

# THE ARISTOTLE MULTI-HAZARD EXPERT ADVICE SYSTEM

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The European Commission's Emergency Response and Coordination Centre (ERCC) of the European Commission's Directorate-General for Humanitarian Aid and Civil Protection (DG-ECHO) is tasked with coordinating the response to crisis of EU Member States within Europe and also, as necessary, globally. Such task requires the processing of a large array of information with the primary goal of assessing rapidly the gravity of the crisis situation. The utilization of multi-hazard information across the Disaster Risk Management Cycle has proven to be important but poses many challenges when a robust operational system needs to be implemented. To reduce such analytical load, in 2015 the DG-ECHO issued a tender pilot project to develop a multi-hazard advisory service for natural hazards. The ARISTOTLE Consortium, with 15 partner institutions (11 from EU Countries; 2 from non-EU countries and 2 European organizations) operating in the Meteorological and Geophysical domains, was selected and since then it has been working to overcome the many challenges of designing, building and running a multi-hazard advisory service for ERCC with information and expert assessment and advice with respect to flooding, earthquakes, severe weather, volcanic emissions and tsunamis. In 2018, a new contract (3 years) has been awarded to the ARISTOTLE2 Consortium to continue and further develop the service developed within the previous project under the new "European Natural Hazards Scientific Partnership" framework (Fig. 1). The ARISTOTLE2 (ENHSP) Consortium extends some existing hazards to global coverage and adds the "forest fire" as new hazard. A total of 14 partners and two sub-contracting institutions participate.

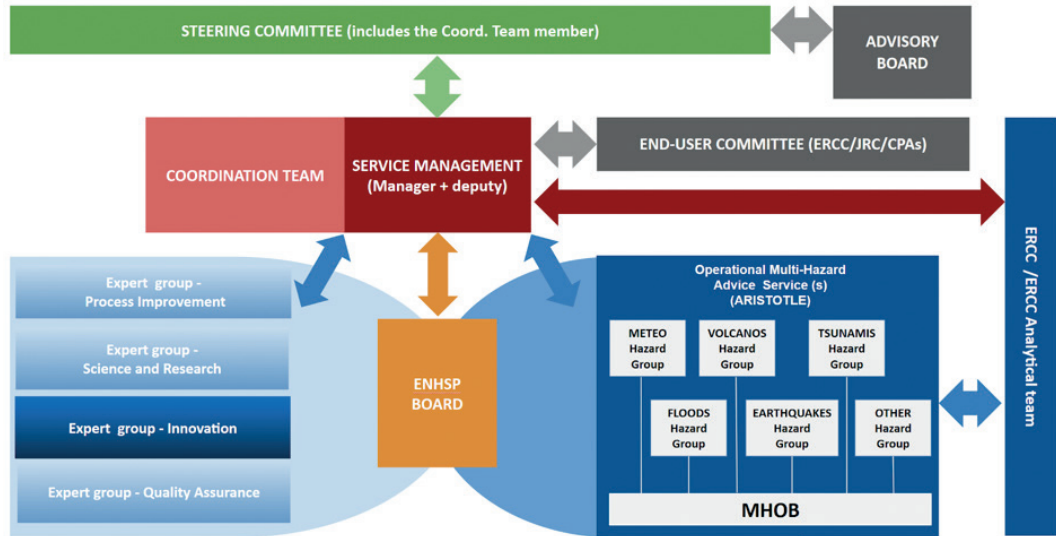


Fig. 1 - The slide shows the management structure of the ARISTOTLE 2. The Coordination Team (currently formed by two GEO and two METEO representatives) assisted by the Service Management Team manages the project on behalf of the Steering Committee formed by all the members of the Consortium. The ENHSP Board gathers the representatives of the Expert Groups (bottom left) and the Hazard Leaders of the Multi-Hazard Operational Board (MHOB) deputed to provide the Advice Service (bottom right) to the ERCC Analytical team. The Advisory Board is formed by external experts one for each hazard and it is deputed to provide external evaluation of the project. The End User Committee being formed by ERCC, JRC and the national Civil Protection authorities seeks to improve and homogenize the information provided within the bigger EC UCPM system.

Within the first year of ARISTOTLE (2016), an operational multi-hazard advisory service was designed in all its components. In the second year, the service was deployed and entered into full operations at the beginning of 2017 for one year. The service focuses on the power of sharing information between the experts all belonging to national operational centers in the corresponding hazards. The Multi-Hazard Operational Board (MHOB) gathers the hazard leads on duty (Fig. 2). The service offered relies on an underpinning IT platform that gathers information automatically from available global and local hazard services as basis upon which the expert assessment is built-up and then delivered to ERCC both verbally and as reports. The system, with routine and emergency modes, has reached maturity within this year and provided advice into the ERCC for 43 emergencies (February 2017 to January, 2018) covering all the aforementioned hazards (Fig. 3). On October 1<sup>st</sup>, 2018, the ARISTOTLE2 project has started and since October 30<sup>th</sup>, 2018, is again operational.

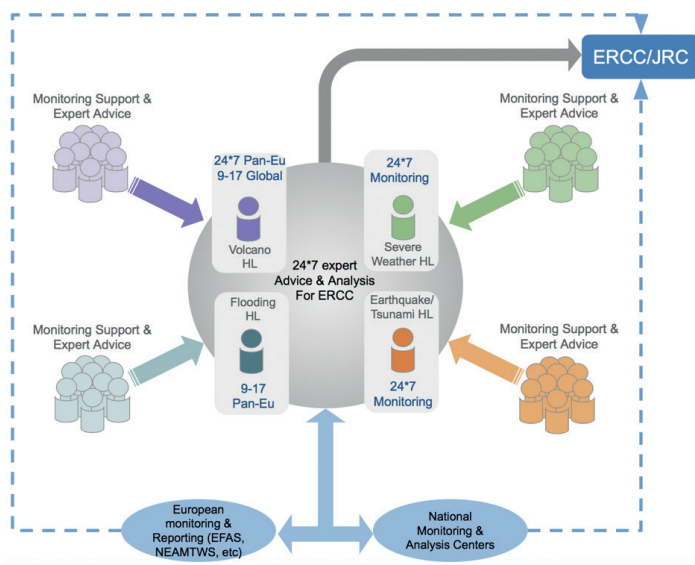


Fig. 2 - Schematic representation of the 24\*7 Service as offered the Multi-Hazard Operational Board and the associated hazard communities. Note that the MHOB avails of all the information available besides that provided by the participating centers.



Fig. 3 - Map showing all the emergency activations during the 1-year operation of ARISTOTLE (Feb. 2017 - Jan. 2018). A total of 43 activations of the system were made by ERCC. [Earthquakes and tsunamis (orange); Volcanos (deep purple); Severe Weather (green); Floods (light blue)].

The service provided to ERCC relies on the SPADA (Scientific Products Archiving and Document Assembly) IT platform that enables the hazard leaders of the MHOB to contribute simultaneously and homogeneously at the creation of the report. SPADA utilizes the same philosophy which INGV has employed nationally for the delivery of the seismic report to the Italian Civil Protection authorities (“Dipartimento della Protezione Civile”) during a major earthquake or during a seismic sequence.

The presentation will illustrate the basic components of the ARISTOTLE 24\*7 advisory service, its modes of operations and lessons learnt within the one year operational phase.

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