

# PECC SEMINAR BUSAN

SUSTAINABILITY AND  
BEAUTIFICATION OF PORTS

## PAPEETE PORT AUTHORITY

SUSTAINABILITY DREDGING AND  
BUILDING NEW PORT FACILITIES  
WITH RESPECT TO ENVIRONMENTAL  
CONCERNS

4 April 2016

# TWO OPTIONS TO HANDLE LARGER VESSELS AND TO OPERATE MORE TEUS

- On site developments
- Extension to the East



# ON SITE DEVELOPMENT

- deepenings of entry bay and international quay / extension of the terminal / new access bridge
- dredging volumes : 35 000 cubicmeter
- estimated cost : 80 million euros
- schedule : 1year for studies / 2 years for works (with strong dependance to the climatic conditions for dredging and Important operating constraints)



# EXTENSION TO THE EAST

- new quays : 900 m / new terminal : 25 hectares / second bridge
- dredging and embankments volumes : about 1 million cubic meter
- estimated cost : 210 million euros
- schedule : 2.5 years for studies / 5 years for works



# ENVIRONMENTAL IMPACTS

- Noise, accidental pollution and operating constraints during works
- Destruction of coral areas
- Changes of the urban landscape
- Species perturbation (martime wildlife)
- Water turbidity (ciguatera risks)
- **Hydrodynamic perturbation**

# HYDRODYNAMICS PERTURBATION

- On site development :
  - swell on the shore (erosion)
  - currents in the entry and between entry and in the middle of the bay
  - water turbidity during works
  
- Extension to the East :
  - water renewal (biological quality)
  - currents in the east channel
  - water turbidity during works



# WATER RENEWAL

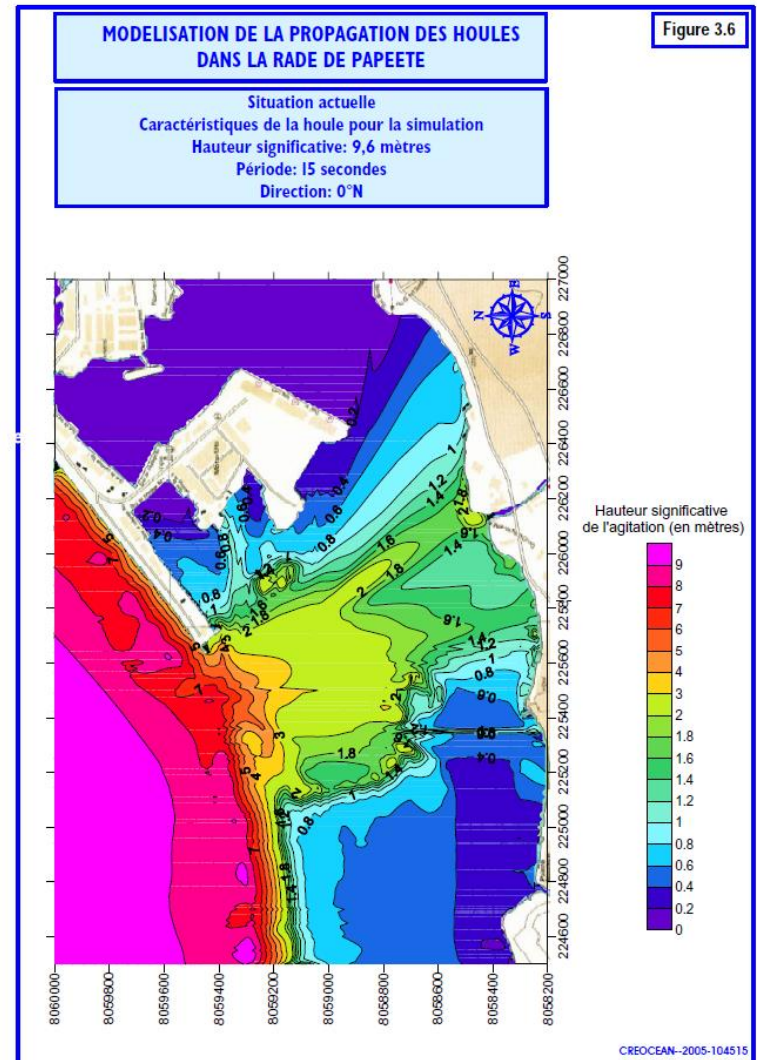
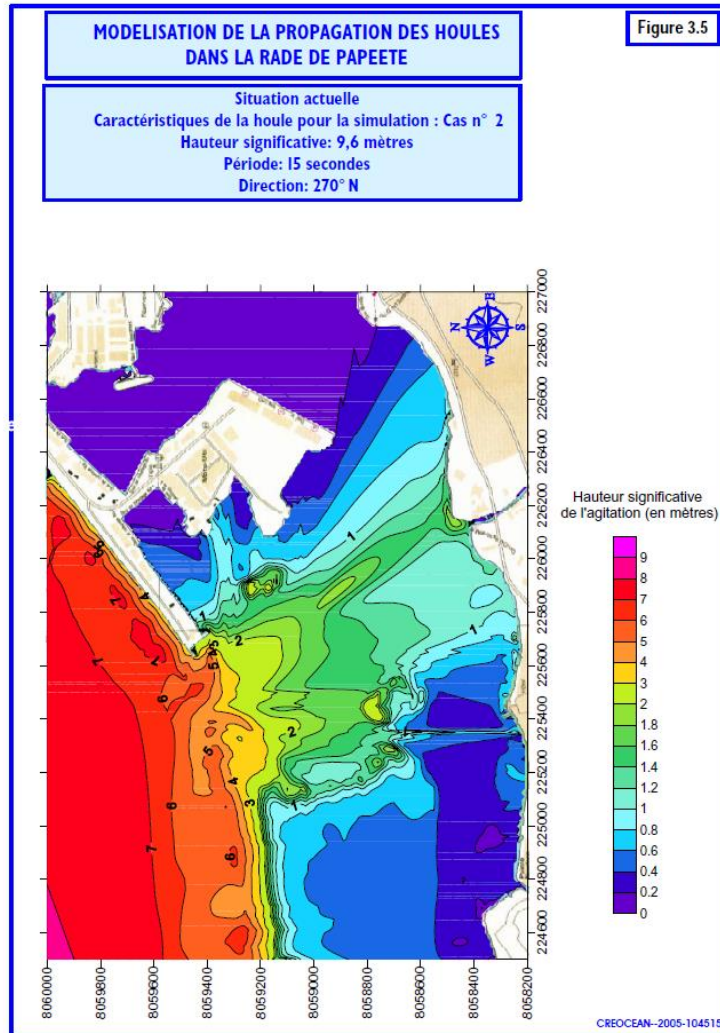


# HYDRODYNAMICS MODELS

- Entry of the bay :
  - waves and currents 2D modeling (TELEMAC) with 90 000 calculation points
- Extension to the East :
  - data acquisition in progress (two seasons)
  - 3D modeling in one year

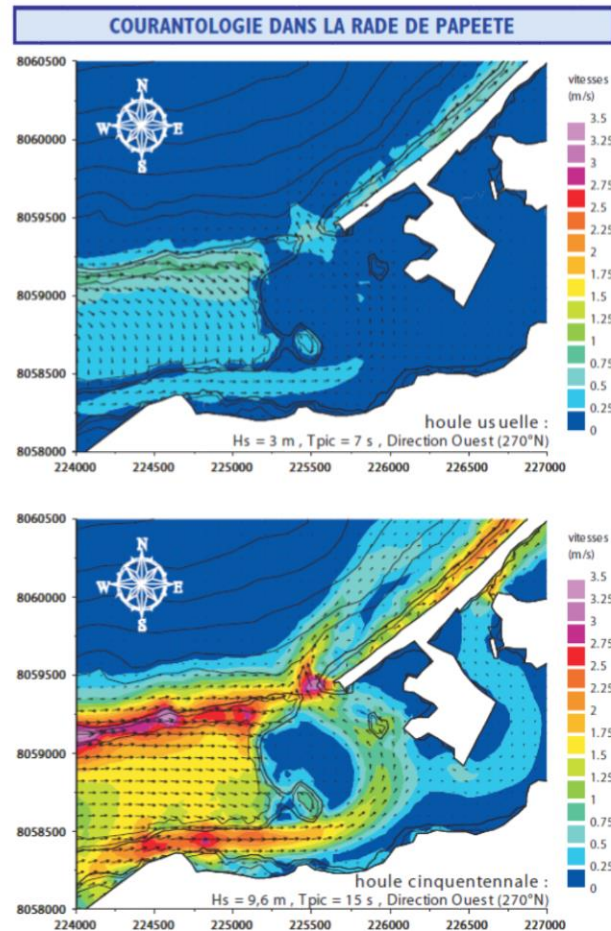


# EXAMPLES OF 2D MODELING RESULTS IN THE ENTRY BAY (SWELL)



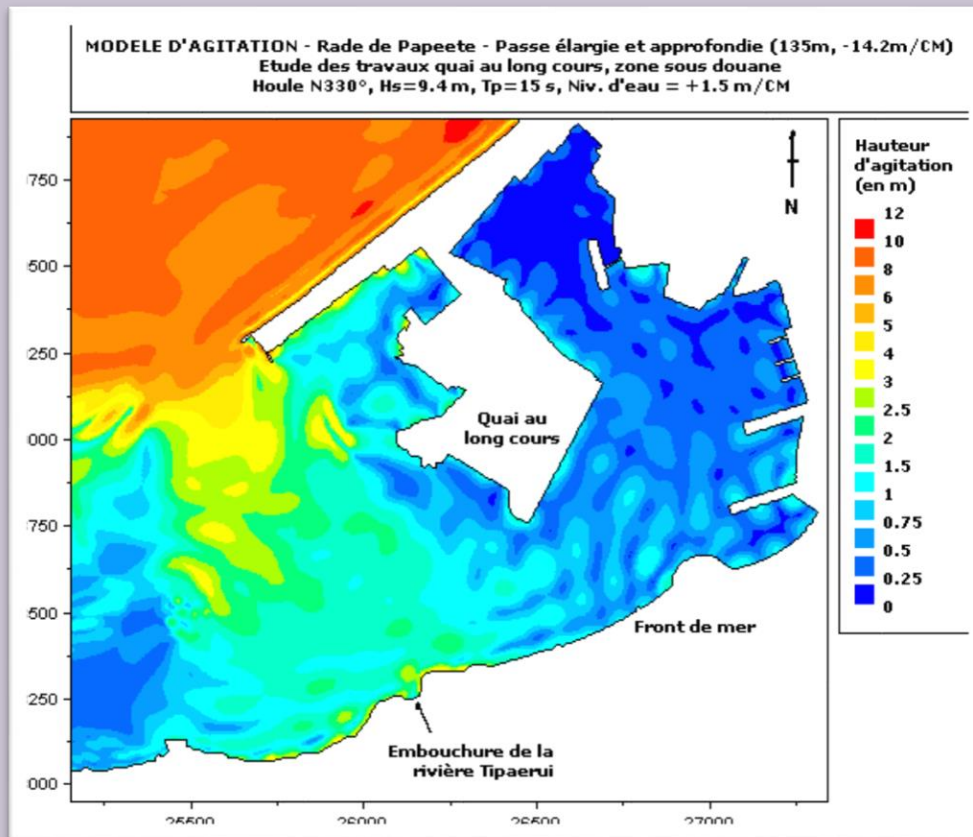
# EXAMPLES OF 2D MODELING RESULTS IN THE ENTRY BAY (CURRENTS)

Figure 3.7



# DEEPENING ENTRY MODELING

## EXAMPLE OF IMPACTS ON THE SHORE

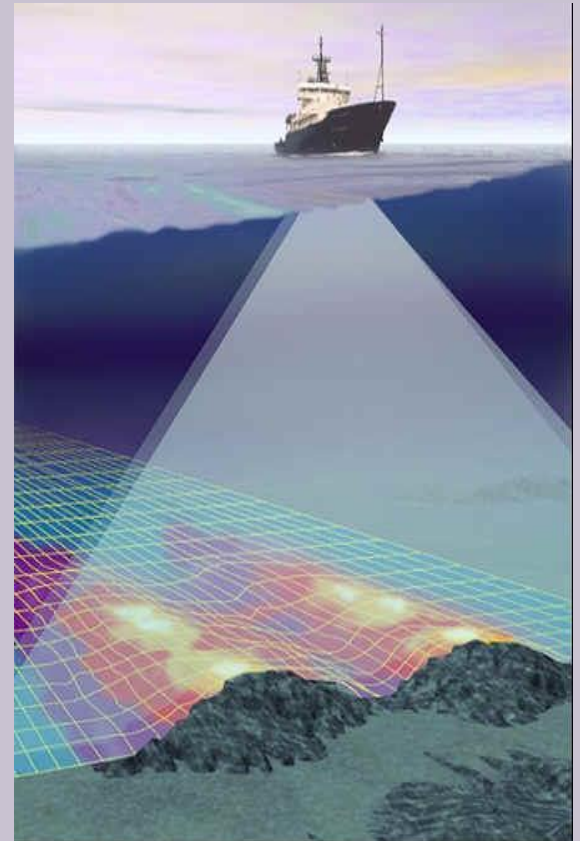
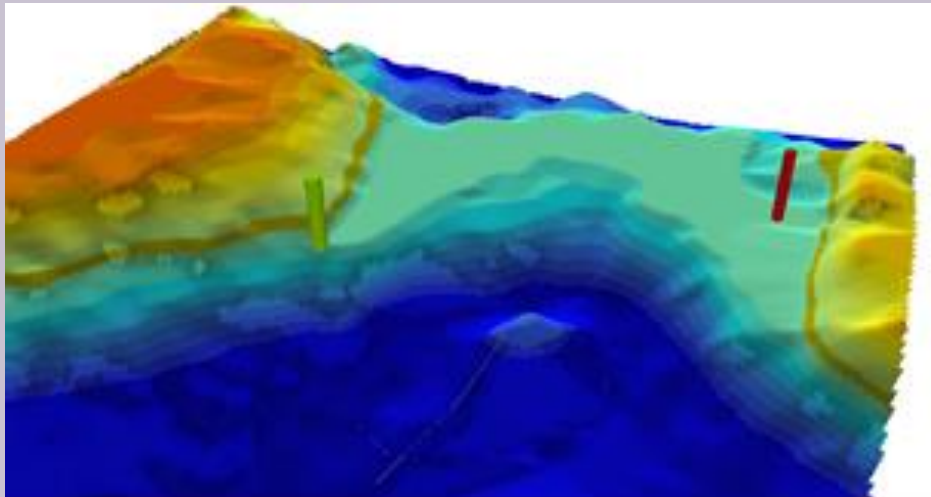


Observation :  
swell aggravation from +35% to +50%  
on the shore

Consequence :  
strengthen the protection stones along  
near 1 km shore

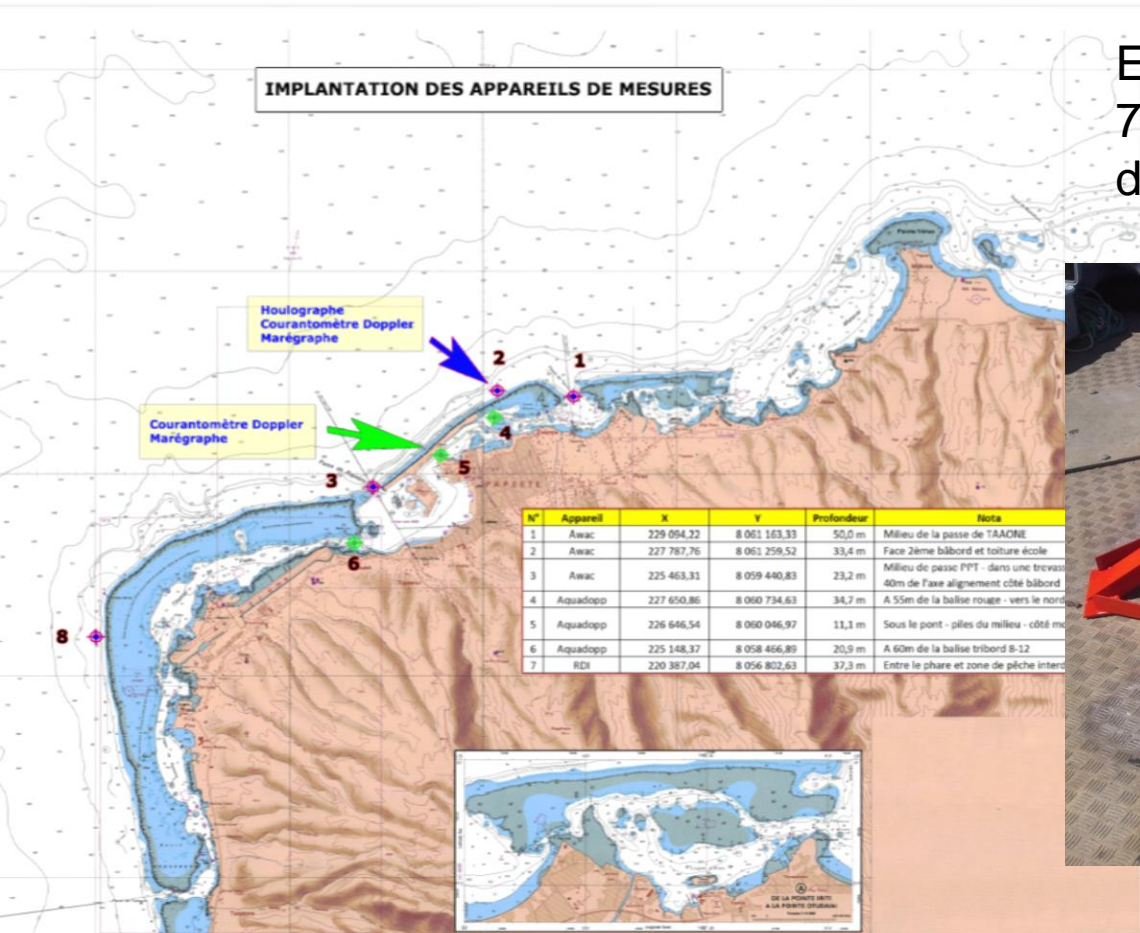
# EXTENSION TO THE EAST MODELING DATA ACQUISITION (BATHYMETRY)

Reliable and precise data with a multi-beam echo sounder





# EXTENSION TO THE EAST MODELING DATA ACQUISITION (CURRENTS AND WAVES)



Equipment :  
7 wave and current doppler effect  
devices





# EXTENSION TO THE EAST MODELING WHICH IS EXPECTED

- results coherent with acquired data to validate the model
- to calculate hydraulic transparencies (width and distribution) through the future sea wall so as to keep water renewal
- to determinate for which swell conditions the water turbidity will be controled

# THANK YOU FOR YOUR ATTENTION

