

Systematic Observations Community Supporting the GST

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on behalf of the SO Community

Earth Information Day @ COP26
3 November 2021



United Nations
Climate Change

Paris Agreement



Transparency Framework

Global Stocktake

Mitigation

Adaptation

Means of
Implementation:
Finance, Technology,
Capacity Building

Cross-cutting:
Response measures,
Loss & Damage,
Equity

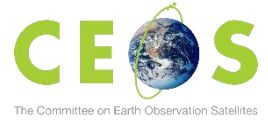
Systematic Observations



Systematic Observations Community



WORLD
METEOROLOGICAL
ORGANIZATION



GCOS
GLOBAL CLIMATE OBSERVING SYSTEM



ECMWF



DLR



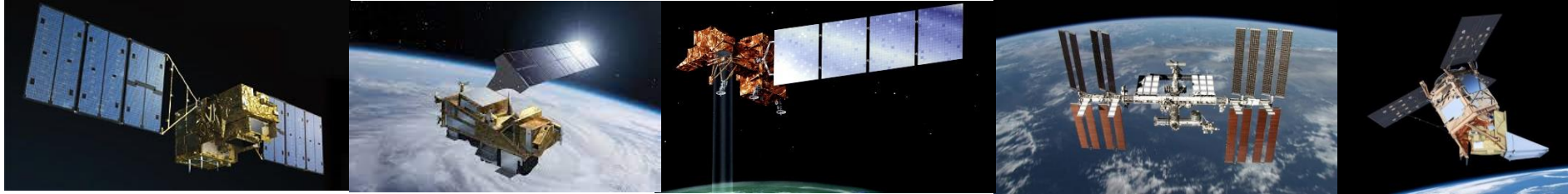
EUMETSAT



GROUP ON
EARTH OBSERVATIONS

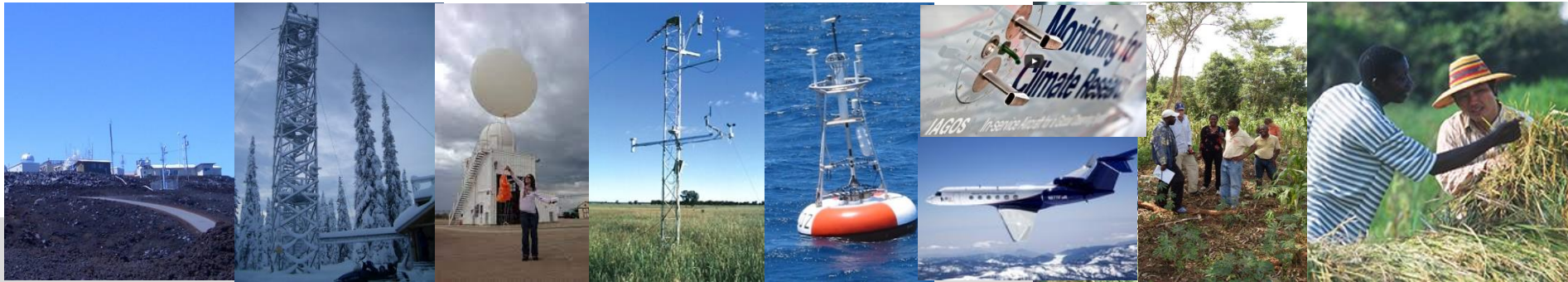


Global Systematic Observations include space-based and ground-based observations



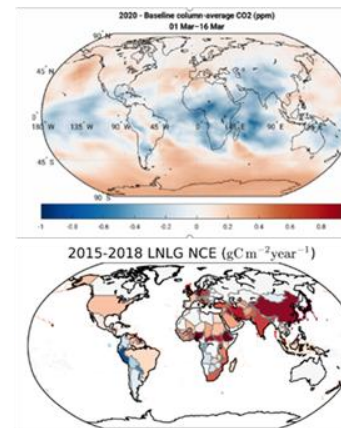
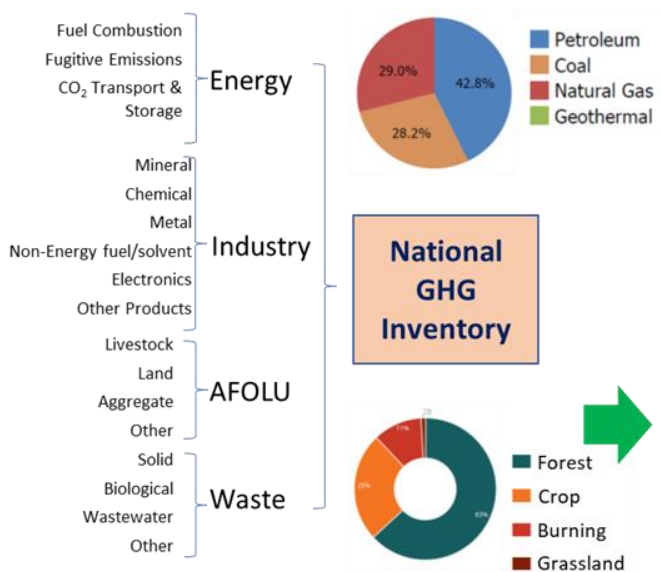
Space-based measurements from a growing fleet of satellites provides high spatial and temporal resolution and greater and more frequent coverage of the globe.

Ground-based and airborne data provide accurate estimates of weather, climate, air quality, greenhouse gases, forest, agriculture, etc. on local scales world wide



Mitigation – GHG

Bottom-up national GHG inventories can be combined with top-down atmospheric GHG budgets to produce a more complete and transparent input to Global Stocktake



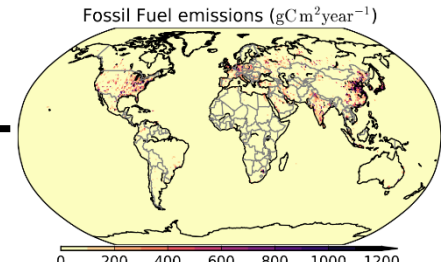
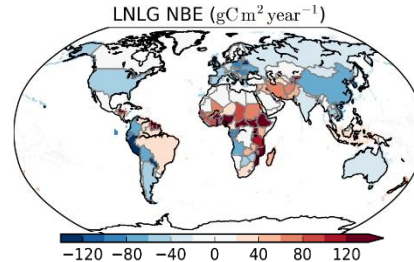
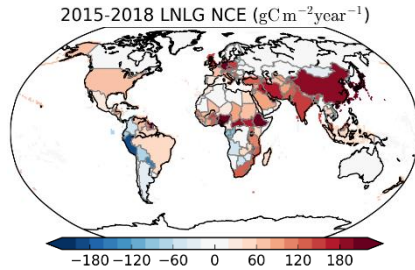
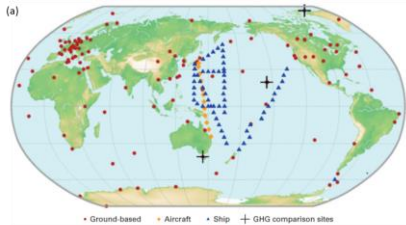
Bottom-up GHG Inventories

Top-down GHG Budgets

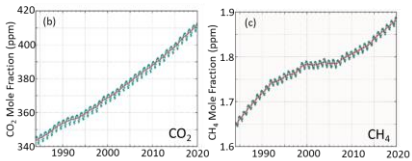
Mitigation – Creating Top-down GHG Budgets



Ground-based and space-based measurements of atmospheric CO₂ and CH₄ are being analyzed with atmospheric inverse methods to estimate greenhouse gas CO₂ and CH₄ emissions and removals from human activities and the natural biosphere and ocean.



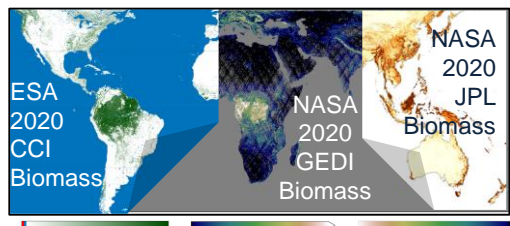
Net Carbon Exchange (NCE) = **Net Biospheric Exchange (NBE)** + **Fossil Fuel Emissions**



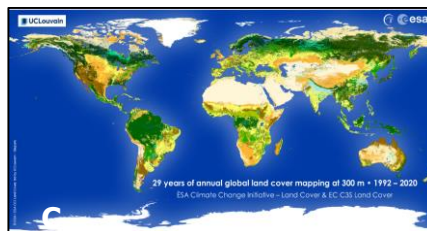
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Mitigation - AFOLU

Agriculture, Forestry and Other Land Use (AFOLU) contributes the second largest source of emissions (after fossil fuel use) globally, and is the primary source of emissions in many developing nations



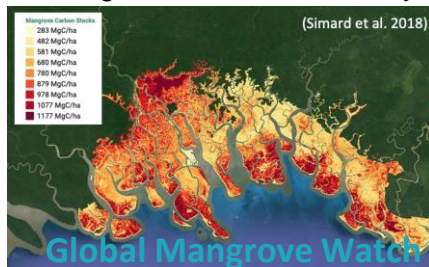
Aboveground Biomass Density (Mg/ha)



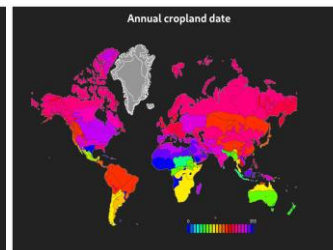
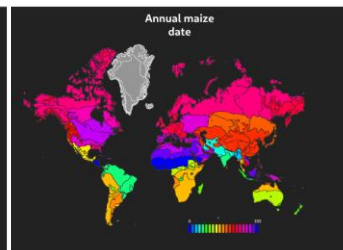
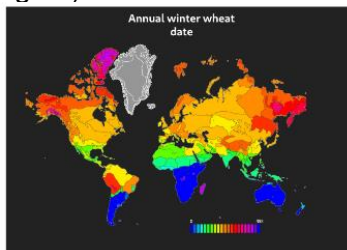
Land Cover



Forests



Mangroves



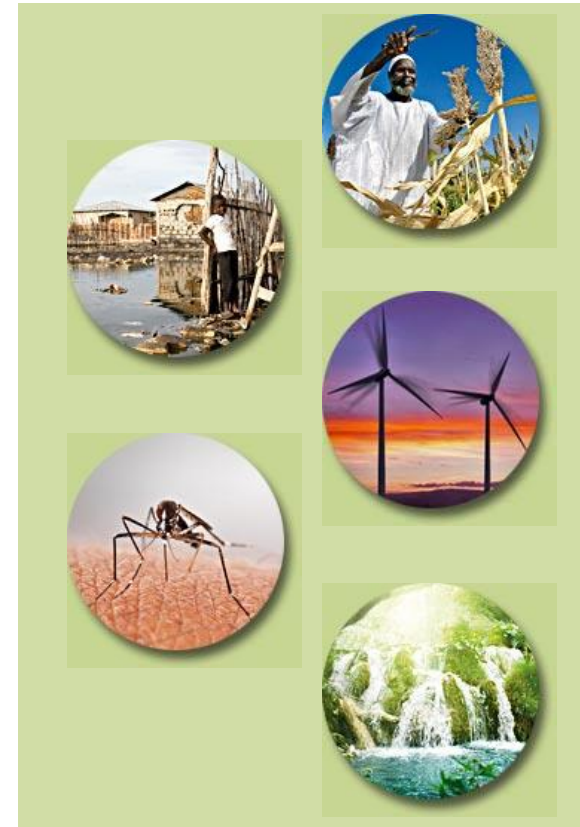
Agriculture

Adaptation

Assessment of aggregate progress on adaptation of countries to climate change under the GST:

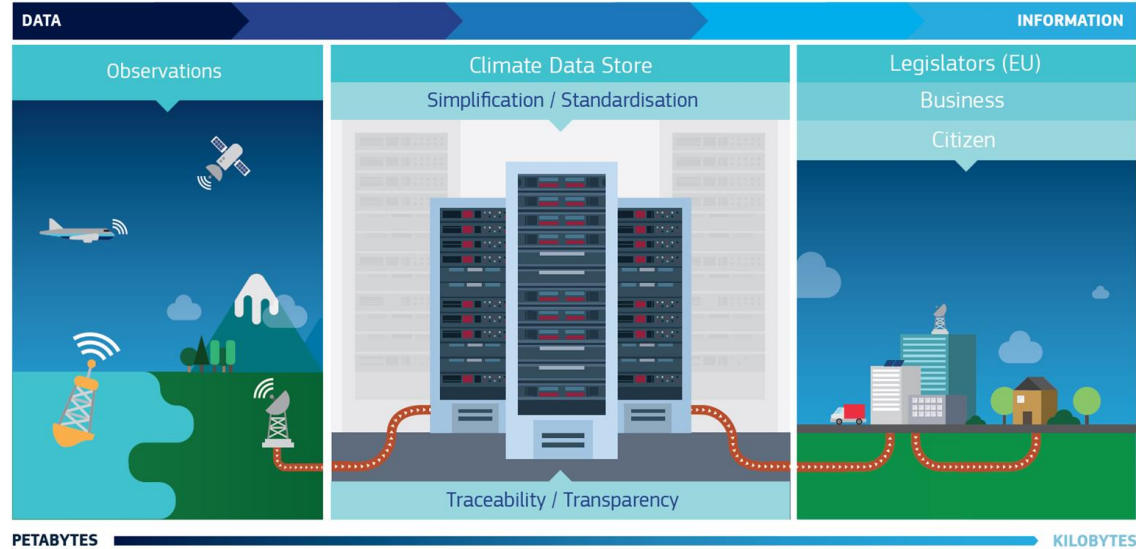
- **Important areas** include agriculture and food security, water supply, coastal vulnerability, exposure to increased climate extremes, energy, biodiversity, health...
- **Multiple datasets on many spatial scales and many non-physical data** e.g. demographic, economic, social data
- **EO-based adaptation indicators** are being developed in key areas

We are looking for **systematic approaches** to integrate and assimilate multiple data sets into models to support countries in their adaptation efforts. Including with **additional technical guidance for National Adaptation Plans (NAPs)**.

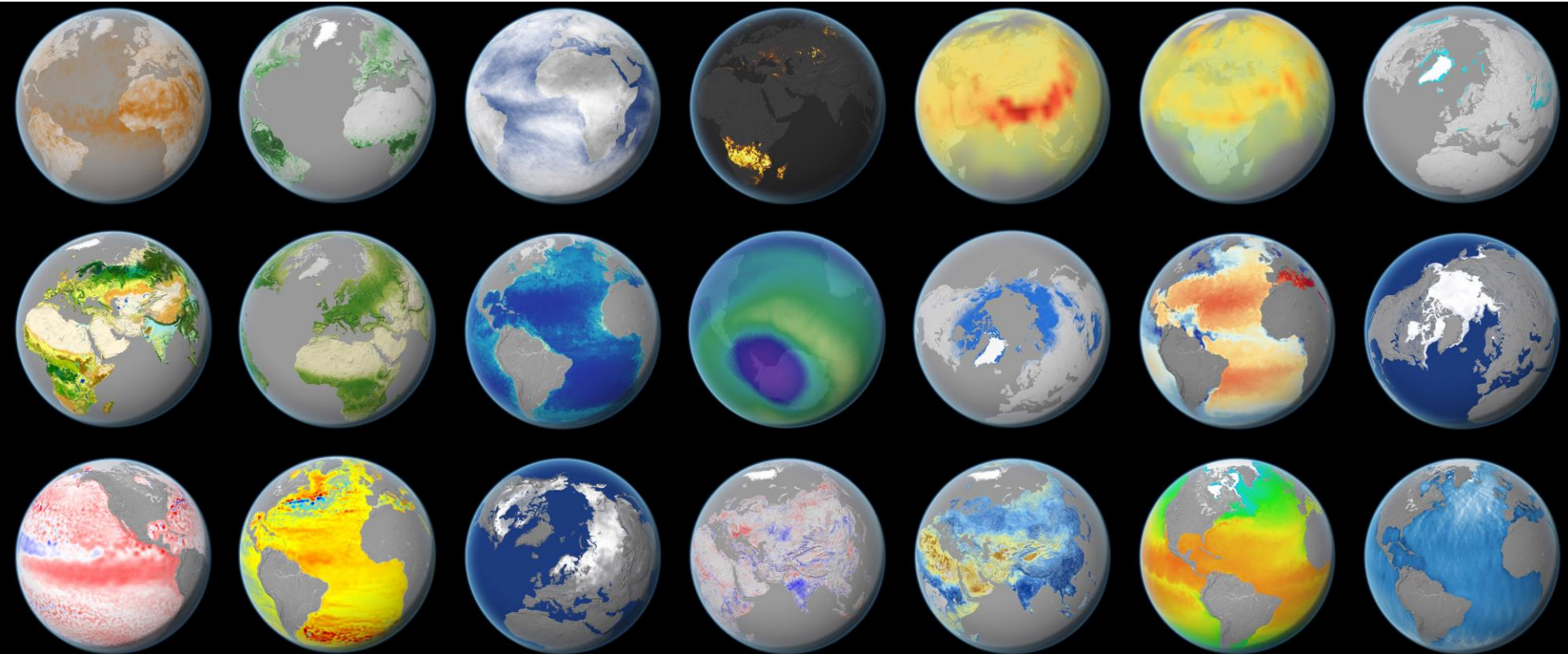


Adaptation - Climate Services

- EO are underpinning climate services
- WMO established the Global Framework for Climate Services
- GEO develops EO-based indicators, applications and services for a diverse range of users
- European Union created Copernicus Climate Change Services, implemented by ECMWF

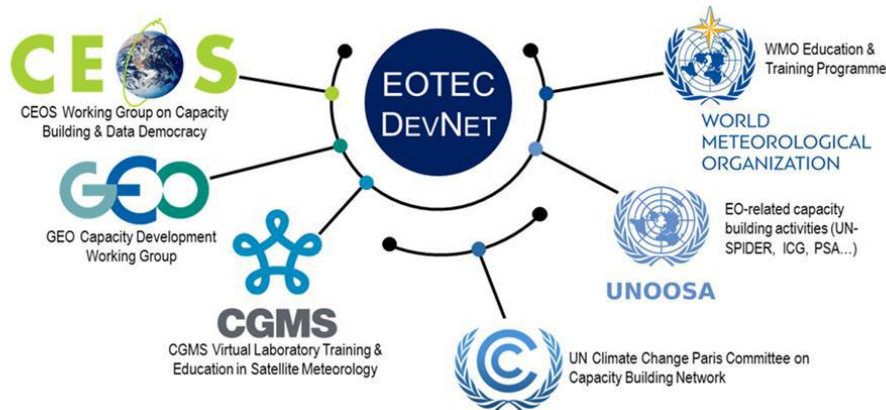


Essential Climate Variables

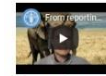


Means of Implementation: Finance, Technology, Capacity Building

WMO Capacity Development Strategy and Implementation Plan



Biomass Monitoring
This is the video reporting of the GFOI... Component and partners the DOPC-SOLD... on the use of Earth Observation to...



From reporting to payments
This is the video reporting of the webinar... on 28 October 2020: [https://doi.org/10.24391/REDC-reporting-to-the](#)



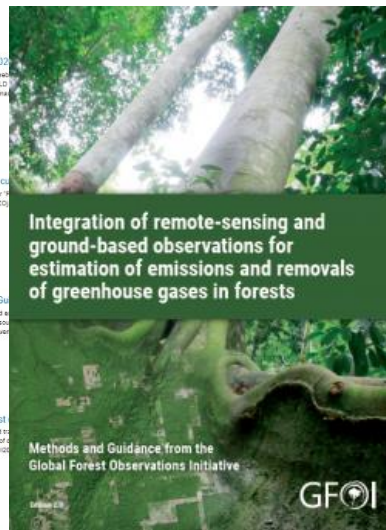
Launch of the Methods and Guidance
This video features the launch of the third... (GFOI). The GFOI has become a vital resource... enterprise measurement, reporting, and verification.



Open and Transparent: Forest
This webinar deals with... the enhanced... the institutional and technical capacities of... Project. This webinar is part of the... project.



CEOS Analysis Ready Data
This webinar explores various aspects of both Analysis Ready Data (ARD) and Future Data Architectures as developed by the Committee on Earth Observation Satellites (CEOS). CEOS has been active in the simplification of earth observations data for users through the development of ARD and specifications for it. This webinar is of interest...



JECAM
Joint Experiment for Crop Assessment



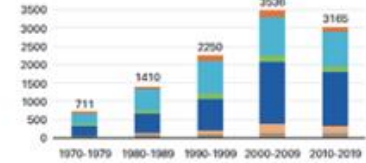
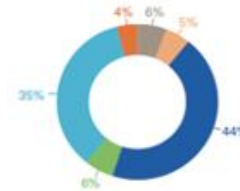
GEO Knowledge Hub Webinar Series

Fostering Open Knowledge with Earth Observations Applications

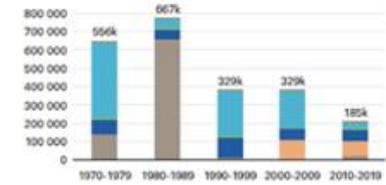
Cross-Cutting

- **EO is increasingly supporting investment decisions for climate resilience and Nature-based Solutions**, and the SO community is expanding relevant collaborations with the sustainable finance sector.
- **EO of loss and damage associated with hydro-meteorological hazards** provide a basis for global indicator of adaptation and resilience
- **EO data and tools**, when co-developed with and for Indigenous peoples, can **promote a "people-centered" and Indigenous knowledge-driven approach** to climate action.

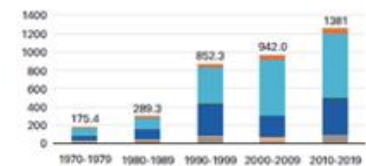
(a) Number of reported disasters
Total = 11 072 disasters



(b) Number of reported deaths
Total = 2 064 929 deaths



(c) Reported economic losses in US\$ billion
Total = US\$ 3.6 trillion



Legend: Drought, Extreme temperature, Flood, Landslide, Storm, Wildfire

The Systematic Observation community is ready to support the GST

- Systematic Observations underpin climate science and services
 - Use atmospheric GHG and space-based AFOLU data avoids gaps, enabling a more complete and transparent GST
 - Identifying best products and producing harmonized EO datasets facilitates their adoption by users on national and global levels
- Developing global Adaptation Indicators is crucial for the GST
- Open data and knowledge exchange support the Enhanced Transparency Framework and the GST
- Interaction of Parties with the Systematic Observation community will be key for an easy uptake of data streams and a boost in capacity building.