

Skimming flow over stepped spillways with non-converging and converging sidewalls using smoothed particles hydrodynamics method

Summary

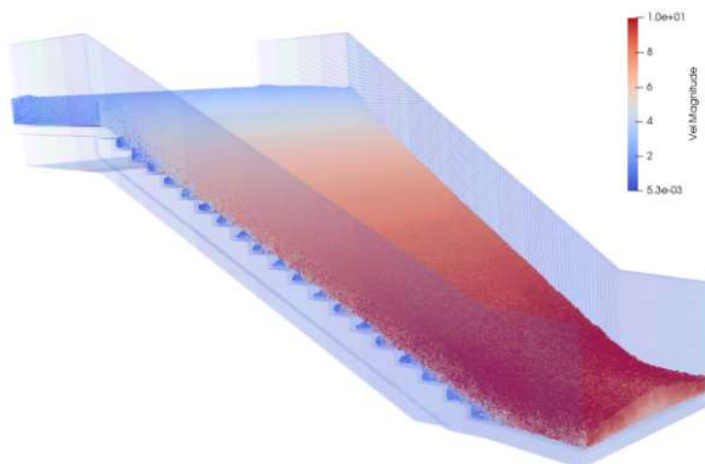
Over the course of the past century, the relationship between humankind and water has resulted in continuous improvement in the quality of life and well-being of people through improved access to water of sufficient quantity and quality to satisfy the various needs for this resource, but has also simultaneously caused the progressive degradation of its quality on an overall, global level. The process of making the right decisions at an opportune time, taking into consideration various different and, at times, antagonistic interests and equating the unequal power relations that exist among interested parties, is managed, within the sphere of water governance, through the creation and implementation of policy, institutional and governance instrument frameworks. The variety of possible conjugations among the elements that constitute governance and the characteristics thereof means that governance and its respective performance are unique for each specific context – in other words, physical, cultural, socio-economic, historical, institutional and technological factors have an influence over governance.

With this in mind, we have chosen to adopt a case study of Cabo Verde in order to outline the scope of research for this thesis, the objective of which is to develop a conceptual model for the analysis and optimization of the performance of water governance that is viable for water-scarce island territories that are highly fragmented and weak in financial resources. A wide-reaching analysis of data regarding the availability, demand and supply of water for the various different sectors and the levels of water service in the country has allowed us to establish the relationship between these conditioning factors and the performance of the main water-related functions in Cabo Verde.

The conjugation of these two water governance approach methods led to the definition of the conceptual model of analysis and performance optimization of water governance that takes into account the interconnection between the various parts thereof and has the ability to generate orientations for the introduction of improvements that may be associated with the current elements of the framework. The framework allows the successes and failures of governance to be identified, integrating the conditions of water scarcity, insularity and financial fragility.

Keywords

Skimming flow, Smooth spillway, SPH method, Stationary shockwaves, Stepped spillway.



3D numerical model of a stepped spillway with converging sidewalls – flow velocity distribution (m/s).



PhD student

Juliana Dorn Nóbrega

PhD program

Civil Engineering (IST, University of Lisbon)

Supervisor

Jorge Saldanha Matos (CERIS, IST, University of Lisbon)

Co-supervisor

Harry Schulz (EESC, University of São Paulo)

Period

2014-2018

Funding

Erasmus Mundus - Smart2 Project