

# Cod has a key role in the whole Baltic Sea

April 18 2012

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A new investigation put in evidence the key role of cod as regulator of the whole Baltic Sea ecosystem. The study shows that when the cod population in the central Baltic increases, it spreads into larger areas and spills over into adjacent marginal systems where it usually does not occur, as for example the Gulf of Riga. Credit: Roger Jansson

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On the other hand, when the cod population size in the central Baltic decreases, it concentrates into the southern Baltic Sea and disappears from the other systems where it cannot reproduce. Cod [population size](#)

and spatial expansions/contractions in the Baltic landscape depend on fishing pressure and hydro-climatic conditions in the central Baltic that acts as source of cod for the more coastal and northern areas.

The presence/absence of cod in the Gulf of Riga impacts the whole local ecosystem, from the main pelagic fish, the herring, to the [zooplankton](#) and phytoplankton through a "trophic cascade". The presence of cod in the Gulf of Riga can therefore decrease the intensity of the local [algal blooms](#). However, other local factors also affect the Gulf of Riga ecosystem, as local fishing on cod and herring, temperature and [river runoff](#) transporting nutrients into the Gulf.

This study increases our knowledge on the predators' effects on ecosystem structure, and stresses the importance of linking both local and regional processes for a full understanding of ecosystem functioning on a broader landscape scale. Investigations on the functional implications of cross-system fluxes of organisms are central in the management of exploited resources and ecosystem conservation.

SLU-researcher Michele Casini was the leader of the study in collaboration with other scientists from Sweden, Denmark, Latvia, Germany and Norway. The analysis is based on biological and hydrological data collected in the Baltic Sea during a 35-year period.

The results of the study have been published early edition online in the scientific journal *Proceedings of the National Academy of Sciences*, April 13, 2012, with the title Predator transitory spillover induces trophic cascades in ecological sinks.

Provided by Swedish Research Council

Citation: Cod has a key role in the whole Baltic Sea (2012, April 18) retrieved 26 April 2024

from <https://phys.org/news/2012-04-cod-key-role-baltic-sea.html>

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