



Coupling of Tsunami modelled flow depth and current velocity for analysis and mapping of impact on human being, buildings and accessibility of the inundated area

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The assessment of vulnerability and damaged caused by tsunamis are mostly expressed through damage functions for buildings and rarely through damage functions for other types of exposed objects or human being.

Tsunami damage functions usually provide, for a specific building typology, the level of damage for a given tsunami flow depth. A new set of buildings damage functions was proposed in SCHEMA project by our team. However, it is recognised that linking flow depth and damage is not sufficient and other factors should be considered. Some authors have worked on the influence of the flow pressure on buildings' damage assessment. Floating objects are also important sources of damages to buildings but this is rarely taken into account. Human being can also be swept away by very low flow depths with floating material arriving at high velocity as seen on videos captured in Banda Aceh.

We propose to combine modelled flow depth and velocity in a new approach for mapping tsunami impact for human being and identifying the areas exposed to shocks by floating objects. The approach is developed on urban coastal areas of the French Riviera (Cannes-Mandelieu) in the framework of the French MAREMOTI project. It is based on the definition of thresholds of the couple Velocity – Flow depth beyond which: i) the human being are affected, or ii) potentially floating objects can be swept away. As output we provide new maps of exposure to danger for people and the visualisation of areas where cars, boats or containers are likely to float and strike increasing the damage caused by a given tsunami scenario. The results are proposed to local users and stakeholders as a new input for coastal risk assessment and rescue organization since the floating debris and destroyed buildings can forbid access to the affected coastal strip.