

Climate Rainfall Map System

Scenario

Taiwan is surrounded by oceans and has a subtropical monsoon climate. The average annual rainfall is about 2,510 mm which is the main source of water resource in Taiwan. However, the rainfall of distribution of time and space is not distributed equally. Even though the total rainfall is quite abundant, most of it is concentrated in summer and autumn. Consequently, the floods in rainy season and droughts in dry seasons are caused usually. Moreover, the change of the climate in recent years also deteriorates the unequal rainfall in Taiwan.

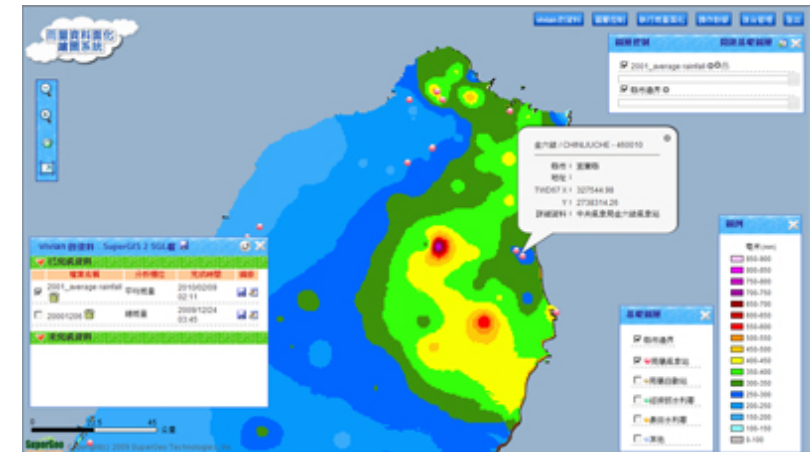
In order to observe the change of rainfall in Taiwan more effectively, Central Weather Bureau in Taiwan has used a stand-alone GIS system to deal with the rainfall data by dynamically mapping, overlaying, storing image, and etc since 2005. The map data generated by the system have been the essential reference for the rainfall forecast and study in Central Weather Bureau.

However, the stand-alone GIS system cannot satisfy the increasingly need and data. Therefore, to improve the convenience of data providing and efficiency of system use, Central Weather Bureau planned to build a WebGIS system to centrally manage the rainfall data. As a result, the related staffs in the bureau can search, display, and save the rainfall map data via an internet browser.

Solutions

Climate Rainfall Map System is a WebGIS system built up by a map server. As to the structure of hardware, the system is built in a server. The data of accounts, rainfall map scheduling, etc are managed centrally in a database server.

In terms of the software, Climate Rainfall Map System adopts SuperWebGIS™ 2.1 as the internet map server to provide mapping and GIS functions. Additionally, the database software uses Microsoft® Windows SQL Server 2000, and the server software applies Windows Server 2003. As to the website development, the system utilizes ASP.Net, Java Script, HTML, and CSS as the basic program languages.



Climate Rainfall Map System Interface

Solutions

- Apply SuperWebGIS™ to build a WebGIS system.
- With the WebGIS system, users can display the data online, rainfall map, and map export, etc.

Results

Climate Rainfall Map System allows users to search, display, save the rainfall map data through the internet browser. According to the function classification, the system can be divided into the front-end for display and search and the back-end for management.

The front-end includes 4 main functions: Basic Map Manipulation, Rainfall Map Manipulation, Users Map Data, and Map Image Export.

1. **Basic Map Manipulation:** This system provides several map navigation tools for users to zoom the map to full-extent, zoom in/out, pan the map, etc.
2. **Rainfall Map Manipulation:** Rainfall map scheduling is the main manipulation function in the system. The aim is to read the rainfall database in the bureau or the users' rainfall data. Through the setting conditions and statistics, the system can draw the rainfall distribution map of a certain time and place within a specified period of time.
3. **Users Map Data:** Each user has two folders, "Finished Data" and "Unfinished Data." Since the rainfall map in the system is processed by scheduling, the system will automatically search the unfinished data regularly. If the data which has been assigned into the schedule has not been finished to map, the system will categorize the file to "Unfinished Data." On the other hand, the finished data are categorized to the "Finished Data." Users can gain the rainfall map to overlay with other layers.
4. **Map Image Export:** The system supports to export the map file as the image of Lan file. It can be easier for users to import the file and to be used in the stand-alone software.

The back-end contains three parts, User Management, Schedule Management and Background Program Management.

1. **User Management:** User Management includes "Add New Users" and "User List." To add a new user, users can apply by themselves or administrator can add a new user. Moreover, the "User List" mainly lists the information of the user, including user name, priority, authority, number limit, etc.
2. **Schedule Management:** The Schedule Management contains "Rainfall Map Schedule Management" and "Rainfall Map Data List." "Rainfall Map Schedule Management" can facilitate administrators to view all of the users' processing status; the administrators can adjust the order of the schedule if the case needs. "Rainfall Map Data List" allows all of the users to view the rainfall schedule record and the thumbnails of the face results.
3. **Background Program Management:** The aim of the Background Program Management is to set the map schedule. Through the management system, the administrator can know the second setting of the current schedule time and can modify the schedule second setting of the schedule time.

Climate Rainfall Map System provides a cross-unit platform integrating geographic information data and system services. In addition to improving the convenience of data providing in the bureau, the cross-unit platform also raises the use of the rainfall data and enlarges the applicability.

Results

- The WebGIS system enables users to search, display, save the rainfall map data via an internet browser.
- The mechanism of the authority management can maintain and update the database effectively.
- The cross-unit platform can not only improve the convenience of data providing but also enhance the usability of the data.

Software Used

- SuperWebGIS 2.1
- Microsoft® Windows Server 2003
- Microsoft® SQL Server 2003