Recreational sea fishing in Europe in a global context—Participation rates, fishing effort, expenditure, and implications for monitoring and assessment

Marine recreational fishing (MRF) is a high-participation activity with large economic value and social benefits globally, and it impacts on some fish stocks. Although reporting MRF catches is a European Union legislative requirement, estimates are only available for some countries. Here, data on numbers of fishers, participation rates, days fished, expenditures, and catches of two widely targeted species were synthesized to provide European estimates of MRF and placed in the global context. Uncertainty assessment was not possible due to incomplete knowledge of error distributions; instead, a semi-quantitative bias assessment was made. There were an estimated 8.7 million European recreational sea fishers corresponding to a participation rate of 1.6%. An estimated 77.6 million days were fished, and expenditure was €5.9 billion annually. There were higher participation, numbers of fishers, days fished and expenditure in the Atlantic than the Mediterranean, but the Mediterranean estimates were generally less robust. Comparisons with other regions showed that European MRF participation rates and expenditure were in the mid-range, with higher participation in Oceania and the United States, higher expenditure in the United States, and lower participation and expenditure in South America and Africa. For both northern European sea bass (Dicentrarchus labrax, Moronidae) and western Baltic cod (Gadus morhua, Gadidae) stocks, MRF represented 27% of the total removals. This study highlights the importance of MRF and the need for bespoke, regular and statistically sound data collection to underpin European fisheries management. Solutions are proposed for future MRF data collection in Europe and other regions to support sustainable fisheries management.

General information

State: Published
Organisations: National Institute of Aquatic Resources, Section for Monitoring and Data, Section for Freshwater Fisheries Ecology, Thünen Institute of Baltic Sea Fisheries, Wageningen IMARES, National Marine Fisheries Research Institute, University of Tasmania, Fisheries Research Institute, University of Algarve, Centre for Environment Fisheries and Aquaculture Science, Institute of Marine Research, Natural Resources Institute Finland, Leibniz-Institute of Freshwater Ecology and Inland Fisheries (IGB), Berlin, Ministry of Environment, IFREMER, Institute of Food Safety, Animal Health and Environment, Akvaplan-niva AS, Cefas, Universidade dos Açores, NIWA, Swedish University of Agricultural Sciences, Institute of Marine Biological Resources and Inland Waters, Swedish National Board of Fisheries, Fledenvig Research Station, UMR CIRED, NOAA, Bangor University, Mediterranean Institute of Advanced Studies (CSIC/UIB), AZTI Technalia, Inland Fisheries Ireland, University of Santiago de Compostela, Memorial University of Newfoundland, Centro Interverniversitario di Biologia Marina ed Ecologia Applicata, Ministry of Agriculture, Fisheries Service, Scottish Government, Institute of Agricultural and Fisheries research (ILVO), Flanders Marine Institute, Centre d'Estudis Avançats de Blanes


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Analysis of marine protected areas – in the Danish part of the North Sea and the Central Baltic around Bornholm: Part 1: The coherence of the present network of MPAs

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Organisations: National Institute of Aquatic Resources, Section for Oceans and Arctic, Section for Ecosystem based Marine Management, Section for Marine Living Resources, Section for Monitoring and Data, DHI Denmark, Geological Survey of Denmark and Greenland, Aarhus University, University of Copenhagen
Number of pages: 105
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Publisher: National Institute of Aquatic Resources, Technical University of Denmark
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Number: 325-2017
Analysis of marine protected areas – in the Danish part of the North Sea and the Central Baltic around Bornholm: Part 2: Ecological and economic value, human pressures, and MPA selection

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Changes in reproductive life history and resource allocation impacting population dynamics of Baltic cod

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Marine Living Resources, Section for Monitoring and Data, Section for Ecosystem based Marine Management, Institute Management
Authors: Tomkiewicz, J. (Intern), Huwer, B. (Intern), Cordón, C. T. F. (Intern), Storr-Paulsen, M. (Intern), Eero, M. (Intern), Köster, F. (Intern)
Publication date: 2017
Main Research Area: Technical/natural sciences
Publication: Research › Conference abstract for conference – Annual report year: 2017

Danish seine – Ecosystem effects of fishing

In 2014, the project “Danish seine – Ecosystem effects of fishing” got initiated in order to establish a better scientific understanding around Danish anchor seining and its effects on the environment. By comparing catch profiles of Danish seiners and demersal otter trawlers, we could show that the Danish seine is an efficient gear to catch flatfish, but is not as flexible as trawlers in terms of fishing areas because it is restricted to relatively flat areas. Furthermore, selectivity characteristics of the codend and other parts of the gear were investigated. We attached a large cover around the codend and a novel arrangement of 12 small mesh bags on different parts of the seine net to collect fish and invertebrates that would escape under commercial conditions. By doing so, we could estimate codend selectivity parameters for relevant species, which were relatively similar to estimates for trawls, and found that the majority of fish attempted to escape through the seine codend. For invertebrates, we observed high escapement rates from gear parts forward of the codend, indicating that there are effects that are ignored in conventional selectivity studies which primarily focus on codend catches. In another set of sea trials, we attached GPS loggers and various self-invented observation systems to the gear to monitor and describe the fishing process in detail. Animations showing the fishing operation with a Danish seine were
created, including information about net opening, net spread, tensile forces between net and ropes and rope behavior. We documented that the majority of fish enters the seine net very late, that fishermen can conduct efficient seine fishing although they do not use any gear monitoring sensors, and that impacts of seine ropes on the sea floor were limited to slight smoothening effects. The PhD project increased the basic scientific understanding of Danish seining and developed methods and equipment than can be used to collect more detailed information in the future. The broad information established here provide data that is of high relevance for tomorrow’s discussions about the fisheries in European waters including the implementation of the new Common Fisheries Policy and its landing obligation.

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Ecosystem based Marine Management, Section for Monitoring and Data
Authors: Noack, T. (Intern), Krag, L. A. (Intern), Wieland, K. (Intern)
Number of pages: 138
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Original language: English
Main Research Area: Technical/natural sciences
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Danish seine – Ecosystem effects of fishing

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Event: Abstract from Dansk Havforskermøde, Helsingør, Denmark.
Main Research Area: Technical/natural sciences
Publication: Research › Conference abstract for conference – Annual report year: 2017

Denitrification in saltwater recirculating aquaculture systems (RAS) using an up-flow sludge bed reactor (USB)

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Monitoring and Data, Section for Aquaculture
Authors: Herreros, M. M. (Intern), Letelier-Gordo, C. O. (Intern)
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Den skjulte sommerproduktion i Nordsøen

General information
Do spatio-temporal spawning closures promote the recovery of cod in the Baltic Sea?

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Monitoring and Data, ClimateLab, University of Copenhagen, Københavns Universitet
Authors: Richardson, K. (Ekstern), Bendtsen, J. (Ekstern), Britsch, E. E. (Intern), Mousing, E. A. (Forskerdatabase)
Publication date: 2017
Event: Abstract from Dansk Havforskermøde, Helsingør, Denmark.
Main Research Area: Technical/natural sciences
Publication: Research › Conference abstract for conference – Annual report year: 2017

Effectiveness of fully documented fisheries to estimate discards in a participatory research scheme

A key challenge for fisheries science and management is the access to reliable and verifiable catch data. In science, the challenge is to collect reliable, precise and traceable data to provide sound advice. In management, the challenge is that catch documentation is necessary to enforce regulations. Currently, catch inspection at sea, self-reporting through e-log and on-board observers are the primary methods to document catches at sea. However, at-sea control and on-board observers are costly and have limited coverage, while self-reporting is susceptible to fraud and provides limited coverage. New cost-effective methods are currently emerging involving Remote Electronic Monitoring (REM) and on-board cameras. Previous studies have tested REM with promising results. However, evaluation of the potential biases of REM is needed before full benefits can be obtained. We deployed REM with on-board cameras on 14 fishing vessels and were able to inspect 56% of 1523 hauls made in the 6 month trial period, using an estimated 582 man-hours of video audit. The results showed an overall good agreement between the fishers self-reported discards and the video inspectors discard estimates. However, there was large variation in precision between individual vessels and species. Additionally, trial setup and process errors were shown to have a large effect on the precision of the video inspectors discard estimates. Nevertheless, despite challenges, REM was evaluated to have the potential to streamline monitoring and scientific documentation in a medium-size fishing fleet

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Freshwater Fisheries Ecology, Section for Monitoring and Data
Authors: Pedersen, S. (Intern), Olesen, H. J. (Intern)
Publication date: 2017

DTU Aqua undersøger trollingfiskeriet i Østersøen

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Ecosystem based Marine Management, Section for Marine Living Resources, Institute Management, Section for Monitoring and Data
Authors: Eero, M. (Intern), Hinrichsen, H. H. (Ekstern), Huwer, B. (Intern), Köster, F. (Intern), Mossgaard, H. (Intern), Storr-Paulsen, M. (Intern)
Publication date: 2017
Main Research Area: Technical/natural sciences
Publication: Research › Conference abstract for conference – Annual report year: 2017

Effectiveness of fully documented fisheries to estimate discards in a participatory research scheme

A key challenge for fisheries science and management is the access to reliable and verifiable catch data. In science, the challenge is to collect reliable, precise and traceable data to provide sound advice. In management, the challenge is that catch documentation is necessary to enforce regulations. Currently, catch inspection at sea, self-reporting through e-log and on-board observers are the primary methods to document catches at sea. However, at-sea control and on-board observers are costly and have limited coverage, while self-reporting is susceptible to fraud and provides limited coverage. New cost-effective methods are currently emerging involving Remote Electronic Monitoring (REM) and on-board cameras. Previous studies have tested REM with promising results. However, evaluation of the potential biases of REM is needed before full benefits can be obtained. We deployed REM with on-board cameras on 14 fishing vessels and were able to inspect 56% of 1523 hauls made in the 6 month trial period, using an estimated 582 man-hours of video audit. The results showed an overall good agreement between the fishers self-reported discards and the video inspectors discard estimates. However, there was large variation in precision between individual vessels and species. Additionally, trial setup and process errors were shown to have a large effect on the precision of the video inspectors discard estimates. Nevertheless, despite challenges, REM was evaluated to have the potential to streamline monitoring and scientific documentation in a medium-size fishing fleet

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Ecosystem based Marine Management, Section for Monitoring and Data, Section for Marine Living Resources, Public Sector Consultancy, Ministry of Food, Agriculture and Fisheries
Effects of environmental variables on survey catch rates and distribution by size of shallow- and deep-water Cape hakes, Merluccius capensis and Merluccius paradoxus off Namibia

In order to study the effects of temperature, oxygen, salinity and time of day on survey trawl catches, we modeled observed catches of juvenile, small, medium and large hakes per station as functions of zenith angle of the sun, geographical position, year, temperature, salinity, oxygen and depth. We used data from summer demersal surveys conducted during the period 2002–2015, together with a computation of the corresponding light level data from which the solar zenith angles were obtained, and fitted the generalized additive models to these data. Based on best model results, important covariates were oxygen, depth, geographical position and temperature. The best models explained 70%, 69%, 57% and 57% of the variability in catches of juvenile, small, medium and large Merluccius capensis, respectively, and 71%, 68%, 81% and 70% of juvenile, small, medium and large Merluccius paradoxus, respectively. The significant effects of temperature, oxygen, depth and geographical position on survey catches of hake of different size groups indicate that survey size structure may be affected by the behavior of both species towards environmental conditions. Greater care should therefore be taken when interpreting hake survey biomass estimates, based on swept area method, especially those that were collected during exceptional unfavourable environmental conditions. It would also be highly desirable if the oceanographic conditions are collected on each trawl station in order to improve understanding of the linkage between resources and environmental conditions.
Environmental effects on the availability of shallow and deep-water hake to the demersal trawl survey in Namibian waters

Studies on several demersal fish species have shown that variability in environmental conditions (including oxygen, temperature, wind and time of day) during trawling may result in differences in the catching efficiency of the trawl gear, which may cause differences in abundance estimations of stocks. This is even complicated in the case of the Cape hakes, Merluccius capensis and Merluccius paradoxus, which are known to perform diurnal vertical migrations possibly for spawning or in search of food. These abundance estimations, together with commercial catch-at-age and catch per unit effort (CPUE) indices, are key input data into the stock assessment model that guides scientific TAC (Total allowable catch) recommendations and other management measure advices, for the Namibian hake stocks. The overall aim of this PhD study was to investigate the effects of environmental conditions (close to the sea bed during trawls) on trawl survey abundance indices through an analysis of existing survey CPUE data, in order to gain a better understanding of the behavioral processes involved. This is crucial for improving the reliability of the hake stock assessment, and it is directly linked to the validation or modification of the current assessment practices. This PhD thesis is made up of a synthesis of four papers with varying objectives. Paper I attempted to study diel patterns in survey trawl catch rates for Namibian hakes using the solar zenith angle of the sun as a proxy for light level near the bottom. The main aim was to examine the effect of diel bias on catchability within and between years, and to explore the implications for survey abundance estimation and the consistency of the survey time-series. Results indicate that time of day has an effect on survey catch rates, mostly for M. capensis, where lower catch rates were obtained during the night, in shallower waters. The second objective (Paper II) was to study the effects of environmental variables and other covariates (temperature, oxygen, salinity as well as geographical position, time of day and year) on survey trawl catch rates at different size groups (juvenile, small, medium and large) of the two hake species. Most of the years, the environmental data were collected independent of the fishing operations usually on few selected transects with limited spatial overlap between the CTD and the trawl stations. The results, however, indicate that the most important covariates affecting catch rates were bottom oxygen, bottom depth, geographical position and bottom temperature. This is an indication that the size structure of the two species as observed in the survey may have been affected by the behavioral reactions in response to the environmental conditions. These results were confirmed by those of Paper III, which used data collected by a trawl-mounted instrument package, which allows the data collection simultaneously to the trawl operations. There is an indication that the use of a trawl-mounted instrument package can provide reliable information on environmental variables for an improved understanding and interpretation of survey catch rates and subsequent use in stock assessment models for provision of scientific advice on resources. Paper IV was an investigation into diel feeding ecology through food composition based on recent stomach samples in order to gain insight into biological explanation of the observed dynamics of survey catchability. Both hake species fed more on semi-demersal and demersal components of the prey field, which predominantly consisted of horse mackerel, jacopever and Atlantic green eye for M. capensis, and grenadier and cephalopods (squid and cuttlefish) for M. paradoxus. Other prey items were pelagic like krill and myctophids. Hake-on-hake predation was observed, with both hake species occurring as prey in the stomachs of M. capensis while only M. paradoxus occurred in the stomachs of M. paradoxus. This study was unfortunately limited by an insufficient number of samples and inadequate geographical coverage. It can, however, be used as a basis to plan future studies that should then also encompass the use of a gastric evacuation model to estimate the time of the day for ingestion of individual prey items and to quantify hake cannibalism from stomach content data. Results of the different papers are synthesized in relation to diagnosing environmental effects on survey catchability and then suggestions for time series adjustments is provided.

General information

State: Published
Organisations: National Institute of Aquatic Resources, Section for Monitoring and Data, Section for Oceans and Arctic, Ministry of Fisheries and Marine Resources
Authors: Kainge, P. I. (Intern), Wieland, K. (Intern), Andersen, N. G. (Intern), Hamukuaya, H. (Ekstern)
Number of pages: 119
Estimating escapement of fish and invertebrates in a Danish anchor seine

The codend is generally presumed to be the place where the main selectivity of fish occurs in towed fishing gears, but other parts of the net have been found to contribute to the selectivity process of several invertebrate species. This means that conventional selectivity or survival studies may ignore the selectivity of net parts other than the codend for certain species. By attaching 12 small meshed collecting bags to different parts of a Danish anchor seine net and conducting normal commercial fishing activities, this study showed that there is a substantial escapement of fish and (especially) invertebrates from the forward parts of the seine net. For seven species of demersal fish, most fish escaped through the lower panel close to the codend. All invertebrate species were found in higher numbers in the collecting bags than in the codend where many organisms escaped in the lower panel of the wings or the belly. Mean levels of visible damage ranged from 1.00 to 3.25 for collected invertebrates and were similar for all gear parts. Common starfish (Asterias rubens), however, showed highest damage in the extension part of the net.
Fine-scale environmental effects on Cape hake survey catch rates in the Northern Benguela, using data from a trawl-mounted instrument package

We investigated fine-scale effects of environmental variables associated with habitat distribution for 4 size groups of Cape hakes, *Merluccius capensis* and *M. paradoxus*, using generalized additive models (GAMs) with a negative binominal error distribution. This study took place during the Namibian hake trawl survey of 2016, and was made possible for the first time in Namibia by collecting oceanographic information with a trawl-mounted instrument package concurrently with the catch data. Depth, geographical position, bottom oxygen and bottom temperature had the most pronounced effect on the catch rates of both hake species, whereas solar zenith angle representing diel effects and surface layer chlorophyll appeared to be less important. The explained deviance for the best models ranged from 71.4% for *M. capensis* to 92.7% for *M. paradoxus* between 43 and 57 cm in length. Differences in catch rates between species and size groups were most pronounced for bottom depth and bottom oxygen. The results show the potential value of trawl-mounted instrumental packages for the collection of reliable environmental data important in the study of environmental influence on abundance, catch rates and distribution, and in turn in the assessment and management of a resource.
Fisheries Impact Evaluation Tool (FIT) with Application to Assess the Bottom Fishing Footprint in Western Baltic Sea (ICES Subdivisions 22-24)

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Ecosystem based Marine Management, Section for Monitoring and Data, Centre for Ocean Life, Wageningen IMARES
Authors: Bastardie, F. (Intern), Eigaard, O. R. (Intern), Nielsen, J. R. (Intern), Egekvist, J. (Intern), Hintzen, N. T. (Ekstern), van Denderen, P. D. (Intern), Rijnsdorp, A. (Ekstern)
Number of pages: 25
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https://zenodo.org/record/883054#.WglXPTKWy70
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Fishing profiles of Danish seiners and bottom trawlers in relation to current EU management regulations
Danish seines and bottom trawls operate differently and have different catching processes. Both gears belong to the same legislative category in European fisheries, but different management strategies in other countries and criticism by fishers on grouping Danish seines and trawls together indicate disagreement on current gear classification. This study compared both gears in terms of their fishing characteristics and catches of commercial species based on 16 years of observer data. Danish seining is a specialised fishing method that targeted few species but with higher total catch rates than bottom trawlers. Bottom trawling is a more all-purpose fishing method that targets a larger number of species, and bottom trawlers use larger engines than Danish seiners. A generalised additive mixed model indicated that catch rates of flatfish are generally higher for Danish seines, and catch rates of roundfish species are higher for...
trawlers. The results do not directly suggest a separation of the gears in terms of legislation as the quantities of fish below current minimum size were similar, but for example future survival studies may reach different conclusions. Additional factors were found to be important in determining catches of both gears.
Forskere hjælper fynske havørreder

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Organisations: National Institute of Aquatic Resources, Section for Monitoring and Data, Section for Freshwater Fisheries Ecology, Institute Management
Authors: Olesen, H. J. (Intern), Skov, C. (Intern), Reeh, L. (Intern)
Pages: 34-35
Publication date: 2017
Main Research Area: Technical/natural sciences

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Forskningsskibet Dana er netop vendt hjem fra Østersøen

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Monitoring and Data, Section for Marine Living Resources
Authors: Storr-Paulsen, M. (Intern), Huwer, B. (Intern)
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Main Research Area: Technical/natural sciences
Publication: Communication › Newspaper article – Annual report year: 2018

Hvordan påvirker bundtrawlfiskeriet Kattegats bundfauna? En analyse af ændringer i densitet og artarigdom og en diskussion af potentielle indikatorer

General information
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Hvorfor samarbejde med biologerne?

General information
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Organisations: National Institute of Aquatic Resources, Section for Monitoring and Data, Danish Fishermen’s Producers’ Organization
Authors: Storr-Paulsen, M. (Intern), Andersen, M. (Ekstern)
Pages: 17
Publication date: 2017

Konsekvensvurdering af fiskeri efter blåmuslinge ved og øst for Horsens Fjord samt Endelave 2017

General information
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Organisations: National Institute of Aquatic Resources, Danish Shellfish Centre, Section for Monitoring and Data
Authors: Nielsen, P. (Intern), Canal-Vergés, P. (Intern), Nielsen, M. M. (Intern), Geitner, K. (Intern), Petersen, J. K. (Intern)
Number of pages: 46
Publication date: 2017

Lost in translation? Multi-metric macrobenthos indicators and bottom trawling
The member states of the European Union use multi-metric macrobenthos indicators to monitor the ecological status of their marine waters in relation to the Water Framework and Marine Strategy Framework Directives. The indicators translate the general descriptors of ecological quality in the directives into a single value of ecological status by combining indices of species diversity, species sensitivity and density. Studies and inter-calibration exercises have shown that the indicators respond to chemical pollution and organic enrichment, but little is known about their response to bottom trawling. We use linear mixed effects models to analyze how bottom trawling intensity affects the indicators used in the Danish (Danish Quality Index, DKI) and Swedish (Benthic Quality Index, BQI) environmental monitoring programs in the Kattegat, the sea area between Sweden and Denmark. Using year and station as random variables and trawling intensity, habitat type, salinity and depth as fixed variables we find a significant negative relationship between the BQI indicator and bottom trawling, while the DKI is related significantly to salinity, but not to trawling intensity. Among the indicator
components, the species diversity and sensitivity indices used in the DKI are not significantly linked to trawling, and trawling only affects the BQI when species sensitivities are derived from rarefied samples. Because the number of species recorded per sample (species density) is limited by the number of individuals per sample (density), we expect species density and density to be positively correlated. This correlation was confirmed by a simulation model and by statistical analysis of the bottom samples in which log species density was highly significantly related to log density ($r = 0.75, df = 144, p$)

**General information**

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Organisations: National Institute of Aquatic Resources, Section for Ecosystem based Marine Management, Section for Monitoring and Data
Authors: Gislason, H. (Intern), Bastardie, F. (Intern), Dinesen, G. E. (Intern), Egekvist, J. (Intern), Eigaard, O. R. (Intern)
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Main Research Area: Technical/natural sciences

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Scopus rating (2016): CiteScore 4.07 SJR 1.308 SNIP 1.756
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.481 SNIP 1.726 CiteScore 3.99
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.463 SNIP 1.996 CiteScore 3.76
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 1.353 SNIP 1.837 CiteScore 3.63
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 1.257 SNIP 1.858 CiteScore 3.42
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 1.21 SNIP 1.732 CiteScore 3.05
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 1.239 SNIP 1.603
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 1.047 SNIP 1.769
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 0.907 SNIP 1.474
Scopus rating (2007): SJR 0.774 SNIP 1.395
Scopus rating (2006): SJR 0.677 SNIP 0.958
Scopus rating (2005): SJR 0.465 SNIP 1.035
Scopus rating (2004): SJR 0.731 SNIP 1.182
Scopus rating (2003): SJR 0.465 SNIP 0.861
Scopus rating (2002): SJR 0.185 SNIP 0.762
Original language: English

Reducing discards without reducing profit: Free gear choice in a Danish result-based management trial

The 2013 Common Fisheries Policy introduced a landing obligation on a range of species. This is changing the fundamental principles on which EU fisheries management is based, with more focus on the full accountability of all catches (a move towards catch quota management) and less accountability on the means used to obtain these catches (a move towards results-based management). To investigate the potentials and challenges that these paradigm shifts give rise to, a 6-months ‘unrestricted gear’ trial was performed in Denmark in 2015. Twelve trawlers of different size, rigging, fishing area and target species were challenged to test their own solutions to reduce unwanted bycatch and/or choke species, while maintaining their profitability. Fully documented fishery (FDF) was required, including electronic monitoring, self-estimation of discards and haul-by-haul catch documentation. Fishers’ participation in the trial was partly incentivized through the allocation of additional quota. Fishers used twinned standard and test gears whenever possible, or switched gear sequentially otherwise. The participating fishers tested different options depending on their fishery and the type of issues they faced individually, and adjusted their test fishery over time through incremental small steps. A total of 1497 hauls were analysed for landings, discards and discard-ratio (discard to catch ratio), along with species composition and temporal trends. Nine vessels reduced discard ratio in the test fishery, one showed no difference between test and control fishery, while two vessels displayed an increase in discard ratio. The catch compositions were also significantly different, with fewer predicted “choke species” occurring in the test fisheries and a more valuable size composition. Ultimately, despite smaller landings in multiple vessels, no vessel showed reduction in value-per-unit-effort (VPUE) and one Baltic vessel significantly increased the VPUE. No temporal trends in discard ratio were noted. This trial showed that relaxing technical regulations has a potential to provide some flexibility to cope with the landing obligation, where unwanted catches could be reduced to some extent without negative effects on economic viability. Some practical implementation challenges were nevertheless encountered, which are discussed in the perspective of implementing results-based management at full scale.

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Ecosystem based Marine Management, Section for Monitoring and Data, Aalborg University
Authors: Mortensen, L. O. (Intern), Ulrich, C. (Intern), Qvist Eliasen, S. (Ekstern), Olesen, H. J. (Intern)
Pages: 1469-1479
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: ICES Journal of Marine Science
Volume: 74
Issue number: 5
ISSN (Print): 1054-3139
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.63
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): CiteScore 2.18
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): CiteScore 2.62
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): CiteScore 2.46
Remote electronic monitoring and the landing obligation – some insights into fishers’ and fishery inspectors’ opinions

The European fisheries management is currently undergoing a fundamental change in the handling of catches of commercial fisheries with the implementation of the 2013 Common Fisheries Policy. One of the main objectives of the policy is to end the practice of discarding in the EU by 2019. However, for such changes to be successful, it is vital to ensure stakeholders acceptance, and it is prudent to consider possible means to verify compliance with the new regulation. Remote Electronic Monitoring (REM) with Closed-Circuit Television (CCTV) has been tested in a variety of fisheries worldwide for different purposes and is currently considered as one possible tool to ensure compliance with a European ban on discards. This study focuses on Danish fishery inspectors and on fishers with REM experience, whose opinions are less well known. Their views on the landing obligation and on the use of REM were investigated using interviews and questionnaires, and contrasted to some fishers without REM experience. 80% of fishery inspectors and 58% of REM-experienced fishers expressed positive views on REM. Participation in a REM trial has not led to antipathy towards REM. Fishery inspectors saw on-board observers, at-sea control and REM as the three best solutions to control the landing obligation but shared the general belief that the landing obligation cannot be enforced properly and will be difficult for fishers to comply with. The strengths and weaknesses of REM in this context are discussed.

General information
State: Published
Organisations: Section for Marine Living Resources, National Institute of Aquatic Resources, Section for Ecosystem based Marine Management, Aalborg University, Ministry of Food, Agriculture and Fisheries
Authors: Schreiber Plet-Hansen, K. (Intern), Qvist Eliasen, S. (Ekstern), Mortensen, L. O. (Intern), Bergsson, H. (Ekstern), Olesen, H. J. (Intern), Ulrich, C. (Intern)
Pages: 98-106
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: Marine Policy
Volume: 76
ISSN (Print): 0308-597X
Ratings:
The footprint of bottom trawling in European waters: distribution, intensity, and seabed integrity

Mapping trawling pressure on the benthic habitats is needed as background to support an ecosystem approach to fisheries management. The extent and intensity of bottom trawling on the European continental shelf (0-1000 m) was analysed from logbook statistics and vessel monitoring system data for 2010-2012 at a grid cell resolution of 1 x 1 min longitude and latitude. Trawling intensity profiles with seabed impact at the surface and subsurface level are presented for...
14 management areas in the North-east Atlantic, Baltic Sea and Mediterranean Sea. The footprint of the management areas ranged between 53-99% and 6-94% for the depth zone from 0 to 200 m (Shallow) and from 201 to 1000 m (Deep), respectively. The footprint was estimated as the total area of all grid cells that were trawled fully or partially. Excluding the untrawled proportions reduced the footprint estimates to 28-85% and 2-77%. Largest footprints per unit landings were observed off Portugal and in the Mediterranean Sea. Mean trawling intensity ranged between 0.5 and 8.5 times per year, but was less in the Deep zone with a maximum intensity of 6.4. Highest intensities were recorded in the Skagerrak-Kattegat, Iberian Portuguese area, Tyrrhenian Sea and Adriatic Sea. Bottom trawling was highly aggregated. For the Shallow zone the seabed area where 90% of the effort occurred comprised between 17% and 63% (median 36%) of the management area. Footprints were high over a broad range of soft sediment habitats. Using the longevity distribution of the untrawled infaunal community, the seabed integrity was estimated as the proportion of the biomass of benthic taxa where the trawling interval at the subsurface level exceeds their life span. Seabed integrity was low (< 0.1) in large parts of the European continental shelves, although smaller pockets of seabed with higher integrity values occur. The methods developed here integrate official fishing effort statistics and industry-based gear information to provide high-resolution pressure maps and indicators, which greatly improve the basis for assessing and managing benthic pressure from bottom trawling. Further they provide quantitative estimates of trawling impact on a continuous scale by which managers can steer.

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Ecosystem based Marine Management, Section for Monitoring and Data, Institute of Marine Research, Spanish Institute of Oceanography, Swedish University of Agricultural Sciences, IFREMER, Hellenic Centre for Marine Research, Cefas, University of Roma ‘Tor Vergata’, National Research Council of Italy, Instituto Português do Mar e da Atmosfera, Wageningen IMARES, Marine Scotland Science, Johann Heinrich von Thünen-Institute, Marine Institute, Institute of Marine Biological Resources and Inland Waters, AFBI, Institute for Agricultural and Fisheries Research
Pages: 847-865
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: ICES Journal of Marine Science
Volume: 74
Issue number: 3
ISSN (Print): 1054-3139
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.63
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): CiteScore 2.18
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): CiteScore 2.62
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): CiteScore 2.46
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): CiteScore 2.35
ISI indexed (2012): ISI indexed yes
**1.500 mærkede torsk skal give bedre bestandsvurdering**

**General information**
State: Published
Organisations: National Institute of Aquatic Resources, Section for Marine Ecology and Oceanography, Section for Monitoring and Data, Danish Fishermen's Producers' Organization
Authors: Hüsey, K. (Intern), Olesen, H. J. (Intern), Hansen, K. K. (Ekstern), Lund, H. S. (Ekstern)
Pages: 11
Publication date: 2016

**Publication information**
Pages (from-to): 11
Newspaper: Fiskeritidende
Volume: 23
No.: 37
Ratings:
ISI indexed (2013): ISI indexed no
ISI indexed (2012): ISI indexed no
ISI indexed (2011): ISI indexed no
Main Research Area: Technical/natural sciences
Publication: Communication › Newspaper article – Annual report year: 2016

**Danish seine – Ecosystem effects of fishing (gear performance trials)**

**General information**
State: Published
Organisations: National Institute of Aquatic Resources, Section for Ecosystem based Marine Management, Section for Monitoring and Data, Thünen Institute of Baltic Sea Fisheries
Number of pages: 1
Publication date: 2016
Main Research Area: Technical/natural sciences
Deciphering the structure of the West Greenland marine food web using stable isotopes (δ13C, δ15N)

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Marine Ecology and Oceanography, Section for Monitoring and Data, Environment Canada, Aarhus University, Greenland Climate Research Centre, Kalundborg Municipality, Greenland Institute of Natural Resources
Authors: Linnebjerg, J. F. (Forskerdatabase), Hobson, K. A. (Ekstern), Fort, J. (Ekstern), Nielsen, T. G. (Intern), Møller, P. (Ekstern), Wieland, K. (Intern), Born, E. W. (Ekstern), Rigét, F. F. (Ekstern), Mosbech, A. (Forskerdatabase)
Publication date: 2016
Main Research Area: Technical/natural sciences

Publication information
Journal: Marine Biology
Volume: 163
Issue number: 11
Article number: 230
ISSN (Print): 0025-3162
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.41 SJR 1.198 SNIP 0.993
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 1.315 SNIP 0.932 CiteScore 2.21
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.204 SNIP 1.041 CiteScore 2.32
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 1.272 SNIP 1.064 CiteScore 2.4
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 1.306 SNIP 1.107 CiteScore 2.43
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 1.145 SNIP 1.073 CiteScore 2.22
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 1.235 SNIP 1.069
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 1.178 SNIP 1.052
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 2
Scopus rating (2008): SJR 1.236 SNIP 1.022
Deliverable CS1 Pelagic fisheries sampling designs: WP2 – Regional sampling design for commercial fisheries. WP2.3 – Case Study fisheries

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Monitoring and Data, IMARES
Authors: Håkansson, K. B. (Intern), Storr-Paulsen, M. (Intern), Chen, C. (Ekstern), Verver, S. (Ekstern), van Helmond, E. (Ekstern), Pout, A. (Ekstern), Clarke, L. (Ekstern)
Pages: 161-216
Publication date: 2016

Host publication information
Title of host publication: Strengthening regional cooperation in fisheries data collection
Chapter: 11
Main Research Area: Technical/natural sciences
Publication: Research › Report chapter – Annual report year: 2016

Fiskeri efter søstjerner i Limfjorden. Fagligt grundlag for en forvaltningsplan

General information
State: Published
Organisations: National Institute of Aquatic Resources, Danish Shellfish Centre, Section for Ecosystem based Marine Management, Section for Monitoring and Data
Authors: Petersen, J. K. (Intern), Gislason, H. (Intern), Fitridge, I. (Intern), Saurel, C. (Intern), Degel, H. (Intern), Nielsen, C. F. (Intern)
Number of pages: 35
Publication date: 2016

Publication information
Publisher: Institut for Akvatiske Ressourcer, Danmarks Tekniske Universitet
ISBN (Print): 978-87-7481-219-7
Original language: Danish

Series: DTU Aqua-rapport
Number: 308-2016
Main Research Area: Technical/natural sciences
Electronic versions:
Identification of high-risk areas for harbour porpoise Phocoena phocoena bycatch using remote electronic monitoring and satellite telemetry data

The bycatch of harbour porpoise Phocoena phocoena is an issue of major concern for fisheries management and for porpoise conservation. We used high-resolution spatial and temporal data on porpoise abundance and fishing effort from the Danish Skagerrak Sea to identify areas with potentially higher and lower risk of porpoise bycatch. From May 2010 to April 2011, 4 commercial gillnet vessels were equipped with remote electronic monitoring (REM) systems. The REM system recorded time, GPS position and closed-circuit television (CCTV) footage of all gillnet hauls. REM data were used to identify fishing grounds, quantify fishing effort and document harbour porpoise bycatch. Movement data from 66 harbour porpoises equipped with satellite transmitters from 1997 to 2012 were used to model population density. A simple model was constructed to investigate the relationship between the response (number of individuals caught) and porpoise density and fishing effort described by net soak time, net string length and target species. Results showed that a model including both porpoise density and fishing effort data predicted bycatch better than models containing only one factor. We therefore conclude that porpoise telemetry or REM data allow for identification of areas of potential high and low bycatch risk, and better predictions are obtained when combining the 2 sources of data. The final model can thus be used as a tool to identify areas of bycatch risk.

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Ecosystem based Marine Management, Section for Marine Living Resources, Section for Monitoring and Data, Aarhus University, University of St Andrews
Authors: Kindt-Larsen, L. (Intern), Berg, C. W. (Intern), Tougaard, J. (Ekstern), Sørensen, T. K. (Intern), Geitner, K. (Intern), Northridge, S. (Ekstern), Sveegaard, S. (Ekstern), Larsen, F. (Intern)
Pages: 261-271
Publication date: 2016
Main Research Area: Technical/natural sciences

Publication information
Journal: Marine Ecology - Progress Series
Volume: 555
ISSN (Print): 0171-8630
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 2.4
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): CiteScore 2.56
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): CiteScore 2.75
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): CiteScore 2.79
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): CiteScore 2.9
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): CiteScore 2.85
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
Identifying blue whiting (Micromesistius poutassou) stock structure in the Northeast Atlantic by otolith shape analysis

Information on stock identification and spatial stock structure provide a basis for understanding fish population dynamics and improving fisheries management. In this study, otolith shape analysis was used to study the stock structure of blue whiting (Micromesistius poutassou) in the northeast Atlantic using 1693 samples from mature fish collected between 37°N and 75°N and 20°W and 25°E. The results indicated two stocks located north and south of ICES Divisions VIa and VIb (54°5N to 60°5N, 4°W to 11°W). The central area corresponds to the spawning area west of Scotland. Sampling year effects and misclassification in the linear discriminant analysis suggested exchanges between the northern and southern stocks. The results corroborate previous studies indicating a structuring of the blue whiting stock into two stocks, with some degree of mixing in the central overlap area.

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Marine Living Resources, Section for Monitoring and Data, IFREMER, Galway - Mayo Institute of Technology, Instituto Português do Mar e da Atmosfera, Marine Research Institute, Institute of Marine Research, Marine Institute, Cefas
Authors: Mahe, K. (Ekstern), Oudard, C. (Ekstern), Mille, T. (Ekstern), Keating, J. (Ekstern), Gonçalves, P. (Ekstern), Worsøe Clausen, L. (Intern), Petursdottir, G. (Ekstern), Rasmussen, H. (Intern), Meland, E. (Ekstern), Mullins, E. (Ekstern), Pinnegar, J. K. (Ekstern), Hoines, A. (Ekstern), Trenkel, V. M. (Ekstern)
Pages: 1363-1371
Publication date: 2016
Main Research Area: Technical/natural sciences

Publication information
Journal: Canadian Journal of Fisheries and Aquatic Sciences
Volume: 73
Issue number: 9
ISSN (Print): 0706-652X
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 2.56 SJR 1.322 SNIP 1.163
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Konsekvensvurdering af fiskeri efter blåmuslinger ved og øst for Horsens Fjord samt Endelave 2016

General information
State: Published
Organisations: National Institute of Aquatic Resources, Danish Shellfish Centre, Section for Monitoring and Data
Authors: Nielsen, P. (Intern), Nielsen, C. F. (Intern), Geitner, K. (Intern), Petersen, J. K. (Intern)
Migration, distribution and population (stock) structure of shallow-water hake (Merluccius capensis) in the Benguela Current Large Marine Ecosystem inferred using a geostatistical population model

Shallow-water hake (Merluccius capensis) is of considerable ecological and economic importance in the Benguela Current Large Marine Ecosystem in South Africa and Namibia. Optimal management of the resource is currently constrained by the limited understanding of migration patterns and population (stock) structure. We combined data from multiple demersal trawl surveys from the entire distribution area to estimate growth rate, mortality and spatial and temporal patterns of M. capensis. Analyses were conducted using the geostatistical model GeoPop. The complexity of the model and the amount of data required a new level of soft- and hardware performance. This was achieved by utilizing Template Model Builder and high-end computational hardware (Amazon Elastic Compute Cloud, EC2). The data and the model enabled us to follow the distribution and infer movements of M. capensis from the recruitment/nursery areas, through the juvenile phase and the adults’ migration to the spawning areas outside/upstream of the nursery areas. This revealed some previously unknown migration patterns and indicated natal homing and the existence of three primary population components in the region, namely the Walvis (central and northern Namibia), the Orange (Southern Namibia-Northern SA) and the Agulhas (Southern part of SA) components. Our results also indicated substantial regional differences in mortality. We recommend that fisheries assessment, advice and management take consideration of these aspects of the distribution and population (stock) structure of M. capensis in the Benguela Current Large Marine Ecosystem.

General information
State: Published
Organisations: Section for Marine Living Resources, National Institute of Aquatic Resources, Section for Monitoring and Data, Section for Marine Ecology and Oceanography, Benguela Current Commission, Ministry of Fisheries and Marine Resources, Institute of Marine Research, Department for Agriculture, Forestry and Fisheries, Rhodes University
Trends in records and contribution of non-indigenous species (NIS) to biotic communities in Danish marine waters

The report investigates trends in the temporal and spatial changes of non-indigenous marine species in the Danish part of the OSPAR and HELCOM regions. The assessment is based on a quantitative analysis of data available in national monitoring databases and covers the period 1989 to 2014 and other documented records of non-indigenous marine species in the Danish waters.

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Monitoring and Data, Aarhus University, Andersen Aqua-consult
Authors: Stæhr, P. A. (Ekstern), Jakobsen, H. H. (Ekstern), Hansen, J. L. (Forskerdatabase), Andersen, P. (Ekstern), Storr-Paulsen, M. (Intern), Christensen, J. P. A. (Forskerdatabase), Lundsteen, S. (Ekstern), Göke, C. (Ekstern), Carausu, M. (Ekstern)
Number of pages: 48
Publication date: 2016

Publication information
Publisher: Aarhus University, DCE - Danish Centre for Environment and Energy
Volume: 179
Original language: English
Main Research Area: Technical/natural sciences
Non-indigenous Species, Danish Marine Waters, HELCOM, OSPAR, Baseline
Source: FindIt
Source-ID: 2291802071
Publication: Research - peer-review › Report – Annual report year: 2016

An integrated end-to-end modeling framework for testing ecosystem-wide effects of human-induced pressures in the Baltic Sea

We present an integrated end-to-end modeling framework that enables whole-of ecosystem climate, eutrophication, and spatial management scenario exploration in the Baltic Sea. The framework is built around the Baltic implementation of the spatially-explicit end-to-end ATLANTIS model, linked to the high-resolution coupled physical-biological model HBM-ERGOM and the fisheries bio-economic FishRent model. We investigate ecosystem-wide responses to changes in human-induced pressures by simulating several eutrophication scenarios that are relevant to existing Baltic Sea management plans (e.g. EU BSAP, EU CFP). We further present the structure and calibration of the Baltic ATLANTIS model and the operational linkage to the other models. Using the results of eutrophication scenarios, and focusing on the relative changes in fish and fishery production, we discuss the robustness of the model linking with respect to the underlying assumptions, strengths and weaknesses of individual models. Furthermore, we describe how to possibly expand the framework to account for spatial impacts and economic consequences, for instance by linking to the individual-vessel based DISPLACE modeling approach. We conclude that the proposed model integration and management scenario evaluation scheme lays the foundations for developing a robust framework for management strategy evaluation that is of strategic importance to stakeholders from around the Baltic Sea.

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Marine Ecology and Oceanography, Section for Ecosystem based Marine Management, Section for Marine Living Resources, Section for Monitoring and Data, Technical University of Denmark, Aarhus University, University of Southern Denmark, CSIRO Ocean and Atmospheres, University of Copenhagen
Authors: Palacz, A. (Intern), Nielsen, J. R. (Intern), Christensen, A. (Intern), Hoff, A. (Ekstern), Frost, H. (Ekstern), Gislason, H. (Intern), Maar, M. (Ekstern), Bastardie, F. (Intern), Geitner, K. (Intern), Hasler, B. (Ekstern), Ravn-Jonsen, L. (Ekstern), Hutniczak, B. (Forskerdatabase), Fulton, E. A. (Ekstern)
Number of pages: 2
Publication date: 2015
Event: Abstract from ICES Annual Science Conference 2015, Copenhagen, Denmark.
Main Research Area: Technical/natural sciences
Additional files:
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Bibliographical note
ICES CM 2015/M:12
Publication: Research › Conference abstract for conference – Annual report year: 2015
Diel effects on bottom-trawl survey catch rates of shallow- and deep-water Cape hakes, Merluccius capensis and M. paradoxus, off Namibia, using solar zenith angle

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Monitoring and Data, Section for Ecosystem based Marine Management
Authors: Kainge, P. I. (Intern), Wieland, K. (Intern), Feeings, J. P. (Intern)
Pages: 583-592
Publication date: 2015
Main Research Area: Technical/natural sciences

Publication information
Journal: African Journal of Marine Science
Volume: 37
Issue number: 4
ISSN (Print): 1814-232X
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 1.36 SJR 0.661 SNIP 0.8
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.696 SNIP 0.732 CiteScore 1.19
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.568 SNIP 0.879 CiteScore 1.15
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.71 SNIP 0.749 CiteScore 1.25
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.529 SNIP 0.488 CiteScore 1.04
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 0.608 SNIP 0.611 CiteScore 1.15
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.857 SNIP 0.611
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 1.091 SNIP 0.836
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 0.921 SNIP 0.62
Scopus rating (2007): SJR 0.578 SNIP 0.611
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 0.643 SNIP 0.746
Scopus rating (2005): SJR 0.778 SNIP 0.838
Scopus rating (2004): SJR 0.355 SNIP 0.358
Web of Science (2004): Indexed yes
Scopus rating (2003): SJR 0.903 SNIP 1.129
Scopus rating (2002): SJR 0.83 SNIP 1.212
Scopus rating (2001): SJR 1.02 SNIP 1.113
Scopus rating (2000): SJR 0.789 SNIP 0.855
Scopus rating (1999): SJR 0.561 SNIP 0.604
Discarding of cod in the Danish Fully Documented Fisheries trials

Denmark was the first nation in Europe to promote the use of Fully Documented Fisheries (FDF) through Remote Electronic Monitoring (REM) and CCTV camera systems, with pilot schemes in place since 2008. In theory, such a scheme could supplement and even potentially replace expensive control and monitoring programmes; and when associated with a catch quota management (CQM) system, incentivize positive changes in fishing patterns in a results-based management approach. New data flows are, however, required to ensure the practical implementation of such a scheme. This paper reviews the quality of the FDF data collected during 2008–2014 and their potential in strengthening information on cod discards. The analyses demonstrate the improved reporting of discards in logbooks and overall discard reductions, but they also show that some uncertainties around the absolute estimates of discard quantities have remained. Regular validation of weight estimation methods and close collaboration between scientific monitoring and control are important to support the use of reported discards as a reliable source of information. We discuss the potential of electronic monitoring in the context of the EU landing obligation.
Eastern Baltic cod in distress: biological changes and challenges for stock assessment

The eastern Baltic (EB) cod (Gadus morhua) stock was depleted and overexploited for decades until the mid-2000s, when fishing mortality rapidly declined and biomass started to increase, as shown by stock assessments. These positive developments were partly assigned to effective management measures, and the EB cod was considered one of the most successful stock recoveries in recent times. In contrast to this optimistic view, the analytical stock assessment failed in 2014, leaving the present stock status unclear. Deteriorated quality of some basic input data for stock assessment in combination with changes in environmental and ecological conditions has led to an unusual situation for cod in the Baltic Sea, which poses new challenges for stock assessment and management advice. A number of adverse developments such as low nutritional condition and disappearance of larger individuals indicate that the stock is in distress. In this study, we (i) summarize the knowledge of recent changes in cod biology and ecosystem conditions, (ii) describe the subsequent challenges for stock assessment, and (iii) highlight the key questions where answers are urgently needed to understand the present stock status and provide scientifically solid support for cod management in the Baltic Sea.
Eel, cod and seatrout harvest in Danish recreational fishing during 2012

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Monitoring and Data
Authors: Olesen, H. J. (Intern), Storr-Paulsen, M. (Intern)
Number of pages: 21
Publication date: 2015

Publication information
Publisher: Institut for Akvatiske Ressourcer, Danmarks Tekniske Universitet
Effect of spatial differences in growth on distribution of seasonally co-occurring herring Clupea harengus stocks

The mechanisms most likely to determine the distribution of the two major herring Clupea harengus stocks in their common early summer feeding ground in the eastern North Sea, Skagerrak and Kattegat were investigated through analysis of acoustic survey data from six consecutive years. No change was detected in biomass of North Sea autumn spawning C. harengus (NSAS) over time, whereas the biomass of western Baltic spring spawning C. harengus (WBSS) declined severely. Analyses of centre of abundance by stock showed no change in NSAS distribution, whereas the WBSS changed to a more western distribution over time. Contrary to previous perception of the juvenile migration, NSAS were found to leave the study area at the age between 1 and 2 years and WBSS 1 year olds were encountered in the Skagerrak. The estimated parameters of von Bertalanffy growth equations showed marked differences between areas with fish in the eastern part of the area having the lowest size at age at all ages. Further, their growth conditions appeared to deteriorate progressively over the period studied. Both NSAS and WBSS showed the highest condition in the North Sea and Skagerrak while condition was substantially lower in age Kattegat. The westward movement of spring spawners over time suggests that growth rate and possibly density of conspecifics influence the migration pattern and distribution of C. harengus in the area. In contrast, there was no evidence to suggest that distribution was constant over time within stocks or that distribution reflected size-dependent limitations on migration distance.
Effekter af blåmuslingefiskeri på bundfauna

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Ecosystem based Marine Management, Danish Shellfish Centre, Section for Monitoring and Data
Authors: Dinesen, G. E. (Intern), Canal-Vergés, P. (Intern), Nielsen, P. (Intern), Filrup, K. (Ekstern), Geitner, K. (Intern), Petersen, J. K. (Intern)
Number of pages: 31
Publication date: 2015

Publication information
Publisher: Institut for Akvatiske Ressourcer, Danmarks Tekniske Universitet
ISBN (Electronic): 978-87-7481-223-4
Original language: Danish
Empowering fishermen towards the landing obligations, with their own technical solutions

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Ecosystem based Marine Management, Section for Monitoring and Data
Authors: Mortensen, L. O. (Intern), Olesen, H. J. (Intern), Egekvist, J. (Intern), Rindorf, A. (Intern), Ulrich, C. (Intern)
Publication date: 2015
Event: Abstract from Conference of the European Association of Fisheries Economists, Salerno, Italy.
Main Research Area: Technical/natural sciences
Publication: Research › Report – Annual report year: 2016

Frivillig fangstregistrering til overvågning af kystnære fiskeforekomster

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Ecosystem based Marine Management, Section for Monitoring and Data
Authors: Støttrup, J. (Intern), Kristensen, L. D. (Intern), Degel, H. (Intern), Andersen, S. K. (Intern)
Publication date: 2015
Event: Abstract from 18. Danske Havforskermøde, Copenhagen, Denmark.
Main Research Area: Technical/natural sciences
Publication: Research › Conference abstract for conference – Annual report year: 2015

Fully documented fisheries - is remote electronic monitoring the future tool in fisheries control?

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Marine Living Resources, Section for Ecosystem based Marine Management, Section for Monitoring and Data, Ministry of Food, Agriculture and Fisheries
Authors: Schreiber Plet-Hansen, K. (Intern), Ulrich, C. (Intern), Olesen, H. J. (Intern), Mortensen, L. O. (Intern), Bergsson, H. (Ekstern)
Publication date: 2015
Event: Poster session presented at ICES Annual Science Conference 2015, Copenhagen, Denmark.
Main Research Area: Technical/natural sciences
Electronic versions:
Publishers version

Bibliographical note
ICES CM 2015/L:36
Publication: Research › Poster – Annual report year: 2015

Kan frit redskabsvalg hjælpe når discardforbudet kommer?

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Ecosystem based Marine Management, Section for Monitoring and Data, Public Sector Consultancy, Aalborg University
Publication date: 2015
Event: Poster session presented at Internationale fiskerimesse, Aalborg, Denmark.
Main Research Area: Technical/natural sciences
Konsekvensvurdering af fiskeri efter blåmuslinger i Lillebælt 2015

General information
State: Published
Organisations: National Institute of Aquatic Resources, Danish Shellfish Centre, Section for Monitoring and Data
Authors: Nielsen, P. (Intern), Nielsen, C. F. (Intern), Geitner, K. (Intern), Petersen, J. K. (Intern)
Number of pages: 48
Publication date: 2015

Publication information
Publisher: Institut for Akvatiske Ressourcer, Danmarks Tekniske Universitet
ISBN (Electronic): 978-87-7481-203-6
Original language: Danish
Series: DTU Aqua-rapport
Number: 292-2015
ISSN: 1395-8216
Main Research Area: Technical/natural sciences
Electronic versions:

Konsekvensvurdering af fiskeri efter østers i Nissum Bredning 2015/2016

General information
State: Published
Organisations: National Institute of Aquatic Resources, Danish Shellfish Centre, Section for Monitoring and Data
Authors: Nielsen, P. (Intern), Canal-Vergés, P. (Intern), Nielsen, C. F. (Intern), Geitner, K. (Intern), Petersen, J. K. (Intern)
Number of pages: 46
Publication date: 2015

Publication information
Publisher: Institut for Akvatiske Ressourcer, Danmarks Tekniske Universitet
Original language: English
Series: DTU Aqua-rapport
Number: 303-2015
ISSN: 1395-8216
Main Research Area: Technical/natural sciences
Electronic versions:

MINIDISC - Minimering af discards i danske fiskerier

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Ecosystem based Marine Management, Section for Monitoring and Data, Public Sector Consultancy
Number of pages: 89
Publication date: 2015

Publication information
Publisher: DTU Aqua. Institut for Akvatiske Ressourcer
Original language: English
Main Research Area: Technical/natural sciences
Publication: Research › Report – Annual report year: 2016
MSC certification of plaice fisheries in area IIIa: Basic investigations and development of a management plan

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Marine Living Resources, Section for Ecosystem based Marine Management, Section for Monitoring and Data, Section for Marine Ecology and Oceanography
Authors: Hansen, J. H. (Intern), Ulrich, C. (Intern), Boje, J. (Intern), Christensen, A. (Intern), Degel, H. (Intern), Hüssy, K. (Intern), Worsøe Clausen, L. (Intern)
Number of pages: 52
Publication date: 2015

Publication information
Place of publication: Charlottenlund
Publisher: DTU aqua. National Institute of Aquatic Resources
ISBN (Electronic): 978-87-7481-216-6
Original language: English
Series: DTU Aqua Report
Number: 302-2015
ISSN: 1395-8216
Main Research Area: Technical/natural sciences
Electronic versions:
Publishers_version

Multidisciplinary mapping of fish habitats in the Sound, Denmark for maritime spatial planning

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Ecosystem based Marine Management, Section for Monitoring and Data, Natural History Museum of Denmark
Number of pages: 2
Publication date: 2015
Event: Abstract from ICES Annual Science Conference 2015, Copenhagen, Denmark.
Main Research Area: Technical/natural sciences
Electronic versions:
Publishers_version

Bibliographical note
ICES CM 2015/O:02

Relations
Press / Media items:
Tilstandsrapport fra havbunden
Publication: Research › Conference abstract for conference – Annual report year: 2015

Muslingeproduktion i danske fjorde – uudnyttet potentiale eller problemfyldt farvand?

General information
State: Published
Organisations: National Institute of Aquatic Resources, Danish Shellfish Centre, Section for Monitoring and Data
Authors: Nielsen, P. (Intern), Geitner, K. (Intern), Funk, E. S. (Intern), Petersen, J. K. (Intern)
Publication date: 2015
Event: Abstract from 18. Danske Havforskermøde, Copenhagen, Denmark.
Main Research Area: Technical/natural sciences
Publication: Research › Conference abstract for conference – Annual report year: 2015

Muslingeproduktion i Vejle Fjord - muligheder og begrænsninger

General information
Oxygen-depleted bottom waters along the west coast of South Africa, 1950-2011

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Monitoring and Data, University of Cape Town, Department of Environmental Affairs Oceans & Coasts
Authors: Jarre, A. (Ekstern), Hutchings, L. (Ekstern), Chrichton, M. (Ekstern), Wieland, K. (Intern), Lamont, T. (Ekstern), Blamey, L. (Ekstern), Illert, C. (Ekstern), Hill, E. (Ekstern), van den Berg, M. (Ekstern)
Pages: 56-73
Publication date: 2015
Main Research Area: Technical/natural sciences

Publication information
Journal: Fisheries Oceanography
Volume: 24
Issue number: Suppl. 1
ISSN (Print): 1054-6006
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 2.19
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): CiteScore 2.4
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): CiteScore 2.61
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): CiteScore 2.61
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): CiteScore 2.21
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): CiteScore 2.42
Pilot project for the preparation of MSC certification of the gillnet fishery in the Baltic Sea

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Monitoring and Data, Section for Ecosystem based Marine Management, Danish Fishermen's Producers' Organization
Authors: Olesen, H. J. (Intern), Larsen, F. (Intern), Kindt-Larsen, L. (Intern), Jacobsen, J. B. (Ekstern)
Number of pages: 26
Publication date: 2015


General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Monitoring and Data, Department for Agriculture, Forestry and Fisheries
Authors: Wieland, K. (Intern), Durholtz, M. D. (Ekstern), Fairweather, T. P. (Ekstern), Glazer, J. (Ekstern), Leslie, R. W. (Ekstern)
Number of pages: 20
Publication date: 2015
Main Research Area: Technical/natural sciences
Source-ID: 119056179
Publication: Research › Paper – Annual report year: 2015

Relaxing technical regulations under the Landings Obligation – effects on the discard ratio
The landings obligation (LO), currently being implemented in the new CFP, puts major constraints on fishers, by making the landing of unwanted catch mandatory. Less restrictive technical rules (TR) in a results-based management frame have been suggested as a mechanism to release some of these constraints. To investigate the effects of the existing TR, some fishers were relaxed from TR during the trial and could freely choose and develop alternative gears, aiming to optimize annual catch value, while reducing discards. The study included 14 demersal fishing vessels, operating in the North Sea, Skagerrak and the Baltic Sea. Fishers used test and control gears interchangeably or in pairs and were required to sort
and weight all discard of seven common target species on a haul by haul basis. All vessels were equipped for Fully Documented Fisheries, including cameras. Collected data were analyzed to investigate differences in landings, discards, discard ratio, CPUE, VPUE and DPUE, between conventional (control) and new gears (test). The results showed a varying degree of success, depending both on area and on choices made by the individual fisher. The best results were observed in the Baltic Sea, where relaxing technical rules led to major improvements in fishing patterns. But gear changes did not contribute much in fisheries where initial discards rates were already low.

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Ecosystem based Marine Management, Section for Monitoring and Data, Aalborg University
Number of pages: 2
Publication date: 2015
Event: Abstract from ICES Annual Science Conference 2015, Copenhagen, Denmark.
Main Research Area: Technical/natural sciences
Electronic versions:
Publishers_version

Bibliographical note
ICES C.M. 2015/L:16
Publication: Research › Conference abstract for conference – Annual report year: 2015

Spawning patterns of shallow-water hake (Merluccius capensis) and deep-water hake (M. paradoxus) in the Benguela Current Large Marine Ecosystem inferred from gonadosomatic indices
We use gonad- and body-weight data from 54,000 samples of Merluccius capensis and Merluccius paradoxus collected in all months of the years between 1991 and 2013 to infer peak spawning periods and areas in the Benguela Current Large Marine Ecosystem. We develop and apply a new gonadosomatic index threshold for identification of spawning individuals. Spawning M. capensis were observed throughout the study area, mainly in areas of about 100. m bottom depth. The highest proportions of spawning M. capensis females in the northern Benguela region were observed off central Namibia between 24.0 and 26.0°S. In the southern Benguela, peaks in the proportions of spawning M. capensis were observed in two areas off the South African West Coast (31.0-32.5°S and 34.5-36.0°S), whereas spawning females off the South African South Coast (east of 20°E) appeared to be more evenly distributed in space. Seasonality differed between areas. In the northern Benguela, the main spawning season of M. capensis appeared to be the austral winter (July-September, peaking in August), while off the South African South Coast, the main spawning season is suggested to be in summer (around January). Between these two extremes, on the western Agulhas bank in the southern Benguela, spawning peaks were observed in both summer and winter. These peaks largely coincided with peaks in phytoplankton production that are linked to upwelling conditions in the region. Hake condition decreased subsequent to the development of the gonads. The annual spawning cycle differed between small and large M. capensis. The current October-closure of the fishery in Namibia may not match the peak spawning in August/September and may need to be shifted to earlier in the year. Spawning M. paradoxus were mainly found in areas of 200-650. m bottom depths. In the northern Benguela, spawning M. paradoxus were observed as far north as 25°S in August. The proportion of spawning females peaked between 34.5°S and 36.5°S off the West Coast, and between 23.0°E and 26.5 °E off the South Coast. It was suggested that M. paradoxus spawn throughout the year off the South African coast, with increased intensity around March and August-October. The finding of multiple spawning seasons and areas of both M. capensis and M. paradoxus strongly suggest multiple stocks (reproductive units).

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Marine Living Resources, Section for Monitoring and Data, Department for Agriculture, Forestry and Fisheries, Benguela Current Commission, Institute of Marine Research, Ministry of Fisheries and Marine Resources
Authors: Jansen, T. (Intern), Kainge, P. I. (Intern), Singh, L. (Ekstern), Wilhelm, M. (Ekstern), Durholtz, D. (Ekstern), Strømme, T. (Ekstern), Kathena, J. (Ekstern), Erasmus, V. (Ekstern)
Pages: 168-180
Publication date: 2015
Main Research Area: Technical/natural sciences

Publication information
Journal: Fisheries Research
Volume: 172
ISSN (Print): 0165-7836
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.21 SJR 1.12 SNIP 1.136
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 1.067 SNIP 1.133 CiteScore 2.01
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.105 SNIP 1.312 CiteScore 2.17
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 1.037 SNIP 1.173 CiteScore 1.85
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.93 SNIP 1.177 CiteScore 1.78
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 1.154 SNIP 1.135 CiteScore 1.7
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 1.041 SNIP 1.1
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 0.985 SNIP 1.065
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 2
Scopus rating (2008): SJR 0.938 SNIP 1.142
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 1.022 SNIP 1.075
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 1.025 SNIP 1.274
Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 0.906 SNIP 1.134
Web of Science (2005): Indexed yes
Scopus rating (2004): SJR 0.944 SNIP 1.023
Web of Science (2004): Indexed yes
Scopus rating (2003): SJR 1.076 SNIP 1.314
Web of Science (2003): Indexed yes
Scopus rating (2002): SJR 1.299 SNIP 1.22
Web of Science (2002): Indexed yes
Scopus rating (2001): SJR 0.934 SNIP 0.891
Web of Science (2001): Indexed yes
Scopus rating (2000): SJR 0.611 SNIP 0.836
Web of Science (2000): Indexed yes
Scopus rating (1999): SJR 0.546 SNIP 0.865
Original language: English
DOIs:
10.1016/j.fishres.2015.07.009
The Baltic ATLANTIS model: Implementing a holistic framework to evaluate ecosystem wide responses to changes in climate and anthropogenic forcing

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Marine Ecology and Oceanography, Section for Ecosystem based Marine Management, Section for Marine Living Resources, Section for Monitoring and Data, Centre for Ocean Life, Aarhus University
Authors: Palacz, A. (Intern), Nielsen, J. R. (Intern), Christensen, A. (Intern), Gislason, H. (Intern), Bastardie, F. (Intern), Geitner, K. (Intern), Maar, M. (Ekstern), Lindegren, M. (Intern), Hufnagl, M. (Intern), Fulton, E. (Ekstern)
Number of pages: 1
Publication date: 2015
Event: Poster session presented at 18. Danske Havforskermøde, Copenhagen, Denmark.
Main Research Area: Technical/natural sciences
Links: http://www.marine-vectors.eu/Core_pages/The_Baltic_ATLANTIS_model_a_holistic_framework_to

Anvendelse af blackboks data i forbindelse med konsekvensvurderinger af fiskeri på skaldyr i Natura 2000-områder

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Monitoring and Data
Authors: Geitner, K. (Intern)
Publication date: 2014
Event: Abstract from ESRI brugerkonference 2014, Copenhagen, Denmark.
Main Research Area: Technical/natural sciences
Publication: Research › Conference abstract for conference – Annual report year: 2014

DTU Aqua søger fiskere til discardprojekt

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Ecosystem based Marine Management, Section for Monitoring and Data, Public Sector Consultancy
Authors: Ulrich, C. (Intern), Olesen, H. J. (Intern), Dalskov, J. (Intern)
Pages: 12
Publication date: 2014

Publication information
Pages (from-to): 12
Newspaper: Fiskeritidende
Volume: 21
No.: 14
Ratings:
ISI indexed (2013): ISI indexed no
ISI indexed (2012): ISI indexed no
ISI indexed (2011): ISI indexed no
Main Research Area: Technical/natural sciences
Publication: Communication › Newspaper article – Annual report year: 2014

DTU og fiskere samarbejder om optimering af fangstmuligheder

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Ecosystem based Marine Management, Section for Monitoring and Data, Public Sector Consultancy
Authors: Ulrich, C. (Intern), Olesen, H. J. (Intern), Dalskov, J. (Intern)
Examining the interactions of growth, climate and recruitment of boarfish (Capros aper) for a better understanding of the recent population expansion

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Monitoring and Data, Section for Marine Ecology and Oceanography
Authors: Davies, J. O. (Intern), Hüssy, K. (Intern)
Publication date: 2014
Event: Abstract from 5th International Otolith Symposium, Mallorca, Spain.
Main Research Area: Technical/natural sciences
Electronic versions:
Examining_the_interactions_of_growth_climate_and_recruitment_of_boarfish_Capros_aper_for_a_better_understanding_of_the_recent_population_expansion.pdf
Publishers version
Links:

Relations
Activities:
Examining the interactions of growth, climate and recruitment of boarfish (Capros aper) for a better understanding of the recent population expansion
Publication: Research › Conference abstract for conference – Annual report year: 2014

Fiskeriforvaltning i Natura 2000 områder

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Monitoring and Data, Section for Marine Ecology and Oceanography
Number of pages: 152
Publication date: 2014

Publication information
Original language: Danish
Main Research Area: Technical/natural sciences
Publication: Commissioned › Report – Annual report year: 2014

Havforskningsskibet Dana er netop vendt hjem fra Østersøen

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Monitoring and Data, Section for Marine Ecology and Oceanography
Konsekvensvurdering af fiskeri på blåmuslinger i Lillebælt 2014

General information
State: Published
Organisations: National Institute of Aquatic Resources, Danish Shellfish Centre, Section for Monitoring and Data, Section for Ecosystem based Marine Management
Authors: Nielsen, P. (Intern), Geitner, K. (Intern), Christoffersen, M. (Intern), Petersen, J. K. (Intern)
Number of pages: 51
Publication date: 2014

Publication information
Publisher: Institut for Akvatiske Ressourcer, Danmarks Tekniske Universitet
ISBN (Electronic): 978-87-7481-188-6
Original language: Danish
Series: DTU Aqua-rapport
Number: 282-2014
ISSN: 1395-8216
Main Research Area: Technical/natural sciences
Electronic versions:
Publishers version
Links:
http://www.aqua.dtu.dk/Publikationer/Forskningsrapporter/Forskningsrapporter_siden_2008
Publication: Commissioned › Report – Annual report year: 2014

Konsekvensvurdering af fiskeri på blåmuslinger og søstjerner i Løgstør Bredning 2014/2015

General information
State: Published
Organisations: National Institute of Aquatic Resources, Danish Shellfish Centre, Section for Monitoring and Data, Danish Shellfish Centre
Authors: Nielsen, P. (Intern), Canal-Vergés, P. (Intern), Geitner, K. (Intern), Christoffersen, M. (Intern), Petersen, J. K. (Intern)
Number of pages: 66
Publication date: 2014

Publication information
Publisher: Danmarks Tekniske Universitet, Institut for Akvatiske Ressourcer - Dansk Skaldyrcenter
ISBN (Electronic): 978-87-7481-193-0
Original language: Danish
Applicant: NaturErhvervstyrelsen
Series: DTU Aqua-rapport
Number: 285-2014
ISSN: 1395-8216
Main Research Area: Technical/natural sciences
Electronic versions:
Publishers version
Recent decline of northern shrimp stocks in the Northwest Atlantic – Coincidence, multiple causes or response to synchronous changes in the environment?

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Monitoring and Data, Greenland Institute of Natural Resources, Instituto Español de Oceanografía, Fisheries and Oceans Canada
Authors: Wieland, K. (Intern), Siegstad, H. (Ekstern), Casas Sanchez, J. (Ekstern), Orr, D. (Ekstern)
Pages: 17-20
Publication date: 2014
Main Research Area: Technical/natural sciences

Publication information
Journal: IMBER Update
Issue number: 26
Original language: English
Links:
http://www.imber.info/index.php/News/Newsletters/Issue-n-26-May-2014#toc_3_7
Publication: Research › Journal article – Annual report year: 2014

Registrering af fangster i de danske kystområder med standardredskaber: Nøglefiskerrapport 2011-2013

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Coastal Ecology, Section for Ecosystem based Marine Management, Section for Monitoring and Data
Authors: Kristensen, L. (Intern), Støttrup, J. (Intern), Andersen, S. K. (Intern), Degel, H. (Intern)
Number of pages: 100
Publication date: 2014

Publication information
Place of publication: Charlottenlund
Publisher: DTU Aqua. Institut for Akvatiske Ressourcer
ISBN (Print): 978-87-7481-197-8
ISBN (Electronic): 978-87-7481-196-1
Original language: Danish
Series: DTU Aqua-rapport
Number: 286-2014
ISSN: 1395-8216
Main Research Area: Technical/natural sciences
Electronic versions:
Publishers version
Links:
http://www.aqua.dtu.dk/Publikationer/Forskningsrapporter/Forskningsrapporter_siden_2008
Publication: Research › Report – Annual report year: 2014

Report of the Sprat Exchange 2014 For the North Sea and Celtic Sea

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Monitoring and Data, Section for Marine Ecology and Oceanography, Section for Marine Living Resources
Authors: Davies, J. O. (Intern), Hüsey, K. (Intern), Worsøe Clausen, L. (Intern)
Number of pages: 33
The Baltic ATLANTIS model: Implementing a holistic framework to evaluate ecosystem wide responses to changes in climate and anthropogenic forcing

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Marine Ecology and Oceanography, Section for Ecosystem based Marine Management, Section for Marine Living Resources, Section for Monitoring and Data, Centre for Ocean Life, Aarhus University
Authors: Palacz, A. (Intern), Nielsen, J. R. (Intern), Christensen, A. (Intern), Gislason, H. (Intern), Bastardie, F. (Intern), Geitner, K. (Intern), Maar, M. (Ekstern), Lindegren, M. (Intern), Hufnagl, M. (Intern), Fulton, E. (Ekstern)
Number of pages: 1
Publication date: 2014
Event: Poster session presented at EU-FP7-VECTORS Symposium, La Grande Motte, France.
Main Research Area: Technical/natural sciences
Publication: Research › Poster – Annual report year: 2014

The recent population expansion of boarfish, Capros aper (Linnaeus, 1758): Interactions of climate, growth and recruitment

The objectives of this study were to evaluate whether temperature changes in the Northeast Atlantic influence the growth and recruitment dynamics of boarfish, Capros aper. Two geographically separate areas were examined, 'north' at the northern distribution range west of Ireland and 'south' on the main fishing grounds south of Ireland. No significant differences in length-at-age were observed between the two areas. Interannual otolith growth patterns were similar between the two areas with distinct years of faster and slower growth. In the 'north', no significant relationship between adult growth and temperature was observed, while growth in the 'south' was positively related to temperature up to approximately 16°C growth rates were suppressed in the years with temperatures above that. Recruitment showed a positive correlation with adult growth the previous year for the Spanish recruitment index only, suggesting spatial connectivity between the Celtic Sea and the Bay of Biscay. The age distributions were similar in both areas and despite the boarfish's longevity of >30 years, are dominated by the age classes corresponding to the years with high recruitment, suggesting that increased recruitment is responsible for the observed stock expansion

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Monitoring and Data, Section for Marine Ecology and Oceanography, Marine Institute
Authors: Coad, J. O. (Intern), Hüussy, K. (Intern), Farrell, E. (Ekstern), Clarke, M. (Ekstern)
Pages: 463-471
Publication date: 2014
Main Research Area: Technical/natural sciences

Publication information
Journal: Journal of Applied Ichthyology
Volume: 30
Issue number: 3
ISSN (Print): 0175-8659
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 0.94
Web of Science (2016): Indexed yes
Where have all the coast fish gone?

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Ecosystem based Marine Management, Section for Marine Ecology and Oceanography, Centre for Ocean Life, Section for Monitoring and Data
Authors: Støttrup, J. (Intern), Munk, P. (Intern), Lund, S. (Ekstern), Kindt-Larsen, L. (Intern), Dutz, J. (Intern), Egekvist, J. (Intern)
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Anvendelse af GIS i forbindelse med konsekvensvurderinger af fiskeri på skaldyr i Natura 2000-områder i Danmark

General information
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Organisations: National Institute of Aquatic Resources, Section for Monitoring and Data, Danish Shellfish Centre, Section for Ecosystem based Marine Management
Authors: Geitner, K. (Intern), Christensen, H. T. (Intern), Christoffersen, M. O. (Intern), Dolmer, P. (Intern)
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Publication: Research › Conference abstract for conference – Annual report year: 2013

Behind the shine: An appraisal of five years of Danish CCTV trials
Denmark has been the first nation in Europe to promote the use of Fully Documented Fisheries (FDF) through Remote Electronic Monitoring (REM) and CCTV camera systems, and some pilot schemes for monitoring cod catches have been in place since 2008. In theory, such a scheme could supplement and even potentially replace expensive control and monitoring programs; and, when associated to a Catch Quota management system, incentivize positive changes in fishing
patterns in a results-based management approach. However, in practice, the technical and institutional challenges remain important hurdles to overcome for the system to be beneficial and reliable. In this paper we investigate the added value on catch information gained over the last five years, and discuss the future of REM as a monitoring program in the context of the future discards ban.
Evaluating the effect of fishery closures: lessons learnt from the Plaice Box

To reduce discarding of plaice Pleuronectes platessa in the North Sea flatfish fisheries, the major nursery areas were closed to large trawlers in 1995. The area closed was named the ‘Plaice Box’ (PB) and beam trawl effort fell by over 90%, while the exemption fleets of small flatfish beam trawlers, gill netters targeting sole (Solea solea) and shrimp (Crangon crangon) trawlers increased their effort. Contrary to the expectation, plaice landings and biomass declined. The initial support for the PB from the fisheries was lost, whereas other stakeholder groups claimed that any failure was due to the fact that fishing had never been completely prohibited in the area. To evaluate whether the PB has been an effective management measure, the changes in the ecosystem (plaice, demersal fish, benthos) and fisheries are analysed to test whether the observed changes are due to the PB or to changes in the environment unrelated to the PB. Juvenile growth rate of plaice decreased and juveniles moved to deeper waters outside the PB. Demersal fish biomass decreased, whereas the abundance of epibenthic predators (Asterias rubens and Cancer pagurus) increased in the PB. Endobenthos, in particular the main food items of plaice (polychaetes and small bivalves) remained stable or decreased both inside and outside the PB. Currently catches of both plaice and sole from within the PB are lower than in the late 1980s and the exemption fleet often prefers to fish outside the Plaice Box alongside much larger competitors. It is concluded that the observed changes are most likely related to changes in the North Sea ecosystem, which may be related to changes in eutrophication and temperature. It is less likely that they are related to the change in fishing. This case study highlights the importance setting testable objectives and an appropriate evaluation framework including both ecological and socio-economic indicators when implementing closed areas.

Key words: Marine Protected Area, MPA, spatial management, fisheries management, discards, climate change, trawling impact, North Sea, benthos, ecosystem change, stakeholder perception
Fiskeriets påvirkning af naturtypen ’Rev’ (1170) i Natura 2000 området i Lillebælt

**General information**

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- **Organisations:** National Institute of Aquatic Resources, Section for Ecosystem based Marine Management, Section for Monitoring and Data, Research Secretariat, Danish Shellfish Centre
- **Authors:** Christoffersen, M. O. (Intern), Dinesen, G. E. (Intern), Geitner, K. (Intern), Stenberg, C. (Intern), Lisbjerg, D. (Intern), Dolmer, P. (Intern)
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Konsekvensvurdering af fiskeri på blåmuslinger i Lillebælt 2013

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Nephrops area definitions in the Skagerrak and Kattegat (FU 3-4)

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Organisations: National Institute of Aquatic Resources, Section for Monitoring and Data, Section for Ecosystem based Marine Management
Authors: Feekings, J. P. (Intern), Jonsson, P. (Ekstern), Wieland, K. (Intern), Ulmestrand, M. (Ekstern), Lövgren, J. (Ekstern)
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Organisations: National Institute of Aquatic Resources, Section for Monitoring and Data, Section for Ecosystem based Marine Management
Authors: Wieland, K. (Intern), Ulmestrand, M. (Ekstern), Feekings, J. P. (Intern), Koppetsch , S. (Ekstern)
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Nephrops UWTV surveys in the Skagerrak and Kattegat
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Rapport om konsekvenser for fiskeriet ved udpegning af lukkede områder i Kattegat til beskyttelse af den bløde bund

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Organisations: National Institute of Aquatic Resources, Section for Ecosystem based Marine Management, Section for Monitoring and Data, Public Sector Consultancy
Authors: Vinther, M. (Intern), Frandsen, R. (Intern), Sørensen, T. K. (Intern), Eero, M. (Intern), Storr-Paulsen, M. (Intern), Dalskov, J. (Intern)
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Use of GIS for evaluation of spatially managed areas

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Stock assessment in the BCC region

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Publication date: 2012
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Introducing state-space stock assessment (SAM), split species issues and spatial modelling

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Changes of cod abundance in the north-eastern central North Sea based on surveys with commercial fishing vessels in 2006 to 2009

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Changes in recruitment, growth, and stock size of northern shrimp (Pandalus borealis) at West Greenland: temperature and density-dependent effects at released predation pressure

Stock size of northern shrimp (Pandalus borealis) in West Greenland waters has been fairly stable from the late 1980s to the mid-1990s. Thereafter, survey estimates of biomass increased substantially, and the exploitation rate declined slightly in the most recent years. The present analysis was carried out on a spatially disaggregated basis in order to account for the latitudinal differences in bottom temperature and shrimp density. Changes in recruitment and, with a lag of 2 years, in stock biomass were most pronounced in the northern part of its distributional range, while bottom temperature increased in all survey regions since the mid-1990s. Length-at-age was positively correlated with temperature in general, but a trend towards slower growth was observed in areas with the highest stock densities in the most recent years. It is concluded that the moderate increase in temperature above a lower threshold of the optimal range in the northern regions has extended the distributional area that is most favourable for northern shrimp. This, together with a decreasing rate of exploitation and a continuous low predation pressure, resulted in an increase of the stock to a level at which density-dependent effects have become prominent in parts of study area. (c) 2005 International Council for the Exploration of the Sea. Published by Elsevier Ltd. All rights reserved.

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