



The background is an aerial photograph of a river system. A large area of the river is highlighted in a bright blue color, indicating floodwaters. Four circular inset images are arranged around the central text, connected by dashed arrows in a clockwise cycle. The top-left inset shows a person in a boat amidst floodwaters. The top-right inset shows a person walking through a field of tall yellow grass, possibly a rice paddy, with floodwaters in the background. The bottom-right inset shows a satellite map of the Korean Peninsula with a large blue area indicating a flood or storm system. The bottom-left inset shows a person operating a surveying instrument on a bridge or dam structure.

**We Protect Your Life and
Property from Floods.**



Ministry of Land, Transport and Maritime Affairs
Han River Flood Control Office

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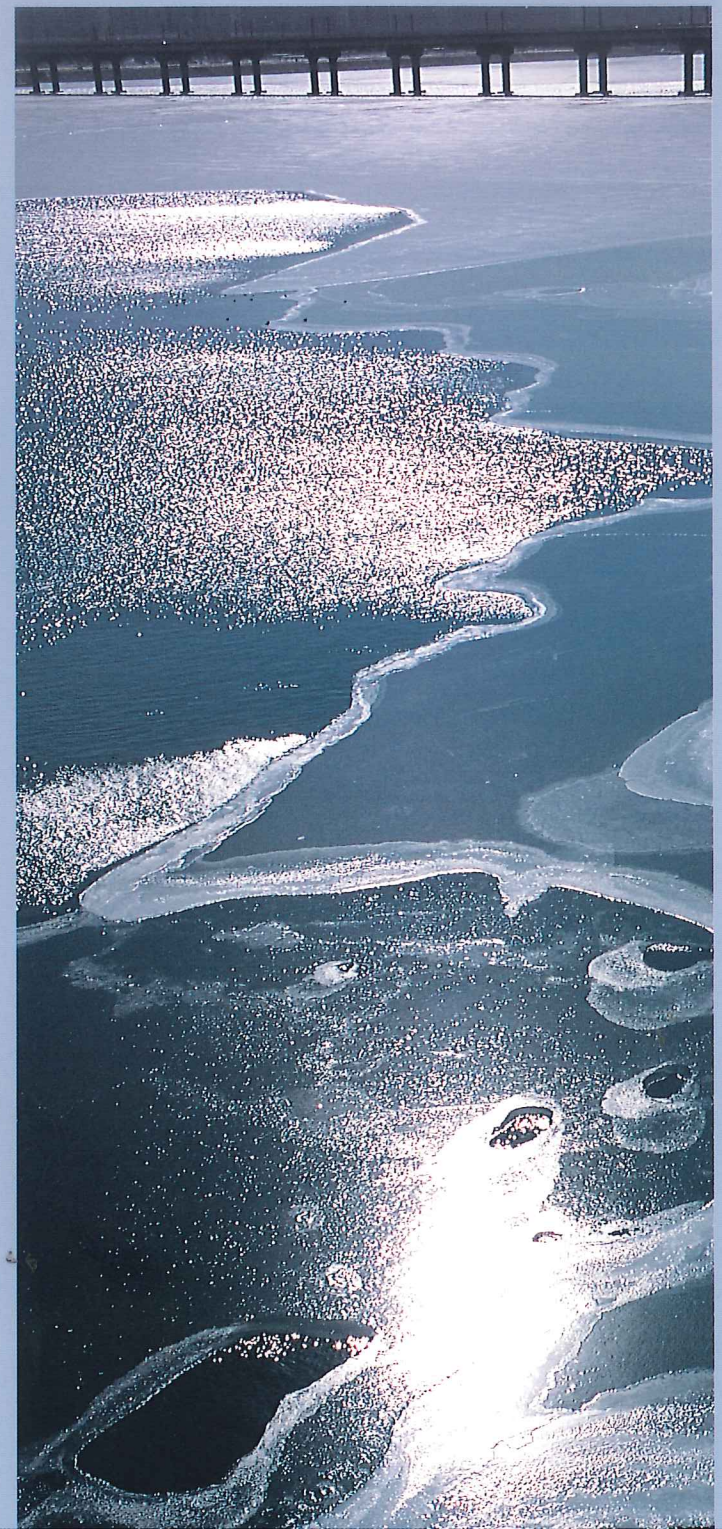
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Mission

Safe **Water**, Affluent **River**



Goal

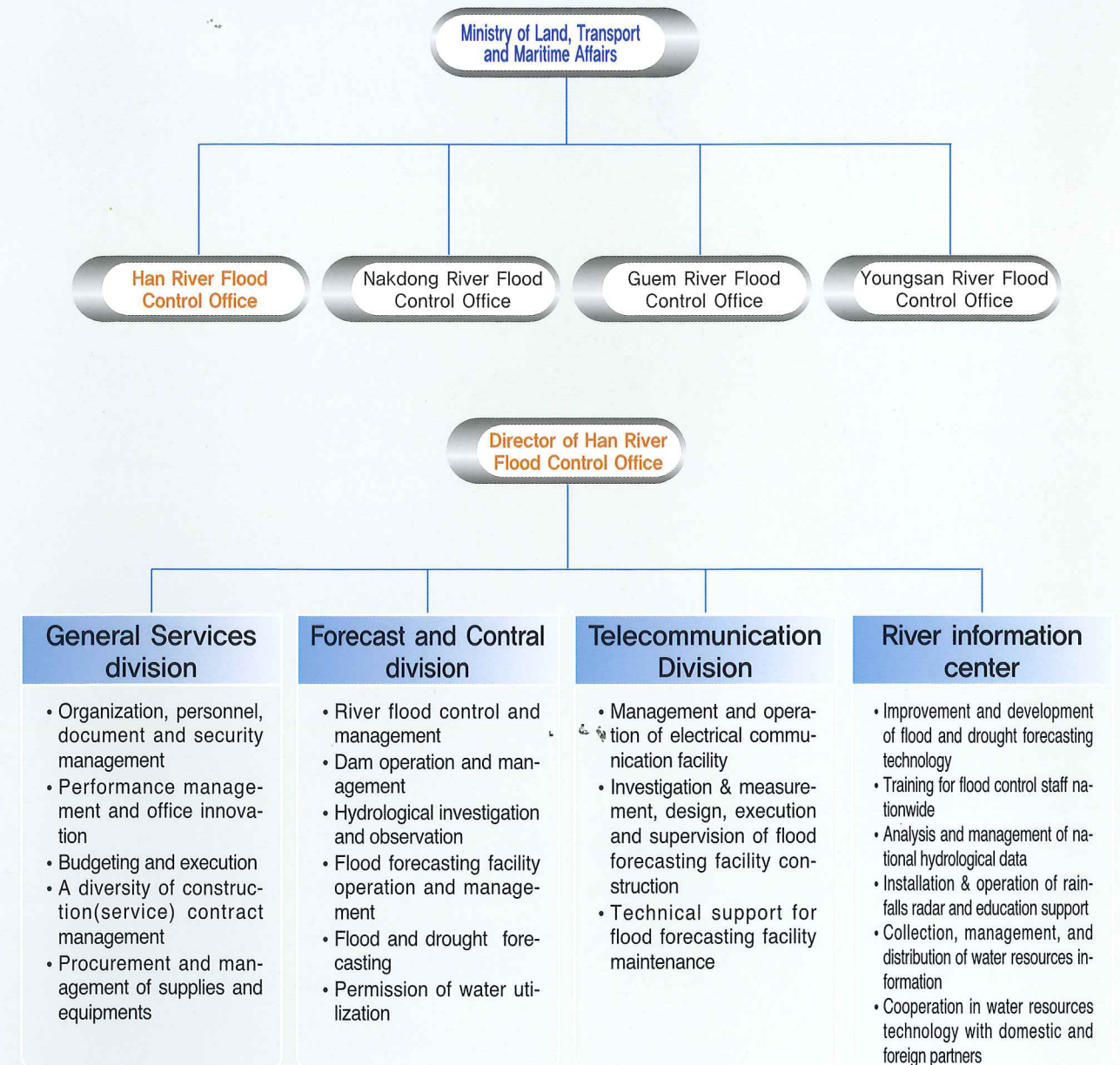
Protection of people's lives and properties from floods
Stable supply and balanced distribution of water

Strategy

Accurate flood forecast
Establishment of on-time water management system
Production and supply of high quality hydrological information

Organization and History

Organization



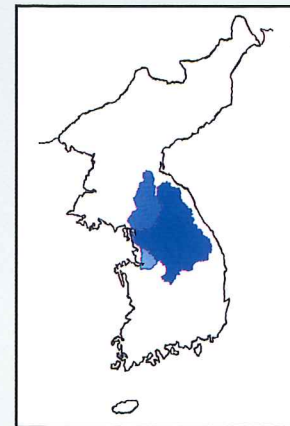
History

- Dec, 1968 : The Han River selected as pilot area for automated flood forecast and warning system (UN ESCAP / WMO Typhoon Committee)
- Jul, 3, 1974 : Han River Flood Control Office established and the flood forecast and alarm facility went into operation
- May 10, 2005 : The river information center of Han River Flood Control Office established

Controlled River Basin

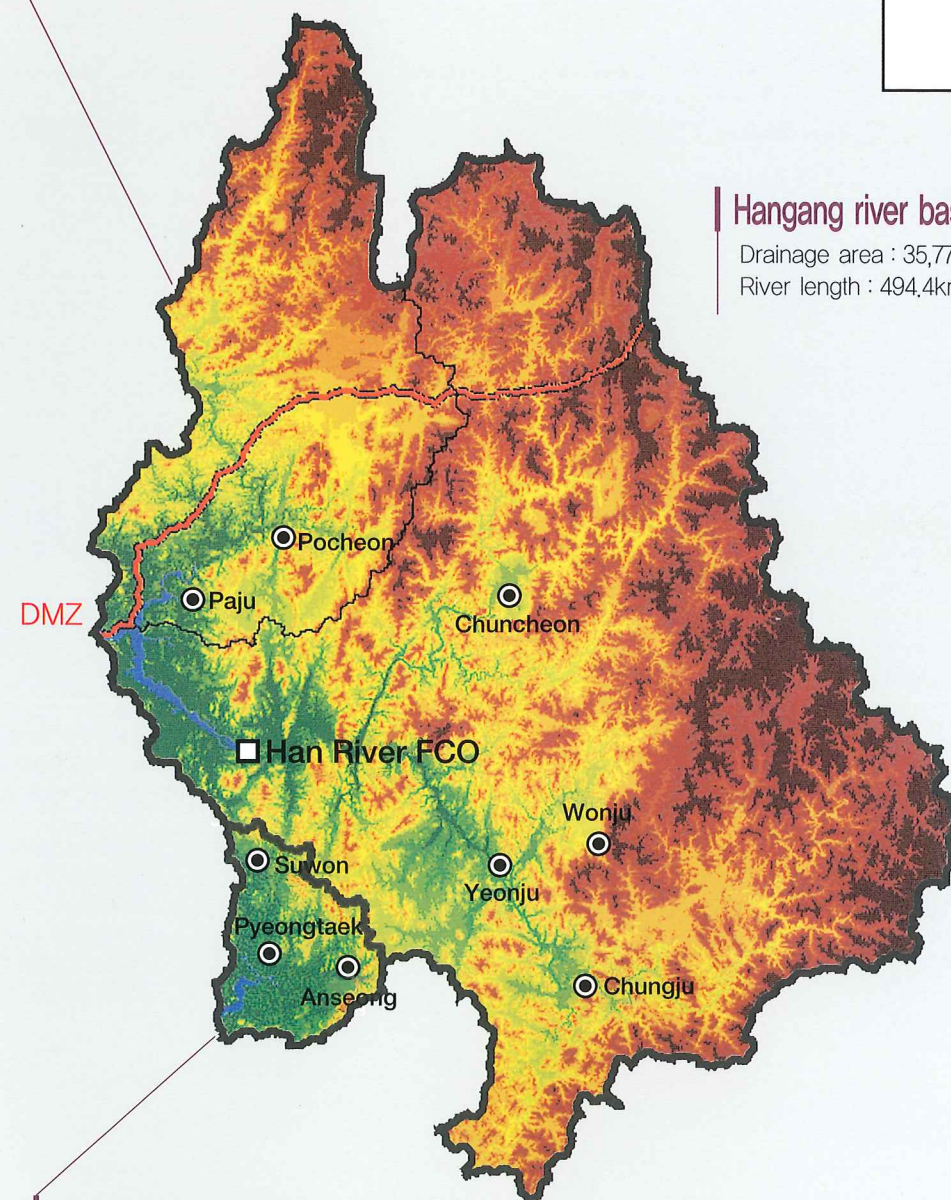
Imjingang River basin

Drainage area : 8,897.2km²
River length : 244.0km



Hangang river basin(including Imjingang)

Drainage area : 35,770.4km²
River length : 494.4km



Anseong Stream basin

Drainage area : 1,655.7km²
River length : 75.5km

Major Responsibilities



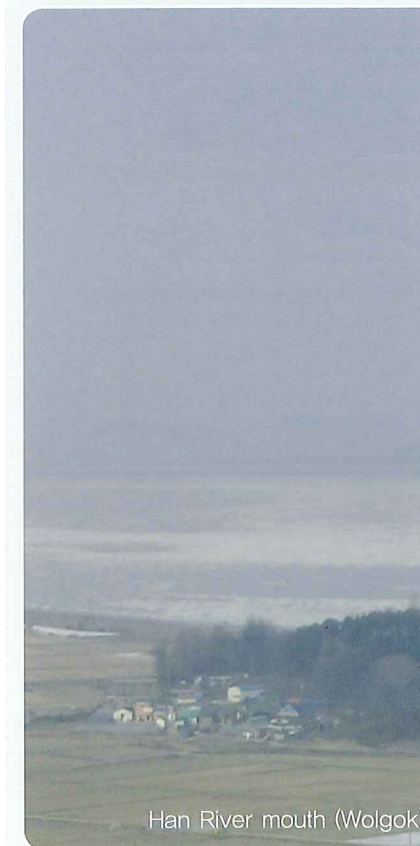
The source of Han River (Geomryungso)

The Korean peninsula is surrounded by sea on three sides and is located in Monsoon zone. In the summer, floods frequently damage people's lives and properties with localized heavy rain and typhoon. On the other hand, in the spring and winter, people have difficulties due to serious drought.

Since established in 1974, the Han River Flood Control Office has concentrated on minimizing natural disasters by managing floods and water shortage scientifically, especially around the Han River basin.

The Han River Flood Control Office will strive to not only protect people's precious lives and properties, but also supply water stably through proper water distribution of upper stream and down stream.

The Han River Flood Control Office's main responsibilities are as follows:



Han River mouth (Wolgok)

- >>> • River flood and drought forecast
- Hydrological observation and data quality management
- Real time water management
- Water use permission and management
- Installation & maintenance of hydrological observation equipment and transmission equipment
- Rainfall radar installation and operation
- Water resource information management and national data service
- Hydrological observation, flood & water shortage forecasting accuracy improvement, and development of water management optimization technology
- Internal and international cooperation for improvement of River water resources technology

Hydrologic Survey

Observation, collection, and utilization of hydrological data

Observation phase



Stages observatory



Automatic discharges measurement



Rain radar observatory

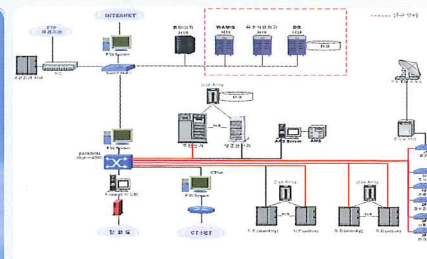
Collection phase



Transmission equipment

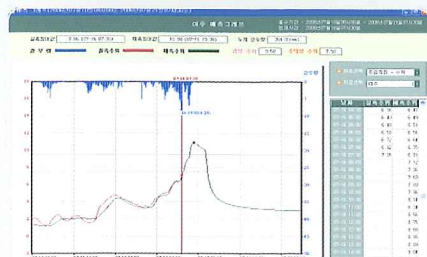


Relay station



System network

Utilization phase



Integrated flood forecasting system



Hydrological data sharing system



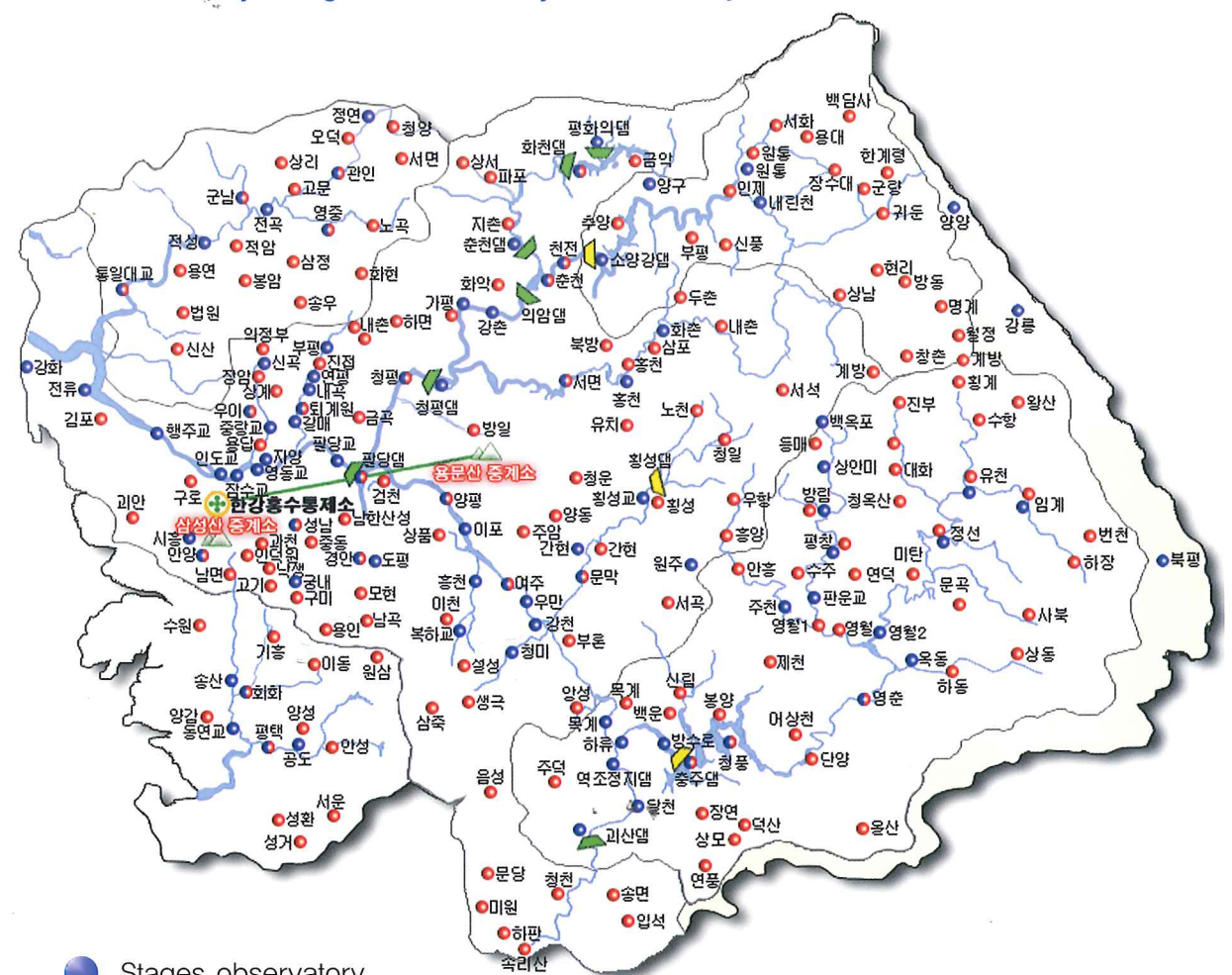
Han River Flood Control Office website offering information

Hydrological survey looks into rainfalls, river stages and discharges in order to examine circulation cycle of water which runs below the earth surface and finally reaches the sea. It is our important duty to quantify water resources which are the nation's valuable asset, as well as to obtain basic data of water management.

The Han River Flood Control Office conducts the hydrological investigation via 147 rainfalls observatories, 115 stages observatories and rainfall radar of Han River basin. The result of investigation is transmitted by radio transmission system and then is uti-

lized for the flood by using National hydrologic data quality control system forecast and real-time water management. In addition, the result is provided to related institutions through the hydrological data sharing system. Korean hydrologic annual report is published and utilized to design river structure and draw national land development plan. Korean hydrologic annual report is provided with the real-time hydrological observation data (rainfalls, stages, dam, etc.) to the public through the Han River Flood Control Office website.

Location of hydrological observatory controlled by the Han River Flood Control Office



- Stages observatory
- Rainfalls observatory
- Rain radar observatory

Status of hydrological observatory (as of June 2011)

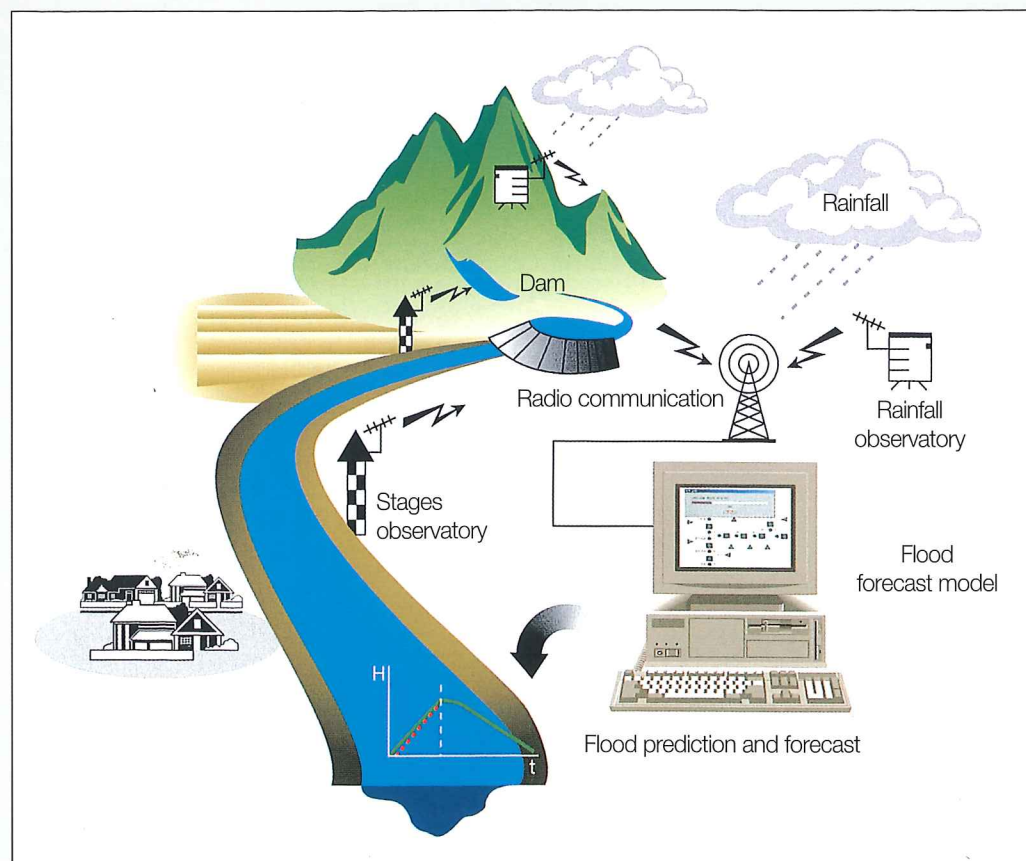
Classification	Total	Stages (TM)	Rainfall (TM)
Total	262	115	147
Han River	199	88	111
Limjin River	30	12	18
Anseong River	23	10	13
Others	10	5	5

Flood forecast



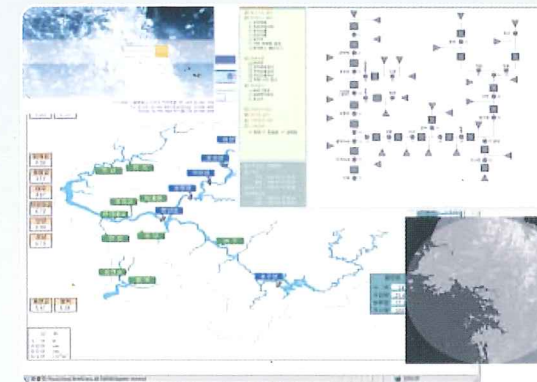
Flood forecast is intended to minimize damages to lives and properties by notifying related institutions and the public of the forecast so that they can evacuate and prepare in advance. The Han River Flood Control Office has operated flood forecast system and provided flood forecasting service since 1974.

The Han River Flood Control Office plans to expand the flood forecast to middle/small cities, not just big cities, and will make efforts to provide the flood information more rapidly.



Flood forecast conceptual diagram

Flood forecast system



As for Flood forecast system, delivering accurate and rapid forecast is essential. That's why the system is based on integrated cutting-edge technologies on hydrology, climate, information, and electronics.

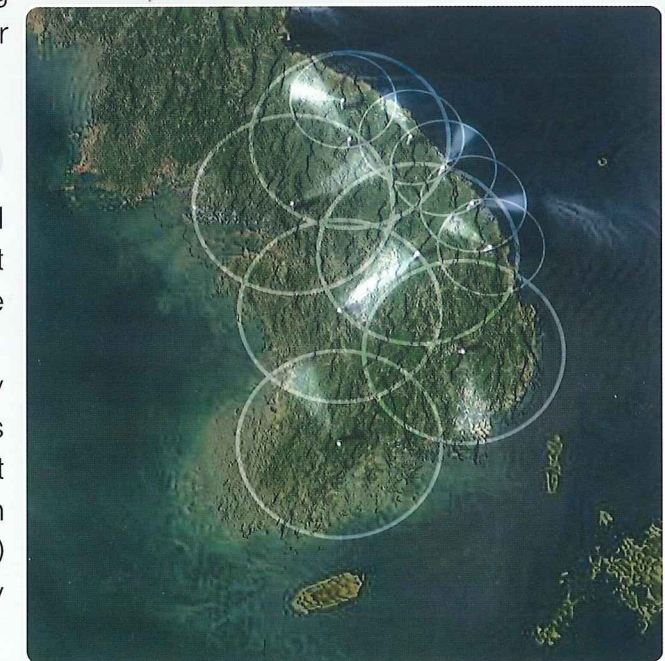
After measuring rain volume and stages using the automatic discharges and stages observation system, we enter the real-time data to the integrated flood forecast system. Then the system automatically calculates expected changes in river stages. The Flood Control Office gives flooding alerts or warnings to relate institutions based on the prediction to help the public evacuate and prepare for the flood in advance.

In recent years, the flood forecast is gaining importance with increasingly severe damage from localized heavy rain. The Han River Flood Control Office will concentrate on advancing technologies and expertise for accurate and rapid flood forecast.

National rain radar network establishment

The project to establish national rain radar network is a government-driven project to prevent damage from natural disasters.

In order to improve the accuracy of flood forecast on major rivers nationwide, and to detect unexpected floods, a total of 11 rain radars (6 large and 5 small radars) will be installed and operated by 2015.



National rain radar network map

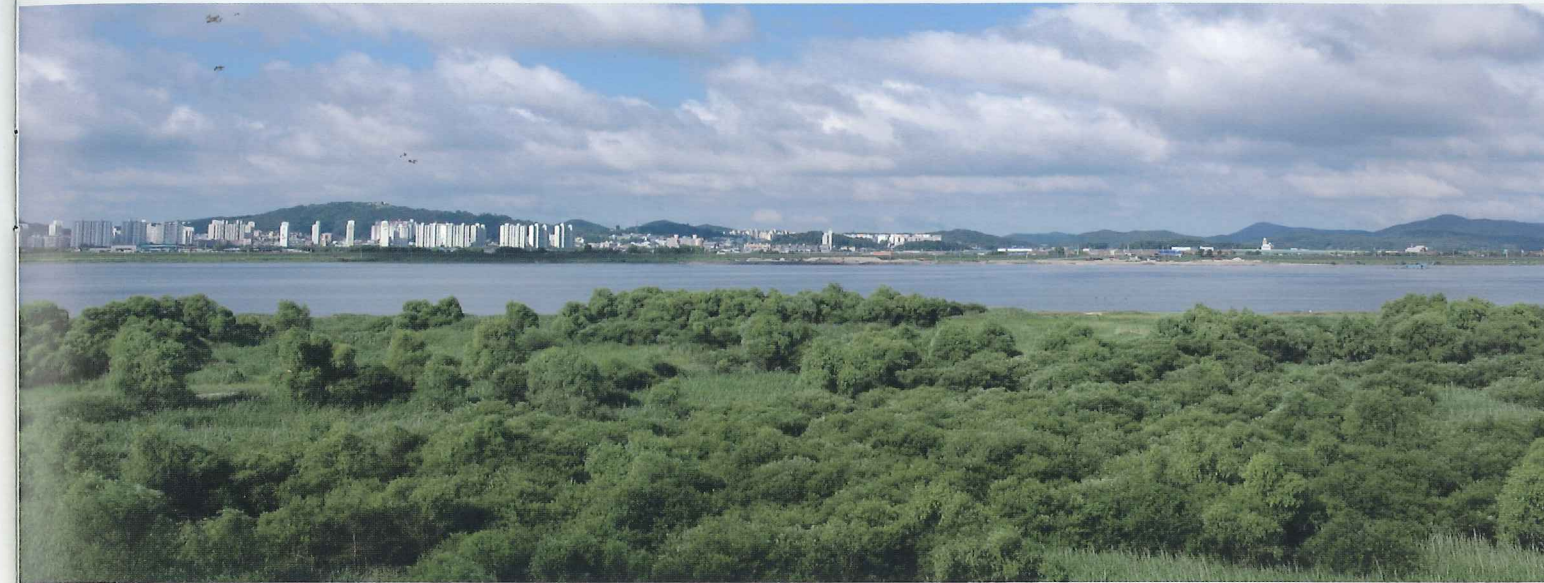
Flood control



Chungju dam

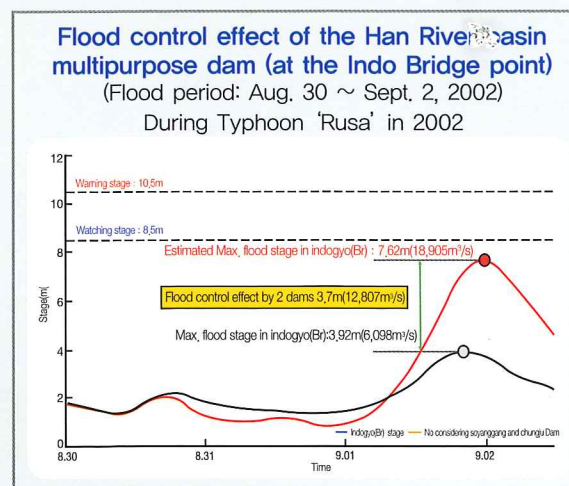
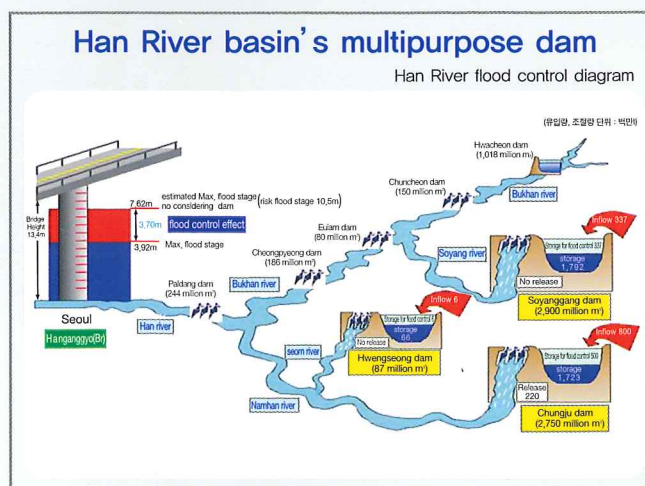


Soyanggang dam



Han River mouth

Han River basin's multipurpose dam



We can control river flood with multipurpose dam. Dam is an important national facility which manages down-stream water in a stable manner. We store water in the dam during floods and release water during droughts.

There are 11 dams including 3 multipurpose dams along Han River system.

The Han River Flood Control Office has controlled down stream floods optimally by utilizing dams and cooperating with the Korea Water Resources Corporation and the Korea Hybrid & Nuclear Power.

Status of Han River Dams (Multipurpose dam and hydraulic dam)

Name	Drainage area (km ²)	Total pondage (Million m ³)	Flood stages (EL,m)	Normal stages (EL,m)	Stages limit during flood season (EL,m)	Storage for flood control (Million m ³)	Outflow capacity (m ³ /s)
Total		10,060					
Peace dam	3,227	2,630	269.3	-	-	-	-
Hwacheon	3,901	1,018	183.0	181.0	175.0	213	5,428
Chuncheon	4,736	150	107.0	103.0	102.0	14	12,600
Soyanggang	2,703	2,900	198.0	193.5	185.5	770	5,500
Euiam	7,709	80	73.36	71.5	70.5	16	16,000
Cheongpyeong	9,921	186	52.0	51.0	50.0	19	20,736
Chungju	6,648	2,750	145.0	141.0	138.0	616	16,200
Gweson	671	15	136.93	135.65	134.0	3	3,080
Hwengseong	209	87	180.0	180.0	178.2	9.5	2,072
Paldang	23,800	244	27.0	25.5	24.0	-	26,000

Flood control effect

Dam	Soyanggang dam			Chungju dam		
	Maximum inflow (m ³ /s)	Outflow (m ³ /s)	Control rate (%)	Maximum inflow (m ³ /s)	Outflow (m ³ /s)	Control rate (%)
Sept. 11, 1990	10,650	5,675	47	22,164	14,000	37
Aug. 25, 1995	5,624	3,532	37	10,800	8,526	21
Jul. 17, 2006	12,058	1,191	90	26,202	9,106	60

Water management

The Flood Control Office manages water use volume, estimating the minimum discharges required for proper function and conditions of rivers, and giving permissions for water for living, agriculture, manufacturing, environmental preservation, power generation, and other purposes.

Water use needs to be managed systematically and reasonably, in a way that all the people can enjoy its benefits and public interests and rights can be well protected. As of now, a total of 500 permissions (permitted volume: 72.13 million ton/day) were given to use water in Han River and Anseong River.

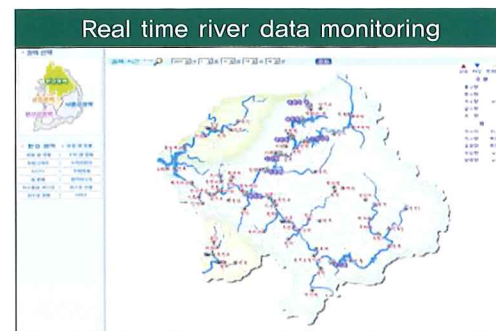
River maintenance discharge is calculated by considering various factors such as water quality, and so on, so that river can maintain normal conditions and functions. In the Han River area, the required volumes for river maintenance were estimated for 7 standard points including the Hangang Bridge and Yeoju.

The Flood Control Office operates water use management system, with a view to distribute water reasonably. It is now working on setting up River flow management system to check available water resource volume, distribution of water by time and space, estimated discharges. We will adjust available discharges to the public when water shortage is expected, and build a healthy water circulatory system under which everybody can share water equally.

Water use permission management

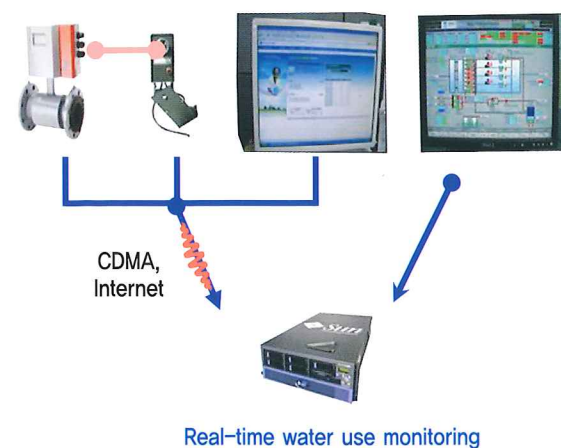
How much is the volume of water flow?

- Hydrological data including rainfalls, stages, and discharges
- Weather data including temperature, humidity, and solar radiation



Who does use water, and how much?

Flow-mete image user monitoring waste water treatment plant



Water, how should it be distributed?

- Water use performance and permission management system
- River maintenance water volume estimation and notification

Water, how much is the volume of water, and where is it?

- Long term rainfalls? outflow model
- Water balance analysis

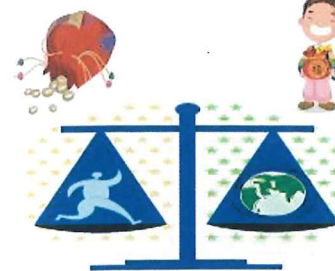


River flow management system

- Establishing healthy water circulatory system
 - Efficient utilization and distribution water
 - Protecting water quality and ecosystem
 - Balance between water use permission and river maintenance water volume

Water use permission
(Maximizing water use)

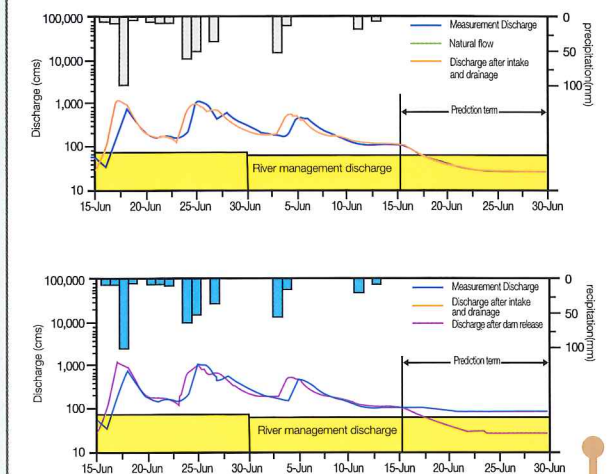
River maintenance water volume
(Maintaining normal functions of river)



River flow management

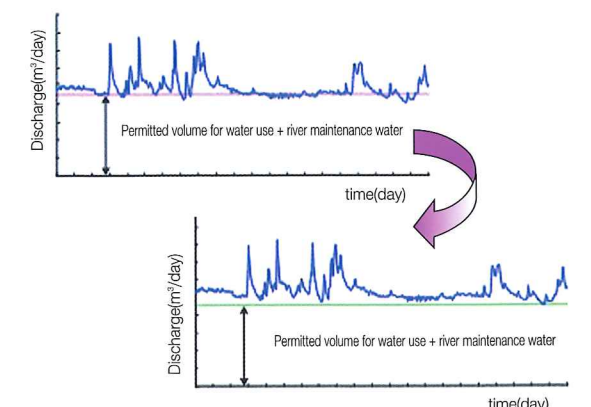
Where or when will water shortage come from?

- Predicting long and short-term discharges
- Distribution of water by time and space



Water shortage, how can it be addressed?

- Adjusting permitted volume for water use and actual consumption
- Reasonable distribution of water
- Acquiring water and river maintenance water
- Drought forecasting



Digital Management of Water Resources

Water Resources Management Information System (WAMIS)

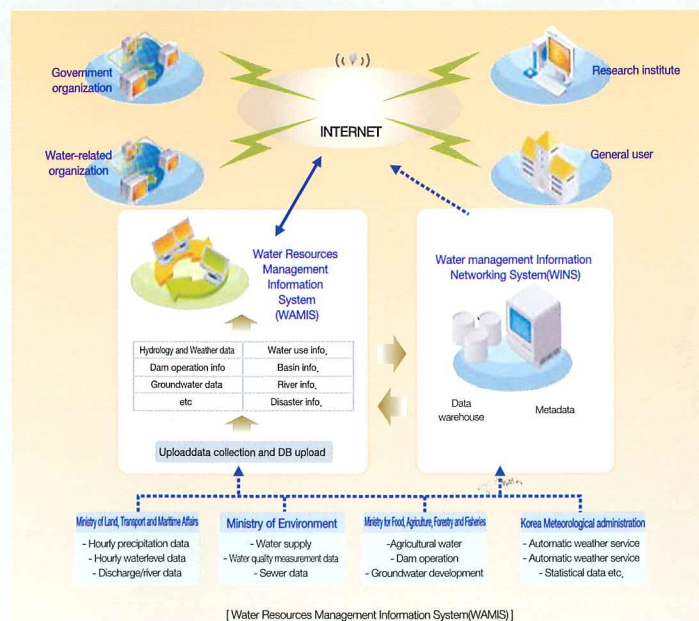


The **W**ater **R**esources **M**anagement **I**nformation **S**ystem (WAMIS) is the portal system built to scientifically collect, process, and analyze water resource data which is distributed nationwide.

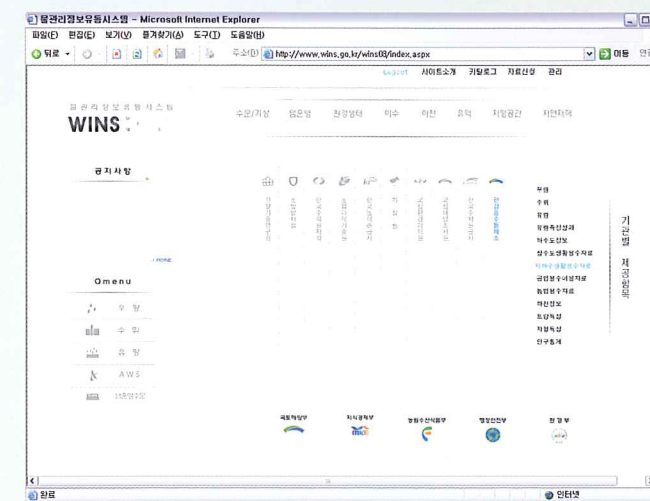
It provides 300 basic data on 10 fields such as hydrological climate, basin, river, dam, underground water and tap water, as well as water resource unit map based on GIS. The system also offers searching services on water-related information by local government, by water resource unit map, and by river.

With the WAMIS, we plan to manage all the water resource data in a systematic and comprehensive manner, by developing specific systems of basic data management system, analysis system, and policy support system.

For more information, visit <http://www.wamis.go.kr>.



Water Management Information Networking System (WINS)



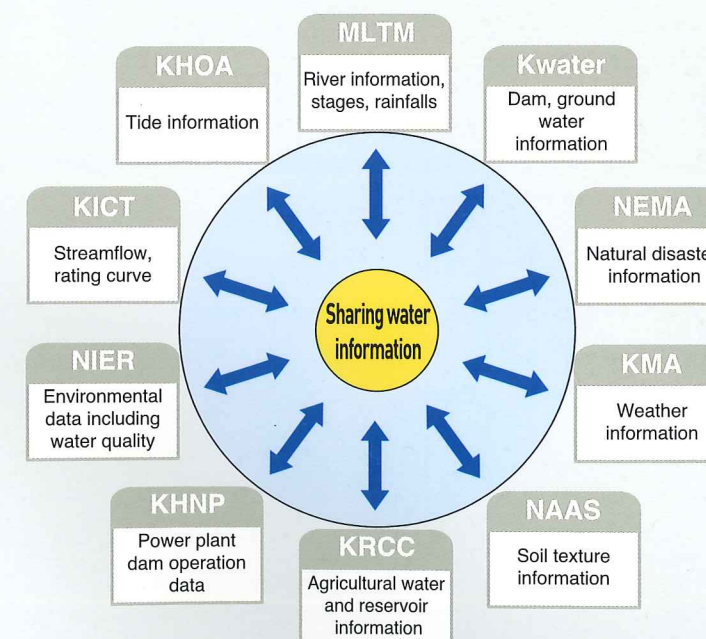
The **W**ater **M**anagement **I**nformation **N**etworking **S**ystem (WINS) is designed to advance basis for digital management, prevent duplicate investment by sharing information. The system provides water resource management information online, so that users can understand management status at a glance.

Based on national water management information standards(2004), 10 organizations including Ministry of Land, Transport and Maritime Affairs and Ministry of Environment now share about 65 water-related data(stages, rainfall, water quality, etc.) and are working on including more agencies and more information under the system, with an ultimate goal of setting up an international water information management system such as that of OECD or GEOSS.

We have been committed to laying foundation to share water management information, and integrating the information under a single system of the WINS for effective decision making and policy formulation. Furthermore, we are working on developing it into a system which protect people's liver and properties..

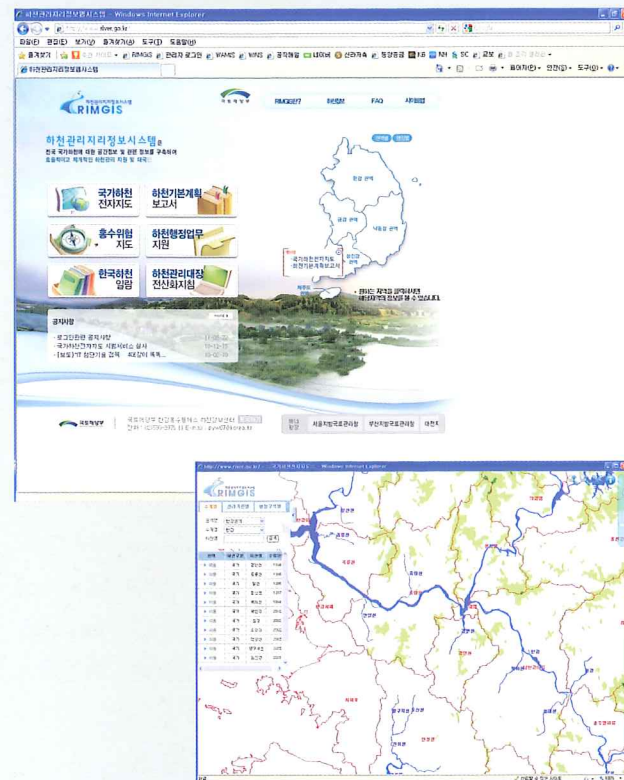
For more information, visit <http://www.wins.go.kr>.

Water-management information distribution under WINS



Digital management of water resources

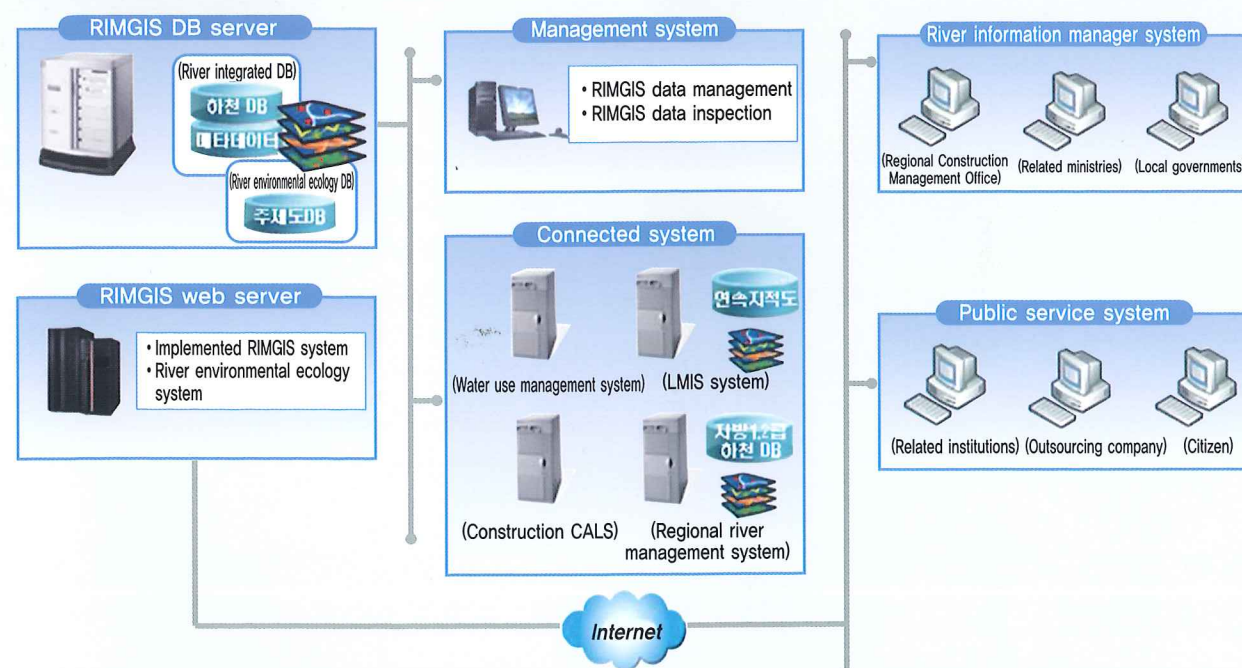
River Management Geographic Information System (RIMGIS)



The River Management Geographic Information System (RIMGIS) is a web-based system which supports river management by computerizing the river control master plan report and national river register.

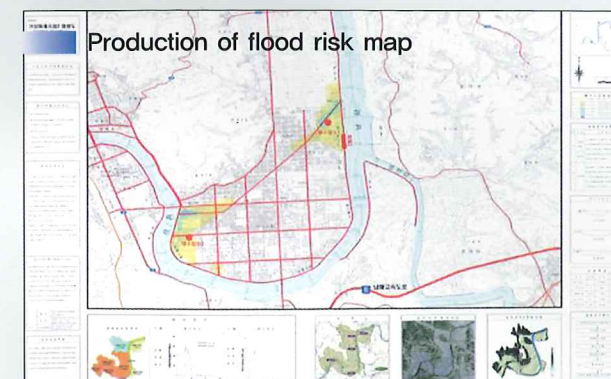
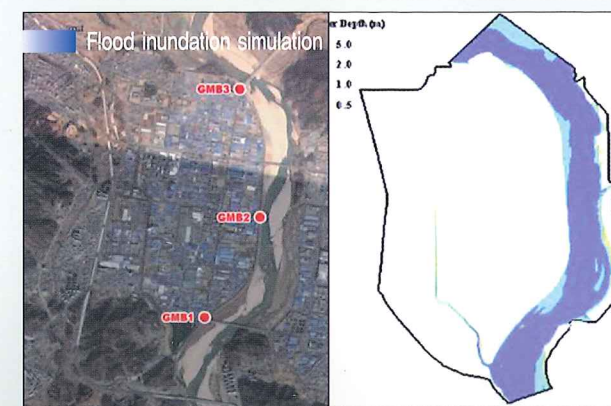
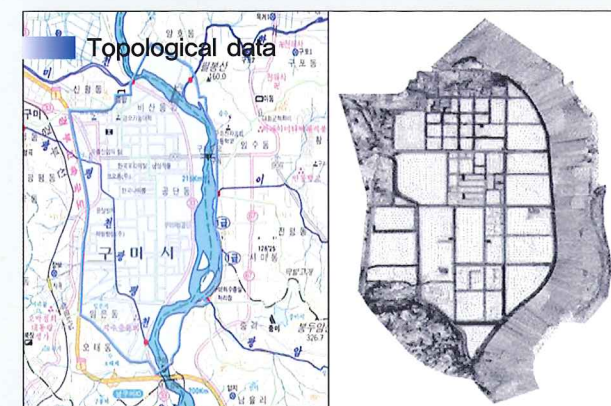
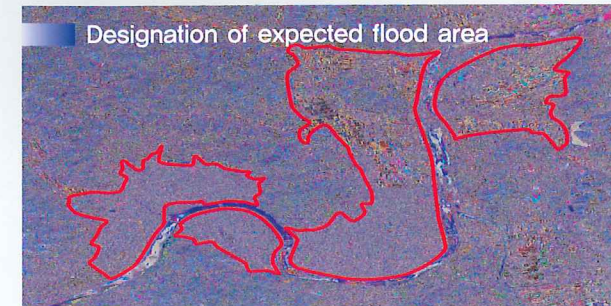
With the system, we provide a variety of basic data about rivers including river occupation permission, river construction record, river facility management, and Korea's river outline, and seek its connection with regional river information and construction CALS.

The Han River Flood Control Office will advance the system to manage river irrigation, flood control, and environmental preservation in a systematic and comprehensive manner, and to develop detailed systems which support basic data management and policy-making process on river management. (<http://www.river.go.kr>)



RIMGIS target system structure

Flood risk zone map

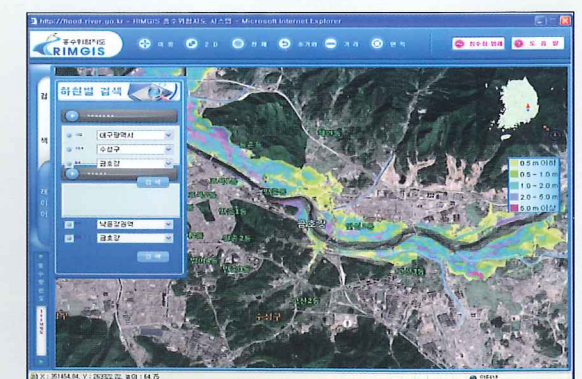
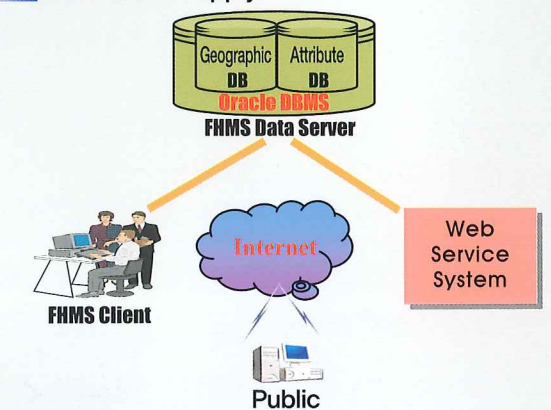


Flood risk map is to analyze and indicate flood area which is expected to get flooded by broken bank or wave overtopping. The map has been utilized for various purposes including evacuation planning, regional development planning, flood control, and windstorm and flood insurance planning.

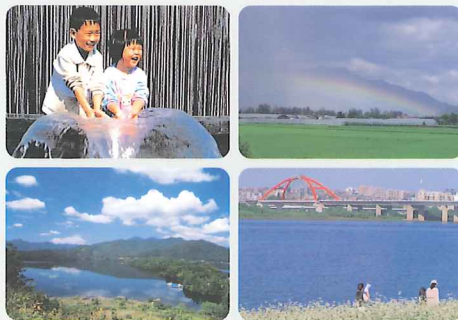
Ministry of Land, Transport and Maritime Affairs started to draw the flood risk map of major rivers, and completed the map of 865.4km in Han River and Nakdong River in 2007.

The flood risk map is provided to local governments and related institutions in the form of paper map or e-map, and will be expanded to cover regional rivers in the future.

Information supply



Flood risk map (e-map)



Location and hydrological information



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Tel : 82-2-590-9920 Fax : 82-2-590-6101

ARS NO. (02) 592-7700
Management division (02) 590-9915
Investigation division (02) 590-9933
Electrical communication division (02) 590-9953
River information center (02) 590-9983

Hydrological information voice service (02)592-7700



Limjingang hydrological radar observatory
San 837-3 Sunggrwe-ri Songhe-meyon
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