

Geo-information Techniques in AIST

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Abstract

Publications and databases in GSJ

The Geological Survey of Japan (GSJ) published geological maps at scale of 1:50,000, 1:75,000, 1:200,000, 1:1,000,000, and 1:2,000,000 during the last 125 years. Other maps like active fault, active volcano, marine geology, hydrogeology, mineral resources, coal, oil and gas fields, intensity of aeromagnetic, and geothermal maps are also published. GSJ published a total of 41 CD-ROM series including 1:200,000 geological maps in vector and raster formats. GSJ established more than 10 databases in the Research Information Data Base (RIO-DB; <http://www.aist.go.jp/RIODB/riohomee.html>) of the National Institute of Advanced Industrial Science and Technology (AIST). The databases include active fault, active volcano, seamless digital geological map, geothermal drill core, marine mineral, geophysical exploration activity, basement rocks, geochemical map, crustal stress, and geological literature databases. These maps and databases have been published on printed sheets, CD-ROMs, and normal html-based websites. GSJ decided to integrate most of these maps and database on a Web-GIS system to facilitate the accessibility of the geological data of the organization in 2005 (GEO-DB project).

GeoMapDB

GSJ introduced a new Integrated Geological Map Database (GeoMapDB) in Sep., 2006 (<http://iggis1.muse.aist.go.jp/en/top.htm>). The GeoMapDB is based on a WebGIS (ArcIMS) technology, which makes it possible to browse, overlay and search geological maps online. The purpose of this database is to make many kinds of geological maps produced by GSJ accessible to the general public. The database contains geological maps with scales ranging from 1:2 million to 1:25,000. The database includes the 1:1 million geological map of Japan (3rd edition), 1:200,000 seamless digital geological map of Japan (http://www.aist.go.jp/RIODB/db084/index_e.html), 1:200,000 geological map of Japan (raster at 150 dpi and vector formats), 1:50,000 quadrangle series (raster format), and the 1:25,000 environmental geologic map of the Tsukuba Science City (raster and vector formats). It is possible to search information using the attribute tables of maps in vector format. Legends and cross sections of the 1:50,000 quadrangle series and environmental map of Tsukuba city are available. Links to Quaternary volcanoes and active faults databases are also available. Links to other databases, such as geological literature, outcrop information, dating, geological sample databases would also be made available soon. Three

dimensional (3D) display of the viewing area is also possible. Downloading viewing image at 150 dpi and original files in raster (geotif and KMZ) and vector (shape and eps) formats is possible. Web Mapping Service (WMS) for the 1:1 million geological map of Japan and 1:200,000 seamless digital map of Japan is available. Thus, overlapping borehole data and landslide data from other agencies and overlaying on the Google Earth map is possible. GSJ decided to contribute the data from GeoMapDB to the OneGeology project (<http://www.onegeology.org/>), which aims to make 1:1 million digital geological map of the world using WFS.

GEO Grid

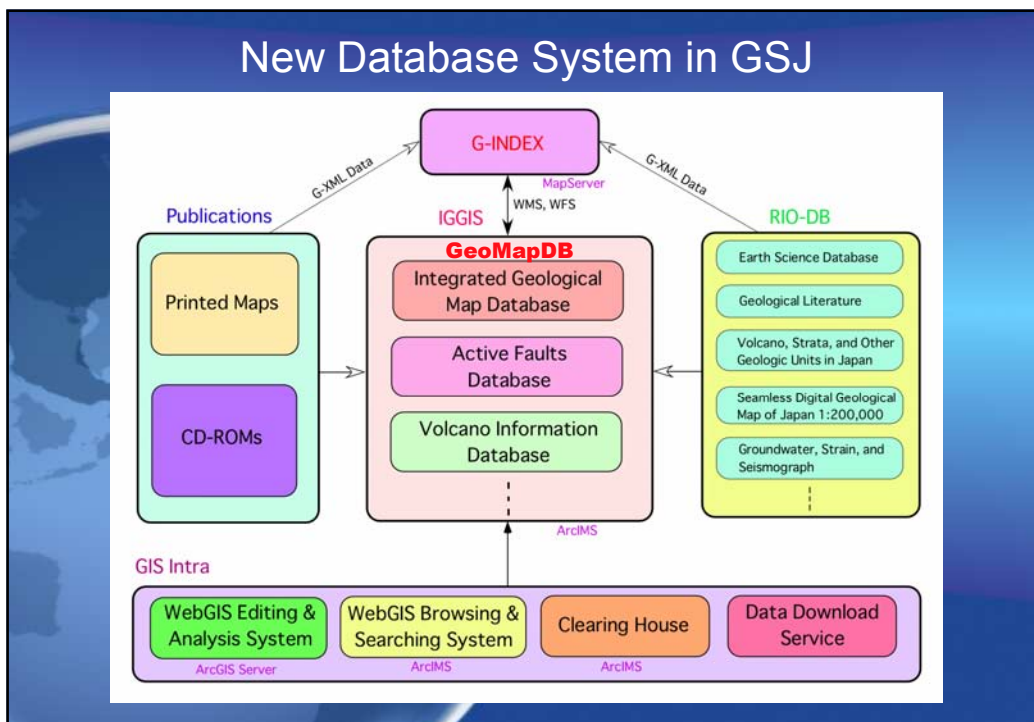
The GEO Grid is a grid technology system to provide securely and rapidly large archives of earth observation satellite data and integrated service with various observation databases and GIS data. The core contents of the system are the observation data from the earth observation satellite (ASTER) and geoscientific information, such as geological and environment technology data in AIST. Numerical simulation of pyroclastic flows on volcanoes using ASTER digital elevation model (15 m mesh) is one of the major application on the GEO Grid project.

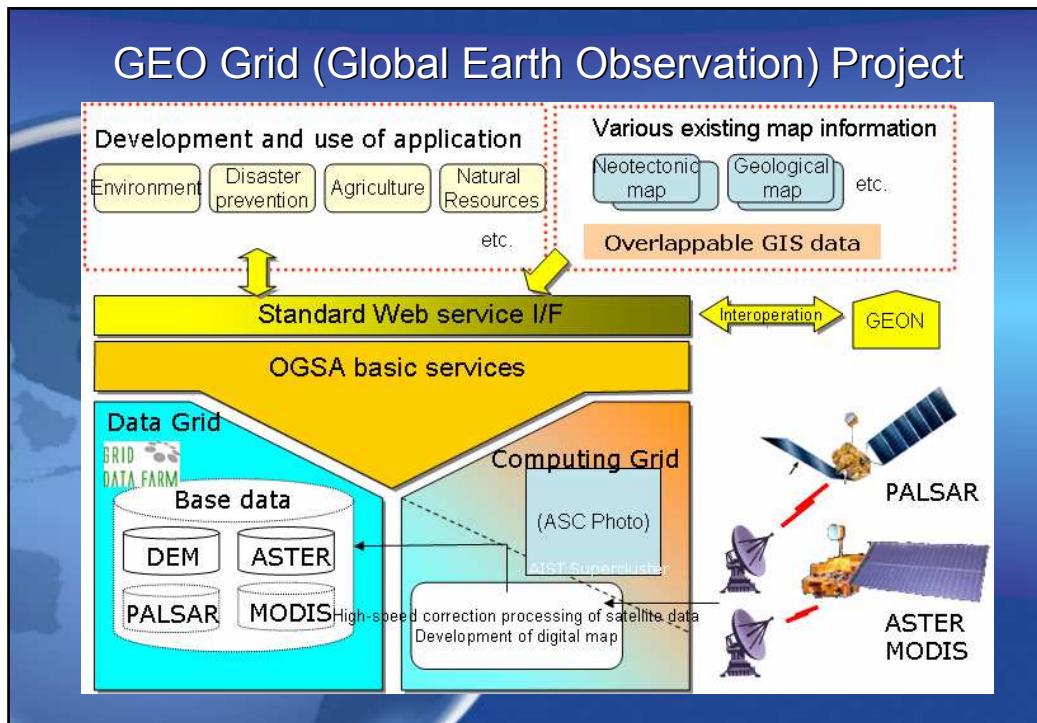
Volcanic disaster mitigation maps (Volcanic hazard maps) are available at most major active volcanoes in Japan. A GIS system overlaying various kinds of information and real time numerical simulations on website are necessarily for the next generation volcanic hazard maps.

Pyroclastic flow simulation using the energy cone model was made on the GEO Grid system. An interactive user interface is available on the GEO Grid website. Only two parameters (column collapse height and equivalent coefficient of friction) are necessarily to evaluate potential hazardous area by pyroclastic flows. In this stage, pyroclastic flow simulations are available at 14 volcanoes, such as Merapi (Indonesia), Fuji, Unzen, Sakurajima, Usu, and Bandai Volcanoes. It is possible to update the DEM data during the eruptions by taking new ASTER satellite data. Runtime for each simulation is only 10 seconds to 3 minutes due to grid computing technology. The energy cone simulation on the GEO Grid system is applicable to other disasters such as debris avalanches and landslides. The pyroclastic flow simulation is open to all scientists and local government officials at <http://www.geogrid.org/gridsphere>. Numbers of applicable volcanoes are increasing. Numerical lava flow and grain flow simulations are planning for the next step.

Integrated Geological Map Database and the GEO Grid project in the Geological Survey of Japan, AIST

Shinji Takarada
Geological Survey of Japan
AIST





Contents

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5. 1991-95 Unzen pyroclastic flow, Japan
6. Next Generation Volcanic Hazard Map
7. **Volcanic Gravity Flow Simulation** using ASTER DEM

Publications

Catalogue of Geologic Maps
 Published by
 Geological Survey of Japan

To Japanese Page, click here

NEWLY PUBLISHED MAPS

- ▶ QUADRANGLE SERIES 1:50,000
- ▶ GEOLOGICAL SHEET MAP 1:75,000
- ▶ DIGITAL GEOSCIENCE MAP
- ▶ NEOTECTONIC MAPS

INQUIRY ON GSJ PUBLICATIONS

- ▶ GEOLOGICAL SHEET MAP 1:200,000
- ▶ GEOLOGICAL SHEET MAP 1:500,000
- ▶ TECTONIC MAP (STRIP MAP OF THE FAULT SYSTEM)
- ▶ GEOLOGICAL MAPS OF VOLCANOES

PURCHASE GUIDE

- ▶ 1:2,000,000 MAP SERIES
- ▶ 1:1,000,000 / 1:3,000,000 / 1:5,000,000 / ATLAS OF JAPAN
- ▶ MISCELLANEOUS MAP
- ▶ MARINE GEOLOGY MAP

Geoscience Map User Survey

- ▶ ASIA AREA GEOSCIENCE MAP
- ▶ WATER ENVIRONMENT MAP
- ▶ INDEX MAPS
- ▶ HYDROGEOLOGICAL MAPS
- ▶ MINERAL RESOURCES MAP
- ▶ GRAVITY MAP
- ▶ GEOLOGICAL MAPS OF COAL FIELDS OF JAPAN
- ▶ GEOLOGICAL MAPS OF OIL AND GAS FIELDS OF JAPAN
- ▶ TOTAL INTENSITY AEROMAGNETIC MAPS
- ▶ ISOHAL CONTOUR MAPS OF GEOTHERMAL AREA

— Last Update — Tue Apr 18 08:32:02 2006

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http://www.gsj.jp/Map/index_e.html

Geological Map of Japan & Atlas

- ▶ Map Catalogue Home
- ▶ Open Page
- ▶ List (text only)

1:1,000,000 Geological Map of Japan (3rd ed.)

- I. Legend, Index
- II. Northeast Japan (Including Offshore Areas)
- III. Central Japan (Including Offshore Areas)
- IV. Southwest Japan

Geological Atlas of Japan

1:1,000,000 Geological Map of Japan -Geological Atlas of Japan (2nd printing copy)

Geochemical Atlas of Japan, -Northern Kanto Area-

1:5,000,000 Geological Map of Japan (4th ed.)

1:3,000,000 Geological Map of Japan

1:3,000,000 Mineral Distribution Map of Japan

- I. Metallic Minerals
- II. Non-metallic Minerals
- III. Fuel Materials excluding Oil and Natural Gas

1:3,000,000 Geothermal Gradient Map of Japan (Printed out by both sides)

- Cover & Explanation
- Geothermal Gradient Map

1:1,000,000 Gravity Map of Japan (Bouguer Anomalies)

- I. Northeast Japan
- II. Central Japan
- III. Southwest Japan

1:1,000,000 Geological Map of Japan (3rd ed.)

- I. Legend, Index
- II. Northeast Japan (Including Offshore Areas)
- III. Central Japan (Including Offshore Areas)
- IV. Southwest Japan

Publications (Printed)

DIGITAL GEOSCIENCE MAP

▶ Map Catalogue Home ▶ Open Page

DGM GT-2
Distribution Map and Catalogue of Hot and Mineral Springs in Japan (Second Edition) (CD-ROM Version)
▶ CD-ROM
▶ Example of displaying

- Pub : 2005
- Prices : ¥1,050

DGM FR-1
Fuel Resource Geology Map "Off Sanriku"
▶ CD-ROM
▶ Example of displaying

- Pub : 2005
- Prices : ¥1,050



DGM EQ-1
Tsunami inundation maps for the Pacific Coast of Hokkaido
▶ CD-ROM
▶ Example of displaying

- Pub : 2004
- Prices : ¥1,155

DGM G20-1
Digital Geological Maps of Japan 1:200,000, North Hokkaido
▶ CD-ROM
▶ Introduction
▶ Requirements and Instruction
▶ Explanation for Vector Data

- Pub : 2003
- Prices : ¥1,050

Digital Geoscience Map Series G20-1
Digital Geological Maps of Japan 1:200,000, North Hokkaido

- Pub : 2003
- Prices : ¥1,050

Publications (CD-ROMs)

RIO-DB

Research Information Database

What's New [Last Up Date 2006/ 5/ 8]

Japanese

RIO-DB (Research Information Database) is a multimedia one concerning various research information which are developed and accumulated as many [AIST](#) R&D projects. RIO-DB project aims to contribute to creation and promotion of new business from academic society to industrial community by spreading around the research information via internet. Following items are published as RIO-DB from [TACC \(Tsukuba Advanced Computing Center\)](#), and the contents will be continually revised.

News

Earth Sciences

Chemistry

Material

Biology

Safety

Information Technology

Standard

Energy

* Research Information Data Base

Earth Sciences

- [Geological Literature](#)
- [Earth Science Database](#)
- [Northwest Pacific Carbon Cycle Study](#)
- [Volcanoes, Strata, and Other Geologic Units in Japan](#)
- [Image Database of Geothermal Drill Core Samples](#)
- [NW-Pacific Marine Mineral Data](#)
- [Environmental Impact Research for Deep Seabed Mineral Resource Development](#)
- [Geophysical Exploration Activity Database](#)
- [Petrophysical Data Base of Basement Rocks in Japan for the 21st Century](#)
- [Ecosystem Database](#)
- [Seamless Digital Geological Map of Japan 1:200,000](#)
- [The Groundwater, Strain and Seismograph Presentation System](#)
- [Database of elemental distribution \(geochemical map\) in Japan](#)
- [Geological Metadata Clearinghouse](#)
- [Active Fault Database](#)
- [Crustal Stress Database](#)

<http://www.aist.go.jp/RIODB/riohomee.html>

RIO-DB

地球科学データベース

Viewing by Zoomview
(for Mac&Windows)

Viewing by ZOOMA
(for Windows)

Viewing by J-Geoview
(for Mac&Windows)

Whole Japan Regional
(Internet Explorer only)

Legend

Seamless Digital Geological Map of Japan (1: 200,000)

To Japanese Version

(With Shaded DEM only)

(With Topo Map and Shaded DEM)

Geological Survey of Japan, AIST

The Geological Survey of Japan (GSJ), AIST started creating the 1:200,000 seamless digital geological map of Japan in 2001. The map is based on the 1:200,000 geological quadrangle maps that have been published by GSJ since the 1950s. The seamless map from Hokkaido to Nansei Island areas was completed in Dec. 2005. It was created mainly according to the litho-stratigraphic framework of the Geological Map of Japan 1:1,000,000, 3rd Edition (GSJ, 1992). The geology of the maps was updated by checking the latest geological data and adjusted the stratigraphic and structural discordance among the original maps using Geographic Information System (GIS) software. Some detailed original information may have been lost during the seamless map generation. However, the quality of some geological information like the rock type and location accuracy are much better compared to the Geological Map of Japan 1:1,000,000, 3rd Edition.

Last Updated: Mar. 14, 2006

The 1:200,000 digital topographic map images and 50m-mesh DEM data published by the Geological Survey Institute of Japan were used in the seamless map creation.

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http://riodb02.ibase.aist.go.jp/db084/index_e.html

RIO-DB

Active fault database of Japan - Microsoft Internet Explorer

http://www.aist.go.jp/RIODB/activefault/cgi-bin/index_e.cgi

Active fault database of Japan

TOP Search What's New Contact Us Japanese Site

Entrance

- Search for behavioral segments
- Name of a behavioral segments
- Fault parameter
- Select all behavioral segments

What's New

2007/3/26
HomePage update.

2006/12/20
HomePage was renewed.

2005/12/01
Publish an English version.

Past Update History

Easy Search

Map Search

Outline

This website contains information of active faults in Japan, sorted by the concept of "behavioral segments" [McCalpin, 1996]. Each fault is subdivided into behavioral segments based on surface trace geometry and rupture history revealed by paleoseismic studies. Faults shown on the index map are linked to a database of behavioral segments, which contains information of geologic and paleoseismic parameters including slip rate, slip per event, recurrence interval, and calculated rupture probability in the future. Behavioral segments can be searched also by name or combination of fault parameters. All those data are compiled from journal articles, theses, and other documents. We are currently developing a revised edition which is based on an improved database system.

Notice

The active fault data displayed on this website cannot be used for commercial purpose. Contact Active Fault Research Center (AFRC) when you wish to reprint or reproduce this database. Proper citation of the source (i.e., AFRC) is required for all other purposes.

AIST | Active Fault Research Center | RIODB | RIODB Maintenance Information | Contact Us | What's New |
©National Institute of Advanced Industrial Science and Technology (AIST)


http://riodb02.ibase.aist.go.jp/activefault/cgi-bin/index_e.cgi

RIO-DB

Quaternary Volcanoes in Japan

This database includes Japanese volcanoes that were active during the Quaternary (ca. 1.7 Ma to present). Most subaerial volcanoes are included. Submarine volcanoes included in this database had erupted, and/or showed seawater discoloration and/or hydrothermal activity. The Japan Meteorological Agency (JMA) has defined active volcanoes in Japan as "volcanoes which have erupted within the past 10,000 years or volcanoes with vigorous fumarolic activity."

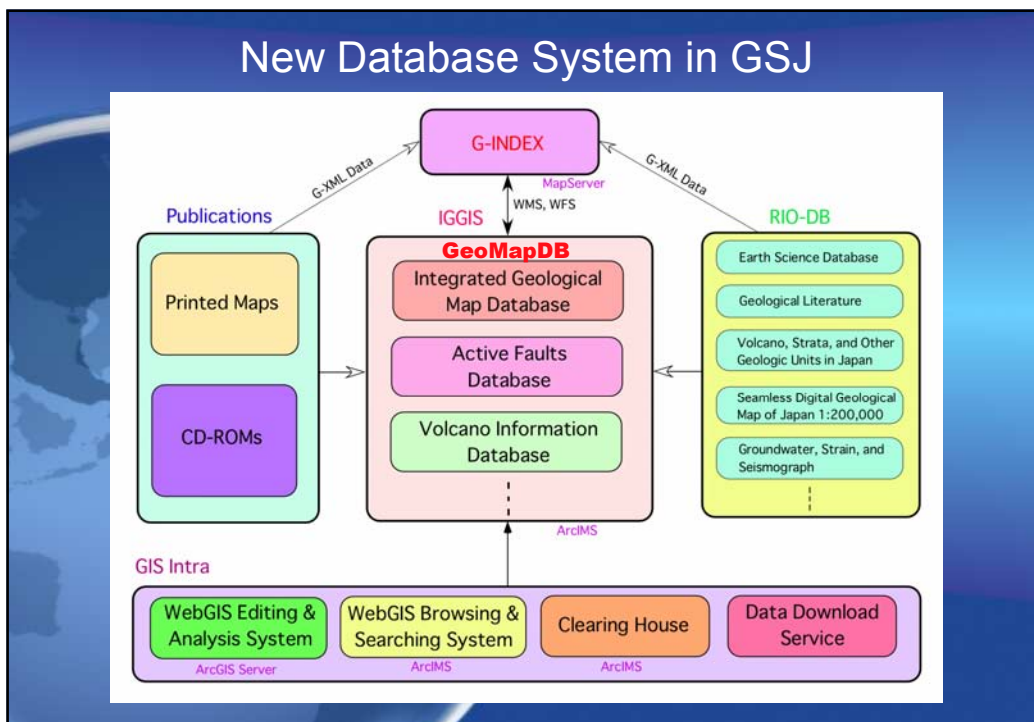
Ver. 0.9E
First update
09 March 2006



- Volcano by Region
 - Index Map of Volcanoes
 - Index Map of Active Volcanoes
- Volcano by Name
 - List of Volcanoes
 - List of Active Volcanoes

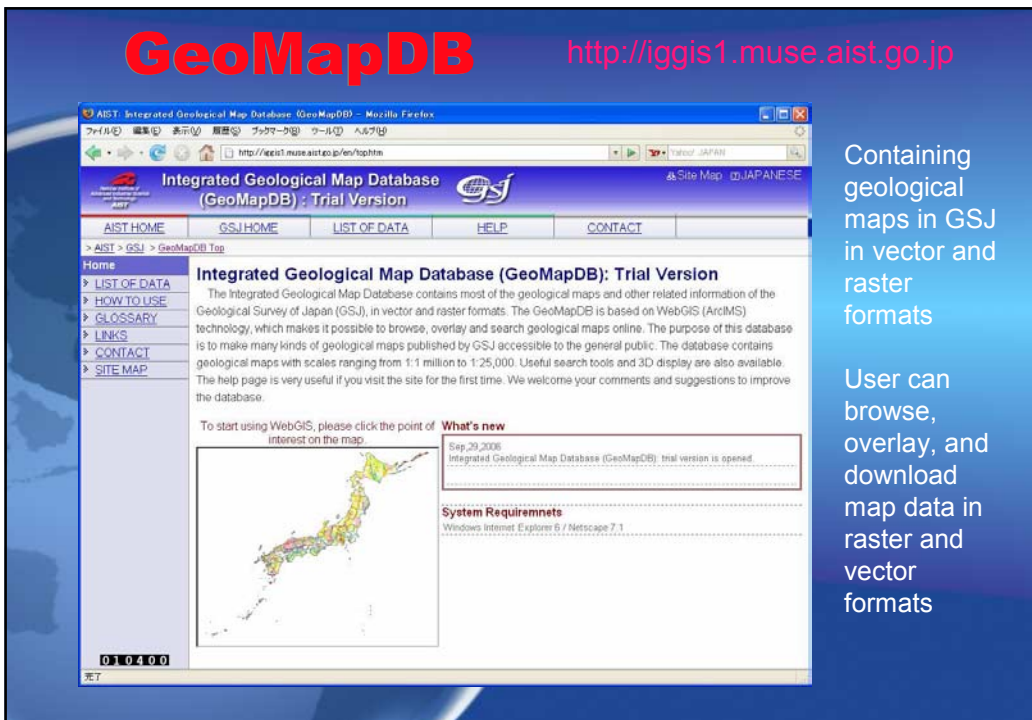
Information (in preparation)
About "Name of Volcanoes in Japanese"

http://riodb02.ibase.aist.go.jp/strata/VOL_JP/EN/index.htm



GeoMapDB

<http://iggis1.muse.aist.go.jp>

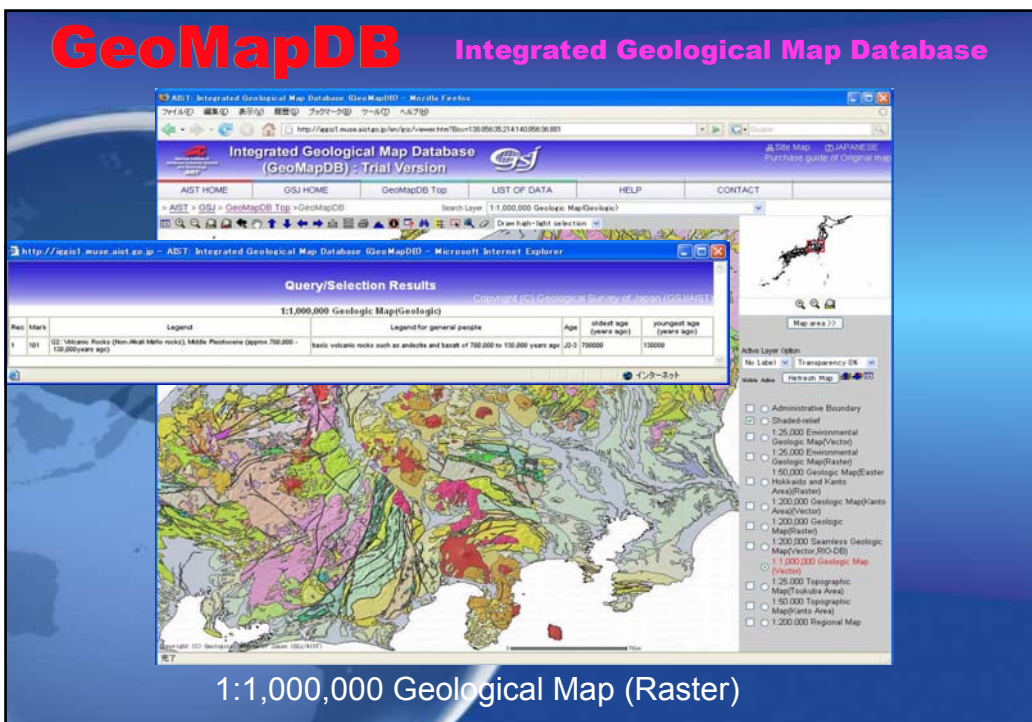


Containing geological maps in GSJ in vector and raster formats

User can browse, overlay, and download map data in raster and vector formats

GeoMapDB

Integrated Geological Map Database



1:1,000,000 Geological Map (Raster)

GeoMapDB Integrated Geological Map Database

1:50,000 Geological Map (Raster)

GeoMapDB Integrated Geological Map Database

No.	Mark	Legend	Age	youngest age (years ago)
1	99	Q3: Holocene River Deposits (Recent alluvium)	0	0
		Q2: Pleistocene River Deposits (Recent alluvium)	0	0
		Q1: Holocene River Deposits (Recent alluvium)	0	0
		Q0: Holocene River Deposits (Recent alluvium)	0	0

1:200,000 Seamless Geological Map of Japan (Vector)

GeoMapDB Integrated Geological Map Database

The screenshot displays the GeoMapDB web application. The main map shows a geological map of Japan with volcanic rocks highlighted in red. The interface includes a search bar, legend, and a 'Query/Selection Results' table. The table lists various geological features and their attributes.

Legend	Legend for general people	Age	Keyword	Search
Undefined	Undefined	10,000 year	Volcanic	All the conditions

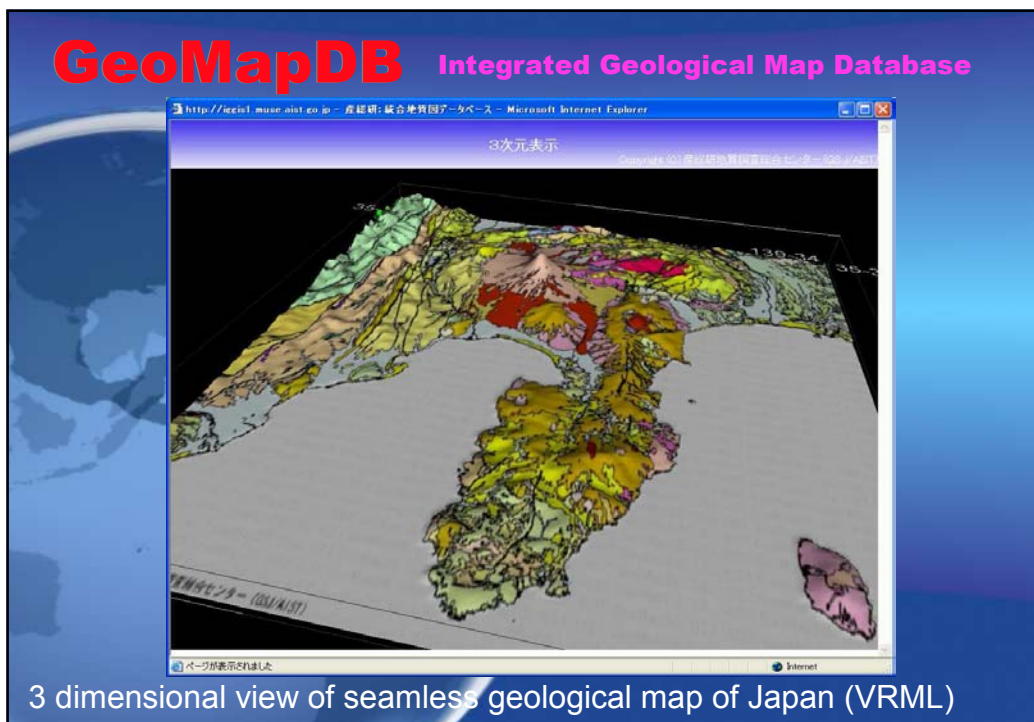
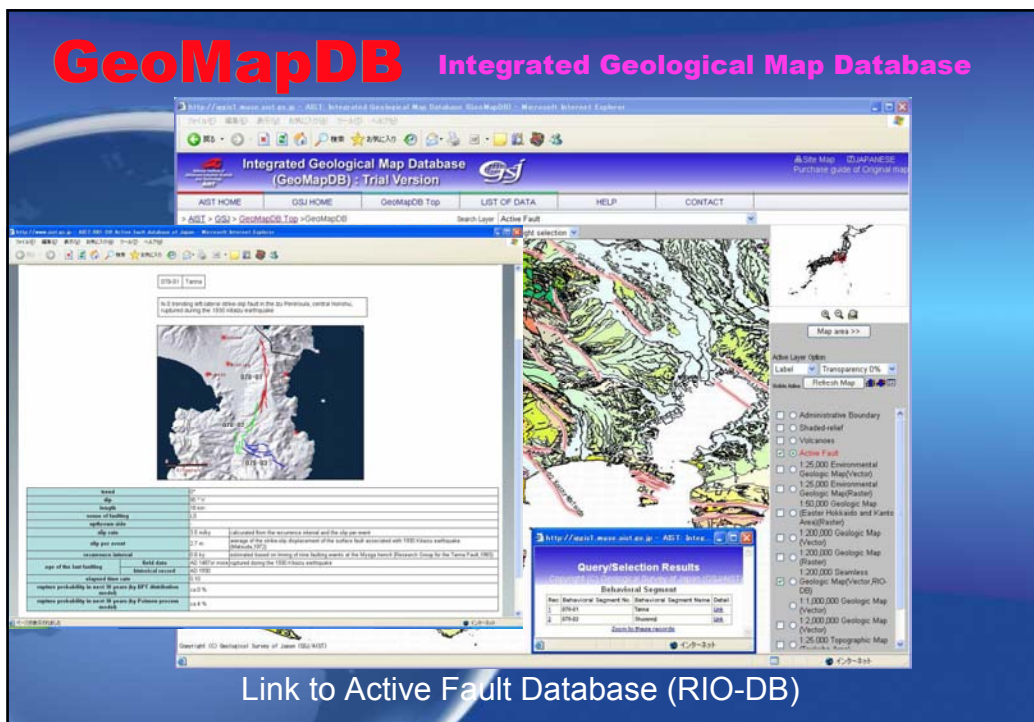
1:200,000 Seamless Geological Map of Japan (Volcanic Rocks)

GeoMapDB Integrated Geological Map Database

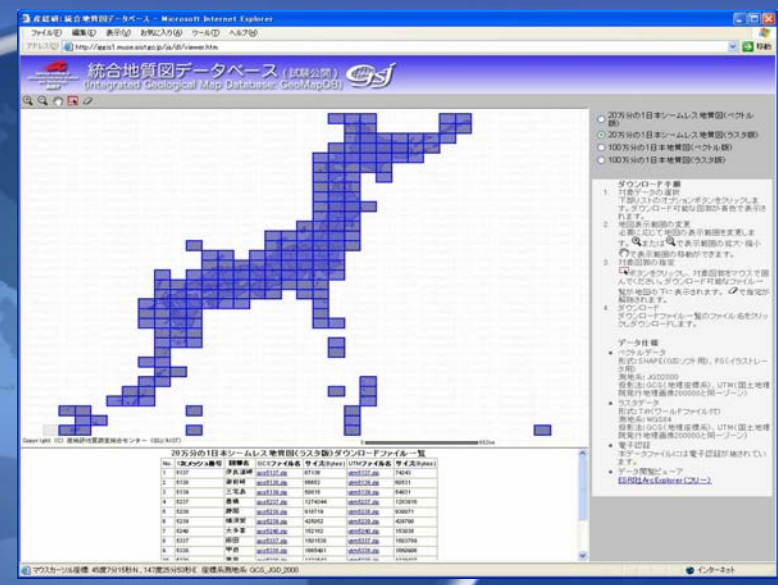
The screenshot displays the GeoMapDB web application with a detailed view of the Asama-Yama volcano. The interface includes a gallery of photos, a detailed information table, and a geological map.

山名	別名	目録
流山	流山	ASAMA-YAMA
標高	2569 m	
郵便番号	群馬 吾野 GUANO, SANGANO	
1/25,000地形図	吾野	
1/25,000地質図	吾野	
1/25,000地質図	吾野	

Link to Volcanic Databases



GeoMapDB Integrated Geological Map Database



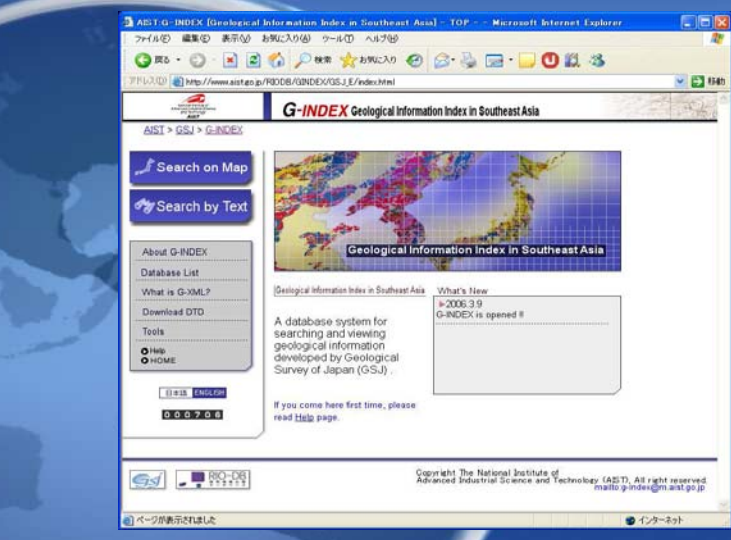
The screenshot shows the GeoMapDB website interface. At the top, there's a navigation menu. The main content area features a map of Japan with a grid overlay. Below the map is a table with columns for 'No.', 'Name', 'URL', 'UTM Zone', and 'UTM Zone'. The table lists various geological maps of Japan.

No.	Name	URL	UTM Zone	UTM Zone
1	伊豆半島	http://www.gsj.go.jp/RIODB/GINDEX/GSJ_E/IDU.html	UTM32Q	UTM32Q
2	伊豆半島	http://www.gsj.go.jp/RIODB/GINDEX/GSJ_E/IDU.html	UTM32Q	UTM32Q
3	伊豆半島	http://www.gsj.go.jp/RIODB/GINDEX/GSJ_E/IDU.html	UTM32Q	UTM32Q
4	伊豆半島	http://www.gsj.go.jp/RIODB/GINDEX/GSJ_E/IDU.html	UTM32Q	UTM32Q
5	伊豆半島	http://www.gsj.go.jp/RIODB/GINDEX/GSJ_E/IDU.html	UTM32Q	UTM32Q
6	伊豆半島	http://www.gsj.go.jp/RIODB/GINDEX/GSJ_E/IDU.html	UTM32Q	UTM32Q
7	伊豆半島	http://www.gsj.go.jp/RIODB/GINDEX/GSJ_E/IDU.html	UTM32Q	UTM32Q
8	伊豆半島	http://www.gsj.go.jp/RIODB/GINDEX/GSJ_E/IDU.html	UTM32Q	UTM32Q
9	伊豆半島	http://www.gsj.go.jp/RIODB/GINDEX/GSJ_E/IDU.html	UTM32Q	UTM32Q
10	伊豆半島	http://www.gsj.go.jp/RIODB/GINDEX/GSJ_E/IDU.html	UTM32Q	UTM32Q

Data download service

- 1:1M map
- Seamless map
- Raster data
- Geotiff
- KMZ
- Vector data
- Shape
- EPS

G-INDEX Geological Information Index in Southeast Asia



The screenshot shows the G-INDEX website interface. It features a search bar, a map of Southeast Asia, and a sidebar with navigation links. The main content area contains a description of the database system and a 'What's New' section.

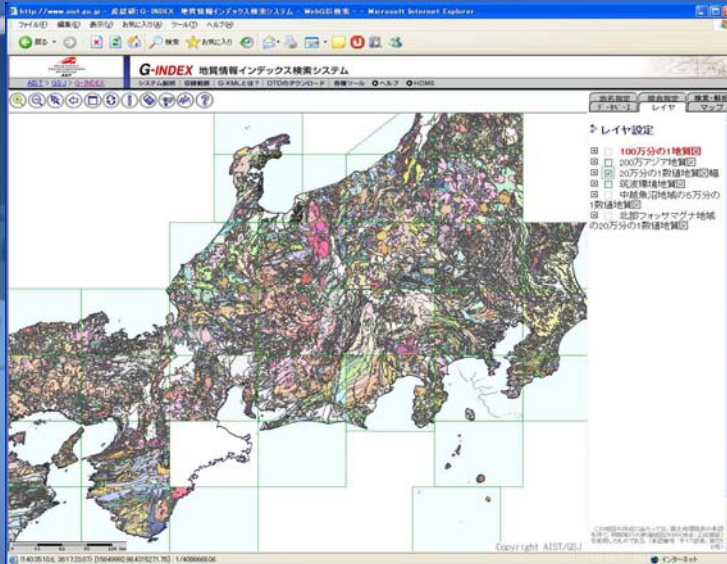
Portal Index Site

- MapServer
- PostgreSQL
- Linux

http://www.aist.go.jp/RIODB/GINDEX/GSJ_E/

G-INDEX

Geological Information Index in Southeast Asia



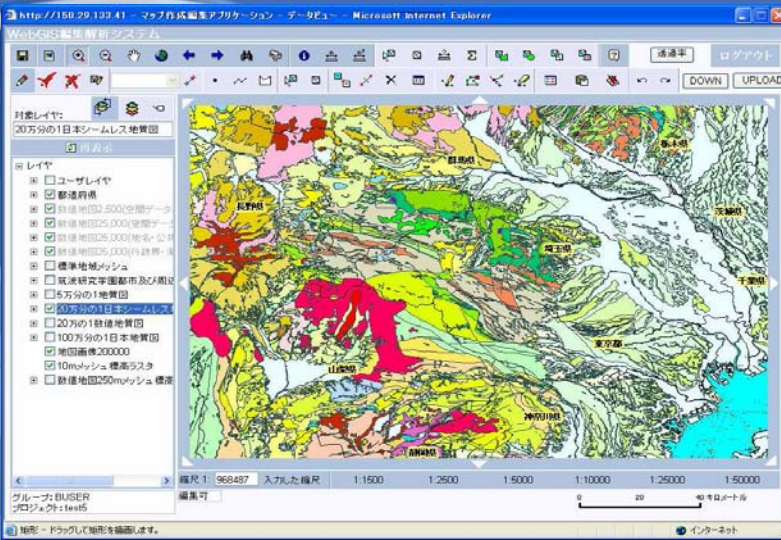
Containing most data in GSJ in vector formats

User can select data, browse, search, and overlay vector data

1:200,000 Geological Maps of Japan

GIS Intra

WebGIS Editing & Analysis System



Containing geological maps in GSJ in vector and raster formats

User can add and edit the data, upload and download the data using a web browser

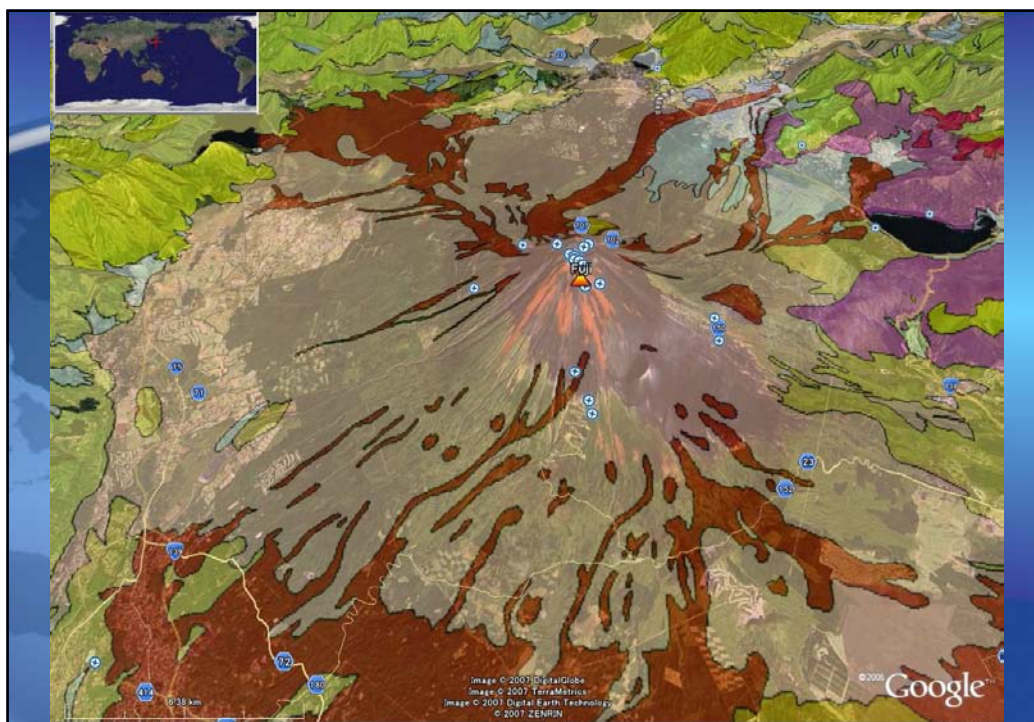
ArcGIS Server 9.1

Collaboration with GEO Grid (WMS)

The screenshot shows the G-INDEX web mapping interface. The main map area displays a geological map with various colored regions (green, brown, purple) overlaid on a satellite image. A sidebar on the right contains a 'レイヤ設定' (Layer Settings) panel with a list of layers and checkboxes. The layers include:

- 100万分の1地質図
- 12000000 asia common
- 200万アジア地質図
- 20万地質図(GeoMapDB)
- 20万分の1数値地質図
- 50万分の1活構造図
- ASTER画像(GEO Grid)
- 岩石物性値DB(G-INDEXX)
- 見島沖志層堆積図
- 地すべり地形分布図
- 中越魚沼地域の6万分の1数値地質図
- 能登半島東方海底地質図
- 北部フォッサマグナ地域の20万分の1数値地質図

Text on the right side of the slide reads: "A test bed overlaying a geological map and ASTER satellite image on the G-INDEX using WMS (Web Mapping Service)".



Overlaying landslide and borehole information

The screenshot shows a web browser window displaying a GIS application. The title bar reads "MapServer Atlas - Mozilla Firefox". The address bar shows a URL starting with "http://www.webgis.jp/webgis/Atlas/". The main content area is a map titled "Web-GIS" showing a geographical area with various features. On the left side, there is a "レイヤー" (Layers) panel with several checked items, including "ボーリング柱状図(千葉県)" (Borehole logs (Chiba Prefecture)) and "3次元モデルIndex". Below the layers panel, there is a "Quick View" dropdown menu and a "Javaモード" (Java mode) option. The map itself shows a topographic background with overlaid data points and shapes. A scale bar at the bottom indicates distances up to 2.8 km. A message at the bottom of the map area says "Could not access data for any layers in service. Check your ArcSDE connection and/or shapefiles."

Landslide data (NIED)

Borehole data (Chiba Prefecture)

Contribution to OneGeology Project

The image shows a group of ten people, seven men and three women, standing in a row for a group photo. They are dressed in professional attire, including suits and blouses. Behind them is a large, stylized logo for "ONE Geology". The logo consists of a globe with a red map of the world overlaid on it, and the letters "ONE" in a large, blue, sans-serif font. Below the globe, the word "Geology" is written in a smaller font. The background of the photo is a patterned curtain.

First OneGeology Workshop, Brighton, UK, March 12-16, 2007

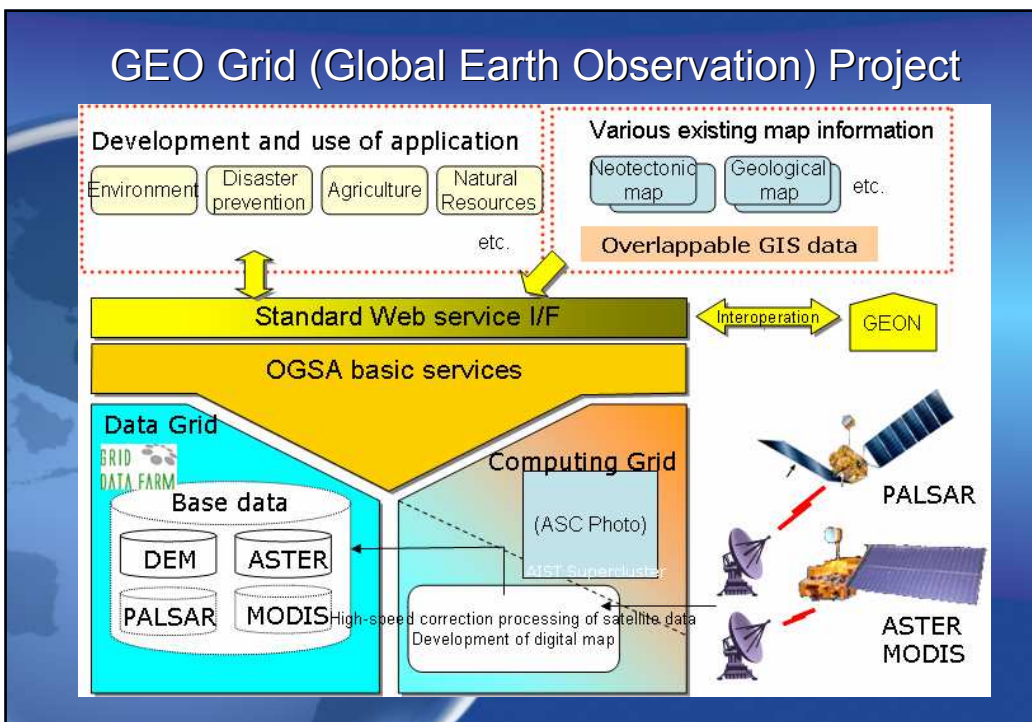
Would you like to know more? Please contact OneGeology@bgs.ac.uk
www.onegeology.org

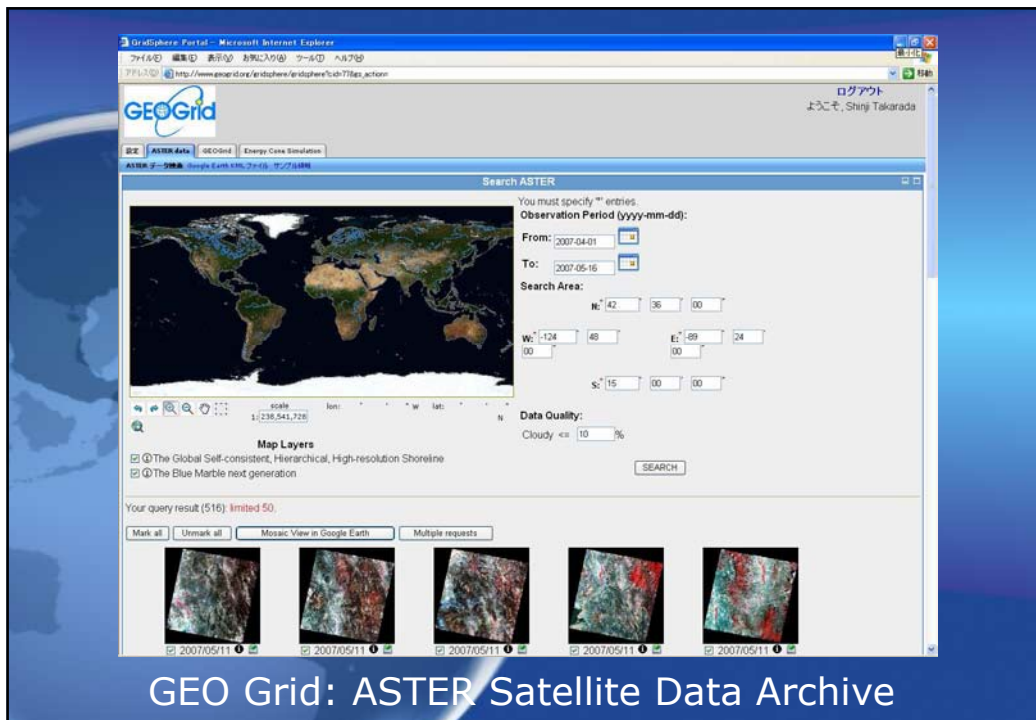
Contribution to GeoSciML Project

The image shows a screenshot of a web browser displaying the GeoSciML website. The browser window title is "GeoSciML: COGModel: TWiki". The website content includes a "Links" section with various resources and a "Summary" section. To the right of the browser window, there is a diagram showing a "GSC schema" box connected to a "WMS WFS" box, which in turn connects to a "GML Client" box via "GeoSciML" arrows. Below the browser window is a group photo of the GeoSciML Design Team Meeting in Tucson, AZ, from May 9-15, 2007. The photo shows a group of people standing in front of a sign for the "Arizona Geological Survey".

GeoSciML Design Team Meeting, Tucson, AZ, May 9-15, 2007

GEO Grid (Global Earth Observation) Project





Volcanic Gravity Flow Simulation Team

Shinji Takarada (Geoinformation Center, AIST)

Ryoshuke Nakamura (Grid Technology Research Center, AIST)

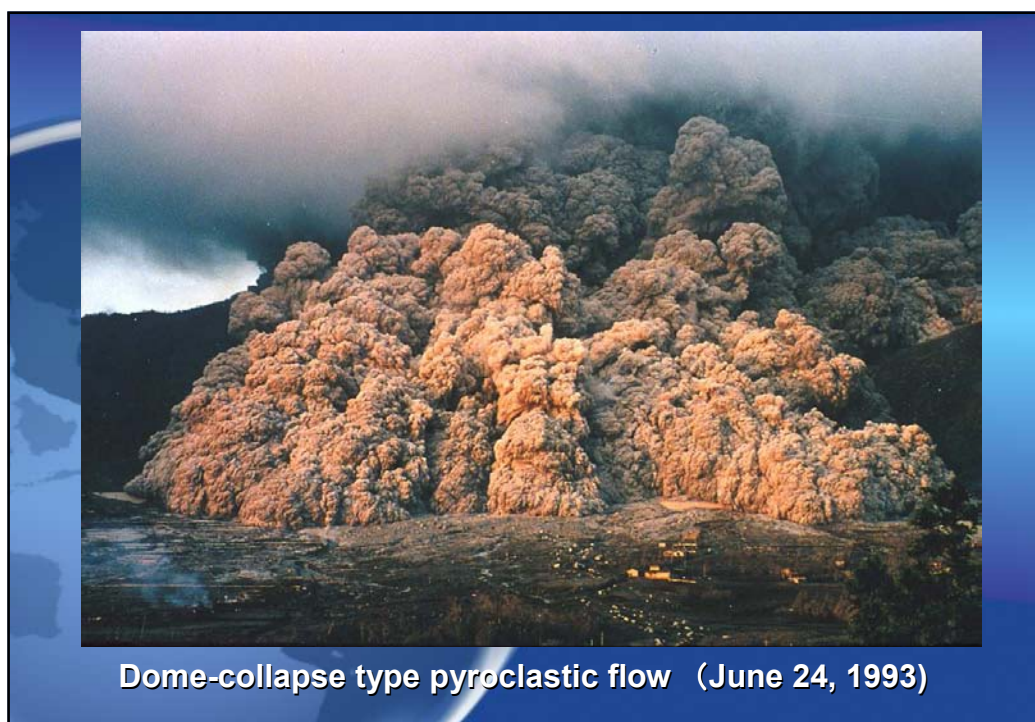
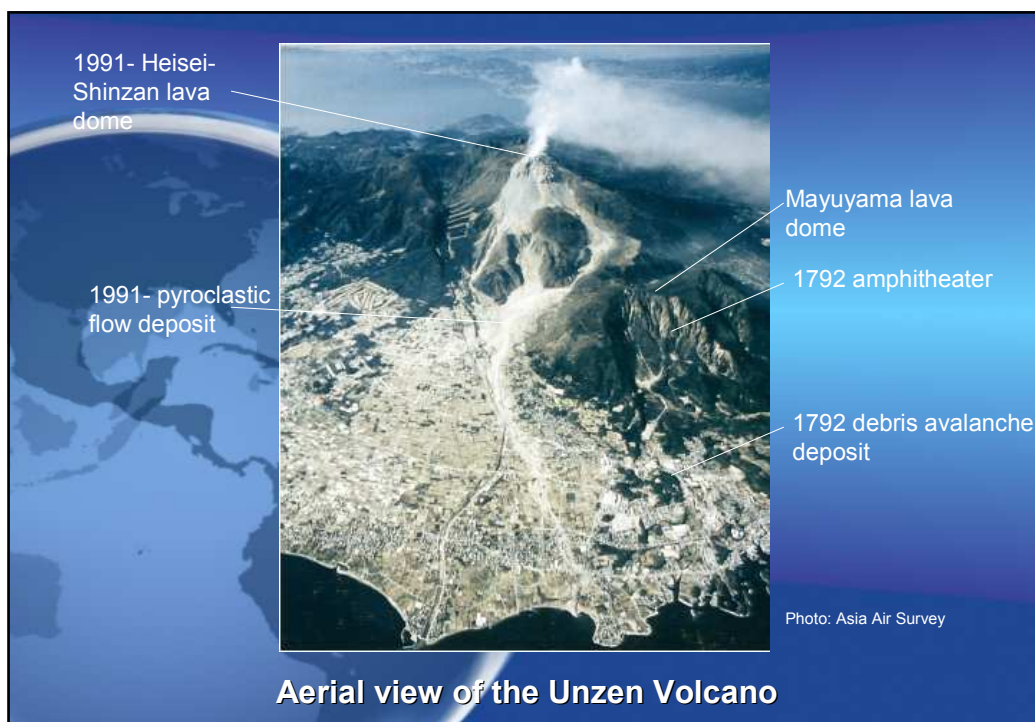
Naotaka Yamamoto (Grid Technology Research Center, AIST)

Hirokazu Yamamoto (Grid Technology Research Center, AIST)

Shinsuke Kodama (Grid Technology Research Center, AIST)

Mai Arioka (Institute of Geology and Geoinformation, AIST)

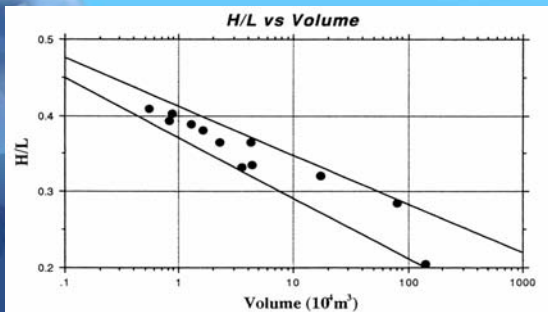
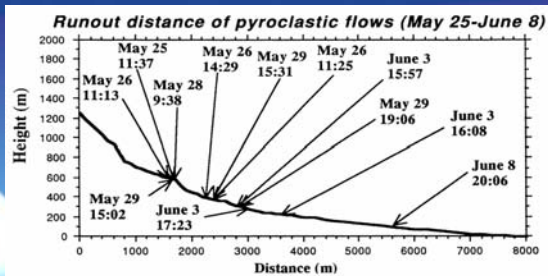
Tsukasa Nakano (Institute of Geology and Geoinformation, AIST)





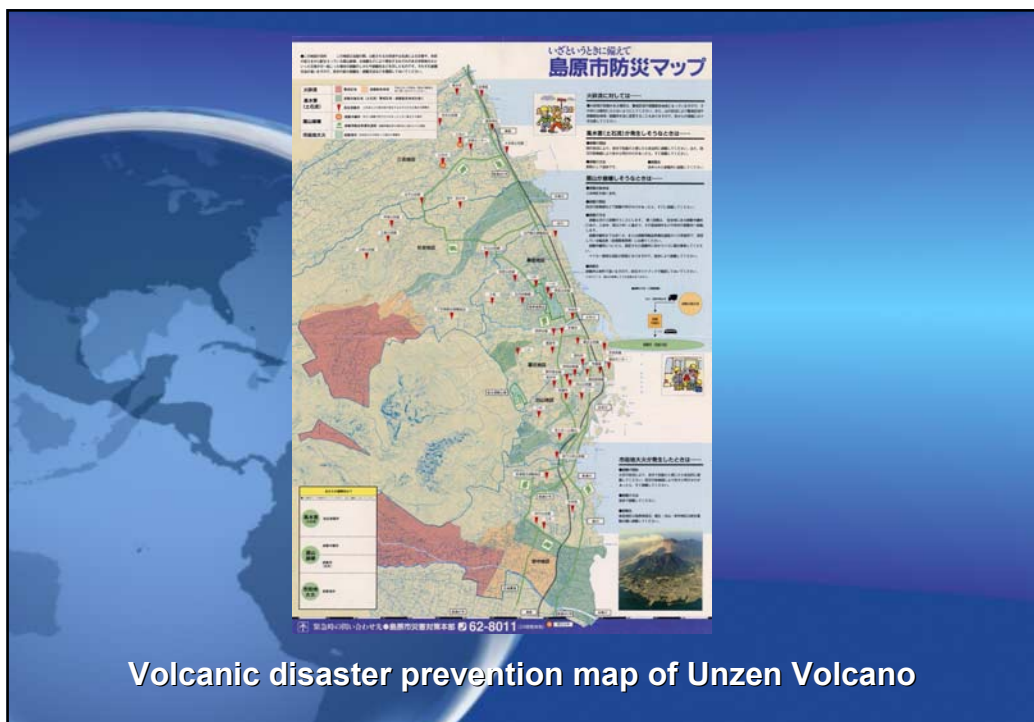
(After Nakada, 1992)

Devastation area attacked by an ash-cloud surge (June 3, 1991)



(after Takarada et al., 1993)

Runout distance and H/L-Volume relations of Unzen pyroclastic flows



Volcanic disaster prevention map of Unzen Volcano



Volcanic disaster prevention map of Usu Volcano

Next Generation Hazard Map

1. Using a GIS System

Overlay all historical eruption products
 Overlay satellite image, resident's information
 Pictures and short video footage to explain possible volcanic eruptions
 How to evacuate (route, where, what to bring, etc)

2. Real Time Hazard Map

Computer simulations using a laptop computer and/or on website
 Energy Cone Model, granular flow model, Bingham flow model

3. 3D Model

Using high resolution DEM, ASTER (15m mesh)

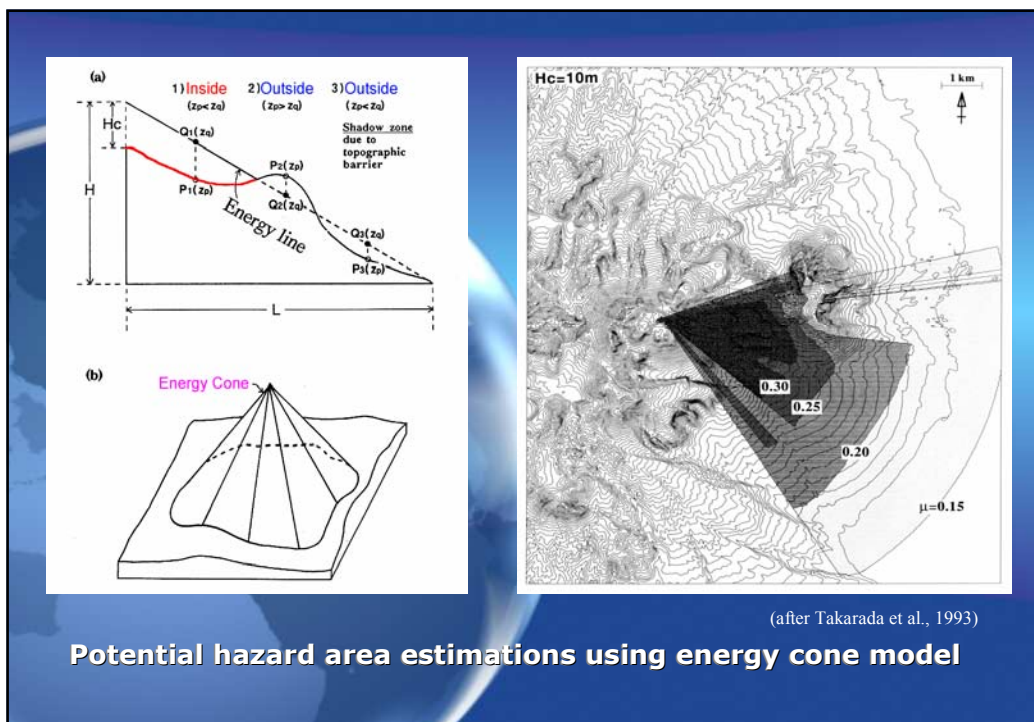
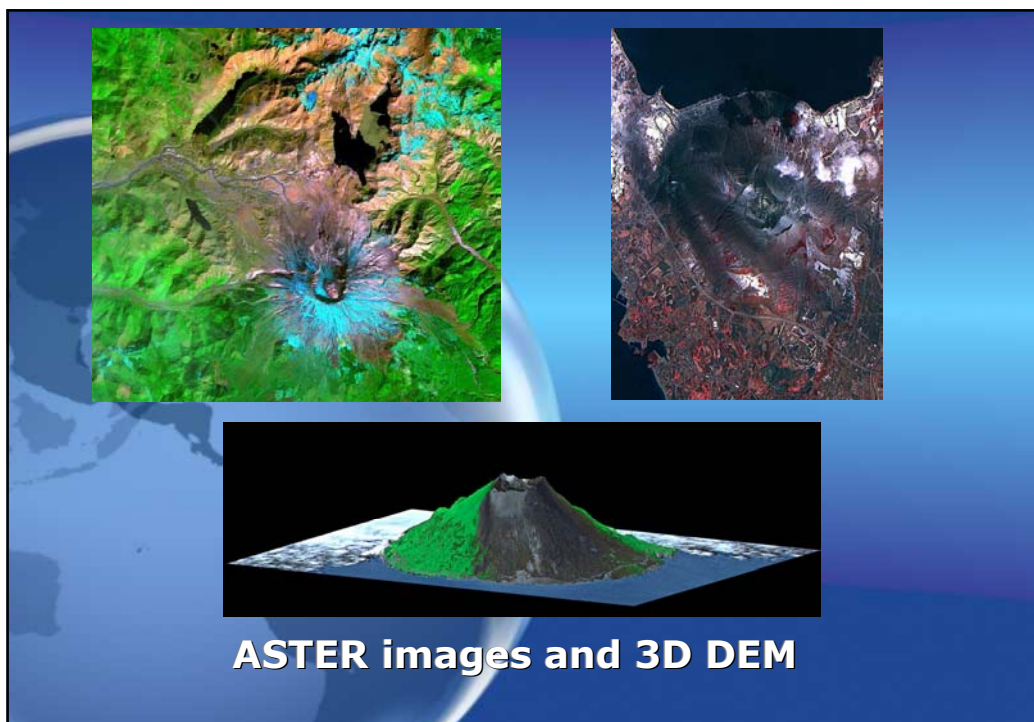
GEO Grid pyroclastic flow simulation

1. Energy Cone Simulation

Simple (less parameters, H_c , H/L only)
 Evaluate potential hazard areas (good for hazard maps)

2. ASTER data DEM, Web-base Application

High resolution (15m)
 Applicable every volcanic areas in the world
 Possible to use updated topography for DEM
 Possible to open for all scientists in the world

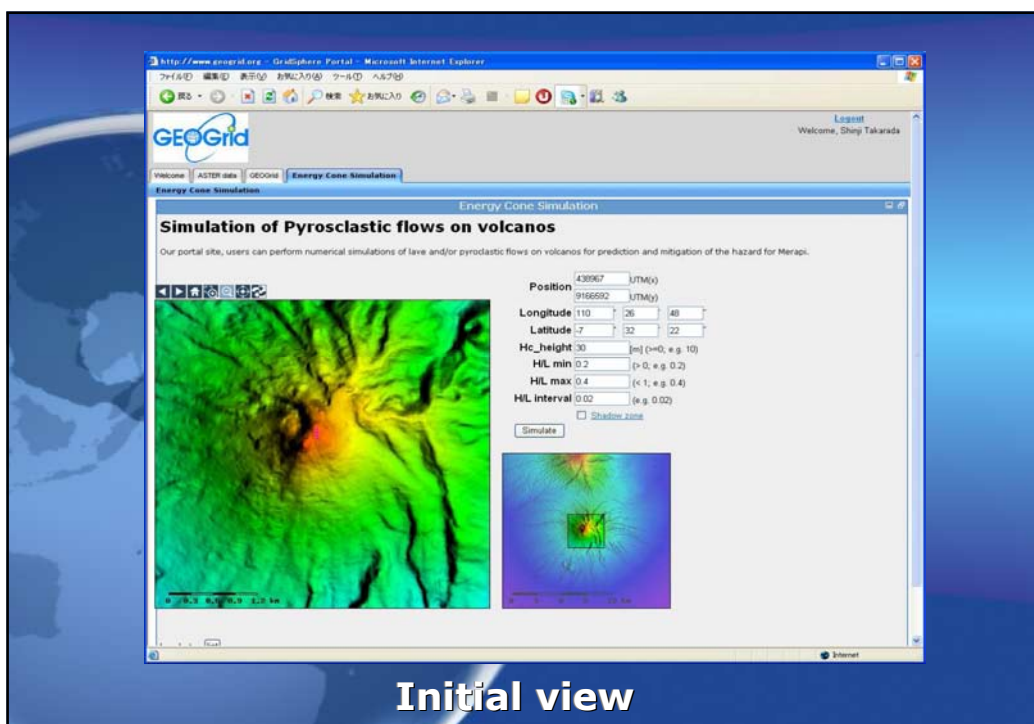
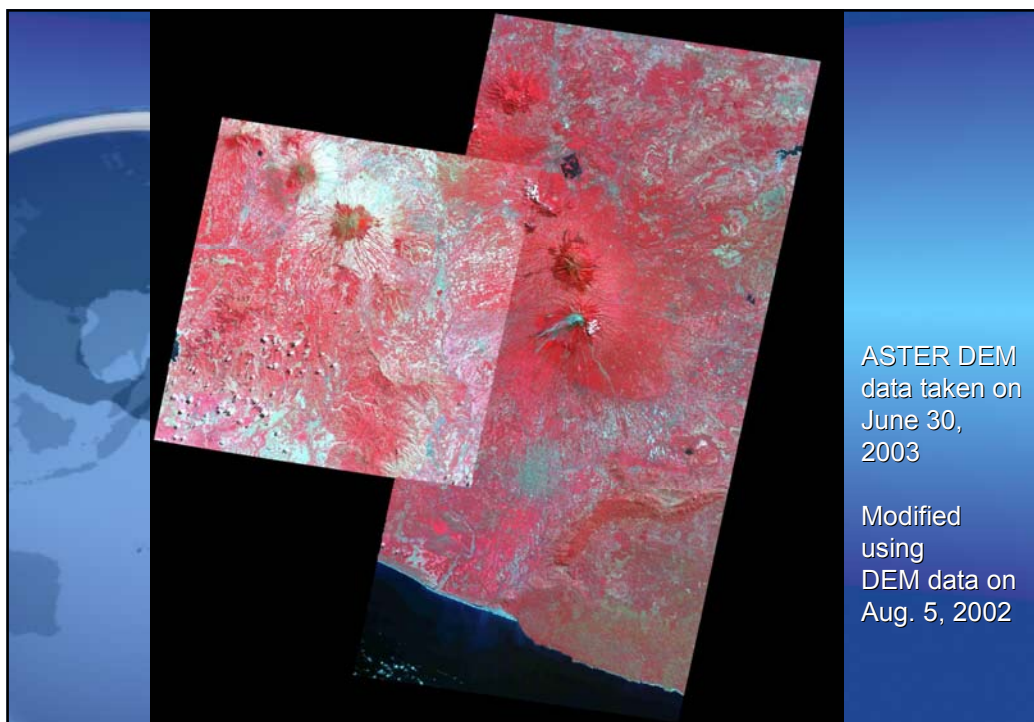


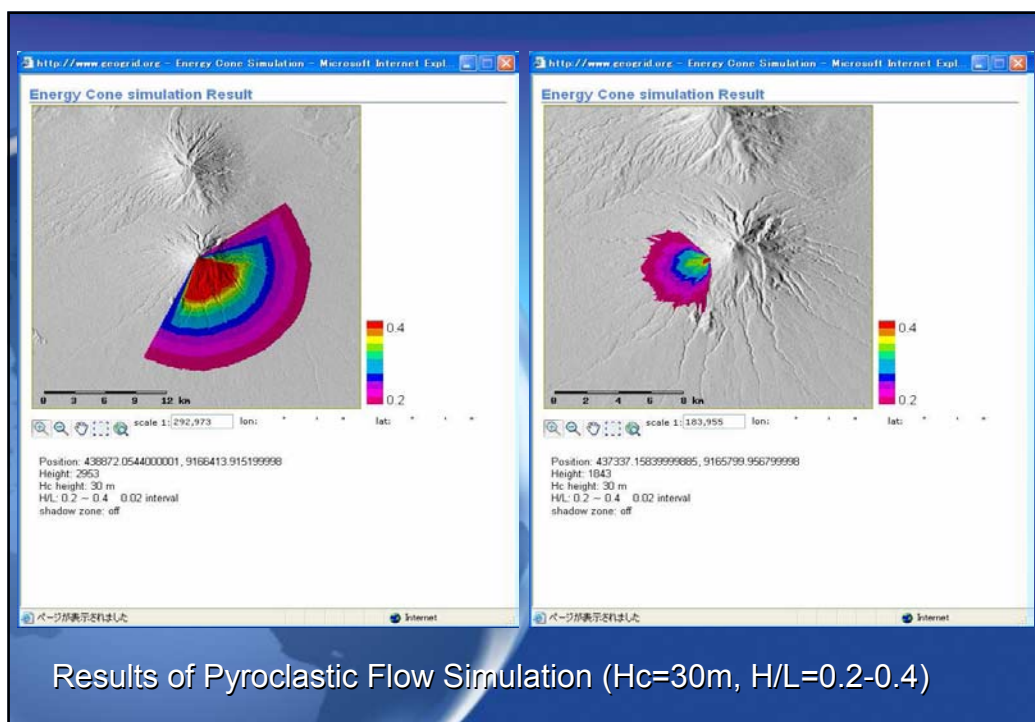
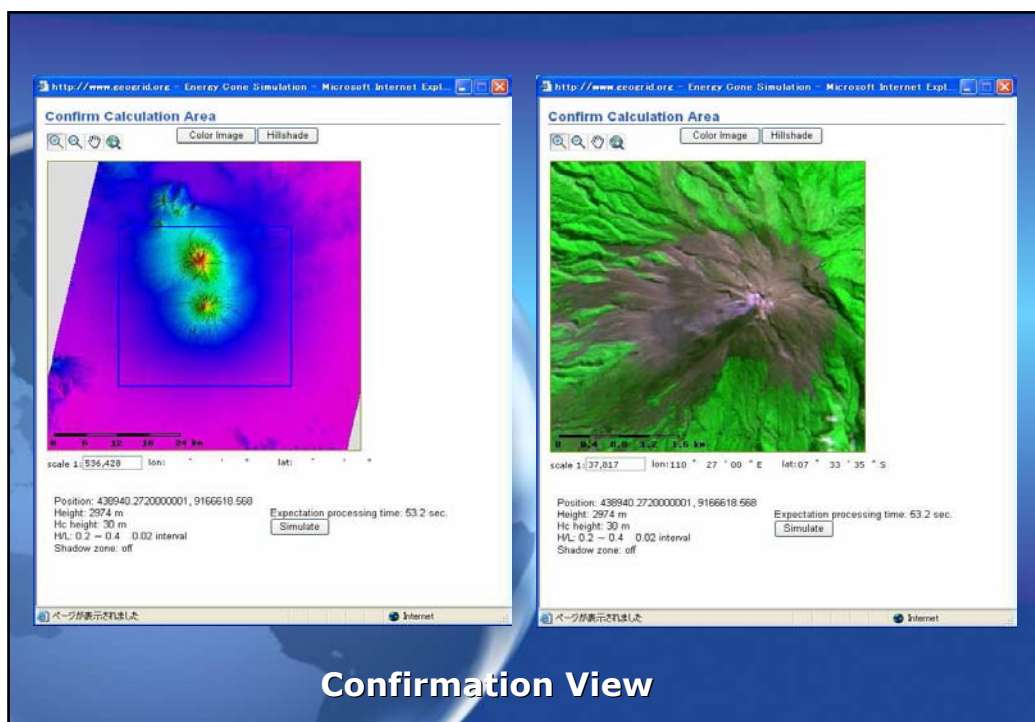
Volcanoes

1. Asama Volcano, Japan
2. Aso Volcano, Japan
3. Bandai Volcano, Japan
4. **Fuji Volcano, Japan**
5. Kirishima Volcano, Japan
6. Sakurajima Volcano, Japan
7. Tarumae Volcano, Japan
8. **Unzen Volcano, Japan**
9. Usu Volcano, Japan
10. Yotei Volcano, Japan
11. **Merapi Volcano, Indonesia**
12. **St. Helens Volcano, USA**
13. **Etna Volcano, Italy**
14. **Vesuvius, Italy**

Merapi Volcano







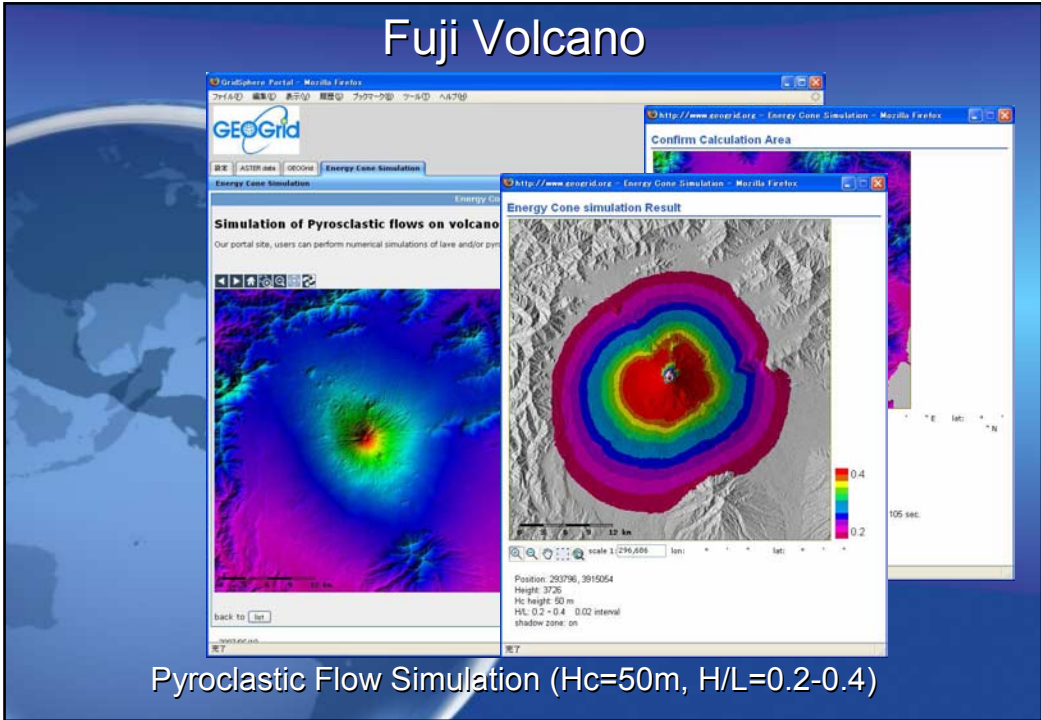
Unzen Volcano

Pyroclastic Flow Simulation

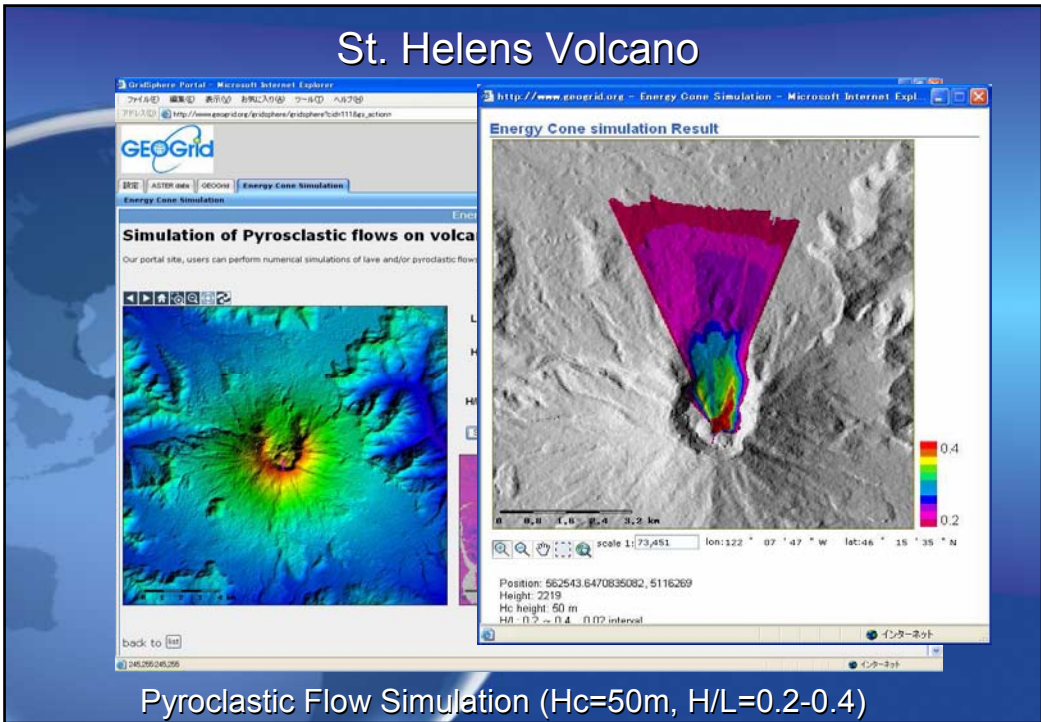
Unzen Volcano

Results of Pyroclastic Flow Simulation (Hc=20m, H/L=0.2-0.4)

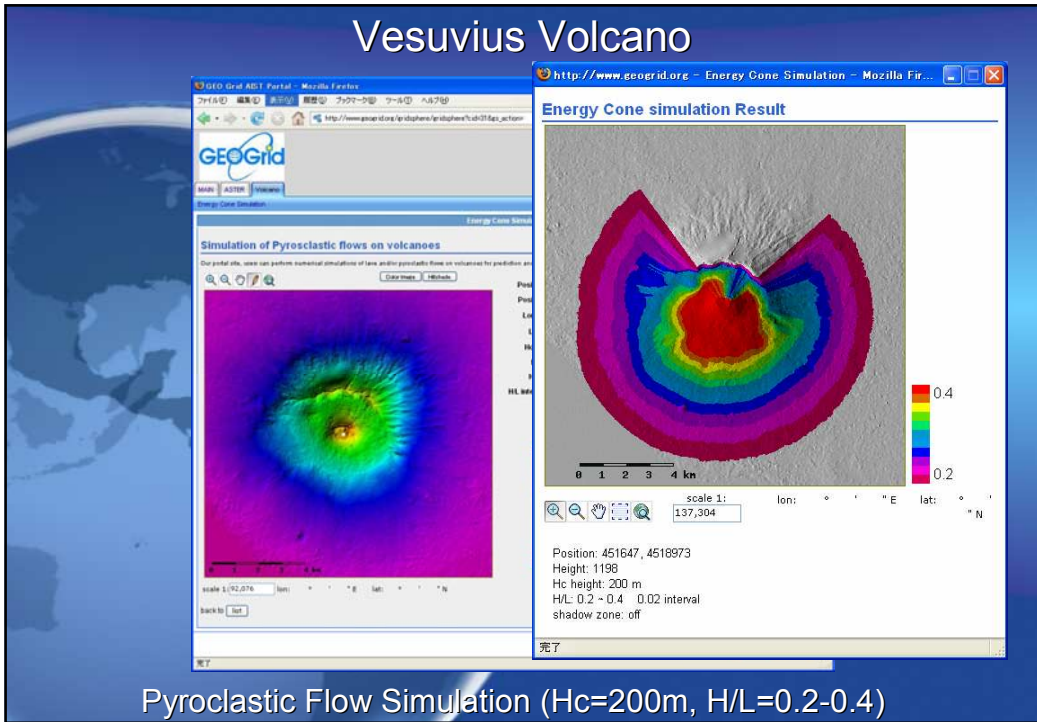
Fuji Volcano



St. Helens Volcano

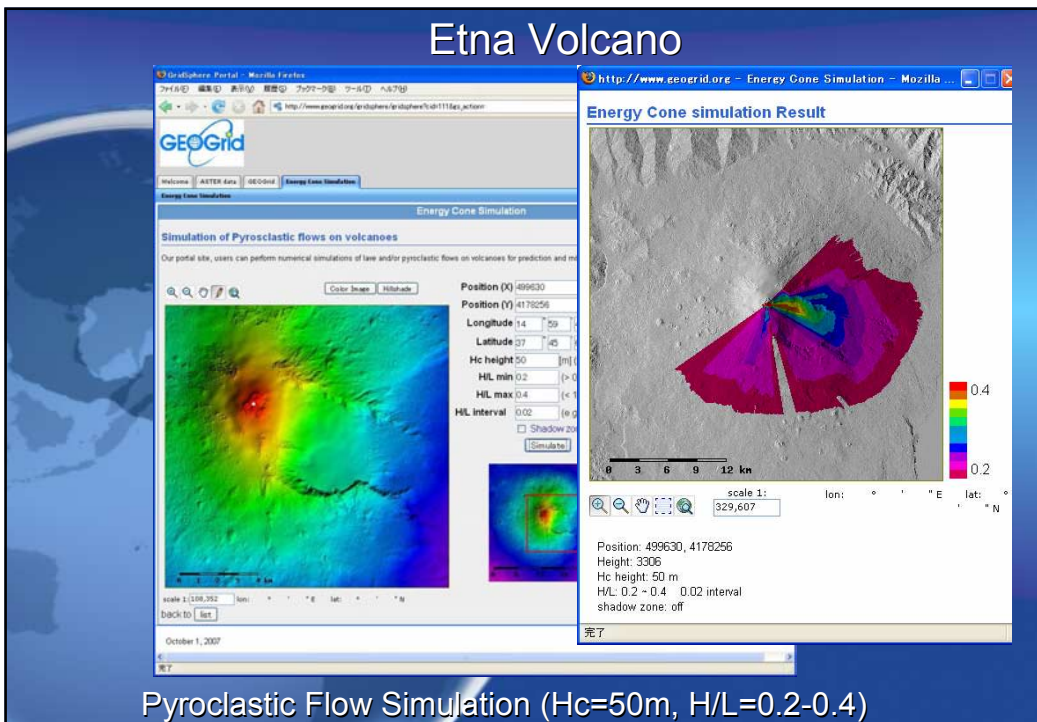


Vesuvius Volcano



Pyroclastic Flow Simulation (Hc=200m, H/L=0.2-0.4)

Etna Volcano



Pyroclastic Flow Simulation (Hc=50m, H/L=0.2-0.4)

GEO Grid Website

The image shows two screenshots from a Microsoft Internet Explorer browser. The left screenshot displays the 'GEO Grid AST Portal' with a navigation menu (MAIN, ASTER, Volcano) and a 'Welcome to AST GEO Grid Portal' message. A large red watermark URL, <http://www.geogrid.org/gridsphere/gridsphere>, is overlaid across the center. The right screenshot shows an 'Energy Cone simulation Result' with a topographic map of a volcano and a colorful energy cone overlay. A legend on the right indicates values from 0.2 to 0.4. Below the map, technical data is provided: Position: 438872.0544000001, 9166413.915199998; Height: 2953; Hc height: 30 m; H/L: 0.2 - 0.4 0.02 interval; shadow zone: off.

Summary

- 1. Publications and databases in GSJ**
 - Large number of geological publications (printed and CD-ROMs)
 - RIO-DB (eg. Geolis, Seamless geological map, Quaternary Volcanoes)
- 2. New WebGIS System (GeoMapDB, G-INDEX, GIS Intra)**
 - GeoMapDB (Integrated Geological map database)
 - G-INDEX (Portal index site)
 - GIS Intra (ArcGIS Server for Scientists in GSJ)
- 3. Collaboration with the GEO Grid project using WMS**
 - Overlaying Geological maps and ASTER satellite images
 - Overlaying on the Google Earth
 - Overlaying borehole and landslide information from other WebGIS Servers
 - Contribution to the OneGeology Project and GeoSciML

Summary

4. 1991-95 Unzen Pyroclastic Flow

High temp. and High Speed, Volume= 10^4 - 10^6 m³, H/L=0.2-0.4

5. Next Generation Volcanic Hazard Map

Overlapping any kinds of data sets using GIS system

Real Time Hazard Map (Available on a laptop and on a website)

High resolution DEM data (ASTER 15m, Applicable for all volcanoes in the world)

6. Volcanic Gravity Flow Simulation using ASTER DEM

Pyroclastic flow simulations using energy cone model

Possible to access all scientists in the world on a website

Possible to update DEM after changing topography due to eruptions

High-speed processing using Grid computing technology (0.1-3min)

Applicable to other natural disasters (landslides, debris avalanches)