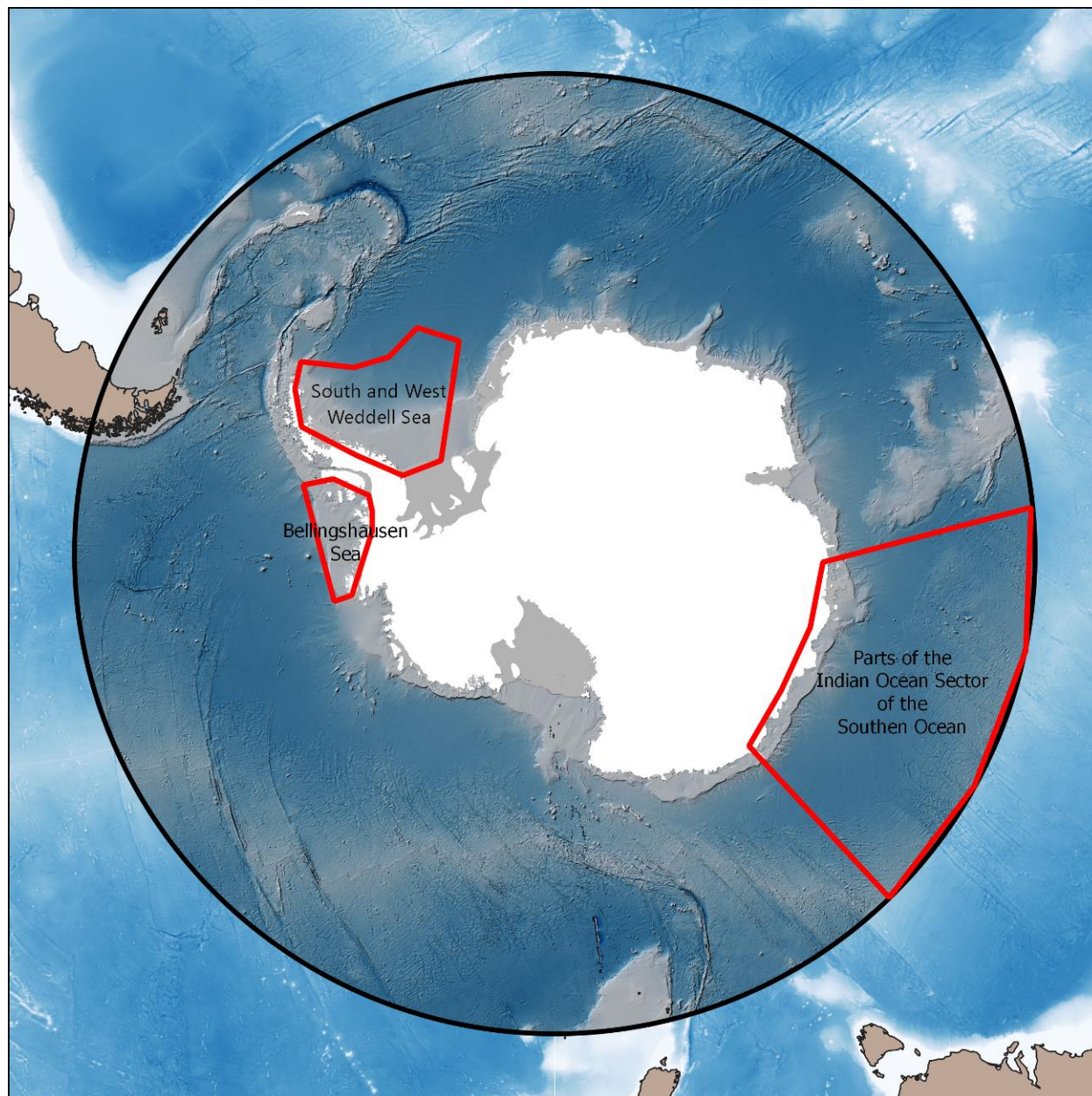


Decade submission Regional Centre – Southern Ocean

Overview



Area 1 Bellingshausen Sea

Rational:

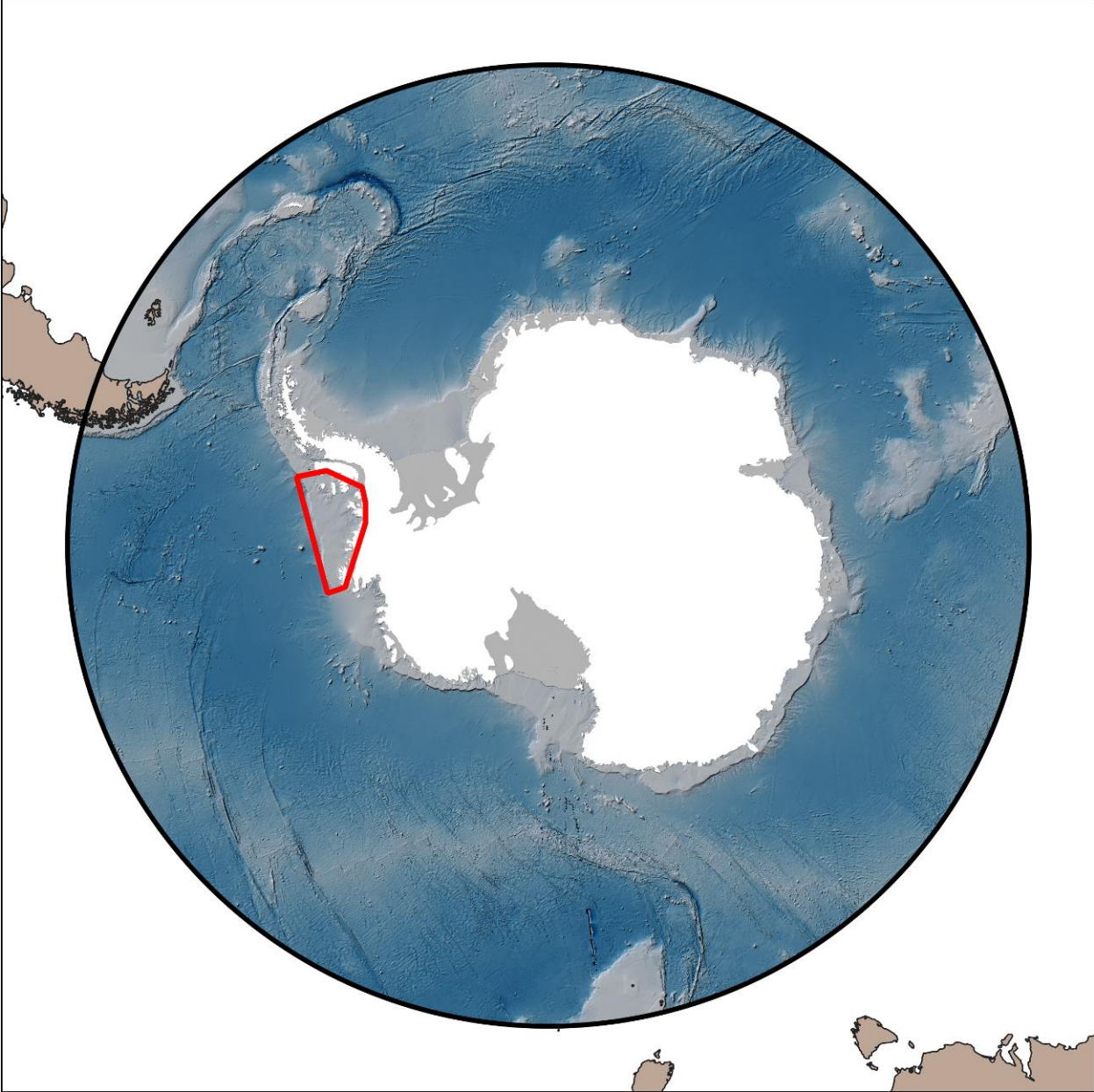
Changes in the climate of Antarctica in general and of West-Antarctica in particular are likely to signpost more radical environmental changes to come on decadal as well as on millennial time scales (e.g. Cook et al., 2005; Turner et al., 2009; Vaughan, 2006). The Antarctic Peninsula as the northernmost tip of the Antarctic continent (reaching as far north as 62°S) and its position in relation to the Pacific Ocean and the Scotia Sea makes the region sensitive to regional and probably global climate trends. Mountain glaciers dominate the coastline of the Pacific-facing margin of the Antarctic Peninsula. They represent drainage way of the West Antarctic Ice Sheet with mass loss of the West Antarctic Ice Sheet contributing to global sea-level rise. To assess the stability of the West Antarctic Ice Sheet under changing climate conditions, it is important to understand the past ice sheet dynamic. The ice sheet's behaviour can be reconstructed from glacial landforms preserved on the shelf. However, hardly any high-resolution bathymetric information exists from the shelf of the Bellingshausen Sea allowing for mapping those landforms. High resolution multibeam data from the shelf of the Bellingshausen Sea are important to understand the processes affecting the stability of the West Antarctic Ice Sheet.

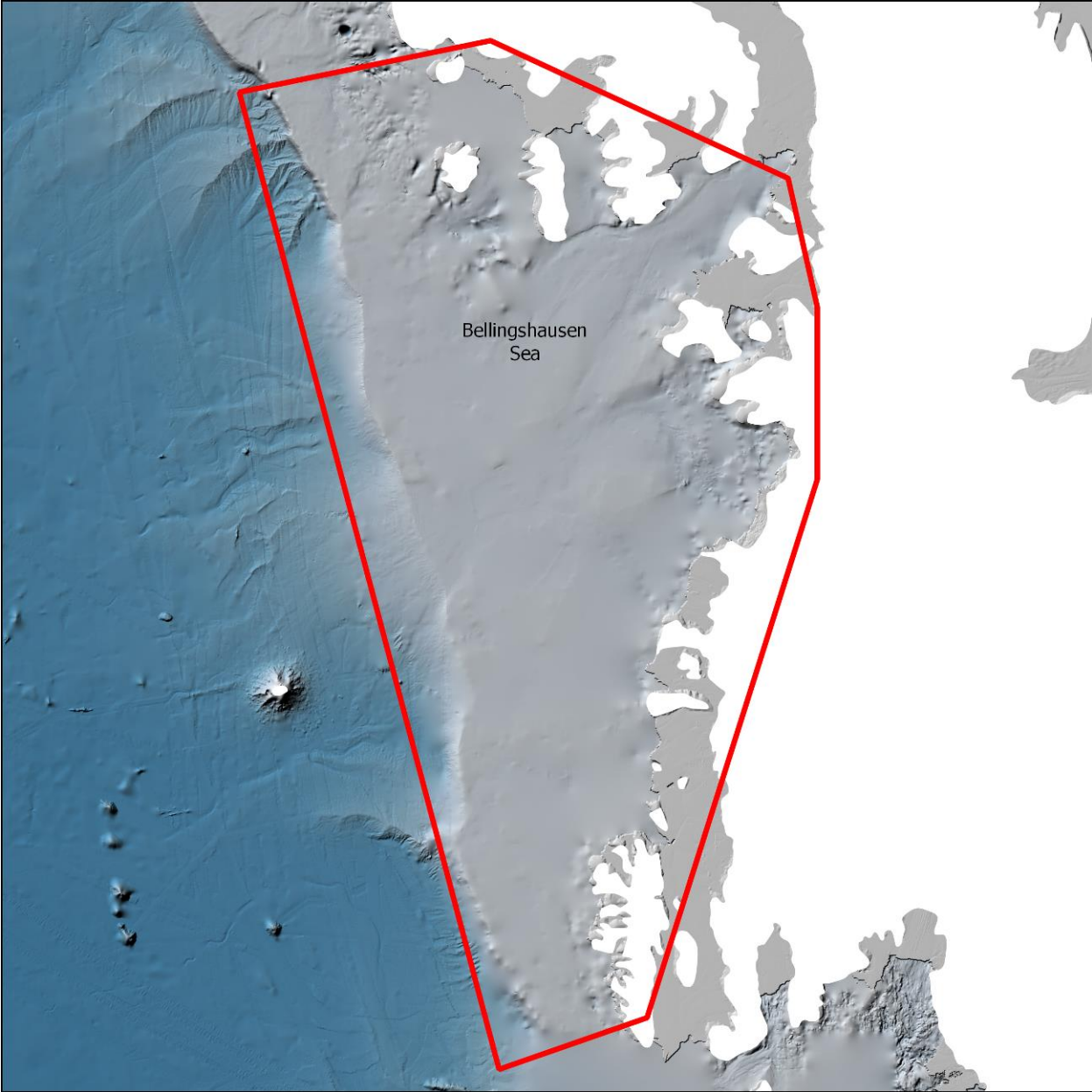
Figures:

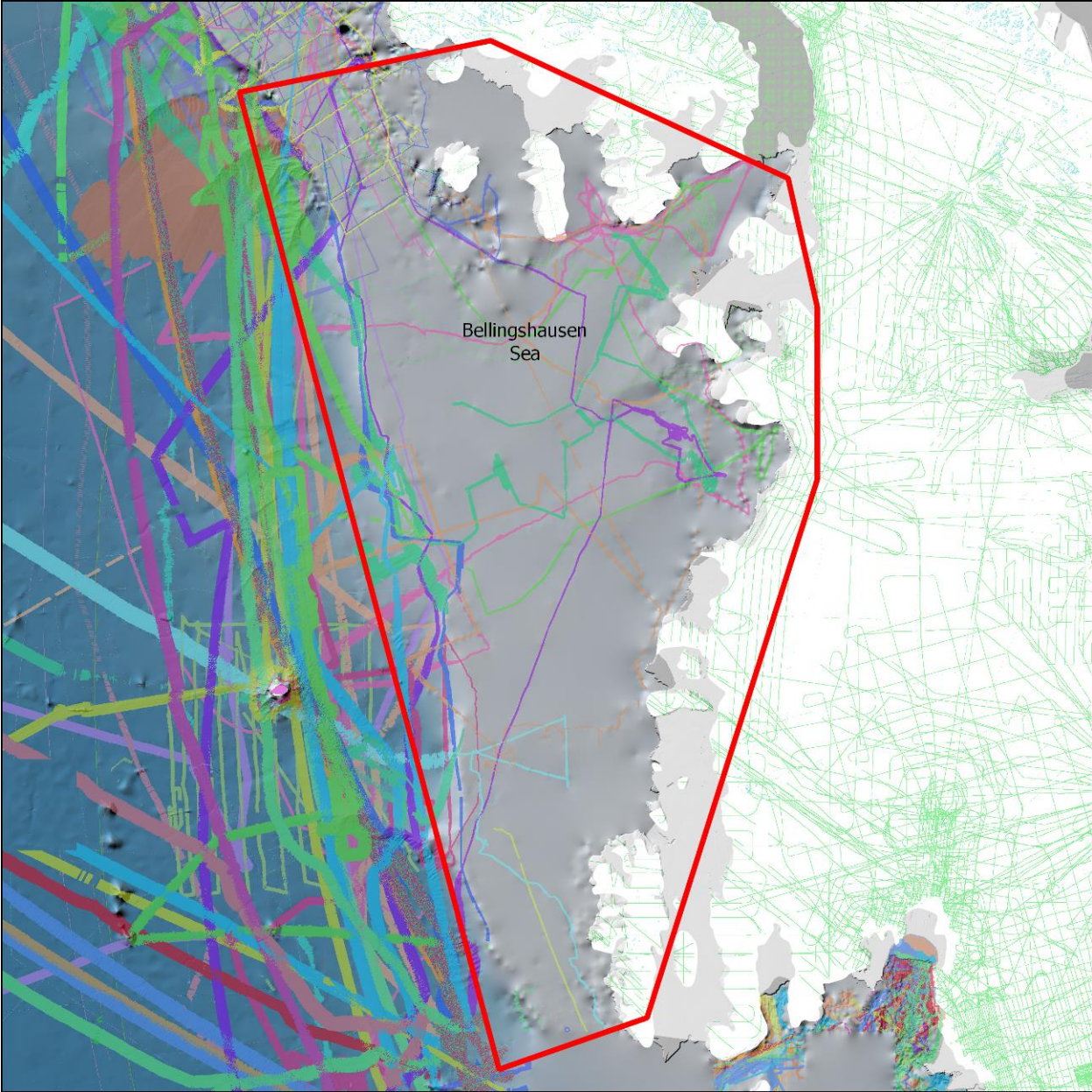
Overview

Detail map of the shelf of the Bellingshausen Sea

Detail map of the shelf of the Bellingshausen Sea with data coverage







Area 2 Part of the Indian Ocean sector of the Southern Ocean

Rational:

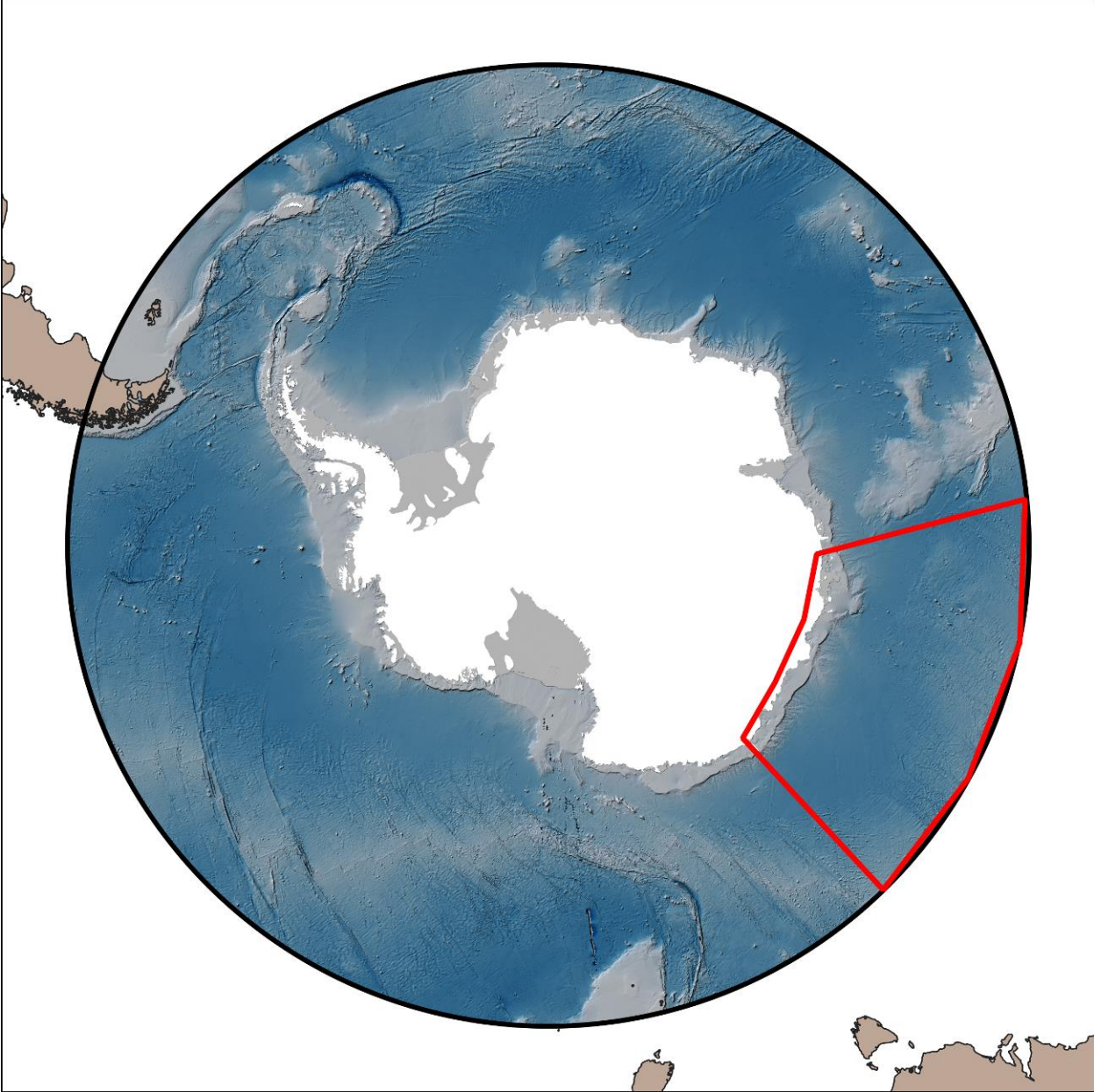
Large Parts of the Indian Ocean sector of the Southern Ocean are unmapped. This includes almost the entire deep abyssal plain in the area and most parts of the continental slope and shelves. Especially the shelves are of importance for mass balance estimations of the East Antarctic Ice Sheet.

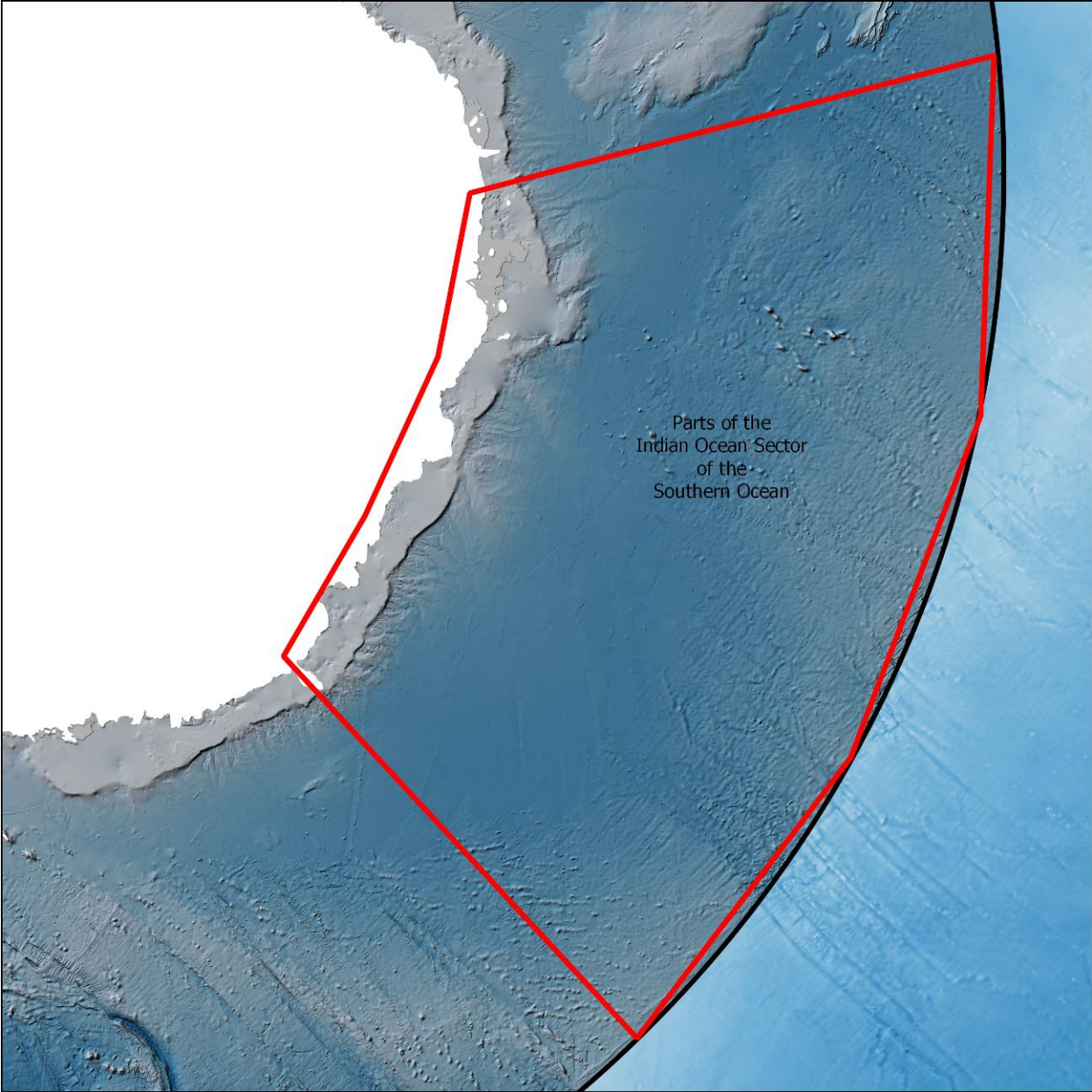
Figures:

Overview

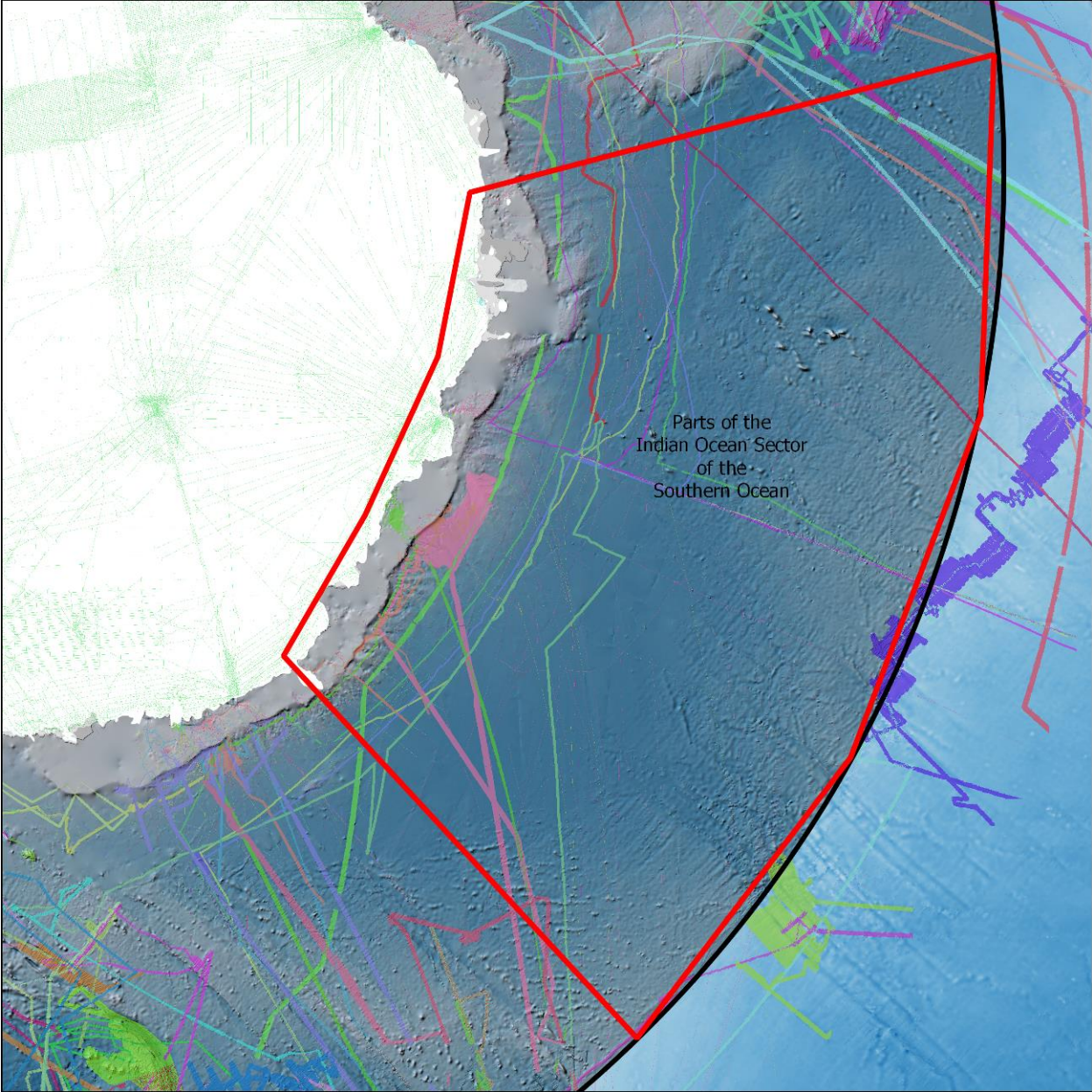
Detail map of a sparsely mapped part of the Indian Ocean sector of the Southern Ocean

Detail map of a sparsely mapped part of the Indian Ocean sector of the Southern Ocean with data coverage





Parts of the
Indian Ocean Sector
of the
Southern Ocean



Area 3 South and West Weddell Sea

Rational:

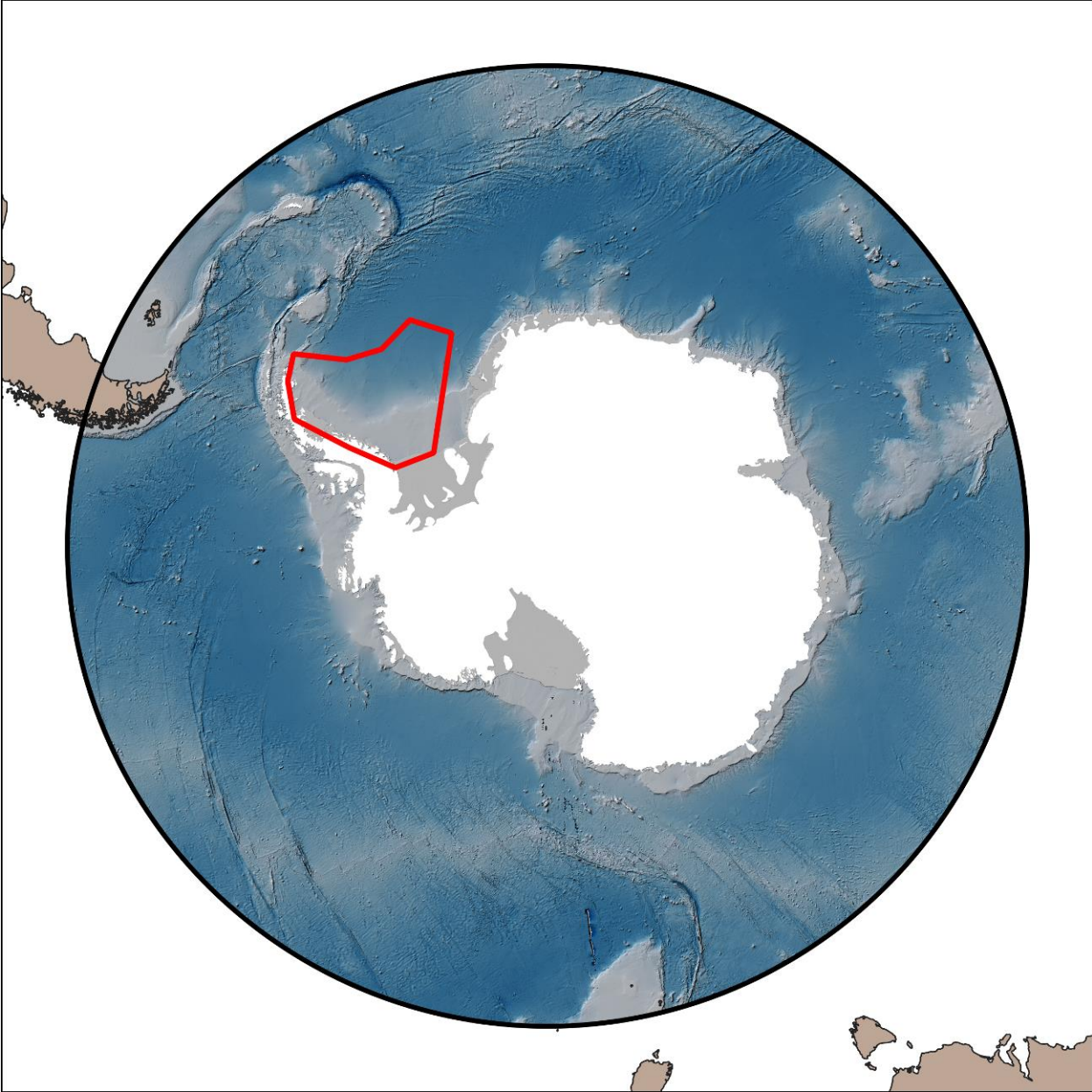
Multibeam surveys covered merely a fraction of the seabed west and south Weddell Sea with large areas without any soundings. The Weddell Sea however represents an important area for deep-water formation as part of the global meridional overturning system. Therefore, it is important to increase the bathymetric data coverage to understand the density driven pathway of the dense waters forming the deep water masses. Furthermore, the disintegrations of the Larsen ice shelves at the western side of the Weddell Sea indicate strong environmental changes affecting the ice sheet of the Antarctic Peninsula and likely also the whole West Antarctic Ice Sheet. The stability of the ice shelves and their capacity to buttress ice streams depends, amongst other factors, on topographic heights acting as pinning points. To assess the stability of the West Antarctic Ice Sheet and thus its potential contribution to future sea level rise, bathymetric information is essential.

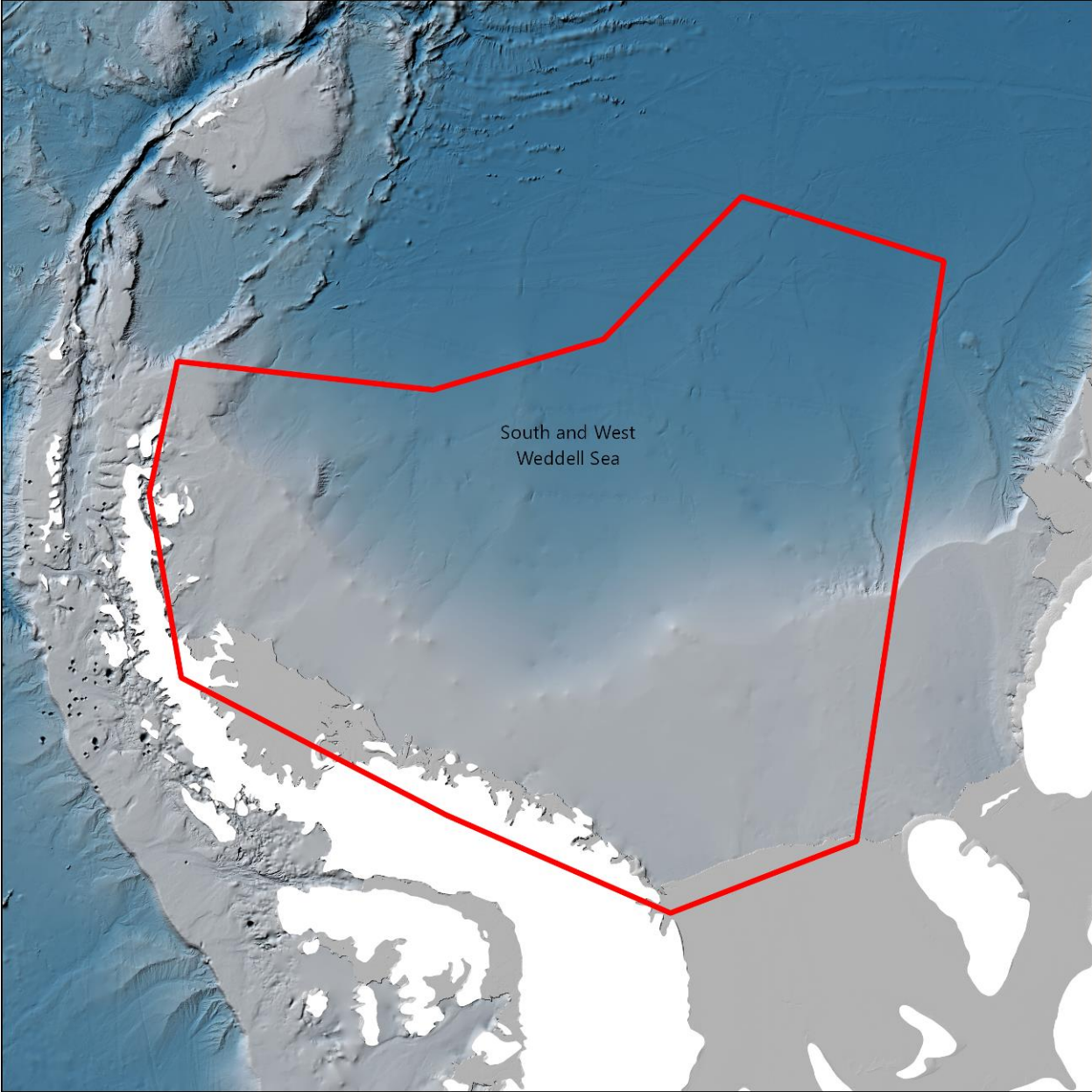
Figures:

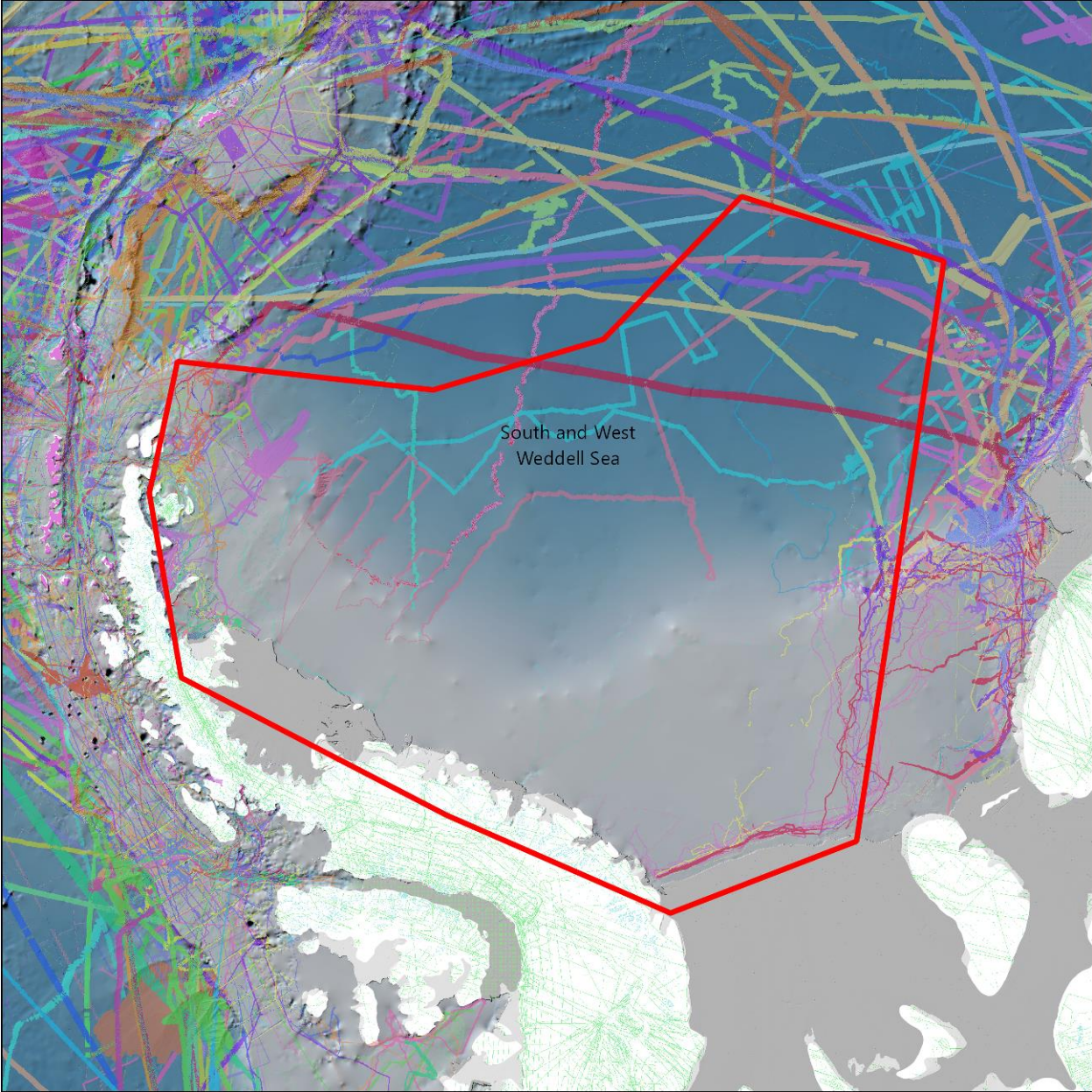
Overview

Detail map of the South and West Weddell Sea

Detail map of the South and West Weddell Sea with data coverage







References

- Cook, A.J., Fox, A.J., Vaughan, D.G., Ferrigno, J.G., 2005. Retreating Glacier Fronts on the Antarctic Peninsula over the Past Half-Century. *Science* 308, 541-544, [10.1126/science.1104235](https://doi.org/10.1126/science.1104235)
- Turner, J., Bindshadler, R.A., Convey, P., Di Prisco, G., Fahrbach, E., Gutt, J., Hodgson, D.A., Mayewski, P.A., Summerhayes, C.P., 2009. *Antarctic Climate Change and the Environment*. SCAR, Scott Polar Research Institute, Cambridge
- Vaughan, D.G., 2006. Recent Trends in Melting Conditions on the Antarctic Peninsula and Their Implications for Ice-Sheet Mass Balance and Sea Level Arctic, *Antarctic and Alpine Research* 38, 147-152, [10.1657/1523-0430\(2006\)038\[0147:RTIMCO\]2.0.CO;2](https://doi.org/10.1657/1523-0430(2006)038[0147:RTIMCO]2.0.CO;2).