Updates on Earth observation applications across key sectors

Earth Information Day

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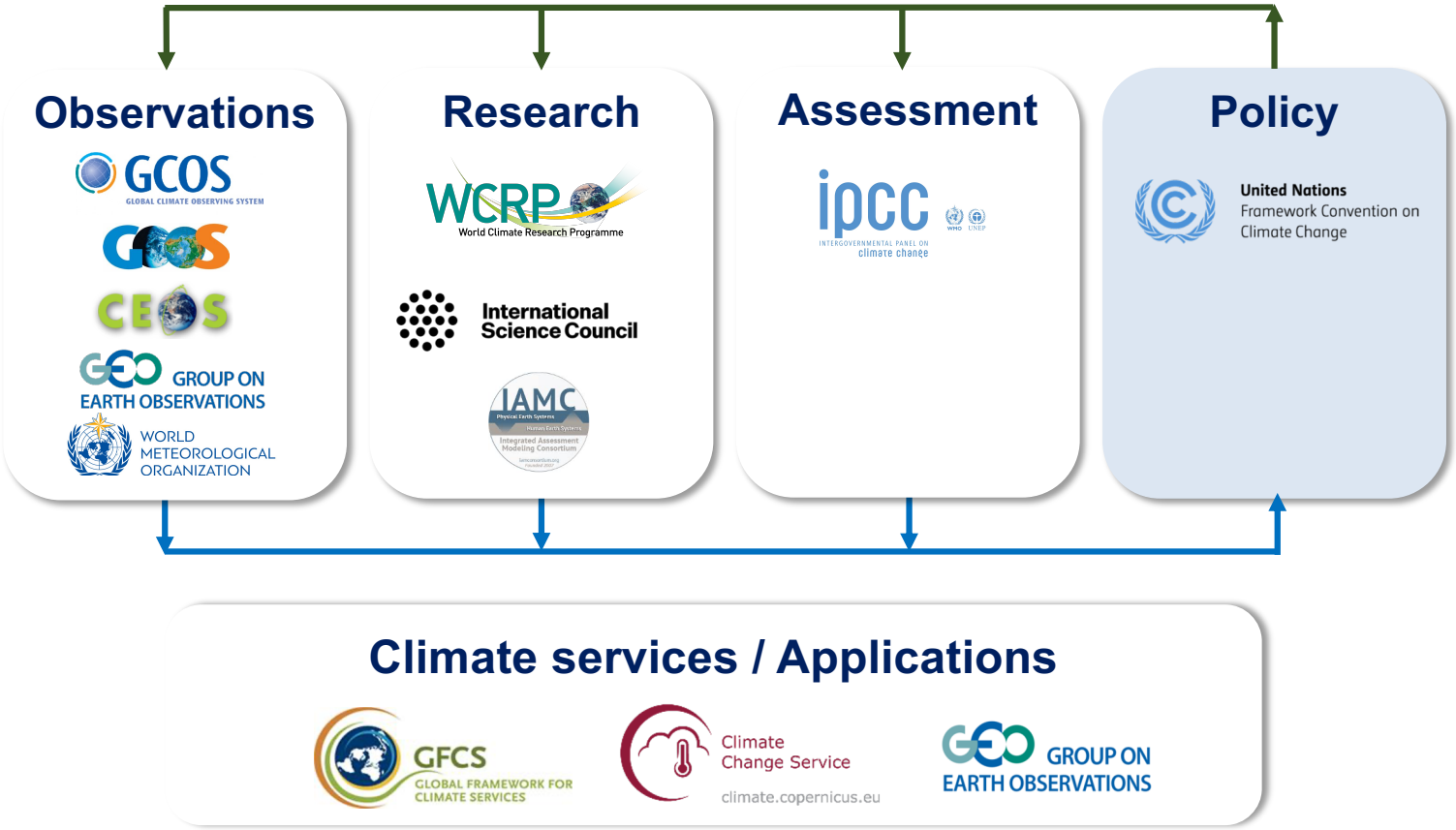
Role of Earth observations

At the foundation of the UNFCCC and climate policy



Adapted from UNFCCC Secretariat, 2020

GEO Flagships

The Global Forest Observation Initiative supports countries to develop national forest monitoring systems and green house gas measurement, reporting and accounting.

The GEO Global Agricultural Monitoring Initiative improves food security through timely and accurate predictions of crop yields and agricultural production at regional, national and global levels.

The GEO Biodiversity Observation Network coordinates the management and delivery of biodiversity and ecosystem observations to decision makers and the scientific community.

The Global Observation System for Mercury contributes to the monitoring of mercury and its compounds using Earth observations to support the Minamata Convention on Mercury.

GEOGLAM
GLOBAL AGRICULTURAL MONITORING

Agriculture and crop monitoring

UNFCCC
NAP Central

SUPPLEMENTARY MATERIALS TO THE NAP TECHNICAL GUIDELINES

The supplementary materials are intended to offer in-depth coverage of selected steps of the process to formulate and implement national adaptation plans (NAPs).

Result

The World Bank Disaster Risk Financing Program supported 300,000+ people to relocate in the Karamoja region of Uganda thanks to GEOGLAM (GEO's global agricultural monitoring).

Impact

Food security challenges, including the availability of food, related jobs and general welfare issues addressed due to GEOGLAM early warning.

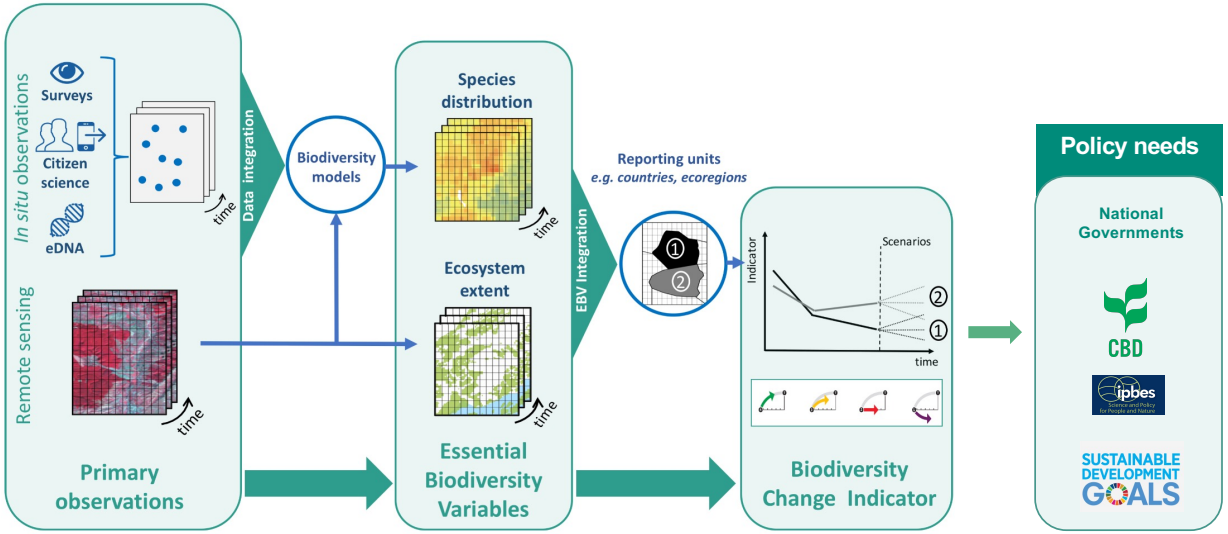
Value

Government of Uganda realized a saving of US $2.6 M in a single financial year, also tackled social challenges ahead of time. Money and livelihoods.

GEO BON
Group on Earth Observations
Biodiversity Observation Network

Climate and Biodiversity

Global network of experts using **Earth observations** and **cutting-edge technologies** (remote sensing, DNA technologies, artificial intelligence) to understand biodiversity change and its drivers, including climate change.

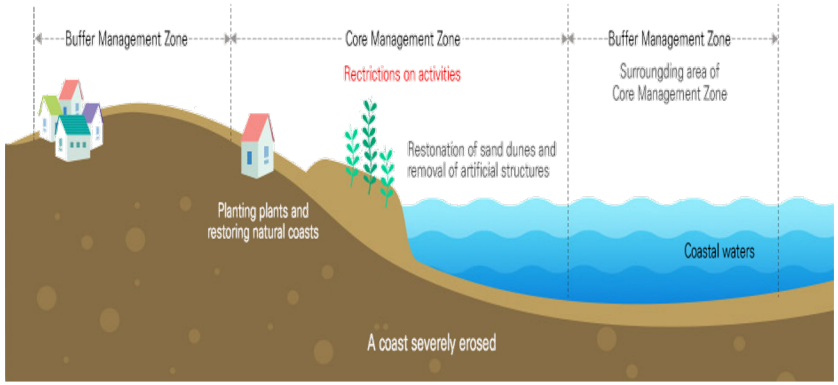


>1,900 members, >120 countries, >1,200 institutions
https://geobon.org

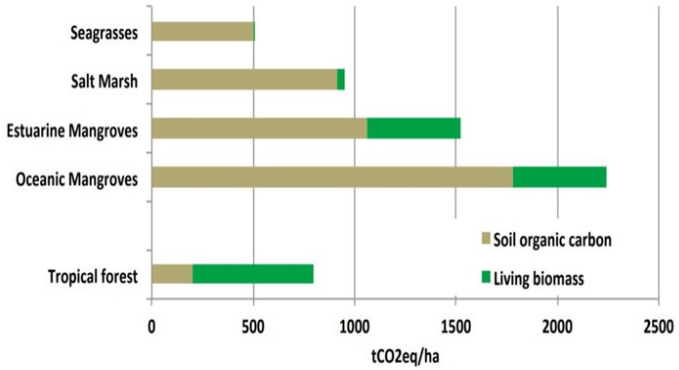
Figure from Navarro et al. 2017

Climate and Oceans

- **Inform National Adaptation Plans**
  - Coastal erosion
  - Saltwater intrusion
  - Changes in species distributions
  - Ocean acidification
  - Storm surge risk assessment
- **Map Blue Carbon for Nationally Determined Contributions**



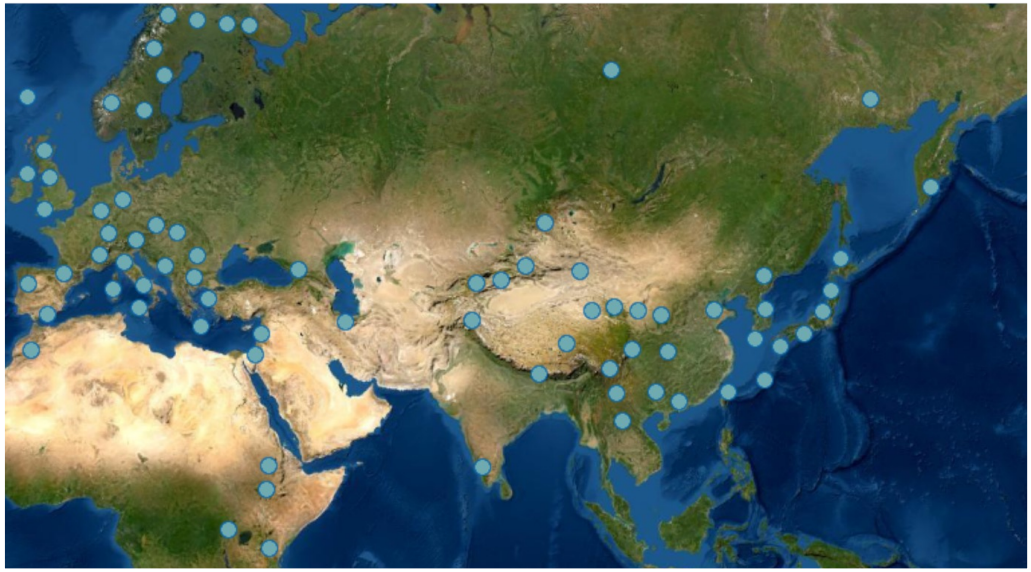
Summary of Korea's coastal erosion management zone



Total carbon sequestered per hectare habitat (Murray et al. 2011)

BLUE PLANET

Climate and Mountains



Networks

GEO Mountains Inventory of In Situ Observational Infrastructure

- Interactive web map
- Datasets
- Metadata

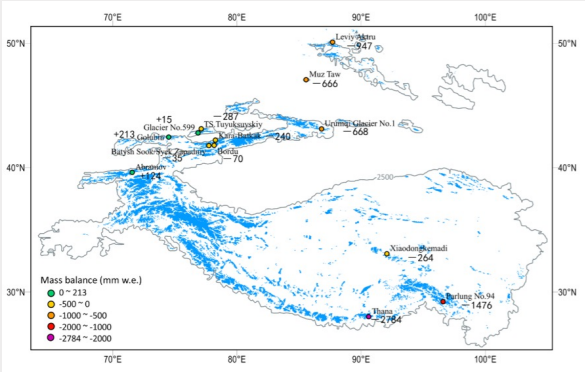
www.geomountains.org

Third Pole Regional Climate Centre (TPRCC) - Network

- Three sub-regional nodes – China (CMA), India (IMD), and Pakistan (PMD)
- Facilitated by WMO

Opportunities

- **Harmonization of climate data and information,** standardization of risk assessment methodologies
- **Advances in techniques of earth system prediction** on extreme events, to reduce impacts caused by extremes
- **Increasing demand for climate services** and greater interest of partners for capacity building on EO to improve **adaptive capacity to climate change**



Source: WMO (2020) State of the Climate in Asia (Figure 8)

Regional focus: Africa

Digital Earth Africa is uniquely positioned to empower decision makers across Africa to take climate action.

Powered by partnerships, Digital Earth Africa provides **open, free, accessible and country agnostic** Earth observation data.

The platform is operational and offers cost effective solutions for countries interested in setting up **independent, country-led and owned, national GHG inventory systems for biennial reporting, mitigation and adaptation.**

Observatoire du Sahara et du Sahel

Centre de Suivi Ecologique

AFRIGIST

sansa SOUTH AFRICAN NATIONAL SPACE AGENCY

REGIONAL CENTRE FOR MAPPING OF RESOURCES FOR DEVELOPMENT

CILSS

Digital Earth AFRICA

Indigenous peoples

The GEO Indigenous Alliance

Indigenous Peoples **protect 80% of the world's biodiversity**, even though they make up **less than 5% of the world's population.**

CLIMATE ACTION/ DRR

WOMEN EMPOWERMENT/ EDUCATION

INDIGENOUS DATA SOVEREIGNTY

FOOD SECURITY

Engaging the international community

Read about the workshop outcomes: **earthobservations.org**

- Policy makers
- Earth observation providers
- Sustainable finance sector

New GEO Climate Finance workstream launched!

Engaging public and private sector

New joint report launch!

Mapping of satellite capabilities to measure GHG

Download the report: **earthobservations.org**

Key Policy Messages from the Report

1. **Satellite observations reduce uncertainty in GHG emission monitoring** by providing data across a range of spatial, temporal, and spectral resolutions or scales;
2. **Government space agencies have the capability to collect national and global baseline data** for all relevant GHGs in a sustained manner with measurement availability ranging into the 2040s;
3. **Private sector companies are speedily entering the market** and bringing additional point-source emissions monitoring capabilities for specific GHGs;
4. **Hybrid models are increasingly emerging** and leveraging respective strengths;
5. **Collaboration, innovation, and financing are key levers** for GHG monitoring from space;
6. **Open data, open science and open knowledge are essential** to drive on-the-ground solutions
7. **New opportunities are arising for analysing secondary remote sensing measurements** with frontier IT technologies which call for transparency and capacity development.

GEO GROUP ON EARTH OBSERVATIONS · CLIMATE TRACE · WGIC World Geospatial Industry Council