



GEO initiatives in Capacity Building and Disaster Risk Reduction

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Group on Earth Observations

Intergovernmental Organization with 79 Members and
56 Participating Organizations



Any Single Problem Requires
Many Data Sets

**Any Single Data Set Serves
Many Applications**

... Observation Systems should be
shared across disciplines



GEOSS - Global Earth Observation System of Systems...

- Coordinate and Sustain Observation Systems
- Provide Easier & More Open Data Access
- Foster Use through Science, Applications and Capacity Building

... to answer Society's need for
informed decision making



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Capacity Building Strategy in GEO

An integrated approach based in three complementary elements:

I³

- **1. Infrastructure CB:** HW, SW and other technology required to develop, access and use EO...
- **2. Individuals (Human) CB:** education and training of individuals to be aware of, access, use and develop EO...
- **3. Institutional CB:** building policies, programs & organizational structures in governments and organizations to enhance the understanding of the value of EO data and products.

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Guiding Principles for GEO Capacity Building

- **DO NOT REINVENT THE WHEEL !** Build on existing efforts and best practices;
- **1ST THE USER, THEN THE USER AND FINALLY THE USER !** Focus on user needs
- **DO IT TOGETHER !** Foster collaboration and partnership
- **HAVE A HOLISTIC VIEW !** End-to-End (E2E), I³, in all SBA, at the global, regional and local levels
- **DO IT TO LAST!** Enhance the sustainability EO

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Capacity Building and Disaster Risk Reduction: Examples

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A globally coordinated approach: International Charter

The Charter provides a unified system for acquiring space data and delivering it to those affected by natural or man-made disasters

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GEO Members not having an Authorized User - AU to activate the Charter (total of 43 + 4 new GEO Members)

1. Australia	12. Egypt	19. Kazakhstan	33. Paraguay
<i>Bahamas</i>	<i>Estonia</i>	20. Korea, Republic of	<i>Peru</i>
2. Bahrain	13. Guinea-Bissau	21. Malaysia	34. Philippines
3. Bangladesh	14. Honduras	22. Mali	35. Romania
4. Belize	15. Iceland	23. Mauritius	36. Russian Federation
5. Brazil	16. Indonesia	24. Mexico	37. South Africa
6. Cameroon	17. Iran	25. Moldova	38. Sudan
7. Central African Republic	18. Israel	26. Morocco	39. Thailand
8. Chile		27. Nepal	40. Tunisia
9. Congo, Republic of the		28. New Zealand	<i>Turkey</i>
10. Costa Rica		29. Niger	41. Uganda
11. Croatia		30. Nigeria	42. Ukraine
		31. Pakistan	43. Uzbekistan
		32. Panama	

Note CHARTER AUTHORIZED USERS are defined as:

- They are the bodies authorized to request the services of the Charter
- They are recognized to be the Charter Associated Bodies
- They receive the single (ODO) phone number
- They represent the civil protection, rescue, defense and security bodies of the country to which the Participating Agencies belong

Exceptionally, the Board may allow certain organizations with which the Charter Parties and Partner Agencies have an interest to cooperate 'Cooperating Bodies', to request the Charter data.

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Some numbers by Regions

- Europe exhibits fairly high levels of disaster incidence matched with highest number of Charter activations;
- Africa shows specific localised areas of moderate/high disaster incidence and low Charter activations;
- South and South East Asia show higher disaster incidence compared to Africa and low Charter activations;
- South America has a high disaster incidence and increased Charter activations in the past 2 years;
- North America has high total number of disasters but few Charter activations;
- Oceania also exhibits high disaster incidence and very low Charter activations, almost completely absent.

↓

Africa, South and Southeast Asia and Oceania are geographical priority areas

REF: BNSC Report: Study on Improving Access to the International Charter Space and Major Disasters, May 2008.

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Extending Charter on Space and Major Disasters Access

As of today, the number of Authorized Users and cooperating bodies that can benefit from the Charter is limited; in particular, 47 GEO Member countries do not have Authorized User status.

In response to GEO request for access for all GEO Members to Charter, the Charter Board unanimously endorsed the principle of « universal access » for all states.

GEO has defined a mechanism for providing Charter access to all GEO Members. The GEO proposal was discussed at the Charter Board Meeting in April 2009. The Board agreed with the proposed approach.

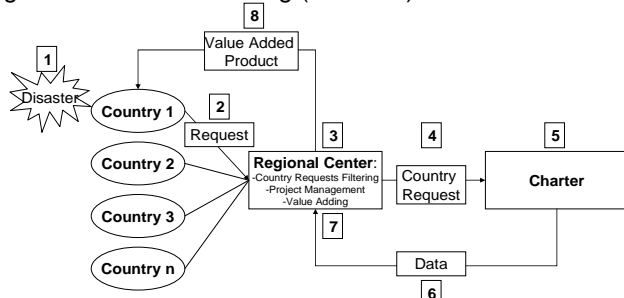
➔ Next steps:

- Consultation with African countries;
- Implementation of Charter access mechanism for Asia-Pacific region through Sentinel Asia.

Extending Charter on Space and Major Disasters Access

Regional Approach: CB I³ approach

The Regional Center will activate the Charter on behalf of the Countries in the region. Regional Center could offer Project management and value adding (PM &VA).



Achievements and Contributions to GEOSS

2. Individuals (Human) CB: education and training of individuals to be aware of, access, use and develop EO...

UN-SPIDER/GEO Summer Schools on Space-based Solutions for Disaster Management and Emergency Response - GEO Task CB-09-02c)

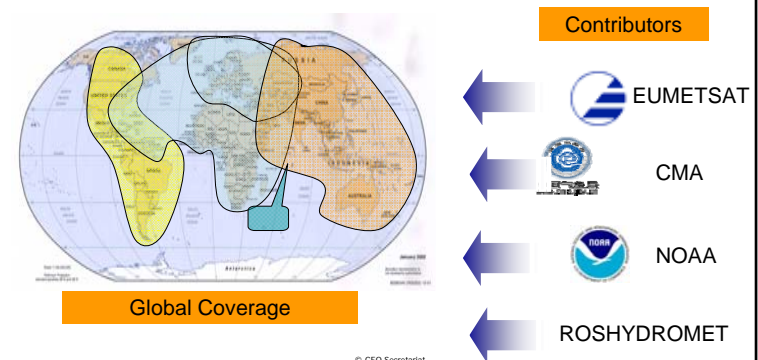
- Understanding existing and upcoming initiatives in the area as well as state-of-the-art space technology applications is necessary to make maximum use of space-based solutions. By focusing on different types of disasters, the Summer Schools deliver in-depth capacity building to disaster managers, thereby enabling them to take necessary institutional and technical measures with regard to the entire disaster management cycle.
- One Spring School was held in Brazil in 2008. The next Spring School will be held in the second half of 2009, probably in Argentina.

Achievements and Contributions to GEOSS

GEONETCast Overview Individual and Infrastructure CB

- Worldwide information dissemination system by which satellite and *in situ* data, products and services are transmitted to users through communications satellites.
- Receiving stations use low-cost, off the shelf technology.
- Information includes climate, weather, agriculture, air quality, disasters, and more, in support of GEOSS Societal Benefit Areas.
- No internet connection required
- Training channel and Hazard and Alert Channel development

GEONETCast Space-based Dissemination System for Data, Products, Services



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GEONETCast Receiving Stations

- Dedicated personal computer (~ \$1000)
- Satellite antenna dish (1-3 m) (~ \$300-1200)
- DTH receiver card or box (~ \$200)

Data analysis and processing should be done on separate computer(s)

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Achievements and Contributions to GEOSS

SERVIR: CB³ approach for Meso-America and Africa

Logos: NASA, USAID, CATHALAC, CCAD

SERVIR Response to Flooding in Panama, November 2006

3-hour Peak Rainfall 23 Nov 2006 08UTC

Met products such as MMS (left), WRF, and S-PORT model outputs, along with GOES imagery (above), provide a continuous support mechanism for decision makers.

Panamanian President Martin Torrijos (left) consults with meteorologist Annette Quinn and Director of CATHALAC Emilio Sempres at the SERVIR facility in the City of Knowledge, Panama.

TRMM data (below) are used to show total rainfall accumulation over the period November 20-28, 2006.

Change detection analysis (above) based on RADARSAT data near Rio Indio, Panama. These images help the Panamanian disaster response agency to focus its efforts in the areas of the flood's greatest impact.

Labels: Rio Indio, SRTM, Bridge, Bridge out, Coastline changed, RADARSAT 10 Oct 2006, RADARSAT 24 Nov 2006

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Achievements and Contributions to GEOSS

Flood (prediction and response) Pilot Project for the Caribbean & Namibia: CB³ approach

NASA, CSA, CEOS, UNOOSA, ESA, ASI, World bank, Servir, Cathalac, CDERA, DLR, NOAA, & others

Flood Hazard Deciles

- 1st - 4th
- 5th - 7th
- 8th - 10th

The World Bank - Natural Disaster Hotspots: A Global Risk Analysis



Flood Pilot Project for the Caribbean & Namibia

- Namibia:** Flood forecasts and flood extent products were developed (NASA) for the 2008/2009 flood events in Mozambique and Namibia. Specific areas were targeted for satellite-data acquisition from a wide range of sensors including EO-1, RADARSAT-2, Envisat and Formosat-2.
- In the **Caribbean:** an ambitious workplan was developed in close consultation with the user community for 2009 hurricane season. The project aims to monitor the entire Caribbean region on a regular basis and flood-prediction software developed by NASA.

In particular, five National Partners were selected for Phase 1: Barbados, British Virgin Islands, Grenada, Jamaica and Saint-Lucia. ➡ 5 thematic projects



Flood Pilot Project for the Caribbean & Namibia

By NASA, ASI, CSA, ESA, UNOOSA, SERVIR, World Bank, CATHALAC, CDERA , etc

RECOVERY:
 Provision of
 assessment maps
 based on satellite
 data for large
 scale disasters
 during Hurricane
 2009 season

RESPONSE:
 Integrate remote
 sensing rapid
 mapping with
 local hydrological
 and met work



MITIGATION:
 •Preparation of
 Directory of Resources
 •In-depth development
 of remote sensing
 baseline
 •Promote collection of
 Caribbean imagery

WARNING:
 development of
 higher
 resolution flood
 prediction
 model



Thank you

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