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Collaborative Cyber-infrastructures for the Management of the UNESCO-IGCP Research Project "Forecast of tephra fallout"

A. Folch (1), A. Costa (2), and G. Cordoba (3)

(1) Barcelona Supercomputing Center, Earth Sciences Division, Barcelona, Spain (arnau.folch@bsc.es), (2) INGV– Sezione "Osservatorio Vesuviano", Via Diocleziano 328, Napoli, Italy, (3) University of Buffalo, Department of Geology, Buffalo, NY, 14260-1350, USA

Tephra fallout following explosive volcanic eruptions produces several hazardous effects on inhabitants, infrastructure, and property and represents a serious threat for communities located around active volcanoes. In order to mitigate the effects on the surrounding areas, scientists and civil decision-making authorities need reliable short-term forecasts during episodes of eruptive crisis and long-term probabilistic maps to plan territorial policies and land use. Modelling, together with field studies and volcano monitoring, constitutes an indispensable tool to achieve these objectives. The UNESCO-IGCP research project proposal "Forecast of tephra fallout" has the aim to produce a series of tools capable to elaborate both short-term forecasts and long-term hazard assessments using the cutting-edge models for tephra transport and sedimentation. A special project website will be designed to supply a set of models, procedures and expertise to several Latino-American Institutes based in countries seriously threatened by this geo-hazard (Argentina, Chile, Colombia, Ecuador, Mexico, and Nicaragua). This will proportionate to the final users a tool to elaborate short-term forecasts of tephra deposition on the ground, and determine airborne ash concentrations (a quantity of special relevance for aerial navigation safety) during eruptions and emergencies. The project web-site will have a public section and a password-protected area to exchange information and data among participants and, eventually, to allow remote execution of high-resolution mesoscale meteorological forecasts at the BSC facilities.

The public website section will be updated periodically and will include sections describing the project objectives and achievements as well as the hazard maps for the investigated volcanoes, and will be linked to other relevant websites such as IAVCEI, IGCP, IUGS and UNESCO homepages. A part of the public section of the website will be devoted to disseminate achieved scientific results, provide general advice, and display hazard maps to a larger public beyond the scientific community. The website private section will include a software and documentation download section as well as a gateway to run the WRF mesoscale meteorological model and the parallel version of the FALL3D model at the BSC facilities. It will be invaluable during an eventual emergency if the affected institution does not yet have an agreement with its national weather service.