

The Spatial Distribution of Marine Bacteria

January 26, 2011

1 Results

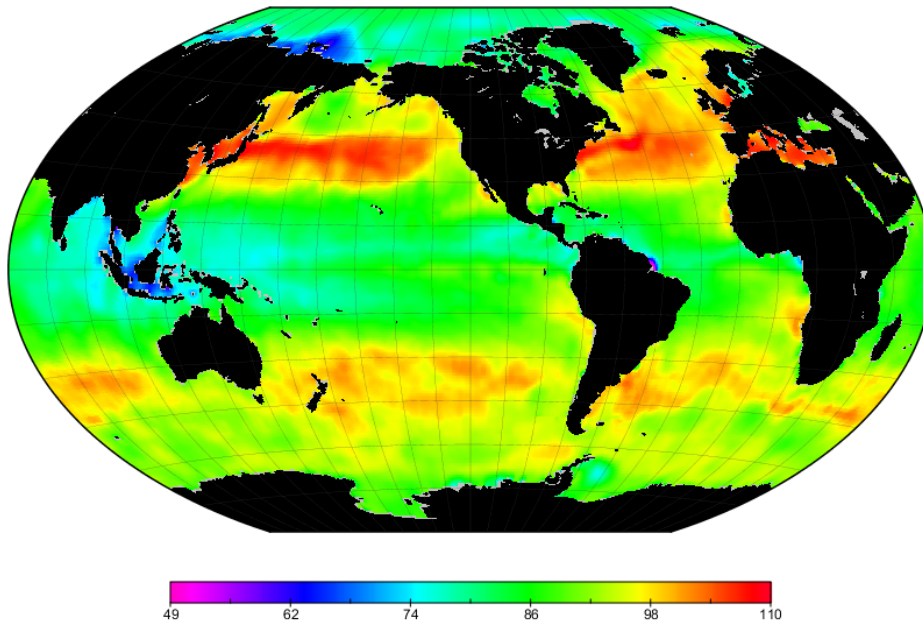


Figure 1: Global patterns of genus richness. Richness predictions are for 1×1 km grid cells, with a global sampling intensity of 10^{13} reads. Genus richness peaks in the the temperate latitudes and in areas of high mixing.

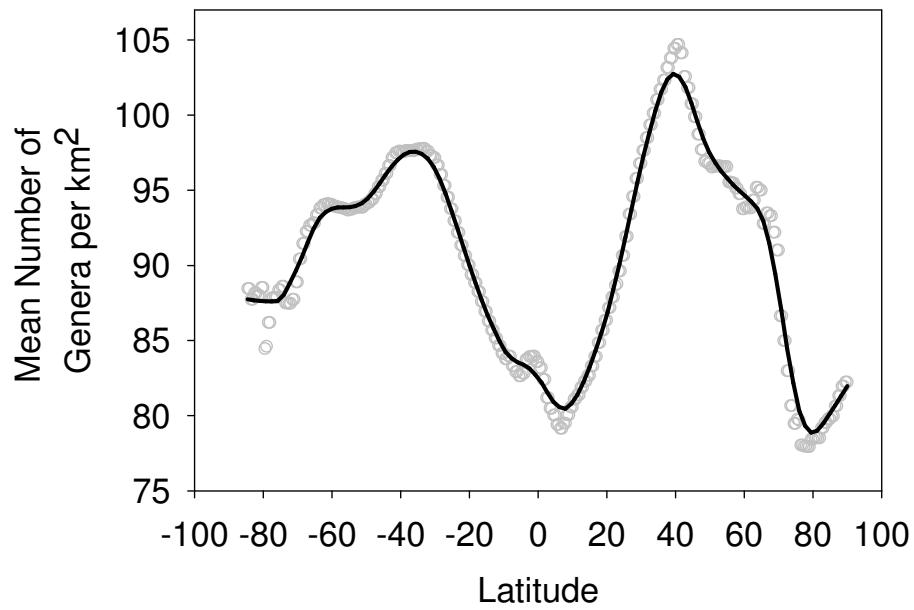


Figure 2: Latitudinal trends in genus richness. Mean richness per 1×1 km grid cell across latitudinal bands is shown. Richness peaks near 40° north and south, and is lowest near the equator and poles.

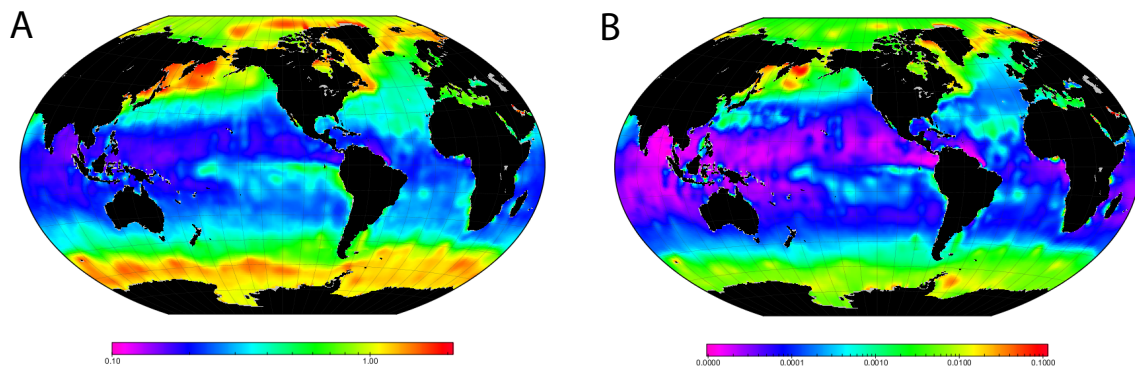


Figure 3: Global patterns of genus diversity. In contrast to genus richness, diversity peaks at the high latitudes, as measured by the (A) Shannon and (B) Simpson diversity indices.

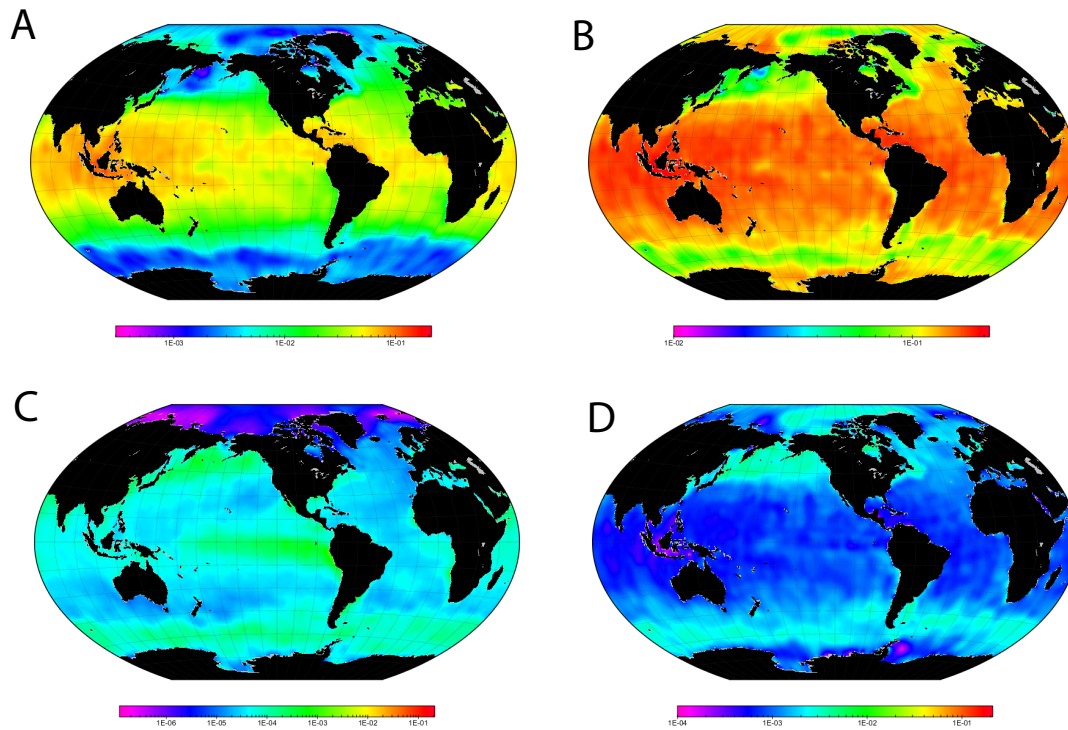


Figure 4: Distributions of representative genera. A minority of taxa, including (A) *Prochlorococcus* and *Synechococcus*, and (B) *Pelagibacter* occur in very high abundance in the tropics and mid-latitudes. Most other taxa, such as (C) *Roseibacillus* and (D) *Pseudomonas* occur in relatively low abundance, often in polar regions. This dichotomy appears to drive the polar peaks in diversity: low-latitude bacterial communities are dominated by *Prochlorococcus*, *Synechococcus*, and *Pelagibacter*, while high-latitude communities lack a single dominating taxon.

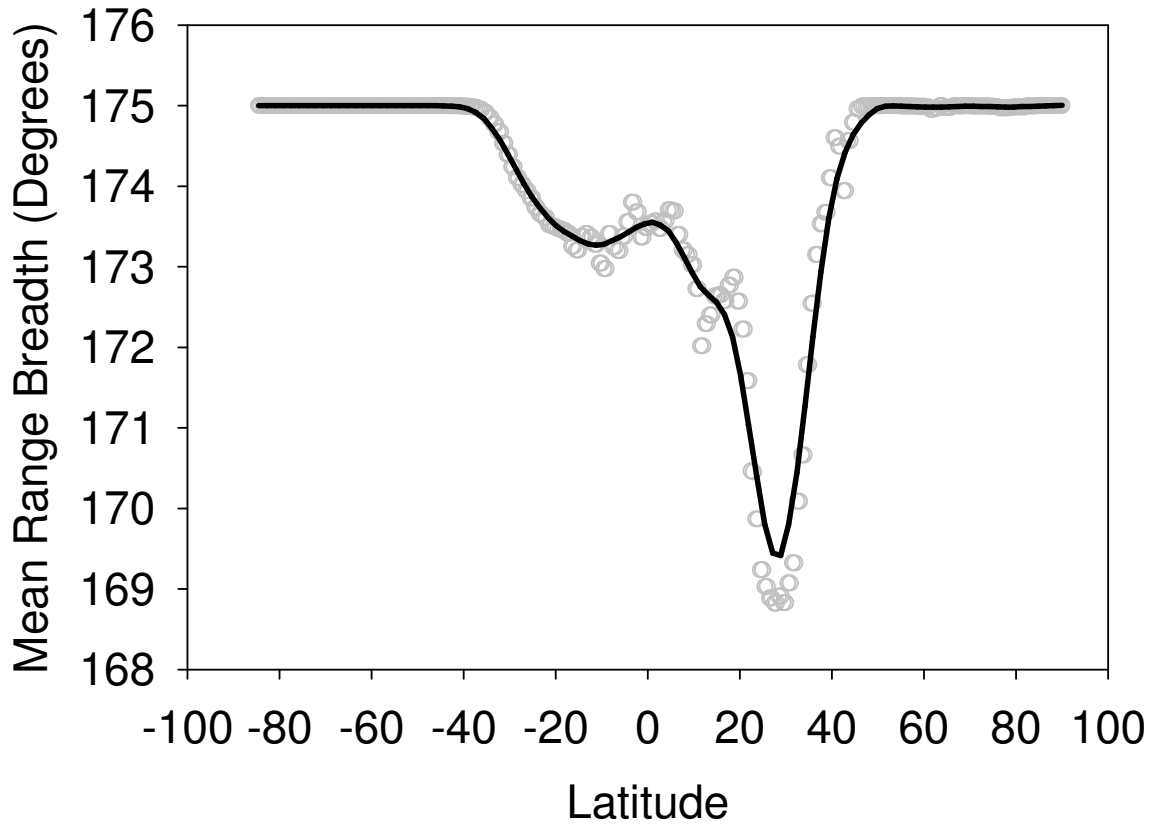


Figure 5: Range breadth as a function of latitude. The mean range breadth of taxa occurring in latitudinal bands is shown. Overall, the average range breadth of taxa is very broad: average range breadths are all above 168° (the maximum possible breadth is 180°). Despite the latitudinal ubiquity of most species, taxa at high latitudes tend to have broader ranges than those at low latitudes, a result consistent with Rapoport's rule.