

# Raising the bar on data discovery and recovery for the Southern Ocean Observing System

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## The Southern Ocean and its moorings

The Southern Ocean plays a disproportionately large role in driving the global climate and ocean currents, by connecting the world's ocean basins, and by extratropical Southern Hemisphere oceans absorbing between 67 and 98% of the heat from the atmosphere (Roemmich et al. 2015). The Southern Ocean Observing System works to improve data sharing across all disciplines in the region.

Fixed moorings are the only platforms capable of providing data on how the ocean varies in the frequency domain; that is, how it changes at different temporal scales. This information is crucial for understanding the forces and dynamics that underpin variation in the Southern Ocean, and therefore predicting future changes.

Despite the high value of mooring data, few datasets are routinely reused by modellers and other scientists for three core reasons:

- moorings are expensive to maintain and are hence comparatively rare
- many data owners have not submitted their data to publicly accessible repositories
- even when data are in such repositories, they are difficult to find due to the lack of a centralised list of all such repositories and their holdings

## Bringing mooring data to the surface

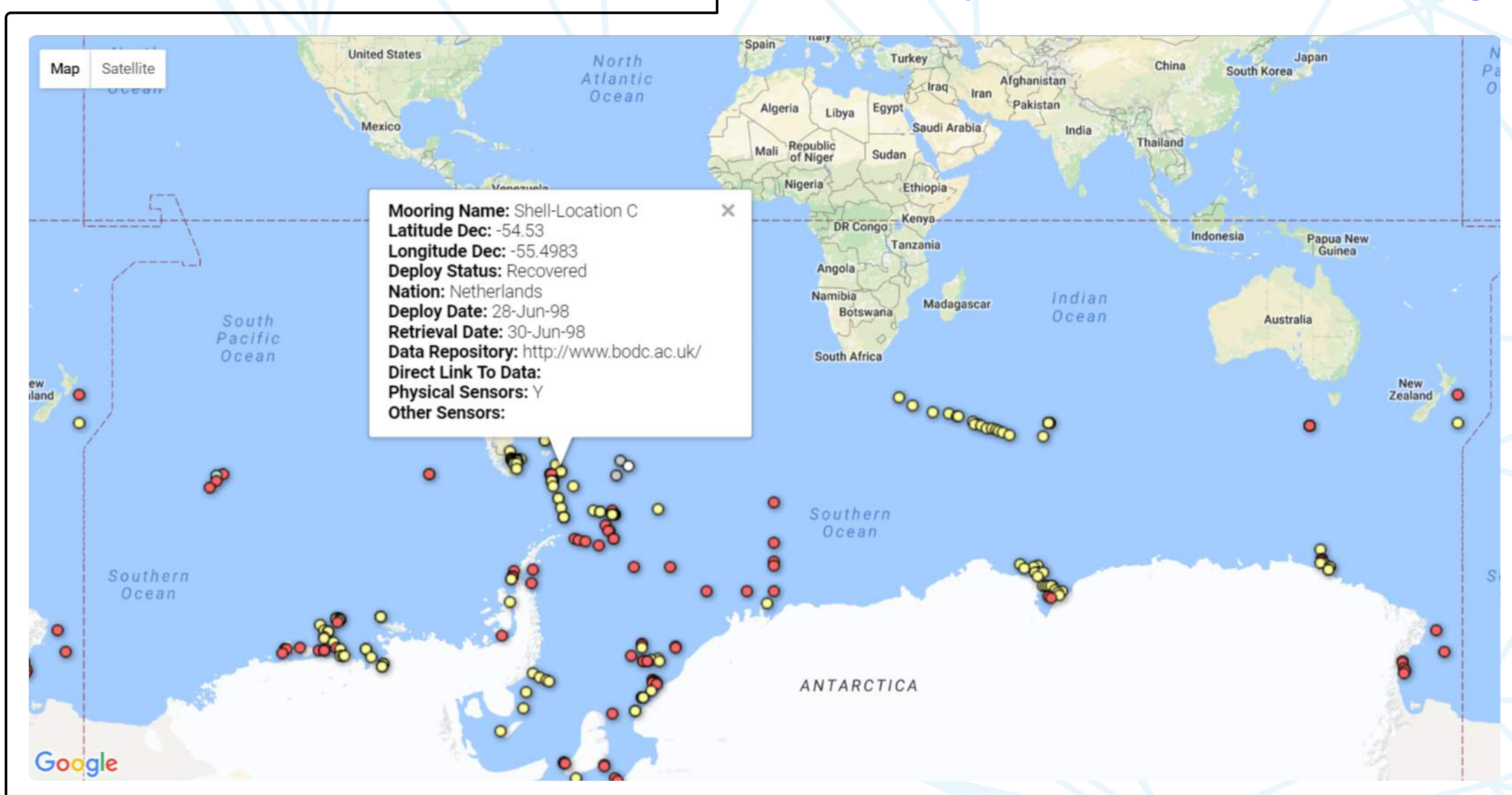
We are working with physical oceanographers to develop a list of all known moorings in the Southern Ocean – more than 300 so far – for publication through an interactive map on the Southern Ocean Observing System (SOOS) website. The map includes links, where known, to each dataset and/or its repository.

For those datasets not held in any repositories, our data rescue procedure includes working with data owners to convert the datasets to a standard format, document them with standard metadata for discovery and archive them in an appropriate repository.

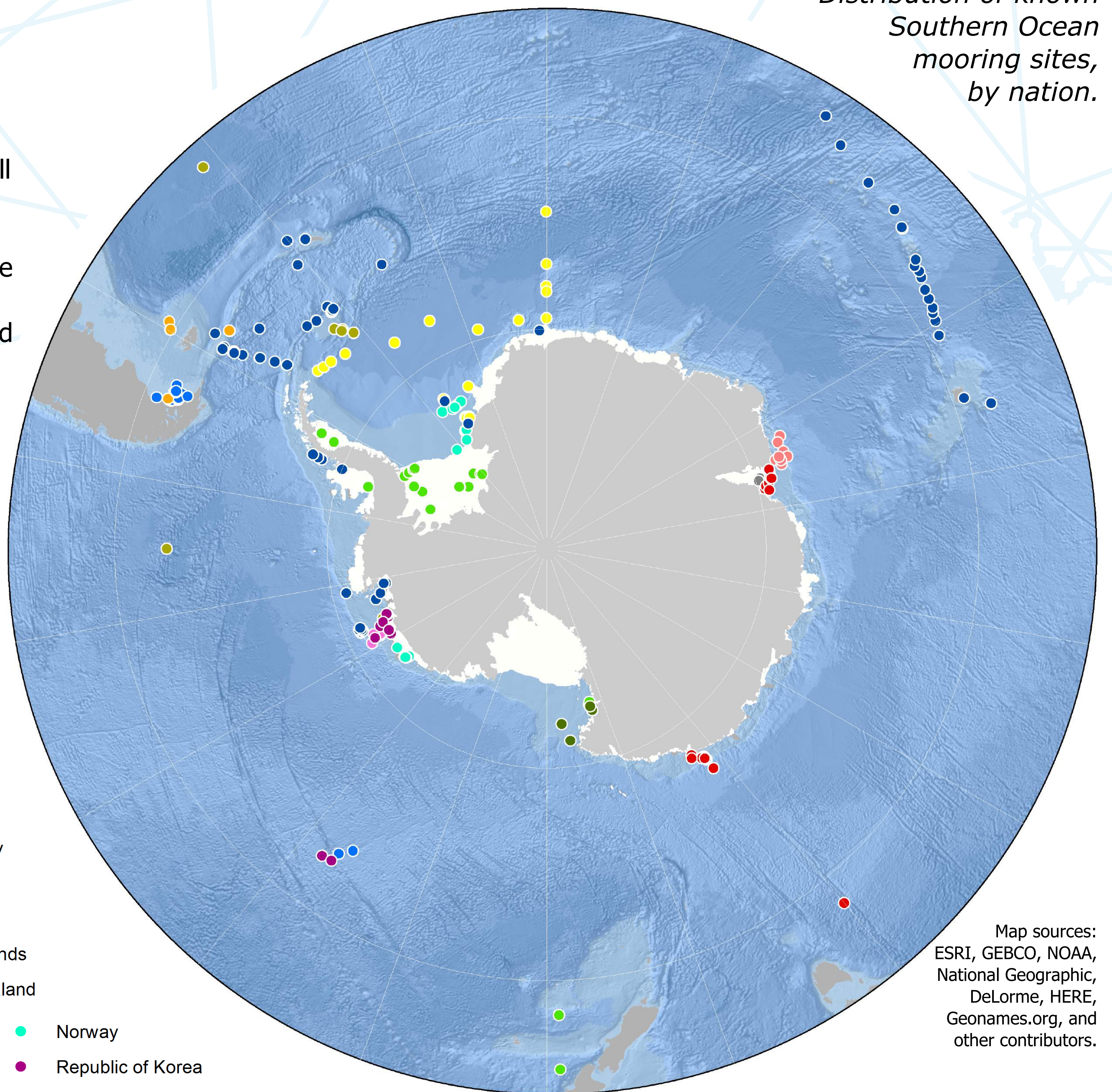
The SOOS web map will be a central search tool to connect potential data users with the archived data.

*The web map for discovery of data holdings, coloured by mooring deployment status (red = deployed; yellow = recovered; grey = unknown; white = failed).*

[www.soos.aq/activities/soos-at-sea/moorings](http://www.soos.aq/activities/soos-at-sea/moorings)



Distribution of known Southern Ocean mooring sites, by nation.



Map sources: ESRI, GEBCO, NOAA, National Geographic, DeLorme, HERE, Geonames.org, and other contributors.

## Saving Southern Ocean Data

This data rescue project is a partnership between SOOS, NOAA's National Centers for Environmental Information (NCEI), and the National Snow and Ice Data Center (NSIDC) at the Cooperative Institute for Research in Environmental Sciences, University of Colorado.

SOOS exists to improve scientists' understanding of the Southern Ocean, through designing and advocating for systematic observations of essential ocean variables, and secure archiving of the resulting data. Likewise, NCEI and NSIDC exist to manage and distribute scientific data that underpin broader scientific programs relating to the natural environment.

Through the NCEI Big Earth Data Initiative we have funding specifically to work with the custodians of Southern Ocean mooring data to safely house and improve the discoverability of mooring data.

## Acknowledgements

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Roemmich D, Church J, Gilson J, Monselesan D, Sutton P, and Wijffels S (2015) Unabated planetary warming and its ocean structure since 2006, Nature Climate Change (5), pp. 240-245, DOI: 10.1038/NCLIMATE2513

