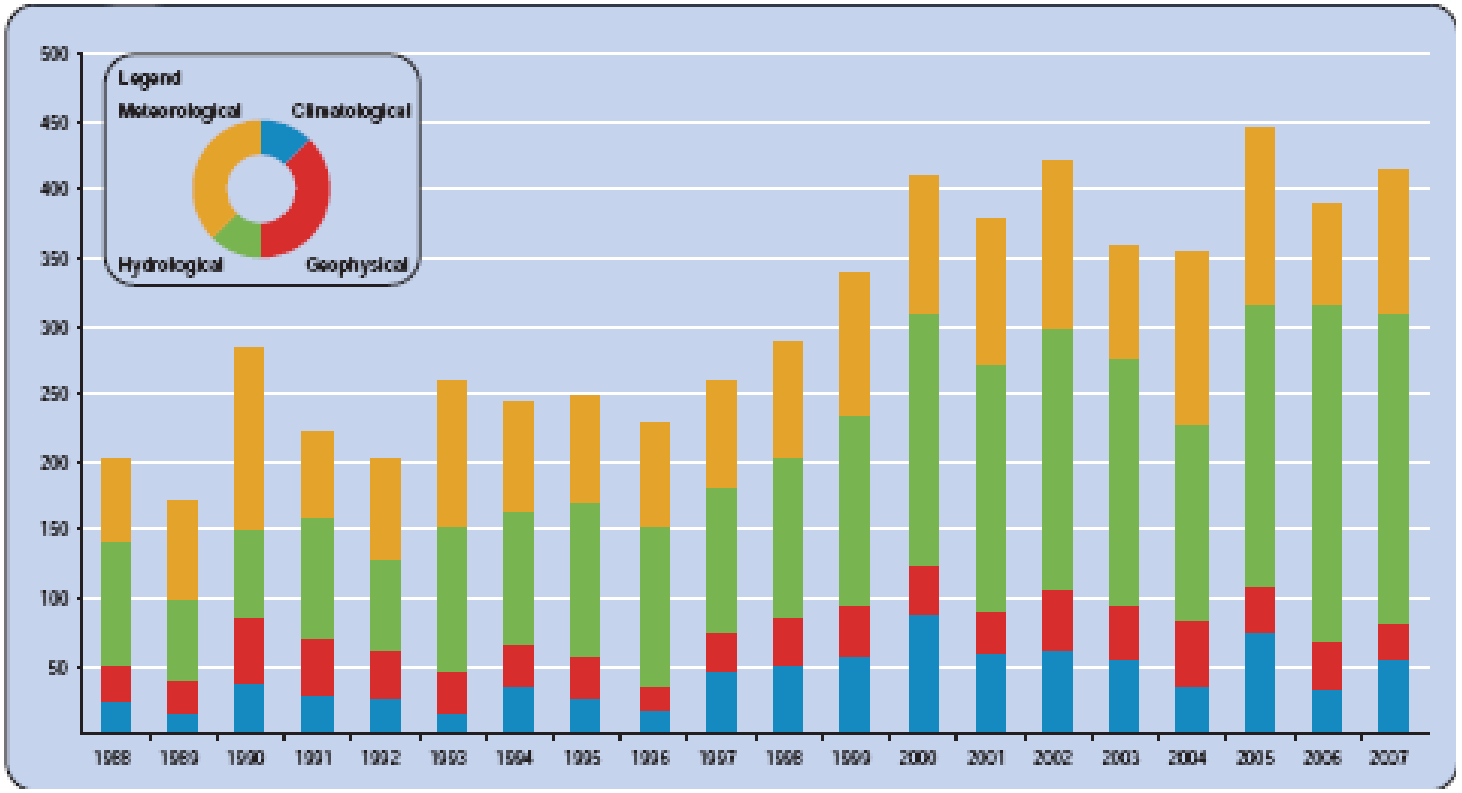
The International Federation of Red Cross and Red Crescent Societies

Hydrometeorological trends, risks and response

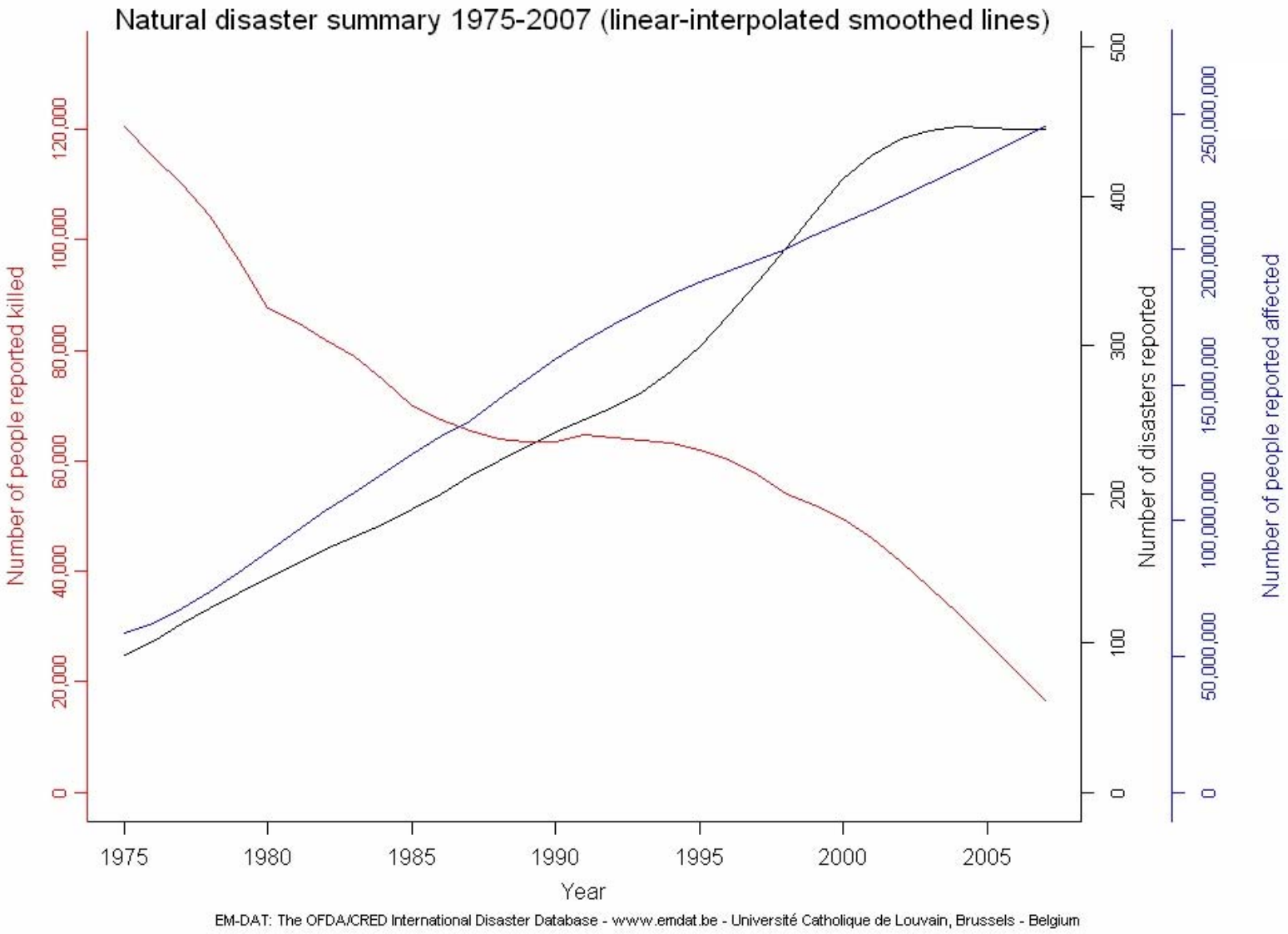
Peter REES-GILDEA, Head, Operations support department

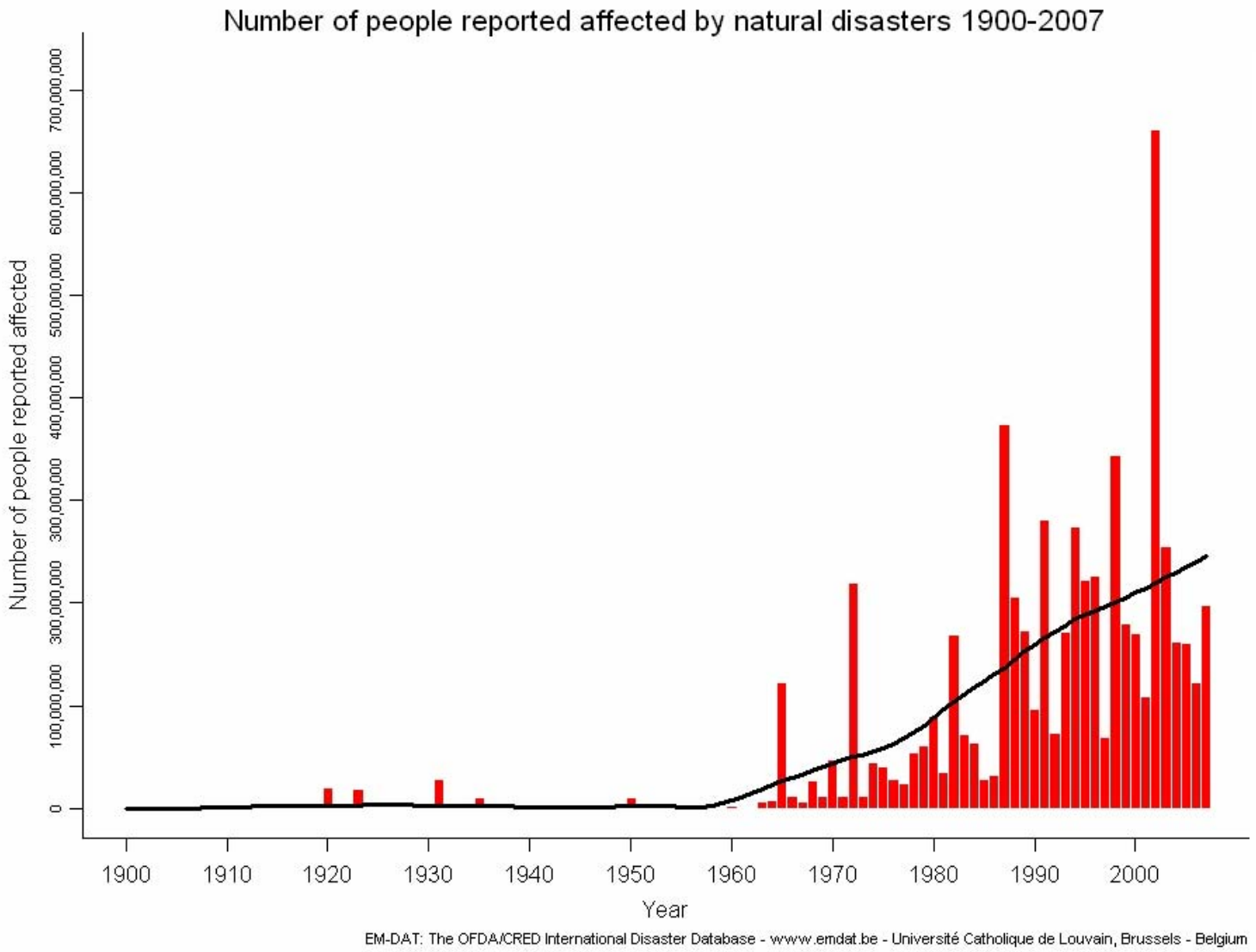
Disaster trends

Trends in disasters

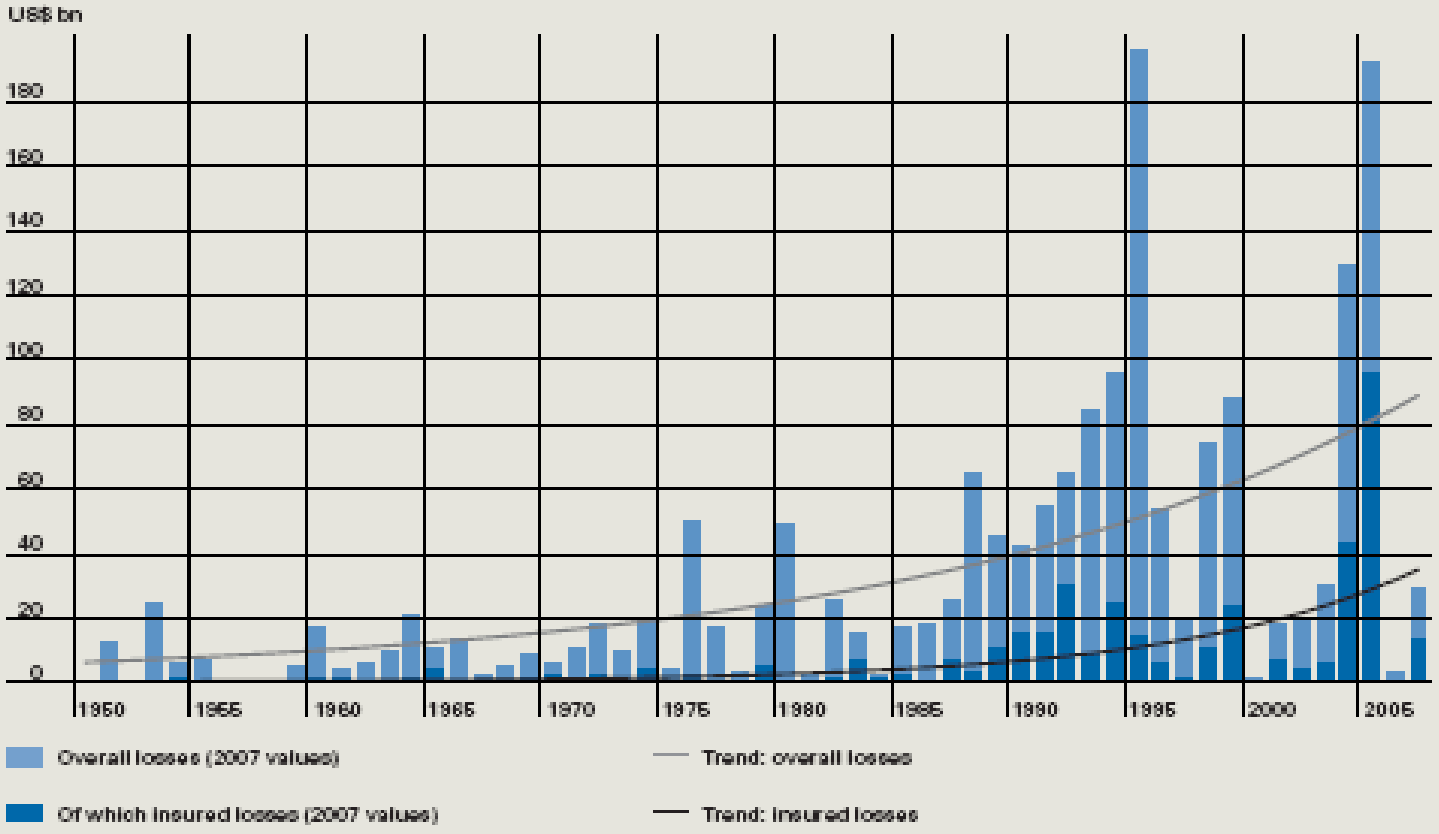


- 2007 – 80% predictability

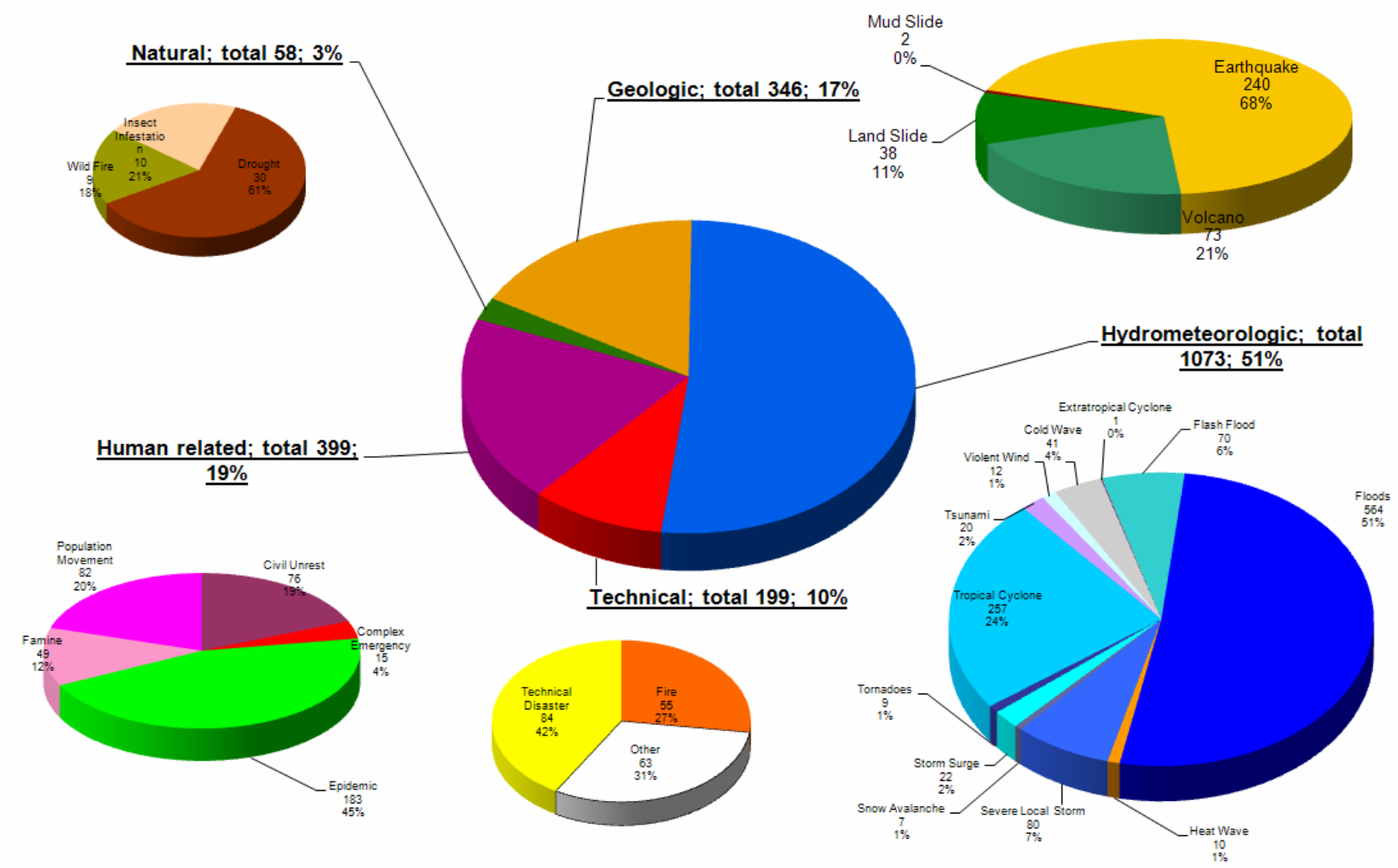

Natural disaster summary 1975-2007 (linear-interpolated smoothed lines)
Number of people reported killed
0
20,000
40,000
60,000
80,000
100,000
120,000
Number of disasters reported
0
100
200
300
400
500
Number of people reported affected
0
50,000,000
100,000,000
150,000,000
200,000,000
250,000,000
1975
1980
1985
1990
1995
2000
2005
Year
EM-DAT: The OFDA/CRED International Disaster Database - www.emdat.be - Université Catholique de Louvain, Brussels - Belgium


Number of people reported affected by natural disasters 1900-2007
Number of people reported affected
0
100,000,000
300,000,000
400,000,000
500,000,000
600,000,000
700,000,000
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
Year
EM-DAT: The OFDA/CRED International Disaster Database - www.emdat.be - Université Catholique de Louvain, Brussels - Belgium

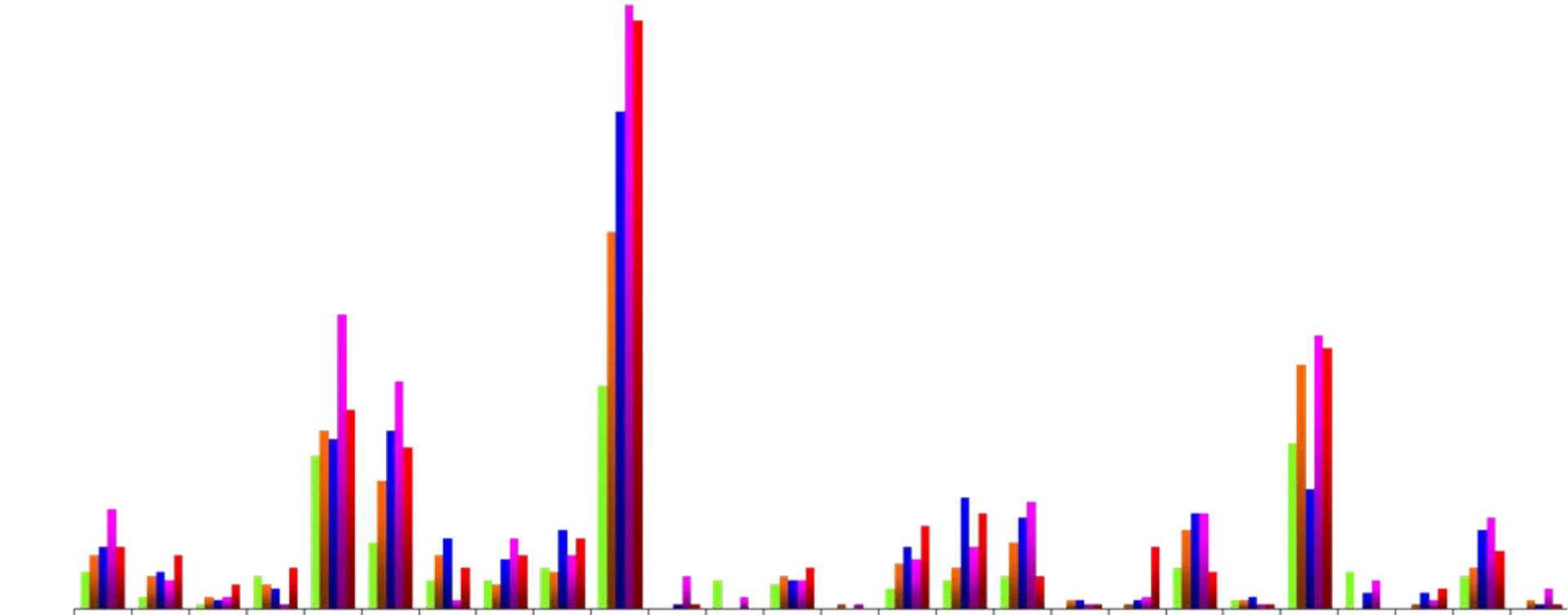
Great natural catastrophes: Overall losses and insured losses – Absolute values and long-term trends
The chart presents the overall losses and insured losses – adjusted to present values. The trend curves verify the increase in catastrophe losses since 1950.



Type of disasters 2004-2008

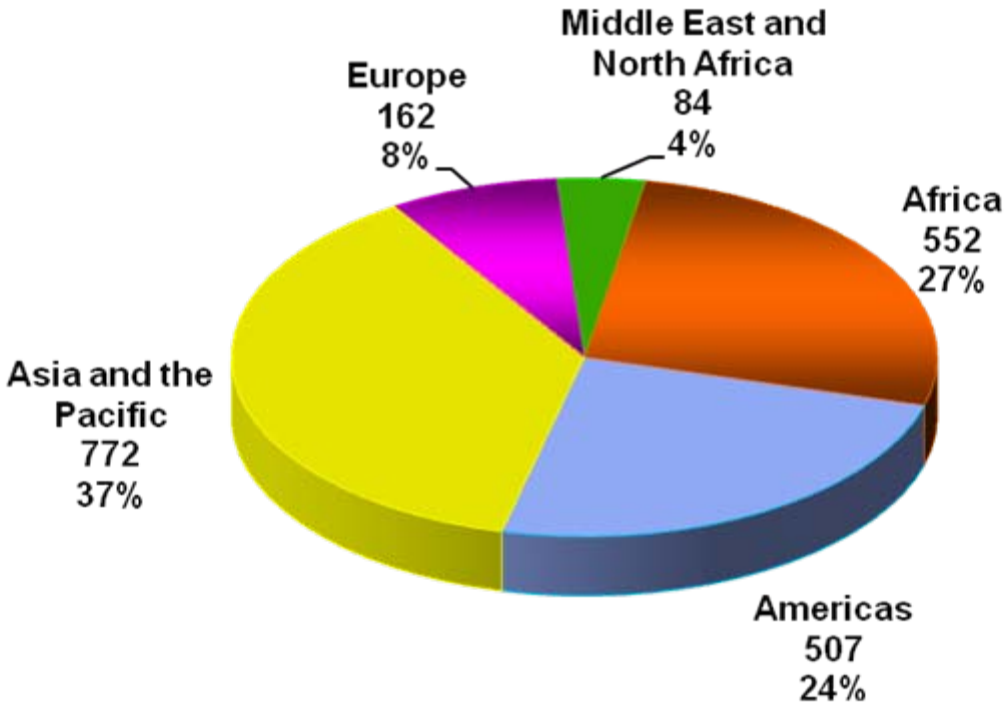


More disasters 2004-2008

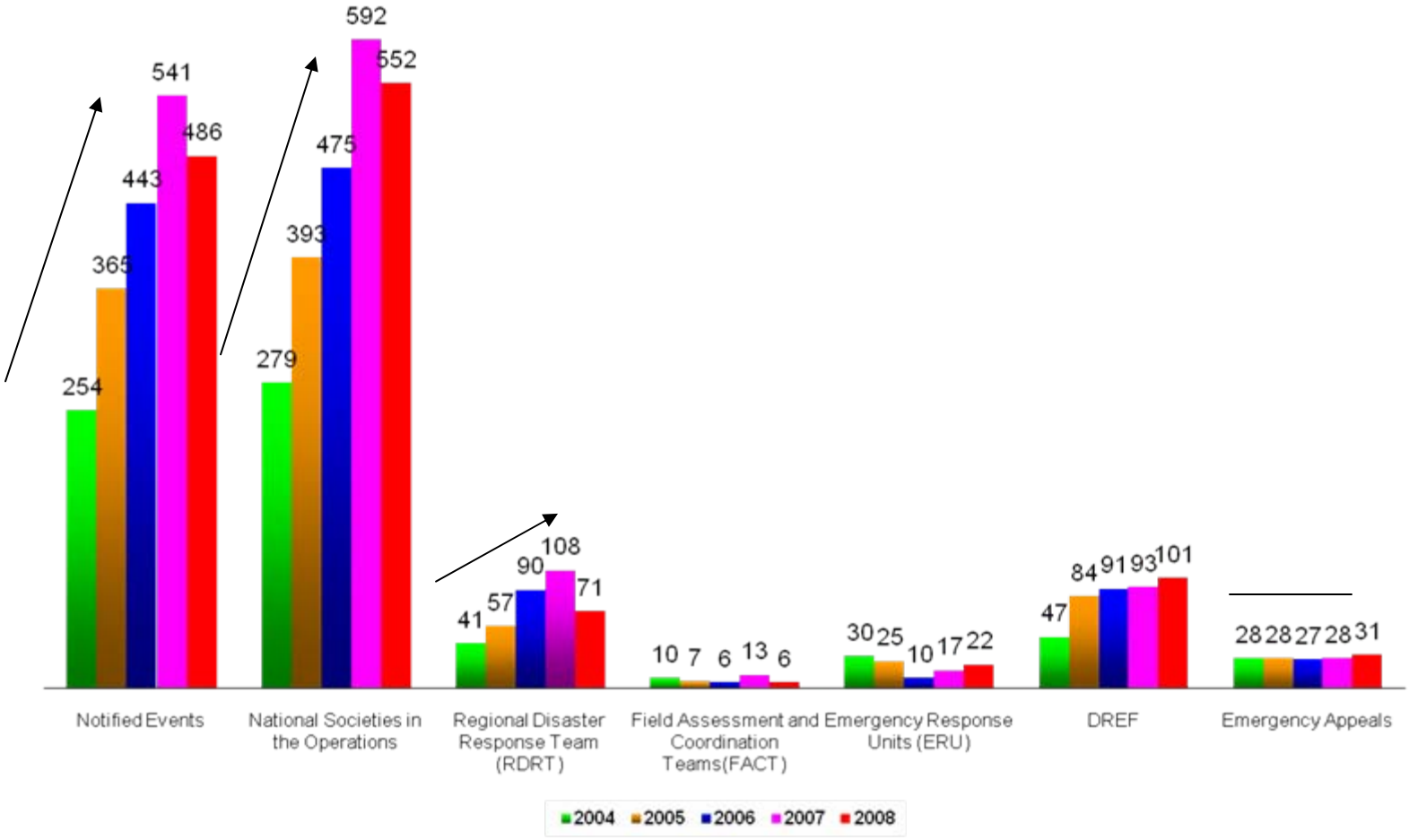


	Civil Unrest	Cold Wave	Complex Emergency	Drought	Earthquake	Epidemic	Famine	Fire	Flash Flood	Floods	Heat Wave	Insect Infestation	Land Slide	Mud Slide	Other	Population Movement	Severe Local Storm	Snow Avalanche	Storm	Tropical Disturbance	Tornado	Tropical Cyclone	Tsunami	Violent Wind	Volcano	Wild Fire
2004	9	3	1	8	37	16	7	7	10	54	0	7	6	0	5	7	8	0	0	10	2	40	9	0	8	0
2005	13	8	3	6	43	31	13	6	9	91	0	0	8	1	11	10	16	2	1	19	2	59	0	1	10	2
2006	15	9	2	5	41	43	17	12	19	120	1	0	7	0	15	27	22	2	2	23	3	29	4	4	19	1
2007	24	7	3	1	71	55	2	17	13	146	8	3	7	1	12	15	26	1	3	23	1	66	7	2	22	5
2008	15	13	6	10	48	39	10	13	17	142	1	0	10	0	20	23	8	1	15	9	1	63	0	5	14	1

Disasters by region 2004-2008



Emergency response by year



Challenges

Challenges 1/4

- 100 % increase in number of disaster in the last 4 years
  - Mostly hydrological
  - Related increase in epidemics
  - Mostly smaller disasters

Challenges 2/4

- Increase in climatic anomalies
  - Poorer public health behaviour
  - Increased psychological stress
  - Poorer security behaviour
  - Lack of government and community preparedness

Challenges 3/4

- Multiple impacts
  - Threat to livelihood and recovery
  - Psychological impact
  - Response challenges

Challenges 4/4

- Longer term events
  - Shelter challenges
  - Displacement and return issues
  - Livelihoods

Risk and response

- Focus on early warning/early action
- Disaster risk reduction
- Increase response capacity

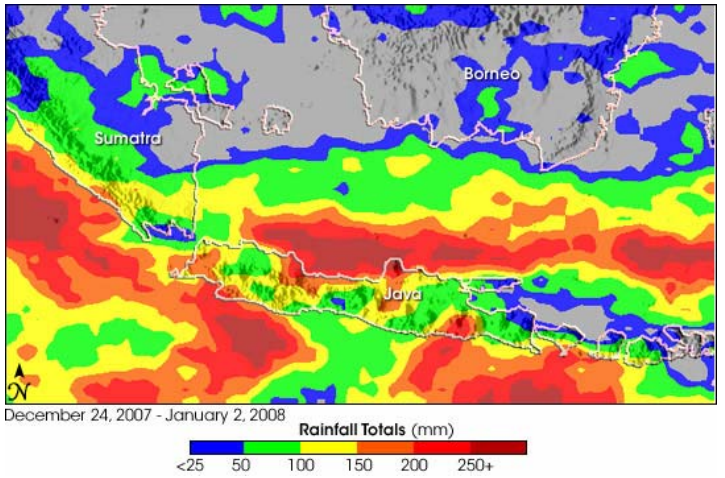
Early warning

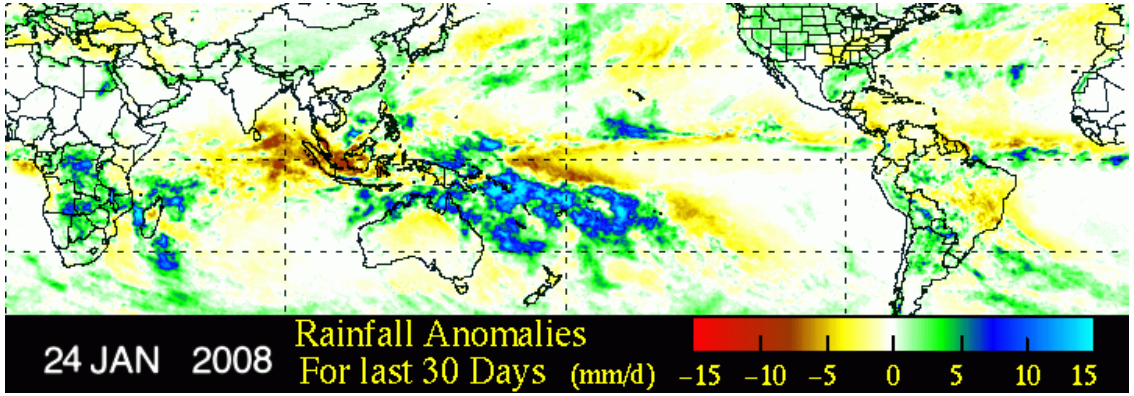
Verification vs prediction

- Most current tools are for verification
- Need to invest more in prediction to move toward early warning / early action

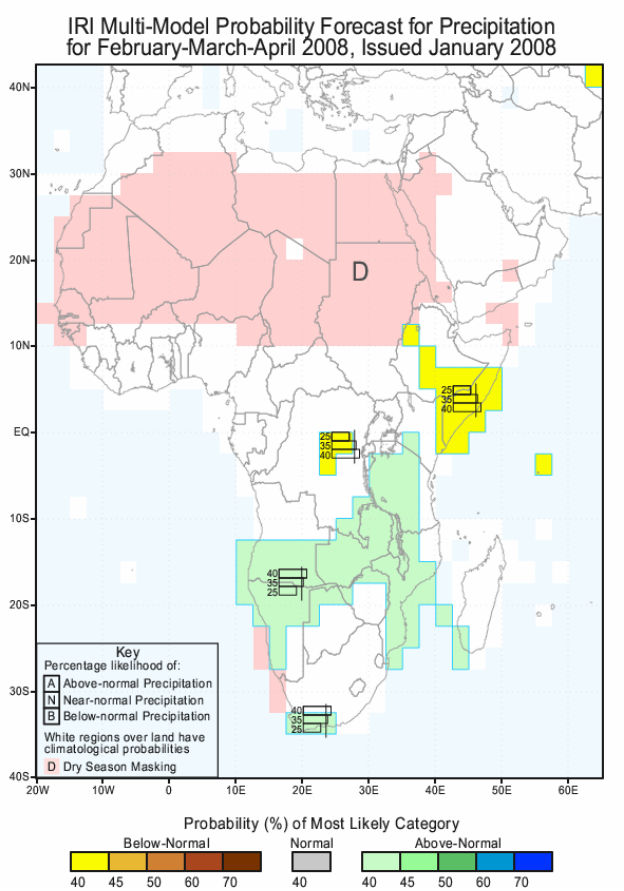
Science can help

- We can monitor but we do not have analysis capacities
- Scientists can.

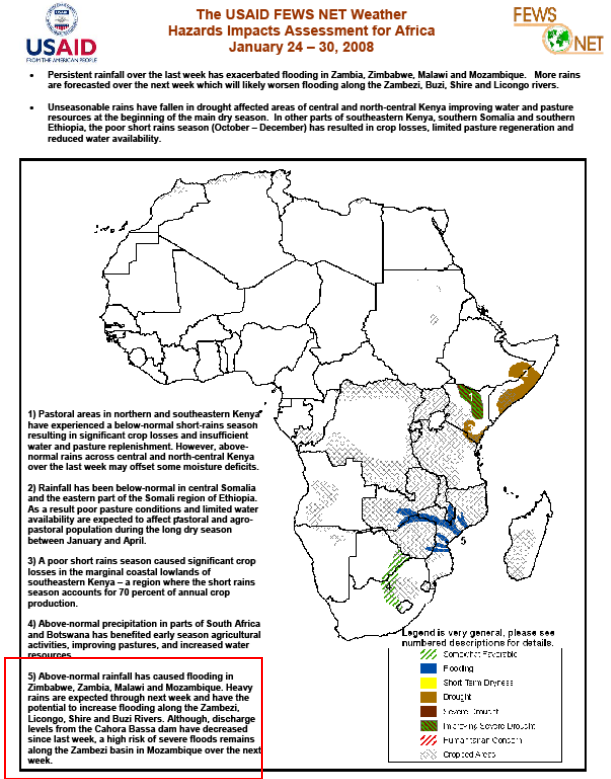




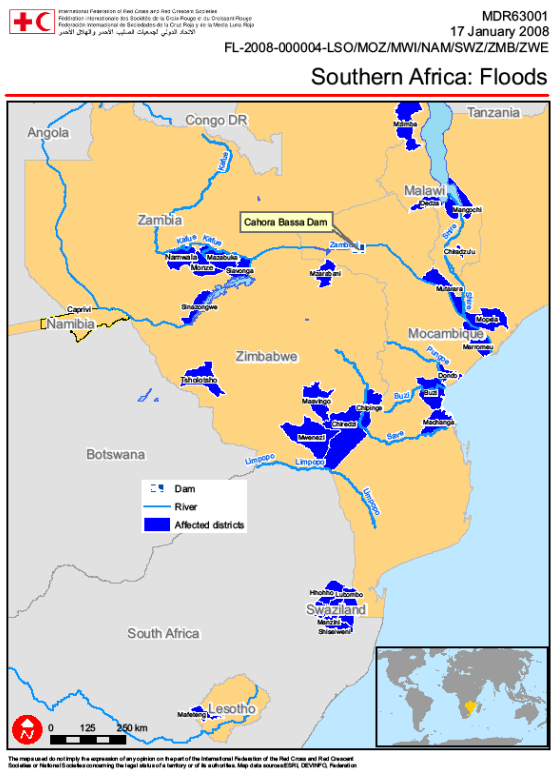
Seasonal forecast



One week forecast



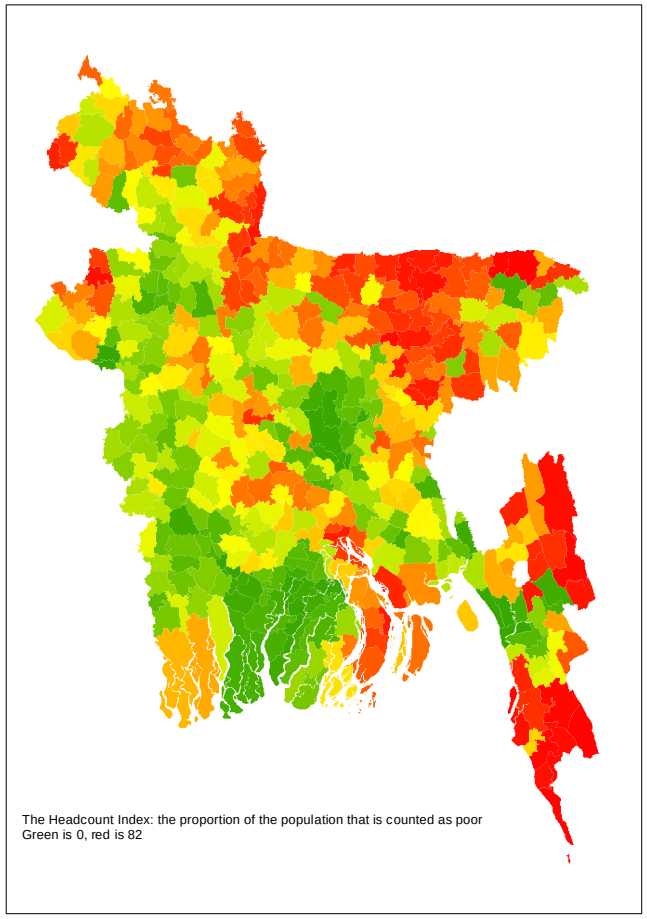
Observation



Above-normal rainfall has caused flooding in Zimbabwe, Zambia, Malawi and Mozambique. Heavy rains are expected through next week and have the potential to increase flooding along the Zambezi, Licongo, Shire and Buzi Rivers. Although, discharge levels from the Cahora Bassa dam have decreased since last week, a high risk of severe floods remains along the Zambezi basin in Mozambique over the next week.

CIESIN (Center for International Earth Science Information Network)

- Specializes in on-line data and information management, spatial data integration
- Provides data on population, poverty, vulnerability, …



IRI
Data Library
Maproom
ENSO
Fire
Food Security
Global
Health
International Federation
Local
Regional
International Federation
Forecasts
Forecasts
day1fcstapcp
day2fcstapcp
day3fcstapcp
day4fcstapcp
day5fcstapcp
day6fcstapcp
instructions
help@iri
Printable Page

International Federation
of Red Cross and Red Crescent Societies

Precipitation Forecast in Context Map Tool

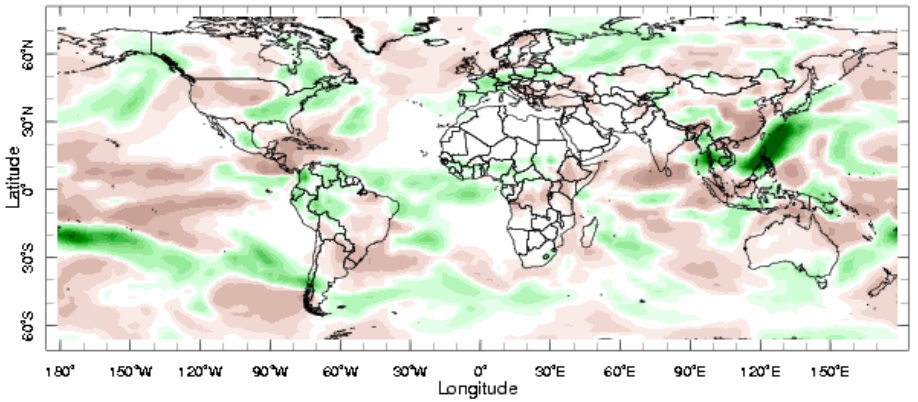
The International Research Institute for Climate and

Map Selection

- Six-Day Total Forecast Precipitation (ESRL)
- (•) Six-Day Total Forecast Precipitation Anomaly (ESRL)
- Six-Day Total Forecast Precipitation Percentile (ESRL)
- Six-Day Total Forecast Precipitation as Percent of Mean Monthly Total (ESRL)
- Seasonal Precipitation Forecast (IRI)
- PiC: Same Tendency in Seasonal Forecast and 3-Month Precipitation Observation (IRI)
- PiC: Reversed Tendency Between Seasonal Forecast and 3-Month Precipitation Observation (IRI)
- Monthly Precipitation Climatology (CPC)
- GPWv3 Year 2005 Projected U.N.-Adjusted Population Count (CIESIN/SEDAC)
- Global Distribution of Poverty, Infant Mortality Rate, Year 2000 (CIESIN/SEDAC)

Forecast Start Time: 0000 14 May 2008 | 0000 13 May 2008

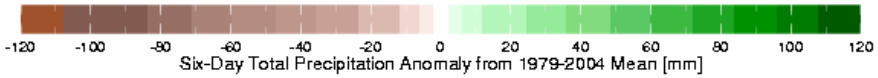
76.25N



66.25S

Forecast for 14-19 May 2008 Issued 0000 14 May 2008

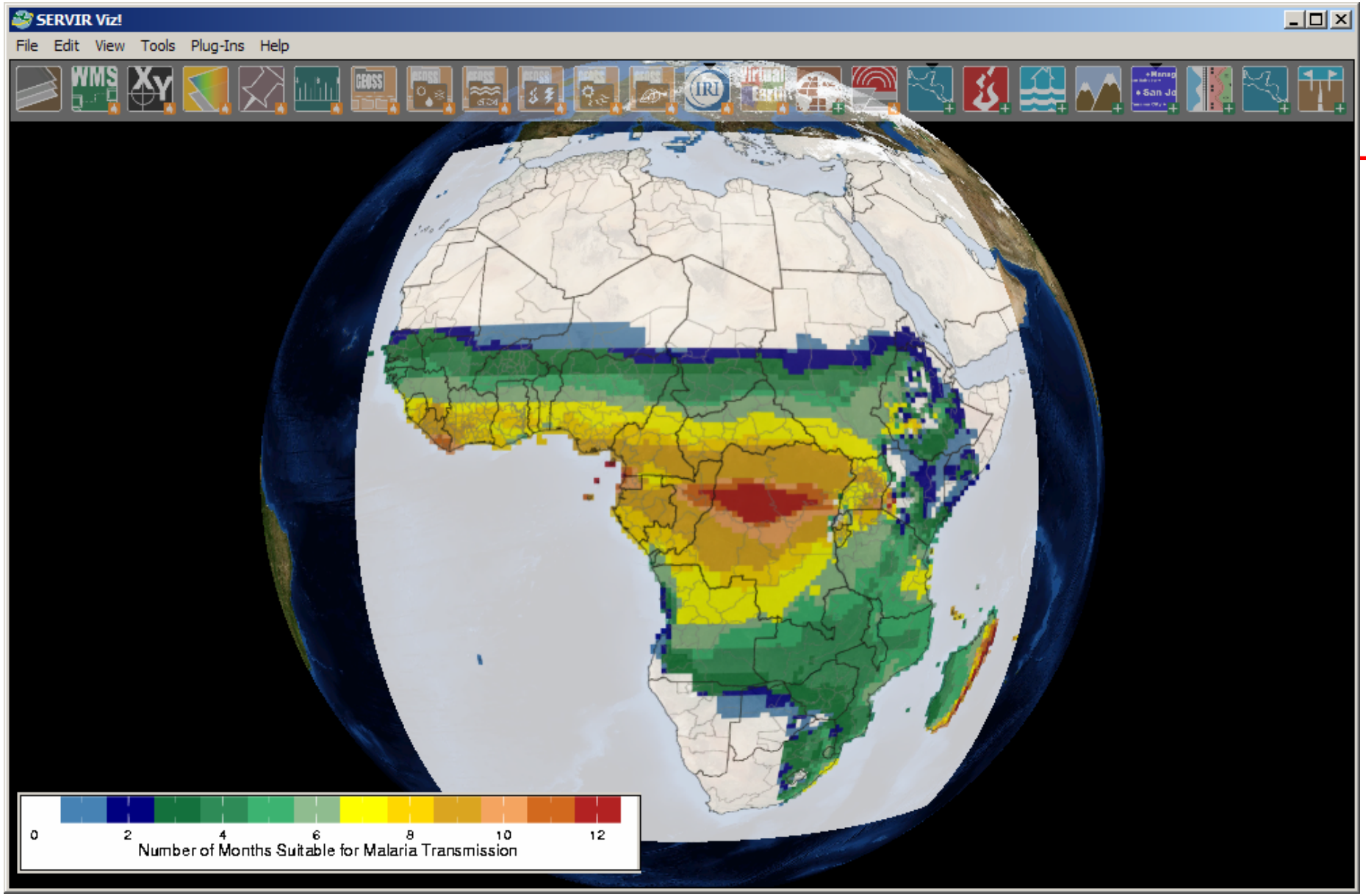
178.75E | 178.75E



This map displays the difference (in millimeters) between the current six-day total forecast precipitation value and the long-term (1979-2004) mean six-day total precipitation value in the model climatology for the same time of year. Although the precipitation anomaly expresses how much the currently forecast precipitation value differs from the long-term "normal" in terms of a precipitation amount, it does not clearly specify how unusual that difference is for that particular location or time of year. For instance, while an anomaly of 30 mm may be significant in North Africa, it might not be significant in Indonesia. The forecast data are courtesy of the NOAA ESRL Reforecast project.

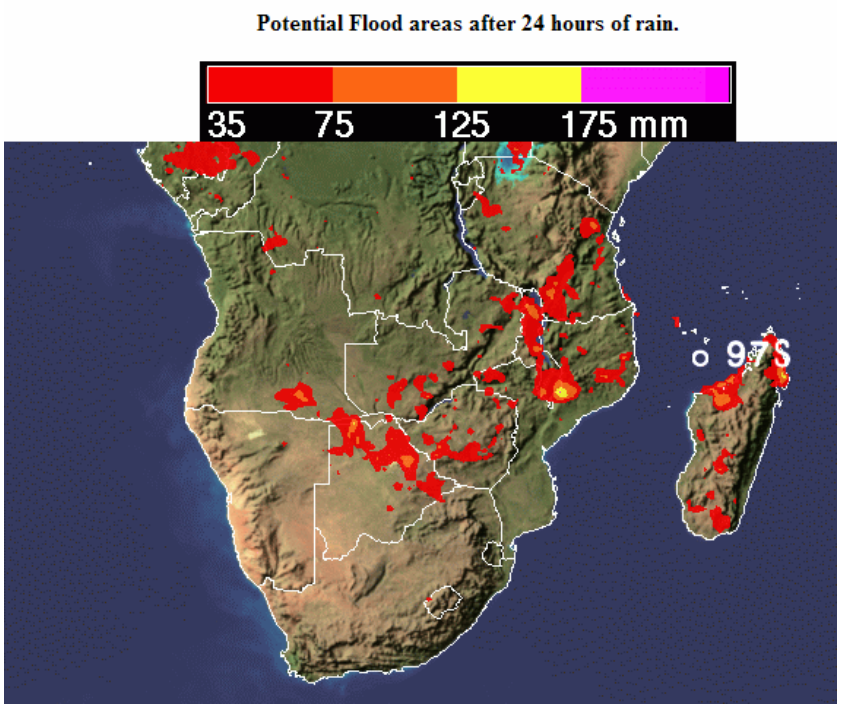
Single-Day (24-Hour) Total Precipitation Forecast Maps					
Day 1 Precipitation Forecast Maps	Day 2 Precipitation Forecast Maps	Day 3 Precipitation Forecast Maps	Day 4 Precipitation Forecast Maps	Day 5 Precipitation Forecast Maps	Day 6 Precipitation Forecast Maps

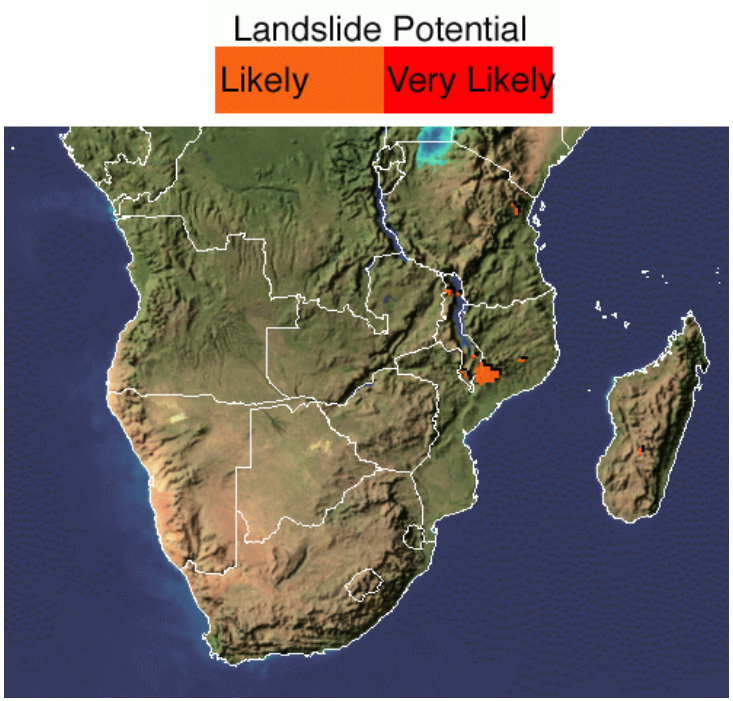
http://iridl.ldeo.columbia.edu/maproom/.IFRC/.Forecasts/



Number of months during the year that are suitable for malaria transmission based on climatological conditions

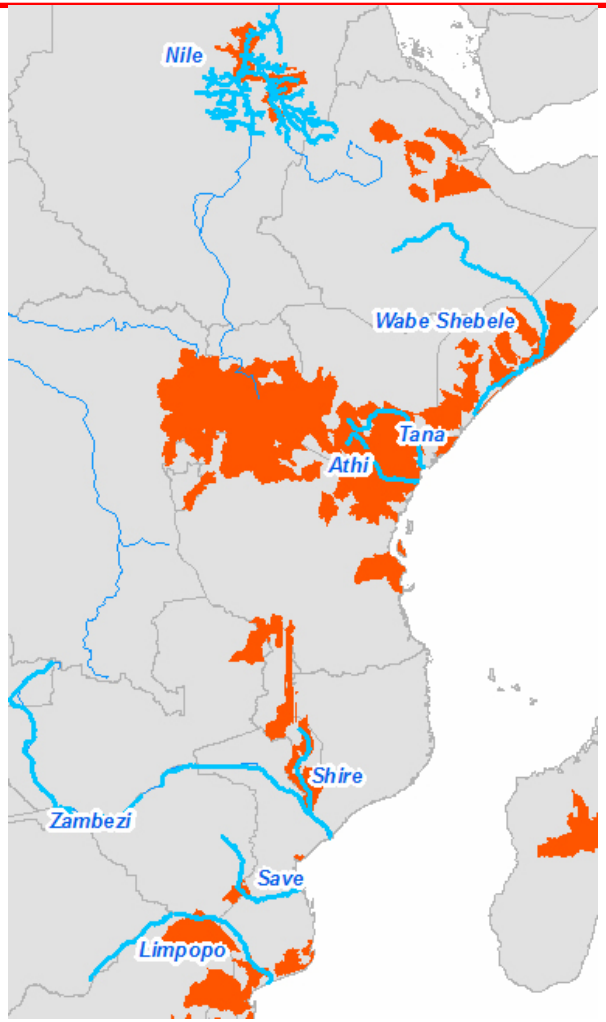
Flood potential and landslide potential





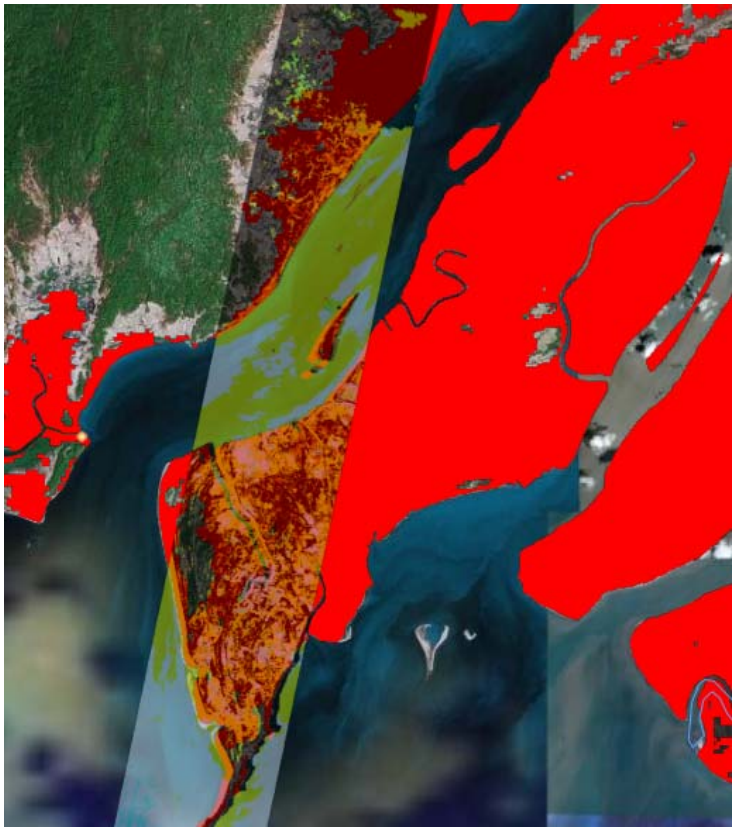
Relevant basins

- Floods detection and forecast in flood-prone basins

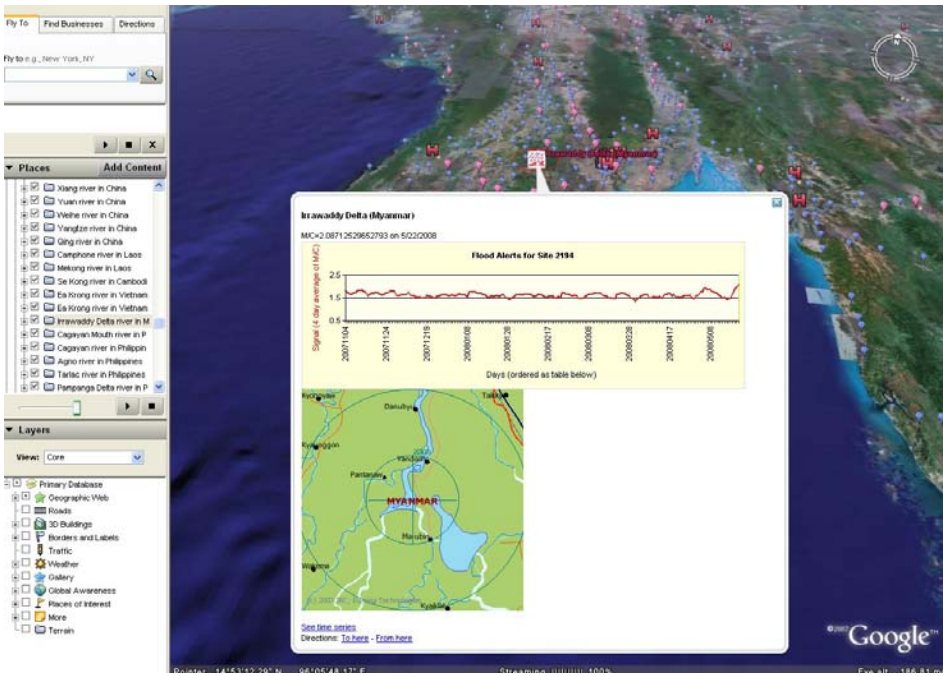


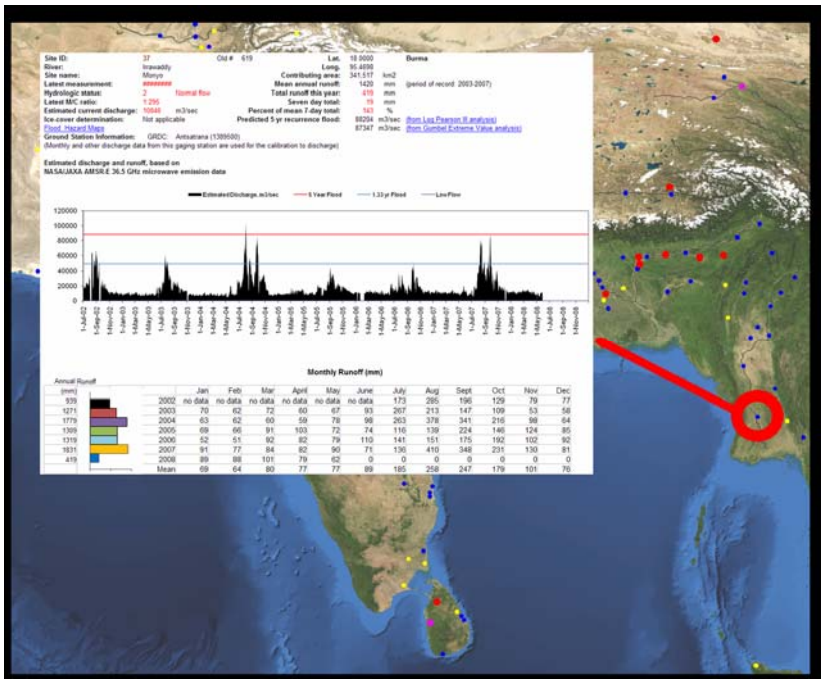
Myanmar – NASA

- Extend of floods
- Red: MODIS derived
- Green, yellow, orange, black : Flood classifier on Hyperion



Myanmar - Dartmouth



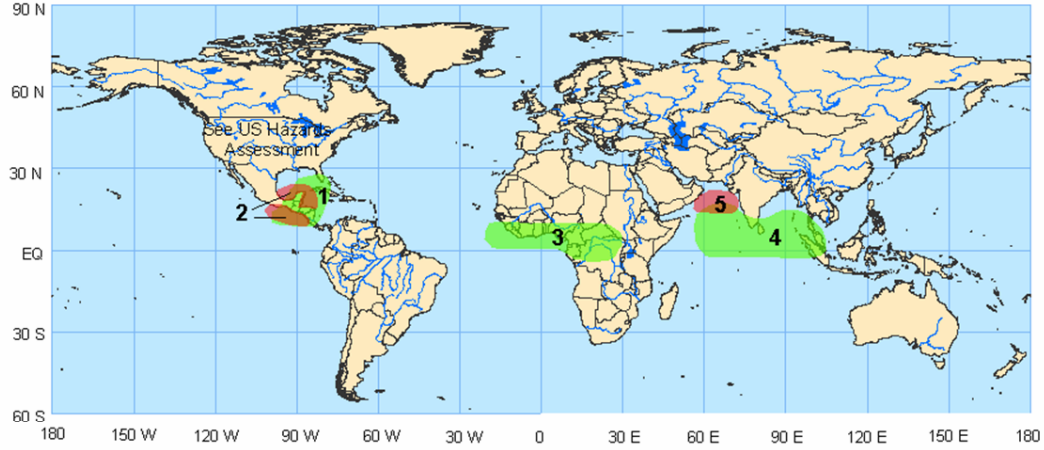


Potential hazards - NOAA

Potential hazards rel. to climate, weather and hydrological events (NOAA)

Issued: 6/2

Week 1 Outlook – Valid: June 3 -9, 2008



1. An increased chance for above-average rainfall for the eastern Pacific, parts of Central America, southern Mexico, the Gulf of Mexico and southern Florida. Continued strong anomalous low-level convergence, the remnants of Tropical Storm Arthur, further potential tropical development and above-average sea surface temperatures (SST) in some areas are expected to contribute to continued wet conditions and flooding in mountainous terrain. **Confidence: High**

2. Favorable conditions exist for tropical cyclogenesis for the western Caribbean Sea, southern Gulf of Mexico, the eastern Bay of Campeche and the eastern Pacific. Continued active convection, low-level westerly flow, areas of low vertical wind shear and above average SSTs in some areas increase the threat for tropical development. **Confidence: High**

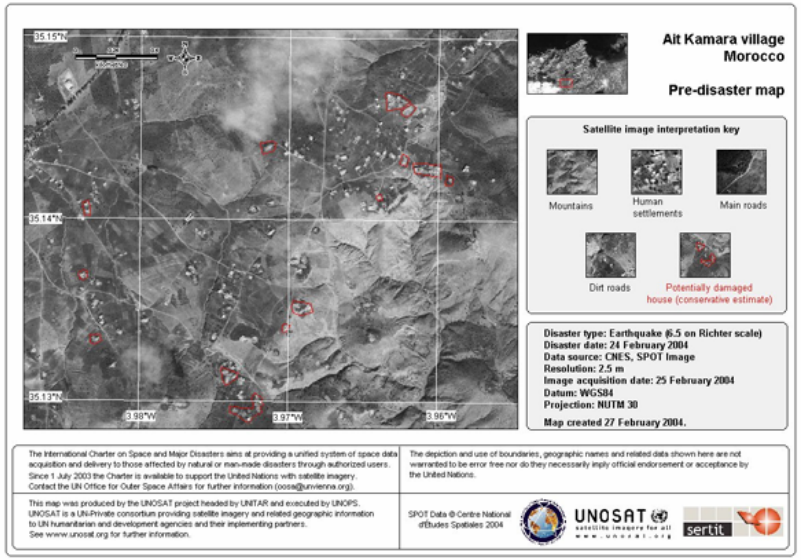
3. An increased chance for above-average rainfall for parts of equatorial Africa. Wet conditions are expected in this area as a result of the continued evolution of the MJO as well as above average SSTs in some areas in the Gulf of Guinea. **Confidence: Moderate**

4. An increased chance for above-average rainfall for the equatorial Indian Ocean, southern India and western Indonesia. Wet conditions are expected in this area as a result of the continued evolution of the MJO as well as above average SSTs in some areas. **Confidence: Moderate**

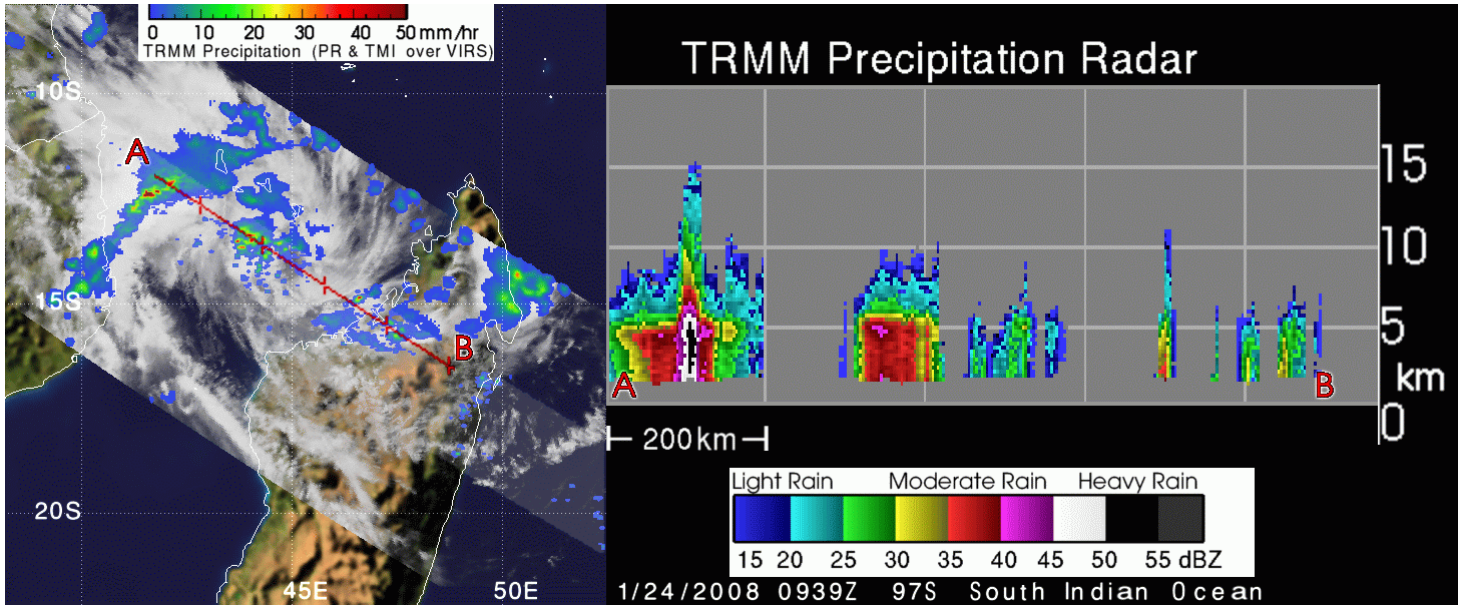
5. Favorable conditions exist for tropical cyclogenesis for the Arabian Sea. As a result of the MJO - active convection, increasingly more prevalent low-level westerly flow equatorward of this region, areas of low vertical wind shear and above average SSTs in some areas increase the threat for tropical development. **Confidence: Moderate**

Please note: Confidence estimates are subjective in nature and are not based on an objective scheme. The estimates are given to provide additional information to the user.

Pre- and post- event analysis

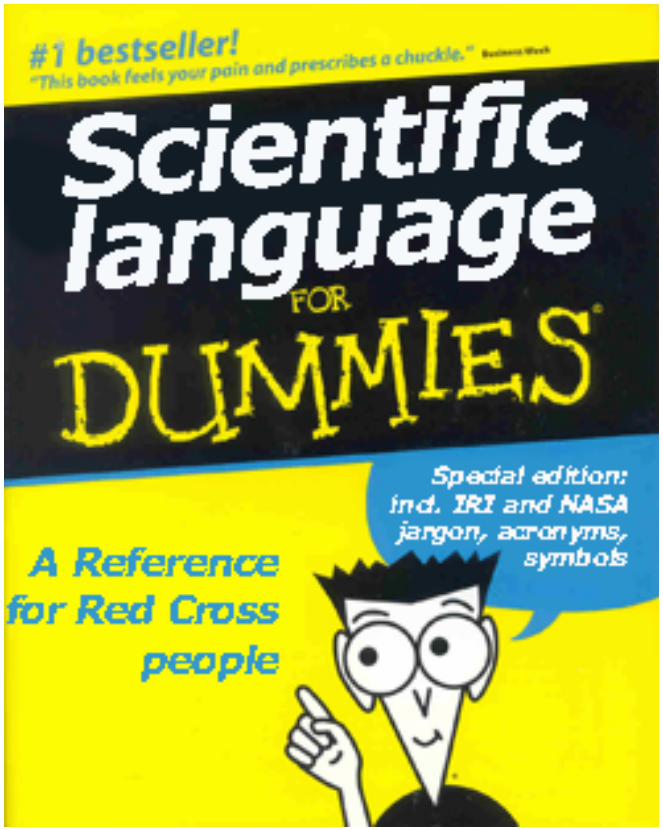


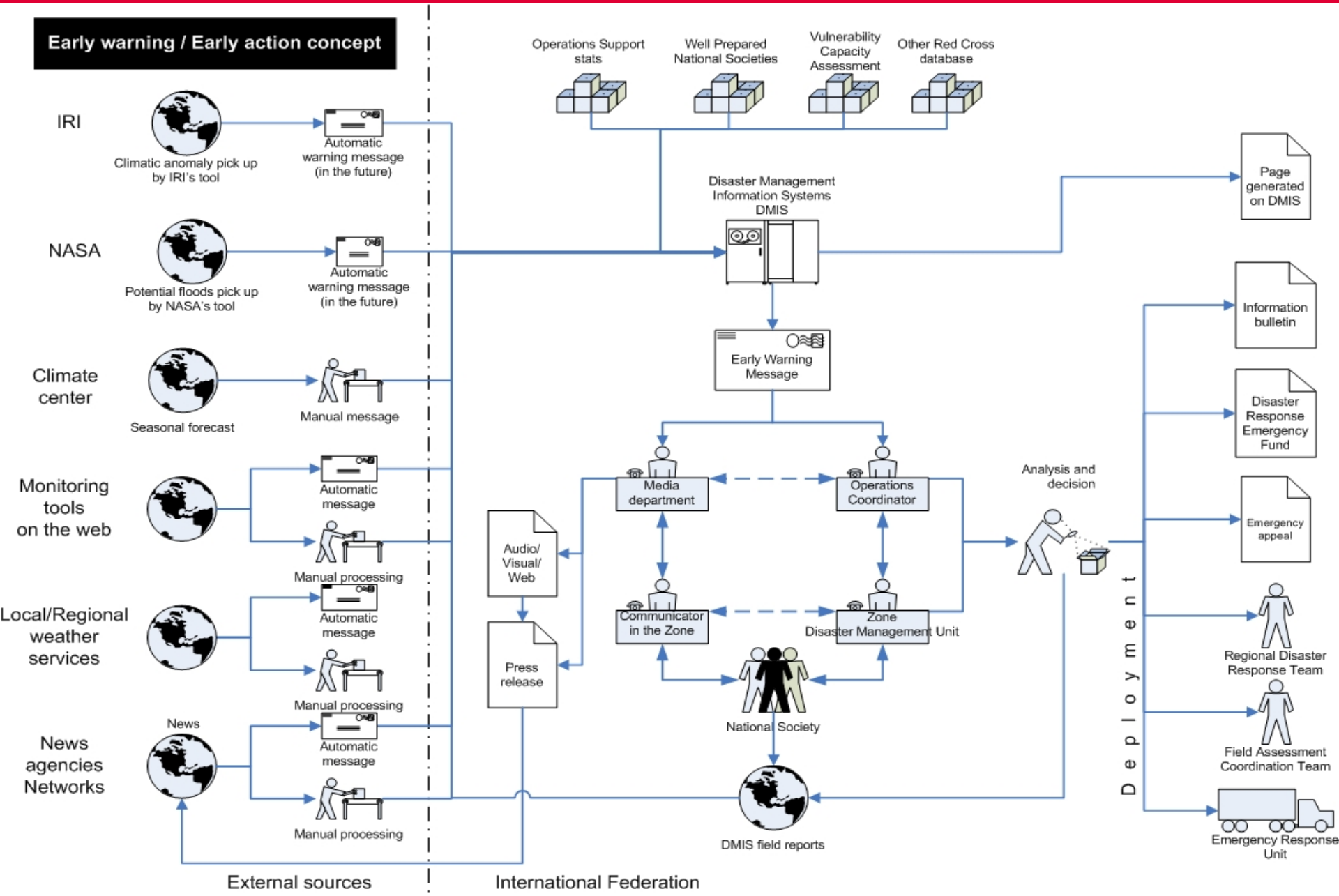
Hurricane intensification



Science and Federation

- Challenge of converting scientific data into vulnerability risks and analysis
- How to manage the last mile with national governments, met offices and communities




Early warning / Early action concept
IRI
Climatic anomaly pick up by IRI's tool
Automatic warning message (in the future)
NASA
Potential floods pick up by NASA's tool
Automatic warning message (in the future)
Climate center
Seasonal forecast
Manual message
Monitoring tools on the web
Automatic message
Manual processing
Local/Regional weather services
Automatic message
Manual processing
News agencies Networks
News
Automatic message
Manual processing
External sources
Operations Support stats
Well Prepared National Societies
Vulnerability Capacity Assessment
Other Red Cross database
Disaster Management Information Systems DMIS
Early Warning Message
Media department
Operations Coordinator
Audio/ Visual/ Web
Press release
Communicator in the Zone
Zone Disaster Management Unit
National Society
DMIS field reports
International Federation
Analysis and decision
Deployment
Page generated on DMIS
Information bulletin
Disaster Response Emergency Fund
Emergency appeal
Regional Disaster Response Team
Field Assessment Coordination Team
Emergency Response Unit

Scientific authority

- The authority and credibility of the scientific community help us make relevant operational decisions.
- Seasonal event – disaster preparedness, moving supplies, increased training, public health education, capacity building
- Specific event – pre-disaster funding, mobilize volunteers, materials, transport, communication, talks with government and UN representative