AQUA PARK

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

www.aqua-park.asia

Environmental impact

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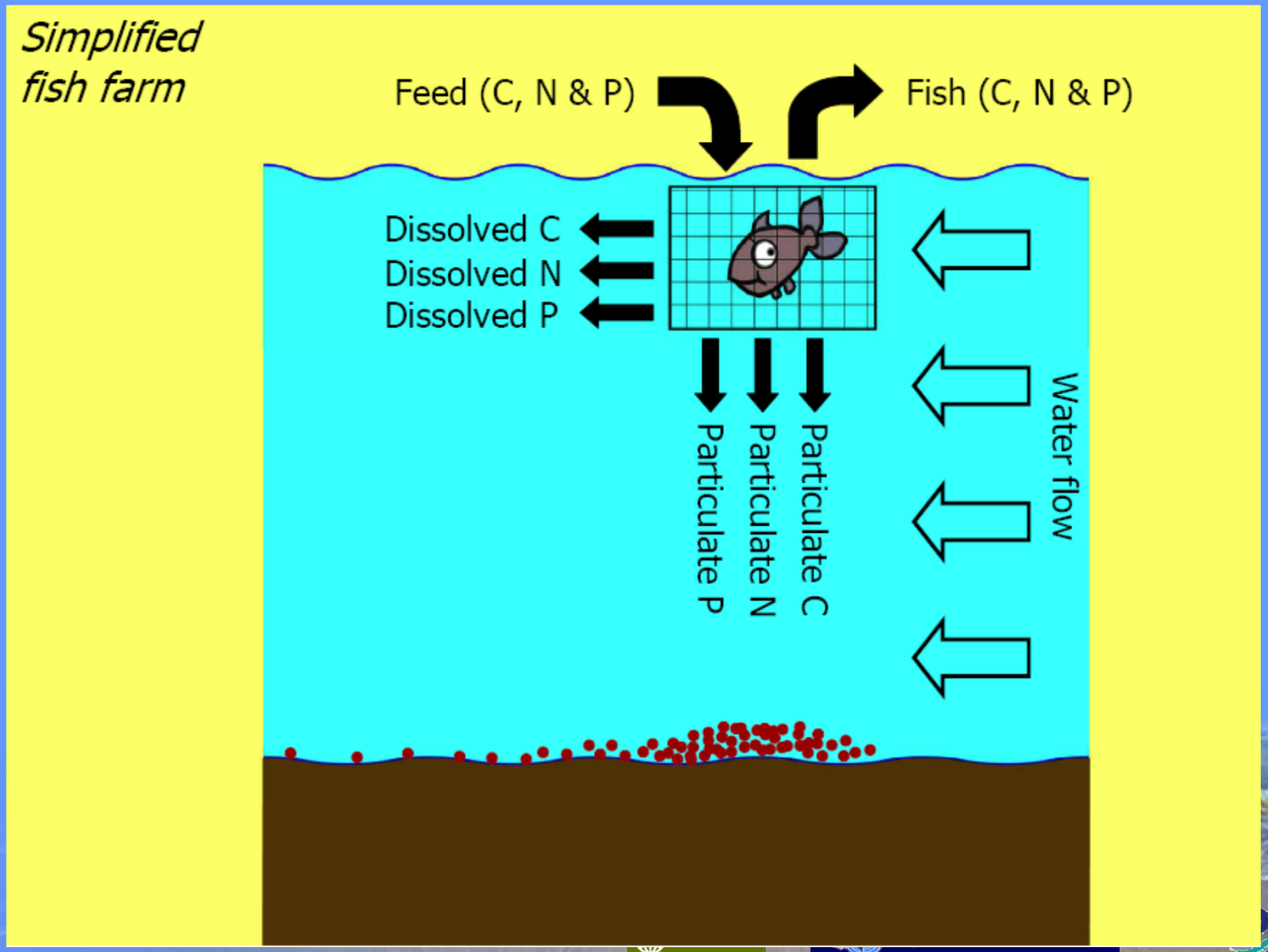
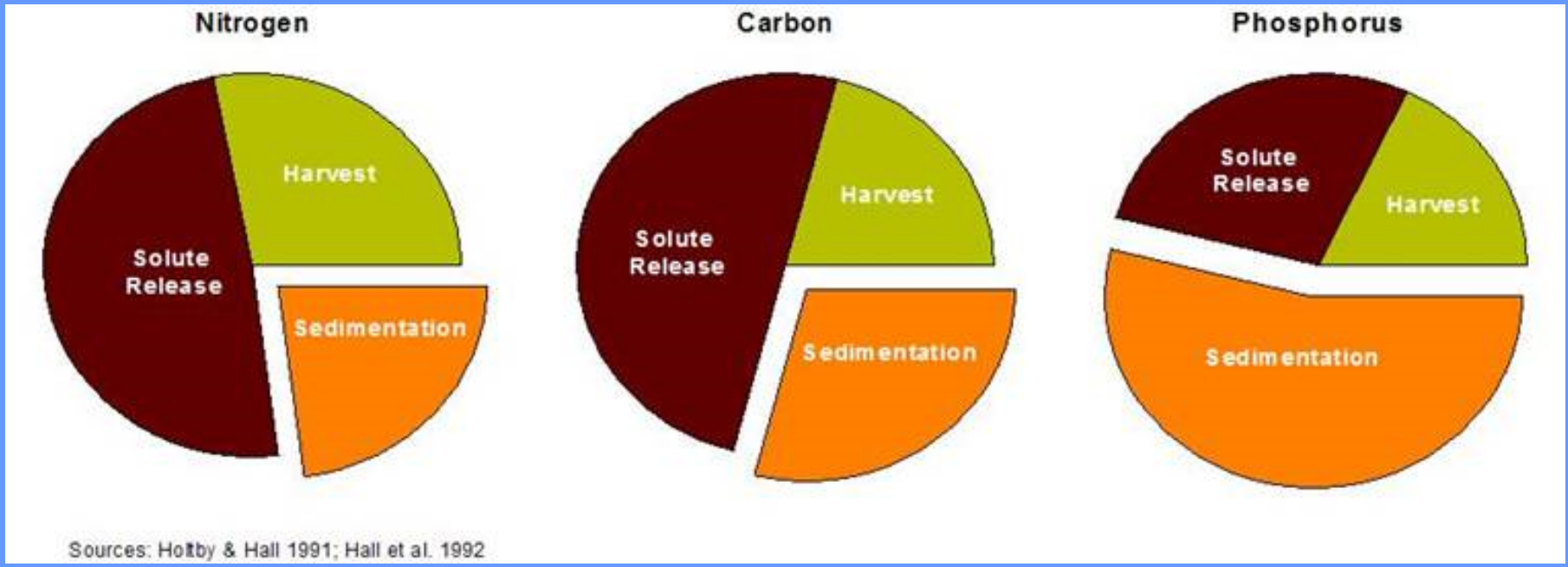
Nutrient balance



Inputs, uptake and outputs



Sources: Holtby & Hall 1991; Hall et al. 1992

Less than30 % of inputs are retained by the fish. The remainder go into the environment

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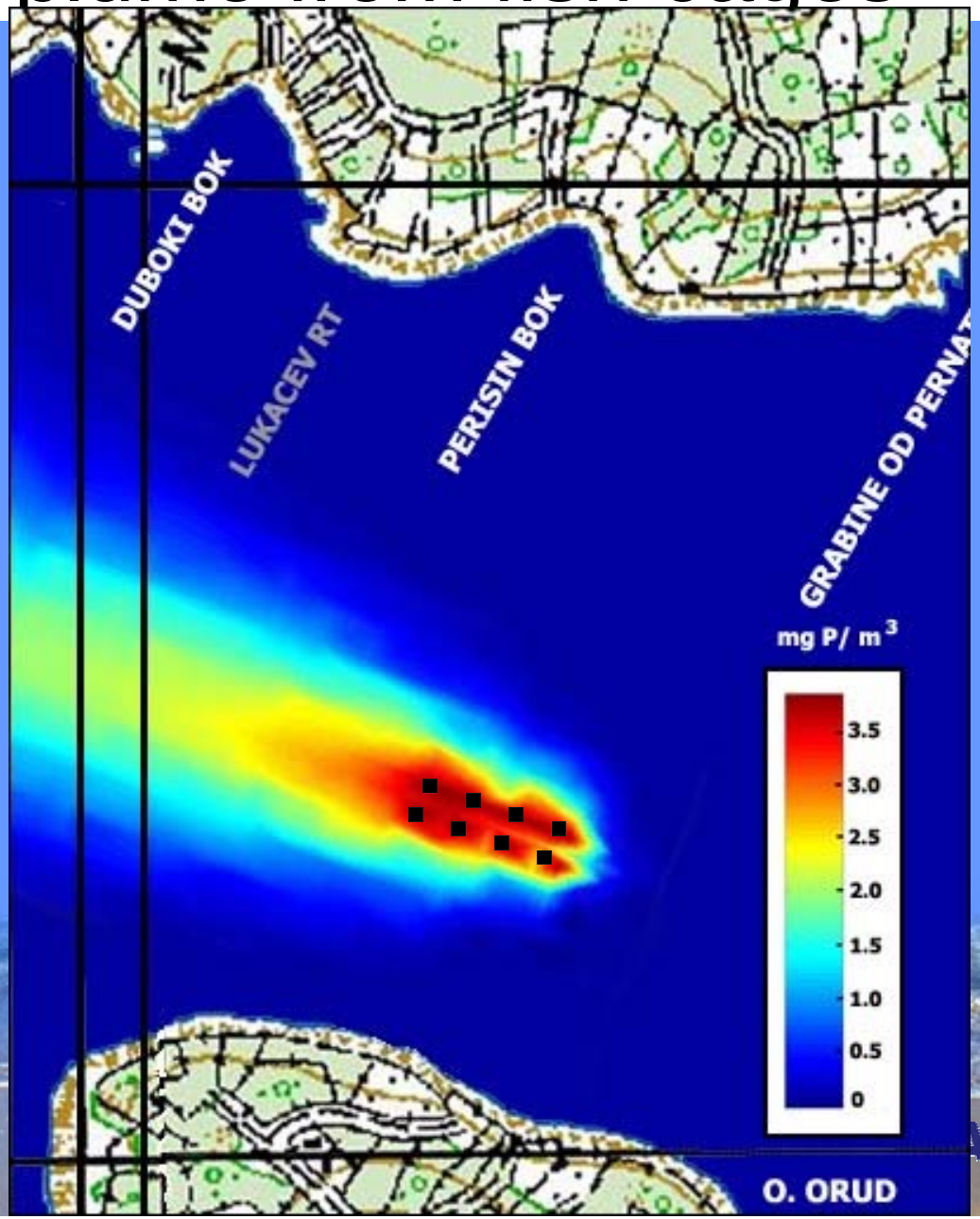
TROPOMOD model

Model of sedimentation from milkfish production

Impact on the sediments

- Sustainable levels – slight build up of organic layer on the seabed
- Unsustainable level - Build up of thick organic layer on the sea bed
- Smothering of seagrass
- Smothering of corals

Phosphorus plume from fish cages



Impact on water column

- Increasing nutrient concentration in the water
- Sustainable levels lead to algae production – zooplankton production – increased wild fishery production
- Unsustainable levels leads to high algae production – algal bloom – algae die off – low/no oxygen – fish kill

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Environmental survey - Sual

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Natural sediment

Heavily impacted sediment

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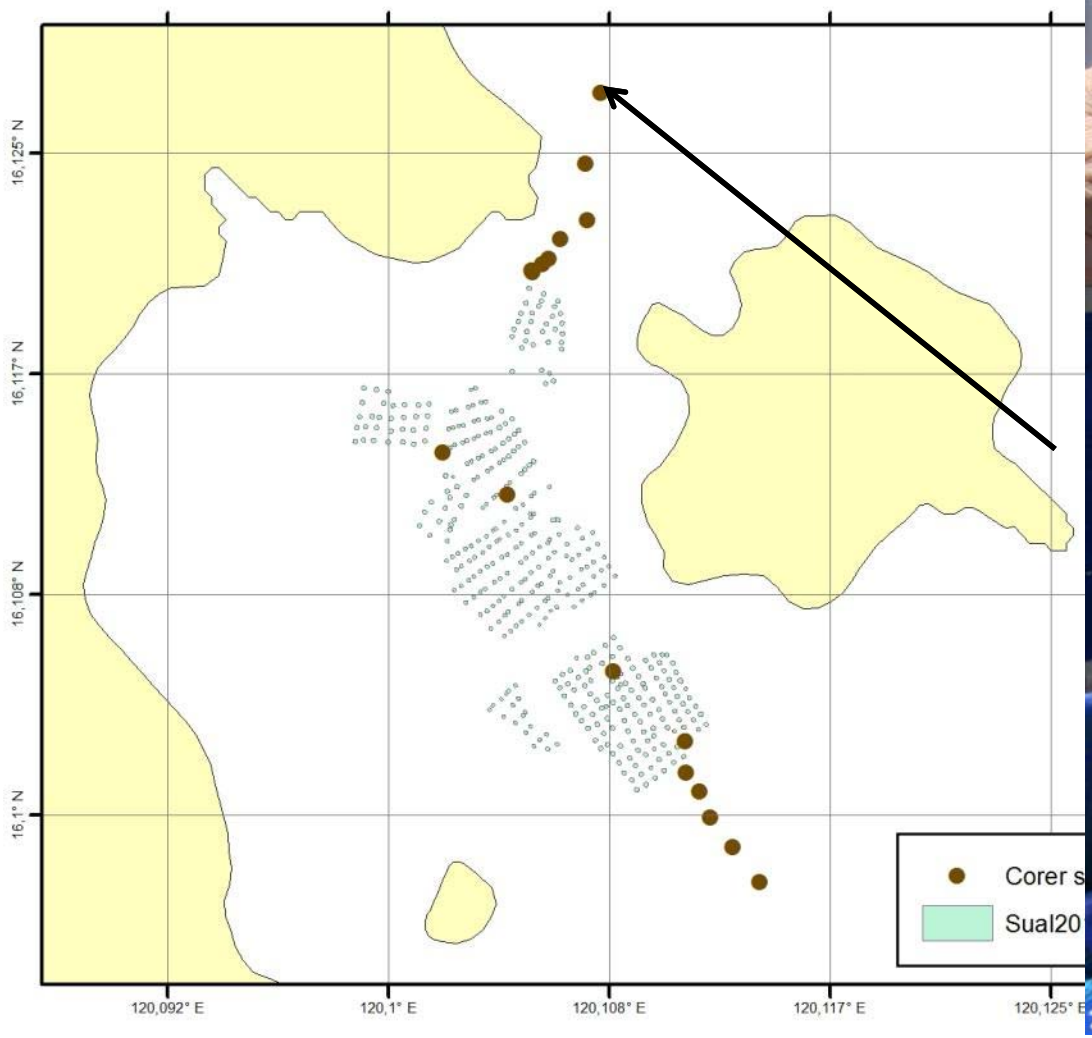
Corer 800 m from cage no black layer



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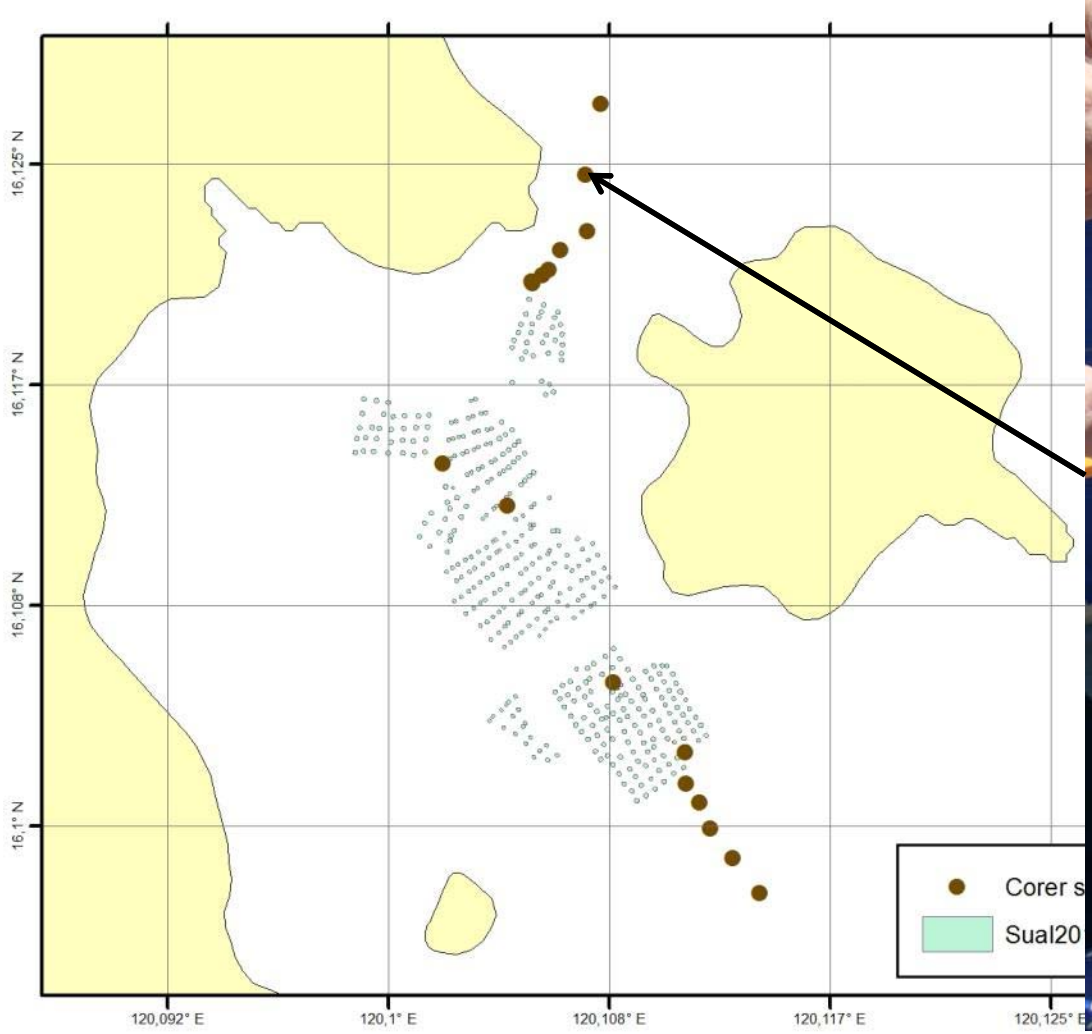
Corer 500 m from cage 5 cm black layer



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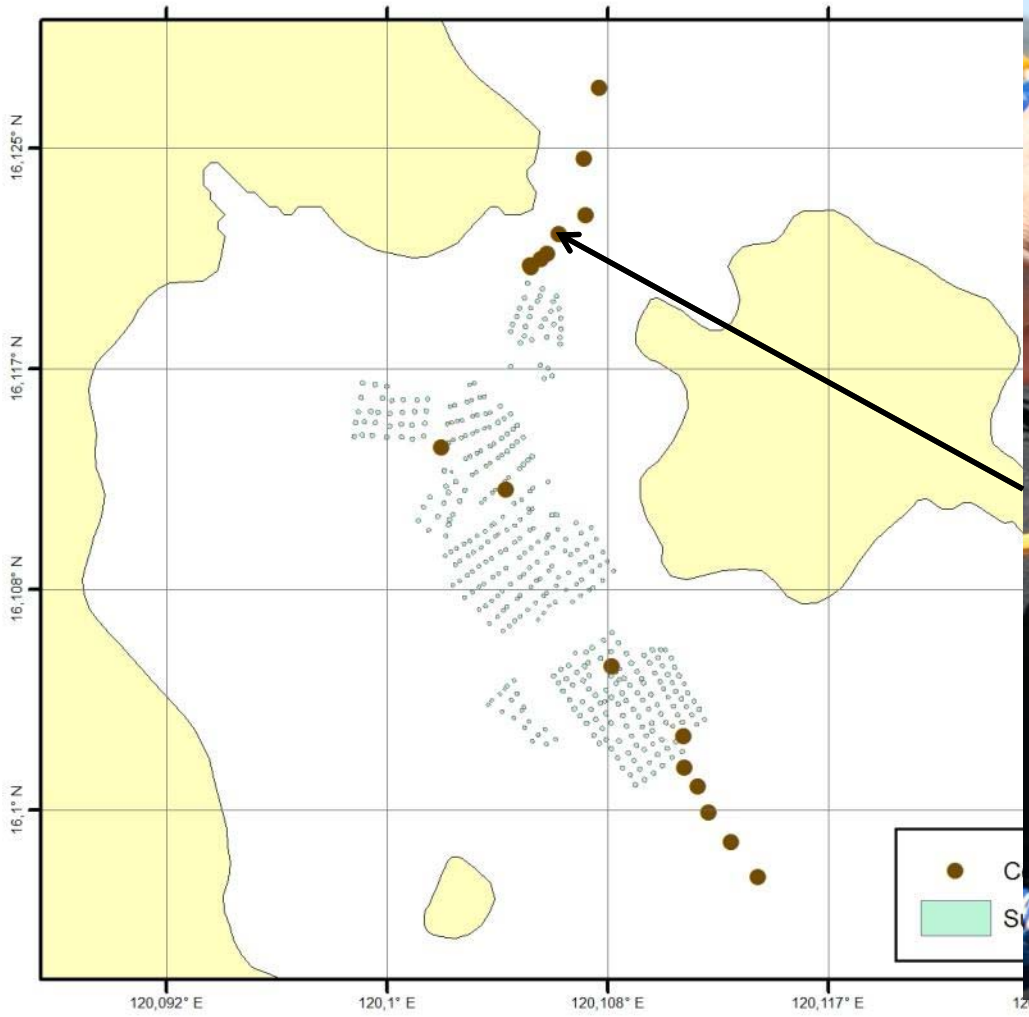
Corer 87 m from cage 13 cm black layer



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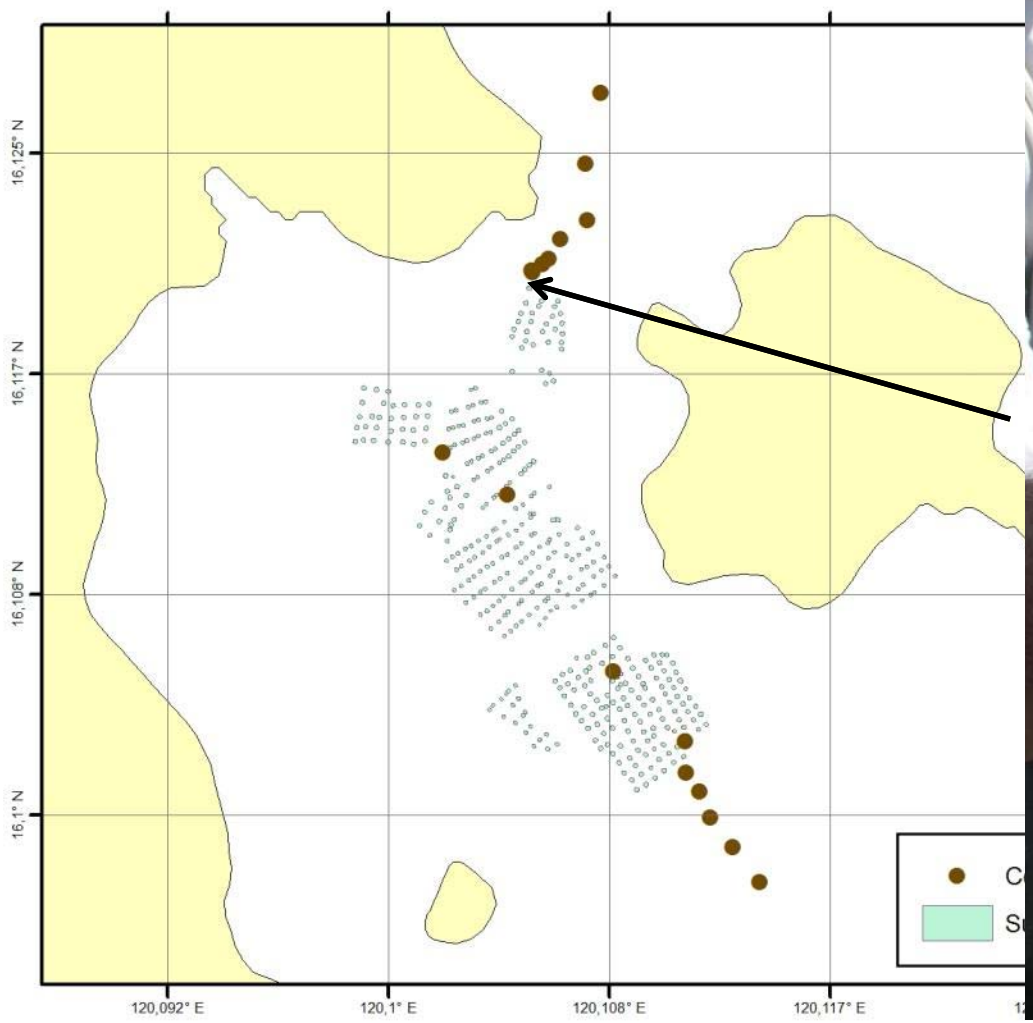
Corer at cage 20 cm black layer



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Modelling environmental 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

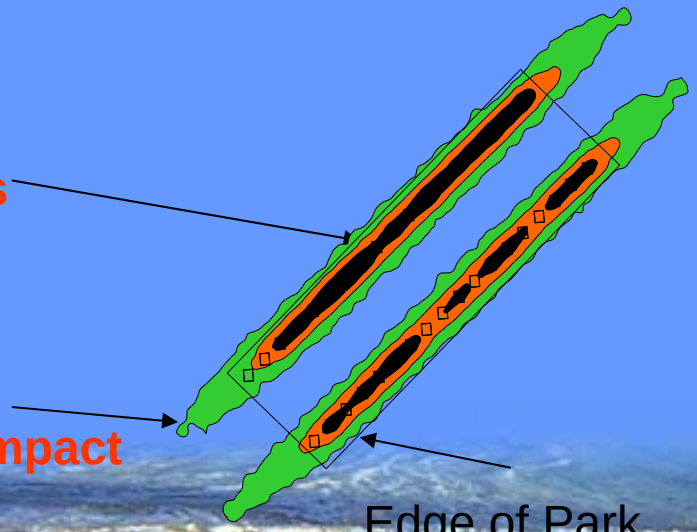
Predict if impact is SEVERE underneath cages

as shown by this deposition footprint

Zone colour

Predict distance to boundary of MODERATE impact

Zone colour



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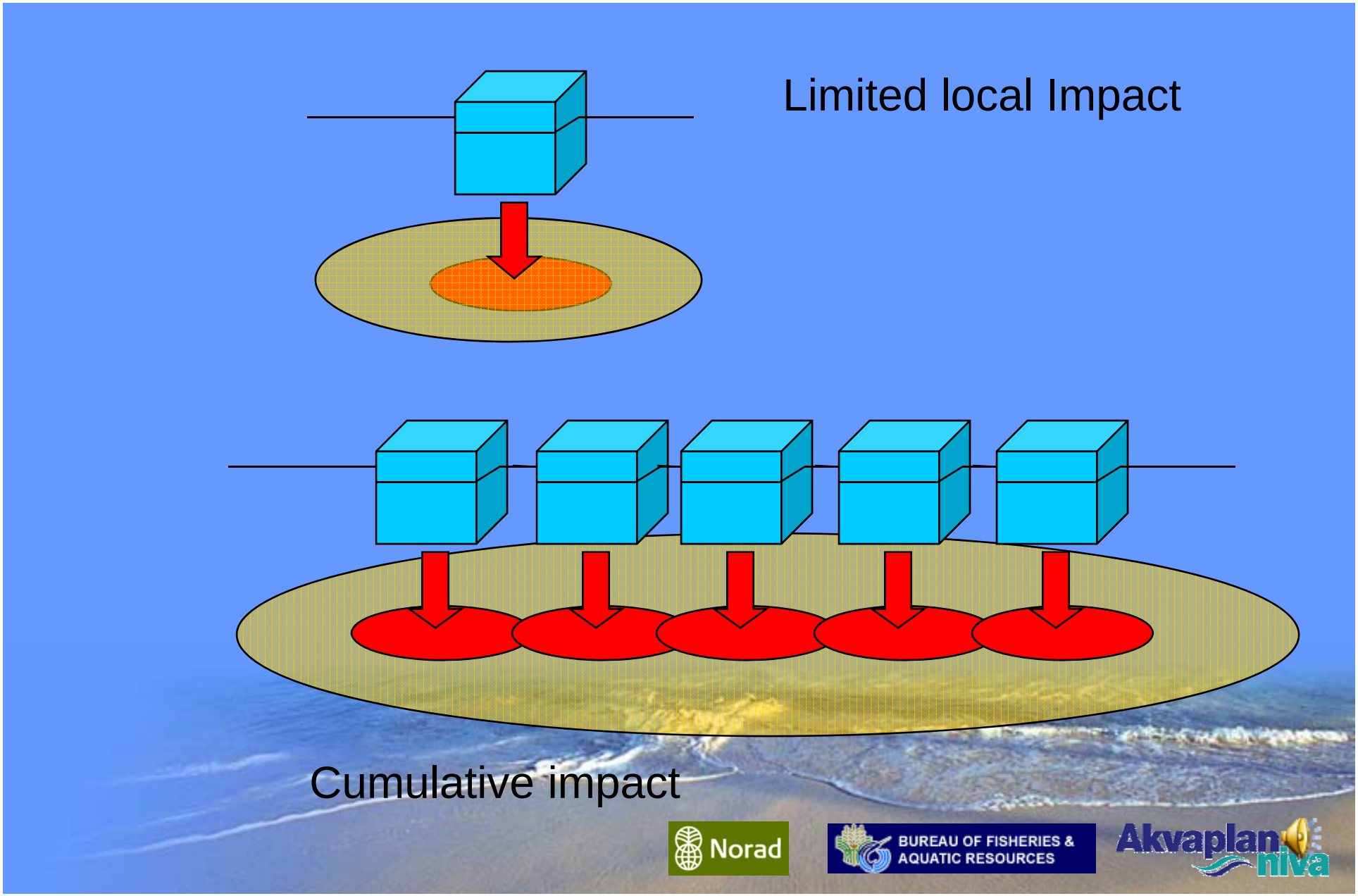
Environmental impact



Cumulative impact

- Increasing disease problems
- Lower survival
- Poor food conversion rate

Often blame

- Poor fry quality
- Poor food quality

But the problem is usually high environmental impact

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Monitoring

Monitoring of the MP is necessary

- To check the level of impact on the environment
- Check if the impact is getting worse, staying the same or getting better
- Early warning of future problems
- Oil spill contingency plan

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