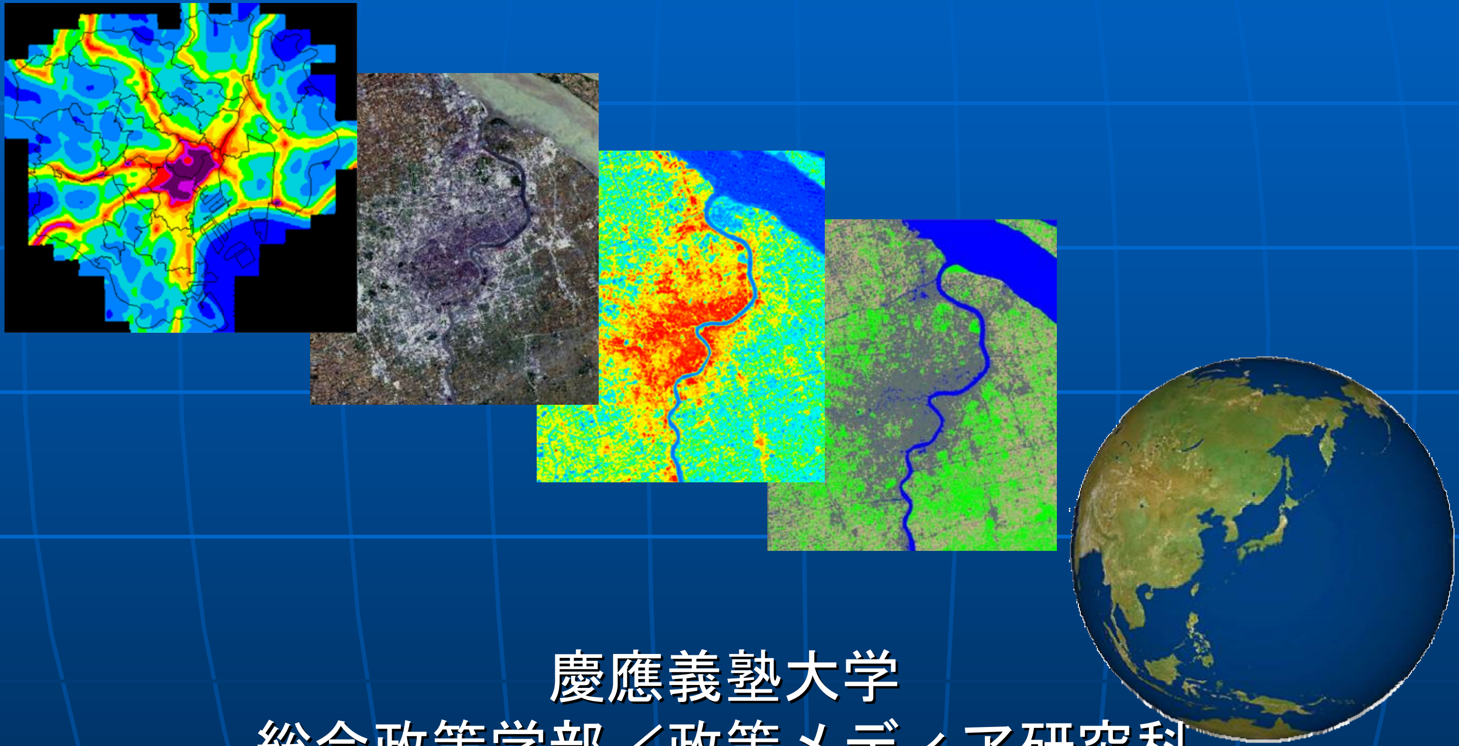
陸域観測衛星ALOSの実利用への期待



慶應義塾大学
総合政策学部／政策メディア研究科
福井　弘道

email:　hfukui@sfc.keio.ac.jp

ALOSの実利用への期待

１．科学利用から実利用（Operational Use）へ
----観測とデータ流通の明確な戦略

２．地上観測データ、ニュース事象等との統合利用

３．ユーザーニーズに対応した具体的な応用領域の開拓とその実運用

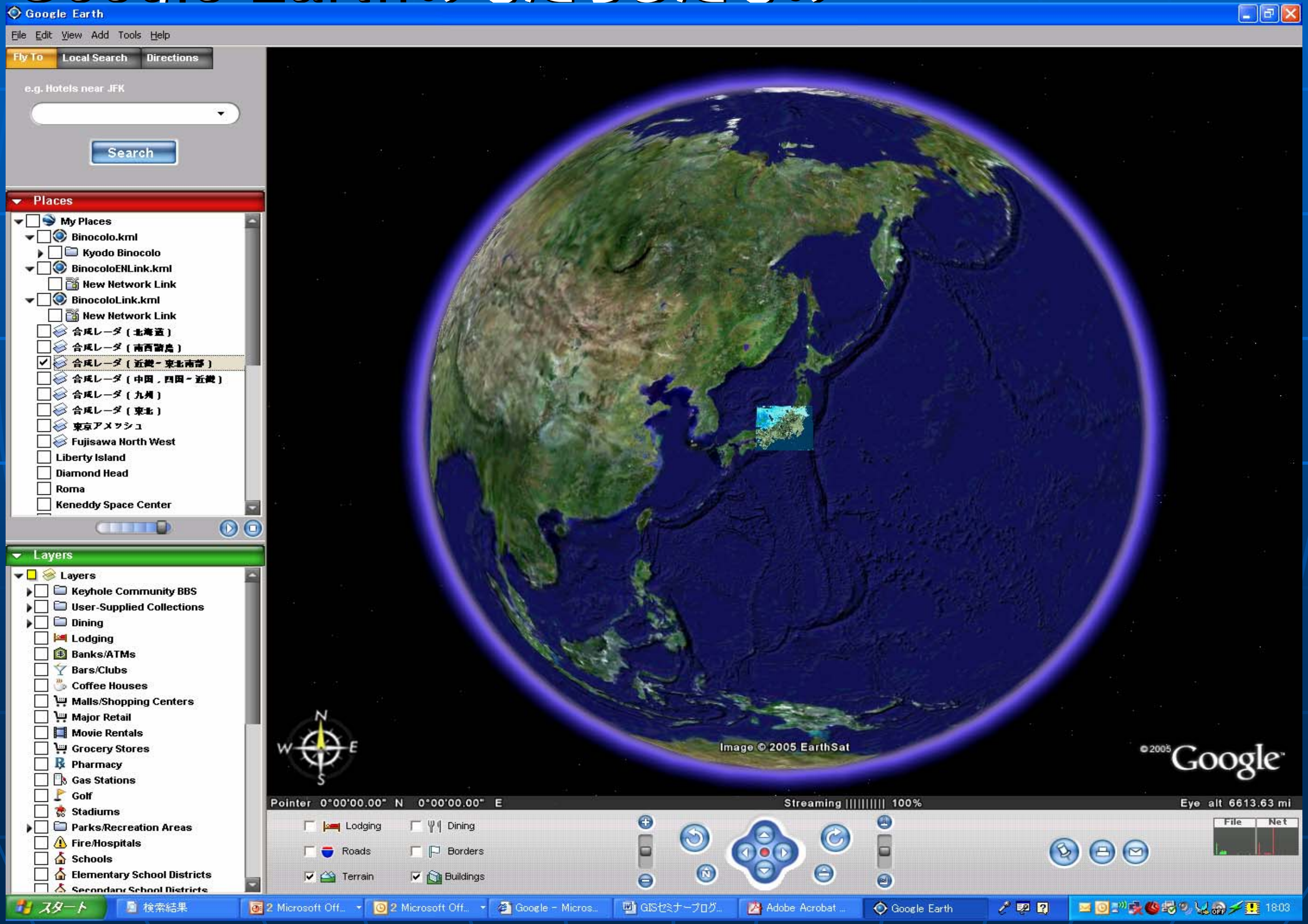
1．科学利用から実利用（Operational Use）
----観測とデータ流通の明確な戦略の構築

- データからプロダクト、情報、そして知識の継続的なサービスへ
- 繰り返し利用、変化抽出など時系列解析を可能にするための継続観測の確立
- 必要な場所でタイムリーな利用（Rapid Response）を可能にするシステム
- データの課金ポリシーの確立、公共財の自由で安価な利用（Open Data Policies）
- ユーザーが利用し易いデータとサービスの流通システムの構築

実感できる地球　の構築へ

- 画像で地球を実感する

  Google Earthのもたらしたもの


Google Earth
File Edit View Add Tools Help
Fly To
Local Search
Directions
e.g. Hotels near JFK
Search
Places
My Places
Binocolo.kml
Kyodo Binocolo
BinocoloENLink.kml
New Network Link
BinocoloLink.kml
New Network Link
合成レーダ（北海道）
合成レーダ（南西諸島）
合成レーダ（近畿－東北南部）
合成レーダ（中国，四国－近畿）
合成レーダ（九州）
合成レーダ（東北）
東京アメッシュ
Fujisawa North West
Liberty Island
Diamond Head
Roma
Keneddy Space Center
Layers
Layers
Keyhole Community BBS
User-Supplied Collections
Dining
Lodging
Banks/ATMs
Bars/Clubs
Coffee Houses
Malls/Shopping Centers
Major Retail
Movie Rentals
Grocery Stores
Pharmacy
Gas Stations
Golf
Stadiums
Parks/Recreation Areas
Fire/Hospitals
Schools
Elementary School Districts
Secondary School Districts
N
W
E
S
Image © 2005 EarthSat
©2005 Google
Pointer 0°00'00.00" N 0°00'00.00" E
Streaming |||||||||| 100%
Eye alt 6613.63 mi
Lodging
Dining
Roads
Borders
Terrain
Buildings
File
Net
スタート
検索結果
2 Microsoft Off...
2 Microsoft Off...
Google - Micros...
GISセミナーブログ...
Adobe Acrobat ...
Google Earth
18:03

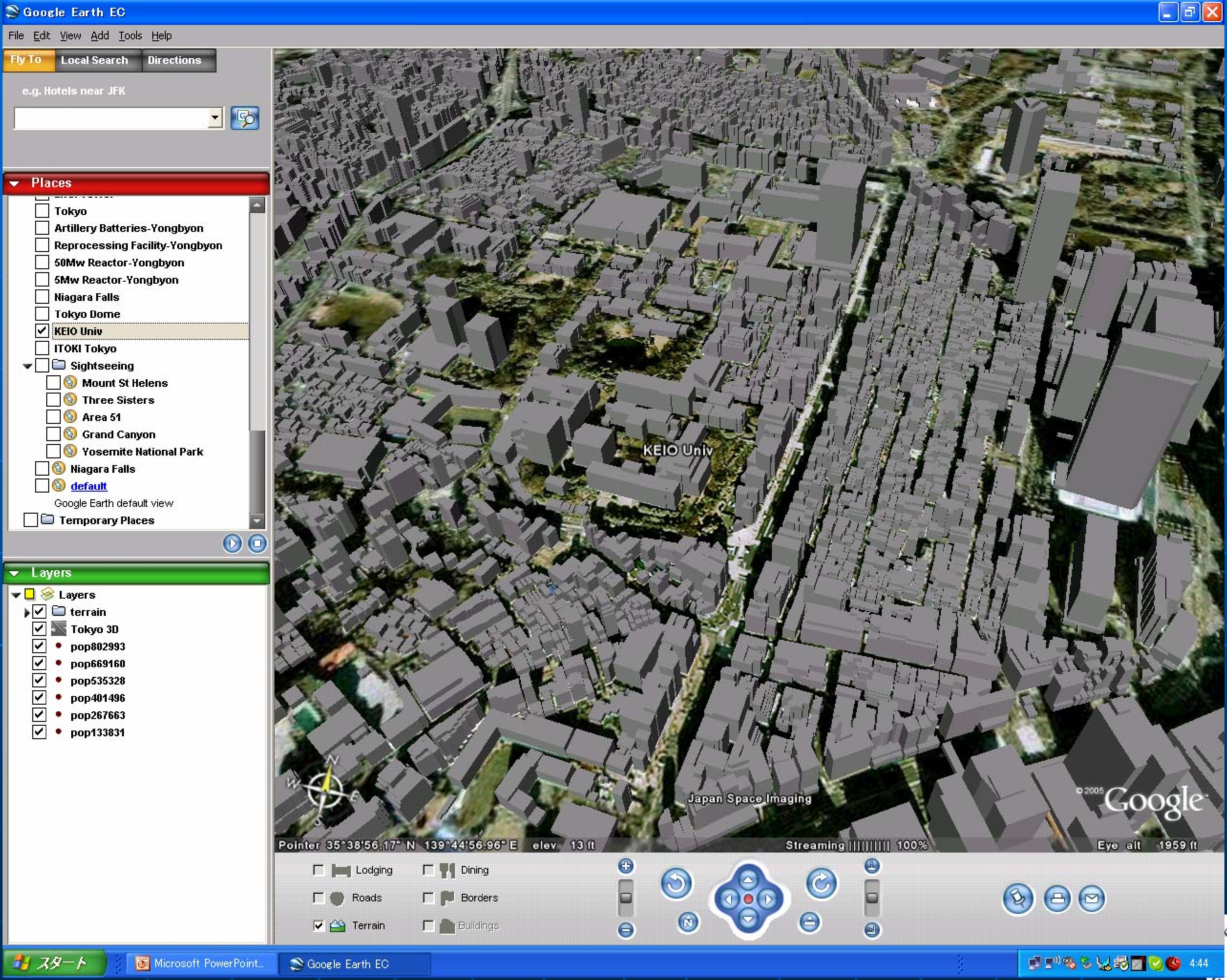
科学利用から実利用（Operational Use）
----観測とデータ流通の明確な戦略の構築

- 情報化社会では、仮想空間を効果的に活用することが、現実社会の問題解決に有効

  ---- g-コンテンツの活用
  GISの活用

- デジタルアースの構築

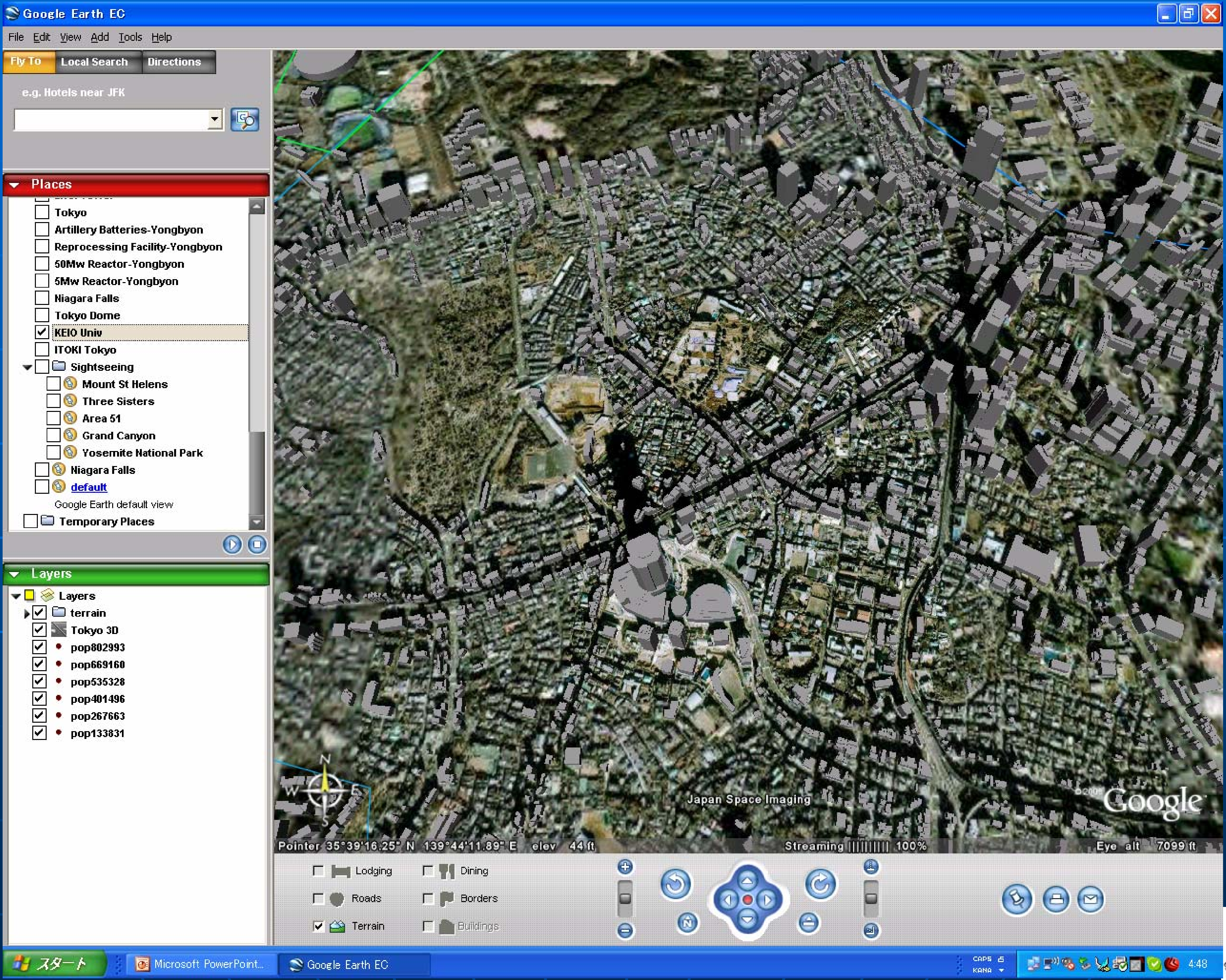
  ---- 視覚により実感する地球へ

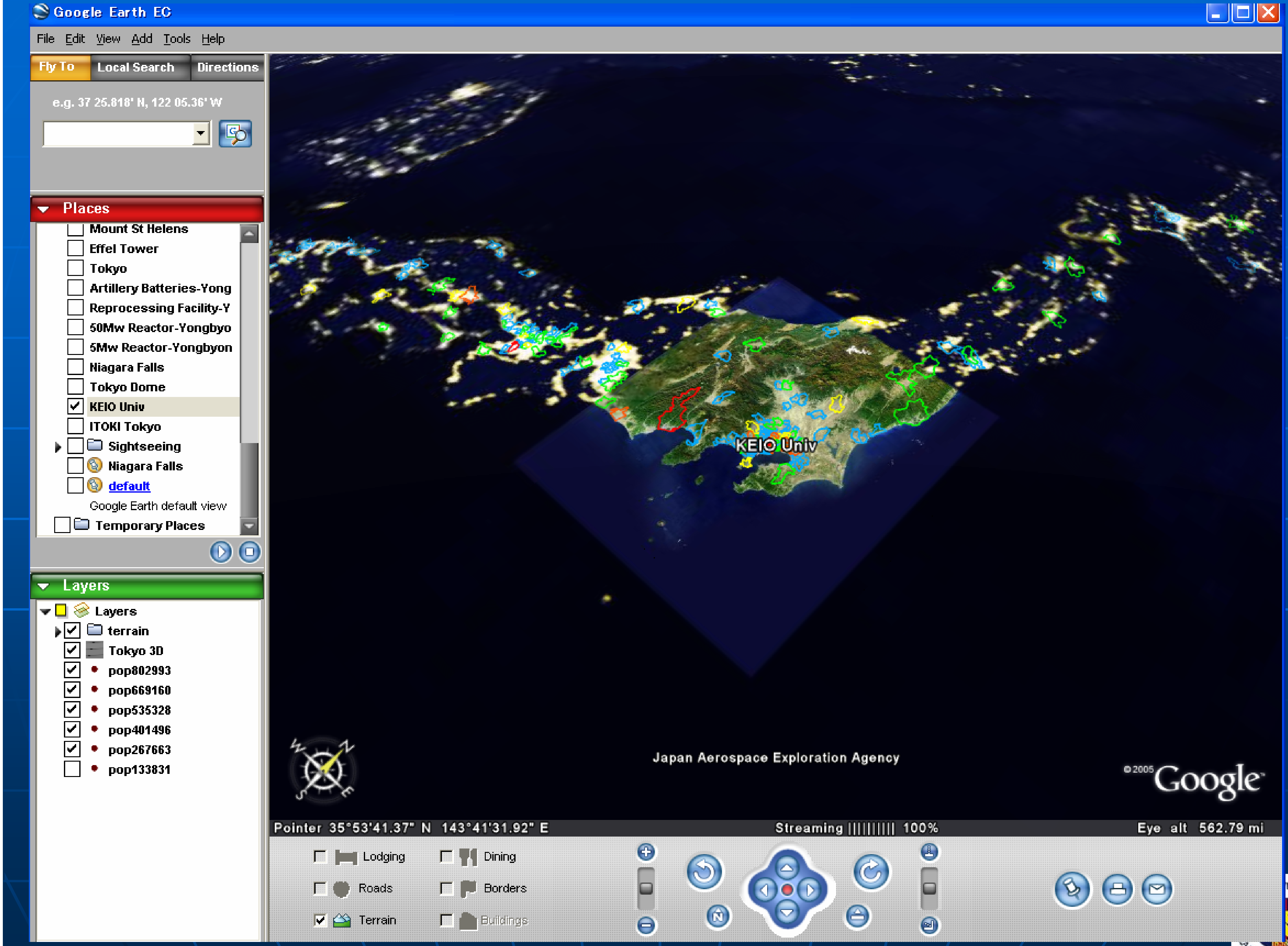

Google Earth EC
File Edit View Add Tools Help
Fly To
Local Search
Directions
e.g. Hotels near JFK
Places
Layers
KEIO Univ
Japan Space Imaging
© 2005 Google
Pointer 35°38'56.17" N 139°44'56.96" E elev 13 ft
Streaming |||||||||| 100%
Eye alt 1959 ft
スタート
Microsoft PowerPoint...
Google Earth EC
4:44

☐ Tokyo
☐ Artillery Batteries-Yongbyon
☐ Reprocessing Facility-Yongbyon
☐ 50Mw Reactor-Yongbyon
☐ 5Mw Reactor-Yongbyon
☐ Niagara Falls
☐ Tokyo Dome
☑ KEIO Univ
☐ ITOKI Tokyo
☐ Sightseeing
  - ☐ Mount St Helens
  - ☐ Three Sisters
  - ☐ Area 51
  - ☐ Grand Canyon
  - ☐ Yosemite National Park
☐ Niagara Falls
☐ default
  Google Earth default view
☐ Temporary Places

☐ Layers
  - ☑ terrain
  - ☑ Tokyo 3D
  - ☑ pop802993
  - ☑ pop669160
  - ☑ pop535328
  - ☑ pop401496
  - ☑ pop267663
  - ☑ pop133831

☐ Lodging ☐ Dining
☐ Roads ☐ Borders
☑ Terrain ☐ Buildings


Google Earth EC
File Edit View Add Tools Help
Fly To
Local Search
Directions
e.g. Hotels near JFK
Places
☐ Tokyo
☐ Artillery Batteries-Yongbyon
☐ Reprocessing Facility-Yongbyon
☐ 50Mw Reactor-Yongbyon
☐ 5Mw Reactor-Yongbyon
☐ Niagara Falls
☐ Tokyo Dome
☑ KEIO Univ
☐ ITOKI Tokyo
☐ Sightseeing
☐ Mount St Helens
☐ Three Sisters
☐ Area 51
☐ Grand Canyon
☐ Yosemite National Park
☐ Niagara Falls
☐ default
Google Earth default view
☐ Temporary Places
Layers
Layers
☑ terrain
☑ Tokyo 3D
☑ pop802993
☑ pop669160
☑ pop535328
☑ pop401496
☑ pop267663
☑ pop133831
Japan Space Imaging
©2005 Google
Pointer 35°39'16.25" N 139°44'11.89" E elev 44 ft
Streaming |||||||||| 100%
Eye alt 7099 ft
☐ Lodging
☐ Dining
☐ Roads
☐ Borders
☑ Terrain
☐ Buildings
スタート
Microsoft PowerPoint...
Google Earth EC
CAPS KANA
4:48

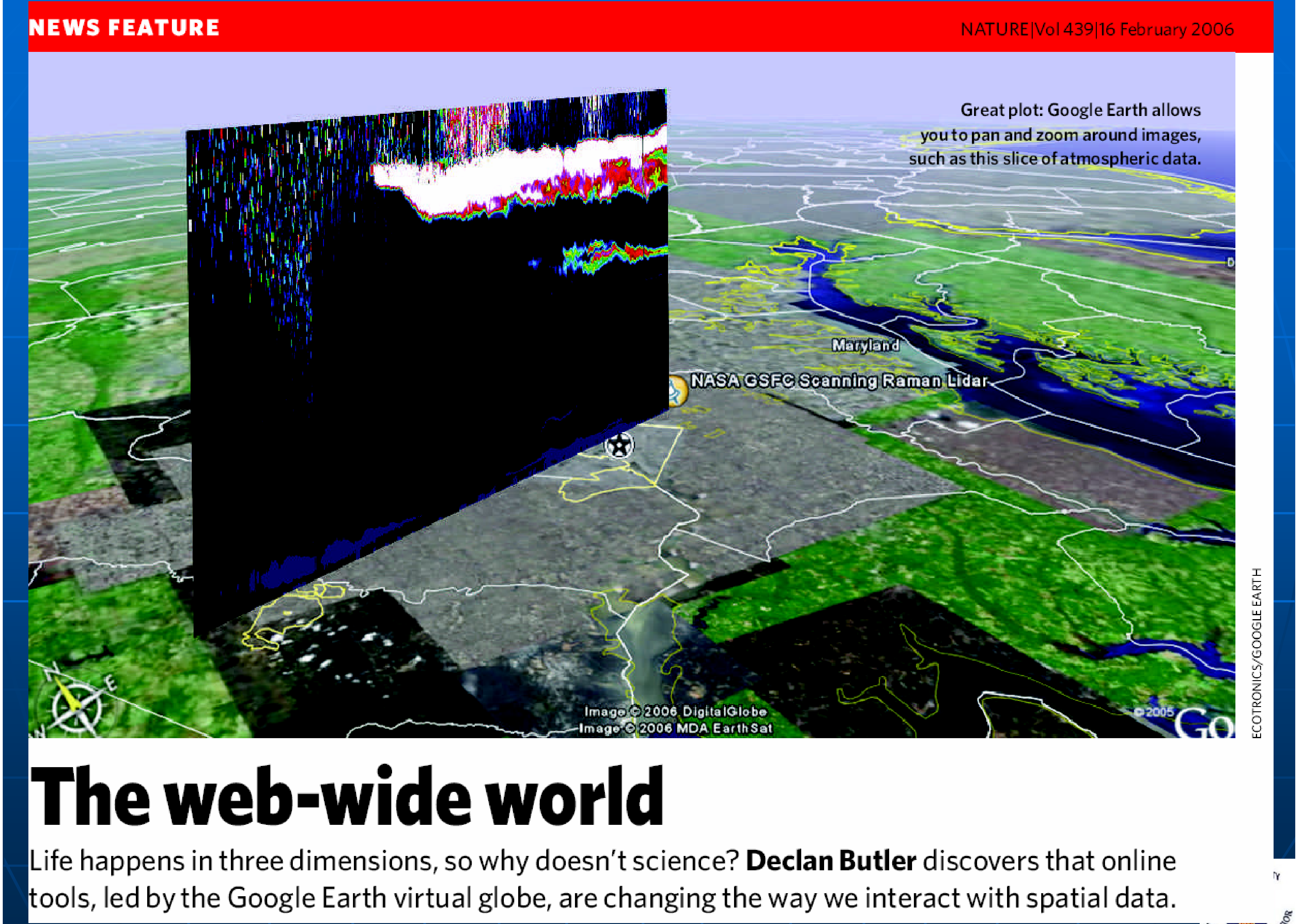

Google Earth EC
File Edit View Add Tools Help
Fly To
Local Search
Directions
e.g. 37 25.818' N, 122 05.36' W
Places
Layers
KEIO Univ
Japan Aerospace Exploration Agency
©2005 Google
Lodging
Dining
Roads
Borders
Terrain
Buildings

Places
- ☐ Mount St Helens
- ☐ Effel Tower
- ☐ Tokyo
- ☐ Artillery Batteries-Yong
- ☐ Reprocessing Facility-Y
- ☐ 50Mw Reactor-Yongbyo
- ☐ 5Mw Reactor-Yongbyon
- ☐ Niagara Falls
- ☐ Tokyo Dome
- ☑ KEIO Univ
- ☐ ITOKI Tokyo
- ☐ Sightseeing
- ☐ Niagara Falls
- ☐ default
  Google Earth default view
- ☐ Temporary Places

Layers
- Layers
  - ☑ terrain
  - ☑ Tokyo 3D
  - ☑ pop802993
  - ☑ pop669160
  - ☑ pop535328
  - ☑ pop401496
  - ☑ pop267663
  - ☐ pop133831

Pointer 35°53'41.37" N 143°41'31.92" E Streaming |||||||||| 100% Eye alt 562.79 mi

☐ Lodging ☐ Dining
☐ Roads ☐ Borders
☑ Terrain ☐ Buildings


Maryland
NASA GSFC Scanning Raman Lidar
Image © 2006 DigitalGlobe
Image © 2006 MDA EarthSat
© 2005
N
E

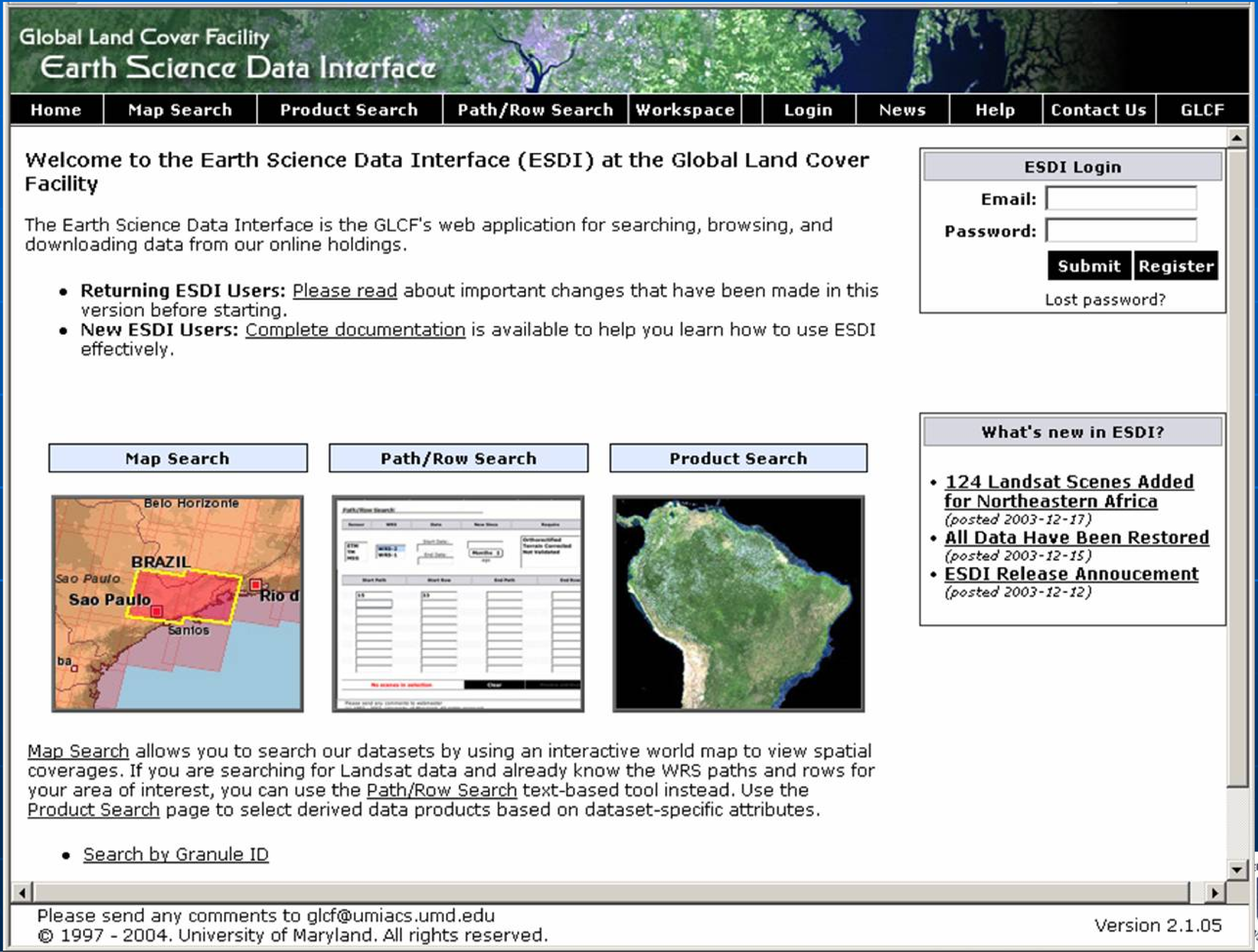
Great plot: Google Earth allows you to pan and zoom around images, such as this slice of atmospheric data.

ECOTRONICS/GOOGLE EARTH

The web-wide world

Life happens in three dimensions, so why doesn't science? **Declan Butler** discovers that online tools, led by the Google Earth virtual globe, are changing the way we interact with spatial data.

Global Land Cover Facility


Global Land Cover Facility
Earth Science Data Interface
Home
Map Search
Product Search
Path/Row Search
Workspace
Login
News
Help
Contact Us
GLCF
ESDI Login
Submit
Register
Lost password?
Map Search
Path/Row Search
Product Search
Belo Horizonte
BRAZIL
Sao Paulo
Sao Paulo
Rio d
Santos
What's new in ESDI?

Welcome to the Earth Science Data Interface (ESDI) at the Global Land Cover Facility

The Earth Science Data Interface is the GLCF's web application for searching, browsing, and downloading data from our online holdings.

- **Returning ESDI Users:** Please read about important changes that have been made in this version before starting.
- **New ESDI Users:** Complete documentation is available to help you learn how to use ESDI effectively.

Email:

Password:

- **124 Landsat Scenes Added for Northeastern Africa** *(posted 2003-12-17)*
- **All Data Have Been Restored** *(posted 2003-12-15)*
- **ESDI Release Annoucement** *(posted 2003-12-12)*

Map Search allows you to search our datasets by using an interactive world map to view spatial coverages. If you are searching for Landsat data and already know the WRS paths and rows for your area of interest, you can use the Path/Row Search text-based tool instead. Use the Product Search page to select derived data products based on dataset-specific attributes.

- Search by Granule ID

Please send any comments to glcf@umiacs.umd.edu

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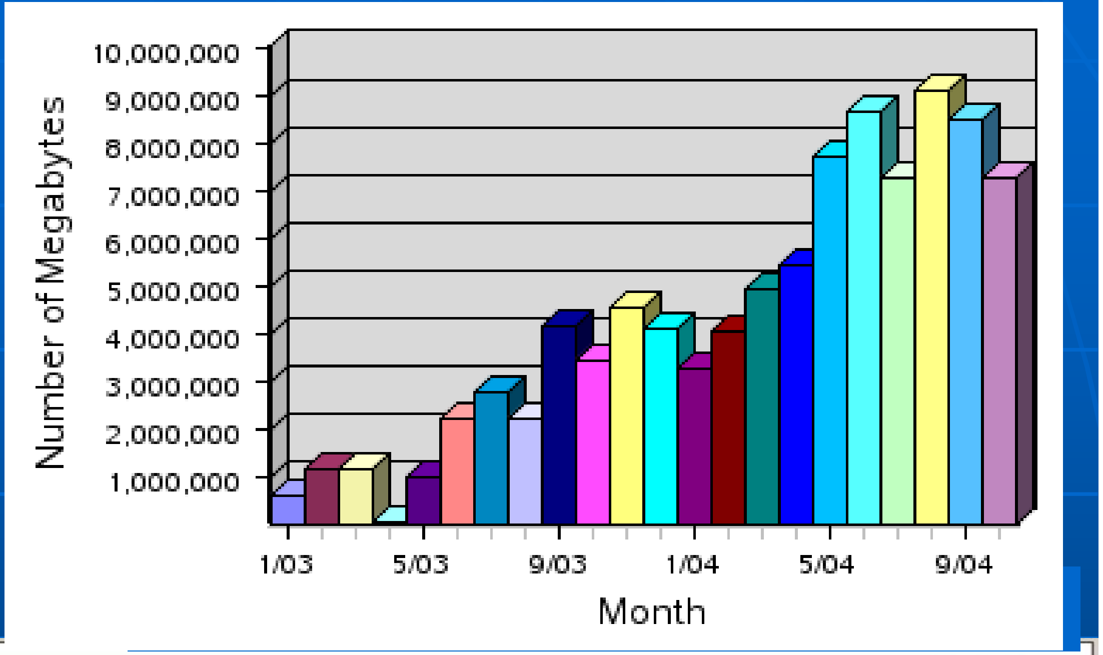
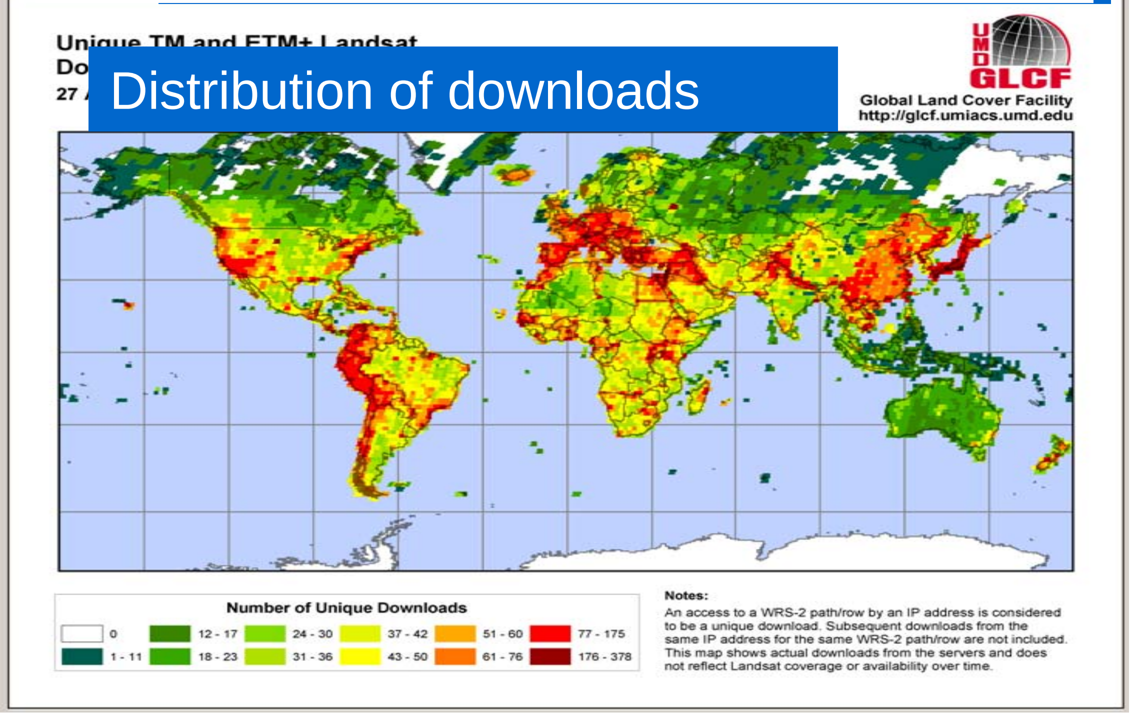
Version 2.1.05

Encouraging the use of products:
Global Land Cover Facility (www.landcover.org)

- Simple interfaces; hide the complexity from the users.
- Multiple ordering mechanisms
- Comprehensive data sets
- Keep data on line
- Large bandwidth.
- Scientifically informed operators of system
- Engagement of computer scientists in design.
- The right price: $0.



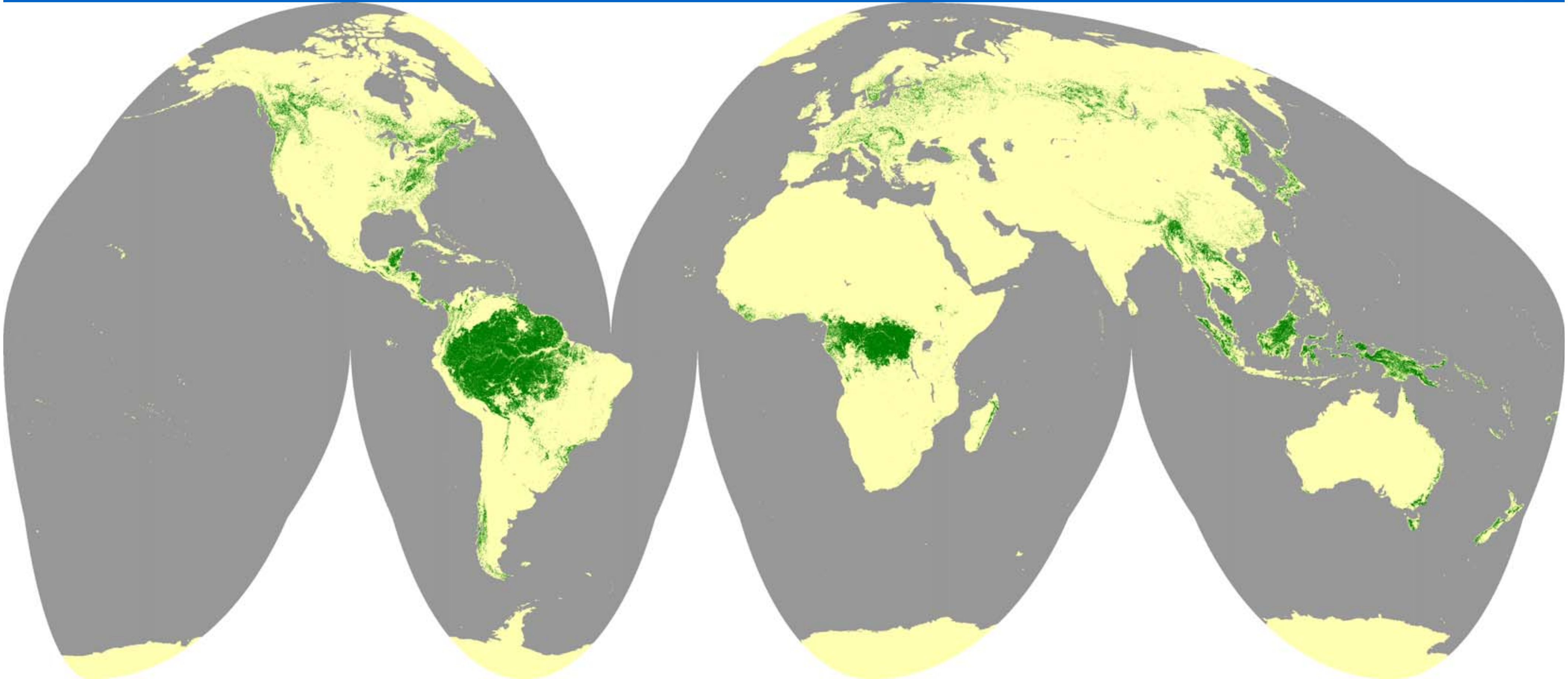

Unique TM and ETM+ Landsat
Do
27
UMD
GLCF
Global Land Cover Facility
http://glcf.umiacs.umd.edu
Number of Unique Downloads
0
1 - 11
12 - 17
18 - 23
24 - 30
31 - 36
37 - 42
43 - 50
51 - 60
61 - 76
77 - 175
176 - 378

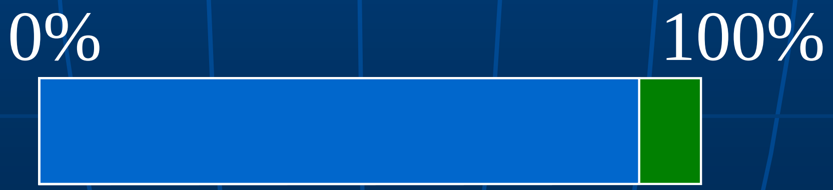
Distribution of downloads

Notes:

An access to a WRS-2 path/row by an IP address is considered to be a unique download. Subsequent downloads from the same IP address for the same WRS-2 path/row are not included. This map shows actual downloads from the servers and does not reflect Landsat coverage or availability over time.

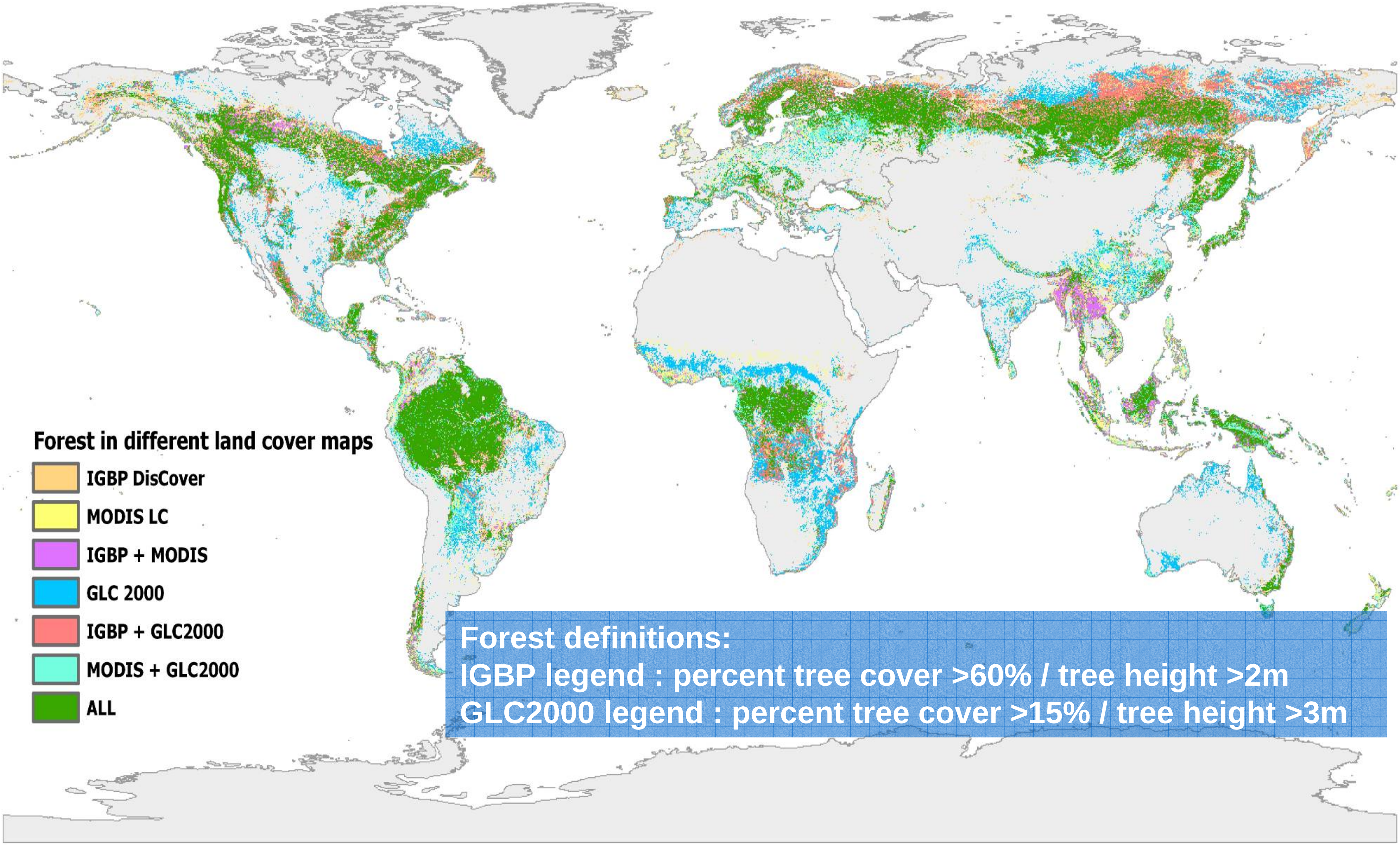
Variable definition of forest cover from MODIS data





Applied tree cover threshold

Forest areas in global land cover maps


Forest in different land cover maps
IGBP DisCover
MODIS LC
IGBP + MODIS
GLC 2000
IGBP + GLC2000
MODIS + GLC2000
ALL

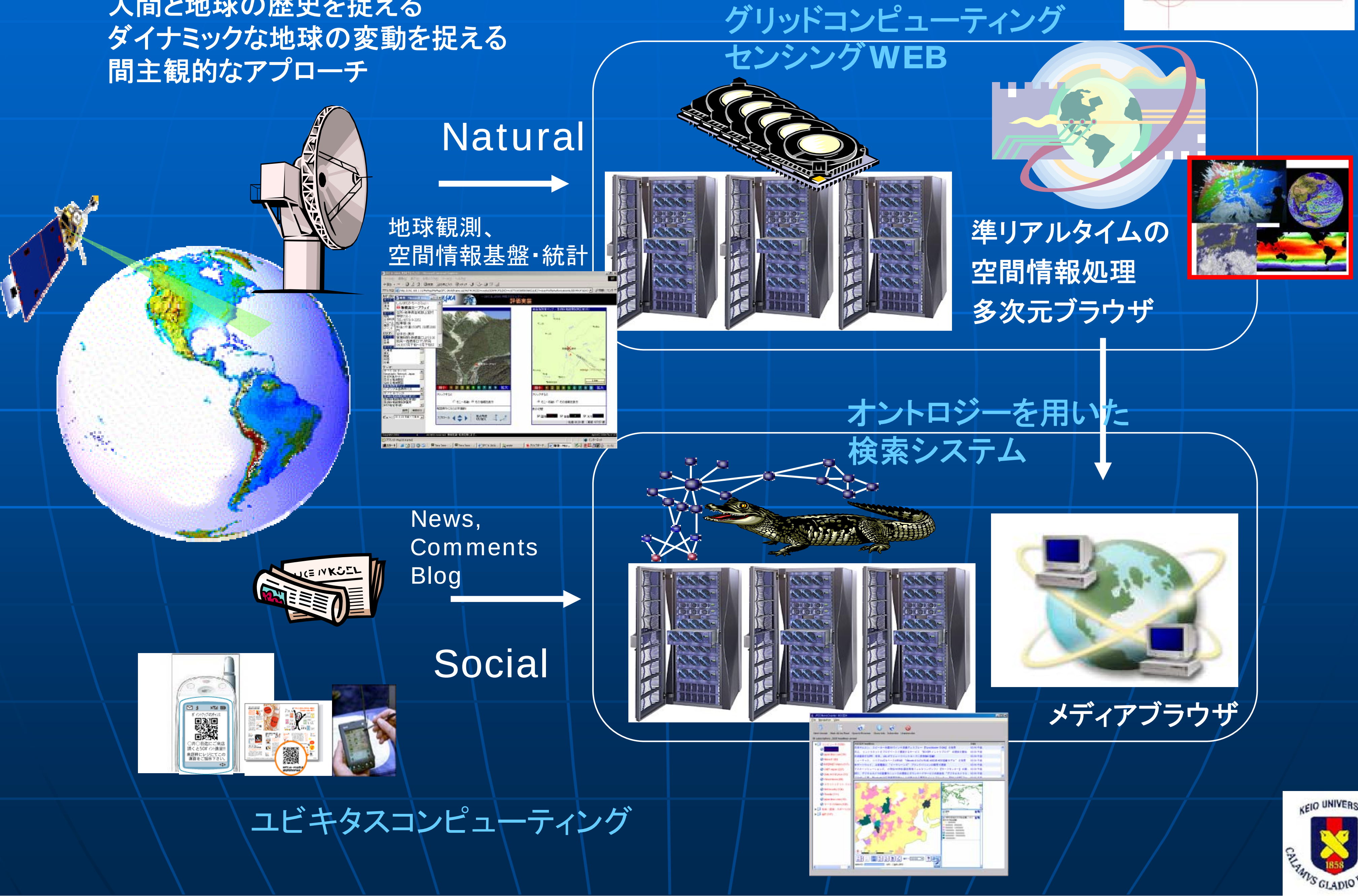
Forest definitions:
IGBP legend : percent tree cover >60% / tree height >2m
GLC2000 legend : percent tree cover >15% / tree height >3m

2. 地上観測データ等との統合利用

- グランドツルースデータ、in-situ（地上観測等）システムとの統合と流通
  - 効果的なCal./Val. 体制、
  - DEMなどベースデータの作成体制
- 他の観測衛星データとの統合利用
- 共通の標準、プロトコル、データプロダクト,Web-Service等の定義

デジタルアジアの二つの分析装置

本当の地球の状態を知る
人間と地球の歴史を捉える
ダイナミックな地球の変動を捉える
間主観的なアプローチ



グリッドコンピューティング
センシングWEB

Natural

地球観測、
空間情報基盤・統計

準リアルタイムの
空間情報処理
多次元ブラウザ

オントロジーを用いた
検索システム

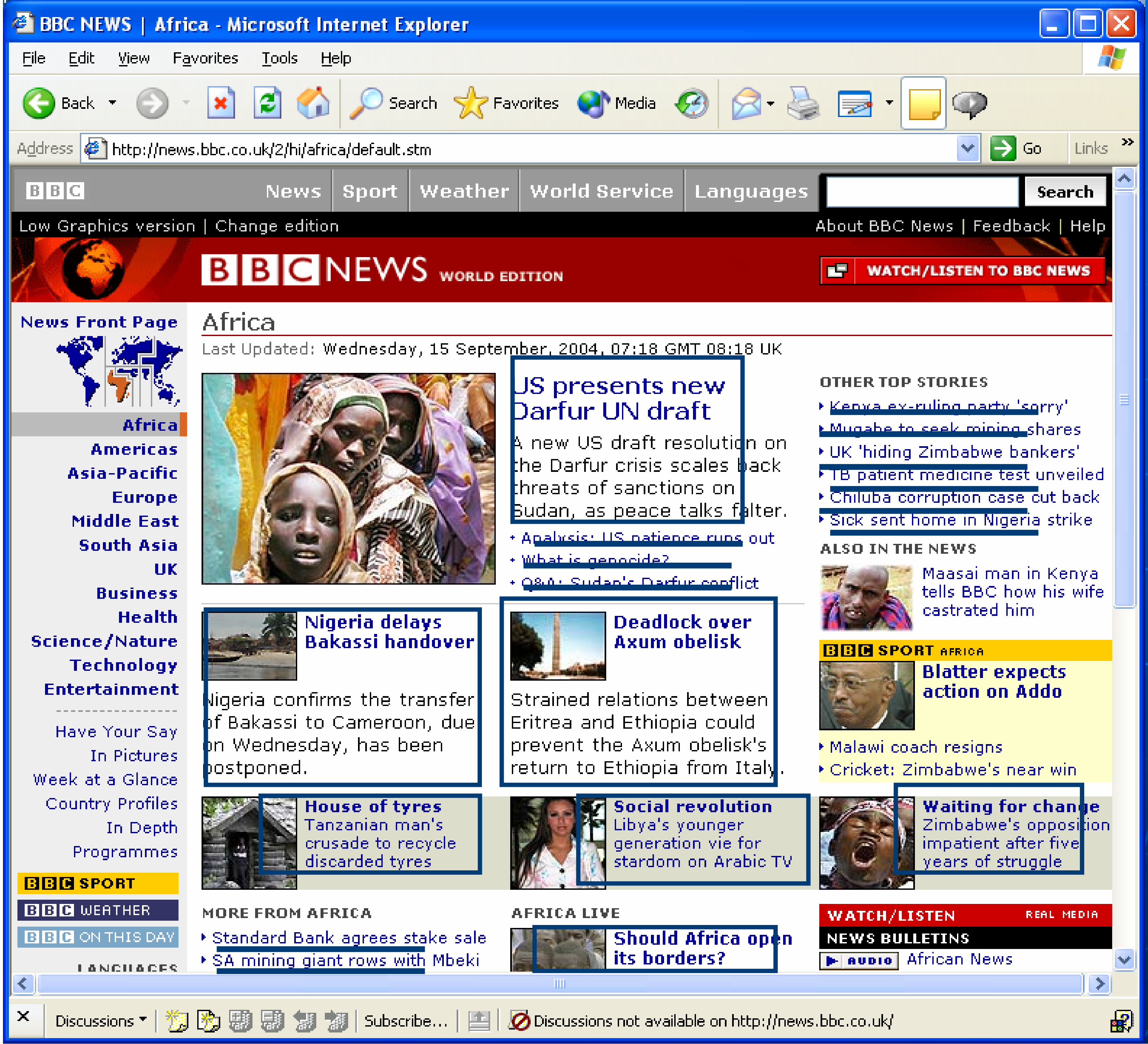
News,
Comments
Blog

Social

メディアブラウザ

ユビキタスコンピューティング

NEWSの
世界での利用


BBC NEWS | Africa - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back
Search
Favorites
Media
Address
Go
Links
Discussions
Subscribe...

http://news.bbc.co.uk/2/hi/africa/default.stm

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Sport
Weather
World Service
Languages
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Low Graphics version | Change edition
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BBC NEWS WORLD EDITION
WATCH/LISTEN TO BBC NEWS
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Asia-Pacific
Europe
Middle East
South Asia
UK
Business
Health
Science/Nature
Technology
Entertainment
Have Your Say
In Pictures
Week at a Glance
Country Profiles
In Depth
Programmes
BBC SPORT
BBC WEATHER
BBC ON THIS DAY
LANGUAGES

Africa

Last Updated: Wednesday, 15 September, 2004, 07:18 GMT 08:18 UK

US presents new Darfur UN draft

A new US draft resolution on the Darfur crisis scales back threats of sanctions on Sudan, as peace talks falter.

- Analysis: US patience runs out
- What is genocide?
- Q&A: Sudan's Darfur conflict

Nigeria delays Bakassi handover

Nigeria confirms the transfer of Bakassi to Cameroon, due on Wednesday, has been postponed.

Deadlock over Axum obelisk

Strained relations between Eritrea and Ethiopia could prevent the Axum obelisk's return to Ethiopia from Italy.

House of tyres
Tanzanian man's crusade to recycle discarded tyres

Social revolution
Libya's younger generation vie for stardom on Arabic TV

Waiting for change
Zimbabwe's opposition impatient after five years of struggle

MORE FROM AFRICA

- Standard Bank agrees stake sale
- SA mining giant rows with Mbeki

AFRICA LIVE

Should Africa open its borders?

OTHER TOP STORIES

- Kenya ex-ruling party 'sorry'
- Mugabe to seek mining shares
- UK 'hiding Zimbabwe bankers'
- TB patient medicine test unveiled
- Chiluba corruption case cut back
- Sick sent home in Nigeria strike

ALSO IN THE NEWS

Maasai man in Kenya tells BBC how his wife castrated him

BBC SPORT AFRICA

Blatter expects action on Addo

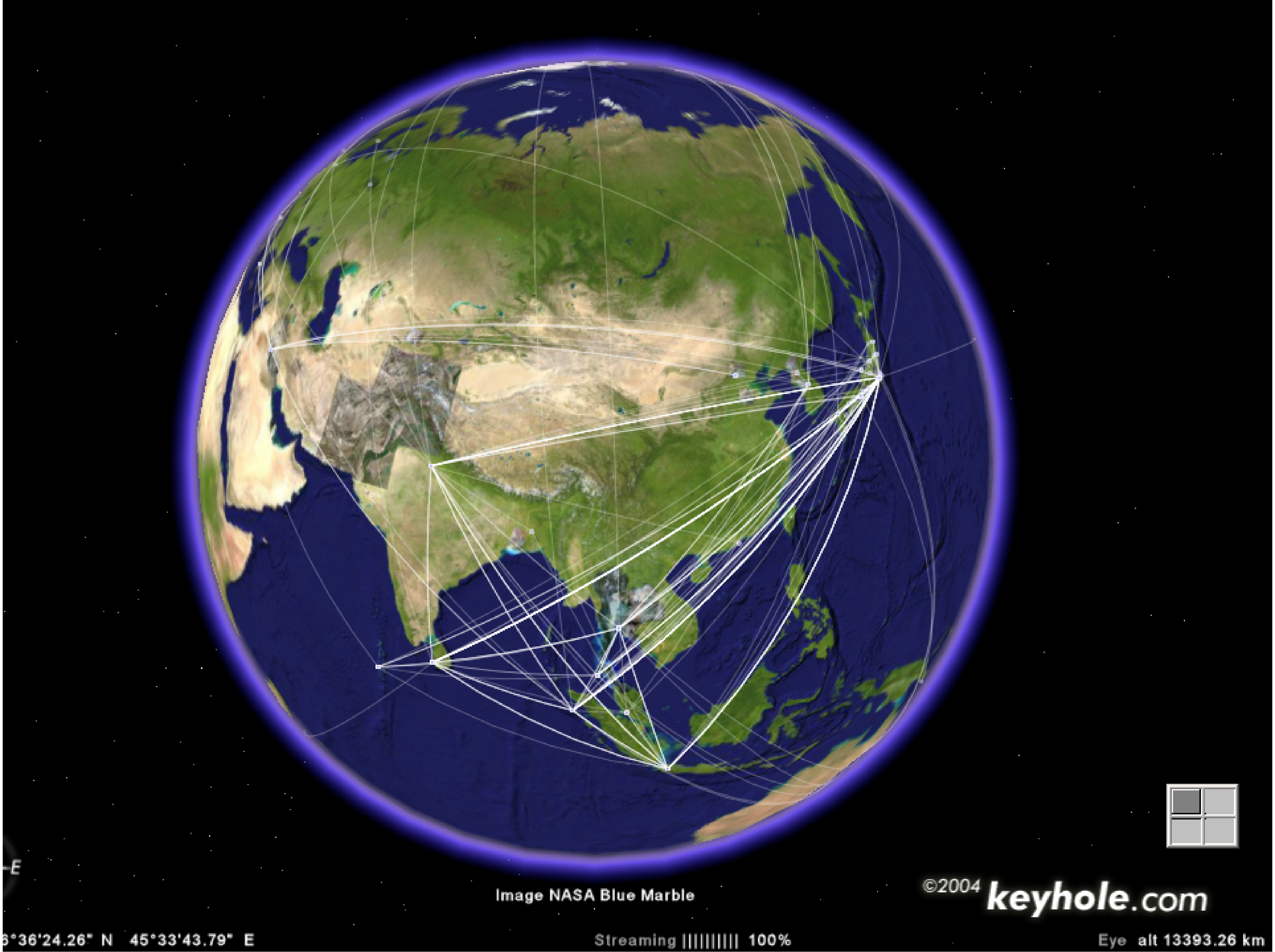
- Malawi coach resigns
- Cricket: Zimbabwe's near win

WATCH/LISTEN REAL MEDIA

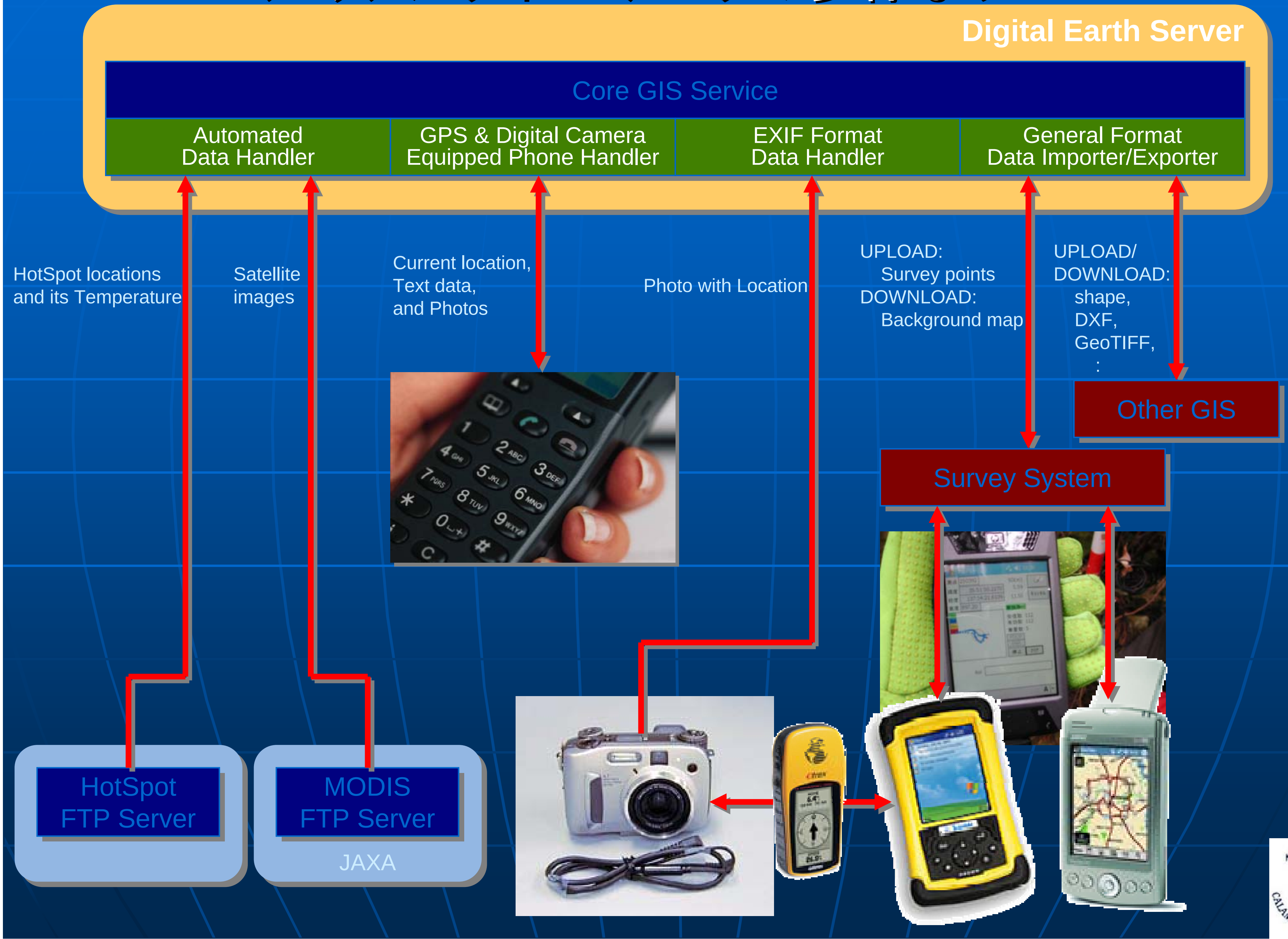
NEWS BULLETINS

AUDIO African News

Discussions not available on http://news.bbc.co.uk/


E
Image NASA Blue Marble
©2004 keyhole.com
6°36'24.26" N 45°33'43.79" E
Streaming |||||||||| 100%
Eye alt 13393.26 km

ニア リアルタイム データの多様なサービス



Digital Earth Server

Core GIS Service

Automated
Data Handler

GPS & Digital Camera
Equipped Phone Handler

EXIF Format
Data Handler

General Format
Data Importer/Exporter

HotSpot locations
and its Temperature

Satellite
images

Current location,
Text data,
and Photos

Photo with Location

UPLOAD:
Survey points
DOWNLOAD:
Background map

UPLOAD/
DOWNLOAD:
shape,
DXF,
GeoTIFF,
:

Other GIS

Survey System

HotSpot
FTP Server

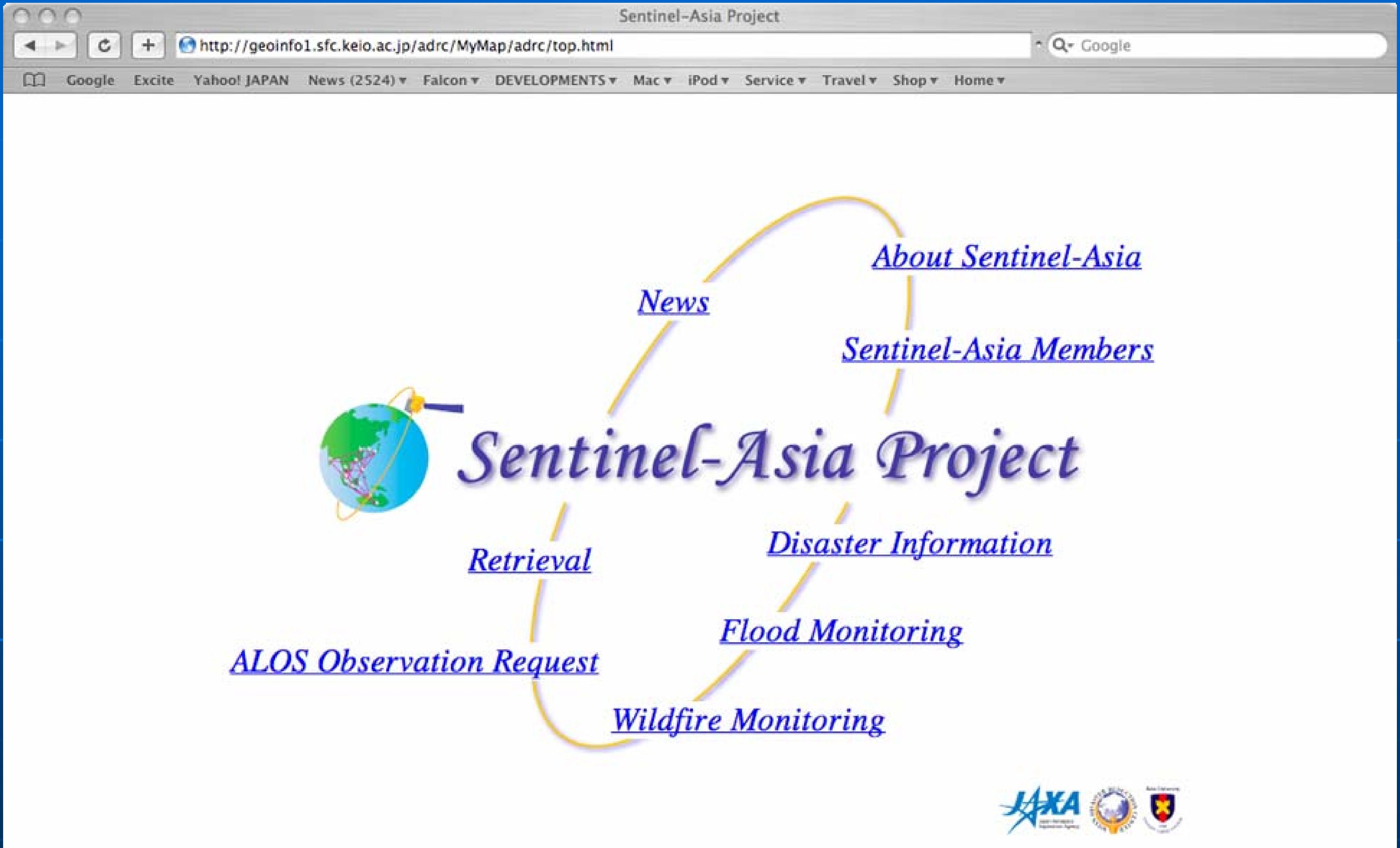
MODIS
FTP Server

JAXA

３．ユーザーニーズに対応した具体的な応用領域の開拓とその実運用

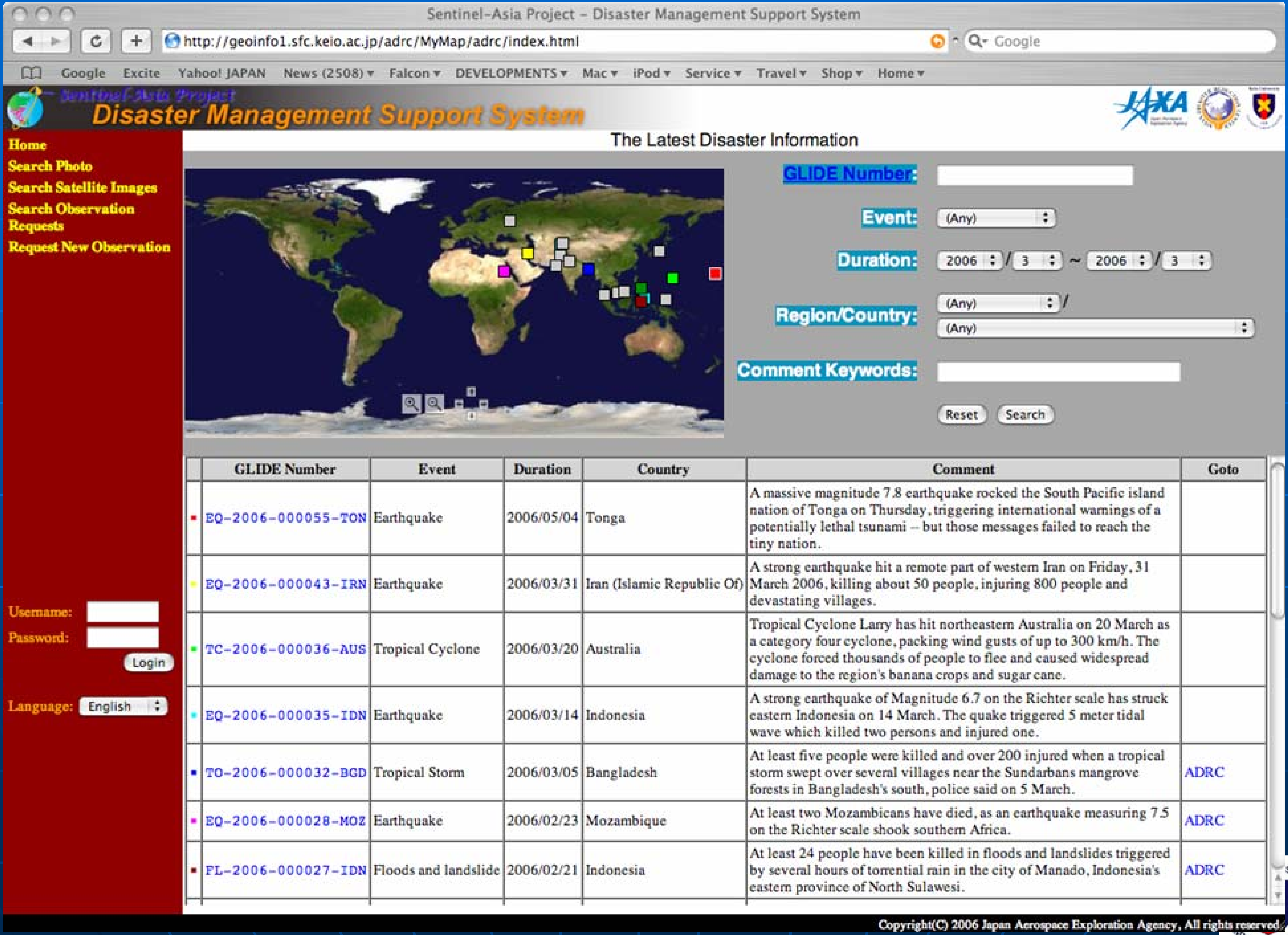
- 防災
  - Sentinel Asia Project
- 地球温暖化対応（土地被覆データ監視等）
- グローバルセキュリティ･･･

ポータル トップページ


Sentinel-Asia Project
http://geoinfo1.sfc.keio.ac.jp/adrc/MyMap/adrc/top.html
Google
Google
Excite
Yahoo! JAPAN
News (2524)
Falcon
DEVELOPMENTS
Mac
iPod
Service
Travel
Shop
Home
About Sentinel-Asia
News
Sentinel-Asia Members
Sentinel-Asia Project
Retrieval
Disaster Information
Flood Monitoring
ALOS Observation Request
Wildfire Monitoring
JAXA

加来さんのご要望をイメージしてみました。

災害情報公開システム トップページ



http://geoinfo1.sfc.keio.ac.jp/adrc/MyMap/adrc/index.html

Home
Search Photo
Search Satellite Images
Search Observation Requests
Request New Observation

The Latest Disaster Information

GLIDE Number:
Event: (Any)
Duration: 2006 / 3 ~ 2006 / 3
Region/Country: (Any) / (Any)
Comment Keywords:
Reset Search

Username:
Password:
Login

Language: English

	GLIDE Number	Event	Duration	Country	Comment	Goto
■	EQ-2006-000055-TON	Earthquake	2006/05/04	Tonga	A massive magnitude 7.8 earthquake rocked the South Pacific island nation of Tonga on Thursday, triggering international warnings of a potentially lethal tsunami -- but those messages failed to reach the tiny nation.	
■	EQ-2006-000043-IRN	Earthquake	2006/03/31	Iran (Islamic Republic Of)	A strong earthquake hit a remote part of western Iran on Friday, 31 March 2006, killing about 50 people, injuring 800 people and devastating villages.	
■	TC-2006-000036-AUS	Tropical Cyclone	2006/03/20	Australia	Tropical Cyclone Larry has hit northeastern Australia on 20 March as a category four cyclone, packing wind gusts of up to 300 km/h. The cyclone forced thousands of people to flee and caused widespread damage to the region's banana crops and sugar cane.	
■	EQ-2006-000035-IDN	Earthquake	2006/03/14	Indonesia	A strong earthquake of Magnitude 6.7 on the Richter scale has struck eastern Indonesia on 14 March. The quake triggered 5 meter tidal wave which killed two persons and injured one.	
■	TO-2006-000032-BGD	Tropical Storm	2006/03/05	Bangladesh	At least five people were killed and over 200 injured when a tropical storm swept over several villages near the Sundarbans mangrove forests in Bangladesh's south, police said on 5 March.	ADRC
■	EQ-2006-000028-MOZ	Earthquake	2006/02/23	Mozambique	At least two Mozambicans have died, as an earthquake measuring 7.5 on the Richter scale shook southern Africa.	ADRC
■	FL-2006-000027-IDN	Floods and landslide	2006/02/21	Indonesia	At least 24 people have been killed in floods and landslides triggered by several hours of torrential rain in the city of Manado, Indonesia's eastern province of North Sulawesi.	ADRC

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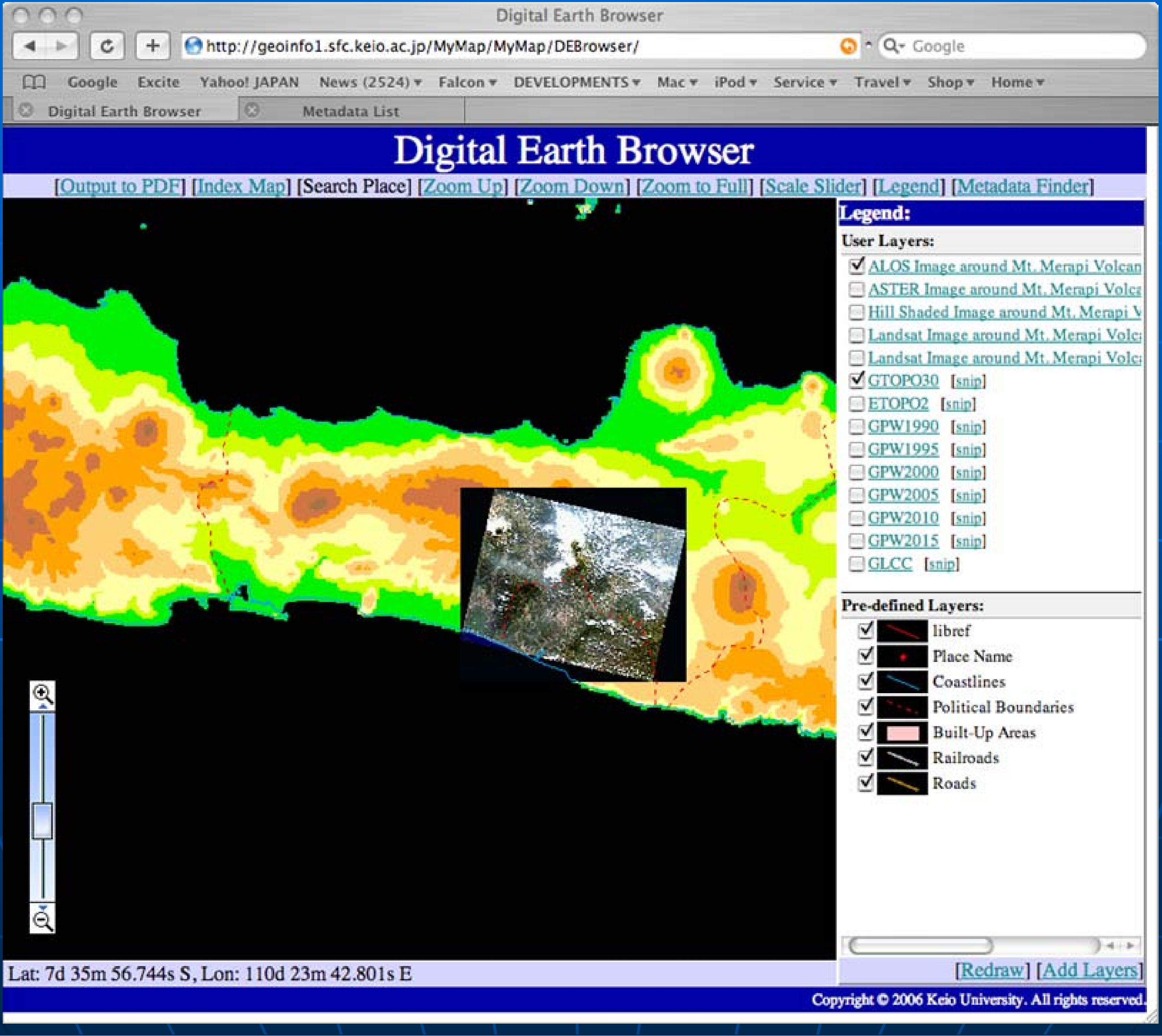
DE Browser (GTOPO30 + ALOS + Vmap0)


Digital Earth Browser
http://geoinfo1.sfc.keio.ac.jp/MyMap/MyMap/DEBrowser/
Google
Google
Excite
Yahoo! JAPAN
News (2524)
Falcon
DEVELOPMENTS
Mac
iPod
Service
Travel
Shop
Home
Digital Earth Browser
Metadata List

Digital Earth Browser

[Output to PDF] [Index Map] [Search Place] [Zoom Up] [Zoom Down] [Zoom to Full] [Scale Slider] [Legend] [Metadata Finder]

Legend:

User Layers:

- ☑ ALOS Image around Mt. Merapi Volcan
- ☐ ASTER Image around Mt. Merapi Volc
- ☐ Hill Shaded Image around Mt. Merapi V
- ☐ Landsat Image around Mt. Merapi Volc
- ☐ Landsat Image around Mt. Merapi Volc
- ☑ GTOPO30 [snip]
- ☐ ETOPO2 [snip]
- ☐ GPW1990 [snip]
- ☐ GPW1995 [snip]
- ☐ GPW2000 [snip]
- ☐ GPW2005 [snip]
- ☐ GPW2010 [snip]
- ☐ GPW2015 [snip]
- ☐ GLCC [snip]

Pre-defined Layers:

- ☑ libref
- ☑ Place Name
- ☑ Coastlines
- ☑ Political Boundaries
- ☑ Built-Up Areas
- ☑ Railroads
- ☑ Roads

[Redraw] [Add Layers]

Lat: 7d 35m 56.744s S, Lon: 110d 23m 42.801s E

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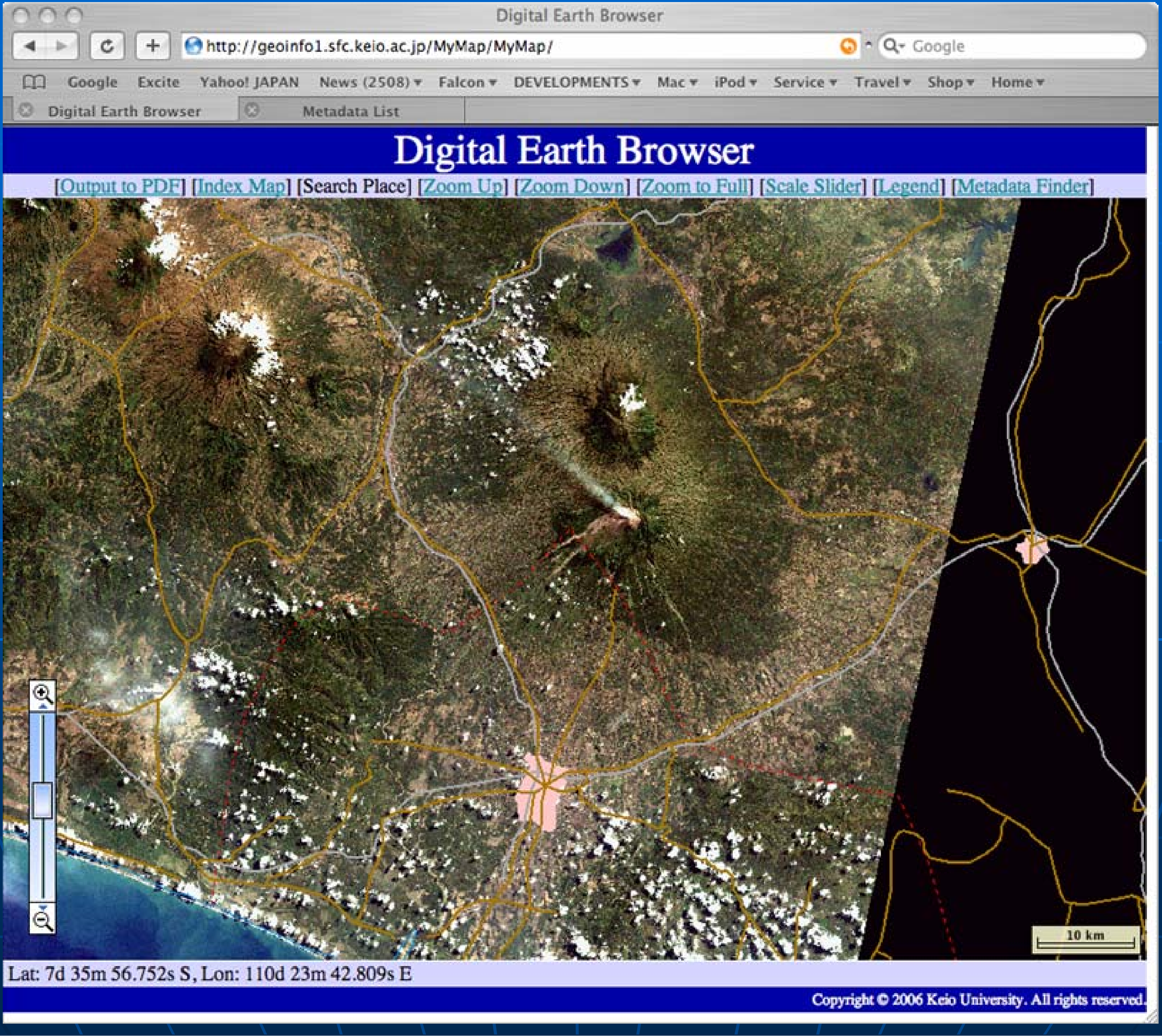
DE Browser (LANDSAT ETM+ + Vmap0)


Digital Earth Browser
http://geoinfo1.sfc.keio.ac.jp/MyMap/MyMap/
Google
Google
Excite
Yahoo! JAPAN
News (2508)
Falcon
DEVELOPMENTS
Mac
iPod
Service
Travel
Shop
Home
Digital Earth Browser
Metadata List
Digital Earth Browser
[Output to PDF] [Index Map] [Search Place] [Zoom Up] [Zoom Down] [Zoom to Full] [Scale Slider] [Legend] [Metadata Finder]
10 km

Lat: 7d 35m 56.752s S, Lon: 110d 23m 42.809s E

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ALOSの実利用への期待

１. 科学利用から実利用（Operational Use）へ
----観測とデータ流通の明確な戦略

２. 地上観測データ、ニュース事象等との統合利用

３. ユーザーニーズに対応した具体的な応用領域の
開拓とその実運用