Contribution to the Disaster Management SensorWeb Pilot Project – a longer-term perspective

DLR/DFD, Joachim.Post@dlr.de

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

Facts and Needs

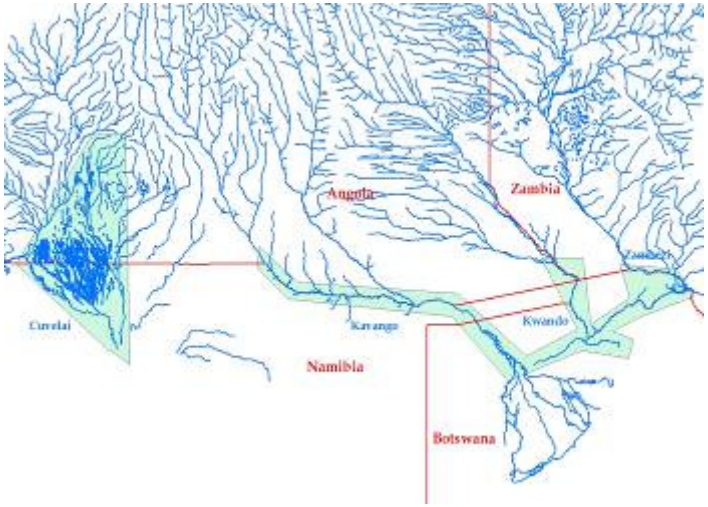
- **recurring floods** are having a devastating effect on the **lives and livelihoods** of the population in the Northern provinces of Namibia and that the only way to prevent this is through investing in **disaster risk management**
- People were **unprepared** … (2009: 750 000 affected, 37.5 % of population, 50 000 displaced, 102 dead, ~215 million US $ losses/damage)
- Economic **losses / damage** mainly within agriculture, manufacture, trade, housing

  (Source: Prof. Katjavivi, *Director General National Planning Commission Office of the President, Namibia*)

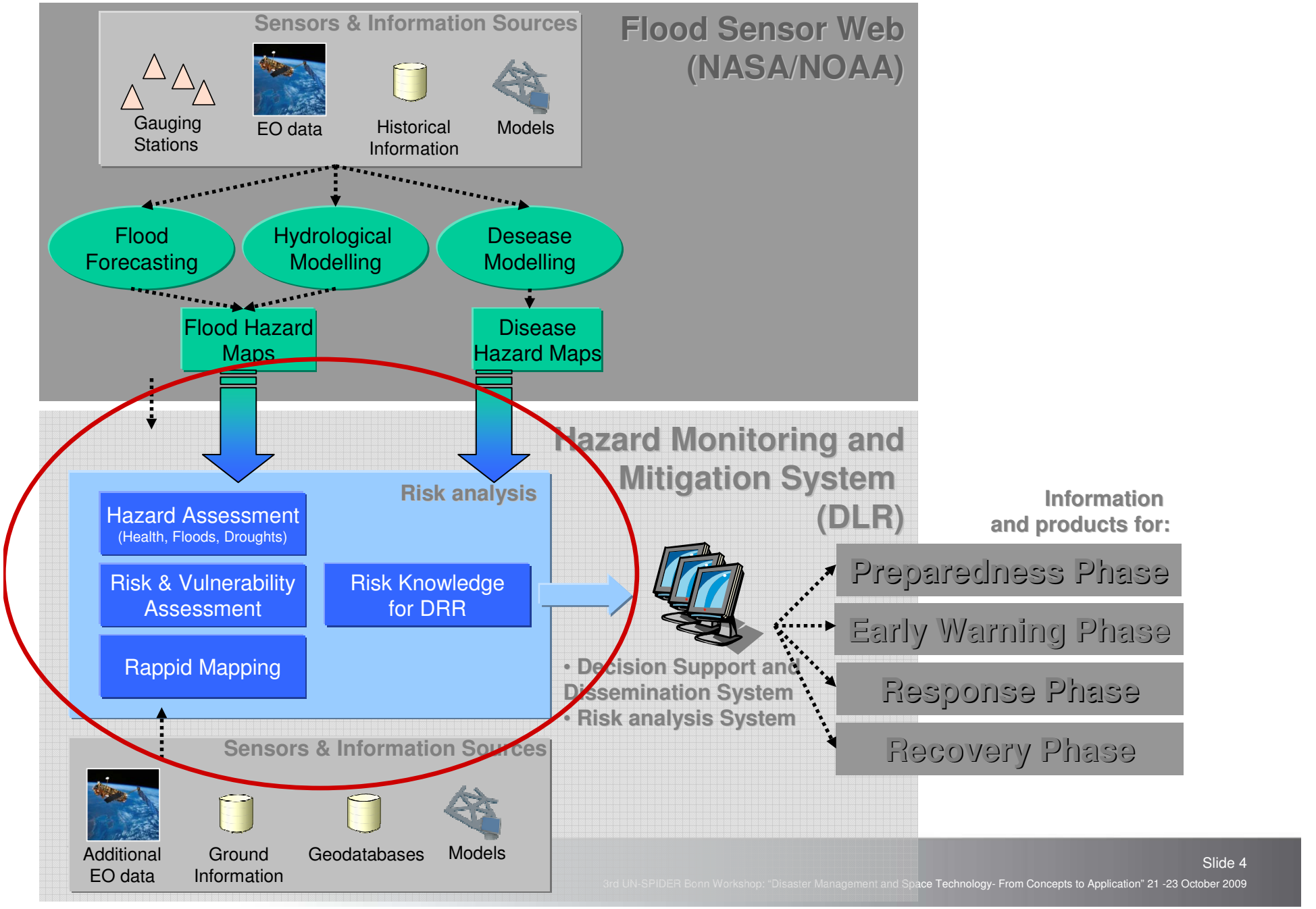
- Weak emergency preparedness and **disaster risk reduction** framework
- Weak **Early Warning** and adequate action upon it
- Better provision of **relief assistance** (on time, quantities, access to health facilities)

  (Source: UN Flash appeal 2009)

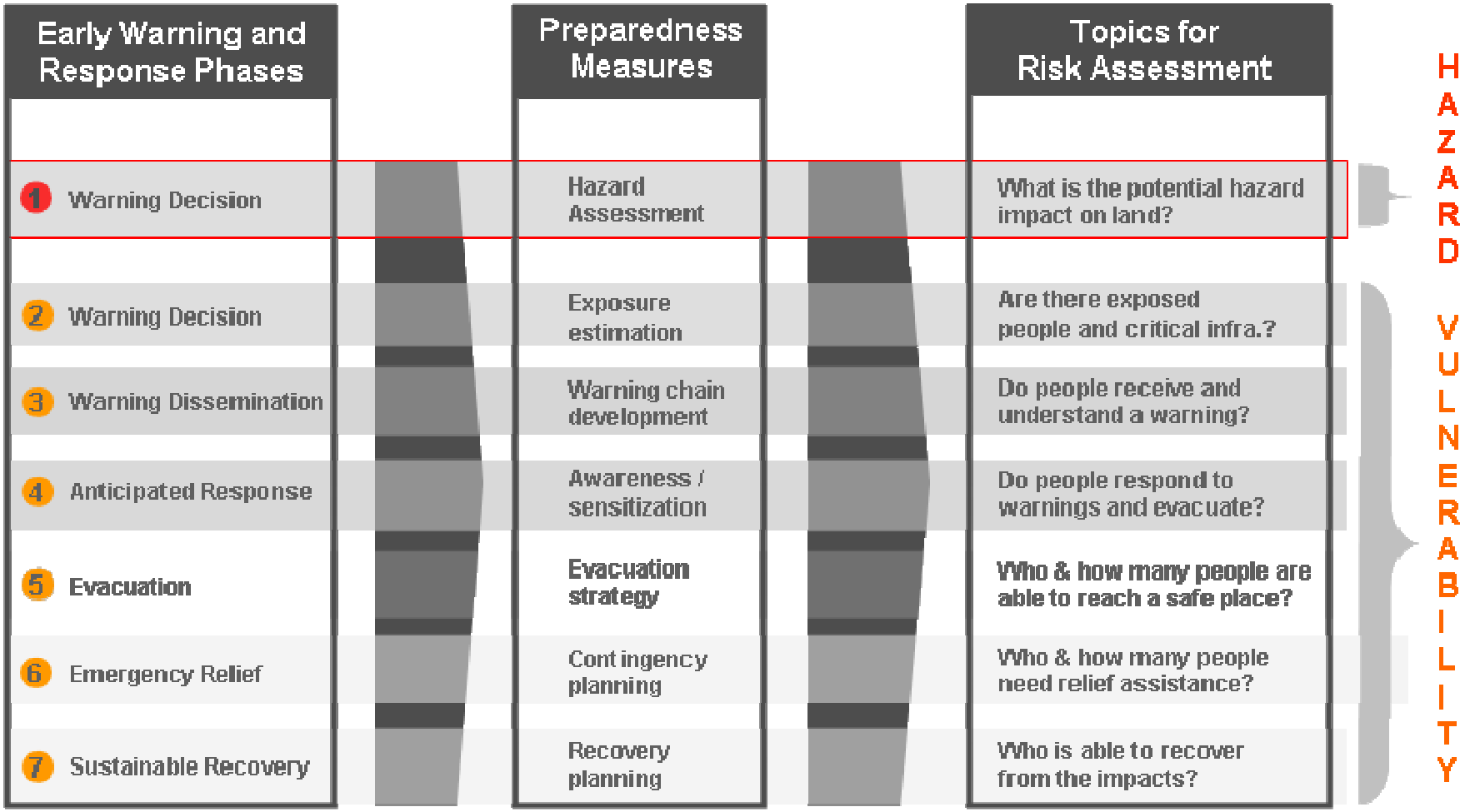
Basic conditions



- Natural hazards and conjoint/cascading effects (e.g. flood – health)
  - Cause transboundary impacts to environment and society
  - Need transboundary strategies and counter measures
  - **Need a Hazard Monitoring and Mitigation Center with transboundary service provision**


Flood Sensor Web (NASA/NOAA)
Sensors & Information Sources
Gauging Stations
EO data
Historical Information
Models
Flood Forecasting
Hydrological Modelling
Desease Modelling
Flood Hazard Maps
Disease Hazard Maps
Hazard Monitoring and Mitigation System (DLR)
Risk analysis
Hazard Assessment (Health, Floods, Droughts)
Risk & Vulnerability Assessment
Risk Knowledge for DRR
Rappid Mapping
• Decision Support and Dissemination System
• Risk analysis System
Information and products for:
Preparedness Phase
Early Warning Phase
Response Phase
Recovery Phase
Sensors & Information Sources
Additional EO data
Ground Information
Geodatabases
Models

Risk assessment framework

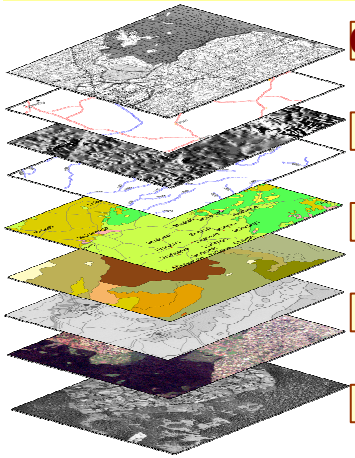


Modelling Risk

Geodatabase, statistical data

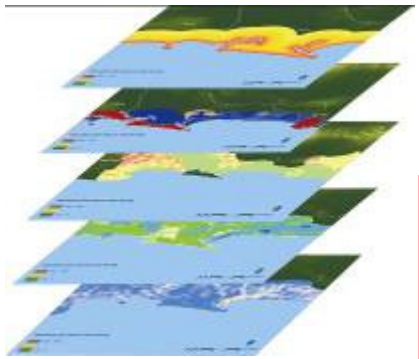
(Geo-)Statistical and GIS Analysis

Vulnerability Assessment



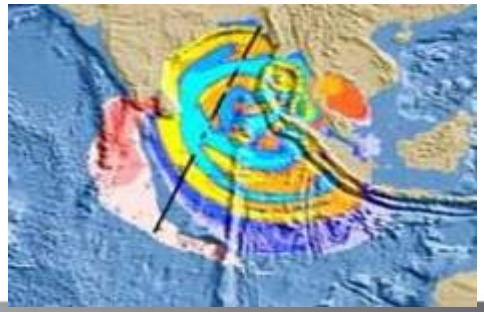
- Crit. Infrastructure
- DEM
- Population
- land use
- income source
- ...

- Exposed Population
- Reachable Safe areas
- ...



Hydrological Modelling

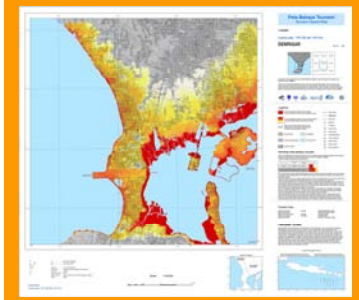
Propagation, Inundation

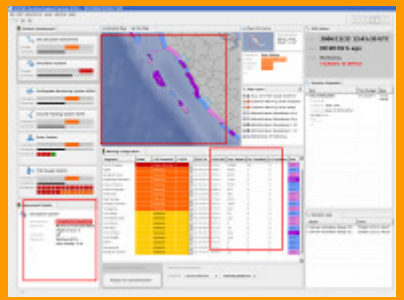


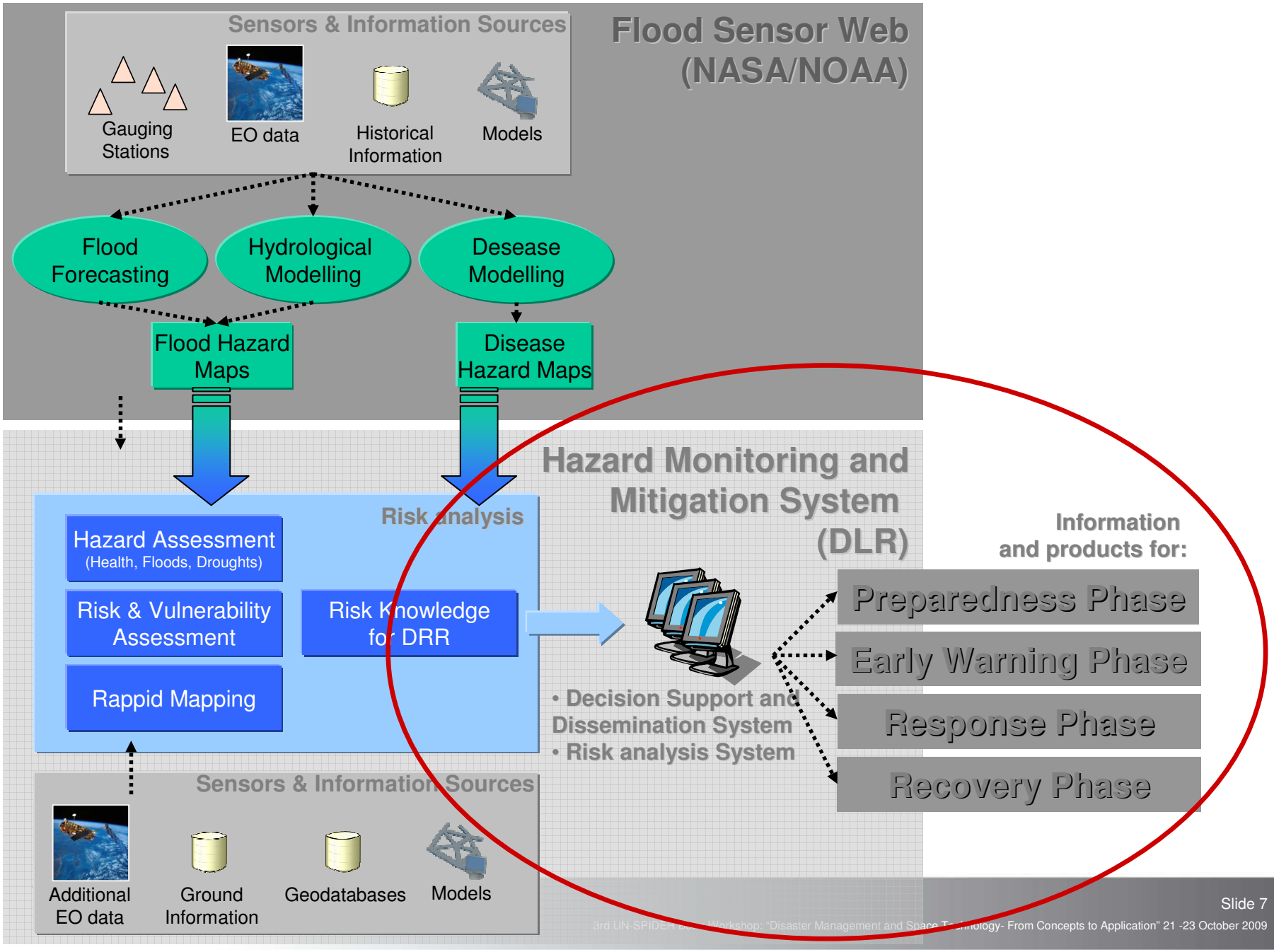
(Geo-)Statistical and GIS-Analysis

Risk products

Hazard maps, Risk zoning, Evacuation planning, Decision Support for Early Warning



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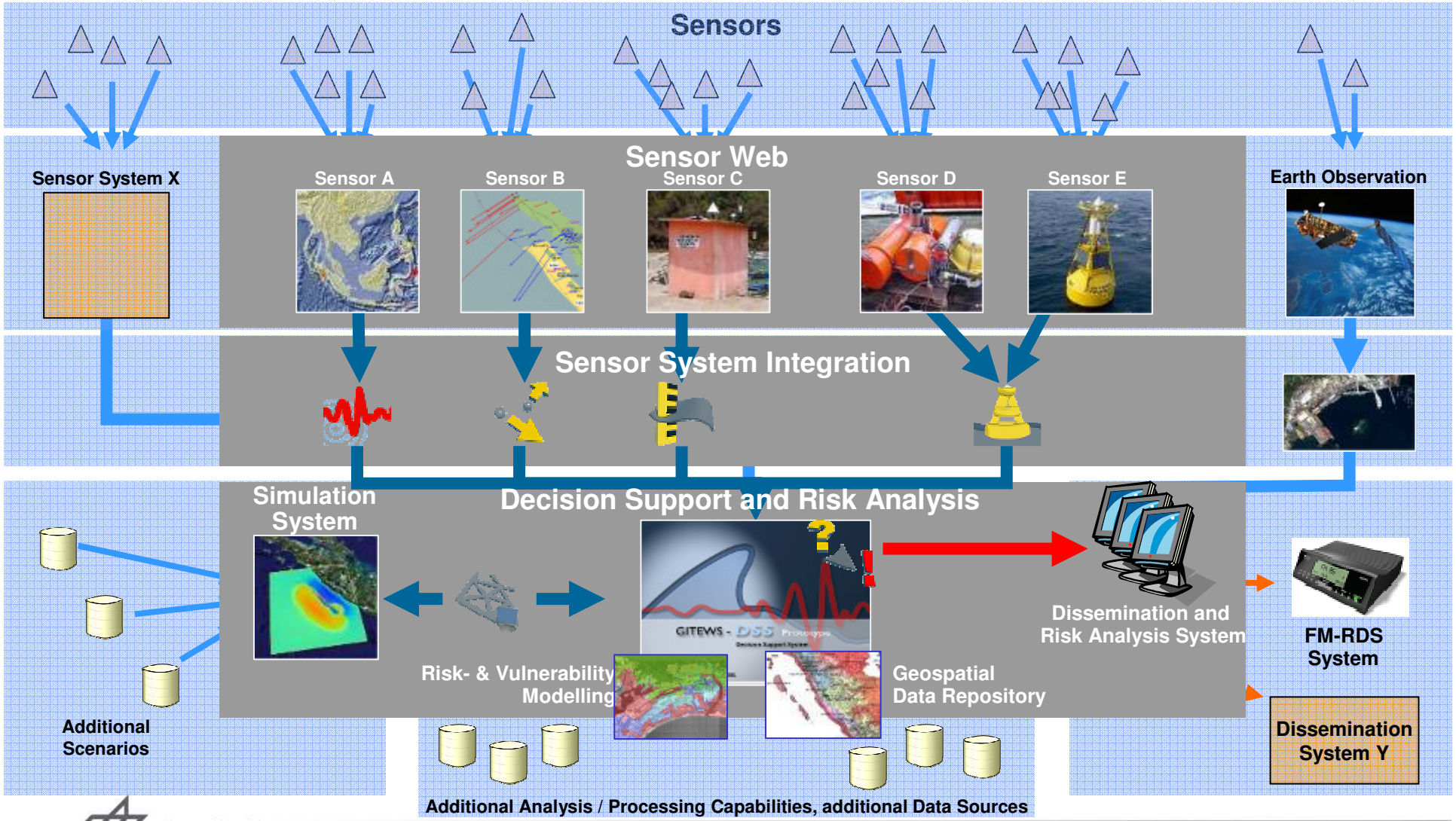
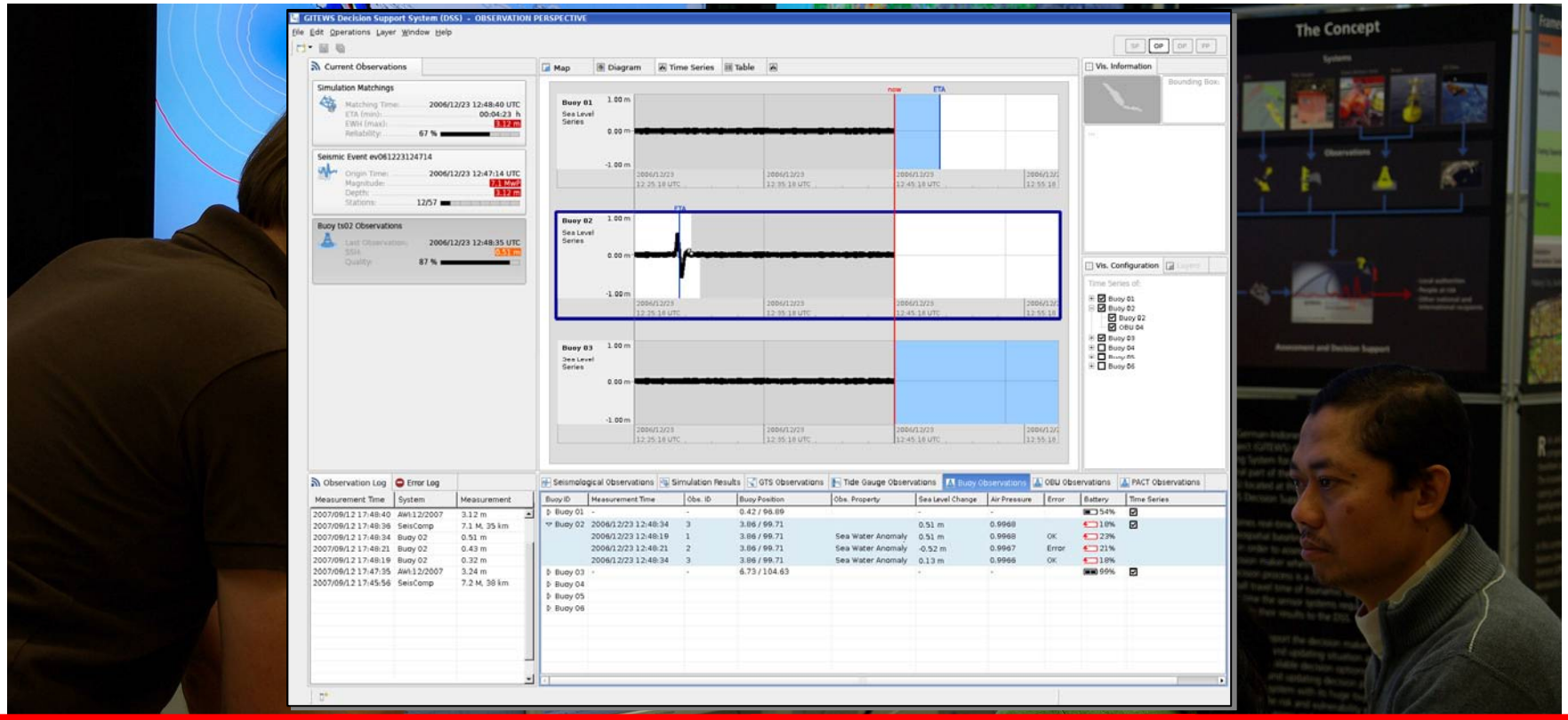
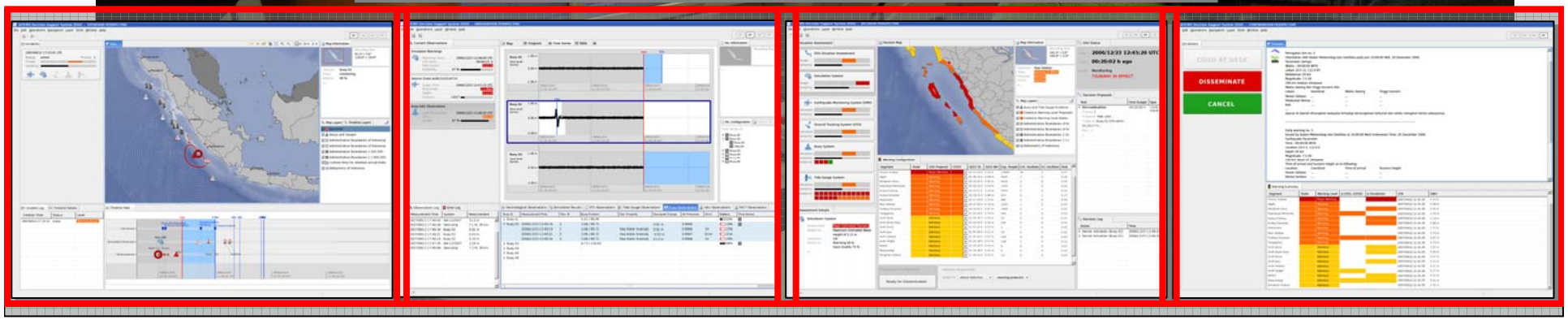
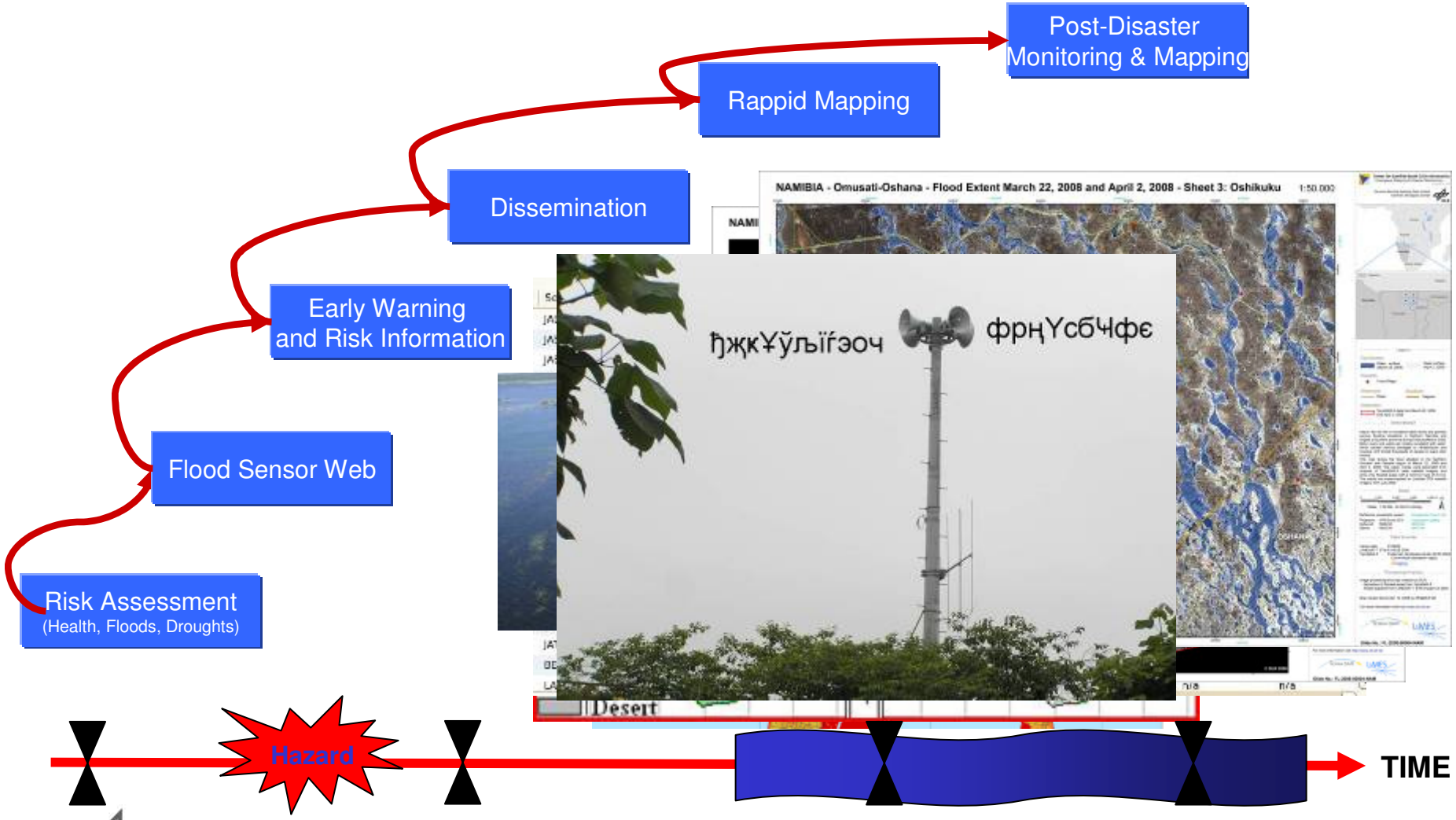
Hazard Monitoring and Mitigation System

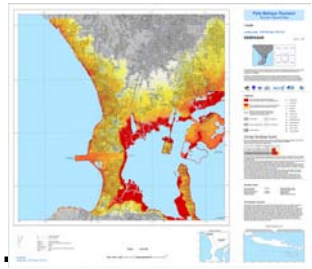



GITEWS Decision Support System (DSS) - OBSERVATION PERSPECTIVE
The Concept


DISSEMINATE
CANCEL

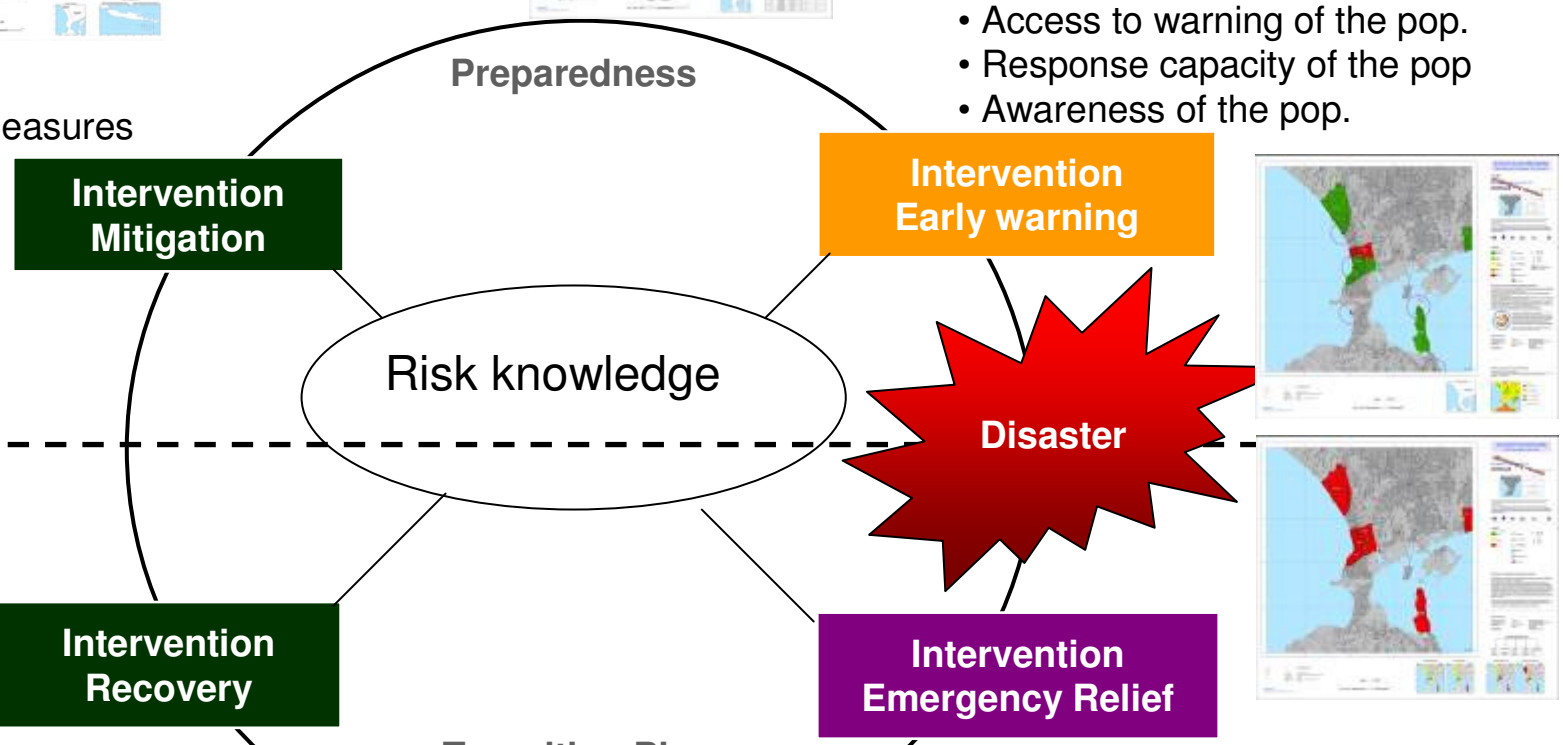
Example: Early Warning and Response products



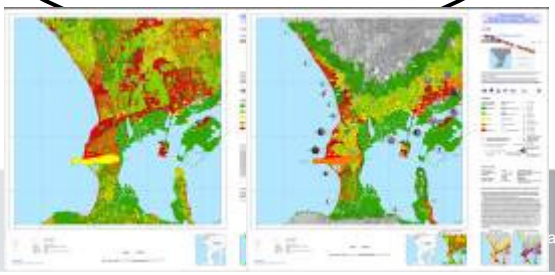


Info on:
• structural /
non-structural measures

Info on:
• Hazard extend and probability
• Access to warning of the pop.
• Response capacity of the pop
• Awareness of the pop.

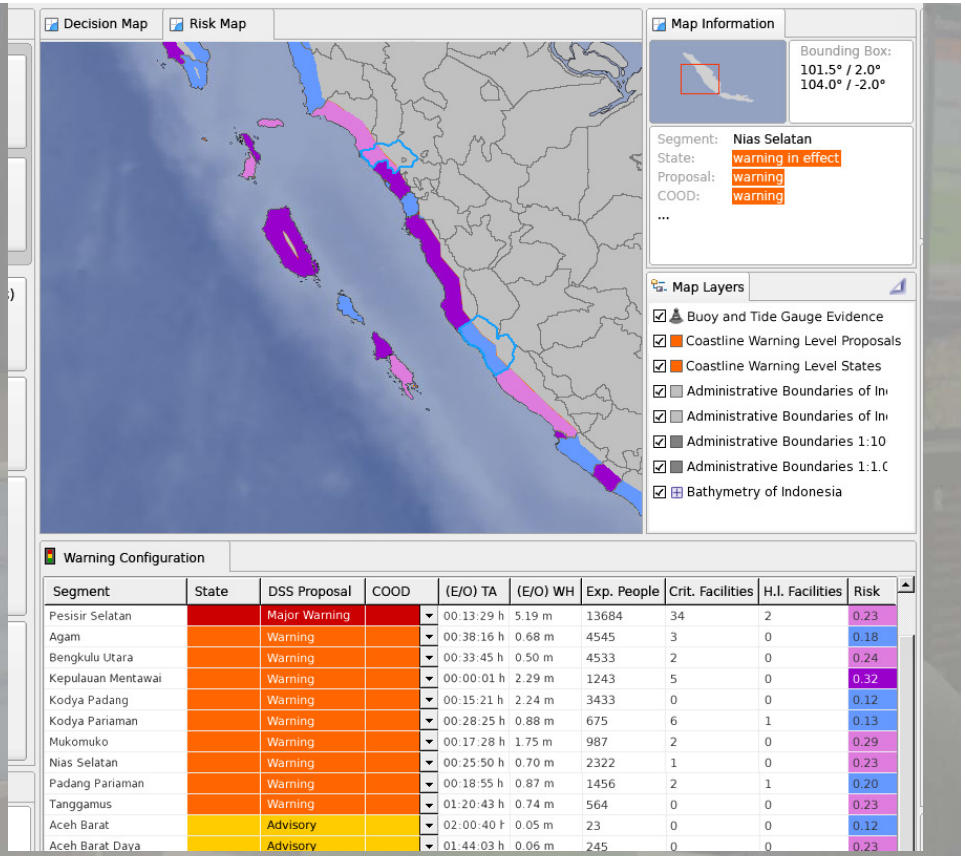


Info on:
• Damage pattern
• Self help capacity of the population
• Economic damage



Info on:
• Number of affected people
(Displaced, dead)
• Shelter capacities
• Relief capacities

- Risk Analysis and updating
- User can access and query information at any time
- In case of threat, specific case-dependent information is displayed
- Pre-disaster use to plan risk reduction strategies
  - Warning chain
  - Evacuation and contigency planning
  - Structural / non-structural mitigation
  - Awareness / Preparedness



Segment	State	DSS Proposal	COOD	(E/O) TA	(E/O) WH	Exp. People	Crit. Facilities	H.I. Facilities	Risk
Pesisir Selatan		Major Warning		00:13:29 h	5.19 m	13684	34	2	0.23
Agam		Warning		00:38:16 h	0.68 m	4545	3	0	0.18
Bengkulu Utara		Warning		00:33:45 h	0.50 m	4533	2	0	0.24
Kepulauan Mentawai		Warning		00:00:01 h	2.29 m	1243	5	0	0.32
Kodya Padang		Warning		00:15:21 h	2.24 m	3433	0	0	0.12
Kodya Pariaman		Warning		00:28:25 h	0.88 m	675	6	1	0.13
Mukomuko		Warning		00:17:28 h	1.75 m	987	2	0	0.29
Nias Selatan		Warning		00:25:50 h	0.70 m	2322	1	0	0.23
Padang Pariaman		Warning		00:18:55 h	0.87 m	1456	2	1	0.20
Tanggamus		Warning		01:20:43 h	0.74 m	564	0	0	0.23
Aceh Barat		Advisory		02:00:40 h	0.05 m	23	0	0	0.12
Aceh Barat Daya		Advisory		01:44:03 h	0.06 m	245	0	0	0.23

Summary

- Hazard Monitoring and Mitigation System as a Center in Namibia with transboundary service provision
- System solution to provide dedicated information and decision support for disaster risk reduction (early warning, emergency relief and recovery, prevention and preparedness)
- Standardized opportunity to integrate sensor systems and geo-databases (e.g. flood sensor web)
- Risk knowledge as key for disaster management


Thank you for your kind attention