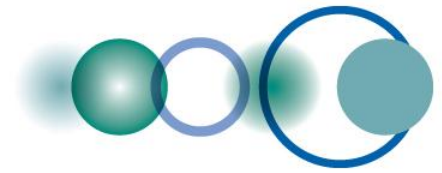


Building a Global Earth Observation System of Systems (GEOSS)

Geospatial World Forum
Rotterdam, The Netherlands
12 May 2013

Barbara J. Ryan
Director, GEO Secretariat



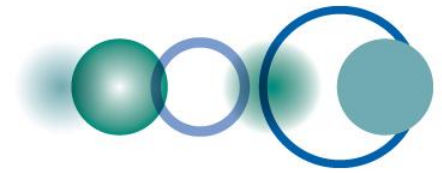


The Group on Earth Observations (GEO)

Earth Observation Summit

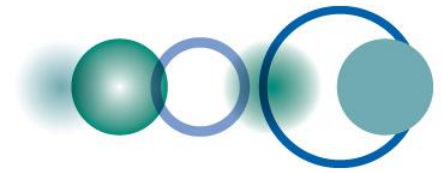


U.S. Department of State
Washington DC
31 July 2003



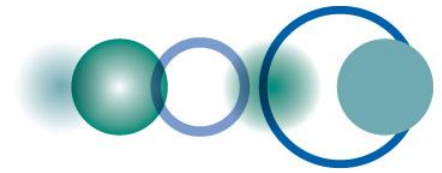
GEO Vision

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



GEO Objectives

- Improve and Coordinate Observation Systems
- Advance Broad Open Data Policies/Practices
- Foster Increased Use of EO Data and Information
- Build Capacity



**Created in 2005, to develop a coordinated and sustained
Global Earth Observation System of Systems (GEOSS) to
enhance decision making in nine Societal Benefit Areas
(SBAs)**

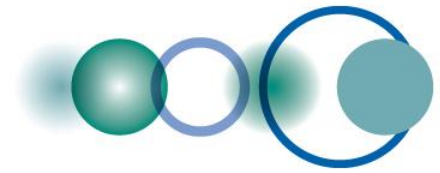


GEO today:

90 Members

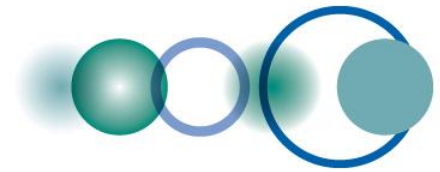
67 Participating

Organizations



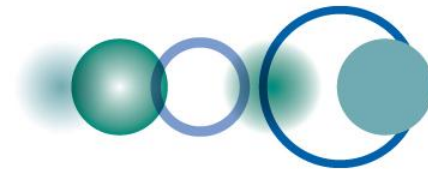
67 Participating Organizations





Broadening Stakeholder Engagement

- GEO Plenary (Nov. 2012, Brazil) approved private sector involvement.
- The private sector includes commercial companies, foundations, development banks – i.e. any non-governmental entities.
- Commercial companies working along the entire value chain – data providers, value-added information products and services, and downstream (SBA) users.



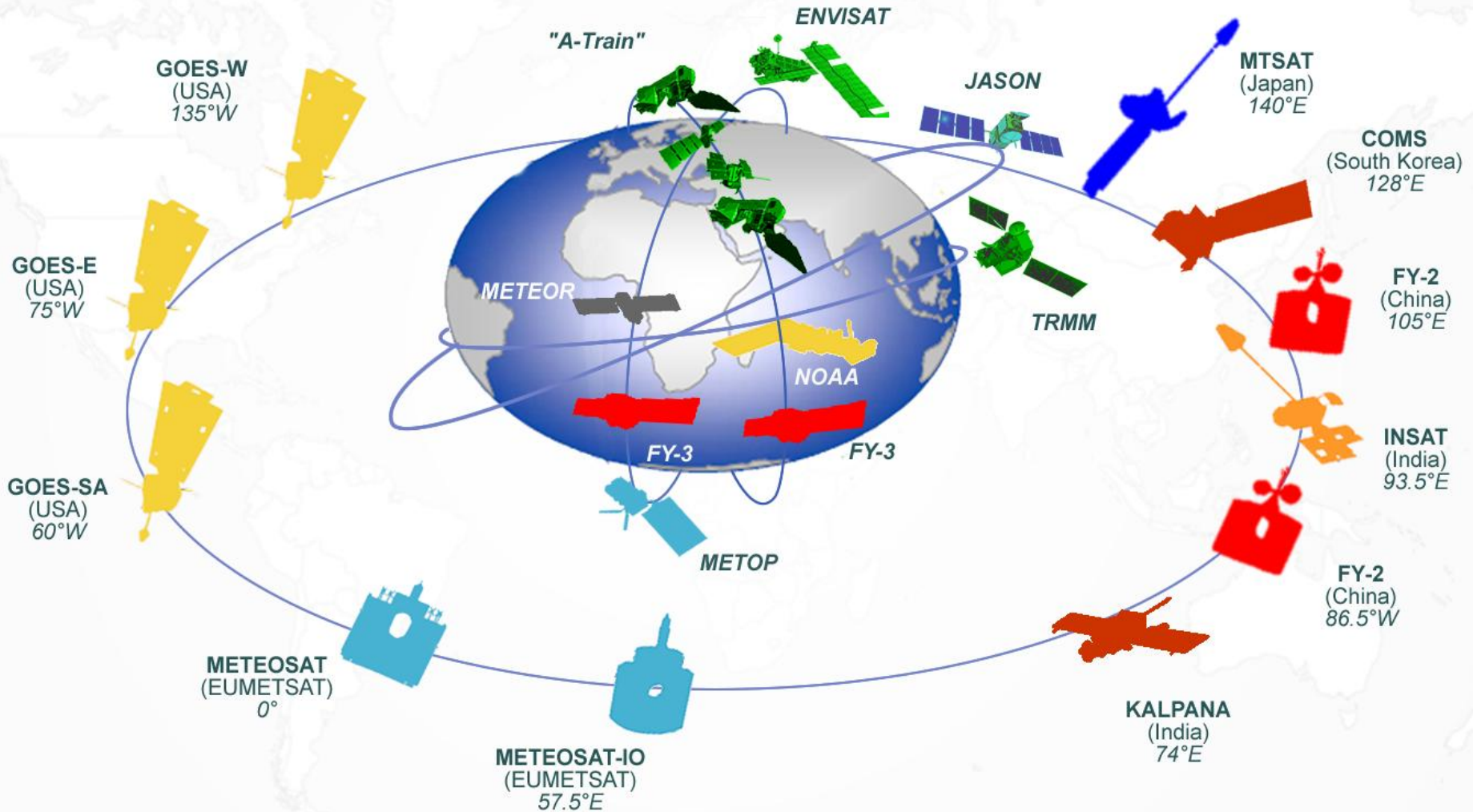
A Global, Coordinated, Comprehensive and Sustained System of Observing Systems

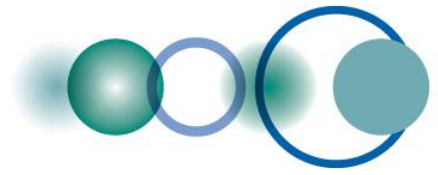
THE GLOBAL EARTH OBSERVATION
SYSTEM OF SYSTEMS



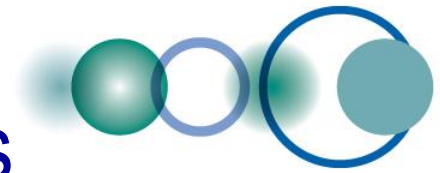


Space-based Assets

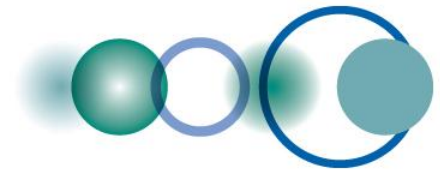




GEOSS Targeted Gaps



- 1. Uncertainty over continuity of observations**
- 2. Large spatial and temporal gaps in specific data sets**
- 3. Eroding or little technical infrastructure in many parts of the world**
- 4. Lack of relevant processing systems to transform data into useful information**
- 5. Limited access to data and associated benefits in developing world**
- 6. Inadequate data integration and interoperability**
- 7. Inadequate user involvement**



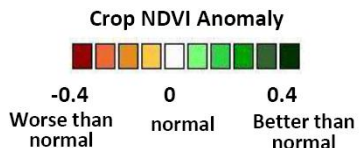
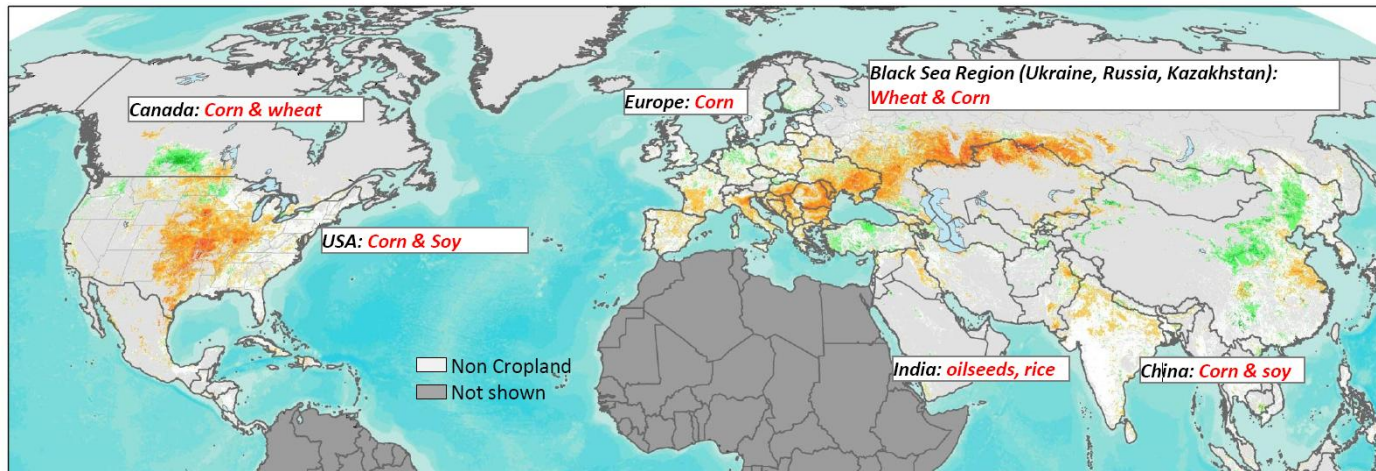
Crop Information for Decision-Making (Canada, China, EC, France, Japan, Kazakhstan, India, Mexico, Russia, USA, CEOS, FAO)



Northern Hemisphere NDVI Crop Anomaly, August 13th, 2012

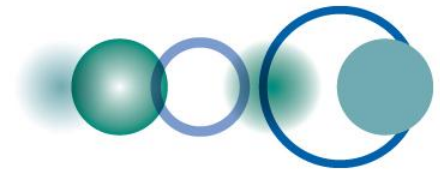


- * GEOGLAM part of G20 Action Plan on Food Price Volatility
- * New crop outlook
- * Rice crop monitoring
- * Draft space strategy



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

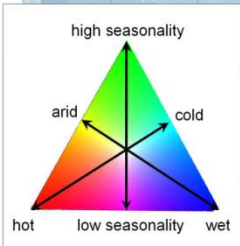
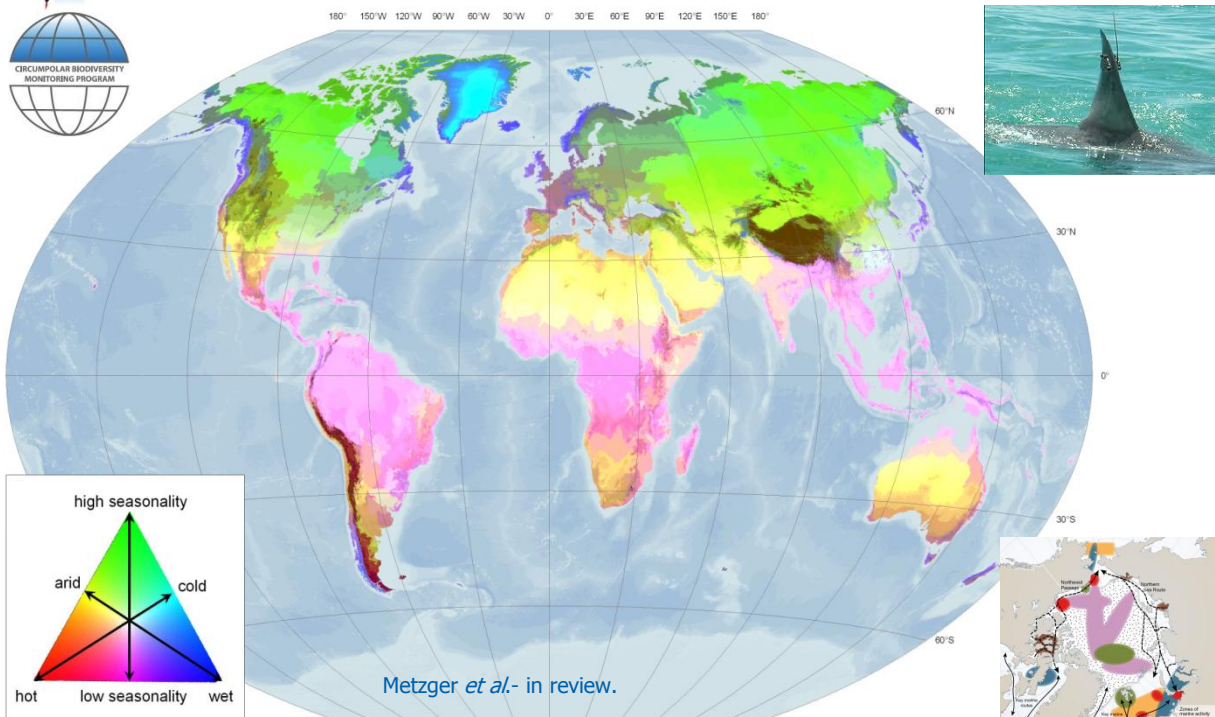


GEO Biodiversity Observation Network

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

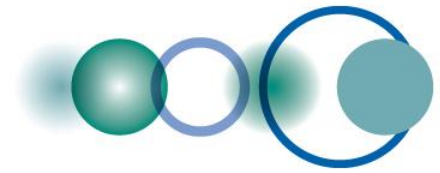


High-resolution bioclimatic map of the world_



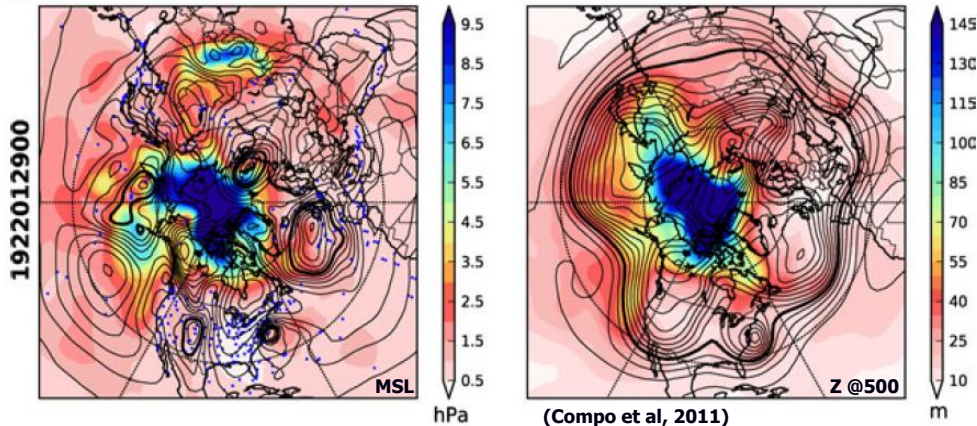
Metzger *et al.*- in review.

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

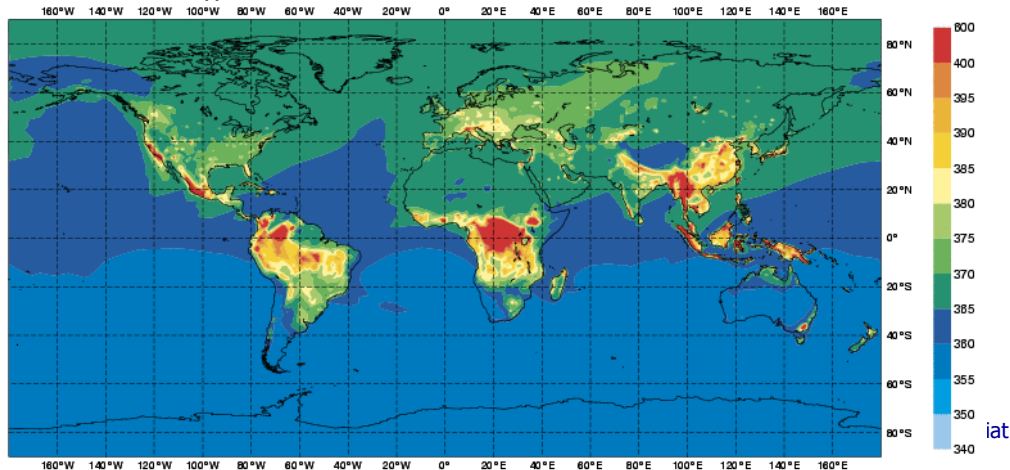


Climate Change Detection

(EC, Japan, USA, ECMWF, GCOS, WCRP)



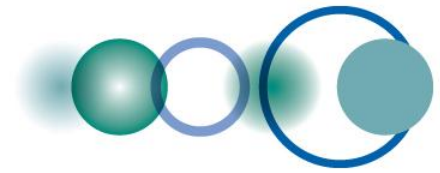
MACC Reanalysis Global Monthly Mean January 2003
 Surface Carbon Dioxide [ppmv] mean: 364.08 max: 594.79



Numerous reanalysis projects underway:

- * JRA-55 (1958-2012)
- * ERA-Interim (1979-1988)
- * MACC (2003-2010)
- * ERA-CLIM (20th century)
- * NCEP Reanalysis-Lite (1948-2010)

Most datasets available online (e.g. ERA-Interim)



Rapid & Open Disasters Information

(Germany, Italy, Japan, Turkey, USA,
CEOS, EPOS, ESA)

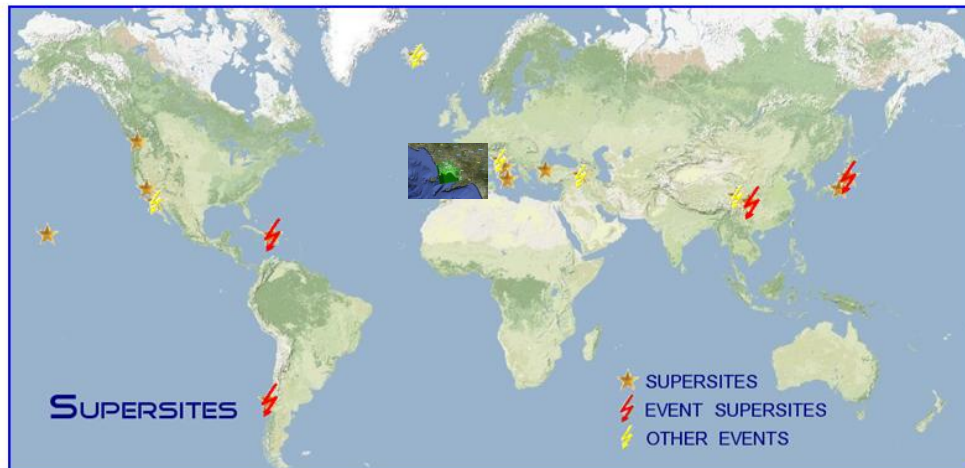
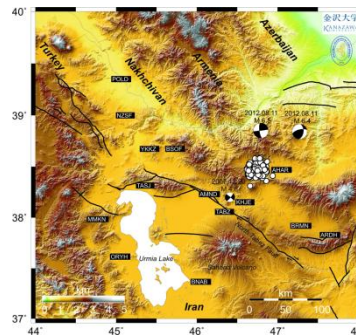
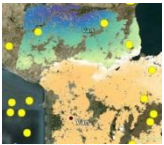
Welcome to the Supersites

New Event

Ahar, Iran Earthquakes

New Partner

ASI contributing to Supersites!



* Hawaii Supersite fully operational



* 3 new Supersites (Europe)



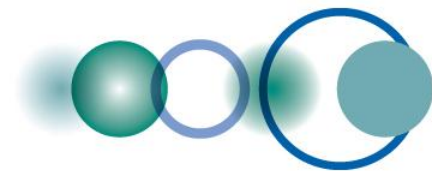
* Supersites selection & definition



* In-situ and space data

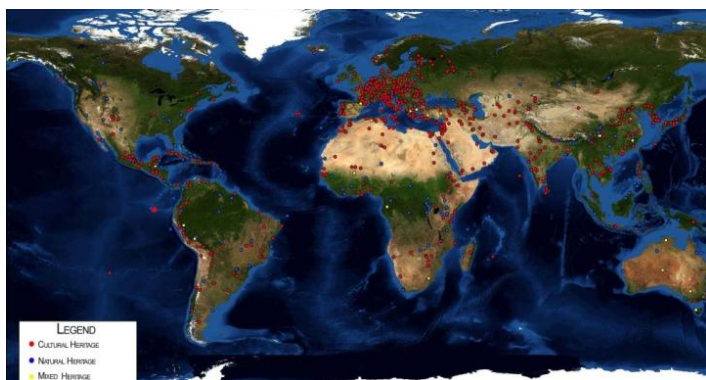
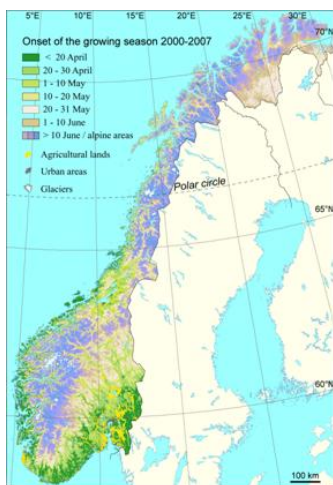


* All data online

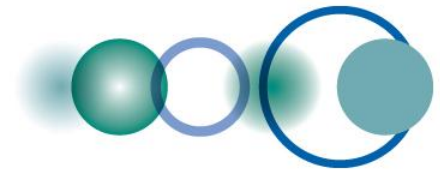


Ecosystem Classification & Mapping

(Australia, Austria, Brazil, Canada, China, EC, Italy, Paraguay, USA, RCMRD, UNESCO)

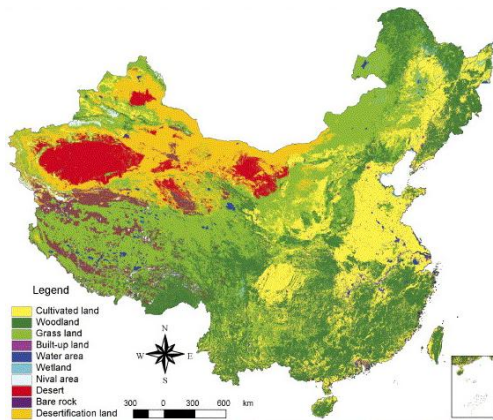


- * SHARE mountain stations operational
- * All ecosystem mapping data available; DataCORE
- * New maps of growing season
- * Atlas of 40 Chinese World Heritage Sites
- * Decision-making support: ABCC program

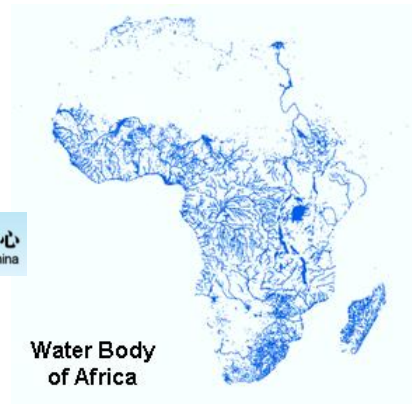


Advanced Land-Cover Products

(Canada, China, EC, Greece, Japan, Netherlands, Nigeria, Spain, Sweden, UK, USA, Spain, EEA, ESA, GTOS, ISPRS)



国家基础地理信息中心
NGCC National Geomatics Center of China



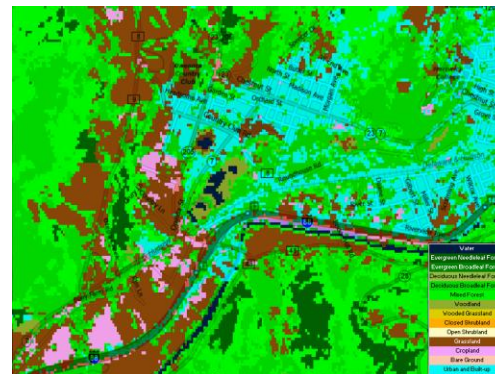
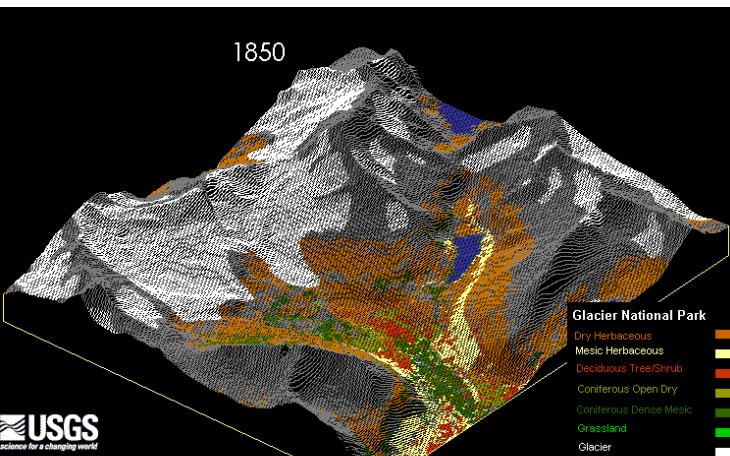
* Global 30m products

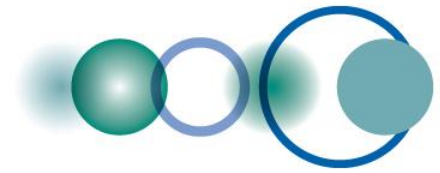
* Major land cover types (eg. wetland)

* Independent validation databases

* Global Land Cover Portal

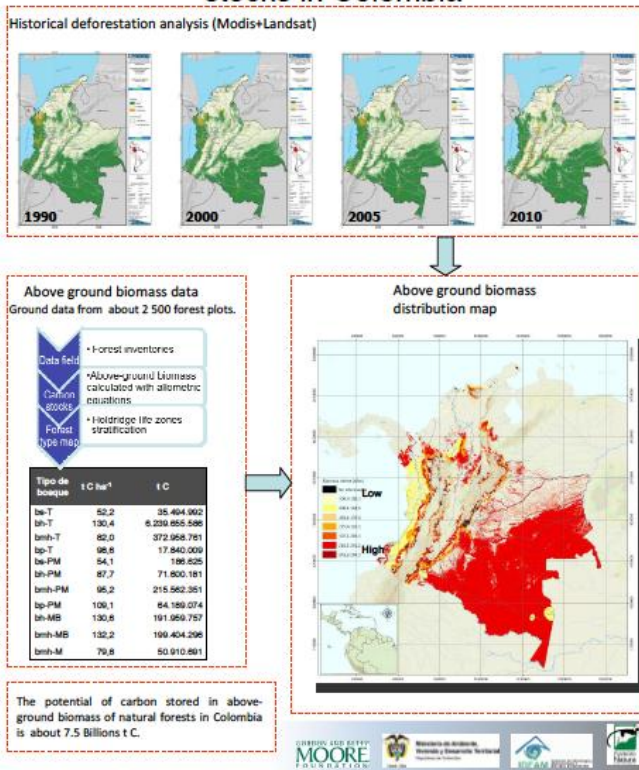
* Growing int'l consensus

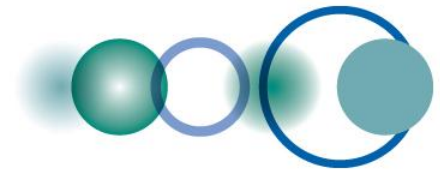




GFOI -- Forest Monitoring and Carbon Tracking from demonstration to implementation of an operational framework to support Countries

Estimation of above ground carbon stocks in Colombia

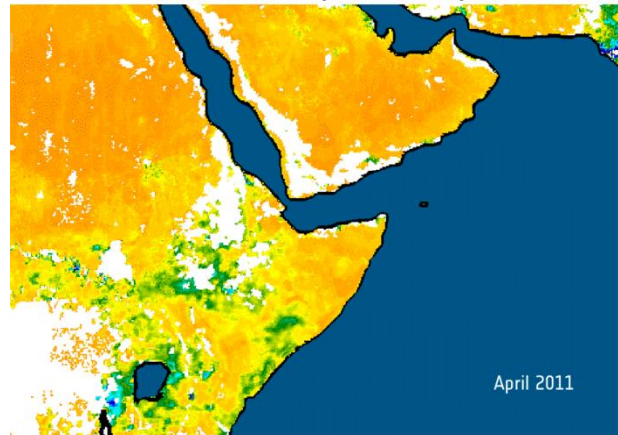




More Water Information

(Austria, EC, Germany, Japan, USA, CEOS, ESA, WCRP, WMO)

Soil Moisture (SMOS, ESA)



Wetter

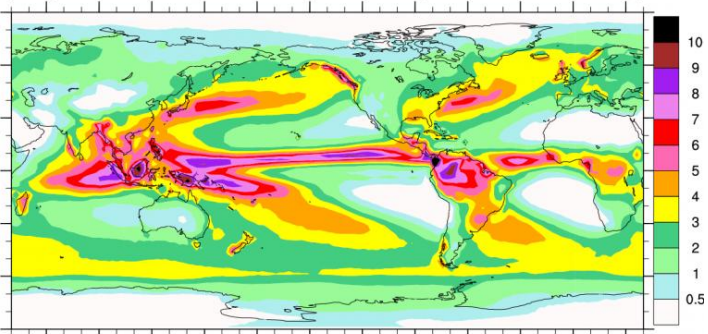


Drier

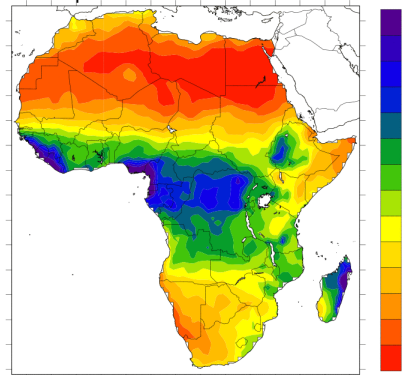
- * Global high-res precipitation datasets 1979-2010
- * New SMOS products & soil moisture datasets 1978-2010
- * Satellite data validation

TRMM GPCP: 1979-2010

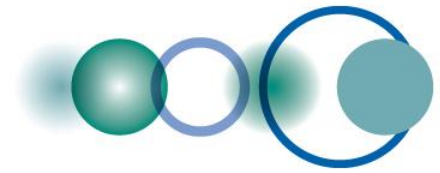
precipitation Areal Mean=2.67 mm/day mm/day



Precip GPCC, 1979-2010 annual

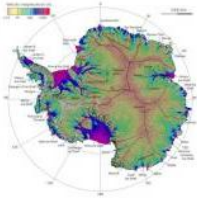


- * Global Drought Information System underway
- * Asian/African Water Cycle Initiative



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

GEO Portals Usability Survey

BROWSE RESOURCES BY SOCIETAL BENEFIT AREAS

-  [DISASTERS](#)
-  [HEALTH](#)
-  [ENERGY](#)
-  [CLIMATE](#)
-  [WATER](#)
-  [WEATHER](#)
-  [ECOSYSTEMS](#)
-  [AGRICULTURE](#)
-  [BIODIVERSITY](#)

[CAPACITY BUILDING](#)

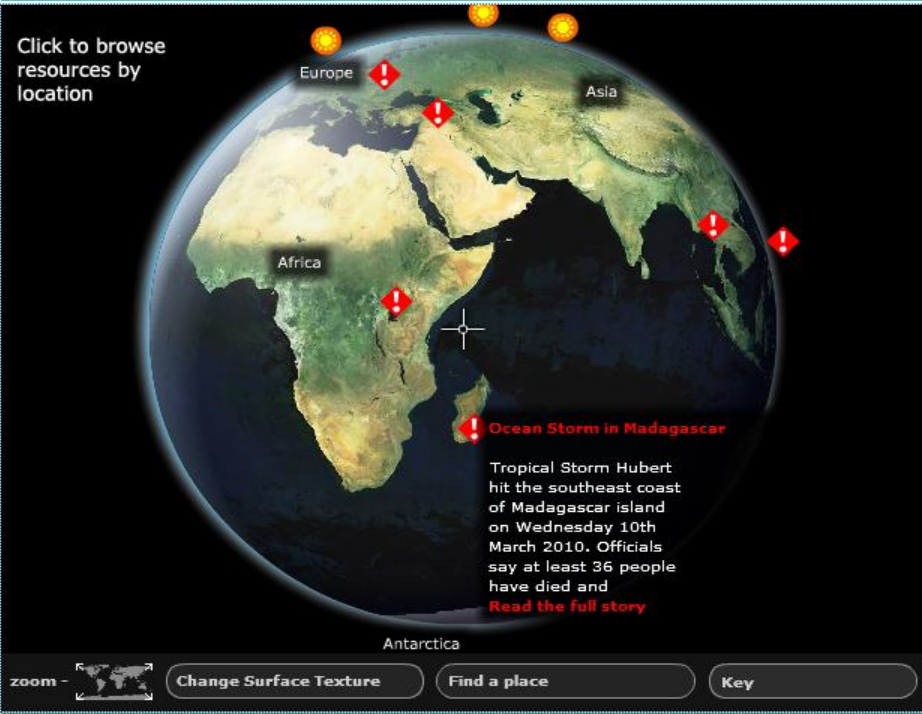


[GEOSS Resources for Haiti Earthquake](#)

WELCOME TO GEOPORTAL
 The GEOportal provides an entry point to access remote sensing, geospatial static and in-situ data, information and services. [More...](#)

BROWSE RESOURCES BY LOCATION

Click to browse resources by location



zoom - 

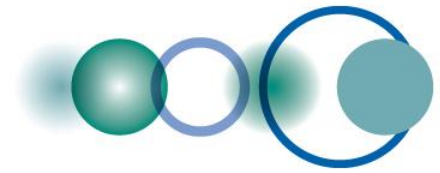
[BREAKING NEWS](#) | [EO NEWS](#)
[Ocean Storm in Madagascar](#) | [New satellite image of earth from space](#)

GEONETCAST

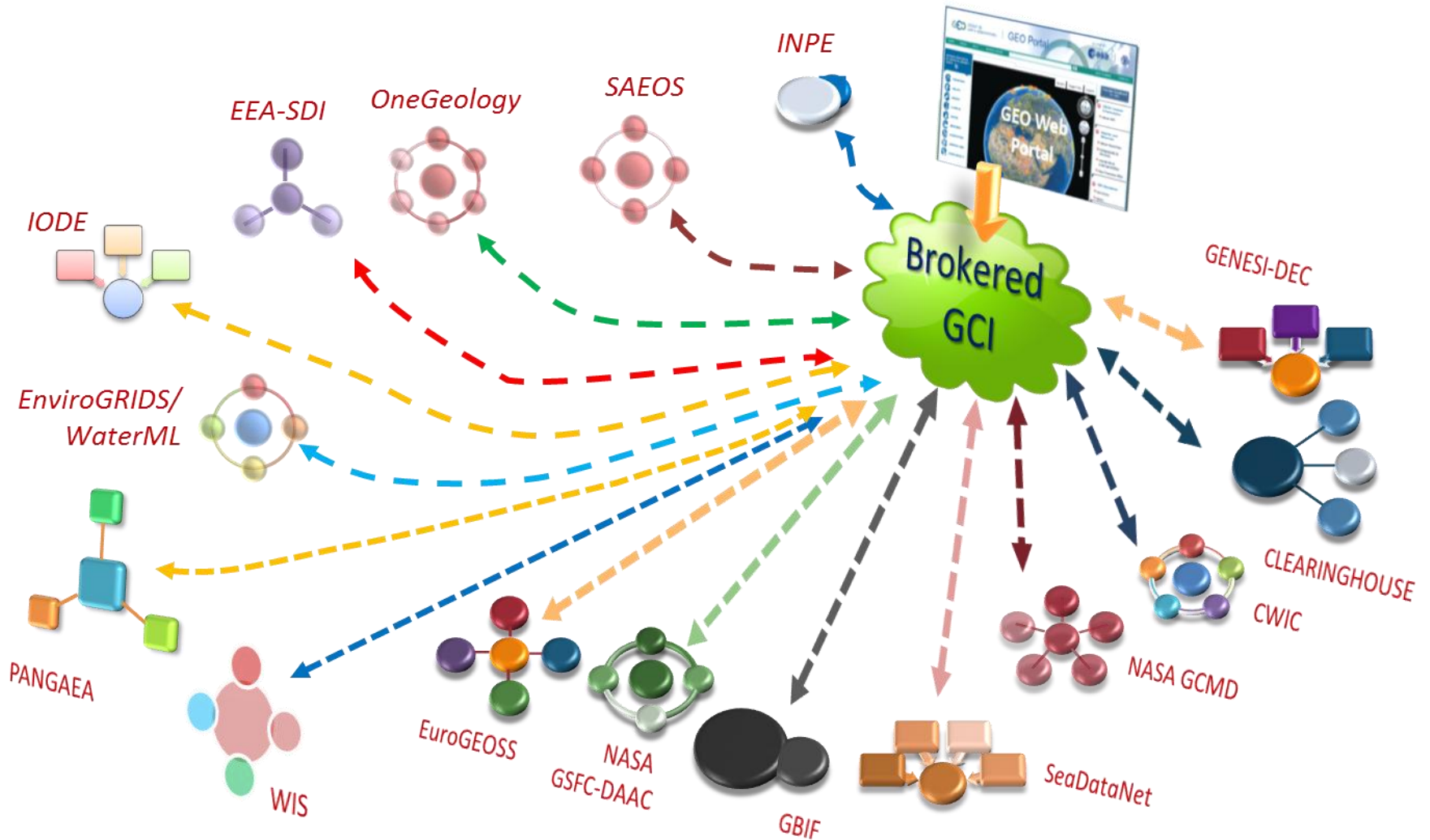
- [GEOSS Common Infrastructure \(GCI\)](#)
- [About GCI](#)
- [REGISTER YOUR RESOURCES](#)
- [Standards and Interoperability Registry](#)
- [More about Registry System](#)
- [Best practices wiki](#)
- [GEO SECRETARIAT](#)
- [News](#)

GEOSS AUGMENTATION

- [Develop and Test your Services and Processing Components](#)
- [AIP-3](#)
- [GEOSS Clearinghouses Test Area](#)

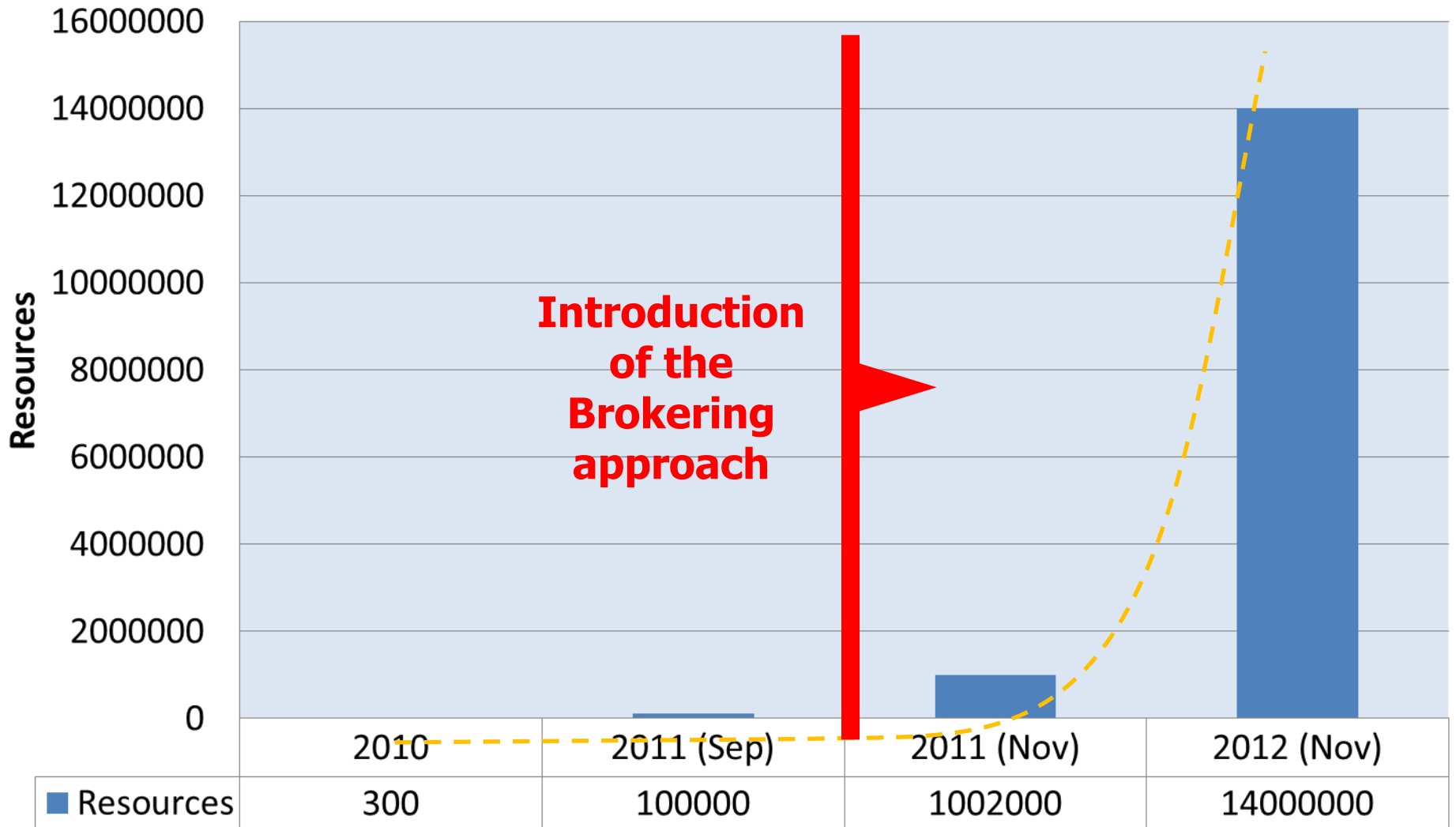


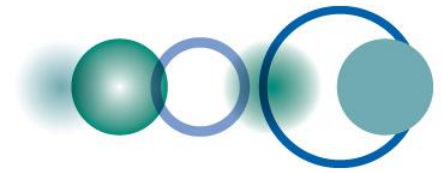
Interoperability Brokers





GEOS Resources

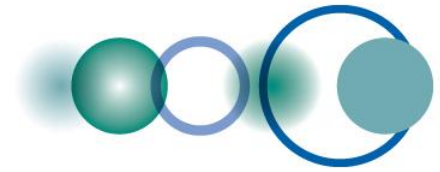




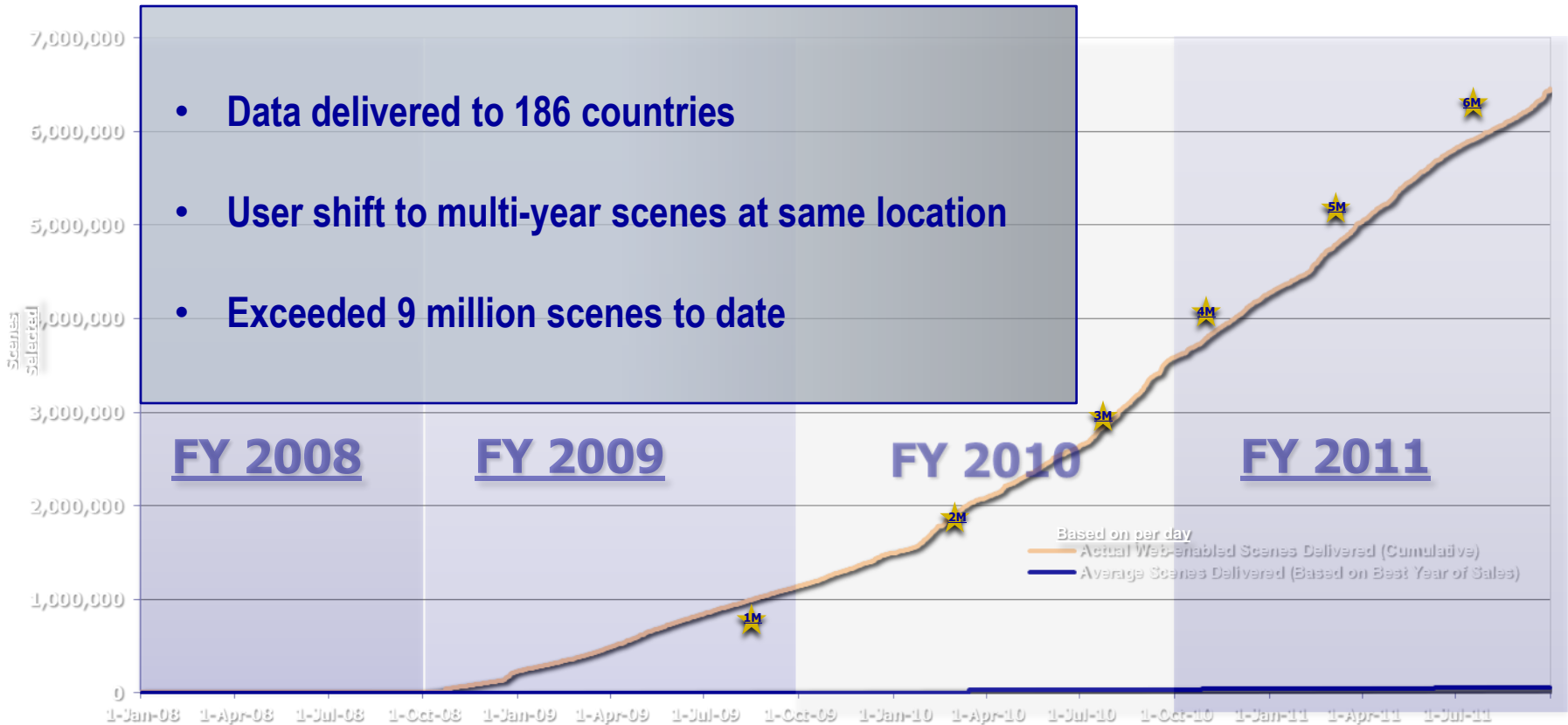
GEOSS Implementation requires: *Data Sharing Principles*

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



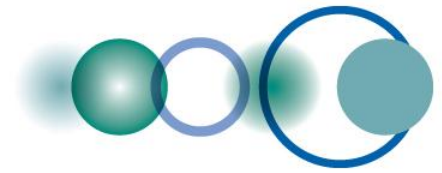


Landsat Internet Data Distribution



Daily Average = 53 scenes for best year of sales (2001)

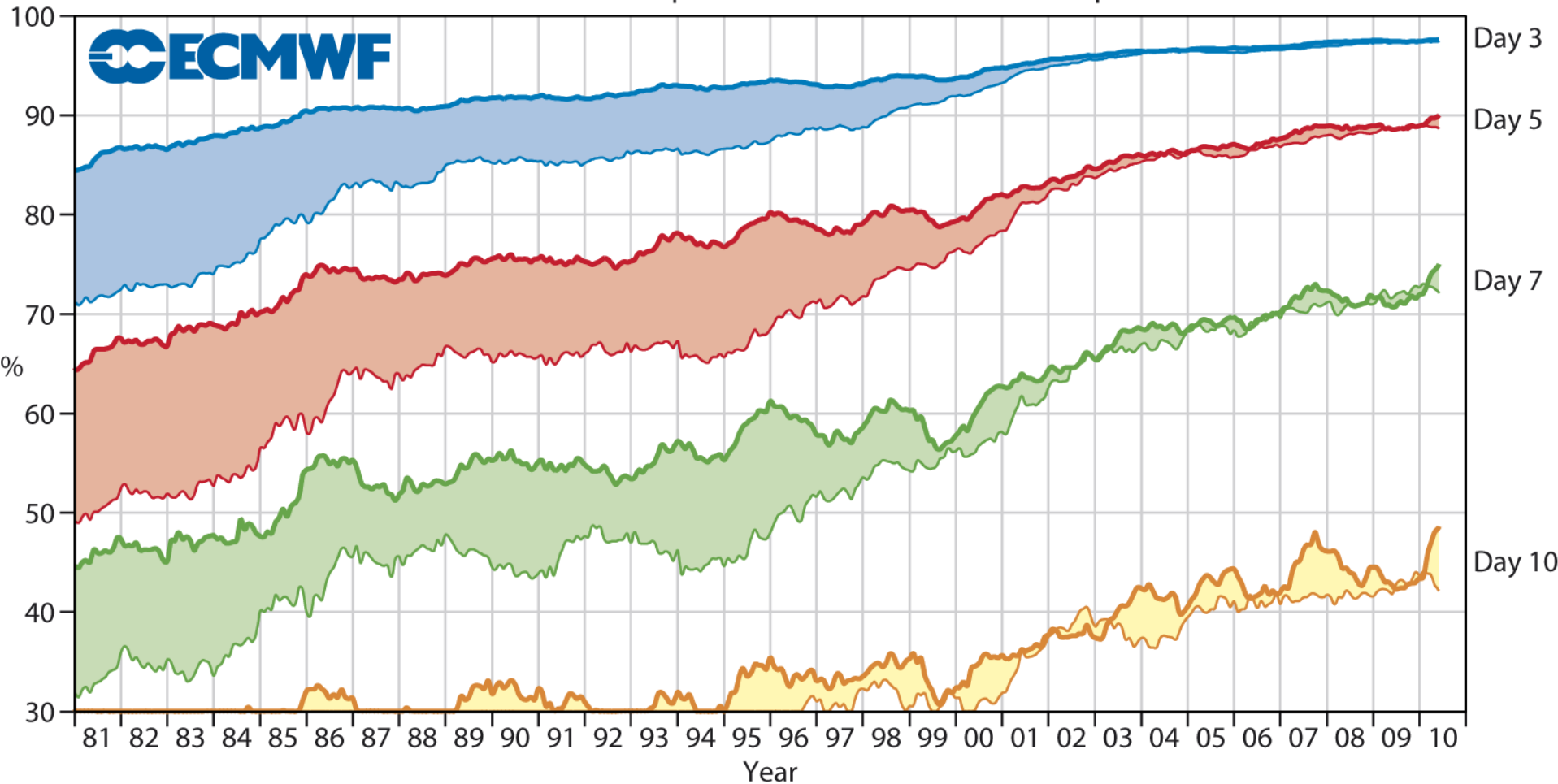
Daily Average \cong 5,700 scenes of web-enabled data delivered

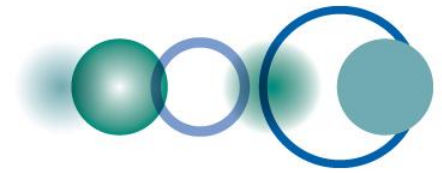


Advances in Global and Regional Weather Forecasts

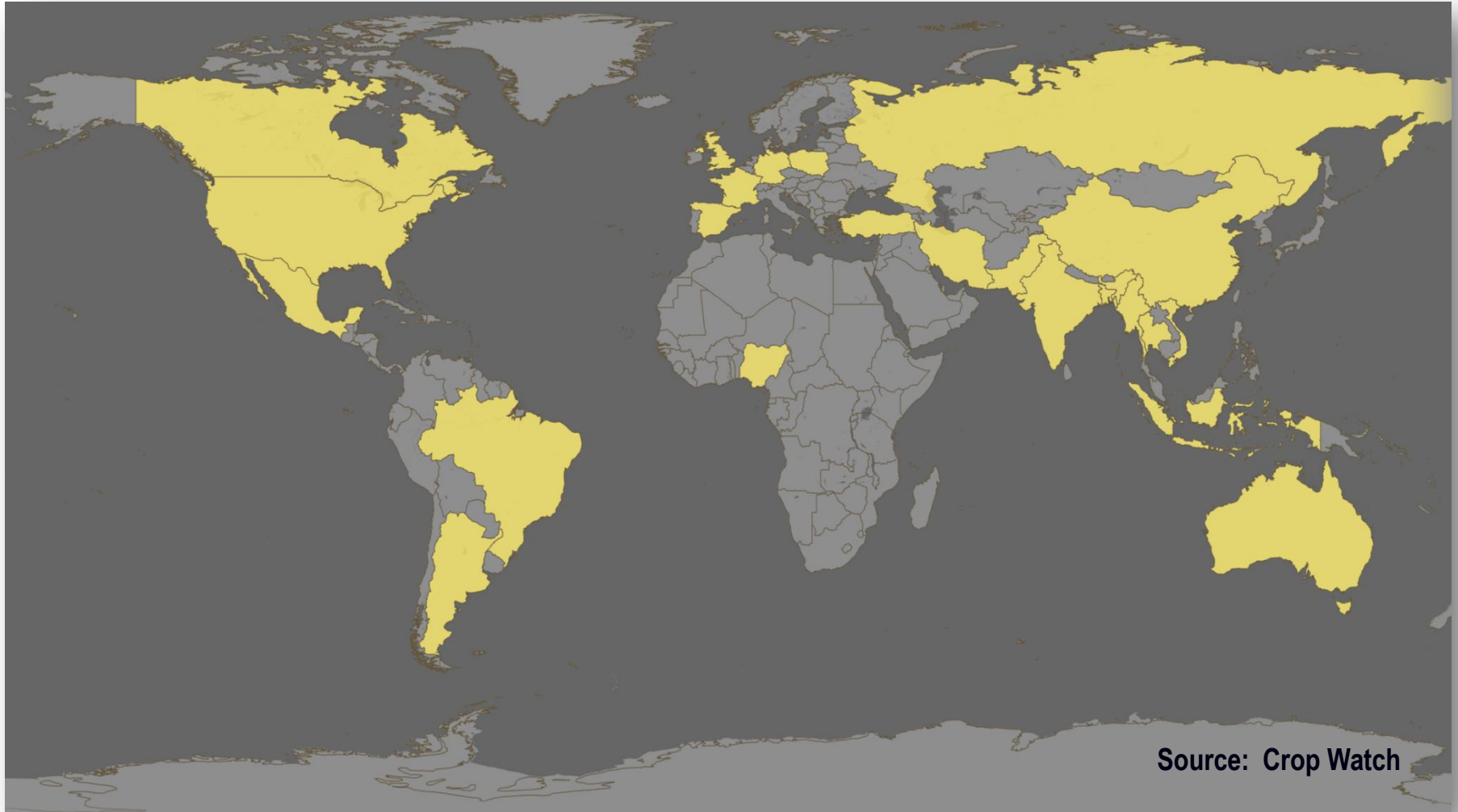
Anomaly correlation of ECMWF 500 hPa height forecasts

— Northern hemisphere — Southern hemisphere

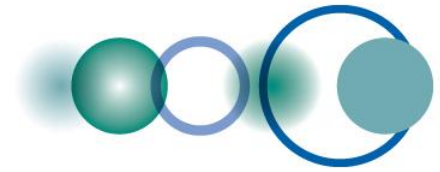




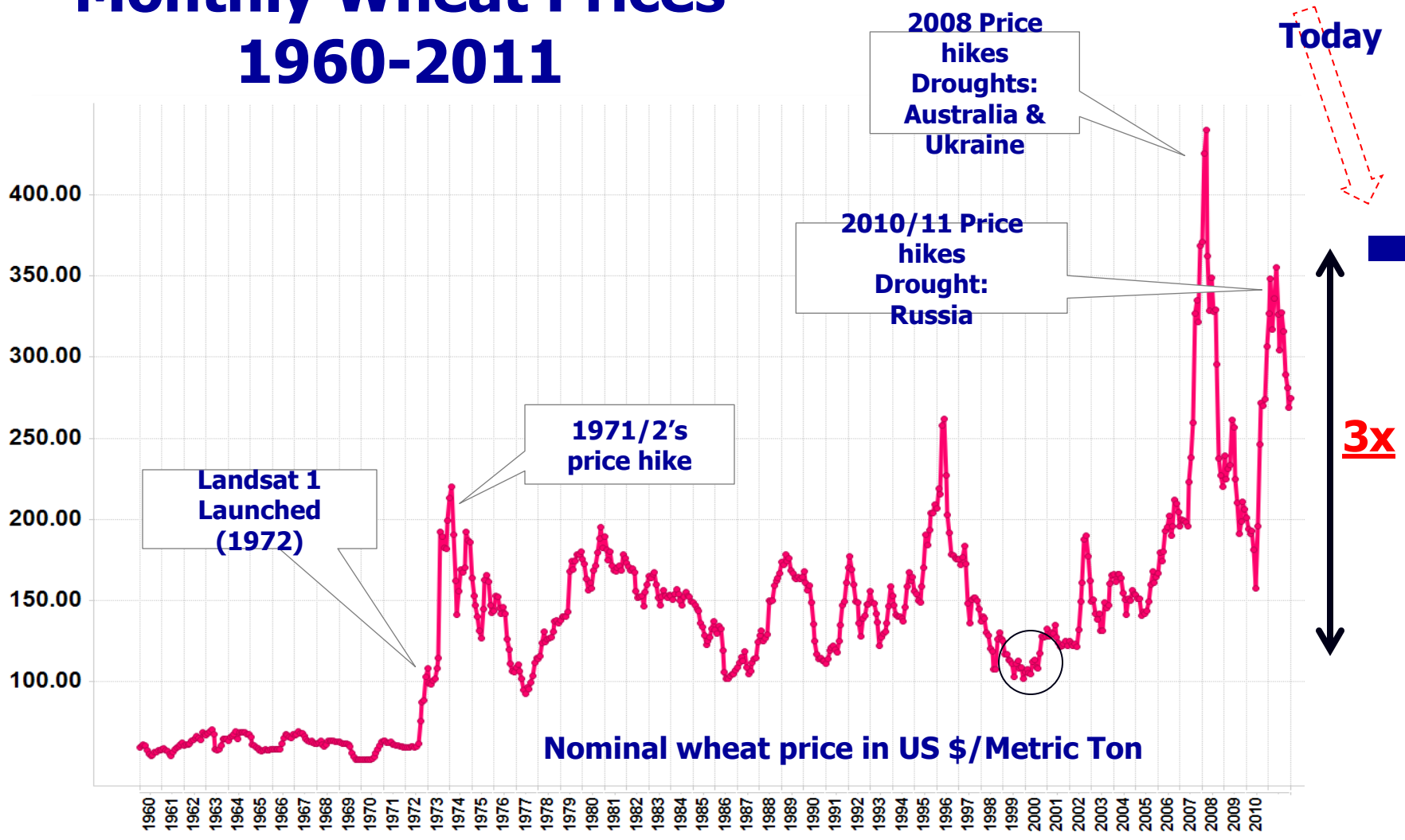
25 COUNTRIES PRODUCE OVER 80% OF WORLD CROPS

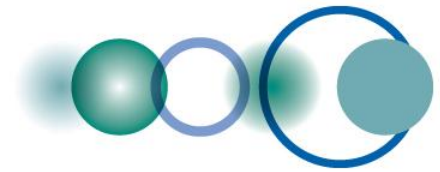


Source: Crop Watch



Monthly Wheat Prices 1960-2011



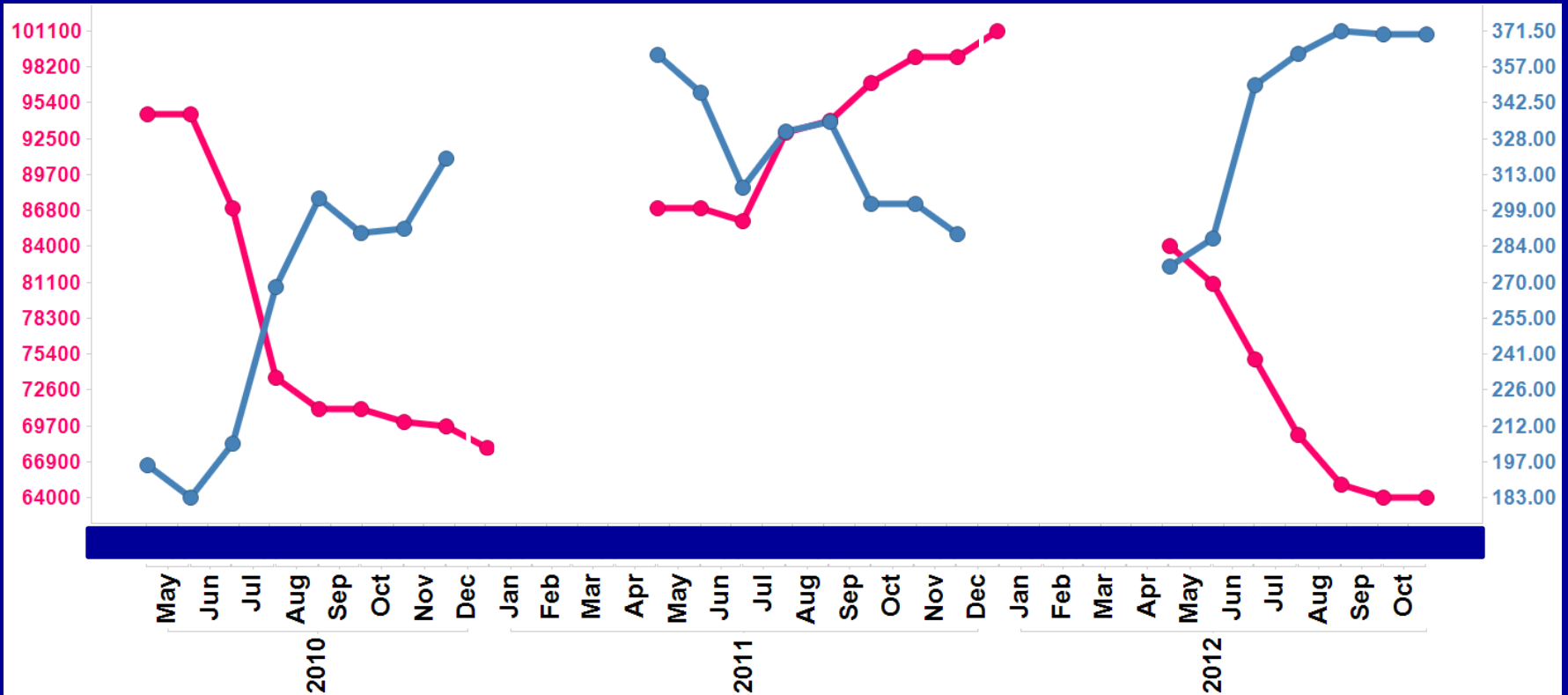


Making the case for improved crop forecasts

Aggregation of Wheat Production Forecasts from Main Wheat Export Countries vs. International Market Price 2010-2012

Production Forecasts (1,000 MT)

Price (\$/Ton)





Summary

- **International collaboration essential to leverage national investments**
- **Broad, open data policies are needed for market growth**
- **GEO is achieving results on both these fronts**
- **While much has been accomplished, more needs to be done and with broader engagement**

<http://www.earthobservations.org>

[Barbara Ryan](mailto:bryan@geosec.org)
bryan@geosec.org

