

TrophicCS: Spatialized trophic data of the Celtic Sea continental shelf food web

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Abstract

Understanding the dynamics of species interactions for food (prey–predator, competition for resources) and the functioning of trophic networks (dependence on trophic pathways, food chain flows, etc.) has become a thriving ecological research field in recent decades. This empirical knowledge is then used to develop population and ecosystem modeling approaches to support ecosystem-based management. The TrophicCS data set offers spatialized trophic information on a large spatial scale (the entire Celtic Sea continental shelf and upper slope) for a wide range of species. It combines ingested prey (gut content analysis) and a more integrated indicator of food sources (stable isotope analysis). A total of 1337 samples of large epifaunal invertebrates (bivalve mollusks and decapod crustaceans), zooplankton, fish, and cephalopods, corresponding to 111 taxa (94% determined at the species level), were collected and analyzed for stable isotope analysis of their carbon and nitrogen content. Samples were collected between 2014 and 2016, mostly during the month of November and between 57 and 516 m depth. Sample size varied between taxa (from 1 to 52), with 98 taxa having at least three samples. The gut contents of 1027 fish belonging to 10 commercially important species: black anglerfish (*Lophius budegassa*), white anglerfish (*Lophius piscatorius*), blue whiting (*Micromesistius poutassou*), cod (*Gadus morhua*), haddock (*Melanogrammus aeglefinus*), hake (*Merluccius merluccius*), megrim (*Lepidorhombus whiffiagonis*), plaice (*Pleuronectes platessa*), sole (*Solea solea*), and whiting (*Merlangius merlangus*) were analyzed. Sampling occurred in November 2014 and 2015. The gut content data set contains the occurrence of prey in gut, identified to the lowest taxonomic level possible. No prey were assigned for 274 empty gut contents. To consider potential ontogenetic diet changes, a large size range was sampled for each species. The TrophicCS data set was used to improve understanding of trophic relationships and ecosystem functioning in the Celtic Sea. Data are released under a CC-BY-NC-SA license, and please cite this paper when reusing the data.

KEYWORDS

carbon and nitrogen stable isotopes, Celtic Sea continental shelf, diet matrix, ecosystem scale, gut content analysis, November 2014–2016, trophic network structure, trophic niche


CONFLICT OF INTEREST

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

Data are provided as Supporting Information and are also available in SEANOE at <https://doi.org/10.17882/81149>.

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SUPPORTING INFORMATION

Additional supporting information may be found in the online version of the article at the publisher's website.

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