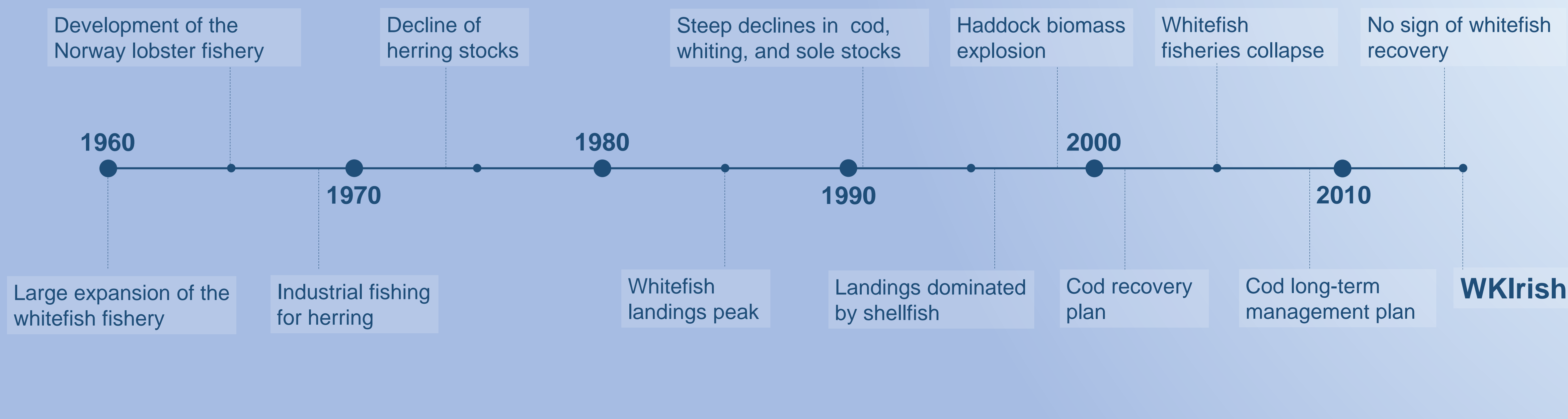


# CO-CREATING KNOWLEDGE FOR SUSTAINABLE FISHERIES MANAGEMENT: A CASE STUDY FOR THE IRISH SEA

Jacob W. Bentley<sup>1</sup>, Natalia Serpetti<sup>1</sup>, Clive Fox<sup>1</sup>, David G. Reid<sup>2</sup>, Sheila J.J. Heymans<sup>1,3</sup>



## Irish Sea fisheries from 1960 to 2015: The road to WKIrish...



**What is WKIrish?**  
After the whitefish stocks failed to recover, industry requested an ICES benchmark (WKIrish). WKIrish aimed to improve single stock assessments and explore the dynamics underpinning stock trends. WKIrish combined the knowledge of scientists, fishermen, industry leaders, and NGOs to co-create a food web model of the Irish Sea.

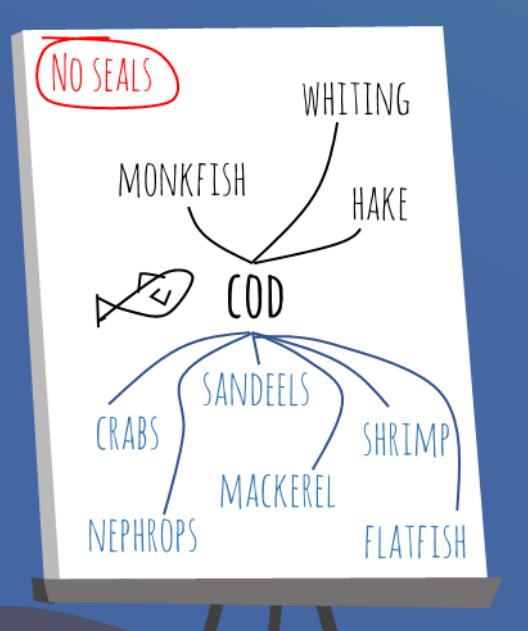
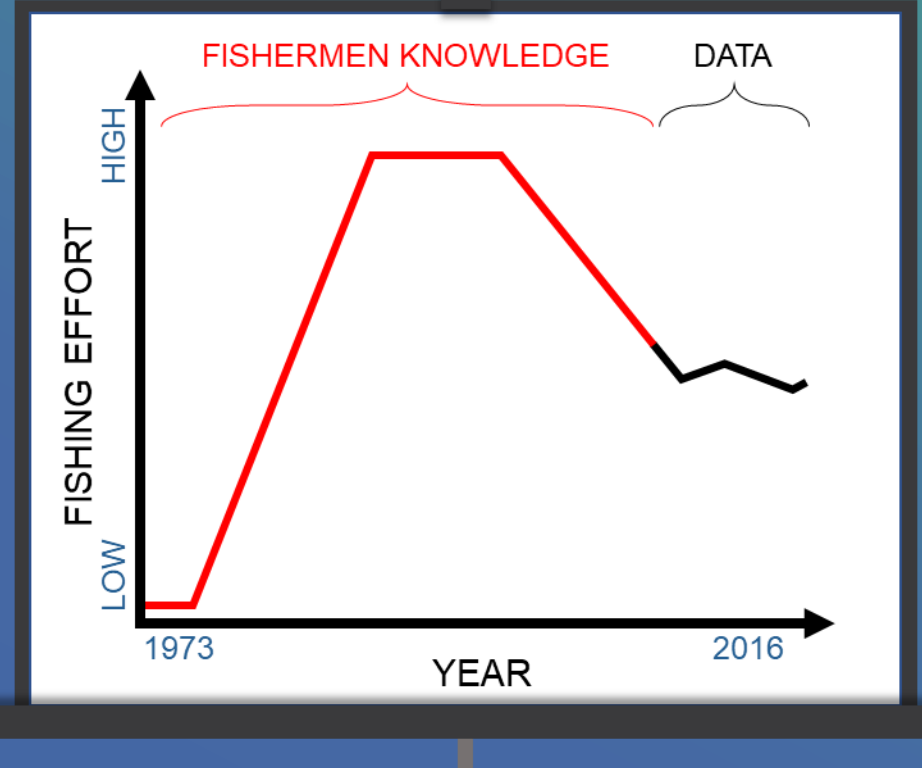
The International Council for the Exploration of the Sea (ICES) is an intergovernmental marine science organisation, providing evidence on the state and sustainable use of our oceans.

The Scottish Association for Marine Science (SAMS) hosted the development of the Irish Sea food web model for WKIrish.

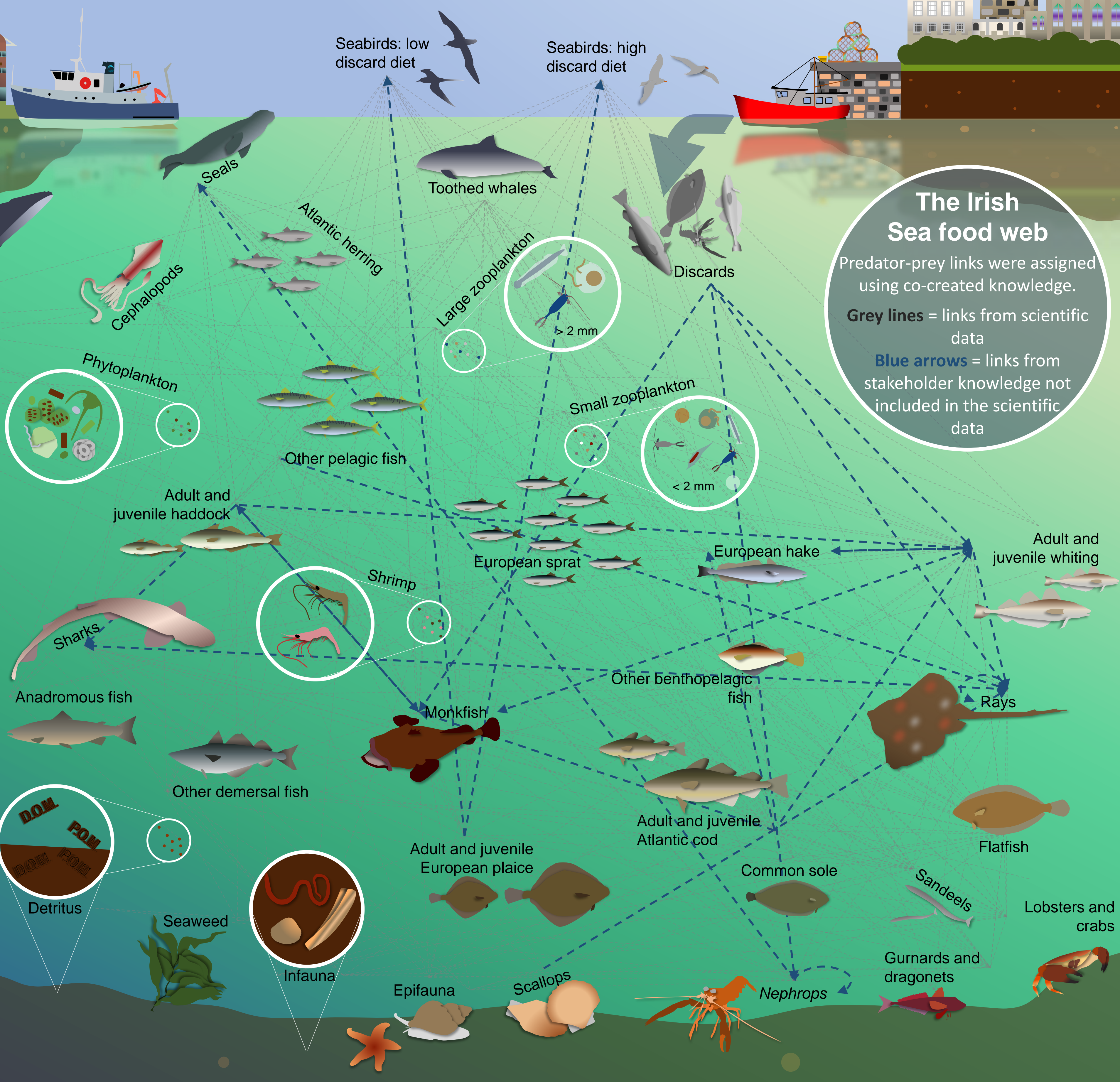
The food web research itself was proposed and funded by the Marine Institute in Galway. Stakeholder workshops were held in Ireland and Northern Ireland.

**The food web model**  
WKIrish built a computer model of the Irish Sea food web using Ecopath with Ecosim (EwE). The model recreates trends of important commercial species as well as all other parts of the food web from plankton to whales. It helped us to understand the impact of fishing and climate drivers.

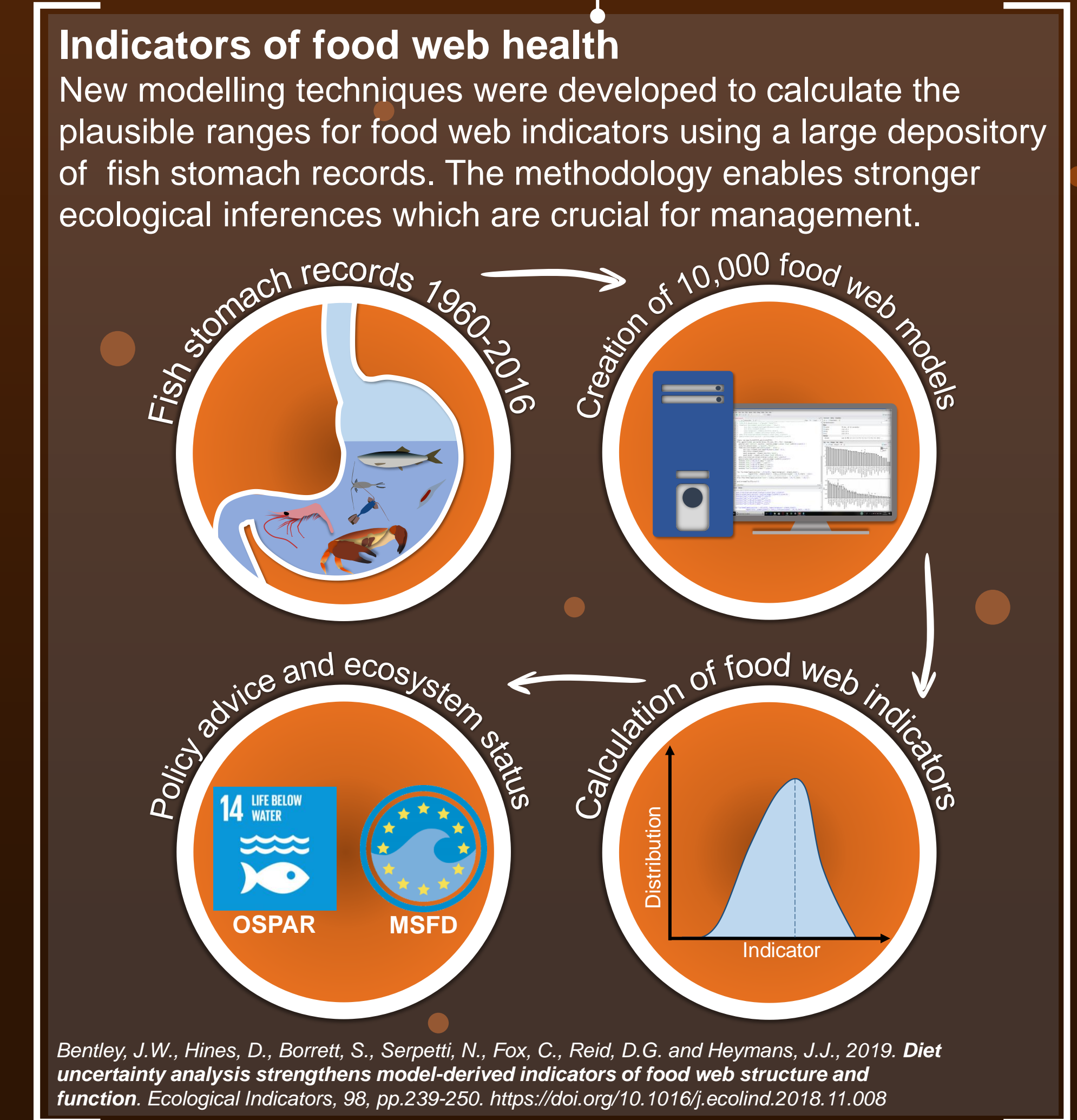
**The benefit of co-creating knowledge**  
Stakeholder knowledge holds considerable value as a source of information to complement and fill gaps in scientific data. Stakeholders provided information on the diets of commercial species, which ran parallel to long-term stomach records, and provided historic fishing effort trends to fill gaps in the available data. Combining scientific and stakeholder knowledge improved the model's ability to simulate the biomass and catch trends of commercial stocks and led to the recognition of additional predator-prey interactions which will influence the advice and indicators derived from the model. By disseminating these results back to stakeholders, we were able to demonstrate the visible impact and value of their knowledge, increasing their buy-in and engagement. Stakeholders continue to guide the direction of future collaboration and research objectives.



Bentley, J.W., Serpetti, N., Fox, C., Heymans, J.J. and Reid, D.G., 2019. Fishers' knowledge improves the accuracy of food web model predictions. *ICES Journal of Marine Science*. <https://doi.org/10.1093/icesjms/fsz003>



**The Irish Sea food web**  
Predator-prey links were assigned using co-created knowledge.  
Grey lines = links from scientific data  
Blue arrows = links from stakeholder knowledge not included in the scientific data



Bentley, J.W., Hines, D., Borratt, S., Serpetti, N., Fox, C., Reid, D.G. and Heymans, J.J., 2019. Diet uncertainty analysis strengthens model-derived indicators of food web structure and function. *Ecological Indicators*, 98, pp.239-250. <https://doi.org/10.1016/j.ecolind.2018.11.008>

