

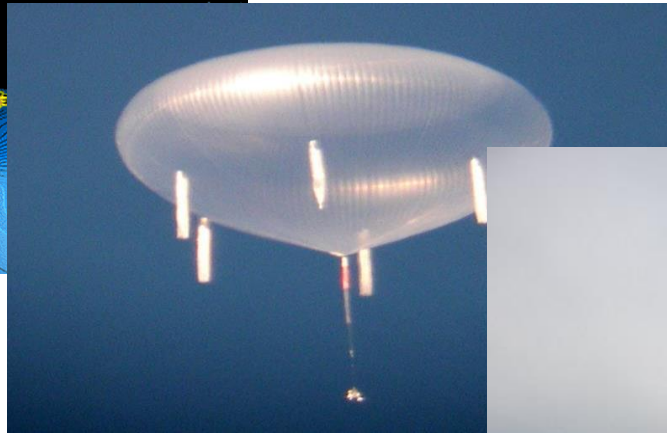
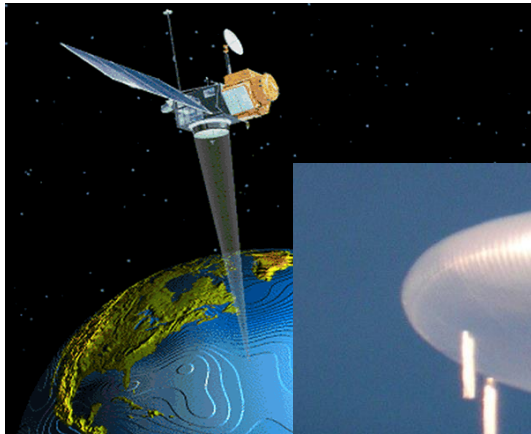
The Group on Earth Observations (GEO) for Use with UNECE

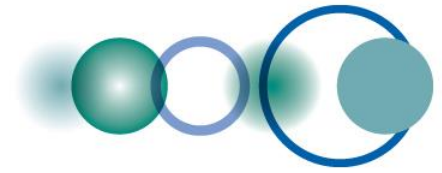
Earth Observations for Ecosystem Accounting (EO4EA)

John Matuszak
U.S. Department of State
Bureau of Oceans, International
Environmental and Scientific Affairs



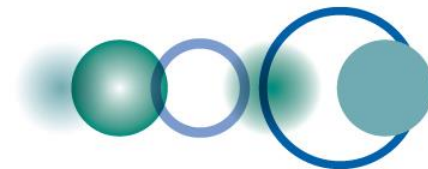
Observations – In, On, and Around the Earth



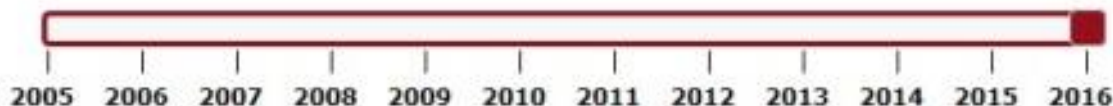


GEO Vision

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



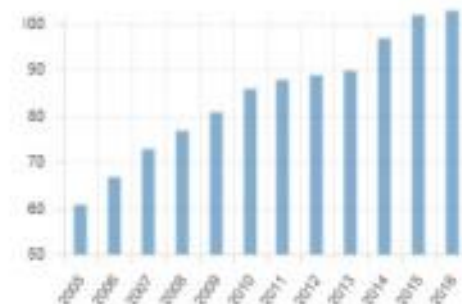
103 GEO Members

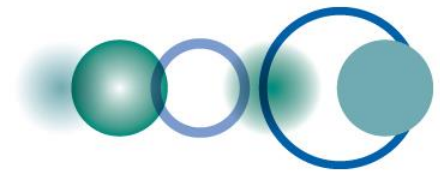


Number of Members (2016)

Africa:	27
Americas:	16
Asia/Oceania:	19
C.I.S.:	7
Europe:	34
Total:	103

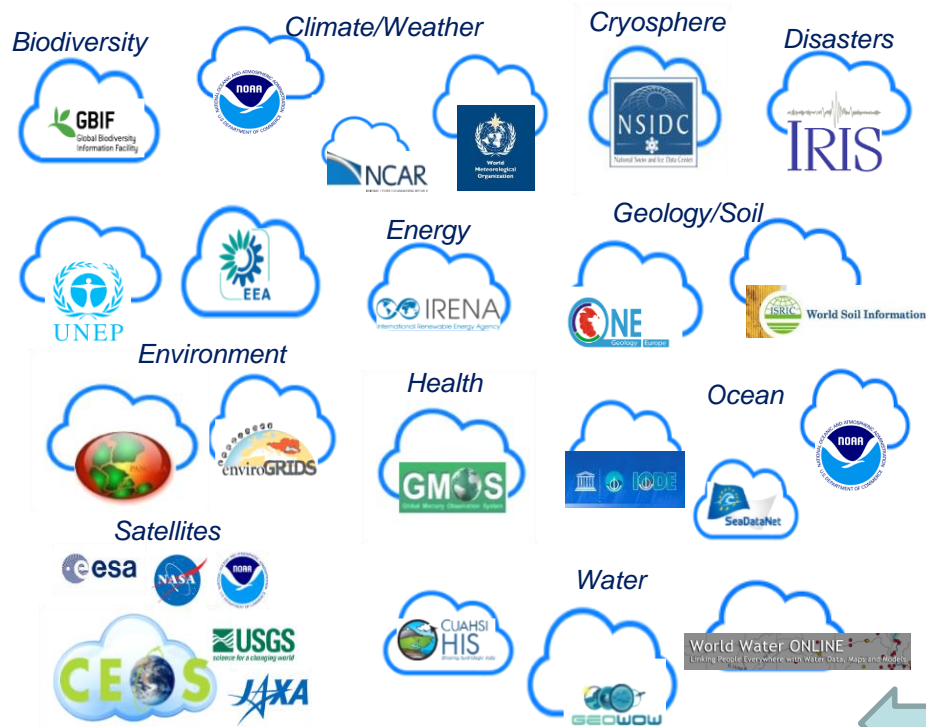
Number of Members by year



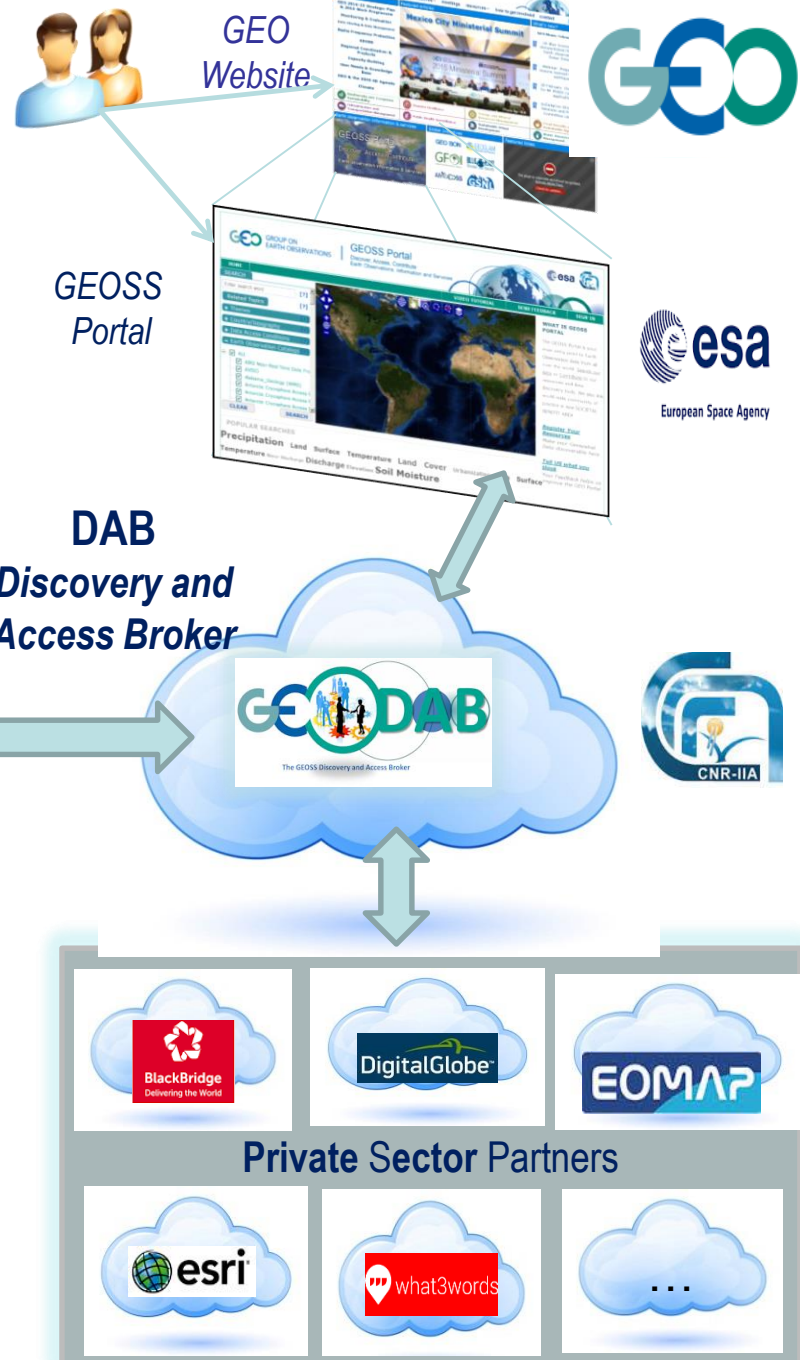


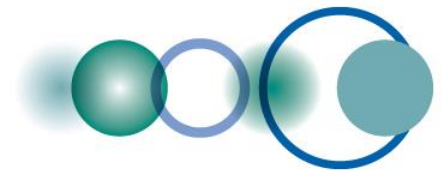
103 Participating Organizations

 AARSE	 ACMAD	 adie ASSOCIATION POUR LE DROIT À L'INITIATIVE ÉCONOMIQUE	 APN	 BELMONT FORUM	 Biodiversity International	 CODATA	 COSPAR
 Convention on Biological Diversity	 Creative Commons	 CEOS	 CGMS	 EEA	 EUMETSAT	 EPOS EUROPEAN PLATFORM FOR OBSERVING THE EARTH	 esa
 CRTEAM	 EARSC European Association of Remote Sensing Scientists	 EARSel	 ECMWF	 EUMETSAT	 EUREC AGENCY European Renewable Energy Research Centre Agency	 eurisy 25 YEARS OF BRIDGING SPACE AND SOCIETY	 EuroGeoSurveys European Cooperation for Geoscientific Surveys
 ESIP	 ESSI	 EUROPEAN UNION SATELLITE CENTRE SatGen Analysts for decision making	 EUMETNET EUROPEAN METEOROLOGICAL DATA EXCHANGE NETWORK	 EUMETSAT	 EUREC AGENCY European Renewable Energy Research Centre Agency	 eurisy 25 YEARS OF BRIDGING SPACE AND SOCIETY	 EuroGeoSurveys European Cooperation for Geoscientific Surveys
 FAO FLAT PAKS	 GOS Global Ocean Observing System	 futureearth research for global sustainability	 GBIF	 GCOS GLOBAL CLIMATE OBSERVING SYSTEM	 GÉANT	 GEM	 THE GLOBE PROGRAM
 GLOS Global Ocean Observing System	 GOS Global Ocean Observing System	 GRSS Geoscience and Remote Sensing Society	 GSDI Global Spatial Data Infrastructure Association	 GTOS	 IBEC INTERBALKAN ENVIRONMENT CENTER	 IAF INTERNATIONAL ASSOCIATION OF AERONAUTICAL FEDERATIONS	 International Association of Geodesy
 ICA ACI	 ICIMOD	 ICSU International Council for Science	 IEEE	 International Hydrographic Organization Organisation Hydrographique Internationale	 IIASA	 IISD International Institute for Sustainable Development Institut international de développement durable	 International Institute of Space Law
 INCOSE International Council on Systems Engineering	 IWM International Water Management Institute	 United Nations Educational, Scientific and Cultural Organization	 International Steering Committee for Global Mapping	 ISDE	 isprs International Society for Photogrammetry and Remote Sensing	 ITC International Technical Commission of the International Geographical Congress	 International Union of Geodesy and Geophysics (IUGG)
 IUGS Earth Science for the Global Community	 IWM International Water Management Institute	 JBGIS Joint Board of Geospatial Information Societies	 MARCHAND FOUNDATION FOR THE ENVIRONMENTAL SCIENCES	 SICA Central American Integration System	 marine technology SOCIETY Opportunity runs deep	 OGC Open Geospatial Consortium, Inc.	 pogo
 RCMRD	 RDA RESEARCH DATA ALLIANCE	 Regional Centre for Training in Aerospace Surveys	 SAON SUSTAINING ARCTIC OBSERVING NETWORKS	 SICA Central American Integration System	 SPC Secretariat of the Pacific Community Applied Geoscience and Technology Division (SOPAC)	 SECURE WORLD FOUNDATION	 THE WORLD BANK
 NCAR UCAR University Corporation for Atmospheric Research	 UNCCD United Nations Convention to Combat Desertification	 UNEP United Nations Environment Programme	 UNEP United Nations Environment Programme	 UN ESCAP United Nations Economic and Social Commission for Asia and the Pacific	 UNESCO United Nations Educational, Scientific and Cultural Organization	 United Nations Framework Convention on Climate Change	 UNISDR The United Nations Office for Disaster Risk Reduction
 unitar United Nations Institute for Training and Research	 UNITED NATIONS Office for Outer Space Affairs	 UNITED NATIONS UNIVERSITY UNU-EHS Institute for Environment and Human Security	 WCRP World Climate Research Programme	 WORLD DATA SYSTEM	 WMO World Meteorological Organization	 WMO World Meteorological Organization	 WMO World Meteorological Organization



more than 100 Public Providers...





GEOSS Implementation Requires:

Data Sharing Principles

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





GEO Mexico City Ministerial Declaration 2015

2) Affirm that GEO and its Earth observations and information will support the implementation of, inter alia, the 2030 Global Goals for Sustainable Development, the Sendai Framework for Disaster Risk Reduction 2015-2030, **the United Nations System of Environmental and Economic Accounts**, and the United Nations Framework Convention on Climate Change.

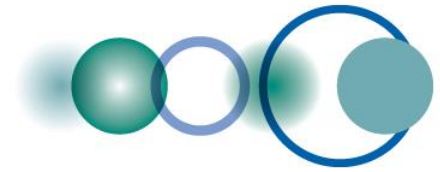
11) Resolve to sustain and develop the observing systems required to provide high-quality reference data and time-series Earth observations; address observation gaps; maintain and evolve the GEOSS common infrastructure as a public good to deliver data, information, and knowledge that responds to stakeholders' requests and informs their decision-making processes. **Further resolve to collaborate with statistical agencies and others to integrate Earth observations with social and economic data to multiply their collective value and to contribute solutions that are linked from the global to local levels.**



GEO Work Program 2017 – 2019

A selection of efforts that could potentially contribute to SEEA

- Earth Observation for Ecosystem Accounting (EO4EA)
- EO in service of the 2030 Agenda for SD – SDGs
- Global Forest Observation Initiative (GFOI)
- GEO Carbon and GHG Initiative (GFOI)
- GEO Global Water Sustainability (GEOGLOWS)
- Air Now
- GEO Biodiversity Observation Network (GEOBON)



Earth Observations for Ecosystem Accounting (EO4EA) A GEO Initiative for 2017 - 2019

To enter widespread use, ecosystem service assessments need to be quantifiable, replicable, credible, flexible, and affordable.” Bagstad et al 2013

- Interim Steering Committee – Statistics Canada, INEGI - Mexico, Colombia, Netherlands, US - GEO, ESA, World Bank – WAVES, Conservation International, Wageningen University and ESRI.

Primary Work Streams:

- Compilation and assessment of Ecosystem Accounts and their use of Earth Observation.
- Information needs to define ecosystem extent and condition – Biophysical (e.g. climate, hydrology, soils, topography, land cover, biodiversity); Classification of ecosystem types; sampling needs and gaps (including periodicity and scale of measurements needed).
- Ecosystem Services Classification Identification of EO measurements to track ecosystem services (e.g. carbon storage, water provisioning).
- Pilots at national and regional scales, in the US, Africa -Gaborone Declaration countries, South America and Europe.



Compilation and assessment of Ecosystem Accounts and their use of Earth Observation.

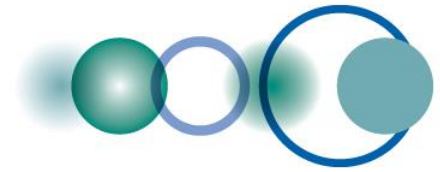
The initiative will:

- **compile an overview on the use of Earth Observation (EO) data in existing Ecosystem Accounting efforts,**
 - **examining at various scales and for different themes, and**
 - **inventory the extent to what types of Eos are being used.**

Examples to included:

Australia Victoria Parks, Great Barrier Reef; Netherlands – Limburg; Canada – MEGS; Mexcio/UNSD/CBD; WB WAVES related - Himachal Pradesh (India), the Philippines, Colombia, Costa Rica and Rwanda, Peru/CI

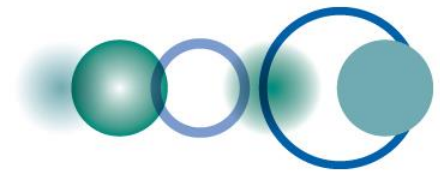
Groups involved: Conservation International and the Government of Peru, the European Environment Agency, WAVES, and several of its core implementing countries developing ecosystem accounts, Statistics Canada, INEGI, and Wageningen University and the Netherlands.



Information needs to define ecosystem extent and condition

The initiative will:

- **Review the information needs to define ecosystem extent and condition – Biophysical (e.g. climate, meteorology; hydrology, soils, topography, land cover, biodiversity);**
- **Work with EO providers to facilitate mapping and and monitoring ecosystem extent and condition.**
- **Develop an outline for methodological guidance on the use of EOs for Ecosystem Accounts including recommendations on definitions, indicators, scale and temporality,**
- **Review sampling regimes and the opportunities and challenges of using various types of sensors from satellite to *in situ*.**



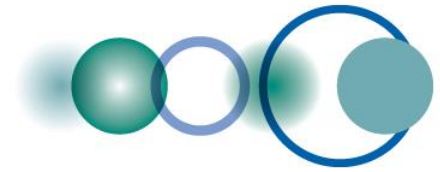
Information needs to define ecosystem extent and condition

(continued)

- **Examine ways to assess the quality and usefulness of EO data for accounting**
 - **the ability to track change over time,**
 - **the alignment between different EO datasets, and**
 - **the consistency of EO data with statistical survey data (e.g. On land cover/use including forestry statistics) and other spatial data source such aerial photography and other forms of ground truthing.**
- **The task force will look at research needs and to the development of tools to facilitate these efforts.**
- **This aims to provide input to the UN Statistical Commission's revision of the technical guidelines for SEEA–EEA in 2017 and beyond.**

Partners:

- **USGS, NOAA, CI, Mexico, ESRI, ESA, EEA and others.**



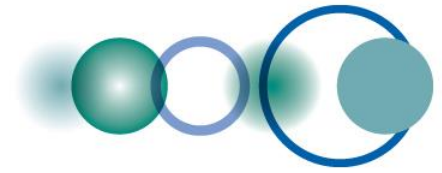
Ecosystem Services Classification Identification of EO measurements to track ecosystem services

The initiative will:

- **Examine how EOs can contribute to the identification, measurement and monitoring of ecosystem services. (e.g. carbon storage, water provisioning).**
- **Build on the efforts of the UNSD, US EPA and EEA to understand the classification and measurements of ecosystem services and the extent to which EO may be useful in tracking biophysical changes that are a component of the Ecosystem service**
- **Identify ation of research needs, with regard to tools and analytics to translate EOs into accounting frameworks and its use in valuation efforts and as a compliment to the UN Statistics Division System of National Accounts.**

Partners include:

US EPA, EEAStatistics Canada, Wageningen University, Conservation International, ESA and others.



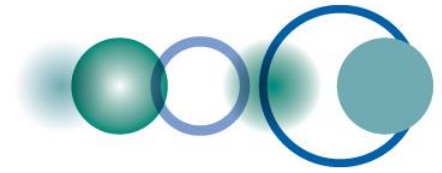
Pilots at national and regional scales

The initiative will:

- **Design and implement pilots to examine methodologies and scale in countries with robust data availability**
- **Design and develop pilots in countries and regions with limited availability of data such as the countries that have signed the Gaboronne Declaration on Natural Capital Accounting**
- **Seek other opportunities to develop accounts based wholly or primarily on EO data.**

Partners include:

CI, WAVES, ESA, NASA, ESRI



Earth Observations for Ecosystem Accounting (EO4EA)

Thank You

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<https://www.earthobservations.org/index.php>