

Trophic plasticity of Antarctic echinoids under contrasted environmental conditions

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Context, objectives & methods

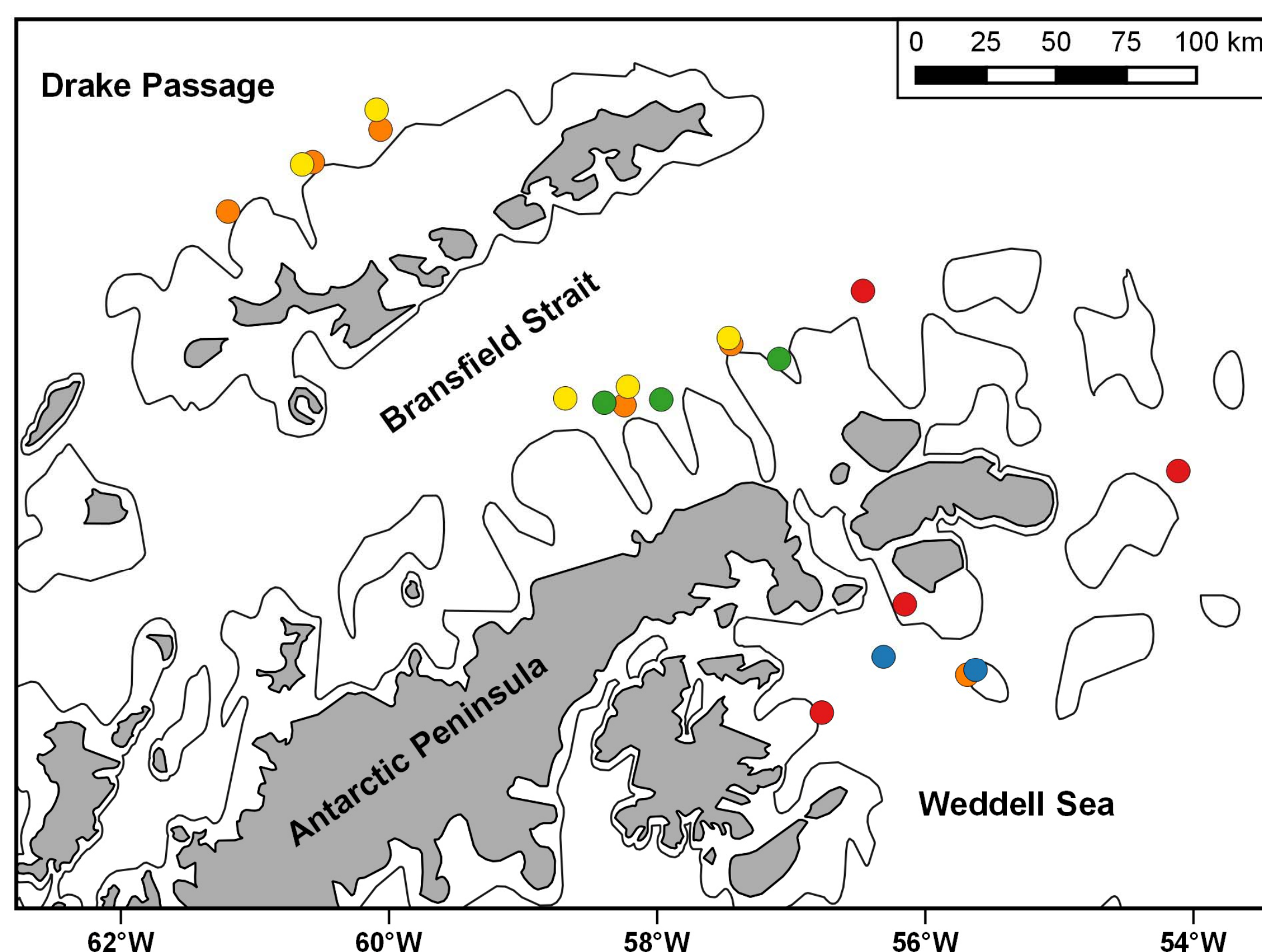
- West Antarctic Peninsula: one of the most quickly warming regions of the world + decrease of sea ice cover.

- How will changes in environmental conditions and food availability impact benthic consumers?



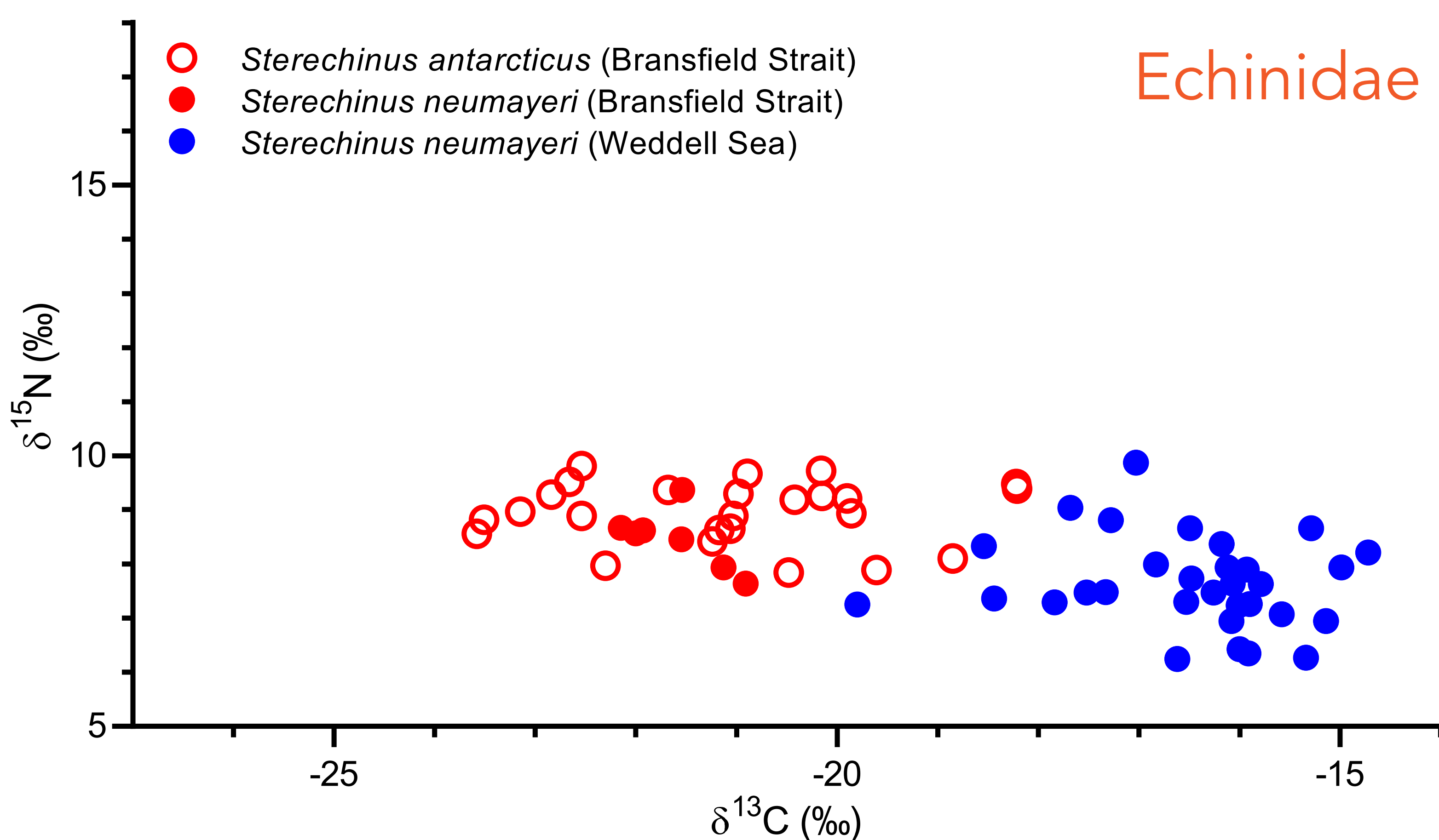
- Focus on 3 sea urchin families: Echinidae (regular, generalist browsers), Cidaridae (regular, prefer animal food items) and Schizasteridae (irregular, infaunal sediment feeders)

Map of the sampled stations. Red: bank, orange: upper slope, yellow: lower slope, green: canyons, blue: deep depressions. Grey line: 200m isobath.



- RV Polarstern ANTXXIX/3 cruise: sampling along a North-South gradient of increasing sea ice cover and primary productivity (Drake Passage < Bransfield Strait < Weddell Sea) in multiple depth-related habitats (cf. map)
- Assessment of trophic plasticity in each family using gut contents & stable isotope ratios of C and N (integrative trophic markers)

Results & discussion

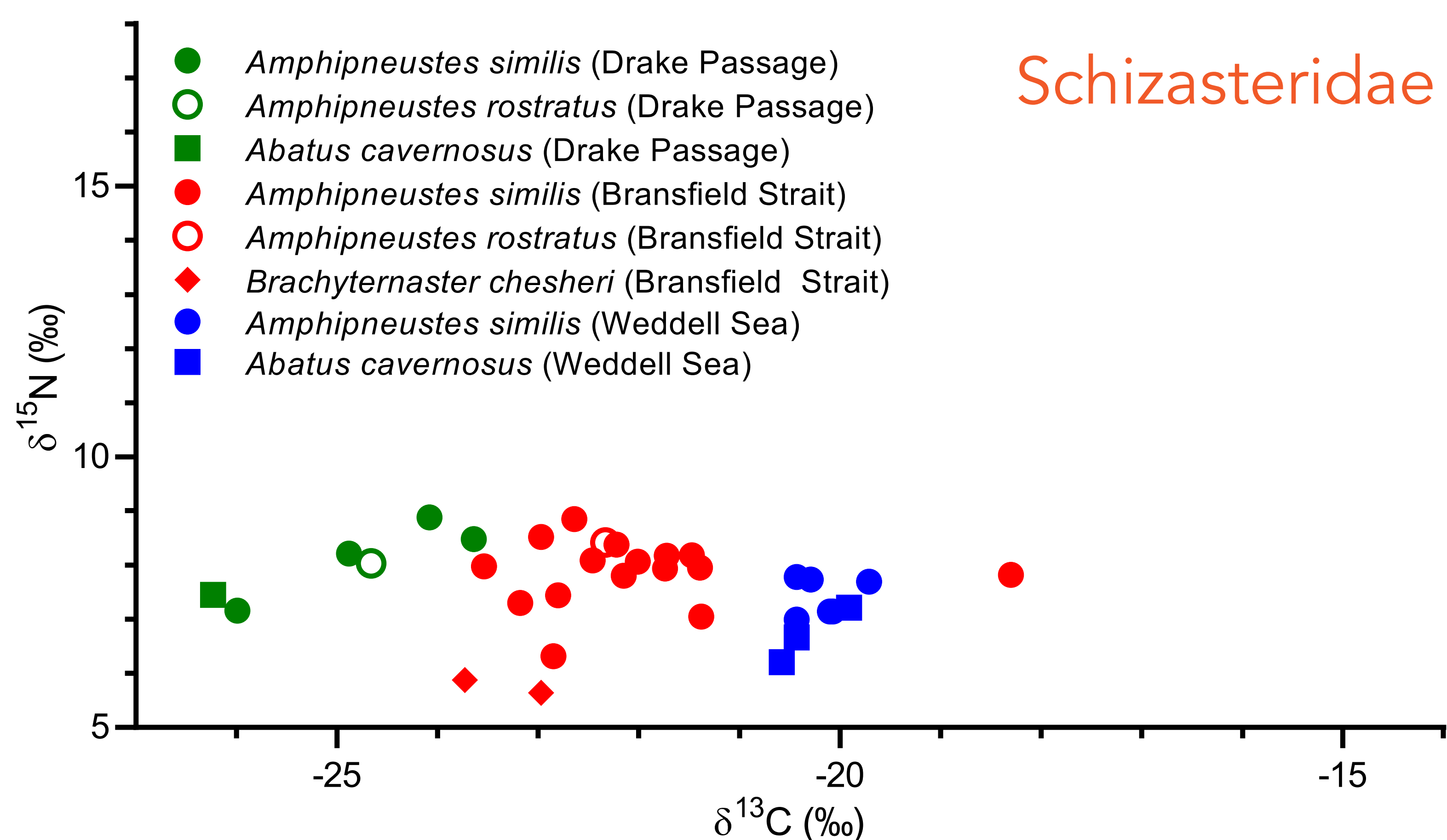


Echinidae

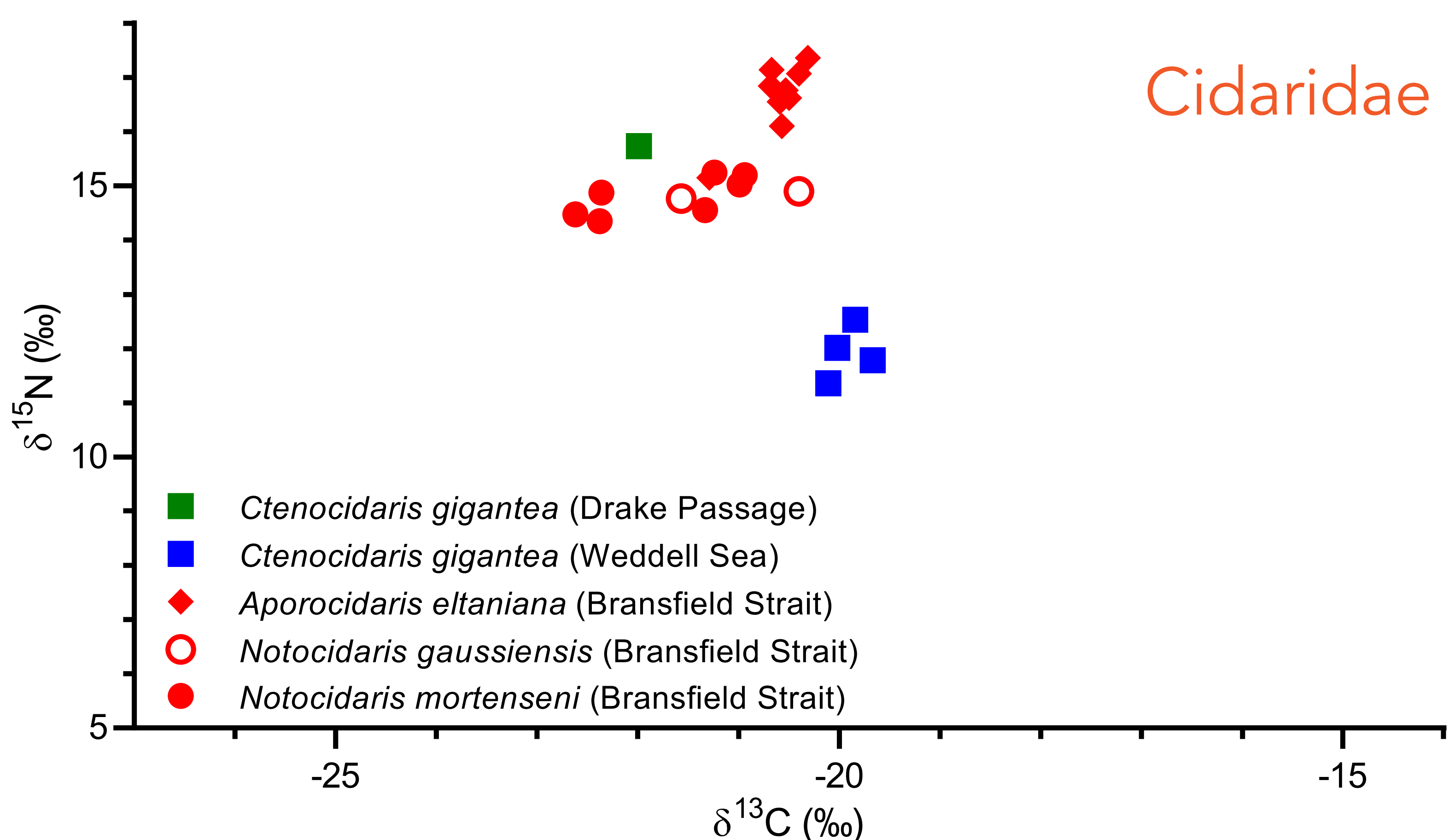
- Echinidae (▲) : Bransfield Strait : detritus feeders, depth-related variation in selectivity. Weddell Sea: strong trophic shift. Hypothesis: selective feeding on microbially-reworked detritus present among sediment "food banks".

- Schizasteridae (▼) : low trophic plasticity, non-selective feeding on sediment and associated particulate organic matter in all regions and depths. Importance of food web baseline shift.

- Cidaridae (►) : trophic level variations. Animal fraction of diet always important, but variation in importance (partial reliance on detritus in Weddell Sea) and nature (Bransfield Strait: more active predation on the slopes, more scavenging in the canyons).



Schizasteridae



Cidaridae

Conclusions & perspectives

- Each family showed a different response to variation in environmental and food conditions.
- Differences in nature and extent of trophic plasticity could lead to different impacts of future environmental changes on each family's feeding habits, biology, and ultimately distribution.

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