

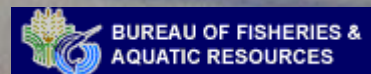
AQUA PARK

AquaPark – Norad funded project

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

www.aqua-park.asia

AquaPark Mid-term meeting - interim results



Agenda

- Introduction
- Status of project deliverables for First Year
- Environmental surveys (Panabo and Sual)
- Identification of stakeholder issues
- Production survey
- Wave modeling for new expansion area
- Sediment impact modeling
- Mooring design

Agenda

- Oil spill contingency
- Better management Practices
- Economic survey
- Socio-economic survey

- MP Site selection Quezon Province

Agenda - Planning

- Development of MP framework
- Better Management Practices
- Oil spill response plan – Panabo
- GIS training
- Wavemodelling
- Production optimisation
- Integrated Multi-trophic aquaculture

AquaPark follow-on from EMMA 2

- This proposal is a follow-on from EMMA.
- EMMA project developed environmental monitoring surveys methodology and carrying capacity model for of 3 aquaculture areas in the Philippines that were at risk from fish kills.
- The project donated the necessary equipment and trained staff in survey methodology, data collection and analyses of data.

AquaPark Objectives

- Existing mariculture parks
 - calculate sustainable aquaculture carrying-capacity for these zones,
 - Recommend cost effective design of moorings and cages
 - develop guidelines for good aquaculture practice in these zones
 - Strengthen the planning and management of mariculture parks
 - Recommend optimal business model for Mariculture Parks

AquaPark Objectives

- Re-organisation of existing aquaculture areas into parks
 - Assess the possibility and methodology of reorganising existing aquaculture production into aquaculture parks
 - Assess carrying capacity
 - Assess present production
 - Assess most suitable sites
 - Discuss with stakeholders and LGUs on best way to organise the production to relocate to mariculture park area

AquaPark Objectives

- New areas
 - Develop the methodology to identify new aquaculture zones using
 - Wave modelling
 - Classification of site exposure
 - GIS
 - Recommend optimal mix of multitrophic integrated aquaculture
 - Fish
 - Mollusc
 - seaweed

AquaPark Objectives

To provide the local, regional and central Government of the Philippines the tools for planning responsible and sustainable cage culture.

- Site selection
- Carrying capacity
- Cage design
- Integrated aquaculture

Outputs

This will allow the Government

- to plan the development of new aquaculture areas in a responsible and sustainable way based on the carrying capacity of the area for aquaculture
- To optimise existing Mariculture park management and profitability
- Strengthen the management and benefits of the small business cluster model

Case studies

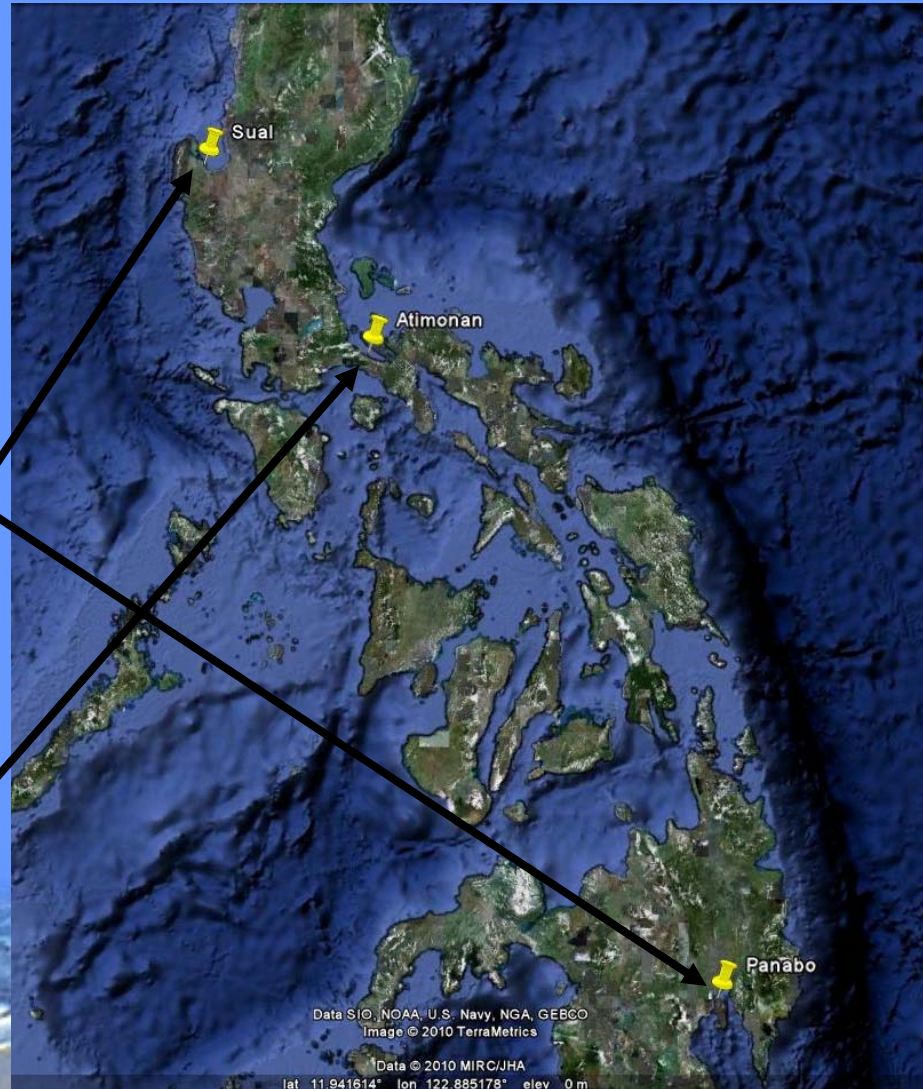
The project will select three case study areas:

- existing mariculture park area
- existing aquaculture production area that could be incorporated into a mariculture park
- new area identified for aquaculture development

Case study sites

The project will select three case study areas:

- Panabo - existing mariculture park area
- Sual - existing aquaculture production area that could be incorporated into a mariculture park
- Quezon Province - new area identified for aquaculture development



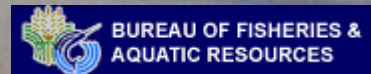
First Survey – April 2010

- Environmental survey
- Production survey
- Sediment output from cages
 - Milkfish
 - Grouper
- Stakeholder meeting

Analysis of Mariculture Park Issues

- Strategic Plan
- Care takers
- Farmers
- Science
- Institutions

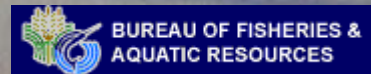
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AquaPark technical assistance

- Carrying capacity
- Optimisation (layout)
- Identifying new areas
- Mooring design
- Oil spill contingency plan

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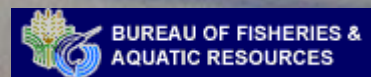
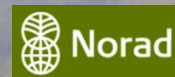


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Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image © 2010 GeoEye
Image © 2010 TerraMetrics
7°17'03.35" N 125°42'08.36" E elev 0 m

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Eye alt 3.36 km

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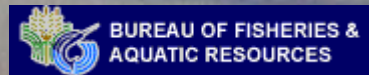
Results - Environmental survey



5 January 2004



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Apr 3, 2010

3 April 2010

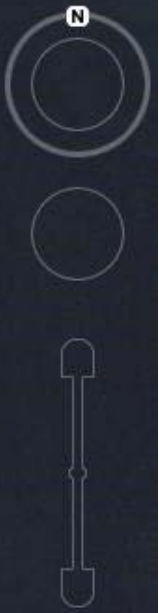


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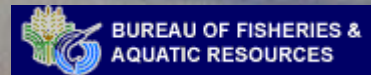
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1412 m
Imagery Date: Apr 3, 2010

16° 6.558' N 120° 6.408' E elev 0 m

Eye alt 5.06 km

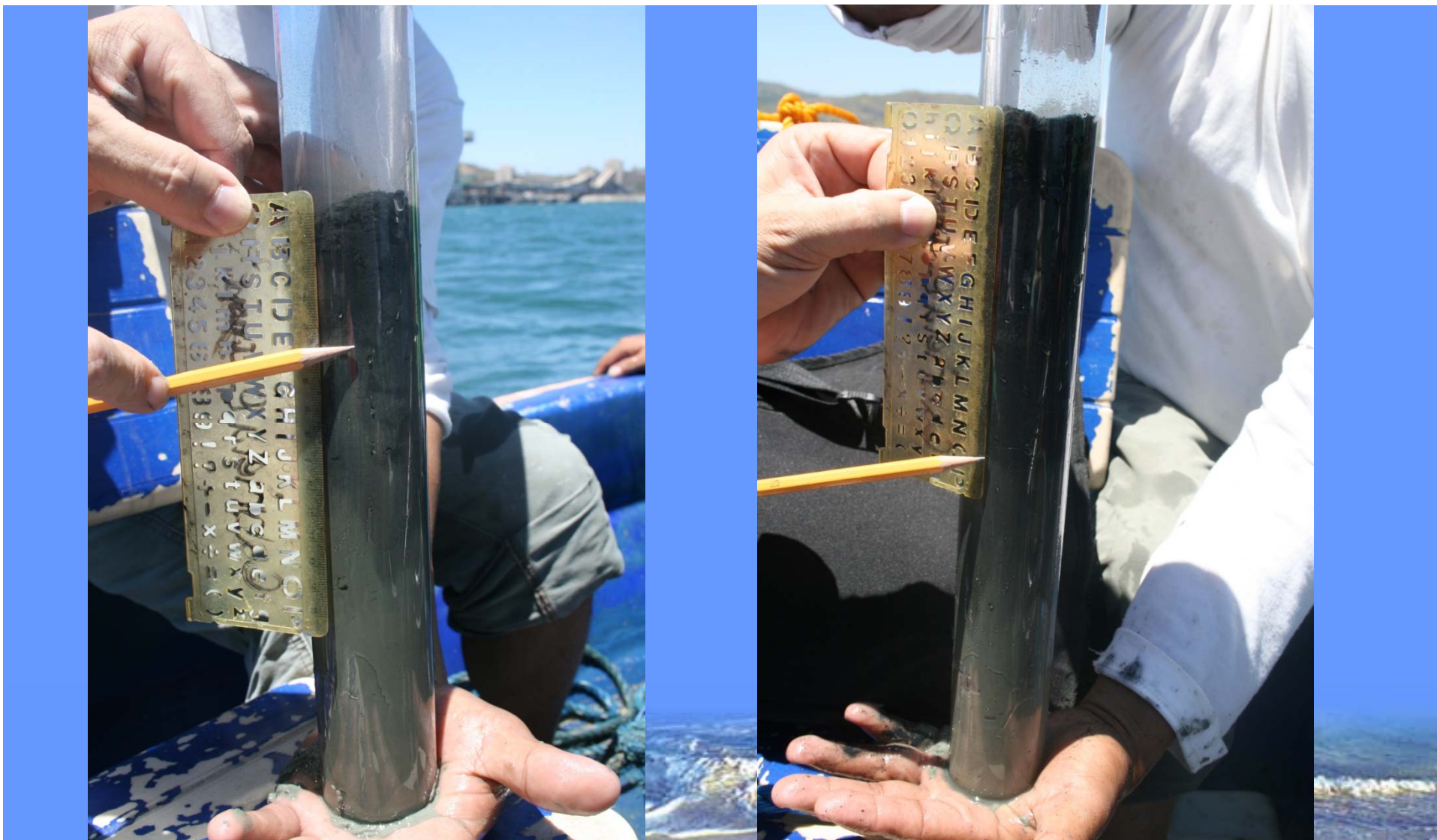
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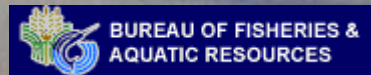
Environmental survey - Sual



Sediment sampling - Sual



AquaPark Mid-term meeting - interim results



Sediment sampling - Sual



AquaPark Mid-term meeting - interim results

Results - Modelling impact

3 important aspects:

1. How severe is the impact – what is the maximum impact underneath cages?
2. How far to the boundary of the impact? (Allowable Zone of Effect)
3. How can husbandry practices be optimised to use the zone most productively?

Objectives

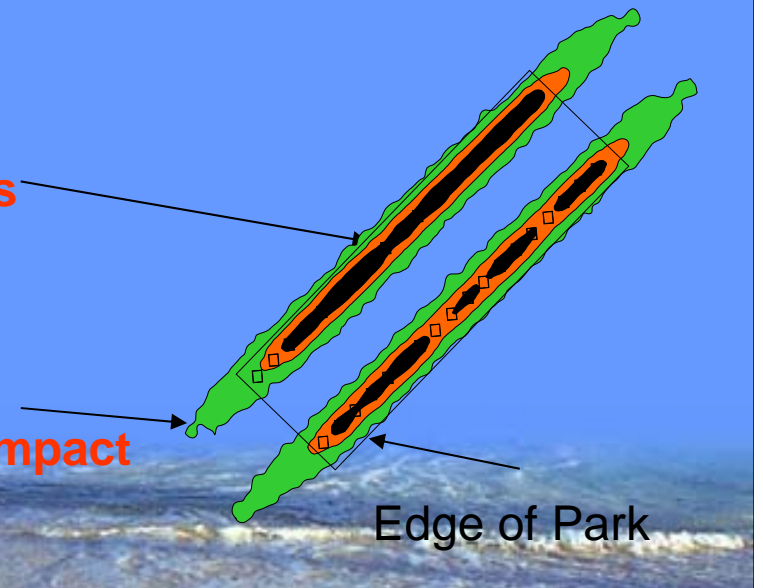
Predict if impact is SEVERE underneath cages

as shown by this deposition footprint

Zone colour

Predict distance to boundary of MODERATE impact

Zone colour



Model predictions - Panabo

Flux ($\text{g m}^{-2}\text{d}^{-1}$)

TROPOMOD predicted flux (deposition) of waste feed and faeces for Panabo

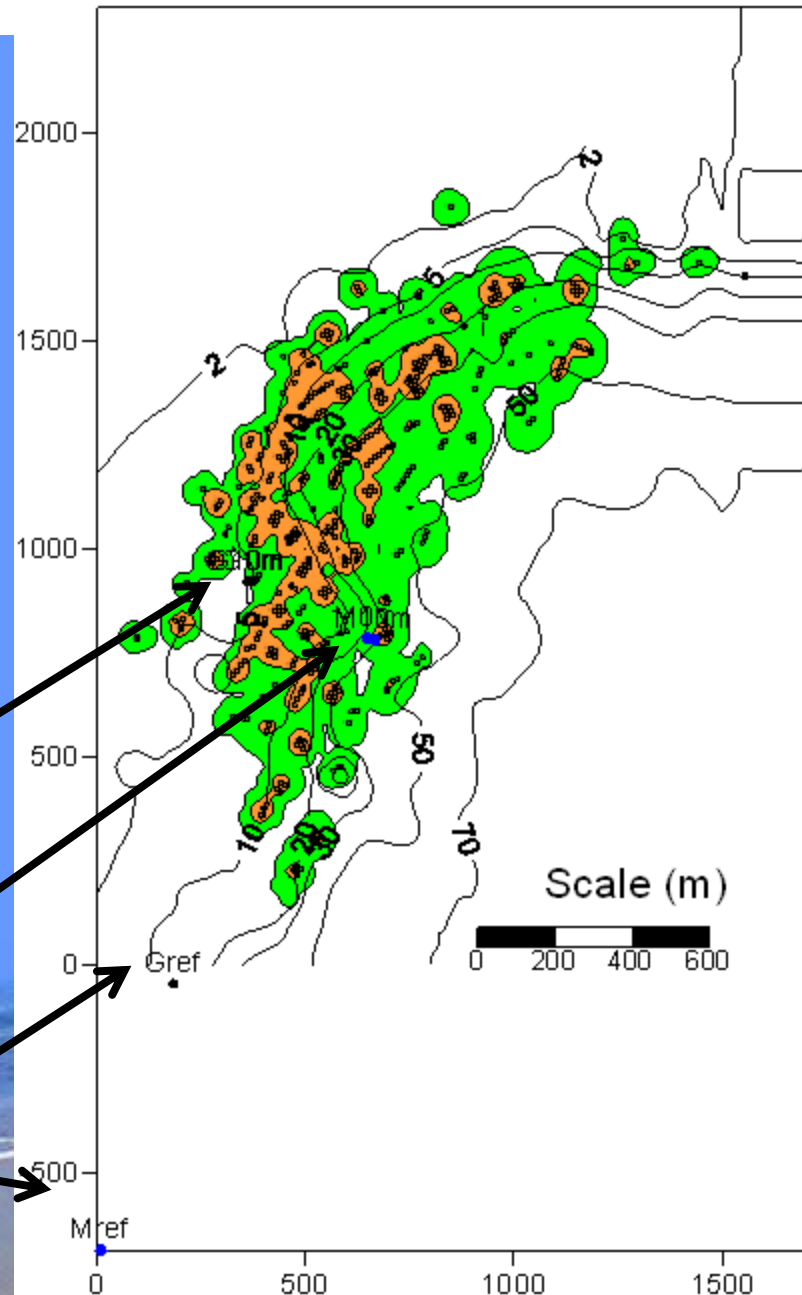
The colours show different amounts of flux

Sediment trap transects:

Grouper (traps are in 6 m depth)

Milkfish transect (traps are in 27 m depth)

Reference traps



Benthic Community

150 Severe impact (no animals)

75

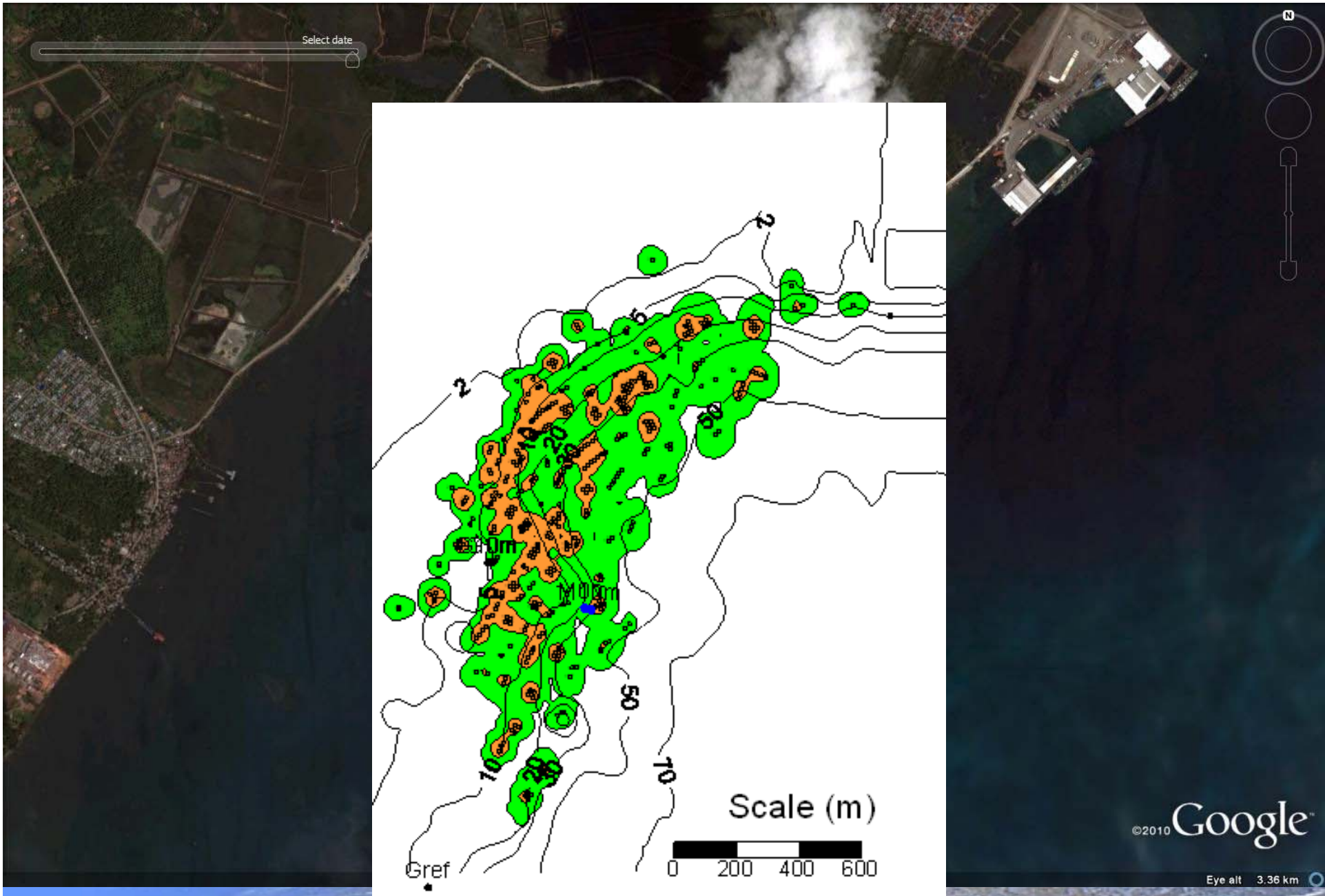
High impact

15

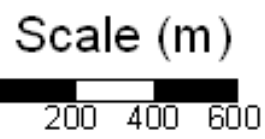
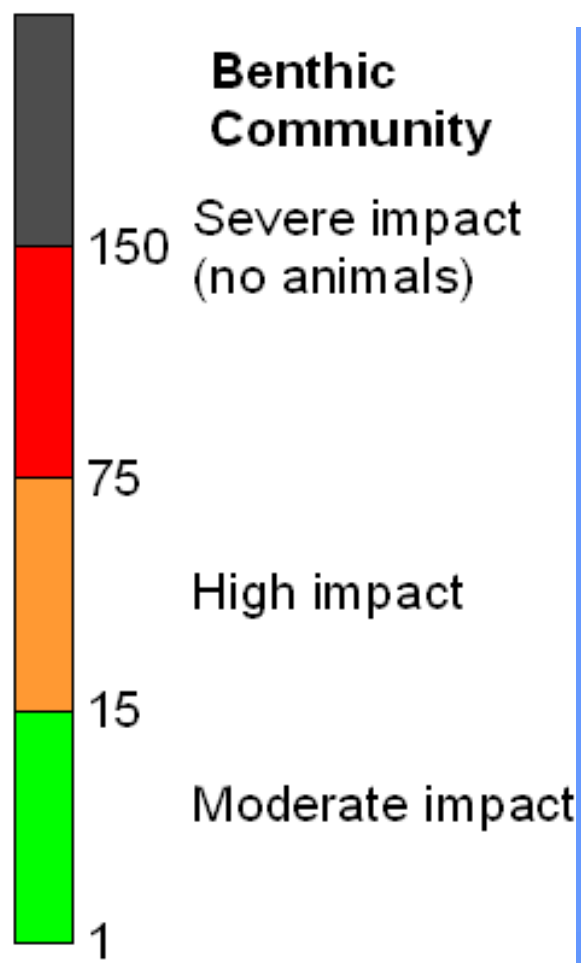
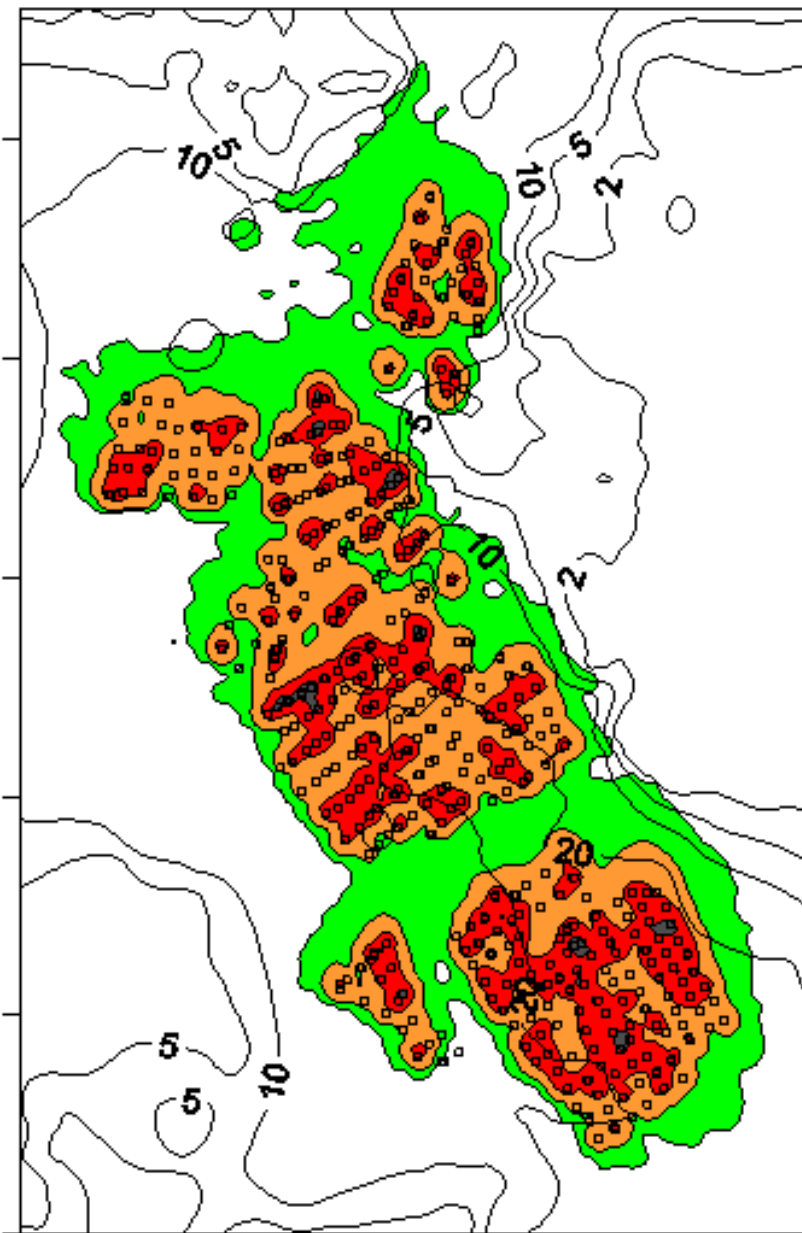
Moderate impact

1

Higher flux and predicted impact in the inshore areas



Flux ($\text{g m}^{-2} \text{d}^{-1}$)



TROPOMOD predicted flux (deposition) of waste feed and faeces

The colours show different amounts of flux

A large area of the AquaPark has orange and red colours indicating high/severe impact



Apr 3, 2010

3 April 2010

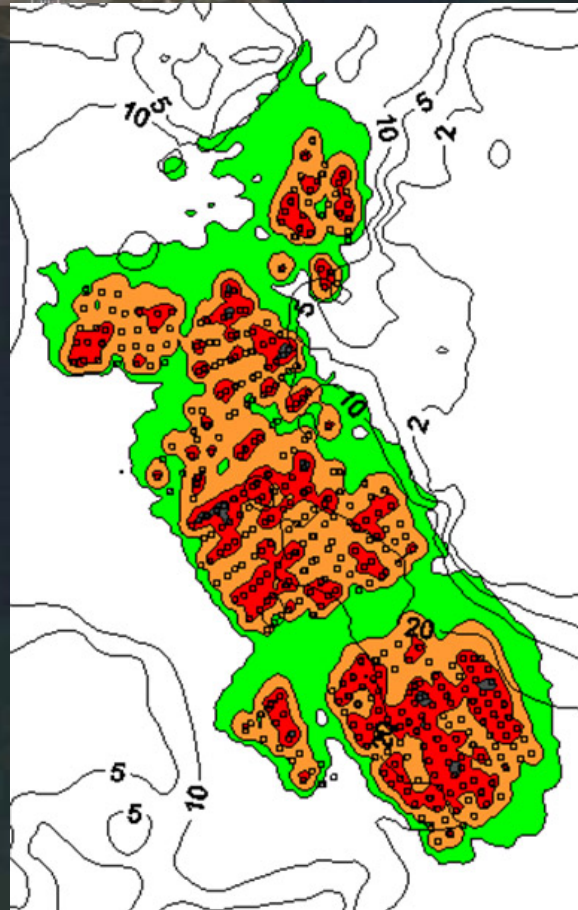


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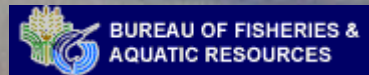
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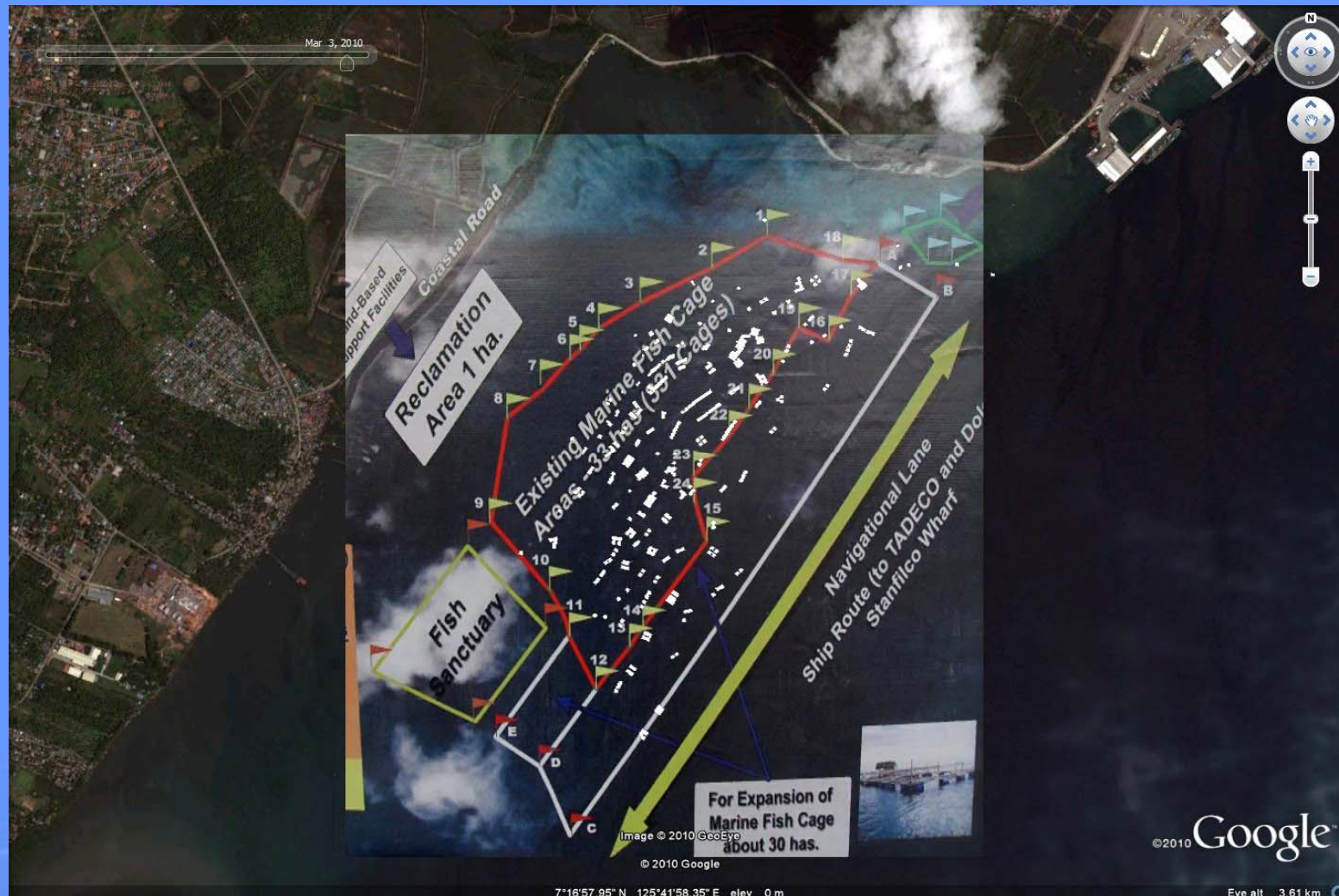
Eye alt 5.06 km

AquaPark Mid-term meeting - interim results



wave modelling for new areas

- Wave modelling for the more exposed areas for Panabo





Results – oil spill contingency

This working report attempts to summarise the measures that Mariculture parks can take to be prepared to deal with oil spills.

The reports summarises

- Biological impacts of spills on fish, shellfish and sensitive environments
- Oil spill contingency planning and response
- Cleanup
- Compensation.

Results – Better Management Practices

Draft BMPs which follow the culture process as follows

Crosscutting issues

1. Planning and siting
2. Farm design and construction
3. Fry and Fingerling purchase or collection
4. Nursery production
- 4 Production management
- 5 Fish health
- 6 Fish quality and food safety
- 7 Harvest and post harvest management
- 8 Monitoring and record keeping
- 9 Social (staff training, health and safety)
- 10 Environmental management
- 11 Dive Operation in Marine Farms

2nd survey September 2010

- Socio-economic survey
- Economic survey
- Site selection criteria
- GIS methodology for site selection
Quezon Province

Socio-economic survey

Undertook socio-economic analysis (positive & negative) either perceived or verifiable impacts of implementing Mariculture Parks for

- farmer-beneficiaries,
- Upstream and downstream stakeholders and
- Local communities and LGUs.

Economic survey

- Investigate the economics and economic benefits of mariculture parks for the different types of locators and for the local Government/BFAR MP development, technical and infrastructure support in case study areas.
- Assess and compare the economic influence of MPs in the case study locations and the comparative regional differences for input costs and market prices

Economic survey

The key components of this investigation are to assess the economics of:

- Different aquacultural farming systems in the MPs;
- LGU and BFAR support for setting up and providing support of the MP
- Differences in regional input cost comparisons,
- Cost/benefit and breakeven analysis for support infrastructure
- Local and regional market analysis comparisons.

3rd survey

- Identification of potential new areas for aquaculture using GIS
- Prioritising selected sites
- Verifying that highlighted areas are suitable for aquaculture
- Simplification of Better Management Practices into farmer language and translation into Tagalog
- Framework for Mariculture Park development and management

GIS layers and buffers

- Base map
- Municipality, municipality water boundaries
- Bathymetry 15 – 50m
- Wave model output
- Roads
- Towns/villages
- Jetties and harbours
- Corals

Planning next works

- Validation of site selection and baseline environmental data collection Quezon Province (Jan 17-19)
- Mariculture Park Framework Workshop (Jan 24-25)
- Finalization of Better Management Practices and translation(Jan 25)
- Panabo Oil Contingency Plan Workshop (Jan 27-28)

Site selection Validation (Jan 17-19)

- Validation of site selection
 - Depth
 - Corals
 - Waves
 - Access and infrastructure
- baseline environmental data collection
Quezon Province
 - Sediment type and quality
 - Current speeds

Development of a MP framework

Development of a framework for MP development to ensure responsible planning and management January 24 and 25

- insulation from politics
- development of generic Better Practice Guidelines (planning and management) for BFAR, LGU and Management Councils.

Better Management Practices

- BMPs for MP cage operators
- Simplify language
- Translate into Tagalog
- Identify key operators to try and implement
- Refine
- Finalise

Oil spill response plan - Panabo

- Risk of oil spills
 - Where
 - What type oil
- Available equipment
 - Port
 - LGU
 - Davao
- Action plan
- Responsibilities
- Clean-up

Planning next 6 months

- GIS training
- Wave modeling
- Mariculture Park production optimisation modelling
- Integrated Multi-trophic Aquaculture planning

GIS training

- 4 staff from NIFTDC
- 4 staff from BFAR
- NAMRIA training – 5 days
- 2 software packages

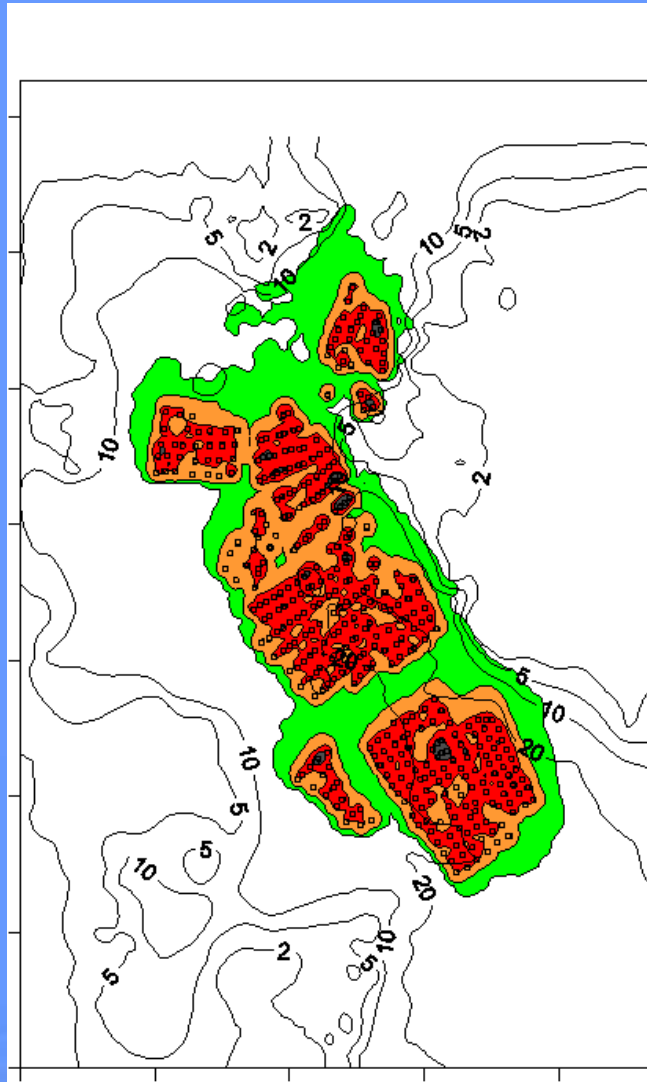
Wave modelling

- 1 software package STWave
- Demonstration
 - Panabo
 - Sual
 - QP

Mariculture park optimisation

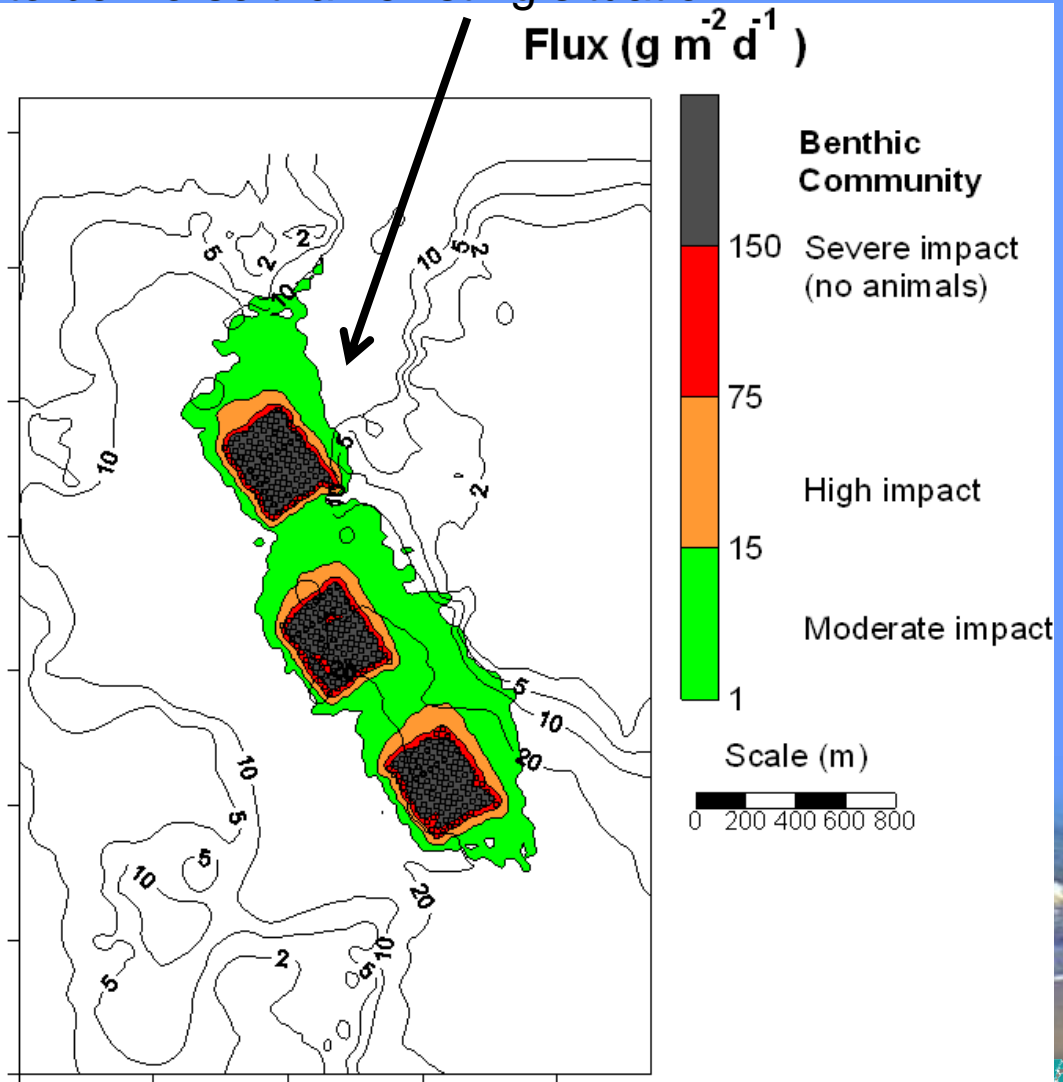
- Started work on trying to optimise Sual production
- Chris Cromey presentation

Scenario A3 – existing situation at Sual



Scenario B1 – AquaPark – three 10 Ha areas with 100 cages (11 rows by 9 columns) in each

Impact is very severe under cages and predicted to be worse than existing situation



Integration of IMTA

- Developing Integrated Multitrophic Aquaculture practice into Mariculture Parks

