

POCTEFA MARLiT

INTERREG Va EFA344/19

Medios de evaluación y Atenuación de los Riesgos costeros Locales debidos a Impactos de los Temporales // Moyens d'évaluation et d'Atténuation des Risques côtiers Locaux dus aux Impacts des Tempêtes

Mitigations actions to reduce impact during actual and future extreme oceanic events

SOFT SOLUTIONS

NATURE BASED SOLUTIONS



Beach Nourishment (Milady beach)



Sand hydraulic bypass (Capbreton beaches)



SOFT SOLUTIONS

NATURE BASED SOLUTIONS



Beach scraping –
Temporary dune protecting the casino of Biarritz

SOFT SOLUTIONS

NATURE BASED SOLUTIONS



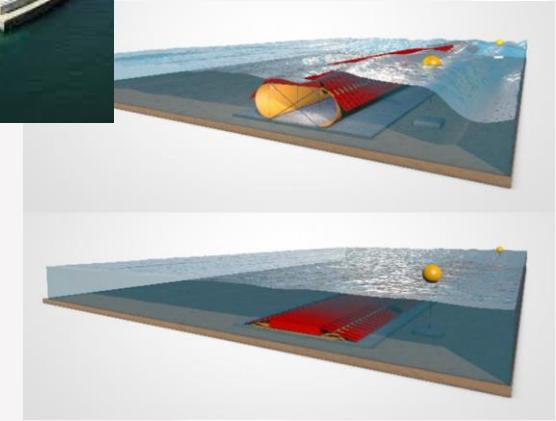
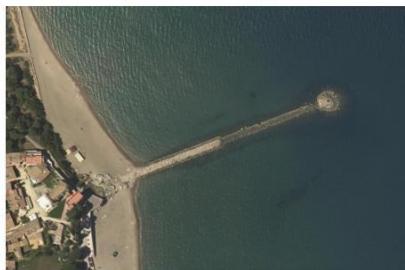
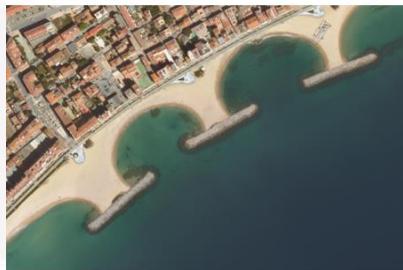
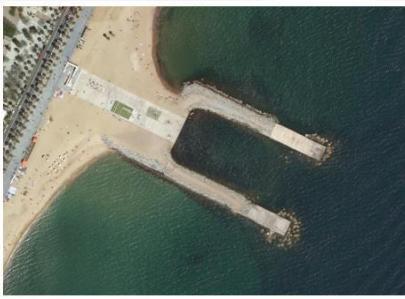
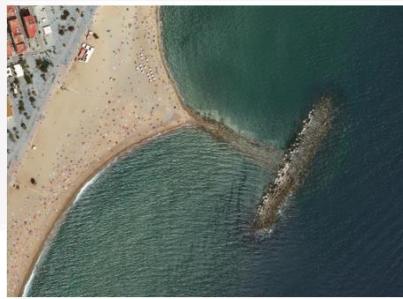
Posidonia planting



Kelp like wave attenuator

HARD SOLUTIONS

TRADITIONAL AND INNOVATIVE MEASURES AT LONG-TERM



Breakwaters & groins
Rumble mound structures

OWC breakwater & Inflatable reefs

Mitigation solutions Inventory

		Russia	Sweden	Estonia	Latvia	Lithuania	Poland	Denmark	Germany	Netherlands	Belgium	Great Britain	Ireland (N&S)	France	Spain	Portugal	Italy	Slovenia	Croatia	Bosnia Herzegovina	Montenegro	Albania	Greece	Bulgaria	Romania	Ukraine
Seawall	concrete	■																								
	bricks	■	■																							
	stones	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	wood	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	fibreglass	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	gabions	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Revetment (interlocking blocks)	natural stones	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	concrete blocks	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	gabions	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Rubble mound or Rip-rap																										
Island platforms	stones																									
	stones + concrete																									
Surfing reefs																										
Detached breakwaters, emerged	rocks	■																								
	concrete																									
Detached breakwaters, submerged	rocks																									
	concrete																									
Groins	emerged	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	submerged	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	mixed (e+s)	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	permeable	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Sediment bypassing																										
Beach nourishment with marine aggregates	sand	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	gravel	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Beach nourishment with terrestrial aggregates	sand	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	gravel	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Nearshore nourishment																										
Dunes	reconstruction	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	stabilisation	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	construction	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Beach dewatering	horizontal drains	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	vertical drains																									
Wave attenuators	floating																									
	fixed																									
Bitumen coatings		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Configurational dredging																										
Posidonia planting	natural	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	artificial																									
Others: Sediment recycling, Tyres, Dikes, Wire	T	■																								
	D		■																							
	W			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	S																									

Frequent

Moderately present

Infrequent

Experiment

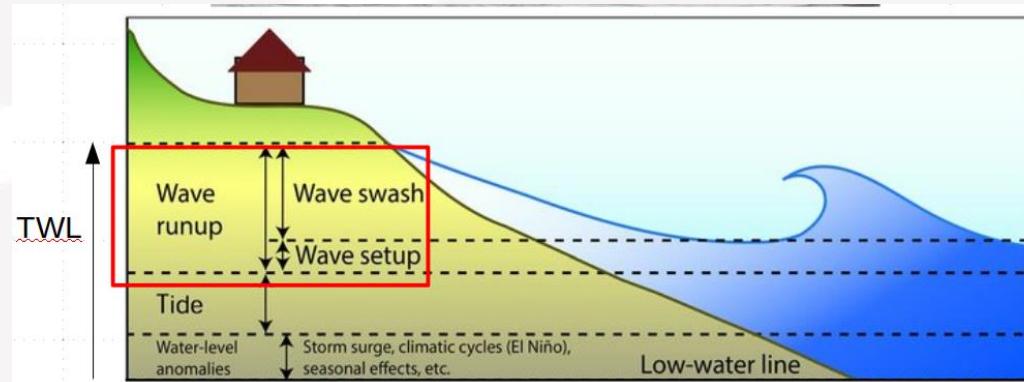
Absent

Numerical assessment of mitigation solutions efficiency



Total water level depends on :

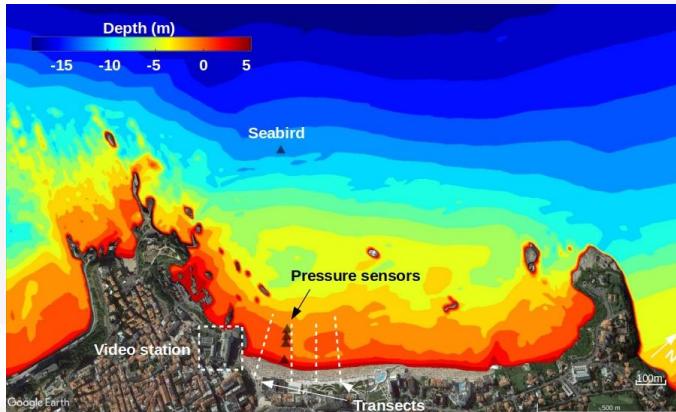
- Tide
- Storm surge
- Waves



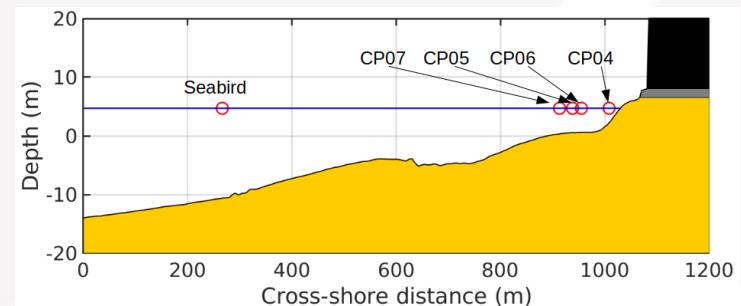
Vitousek et al. (2017)

Numerical assessment of mitigation solutions efficiency

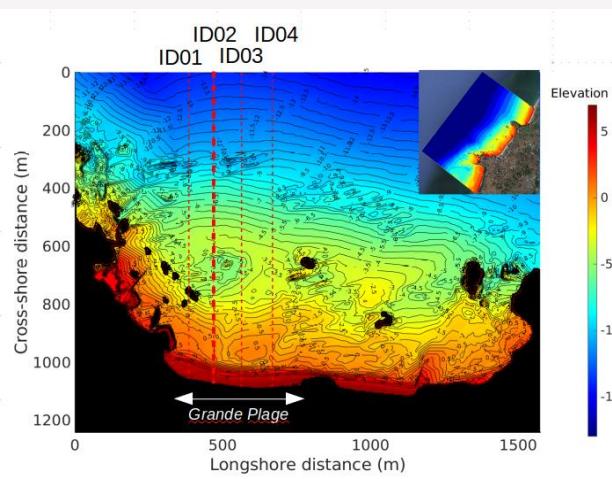
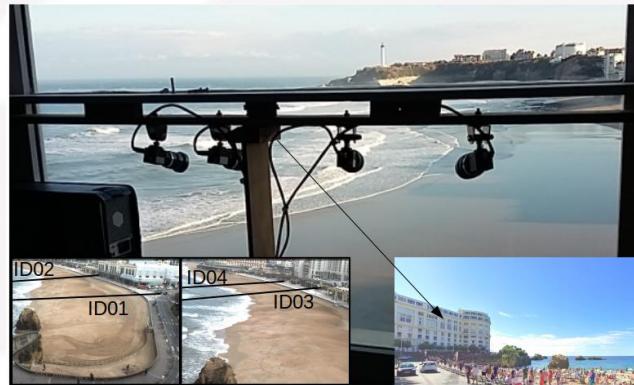
Pilote site Grande Plage de Biarritz



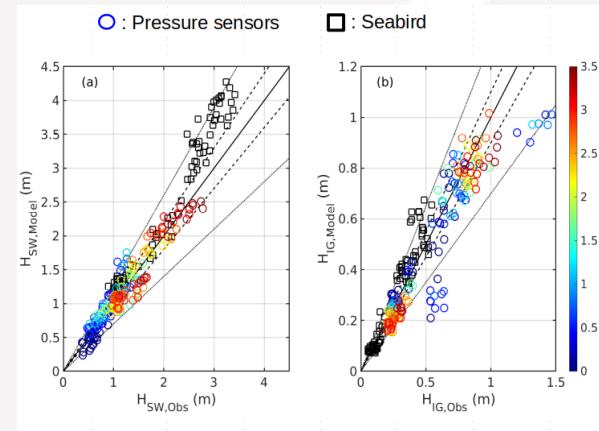
Marea field campaign 2018 : Model validation



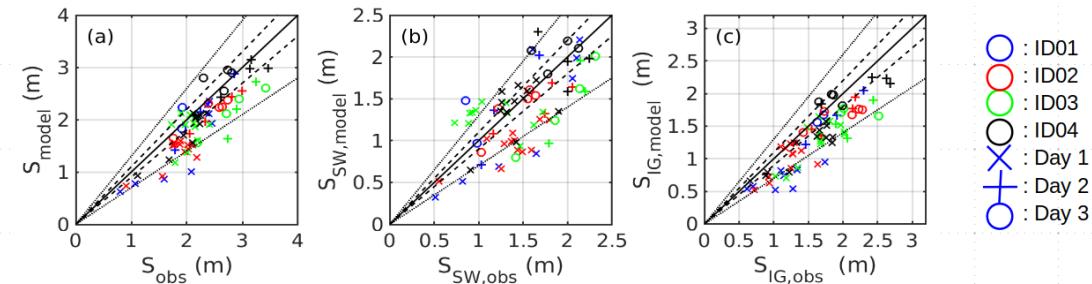
Marea field campaign 2018 : model validation



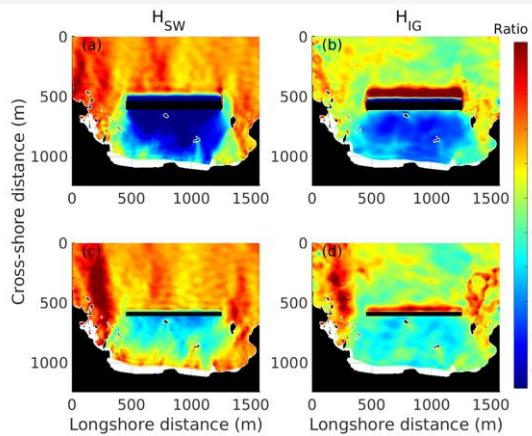
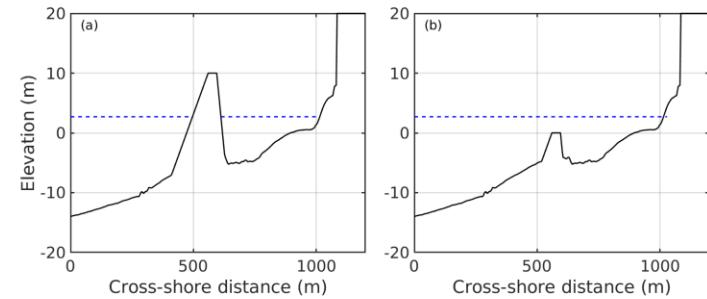
Nearshore waves



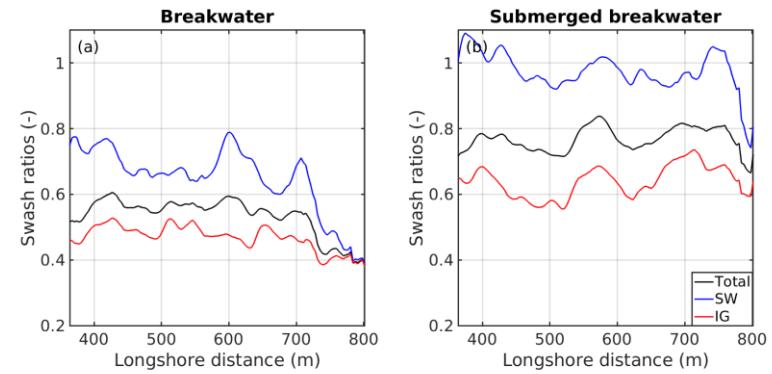
Swash (wave contribution to TWL)



OFFSHORE BREAKWATER

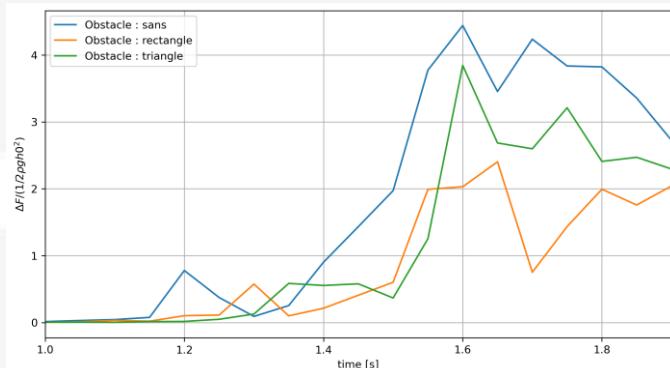
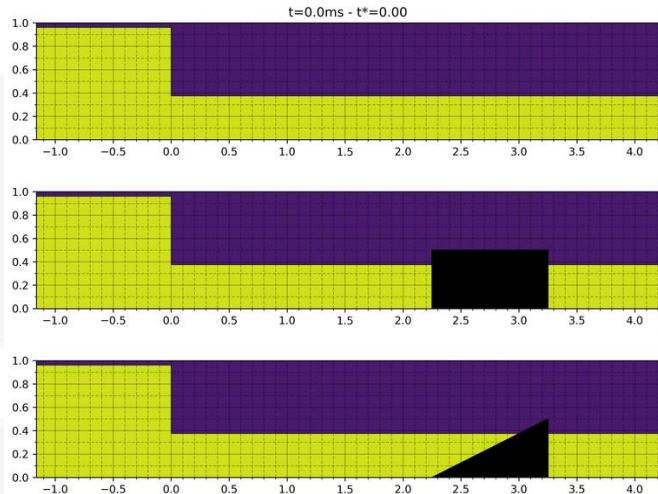


Nearshore wave field



Swash height

INCREASE BEACH RUGOSITY- WORK IN PROGRESS



Impact force



Rocky plateform (Sokoa)

REMovable DIKE



2 rows of sand bags (2t / bag)

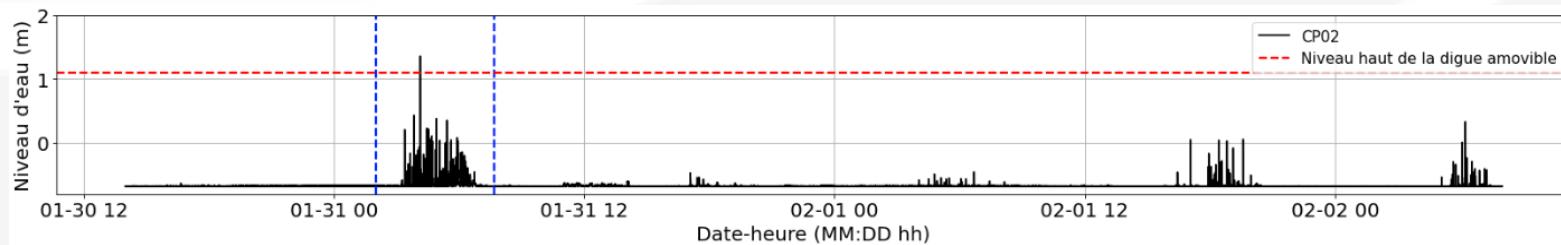
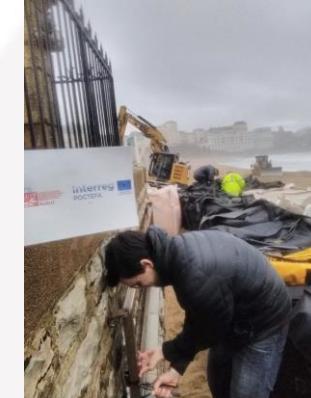
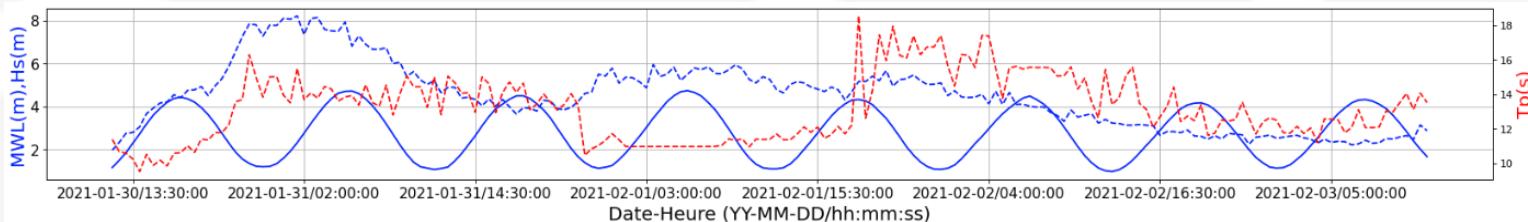


AFTER



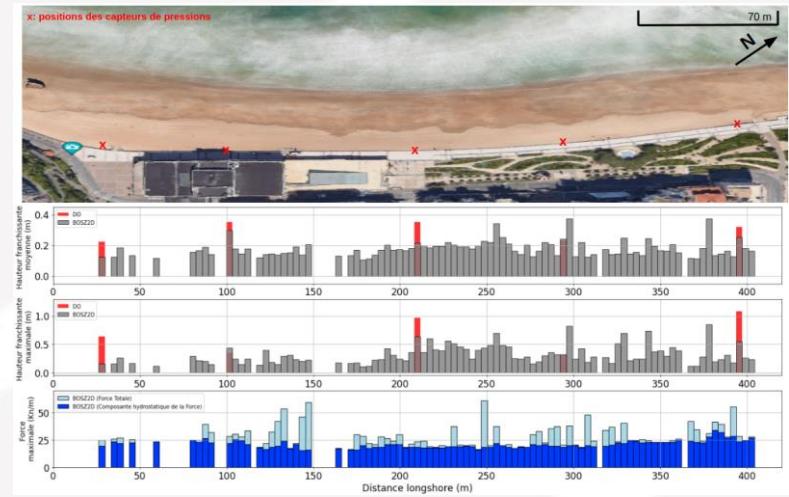
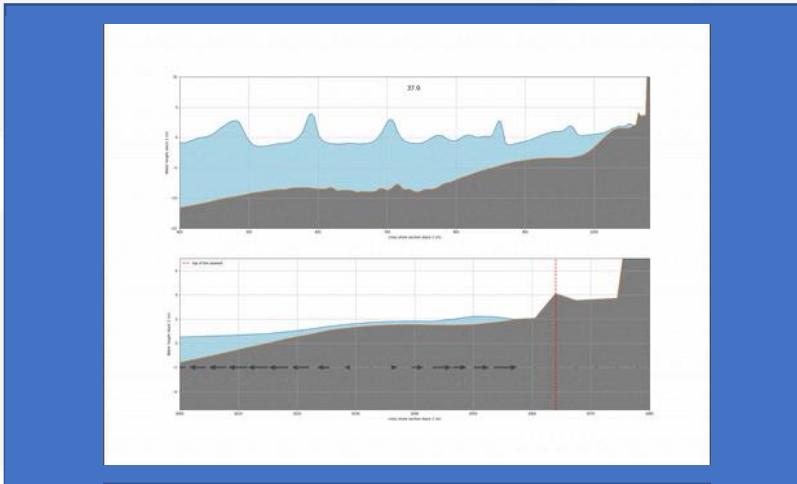
Justine Storm – Janvier 2021

REMOVABLE DIKE



REMovable DIKE

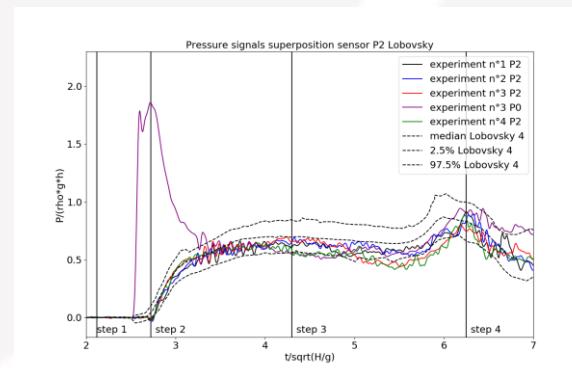
Overtopping occurrence and water level along the beach



REMovable DIKE

Determination of overtopping wave impact force

LABORATORY CONDITIONS



REAL FIELD CONDITIONS

