SUPERMAP COMMUNICATIONS

June 2022 Issue 05

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SuperMap GIS Solutions for Natural Disasters Prevention and Management

Who is SuperMap?

SuperMap was founded in 1997, focusing on the research, development and application services of GIS related software technology. It consists of SuperMap Software (parent company, stock code: 300036), wholly owned subsidiaries, and holding subsidiaries, as well as domestic branch offices and agencies. The total staff number of SuperMap is more than 4,000 and the annual revenue reached 260 million USD (1.7 billion RMB).

1997
Founded

How has SuperMap Performed So Far?

As a GIS software manufacturer, SuperMap has made a great effort on the development of GIS platform. It has two business lines of platform software and application software, and more than 1,000 ecological partners to empower the informationization of governments and enterprises in industries. Now, SuperMap ranks 1st in Chinese GIS market and has developed distributors and partners in over 50 countries and SuperMap GIS end users in over 100 countries.

100+
Countries'
Users

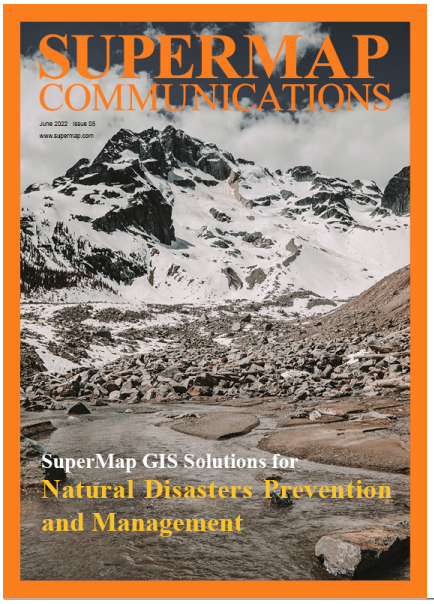
What will SuperMap be?

With "Innovate IT Value with Geo-intelligence" as the mission and "Create Cutting-edge Technologies constantly, Light up Every Corner of the Planet with Geo-intelligence" as the vision, SuperMap will keep providing advanced GIS technologies and products to more global users.

1000+
Partners

4000+
Employees

SuperMap



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FOCUS

CASE STUDY

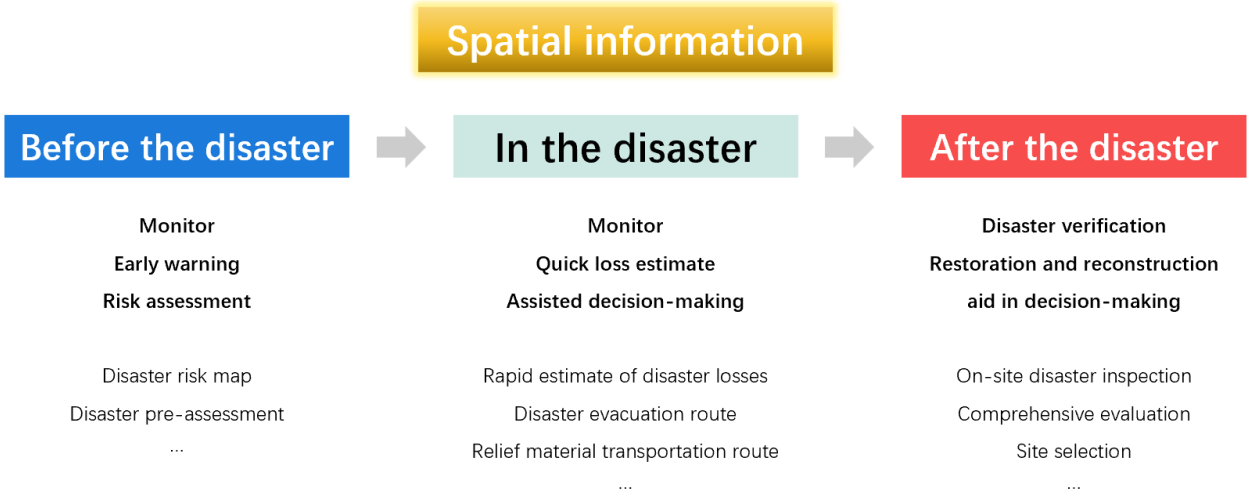
Natural Disaster Spatial Information Service Platform

Construction background

Spatial information is vital in natural disaster management including prevention and mitigation. Although some information service systems have emerged in recent years, there is no unified planning for each system, and there also exists duplication of construction and information inaccessibility, resulting in multiple information silos and the failure to share data synchronously. Therefore, it is necessary to build a natural disaster spatial information service platform to support efficient natural disaster management.

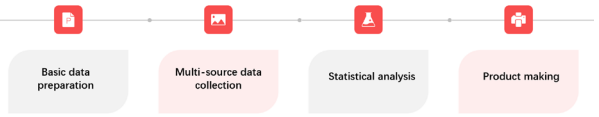
Program overview

The Natural Disaster Spatial Information Service Platform takes the framework of “application + platform” and “end + cloud”. It is developed based on multi-source data. This platform can effectively plan and utilize various information resources, expand information acquisition means, and improve data processing and analysis. It also increases standards of acquisition, transmission, processing, and storage of damage data; builds a natural disaster information database, improves the dynamic mechanism of information, and enhances information system security. At the same time, based on the shared platform, people can develop various applications.



Platform features

Operation process



Database construction

Databases include image databases, basic geographic databases, and operation thematic databases. The image database can access various image data, such as environmental disaster mitigation satellites, Gaofen(satellites), drones, Google images, etc. The basic geographic database stores basic data such as place-name data and DOM/DEM/DRG/DLG. The thematic database can store various data used in natural disaster management, such as disaster damages data such as earthquakes, floods, drought, meteorological data, social and economic data, etc.

1. Image data

- Environmental disaster mitigation satellite, Gaofen (satellite), Drone, Google Image

2. Basic geographic data

- DOM/DEM/DRG/DLG
- Place-name data

3. Operation thematic data

- Meteorology feature (weather stations/precipitation, etc.)
- Earthquakes feature (seismic activity maps, etc.)
- Forestry (forest fire hazard zoning, etc.)
- Land (spatial distribution of debris flow/landslide, etc.)
- Transportation (road/rail, etc.)
- Water conservancy (hydrological station data, etc.)
- Socioeconomic data
- Disaster preparedness data (reserves of disaster relief materials, etc.)
- Disaster relief data (damage data/historical disaster relief data, etc.)

Main functions

· Comprehensive data management

It aims to solve the rapid conversion and storage of various heterogeneous data (such as SHP, Coverage, Tiff, etc.), improve work efficiency, manage and maintain various operation forms, and provide flexible configuration functions of forms.

· Terminal data collection

When a natural disaster occurs, the onsite work team goes to the site to quickly collect information such as disaster damages and disaster relief, and start the collection process. Tasks are created, packaged and distributed on the server, and

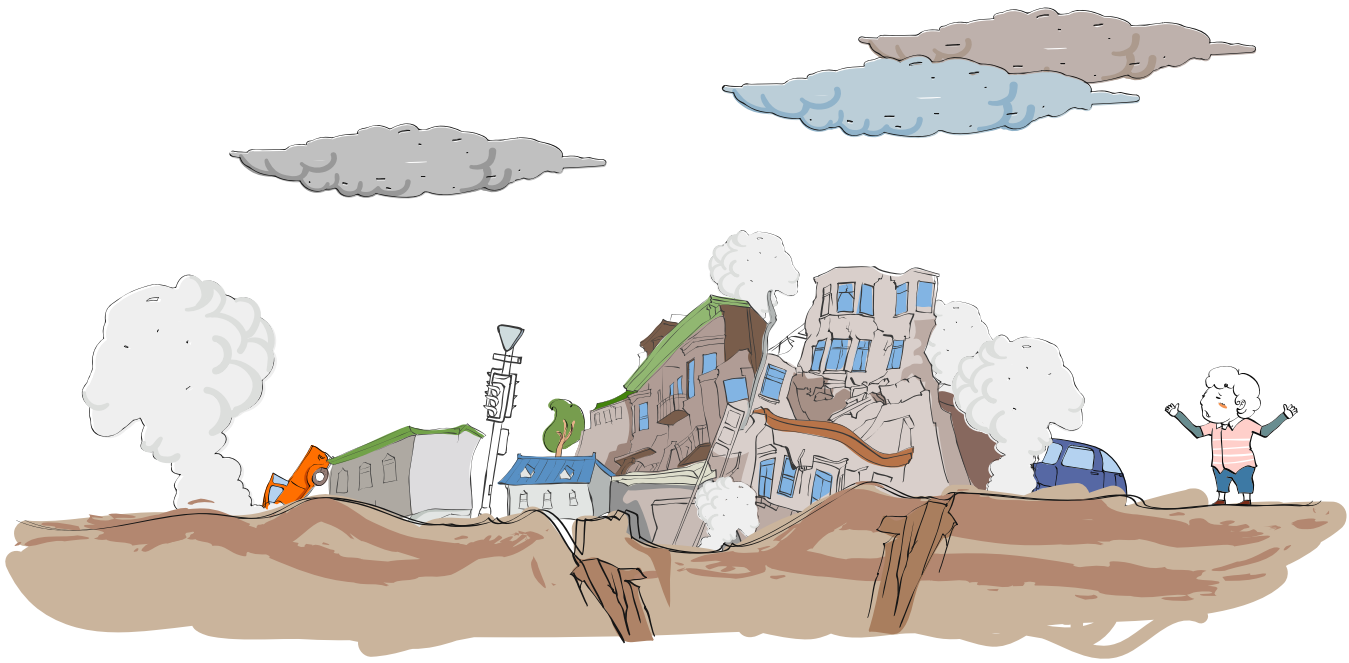
sent to the mobile terminal. The mobile terminal collects and reports the onsite information, and the server receives the data submitted by the terminal and completes the statistical analysis.

· Statistical decision

When information on a certain range of the affected population, economic losses, and disaster relief is required, the evaluation and analysis can be carried out through the statistical decision-making module. Based on the disaster damage and disaster relief data, the spatial map is taken as the main means of display, and the disaster loss query statistics and early warning analysis are carried out through various methods such as text, statistical charts, pictures, videos, to provide disaster relief decision-making support for the leaders.

· Product making

This function can enable people to publish the disaster data after analysis. It provides all kinds of product templates to achieve one-click mapping, one-click report generation, etc.



“One Map” Solution for Natural Disaster Prevention, Mitigation and Relief in Cities

The frequency of natural disasters brings obstacles to the rapid development of cities. A key point in building a “smart city” is how to “smart” deal with natural disasters’ impacts on cities. Natural disaster prevention and mitigation is an important part of the smart city emergency response system. The monitoring, early warning, assessment, response and recovery of natural disasters can be carried out by means of information technology, which will greatly improve the comprehensive emergency management level of cities and help the construction and development of smart cities.

Natural Disaster Prevention and Mitigation System

The disaster prevention and mitigation of natural disasters can be interpreted from multiple dimensions such as disaster dimension, industry dimension, business dimension, and time dimension:

1.Disaster dimension: According to the causes and characteristics of disasters, it is generally divided into meteorological disasters, flood and drought disasters, geological disasters, forest and grass fires, marine disasters, earthquake disasters, etc.

2.Industry dimension: Disaster + industry, such as agricultural meteorological disasters, power meteorological disasters, etc.

3.Operation dimension: The whole business process of disaster management, including disaster risk zoning, disaster investigation, disaster monitoring, disaster early warning, risk assessment, impact assessment, disaster response, disaster recovery, etc.

4.Time dimension: The disaster management is divided according to the time scale. The large scale of time includes the past (historical disaster investigation, risk zoning), the present (current disaster monitoring, early warning, risk assessment, etc.), and the future (disaster prediction, impact, etc.) Pre-assessment); the small scale of time is to divide the operation into the pre-disaster (monitoring, early warning), during the disaster (impact assessment, disaster response), and after the disaster (recovery and construction).

The comprehensive emergency management platform for urban disaster prevention, mitigation, and relief based on “One Map” covers the entire process of natural disaster emergency management, so as to achieve the normalized management of pre-disaster monitoring and early warning, disaster prevention and control, and disaster release and emergency response during disasters. The combination of abnormal management can conduct early warning before disasters, eliminate hidden dangers, predict and evaluate during disasters, respond effectively, and minimize losses.

"One Map" Solution for Natural Disaster Prevention, Mitigation and Relief in Cities

Natural disasters are typically spatially distributed. Therefore, the monitoring, early warning, evaluation of natural disasters, disaster emergency command and rescue, research and decision-making are inseparable from the support of spatial information and GIS technology. With SuperMap GIS spatial information technology as the core, the "One Map" solution will play an important role in the prevention, mitigation and relief of natural disasters in cities.

"One Map" is to integrate multi-element, multi-temporal and multi-regional basic geographic data and various natural disaster thematic spatial data under a unified geospatial framework. It integrates various dynamically changing information through the association of spatial elements, forming a unified natural disaster emergency management spatio-temporal information database. It constructed spatial information services and spatial information software support to provide stable and reliable natural disaster spatiotemporal services for various industries and departments. It can support the co-construction and sharing of resources of the emergency geographic information layer of natural disaster information in each department. It mainly functions in:

Data support (big data)

"One Map" gathers basic GIS basemap data including vector, terrain, image, BIM, oblique photogrammetry data, etc.; emergency response operation data including protection targets, emergency supplies, rescue forces, shelters, etc., and various disaster perception monitoring data

including meteorological disaster monitoring, flood disaster monitoring, fire monitoring, debris flow monitoring, video monitoring, etc.

Application support (workbench)

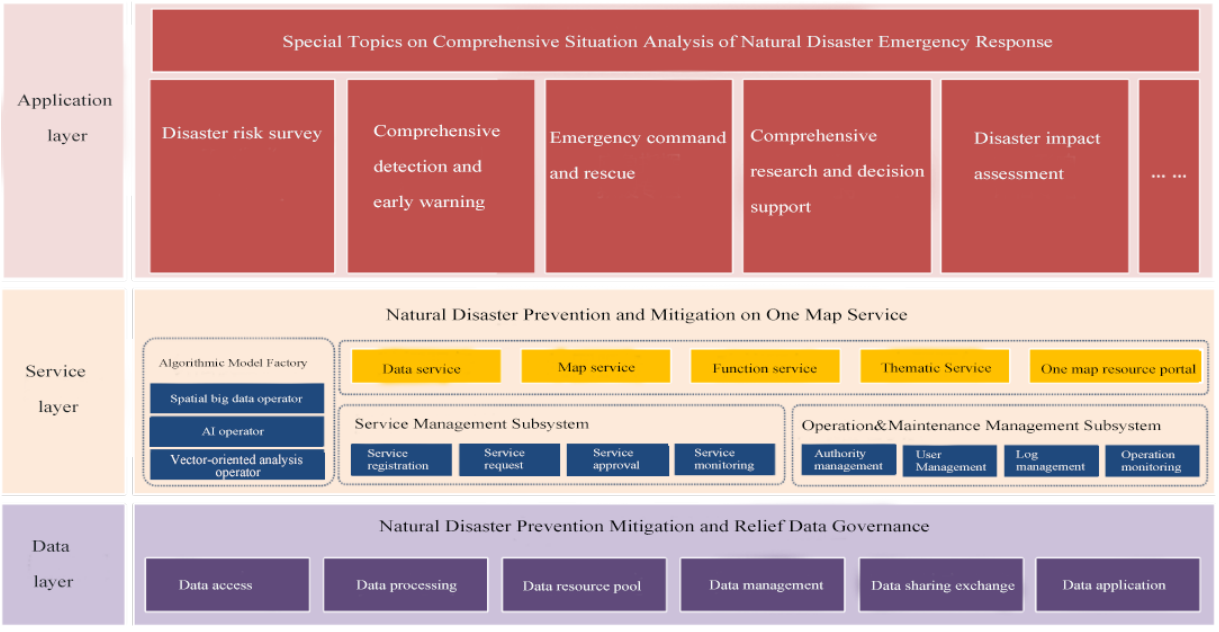
"One Map" can provide unified, stable, reliable and safe geographic information services and spatial information software development technical support for all disaster emergency management cooperative departments. It includes basic GIS services, disaster emergency management general operation services, quick processing and publication of disaster emergency spatial-temporal data as well as emergency operation secondary development components, etc.

Integrated platform (integrated warehouse)

"One Map", as an integrated display platform for disaster prevention and mitigation applications, can show natural disaster risk zoning, network monitoring and early warning of major risks, distribution of emergency rescue resources, disaster situation analysis and comprehensive research and judgment, and emergency rescue command and dispatch, emergency rescue tracking, disaster impact assessment, etc. based on the map.

The construction framework of the comprehensive emergency management platform for urban disaster prevention, mitigation, and relief based on "One Map"

The construction of the platform in the data layer, service layer, and application layer mainly includes:



1.Data governance system: Combined with the disaster prevention and mitigation emergency management needs, it can access and integrate basic data from local government departments in natural resources, ecological environment, transportation, health care, meteorology, etc. It built up the natural disaster emergency data government system and carries out whole-chain governance including data access, processing, storage, application and control. The unified big data resources center based on data aggregation and governance offers services of data sharing, exchanging and application.

2. "One Map" service system: Use the data provided by the data governance system to build algorithm model management, business model development, algorithm development and other capabilities through machine learning, knowledge map and other technologies, and form an algorithm model pool to provide emergency services.

3.Thematic application in disaster risk investigation: Based on the data resource pool and the services provided by the "One Map" service system, build a map of disaster risk investigation, and present historical disaster distribution maps and disaster risk analysis based on the map. It not only includes the disaster risk of each single disaster type, but also comprehensively analyzes the disaster risk of multiple disasters. The comprehensive "risk map" of natural disasters and the "zoning map" of comprehensive prevention and control of natural disasters will be presented intuitively. It can find out the underlying risks and hidden dangers in the jurisdiction, make up for the shortcomings of decentralized censuses and separate statistics by departments and disaster types in the past.

4.Thematic application in comprehensive monitoring and early warning of natural disasters: Access to the monitoring data of the perception network constructed according to the characteristics of natural disasters in the jurisdiction, mainly including the perception data of forest fire risk monitoring stations, the aggregate displacement of geological disasters, cracks, moisture content, water level and other monitoring data and Early warning data, water conservancy projects, hydrology and other perception data of flood and drought disasters, and meteorological perception data such as aggregated data products, forecast products, early warning products and service products of meteorological disasters. "One Map" can conduct the comprehensive display and analysis of real-time disaster monitoring data, statistical data, disaster identification, risk zoning, disaster forecasting, risk assessment, forecasting and early warning, etc.

5.Thematic application in emergency command and rescue: It supports the map positioning and aggregation display of emergency resource information such as danger sources, protection targets, shelters, rescue teams, medical and health care, and material storage warehouses on "one map". Centering on the location of emergencies, it analyzes resources based on the type and level of emergencies, as well as the

radius of resource distribution. By superimposing shelters, rescue teams, material reserves, communication resources, transportation resources, medical and health care and other information, it forms a resource analysis circle, and achieves the quick query, dispatch and tracking of emergency materials, emergency teams, emergency experts, etc. Based on disaster information, material and resource demand information, combined with emergency thematic data and real-time monitoring data, the most appropriate material and resource allocation plan is achieved through analysis and calculation, providing spatial analysis support for the whole process of emergency event processing and assisting leaders in emergency command.

6.Thematic application in comprehensive research and decision support: Integrate geographic information technology with cloud computing, big data, Internet of Things, mobile Internet and other new-generation information technologies, and achieve comprehensive research and analysis of natural disaster emergency rescue functions based on "One Map", including:

6.1 Relevant research and judgment of pre-plan cases: According to the disaster information filled in by emergency duty guards, the intelligent matching technology is used to correlate with relevant pre-plans, cases, departments, response levels, proposed opinions, etc., to provide technical support for the preliminary research and judgment of incidents.

6.2 Analysis of disaster trends: After an emergency event occurs, it is necessary to effectively monitor the trends of the event to reduce secondary disaster losses. Through the comprehensive dynamic monitoring of the accident site, the system analyzes the event status in time according to the accident disaster fluctuation curve, and displays it visually with data and charts, allowing decision makers to learn the accident dynamics and trends.

6.3 Analysis of accident impact: When an emergency event occurs, the system automatically evaluates the impact of the event according to the event type and real-time data. At the same time, according to the surrounding geographical elements and socio-economic data of the event, relyingon GIS spatial analysis and overlay analysis, it automatically measures the impact of the event on the surrounding area and the scope of social impact.

6.4 Judgment of personnel evacuation plan: Based on the results of accident disaster trend analysis and impact scope analysis, the population evacuation model is used to determine the personnel emergency evacuation plan, and the personnel in the accident area are evacuated in time. It analyzes the severely affected areas that need to be evacuated, finds places that can be placed within a certain range (hospitals, schools, open spaces, etc.), find nearby medical institutions, blocks surrounding roads, deploys evacuation action teams, and

determine evacuation routes for evacuation. At the same time, based on factors such as weather conditions and population distribution, the system recommends and delineates the isolation and evacuation range in geographic information, including densely populated areas, schools, commercial areas, key protection areas, protected areas, and water sources.

6.5 Judgment of rescue forces: After an emergency occurs, to ensure the effectiveness of the emergency response, the rapid input of rescue forces is crucial. Aiming at the deployment of rescue forces, the system will coordinate the deployment plan of rescue materials, rescue teams and departments.

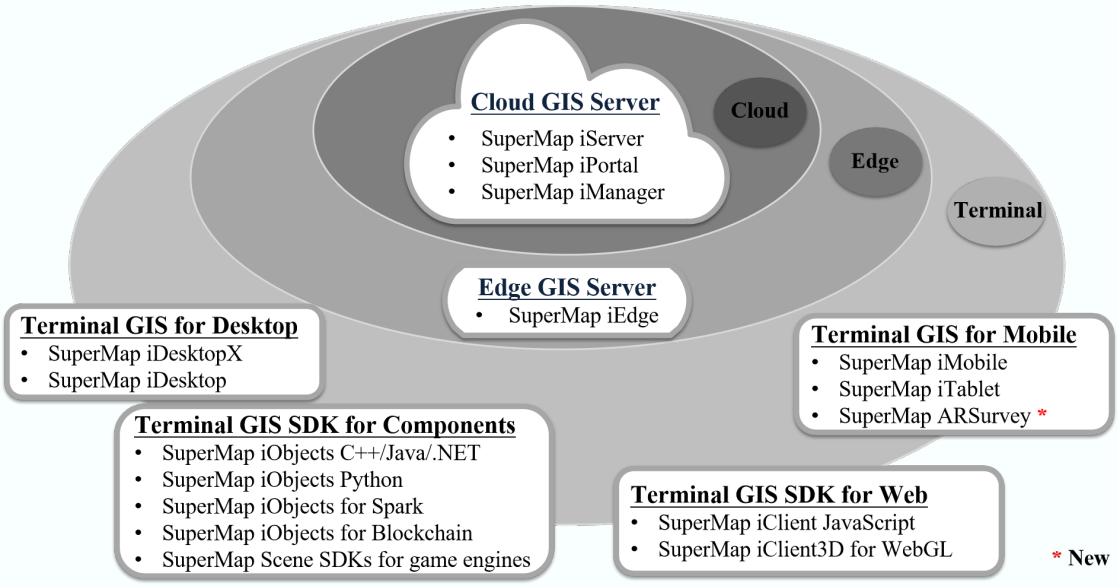
7.Thematic application in disaster impact assessment: Based on various types of disaster loss assessment models, predict the scope and affected area of danger at different times, apply the spatial analysis function of GIS, obtain information on people, buildings, and economic activities in the area, and finally estimate disaster losses.

8.Thematic application in emergency comprehensive situation analysis: For the dashboard of the emergency command center, the visual analysis engine is used to construct data visualization analysis and business resource visualization analysis in a self-service manner, so as to satisfy the simple, efficient, flexible and diversified visual display and information of information resources. Display requirements. Integrate the data resources of the information system related to natural disaster emergency management, covering daily monitoring and supervision, emergency command and dispatch, research and analysis and other business fields. This function is used in emergency monitoring and command, analysis and judgment, display and reporting and other scenarios.

Products:

What is SuperMap GIS

SuperMap GIS is developed by SuperMap Software Co., Ltd. It is a complete package of GIS platform software, including Desktop GIS, Service GIS, Component GIS, Mobile GIS platforms, spatial data production, processing and management tools. Furthermore, it is a good GIS software brand with full angles and strong functions which can meet different requirements for a wide range of industries.



SuperMap iServer: Full-featured Application Server for Cloud GIS

SuperMap iPortal: Portal for Cloud GIS

SuperMap iManager: Operation Manager for Cloud GIS

SuperMap iEdge: Server for Edge Computing GIS

SuperMap iObject: Full-featured Components GIS SDKs

SuperMap iDesktop: Full-featured Customizable Desktop GIS

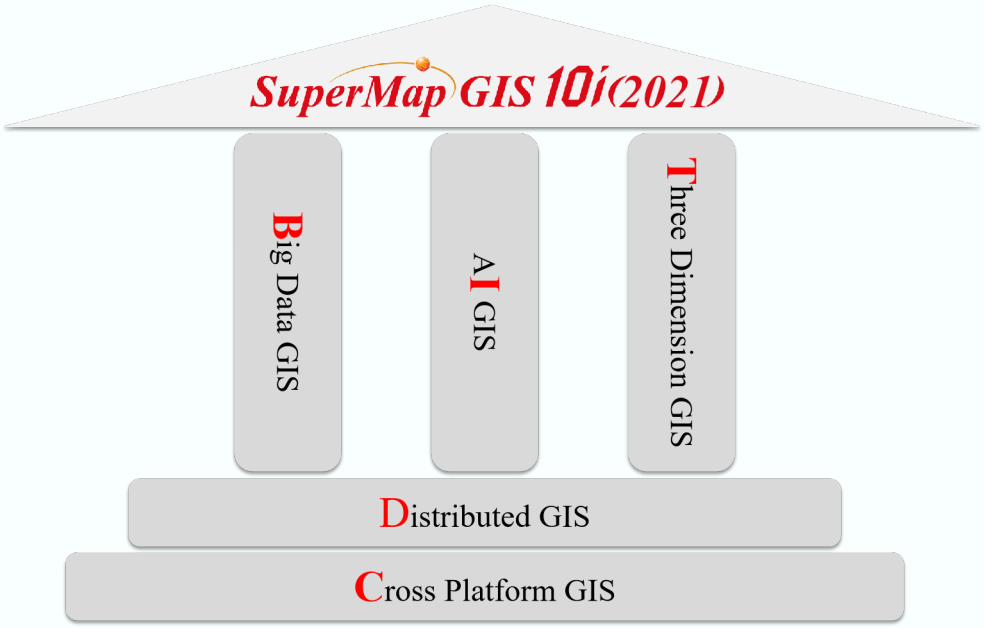
SuperMap iMobile: Native SDKs for Mobile GIS

SuperMap iTablet: Native App for Mobile GIS

SuperMap iClient: Web GIS APIs for Browsers

Technologies:

SuperMap GIS 10i(2021) integrates AI GIS technology, and further innovates Big Data GIS, 3D GIS, Distributed GIS and Cross Platform GIS to establish a five key technologies system of “BitDC” for GIS platform software.



Big Data GIS:

Supports distributed technologies, Spark distributed computing architecture and streaming data processing and analysis

AI GIS:

The integration of AI and GIS

3D GIS:

Integrates new IT technologies, such as WebGL, VR, AR, and 3D Printing, brings a more realistic and convenient 3D experience

Distributed GIS:

Builds a new distributed collaborative model of cloud, edge and terminal integrated GIS

Cross Platform GIS:

Supports multiple CPU architectures and operating systems

Application Cases:

- *Municipality GIS for Nyköping, Sweden*
- *3D Underground Pipeline Management System, Germany*
- *3D Cadastral Project, Turkey*
- *Mobile AI Recognition of Water Meter, South Africa*
- *National Police GIS, Mauritius*
- *Land Property Management System, Egypt*
- *House Decision Support System, Malaysia*
- *Geospatial Data Services Portal, Malaysia*
- *Global IOT Management System of HITACHI, Japan*
- *One Map of Ground Strength of National Residence, Japan*
- *Mobile Mapping Solution for Foreclime, Indonesia*
- *Big Data Spatial for Secure BaseMap System in BSSN, Indonesia*
- *Nature Reservoirs Locating System, Thailand*
- *Smart Agriculture Real-time Soil Monitoring System, Thailand*
- *Pipeline Analysis Solution, South Korea*
- *Forest Disaster Management System, South Korea*
- *Flight Monitoring System for Asiana Airline, South Korea*
- *Mountain Development Support System, Cuba*
- *Epidemic Surveillance System, Laos*

Human+Technology Pattern in Geological Disaster Monitoring and Early Warning

Author: Wang Yajun, SuperMap Platform Business Group

Tongchuan geological disaster monitoring and early warning management platform integrates human work and technologies, innovating geological disaster monitoring methods and prevention measures, and improving the early detection and early prevention of geological disaster hidden dangers.

Human beings keep searching for more advanced measures to conquer natural disasters throughout history. Traditionally, disaster management purely by human work has been the primary and single method. For instance, in group management, we used the telephone, documents, and other communication tools to exchange information; however, it is incapable of data-trace, management, and historical data analysis. Such a mere labor method finds it difficult to detect some creeping landslide or landslide with slow displacement change and has shortcomings in all-weather monitoring, which is to the disadvantage of danger detection and trend prediction.

Innovations

1.Human+Technology Disaster Prevention Pattern comprehensively improves the efficiency of early warning

Through the combination of labor work and information technology, the platform has optimized the reporting process and shortened the time for early warning of hidden dangers. This project has built a group monitoring&prevention grid system in response to hidden dangers and threats of geological disaster, where human defense is the major method and geological disaster monitoring and early warning system is the auxiliary method. It can prevent hidden dangers in advance, and enable people to quickly discover and report dangers.

2.Technology scheme in information construction of geological disaster monitoring and early warning

The information construction of geological disaster monitoring and early warning system adopts the platform cloud architecture, and the technical scheme includes the following aspects:

•(The design of the operating system) Adopt layered architecture technology, rely on the front-end and back-end separation architecture, and utilize mainstream Web technology and standard service interface development.

•Integrate data based on GIS one-map mode, integrate and distribute data for Internet of Things data and geological thematic data.

•Use the Internet of Things monitoring, early warning big data analysis, and timely communication technologies to build an all-weather monitoring and early warning perception system.

•Integrate monitoring data and real-time information to communicate with terminals to provide GIS 3D digital sand table for the command and dispatch in early warning.

3.Key technologies and innovative approaches

The project integrates the information technology and geological disaster prevention and control operation:

•Innovate the previous loess landslide monitoring and early warning model algorithm. Most of the geological disasters in Tongchuan City are Weibei (a region on the Loess Plateau) loess landslides. We innovatively built an early warning model for this type of landslide, calculating the tangent angle of the landslide variable rate based on the Xiyuan model, and conducted the qualitative and quantitative calculation of the tangent angle for an automatic early warning system.

•Use advanced GIS three-dimensional maps to assist in the layout of professional monitoring equipment. According to the geological hazard survey data, it can survey the objects within the landslide mass, speculate the location of the cracks, combine the survey data with the GIS three-dimensional map, and reasonably plan the location of monitoring stations.

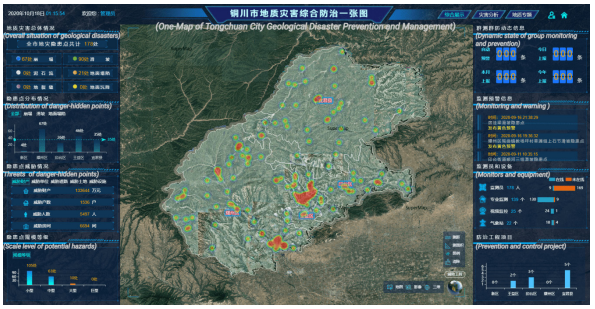
•Use GIS three-dimensional scene + Internet of Things to achieve the dynamic monitoring of geological disaster deformation. Support the visualization of the deformation monitoring data of geological disaster points based on the 3D digital sand table, analyze the deformation trend of the sliding mass in combination with the geological characteristics, and assist users in comprehensive research and judgment, early warning, and emergency command.

•Real-time convergence technology based on BeiDou monitoring sliding mass deformation data. This technology can monitor the deformation data of geological hazard bodies around the clock and send it back to the early warning center, achieving real-time collection and storage of multi-device monitoring data and big data calculation.

What users say

Combined with the status quo of geological disaster prevention and control in Tongchuan City, this system has enriched geological disaster monitoring methods, optimized geological disaster management mechanisms, and strengthened the training of professionals in geological disaster prevention and control. Tongchuan City’s geological disaster prevention and control have been transformed from passive management to active prevention and control and from lagging management to source management.

Since the official operation of the platform, there have been 351 automatic early warnings, including 218 blue early warnings, 112 yellow early warnings, 18 orange early warnings, and 3 red early warnings. The responsible person in charge of geological disaster prevention and control in the jurisdiction was notified in time through text messages and other handy means. All localities have stepped up inspections and urgently dealt with dangerous situations according to the early warning information.



SuperMap Forest Disaster Management System in Korea

Source: SPH

Forests play a special role in reducing various natural disasters. The quantity and quality of forest resources not only affect the economic development of a country or a region, but also the ecological development and human survival.

In order to better implement the Korean forest planning, the Korean Forestry Bureau and SuperMap created a GIS forest disaster management system based on various forest databases (including forest maps and national forest resources surveys).

Construction objects

The main objects of the system are: First, it protects forest resources, protects and improves forest ecosystem. Second, it predicts forest disaster information related to the forest spatial information. Third, it prevents forest disasters, and reduces identification time of disasters. Fourth, it connects with various government agencies and information to manage fires, landslides, pests and forest ecosystems, so as to improve the efficiency of rescue operations and minimize the deaths and property losses in forest disasters. Fifth, it provides space location information and quick response services for on-site rescue.

System requirements

-Data processing

The project involves a large number of different types and formats of data, including basic vector data, remote sensing image data, text data, and some intermediate results data. These data usually have various quality problems that need to be extensively collected and classified before use. Also, the necessary processing actions should be performed on data according to system construction requirements, such as image data correction, splicing, etc. Therefore, the data collection, classification, pre-processing, warehousing and so on should be carried out before the system construction, which can provide data guarantees for system construction.

-Database building

After the preparation work of data collection and processing, the database structure needs to be designed. A good database structure can guarantee the efficiency and performance of the system and avoid unnecessary redundancy.

Therefore, the database construction and qualified data inputting is the premise of system construction and the guarantee of qualified operations. The system established a forest disaster database that includes forest space information and forest ecosystem information.

-Subsystem construction

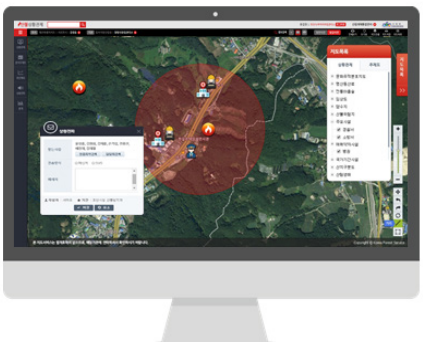
Based on the forest disaster database, the forest information sharing platform and forest information sharing portal are established for the sharing of forestry information and forest thematic maps. According to the business requirements of Korean Forestry Bureau, the forest disaster database management system, forest fire management system, forest pest management system, and landslide management system were established. Among them, the database management system is used to store and manage various types of forest disaster monitoring data and related geospatial data. The forest fire management system is used to manage fire monitoring, fire spreading, fire fighting and afterwards management. The forest pest management system is used for forest pests management includes forecasting, epidemic investigation, disaster prevention planning implementation and analysis. The landslide management system is used for landslide detection, forecasting, management, prevention planning implementation and disaster afterwards management.

System function design

-Forest Fire Management System

The forest fire management system provides the functions such as disaster rescue information inquiry, forest fire monitoring, COMS automatic detection, disaster response, and disaster warning. The disaster rescue information inquiry function enables people to inquire the disaster rescue information of the place where wildfire occurs. The forest fire monitoring function provides wildfire monitoring, which can be divided into the individual report and system report. The individual report can report fire cases through the 119 public reporting system and forest guard activities. And the system report can monitor wildfire through the COMS and the closed circuit television. The COMS automatic detection function refers to the development and application of the wildfire detection algorithm. It not only automatically monitors Korea, but also monitors Southeast Asia, which can be effectively used to monitor the fires at nighttime.

The rapid response function of disasters refers to the possibility of conducting the space survey when a disaster occurs. For instance, the confirmation of the infrastructure of the country within 1–2 km from the origin of a fire can help to minimize the loss of life and property. When a disaster occurs, it can send the text messages to nearby fire fighters with mobile phones and display the location and movement path of wild fires, so that fire fighters can quickly understand the fire status. The disaster warning function can predict the occurrence of wild fires and confirm the location where forest fires are prone to occur through the classification of wild fire risks.



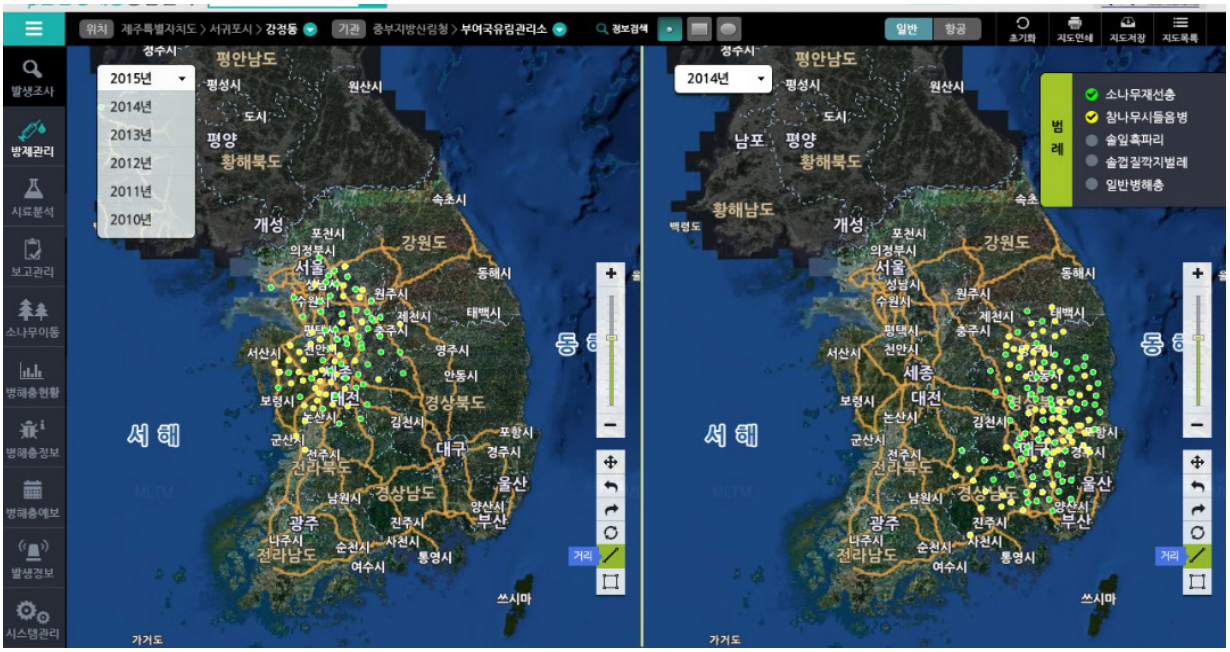
Forest Pest Management System

The forest pest management system provides the functions of forest pest information sharing, forest pest forecasting, and forest pest disaster time-series simulation. The forest pest information sharing function can help to minimize damages by sharing and using information of forest disaster, pests disaster and disaster prevention. It can spread information to nearby areas of forest disasters and pest disasters, and provide disaster prevention resources and cases. The forest pest disaster forecasting function refers to automatically inputting forest disaster and pest survey data through excel and sharing in real time to reduce the management work. The system can also share the information with nearby governments to prevent the spread of forest diseases and pests. The time-series simulation function of forest pests disaster can conduct time-series analysis on the development of forest pests disaster, and develop basic information for planning and conducting basic research on forest pests disaster.

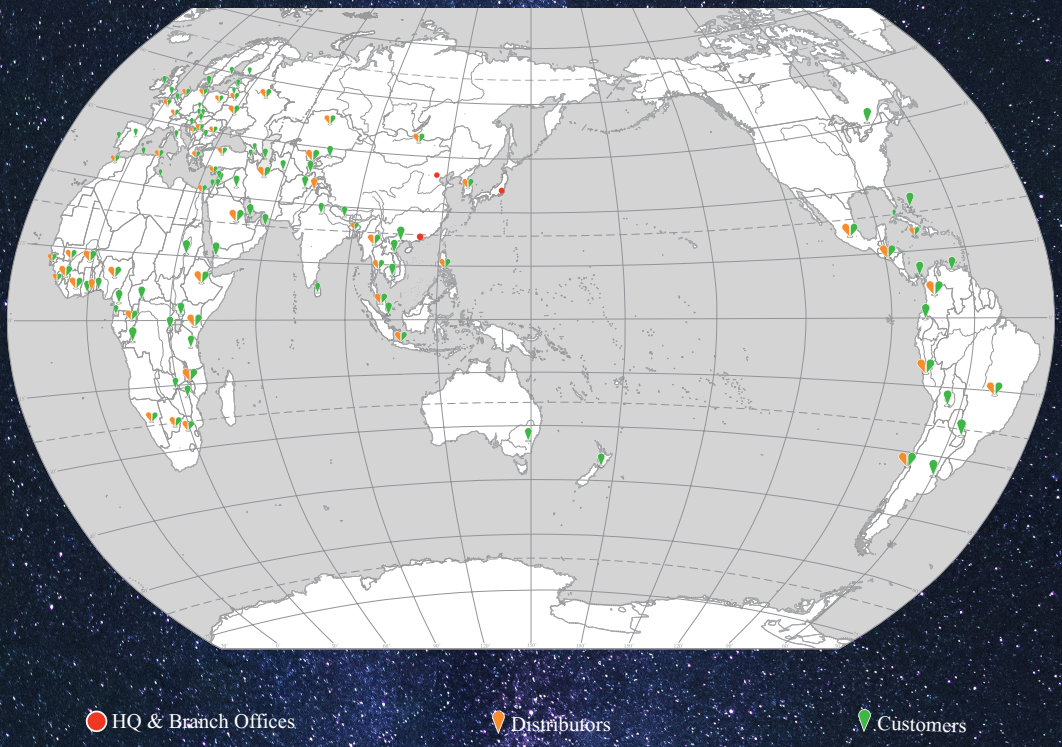
Mountain Landslide Management System

The landslide forecasting system integrates the information of regional rainfall distribution and geological features in Korea for landslide prediction.

The Korean Forest Disaster Management System enables the minimization of death and property damage, protects forest resources, and improves the forest ecosystems. It has completely changed the traditional working methods, shortened the forest disaster processing time and the identification time of forest disasters and pest disasters, and improved the accuracy of fire forecasting and landslide forecasting. In all, the system greatly improves the economic benefits of the Korean government in forest disaster prevention and relief.



Global Distributors and Users



SuperMap has developed distributors and partners in more than 50 countries and SuperMap GIS end users in over 100 countries. We are looking for more partners from all over the world to build a global partner eco-system.