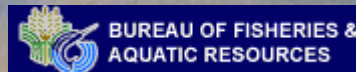


AQUA PARK

AquaPark – Norad funded project

**Planning and management of
aquaculture parks for sustainable
development of cage farms in the
Philippines**

Mid-term meeting report



Wave modelling for exposed cage areas

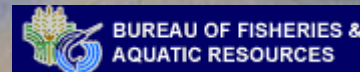
by
Øyvind Leikvin & Lars Øvergaard

Out put from AquaPark

Aquapark Project Partners

- Bureau of Fisheries and Aquatic Resources
- Akvaplan-niva AS
- Map and Marine Ltd

Mid-term meeting report





STWAVE Wave Model



STWAVE simulates

- Depth-induced wave refraction and shoaling
- Current-induced wave refraction and shoaling
- Depth- steepness-induced wave breaking
- Diffraction
- Wind-wave growth
- Wave-wave interaction
- Whitecapping
- Reflection

Mid-term meeting report

STWAVE assumptions

- Mild bottom slope
- Spatially homogeneous offshore wave conditions
- Steady-state waves, currents, and winds
- Linear refraction and shoaling
- Depth-uniform current
- Linear radiation stress

STWAVE modelling, Panabo - Main input data

- **Bathymetry**

(provided from oceanographic charts and own measurements)

- **Wind speed in model domain**

(1 year of wind-data (2009) extracted from measurements from Panabo area given by Namria)

- **Wave height at ocean boundary**

(10 years of offshore wave data retrieved from www.buoyweather.com, and is extracted from hindcast data from a global WAM wave model.)

- **Wave energy spectrum**

(default by the model/ defined by user)

STWAVE modelling, Panabo - Model setup

- Resolution: 100 * 100 m (nesting also possible)
- Whole bay of Davao covered, an area of about 6000 km².
- o1
- Incoming wind and waves from the opening of Davao Bay in the south

Slide 7

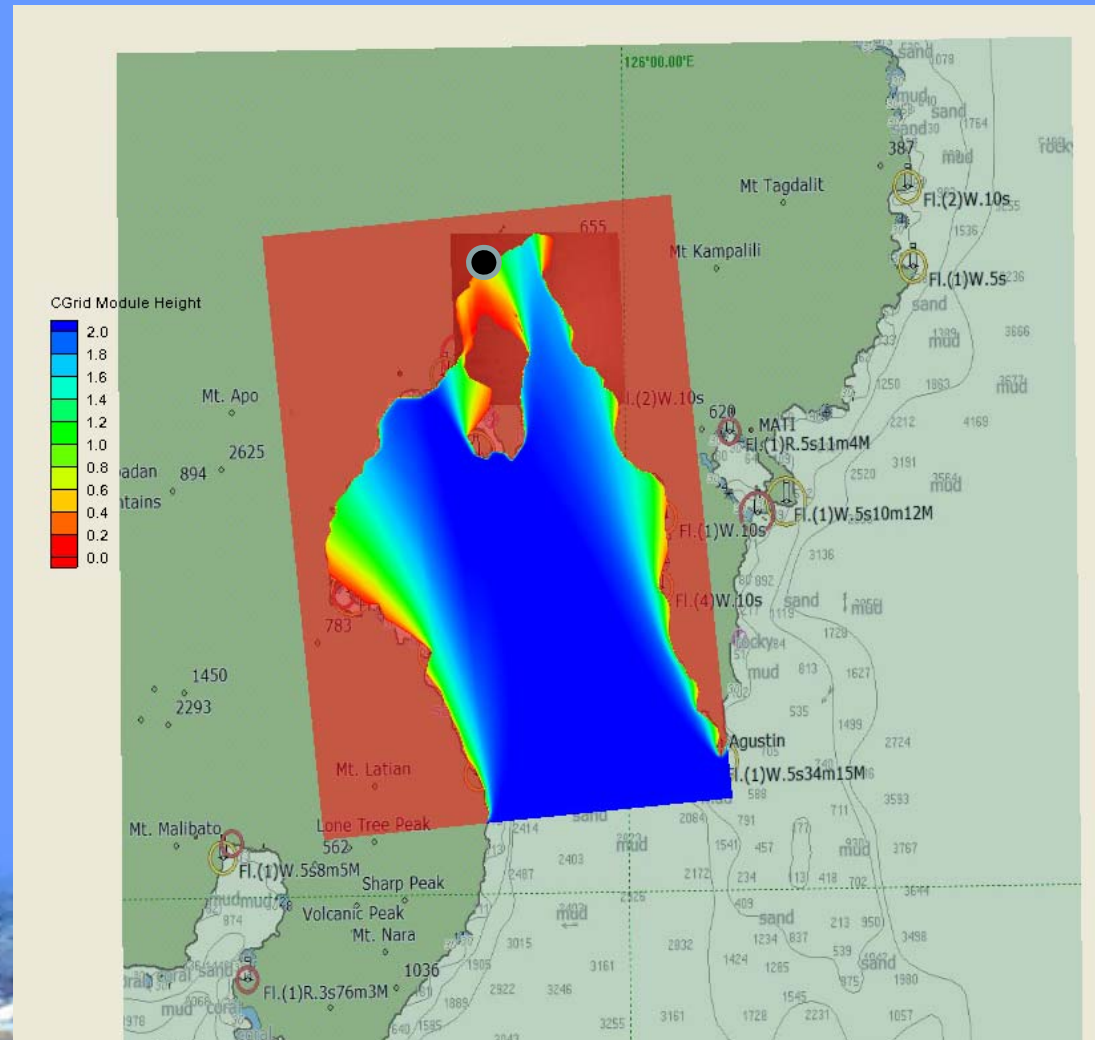
o11

Can you find reference on this, Patrick?

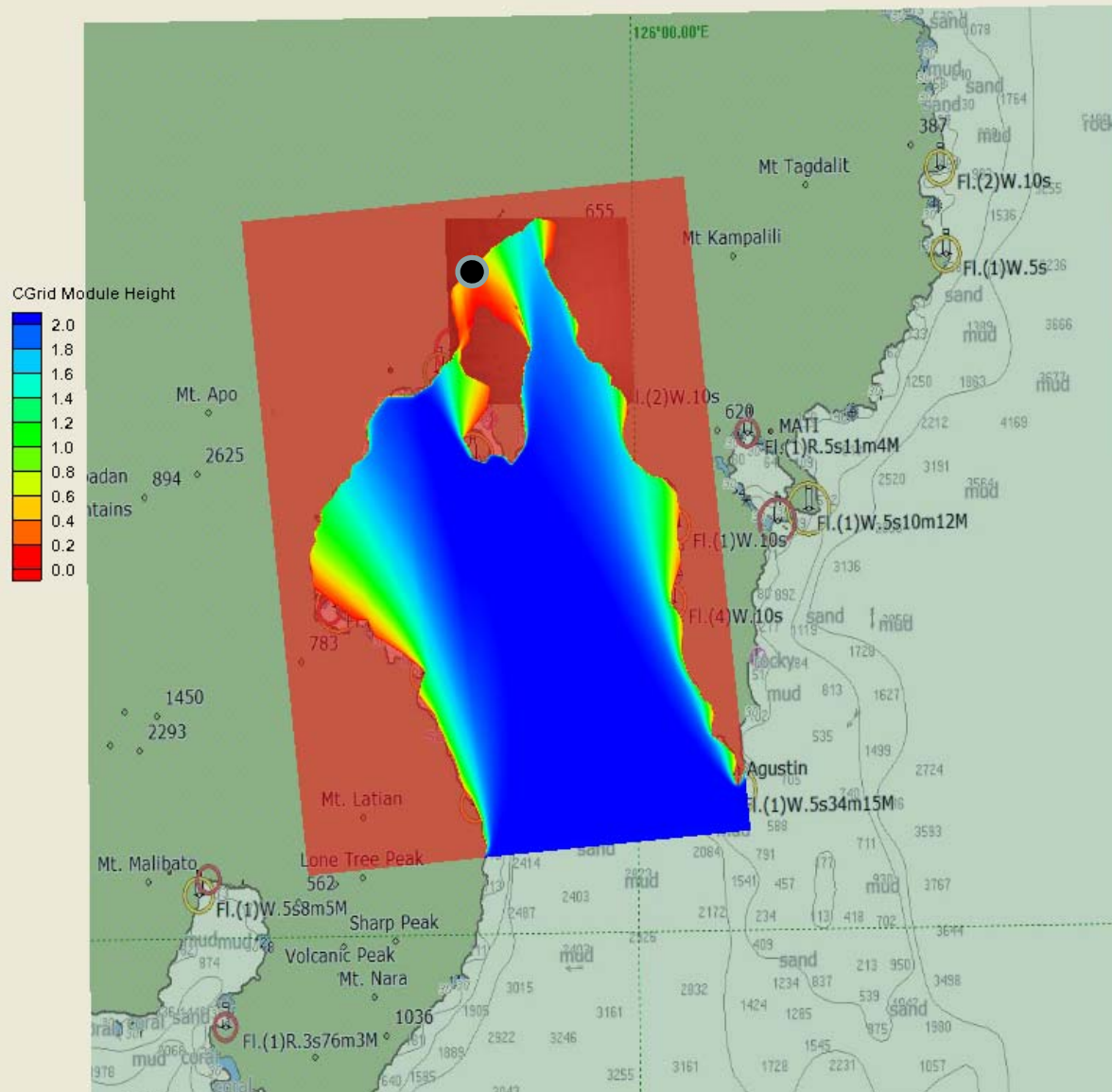
oyvind leikvin, 9/1/2010

Results

- A georeferenced picture/map may be placed as a background for the model plot
- A wave train is set up, entering the model domain from offshore.
- Typically the whole bay system and the boundary towards the open ocean will be covered

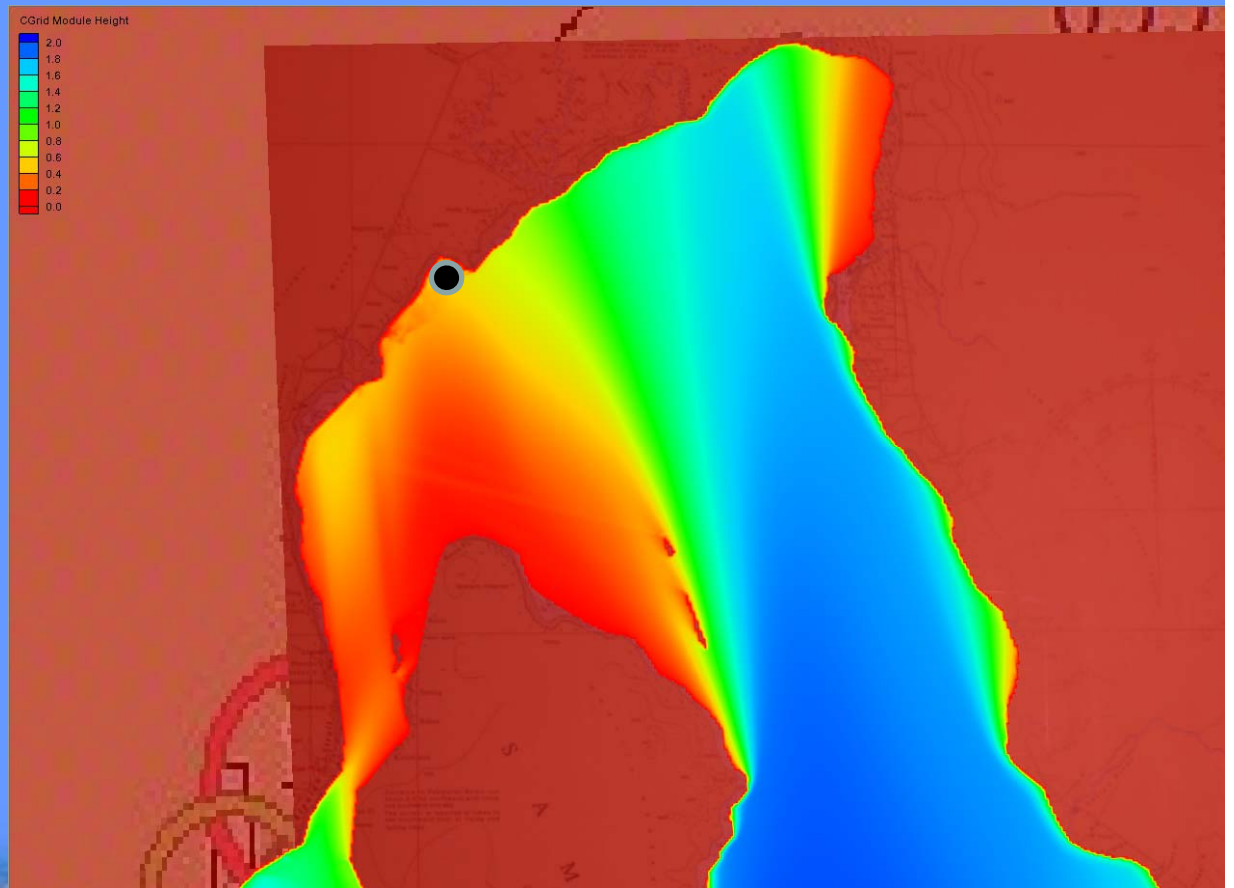


Overview of the area

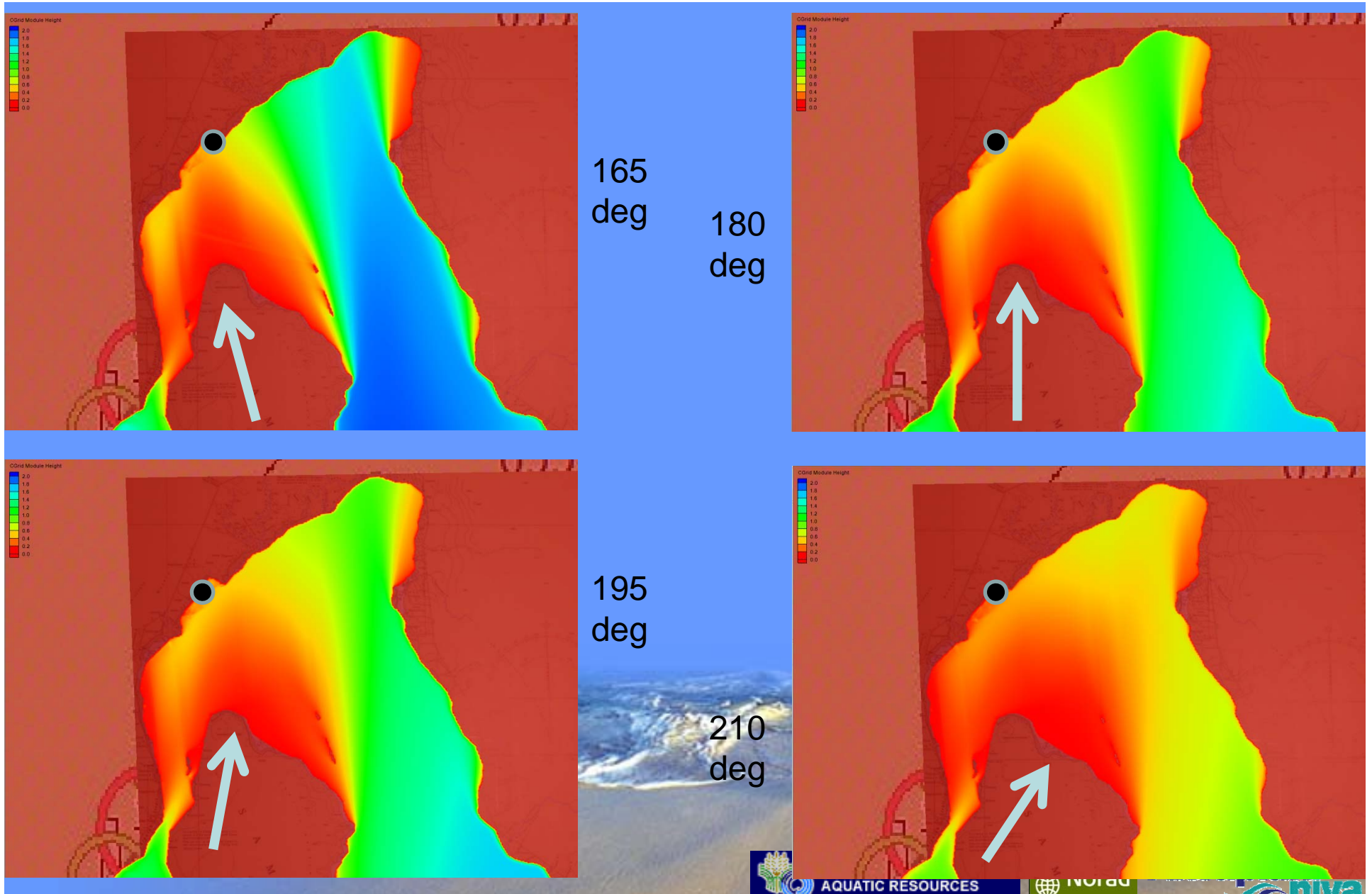


Significant wave height (Hs)

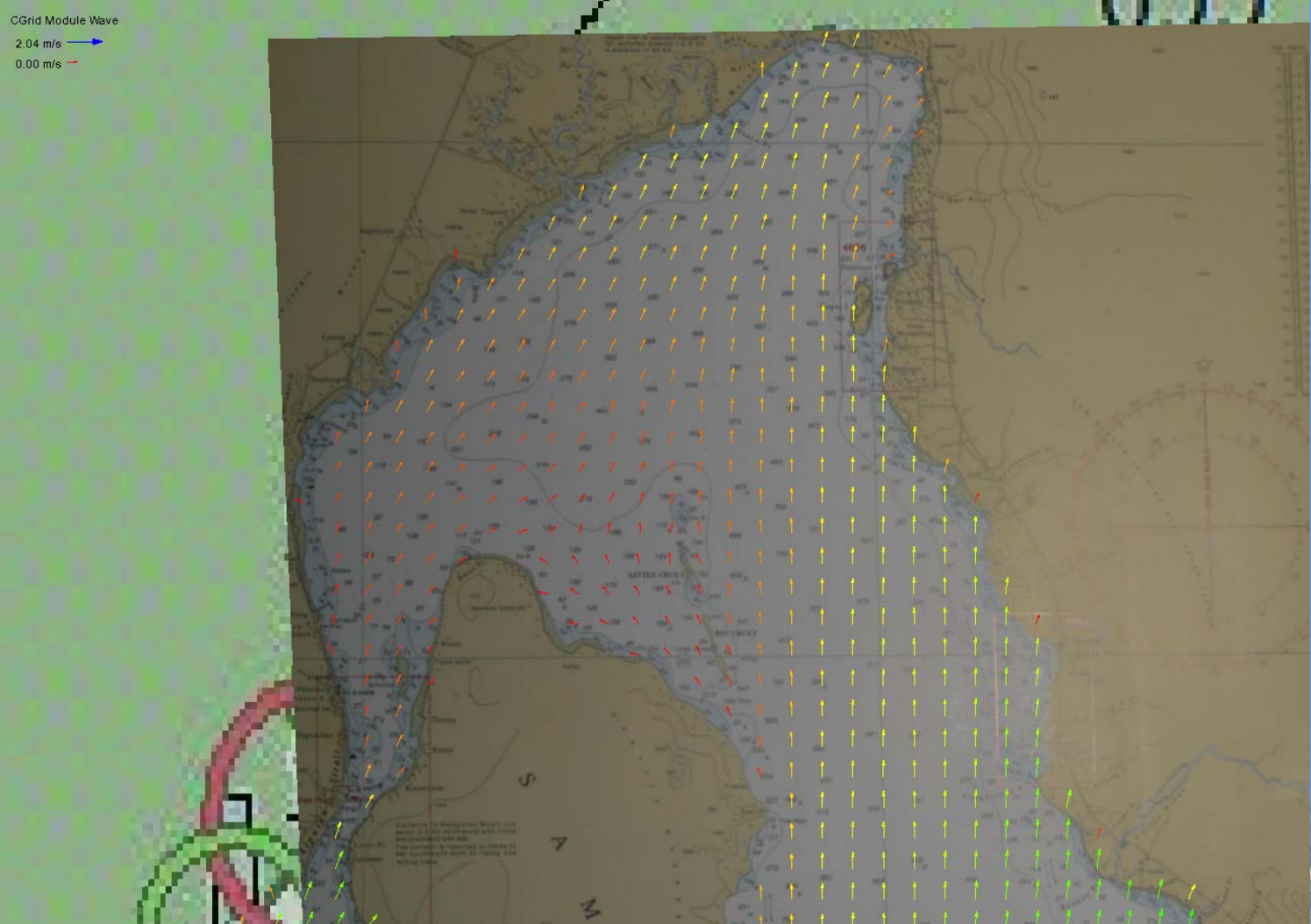
- Red areas: 0-1 m
- Blue areas: 2 m
(input wave at offshore: 2,1 m)
- Should look at winds and waves from all directions, as well as taking peak periods into account.
- Reveals possible places for aquaculture



Significant wave height (H_s), from different angles



The STWAVE model also simulates the directional spreading of the waves into the bay:



MARAMING SALAMAT !

Mid-term meeting report

