



Committee on Earth Observation Satellites



Recovery Observatory (RO) :

Utiliser les enseignements du RO Haïti pour élaborer le concept du RO « générique »

2 mai 2019 à Port-au-Prince

Helene de Boissezon, CNES
Andrew Eddy, AthenaGlobal

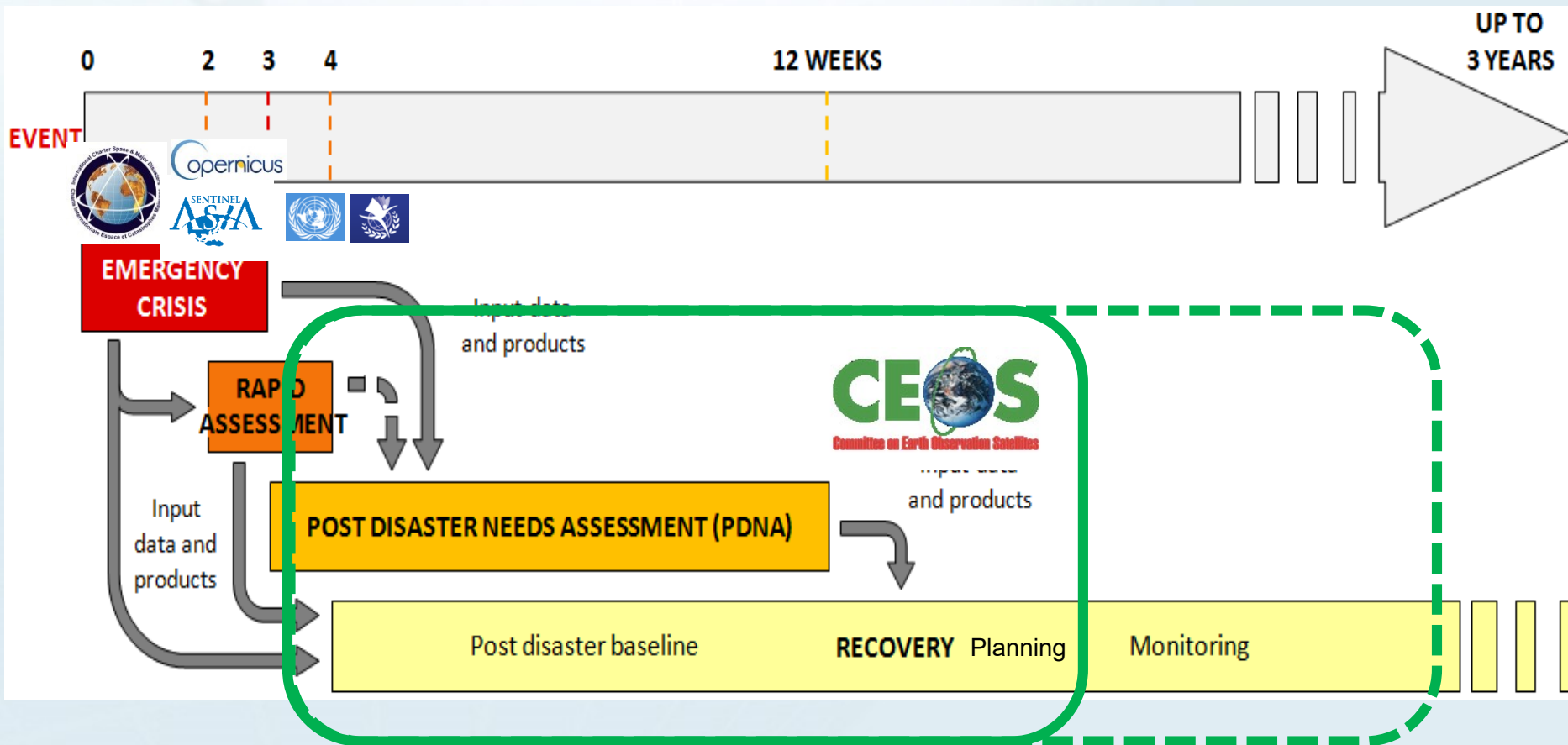




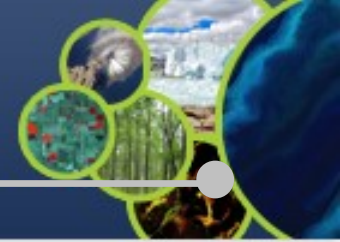
- G-RO Concept
- Genesis of ad hoc G-RO Team and Advocacy Paper
- World Reconstruction Conference 4 Session
- Haiti RO achievements and lessons learned
- In a nutshell (summary)
- Next steps



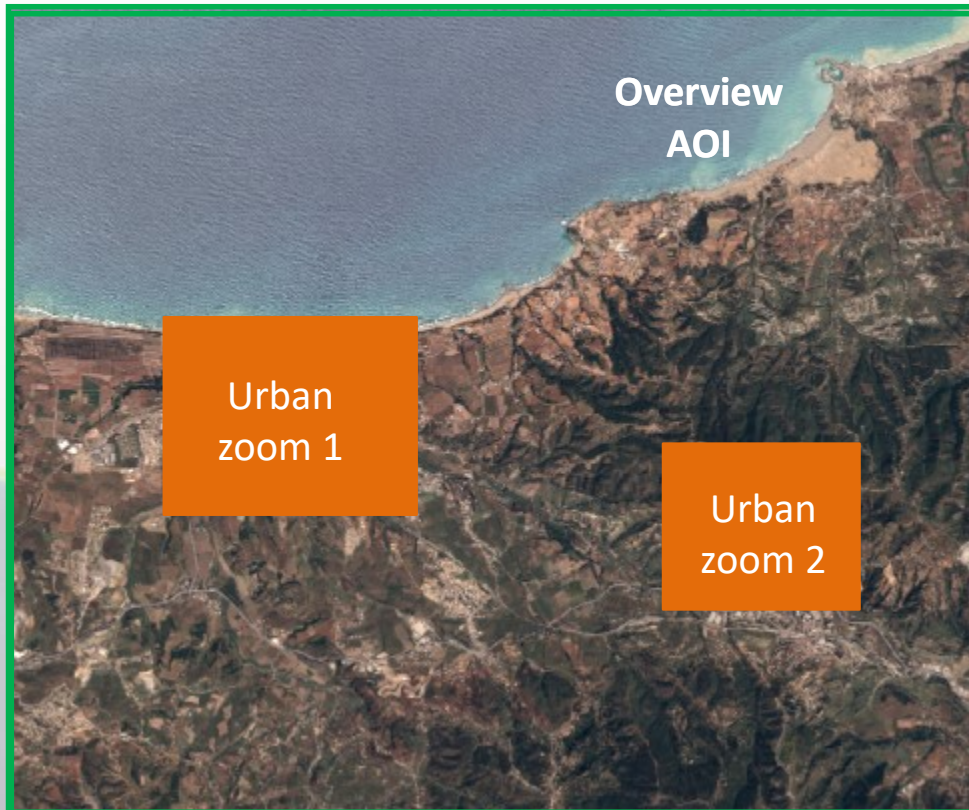
“Response” vs “Recovery”



“Recovery Observatory” : a concept for helping reconstruction planning and monitoring



Collection of **satellite images and maps** at several scales during 6 months after a major disaster



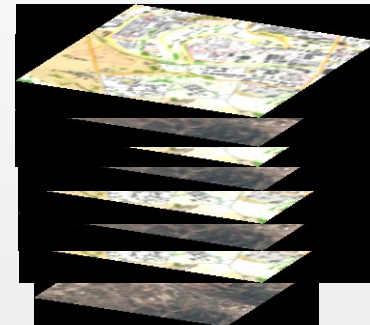
Ancillary data remain indispensable: terrain validation data, aerial and drone data, statistics, cartography, ...

Overview area

Mid-scale products from Sentinel data at 10m resolution

- Change in landcover, open spaces
- Vegetation loss or re-growth
- Agriculture

Update frequency:
every 10 days to 6 months



Hot spot zooms

Large scale products from very high resolution data

- Urban areas, housing,
- Transport infrastructure, coastal areas, ...
- IDP camps, ...
- Specific areas of interest

Update frequency: every 1 to 2 months

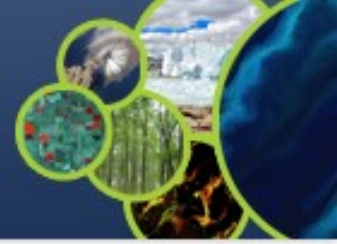
Mainly EO based	Baseline mapping	Monitoring
	<ul style="list-style-type: none"> Buildings footprint mapping Building attributes (roof type, height indication, collapsed or partially collapsed) <ul style="list-style-type: none"> Indicate density of damaged buildings Urban blocks with indication of damage 	<ul style="list-style-type: none"> Building removal and construction Change in urban land use, morphology and density <ul style="list-style-type: none"> Indicate type of dwelling reconstruction
	<ul style="list-style-type: none"> Location of spontaneous and organized gathering areas Location of temporary dwellings <ul style="list-style-type: none"> Land use, open spaces 	<ul style="list-style-type: none"> Camp removal and installation Tent removal and installation New land use / open spaces
	<ul style="list-style-type: none"> Accurate transport network mapping with detailed metadata (type, damage level) <ul style="list-style-type: none"> Accessibility analysis Proximity analysis Traffic activity analysis 	<ul style="list-style-type: none"> Rebuilt transport facilities <ul style="list-style-type: none"> New transport facilities Removal of transport facilities <ul style="list-style-type: none"> Accessibility analysis Proximity analysis Traffic activity analysis
	<ul style="list-style-type: none"> Mapping of utilities and services infrastructures (administration, education, healthcare, power - water - sanitation facilities...) with detailed metadata (type, level of damage) 	<ul style="list-style-type: none"> Recovered infrastructures Infrastructure removal and construction
	<ul style="list-style-type: none"> Landcover, open spaces Affected landcover (e.g. burn scar with fire damage severity...) 	<ul style="list-style-type: none"> Change in landcover, open spaces <ul style="list-style-type: none"> Indicate loss of vegetation Vegetation re-growth
Topography	<ul style="list-style-type: none"> Risk analysis (vulnerability to flood, to water run-off risk, to soil erosion...) 	Significant external input required • Risk analysis



- Initially discussed between GFDRR and CEOS/CNES at UR2018 Mexico
- Team will work within recovery community to define a sustainable vision for increased use of satellite EO in support of recovery.
- First order of business : draft an advocacy paper documenting existing experience using EO for recovery.
- 1st telcon in Oct.; 2nd telcon Nov; 1st meeting 5 Dec; 3rd telcon Jan.
- How to develop a scalable & replicable Recovery Observatory
- Preparing input to WRC4 – May 2019

Generic RO ad hoc group

- GFDRR/WB: Joe Leitmann, Mare Lo
- CEOS WGD RO: Hélène de Boissezon (CNES, CEOS Haiti RO leader), Andrew Eddy (CEOS WGD, RO Sec, Consultant to CNES)
- WB: Claudia Soto, Roland Bradshaw
- UE/CE: Ricardo Zapata-Marti, Françoise Villette, Peter Spruyt, Pierre Norzeron
- UNDP: Stefanie Afonso, Rita Missal, Krishna Vatsa
- UNOSAT: Samir Belabbes, Einar Bjorgo, Luca Dell'Oro
- CEOS WGD Leader: Simona Zoffoli (ASI)
- CEOS WGD Data Coordination Team: Jens Danzeglocke (DLR)



World Reconstruction Conference 4 to be held in Geneva 13 and 14 May

GFDRR and CNES will co-lead a session: **Facilitating Recovery and Inclusion through Satellite EO Technology**, May 14, 2019 @ 16:00

The session will have three objectives:

- Increasing awareness on how satellite imagery has been used in the past to scale up inclusion in the recovery process;
- Advocating for the use of satellite EO to enable inclusive recovery efforts;
- Discussing how the use of technology can be improved to support recovery planning and monitoring.

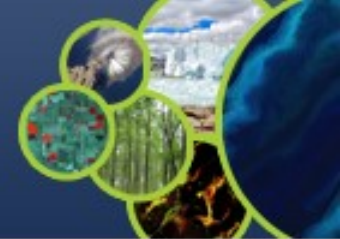


- What are the main benefits of using satellite EO for recovery?
- How has satellite imagery been used to ensure inclusion of vulnerable groups in the recovery planning and monitoring?
- How can we increase the use of EO, in order to apply the full range of EO data to recovery challenges?
- What can be expected in the future in terms of technological innovations that will facilitate recovery monitoring?
- Is there a different approach in the use of satellite EO for major disasters than for recurring or protracted crisis?
- How can satellite EO be used to better prepare for disaster recovery? How can inclusive recovery be advanced using these technologies?
- How can early action support prioritization of response and reduce the impact on vulnerable populations?

Haiti RO Achievements – building blocks for G-RO



- Access for Haitian users to regular imaging of affected areas over a long period, esp. higher resolution data not typically freely available (Pleiades, Cosmo-SKYMED);
- Range of thematic products showing status of southwest Haiti immediately after and one-year after Matthew (Built areas in Jeremie and Les Cayes, Agriculture, Parc Macaya, mangroves near Port-Louis);
- Key data sets compiled in a single framework to use seamlessly
- Key information (analytical, geospatial) about Recovery progress to support decision-making processes;
- Capacity building initiatives tied to optical and SAR data processing for CNIGS;
- Full-scale demonstrator to identify where EO can support Recovery.



Lesson Learned

Applicability to G-RO

Critical role of local champions as end users and capacity nodes

Need for clear relay to local users through international stakeholders

Involvement of end users without any funding

Necessary local capacity development (producers and users)

Funds to be identified to ensure local capacity development on systematic basis for G-RO

A few standard products can be defined (e.g. annual landcover change map based on Sentinel-2)

Document standard product methodology and develop technology transfer procedure

Challenging linkages with Charter/Copernicus and PDNA process

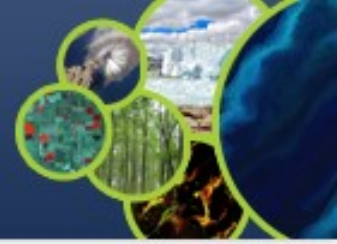
Need for predefined procedures (between G-RO and Charter, and PDNA, but also with data providers for data licensing) and clear end-to-end approach from event through to National Recovery Plan

Long lead time to establish RO

Need to fast-track roll-out and plan for legacy strategies at outset

Value-adding budget is critical stumbling block, which was partially addressed in RO through Copernicus support

Need to define at outset value-adding approach and determine level of effort (sliding scale of benefits)



- How to develop a **scalable & replicable RO** ?
- Should /could RO start with **PDNA** or just after?
- Should RO contribute **only to Recovery Planning** ?
(a few months)
- Should RO cover the **whole Recovery Monitoring** ?
(a few years)

In any case, there is clearly a **potential role for Charter to increase the use of EO data for post crisis process.**



- **Recovery satellite EO needs** are different from those of other phases of disasters
- **Imaging and value adding** resources present **challenges** (e.g. scope vs resolution, cost-benefit of value adding)
- **Specific approaches and adapted strategies** are required to address them, before events occur
- A coordinated approach **from Event to National Recovery Plan** (including Charter/Copernicus and PDNA) is required
- **Strong involvement of local users** (and providers when applicable) is necessary to success, however **international stakeholder community** is a critical corollary
- **Local capacity building** should be a standard component
- **Lessons learned** to date (in Haiti and elsewhere) offer **valuable** input but can be **challenging to scale up**



- Publication of Advocacy Paper by GFDRR May 2019
- WRC #4 session
- 2nd G-RO meeting during WRC #4 (mid May)
- Ad hoc Team to begin working on scenarios for cooperation
- Defining linkages to other groups (Charter, Copernicus EMS)
- Proposal to CEOS on G-RO collaboration to be developed in 2020

A photograph of a tropical landscape. In the foreground, several tall palm trees are silhouetted against a bright, cloudy sky. The sun is visible through the clouds, creating a strong light source. In the background, a road or path leads towards a distant horizon, flanked by more palm trees and some small structures. The overall scene is serene and tropical.

Mesi anpil !