



Contribution of Earth Observation data to flood risk mapping

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An important contribution of Earth Observation (EO) information towards managing flooding-connected phenomena could be envisaged at the level of mapping aspects. EO satellites can provide necessary information for flood hazard and vulnerability assessment and mapping, which are directly used in the decision - making process.

EO-derived information concerning land cover and land use is important because it makes possible periodical updating and comparisons, and thus contributes to characterizing the human presence. It also provides information concerning flood vulnerability, as well as evaluations of the impact of the floods.

In order to obtain high-level thematic products, the data extracted from EO images must be integrated with other non-space ancillary data (topographical, pedological, meteorological data) and hydrologic/hydraulic models outputs. This approach may be used in different phases of establishing flood-sensitive areas such as: the management of the database that is constructed from the ensemble of the spatially geo-referenced information; the elaboration of the risk indices from morpho-hydrographical, meteorological and hydrological data; the interfacing of the models in order to improve their compatibility with input data; recovery of results and the possibility to examine scenarios; and the presentation of results as synthesis maps easy to access and interpret and which may then be combined with other information in the GIS database.

The paper presents the specific methods, developed in the framework of the NATO SfP "TIGRU" project "Monitoring of extreme flood events in Romania and Hungary using EO data" for deriving satellite-based applications and products for flood risk mapping.

The study area is situated in the Crisul Alb - Crisul Negru - Kőrös transboundary basin, crossing the Romanian – Hungarian border.

Using the optical and microwave data supplied by the new satellite sensors (U.S. DMSP/Quikscat, LANDSAT-7/TM, EOS-AM “TERRA”/MODIS and ASTER) different products (updated digital maps of the drainage network and land cover/land use, mask of flooded areas, multi-temporal maps of the flood dynamics, hazard maps with the extent of the flooded areas and the affected zones, etc.) have been obtained. These results, at different spatial scales, include synthesis maps that are easy to access and interpret and that can be combined with other information from the GIS database and also in order to ingest rainfall-runoff models outputs.

The presented applications will contribute to preventive consideration of the extreme flood events by planning more judiciously land-use development, by elaborating plans for food mitigation, including infrastructure construction in the flood-prone areas and by optimization of the flood - related spatial information distribution facilities to end-users.