**Climate change and fisheries management lead to changes in fish community structure in the Southern Ocean**

**Joel Williams, Nicole Hill, Scott Foster, Skip Woolley, Philippe Ziegler, Craig Johnson**

Heard Island and McDonald Island are located within the northern half of the Kerguelen Plateau in the Southern Ocean. The Kerguelen Plateau is a biodiversity hotspot with many endemic fish species and the region has economic importance as it supports large fisheries. This region is also a climate change hotspot; water temperatures and oceans currents are changing and shifting. Most existing information on fish species and their distribution in this region is derived from annual random trawl surveys, fishery observations, and indirectly from research on fish predators. In this study we use trawl survey data and contemporary joint species distribution models to understand how the fish assemblages have changed through time and space. Using a hierarchical model of species community approach, we demonstrate that several species, including mackerel icefish, have had large changes in distribution and abundance through time and these changes could be related to environmental factors such as SST anomaly and southern annular mode. We found evidence of several species distributions responding to temperature variability and are potentially exposed to the ongoing impacts of climate change. This new information can be used by managers and policy makers to ensure sustainable fisheries and the protection of biodiversity into the future.