

The Environmental Hydraulics Laboratory of Quebec (EHL)
for the INRS Research Chair in Coastal and River Engineering



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CONTEXT

The creation of a research chair in coastal and river engineering at the Institut National de la Recherche Scientifique – Centre Eau Terre Environnement (INRS-ETE) comes from a combined approach of the ministère des transports du Québec (MTQ) and the ministère de la sécurité publique (MSP) in order to fill in a shared need of coastal engineering expertise relating to the adaptation of infrastructures to climate change effects. An agreement for a research chair was signed between MTQ, MSP and INRS in October 2012.

COASTAL EROSION AND COASTAL PROTECTION

A major goal of the present research chair team is to study and solve the problems related to coastal erosion in Quebec to ensure effective and sustainable protection of the shorelines. To do that, a focused effort is on the development of new protection methods using both small- and large-scales physical models as well as numerical modelling.



Seawall protecting the road Beach surveying, Magdalen 132, Gaspé Peninsula, Islands, Quebec. Quebec.



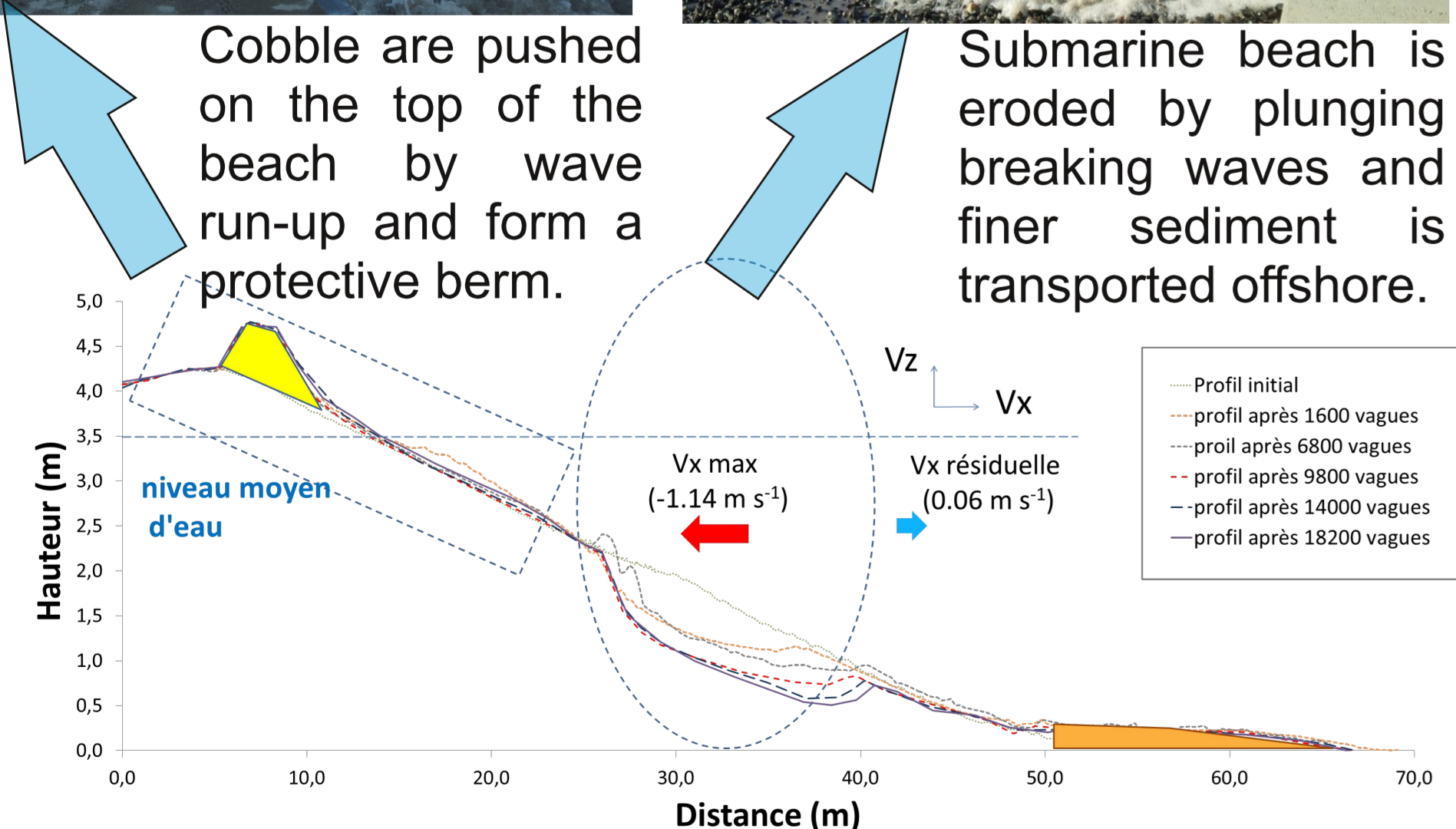
Example of complex wave breaking near a beach. Wave breaks at surface and bed.



Frozen shore along the St-Lawrence River in May. Wave-ice-sediment interaction are complex but can be modeled at EHL facility, Quebec.



Spilling breaker.



Beach profile evolution caused by plunging breakers (duration equivalent to 10 storms). Model scale is 1:3.

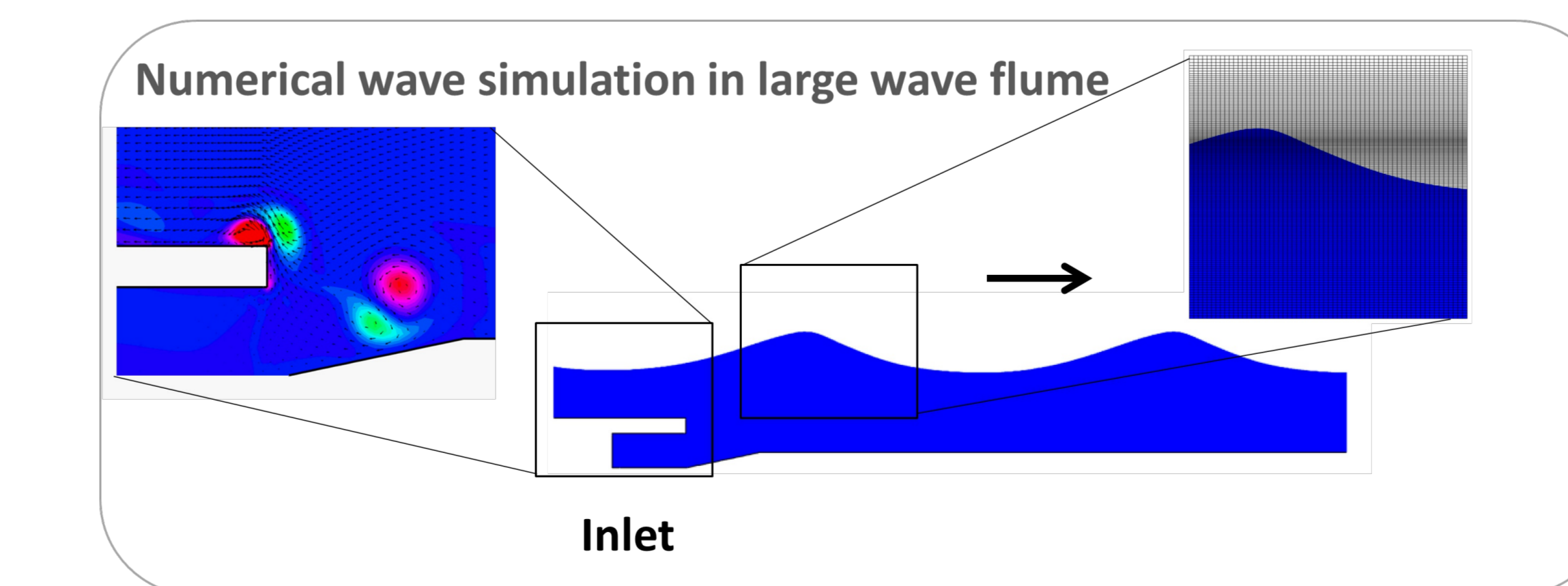
Examples of coastal protection methods.

1. Experimental investigation of wave energy converters for coastal protection purposes

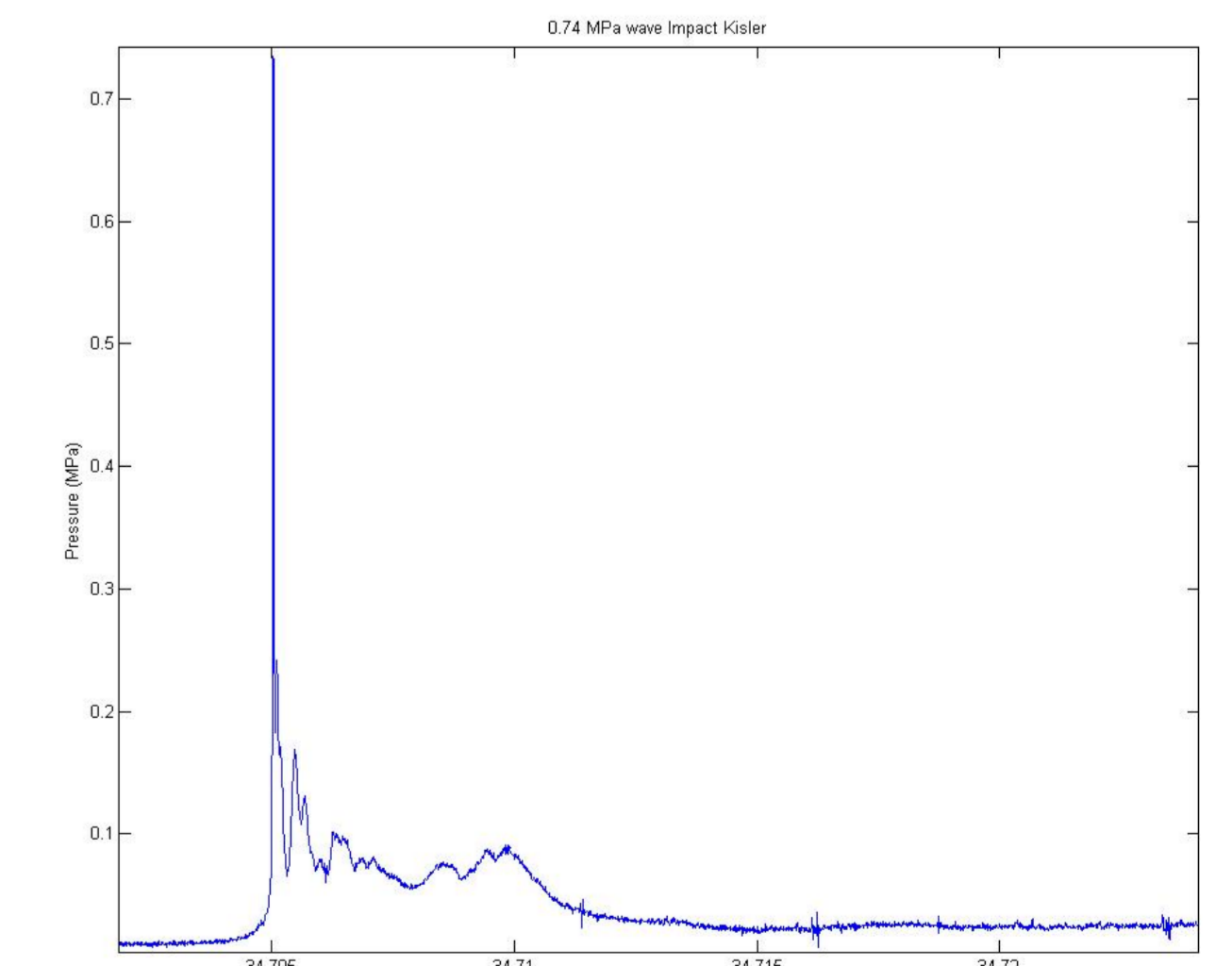
2. Breakwater
Amplitude max 1 = 0.05 m
Amplitude max 2 = 0.02 m
Vitesse max 1 = 1.0 m/s
Vitesse max 2 = 0.4 m/s

3. Wave impact experiment on a seawall. Impacts are measured on a rigid plate equipped with up to 55 pressure sensors. Model scale is 1:4.

Experimental set-up of a heave-surge buoy to collect wave energy (scale 1:110). Example of wave interaction with dike (overtopping).



Example of numerical model of moderate amplitude waves in the EHL wave flume.



Wall pressure record. Plunging breaking wave generates a short-duration pressure peak.

ACKNOWLEDGEMENT

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