



Dongting Lake Newsletter

May 2020 - Issue #4



© FAO

The Construction of Information Monitoring System of Dongting Lake

As the second largest freshwater lake in China, Dongting Lake has been identified as an important global ecological area, including two National Nature Reserves in the East and West Dongting, and two Provincial Nature Reserves in the South Dongting and Hengling lakes, with a total area of 31,200 hectares. It bears the important function of regulating and storing the water of Yangtze River and the four rivers of Hunan Province, which are Xiang River, Zi River, Ruan River, and Li River. Therefore, it plays an irreplaceable role in maintaining the safety of people along those rivers and ensuring the ecological security in the middle and lower reaches of Yangtze River. Dongting Lake has received intensive attention in recent years. It is listed as the key target in "Green Sword Operation", "Green Shield Operation", and other environmental protection projects at national or provincial level.

As an important part of the information management of Dongting Lake, the integrated Information Monitoring System can monitor a variety of natural resources of Dongting Lake in real time, which helps to understand the ecosystem of Dongting Lake in the macro sense, but also dynamically monitor changes in the area and quantity of ecological problems under the influence of human activities, providing detailed information and scientific data for protecting species and ecological environment of the area and making management decisions.

1. Project Progress

1.1 Demand Survey



© FAO

Conducting survey in East Dongting Lake Nature Reserve

In order to find out what the Nature Reserves need in terms of protection, monitoring and management, and to understand the current situation and existing problems of the four Nature Reserves on the spot, the project team made a demand survey plan in the first quarter of 2018, and then conducted the survey in Hunan Forestry Bureau, Yueyang Forestry Bureau, and four Nature Reserves in the second quarter. The survey collected a large number of data and application requirements so as to determine the

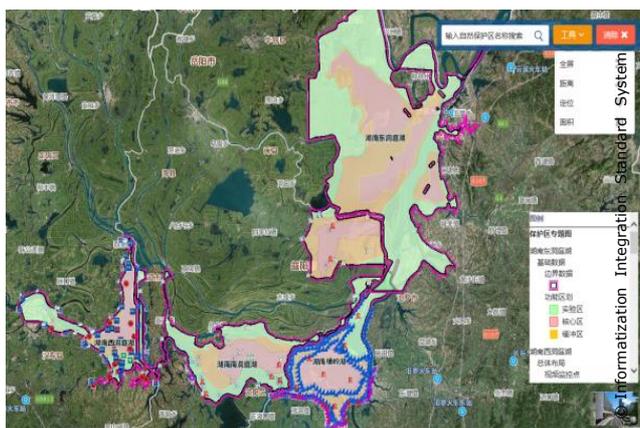
project scope and analyze the demands. A return visit has been made in the second half of 2018, further satisfying the functional and data demands of the Information Monitoring System.



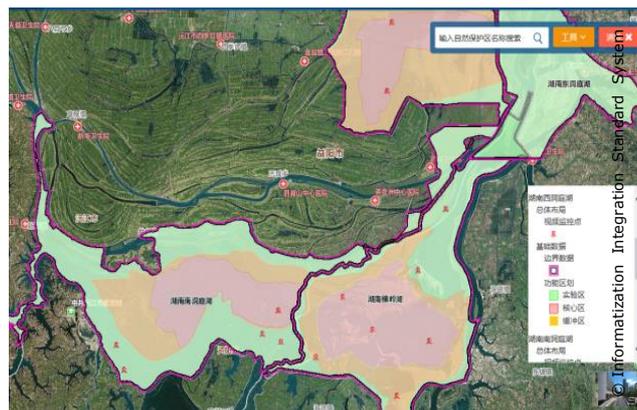
Conducting survey in Hunan Forestry Bureau

1.2 Data Analysis and Storage

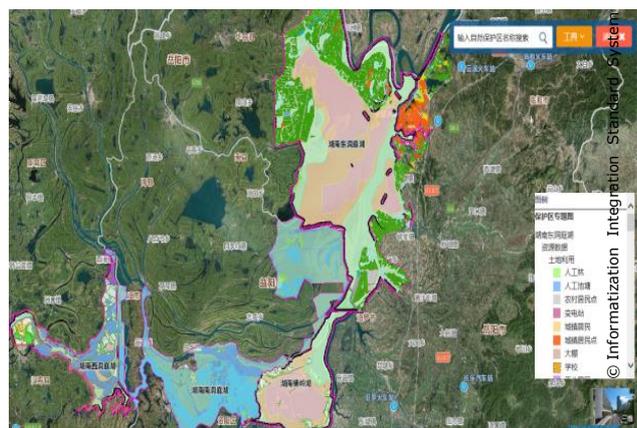
There are three main sources of data during project implementation: the data collected in the demand survey in the four Nature Reserves, the data obtained through data sharing with other experts, and the data purchased by the project team. In the second and third quarters of 2018, the project team completed data collection, data standardization, and database construction, providing fundamental support for the software development. The collected data include basic geographic data, satellite image data, thematic data of Nature Reserves, and system operation results.



Overall distribution and layout data of the protected areas



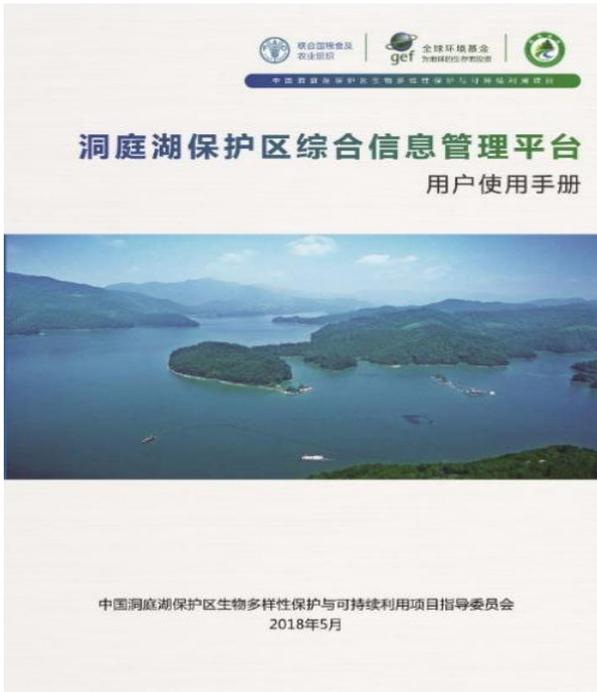
Video surveillance data of the protected areas



Resource data for the protected areas

1.3 Software Development and Testing

Since the beginning of 2018, the project team has been working on the implementation plan and the system framework of the integrated Information Monitoring System for Dongting Lake wetland. Based on the demand survey results, experts' opinions and users' feedback, the project team has completed the general design and detailed design of the system. In the third quarter of 2018, the research and development of the System has been completed, including the integrated management system, the patrol monitoring management system, the operation management system, and the website. During the implementation of the project, the operation manual, installation and deployment manual, training plan, as well as the data monitoring and updating plan have been developed.



User manual of Integrated Management Information System for Dongting Lake Nature Reserves

1.4 Exchange and Training

The main work in the first half of 2019 was to promote the System and provide training to all relevant departments, and collect their opinions for improving the System. In particular, as for urgent needs such as patrol monitoring and bird investigation in the Nature Reserves, the project team carried out targeted research and completed the online trial operation. During the implementation of the project, the project team kept in touch with the four Nature Reserves, Hunan Forestry Bureau, Hunan Development Research Centre, as well as baseline survey experts and ornithologists, to better figure out the user demands and provide training, which was of instructive significance for the implementation of the project.



Information System training in the East Dongting Lake Nature Reserve

2. Project Outcome

2.1 Informatization Integration Standard

System of Dongting Lake



Unified authentication platform and authority management

The project has built the Informatization Integration Standard System of Dongting Lake, laying a solid foundation for interconnecting and resource sharing, and ensuring the informatization of unified authentication platform, unified authority management, unified task model management, heterogeneous data integration in different places, and open process management.

2.2 Big Data Collection System of Dongting Lake

The data of the Nature Reserves are multi-type, multi-dimensional, multi-temporal and multi-scale. Therefore, a comprehensive, full-scale, all-time and all-space collection is needed for capturing the data in terms of tense, format, task, and content. Meanwhile, data standardization processing, data storage and data update are conducted, forming the big data collection system of Dongting Lake, so that the data scattered in different departments can be effectively managed and data sharing across departments can be facilitated.



Big data collection

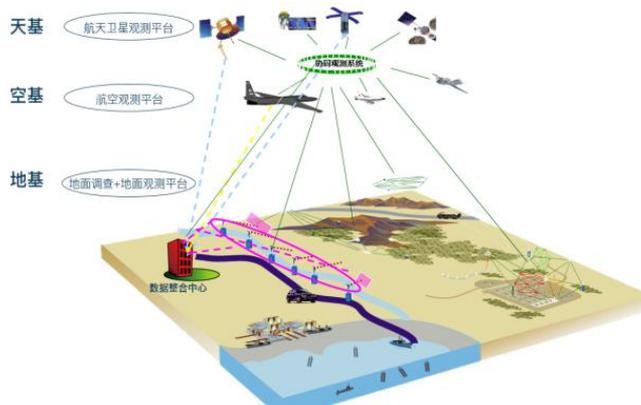
2.3 Multi-service Application System of Dongting Lake

Cutting-edge information technologies like cloud computing, Internet of Things, and mobile Internet were applied when building the Integrated Management Information System of Dongting Lake wetland. By customizing the System in terms of integrated management, patrol monitoring management, and website, it visualized management and monitoring of the ecology in the Nature Reserves and realized the analysis and utilization of multi-source spatiotemporal big data.



Dongting Lake wetland Integrated Management Information System

2.4 Space-air-ground Integration Technology Support



Space-air-ground Integrated Monitoring System

Combined network transmission system with geographic information system, an accurate, efficient, and integrated

resource monitoring technology support system of Dongting lake has been established by applying means that are space-based (satellite remote sensing, navigation, communication), air-based (aviation and remote sensing system), and ground-based (video monitoring, ecological monitoring, intelligent mobile terminal and Internet of Things monitoring). It has realized the accurate, continuous and comprehensive monitoring and sensing of the land use changes, natural disasters, management activities, resource dynamics and the changing data of non-biological factors such as meteorology and hydrology within and around the Nature Reserves, providing timely and effective information for ecological protection, resource management and decision-making.

Project Overview

“Securing biodiversity conservation and sustainable use in China’s Dongting Lake protected areas” is a five-year-long project being executed by the Forestry Department of Hunan Province (FDHP) and the Hunan Province Finance Department (HPFD) under the supervision of the Food and Agriculture Organization of the UN (FAO) and financing through the Global Environment Facility (GEF). The total budget of the project is USD 10.55 million, of which USD 2.95 million is contributed by GEF and the other USD 7.5 million is co-financed by FAO and FDHP.

- The project aims to strengthen the existing institutional and policy framework; to promote an integrated, ecosystem-wide planning and management approach; to develop biodiversity and biodiversity friendly production practices to reduce human activity pressure on the Wetlands; and to increase institutional capacity and public awareness and support for wetlands conservation.
- The project consists of four major components:
 - Component 1: Strengthening of institutional capacities for integrated monitoring and management of biodiversity in Dongting Wetlands Ecosystem (DWE);
 - Component 2: Strengthening of management effectiveness of DWE NRs network;
 - Component 3: Mainstreaming of conservation of biodiversity in key sectors in DWE;
 - Component 4: Environmental education and awareness.



Some rights reserved. This work is available under a CC BY-NC-SA 3.0 IGO licence

Address: Jianwai Diplomatic Compound 4-2-151/152, Jianguomenwai, 100600 Beijing
 Contact: fao-cn@fao.org
<http://www.fao.org/china/en>