

# The CEOS Role in EO Data Supply

*Personal Perspective*

Stephen Ward





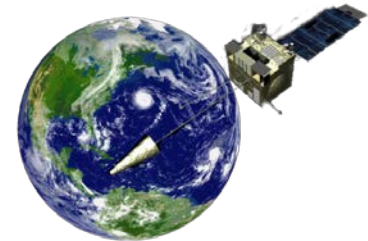
- **CEOS**
- **3 phases of CEOS history**
  - Basic interoperability & standards
  - User Engagement (IGOS-P)
  - Space segment for the GEOSS (GEO)
- **Current priorities**



- **Established in 1984 under auspices of G-7 Economic Summit of Industrialised Nations**
  - Focal point for international coordination of space-related Earth Observation (EO) activities
  - Optimize benefits through cooperation of members in mission planning and in development of compatible data products, formats, services, applications, and policies
- **Operates through best efforts of Members and Associates via voluntary contributions**
- **30 Members (Space Agencies), 22 Associates (UN Agencies, Phase A programs or supporting ground facility programs)**



- 1. To optimize benefits of space-borne Earth observations through:**
  - Cooperation of its Members in mission planning
  - Development of compatible data products, formats, services, applications, and policies;
- 2. To serve as a focal point for international coordination of space-related Earth observation activities**
- 3. To exchange policy and technical information to encourage complementarity and compatibility of observation and data exchange systems**





## MEMBERS

Agenzia Spaziale Italiana (ASI)  
 Canadian Space Agency (CSA)  
 Centre National d'Etudes Spatiales (CNES), France  
 Centro para Desarrollo Tecnológico Industrial (CDTI), Spain  
 China Center for Resources Satellite Data and Applications (CRESDA)  
 Chinese Academy of Space Technology (CAST)  
 Comisión Nacional de Actividades Espaciales (CONAE), Argentina  
 Commonwealth Scientific & Industrial Research Organisation (CSIRO), Australia  
 Deutsches Zentrum für Luft- und Raumfahrt (DLR), Germany  
 European Commission (EC)  
 European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT)  
 European Space Agency (ESA)  
 Geo-Informatics and Space Technology Development Agency (GISTDA), Thailand  
 Indian Space Research Organisation (ISRO)  
 Instituto Nacional de Pesquisas Espaciais (INPE), Brazil  
 Japan Aerospace Exploration Agency/Ministry of Education, Culture, Sports, Science, and Technology (JAXA/MEXT)  
 Korea Aerospace Research Institute (KARI)  
 National Aeronautics and Space Administration (NASA), USA  
 National Oceanic and Atmospheric Administration (NOAA), USA  
 National Remote Sensing Center of China (NRSCC)  
 National Satellite Meteorological Center/Chinese Meteorological Administration (NSMC/CMA)  
 National Space Agency of Ukraine (NSAU)  
 National Space Research Agency of Nigeria (NASRDA)  
 Netherlands Space Office (NSO)  
 Russian Federal Space Agency (ROSKOSMOS)  
 Russian Federal Service for Hydrometeorology and Environmental Monitoring (ROSHYDROMET)  
 South African National Space Agency (SANSA)  
 Scientific and Technological Research Council of Turkey (TÜBİTAK)  
 United Kingdom Space Agency (UKSA)  
 United States Geological Survey (USGS)

## ASSOCIATES

Belgian Federal Science Policy Office (BELSPO)  
 Canada Centre for Remote Sensing (CCRS)  
 Council for Scientific and Industrial Research (CSIR)  
 Crown Research Institute (CRI), New Zealand  
 Global Climate Observing System (GCOS)  
 Global Geodetic Observing System (GGOS)  
 Global Ocean Observing System (GOOS)  
 Global Terrestrial Observing System (GTOS)  
 Intergovernmental Oceanographic Commission (IOC)  
 International Council for Science (ICSU)  
 International Geosphere-Biosphere Programme (IGBP)  
 International Ocean Colour Coordinating Group (IOCCG)  
 International Society of Photogrammetry and Remote Sensing (ISPRS)  
 Norwegian Space Center (NSC)  
 Swedish National Space Board (SNSB)  
 United Nations Economic and Social Commission for Asia and the Pacific (ESCAP)  
 United Nations Educational, Scientific and Cultural Organization (UNESCO)  
 United Nations Environment Programme (UNEP)  
 United Nations Food and Agriculture Organization (FAO)  
 United Nations Office for Outer Space Affairs (UNOOSA)  
 World Climate Research Programme (WCRP)  
 World Meteorological Organization (WMO)

# 3 phases of CEOS development



- 1. Basic interoperability issues (1984 – mid 1990s)**
- 2. User engagement (mid 1990s – mid 2000s)**
- 3. Space segment of the GEOSS (from mid-2000s)**

# 3 phases of CEOS development



## 1. Start-up & basic interoperability issues (1984 – mid 1990s)

- Standards & data formats (WGD, WGCV)
  - Information systems
  - Data discovery and sharing
  - Dialogue between countries
- 
- G-7 saw the opportunity/necessity of countries combining resources to address significant challenges
  - Until 1986 (SPOT) and 1988 (IRS) only USA had non-met polar orbiting EO satellites



## 2. User engagement (mid 1990s – mid 2000s)

- Establishment of IGOS Partnership

*The IGOS Partnership was established by a formal exchange of letters among the 13 founding Partners for the definition, development and implementation of the Integrated Global Observing Strategy. The principal objectives of the Integrated Global Observing Strategy are to address how well user requirements are being met by the existing mix of observations, including those of the global observing systems, and how they could be met in the future through better integration and optimization of remote sensing (especially space-based) and in-situ systems.*



# 3 phases of CEOS development



## THE IGOS PARTNERSHIP

WCRP

An agreement among the partners  
for the definition, development and  
implementation of an integrated global  
observing strategy



GOS/GAW



GTOS

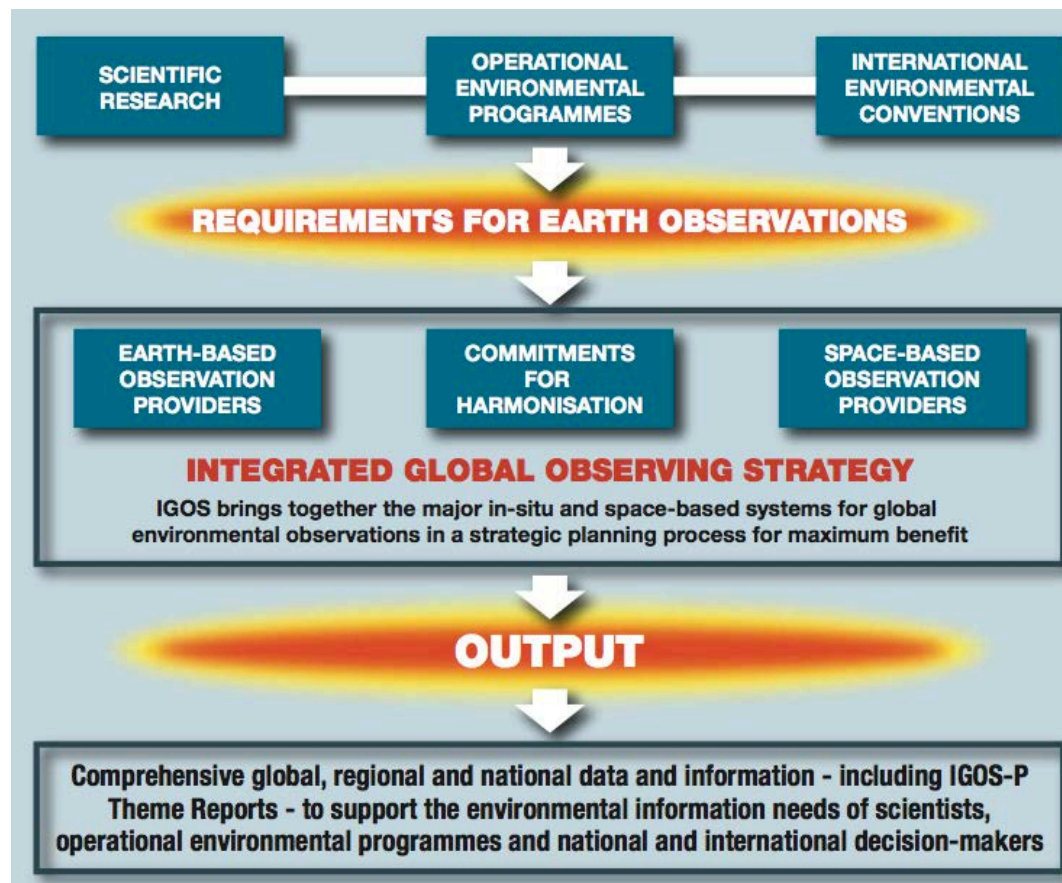


GLOBAL CHANGE

IGFA



- Provider & user partnership
- Thematic partnership: atmospheric chemistry, cryosphere, oceans, water cycle...
- Theme Reports spelt out requirements, observations and a strategy for fulfilment of needs
- Strategic Implementation Team established to secure agency commitments



# 3 phases of CEOS development



## 3. Delivering the GEOSS space segment (from mid-2000s)

- IGOS-P was productive on a technical level but no political traction
- No big wins or increased budgets
- **Establishment of GEO (2003..)** a further (final?) attempt to establish importance of EO and achieve effective cooperation towards pressing challenges
- Ministerial-level meetings – govt agencies with responsibilities for monitoring, environment etc
- Voluntary partnership of 88 governments + EC + 64 Participating Organisations (inc CEOS) - Provides a framework within which these partners can develop new projects and coordinate their strategies and investments
- The GEOSS is the characterisation of the purpose of GEO



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





## *Personal perspective*

- **Implementation plan of 10 years (2005-2015) for GEOSS**
- **Still finding its feet**
- **Engineers approach – multitude of tasks with serial numbers**
- **More recent versions attempt to focus and prioritise**
- **Need big headlines to demonstrate value of GEO and ensure its longevity:**
  - **GFOI**
  - **GEOGLAM**
  - **Disasters Supersites**



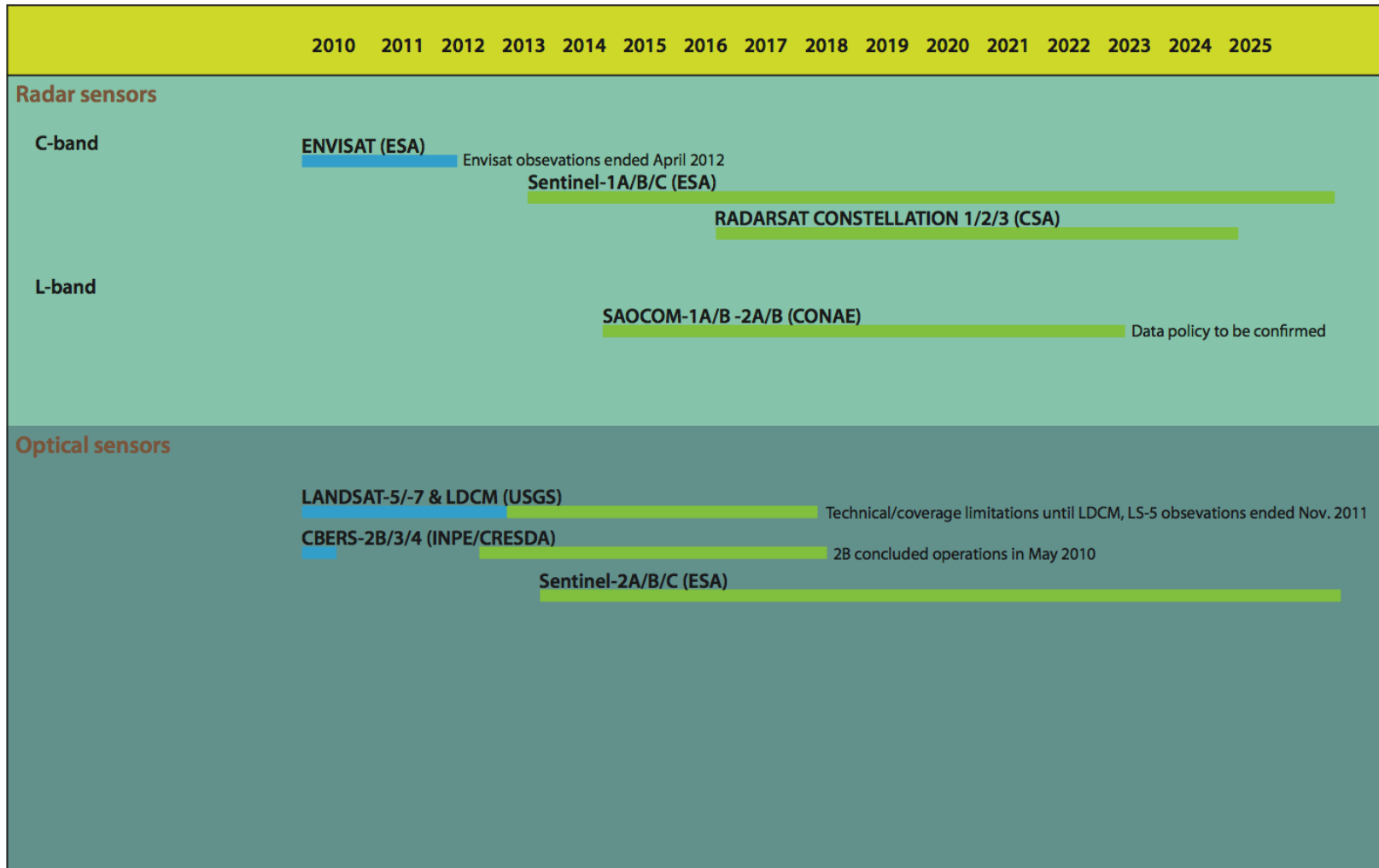
### 3. Delivering the GEOSS space segment (from mid-2000s)

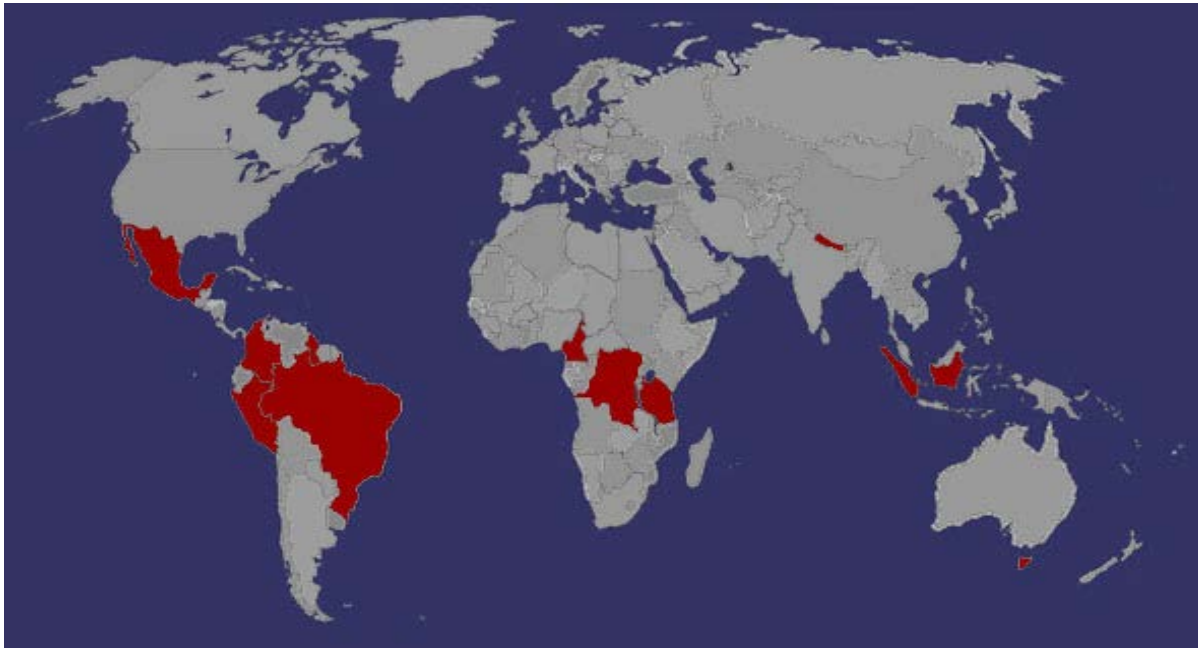
- CEOS resources heavily aligned towards systematic implementation of the GEOSS space segment – Work Plan
- Thematic coordination of key measurement groups – the CEOS Virtual Constellations for GEO: ACC, OST, OSVW, OCR, SST, LSI, PC
- CEOS Response to the GCOS IP – and WGClimate: systematic planning for ECV provision
- Improved information systems: eohandbook.com; VC portals
- Space Data Coordination Group: coordinated acquisition strategies in support of the big tickets (GFOI, GEOGLAM)



**Sub 30m core satellite data streams for continuous, annual, global coverage**

June 2012





## 11 ND Countries

- Australia (Tasmania)
- Brazil
- Cameroon
- Colombia
- DR Congo
- Guyana
- Indonesia (Sumatra, Kalimantan)
- Mexico
- Nepal
- Peru
- Tanzania.

### From 2009

- Brazil
- Guyana
- Mexico
- Indonesia (Kalimantan)
- Australia (Tasmania)
- Cameroon
- Tanzania

### From June 2010

- Colombia
  - DR Congo
  - Peru, and
- adding Sumatra to Indonesia

### From June 2011

- Nepal



# FCT Acquisition Summary

Campaign	Summer 2009	Spring 2010	Summer 2010	Spring 2011	Summer 2011	Total
ALOS PALSAR	6189	7531	13746	15079	mission lost	42545
RADARSAT-2	595	1278	875	1160	1093	5001
ENVISAT ASAR	684	1419	2785	1547	3318	9753
COSMO - Skymed	not planned	183	N/A	N/A	91	274
TerraSAR-X	not planned	243	116	116	217	756
Landsat 5 & SPOT	238	5280	11362	11691	10149	44770
SPOT	TPM by ESA, but restrictions related to repatriation		2252	2810	6192	11254
CBERS-2B	3580	N/A	mission lost	mission lost	mission lost	3580
IRS	not planned	100	13674	6015	1187	20976

**more than 139,000 scenes**



- **GEO must deliver**
- **CEOS is by far the largest single contributor to GEO and is fundamental to success of GEO**
- **GFOI, GEOGLAM, Supersites... big tickets needed to demonstrate the potential of EO that the community is convinced of, but others may not yet appreciate**
- **Sharp-end focus for CEOS: programmatic still important but looking to see physical outputs like GFOI datasets**



Committee on Earth Observation Satellites

