

Scenario

Yilan county is a popular tourist area in Taiwan due to the beautiful landscape with some lakes. However, with the rapid development in transportation in recent years, more and more people are attracted to visit her, contributing more prosperous and growing commercial activities. Thus, more and more garbage increase as well. Great amount of discards are thrown into rivers and lakes, which not only influences the appearance but also damages the original water ecology and the environmental sanitation.

In order to maintain and protect the river environment, the Environmental Protection Bureau of Yilan County constructively begins to clean surface of water body such as rivers or lakes and to investigate the water pollution, expecting to provide some basic data for pollution basis through GIS system and to assist in decision-making, and to improve the water quality and increase the management efficiency.

Solutions

This project is planning to use SuperWebGIS and program design to build up a set of system with database management and WebGIS functions, which is "Quality of Water Body and Pollutant Management System".

Through the system, the related staffs can display files and charts, query, position

and modify files online through WebGIS without installing any internet browser plug-ins. As a result, the staffs of the bureau can easily obtain the needed information through the system and do the advanced analysis with GIS tools. Additionally, the business unit can upload the existing information to database then display in the form of WebGIS to share information with the public.

Besides, in respect of data exchange mechanism, the system supports WMS (Web Map Service) developed by OGC (OpenGIS Consortium).



Quality of Water Body and Pollutant Management System Interface.

Solutions

- Build a set of WebGIS system with SuperWebGIS.
- File display, query and management can be conducted online via WebGIS.

Results

"Quality of Water Body and Pollutant Management System" is designed with water quality of all body of water, pollutant query and GIS position as the major part. With WebGIS technology applied, the WebGIS system is created for multiple-online query and position functions.

The system function architecture can be divided into four parts: Basic Map Manipulation, Thematic Layer Query, GIS Position as well as File Editing and Management.

- 1. Basic Map Manipulation:** "Quality of Water Body and Pollutant Management System" provides various map navigation tools, such as Zoom to Full Extent, Zoom In, Zoom Out, Pan and Measure tools, to do basic browsing.
- 2. Thematic Layer Query:** This function allows users to query data of the animal husbandry, the controlled industries, drain system and water quality monitor station layers. By clicking any point on the map, users can see the attribute information of the clicked point showing on the screen. Or users can use "Query Upstream Pollutant" or "Query Pollutant" to quickly find out the pollutant of specific stream. Then, through clicking the pollutant's point, the attribute data will be obtained; therefore the correct solution can be drafted.
- 3. GIS Position:** "Quality of Water Body and Pollutant Management System" provides five position methods: Coordinate Position, Township and Village Road Position, Address Position, Landmark Position and Layer Position. Users can choose the suitable method and rapidly and efficiently get the searching point through clicking the list.

- 4. File Editing and Management:** The account authentication mechanism is used as the foundation of the system to manage the web. Through the level of account authentication, users can manage the account, layer or edit layer field and point according to their own authentication to effectively maintain and update database.

"Quality of Water Body and Pollutant Management System" not only assists the local authority concerned about the quality of water body but also allows related units to trace the pollutant instantaneously as the abnormal condition occurs to prevent pollution from getting worse. Besides, "Quality of Water Body and Pollutant Management System" also provides a cross-unit service platform for integration of geographic information file and system, which will simplify the procedures, reduce administrative cost, increase water quality controlling efficiency and significantly improve the current water quality situation in Yilan county.



"Query Upstream Pollutant" function will mark the pollutant of the specific section in red frame for users to recognize the right pollutant.

Results

- The WebGIS architecture allows users of different units to rapidly query or orient through one common web platform, improving working efficiency.
- Authentication mechanism can effectively maintain and update the database.
- Cross-unit service platform can effectively simplify the business procedure, reduce the administrative cost and improve the service quality and efficiency.

Software Used

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