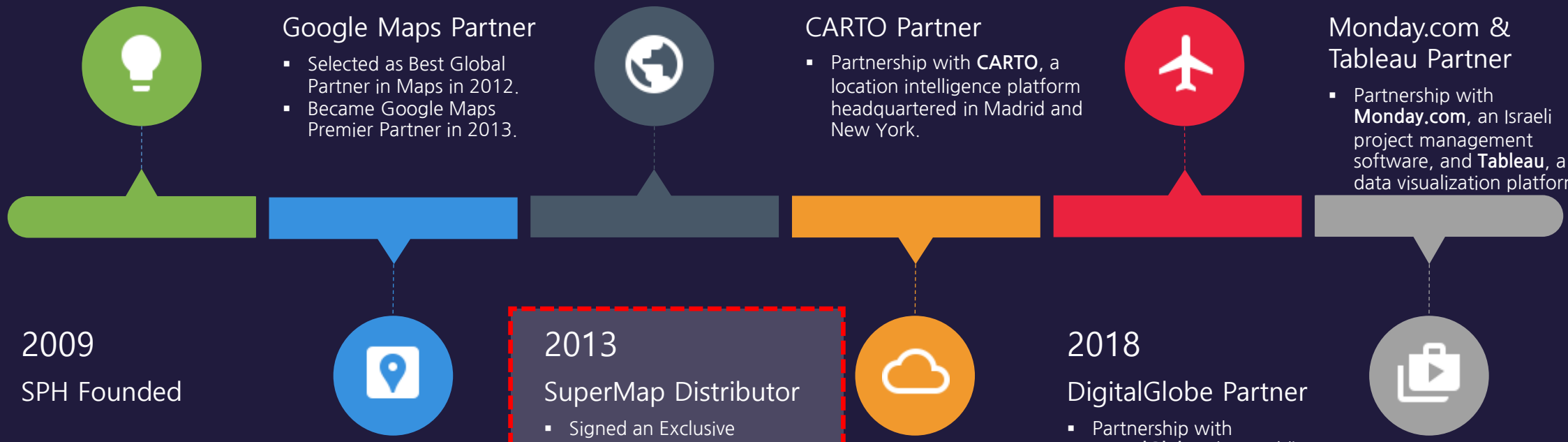
Remote Sensing/SAR Satellite Imagery Analysis and Utilization System using Deep Learning Model

Hyojin Lee
Global Marketing Manager, SPH

SPH History

"Making a Story of Human and Place with Technology."



2009
SPH Founded

2011
Google Maps Partner

- Selected as Best Global Partner in Maps in 2012.
- Became Google Maps Premier Partner in 2013.

2013
SuperMap Distributor

- Signed an Exclusive Distributorship with SuperMap, the No.1 in the Chinese GIS S/W market

2015
CARTO Partner

- Partnership with **CARTO**, a location intelligence platform headquartered in Madrid and New York.

2018
DigitalGlobe Partner

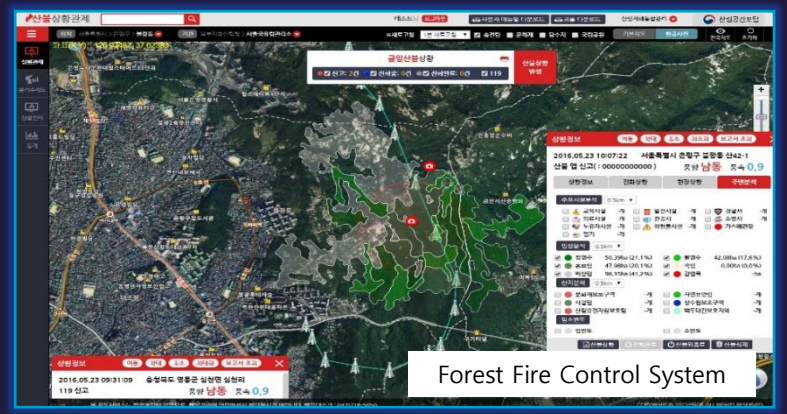
- Partnership with **DigitalGlobe**, the world's No. 1 supplier of satellite imagery

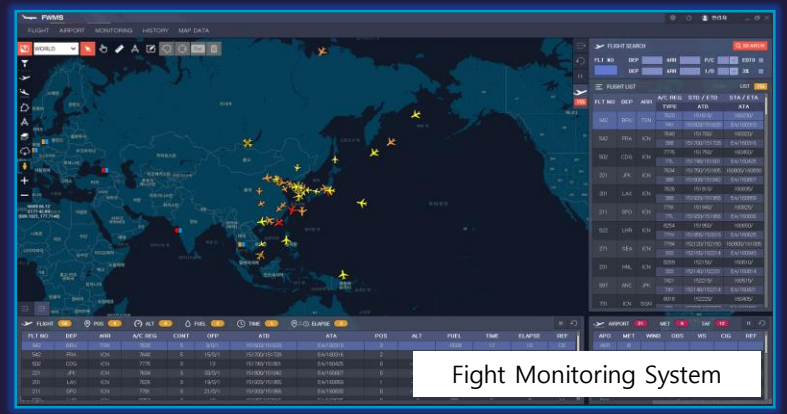
2020
Monday.com & Tableau Partner

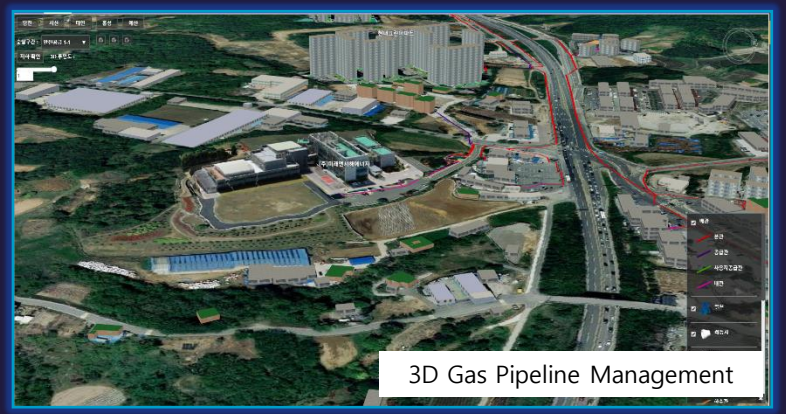
- Partnership with **Monday.com**, an Israeli project management software, and **Tableau**, a data visualization platform.

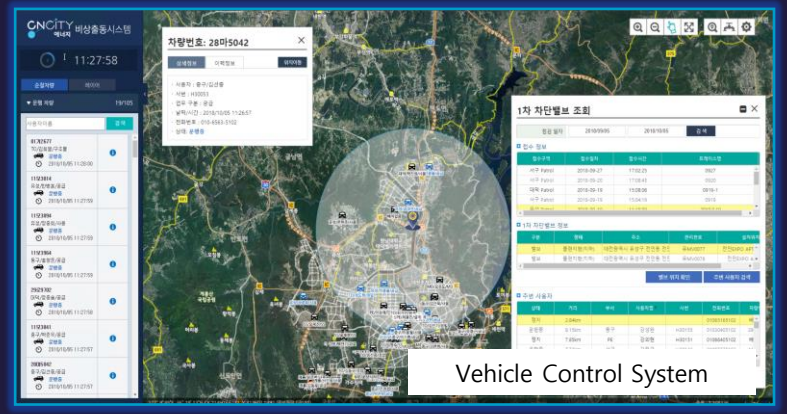
SPH History

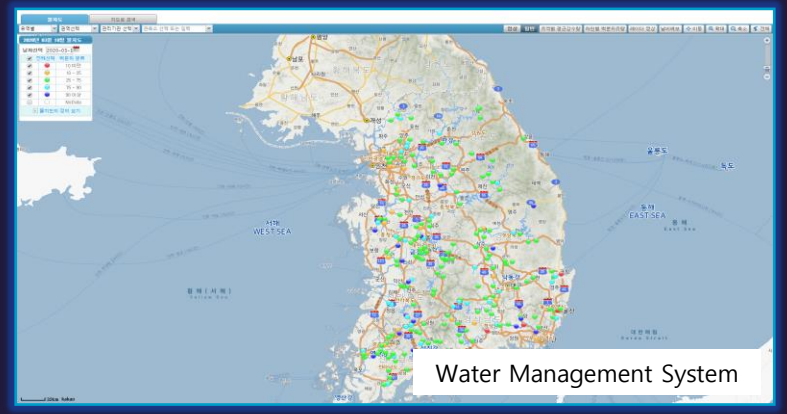
- Provided various Business Systems using SuperMap to Government, Private enterprises, and Schools

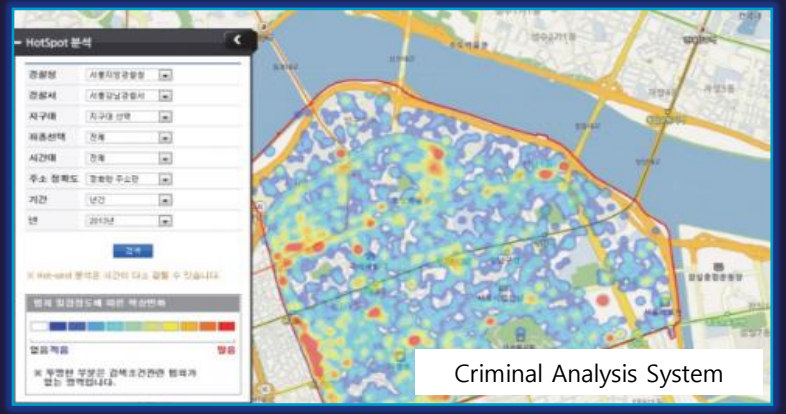

Forest Fire Control System


Fight Monitoring System


3D Gas Pipeline Management


Vehicle Control System

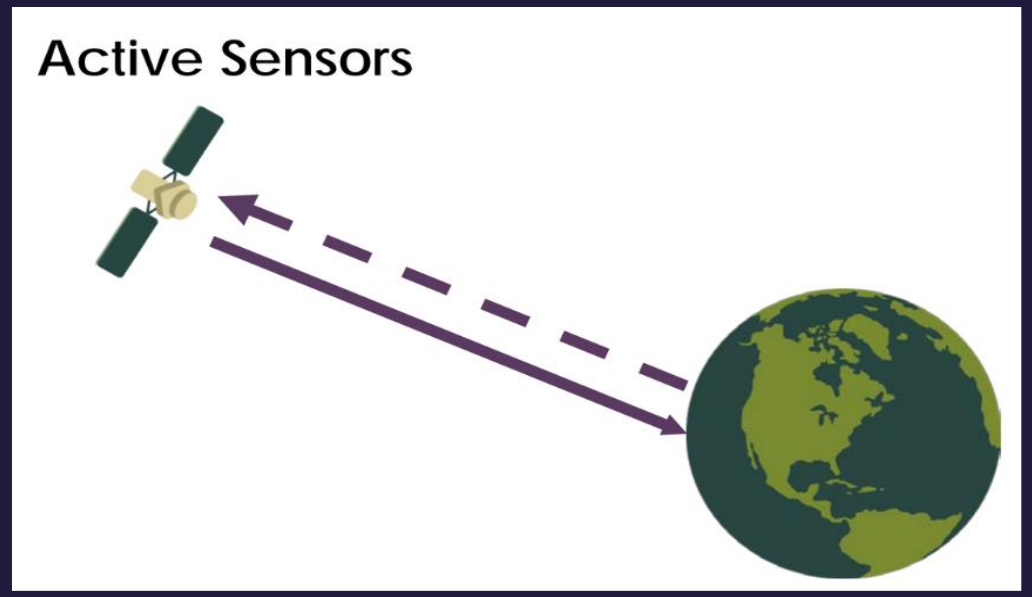

Water Management System

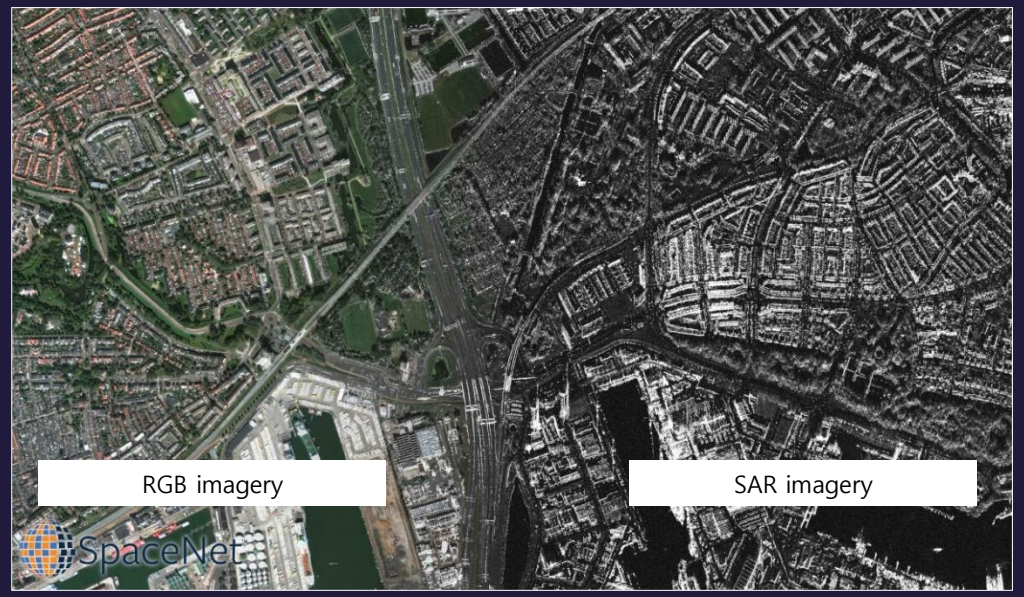

Criminal Analysis System

SAR(Synthetic Aperture Radar) Imagery

- SAR (Synthetic Aperture Radar)

An active electromagnetic wave radar sensor that obtains imagery information using microwaves



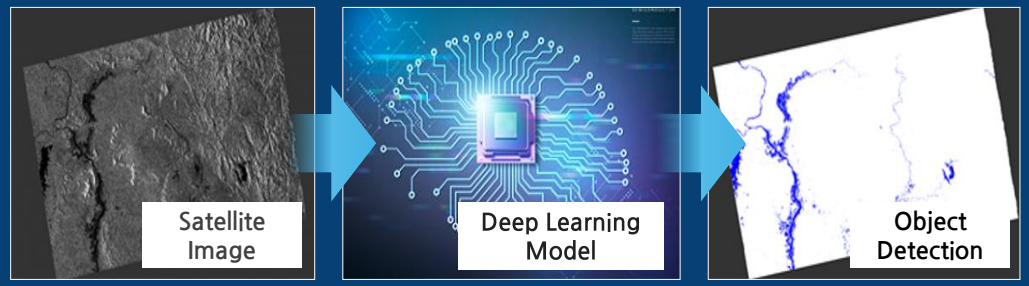


Remote Sensing/SAR Satellite Imagery Analysis & Utilization System

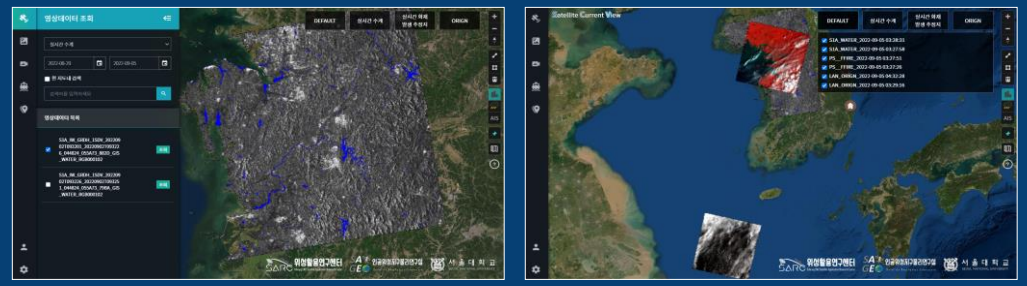
- Remote Sensing/SAR Satellite Imagery Analysis using Deep Learning
- Remote Sensing Imagery Display system for visualization of massive data

Remote sensing/SAR satellite Imagery Analysis and Utilization System

Remote Sensing/SAR Satellite AI Web Service

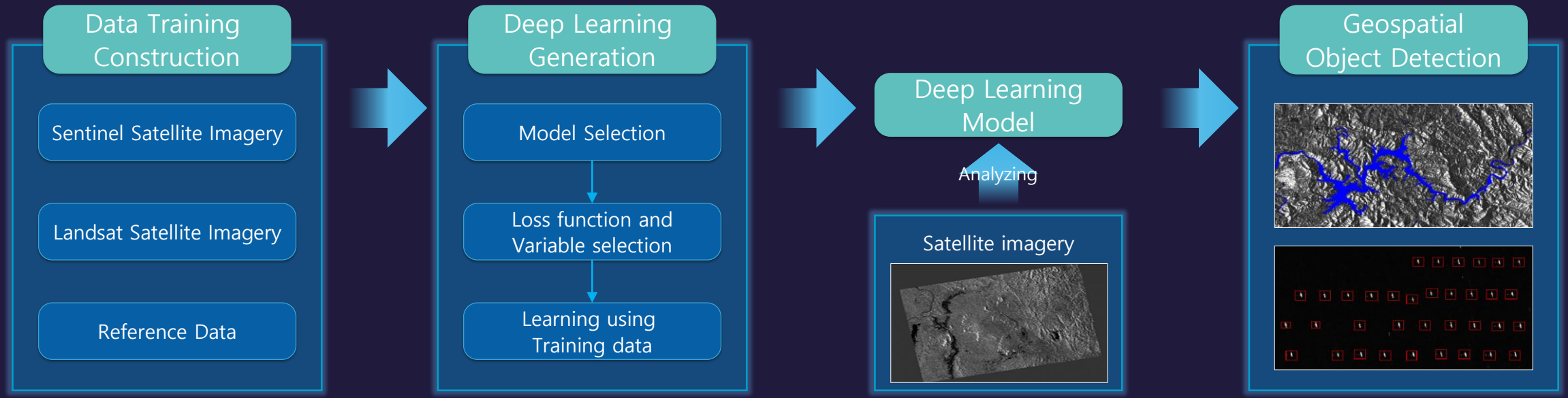


Analyzed Satellite Imagery Utilization Service



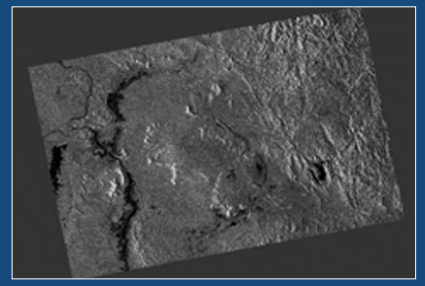
Remote Sensing/SAR Satellite Imagery Analysis & Utilization System

- Example of a general process for Deep Learning model generation for Remote sensing/SAR imagery analysis



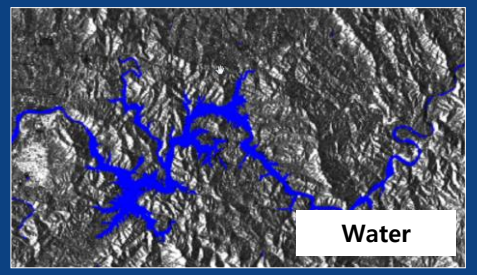
Remote Sensing/SAR Satellite Imagery Analysis & Utilization System

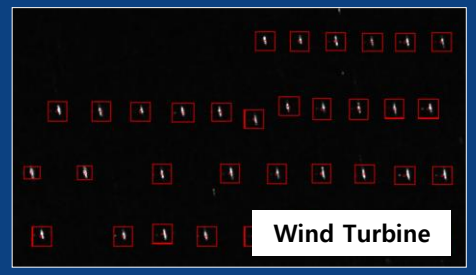
Satellite Imagery



Deep Learning

Utilization Service





Geospatial Object Detection (10types) + Analytical Model (3types)

Remote Sensing/SAR Satellite Imagery Analysis & Utilization System

- Examples of Geospatial Object Detection, Analyzed Model Utilization

Ship Detection

- Control of illegal fishing
- Monitoring marine pollution, such as oil spills.

Vehicle Detection

- Used for marketing and research materials.

Building Detection

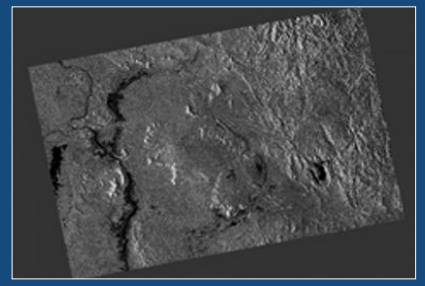
- Monitoring the progress of large-scale construction works.
- Prevention of illegal land or construction use.

Natural Disaster Analysis

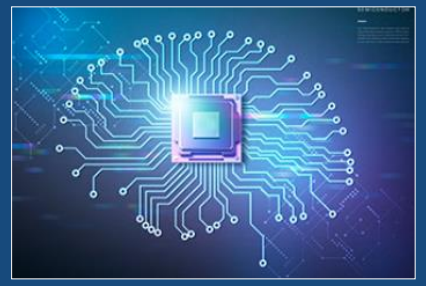
- Analysis of the size of the damaged area due to natural disasters.

Remote Sensing/SAR Satellite Imagery Analysis & Utilization System

Satellite Imagery



Deep Learning



Utilization Service

Technologies used

SuperMap iServer

PostGIS

React

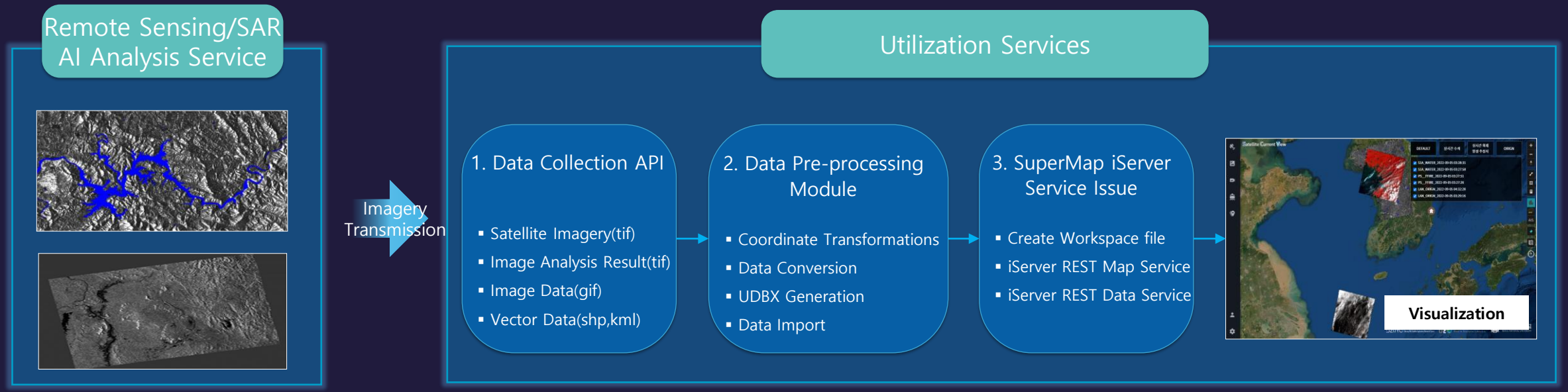
SuperMap iClient for MapboxGL

Key Function

- Satellite Imagery Data Visualization
- Weather Data Visualization
- Imagery Data Analysis Visualization
- AIS Data Visualization
- GIS Data Visualization
- User Management

Remote Sensing/SAR Satellite Imagery Analysis & Utilization System

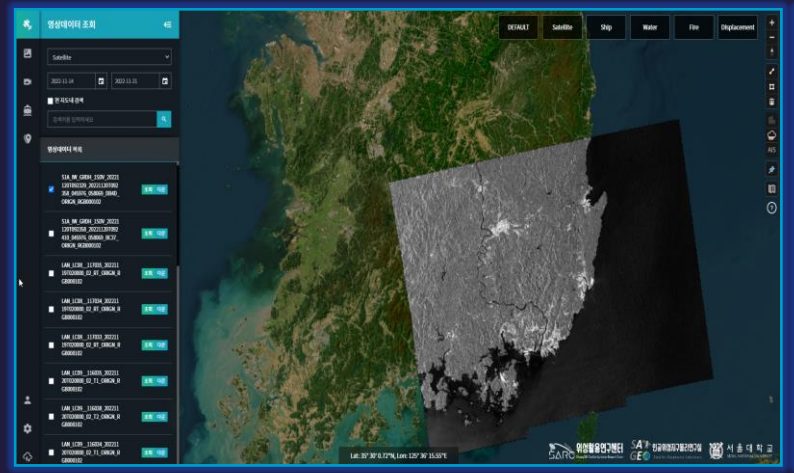
- Example of a general process for Visualization of Satellite Imagery Analysis Data using SuperMap



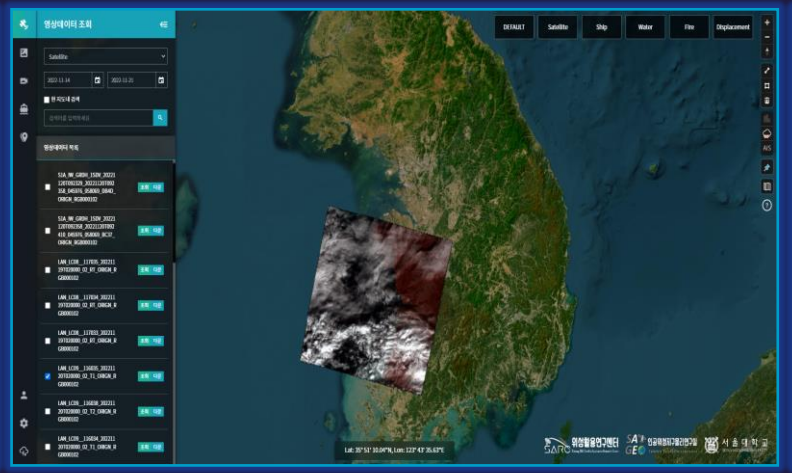
Remote Sensing/SAR Satellite Imagery Analysis & Utilization System

Satellite Imagery Data Visualization

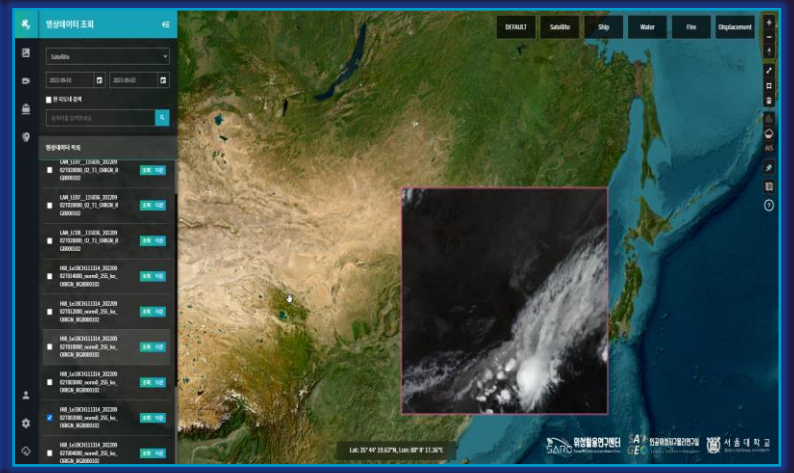
- Visualization of Remote Sensing/SAR Imagery with location information and distortion correction



Sentinel S1A Satellite



Landsat 8 Satellite

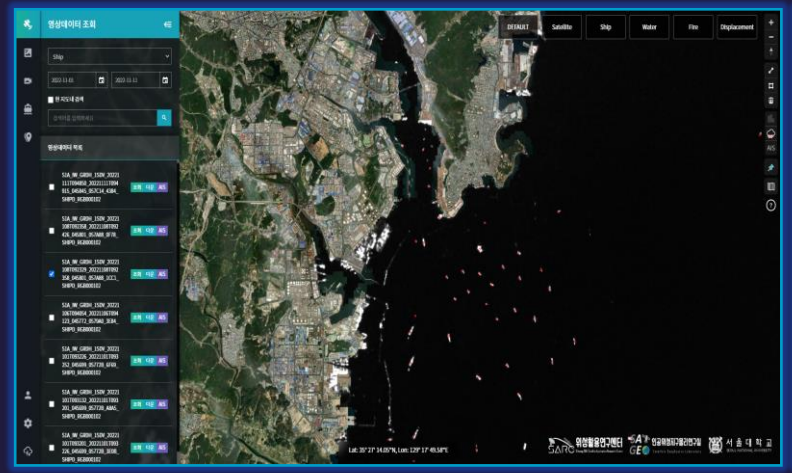


Himawari 8 Satellite

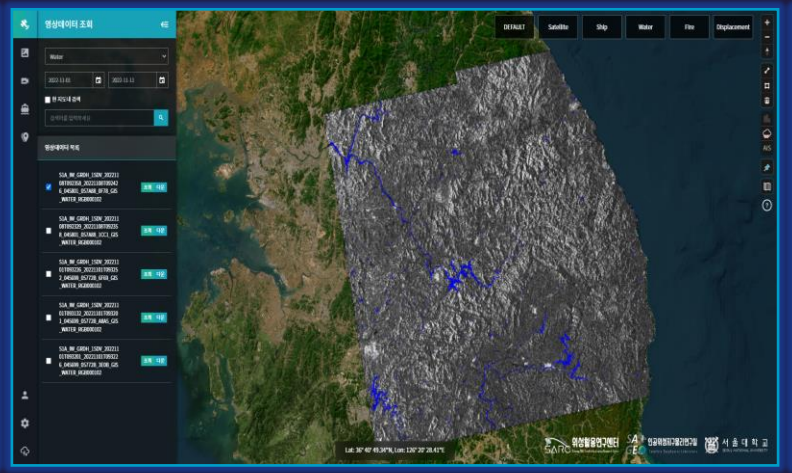
Remote Sensing/SAR Satellite Imagery Analysis & Utilization System

Imagery Data Analysis Visualization

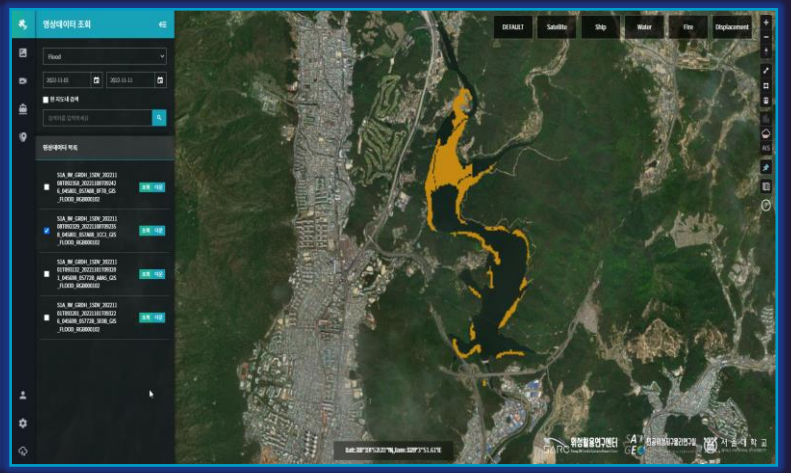
- Visualization of the Spatial Object Detection of Remote Sensing/SAR Imagery analyzed



Ship



Water

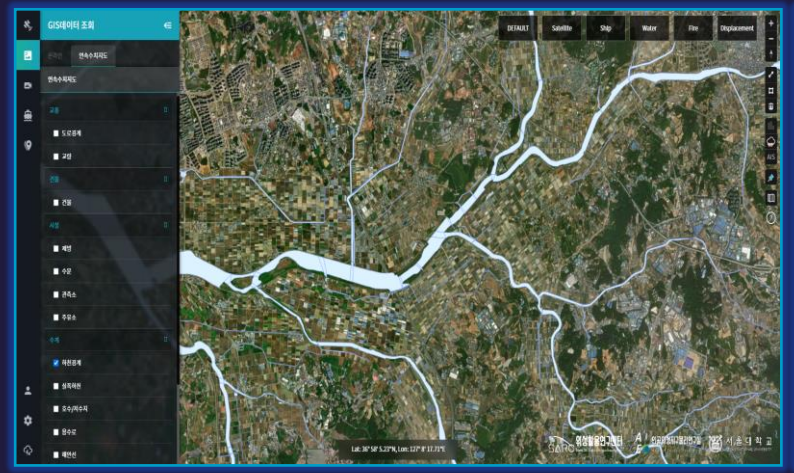


Flood

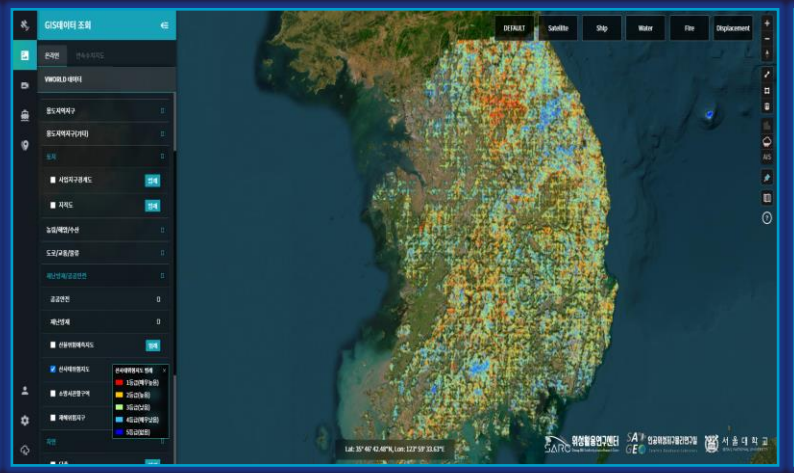
Remote Sensing/SAR Satellite Imagery Analysis & Utilization System

GIS Data Visualization

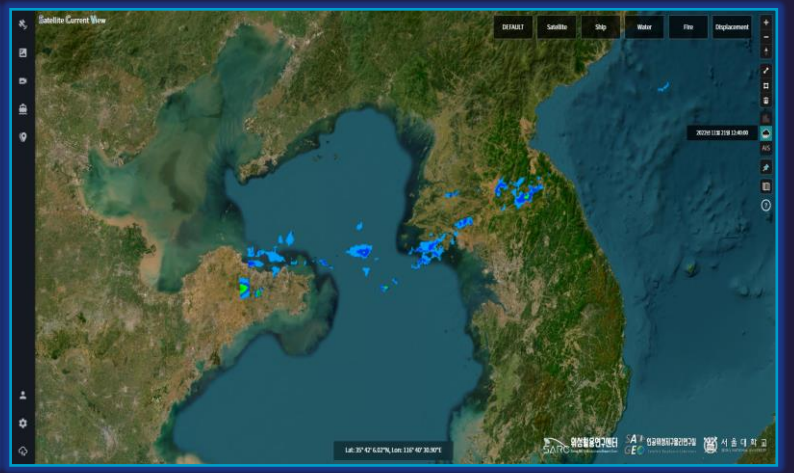
- Visualization of GIS data using Public Open Data and SuperMap iServer REST API



OPEN API - River



OPEN API - Landslide



OPEN API – Weather

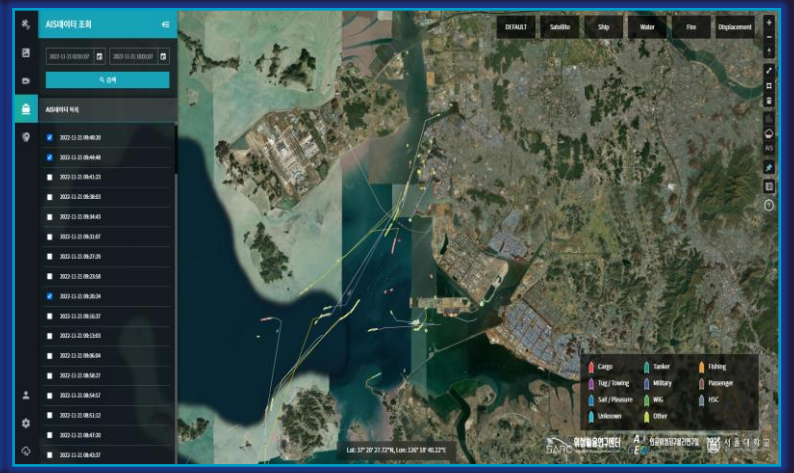
Remote Sensing/SAR Satellite Imagery Analysis & Utilization System

AIS Data Visualization

- Visualization of Automatic Identification System (AIS) updated every 5 minutes

Real-time ship location

Ship Information

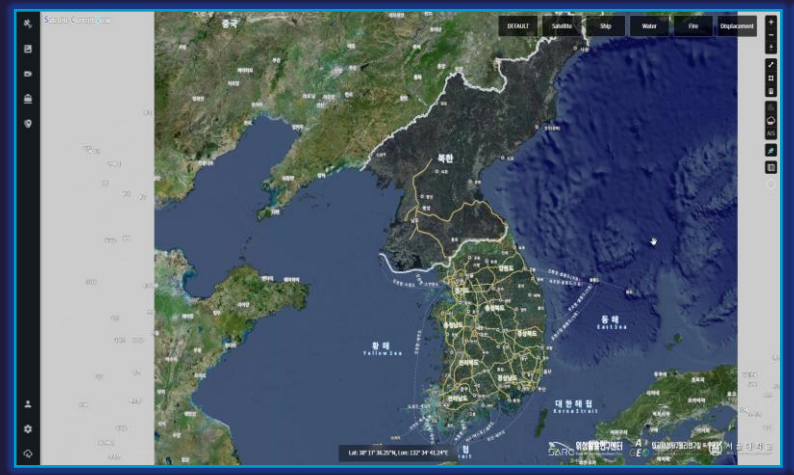


Ship Search

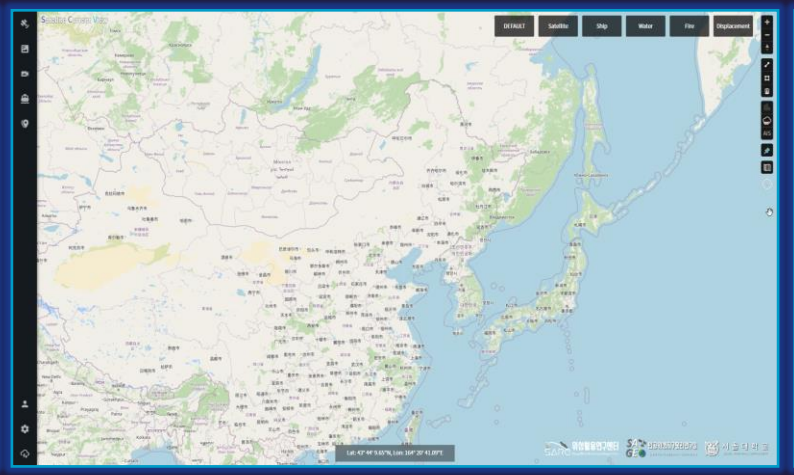
Remote Sensing/SAR Satellite Imagery Analysis & Utilization System

Various Map Background

- Provided various Background Maps



VWorld(KOR)



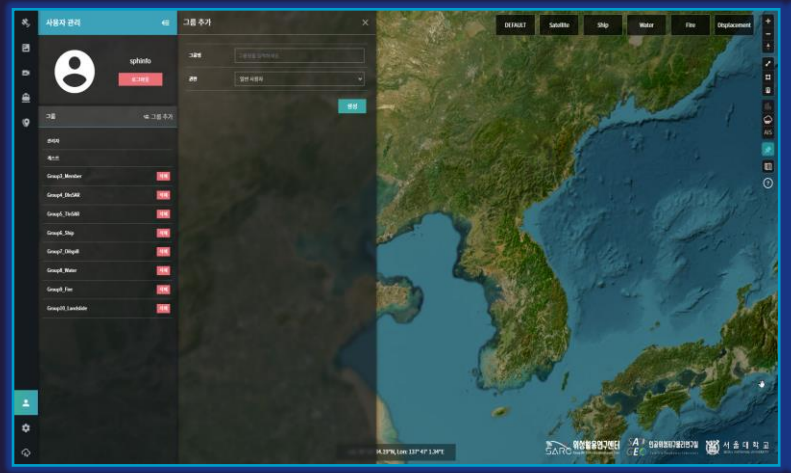
OpenStreetMap

Global Satellite Imagery

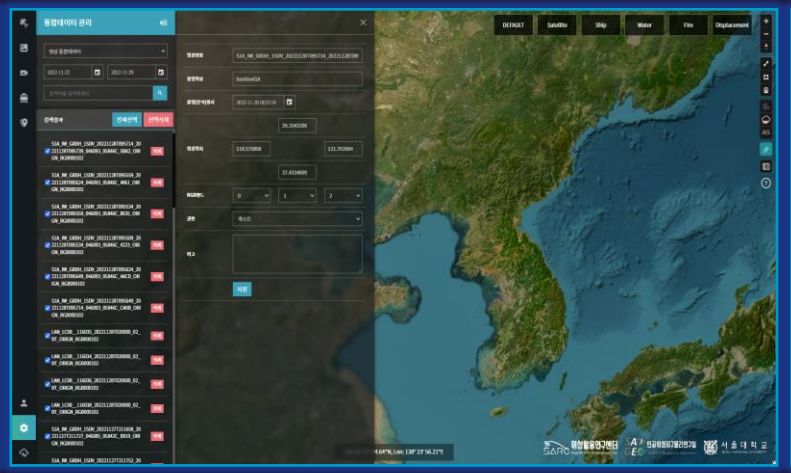
Remote Sensing/SAR Satellite Imagery Analysis & Utilization System

Administrator Section

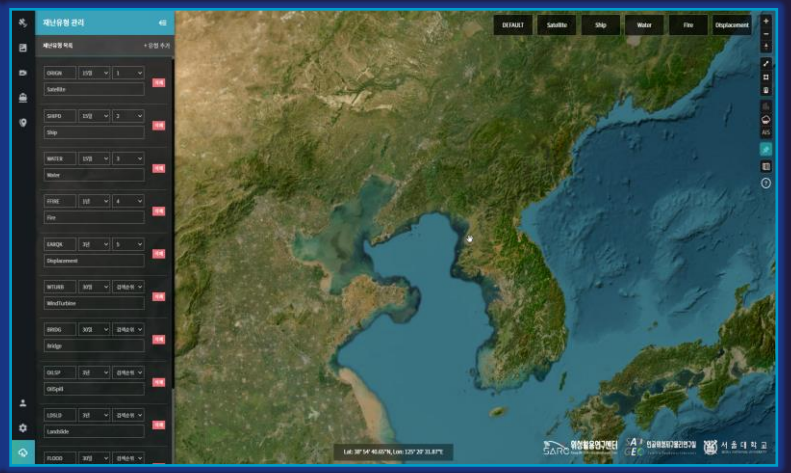
- Provided functions that only administrators can use



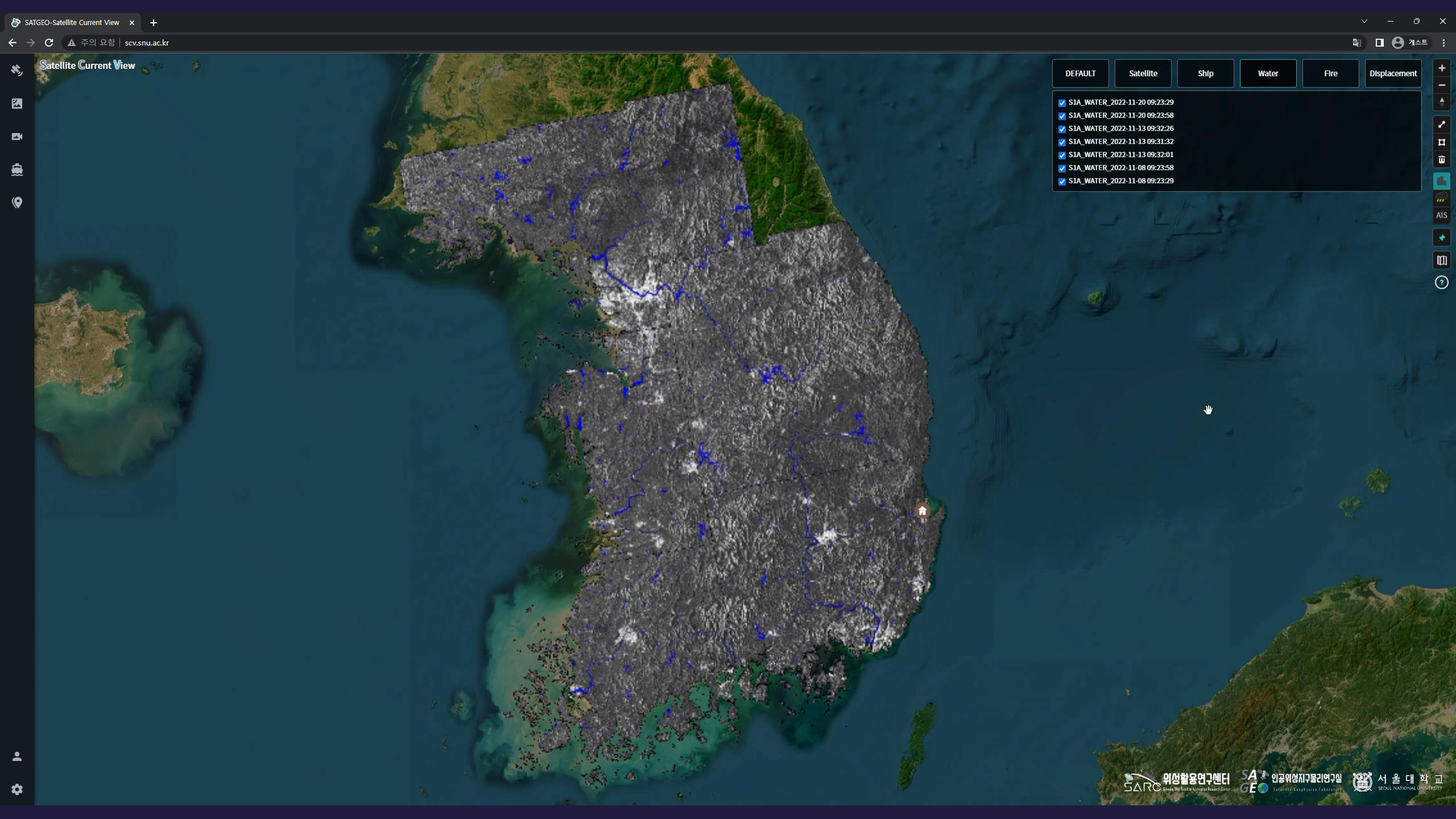
User Management



Data Deletion



Spatial Object Detection


SATGEO-Satellite Current View
주의 요함 | scv.snu.ac.kr
Satellite Current View
DEFAULT
Satellite
Ship
Water
Fire
Displacement
S1A_WATER_2022-11-20 09:23:29
S1A_WATER_2022-11-20 09:23:58
S1A_WATER_2022-11-13 09:32:26
S1A_WATER_2022-11-13 09:31:32
S1A_WATER_2022-11-13 09:32:01
S1A_WATER_2022-11-08 09:23:58
S1A_WATER_2022-11-08 09:23:29
AIS
위성활용연구센터
인공위성지구물리연구실
서울대학교
SEOUL NATIONAL UNIVERSITY

Thank you !