Disaster Risk Assessment Vision

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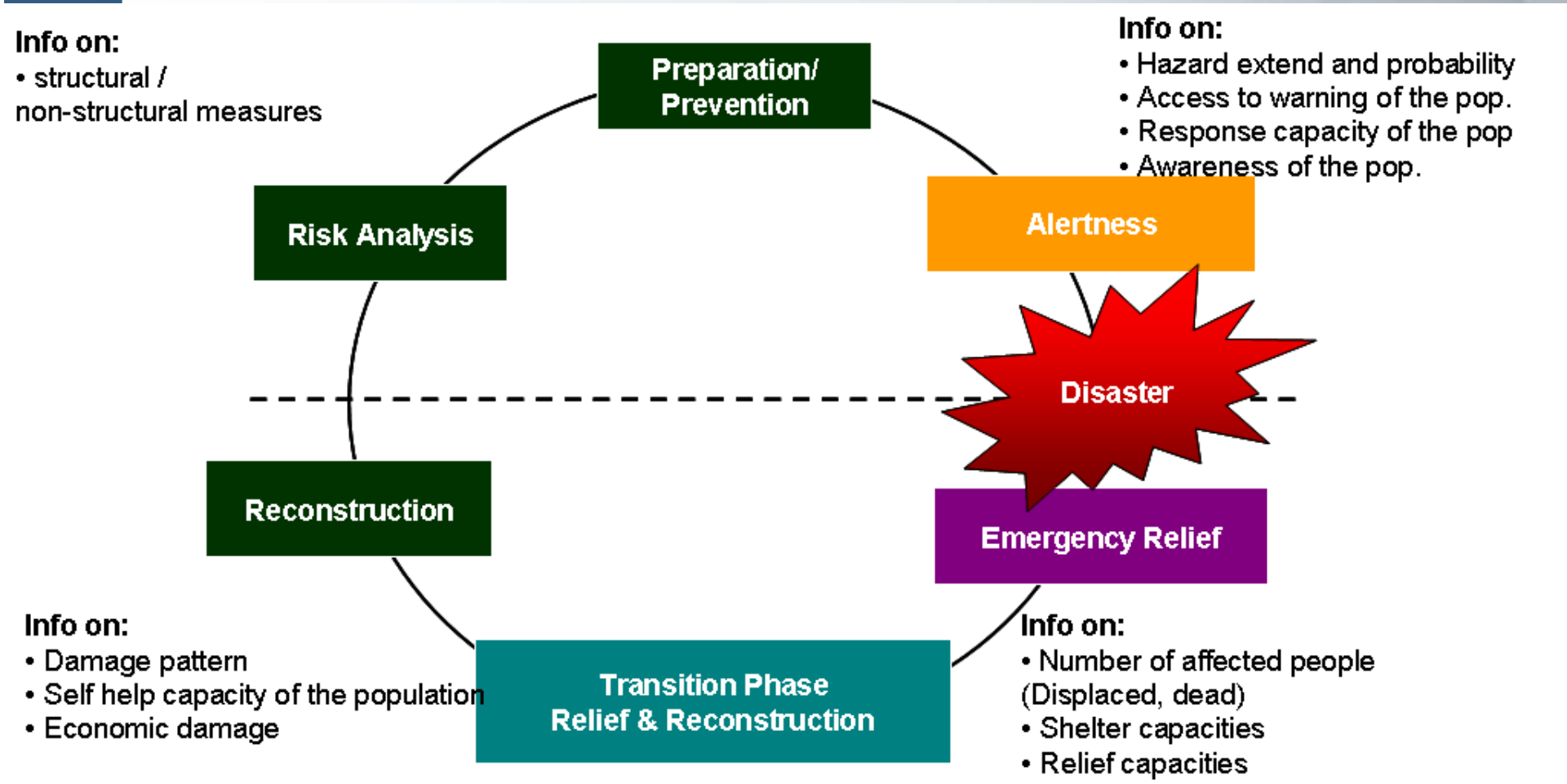
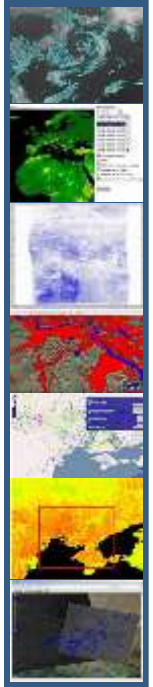
General approach

….to support the full Disaster Management Cycle



Measuring “flood risk”

Risk = *F*(Hazard, Vulnerability)



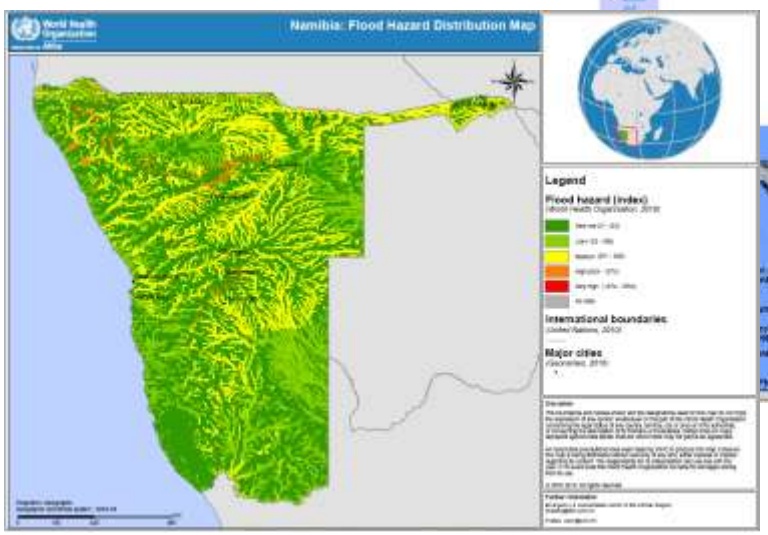
- A popular approach
  - Risk = *the probability of each possible flood event per year* x *the consequences of that event*
  - Simple risk measures:
    - average annual economic damage (AAD)
    - average annual number of casualties (AAC)
  - Problems
    - **regular flooding** with **limited consequences** and exceptional **flooding with huge consequences** may have **the same AAD**, but in practice they differ significantly: it is possible to cope with the first type but not with the second one

Existing initiatives

- **EU Floods Directive**
  - to **assess** if all water courses and coast lines are at **risk from flooding**,
  - to **map the flood extent** and assets and humans at risk in these areas and
  - to take adequate and coordinated measures to reduce this flood risk.
- **UN Global Risk Data Platform** (http://preview.grid.unep.ch/)
  - "a multiple agencies effort to share **spatial data information on global risk from natural hazards**. Users can **visualise, download or extract** data on **past hazardous events**, **human** & **economical** hazard exposure and **risk** from natural hazards".
  - Registered as GEOSS service in GEOSS Registry

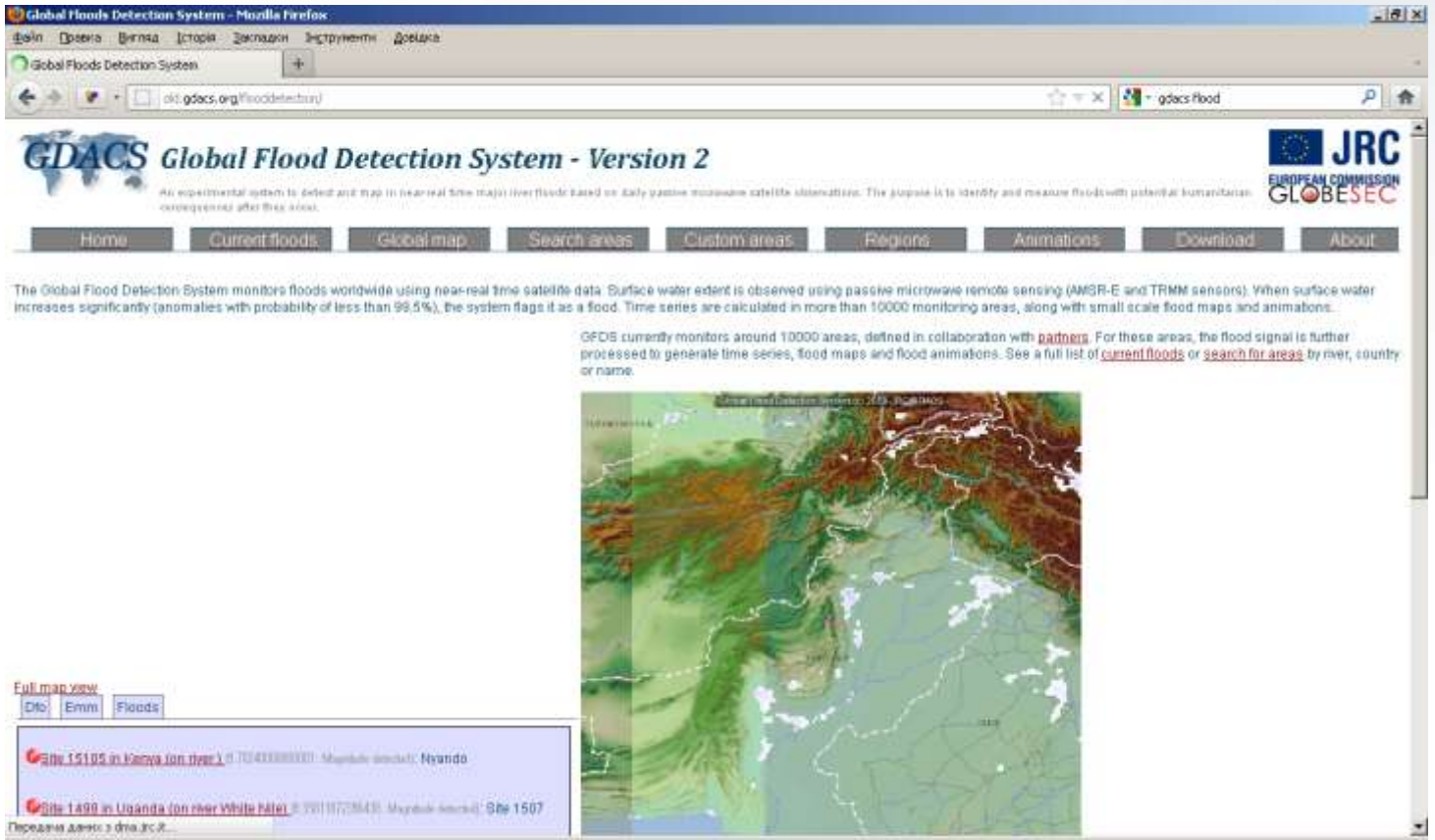
Existing initiatives

- **Global Flood and Landslide Monitoring** provided by NASA
- **Dartmouth Flood Observatory**
- **World Heath Organization**

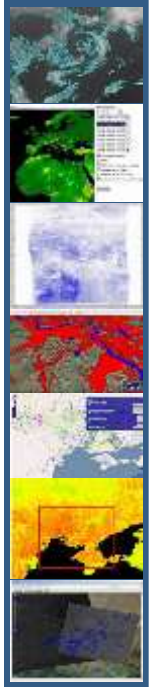


Existing initiatives

- **Global Disaster Alert and Coordination System (GDACS)**
  - a cooperation framework between the United Nations, the European Commission and disaster managers worldwide to improve **alerts**, **information exchange** and **coordination** in the first phase after major sudden-onset disasters



EO and Insurance Workshop 2012



- Co-organised by
  - ESA, the European Association of Remote Sensing Companies, reinsurer Swiss Re and
  - insurance brokers Willis and Lloyds
- Requirement for catastrophe risk management
  - the need for **daily updated flood extent information** during a major plain flood event
    - Examples:
      - Mid-res: MODIS (optical) and Envisat WSM (radar) -> 100%
      - High-res: RADARSAT & COSMOSkyMed (SARs) and SPOT & RapidEye (Optical) ->100% [*P.Bally*]
      - Newly available missions [*P.Bally*]:
        - » Sentinel-1 mission alone -> requirement met at 84% (all weather)
        - » Radarsat Constellation -> requirement met at 100% (all weather)

General approach

- Natural disaster risk assessment
  - To map **globally** regions with **high risk** of disaster
  - **Scaled** (layered) approach
    - global (low-resolution) observations and models to assess risks (detect possible hazards) everywhere;
    - higher-res observations in known high-risk areas;
    - highest resolutions where disaster response is currently needed or underway
  - **Maps** of regions with high risk of disasters to be available **in advance**
    - past disasters, infrastructure objects, roads, distribution of population, shelter capacities etc.
  - **Service-oriented approach**
    - As in GEOSS
  - **Crowd source mapping**