Publications:

Marine resources management in the face of change: from ecosystem science to ecosystem-based management

General information
State: Published
Organisations: Section for Management Systems, National Institute of Aquatic Resources, Institute Management
Authors: Barange, M. (Ekstern), O. Boyle, R. (Ekstern), Cochrane, K. L. (Ekstern), Fogarty, M. J. (Ekstern), Jarre, A. (Intern), Kell, L. T. (Ekstern), Köster, F. (Intern), King, J. R. (Ekstern), de Moor, C. L. (Ekstern), Reed, K. (Ekstern), Sinclair, M. (Ekstern), Yatsu, A. (Ekstern)
Pages: 253-287
Publication date: 2010

Host publication information
Title of host publication: Marine ecosystems and global change
Volume: 9
Place of publication: Oxford
Publisher: Oxford University Press
Editors: Barange, M., Field, J., Harris, R., Hofmann, E., Perry, R., Werner, C.
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 267830
Publication: Research - peer-review › Book chapter – Annual report year: 2010

An ecosystem-based framework for tracking performance of fish stocks and related forcings using fuzzy-logic approach

General information
State: Published
Organisations: Section for Management Systems, National Institute of Aquatic Resources, Institute Management
Authors: Eero, M. (Intern), Jarre, A. (Intern), Ojaveer, H. (Ekstern), Tomczak, M. (Intern), Lindegren, M. (Intern), Köster, F. (Intern)
Publication date: 2009
Event: Abstract from ICES/PICES/UNCOVER Symposium 2009 on Rebuilding Depleted Fish Stocks, Warnemünde/Rostock, Germany.
Main Research Area: Technical/natural sciences
Links:
http://www.academia.edu/3478438/Stock-based_vs._fleet-based_evaluation_of_the_multi-
annual_management_plan_for_the_cod_stocks_in_the_Baltic_Sea
Source: orbit
Source-ID: 284726
Publication: Research › Conference abstract for conference – Annual report year: 2009

Knowledge-based systems as decision support tools in an ecosystem approach to fisheries: Comparing a fuzzy-logic and rule-based approach

In an ecosystem approach to fisheries (EAF), management must draw on information of widely different types, and information addressing various scales. Knowledge-based systems assist in the decision-making process by summarising this information in a logical, transparent and reproducible way. Both rule-based Boolean and fuzzy-logic models have been used successfully as knowledge-based decision support tools. This study compares two such systems relevant to fisheries
management in an EAF developed for the southern Benguela. The first is a rule-based system for the prediction of anchovy recruitment and the second is a fuzzy-logic tool to monitor implementation of an EAF in the sardine fishery. We construct a fuzzy-logic counterpart to the rule-based model, and a rule-based counterpart to the fuzzy-logic model, compare their results, and include feedback from potential users of these two decision support tools in our evaluation of the two approaches. With respect to the model objectives, no method clearly outperformed the other. The advantages of numerically processing continuous variables, and interpreting the final output, as in fuzzy-logic models, can be weighed up against the advantages of using a few, qualitative, easy-to-understand categories as in rule-based models. The natural language used in rule-based implementations is easily understood by, and communicated among, users of these systems. Users unfamiliar with fuzzy-set theory must "trust" the logic of the model. Graphical visualization of intermediate and end results is an important advantage of any system. Applying the two approaches in parallel improved our understanding of the model as well as of the underlying problems. Even for complex problems, small knowledge-based systems such as the ones explored here are worth developing and using. Their strengths lie in (i) synthesis of the problem in a logical and transparent framework, (ii) helping scientists to deliberate how to apply their science to transdisciplinary issues that are not purely scientific, and (iii) representing vehicles for delivering state-of-the-art science to those who need to use it. Possible applications of this approach for ecosystems of the Humboldt Current are discussed.

General information
State: Published
Organisations: Section for Management Systems, National Institute of Aquatic Resources
Authors: Jarre, A. (Intern), Paterson, B. (Ekstern), Moloney, C. (Ekstern), Miller, D. (Ekstern), Field, J. (Ekstern), Starfield, A. M. (Ekstern)
Pages: 390-400
Publication date: 2008
Main Research Area: Technical/natural sciences

Publication information
Journal: Progress in Oceanography
Volume: 79
Issue number: 2-4
ISSN (Print): 0079-6611
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BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 3.4 SJR 1.922 SNIP 1.278
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.703 SNIP 1.348 CiteScore 3.34
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.909 SNIP 1.461 CiteScore 3.65
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 2.397 SNIP 1.595 CiteScore 3.87
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 2.741 SNIP 1.794 CiteScore 4.17
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 2.279 SNIP 1.341 CiteScore 3.41
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 2.643 SNIP 1.586
Web of Science (2010): Indexed yes
A fuzzy-logic tool for multi-criteria decision making in fisheries: the case of the South African pelagic fishery

The present study presents an electronic decision-support tool that uses a fuzzy-logic model of expert knowledge to assist in multi-criteria decision-making in the context of an Ecosystem Approach to Fisheries (EAF). The prototype model integrates the multiple goals and objectives related to the evaluation of the ecosystem performance of the South African sardine Sardinops sagax fishery into a NetWeaver knowledge base and provides intuitive visual outputs to communicate results to managers and stakeholders. The software tool was developed in a consultative process with key experts and follows the hierarchical tree approach recommended in the FAO guidelines for responsible fisheries. Input variables are based both on quantitative data and expert opinion. We evaluated the model in terms of robustness to input changes, influence of system structure, and appropriateness of input scales for parameters based on expert opinion. Results show that the model is robust and conservative. The strength of the approach lies in the ability to include variables that are difficult to measure. It provides a means of rendering value judgements explicit and transparent. The tool synthesises a large amount of information and aims at improving understanding rather than achieving precision. The system has the potential to have wide application in the context of EAF.

General information
State: Published
Organisations: Section for Management Systems, National Institute of Aquatic Resources
Authors: Paterson, B. (Ekstern), Jarre, A. (Intern), Moloney, C. (Ekstern), Fairweather, T. (Ekstern), van der Lingen, C. (Ekstern), Shannon, L. (Ekstern), Field, J. (Ekstern)
Pages: 1056-1068
Publication date: 2007
Main Research Area: Technical/natural sciences

Publication information
Journal: Marine and Freshwater Research
Volume: 58
Issue number: 11
ISSN (Print): 1323-1650
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
Application of the sequential t-test algorithm for analysing regime shifts to the southern Benguela ecosystem

Long-term ecosystem changes, such as regime shifts, have occurred in several marine ecosystems worldwide. Multivariate statistical methods have been used to detect such changes. A new method known as the sequential t-test algorithm for analysing regime shifts (STARS) is applied to a set of biological state variables as well as environmental and anthropogenic forcing variables in the southern Benguela. The method is able to correct for auto-correlation within time-series by a process known as prewhitening. All variables were tested with and without prewhitening. Shifts that were detected with both methods were termed robust. The STARS method detected shifts in relatively short time-series and identified when these shifts occurred without a priori hypotheses. Shifts were generally well detected at the end of time-series, but further development of the method is needed to enhance its performance for auto-correlated time-series. Since 1950, two major long-term ecosystem changes were identified for the southern Benguela. The first change occurred during the 1960s, caused predominantly by heavy fishing pressure but with some environmental forcing. The second change occurred in the early 2000s, caused mainly by environmental forcing. To strengthen these findings, further analyses should be carried out using different methods.
General information
State: Published
Organisations: University of Cape Town
Authors: Howard, J. (Ekstern), Jarre, A. (Intern), Clark, A. (Ekstern), Moloney, C. (Ekstern)
Pages: 437-451
Publication date: 2007
Main Research Area: Technical/natural sciences

Publication information
Journal: African Journal of Marine Science
Volume: 29
Issue number: 3
ISSN (Print): 1814-232X
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 1.36 SJR 0.661 SNIP 0.8
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.696 SNIP 0.732 CiteScore 1.19
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.568 SNIP 0.879 CiteScore 1.15
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.71 SNIP 0.749 CiteScore 1.25
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.529 SNIP 0.488 CiteScore 1.04
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 0.608 SNIP 0.611 CiteScore 1.15
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.857 SNIP 0.611
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 1.091 SNIP 0.836
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 0.921 SNIP 0.62
Scopus rating (2007): SJR 0.578 SNIP 0.611
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 0.643 SNIP 0.746
Scopus rating (2005): SJR 0.778 SNIP 0.838
Scopus rating (2004): SJR 0.355 SNIP 0.358
Web of Science (2004): Indexed yes
Scopus rating (2003): SJR 0.903 SNIP 1.129
Scopus rating (2002): SJR 0.83 SNIP 1.212
Scopus rating (2001): SJR 1.02 SNIP 1.113
Scopus rating (2000): SJR 0.789 SNIP 0.855
Scopus rating (1999): SJR 0.561 SNIP 0.604

Original language: English
Ecosystem, Prewhitening, Regime shift, Sequential analysis, Southern Benguela, t-test

DOI: 10.2989/AJMS.2007.29.3.11.341
A fuzzy spin for fishy problems: a fuzzy-logic tool for multi-criteria decision making in the southern Benguela

General information
State: Published
Organisations: Section for Management Systems, National Institute of Aquatic Resources
Authors: Paterson, B. (Ekstern), Moloney, C. (Ekstern), Jarre, A. (Intern), Fairweather, T. (Ekstern), Shannon, L. (Ekstern), van der Lingen, C. (Ekstern), Field, J. (Ekstern)
Publication date: 2006
Event: Poster session presented at International Conference Humboldt Current System, Lima, Peru.
Main Research Area: Technical/natural sciences

Compiling the basis for assessment of responsible fisheries: Forage fish off West Greenland: final report

General information
State: Published
Organisations: Section for Management Systems, National Institute of Aquatic Resources
Authors: Jarre, A. (Intern)
Publication date: 2006

Publication information
Place of publication: Copenhagen
Publisher: Nordic Council of Ministers
Original language: English
Main Research Area: Technical/natural sciences

Detecting and forecasting long-term ecosystem changes

General information
State: Published
Organisations: Section for Management Systems, National Institute of Aquatic Resources
Authors: Jarre, A. (Intern), Moloney, C. (Ekstern), Shannon, L. (Ekstern), Fréon, P. (Ekstern), van der Lingen, C. (Ekstern), Verheye, H. (Ekstern), Hutchings, L. (Ekstern), Roux, J. (Ekstern), Cury, P. (Ekstern)
Pages: 239-272
Publication date: 2006

Host publication information
Title of host publication: The Benguela: Predicting a large marine environment
Volume: 11
Place of publication: Amsterdam
Publisher: Elsevier

Series: Large Marine Ecosystems
Number: 14
ISSN: 1570-0461
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 225962
Expert systems as decision support tools in an ecosystem approach to fisheries management: comparing fuzzy-logic and rule-based approached

General information
State: Published
Organisations: Section for Management Systems, National Institute of Aquatic Resources
Authors: Jarre, A. (Intern), Paterson, B. (Ekstern), Moloney, C. (Ekstern), Miller, D. (Ekstern), Field, J. (Ekstern), Starfield, A. (Ekstern)
Publication date: 2006
Event: Poster session presented at International Conference Humboldt Current System, Lima, Peru.
Main Research Area: Technical/natural sciences

Comparing the Benguela and Humboldt marine upwelling ecosystems with indicators derived from inter-calibrated models

General information
State: Published
Organisations: Section for Management Systems, National Institute of Aquatic Resources
Authors: Moloney, C. (Ekstern), Jarre, A. (Intern), Arancibia, H. (Ekstern), Bozec, Y. (Ekstern), Neira, S. (Ekstern), Roux, J. (Ekstern), Shannon, L. (Ekstern)
Pages: 493-502
Publication date: 2005
Main Research Area: Technical/natural sciences

Publication information
Journal: ICES Journal of Marine Science
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BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.63
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): CiteScore 2.18
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): CiteScore 2.62
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): CiteScore 2.46
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): CiteScore 2.35
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Trophodynamic indicators for an ecosystem approach to fisheries
Acknowledging ecological interactions, such as predation, is key to an ecosystem approach to fisheries. Trophodynamic indicators are needed to measure the strength of the interactions between the different living components, and of structural ecosystem changes resulting from exploitation. We review trophodynamic indicators derived from models, as well as from emergent patterns such as trophic cascades and regime shifts. From 46 indicators identified in the literature, six (catch or biomass ratios, primary production required to support catch, production or consumption ratios and predation mortality, trophic level of the catch, fishing-in-balance, and mixed trophic impact) were selected because of their ability to reveal ecosystem-level patterns, and because they match published criteria. This suite of indicators is applied to the northern and southern Benguela ecosystems, and their performance is evaluated to depict drastic and contrasted ecosystem changes. A few complementary indicators are suggested as needed to detect the trophodynamic impacts of fisheries and ecosystem changes. Trends in indicators are sensitive to the choice of trophic level made for certain species. Trophodynamic indicators appear to be conservative, because they respond slowly to large structural changes in an ecosystem. Application of the selected indicators to other marine ecosystems is encouraged so as to evaluate fully their usefulness to an ecosystem approach to fisheries, and to establish international comparability. (c) 2004 International Council for the Exploration of the Sea. Published by Elsevier Ltd. All rights reserved.
Changes in the northern Benguela ecosystem over three decades: 1970s, 1980s, and 1990s

The northern Benguela ecosystem has been overfished and physically challenged over the past three decades. Ecopath with Ecosim was used to construct three ecosystem models (1971-1977, 1980-1989, and 1990-1995) and to compare differences in ecosystem structure. In the 1970s, the system sustained high catches, and had large populations of a few planktivorous fish. In the 1980s, the planktivorous fish species were expanded (horse mackerel, mesopelagic fish, and other small pelagics), although anchovy and sardine biomass was reduced. Catches remained high in the 1980s and the system was well connected. In the 1990s, the system was severely stressed, catches were much lower and omnivory was reduced. Most of the energy flowed through few pathways in the 1990s, and the energy was not transferred as efficiently up the trophic chain as in the 1980s. The fishery operated at the highest trophic level during the 1980s and there are some indications of "fishing down the foodweb" in this ecosystem between the 1980s and the 1990s. The high catches of sardine and hake in the 1970s are reflected in the high primary production required (PPR) by those compartments; the high catches of horse mackerel in the 1980s are shown by the high PPR for horse mackerel. The overall PPR for the fishery was highest in the 1980s, when the system was fished at nearly the same intensity as the 1970s, but the species taken were from higher trophic levels, requiring larger concentrations of primary production for their own existence. The importance of ecosystem-environmental interactions are highlighted by the abundance of horse mackerel, mesopelagics, small pelagics, and hake in the 1980s and the reduced biomass of most species in the 1990s, not only due to overfishing, but also due to the Benguela Nino that occurred in 1995. The system changed from an efficient ecosystem dominated by only two planktivores (anchovy and sardine) in the 1970s, to a system of large resilience and a varied planktivore
population during the 1980s. However, the system's resilience was lower, but its connectance, was higher in the 1990s, where sardine was making a comeback and the marine mammals were doing well until the Benguela Nino reduced the system to a state of lower maturity. (C) 2003 Elsevier B.V. All rights reserved.

**General information**

**State:** Published  
**Organisations:** Section for Management Systems, National Institute of Aquatic Resources  
**Authors:** Heymans, J. (Ekstern), Shannon, L. (Ekstern), Jarre, A. (Intern)  
**Pages:** 175-195  
**Publication date:** 2004  
**Main Research Area:** Technical/natural sciences

**Publication information**

**Journal:** Ecological Modelling  
**Volume:** 172  
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**Ratings:**  
BFI (2018): BFI-level 2  
Web of Science (2018): Indexed yes  
BFI (2017): BFI-level 2  
Web of Science (2017): Indexed Yes  
BFI (2016): BFI-level 2  
Scopus rating (2016): CiteScore 2.43 SJR 0.941 SNIP 1.089  
Web of Science (2016): Indexed yes  
BFI (2015): BFI-level 2  
Scopus rating (2015): SJR 1.087 SNIP 1.112 CiteScore 2.43  
Web of Science (2015): Indexed yes  
BFI (2014): BFI-level 2  
Scopus rating (2014): SJR 1.135 SNIP 1.353 CiteScore 2.7  
Web of Science (2014): Indexed yes  
BFI (2013): BFI-level 2  
Scopus rating (2013): SJR 1.153 SNIP 1.329 CiteScore 2.53  
ISI indexed (2013): ISI indexed yes  
Web of Science (2013): Indexed yes  
BFI (2012): BFI-level 2  
Scopus rating (2012): SJR 1.029 SNIP 1.229 CiteScore 2.28  
ISI indexed (2012): ISI indexed yes  
Web of Science (2012): Indexed yes  
BFI (2011): BFI-level 2  
Scopus rating (2011): SJR 1.183 SNIP 1.134 CiteScore 2.34  
ISI indexed (2011): ISI indexed yes  
Web of Science (2011): Indexed yes  
BFI (2010): BFI-level 2  
Scopus rating (2010): SJR 1.077 SNIP 1.132  
Web of Science (2010): Indexed yes  
BFI (2009): BFI-level 2  
Scopus rating (2009): SJR 1.294 SNIP 1.26  
Web of Science (2009): Indexed yes  
BFI (2008): BFI-level 1  
Scopus rating (2008): SJR 1.335 SNIP 1.312  
Web of Science (2008): Indexed yes  
Scopus rating (2007): SJR 1.335 SNIP 1.363  
Web of Science (2007): Indexed yes  
Scopus rating (2006): SJR 1.223 SNIP 1.548  
Web of Science (2006): Indexed yes  
Scopus rating (2005): SJR 1.441 SNIP 1.327
Review of indicators in fisheries management - a development perspective

General information
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Organisations: Section for Management Systems, National Institute of Aquatic Resources
Authors: Degnbol, P. (Ekstern), Jarre, A. (Intern)
Pages: 303-326
Publication date: 2004
Main Research Area: Technical/natural sciences

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Journal: African Journal of Marine Science
Volume: 26
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BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 1.36 SJR 0.661 SNIP 0.8
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.696 SNIP 0.732 CiteScore 1.19
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.568 SNIP 0.879 CiteScore 1.15
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.71 SNIP 0.749 CiteScore 1.25
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.529 SNIP 0.488 CiteScore 1.04
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 0.608 SNIP 0.611 CiteScore 1.15
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.857 SNIP 0.611
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 1.091 SNIP 0.836
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 0.921 SNIP 0.62
Scopus rating (2007): SJR 0.578 SNIP 0.611
Epibenthic diversity in the North Sea

General information
State: Published
Organisations: Section for Management Systems, National Institute of Aquatic Resources
Authors: Zühlke, R. (Ekstern), Alsväg, J. (Ekstern), de Boois, I. (Ekstern), Cotter, J. (Ekstern), Ehrich, S. (Ekstern), Ford, A. (Ekstern), Hinze, H. (Ekstern), Jarre, A. (Intern), Jennings, S. (Ekstern), Kröncke, I. (Ekstern), Lancaster, J. (Ekstern), Piet, G. (Ekstern), Prince, P. (Ekstern)
Pages: 269-281
Publication date: 2002
Main Research Area: Technical/natural sciences

Changes in the timing of spawning of Baltic cod: possible causes and implications for recruitment
Interannual variations in spawning time, defined as the peak in egg abundance, of cod (Gadus morhua) in the Bornholm Basin, Baltic Sea, were analysed. Effects of water temperature, size and age structure of the spawning stock, abundance of food, and timing of spawning in preceding years were studied as possible determinants of annual spawning time. During the 1970s and late 1980s, peak spawning took place between the end of April and mid-June. A remarkable shift in the timing of spawning to the end of July was observed in the 1990s. The key factors governing the timing of spawning are water temperature during the period of gonadal maturation, density-dependent processes related to the size of the spawning stock, and food availability. The age structure of the spawning stock is suggested to have an additional effect. A high proportion of first-time spawners and decreasing water temperature have caused progressively delayed spawning since the early 1990s. Late spawning involves several processes that are detrimental to the survival of the early life stages. Recruitment in the mid-1990s was below what could be expected from spawning stock biomass and favourable hydrographic conditions. It is therefore suggested that the rebuilding of the Baltic cod stock could be improved by reduced fishing pressure in spring on early spawners. (C) 2000 International Council for the Exploration of the Sea.
Modelling effects of fishing in the Southern Benguela ecosystem

General information
State: Published
Organisations: Section for Management Systems, National Institute of Aquatic Resources
Authors: Shannon, L. (Ekstern), Cury, P. (Ekstern), Jarre, A. (Intern)
Performance comparison between regression and neuronal network models for forecasting Pacific sardine (Sardinops caeruleus) biomass
Small pelagics in upwelling systems: patterns of interaction and structural changes in "wasp-waist" ecosystems

General information
State: Published
Organisations: Section for Management Systems, National Institute of Aquatic Resources
Authors: Cisneros Mata, M. (Ekstern), Brey, T. (Ekstern), Jarre, A. (Intern)
Pages: 157-164
Publication date: 2000

Publication information
Journal: ICES Journal of Marine Science
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BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
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Scopus rating (2016): CiteScore 2.63
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): CiteScore 2.18
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): CiteScore 2.62
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): CiteScore 2.46
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): CiteScore 2.35
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): CiteScore 2.32
ISI indexed (2011): ISI indexed yes
Stock recruitment relationships for cod (Gadus morhua L.) in the central Baltic Sea incorporating environmental variability

Recruitment of central/eastern Baltic cod critically depends on favourable oceanographic conditions in the deeper basins of the Baltic Sea creating a suitable habitat for the development of early life stages. The decline in the size of the spawning stock since the mid-1980s initiated a series of investigations on recruitment, which were continued through a partial recovery of the stock in the mid-1990s. The principal factors influencing recruitment and recognized at present are: (i) the volume of water with temperature, oxygen and salinity conditions which meet the minimum requirements for successful egg development ("reproductive volume"); (ii) the age-structure of the spawning stock; (iii) the timing of spawning; and (iv) predation mortality on eggs due to sprat (Sprattus sprattus) and herring (Clupea harengus), as well as cod cannibalism. We relate recruitment at age 2 to parent stock size using updated time series of these variables, comprising the period 1966 to 1994. Spawning stock biomass and egg production are compared as measures of parent stock size. The influence of wind energy and zooplankton abundance on cod recruitment are discussed. A modified Ricker model is outlined explicitly accounting for environmentally-induced oscillations around the two observed levels of cod stock size.

General information
State: Published
Organisations: Section for Management Systems, National Institute of Aquatic Resources, Section for Fisheries- and Monitoring Technology, Section for Population- and Ecosystem Dynamics
Authors: Jarre, A. (Intern), Wieland, K. (Intern), MacKenzie, B. (Intern), Hinrichsen, H. (Ekstern), Plikshs, M. (Ekstern), Aro, E. (Ekstern)
Pages: 97-123
Publication date: 2000
Main Research Area: Technical/natural sciences

Publication information
Journal: Archive of Fishery and Marine Research
Volume: 48
Issue number: 2
ISSN (Print): 0944-1921
Ratings:
BFI (2008): BFI-level 1
Scopus rating (2006): SJR 0.289 SNIP 0.495
Scopus rating (2005): SJR 0.389 SNIP 0.933
Scopus rating (2004): SJR 0.302 SNIP 0.84
Scopus rating (2003): SJR 0.417 SNIP 0.797
Scopus rating (2002): SJR 0.546 SNIP 0.412
Scopus rating (2001): SJR 0.492 SNIP 0.538
Scopus rating (2000): SJR 0.361 SNIP 0.449
Web of Science (2000): Indexed yes
A model of trophic flows in the northern Benguela upwelling system during the 1980s

General information
State: Published
Organisations: Section for Management Systems, National Institute of Aquatic Resources
Authors: Shannon, L. (Ekstern), Jarre, A. (Intern)
Pages: 349-366
Publication date: 1999
Main Research Area: Technical/natural sciences

Publication information
Journal: South African Journal of Marine Science
Volume: 21
ISSN (Print): 0257-7615
Ratings:
BFI (2008): BFI-level 1
Web of Science (2002): Indexed yes
Original language: English
Source: orbit
Source-ID: 227349
Publication: Research - peer-review › Journal article – Annual report year: 1999

Fishing effects in northeast Atlantic shelf seas : patterns in fishing effort, diversity and community structure. III. International trawling effort in the North Sea : an analysis of spatial and temporal trends

This paper describes trends in beam and otter trawling effort in the North Sea from 1977 to 1995. Data are presented as total hours fishing by English, German, Norwegian, Scottish and Welsh vessels for the period 1977-1995, and by Danish, Dutch, English, German, Norwegian, Scottish and Welsh vessels for the period 1990-1995. Analyses of temporal trends indicated that total international trawling effort in the entire North Sea has increased slowly since 1977 and that it is currently (1995) 2.25 million h yr\(^{-1}\) of which 55% is due to beam trawling. Spatial analyses indicate that the proportion of beam trawling effort increases from north to south. Plots of annual fishing effort by ICES statistical rectangle (211 boxes of 0.5 degrees latitude x 1 degrees longitude) indicate that the majority of fishing effort in the North Sea are concentrated in a very few rectangles. Thus mean annual total fishing effort (1990-1995) was less than 2 000 h in 29% of rectangles and less than 10 000 h in 66% of rectangles. Total effort exceeded 40 000 h in 4% of rectangles. The results indicate that assessments of the average area swept by trawls in the North Sea give a poor indication of the direct impacts of trawling on the biota. Some areas are intensively fished but many others are not. Our dataset is likely to underestimate trawling effort in the southern North Sea (ICES Area IVc) because data for Belgian and French vessels were not available. However, the absence of French and Belgian data would not significantly alter total trawling effort estimates from the central (IVb) and northern (IVa) North Sea. Crown copyright (C) 1999 Published by Elsevier Science B.V. All rights reserved.

General information
State: Published
Organisations: Section for Management Systems, National Institute of Aquatic Resources
Authors: Jennings, S. (Ekstern), Alsvåg, J. (Ekstern), Cotter, A. (Ekstern), Ehrich, S. (Ekstern), Greenstreet, S. (Ekstern), Jarre, A. (Intern), Mergardt, N. (Ekstern), Rijnsdorp, A. (Ekstern), Smedstad, O. (Ekstern)
Pages: 125-134
Publication date: 1999
Main Research Area: Technical/natural sciences

Publication information
Journal: Fisheries Research
Volume: 40
Issue number: 2
ISSN (Print): 0165-7836
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BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
An approach to modelling persistent pollutants in marine ecosystems

General information
State: Published
Organisations: Section for Management Systems, National Institute of Aquatic Resources
Authors: Dalsgaard, J. (Ekstern), Jarre, A. (Intern), Walters, C. (Ekstern), Pauly, D. (Ekstern)
Pages: 1-21
Publication date: 1998
Main Research Area: Technical/natural sciences

Publication information
Journal: ICES CM 1998/
Volume: V:10
Original language: English
Source: orbit
Source-ID: 225235
Publication: Research › Conference article – Annual report year: 1998

An approach to the modelling of persistent pollutants in marine ecosystems

General information
State: Published
Organisations: Section for Aquaculture, National Institute of Aquatic Resources, Section for Management Systems
Authors: Dalsgaard, A. J. T. (Intern), Jarre, A. (Intern), Walters, C. (Ekstern), Pauly, D. (Ekstern)
Pages: 16
Publication date: 1998
Main Research Area: Technical/natural sciences

Publication information
Journal: ICES Council Meeting
Volume: V:10
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: 315949
Publication: Research › Conference article – Annual report year: 1998

Changes through time in macrofaunal composition on the Dogger Bank in the North Sea

General information
State: Published
Organisations: Section for Population- and Ecosystem Dynamics, National Institute of Aquatic Resources, Section for Management Systems
Authors: Jansen, T. (Intern), Jarre, A. (Intern)
Publication date: 1998

Host publication information
Title of host publication: Monitoring biodiversity in the North Sea using groundfish surveys
Publisher: EU

Series: EU-FAIR
Number: CT95-0817
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 231444
Comparative analyses of trophic flows in upwelling ecosystems: Global vs. local changes

General information
State: Published
Organisations: Section for Management Systems, National Institute of Aquatic Resources
Authors: Jarre, A. (Intern)
Pages: 423-443
Publication date: 1998

Host publication information
Title of host publication: Local vs. global changes in upwelling ecosystems
Place of publication: Ostrom, France
Editors: Durand, M., Cury, P., Mendelssohn, R., Roy, C., Bakun, A., Pauly, D.
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 225953
Publication: Research - peer-review » Book chapter – Annual report year: 1998

Comparing trophic flows in the Southern Benguela to those in other upwelling systems

General information
State: Published
Organisations: Section for Management Systems, National Institute of Aquatic Resources
Authors: Jarre, A. (Intern)
Pages: 391-414
Publication date: 1998
Main Research Area: Technical/natural sciences

Publication information
Journal: South African Journal of Marine Science
Volume: 19
ISSN (Print): 1814-232X
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 1.36 SJR 0.661 SNIP 0.8
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.696 SNIP 0.732 CiteScore 1.19
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.568 SNIP 0.879 CiteScore 1.15
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.71 SNIP 0.749 CiteScore 1.25
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.529 SNIP 0.488 CiteScore 1.04
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 0.608 SNIP 0.611 CiteScore 1.15
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.857 SNIP 0.611
Equipment for the sampling of bentic macrofauna: A comparison between a 2m beamtrawl and a 0.1 m² van Veen grab

General information
State: Published
Organisations: Section for Population- and Ecosystem Dynamics, National Institute of Aquatic Resources, Section for Management Systems
Authors: Jansen, T. (Intern), Jarre, A. (Intern)
Publication date: 1998

Host publication information
Title of host publication: Monitoring biodiversity in the North Sea using groundfish surveys
Publisher: EU
Series: EU-FAIR
Number: CT95-0817
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 231445
Publication: Research › Book chapter – Annual report year: 1998

Field estimates of the food consumption of the searobin Prionotus punctatus (Bloch, 1797) on the continental shelf of Ubatuba, south-eastern Brazil

General information
State: Published
Organisations: Section for Management Systems, National Institute of Aquatic Resources
Authors: Jarre, A. (Intern)
Pages: 45-60
Publication date: 1998
Main Research Area: Technical/natural sciences

Publication information
Journal: Revista Brasileira de Oceanografia
Volume: 46
ISSN (Print): 1413-7739
Ratings:
ISI indexed (2013): ISI indexed no
ISI indexed (2012): ISI indexed no
ISI indexed (2011): ISI indexed no
Original language: English
Placing fisheries in their ecosystem context: Regional training course for Europe and West Afrika

General information
State: Published
Organisations: Section for Management Systems, National Institute of Aquatic Resources
Authors: Jarre, A. (Intern)
Pages: 1-17
Publication date: 1998
Main Research Area: Technical/natural sciences

Publication information
Journal: EC Fisheries Cooperation Bulletin
Volume: 11
ISSN (Print): 1023-1218
Ratings:
ISI indexed (2013): ISI indexed no
ISI indexed (2012): ISI indexed no
ISI indexed (2011): ISI indexed no
Scopus rating (1999): SJR 0.107
Original language: English
Source-ID: 225955
Publication: Research › Journal article – Annual report year: 1998

Quantitative model of thophic interactions in the Ubatuba shelf system (southeastern Brazil)

General information
State: Published
Organisations: Section for Management Systems, National Institute of Aquatic Resources
Pages: 25-31
Publication date: 1998
Main Research Area: Technical/natural sciences

Publication information
Journal: Naga
Volume: 21
Issue number: 4
ISSN (Print): 0116-290X
Original language: English
Source-ID: 227299
Publication: Research › Journal article – Annual report year: 1998

Spatial distribution and variability of abundance estimates of juvenile (age 1 and 2) whiting and cod in the North Sea

General information
State: Published
Organisations: Section for Fisheries- and Monitoring Technology, National Institute of Aquatic Resources, Section for Management Systems
Authors: Wieland, K. (Intern), Foldager, L. (Ekstern), Holst, R. (Intern), Jarre, A. (Intern)
Pages: 1-31
Publication date: 1998
Main Research Area: Technical/natural sciences

Publication information
The potential role of mass balance models for the management of upwelling ecosystems

Upwelling ecosystems are productive fishing grounds, contributing >30% to the world’s catch of marine fish. A set of seven trophic mass balance models of productive subsystems of the four largest upwelling areas is used to demonstrate key features of the modeling process and the analysis of the models using some flow network techniques. The models describe trophic interactions in the northern Humboldt Current (4 degrees-14 degrees S), the northern Benguela Current (15 degrees-35 degrees S), the southern Canary Current (12 degrees-25 degrees N), and the California Current (28 degrees-43 degrees N), focusing on different biological regimes in the 1970s and 1980s. The straightforwardness of the method is emphasized as a coherent basis for more sophisticated modeling approaches. One major advantage over more traditional assessment methods is that the fishery is explicitly tied into the full set of species interactions, and its impact can thus be readily compared to that of other piscivores in the ecosystem. This approach consequently allows us to assess the ecological sustainability of a fishery. It therefore addresses the Code of Conduct for Responsible Fisheries recently published by the Food and Agricultural Organization of the United Nations.
Prediction of vertical distribution and ambient development temperature of Baltic cod, Gadus morhua L., eggs
An artificial neural network (ANN) model was established to predict the vertical distribution of Baltic cod eggs. Data from vertical distribution sampling in the Bornholm Basin over the period 1986-1995 were used to train and test the network, while data sets from sampling in 1996 were used for validation. The model explained 82% of the variance between observed and predicted relative frequencies of occurrence of the eggs in relation to salinity, temperature and oxygen concentration; The ANN fitted all observations satisfactorily except for one sampling date, where an exceptional hydrographic situation was observed. Mean ambient temperatures, calculated from the predicted vertical distributions of the eggs and used for the computation of egg developmental times, were overestimated by 0.05 degrees C on average. This corresponds to an error in prediction of egg developmental time of less than 1%

General information
State: Published
Organisations: Section for Fisheries- and Monitoring Technology, National Institute of Aquatic Resources, Section for Management Systems
Authors: Wieland, K. (Intern), Jarre, A. (Intern)
Pages: 172-187
Publication date: 1997
Main Research Area: Technical/natural sciences

Publication information
Journal: Fisheries Oceanography
Volume: 6
Issue number: 3
ISSN (Print): 1365-2419
Ratings:
Web of Science (2018): Indexed yes
Web of Science (2017): Indexed Yes
Trophic flows in the benthic shelf community of the eastern Weddell Sea, Antarctica

General information
State: Published
Organisations: Section for Management Systems, National Institute of Aquatic Resources
Authors: Jarre, A. (Intern), Brey, T. (Ekstern), Bathmann, U. (Ekstern), Dahm, C. (Ekstern), Dieckmann, G. (Ekstern), Gorny, M. (Ekstern), Klages, M. (Ekstern), Pagés, F. (Ekstern), Plötz, J. (Ekstern), Schnack-Schiel, S. (Ekstern), Stiller, M. (Ekstern), Arntz, W. (Ekstern)
Pages: 118-134
Publication date: 1997

Artificial neural networks to forecast biomass of Pacific sardine and its environment

We tested the forecasting performance of artificial neural networks (ANNs) using several time series of environmental and biotic data pertaining to the California Current (CC) neritic ecosystem. ANNs performed well predicting CC monthly 10-m depth temperature up to nine years in advance, using temperature recorded at Scripps Institution of Oceanography pier. Annual spawning biomass of Pacific sardine (Sardinops sagax caeruleus) was forecasted reasonably well one year in advance using time series of water temperature, wind speed cubed, egg and larval abundance, commercial catch, and spawning biomass of northern anchovy (Engraulis mordax) and Pacific sardine as predictors. We discuss our results and focus on the philosophy and potential problems faced during ANN modelling.

General information
State: Published
Organisations: Section for Management Systems, National Institute of Aquatic Resources
Authors: Cisneros Mata, M. (Ekstern), Brey, T. (Ekstern), Jarre, A. (Intern), Garcia Franco, W. (Ekstern), Montemayor Lopez, G. (Ekstern)
Pages: 427-442
Artificial neural networks versus multiple linear regression: predicting P/B ratios from empirical data

General information
State: Published
Organisations: Section for Management Systems, National Institute of Aquatic Resources
Authors: Brey, T. (Ekstern), Jarre, A. (Intern), Borlich, O. (Ekstern)
Pages: 251-256
Publication date: 1996
Main Research Area: Technical/natural sciences

Publication information
Journal: Marine Ecology Progress Series
Volume: 140
ISSN (Print): 0171-8630
Projects:

**Indicators for fisheries management in Europe (IMAGE) (38225)**

The Common Fisheries Policy (CFP) requires the progressive implementation of an ecosystem-based approach to fisheries management (EBFM). To implement effective management, it is essential to develop a framework that allows for the evaluation of different management strategies based on indicators. Indicators can support the decision making process by (i) describing the pressures affecting the ecosystem, the state of the ecosystem and the response of managers, (ii) tracking progress towards meeting management objectives and (iii) communicating trends in complex impacts and management processes to a non-specialist audience. The aim of this project was to develop an indicator-based operational framework that can support ecosystem-based management, and also show how this can be applied to test and evaluate different management strategies or sampling programs.

The principal objectives of IMAGE were:
- To develop an operational framework of candidate indicators (ecological, economic, social) that can support ecosystem-based fisheries management at the regional and pan-European scale
- To elaborate these indicators in comprehensive dashboards (e.g. current values, trends, reference levels)
- To develop methodology to integrate this information into tools supporting the decision-making process
- To develop a framework that can evaluate management strategies based on indicators
- To advise on how indicators can be used to support EBFM in selected regional case studies based on the RAC areas.

The project consisted of a conceptual phase where the operational framework was designed. This was followed by a phase of methodology development, an implementation phase consisting of regional case studies linked to the RACs and finally a pan-European evaluation and synthesis of the projects results. The results of this project contribute to the development of an effective EBFM in the context of the CFP, while also contributing to the applied science needed to support the emerging European Marine Strategy and Maritime Policy.

The project was coordinated by Institute for Marine Resources and Ecosystem Studies (IMARES), The Netherlands.

National Institute of Aquatic Resources
Section for Ecosystem based Marine Management
Wageningen IMARES
Cefas
IFREMER
Aalborg University
COISPA Tecnologia & Ricerca
University of Tartu

Period: 01/01/2006 → 31/12/2009
Number of participants: 11

Research area: Ecosystem Based Marine Management

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