



ORCHESTRA: Developing a Unified Open Architecture for Risk Management Applications

ORCHESTRA presentation & status

Atos Origin sae

© ORCHESTRA Consortium

orchestra

Basics (1 of 4). Basic Data



- The European Commission (EC) highlighted the strategic objective of “Improving Risk Management” within the FP6 of RTD IST Programme
- ORCHESTRA is a strategic Integrated Project of the European Commission coordinated by Atos Origin
- ORCHESTRA stands for “Open Architecture and Spatial Data Infrastructure for Risk Management”
 - Started in September 2004, ending in February 2008
 - A consortium of 14 partners in Europe
 - A budget of 13,7 M€, with 8,2 M€ funded by the EC





Basics (2 of 4). Why ORCHESTRA?

- EU citizens and environment have to face large series of risks: forest fires, floods, landslides, tornadoes, storms, earthquakes, volcanic eruptions, etc.
- Disasters do not respect national borders
- The number of victims and economic losses of disasters are increasing
- Governments, civil protection bodies and emergency services are becoming more dependent on integrated information systems to address different phases of Risk & Disaster Management in complex trans-boundary, multi-risk scenarios
- Such integration is difficult due to lack of
 - common terminology,
 - accessibility and availability of data,
 - interoperability (e.g. lack of standards and their use),
 - co-ordination, procedures and business models, ...
- In summary, existing legacy systems were not designed to work together



Basics (3 of 4). ORCHESTRA Goals



- Improve efficiency risk management activities through:
 - The design and implementation of an open service-oriented architecture based on standards (de-facto and de-jure) and in INSPIRE and GMES specifications
 - To validate the architecture in multi-risk scenarios, developing the sets of services that are most useful and adequate for the risk management end users
- ORCHESTRA is one of the basic building blocks towards the Single Information Space for the Environment in Europe





Basics (4 of 4). ORCHESTRA Partners



What ORCHESTRA is NOT



ORCHESTRA is NOT:

- A system (centralised or distributed) to be used in risk management
 - Each institution in each European region must work with the systems they consider more appropriate according to their needs, characteristics, policies, etc.
- A list of methodologies or procedures for risk management
 - Each institution in each European region must have the flexibility and autonomy to establish the most adequate to their case
- An effort of systems integration
 - Because then it would solve – with a prohibitive cost – the actual situation, but not the future ones





What ORCHESTRA is

- ORCHESTRA is the definition of a service architecture that enables interoperability at a European level
- ORCHESTRA defines the interface that a software service must have in order to be interoperable
- ORCHESTRA has not only designed the architecture but also developed a number of services for risk management in order to:
 - Validate the architecture in the pilots
 - Provide this software together with the specifications, so the interested institutions can see how to make their own services and applications interoperable
- ORCHESTRA cannot develop all the required services for risk management. In fact, the continuous emergence of new needs, together with the flexibility and interoperability that provides ORCHESTRA, constitutes the project business case



What ORCHESTRA is

- Summarising, with ORCHESTRA an institution working in environmental risk & disaster management can decide which of their services or applications they want to make accessible (with or without restrictions), and achieve this with minimum technical and economic efforts following the architecture directives.
- These services will be interoperable with those of other institutions and can be offered for free or under different restricted payment schemes that may be decided according to the business model of the institution.
- The final goal is to enable adequate and timely preparation and response to risks and disasters among the actors involved (civil protections, local/regional/national governments, data providers, etc.)

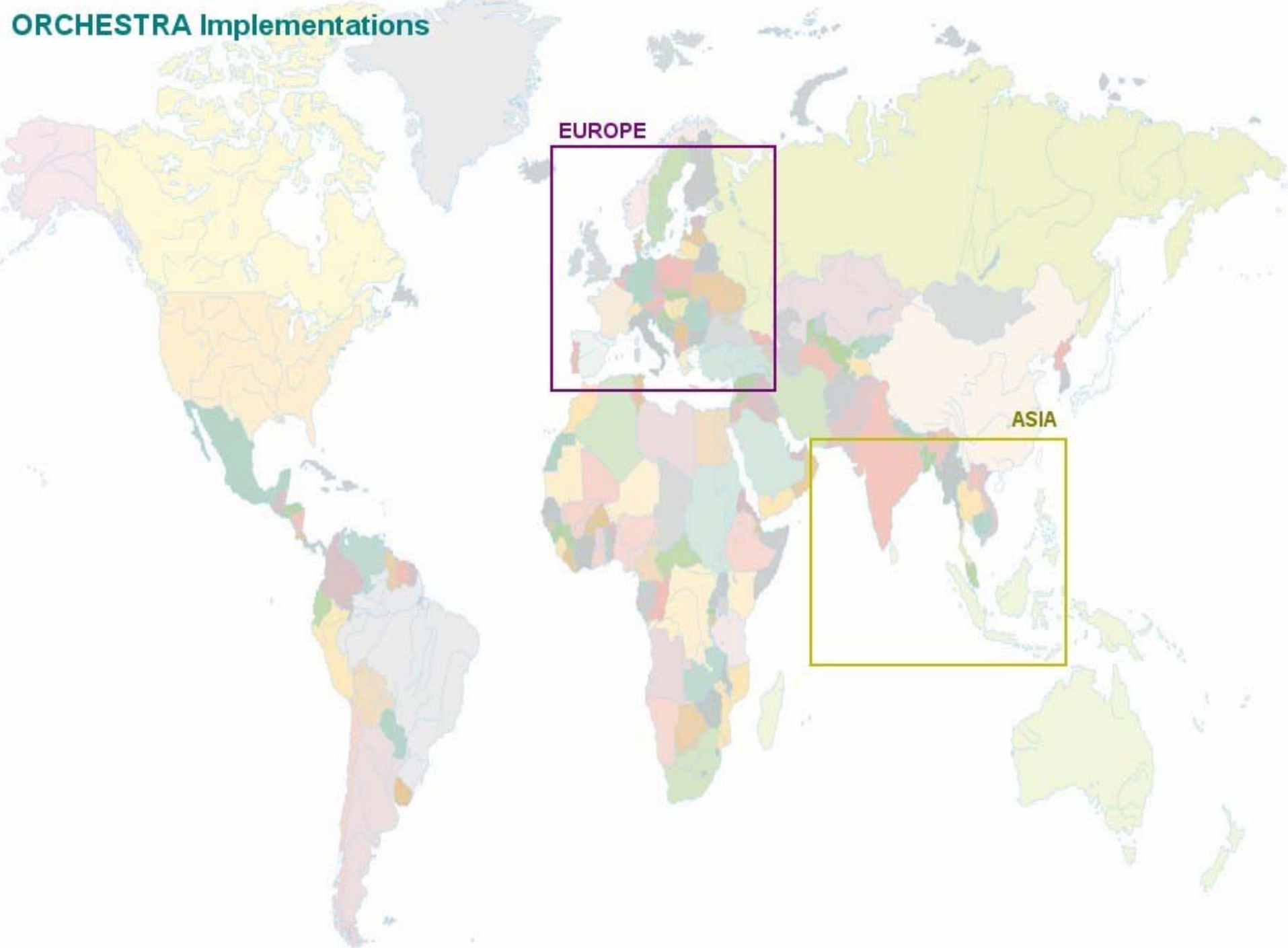


Current Status

- The ORCHESTRA architecture has reached Best Practice status within the world-wide standards organisation OGC
 - Available (open and free-of-charge) at
 - <http://www.eu-orchestra.org/publications.shtml>
 - <http://www.opengeospatial.org/standards/bp>
- ORCHESTRA is providing feedback to OGC for the extension of existing standards for geographical information
- ORCHESTRA has been deployed in 4 pilots
- ORCHESTRA is going to be applied to the tsunami early warning system of the German government in the Indian Ocean (2007-2010)
- ORCHESTRA is cooperating with EU initiatives like INSPIRE (European Directive for data harmonisation) and GMES.
- ORCHESTRA is cooperating with other projects that are based on ORCHESTRA results, such as SANY and DEWS.



ORCHESTRA Implementations



ORCHESTRA Implementations

Pan-European Assessment of natural Hazards

* Member states of European Union



The map shows Europe with various regions highlighted in different colors. A green box highlights the German Bight-Wadden Sea Area. A red box highlights the French-Italian border region. A black box highlights the Tordera Basin in Catalonia, Spain. The map is titled 'ORCHESTRA Implementations' and includes a legend for 'Pan-European Assessment of natural Hazards' and '* Member states of European Union'.

**Assessment of Risks generated by Ship Traffic Activity
in the German Bight-Wadden Sea Area**

**Risk assessment for the road network
in the French-Italian border region**

**Floods and Forest Fire Risk prevention assessment
in the Tordera Basin (Catalonia, Spain)**

Pilots (1 of 4)

Pan-European Assessment of natural Hazards (PEUNHA)



- Objectives:
 - To assess the risk of forest fires in the Member States of the European Union and to support forest fire prevention
 - To assess the vulnerability towards floods and droughts within the Member States of European Union according to different considerations and scenarios
 - To assess the vulnerability to various hazards (floods, droughts, forest fires) within the Member States of European Union
- Leader: JRC-IES (the Joint Research Centre of the European Commission)
- Participants:
 - Within the consortium: JRC-IES, INTECS, BRGM
 - External: European experts, personnel from different EU DGs and from the INFOREST and WDNH (Weather Driven Natural Hazards) actions of the JRC



Pilots (2 of 4)

Floods and Forest Fire Risk prevention assessment in the Tordera Basin (Catalonia, Spain)



- Objectives

- Improve the context of decision-making process in the prevention planning of various risks (floods and forest fires) in a basin by focusing on the efficiency of information management and assessment services, thus improving the interoperability among the involved actors and systems
- Prove the adequacy of ORCHESTRA Architecture as a solution for the mentioned challenges and, in turn, identify which parts need to be corrected or modified towards a fully operational implementation in other similar/larger cases

- Leader: TYPESA

- Participants:

- Within the consortium: TYPESA, ATOS, INTECS
- External: ACA, ICC, Comissió de Protecció Civil



Pilots (3 of 4)

Risk assessment for the road network in the French-Italian border region



- The main objective of the pilot is to demonstrate how ORCHESTRA can be used to effectively support cross border, regional and provincial risk management with a focus on the activities related to the vulnerability and consequence analysis of road infrastructure
- Leader: BRGM
- Participants:
 - Within the consortium: BRGM, Ordnance Survey, JRC-IPSC, JRC-IES, ARCS
 - External: Local authorities from Provence, Piedmont Region and Liguria Regions, Italian Transport companies, Italian Ministry of Transport, French Ministry of transport and ESCOTA (operates the toll motorways)



Pilots (4 of 4)

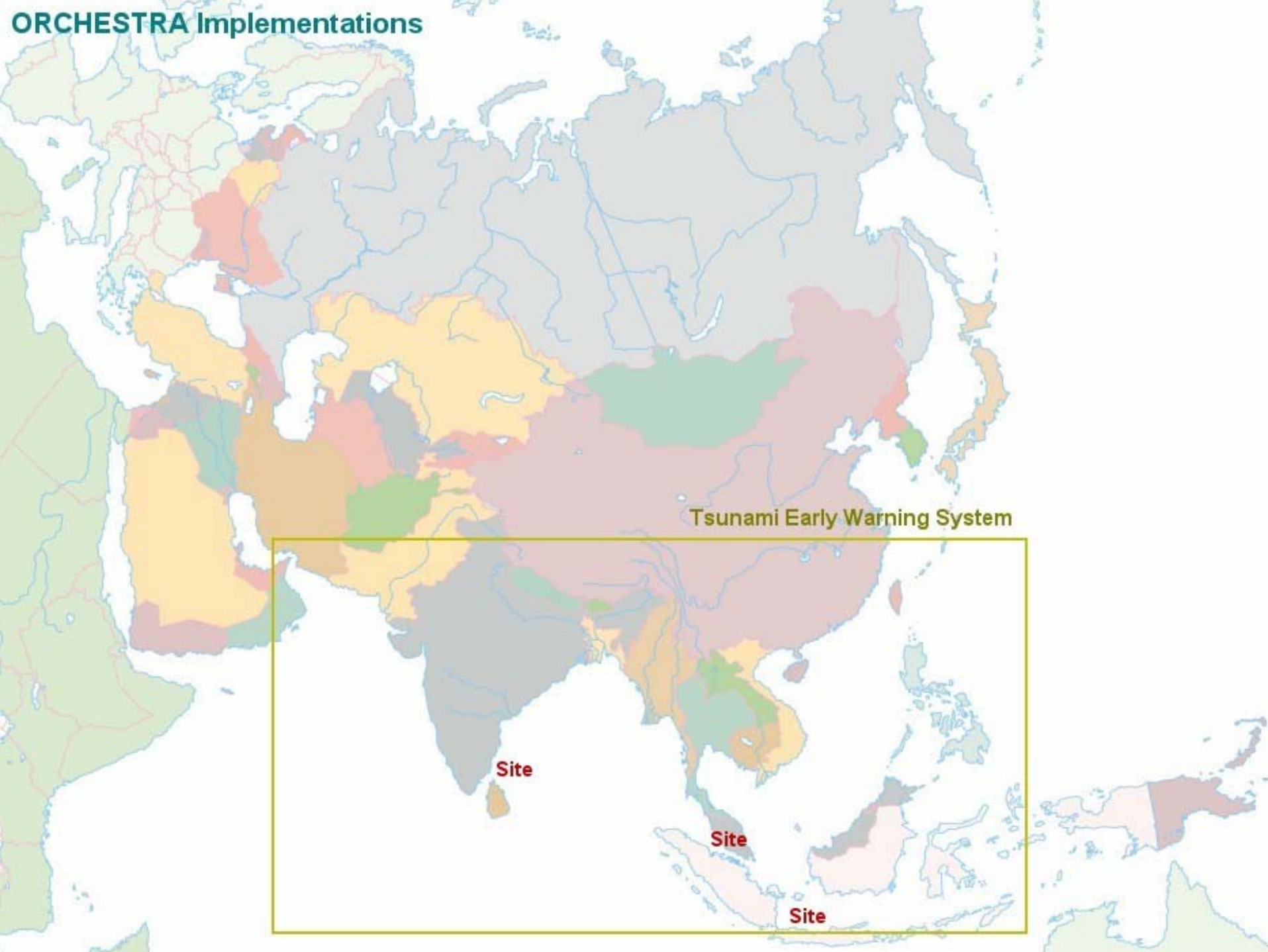
Assessment of Risks generated by Ship Traffic Activity in the German Bight-Wadden Sea Area



- Objectives:
 - Assess and quantify the multi-environmental risks which are generated by ship traffic activity around the German Bight coastal zone region
 - Provide access to risk management spatial information to the German Bight stakeholders and other users using Orchestra Architecture
- Leader: BMT
- Participants:
 - Within the consortium: BMT, AMRIE, DATAMAT, IITB
 - External: Trilateral Wadden Sea Cooperation, Schleswig-Holstein (Ministerium für Landwirtschaft, Umwelt und ländliche Räume), GAUSS GmbH y Brockmann-Consult



ORCHESTRA Implementations



Tsunami Early Warning System

Site

Site

Site

Project DEWS

Distant Early Warning System (1 of 4)



- Rationale:
 - The tsunami 2004 event revealed critical shortcomings
 - There is an urgent need for a new generation of reliable tsunami early warning systems based on a stable multi sensor monitoring platform.
 - The time interval between an initial strong earthquake and the detection of the tsunami has to be drastically reduced.
 - Warning messages should be generated more rapidly and should only be disseminated to responsible authorities and people at risk.
 - Initial warnings should be followed by in depth information that is understandable by and reliable for people.
 - Another important challenge is the international communication and warning exchange in the Indian Ocean region.



Project DEWS

Distant Early Warning System (2 of 4)



- Objectives:
 - To strengthen early warning capacities by building an innovative generation of **interoperable tsunami early warning systems**.
 - Tsunami detection will be based on an **open sensor platform**, integrating sensor systems for earthquake (seismic), sea level (tide gauge, buoys) and ground displacement (GPS land stations) monitoring provided by German project GITEWS (led by GFZ).
 - Based on this improved upstream information flow the downstream capacities will be enhanced by improving **information logistics** and **multi channel warning dissemination**.
 - Warning messages have to be disseminated to the public, authorities and emergency management forces. Of special importance is the distant communication of warning information among warning centres in the Indian Ocean region.



Project DEWS

Distant Early Warning System (3 of 4)



- Participants:
 - Atos Origin (coordinator), Spain
 - GFZ (GeoForschungsZentrum Potsdam), Germany
 - SAAB, Sweden
 - Elsag Datamat, Italy
 - Institute of Geological and Nuclear Sciences, New Zealand
 - Geological Survey and Mines Bureau, Sri Lanka
 - TKK, Finland
 - Seismological Bureau, Thailand
 - Citizen Alert Services, Netherlands
 - SRSA, Sweden
 - University of Bologna, Italy

(see next slide)



Project DEWS

Distant Early Warning System (4 of 4)



- Participants (continued):
 - National Disaster Warning Center, Thailand
 - Meteorological and Geophysical Agency, Indonesia
 - Engineering Ingegneria Informatica, Italy
 - Disaster Management Centre, Sri Lanka
 - Bandung Institute of Technology, Indonesia
 - University of Moratuwa, Sri Lanka
 - Prince of Songkla University, Thailand
 - Chiang Mai University, Thailand
 - Department of Disaster Prevention and Mitigation, Thailand





Thank you for your attention

José Fernando Esteban Lauzán

jfernando.esteban@atosorigin.com

Atos Origin Spain
Albarracín 25
28037 Madrid

Tel: +34 91 214 8613
Fax: +34 91 754 3252

www.eu-orchestra.org

