

World Meteorological Organization

Contribution of National Meteorological and Hydrological Services in Europe for Disaster Risk Reduction

Filipe D. F. Lúcio, World Meteorological Organization,
Disaster Risk Reduction Programme

*European Network of National Platforms, Divonne les Bains,
5-6 December 2007*

Topics

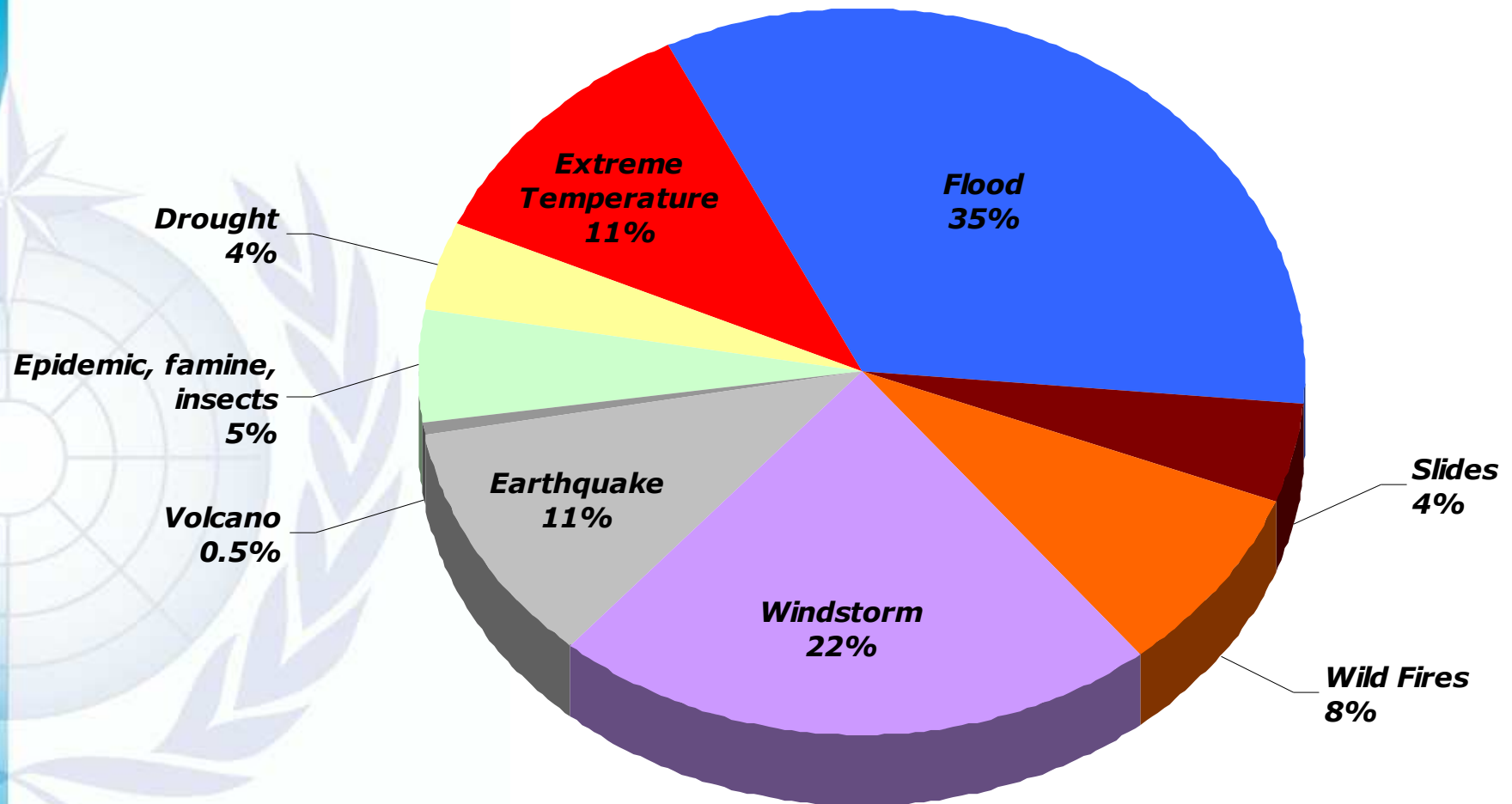
- Disaster Statistics in Europe
- WMO Disaster Risk Reduction Programme
- Contribution of NMHSs in Support of DRR at national level
- Opportunities for Leveraging Regional Cooperation in support of National DRR



Disaster Statistics in Europe

WMO
OMM

Number of Disasters (1980-2005)



84% of disasters were related to hydro-meteorological factors.

Source: EM-DAT: The OFDA/CRED International Disaster Database - www.em-dat.net - Université Catholique de Louvain - Brussels - Belgium

Loss of Human Life (1980-2005)

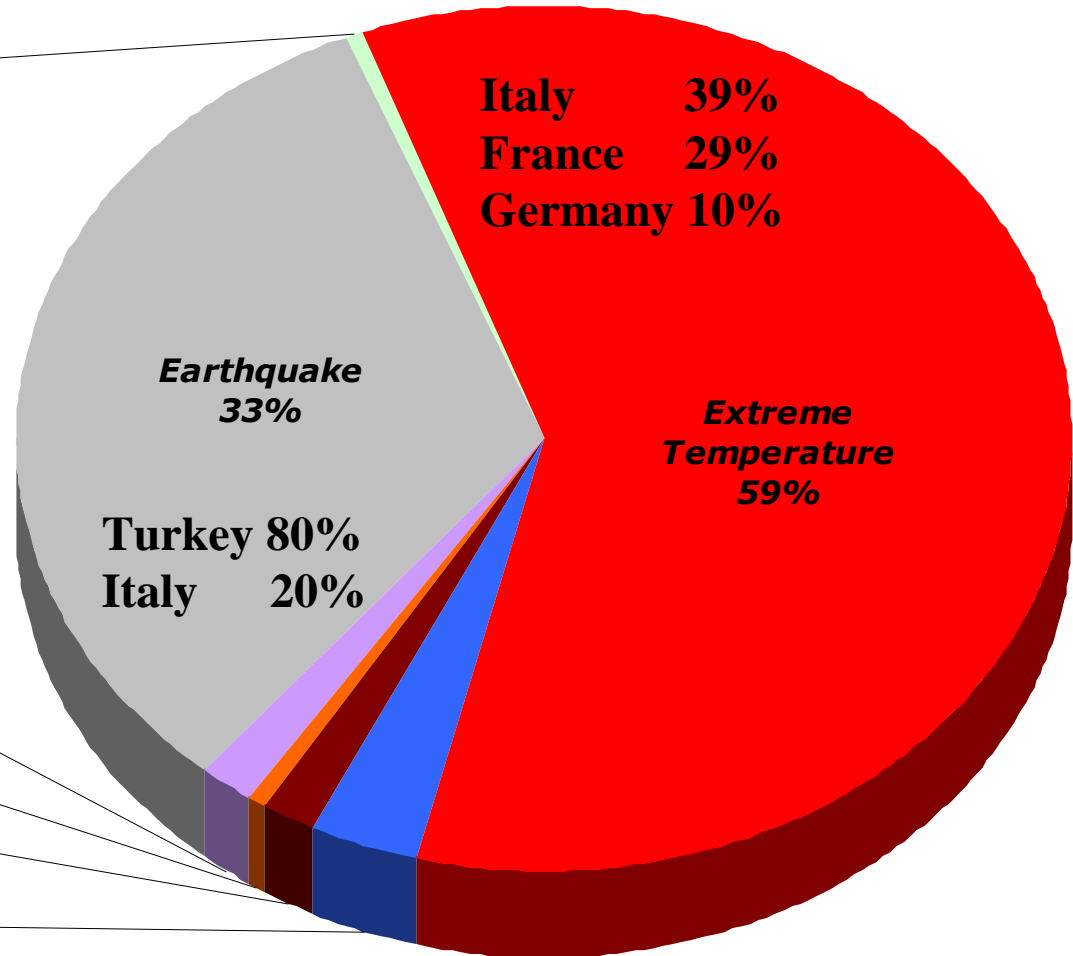
**Epidemic, famine,
insects**
0.5%

Windstorm
2%

Wild Fires
0.4%

Slides
1.8%

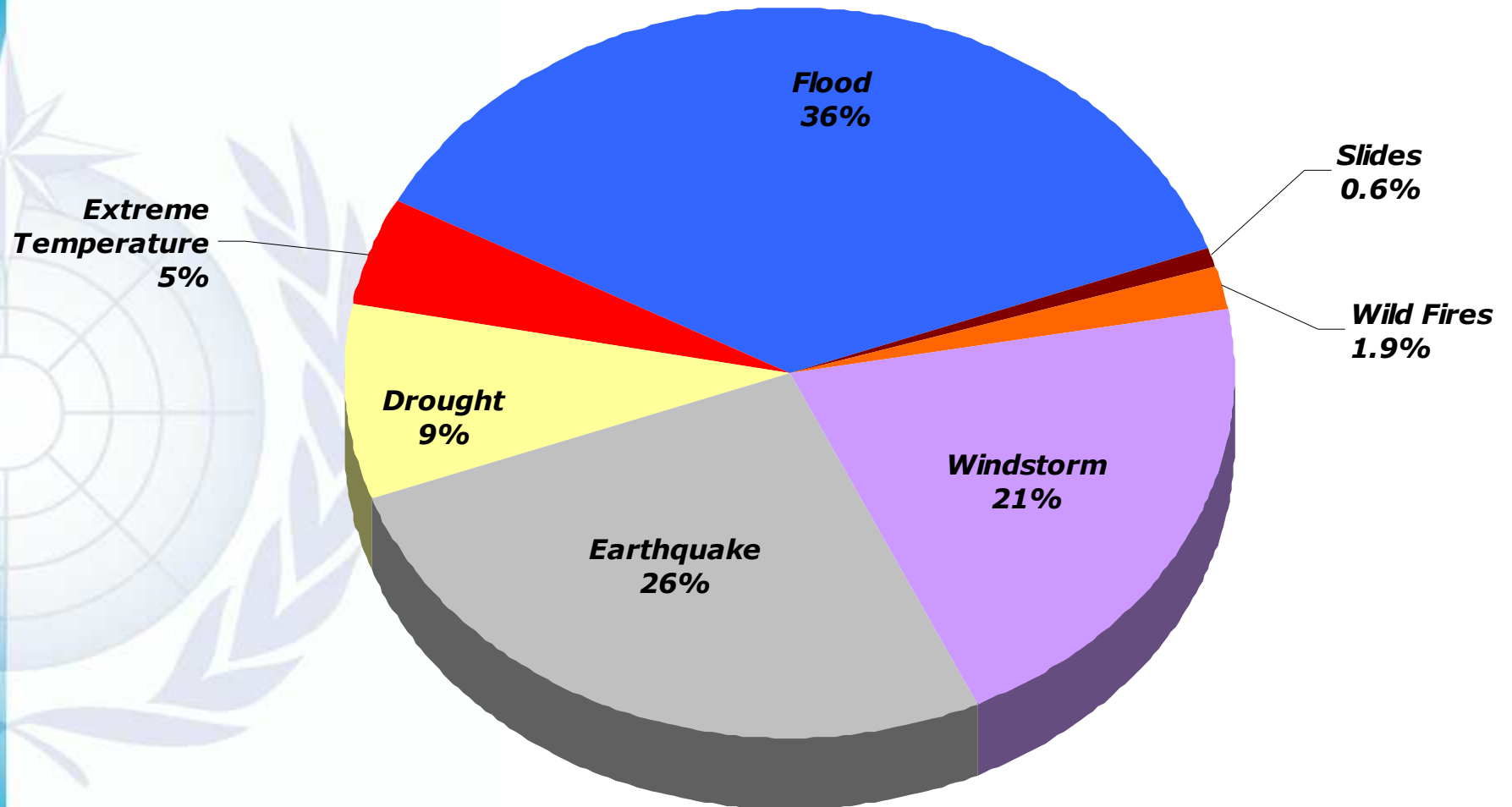
Flood
3%



70% of loss of life are related to hydro-meteorological factors

Source: EM-DAT: The OFDA/CRED
International Disaster Database - www.em-dat.net
- Université Catholique de Louvain - Brussels -
Belgium

Economic Losses (1980-2005)



74% of economic losses are related to hydro-meteorological factors

Source: EM-DAT: The OFDA/CRED International Disaster Database - www.em-dat.net - Université Catholique de Louvain - Brussels - Belgium



WMO Disaster Risk Reduction Programme

**WMO
OMM**

Brief Overview of WMO

- **Specialized Scientific and Technical Agency of the United Nations Responsible for Observing, Monitoring, Detecting, Forecasting and Warnings of Meteorological, Hydrological and Climate Conditions**
- **188 Members, Represented by the Heads of the National Meteorological and Hydrological Services at the WMO Governing Bodies**

Natural Hazards

Weather, Climate and Water ...



Primary mandate for: Severe storms, tropical cyclones (hurricanes and typhoons), storm surges, floods, cold spells, heat waves, cold waves, droughts, volcanic ash transport, air pollution, Sand and dust storms, etc.

Contributing to: Forest fires, locust swarms, health epidemics, tsunami, etc...

Disaster Risk Management and Hyogo Framework for Action 2005-2015

Governance and Organizational Coordination

Risk Identification

Historical hazard data
and analysis

Changing hazard trends

Vulnerability assessment

Risk quantification

Risk Reduction

Sectoral planning

Early Warning Systems

Emergency preparedness
planning

Education and training

Risk Transfer

Cat Insurance and
Bond Markets

Weather Derivatives

Knowledge Sharing

DRR Strategic Goals - Key Words

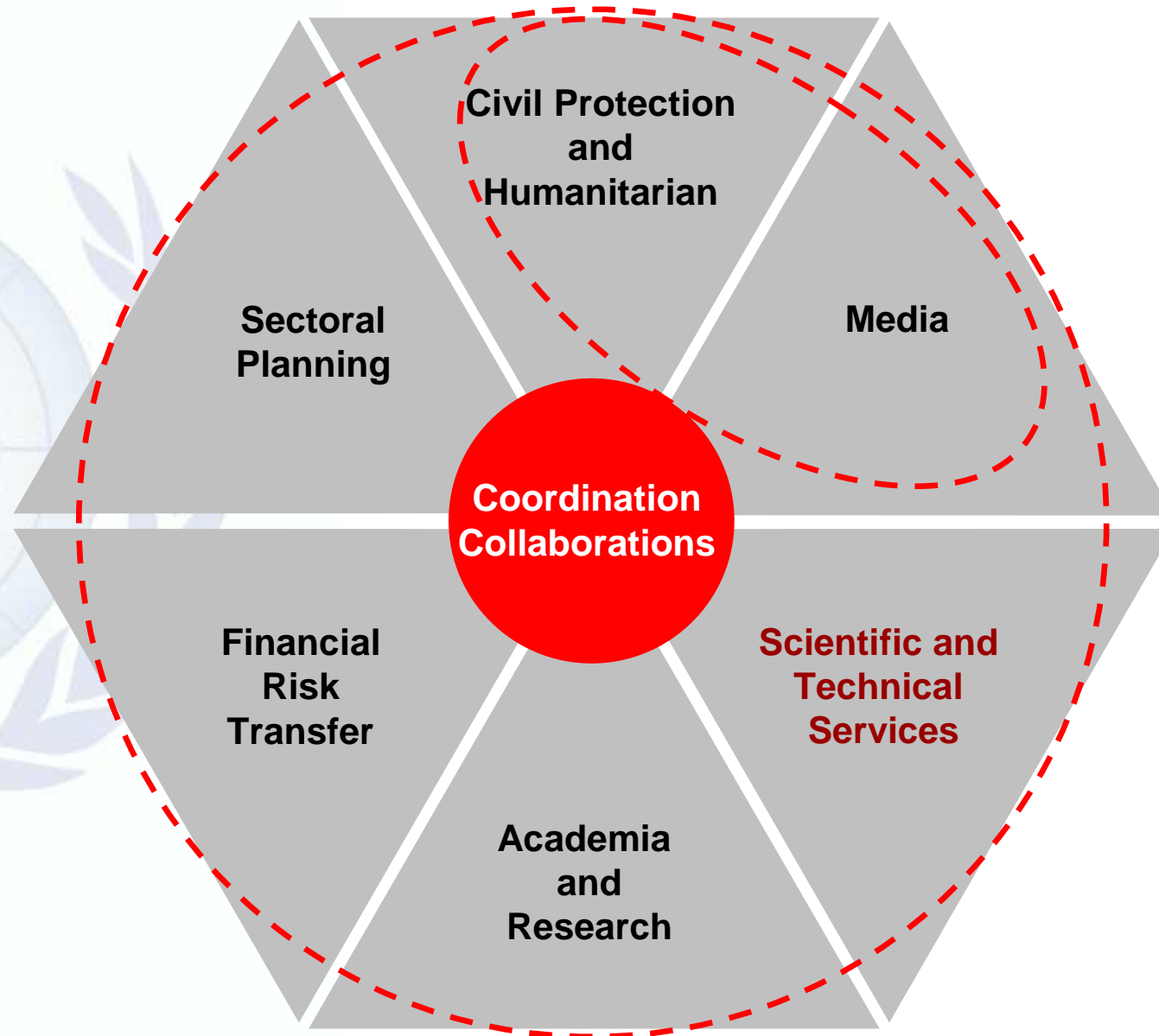
1. Strengthening and sustainability of **early warning systems**
2. Analyzing and providing hazard **information for risk assessment**
3. Delivery of **timely and understandable warnings and specialized forecasts -- driven by user requirements**
4. **Integration** of NMHSs' products and services in disaster risk reduction, and **public outreach campaigns**
5. Strengthening WMO/NMHS **cooperation and partnerships** with national and international disaster risk reduction organizations

WMO Action Plan for Disaster Risk Reduction

Implementation through regional and national projects, with following end results:

1. **Modernized** NMHSs and observing networks.
2. Strengthened national operational multi-hazard **early warning systems**.
3. Strengthened **hazard analysis** and hydro-meteorological **risk assessment** capacities.
4. Strengthened NMHSs **cooperation** with civil protection and **disaster risk management agencies**.
5. **Trained** management and staff of NMHS
6. **Enhanced** ministerial and public **awareness**

Need for **Coordination and Collaborations** Among Various Stakeholders



Need for Effective and Harmonized Governance, Organizational and Operational Mechanisms



Awareness, Knowledge Sharing, Capacity development

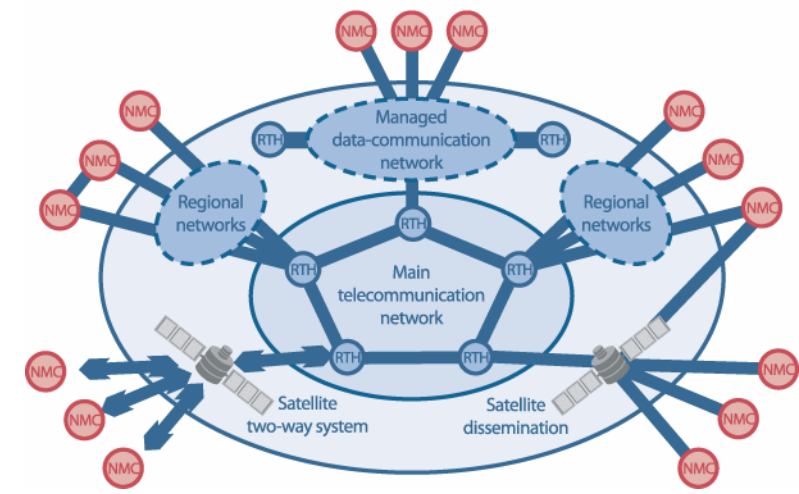
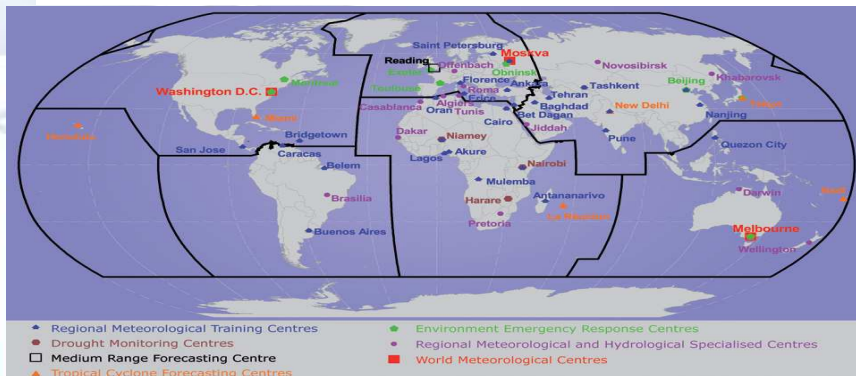
Global Coordination in Hazard Detection and Forecasting to Support MH EWS

Global Observing System



Coordinated Satellite System

Network of Regional Specialized Centres

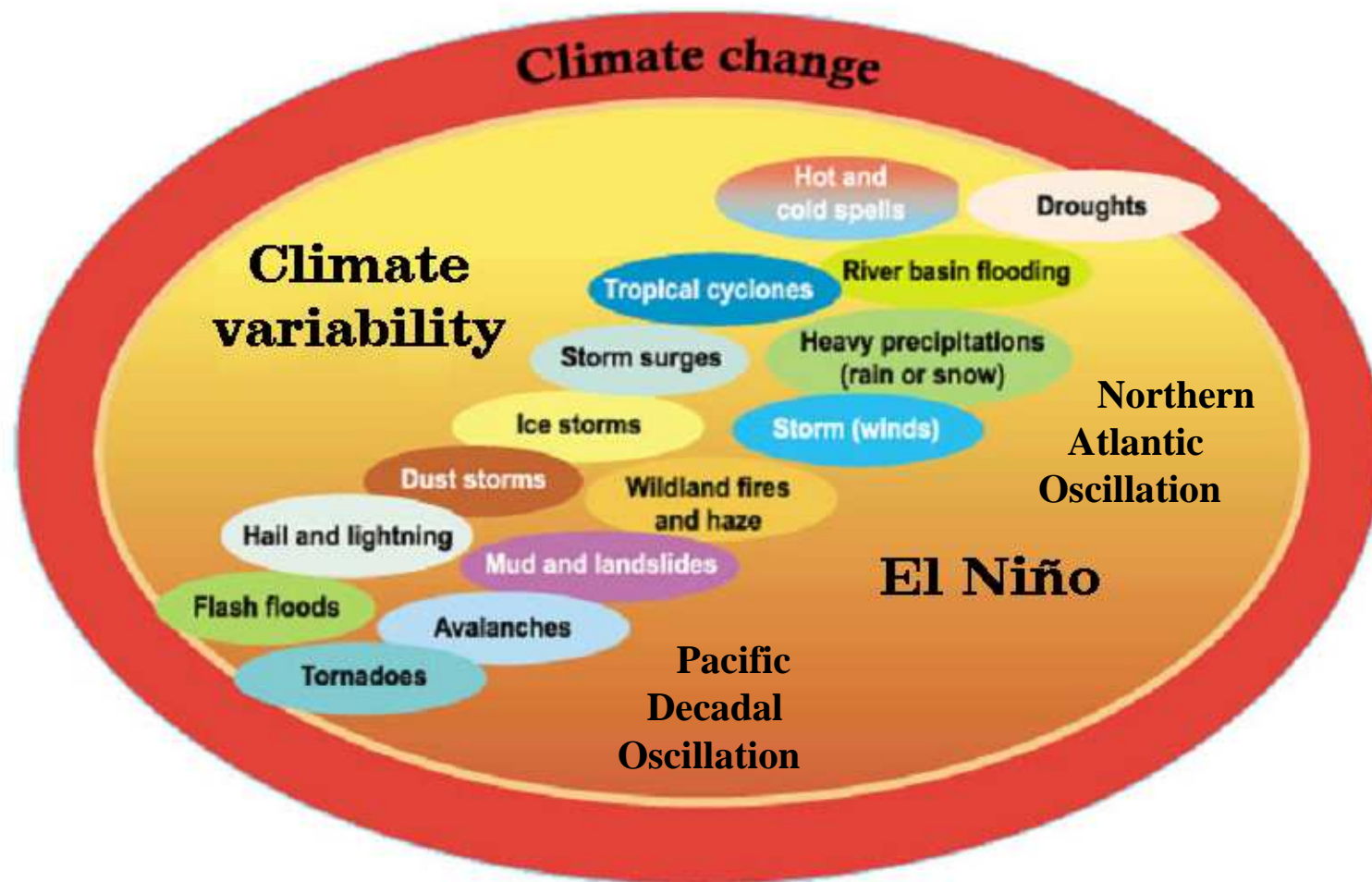


Global Telecommunication System

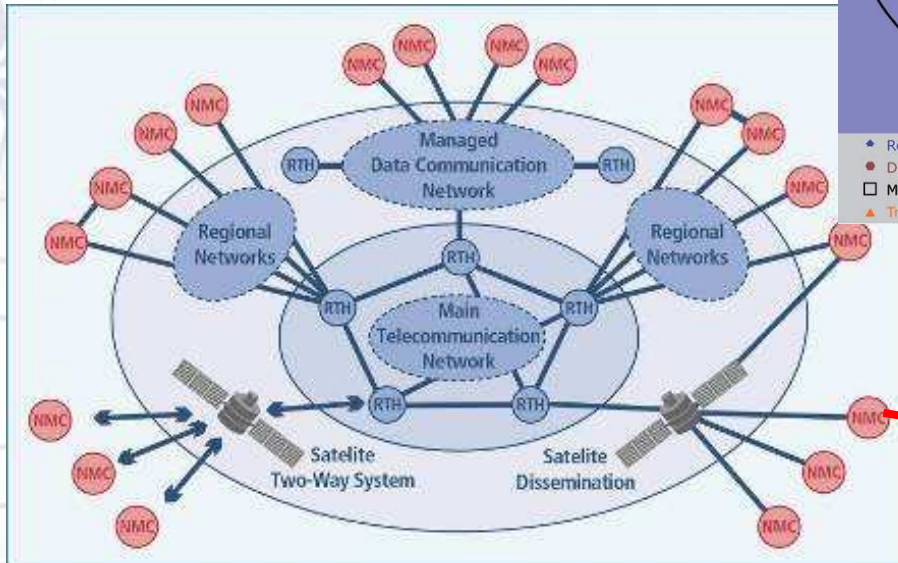
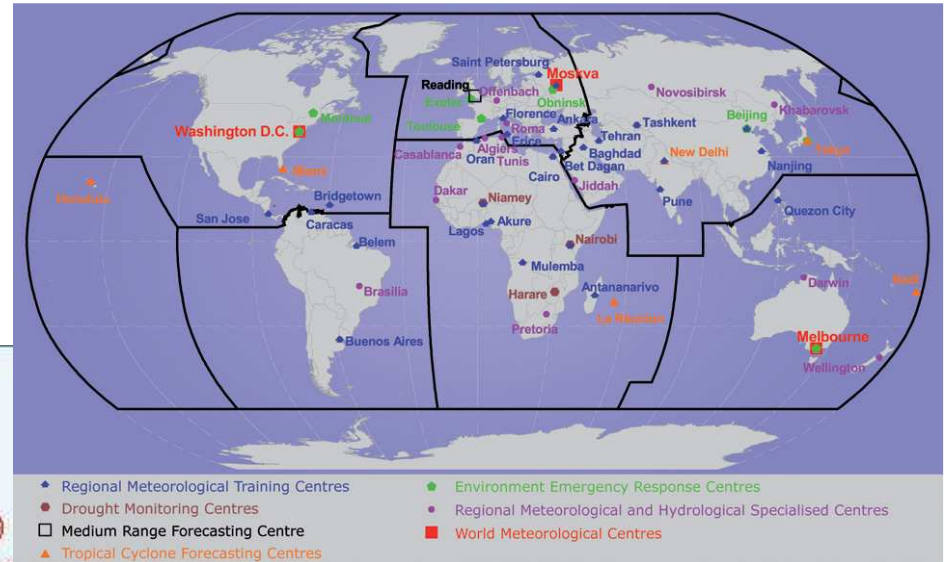
Operational Side: Global Coordination of Network of National Meteorological and Hydrological Services and Space Agencies

- Coordination of global observing networks
 - In situ and Satellites
- National data policy and exchange issues
- Standardization and protocols for information content, exchange, exchange
 - Observations, bulletins and forecasts
 - Sectoral requirements for products and services
- Global Telecommunication System (GTS)
- Global Data Processing and Forecasting System (GDPFS)
- International and Regional Cooperation Projects and capacity development of NMHS

Research Side: International Coordination of Scientific Research and Assessment
World Climate Research Programme (WCRP)
World Weather Research Programme (WWRP)/THORPEX
IPCC



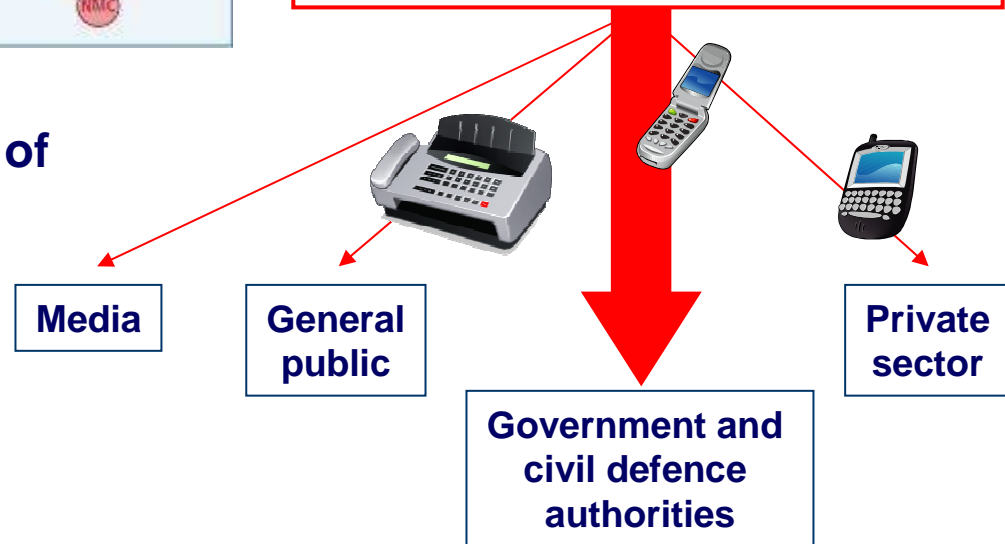
Communication and Dissemination



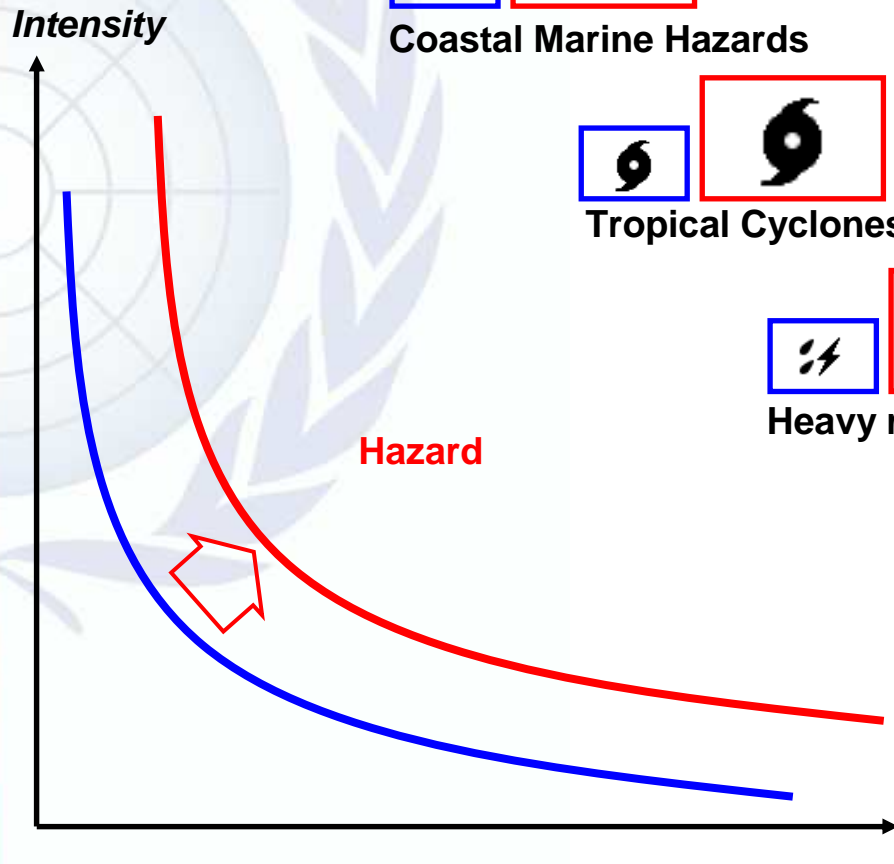
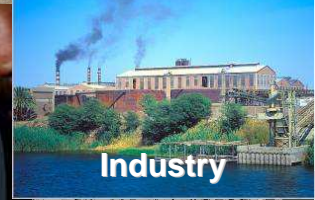
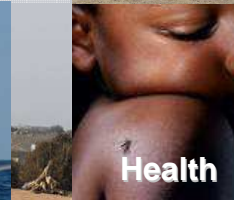
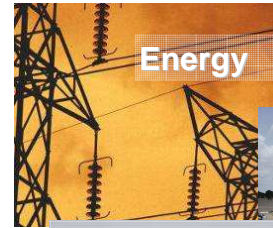
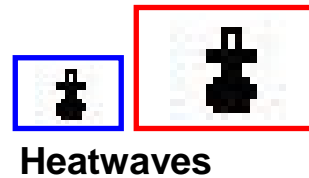
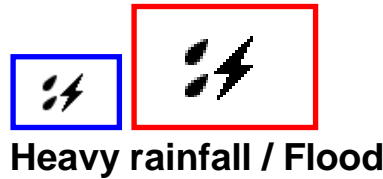
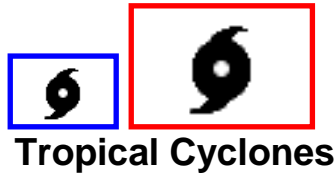
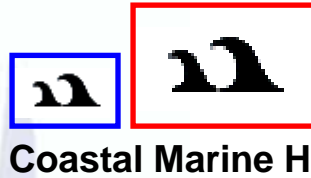
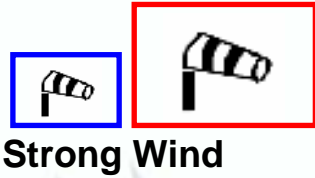
National Meteorological and Hydrological Services

National level: dissemination of authoritative warnings

- Hazards under the mandate of NMHS
- Hazards under the joint mandate of NMHS and another technical agency
- Hazard for which NMHS only provides supports (information / dissemination)



Increasing Risks under a Changing Climate



Exposure is increasing !

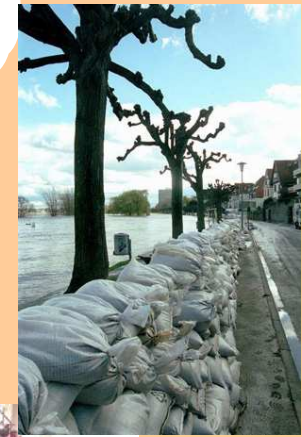


Need for Prevention and Mitigation

Effective Early Warning Systems



Community Preparedness



requirements

preventive actions



NATIONAL SERVICES (coordination)

Meteorological

Hydrological

Geological

Marine

Health (etc.)

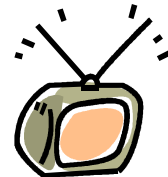
requirements

warning



warning

requirements



National to local governments

supported by DRR plans, legislation and coordination mechanisms

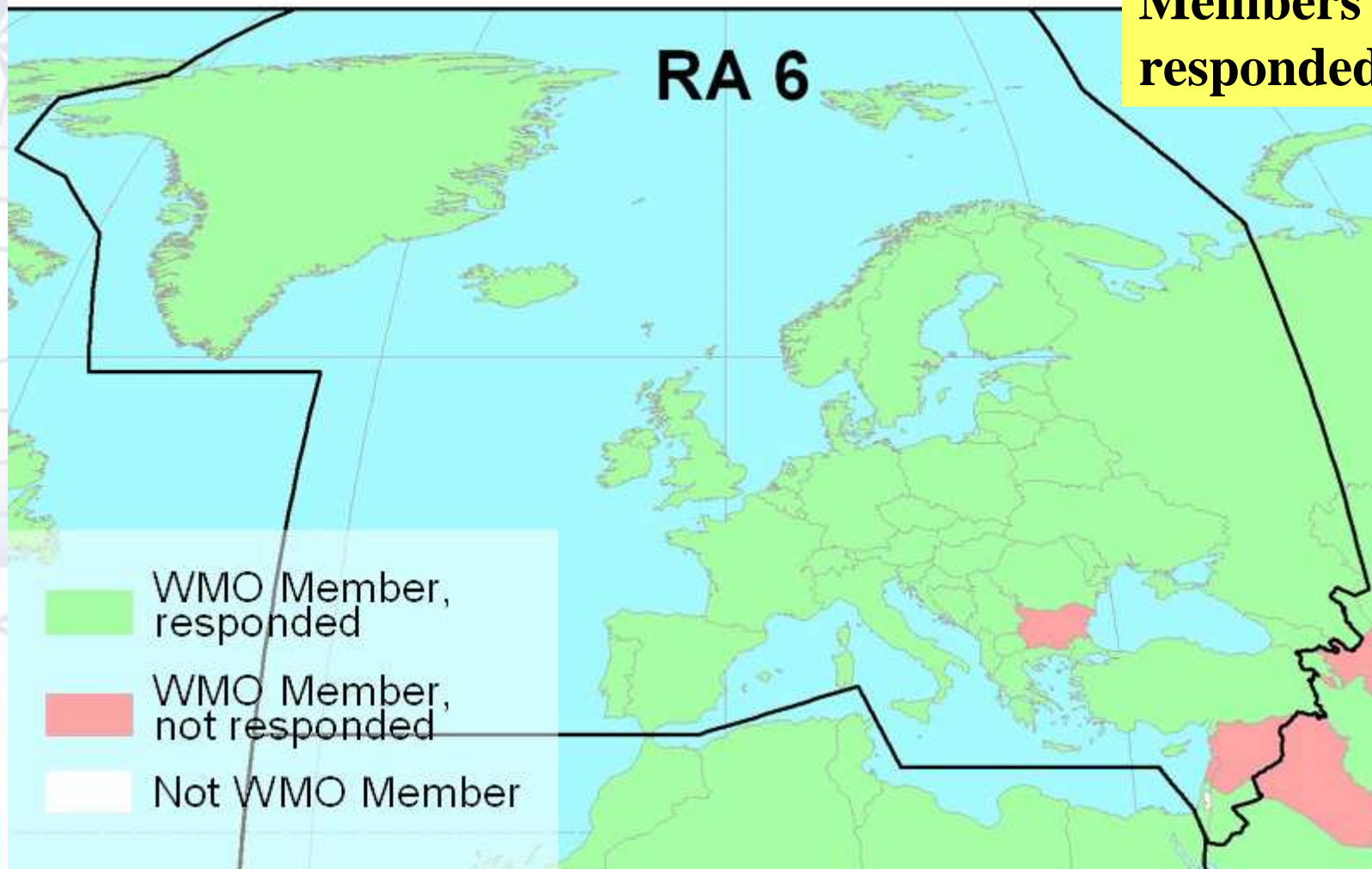
warning



**Status of National Meteorological and
Hydrological Services' Capacities in
Support of Disaster Risk Reduction in
Europe**

Responses to the WMO Country-Level DPM Survey in Europe

**44 out of 48
Members
responded**



Ranking from the country-level survey

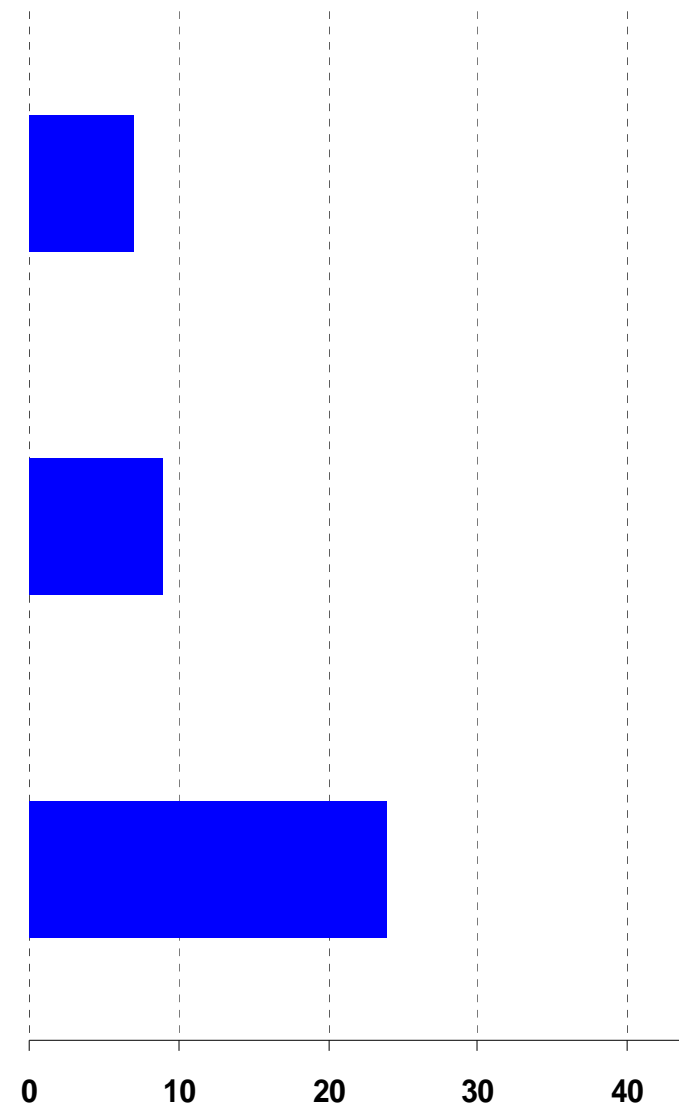
Hazard	Countries affected (out of 44)
Strong winds	43
Heavy snow	36
River flooding	36
Flash flood	33
Heat wave	31
Thunderstorm or lightning	30
Freezing rain	29
Hailstorm	29
Cold wave	28
Dense fog	27
Drought	27
Forest or wild land fire	25
Earthquakes	22
Hazards to aviation	22
Landslide or mudslide	21
Airborne substances	20
Waterborne hazards	20
Avalanche	19
Marine hazards	19
Storm surge	15
Tornado	15
Coastal flooding	12
Smoke, Dust or Haze	12
Sandstorm	5
Volcanic events	5
Desert locust swarm	4
Tropical cyclone	4
Tsunami	4

GOVERNANCE: Understanding of Benefits of NMHSs at Ministerial Level

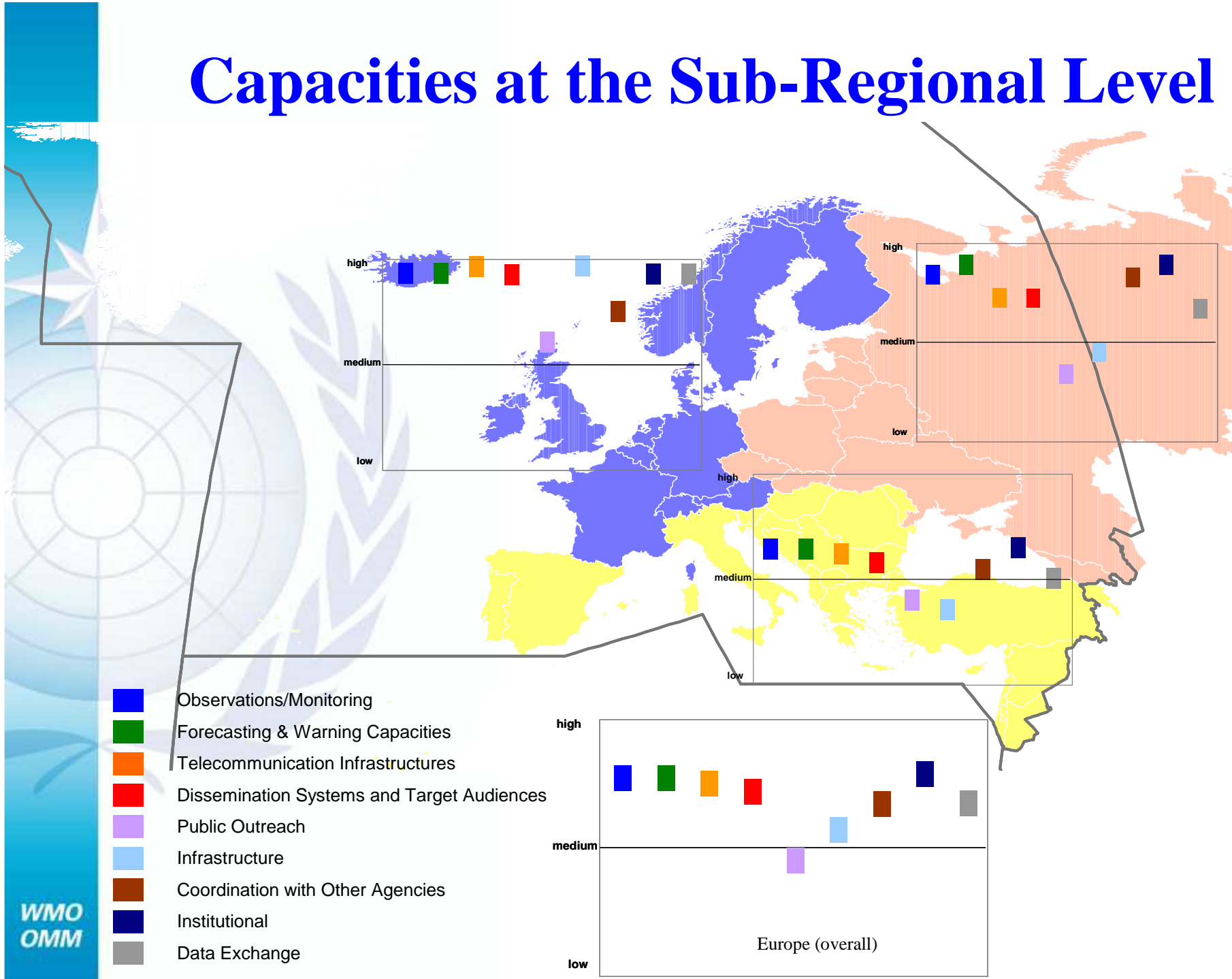
Benefits of hydro-met services to DRM well understood at the ministerial level

Appropriate visibility of NMHS within government

National legislation and policies adequately reflect role of NMHSs in DRM



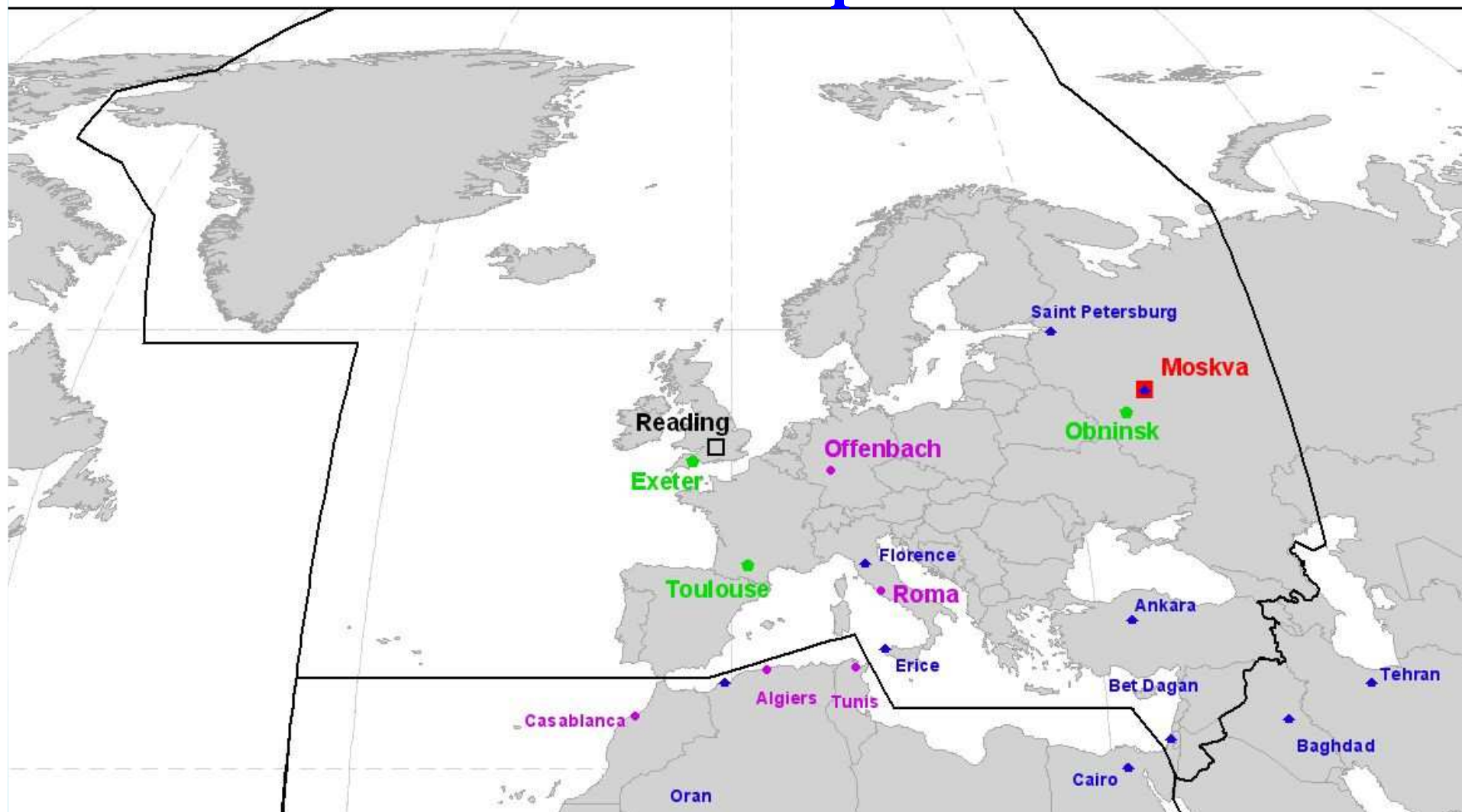
Capacities at the Sub-Regional Level





Opportunities for leveraging regional cooperation in support of National DRR in Europe

Regional capacities and activities in Europe



- ◆ Regional Meteorological Training Centres
- Drought Monitoring Centres
- Medium Range Forecasting Centre
- ▲ Tropical Cyclone Forecasting Centres
- Environment Emergency Response Centres
- Regional Meteorological and Hydrological Specialised Centres
- World Meteorological Centres

Regional capacities

- Regional Meteorological Specialized Centres (Exeter, Rome, Offenbach, Moscow)
 - (ECMWF)
- European Agency for the Exploitation of Meteorological Satellites (EUMETSAT)
- EUMETNET

Regional Specialized Meteorological Centres - RSMCs

Exeter, Offenbach, Rome, Moscow

- long-range or medium-range forecasting products;
- advisories for (tropical cyclones), severe storms and other dangerous weather phenomena;
- tailored aviation or marine products to service users in a particular area;
- trajectories or dispersion of pollutants in case of nuclear or chemical accident;
- information on prolonged adverse weather conditions, including drought monitoring;
- activities related to the World Climate Programme (WCP) and other WMO or international programmes.

RSMCs

- run workshops to enhance products delivered to NMCs in the region (Exeter)
- Guidance on storm-position and track forecasts for the areas affected by tropical storms (Offenbach)
- Provision of UV-B forecasts (Offenbach)
- Agrometeorological, aviation, hydrological forecasts, marine forecasts (Moscow)
- Transport model products for environmental emergency (Exeter, Toulouse)

ECMWF – The European Centre for Medium-Range Weather Forecasts (1975-)

- **supported by 26 (+8) European States + a multitude of co-operation agreements with international organisations**

Objectives and functions:

- **development of numerical models for medium-range and long range weather forecasting;**
- **distribution of forecasts and products to NMSs of the Member States;**
- **research for improving weather forecasts;**
- **provision of technical and scientific capacities to Member states**

EUMETSAT - Strategic priorities

- Ensure continuity of the operational meteorological and climate observing facilities with adequate satellite and ground infrastructure, and user services;
- Ensure that the European contribution to global operational satellite systems is optimised so that the global system meets the needs of Europe and contributes effectively to the requirements of WMO.
- Contribute with products and services for alleviation of the impact of weather related natural disasters;
- Provide additional services in meteorology, climate and environment for Europe;
- Contribute to capacity building by providing and funding courses

EUMETNET

A joint effort 20 European countries

- Establish Programmes making use of the expertise and facilities of its Members through an appropriate sharing of tasks and resources
- Co-ordinate activities with European organisations such as ECMWF and EUMETSAT

Supports Members with

- leading expertise on weather, climate, environment and related activities;
- technical and scientific capacities;
- high quality basic data and products.

Meteoalarm - Alerting Europe for extreme Weather - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

meteoalarm
alerting europe for extreme weather

EUMETNET
The Network of European Meteorological Services

Start | About Meteoalarm | Help | Terms and Conditions | Greyscale Maps | Login

Change Language: english

» Europe

Weather warnings: Europe [For Testing purposes only!]

Created: 01.12.2006 15:06:39 Zoom

Awareness Reports
You can find detailed information about the warnings in the awareness reports issued for each country. Select the relevant country.

AT						
BE						
CH						
CY						
DE						
DK						
ES						
FI						
FR						
GR						
HU						
IE						
IS						
IT						
LU						
NL						
NO						
PT						
SE						
UK						

White
 Green
 Yellow
 Orange
 Red

Wind
 Rain
 Snow/Ice
 Thunderstorms
 Fog

Extreme high temperature
 Extreme low temperature
 Coastal Event
 Forestfire
 Avalanches

awareness types Display:

EU Flood Initiative

- **STRATEGIES** -On 18/01/2006 the European Commission proposed a directive on the assessment and management of floods.
 - to reduce and manage flood risk. Under the proposed directive member states would need to carry out a flood risk assessment, develop flood risk maps and then flood risk management plans focused on prevention, protection and preparedness.

The Directive 2007/60 of the European Parliament and of the Council (23 October 2007)

Sava River Project

- Improvement of Hydrometeorological data and flood forecasting that will serve: Albania, Bosnia and Herzegovina, Croatia, Montenegro, Serbia and Slovenia:

Partners: WMO, WB

- **Status: Development phase**

Drought Management Centre for South Eastern Europe

- Establishmen of a drought monitoring Centre that will serve: Albania, Bosnia and Hezergovina, Bulgaria, Croatia, Former Youguslav Republic of Macedonia, Greece, Hungary, Republic off Moldova, Romania, Slovenia and Turkey
- Partners: UNCCD, WMO

Status: Proposal developed for implementation



Conclusions

Conclusions - Capacities

- Major Centres: RSMCs, EUMETSAT and joint efforts such as EUMETNET provide a capacities for DRR in the region

Conclusions - gaps

- Geographical variation in national capacities (mainly 'W-E' in RAVI)
- Understanding at the ministerial level of the socio-economic benefits and capacities of NMHS in DPM
 - Need for new value-added services: e.g. quick response now-casting services
 - Better Coordination with neighbouring countries
 - Educational modules for NMSs for outreach to the users
 - Need for better co-ordination and standardisation of impact databases – at national and international level