

E-NUNDATION

A web-based solution to simulate and manage flood risks

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Innovative solutions for a better understanding and management of flood risks

Floods, the most destructive natural hazard in the world

Flooding is the most frequent natural hazard worldwide, accounting for 45% of all natural hazards events recorded between 1990 and 2020. During these three decades, floods have caused (CRED, 2020) :

112 000
deaths

2.4 Billion
affected person

US\$ 537 billion
in damages

By 2030, if no efficient adaptation and mitigation measures are put in place, flooding will impact annually 147 million people and will cause US\$ 712 billion in damages to urban structures such as private properties, companies and public infrastructures (World Resources Institute, 2020).



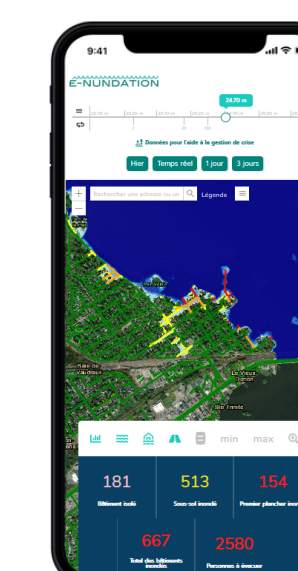
On the other hand, governments, citizens and professionals don't have access to a reliable and easy-to-use tool allowing them to better understand the risk of flooding in their area, to anticipate flooding events and to better prepare for them in order to reduce their human and economic impacts.



First complete flood risk assessment and mapping tool

E-NUNDATION is a web-based platform for flood risk mapping. It assesses and forecasts the impacts of floods on people, buildings and critical infrastructure.

E-NUNDATION is a user-friendly tool. It does not require specific training or knowledge to be used. It is also not a static web tool: the service also offers adapted support and advices to better answer questions and specific needs.



E-NUNDATION is not limited to the simulation of flood hazard, generally characterized by the extent of the flooded area and the depth of flooding. The tool is unique in that it assesses the overall RISK by integrating the exposure of vulnerable elements to flood hazard.

Improving societies preparedness and resilience to flood risk

E-NUNDATION is a decision support tool for effective flood risk management in prevention, emergency and recovery.

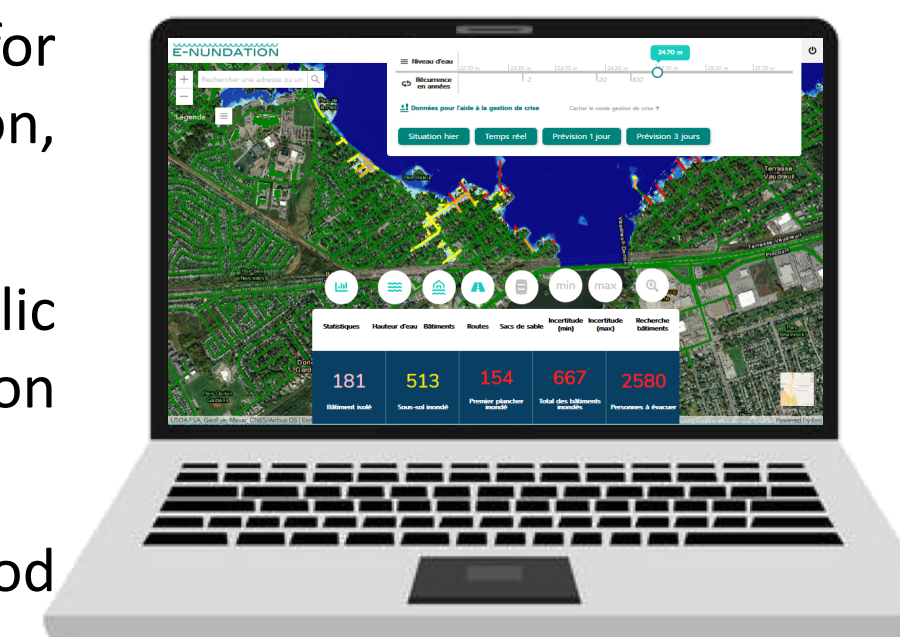
E-NUNDATION's prime objective is to assist public decision-makers in making informed decisions on flood risk management.

E-NUNDATION offers dynamic and predictive flood mapping that can be used to

determine both the extent and depth of water over the entire floodplain. **E-NUNDATION** enables the characterization of the vulnerability of assets present in floodplains and their levels of exposure to this hazard. It helps de answer questions like :

- Which areas will be affected? And at what level?
- Which roads will be impassable?
- Which citizens should be evacuated first?
- How much will it cost in damage to this or that building?
- Where and how should the temporary dikes be placed?

Thanks to a dashboard providing a portrait of the situation, **E-NUNDATION** enables decision-makers to review forecasted, current or future events, thus encouraging proactive rather than reactive actions.

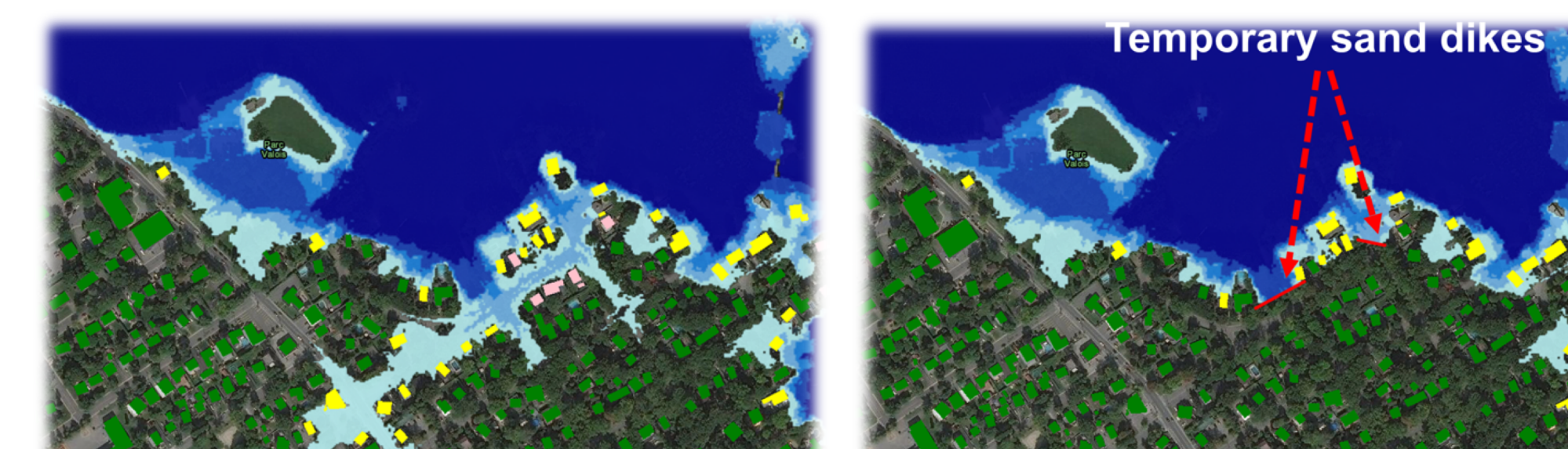


Case study : Lac des Deux Montagnes, Quebec, Canada

In early 2020, **E-NUNDATION** was deployed on the Lac des Deux Montagnes, one of the most exposed areas to flooding risk in Quebec and Canada. The flood maps simulated by **E-NUNDATION** (blue line in the images below) were compared the aerial photography captured during the 2019 floods. The results obtained were in strong agreement with the real situation.



The impact of adding a temporary dike on water flow was also simulated. This functionality helps the emergency services to identify where exactly to install the dike and what are the suitable dimensions to protect a building or a whole area.



Flood risk assessment maps - Lac des Deux Montagnes - without (left) and with (right) temporary dikes

Why using E-NUNDATION?

One of the advantages of **E-NUNDATION** is that it can customized depending on the need of the users and its deployment is based on generally available and free data (depending on the country).

Our mission is to help decision-makers manage flood risks more effectively by providing them with clear and easy-to-understand information. The use of **E-NUNDATION** makes it possible to take preventive actions and to make effective use of human and material resources. In this way, the financial and psychosocial costs associated with floods will be dramatically reduced.