Global IT Innovator
NTT DATA GROUP

NTT DATA CCS CORPORATION
(BizEarth Business Community)

baba@nttdata-ccs.co.jp
aguidi@nttdata-ccs.co.jp

The 2nd Meeting of the Japan-Arab Economic Forum
December12, 2010 Workshop6
IT, High Technology and Satellite

INDEX

CORPORATE DATA

- **Established** April 14, 1970
- **President and CEO** Ryozo Ono
- **Capital** 330 million yen (as of March 31, 2010)
- **Stockholders** NTT DATA CORPORATION (60%) *1 ,
  JX Holdings, Inc. (40%) *2
- **Number of Employees** 644 (as of April 1, 2010)
- **Net Sales** 12,080 million yen (2009)
- **Businesses** System integrator
  [Scientific Systems Solutions]
  [Business Systems Solutions]
  [Retailing Application Services Providing]
  [Outsourcing Business]
- **Head Office** 6-41-10 Kameido, Koto-ku, Tokyo 136-8503 Japan
  Tel. +81-3-5626-7701 (swbd.)

*1 NTT DATA & NTT DATA Group are one of the leading providers of ICT services & solutions in Japan.

*2 JX Holdings and JX Group are the largest “integrated energy, resources and materials business groups” in Japan.

Our Activities in Middle East

2-1 Agenda

Activities in the Kingdom of Saudi Arabia

* Downstream-related Joint R&D projects with KACST since 2007

  aimed at transferring technology and know-how in the field of Monitoring ground changes

* Active financial support from JCCP (Japan Cooperation Center, Petroleum)

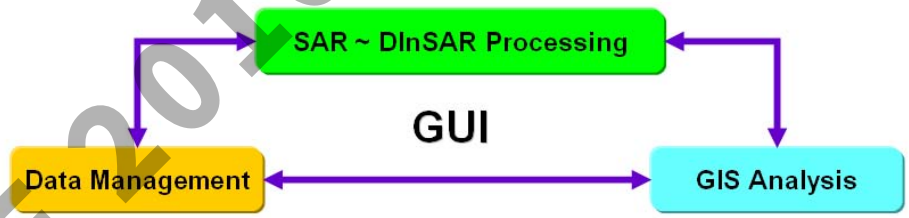
Outline of our past and current projects

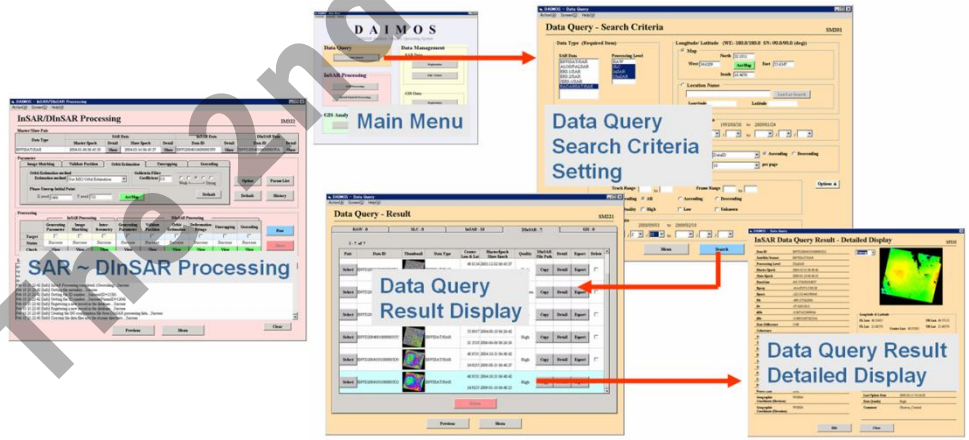
- Monitoring Ground Surface Displacements using Differential Interferometric SAR (DInSAR) technology

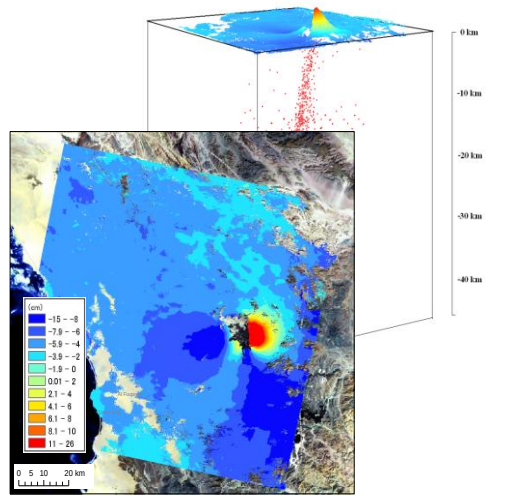
- Monitoring time-lapse changes by means of an Accurately Controlled, Routinely Operated, Signal System (ACROSS)

2-2 Monitoring Ground Surface Deformations: Displacement & Hazards Maps from SAR Data

- **Main characteristics**
  - Windows platform
  - Flexible architecture (single ~ multi-user)
- **Integrated capabilities**
  - SAR~DInSAR processing, GIS analysis, Data management
  - GUI binder and embedded knowledge (user friendly environment)
- **Outputs**
  - Displacement maps over large areas and with a sub-cm accuracy
    - Production monitoring
    - Identification of earthquakes, landslides, etc and assessment of their current and future impact
  - Hazard maps and simulation for a range of infrastructures and facilities for three classes of land use
    - Identification of areas at risk, forecasting, etc.

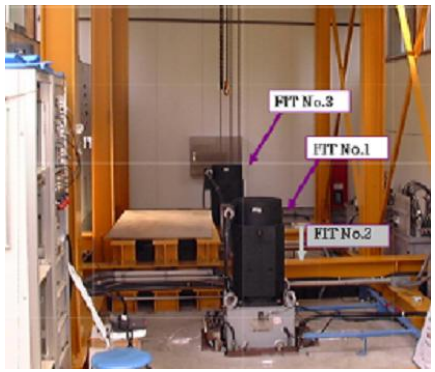


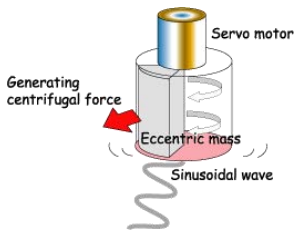




DInSAR (C-band) well suited for applications in the Middle East

2-3 Continuous Monitoring of Physical Changes in CO2 Reservoir Storage - ACROSS



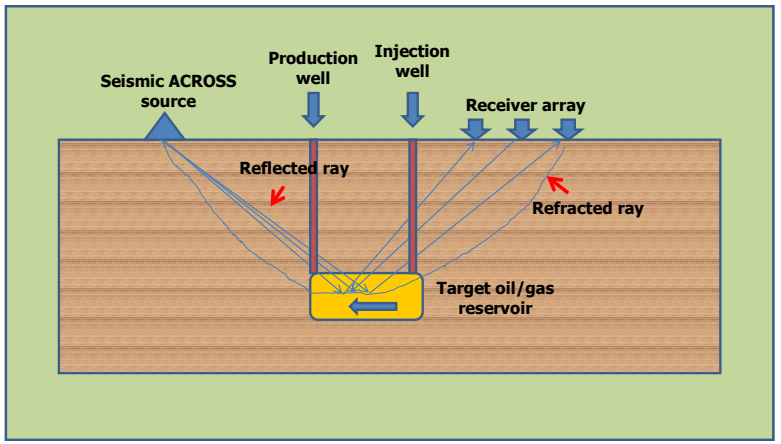


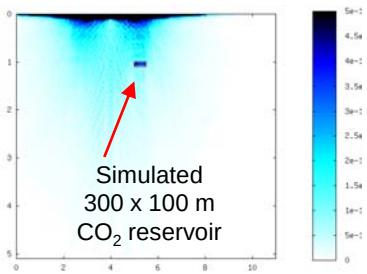
ACROSS (Accurately Controlled, Routinely Operated, Signal System)

- **A generator of highly characterized elastic waves**
  - A rotating eccentric mass
  - A controller regulating the rotational frequency (frequency modulation, GPS clock-based synchronization, etc.)
- **A signal processing technique in the frequency domain**
  - Optimization of the Source-Receiver Array geometry
  - Improved discrimination of phases and reflectors, etc.

Advantages

- *Robust against noise*
- *High repeatability*
- *Exceptionally high stability of the signal over years*
- *Low power and non-destructive*
- *Integrates with existing networks of geophones, etc.*
- *Operational concept validated in Japan (eight years long continuous operation), etc.*





Suitable solution in a wide range of industrial and environmental applications for continuous as well as routine monitoring of CO2 injection and storage, O&G production-related changes, EOR operations, aquifer surveying, etc.

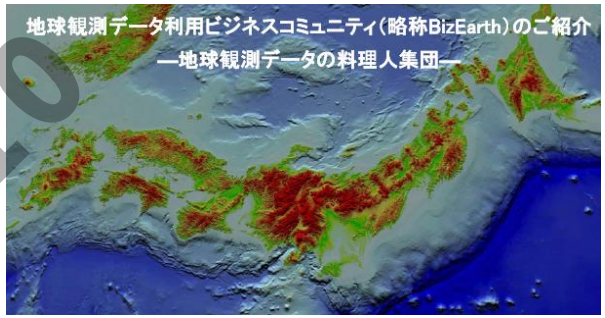
An overview of BizEarth and Solutions

3 Overview

Global IT Innovator
NTT DATA GROUP

Business Community of Earth Observation Data Users

BizEarth



We are a group striving to promote the use of Earth observation data, primarily within the Industry, by

1) Proposing policy recommendations

2) Elaborating and performing marketing surveys (Concept of business simulation)

3) Supporting Human resource development (Technical management staff and Project Scientists)

BizEarth Officers

Chairman
Pf. Rokugawa, *Univ. of Tokyo*

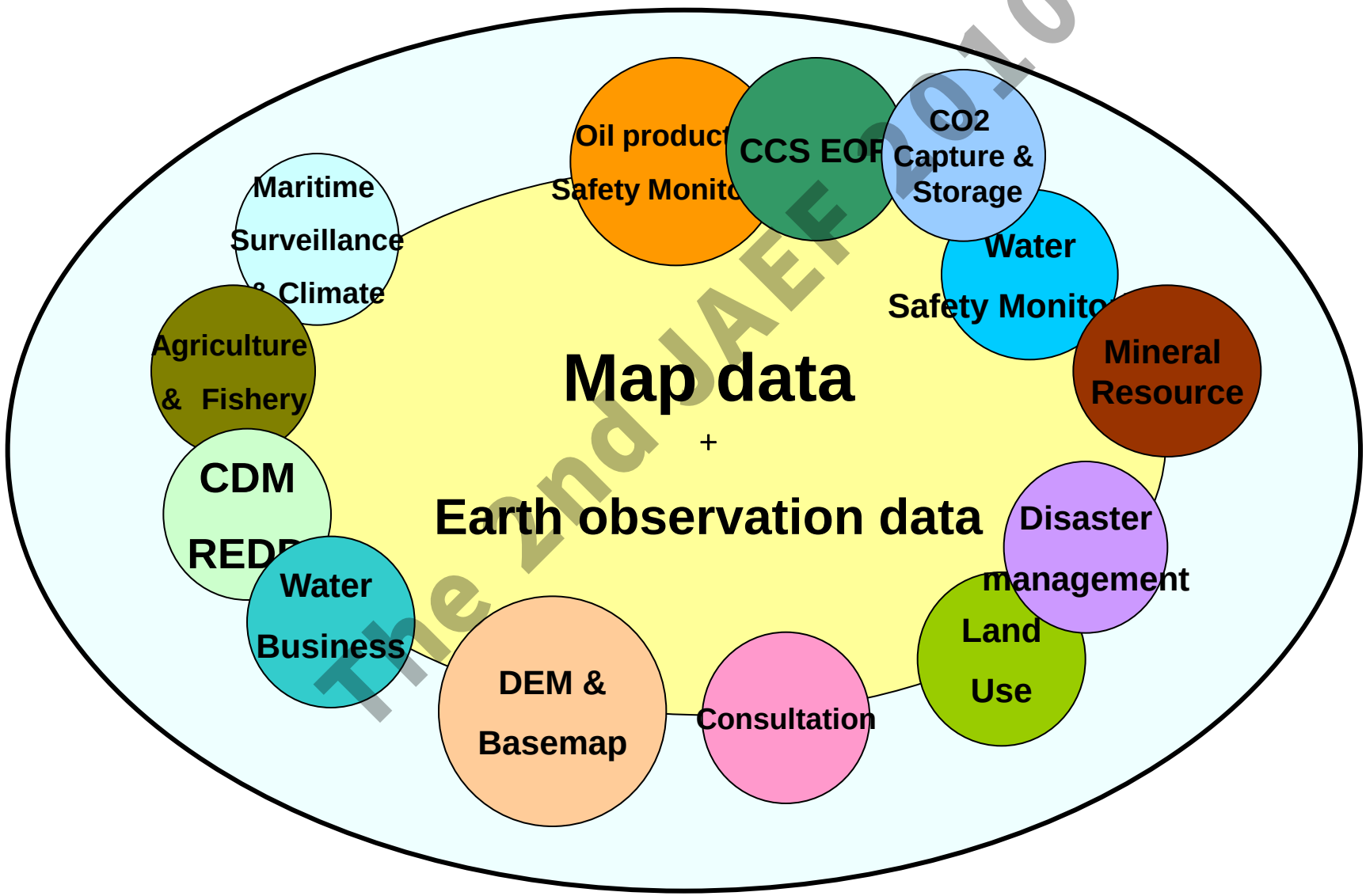
Executive secretary
Baba, *NTT Data CCS Corp.*
Kusuda, *NTT DATA Corp.*
Watanabe, *MITSUBISHI SPACE SOFTWARE CO.,LTD.*

Secretariat
Fujikawa, *GEOTECHNOS Co., Ltd.*

Supervisor
Takahashi, *Mitsubishi Research Institute, Inc.*

Business Community of Earth Observation Data Users
secretariat@remosen.jp

3-1 Examples of Solutions we can provide



3-2 New Solutions

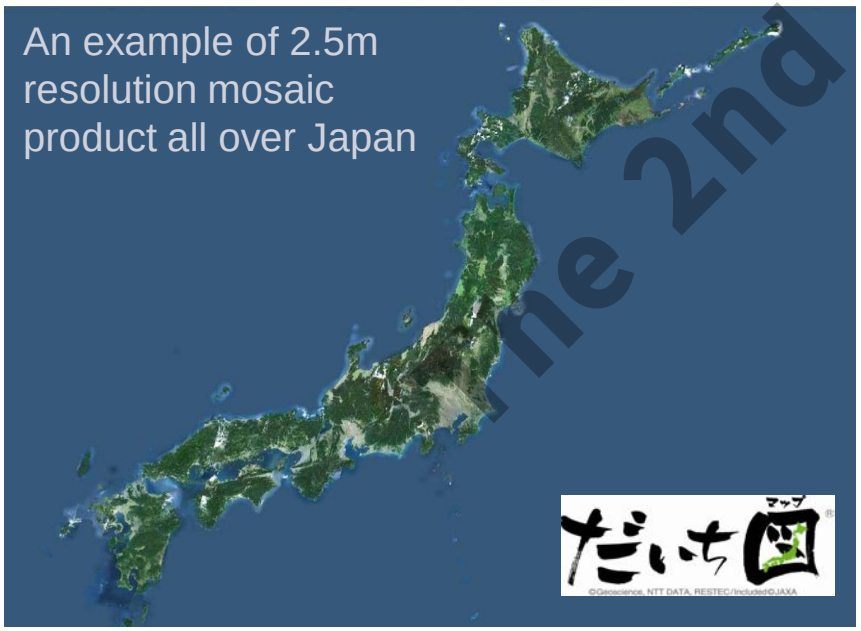
3-2-1 Satellite Basemap Service

Global IT Innovator
NTT DATA GROUP

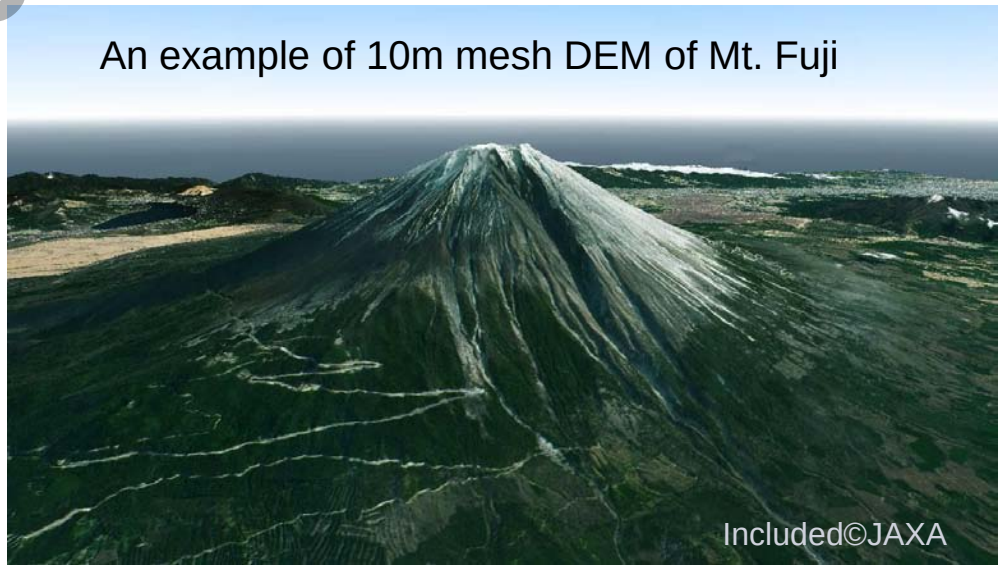
Advantages:

- **Worldwide basemap service of ortho-imagery and DEM.**
- **High resolution (2.5m for imagery and 10m mesh for DEM) and high geolocation accuracy (horizontal & vertical accuracy of < 10m).**
- **Seamless mosaic removing the differences of seasons and weather conditions.**
- **Technical support for satellite mapping.**

"Daichi Map"
Seamless ortho-image product



"ALOS WORLD DEM"
Seamless DEM product



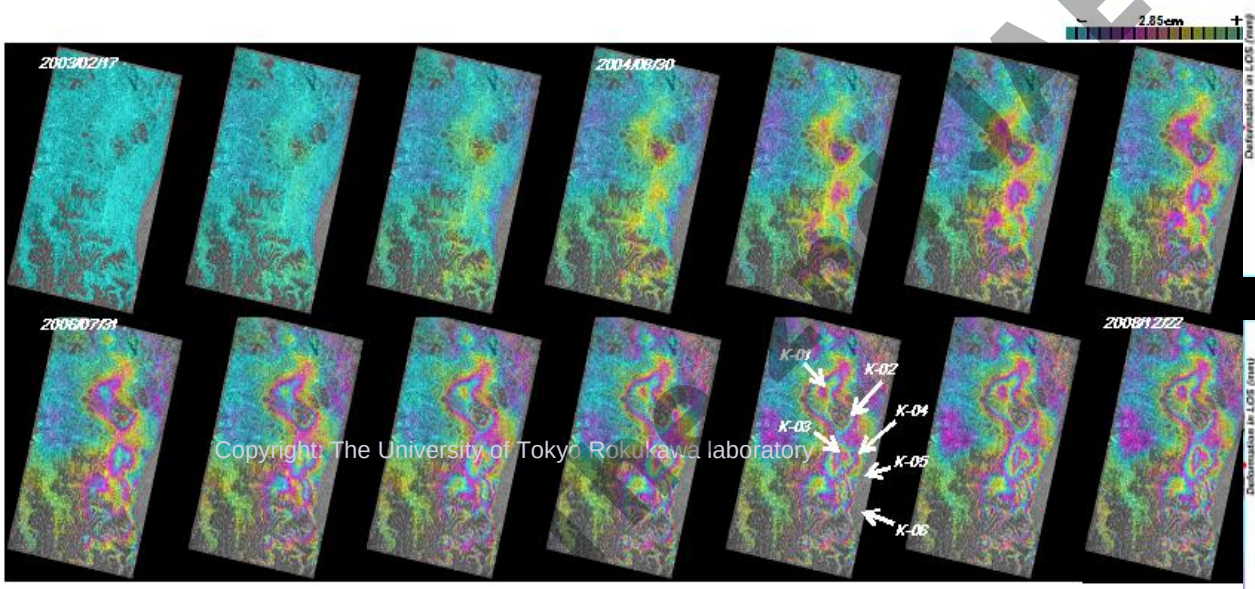
NTT DATA Corporation
To contact us: imsinfo@kits.nttdata.co.jp

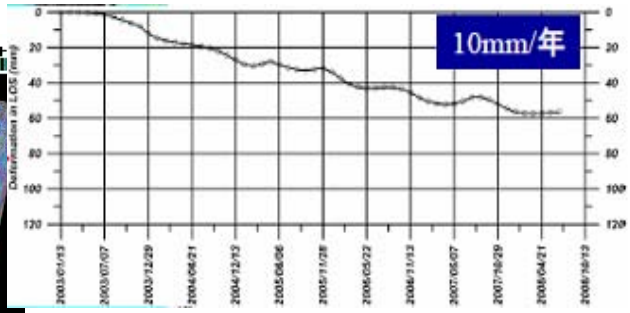
3-2-2 Monitoring Ground Deformations

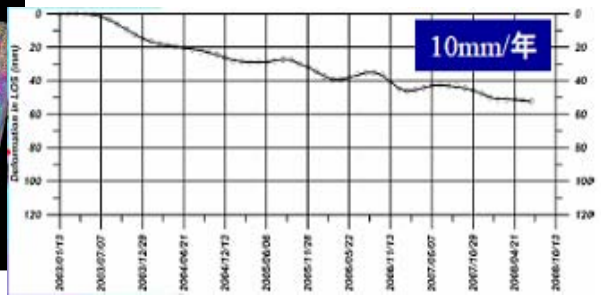
Global IT Innovator
NTT DATA GROUP

Advantages:

- Handling of various SAR data types and formats (L and C bands)
- Continuous update of the deformation, useful for risk assessment and management
- Ongoing implementation of the latest algorithm (Inversion model) for an effective removal of atmospheric effects, allowing to accurately capture non-linear temporal changes of ground displacement





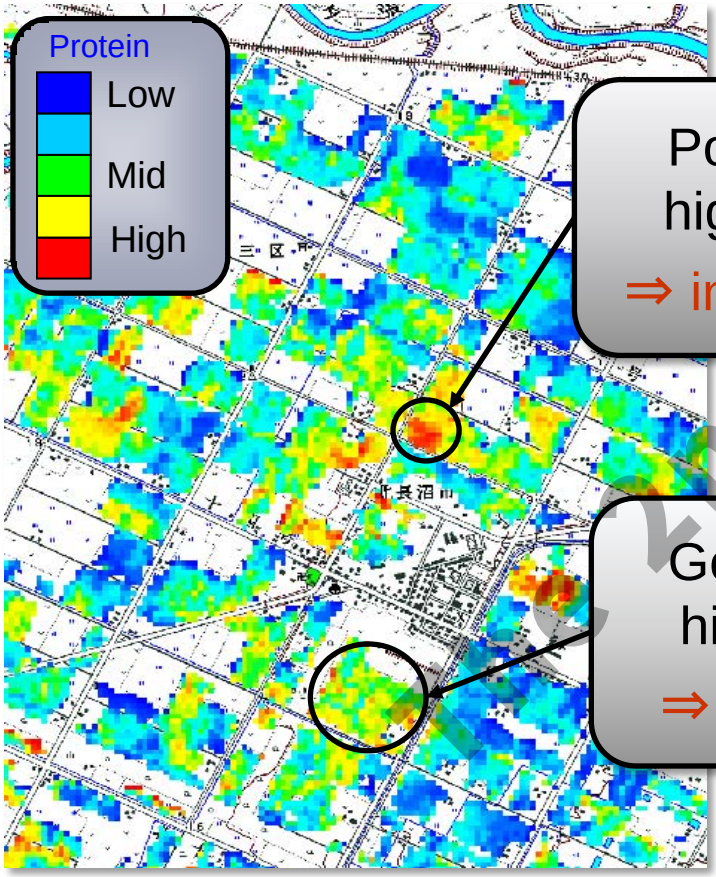


NTT DATA CCS
To contact us：baba@nttdata-ccs.co.jp

Global IT Innovator
NTT DATA GROUP

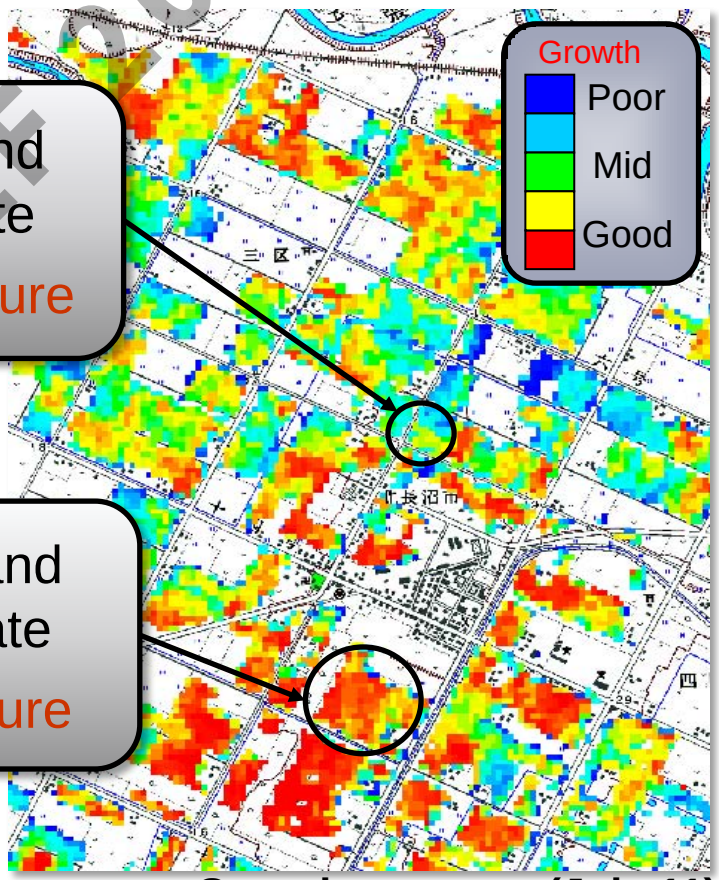
Advantages:

- Production of delicious rice using the technology of analysis of earth observation data



Poor growth and high protein rate
⇒ increase manure

Good growth and high protein rate
⇒ reduce manure



Protein rate map (September 4)

Growth rate map (July 11)

FUJITSU LIMITED
To contact us： ariyama.toshi@jp.fujitsu.com

Global IT Innovator
NTT DATA GROUP

Advantages:

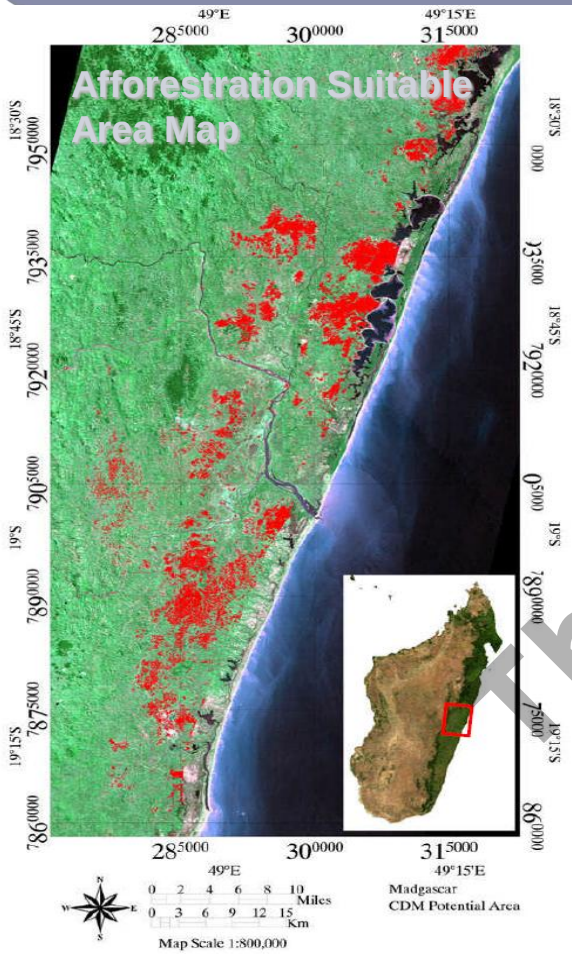
- Disaster prevention solution that uses earth observation satellite and communications satellite

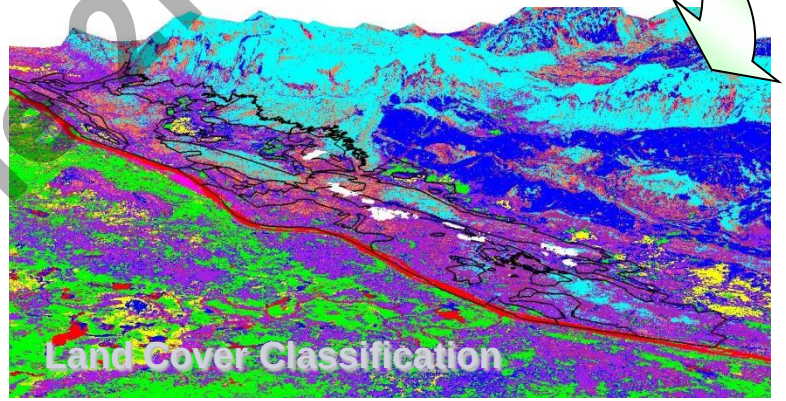
FUJITSU LIMITED
To contact us： ariyama.toshi@jp.fujitsu.com

3-2-5 Global Environment Problem
(Climate Change & Biodiversity)

Global IT Innovator
NTT DATA GROUP

As for projects on biodiversity conservation and global warming countermeasures using forest carbon sink such as afforestation CDM and REDD/REDD+, we challenge the project design and development of monitoring method combined with knowledge and technique from satellite image analysis and biophysical approach.





- Key Issue
  - Afforestation CDM
  - REDD/REDD+
  - Biodiversity
- Solution
  - Monitoring System Design
  - Project Design
  - PDD
  - Research & Development

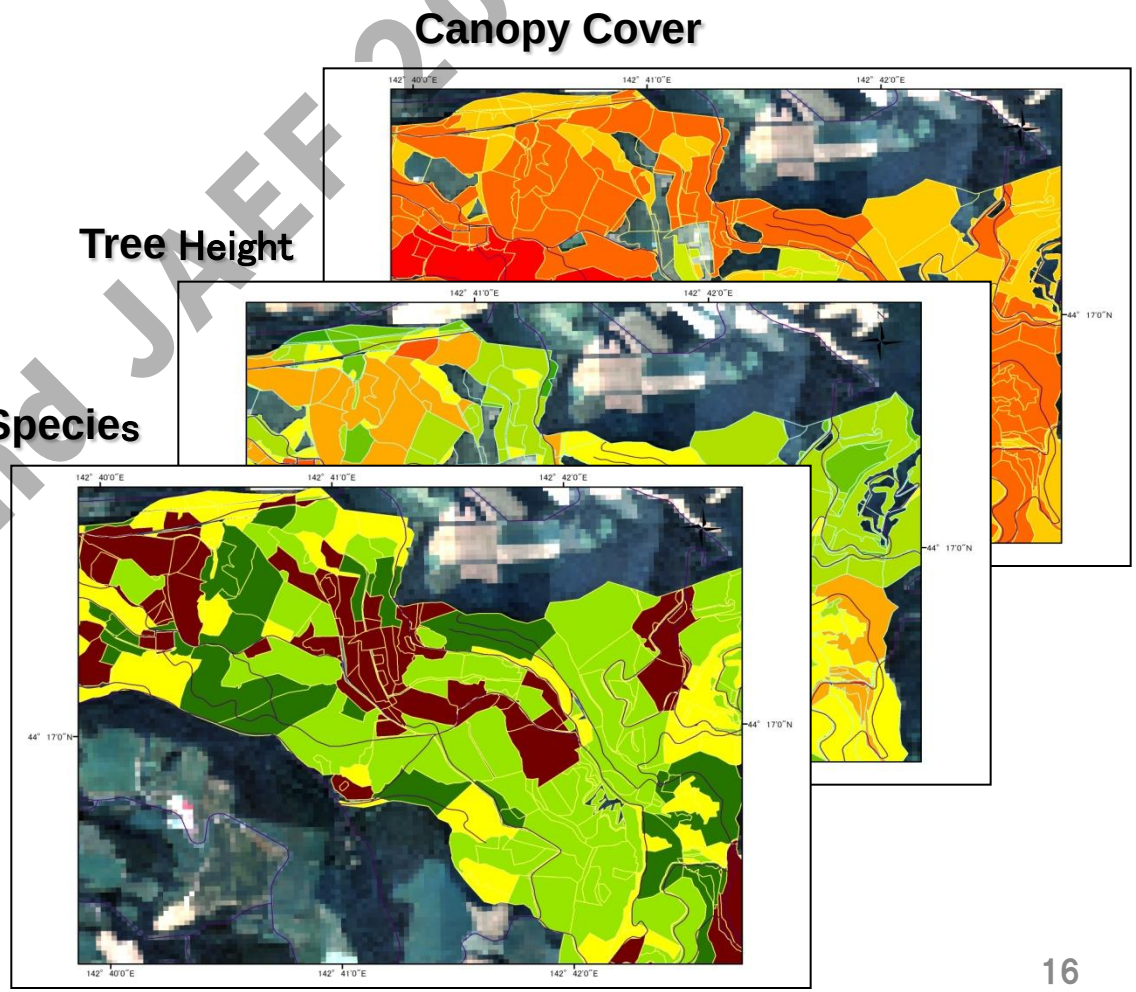
Mitsubishi Research Institute, Inc.
To contact us： yasuo@mri.co.jp

3-2-6 Forest Management Support

Global IT Innovator
NTT DATA GROUP

Conduct R&D on information extraction for forest management information of high accuracy by data fusion of Hyper-Spectral Sensor and SAR using data mining method. Review monitoring system based on the assumption of application for forest management.

- Key Issue
  - Domestic Forest Management at the Forest Industry
  - Woody Biomass Utilization for Energy
- Solution
  - Monitoring System Design
  - Resource Storage & Future Supply Estimation
  - Research & Development
- Technology
  - Data-fusion of optical sensor & SAR
  - Data Mining for Remote Sensing Data



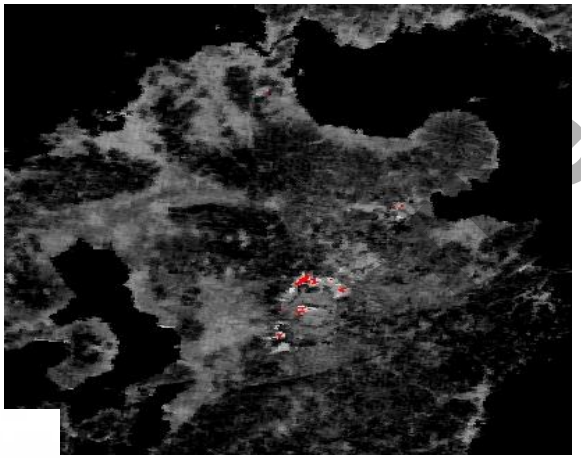
** Developed on the ERSDAC research program*

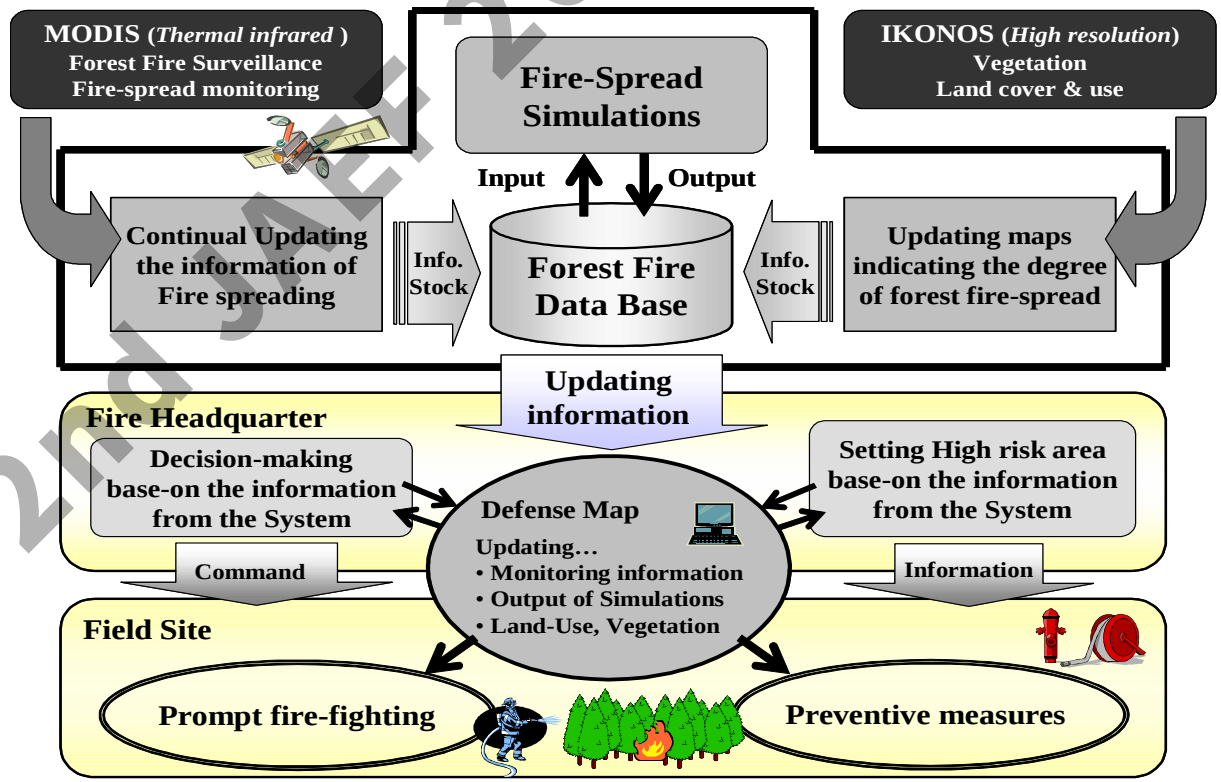
Mitsubishi Research Institute, Inc.
To contact us： yasuo@mri.co.jp

3-2-7 Predicting and Mapping System of Forest Fires

We developed the algorithm for detecting forest fire by using MODIS data, also the method assessing crown fire risk using high-resolution satellite image, and the fire spread forecasting model. Integrated these on WebGIS, we established the system useful for planning fire extinguishing.

- Key Issue
  - Forest Fire
- Solution
  - Forest Fire Monitoring
  - Crown Fire Risk Map
  - Simulation of Forest Fire Spread





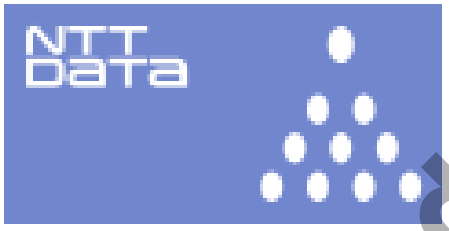
** Developed on the FDMA research program*

Mitsubishi Research Institute, Inc.
To contact us： yasuo@mri.co.jp

「BizEarth」 Members

Global IT Innovator
NTT DATA GROUP

Asia Air Survey Co., Ltd.	http://www.ajiko.co.jp/en/
ImageONE Co., Ltd	
Infoserve Inc.	
ESRI Japan Corp.	
NTT DATA CCS Corp.	
NTT DATA Corp.	http://www.nttdata.co.jp/en/index.html
Orkney, inc.	
KOKUSAI KOGYO CO., LTD.	http://www.kk-grp.jp/english/index.html
CBMICorp.	
NS Solutions Corp.	http://www.ns-sol.co.jp/en/corporate/index.html
GEOTECHNOS Co., Ltd.	
NIKKO EXPLORATION & DEVELOPMENT Co., Ltd.	
VisionTech Inc.	http://www.vti.co.jp/english1/index.html
HITACHI Solutions Ltd.	http://www.hitachi-solutions.com/
Fixstars Corp.	http://www.fixstars.com/en/index.html
FUJITSU LIMITED	http://www.fujitsu.com/global/
MITSUBISHI SPACE SOFTWARE CO.,LTD.	http://www.mss.co.jp/en/index.html
Mitsubishi Research Institute, Inc.	http://www.mri.co.jp/E/index.html



Global IT Innovator

NTT DATA GROUP