INFLUENCES OF COASTAL ZONE MANAGEMENT ON THE TRANSMISSION AND IMPACT OF AQUATIC ANIMAL PATHOGENS.

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CASE STUDIES

Case Study 1: Algarve Coast, Portugal
The Algarve coastal waters are calm and very productive.
Heavy fishing pressure and a high level of inshore-estuarine lagoon aquaculture production
- Main species cultured: Shellfish, Clams (Austrobaileya dentium), Pacific oysters (Crassostrea gigas), C. angulata, Cockles (Cerastoderma edule), Fish: Gilthead seabream (Sparus aurata), Seabass (Dicentrarchus labrax), Mussels (Mytilus galloprovincialis).
- A large multi-trophic aquaculture (MTA) area has now been implemented offshore the Algarve Coast (Área Piloto de Produção Aquícola da Ilha da Armona, APPA da Armona).
- Main interactions between fisheries, aquaculture, tourism and artificial reefs.
- Ra-forefront natural park with high conservation/nature value, significant challenge to manage these interactions sensitively.
- Surveillance program on sea loe since 2006 (field data).
- Carrying capacity models under development, including environmental conditions (hydrography) and effects of pathogens and parasites on wild fish.
- Modelled distribution of salmon lice after 10 days of continuous release from the various sources marked by colored squares.

Case Study 2: Hardangerfjord, Norway
Large aquaculture industry (~50,000 tonnes salmon).
Wild fish stock populations are possibly negatively affected by parasites and pathogens.
- Surveillance program on sea loe since 2006 (field data).
- Carrying capacity models under development, including environmental conditions (hydrography) and effects of pathogens and parasites on wild fish.
- Modelled distribution of salmon lice after 10 days of continuous release from the various sources marked by colored squares.

DISEASE
Most significant limiting factor in aquaculture.
Direct impact: mortality/morbidity.
Pathogens can be amplified within farms: significant infection pressure to wild fish stocks.
Aquaculture and coastal management practices: influence the transmission and impact of pathogens.

ULTIMATE PROJECT OUTCOMES
Management recommendations,
- To reduce the impact and spread of different pathogens in the study regions.
- Facilitate their control and eradication should they be introduced to a coastal zone.

TOOLS FOR SUPPORTING THE DECISION-MAKER AND OTHER STAKEHOLDERS.

COEXIST: Multidisciplinary project with thirteen partners from ten European countries
Aim: evaluate competing activities and interactions in European coastal areas with the ultimate goal to provide a roadmap to better integration, sustainability and synergies across the diverse activities taking place in the European coastal zone.

COEXIST PROBLEMS ADDRESSED
Europe’s coastal zones are of great socio-economic value.
Highly demanded areas for developing multiple activities.
Source of potential conflict for space allocation.

COEXIST CHALLENGE
To balance competing activities with environmental protection.

KEY QUESTIONS
1. What are main mechanisms for disease spread in areas with aquaculture activities?
2. How does aquaculture stocking density affect disease spread?
3. How to predict outbreaks?
4. How to quantify the socio-economic (fisheries and aquaculture activities) and ecological (system health, recovery) impacts of disease spread?
5. How can we use spatial management (tools) to prevent or reduce the impact and spread of pathogens?
6. How can we use spatial management (tools) to achieve better integration, sustainability and synergies of aquaculture with other coastal activities while taking the transmission and impact of pathogens into account?

NEXT STEP
1. Use combination of direct observations and stakeholder surveys to determine importance of disease in limiting, or otherwise influencing, aquaculture and other activities in the Algarve coast and Hardangerfjord regions.
2. Create network modelling framework to study influence of anthropogenic stock movements.
- Hydrodynamic connectivity wild aquatic animal migrations on pathogen transmission between farmed and wild sites in Ria Formosa and Hardangerfjord.

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