Unleashing the Power of Earth Observations

30 Years of Earth Observation Research Research
Brussels, Belgium
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Barbara J. Ryan
Director, GEO Secretariat
Geneva, Switzerland
When GEO talks about Earth Observations
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To realize a future wherein decisions and actions, for the benefit of humankind, are informed by coordinated, comprehensive and sustained Earth observations and information.
A Global System of Systems

INFORMATION FOR THE BENEFIT OF SOCIETY
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

European Commission
87 Participating Organizations
Commercial Sector Spans Information Value Chain

Data providers

Value-Added providers

Downstream users
GEOSS Resources

About **45** brokered data providers
About 45 brokered data providers

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

Contain

More than 174 Million assets (mix of satellite scenes, raingage, streamgage records, etc.)
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
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)
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
Leveraging Earth Observations for Reducing Price Volatility

Monthly Wheat Prices 1960-2011
($/Metric Ton) Source: World Bank

Nominal wheat price in US $/metric Ton

1971/2 Price hikes

1996 Price hike

2008 Price hike
Droughts: Australia & Ukraine

2010/11 Price hikes
Droughts: Russia & USA
Crop Information for Decision-Making
(Canada, China, EC, France, Japan, Kazakhstan, India, Mexico, Russia, USA, CEOS, FAO, WMO)

Northern Hemisphere NDVI Crop Anomaly, August 13th, 2012

* GEOGLAM part of G20 Action Plan on Food Price Volatility
* New crop outlook
* Rice crop monitoring

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 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)

August 2014 Crop Conditions
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August 2014 Crop Conditions

Rice

Conditions:
- Exceptional
- Favourable
- Watch
- Poor
- Out-of-Season
- No Data

Countries:
- AMIS Countries
- Non-AMIS Countries

Crops:
- Maize
- Wheat
- Soybean
- Rice

Thailand

China

Indonesia

India
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
Before Open-Data Policy: 53 scenes/day

After Open-Data Policy: 5,700 scenes/day
Annual Economic Benefit

USA $1.70 B
International $400 M
Global Total $2.1 B
Canada's Experience

RADARSAT Images Acquired by the Government of Canada

- R1
- R1 + R2

[Bar chart showing the number of RADARSAT images acquired each year from 1996-97 to 2012-13.]
Visualizing the Impact of Public Policy

EXPLANATION
- Corn
- Soybeans
- Small grains / Hay
- Alfalfa
- Fallow / Idle Cropland
- Grass / Pasture / Non-ag
- Woodland
- Urban / Developed
- Developed/Low Intensity
- Developed-Open Space

Waterloo, Iowa

Maps showing changes in land use from 2000 to 2012.
Countries have borders; Earth observations don’t.

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