



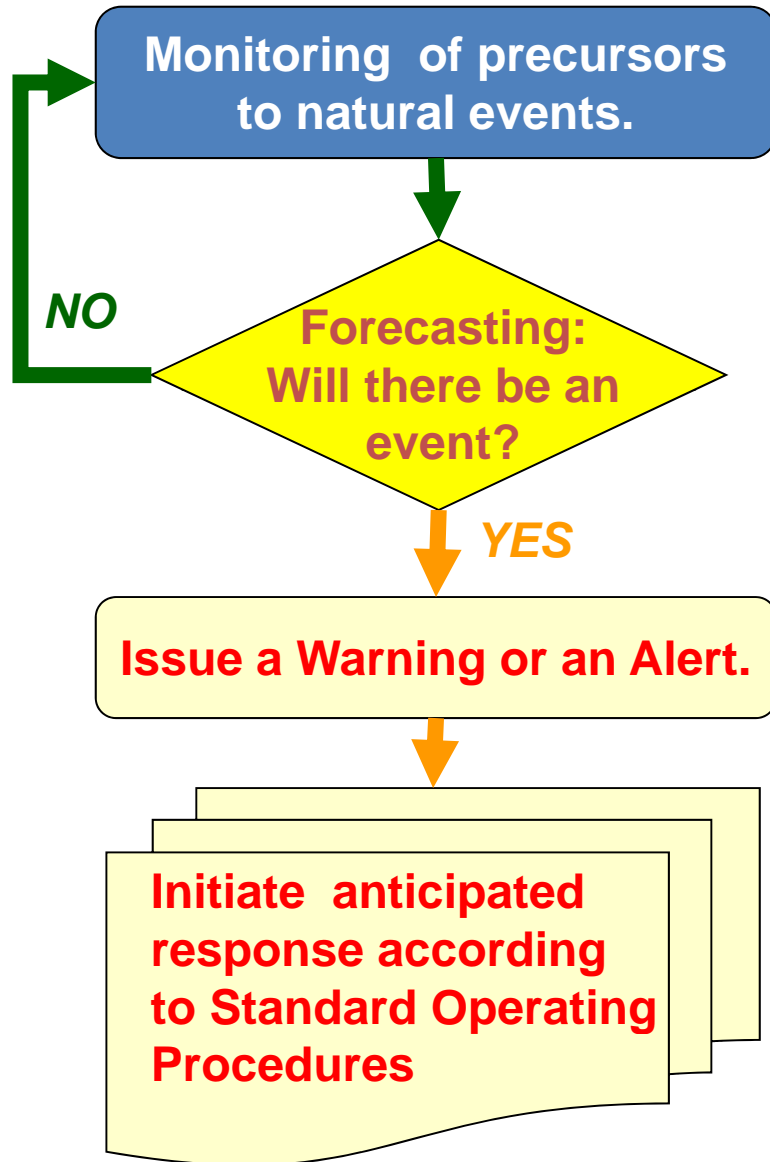
UNITED NATIONS
Office for Outer Space Affairs

UN-SPIDER

UN-SPIDER and Early Warning Efforts

**“United Nations/Germany
Expert Meeting on the Use of
Space Based Information in
Early Warning Systems”**





Uses of space-based applications

Using Earth Observation applications to track the temporal and spatial evolution of events capable of provoking disasters.

Using Earth Observation applications to improve the outline of the spatial extent of the forecasted event.

Using a combination of ground-based data as well as a combination of up-to-date and archived satellite imagery:

- To increase the warning time;
- to define more specifically who to warn (those at risk)
- To suggest potential impacts from historical information and analysis.



Intercontinental and continental hazards:

NEO, tsunamis, hurricanes or typhoons or cyclones

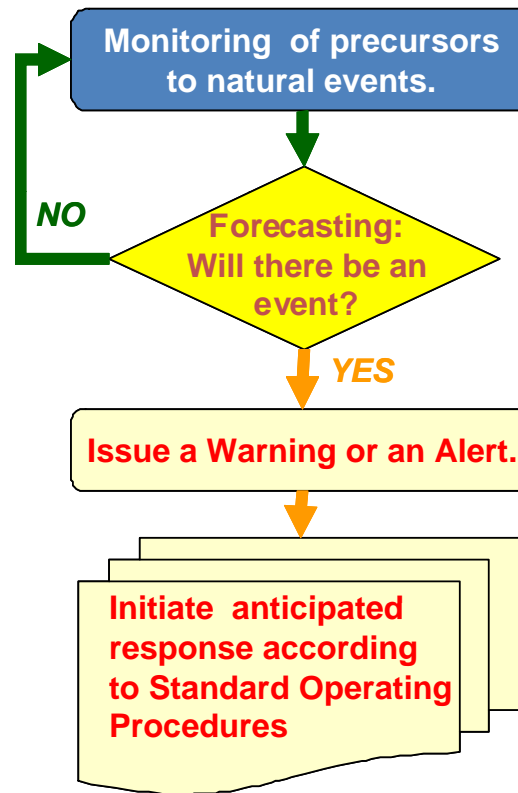
Sub-continental or regional hazards:

NEO, tsunamis, hurricanes or typhoons or cyclones, droughts, locust episodes, volcanic eruptions, pandemics

National to local hazards:

NEO, tsunamis, hurricanes, cyclones, storms, droughts, floods, earthquakes, volcanic eruptions, lahars, landslides, forest fires, locust swarms, harmful algae blooms, pandemics

Typical operational flowchart of an EWS



Regional Tsunami Watch Centers

National Met Offices;
National Observatories (volcano, health, agriculture)

National Met Offices;
National Observatories (volcano, health, agriculture, environment);
Community-based EWS



Discussion sessions

DISCUSSION SESSION 1 **IMPROVING EW: USING SBI IN** **MONITORING & FORECASTING**

- Hydrometeorological
- Geological
- Biological

Discuss how SBI can enhance existing EWS in monitoring and forecasting potentially catastrophic events:

- In terms of expanding the warning time:
- In terms of refining the spatial extent of the event and the corresponding warning;

DISCUSSION SESSION 2 **IMPROVING EW: USING SBI: FROM** **EXPOSITION OF VULNERABLE ELEMENTS** **TO IMPACTS**

- Hydrometeorological
- Geological
- Biological

Discuss :

- how SBI can enhance the identification and location of vulnerable elements, exposition of assets;
- How to enhance the warning message from providing warnings regarding hazards to potential impacts:
- How to develop damage curves for different types of vulnerable elements or assets

DISCUSSION SESSION 3 **IMPROVING EW: ENHANCING LINKS:**

- From global to national to local
- Combining archived and up to date imagery;
- The role of GNSS in EW applications

Discuss how :

- Local or national EWS can incorporate SBI and in particular globally generated information;
- How existing EWS can take advantage of archived imagery to improve warnings:
- How the combination of GNSS and RS can improve EWS



General suggestions from Discussion sessions

- To identify and systematize **areas and applications** where space-based information can improve the functionality of EWS;
- To raise awareness concerning the **most recent advances** regarding space-based applications in early warning systems and disaster preparedness;
- To become aware of needs at the national and local levels: whether the need is for data or for information;
- To conduct **training activities and to transfer technical know-how** to facilitate access to and use of space-based information in early warning systems, including **simulations and exercises**;
- To develop **methods that combine space-based and ground-based information** to improve the warning message (potential impacts based on vulnerability).
- To identify ways in which **Voluntary Technical Communities (Crowd-source efforts)** and local stakeholders can be involved in the generation of data and information used in EWS.



Discussion sessions: data / information

- **Integrate data sources (local, national and international / archived and up to date data), including with the support of Volunteer Technical Communities (VTCs); consider ways to integrate data that is produced through projects;**
- **Facilitate the production and sharing of data at all levels, making reference to the uncertainties concerning the data and the implications concerning such uncertainties;**
- **Consider the standardization of data, data models as a way to promote its use globally;**
- **Facilitate the extraction of information from data; for example develop and promote the use of “what if” type scenarios in early warning systems; and**
- **Aim to use a standardized vocabulary (terminology).**



Discussion sessions: mapping

- **Facilitate the production and calibration of maps;**
- **Facilitate the production of maps through the sharing of data, through the incorporation of data produced locally, and through the digitalization and incorporation of indigenous knowledge;**
- **Promote the used of methods that allow people to track changes over the years in hazards, in exposition to hazards due to urban growth, etc;**
- **Facilitate the visualization of hazards, vulnerability and risk through maps, geo-viewers and other geo-spatial technologies;**
- **Develop tools and methods that allow operators or decision makers to become aware of trends over time; and**
- **Promote the elaboration of reference maps which can be used as benchmarks to track changes over time, to be used in EWS;**



Discussion sessions: training

- **Conduct training activities as a way to enhance local capacities to access data, to use innovative models and methods;**
- **Use simulations and drills as training activities;**
- **To identify other **knowledge management strategies** that can facilitate access to and use of space-based information in early warning and preparedness.**



Discussion sessions: other suggestions

- Important to be aware of the differentiated needs from country to country and from region to region;
- Collect, systematize and disseminate success stories concerning the usefulness of space-based applications in EWS in understandable fashion;
- Conduct applied research to develop methods that combine ground based data, archived and up-to-date imagery that can be used in EWS;
- To identify **knowledge management strategies** that can facilitate access to and use of space-based information in early warning and preparedness; and
- To bridge the space and the early warning communities.



Discussion session: linkages from global to national to local

- **To promote the usefulness of geo-spatial information in early warning systems at the regional, national and local levels;**
- **Ensure that any efforts to link efforts are linked to the national early warning systems; so there should not be a direct link between global and local excluding the national level;**
- **Important to be aware of institutional responsibilities;**
- **Important to be aware of needs: whether data or information. At the local level maybe the interest is more on information, whereas scientists may be more interested in data;**
- **When promoting the use of information or data available in the web globally, important to look at the issue of language when promoting its use locally; and**
- **Important to be aware of the capacities at national and local levels to match tools to such capacities as a way to enhance the use of these tools;**
- **UN-SPIDER to link with other UN agencies which are involved in early warning efforts (UNESCO-IOC, WMO, WHO, etc).**



Discussion session: linkages from global to national to local: KP

- **Incorporate case studies, success stories in the KP to promote the use of SBI in EW; include and provide visibility to the issue of cost/benefit; consider presenting them in the format of a booklet or printed publication as well as putting it in the KP**
- **Incorporate guides and suggestions in the KP that can be used to strengthen capacities at national and local levels;**
- **Local level users may not really be interested in global data. In Europe, there are 2 regional systems for floods and fires, but they are not really used in Italy at the local level;**
- **Institutional responsibility regarding Civil Protection and early warning are at the national level; so we cannot expect UN-SPIDER to go a train at the local level; its more the responsibility of national agencies to do trainings at local levels;**



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Discussion session: linkages from global to national to local: cost/benefit

- **GIZ already did a cost/benefit study of the EWS and the assets that can be saved through EWS; GIZ willing to contribute to such an effort;**
- **World Bank has financed studies on the cost/benefit of DRR efforts in cities in Northern Africa (Alexandria,);**



Discussion sessions: strategies

- **Continue to promote the generation and use of information, including space-based information, in EWS;**
- **Facilitate the discussion between scientists, policy makers and operators of early warning systems;**
- **Carry out efforts in the areas of capacity building and institutional strengthening through improved generation and use of information;**
- **Encourage the sharing of data and information;**
- **Establish an international technical group that can focus on the development of the proposed methods and tools; and**
- **Train the public to use data and information properly, particularly in the case of EWS.**



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**Thanks for your
kind attention**

<http://www.un-spider.org>

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