



The impact of management regulations on fishers' behaviour  
A case study using a satellite-based vessel monitoring system

**Feekings, Jordan P.; Skjöld, M.; Bartolino, V.; Lövgren, J.**

*Publication date:*  
2010

*Document Version*  
Publisher's PDF, also known as Version of record

[Link back to DTU Orbit](#)

*Citation (APA):*

Feekings, J. P., Skjöld, M., Bartolino, V., & Lövgren, J. (2010). The impact of management regulations on fishers' behaviour: A case study using a satellite-based vessel monitoring system. Poster session presented at Fishery Dependent Information Conference, Galway, Ireland.

---

**General rights**

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

# THE IMPACT OF MANAGEMENT REGULATIONS ON FISHERS' BEHAVIOUR: A CASE STUDY USING A SATELLITE-BASED VESSEL MONITORING SYSTEM

<sup>1</sup>Feekings, J. <sup>2</sup>Sköld, M. <sup>2</sup>Bartolino, V. <sup>2</sup>Lövgren, J.

<sup>1</sup>National Institute of Aquatic Resources, Nordsøen Forskerspark, Postboks 101, 9850 Hirtshals, Denmark

<sup>2</sup>Institute of Marine Research, Swedish Board of Fisheries, P.O. Box 4, S-453 21 Lysekil, Sweden

The spatial distribution of a fishery is based on the fisher's perception of the spatial distribution of fish and the regulations governing the fishery. Regulations such as Total Allowable Catches (TAC's) and Minimum Landings Sizes (MLS's) alter what a fisher is allowed to land, therefore resulting in a redistribution of fishing effort among alternative fisheries or areas based on the fisher's perception of where/ what is the best possible catch. The extent to which a fisher is able to change location will depend on the fishers' ability to change target species and area, as well as the heterogeneity of the fishing grounds.

**Fishers are an important component of a fishery and need to be incorporated into the construction of management policies and regulations. This study focuses on how catch controls impact on fishers' spatial displacement.**

**Methods:** We analysed landings and VMS data (Fig. 1) from the Swedish demersal fishing fleet active within the Kattegat during 2005-2007 and the ability of fishers to alter fishing grounds in relation to cod quotas being exhausted. To determine whether a shift in spatial distribution occurred, the spatial point patterns for the periods before and after quota exhaustion (Fig. 2) were analysed and compared using the difference in the K-function,  $K(s) = \lambda^{-1} \cdot E[N_o(s)]$ , between the two periods. Within the Swedish demersal fishery, the otter trawl fishery using >90mm mesh size has accounted for more than 90% of the total landings in the last five years.

**Results:** Fishers seldom altered their location when the quota for the main target species, cod, was closed. Only during 2006 in the southern and central fishing grounds and in 2005 central fishing ground did the fleet alter their spatial dispersal (Fig. 4).

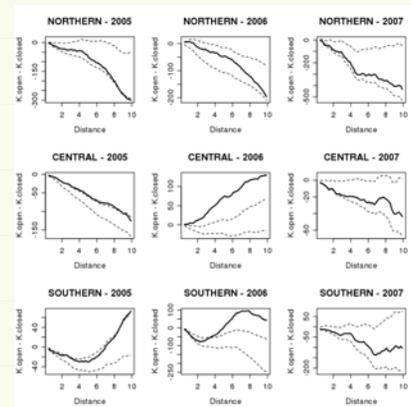


Fig.4. The difference between the K-function calculated on the points patterns from the open and closed periods (thick line) and the bootstrap 95% confidence interval (dotted line).

**Conclusions:** The findings from this study show that the closure of quotas as a management tool within the Kattegat is rather ineffective. A species quota closure leads to a shift in documented landing compositions (Fig. 3), while seldom to a shift in spatial location. Fishing mortality is thus sustained and the regulation more than likely leads to an increase in discards, illegal landings, or both. Such behaviour is not the intention of the manager. The hypothesis that reduced TAC's lead to increased discarding or illegal fishing and not a change in fishing behaviour is thus supported.

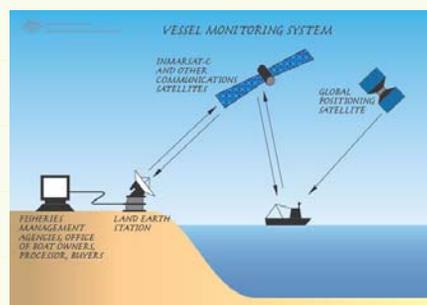


Fig. 1. Vessel Monitoring System (VMS). Taken from the Australian Fisheries Management website.

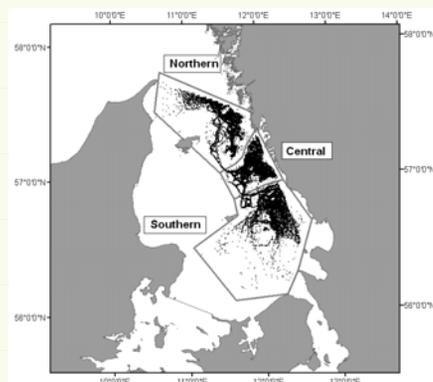


Fig. 2. Three main fishing grounds were identified in the Kattegat; Northern, Central, Southern. Points represent VMS signals for the periods analysed.

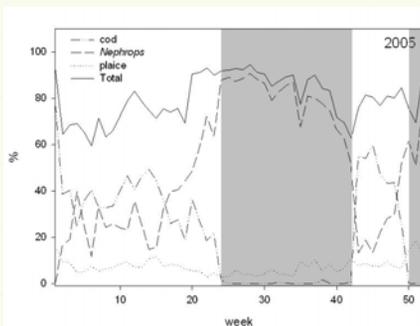


Fig. 3. Composition of the three most common species and their pooled total per week for 2005. Weeks 1-23, 43-49 cod fishery open (white). Weeks 24-42, 50-52 cod fishery closed (grey).

**Acknowledgements:**

This study was undertaken at the Institute of Marine Research, Lysekil, Sweden.