RASOR

RAPID ANALYSIS AND SPATIALISATION OF RISK

ANALYSE RAPIDE ET SPATIALISATION DE RISQUES

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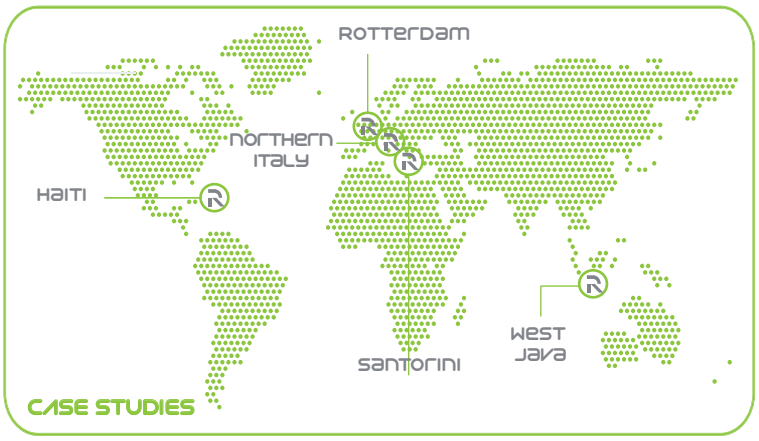
# NEWSLETTER # 1

## RASOR KICK-OFF – PUSHING BEYOND THE CURRENT STATE-OF-THE-ART





RISK ASSESSMENT MAPPING : FIVE MAIN AREAS OF IMPACT

**Brussels, December 2013.** A consortium of European research institutes and companies meet with the European Commission's Research Agency to kick off the Rapid Analysis and Spatialisation of Risk Project, or RASOR Phase 1. The EC has already invested significantly in rapid response services through the Emergency Management Services Programme, one the Copernicus Core Services. Through the Copernicus downstream services call, the EC signaled a desire to see new disaster risk management services created, facilitating the work of those interested in risk reduction and mitigation, and supporting the full cycle of disaster management. RASOR aims to increase the simulation abilities of national civil protection agencies, international organisations interested in risk reduction and the reinsurance sector.

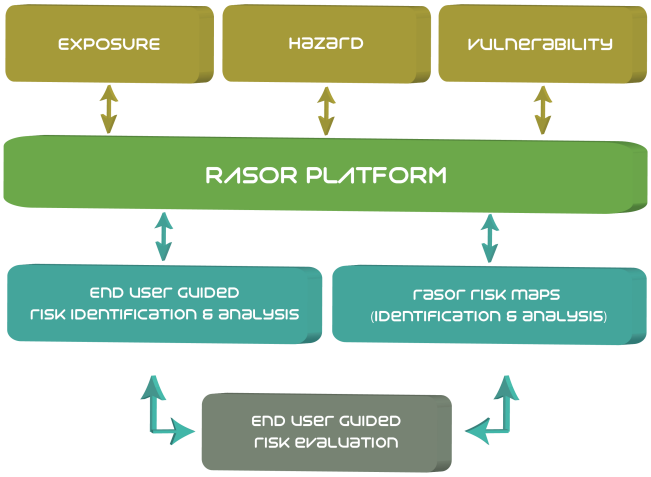
RASOR has a global focus, and aims to support risk reduction through enhanced spatialisation of hazard, exposure and vulnerability, combined with the possibility of simulating risk reduction measures that support the development of new emergency management protocols. Unlike many new disaster-related applications, RASOR is not a mapping services, or a visualization portal. RASOR is a trade-space, in which users and practitioners can upload information and products from a wide range of different sources and perform simulations based on real or imaged events from the past, present and future. Users can compare the results of flood models with EO-based flood monitoring, or analyse the impact of a landslide on a flood risk profile. Ultimately, risk reduction decision makers will always be taking subjective decisions. RASOR aims to make those subjective decisions as expert as possible by enabling a single, common spatialisation and viewing platform for risk-related information. Ultimately, RASOR users will be able to analyse impact on five critical areas of interest: physical, demographic, social, economic, environmental.

partners

## A platform for interactive multi-risk scenarios

The RASOR Platform is designed to address first and foremost the needs of those who conduct risk assessment. The focus of the effort in developing the RASOR platform has been to create a tool to support risk assessment conducted before events, but the platform can be used to support the full-cycle of risk management

Assessing risk is a necessary first step to reducing the exposure of populations and assets to risk. It is essentially contained in the analysis of three separate elements: exposure, hazards and vulnerability. Documenting them, and understanding how they evolve and interact, are critical to reducing risk.




At a high-level, RASOR users need the following:

- Up-to-date spatialised view of hazard extent (across several hazards)
- Up-to-date information on exposure of people and assets (and ability to project change)
- Comprehensive information on past disasters (to assist in risk identification)
- Ability to modify key parameters and project impact
- Ability to project cumulative effect of risk and correlations
- Ability to integrate analysis in a single tool
- Ability to produce information (layers) for ingestion in other tools

This can be further refined as follows:

- Hazard – from known data bases and new EO-based sources; evolution of hazard after major event (e.g. new flood hazard given displaced debris and temporary dams)
- Exposure – from global data bases and newly extracted EO-based sources inside the RASOR tool (including comparative exposure merging out of date but detailed in situ with calibrated but less precise EO-based layer)
- Vulnerability – from in-situ information when available
- Online/offline – RASOR users require limited offline functionality of the tool, in order to project the results of past analyses and add in-situ and other data to these in the field, and to upload this data to the on-line tool when on-line.
- Full cycle – RASOR users require sophisticated risk assessment capabilities during the mitigation phase, and simulation capabilities to support warning generation; the ability to integrate new information in near-real time, including new EO data acquisitions that allow updating of situational awareness (affected infrastructure, flood extent and depth, actual location of damage, etc).
  - Mitigation: compile new analysis with or without in-situ data in hours or days instead of weeks and months
  - Warning: update existing risk analysis with NRT data from satellites as risk materializes; projections of future impact
  - Response: mark up data layers and inject new information to refine analysis
  - Recovery: track assets and support logistics of major recovery in NRT
- Basic visualisation in a Google Earth environment – a basic layer that displays the baseline data over a given area in a Google Earth format (because it is familiar to users and easy to use).
  - VHR DEMs (TanDEM-X and Pleiades)
  - Satellite-based visualization
- Overlay – the ability to add multiple layers of geo-referenced data a layer at a time, covering basic attributes of interest to the end users (e.g. toponomy/street names, built up infrastructure, critical infrastructure by type (energy, hospitals, etc), hazards, exposure by $ value, exposure by class type, land cover/land use, historical events (extent/damage), demographics by neighbourhood/district, etc
  - Past case studies of events, current situations, future scenarios
  - Multiple variables, sectoral perspectives, inter-related hazards
  - Evolving exposure and hazards
  - Flexible outputs

## Applying RASOR to operational challenges – a quick look at RASOR end users

A ravine in Port-au-Prince

RASOR users exist at varying levels of expertise and familiarity with risk assessment tools, ranging from the uninitiated to sophisticated GIS users. The RASOR tool will exist in different modes, offering both expert practitioners and policy users the possibility of querying the system. Advanced queries can be supported with input of dedicated data layers into the system, and changing the parameters for display of main variable, generally operating at a limited programming level. Other users do not want the possibility of changing display of key parameters, but prefer pre-determined, "standard" questions and the possibility of selecting from a short list of standard products according to the risks being considered.

There are a large number of organisations with an international interest in risk assessment. This can range from development organisations with a clear stake in ensuring that disasters do not offset the efforts of development programs, development banks, with similar concerns, international aid organisations, with a need to track their own efforts in the field during crises present and future, and many others.

These organisations have a need to integrate their own information into operational systems, and have the ability to either use the RASOR tool as an integrating platform or to generate data layers that are integrated in their own tools.

Information to be analysed is generated at a variety of different scales. Ultimately, each project needs to be considered at a local level, but an institution with global interests also wants a common standard to compare projects across different countries and regions, a common display system to show results in a common fashion, and the ability to compare results with global data bases that track related data, such as climate change information or global demographic trends.

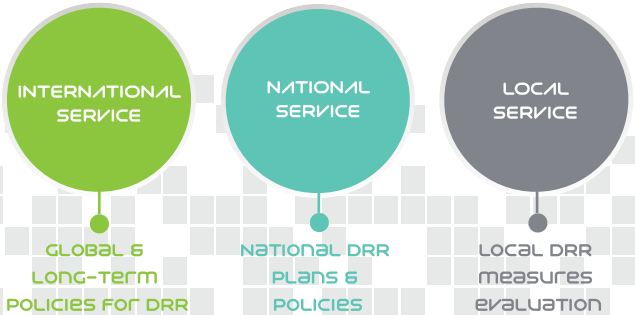
RASOR will address the following common characteristics of user requirements:

- Need for a homogenous approach across the globe (identical projections o frisk across multiple areas)
- Need for comparison with global data sets (e.g. climate change scenarios and their impact at national and if possible local level)
- Need for multiple hazard risk analysis, with special emphasis on interrelated risks (e.g. how the realisation of one risk increases the likelihood of another)
- Need for seamless integration with existing risk assessment tools (i.e. RASOR may initially be a parallel platform to generate an information layer rather than the main integrator)
- Need for compatibility across multiple layers of detail (e.g. remote analysis by desk officer must be able to integrate data layers generated in the field, or detailed in-situ data sets)
- Need for standard data sets that have been validated/calibrated (e.g. satellite EO data that can be applied rapidly over any area of the global and achieve a rough result that is accurate and validated with a high degree of reliability)
- Need for an inexpensive and comprehensive (globally available) source of exposure data that can be easily updated to reflect frequent changes in exposure (most existing exposure data is either proprietary, out of date or incomplete).

In most countries, at a national level, there is an organization tasked with managing risk. In Italy, this is the case of the DPC. In other countries, this may be an office of the executive Government, or a specialized agency. In any event, there is usually a national body with a legislative mandate to monitor risk.

RASOR supports a range of end users, many of which deal with real operational challenges in risk reduction. At the recent Understanding Risk event in Haiti, organised through the World Bank in conjunction with local risk stakeholders, RASOR was given an opportunity to present its approach to some 200 risk analysts and researchers active in risk reduction and disaster management in Haiti. In fact, Haiti is one of RASOR's five global case studies, used to showcase how a fully-operational RASOR could function on a global basis. RASOR will work closely with the Centre National d'Information Geo-Spatial or CNIGS in Haiti, developing specially adapted risk reduction products to better understand the risks affecting development in Haiti. RASOR and the CNIGS will work on filling the RASOR platform with relevant data to ensure that risk managers in Haiti will be able to overlay multiple hazards (flood risk, seismic hazard, landslide hazards, storm surge exposure, etc) in a single projection, and analyse the relationship between different risks. Users can also look at evolving exposure, based on satellite data-generated exposure layers that show up-to-date information on exposed people and assets in a very dynamic environment. These data are combined with vulnerability curves that are used to project potential damages to infrastructure depending on the intensity of events.

Within Haiti, users of the RASOR platform may include government departments with a stake in risk reduction, international organisations active in development projects and interested in resilience, and non-governmental organisations with a concern for risk in Haiti. Andrew Eddy and Carlos Uribe from the RASOR Consortium organised a RASOR side session during the UR Haiti event and were able to exchange openly with end users on their needs and specific requirements. Haiti is one of five case study areas within RASOR; similar visits have taken place in Santorini and Italy and are expected in Rotterdam and Indonesia in the fall. In parallel, RASOR has engaged in discussion with the reinsurance community, including Munich Re in Germany and the reinsurance tool providers, Risk Management Solutions (London) and AIR Worldwide (San Francisco).




Urban vulnerability in Port-au-Prince

Earlier this year, in Washington, RASOR met with the Global Facility for Disaster Reduction and Recovery (GFDRR), in order to exchange on the state-of-the-art in risk reduction software, and the needs of the global risk reduction community. GFDRR and the World Bank are key partners and users for RASOR. Francis Ghesquiere, head of GFDRR, sits on the RASOR Advisory Board and together with Alanna Simpson, head of the GFDRR Labs, has provided critical advice on structuring the services to be offered through RASOR in the future.

While the reinsurance industry is not the core end user community for RASOR, the RASOR Consortium has identified a range of potential add-on products and services that may be provided on a cost recovery basis to this community to support RASOR growth. Under the RASOR Business Model, the basic RASOR platform will be made available free of charge to end users globally, but will be offered in conjunction with add-on products and value added services to generate revenue that supports RASOR updates and upgrades.

Other RASOR supporting partners include: World Bank (WB)/Global Facility for Disaster Reduction and Recovery (GFDRR); UNITAR'S Operational Satellite Applications Programme (UNOSAT), Caribbean Institute for Meteorology & Hydrology (CIMH), University of the West Indies (UWI), Indonesia Ministry of Public Works – Research Center for Water Resources (RCWC), Italy National Civil Protection Department (DPC), Agenzia Regionale per la Protezione dell'Ambiente – Emilia Romagna (ARPA-SIMC), General Secretariat for Civil Protection of Greece (GSCP), Dutch Ministry of Environment and Infrastructure, GEO Secretariat, NASA and CEOS Caribbean Satellite Disaster Pilot & Global Regional End-to-end Disaster Pilots, Agenzia Spaziale Italiana (ASI), EARCS (European Association of Remote Sensing Companies), Global Earthquake Model (GEM) and the UN International Strategy for Disaster Reduction (UNISDR).

## RASOR Advisory Board – High-Level Advice to Keep RASOR on Track

The RASOR Project held the first meeting of its Advisory Board at the Santorini Case Study site, in June 2014. The Advisory Board members are Walter Ammann (CEO, Davos Risk Forum), Sinta Kaniawati (General Manager, Unilever Indoensia Foundation), Francis Ghesquiere (Head. Global Facility for Disaster Reduction and Recovery), Arno Hilberts (Senior Partner, Risk Management Solutions) and Ronald Jackson (Executive Director, Caribbean Disaster and Emergency Management Agency). (check titles please). Francis Ghesquierre was replaced by Alanna Simpson, head of the GFDRR Labs, and Ronald Jackson was unable to attend due to a conflicting meeting. The Advisory Board meeting included a detailed review of the project status, discussions on the RASOR business model, issues tied to project sustainability and a detailed review of the Santorini site, including new risk considerations toed to landslides and tsunamis. At a high-level, the Advisory Boards provided a strong endorsement for the RASOR multi-hazard risk reduction approach, and offered useful advice for the development of the tool and partnerships to support the dual approach, whereby RASOR will offer both a free global tool and add-on products and services on a commercial basis. The Board will meet again in May 2015 to review the first RASOR prototype and meet with RASOR users as part of the RASOR User Workshop in Savona, Italy.

**Key Conferences:**
Since its launch in December 2013, RASOR has already presented to a number of conferences and international events where the RASOR approach was well received. This has included the GEO Ministerial Summit in Geneva, the Global Flood Partnership in March in Reading (UK), Understanding Risk London in July, Understanding Risk in Haiti, also in July, as well as during the EGU Gen assembly and SPIE meetings.