

## Deliverable 8.11

### BENTHIS newsletter 2014

Due date of deliverable: month 12 (Sept 2013)  
Actual submission date: month 17 (Feb 2014)

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Grant Agreement number:	312088
Project acronym:	BENTHIS
Project title:	Benthic Ecosystem Fisheries Impact Study
Funding Scheme:	Collaborative project
Project coordination:	IMARES, IJmuiden, the Netherlands
Project website:	<a href="http://www.benthis.eu">www.benthis.eu</a>

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## DOCUMENT CHANGE RECORD

<b>Authors</b>	<b>Modification</b>	<b>Issue</b>	<b>Date</b>
Adriaan Rijnsdorp	First draft based on texts of individual contributions of WP leaders		28 Jan 2014
Oscar Bos	Editing of all texts, making them suitable for an internet newsletter, feedback from WP leaders, communication with internet editors of the BENTHIS website, production of newsletter.		25 Feb 2014



## SUMMARY

This newsletter describes the results of the BENTHIS project for the year 2013. The newsletter is published on our website [www.benthis.eu](http://www.benthis.eu) as a set of webpages. In this document we show the plain texts and figures and some screenshots.



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## 1.1 BENTHIS Newsletter February 2014

[INTRO]

This first BENTHIS Newsletter presents a selection of activities and results of the first year of our project. The EU has funded the BENTHIS project to provide knowledge to support an integrated approach to the management of human activities in the marine environment, in particular fishing. BENTHIS studies the vulnerability of different benthic ecosystems in European waters and analyses the physical impact of the current fishing practices on benthic organisms and geo-chemical processes. In collaboration with the fishing industry, technological innovations and alternative management scenario's will be studied to mitigate the impacts.

Logo:

[http://www.benthis.eu/upload\\_mm/b/5/6/aaaaf12d-4d1f-4d3b-9793-09d7636ea1bb\\_benthis\\_logo\\_2colors-blue-230px\\_183x112.png](http://www.benthis.eu/upload_mm/b/5/6/aaaaf12d-4d1f-4d3b-9793-09d7636ea1bb_benthis_logo_2colors-blue-230px_183x112.png)

Contact: Adriaan Rijnsdorp (IMARES) <adriaan.rijnsdorp@wur.nl>

[www.benthis.eu](http://www.benthis.eu)

## 1.2 Role of benthic invertebrates in the ecosystem functioning revealed

[INTRO]

Ever watched one of these talent shows on television where the jury judges the performers only on their voice, and not on their appearance? It's the same story for benthic invertebrates in relation to ecosystem functioning: it's more important what they do, than what they look like.

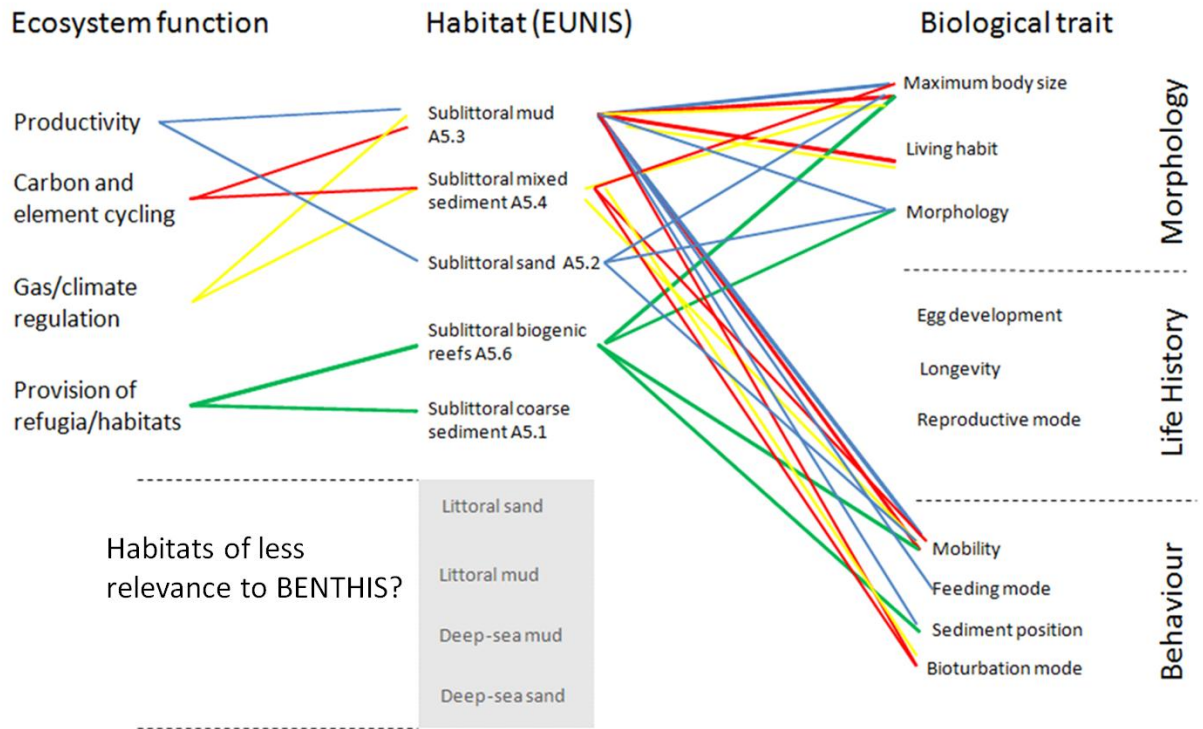
[READ MORE]

The question is: how can we relate the occurrence of species to ecosystem functioning? Fishing will impact the structure and functioning of the benthic ecosystem by changing the benthic biomass and the species composition of the benthic fauna. The large number of species present, which all differ in their vulnerability for fishing and differ in their role in the ecosystem, makes it difficult to predict how fishing will impact the functioning of a benthic ecosystem.

In BENTHIS we use a Biological Traits Analysis (BTA) as an approach to get around this problem. This is an ecological approach that looks beyond the species diversity by focusing on the form and function of the species. That is, what matters is 'what they do' rather than 'who they are', just like in 'The Voice'. Essentially, the analysis uses a number of life history, morphological and behavioural characteristics of species present in assemblages to indicate aspects of their ecological functioning. The BTA approach is generic and can be applied irrespective of the region.

In 2013 BENTHIS has made a first inventory of the relation between traits, habitats and ecosystem functioning. In the next years, we will analyse the relative occurrence of the traits in different benthic habitats in Europe and relate them to accompanying metrics of functioning. Ultimately, this analysis should give us insight in the impact of fishing on different benthic ecosystems.

Contact: Stefan Bolam (CEFAS) < stefan.bolam@cefas.co.uk >



### 1.3 Regional fishery impacts in Europe

[INTRO]

Which fishery is causing the highest impact on the benthic ecosystem? BENTHIS zoomed in on 4 European regions.

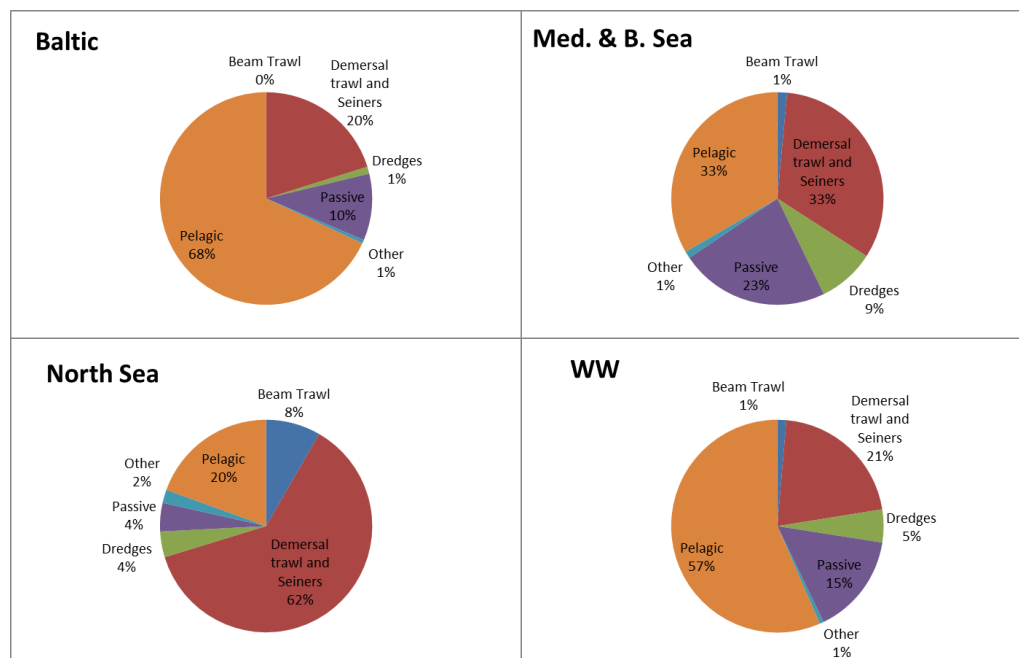
[READ MORE]

The European fisheries represent a variety of fleet segments which have very different effects on the benthic ecosystem depending on fishing methods and target species. The most severe type of impact is caused by beam trawls and dredges. A smaller but still significant impact is generated by demersal trawls and seines, followed by passive gears. The smallest impact on the seafloor ecosystem is caused by pelagic trawls. The major effects and mechanisms of impact are:

- mortality of benthic organisms from direct contact of the gear with the sea bed during fishing.
- habitat alterations through disturbance of sediments and biogenic habitats
- geo-chemical processes from disturbance of sediment
- food subsidies from discards and gear track mortality.

The contribution of these gears to the total landings is illustrated in the pie chart below for the BENTHIS case study regions Baltic Sea, North Sea, Mediterranean Sea and Black Sea and Western Waters.

In the next phase of the project, we will estimate footprints of the four active demersal gear types, based on the sea-bed contact of the individual components of the gear. For such technical information on gears, we have questioned the European and Turkish fishing industries. In the end, footprints per gear type will be combined with Vessel Monitoring System data (VMS: monitoring of ships by satellites) and logbook data of fishing effort, to provide fine-scale mapping of fishing pressure from physical gear-seabed interactions for each BENTHIS case study region.



The proportion of total yearly fishing effort of member states in 2010 split on regions and vessel groups according to expected benthic impact (data from STECF-12-10).

Contact: Ole Eigaard (DTU-Aqua) < ore@aqua.dtu.dk >

## 1.4 Does bottom trawling enhance fish production by manipulating the seafloor ecosystem?

[INTRO]

Fishermen have long argued that positive effects of trawling on fish growth exist. But can we theoretically explain this claim? How does bottom trawling enhance fish production?

[READ MORE]

To understand the mechanisms of possible enhancement of fish production by fishing, BENTHIS modelled the effects of fishing on the seabed ecosystem. This study provides a theoretical basis for such claims and shows for which type of seafloor ecosystems it can occur. These results imply that understanding the seabed ecosystem is key for successful fishery management.

The BENTHIS modelling work revealed that the much-criticized side-effects of bottom trawling can indeed stimulate the growth of the fish it targets. This is how it works: trawl gears damage the bottom fauna and alter the seafloor food web. Some benthic organisms are very sensitive to trawling, others less so. Many of the species in the benthos compete for the same food, and when the seafloor is trawled, the species which are not so sensitive can use more of the available food that is left by their more sensitive competitors. If these less sensitive species are a particularly good food source for fish, fish growth may benefit from trawling. In other cases trawling will only induce extra mortality on all benthos and this will decrease the food for fish.

Whether this positive effect applies to the soft bottom habitats used by flatfish fishers will be the focus of future work in BENTHIS.

Contact: Daniel van Denderen (IMARES) <daniel.vandenderen@wur.nl>

Article: <http://rspb.royalsocietypublishing.org/content/280/1769/20131883.short>

## 1.5 Baltic Sea: technological innovations in mussel dredging

[INTRO]

Harvesting blue mussels in nature using a dredge inevitably causes damage to the seafloor. BENTHIS researchers in Denmark are developing innovative harvesting methods.

[READ MORE]

The effects of dredging blue mussels, *Mytilus edulis* are not only the physical removal of structural musselbeds and resuspension of sediment, but also the removal of water filtration capacity, all of which impact the ecosystem. The present study demonstrates that fishing impacts can be reduced through gear developments based on stakeholder involvement.

We developed a new Light Dredge and tested it against a standard dredge on commercial vessels using different experimental setups. The development and test part was already done before BENTHIS started as part of other projects. But the analysis had not been done yet. Results from the experimental fisheries demonstrate that the weight of sediment retained and resuspension of sediment at the surface is less in the Light Dredge. Also, the drag resistance was significantly lower indicating a reduction in energy transfer to the sediment, whereas catch efficiency was increased. Sea floor tracks made by the two dredges could not be distinguished by use of a side-scan sonar and the tracks were still detectable two months after fishing.

The experiment was successful. In comparison with a standard dredge, the Light Dredge can reduce the impact on the ecosystem by reducing resuspension of sediment, reducing area of impact through an increase in catch efficiency, and by reducing fuel consumption and energy transfer to the sediment through a reduced gear drag resistance.

Contact: Rikke Petri Frandsen (DTU-Aqua), [rif@aqua.dtu.dk](mailto:rif@aqua.dtu.dk)

Links:

BENTHIS Case Study overview: <http://www.benthis.eu/en/benthis/Case-studies.htm>



Blue mussels

## 1.6 North Sea case study – First campaign completed

[INTRO]

From June 13th to June 20th the first fieldwork campaign of the BENTHIS North Sea case study was carried out in the Dutch Voordelta.

[READ MORE]

Link: <http://www.benthis.eu/en/benthis/News/Show-1/BENTHIS-North-Sea-case-study-First-campaign-completed.htm>



## 1.7 Penetration depth of beam trawling revisited

[INTRO]

Beam trawls are known to penetrate relatively deep in the seafloor, but what about pulse trawl? BENTHIS has tested the two types of gears.

[READ MORE]

The penetration of a beam trawl into the seafloor compacts, displaces and re-suspends the sediment. In the 1990s, the penetration depth was estimated to range from 1 to 8 cm, depending on the sediment and rigging of the gear. The introduction of pulse trawl gear called for a revisit of this question.

During the first BENTHIS fieldwork campaign in the North Sea a modern multi-beam echosounder (Kongsberg EM2040) was deployed to investigate the differences in penetration depth between two types of beam trawls: the novel pulse trawl and the traditional tickler chain trawl. Such echo sounders produce detailed images of the seafloor from which we can derive the penetration depth of the trawls. For the experiment, we used relatively small beam trawls (4 m width), which are commonly used in the coastal zone. They are much smaller than their cousins that are used further out in the North Sea (12 m beams).

And there we went. The aim was to fish on experimental plots and detect damage to the seafloor fauna. We expected that we needed up to 4 passages for the pulse trawl while 2 passages of the traditional tickler chain beam trawls would suffice. The maximum penetration depth of the pulse trawl passages together (up to 4 trawls) was about 6 cm. For the traditional gear, almost double the penetration depth was reached (11 cm), with half the number of passages!

BENTHIS expedition leader Depestele expects that the differences in reality can be even larger: "The pulse trawl used in the experiment was the heavier version of two types used in the commercial fishery, while the deployed tickler chain beam trawl was a lighter version than typically used. For instance, we saw trawl tracks in the experimental plot of an unidentified 4m beam trawl, presumably a heavier beam trawl version, which were deeper than the measurements of the experimentally deployed gears."

While this experiment confirms that beam trawls generally have a significant physical impact, these BENTHIS trials also highlight that a generic beam trawl is a theoretical concept with considerable variation in practice. The efforts undertaken by the fishing industry to improve the technical viability of their gears have clearly led to a modern version of the beam trawl that penetrates less deep in the seafloor.

Contact: Jochen Depestele (ILVO) <[jochen.depestele@ilvo.vlaanderen.be](mailto:jochen.depestele@ilvo.vlaanderen.be)>



The 4m tickler chain beam trawl (left) and pulse beam trawl (right) used in the experimental trials.

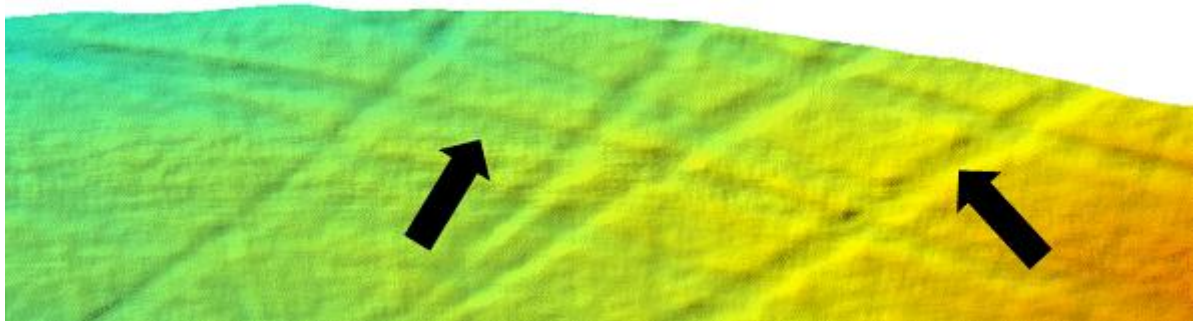


Image of the seafloor. Note the differences in penetration depths between different unidentified beam trawl trawls.

Links:

Pulse trawling: <http://www.zeeinzicht.nl/vleet/index.php?id=4211&template=template-vleeteng&language=2&item=Pulse-trawling>

Beam trawling: [http://www.zeeinzicht.nl/vleet/index.php?template=template-vleeteng&language=2&online=0&keep\\_empty\\_divs=0&title\\_inside\\_lead=0&edit=0&id=4209&item=Beam-trawl fisheries](http://www.zeeinzicht.nl/vleet/index.php?template=template-vleeteng&language=2&online=0&keep_empty_divs=0&title_inside_lead=0&edit=0&id=4209&item=Beam-trawl%20fisheries)

## 1.8 Black Sea case study

[INTRO]

In the Black Sea, BENTHIS focusses on the beam trawl fishery for rapa whelks: large fleshy sea snails originating from Japan.

[READ MORE]

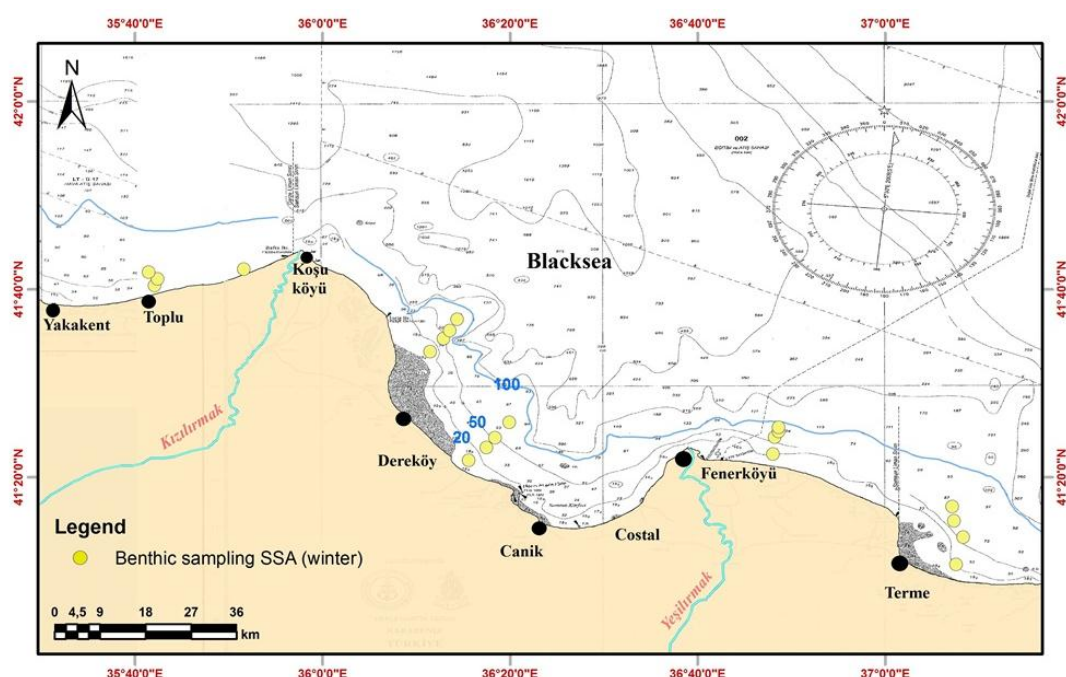
In the Black Sea, they form a pest: rapa whelks (*Rapana venosa*). Due to the increase in abundance, rapa whelks have gained commercial importance since the 1980s in the eastern Black Sea. This fishery is characterised by an important bycatch of juvenile flatfish. The adverse impact of bottom trawling on commercial and non-commercial fauna is a major concern in Turkey and has raised many speculations often without any firm scientific basis.

The BENTHIS study area is the Samsun shelf area, in the southern Black Sea, which has been trawled intensively for a long period. To study the effects of this type of fisheries, researchers conducted monthly surveys between May and November 2013 with a commercial gear (9 cm mesh size) to catch the snails, and reference gear (12 mm mesh size) to study the impact on the rest of the benthic macro fauna. The aims are to study:

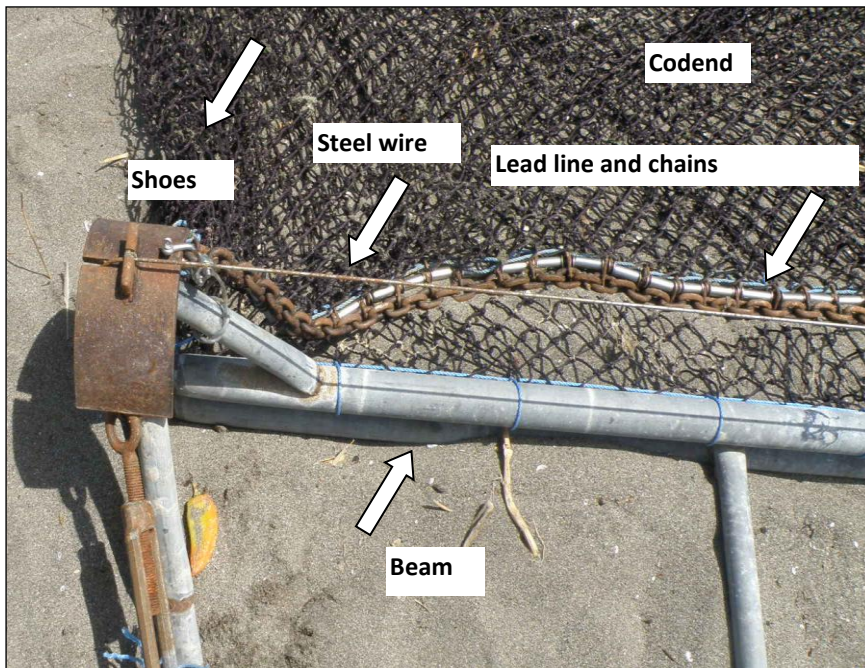
- the technical properties of beam trawls used for rapa whelk fisheries.
- the catch per unit effort
- the selectivity of the commercial gear with regard to the fish and macro benthos and
- the monthly variation in by-catch in the beam trawl fishery.

In 2013, the focus was on the fieldwork, so no results are available yet. The figures provide the information on the study area, the gear used and the catch composition. A first minor result is that the researchers discovered a species new to the region, the colonial golden star tunicate (*Botryllus schlosseri*), living on the inside of empty *Anadara cornea* shell.

Contact: Mustafa Zengin (CFRI) < muze5961@gmail.com >



Study area: Samsun Shelf and sampling stations



'Algarna' beam trawl for rapa whelks along the Turkish coast (Samsun area).



The hauling in of an 'algarna' beam trawl.



The catch is dominated by rapa whelk

**Links:**

Rapa whelk (*Rapana venosa*): <http://eol.org/pages/2972771/overview>

Golden star tunicate (*Botryllus schlosseri*): <http://eol.org/pages/393430/overview>

BENTHIS Case Study overview: <http://www.benthis.eu/en/benthis/Case-studies.htm>



*Botryllus schlosseri* a colonial tunicate identified for the first time in this area.

## 1.9 Bay of Biscay field study

[INTRO]

The remarkably biodiverse "Grande Vasière" area (Bay of Biscay) is home to an important fishery focusing on Nephrops (also known as Norway lobster or langoustine). BENTHIS studies trawling impact on the benthic ecosystem.

[READ MORE]

The "Grande Vasière" area (literally "big mud flat") in the Bay of Biscay is remarkable for its biodiversity (burrowing megafauna community) and provides essential functions such as a nursery for hake and fishing grounds for Norway lobster fisheries.

To study the impact of Nephrops trawling on the structure and the functioning of the benthic ecosystem, BENTHIS will conduct 4 surveys in total. In 2013, the first surveys (FEBBE 1 & 2) were conducted in May and August on board the Ifremer research vessel "Gwen Drez". The researchers have used an impressive variety of techniques to get insight in the exact structure and functioning of the seafloor community and in habitat features at 20 different stations. There we go:

The vertical profile of physico-chemical sediment structure (granulometry, organic matter, ...) was measured with a multi-corer (see picture). The small fauna living in and on the seafloor (endo and epi-benthic macrofauna) and the small fauna (meiofauna) were sampled with a Day-grab. Epi-benthic and macrofauna invertebrates and fishes were sampled with a 2m beam trawl and an otter trawl. The amount and composition of organic matter in the water column was sampled with a Niskin bottle. Zooplankton was sampled with a WP2 plankton net. The temperature and salinity profile of the water column was measured with a CTD.

Results of the surveys will be published in later newsletters.

Contact: Pascal LAFFARGUE (IFREMER) [Pascal.Laffargue@ifremer.fr](mailto:Pascal.Laffargue@ifremer.fr)

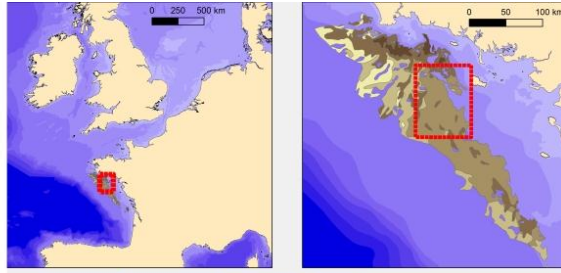
### Links

FEBBE survey: <http://www.ifremer.fr/sismer/UK/catal/campagne/campagnea.html?crno=13050050>

BENTHIS Case Study overview: <http://www.benthis.eu/en/benthis/Case-studies.htm>



RV Gwen Drez

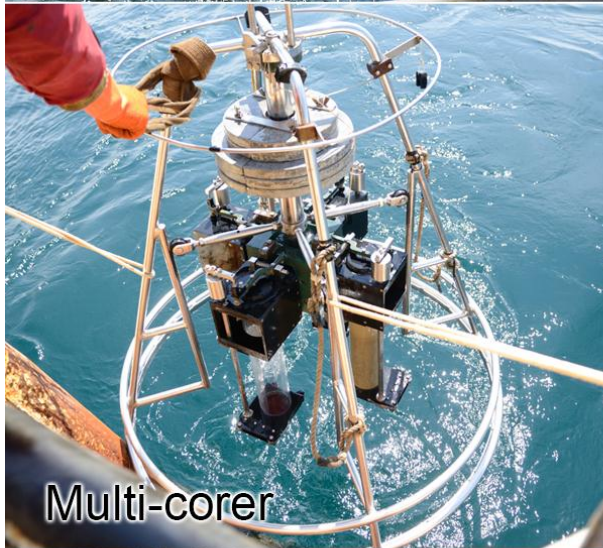


Area of fieldwork  
& sampling stations  
during FEBBE surveys





Otter trawl



Multi-corer



Beam trawl



Day-Grab samples



Niskin bottle





Norway lobster

## 1.10 Regional Stakeholder meetings: what do they think of innovative fishing technologies?

[INTRO]

In spring 2013, BENTHIS organised stakeholder workshops in each of our five case studies. The central question was which attitude stakeholders had towards innovative technologies in sustainable managed demersal fisheries.

[READ MORE]

The stakeholders consisted of representatives of the fishing industry, NGO's, policy and research. Our aim was to explore their views on technological innovations and management measures to reduce the benthic impact of fisheries. Stakeholders were asked to fill in a questionnaire with questions addressing governance, ecology, management, socio-economics and technology issues.

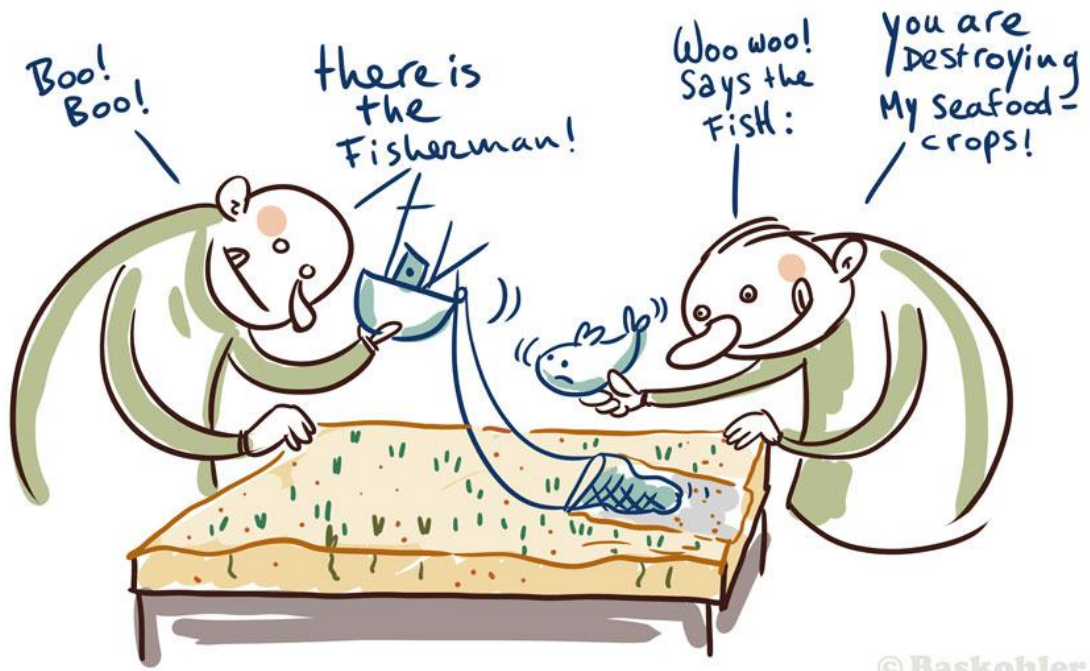


Stakeholder workshop Baltic region, May 2013

All groups agreed about the need to minimise the unintended mortality caused by fishing on benthic organisms to improve the seabed fauna. Interestingly, the scientific data demonstrating negative impacts of trawling were not trusted by all groups. Hence, not everyone was convinced of the need to reduce trawling disturbance, whether discards are an ecological concern and whether trawling may increase the food for flatfish.

With regard to the technological innovations, the stakeholder groups had different views on whether bottom trawls should be replaced with passive gears. They weren't convinced either whether pelagic otter boards or electrical stimulation would reduce the impact. They all agreed on the importance to improve compliance, moving towards decentralised fishery management and co-management, and the lack of transparency in fisheries management.

# Modelling the ecoSystem...



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## 1.11 EU-wide Stakeholder Meeting

[INTRO]

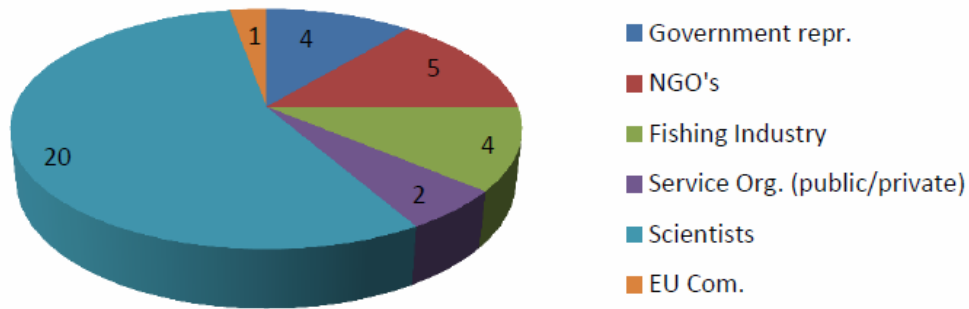
In early summer 2013 we organised a EU-wide Stakeholder meeting in Haarlem (NL), to bring together the results of our regional stakeholder meetings.

[READ MORE]

The main objective of our first EU-wide workshop was to obtain a common understanding of the benthic problems and issues, and to agree on common definitions and understandings of terms in line with the BENTHIS project. Also the purpose was to present and get feedback on what technological and management initiatives the regional stakeholders have an interest in exploring during the project lifetime. Discussions revealed that there is a need for clarifying the concept of impact among stakeholders: what is impact, and how should we measure impact? The impacts of fishing that were considered most relevant comprised of discards, food production, removal of biomass (fish and benthos), natural resilience, catch functions, food web, biology, physical and biodiversity. The answer and value judgement of the “What is impact?” question depends on whether one approaches the benthic ecosystem from a “wilderness” perspective or from a “production” perspective.

Participation of the various stakeholders from all case study areas is shown in the pie-chart.

## EU stakeholder workshop



Contact: Olavur Gregersen (Synthesa) <olavur@syntesa.fo>

## 1.12 Seabird happy meals

[INTRO]

How much of discarded fish ends up in seabird stomachs? And how much sinks to the seafloor? For the *Nephrops* fishery (Norway lobster or langoustines) in the Bay of Biscay this was not known. BENTHIS went to sea and tested the birds' fast food skills.

[READ MORE]

A team consisting of a BENTHIS 'fish discarder' and an ornithologist stepped onboard the Research Vessel 'Thalassa' during Ifremer's EVHOE survey last November. This survey covers most of the Bay of Biscay. Their mission: collect buckets of discards (roundfish, cephalopods and invertebrates) and measure all items, before feeding them to the birds.

For each experiment, 2 or 3 buckets were prepared. Discard material needed for the experiment was obtained from fishermen involved in the BENTHIS project (Cote d'Ambré Vessel) and directly from EVHOE survey. After that, the buffet was opened. The first person discarded the buckets during 15-20 minutes, while our Belgium ornithologist recorded the seabirds behaviour by a digital voice recorder.

During the survey, they managed to do the show 46 times. For each fish, cephalopod or invertebrate that was thrown overboard, the bird biologist recorded which species of bird of which age class picked it, or stole it from another feathered friend (kleptoparasitism). The amount of discarded material estimated not to have been picked by birds was considered as sunk and returned to the benthic environment. In addition, the species and age compositions of the ship following birds have been evaluated prior and after experimental discarding of each bucket.

In the next newsletter we will show the results.

Contact: Pascal LAFFARGUE (IFREMER) <Pascal.Laffargue@ifremer.fr>

Links: EVHOE survey:

<http://www.ifremer.fr/sismerData/jsp/visualisationMetadata2.jsp?strPortail=ifremer&langue=EN&pageOrigine=CAM&cle1=FI352005040080>



Kleptoparasitism of great skuas during discard-bird experiments



Digital voice-recordings of discard consumption (discard category, bird species and age, and kleptoparasitism)

## 1.13 Testing alternative gears: otter boards in a large wind tunnel

[INTRO]

Wind tunnels are the newest playground of BENTHIS research. In our search for less impacting fishing gear, we tested traditional and novel otter boards, the door-like devices that make the mouth of the fishing net go open.

[READ MORE]

In the Mediterranean case study of BENTHIS the focus is on gear innovations. In this area, there is a shift from the traditional demersal otter boards to semi-pelagic otter boards. The idea is that the novel otter boards have a lower impact on the seafloor than the traditional ones.

Novel semi-pelagic otter boards were developed by two small Italian companies (Grilli and Mori) participating in BENTHIS. The novel otter boards are supposed to hover over the seafloor, instead of touching it. Researchers from CNR tested the different otter boards in the wind tunnel of the University of Rostock (Germany) in October 2013. Next to the traditional and novel otter boards of each of the manufacturers, also the 'Thyboron VF15' otter board was tested, serving as a reference.

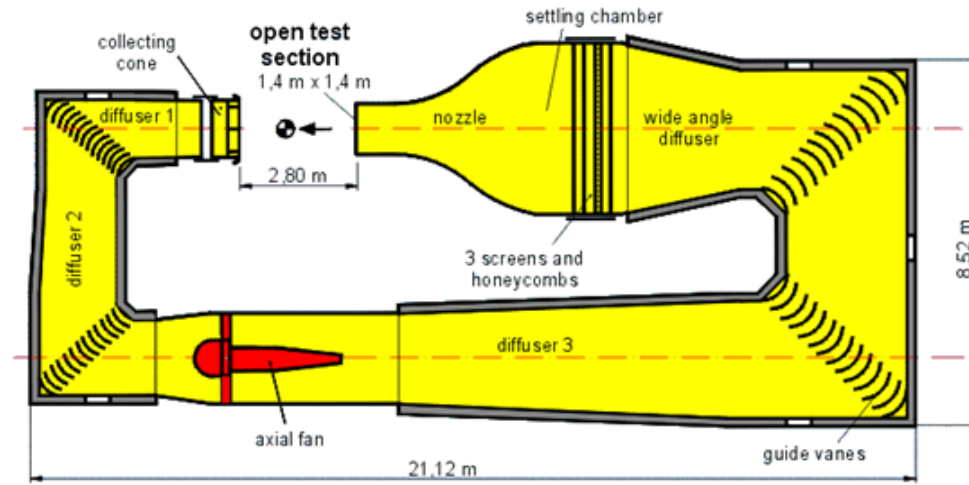
Wind tunnel measurements have advantages over the commonly used flume tank experiments as they are less time consuming, less expensive and provide more information. The wind tunnel tests produce detailed data on aerodynamic forces and moments of otter boards that can be translated to circumstances more relevant for fisheries: the hydrodynamic forces during fishing. The researchers tested the boards under different configurations in terms of pitch and attack angles. The pitch angle is the angle between the longitudinal axis of the otter board or chord line, and the vertical z-axis of the wind tunnel. The attack angle is the rotation of the door with respect to z-axis.

The next steps will be made in February 2014, when researchers will test the otterboards at sea. Scientist-in-charge Antonello Sala expects to present the first results at the next BENTHIS annual meeting (Rome, 30 March-4 April).

Contact: Antonello Sala (CNR) <a.sala@ismar.cnr.it>

Links: otter trawling [http://en.wikipedia.org/wiki/Bottom\\_trawling#Otter\\_trawling](http://en.wikipedia.org/wiki/Bottom_trawling#Otter_trawling)





large low-velocity wind tunnel

Schematic diagram of large wind tunnel.



Wind tunnel: view at the open test section to the nozzle.



Otter boards models mounted on the six-component balance during tests (On the top, the Thyboron VF15, on the bottom the experimental models provided by our Italian manufacturers: on the left the Grilli "Fly", on the right the Mori "Biplan").



Wind tunnel trials participants: from the left, Joana D'Arc Prat Farran (University of Cataluña), Fernando Mellibowsky (University of Cataluña), Emilio Notti (CNR-ISMAR), Sebastian Schreier (University of Rostock), Christian Semlow (Marikom GmbH) Giuseppe Mori (Mori), Mathias Paschen (University of Rostock), Antonello Sala (CNR-ISMAR).

## 1.14 BENTHIS Publications

[INTRO]

In the last year, BENTHIS has produced 5 scientific papers and our scientists have presented the results at different international congresses, meetings and workshops.

[READ MORE]

Link to: <http://www.benthis.eu/en/benthis/Results.htm>

### 1.14.1 Scientific Articles

2014

- Bolam, S.G., Eggleton, J.D. (2014) Macrofaunal production and biological traits: Spatial relationships along the UK continental shelf. *Journal of Sea Research*  
<http://dx.doi.org/10.1016/j.seares.2014.01.00>
- van Marlen, B., Wiegerinck, J.A.M., van Os-Koomen, E., van Barneveld, E. (2014) Catch comparison of flatfish pulse trawls and a tickler chain beam trawl. *Fisheries Research* 151: 57-69
- Brind'Amour A., Laffargue P., Morin J., Vaz S., Fovau, A. and Le Bris H (2014). Taxonomic sufficiency of epibenthic macro and mega-fauna in scientific bottom trawl surveys. *Continental Shelf Research* 72:1-9 (<http://dx.doi.org/10.1016/j.csr.2013.10.015>)

2013

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(<http://rspb.royalsocietypublishing.org/content/280/1769/20131883>)

### 1.14.2 Workshops and meetings

2013

- Best Trawling Practice Initiative Workshops [17-19 June 2013, Seattle, USA; 24-26 November 2013, Ijmuiden, The Netherlands]

BENTHIS Scientists from CEFAS, Bangor University and IMARES participated in two Workshops organised by the Best Trawling Practice Initiative <http://trawlingpractices.wordpress.com/>. This initiative has a global scope with partners from the North and South America, Australia and Europe. The aims are (1) to assemble data bases on the extent of trawling, habitats trawled, impacts of trawling on different biota in different habitats and impacts of trawling on ecosystem productivity and services. Once these data are assembled and analysed these data bases will be made public; (2) Analyse the data bases to evaluate the overall extent of trawl impacts on biota, productivity and ecosystem services, to the extent possible by geographic regions; (3) Identify a range of "best practices" for trawling and determine the consequences

of adoption of different best practices on biota, sustainable food production, ecosystems and ecosystem services.

- Presentation of BENTHIS to the fishing sector

Scientists from IFREMER have presented the BENTHIS project at several meetings with the fishing sector. The objectives of the project to work on trawling impacts and to test and develop relevant and efficient alternative strategies minimizing benthic impact by close collaboration with fishing industry have created a lot of concern in the fishing sector. A communication strategy was therefore developed, that takes account of the different levels of organisation of French professional fishermen, to inform the fishing sector about the different steps of the project and to get their feedback. We participated in the following meetings in 2013: (1) National French committee (CNPMEM, Paris 17/05/2013, <http://www.comite-peches.fr/>); (2) Benthic and Demersal species commission (CEBDGG/CNPMEM, Paris, Feb 2013 and Nov.2013); (3) Loire Regional Committee (CRPMEM, Nantes); (4) Aglia association (AGLIA, Lorient, <http://www.aglia.org/>).

### 1.14.3 Presentations at (inter-)national conferences

#### 2013

- Batsleer J, Poos JJ, Hamon K, van Overzee HMJ, Rijnsdorp AD. 2013. Influence of a discard ban on the transition towards more selective fishing gear. ICES CM 2013. Reykjavik, Iceland. *Batsleer showed that the current economic conditions are favourable for the transition of the traditional tickler chain beam trawl towards the pulse trawl gear which will contribute to a reduction in the bycatch of undersized flatfish. Compliance to a discard ban will further enhance this transition.*
- Pinnegar, Townhill, Birchenough, Mackinson, Le Quesne. Ocean acidification and the possible loss of benthic invertebrates: would commercial fin-fish be affected? ICES CM 2013. Reykjavik, Iceland. *Pinnegar showed that North Sea fishing fleets could actually benefit from ocean acidification as a result of the complex interplay between vulnerable and non-vulnerable invertebrate species. Since calcifying organisms such as bivalves or echinoderms, are more vulnerable than non-calcifying species such as crustaceans, the effect of trawling will interact with the effects of other environmental factors such as ocean acidification.*
- Laurie Tissière, S. Mahévas, B. Trouillet, A. Brind'Amour and P. Petitgas. 2013. Gouvernance du golfe de Gascogne: quelle connaissance pour construire des scénarios de gestion et anticiper leurs conséquences sur la pêche de sole commune? (Governance of the Bay of Biscay: what knowledge is needed for building management scenarios and anticipating their impact on the fishery for common sole?) 11ème forum de l'Association Française d'Halieutique. Bordeaux, France.
- Mahévas, S. et Bertignac, M. 2013. Dynamique spatio-temporelle des flottilles démersales du golfe de Gascogne pour anticiper l'incidence d'une gestion spatialisée (Spatio-temporal dynamics of demersal fleets Bay of Biscay to anticipate the impact of spatial management). 11ème forum de l'Association Française d'Halieutique. Bordeaux, France.
- Mahévas, S., S. Lehuta, M. Bertignac, Y. Vermard and P. Marchel. 2013. Modelling fishermen behaviour is firstly a question of spatial and temporal scale. C:11. ICES Annual Science Conference. Reykjavik, Islande.
- Van Denderen PD, van Kooten T, Rijnsdorp AD. 2013. When does fishing lead to more fish? Community consequences of bottom trawl fisheries in demersal food webs. ICES ASC 2013. Reykjavik, Iceland.

## SCREENSHOTS

Screenshots of the BENTHIS newsletter 2014 (see [www.benthis.eu](http://www.benthis.eu))

