Space in Support of Disaster Management – Where do we stand?

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UN-SPIDER Workshop Bonn, 13.-15. October 2008

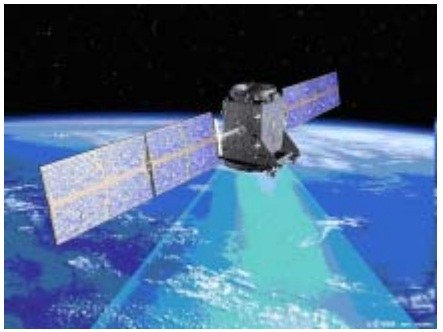
Deutsches Zentrum
DLR für Luft- und Raumfahrt e.V.
in der Helmholtz-Gemeinschaft

Space for Disaster management is a young discipline

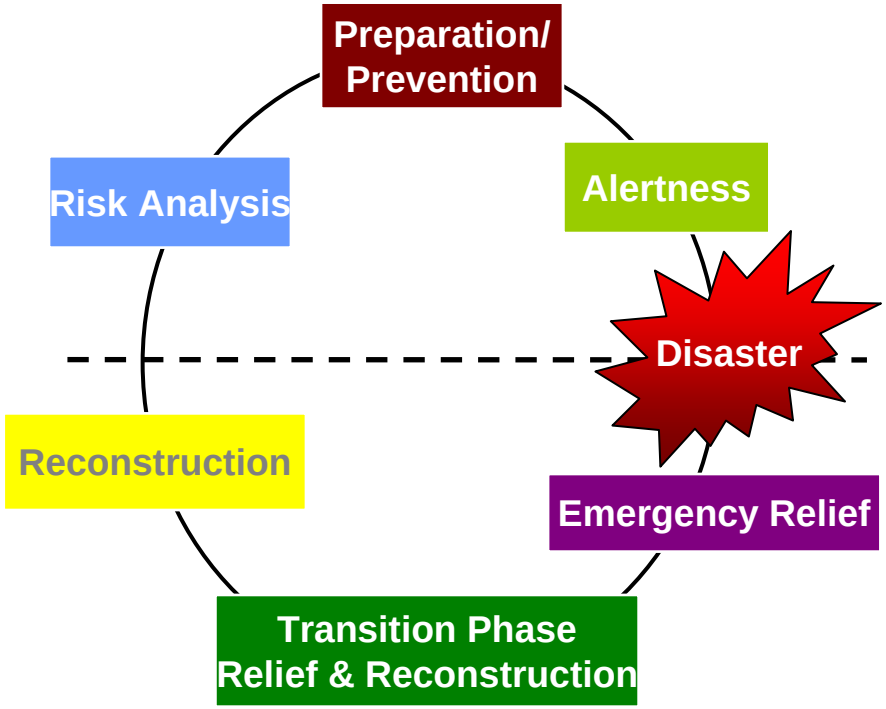
- **From military** applications, espionage, telecommunication, environmental monitoring, navigation **to safety and security of people**
- **Disaster management is often a local/regional** in scale and fast response tasks, where civilian satellite systems were useless for long time
- **Today, space systems support**
  - disaster management
  - humanitarian relief
  - Mitigation of threats to society

Earth Observation, Communication and Navigation

- **SatCom (voice/data) mature,** tricky to handle, limited bandwidth - off the shelf solutions exist and are applied widely
- **Global Navigation Satellite System (GNSS) – enter public domain** for positioning, navigation and tracking.
- **Earth Observation (EO) programmes dominate,** as EO takes more value adding to be applied
- **Push for integration** of EO/NAV/COM services => more coherence (ESA/EU)
  - Is it possible to integrate?
  - Do we have to integrate?
- **Different service types**
  - NAV/COM is individual / peer to peer
  - EO is “multilateral”: one image/map may serve different purposes or user groups



Spaced Assets can contribute to all phases of the disaster cycle

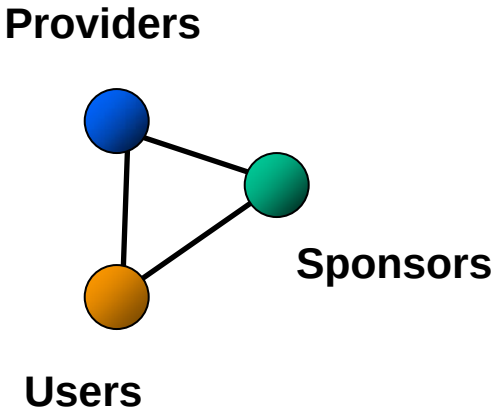


Space and disaster management experiences a boom

- **Many programmes/initiatives:**
  - UN, International, Regional (Asia, Caribbean, EU,…), National
  - CEOS-DMSG, UNISPACE Meetings, Int. Charter Space and Major Disasters, UN-SPIDER, GMES/Kopernikus, GEO/GEOSS, Sentinel Asia, Servir, …
- **A large window of opportunity**
- **High responsibility for all actors**
  - To act coherently
  - To convince, but not oversell
  - To serve the user needs and not just promote the use of space assets and systems

Space Technology Push

- The push is large, and is even getting larger - good and dangerous at the same time
- Users are not (yet?) customers!
- Earth Observation:
  Sponsor – Provider – User
- NAV/COM: used more directly and commercially



User “Issues”

- **90% of the disasters are handled locally or regionally** this requires local to regional capacities and solutions
- **Data and information residing with UN, are not necessarily available** at the local government/disaster management authorities
- **Users don’t like maps which are wrong**, too few, too many or too late – customers would tell right away
- **Need to move from “users” to “ stakeholders” and “customers”**
- **Of course blankets are more important then satellite imagery…**

Tsunami 2004 – What have we learned?

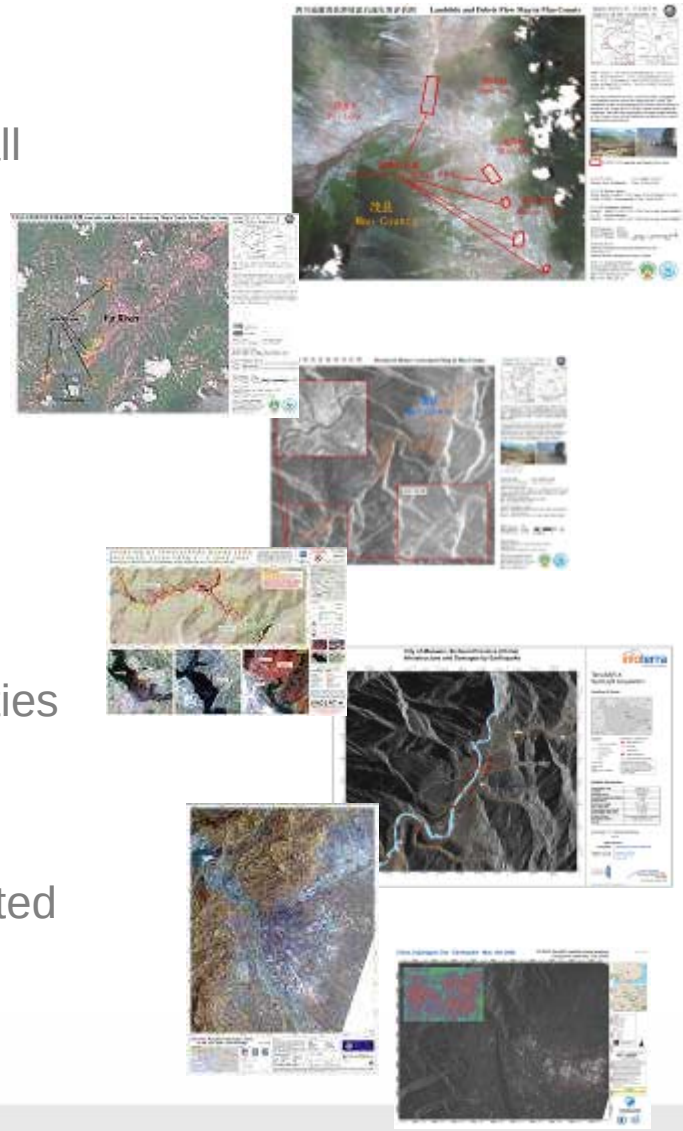
- Three Charter activations, probably many more calls
- Many people started out in parallel
- After a few days at least in Europe we managed to sort the base mapping job out
- Many mapping activities to follow, building on the first basis mappings at all scales
- Maps were printed in hundreds and distributed by various actors locally

=> divide task, standardize analysis, cross-check results

China Earthquake May 2008

- Very fast provision of satellite imagery of all kinds, Charter data and beyond
- Analysis to large extent as centrally coordinated work
- Main mapping was procured in China with local to very local scale
- SAR data proved to be very difficult to interpret (COSMO/TerraSAR-X) due to missing archive data and the radar properties

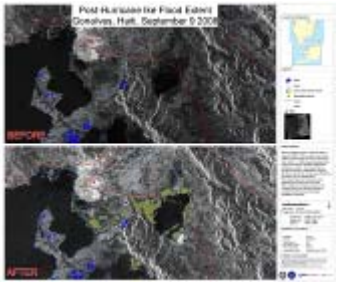
=> AOIs were communicated fast, data was provided very informally, processing capacities were at hand nationally, supported by different international actors

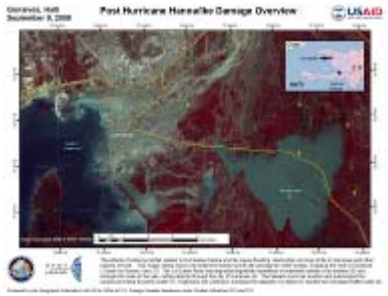


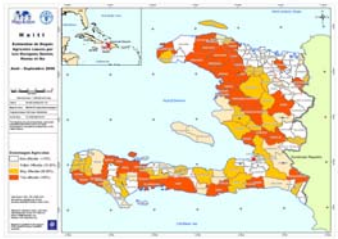
Haiti September 2008

- Three different Charter calls => joint to one activation
- Many different actors, data sets and maps
- Some coordination via UN, some nationally
- Beneficiaries (UN, EU, National International Relief activities, local government?)
- “Some one send us a maps, we need more of this” => need more coordination who does what for whom, where, when and how?

=> Better coordination tools, how can create better synergy and coherence of different mapping products?





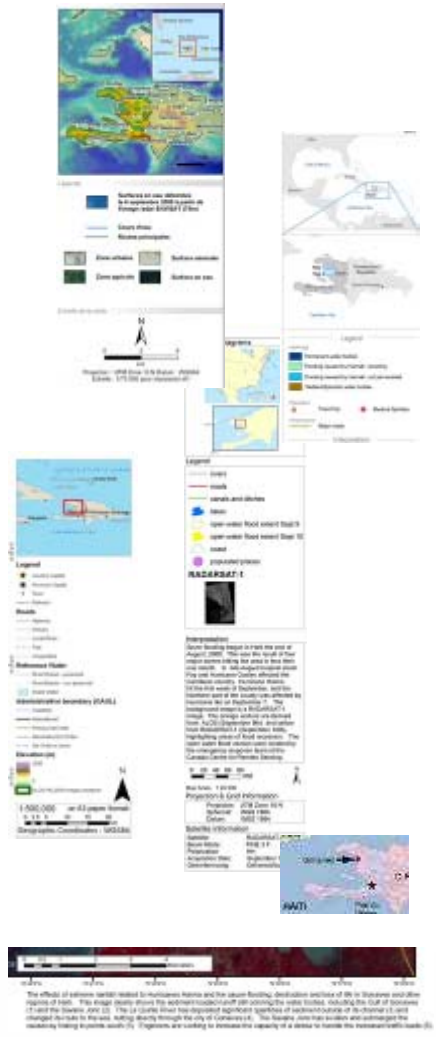


From concepts to operational and coordinated doing

- **1990+: Concepts**
  - IDNDR, CEOS DMSG, UNISPACE Meetings, national initiatives, etc.
- **2000+: Doing**
  - High resolution optical and radar made a difference.
  - More satellite systems available
  - Charter: A big success! First time we got something moving!
- **2010+: Coordination**
  - A map the diversity of space activates in support of disaster relief
  - To better network what is available => brokerage of action, data and information
  - Reliefweb of Space: Virtual Coordination Centre of Space Assets

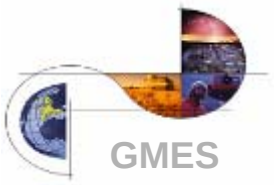
Standards, quality and accountability

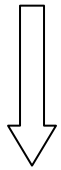
- **Approved emergency mapping standards:**
  - Standard procedures, methods
  - Nomenclature, legends, languages, etc.
- **Quality:**
  - People have to be able to blindly rely on results
  - Results have to be comparable when produced by different providers
  - universal quality, validation and benchmarking procedures
- **Reliability and liability:**
  - Operational mandates and institutions
  - Move from best effort to accountable services



What is going in Europe these days

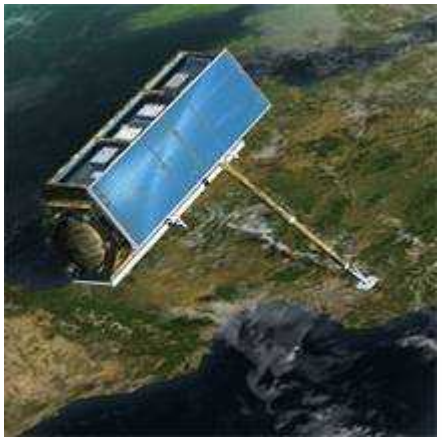
- **Kopernikus** the EU program formerly known as GMES
- **We'll see a transition from GSEs to Fast track services** (Emergency and Security)
- **Respond, RiskEos, Preview => SAFER** Fast track emergency Response (mapping, benchmarking and European standards)
- **GMOSS, LIMES => G-MOSAIC** (Civilian Security Issues)
- **Core and Downstream Services**
- **Kopernikus -** Operational budget lines 2013
- **Preoperational now:** Supporting the Implementation of ER – user federation and technical interfaces





What is going on at DLR / ZKI

- **TerraSAR-X** service improvements in the domain of disaster mitigation
- **DLR not yet a member of the Charter** – this is under preparation
- **DLR upgrades operation and procedures its Centre for Satellite Based Crisis Information (ZKI) continuously**
- **Trainings and Exercises** with users and providers (GNEX, AMC, Respond, Limes)
- **Preparation of the EC Kopernikus Fast Track Service Emergency Response „ SAFER“,** where DLR/ZKI was mandated the role of Rapid Mapping Coordinator



Summary and Conclusion

- **Space assets can significantly contribute** to many elements of disaster management operations
- **EO has to enter the public domain for disaster relief**, just as COM and NAV already have
- **Integration of EO, NAV and COM** should be achieved **for field applications**
- **“Users” need to become “customers” and “stakeholders”**
- **A Relief-Web and a Virtual Coordination Centre of space assets** should be built as a map of the diversity as well as a **guide to quality and reliability** of space for disaster mitigation
- We need to **establish and agree**
  - Commonly applied **standards**
  - Universal **quality, validation and benchmarking** procedures
- We need to move **from ”best effort” to reliable operations**
- Let’s discuss, but also **move things forward together!**