New measure shifts biodiversity focus

Some temperate waters rival tropical reefs in new analysis.

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The traditional approach to measuring biodiversity may miss important aspects of marine ecology, and be mistakenly focusing conservation efforts on tropical waters.

To quantify the biodiversity of a particular area, researchers often look at the number of different species that live there. But in a paper in *Nature*, Rick Stuart-Smith, an ecologist at the University of Tasmania in Hobart, Australia, and his colleagues showcase a different approach[1].

Using data from 4,357 surveys of reef fishes conducted by divers at 1,844 sites around the world, the team determined not just the number of species at each site but the 'functional diversity' of the sites — a measure that adds in the abundance of different species and 'functional traits', such as what they eat and where they live. Stuart-Smith describes this as adding "dissimilarity to the concept of diversity".

"It is a useful measure because of its relevance to ecological processes compared to traditional species diversity," says Stuart-Smith. "It is often assumed that more species translates to more natural functioning of any particular system, but of course species aren't all doing the same thing, and often there may only be one or two individuals of many species, compared to hundreds of some others."

When the researchers mapped standard species richness, the classic pattern of highly diverse tropical waters and less-diverse cooler waters appeared (slide 2 in slideshow above). But when they used functional diversity as the measure (slide 3), the map showed many fewer hotspots in tropical regions, and some sites outside the tropics with greater functional diversity than many of the tropical sites.

This new approach may help to identify previously unrecognized areas in need of conservation, the researchers say.

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References

1. Stuart-Smith, R. *et al*. *Nature* **501**, 539–542 (2013).