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Southern Ocean Benthic habitat classification, assessment and measurement

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Our understanding of Southern Ocean benthic habitats is patchy and determined by data collected at a range of spatial and temporal scales. The majority of high-resolution data are collected near scientific research stations. Benchmarking these benthic habitats and communities requires a hierarchical approach, ranging from a broad sweep of coarse attributes (e.g. geomorphology and oceanography) to a finer scale approach. The data available for a truly circumpolar assessment is generally only available at scales far larger than those affecting the biology on the seafloor. Identifying the types of sampling and geographic locations that might fit best into a representative hierarchical scheme is a key challenge. Here we present a review of the environmental factors that are important in determining benthic habitats, communities and diversity, at what scales they are important and whether we are currently able to observe or measure them at the required scales.

Important questions include:

- What data exists at the broad scale?
- Are these the data that we need to characterise benthic habitats?
- What are the gaps in data and their distribution?
- What is the minimum, in terms of data types and resolution, that we need to map the benthos?

Some variables are collected and informative at circumpolar scales (e.g. predicting large soft sediment regions from geomorphological characteristics derived from global bathymetric data). Other features (e.g. small, seemingly random, features such as dropstones or iceberg scours) are currently difficult to measure or extrapolate over large geographic areas but are crucial in determining the structure and function of Antarctic benthic communities.