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Conference Paper, Published Version

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Verfügbar unter/Available at: <https://hdl.handle.net/20.500.11970/107189>

Vorgeschlagene Zitierweise/Suggested citation:

Escobar-Vargas, Jorge; Fuentes-Cabrejo, Carlos (2019): Open TELEMAC as a decision making tool in developing countries. Case of flash floods and boundary demarcation in Colombia. In: XXVIth TELEMAC-MASCARET User Conference, 15th to 17th October 2019, Toulouse.

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# Open TELEMAC as a decision making tool in developing countries. Case of flash floods and boundary demarcation in Colombia

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**Abstract:** In this work, we present the recent improvements of using Open TELEMAC as a decision making tool for regional planning in Colombia. Two specific cases are presented: a first one where the modeling suite was used for the development of an early warning system for debris flows and flash floods, and a second one for boundary demarcation over periodically flooded territories. For both cases, a detailed explanation of the numerical set up, and limitations of the information needed to build the models is described. In the same way, the adaptations and modifications done to the source code, in terms of added source terms to the mass and momentum equations, are presented. The latter, in order to represent in a more detailed way the observed dynamics of the flows. Results of the first case showed that OpenTELEMAC is a versatile tool to compute, in a detailed way, the flow path, the force imposed by the fluid to the structures, and the deposition patterns in the municipality affected by the debris flow. For the second case was found that for flat regions, with terrain slopes smaller to 2%, precision in altimetry data is required to obtain plausible results. On the other side, OpenTELEMAC was found to be suited to represent the hydrodynamics of shallow lagoons (ciénagas), and the connections between them and the river who supply the water to the ecosystem. Preliminary results of an exercise where OpenTELEMAC is being use for the representation of surface water/ground water interaction in flat regions are presented as well. The work finishes with a discussion on the way this type of tools can be used in rural areas of a developing country, where there is not enough technical capacity to manage this type of technology.

**Proposed session:** *River and urban floods, flood forecasting and management*

**Key words:** Flash Floods, land demarcation, numerical modeling, regional planning, developing countries

**Speaker:** Jorge Escobar-Vargas