

Month	Station	gfdl_cm2_0	gfdl_cm2_1	ingv_echam4	K-1	miroc3_2_hires	ncar_ccsm3_0
1	105.2	100.4	95.6	97.9	96.3	97.7	99.2
2	59.8	53.6	58.5	54.4	53.9	55.5	55.3
3	53.0	41.3	44.4	43.8	46.0	47.1	43.4
4	66.8	61.9	60.3	62.7	61.7	62.1	56.5
5	139.3	128.1	126.5	123.8	129.5	129.5	122.1
6	150.6	143.4	143.8	131.6	137.6	137.5	129.7
7	186.0	160.2	180.0	172.0	178.1	177.7	167.1
8	200.8	179.9	192.9	184.7	187.6	187.3	190.7
9	459.1	456.9	445.3	451.0	455.0	454.8	454.5
10	577.0	573.2	573.6	576.3	575.8	575.6	577.3
11	182.7	179.1	180.9	181.7	171.8	171.7	188.4
12	104.1	107.0	109.1	107.6	101.3	102.3	117.0
Total	**2,284.4**	**2,184.9**	**2,210.9**	**2,187.7**	**2,194.6**	**2,198.7**	**2,201.2**

Table 6-7 shows increasing and decreasing future runoff comparing to monthly past runoff. Future runoff in the dry season (Dec-Feb) expresses decreasing future runoff in December for gfdl_cm2_1, ingv_echam4, ncar_ccsm3_0. There is increasing future runoff in January and February. The difference of monthly future runoff and monthly past runoff is in the range of

(-8.2-12.3) in the dry season (Dec-Feb) MCM/month. In the 1st rainy season (Mar-Jul), most of GCMs expresses increasing future runoff in the range of (1.2-20.3) MCM/month. Only the gfdl_cm2_0 model results decreasing future runoff about -2.3 MCM/month in June. In the 2nd rainy season (Aug-Nov), most of GCMs expresses increasing future runoff in the range of (0.3-17.6) MCM/month. Only the ncar_ccsm3_0 model results decreasing future runoff in the range of (-6.2-(-0.3)) MCM/month from October to November. Total different of monthly future runoff and monthly past runoff is in the range of (53.2-88.1) MCM/month.

Table 6-7 The difference of monthly future runoff and monthly past runoff

Unit: MCM

Month	gfdl_cm2_0	gfdl_cm2_1	ingv_echam4	K-1	miroc3_2_hires	ncar_ccsm3_0
1	5.5	6.7	2.8	12.3	10.5	2.5
2	7.1	1.2	3.3	7.7	6.0	3.4
3	6.6	5.1	7.4	4.1	2.9	5.5
4	1.2	6.1	1.4	3.3	2.9	9.1
5	8.1	11.6	11.8	10.6	10.5	15.6
6	-2.3	2.1	12.5	8.4	8.9	15.2
7	20.8	3.0	4.6	2.2	2.5	13.4
8	17.2	3.0	8.1	6.6	6.8	3.5
9	3.2	12.2	5.1	2.8	2.6	1.6
10	6.1	7.7	3.0	2.2	1.7	-0.3
11	9.3	7.1	0.3	17.6	16.8	-6.2
12	2.9	-1.0	-7.1	10.2	8.4	-8.2
Total	**85.5**	**64.7**	**53.2**	**88.1**	**80.6**	**55.1**

Figure 6-23 shows monthly future runoff calculated from January 2046 to December 2065. Figure 6-24 shows average calculated monthly future runoff. The distribution of monthly runoff calculated is shown in Fig. 6-25.

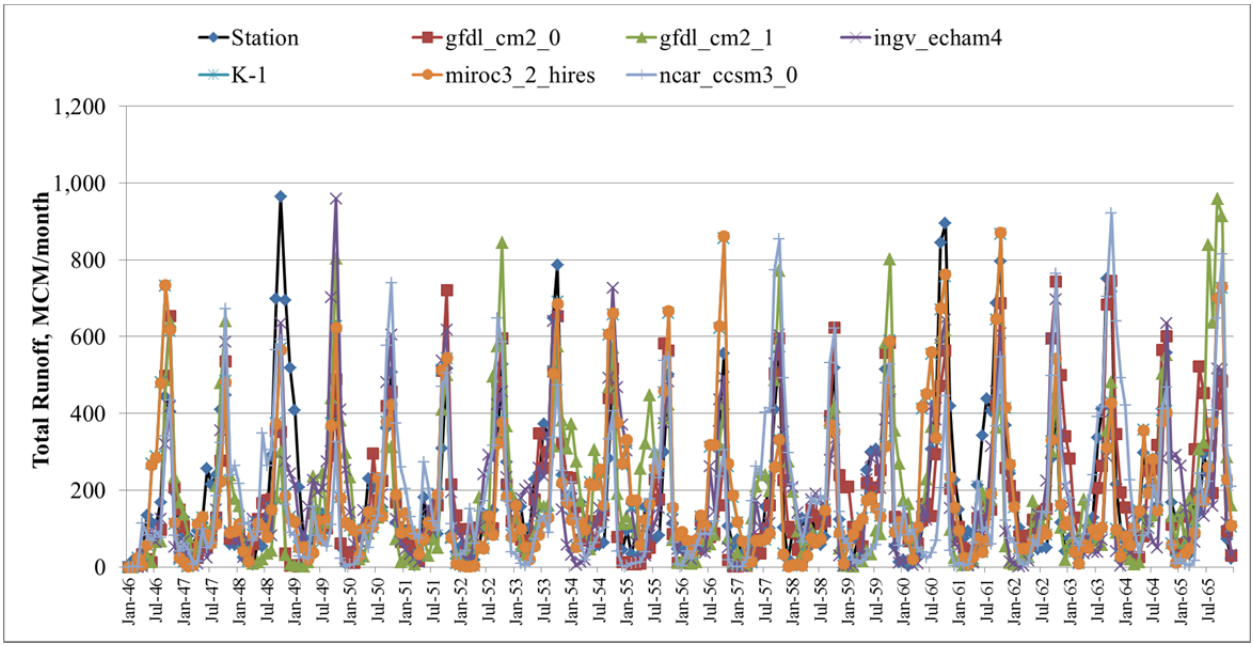


Fig. 6-23 Calculated monthly future runoff

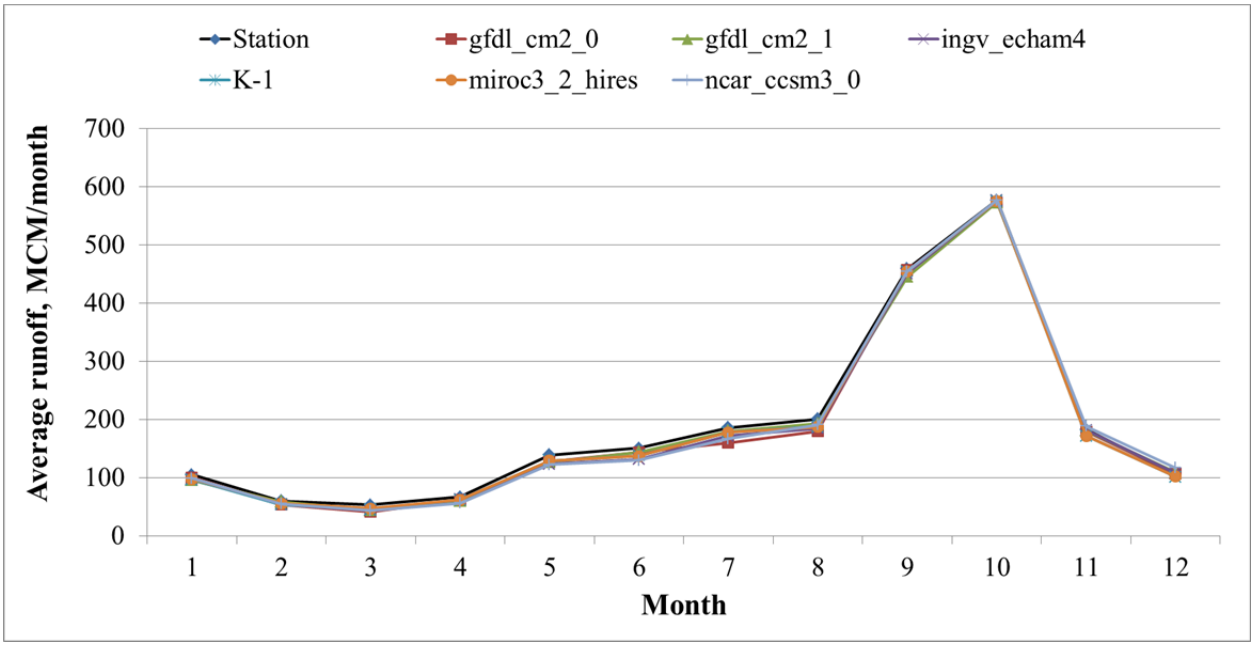
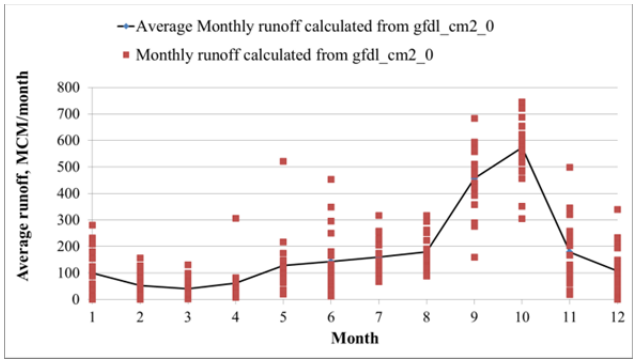
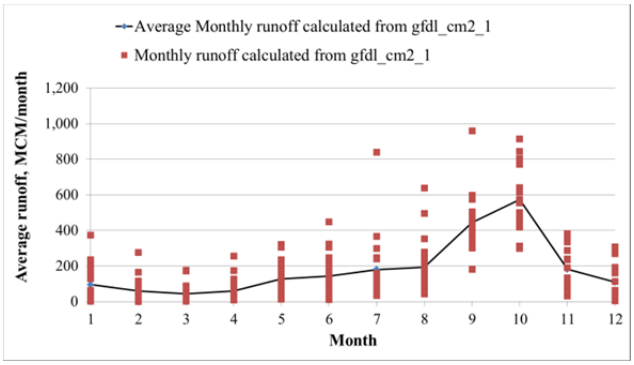


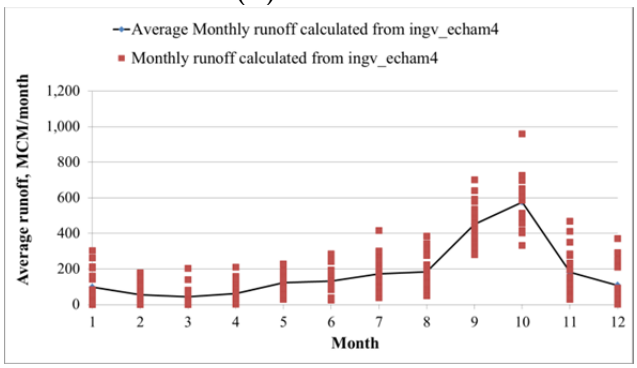
Fig. 6-24 Average calculated monthly future runoff



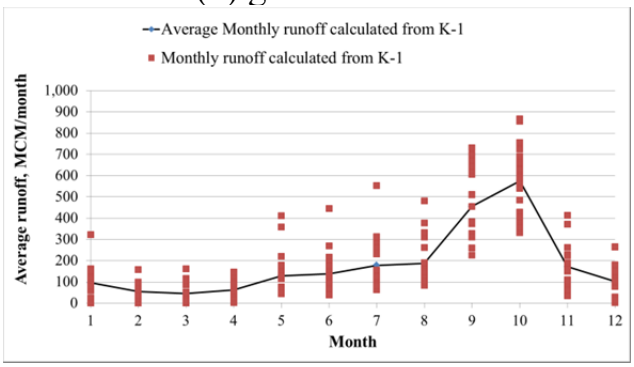
(a) Station



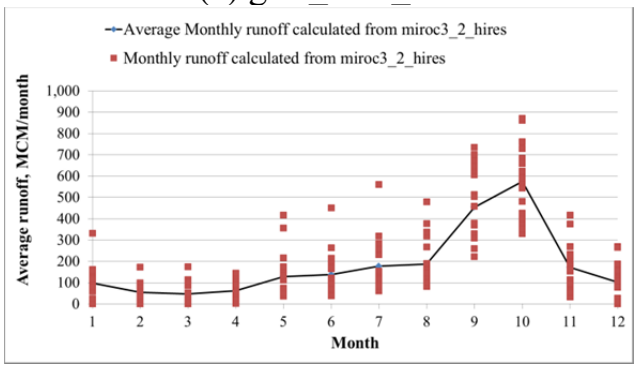
(b) gfdl_cm2_0



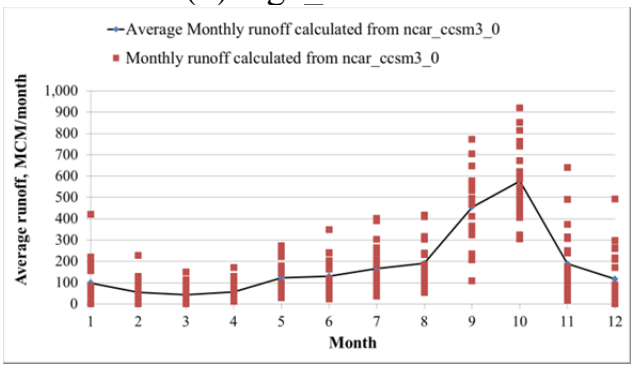
(c) gfdl_cm2_1



(d) ingv_echam4



(e) K-1



(f) ncar_ccsm3_0

Fig. 6-25 The distribution of calculated monthly future runoff

7. Demand projection module

Development of Demand projection module was performed in the following steps: 1) Water unit Estimation 2) Input-output model for Irrigation project and Non-Irrigation area 3) Water demand estimation for base year 4) Water demand projection for future present growth rate and climate change affected to Agricultural water demand

- ***Water unit estimation***

Water use and water unit were calculated based on production sectors of Thailand Input-output table. Water use in agricultural sectors, industrial sectors, services and domestics use were estimated following steps as shown in Fig. 7-1

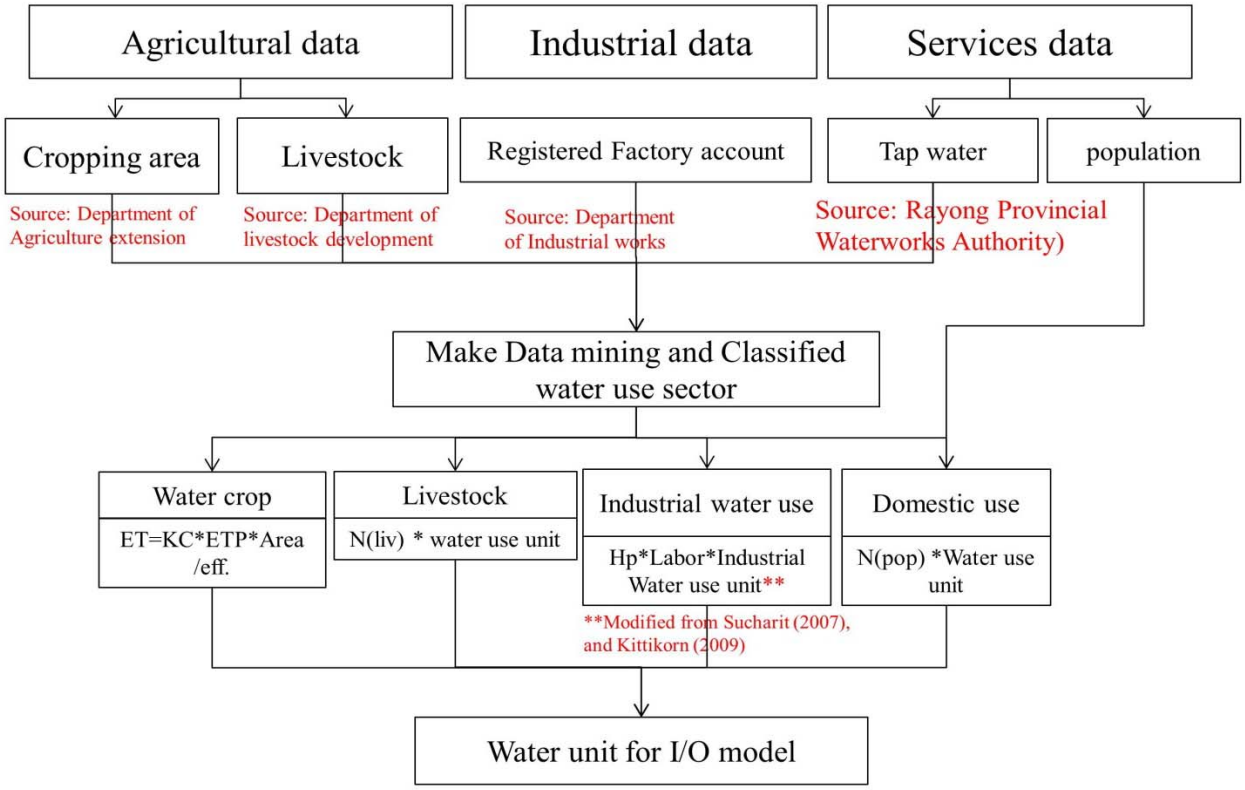


Fig. 7-1 Water unit estimation steps

Water use was estimated in each production sector in Rayong province by data collection on Agricultural, Industrial, Services and Domestics sectors. The Meteo-Hydrological data and cropping area were collected and were then analyzed water use in agricultural sectors in the Rayong province with past

data (1975-2011). Industrial water use was calculated using registered data of manufacturing production sectors with horse power, number of workers and water use unit modified from the study in the past (Sucharit K. et.al., 2008). We developed and improved water unit sectors in agricultural and industrial sectors unit. Service water use was estimated with population and water use rates in domestic use and calculated actually water use with recorded tab water data. This study presents in 3 main production sectors; i.e., Agriculture, Industrial and Service production sectors that have been modified based on Thailand Input-output table for Input-output table of Rayong province, Thailand studied on 40 sectors (Pawinee, 2011). Industrial sectors water unit calculated and improved from Sucharit K. et.al., 2008 for this study as shown in Table 7-1.

Table 7-1 Water unit using for water demand calculation

Unit : CM/Day/Hp

Economics sectors	Types	Original	Improved
Agricultural Sectors	Livestock	-	0.004-0.0146[1]
Industrial Sectors	Mining and Quarrying	0.0909	-
	Petroleum	-	0.0506[2]
	Food Manufacturing	0.0706	-
	Coconut and Palm Oil	0.0339	-
	Sugar Refineries	0.0100	-
	Beverages and Tobacco	0.0179	-
	Basic Chemical Products	0.1488	-
	Basic Chemical Products	0.1488	-
	Fertilizer and Pesticides	0.2744	-
	Other Chemical Products	0.4045	-
	Ceramic, Concrete Products	0.0440	-
	Petroleum Refineries	0.0000	-
	Basic Metal	0.0683	-
	Electricity	-	0.0021
	Pipe Line	0.0063	-
Service Sectors	Water Works and Supply	-	0.0765[3]
Domestics	Municipal	-	70-250[4]

Note :
1 l/n/day
2 cm^3/1000THB
3 cm^3/day/MW
4 l/n/day

- ***Input-output model for Irrigation area and Non-Irrigation area***

In Thailand, value change, infrastructure and laws/regulations in agricultural, industrial, and services were commonly organized under Macroeconomic policy. Policy and constrains of the area reflect relationship among the production sectors in term of Input and Output to produce the productions. This relationship is called as Input-output table model that can be applied to predict the productions in future.

Benefits of Input-Output model use for water demand calculation, which is necessary to calculate water unit for water demand calculation in each production sector to product GPP of province. For water demand calculation, we collected and analyzed basic data provided to Input-Output model such as agricultural, industrial, services and populations. There are 40 production sectors that were collected and analyzed data from field, which was provided Rayong Provincial Input-Output Table for year 2009. To develop Input-Output model for Rayong, we considered in main production sectors produced production in a large number of GPP. So, we integrated production sector groups from 40 production sectors of Provincial Input-Output Table to main sectors as shown in Table 7-2.

For using Input-Output model for sub basin area, we considered not only sub basin area but we also considered on water provider supported water supply for the area. In Rayong province, water provider as Royal Irrigation Department (RID) delivers water to Irrigation area for agricultural activity. Industrial water and Provincial water works authority also are released using operation rule from the reservoirs under RID. Ras Method is a tool to work updating Input Output Table on impractically and non-survey method. To provide water use and water demand for water balance calculation, we can use Ras Method to downscale Input-output table into water provider scale such as Irrigation area (RID) and Non-Irrigation area (Non-RID) which water supply is operated under reservoir operation rules. So, Input-Output for Rayong was performed downscaling to predict Input Output for production at Irrigation area scale and Non-Irrigation area scale.

We performed downscaling Input-Output using proportion of production sectors as following steps shown in Fig.7-2. For Ras Method application as shown in Fig.7-3, the Input-output model was downscaled to update Input-output table at sub basin scale and update Input-output table for future scenarios using as GPP growth rate and Provincial economic plan.

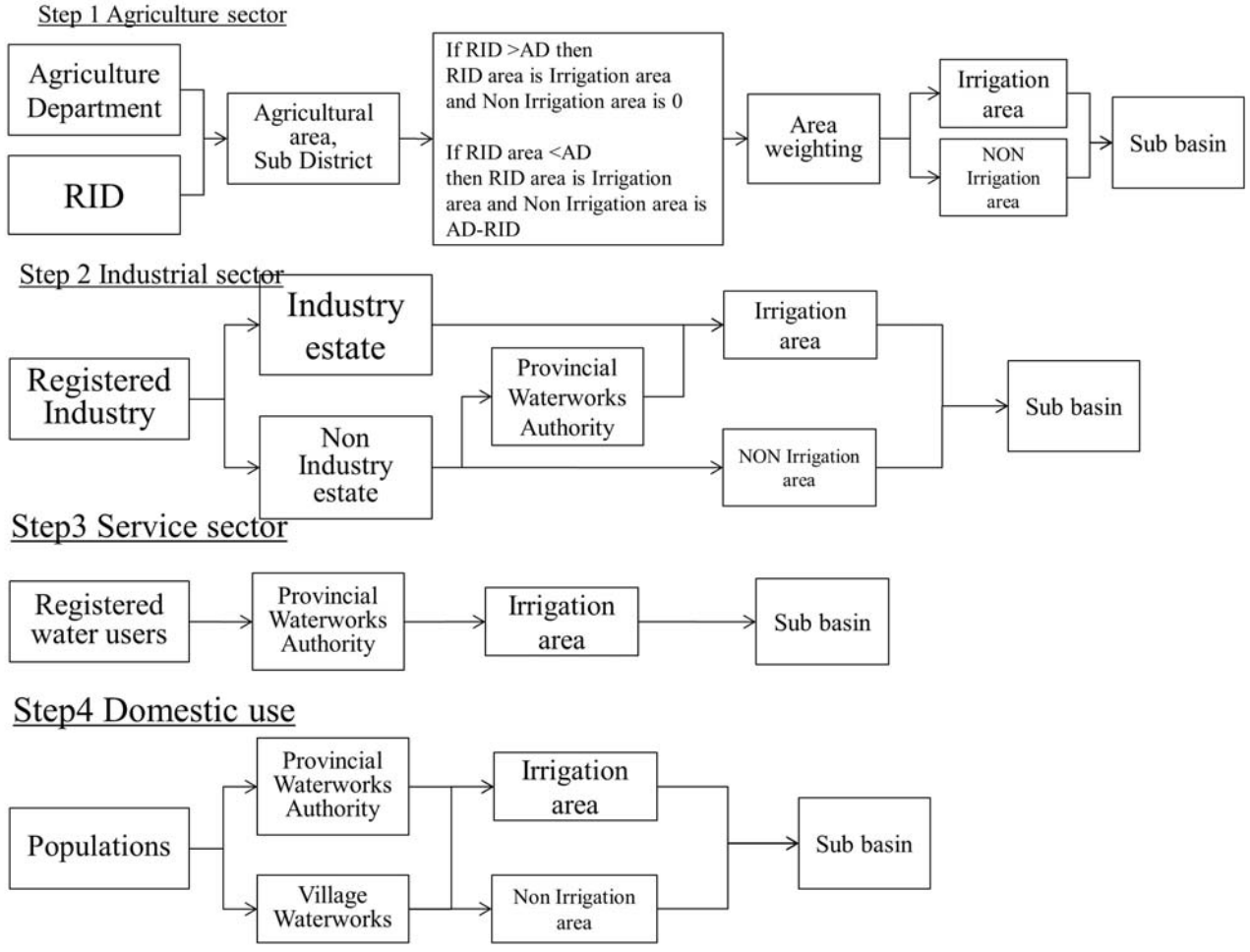


Fig. 7-2 Steps used for performing downscale Input-and Output model to Irrigation area and Non Irrigation area

Table 7-2 Input and Output model for Rayong

Unit : MTB

Sub-Sectors	Agr.					Ind.				Ser.		Total IT	Total Final Demand	Total Input/Output
	Rice Field	Dry crop	Orchards	Rubber	Agr.-Mis.	Chem. Product	Petro-Ref.	Metal	Ind.-Mis.	Tourist	Ser.-Mis.			
Rice Field	35.5	82.8	97.8	0.0	18.8	0.0	0.0	0.0	178.2	62.4	9.0	484.4	14.6	499.0
Dry crop	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2,155.4	0.0	0.0	2,155.4	-1,525.4	630.0
Orchards	0.5	0.0	0.1	0.0	0.2	136.1	0.0	0.0	271.6	0.4	0.0	408.9	8,656.1	9,065.0
Rubber	0.0	0.0	0.0	0.0	0.0	561.6	0.0	0.0	4,239.5	0.0	0.1	4,801.3	7,362.7	12,164.0
Agr.-Mis.	1.9	0.0	0.0	5.4	194.6	3.5	0.0	0.0	764.9	45.9	0.9	1,017.1	7,130.9	8,148.0
Chem. Product	0.3	5.3	7.8	603.3	246.3	20,338.8	1,005.7	2,806.5	10,934.4	534.1	1,657.6	38,140.0	109,356.0	147,496.0
Petro-Ref.	34.2	6.2	605.9	240.6	627.6	9.0	2,734.9	377.8	17,983.1	2,216.0	1,186.1	26,021.4	1,459,532.6	1,485,554.0
Metal	6.8	2.3	188.5	80.7	135.4	1,951.2	1,231.5	13,809.3	21,568.2	137.9	2,955.0	42,066.9	46,297.1	88,364.0
Ind.-Mis.	51.7	160.8	2,539.7	1,588.9	2,285.0	21,095.3	1,217,163.4	5,269.1	93,404.1	3,462.9	10,509.9	1,357,530.8	-968,360.8	389,170.0
Tourist	0.8	13.1	5.3	19.3	112.9	12.7	974.5	4,525.8	5,425.3	671.8	2,354.9	14,116.4	365.6	14,482.0
Ser.-Mis.	30.5	49.6	311.4	716.4	164.4	1,523.5	12,487.6	1,860.9	30,388.2	1,907.3	6,817.4	56,257.4	17,260.6	73,518.0
Total IT	162.2	320.2	3,756.5	3,254.6	3,785.3	45,631.6	1,235,597.7	28,649.5	187,312.8	9,038.7	25,490.8	1,542,999.9	686,090.1	2,229,090.0
Total Value Added	336.8	309.8	5,308.5	8,909.4	4,362.7	101,864.4	249,956.3	59,714.5	201,857.2	5,443.3	48,027.2			
Total Input/Output	499.0	630.0	9,065.0	12,164.0	8,148.0	147,496.0	1,485,554.0	88,364.0	389,170.0	14,482.0	73,518.0			
Water : MCM	19.73	50.72	232.80	0.85	11.68	261.23	34.86	29.30	40.49	0.57	3.01			
WD/TI	0.03954	0.08050	0.02568	0.00007	0.00143	0.00177	0.00002	0.00033	0.00010	0.00004	0.00004			

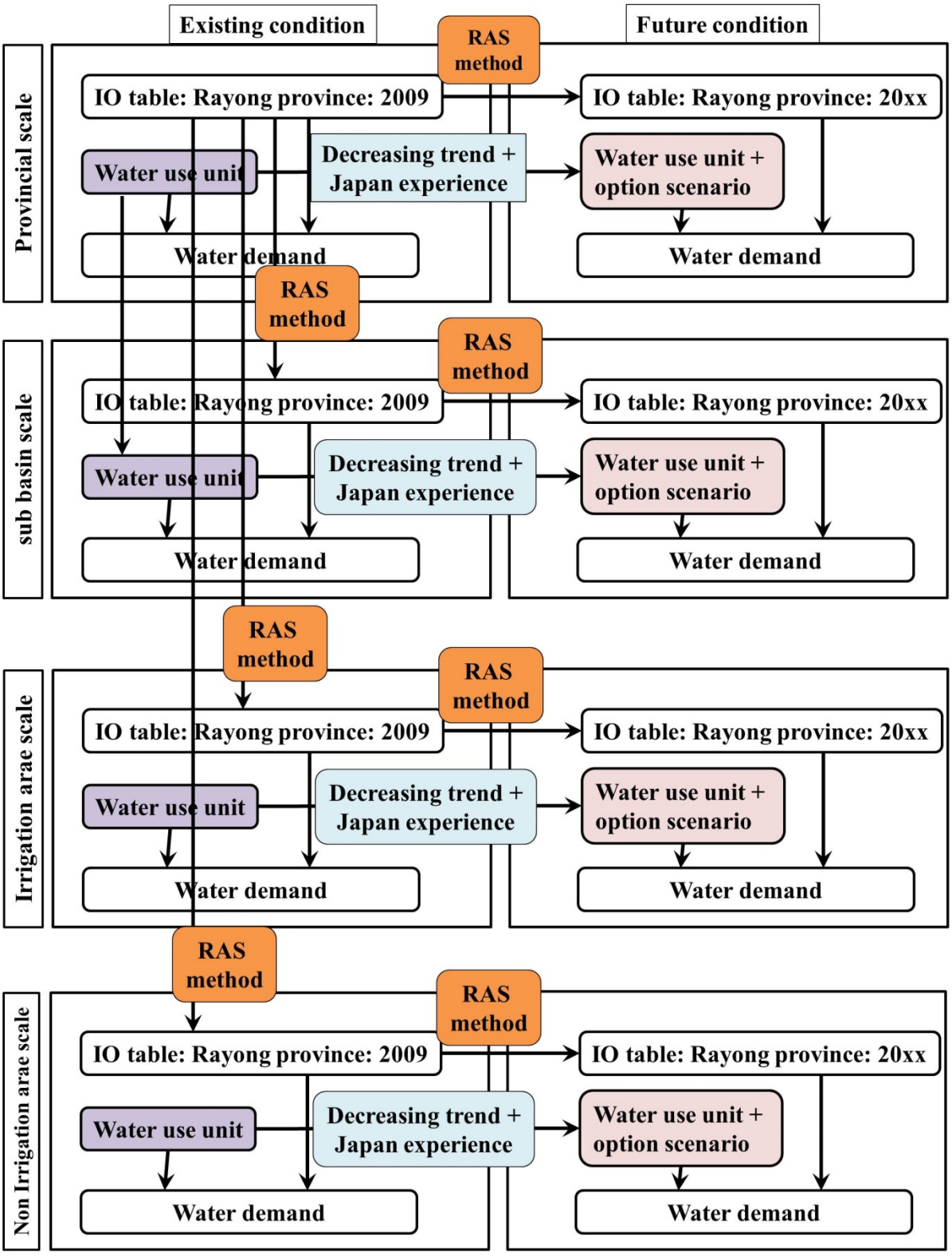


Fig. 7-3 RAS Method for updating Input-Output table

Table 7-3 shows proportion for downscaling Input-Output model from provincial to sub basin scale. Table 7-4 shows Proportion for downscaling Input-Output model from provincial to sub basin scale for Irrigation area. Table 7-5 shows Proportion for downscaling Input-Output model from provincial to sub basin scale for Non-Irrigation area

Table 7-3 Proportion for downscaling Input-Output model from provincial to sub basin scale

Sub basin	Rice Field	Dry crop	Orchards	Rubber	Agr.-Mis.	Chem. Product	Petro-Ref.	Metal	Ind.-Mis.	Tourist	Ser.-Mis.
DK.D	0.00	0.00	0.007	0.000	0.002	0.013	0.000	0.004	0.00	0.000	0.03
DK.U	0.00	0.03	0.123	0.002	0.078	0.069	0.000	0.098	0.05	0.000	0.06
DK.UO	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.00
EC.01	0.00	0.05	0.028	0.004	0.000	0.002	0.000	0.006	0.00	0.001	0.01
EC.01O	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.00
EC.02	0.00	0.08	0.010	0.000	0.000	0.086	0.000	0.035	0.06	0.115	0.07
EC.03	0.00	0.08	0.012	0.004	0.006	0.385	1.000	0.135	0.43	0.118	0.16
EC.04	0.02	0.01	0.035	0.171	0.044	0.004	0.000	0.000	0.00	0.049	0.00
EC.05	0.01	0.01	0.052	0.037	0.049	0.000	0.000	0.000	0.00	0.286	0.00
EC.06	0.07	0.02	0.034	0.026	0.109	0.000	0.000	0.000	0.00	0.000	0.00
EC.06O	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.00
IG.	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.00
KLY.D	0.00	0.00	0.003	0.001	0.002	0.002	0.000	0.009	0.00	0.000	0.00
KLY.U	0.00	0.10	0.060	0.015	0.201	0.000	0.000	0.000	0.00	0.000	0.00
KLY.U	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.00
MD.10	0.09	0.06	0.146	0.129	0.240	0.005	0.000	0.007	0.06	0.097	0.03
MD.11	0.77	0.24	0.227	0.306	0.113	0.367	0.000	0.438	0.30	0.334	0.38
NPL.D	0.00	0.00	0.003	0.002	0.001	0.000	0.000	0.000	0.00	0.000	0.00
NPL.U	0.00	0.05	0.082	0.000	0.071	0.067	0.000	0.264	0.04	0.000	0.21
NPL.UO	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.00
PS.D	0.00	0.11	0.087	0.139	0.062	0.000	0.000	0.003	0.00	0.000	0.00
PS.U	0.00	0.03	0.017	0.003	0.006	0.000	0.000	0.000	0.00	0.000	0.00
PS.UO1	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.00
PS.UO2	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.00
RO.U	0.00	0.00	0.010	0.027	0.000	0.000	0.000	0.000	0.00	0.000	0.00
Z.18	0.00	0.02	0.028	0.099	0.006	0.000	0.000	0.000	0.00	0.000	0.00
Z.5	0.00	0.02	0.037	0.036	0.010	0.001	0.000	0.001	0.01	0.000	0.00
Total	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Table 7-4 Proportion for downscaling Input-Output model from provincial to sub basin scale for Irrigation area

Sub basin	Rice Field	Dry crop	Orchards	Rubber	Agr.-Mis.	Chem. Product	Petro-Ref.	Metal	Ind.-Mis.	Tourist	Ser.-Mis.
DK.D	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.00
DK.U	0.00	0.00	0.000	0.000	0.000	0.029	0.000	0.085	0.03	0.000	0.00
DK.UO	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.00
EC.01	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.001	0.01
EC.01O	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.00
EC.02	0.00	0.00	0.000	0.000	0.000	0.083	0.000	0.019	0.05	0.115	0.07
EC.03	0.00	0.00	0.002	0.004	0.000	0.368	1.000	0.104	0.22	0.118	0.14
EC.04	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.049	0.00
EC.05	0.00	0.00	0.004	0.001	0.036	0.000	0.000	0.000	0.00	0.286	0.00
EC.06	0.03	0.00	0.003	0.001	0.027	0.000	0.000	0.000	0.00	0.000	0.00
EC.06O	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.00
IG.	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.00
KLY.D	0.00	0.00	0.002	0.001	0.000	0.000	0.000	0.003	0.00	0.000	0.00
KLY.U	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.00
KLY.U	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.00
MD.10	0.05	0.02	0.068	0.037	0.033	0.000	0.000	0.000	0.00	0.097	0.03
MD.11	0.41	0.01	0.036	0.028	0.030	0.186	0.000	0.116	0.07	0.334	0.28
NPL.D	0.00	0.00	0.001	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.00
NPL.U	0.00	0.00	0.009	0.000	0.005	0.050	0.000	0.255	0.03	0.000	0.18
NPL.UO	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.00
PS.D	0.00	0.03	0.025	0.015	0.034	0.000	0.000	0.000	0.00	0.000	0.00
PS.U	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.00
PS.UO1	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.00
PS.UO2	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.00
RO.U	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.00
Z.18	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.00
Z.5	0.00	0.00	0.023	0.006	0.006	0.000	0.000	0.000	0.00	0.000	0.00
Total	0.52	0.11	0.17	0.09	0.17	0.72	1.00	0.58	0.42	1.00	0.75

Table 7-5 Proportion for downscaling Input-Output model from provincial to sub basin scale for Non-Irrigation area

Sub basin	Rice Field	Dry crop	Orchards	Rubber	Agr.-Mis.	Chem. Product	Petro-Ref.	Metal	Ind.-Mis.	Tourist	Ser.-Mis.
DK.D	0.00	0.00	0.007	0.000	0.002	0.013	0.000	0.004	0.00	0.000	0.03
DK.U	0.00	0.03	0.123	0.002	0.078	0.040	0.000	0.013	0.02	0.000	0.05
DK.UO	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.00
EC.01	0.00	0.05	0.028	0.004	0.000	0.002	0.000	0.006	0.00	0.000	0.00
EC.01O	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.00
EC.02	0.00	0.08	0.010	0.000	0.000	0.002	0.000	0.016	0.00	0.000	0.00
EC.03	0.00	0.07	0.010	0.000	0.006	0.017	0.000	0.031	0.20	0.000	0.01
EC.04	0.02	0.01	0.035	0.171	0.044	0.004	0.000	0.000	0.00	0.000	0.00
EC.05	0.01	0.01	0.048	0.036	0.014	0.000	0.000	0.000	0.00	0.000	0.00
EC.06	0.03	0.01	0.031	0.025	0.082	0.000	0.000	0.000	0.00	0.000	0.00
EC.06O	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.00
IG.	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.00
KLY.D	0.00	0.00	0.002	0.000	0.001	0.002	0.000	0.005	0.00	0.000	0.00
KLY.U	0.00	0.10	0.060	0.015	0.201	0.000	0.000	0.000	0.00	0.000	0.00
KLY.U	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.00
MD.10	0.03	0.03	0.078	0.092	0.207	0.005	0.000	0.007	0.06	0.000	0.00
MD.11	0.35	0.23	0.191	0.279	0.084	0.181	0.000	0.322	0.23	0.000	0.10
NPL.D	0.00	0.00	0.002	0.002	0.001	0.000	0.000	0.000	0.00	0.000	0.00
NPL.U	0.00	0.04	0.073	0.000	0.066	0.016	0.000	0.009	0.00	0.000	0.02
NPL.UO	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.00
PS.D	0.00	0.08	0.062	0.124	0.028	0.000	0.000	0.003	0.00	0.000	0.00
PS.U	0.00	0.03	0.017	0.003	0.006	0.000	0.000	0.000	0.00	0.000	0.00
PS.UO1	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.00
PS.UO2	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.000	0.00
RO.U	0.00	0.00	0.010	0.027	0.000	0.000	0.000	0.000	0.00	0.000	0.00
Z.18	0.00	0.02	0.028	0.099	0.006	0.000	0.000	0.000	0.00	0.000	0.00
Z.5	0.00	0.01	0.013	0.030	0.004	0.001	0.000	0.001	0.01	0.000	0.00
Total	0.48	0.89	0.827	0.908	0.830	0.284	0.000	0.418	0.57	0.000	0.24

With this proportion in base year from each production sectors, we performed downscaling Input-Output model from provincial to sub basin scale and Irrigation area (RID) and Non-Irrigation area (Non-RID) as shown in Table 7-6 and Table 7-7 respectively.

Table 7-6 Input and Output model for Irrigation area

Unit : MTB

Sub-Sectors	Agr.					Ind.				Ser.		Total IT	Total Final Demand	Total Input/Output
	Rice Field	Dry crop	Orchards	Rubber	Agr.-Mis.	Chem. Product	Petro-Ref.	Metal	Ind.-Mis.	Tourist	Ser.-Mis.			
Rice Field	18.5	9.1	16.9	0.0	3.2	0.0	0.0	0.0	75.2	62.4	6.8	192.0	67.2	259.2
Dry crop	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	909.5	0.0	0.0	909.5	-840.4	69.2
Orchards	0.2	0.0	0.0	0.0	0.0	97.5	0.0	0.0	114.6	0.4	0.0	212.8	1,357.2	1,570.0
Rubber	0.0	0.0	0.0	0.0	0.0	402.3	0.0	0.0	1,789.0	0.0	0.1	2,191.4	-1,066.4	1,125.1
Agr.-Mis.	1.0	0.0	0.0	0.5	33.1	2.5	0.0	0.0	322.8	45.9	0.6	406.4	977.4	1,383.8
Chem. Product	0.2	0.6	1.3	55.8	41.8	14,570.9	1,005.7	1,633.4	4,614.1	534.1	1,250.0	23,707.9	81,959.9	105,667.8
Petro-Ref.	17.7	0.7	104.9	22.3	106.6	6.4	2,734.9	219.9	7,588.4	2,216.0	894.4	13,912.3	1,471,641.7	1,485,554.0
Metal	3.5	0.3	32.6	7.5	23.0	1,397.9	1,231.5	8,037.2	9,101.3	137.9	2,228.4	22,201.1	29,228.1	51,429.3
Ind.-Mis.	26.9	17.7	439.9	147.0	388.1	15,112.9	1,217,163.4	3,066.7	39,414.3	3,462.9	7,925.8	1,287,165.4	-1,122,945.0	164,220.4
Tourist	0.4	1.4	0.9	1.8	19.2	9.1	974.5	2,634.1	2,289.3	671.8	1,775.9	8,378.5	6,103.5	14,482.0
Ser.-Mis.	15.9	5.5	53.9	66.3	27.9	1,091.5	12,487.6	1,083.1	12,823.1	1,907.3	5,141.2	34,703.2	20,738.8	55,441.9
Total IT	84.3	35.2	650.6	301.0	642.9	32,691.0	1,235,597.7	16,674.4	79,041.5	9,038.7	19,223.3	1,393,980.5	487,222.1	1,881,202.5
Total Value Added	174.9	34.0	919.4	824.0	740.9	72,976.8	249,956.3	34,754.8	85,178.9	5,443.3	36,218.6			
Total Input/Output	259.2	69.2	1,570.0	1,125.1	1,383.8	105,667.8	1,485,554.0	51,429.3	164,220.4	14,482.0	55,441.9			
Water : MCM	0.00	0.26	1.64	0.00	0.02	3.50	0.00	0.10	0.10	0.00	0.23			
WD/TI	0.03954	0.08050	0.02568	0.00007	0.00143	0.00177	0.00002	0.00033	0.00010	0.00004	0.00004			

Table 7-7 Input and Output model for Non-Irrigation area

Unit : MTB

Sub-Sectors	Agr.					Ind.				Ser.		Total IT	Total Final Demand	Total Input/Output
	Rice Field	Dry crop	Orchards	Rubber	Agr.-Mis.	Chem. Product	Petro-Ref.	Metal	Ind.-Mis.	Tourist	Ser.-Mis.			
Rice Field	17.1	73.7	80.9	0.0	15.6	0.0	0.0	0.0	103.0	0.0	2.2	292.4	-52.6	239.8
Dry crop	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,245.9	0.0	0.0	1,245.9	-685.0	560.8
Orchards	0.2	0.0	0.1	0.0	0.2	38.6	0.0	0.0	157.0	0.0	0.0	196.1	7,299.0	7,495.0
Rubber	0.0	0.0	0.0	0.0	0.0	159.3	0.0	0.0	2,450.5	0.0	0.0	2,609.8	8,429.1	11,038.9
Agr.-Mis.	0.9	0.0	0.0	4.9	161.6	1.0	0.0	0.0	442.1	0.0	0.2	610.7	6,153.5	6,764.2
Chem. Product	0.1	4.7	6.4	547.5	204.5	5,767.8	0.0	1,173.1	6,320.3	0.0	407.6	14,432.1	27,396.1	41,828.2
Petro-Ref.	16.4	5.5	501.0	218.3	521.0	2.5	0.0	157.9	10,394.7	0.0	291.6	12,109.1	-12,109.1	0.0
Metal	3.3	2.1	155.9	73.3	112.4	553.3	0.0	5,772.1	12,466.9	0.0	726.5	19,865.8	17,069.0	36,934.7
Ind.-Mis.	24.9	143.2	2,099.9	1,441.9	1,896.9	5,982.4	0.0	2,202.4	53,989.8	0.0	2,584.1	70,365.4	154,584.2	224,949.6
Tourist	0.4	11.6	4.4	17.5	93.7	3.6	0.0	1,891.7	3,135.9	0.0	579.0	5,738.0	-5,738.0	0.0
Ser.-Mis.	14.7	44.2	257.4	650.2	136.5	432.1	0.0	777.8	17,565.1	0.0	1,676.2	21,554.2	-3,478.2	18,076.1
Total IT	78.0	285.0	3,105.9	2,953.6	3,142.5	12,940.6	0.0	11,975.0	108,271.3	0.0	6,267.5	149,019.5	198,868.0	347,887.5
Total Value Added	161.8	275.8	4,389.1	8,085.3	3,621.7	28,887.6	0.0	24,959.7	116,678.3	0.0	11,808.6			
Total Input/Output	239.8	560.8	7,495.0	11,038.9	6,764.2	41,828.2	0.0	36,934.7	224,949.6	0.0	18,076.1			
Water : MCM	0.00	0.26	1.64	0.00	0.02	3.50	0.00	0.10	0.10	0.00	0.23			
WD/TI	0.03954	0.08050	0.02568	0.00007	0.00143	0.00177	0.00002	0.00033	0.00010	0.00004	0.00004			

- ***Water use estimation for base year***

From the water unit estimation steps as show in Fig. 7-1, calculated water unit were applied for calculation of Irrigation water usage, Industrial water usage and service water usage. Water use and water unit in 2009 were expressed in term of MCM/MTHB for agricultural sectors, industrial sectors and services sectors as shown in Table7-8. It means that these water units have been applied to calculate final demand in future.

Table 7-8 Water use and water unit in sectors group

Group	Sectors	Water use mm/year	Water Unit MCM/THB
Agricultural sectors 315.78	Rice Field	19.73	0.039545
	Dry crop	50.72	0.080503
	Orchards	232.80	0.025681
	Rubber	0.85	0.000070
	Agr.-Mis.	11.68	0.001434
Industrial sectors 365.87	Chem. Product	261.23	0.001771
	Petro-Ref.	34.86	0.000023
	Metal	29.30	0.000332
	Ind.-Mis.	40.48	0.000104
Services 6.68	Tourist	0.57	0.000040
	Ser.-Mis.	6.11	0.000041
Domestics 22.25	Domestics	22.25	0.039545

Note: 22.25 this format is the total water use in mm/year in sectors group.

Water use estimation for sub basin was shown in Table 7-9. With the steps in Fig.7-2, we estimated water use for Irrigation area and Non-Irrigation area in sub basin scale as shown in Table 7-10 and Table 7-11 respectively. Table 7-12 shows domestic water for for Irrigation area and Non Irrigation area in sub basin scale

For Water demand estimation verification for water use and water unit in base year, we verified with volume of actual water use from 3 main reservoirs, i.e. DK, NPL and KLY reservoirs in total water and result of water use estimation. Total actual water uses from DK, NPL and

KLY reservoirs is 297.14 MCM/yr and water use estimation in industrial sectors is 256.14 MCM/yr. The difference of water use estimation is around 13.8%, so we have adjusted water unit into sectors group with 1.16 for industrial sectors.

Table 7-9 Water use at sub basin scale

Unit : MCM

Sub basin	Rice Field	Dry crop	Orchards	Rubber	Agr.-Mis.	Chem. Product	Petro-Ref.	Metal	Ind.-Mis.	Tourist	Ser.-Mis.
DK.D	0.00	0.26	1.64	0.00	0.02	3.50	0.00	0.10	0.10	0.00	0.23
DK.U	0.00	1.69	28.72	0.00	0.92	17.90	0.00	2.87	2.08	0.00	0.38
DK.UO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EC.01	0.03	2.99	6.56	0.00	0.00	0.56	0.00	0.19	0.22	0.00	0.08
EC.01O	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EC.02	0.00	4.40	2.27	0.00	0.00	22.43	0.00	1.03	2.49	0.07	0.44
EC.03	0.17	4.16	2.82	0.00	0.07	100.57	34.86	3.95	17.43	0.07	0.98
EC.04	0.51	0.83	8.13	0.15	0.51	1.00	0.00	0.00	0.24	0.03	0.03
EC.05	0.23	0.72	12.14	0.03	0.58	0.02	0.00	0.01	0.18	0.16	0.05
EC.06	1.52	1.15	7.91	0.02	1.27	0.08	0.00	0.00	0.24	0.00	0.01
EC.06O	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IG.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
KLY.D	0.01	0.38	0.77	0.00	0.02	0.56	0.00	0.26	0.19	0.00	0.00
KLY.U	0.01	5.41	13.95	0.01	2.34	0.00	0.00	0.00	0.00	0.00	0.00
KLY.U	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MD.10	1.78	3.09	34.00	0.11	2.80	1.20	0.00	0.20	2.61	0.06	0.22
MD.11	15.24	12.57	52.79	0.26	1.32	95.83	0.00	12.83	12.30	0.19	2.37
NPL.D	0.00	0.02	0.59	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00
NPL.U	0.00	2.95	19.03	0.00	0.83	17.40	0.00	7.73	1.75	0.00	1.31
NPL.UO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PS.D	0.12	6.02	20.23	0.12	0.72	0.02	0.00	0.08	0.13	0.00	0.00
PS.U	0.03	1.57	3.96	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00
PS.UO1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PS.UO2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RO.U	0.01	0.13	2.33	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Z.18	0.00	1.38	6.43	0.08	0.07	0.00	0.00	0.00	0.00	0.00	0.00
Z.5	0.06	1.01	8.53	0.03	0.12	0.17	0.00	0.04	0.53	0.00	0.02
Total	19.73	50.72	232.80	0.85	11.68	261.23	34.86	29.30	40.48	0.57	6.11

Table 7-10 Water use at sub basin scale for Irrigation area

Unit : MCM

Sub basin	Rice Field	Dry crop	Orchards	Rubber	Agr.-Mis.	Chem. Product	Petro-Ref.	Metal	Ind.-Mis.	Tourist	Ser.-Mis.
DK.D	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DK.U	0.00	0.00	0.00	0.00	0.00	7.57	0.00	2.49	1.23	0.00	0.05
DK.UO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EC.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
EC.01O	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EC.02	0.00	0.00	0.00	0.00	0.00	21.79	0.00	0.54	2.18	0.07	0.43
EC.03	0.15	0.34	0.50	0.00	0.00	96.01	34.86	3.05	9.28	0.07	0.87
EC.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03
EC.05	0.00	0.04	0.90	0.00	0.42	0.00	0.00	0.00	0.00	0.16	0.05
EC.06	0.75	0.17	0.77	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.01
EC.06O	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IG.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
KLY.D	0.00	0.13	0.42	0.00	0.00	0.05	0.00	0.10	0.03	0.00	0.00
KLY.U	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
KLY.U	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MD.10	1.05	1.35	15.88	0.03	0.39	0.00	0.00	0.00	0.00	0.06	0.19
MD.11	8.20	0.87	8.37	0.02	0.35	48.63	0.00	3.41	2.85	0.19	1.76
NPL.D	0.00	0.01	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NPL.U	0.00	0.47	2.15	0.00	0.06	13.09	0.00	7.46	1.51	0.00	1.15
NPL.UO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PS.D	0.05	1.76	5.73	0.01	0.39	0.00	0.00	0.00	0.00	0.00	0.00
PS.U	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PS.UO1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PS.UO2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RO.U	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Z.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Z.5	0.06	0.43	5.46	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00
Total	10.2	5.57	40.32	0.08	1.98	187.15	34.86	17.05	17.0	0.57	4.61

Table 7-11 Water use at sub basin scale for Non Irrigation area

Unit : MCM

Sub basin	Rice Field	Dry crop	Orchards	Rubber	Agr.-Mis.	Chem. Product	Petro-Ref.	Metal	Ind.-Mis.	Tourist	Ser.-Mis.
DK.D	0.00	0.26	1.64	0.00	0.02	3.50	0.00	0.10	0.10	0.00	0.23
DK.U	0.00	1.69	28.72	0.00	0.92	10.33	0.00	0.39	0.85	0.00	0.33
DK.UO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EC.01	0.03	2.99	6.56	0.00	0.00	0.56	0.00	0.19	0.22	0.00	0.01
EC.01O	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EC.02	0.00	4.40	2.27	0.00	0.00	0.64	0.00	0.48	0.31	0.00	0.00
EC.03	0.02	3.82	2.31	0.00	0.07	4.55	0.00	0.90	8.15	0.00	0.10
EC.04	0.51	0.83	8.13	0.15	0.51	1.00	0.00	0.00	0.24	0.00	0.00
EC.05	0.23	0.69	11.24	0.03	0.16	0.02	0.00	0.01	0.18	0.00	0.00
EC.06	0.76	0.98	7.14	0.02	0.96	0.08	0.00	0.00	0.24	0.00	0.00
EC.06O	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IG.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
KLY.D	0.01	0.24	0.35	0.00	0.01	0.51	0.00	0.16	0.16	0.00	0.00
KLY.U	0.01	5.41	13.95	0.01	2.34	0.00	0.00	0.00	0.00	0.00	0.00
KLY.U	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MD.10	0.73	1.74	18.12	0.08	2.42	1.20	0.00	0.20	2.61	0.00	0.03
MD.11	7.05	11.6	44.42	0.24	0.98	47.20	0.00	9.42	9.45	0.00	0.61
NPL.D	0.00	0.01	0.45	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
NPL.U	0.00	2.48	16.88	0.00	0.78	4.30	0.00	0.27	0.24	0.00	0.16
NPL.UO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PS.D	0.07	4.26	14.50	0.11	0.33	0.02	0.00	0.08	0.13	0.00	0.00
PS.U	0.03	1.57	3.96	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00
PS.UO1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PS.UO2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RO.U	0.01	0.13	2.33	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Z.18	0.00	1.38	6.43	0.08	0.07	0.00	0.00	0.00	0.00	0.00	0.00
Z.5	0.00	0.57	3.07	0.03	0.05	0.17	0.00	0.04	0.53	0.00	0.02
Total	9.48	45.1	192.48	0.77	9.70	74.08	0.00	12.25	23.4	0.00	1.50

Table 7-12 Domestic use at sub basin scale for Irrigation area and Non-Irrigation area in 2009

Unit : MCM

Non-RID	RID	Total
0.00	0.01	0.01
0.00	0.11	0.11
0.00	0.00	0.00
0.43	0.13	0.55
0.00	0.00	0.00
2.66	0.27	2.94
3.13	0.04	3.16
0.25	0.20	0.45
0.25	0.21	0.47
0.03	0.25	0.28
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.01	0.01
0.00	0.07	0.07
0.00	0.00	0.00
1.29	1.42	2.71
9.24	1.36	10.59
0.00	0.01	0.01
0.00	0.22	0.22
0.00	0.00	0.00
0.00	0.31	0.31
0.00	0.04	0.04
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.02	0.02
0.00	0.18	0.18
0.00	0.11	0.11
17.28	4.97	22.25

- ***Water demand projection for future***

Water demand projection was applied for the followings water demand scenarios: 1) Water demand prediction for future with climate change affected to Agricultural water 2) Water demand for future using present growth rate 3) Water demand prediction for future using Provincial Economic plan.

1) Water demand prediction for future with climate change affected to Agricultural water

Monthly temperature parameter of selected GCMs model was bias corrected with pattern of observed monthly mean temperature data at station in past year covered Rayong province, Thailand region. Monthly CGDF function of selected GCMs model data was mapping to monthly CGDF of observed data using following Eq.7-1:

$$T_{cor} = CDF_p^{-1}(T_p ; \alpha_{obs,} \beta_{obs}) \quad (7\text{-}1)$$

Where;

T_{cor} = Corrected temperature parameter

T_p = GCMs temperature parameter in past year

CDF_p^{-1} = Inverse cumulative gamma distribution function (CGDF) on past temperature parameter of selected GCMs model with α_{obs} and $\beta_{obs.}$

Future representative time period of climate temperature parameter was determined in 2046-2065 by using selected GCM model with good correlation on monthly pattern in past year. For future temperature prediction, monthly CGDF of future GCMs model data mapping to monthly CGDF of corrected GCMs model data using following Eq.7-2:

$$T_{pre} = CDF_f^{-1}(T_f ; \alpha_{cor}, \beta_{cor}) \quad (7\text{-}2)$$

Where;

T_{pre} = Predicted temperature parameter

T_f = GCMs temperature parameter in future year

CDF_f^{-1} = Inverse cumulative gamma distribution function (CGDF) on future temperature parameter of selected GCMs model with α_{cor} and β_{cor}

Future temperature parameter of selected GCMs model was bias corrected with past pattern of temperature parameter covered Rayong province region, Thailand region. Future agricultural water demand was estimated with reference evapotranspiration (ET_o) using following Eq.7-3 that was calculated from future temperature parameter by Blaney–Criddle equation (FAO) and

cropping area in base year (2009). Reference crop evapotranspiration (ET_p) is estimated from the FAO using following Eq.7-4:

$$ET_o = p\,(0.46T + 8) \quad (7\text{-}3)$$

$$ETp = K \times ET_o \quad (7\text{-}4)$$

Where;

ETp = Reference crop evapotranspiration (mm/d)

P = Mean daily percentage of total annual daytime hours

T = Mean daily air temperature (oC)

K = Adjusted factor = 1.15.

Water requirement for agriculture water demand (WD) in the future based on the relationship between cropping pattern and bias corrected climate data was calculated using following Eq.7-5 and Eq.7-6:

$$ET = Kc \times ETp \quad (7\text{-}5)$$

$$WD = (ET + P - Re) \times Area / Eff \quad (7\text{-}6)$$

Where;

WD = Agricultural water demand, MCM

ET = Water consumption of plant (mm)

P = Percolation in paddy field (mm)

Re = Effective rainfall (mm)

Kc = Water demand coefficient

Eff = Effective of irrigation water demand

2) Water demand for future using present growth rate

We learned from GDP Increasing trend and Decreasing trend in past and then applied for Rayong GDP trend for prediction. Ras Method was applied to update Input Output table while GDP or final demand change in future using assumption proportion between total intermediate transaction and final demand is not change from base year in 2009. With Thailand GDP and Rayong GPP growth rate, we generated scenarios from increasing and decreasing trend of GDP and GDP growth rate shown in Table 7-13. In addition, Domestics demand for future was estimated using population grown rate and water demand unit.

Table 7-13 GDP and GDP growth rate for scenarios

Region	Sector	2001-2009		
		Max	Avg	Min
%GDP growth				
Rayong	Agr	9.0	4.8	-7.3
	Ind	19.8	4.0	-3.7
	Service	13.2	7.4	-8.9
	Total	15.6	4.4	-3.8
Thailand	Agr	11.9	2.4	-2.5
	Ind	11.2	4.6	-8.3
	Service	7.2	2.9	-8.6
	Total	7.9	3.3	-8.1
The Eastern Province Cluster	Agr	9.2	2.4	-9.1
	Ind	21.1	7.3	-11.5
	Service	11.2	4.5	-6.1
	Total	14.0	6.0	-8.7
%POP growth				
Rayong	POP	2.96	1.26	-0.38

Source : NESDB, 2011

With Thailand GDP and Rayong GPP growth rate, we applied RAS Method for updating Input-output table following GPP growth rate for past year in 2000 using real GPP recorded and future year in 2065 using GPP growth rate.

3) Water demand prediction for future using Provincial Economic plan

We reviewed from Thailand economic plan for The Eastern Province Cluster Office plan, Provincial economic plan and Rayong Provincial Administration Organization plan. Ras Method was applied to update Input Output table while Provincial economic plan make final demand change in future using assumption proportion between total intermediate transaction and final demand is not change from base year in 2009. With Provincial

economic plan, we generated possible scenarios from increasing or decreasing trend of Provincial economic plan growth rates shown in Table 7-14.

Table 7-14 Provincial economic plan growth rates for scenarios

Sector	The Eastern Province Cluster Office plan		Provincial plan		Rayong Provincial Administration Organiztion plan	
	Strategy	2014-2017 %/yr	Strategy	2015-2018 %/yr	Strategy	2014-2017 %/yr
Agr	Increase product value	3	Increase product value	25 [19,877]	Increase product value	-
Ind	Increase Investment value	5				
Ser	Increase tourism value	3	Increase tourism value	12	Increase tourism value	-
			6%-12%	[17,891]		
	Increase Border trade value	3				
Total			Increase economic 3.5-4.2%	4.2		
POP			Increase tourists	6 {2,978,355}		

Note: [MTHB]
{Heads}

- ***Result and discussion***

The result and discussion for water demand projection can express in the followings water demand scenarios: 1) Water demand prediction for future with climate change affected to Agricultural water 2) Water demand for future using present growth rate 3) Water demand prediction for future using Provincial Economic plan.

1) Water demand prediction for future with climate change affected to Agricultural water demand prediction

Water demand prediction for future with climate change affected to Agricultural water was calculated using parameters form selected GCMs model output that are suitable to Thailand region; i.e., gfdl_cm2_0, gfdl_cm2_1, ingv_echam4, inmcm3_0, k-1, miroc3_2_hires and ncar_ccsm3_0. Bias correction was performed on temperatures parameters for 6 selected GCMs model. These 6 selected GCMs model were used to analysis and bias correct mean temperature parameter with past temperature data (1981-2000) from observed meteorological station by cumulative gamma distribution function, however mean temperature parameters is available on only 5 GCMs models; i.e., gfdl_cm2_0, gfdl_cm2_1, ingv_echam4, inmcm3_0, k-1 and miroc3_2_hires. Bias corrected mean temperature parameter is shown in Figure 7-4. Future (2046-2065) mean temperature parameter was also predicted based on mean temperature parameter past pattern as shown in Figure 7-5.

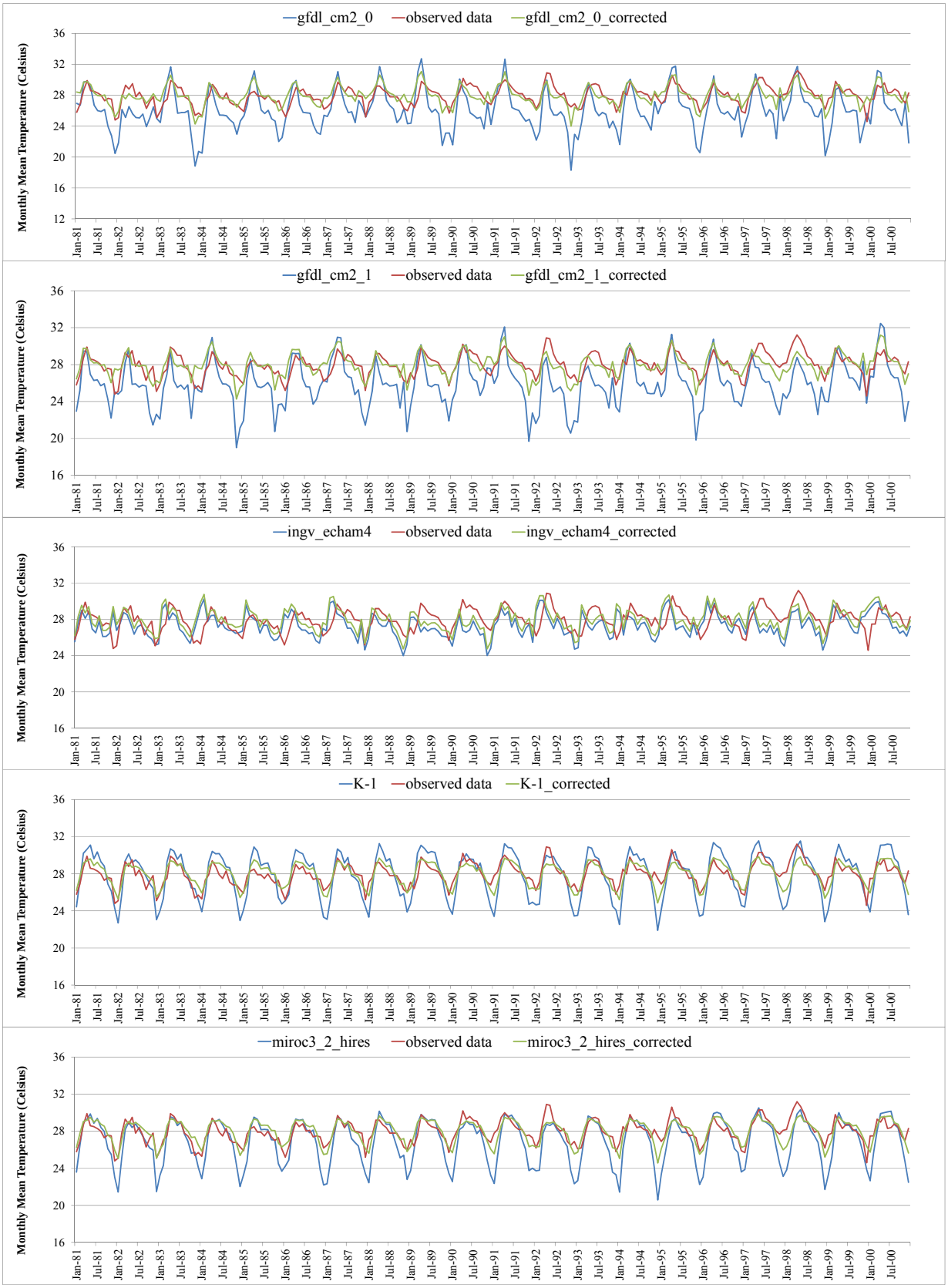


Fig. 7-4 Bias corrected mean temperature parameter in past year (1980-2000)

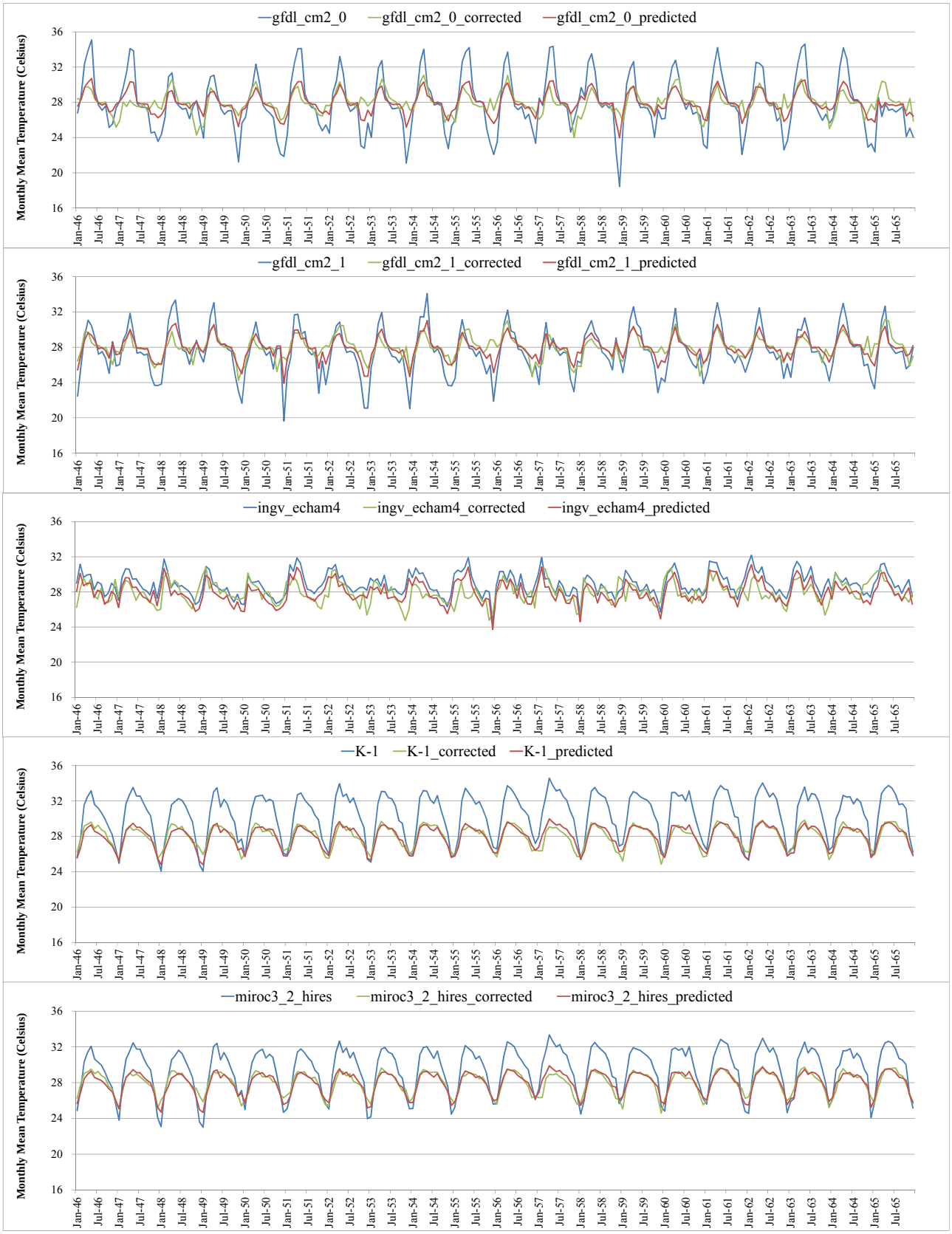


Fig. 7-5 Corrected mean temperature parameter in future year (2046-2065)

In future (2046-2065), average of mean temperature is increasing in two periods. There are in the range of 0.24 to 0.89 Celsius from December to March and in the range of 0.00 to 0.13 Celsius from August to September. Average of Mean temperature is also decreasing in two periods. There are in range of 0.09 to 0.24 Celsius from April to July and in range of 0.04 to 0.27 Celsius from October to November as shown in Fig. 7-6.

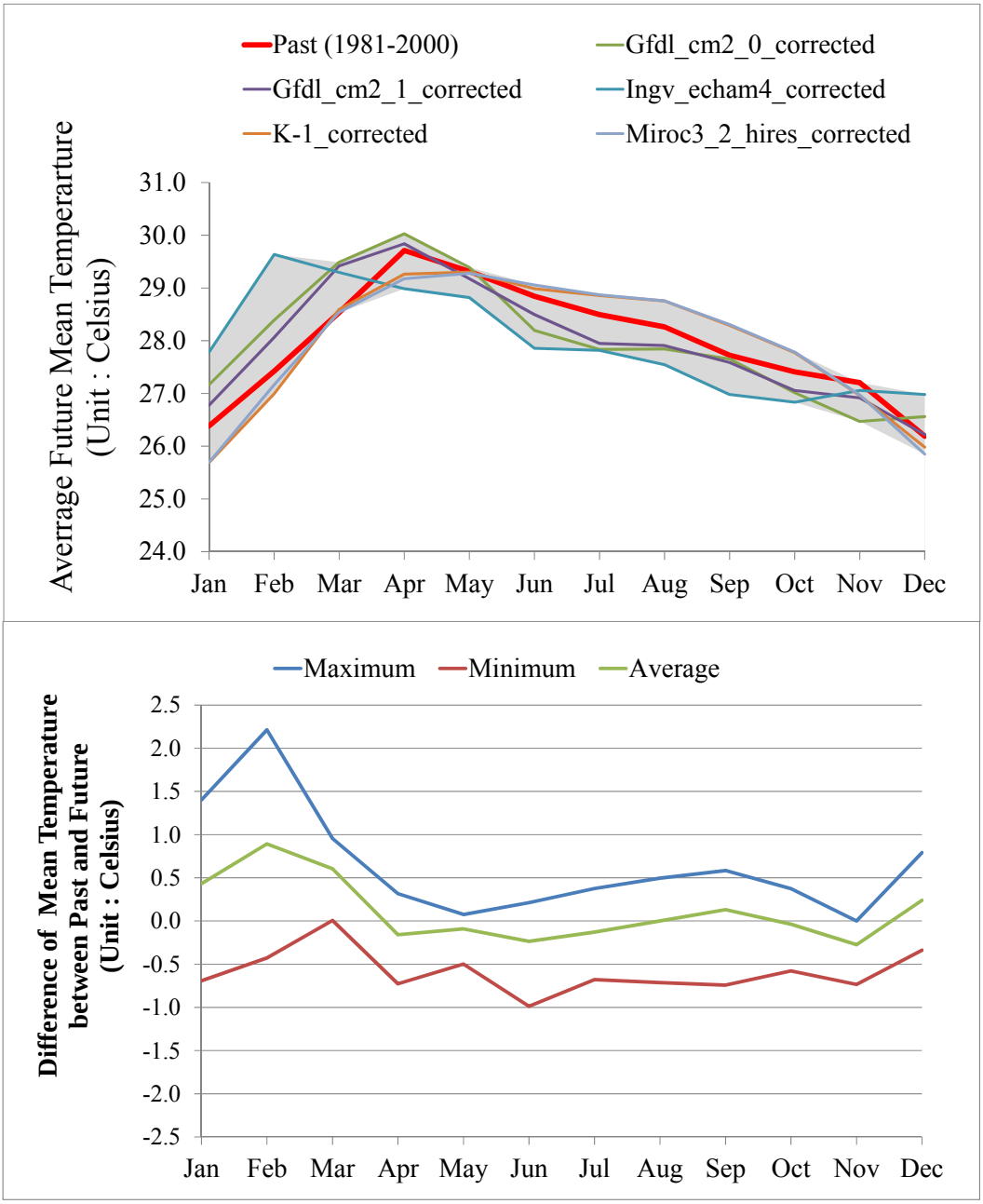


Fig. 7-6 Corrected mean temperature parameter in future year (2046-2065)

Agricultural water use is in range of 297.9-306.2 MCM/year in past year (1981-2000). Agricultural water demand is going to in range of 341.1-357.7 MCM/year in future year (2046-2065) as shown in Figure 7-7.

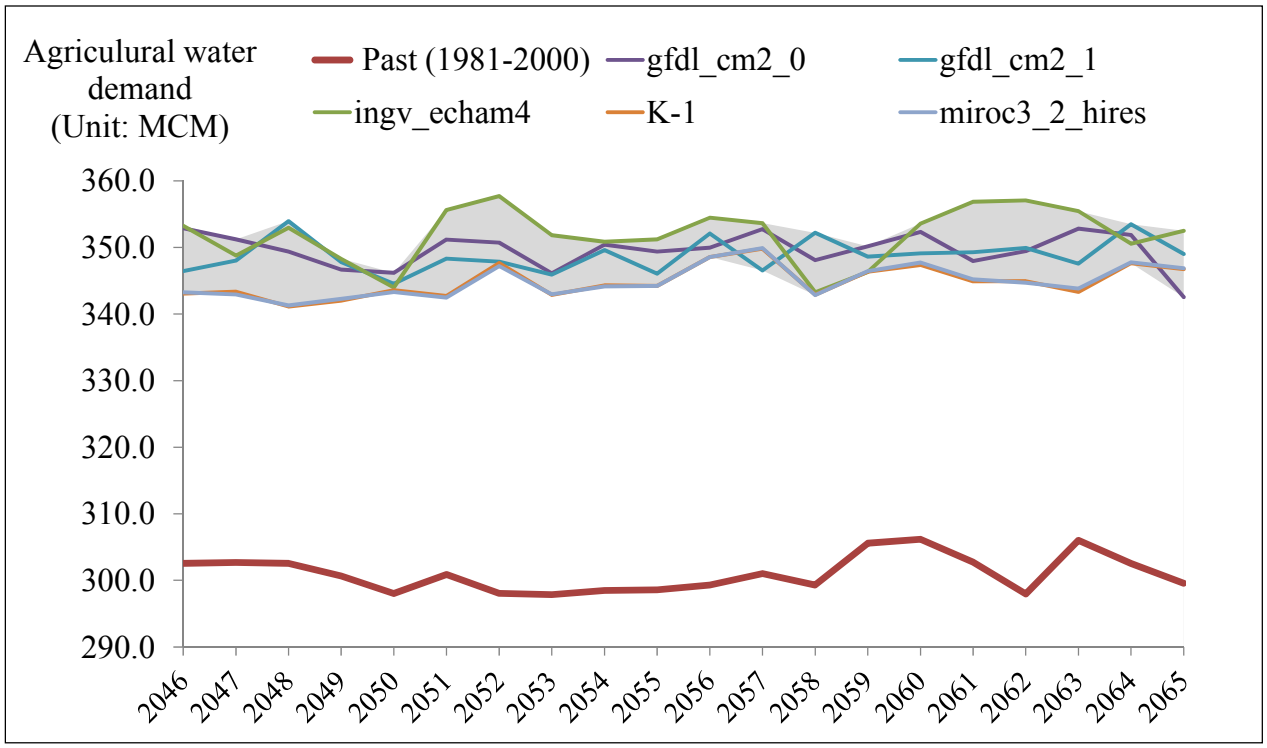


Fig. 7-7 Future agricultural water demand (2046-2065)

2) Water demand prediction for future using present growth rate

For water demand prediction for past year in 2000 and for future year in 2065, we applied RAS Method for updating Input-output table following GPP growth rate for past year in 2000 with using real GPP recorded and future year in 2065 using GPP growth rate from input-output model for base year in 2009. Table 7-15 and Table 7-16 show Input and output model updated for past year in 2000 and future year in 2065. Table 7-17 and Table 7-18 show Input and output updated for RID and Non-RID in 2000. Table 7-19 and Table 7-20 Input and output updated for RID and Non-RID in 2065.

Table 7- 15 Input and output model updated for past year in 2000

Unit : MTB

Sub-Sectors	Agr.				Ind.					Ser.		Total IT	Total Final Demand	Total Input/Output
	Rice Field	Dry crop	Orchards	Rubber	Agr.-Mis.	Chem. Product	Petro-Ref.	Metal	Ind.-Mis.	Tourist	Ser.-Mis.			
Rice Field	23.8	55.4	62.8	0.0	12.1	0.0	0.0	0.0	129.1	34.3	5.0	322.6	7.79	330.35
Dry crop	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,435.3	0.0	0.0	1,435.3	-1,018.24	417.07
Orchards	0.3	0.0	0.1	0.0	0.1	88.1	0.0	0.0	183.5	0.2	0.0	272.3	5,728.89	6,001.17
Rubber	0.0	0.0	0.0	0.0	0.0	360.1	0.0	0.0	2,837.1	0.0	0.1	3,197.2	4,855.52	8,052.76
Agr.-Mis.	1.2	0.0	0.0	3.4	119.0	2.3	0.0	0.0	526.8	24.0	0.5	677.3	4,716.81	5,394.10
Chem. Product	0.2	3.7	5.2	418.5	164.7	14,677.9	712.2	2,157.6	8,236.0	305.2	968.6	27,649.8	78,651.87	106,301.71
Petro-Ref.	23.9	4.3	406.6	167.8	422.1	6.5	1,947.7	292.1	13,622.4	1,273.8	697.0	18,864.3	1,051,787.90	1,070,652.25
Metal	4.6	1.6	122.9	54.7	88.5	1,375.2	851.7	10,368.1	15,866.1	77.0	1,686.4	30,496.6	33,188.11	63,684.74
Ind.-Mis.	36.8	114.1	1,729.9	1,125.1	1,559.7	15,540.3	879,803.1	4,134.9	71,816.3	2,020.4	6,269.1	984,149.7	-703,671.38	280,478.35
Tourist	0.4	6.8	2.7	10.1	56.8	6.9	518.8	2,615.7	3,072.1	288.7	1,034.5	7,613.5	151.40	7,764.88
Ser.-Mis.	16.1	26.0	156.8	375.0	83.0	829.7	6,673.1	1,079.6	17,273.2	822.7	3,006.3	30,341.5	9,076.96	39,418.46
Total IT	107.4	212.0	2,486.9	2,154.6	2,506.0	32,887.1	890,506.4	20,647.9	134,998.1	4,846.3	13,667.5	1,105,020.2	483,475.6	1,588,495.8
Total Value Added	222.9	205.1	3,514.3	5,898.1	2,888.1	73,414.6	180,145.8	43,036.8	145,480.3	2,918.6	25,751.0			
Total Input/Output	330.3	417.1	6,001.2	8,052.8	5,394.1	106,301.7	1,070,652.3	63,684.7	280,478.4	7,764.9	39,418.5			
Water : MCM	13.06	33.58	154.12	0.56	7.73	218.41	29.14	24.49	33.85	0.31	3.28			
WD/TI	0.03954	0.08050	0.02568	0.00007	0.00143	0.00205	0.00003	0.00038	0.00012	0.00004	0.00008			

Table 7- 16 Input and output model updated for future year in 2065

Unit : MTB

Sub-Sectors	Agr.				Ind.					Ser.		Total IT	Total Final Demand	Total Input/Output
	Rice Field	Dry crop	Orchards	Rubber	Agr.-Mis.	Chem. Product	Petro-Ref.	Metal	Ind.-Mis.	Tourist	Ser.-Mis.			
Rice Field	339.3	804.8	1,413.5	0.0	270.1	0.0	0.0	0.0	1,096.9	1,966.8	243.5	6,134.9	857.03	6,991.88
Dry crop	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	27,299.2	0.0	0.0	27,299.2	-18,471.78	8,827.42
Orchards	7.6	0.0	2.4	0.0	5.5	2,353.2	0.0	0.0	2,790.4	19.6	0.0	5,178.6	121,838.19	127,016.82
Rubber	0.0	0.0	0.0	0.0	0.0	11,085.5	0.0	0.0	49,717.7	0.0	7.6	60,810.8	109,628.52	170,439.34
Agr.-Mis.	26.2	0.0	0.0	71.7	3,973.7	51.4	0.0	0.0	6,674.3	2,051.6	33.1	12,882.0	101,286.03	114,168.02
Chem. Product	2.3	41.6	90.6	4,547.8	2,860.9	169,928.2	11,181.3	12,061.4	54,273.9	13,579.7	36,257.8	304,825.3	999,297.38	1,304,122.72
Petro-Ref.	248.5	45.8	6,671.4	1,713.5	6,886.0	70.9	28,726.0	1,534.1	84,329.4	53,233.6	24,510.6	207,969.9	12,926,926.85	13,134,896.71
Metal	65.2	22.6	2,746.1	760.7	1,966.0	20,376.2	17,113.2	74,177.7	133,808.6	4,383.5	80,790.1	336,209.8	445,082.54	781,292.37
Ind.-Mis.	296.4	937.8	22,022.1	8,912.0	19,743.7	131,135.8	10,068,340.8	16,848.3	344,949.9	65,514.4	171,049.6	10,849,750.7	-7,408,806.97	3,440,943.75
Tourist	34.1	559.0	337.3	793.4	7,149.7	576.7	59,066.2	106,037.3	146,808.0	93,132.1	280,821.7	695,315.5	93,823.01	789,138.51
Ser.-Mis.	1,253.7	2,074.7	19,352.1	28,804.3	10,184.0	67,885.5	740,417.7	42,652.7	804,425.1	258,644.3	795,303.8	2,770,997.8	1,235,070.74	4,006,068.57
Total IT	2,273.2	4,486.2	52,635.4	45,603.4	53,039.5	403,463.4	10,924,845.3	253,311.4	1,656,173.2	492,525.7	1,389,017.8	15,277,374.6	8,606,531.5	23,883,906.1
Total Value Added	4,718.7	4,341.2	74,381.4	124,835.9	61,128.5	900,659.3	2,210,051.5	527,981.0	1,784,770.5	296,612.8	2,617,050.8			
Total Input/Output	6,991.9	8,827.4	127,016.8	170,439.3	114,168.0	1,304,122.7	13,134,896.7	781,292.4	3,440,943.8	789,138.5	4,006,068.6			
Water : MCM	276.49	710.64	3261.91	11.91	163.69	2679.44	357.55	300.48	415.25	31.21	332.89			
WD/TI	0.03954	0.08050	0.02568	0.00007	0.00143	0.00205	0.00003	0.00038	0.00012	0.00004	0.00008			

Table 7- 17 Input and output model updated for RID area in 2000

Unit : MTB

Sub-Sectors	Agr.					Ind.				Ser.		Total IT	Total Final Demand	Total Input/Output
	Rice Field	Dry crop	Orchards	Rubber	Agr.-Mis.	Chem. Product	Petro-Ref.	Metal	Ind.-Mis.	Tourist	Ser.-Mis.			
Rice Field	12.4	6.1	10.9	0.0	2.0	0.0	0.0	0.0	54.5	34.3	3.8	124.0	47.63	171.61
Dry crop	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	605.7	0.0	0.0	605.7	-559.87	45.79
Orchards	0.2	0.0	0.0	0.0	0.0	63.1	0.0	0.0	77.4	0.2	0.0	140.9	898.42	1,039.34
Rubber	0.0	0.0	0.0	0.0	0.0	258.0	0.0	0.0	1,197.2	0.0	0.1	1,455.2	-710.40	744.80
Agr.-Mis.	0.6	0.0	0.0	0.3	20.2	1.7	0.0	0.0	222.3	24.0	0.3	269.5	646.60	916.08
Chem. Product	0.1	0.4	0.9	38.7	28.0	10,515.4	712.2	1,255.7	3,475.4	305.2	730.4	17,062.5	59,093.20	76,155.74
Petro-Ref.	12.4	0.5	70.4	15.5	71.7	4.7	1,947.7	170.0	5,748.3	1,273.8	525.6	9,840.7	1,060,811.60	1,070,652.25
Metal	2.4	0.2	21.3	5.1	15.0	985.2	851.7	6,034.4	6,695.1	77.0	1,271.8	15,959.1	21,106.46	37,065.53
Ind.-Mis.	19.1	12.5	299.6	104.1	264.9	11,133.3	879,803.1	2,406.6	30,304.7	2,020.4	4,727.7	931,096.0	-812,740.86	118,355.12
Tourist	0.2	0.8	0.5	0.9	9.6	4.9	518.8	1,522.4	1,296.4	288.7	780.2	4,423.3	3,341.56	7,764.88
Ser.-Mis.	8.3	2.9	27.2	34.7	14.1	594.4	6,673.1	628.4	7,288.9	822.7	2,267.1	18,361.7	11,364.87	29,726.54
Total IT	55.8	23.3	430.7	199.3	425.6	23,560.7	890,506.4	12,017.4	56,965.9	4,846.3	10,307.0	999,338.5	343,299.2	1,342,637.7
Total Value Added	115.8	22.5	608.6	545.5	490.5	52,595.0	180,145.8	25,048.1	61,389.2	2,918.6	19,419.5			
Total Input/Output	171.6	45.8	1,039.3	744.8	916.1	76,155.7	1,070,652.3	37,065.5	118,355.1	7,764.9	29,726.5			
Water : MCM	6.79	3.69	26.69	0.05	1.31	156.47	29.14	14.26	14.28	0.31	2.47			
WD/TI	0.03954	0.08050	0.02568	0.00007	0.00143	0.00205	0.00003	0.00038	0.00012	0.00004	0.00008			

Table 7- 18 Input and output model updated for Non-RID area in 2000

Unit : MTB

Sub-Sectors	Agr.					Ind.				Ser.		Total IT	Total Final Demand	Total Input/Output
	Rice Field	Dry crop	Orchards	Rubber	Agr.-Mis.	Chem. Product	Petro-Ref.	Metal	Ind.-Mis.	Tourist	Ser.-Mis.			
Rice Field	11.4	49.3	51.9	0.0	10.0	0.0	0.0	0.0	74.6	0.0	1.2	198.6	-39.83	158.74
Dry crop	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	829.6	0.0	0.0	829.6	-458.36	371.28
Orchards	0.1	0.0	0.0	0.0	0.1	25.0	0.0	0.0	106.1	0.0	0.0	131.4	4,830.48	4,961.83
Rubber	0.0	0.0	0.0	0.0	0.0	102.1	0.0	0.0	1,639.9	0.0	0.0	1,742.0	5,565.92	7,307.96
Agr.-Mis.	0.6	0.0	0.0	3.1	98.8	0.7	0.0	0.0	304.5	0.0	0.1	407.8	4,070.21	4,478.02
Chem. Product	0.1	3.3	4.3	379.8	136.8	4,162.5	0.0	901.8	4,760.6	0.0	238.2	10,587.3	19,558.67	30,145.97
Petro-Ref.	11.5	3.9	336.2	152.3	350.4	1.8	0.0	122.1	7,874.1	0.0	171.4	9,023.7	-9,023.69	0.00
Metal	2.2	1.4	101.6	49.6	73.4	390.0	0.0	4,333.7	9,171.0	0.0	414.6	14,537.6	12,081.65	26,619.20
Ind.-Mis.	17.7	101.6	1,430.3	1,021.0	1,294.8	4,407.1	0.0	1,728.3	41,511.5	0.0	1,541.4	53,053.7	109,069.49	162,123.23
Tourist	0.2	6.1	2.2	9.1	47.1	1.9	0.0	1,093.3	1,775.8	0.0	254.4	3,190.2	-3,190.16	0.00
Ser.-Mis.	7.7	23.2	129.6	340.4	68.9	235.3	0.0	451.3	9,984.3	0.0	739.2	11,979.8	-2,287.91	9,691.92
Total IT	51.6	188.7	2,056.2	1,955.3	2,080.4	9,326.4	0.0	8,630.5	78,032.1	0.0	3,360.5	105,681.7	140,176.5	245,858.2
Total Value Added	107.1	182.6	2,905.7	5,352.6	2,397.7	20,819.5	0.0	17,988.7	84,091.1	0.0	6,331.5			
Total Input/Output	158.7	371.3	4,961.8	7,308.0	4,478.0	30,146.0	0.0	26,619.2	162,123.2	0.0	9,691.9			
Water : MCM	6.28	29.89	127.42	0.51	6.42	61.94	0.00	10.24	19.57	0.00	0.81			
WD/TI	0.03954	0.08050	0.02568	0.00007	0.00143	0.00205	0.00003	0.00038	0.00012	0.00004	0.00008			

Table 7- 19 Input and output model updated for RID area in 2065

Unit : MTB

Sub-Sectors	Agr.					Ind.				Ser.		Total IT	Total Final Demand	Total Input/Output
	Rice Field	Dry crop	Orchards	Rubber	Agr.-Mis.	Chem. Product	Petro-Ref.	Metal	Ind.-Mis.	Tourist	Ser.-Mis.			
Rice Field	176.2	88.4	244.8	0.0	45.9	0.0	0.0	0.0	462.9	1,966.8	183.7	3,168.6	463.53	3,632.13
Dry crop	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11,519.6	0.0	0.0	11,519.6	-10,550.45	969.16
Orchards	3.9	0.0	0.4	0.0	0.9	1,685.9	0.0	0.0	1,177.5	19.6	0.0	2,888.2	19,109.66	21,997.91
Rubber	0.0	0.0	0.0	0.0	0.0	7,941.8	0.0	0.0	20,979.7	0.0	5.7	28,927.2	-13,163.23	15,763.97
Agr.-Mis.	13.6	0.0	0.0	6.6	674.8	36.8	0.0	0.0	2,816.4	2,051.6	24.9	5,624.9	13,764.25	19,389.11
Chem. Product	1.2	4.6	15.7	420.6	485.9	121,738.5	11,181.3	7,019.9	22,902.3	13,579.7	27,343.0	204,692.5	729,595.66	934,288.21
Petro-Ref.	129.1	5.0	1,155.4	158.5	1,169.5	50.8	28,726.0	892.9	35,585.0	53,233.6	18,484.1	139,589.8	12,995,306.88	13,134,896.71
Metal	33.9	2.5	475.6	70.4	333.9	14,597.7	17,113.2	43,172.6	56,464.0	4,383.5	60,926.0	197,573.3	257,151.32	454,724.62
Ind.-Mis.	154.0	103.0	3,814.0	824.3	3,353.1	93,947.1	10,068,340.8	9,806.0	145,560.6	65,514.4	128,993.2	10,520,410.3	-9,068,414.77	1,451,995.54
Tourist	17.7	61.4	58.4	73.4	1,214.2	413.2	59,066.2	61,715.4	61,949.4	93,132.1	211,775.3	489,476.8	299,661.74	789,138.51
Ser.-Mis.	651.3	227.8	3,351.6	2,664.1	1,729.5	48,633.9	740,417.7	24,824.5	339,448.1	258,644.3	599,760.3	2,020,353.1	1,000,732.72	3,021,085.87
Total IT	1,180.9	492.5	9,115.9	4,217.9	9,007.7	289,045.8	10,924,845.3	147,431.3	698,865.3	492,525.7	1,047,496.3	13,624,224.4	6,223,657.3	19,847,881.7
Total Value Added	2,451.3	476.6	12,882.0	11,546.1	10,381.4	645,242.4	2,210,051.5	307,293.3	753,130.2	296,612.8	1,973,589.6			
Total Input/Output	3,632.1	969.2	21,997.9	15,764.0	19,389.1	934,288.2	13,134,896.7	454,724.6	1,451,995.5	789,138.5	3,021,085.9			
Water : MCM	143.63	78.02	564.93	1.10	27.80	1919.58	357.55	174.89	175.23	31.21	251.04			
WD/TI	0.03954	0.08050	0.02568	0.00007	0.00143	0.00205	0.00003	0.00038	0.00012	0.00004	0.00008			

Table 7- 20 Input and output model updated for Non-RID area in 2065

Unit : MTB

Sub-Sectors	Agr.					Ind.				Ser.		Total IT	Total Final Demand	Total Input/Output
	Rice Field	Dry crop	Orchards	Rubber	Agr.-Mis.	Chem. Product	Petro-Ref.	Metal	Ind.-Mis.	Tourist	Ser.-Mis.			
Rice Field	163.0	716.4	1,168.7	0.0	224.2	0.0	0.0	0.0	634.0	0.0	59.9	2,966.2	393.50	3,359.75
Dry crop	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15,779.6	0.0	0.0	15,779.6	-7,921.33	7,858.26
Orchards	3.6	0.0	2.0	0.0	4.5	667.4	0.0	0.0	1,612.9	0.0	0.0	2,290.4	102,728.53	105,018.91
Rubber	0.0	0.0	0.0	0.0	0.0	3,143.7	0.0	0.0	28,738.0	0.0	1.9	31,883.6	122,791.75	154,675.38
Agr.-Mis.	12.6	0.0	0.0	65.1	3,298.8	14.6	0.0	0.0	3,857.9	0.0	8.1	7,257.1	87,521.78	94,778.90
Chem. Product	1.1	37.0	74.9	4,127.2	2,375.0	48,189.7	0.0	5,041.5	31,371.6	0.0	8,914.8	100,132.8	269,701.72	369,834.52
Petro-Ref.	119.4	40.8	5,516.0	1,555.0	5,716.6	20.1	0.0	641.2	48,744.4	0.0	6,026.5	68,380.0	-68,380.03	0.00
Metal	31.3	20.1	2,270.5	690.3	1,632.1	5,778.5	0.0	31,005.1	77,344.6	0.0	19,864.1	138,636.5	187,931.23	326,567.75
Ind.-Mis.	142.4	834.8	18,208.1	8,087.7	16,390.6	37,188.6	0.0	7,042.3	199,389.3	0.0	42,056.4	329,340.4	1,659,607.80	1,988,948.21
Tourist	16.4	497.7	278.9	720.0	5,935.5	163.6	0.0	44,321.9	84,858.5	0.0	69,046.4	205,838.7	-205,838.72	0.00
Ser.-Mis.	602.4	1,846.9	16,000.5	26,140.2	8,454.5	19,251.6	0.0	17,828.1	464,977.0	0.0	195,543.4	750,644.7	234,338.02	984,982.69
Total IT	1,092.3	3,993.7	43,519.6	41,385.6	44,031.8	114,417.7	0.0	105,880.1	957,308.0	0.0	341,521.5	1,653,150.1	2,382,874.2	4,036,024.4
Total Value Added	2,267.4	3,864.6	61,499.4	113,289.8	50,747.1	255,416.8	0.0	220,687.6	1,031,640.3	0.0	643,461.2			
Total Input/Output	3,359.7	7,858.3	105,018.9	154,675.4	94,778.9	369,834.5	0.0	326,567.8	1,988,948.2	0.0	984,982.7			
Water : MCM	132.86	632.62	2696.99	10.81	135.89	759.86	0.00	125.60	240.03	0.00	81.85			
WD/TI	0.03954	0.08050	0.02568	0.00007	0.00143	0.00205	0.00003	0.00038	0.00012	0.00004	0.00008			

Table 7- 21 Input and output model updated for Provincial economic plan in 2017

Unit : MTB

Sub-Sectors	Agr.					Ind.				Ser.		Total IT	Total Final Demand	Total Input/Output
	Rice Field	Dry crop	Orchards	Rubber	Agr.-Mis.	Chem. Product	Petro-Ref.	Metal	Ind.-Mis.	Tourist	Ser.-Mis.			
Rice Field	50.6	118.2	145.3	0.0	27.8	0.0	0.0	0.0	238.6	106.1	14.9	701.5	26.06	727.59
Dry crop	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3,121.7	0.0	0.0	3,121.7	-2,203.12	918.60
Orchards	0.7	0.0	0.2	0.0	0.4	203.1	0.0	0.0	387.2	0.7	0.0	592.2	12,625.41	13,217.60
Rubber	0.0	0.0	0.0	0.0	0.0	846.9	0.0	0.0	6,106.7	0.0	0.3	6,953.8	10,782.39	17,736.22
Agr.-Mis.	2.9	0.0	0.0	8.1	302.1	5.1	0.0	0.0	1,071.7	81.7	1.5	1,473.1	10,407.45	11,880.53
Chem. Product	0.4	7.4	11.2	836.0	355.4	27,727.8	1,400.4	3,579.9	14,238.7	883.0	2,682.9	51,723.1	149,649.31	201,372.42
Petro-Ref.	47.0	8.5	870.9	331.7	900.6	12.2	3,788.2	479.4	23,295.4	3,644.9	1,909.7	35,288.6	1,992,899.34	2,028,187.91
Metal	9.6	3.3	279.1	114.6	200.2	2,725.6	1,757.0	18,047.9	28,777.1	233.7	4,900.5	57,048.5	63,592.58	120,641.05
Ind.-Mis.	69.9	218.1	3,585.7	2,151.6	3,220.8	28,101.8	1,656,016.5	6,567.3	118,849.6	5,594.9	16,622.0	1,840,998.0	-1,309,674.46	531,323.59
Tourist	1.4	23.3	9.8	34.3	209.0	22.1	1,740.6	7,405.5	9,062.6	1,425.0	4,889.4	24,823.1	814.38	25,637.46
Ser.-Mis.	54.0	88.1	575.1	1,269.2	303.2	2,655.1	22,226.4	3,034.3	50,584.0	4,031.3	14,105.2	98,925.9	31,222.89	130,148.77
Total IT	236.6	466.8	5,477.3	4,745.6	5,519.4	62,299.7	1,686,929.1	39,114.4	255,733.3	16,001.1	45,126.3	2,121,649.5	960,142.2	3,081,791.7
Total Value Added	491.0	451.8	7,740.3	12,990.6	6,361.1	139,072.8	341,258.8	81,526.7	275,590.3	9,636.3	85,022.5			
Total Input/Output	727.6	918.6	13,217.6	17,736.2	11,880.5	201,372.4	2,028,187.9	120,641.1	531,323.6	25,637.5	130,148.8			
Water : MCM	28.77	73.95	339.44	1.24	17.03	413.74	55.21	46.40	64.12	1.01	10.81			
WD/TI	0.03954	0.08050	0.02568	0.00007	0.00143	0.00205	0.00003	0.00038	0.00012	0.00004	0.00008			

Table 7- 22 Input and output model updated for RID area from Provincial economic plan in 2017

Unit : MTB

Sub-Sectors	Agr.					Ind.				Ser.		Total IT	Total Final Demand	Total Input/Output
	Rice Field	Dry crop	Orchards	Rubber	Agr.-Mis.	Chem. Product	Petro-Ref.	Metal	Ind.-Mis.	Tourist	Ser.-Mis.			
Rice Field	26.3	13.0	25.2	0.0	4.7	0.0	0.0	0.0	100.7	106.1	11.3	287.2	90.81	377.97
Dry crop	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,317.3	0.0	0.0	1,317.3	-1,216.44	100.85
Orchards	0.4	0.0	0.0	0.0	0.1	145.5	0.0	0.0	163.4	0.7	0.0	310.0	1,979.12	2,289.14
Rubber	0.0	0.0	0.0	0.0	0.0	606.7	0.0	0.0	2,576.9	0.0	0.2	3,183.8	-1,543.36	1,640.43
Agr.-Mis.	1.5	0.0	0.0	0.7	51.3	3.7	0.0	0.0	452.2	81.7	1.1	592.3	1,425.41	2,017.67
Chem. Product	0.2	0.8	1.9	77.3	60.4	19,864.5	1,400.4	2,083.5	6,008.4	883.0	2,023.2	32,403.7	111,861.72	144,265.47
Petro-Ref.	24.4	0.9	150.8	30.7	153.0	8.7	3,788.2	279.0	9,830.1	3,644.9	1,440.1	19,350.9	2,008,836.98	2,028,187.91
Metal	5.0	0.4	48.3	10.6	34.0	1,952.6	1,757.0	10,504.2	12,143.2	233.7	3,695.6	30,384.5	39,830.48	70,215.02
Ind.-Mis.	36.3	23.9	621.0	199.0	547.0	20,132.4	1,656,016.5	3,822.3	50,151.7	5,594.9	12,535.1	1,749,680.1	-1,525,474.27	224,205.78
Tourist	0.7	2.6	1.7	3.2	35.5	15.9	1,740.6	4,310.1	3,824.2	1,425.0	3,687.2	15,046.7	10,590.78	25,637.46
Ser.-Mis.	28.0	9.7	99.6	117.4	51.5	1,902.1	22,226.4	1,766.0	21,345.2	4,031.3	10,637.1	62,214.4	35,934.34	98,148.75
Total IT	122.9	51.3	948.6	438.9	937.4	44,632.2	1,686,929.1	22,765.2	107,913.3	16,001.1	34,031.0	1,914,770.9	682,315.6	2,597,086.4
Total Value Added	255.1	49.6	1,340.5	1,201.5	1,080.3	99,633.3	341,258.8	47,449.8	116,292.5	9,636.3	64,117.8			
Total Input/Output	378.0	100.9	2,289.1	1,640.4	2,017.7	144,265.5	2,028,187.9	70,215.0	224,205.8	25,637.5	98,148.7			
Water : MCM	14.95	8.12	58.79	0.11	2.89	296.41	55.21	27.00	27.06	1.01	8.16			
WD/TI	0.03954	0.08050	0.02568	0.00007	0.00143	0.00205	0.00003	0.00038	0.00012	0.00004	0.00008			

Table 7- 23 Input and output model updated for Non-RID from Provincial economic plan in 2017

Unit : MTB

Sub-Sectors	Agr.					Ind.				Ser.		Total IT	Total Final Demand	Total Input/Output
	Rice Field	Dry crop	Orchards	Rubber	Agr.-Mis.	Chem. Product	Petro-Ref.	Metal	Ind.-Mis.	Tourist	Ser.-Mis.			
Rice Field	24.3	105.2	120.2	0.0	23.1	0.0	0.0	0.0	137.9	0.0	3.7	414.4	-64.75	349.62
Dry crop	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,804.4	0.0	0.0	1,804.4	-986.68	817.74
Orchards	0.3	0.0	0.1	0.0	0.3	57.6	0.0	0.0	223.8	0.0	0.0	282.2	10,646.29	10,928.46
Rubber	0.0	0.0	0.0	0.0	0.0	240.2	0.0	0.0	3,529.8	0.0	0.1	3,770.0	12,325.75	16,095.80
Agr.-Mis.	1.4	0.0	0.0	7.3	250.8	1.5	0.0	0.0	619.5	0.0	0.4	880.8	8,982.04	9,862.86
Chem. Product	0.2	6.6	9.3	758.7	295.0	7,863.3	0.0	1,496.3	8,230.3	0.0	659.6	19,319.4	37,787.58	57,106.95
Petro-Ref.	22.6	7.6	720.1	301.0	747.7	3.5	0.0	200.4	13,465.3	0.0	469.5	15,937.6	-15,937.64	0.00
Metal	4.6	2.9	230.8	104.0	166.2	772.9	0.0	7,543.7	16,633.8	0.0	1,204.9	26,663.9	23,762.10	50,426.04
Ind.-Mis.	33.6	194.2	2,964.7	1,952.6	2,673.8	7,969.3	0.0	2,745.0	68,697.9	0.0	4,086.9	91,318.0	215,799.81	307,117.81
Tourist	0.7	20.7	8.1	31.1	173.5	6.3	0.0	3,095.4	5,238.4	0.0	1,202.2	9,776.4	-9,776.40	0.00
Ser.-Mis.	25.9	78.4	475.5	1,151.8	251.7	752.9	0.0	1,268.3	29,238.8	0.0	3,468.1	36,711.5	-4,711.45	32,000.02
Total IT	113.7	415.6	4,528.7	4,306.7	4,582.0	17,667.5	0.0	16,349.2	147,820.0	0.0	11,095.3	206,878.6	277,826.7	484,705.3
Total Value Added	236.0	402.2	6,399.7	11,789.1	5,280.8	39,439.5	0.0	34,076.9	159,297.8	0.0	20,904.7			
Total Input/Output	349.6	817.7	10,928.5	16,095.8	9,862.9	57,107.0	0.0	50,426.0	307,117.8	0.0	32,000.0			
Water : MCM	13.83	65.83	280.65	1.12	14.14	117.33	0.00	19.39	37.06	0.00	2.66			
WD/TI	0.03954	0.08050	0.02568	0.00007	0.00143	0.00205	0.00003	0.00038	0.00012	0.00004	0.00008			

3) Water demand prediction for future using Provincial Economic plan

For water demand prediction for future using Provincial Economic plan in 2017, we also applied RAS Method for updating Input-output table following possible strategy rate from Provincial economic plan. Table 7-21 shows Input and output model updated for future year in 2017 following Provincial economic strategy rate. Table 7-22 and Table 7-23 show Input and output table updated for RID and Non-RID in 2017.

From water demand prediction for past year in 2000 and future year in 2017 and 2065, scenarios were used for calculation as shown in Table 24.

Table 7- 24 GPP rate compared to 2009 for water demand calculation

Sectors	2000	2009	2017	2065
Agr	66.2% from base year	base year	Increasing 3.0%	Increasing 4.8%
Industry	72.1% from base year	base year	Increasing 5.0%	Increasing 4.0%
Services	53.6% from base year	base year	Increasing 3.0%	Increasing 7.4%
Total	69.3% from base year	base year	Increasing 3.7%	Increasing 4.4%

Water demand prediction of production sectors for past year in 2000 and future year in 2017 and 2065 were shown in Table 7-25. Water demand for past year in 2000 and future year 2017 and 2065 were calculated Input and output model updated using RAS Method from base year in 2009. Water demand is increasing from 2009 to 2065 in range of 746.89-8,541.46 MCM/yr. In 2007, water demand predicted from Provincial economic plan is 1,051 MCM/yr. The greatest water demand in agriculture from orchards is 339.4 and 3,261.9 MCM/yr in 2017 and 2065 respectively. The greatest water demand in industry from chemical product is 413.7 and 2,679.4 MCM/yr in 2017 and 2065 respectively. The greatest water demand in services sectors form miscellaneous services is 10.8 and 332.9 MCM/yr in 2017 and 2065 respectively.

Table 7- 25 Water demand prediction of production sectors in 2000, 2009, 2017 and 2065

Unit : MCM/yr

Sectors		2000	2009	2017	2065
Agricultures	Rice Field	13.1	19.7	28.8	276.5
	Dry crop	33.6	50.7	74.0	710.6
	Orchards	154.1	232.8	339.4	3,261.9
	Rubber	0.6	0.9	1.2	11.9
	Agr.-Mis.	7.7	11.7	17.0	163.7
Industry	Chem. Product	218.4	303.0	413.7	2,679.4
	Petro-Ref.	29.1	40.4	55.2	357.6
	Metal	24.5	34.0	46.4	300.5
	Ind.-Mis.	33.8	47.0	64.1	415.3
Services	Tourist	0.3	0.6	1.0	31.2
	Ser.-Mis.	3.3	6.1	10.8	332.9
Total		518.53	746.89	1,051.73	8,541.46

Table 7-26 shows Water demand prediction of production sectors for past year for Non-RID area and RID area in 2000 and future year in 2017 and 2065.

- The greatest water demand in agriculture from orchards is 58.8 and 280.7 MCM/yr in RID and Non-RID area in 2017 respectively.
- The greatest water demand in industry from chemical product is 296.4 and 117.6 MCM/yr in RID and Non-RID area in 2017 respectively.
- The greatest water demand in services sectors form miscellaneous services is 8.2 and 2.7 MCM/yr in RID and Non-RID area in 2017 respectively.
- The greatest water demand in agriculture from orchards is 564.9 and 2,697.0 MCM/yr in RID and Non-RID area in 2065 respectively.
- The greatest water demand in industry from chemical product is 1,919.6 and 759.9 MCM/yr in RID and Non-RID area in 2065 respectively.
- The greatest water demand in services sectors form miscellaneous services is 251.0 and 81.8 MCM/yr in RID and Non-RID area in 2065 respectively.

Figure 7-8 shows water demand prediction in production sectors in 2000, 2009, 2017 and 2065.

Table 7- 26 Water demand prediction for Water demand for past year in 2000 and future year 2017 and 2065 for Non-RID area and RID

Unit: MCM/yr

Sectors		2000			2009			2017			2065		
		Total	RID	Non-RID	Total	RID	Non-RID	Total	RID	Non-RID	Total	RID	Non-RID
Agricultur	Rice Field	13.1	6.8	6.3	19.7	10.3	9.5	28.8	14.9	13.8	276.5	143.6	132.9
	Dry crop	33.6	3.7	29.9	50.7	5.6	45.1	74.0	8.1	65.8	710.6	78.0	632.6
	Orchards	154.1	26.7	127.4	232.8	40.3	192.5	339.4	58.8	280.7	3,261.9	564.9	2,697.0
	Rubber	0.6	0.1	0.5	0.9	0.1	0.8	1.2	0.1	1.1	11.9	1.1	10.8
	Agr.-Mis.	7.7	1.3	6.4	11.7	2.0	9.7	17.0	2.9	14.1	163.7	27.8	135.9
Industry	Chem. Product	218.4	156.5	61.9	303.0	217.1	85.9	413.7	296.4	117.3	2,679.4	1,919.6	759.9
	Petro-Ref.	29.1	29.1	0.0	40.4	40.4	0.0	55.2	55.2	0.0	357.6	357.6	0.0
	Metal	24.5	14.3	10.2	34.0	19.8	14.2	46.4	27.0	19.4	300.5	174.9	125.6
	Ind.-Mis.	33.8	14.3	19.6	47.0	19.8	27.1	64.1	27.1	37.1	415.3	175.2	240.0
Services	Tourist	0.3	0.3	0.0	0.6	0.6	0.0	1.0	1.0	0.0	31.2	31.2	0.0
	Ser.-Mis.	3.3	2.5	0.8	6.1	4.6	1.5	10.8	8.2	2.7	332.9	251.0	81.8

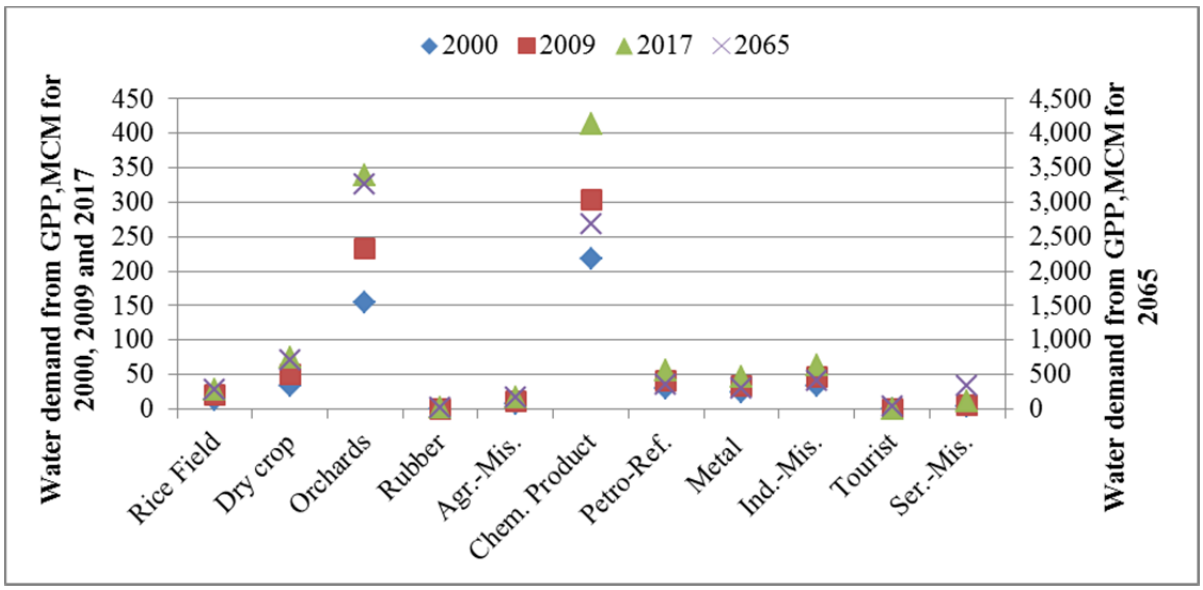


Figure 7-8 Water demand prediction in production sectors in 2000, 2009, 2017 and 2065.

8. Economic impact evaluation module

Development of Economic impact evaluation module was performed in the following steps: 1) Evaluation impact method and 2) Application in case study area

- ***Evaluation impact method***

Input-Output Model can be used not only to calculate water demand but also to evaluate economics impacts under policy change and can be used to evaluate benefits under countermeasure scenarios. Input-output model was applied to evaluate impact from water shortage resulted from water balance process that reflects impact from water demand in term of money.

In economic impact evaluation module, Input-output table model can be applied to predict the productions in future. We evaluated impact of future climate change in term of water affected to final demand in term of economic as following Eq. 8-1 and Eq. 8-2.

$$WD = Uw \times [I-A]\text{-}1 \times FD \quad (8\text{-}1)$$

$$WD = C \times D$$

$$FD = C^{-1} \times WD \quad (8\text{-}2)$$

Where;

WD = Water demand (MCM/year)

U_w = Water unit (MCM/THB)

$[I-A]^{-1}$ = Leontief Inverse Matrix

FD = Final demand (THB)

- ***Application in case study area***

The result of economic impact evolution for application in case study area can express in the followings scenarios: 1) Water demand prediction for future with climate change affected to Agricultural water 2) Water demand for future using present growth rate 3) Water demand prediction for future using Provincial Economic plan.

1) Water demand prediction for future with climate change affected to Agricultural water.

We developed and applied economic impact evaluation module for case study area in Rayong province, Thailand. For example, application for future water demand prediction, since future agricultural water demand are maximum increasing about 13.3% (42 MCM) of past year, it could make GDP of agricultural sectors also directly increasing about 18.4% (3,993MTB) of past year. With using Input-output model, GDP of industrial and service are being indirectly increased about 0.2% and 0.3% of past year (1,204 and 235 MTB respectively). The relationship between water demand and final demand are represented by linear as shown in Fig. 8-1

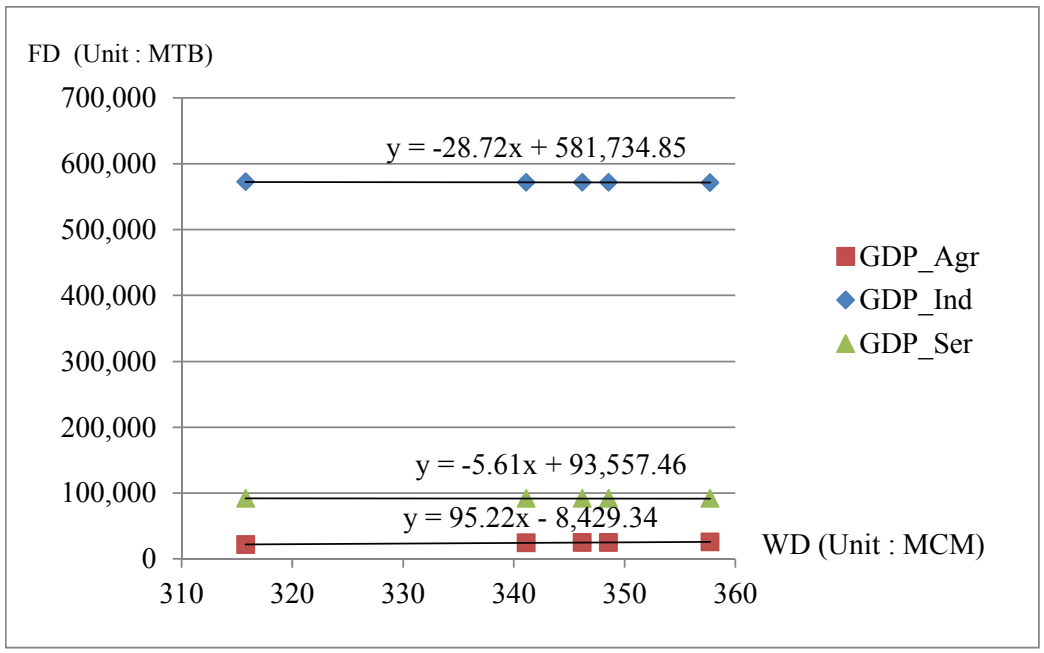


Fig. 8-1 The relationship between water demand and final demand (FD)

GDP of industrial and service sector are indirectly affected by increasing GDP of agricultural sector about 30% and 6% of GDP of agricultural sector respectively). The relationship between GDP of industrial and service sector and GDP of agricultural sector are represented by linear as shown in Fig. 8-2

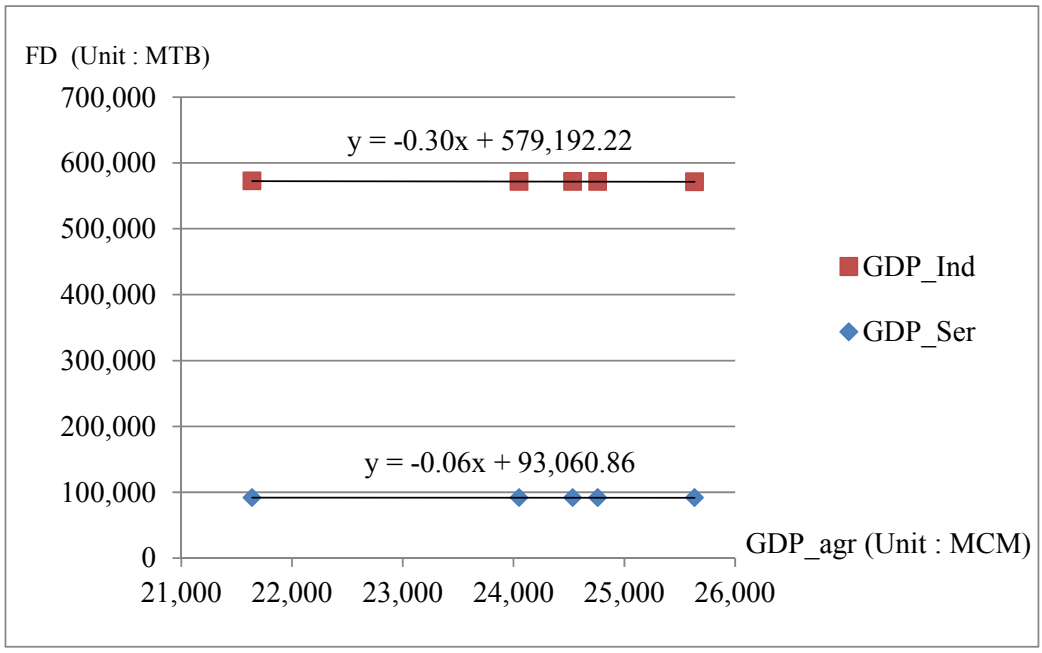


Fig. 8-2 The relationship between GDP (FD) of industrial and service sector and GDP (FD) of agricultural sector

2) Case of Water demand prediction for future using present growth rate

We performed water demand prediction in 2000 and 2065 for the scenarios and performed water balance with runoff predicted with climate change model output from Tank model. We used runoff predicted from past station data and GCM past data in 2000 and runoff predicted from GCM future data in 2065. We predicted impact from water shortage using Input-output model as following Eq. (8-1).

- ***Result and discussion***

Table 8-1 shows water shortage for 2000. The water shortage can make economic impact in each production sector as shown in Table 8-2. Fig. 8-3 shows shortage and impact from water shortage in 2000. The total water shortage is in the range of 65.9-173.5 MCM/yr from station data and GCM outputs in 2000. It indicates that impact from water shortage can reduce final demand in the range of 1.17-2.89 MTB/yr from station data and GCM outputs in 2000.

Table 8-1 Water shortage predicted in 2000

unit:MCM

	Station	gfdl_cm2_0	gfdl_cm2_1	ingv_echam4	K-1	miroc3_2_hires	ncar_ccsm3_0
Rice Field	4.7	8.2	2.2	7.7	4.8	4.9	1.3
Dry crop	9.0	11.3	6.7	11.1	9.2	9.3	5.6
Orchards	38.2	51.1	25.7	47.4	40.5	40.6	21.4
Rubber	0.2	0.3	0.1	0.2	0.2	0.2	0.1
Agr.-Mis.	1.5	1.8	1.1	1.6	1.6	1.6	0.9
Chem. Product	30.6	52.5	18.0	46.4	40.3	37.6	20.7
Petro-Ref.	3.9	6.8	3.2	5.2	5.2	5.0	3.2
Metal	3.5	5.9	1.9	5.4	4.6	4.2	2.2
Ind.-Mis.	5.1	9.2	2.6	7.5	7.0	6.7	3.0
Tourist	1.3	2.1	0.4	2.2	1.6	1.5	0.6
Ser.-Mis.	15.0	24.4	4.1	26.2	19.2	16.8	7.1
Total	112.9	173.5	65.9	161.0	134.3	128.4	66.1

Table 8-2 Economic impact predicted from shortage in 2000

unit:MTB

	Station	gfdl_cm2_0	gfdl_cm2_1	ingv_echam4	K-1	miroc3_2_hires	ncar_ccsm3_0
Rice Field	0.272	0.441	0.147	0.415	0.280	0.282	0.098
Dry crop	0.747	0.943	0.555	0.924	0.766	0.772	0.462
Orchards	0.983	1.315	0.660	1.220	1.043	1.045	0.552
Rubber	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Agr.-Mis.	0.002	0.003	0.002	0.003	0.003	0.003	0.001
Chem. Product	0.080	0.135	0.047	0.120	0.104	0.097	0.053
Petro-Ref.	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Metal	0.004	0.007	0.002	0.006	0.005	0.005	0.002
Ind.-Mis.	0.006	0.010	0.004	0.009	0.008	0.007	0.004
Tourist	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ser.-Mis.	0.002	0.003	0.001	0.003	0.002	0.002	0.001
Total	2.097	2.858	1.418	2.701	2.212	2.213	1.173

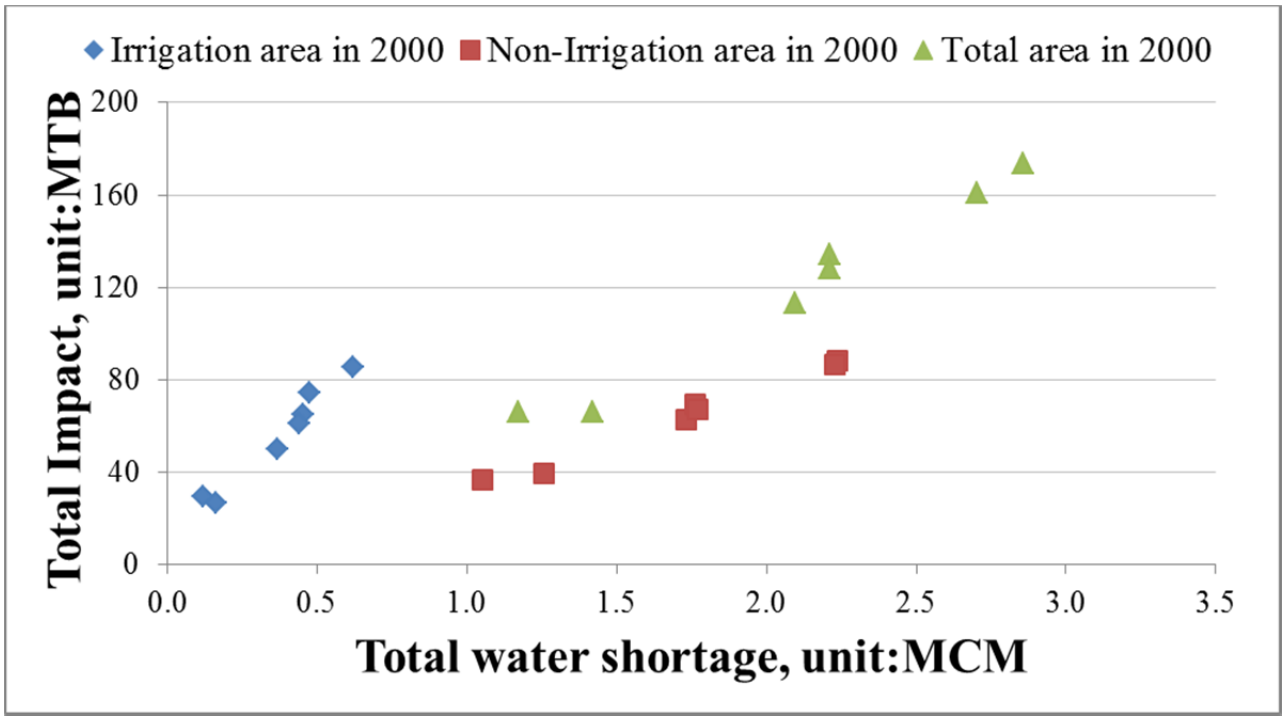


Fig. 8-3 shortage and impact from water shortage in 2000

Table 8-3 shows water shortage for 2065. The water shortage can make economic impact in each production sectors as shown in Table 8-4. Fig.8-4 shows shortage and impact from water shortage in 2065. The total water shortage is in the range of 4,446.3-5,873.9 MCM/yr from station data and GCM outputs in 2065. It indicates that impact from water shortage can reduce final demand in the range of 85.3-93.6 MTB/yr from station data and GCM outputs in 2065.

Table 8-3 Water shortage predicted in 2065

unit:MCM

	gfdl_cm2_0	gfdl_cm2_1	ingv_echam4	K-1	miroc3_2_hires	ncar_ccsm3_0
Rice Field	240.1	229.8	236.7	241.4	241.4	241.3
Dry crop	359.4	342.0	340.1	363.9	365.2	367.6
Orchards	1,749.1	1,617.7	1,655.9	1,796.4	1,802.1	1,812.0
Rubber	8.8	8.0	8.5	9.0	9.1	9.1
Agr.-Mis.	68.2	60.9	60.9	70.0	70.0	70.7
Chem. Product	1,510.3	1,247.7	1,726.7	1,620.9	1,619.4	1,574.3
Petro-Ref.	193.2	174.0	216.2	207.2	207.0	197.4
Metal	172.0	139.7	197.2	184.6	184.4	180.0
Ind.-Mis.	283.3	240.1	317.4	305.7	305.4	302.7
Tourist	73.5	52.5	82.1	74.3	74.2	78.7
Ser.-Mis.	906.4	664.0	1,032.2	932.0	931.3	941.2
Total	5,564.2	4,776.3	5,873.9	5,805.4	5,809.4	5,775.0

Table 8-4 Economic impact predicted from shortage in 2065

unit:MTB

	gfdl_cm2_0	gfdl_cm2_1	ingv_echam4	K-1	miroc3_2_hires	ncar_ccsm3_0
Rice Field	12.3	11.7	12.0	12.4	12.4	12.4
Dry crop	29.8	28.3	28.3	30.3	30.4	30.5
Orchards	45.0	41.6	42.7	46.3	46.4	46.7
Rubber	0.0	0.0	0.0	0.0	0.0	0.0
Agr.-Mis.	0.1	0.1	0.1	0.1	0.1	0.1
Chem. Product	3.7	3.1	4.2	4.0	4.0	3.9
Petro-Ref.	0.0	0.0	0.0	0.0	0.0	0.0
Metal	0.1	0.1	0.2	0.2	0.2	0.2
Ind.-Mis.	0.2	0.2	0.2	0.2	0.2	0.2
Tourist	0.0	0.0	0.0	0.0	0.0	0.0
Ser.-Mis.	0.2	0.2	0.2	0.2	0.2	0.2
Total	91.5	85.3	87.9	93.6	93.8	94.1

The water shortage in RID area and Non-RID area in 2000 shows in Table 8-5 and Table 8-6 respectively. The economic impact in each production sectors in RID area and Non-RID area in 2000 shows in Table 8-7 and Table 8-8 respectively. Fig.8-5 and Fig.8-6 shows shortage and Impact in each production sectors in RID area respectively. Fig.8-7 and Fig.8-8 shows shortage and economic impact in each production sectors in Non-RID area respectively. Fig.8-9 and Fig.8-10 shows shortage and economic impact in each production sectors in total area in 2000 respectively.

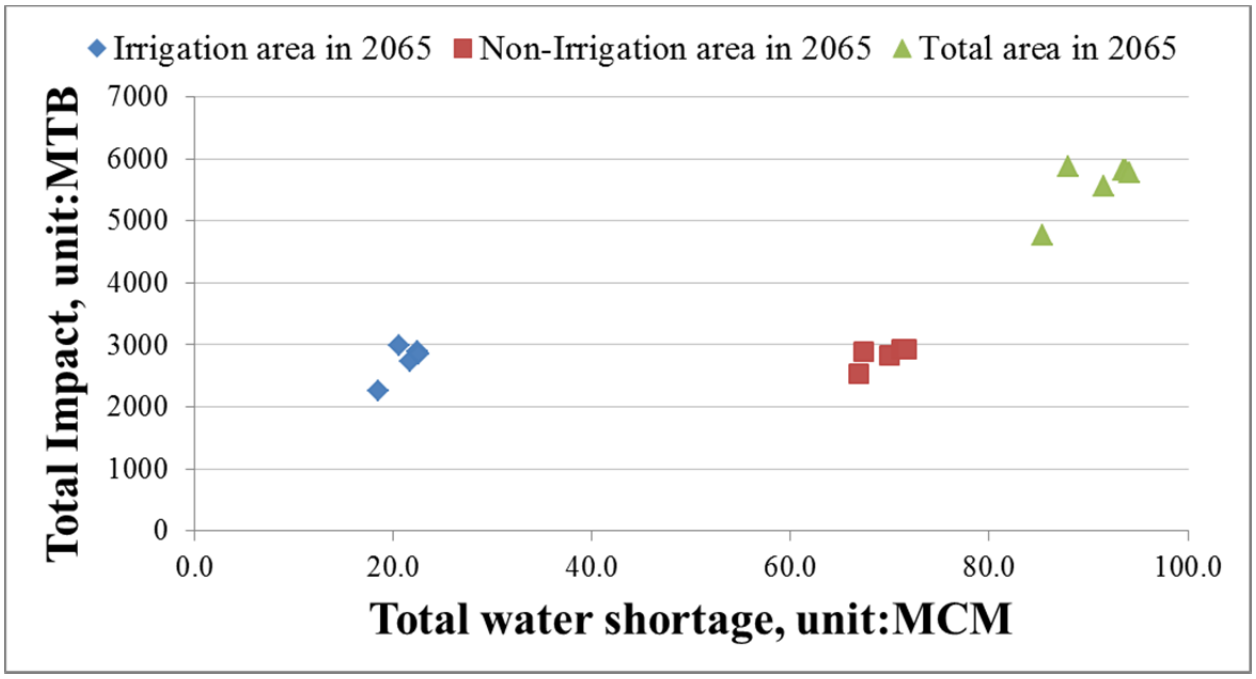


Fig. 8-4 shortage and impact from water shortage in 2065

Table 8-5 Water shortage in RID area in 2000

unit:MCM

	Station	gfdl_cm2_0	gfdl_cm2_1	ingv_echam4	K-1	miroc3_2_hires	ncar_ccsm3_0
Rice Field	2.4	4.3	1.1	4.0	2.5	2.5	0.6
Dry crop	0.6	1.0	0.3	0.6	0.8	0.8	0.2
Orchards	5.2	8.7	1.7	5.5	6.8	6.6	1.1
Rubber	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Agr.-Mis.	0.2	0.4	0.1	0.3	0.3	0.3	0.0
Chem. Product	21.5	37.2	14.2	31.7	28.5	26.9	15.6
Petro-Ref.	3.9	6.8	3.2	5.2	5.2	5.0	3.2
Metal	1.9	3.4	1.4	2.8	2.6	2.5	1.5
Ind.-Mis.	1.9	3.4	1.4	2.8	2.6	2.5	1.5
Tourist	1.3	2.1	0.4	2.2	1.6	1.5	0.6
Ser.-Mis.	11.1	18.1	3.1	19.5	14.2	12.5	5.3
Total	50.2	85.3	26.7	74.5	65.1	61.0	29.5

Table 8-6 Water shortage in Non-RID area in 2000

unit:MCM

	Station	gfdl_cm2_0	gfdl_cm2_1	ingv_echam4	K-1	miroc3_2_hires	ncar_ccsm3_0
Rice Field	2.3	3.9	1.1	3.7	2.3	2.3	0.7
Dry crop	8.4	10.3	6.4	10.5	8.3	8.4	5.4
Orchards	33.0	42.4	24.0	41.9	33.8	34.0	20.4
Rubber	0.2	0.2	0.1	0.2	0.2	0.2	0.1
Agr.-Mis.	1.3	1.4	1.0	1.3	1.3	1.3	0.9
Chem. Product	9.1	15.3	3.7	14.8	11.8	10.7	5.1
Petro-Ref.	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Metal	1.5	2.6	0.5	2.5	2.0	1.8	0.8
Ind.-Mis.	3.2	5.8	1.2	4.8	4.5	4.2	1.5
Tourist	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ser.-Mis.	3.8	6.3	1.1	6.7	5.0	4.4	1.8
Total	62.7	88.2	39.2	86.4	69.2	67.4	36.5

Table 8-7 Economic impact predicted from water shortage in RID area in 2000

unit:MTB

	Station	gfdl_cm2_0	gfdl_cm2_1	ingv_echam4	K-1	miroc3_2_hires	ncar_ccsm3_0
Rice Field	0.111	0.194	0.051	0.177	0.116	0.116	0.028
Dry crop	0.061	0.097	0.028	0.063	0.080	0.079	0.022
Orchards	0.134	0.225	0.044	0.143	0.175	0.171	0.028
Rubber	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Agr.-Mis.	0.000	0.001	0.000	0.001	0.001	0.001	0.000
Chem. Product	0.054	0.094	0.035	0.080	0.072	0.068	0.039
Petro-Ref.	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Metal	0.002	0.003	0.001	0.003	0.003	0.002	0.001
Ind.-Mis.	0.003	0.005	0.002	0.004	0.003	0.003	0.002
Tourist	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ser.-Mis.	0.001	0.002	0.000	0.002	0.002	0.001	0.001
Total	0.367	0.621	0.162	0.473	0.452	0.441	0.120

Table 8-8 Economic impact predicted from water shortage in Non-RID area in 2000

unit:MTB

	Station	gfdl_cm2_0	gfdl_cm2_1	ingv_echam4	K-1	miroc3_2_hires	ncar_ccsm3_0
Rice Field	0.161	0.247	0.096	0.238	0.164	0.165	0.070
Dry crop	0.686	0.846	0.527	0.861	0.686	0.693	0.440
Orchards	0.850	1.090	0.616	1.078	0.868	0.874	0.523
Rubber	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Agr.-Mis.	0.002	0.002	0.002	0.002	0.002	0.002	0.001
Chem. Product	0.025	0.042	0.011	0.040	0.032	0.030	0.014
Petro-Ref.	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Metal	0.002	0.003	0.001	0.003	0.003	0.002	0.001
Ind.-Mis.	0.004	0.005	0.002	0.005	0.004	0.004	0.002
Tourist	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ser.-Mis.	0.001	0.001	0.000	0.001	0.001	0.001	0.000
Total	1.731	2.237	1.256	2.228	1.760	1.771	1.053

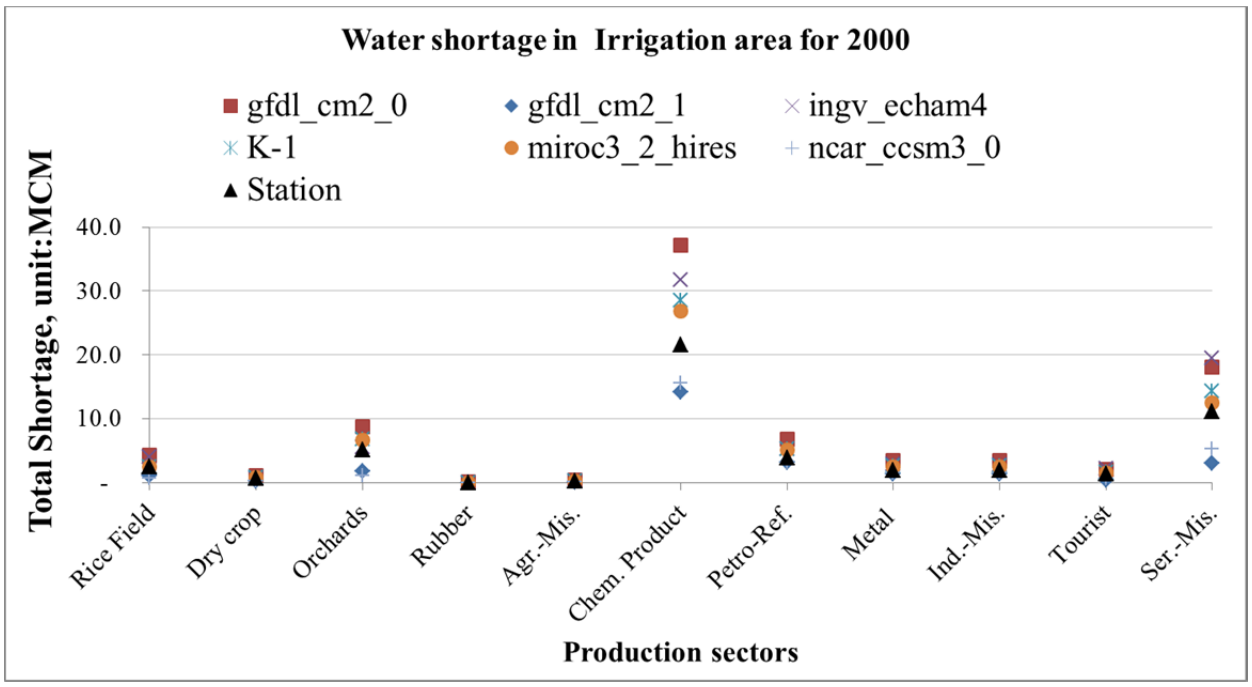


Fig. 8-5 Water shortage in RID area in 2000

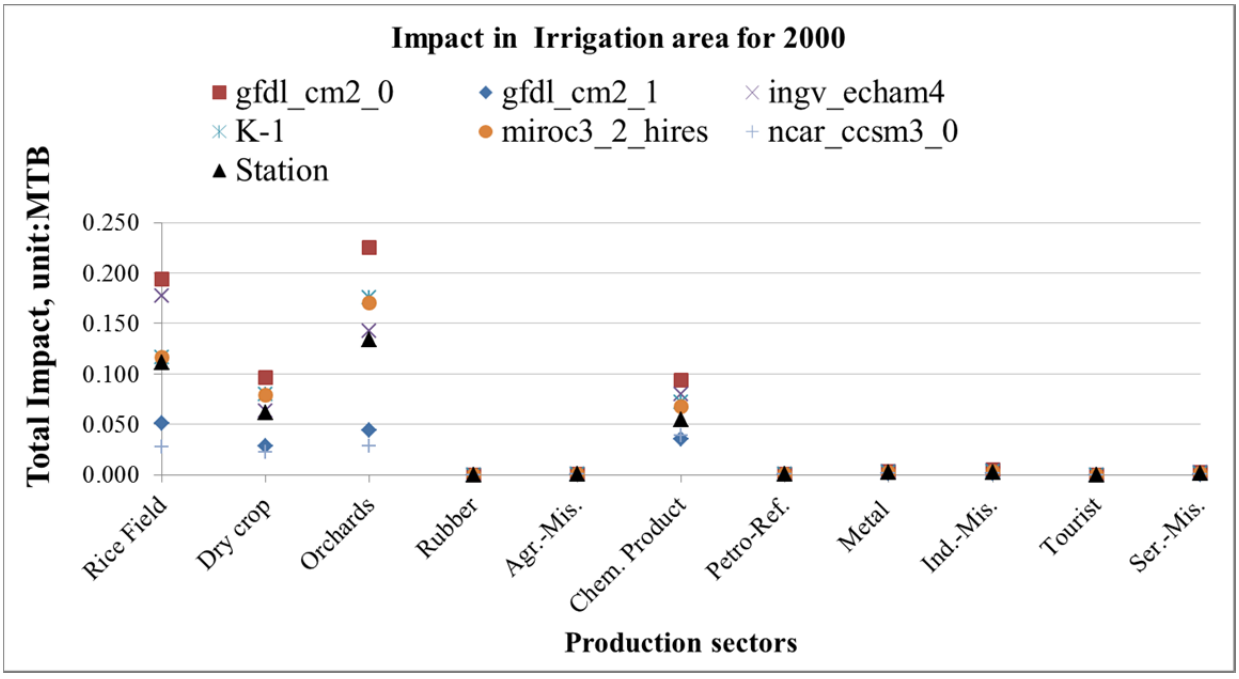


Fig. 8-6 Economic impact predicted from water shortage in RID area in 2000

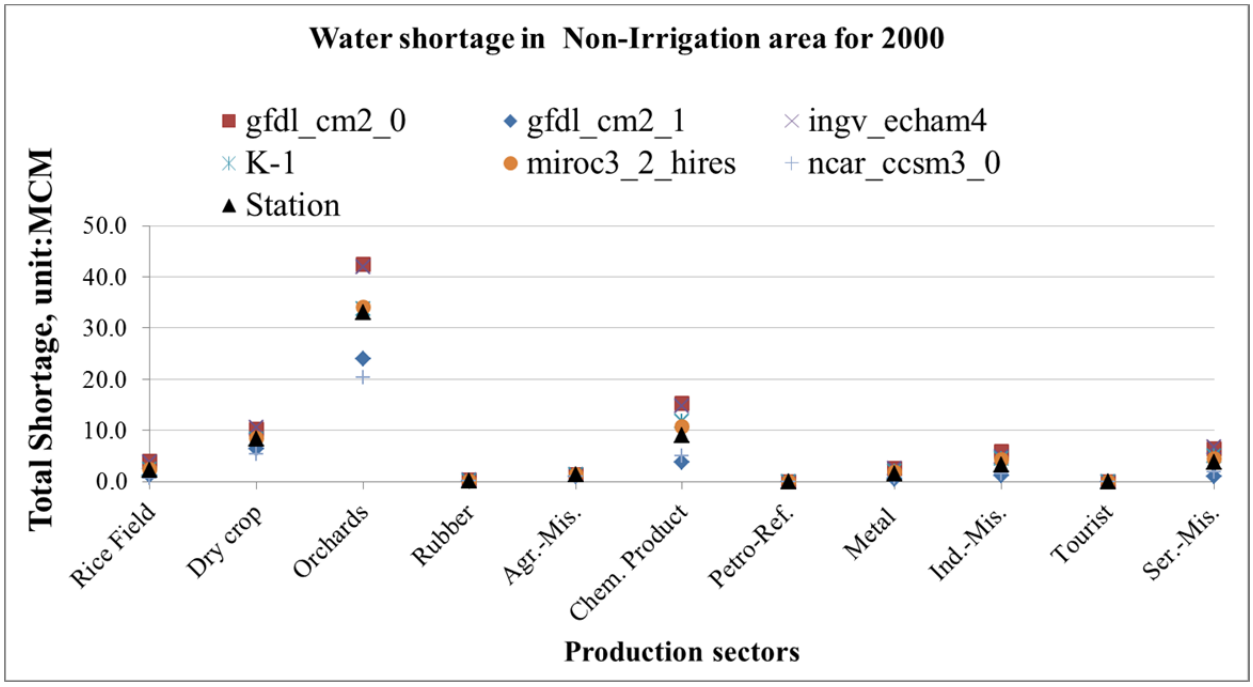


Fig. 8-7 Water shortage in Non-RID area in 2000

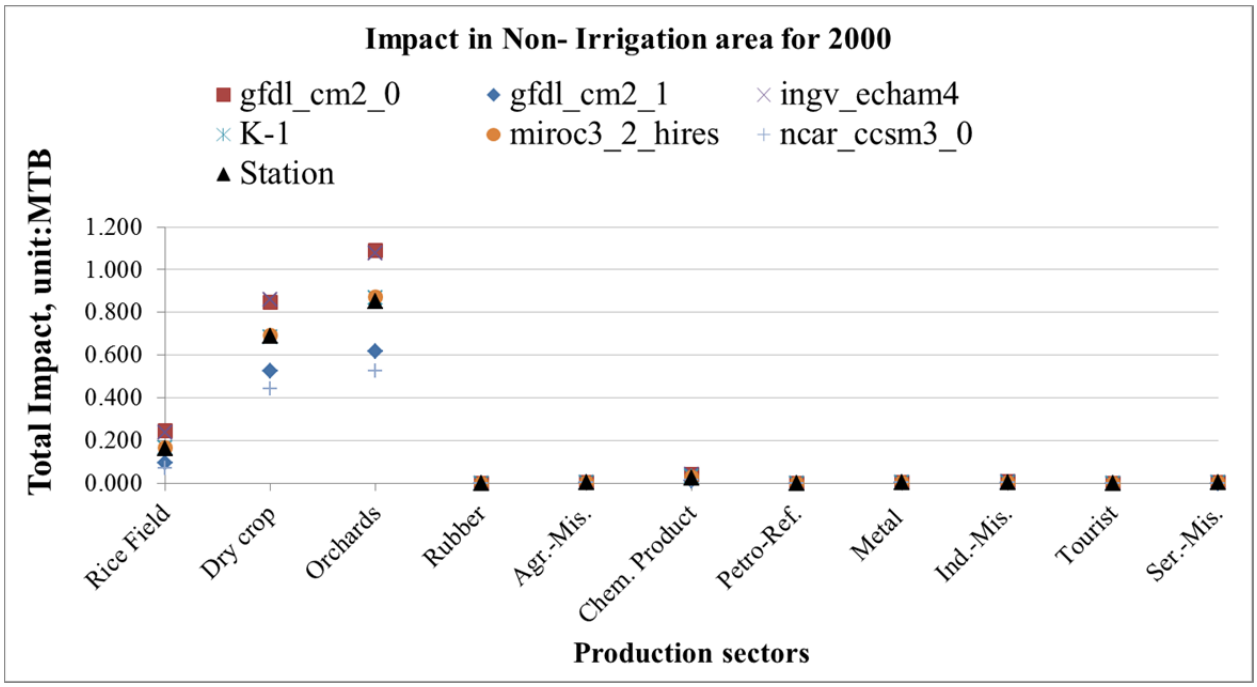


Fig. 8-8 Economic impact predicted from water shortage in Non-RID area in 2000

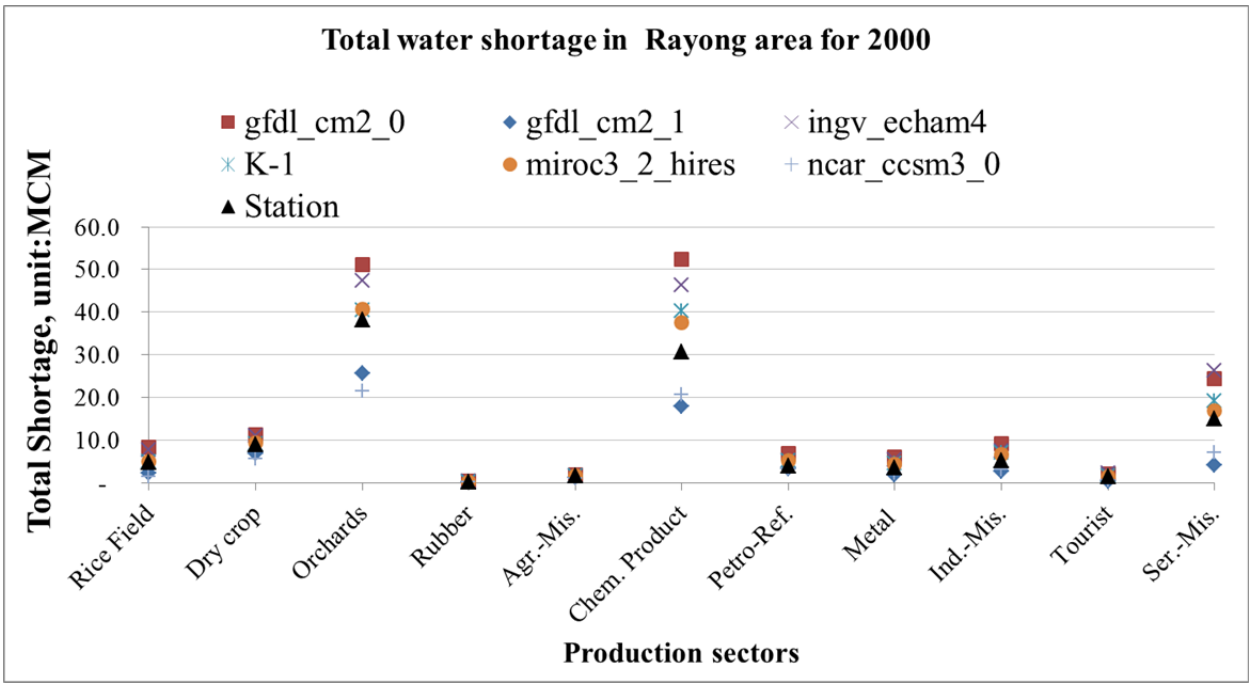


Fig. 8-9 Water shortage in total area in 2000

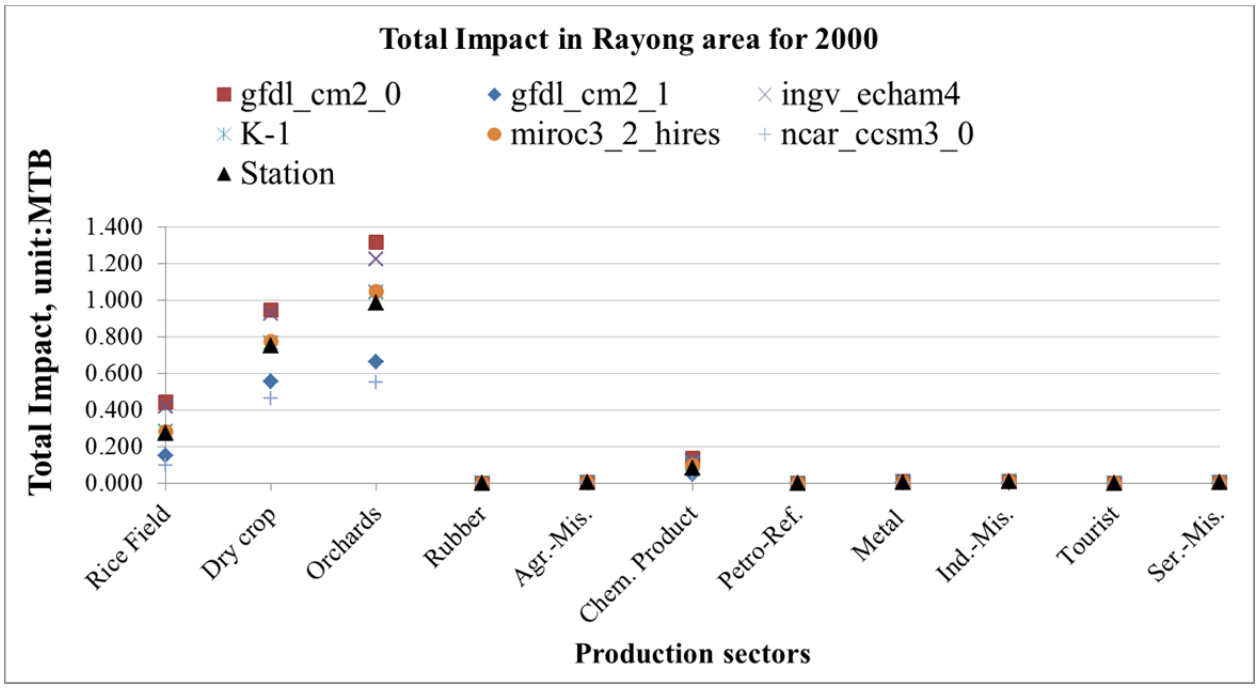


Fig. 8-10 Economic impact predicted from water shortage in total area in 2000

The water shortage in RID area and Non-RID area in 2065 shows in Table 8-9 and Table 8-10 respectively. The economic impact in each production sectors in RID area and Non-RID area in 2065 shows in Table 8-11 and Table 8-12 respectively. Fig.8-11 and Fig.8-12 shows shortage and Impact in each production sectors in RID area respectively. Fig.8-13 and Fig.8-14 shows shortage and economic impact in each production sectors in Non-RID area respectively. Fig.8-15 and Fig.8-16 shows shortage and economic impact in each production sectors in total area in 2065 respectively

Table 8-9 Water shortage in RID area in 2065

unit:MCM

	gfdl_cm2_0	gfdl_cm2_1	ingv_echam4	K-1	miroc3_2_hires	ncar_ccsm3_0
Rice Field	125.0	119.4	122.9	125.6	125.5	125.5
Dry crop	41.8	33.4	36.1	43.1	43.1	44.0
Orchards	361.3	296.1	325.5	378.6	378.0	382.0
Rubber	0.7	0.6	0.7	0.8	0.8	0.8
Agr.-Mis.	15.8	13.2	14.9	16.7	16.7	16.9
Chem. Product	1,063.0	900.1	1,208.6	1,140.0	1,138.9	1,099.6
Petro-Ref.	193.2	174.0	216.2	207.2	207.0	197.4
Metal	96.3	82.7	109.1	103.3	103.2	99.3
Ind.-Mis.	96.2	83.3	108.7	103.1	103.0	99.1
Tourist	73.5	52.5	82.1	74.3	74.2	78.7
Ser.-Mis.	673.6	494.0	767.3	692.9	692.3	699.7
Total	2,740.4	2,249.4	2,992.1	2,885.6	2,882.7	2,843.1

Table 8-10 Water shortage in Non-RID area in 2065

unit:MCM

	gfdl_cm2_0	gfdl_cm2_1	ingv_echam4	K-1	miroc3_2_hires	ncar_ccsm3_0
Rice Field	115.1	110.4	113.8	115.8	115.8	115.8
Dry crop	317.6	308.7	303.9	320.8	322.2	323.5
Orchards	1,387.8	1,321.6	1,330.4	1,417.8	1,424.1	1,430.0
Rubber	8.0	7.4	7.9	8.2	8.3	8.3
Agr.-Mis.	52.4	47.6	46.0	53.3	53.3	53.8
Chem. Product	447.4	347.6	518.1	480.9	480.4	474.6
Petro-Ref.	0.0	0.0	0.0	0.0	0.0	0.0
Metal	75.7	57.0	88.1	81.3	81.2	80.7
Ind.-Mis.	187.1	156.8	208.6	202.6	202.4	203.7
Tourist	0.0	0.0	0.0	0.0	0.0	0.0
Ser.-Mis.	232.8	169.9	264.9	239.1	238.9	241.5
Total	2,823.8	2,527.0	2,881.8	2,919.8	2,926.7	2,932.0

Table 8-11 Economic impact predicted from water shortage in RID area in 2065

unit:MTB

	gfdl_cm2_0	gfdl_cm2_1	ingv_echam4	K-1	miroc3_2_hires	ncar_ccsm3_0
Rice Field	5.6	5.3	5.5	5.6	5.6	5.6
Dry crop	3.8	3.0	3.4	3.9	3.9	4.0
Orchards	9.4	7.7	8.4	9.8	9.8	9.9
Rubber	0.0	0.0	0.0	0.0	0.0	0.0
Agr.-Mis.	0.0	0.0	0.0	0.0	0.0	0.0
Chem. Product	2.6	2.2	2.9	2.8	2.8	2.7
Petro-Ref.	0.0	0.0	0.0	0.0	0.0	0.0
Metal	0.1	0.1	0.1	0.1	0.1	0.1
Ind.-Mis.	0.1	0.1	0.1	0.1	0.1	0.1
Tourist	0.0	0.0	0.0	0.0	0.0	0.0
Ser.-Mis.	0.1	0.1	0.1	0.1	0.1	0.1
Total	21.6	18.4	20.5	22.4	22.4	22.5

Table 8-12 Economic impact predicted from water shortage in Non-RID area in 2065

unit:MTB

	gfdl_cm2_0	gfdl_cm2_1	ingv_echam4	K-1	miroc3_2_hires	ncar_ccsm3_0
Rice Field	6.7	6.4	6.6	6.7	6.8	6.8
Dry crop	26.1	25.3	25.0	26.3	26.5	26.6
Orchards	35.7	34.0	34.2	36.5	36.6	36.8
Rubber	0.0	0.0	0.0	0.0	0.0	0.0
Agr.-Mis.	0.1	0.1	0.1	0.1	0.1	0.1
Chem. Product	1.1	0.9	1.3	1.2	1.2	1.2
Petro-Ref.	0.0	0.0	0.0	0.0	0.0	0.0
Metal	0.1	0.1	0.1	0.1	0.1	0.1
Ind.-Mis.	0.1	0.1	0.1	0.1	0.1	0.1
Tourist	0.0	0.0	0.0	0.0	0.0	0.0
Ser.-Mis.	0.1	0.1	0.1	0.1	0.1	0.1
Total	69.9	66.9	67.4	71.1	71.4	71.7

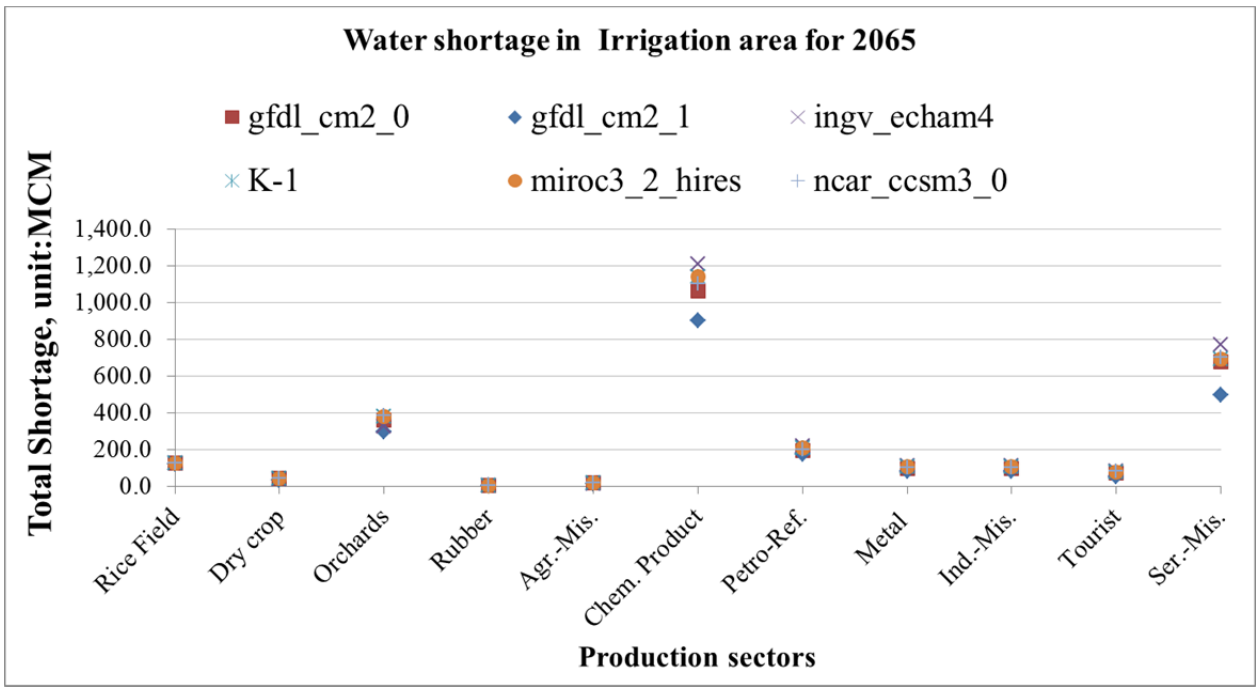


Fig. 8-11 Water shortage in RID area in 2065

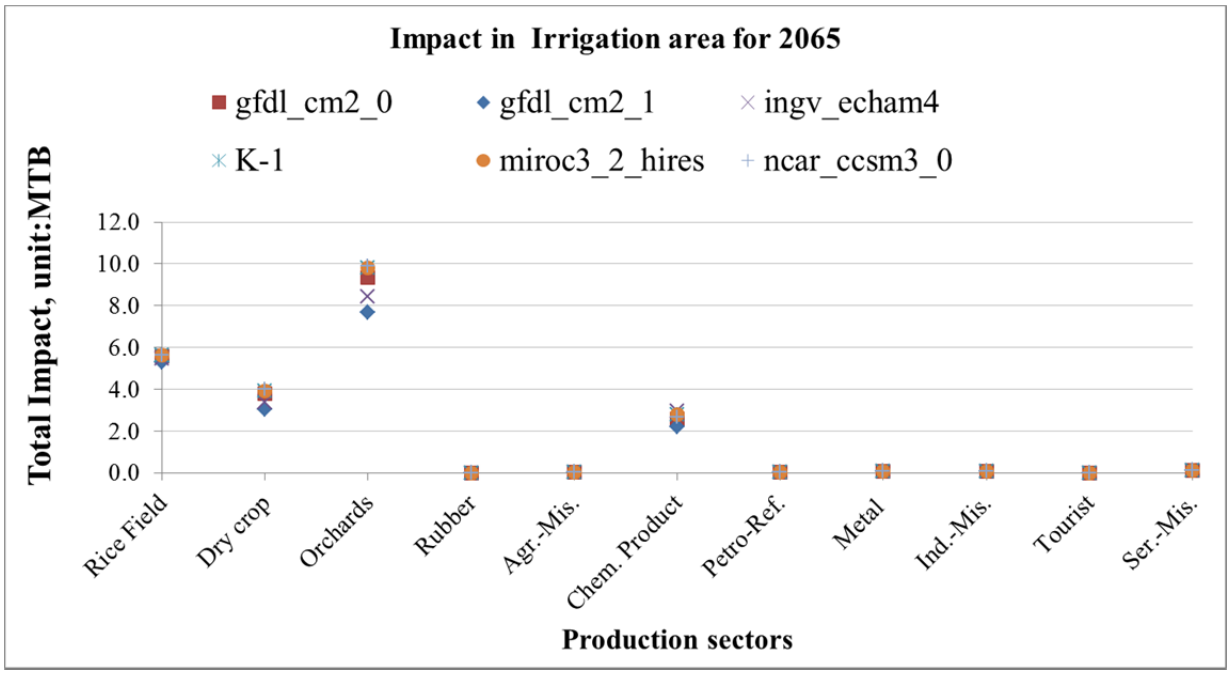


Fig. 8-12 Economic impact predicted from water shortage in RID area in 2065

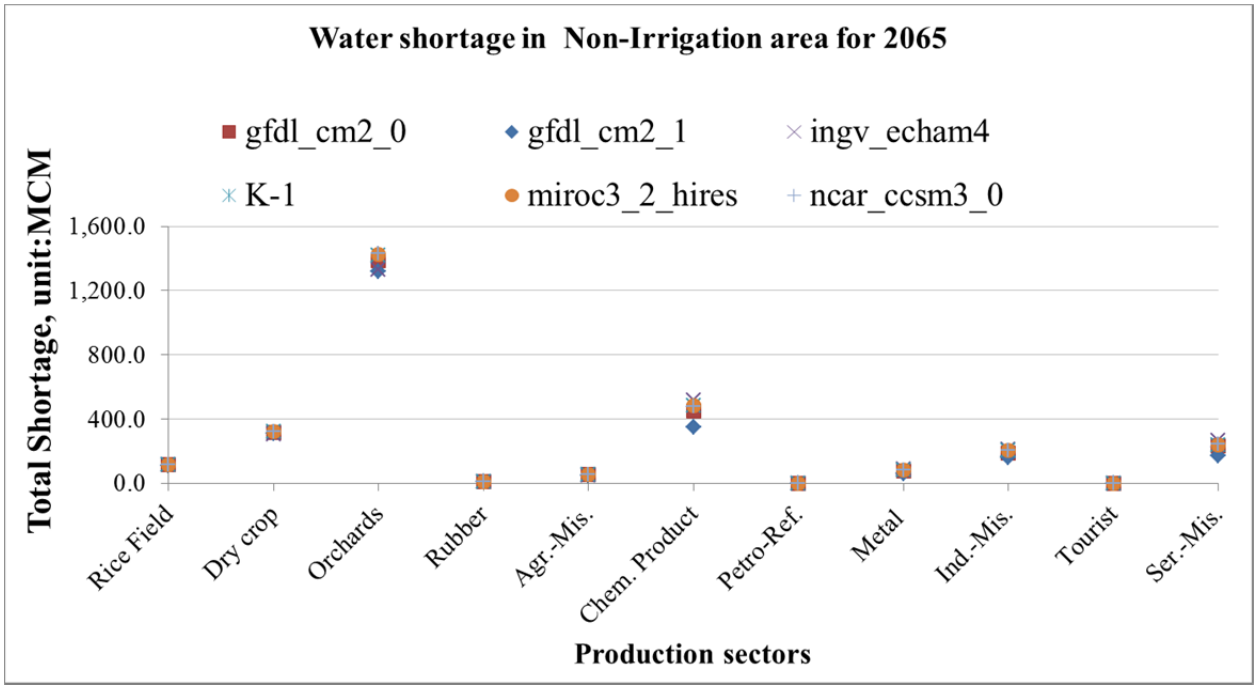


Fig. 8-13 Water shortage in Non-RID area in 2065

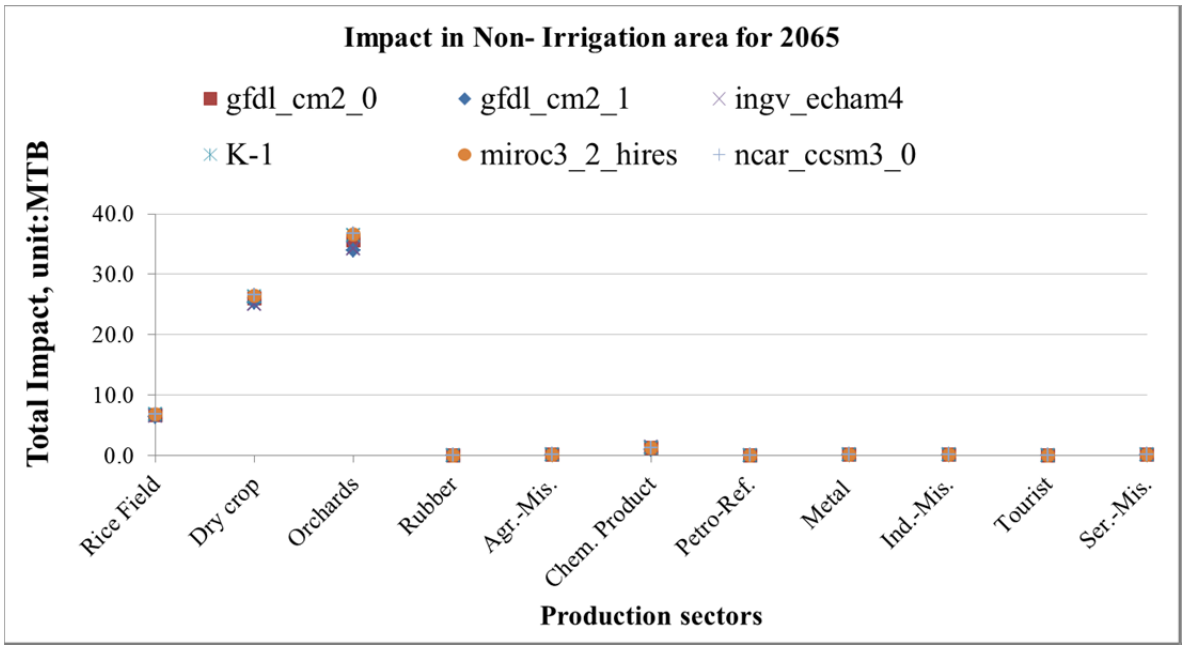


Fig. 8-14 Economic impact predicted from water shortage in Non-RID area in 2065

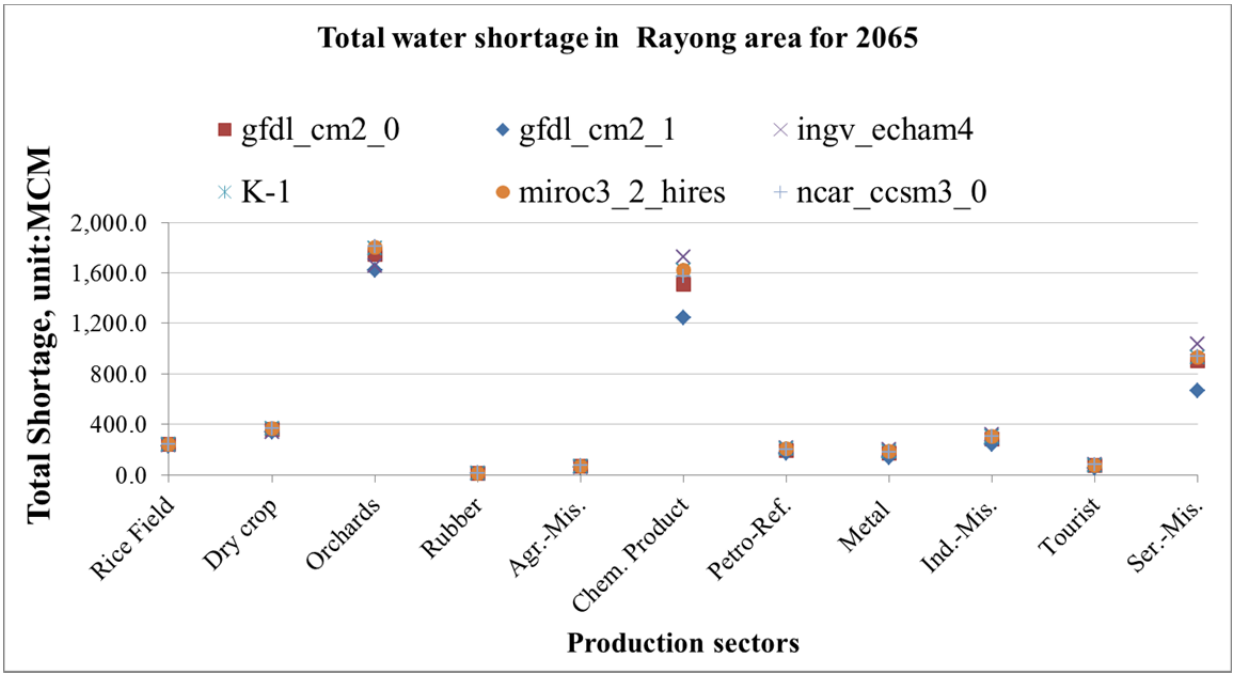


Fig. 8-15 Water shortage in total area in 2065

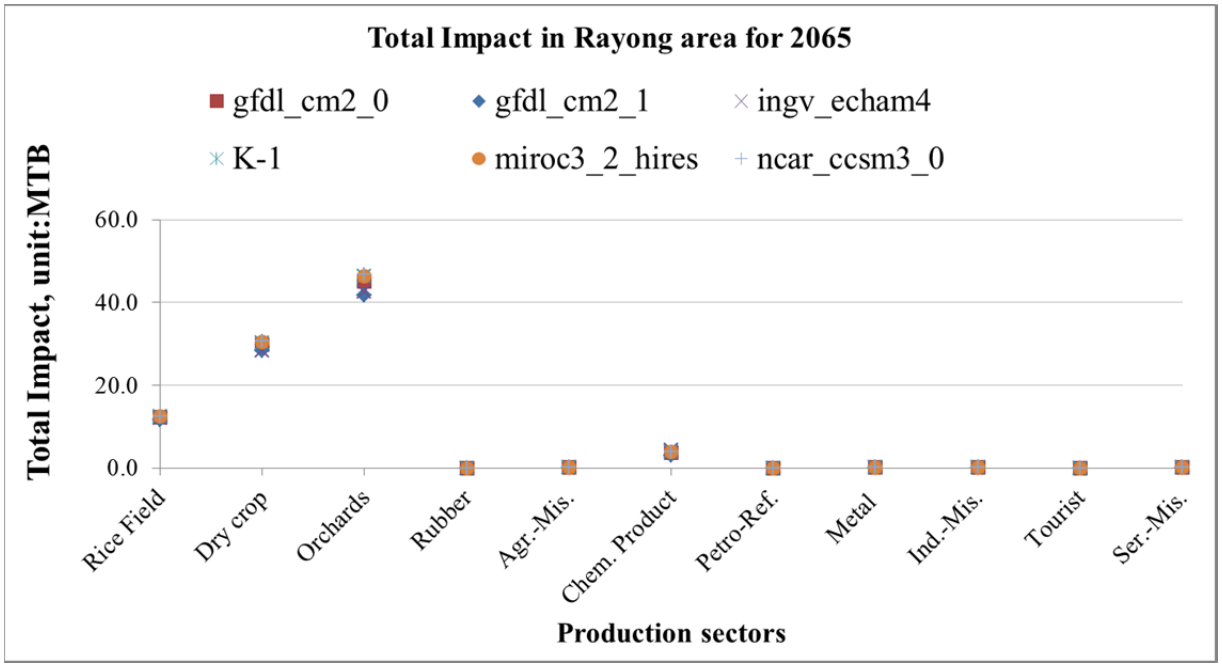


Fig. 8-16 Economic impact predicted from water shortage in total area in 2065

Input-Output can be used as tool to estimate impact of water demand change both direct and indirect effect as well. There is not only a production sector, but it can make impact to other sectors. This study has been done by using Input-Output table calculation for climate change scenario, have been calculated water demand for scenarios and have been applied to predict final demand (GDP) and impact based future water demand scenarios from GPP growth rate and Provincial economic strategy. Input-Output table should be used carefully for GDP prediction in far future because at that time production structures would change by new production and technology that would be different from present.

For application economic impact evolution in future in irrigation area and Non-irrigation area, we collected the development plan from Royal Irrigation Department. The development project is shown in Table 8-13.

Table 8-13 Development plan collected from Royal Irrigation Department

Sectors	Water demand	Water supply
Agricultural	Increase the effectiveness of water use in orchards, rice field and dry crop	Increase reservoir volume by dredging the sediment load in reservoir
Industrial	Using water recycle in production sectors	Increase reservoir volume by dredging the sediment load in reservoir
Services	Reduce losses in Services and service miscellaneous	Increase reservoir volume by dredging the sediment load in reservoir
Target	-	83.78 MCM

Source: Royal Irrigation Department, 2017

We can apply economic impact evolution module for the policy of RID to simulate impact for Irrigation area and Non-Irrigation area for next study in the future. The impact evolution module can be applied for impact assessment and develop policy for area in Irrigation area and Non-Irrigation area in future.

9. Conclusions and recommendation

The results of this study suggest that generalized simulation system can be used as an integrated water resources simulation system for water resources management in the study area. This generalized simulation system is a beneficial tool for assessment of economic impact from future water demand for area. We start to develop a simulation system for water resources management under climate change as End-to-End-model for impact assessment in area. The generalized simulation system as End-to-End-model is a combination of climate model, rainfall-runoff model and economic model. Climate model was performed model selection, downscaling and seasonal bias correction for assuring future precipitation reliable to predict future water availability. Hydrological Tank model has been applied as runoff model reliable to estimate runoff for area. Economic model as Input-output model was applied for estimating production structure in future. Water demand was calculated using Input-output model from scenarios of climate change, GPP growth rate, and Provincial economic strategy. Impact from these scenarios was also calculated Input-output model. Water balance was calculated from water demand and runoff/water supply, results shortage that was applied to calculate impact from scenarios. Impact assessment of water demand in future can be estimated using this generalized simulation system as well. Finally, we assure that this study of the generalized simulation system can be extended to be applied as an integrated water resources simulation system as End-to End model for water resources management in other areas.

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Appendix

I. Precipitation parameters
II. Runoff parameters
III. Input-Output table for Irrigation area and Non-irrigation area

I. Precipitation parameters

459201 : corrected monthly precipitation data from 1981-1985

month	codemonth	Row Labels	month	459201	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-81	198101	1981	1	0.2	12.7	9.3	3.8	10.01	9.56	7.61
Feb-81	198102		2	54.5	19.2	27.6	12.0	45.99	48.15	14.63
Mar-81	198103		3	23.6	64.6	15.7	21.0	38.16	41.99	15.59
Apr-81	198104		4	186.4	123.3	115.1	95.3	96.34	98.86	90.39
May-81	198105		5	247.5	338.6	252.5	220.0	244.28	242.22	283.28
Jun-81	198106		6	68.3	173.3	90.0	180.2	156.53	156.12	102.06
Jul-81	198107		7	169.8	197.2	235.0	191.5	69.91	68.58	144.98
Aug-81	198108		8	106.4	107.8	246.1	29.4	128.40	128.76	158.72
Sep-81	198109		9	477.4	421.0	433.5	386.0	411.56	408.49	318.21
Oct-81	198110		10	177.3	282.8	102.3	76.6	143.69	146.39	157.43
Nov-81	198111		11	113.1	110.9	44.1	45.1	114.74	119.40	87.44
Dec-81	198112		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Jan-82	198201	1982	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-82	198202		2	10.5	5.0	1.5	0.0	0.00	0.77	7.31
Mar-82	198203		3	49.3	91.8	52.9	27.1	87.18	85.07	45.10
Apr-82	198204		4	29.2	127.4	34.4	73.7	43.78	43.97	33.97
May-82	198205		5	139.3	72.5	106.6	83.4	127.29	130.17	100.18
Jun-82	198206		6	453.9	253.4	318.5	361.1	291.31	288.41	267.74
Jul-82	198207		7	178.3	56.1	130.5	111.7	195.64	185.61	168.12
Aug-82	198208		8	136.0	164.1	126.7	213.7	194.07	198.36	304.43
Sep-82	198209		9	149.2	167.5	178.2	106.1	238.76	242.94	188.03
Oct-82	198210		10	137.5	141.0	158.9	220.1	140.82	143.83	148.15
Nov-82	198211		11	30.5	5.7	97.7	33.4	41.97	41.56	32.34
Dec-82	198212		12	19.8	2.4	15.2	3.5	27.67	27.92	1.12
Jan-83	198301	1983	1	0.1	6.9	15.6	3.8	0.00	1.60	1.66
Feb-83	198302		2	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Mar-83	198303		3	23.7	20.2	14.8	13.1	31.64	28.88	11.82
Apr-83	198304		4	33.2	20.5	44.7	6.0	12.81	14.52	32.95
May-83	198305		5	120.1	103.5	133.2	78.6	85.35	84.39	53.32
Jun-83	198306		6	153.1	161.9	150.0	108.9	249.86	249.14	278.59
Jul-83	198307		7	129.6	130.6	134.3	263.9	100.17	97.55	116.22
Aug-83	198308		8	408.6	370.4	338.7	341.3	436.33	448.14	405.74
Sep-83	198309		9	192.8	225.1	248.6	200.3	207.55	209.26	194.91
Oct-83	198310		10	310.1	339.9	380.1	267.1	191.77	196.73	185.47
Nov-83	198311		11	116.2	29.8	55.0	82.2	40.99	36.48	42.06
Dec-83	198312		12	13.6	11.1	10.3	9.6	1.28	1.53	10.79
Jan-84	198401	1984	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-84	198402		2	4.3	18.4	20.0	27.4	8.34	8.33	8.18
Mar-84	198403		3	41.7	58.8	12.8	42.8	31.86	33.81	67.54
Apr-84	198404		4	65.3	107.4	63.2	154.0	93.27	94.44	70.40
May-84	198405		5	105.7	141.1	107.7	80.0	133.18	137.10	75.01
Jun-84	198406		6	354.1	236.7	356.0	340.5	352.16	364.70	343.83
Jul-84	198407		7	183.6	206.0	285.7	213.7	182.14	190.02	258.54
Aug-84	198408		8	117.6	62.6	55.3	99.6	75.31	73.80	126.37
Sep-84	198409		9	260.3	242.3	227.4	259.9	221.87	216.13	233.86
Oct-84	198410		10	88.0	364.9	292.4	130.7	194.31	201.71	120.68
Nov-84	198411		11	40.2	56.9	220.2	33.3	69.90	70.80	34.60
Dec-84	198412		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Jan-85	198501	1985	1	16.2	4.8	50.6	0.0	4.70	4.11	23.68
Feb-85	198502		2	18.1	15.6	20.6	38.8	8.15	8.58	9.34
Mar-85	198503		3	7.1	32.7	12.3	44.7	57.55	58.61	54.65
Apr-85	198504		4	98.5	35.3	114.7	90.1	139.56	135.48	69.03
May-85	198505		5	179.0	215.0	259.3	267.0	213.45	203.80	246.66
Jun-85	198506		6	17.8	102.2	32.0	83.0	176.29	186.80	117.30
Jul-85	198507		7	76.0	106.6	84.9	81.2	102.36	103.89	180.14
Aug-85	198508		8	70.4	141.4	98.6	93.4	73.72	79.53	77.38
Sep-85	198509		9	297.2	286.8	292.5	251.7	322.39	326.73	312.16
Oct-85	198510		10	177.8	378.6	121.3	120.0	119.12	119.94	43.73
Nov-85	198511		11	155.5	171.2	15.7	157.3	176.74	174.67	166.42
Dec-85	198512		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00

459201 : corrected monthly precipitation data from 1986-1990

month	codemonth	Row Labels	month	459201	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-86	198601	1986	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-86	198602		2	12.1	11.6	14.5	44.1	27.97	28.95	17.07
Mar-86	198603		3	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Apr-86	198604		4	48.6	84.4	76.9	45.3	65.42	64.77	45.90
May-86	198605		5	210.7	246.2	223.6	298.5	203.65	203.32	225.67
Jun-86	198606		6	60.4	122.4	157.8	63.6	28.09	28.08	121.67
Jul-86	198607		7	124.4	120.9	124.6	122.2	255.48	258.47	125.86
Aug-86	198608		8	194.4	128.3	173.9	177.0	98.83	97.27	76.50
Sep-86	198609		9	184.0	160.9	172.0	240.1	135.70	135.31	203.25
Oct-86	198610		10	294.9	332.1	141.5	467.6	376.71	378.48	288.78
Nov-86	198611		11	19.7	5.8	4.1	1.9	4.88	5.26	22.80
Dec-86	198612		12	4.4	1.8	9.0	3.4	9.46	9.61	14.36
Jan-87	198701	1987	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-87	198702		2	5.8	6.6	19.8	12.8	12.64	13.93	8.36
Mar-87	198703		3	51.2	20.5	54.1	39.1	7.93	7.35	47.43
Apr-87	198704		4	67.3	74.1	47.9	27.4	61.67	64.26	81.47
May-87	198705		5	211.7	168.2	133.5	196.2	165.91	160.63	188.11
Jun-87	198706		6	94.4	54.4	149.9	78.2	172.90	167.47	84.87
Jul-87	198707		7	98.8	136.6	116.0	187.2	151.12	156.07	127.52
Aug-87	198708		8	125.6	196.6	246.4	276.0	244.65	233.02	240.76
Sep-87	198709		9	175.2	185.5	118.9	225.9	306.07	307.28	226.68
Oct-87	198710		10	479.6	210.2	458.1	405.6	332.12	338.63	335.54
Nov-87	198711		11	198.2	164.8	139.2	189.6	190.83	188.24	185.64
Dec-87	198712		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Jan-88	198801	1988	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-88	198802		2	27.3	20.0	10.0	6.3	4.90	4.81	15.67
Mar-88	198803		3	44.7	29.8	9.9	20.3	24.90	25.04	26.58
Apr-88	198804		4	148.3	141.0	208.4	129.9	128.73	131.67	178.33
May-88	198805		5	312.5	143.4	279.4	249.4	227.99	226.16	250.07
Jun-88	198806		6	163.0	196.6	127.8	37.7	198.58	180.26	54.58
Jul-88	198807		7	253.2	283.5	185.3	188.6	187.43	186.52	248.38
Aug-88	198808		8	220.1	203.0	77.2	182.8	299.19	293.92	161.27
Sep-88	198809		9	221.5	229.4	317.3	442.0	419.63	415.27	369.85
Oct-88	198810		10	274.7	167.7	218.6	232.7	390.15	396.89	327.73
Nov-88	198811		11	19.2	4.0	38.7	8.0	14.13	15.25	31.45
Dec-88	198812		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Jan-89	198901	1989	1	21.6	5.8	10.8	47.2	1.76	2.84	25.24
Feb-89	198902		2	1.8	13.2	14.5	43.7	19.34	19.06	6.38
Mar-89	198903		3	50.7	26.4	27.2	53.3	29.26	28.82	18.69
Apr-89	198904		4	34.6	5.9	64.6	35.8	39.99	37.23	39.65
May-89	198905		5	86.1	127.8	192.8	214.9	178.54	179.32	176.62
Jun-89	198906		6	122.8	156.1	188.4	41.7	174.21	171.92	123.01
Jul-89	198907		7	106.3	99.8	77.9	92.0	112.18	114.62	90.69
Aug-89	198908		8	128.6	91.4	147.9	56.8	57.76	60.37	102.61
Sep-89	198909		9	337.5	400.5	390.6	368.9	444.99	454.74	397.33
Oct-89	198910		10	220.9	186.3	194.9	265.5	187.47	186.76	281.74
Nov-89	198911		11	64.4	166.2	130.8	145.3	104.07	107.65	159.92
Dec-89	198912		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Jan-90	199001	1990	1	27.0	47.7	7.2	6.0	6.45	6.15	17.54
Feb-90	199002		2	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Mar-90	199003		3	74.7	37.3	12.2	20.9	61.66	60.51	13.42
Apr-90	199004		4	52.0	70.5	75.7	38.5	49.48	54.86	60.95
May-90	199005		5	214.4	197.4	135.6	182.9	201.00	198.98	213.07
Jun-90	199006		6	62.2	18.2	34.1	53.3	9.55	10.54	31.36
Jul-90	199007		7	105.8	76.9	66.3	67.8	83.16	87.40	41.28
Aug-90	199008		8	100.6	10.1	130.3	85.4	85.47	85.25	145.23
Sep-90	199009		9	225.4	251.4	152.2	154.6	201.20	196.99	234.97
Oct-90	199010		10	386.7	318.6	429.3	404.3	348.74	348.37	446.13
Nov-90	199011		11	62.2	6.4	36.3	49.1	20.86	21.18	36.83
Dec-90	199012		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00

459201 : corrected monthly precipitation data from 1991-1995

month	codemonth	Row Labels	month	459201	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-91	199101	1991	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-91	199102		2	14.0	31.1	23.1	5.6	7.50	7.33	60.29
Mar-91	199103		3	17.0	27.8	83.0	45.4	26.19	23.41	66.11
Apr-91	199104		4	59.8	6.9	9.6	37.3	28.67	21.34	63.44
May-91	199105		5	164.4	227.7	222.0	169.8	168.55	173.41	160.27
Jun-91	199106		6	121.7	107.7	116.5	85.1	69.49	77.54	102.41
Jul-91	199107		7	88.5	163.1	91.2	128.9	74.74	72.59	75.82
Aug-91	199108		8	63.8	133.5	77.7	213.5	173.89	187.93	101.38
Sep-91	199109		9	369.5	408.4	261.7	283.6	309.59	307.26	376.60
Oct-91	199110		10	137.9	56.2	179.7	134.5	207.85	210.01	80.03
Nov-91	199111		11	4.6	41.9	12.3	5.7	0.00	0.15	0.00
Dec-91	199112		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Jan-92	199201	1992	1	1.8	28.6	12.5	6.4	37.06	38.18	2.28
Feb-92	199202		2	15.4	11.5	3.9	16.7	48.84	47.11	8.46
Mar-92	199203		3	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Apr-92	199204		4	0.2	16.6	43.0	28.6	9.33	7.76	9.64
May-92	199205		5	121.2	163.5	208.9	113.2	162.95	162.62	165.73
Jun-92	199206		6	169.3	168.8	88.9	187.2	209.94	216.44	96.44
Jul-92	199207		7	236.6	127.4	62.3	128.2	169.78	160.20	147.15
Aug-92	199208		8	216.3	169.0	135.5	80.5	184.30	186.00	109.10
Sep-92	199209		9	158.3	163.4	127.2	151.3	143.08	137.27	78.12
Oct-92	199210		10	261.6	235.0	259.3	251.3	273.68	264.95	232.38
Nov-92	199211		11	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Dec-92	199212		12	9.6	7.0	10.0	26.0	0.00	1.19	9.37
Jan-93	199301	1993	1	23.2	7.0	9.2	12.1	40.85	40.00	4.80
Feb-93	199302		2	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Mar-93	199303		3	41.6	40.3	48.9	57.0	25.18	26.64	22.76
Apr-93	199304		4	30.1	15.6	37.5	26.4	52.40	55.68	20.97
May-93	199305		5	135.4	146.8	184.3	67.7	132.95	136.77	105.71
Jun-93	199306		6	49.9	65.9	47.7	88.4	10.68	9.35	101.76
Jul-93	199307		7	37.1	87.7	109.8	52.0	44.31	45.01	162.86
Aug-93	199308		8	148.4	312.2	104.9	129.3	98.16	101.39	152.85
Sep-93	199309		9	274.7	315.7	191.6	320.6	252.99	260.62	301.62
Oct-93	199310		10	166.3	139.1	112.1	141.8	116.21	114.05	198.85
Nov-93	199311		11	1.6	6.2	35.7	3.7	2.58	1.98	6.35
Dec-93	199312		12	1.5	6.4	10.6	0.0	3.80	3.53	6.39
Jan-94	199401	1994	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-94	199402		2	5.7	14.6	26.5	5.5	10.94	11.19	9.77
Mar-94	199403		3	46.3	69.3	55.6	66.9	68.20	69.91	42.14
Apr-94	199404		4	69.2	139.9	143.3	113.6	184.35	179.32	107.97
May-94	199405		5	206.7	247.0	376.3	318.8	330.06	337.38	330.18
Jun-94	199406		6	454.7	627.1	589.0	542.7	377.12	376.67	540.08
Jul-94	199407		7	69.0	186.7	160.1	91.4	136.52	138.46	160.10
Aug-94	199408		8	130.9	93.6	106.3	129.3	113.86	118.27	63.04
Sep-94	199409		9	259.2	234.3	134.4	170.1	223.57	224.88	222.49
Oct-94	199410		10	193.2	168.4	321.5	287.3	157.76	154.44	251.42
Nov-94	199411		11	23.7	3.3	4.8	0.5	35.34	35.47	38.85
Dec-94	199412		12	32.8	5.9	20.3	0.0	0.00	1.53	35.48
Jan-95	199501	1995	1	38.3	9.9	6.4	5.0	19.24	18.83	43.68
Feb-95	199502		2	7.0	15.7	4.6	0.0	19.16	17.05	2.61
Mar-95	199503		3	37.3	22.5	53.3	18.6	38.98	38.80	29.32
Apr-95	199504		4	56.1	22.1	14.2	36.8	11.95	9.78	52.38
May-95	199505		5	177.1	65.3	132.1	205.8	123.04	119.90	184.82
Jun-95	199506		6	56.7	66.4	84.3	96.6	59.90	63.90	84.73
Jul-95	199507		7	143.1	169.2	153.5	150.3	253.05	255.24	166.15
Aug-95	199508		8	384.4	272.4	420.9	310.3	194.81	188.21	328.09
Sep-95	199509		9	344.6	362.4	296.2	387.4	251.58	261.92	316.94
Oct-95	199510		10	225.6	361.7	146.5	140.6	124.87	123.94	166.94
Nov-95	199511		11	40.6	55.7	35.5	55.7	26.15	24.65	28.25
Dec-95	199512		12	2.1	4.5	5.9	1.9	0.00	1.06	0.30

459201 : corrected monthly precipitation data from 1996-2000

month	codemonth	Row Labels	month	459201	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-96	199601	1996	1	0.3	9.2	7.7	32.2	4.33	4.14	9.09
Feb-96	199602		2	29.9	7.4	10.1	13.9	0.00	0.99	3.67
Mar-96	199603		3	42.1	40.8	47.7	41.4	22.07	21.08	46.55
Apr-96	199604		4	49.6	55.3	73.5	88.3	127.73	126.61	142.91
May-96	199605		5	296.0	204.5	150.6	210.9	153.31	153.61	172.28
Jun-96	199606		6	205.3	59.4	118.2	130.7	22.90	21.65	29.19
Jul-96	199607		7	200.1	135.9	215.6	120.8	154.13	150.02	173.71
Aug-96	199608		8	137.6	212.7	197.7	291.7	110.48	107.49	154.61
Sep-96	199609		9	384.0	284.5	512.9	316.5	402.50	391.26	468.39
Oct-96	199610		10	195.4	217.6	224.5	118.8	256.04	254.47	127.07
Nov-96	199611		11	37.1	6.9	62.7	63.5	24.97	25.93	49.30
Dec-96	199612		12	1.3	12.6	9.6	25.8	31.05	30.63	4.69
Jan-97	199701	1997	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-97	199702		2	3.6	11.7	16.4	4.5	13.74	13.29	15.81
Mar-97	199703		3	50.6	23.4	25.0	61.1	49.18	46.67	76.70
Apr-97	199704		4	108.8	38.3	62.3	123.0	76.37	75.94	85.18
May-97	199705		5	47.4	94.0	120.4	127.9	87.10	87.73	61.96
Jun-97	199706		6	139.5	111.4	118.2	263.2	135.84	135.25	124.67
Jul-97	199707		7	30.6	33.4	47.6	58.0	59.90	59.19	52.97
Aug-97	199708		8	32.0	83.7	78.4	72.5	95.58	87.57	89.55
Sep-97	199709		9	406.0	419.7	296.2	368.3	302.82	307.11	332.62
Oct-97	199710		10	130.3	57.5	131.1	234.0	113.54	109.90	185.14
Nov-97	199711		11	11.5	75.3	20.2	89.8	12.02	11.12	16.21
Dec-97	199712		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Jan-98	199801	1998	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-98	199802		2	5.9	18.7	15.4	0.0	6.24	7.20	9.90
Mar-98	199803		3	31.0	28.6	67.6	25.2	54.20	54.98	12.43
Apr-98	199804		4	14.6	1.4	29.3	4.4	4.69	4.95	12.50
May-98	199805		5	120.4	166.5	100.6	179.6	116.69	114.20	177.29
Jun-98	199806		6	178.2	216.0	106.5	163.3	116.73	110.27	211.22
Jul-98	199807		7	169.2	186.3	146.6	82.2	145.19	144.33	88.83
Aug-98	199808		8	172.6	203.2	183.6	120.8	247.17	236.99	172.65
Sep-98	199809		9	225.5	351.6	443.6	308.4	329.16	320.85	334.89
Oct-98	199810		10	119.5	128.4	284.7	167.2	230.96	237.47	241.21
Nov-98	199811		11	34.7	38.7	6.0	13.7	42.96	41.18	55.55
Dec-98	199812		12	0.5	36.0	5.6	16.8	3.39	3.03	4.24
Jan-99	199901	1999	1	12.4	7.2	13.6	13.5	10.56	10.77	5.66
Feb-99	199902		2	5.6	17.1	10.8	4.3	5.15	5.09	30.11
Mar-99	199903		3	66.5	52.8	33.1	65.1	18.63	19.42	41.44
Apr-99	199904		4	155.0	196.3	154.8	153.0	136.38	141.19	122.60
May-99	199905		5	277.5	262.6	177.5	197.4	357.40	352.91	260.04
Jun-99	199906		6	38.1	9.1	18.1	51.0	36.03	37.88	21.88
Jul-99	199907		7	112.6	70.7	97.6	106.8	100.35	104.31	56.11
Aug-99	199908		8	90.7	38.2	75.2	125.1	118.05	114.42	48.74
Sep-99	199909		9	271.4	267.7	574.9	310.6	225.70	229.84	231.08
Oct-99	199910		10	398.2	318.3	155.1	241.9	460.13	447.70	431.40
Nov-99	199911		11	67.5	10.7	51.1	37.7	87.08	89.00	41.54
Dec-99	199912		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Jan-00	200001	2000	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-00	200002		2	33.2	23.7	24.5	8.4	14.40	12.10	28.53
Mar-00	200003		3	48.4	26.0	63.9	72.2	49.74	51.59	69.89
Apr-00	200004		4	132.7	89.4	19.1	136.2	74.67	74.48	61.89
May-00	200005		5	239.5	279.8	116.7	148.3	208.07	216.16	224.65
Jun-00	200006		6	170.7	197.8	205.4	148.0	314.73	309.45	275.77
Jul-00	200007		7	158.1	96.0	141.1	232.4	92.12	91.51	85.32
Aug-00	200008		8	79.7	74.7	28.0	32.6	23.13	25.12	31.03
Sep-00	200009		9	337.6	172.7	240.7	298.1	201.28	197.62	207.83
Oct-00	200010		10	117.9	86.6	178.0	185.0	124.15	115.71	241.88
Nov-00	200011		11	6.4	13.3	11.7	12.5	2.20	1.96	10.87
Dec-00	200012		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00

459202 : corrected monthly precipitation data from 1981-1985

month	codemonth	Row Labels	month	459202	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-81	198101	1981	1	1.7	15.5	5.8	2.5	2.49	12.48	12.48
Feb-81	198102		2	42.3	30.7	12.6	21.1	11.47	16.61	16.61
Mar-81	198103		3	50.4	36.1	15.8	14.2	14.21	11.08	11.08
Apr-81	198104		4	60.8	88.6	84.6	74.8	74.83	48.16	48.16
May-81	198105		5	259.4	275.7	136.3	136.1	136.11	138.13	138.13
Jun-81	198106		6	130.0	154.4	87.3	121.9	121.88	113.16	113.16
Jul-81	198107		7	231.8	255.5	250.4	177.9	177.87	236.74	236.74
Aug-81	198108		8	52.6	62.3	160.3	73.8	73.75	75.28	75.28
Sep-81	198109		9	638.4	655.7	597.3	594.5	594.53	464.53	464.53
Oct-81	198110		10	156.3	221.4	82.6	135.8	135.83	151.74	151.74
Nov-81	198111		11	189.0	251.7	164.2	211.8	211.81	225.76	225.76
Dec-81	198112		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Jan-82	198201	1982	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-82	198202		2	11.5	11.1	14.9	17.4	9.14	6.77	6.77
Mar-82	198203		3	139.0	134.0	132.5	144.5	144.48	131.80	131.80
Apr-82	198204		4	54.0	99.3	26.8	48.4	48.38	33.49	33.49
May-82	198205		5	68.0	63.7	110.8	203.2	203.17	147.66	147.66
Jun-82	198206		6	144.6	173.7	203.5	222.4	222.40	189.60	189.60
Jul-82	198207		7	145.1	59.8	151.7	225.7	225.75	199.37	199.37
Aug-82	198208		8	42.0	92.6	65.7	80.2	80.18	135.39	135.39
Sep-82	198209		9	200.9	192.2	247.0	336.2	336.24	237.34	237.34
Oct-82	198210		10	157.8	169.4	208.6	205.1	205.09	208.29	208.29
Nov-82	198211		11	100.8	17.1	105.8	61.7	61.75	48.81	48.81
Dec-82	198212		12	64.2	6.9	31.2	30.1	30.08	11.76	11.76
Jan-83	198301	1983	1	0.4	14.7	16.3	0.0	0.00	0.33	0.33
Feb-83	198302		2	1.1	3.6	35.7	0.0	0.00	19.13	19.13
Mar-83	198303		3	53.1	7.4	15.6	26.1	26.13	10.07	10.07
Apr-83	198304		4	0.0	0.0	0.0	0.0	0.00	0.00	0.00
May-83	198305		5	82.9	86.8	114.4	40.6	40.64	30.00	30.00
Jun-83	198306		6	118.5	47.9	28.1	80.1	80.07	63.50	63.50
Jul-83	198307		7	389.1	325.1	327.3	311.1	311.10	321.26	321.26
Aug-83	198308		8	278.9	327.3	287.7	412.1	412.07	376.52	376.52
Sep-83	198309		9	244.7	306.1	294.1	320.6	320.56	228.72	228.72
Oct-83	198310		10	332.0	278.9	376.9	222.8	222.81	215.75	215.75
Nov-83	198311		11	170.0	65.2	62.3	48.9	48.92	55.17	55.17
Dec-83	198312		12	14.9	11.6	10.3	0.1	0.07	13.16	13.16
Jan-84	198401	1984	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-84	198402		2	9.0	9.5	14.5	0.0	0.00	0.27	0.27
Mar-84	198403		3	38.2	31.9	15.3	45.2	45.17	63.01	63.01
Apr-84	198404		4	34.2	76.1	38.3	55.7	55.72	47.16	47.16
May-84	198405		5	166.0	215.1	189.7	189.2	189.23	128.36	128.36
Jun-84	198406		6	163.7	145.6	231.0	156.4	156.39	160.66	160.66
Jul-84	198407		7	198.5	196.4	255.4	184.2	184.23	200.24	200.24
Aug-84	198408		8	39.9	31.2	37.0	33.9	33.86	76.71	76.71
Sep-84	198409		9	144.1	251.9	221.6	180.4	180.43	200.62	200.62
Oct-84	198410		10	191.3	383.1	393.5	269.1	269.09	222.60	222.60
Nov-84	198411		11	126.3	63.6	266.3	65.3	65.25	42.93	42.93
Dec-84	198412		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Jan-85	198501	1985	1	53.2	8.9	70.5	4.1	4.15	24.06	24.06
Feb-85	198502		2	3.1	13.2	27.3	9.4	4.40	70.43	70.43
Mar-85	198503		3	19.3	7.3	14.0	39.7	39.71	39.73	39.73
Apr-85	198504		4	199.4	31.1	111.7	127.1	127.06	46.73	46.73
May-85	198505		5	190.5	159.2	154.9	133.5	133.49	160.41	160.41
Jun-85	198506		6	21.2	96.5	47.2	224.3	224.34	91.49	91.49
Jul-85	198507		7	127.5	94.8	74.8	129.0	129.05	129.09	129.09
Aug-85	198508		8	90.9	69.8	42.5	63.5	63.52	28.50	28.50
Sep-85	198509		9	286.1	402.7	384.4	397.8	397.76	440.56	440.56
Oct-85	198510		10	159.2	332.0	141.5	127.8	127.75	49.52	49.52
Nov-85	198511		11	129.3	74.9	15.7	146.2	146.21	43.37	43.37
Dec-85	198512		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00

459202 : corrected monthly precipitation data from 1986-1990

month	codemonth	Row Labels	month	459202	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-86	198601	1986	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-86	198602		2	2.3	13.3	11.4	39.5	23.48	17.20	17.20
Mar-86	198603		3	2.4	7.0	8.9	10.3	10.29	27.01	27.01
Apr-86	198604		4	84.9	171.5	164.9	142.2	142.22	139.46	139.46
May-86	198605		5	161.0	159.8	150.1	155.0	155.02	135.30	135.30
Jun-86	198606		6	52.3	69.8	63.6	32.2	32.25	59.87	59.87
Jul-86	198607		7	80.5	94.9	108.4	252.8	252.79	101.37	101.37
Aug-86	198608		8	155.6	140.4	190.6	108.0	108.01	150.66	150.66
Sep-86	198609		9	238.1	130.6	177.4	102.0	102.04	148.92	148.92
Oct-86	198610		10	448.5	332.0	238.6	410.6	410.57	294.20	294.20
Nov-86	198611		11	2.8	11.8	3.2	9.8	9.78	18.50	18.50
Dec-86	198612		12	2.2	2.8	10.1	5.1	5.05	17.75	17.75
Jan-87	198701	1987	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-87	198702		2	7.7	5.8	17.7	0.0	0.00	1.30	1.30
Mar-87	198703		3	33.3	6.8	13.3	0.0	0.00	21.78	21.78
Apr-87	198704		4	7.4	14.5	30.8	31.3	31.29	51.65	51.65
May-87	198705		5	127.4	69.0	48.6	80.4	80.41	58.35	58.35
Jun-87	198706		6	151.2	142.9	185.2	197.3	197.27	111.42	111.42
Jul-87	198707		7	30.5	34.3	32.5	43.8	43.77	32.95	32.95
Aug-87	198708		8	134.8	101.3	118.1	156.8	156.77	115.09	115.09
Sep-87	198709		9	253.5	228.3	188.6	425.2	425.16	291.73	291.73
Oct-87	198710		10	211.9	169.4	315.0	252.3	252.35	239.25	239.25
Nov-87	198711		11	223.6	212.4	183.8	265.3	265.31	228.43	228.43
Dec-87	198712		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Jan-88	198801	1988	1	0.1	7.4	7.2	0.0	0.00	6.34	6.34
Feb-88	198802		2	19.7	13.6	7.3	12.7	6.27	17.87	17.87
Mar-88	198803		3	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Apr-88	198804		4	185.3	169.8	282.7	122.5	122.54	210.17	210.17
May-88	198805		5	132.8	85.9	240.4	178.1	178.06	226.41	226.41
Jun-88	198806		6	181.7	212.9	162.8	191.4	191.44	80.72	80.72
Jul-88	198807		7	142.7	153.3	52.0	55.7	55.70	92.61	92.61
Aug-88	198808		8	305.6	308.9	161.8	343.5	343.53	263.52	263.52
Sep-88	198809		9	398.5	353.8	459.7	561.6	561.61	493.61	493.61
Oct-88	198810		10	309.5	183.6	216.5	341.7	341.73	288.23	288.23
Nov-88	198811		11	79.9	201.2	165.1	118.4	118.38	202.59	202.59
Dec-88	198812		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Jan-89	198901	1989	1	23.9	12.8	12.3	5.4	5.37	49.10	49.10
Feb-89	198902		2	11.1	19.4	14.8	48.8	29.75	4.99	4.99
Mar-89	198903		3	75.5	127.5	131.5	108.2	108.17	114.78	114.78
Apr-89	198904		4	1.2	1.9	8.9	0.4	0.43	12.67	12.67
May-89	198905		5	114.5	100.5	153.4	103.3	103.30	112.42	112.42
Jun-89	198906		6	59.2	92.7	82.4	109.2	109.18	56.03	56.03
Jul-89	198907		7	77.2	50.9	42.1	56.7	56.67	58.53	58.53
Aug-89	198908		8	87.5	93.7	146.5	84.6	84.58	73.29	73.29
Sep-89	198909		9	383.3	515.5	447.6	524.2	524.20	469.80	469.80
Oct-89	198910		10	237.2	196.1	207.7	248.3	248.27	276.11	276.11
Nov-89	198911		11	8.5	23.8	33.5	79.7	79.71	21.48	21.48
Dec-89	198912		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Jan-90	199001	1990	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-90	199002		2	1.1	13.3	4.0	0.0	0.00	28.42	28.42
Mar-90	199003		3	6.3	11.5	12.5	43.0	43.03	5.80	5.80
Apr-90	199004		4	42.4	44.3	60.6	25.3	25.32	45.41	45.41
May-90	199005		5	118.6	117.2	127.3	87.8	87.83	98.31	98.31
Jun-90	199006		6	26.1	12.7	23.5	11.3	11.31	18.79	18.79
Jul-90	199007		7	30.9	32.3	26.0	30.1	30.14	21.60	21.60
Aug-90	199008		8	115.3	9.0	108.9	53.1	53.08	121.66	121.66
Sep-90	199009		9	335.6	386.2	276.6	301.9	301.87	406.85	406.85
Oct-90	199010		10	313.8	300.0	416.3	365.5	365.50	503.70	503.70
Nov-90	199011		11	44.3	17.5	43.4	30.5	30.47	72.21	72.21
Dec-90	199012		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00

459202 : corrected monthly precipitation data from 1991-1995

month	codemonth	Row Labels	month	459202	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-91	199101	1991	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-91	199102		2	13.9	10.8	21.3	7.2	3.18	9.92	9.92
Mar-91	199103		3	23.7	12.4	29.9	16.4	16.43	54.22	54.22
Apr-91	199104		4	89.3	168.4	147.8	125.1	125.13	174.95	174.95
May-91	199105		5	57.2	176.6	170.9	129.7	129.73	136.33	136.33
Jun-91	199106		6	77.2	191.3	209.8	146.1	146.06	155.58	155.58
Jul-91	199107		7	63.2	183.4	100.6	68.3	68.34	78.33	78.33
Aug-91	199108		8	59.7	97.3	58.4	105.5	105.53	67.06	67.06
Sep-91	199109		9	338.7	261.0	192.5	209.3	209.27	271.28	271.28
Oct-91	199110		10	223.1	256.0	320.2	329.6	329.55	273.57	273.57
Nov-91	199111		11	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Dec-91	199112		12	21.2	5.0	12.3	28.4	28.45	3.12	3.12
Jan-92	199201	1992	1	3.3	29.9	12.4	15.6	15.62	1.11	1.11
Feb-92	199202		2	64.4	16.2	2.9	62.1	38.80	32.65	32.65
Mar-92	199203		3	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Apr-92	199204		4	4.3	42.2	36.9	40.9	40.92	8.57	8.57
May-92	199205		5	87.1	118.8	105.9	103.9	103.91	92.00	92.00
Jun-92	199206		6	73.4	95.0	104.3	200.1	200.09	102.91	102.91
Jul-92	199207		7	214.8	136.1	111.7	191.9	191.87	216.34	216.34
Aug-92	199208		8	191.2	127.0	109.1	139.9	139.89	59.86	59.86
Sep-92	199209		9	172.5	161.2	153.1	134.9	134.91	51.27	51.27
Oct-92	199210		10	237.6	204.1	219.7	226.4	226.42	184.82	184.82
Nov-92	199211		11	0.3	50.1	13.3	9.1	9.06	13.30	13.30
Dec-92	199212		12	7.0	7.5	12.2	0.1	0.14	7.23	7.23
Jan-93	199301	1993	1	47.9	23.8	10.0	29.8	29.77	1.76	1.76
Feb-93	199302		2	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Mar-93	199303		3	112.9	73.7	45.0	25.0	24.97	24.99	24.99
Apr-93	199304		4	27.8	12.0	5.2	32.5	32.53	13.52	13.52
May-93	199305		5	100.6	147.4	188.2	130.9	130.90	95.06	95.06
Jun-93	199306		6	33.1	60.5	53.2	34.7	34.68	76.89	76.89
Jul-93	199307		7	42.9	30.5	47.3	22.4	22.39	68.00	68.00
Aug-93	199308		8	87.0	280.8	99.4	93.5	93.47	123.77	123.77
Sep-93	199309		9	196.3	271.2	153.7	242.5	242.48	255.00	255.00
Oct-93	199310		10	241.2	209.3	132.3	208.5	208.54	258.28	258.28
Nov-93	199311		11	0.1	5.7	15.6	0.0	0.00	29.52	29.52
Dec-93	199312		12	4.6	5.1	14.7	25.6	25.57	32.24	32.24
Jan-94	199401	1994	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-94	199402		2	7.8	7.5	27.1	16.2	8.39	7.13	7.13
Mar-94	199403		3	81.4	17.8	35.2	73.3	73.30	32.14	32.14
Apr-94	199404		4	36.6	2.1	57.9	48.7	48.69	32.88	32.88
May-94	199405		5	236.6	159.5	286.3	221.2	221.24	267.47	267.47
Jun-94	199406		6	202.2	235.5	240.1	43.5	43.50	224.32	224.32
Jul-94	199407		7	16.4	193.5	164.5	120.2	120.20	162.98	162.98
Aug-94	199408		8	119.7	93.1	91.6	127.2	127.19	53.61	53.61
Sep-94	199409		9	170.8	213.9	139.9	169.7	169.69	188.85	188.85
Oct-94	199410		10	82.3	110.3	182.8	69.8	69.76	164.14	164.14
Nov-94	199411		11	2.2	11.2	4.1	45.2	45.18	54.47	54.47
Dec-94	199412		12	9.0	6.4	24.1	0.0	0.00	46.28	46.28
Jan-95	199501	1995	1	6.9	22.7	3.8	11.4	11.35	53.79	53.79
Feb-95	199502		2	3.6	18.1	1.5	24.1	13.36	0.25	0.25
Mar-95	199503		3	17.2	5.3	13.4	8.8	8.84	10.43	10.43
Apr-95	199504		4	62.6	54.3	7.2	9.0	9.02	38.08	38.08
May-95	199505		5	211.8	45.1	121.5	91.2	91.18	196.40	196.40
Jun-95	199506		6	150.0	88.3	113.5	105.4	105.42	120.41	120.41
Jul-95	199507		7	139.6	132.9	131.4	185.2	185.17	148.45	148.45
Aug-95	199508		8	423.9	342.5	502.4	262.0	262.03	421.00	421.00
Sep-95	199509		9	629.5	512.6	411.4	349.7	349.67	614.40	614.40
Oct-95	199510		10	282.3	440.3	223.3	246.3	246.33	265.92	265.92
Nov-95	199511		11	30.5	39.0	36.6	35.2	35.15	38.53	38.53
Dec-95	199512		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00

459202: corrected monthly precipitation data from 1996-2000

month	codemonth	Row Labels	month	459202	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-96	199601	1996	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-96	199602		2	39.4	9.1	6.5	0.0	0.00	0.60	0.60
Mar-96	199603		3	20.4	14.7	22.7	10.3	10.33	15.37	15.37
Apr-96	199604		4	196.7	177.9	161.2	226.2	226.25	242.68	242.68
May-96	199605		5	68.3	148.0	129.1	141.4	141.38	122.65	122.65
Jun-96	199606		6	330.8	187.7	273.9	111.2	111.24	173.52	173.52
Jul-96	199607		7	199.1	215.4	285.1	205.4	205.38	248.69	248.69
Aug-96	199608		8	73.8	133.9	126.7	95.6	95.57	90.42	90.42
Sep-96	199609		9	299.4	152.8	364.0	213.4	213.37	306.08	306.08
Oct-96	199610		10	220.9	262.0	247.6	297.0	296.98	213.53	213.53
Nov-96	199611		11	39.5	37.0	66.0	14.8	14.78	116.87	116.87
Dec-96	199612		12	3.6	21.5	8.7	48.3	48.30	18.77	18.77
Jan-97	199701	1997	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-97	199702		2	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Mar-97	199703		3	86.2	127.5	131.5	119.1	119.07	134.09	134.09
Apr-97	199704		4	11.0	34.7	43.0	65.6	65.64	55.92	55.92
May-97	199705		5	66.7	59.1	125.5	85.2	85.15	49.68	49.68
Jun-97	199706		6	59.9	37.0	32.6	36.1	36.09	37.71	37.71
Jul-97	199707		7	43.3	18.8	45.3	55.8	55.79	59.90	59.90
Aug-97	199708		8	62.7	56.8	59.9	38.8	38.80	75.74	75.74
Sep-97	199709		9	344.5	352.3	240.3	273.9	273.90	282.38	282.38
Oct-97	199710		10	108.5	105.1	94.4	102.5	102.50	137.23	137.23
Nov-97	199711		11	52.3	105.8	21.1	69.3	69.35	31.25	31.25
Dec-97	199712		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Jan-98	199801	1998	1	16.0	21.0	11.1	68.9	68.92	3.04	3.04
Feb-98	199802		2	5.2	26.2	45.4	7.7	3.45	10.01	10.01
Mar-98	199803		3	8.0	5.1	27.0	48.5	48.54	10.29	10.29
Apr-98	199804		4	39.4	3.4	30.0	14.4	14.44	40.02	40.02
May-98	199805		5	188.2	138.0	98.6	98.4	98.36	215.66	215.66
Jun-98	199806		6	190.2	278.5	163.7	190.9	190.86	313.51	313.51
Jul-98	199807		7	132.9	190.8	127.8	137.1	137.07	87.91	87.91
Aug-98	199808		8	166.4	150.7	134.1	193.0	193.05	164.67	164.67
Sep-98	199809		9	251.3	284.7	281.8	274.1	274.10	295.12	295.12
Oct-98	199810		10	142.3	93.4	232.2	188.0	188.00	111.47	111.47
Nov-98	199811		11	100.7	63.6	5.7	54.6	54.59	65.32	65.32
Dec-98	199812		12	6.4	60.6	14.1	1.2	1.19	1.65	1.65
Jan-99	199901	1999	1	1.3	15.1	6.9	10.4	10.36	0.06	0.06
Feb-99	199902		2	13.1	31.3	6.8	7.4	3.27	35.70	35.70
Mar-99	199903		3	38.8	32.8	19.4	4.9	4.93	23.28	23.28
Apr-99	199904		4	361.9	394.0	351.3	399.5	399.46	358.21	358.21
May-99	199905		5	200.7	187.9	57.7	310.1	310.08	190.30	190.30
Jun-99	199906		6	58.5	10.1	44.5	25.3	25.29	37.10	37.10
Jul-99	199907		7	64.9	36.0	46.8	42.5	42.50	32.94	32.94
Aug-99	199908		8	165.1	126.0	169.2	201.5	201.55	177.48	177.48
Sep-99	199909		9	377.0	265.5	588.5	239.9	239.91	179.07	179.07
Oct-99	199910		10	384.9	242.4	183.0	265.5	265.53	317.63	317.63
Nov-99	199911		11	52.1	25.2	51.2	79.9	79.85	52.17	52.17
Dec-99	199912		12	0.5	5.3	5.2	7.1	7.11	0.00	0.00
Jan-00	200001	2000	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-00	200002		2	31.5	24.9	15.1	8.7	3.99	8.37	8.37
Mar-00	200003		3	14.5	21.0	25.9	47.5	47.53	55.00	55.00
Apr-00	200004		4	176.5	71.9	7.5	83.8	83.75	76.06	76.06
May-00	200005		5	103.0	227.9	32.5	128.2	128.20	141.68	141.68
Jun-00	200006		6	271.8	173.8	148.3	269.5	269.49	302.67	302.67
Jul-00	200007		7	130.1	68.6	110.5	13.5	13.49	10.24	10.24
Aug-00	200008		8	98.7	97.7	49.0	66.1	66.06	71.29	71.29
Sep-00	200009		9	114.5	114.7	200.4	166.9	166.85	192.83	192.83
Oct-00	200010		10	177.5	126.6	185.6	106.6	106.65	241.09	241.09
Nov-00	200011		11	10.4	29.6	11.0	2.5	2.51	12.57	12.57
Dec-00	200012		12	6.0	10.3	6.8	0.3	0.28	0.00	0.00

459203 : corrected monthly precipitation data from 1981-1985

month	codemonth	Row Labels	month	459203	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-81	198101	1981	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-81	198102		2	22.2	17.5	24.8	13.3	40.67	40.93	16.30
Mar-81	198103		3	12.7	14.2	12.2	1.6	9.76	9.76	6.05
Apr-81	198104		4	61.6	97.3	73.6	39.1	70.64	70.64	50.83
May-81	198105		5	272.9	276.0	99.2	90.5	150.86	150.87	94.79
Jun-81	198106		6	59.9	174.4	121.5	187.6	113.92	113.94	122.21
Jul-81	198107		7	101.2	101.0	100.6	51.8	27.42	27.43	65.32
Aug-81	198108		8	68.5	59.9	115.1	11.1	67.90	67.89	80.11
Sep-81	198109		9	324.1	389.1	357.8	343.0	327.79	327.79	264.08
Oct-81	198110		10	138.2	258.5	128.0	61.1	158.46	158.46	175.34
Nov-81	198111		11	248.0	274.9	175.7	168.2	255.12	255.14	200.39
Dec-81	198112		12	3.0	51.5	3.5	20.0	0.30	0.31	4.08
Jan-82	198201	1982	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-82	198202		2	0.4	5.0	8.6	0.0	0.00	0.89	0.00
Mar-82	198203		3	108.4	49.1	27.1	20.3	70.84	70.84	33.99
Apr-82	198204		4	108.5	157.3	112.0	164.4	99.84	99.84	111.61
May-82	198205		5	176.0	170.7	264.0	235.8	317.04	317.03	285.33
Jun-82	198206		6	134.7	66.4	77.4	184.8	126.69	126.69	66.03
Jul-82	198207		7	70.7	12.8	28.5	29.9	62.82	62.81	55.29
Aug-82	198208		8	68.1	86.5	60.4	135.9	68.97	68.97	126.16
Sep-82	198209		9	148.9	122.1	138.9	67.8	194.77	194.76	118.85
Oct-82	198210		10	106.9	146.7	124.8	200.2	160.89	160.89	102.54
Nov-82	198211		11	103.4	44.6	117.2	61.8	57.69	57.69	45.96
Dec-82	198212		12	22.2	5.5	16.1	6.9	41.07	41.23	3.13
Jan-83	198301	1983	1	2.2	8.7	17.8	5.3	0.00	4.46	6.84
Feb-83	198302		2	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Mar-83	198303		3	65.1	110.3	110.9	90.7	96.20	96.20	104.46
Apr-83	198304		4	0.0	0.0	0.0	0.0	0.00	0.00	0.00
May-83	198305		5	121.2	131.7	171.9	100.7	109.63	109.63	104.26
Jun-83	198306		6	42.6	68.2	34.7	5.8	64.57	64.56	61.58
Jul-83	198307		7	86.5	47.5	47.9	157.8	27.74	27.74	44.27
Aug-83	198308		8	255.8	249.2	260.3	291.1	297.99	297.99	254.93
Sep-83	198309		9	202.0	229.5	210.7	157.6	217.76	217.75	174.49
Oct-83	198310		10	472.2	357.8	493.6	424.8	355.67	355.66	344.72
Nov-83	198311		11	368.8	349.5	309.4	362.3	283.93	283.91	355.34
Dec-83	198312		12	11.6	7.9	7.3	24.5	1.21	1.14	11.55
Jan-84	198401	1984	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-84	198402		2	19.9	7.5	13.1	50.3	8.01	7.79	11.95
Mar-84	198403		3	60.6	37.6	14.3	45.7	53.79	53.78	62.58
Apr-84	198404		4	10.2	47.7	17.1	46.7	40.72	40.71	60.18
May-84	198405		5	49.3	90.4	25.4	56.6	85.94	85.93	31.74
Jun-84	198406		6	92.4	55.6	94.5	105.7	52.35	52.36	70.97
Jul-84	198407		7	76.8	76.0	87.8	68.7	57.70	57.70	57.09
Aug-84	198408		8	34.6	24.1	18.3	39.3	15.74	15.74	25.97
Sep-84	198409		9	248.7	176.3	183.2	195.7	151.80	151.80	161.72
Oct-84	198410		10	117.1	302.7	296.1	130.7	157.97	157.96	141.32
Nov-84	198411		11	105.6	61.5	313.9	32.6	51.42	51.43	46.96
Dec-84	198412		12	0.1	2.7	1.7	4.6	0.00	0.11	1.71
Jan-85	198501	1985	1	51.9	10.7	48.2	0.0	7.64	7.81	15.83
Feb-85	198502		2	5.1	7.2	29.2	0.0	1.84	1.82	0.89
Mar-85	198503		3	50.0	17.9	61.4	37.8	35.62	35.62	51.59
Apr-85	198504		4	86.1	22.1	77.0	44.2	112.82	112.82	46.07
May-85	198505		5	337.4	343.8	354.2	398.0	272.40	272.41	397.28
Jun-85	198506		6	37.9	66.7	36.9	70.5	80.36	80.35	56.58
Jul-85	198507		7	58.6	40.7	37.0	28.7	85.01	85.01	88.87
Aug-85	198508		8	110.0	58.8	48.3	60.8	55.92	55.92	26.77
Sep-85	198509		9	214.1	121.9	156.2	113.8	121.56	121.55	142.87
Oct-85	198510		10	371.2	453.6	363.1	355.3	307.08	307.08	289.54
Nov-85	198511		11	101.2	53.6	6.0	41.3	186.71	186.70	37.20
Dec-85	198512		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00

459203 : corrected monthly precipitation data from 1986-1990

month	codemonth	Row Labels	month	459203	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-86	198601	1986	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-86	198602		2	3.7	19.0	9.3	16.9	28.90	28.89	17.56
Mar-86	198603		3	12.9	13.3	6.7	20.9	7.37	7.38	24.81
Apr-86	198604		4	71.2	124.4	112.4	82.2	113.23	113.22	89.94
May-86	198605		5	203.3	274.7	217.8	339.4	159.08	159.07	194.16
Jun-86	198606		6	52.5	90.8	105.2	72.2	43.06	43.06	81.06
Jul-86	198607		7	42.6	119.9	129.5	109.2	223.98	223.99	160.49
Aug-86	198608		8	27.5	57.2	85.9	81.2	49.45	49.44	45.95
Sep-86	198609		9	170.3	129.3	155.7	210.7	67.83	67.84	149.32
Oct-86	198610		10	247.4	258.7	79.6	313.3	240.55	240.56	159.78
Nov-86	198611		11	30.9	5.1	0.3	2.2	4.11	4.12	30.95
Dec-86	198612		12	3.9	1.9	22.4	8.1	9.59	9.29	18.43
Jan-87	198701	1987	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-87	198702		2	2.2	3.8	20.6	0.0	0.00	0.75	6.75
Mar-87	198703		3	88.8	110.3	111.5	107.8	118.96	118.96	114.97
Apr-87	198704		4	127.5	123.4	121.4	137.9	139.33	139.34	181.10
May-87	198705		5	66.0	59.8	46.3	83.9	70.71	70.71	87.16
Jun-87	198706		6	123.3	189.2	285.1	144.8	284.09	284.09	196.04
Jul-87	198707		7	29.1	40.1	44.2	67.6	53.87	53.86	43.01
Aug-87	198708		8	74.1	90.1	94.8	124.6	115.61	115.61	90.78
Sep-87	198709		9	82.9	158.3	122.0	175.4	232.83	232.83	151.76
Oct-87	198710		10	269.2	96.7	271.5	249.8	208.13	208.13	178.47
Nov-87	198711		11	228.6	197.7	197.1	230.9	300.30	300.30	201.59
Dec-87	198712		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Jan-88	198801	1988	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-88	198802		2	42.8	9.0	16.4	11.2	9.09	8.86	25.21
Mar-88	198803		3	2.0	14.9	7.2	0.3	18.04	18.03	14.07
Apr-88	198804		4	144.3	14.7	171.6	72.3	29.97	30.01	85.15
May-88	198805		5	138.2	35.3	171.4	101.4	143.60	143.61	137.33
Jun-88	198806		6	178.6	189.7	153.2	69.5	217.86	217.84	127.15
Jul-88	198807		7	210.5	143.8	62.0	63.3	66.80	66.80	98.15
Aug-88	198808		8	153.5	149.6	60.5	132.1	131.07	131.08	107.31
Sep-88	198809		9	238.6	159.1	240.1	352.0	350.10	350.09	264.05
Oct-88	198810		10	279.3	238.7	306.4	272.1	453.75	453.75	371.34
Nov-88	198811		11	25.1	4.9	23.2	7.5	7.06	7.06	27.66
Dec-88	198812		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Jan-89	198901	1989	1	135.2	142.5	136.9	132.9	141.17	141.25	143.14
Feb-89	198902		2	21.3	10.3	19.4	19.2	22.30	22.19	25.41
Mar-89	198903		3	68.1	110.3	110.8	87.6	91.78	91.77	103.72
Apr-89	198904		4	2.6	1.8	1.4	0.8	15.33	15.33	1.13
May-89	198905		5	52.8	41.1	72.7	101.2	98.33	98.33	88.63
Jun-89	198906		6	59.4	25.4	22.4	24.7	45.30	45.29	22.35
Jul-89	198907		7	69.9	68.8	59.1	58.7	64.70	64.71	82.51
Aug-89	198908		8	57.4	33.1	56.3	13.6	23.28	23.28	23.27
Sep-89	198909		9	284.1	327.7	279.5	332.5	395.07	395.07	297.81
Oct-89	198910		10	188.2	150.8	125.0	167.1	128.40	128.39	173.84
Nov-89	198911		11	35.4	88.1	15.3	95.1	52.51	52.50	28.83
Dec-89	198912		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Jan-90	199001	1990	1	1.5	36.5	4.7	6.9	12.94	12.49	18.24
Feb-90	199002		2	17.6	63.0	15.8	22.6	11.73	11.49	22.23
Mar-90	199003		3	54.6	24.4	11.0	37.9	54.38	54.38	9.65
Apr-90	199004		4	61.3	84.7	42.4	38.7	28.92	28.91	52.73
May-90	199005		5	349.3	347.7	386.7	279.8	311.57	311.57	359.18
Jun-90	199006		6	12.3	8.4	17.8	30.4	3.74	3.74	9.51
Jul-90	199007		7	22.0	41.4	43.6	29.1	43.96	43.95	24.76
Aug-90	199008		8	55.1	11.1	74.5	74.1	80.41	80.41	85.13
Sep-90	199009		9	104.0	184.1	148.8	142.2	150.15	150.15	197.52
Oct-90	199010		10	304.7	257.3	316.0	359.3	263.51	263.51	377.04
Nov-90	199011		11	89.3	5.8	37.4	66.6	27.54	27.54	73.30
Dec-90	199012		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00

459203 : corrected monthly precipitation data from 1991-1995

month	codemonth	Row Labels	month	459203	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-91	199101	1991	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-91	199102		2	5.8	10.0	23.5	6.4	11.96	11.73	15.76
Mar-91	199103		3	18.4	10.9	25.5	41.3	12.62	12.62	44.23
Apr-91	199104		4	130.5	120.4	111.8	87.4	104.85	104.85	137.04
May-91	199105		5	164.2	188.4	179.9	113.0	119.89	119.89	104.75
Jun-91	199106		6	95.8	139.1	156.2	116.6	118.19	118.19	94.65
Jul-91	199107		7	124.7	260.9	173.8	175.8	110.09	110.09	120.18
Aug-91	199108		8	79.0	111.6	62.2	98.0	120.28	120.28	107.00
Sep-91	199109		9	339.0	368.3	267.4	270.2	299.71	299.71	396.25
Oct-91	199110		10	297.8	205.6	265.0	241.5	331.42	331.42	209.43
Nov-91	199111		11	0.6	36.9	5.7	0.0	0.00	0.01	0.00
Dec-91	199112		12	5.4	3.4	6.2	0.0	12.29	11.97	7.92
Jan-92	199201	1992	1	5.9	14.4	15.4	19.4	15.31	14.93	14.86
Feb-92	199202		2	16.5	7.9	7.6	30.3	40.44	40.68	16.05
Mar-92	199203		3	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Apr-92	199204		4	27.6	10.6	33.8	86.8	11.89	11.90	11.23
May-92	199205		5	27.8	88.2	97.1	53.7	66.34	66.33	53.26
Jun-92	199206		6	44.9	111.8	81.4	132.5	167.27	167.26	86.18
Jul-92	199207		7	243.1	188.9	181.4	196.3	269.02	269.02	298.43
Aug-92	199208		8	55.5	81.9	75.6	34.5	83.97	83.97	56.43
Sep-92	199209		9	158.4	167.5	152.0	131.0	128.23	128.22	65.79
Oct-92	199210		10	266.0	283.5	288.0	274.0	318.38	318.38	261.82
Nov-92	199211		11	16.0	134.9	81.9	63.6	49.03	49.03	79.33
Dec-92	199212		12	7.0	6.3	8.6	41.4	0.00	0.16	7.85
Jan-93	199301	1993	1	16.9	12.6	12.8	25.7	42.76	42.07	10.32
Feb-93	199302		2	4.5	11.7	17.2	20.0	6.56	6.33	10.42
Mar-93	199303		3	107.2	116.8	112.7	128.1	102.66	102.67	106.26
Apr-93	199304		4	78.6	120.4	126.7	83.6	162.09	162.08	107.43
May-93	199305		5	80.8	102.8	152.4	35.2	106.52	106.51	85.06
Jun-93	199306		6	82.9	38.9	27.1	44.5	36.20	36.20	77.82
Jul-93	199307		7	47.0	34.1	63.3	16.4	34.06	34.06	96.33
Aug-93	199308		8	114.0	194.6	84.4	96.6	89.65	89.65	98.21
Sep-93	199309		9	142.8	237.1	154.1	223.7	235.96	235.97	203.07
Oct-93	199310		10	245.0	273.6	218.6	257.7	329.53	329.52	362.60
Nov-93	199311		11	19.6	7.5	63.7	6.3	1.33	1.35	29.71
Dec-93	199312		12	0.1	2.4	3.8	0.0	40.46	40.60	16.63
Jan-94	199401	1994	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-94	199402		2	17.0	4.9	26.7	6.5	11.25	11.00	12.64
Mar-94	199403		3	77.2	20.2	25.4	65.6	63.76	63.77	22.51
Apr-94	199404		4	17.7	1.6	10.1	27.4	33.94	33.93	13.18
May-94	199405		5	136.3	117.3	229.5	136.4	148.31	148.32	190.85
Jun-94	199406		6	253.2	246.8	240.9	303.5	128.26	128.28	274.81
Jul-94	199407		7	21.5	127.0	77.3	52.2	96.03	96.03	66.11
Aug-94	199408		8	54.5	54.3	56.9	51.3	73.22	73.22	55.24
Sep-94	199409		9	161.6	222.7	155.6	122.1	194.46	194.46	212.03
Oct-94	199410		10	117.4	166.1	209.9	303.6	95.51	95.50	188.88
Nov-94	199411		11	1.0	1.9	0.3	0.0	0.00	0.01	44.06
Dec-94	199412		12	55.5	5.3	18.9	0.0	0.00	0.28	19.81
Jan-95	199501	1995	1	33.6	11.8	4.8	5.0	12.00	11.60	22.87
Feb-95	199502		2	0.4	10.9	8.8	0.0	16.51	16.30	3.70
Mar-95	199503		3	30.3	13.1	27.8	6.4	37.59	37.59	20.13
Apr-95	199504		4	88.0	39.1	2.7	112.5	27.80	27.79	43.23
May-95	199505		5	181.1	91.1	191.6	203.7	136.72	136.73	228.28
Jun-95	199506		6	73.9	48.3	45.7	65.7	58.12	58.12	49.53
Jul-95	199507		7	65.9	97.8	99.3	87.0	146.62	146.62	115.47
Aug-95	199508		8	232.0	162.1	257.7	142.0	115.10	115.11	184.27
Sep-95	199509		9	371.7	292.4	217.1	340.6	174.38	174.39	248.92
Oct-95	199510		10	299.8	407.2	257.5	331.5	255.92	255.91	346.90
Nov-95	199511		11	72.1	29.7	21.2	31.3	63.95	63.94	37.05
Dec-95	199512		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00

459203: corrected monthly precipitation data from 1996-2000

month	codemonth	Row Labels	month	459203	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-96	199601	1996	1	5.3	14.1	6.1	59.8	9.59	9.31	16.27
Feb-96	199602		2	6.3	5.3	11.3	16.3	0.00	0.75	5.04
Mar-96	199603		3	11.7	16.7	20.9	4.9	7.41	7.46	11.28
Apr-96	199604		4	29.6	42.0	19.2	34.0	73.89	73.89	81.89
May-96	199605		5	194.8	211.5	87.8	173.3	169.94	169.93	175.95
Jun-96	199606		6	298.6	185.6	242.4	259.2	177.72	177.72	229.69
Jul-96	199607		7	202.2	140.8	238.7	168.0	148.04	148.05	190.93
Aug-96	199608		8	74.8	81.3	77.9	105.2	59.78	59.79	71.72
Sep-96	199609		9	326.6	220.2	382.7	272.3	305.32	305.33	406.74
Oct-96	199610		10	266.4	243.2	208.5	134.2	216.70	216.72	146.47
Nov-96	199611		11	81.8	186.5	156.7	234.8	106.21	106.20	274.41
Dec-96	199612		12	3.3	2.8	1.9	0.0	13.77	13.46	4.25
Jan-97	199701	1997	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-97	199702		2	4.5	3.7	11.9	8.4	2.12	2.08	13.65
Mar-97	199703		3	48.8	13.6	21.9	47.6	35.64	35.64	51.57
Apr-97	199704		4	44.9	24.9	39.0	84.2	49.65	49.65	41.32
May-97	199705		5	51.8	38.2	104.8	111.5	55.26	55.26	34.50
Jun-97	199706		6	0.5	2.8	0.9	6.3	0.02	0.03	6.79
Jul-97	199707		7	72.3	25.5	66.5	32.7	100.76	100.75	77.08
Aug-97	199708		8	23.8	54.0	45.8	57.5	66.35	66.35	64.37
Sep-97	199709		9	236.7	296.2	165.6	201.9	176.06	176.05	229.07
Oct-97	199710		10	176.0	114.9	177.0	197.5	155.89	155.90	164.99
Nov-97	199711		11	56.5	86.8	25.8	126.7	47.71	47.70	30.24
Dec-97	199712		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Jan-98	199801	1998	1	9.7	6.8	13.6	0.0	19.08	18.52	11.07
Feb-98	199802		2	14.3	10.7	24.7	0.0	12.55	12.32	18.77
Mar-98	199803		3	0.2	25.3	18.1	17.4	12.55	12.55	10.65
Apr-98	199804		4	33.8	2.4	39.0	8.4	24.74	24.73	32.74
May-98	199805		5	162.6	130.1	70.2	243.1	63.16	63.17	155.29
Jun-98	199806		6	153.3	165.0	126.1	115.4	128.97	128.96	195.67
Jul-98	199807		7	158.9	156.0	122.4	77.5	108.30	108.30	78.11
Aug-98	199808		8	157.8	183.4	183.2	153.7	210.98	210.98	234.72
Sep-98	199809		9	220.4	196.0	215.2	169.7	221.53	221.54	198.90
Oct-98	199810		10	146.9	125.2	217.0	78.3	211.45	211.45	172.74
Nov-98	199811		11	25.7	42.7	7.2	25.0	85.98	85.98	61.40
Dec-98	199812		12	15.4	31.0	5.3	27.6	4.23	4.01	7.98
Jan-99	199901	1999	1	3.8	9.5	16.1	22.2	19.52	19.01	12.12
Feb-99	199902		2	1.9	18.1	32.9	7.6	12.30	12.08	8.63
Mar-99	199903		3	44.6	33.8	18.9	46.5	5.89	5.96	24.68
Apr-99	199904		4	33.7	90.4	65.6	39.2	47.63	47.64	48.65
May-99	199905		5	341.3	309.1	196.2	243.0	458.40	458.40	248.89
Jun-99	199906		6	97.9	43.0	42.1	36.8	60.91	60.91	54.15
Jul-99	199907		7	40.4	47.0	79.0	147.4	69.64	69.64	40.61
Aug-99	199908		8	108.6	40.2	76.8	99.6	69.10	69.09	52.30
Sep-99	199909		9	224.6	212.3	398.2	261.0	187.18	187.17	218.23
Oct-99	199910		10	308.3	296.5	242.8	235.6	328.11	328.11	391.81
Nov-99	199911		11	46.9	9.5	49.5	54.0	79.81	79.80	76.26
Dec-99	199912		12	0.2	1.4	17.0	4.5	4.38	4.12	13.71
Jan-00	200001	2000	1	12.9	8.4	2.4	0.0	0.00	4.69	3.89
Feb-00	200002		2	38.0	13.8	29.3	11.1	7.71	7.53	17.78
Mar-00	200003		3	42.6	13.5	29.3	57.8	43.83	43.82	50.17
Apr-00	200004		4	114.8	71.8	16.4	88.7	79.87	79.89	65.08
May-00	200005		5	14.6	73.2	10.4	21.6	70.36	70.36	62.22
Jun-00	200006		6	190.0	184.6	178.9	151.0	193.36	193.38	205.77
Jul-00	200007		7	76.4	44.5	77.2	164.9	17.96	17.98	8.87
Aug-00	200008		8	34.7	50.5	28.5	33.9	36.86	36.86	38.38
Sep-00	200009		9	94.8	83.3	200.9	211.1	161.71	161.71	192.59
Oct-00	200010		10	198.3	168.3	227.9	222.4	139.28	139.29	257.73
Nov-00	200011		11	17.7	7.5	5.7	49.8	1.22	1.24	18.35
Dec-00	200012		12	0.2	5.6	17.3	0.0	5.84	5.55	11.16

459204 : corrected monthly precipitation data from 1981-1985

month	codemonth	Row Labels	month	459204	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-81	198101	1981	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-81	198102		2	14.1	16.0	10.8	0.0	21.53	20.93	16.03
Mar-81	198103		3	10.0	15.7	36.8	1.7	6.62	6.64	15.94
Apr-81	198104		4	65.7	132.5	94.0	51.2	78.07	78.08	67.46
May-81	198105		5	187.8	294.1	166.7	119.5	165.23	165.23	141.63
Jun-81	198106		6	92.7	209.1	103.4	184.8	138.20	138.22	138.37
Jul-81	198107		7	31.6	67.8	77.1	80.5	33.49	33.49	55.30
Aug-81	198108		8	163.2	69.7	139.7	3.8	88.88	88.87	80.77
Sep-81	198109		9	193.4	260.2	214.4	221.6	151.62	151.62	122.02
Oct-81	198110		10	187.8	243.9	108.2	29.1	112.27	112.27	152.15
Nov-81	198111		11	274.5	356.4	216.5	218.8	290.74	290.75	257.51
Dec-81	198112		12	0.2	20.4	8.6	6.0	17.89	17.64	1.71
Jan-82	198201	1982	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-82	198202		2	35.3	19.3	12.2	17.0	11.49	10.98	13.53
Mar-82	198203		3	61.7	50.5	32.7	15.0	72.52	72.52	44.06
Apr-82	198204		4	21.4	64.6	4.2	27.3	35.78	35.78	16.49
May-82	198205		5	164.3	133.0	190.6	208.1	254.46	254.45	216.23
Jun-82	198206		6	174.1	108.1	129.4	302.6	215.25	215.27	114.06
Jul-82	198207		7	91.8	32.8	61.9	55.5	69.60	69.59	109.82
Aug-82	198208		8	104.1	106.3	57.5	192.1	75.09	75.09	171.57
Sep-82	198209		9	212.7	157.2	224.4	152.4	291.25	291.24	237.26
Oct-82	198210		10	133.1	134.2	150.3	250.1	141.68	141.68	117.97
Nov-82	198211		11	69.8	20.8	128.6	83.1	61.47	61.48	41.94
Dec-82	198212		12	66.2	73.5	72.9	75.5	75.80	75.99	77.76
Jan-83	198301	1983	1	2.7	16.6	38.0	13.5	3.85	4.53	12.97
Feb-83	198302		2	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Mar-83	198303		3	32.3	6.3	27.2	22.6	17.39	17.40	22.76
Apr-83	198304		4	0.0	0.0	0.0	0.0	0.00	0.00	0.00
May-83	198305		5	196.8	190.2	268.8	130.1	155.39	155.38	151.77
Jun-83	198306		6	63.3	104.6	97.9	38.8	164.79	164.76	152.36
Jul-83	198307		7	138.7	167.7	202.0	325.0	120.91	120.90	241.12
Aug-83	198308		8	428.9	441.0	465.9	456.3	490.80	490.80	483.05
Sep-83	198309		9	220.3	240.7	212.0	210.1	230.84	230.84	184.47
Oct-83	198310		10	393.0	357.6	477.5	369.6	322.46	322.46	330.65
Nov-83	198311		11	368.8	324.2	296.4	348.8	264.41	264.41	364.82
Dec-83	198312		12	10.6	9.1	5.4	14.4	5.44	5.37	5.45
Jan-84	198401	1984	1	22.0	13.3	2.6	0.0	21.53	20.45	9.77
Feb-84	198402		2	21.0	17.7	10.8	13.3	22.07	21.48	17.82
Mar-84	198403		3	56.8	134.6	137.7	143.3	144.85	144.86	158.73
Apr-84	198404		4	37.3	78.8	20.1	86.4	61.64	61.63	32.14
May-84	198405		5	36.4	85.7	52.3	68.6	91.78	91.77	40.49
Jun-84	198406		6	143.2	44.6	81.6	111.8	38.09	38.10	63.80
Jul-84	198407		7	107.1	96.8	94.2	53.8	112.72	112.71	62.36
Aug-84	198408		8	29.7	25.7	15.7	13.4	29.15	29.15	25.10
Sep-84	198409		9	179.3	164.4	217.0	250.4	170.82	170.83	217.37
Oct-84	198410		10	138.5	333.6	241.4	161.0	284.36	284.36	139.81
Nov-84	198411		11	67.3	55.7	343.3	20.3	62.20	62.21	53.37
Dec-84	198412		12	0.1	3.7	2.3	0.0	3.89	3.91	14.05
Jan-85	198501	1985	1	21.4	44.7	146.3	34.1	14.20	13.73	67.07
Feb-85	198502		2	57.4	101.4	130.9	90.5	79.19	79.97	104.50
Mar-85	198503		3	71.8	15.1	22.7	39.1	48.24	48.23	18.74
Apr-85	198504		4	59.9	26.5	109.0	37.9	37.27	37.28	49.21
May-85	198505		5	264.5	291.5	258.3	366.1	209.71	209.72	277.33
Jun-85	198506		6	86.5	150.5	72.8	125.2	271.44	271.42	114.00
Jul-85	198507		7	77.5	79.4	58.9	44.4	119.49	119.49	92.82
Aug-85	198508		8	34.6	56.8	34.0	46.8	80.35	80.35	21.85
Sep-85	198509		9	257.2	130.9	167.4	115.4	200.69	200.69	181.02
Oct-85	198510		10	387.8	479.1	462.9	375.6	284.03	284.03	329.36
Nov-85	198511		11	98.7	86.6	7.5	59.6	202.10	202.10	37.67
Dec-85	198512		12	1.1	4.8	2.2	5.8	4.62	4.52	5.18

459204 : corrected monthly precipitation data from 1986-1990

month	codemonth	Row Labels	month	459204	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-86	198601	1986	1	14.1	9.9	6.8	59.6	35.77	34.64	26.58
Feb-86	198602		2	3.2	21.4	6.1	40.9	55.69	55.78	19.24
Mar-86	198603		3	1.8	9.4	7.7	20.7	8.33	8.33	34.59
Apr-86	198604		4	60.4	23.2	47.5	34.7	8.73	8.74	51.32
May-86	198605		5	199.3	258.7	202.6	319.4	157.11	157.10	215.31
Jun-86	198606		6	22.9	86.1	89.3	55.3	21.53	21.53	72.75
Jul-86	198607		7	139.5	111.1	60.7	98.4	146.14	146.13	98.45
Aug-86	198608		8	16.2	51.7	74.8	116.0	57.35	57.34	49.97
Sep-86	198609		9	330.0	282.9	252.0	328.6	207.73	207.73	296.90
Oct-86	198610		10	360.2	331.4	231.3	443.0	324.41	324.41	297.80
Nov-86	198611		11	67.4	8.1	0.2	1.6	6.58	6.58	24.31
Dec-86	198612		12	0.9	2.4	4.5	8.6	7.44	7.26	9.57
Jan-87	198701	1987	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-87	198702		2	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Mar-87	198703		3	7.2	16.9	35.9	38.3	9.29	9.28	3.83
Apr-87	198704		4	15.5	59.9	9.9	11.4	4.38	4.39	54.93
May-87	198705		5	106.2	83.2	88.6	116.6	116.70	116.69	87.48
Jun-87	198706		6	196.4	101.2	236.6	108.1	179.73	179.75	81.22
Jul-87	198707		7	36.6	32.8	33.3	76.5	41.92	41.91	31.48
Aug-87	198708		8	74.1	106.4	123.1	140.7	108.23	108.22	96.96
Sep-87	198709		9	269.6	201.9	196.1	216.8	318.31	318.32	219.15
Oct-87	198710		10	280.8	207.5	414.3	299.2	307.22	307.21	290.64
Nov-87	198711		11	235.3	88.9	153.4	190.3	218.41	218.42	97.85
Dec-87	198712		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Jan-88	198801	1988	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-88	198802		2	60.1	18.9	9.4	17.8	7.34	6.99	20.46
Mar-88	198803		3	60.2	12.3	61.9	24.6	18.48	18.49	32.25
Apr-88	198804		4	105.0	14.8	161.7	64.8	25.43	25.46	59.16
May-88	198805		5	308.7	143.9	281.9	190.0	273.72	273.72	324.29
Jun-88	198806		6	82.9	159.5	117.0	19.1	145.02	145.02	71.47
Jul-88	198807		7	132.2	222.3	86.4	98.3	101.39	101.40	151.64
Aug-88	198808		8	204.2	242.8	140.0	201.7	224.37	224.38	228.98
Sep-88	198809		9	272.5	294.4	283.8	375.1	405.25	405.25	330.21
Oct-88	198810		10	348.7	216.1	244.8	216.8	430.23	430.23	299.68
Nov-88	198811		11	2.3	9.8	11.9	0.1	20.69	20.69	11.84
Dec-88	198812		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Jan-89	198901	1989	1	135.6	84.7	23.4	115.1	40.74	39.83	79.67
Feb-89	198902		2	52.5	16.8	14.0	46.1	50.06	50.00	22.93
Mar-89	198903		3	115.4	131.7	137.4	102.6	112.19	112.17	118.78
Apr-89	198904		4	21.0	7.7	32.4	26.7	73.72	73.71	33.37
May-89	198905		5	58.8	36.6	95.8	129.0	78.15	78.15	95.24
Jun-89	198906		6	63.7	41.3	58.3	19.9	73.10	73.09	45.50
Jul-89	198907		7	99.0	78.7	73.7	80.6	92.34	92.34	129.10
Aug-89	198908		8	92.7	108.6	168.9	56.0	82.90	82.89	135.59
Sep-89	198909		9	234.4	204.7	224.3	266.6	264.45	264.44	232.15
Oct-89	198910		10	312.9	232.4	241.8	307.0	287.70	287.70	304.27
Nov-89	198911		11	44.5	117.0	75.7	168.9	165.18	165.17	38.03
Dec-89	198912		12	1.9	3.9	15.9	7.6	6.18	6.02	4.92
Jan-90	199001	1990	1	57.6	60.6	11.8	24.5	21.08	20.19	53.86
Feb-90	199002		2	0.5	13.9	9.1	22.0	0.00	3.18	14.90
Mar-90	199003		3	26.5	23.8	31.0	49.8	63.15	63.14	17.54
Apr-90	199004		4	19.7	98.5	62.4	55.8	140.42	140.42	63.30
May-90	199005		5	196.6	241.0	204.2	189.7	208.85	208.85	242.12
Jun-90	199006		6	14.0	16.8	25.2	4.3	47.12	47.10	17.85
Jul-90	199007		7	16.4	35.3	38.6	56.1	60.70	60.68	21.75
Aug-90	199008		8	45.0	2.5	47.0	69.9	35.15	35.14	67.52
Sep-90	199009		9	158.2	156.0	126.4	153.1	140.79	140.79	171.65
Oct-90	199010		10	201.9	239.0	307.5	312.2	219.10	219.10	364.41
Nov-90	199011		11	100.5	9.7	48.3	72.6	28.64	28.64	96.72
Dec-90	199012		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00

459204 : corrected monthly precipitation data from 1991-1995

month	codemonth	Row Labels	month	459204	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-91	199101	1991	1	3.7	20.0	58.6	0.0	8.40	8.49	31.30
Feb-91	199102		2	14.6	19.2	18.5	16.9	18.62	18.02	17.43
Mar-91	199103		3	14.0	7.4	8.2	35.4	0.22	0.48	0.36
Apr-91	199104		4	137.3	153.5	148.2	92.1	120.93	120.91	170.66
May-91	199105		5	188.5	237.9	212.8	158.9	182.01	182.02	162.79
Jun-91	199106		6	132.2	139.0	158.8	141.1	106.99	106.99	124.88
Jul-91	199107		7	114.0	171.0	86.0	126.0	66.29	66.28	61.25
Aug-91	199108		8	72.9	108.4	66.6	94.7	147.76	147.76	134.56
Sep-91	199109		9	188.0	293.7	231.6	225.0	252.83	252.83	290.98
Oct-91	199110		10	300.7	207.9	266.1	238.3	321.15	321.15	194.49
Nov-91	199111		11	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Dec-91	199112		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Jan-92	199201	1992	1	43.5	36.9	30.6	32.1	23.83	22.85	17.79
Feb-92	199202		2	9.5	15.2	1.7	20.6	36.33	35.95	12.85
Mar-92	199203		3	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Apr-92	199204		4	18.3	38.8	32.8	87.4	56.84	56.83	16.43
May-92	199205		5	18.7	76.3	98.9	78.5	78.17	78.16	48.17
Jun-92	199206		6	114.4	97.1	70.5	125.4	253.16	253.13	66.73
Jul-92	199207		7	170.2	110.8	59.3	129.8	159.97	159.99	151.49
Aug-92	199208		8	123.8	83.4	98.0	46.1	95.01	95.01	60.47
Sep-92	199209		9	134.0	166.9	191.6	179.9	136.20	136.20	122.97
Oct-92	199210		10	366.1	300.0	286.8	299.4	408.19	408.19	302.83
Nov-92	199211		11	24.6	152.7	100.3	73.6	56.31	56.31	100.05
Dec-92	199212		12	13.5	10.8	11.0	25.3	8.96	8.79	10.67
Jan-93	199301	1993	1	94.2	108.5	20.4	71.4	137.44	139.18	27.75
Feb-93	199302		2	14.3	15.9	12.2	23.7	12.16	11.58	14.65
Mar-93	199303		3	53.8	99.7	24.0	86.0	48.14	48.14	41.79
Apr-93	199304		4	51.5	10.9	6.8	6.4	46.12	46.11	10.08
May-93	199305		5	213.8	220.3	250.4	143.6	217.22	217.21	269.22
Jun-93	199306		6	57.7	30.0	21.3	54.0	1.80	1.81	60.86
Jul-93	199307		7	53.4	55.5	70.4	21.1	19.04	19.04	107.95
Aug-93	199308		8	170.9	200.2	74.6	81.2	64.23	64.24	89.98
Sep-93	199309		9	139.4	219.6	121.3	184.5	162.47	162.47	180.99
Oct-93	199310		10	283.2	296.2	166.8	250.5	378.31	378.32	302.42
Nov-93	199311		11	53.2	51.9	78.9	12.9	27.84	27.83	23.34
Dec-93	199312		12	0.8	5.9	8.2	8.8	4.62	4.64	8.11
Jan-94	199401	1994	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-94	199402		2	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Mar-94	199403		3	137.9	16.6	34.6	83.0	94.45	94.47	35.18
Apr-94	199404		4	15.5	0.6	62.5	23.9	6.08	6.08	24.84
May-94	199405		5	303.9	246.9	362.6	318.8	323.76	323.76	308.86
Jun-94	199406		6	255.9	309.2	301.4	304.6	113.07	113.09	262.38
Jul-94	199407		7	57.9	175.4	125.3	94.2	109.26	109.28	129.37
Aug-94	199408		8	65.9	51.5	57.9	63.6	84.45	84.45	30.97
Sep-94	199409		9	222.3	196.1	149.7	149.2	185.25	185.24	196.87
Oct-94	199410		10	119.2	155.0	212.2	355.3	76.28	76.28	191.20
Nov-94	199411		11	15.3	1.8	0.1	0.1	0.59	0.60	32.40
Dec-94	199412		12	34.6	5.6	7.2	11.2	4.25	4.39	11.06
Jan-95	199501	1995	1	18.1	20.9	4.1	0.0	43.05	42.04	73.26
Feb-95	199502		2	6.6	15.9	5.0	0.0	12.01	11.44	8.84
Mar-95	199503		3	28.7	8.8	35.4	17.5	42.08	42.08	41.83
Apr-95	199504		4	30.9	51.1	0.3	145.4	9.51	9.52	39.65
May-95	199505		5	200.2	52.8	145.0	143.3	85.55	85.56	171.59
Jun-95	199506		6	95.3	96.4	98.8	183.3	89.76	89.75	59.53
Jul-95	199507		7	211.4	151.5	249.5	166.9	298.65	298.63	171.47
Aug-95	199508		8	191.6	169.6	270.5	177.9	109.27	109.29	137.83
Sep-95	199509		9	316.6	369.7	239.1	359.4	228.32	228.32	274.78
Oct-95	199510		10	246.6	483.0	271.4	302.0	270.29	270.28	324.65
Nov-95	199511		11	34.3	27.8	20.8	30.0	33.12	33.11	34.44
Dec-95	199512		12	7.2	4.6	1.9	3.7	2.69	3.72	3.15

459204: corrected monthly precipitation data from 1996-2000

month	codemonth	Row Labels	month	459204	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-96	199601	1996	1	6.4	25.6	27.0	87.5	15.99	15.14	51.28
Feb-96	199602		2	56.1	20.4	17.7	23.6	0.00	3.94	13.27
Mar-96	199603		3	25.8	11.4	25.2	2.8	4.67	4.73	21.75
Apr-96	199604		4	68.0	48.1	48.5	40.8	84.39	84.38	95.25
May-96	199605		5	137.4	165.1	91.4	128.4	154.42	154.42	107.18
Jun-96	199606		6	427.7	322.9	413.0	322.7	301.16	301.16	420.17
Jul-96	199607		7	234.1	155.2	224.3	138.4	115.45	115.48	240.37
Aug-96	199608		8	71.4	67.0	58.0	87.2	59.97	59.97	42.36
Sep-96	199609		9	308.0	232.5	375.2	266.5	289.83	289.84	371.31
Oct-96	199610		10	264.9	289.3	224.9	141.2	232.05	232.07	167.30
Nov-96	199611		11	61.7	39.3	72.0	96.2	12.52	12.53	214.64
Dec-96	199612		12	7.1	3.7	2.5	0.0	20.40	20.16	5.93
Jan-97	199701	1997	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-97	199702		2	6.2	12.6	12.1	14.1	11.18	10.62	21.43
Mar-97	199703		3	28.3	6.1	3.2	14.2	9.89	9.90	52.79
Apr-97	199704		4	156.9	24.0	39.9	154.0	105.00	105.01	102.11
May-97	199705		5	87.7	36.8	148.2	134.9	41.28	41.29	72.86
Jun-97	199706		6	9.9	9.8	8.4	40.2	6.31	6.30	22.12
Jul-97	199707		7	61.4	37.6	95.3	58.2	160.62	160.62	99.25
Aug-97	199708		8	56.0	48.0	31.4	48.5	52.28	52.27	66.08
Sep-97	199709		9	277.1	301.7	172.3	252.0	218.33	218.33	204.72
Oct-97	199710		10	321.0	327.1	396.3	406.8	333.22	333.22	459.16
Nov-97	199711		11	91.3	104.6	20.5	194.6	61.47	61.46	43.73
Dec-97	199712		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Jan-98	199801	1998	1	32.3	26.7	30.2	0.0	84.75	84.72	31.45
Feb-98	199802		2	10.1	18.3	32.3	6.6	15.89	15.30	17.31
Mar-98	199803		3	7.3	19.8	14.3	3.5	1.29	1.35	39.84
Apr-98	199804		4	90.9	153.5	183.7	78.9	162.97	162.94	140.65
May-98	199805		5	206.6	128.5	109.6	236.1	117.28	117.28	167.73
Jun-98	199806		6	105.5	237.9	175.0	114.9	99.11	99.12	289.60
Jul-98	199807		7	230.8	231.3	246.2	116.9	156.67	156.68	100.62
Aug-98	199808		8	196.7	143.6	144.8	79.9	141.34	141.34	128.28
Sep-98	199809		9	370.8	366.9	309.9	265.3	321.39	321.40	306.45
Oct-98	199810		10	173.5	135.1	232.9	138.0	247.86	247.86	178.42
Nov-98	199811		11	34.1	111.5	9.9	39.1	95.64	95.63	90.26
Dec-98	199812		12	33.8	31.6	14.3	16.1	10.47	10.28	9.88
Jan-99	199901	1999	1	11.0	11.8	31.3	44.3	32.27	31.18	11.77
Feb-99	199902		2	11.1	21.2	29.6	11.3	13.37	12.86	24.91
Mar-99	199903		3	124.4	134.3	137.4	124.0	112.40	112.39	122.68
Apr-99	199904		4	123.7	111.1	65.6	51.7	48.93	48.95	58.68
May-99	199905		5	250.2	250.3	113.5	162.3	362.48	362.49	189.22
Jun-99	199906		6	81.1	15.6	50.0	103.7	41.73	41.73	68.55
Jul-99	199907		7	49.4	45.9	45.8	101.3	110.54	110.52	43.22
Aug-99	199908		8	68.8	36.0	80.2	140.3	115.89	115.89	78.37
Sep-99	199909		9	97.6	131.4	378.2	144.1	155.00	154.99	129.69
Oct-99	199910		10	477.8	359.7	330.5	320.3	384.25	384.25	479.44
Nov-99	199911		11	191.0	216.4	201.1	219.2	237.49	237.47	256.44
Dec-99	199912		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Jan-00	200001	2000	1	8.7	13.7	51.3	0.0	0.00	3.43	6.16
Feb-00	200002		2	6.8	21.1	25.4	13.3	10.57	10.07	16.07
Mar-00	200003		3	42.2	9.7	35.6	64.1	50.09	50.09	64.72
Apr-00	200004		4	305.2	295.6	268.5	318.4	297.95	297.98	312.81
May-00	200005		5	55.2	204.8	35.8	42.6	107.79	107.80	90.93
Jun-00	200006		6	219.6	162.3	115.0	84.9	156.28	156.31	171.15
Jul-00	200007		7	51.7	44.2	101.3	181.9	11.13	11.14	9.94
Aug-00	200008		8	35.4	107.6	57.7	109.7	71.64	71.64	75.40
Sep-00	200009		9	196.8	204.0	294.6	263.8	249.93	249.92	307.39
Oct-00	200010		10	214.4	188.3	245.6	286.6	148.73	148.75	283.29
Nov-00	200011		11	0.7	9.9	2.6	17.6	0.80	0.81	16.45
Dec-00	200012		12	12.7	9.0	32.7	7.9	20.19	19.95	20.68

459205 : corrected monthly precipitation data from 1981-1985

month	codemonth	Row Labels	month	459205	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-81	198101	1981	1	0.0	2.3	2.3	0.5	4.73	4.45	0.57
Feb-81	198102		2	29.9	23.7	31.8	14.9	40.60	41.08	20.90
Mar-81	198103		3	15.3	22.3	8.3	10.0	7.95	9.01	5.35
Apr-81	198104		4	91.4	78.8	77.7	50.4	74.94	75.47	55.43
May-81	198105		5	266.8	277.4	142.7	131.1	183.39	183.27	152.85
Jun-81	198106		6	61.9	204.0	122.5	183.1	116.67	116.39	118.11
Jul-81	198107		7	117.6	133.0	136.8	84.5	38.98	38.52	85.81
Aug-81	198108		8	77.6	66.6	156.2	18.6	84.76	84.59	111.01
Sep-81	198109		9	360.7	465.9	411.6	382.1	352.72	351.00	293.70
Oct-81	198110		10	147.5	256.5	119.2	54.6	149.28	149.94	168.79
Nov-81	198111		11	215.8	240.2	141.7	142.1	219.82	221.53	183.59
Dec-81	198112		12	2.3	26.6	5.1	9.6	1.68	1.69	4.33
Jan-82	198201	1982	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-82	198202		2	2.8	10.3	7.0	0.0	0.00	1.79	0.07
Mar-82	198203		3	94.3	37.5	21.3	20.9	66.75	66.22	29.34
Apr-82	198204		4	89.6	104.3	89.3	134.6	84.62	84.67	91.48
May-82	198205		5	167.2	143.8	215.0	195.9	262.61	263.98	231.36
Jun-82	198206		6	211.0	109.7	122.3	212.8	150.66	149.89	104.54
Jul-82	198207		7	96.4	23.8	39.2	42.8	93.76	91.51	81.95
Aug-82	198208		8	84.3	98.8	78.5	155.8	95.94	96.54	186.10
Sep-82	198209		9	149.0	125.5	149.5	84.3	191.11	192.27	139.40
Oct-82	198210		10	114.2	135.8	128.5	192.2	150.54	151.26	109.18
Nov-82	198211		11	86.0	29.1	113.7	54.2	62.74	62.68	33.75
Dec-82	198212		12	21.6	7.2	15.9	4.6	16.76	16.70	3.82
Jan-83	198301	1983	1	1.7	8.4	21.8	5.2	0.00	3.36	9.18
Feb-83	198302		2	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Mar-83	198303		3	55.2	66.6	91.8	79.1	76.44	76.17	85.30
Apr-83	198304		4	7.9	12.8	13.9	1.3	2.52	2.83	7.14
May-83	198305		5	120.9	127.7	159.2	101.4	100.83	100.52	96.78
Jun-83	198306		6	69.0	97.2	57.4	29.7	92.79	92.13	102.58
Jul-83	198307		7	96.8	72.1	59.2	208.2	45.40	44.65	62.50
Aug-83	198308		8	292.3	274.8	324.7	301.7	316.20	317.35	342.87
Sep-83	198309		9	199.8	243.6	230.7	182.5	201.37	201.95	187.08
Oct-83	198310		10	433.5	358.9	475.1	387.4	318.81	319.63	321.66
Nov-83	198311		11	308.4	286.3	240.2	307.2	218.51	217.61	321.58
Dec-83	198312		12	12.1	10.5	10.6	12.7	2.85	2.80	12.17
Jan-84	198401	1984	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-84	198402		2	16.2	14.9	15.9	47.5	10.09	9.87	15.21
Mar-84	198403		3	56.1	28.6	8.6	44.8	37.96	38.40	56.17
Apr-84	198404		4	23.4	54.8	24.4	68.3	50.12	50.18	57.31
May-84	198405		5	62.8	111.2	42.3	69.4	97.11	98.44	47.11
Jun-84	198406		6	154.9	96.0	143.9	149.2	98.05	99.17	124.12
Jul-84	198407		7	102.3	114.6	134.5	107.0	86.86	88.21	100.63
Aug-84	198408		8	54.4	29.1	24.9	56.3	31.96	31.51	47.79
Sep-84	198409		9	251.5	196.9	200.5	228.8	151.72	150.32	186.61
Oct-84	198410		10	110.1	309.9	291.5	117.8	159.89	161.65	132.55
Nov-84	198411		11	90.0	51.2	298.4	31.8	66.75	67.23	35.11
Dec-84	198412		12	0.1	4.5	3.6	3.0	0.00	1.19	2.36
Jan-85	198501	1985	1	43.4	9.4	54.6	0.0	6.50	6.51	21.48
Feb-85	198502		2	8.2	14.1	36.2	11.2	4.67	4.69	3.73
Mar-85	198503		3	39.7	14.7	47.8	38.8	29.07	29.42	44.85
Apr-85	198504		4	89.1	27.5	80.1	53.0	122.99	121.72	45.68
May-85	198505		5	299.6	280.8	329.2	349.2	260.11	257.36	345.83
Jun-85	198506		6	33.1	85.1	38.7	76.2	93.50	94.90	65.61
Jul-85	198507		7	62.8	60.6	38.8	34.5	91.96	92.20	112.21
Aug-85	198508		8	100.5	71.3	61.5	73.6	65.51	66.29	40.64
Sep-85	198509		9	234.0	157.6	190.4	158.4	154.73	155.70	191.62
Oct-85	198510		10	325.0	459.2	319.1	296.3	263.15	263.03	244.39
Nov-85	198511		11	114.2	83.0	7.1	80.0	195.39	194.87	74.96
Dec-85	198512		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00

459205 : corrected monthly precipitation data from 1986-1990

month	codemonth	Row Labels	month	459205	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-86	198601	1986	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-86	198602		2	5.7	23.7	10.7	24.6	29.25	29.34	22.82
Mar-86	198603		3	9.8	9.8	2.9	15.5	1.90	1.84	16.69
Apr-86	198604		4	65.8	84.9	97.1	70.2	102.12	101.95	75.67
May-86	198605		5	205.1	250.6	220.9	319.3	174.76	175.11	205.93
Jun-86	198606		6	54.4	112.3	122.1	73.2	36.04	35.77	87.37
Jul-86	198607		7	62.1	127.5	138.9	117.7	232.42	233.37	157.72
Aug-86	198608		8	67.4	67.8	112.9	104.7	64.67	64.17	60.04
Sep-86	198609		9	173.6	130.3	163.1	236.5	65.16	65.35	168.44
Oct-86	198610		10	258.7	264.5	92.0	338.6	263.29	263.93	186.31
Nov-86	198611		11	28.2	2.3	0.5	1.5	7.33	7.36	20.61
Dec-86	198612		12	4.0	4.4	17.4	5.2	7.41	7.29	17.68
Jan-87	198701	1987	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-87	198702		2	3.1	9.3	24.9	4.0	4.04	4.91	10.60
Mar-87	198703		3	79.8	66.6	92.9	99.1	95.56	95.71	97.95
Apr-87	198704		4	113.1	83.2	98.8	105.2	123.71	124.56	166.51
May-87	198705		5	100.8	98.0	66.3	120.0	96.07	94.52	120.12
Jun-87	198706		6	116.4	190.0	275.6	130.5	257.02	256.74	178.44
Jul-87	198707		7	45.8	66.8	51.8	98.2	77.43	78.21	63.63
Aug-87	198708		8	86.4	107.3	135.2	156.3	141.69	139.78	136.96
Sep-87	198709		9	105.0	163.8	121.2	203.5	241.44	241.55	176.51
Oct-87	198710		10	319.5	118.5	298.5	273.1	228.27	229.89	211.69
Nov-87	198711		11	221.3	191.1	185.5	234.4	273.63	273.05	213.08
Dec-87	198712		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Jan-88	198801	1988	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-88	198802		2	39.1	16.5	17.9	12.1	10.32	10.08	28.40
Mar-88	198803		3	12.2	12.7	5.2	9.6	9.58	9.66	11.98
Apr-88	198804		4	145.3	50.8	183.7	81.8	51.97	52.47	109.62
May-88	198805		5	179.8	73.2	205.6	146.7	172.11	172.00	173.78
Jun-88	198806		6	174.9	223.6	157.6	65.0	208.24	205.01	109.38
Jul-88	198807		7	220.7	189.6	84.4	94.6	95.33	94.94	133.38
Aug-88	198808		8	169.4	159.1	68.9	147.5	162.27	161.45	139.89
Sep-88	198809		9	234.5	176.9	273.3	403.3	374.27	372.07	307.61
Oct-88	198810		10	278.2	219.8	287.6	252.9	440.95	442.23	374.43
Nov-88	198811		11	23.7	2.1	26.0	6.4	12.64	13.01	21.04
Dec-88	198812		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Jan-89	198901	1989	1	108.1	114.1	99.3	111.2	116.50	116.35	104.09
Feb-89	198902		2	16.6	16.8	22.4	26.3	23.00	22.79	25.27
Mar-89	198903		3	63.9	66.6	91.9	83.6	71.85	71.96	84.99
Apr-89	198904		4	10.2	5.7	22.2	8.2	17.27	16.37	9.06
May-89	198905		5	60.8	73.3	103.9	137.2	121.16	121.72	118.00
Jun-89	198906		6	74.5	52.2	50.1	32.4	64.90	64.04	37.80
Jul-89	198907		7	78.6	82.2	57.5	63.2	78.07	78.43	88.39
Aug-89	198908		8	74.4	41.3	78.3	25.7	35.50	35.76	41.11
Sep-89	198909		9	296.9	395.8	326.7	369.2	420.71	422.56	343.11
Oct-89	198910		10	196.0	148.3	135.8	176.3	135.55	135.60	195.81
Nov-89	198911		11	42.3	105.1	64.4	114.9	79.55	81.06	68.61
Dec-89	198912		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Jan-90	199001	1990	1	7.6	44.6	8.2	6.9	10.95	10.61	22.11
Feb-90	199002		2	13.4	49.5	12.2	21.2	11.64	11.39	21.42
Mar-90	199003		3	59.4	18.9	6.9	33.4	45.31	45.11	6.44
Apr-90	199004		4	59.1	65.3	42.8	37.7	29.17	30.43	48.72
May-90	199005		5	317.1	278.1	309.2	249.9	283.63	283.67	311.36
Jun-90	199006		6	24.2	12.7	23.2	39.4	4.75	4.85	11.05
Jul-90	199007		7	42.0	54.2	40.9	31.6	55.31	56.02	30.85
Aug-90	199008		8	66.0	9.8	93.2	83.0	87.46	87.05	113.69
Sep-90	199009		9	133.0	207.1	152.5	158.5	144.91	144.00	216.50
Oct-90	199010		10	324.3	261.1	330.8	362.8	276.11	276.22	403.83
Nov-90	199011		11	82.8	2.8	36.1	62.5	33.29	33.35	56.48
Dec-90	199012		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00

459205 : corrected monthly precipitation data from 1991-1995

month	codemonth	Row Labels	month	459205	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-91	199101	1991	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-91	199102		2	7.8	18.7	29.2	7.7	13.10	12.84	39.99
Mar-91	199103		3	18.1	10.8	23.7	41.8	6.77	6.36	41.35
Apr-91	199104		4	113.6	76.5	87.8	72.0	84.72	82.79	121.71
May-91	199105		5	164.2	195.5	193.1	133.5	133.85	135.77	125.20
Jun-91	199106		6	102.0	155.9	157.7	111.1	102.12	103.86	94.49
Jul-91	199107		7	116.1	244.3	173.8	182.2	105.18	104.69	114.61
Aug-91	199108		8	75.4	114.2	70.6	124.5	134.56	136.47	127.12
Sep-91	199109		9	346.3	440.3	287.2	296.6	298.59	297.57	419.22
Oct-91	199110		10	259.6	170.3	245.8	206.0	302.28	302.57	180.79
Nov-91	199111		11	1.6	29.5	6.2	1.8	0.00	0.09	0.00
Dec-91	199112		12	4.1	5.1	6.8	0.0	7.39	7.22	7.06
Jan-92	199201	1992	1	4.9	19.8	19.0	16.9	21.02	21.19	16.23
Feb-92	199202		2	16.2	14.3	6.8	29.7	40.93	40.73	18.67
Mar-92	199203		3	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Apr-92	199204		4	21.1	15.9	27.4	69.5	7.40	6.96	6.34
May-92	199205		5	50.1	115.9	127.7	75.8	91.75	91.83	88.17
Jun-92	199206		6	74.6	141.5	88.4	143.0	169.39	170.61	85.85
Jul-92	199207		7	241.5	180.9	171.2	201.4	248.19	246.56	270.13
Aug-92	199208		8	93.9	95.7	95.3	48.9	106.78	106.89	77.09
Sep-92	199209		9	158.4	166.2	149.8	148.4	112.75	111.65	68.93
Oct-92	199210		10	264.9	272.2	279.0	258.6	305.35	303.50	258.46
Nov-92	199211		11	12.2	102.1	68.0	48.4	48.53	48.28	55.86
Dec-92	199212		12	7.6	8.7	11.3	21.3	0.00	1.47	9.19
Jan-93	199301	1993	1	176.5	0.3	178.9	175.3	180.33	180.41	185.03
Feb-93	199302		2	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Mar-93	199303		3	41.8	70.2	101.2	109.5	78.57	78.61	84.27
Apr-93	199304		4	49.4	80.3	24.4	14.4	51.00	51.02	14.44
May-93	199305		5	126.7	118.9	168.7	61.6	126.27	126.06	96.24
Jun-93	199306		6	83.2	38.5	48.2	56.7	41.54	41.22	70.52
Jul-93	199307		7	18.9	31.9	38.4	12.3	24.13	24.07	49.60
Aug-93	199308		8	139.3	214.5	89.3	86.5	95.20	95.34	115.58
Sep-93	199309		9	171.8	296.9	168.7	197.2	256.43	256.94	217.49
Oct-93	199310		10	345.8	269.4	216.5	293.4	340.85	339.79	357.03
Nov-93	199311		11	31.9	65.8	39.5	23.5	2.33	2.29	9.45
Dec-93	199312		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Jan-94	199401	1994	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-94	199402		2	5.1	0.5	6.3	0.0	12.58	12.33	3.96
Mar-94	199403		3	118.6	12.8	28.7	76.5	69.70	69.70	25.26
Apr-94	199404		4	66.6	207.7	99.2	81.9	117.83	118.11	67.55
May-94	199405		5	158.1	244.2	217.0	229.1	207.67	207.64	215.56
Jun-94	199406		6	195.2	151.3	200.3	271.6	99.74	99.64	186.41
Jul-94	199407		7	18.4	120.0	95.3	75.7	93.59	93.75	92.21
Aug-94	199408		8	77.0	50.1	67.9	70.3	95.16	95.29	37.27
Sep-94	199409		9	309.1	265.7	219.5	194.0	342.14	342.51	258.83
Oct-94	199410		10	80.9	73.4	177.2	297.6	52.96	52.66	149.46
Nov-94	199411		11	34.3	162.1	122.3	0.8	58.54	58.26	144.58
Dec-94	199412		12	16.5	0.0	5.1	5.3	0.00	0.73	13.51
Jan-95	199501	1995	1	23.2	0.1	0.0	0.0	5.85	5.61	11.79
Feb-95	199502		2	0.3	13.9	0.0	0.0	15.30	15.06	0.22
Mar-95	199503		3	25.3	76.6	28.8	21.5	31.51	31.35	21.19
Apr-95	199504		4	39.3	73.5	6.3	121.1	31.97	31.94	68.58
May-95	199505		5	171.0	34.0	75.6	117.5	75.92	75.67	123.31
Jun-95	199506		6	162.6	117.8	159.5	219.7	156.91	157.17	186.69
Jul-95	199507		7	107.1	83.9	104.3	70.1	152.46	152.88	113.36
Aug-95	199508		8	221.1	148.6	240.2	202.8	125.89	125.87	153.11
Sep-95	199509		9	489.8	423.1	360.5	515.3	390.05	390.32	394.31
Oct-95	199510		10	235.4	317.6	186.4	210.3	186.98	186.27	225.15
Nov-95	199511		11	27.0	8.7	27.6	42.2	20.18	20.00	33.77
Dec-95	199512		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00

459205: corrected monthly precipitation data from 1996-2000

month	codemonth	Row Labels	month	459205	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-96	199601	1996	1	17.8	0.0	0.2	50.4	3.87	3.74	6.85
Feb-96	199602		2	8.0	0.0	0.3	16.8	0.00	0.47	0.49
Mar-96	199603		3	23.3	10.7	23.2	5.1	5.45	5.40	11.65
Apr-96	199604		4	76.5	45.1	59.6	48.3	82.04	82.19	94.76
May-96	199605		5	234.5	188.2	216.6	212.8	190.63	190.55	235.50
Jun-96	199606		6	267.0	210.1	193.6	205.1	137.24	137.37	196.95
Jul-96	199607		7	172.7	178.5	304.5	190.8	177.74	178.29	233.15
Aug-96	199608		8	59.1	210.2	97.2	91.9	68.73	68.97	71.68
Sep-96	199609		9	474.2	311.1	498.5	333.5	432.17	432.36	533.85
Oct-96	199610		10	160.4	197.1	187.1	112.7	204.34	203.61	127.98
Nov-96	199611		11	35.1	1.8	67.5	98.2	29.95	29.75	108.61
Dec-96	199612		12	1.8	0.0	0.7	0.0	24.79	24.83	6.35
Jan-97	199701	1997	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-97	199702		2	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Mar-97	199703		3	64.4	138.9	100.8	18.2	93.36	93.49	104.48
Apr-97	199704		4	29.9	95.1	48.8	126.5	65.12	65.20	55.80
May-97	199705		5	80.8	40.5	96.4	110.9	71.94	71.68	39.20
Jun-97	199706		6	32.7	25.1	32.3	45.2	48.50	48.18	37.27
Jul-97	199707		7	58.4	67.0	74.0	42.8	113.65	113.89	82.34
Aug-97	199708		8	43.2	125.4	76.4	55.8	79.88	80.08	94.48
Sep-97	199709		9	290.0	233.2	215.0	328.5	219.74	220.28	255.09
Oct-97	199710		10	162.1	203.8	155.6	154.2	134.89	134.33	148.53
Nov-97	199711		11	79.7	41.3	22.2	167.6	48.49	48.23	31.59
Dec-97	199712		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Jan-98	199801	1998	1	1.0	0.0	2.7	0.0	12.32	11.97	4.00
Feb-98	199802		2	15.1	8.6	10.8	1.2	4.36	4.23	8.00
Mar-98	199803		3	5.3	47.1	25.1	6.1	45.72	45.58	7.15
Apr-98	199804		4	10.9	50.1	26.5	10.4	6.97	6.95	30.86
May-98	199805		5	117.1	203.9	86.1	188.0	70.86	70.62	155.29
Jun-98	199806		6	178.4	147.1	95.5	121.0	129.29	129.36	191.20
Jul-98	199807		7	187.4	130.4	129.6	138.8	137.85	138.19	101.16
Aug-98	199808		8	229.6	180.2	225.1	171.1	245.31	244.45	219.21
Sep-98	199809		9	195.9	181.0	211.9	173.8	192.71	193.29	174.32
Oct-98	199810		10	169.5	116.2	235.5	152.2	218.35	217.56	192.05
Nov-98	199811		11	60.2	69.1	9.8	51.0	48.75	48.50	73.82
Dec-98	199812		12	2.0	0.1	0.4	12.8	2.57	2.45	1.49
Jan-99	199901	1999	1	4.3	176.5	0.4	15.6	13.36	12.98	0.58
Feb-99	199902		2	6.5	0.0	0.3	3.8	4.69	4.62	14.36
Mar-99	199903		3	25.7	59.9	24.6	44.7	11.69	11.56	18.89
Apr-99	199904		4	98.1	85.8	126.0	56.9	105.20	105.44	114.51
May-99	199905		5	248.4	227.2	168.3	188.9	362.17	362.60	204.06
Jun-99	199906		6	87.6	32.7	84.9	95.1	117.31	117.29	86.26
Jul-99	199907		7	97.2	40.6	80.1	82.4	60.97	61.01	47.80
Aug-99	199908		8	214.7	101.7	146.2	208.1	206.29	205.72	115.04
Sep-99	199909		9	292.6	290.2	453.4	171.4	281.32	281.78	252.49
Oct-99	199910		10	264.8	299.2	214.4	195.9	323.02	322.00	348.03
Nov-99	199911		11	59.2	41.1	60.5	69.6	118.40	118.12	71.61
Dec-99	199912		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Jan-00	200001	2000	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-00	200002		2	41.5	4.1	8.6	5.4	6.67	6.52	6.46
Mar-00	200003		3	27.2	23.7	33.5	61.7	46.65	46.54	54.53
Apr-00	200004		4	147.1	57.9	99.4	141.3	138.86	139.26	106.40
May-00	200005		5	77.0	127.0	65.0	71.9	124.69	124.47	123.05
Jun-00	200006		6	216.6	182.0	201.1	115.0	257.67	258.82	301.09
Jul-00	200007		7	94.6	32.5	70.9	161.3	25.85	25.81	12.38
Aug-00	200008		8	72.0	134.2	40.9	112.1	48.12	48.41	54.16
Sep-00	200009		9	145.8	134.5	228.4	245.0	188.85	189.43	224.67
Oct-00	200010		10	212.8	205.4	289.3	332.0	208.35	207.59	329.06
Nov-00	200011		11	15.2	42.6	10.7	29.2	2.18	2.17	14.91
Dec-00	200012		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00

478201 : corrected monthly precipitation data from 1981-1985

month	codemonth	Row Labels	month	478201	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-81	198101	1981	1	0.3	20.3	18.7	0.0	9.79	9.93	42.10
Feb-81	198102		2	15.8	32.1	37.2	44.8	61.95	61.90	33.10
Mar-81	198103		3	22.4	29.6	25.6	19.1	15.16	15.19	50.41
Apr-81	198104		4	85.0	113.7	106.3	86.0	101.49	101.49	75.15
May-81	198105		5	219.4	284.4	130.1	95.5	80.03	80.04	96.73
Jun-81	198106		6	218.3	252.9	176.7	254.2	248.73	248.73	245.46
Jul-81	198107		7	34.4	75.1	67.1	118.9	28.95	28.96	56.86
Aug-81	198108		8	114.5	82.3	159.8	44.4	89.69	89.69	97.39
Sep-81	198109		9	190.8	349.9	298.0	244.4	202.00	202.00	165.38
Oct-81	198110		10	142.9	266.3	174.2	177.9	173.61	173.60	233.13
Nov-81	198111		11	210.0	152.1	73.5	74.3	167.04	167.06	95.08
Dec-81	198112		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Jan-82	198201	1982	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-82	198202		2	34.6	47.8	38.3	0.0	23.45	23.42	33.62
Mar-82	198203		3	101.8	81.4	55.7	40.2	147.30	147.29	64.76
Apr-82	198204		4	105.3	118.4	22.3	70.3	43.81	43.82	25.44
May-82	198205		5	153.7	69.7	156.4	154.6	234.43	234.42	139.72
Jun-82	198206		6	325.6	170.3	179.1	341.7	266.85	266.86	202.67
Jul-82	198207		7	80.2	29.3	103.2	90.4	149.17	149.17	148.32
Aug-82	198208		8	109.1	115.3	67.7	193.9	83.80	83.80	167.71
Sep-82	198209		9	207.9	167.3	213.5	183.0	307.80	307.79	226.66
Oct-82	198210		10	102.7	84.1	45.3	196.8	74.76	74.75	63.67
Nov-82	198211		11	156.0	176.2	206.4	161.2	129.07	129.07	178.55
Dec-82	198212		12	19.0	8.4	9.4	5.2	29.85	29.94	4.47
Jan-83	198301	1983	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-83	198302		2	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Mar-83	198303		3	140.4	192.7	198.6	159.6	160.26	160.26	177.85
Apr-83	198304		4	0.0	0.0	0.0	0.0	0.00	0.00	0.00
May-83	198305		5	124.1	67.1	148.8	86.3	82.78	82.79	68.49
Jun-83	198306		6	143.4	192.4	215.2	174.0	219.18	219.16	338.74
Jul-83	198307		7	240.1	297.8	334.4	497.5	241.65	241.63	371.68
Aug-83	198308		8	377.0	341.7	342.2	327.1	418.40	418.40	363.50
Sep-83	198309		9	304.9	364.3	283.6	231.4	311.92	311.91	265.56
Oct-83	198310		10	226.0	232.5	370.7	215.7	185.70	185.70	171.71
Nov-83	198311		11	164.2	29.8	46.8	70.9	21.88	21.89	43.37
Dec-83	198312		12	15.1	9.5	6.2	17.3	1.07	1.18	9.91
Jan-84	198401	1984	1	2.0	23.2	14.2	13.4	12.10	12.17	15.36
Feb-84	198402		2	25.5	37.3	26.0	61.5	33.44	33.36	35.67
Mar-84	198403		3	10.4	68.7	36.4	76.1	53.90	53.88	79.66
Apr-84	198404		4	14.1	93.1	52.8	101.1	94.21	94.20	50.89
May-84	198405		5	161.2	267.0	194.1	216.4	272.67	272.66	191.53
Jun-84	198406		6	148.1	99.8	135.0	214.5	125.71	125.71	100.27
Jul-84	198407		7	110.8	52.8	43.2	46.4	34.56	34.55	32.70
Aug-84	198408		8	48.2	44.0	32.8	79.0	55.97	55.97	47.43
Sep-84	198409		9	195.9	131.4	225.6	252.3	130.09	130.10	175.20
Oct-84	198410		10	122.7	318.0	221.5	148.2	229.81	229.81	154.90
Nov-84	198411		11	26.3	13.6	148.9	13.5	41.24	41.23	21.40
Dec-84	198412		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Jan-85	198501	1985	1	3.7	38.0	99.7	28.4	11.59	11.76	33.19
Feb-85	198502		2	38.2	24.8	58.3	22.0	20.77	20.71	23.02
Mar-85	198503		3	75.0	14.5	39.6	28.8	51.70	51.67	75.30
Apr-85	198504		4	241.4	172.0	263.5	205.2	245.93	245.95	256.78
May-85	198505		5	358.9	312.4	300.9	360.3	258.23	258.25	300.06
Jun-85	198506		6	132.9	238.2	159.9	200.9	320.44	320.43	200.08
Jul-85	198507		7	161.1	82.5	69.7	60.6	138.64	138.64	125.80
Aug-85	198508		8	69.2	82.7	50.6	56.8	63.48	63.49	46.94
Sep-85	198509		9	234.2	187.9	220.6	188.0	219.91	219.91	185.84
Oct-85	198510		10	214.5	279.7	179.4	162.9	119.92	119.92	81.50
Nov-85	198511		11	33.3	63.2	5.0	20.2	108.94	108.94	29.28
Dec-85	198512		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00

478201 : corrected monthly precipitation data from 1986-1990

month	codemonth	Row Labels	month	478201	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-86	198601	1986	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-86	198602		2	55.0	32.8	16.1	69.5	88.59	88.58	36.22
Mar-86	198603		3	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Apr-86	198604		4	70.4	47.0	59.2	66.6	61.13	61.13	99.03
May-86	198605		5	217.7	330.7	259.0	361.8	213.77	213.76	286.27
Jun-86	198606		6	39.8	88.2	90.4	82.8	50.13	50.12	61.07
Jul-86	198607		7	170.0	227.6	247.1	197.6	299.30	299.29	252.83
Aug-86	198608		8	79.1	81.4	137.1	152.2	64.92	64.92	89.60
Sep-86	198609		9	311.5	251.2	259.0	351.8	199.10	199.09	321.54
Oct-86	198610		10	298.1	235.7	60.5	412.0	202.55	202.56	163.86
Nov-86	198611		11	46.0	16.3	10.8	5.6	11.02	11.02	19.52
Dec-86	198612		12	3.5	2.7	13.2	10.7	2.01	1.92	10.01
Jan-87	198701	1987	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-87	198702		2	5.0	28.2	27.2	40.6	11.35	11.37	33.99
Mar-87	198703		3	38.9	29.7	64.1	82.5	9.62	9.68	32.50
Apr-87	198704		4	29.8	26.6	30.1	4.0	42.76	42.76	72.45
May-87	198705		5	143.0	76.5	117.8	130.3	101.06	101.05	127.02
Jun-87	198706		6	213.4	163.4	276.0	164.9	195.04	195.07	152.86
Jul-87	198707		7	101.1	160.4	159.7	207.4	120.99	120.99	134.47
Aug-87	198708		8	173.4	185.3	186.6	187.3	208.38	208.38	165.94
Sep-87	198709		9	222.1	305.6	226.0	300.3	439.83	439.82	308.29
Oct-87	198710		10	223.4	90.2	290.5	263.4	153.12	153.12	166.44
Nov-87	198711		11	129.4	75.1	109.0	125.8	180.50	180.51	65.22
Dec-87	198712		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Jan-88	198801	1988	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-88	198802		2	112.7	172.1	163.8	135.2	125.36	125.46	174.77
Mar-88	198803		3	59.2	25.5	43.3	46.0	34.49	34.50	39.74
Apr-88	198804		4	97.0	22.0	113.6	50.7	11.14	11.17	67.11
May-88	198805		5	296.8	162.8	316.0	263.9	271.59	271.60	314.42
Jun-88	198806		6	188.0	314.4	251.5	136.8	255.06	255.06	200.96
Jul-88	198807		7	265.0	219.0	62.0	134.9	84.07	84.08	145.18
Aug-88	198808		8	137.1	218.1	99.1	213.1	169.37	169.38	167.00
Sep-88	198809		9	305.3	172.7	219.0	378.1	388.46	388.47	219.63
Oct-88	198810		10	298.9	200.0	190.5	211.6	321.39	321.40	303.88
Nov-88	198811		11	3.6	2.2	0.5	0.0	0.02	0.03	2.14
Dec-88	198812		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Jan-89	198901	1989	1	87.3	83.2	32.9	109.3	29.10	29.25	55.28
Feb-89	198902		2	107.9	26.4	30.2	88.2	54.63	54.57	36.05
Mar-89	198903		3	51.9	14.0	41.4	28.3	4.24	4.48	12.87
Apr-89	198904		4	8.8	11.8	53.7	32.5	57.77	57.75	33.88
May-89	198905		5	41.4	126.3	179.7	200.1	146.36	146.37	172.80
Jun-89	198906		6	66.5	50.9	51.4	52.1	52.10	52.09	34.07
Jul-89	198907		7	131.2	88.0	87.7	99.3	86.97	86.98	115.45
Aug-89	198908		8	60.1	39.0	57.3	49.8	39.67	39.67	39.72
Sep-89	198909		9	212.4	324.0	274.6	348.1	303.07	303.08	268.56
Oct-89	198910		10	367.2	267.9	310.8	404.5	315.42	315.40	355.01
Nov-89	198911		11	10.7	100.7	77.2	78.8	168.35	168.35	27.00
Dec-89	198912		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Jan-90	199001	1990	1	79.8	52.3	23.5	28.8	23.19	23.19	52.26
Feb-90	199002		2	7.7	56.0	28.5	46.9	34.17	34.08	30.45
Mar-90	199003		3	150.6	193.2	198.6	151.8	201.55	201.56	185.36
Apr-90	199004		4	3.3	112.3	87.4	46.8	125.22	125.20	55.38
May-90	199005		5	182.0	226.5	173.2	205.3	191.99	192.01	203.40
Jun-90	199006		6	16.5	24.1	46.7	119.5	35.98	35.97	40.83
Jul-90	199007		7	31.2	59.8	89.1	80.6	77.32	77.31	43.57
Aug-90	199008		8	116.6	49.9	202.0	203.8	170.40	170.39	253.67
Sep-90	199009		9	289.9	214.5	201.6	198.6	203.48	203.47	307.37
Oct-90	199010		10	167.7	121.2	157.9	154.5	150.01	150.01	229.86
Nov-90	199011		11	56.5	17.1	39.4	77.0	34.60	34.61	74.74
Dec-90	199012		12	0.6	2.6	2.0	0.0	3.32	3.19	7.73

478201 : corrected monthly precipitation data from 1991-1995

month	codemonth	Row Labels	month	478201	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-91	199101	1991	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-91	199102		2	46.7	41.4	36.1	27.8	32.81	32.71	34.15
Mar-91	199103		3	35.6	25.4	14.0	64.6	1.54	2.58	4.91
Apr-91	199104		4	56.6	2.6	10.3	18.7	8.56	8.56	29.57
May-91	199105		5	95.5	179.8	192.1	133.2	136.24	136.24	119.14
Jun-91	199106		6	129.8	100.0	115.1	84.8	108.38	108.37	91.36
Jul-91	199107		7	108.3	232.4	119.5	165.6	110.31	110.31	83.73
Aug-91	199108		8	40.7	114.9	87.6	129.0	145.28	145.27	95.09
Sep-91	199109		9	259.8	313.0	282.4	286.0	288.31	288.32	370.87
Oct-91	199110		10	195.9	113.5	254.3	128.2	240.39	240.39	119.55
Nov-91	199111		11	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Dec-91	199112		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Jan-92	199201	1992	1	69.5	59.3	37.4	39.7	31.82	31.76	33.91
Feb-92	199202		2	55.6	29.0	21.6	32.0	52.84	52.76	27.08
Mar-92	199203		3	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Apr-92	199204		4	65.4	61.3	96.6	114.3	70.60	70.58	33.35
May-92	199205		5	66.4	135.8	151.3	131.4	90.55	90.54	109.54
Jun-92	199206		6	204.3	169.9	148.8	225.3	301.14	301.14	134.28
Jul-92	199207		7	385.5	271.9	203.7	295.4	356.05	356.05	398.25
Aug-92	199208		8	123.8	84.7	96.5	71.9	87.69	87.69	65.14
Sep-92	199209		9	88.7	136.5	153.7	153.7	124.66	124.66	75.59
Oct-92	199210		10	150.4	207.6	148.0	158.5	194.05	194.05	206.58
Nov-92	199211		11	33.4	52.0	60.1	80.6	26.83	26.83	49.16
Dec-92	199212		12	33.3	7.6	12.4	27.4	4.12	4.03	13.85
Jan-93	199301	1993	1	59.2	33.7	46.1	46.2	123.50	123.46	27.08
Feb-93	199302		2	42.4	28.8	28.6	55.7	26.74	26.66	30.29
Mar-93	199303		3	124.0	134.6	58.0	151.9	80.70	80.69	61.38
Apr-93	199304		4	70.9	77.1	35.6	67.9	55.79	55.79	32.51
May-93	199305		5	155.0	133.8	196.8	98.9	150.38	150.37	135.06
Jun-93	199306		6	131.4	129.7	98.7	154.9	56.76	56.78	133.93
Jul-93	199307		7	63.3	70.4	96.2	52.0	41.25	41.26	170.17
Aug-93	199308		8	134.1	255.4	131.9	132.6	137.97	137.98	143.76
Sep-93	199309		9	309.9	352.7	194.6	370.4	280.77	280.77	284.94
Oct-93	199310		10	278.0	253.0	161.4	234.5	355.73	355.73	320.28
Nov-93	199311		11	38.7	34.0	59.6	22.7	16.54	16.54	21.33
Dec-93	199312		12	3.1	13.9	7.1	8.9	0.00	0.49	5.17
Jan-94	199401	1994	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-94	199402		2	5.3	20.7	26.4	28.4	16.30	16.27	26.95
Mar-94	199403		3	93.6	23.4	35.2	89.5	137.46	137.46	29.15
Apr-94	199404		4	41.9	8.3	11.3	32.9	20.37	20.36	17.05
May-94	199405		5	409.9	371.2	490.5	354.4	420.64	420.63	429.89
Jun-94	199406		6	325.3	394.9	406.2	364.4	226.68	226.70	356.00
Jul-94	199407		7	53.1	176.0	91.7	103.9	95.84	95.85	55.79
Aug-94	199408		8	144.4	73.6	97.1	89.6	110.12	110.12	85.60
Sep-94	199409		9	243.2	239.6	180.8	167.9	210.20	210.19	235.93
Oct-94	199410		10	38.8	92.8	196.1	212.8	80.25	80.24	117.17
Nov-94	199411		11	2.4	14.6	0.6	2.9	20.86	20.85	35.04
Dec-94	199412		12	7.0	4.6	2.7	6.0	2.37	2.30	13.16
Jan-95	199501	1995	1	36.6	27.6	15.8	20.2	48.32	48.13	51.44
Feb-95	199502		2	0.9	24.1	18.2	0.0	15.62	15.60	17.03
Mar-95	199503		3	56.1	24.2	56.5	68.2	75.23	75.21	39.57
Apr-95	199504		4	59.9	62.0	16.6	182.6	23.11	23.13	90.25
May-95	199505		5	258.6	121.5	250.7	228.9	249.52	249.50	322.14
Jun-95	199506		6	233.9	303.0	350.6	293.6	342.52	342.50	339.82
Jul-95	199507		7	339.0	300.0	349.7	236.4	426.54	426.53	322.34
Aug-95	199508		8	235.1	223.1	305.8	232.5	155.52	155.53	239.52
Sep-95	199509		9	499.0	420.8	294.3	447.5	274.10	274.11	351.42
Oct-95	199510		10	193.5	389.9	193.2	268.8	216.46	216.46	256.73
Nov-95	199511		11	87.0	177.0	160.6	147.2	108.45	108.44	178.50
Dec-95	199512		12	1.1	5.4	6.3	0.0	6.64	6.49	5.25

478201: corrected monthly precipitation data from 1996-2000

month	codemonth	Row Labels	month	478201	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-96	199601	1996	1	11.5	29.9	26.8	85.5	21.19	21.21	40.00
Feb-96	199602		2	67.4	39.0	35.2	43.0	7.56	8.43	26.18
Mar-96	199603		3	89.5	40.8	51.9	45.9	15.51	15.59	33.78
Apr-96	199604		4	117.4	53.3	73.8	51.1	105.43	105.43	149.65
May-96	199605		5	269.6	273.7	169.8	275.2	217.67	217.67	227.83
Jun-96	199606		6	321.7	163.4	237.9	250.0	123.00	123.01	202.62
Jul-96	199607		7	312.6	289.4	349.3	224.8	303.51	303.53	304.73
Aug-96	199608		8	166.0	172.3	164.4	214.6	161.13	161.13	150.44
Sep-96	199609		9	292.0	223.2	388.8	305.3	298.35	298.36	303.52
Oct-96	199610		10	289.7	259.4	224.8	138.9	230.56	230.58	156.47
Nov-96	199611		11	87.6	36.3	87.4	117.9	38.36	38.37	171.83
Dec-96	199612		12	0.5	12.4	8.7	20.6	25.00	25.02	7.80
Jan-97	199701	1997	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-97	199702		2	43.4	27.9	30.9	29.3	93.10	93.12	41.84
Mar-97	199703		3	49.8	12.2	12.7	31.2	40.37	40.34	76.96
Apr-97	199704		4	55.2	28.4	65.0	57.8	55.34	55.34	46.56
May-97	199705		5	89.0	57.6	139.1	123.1	103.36	103.35	65.24
Jun-97	199706		6	2.4	39.5	18.6	0.0	21.50	21.50	41.86
Jul-97	199707		7	51.6	18.2	39.2	22.0	79.41	79.40	51.77
Aug-97	199708		8	22.8	78.2	47.0	13.7	104.05	104.05	50.59
Sep-97	199709		9	287.1	300.9	177.9	196.8	181.72	181.72	214.69
Oct-97	199710		10	186.0	108.4	146.0	108.1	137.93	137.93	175.30
Nov-97	199711		11	104.8	200.6	160.2	221.6	106.20	106.19	172.71
Dec-97	199712		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Jan-98	199801	1998	1	33.6	20.8	40.9	12.7	45.02	44.93	32.41
Feb-98	199802		2	51.8	28.2	54.1	14.1	20.25	20.22	32.41
Mar-98	199803		3	1.4	37.3	74.2	0.0	24.39	24.40	54.45
Apr-98	199804		4	133.8	161.1	178.9	99.2	186.65	186.64	173.42
May-98	199805		5	242.1	184.4	102.4	256.0	98.79	98.79	180.09
Jun-98	199806		6	213.0	233.1	156.3	133.3	147.64	147.64	237.38
Jul-98	199807		7	373.7	390.9	355.1	156.2	261.99	262.01	228.40
Aug-98	199808		8	241.9	203.9	173.5	85.7	146.34	146.35	170.50
Sep-98	199809		9	243.6	336.0	291.4	212.5	306.74	306.75	320.72
Oct-98	199810		10	187.7	189.2	324.0	184.3	321.95	321.93	216.99
Nov-98	199811		11	47.3	92.5	4.8	53.7	61.96	61.96	72.50
Dec-98	199812		12	5.6	23.0	2.5	0.0	4.39	4.27	10.41
Jan-99	199901	1999	1	1.8	22.6	44.1	0.0	36.30	36.28	27.80
Feb-99	199902		2	12.7	34.6	49.8	0.0	37.69	37.65	58.74
Mar-99	199903		3	219.8	194.2	198.8	212.4	154.36	154.36	213.42
Apr-99	199904		4	234.4	241.3	201.9	197.5	196.26	196.27	201.00
May-99	199905		5	221.6	238.0	110.7	126.0	367.14	367.14	184.51
Jun-99	199906		6	33.8	78.0	110.0	7.0	123.05	123.05	102.67
Jul-99	199907		7	94.2	69.5	91.2	130.3	132.84	132.83	55.57
Aug-99	199908		8	113.3	66.8	122.1	96.1	146.10	146.10	110.78
Sep-99	199909		9	197.3	235.8	481.8	182.0	220.66	220.65	225.99
Oct-99	199910		10	281.6	204.3	196.3	165.0	250.24	250.24	323.21
Nov-99	199911		11	90.4	22.5	51.6	32.9	89.16	89.16	63.33
Dec-99	199912		12	0.8	4.0	2.5	0.0	11.85	11.72	4.00
Jan-00	200001	2000	1	7.2	14.8	21.8	0.0	9.96	10.05	20.93
Feb-00	200002		2	45.6	34.7	44.8	17.5	18.02	18.06	32.68
Mar-00	200003		3	13.5	19.9	66.2	25.2	69.80	69.78	83.97
Apr-00	200004		4	178.3	227.7	169.9	200.4	166.31	166.32	160.42
May-00	200005		5	129.7	218.5	53.9	30.4	149.12	149.12	160.13
Jun-00	200006		6	266.1	151.5	131.2	98.0	138.80	138.80	140.66
Jul-00	200007		7	164.2	166.3	297.7	345.6	195.52	195.53	167.72
Aug-00	200008		8	130.4	114.1	65.5	65.0	78.57	78.57	76.31
Sep-00	200009		9	367.1	235.0	397.3	265.8	371.45	371.43	435.93
Oct-00	200010		10	112.5	149.9	234.5	125.4	124.55	124.56	260.82
Nov-00	200011		11	3.2	13.1	4.2	0.0	0.19	0.21	4.12
Dec-00	200012		12	2.5	4.6	25.6	0.0	2.97	2.86	7.10

478301 : corrected monthly precipitation data from 1981-1985

month	codemonth	Row Labels	month	478301	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-81	198101	1981	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-81	198102		2	83.7	121.8	37.9	121.0	115.51	115.62	121.44
Mar-81	198103		3	5.5	13.8	13.9	26.1	1.85	1.83	4.94
Apr-81	198104		4	129.4	149.7	123.2	150.0	116.85	116.80	76.35
May-81	198105		5	191.4	328.5	107.2	148.7	141.88	141.91	138.32
Jun-81	198106		6	253.6	336.1	138.6	198.3	297.82	295.63	318.79
Jul-81	198107		7	79.3	136.8	62.4	113.4	53.80	49.15	89.58
Aug-81	198108		8	183.6	167.9	173.7	254.7	180.38	179.23	230.06
Sep-81	198109		9	218.8	312.2	281.2	250.9	212.04	214.31	132.90
Oct-81	198110		10	106.4	246.0	288.4	128.9	145.20	142.37	171.26
Nov-81	198111		11	263.9	299.1	82.6	191.2	288.04	288.36	216.78
Dec-81	198112		12	0.5	34.3	0.0	21.1	22.36	22.26	7.99
Jan-82	198201	1982	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-82	198202		2	44.3	31.0	37.9	28.5	20.69	20.42	30.29
Mar-82	198203		3	62.6	46.0	34.3	23.7	99.07	99.12	28.29
Apr-82	198204		4	208.4	230.4	36.7	173.9	151.90	151.88	158.78
May-82	198205		5	143.3	86.1	132.5	166.6	238.80	238.79	134.17
Jun-82	198206		6	321.7	121.7	177.6	164.3	212.83	210.52	129.36
Jul-82	198207		7	122.7	38.8	97.8	82.3	190.99	188.43	132.73
Aug-82	198208		8	100.5	111.3	72.9	60.1	61.46	59.29	163.73
Sep-82	198209		9	412.0	214.6	166.6	246.0	294.22	294.99	290.54
Oct-82	198210		10	142.2	116.6	57.1	177.1	122.36	119.55	132.66
Nov-82	198211		11	91.3	6.8	312.3	120.2	25.41	25.22	44.92
Dec-82	198212		12	5.9	7.0	13.2	11.3	30.55	30.64	6.41
Jan-83	198301	1983	1	0.3	12.9	0.0	35.2	1.67	2.84	10.76
Feb-83	198302		2	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Mar-83	198303		3	72.6	117.9	163.8	120.0	112.81	112.95	120.54
Apr-83	198304		4	1.5	9.9	0.0	33.9	1.28	1.27	8.47
May-83	198305		5	123.1	84.1	128.5	133.6	70.47	70.50	24.58
Jun-83	198306		6	36.6	100.8	169.3	126.9	213.47	211.12	177.80
Jul-83	198307		7	179.1	157.3	352.8	176.7	142.50	138.45	189.33
Aug-83	198308		8	418.6	348.5	421.6	414.2	463.70	469.24	380.40
Sep-83	198309		9	400.0	470.5	279.4	327.8	356.82	356.24	409.67
Oct-83	198310		10	426.1	402.9	434.4	464.8	385.19	384.28	346.59
Nov-83	198311		11	386.3	291.6	57.4	269.1	258.45	258.64	287.29
Dec-83	198312		12	20.6	7.2	9.5	5.8	0.24	0.28	8.52
Jan-84	198401	1984	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-84	198402		2	10.9	28.8	25.7	21.7	29.87	29.56	28.60
Mar-84	198403		3	22.8	45.8	19.6	23.5	31.00	30.85	66.11
Apr-84	198404		4	50.1	129.0	70.3	53.6	110.06	109.97	87.04
May-84	198405		5	91.3	137.0	199.0	54.9	114.32	114.35	67.20
Jun-84	198406		6	200.4	53.8	134.4	126.1	55.26	53.64	73.49
Jul-84	198407		7	125.3	97.2	39.9	69.3	101.13	96.32	68.81
Aug-84	198408		8	38.4	35.4	31.2	27.3	34.54	32.69	30.05
Sep-84	198409		9	252.6	206.9	192.1	225.0	178.01	180.74	220.63
Oct-84	198410		10	202.2	449.5	261.9	378.5	316.89	315.19	277.73
Nov-84	198411		11	52.7	25.1	199.0	263.8	38.56	38.33	47.28
Dec-84	198412		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Jan-85	198501	1985	1	21.5	34.6	112.6	152.6	8.96	8.95	57.34
Feb-85	198502		2	56.5	23.1	58.4	48.0	8.42	8.64	17.12
Mar-85	198503		3	52.7	13.4	21.4	20.0	19.53	19.37	7.30
Apr-85	198504		4	148.6	187.8	309.5	272.8	217.42	217.56	226.75
May-85	198505		5	319.5	329.0	291.2	385.4	235.69	235.70	350.71
Jun-85	198506		6	100.6	106.1	123.2	56.9	178.14	175.80	90.25
Jul-85	198507		7	133.8	88.8	68.6	68.3	142.85	138.83	143.03
Aug-85	198508		8	98.3	131.2	51.4	101.7	133.33	131.49	90.56
Sep-85	198509		9	151.0	205.7	184.8	223.4	195.77	198.27	254.96
Oct-85	198510		10	281.5	387.4	222.8	219.6	150.74	147.93	92.77
Nov-85	198511		11	84.8	68.7	6.2	6.9	196.93	196.93	40.36
Dec-85	198512		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00

478301 : corrected monthly precipitation data from 1986-1990

month	codemonth	Row Labels	month	478301	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-86	198601	1986	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-86	198602		2	11.5	30.7	17.8	22.0	79.94	79.79	31.16
Mar-86	198603		3	0.7	4.3	0.0	4.1	3.14	3.08	15.10
Apr-86	198604		4	71.2	66.9	73.0	59.2	11.78	11.76	91.47
May-86	198605		5	223.5	274.4	197.6	205.4	160.90	160.92	251.59
Jun-86	198606		6	47.1	165.4	81.2	203.9	90.86	88.86	172.51
Jul-86	198607		7	126.1	156.3	186.9	117.1	229.22	228.14	166.21
Aug-86	198608		8	69.0	95.8	148.5	158.5	113.88	111.84	81.41
Sep-86	198609		9	189.1	176.8	243.0	183.8	166.25	125.58	175.59
Oct-86	198610		10	216.8	295.4	86.9	92.9	218.77	216.24	185.04
Nov-86	198611		11	54.8	13.9	15.3	3.2	28.04	27.83	47.53
Dec-86	198612		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Jan-87	198701	1987	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-87	198702		2	38.1	24.6	27.0	27.3	18.34	18.09	27.52
Mar-87	198703		3	12.7	13.0	38.0	27.9	52.60	52.43	10.48
Apr-87	198704		4	63.7	94.2	45.0	31.1	47.10	47.01	110.36
May-87	198705		5	134.2	82.0	87.0	141.6	165.65	165.66	133.87
Jun-87	198706		6	211.4	292.8	299.8	323.3	347.99	345.97	253.75
Jul-87	198707		7	49.8	66.8	141.3	62.6	57.91	53.17	67.86
Aug-87	198708		8	126.6	152.4	209.5	177.1	220.84	220.41	165.77
Sep-87	198709		9	229.7	261.0	222.7	185.7	422.53	420.38	256.48
Oct-87	198710		10	341.8	199.2	344.1	426.6	303.50	301.66	319.50
Nov-87	198711		11	188.0	80.8	118.3	120.4	195.60	195.62	87.07
Dec-87	198712		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Jan-88	198801	1988	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-88	198802		2	105.5	121.8	187.9	121.0	110.94	111.01	121.68
Mar-88	198803		3	9.4	12.3	23.5	6.8	22.84	22.67	14.78
Apr-88	198804		4	121.6	30.9	129.0	182.3	80.39	80.31	104.67
May-88	198805		5	240.6	67.5	352.5	206.8	210.01	210.03	203.48
Jun-88	198806		6	96.9	148.3	240.0	102.3	85.01	83.07	43.68
Jul-88	198807		7	320.7	316.9	61.1	177.1	214.22	212.54	234.35
Aug-88	198808		8	225.6	265.2	110.8	105.5	273.94	274.66	195.06
Sep-88	198809		9	376.1	265.1	192.0	372.6	442.57	439.91	409.56
Oct-88	198810		10	291.6	223.9	243.0	259.7	437.39	437.17	332.24
Nov-88	198811		11	12.3	8.4	1.9	17.6	14.67	14.52	31.63
Dec-88	198812		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Jan-89	198901	1989	1	140.5	15.1	43.3	21.6	26.70	25.96	69.15
Feb-89	198902		2	138.2	121.8	30.8	121.0	113.94	114.04	121.97
Mar-89	198903		3	64.0	117.9	22.6	128.2	105.02	105.10	120.37
Apr-89	198904		4	72.4	16.0	71.0	75.9	74.66	74.54	9.62
May-89	198905		5	57.8	91.5	158.3	145.0	127.85	127.88	141.38
Jun-89	198906		6	39.3	37.2	42.0	40.4	60.57	58.85	31.82
Jul-89	198907		7	76.7	126.4	84.5	108.5	107.50	102.79	150.46
Aug-89	198908		8	131.6	47.4	57.3	90.9	34.78	32.92	69.12
Sep-89	198909		9	208.1	243.6	262.1	280.1	277.78	278.88	253.76
Oct-89	198910		10	284.6	231.5	443.7	267.3	291.01	289.04	284.64
Nov-89	198911		11	36.3	103.5	103.5	29.4	161.98	161.89	44.94
Dec-89	198912		12	4.5	1.8	0.0	23.0	0.58	0.51	4.43
Jan-90	199001	1990	1	33.8	53.8	29.3	7.4	19.76	18.94	45.39
Feb-90	199002		2	1.0	23.8	26.8	18.4	0.00	4.81	16.22
Mar-90	199003		3	61.6	25.4	125.7	23.7	46.08	45.91	7.04
Apr-90	199004		4	14.7	76.2	105.2	86.3	164.32	164.32	86.23
May-90	199005		5	154.5	153.5	146.6	145.5	122.33	122.37	114.07
Jun-90	199006		6	38.7	72.3	36.8	125.3	74.36	72.51	82.91
Jul-90	199007		7	31.1	74.9	85.4	75.6	74.62	69.71	42.55
Aug-90	199008		8	82.2	9.6	189.0	88.2	63.81	61.63	130.93
Sep-90	199009		9	222.7	155.8	162.9	139.1	148.80	151.83	155.50
Oct-90	199010		10	230.9	129.3	203.9	217.9	207.82	205.22	256.03
Nov-90	199011		11	31.8	9.9	50.5	42.9	20.14	19.97	90.77
Dec-90	199012		12	2.4	1.0	3.6	0.4	1.28	1.14	9.07

478301 : corrected monthly precipitation data from 1991-1995

month	codemonth	Row Labels	month	478301	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-91	199101	1991	1	0.9	11.7	0.0	18.2	0.00	3.30	31.65
Feb-91	199102		2	40.8	26.5	36.3	30.2	35.44	35.11	29.95
Mar-91	199103		3	21.4	6.1	9.3	5.7	0.96	0.96	35.17
Apr-91	199104		4	144.8	7.6	10.7	13.5	45.82	45.70	62.92
May-91	199105		5	191.3	257.7	171.2	217.3	181.18	181.21	186.49
Jun-91	199106		6	123.2	103.6	111.6	126.4	90.81	88.81	79.31
Jul-91	199107		7	150.5	216.7	114.7	120.2	102.22	97.42	99.03
Aug-91	199108		8	59.3	165.2	93.6	109.0	185.05	183.97	166.54
Sep-91	199109		9	151.2	231.1	244.3	175.9	190.29	192.86	222.72
Oct-91	199110		10	304.5	112.2	302.3	216.7	218.39	215.83	128.48
Nov-91	199111		11	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Dec-91	199112		12	0.1	2.9	0.0	3.7	10.43	10.14	11.67
Jan-92	199201	1992	1	31.1	53.1	49.9	32.2	39.04	38.20	32.27
Feb-92	199202		2	5.5	23.0	8.7	0.0	48.33	48.03	0.62
Mar-92	199203		3	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Apr-92	199204		4	51.9	62.2	114.3	77.9	22.08	22.00	23.86
May-92	199205		5	18.5	89.8	127.4	103.0	41.19	41.21	60.07
Jun-92	199206		6	190.8	202.4	151.1	150.9	351.62	349.58	125.16
Jul-92	199207		7	407.8	454.0	207.3	413.9	479.23	491.24	496.46
Aug-92	199208		8	155.6	110.4	106.8	111.3	94.58	92.43	78.87
Sep-92	199209		9	140.4	142.5	108.4	156.7	121.78	124.98	70.10
Oct-92	199210		10	325.1	324.4	187.3	286.1	342.48	341.06	296.80
Nov-92	199211		11	20.4	141.7	78.2	90.4	78.62	78.37	90.84
Dec-92	199212		12	10.5	7.1	17.4	6.3	0.57	0.55	14.95
Jan-93	199301	1993	1	91.6	129.4	59.3	22.9	136.47	137.35	20.13
Feb-93	199302		2	44.2	27.3	29.3	24.6	21.24	20.96	29.30
Mar-93	199303		3	106.9	153.6	34.6	145.5	126.67	126.92	129.53
Apr-93	199304		4	83.1	186.0	49.1	187.5	199.07	199.14	170.90
May-93	199305		5	134.3	125.3	177.6	171.6	131.13	131.16	100.62
Jun-93	199306		6	37.7	12.7	92.0	16.5	14.18	13.42	44.35
Jul-93	199307		7	67.9	47.6	92.2	66.2	21.97	18.72	109.08
Aug-93	199308		8	106.3	274.8	142.0	113.7	102.19	100.08	116.56
Sep-93	199309		9	268.0	307.4	149.6	183.3	242.61	244.36	280.81
Oct-93	199310		10	246.9	272.8	196.0	193.6	337.30	335.83	309.26
Nov-93	199311		11	83.8	49.1	75.0	71.2	21.48	21.29	42.25
Dec-93	199312		12	1.2	1.2	11.0	15.0	2.87	2.65	10.84
Jan-94	199401	1994	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-94	199402		2	0.2	33.1	19.1	33.6	25.78	25.45	26.08
Mar-94	199403		3	126.9	12.2	19.6	16.7	71.21	71.14	11.74
Apr-94	199404		4	28.5	7.7	17.9	70.8	24.87	24.79	22.39
May-94	199405		5	432.4	275.5	410.7	361.9	368.68	368.59	392.56
Jun-94	199406		6	287.1	324.8	457.4	415.2	168.95	166.65	369.66
Jul-94	199407		7	111.5	116.6	85.4	73.8	138.37	134.20	171.73
Aug-94	199408		8	136.2	64.8	100.7	94.8	114.33	112.31	67.17
Sep-94	199409		9	120.1	149.6	133.3	113.3	168.92	171.74	148.12
Oct-94	199410		10	39.7	108.0	243.9	215.5	74.08	71.55	180.90
Nov-94	199411		11	15.2	2.7	0.8	0.4	0.13	0.14	54.60
Dec-94	199412		12	1.1	2.2	5.0	0.9	0.30	0.27	12.52
Jan-95	199501	1995	1	21.7	18.3	16.5	3.0	41.13	40.15	65.88
Feb-95	199502		2	12.1	29.4	16.2	19.8	14.67	14.52	23.91
Mar-95	199503		3	31.5	7.5	32.3	20.3	15.47	15.33	13.55
Apr-95	199504		4	64.5	81.0	26.2	4.7	126.39	126.32	81.79
May-95	199505		5	194.5	46.8	224.3	170.8	144.84	144.88	237.05
Jun-95	199506		6	194.0	257.3	351.9	250.6	234.37	232.03	216.67
Jul-95	199507		7	310.0	276.0	365.1	384.7	344.78	349.22	309.91
Aug-95	199508		8	273.7	364.6	387.7	425.3	264.29	264.78	442.99
Sep-95	199509		9	333.7	350.8	329.1	252.8	243.64	245.39	278.16
Oct-95	199510		10	187.2	370.6	337.3	172.3	192.37	189.68	209.33
Nov-95	199511		11	124.7	40.2	336.9	24.8	74.57	74.32	40.48
Dec-95	199512		12	5.2	4.3	9.4	1.1	2.39	2.19	3.85

478301 : corrected monthly precipitation data from 1996-2000

month	codemonth	Row Labels	month	478301	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-96	199601	1996	1	27.3	17.6	35.6	12.3	15.26	14.60	31.68
Feb-96	199602		2	48.8	30.2	34.8	29.0	0.00	5.68	23.44
Mar-96	199603		3	141.6	117.9	28.8	120.1	104.81	104.90	121.49
Apr-96	199604		4	112.5	72.0	90.3	38.5	146.46	146.43	129.24
May-96	199605		5	179.7	230.9	179.9	137.1	201.04	201.06	161.18
Jun-96	199606		6	393.2	370.0	222.6	396.2	325.66	323.54	428.97
Jul-96	199607		7	268.7	208.6	343.8	362.6	199.21	197.00	264.22
Aug-96	199608		8	174.6	149.1	177.6	138.6	121.84	119.90	106.61
Sep-96	199609		9	296.3	210.5	369.3	323.2	275.33	276.49	351.34
Oct-96	199610		10	324.5	289.3	257.8	259.3	290.86	288.91	186.69
Nov-96	199611		11	214.7	293.4	97.6	272.4	223.09	223.19	383.90
Dec-96	199612		12	0.4	9.1	11.7	7.8	24.36	24.30	8.13
Jan-97	199701	1997	1	1.4	16.2	0.0	63.4	4.31	4.81	0.00
Feb-97	199702		2	63.3	25.8	31.5	26.4	68.78	68.58	35.58
Mar-97	199703		3	13.4	5.3	7.7	3.8	4.60	4.54	41.40
Apr-97	199704		4	103.2	54.2	73.4	63.2	65.60	65.51	40.07
May-97	199705		5	182.3	128.9	119.1	301.5	128.82	128.85	211.60
Jun-97	199706		6	4.6	50.7	11.9	57.6	60.00	58.30	85.42
Jul-97	199707		7	57.4	70.9	36.1	102.3	156.58	152.92	98.52
Aug-97	199708		8	46.7	125.5	44.8	109.8	124.79	122.87	125.80
Sep-97	199709		9	236.4	292.0	199.4	187.7	200.17	202.60	214.49
Oct-97	199710		10	284.4	330.9	185.7	380.8	368.07	366.95	460.03
Nov-97	199711		11	87.9	232.8	233.6	258.0	146.32	146.18	186.38
Dec-97	199712		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Jan-98	199801	1998	1	24.3	73.0	46.6	24.9	90.81	90.65	33.93
Feb-98	199802		2	10.1	26.7	50.9	41.9	18.07	17.83	30.98
Mar-98	199803		3	9.2	21.7	42.0	31.4	10.34	10.24	25.28
Apr-98	199804		4	67.1	8.0	180.6	59.7	40.56	40.46	57.04
May-98	199805		5	123.4	142.3	76.9	94.0	101.04	101.08	189.81
Jun-98	199806		6	163.2	165.5	164.7	82.9	41.82	40.42	164.78
Jul-98	199807		7	296.7	278.7	326.2	294.9	163.07	159.62	124.16
Aug-98	199808		8	346.4	160.0	196.5	152.2	141.36	139.63	138.21
Sep-98	199809		9	289.1	313.8	241.5	290.5	300.49	301.15	316.69
Oct-98	199810		10	241.0	209.6	338.9	322.8	309.36	307.58	247.52
Nov-98	199811		11	58.2	100.4	6.9	9.6	74.75	74.51	84.61
Dec-98	199812		12	42.7	31.6	7.8	19.6	16.19	15.98	15.17
Jan-99	199901	1999	1	5.2	7.5	52.1	30.2	13.04	12.53	22.64
Feb-99	199902		2	28.3	30.6	48.4	20.2	16.19	16.06	36.61
Mar-99	199903		3	55.4	29.9	130.2	17.1	5.21	5.18	46.22
Apr-99	199904		4	114.7	162.3	198.5	86.6	60.80	60.71	137.47
May-99	199905		5	211.2	284.2	83.5	102.7	422.29	422.17	215.10
Jun-99	199906		6	226.8	128.5	98.8	132.6	205.42	203.08	207.85
Jul-99	199907		7	39.0	60.2	85.7	81.4	98.12	93.27	58.38
Aug-99	199908		8	73.3	84.7	130.7	136.3	156.73	155.21	100.90
Sep-99	199909		9	168.8	214.7	488.7	487.1	198.69	201.14	181.08
Oct-99	199910		10	280.1	248.5	278.2	228.8	273.58	271.46	346.67
Nov-99	199911		11	68.8	17.1	66.3	57.4	68.95	68.71	82.38
Dec-99	199912		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Jan-00	200001	2000	1	38.4	12.3	32.0	21.0	44.69	43.74	58.22
Feb-00	200002		2	33.4	31.2	44.0	36.4	15.60	15.48	27.99
Mar-00	200003		3	7.2	7.3	39.1	24.5	33.91	33.73	44.22
Apr-00	200004		4	348.6	297.9	236.8	266.0	291.78	292.16	316.30
May-00	200005		5	58.4	190.3	30.5	12.8	102.69	103.07	91.78
Jun-00	200006		6	271.3	191.0	129.9	134.8	135.88	175.03	133.91
Jul-00	200007		7	86.8	35.7	185.1	57.1	16.62	55.89	14.93
Aug-00	200008		8	86.4	67.5	67.4	37.1	34.81	53.20	29.25
Sep-00	200009		9	118.1	58.2	327.7	182.9	156.50	170.62	159.07
Oct-00	200010		10	430.0	222.9	270.9	279.2	202.51	240.79	416.90
Nov-00	200011		11	6.4	6.9	5.3	3.2	0.00	0.39	6.57
Dec-00	200012		12	11.9	0.0	29.5	0.0	0.00	0.94	0.00

480201 : corrected monthly precipitation data from 1981-1985

month	codemonth	Row Labels	month	480201	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-81	198101	1981	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-81	198102		2	93.1	26.1	17.5	20.1	43.66	43.64	97.34
Mar-81	198103		3	81.7	54.4	49.5	9.6	16.33	16.25	35.32
Apr-81	198104		4	121.4	129.5	164.0	94.3	112.26	112.16	156.65
May-81	198105		5	372.2	505.0	318.3	290.2	211.74	204.20	309.83
Jun-81	198106		6	460.8	701.2	550.8	719.9	640.86	631.83	675.11
Jul-81	198107		7	607.8	782.3	702.1	643.7	491.76	493.75	632.66
Aug-81	198108		8	493.6	422.2	656.5	321.2	521.88	521.32	625.41
Sep-81	198109		9	571.6	697.1	615.3	550.0	466.79	457.23	414.40
Oct-81	198110		10	238.4	446.3	310.5	132.6	257.80	260.04	329.94
Nov-81	198111		11	40.4	190.3	105.4	57.3	140.28	138.31	65.76
Dec-81	198112		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Jan-82	198201	1982	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-82	198202		2	10.7	77.9	42.7	0.0	13.28	13.20	13.99
Mar-82	198203		3	26.1	124.3	79.6	24.6	60.22	60.04	50.42
Apr-82	198204		4	136.3	203.6	90.3	120.0	88.67	88.70	134.70
May-82	198205		5	220.0	229.9	414.7	281.3	509.22	524.43	294.08
Jun-82	198206		6	697.2	484.6	531.3	717.7	649.76	695.42	533.84
Jul-82	198207		7	676.2	448.1	671.9	556.6	826.92	828.70	890.49
Aug-82	198208		8	559.8	608.9	508.3	616.2	710.81	627.23	738.30
Sep-82	198209		9	323.1	311.8	384.9	254.5	478.00	481.32	410.41
Oct-82	198210		10	139.3	161.0	167.9	287.4	260.19	262.60	124.56
Nov-82	198211		11	65.0	33.2	109.3	53.5	37.27	37.37	48.48
Dec-82	198212		12	9.7	7.7	13.7	4.1	11.80	11.78	4.20
Jan-83	198301	1983	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-83	198302		2	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Mar-83	198303		3	26.7	12.8	36.7	4.8	10.15	10.09	10.93
Apr-83	198304		4	1.9	10.2	31.8	4.2	14.98	15.15	5.96
May-83	198305		5	578.4	284.5	323.7	200.9	336.92	337.22	214.15
Jun-83	198306		6	568.1	404.1	482.5	419.8	644.56	583.62	574.40
Jul-83	198307		7	477.6	600.7	567.1	799.2	385.20	428.24	509.97
Aug-83	198308		8	889.6	695.8	655.9	809.5	756.44	794.01	683.47
Sep-83	198309		9	605.0	635.9	686.2	649.7	650.04	688.03	580.80
Oct-83	198310		10	765.8	682.8	743.4	674.6	556.43	550.37	473.52
Nov-83	198311		11	175.3	232.0	210.5	236.0	164.28	172.42	260.52
Dec-83	198312		12	0.8	9.7	6.0	24.1	0.00	0.43	3.34
Jan-84	198401	1984	1	15.9	19.6	8.3	23.6	10.50	10.52	4.72
Feb-84	198402		2	9.9	44.1	36.4	86.6	21.59	21.50	8.67
Mar-84	198403		3	32.2	96.6	16.3	75.1	147.87	148.06	145.42
Apr-84	198404		4	256.4	353.4	287.1	357.7	424.47	424.17	444.08
May-84	198405		5	514.5	313.8	209.1	326.7	391.62	396.28	232.52
Jun-84	198406		6	630.7	756.4	868.8	961.7	820.88	852.44	847.27
Jul-84	198407		7	249.9	344.1	321.0	348.8	383.06	380.73	255.58
Aug-84	198408		8	536.2	388.0	398.2	494.3	479.49	508.98	578.64
Sep-84	198409		9	434.8	346.0	332.6	325.2	329.52	335.19	327.24
Oct-84	198410		10	199.9	411.7	466.3	169.5	265.27	268.06	147.22
Nov-84	198411		11	55.8	43.3	180.7	22.6	36.22	36.32	31.47
Dec-84	198412		12	18.0	3.1	3.1	1.2	0.00	0.40	2.52
Jan-85	198501	1985	1	25.1	7.9	60.8	0.0	8.40	8.40	32.07
Feb-85	198502		2	22.6	13.0	144.5	12.8	17.86	17.83	54.91
Mar-85	198503		3	71.8	38.2	25.4	134.6	133.25	133.37	74.23
Apr-85	198504		4	164.4	93.7	258.7	143.4	264.82	263.87	88.81
May-85	198505		5	262.4	316.0	347.1	462.2	285.09	281.75	310.55
Jun-85	198506		6	450.4	489.5	375.1	508.9	536.20	522.30	388.62
Jul-85	198507		7	412.9	522.2	447.4	433.5	580.85	553.86	627.48
Aug-85	198508		8	367.2	549.5	448.0	586.2	328.45	333.09	324.25
Sep-85	198509		9	374.7	502.7	546.6	426.1	614.06	549.50	567.15
Oct-85	198510		10	374.2	441.7	217.2	192.2	168.13	164.48	101.69
Nov-85	198511		11	20.1	90.2	9.8	77.9	101.45	100.38	40.14
Dec-85	198512		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00

480201 : corrected monthly precipitation data from 1986-1990

month	codemonth	Row Labels	month	480201	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-86	198601	1986	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-86	198602		2	0.9	6.3	10.7	112.8	3.59	3.55	5.90
Mar-86	198603		3	0.1	10.9	0.5	1.5	9.26	9.19	7.27
Apr-86	198604		4	81.4	103.8	127.5	129.9	99.24	99.22	73.59
May-86	198605		5	625.1	562.3	433.9	625.5	494.92	552.82	538.66
Jun-86	198606		6	649.8	820.7	872.4	641.6	757.11	818.44	828.56
Jul-86	198607		7	262.0	387.9	453.5	372.5	451.78	451.55	443.78
Aug-86	198608		8	461.3	611.8	713.5	633.5	537.19	555.60	571.07
Sep-86	198609		9	273.3	355.6	298.0	461.8	222.67	229.20	417.08
Oct-86	198610		10	297.9	382.9	60.6	484.5	263.81	266.52	212.64
Nov-86	198611		11	81.6	33.4	24.6	3.2	51.42	51.31	52.17
Dec-86	198612		12	1.4	3.1	20.4	11.0	5.26	5.26	25.40
Jan-87	198701	1987	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-87	198702		2	16.1	10.7	44.0	22.1	0.00	0.10	13.85
Mar-87	198703		3	18.5	39.1	103.0	36.8	43.50	43.34	58.00
Apr-87	198704		4	31.4	109.6	31.4	57.4	30.62	30.84	83.65
May-87	198705		5	138.4	199.9	219.6	288.4	326.84	326.38	226.76
Jun-87	198706		6	835.4	893.4	951.9	844.8	1013.42	889.02	1007.57
Jul-87	198707		7	313.5	347.0	400.9	462.6	257.46	252.22	397.59
Aug-87	198708		8	610.2	544.7	550.2	488.9	596.32	596.72	492.95
Sep-87	198709		9	367.7	472.7	352.7	474.8	881.02	877.25	532.63
Oct-87	198710		10	246.9	136.0	377.1	318.0	157.87	153.67	241.10
Nov-87	198711		11	220.4	84.6	125.2	140.9	170.32	167.57	77.03
Dec-87	198712		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Jan-88	198801	1988	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-88	198802		2	150.8	16.4	13.1	19.8	0.57	0.72	71.41
Mar-88	198803		3	33.3	26.1	204.7	32.6	5.32	5.31	25.28
Apr-88	198804		4	137.7	61.0	326.9	117.2	127.71	127.54	138.01
May-88	198805		5	389.8	211.2	504.5	311.1	460.98	471.71	456.71
Jun-88	198806		6	733.4	829.1	727.1	541.2	750.83	787.46	608.27
Jul-88	198807		7	597.2	502.8	201.6	343.0	261.14	255.94	377.91
Aug-88	198808		8	418.2	530.9	308.0	447.3	557.48	558.63	441.19
Sep-88	198809		9	334.5	215.1	247.6	412.6	351.76	357.13	303.24
Oct-88	198810		10	531.6	344.8	390.1	414.2	714.89	701.13	554.63
Nov-88	198811		11	4.2	13.9	15.3	1.1	0.25	0.28	7.31
Dec-88	198812		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Jan-89	198901	1989	1	40.3	13.8	11.3	45.9	54.22	54.22	31.98
Feb-89	198902		2	28.3	13.1	16.2	18.8	101.89	101.89	33.32
Mar-89	198903		3	89.8	21.4	35.2	66.5	56.72	56.56	5.64
Apr-89	198904		4	68.1	41.1	20.1	37.0	75.90	75.95	52.28
May-89	198905		5	311.2	287.7	446.7	433.4	284.06	280.65	335.49
Jun-89	198906		6	272.2	406.5	327.5	155.8	365.40	351.04	320.15
Jul-89	198907		7	299.3	282.7	269.6	328.9	242.57	237.03	266.50
Aug-89	198908		8	500.0	637.2	736.4	559.5	559.17	468.50	698.11
Sep-89	198909		9	291.1	521.1	556.8	578.9	681.40	675.58	586.31
Oct-89	198910		10	274.7	187.5	256.6	441.5	199.05	197.17	273.58
Nov-89	198911		11	82.8	39.5	45.3	85.1	111.46	110.15	36.01
Dec-89	198912		12	8.0	4.5	6.6	0.0	2.53	2.52	1.54
Jan-90	199001	1990	1	8.7	45.6	8.2	21.8	0.00	2.21	33.14
Feb-90	199002		2	3.2	13.9	15.8	18.6	0.00	0.06	8.26
Mar-90	199003		3	166.9	126.4	11.5	106.0	152.49	152.74	26.21
Apr-90	199004		4	110.9	109.7	82.4	93.5	122.17	121.99	89.51
May-90	199005		5	445.1	486.6	588.7	450.9	432.40	417.47	601.58
Jun-90	199006		6	375.5	478.9	591.4	585.2	427.06	408.07	525.06
Jul-90	199007		7	374.0	468.6	560.6	450.8	580.65	574.23	534.16
Aug-90	199008		8	643.3	235.1	600.9	478.0	508.55	524.36	610.92
Sep-90	199009		9	744.7	750.1	672.9	599.4	716.55	840.86	748.92
Oct-90	199010		10	387.8	294.5	412.9	498.6	394.17	433.50	566.47
Nov-90	199011		11	43.8	35.3	43.9	63.1	47.21	47.18	65.63
Dec-90	199012		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00

480201 : corrected monthly precipitation data from 1991-1995

month	codemonth	Row Labels	month	480201	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-91	199101	1991	1	4.5	21.0	19.9	0.0	1.74	2.83	9.91
Feb-91	199102		2	59.6	41.6	51.9	31.0	107.11	107.15	97.48
Mar-91	199103		3	26.4	50.4	66.1	14.0	2.95	2.96	74.63
Apr-91	199104		4	94.6	5.5	14.8	17.2	46.71	46.87	38.28
May-91	199105		5	272.8	448.6	439.9	297.2	271.67	267.47	323.50
Jun-91	199106		6	307.1	433.5	436.0	387.9	356.29	341.96	395.82
Jul-91	199107		7	455.1	579.6	414.1	413.9	440.42	439.85	306.44
Aug-91	199108		8	579.7	613.4	468.2	686.8	602.26	567.80	620.88
Sep-91	199109		9	962.9	852.1	776.4	945.4	825.06	798.00	1098.30
Oct-91	199110		10	313.5	161.3	351.3	198.9	401.06	415.75	163.07
Nov-91	199111		11	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Dec-91	199112		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Jan-92	199201	1992	1	14.6	28.6	11.9	43.7	29.83	29.79	14.96
Feb-92	199202		2	2.0	165.3	14.8	33.6	90.95	90.92	25.59
Mar-92	199203		3	6.3	20.5	1.0	4.5	6.68	6.64	15.67
Apr-92	199204		4	34.5	74.8	83.0	50.8	32.10	32.30	28.74
May-92	199205		5	189.0	392.8	424.2	264.5	227.58	220.79	282.62
Jun-92	199206		6	396.1	333.5	291.0	774.0	360.14	345.80	331.60
Jul-92	199207		7	420.4	394.3	207.2	368.9	488.26	489.24	442.89
Aug-92	199208		8	576.4	576.1	476.6	487.8	641.60	716.72	511.41
Sep-92	199209		9	359.4	410.4	381.1	258.4	290.09	296.19	226.82
Oct-92	199210		10	222.7	268.6	205.4	187.2	209.24	208.01	226.17
Nov-92	199211		11	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Dec-92	199212		12	30.9	9.7	20.3	24.1	4.73	4.74	23.65
Jan-93	199301	1993	1	37.4	20.7	13.1	18.1	39.34	39.33	4.10
Feb-93	199302		2	7.5	13.3	11.4	52.1	44.58	44.48	22.36
Mar-93	199303		3	164.8	233.8	56.3	172.4	99.61	99.56	96.14
Apr-93	199304		4	59.8	39.4	63.7	34.6	58.36	58.48	23.06
May-93	199305		5	203.3	238.3	274.4	153.4	253.27	247.90	208.11
Jun-93	199306		6	396.4	443.8	353.2	401.9	336.73	322.48	467.69
Jul-93	199307		7	308.5	246.3	351.4	290.3	225.74	219.96	409.21
Aug-93	199308		8	545.5	659.7	452.2	366.4	473.70	476.33	447.18
Sep-93	199309		9	889.1	894.0	645.4	887.5	776.80	762.75	725.65
Oct-93	199310		10	261.2	339.3	199.9	269.1	392.89	406.80	390.84
Nov-93	199311		11	13.2	19.9	60.9	15.2	0.71	0.77	14.46
Dec-93	199312		12	0.4	5.8	8.6	0.0	4.87	4.86	8.43
Jan-94	199401	1994	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-94	199402		2	48.5	12.5	23.0	3.6	0.26	0.37	1.74
Mar-94	199403		3	131.9	92.0	54.2	150.3	150.57	150.81	55.02
Apr-94	199404		4	45.8	43.2	65.4	55.9	15.48	15.70	70.46
May-94	199405		5	301.1	373.5	538.3	511.4	456.47	466.79	421.43
Jun-94	199406		6	772.7	798.6	732.4	640.6	510.79	495.71	656.16
Jul-94	199407		7	230.7	464.3	463.9	348.1	395.68	393.72	360.26
Aug-94	199408		8	714.7	665.1	674.5	641.6	681.38	625.06	639.74
Sep-94	199409		9	716.0	542.9	351.7	281.7	366.86	372.03	451.69
Oct-94	199410		10	133.4	162.5	253.4	378.2	86.64	80.16	295.93
Nov-94	199411		11	9.0	7.4	0.2	0.3	1.65	1.75	37.26
Dec-94	199412		12	3.2	9.9	1.1	6.0	31.94	31.95	25.88
Jan-95	199501	1995	1	20.3	7.8	9.0	9.8	1.85	2.77	37.07
Feb-95	199502		2	48.7	83.1	11.1	142.4	5.20	5.28	43.92
Mar-95	199503		3	53.4	18.3	36.8	36.2	30.70	30.55	12.22
Apr-95	199504		4	68.3	121.0	18.8	212.3	105.84	105.77	92.83
May-95	199505		5	385.0	118.3	219.5	217.1	146.27	136.39	277.66
Jun-95	199506		6	705.4	554.8	638.9	592.0	632.97	586.70	584.30
Jul-95	199507		7	529.9	397.8	380.2	381.2	428.65	427.67	376.62
Aug-95	199508		8	736.9	800.7	821.9	777.8	755.96	765.18	737.77
Sep-95	199509		9	699.4	809.4	666.1	846.2	702.29	659.45	754.22
Oct-95	199510		10	350.2	475.1	190.6	173.5	316.56	323.57	279.42
Nov-95	199511		11	10.7	74.4	38.7	61.6	24.86	25.07	39.39
Dec-95	199512		12	1.9	5.0	4.4	0.0	2.56	2.55	0.06

480201 : corrected monthly precipitation data from 1996-2000

month	codemonth	Row Labels	month	480201	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-96	199601	1996	1	5.1	21.6	11.4	0.0	0.00	2.34	21.58
Feb-96	199602		2	59.1	10.3	20.5	75.0	0.63	0.74	3.80
Mar-96	199603		3	14.7	59.3	64.0	21.1	7.12	7.08	18.63
Apr-96	199604		4	122.6	79.0	86.4	58.0	108.54	108.44	150.96
May-96	199605		5	372.6	404.8	364.8	403.8	302.50	300.34	367.91
Jun-96	199606		6	378.0	231.6	335.2	286.1	203.40	190.67	270.91
Jul-96	199607		7	417.3	329.3	422.7	381.2	422.09	420.93	391.46
Aug-96	199608		8	325.5	451.8	444.9	582.5	389.77	393.64	367.09
Sep-96	199609		9	512.0	254.1	571.4	341.1	432.25	436.41	432.87
Oct-96	199610		10	303.2	273.8	243.7	161.5	270.87	274.13	184.09
Nov-96	199611		11	120.7	45.8	94.8	121.4	4.03	4.22	154.63
Dec-96	199612		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Jan-97	199701	1997	1	6.6	8.2	21.5	0.0	9.62	9.60	0.00
Feb-97	199702		2	90.4	55.9	22.9	10.9	69.50	69.47	10.99
Mar-97	199703		3	150.0	18.6	1.4	59.9	22.03	21.90	94.05
Apr-97	199704		4	78.1	77.5	87.6	101.6	112.72	112.60	77.85
May-97	199705		5	204.9	187.0	178.1	247.0	341.42	342.05	242.68
Jun-97	199706		6	165.9	301.7	304.1	417.6	357.93	343.57	343.15
Jul-97	199707		7	512.0	230.8	360.2	320.9	417.82	416.52	339.40
Aug-97	199708		8	378.9	372.4	330.5	242.0	279.61	284.66	387.95
Sep-97	199709		9	436.2	438.4	310.5	414.9	325.38	360.91	381.42
Oct-97	199710		10	257.8	166.0	202.3	246.2	207.34	206.00	251.49
Nov-97	199711		11	42.5	109.8	28.8	117.7	91.33	90.47	40.33
Dec-97	199712		12	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Jan-98	199801	1998	1	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Feb-98	199802		2	22.0	24.4	137.0	10.7	92.17	92.20	30.65
Mar-98	199803		3	3.4	50.7	180.5	37.3	50.53	50.35	49.80
Apr-98	199804		4	21.4	4.0	43.4	13.1	16.67	16.88	52.55
May-98	199805		5	499.8	489.2	374.5	592.7	395.89	397.78	691.69
Jun-98	199806		6	867.7	655.6	574.3	502.4	639.12	685.31	700.57
Jul-98	199807		7	520.3	716.1	596.0	440.1	552.24	554.22	490.60
Aug-98	199808		8	443.4	502.7	545.2	434.9	535.48	589.53	511.18
Sep-98	199809		9	569.9	586.4	619.9	526.9	606.08	574.83	592.55
Oct-98	199810		10	168.6	153.3	290.1	163.3	243.61	244.78	239.10
Nov-98	199811		11	18.2	62.1	8.8	17.4	59.95	59.71	82.66
Dec-98	199812		12	17.0	39.5	24.7	12.7	6.47	6.49	6.87
Jan-99	199901	1999	1	1.1	16.7	17.5	22.2	14.14	14.09	4.94
Feb-99	199902		2	25.4	23.0	17.8	12.8	72.26	72.24	33.88
Mar-99	199903		3	55.8	64.4	50.4	111.5	57.48	57.33	94.03
Apr-99	199904		4	463.4	362.6	323.1	257.5	274.27	276.10	336.13
May-99	199905		5	480.4	573.7	447.9	548.1	751.47	705.78	509.25
Jun-99	199906		6	394.0	259.6	374.4	226.7	349.74	335.40	290.12
Jul-99	199907		7	731.4	432.2	518.5	589.7	586.26	536.14	381.34
Aug-99	199908		8	331.7	304.0	467.8	546.2	428.21	431.54	333.47
Sep-99	199909		9	619.9	525.0	1049.3	695.0	464.26	423.08	554.36
Oct-99	199910		10	308.5	313.1	277.9	272.0	380.76	326.95	472.40
Nov-99	199911		11	97.8	31.5	48.5	39.2	131.53	129.76	77.35
Dec-99	199912		12	0.3	4.0	1.6	7.1	29.23	29.22	1.71
Jan-00	200001	2000	1	35.0	14.4	17.9	11.9	10.91	10.95	22.25
Feb-00	200002		2	28.0	69.5	67.9	42.3	40.48	40.48	146.49
Mar-00	200003		3	25.5	61.8	103.5	88.8	117.93	117.98	227.40
Apr-00	200004		4	179.8	250.8	72.6	319.6	148.66	148.38	115.11
May-00	200005		5	382.1	522.4	86.7	246.2	277.69	273.87	302.70
Jun-00	200006		6	720.3	498.6	455.3	443.7	425.98	587.39	432.50
Jul-00	200007		7	516.7	431.4	603.4	686.7	492.19	556.62	468.22
Aug-00	200008		8	488.8	432.2	344.7	399.3	255.21	260.46	280.28
Sep-00	200009		9	325.1	287.5	345.4	481.2	229.17	235.67	307.67
Oct-00	200010		10	235.5	228.8	388.6	340.0	256.92	259.09	482.79
Nov-00	200011		11	74.9	39.4	9.2	55.9	6.19	6.40	57.95
Dec-00	200012		12	18.8	8.4	6.7	22.6	3.95	3.97	7.30

459201 : corrected monthly precipitation data from 2046-2050

month	codemonth	Row Labels	month	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-51	205101	2051	1	2.9	4.4	0.0	5.91	6.03	1.84
Feb-51	205102		2	7.1	7.2	17.5	17.63	17.67	39.33
Mar-51	205103		3	24.6	17.3	38.5	48.47	48.48	45.42
Apr-51	205104		4	13.9	91.0	19.4	44.56	44.50	75.04
May-51	205105		5	86.3	140.8	137.6	101.34	101.35	262.23
Jun-51	205106		6	150.4	46.8	278.0	192.90	193.11	138.18
Jul-51	205107		7	249.6	134.4	73.9	106.16	106.10	10.65
Aug-51	205108		8	147.7	81.7	145.6	187.62	187.56	107.23
Sep-51	205109		9	320.4	423.6	353.1	347.43	347.46	447.67
Oct-51	205110		10	364.8	150.4	189.5	142.13	142.24	135.50
Nov-51	205111		11	22.1	5.1	51.5	6.52	6.48	28.56
Dec-51	205112		12	1.0	20.1	1.0	0.49	0.66	0.00
Jan-52	205201	2052	1	3.1	4.0	0.0	0.00	0.00	3.36
Feb-52	205202		2	20.9	16.5	8.2	0.49	0.53	53.64
Mar-52	205203		3	41.6	46.4	10.7	12.10	12.07	77.06
Apr-52	205204		4	69.3	77.4	188.5	4.75	4.73	21.36
May-52	205205		5	151.3	236.0	114.9	210.58	210.56	217.33
Jun-52	205206		6	113.2	58.9	246.6	72.93	71.73	225.18
Jul-52	205207		7	75.4	43.2	181.5	177.32	177.33	289.62
Aug-52	205208		8	21.7	606.7	96.6	34.12	33.75	179.35
Sep-52	205209		9	409.3	191.6	157.3	177.28	177.21	291.97
Oct-52	205210		10	324.4	259.7	121.3	135.91	136.00	56.73
Nov-52	205211		11	26.2	48.1	214.6	210.82	211.00	43.55
Dec-52	205212		12	0.3	11.9	0.0	0.01	0.02	23.11
Jan-53	205301	2053	1	52.4	5.2	6.5	13.79	13.97	1.65
Feb-53	205302		2	8.9	6.9	59.8	10.23	10.29	4.40
Mar-53	205303		3	42.1	35.1	68.0	33.79	33.77	19.54
Apr-53	205304		4	106.3	64.8	113.6	50.15	50.08	72.66
May-53	205305		5	238.5	180.7	95.2	165.27	165.28	205.23
Jun-53	205306		6	296.9	197.9	258.7	195.30	195.56	209.96
Jul-53	205307		7	37.0	74.8	151.3	119.36	119.29	137.43
Aug-53	205308		8	222.7	118.4	262.2	148.25	148.05	41.80
Sep-53	205309		9	281.1	106.9	336.5	351.38	351.43	218.85
Oct-53	205310		10	295.4	383.8	167.2	359.10	358.99	202.90
Nov-53	205311		11	114.7	244.6	1.7	6.72	6.68	124.94
Dec-53	205312		12	0.6	1.1	0.4	0.00	0.00	0.46
Jan-54	205401	2054	1	2.2	3.0	0.0	11.30	11.43	3.40
Feb-54	205402		2	29.8	30.7	0.7	9.17	9.22	8.78
Mar-54	205403		3	23.8	38.8	30.5	74.48	74.56	37.01
Apr-54	205404		4	74.5	47.9	19.6	74.09	74.04	23.04
May-54	205405		5	204.3	57.4	199.6	234.20	234.19	157.39
Jun-54	205406		6	47.8	388.4	158.5	192.13	192.34	134.64
Jul-54	205407		7	167.8	160.6	119.7	195.36	195.37	160.76
Aug-54	205408		8	239.1	91.3	69.3	36.03	35.65	117.51
Sep-54	205409		9	286.3	174.3	325.8	397.65	397.70	206.95
Oct-54	205410		10	155.1	255.6	386.6	269.57	269.54	131.04
Nov-54	205411		11	11.0	77.1	165.1	118.14	118.17	8.02
Dec-54	205412		12	0.3	0.8	0.0	0.00	0.00	0.01
Jan-55	205501	2055	1	2.2	2.1	0.0	35.98	35.97	2.74
Feb-55	205502		2	7.5	20.3	5.8	4.14	4.20	11.59
Mar-55	205503		3	21.6	43.8	32.2	44.32	44.32	38.27
Apr-55	205504		4	29.8	241.6	13.7	14.01	13.95	41.64
May-55	205505		5	117.7	212.5	89.8	163.87	163.87	83.19
Jun-55	205506		6	82.1	254.5	210.3	172.25	172.15	306.93
Jul-55	205507		7	387.9	6.6	57.3	309.81	310.02	209.15
Aug-55	205508		8	129.8	135.9	137.7	135.56	135.32	35.92
Sep-55	205509		9	338.6	181.8	183.5	186.10	186.03	247.52
Oct-55	205510		10	100.2	111.3	190.3	398.31	398.15	197.56
Nov-55	205511		11	1.3	58.2	82.1	34.14	34.07	16.23
Dec-55	205512		12	2.1	4.1	36.4	0.21	0.30	0.59

459201 : corrected monthly precipitation data from 2051-2055

month	codemonth	Row Labels	month	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-46	204601	2046	1	1.9	19.7	0.8	1.99	2.08	2.50
Feb-46	204602		2	9.0	8.1	7.3	1.12	1.16	3.92
Mar-46	204603		3	35.7	47.1	36.9	69.98	70.04	5.26
Apr-46	204604		4	56.5	51.4	36.4	39.51	39.43	223.39
May-46	204605		5	8.6	101.8	177.9	114.15	114.16	131.05
Jun-46	204606		6	76.6	93.2	235.6	353.36	356.81	80.12
Jul-46	204607		7	290.7	174.6	8.4	149.03	148.97	98.40
Aug-46	204608		8	199.7	113.0	168.6	245.09	245.37	78.96
Sep-46	204609		9	343.6	492.2	249.0	256.53	256.49	248.88
Oct-46	204610		10	345.4	281.9	238.8	139.69	139.78	265.78
Nov-46	204611		11	0.0	25.1	25.2	10.06	10.01	61.83
Dec-46	204612		12	0.1	3.7	5.5	1.46	1.78	0.00
Jan-47	204701	2047	1	2.7	11.2	17.1	0.06	0.07	2.33
Feb-47	204702		2	9.4	20.4	0.4	1.60	1.64	14.73
Mar-47	204703		3	66.3	19.7	15.9	18.48	18.45	20.46
Apr-47	204704		4	36.1	86.6	65.6	126.72	126.75	49.82
May-47	204705		5	118.0	154.1	227.3	184.26	184.25	208.39
Jun-47	204706		6	135.6	167.4	54.1	84.49	83.38	124.05
Jul-47	204707		7	150.3	89.8	161.5	3.14	3.12	17.51
Aug-47	204708		8	111.4	230.3	242.3	166.56	166.43	255.59
Sep-47	204709		9	213.2	362.6	242.4	235.58	235.54	236.13
Oct-47	204710		10	268.4	222.0	256.1	285.40	285.36	386.28
Nov-47	204711		11	6.1	67.9	3.1	69.19	69.14	52.40
Dec-47	204712		12	1.3	7.7	10.0	0.28	0.40	39.28
Jan-48	204801	2048	1	3.0	10.0	4.7	0.61	0.66	1.53
Feb-48	204802		2	27.1	4.2	12.5	2.13	2.17	10.58
Mar-48	204803		3	24.2	19.7	59.5	24.76	24.73	55.87
Apr-48	204804		4	120.1	39.3	159.6	158.20	158.28	78.36
May-48	204805		5	255.5	44.4	113.6	194.57	194.56	150.86
Jun-48	204806		6	121.7	86.1	92.6	74.84	73.65	358.11
Jul-48	204807		7	94.2	27.4	246.5	13.58	13.51	77.51
Aug-48	204808		8	145.5	96.6	45.3	271.12	271.54	196.48
Sep-48	204809		9	147.3	180.2	286.0	270.28	270.24	351.30
Oct-48	204810		10	41.3	111.0	437.7	256.67	256.67	206.03
Nov-48	204811		11	31.5	29.0	69.7	53.90	53.85	49.33
Dec-48	204812		12	0.1	0.7	0.5	0.00	0.00	0.01
Jan-49	204901	2049	1	2.9	2.3	2.1	0.00	0.00	2.17
Feb-49	204902		2	6.3	7.9	5.5	3.45	3.51	2.85
Mar-49	204903		3	39.8	21.6	47.6	56.08	56.11	46.84
Apr-49	204904		4	77.1	49.1	140.7	3.31	3.29	18.90
May-49	204905		5	220.7	327.3	238.9	78.57	78.59	232.59
Jun-49	204906		6	183.1	84.4	109.2	254.69	256.04	104.48
Jul-49	204907		7	67.5	180.8	59.3	18.54	18.47	7.06
Aug-49	204908		8	91.4	56.6	344.6	194.81	194.83	81.28
Sep-49	204909		9	279.9	400.5	466.6	291.57	291.54	118.66
Oct-49	204910		10	262.4	450.3	282.3	331.64	331.54	91.58
Nov-49	204911		11	2.3	91.2	12.9	30.05	29.98	20.18
Dec-49	204912		12	0.1	4.7	0.1	5.58	6.11	2.29
Jan-50	205001	2050	1	5.3	0.6	0.0	7.02	7.14	1.67
Feb-50	205002		2	6.5	4.6	17.6	37.36	37.31	2.02
Mar-50	205003		3	65.3	10.0	79.1	36.23	36.22	60.24
Apr-50	205004		4	103.0	83.7	88.7	147.97	148.05	101.80
May-50	205005		5	182.0	200.3	132.0	198.28	198.28	78.29
Jun-50	205006		6	301.3	172.1	116.2	120.87	120.06	173.13
Jul-50	205007		7	7.4	59.6	87.1	295.21	295.36	75.06
Aug-50	205008		8	107.3	119.5	161.4	68.56	68.17	325.55
Sep-50	205009		9	227.6	158.5	333.1	223.50	223.48	406.95
Oct-50	205010		10	117.8	65.5	243.9	119.70	119.78	305.22
Nov-50	205011		11	129.4	116.0	9.5	149.31	149.38	145.33
Dec-50	205012		12	0.6	3.0	0.1	0.31	0.44	3.53

459201 : corrected monthly precipitation data from 2056-2060

month	codemonth	Row Labels	month	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-56	205601	2056	1	9.7	13.1	5.0	17.41	17.51	0.58
Feb-56	205602		2	9.2	14.1	9.3	29.45	29.43	31.46
Mar-56	205603		3	29.5	16.2	21.1	32.55	32.54	29.10
Apr-56	205604		4	66.2	23.7	83.8	58.82	58.76	61.30
May-56	205605		5	218.2	159.7	63.2	201.65	201.66	197.36
Jun-56	205606		6	119.1	112.5	83.6	60.82	59.59	117.42
Jul-56	205607		7	22.2	40.1	504.5	295.04	295.21	106.55
Aug-56	205608		8	114.6	144.4	19.8	131.59	131.34	121.44
Sep-56	205609		9	78.2	268.7	231.9	320.18	320.19	131.48
Oct-56	205610		10	155.6	159.7	159.1	326.79	326.72	93.35
Nov-56	205611		11	15.3	74.5	32.5	3.68	3.65	5.89
Dec-56	205612		12	1.1	2.2	0.5	0.02	0.04	0.70
Jan-57	205701	2057	1	2.1	8.1	0.0	0.22	0.25	2.73
Feb-57	205702		2	20.5	8.5	0.8	18.83	18.88	4.35
Mar-57	205703		3	22.0	30.6	46.5	5.39	5.38	93.17
Apr-57	205704		4	21.4	151.5	50.2	27.52	27.46	155.09
May-57	205705		5	112.2	235.0	247.2	176.35	176.37	215.95
Jun-57	205706		6	101.7	186.2	159.9	182.78	182.86	75.83
Jul-57	205707		7	85.7	91.4	5.3	27.06	26.98	281.48
Aug-57	205708		8	186.1	90.0	206.3	115.85	115.53	252.64
Sep-57	205709		9	335.7	372.2	466.2	221.04	221.00	377.35
Oct-57	205710		10	148.3	417.4	164.5	63.71	63.81	274.86
Nov-57	205711		11	9.1	17.2	73.4	11.67	11.62	17.63
Dec-57	205712		12	0.3	22.5	0.2	0.01	0.02	0.03
Jan-58	205801	2058	1	5.2	3.6	19.9	13.30	13.42	5.29
Feb-58	205802		2	8.1	8.8	41.3	9.39	9.45	26.50
Mar-58	205803		3	39.1	19.9	20.1	2.93	2.93	36.09
Apr-58	205804		4	54.5	97.4	65.5	58.80	58.73	110.94
May-58	205805		5	205.2	154.9	213.0	165.45	165.46	215.33
Jun-58	205806		6	178.3	78.1	190.3	94.69	93.63	137.22
Jul-58	205807		7	28.5	70.7	68.7	79.40	79.31	159.94
Aug-58	205808		8	135.5	266.1	71.0	241.86	242.14	118.39
Sep-58	205809		9	220.6	151.9	162.9	178.74	178.68	270.34
Oct-58	205810		10	432.0	95.5	137.3	65.07	65.19	207.01
Nov-58	205811		11	97.7	25.0	11.8	81.72	81.69	2.66
Dec-58	205812		12	12.9	1.8	0.4	23.52	23.74	0.09
Jan-59	205901	2059	1	17.2	4.5	24.8	8.87	9.02	3.76
Feb-59	205902		2	10.3	6.5	17.0	52.51	52.38	6.58
Mar-59	205903		3	44.8	41.6	38.6	36.34	36.33	31.37
Apr-59	205904		4	72.7	43.0	34.0	101.31	101.32	23.29
May-59	205905		5	323.4	109.7	302.2	201.05	201.04	96.33
Jun-59	205906		6	152.5	36.1	253.2	269.37	271.03	204.31
Jul-59	205907		7	120.9	197.2	70.4	103.13	103.08	12.13
Aug-59	205908		8	181.6	145.0	76.9	142.17	141.98	243.96
Sep-59	205909		9	285.8	564.6	205.4	152.63	152.55	319.30
Oct-59	205910		10	122.4	335.9	183.9	284.24	284.20	101.06
Nov-59	205911		11	56.5	39.0	35.4	54.51	54.45	56.69
Dec-59	205912		12	35.1	1.2	0.2	27.55	27.62	0.34
Jan-60	206001	2060	1	14.5	2.7	11.6	0.67	0.73	58.57
Feb-60	206002		2	7.5	39.0	10.6	13.44	13.50	4.67
Mar-60	206003		3	43.7	18.9	20.4	22.76	22.74	20.59
Apr-60	206004		4	82.5	47.1	27.8	102.24	102.24	55.01
May-60	206005		5	225.2	230.7	281.5	397.73	397.70	86.46
Jun-60	206006		6	233.4	239.8	132.2	153.97	153.61	34.89
Jul-60	206007		7	18.9	258.1	407.1	184.07	184.13	108.16
Aug-60	206008		8	392.2	141.2	153.6	28.58	28.25	182.51
Sep-60	206009		9	189.5	226.7	173.1	415.09	415.18	206.84
Oct-60	206010		10	140.9	163.0	203.3	303.16	303.15	220.59
Nov-60	206011		11	131.0	4.8	48.0	0.34	0.34	9.46
Dec-60	206012		12	1.2	6.6	9.3	0.42	0.58	0.04

459201 : corrected monthly precipitation data from 2061-2065

month	codemonth	Row Labels	month	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-61	206101	2061	1	6.8	1.7	0.1	0.00	0.00	5.17
Feb-61	206102		2	11.4	5.4	0.6	0.32	0.35	6.00
Mar-61	206103		3	21.8	25.1	17.5	21.43	21.40	29.27
Apr-61	206104		4	61.1	56.2	28.4	97.32	97.31	138.73
May-61	206105		5	161.3	179.8	263.8	146.80	146.81	275.99
Jun-61	206106		6	105.5	286.2	78.5	27.90	26.85	39.32
Jul-61	206107		7	289.4	40.3	93.9	40.93	40.84	68.51
Aug-61	206108		8	138.4	110.2	288.0	369.97	371.08	42.28
Sep-61	206109		9	225.8	211.7	192.8	498.41	498.58	399.16
Oct-61	206110		10	400.5	150.9	163.8	183.08	183.16	262.59
Nov-61	206111		11	82.3	4.7	0.8	7.01	6.96	6.89
Dec-61	206112		12	12.7	0.4	0.1	0.02	0.04	0.18
Jan-62	206201	2062	1	14.9	2.2	0.1	0.14	0.16	3.90
Feb-62	206202		2	9.6	19.8	0.3	4.49	4.55	3.91
Mar-62	206203		3	41.4	54.9	26.8	46.99	46.99	19.91
Apr-62	206204		4	100.0	28.0	58.4	61.84	61.78	36.40
May-62	206205		5	163.3	225.8	141.3	83.48	83.52	153.64
Jun-62	206206		6	107.1	141.6	220.9	186.33	186.46	199.24
Jul-62	206207		7	154.6	62.8	125.2	162.36	162.34	221.93
Aug-62	206208		8	120.5	114.2	199.8	63.99	63.59	73.33
Sep-62	206209		9	431.4	117.7	332.2	257.26	257.23	330.51
Oct-62	206210		10	260.4	203.9	253.3	263.11	263.12	377.87
Nov-62	206211		11	207.9	74.5	72.7	50.73	50.67	79.16
Dec-62	206212		12	0.1	1.1	1.8	12.87	13.39	0.50
Jan-63	206301	2063	1	2.3	8.8	0.0	9.56	9.74	12.68
Feb-63	206302		2	6.0	17.9	6.1	0.50	0.53	6.66
Mar-63	206303		3	37.0	86.0	15.2	9.31	9.29	41.17
Apr-63	206304		4	66.2	93.2	59.9	87.99	87.94	54.49
May-63	206305		5	48.5	110.5	182.2	132.31	132.32	157.93
Jun-63	206306		6	120.4	80.4	5.4	249.88	251.16	256.88
Jul-63	206307		7	291.7	48.6	26.6	29.51	29.43	153.87
Aug-63	206308		8	214.7	79.9	230.5	135.71	135.49	167.01
Sep-63	206309		9	355.1	349.2	236.3	203.35	203.29	267.49
Oct-63	206310		10	151.1	221.6	124.4	203.34	203.38	430.21
Nov-63	206311		11	9.6	18.8	16.3	50.76	50.70	233.27
Dec-63	206312		12	0.4	1.0	8.8	0.70	0.91	6.09
Jan-64	206401	2064	1	1.9	3.1	39.3	2.36	2.47	4.77
Feb-64	206402		2	6.6	11.7	5.8	15.29	15.34	8.60
Mar-64	206403		3	23.0	12.2	87.7	80.31	80.41	12.16
Apr-64	206404		4	61.7	25.5	81.4	133.64	133.69	28.37
May-64	206405		5	164.6	265.7	124.6	271.85	271.82	146.11
Jun-64	206406		6	370.4	206.9	136.2	79.44	78.32	150.18
Jul-64	206407		7	102.6	56.0	11.2	194.21	194.26	343.13
Aug-64	206408		8	165.6	125.5	62.3	67.25	66.84	61.59
Sep-64	206409		9	294.3	382.0	311.7	226.94	226.88	205.72
Oct-64	206410		10	221.3	191.3	481.4	122.48	122.59	215.05
Nov-64	206411		11	9.1	21.5	72.7	40.74	40.68	7.54
Dec-64	206412		12	14.3	0.9	9.3	3.76	4.24	0.10
Jan-65	206501	2065	1	6.4	51.1	5.2	1.25	1.32	8.30
Feb-65	206502		2	32.3	8.0	19.3	22.39	22.42	5.57
Mar-65	206503		3	102.0	103.1	19.6	46.69	46.71	3.54
Apr-65	206504		4	251.8	51.3	102.1	55.78	55.73	56.57
May-65	206505		5	331.6	278.8	264.4	201.39	201.39	346.80
Jun-65	206506		6	93.8	171.1	96.5	142.79	142.28	85.49
Jul-65	206507		7	2.4	785.4	187.3	166.38	166.33	105.63
Aug-65	206508		8	7.3	132.3	79.4	264.30	264.69	357.51
Sep-65	206509		9	290.6	290.0	304.0	335.42	335.43	266.85
Oct-65	206510		10	165.7	257.1	151.5	234.77	234.80	329.65
Nov-65	206511		11	11.9	6.8	27.6	16.29	16.24	25.94
Dec-65	206512		12	0.2	1.2	1.0	0.02	0.04	2.49

459202 : corrected monthly precipitation data from 2046-2050

month	codemonth	Row Labels	month	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-46	204601	2046	1	4.8	22.4	0.2	1.15	1.30	1.48
Feb-46	204602		2	9.3	7.5	8.1	0.70	0.81	3.56
Mar-46	204603		3	24.6	50.2	25.5	103.54	103.51	0.44
Apr-46	204604		4	53.8	40.2	21.1	17.40	18.42	390.12
May-46	204605		5	4.1	72.9	143.1	89.12	89.13	94.67
Jun-46	204606		6	66.3	74.7	191.8	270.73	273.41	68.37
Jul-46	204607		7	219.5	159.7	29.4	143.14	143.12	106.83
Aug-46	204608		8	182.9	89.8	159.9	219.03	219.03	60.91
Sep-46	204609		9	401.0	522.3	231.3	290.20	290.19	250.98
Oct-46	204610		10	338.4	284.8	244.3	158.31	158.30	268.98
Nov-46	204611		11	0.1	28.3	34.4	14.16	14.17	83.37
Dec-46	204612		12	0.2	6.1	9.1	3.34	3.33	0.00
Jan-47	204701	2047	1	5.9	10.8	21.8	0.01	0.01	1.35
Feb-47	204702		2	9.8	23.2	0.4	0.79	0.92	16.11
Mar-47	204703		3	89.5	9.3	5.4	8.85	8.91	10.97
Apr-47	204704		4	26.6	93.9	47.4	186.30	185.66	38.46
May-47	204705		5	84.7	114.2	181.1	135.14	135.14	159.71
Jun-47	204706		6	111.6	134.5	49.2	68.38	67.55	101.41
Jul-47	204707		7	145.4	106.7	152.4	13.54	13.50	35.38
Aug-47	204708		8	89.9	215.6	245.5	143.09	143.07	241.25
Sep-47	204709		9	198.8	390.7	262.3	209.71	209.71	232.23
Oct-47	204710		10	272.1	232.4	269.9	297.49	297.47	370.60
Nov-47	204711		11	10.5	83.2	4.8	84.57	84.58	71.54
Dec-47	204712		12	2.1	11.8	18.5	1.95	1.95	60.99
Jan-48	204801	2048	1	6.2	9.3	3.4	0.33	0.40	0.75
Feb-48	204802		2	29.6	3.0	14.1	2.09	2.31	11.12
Mar-48	204803		3	9.3	9.6	89.6	16.74	16.81	70.54
Apr-48	204804		4	161.4	23.1	266.5	246.94	244.93	83.13
May-48	204805		5	199.4	26.5	79.6	150.58	150.58	111.07
Jun-48	204806		6	100.6	68.4	82.2	61.12	60.21	269.23
Jul-48	204807		7	111.5	54.5	188.3	31.46	31.41	90.85
Aug-48	204808		8	125.5	74.8	27.2	263.63	263.61	178.57
Sep-48	204809		9	111.9	193.3	335.1	288.41	288.38	411.37
Oct-48	204810		10	58.0	127.5	408.6	254.11	254.11	217.01
Nov-48	204811		11	45.8	33.4	109.2	73.20	73.22	67.66
Dec-48	204812		12	0.2	1.4	0.8	0.00	0.00	0.10
Jan-49	204901	2049	1	6.1	1.2	1.2	0.00	0.00	1.22
Feb-49	204902		2	6.4	7.1	5.8	2.99	3.25	2.45
Mar-49	204903		3	31.4	11.3	54.1	71.09	71.12	52.54
Apr-49	204904		4	85.9	34.8	249.8	0.15	0.20	5.92
May-49	204905		5	169.6	261.3	165.7	52.04	52.07	180.50
Jun-49	204906		6	147.7	65.5	85.8	192.83	193.84	86.82
Jul-49	204907		7	92.0	165.2	78.2	38.25	38.21	20.74
Aug-49	204908		8	70.1	37.3	338.4	155.02	155.01	63.07
Sep-49	204909		9	295.3	430.6	589.8	311.11	311.09	79.49
Oct-49	204910		10	265.8	426.7	285.7	343.58	343.57	111.57
Nov-49	204911		11	4.6	115.4	19.5	40.30	40.32	29.93
Dec-49	204912		12	0.2	7.7	0.2	12.54	12.52	5.62
Jan-50	205001	2050	1	8.8	0.2	0.0	3.55	3.82	0.84
Feb-50	205002		2	6.7	3.5	19.4	44.81	44.65	1.64
Mar-50	205003		3	87.3	2.1	134.4	28.12	28.19	79.69
Apr-50	205004		4	130.0	90.5	84.3	194.04	193.28	125.91
May-50	205005		5	137.5	153.3	93.6	144.81	144.82	52.35
Jun-50	205006		6	233.6	139.0	93.8	95.68	95.09	137.42
Jul-50	205007		7	31.7	83.9	108.9	226.65	226.71	88.91
Aug-50	205008		8	86.0	96.6	149.9	55.21	55.22	317.02
Sep-50	205009		9	221.3	171.2	349.5	213.31	213.34	504.18
Oct-50	205010		10	135.1	84.1	256.4	149.71	149.70	302.63
Nov-50	205011		11	166.4	145.8	15.5	186.59	186.58	185.54
Dec-50	205012		12	1.0	5.0	0.1	1.81	1.81	7.91

459202 : corrected monthly precipitation data from 2051-2055

month	codemonth	Row Labels	month	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-51	205101	2051	1	6.1	3.1	0.0	5.35	5.67	0.97
Feb-51	205102		2	7.3	6.2	21.4	21.38	21.68	47.29
Mar-51	205103		3	9.7	7.1	35.8	65.93	65.96	49.84
Apr-51	205104		4	5.3	103.7	9.4	24.10	25.26	77.44
May-51	205105		5	59.0	101.2	105.8	71.31	71.33	206.19
Jun-51	205106		6	122.5	35.9	215.4	160.13	160.51	111.85
Jul-51	205107		7	199.4	135.3	100.3	105.60	105.58	26.34
Aug-51	205108		8	127.4	59.9	124.6	176.77	176.72	87.89
Sep-51	205109		9	358.7	455.6	416.4	407.29	407.30	573.99
Oct-51	205110		10	355.3	168.9	194.4	153.28	153.31	153.36
Nov-51	205111		11	33.2	4.9	55.6	8.74	8.75	41.01
Dec-51	205112		12	1.7	29.2	2.1	2.20	2.20	0.02
Jan-52	205201	2052	1	6.3	2.7	0.0	0.00	0.00	2.24
Feb-52	205202		2	22.5	18.1	9.6	0.25	0.31	65.95
Mar-52	205203		3	34.9	48.3	3.5	3.06	3.10	117.08
Apr-52	205204		4	73.5	79.8	315.3	0.22	0.27	7.62
May-52	205205		5	112.0	183.5	85.3	167.71	167.71	167.37
Jun-52	205206		6	93.6	45.2	207.3	62.89	62.00	174.99
Jul-52	205207		7	98.2	70.8	177.6	168.99	169.02	233.00
Aug-52	205208		8	10.8	652.2	78.1	19.88	19.89	160.72
Sep-52	205209		9	509.9	208.3	122.8	142.46	142.45	316.52
Oct-52	205210		10	319.3	264.9	146.5	170.00	169.99	76.22
Nov-52	205211		11	38.6	57.4	250.5	258.73	258.71	60.33
Dec-52	205212		12	0.5	17.7	0.0	0.15	0.15	38.03
Jan-53	205301	2053	1	43.8	4.0	4.8	18.16	18.65	0.83
Feb-53	205302		2	9.4	5.9	71.9	9.38	9.76	4.07
Mar-53	205303		3	35.9	29.0	95.3	24.57	24.64	9.95
Apr-53	205304		4	136.0	58.5	164.3	46.93	48.24	73.43
May-53	205305		5	184.8	137.8	72.5	117.57	117.59	157.00
Jun-53	205306		6	230.4	157.3	196.6	157.62	157.96	164.05
Jul-53	205307		7	67.3	96.0	138.7	121.04	121.02	134.84
Aug-53	205308		8	207.1	94.5	217.3	124.00	124.01	27.92
Sep-53	205309		9	298.7	115.3	396.3	429.43	429.46	207.37
Oct-53	205310		10	294.1	368.7	179.3	335.04	335.04	214.25
Nov-53	205311		11	147.1	325.7	1.7	10.63	10.64	160.87
Dec-53	205312		12	0.9	2.1	0.9	0.00	0.00	1.64
Jan-54	205401	2054	1	5.2	1.8	0.0	7.00	7.37	2.27
Feb-54	205402		2	32.9	37.9	0.9	8.56	8.92	9.00
Mar-54	205403		3	8.9	34.9	23.2	117.91	117.87	34.72
Apr-54	205404		4	82.0	33.4	4.3	64.04	65.29	8.88
May-54	205405		5	155.9	36.1	151.7	181.38	181.37	116.52
Jun-54	205406		6	42.9	318.9	122.5	141.07	141.13	109.24
Jul-54	205407		7	154.4	151.7	119.1	166.69	166.70	150.79
Aug-54	205408		8	225.0	69.8	54.1	25.61	25.60	97.97
Sep-54	205409		9	306.5	189.1	355.2	538.40	538.37	190.64
Oct-54	205410		10	170.3	259.3	374.2	264.97	264.96	149.21
Nov-54	205411		11	17.7	94.6	203.4	154.38	154.40	13.08
Dec-54	205412		12	0.5	1.6	0.1	0.00	0.00	0.07
Jan-55	205501	2055	1	5.2	1.1	0.0	42.75	42.95	1.69
Feb-55	205502		2	7.7	23.0	6.3	3.43	3.71	12.32
Mar-55	205503		3	6.9	44.1	21.9	53.81	53.87	36.89
Apr-55	205504		4	19.3	443.0	1.8	3.33	3.74	27.81
May-55	205505		5	84.2	164.3	67.1	125.43	125.45	56.17
Jun-55	205506		6	69.6	208.4	165.2	141.12	141.19	233.16
Jul-55	205507		7	265.8	27.5	79.3	241.16	241.26	182.61
Aug-55	205508		8	108.7	114.8	117.0	113.87	113.87	23.11
Sep-55	205509		9	390.8	194.8	148.9	172.26	172.26	248.97
Oct-55	205510		10	118.6	129.6	191.7	355.83	355.83	209.52
Nov-55	205511		11	2.8	70.8	120.3	52.53	52.54	24.58
Dec-55	205512		12	3.4	6.7	59.0	1.38	1.38	1.99

459202 : corrected monthly precipitation data from 2056-2060

month	codemonth	Row Labels	month	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-56	205601	2056	1	12.9	13.5	4.2	25.03	25.39	0.19
Feb-56	205602		2	9.6	14.8	9.4	30.06	30.22	37.15
Mar-56	205603		3	15.5	6.6	13.3	24.94	25.02	22.18
Apr-56	205604		4	68.6	8.6	67.8	53.47	54.77	55.20
May-56	205605		5	167.9	121.5	41.8	155.35	155.36	150.29
Jun-56	205606		6	100.6	90.2	71.1	57.87	56.94	96.48
Jul-56	205607		7	52.4	67.9	344.9	251.43	251.52	112.85
Aug-56	205608		8	93.5	121.2	10.0	112.87	112.87	101.86
Sep-56	205609		9	38.1	289.8	240.1	342.21	342.21	93.90
Oct-56	205610		10	169.8	174.0	176.0	322.53	322.53	113.31
Nov-56	205611		11	24.0	93.0	36.4	6.00	6.00	9.93
Dec-56	205612		12	1.8	3.8	0.7	0.30	0.31	2.25
Jan-57	205701	2057	1	5.1	7.1	0.0	0.07	0.09	1.68
Feb-57	205702		2	22.1	8.0	0.8	21.18	21.49	4.02
Mar-57	205703		3	7.1	22.7	49.4	0.57	0.59	155.28
Apr-57	205704		4	11.1	224.3	38.3	9.66	10.43	235.43
May-57	205705		5	79.9	181.5	197.2	127.80	127.83	166.18
Jun-57	205706		6	85.7	150.6	106.9	150.86	151.10	65.07
Jul-57	205707		7	104.2	107.5	19.4	48.33	48.28	228.01
Aug-57	205708		8	168.0	66.6	192.0	106.30	106.29	238.09
Sep-57	205709		9	384.8	396.5	620.8	217.67	217.68	454.40
Oct-57	205710		10	163.7	395.1	176.9	85.10	85.09	276.76
Nov-57	205711		11	15.4	18.5	104.4	18.56	18.57	26.49
Dec-57	205712		12	0.5	32.3	0.4	0.15	0.15	0.21
Jan-58	205801	2058	1	8.5	2.4	20.0	13.36	13.77	4.14
Feb-58	205802		2	8.3	8.4	48.8	9.89	10.27	30.82
Mar-58	205803		3	30.8	9.5	9.8	0.07	0.07	33.17
Apr-58	205804		4	51.1	113.5	48.2	48.43	49.74	143.66
May-58	205805		5	157.2	114.2	149.2	122.14	122.16	165.65
Jun-58	205806		6	143.6	60.7	146.7	89.85	89.20	111.15
Jul-58	205807		7	59.0	92.2	79.3	90.84	90.80	150.24
Aug-58	205808		8	115.0	262.4	56.7	236.29	236.30	98.84
Sep-58	205809		9	211.1	163.7	121.8	150.20	150.21	283.22
Oct-58	205810		10	412.8	115.1	151.8	83.49	83.50	217.87
Nov-58	205811		11	128.1	30.6	16.2	117.07	117.08	4.91
Dec-58	205812		12	21.1	3.3	0.6	38.45	38.43	0.47
Jan-59	205901	2059	1	19.2	3.4	27.2	9.21	9.63	2.61
Feb-59	205902		2	10.8	5.5	20.5	64.94	64.29	6.48
Mar-59	205903		3	41.1	40.4	33.6	35.18	35.26	25.59
Apr-59	205904		4	79.4	27.3	33.6	149.02	149.16	9.08
May-59	205905		5	259.2	77.6	244.8	156.64	156.64	66.55
Jun-59	205906		6	124.0	26.3	201.4	201.54	202.74	159.98
Jul-59	205907		7	126.9	172.4	87.6	99.58	99.57	28.43
Aug-59	205908		8	163.5	122.3	60.0	122.73	122.75	228.80
Sep-59	205909		9	309.2	605.5	206.7	119.77	119.78	359.61
Oct-59	205910		10	139.5	328.9	196.7	291.44	291.43	120.79
Nov-59	205911		11	77.5	45.8	43.0	75.70	75.71	76.94
Dec-59	205912		12	57.4	2.2	0.3	42.45	42.43	1.30
Jan-60	206001	2060	1	17.0	1.5	10.3	0.22	0.28	80.51
Feb-60	206002		2	7.7	49.7	11.3	15.72	16.08	4.36
Mar-60	206003		3	38.9	8.8	10.4	11.20	11.27	11.11
Apr-60	206004		4	95.1	32.4	10.6	153.10	153.13	45.78
May-60	206005		5	173.7	176.2	241.5	327.08	327.04	58.74
Jun-60	206006		6	185.1	194.9	107.3	137.53	137.55	32.69
Jul-60	206007		7	48.2	204.4	292.6	168.92	168.97	114.03
Aug-60	206008		8	401.2	123.3	113.4	18.90	18.91	164.00
Sep-60	206009		9	166.5	240.9	148.0	492.98	493.00	190.49
Oct-60	206010		10	156.8	176.4	218.6	311.68	311.70	229.81
Nov-60	206011		11	169.7	4.4	55.3	0.86	0.86	15.14
Dec-60	206012		12	2.0	10.3	15.8	2.15	2.15	0.27

459202: corrected monthly precipitation data from 2061-2065

month	codemonth	Row Labels	month	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-61	206101	2061	1	10.2	0.8	0.0	0.00	0.00	4.03
Feb-61	206102		2	12.0	4.3	0.6	0.16	0.20	5.83
Mar-61	206103		3	6.9	15.4	7.4	13.45	13.52	22.43
Apr-61	206104		4	60.8	45.4	11.8	94.22	95.20	200.42
May-61	206105		5	120.1	135.5	198.7	105.72	105.74	218.19
Jun-61	206106		6	88.2	237.7	67.3	25.36	24.49	36.31
Jul-61	206107		7	219.0	66.7	111.1	61.12	61.07	83.66
Aug-61	206108		8	117.0	91.6	266.8	356.11	356.15	28.32
Sep-61	206109		9	216.1	230.2	168.1	637.47	637.50	491.00
Oct-61	206110		10	384.5	168.0	181.2	199.54	199.54	266.24
Nov-61	206111		11	109.8	4.5	1.3	12.96	12.97	11.42
Dec-61	206112		12	20.5	0.8	0.2	0.12	0.12	0.80
Jan-62	206201	2062	1	17.2	1.4	0.0	0.01	0.01	2.74
Feb-62	206202		2	10.0	22.5	0.2	3.17	3.44	3.55
Mar-62	206203		3	34.5	63.8	17.7	58.28	58.33	10.35
Apr-62	206204		4	124.7	12.1	29.4	49.72	51.03	21.67
May-62	206205		5	121.7	172.0	99.0	61.11	61.15	113.38
Jun-62	206206		6	89.5	113.6	181.1	142.47	142.57	156.33
Jul-62	206207		7	148.3	87.8	129.0	152.26	152.27	190.80
Aug-62	206208		8	99.6	92.1	172.3	45.60	45.61	55.69
Sep-62	206209		9	547.3	125.6	375.3	270.41	270.41	377.60
Oct-62	206210		10	264.4	215.9	253.5	273.53	273.55	363.60
Nov-62	206211		11	261.1	92.7	106.7	69.61	69.63	104.89
Dec-62	206212		12	0.2	2.0	2.2	26.30	26.29	1.75
Jan-63	206301	2063	1	5.3	8.1	0.0	4.39	4.75	12.99
Feb-63	206302		2	6.1	20.4	6.9	0.21	0.27	6.56
Mar-63	206303		3	26.7	131.3	3.7	2.06	2.09	42.00
Apr-63	206304		4	68.3	108.7	44.5	81.04	82.14	45.04
May-63	206305		5	30.8	80.6	131.9	89.10	89.13	116.96
Jun-63	206306		6	99.8	63.0	7.6	181.48	182.28	197.64
Jul-63	206307		7	219.7	76.4	50.7	46.47	46.43	146.13
Aug-63	206308		8	199.3	58.2	241.8	120.38	120.39	147.97
Sep-63	206309		9	414.5	369.7	234.0	180.06	180.05	278.89
Oct-63	206310		10	166.7	231.1	143.4	205.22	205.21	406.91
Nov-63	206311		11	15.8	20.6	18.5	73.11	73.13	290.94
Dec-63	206312		12	0.7	1.8	17.5	2.83	2.82	12.29
Jan-64	206401	2064	1	4.8	1.9	51.5	2.56	2.81	3.61
Feb-64	206402		2	6.7	11.6	6.0	18.33	18.67	8.79
Mar-64	206403		3	8.1	3.3	140.1	107.20	107.19	3.48
Apr-64	206404		4	61.6	9.8	73.1	197.77	196.91	13.43
May-64	206405		5	122.7	209.3	87.1	213.35	213.33	107.11
Jun-64	206406		6	282.4	168.4	119.2	64.96	64.11	120.67
Jul-64	206407		7	116.3	81.5	28.7	177.67	177.72	265.34
Aug-64	206408		8	145.9	102.5	54.9	39.70	39.70	45.03
Sep-64	206409		9	321.1	412.4	348.6	217.38	217.37	188.93
Oct-64	206410		10	230.0	202.4	451.7	124.11	124.12	224.95
Nov-64	206411		11	15.1	23.6	117.5	60.37	60.40	12.37
Dec-64	206412		12	23.4	1.7	13.8	9.51	9.50	0.53
Jan-65	206501	2065	1	9.9	70.0	4.3	0.47	0.55	7.53
Feb-65	206502		2	35.2	7.2	22.4	26.75	26.97	5.34
Mar-65	206503		3	190.6	168.1	10.1	50.69	50.76	0.15
Apr-65	206504		4	425.7	38.5	124.7	64.59	65.87	48.06
May-65	206505		5	265.9	219.7	203.7	154.00	154.01	280.47
Jun-65	206506		6	79.7	137.7	84.6	105.83	105.39	72.47
Jul-65	206507		7	19.3	455.2	174.0	160.02	160.01	112.17
Aug-65	206508		8	2.4	109.2	64.7	271.85	271.86	352.04
Sep-65	206509		9	314.9	309.9	336.4	372.35	372.33	277.92
Oct-65	206510		10	179.3	261.3	168.4	239.35	239.36	323.26
Nov-65	206511		11	19.1	6.7	39.2	24.90	24.92	37.57
Dec-65	206512		12	0.4	2.3	1.3	0.27	0.27	6.00

459203 : corrected monthly precipitation data from 2046-2050

month	codemonth	Row Labels	month	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-46	204601	2046	1	0.7	35.0	0.6	0.97	1.16	1.89
Feb-46	204602		2	3.5	5.1	7.3	1.20	1.24	3.62
Mar-46	204603		3	31.5	49.0	29.8	97.51	97.50	2.09
Apr-46	204604		4	47.4	43.6	35.1	29.83	29.82	197.32
May-46	204605		5	0.5	51.9	162.6	81.18	81.16	59.19
Jun-46	204606		6	34.1	48.2	182.1	267.88	267.89	58.12
Jul-46	204607		7	171.0	118.4	9.4	112.36	112.34	84.42
Aug-46	204608		8	122.2	62.3	100.2	146.47	146.46	46.79
Sep-46	204609		9	290.5	346.7	172.2	215.78	215.78	211.76
Oct-46	204610		10	351.5	289.3	253.7	160.89	160.88	257.69
Nov-46	204611		11	0.1	39.0	42.6	13.91	13.91	74.18
Dec-46	204612		12	0.4	5.8	8.8	2.87	2.79	0.01
Jan-47	204701	2047	1	2.8	30.6	41.7	0.00	0.01	1.23
Feb-47	204702		2	4.3	17.8	0.6	1.11	1.15	16.42
Mar-47	204703		3	84.9	13.3	10.2	17.05	17.05	15.97
Apr-47	204704		4	30.3	71.7	45.0	135.89	135.89	45.22
May-47	204705		5	73.6	110.7	220.4	139.57	139.55	183.13
Jun-47	204706		6	79.2	111.8	19.1	48.48	48.49	74.23
Jul-47	204707		7	105.3	64.2	98.7	3.62	3.62	18.46
Aug-47	204708		8	61.0	140.8	153.5	97.83	97.81	172.60
Sep-47	204709		9	145.9	268.2	193.8	146.80	146.80	170.60
Oct-47	204710		10	293.0	236.1	278.0	332.05	332.03	386.40
Nov-47	204711		11	9.2	103.2	3.5	85.22	85.21	102.16
Dec-47	204712		12	1.3	11.8	15.1	2.08	2.01	57.26
Jan-48	204801	2048	1	1.7	12.2	7.1	0.60	0.74	0.77
Feb-48	204802		2	43.5	2.2	13.1	3.20	3.25	10.61
Mar-48	204803		3	17.1	13.5	88.0	25.09	25.09	74.69
Apr-48	204804		4	103.9	25.3	149.0	137.62	137.60	61.87
May-48	204805		5	252.8	11.3	68.4	198.11	198.10	122.34
Jun-48	204806		6	59.4	51.6	55.5	44.02	44.02	253.73
Jul-48	204807		7	74.0	25.9	132.6	12.02	12.01	51.19
Aug-48	204808		8	87.5	56.3	17.6	170.40	170.38	77.77
Sep-48	204809		9	103.9	148.4	228.4	206.61	206.60	268.65
Oct-48	204810		10	71.7	137.0	419.1	269.82	269.82	221.77
Nov-48	204811		11	55.9	36.3	142.4	90.36	90.37	69.91
Dec-48	204812		12	0.1	1.7	0.9	0.00	0.00	0.13
Jan-49	204901	2049	1	1.7	0.7	1.6	0.00	0.00	1.85
Feb-49	204902		2	1.3	6.4	6.3	4.87	4.92	3.52
Mar-49	204903		3	36.8	18.6	65.6	81.05	81.04	61.21
Apr-49	204904		4	67.6	37.9	141.8	5.82	5.82	23.07
May-49	204905		5	204.1	377.1	199.1	33.72	33.73	246.48
Jun-49	204906		6	123.5	47.6	60.3	165.56	165.54	61.17
Jul-49	204907		7	52.4	121.5	49.0	18.95	18.95	4.71
Aug-49	204908		8	47.5	25.5	214.9	101.66	101.66	35.19
Sep-49	204909		9	207.9	282.5	388.9	227.11	227.10	71.58
Oct-49	204910		10	277.3	430.9	299.8	336.42	336.40	207.55
Nov-49	204911		11	4.6	145.7	21.5	49.43	49.44	53.71
Dec-49	204912		12	0.1	7.1	0.4	11.74	11.61	5.06
Jan-50	205001	2050	1	5.7	0.0	0.0	4.19	4.66	1.05
Feb-50	205002		2	1.5	3.0	17.0	32.90	32.84	4.07
Mar-50	205003		3	84.5	5.2	125.6	33.16	33.16	101.05
Apr-50	205004		4	88.4	69.9	80.8	102.96	102.97	88.62
May-50	205005		5	150.0	166.6	82.1	157.64	157.64	23.93
Jun-50	205006		6	241.8	121.9	71.2	63.62	63.62	123.92
Jul-50	205007		7	11.0	49.3	63.5	182.91	182.89	101.12
Aug-50	205008		8	56.8	68.1	103.5	37.04	37.05	145.29
Sep-50	205009		9	171.5	137.7	249.0	170.19	170.21	281.51
Oct-50	205010		10	140.2	90.9	267.1	167.04	167.02	320.28
Nov-50	205011		11	188.9	175.8	11.9	250.72	250.71	170.15
Dec-50	205012		12	0.8	4.7	0.3	1.38	1.32	8.20

459203 : corrected monthly precipitation data from 2051-2055

month	codemonth	Row Labels	month	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-51	205101	2051	1	1.5	2.7	0.0	9.35	10.05	0.97
Feb-51	205102		2	1.9	5.6	18.9	17.84	17.86	35.10
Mar-51	205103		3	18.0	14.1	38.5	68.80	68.79	53.34
Apr-51	205104		4	10.4	75.0	22.0	30.06	30.06	56.26
May-51	205105		5	35.4	94.8	107.4	53.00	53.00	293.74
Jun-51	205106		6	107.6	19.4	204.7	143.46	143.45	95.07
Jul-51	205107		7	168.5	91.5	55.2	63.82	63.83	9.93
Aug-51	205108		8	88.8	44.6	90.6	125.46	125.44	48.29
Sep-51	205109		9	226.4	316.1	283.3	275.06	275.06	347.13
Oct-51	205110		10	365.0	171.5	200.1	142.66	142.68	149.31
Nov-51	205111		11	34.9	4.7	71.9	7.05	7.05	39.14
Dec-51	205112		12	1.4	24.5	3.0	2.36	2.29	0.01
Jan-52	205201	2052	1	1.8	4.5	0.0	0.00	0.00	3.44
Feb-52	205202		2	20.7	17.5	8.8	0.71	0.75	45.61
Mar-52	205203		3	43.1	56.6	8.1	6.23	6.24	98.07
Apr-52	205204		4	61.1	64.6	163.1	3.74	3.75	18.37
May-52	205205		5	108.4	235.6	70.8	182.90	182.88	161.74
Jun-52	205206		6	51.4	28.7	194.8	55.20	55.19	125.61
Jul-52	205207		7	62.9	33.6	143.3	130.61	130.62	164.43
Aug-52	205208		8	8.1	415.4	68.9	15.38	15.38	127.61
Sep-52	205209		9	331.7	157.3	104.2	130.94	130.94	249.20
Oct-52	205210		10	327.4	265.4	154.5	184.75	184.75	95.83
Nov-52	205211		11	37.0	68.0	330.9	332.74	332.73	69.57
Dec-52	205212		12	0.3	15.2	0.0	0.21	0.19	31.39
Jan-53	205301	2053	1	141.2	7.9	7.7	33.39	34.47	0.71
Feb-53	205302		2	16.5	6.8	51.4	9.12	9.17	3.37
Mar-53	205303		3	43.6	33.7	96.6	32.45	32.44	17.76
Apr-53	205304		4	94.1	48.8	99.6	44.64	44.63	53.57
May-53	205305		5	234.8	143.8	43.3	107.19	107.19	169.15
Jun-53	205306		6	250.3	138.5	188.9	127.75	127.73	122.55
Jul-53	205307		7	33.6	58.2	90.4	81.37	81.36	63.09
Aug-53	205308		8	135.4	75.9	148.0	79.94	79.94	31.21
Sep-53	205309		9	207.6	101.0	261.7	291.81	291.82	184.00
Oct-53	205310		10	299.0	383.9	187.5	335.36	335.36	248.50
Nov-53	205311		11	179.6	437.1	0.8	8.34	8.34	312.32
Dec-53	205312		12	0.7	2.1	1.5	0.01	0.01	2.35
Jan-54	205401	2054	1	1.1	1.3	0.0	8.40	9.10	3.64
Feb-54	205402		2	36.0	30.9	1.1	9.43	9.47	7.97
Mar-54	205403		3	19.6	41.9	34.5	116.42	116.42	33.85
Apr-54	205404		4	66.2	33.7	18.4	55.95	55.94	16.97
May-54	205405		5	176.6	17.6	176.8	222.76	222.75	87.81
Jun-54	205406		6	9.6	301.2	96.6	112.23	112.22	90.86
Jul-54	205407		7	108.6	107.1	86.8	127.14	127.13	106.31
Aug-54	205408		8	132.6	44.1	41.4	22.79	22.79	68.52
Sep-54	205409		9	217.9	154.4	261.0	359.38	359.36	152.95
Oct-54	205410		10	176.8	269.3	385.7	266.26	266.24	172.13
Nov-54	205411		11	16.3	142.4	275.3	199.95	199.97	7.38
Dec-54	205412		12	0.3	1.1	0.2	0.00	0.00	0.31
Jan-55	205501	2055	1	0.9	0.5	0.0	99.52	99.66	2.16
Feb-55	205502		2	2.3	23.7	6.5	5.12	5.17	11.14
Mar-55	205503		3	13.5	52.6	28.6	62.71	62.70	43.80
Apr-55	205504		4	23.9	232.9	10.2	11.02	11.02	37.81
May-55	205505		5	68.4	190.9	34.0	135.52	135.52	41.70
Jun-55	205506		6	36.9	182.1	157.8	128.44	128.44	228.82
Jul-55	205507		7	236.1	6.5	49.7	174.40	174.41	167.47
Aug-55	205508		8	76.8	79.9	90.9	79.38	79.37	21.29
Sep-55	205509		9	267.5	146.3	131.9	127.06	127.06	194.93
Oct-55	205510		10	133.3	140.3	202.4	347.69	347.69	190.85
Nov-55	205511		11	4.1	82.4	141.1	60.58	60.57	10.98
Dec-55	205512		12	3.4	6.3	50.0	1.55	1.49	2.16

459203 : corrected monthly precipitation data from 2056-2060

month	codemonth	Row Labels	month	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-56	205601	2056	1	12.8	20.7	10.8	28.83	29.77	0.11
Feb-56	205602		2	3.9	13.4	9.3	24.25	24.24	29.84
Mar-56	205603		3	23.4	14.3	20.0	34.97	34.98	43.00
Apr-56	205604		4	58.3	14.2	69.3	59.82	59.82	48.86
May-56	205605		5	201.2	115.4	21.3	171.87	171.88	127.26
Jun-56	205606		6	60.5	70.4	46.0	51.39	51.38	90.85
Jul-56	205607		7	24.8	31.3	315.9	235.99	235.98	59.32
Aug-56	205608		8	63.7	88.2	5.8	84.97	84.97	80.65
Sep-56	205609		9	41.2	204.8	171.5	237.00	237.00	77.49
Oct-56	205610		10	173.2	180.5	182.0	349.38	349.38	101.02
Nov-56	205611		11	35.0	111.4	37.2	3.38	3.38	9.11
Dec-56	205612		12	1.4	3.0	1.2	0.34	0.32	2.10
Jan-57	205701	2057	1	1.0	8.5	0.0	0.11	0.15	1.87
Feb-57	205702		2	21.7	6.4	1.1	18.43	18.46	5.01
Mar-57	205703		3	13.3	32.7	56.8	4.26	4.28	136.84
Apr-57	205704		4	19.0	141.8	41.6	19.66	19.68	153.84
May-57	205705		5	61.6	225.5	256.0	128.87	128.89	225.49
Jun-57	205706		6	48.8	126.4	80.7	122.62	122.62	67.93
Jul-57	205707		7	69.8	66.5	4.7	24.37	24.37	200.16
Aug-57	205708		8	116.8	46.2	113.3	71.35	71.34	112.78
Sep-57	205709		9	250.9	278.7	400.1	153.19	153.19	357.39
Oct-57	205710		10	167.2	415.8	192.1	97.38	97.36	257.52
Nov-57	205711		11	21.7	27.7	135.3	20.47	20.47	127.60
Dec-57	205712		12	1.1	27.5	0.7	0.14	0.13	0.14
Jan-58	205801	2058	1	2.6	2.0	39.9	26.82	27.75	6.80
Feb-58	205802		2	3.3	7.8	36.3	10.24	10.29	27.44
Mar-58	205803		3	42.3	16.1	17.1	0.66	0.68	39.72
Apr-58	205804		4	47.0	79.0	48.3	51.03	51.03	102.47
May-58	205805		5	184.2	117.4	178.2	121.60	121.60	171.77
Jun-58	205806		6	113.6	44.4	123.3	76.72	76.72	94.30
Jul-58	205807		7	30.1	56.6	51.8	53.43	53.43	105.12
Aug-58	205808		8	79.0	160.2	34.9	155.74	155.75	77.57
Sep-58	205809		9	180.3	138.7	101.9	134.79	134.80	234.88
Oct-58	205810		10	424.0	130.3	157.5	83.13	83.14	251.61
Nov-58	205811		11	186.4	40.4	13.8	164.08	164.08	15.03
Dec-58	205812		12	19.7	3.0	0.8	34.50	34.48	0.52
Jan-59	205901	2059	1	37.5	2.0	53.0	17.43	18.35	3.24
Feb-59	205902		2	9.7	4.6	17.6	46.86	46.72	6.50
Mar-59	205903		3	60.3	42.4	33.7	41.47	41.47	30.51
Apr-59	205904		4	64.0	29.8	50.9	98.10	98.11	23.77
May-59	205905		5	378.7	66.0	338.9	170.43	170.41	44.77
Jun-59	205906		6	89.7	17.0	200.6	172.04	172.04	116.01
Jul-59	205907		7	84.3	130.2	43.0	48.90	48.92	9.73
Aug-59	205908		8	111.2	81.4	31.2	76.73	76.74	198.88
Sep-59	205909		9	237.6	394.6	153.2	114.42	114.43	248.69
Oct-59	205910		10	149.1	341.7	202.3	316.73	316.72	113.56
Nov-59	205911		11	92.0	47.8	41.3	82.84	82.84	88.90
Dec-59	205912		12	52.7	1.6	0.7	37.46	37.46	0.67
Jan-60	206001	2060	1	26.1	0.9	18.4	0.50	0.62	160.84
Feb-60	206002		2	2.6	43.7	11.3	14.67	14.71	4.06
Mar-60	206003		3	45.6	13.5	13.4	13.55	13.56	19.20
Apr-60	206004		4	70.9	33.3	25.6	114.46	114.46	33.79
May-60	206005		5	212.0	219.2	320.7	525.55	525.59	38.92
Jun-60	206006		6	180.5	176.8	87.2	121.65	121.67	23.11
Jul-60	206007		7	23.3	165.1	263.3	128.90	128.93	64.52
Aug-60	206008		8	260.0	81.4	89.0	14.28	14.28	99.16
Sep-60	206009		9	138.9	182.3	127.8	313.91	313.91	132.07
Oct-60	206010		10	168.5	195.9	229.4	329.54	329.57	248.31
Nov-60	206011		11	223.8	7.0	66.1	0.53	0.53	7.56
Dec-60	206012		12	2.8	7.8	15.8	2.48	2.41	0.20

459203: corrected monthly precipitation data from 2061-2065

month	codemonth	Row Labels	month	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-61	206101	2061	1	7.7	0.3	0.0	0.00	0.00	7.73
Feb-61	206102		2	5.9	3.1	0.7	0.67	0.71	5.91
Mar-61	206103		3	13.7	18.9	12.9	22.11	22.13	28.54
Apr-61	206104		4	52.7	43.2	26.8	63.86	63.86	119.50
May-61	206105		5	121.7	144.6	259.5	94.45	94.45	273.51
Jun-61	206106		6	58.5	203.3	44.7	14.83	14.83	25.12
Jul-61	206107		7	185.2	38.1	73.6	39.96	39.97	39.63
Aug-61	206108		8	78.1	58.5	192.4	212.59	212.61	30.06
Sep-61	206109		9	164.2	165.2	135.0	428.68	428.70	322.51
Oct-61	206110		10	401.0	171.8	196.8	210.23	210.24	246.29
Nov-61	206111		11	125.7	2.5	0.5	13.82	13.82	3.39
Dec-61	206112		12	19.0	0.5	0.3	0.12	0.11	0.60
Jan-62	206201	2062	1	27.5	1.9	0.0	0.01	0.01	3.64
Feb-62	206202		2	4.5	18.7	0.5	3.27	3.33	5.69
Mar-62	206203		3	43.5	68.0	23.5	70.50	70.49	13.41
Apr-62	206204		4	88.5	16.9	41.6	46.33	46.33	34.89
May-62	206205		5	124.8	216.8	85.6	39.91	39.92	108.55
Jun-62	206206		6	55.5	95.2	177.0	110.15	110.14	97.72
Jul-62	206207		7	110.3	48.5	87.0	99.67	99.66	176.40
Aug-62	206208		8	69.7	69.5	105.2	34.65	34.65	40.77
Sep-62	206209		9	368.2	119.4	263.5	193.74	193.74	254.20
Oct-62	206210		10	274.0	230.1	262.4	293.29	293.30	382.30
Nov-62	206211		11	362.0	116.2	136.9	85.13	85.15	57.48
Dec-62	206212		12	0.2	2.3	2.7	24.57	24.49	1.08
Jan-63	206301	2063	1	0.9	9.1	0.0	7.41	8.14	26.71
Feb-63	206302		2	1.3	16.2	6.7	0.66	0.69	6.21
Mar-63	206303		3	34.8	124.2	8.0	7.84	7.85	53.51
Apr-63	206304		4	55.2	79.7	53.0	70.79	70.77	65.19
May-63	206305		5	12.1	62.9	148.3	62.28	62.28	172.53
Jun-63	206306		6	73.0	45.5	1.2	141.85	141.85	187.44
Jul-63	206307		7	175.1	35.9	17.0	15.67	15.67	131.75
Aug-63	206308		8	137.4	39.9	155.3	83.23	83.24	103.96
Sep-63	206309		9	296.3	261.8	179.6	142.00	142.00	214.35
Oct-63	206310		10	176.5	242.7	148.2	217.00	216.99	436.72
Nov-63	206311		11	13.9	23.0	18.1	93.85	93.85	352.68
Dec-63	206312		12	0.5	1.2	16.6	2.25	2.18	9.88
Jan-64	206401	2064	1	0.6	1.2	97.9	8.86	9.60	6.05
Feb-64	206402		2	1.5	10.3	5.8	17.21	17.23	8.08
Mar-64	206403		3	18.9	15.5	128.3	96.16	96.16	11.03
Apr-64	206404		4	53.5	18.0	68.0	121.73	121.74	21.11
May-64	206405		5	124.7	267.8	73.3	283.24	283.23	126.23
Jun-64	206406		6	361.4	139.3	90.1	48.74	48.76	109.72
Jul-64	206407		7	74.1	42.2	6.9	131.31	131.32	176.27
Aug-64	206408		8	99.1	68.6	34.7	21.02	21.02	23.79
Sep-64	206409		9	223.3	269.1	239.2	161.97	161.96	137.89
Oct-64	206410		10	243.8	222.6	470.6	142.54	142.55	213.94
Nov-64	206411		11	22.8	27.2	132.3	69.60	69.62	9.03
Dec-64	206412		12	19.2	1.2	15.0	8.33	8.21	0.54
Jan-65	206501	2065	1	7.9	139.1	11.8	2.62	3.00	15.72
Feb-65	206502		2	40.5	5.2	19.9	22.04	22.04	5.58
Mar-65	206503		3	169.1	156.1	18.7	53.85	53.86	2.81
Apr-65	206504		4	229.5	37.4	81.9	72.21	72.21	53.16
May-65	206505		5	381.2	306.2	275.0	185.48	185.48	423.86
Jun-65	206506		6	43.9	112.4	50.5	81.99	82.00	47.17
Jul-65	206507		7	5.6	487.1	128.7	128.24	128.21	67.33
Aug-65	206508		8	1.5	78.6	47.8	199.01	199.01	277.45
Sep-65	206509		9	224.4	227.4	245.8	255.73	255.72	181.73
Oct-65	206510		10	179.5	271.2	176.3	233.86	233.87	315.08
Nov-65	206511		11	17.7	5.8	45.8	22.83	22.84	60.32
Dec-65	206512		12	0.4	2.0	2.0	0.33	0.31	5.26

459204 : corrected monthly precipitation data from 2046-2050

month	codemonth	Row Labels	month	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-46	204601	2046	1	10.5	53.1	7.2	5.88	5.71	11.05
Feb-46	204602		2	5.5	0.8	12.2	0.59	0.64	3.47
Mar-46	204603		3	24.3	49.5	18.9	92.15	92.14	0.84
Apr-46	204604		4	49.1	51.6	19.5	16.73	16.73	268.65
May-46	204605		5	5.4	76.5	189.7	125.34	125.32	78.90
Jun-46	204606		6	53.7	64.1	193.9	276.21	276.22	94.30
Jul-46	204607		7	203.4	137.2	7.4	154.37	154.35	105.64
Aug-46	204608		8	151.2	60.6	118.0	159.84	159.83	47.90
Sep-46	204609		9	300.7	339.3	183.6	274.07	274.07	240.39
Oct-46	204610		10	390.4	322.7	285.2	191.04	191.03	274.14
Nov-46	204611		11	0.1	50.9	64.2	18.86	18.86	69.28
Dec-46	204612		12	1.2	5.8	9.3	1.34	1.33	0.10
Jan-47	204701	2047	1	19.2	65.9	103.8	2.61	2.51	7.17
Feb-47	204702		2	7.3	19.3	1.6	0.28	0.32	30.04
Mar-47	204703		3	85.1	12.7	10.9	18.69	18.71	9.68
Apr-47	204704		4	27.7	81.9	23.8	195.19	195.19	39.36
May-47	204705		5	101.2	132.0	241.1	146.38	146.36	191.78
Jun-47	204706		6	100.0	131.4	29.6	72.22	72.24	90.79
Jul-47	204707		7	120.5	70.4	114.9	5.95	5.95	28.13
Aug-47	204708		8	61.4	177.8	199.6	111.09	111.06	228.92
Sep-47	204709		9	166.1	278.1	229.1	166.82	166.82	193.78
Oct-47	204710		10	334.2	271.9	323.2	362.28	362.26	413.74
Nov-47	204711		11	11.4	114.7	12.1	75.85	75.85	124.57
Dec-47	204712		12	2.2	20.7	20.0	8.21	8.19	78.42
Jan-48	204801	2048	1	14.3	28.1	20.7	14.58	14.31	6.57
Feb-48	204802		2	74.2	0.1	19.8	3.85	3.97	16.02
Mar-48	204803		3	11.2	13.4	101.9	19.69	19.72	85.76
Apr-48	204804		4	126.4	19.4	221.7	172.68	172.65	57.25
May-48	204805		5	251.4	28.1	105.4	217.74	217.73	167.26
Jun-48	204806		6	77.6	74.8	91.0	61.87	61.87	254.16
Jul-48	204807		7	84.2	28.2	134.8	14.48	14.47	54.73
Aug-48	204808		8	100.6	59.0	8.5	219.67	219.64	53.88
Sep-48	204809		9	134.5	168.3	256.3	232.38	232.37	257.19
Oct-48	204810		10	102.0	165.1	439.3	313.56	313.56	258.59
Nov-48	204811		11	66.7	41.6	188.1	131.59	131.60	76.16
Dec-48	204812		12	0.2	0.5	0.8	0.00	0.00	0.42
Jan-49	204901	2049	1	14.5	6.4	13.5	0.00	0.00	12.16
Feb-49	204902		2	2.1	2.6	8.4	5.81	5.96	4.58
Mar-49	204903		3	30.3	20.7	76.8	85.72	85.72	63.94
Apr-49	204904		4	76.3	38.4	248.2	2.35	2.35	21.15
May-49	204905		5	212.9	352.0	171.5	69.56	69.57	263.16
Jun-49	204906		6	144.0	65.6	73.4	170.22	170.21	80.33
Jul-49	204907		7	55.1	139.6	82.6	24.52	24.51	4.61
Aug-49	204908		8	43.3	14.7	288.8	92.49	92.48	24.00
Sep-49	204909		9	222.5	284.2	347.0	245.96	245.95	101.60
Oct-49	204910		10	315.3	466.8	341.2	387.16	387.14	310.66
Nov-49	204911		11	7.1	162.9	34.5	65.61	65.61	90.96
Dec-49	204912		12	0.2	8.2	0.3	18.57	18.54	7.76
Jan-50	205001	2050	1	24.4	1.6	1.6	10.58	10.33	7.97
Feb-50	205002		2	2.3	0.2	25.5	49.90	49.81	7.69
Mar-50	205003		3	85.3	5.0	126.0	20.42	20.44	129.35
Apr-50	205004		4	104.7	79.9	77.9	93.39	93.39	98.60
May-50	205005		5	168.7	175.4	119.3	173.16	173.16	48.10
Jun-50	205006		6	251.6	145.0	106.9	79.05	79.05	143.27
Jul-50	205007		7	9.6	57.9	77.0	189.20	189.17	170.23
Aug-50	205008		8	56.5	69.8	140.4	24.39	24.40	137.35
Sep-50	205009		9	196.7	162.1	234.1	183.50	183.51	257.40
Oct-50	205010		10	169.4	113.9	308.0	228.94	228.92	354.37
Nov-50	205011		11	189.3	174.1	15.4	251.26	251.24	133.63
Dec-50	205012		12	1.8	3.8	0.1	4.52	4.50	15.15

459204 : corrected monthly precipitation data from 2051-2055

month	codemonth	Row Labels	month	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-51	205101	2051	1	13.4	12.3	1.1	23.32	23.00	6.89
Feb-51	205102		2	2.9	1.8	30.0	33.14	33.20	56.91
Mar-51	205103		3	12.1	15.9	32.7	74.58	74.58	44.76
Apr-51	205104		4	6.7	85.2	8.4	16.83	16.83	43.05
May-51	205105		5	59.0	113.5	148.6	83.89	83.89	273.00
Jun-51	205106		6	133.5	31.5	221.7	152.35	152.34	120.63
Jul-51	205107		7	206.3	100.6	78.4	69.92	69.93	13.58
Aug-51	205108		8	103.6	40.1	108.4	181.70	181.66	40.58
Sep-51	205109		9	238.0	324.4	291.8	271.79	271.79	324.84
Oct-51	205110		10	400.0	200.1	219.5	153.97	154.00	175.28
Nov-51	205111		11	39.6	6.4	64.1	4.58	4.58	43.54
Dec-51	205112		12	2.8	49.5	6.3	4.52	4.51	0.02
Jan-52	205201	2052	1	14.6	20.0	0.0	0.07	0.07	14.89
Feb-52	205202		2	30.6	28.2	11.8	0.81	0.89	74.97
Mar-52	205203		3	37.2	65.6	6.9	1.78	1.79	92.36
Apr-52	205204		4	68.4	76.1	192.9	1.23	1.23	9.47
May-52	205205		5	133.8	245.3	111.1	186.61	186.59	150.88
Jun-52	205206		6	71.2	44.3	202.3	85.71	85.70	125.22
Jul-52	205207		7	69.5	35.4	171.2	177.37	177.38	159.65
Aug-52	205208		8	3.3	654.0	68.3	9.53	9.53	172.36
Sep-52	205209		9	325.8	180.1	124.1	163.46	163.46	280.88
Oct-52	205210		10	363.8	297.0	201.7	247.28	247.28	140.28
Nov-52	205211		11	40.4	76.5	315.5	308.15	308.13	79.48
Dec-52	205212		12	0.6	25.3	0.0	1.00	0.99	41.99
Jan-53	205301	2053	1	128.7	28.0	20.7	99.34	99.52	5.14
Feb-53	205302		2	34.7	3.5	87.4	10.67	10.84	2.31
Mar-53	205303		3	37.7	34.2	106.8	25.35	25.37	10.78
Apr-53	205304		4	112.9	49.2	111.7	33.07	33.06	36.40
May-53	205305		5	236.5	160.7	72.3	121.79	121.79	174.61
Jun-53	205306		6	262.9	154.9	197.6	143.81	143.80	129.81
Jul-53	205307		7	34.9	67.0	99.1	96.01	96.00	55.51
Aug-53	205308		8	170.3	92.0	167.3	91.86	91.87	34.68
Sep-53	205309		9	223.5	128.8	269.4	312.02	312.03	221.68
Oct-53	205310		10	336.6	424.4	217.7	340.13	340.14	308.21
Nov-53	205311		11	187.8	454.4	1.3	10.49	10.49	332.85
Dec-53	205312		12	1.4	0.7	2.7	0.00	0.00	5.29
Jan-54	205401	2054	1	12.7	8.5	0.7	13.11	12.85	16.02
Feb-54	205402		2	53.3	60.7	3.4	12.15	12.31	9.08
Mar-54	205403		3	14.9	45.9	35.1	141.98	141.96	21.46
Apr-54	205404		4	75.4	29.7	13.9	45.98	45.96	7.49
May-54	205405		5	189.6	35.5	185.9	217.39	217.38	95.89
Jun-54	205406		6	18.1	303.2	116.2	125.84	125.83	113.87
Jul-54	205407		7	121.9	120.7	99.9	130.68	130.66	107.21
Aug-54	205408		8	166.6	34.2	54.6	19.97	19.96	76.18
Sep-54	205409		9	233.1	183.4	252.0	379.38	379.37	182.62
Oct-54	205410		10	210.5	305.9	436.6	280.62	280.60	212.44
Nov-54	205411		11	18.7	175.1	245.6	214.58	214.60	10.90
Dec-54	205412		12	0.8	0.1	0.2	0.01	0.01	1.92
Jan-55	205501	2055	1	11.4	5.1	0.0	109.43	109.71	10.94
Feb-55	205502		2	3.7	50.3	10.3	6.74	6.90	15.80
Mar-55	205503		3	8.2	60.7	22.3	62.06	62.07	36.00
Apr-55	205504		4	20.4	324.4	3.5	3.31	3.32	31.36
May-55	205505		5	94.3	201.5	56.2	168.69	168.69	85.67
Jun-55	205506		6	53.3	195.5	161.0	156.37	156.37	237.10
Jul-55	205507		7	294.9	5.8	93.4	171.57	171.58	210.97
Aug-55	205508		8	85.1	89.3	103.0	87.24	87.24	18.29
Sep-55	205509		9	274.0	164.0	161.0	143.69	143.69	219.39
Oct-55	205510		10	170.0	170.5	208.3	326.27	326.27	208.44
Nov-55	205511		11	7.4	89.4	161.0	67.22	67.21	9.85
Dec-55	205512		12	6.3	6.8	70.3	4.57	4.55	3.65

459204 : corrected monthly precipitation data from 2056-2060

month	codemonth	Row Labels	month	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-56	205601	2056	1	32.8	40.9	26.7	48.49	48.23	2.05
Feb-56	205602		2	6.2	14.6	12.4	31.05	31.12	51.51
Mar-56	205603		3	16.3	16.4	24.8	29.41	29.44	52.70
Apr-56	205604		4	64.3	10.0	64.2	61.76	61.74	38.30
May-56	205605		5	210.5	136.4	49.8	183.06	183.07	121.35
Jun-56	205606		6	82.7	92.4	63.0	88.69	88.68	120.80
Jul-56	205607		7	24.6	32.3	370.4	322.88	322.87	60.11
Aug-56	205608		8	65.8	101.9	0.8	100.91	100.91	103.44
Sep-56	205609		9	63.8	219.8	190.8	236.95	236.95	107.26
Oct-56	205610		10	204.7	208.0	212.4	417.37	417.38	118.89
Nov-56	205611		11	47.3	119.7	38.2	3.73	3.73	17.23
Dec-56	205612		12	2.6	1.2	1.5	0.35	0.35	3.70
Jan-57	205701	2057	1	12.1	23.6	0.6	13.31	13.06	9.40
Feb-57	205702		2	33.5	2.6	3.8	29.51	29.62	7.22
Mar-57	205703		3	7.3	38.6	67.6	2.29	2.31	148.50
Apr-57	205704		4	16.2	189.7	37.6	10.45	10.47	251.87
May-57	205705		5	86.6	228.2	256.5	150.56	150.58	243.23
Jun-57	205706		6	68.9	145.7	71.1	128.30	128.30	113.25
Jul-57	205707		7	76.4	74.9	2.9	28.87	28.87	253.62
Aug-57	205708		8	147.0	35.5	100.7	80.98	80.98	102.62
Sep-57	205709		9	260.0	284.4	398.4	169.24	169.24	366.05
Oct-57	205710		10	199.7	462.2	224.1	139.29	139.28	269.65
Nov-57	205711		11	31.3	38.3	161.8	28.04	28.04	232.58
Dec-57	205712		12	2.8	58.2	1.6	0.51	0.51	0.26
Jan-58	205801	2058	1	18.7	11.0	56.1	27.87	27.55	22.18
Feb-58	205802		2	5.6	4.8	57.5	16.88	17.04	44.42
Mar-58	205803		3	39.3	17.6	17.4	0.07	0.07	36.71
Apr-58	205804		4	49.1	87.2	35.2	50.36	50.36	120.56
May-58	205805		5	197.0	140.3	181.0	139.82	139.82	165.74
Jun-58	205806		6	132.2	65.0	142.7	112.47	112.47	116.74
Jul-58	205807		7	29.5	66.2	53.1	60.92	60.92	118.83
Aug-58	205808		8	85.4	209.5	22.2	206.57	206.58	93.03
Sep-58	205809		9	205.8	167.2	119.4	171.90	171.91	263.31
Oct-58	205810		10	464.2	164.8	200.2	115.81	115.82	309.44
Nov-58	205811		11	218.5	52.3	19.8	190.37	190.36	41.15
Dec-58	205812		12	29.2	1.5	0.8	40.10	40.09	1.14
Jan-59	205901	2059	1	60.8	10.5	64.8	38.96	38.69	12.43
Feb-59	205902		2	18.5	0.9	27.6	78.83	78.44	7.39
Mar-59	205903		3	66.3	43.9	29.6	38.61	38.64	21.54
Apr-59	205904		4	72.2	25.4	81.5	119.51	119.53	20.00
May-59	205905		5	348.9	93.7	305.6	188.25	188.23	73.88
Jun-59	205906		6	109.3	31.6	219.5	169.47	169.47	122.75
Jul-59	205907		7	93.0	149.3	55.8	35.66	35.67	11.83
Aug-59	205908		8	136.4	84.1	24.9	72.37	72.37	306.29
Sep-59	205909		9	254.7	382.1	187.1	156.68	156.68	249.47
Oct-59	205910		10	182.3	381.3	233.4	364.06	364.06	135.11
Nov-59	205911		11	99.8	50.0	42.5	91.61	91.60	94.78
Dec-59	205912		12	69.9	0.2	0.8	46.41	46.41	0.93
Jan-60	206001	2060	1	48.6	6.3	32.7	3.54	3.42	167.50
Feb-60	206002		2	4.4	112.4	15.5	24.10	24.23	3.83
Mar-60	206003		3	39.9	13.8	9.6	8.64	8.67	14.41
Apr-60	206004		4	79.7	29.6	9.1	187.57	187.58	13.30
May-60	206005		5	220.4	222.0	347.8	450.01	450.04	75.95
Jun-60	206006		6	199.6	192.7	97.8	148.98	148.99	47.98
Jul-60	206007		7	22.7	186.3	269.9	138.71	138.75	61.11
Aug-60	206008		8	373.1	95.1	96.4	7.86	7.87	101.61
Sep-60	206009		9	167.4	199.7	153.9	292.40	292.41	146.44
Oct-60	206010		10	203.1	237.7	288.3	426.56	426.59	287.77
Nov-60	206011		11	240.9	10.4	62.9	1.31	1.31	9.43
Dec-60	206012		12	5.9	6.7	19.4	13.01	12.99	0.44

459204: corrected monthly precipitation data from 2061-2065

month	codemonth	Row Labels	month	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-61	206101	2061	1	27.1	4.0	2.2	0.21	0.20	25.79
Feb-61	206102		2	8.8	0.2	2.9	1.99	2.09	7.03
Mar-61	206103		3	8.2	18.0	9.4	17.90	17.94	22.78
Apr-61	206104		4	55.7	43.4	13.8	49.31	49.31	145.90
May-61	206105		5	144.1	161.3	236.3	127.68	127.68	243.18
Jun-61	206106		6	78.6	214.9	74.0	32.09	32.09	51.56
Jul-61	206107		7	223.0	45.6	112.2	59.21	59.22	42.00
Aug-61	206108		8	84.9	61.4	272.5	279.27	279.31	30.15
Sep-61	206109		9	184.4	181.5	171.5	383.91	383.93	325.71
Oct-61	206110		10	442.7	200.1	231.7	243.63	243.64	259.47
Nov-61	206111		11	131.9	2.6	1.0	33.83	33.82	3.67
Dec-61	206112		12	29.5	0.0	0.8	0.01	0.01	0.89
Jan-62	206201	2062	1	51.2	12.7	3.4	0.66	0.63	13.77
Feb-62	206202		2	7.1	26.5	3.2	3.56	3.69	10.55
Mar-62	206203		3	38.5	74.4	22.2	72.42	72.43	6.14
Apr-62	206204		4	105.1	12.2	21.9	30.75	30.75	29.70
May-62	206205		5	147.2	224.6	99.3	68.29	68.30	130.53
Jun-62	206206		6	76.1	118.0	201.4	119.57	119.57	95.80
Jul-62	206207		7	128.6	54.8	86.4	100.09	100.09	212.76
Aug-62	206208		8	74.1	80.5	134.5	33.58	33.58	41.19
Sep-62	206209		9	352.4	151.7	292.9	195.49	195.49	250.63
Oct-62	206210		10	312.3	270.0	279.5	346.16	346.17	426.84
Nov-62	206211		11	382.8	129.5	182.3	104.16	104.17	42.62
Dec-62	206212		12	0.5	1.0	2.9	37.73	37.72	1.52
Jan-63	206301	2063	1	11.3	23.6	0.3	35.99	35.80	50.82
Feb-63	206302		2	2.0	19.6	10.2	0.39	0.43	6.72
Mar-63	206303		3	27.8	139.0	5.1	4.15	4.17	57.34
Apr-63	206304		4	58.7	96.8	49.7	75.14	75.10	94.36
May-63	206305		5	30.8	89.2	158.4	80.46	80.48	244.93
Jun-63	206306		6	96.0	66.1	6.7	149.07	149.07	197.61
Jul-63	206307		7	207.2	39.0	18.3	14.75	14.76	180.59
Aug-63	206308		8	178.0	30.4	226.9	120.01	120.02	130.44
Sep-63	206309		9	300.3	267.5	204.3	171.29	171.29	240.28
Oct-63	206310		10	212.4	280.5	184.2	235.03	235.03	480.98
Nov-63	206311		11	16.5	28.3	16.9	124.93	124.93	314.73
Dec-63	206312		12	1.0	0.1	30.3	1.94	1.93	11.87
Jan-64	206401	2064	1	10.0	7.9	107.0	26.37	26.10	20.97
Feb-64	206402		2	2.4	7.9	10.7	29.65	29.75	10.08
Mar-64	206403		3	14.3	18.9	139.1	100.13	100.14	8.50
Apr-64	206404		4	57.2	16.0	70.1	152.35	152.36	8.81
May-64	206405		5	145.8	261.9	94.0	283.48	283.47	172.63
Jun-64	206406		6	351.9	151.1	116.2	79.91	79.93	137.19
Jul-64	206407		7	79.6	45.1	5.9	144.38	144.39	165.67
Aug-64	206408		8	116.6	66.1	41.1	8.31	8.31	13.85
Sep-64	206409		9	233.8	271.7	246.9	183.35	183.34	158.87
Oct-64	206410		10	281.4	264.6	527.4	167.44	167.45	231.82
Nov-64	206411		11	33.5	33.3	170.8	81.47	81.48	15.18
Dec-64	206412		12	26.5	0.1	18.4	8.28	8.26	1.17
Jan-65	206501	2065	1	28.2	146.9	27.8	7.55	7.35	37.23
Feb-65	206502		2	59.0	1.0	30.6	40.50	40.51	6.86
Mar-65	206503		3	203.5	169.7	16.6	60.70	60.73	2.28
Apr-65	206504		4	322.6	35.9	76.7	99.33	99.34	48.97
May-65	206505		5	347.9	300.7	253.5	198.19	198.19	372.96
Jun-65	206506		6	64.0	129.5	66.8	110.03	110.04	64.85
Jul-65	206507		7	4.8	584.0	166.4	161.88	161.85	75.21
Aug-65	206508		8	0.2	87.6	49.8	303.02	303.04	431.73
Sep-65	206509		9	240.6	243.7	266.6	243.84	243.83	193.44
Oct-65	206510		10	209.9	307.5	204.7	224.81	224.82	337.69
Nov-65	206511		11	21.1	7.3	65.3	38.09	38.10	90.08
Dec-65	206512		12	0.9	0.5	1.3	1.10	1.10	7.84

459205 : corrected monthly precipitation data from 2046-2050

month	codemonth	Row Labels	month	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-46	204601	2046	1	1.0	51.0	0.6	0.98	1.02	1.62
Feb-46	204602		2	5.3	4.5	6.5	0.87	0.94	3.25
Mar-46	204603		3	36.9	50.1	30.8	89.41	89.37	2.71
Apr-46	204604		4	60.4	52.6	39.5	36.29	36.29	192.03
May-46	204605		5	2.1	73.9	167.6	100.09	100.08	89.76
Jun-46	204606		6	47.3	64.0	189.6	259.15	258.71	73.40
Jul-46	204607		7	179.7	129.3	22.8	122.75	122.73	94.53
Aug-46	204608		8	149.8	84.1	126.7	177.76	177.75	62.58
Sep-46	204609		9	331.2	424.2	197.8	245.89	245.89	234.60
Oct-46	204610		10	339.9	281.4	246.2	156.61	156.61	258.66
Nov-46	204611		11	0.2	43.3	44.9	16.10	16.14	80.40
Dec-46	204612		12	0.1	2.7	5.0	1.14	1.39	0.00
Jan-47	204701	2047	1	2.0	35.5	56.1	0.00	0.00	1.19
Feb-47	204702		2	5.7	18.6	0.4	0.90	0.97	14.63
Mar-47	204703		3	85.2	15.8	10.8	17.48	17.52	17.33
Apr-47	204704		4	43.6	80.6	52.2	131.03	131.03	49.75
May-47	204705		5	92.9	127.6	213.6	153.92	153.91	185.81
Jun-47	204706		6	97.9	128.5	33.4	66.86	67.01	95.36
Jul-47	204707		7	118.6	84.0	118.1	9.53	9.56	28.75
Aug-47	204708		8	84.1	171.3	184.4	123.74	123.73	202.56
Sep-47	204709		9	170.3	317.3	219.9	170.06	170.06	194.37
Oct-47	204710		10	276.3	228.8	268.3	314.47	314.44	376.78
Nov-47	204711		11	15.1	101.9	5.9	86.44	86.47	91.75
Dec-47	204712		12	1.0	6.7	8.3	0.66	0.84	29.76
Jan-48	204801	2048	1	2.2	17.4	8.8	0.40	0.42	0.63
Feb-48	204802		2	33.6	1.7	11.9	2.41	2.52	9.74
Mar-48	204803		3	21.3	15.7	80.3	25.25	25.28	68.87
Apr-48	204804		4	108.9	37.4	147.8	138.11	138.10	70.59
May-48	204805		5	240.7	26.6	90.0	192.03	192.02	132.06
Jun-48	204806		6	83.1	64.9	71.6	61.67	61.81	247.64
Jul-48	204807		7	88.6	45.3	148.7	22.67	22.71	69.69
Aug-48	204808		8	110.4	75.3	29.6	202.72	202.70	116.09
Sep-48	204809		9	103.0	165.5	265.9	239.56	239.54	328.36
Oct-48	204810		10	60.2	133.4	404.5	261.20	261.19	216.28
Nov-48	204811		11	57.2	43.2	127.4	85.41	85.45	70.34
Dec-48	204812		12	0.1	0.4	0.7	0.00	0.00	0.04
Jan-49	204901	2049	1	2.2	1.0	2.0	0.00	0.00	1.49
Feb-49	204902		2	2.6	5.4	5.3	3.83	3.95	2.79
Mar-49	204903		3	42.3	20.0	60.0	73.20	73.18	56.17
Apr-49	204904		4	77.2	49.0	140.1	8.17	8.18	25.38
May-49	204905		5	202.2	327.0	201.9	55.72	55.73	225.96
Jun-49	204906		6	141.6	62.6	77.7	176.73	176.58	82.00
Jul-49	204907		7	71.9	131.7	68.5	30.67	30.72	12.57
Aug-49	204908		8	69.2	40.5	251.1	130.60	130.60	54.79
Sep-49	204909		9	246.9	339.6	477.8	264.14	264.12	74.25
Oct-49	204910		10	268.3	419.0	288.8	328.21	328.19	166.71
Nov-49	204911		11	7.1	135.6	25.1	49.02	49.07	44.63
Dec-49	204912		12	0.1	3.5	0.3	5.28	5.69	2.35
Jan-50	205001	2050	1	6.5	0.1	0.0	5.23	5.32	0.84
Feb-50	205002		2	2.9	2.3	16.0	33.21	33.13	2.76
Mar-50	205003		3	84.0	6.6	113.7	34.15	34.17	84.37
Apr-50	205004		4	96.1	78.6	83.6	111.36	111.36	92.92
May-50	205005		5	159.5	174.7	103.9	168.28	168.28	46.30
Jun-50	205006		6	255.9	136.6	87.7	84.82	84.92	136.57
Jul-50	205007		7	23.0	68.8	84.2	188.92	188.84	95.83
Aug-50	205008		8	80.0	90.4	128.2	53.60	53.63	197.65
Sep-50	205009		9	188.0	150.4	296.2	191.11	191.14	359.16
Oct-50	205010		10	138.3	88.3	257.8	157.08	157.07	309.05
Nov-50	205011		11	190.3	166.2	16.2	221.97	221.93	183.43
Dec-50	205012		12	0.5	2.1	0.3	0.45	0.60	3.87

459205 : corrected monthly precipitation data from 2051-2055

month	codemonth	Row Labels	month	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-51	205101	2051	1	2.2	3.8	0.0	10.42	10.54	0.86
Feb-51	205102		2	3.4	4.7	17.6	16.86	16.96	35.46
Mar-51	205103		3	21.8	15.5	37.9	63.31	63.30	50.89
Apr-51	205104		4	21.7	83.6	25.7	37.76	37.76	66.93
May-51	205105		5	60.0	115.6	123.0	76.32	76.32	264.26
Jun-51	205106		6	114.7	30.7	212.4	153.58	153.50	110.04
Jul-51	205107		7	166.3	108.3	75.9	81.63	81.67	18.80
Aug-51	205108		8	111.5	62.6	114.1	151.31	151.28	69.90
Sep-51	205109		9	286.0	376.8	338.0	328.05	328.06	437.07
Oct-51	205110		10	357.0	166.7	196.8	143.02	143.05	148.63
Nov-51	205111		11	42.9	8.5	72.9	9.24	9.27	42.86
Dec-51	205112		12	0.8	17.7	1.8	0.80	1.00	0.00
Jan-52	205201	2052	1	2.5	5.1	0.0	0.00	0.00	3.17
Feb-52	205202		2	22.6	16.5	7.8	0.44	0.50	46.98
Mar-52	205203		3	46.3	54.8	8.2	7.68	7.72	95.52
Apr-52	205204		4	71.1	73.2	162.9	6.55	6.56	23.68
May-52	205205		5	125.4	223.1	92.8	188.27	188.26	182.83
Jun-52	205206		6	74.0	41.4	200.6	70.41	70.53	150.30
Jul-52	205207		7	78.3	54.2	150.1	140.16	140.15	181.70
Aug-52	205208		8	17.1	457.7	86.6	25.69	25.71	148.50
Sep-52	205209		9	408.7	174.9	111.5	141.27	141.26	280.18
Oct-52	205210		10	320.8	258.9	150.0	174.23	174.23	86.37
Nov-52	205211		11	48.3	72.0	288.7	294.87	294.78	68.29
Dec-52	205212		12	0.3	9.9	0.0	0.04	0.07	16.15
Jan-53	205301	2053	1	206.0	9.0	10.3	42.50	42.94	0.65
Feb-53	205302		2	5.1	5.5	52.7	8.36	8.50	3.25
Mar-53	205303		3	47.0	35.7	88.7	32.68	32.70	18.55
Apr-53	205304		4	99.5	60.2	103.6	51.02	51.02	62.54
May-53	205305		5	224.1	154.6	68.0	128.70	128.70	177.88
Jun-53	205306		6	254.4	155.7	197.1	142.81	142.76	143.23
Jul-53	205307		7	51.0	77.5	110.8	96.94	96.95	89.44
Aug-53	205308		8	165.7	96.4	180.5	104.90	104.91	41.14
Sep-53	205309		9	246.8	105.2	312.0	347.04	347.07	197.57
Oct-53	205310		10	294.2	372.0	183.3	330.86	330.86	230.17
Nov-53	205311		11	171.8	363.1	2.1	10.51	10.53	249.03
Dec-53	205312		12	0.5	0.6	1.0	0.00	0.00	0.89
Jan-54	205401	2054	1	1.3	1.8	0.0	11.47	11.63	3.33
Feb-54	205402		2	37.5	33.1	0.7	8.37	8.50	7.54
Mar-54	205403		3	20.6	42.5	32.6	103.53	103.47	36.94
Apr-54	205404		4	75.2	45.8	22.3	63.30	63.29	23.68
May-54	205405		5	183.3	36.2	180.8	216.17	216.16	118.53
Jun-54	205406		6	23.6	308.4	113.8	130.41	130.40	107.19
Jul-54	205407		7	125.8	120.9	104.2	138.90	138.88	122.71
Aug-54	205408		8	171.8	63.7	57.3	34.07	34.07	89.29
Sep-54	205409		9	255.3	168.2	306.8	430.05	430.05	168.92
Oct-54	205410		10	172.4	261.5	371.4	261.26	261.24	161.60
Nov-54	205411		11	24.3	128.3	239.6	179.67	179.68	10.34
Dec-54	205412		12	0.2	0.3	0.2	0.00	0.00	0.07
Jan-55	205501	2055	1	1.3	0.7	0.0	137.61	137.92	1.99
Feb-55	205502		2	3.8	23.0	5.5	4.13	4.26	10.43
Mar-55	205503		3	17.6	51.1	28.7	57.42	57.42	43.10
Apr-55	205504		4	37.4	211.1	13.9	16.07	16.08	44.24
May-55	205505		5	91.5	191.5	59.0	147.16	147.16	61.80
Jun-55	205506		6	52.7	197.1	167.3	140.11	140.08	221.42
Jul-55	205507		7	223.2	19.6	68.7	186.03	185.97	164.61
Aug-55	205508		8	98.6	103.0	112.7	102.45	102.45	31.43
Sep-55	205509		9	320.1	164.3	143.1	141.41	141.40	221.70
Oct-55	205510		10	121.3	135.5	198.4	346.71	346.70	194.12
Nov-55	205511		11	4.4	85.3	130.4	58.90	58.94	17.36
Dec-55	205512		12	1.7	3.0	25.1	0.47	0.62	0.92

459205 : corrected monthly precipitation data from 2056-2060

month	codemonth	Row Labels	month	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-56	205601	2056	1	18.4	28.7	12.9	40.59	40.80	0.08
Feb-56	205602		2	5.5	12.6	8.3	24.07	24.10	29.25
Mar-56	205603		3	28.5	15.3	19.6	34.06	34.10	36.61
Apr-56	205604		4	68.7	24.2	74.0	63.66	63.66	56.75
May-56	205605		5	199.7	130.9	41.4	178.61	178.61	154.49
Jun-56	205606		6	80.8	85.4	62.3	65.72	65.85	103.39
Jul-56	205607		7	39.7	51.9	288.0	224.51	224.40	79.49
Aug-56	205608		8	86.5	112.3	12.2	106.74	106.75	99.87
Sep-56	205609		9	39.7	237.0	195.1	281.12	281.13	81.83
Oct-56	205610		10	172.1	176.6	177.8	334.91	334.90	103.37
Nov-56	205611		11	31.8	109.6	42.8	5.06	5.08	10.37
Dec-56	205612		12	0.9	1.2	0.8	0.08	0.12	0.94
Jan-57	205701	2057	1	1.2	11.9	0.0	0.05	0.06	1.83
Feb-57	205702		2	22.1	5.5	0.7	17.51	17.61	4.16
Mar-57	205703		3	18.4	32.8	53.4	4.61	4.65	123.51
Apr-57	205704		4	29.8	138.4	47.5	25.99	26.01	144.27
May-57	205705		5	86.0	218.6	238.7	145.30	145.32	210.76
Jun-57	205706		6	66.9	142.7	100.9	137.55	137.53	76.66
Jul-57	205707		7	84.9	85.7	15.3	37.39	37.43	196.45
Aug-57	205708		8	140.2	66.7	144.0	93.20	93.20	157.26
Sep-57	205709		9	309.6	332.3	490.3	175.15	175.14	412.27
Oct-57	205710		10	165.2	401.8	186.3	91.55	91.55	260.83
Nov-57	205711		11	20.9	32.2	123.3	21.96	22.00	78.49
Dec-57	205712		12	0.2	20.2	0.5	0.03	0.05	0.06
Jan-58	205801	2058	1	4.7	2.6	55.2	33.77	33.96	7.00
Feb-58	205802		2	4.3	6.6	36.6	9.11	9.25	26.09
Mar-58	205803		3	42.2	17.8	17.0	1.06	1.09	39.44
Apr-58	205804		4	59.1	88.1	55.0	56.81	56.81	104.55
May-58	205805		5	185.8	132.4	183.4	138.62	138.62	185.78
Jun-58	205806		6	136.1	58.2	138.8	91.34	91.43	109.68
Jul-58	205807		7	46.0	75.8	71.5	70.00	70.03	120.18
Aug-58	205808		8	103.3	191.9	51.7	185.82	185.82	95.84
Sep-58	205809		9	186.6	149.6	110.1	145.71	145.71	261.70
Oct-58	205810		10	411.0	123.7	154.9	81.29	81.31	233.70
Nov-58	205811		11	149.7	43.8	18.4	144.34	144.35	11.06
Dec-58	205812		12	9.9	1.1	0.6	17.73	17.83	0.20
Jan-59	205901	2059	1	45.0	2.8	74.5	20.68	20.93	3.43
Feb-59	205902		2	6.9	3.8	16.5	47.70	47.43	5.88
Mar-59	205903		3	51.2	43.6	34.5	40.08	40.11	31.97
Apr-59	205904		4	73.6	41.8	51.8	100.54	100.55	27.90
May-59	205905		5	324.0	86.6	299.5	177.81	177.79	69.23
Jun-59	205906		6	112.0	26.5	205.5	183.39	183.23	138.91
Jul-59	205907		7	102.5	139.3	65.3	69.76	69.82	20.08
Aug-59	205908		8	136.4	106.9	48.9	101.92	101.95	215.85
Sep-59	205909		9	262.1	485.3	170.5	120.73	120.72	297.54
Oct-59	205910		10	142.8	331.0	197.8	302.92	302.91	114.08
Nov-59	205911		11	94.2	55.5	47.2	81.10	81.14	87.39
Dec-59	205912		12	27.0	0.5	0.5	19.55	19.58	0.36
Jan-60	206001	2060	1	34.6	1.3	25.3	0.32	0.34	233.34
Feb-60	206002		2	3.8	47.2	10.1	13.42	13.54	3.74
Mar-60	206003		3	49.2	15.5	14.5	15.99	16.04	19.24
Apr-60	206004		4	81.2	45.3	30.2	111.85	111.84	46.25
May-60	206005		5	207.3	214.6	285.4	423.30	423.33	60.67
Jun-60	206006		6	191.1	191.0	102.5	133.09	133.09	36.56
Jul-60	206007		7	37.2	167.5	247.2	139.30	139.31	85.89
Aug-60	206008		8	292.1	103.7	112.7	23.88	23.90	131.67
Sep-60	206009		9	146.4	208.4	137.8	383.91	383.93	153.76
Oct-60	206010		10	160.7	187.3	221.9	316.27	316.29	237.67
Nov-60	206011		11	195.4	10.8	68.3	0.90	0.90	11.25
Dec-60	206012		12	0.9	4.4	8.4	0.82	1.03	0.08

459205: corrected monthly precipitation data from 2061-2065

month	codemonth	Row Labels	month	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-61	206101	2061	1	10.0	0.5	0.0	0.00	0.00	7.48
Feb-61	206102		2	8.2	2.5	0.5	0.39	0.43	5.32
Mar-61	206103		3	18.0	21.6	13.3	22.15	22.20	29.73
Apr-61	206104		4	64.6	54.4	31.2	73.08	73.08	122.42
May-61	206105		5	137.0	155.7	243.9	115.95	115.95	259.10
Jun-61	206106		6	73.3	217.0	59.9	27.58	27.73	38.72
Jul-61	206107		7	183.7	57.4	92.2	53.04	53.08	57.56
Aug-61	206108		8	103.7	77.8	222.5	252.79	252.80	40.27
Sep-61	206109		9	186.9	187.6	148.9	525.15	525.21	386.04
Oct-61	206110		10	385.6	167.4	189.9	202.63	202.65	248.71
Nov-61	206111		11	128.4	5.8	1.3	15.19	15.22	6.63
Dec-61	206112		12	9.5	0.1	0.3	0.03	0.05	0.27
Jan-62	206201	2062	1	34.9	2.0	0.0	0.00	0.00	3.79
Feb-62	206202		2	6.0	18.8	0.3	2.90	3.02	4.33
Mar-62	206203		3	46.0	66.3	23.7	63.44	63.43	15.94
Apr-62	206204		4	94.8	27.5	47.7	53.82	53.83	39.94
May-62	206205		5	139.2	211.4	108.5	62.69	62.71	129.49
Jun-62	206206		6	72.6	110.6	183.0	128.69	128.69	126.88
Jul-62	206207		7	121.1	68.5	105.5	116.20	116.20	172.28
Aug-62	206208		8	91.8	89.5	135.3	49.99	50.01	56.95
Sep-62	206209		9	448.1	124.9	311.9	223.66	223.65	305.16
Oct-62	206210		10	265.7	221.1	255.5	280.91	280.92	369.17
Nov-62	206211		11	298.4	112.1	124.5	80.94	80.99	74.02
Dec-62	206212		12	0.1	0.7	1.8	11.89	12.19	0.56
Jan-63	206301	2063	1	1.4	13.0	0.0	9.41	9.66	31.71
Feb-63	206302		2	2.4	15.9	5.7	0.41	0.46	5.69
Mar-63	206303		3	39.2	115.2	8.8	8.30	8.34	48.71
Apr-63	206304		4	67.9	86.6	57.8	76.50	76.48	62.46
May-63	206305		5	27.7	83.7	158.5	90.01	90.01	157.35
Jun-63	206306		6	86.1	59.3	4.0	159.91	159.82	190.88
Jul-63	206307		7	181.7	56.4	35.4	29.78	29.83	132.84
Aug-63	206308		8	162.0	58.3	184.2	106.61	106.63	127.80
Sep-63	206309		9	345.6	311.8	203.1	158.74	158.72	242.80
Oct-63	206310		10	169.3	234.5	145.7	210.59	210.59	419.62
Nov-63	206311		11	21.5	29.5	23.2	87.15	87.19	325.75
Dec-63	206312		12	0.3	0.3	8.7	0.81	1.02	5.19
Jan-64	206401	2064	1	1.0	1.8	138.9	7.73	7.90	5.91
Feb-64	206402		2	2.9	9.4	5.0	15.87	15.98	7.49
Mar-64	206403		3	19.4	16.0	118.0	91.05	91.02	11.12
Apr-64	206404		4	65.1	27.7	72.9	122.27	122.27	28.50
May-64	206405		5	140.5	250.0	96.3	260.14	260.14	133.51
Jun-64	206406		6	342.4	157.3	106.3	66.36	66.52	121.01
Jul-64	206407		7	93.1	63.1	20.1	142.63	142.63	198.77
Aug-64	206408		8	124.5	92.2	50.1	36.65	36.66	40.27
Sep-64	206409		9	266.6	322.6	282.6	183.81	183.79	156.75
Oct-64	206410		10	233.6	213.2	450.6	137.15	137.17	215.74
Nov-64	206411		11	20.9	33.7	122.5	67.34	67.40	11.26
Dec-64	206412		12	10.8	0.3	8.0	3.64	4.03	0.22
Jan-65	206501	2065	1	9.1	201.0	14.1	1.88	1.94	17.07
Feb-65	206502		2	41.9	4.6	18.7	21.20	21.27	4.98
Mar-65	206503		3	147.6	144.4	18.2	52.01	52.03	2.76
Apr-65	206504		4	200.6	48.9	87.6	72.80	72.81	56.98
May-65	206505		5	332.0	274.9	253.8	186.18	186.17	356.72
Jun-65	206506		6	60.7	129.9	68.4	101.24	101.32	68.70
Jul-65	206507		7	13.5	392.4	141.0	136.33	136.30	86.21
Aug-65	206508		8	5.7	101.6	65.0	225.80	225.79	301.91
Sep-65	206509		9	260.6	264.0	286.9	304.51	304.50	216.75
Oct-65	206510		10	180.8	263.1	172.0	230.73	230.74	311.90
Nov-65	206511		11	25.5	10.3	48.2	25.42	25.47	51.46
Dec-65	206512		12	0.2	0.6	1.3	0.07	0.12	2.62

478201 : corrected monthly precipitation data from 2046-2050

month	codemonth	Row Labels	month	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-46	204601	2046	1	11.9	42.6	5.2	5.6	5.6	9.8
Feb-46	204602		2	15.2	13.9	24.5	6.9	7.0	13.9
Mar-46	204603		3	46.0	77.5	40.2	129.7	129.7	1.3
Apr-46	204604		4	63.2	58.6	37.9	32.0	32.0	255.6
May-46	204605		5	9.3	85.4	209.2	136.9	136.9	110.0
Jun-46	204606		6	87.0	101.8	242.7	421.9	421.9	125.2
Jul-46	204607		7	272.3	211.4	38.3	238.0	238.0	158.6
Aug-46	204608		8	174.6	99.9	125.3	198.3	198.3	79.9
Sep-46	204609		9	341.4	397.6	223.2	282.6	282.6	264.6
Oct-46	204610		10	297.4	235.0	214.0	128.7	128.7	195.3
Nov-46	204611		11	0.3	40.7	49.9	22.5	22.5	60.7
Dec-46	204612		12	1.4	4.5	5.2	1.4	1.4	0.1
Jan-47	204701	2047	1	17.3	62.1	69.1	0.9	0.9	6.7
Feb-47	204702		2	17.3	49.2	7.4	3.5	3.6	53.6
Mar-47	204703		3	134.2	24.5	15.4	36.7	36.8	15.4
Apr-47	204704		4	40.4	104.0	38.2	223.7	223.8	55.1
May-47	204705		5	117.7	150.6	256.9	172.5	172.4	245.3
Jun-47	204706		6	142.2	185.1	39.9	95.6	95.6	120.8
Jul-47	204707		7	188.4	135.2	165.3	26.2	26.2	77.6
Aug-47	204708		8	93.8	198.4	177.9	158.5	158.5	241.6
Sep-47	204709		9	190.2	321.0	247.8	186.4	186.4	228.1
Oct-47	204710		10	247.4	204.1	231.0	289.7	289.6	318.1
Nov-47	204711		11	14.0	92.2	9.0	57.6	57.6	103.5
Dec-47	204712		12	2.3	11.1	7.7	2.7	2.7	40.5
Jan-48	204801	2048	1	15.2	24.6	15.0	6.4	6.5	7.0
Feb-48	204802		2	115.5	8.2	41.5	12.6	12.6	39.1
Mar-48	204803		3	23.0	22.9	135.1	26.7	26.8	157.4
Apr-48	204804		4	142.3	30.7	212.7	182.5	182.4	101.2
May-48	204805		5	284.0	41.5	126.6	265.3	265.3	210.5
Jun-48	204806		6	119.2	106.5	126.0	80.3	80.3	393.9
Jul-48	204807		7	143.7	81.3	202.5	46.9	46.9	102.0
Aug-48	204808		8	127.7	93.0	34.4	219.8	219.8	77.1
Sep-48	204809		9	150.8	192.3	262.5	253.9	253.9	276.8
Oct-48	204810		10	56.5	127.6	344.2	244.5	244.5	196.0
Nov-48	204811		11	50.4	35.7	117.9	83.4	83.5	52.0
Dec-48	204812		12	0.7	0.7	0.5	0.0	0.0	0.1
Jan-49	204901	2049	1	15.3	7.9	6.2	0.0	0.0	10.9
Feb-49	204902		2	6.9	21.3	25.4	22.9	22.9	14.4
Mar-49	204903		3	51.1	33.6	114.6	129.0	129.0	98.7
Apr-49	204904		4	91.2	52.3	214.8	11.6	11.6	30.2
May-49	204905		5	240.5	400.5	227.2	86.9	86.9	272.0
Jun-49	204906		6	192.0	102.6	121.3	238.8	238.7	90.8
Jul-49	204907		7	114.5	205.3	153.7	69.2	69.2	28.9
Aug-49	204908		8	76.8	41.9	246.4	139.7	139.7	54.3
Sep-49	204909		9	264.7	331.0	422.3	284.1	284.1	121.8
Oct-49	204910		10	237.4	360.1	258.3	244.0	244.0	221.6
Nov-49	204911		11	8.1	114.5	29.4	60.4	60.4	73.7
Dec-49	204912		12	0.7	5.6	0.3	9.4	9.4	2.9
Jan-50	205001	2050	1	22.0	4.1	0.8	15.9	15.9	6.3
Feb-50	205002		2	8.1	8.5	53.7	89.2	89.1	28.9
Mar-50	205003		3	135.9	9.4	173.4	38.6	38.7	151.4
Apr-50	205004		4	120.0	90.4	123.7	124.9	124.9	106.8
May-50	205005		5	191.2	206.1	139.7	200.8	200.8	47.8
Jun-50	205006		6	317.1	190.5	160.7	90.1	90.1	162.2
Jul-50	205007		7	41.6	120.1	125.2	269.8	269.8	246.8
Aug-50	205008		8	86.0	104.8	158.2	48.8	48.8	168.3
Sep-50	205009		9	217.8	182.0	297.6	220.2	220.2	296.8
Oct-50	205010		10	115.0	76.5	219.6	158.5	158.5	249.8
Nov-50	205011		11	136.3	129.1	10.9	177.2	177.2	113.8
Dec-50	205012		12	2.0	2.9	0.2	0.9	0.9	10.6

478201 : corrected monthly precipitation data from 2051-2055

month	codemonth	Row Labels	month	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-51	205101	2051	1	14.5	13.0	0.5	20.6	20.6	6.9
Feb-51	205102		2	9.2	19.0	60.1	54.6	54.6	98.0
Mar-51	205103		3	22.9	25.8	49.0	103.2	103.2	59.1
Apr-51	205104		4	11.1	105.8	12.2	28.1	28.1	76.0
May-51	205105		5	72.1	136.4	167.1	100.1	100.1	305.7
Jun-51	205106		6	187.9	59.4	263.5	214.9	214.9	159.7
Jul-51	205107		7	273.1	171.7	128.2	134.4	134.4	39.4
Aug-51	205108		8	130.5	74.2	146.9	191.0	191.0	67.2
Sep-51	205109		9	278.6	366.3	328.0	303.2	303.2	401.7
Oct-51	205110		10	310.7	141.2	165.8	99.4	99.4	126.1
Nov-51	205111		11	35.5	8.8	70.0	10.6	10.6	30.6
Dec-51	205112		12	2.6	20.3	3.1	2.1	2.0	0.0
Jan-52	205201	2052	1	15.5	17.8	0.0	0.0	0.0	12.9
Feb-52	205202		2	67.8	61.2	25.5	5.2	5.3	126.5
Mar-52	205203		3	62.8	100.1	9.7	2.9	3.0	150.9
Apr-52	205204		4	85.9	94.3	193.9	5.1	5.1	28.0
May-52	205205		5	149.4	270.7	125.4	199.1	199.1	195.0
Jun-52	205206		6	118.8	77.1	238.7	122.8	122.8	178.4
Jul-52	205207		7	131.3	92.0	242.0	245.0	245.1	235.3
Aug-52	205208		8	16.3	509.8	128.8	31.3	31.3	186.3
Sep-52	205209		9	372.9	205.6	148.3	210.4	210.4	334.8
Oct-52	205210		10	280.9	222.0	135.6	153.2	153.1	100.0
Nov-52	205211		11	39.9	60.5	217.6	196.2	196.1	56.2
Dec-52	205212		12	1.1	12.6	0.0	0.4	0.4	17.1
Jan-53	205301	2053	1	101.9	25.9	13.9	57.2	57.3	4.1
Feb-53	205302		2	58.6	26.0	137.9	30.0	30.0	9.3
Mar-53	205303		3	62.2	53.6	159.8	42.0	42.1	13.0
Apr-53	205304		4	130.7	69.9	122.1	39.8	39.8	39.3
May-53	205305		5	270.4	176.5	60.6	146.6	146.6	206.0
Jun-53	205306		6	328.5	219.4	270.6	174.1	174.0	192.0
Jul-53	205307		7	84.2	129.9	163.5	162.1	162.1	134.4
Aug-53	205308		8	188.8	122.0	219.2	122.9	122.9	60.2
Sep-53	205309		9	262.5	151.3	291.2	345.6	345.7	257.2
Oct-53	205310		10	260.6	320.3	157.0	272.3	272.3	223.9
Nov-53	205311		11	136.2	274.1	1.8	12.7	12.7	183.9
Dec-53	205312		12	1.7	1.1	1.3	0.0	0.0	2.3
Jan-54	205401	2054	1	13.2	9.4	0.1	13.8	13.8	13.4
Feb-54	205402		2	94.5	85.8	9.1	33.7	33.6	21.0
Mar-54	205403		3	32.7	69.5	59.5	202.0	201.9	36.5
Apr-54	205404		4	86.9	42.3	33.6	63.1	63.0	20.2
May-54	205405		5	216.3	44.6	216.6	244.9	244.9	125.8
Jun-54	205406		6	42.1	384.3	161.4	173.2	173.2	145.5
Jul-54	205407		7	199.0	193.9	196.4	207.0	207.0	148.5
Aug-54	205408		8	185.1	68.5	100.8	56.0	56.0	120.8
Sep-54	205409		9	269.8	205.7	312.4	405.7	405.7	204.7
Oct-54	205410		10	145.8	238.2	330.2	206.9	206.9	140.2
Nov-54	205411		11	20.7	122.4	181.0	146.1	146.2	13.0
Dec-54	205412		12	1.3	0.4	0.2	0.0	0.0	1.0
Jan-55	205501	2055	1	12.7	7.0	0.0	115.2	115.2	8.6
Feb-55	205502		2	11.3	80.7	23.9	25.7	25.7	38.9
Mar-55	205503		3	15.2	85.3	42.1	91.2	91.2	47.6
Apr-55	205504		4	31.6	322.6	7.6	8.8	8.8	52.6
May-55	205505		5	111.2	225.5	37.2	187.4	187.4	104.6
Jun-55	205506		6	92.8	255.8	227.3	232.6	232.6	321.2
Jul-55	205507		7	353.5	36.0	176.6	216.7	216.7	274.5
Aug-55	205508		8	114.2	121.1	152.0	124.9	124.9	44.3
Sep-55	205509		9	315.0	189.6	197.2	158.2	158.2	252.8
Oct-55	205510		10	107.3	116.5	165.5	263.2	263.2	150.5
Nov-55	205511		11	7.1	73.9	94.3	52.8	52.8	10.3
Dec-55	205512		12	6.9	4.3	34.4	1.4	1.4	1.3

478201 : corrected monthly precipitation data from 2056-2060

month	codemonth	Row Labels	month	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-56	205601	2056	1	30.2	35.4	22.7	25.3	25.3	2.1
Feb-56	205602		2	14.4	41.5	32.7	68.2	68.1	91.3
Mar-56	205603		3	30.4	26.6	30.7	39.2	39.4	85.6
Apr-56	205604		4	79.8	17.5	106.8	86.9	86.8	43.7
May-56	205605		5	236.0	156.5	58.5	205.0	205.0	143.4
Jun-56	205606		6	115.3	127.9	109.5	125.8	125.8	151.1
Jul-56	205607		7	68.5	88.8	419.8	394.5	394.5	110.2
Aug-56	205608		8	96.2	130.9	9.9	133.4	133.4	152.3
Sep-56	205609		9	77.5	253.8	206.6	282.4	282.4	125.1
Oct-56	205610		10	145.8	150.4	149.3	319.6	319.6	84.4
Nov-56	205611		11	32.9	84.6	39.6	4.6	4.6	19.5
Dec-56	205612		12	2.8	1.6	0.8	0.3	0.3	1.7
Jan-57	205701	2057	1	12.7	21.7	0.1	6.2	6.2	8.7
Feb-57	205702		2	66.9	21.4	12.0	57.1	57.1	27.7
Mar-57	205703		3	15.3	56.8	100.1	4.3	4.4	205.2
Apr-57	205704		4	27.2	210.8	47.8	18.2	18.2	279.3
May-57	205705		5	101.3	257.9	297.9	169.3	169.3	268.1
Jun-57	205706		6	105.1	201.9	135.6	161.9	161.9	167.1
Jul-57	205707		7	154.6	145.9	28.2	70.5	70.5	355.1
Aug-57	205708		8	169.4	72.6	115.3	110.1	110.1	142.9
Sep-57	205709		9	303.5	325.8	450.8	184.0	184.0	386.0
Oct-57	205710		10	138.4	367.8	172.5	92.8	92.8	197.8
Nov-57	205711		11	25.0	34.2	112.9	26.7	26.7	130.0
Dec-57	205712		12	2.2	22.7	0.9	0.1	0.1	0.1
Jan-58	205801	2058	1	17.9	11.4	53.8	28.3	28.3	17.0
Feb-58	205802		2	15.4	26.6	101.5	35.1	35.1	61.8
Mar-58	205803		3	57.4	28.3	27.9	0.2	0.2	52.8
Apr-58	205804		4	62.0	106.5	61.5	66.2	66.1	115.4
May-58	205805		5	221.0	152.6	235.0	169.9	169.9	192.6
Jun-58	205806		6	181.4	105.2	193.3	149.8	149.8	139.2
Jul-58	205807		7	79.4	135.3	139.9	111.3	111.3	159.3
Aug-58	205808		8	113.7	210.8	46.1	196.7	196.7	120.6
Sep-58	205809		9	226.6	187.2	144.9	204.9	204.9	292.5
Oct-58	205810		10	360.4	106.0	144.6	63.0	63.0	230.8
Nov-58	205811		11	137.7	31.2	16.9	131.6	131.6	40.0
Dec-58	205812		12	12.9	1.8	0.5	21.2	21.2	0.4
Jan-59	205901	2059	1	48.4	10.8	64.6	31.2	31.2	10.2
Feb-59	205902		2	37.4	15.5	51.5	127.9	127.8	27.9
Mar-59	205903		3	96.7	67.2	44.9	51.0	51.2	26.2
Apr-59	205904		4	82.8	37.9	80.2	119.4	119.4	25.8
May-59	205905		5	384.1	106.5	327.9	195.0	195.0	56.0
Jun-59	205906		6	156.9	62.1	287.2	225.4	225.4	203.1
Jul-59	205907		7	163.0	221.7	99.9	74.3	74.3	36.5
Aug-59	205908		8	158.8	120.8	39.7	103.6	103.6	279.9
Sep-59	205909		9	287.5	428.6	194.2	182.8	182.8	293.5
Oct-59	205910		10	124.9	285.3	167.9	290.2	290.2	88.1
Nov-59	205911		11	76.5	42.9	34.3	61.4	61.4	68.4
Dec-59	205912		12	25.0	0.6	0.6	26.1	26.1	0.6
Jan-60	206001	2060	1	40.5	8.7	26.9	5.3	5.3	143.1
Feb-60	206002		2	12.7	136.3	38.5	48.8	48.8	13.7
Mar-60	206003		3	65.5	21.6	12.9	7.8	7.9	18.6
Apr-60	206004		4	93.8	42.2	28.6	183.6	183.6	25.4
May-60	206005		5	249.0	257.6	327.6	497.5	497.5	99.3
Jun-60	206006		6	248.1	248.9	152.1	204.7	204.7	56.2
Jul-60	206007		7	67.8	261.1	341.6	210.5	210.6	106.9
Aug-60	206008		8	339.1	122.4	165.9	28.4	28.5	138.1
Sep-60	206009		9	190.4	233.8	187.5	341.0	341.0	162.9
Oct-60	206010		10	141.5	176.3	198.5	298.2	298.2	204.1
Nov-60	206011		11	154.7	11.6	62.1	2.8	2.8	9.9
Dec-60	206012		12	4.8	4.7	11.4	4.7	4.7	0.3

478201: corrected monthly precipitation data from 2061-2065

month	codemonth	Row Labels	month	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-61	206101	2061	1	26.1	5.9	1.3	0.2	0.2	19.0
Feb-61	206102		2	23.0	11.1	8.7	7.3	7.4	18.7
Mar-61	206103		3	17.8	29.7	14.8	24.4	24.5	40.3
Apr-61	206104		4	69.7	56.1	35.0	60.7	60.7	156.5
May-61	206105		5	165.0	181.9	279.3	136.9	136.8	258.2
Jun-61	206106		6	122.3	274.3	120.2	45.4	45.4	68.4
Jul-61	206107		7	291.0	106.4	178.1	139.5	139.5	102.5
Aug-61	206108		8	116.6	91.8	294.5	250.9	251.0	50.5
Sep-61	206109		9	215.6	207.1	191.0	488.1	488.1	400.6
Oct-61	206110		10	349.4	141.1	172.1	194.9	194.9	193.4
Nov-61	206111		11	95.5	4.6	0.7	26.3	26.3	5.4
Dec-61	206112		12	13.6	0.1	0.4	0.0	0.0	0.2
Jan-62	206201	2062	1	41.9	10.9	0.5	0.5	0.5	11.1
Feb-62	206202		2	17.7	56.1	7.9	12.2	12.3	29.0
Mar-62	206203		3	63.1	109.9	37.4	113.9	113.9	12.9
Apr-62	206204		4	122.9	20.3	55.6	45.7	45.7	50.4
May-62	206205		5	173.9	265.8	117.7	81.7	81.7	146.6
Jun-62	206206		6	117.8	161.5	265.9	150.1	150.1	128.8
Jul-62	206207		7	196.3	115.3	161.4	157.4	157.4	259.9
Aug-62	206208		8	104.6	111.9	148.6	62.2	62.1	85.3
Sep-62	206209		9	407.7	168.3	330.4	226.5	226.5	267.6
Oct-62	206210		10	230.1	188.0	215.7	264.1	264.1	342.7
Nov-62	206211		11	243.2	92.2	115.3	75.4	75.4	47.9
Dec-62	206212		12	0.8	1.2	2.1	16.7	16.6	0.8
Jan-63	206301	2063	1	12.7	20.8	0.0	24.2	24.3	41.5
Feb-63	206302		2	7.2	48.2	22.3	3.7	3.8	18.8
Mar-63	206303		3	48.3	199.3	10.7	8.4	8.5	84.6
Apr-63	206304		4	73.1	108.1	79.7	106.6	106.6	104.4
May-63	206305		5	37.8	92.0	197.4	97.9	97.9	251.7
Jun-63	206306		6	137.6	106.7	15.4	198.1	198.1	269.5
Jul-63	206307		7	281.4	97.1	48.3	43.7	43.7	270.4
Aug-63	206308		8	193.8	66.3	194.5	138.1	138.1	163.9
Sep-63	206309		9	350.4	312.4	236.1	202.5	202.5	280.7
Oct-63	206310		10	146.9	202.0	122.5	182.1	182.1	383.6
Nov-63	206311		11	18.6	26.6	19.9	94.8	94.8	229.2
Dec-63	206312		12	1.4	0.3	12.4	1.0	1.0	3.6
Jan-64	206401	2064	1	11.4	9.2	93.4	25.8	25.8	17.7
Feb-64	206402		2	7.7	32.7	25.2	57.5	57.5	26.2
Mar-64	206403		3	24.0	29.8	202.9	150.9	150.9	20.9
Apr-64	206404		4	74.5	23.5	103.7	156.0	156.0	16.0
May-64	206405		5	167.6	296.1	117.7	323.2	323.2	169.6
Jun-64	206406		6	429.2	194.4	144.7	99.7	99.8	188.1
Jul-64	206407		7	142.1	105.9	30.3	206.8	206.9	253.9
Aug-64	206408		8	141.4	105.5	56.2	29.0	29.0	42.0
Sep-64	206409		9	265.2	319.3	279.4	206.1	206.1	174.0
Oct-64	206410		10	205.8	189.4	415.5	147.1	147.1	170.2
Nov-64	206411		11	27.0	37.7	83.3	58.7	58.7	15.9
Dec-64	206412		12	11.6	0.4	11.8	4.3	4.3	0.5
Jan-65	206501	2065	1	26.7	104.7	26.0	16.4	16.4	28.3
Feb-65	206502		2	110.6	16.5	61.8	66.8	66.8	18.7
Mar-65	206503		3	282.8	244.4	29.5	93.7	93.8	3.4
Apr-65	206504		4	325.7	50.8	81.6	117.6	117.6	70.3
May-65	206505		5	389.7	329.0	314.0	228.5	228.5	422.3
Jun-65	206506		6	99.5	182.9	88.7	146.8	146.8	86.5
Jul-65	206507		7	25.9	569.2	229.4	239.2	239.2	155.6
Aug-65	206508		8	4.0	122.4	86.9	294.7	294.7	347.8
Sep-65	206509		9	277.1	286.9	313.8	289.9	289.9	239.4
Oct-65	206510		10	149.1	234.0	144.7	165.2	165.2	261.3
Nov-65	206511		11	22.7	9.4	49.5	28.9	29.0	60.7
Dec-65	206512		12	1.4	0.9	1.2	0.5	0.5	5.3

478301 : corrected monthly precipitation data from 2046-2050

month	codemonth	Row Labels	month	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-46	204601	2046	1	8.6	54.9	5.5	3.8	3.8	8.6
Feb-46	204602		2	10.9	11.8	24.5	2.2	2.5	10.9
Mar-46	204603		3	0.8	49.9	17.6	98.2	98.2	0.8
Apr-46	204604		4	317.0	72.8	46.2	47.2	47.1	317.0
May-46	204605		5	82.4	70.4	183.1	114.9	114.9	82.4
Jun-46	204606		6	105.0	97.6	243.5	453.6	451.7	105.0
Jul-46	204607		7	147.6	195.2	28.4	213.4	212.8	147.6
Aug-46	204608		8	77.5	101.5	140.3	231.6	231.8	77.5
Sep-46	204609		9	241.9	383.6	192.1	255.1	255.1	241.9
Oct-46	204610		10	266.1	307.8	271.4	172.2	172.4	266.1
Nov-46	204611		11	83.1	51.9	64.7	26.7	26.6	83.1
Dec-46	204612		12	0.0	4.8	7.4	2.1	2.1	0.0
Jan-47	204701	2047	1	6.2	53.3	69.7	0.4	0.4	6.2
Feb-47	204702		2	54.7	54.8	3.7	1.5	1.7	54.7
Mar-47	204703		3	10.2	11.3	4.0	14.8	14.7	10.2
Apr-47	204704		4	65.4	119.0	47.9	255.4	255.6	65.4
May-47	204705		5	194.3	130.4	225.6	155.4	155.4	194.3
Jun-47	204706		6	108.9	176.1	39.9	73.2	73.7	108.9
Jul-47	204707		7	49.4	120.8	154.3	15.8	15.8	49.4
Aug-47	204708		8	272.3	223.3	216.6	159.7	159.4	272.3
Sep-47	204709		9	194.6	297.6	218.8	154.8	154.6	194.6
Oct-47	204710		10	399.6	255.2	292.3	371.0	370.8	399.6
Nov-47	204711		11	127.3	121.0	7.2	82.4	82.2	127.3
Dec-47	204712		12	44.9	11.1	10.4	2.8	2.8	44.9
Jan-48	204801	2048	1	5.2	31.6	20.5	6.8	6.8	5.2
Feb-48	204802		2	34.6	4.3	44.8	9.1	9.6	34.6
Mar-48	204803		3	86.6	11.5	86.8	20.3	20.2	86.6
Apr-48	204804		4	99.9	43.1	254.8	209.6	209.6	99.9
May-48	204805		5	156.7	22.6	104.4	237.4	237.4	156.7
Jun-48	204806		6	406.4	102.1	112.9	67.4	67.9	406.4
Jul-48	204807		7	94.4	62.3	193.0	32.2	32.2	94.4
Aug-48	204808		8	101.2	92.2	24.4	259.9	260.3	101.2
Sep-48	204809		9	279.4	165.4	241.2	231.8	231.7	279.4
Oct-48	204810		10	244.4	154.0	429.9	300.0	299.9	244.4
Nov-48	204811		11	83.5	48.2	165.9	119.0	118.9	83.5
Dec-48	204812		12	0.2	1.0	1.4	0.0	0.0	0.2
Jan-49	204901	2049	1	9.3	9.5	7.2	0.0	0.0	9.3
Feb-49	204902		2	11.8	17.0	23.2	17.5	18.2	11.8
Mar-49	204903		3	61.8	17.1	72.5	94.0	94.0	61.8
Apr-49	204904		4	36.4	64.4	246.6	15.2	15.1	36.4
May-49	204905		5	262.8	369.1	213.1	66.6	66.7	262.8
Jun-49	204906		6	90.7	97.0	116.4	241.9	241.6	90.7
Jul-49	204907		7	13.4	197.3	126.5	54.0	54.0	13.4
Aug-49	204908		8	52.4	42.2	319.4	157.0	156.7	52.4
Sep-49	204909		9	86.8	312.8	423.2	259.2	259.2	86.8
Oct-49	204910		10	256.7	452.0	323.1	327.3	327.2	256.7
Nov-49	204911		11	87.7	164.3	33.2	76.3	76.2	87.7
Dec-49	204912		12	4.4	6.1	1.1	10.4	10.4	4.4
Jan-50	205001	2050	1	6.0	3.4	0.7	10.1	10.1	6.0
Feb-50	205002		2	16.2	6.1	57.0	99.6	99.3	16.2
Mar-50	205003		3	112.5	3.8	136.9	25.4	25.2	112.5
Apr-50	205004		4	139.4	114.6	150.1	134.6	134.5	139.4
May-50	205005		5	41.5	181.9	111.8	177.3	177.3	41.5
Jun-50	205006		6	189.0	186.7	143.9	78.1	78.5	189.0
Jul-50	205007		7	204.2	100.1	111.3	274.9	274.1	204.2
Aug-50	205008		8	205.4	110.4	172.2	53.4	52.8	205.4
Sep-50	205009		9	293.6	154.0	278.7	198.3	198.1	293.6
Oct-50	205010		10	334.4	104.0	286.0	199.3	199.4	334.4
Nov-50	205011		11	168.5	193.7	11.2	263.8	263.9	168.5
Dec-50	205012		12	9.0	3.7	0.8	1.3	1.3	9.0

478301 : corrected monthly precipitation data from 2051-2055

month	codemonth	Row Labels	month	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-51	205101	2051	1	5.6	16.2	0.6	21.1	21.1	5.6
Feb-51	205102		2	109.1	14.5	63.3	54.1	54.6	109.1
Mar-51	205103		3	45.0	12.6	23.6	66.4	66.3	45.0
Apr-51	205104		4	86.3	122.9	19.4	38.1	38.0	86.3
May-51	205105		5	280.4	115.3	144.3	81.7	81.7	280.4
Jun-51	205106		6	150.3	54.3	263.7	222.6	222.4	150.3
Jul-51	205107		7	27.3	158.8	99.3	110.5	110.3	27.3
Aug-51	205108		8	74.2	73.6	160.5	215.3	215.3	74.2
Sep-51	205109		9	378.3	349.7	310.5	294.6	294.7	378.3
Oct-51	205110		10	164.3	186.7	215.0	136.2	136.4	164.3
Nov-51	205111		11	50.0	8.9	96.5	12.9	12.8	50.0
Dec-51	205112		12	0.0	24.9	4.2	2.7	2.7	0.0
Jan-52	205201	2052	1	11.8	20.6	0.0	0.0	0.0	11.8
Feb-52	205202		2	142.5	56.2	27.7	2.2	2.5	142.5
Mar-52	205203		3	107.9	59.7	2.4	1.5	1.5	107.9
Apr-52	205204		4	25.6	107.2	260.6	5.7	5.7	25.6
May-52	205205		5	169.4	245.2	99.8	180.2	180.2	169.4
Jun-52	205206		6	181.7	69.8	239.2	107.8	108.2	181.7
Jul-52	205207		7	236.8	74.6	236.1	225.5	224.8	236.8
Aug-52	205208		8	207.3	644.2	141.1	27.3	26.9	207.3
Sep-52	205209		9	295.5	175.6	118.9	170.8	170.6	295.5
Oct-52	205210		10	120.8	284.4	175.7	210.2	210.3	120.8
Nov-52	205211		11	85.2	83.5	349.9	310.1	310.3	85.2
Dec-52	205212		12	24.0	14.6	0.1	0.5	0.5	24.0
Jan-53	205301	2053	1	4.4	26.7	17.9	64.5	64.5	4.4
Feb-53	205302		2	9.1	18.5	150.7	26.4	27.1	9.1
Mar-53	205303		3	10.4	32.9	108.7	28.1	28.0	10.4
Apr-53	205304		4	72.1	81.5	137.0	54.5	54.4	72.1
May-53	205305		5	179.6	160.2	49.5	124.0	124.1	179.6
Jun-53	205306		6	182.1	206.8	254.8	179.1	179.2	182.1
Jul-53	205307		7	106.1	112.8	152.9	143.3	142.9	106.1
Aug-53	205308		8	57.4	124.0	245.3	122.5	122.1	57.4
Sep-53	205309		9	216.8	114.6	272.3	323.6	323.8	216.8
Oct-53	205310		10	280.5	405.5	207.1	340.2	340.1	280.5
Nov-53	205311		11	307.0	446.2	1.2	14.7	14.6	307.0
Dec-53	205312		12	2.7	1.3	2.5	0.0	0.0	2.7
Jan-54	205401	2054	1	12.6	12.0	0.0	13.8	13.9	12.6
Feb-54	205402		2	23.2	104.2	6.3	30.7	31.4	23.2
Mar-54	205403		3	27.7	42.6	30.6	137.2	137.3	27.7
Apr-54	205404		4	24.6	57.1	30.2	81.5	81.4	24.6
May-54	205405		5	102.6	31.2	196.6	226.6	226.6	102.6
Jun-54	205406		6	139.5	373.7	155.5	162.9	163.1	139.5
Jul-54	205407		7	159.3	180.0	175.0	208.4	207.8	159.3
Aug-54	205408		8	114.1	72.1	79.6	47.5	46.9	114.1
Sep-54	205409		9	177.3	172.7	298.4	396.2	396.6	177.3
Oct-54	205410		10	189.7	290.2	404.9	270.3	270.3	189.7
Nov-54	205411		11	14.8	163.2	294.1	214.5	214.5	14.8
Dec-54	205412		12	0.8	0.6	0.7	0.0	0.0	0.8
Jan-55	205501	2055	1	8.8	8.1	0.0	133.3	133.1	8.8
Feb-55	205502		2	35.0	79.5	23.5	18.1	18.9	35.0
Mar-55	205503		3	37.5	54.4	18.8	63.9	63.8	37.5
Apr-55	205504		4	59.2	368.2	8.8	12.4	12.4	59.2
May-55	205505		5	73.3	203.9	34.2	166.8	166.8	73.3
Jun-55	205506		6	355.2	251.8	230.2	222.0	221.9	355.2
Jul-55	205507		7	270.3	23.7	128.8	219.8	219.1	270.3
Aug-55	205508		8	38.2	128.3	167.9	129.6	129.2	38.2
Sep-55	205509		9	223.8	163.3	167.5	130.3	130.0	223.8
Oct-55	205510		10	202.3	155.7	222.0	338.8	338.7	202.3
Nov-55	205511		11	15.9	98.5	133.6	75.6	75.4	15.9
Dec-55	205512		12	2.0	5.3	33.3	2.0	2.0	2.0

478301 : corrected monthly precipitation data from 2056-2060

month	codemonth	Row Labels	month	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-56	205601	2056	1	1.6	41.6	28.8	26.6	26.6	1.6
Feb-56	205602		2	96.0	40.3	32.8	74.6	74.8	96.0
Mar-56	205603		3	42.9	12.5	11.2	32.2	32.1	42.9
Apr-56	205604		4	72.1	25.0	127.9	105.8	105.8	72.1
May-56	205605		5	134.3	132.7	43.8	182.4	182.5	134.3
Jun-56	205606		6	143.3	125.7	99.3	104.7	105.1	143.3
Jul-56	205607		7	103.6	70.9	438.9	405.0	403.6	103.6
Aug-56	205608		8	142.1	142.2	5.4	149.9	149.6	142.1
Sep-56	205609		9	93.9	227.8	179.5	258.4	258.4	93.9
Oct-56	205610		10	111.3	197.5	196.6	392.1	391.8	111.3
Nov-56	205611		11	19.6	127.7	43.7	5.9	5.9	19.6
Dec-56	205612		12	2.2	2.1	2.1	0.4	0.4	2.2
Jan-57	205701	2057	1	8.1	26.8	0.1	3.8	3.8	8.1
Feb-57	205702		2	17.4	17.1	6.9	58.7	59.1	17.4
Mar-57	205703		3	153.3	32.6	56.7	3.4	3.3	153.3
Apr-57	205704		4	274.3	229.8	50.7	26.6	26.6	274.3
May-57	205705		5	240.8	235.9	257.6	151.4	151.4	240.8
Jun-57	205706		6	121.7	192.4	135.7	167.1	167.2	121.7
Jul-57	205707		7	333.6	125.1	18.8	57.4	57.3	333.6
Aug-57	205708		8	163.2	75.2	139.1	111.9	111.4	163.2
Sep-57	205709		9	396.7	308.2	434.9	158.3	158.0	396.7
Oct-57	205710		10	264.9	440.2	221.8	123.8	124.0	264.9
Nov-57	205711		11	188.7	39.1	156.9	37.2	37.1	188.7
Dec-57	205712		12	0.2	28.2	1.7	0.2	0.2	0.2
Jan-58	205801	2058	1	18.6	14.1	60.8	39.3	39.2	18.6
Feb-58	205802		2	79.8	21.8	108.6	33.1	33.8	79.8
Mar-58	205803		3	38.8	14.5	9.6	0.1	0.1	38.8
Apr-58	205804		4	159.5	130.0	63.2	80.7	80.6	159.5
May-58	205805		5	178.8	136.7	209.9	145.2	145.2	178.8
Jun-58	205806		6	141.9	93.2	181.8	132.6	133.0	141.9
Jul-58	205807		7	176.2	111.2	123.7	96.5	96.3	176.2
Aug-58	205808		8	127.0	251.9	43.6	241.9	242.3	127.0
Sep-58	205809		9	269.0	155.3	116.0	173.3	173.1	269.0
Oct-58	205810		10	282.2	145.2	178.7	91.8	92.1	282.2
Nov-58	205811		11	36.6	50.7	16.7	196.6	196.6	36.6
Dec-58	205812		12	0.7	2.1	1.3	26.9	26.8	0.7
Jan-59	205901	2059	1	11.1	14.1	73.0	34.5	34.5	11.1
Feb-59	205902		2	18.7	11.2	57.1	147.1	145.7	18.7
Mar-59	205903		3	24.3	42.5	17.9	34.3	34.2	24.3
Apr-59	205904		4	39.0	50.7	93.7	146.5	146.6	39.0
May-59	205905		5	66.5	85.7	314.5	178.4	178.4	66.5
Jun-59	205906		6	174.2	50.6	278.2	247.7	247.4	174.2
Jul-59	205907		7	27.1	210.3	80.5	67.2	67.1	27.1
Aug-59	205908		8	327.1	131.3	31.7	111.3	110.8	327.1
Sep-59	205909		9	267.3	434.0	164.2	153.0	152.7	267.3
Oct-59	205910		10	124.9	362.5	217.3	353.8	353.7	124.9
Nov-59	205911		11	102.8	60.8	41.2	92.0	91.9	102.8
Dec-59	205912		12	0.8	0.9	1.6	29.3	29.2	0.8
Jan-60	206001	2060	1	173.6	10.2	33.2	4.3	4.3	173.6
Feb-60	206002		2	12.1	154.5	40.2	45.5	46.1	12.1
Mar-60	206003		3	13.2	11.5	3.5	4.6	4.6	13.2
Apr-60	206004		4	44.2	56.3	33.3	207.7	207.8	44.2
May-60	206005		5	65.6	231.6	296.5	473.3	473.1	65.6
Jun-60	206006		6	37.2	245.9	151.0	195.7	195.8	37.2
Jul-60	206007		7	103.9	254.4	370.6	206.7	206.2	103.9
Aug-60	206008		8	151.2	131.2	174.4	23.3	22.9	151.2
Sep-60	206009		9	142.5	203.4	155.3	323.3	323.5	142.5
Oct-60	206010		10	266.9	215.5	255.9	365.6	365.5	266.9
Nov-60	206011		11	13.6	12.4	81.8	2.6	2.6	13.6
Dec-60	206012		12	0.3	6.6	12.9	4.1	4.1	0.3

478301 : corrected monthly precipitation data from 2061-2065

month	codemonth	Row Labels	month	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-61	206101	2061	1	20.5	7.0	1.5	0.1	0.1	20.5
Feb-61	206102		2	18.1	6.8	5.7	3.7	4.1	18.1
Mar-61	206103		3	25.3	16.9	4.8	17.5	17.4	25.3
Apr-61	206104		4	193.9	72.2	35.8	79.4	79.3	193.9
May-61	206105		5	263.9	162.2	262.2	118.9	118.9	263.9
Jun-61	206106		6	42.3	273.4	104.5	24.1	24.5	42.3
Jul-61	206107		7	76.1	83.1	151.3	104.9	104.7	76.1
Aug-61	206108		8	51.3	95.4	342.3	302.4	303.2	51.3
Sep-61	206109		9	364.0	183.3	160.3	478.1	479.0	364.0
Oct-61	206110		10	253.4	187.7	225.1	230.4	230.5	253.4
Nov-61	206111		11	6.8	5.0	0.4	31.4	31.2	6.8
Dec-61	206112		12	0.6	0.2	1.1	0.1	0.1	0.6
Jan-62	206201	2062	1	12.0	13.8	0.5	0.3	0.3	12.0
Feb-62	206202		2	22.1	59.6	6.1	7.2	7.8	22.1
Mar-62	206203		3	7.9	72.6	13.4	79.3	79.3	7.9
Apr-62	206204		4	54.2	29.4	62.2	59.8	59.7	54.2
May-62	206205		5	131.2	230.2	103.6	64.6	64.6	131.2
Jun-62	206206		6	133.2	156.3	253.2	149.7	149.9	133.2
Jul-62	206207		7	268.8	97.9	149.6	142.2	141.9	268.8
Aug-62	206208		8	72.7	113.3	154.7	62.3	61.7	72.7
Sep-62	206209		9	267.6	134.9	303.5	206.5	206.4	267.6
Oct-62	206210		10	411.1	248.1	277.8	323.4	323.3	411.1
Nov-62	206211		11	63.6	133.5	161.2	108.3	108.2	63.6
Dec-62	206212		12	1.2	1.6	3.4	20.6	20.5	1.2
Jan-63	206301	2063	1	44.9	27.3	0.0	26.5	26.7	44.9
Feb-63	206302		2	17.8	49.4	22.6	1.9	2.2	17.8
Mar-63	206303		3	53.6	138.9	2.5	5.8	5.8	53.6
Apr-63	206304		4	110.8	130.8	89.1	120.8	120.7	110.8
May-63	206305		5	216.4	80.8	177.8	76.5	76.6	216.4
Jun-63	206306		6	288.5	94.7	12.2	193.5	193.6	288.5
Jul-63	206307		7	236.0	78.8	35.7	28.1	28.1	236.0
Aug-63	206308		8	172.0	65.6	229.4	143.6	143.3	172.0
Sep-63	206309		9	246.7	290.0	207.5	166.1	165.9	246.7
Oct-63	206310		10	462.7	261.5	164.9	236.8	236.9	462.7
Nov-63	206311		11	339.9	33.0	23.9	123.7	123.6	339.9
Dec-63	206312		12	7.4	0.6	13.5	1.5	1.5	7.4
Jan-64	206401	2064	1	17.0	11.7	111.9	28.8	28.8	17.0
Feb-64	206402		2	24.5	29.8	21.5	57.3	57.8	24.5
Mar-64	206403		3	7.2	14.3	148.5	100.4	100.5	7.2
Apr-64	206404		4	27.4	31.5	114.0	189.1	189.1	27.4
May-64	206405		5	158.6	273.1	99.2	282.7	282.7	158.6
Jun-64	206406		6	173.0	204.4	140.7	83.7	84.3	173.0
Jul-64	206407		7	257.4	88.4	19.8	199.7	199.2	257.4
Aug-64	206408		8	37.0	110.9	47.7	24.4	23.9	37.0
Sep-64	206409		9	154.3	297.9	257.8	178.7	178.4	154.3
Oct-64	206410		10	224.3	241.5	496.2	180.0	180.1	224.3
Nov-64	206411		11	18.7	38.4	118.2	85.1	85.0	18.7
Dec-64	206412		12	0.7	0.7	13.3	6.2	6.2	0.7
Jan-65	206501	2065	1	31.2	131.5	31.6	16.3	16.3	31.2
Feb-65	206502		2	17.8	12.7	67.4	70.3	70.6	17.8
Mar-65	206503		3	1.5	177.9	11.9	52.3	52.2	1.5
Apr-65	206504		4	76.2	63.2	104.0	138.8	138.8	76.2
May-65	206505		5	403.9	306.7	285.1	208.6	208.6	403.9
Jun-65	206506		6	69.6	176.1	86.4	128.9	129.3	69.6
Jul-65	206507		7	123.5	630.6	208.8	226.4	225.7	123.5
Aug-65	206508		8	453.0	127.3	82.2	346.5	347.7	453.0
Sep-65	206509		9	201.9	253.3	286.3	275.1	275.1	201.9
Oct-65	206510		10	327.7	291.1	193.6	224.2	224.3	327.7
Nov-65	206511		11	86.6	10.3	62.4	35.0	34.9	86.6
Dec-65	206512		12	4.9	1.3	2.8	0.5	0.6	4.9

480201 : corrected monthly precipitation data from 2046-2050

month	codemonth	Row Labels	month	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-46	204601	2046	1	5.7	17.2	8.4	2.5	3.0	3.7
Feb-46	204602		2	7.4	6.3	20.3	10.0	10.0	8.5
Mar-46	204603		3	61.4	64.9	47.3	64.5	64.4	1.9
Apr-46	204604		4	84.1	97.1	32.0	8.1	8.1	411.4
May-46	204605		5	63.4	200.0	395.3	293.5	292.6	223.9
Jun-46	204606		6	342.4	281.3	611.5	1503.5	1460.9	367.6
Jul-46	204607		7	644.1	583.3	133.1	699.0	700.0	456.0
Aug-46	204608		8	638.2	498.6	514.8	620.4	620.4	440.5
Sep-46	204609		9	792.2	869.7	462.4	533.1	533.1	524.3
Oct-46	204610		10	429.4	311.0	326.4	146.2	146.2	304.7
Nov-46	204611		11	0.4	32.2	40.0	27.8	27.7	50.6
Dec-46	204612		12	0.4	6.7	9.1	2.9	2.9	0.0
Jan-47	204701	2047	1	9.5	48.2	40.1	0.2	0.3	2.7
Feb-47	204702		2	10.8	36.5	7.7	0.5	0.5	51.7
Mar-47	204703		3	109.6	25.5	11.4	102.1	102.1	16.9
Apr-47	204704		4	56.5	152.1	122.8	253.5	253.5	66.1
May-47	204705		5	263.4	294.7	491.8	302.0	301.2	399.9
Jun-47	204706		6	403.2	611.0	113.0	416.7	422.1	379.9
Jul-47	204707		7	478.8	379.3	459.7	114.6	113.8	237.6
Aug-47	204708		8	484.0	672.5	522.9	757.5	757.4	709.2
Sep-47	204709		9	256.0	679.7	495.2	398.4	398.4	416.6
Oct-47	204710		10	375.7	321.8	352.7	332.2	332.1	513.8
Nov-47	204711		11	11.8	96.0	7.6	67.7	67.6	78.4
Dec-47	204712		12	0.4	18.7	3.5	3.5	3.6	43.0
Jan-48	204801	2048	1	7.5	9.3	2.1	0.5	0.7	2.2
Feb-48	204802		2	142.5	4.6	25.2	4.7	4.7	31.2
Mar-48	204803		3	37.5	21.1	142.9	16.6	16.5	114.0
Apr-48	204804		4	183.1	30.5	165.9	260.7	260.7	109.7
May-48	204805		5	499.5	181.3	280.4	464.0	464.4	344.3
Jun-48	204806		6	346.8	337.5	470.3	175.7	185.0	1261.5
Jul-48	204807		7	408.4	278.3	556.2	232.7	231.9	346.1
Aug-48	204808		8	553.4	503.7	353.0	666.6	666.6	482.8
Sep-48	204809		9	286.2	328.0	440.8	380.3	380.3	610.4
Oct-48	204810		10	84.8	197.4	508.1	394.0	393.9	272.4
Nov-48	204811		11	46.7	21.4	77.8	62.2	62.1	50.8
Dec-48	204812		12	0.0	0.7	1.0	0.0	0.0	0.2
Jan-49	204901	2049	1	7.3	2.8	3.2	0.0	0.0	3.9
Feb-49	204902		2	2.3	15.1	38.6	23.4	23.4	9.4
Mar-49	204903		3	52.8	33.2	88.5	80.2	80.2	83.8
Apr-49	204904		4	119.8	74.7	244.6	25.0	25.0	32.1
May-49	204905		5	423.0	640.7	351.5	230.6	229.4	496.6
Jun-49	204906		6	601.3	304.4	300.3	937.0	922.4	322.8
Jul-49	204907		7	335.7	541.3	448.8	185.8	184.9	118.8
Aug-49	204908		8	460.0	310.6	629.9	541.3	541.4	388.5
Sep-49	204909		9	564.5	669.1	867.3	577.8	577.8	176.0
Oct-49	204910		10	373.4	547.8	398.3	235.5	235.5	290.6
Nov-49	204911		11	8.4	109.4	27.4	77.8	77.8	53.5
Dec-49	204912		12	0.0	8.4	0.2	11.0	11.1	4.0
Jan-50	205001	2050	1	11.0	1.7	3.1	26.0	26.5	2.6
Feb-50	205002		2	3.0	4.9	45.1	91.2	91.2	13.5
Mar-50	205003		3	123.6	8.2	94.2	44.2	44.1	145.3
Apr-50	205004		4	152.4	101.4	65.9	333.2	333.2	161.9
May-50	205005		5	359.8	388.6	372.8	403.9	403.8	145.2
Jun-50	205006		6	982.1	608.1	577.8	235.1	244.1	623.9
Jul-50	205007		7	178.8	374.3	372.9	635.2	636.0	562.4
Aug-50	205008		8	457.3	499.6	597.7	287.2	287.3	630.3
Sep-50	205009		9	427.2	300.1	576.9	324.0	324.0	643.1
Oct-50	205010		10	142.0	81.6	256.1	282.4	282.4	409.7
Nov-50	205011		11	100.8	108.0	4.4	212.3	212.6	104.4
Dec-50	205012		12	0.6	2.9	0.2	0.7	0.7	8.3

480201 : corrected monthly precipitation data from 2051-2055

month	codemonth	Row Labels	month	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-51	205101	2051	1	6.5	4.8	0.3	7.2	7.9	2.4
Feb-51	205102		2	3.0	13.1	58.5	53.1	53.1	108.7
Mar-51	205103		3	34.6	24.5	56.7	125.2	125.2	62.8
Apr-51	205104		4	10.5	169.6	1.7	43.0	43.1	92.1
May-51	205105		5	176.0	272.1	287.5	247.6	246.4	520.6
Jun-51	205106		6	835.3	162.4	718.3	655.6	652.9	507.1
Jul-51	205107		7	705.3	457.2	455.3	492.0	492.0	172.0
Aug-51	205108		8	570.5	433.8	530.1	623.0	623.0	434.4
Sep-51	205109		9	553.2	799.8	629.9	479.9	479.9	838.8
Oct-51	205110		10	446.4	189.3	282.2	171.7	171.7	159.4
Nov-51	205111		11	27.3	3.5	55.3	10.0	9.9	30.0
Dec-51	205112		12	1.1	23.0	8.2	1.6	1.7	0.0
Jan-52	205201	2052	1	7.4	8.1	0.0	0.0	0.0	5.0
Feb-52	205202		2	74.2	73.2	10.7	2.0	2.0	144.3
Mar-52	205203		3	66.5	110.0	8.1	17.2	17.2	139.7
Apr-52	205204		4	142.1	159.2	143.6	11.6	11.7	20.6
May-52	205205		5	294.8	476.1	353.0	348.8	348.3	363.4
Jun-52	205206		6	620.3	236.3	743.0	381.3	387.5	602.2
Jul-52	205207		7	395.7	293.1	570.3	647.9	648.7	620.5
Aug-52	205208		8	256.7	1034.2	481.9	322.4	322.5	632.7
Sep-52	205209		9	725.3	378.1	295.8	488.1	488.1	647.3
Oct-52	205210		10	419.8	319.8	188.7	109.7	109.7	103.6
Nov-52	205211		11	43.2	46.1	167.0	148.0	148.1	51.9
Dec-52	205212		12	0.1	15.8	0.0	0.4	0.4	22.7
Jan-53	205301	2053	1	53.6	14.7	5.9	16.3	17.0	1.9
Feb-53	205302		2	107.5	24.1	152.4	27.0	27.0	6.9
Mar-53	205303		3	59.5	43.4	150.1	42.8	42.7	17.2
Apr-53	205304		4	180.2	114.4	236.3	57.0	57.0	74.3
May-53	205305		5	472.5	327.6	209.3	330.3	329.6	378.5
Jun-53	205306		6	1101.1	729.1	1014.0	412.2	417.6	603.5
Jul-53	205307		7	287.7	380.9	432.1	497.5	497.6	371.4
Aug-53	205308		8	622.0	570.5	798.5	652.4	652.4	399.6
Sep-53	205309		9	589.6	275.1	595.2	722.5	722.5	467.1
Oct-53	205310		10	442.7	465.9	207.6	409.7	409.6	326.4
Nov-53	205311		11	120.2	254.0	0.7	11.7	11.6	192.5
Dec-53	205312		12	0.3	1.2	1.7	0.0	0.0	2.4
Jan-54	205401	2054	1	6.5	3.1	0.1	5.1	5.7	5.4
Feb-54	205402		2	62.9	71.6	12.2	21.1	21.1	20.0
Mar-54	205403		3	59.5	62.3	46.7	156.6	156.8	40.7
Apr-54	205404		4	104.0	41.1	137.5	69.8	69.8	19.6
May-54	205405		5	392.8	139.2	302.0	409.8	409.7	258.5
Jun-54	205406		6	125.7	1324.8	466.1	614.3	613.2	474.3
Jul-54	205407		7	524.2	520.2	529.2	398.0	397.6	478.7
Aug-54	205408		8	617.7	383.6	572.3	441.7	441.8	503.6
Sep-54	205409		9	540.3	411.5	621.9	783.3	783.3	377.5
Oct-54	205410		10	197.7	396.2	526.6	314.8	314.7	194.0
Nov-54	205411		11	14.7	141.2	139.6	118.7	118.7	8.5
Dec-54	205412		12	0.3	0.3	0.1	0.0	0.0	0.7
Jan-55	205501	2055	1	5.7	2.6	0.0	52.4	52.0	3.8
Feb-55	205502		2	5.3	97.7	20.3	35.6	35.6	31.7
Mar-55	205503		3	26.4	83.2	48.0	85.6	85.5	53.3
Apr-55	205504		4	44.7	423.1	1.5	20.6	20.6	58.5
May-55	205505		5	239.1	408.9	103.6	319.2	318.4	207.6
Jun-55	205506		6	286.1	817.7	651.0	797.7	789.3	1113.3
Jul-55	205507		7	821.4	139.9	608.0	445.8	445.6	678.6
Aug-55	205508		8	529.0	553.0	555.2	659.3	659.2	353.0
Sep-55	205509		9	617.8	300.4	336.0	334.5	334.5	482.9
Oct-55	205510		10	157.6	144.6	220.8	350.6	350.6	211.6
Nov-55	205511		11	10.0	68.0	100.8	39.0	38.9	9.1
Dec-55	205512		12	16.0	5.2	31.6	1.2	1.2	1.8

480201 : corrected monthly precipitation data from 2056-2060

month	codemonth	Row Labels	month	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-56	205601	2056	1	13.2	17.8	9.0	19.1	19.7	0.7
Feb-56	205602		2	7.0	36.4	41.8	51.7	51.7	94.8
Mar-56	205603		3	35.6	27.7	23.2	8.2	8.2	60.1
Apr-56	205604		4	118.9	22.0	88.3	100.2	100.2	74.3
May-56	205605		5	412.0	346.6	183.6	381.1	380.8	309.7
Jun-56	205606		6	371.7	392.6	448.8	423.2	428.3	485.7
Jul-56	205607		7	243.5	284.9	938.6	773.1	774.7	366.0
Aug-56	205608		8	491.7	545.0	276.9	489.5	489.5	545.9
Sep-56	205609		9	97.4	481.1	345.9	548.2	548.2	191.5
Oct-56	205610		10	206.0	191.0	191.3	440.4	440.3	92.2
Nov-56	205611		11	35.5	62.6	50.5	1.3	1.3	11.4
Dec-56	205612		12	1.5	1.6	0.4	0.8	0.8	2.0
Jan-57	205701	2057	1	5.8	9.0	0.0	7.1	7.7	3.4
Feb-57	205702		2	58.7	15.2	14.8	51.1	51.1	14.5
Mar-57	205703		3	21.9	55.8	83.9	2.5	2.5	193.8
Apr-57	205704		4	43.6	339.4	153.5	13.2	13.3	350.3
May-57	205705		5	200.6	437.6	637.3	294.1	293.2	466.2
Jun-57	205706		6	344.6	681.6	414.0	469.5	473.4	419.4
Jul-57	205707		7	585.0	437.3	163.5	227.7	226.9	784.5
Aug-57	205708		8	653.9	404.2	491.6	541.0	541.0	575.5
Sep-57	205709		9	634.7	662.9	1070.2	366.8	366.8	881.7
Oct-57	205710		10	186.4	647.4	256.0	118.1	118.1	302.9
Nov-57	205711		11	32.8	29.1	149.3	15.3	15.2	117.2
Dec-57	205712		12	1.1	23.9	1.9	0.1	0.1	0.2
Jan-58	205801	2058	1	10.5	4.3	29.2	3.0	3.5	7.9
Feb-58	205802		2	13.1	21.1	126.5	18.4	18.4	77.7
Mar-58	205803		3	65.6	26.0	30.8	0.4	0.4	54.9
Apr-58	205804		4	80.7	115.7	223.6	70.1	70.1	189.2
May-58	205805		5	393.2	280.0	412.2	340.3	339.7	377.3
Jun-58	205806		6	514.9	383.8	726.1	554.7	555.8	481.5
Jul-58	205807		7	266.5	433.8	366.4	302.3	301.6	510.7
Aug-58	205808		8	483.0	643.4	331.7	516.5	516.5	523.6
Sep-58	205809		9	430.6	351.7	261.1	357.6	357.6	586.4
Oct-58	205810		10	547.2	125.6	237.6	58.7	58.7	329.0
Nov-58	205811		11	150.0	19.5	14.1	104.2	104.2	21.7
Dec-58	205812		12	18.1	2.2	0.5	12.7	12.8	0.6
Jan-59	205901	2059	1	27.6	3.9	41.1	5.9	6.5	4.7
Feb-59	205902		2	56.0	9.9	26.7	150.1	150.1	15.7
Mar-59	205903		3	127.8	56.0	100.7	49.7	49.6	36.2
Apr-59	205904		4	97.8	42.7	18.1	111.8	111.9	35.0
May-59	205905		5	624.1	261.2	451.7	321.1	320.3	195.0
Jun-59	205906		6	479.4	248.9	975.3	461.9	466.0	579.4
Jul-59	205907		7	428.0	581.4	342.0	233.5	232.7	171.0
Aug-59	205908		8	612.6	509.0	368.9	491.8	491.9	768.7
Sep-59	205909		9	625.3	872.0	375.8	289.5	289.6	582.5
Oct-59	205910		10	187.1	418.3	245.5	478.7	478.6	108.7
Nov-59	205911		11	67.1	23.9	39.4	33.1	32.9	62.9
Dec-59	205912		12	29.0	0.3	0.5	39.7	39.6	0.7
Jan-60	206001	2060	1	19.9	3.5	11.6	2.8	3.2	73.3
Feb-60	206002		2	7.9	163.0	38.5	68.5	68.5	9.6
Mar-60	206003		3	62.1	18.5	15.2	12.5	12.5	21.2
Apr-60	206004		4	107.1	45.1	73.2	231.5	231.6	40.9
May-60	206005		5	451.0	436.9	531.2	717.1	720.1	193.2
Jun-60	206006		6	722.5	794.4	403.7	695.4	691.2	147.6
Jul-60	206007		7	254.0	654.3	724.9	486.7	486.8	366.8
Aug-60	206008		8	776.6	542.0	629.1	337.4	337.6	558.9
Sep-60	206009		9	413.2	447.5	383.4	752.5	752.6	299.2
Oct-60	206010		10	208.0	287.9	262.2	382.8	382.8	306.0
Nov-60	206011		11	136.2	5.5	60.9	1.7	1.7	7.8
Dec-60	206012		12	7.5	3.5	17.4	9.0	9.1	0.2

480201 : corrected monthly precipitation data from 2061-2065

month	codemonth	Row Labels	month	gfdl_cm2_0_corrected	gfdl_cm2_1_corrected	ingv_echam4_corrected	K-1_corrected	miroc3_2_hires_corrected	ncar_ccsm3_0_corrected
Jan-61	206101	2061	1	14.5	2.1	2.3	0.0	0.0	8.7
Feb-61	206102		2	14.4	6.9	7.8	1.4	1.5	15.2
Mar-61	206103		3	31.5	22.4	4.4	17.7	17.6	37.5
Apr-61	206104		4	85.2	69.1	96.4	74.7	74.8	236.7
May-61	206105		5	326.4	334.7	431.3	257.2	256.1	498.1
Jun-61	206106		6	414.4	862.1	457.5	293.0	301.1	165.0
Jul-61	206107		7	672.5	363.7	512.9	632.6	633.4	304.4
Aug-61	206108		8	526.6	473.9	861.9	625.5	625.5	386.0
Sep-61	206109		9	383.9	338.6	319.9	1194.4	1194.5	805.8
Oct-61	206110		10	590.6	175.2	212.1	455.5	455.4	285.8
Nov-61	206111		11	71.1	0.9	0.1	20.9	20.8	3.8
Dec-61	206112		12	24.2	0.0	0.4	0.0	0.0	0.5
Jan-62	206201	2062	1	22.2	4.5	0.4	0.0	0.0	5.1
Feb-62	206202		2	10.2	48.1	7.0	7.2	7.3	19.0
Mar-62	206203		3	64.8	96.3	70.9	108.8	108.8	13.5
Apr-62	206204		4	171.3	21.3	77.6	84.3	84.3	52.5
May-62	206205		5	392.7	487.3	216.5	252.5	251.4	304.9
Jun-62	206206		6	419.3	513.7	976.9	368.1	374.8	454.9
Jul-62	206207		7	521.0	355.2	455.7	548.2	548.6	676.0
Aug-62	206208		8	504.8	552.0	588.2	388.7	388.8	431.4
Sep-62	206209		9	696.8	303.0	684.4	420.7	420.7	583.1
Oct-62	206210		10	334.6	249.3	327.6	448.3	448.2	532.4
Nov-62	206211		11	235.0	79.5	111.9	51.9	51.8	38.4
Dec-62	206212		12	0.1	1.3	6.9	12.0	12.1	1.0
Jan-63	206301	2063	1	5.9	7.7	0.0	6.6	7.3	19.0
Feb-63	206302		2	2.7	45.8	18.3	0.2	0.2	14.9
Mar-63	206303		3	49.8	191.1	8.1	10.0	9.9	73.6
Apr-63	206304		4	91.6	138.2	95.1	209.1	209.0	123.9
May-63	206305		5	128.5	207.9	315.7	277.8	276.8	431.8
Jun-63	206306		6	441.4	382.6	51.0	619.9	618.6	918.8
Jul-63	206307		7	687.2	306.0	179.9	264.4	263.7	619.0
Aug-63	206308		8	663.4	408.2	610.0	538.6	538.6	587.4
Sep-63	206309		9	751.2	643.6	446.4	460.3	460.3	535.4
Oct-63	206310		10	205.7	277.1	142.1	306.4	306.3	616.9
Nov-63	206311		11	16.0	15.9	15.1	107.5	107.5	213.5
Dec-63	206312		12	0.2	0.1	14.1	1.4	1.5	6.8
Jan-64	206401	2064	1	5.3	3.1	31.7	10.2	10.9	7.2
Feb-64	206402		2	2.8	25.6	31.3	53.2	53.2	21.3
Mar-64	206403		3	38.7	29.8	134.9	129.6	129.7	12.5
Apr-64	206404		4	117.1	35.4	175.7	174.6	174.7	22.5
May-64	206405		5	314.4	490.9	277.0	658.0	660.3	347.1
Jun-64	206406		6	1048.8	481.8	414.7	209.3	218.6	575.8
Jul-64	206407		7	341.2	322.6	126.3	460.2	460.2	656.4
Aug-64	206408		8	549.8	498.5	417.5	330.3	330.4	349.7
Sep-64	206409		9	396.2	658.5	511.9	449.7	449.7	325.7
Oct-64	206410		10	302.2	287.2	705.1	343.0	342.9	243.1
Nov-64	206411		11	36.4	37.2	100.2	37.4	37.3	10.8
Dec-64	206412		12	7.5	0.3	15.6	2.2	2.3	0.6
Jan-65	206501	2065	1	15.5	50.3	14.1	12.9	13.6	13.2
Feb-65	206502		2	88.8	10.3	46.3	62.7	62.7	14.9
Mar-65	206503		3	231.5	205.0	18.1	123.1	123.2	3.3
Apr-65	206504		4	471.4	71.0	96.1	134.6	134.6	79.3
May-65	206505		5	636.3	537.0	549.3	373.0	372.6	683.7
Jun-65	206506		6	344.4	588.6	268.0	505.1	507.8	255.3
Jul-65	206507		7	123.8	1189.2	592.2	635.1	635.8	407.8
Aug-65	206508		8	157.6	558.0	471.5	768.0	767.9	894.2
Sep-65	206509		9	635.3	637.7	688.9	520.7	520.7	433.2
Oct-65	206510		10	189.0	372.9	200.3	221.8	221.8	399.2
Nov-65	206511		11	21.5	3.4	24.7	27.1	26.9	52.8
Dec-65	206512		12	0.4	0.6	0.8	1.4	1.4	4.4

II. Runoff parameters

Calculated monthly past runoff from 1981-1985

month	Station	gfdl_cm2_0	gfdl_cm2_1	ingv_echam4	K-1	miroc3_2_hires	ncar_ccsm3_0
Jan-81	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Feb-81	15.6	23.0	8.4	19.7	30.2	30.3	30.4
Mar-81	1.8	4.0	1.6	1.5	0.8	0.9	7.0
Apr-81	31.1	49.1	33.4	27.0	33.1	33.4	25.5
May-81	133.8	207.9	81.0	70.7	73.6	73.2	78.0
Jun-81	116.1	240.7	77.0	117.8	120.7	119.6	124.3
Jul-81	110.7	275.5	92.0	112.9	73.6	72.4	100.3
Aug-81	167.9	304.0	178.4	140.4	134.6	132.7	189.6
Sep-81	443.5	660.4	524.3	456.2	386.6	383.5	395.7
Oct-81	404.3	657.2	518.1	373.1	378.8	376.8	429.1
Nov-81	193.5	414.9	188.5	100.4	180.6	179.5	134.0
Dec-81	80.0	289.6	98.9	21.2	83.0	82.1	55.7
Jan-82	128.5	261.5	95.8	56.4	137.8	137.5	96.0
Feb-82	79.4	156.3	52.5	24.4	76.0	76.0	54.2
Mar-82	53.5	83.0	24.5	7.0	68.7	68.6	24.5
Apr-82	93.9	144.1	20.8	48.3	68.5	68.5	43.1
May-82	114.5	100.1	88.0	92.9	197.5	199.0	92.2
Jun-82	256.4	124.9	105.0	198.3	240.0	244.6	102.9
Jul-82	214.6	85.1	118.1	154.4	285.4	288.1	155.8
Aug-82	239.6	122.7	125.9	238.4	279.8	275.0	245.7
Sep-82	409.7	229.1	277.9	331.2	485.6	482.2	413.5
Oct-82	446.5	331.2	322.4	468.6	504.7	499.0	462.5
Nov-82	58.4	25.2	55.3	57.2	73.6	70.4	56.7
Dec-82	56.9	27.0	64.4	69.8	75.8	74.0	48.1
Jan-83	58.2	11.3	93.7	92.2	59.4	59.6	39.9
Feb-83	23.3	4.5	53.6	39.3	22.3	22.6	14.2
Mar-83	67.2	87.4	128.1	91.5	83.6	83.7	88.7
Apr-83	7.3	10.8	24.3	14.8	11.7	11.8	12.2
May-83	61.3	35.8	70.5	36.5	37.2	37.2	25.5
Jun-83	53.2	46.5	77.6	43.3	78.7	75.2	82.3
Jul-83	132.9	127.9	219.2	226.4	123.9	122.4	176.0
Aug-83	289.4	237.9	338.9	328.0	323.6	326.1	324.3
Sep-83	698.7	705.3	758.9	760.7	733.9	740.1	739.5
Oct-83	965.2	929.5	1057.3	987.8	901.7	909.0	867.9
Nov-83	695.2	603.5	574.6	610.3	523.1	530.1	536.8
Dec-83	519.0	444.3	441.7	441.8	357.5	362.1	362.2
Jan-84	407.8	338.1	313.0	342.0	264.0	266.6	286.8
Feb-84	207.5	175.6	153.9	197.6	131.0	132.1	148.9
Mar-84	75.5	83.8	48.4	95.4	57.8	58.3	82.5
Apr-84	44.6	107.9	54.5	105.7	95.8	96.1	94.7
May-84	77.9	151.7	89.8	109.6	143.7	144.7	92.5
Jun-84	144.8	146.7	151.0	210.3	165.2	169.8	139.5
Jul-84	137.3	146.0	123.8	158.3	154.4	156.9	110.5
Aug-84	113.6	95.0	93.0	139.3	114.3	119.3	101.9
Sep-84	313.7	237.1	256.7	321.7	239.2	243.3	241.7
Oct-84	436.8	585.2	507.5	492.2	463.5	467.0	414.9
Nov-84	51.9	89.1	232.7	98.8	49.3	50.9	34.9
Dec-84	8.5	56.1	128.0	23.6	9.0	9.8	4.3
Jan-85	17.0	80.9	252.9	87.5	17.9	18.7	26.5
Feb-85	28.8	40.3	175.7	54.4	14.2	14.5	22.0
Mar-85	17.1	9.5	115.1	34.4	10.0	10.2	20.4
Apr-85	104.3	56.4	212.9	121.0	105.9	106.0	99.9
May-85	229.3	175.6	311.4	292.0	180.5	179.3	227.1
Jun-85	205.6	212.9	288.0	294.2	310.5	308.2	234.4
Jul-85	214.1	197.8	227.4	248.4	293.9	288.1	266.8
Aug-85	154.2	197.4	145.5	200.8	236.3	232.4	168.7
Sep-85	360.4	373.2	339.8	350.0	442.2	433.1	395.5
Oct-85	507.6	617.1	448.7	439.2	447.9	441.9	384.7
Nov-85	115.9	188.2	60.1	66.4	168.7	163.6	53.4
Dec-85	64.3	152.6	11.6	12.5	59.4	54.8	4.7

Calculated monthly past runoff from 1986-1990

month	Station	gfdl_cm2_0	gfdl_cm2_1	ingv_echam4	K-1	miroc3_2_hires	ncar_ccsm3_0
Jan-86	74.0	133.3	10.5	22.6	91.7	89.0	6.5
Feb-86	33.4	59.2	7.4	37.1	72.0	71.0	15.2
Mar-86	5.3	11.0	1.4	8.0	17.9	17.7	4.5
Apr-86	24.1	31.6	25.0	29.4	30.9	30.5	31.8
May-86	181.6	247.5	174.8	268.0	154.7	159.0	207.0
Jun-86	77.2	184.2	128.1	178.1	80.8	87.3	148.9
Jul-86	109.7	215.8	184.4	193.1	197.3	203.6	203.6
Aug-86	84.6	176.4	198.7	201.4	134.8	142.5	153.6
Sep-86	309.1	405.1	444.1	478.8	351.7	349.9	426.1
Oct-86	516.9	596.5	449.9	717.4	518.5	513.5	517.3
Nov-86	85.9	83.8	41.4	168.6	52.4	51.6	70.0
Dec-86	39.0	33.1	3.5	124.5	7.1	7.4	16.3
Jan-87	50.9	30.5	1.2	79.0	9.1	8.4	18.4
Feb-87	12.0	9.5	2.6	27.8	2.4	2.3	9.6
Mar-87	23.6	18.1	38.5	44.1	16.4	16.2	23.8
Apr-87	17.3	24.1	17.1	20.9	16.4	16.5	34.3
May-87	50.1	41.1	45.6	70.1	57.2	56.8	69.1
Jun-87	138.9	146.4	212.5	167.8	215.6	202.4	179.8
Jul-87	85.4	106.1	151.9	148.4	132.4	124.0	126.5
Aug-87	147.4	175.6	253.4	230.6	251.2	238.5	194.8
Sep-87	335.4	425.8	437.3	474.4	641.5	630.5	447.2
Oct-87	528.4	451.4	650.9	675.3	694.0	686.6	556.7
Nov-87	272.4	133.0	299.8	353.3	481.0	476.0	221.8
Dec-87	161.4	21.8	178.9	218.1	286.7	283.5	105.9
Jan-88	166.3	43.4	155.3	181.8	227.3	225.5	98.9
Feb-88	156.9	91.3	160.1	148.9	164.1	163.3	124.0
Mar-88	76.3	30.3	93.0	59.2	64.2	63.8	51.1
Apr-88	102.3	27.1	156.0	78.6	45.9	45.6	76.2
May-88	228.6	46.2	326.0	162.5	156.5	156.8	200.6
Jun-88	234.5	141.9	375.6	131.0	205.7	206.9	172.2
Jul-88	372.0	251.7	287.7	161.0	213.7	213.9	229.4
Aug-88	337.6	310.7	193.5	153.4	272.6	273.2	215.7
Sep-88	648.3	556.9	389.3	536.4	642.2	641.1	529.3
Oct-88	786.0	631.1	498.3	656.9	930.7	928.6	741.6
Nov-88	239.5	99.2	68.5	194.8	390.5	388.9	231.6
Dec-88	166.3	29.0	21.7	126.5	319.8	318.3	178.4
Jan-89	191.2	70.3	56.8	143.7	235.6	234.6	175.7
Feb-89	146.8	49.8	26.7	108.9	150.7	150.1	109.1
Mar-89	167.3	87.7	55.2	144.6	130.0	129.5	124.7
Apr-89	111.1	39.1	44.2	96.7	100.1	99.4	67.2
May-89	67.1	54.3	96.8	142.3	109.3	108.7	98.5
Jun-89	52.4	37.3	52.7	55.7	78.6	77.0	47.5
Jul-89	58.2	48.6	62.6	73.1	76.9	74.9	71.0
Aug-89	62.9	53.0	73.5	58.3	62.6	57.8	68.0
Sep-89	283.1	338.6	357.3	377.3	391.7	383.5	363.2
Oct-89	490.8	455.0	544.8	570.6	520.9	511.4	544.0
Nov-89	79.9	137.8	166.6	201.0	225.5	218.9	137.0
Dec-89	44.0	72.5	122.3	160.5	156.2	152.0	94.0
Jan-90	94.5	135.2	130.0	151.1	163.6	161.6	122.3
Feb-90	32.5	87.6	64.2	83.3	75.8	76.7	58.5
Mar-90	93.5	119.2	104.8	88.6	116.7	117.0	75.8
Apr-90	29.6	82.0	65.1	45.2	95.3	95.8	44.7
May-90	156.0	201.7	185.6	154.3	198.1	197.0	172.6
Jun-90	55.5	84.8	88.2	100.9	92.2	89.8	78.5
Jul-90	70.3	115.1	130.4	121.6	130.8	127.3	106.8
Aug-90	82.1	54.7	170.1	138.2	118.6	116.8	162.6
Sep-90	298.4	255.7	351.0	314.0	318.4	327.8	384.8
Oct-90	502.4	400.0	557.5	540.7	499.0	509.4	658.9
Nov-90	114.4	44.8	110.2	117.0	80.5	88.8	224.7
Dec-90	46.5	7.9	39.4	46.7	19.2	25.5	144.7

Calculated monthly past runoff from 1991-1995

month	Station	gfdl_cm2_0	gfdl_cm2_1	ingv_echam4	K-1	miroc3_2_hires	ncar_ccsm3_0
Jan-91	46.4	5.7	37.9	49.5	16.8	21.8	120.9
Feb-91	33.1	13.7	29.0	25.0	21.6	22.9	67.3
Mar-91	8.7	3.0	6.5	15.0	3.4	3.6	22.2
Apr-91	73.1	14.9	26.9	21.6	24.9	24.5	63.9
May-91	99.0	119.8	111.0	86.9	77.7	77.5	98.9
Jun-91	92.6	86.6	97.6	68.3	57.3	56.8	78.1
Jul-91	104.6	195.0	119.4	102.5	73.9	73.0	78.8
Aug-91	88.9	224.3	114.1	143.4	127.7	124.3	109.8
Sep-91	366.9	551.3	386.8	424.1	400.1	395.1	446.4
Oct-91	556.3	578.0	584.6	541.9	619.6	616.0	522.5
Nov-91	105.8	124.0	109.2	95.2	136.7	133.7	111.5
Dec-91	55.5	39.4	65.8	31.7	85.1	83.4	44.2
Jan-92	70.4	56.3	76.5	43.3	84.0	83.0	41.9
Feb-92	34.0	40.2	26.0	22.0	63.4	62.8	17.2
Mar-92	5.2	7.6	3.8	3.5	11.3	11.1	3.0
Apr-92	11.9	17.7	32.4	34.7	15.3	15.1	5.8
May-92	23.5	58.8	76.7	51.9	37.1	36.7	33.0
Jun-92	35.6	55.6	49.9	88.0	112.8	111.5	25.3
Jul-92	156.5	164.9	98.9	186.0	235.0	235.1	166.6
Aug-92	223.4	204.3	114.7	214.2	321.5	328.9	174.7
Sep-92	410.4	390.8	266.5	385.5	474.5	481.1	322.7
Oct-92	559.6	551.1	420.0	511.6	612.6	618.5	479.8
Nov-92	102.1	180.9	84.5	118.9	149.4	153.1	97.1
Dec-92	19.5	81.1	8.9	31.0	48.8	50.9	9.2
Jan-93	101.1	140.9	70.7	97.0	156.1	157.0	62.2
Feb-93	55.0	66.9	37.2	61.1	72.2	72.4	34.2
Mar-93	126.0	151.8	57.3	149.1	141.5	141.9	73.3
Apr-93	94.9	136.4	40.5	129.3	146.3	146.8	71.7
May-93	131.3	157.4	137.5	127.8	161.4	161.4	106.7
Jun-93	67.5	76.5	56.2	69.9	55.8	55.4	62.1
Jul-93	58.2	62.0	67.4	53.4	50.6	50.0	81.1
Aug-93	77.3	153.4	72.8	56.7	54.7	54.2	89.2
Sep-93	393.4	537.3	300.5	368.1	325.3	323.2	436.8
Oct-93	517.9	668.6	372.0	458.0	534.0	533.3	606.7
Nov-93	122.7	225.4	62.4	86.1	110.2	109.6	146.4
Dec-93	68.3	143.3	7.3	38.2	92.1	92.3	114.9
Jan-94	70.0	102.2	19.1	43.6	78.4	78.6	92.1
Feb-94	21.0	32.5	11.4	14.1	21.7	21.9	30.1
Mar-94	69.2	17.5	13.6	42.7	70.0	70.1	15.0
Apr-94	28.5	22.9	16.1	30.7	35.1	34.7	15.8
May-94	251.6	177.8	275.6	241.4	271.9	273.0	232.0
Jun-94	298.3	274.9	380.8	346.2	207.3	206.2	298.9
Jul-94	306.8	387.7	468.5	384.8	278.0	276.2	387.0
Aug-94	298.6	338.6	413.9	336.9	236.1	229.3	322.1
Sep-94	515.6	561.2	525.7	454.3	454.9	450.2	511.1
Oct-94	449.8	509.2	589.2	590.3	426.4	420.8	535.2
Nov-94	54.2	60.7	65.3	67.4	40.1	38.3	68.7
Dec-94	13.0	19.5	19.8	15.2	5.9	5.5	46.3
Jan-95	18.7	13.5	14.7	13.4	18.8	18.3	60.3
Feb-95	3.0	12.3	6.1	6.6	4.3	4.0	34.7
Mar-95	13.7	7.6	12.4	12.5	14.9	14.6	27.1
Apr-95	28.0	32.0	9.2	57.0	27.7	27.3	47.9
May-95	109.9	37.2	78.3	100.4	71.5	70.5	132.0
Jun-95	168.0	118.9	195.6	215.0	165.4	161.5	216.8
Jul-95	307.0	173.1	323.4	307.9	335.6	331.7	338.5
Aug-95	426.2	329.4	543.2	461.1	394.1	390.1	487.1
Sep-95	844.7	759.0	829.4	845.5	701.4	695.9	799.5
Oct-95	894.7	1041.8	915.6	904.0	747.2	744.0	892.3
Nov-95	420.0	537.3	485.1	414.2	259.2	256.0	395.1
Dec-95	225.8	357.0	272.1	215.7	112.6	110.5	211.2

Calculated monthly past runoff from 1996-2000

month	Station	gfdl_cm2_0	gfdl_cm2_1	ingv_echam4	K-1	miroc3_2_hires	ncar_ccsm3_0
Jan-96	148.4	240.8	209.6	171.4	86.4	85.3	159.7
Feb-96	74.1	104.5	97.4	83.3	22.0	22.5	62.8
Mar-96	93.6	81.8	62.9	84.4	27.8	28.6	64.1
Apr-96	84.9	48.3	49.4	51.5	51.1	51.5	86.4
May-96	212.2	192.1	132.3	168.2	152.8	153.2	185.1
Jun-96	341.9	213.2	188.2	241.3	162.3	160.9	269.0
Jul-96	437.2	291.7	342.0	326.0	249.3	247.0	372.3
Aug-96	405.5	288.9	324.3	355.1	204.1	201.6	314.2
Sep-96	686.7	501.6	726.2	626.6	517.3	514.7	651.9
Oct-96	796.2	644.4	820.8	669.4	656.9	654.6	676.2
Nov-96	369.4	244.5	381.5	325.7	245.8	244.5	416.0
Dec-96	242.8	157.1	242.0	185.2	175.8	174.8	252.7
Jan-97	182.2	140.4	168.2	169.9	139.8	139.4	212.7
Feb-97	103.0	69.8	76.7	81.5	99.2	98.8	111.6
Mar-97	52.6	18.1	18.1	35.1	35.4	35.2	71.9
Apr-97	83.5	36.2	48.8	68.4	65.5	65.0	71.4
May-97	111.4	57.7	94.7	157.1	94.1	93.9	108.0
Jun-97	45.5	31.6	43.1	71.3	40.9	40.1	55.3
Jul-97	52.6	35.3	46.9	66.3	63.1	62.1	57.6
Aug-97	49.5	48.3	46.8	53.2	77.0	75.8	66.3
Sep-97	281.6	297.2	205.3	264.1	271.6	273.5	281.8
Oct-97	412.1	410.3	341.8	430.9	431.3	431.0	489.7
Nov-97	115.4	208.8	111.3	235.0	118.6	119.8	186.1
Dec-97	40.6	105.5	8.8	125.7	29.1	30.1	105.9
Jan-98	74.7	142.1	66.4	151.3	94.5	95.1	126.5
Feb-98	38.4	73.2	64.9	75.8	47.7	47.8	65.8
Mar-98	9.2	37.3	53.1	22.4	30.2	30.2	32.0
Apr-98	45.0	59.4	136.8	38.1	68.6	68.5	76.6
May-98	106.4	108.6	98.6	122.0	66.8	66.8	147.6
Jun-98	127.9	135.0	105.8	87.4	60.3	61.7	180.8
Jul-98	335.8	348.5	283.6	192.1	155.9	157.9	263.9
Aug-98	412.5	368.3	292.8	165.4	184.9	192.3	293.6
Sep-98	750.9	754.0	672.3	488.1	567.9	569.4	646.0
Oct-98	716.8	689.0	774.1	528.6	682.2	684.2	663.1
Nov-98	215.4	240.0	236.8	91.6	246.9	246.2	227.9
Dec-98	92.2	122.0	130.9	21.5	144.1	142.9	115.2
Jan-99	65.4	110.4	102.5	38.2	126.7	125.6	105.5
Feb-99	28.2	74.5	58.0	13.3	65.6	64.8	68.2
Mar-99	67.2	83.4	98.0	60.2	57.5	57.0	87.7
Apr-99	130.7	158.6	160.9	89.1	87.3	87.5	135.6
May-99	297.5	345.2	210.9	168.4	406.9	402.4	269.3
Jun-99	207.7	198.8	124.7	77.9	263.2	258.6	171.1
Jul-99	215.4	178.7	134.6	119.1	318.4	307.1	154.1
Aug-99	159.4	105.0	129.5	132.7	268.5	259.1	112.4
Sep-99	411.6	351.8	677.9	471.5	499.1	486.8	350.9
Oct-99	558.5	471.2	719.7	551.1	624.3	609.6	572.1
Nov-99	168.6	86.9	328.8	155.9	217.9	207.3	186.0
Dec-99	117.2	36.6	211.2	75.5	159.5	149.4	164.8
Jan-00	138.6	60.0	170.6	81.1	164.7	158.7	182.1
Feb-00	70.3	29.1	81.6	31.4	75.9	72.8	95.2
Mar-00	33.3	16.4	53.6	24.2	43.5	42.6	77.7
Apr-00	189.8	161.8	154.1	174.3	175.4	174.7	207.3
May-00	142.0	206.9	76.7	88.6	153.2	152.9	179.7
Jun-00	293.1	263.4	120.5	118.8	208.2	234.5	231.8
Jul-00	241.3	215.0	176.6	197.6	163.8	193.5	163.4
Aug-00	196.1	153.0	94.9	108.2	88.6	112.5	88.3
Sep-00	418.7	309.3	422.8	394.0	310.7	342.9	339.8
Oct-00	493.0	368.3	533.1	477.8	364.0	390.5	525.1
Nov-00	73.1	38.9	98.7	82.0	38.4	42.7	107.1
Dec-00	20.9	3.6	84.2	25.8	3.5	4.4	96.8

Calculated monthly future runoff from 2046-2050

month	gfdl_cm2_0	gfdl_cm2_1	ingv_echam4	K-1	miroc3_2_hires	ncar_ccsm3_0
Jan-46	0.0	1.6	0.0	0.0	0.0	0.0
Feb-46	0.0	0.0	0.2	0.0	0.0	0.0
Mar-46	3.0	12.8	0.2	22.8	22.9	0.0
Apr-46	34.0	9.5	1.8	5.0	5.1	114.4
May-46	19.9	29.7	87.0	58.0	57.9	84.6
Jun-46	12.1	11.6	90.3	268.8	264.6	67.8
Jul-46	67.3	64.9	65.1	287.3	284.7	92.0
Aug-46	96.6	67.5	125.4	480.9	479.4	76.9
Sep-46	497.9	486.3	319.0	731.9	734.2	340.5
Oct-46	653.9	637.6	416.3	613.7	617.4	434.2
Nov-46	207.2	233.8	51.5	110.9	114.7	81.0
Dec-46	148.6	167.3	26.1	20.0	23.7	41.0
Jan-47	104.1	135.9	67.1	11.8	11.9	60.9
Feb-47	41.9	78.8	21.5	0.7	0.7	44.5
Mar-47	46.4	18.7	2.9	4.1	4.1	6.9
Apr-47	23.0	48.0	8.2	109.5	112.3	14.1
May-47	64.3	70.5	111.2	128.2	130.3	99.2
Jun-47	49.5	94.2	24.2	83.0	83.6	49.7
Jul-47	81.2	100.3	85.9	62.5	60.6	60.7
Aug-47	128.8	211.8	149.4	115.1	112.0	184.2
Sep-47	276.1	479.1	354.7	226.7	223.1	324.3
Oct-47	536.2	641.0	585.2	484.8	480.5	672.0
Nov-47	74.0	238.6	87.4	92.6	89.3	239.1
Dec-47	81.8	177.4	66.4	97.3	93.3	264.2
Jan-48	88.2	158.6	65.4	111.4	111.0	216.3
Feb-48	58.3	64.0	24.9	41.1	41.1	112.4
Mar-48	35.7	20.0	72.3	14.4	14.4	115.1
Apr-48	59.8	7.8	124.5	83.9	81.1	67.9
May-48	124.7	12.8	78.6	113.8	113.3	90.9
Jun-48	166.2	19.3	98.3	103.3	103.3	348.7
Jul-48	173.5	34.2	164.0	79.3	78.2	263.6
Aug-48	178.2	42.9	81.0	151.2	149.5	304.1
Sep-48	358.3	181.6	353.7	374.9	372.0	565.9
Oct-48	351.2	299.0	635.2	569.0	564.8	591.4
Nov-48	34.4	32.1	274.6	190.1	185.1	162.7
Dec-48	3.5	7.1	243.4	130.9	125.1	89.5
Jan-49	4.8	3.8	212.3	120.4	117.1	81.9
Feb-49	1.8	2.5	105.1	52.0	50.8	27.2
Mar-49	12.0	1.4	59.8	51.8	51.7	25.0
Apr-49	32.2	11.7	156.9	26.3	20.6	23.7
May-49	139.9	235.5	226.4	44.2	37.6	156.9
Jun-49	128.0	102.0	194.1	129.3	121.8	81.3
Jul-49	115.6	244.0	205.3	76.9	69.8	67.5
Aug-49	101.1	114.7	275.1	130.0	123.2	53.3
Sep-49	289.4	440.5	701.5	374.3	368.9	109.1
Oct-49	488.5	803.4	959.1	627.6	623.9	324.6
Nov-49	60.5	380.9	410.6	181.1	178.8	22.0
Dec-49	22.7	296.5	252.4	115.5	116.3	0.9
Jan-50	39.2	233.9	142.2	106.9	108.2	6.6
Feb-50	10.6	99.1	59.3	93.1	94.8	7.0
Mar-50	29.5	19.5	67.1	28.5	29.6	26.4
Apr-50	83.0	27.4	147.6	96.9	98.5	94.8
May-50	110.0	87.3	136.9	143.3	144.5	49.1
Jun-50	295.9	139.7	149.9	103.0	103.8	105.6
Jul-50	174.5	128.6	134.4	230.8	231.4	131.5
Aug-50	223.6	156.4	188.7	132.1	132.7	239.1
Sep-50	419.1	314.9	481.2	378.4	378.3	577.0
Oct-50	456.4	311.7	604.2	424.2	423.5	740.0
Nov-50	167.1	71.6	125.7	188.6	188.1	374.4
Dec-50	64.7	12.8	66.8	90.4	90.0	259.6

Calculated monthly future runoff from 2051-2055

month	gfdl_cm2_0	gfdl_cm2_1	ingv_echam4	K-1	miroc3_2_hires	ncar_ccsm3_0
Jan-51	94.9	25.1	44.9	140.8	140.8	203.6
Feb-51	55.7	17.9	33.9	91.6	91.7	130.2
Mar-51	23.2	6.6	24.2	85.8	85.9	86.5
Apr-51	15.9	44.5	12.2	32.0	32.2	75.2
May-51	71.9	72.6	83.8	72.4	71.7	273.8
Jun-51	88.9	28.9	157.3	116.8	116.3	204.1
Jul-51	137.0	72.8	134.9	108.6	108.1	119.4
Aug-51	160.2	50.5	186.9	189.9	189.0	94.6
Sep-51	511.5	409.7	536.9	512.2	512.8	468.9
Oct-51	721.1	500.5	617.3	542.9	543.8	505.5
Nov-51	214.6	78.7	195.2	74.8	75.2	111.5
Dec-51	135.0	35.2	91.5	8.9	9.4	31.2
Jan-52	98.0	27.8	79.5	4.2	4.2	31.3
Feb-52	39.5	10.9	20.0	0.5	0.5	42.8
Mar-52	99.5	68.6	13.1	0.9	0.9	150.2
Apr-52	58.2	50.7	79.2	3.4	3.4	62.1
May-52	102.5	180.8	101.5	53.7	53.8	144.7
Jun-52	114.1	108.0	241.7	47.9	47.5	172.2
Jul-52	128.1	94.4	290.9	133.8	132.9	245.4
Aug-52	101.4	495.0	278.0	84.2	83.1	316.0
Sep-52	481.3	574.2	423.3	325.9	322.0	647.2
Oct-52	595.7	843.9	455.7	381.8	376.4	585.0
Nov-52	215.1	366.7	233.5	188.2	182.3	172.3
Dec-52	118.5	191.4	93.3	83.9	78.2	38.3
Jan-53	117.4	128.3	155.0	161.8	160.8	32.2
Feb-53	70.3	53.0	179.1	99.2	99.4	9.2
Mar-53	40.2	31.2	202.3	52.1	52.2	3.3
Apr-53	69.5	29.4	210.9	25.7	20.3	12.4
May-53	174.8	86.0	133.7	58.9	54.1	72.1
Jun-53	348.2	164.6	258.8	88.4	83.3	118.9
Jul-53	258.1	157.3	235.5	124.8	118.6	132.8
Aug-53	298.8	160.6	343.7	134.9	129.3	89.9
Sep-53	510.0	314.2	639.6	509.1	503.4	336.7
Oct-53	652.8	573.8	652.3	691.2	684.7	473.2
Nov-53	319.5	380.9	148.4	225.8	219.4	251.3
Dec-53	233.6	308.1	56.9	174.0	167.8	171.9
Jan-54	232.1	372.7	31.0	127.8	123.6	220.5
Feb-54	157.3	275.3	4.3	53.5	51.2	125.7
Mar-54	70.8	172.1	13.0	116.1	114.9	60.1
Apr-54	69.0	91.6	18.1	100.7	96.4	18.1
May-54	119.0	46.9	91.8	220.3	216.7	45.7
Jun-54	65.4	305.1	106.8	215.6	213.7	63.1
Jul-54	116.9	246.8	152.2	254.5	253.9	90.9
Aug-54	148.0	247.5	133.9	159.9	160.2	102.2
Sep-54	440.0	467.9	492.8	605.5	606.5	332.1
Oct-54	516.4	571.8	727.1	657.8	660.2	405.7
Nov-54	77.7	190.2	467.7	372.4	375.6	40.8
Dec-54	13.0	112.3	370.4	265.3	269.2	2.5
Jan-55	13.3	130.6	303.8	322.5	331.1	2.9
Feb-55	7.0	113.9	151.0	157.1	172.9	7.8
Mar-55	5.9	88.9	63.8	161.6	174.5	11.4
Apr-55	8.0	256.3	20.3	48.1	58.1	12.5
May-55	36.4	321.9	29.0	116.7	122.5	39.5
Jun-55	50.5	446.9	82.6	159.8	164.8	178.1
Jul-55	228.8	298.6	112.8	250.8	256.1	304.1
Aug-55	174.6	277.4	152.6	262.1	267.0	231.9
Sep-55	582.0	388.2	374.6	454.4	458.6	537.3
Oct-55	563.8	423.0	483.7	661.5	665.8	546.8
Nov-55	85.5	70.5	123.8	149.6	154.1	62.9
Dec-55	10.0	10.3	45.3	77.8	82.3	7.1

Calculated monthly future runoff from 2056-2060

month	gfdl_cm2_0	gfdl_cm2_1	ingv_echam4	K-1	miroc3_2_hires	ncar_ccsm3_0
Jan-56	10.5	14.8	82.6	82.8	92.0	3.7
Feb-56	15.9	24.8	48.6	64.3	69.0	41.4
Mar-56	11.0	8.7	19.4	32.8	36.2	21.5
Apr-56	46.4	13.1	63.4	65.7	71.3	55.0
May-56	121.2	67.9	41.2	130.1	133.4	85.4
Jun-56	88.4	53.1	37.7	104.5	108.7	88.2
Jul-56	77.9	59.1	261.2	312.9	318.7	85.4
Aug-56	87.8	83.5	142.8	311.5	317.9	119.3
Sep-56	159.6	317.4	436.3	621.5	627.8	235.5
Oct-56	305.4	424.2	494.6	855.9	862.1	304.6
Nov-56	18.5	74.2	50.1	261.5	268.8	17.8
Dec-56	0.4	8.9	3.8	180.7	187.6	0.5
Jan-57	0.8	36.4	3.2	114.9	117.5	0.7
Feb-57	15.1	16.2	1.9	66.4	67.1	1.8
Mar-57	2.6	5.4	8.7	9.5	9.7	24.5
Apr-57	43.4	125.9	15.4	11.2	15.2	171.9
May-57	73.3	208.4	174.0	65.4	67.9	261.5
Jun-57	34.9	245.9	101.8	66.1	68.7	241.2
Jul-57	100.0	239.1	92.0	70.0	72.0	402.3
Aug-57	160.2	198.6	113.3	87.3	86.8	413.0
Sep-57	500.8	486.5	530.5	260.9	260.1	772.8
Oct-57	594.4	771.2	604.9	332.8	331.0	853.2
Nov-57	226.8	334.5	351.0	35.7	32.2	491.7
Dec-57	103.8	275.5	213.1	3.6	1.0	297.7
Jan-58	90.0	195.4	206.6	4.4	4.4	214.5
Feb-58	43.6	92.6	141.4	6.2	6.3	125.0
Mar-58	25.5	32.9	82.0	2.4	2.5	64.5
Apr-58	58.6	71.0	87.2	32.5	29.2	129.5
May-58	147.7	97.7	175.3	76.2	74.8	179.5
Jun-58	132.8	70.6	190.0	65.4	63.9	165.8
Jul-58	111.4	85.2	170.9	74.8	72.1	184.8
Aug-58	120.0	160.1	116.9	149.0	147.3	176.4
Sep-58	392.4	382.0	279.4	373.9	371.0	532.1
Oct-58	622.6	417.5	331.5	356.7	353.6	621.0
Nov-58	238.8	47.3	29.3	90.2	86.5	143.3
Dec-58	207.6	3.7	2.8	9.7	8.1	74.7
Jan-59	209.6	3.2	3.7	59.2	59.2	61.1
Feb-59	105.0	1.7	4.6	85.6	85.6	17.9
Mar-59	86.7	19.0	19.8	108.0	107.5	9.5
Apr-59	53.2	14.2	32.9	126.1	125.0	15.7
May-59	217.8	41.6	228.5	173.4	172.8	29.4
Jun-59	181.1	33.1	284.8	182.3	181.2	46.1
Jul-59	207.6	94.3	300.8	155.3	153.5	56.7
Aug-59	251.7	85.1	205.4	131.6	129.8	150.1
Sep-59	558.2	583.4	383.4	317.4	314.8	478.7
Oct-59	583.2	801.6	457.0	589.7	588.5	528.7
Nov-59	130.9	356.1	46.9	92.0	91.6	112.6
Dec-59	98.9	269.6	10.5	99.2	117.3	55.5
Jan-60	124.1	173.3	16.1	88.3	99.8	156.2
Feb-60	67.5	163.8	17.2	66.3	75.5	83.9
Mar-60	68.4	73.9	4.4	16.0	20.2	96.2
Apr-60	60.6	55.8	8.8	101.6	105.1	49.2
May-60	120.3	152.4	156.7	411.7	416.9	38.0
Jun-60	164.9	228.7	122.7	445.3	451.5	23.0
Jul-60	132.1	365.3	416.3	553.4	560.1	36.3
Aug-60	293.9	351.9	383.5	331.6	336.9	69.5
Sep-60	471.0	597.9	578.5	669.4	674.3	206.2
Oct-60	562.6	615.5	644.9	756.5	762.2	445.5
Nov-60	204.2	96.2	152.5	227.4	232.8	42.8
Dec-60	77.6	23.7	58.8	150.2	155.2	3.4

Calculated monthly future runoff from 2061-2065

month	gfdl_cm2_0	gfdl_cm2_1	ingv_echam4	K-1	miroc3_2_hires	ncar_ccsm3_0
Jan-61	104.5	14.8	52.0	90.7	94.5	10.0
Feb-61	49.5	4.3	14.6	22.4	24.2	3.1
Mar-61	20.8	6.1	3.1	7.1	7.5	7.7
Apr-61	43.3	16.1	10.0	22.7	25.9	63.3
May-61	126.5	81.2	142.4	71.0	73.4	222.8
Jun-61	71.0	195.1	84.2	38.5	39.4	94.8
Jul-61	173.2	152.5	133.5	69.2	68.8	101.9
Aug-61	149.2	174.9	313.8	190.2	190.3	58.9
Sep-61	421.4	362.6	456.7	644.3	646.6	366.9
Oct-61	687.7	434.3	608.9	867.7	871.3	546.9
Nov-61	257.9	54.4	93.7	413.3	416.2	120.7
Dec-61	210.8	10.2	15.2	263.9	266.5	75.0
Jan-62	180.7	7.0	10.3	154.9	156.2	62.5
Feb-62	80.3	20.6	1.1	46.4	46.7	17.6
Mar-62	27.3	37.4	2.8	47.8	48.0	4.6
Apr-62	81.5	26.5	15.4	45.0	47.6	11.7
May-62	122.6	172.3	54.7	64.9	67.0	71.4
Jun-62	90.1	119.5	136.2	70.5	72.7	54.9
Jul-62	145.2	111.6	133.5	89.4	92.4	144.2
Aug-62	151.6	138.2	224.7	83.8	86.5	141.5
Sep-62	594.5	301.3	592.8	327.4	330.3	497.3
Oct-62	743.8	453.3	695.6	540.1	543.5	763.7
Nov-62	499.3	103.3	350.9	158.1	161.7	307.9
Dec-62	339.6	17.8	209.5	106.8	109.5	216.3
Jan-63	281.5	62.0	160.6	118.3	118.4	179.2
Feb-63	128.2	50.0	69.8	39.1	39.3	74.3
Mar-63	65.1	81.9	11.5	8.7	8.8	55.6
Apr-63	66.5	174.6	35.6	56.5	58.2	84.8
May-63	68.6	116.3	93.0	50.2	50.6	173.0
Jun-63	82.1	67.3	38.2	95.6	96.4	239.7
Jul-63	204.9	75.9	38.7	83.0	84.0	390.4
Aug-63	262.8	56.6	70.6	102.0	101.9	416.6
Sep-63	684.0	355.8	288.1	311.3	310.1	703.8
Oct-63	744.8	480.5	403.4	428.4	426.2	921.1
Nov-63	345.2	89.3	41.1	98.9	96.3	640.7
Dec-63	193.9	30.8	2.7	28.9	26.5	492.0
Jan-64	154.4	40.9	59.5	79.4	79.5	420.6
Feb-64	64.1	19.5	36.5	56.6	56.9	227.0
Mar-64	21.9	6.3	140.8	102.1	102.4	94.9
Apr-64	25.3	12.8	141.5	147.3	145.4	36.0
May-64	79.0	142.4	142.4	358.1	355.7	81.0
Jun-64	249.9	118.6	99.8	194.6	193.0	88.4
Jul-64	254.6	135.1	64.5	281.6	279.8	211.1
Aug-64	317.5	148.3	49.8	148.7	146.6	167.1
Sep-64	565.9	503.8	281.4	382.5	379.5	411.1
Oct-64	600.6	553.1	635.6	406.7	402.9	468.5
Nov-64	110.5	132.9	284.7	61.8	56.7	57.2
Dec-64	46.7	62.2	291.7	15.4	10.0	9.4
Jan-65	59.4	145.1	263.3	26.1	24.6	19.1
Feb-65	59.7	61.0	153.7	35.4	35.6	6.9
Mar-65	130.4	176.0	65.2	48.0	48.6	3.9
Apr-65	305.9	118.9	64.6	94.4	90.0	17.1
May-65	522.0	306.2	188.3	178.8	174.8	243.9
Jun-65	453.4	324.2	131.7	174.2	171.1	163.0
Jul-65	316.8	839.8	247.9	262.1	259.1	221.8
Aug-65	191.8	637.0	158.6	376.8	376.6	408.7
Sep-65	424.4	958.6	516.3	698.7	701.0	647.2
Oct-65	483.3	914.6	513.4	725.9	729.4	814.4
Nov-65	93.7	286.7	116.1	223.6	227.8	315.3
Dec-65	29.5	161.3	32.1	103.7	108.7	208.9

III. Input-Output table for Irrigation area and Non-irrigation area

Input-Output table for Rayong in 2009 : Total area

Sub-Sectors	Agr.				Ind.					Ser.		Total IT	Total Final Demand	Total Input/Output
	Rice Field	Dry crop	Orchards	Rubber	Agr.-Mis.	Chem. Product	Petro-Ref.	Metal	Ind.-Mis.	Tourist	Ser.-Mis.			
Rice Field	35.5	82.8	97.8	0.0	18.8	0.0	0.0	0.0	178.2	62.4	9.0	484.4	14.63	499.00
Dry crop	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2,155.4	0.0	0.0	2,155.4	-1,525.38	630.00
Orchards	0.5	0.0	0.1	0.0	0.2	136.1	0.0	0.0	271.6	0.4	0.0	408.9	8,656.13	9,065.00
Rubber	0.0	0.0	0.0	0.0	0.0	561.6	0.0	0.0	4,239.5	0.0	0.1	4,801.3	7,362.74	12,164.00
Agr.-Mis.	1.9	0.0	0.0	5.4	194.6	3.5	0.0	0.0	764.9	45.9	0.9	1,017.1	7,130.91	8,148.00
Chem. Product	0.3	5.3	7.8	603.3	246.3	20,338.8	1,005.7	2,806.5	10,934.4	534.1	1,657.6	38,140.0	109,355.97	147,496.00
Petro-Ref.	34.2	6.2	605.9	240.6	627.6	9.0	2,734.9	377.8	17,983.1	2,216.0	1,186.1	26,021.4	1,459,532.62	1,485,554.00
Metal	6.8	2.3	188.5	80.7	135.4	1,951.2	1,231.5	13,809.3	21,568.2	137.9	2,955.0	42,066.9	46,297.12	88,364.00
Ind.-Mis.	51.7	160.8	2,539.7	1,588.9	2,285.0	21,095.3	1,217,163.4	5,269.1	93,404.1	3,462.9	10,509.9	1,357,530.8	-968,360.83	389,170.00
Tourist	0.8	13.1	5.3	19.3	112.9	12.7	974.5	4,525.8	5,425.3	671.8	2,354.9	14,116.4	365.6	14,482.0
Ser.-Mis.	30.5	49.6	311.4	716.4	164.4	1,523.5	12,487.6	1,860.9	30,388.2	1,907.3	6,817.4	56,257.4	17,260.6	73,518.0
Total IT	162.2	320.2	3,756.5	3,254.6	3,785.3	45,631.6	1,235,597.7	28,649.5	187,312.8	9,038.7	25,490.8	1,542,999.9	686,090.1	2,229,090.0
Total Value Added	336.8	309.8	5,308.5	8,909.4	4,362.7	101,864.4	249,956.3	59,714.5	201,857.2	5,443.3	48,027.2			
Total Input/Output	499.0	630.0	9,065.0	12,164.0	8,148.0	147,496.0	1,485,554.0	88,364.0	389,170.0	14,482.0	73,518.0			
Water : MCM	19.73	50.72	232.80	0.85	11.68	261.23	34.86	29.30	40.49	0.57	3.01			
WD/TI	0.03954	0.08050	0.02568	0.00007	0.00143	0.00177	0.00002	0.00033	0.00010	0.00004	0.00004			

Input-Output table for Rayong in 2009 : Irrigation area

Sub-Sectors	Agr.				Ind.					Ser.		Total IT	Total Final Demand	Total Input/Output
	Rice Field	Dry crop	Orchards	Rubber	Agr.-Mis.	Chem. Product	Petro-Ref.	Metal	Ind.-Mis.	Tourist	Ser.-Mis.			
Rice Field	18.5	9.1	16.9	0.0	3.2	0.0	0.0	0.0	75.2	62.4	6.8	192.0	67.24	259.22
Dry crop	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	909.5	0.0	0.0	909.5	-840.35	69.17
Orchards	0.2	0.0	0.0	0.0	0.0	97.5	0.0	0.0	114.6	0.4	0.0	212.8	1,357.17	1,569.96
Rubber	0.0	0.0	0.0	0.0	0.0	402.3	0.0	0.0	1,789.0	0.0	0.1	2,191.4	-1,066.37	1,125.05
Agr.-Mis.	1.0	0.0	0.0	0.5	33.1	2.5	0.0	0.0	322.8	45.9	0.6	406.4	977.41	1,383.77
Chem. Product	0.2	0.6	1.3	55.8	41.8	14,570.9	1,005.7	1,633.4	4,614.1	534.1	1,250.0	23,707.9	81,959.87	105,667.80
Petro-Ref.	17.7	0.7	104.9	22.3	106.6	6.4	2,734.9	219.9	7,588.4	2,216.0	894.4	13,912.3	1,471,641.67	1,485,554.00
Metal	3.5	0.3	32.6	7.5	23.0	1,397.9	1,231.5	8,037.2	9,101.3	137.9	2,228.4	22,201.1	29,228.13	51,429.26
Ind.-Mis.	26.9	17.7	439.9	147.0	388.1	15,112.9	1,217,163.4	3,066.7	39,414.3	3,462.9	7,925.8	1,287,165.4	-1,122,945.01	164,220.38
Tourist	0.4	1.4	0.9	1.8	19.2	9.1	974.5	2,634.1	2,289.3	671.8	1,775.9	8,378.5	6,103.5	14,482.0
Ser.-Mis.	15.9	5.5	53.9	66.3	27.9	1,091.5	12,487.6	1,083.1	12,823.1	1,907.3	5,141.2	34,703.2	20,738.8	55,441.9
Total IT	84.3	35.2	650.6	301.0	642.9	32,691.0	1,235,597.7	16,674.4	79,041.5	9,038.7	19,223.3	1,393,980.5	487,222.1	1,881,202.5
Total Value Added	174.9	34.0	919.4	824.0	740.9	72,976.8	249,956.3	34,754.8	85,178.9	5,443.3	36,218.6			
Total Input/Output	259.2	69.2	1,570.0	1,125.1	1,383.8	105,667.8	1,485,554.0	51,429.3	164,220.4	14,482.0	55,441.9			
Water : MCM	0.00	0.26	1.64	0.00	0.02	3.50	0.00	0.10	0.10	0.00	0.23			
WD/TI	0.03954	0.08050	0.02568	0.00007	0.00143	0.00177	0.00002	0.00033	0.00010	0.00004	0.00004			

Input-Output table for Rayong in 2009 : Non-Irrigation area

Sub-Sectors	Agr.				Ind.					Ser.		Total IT	Total Final Demand	Total Input/Output
	Rice Field	Dry crop	Orchards	Rubber	Agr.-Mis.	Chem. Product	Petro-Ref.	Metal	Ind.-Mis.	Tourist	Ser.-Mis.			
Rice Field	17.1	73.7	80.9	0.0	15.6	0.0	0.0	0.0	103.0	0.0	2.2	292.4	-52.61	239.78
Dry crop	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,245.9	0.0	0.0	1,245.9	-685.03	560.83
Orchards	0.2	0.0	0.1	0.0	0.2	38.6	0.0	0.0	157.0	0.0	0.0	196.1	7,298.95	7,495.04
Rubber	0.0	0.0	0.0	0.0	0.0	159.3	0.0	0.0	2,450.5	0.0	0.0	2,609.8	8,429.10	11,038.95
Agr.-Mis.	0.9	0.0	0.0	4.9	161.6	1.0	0.0	0.0	442.1	0.0	0.2	610.7	6,153.50	6,764.23
Chem. Product	0.1	4.7	6.4	547.5	204.5	5,767.8	0.0	1,173.1	6,320.3	0.0	407.6	14,432.1	27,396.10	41,828.20
Petro-Ref.	16.4	5.5	501.0	218.3	521.0	2.5	0.0	157.9	10,394.7	0.0	291.6	12,109.1	-12,109.05	0.00
Metal	3.3	2.1	155.9	73.3	112.4	553.3	0.0	5,772.1	12,466.9	0.0	726.5	19,865.8	17,068.98	36,934.74
Ind.-Mis.	24.9	143.2	2,099.9	1,441.9	1,896.9	5,982.4	0.0	2,202.4	53,989.8	0.0	2,584.1	70,365.4	154,584.18	224,949.62
Tourist	0.4	11.6	4.4	17.5	93.7	3.6	0.0	1,891.7	3,135.9	0.0	579.0	5,738.0	-5,738.0	0.0
Ser.-Mis.	14.7	44.2	257.4	650.2	136.5	432.1	0.0	777.8	17,565.1	0.0	1,676.2	21,554.2	-3,478.2	18,076.1
Total IT	78.0	285.0	3,105.9	2,953.6	3,142.5	12,940.6	0.0	11,975.0	108,271.3	0.0	6,267.5	149,019.5	198,868.0	347,887.5
Total Value Added	161.8	275.8	4,389.1	8,085.3	3,621.7	28,887.6	0.0	24,959.7	116,678.3	0.0	11,808.6			
Total Input/Output	239.8	560.8	7,495.0	11,038.9	6,764.2	41,828.2	0.0	36,934.7	224,949.6	0.0	18,076.1			
Water : MCM	0.00	0.26	1.64	0.00	0.02	3.50	0.00	0.10	0.10	0.00	0.23			
WD/TI	0.03954	0.08050	0.02568	0.00007	0.00143	0.00177	0.00002	0.00033	0.00010	0.00004	0.00004			

Input-Output table for Rayong in 2000 : Total area

Sub-Sectors	Agr.				Ind.					Ser.		Total IT	Total Final Demand	Total Input/Output
	Rice Field	Dry crop	Orchards	Rubber	Agr.-Mis.	Chem. Product	Petro-Ref.	Metal	Ind.-Mis.	Tourist	Ser.-Mis.			
Rice Field	23.8	55.4	62.8	0.0	12.1	0.0	0.0	0.0	129.1	34.3	5.0	322.6	7.79	330.35
Dry crop	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,435.3	0.0	0.0	1,435.3	-1,018.24	417.07
Orchards	0.3	0.0	0.1	0.0	0.1	88.1	0.0	0.0	183.5	0.2	0.0	272.3	5,728.89	6,001.17
Rubber	0.0	0.0	0.0	0.0	0.0	360.1	0.0	0.0	2,837.1	0.0	0.1	3,197.2	4,855.52	8,052.76
Agr.-Mis.	1.2	0.0	0.0	3.4	119.0	2.3	0.0	0.0	526.8	24.0	0.5	677.3	4,716.81	5,394.10
Chem. Product	0.2	3.7	5.2	418.5	164.7	14,677.9	712.2	2,157.6	8,236.0	305.2	968.6	27,649.8	78,651.87	106,301.71
Petro-Ref.	23.9	4.3	406.6	167.8	422.1	6.5	1,947.7	292.1	13,622.4	1,273.8	697.0	18,864.3	1,051,787.90	1,070,652.25
Metal	4.6	1.6	122.9	54.7	88.5	1,375.2	851.7	10,368.1	15,866.1	77.0	1,686.4	30,496.6	33,188.11	63,684.74
Ind.-Mis.	36.8	114.1	1,729.9	1,125.1	1,559.7	15,540.3	879,803.1	4,134.9	71,816.3	2,020.4	6,269.1	984,149.7	-703,671.38	280,478.35
Tourist	0.4	6.8	2.7	10.1	56.8	6.9	518.8	2,615.7	3,072.1	288.7	1,034.5	7,613.5	151.4	7,764.9
Ser.-Mis.	16.1	26.0	156.8	375.0	83.0	829.7	6,673.1	1,079.6	17,273.2	822.7	3,006.3	30,341.5	9,077.0	39,418.5
Total IT	107.4	212.0	2,486.9	2,154.6	2,506.0	32,887.1	890,506.4	20,647.9	134,998.1	4,846.3	13,667.5	1,105,020.2	483,475.6	1,588,495.8
Total Value Added	222.9	205.1	3,514.3	5,898.1	2,888.1	73,414.6	180,145.8	43,036.8	145,480.3	2,918.6	25,751.0			
Total Input/Output	330.3	417.1	6,001.2	8,052.8	5,394.1	106,301.7	1,070,652.3	63,684.7	280,478.4	7,764.9	39,418.5			
Water : MCM	13.06	33.58	154.12	0.56	7.73	218.41	29.14	24.49	33.85	0.31	3.28			
WD/TI	0.03954	0.08050	0.02568	0.00007	0.00143	0.00205	0.00003	0.00038	0.00012	0.00004	0.00008			

Input-Output table for Rayong in 2000 : Irrigation area

Sub-Sectors	Agr.				Ind.					Ser.		Total IT	Total Final Demand	Total Input/Output
	Rice Field	Dry crop	Orchards	Rubber	Agr.-Mis.	Chem. Product	Petro-Ref.	Metal	Ind.-Mis.	Tourist	Ser.-Mis.			
Rice Field	12.4	6.1	10.9	0.0	2.0	0.0	0.0	0.0	54.5	34.3	3.8	124.0	47.63	171.61
Dry crop	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	605.7	0.0	0.0	605.7	-559.87	45.79
Orchards	0.2	0.0	0.0	0.0	0.0	63.1	0.0	0.0	77.4	0.2	0.0	140.9	898.42	1,039.34
Rubber	0.0	0.0	0.0	0.0	0.0	258.0	0.0	0.0	1,197.2	0.0	0.1	1,455.2	-710.40	744.80
Agr.-Mis.	0.6	0.0	0.0	0.3	20.2	1.7	0.0	0.0	222.3	24.0	0.3	269.5	646.60	916.08
Chem. Product	0.1	0.4	0.9	38.7	28.0	10,515.4	712.2	1,255.7	3,475.4	305.2	730.4	17,062.5	59,093.20	76,155.74
Petro-Ref.	12.4	0.5	70.4	15.5	71.7	4.7	1,947.7	170.0	5,748.3	1,273.8	525.6	9,840.7	1,060,811.60	1,070,652.25
Metal	2.4	0.2	21.3	5.1	15.0	985.2	851.7	6,034.4	6,695.1	77.0	1,271.8	15,959.1	21,106.46	37,065.53
Ind.-Mis.	19.1	12.5	299.6	104.1	264.9	11,133.3	879,803.1	2,406.6	30,304.7	2,020.4	4,727.7	931,096.0	-812,740.86	118,355.12
Tourist	0.2	0.8	0.5	0.9	9.6	4.9	518.8	1,522.4	1,296.4	288.7	780.2	4,423.3	3,341.6	7,764.9
Ser.-Mis.	8.3	2.9	27.2	34.7	14.1	594.4	6,673.1	628.4	7,288.9	822.7	2,267.1	18,361.7	11,364.9	29,726.5
Total IT	55.8	23.3	430.7	199.3	425.6	23,560.7	890,506.4	12,017.4	56,965.9	4,846.3	10,307.0	999,338.5	343,299.2	1,342,637.7
Total Value Added	115.8	22.5	608.6	545.5	490.5	52,595.0	180,145.8	25,048.1	61,389.2	2,918.6	19,419.5			
Total Input/Output	171.6	45.8	1,039.3	744.8	916.1	76,155.7	1,070,652.3	37,065.5	118,355.1	7,764.9	29,726.5			
Water : MCM	6.79	3.69	26.69	0.05	1.31	156.47	29.14	14.26	14.28	0.31	2.47			
WD/TI	0.03954	0.08050	0.02568	0.00007	0.00143	0.00205	0.00003	0.00038	0.00012	0.00004	0.00008			

Input-Output table for Rayong in 2000 : Non-Irrigation area

Sub-Sectors	Agr.				Ind.					Ser.		Total IT	Total Final Demand	Total Input/Output
	Rice Field	Dry crop	Orchards	Rubber	Agr.-Mis.	Chem. Product	Petro-Ref.	Metal	Ind.-Mis.	Tourist	Ser.-Mis.			
Rice Field	11.4	49.3	51.9	0.0	10.0	0.0	0.0	0.0	74.6	0.0	1.2	198.6	-39.83	158.74
Dry crop	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	829.6	0.0	0.0	829.6	-458.36	371.28
Orchards	0.1	0.0	0.0	0.0	0.1	25.0	0.0	0.0	106.1	0.0	0.0	131.4	4,830.48	4,961.83
Rubber	0.0	0.0	0.0	0.0	0.0	102.1	0.0	0.0	1,639.9	0.0	0.0	1,742.0	5,565.92	7,307.96
Agr.-Mis.	0.6	0.0	0.0	3.1	98.8	0.7	0.0	0.0	304.5	0.0	0.1	407.8	4,070.21	4,478.02
Chem. Product	0.1	3.3	4.3	379.8	136.8	4,162.5	0.0	901.8	4,760.6	0.0	238.2	10,587.3	19,558.67	30,145.97
Petro-Ref.	11.5	3.9	336.2	152.3	350.4	1.8	0.0	122.1	7,874.1	0.0	171.4	9,023.7	-9,023.69	0.00
Metal	2.2	1.4	101.6	49.6	73.4	390.0	0.0	4,333.7	9,171.0	0.0	414.6	14,537.6	12,081.65	26,619.20
Ind.-Mis.	17.7	101.6	1,430.3	1,021.0	1,294.8	4,407.1	0.0	1,728.3	41,511.5	0.0	1,541.4	53,053.7	109,069.49	162,123.23
Tourist	0.2	6.1	2.2	9.1	47.1	1.9	0.0	1,093.3	1,775.8	0.0	254.4	3,190.2	-3,190.2	0.0
Ser.-Mis.	7.7	23.2	129.6	340.4	68.9	235.3	0.0	451.3	9,984.3	0.0	739.2	11,979.8	-2,287.9	9,691.9
Total IT	51.6	188.7	2,056.2	1,955.3	2,080.4	9,326.4	0.0	8,630.5	78,032.1	0.0	3,360.5	105,681.7	140,176.5	245,858.2
Total Value Added	107.1	182.6	2,905.7	5,352.6	2,397.7	20,819.5	0.0	17,988.7	84,091.1	0.0	6,331.5			
Total Input/Output	158.7	371.3	4,961.8	7,308.0	4,478.0	30,146.0	0.0	26,619.2	162,123.2	0.0	9,691.9			
Water : MCM	6.28	29.89	127.42	0.51	6.42	61.94	0.00	10.24	19.57	0.00	0.81			
WD/TI	0.03954	0.08050	0.02568	0.00007	0.00143	0.00205	0.00003	0.00038	0.00012	0.00004	0.00008			

Input-Output table for Rayong in 2017 : Total area

Sub-Sectors	Agr.				Ind.					Ser.		Total IT	Total Final Demand	Total Input/Output
	Rice Field	Dry crop	Orchards	Rubber	Agr.-Mis.	Chem. Product	Petro-Ref.	Metal	Ind.-Mis.	Tourist	Ser.-Mis.			
Rice Field	50.6	118.2	145.3	0.0	27.8	0.0	0.0	0.0	238.6	106.1	14.9	701.5	26.06	727.59
Dry crop	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3,121.7	0.0	0.0	3,121.7	-2,203.12	918.60
Orchards	0.7	0.0	0.2	0.0	0.4	203.1	0.0	0.0	387.2	0.7	0.0	592.2	12,625.41	13,217.60
Rubber	0.0	0.0	0.0	0.0	0.0	846.9	0.0	0.0	6,106.7	0.0	0.3	6,953.8	10,782.39	17,736.22
Agr.-Mis.	2.9	0.0	0.0	8.1	302.1	5.1	0.0	0.0	1,071.7	81.7	1.5	1,473.1	10,407.45	11,880.53
Chem. Product	0.4	7.4	11.2	836.0	355.4	27,727.8	1,400.4	3,579.9	14,238.7	883.0	2,682.9	51,723.1	149,649.31	201,372.42
Petro-Ref.	47.0	8.5	870.9	331.7	900.6	12.2	3,788.2	479.4	23,295.4	3,644.9	1,909.7	35,288.6	1,992,899.34	2,028,187.91
Metal	9.6	3.3	279.1	114.6	200.2	2,725.6	1,757.0	18,047.9	28,777.1	233.7	4,900.5	57,048.5	63,592.58	120,641.05
Ind.-Mis.	69.9	218.1	3,585.7	2,151.6	3,220.8	28,101.8	1,656,016.5	6,567.3	118,849.6	5,594.9	16,622.0	1,840,998.0	-1,309,674.46	531,323.59
Tourist	1.4	23.3	9.8	34.3	209.0	22.1	1,740.6	7,405.5	9,062.6	1,425.0	4,889.4	24,823.1	814.4	25,637.5
Ser.-Mis.	54.0	88.1	575.1	1,269.2	303.2	2,655.1	22,226.4	3,034.3	50,584.0	4,031.3	14,105.2	98,925.9	31,222.9	130,148.8
Total IT	236.6	466.8	5,477.3	4,745.6	5,519.4	62,299.7	1,686,929.1	39,114.4	255,733.3	16,001.1	45,126.3	2,121,649.5	960,142.2	3,081,791.7
Total Value Added	491.0	451.8	7,740.3	12,990.6	6,361.1	139,072.8	341,258.8	81,526.7	275,590.3	9,636.3	85,022.5			
Total Input/Output	727.6	918.6	13,217.6	17,736.2	11,880.5	201,372.4	2,028,187.9	120,641.1	531,323.6	25,637.5	130,148.8			
Water : MCM	28.77	73.95	339.44	1.24	17.03	413.74	55.21	46.40	64.12	1.01	10.81			
WD/TI	0.03954	0.08050	0.02568	0.00007	0.00143	0.00205	0.00003	0.00038	0.00012	0.00004	0.00008			

Input-Output table for Rayong in 2017 : Irrigation area

Sub-Sectors	Agr.				Ind.					Ser.		Total IT	Total Final Demand	Total Input/Output
	Rice Field	Dry crop	Orchards	Rubber	Agr.-Mis.	Chem. Product	Petro-Ref.	Metal	Ind.-Mis.	Tourist	Ser.-Mis.			
Rice Field	26.3	13.0	25.2	0.0	4.7	0.0	0.0	0.0	100.7	106.1	11.3	287.2	90.81	377.97
Dry crop	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,317.3	0.0	0.0	1,317.3	-1,216.44	100.85
Orchards	0.4	0.0	0.0	0.0	0.1	145.5	0.0	0.0	163.4	0.7	0.0	310.0	1,979.12	2,289.14
Rubber	0.0	0.0	0.0	0.0	0.0	606.7	0.0	0.0	2,576.9	0.0	0.2	3,183.8	-1,543.36	1,640.43
Agr.-Mis.	1.5	0.0	0.0	0.7	51.3	3.7	0.0	0.0	452.2	81.7	1.1	592.3	1,425.41	2,017.67
Chem. Product	0.2	0.8	1.9	77.3	60.4	19,864.5	1,400.4	2,083.5	6,008.4	883.0	2,023.2	32,403.7	111,861.72	144,265.47
Petro-Ref.	24.4	0.9	150.8	30.7	153.0	8.7	3,788.2	279.0	9,830.1	3,644.9	1,440.1	19,350.9	2,008,836.98	2,028,187.91
Metal	5.0	0.4	48.3	10.6	34.0	1,952.6	1,757.0	10,504.2	12,143.2	233.7	3,695.6	30,384.5	39,830.48	70,215.02
Ind.-Mis.	36.3	23.9	621.0	199.0	547.0	20,132.4	1,656,016.5	3,822.3	50,151.7	5,594.9	12,535.1	1,749,680.1	-1,525,474.27	224,205.78
Tourist	0.7	2.6	1.7	3.2	35.5	15.9	1,740.6	4,310.1	3,824.2	1,425.0	3,687.2	15,046.7	10,590.8	25,637.5
Ser.-Mis.	28.0	9.7	99.6	117.4	51.5	1,902.1	22,226.4	1,766.0	21,345.2	4,031.3	10,637.1	62,214.4	35,934.3	98,148.7
Total IT	122.9	51.3	948.6	438.9	937.4	44,632.2	1,686,929.1	22,765.2	107,913.3	16,001.1	34,031.0	1,914,770.9	682,315.6	2,597,086.4
Total Value Added	255.1	49.6	1,340.5	1,201.5	1,080.3	99,633.3	341,258.8	47,449.8	116,292.5	9,636.3	64,117.8			
Total Input/Output	378.0	100.9	2,289.1	1,640.4	2,017.7	144,265.5	2,028,187.9	70,215.0	224,205.8	25,637.5	98,148.7			
Water : MCM	14.95	8.12	58.79	0.11	2.89	296.41	55.21	27.00	27.06	1.01	8.16			
WD/TI	0.03954	0.08050	0.02568	0.00007	0.00143	0.00205	0.00003	0.00038	0.00012	0.00004	0.00008			

Input-Output table for Rayong in 2017 : Non-Irrigation area

Sub-Sectors	Agr.				Ind.					Ser.		Total IT	Total Final Demand	Total Input/Output
	Rice Field	Dry crop	Orchards	Rubber	Agr.-Mis.	Chem. Product	Petro-Ref.	Metal	Ind.-Mis.	Tourist	Ser.-Mis.			
Rice Field	24.3	105.2	120.2	0.0	23.1	0.0	0.0	0.0	137.9	0.0	3.7	414.4	-64.75	349.62
Dry crop	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,804.4	0.0	0.0	1,804.4	-986.68	817.74
Orchards	0.3	0.0	0.1	0.0	0.3	57.6	0.0	0.0	223.8	0.0	0.0	282.2	10,646.29	10,928.46
Rubber	0.0	0.0	0.0	0.0	0.0	240.2	0.0	0.0	3,529.8	0.0	0.1	3,770.0	12,325.75	16,095.80
Agr.-Mis.	1.4	0.0	0.0	7.3	250.8	1.5	0.0	0.0	619.5	0.0	0.4	880.8	8,982.04	9,862.86
Chem. Product	0.2	6.6	9.3	758.7	295.0	7,863.3	0.0	1,496.3	8,230.3	0.0	659.6	19,319.4	37,787.58	57,106.95
Petro-Ref.	22.6	7.6	720.1	301.0	747.7	3.5	0.0	200.4	13,465.3	0.0	469.5	15,937.6	-15,937.64	0.00
Metal	4.6	2.9	230.8	104.0	166.2	772.9	0.0	7,543.7	16,633.8	0.0	1,204.9	26,663.9	23,762.10	50,426.04
Ind.-Mis.	33.6	194.2	2,964.7	1,952.6	2,673.8	7,969.3	0.0	2,745.0	68,697.9	0.0	4,086.9	91,318.0	215,799.81	307,117.81
Tourist	0.7	20.7	8.1	31.1	173.5	6.3	0.0	3,095.4	5,238.4	0.0	1,202.2	9,776.4	-9,776.4	0.0
Ser.-Mis.	25.9	78.4	475.5	1,151.8	251.7	752.9	0.0	1,268.3	29,238.8	0.0	3,468.1	36,711.5	-4,711.4	32,000.0
Total IT	113.7	415.6	4,528.7	4,306.7	4,582.0	17,667.5	0.0	16,349.2	147,820.0	0.0	11,095.3	206,878.6	277,826.7	484,705.3
Total Value Added	236.0	402.2	6,399.7	11,789.1	5,280.8	39,439.5	0.0	34,076.9	159,297.8	0.0	20,904.7			
Total Input/Output	349.6	817.7	10,928.5	16,095.8	9,862.9	57,107.0	0.0	50,426.0	307,117.8	0.0	32,000.0			
Water : MCM	13.83	65.83	280.65	1.12	14.14	117.33	0.00	19.39	37.06	0.00	2.66			
WD/TI	0.03954	0.08050	0.02568	0.00007	0.00143	0.00205	0.00003	0.00038	0.00012	0.00004	0.00008			

Input-Output table for Rayong in 2065 : Total area

Sub-Sectors	Agr.				Ind.					Ser.		Total IT	Total Final Demand	Total Input/Output
	Rice Field	Dry crop	Orchards	Rubber	Agr.-Mis.	Chem.	Petro-Ref.	Metal	Ind.-Mis.	Tourist	Ser.-Mis.			
Rice Field	339.3	804.8	1,413.5	0.0	270.1	0.0	0.0	0.0	1,096.9	1,966.8	243.5	6,134.9	857.03	6,991.88
Dry crop	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	27,299.2	0.0	0.0	27,299.2	-18,471.78	8,827.42
Orchards	7.6	0.0	2.4	0.0	5.5	2,353.2	0.0	0.0	2,790.4	19.6	0.0	5,178.6	121,838.19	127,016.82
Rubber	0.0	0.0	0.0	0.0	0.0	11,085.5	0.0	0.0	49,717.7	0.0	7.6	60,810.8	109,628.52	170,439.34
Agr.-Mis.	26.2	0.0	0.0	71.7	3,973.7	51.4	0.0	0.0	6,674.3	2,051.6	33.1	12,882.0	101,286.03	114,168.02
Chem. Product	2.3	41.6	90.6	4,547.8	2,860.9	169,928.2	11,181.3	12,061.4	54,273.9	13,579.7	36,257.8	304,825.3	999,297.38	1,304,122.72
Petro-Ref.	248.5	45.8	6,671.4	1,713.5	6,886.0	70.9	28,726.0	1,534.1	84,329.4	53,233.6	24,510.6	207,969.9	12,926,926.85	13,134,896.71
Metal	65.2	22.6	2,746.1	760.7	1,966.0	20,376.2	17,113.2	74,177.7	133,808.6	4,383.5	80,790.1	336,209.8	445,082.54	781,292.37
Ind.-Mis.	296.4	937.8	22,022.1	8,912.0	19,743.7	131,135.8	10,068,340.8	16,848.3	344,949.9	65,514.4	171,049.6	10,849,750.7	-7,408,806.97	3,440,943.75
Tourist	34.1	559.0	337.3	793.4	7,149.7	576.7	59,066.2	106,037.3	146,808.0	93,132.1	280,821.7	695,315.5	93,823.0	789,138.5
Ser.-Mis.	1,253.7	2,074.7	19,352.1	28,804.3	10,184.0	67,885.5	740,417.7	42,652.7	804,425.1	258,644.3	795,303.8	2,770,997.8	1,235,070.7	4,006,068.6
Total IT	2,273.2	4,486.2	52,635.4	45,603.4	53,039.5	403,463.4	10,924,845.3	253,311.4	1,656,173.2	492,525.7	1,389,017.8	15,277,374.6	8,606,531.5	23,883,906.1
Total Value Added	4,718.7	4,341.2	74,381.4	124,835.9	61,128.5	900,659.3	2,210,051.5	527,981.0	1,784,770.5	296,612.8	2,617,050.8			
Total Input/Output	6,991.9	8,827.4	127,016.8	170,439.3	114,168.0	1,304,122.7	13,134,896.7	781,292.4	3,440,943.8	789,138.5	4,006,068.6			
Water : MCM	276.49	710.64	3261.91	11.91	163.69	2679.44	357.55	300.48	415.25	31.21	332.89			
WD/TI	0.03954	0.08050	0.02568	0.00007	0.00143	0.00205	0.00003	0.00038	0.00012	0.00004	0.00008			

Input-Output table for Rayong in 2065 : Irrigation area

Sub-Sectors	Agr.					Ind.				Ser.		Total IT	Total Final Demand	Total Input/Output
	Rice Field	Dry crop	Orchards	Rubber	Agr.-Mis.	Chem.	Petro-Ref.	Metal	Ind.-Mis.	Tourist	Ser.-Mis.			
Rice Field	176.2	88.4	244.8	0.0	45.9	0.0	0.0	0.0	462.9	1,966.8	183.7	3,168.6	463.53	3,632.13
Dry crop	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11,519.6	0.0	0.0	11,519.6	-10,550.45	969.16
Orchards	3.9	0.0	0.4	0.0	0.9	1,685.9	0.0	0.0	1,177.5	19.6	0.0	2,888.2	19,109.66	21,997.91
Rubber	0.0	0.0	0.0	0.0	0.0	7,941.8	0.0	0.0	20,979.7	0.0	5.7	28,927.2	-13,163.23	15,763.97
Agr.-Mis.	13.6	0.0	0.0	6.6	674.8	36.8	0.0	0.0	2,816.4	2,051.6	24.9	5,624.9	13,764.25	19,389.11
Chem. Product	1.2	4.6	15.7	420.6	485.9	121,738.5	11,181.3	7,019.9	22,902.3	13,579.7	27,343.0	204,692.5	729,595.66	934,288.21
Petro-Ref.	129.1	5.0	1,155.4	158.5	1,169.5	50.8	28,726.0	892.9	35,585.0	53,233.6	18,484.1	139,589.8	12,995,306.88	13,134,896.71
Metal	33.9	2.5	475.6	70.4	333.9	14,597.7	17,113.2	43,172.6	56,464.0	4,383.5	60,926.0	197,573.3	257,151.32	454,724.62
Ind.-Mis.	154.0	103.0	3,814.0	824.3	3,353.1	93,947.1	10,068,340.8	9,806.0	145,560.6	65,514.4	128,993.2	10,520,410.3	-9,068,414.77	1,451,995.54
Tourist	17.7	61.4	58.4	73.4	1,214.2	413.2	59,066.2	61,715.4	61,949.4	93,132.1	211,775.3	489,476.8	299,661.7	789,138.5
Ser.-Mis.	651.3	227.8	3,351.6	2,664.1	1,729.5	48,633.9	740,417.7	24,824.5	339,448.1	258,644.3	599,760.3	2,020,353.1	1,000,732.7	3,021,085.9
Total IT	1,180.9	492.5	9,115.9	4,217.9	9,007.7	289,045.8	10,924,845.3	147,431.3	698,865.3	492,525.7	1,047,496.3	13,624,224.4	6,223,657.3	19,847,881.7
Total Value Added	2,451.3	476.6	12,882.0	11,546.1	10,381.4	645,242.4	2,210,051.5	307,293.3	753,130.2	296,612.8	1,973,589.6			
Total Input/Output	3,632.1	969.2	21,997.9	15,764.0	19,389.1	934,288.2	13,134,896.7	454,724.6	1,451,995.5	789,138.5	3,021,085.9			
Water : MCM	143.63	78.02	564.93	1.10	27.80	1919.58	357.55	174.89	175.23	31.21	251.04			
WD/TI	0.03954	0.08050	0.02568	0.00007	0.00143	0.00205	0.00003	0.00038	0.00012	0.00004	0.00008			

Input-Output table for Rayong in 2065 : Non-Irrigation area

Sub-Sectors	Agr.				Ind.					Ser.		Total IT	Total Final Demand	Total Input/Output
	Rice Field	Dry crop	Orchards	Rubber	Agr.-Mis.	Chem.	Petro-Ref.	Metal	Ind.-Mis.	Tourist	Ser.-Mis.			
Rice Field	163.0	716.4	1,168.7	0.0	224.2	0.0	0.0	0.0	634.0	0.0	59.9	2,966.2	393.50	3,359.75
Dry crop	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15,779.6	0.0	0.0	15,779.6	-7,921.33	7,858.26
Orchards	3.6	0.0	2.0	0.0	4.5	667.4	0.0	0.0	1,612.9	0.0	0.0	2,290.4	102,728.53	105,018.91
Rubber	0.0	0.0	0.0	0.0	0.0	3,143.7	0.0	0.0	28,738.0	0.0	1.9	31,883.6	122,791.75	154,675.38
Agr.-Mis.	12.6	0.0	0.0	65.1	3,298.8	14.6	0.0	0.0	3,857.9	0.0	8.1	7,257.1	87,521.78	94,778.90
Chem. Product	1.1	37.0	74.9	4,127.2	2,375.0	48,189.7	0.0	5,041.5	31,371.6	0.0	8,914.8	100,132.8	269,701.72	369,834.52
Petro-Ref.	119.4	40.8	5,516.0	1,555.0	5,716.6	20.1	0.0	641.2	48,744.4	0.0	6,026.5	68,380.0	-68,380.03	0.00
Metal	31.3	20.1	2,270.5	690.3	1,632.1	5,778.5	0.0	31,005.1	77,344.6	0.0	19,864.1	138,636.5	187,931.23	326,567.75
Ind.-Mis.	142.4	834.8	18,208.1	8,087.7	16,390.6	37,188.6	0.0	7,042.3	199,389.3	0.0	42,056.4	329,340.4	1,659,607.80	1,988,948.21
Tourist	16.4	497.7	278.9	720.0	5,935.5	163.6	0.0	44,321.9	84,858.5	0.0	69,046.4	205,838.7	-205,838.7	0.0
Ser.-Mis.	602.4	1,846.9	16,000.5	26,140.2	8,454.5	19,251.6	0.0	17,828.1	464,977.0	0.0	195,543.4	750,644.7	234,338.0	984,982.7
Total IT	1,092.3	3,993.7	43,519.6	41,385.6	44,031.8	114,417.7	0.0	105,880.1	957,308.0	0.0	341,521.5	1,653,150.1	2,382,874.2	4,036,024.4
Total Value Added	2,267.4	3,864.6	61,499.4	113,289.8	50,747.1	255,416.8	0.0	220,687.6	1,031,640.3	0.0	643,461.2			
Total Input/Output	3,359.7	7,858.3	105,018.9	154,675.4	94,778.9	369,834.5	0.0	326,567.8	1,988,948.2	0.0	984,982.7			
Water : MCM	132.86	632.62	2696.99	10.81	135.89	759.86	0.00	125.60	240.03	0.00	81.85			
WD/TI	0.03954	0.08050	0.02568	0.00007	0.00143	0.00205	0.00003	0.00038	0.00012	0.00004	0.00008			