



## **A free and open source QGIS plugin for flood risk analysis: FloodRisk**

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An analysis of global statistics shows a substantial increase in flood damage over the past few decades. Moreover, it is expected that flood risk will continue to rise due to the combined effect of increasing numbers of people and economic assets in risk-prone areas and the effects of climate change. In order to increase the resilience of European economies and societies, the improvement of risk assessment and management has been pursued in the last years. This results in a wide range of flood analysis models of different complexities with substantial differences in underlying components needed for its implementation, as geographical, hydrological and social differences demand specific approaches in the different countries. At present, it is emerging the need of promote the creation of open, transparent, reliable and extensible tools for a comprehensive, context-specific and applicable flood risk analysis.

In this context, the free and open-source Quantum GIS (QGIS) plugin “FloodRisk” is a good starting point to address this objective. The vision of the developers of this free and open source software (FOSS) is to combine the main features of state-of-the-art science, collaboration, transparency and interoperability in an initiative to assess and communicate flood risk worldwide and to assist authorities to facilitate the quality and fairness of flood risk management at multiple scales. Among the scientific community, this type of activity can be labelled as “participatory research”, intended as adopting a set of techniques that “are interactive and collaborative” and reproducible, “providing a meaningful research experience that both promotes learning and generates knowledge and research data through a process of guided discovery” (Albano et al., 2015). Moreover, this FOSS geospatial approach can lowering the financial barriers to understanding risks at national and sub-national levels through a spatio-temporal domain and can provide better and more complete information and to generate knowledge in the stakeholders for improving flood risk management. In particular, Floodrisk comprises a set of calculators capable of computing human or economic losses for a collection of assets, caused by a given scenario event, explicitly covering mitigation and adaptation measures (Mancusi et al., 2015). It is important to mention that despite the fact that some literature models incorporates calculator philosophies identical to the ones implemented in the FloodRisk engine, its implementation might vary significantly, such as the need for a user-friendly and intuitive user interface, or the capability of running the calculations on any platform (Windows, Mac, Linux, etc.), the ability to promotes extensibility, efficient testability, and scientific operability. FloodRisk has been designed as an initiative for implemented a standard and harmonized procedure to determine the flood impacts.

Albano, R.; Mancusi, L.; Sole, A.; Adamowski, J. Collaborative Strategies for Sustainable EU Flood Risk Management: FOSS and Geospatial Tools—Challenges and Opportunities for Operative Risk Analysis. *ISPRS Int. J. Geo-Inf.* 2015, 4, 2704-2727.

Mancusi, L., Albano, R., Sole, A.. FloodRisk: a QGIS plugin for flood consequences estimation, In: *Geomatics Workbooks n°12 – FOSS4G Europe Como*, 2015