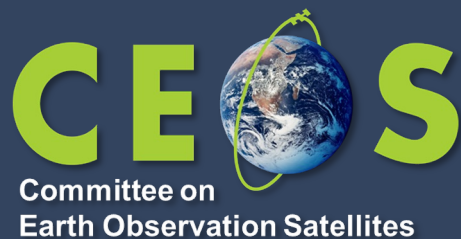


# The CEOS Working Group on Disasters – an overview



**Andrew Eddy**  
**CEOS WG Disasters Secretary**  
**Open session with UCA students**  
**3 October 2022**

- ❖ Overview of WG Disasters objectives and current priorities
- ❖ WG Disasters workplan status and perspectives
- Overview of pilot and demonstrator successes
- Challenges for sustainability and current approach to address them
- Current and prospective user and stakeholder communities

# WGDisasters fundamentals



- Earth observations to address risk: identification of natural **hazards**, **exposure** of people, assets and livelihoods, and related **vulnerabilities**
- CEOS WG Disasters Work Plan is aligned with the **Sendai Framework** on Disaster Risk Reduction

• GEO4DRM



- International Charter Space and Major Disasters and Copernicus EMS



# WGDisasters Objectives



- ❖ Support the efforts of **Disaster Risk Management (DRM) authorities** in protecting lives and safeguarding property by means of **satellite-based EO** and **science-based analyses**
- ❖ Support the implementation and monitoring of the **UNDRR Sendai Framework**, (mainly Priority<sub>1</sub> “Understanding Risk”, more recently Priority<sub>4</sub> “Build Back Better”)
- ❖ Support the work of **international initiatives** such as GEO
- ❖ Raise the **awareness of politicians, decision-makers, and major stakeholders** of the benefits of using satellite EO in all phases of DRM
- ❖ Foster **increased use of EO** in support of **DRM and DRR**, and express **related EO needs**

# WGDisasters Subgroups



## Pilot and Demonstrator projects :

- Wildfire Pilot
- Flood (GEO/LEO/SAR) Pilot
- Landslide Demonstrator
- Volcano Demonstrator
- Seismic Hazards Demonstrator
- Recovery Observatory Demonstrator
  
- Geohazards lab

## Contribution to GEO :

- GEO4DRM
- GSNL
- GEODARMA
  
- *GFRM*
- *GEO4SENDAI*

# WGDisasters Priorities 2022-2023



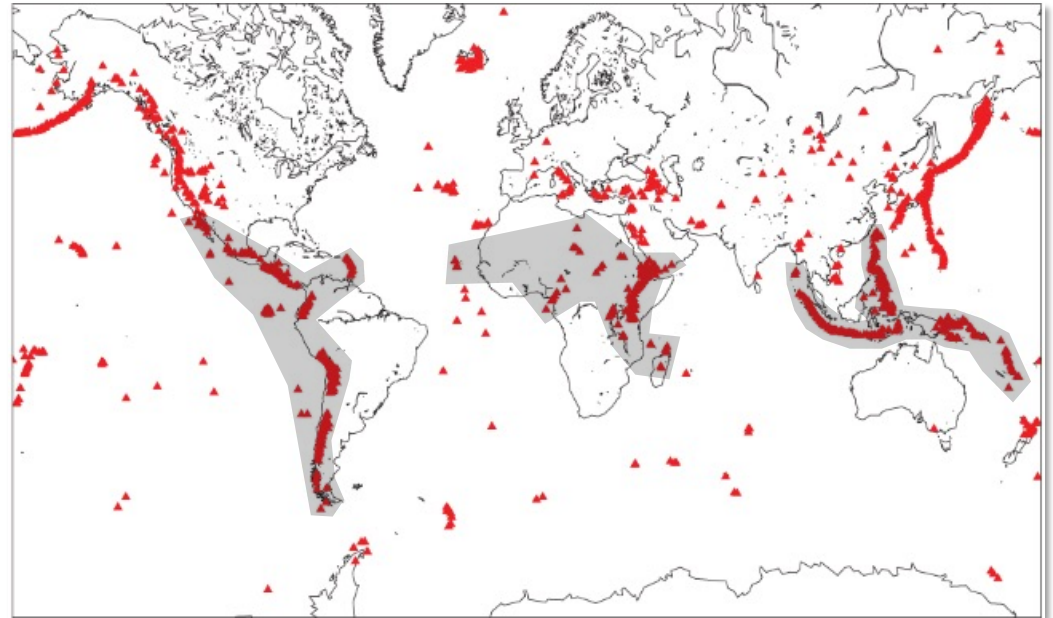
**“The path to sustainability - use cases or the operational uptake of satellite EO at the local scale”**: Focus on Operational Uptake of WG successes to increase resilience

- **Demonstrators**:
  - Continue to demonstrate potential but begin **building path to sustainable operations** post demonstrator – stronger ties to international stakeholders but also local actors
  - Increase focus on **capacity building** in all demonstrator activities
- Strengthen **ties to GEO WGs** through increased visibility of WG Disasters activities within GEO
- Explore ***linkages to climate related activities***, especially through the impact of CC relating to extreme weather events and local impacts of climate (assessment, mitigation, resilience)
- Exploit ***new technology opportunities***, either through new missions, new activities or new data exploitation techniques

# Volcano Demonstrator



- ❖ Aims to evaluate the utility of remote sensing data for anticipating, detecting, and tracking volcanic eruptions.
- ❖ Supports EO applications that promote volcanic disaster risk reduction worldwide.
- ❖ Focus on high-risk volcanoes in areas where monitoring is not currently well developed (LAC, Africa, SE Asia).



**Demonstrator Leads: Mike Poland, USGS; Susi Ebmeier, University of Leeds.**

# Landslide Demonstrator



Elkhorn city (Kentucky, US) – February 2020 – shallow landslide / mudflow



East France – March 2020 – landslide on high speed train TGV

- ❖ Aims to demonstrate the effective exploitation of satellite EO across the full cycle of landslide disaster risk management (i. e. preparedness, response, and recovery at global, regional, and local scales), including the possibility of multi-hazard focus on cascading impacts and risk.

**Demonstrator Leads: Pukar Amatya, NASA;  
Jean-Philippe Malet, UNISTRA/EOST**



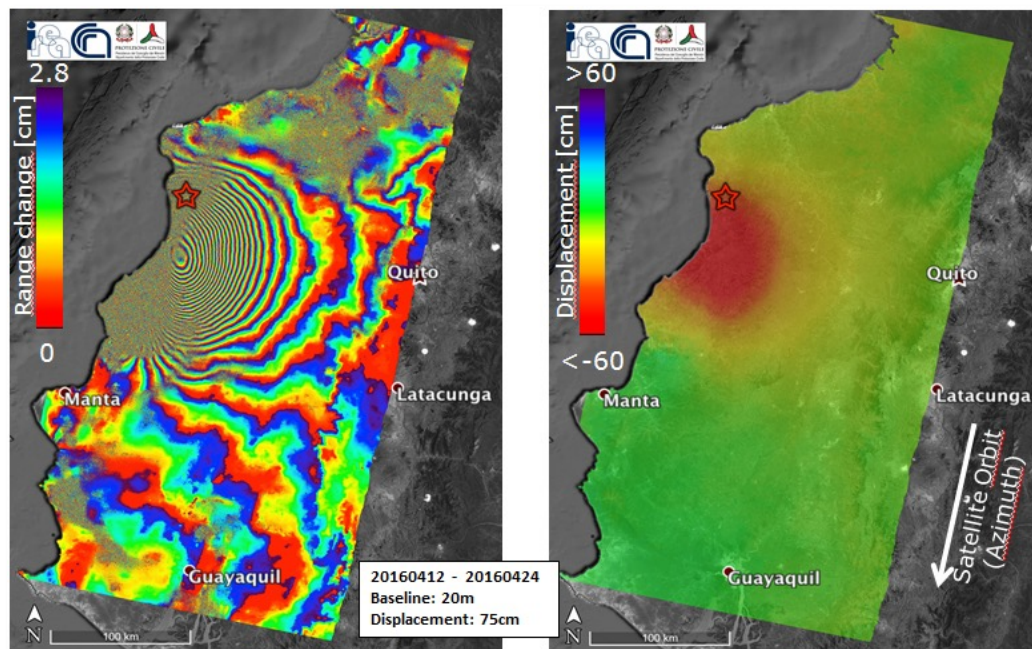
# Recovery Observatory (RO) Demonstrator

- ❖ Showcase contribution of satellite data and products to recovery efforts following major disaster events. Direct input to Post Disaster Needs Assessments and long-term contribution to Recovery Framework. Cited in Space Agenda 2030 (UN GA).
- ❖ Haiti (Matthew hurricane) Pilot 2017-2020
- ❖ Demonstrator objective : 3-5 ROs 2020-2023.
- ❖ To date:
  - Beirut Explosion 2020
  - Eta-Iota Central America 2020-21
  - Haiti Earthquake 2021-22
  - *Pakistan Floods 22*



**Demonstrator leads : H el ene de Boissezon, CNES; Rashmin Gunasekera; World Bank**

# Seismic Hazards Demonstrator



- ❖ Develops and demonstrates advanced science products for rapid earthquake response and better understanding of risk and exposure.
- ❖ Supports the uptake of these products and methodologies through co-design and development with WG stakeholders and users.

**Demonstrator leads : Philippe Bally, ESA; Stefano Salvi, INGV**

# GSNL - Geohazards Supersites & Natural Laboratories **CEOS**



**Lead : Stefano Salvi, INGV**

- ❖ Aims to improve geophysical scientific and geohazard assessment, promoting rapid and effective uptake of new science results for enhanced societal benefits in DRR
- ❖ Voluntary international partnership.

**Volcanoes** : Hawaii ; Iceland; Etna; Campi Flegrei/Vesuvius; Taupo Ecuador; Southern Andes; Virunga; Kamchatka Kuriles

**Faults / Earthquakes** : Marmara Western North Anatolian fault ; San Andreas Fault NL; China Earthquakes; Nicaragua



- ❖ Aims to support practical implementation of critical elements of the UN Sendai Framework by making satellite data more accessible to risk related initiatives.
- ❖ Open initiative undertaken with partners from both satellite and non-satellite organizations.

**Lead : Ivan Petiteville, ESA**

# Flood Pilot



- ❖ Explores and demonstrates best practices for combining diverse optical and radar data sources to improve current abilities to map flood extent and depth and improve understanding of how hazard science can be better integrated with vulnerability and exposure information.

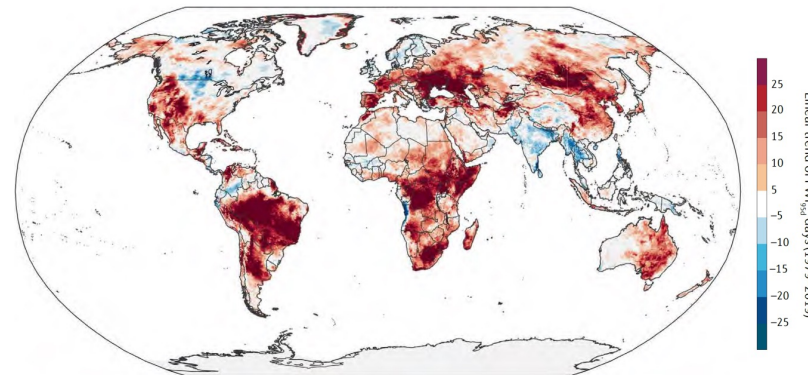


**Pilot leads : Marcelo Uriburu Quirno, CONAE; Mitch Goldberg, NOAA; Guy Schumann, RSS Hydro**

# Wildfire Pilot



- ❖ Aims to provide a fundamental basis for defining global priorities for active-fire monitoring and characterization.
- ❖ Explores the existing gaps in wildfire EO capabilities (existing and proposed).
- ❖ Articulates global stakeholders and user requirements for active-fire remote sensing.



**Pilot leads : Joshua Johnston and Mark de Jong, NRCan; Peter Moore, FAO;  
Denis Dufour CSA**

# Pilot and Demonstrator Successes



- ❖ Demonstration of **technical feasibility** as applied to each thematic area or phase of disaster cycle
- ❖ **Working-level, proto-operational uptake of EO-based products** from practitioners and end users (e.g. volcano observatories, civil protection agencies, specialized research bodies working on advanced risk management in collaboration with civil protection agencies.. )
- ❖ Exploration of **new partnerships** and **bridging gaps** between **different types of partners**, including international organizations, governments, research institutes, companies, non-governmental organizations... solution-focused work to improve Disaster Risk Management using EO
- ❖ Demonstration of **best practices** for **combining diverse satellite data** to improve understanding and management of risk
- ❖ **New activities envisaged** - CC impact : synergy with SCO (Space for Climate Observatory); Geodesy for Disasters / GEO4Sendai - to be discussed at Nice Meeting18

# User Communities



Pilot or Demo	User Community	Objective
<b>Recovery Observatory Demo</b>  CC	International recovery stakeholder community (World Bank/GFDRR, UNDP, EU – but also regional DRM stakeholders (e.g. CEPREDENAC) or national governments (e.g. Haiti))	Create strong consensus around use of satellites for recovery (support to PDNAs and longer-term recovery framework planning and monitoring)
<b>Volcano Demo</b>	Volcano Observatories in developing world	Showcase benefit of EO for risk reduction and improved response; develop local capacity to use EO; facilitate EO access and uptake of EO for advanced volcano products
<b>Landslide Demo</b>  CC	National and regional authorities International stakeholder community Insurance	Demonstrate value of using EO to understand risk and reduce risk to critical infrastructure; improve global landslide inventory used by national and local authorities
<b>Wildfire Pilot</b>  CC	National Forestry agencies	Better coordinate use of satellites for fire monitoring; increase use of satellites, especially new missions or different missions than those currently used
<b>Flood Pilot</b>  CC	National governments, civil protection agencies, watershed authorities	Showcase value of using a wide range of sensors (optical, SAR, LEO, GEO) for comprehensive flood monitoring in a few key basins



Thank You! Merci!

[andrew.eddy@athenaglobal.com](mailto:andrew.eddy@athenaglobal.com)

[helene.deboissezon@cnes.fr](mailto:helene.deboissezon@cnes.fr)