GROUP ON EARTH OBSERVATIONS

Unleashing the Power of Earth Observations

30 Years of Earth Observation Research
Brussels, Belgium
17 September 2015

Barbara J. Ryan
Director, GEO Secretariat
Geneva, Switzerland

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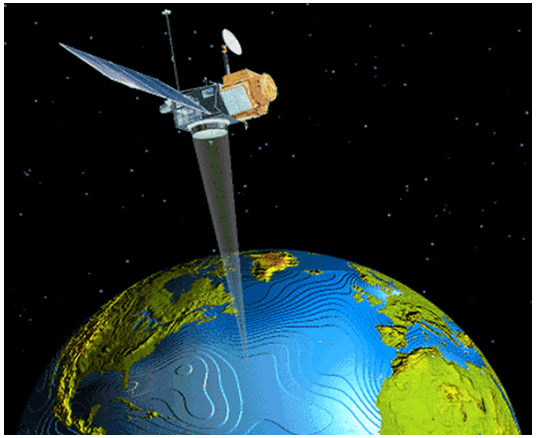
When GEO talks about Earth Observations



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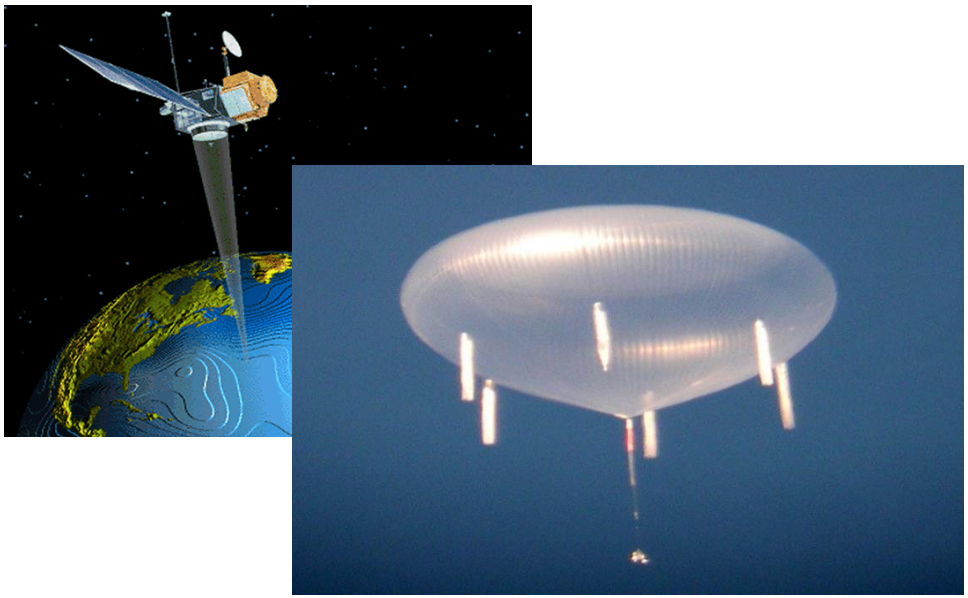
When GEO talks about Earth Observations



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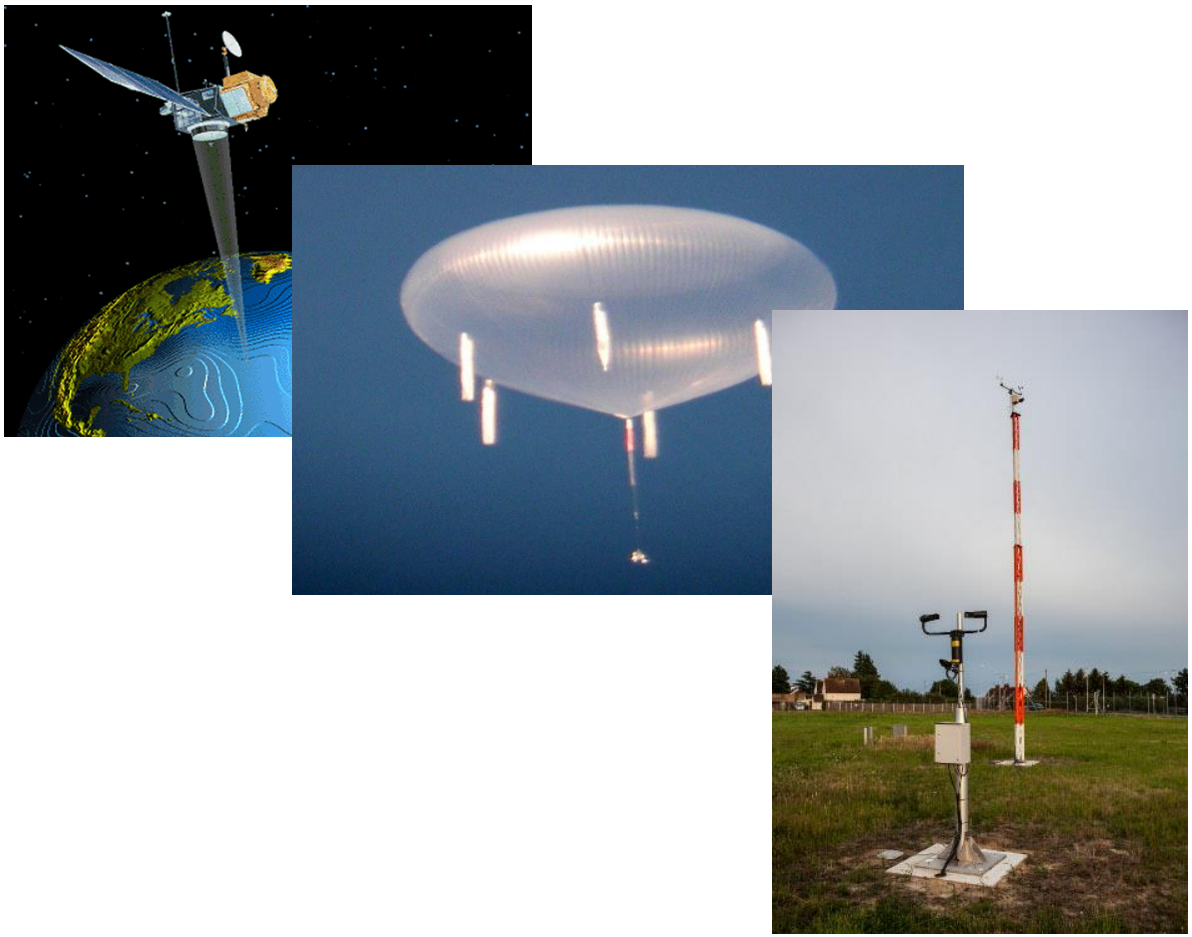
When GEO talks about Earth Observations



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When GEO talks about Earth Observations

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GEO Vision

To realize a future wherein decisions and actions, for the benefit of humankind, are informed by coordinated, comprehensive and sustained Earth observations and information.

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A Global System of Systems

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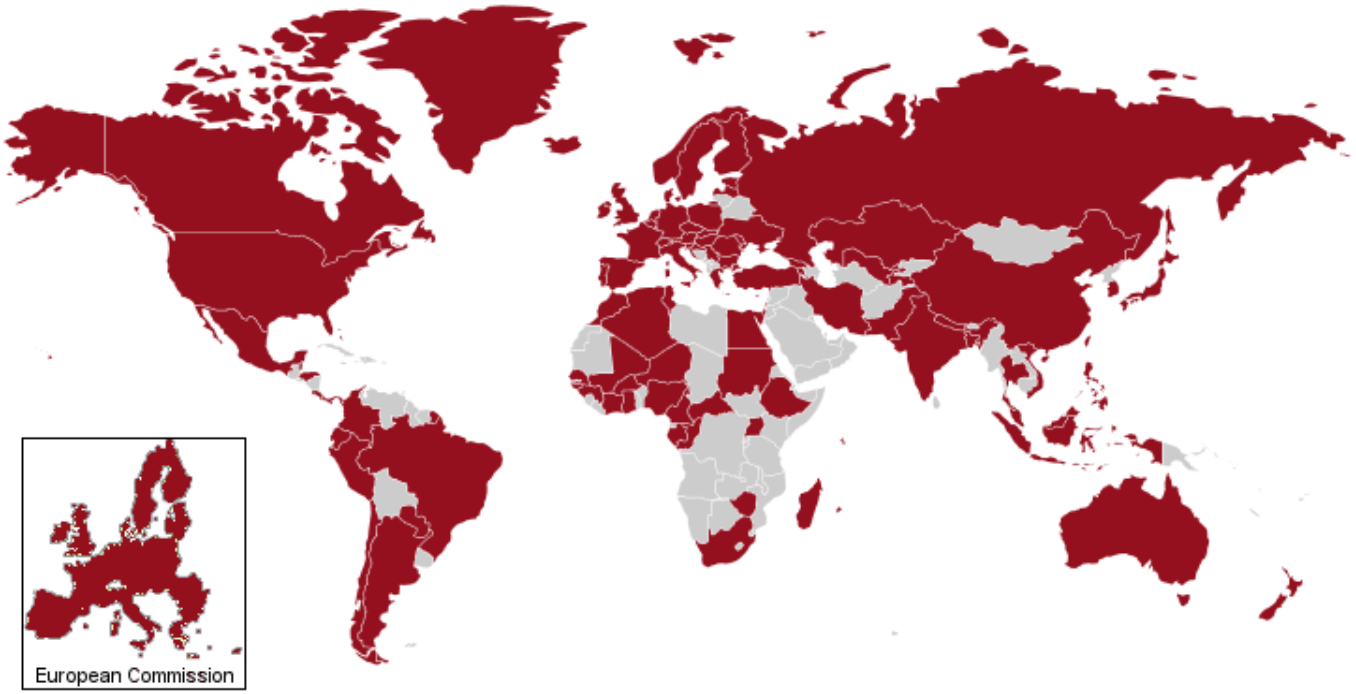
GEO Member States

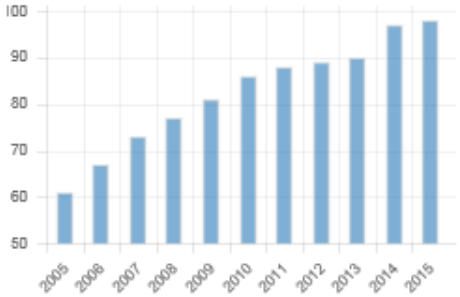
GEO Member Map for the year 2015



Number of Members (2015)

Africa:	25
Americas:	15
Asia/Oceania:	17
C.I.S.:	7
Europe:	34
Total:	98

Number of Members by year



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87 Participating Organizations

Commercial Sector Spans Information Value Chain

Data providers

Value-Added providers

Downstream users

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GEOSS Information System

Data Providers Brokered (capacities, systems, networks, etc.)

GEO website Home Page

GEOSS Portal

Private sector (tested interoperability)

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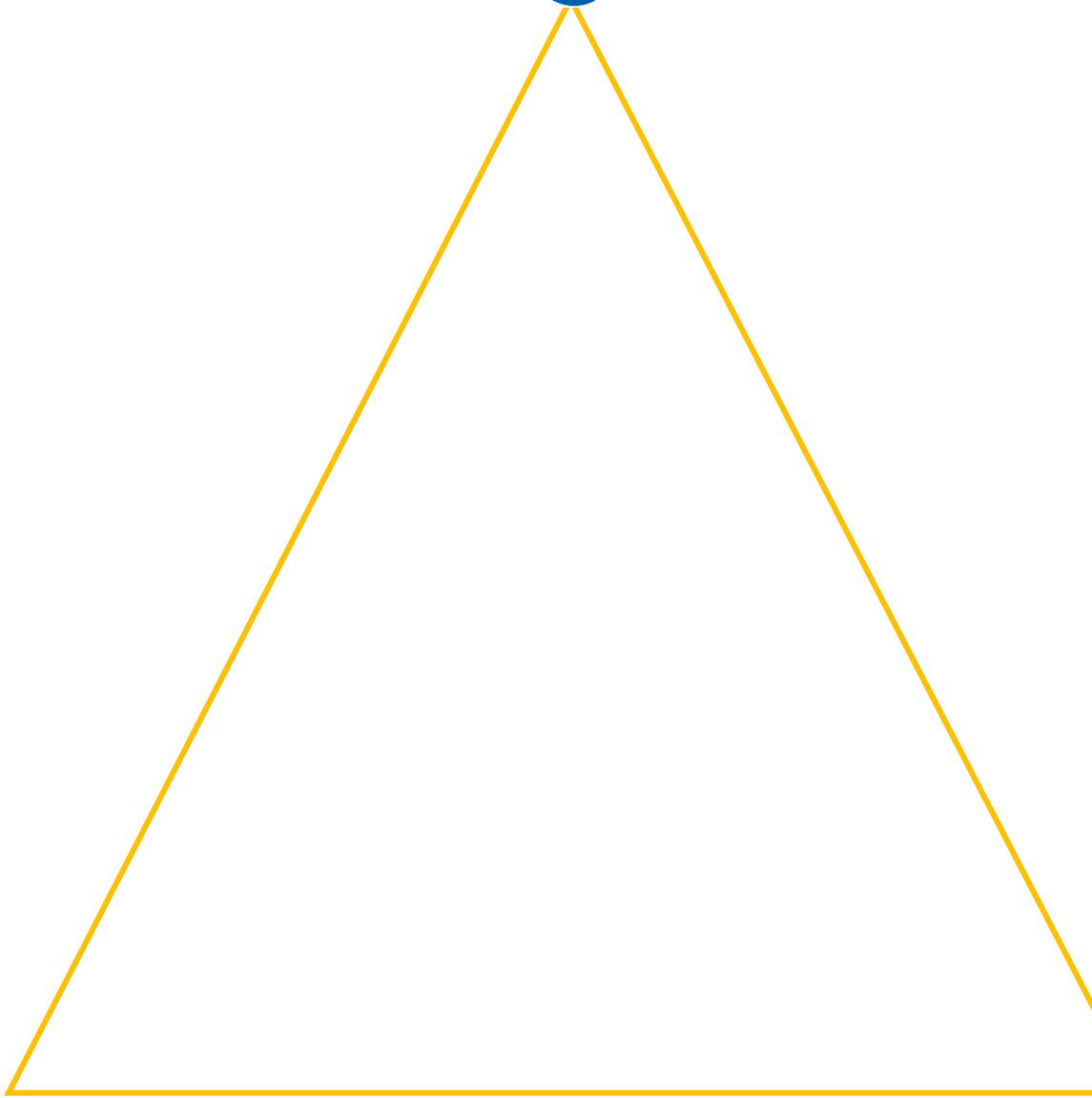
GEOSS Resources



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GEOSS Resources

About 45 brokered data providers

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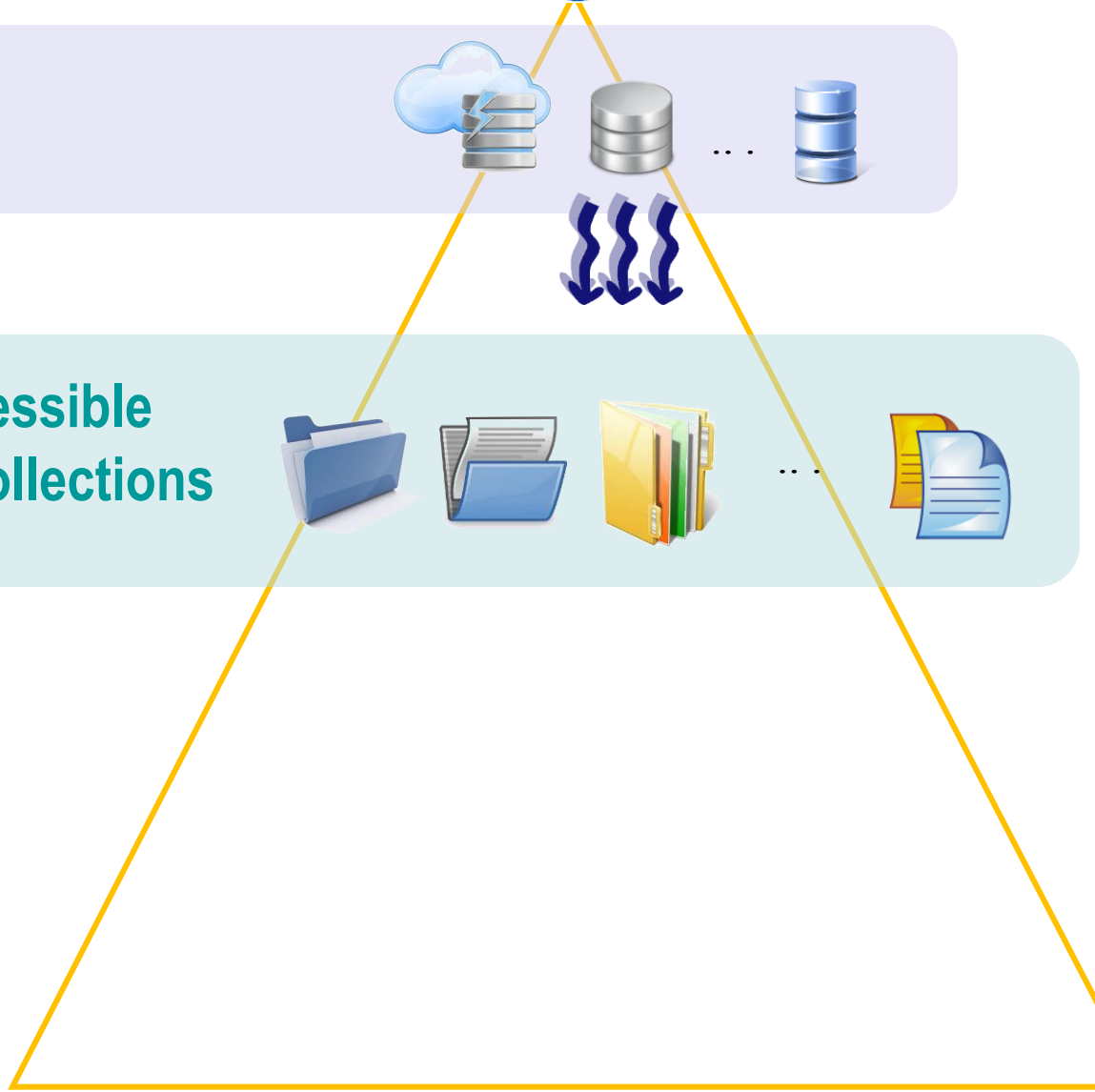
GEOSS Resources

About 45 brokered data providers

Publish

More than 50 Million accessible resources (mix of data collections and datasets)



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GEOSS Resources

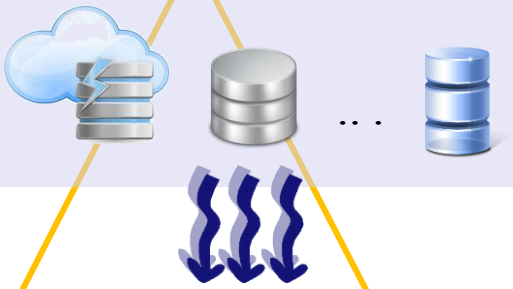
About 45 brokered data providers

Publish

More than 50 Million accessible resources (mix of data collections and datasets)

Contain

More than 174 Million assets (mix of satellite scenes, rain streamgage records, etc.)



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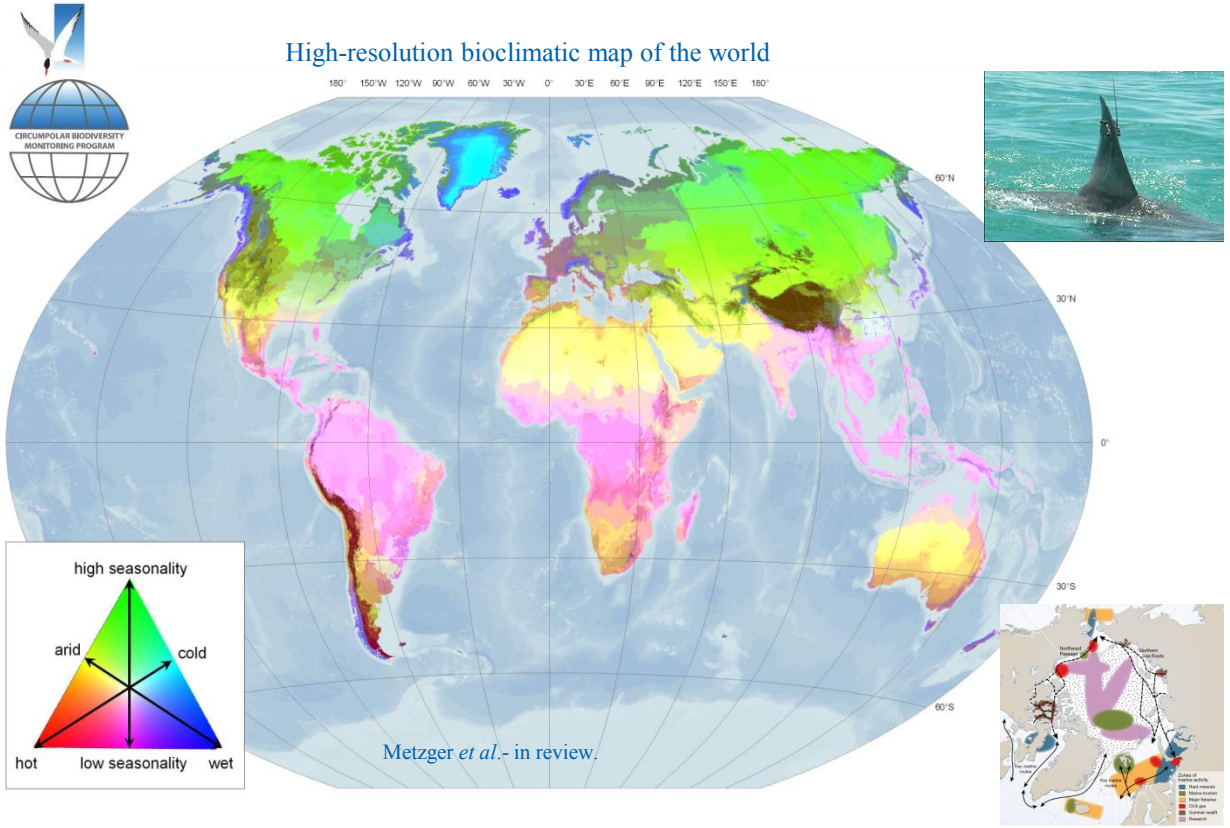
GEO BON

GEO Biodiversity Observation Network

(France, Germany, Japan, Netherlands, Spain, Sweden, South Africa, USA, Diversitas, GBIF, IUCN)



* Response to CBD
* Essential Biodiversity Variables (EBVs)
* Global high-res bio-climatic map
* Arctic and French Biodiversity Networks
* Strong outreach

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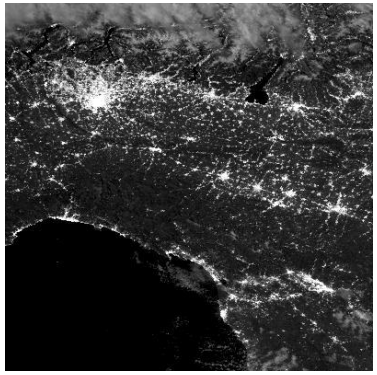
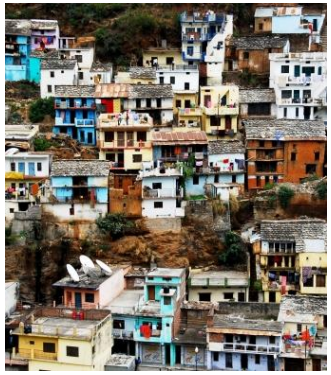
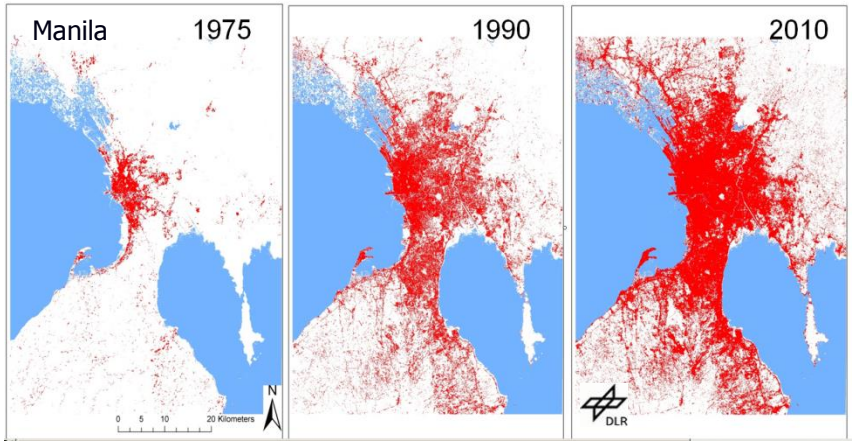
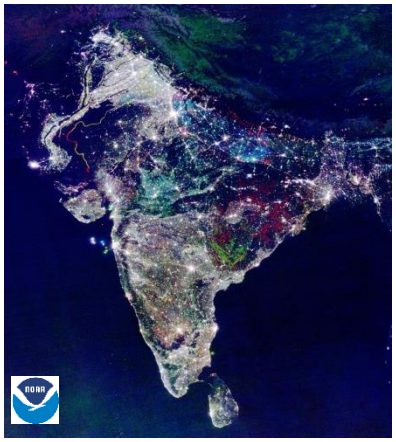
Global & Local Urban Footprints

(China, EC, Germany, Greece, Italy, Pakistan, USA)









* 35-yr evolution of 26 mega-cities
* Global night-time lights for 2012
* Urban Heat Island patterns
* Over 3’700 cities mapped using ASTER (15m)

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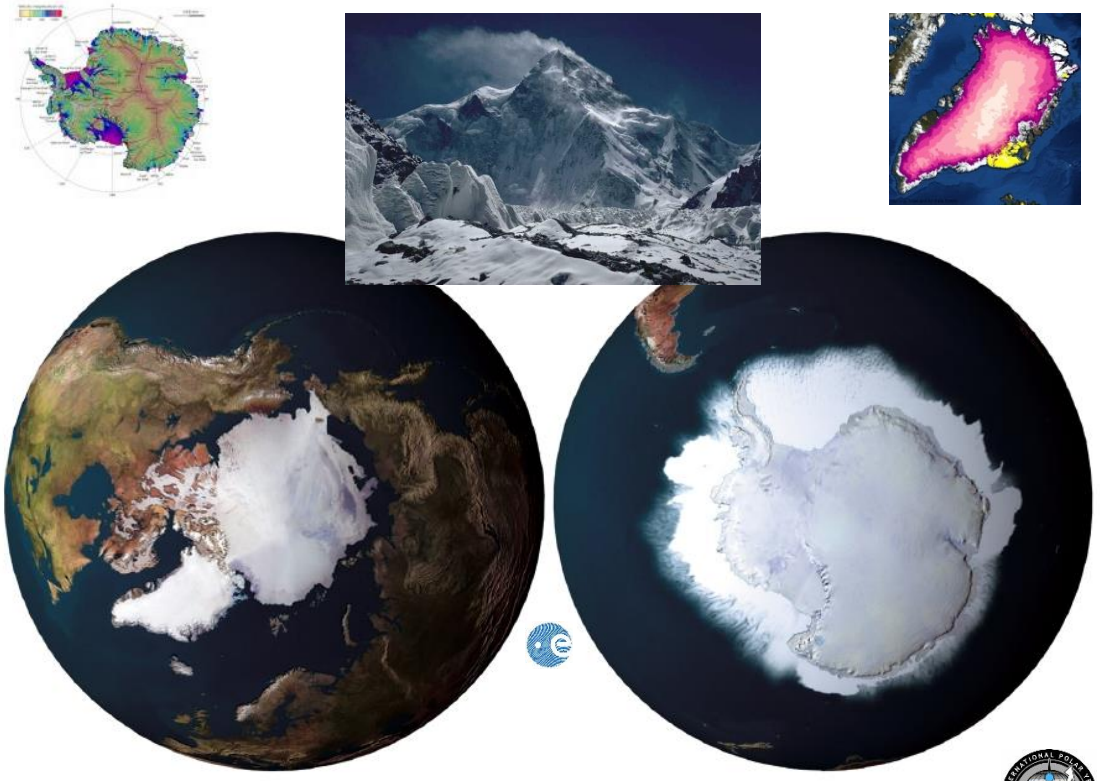
Cold Regions Monitoring

(Canada, China, Denmark, Germany, Norway, India, Italy, Japan, Spain, USA, ICIMOD, IEEE, WCRP, WMO)



* CryoClim climate monitoring service
* Svalbard Integrated Arctic Earth Observing System
* Sea-ice ECV for Arctic/ Antarctic snow-cover
* Focus on Tibetan Plateau
* Glacier dynamics mapping

SAON SUSTAINING ARCTIC OBSERVING NETWORKS

SIOS

POLARDATA CATALOGUE

ARCTIC COUNCIL

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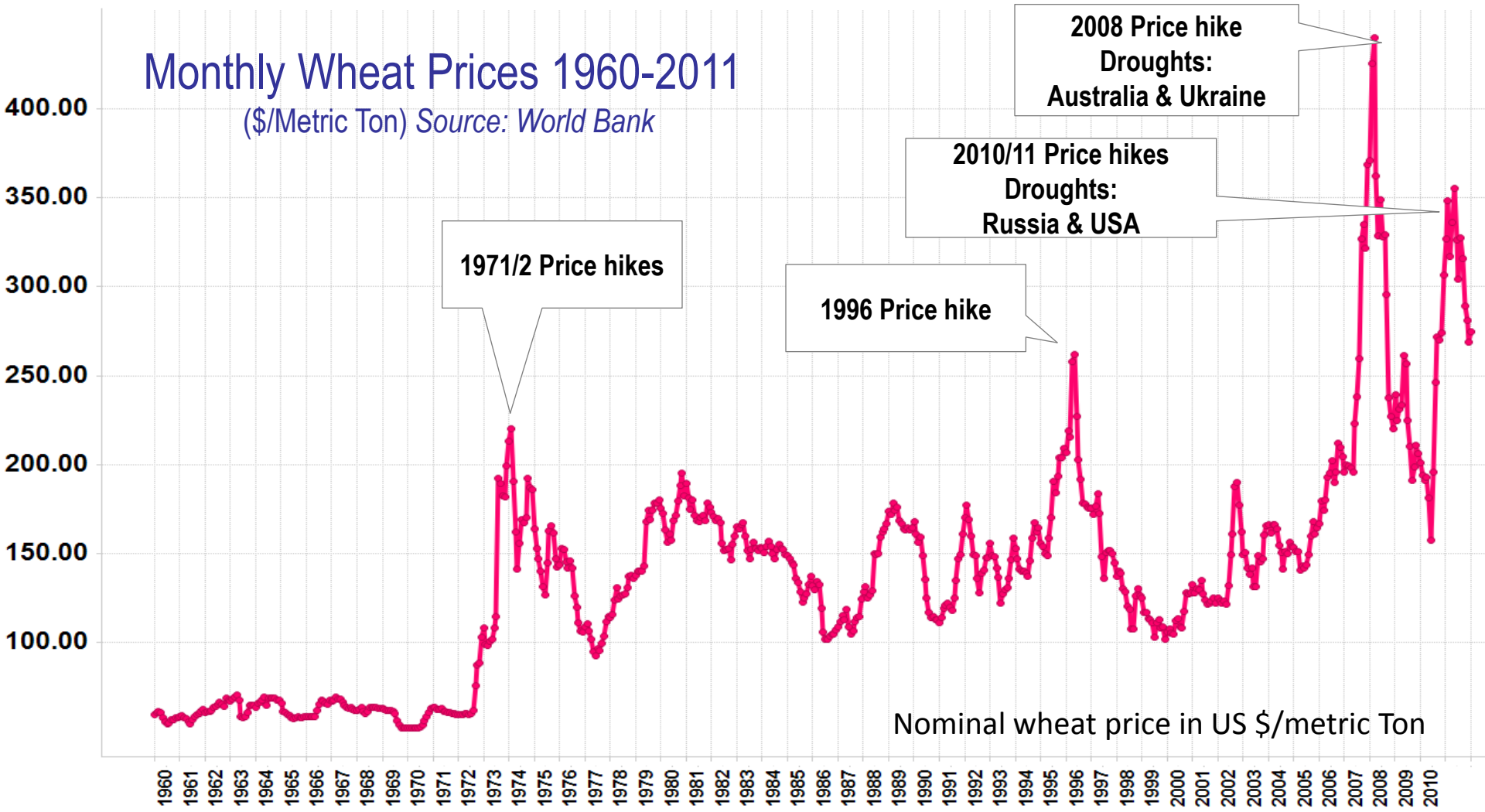
Leveraging Earth Observations for Reducing Price Volatility



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Crop Information for Decision-Making

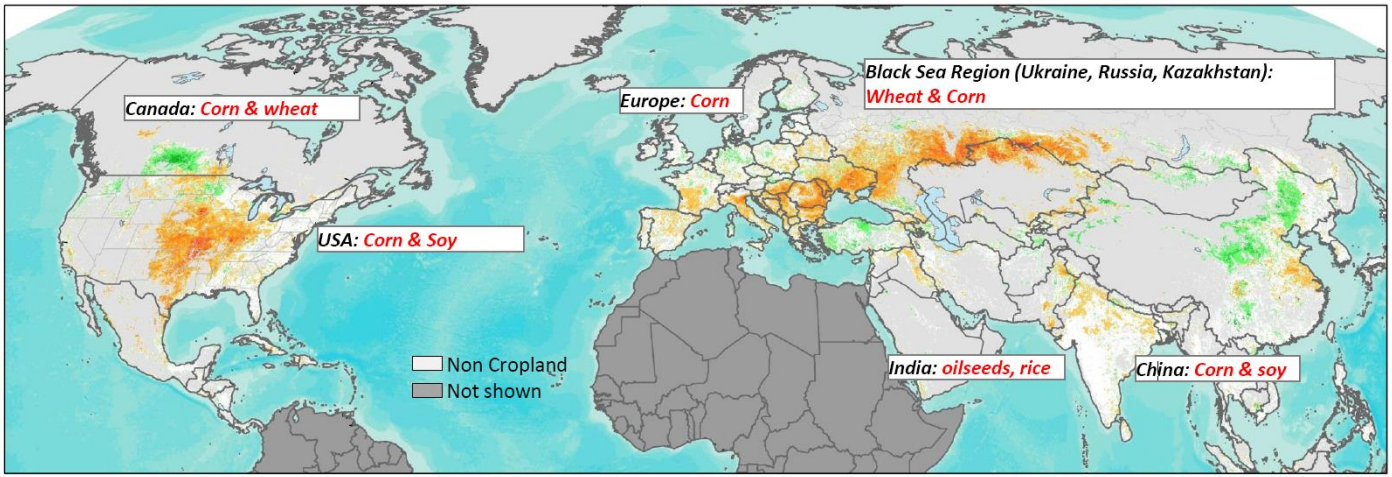
(Canada, China, EC, France, Japan, Kazakhstan, India, Mexico, Russia, USA, CEOS, FAO, WMO)

G20 FRANCE 2011 NEW WORLD NEW IDEAS

G2012 MÉXICO

GEOGLAM Global Agricultural Monitoring

Northern Hemisphere NDVI Crop Anomaly, August 13th, 2012



Crop NDVI Anomaly

-0.4 Worse than normal | 0 normal | 0.4 Better than normal

Observed highlights:

- Drought conditions persist in US, south eastern Ukraine, Russia, and Kazakhstan, with slight improvement in some areas in northern Kazakhstan
- Rains in India mitigate dry conditions

*** GEOGLAM part of G20 Action Plan on Food Price Volatility**

*** New crop outlook**

*** Rice crop monitoring**

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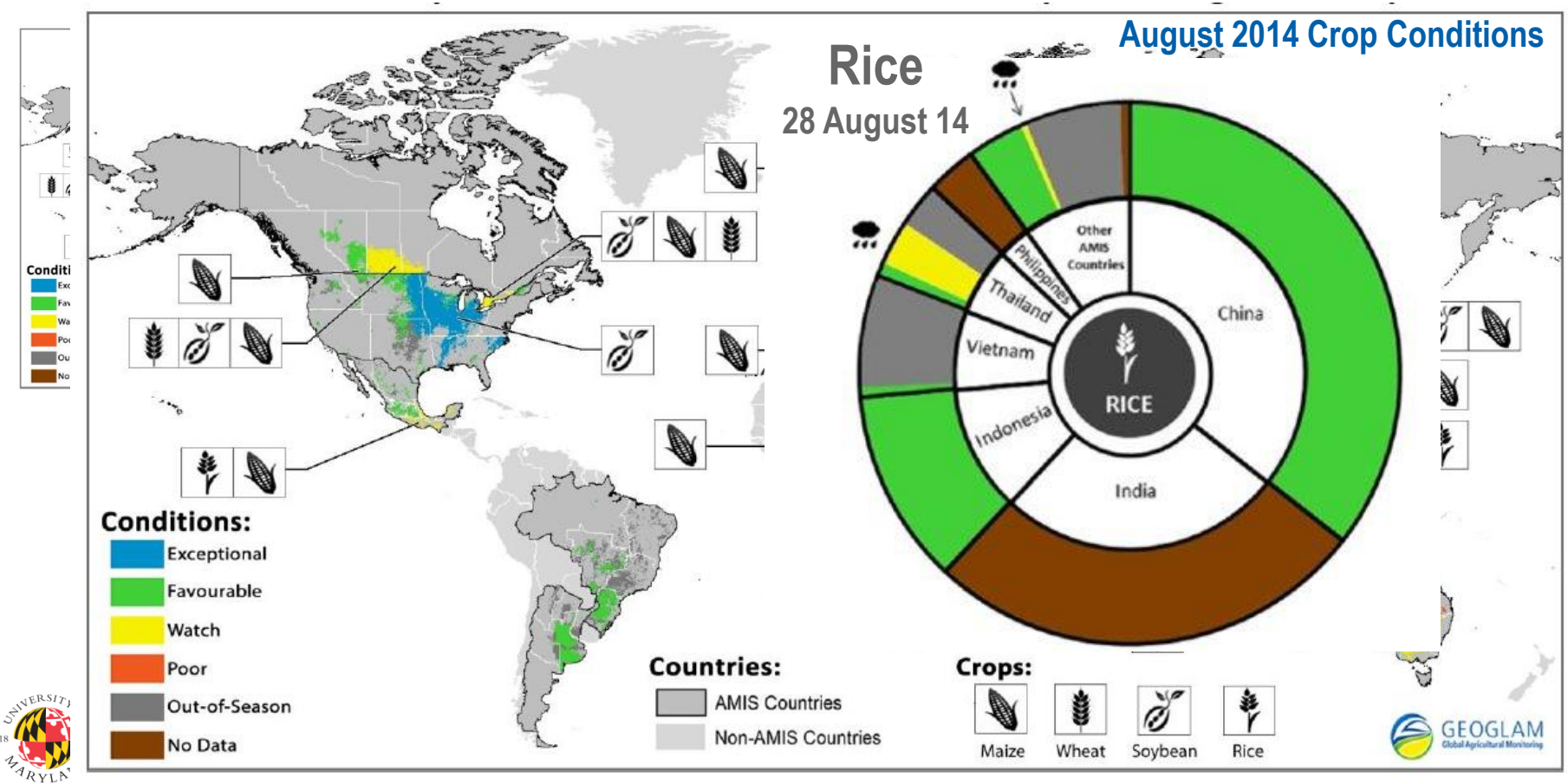
GEOGLAM Crop Monitor for AMIS

- Operational since September 2013
- 36 institutions, 22 countries + 7 international organizations
- Global map for the 4 AMIS crops (Maize, Wheat, Soybean, Rice)



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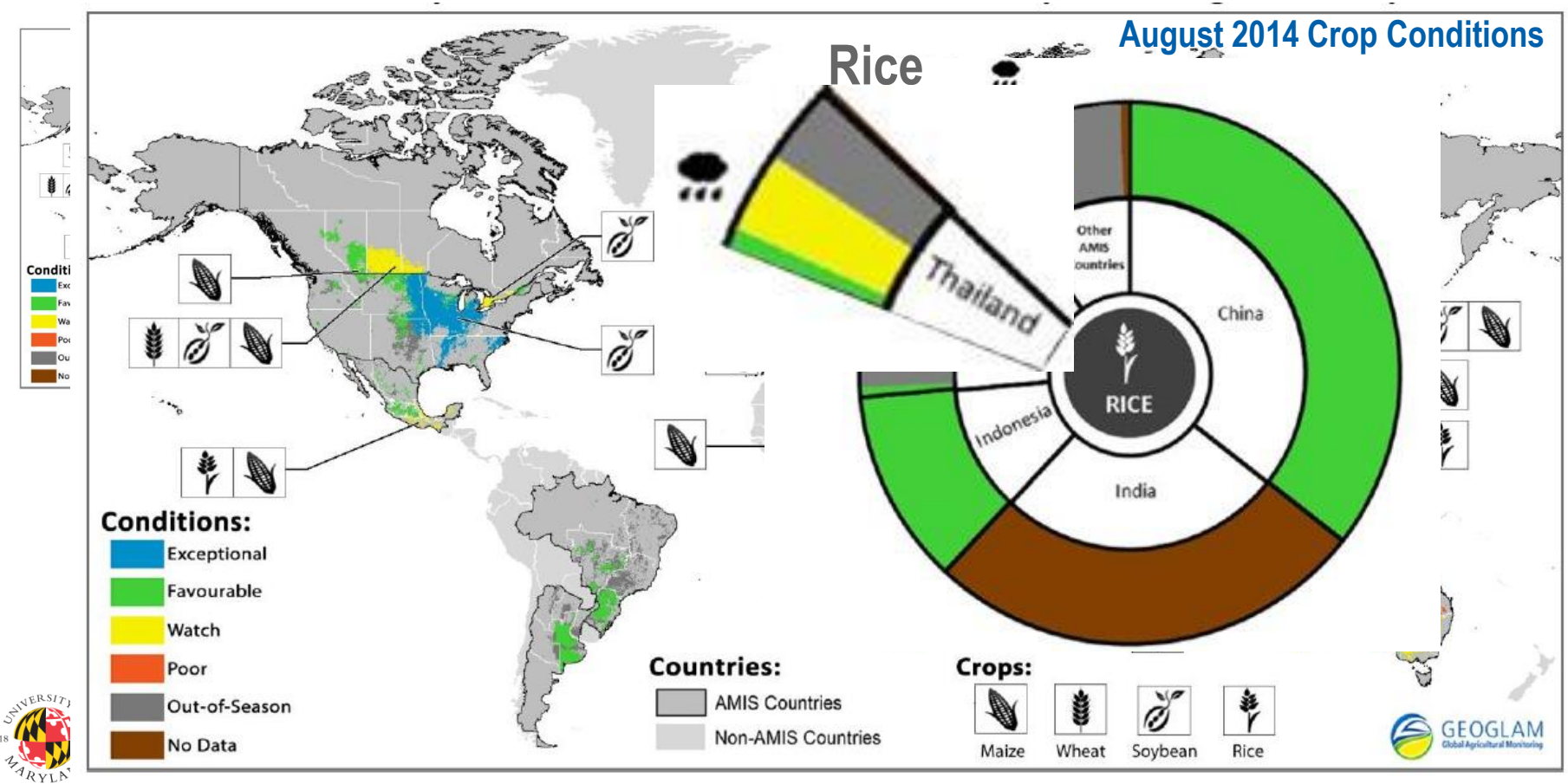

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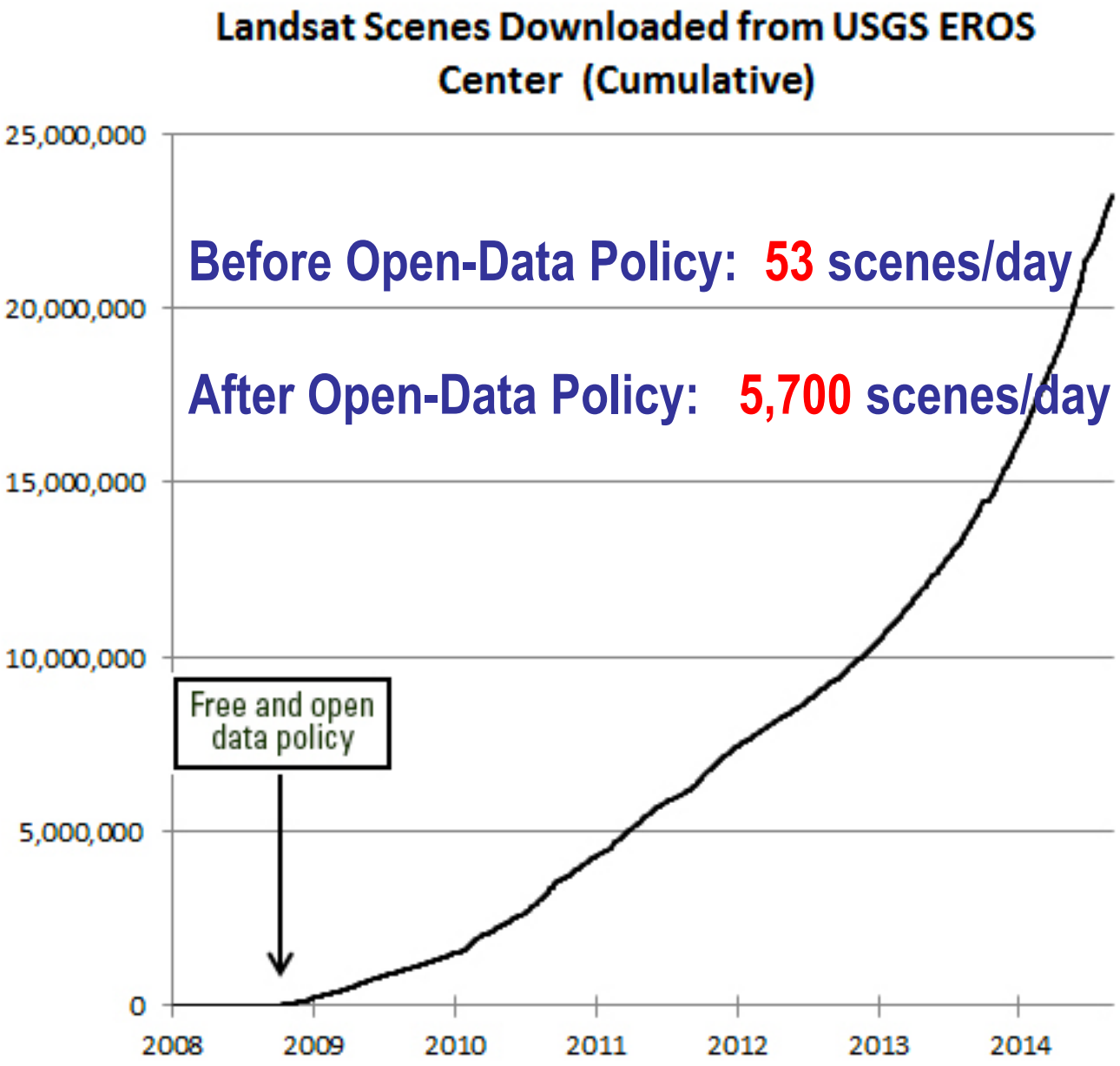
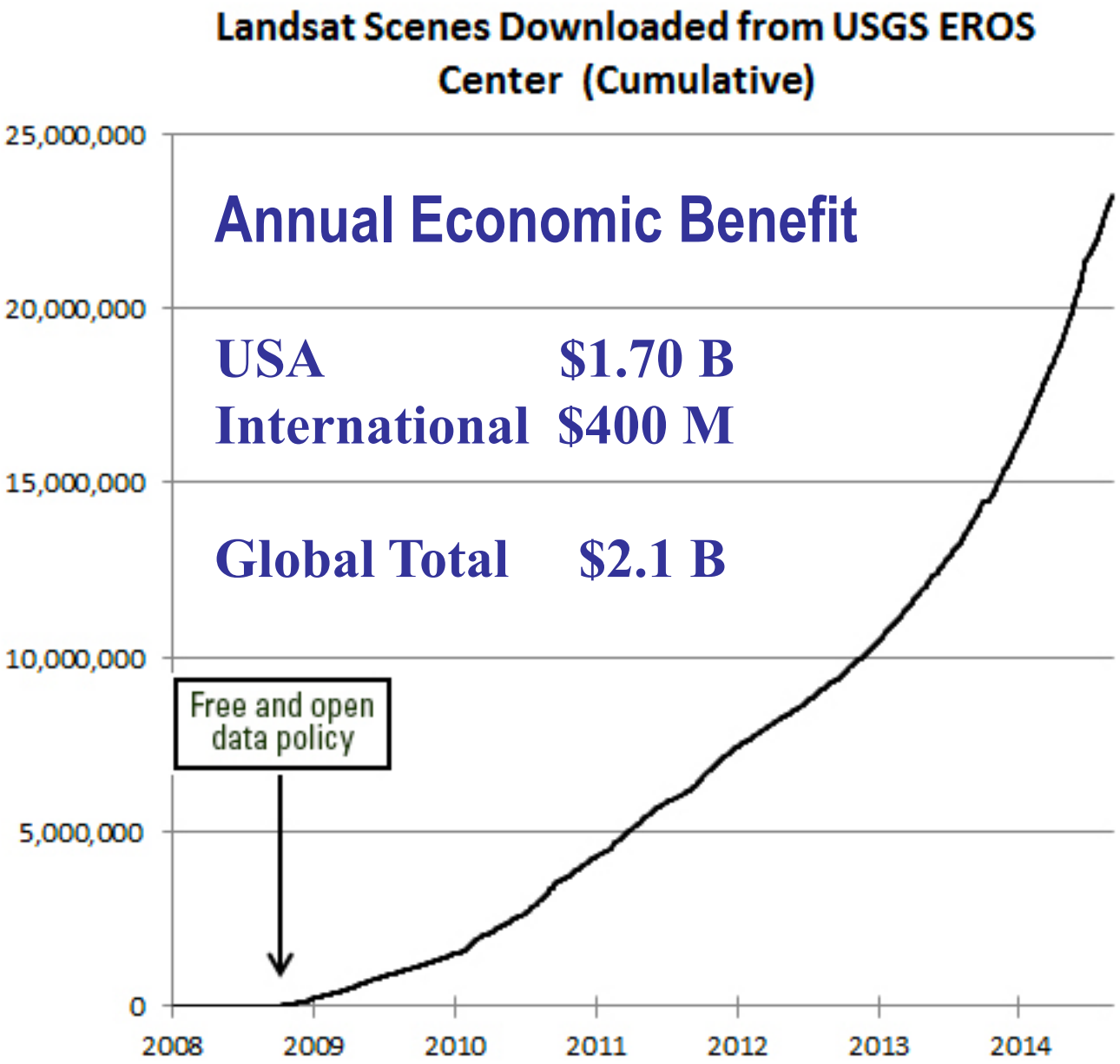
GEOSS Implementation Requires: *Data Sharing Principles*

- Full and Open Exchange of Data
- Data and Products at Minimum Time Delay and at Minimum Cost
- Free of Charge or Cost of Reproduction


Landsat Scenes Downloaded from USGS EROS Center (Cumulative)
25,000,000
20,000,000
15,000,000
10,000,000
5,000,000
0
2008
2009
2010
2011
2012
2013
2014
Before Open-Data Policy: 53 scenes/day
After Open-Data Policy: 5,700 scenes/day
Free and open data policy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25,000,000
20,000,000
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10,000,000
5,000,000
0
2008
2009
2010
2011
2012
2013
2014
Annual Economic Benefit
USA $1.70 B
International $400 M
Global Total $2.1 B
Free and open data policy

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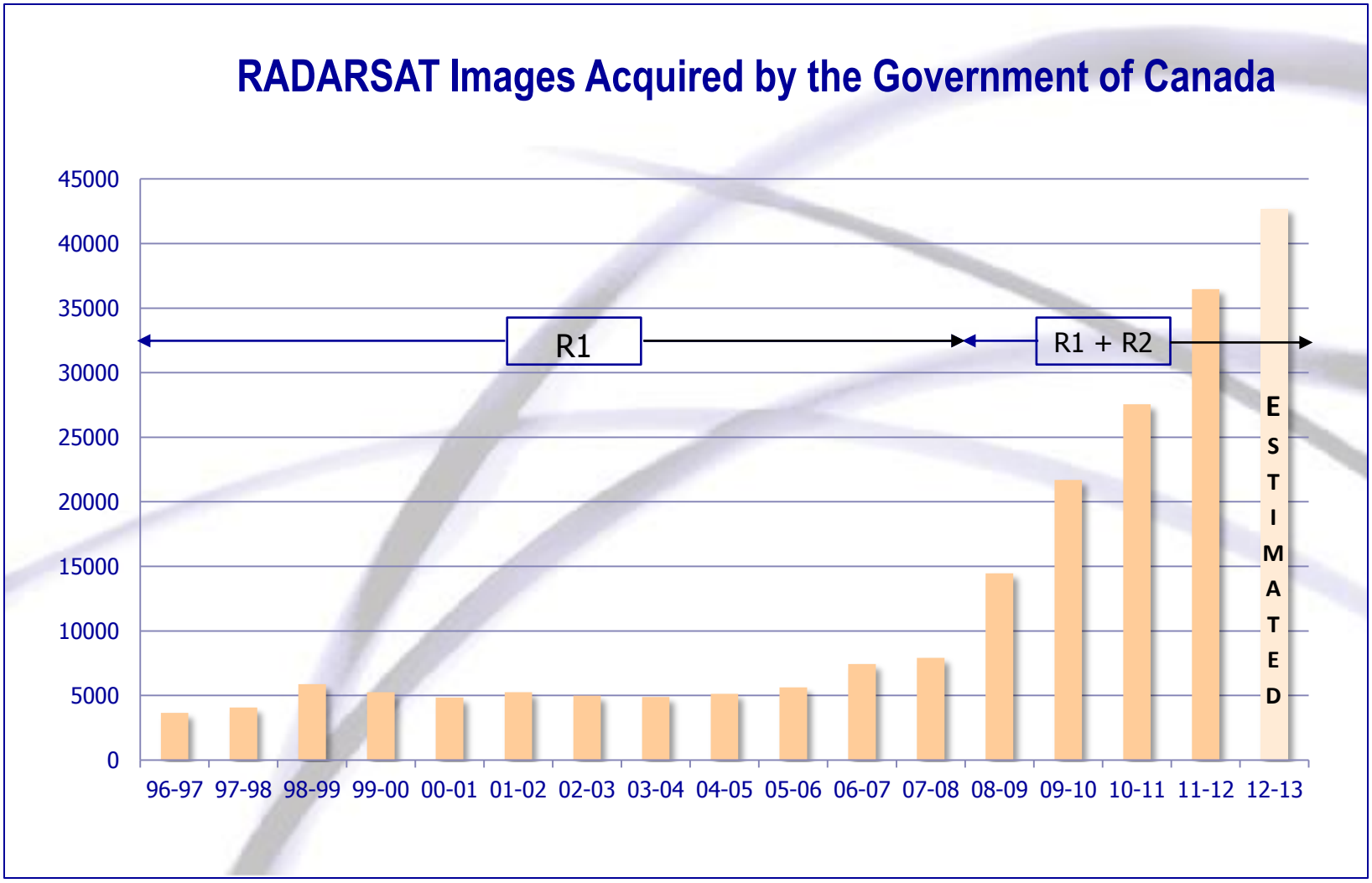
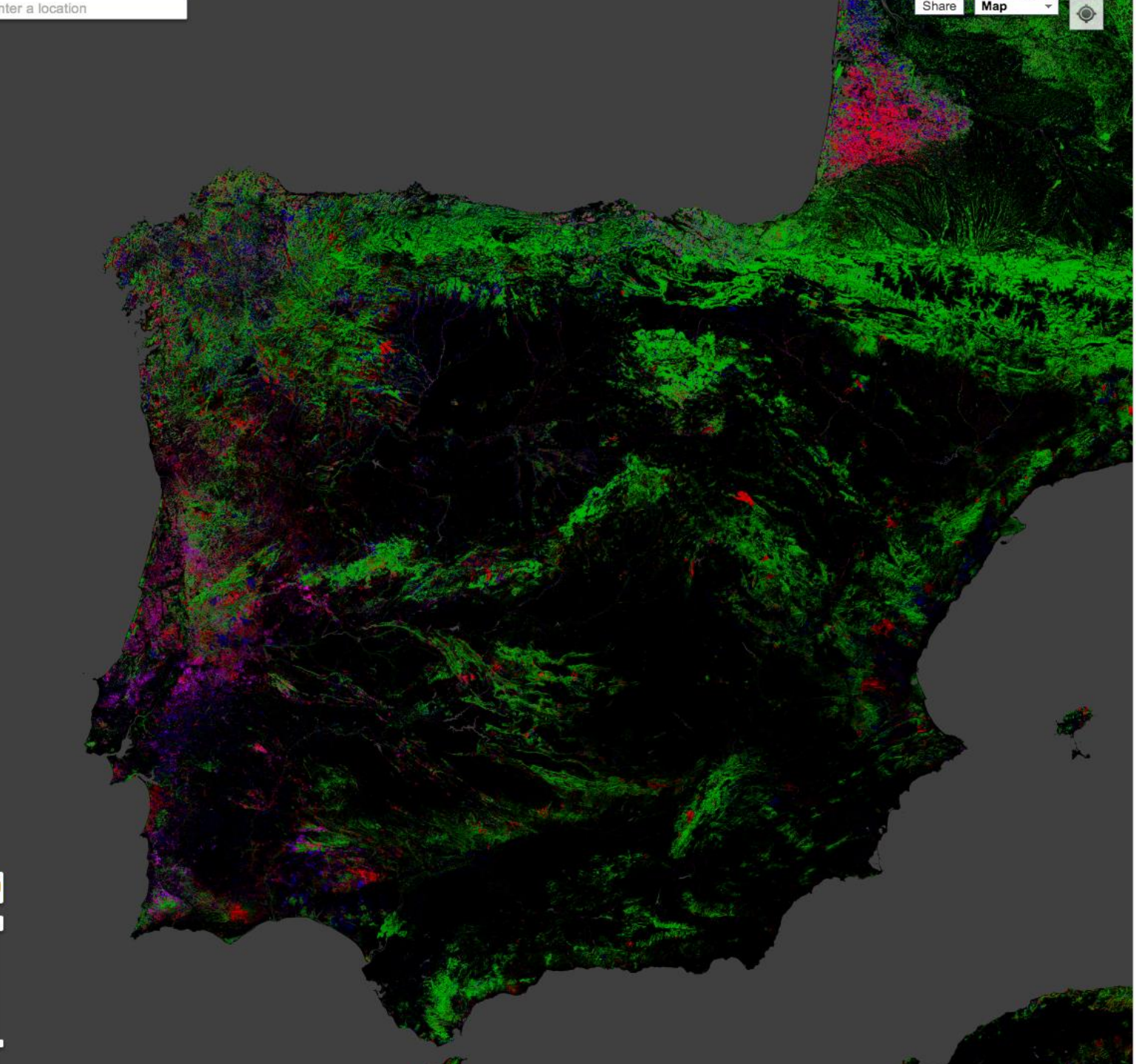
Canada's Experience





Global Forest Change

Published by Hansen, Potapov, Moore, Hancher et al.

UNIVERSITY OF MARYLAND
DEPARTMENT OF GEOGRAPHICAL SCIENCES

Results from time-series analysis of 654,178 Landsat images in characterizing forest extent and change, 2000–2012.

Trees are defined as all vegetation taller than 5m in height and are expressed as a percentage per output grid cell as '2000 Percent Tree Cover'. 'Forest Loss' is defined as a stand-replacement disturbance, or a change from a forest to non-forest state. 'Forest Gain' is defined as the inverse of loss, or a non-forest to forest change entirely within the study period. 'Forest Loss Year' is a disaggregation of total 'Forest Loss' to annual time scales.

Reference 2000 and 2012 imagery are median observations from a set of quality assessment-passed growing season observations.

Reset to default view

Data Products

Loss/Extent/Gain (Red/Green/Blue)

Legend

- Forest Loss 2000–2012
- Forest Gain 2000–2012
- Both Loss and Gain
- Forest Extent

Background Imagery

Year 2000 Bands 5/4/3

Example Locations

Forestry and Tornado in Alabama

Zoom to area

The trail of destruction from the April 27 2011 Tuscaloosa-Birmingham tornado is clearly visible in location. This was one of 358 recorded tornadoes during the April 25-28, 2011 tornado outbreak, the severe in US history.

Zoom out to spot tracks from other tornadoes nearb

Visualizing the Impact of Public Policy

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Countries have borders; Earth observations don't.

B. Ryan

(Modified from advertisement in NY Times, 11 September 2015)

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Mexico City Ministerial Summit and GEO-XII

GEO Week
9-13 November 2015
Mexico City

Barbara Ryan – bryan@geosec.org

www.earthobservations.org