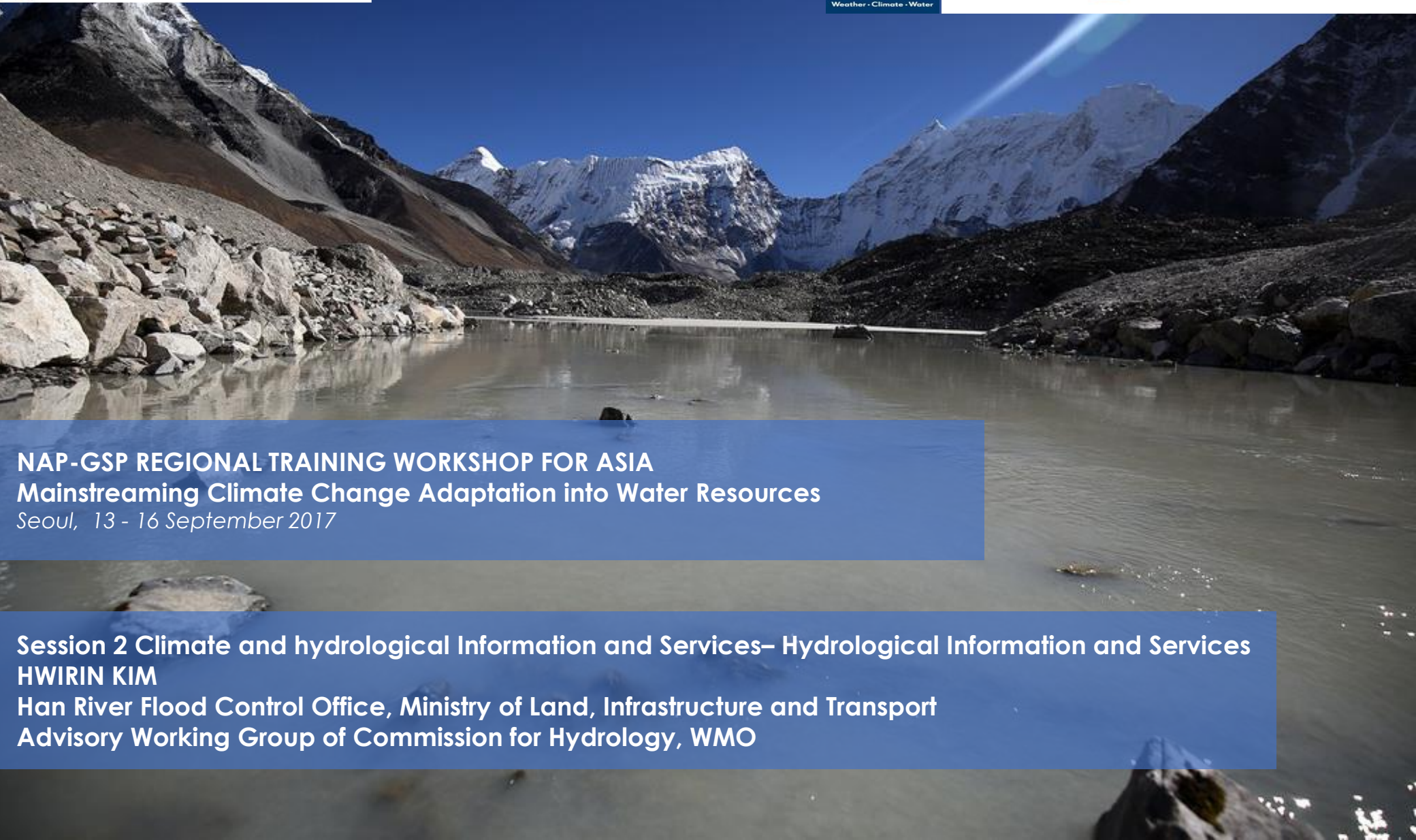
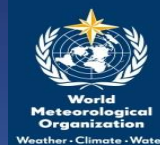




Ministry of Land, Infrastructure and Transport
Han River Flood Control Office



NAP-GSP REGIONAL TRAINING WORKSHOP FOR ASIA
Mainstreaming Climate Change Adaptation into Water Resources
Seoul, 13 - 16 September 2017

Session 2 Climate and hydrological Information and Services– Hydrological Information and Services
HWIRIN KIM
Han River Flood Control Office, Ministry of Land, Infrastructure and Transport
Advisory Working Group of Commission for Hydrology, WMO

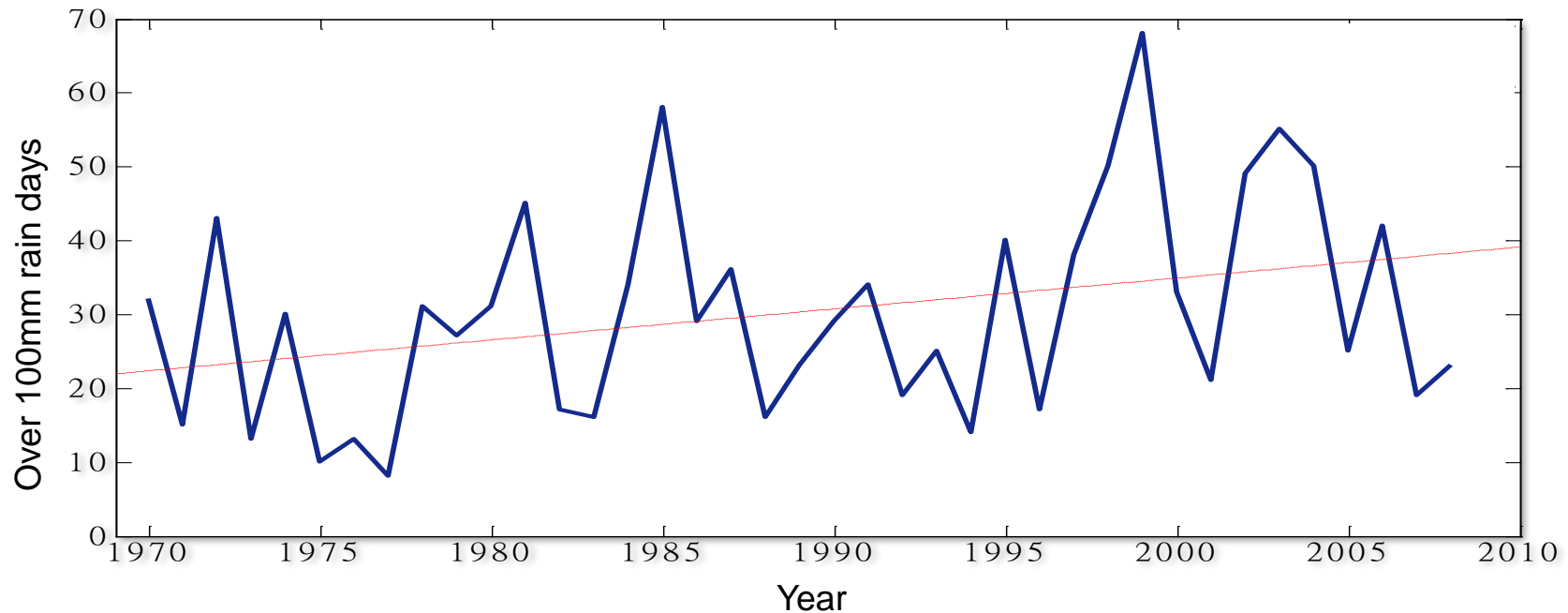
Contents

1. Integrated Water Management
 2. Flood Forecast & Control
 3. Hydrological Services
 4. WMO APFM & IDMP
-

Increase in Local heavy rain & Flood

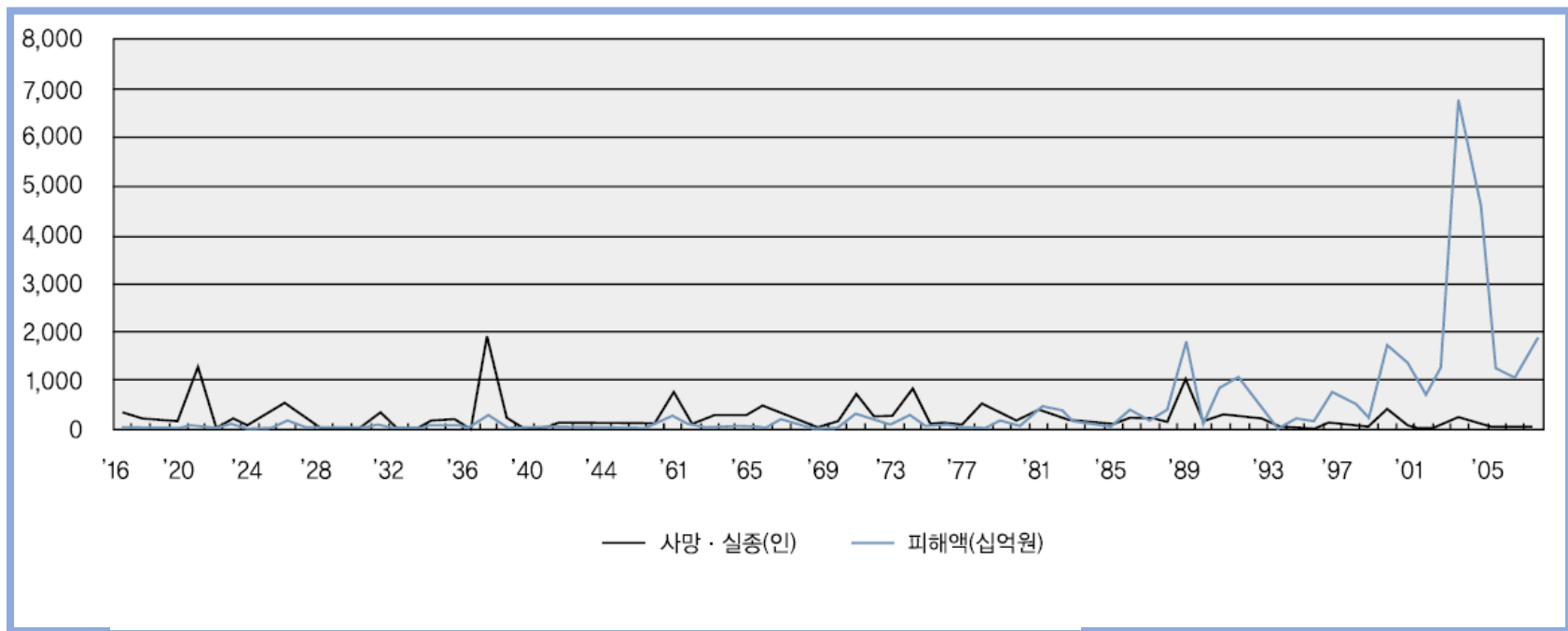
- Increase in frequency of heavy rain over 100mm per day 1.7 times to 1970's
- Annual average frequency of disaster increase

Increase from 5.3 (1940~1970) to 8.8(1980~1999)



Annual Trends by water-related disasters

- Increase in economic damages since the last of 1980s



Trend in Damages from in1916 to in 2007

Historical Flood Damage(1950s-2000s)



Damage by Typhoon Maemi (2003)

Water Management in R. of Korea

- Water Management is Divided into Water Quantity(Flood, Water Shortage Control), Water Supply(Domestic, Industrial, Irrigation), Water Quality and Hydropower Generation
- Each Organization has a Role According to the Functions and Characteristics (Water Quantity and Quality are Managed Separately)



- **Water Quantity** (Flood & Water Shortage Control)
- Water Supply
- Multipurpose Dams, Rivers
- Groundwater Facility
- Multiregional Water Supply



- **Water Quality**
- Regional Water Supply
- Waste Water Treatment Facility



- **Water Supply** (Irrigation)
- Reservoirs for Agricultural Use



- **Electricity Generation**
- Hydropower Generation of Dams



- **Disaster Rescues with Local Government**



Flood Control Office

Ministry of Land, Infrastructure and Transport

Ministry of Land, Infrastructure and Transport

4 Flood Control Offices (FCO)

Han River FCO

Nakdong River FCO

Guem River FCO

Yeongsan River FCO

Water Quantity & Quality Control

Dam & Weir Operation Control

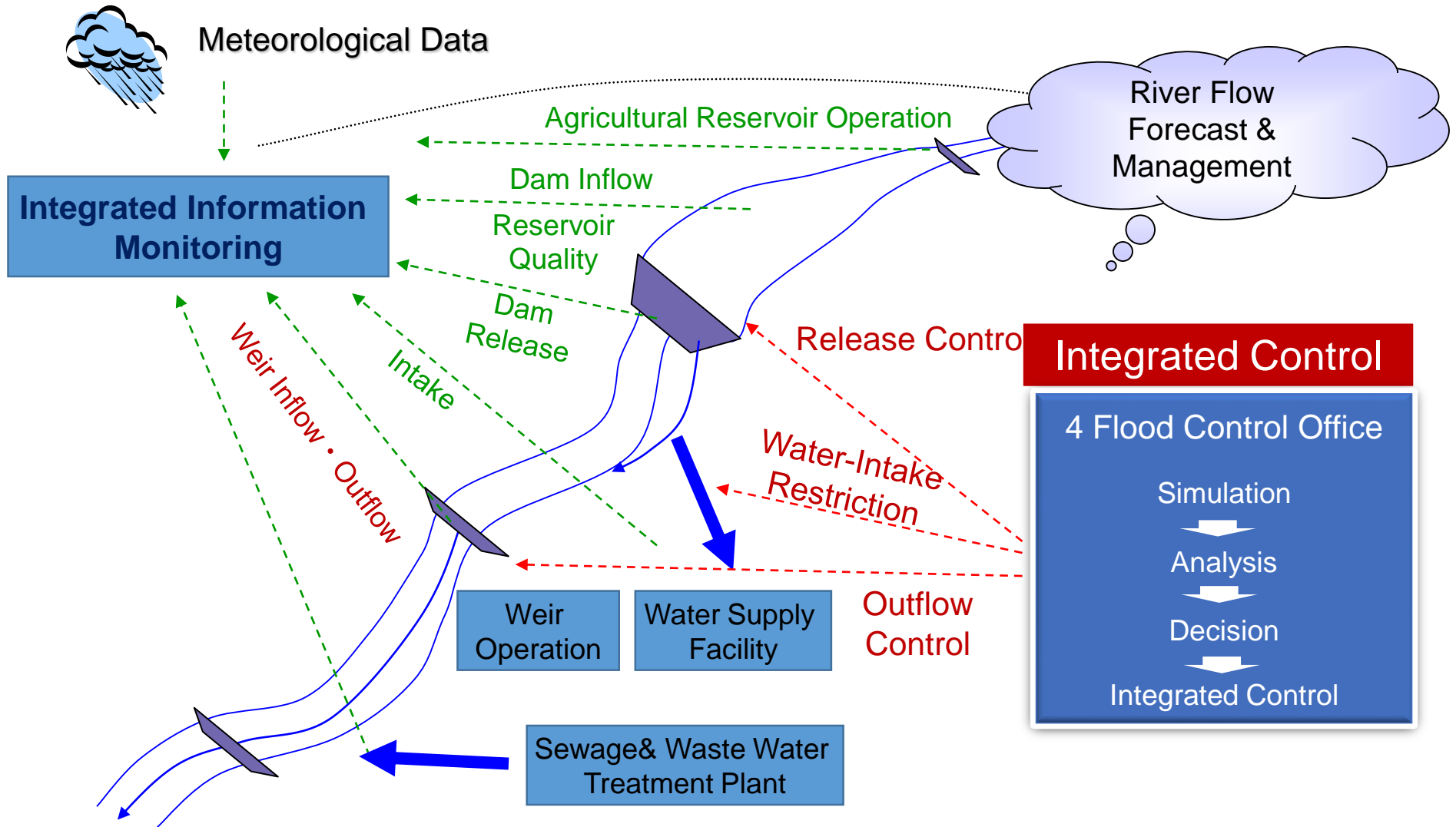
Intake Water Control

Flood & Drought Management

Integrated Information Monitoring

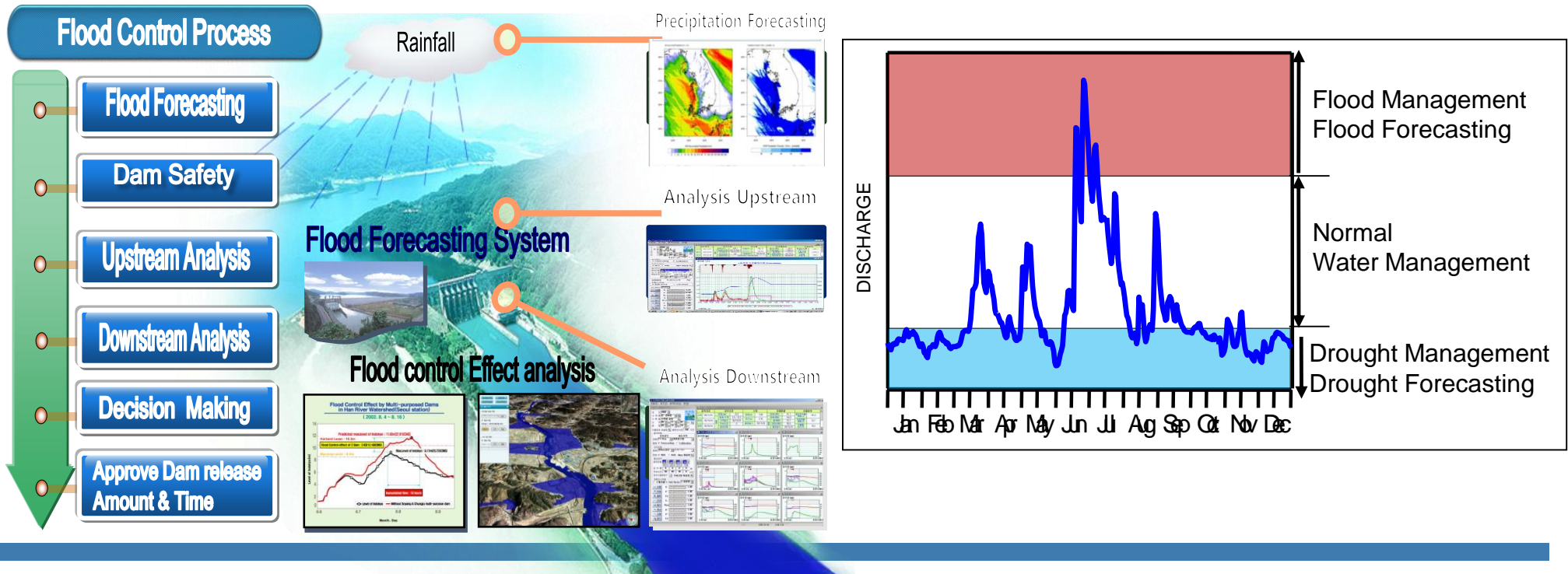


Integrated River Flow Management

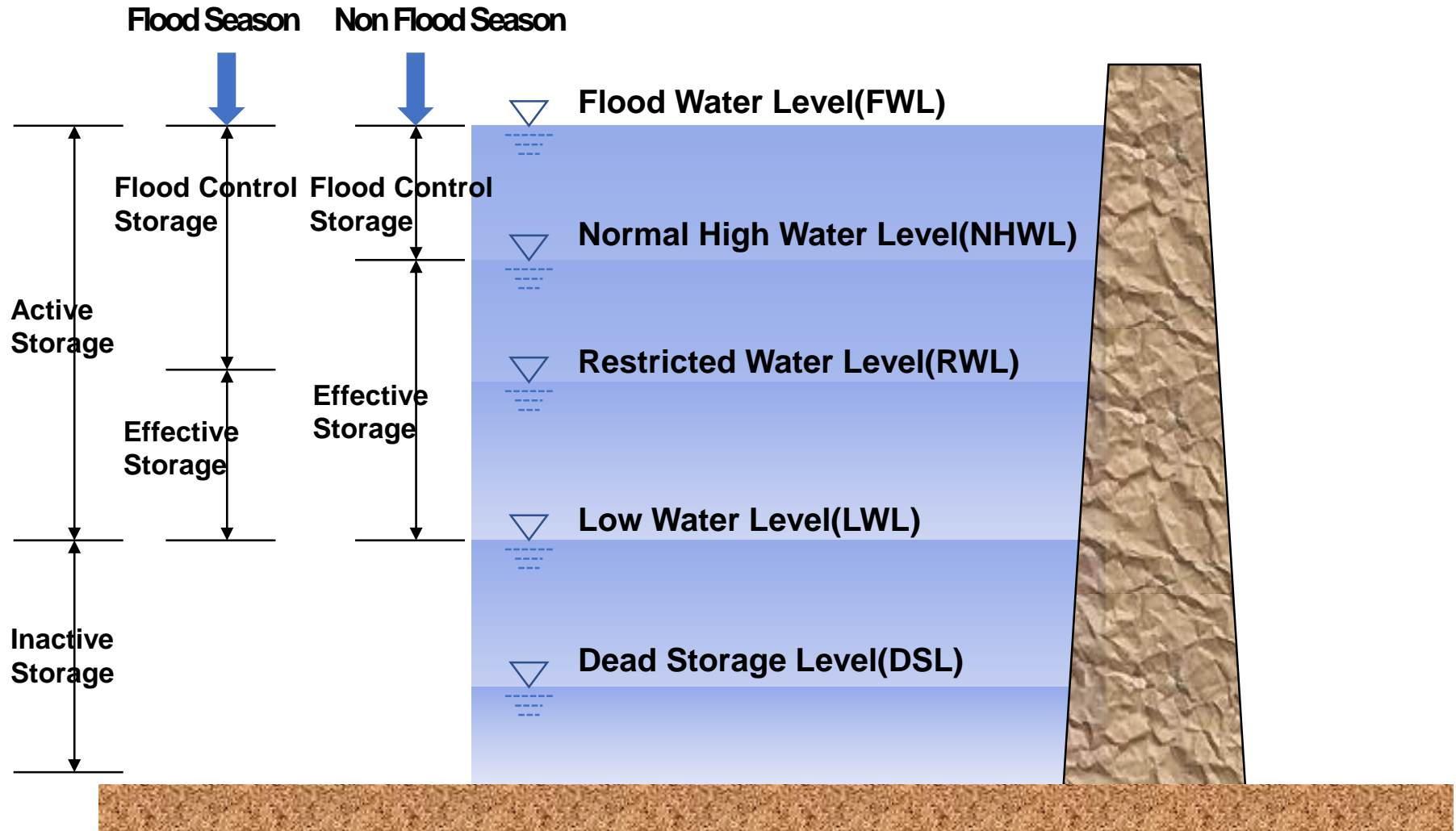


Real Time River Flow Management

- FCO approve the Dam release amount & time
 - Comprehensive analysis
 - Upstream + Downstream + Dam Safety + Historical event, etc

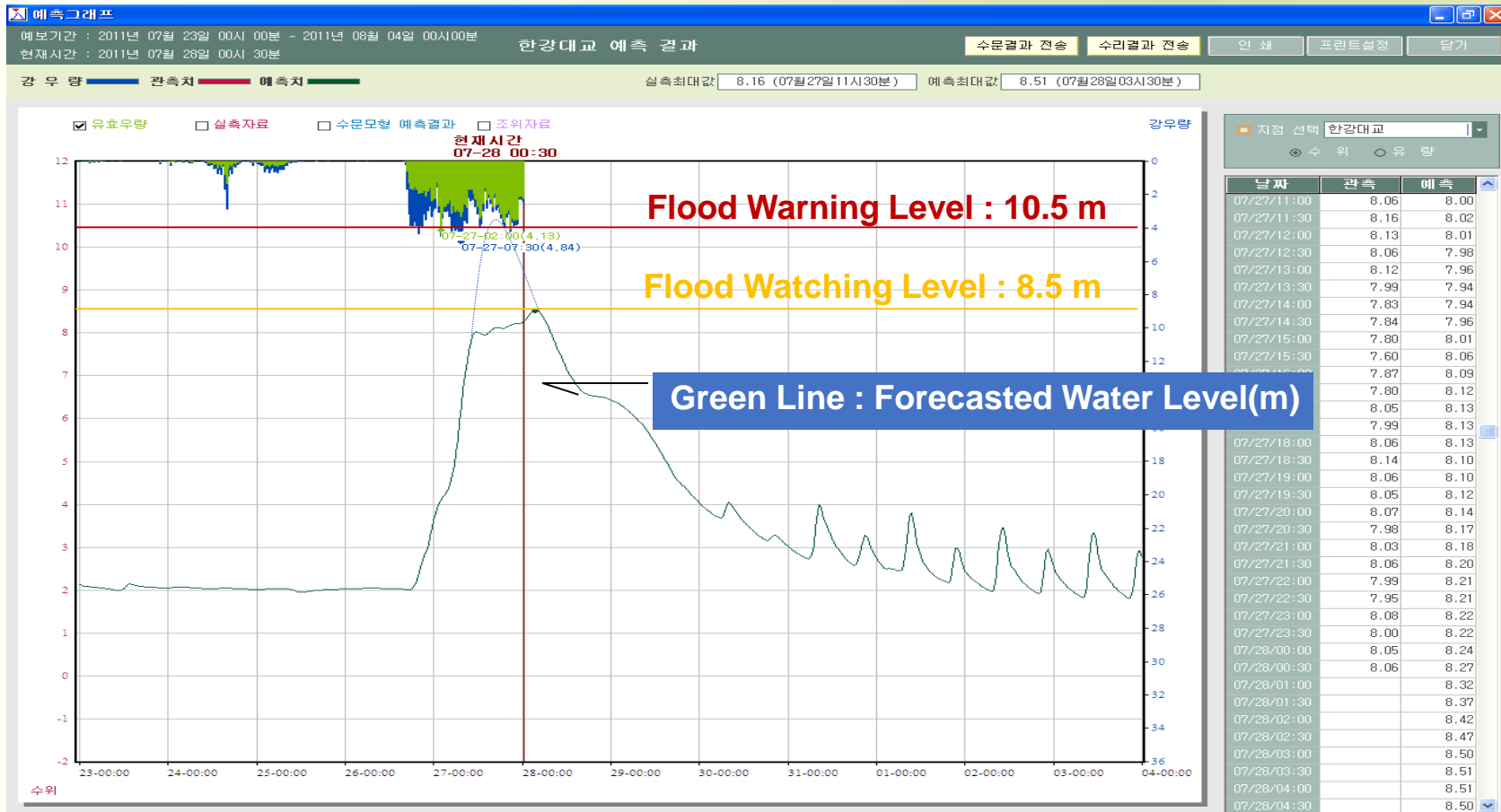


Flood Forecast and Dam Controls



Flood Forecast and Control

Flood Forecast Results (Hangang Bridge)



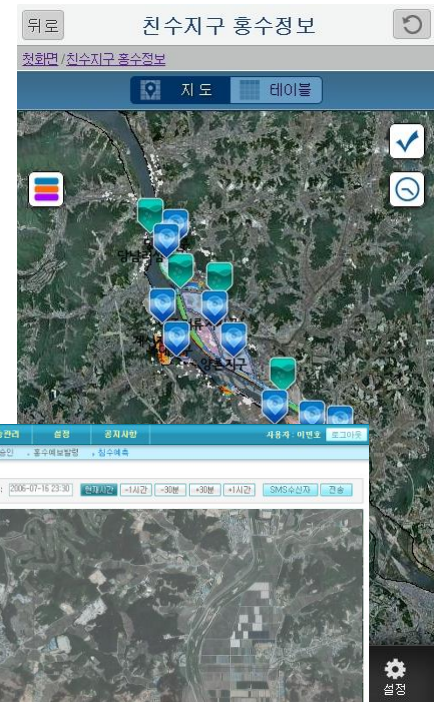
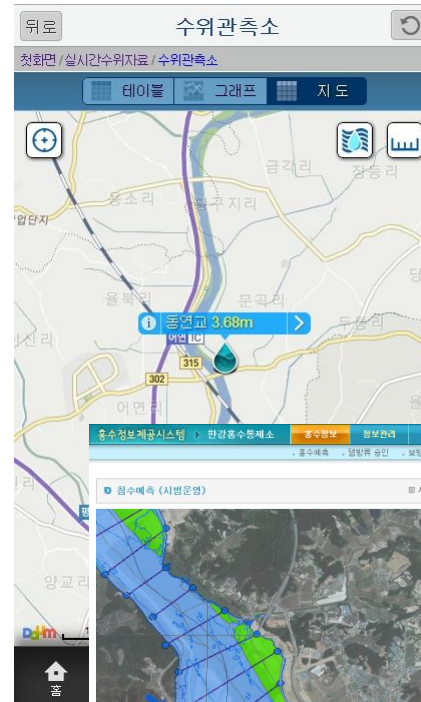
Hydrological Services

Smart Phone APP and Web - Korea Flood, Flood Korea

실시간 수위자료

2014-08-10 23시 30분 검색

관측소	행정구역	수위 [m]	유량 [m³/s]	수심비 [%]
동연교	경기도	3.68	351.54	39.6
성남	서울특별시	2.74	114.73	22.7
신정	서울특별시	2.49	105.87	19.3
여주	경기도	0.68	114.49	42.6
영월	강원도	0.96	71.47	15.8
적성	경기도	-0.05	40.83	13.4
전곡	경기도	0.29	20.61	12.4
종량교	서울특별시	0.92	24.72	2.9
퇴계원	경기도	0.02	19.94	15.8
평택	경기도	2.74	209.10	27.3
한강대교	서울특별시	1.38	1056.31	52.1



Hydrological Services

Inundation Prediction Information in Water front

[홍수정보제공시스템](#) > [한강홍수통제소](#) > **홍수정보** > [정보관리](#) > [전송관리](#) > [설정](#) > [공지사항](#) > 사용자: 이만호 [로그아웃](#)
[홍수예측](#) > [댐방류 승인](#) > [보방류 승인](#) > [홍수예보발령](#) > [침수예측](#)

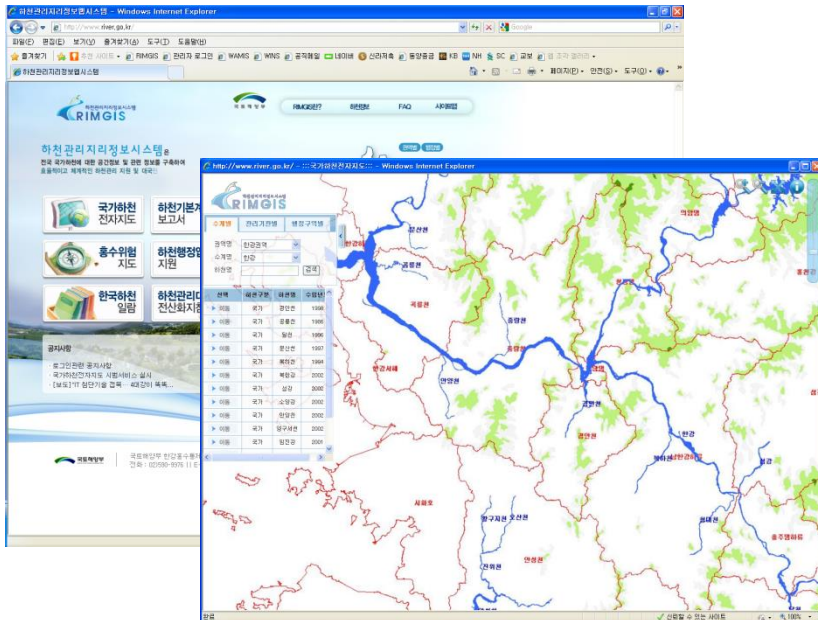
[침수예측](#) @ 시간: [2006-07-16 22:30] 현재시간: [-1시간] [-30분] [+30분] [+1시간] SMS수신자 전송

지구명	면적 (km ²)	최저표고 (m)	침수면적 (km ²)	침수심 (m)
<input type="checkbox"/> 가산지구	0.50	35.00	0.0287	8.74
<input type="checkbox"/> 계신지구	0.33	32.61	0.0320	9
<input type="checkbox"/> 내양지구(하)	0.48	33.69	0.0242	11.26
<input type="checkbox"/> 당남리섬지구	0.37	31.89	0.0258	9.27
<input type="checkbox"/> 당남지구	0.39	31.92	0.0232	6.47
<input type="checkbox"/> 백석리섬지구	0.87	45.00	0.0169	10.49
<input type="checkbox"/> 북대지구	0.18	33.20	0.0101	8.62
<input type="checkbox"/> 양촌지구	1.06	32.63	0.0804	11.04
<input type="checkbox"/> 여주보지구(우)	0.07	45.75	0.0016	5.77
<input type="checkbox"/> 여주보지구(좌)	0.04	36.37	0.0020	14.05
<input type="checkbox"/> 여주저류지지구	2.84	35.50	0.0038	5.44
<input type="checkbox"/> 이포보지구(우)	0.04	35.09	0.0012	5.5
<input type="checkbox"/> 이포보지구(좌)	0.01	35.30	0.0005	12.31
<input type="checkbox"/> 천남지구(하)	0.22	35.00	0.0203	9.55

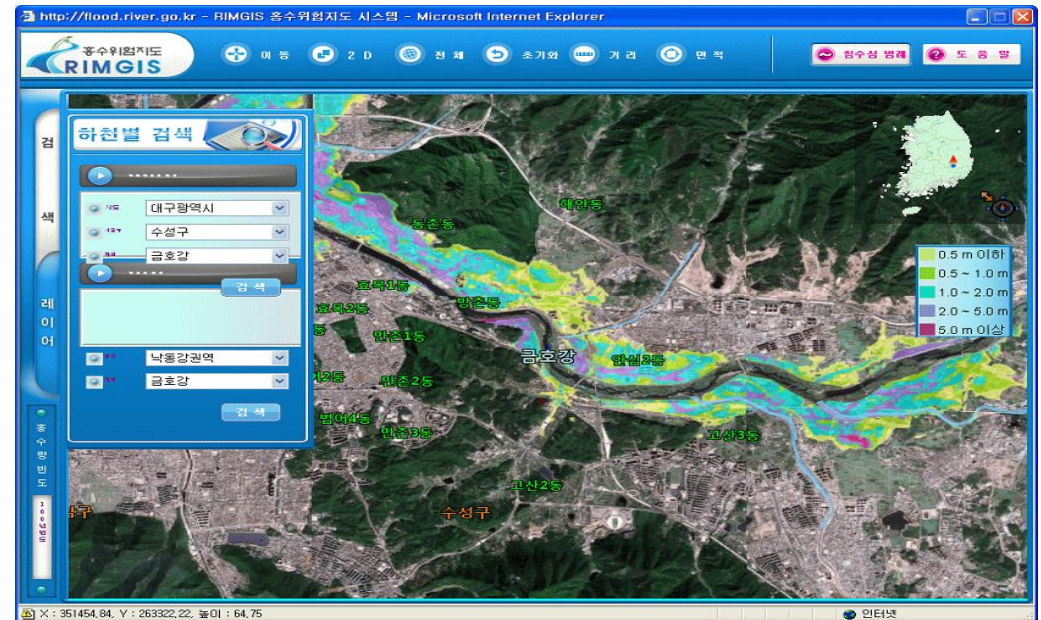
Hydrological Services

River Management Geographic Information System(RIMGIS)

- Web-based system to support river management by computerizing the river control master plan report and national river register
- Providing a variety of basic data about rivers including river occupation permission, river construction record, river facility management



RIMGIS : <http://www.river.go.kr>



Flood Risk Map(e-map)

Hydrological Services

Flood Risk Map

To provide the escape information for people as levee failure
Information flow depth and area is provided by 2-D hydraulic model

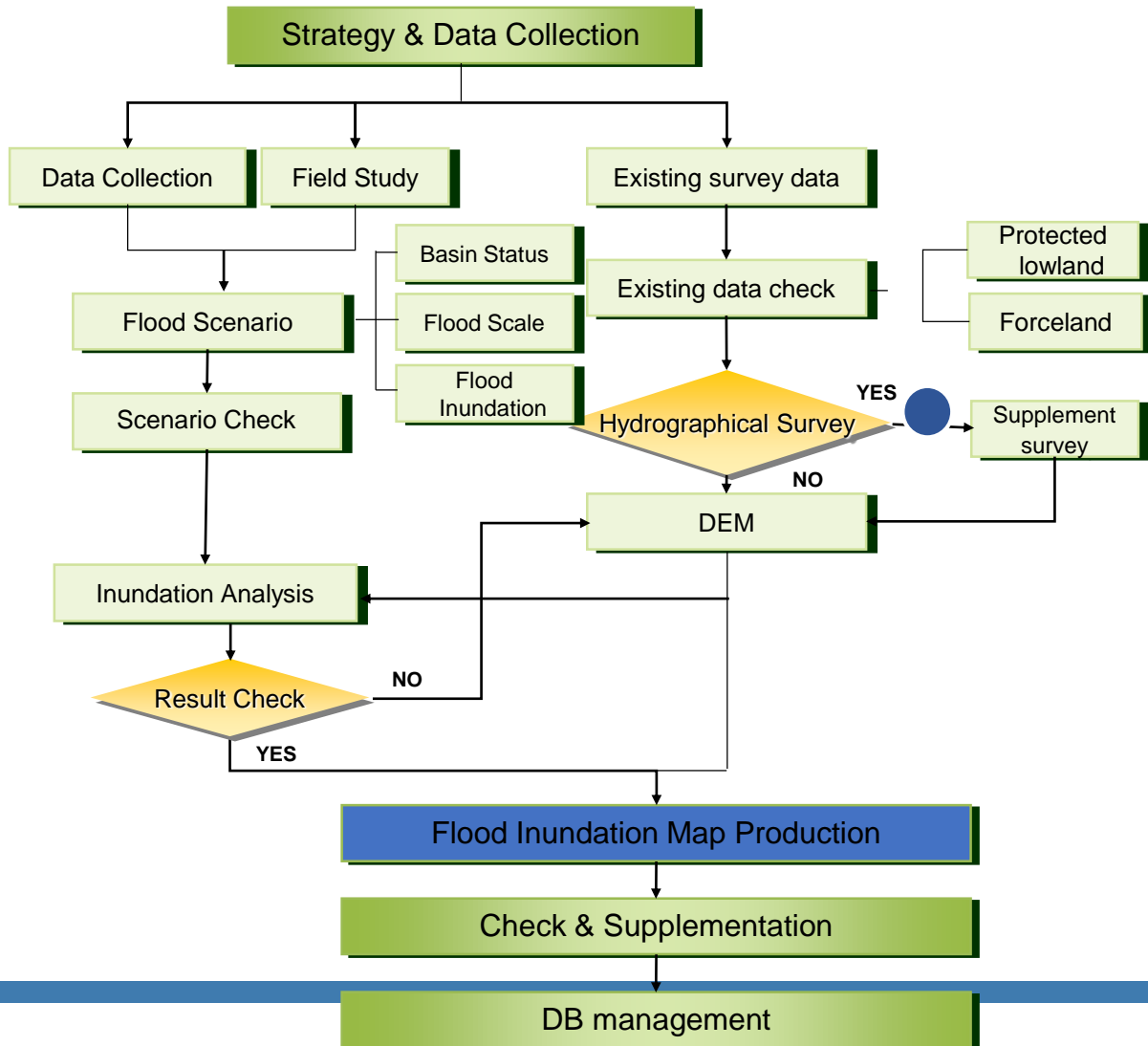
Heavy Rainfall
Levee Failure

• Flow Depth
• Flow Area

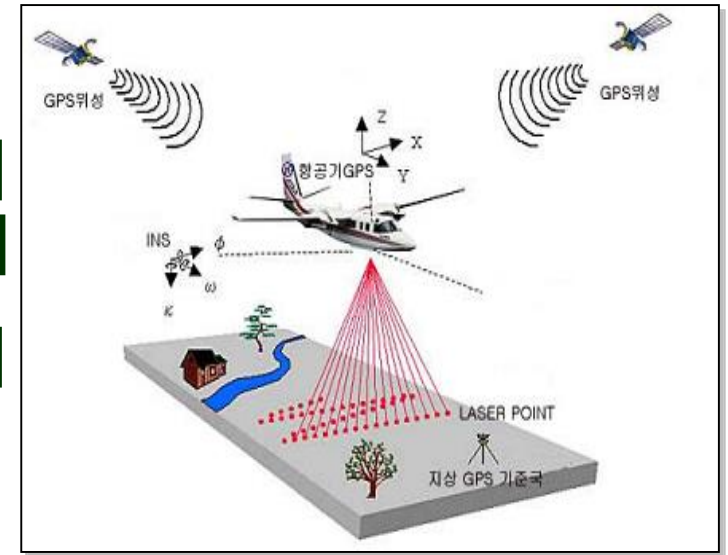
• Escape
• Shelter

Hydrological Services

Flood Risk Map



LiDAR



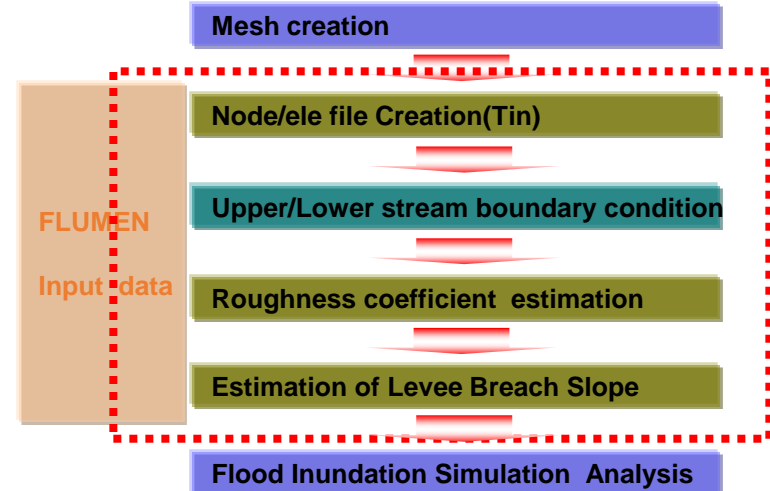
Hydrological Services

Flood Risk Map

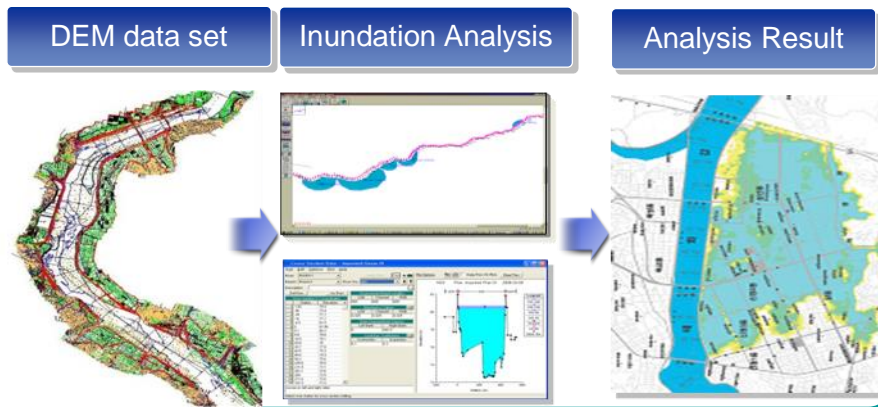
Inundation Analysis Technique

Dimension	Contents	Model
1-D non-uniform flow non-permanent flow	<ul style="list-style-type: none"> • Easy data set • Rural Area 	HEC-RAS
2-D non-permanent flow	<ul style="list-style-type: none"> • Urban Area • Hydraulic equation 	FLUMEN

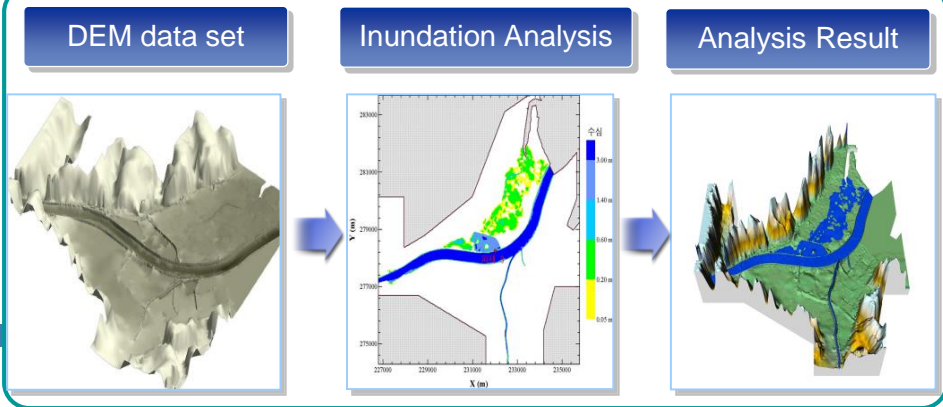
FLUMEN Input data set



1-D hydraulic model (HEC-RAS)



2-D hydraulic model (FLUMEN)



WMO APFM & IDMP

Associated Program Flood Management (APFM)

- Water will be the primary medium through which the expected effects of climate change will materialize. Climate change will affect flood processes, sea level rise will place coastal communities at higher flood risk. And changing precipitation patterns will lead to an increased occurrence of flash floods. Flood Management takes account of those expected effect, and is therefore an autonomous adaptation strategy to climate variability and change.



[About](#) [IFM HelpDesk](#) [Publications](#) [Projects](#) [Community](#) [News](#) [Q & A](#) [Q](#)



CAPACITY
BUILDING



IFM
HELPDESK



PUBLICATIONS
& TOOLS



PILOT
PROJECTS

WMO APFM & IDMP

Integrated Drought Management Program (IDMP)

- Drought Management Plan Report including Agricultural, Drought Indicators and Climate Change
 - Technical Report 2008-023, Including Agricultural, Drought Indicators and Climate Change Aspects

The screenshot displays the IDMP website interface. At the top, the IDMP logo is on the left, and the WMO and Global Water Partnership logos are on the right. A navigation menu includes HOME, ABOUT, ASK, FIND, and CONNECT-ACTIVITIES. A search bar is located on the right side of the menu. The main content area features a large banner for a literature review titled "Benefits of action and costs of inaction: Drought mitigation and preparedness – a literature review". The banner includes a thumbnail of the document and the text "Now available online". Below the banner, the text "Integrated Drought Management HelpDesk" is displayed. At the bottom, there are three interactive buttons: "Ask" with a question mark icon, "Find" with a magnifying glass icon, and "Connect" with a group of people icon.

Thanks for your attention
hydro@korea.kr

