



Kai Wätjen, Melanie Bergmann, Carlotta Järnmark & Steve Mackinson

Aspects of the inshore and wadden sea brown shrimp fishery with a special focus on the effects of climate change how can a small scale fishery react?

The objectives of the GAP project are driven by the need for fisheries stakeholders, scientists and policy makers

to work together more effectively to address, the challenges of sustainable fisheries management.

GAP aims to incorporate the knowledge and the skills of fishermen in research that provides the scientific advice to policy makers.

GAP1 explores how the knowledge and skills of science and fishery stakeholder partners can be combined to enhance the understanding and management of fisheries.

What are the benefits?

Improving sustainability

- Greater compliance with management decisions as fishermen have a feeling of ownership over the data provided to decision makers
- Trust and respect between fisheries stakeholders, researchers and decision makers

Making better use of available information

- Identification of researcher priorities of direct relevance to resource management
- More efficient use of available knowledge by partnering with existing data

Improving knowledge and understanding

- more transparency
- Mutual learning, co educating of fisheries stakeholders and researchers

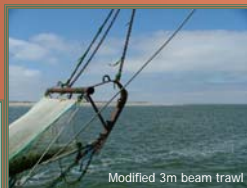
Participatory research in fisheries science involves fishermen and scientists working together in the planning and development of fisheries research.

- Deciding what research needs to be carried out, as well as how it will be done
- Participants having a say in the design of the participation process
- Adapting the process to individuals involved
- Joint ownership of data and results
- Co-education of fisheries stakeholders and researcher
- Long-term engagement
- Empower the stakeholder to become an active role in processes which lead to decisions made by policy makers



- 15 fisheries science & 15 stakeholder partners from 11 countries
- Committed to building the capacity to collaborate in participatory research
- Engaging through European and regional workshops
- Sharing their experiences and working together to develop participatory fisheries research case studies

On a global scale, marine ecosystems are currently being subjected to large-scale perturbations, mainly over-exploitation, changing land-ocean interactions owing to human population increase in coastal areas, spread of invasive species, and increasing effects of global change. There is ample evidence that such perturbations significantly affect marine community structure, ecosystem function and sustainability of ecosystem services on all scales, from global to small scale, e.g. in the Wadden Sea the small-scale fishery on brown shrimp (*Crangon crangon* L.)



Modified 3m beam trawl



Commercial 8m beam trawl



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The fisheries sector is distinguished by his courage and his authority. Like no other industry, the fishery is confronted with steadily changing economic and policy regulations, but instead of throwing in the towel, the fishery is looking for solutions through innovation. Therefore our stakeholders are strongly interested to get more knowledge about the ecology, distribution and the possibilities of a sustainable management of potential newcomers, like the pacific oyster and the razor clam or the thermophilic red gurnard and two species of Lusitanian goatfishes.



Map: Wadden Sea area (blue) and the ports of registry of the fisheries stakeholder.



With our case study we want to bridge gaps of knowledge concerning the biology, ecology and population dynamics of *C. crangon*. The data to be retrieved could serve as background to deal with forthcoming issues concerning climate change and hence resulting large-scale environmental changes in the next decades.

In collaboration with fishermen, we agreed that possible case studies pertaining to the impact of climate change on the fishery and other species dynamics (e.g. *Ensis*, mullet and stocks of *Crangon* predators) are of particular interest to the fishermen. The sustainable development of the fishery, e.g. through the implementation of an MSC certification, is also of interest to the stakeholder.

As a result of increasing water temperatures, more frequently stormy weather periods, and other or new target species of commercial interest, the fishermen observe clear alterations in the Wadden Sea. Ranging from an increase in the abundance of some species during the last decade, to a longer fishing season.

The Wadden Sea and its residents, who live from the fishing industry, are facing a great challenge. Therefore its very important to get more information about the behaviour of the fauna in their fishing grounds.

Kai Wätjen & Melanie Bergmann
Alfred Wegener Institute for Polar and Marine Research Bremerhaven, Germany

Website:
<http://www.awi.de>
Contact:
Kai Wätjen
kai.waetjen@awi.de



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Carlotta Järnmark
GAP1 Communication Officer
cjarnmark@gmail.com



Steve Mackinson
GAP1 Project Coordinator
Cefas, Lowestoft, Suffolk
United Kingdom
steve.mackinson@cefas.co.uk

