
Achieving good environmental status in the Baltic Sea region requires decision support tools which are based on scientific knowledge across multiple disciplines. Such tools should integrate the complexity of the ecosystem and enable exploration of different natural and anthropogenic pressures such as climate change, eutrophication and fishing pressures in order to compare alternative management strategies. We present a new framework, with a Baltic implementation of the spatially-explicit end-to-end Atlantis ecosystem model linked to two external models, to explore the different pressures on the marine ecosystem. The HBM-ERGOM initializes the Atlantis model with high-resolution physical-chemical-biological and hydrodynamic information while the FISHRENT model analyses the fisheries economics of the output of commercial fish biomass for the Atlantis terminal projection year. The Baltic Atlantis model composes 29 subareas, 9 vertical layers and 30 biological functional groups. The balanced calibration provides realistic levels of biomass for, among others, known stock sizes of top predators and of key fish species. Furthermore, it gives realistic levels of phytoplankton biomass and shows reasonable diet compositions and geographical distribution patterns for the functional groups. By simulating several scenarios of nutrient load reductions on the ecosystem and testing sensitivity to different fishing pressures, we show that the model is sensitive to those changes and capable of evaluating the impacts on different trophic levels, fish stocks, and fisheries associated with changed benthic oxygen conditions. We conclude that the Baltic Atlantis forms an initial basis for strategic management evaluation suited for conducting medium to long term ecosystem assessments which are of importance for a number of pan-Baltic stakeholders in relation to anthropogenic pressures such as eutrophication, climate change and fishing pressure, as well as changed biological interactions between functional groups.
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

General information
State: Published

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

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

General information
State: Published
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: 120
Publication date: 2017

Fouragerings-strategi hos ådselædende slimål i Kattegat

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Ecosystem based Marine Management, Arctic Section
Publication date: 2017
Peer-reviewed: No
Event: Poster session presented at Dansk Havforskmøde, Helsingør, Denmark.
Research output: Research › Poster – Annual report year: 2017

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

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Ecosystem based Marine Management, Section for Monitoring and Data
Contributors: Gislason, H., Dinesen, G. E., Bastardie, F., Egekvist, J., Eigaard, O. R.
Publication date: 2017
Peer-reviewed: No
Event: Abstract from Dansk Havforskmøde, Helsingør, Denmark.
Source: PublicationPreSubmission
Source-ID: 128598616
Research output: Research › Conference abstract for conference – Annual report year: 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
State: Published
Organisations: National Institute of Aquatic Resources, Section for Ecosystem based Marine Management, Section for Monitoring and Data
Contributors: Gislason, H., Bastardie, F., Dinesen, G. E., Egekvist, J., Eigaard, O. R.
Pages: 260-270
Publication date: 2017
Peer-reviewed: Yes

Publication information
Journal: Ecological Indicators
Volume: 82
ISSN (Print): 1470-160X
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Scopus rating (2017): CiteScore 4.42 SJR 1.406 SNIP 1.643
Web of Science (2017): Impact factor 3.983
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 4.07 SJR 1.35 SNIP 1.784
Web of Science (2016): Impact factor 3.898
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): CiteScore 3.99 SJR 1.478 SNIP 1.727
BFI (2014): BFI-level 2
Scopus rating (2014): CiteScore 3.76 SJR 1.464 SNIP 1.974
Web of Science (2014): Impact factor 3.444
BFI (2013): BFI-level 1
Scopus rating (2013): CiteScore 3.63 SJR 1.347 SNIP 1.825
Web of Science (2013): Impact factor 3.23
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): CiteScore 3.42 SJR 1.252 SNIP 1.845
Web of Science (2012): Impact factor 2.89
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
Scavenging strategies of hagfish in the Kattegat

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Ecosystem based Marine Management, Arctic Section
Publication date: 2017
Peer-reviewed: No
Event: Poster session presented at Dansk Havforsknemøde, Helsingør, Denmark.
Research output: Research › Poster – Annual report year: 2017

Unplanned ecological engineering
Fisheries can double the production of protein and revenue by abandoning current single-species management. This provocative prediction is the implication of the work in PNAS by Szuwalski et al. (1). Using the East China Sea as a case, they show how an indiscriminate fishery can support unexpectedly large catches by removing predators from the ecosystem. Such ecosystem engineering stands in stark contrast to reigning management paradigms that do not allow fishing down predators to increase the productivity of their prey.

The theoretical support for such a feat of ecosystem engineering is well developed (2, 3). Trusting the Chinese catch statistics, Szuwalski et al. (1) provide empirical evidence that theory may be turned into practice. But their work is more than “just another fisheries paper;” it underscores highly controversial issues about the unavoidable trade-offs in managing fisheries and ecosystems. If we narrowly consider food security, maximizing fisheries catch from the ecosystem is a “no-brainer,” but from a conservation point of view, the loss of biodiversity in the East China Sea may seem like Aquacalypse come true (4). Can we really double fisheries’ production by turning the oceans into mega-scale mariculture operations? Is it what we want?

General information
State: Published
Organisations: National Institute of Aquatic Resources, Centre for Ocean Life, Section for Ecosystem based Marine Management
Assumptions behind size-based ecosystem models are realistic: Comment

A recent publication about balanced harvesting (Froese et al., ICES Journal of Marine Science; doi:10.1093/icesjms/fsv122) contains several erroneous statements about size-spectrum models. We refute the statements by showing that the assumptions pertaining to size-spectrum models discussed by Froese et al. are realistic and consistent. We further show that the assumption about density-dependence being described by a stock recruitment relationship is responsible for determining whether a peak in the cohort biomass of a population occurs late or early in life. Finally, we argue that there is indeed a constructive role for a wide suite of ecosystem models to evaluate fishing strategies in an ecosystem context.

General information
State: Published
Organisations: National Institute of Aquatic Resources, Centre for Ocean Life, Section for Ecosystem based Marine Management, University of Tasmania, Commonwealth Scientific and Industrial Research Organisation, Wageningen IMARES
Pages: 1651-1655
Publication date: 2016
Peer-reviewed: Yes

Publication information
Journal: ICES Journal of Marine Science
Volume: 73
Issue number: 6
ISSN (Print): 1054-3139
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Scopus rating (2017): CiteScore 2.98
Web of Science (2017): Impact factor 2.906
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.63
Web of Science (2016): Impact factor 2.76
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): CiteScore 2.18
Differences in density-dependence drive dual offspring size strategies in fish

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Ecosystem based Marine Management, Centre for Ocean Life
Contributors: Olsson, K. H., Gislason, H., Andersen, K. H.
Pages: 118-127
Publication date: 2016
Peer-reviewed: Yes

Publication information
Journal: Journal of Theoretical Biology
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
Contributors: Petersen, J. K., Gislason, H., Fitridge, I., Saurel, C., Degel, H., Nielsen, C. F.
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
(DTU Aqua-rapport; No. 308-2016).
Electronic versions:
Publishers version
Research output: Research - Report – Annual report year: 2016

Methods for the study of marine biodiversity

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Ecosystem based Marine Management
Pages: 129-163
Publication date: 2016

Host publication information
Title of host publication: The GEO Handbook on Biodiversity Observation Networks
Publisher: Springer
Editors: Walters, M., Scholes, R.
ISBN (Print): 978-3-319-27286-3
Electronic versions:
Postprint
DOIs:
10.1007/978-3-319-27288-7_6
Research output: Research - peer-review › Book chapter – Annual report year: 2016

Species interactions in the western Baltic Sea: With focus on the ecological role of whiting
The food web of the upper trophic levels in marine ecosystems is often complex, encompassing multiple biological interactions. One species may serve as prey, predator and competitor at the same time, and the interactions are likely to change with the ontogenetic development from juvenile to adult. Disentangling food web dynamics is important for both ecologists and conservationists involved with management. Multispecies assessment models and ecosystem-based trophic models are becoming increasingly used as tools to investigate and assess biological interactions and predation impacts of key species in the food web. Furthermore, the models can be used to evaluate effects of anthropogenic activities such as fishing, eutrophication and pollution from land-based activities and shipping. Despite the growing awareness of the strength of these models to describe food web dynamics and ecosystem functioning, implementation of the models in
strategic management advice for commercially important fish stocks and protected marine mammals is not common practice. This is due to the lack of sufficient information about species interactions including knowledge about the diet, food intake and growth dynamics. This thesis investigates the ecological role of whiting in the western Baltic Sea. The ecosystem is more brackish than for example the North Sea and the species diversity of the upper trophic levels is lower and the food web simpler. The main piscivorous fish species are whiting and cod, while herring and sprat are the predominant forage fishes. The growth dynamics and feeding ecology of whiting in the western Baltic Sea has not previously been investigated, despite the fact that it is an important species both in the commercial fishery and in the food web of the North Sea. Due to differences in hydrography, species diversity and fishing pressure, the ecological role of whiting in the Baltic Sea is likely to differ considerably from that of its conspecific in the North Sea. The western Baltic Sea also provides a habitat for protected marine mammals, including the harbour porpoise, the grey seal and the harbour seal, which potentially prey on and compete for food with whiting. Here, the growth dynamics and feeding ecology of whiting in the western Baltic Sea is investigated and discussed in an ecosystem context. Furthermore, the diet of the harbour porpoise is examined and the interactions between whiting, cod and porpoises are discussed. Describing the fish population dynamics and biological interactions of the main species at the higher tropic levels in the western Baltic Sea is an important step towards a broader regional understanding of the ecosystem dynamics. The information can be used to inform single species and multispecies assessment models for fish and ecosystem-based trophic models, and, thus, potentially improve management advice for fish stocks and protected marine mammals in the western Baltic Sea.

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Ecosystem based Marine Management, Section for Marine Ecology and Oceanography
Contributors: Ross, S. D., Nielsen, J. R., Gislason, H., Andersen, N. G.
Number of pages: 180
Publication date: 2016

Publication information
Publisher: DTU aqua. National Institute of Aquatic Resources
Original language: English

Testing reproductive allometry in fish

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Ecosystem based Marine Management
Contributors: Olsson, K. H., Gislason, H.
Pages: 1466-1473
Publication date: 2016
Peer-reviewed: Yes

Publication information
Journal: ICES Journal of Marine Science
Volume: 73
Issue number: 6
ISSN (Print): 1054-3139
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Scopus rating (2017): CiteScore 2.98
Web of Science (2017): Impact factor 2.906
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.63
Web of Science (2016): Impact factor 2.76
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): CiteScore 2.18
Web of Science (2015): Impact factor 2.626
Web of Science (2015): Indexed yes
The diet of whiting Merlangius merlangus in the western Baltic Sea

The diet of whiting Merlangius merlangus in the western Baltic Sea was investigated and compared to the diet in the southern North Sea. Clupeids were important prey in both areas, but especially in the western Baltic Sea where they constituted up to 90% of the diet of larger individuals. Gobies, brown shrimps and polychaetes were the main prey of juveniles in the western Baltic Sea, while a wider range of species were consumed in the North Sea. The shift to piscivory occurred at smaller sizes in the western Baltic Sea and the fish prey consumed was proportionately larger than in the southern North Sea. Estimates of prey abundance and food intake of M. merlangus are required to evaluate its predatory significance in the western Baltic Sea, but its diet suggests that it could be just as significant a fish predator here as in the southern North Sea

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Ecosystem based Marine Management, Section for Marine Living Resources, Section for Marine Ecology and Oceanography
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
Number of pages: 2
Publication date: 2015
Peer-reviewed: No
Event: Abstract from ICES Annual Science Conference 2015, Copenhagen, Denmark.
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ICES CM 2015/M:12
Research output: Research › Conference abstract for conference – Annual report year: 2015

Havets artsrigdom
Management of fishery: Importance of fish food web dynamics in coupling of multispecies and bio-economic fisheries management evaluation models

Status og muligheder for det danske hav: Rapport til VILLUM FONDEN og VELUX FONDENs miljøprogram

The Baltic ATLANTIS model: Implementing a holistic framework to evaluate ecosystem wide responses to changes in climate and anthropogenic forcing
Turning pests into protein – starfish by-product management in the Danish mussel industry

General information
State: Published
Organisations: National Institute of Aquatic Resources, Danish Shellfish Centre, Section for Ecosystem based Marine Management
Contributors: Fitridge, I., Nielsen, C. F., Gislason, H., Saurel, C., Petersen, J. K.
Publication date: 2015
Peer-reviewed: No
Event: Abstract from 18. Danske Havforskermøde, Copenhagen, Denmark.
Research output: Research › Conference abstract for conference – Annual report year: 2015

Understanding patterns in marine species richness

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Ecosystem based Marine Management
Contributors: Gislason, H.
Publication date: 2015
Peer-reviewed: No
Event: Abstract from ICES Annual Science Conference 2015, Copenhagen, Denmark.
URLs:
Research output: Research › Conference abstract for conference – Annual report year: 2015

When bigger is better - a theoretical and empirical examination of factors contributing to selection on offspring size in fish

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Ecosystem based Marine Management, Centre for Ocean Life
Contributors: Olsson, K., Gislason, H., Andersen, K. H.
Number of pages: 164
Publication date: 2015

Publication information
Place of publication: Charlottenlund
Publisher: National Institute of Aquatic Resources, Technical University of Denmark
Original language: English
Research output: Research › Ph.D. thesis – Annual report year: 2015

Forage fish interactions: A symposium on creating the tools for ecosystem-based management of marine resources

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Marine Ecology and Oceanography, Section for Ecosystem based Marine Management
Pages: 1-4
Publication date: 2014
Peer-reviewed: Yes

Publication information
Journal: ICES Journal of Marine Science
Importance of food web dynamics in coupling of multispecies models and bio-economic fisheries management evaluation models

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Ecosystem based Marine Management, Section for Marine Ecology and Oceanography
Contributors: Ross, S. D., Nielsen, J. R., Gislason, H., Andersen, N. G., Vinther, M., Bastardie, F.
Number of pages: 1
Publication date: 2014
Peer-reviewed: No
Event: Poster session presented at Danish Innovation Fund Conference, Copenhagen, Denmark.
Research output: Research – Poster – Annual report year: 2014

Marine fish species richness in the north and north-eastern Atlantic

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Ecosystem based Marine Management
Contributors: Gislason, H.
Publication date: 2014
Peer-reviewed: No
Event: Abstract from World Conference on Marine Biodiversity 2014, Qingdao, China.
Research output: Research – Conference abstract for conference – Annual report year: 2014

Miljøskånsomhed og økologisk bæredygtighed i dansk fiskeri

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Ecosystem based Marine Management, Public Sector Consultancy, Section for Monitoring and Data, Section for Freshwater Fisheries Ecology
Number of pages: 83
Publication date: 2014

Publication information
Place of publication: Charlottenlund
Publisher: Institut for Akvatiske Ressourcer, Danmarks Tekniske Universitet
ISBN (Print): 978-87-7481-195-4
ISBN (Electronic): 978-87-7481-194-7
Original language: Danish
(DTU Aqua Report; No. 279-2014).
Electronic versions:
Publishers version
URLs: http://www.aqua.dtu.dk/Publikationer/Forskningsrapporter

Patterns in marine fish species richness in the north and north-eastern Atlantic

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Ecosystem based Marine Management
Contributors: Gislason, H.
Publication date: 2014
Peer-reviewed: No
Size spectra and species diversity in the sea

Technological development in fisheries management

Many marine fish stocks are overexploited and considerable overcapacity exists in fishing fleets worldwide. One of the reasons for the imbalance between resource availability and fishing capacity is technological development, which continuously increases the efficiency of the vessels—a mechanism referred to as “technological creep.” We review how the introduction of new and more efficient electronic equipment, gear design, engines, deck equipment, and catch-handling procedures influences the capture efficiency (catchability) of commercial fishing vessels. On average, we estimate that catchability increases by 3.2% per year due to technological developments, an increase often ignored in fisheries management. The documentation and quantification of technological creep improves the basis for successfully integrating the effects of technological development (and catchability changes) in fisheries management regulations and policies. Ways of counteracting the undesired effects of technological creep are discussed as are the potential management benefits from improved fishing technology. Specific suggestions are given on the selection, application, and tuning of fisheries management tools that can be used to improve the balance between harvesting capacity and resource availability.
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
Contributors: Palacz, A., Nielsen, J. R., Christensen, A., Gislason, H., Bastardie, F., Geitner, K., Maar, M., Lindegren, M., Hufnagl, M., Fulton, E.
Number of pages: 1
Publication date: 2014
Peer-reviewed: No
Event: Poster session presented at EU-FP7-VECTORS Symposium, La Grande Motte, France.
Research output: Research - peer-review › Journal article – Annual report year: 2014

The consequences of balanced harvesting of fish communities
Balanced harvesting, where species or individuals are exploited in accordance with their productivity, has been proposed as a way to minimize the effects of fishing on marine fish communities and ecosystems. This calls for a thorough examination of the consequences balanced harvesting has on fish community structure and yield. We use a size- and trait-based model that resolves individual interactions through competition and predation to compare balanced harvesting with traditional selective harvesting, which protects juvenile fish from fishing. Four different exploitation patterns, generated by combining selective or unselective harvesting with balanced or unbalanced fishing, are compared. We find that unselective balanced fishing, where individuals are exploited in proportion to their productivity, produces a slightly larger total maximum sustainable yield than the other exploitation patterns and, for a given yield, the least change in the relative biomass composition of the fish community. Because fishing reduces competition, predation and cannibalism within the community, the total maximum sustainable yield is achieved at high exploitation rates. The yield from unselective balanced fishing is dominated by small individuals, whereas selective fishing produces a much higher proportion of large individuals in the yield. Although unselective balanced fishing is predicted to produce the highest total maximum sustainable yield and the lowest impact on trophic structure, it is effectively a fishery predominantly targeting small forage fish

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Marine Ecology and Oceanography, Section for Ecosystem based Marine Management
Contributors: Jacobsen, N. S., Gislason, H., Andersen, K. H.
Publication date: 2014
Peer-reviewed: Yes

Publication information
Journal: Proceedings of the Royal Society B-Biological Sciences
Volume: 281
Issue number: 1775
The marine diversity spectrum

Distributions of species body sizes within a taxonomic group, for example, mammals, are widely studied and important because they help illuminate the evolutionary processes that produced these distributions. Distributions of the sizes of species within an assemblage delineated by geography instead of taxonomy (all the species in a region regardless of clade) are much less studied but are equally important and will illuminate a different set of ecological and evolutionary processes. We develop and test a mechanistic model of how diversity varies with body mass in marine ecosystems. The model predicts the form of the diversity spectrum, which quantifies the distribution of species' asymptotic body masses, is a species analogue of the classic size spectrum of individuals, and which we have found to be a new and widely applicable description of diversity patterns. The marine diversity spectrum is predicted to be approximately linear across an asymptotic mass range spanning seven orders of magnitude. Slope -0.5 center dot 5 is predicted for the global marine diversity spectrum for all combined pelagic zones of continental shelf seas, and slopes for large regions are predicted to lie between -0 center dot 5 and -0 center dot 1. Slopes of -0 center dot 5 and -0 center dot 1 represent markedly different communities: a slope of -0 center dot 5 depicts a 10-fold reduction in diversity for every 100-fold increase in asymptotic mass; a slope of -0 center dot 1 depicts a 1 center dot 6-fold reduction. Steeper slopes are predicted for larger or colder regions, meaning fewer large species per small species for such regions. Predictions were largely validated by a global empirical analysis. Results explain for the first time a new and widespread phenomenon of biodiversity. Results have implications for estimating numbers of species of small asymptotic mass, where taxonomic inventories are far from complete. Results show that the relationship between diversity and body mass can be explained from the dependence of predation behaviour, dispersal, and life history on body mass, and a neutral assumption about speciation and extinction.

General information

State: Published
Organisations: National Institute of Aquatic Resources, Section for Ecosystem based Marine Management, Imperial College London, Cefas Weymouth Laboratory, European Commission - Joint Research Center
Contributors: Reuman, D. C., Gislason, H., Barnes, C., Melin, F., Jennings, S.
Pages: 963-979
Publication date: 2014
Peer-reviewed: Yes

Publication information

Journal: Journal of Animal Ecology
Volume: 83
Issue number: 4
ISSN (Print): 0021-8790
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Scopus rating (2017): CiteScore 4.66 SJR 2.778 SNIP 1.72
Web of Science (2017): Impact factor 4.459
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 4.65 SJR 3.076 SNIP 1.702
Web of Science (2016): Impact factor 4.474
BFI (2015): BFI-level 2
Scopus rating (2015): CiteScore 4.55 SJR 3.347 SNIP 1.781
Web of Science (2015): Impact factor 4.827
Does functional redundancy stabilize fish communities?

Functional redundancy of species sharing a feeding strategy and/or maximum size has been hypothesized to contribute to increased resilience of marine fish communities (the "portfolio effect"). A consistent time-series of survey data of fish in the North Sea was used to examine if trophic functional groups or maximum length of species (Lmax) groups with larger numbers of species had lower coefficients of variation in abundance and biomass over time than did groupings with fewer species. Results supported this hypothesis. However, the stabilizing effect of numbers of species in a group on variation in abundance or biomass could be accounted for by the Law of Large Numbers, providing no evidence that specific
ecological processes or co-adaptations are necessary to produce this effect. This implies that successful conservation policies to maintain the resilience of a marine fish community could be based on strategies to maintain the number of species in functional groups, without having to know the detailed ecological interactions between the species.

**General information**

State: Published

Organisations: National Institute of Aquatic Resources, Section for Ecosystem based Marine Management, Fisheries and Oceans Canada, Waaldijk 39, 6621KH Dreumel, The Netherlands

Contributors: Rice, J., Daan, N., Gislason, H., Pope, J.

Pages: 734-742

Publication date: 2013

Peer-reviewed: Yes

**Publication information**

Journal: ICES Journal of Marine Science

Volume: 70

Issue number: 4

ISSN (Print): 1054-3139

Ratings:

BFI (2018): BFI-level 1

Web of Science (2018): Indexed yes

BFI (2017): BFI-level 1

Scopus rating (2017): CiteScore 2.98

Web of Science (2017): Impact factor 2.906

Web of Science (2017): Indexed yes

BFI (2016): BFI-level 1

Scopus rating (2016): CiteScore 2.63

Web of Science (2016): Impact factor 2.76

Web of Science (2016): Indexed yes

BFI (2015): BFI-level 1

Scopus rating (2015): CiteScore 2.18

Web of Science (2015): Impact factor 2.626

Web of Science (2015): Indexed yes

BFI (2014): BFI-level 1

Scopus rating (2014): CiteScore 2.62

Web of Science (2014): Impact factor 2.377

Web of Science (2014): Indexed yes

BFI (2013): BFI-level 1

Scopus rating (2013): CiteScore 2.46

Web of Science (2013): Impact factor 2.525

ISI indexed (2013): ISI indexed yes

Web of Science (2013): Indexed yes

BFI (2012): BFI-level 1

Scopus rating (2012): CiteScore 2.35

Web of Science (2012): Impact factor 2.277

ISI indexed (2012): ISI indexed yes

Web of Science (2012): Indexed yes

BFI (2011): BFI-level 1

Scopus rating (2011): CiteScore 2.32

Web of Science (2011): Impact factor 2.007

ISI indexed (2011): ISI indexed yes

Web of Science (2011): Indexed yes

BFI (2010): BFI-level 1

Web of Science (2010): Impact factor 1.808

Web of Science (2010): Indexed yes

BFI (2009): BFI-level 1

Web of Science (2009): Indexed yes
Population structure of Atlantic Mackerel (Scomber scombrus)

Atlantic mackerel (Scomber scombrus) occurs on both sides of the north Atlantic and has traditionally been grouped into 5 spawning components, some of which were thought to be isolated natal homing stocks. Previous studies have provided no
evidence for cross Atlantic migration and no or weak support for isolated spawning components within either side of the North Atlantic. We question the de-facto accepted hypothesis of isolation between spawning components on the basis of spawning and age distribution data. The spawning intensities, proxied by larval abundances, are negatively correlated between the North Sea and Celtic Sea, which indicates that the two spawning components may be connected by straying individuals. This finding is based on unique larvae samples collected before the collapse of North Sea component, thus showing that the exchange is not a recent phenomenon due to the collapse. The analyses of old as well as more recent age distributions show that strong year classes spread into other areas where they spawn as adults ("twinning"). Our findings are in accordance with the lack of solid evidence for stock separation from previous analyses of tagging data, genetics, ectoparasite infections, otolith shapes, and blood phenotypes. Because no method has been able to identify the origin of spawning mackerel unequivocally from any of the traditional spawning components, and in the light of our results, we conclude that straying outweighs spatial segregation. We propose a new model where the population structure of mackerel is described as a dynamic cline, rather than as connected contingents. Temporal changes in hydrography and mackerel behavior may affect the steepness of the cline at various locations. The new interpretation of the population structure of Atlantic mackerel has important implications for research, assessment and management.
Does functional redundancy stabilize fish communities?
Functional redundancy is a community property thought to contribute to ecosystem resilience. It is argued that trophic (or other) functional groups with more species have more linkages and opportunities to buffer variation in abundance of individual species. We explored this concept with a 30-year time-series of data on 83 species sampled in the International Bottom Trawl Survey. Our results were consistent with the hypothesis that functional redundancy leads to more stable (and by inference more resilient) communities. Over the time-series trophic groups (assigned by diet, size (Lmax) group, or both factors) with more species had lower coefficients of variation (CVs) in abundance and biomass than did trophic groups with fewer species. These findings are also consistent with Bernoulli’s Law of Large Numbers, a rule that does not require complex ecological and evolutionary processes to produce the observed patterns. Through iterative randomizations of the species’ time-series into groupings of the same size as the functional groups, we developed expected pdfs of CVs in abundances and biomasses, assuming only the Law of Large Numbers was at work. The observed CVs of all groupings were not significantly different from these simulated distributions. These results do not prove the absence of ecological processes contributing to the greater stability of functional groups with more redundancy, however they do not justify invoking any such processes. The results support management approaches that maintain species richness, but do not require management to try to protect complex (and poorly understood) ecological processes.

Evolutionary assembly rules for fish life histories
We revisit the empirical equation of Gislason et al. (2010, Fish and Fisheries11:149-158) for predicting natural mortality (M, year^-1) of marine fish. We show it to be equivalent to , where L ∞ (cm) and K (year^-1) are the von Bertalanffy growth equation (VBGE) parameters, and L (cm) is fish length along the growth trajectory within the species. We then interpret K in terms of the VBGE in mass , and show that the previous equation is itself equivalent to a -1/3 power function rule between M and the mass at first reproduction (W α); this new -1/3 power function emerges directly from the life history that maximizes Darwinian fitness in non-growing populations. We merge this M, W α power function with other power functions to produce general across-species scaling rules for yearly reproductive allocation, reproductive effort and age at first reproduction in fish. We then suggest a new way to classify habitats (or lifestyles) as to the life histories they should contain, and we contrast our scheme with the widely used Winemiller-Rose fish lifestyle classification.
Explaining growth variation over large spatial scales: Effects of temperature and food on walleye growth

Most fishes exhibit strong spatial variation in growth. Because fish growth and production are tightly linked, quantifying and explaining variation in growth can mean the difference between successful management and unforeseen collapse. However, disentangling the factors that are responsible for among-lake variation in growth (e.g., food and temperature) has proved very difficult. Here, we use length at age and temperature data from hundreds of water bodies between 44⁰N to 53⁰N latitude to explain variation in immature growth of walleye (Sander vitreus), one of the most economically valuable freshwater fish species in North America. We then use length at age data from yellow perch (Perca flavescens) to identify the mechanisms behind the remaining variation in the length at age – temperature relationship for walleye. A positive perch – walleye relationship indicates that the mechanism behind the variation is productivity and a negative relationship indicates density-dependence. We found that variation in walleye growth among water bodies is largely explained by food productivity - not density-dependence. These results suggest that we can’t detect density-dependence among lakes when density-dependent effects are swamped by differences in productivity.
**Torsk og klima: Hvordan påvirker klimaændringerne torsken i Nordsøen?**

**General information**
State: Published
Organisations: National Institute of Aquatic Resources, Section for Population Ecology and Genetics, Section for Ocean Ecology and Climate, Section for Public Sector Consultancy
Contributors: Rindorf, A., Brøgger Pedersen, J., Christensen, A., Grønkjær, P., Höffle, H., Jonasdottir, S., Mariani, P., Munk, P., Møller, E. F., Maar, M., She, J., Tirsgaard, B., Vinther, M., Gislason, H.
Number of pages: 22
Publication date: 2012

**Publication information**
Place of publication: Charlottenlund
Publisher: Institut for Akvatiske Ressourcer, Danmarks Tekniske Universitet
Year: 2012
Original language: English
Electronic versions: Torskogklima_web.pdf
Research output: Education › Other contribution – Annual report year: 2012

**Apocalypse in world fisheries? The reports of their death are greatly exaggerated: Food for thought**
The catch-based methods underlying the forecast that by 2048 all commercially exploited stocks will have collapsed have been severely criticized, and a recent and more-elaborate analysis by a group of scientists that included the lead author of the original article has led to a quite different interpretation. Nonetheless, the 2006 forecast of a forthcoming apocalypse in the oceans is still uncritically referred to by critics of current management and fisheries science. In the title, the quote by Mark Twain is paraphrased to underline the fact that this prediction is both technically and conceptually flawed: (i) any series of random numbers subjected to the algorithm underlying the prediction will show a pattern similar to that observed in catch statistics; (ii) this pattern should be accounted for in making predictions; and (iii) interpreting the period of maximum harvest in a time-series as generally reflecting a period during which a stock was fully exploited is incorrect, because history often has shown that these maximum yields were taken during a period of overexploitation and could not have been sustainable.

**General information**
State: Published
Organisations: Section for Population Ecology and Genetics, National Institute of Aquatic Resources
Contributors: Daan, N., Gislason, H., Pope, J. G., Rice, J. C.
Pages: 1375-1378
Publication date: 2011
Peer-reviewed: Yes

**Publication information**
Journal: I C E S Journal of Marine Science
Volume: 68
Issue number: 7
ISSN (Print): 1054-3139
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Scopus rating (2017): CiteScore 2.98
Web of Science (2017): Impact factor 2.906
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Multi-decadal responses of a cod (Gadus morhua) population to human-induced trophic changes, fishing, and climate

Understanding how human impacts have interacted with natural variability to affect populations and ecosystems is required for sustainable management and conservation. The Baltic Sea is one of the few large marine ecosystems worldwide where the relative contribution of several key forcings to changes in fish populations can be analyzed with empirical data. In this study we investigate how climate variability and multiple human impacts (fishing, marine mammal hunting, eutrophication) have affected multi-decadal scale dynamics of cod in the Baltic Sea during the 20th century. We document significant climate-driven variations in cod recruitment production at multi-annual timescales, which had major impacts on population dynamics and the yields to commercial fisheries. We also quantify the roles of marine mammal
predation, eutrophication, and exploitation on the development of the cod population using simulation analyses, and show how the intensity of these forcings differed over time. In the early decades of the 20th century, marine mammal predation and nutrient availability were the main limiting factors; exploitation of cod was still relatively low. During the 1940s and subsequent decades, exploitation increased and became a dominant forcing on the population. Eutrophication had a relatively minor positive influence on cod biomass until the 1980s. The largest increase in cod biomass occurred during the late 1970s, following a long period of hydrographically related above-average cod productivity coupled to a temporary reduction in fishing pressure. The Baltic cod example demonstrates how combinations of different forcings can have synergistic effects and consequently dramatic impacts on population dynamics. Our results highlight the potential and limitations of human manipulations to influence predator species and show that sustainable management can only be achieved by considering both anthropogenic and naturally varying processes in a common framework.

**General information**

State: Published
Organisations: Section for Management Systems, National Institute of Aquatic Resources, Section for Ocean Ecology and Climate, Institute Management, Section for Population Ecology and Genetics
Contributors: Eero, M., MacKenzie, B., Köster, F., Gislason, H.
Pages: 214-226
Publication date: 2011
Peer-reviewed: Yes

**Publication information**

Journal: Ecological Applications
Volume: 21
Issue number: 1
ISSN (Print): 1051-0761
Ratings:
  - BFI (2018): BFI-level 2
  - Web of Science (2018): Indexed yes
  - BFI (2017): BFI-level 2
  - Scopus rating (2017): CiteScore 4.64 SJR 2.569 SNIP 1.554
  - Web of Science (2017): Impact factor 4.393
  - Web of Science (2017): Indexed yes
  - BFI (2016): BFI-level 2
  - Scopus rating (2016): CiteScore 4.4 SJR 2.376 SNIP 1.575
  - Web of Science (2016): Impact factor 4.314
  - Web of Science (2016): Indexed yes
  - BFI (2015): BFI-level 2
  - Scopus rating (2015): CiteScore 4.63 SJR 2.775 SNIP 1.764
  - Web of Science (2015): Indexed yes
  - BFI (2014): BFI-level 2
  - Scopus rating (2014): CiteScore 4.59 SJR 2.601 SNIP 1.841
  - Web of Science (2014): Impact factor 4.093
  - Web of Science (2014): Indexed yes
  - BFI (2013): BFI-level 2
  - Scopus rating (2013): CiteScore 4.77 SJR 2.686 SNIP 1.85
  - Web of Science (2013): Impact factor 4.126
  - ISI indexed (2013): ISI indexed yes
  - Web of Science (2013): Indexed yes
  - BFI (2012): BFI-level 2
  - Scopus rating (2012): CiteScore 4.55 SJR 2.98 SNIP 1.921
  - Web of Science (2012): Impact factor 3.815
  - ISI indexed (2012): ISI indexed yes
  - BFI (2011): BFI-level 2
  - Scopus rating (2011): CiteScore 4.86 SJR 3.325 SNIP 1.974
  - Web of Science (2011): Impact factor 5.102
  - ISI indexed (2011): ISI indexed yes
  - Web of Science (2011): Indexed yes
Temperature affects the timing of spawning and migration of North Sea mackerel

Climate change accentuates the need for knowing how temperature impacts the life history and productivity of economically and ecologically important species of fish. We examine the influence of temperature on the timing of the spawning and migrations of North Sea Mackerel using data from larvae CPR surveys, egg surveys and commercial landings from Danish coastal fisheries in the North Sea, Skagerrak, Kattegat and inner Danish waters. The three independent sources of data all show that there is a significant relationship between the timing of spawning and sea surface temperature. Large mackerel are shown to arrive at the feeding areas before and leave later than small mackerel and the sequential appearance of mackerel in each of the feeding areas studied supports the anecdotal evidence for an eastward post-spawning migration. Occasional commercial catches taken in winter in the Sound N, Kattegat and Skagerrak together with catches in the first quarter IBTS survey furthermore indicate some overwintering here. Significant relationships between temperature and North Sea mackerel spawning and migration have not been documented before. The results have implications for mackerel resource management and monitoring. An increase in temperature is likely to affect the timing and magnitude of the growth, recruitment and migration of North Sea mackerel with subsequent impacts on its sustainable exploitation.
BFI (2017): BFI-level 1
Scopus rating (2017): CiteScore 2.3 SJR 0.945 SNIP 1.206
Web of Science (2017): Impact factor 1.942
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.27 SJR 1.062 SNIP 1.142
Web of Science (2016): Impact factor 2.064
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): CiteScore 2.07 SJR 0.986 SNIP 1.125
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): CiteScore 2.08 SJR 1.114 SNIP 1.221
Web of Science (2014): Impact factor 1.892
BFI (2013): BFI-level 1
Scopus rating (2013): CiteScore 2.28 SJR 1.166 SNIP 1.435
Web of Science (2013): Impact factor 2.115
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): CiteScore 2.02 SJR 1.123 SNIP 1.204
Web of Science (2012): Impact factor 1.889
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): CiteScore 2.31 SJR 1.382 SNIP 1.414
Web of Science (2011): Impact factor 2.088
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 1.327 SNIP 1.303
Web of Science (2010): Impact factor 1.928
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 1.299 SNIP 1.289
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 2
Scopus rating (2008): SJR 1.163 SNIP 1.316
Scopus rating (2007): SJR 1.38 SNIP 1.535
Scopus rating (2006): SJR 1.466 SNIP 1.424
Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 0.907 SNIP 1.274
Scopus rating (2004): SJR 0.965 SNIP 1.247
Web of Science (2004): Indexed yes
Scopus rating (2003): SJR 1.256 SNIP 1.372
Web of Science (2003): Indexed yes
Scopus rating (2002): SJR 1.086 SNIP 1.221
Scopus rating (2001): SJR 1.041 SNIP 1.063
Web of Science (2001): Indexed yes
Scopus rating (2000): SJR 1.281 SNIP 1.053
Scopus rating (1999): SJR 1.191 SNIP 1.341
Original language: English
DOIs:
10.1016/j.csr.2010.11.003
Global patterns in fish species richness

**General information**
State: Published
Organisations: Section for Population Ecology and Genetics, National Institute of Aquatic Resources
Contributors: Gislason, H., Jennings, S., Reuman, D. C., Barnes, C., Melin, F.
Number of pages: 13
Publication date: 2010
Peer-reviewed: No
URLs:

Bibliographical note
ICES CM 2010/Q:19
Source: orbit
Source-ID: 267571
Research output: Research - Paper – Annual report year: 2010

Macro-ecological patterns in fish biodiversity and survey abundance

**General information**
State: Published
Organisations: Section for Population Ecology and Genetics, National Institute of Aquatic Resources, Section for Ocean Ecology and Climate, Section for Management Systems
Number of pages: 346
Publication date: 2010

Host publication information
Title of host publication: ICES Annual Science Conference
Place of publication: Copenhagen
Publisher: International Council for the Exploration of the Sea

Bibliographical note
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Source: orbit
Source-ID: 267858
Research output: Research - Conference abstract in proceedings – Annual report year: 2010

Macro-ecological patterns in fish biodiversity and survey abundance

**General information**
State: Published
Organisations: Section for Population Ecology and Genetics, National Institute of Aquatic Resources, Section for Ocean Ecology and Climate, Section for Management Systems
Number of pages: 15
Publication date: 2010
Peer-reviewed: No
URLs:
http://www.ices.dk/products/CMdocs/CM-2010/Q/Q1110.pdf
Source: orbit
Source-ID: 267572
Research output: Research - Paper – Annual report year: 2010
Predicting the natural mortality of marine fish from life history characteristics
For fish much of the life history is determined by body size. Body size and asymptotic size significantly influences important life history processes such as growth, maturity, egg production, and natural mortality. Furthermore, for a population to persist, offspring must be able to replace their parents on a one-for-one basis in the long run. Otherwise the population would either increase exponentially or become extinct. Combining data on growth and specific fecundity in a size-based fish community model of the North Sea and using the requirement of a one-for-one replacement provides the information necessary to estimate the scaling of natural mortality with size and asymptotic size. The estimated scaling is compared with output from multispecies fish stock models, with the empirical scaling of the maximum number of recruits per unit of spawning stock biomass with body size, and with estimates from a comprehensive compilation of empirical data on the natural mortality of marine fishes. The comparisons are all in agreement with the predictions from the model. We conclude that natural mortality scales with body length raised to a power around -1.6, with the asymptotic length of the species, and with the von Bertalanffy growth parameter $K$.

General information
State: Published
Organisations: Section for Population Ecology and Genetics, National Institute of Aquatic Resources
Contributors: Gislason, H.
Publication date: 2010
Peer-reviewed: No
Source: orbit
Source-ID: 268724
Research output: Research › Conference abstract for conference – Annual report year: 2010

Size, growth, temperature and the natural mortality of marine fish
The natural mortality of exploited fish populations is often assumed to be a species-specific constant independent of body size. This assumption has important implications for size-based fish population models and for predicting the outcome of size-dependent fisheries management measures such as mesh-size regulations. To test the assumption, we critically review the empirical estimates of the natural mortality, $M$ (year$^{-1}$), of marine and brackish water fish stocks and model them as a function of von Bertalanffy growth parameters, $L_{\infty}$ (cm) and $K$ (year$^{-1}$), temperature (Kelvin) and length, $L$ (cm). Using the Arrhenius equation to describe the relationship between $M$ and temperature, we find $M$ to be significantly related to length, $L_{\infty}$ and $K$, but not to temperature ($R^2 = 0.62$, $P < 0.0001$, $n = 168$). Temperature and $K$ are significantly correlated and when $K$ is removed from the model the temperature term becomes significant, but the resulting model explains less of the total variance ($R^2 = 0.42$, $P < 0.0001$, $n = 168$). The relationships between $M$, $L$, $L_{\infty}$, $K$ and temperature are shown to be in general accordance with previous theoretical and empirical investigations. We conclude that natural mortality is significantly related to length and growth characteristics and recommend to use the empirical formula: $\ln(M) = 0.55 - 1.61\ln(L) + 1.44\ln(L_{\infty}) + \ln(K)$, for estimating the natural mortality of marine and brackish water fish.

General information
State: Published
Organisations: Section for Population Ecology and Genetics, National Institute of Aquatic Resources
Contributors: Gislason, H., Daan, N., Rice, J. C., Pope, J. G.
Pages: 149-158
Publication date: 2010
Peer-reviewed: Yes

Publication information
Journal: Fish and Fisheries
Volume: 11
Issue number: 2
ISSN (Print): 1467-2960
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Scopus rating (2017): CiteScore 7.94 SJR 3.615 SNIP 3.156
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 7.7 SJR 3.703 SNIP 3.156
A fishery-induced cause of regime shifts that does not require a change in environmental conditions

General information
State: Published
Organisations: Section for Population- and Ecosystem Dynamics, National Institute of Aquatic Resources
Contributors: Daan, N., Gislason, H., Pope, J. G., Rice, J. C.
Publication date: 2009

Host publication information
Title of host publication: ICES C.M.
Fiskebiodiversitet og Boltzmanns konstant

General information
State: Published
Organisations: Section for Population- and Ecosystem Dynamics, National Institute of Aquatic Resources
Contributors: Gislason, H.
Publication date: 2009
Peer-reviewed: No
Source: orbit
Source-ID: 252672
Research output: Research › Conference abstract for conference – Annual report year: 2009

Honey, I cooled the cods: Modelling the effect of temperature on the structure of Boreal/Arctic fish ecosystems

General information
State: Published
Organisations: Section for Population- and Ecosystem Dynamics, National Institute of Aquatic Resources
Contributors: Pope, J. G., Falk-Pedersen, J., Jennings, S., Rice, J. C., Gislason, H., Daan, N.
Pages: 2097-2107
Publication date: 2009
Peer-reviewed: Yes

Publication information
Volume: 56
Issue number: 21-22
ISSN (Print): 0967-0645
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Scopus rating (2017): CiteScore 2.65 SJR 1.352 SNIP 0.975
Web of Science (2017): Impact factor 2.451
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.35 SJR 1.389 SNIP 0.999
Web of Science (2016): Impact factor 1.713
BFI (2015): BFI-level 1
Scopus rating (2015): CiteScore 2.5 SJR 1.394 SNIP 1.128
Web of Science (2015): Impact factor 2.137
BFI (2014): BFI-level 1
Scopus rating (2014): CiteScore 2.68 SJR 1.755 SNIP 1.113
Web of Science (2014): Impact factor 2.19
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): CiteScore 3.06 SJR 2.226 SNIP 1.345
Web of Science (2013): Impact factor 2.763
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): CiteScore 2.59 SJR 1.936 SNIP 1.185
Web of Science (2012): Impact factor 2.243
How community ecology links natural mortality, growth, and production of fish populations

General information
State: Published
Organisations: Section for Population- and Ecosystem Dynamics, National Institute of Aquatic Resources
Contributors: Andersen, K. H., Farnsworth, K., Pedersen, M., Gislason, H., Beyer, J.
Pages: 1978-1984
Publication date: 2009
Peer-reviewed: Yes

Publication information
Journal: ICES Journal of Marine Science
Volume: 66
Issue number: 9
ISSN (Print): 1054-3139
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Scopus rating (2017): CiteScore 2.98
Web of Science (2017): Impact factor 2.906
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Coexistence in North Sea fish communities: implications for growth and natural mortality

General information
State: Published
Organisations: Section for Population- and Ecosystem Dynamics, National Institute of Aquatic Resources
Contributors: Gislason, H., Pope, J., Rice, J., Daan, N.
Pages: 514-530
Bibliographical note
Open Access Article
Source: orbit
Source-ID: 225502
Research output: Research - peer-review › Journal article – Annual report year: 2008

Does natural mortality depend on individual size

General information
State: Published
Organisations: Section for Population- and Ecosystem Dynamics, National Institute of Aquatic Resources
Contributors: Gislason, H., Daan, N., Rice, J., Pope, J.
Pages: 1-16
Publication date: 2008
Peer-reviewed: No

Publication information
Journal: ICES Council Meeting
Volume: F:16
ISSN (Print): 1015-4744
Ratings:
ISI indexed (2013): ISI indexed no
ISI indexed (2012): ISI indexed no
ISI indexed (2011): ISI indexed no
Web of Science (2003): Indexed yes
Original language: English
Source: orbit
Source-ID: 231111
Research output: Research › Conference article – Annual report year: 2008

Life-history constraints on the success of the many small eggs reproductive strategy

The reproductive strategy of most fishes is to produce a large number of tiny eggs, leading to a huge difference between egg size and asymptotic body size. The viability of this strategy is examined by calculating the life-time reproductive success $R_0$ as a function of the asymptotic body size. A simple criterion for the optimality of producing small eggs is found, depending on the rate of predation relative to the specific rate of consumption. Secondly it is shown that the success of the reproductive strategy is increasing with asymptotic body size. Finally the existence of both upper and lower limits on the allowed asymptotic sizes is demonstrated. A metabolic upper limit to asymptotic body size for all higher animals is derived

General information
State: Published
Organisations: Section for Population- and Ecosystem Dynamics, National Institute of Aquatic Resources
Contributors: Andersen, K. H., Beyer, J., Pedersen, M., Andersen, N. G., Gislason, H.
Pages: 490-497
Publication date: 2008
Peer-reviewed: Yes

Publication information
Journal: Theoretical Population Biology
Volume: 73
Issue number: 4
ISSN (Print): 0040-5809
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
The Eastern Baltic cod stock in the 20th century: Resolving impacts of fishing, human-induced trophic changes and climate
Developing an integrated view on the Baltic Sea ecosystem: The EUR-OCEANS Baltic system study

General information
State: Published
Organisations: Institute Management, National Institute of Aquatic Resources, Section for Population- and Ecosystem Dynamics, Section for Management Systems
Contributors: Köster, F., Turner, D., Omstedt, A., Möllmann, C., Gislason, H., Autio, R., Olsson, A., Diekmann, R.
Pages: 90-92
Publication date: 2007

Host publication information
Title of host publication: Fifth study conference on BALTEX, Kuressaare, Saaremaa, Estonia, 4-8 June 2007: Conference proceedings
Editor: Isemer, H.
(Publication / International BALTEX Secretariat; No. 38).
Source: orbit
Source-ID: 240040
Research output: Research › Article in proceedings – Annual report year: 2007

Impact of 21st century climate change on the Baltic Sea fish community and fisheries
The Baltic Sea is a large brackish semienclosed sea whose species-poor fish community supports important commercial and recreational fisheries. Both the fish species and the fisheries are strongly affected by climate variations. These climatic effects and the underlying mechanisms are briefly reviewed. We then use recent regional - scale climate - ocean modelling results to consider how climate change during this century will affect the fish community of the Baltic and fisheries management. Expected climate changes in northern Europe will likely affect both the temperature and salinity of the Baltic, causing it to become warmer and fresher. As an estuarine ecosystem with large horizontal and vertical salinity gradients, biodiversity will be particularly sensitive to changes in salinity which can be expected as a consequence of altered precipitation patterns. Marine-tolerant species will be disadvantaged and their distributions will partially contract from the Baltic Sea; habitats of freshwater species will likely expand. Although some new species can be expected to immigrate because of an expected increase in sea temperature, only a few of these species will be able to successfully colonize the Baltic because of its low salinity. Fishing fleets which presently target marine species (e.g. cod, herring, sprat, plaice, sole) in the Baltic will likely have to relocate to more marine areas or switch to other species which tolerate decreasing salinities. Fishery management thresholds that trigger reductions in fishing quotas or fishery closures to conserve local populations (e.g. cod, salmon) will have to be reassessed as the ecological basis on which existing thresholds have been established changes, and new thresholds will have to be developed for immigrant species. The Baltic situation illustrates some of the uncertainties and complexities associated with forecasting how fish populations, communities and industries dependent on an estuarine ecosystem might respond to future climate change.

General information
State: Published
Organisations: Section for Population- and Ecosystem Dynamics, National Institute of Aquatic Resources, Institute Management
Impact of 21st century climate change on the Baltic Sea fish community and fisheries

**General information**
State: Published
Organisations: Section for Population- and Ecosystem Dynamics, National Institute of Aquatic Resources, Institute Management
Contributors: MacKenzie, B., Gislason, H., Möllmann, C., Köster, F.
Pages: 1-41
Publication date: 2007
Peer-reviewed: No

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Journal: ICES Council Meeting
Volume: E:11
ISSN (Print): 1015-4744
Ratings:
ISI indexed (2013): ISI indexed no
ISI indexed (2012): ISI indexed no
ISI indexed (2011): ISI indexed no
Web of Science (2003): Indexed yes
Original language: English
URLs:

**Bibliographical note**
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Source: orbit
Source-ID: 226520
Research output: Research - Conference article – Annual report year: 2007

Størrelse og sameksistens i marine fiskesamfund

**General information**
State: Published
Organisations: Section for Population- and Ecosystem Dynamics, National Institute of Aquatic Resources
Contributors: Gislason, H.
Number of pages: 1
Publication date: 2007
Havet som menneskets spisekammer

General information
State: Published
Organisations: Section for Population- and Ecosystem Dynamics, National Institute of Aquatic Resources
Contributors: Gislason, H.
Pages: 397-431
Publication date: 2006

Host publication information
Title of host publication: Havet
Volume: 17
Place of publication: København
Publisher: Gyldendal
Editor: Fenchel, T.
ISBN (Print): 87-02-03026-8
(Naturen i Danmark).
Source: orbit
Source-ID: 225506
Research output: Research - peer-review › Book chapter – Annual report year: 2006

Modelling an exploited marine fish community with 15 parameters - results from a simple size-based model

General information
State: Published
Organisations: Section for Population- and Ecosystem Dynamics, National Institute of Aquatic Resources
Contributors: Pope, J., Rice, J., Daan, N., Jennings, S., Gislason, H.
Pages: 1029-1044
Publication date: 2006
Peer-reviewed: Yes

Publication information
Journal: ICES Journal of Marine Science
Volume: 63
Issue number: 6
ISSN (Print): 1054-3139
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Scopus rating (2017): CiteScore 2.98
Web of Science (2017): Impact factor 2.906
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.63
Web of Science (2016): Impact factor 2.76
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): CiteScore 2.18
Web of Science (2015): Impact factor 2.626
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Painting the floor with a hammer: Technical fixes in fisheries management

Fisheries management benefits from the contribution of several academic disciplines, each with their own perspectives, concerns and solutions. In this essay we argue that the contribution of biology, economics, sociology and other relevant disciplines to fisheries would be improved if they originated from broader, more integrated analytical perspectives that are attuned to the empirical realities of fisheries management. Today, disciplinary boundaries narrow the perspectives of fisheries management, creating tunnel vision and standardized technical fixes to complex and diverse management problems. Having worked separately and together for a number of years in fisheries research and consultancy in many parts of the world we, as a group of biologists, economists and sociologists, feel that the time to rid ourselves from disciplinary dogmatism is long overdue. We claim that improvements in fisheries management will be realized not through the promotion of technical fixes but instead by embracing and responding to the complexity of the management problem.

General information
State: Published
Organisations: Section for Population- and Ecosystem Dynamics, National Institute of Aquatic Resources
Contributors: Degnbol, P., Gislason, H., Hanna, S., Jentoft, S., Raaðkjær Nielsen, J., Sverdrup-Jensen, S., Wilson, D.
Pages: 534-543
Publication date: 2006
Prey switching of cod and whiting in the North Sea

General information
State: Published
Organisations: Section for Population- and Ecosystem Dynamics, National Institute of Aquatic Resources
Contributors: Rindorf, A., Gislason, H., Lewy, P.
Pages: 243-253
Publication date: 2006
Peer-reviewed: Yes

Publication information
Journal: Marine Ecology - Progress Series
Volume: 325
ISSN (Print): 0171-8630
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Scopus rating (2017): CiteScore 2.53
Web of Science (2017): Impact factor 2.276
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 2.4
Web of Science (2016): Impact factor 2.292
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): CiteScore 2.56
Web of Science (2015): Impact factor 2.361
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): CiteScore 2.75
Web of Science (2014): Impact factor 2.619
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): CiteScore 2.79
Web of Science (2013): Impact factor 2.64
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): CiteScore 2.9
Web of Science (2012): Impact factor 2.546
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): CiteScore 2.85
The requirements of an ecosystem approach to fisheries management

General information
State: Published
Organisations: Section for Population- and Ecosystem Dynamics, National Institute of Aquatic Resources
Contributors: Gislason, H.
Pages: 307-327
Publication date: 2006

Host publication information
Title of host publication: The knowledge base for fisheries management
Volume: 12
Place of publication: Amsterdam
Publisher: Elsevier
Editors: Motos, L., Wilson, D.
ISBN (Print): 0-444-52850-4
(Developments in aquaculture and fisheries science series; No. 36).
Source: orbit
Source-ID: 225517
Research output: Research - peer-review › Book chapter – Annual report year: 2006

Changes in the North Sea fish community: evidence of indirect effects of fishing?
We investigate changes in the North Sea fish community with particular reference to possible indirect effects of fishing, mediated through the ecosystem. In the past, long-term changes in the slope of size spectra of research vessel catches have been related to changes in fishing effort, but such changes may simply reflect the cumulative, direct effects of fishing through selective removal of large individuals. If there is resilience in a fish community towards fishing, we may expect increases in specific components, for instance as a consequence of an associated reduction in predation and/or competition. We show on the basis of three long-term trawl surveys that abundance of small fish (all species) as well as abundance of demersal species with a low maximum length (Lmax) have steadily and significantly increased in absolute numbers over large parts of the North Sea during the last 30 years. Taking average fishing mortality of assessed commercial species as an index of exploitation rate of the fish community, it appears that fishing effort reached its maximum in the mid-1980s and has declined slightly since. If the observed changes in the community are caused by indirect effects of fishing, there must be a considerable delay in response time, because the observed changes generally proceed up to recent years, although both size and Lmax spectra suggest some levelling off, or even recovery in one of the surveys. Indeed, significant correlations between all community metrics and exploitation rate were obtained only if time lags greater than or equal to 6 years were introduced. (C) 2004 International Council for the Exploration of the Sea.
Using size-based indicators to evaluate the ecosystem effects of fishing

General information
State: Published
Organisations: Section for Population- and Ecosystem Dynamics, National Institute of Aquatic Resources
Contributors: Shin, Y., Rochet, M., Jennings, S., Field, J., Gislason, H.
Pages: 384-396
Publication date: 2005
Peer-reviewed: Yes

Publication information
Journal: ICES Journal of Marine Science
Volume: 62
Issue number: 3
ISSN (Print): 1054-3139
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Scopus rating (2017): CiteScore 2.98
Web of Science (2017): Impact factor 2.906
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.63
Web of Science (2016): Impact factor 2.76
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): CiteScore 2.18
Web of Science (2015): Impact factor 2.626
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): CiteScore 2.62
Web of Science (2014): Impact factor 2.377
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): CiteScore 2.46
Web of Science (2013): Impact factor 2.525
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): CiteScore 2.35
Web of Science (2012): Impact factor 2.277
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Are the slopes of size spectra a useful tool for measuring the impact of fisheries in multispecies systems?

General information
State: Published
Organisations: Section for Population- and Ecosystem Dynamics, National Institute of Aquatic Resources
Contributors: Pope, J., Rice, J., Jennings, S., Daan, N., Gislason, H.
Pages: 1-32
Publication date: 2004
Peer-reviewed: No

Publication information
Journal: ICES C.M. 2004/
Volume: FF:32
Original language: English
Source-ID: 227351

Research output: Research - peer-review › Journal article – Annual report year: 2005

Stock dynamics of sandeel in the North Sea and sub-regions including uncertainties

General information
State: Published
Organisations: Section for Population- and Ecosystem Dynamics, National Institute of Aquatic Resources, Section for Fisheries Advice
Contributors: Lewy, P., Nielsen, A., Gislason, H.
Pages: 237-248
Publication date: 2004
Peer-reviewed: Yes

Publication information
Journal: Fisheries Research
Volume: 68
Issue number: 1/3
ISSN (Print): 0165-7836
Ratings:

BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Scopus rating (2017): CiteScore 1.94 SJR 0.941 SNIP 0.959
Web of Science (2017): Impact factor 1.874
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.21 SJR 1.183 SNIP 1.153
Web of Science (2016): Impact factor 2.185
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): CiteScore 2.01 SJR 1.092 SNIP 1.131
Web of Science (2015): Impact factor 2.23
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): CiteScore 2.17 SJR 1.122 SNIP 1.305
Web of Science (2014): Impact factor 1.903
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): CiteScore 1.85 SJR 1.049 SNIP 1.167
Web of Science (2013): Impact factor 1.843
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): CiteScore 1.78 SJR 0.948 SNIP 1.189
Web of Science (2012): Impact factor 1.695
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): CiteScore 1.7 SJR 1.162 SNIP 1.142
Web of Science (2011): Impact factor 1.586
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 1.063 SNIP 1.107
Web of Science (2010): Impact factor 1.656
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 0.994 SNIP 1.068
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 2
Scopus rating (2008): SJR 0.946 SNIP 1.136
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 1.031 SNIP 1.079
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 1.028 SNIP 1.274
Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 0.924 SNIP 1.139
Web of Science (2005): Indexed yes
Scopus rating (2004): SJR 0.964 SNIP 1.032
Web of Science (2004): Indexed yes
Scopus rating (2003): SJR 1.078 SNIP 1.29
Using AMOEBA's to display trade-offs in multispecies fisheries

General information
State: Published
Organisations: University of Rhode Island, University of Copenhagen, Danish Institute for Fisheries Research
Contributors: Collie, J. S., Gislason, H., Vinther, M.
Number of pages: 489
Publication date: 2004

Host publication information
Editor: Coleman, F. C.
(Bulletin of Marine Science; No. 74:3).
Source: orbit
Source-ID: 282330
Research output: Research - Article in proceedings – Annual report year: 2004

Changes in the North Sea fish community: evidence of indirect effects of fishing?

General information
State: Published
Organisations: Section for Population- and Ecosystem Dynamics, National Institute of Aquatic Resources
Contributors: Daan, N., Gislason, H., Pope, J., Rice, J.
Pages: 1-11
Publication date: 2003
Peer-reviewed: No

Publication information
Journal: ICES C.M. 2003/
Volume: N:10
Original language: English
Source: orbit
Source-ID: 225165
Research output: Research › Conference article – Annual report year: 2003

Changes in the size structure of the North Sea fish community

General information
State: Published
Organisations: Fisheries and Oceans Canada, Danish Institute for Fisheries and Marine Research
Contributors: Daan, N., Gislason, H., Pope, J., Rice, J.
Publication date: 2003
Peer-reviewed: No

Publication information
Journal: ICES C.M.
The effects of fishing on non-target species and ecosystem structure and function

General information
State: Published
Organisations: Section for Population- and Ecosystem Dynamics, National Institute of Aquatic Resources
Contributors: Gislason, H.
Pages: 255-274
Publication date: 2003

Host publication information
Title of host publication: Responsible fisheries in marine ecosystem
Volume: 15
Place of publication: Rome, New York
Publisher: FAO, CABI publ.
Editors: Sinclair, M., Valdimarsson, G.
ISBN (Print): 0-85199-633-7
Source: orbit
Source-ID: 225515
Research output: Research - peer-review › Book chapter – Annual report year: 2003

Using AMOEBA to display multispecies, multifleet fisheries advice

General information
State: Published
Organisations: Section for Population- and Ecosystem Dynamics, National Institute of Aquatic Resources, Section for Fisheries Advice
Contributors: Collie, J., Gislason, H., Vinther, M.
Pages: 709-720
Publication date: 2003
Peer-reviewed: Yes

Publication information
Journal: I C E S Journal of Marine Science
Volume: 60
Issue number: 4
ISSN (Print): 1054-3139
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Scopus rating (2017): CiteScore 2.98
Web of Science (2017): Impact factor 2.906
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.63
Web of Science (2016): Impact factor 2.76
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): CiteScore 2.18
Web of Science (2015): Impact factor 2.626
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): CiteScore 2.62
Web of Science (2014): Impact factor 2.377
A comparative analysis of the North Sea based on Ecopath with Ecosim and multi-species virtual population analysis

General information
State: Published
Organisations: Danish Institute for Fisheries and Marine Research, University of Copenhagen
Contributors: Christensen, V., Beyer, J., Gislason, H., Vinther, M.
Number of pages: 48
Publication date: 2002

Host publication information
Title of host publication: Proceedings of the INCO-DC Conference Placing Fisheries in their Ecosystem Context
Source: orbit
Source-ID: 282334
Research output: Research › Conference abstract in proceedings – Annual report year: 2002

Biological reference points for fish stocks in a multispecies context
Biological reference points (BRPs) are widely used to define safe levels of harvesting for marine fish populations. Most BRPs are either minimum acceptable biomass levels or maximum fishing mortality rates. The values of BRPs are determined from historical abundance data and the life-history parameters of the fish species. However, when the life-history parameters change over time, the BRPs become moving targets. In particular, the natural mortality rate of prey
species depends on predator levels; conversely, predator growth rates depend on prey availability. We tested a suite of BRPs for their robustness to observed changes in natural mortality and growth rates. We used the relatively simple Baltic Sea fish community for this sensitivity test, with cod as predator and sprat and herring as prey. In general, the BRPs were much more sensitive to the changes in natural mortality rates than to growth variation. For a prey species like sprat, fishing mortality reference levels should be conditioned on the level of predation mortality. For a predator species, a conservative level of fishing mortality can be identified that will prevent growth overfishing and ensure stock replacement. These first-order multispecies interactions should be considered when defining BRPs for medium-term (5-10 year) management decisions.

General information
State: Published
Organisations: Section for Population- and Ecosystem Dynamics, National Institute of Aquatic Resources
Contributors: Collie, J., Gislason, H.
Pages: 2167-2176
Publication date: 2001
Peer-reviewed: Yes

Publication information
Journal: Canadian Journal of Fisheries and Aquatic Sciences
Volume: 58
Issue number: 11
ISSN (Print): 0706-652X
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Scopus rating (2017): CiteScore 2.44 SJR 1.329 SNIP 1.036
Web of Science (2017): Impact factor 2.631
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 2.56 SJR 1.388 SNIP 1.185
Web of Science (2016): Impact factor 2.466
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): CiteScore 2.22 SJR 1.267 SNIP 1.025
Web of Science (2015): Impact factor 2.437
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): CiteScore 2.6 SJR 1.476 SNIP 1.379
Web of Science (2014): Impact factor 2.287
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): CiteScore 2.25 SJR 1.439 SNIP 1.086
Web of Science (2013): Impact factor 2.276
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): CiteScore 2.29 SJR 1.359 SNIP 1.232
Web of Science (2012): Impact factor 2.323
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): CiteScore 2.13 SJR 1.452 SNIP 1.136
Web of Science (2011): Impact factor 2.213
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 1.466 SNIP 1.154
Report of a private working group

We address the issue ofwedding fisheries management to ecosystem management and in particular put forward ideas about the construction of neutral models for investigating community assembly rules and testing ecological hypotheses. To build a statistical model that mimics the North Sea fish community, we derived distributions of relevant parameters such as k-dominance curves, maximum length, log abundance, and species richness from survey data. Subsequently, abundance and distribution of 100 species was modelled in MATLAB based on the lognormal distribution of species abundance observed in the North Sea and varying assumptions of annual variations in \( \mu \), \( s \) and in the center of distribution. The hypothetical community was sampled annually to investigate temporal developments in emergent properties such as species richness and rarity indices and these were compared with survey estimates of the same 2 parameters. In addition, an old idea of using MSVPA and MSFOR results to fit multispecies Schaeffer Models was elaborated, and some ideas are presented on possibilities to simulate multispecies, size structured communities and on potential measures of level of exploitation of fish communities as a basis for ecosystem comparison.

General information

State: Published
Organisations: Unknown
Contributors: Pope, J., Daan, N., Gislason, H., Rice, J.
Publication date: 2001
Peer-reviewed: No

Publication information

Journal: ICES C.M.
Volume: T:05
Original language: English
URLs:
Source: orbit
Source-ID: 225147
Research output: Research - peer-review › Journal article – Annual report year: 2001
Using AMOEBAss to integrate multispecies, multifleet fisheries advice

General information
State: Published
Organisations: Section for Population- and Ecosystem Dynamics, National Institute of Aquatic Resources, Section for Fisheries Advice
Contributors: Collie, J., Gislason, H., Vinther, M.
Pages: 1-25
Publication date: 2001
Peer-reviewed: No

Publication information
Journal: ICES C.M. 2001/
Volume: T:01
Original language: English
Source: orbit
Source-ID: 225146
Research output: Research › Conference article – Annual report year: 2001

Ecosystem effects of fishing - Introduction

General information
State: Published
Organisations: Section for Population- and Ecosystem Dynamics, National Institute of Aquatic Resources
Contributors: Gislason, H., Sinclair, M.
Pages: 466-467
Publication date: 2000
Peer-reviewed: Yes

Publication information
Journal: ICES Journal of Marine Science
Volume: 57
Issue number: 3
ISSN (Print): 1054-3139
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Scopus rating (2017): CiteScore 2.98
Web of Science (2017): Impact factor 2.906
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.63
Web of Science (2016): Impact factor 2.76
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): CiteScore 2.18
Web of Science (2015): Impact factor 2.626
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): CiteScore 2.62
Web of Science (2014): Impact factor 2.377
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): CiteScore 2.46
Web of Science (2013): Impact factor 2.525
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
Impact of fishing on size composition and diversity of demersal fish communities

By analysing data sets from different world regions we add evidence to documented changes in demersal fish community structure that may be related to fishing. Changes are analysed by community properties that might be expected to capture relevant overall changes - size spectra slopes and intercepts, Shannon-Wiener diversity, and dominance. Cross-system differences in the shape of the integrated community size spectra appear to be related to ecosystem productivity. The slope of size spectra appears to respond in a consistent way to changes in exploitation levels. In most areas studied, but particularly in high-latitude regions, we observe a decreasing trend in the slope, reflecting changes in size composition toward a relative decline in larger fish. The results from tropical regions are less conclusive, partly owing to the difficulty in obtaining consistent data series, but probably also because the generally higher growth rates of the constituent species make the slope less sensitive to changes in fishing. No evidence was found of any decline in species richness, while changes in diversity (richness and evenness) were caused either by changes in patterns of dominance or by changes in the number of species identified resulting from improved survey protocols. (C) 2000 International Council for the Exploration of the Sea
Symposium overview: incorporating ecosystem objectives within fisheries management

Following an introduction to the broader context of the Symposium, the score of the oral presentations is summarized under three themes: a global synthesis of fisheries impacts in different ecosystems; an overview of the methods available for quantifying ecosystem impacts; and the integration of fisheries and environmental management. The presentations generated substantial evidence that marine ecosystems have been impacted by fishing. Also there appeared to be a broad consensus that the present approach to achieving conservation objectives of fisheries management does not sufficiently take into account ecosystem considerations. There was not, however, a consensus on what additional restrictions are required, or on what features of ecosystems need to be protected. A way forward is to add ecosystem objectives to the conservation component of fisheries management plans, as well as to the management plans for other ocean-use setters. The aggregate ocean-use activities would need to be evaluated in a nested manner, at a range of geographic scales, in relation to the more broadly defined conservation objectives. It is suggested that the geographic scales for evaluation of ecosystem considerations could be defined in a pragmatic manner based on the somewhat artificial boundaries of political and administrative systems already in place. The six conservation objectives proposed are maintenance of (1) ecosystem diversity, (2) species diversity, (3) genetic variability within species, (4) directly impacted species, (5) ecologically dependent species, and (6) trophic level balance. Indicators for each objective are discussed, as well as reference points that would trigger management actions. Such a broadening of conservation objectives for fisheries management would require both enhanced monitoring and a greater workload added to the process of provision of scientific advice through peer review. Of equal importance would be the challenges of establishing a governance framework to address multiple uses of marine resources. The spirit of the Symposium was that these coupled scientific and governance challenges will be very stimulating. (C) 2000 International Council for the Exploration of the Sea.

General information
State: Published
Organisations: Section for Population- and Ecosystem Dynamics, National Institute of Aquatic Resources
Contributors: Gislason, H., Sinclair, M., Sainsbury, K., O'Boyle, R.
Pages: 468-475
Publication date: 2000
Peer-reviewed: Yes

Publication information
Journal: ICES Journal of Marine Science
Volume: 57
Issue number: 3
ISSN (Print): 1054-3139
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Scopus rating (2017): CiteScore 2.98
Web of Science (2017): Impact factor 2.906
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.63
Web of Science (2016): Impact factor 2.76
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): CiteScore 2.18
Web of Science (2015): Impact factor 2.626
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): CiteScore 2.62
Web of Science (2014): Impact factor 2.377
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): CiteScore 2.46
Web of Science (2013): Impact factor 2.525
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
Using continuation-ratio logits to analyze the variation of the age composition of fish catches

Major sources of information for the estimation of the size of the fish stocks and the rate of their exploitation are samples from which the age composition of catches may be determined. However, the age composition in the catches often varies as a result of several factors. Stratification of the sampling is desirable, because it leads to better estimates of the age composition, and the corresponding variances and covariances. The analysis is impeded by the fact that the response is ordered categorical. This paper introduces an easily applicable method to analyze such data. The method combines continuation-ratio logits and the theory for generalized linear mixed models. Continuation-ratio logits are designed for ordered multinomial response and have the feature that the associated log-likelihood splits into separate terms for each category levels. Thus, generalized linear mixed models can be applied separately to each level of the logits. The method is illustrated by the analysis of age-composition data collected from the Danish sandeel fishery in the North Sea in 1993. The significance of possible sources of variation is evaluated, and formulae for estimating the proportions of each age group and their variance-covariance matrix are derived.

General information
State: Published
Organisations: Department of Informatics and Mathematical Modeling, Section for Population- and Ecosystem Dynamics, National Institute of Aquatic Resources
Contributors: Kvist, T., Gislason, H., Thyregod, P.
Pages: 303-319
Publication date: 2000
Peer-reviewed: Yes

Publication information
Journal: Journal of Applied Statistics
Volume: 27
Issue number: 3
ISSN (Print): 0266-4763
Analysing the Age-composition of Fish by Means of Continuation-ratio Logits
Modeling environmentally driven uncertainties in Baltic cod (Gadus morhua) by Bayesian influence diagrams

General information
State: Published
Organisations: Section for Population- and Ecosystem Dynamics, National Institute of Aquatic Resources
Contributors: Kuikka, S., Hildén, M., Gislason, H., Hansson, S., Sparholt, H., Varis, O.
Pages: 629-641
Publication date: 1999
Peer-reviewed: Yes

Publication information
Journal: Canadian Journal of Fisheries and Aquatic Sciences
Volume: 56
Issue number: 4
ISSN (Print): 0706-652X
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Scopus rating (2017): CiteScore 2.44 SJR 1.329 SNIP 1.036
Web of Science (2017): Impact factor 2.631
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 2.56 SJR 1.388 SNIP 1.185
Web of Science (2016): Impact factor 2.466
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): CiteScore 2.22 SJR 1.267 SNIP 1.025
Web of Science (2015): Impact factor 2.437
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): CiteScore 2.6 SJR 1.476 SNIP 1.379
Web of Science (2014): Impact factor 2.287
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): CiteScore 2.25 SJR 1.439 SNIP 1.086
Web of Science (2013): Impact factor 2.276
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): CiteScore 2.29 SJR 1.359 SNIP 1.232
Web of Science (2012): Impact factor 2.323
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
Single and multispecies reference points for Baltic fish stocks

Single and multispecies models are used to examine the effect of species interaction on biological reference points for cod, herring, and sprat in the Baltic. The results demonstrate that reference points are different in single and multispecies contexts. Reference points for fishing mortality based on single-species yield and SSB calculations are difficult to use when natural mortality depends on the absolute abundance of the predators and their alternative prey. Reference points based on maximizing total yield from the system may lead to impractical results when species interact. Multispecies predictions suggest that the cod stock in the Baltic should be reduced to a very low level of biomass in order to benefit from the higher productivity of herring and sprat, its major prey. Such a result stresses the need for incorporating socio-economic considerations in the definition of target reference points. Management advice based on biomass reference points will also differ. In the single species situation the combinations of cod and pelagic fishing effort for which the equilibrium spawning-stock biomass of the three species is above the biomass reference points forms a rectangular area. When biological interaction is taken into account the limits of this area becomes curved. Reference limits for forage fish cannot be defined without considering changes in the biomass of their natural predators. Likewise, reference limits for predators cannot be defined without considering changes in the biomass of their prey. (C) 1999 International Council for the Exploration of the Sea.
Does the diet of cod and whiting reflect the species composition estimated from trawl surveys?

General information
State: Published
Organisations: Section for Population- and Ecosystem Dynamics, National Institute of Aquatic Resources
Contributors: Rindorf, A., Gislason, H., Lewy, P.
Pages: 1-23
Publication date: 1998
Peer-reviewed: No

Publication information
Journal: ICES CM 1998/
Volume: CC:5
Original language: English
Source: orbit
Source-ID: 227287
Research output: Research › Conference article – Annual report year: 1998

Feeding ecology of North Sea fish with emphasis on the data of the Stomach Sampling Project 1991 for use in multispecies assessment

General information
State: Published
Organisations: Institute of Marine Research, Danish Institute for Fisheries and Marine Research
Contributors: Adlerstein, S., Dietrich, S., Hislop, J., Gislason, H., Skagen, D., Daan, N.
Pages: 257-261
Publication date: 1998

Host publication information
Title of host publication: Project Synopsis : Fisheries and Aquaculture (AIR: 1990-94)
Volume: 5

Bibliographical note
Selected projects from the research programme for Agriculture and Agro-Industry including Fisheries. European Commission DG 12 Science, Research and Development, Luxembourg (Luxembourg), 1998
Source: orbit
Source-ID: 282302
Research output: Research › Article in proceedings – Annual report year: 1998

Is the industrial fishery in the North Sea sustainable?

General information
State: Published
Organisations: Section for Population- and Ecosystem Dynamics, National Institute of Aquatic Resources, Institute Management
Contributors: Gislason, H., Kirkegaard, E.
Pages: 195-208
Publication date: 1998

Host publication information
Title of host publication: Northern Waters: Management Issues and Practices
Place of publication: Oxford
Publisher: Fishing News Books
Editor: Symes, D.
Source: orbit
Source-ID: 225507
Mini-Symposium on Ecosystem Effects of Fishing, 1996 - Introduction

General information
State: Published
Organisations: Section for Population- and Ecosystem Dynamics, National Institute of Aquatic Resources
Contributors: Gislason, H., Rice, J.
Pages: 329-329
Publication date: 1998
Peer-reviewed: Yes

Publication information
Journal: I C E S Journal of Marine Science
Volume: 55
Issue number: 3
ISSN (Print): 1054-3139
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Scopus rating (2017): CiteScore 2.98
Web of Science (2017): Impact factor 2.906
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.63
Web of Science (2016): Impact factor 2.76
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): CiteScore 2.18
Web of Science (2015): Impact factor 2.626
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): CiteScore 2.62
Web of Science (2014): Impact factor 2.377
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): CiteScore 2.46
Web of Science (2013): Impact factor 2.525
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): CiteScore 2.35
Web of Science (2012): Impact factor 2.277
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): CiteScore 2.32
Web of Science (2011): Impact factor 2.007
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Web of Science (2010): Impact factor 1.808
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Web of Science (2009): Indexed yes
Modelling the response of size and diversity spectra of fish assemblages to changes in exploitation

In this paper we investigate whether single and multispecies fisheries models can be used to predict the response of size and diversity spectra of fish assemblages to changes in exploitation. Both types of models estimate that the slope of the size spectrum will steepen and the intercept will increase when fishing intensity increases, while the response of the slope and intercept of the diversity spectrum depend on the model used. The changes in the slope and intercept of the size spectrum are found to be proportional to the change in fishing intensity. The proportionality is insensitive to changes in natural mortality, but sensitive to changes in growth and to the relationship between stock and recruitment. The results agree well with results obtained from previous analysis of survey data from the North Sea and suggest that the slope of the size spectrum is a useful measure of fishing impacts. (C) 1998 International Council for the Exploration of the Sea.
Population structure in the lesser sandeel (Ammodytes marinus) and its implications for fishery-predator interactions

General information
State: Published
Organisations: Section for Ocean Ecology and Climate, National Institute of Aquatic Resources, Section for Population-and Ecosystem Dynamics
Number of pages: 200
Publication date: 1998

Publication information
Publisher: [s.n.]
Original language: English
(Final EC Report. DG XIV Contract; No. 94/071).
Source: orbit

Bibliographical note
J English Article JUN 101KH Gislason H Univ Copenhagen, Danish Inst Fisheries Res, Charlottenlund Slot, DK-2920 Charlottenlund, Denmark ICES J MAR SCI
Source: orbit
Source-ID: 225510
Research output: Research - peer-review › Journal article – Annual report year: 1998

DOI: 10.1006/jmsc.1997.0323
Changes in length at age of North Sea whiting, 1980-95

This paper analyses the changes in length at age for North Sea whiting Merlangus merlangus in the period from 1980 to 1995 based on data collected by the International Bottom Trawl survey. The results show that length at age is larger for females than for males. This difference between the sexes depends on the area and does not change with time. For both sexes and in both areas there has been a significant decrease in length at age over time. The decrease is most pronounced for the older age groups.

Database report of the Stomach Sampling Project, 1991

Feeding ecology of North Sea fish with emphasis on the database of "Stomach Sampling Project 1991" for use in multispecies assessment. Final progress report, EU financed study
On the linear relationship between fishing effort and the slope of the size spectrum

General information
State: Published
Organisations: Section for Population- and Ecosystem Dynamics, National Institute of Aquatic Resources
Contributors: Gislason, H., Lassen, H.
Publication date: 1997
Peer-reviewed: No

Publication information
Journal: ICES CM 1997/
Volume: DD:05
Original language: English
Source: orbit
Source-ID: 225511
Research output: Research › Conference article – Annual report year: 1997

The industrial fishery and the North Sea sandeel stock

General information
State: Published
Organisations: Section for Population- and Ecosystem Dynamics, National Institute of Aquatic Resources, Institute Management
Contributors: Gislason, H., Kirkegaard, E.
Publication date: 1997

Publication information
Publisher: [s.n.]
Original language: English
(Fisken og Havet; No. 1-1997).

Bibliographical note
Seminar report: The Precautionary Approach to North Sea Fisheries Management
Source: orbit
Source-ID: 225516
Research output: Research › Report – Annual report year: 1997

Fiskeriets modeller: Forvaltning på et objektivt grundlag?

General information
State: Published
Organisations: Section for Population- and Ecosystem Dynamics, National Institute of Aquatic Resources, Institute Management
Contributors: Gislason, H., Kirkegaard, E.
Pages: 9-12
Publication date: 1996
Peer-reviewed: No

Publication information
Journal: Samfundsoekonomen
Volume: 2
ISSN (Print): 0108-3937
Ratings:
BFI (2018): BFI-level 1
BFI (2017): BFI-level 1
BFI (2016): BFI-level 1
BFI (2015): BFI-level 1
BFI (2014): BFI-level 1
BFI (2013): BFI-level 1
ISI indexed (2013): ISI indexed no
BFI (2012): BFI-level 1
ISI indexed (2012): ISI indexed no
Modelling the effect of changes in fishing effort on the size and diversity spectra of exploited fish assemblages

General information
State: Published
Organisations: Section for Population- and Ecosystem Dynamics, National Institute of Aquatic Resources
Contributors: Gislason, H., Rice, J.
Publication date: 1996
Peer-reviewed: No

Publication information
Journal: ICES CM 1996/
Volume: Mini:15
Original language: English
Source: orbit
Source-ID: 225509
Research output: Research › Conference article – Annual report year: 1996

Patterns of change in the size spectra of numbers and diversity of the North Sea fish assemblage, as reflected in surveys and models

Trends were analysed over two decades in the size spectra of numbers and diversity of the North Sea fish assemblage. Trawl survey data, the abundance spectrum was smoothly linear each year. Bath slopes and intercepts increased significantly over the period, reflecting the effects of fishing. The diversity size spectrum was curvilinear, with diversity increasing among smaller sizes and decreasing linearly over larger sizes. The slope of the linear component of the spectrum varied with a multi-year pattern but without an overall trend. The much greater stability of the diversity spectrum compared with the abundance spectrum suggests that the fish community structure has remained fairly stable over the period, despite significant increases in harvesting on component populations. To explore the hypothesis that the regulation of the community structure arises from trophic interactions, the same community metrics were calculated from the output of a multi-species virtual population analysis of the major exploited fish predators and prey, parameterized with extensive catch data and feeding habits. Although many fewer species were included in the modelled assemblage than in the survey data, overall patterns were very similar. Annual abundance spectra were linear and slopes increased significantly and fairly smoothly over the 20 years, indicating significant effects of fishing on the size composition of the exploited fish assemblage. The annual diversity spectra were more dome-shaped than in the survey data. The shape showed no overall trend, but diversity of smaller size classes showed a different temporal pattern from the diversity of intermediate and large size classes. The patterns in modelled output are consistent with, but do not prove, the hypothesis that trophic interactions are an important factor in the fish community structure in the North Sea. (C) 1996 International Council for the Exploration of the Sea.

General information
State: Published
Organisations: Section for Population- and Ecosystem Dynamics, National Institute of Aquatic Resources
Contributors: Rice, J., Gislason, H.
Pages: 1214-1225
Publication date: 1996
Peer-reviewed: Yes

Publication information
Journal: ICES Journal of Marine Science
Volume: 53
Issue number: 6
ISSN (Print): 1054-3139
Ratings:

BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Ecosystem effects of fishing activities in the North Sea
The North Sea harbours an intensive fishery which removes between 30 and 40% of the biomass of exploited fish species each year. In addition fishing causes mortality of non-target species of benthos, fish, seabirds and mammals. Heavy towed gears disturb the uppermost layer of the seabed and cause mortality of benthos, while gillnets accidentally entangle seabirds and marine mammals. Unwanted catch is usually returned to the sea where it is eaten by scavenging species, such as seabirds. Since the North Sea ecosystem is highly complex and exhibits a high natural variability, it has proved difficult to isolate the longer term consequences of these impacts. Until more is known about the environmental impact of fisheries management, action (or no action) will have to be agreed upon in the light of considerable scientific uncertainty.
Some thoughts on the incorporation of areas and migrations in MSVPA

General information
Effect of changes in recruitment levels on multispecies long-term predictions

A multispecies model (MSFOR) is used to predict the relative change in equilibrium yield and spawning stock biomass (SSB) of commercially important fish stocks in the North Sea resulting from a reduction in the fishing mortality generated by the roundfish fishery. Because predation mortality is a function of the abundance of prey and predators the results will depend on recruitment. Assuming recruitment to be independent of stock sizes the effect of changes in recruitment is studied by repeating the predictions at all possible combinations of +50% and -50% changes in predator and prey recruitment levels. All of the predictions result in a relative increase in the SSB of Atlantic cod (Gadus morhua) and saithe (Pollachius virens) and in a relative decrease in the SSB of Atlantic herring (Clupea harengus) and Norway pout (Trisopterus esmarkii). In these cases the sign of the relative change is robust to recruitment changes. However, for haddock (Melanogrammus aeglefinus), sprat (Sprattus sprattus), and sandeel (Ammodytes marinus) the relative change in SSB is found to be either positive or negative depending on the level of recruitment. The predictions for haddock are highly sensitive to changes in the level of saithe recruitment.
Fishing mortality and the variation of catches: A time series approach

The effect of fishing mortality on the variation of yield is re-examined, with particular attention to the changes of stock size from one year to the next. Using the SHOT model of the stock dynamics, we show that the year-on-year variability of the exploitable biomass increases roughly in proportion to the fishing mortality. The theory is further developed by means of an age-structured model which takes account of the exploitation pattern (the fishing mortality as a function of age). We determined the condition for minimum variability. The corresponding exploitation pattern is not unique but depends on the fishing mortality on the recruiting year class. We discuss the relationship between the exploitation pattern and the selectivity of the fishing gears used to exploit the stock. As an example, the theory is applied to the cod stock in the North Sea. We show how the variability of the yield depends on the fishing effort through the number of year-classes contributing
to the fishery. The effect of changing the exploitation pattern is considered. It appears that the optimum gear selectively function for the lowest variability of yield depends on the level of exploitation. When the exploitation is high, it is better to have a selectivity function which increases steadily with age, rather than the S-shaped to give which is commonly believed to be more desirable. We conclude that the reduction of stability due to heavy exploitation, and the improvement available through effort reduction and/or technical measures to control the selectivity of fishing gear, are much larger than indicated by previous work which considered only the variation of yield about its mean level.

**General information**
State: Published
Organisations: Marine Laboratory, Department for Environment, Food and Rural Affairs, Danish Institute for Fisheries and Marine Research
Contributors: MacLennan, D. N., Shepherd, J., Pope, J., Gislason, H.
Pages: 425-430
Publication date: 1992
Peer-reviewed: Yes

**Publication information**
Volume: 49
Issue number: 4
ISSN (Print): 1054-3139
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Scopus rating (2017): CiteScore 2.98
Web of Science (2017): Impact factor 2.906
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.63
Web of Science (2016): Impact factor 2.76
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): CiteScore 2.18
Web of Science (2015): Impact factor 2.626
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): CiteScore 2.62
Web of Science (2014): Impact factor 2.377
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): CiteScore 2.46
Web of Science (2013): Impact factor 2.525
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): CiteScore 2.35
Web of Science (2012): Impact factor 2.277
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): CiteScore 2.32
Web of Science (2011): Impact factor 2.007
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Web of Science (2010): Impact factor 1.808
Fiskeriet og Nordsøens miljø

General information
State: Published
Organisations: Danish Institute for Fisheries and Marine Research
Contributors: Gislason, H.
Pages: 3-13
Publication date: 1992
Peer-reviewed: No

Publication information
Journal: Fisk og Hav
Issue number: 42
ISSN (Print): 0105-9211
Ratings:
ISI indexed (2013): ISI indexed no
ISI indexed (2012): ISI indexed no
ISI indexed (2011): ISI indexed no
Original language: Danish
Source: orbit
Source-ID: 281931
Research output: Research - Journal article – Annual report year: 1992

MSVPA and prey/predator switching

General information
State: Published
Organisations: Danish Institute for Fisheries and Marine Research
Contributors: Larsen, J. R., Gislason, H.
Pages: 11
Publication date: 1992
Peer-reviewed: No

Publication information
Journal: ICES C.M.
Volume: G:42
Original language: English

Bibliographical note
Also published as: DF&H rapport, nr. 447
Source: orbit
Sensitivity analysis of Multispecies Assessments and Predictions for the North Sea

General information
State: Published
Organisations: Unknown
Contributors: Finn, J., Idoine, J., Gislason, H.
Publication date: 1991
Peer-reviewed: No

Publication information
Journal: ICES C.M.
Volume: D:7
Original language: English
Source: orbit
Source-ID: 282267
Research output: Research › Conference article – Annual report year: 1991

The influence of variations in recruitment on multispecies yield predictions in the North Sea

General information
State: Published
Organisations: International Council for the Exploration of the Sea
Contributors: Gislason, H.
Pages: 50-59
Publication date: 1991
Peer-reviewed: Yes

Publication information
Journal: IC E S Marine Science Symposia
Volume: 193
ISSN (Print): 0906-060X
Ratings:
Web of Science (2018): Indexed yes
Scopus rating (2017): CiteScore 2.98
Web of Science (2017): Impact factor 2.906
Web of Science (2017): Indexed yes
Scopus rating (2016): CiteScore 2.63
Web of Science (2016): Impact factor 2.76
Web of Science (2016): Indexed yes
Scopus rating (2015): CiteScore 2.18
Web of Science (2015): Impact factor 2.626
Web of Science (2015): Indexed yes
Scopus rating (2014): CiteScore 2.62
Web of Science (2014): Impact factor 2.377
Web of Science (2014): Indexed yes
Scopus rating (2013): CiteScore 2.46
Web of Science (2013): Impact factor 2.525
Web of Science (2013): Indexed yes
Scopus rating (2012): CiteScore 2.35
Web of Science (2012): Impact factor 2.277
ISI indexed (2012): ISI indexed no
Web of Science (2012): Indexed yes
Scopus rating (2011): CiteScore 2.32
Web of Science (2011): Impact factor 2.007
ISI indexed (2011): ISI indexed no
Web of Science (2011): Indexed yes
The stability of estimates of suitabilities in MSVPA over 4 years of data from predator stomachs

General information
State: Published
Organisations: Unknown
Contributors: Rice, J., Daan, N., Pope, J., Gislason, H.
Pages: 34-45
Publication date: 1991
Peer-reviewed: Yes

Publication information
Journal: MULTISPECIES MODELS RELEVANT TO MANAGEMENT OF LIVING RESOURCES
Volume: 193
Original language: English
Source: orbit
Source-ID: 281900
Research output: Research - peer-review › Journal article – Annual report year: 1991

Fishing patterns and yield variations

General information
State: Published
Organisations: Danish Institute for Fisheries and Marine Research
Contributors: Gislason, H.
Pages: 9
Publication date: 1990
Peer-reviewed: No

Publication information
Journal: ICES C.M.
Volume: G:30
Original language: English

Bibliographical note
Also published as: DF&H rapport, nr. 385
Source: orbit
Source-ID: 281913
Research output: Research › Conference article – Annual report year: 1990

Multispecies yield and SSB curves for North Sea cod, haddock and whiting

General information
State: Published
Organisations: Danish Institute for Fisheries and Marine Research
**The influence of variations in recruitment on multispecies yield predictions in the North Sea**

**General information**
State: Published
Organisations: International Council for the Exploration of the Sea
Contributors: Gislason, H.
Number of pages: 18
Publication date: 1990

**Publication information**
Place of publication: Charlottenlund
Publisher: Danish Institute for Fisheries and Marine Research
Original language: English
(DFH rapport; No. 365a).
Source: orbit
Source-ID: 281915
Research output: Research › Report – Annual report year: 1990

**An assessment of the stock of scad and mackerel at Sofala Bank and Boa Paz, Mozambique**

**General information**
State: Published
Organisations: Danish Institute for Fisheries and Marine Research
Contributors: Gislason, H., Sousa, M.
Pages: 89-141
Publication date: 1989
Peer-reviewed: No

**Publication information**
Journal: Revista de Investigacao Pesqueira
Volume: 19
ISSN (Print): 1016-9601
Ratings:
- ISI indexed (2013): ISI indexed no
- ISI indexed (2012): ISI indexed no
- ISI indexed (2011): ISI indexed no
Original language: English
Source: orbit
Source-ID: 281962
Research output: Research › Journal article – Annual report year: 1989

**Flæartsmøller og rådgivning**

**General information**
State: Published
Organisations: Danish Institute for Fisheries and Marine Research
Contributors: Gislason, H.
Pages: 55-60
Publication date: 1989
Peer-reviewed: No
Results of a stratified random bottom trawl survey for scad and mackerel in Mozambican waters, from May to June 1984

Some observations on the food selection of plaice and dab in Øresund, Denmark

Some theoretical aspects of the implementation of virtual population analysis in ICES
A preliminary assessment of the scad and mackerel stocks at Sofala Bank, Mozambique

General information
State: Published
Organisations: Danish Institute for Fisheries and Marine Research
Contributors: Borges, F., Gislason, H., Sousa, M.
Pages: 37-107
Publication date: 1985
Peer-reviewed: No

Publication information
Journal: ICES C.M.
Volume: G:51
Original language: English

Bibliographical note
Also published as: DF&H rapport, nr. 299
Source: orbit
Source-ID: 281917
Research output: Research › Conference article – Annual report year: 1987

A short note on the available information about demersal fish on the shallow part of Sofala Bank

General information
State: Published
Organisations: Danish Institute for Fisheries and Marine Research
Contributors: Gislason, H.
Pages: 83-95
Publication date: 1985
Peer-reviewed: No

Publication information
Journal: Revista de Investigacao Pesqueira
Volume: 12
ISSN (Print): 1016-9601
Ratings:
ISI indexed (2013): ISI indexed no
ISI indexed (2012): ISI indexed no
ISI indexed (2011): ISI indexed no
Original language: English
Source: orbit
Source-ID: 282266
Research output: Research › Journal article – Annual report year: 1984

Biology, stock size and catch of small pelagic fish along the coast of Mozambique
Reproduction, age and growth of the Indian mackerel, Rastrelliger kanagurta (Cuvier, 1816) from Sofala Bank, Mozambique

Species interaction in assessment of fish stocks with special application to the North Sea

A multispecies Virtual Population Analysis model is presented in which natural mortality is split into a variable mortality due to predation and a constant mortality due to other causes. Predation is calculated within the model from the food selection of the predators, their yearly food intake and the average stock sizes. The model is tested on a set of data from the North Sea. The results indicate that predation is very important. On average the total biomass of fish dead due to predation amounts to 1.6 times that removed by the fishery. Furthermore the introduction of predation mortality changes the exploitation pattern calculated by traditional VPA.
A preliminary estimate of the yearly intake of fish by saithe in the North Sea

General information
State: Published
Organisations: Danish Institute for Fisheries and Marine Research
Contributors: Gislason, H.
Number of pages: 31
Publication date: 1983
Peer-reviewed: No

Publication information
Journal: ICES C.M.
Volume: G:52
Original language: English

Bibliographical note
Also published as: Intern rapport / Danmarks Fiskeri- og Havundersøgelser, nr. 212.

Fødekæden i Roskilde Fjord

General information
State: Published
Organisations: Unknown
Contributors: Gislason, H.
Pages: 23-28
Publication date: 1981
Peer-reviewed: No

Publication information
Journal: Fisk og Hav
Issue number: 38
ISSN (Print): 0105-9211
Ratings:
ISI indexed (2013): ISI indexed no
ISI indexed (2012): ISI indexed no
ISI indexed (2011): ISI indexed no
Original language: Danish
Source: orbit
Source-ID: 281935
Research output: Research › Journal article – Annual report year: 1981

VPA-analysis with special interaction due to predation

General information
State: Published
Organisations: Unknown
Contributors: Helgason, T., Gislason, H.
Pages: 10
Publication date: 1979
Peer-reviewed: No

Publication information
Projects:

**Sand banks and fisheries impact in relation to EU fisheries and environmental policy (39519)**

Objective of the project: The project will improve the knowledge base for ongoing and upcoming Natura 2000 and MSFD implementations in the North Sea. For nature-type 'sand banks', in particular Danish sandeel and plaice fishing will be affected. Activities in the project: The key activities of the project are targeted method developments and knowledge production in relation to EU fisheries and environmental policy: 1) Development of a gear and sediment-specific model for bottom impact from all types of mobile bottom-contacting fishing gears in the North Sea. 2) Field trials to document short-term impact on sandbank fauna from demersal seine fishery. 3) Analyses of data from the seine gear field trials and of existing data for the impact of sandbanks from trawlers, including impact differences between bottom and floating trawl doors. 4) Estimation of sediment impact from natural disturbance on sand banks (e.g. tide and wave impact) as well as scaling of these in relation to physical effects of different types of gear. 5) Integrated analysis of the impact of different fisheries and other pressure factors on sand banks. 6) Dissemination. Project Expected Effects: The project's results and method developments can be used directly in the management to separate different fisheries with regard to bottom impact; e.g. by nature conservation via area restrictions. Activity 4 and 5 will generate management tools that can quantitatively address descriptor 6 under the Marine Strategy Framework Directive relative to sand banks. The project is coordinated by DTU Aqua and is funded by the European Maritime and Fisheries Fund (EMFF).

Eigaard, O. R., Project Coordinator, National Institute of Aquatic Resources, Section for Ecosystem based Marine Management
Dinesen, G. E., Project Manager, National Institute of Aquatic Resources
Gislason, H., Project Participant, National Institute of Aquatic Resources
Bastardie, F., Project Participant, National Institute of Aquatic Resources
Nielsen, J. R., Project Participant, National Institute of Aquatic Resources
Egekvist, J., Project Participant, National Institute of Aquatic Resources
Pedersen, E. M., Project Participant, National Institute of Aquatic Resources
Støttrup, J. G., Project Participant, National Institute of Aquatic Resources
Nielsen, A., Project Participant, National Institute of Aquatic Resources
Hansen, F. T., Project Participant, National Institute of Aquatic Resources
O’Neill, B., Project Participant, National Institute of Aquatic Resources
Noack, T., Project Participant, National Institute of Aquatic Resources
Lundgaard, L. S., Project Participant, National Institute of Aquatic Resources
Hansen, A. D., Project Participant, National Institute of Aquatic Resources

Keywords: Research areas: Ecosystem based Marine Management & Coastal Ecology & Marine Living Resources & Fisheries Technology & Fisheries Management
Project: Research

**Other pressure factors in the marine environment than nutrients (39529)**

Anthropogenic pressures are potentially of major importance to the ecological state of the marine environment. In coastal areas, ecological state of the marine environment is assessed according to the EU Water Framework Directive (WFD) using the quality elements phytoplankton, angiosperms (eelgrass), macro algae and benthic fauna. Additional supportive parameters like Secchi depth and occurrence of anoxia or hypoxia can be included in the assessment. Extensive research efforts have shown that excessive loading of the nutrients nitrogen and phosphorous are the most important pressure factors in the coastal marine environment of Denmark. However, other pressure factors like e.g. fisheries, gravel and sand extraction, invasive species, run-off of micro plastics and hazardous substances and physical modifications like sluices and dams. For Danish coastal areas, there is no overarching perspective to other pressure factors than nutrients and assessment of their potential impact on environmental status. In the present project, the aim is to assess the potential impact of a number of expected pressure factors other than excess loading of nutrients and effects of climate changes on environmental state of the Danish water bodies according to the WFD. The assessment will be based on existing knowledge and existing data. The assessment will be performed as a review of documented effects of the different pressure factors on the quality elements and supportive parameters, assessment of data availability for analysis on water body level and documentation of dependence on the pressure factor of external environmental parameters like salinity and temperature. Based on the review of each pressure factor, an analysis will be performed to assess the impact of the pressure factor on the indicators depth limit of eelgrass, DKI and concentration of chlorophyll a during the summer period. The analysis will only be performed if an effect of the pressure factor is well documented and sufficient data are available.
Finally, the project will assess how pres factors can be cumulated. The project is funded by the Danish Environmental Protection Agency and is coordinated by DTU Aqua.

Petersen, J. K., Project Coordinator, National Institute of Aquatic Resources, Danish Shellfish Centre
Rindorf, A., Project Participant, National Institute of Aquatic Resources, Section for Ecosystem based Marine Management
Gislason, H., Project Participant, National Institute of Aquatic Resources, Section for Ecosystem based Marine Management
Christensen, A., Project Participant, National Institute of Aquatic Resources, Section for Marine Living Resources
Eigaard, O. R., Project Participant, National Institute of Aquatic Resources, Section for Ecosystem based Marine Management

Petersen, J. K., Project Coordinator, National Institute of Aquatic Resources, Danish Shellfish Centre
Rindorf, A., Project Participant, National Institute of Aquatic Resources, Section for Ecosystem based Marine Management
Gislason, H., Project Participant, National Institute of Aquatic Resources, Section for Ecosystem based Marine Management
Christensen, A., Project Participant, National Institute of Aquatic Resources, Section for Marine Living Resources
Eigaard, O. R., Project Participant, National Institute of Aquatic Resources, Section for Ecosystem based Marine Management

Analysis of protected areas in the North Sea and the Central Baltic (Beskyttede områder) (39425)
The project aims at delivering a report on the scientific basis and coherence of the current system of marine protected areas in the Danish North Sea, Skagerrak and central Baltic Sea EEZ’s. This will enable the Danish Nature Agency to decide whether the existing network of protected areas is coherent (representative, adequate and connected) with respect to the requirements of the MSFD art. 13 part 4. The most important biodiversity elements, habitats and ecological processes of the North Sea/Skagerrak and the central Baltic Sea will be addressed including selected ecosystem components, oceanographic features and seabed habitats. The work will be based on available data, literature studies and results from recent investigations. Furthermore, ecologically valuable – “hot-spots” – and areas of economic value are to be identified. The network of ecologically valuable areas will be analyzed based on data, distribution mapping, weighting of data and connectivity consideration using several types of software. Areas of economic value inside and outside the Natura2000 network will be identified based on existing data collected by the partners and located at the partner's database. Finally, areas of economic importance will be combined to suggest marine protected areas. The project is coordinated by DTU Aqua. The project is funded by Danish Agrifish Agency.

Edelvang, K., Project Coordinator, National Institute of Aquatic Resources, Section for Oceans and Arctic
Gislason, H., Project Participant, National Institute of Aquatic Resources, Section for Oceans and Arctic

The effect of bottom trawling on marine bottom fauna and eelgrass (ØB Bundfauna) (39192)
The project provided input to the analysis of the impact of fishing on the ecological quality of the Danish marine environment to the Danish Nature Agency in relation to the water plans needed in connection with the implementation of the Water Framework Directive. It contained three subprojects: - Quantifying the area of seabed swept by Danish bottom trawl fisheries. - Quantifying the impact of bottom trawling on marine benthos. - Quantifying the possible interaction between bottom trawling and the depth distribution of eelgrass (Zostera marina). This project was coordinated by DTU Aqua. The Project was funded by the Danish Nature Agency.

Gislason, H., Project Coordinator, National Institute of Aquatic Resources, Section for Oceans and Arctic

Sustainable bycatch in Danish fishery - Reasonable management under the landing obligation (38028)
The project facilitated a more robust advice of by-catch species in the Danish fishery in the Skagerrak by suggesting and testing stock assessment approaches for data poor stocks as well as providing guidance for various options to reduce by-catch without limiting the target fishery. The approach applied in the projects was suggested to be adopted for other areas where the landing obligation potentially can be restrictive for target fisheries (mixed-fish cases). Through thorough exploration of existing data in survey time-series it was possible to provide size-based life-history models to gauge the
sensitivity of stocks in relation to fishing pressure. The models were used to determine relevant biological reference points for the most relevant by-catch species and the resulting assessment and stock status was then compared to the prevailing ICES/RGLIFE classification. Finally, the project suggested upgrading the stocks to a higher and less restrictive ICES category for management purposes where possible. This project was coordinated by DTU Aqua. The project was funded by the Danish Ministry of Food, Agriculture and Fisheries and the European Fisheries Fund (EFF).

Worsøe Clausen, L., Project Manager, National Institute of Aquatic Resources, Section for Marine Living Resources
Gislason, H., Project Participant, National Institute of Aquatic Resources
Andersen, K. H., Project Participant, National Institute of Aquatic Resources
Jørgensen, O. A., Project Participant, National Institute of Aquatic Resources
Kokkalis, A., PhD Student, National Institute of Aquatic Resources

01/06/2012 → 31/01/2014
Keywords: Research areas: Marine Living Resources & Fisheries Management & Marine Populations and Ecosystem Dynamics
Collaborators: Danish Agricultural Agency, Danish Fishermen's Association
Project: Research

Identifying simple and cost effective gear solutions which can lead to an effective implementation of the new EU common Fisheries Policy (CFP)
Melli, V., PhD Student, National Institute of Aquatic Resources
Krag, L. A., Main Supervisor, National Institute of Aquatic Resources
Gislason, H., Supervisor, National Institute of Aquatic Resources
Karlsen, J. D., Supervisor, National Institute of Aquatic Resources

Samfinansieret - Andet
15/12/2015 → 14/12/2018
Award relations: Identifying simple and cost effective gear solutions which can lead to an effective implementation of the new EU common Fisheries Policy (CFP)
Project: PhD

Industry lead gear selectivity improvements, its strenghts and weakness in the new CFP
Malta, T. A. M. D. V., PhD Student, National Institute of Aquatic Resources
Krag, L. A., Main Supervisor, National Institute of Aquatic Resources
Feekeings, J. P., Supervisor, National Institute of Aquatic Resources
Gislason, H., Supervisor, National Institute of Aquatic Resources

Samfinansieret - Andet
15/12/2015 → 29/03/2019
Award relations: Industry lead gear selectivity improvements, its strenghts and weakness in the new CFP
Project: PhD

North Sea Mackerel or Mackerel in the North (Sea)?
Jansen, T., PhD Student, National Institute of Aquatic Resources
Gislason, H., Main Supervisor, National Institute of Aquatic Resources
MacKenzie, B., Examiner, National Institute of Aquatic Resources
Sparholt, H., Examiner
Villamor, B., Examiner
§15 Re-enrolment
01/08/2012 → 21/11/2012
Award relations: North Sea Mackerel or Mackerel in the North (Sea)?
Project: PhD

PhD Scholarship in Marine Ecology and Climate
Ferreira, A. S., PhD Student, National Institute of Aquatic Resources
Visser, A., Main Supervisor, National Institute of Aquatic Resources
MacKenzie, B., Supervisor, National Institute of Aquatic Resources
Gislason, H., Examiner, National Institute of Aquatic Resources
Martin, A. P., Examiner
Subramaniam, A., Examiner
Eksternt finansieret virksomhed
15/09/2011 → 01/04/2015
Award relations: PhD Scholarship in Marine Ecology and Climate
Project: PhD
Comparative growth and feeding ecology between whiting (Merlangius merlangus) in the Baltic Sea and the North Sea
Ross, S. D., PhD Student, National Institute of Aquatic Resources
Nielsen, J. R., Main Supervisor, National Institute of Aquatic Resources
Andersen, N. G., Supervisor, National Institute of Aquatic Resources
Gislason, H., Supervisor, National Institute of Aquatic Resources
MacKenzie, B., Examiner, National Institute of Aquatic Resources
Rijnsdorp, A. D., Examiner
Temming, A., Examiner
Institut stipendie (DTU) Samf.
01/11/2011 → 21/04/2016
Award relations: Comparative growth and feeding ecology between whiting (Merlangius merlangus) in the Baltic Sea and the North Sea
Project: PhD

Trait-based analysis and modelling of fish communities
Olsson, K., PhD Student, National Institute of Aquatic Resources
Gislason, H., Main Supervisor, National Institute of Aquatic Resources
Andersen, K. H., Supervisor, National Institute of Aquatic Resources
Christensen, A., Examiner, National Institute of Aquatic Resources
Falster, D., Examiner
Jørgensen, C., Examiner
1/3 FUU, 1/3 inst 1/3 Andet
01/03/2012 → 01/07/2015
Award relations: Trait-based analysis and modelling of fish communities
Project: PhD

Operationalization of trait-based modelling for an ecosystem approach to fisheries
Jacobsen, N. S., PhD Student, National Institute of Aquatic Resources
Gislason, H., Main Supervisor, National Institute of Aquatic Resources
Andersen, K. H., Supervisor, National Institute of Aquatic Resources
Nielsen, J. R., Examiner, National Institute of Aquatic Resources
Jennings, S., Examiner
Law, R., Examiner
Eksternt finansieret virksomhed
01/11/2012 → 15/12/2015
Award relations: Operationalization of trait-based modelling for an ecosystem approach to fisheries
Project: PhD

Demography of fished Populations: Yield, Resilience and Evolutionary Change
Verdiell, N. C., PhD Student, National Institute of Aquatic Resources
Andersen, K. H., Main Supervisor, National Institute of Aquatic Resources
MacKenzie, B., Supervisor, National Institute of Aquatic Resources
Vaupel, J. W., Supervisor
Gislason, H., Examiner, National Institute of Aquatic Resources
Caswell, H., Examiner
Rijnsdorp, A. D., Examiner
Stipendie fra uelandet
01/12/2009 → 28/03/2012
Award relations: Demography of fished Populations: Yield, Resilience and Evolutionary Change
Project: PhD

Starfish - power and management (Søstjerner) (39087)
The overall objective of the project was to provide the scientific basis for management that can lead to the establishment of a commercial fishery of starfish (Asterias rubens) in primarily the Limfjorden, including Natura 2000 areas. The project background was the increasing prevalence of starfish that is both a threat to the mussel fishing and a potential source of income for fishing. In the project, the population of starfish and production was determined and analyzed and based on population stock estimates and stock modeling a total allowable quota of 10,000 tonnes annually was estimated as a conservative annual catch, which is considered sufficient to maintain a potential starfish meal industry. Effect of fishing was determined both for the population of starfish, the stock of mussels and benthic components like infauna and macroalgae. It was shown that using the starfish purse seine will have no or negligible effects on infauna and blue mussels. In terms of biodiversity and biomass of macro algae, no significant effects of the purse seine, including a load of 300 tonnes of starfish in the net, could be detected. Torn of macro algae leafs were however detected in the purse seine after fishery over macro algae habitats and this was included in management advise on effects of starfish fisheries. A guide for management including recommendations on environmental impact and starfish populations were developed.
Developing fisheries management indicators and targets (DEFINEIT) (38763)

DEFINEIT constructed operational models of fish stock dynamics explicitly taking into account exploitation and climatic conditions and combine these models with basic economic models. To ensure an outstanding scientific level in each of these areas, the project brought together key competences in operational multispecies modelling, stock recruitment relationships, population dynamics of non-target fish species and economic modelling of fisheries from a wide geographic area ranging from the Barents Sea to the North Sea. The project used multispecies models to investigate changes in predation induced by differences in the distribution and the amount of alternative food. Effects of technical interactions in the fishing process were considered to avoid delivering management advice for different stocks which is mutually inconsistent. Integrating the knowledge gained, the project suggested methods for estimating reference points. The project identified the main causes of variation in recruitment patterns between stocks as well as the key processes from spawning to recruitment of selected stocks. The consequences of using proxies to describe stock reproductive potential were determined and survival during early life stages was investigated in order to identify the role of the physical and biological environment. The improved understanding of recruitment variability was used in individual stock assessment and included in multispecies models to provide reliable predictions. The maximum level of fishing effort consistent with sustainment of susceptible species was estimated along with the effect of discard of by-catch on economic yield. The project developed resource indicators that combine economic, social and biological indicators and relate directly to the benefit for the society. Future stock dynamics limits to sustainable ecosystem exploitation and the fishing levels delivering maximum sustainable economic yield under selected climatic scenarios were analyzed in unison to ensure the delivery of mutually consistent management advice. General properties of the ecosystems were used to suggest rules of thumb for management in areas where the amount of data available is insufficient to construct similar models. The project was coordinated by DTU Aqua. The project was funded by EU, MariFish, ERA-NET.

Rindorf, A., Project Manager, National Institute of Aquatic Resources, Section for Ecosystem based Marine Management
Gislason, H., Project Participant, National Institute of Aquatic Resources
Payne, M., Project Participant, National Institute of Aquatic Resources
Worsøe Clausen, L., Project Participant, National Institute of Aquatic Resources
Mosegaard, H., Project Participant, National Institute of Aquatic Resources
Bekkevold, D., Project Participant, National Institute of Aquatic Resources
Eg Nielsen, E., Project Participant, National Institute of Aquatic Resources
Vinthar, M., Project Participant, National Institute of Aquatic Resources
Lewy, P., Project Participant, National Institute of Aquatic Resources

01/01/2009 → 30/06/2012

Keywords: Research areas: Ecosystem based Marine Management & Marine Living Resources & Marine Populations and Ecosystem Dynamics & Population Genetics
Collaborators: Imperial College London, Marine Research Institute Reykjavik, University of Southern Denmark, Wageningen IMARES, Institute of Marine Research, Hellenic Centre for Marine Research, University of Copenhagen, Cefas Weymouth Laboratory, University of St Andrews

Project: Research

Sustainable fisheries, climate change and the North Sea ecosystem (SUNFISH) (38135)

Global climate changes will seriously challenge the governance of fisheries in the North Sea and elsewhere. Changes in temperature, wind conditions, river runoff and currents will affect primary and secondary production, the distribution, feeding, growth and survival of commercially exploited fish at all stages of life. Without improved knowledge about the effect of climate on the basic biological processes involved in fish production, it will be increasingly difficult to separate the effects of fishing from those of environmental fluctuations and change, identify biological reference points, and to develop management strategies for sustainable fisheries. By combining models of the effects of climate on the hydrographical and biological processes important for fish production with models of fish stock dynamics and fishing, the project provided a basis for improved predictions of the effects of climate change on the sustainable exploitation and maximum yield of North Sea fish stocks. The dynamics of cod (a top predator), herring and sandeel (two important prey for fish), seabirds and marine mammals were studied in detail. Their spawning, egg and larval drift, juvenile and adult distribution, growth and survival were investigated through experiments, statistical analyses of collected data and advanced bio-oceanographic models. The sustainability of exploitation under changing climate conditions were examined by modifying an existing
stochastic multispecies fisheries model to make it account for climate effects on fish ecology. The project provided an integrated modelling framework for developing sustainable fisheries management strategies superior to using simple extrapolations of observed historical trends to predict the likely outcome of climate change on the North Sea ecosystem. The project was coordinated by DTU Aqua. The project was funded by the Danish Council for Strategic Research.

Rindorf, A., Project Manager, National Institute of Aquatic Resources, Section for Ecosystem based Marine Management
Gislason, H., Project Manager, National Institute of Aquatic Resources

Keywords: Research areas: Ecosystem Based Marine Management & Marine Living Resources
Collaborators: Aarhus University, University of Copenhagen, Danish Meteorological Institute, Marine Scotland, University of Hamburg
Project: Research

Center for Ocean Life (COOL) - a Villum-Kahn Rasmussen Centre of excellence for the study of life in a changing ocean (38960)

Our goal is to develop a fundamental understanding and predictive capability of marine ecosystems through the use of novel trait-based approaches and models. The Centre is organized around three main research activities: - Identification and mechanistic description of the traits and trade-offs required to characterize the main Darwinian missions (feed, survive, reproduce) of the various life forms in the ocean through experimental and theoretical work, as well as analysis of literature data. - Models: scaling of individual behavior to population and ecosystem dynamics through the development of trait-based models. - Testing model prediction by comparing to observed trait patterns in the ocean. The Centre involves biologists, physicists, chemists, and mathematicians and has a very strong training component through the supervision of master students, and about 30 PhD and postdoctoral fellows as well as by offering PhD summer schools and organizing international workshops. The Centre in addition host many visiting students and scientists. The Centre is lead by DTU Aqua. The project is funded by the Villum Kahn-Rasmussen Foundation (Velux Foundations) as well as through various national and European fellowship programs (Research Council, H.C. Ørsted Fellowship programme, Marie Curie, Carlsberg Foundation, etc).

Kierboe, T., Project Manager, National Institute of Aquatic Resources, Centre for Ocean Life
Andersen, K. H., Project Participant, National Institute of Aquatic Resources
Visser, A., Project Participant, National Institute of Aquatic Resources
Stedmon, C., Project Participant, National Institute of Aquatic Resources
Gislason, H., Project Participant, National Institute of Aquatic Resources
Payne, M., Project Participant, National Institute of Aquatic Resources
Thygesen, U. H., Project Participant, National Institute of Aquatic Resources
MacKenzie, B., Project Participant, National Institute of Aquatic Resources
Mariani, P., Project Participant, National Institute of Aquatic Resources
Nielsen, T. G., Project Participant, National Institute of Aquatic Resources

01/01/2012 → 31/12/2017

Keywords: Research areas: Oceanography & Marine Populations and Ecosystem Dynamics & Marine Living Resources & Ecosystem based Marine Management
Collaborators: Michigan State University, University of Bergen, Kiel University, University of Copenhagen, Massachusetts Institute of Technology, University of Oxford, Roskilde University
Project: Research

Danish Network for Aquaculture and Fisheries Research (FISHNET) (38082)

FISHNET is a network of Danish Fisheries and Aquaculture scientists. It was established to foster cooperation in aquaculture and fisheries research and research education in Denmark. From the start it functioned as an umbrella over four independent thematic research schools and networks in fisheries biology (SLIP), Fisheries and Aquaculture Management and Economics (FAME), Fish Food, Biochemistry and Physiology (FIBP) and Sustainable Control of Fish Diseases in Aquaculture (SCOFDA). In 2001 a research school in Maritime History and Marine Environmental Research (MARINERS) was added to the network. FISHNET aims to enhance the visibility and quality of Danish fisheries and aquaculture research through improved collaboration and communication, improving the recruitment and training of PhD students through networks and research schools, thus providing high quality courses, seminars and workshops. FISHNET has organised a large number of joint courses, seminars, workshops and conferences connecting more than 100 fisheries and aquaculture scientists from Danish universities and sectoral research institutions. In 2004 Fishnet received funds to embed the network through a number of postdoc grants and co-funded professorships in Fisheries Oceanography, Fisheries Management and Fish Physiology. The merger of the Danish Universities and Sectoral Research Institutions and various changes in Danish marine research made it necessary to extend the second phase of the project from 2008 to the end of 2012. The project is coordinated by DTU Aqua.

Gislason, H., Project Manager, National Institute of Aquatic Resources
MacKenzie, B., Project Manager, National Institute of Aquatic Resources
Rindorf, A., Project Participant, National Institute of Aquatic Resources
Statistical aspects of heterogeneous population dynamics (38102)
A variety of 'indices' of distribution are often considered: occurrence, aggregation and geographical range. However, the estimators of these indices are frequently biased and the results often do not reflect changes in distribution, often due to effects of non-random sampling in space and time. Another type of bias in many existing methods results from the assumption that the individual observations of abundance in an area are all independent and spatial correlation is ignored. Methods that do take spatial correlation into account, such as kriging, are often inappropriate because they do not handle the high frequency of zero observations, which are typical of survey data. During this task we will develop new types of models using the so-called "Log Gaussian Cox Process" (e.g. Lewy and Kristensen 2009; Kristensen 2008), which account for spatial correlation and better involve the information from zero observations. These models will further strengthen our ability to detect changes in distribution and provide useful indices of biological aggregation or 'clumping' based on the degree of spatial correlation. 24 research institutes and 14 universities are partners in the project. The project is coordinated by Plymouth Marine Laboratory, UK.
Gislason, H., Project Manager, National Institute of Aquatic Resources
Lewy, P., Project Manager, National Institute of Aquatic Resources
Rindorf, A., Project Participant, National Institute of Aquatic Resources

Vectors of change (VECTORS) (38907)
Marine life makes a substantial contribution to the economy and society of Europe. VECTORS aimed at elucidating the drivers, pressures and vectors that cause change in marine life, the mechanisms by which they do so, the impacts that they have on ecosystem structures and functioning, and on the economics of associated marine sectors and society. VECTORS particularly focused on causes and consequences of invasive alien species, outbreak forming species, and changes in fish distribution and productivity. New and existing knowledge and insight was synthesized and integrated to project changes in marine life, ecosystems and economies under future scenarios for adaptation and mitigation in the light of new technologies, fishing strategies and policy needs. VECTORS also evaluated current forms and mechanisms of marine governance in relation to the vectors of change. Based on its findings, VECTORS outlined solutions and tools for relevant stakeholders and policymakers during the lifetime of the project. The VECTORS consortium included a mixture of natural scientists with knowledge of socio-economic aspects, and social scientists (environmental economists, policy and governance analysts and environmental law specialists) with interests in natural system functioning. DTU Aqua contributed to VECTORS by developing new statistical models of fish species distributions, by further developing spatially resolved bio-economic models of fishing, and by analyzing fish species richness and distribution in the north Atlantic and the general relationship between changes in fish stock abundance and distribution area. We coordinated the Baltic WP where we implemented the ATLANTIS end-to-end model and performed initial scenario testing. We also analyzed the most important drivers of fish population dynamics in the Baltic, and contributed to the study of invasive species. VECTORS comprised a total of 37 European Universities, research institutions and professional associations dealing with applied maritime and marine research. The project included marine environmental scientists, fisheries scientists, conservation biologists, sociologists and economists from across the European scientific community providing expertise in marine ecosystems, management, fisheries, maritime transport, tourism and coastal development. The project was coordinated by Plymouth Marine Laboratory, UK. The project was funded by EU, Framework Programme 7.
Gislason, H., Project Manager, National Institute of Aquatic Resources, Section for Ecosystem based Marine Management
Eero, M., Project Manager, National Institute of Aquatic Resources
Nielsen, J. R., Project Participant, National Institute of Aquatic Resources
Köster, F., Contact Person, National Institute of Aquatic Resources
Lewy, P., Project Participant, National Institute of Aquatic Resources
Rindorf, A., Project Participant, National Institute of Aquatic Resources
Bastardie, F., Project Participant, National Institute of Aquatic Resources
Kristensen, K., Project Participant, National Institute of Aquatic Resources
Huwer, B., Project Participant, National Institute of Aquatic Resources

Scaling from individuals to populations (SLIP) (38728)
The research school SLIP (Scaling from Individuals to Populations) focuses on how individual behavior and mutual interactions generate the dynamics observed at the population level. This topic forms the link between the basic and applied marine ecological research environments in Denmark and requires input from biology, mathematics and statistics. SLIP is one of the five research networks and research schools under the Danish Network for Aquaculture and Fisheries
Research (Fishnet). SLIP has arranged a number of national and international PhD courses and workshops and has served to focus the interest on size and trait-based modeling, as well as on improved understanding of the physiology, genetics and behavior of marine organisms, in particular fish. The project is coordinated by DTU Aqua.

Gislason, H., Project Manager, National Institute of Aquatic Resources
Kiørboe, T., Project Manager, National Institute of Aquatic Resources
Eg Nielsen, E., Project Manager, National Institute of Aquatic Resources, Section for Marine Living Resources
Höffle, H., Project Participant
Gürkan, Z., Project Participant, National Institute of Aquatic Resources, Section for Marine Living Resources
Therkildsen, N. O., Project Participant, National Institute of Aquatic Resources, Section for Marine Living Resources
Sichlau, M. H., Project Participant, National Institute of Aquatic Resources, Section for Marine Living Resources
Mosgaard, T., Project Participant, National Institute of Aquatic Resources, Section for Marine Living Resources
Frisk, C., Project Participant
01/01/2000 → 31/12/2008
Keywords: Research area: Marine Populations and Ecosystem Dynamics
Collaborators: Aarhus University, University of Copenhagen, Roskilde University
Project: Research

Activities:

**ICES - Working Group on Biodiversity Science - WGBIODIV (External organisation)**
Period: 2015
Henrik Gislason (Participant)
National Institute of Aquatic Resources
Section for Ecosystem based Marine Management
Degree of recognition: International

Related external organisation

**ICES - Working Group on Biodiversity Science - WGBIODIV**
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar

**ICES - Working Group on the Ecosystem Effects of Fishing Activities - WGECO (External organisation)**
Period: 2014
Henrik Gislason (Participant)
National Institute of Aquatic Resources
Section for Ecosystem based Marine Management
Degree of recognition: International

Related external organisation

**ICES - Working Group on the Ecosystem Effects of Fishing Activities - WGECO**
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar

**ICES - Working Group on Biodiversity Science - WGBIODIV (External organisation)**
Period: 2012 → …
Henrik Gislason (Participant)
National Institute of Aquatic Resources
Section for Population Ecology and Genetics
Degree of recognition: International

Related external organisation

ICES - Working Group on Biodiversity Science - WGBIODIV
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar