USES OF SATELLITE MONITORING OF FISHING VESSEL ACTIVITY IN FISHERIES ASSESSMENT

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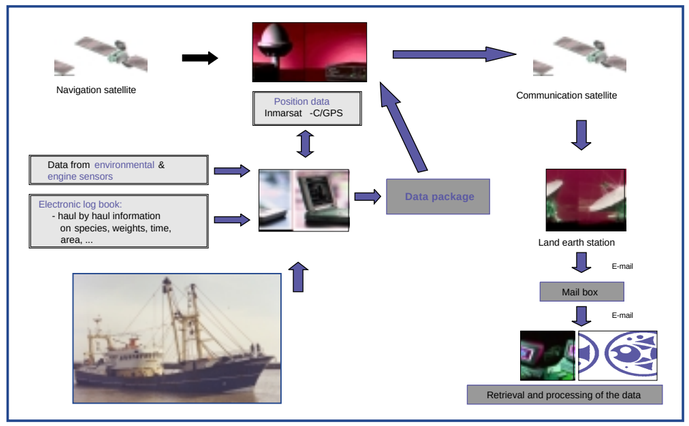
Introduction

Satellite based vessel monitoring systems (VMS) are widely used to monitor activity of fishing vessels. In EU waters VMS began in 1998 and was extended to all fishing vessels over 24m in 2000. Although primarily aimed at enforcement, this data has immediate application for fisheries research in a number of areas by providing:

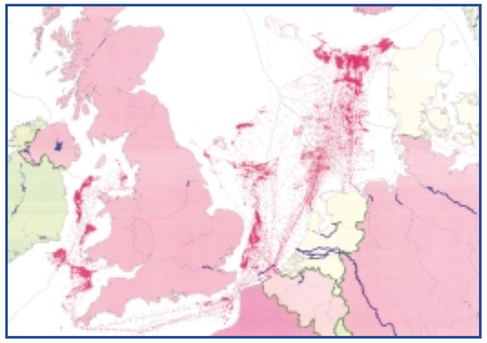
- unbiased descriptions of fishing activity by key fleets
- identification of seasonal patterns
- potential to describe and understand variations in CPUE if associated with catch data
- data for directly assessing impacts of management decisions such as closed areas



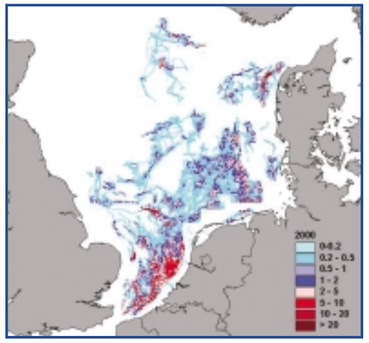
Two EU funded projects have looked at the activity of beam trawlers primarily in the North Sea over the period 1998-2001. The projects involved cooperation between Belgium, the Netherlands and the UK, to ensure full coverage of the three main fleets. Vessel positions together with time, speed and course over the ground were obtained at least every two hours and transmitted by Inmarsat satellite network to a receiving station on land. Data was displayed in real time at the control stations and was then stored for processing and analysis by the participating institutes (CLO-DvZ Belgium; CEFAS England; RIVO-DLO Netherlands)

Fishing activity

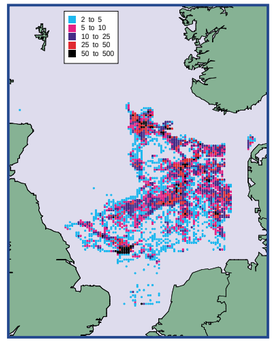
Distribution of annual fishing activity for the three fleets shows a high intensity in the southern North Sea and in the shallow coastal areas from Belgium to Denmark.



Belgium fleet activity

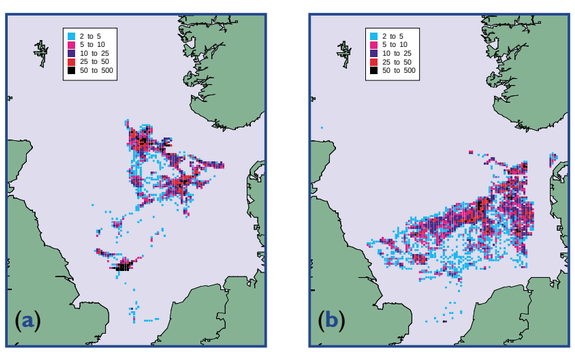


Netherlands fleet activity



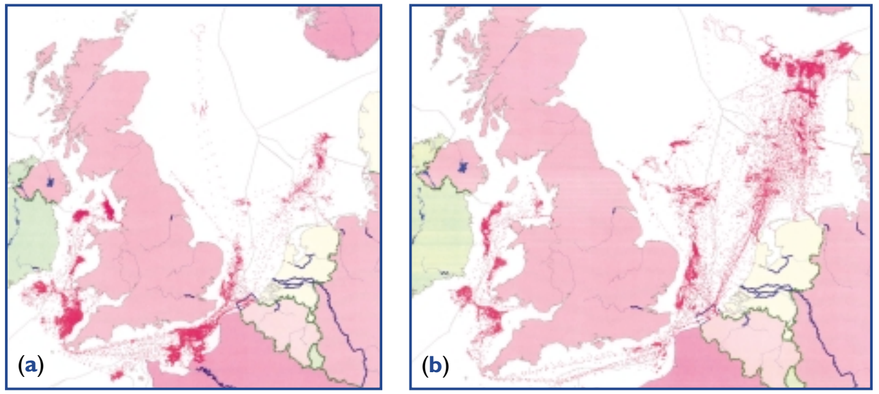
UK fleet activity

In the UK, there was a clear separation between vessels fishing (**a**) mainly for plaice which registered activity north of 56° N and (**b**) the vessels fishing on plaice and sole.

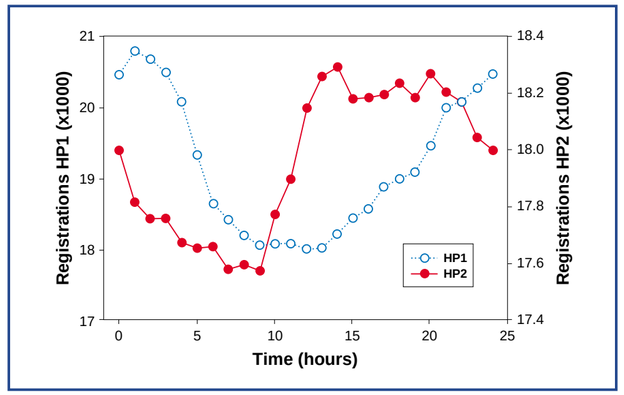


Seasonal and temporal variability

There is considerable variability in the seasonal pattern of fishing especially in the Belgian fleet which mainly fishes in (**a**) the English Channel and Irish Sea in the first quarter of the year and (**b**) in the North Sea and Irish Sea in quarter three.

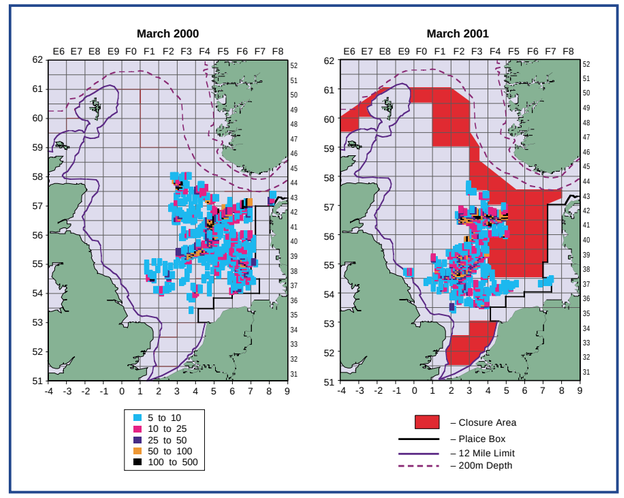


In the Netherlands patterns of fishing activity vary diurnally between small and large beam trawlers. The smaller vessels (HP1) concentrate fishing activity during the night whereas, the larger vessels (HP2) show the highest fishing activity from noon to 2200 h at night.



Assessing impact of management measures

Detailed information on vessel activity provides a means of assessing impacts of management measures such as closed areas. For instance, it has been possible to track changes in fleet activity around the Plaice Box on the coast of the Netherlands, Germany and Denmark. Another shift in vessel activity occurred following the Cod Closure in the North Sea in 2001. Comparison of fishing activity of UK beam trawlers between March 2000 (no closure) and March 2001 (closure) indicates a marked displacement of effort to the east after the closure.



Conclusion

Satellite monitoring of vessels provides a powerful tool for fisheries scientists to monitor and explain the behaviour and activity of fleet segments. If it could be combined with automatic recording of catches on a haul by haul basis, this would greatly strengthen the understanding of commercial CPUE indices in relation to the spatial distribution of fleet effort.

Acknowledgements

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