



Using Distributions of Biotracers to Predict Global Food Traceability

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Biotracers

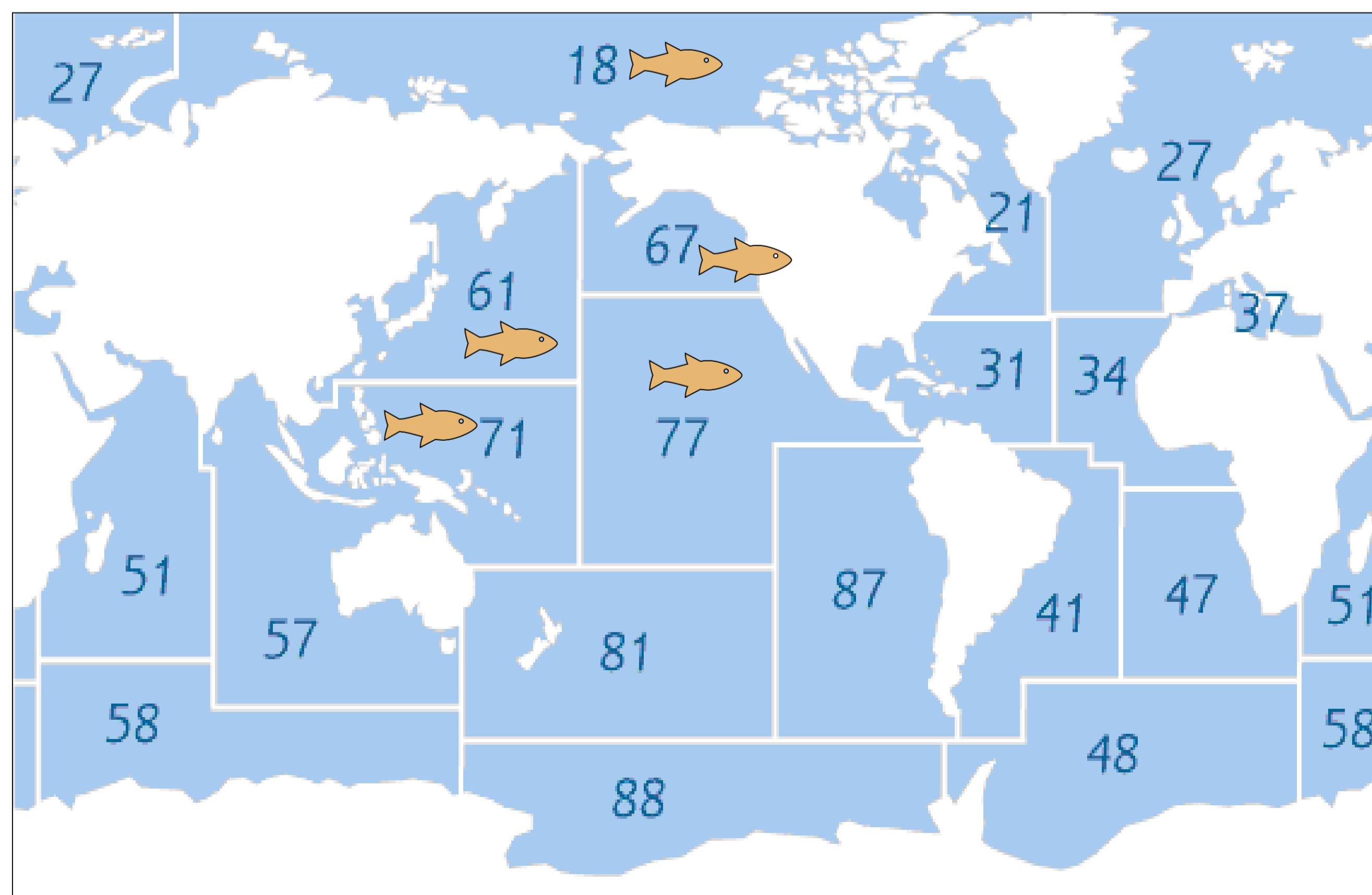
Seafood enters complex food supply chains, where provenance is difficult to trace. We argue for the importance of a general framework that uses biotracers, such as isotopes to predict region of catch.

Multi-Dimensional Models

Our simple models use multiple tracers to predict origin based on sample sizes, distribution overlap, and correlations between tracers.

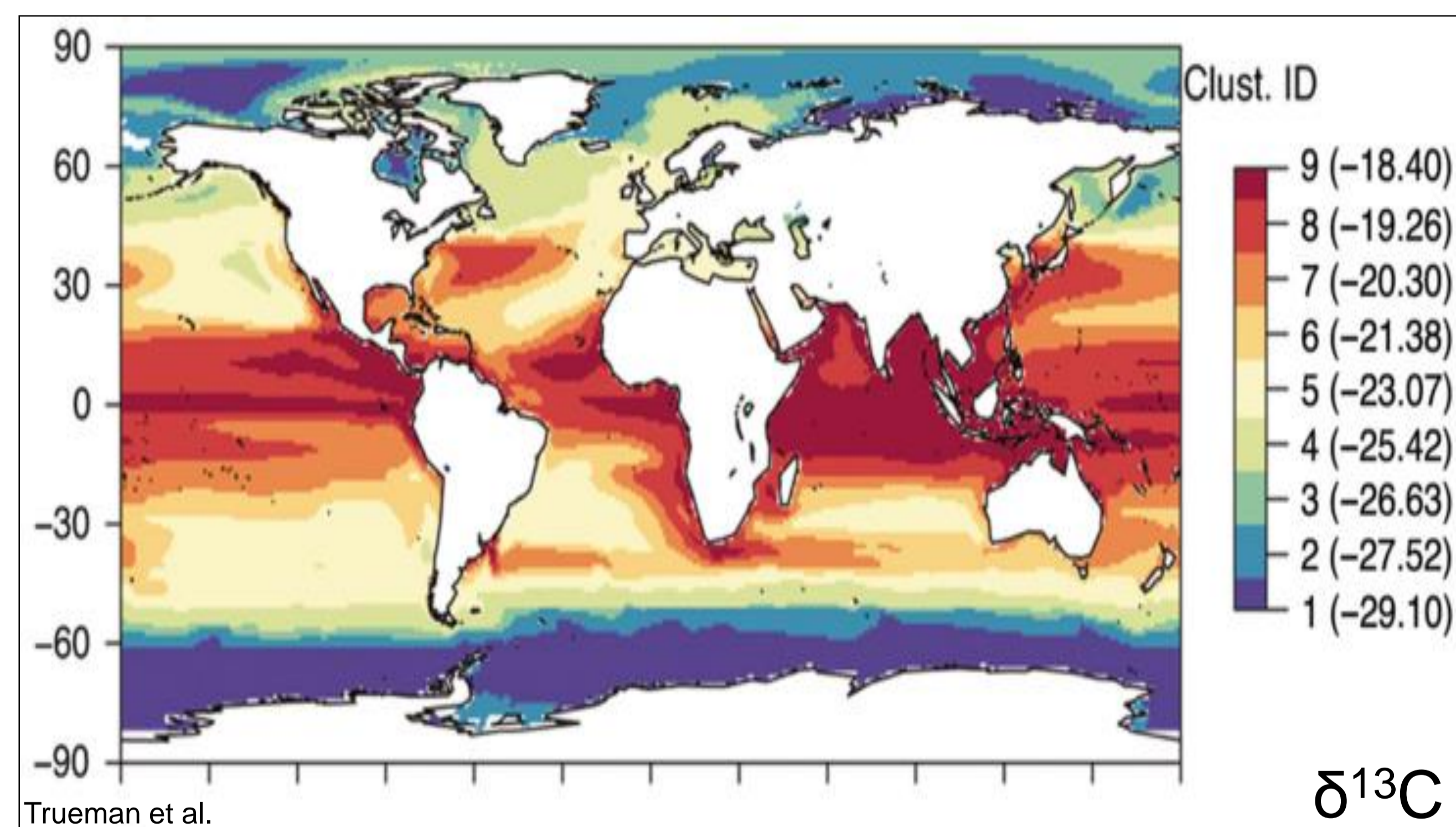
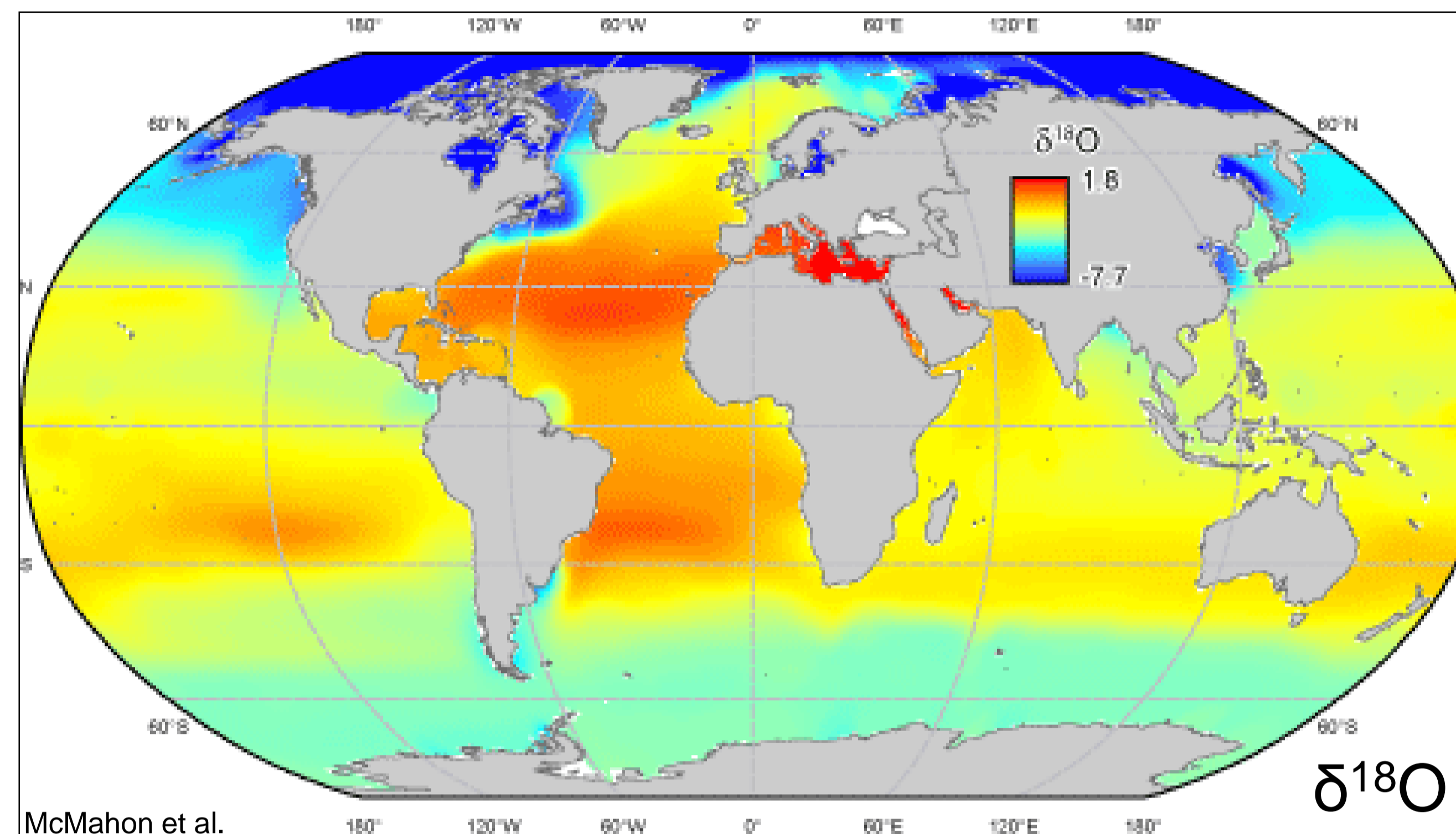
Regional Differentiation

We use FAO commercial fishing regions as our regions of interest. Here we focus on 5 regions.

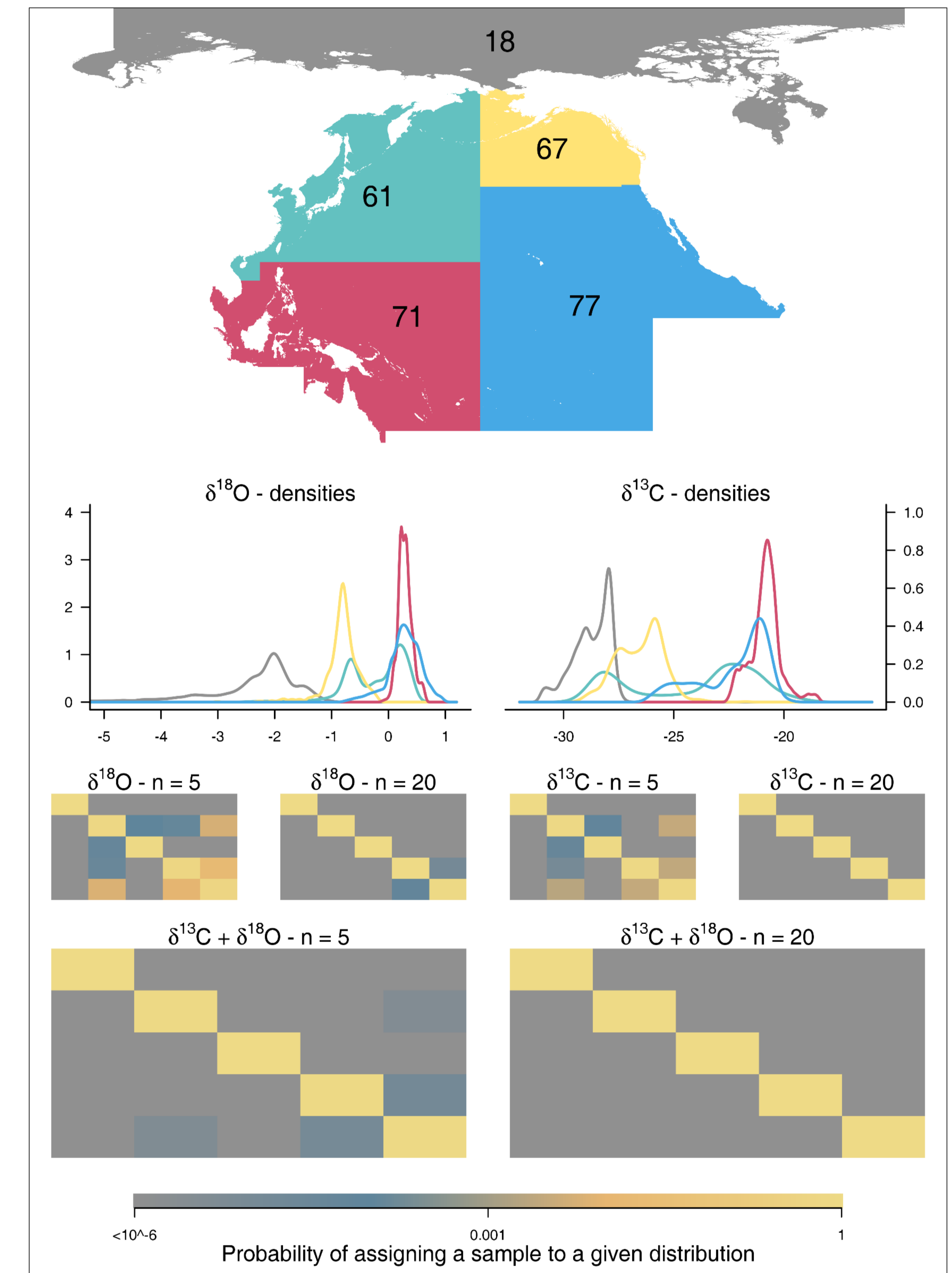


Isoscapes

Isoscapes are predictive maps of isotope signatures. Here we use isoscapes created for $\delta^{18}\text{O}$, and $\delta^{13}\text{C}$.



Isoscape Predictions



Marine Distributions

We show distributions of both $\delta^{18}\text{O}$, and $\delta^{13}\text{C}$ between our 5 FAO regions. Heat maps show probability of assigning seafood to the correct region, and changes with different sample sizes and quantity of tracers.

Future Work

Future work in creating a biotracer databases will help seafood companies, NGOs and governments with traceability and labelling issues, as well as allow for predictions across species to be made.