

Southern Ocean Data Recue – Extending time series into the past

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NATURAL ENVIRONMENT RESEARCH COUNCIL

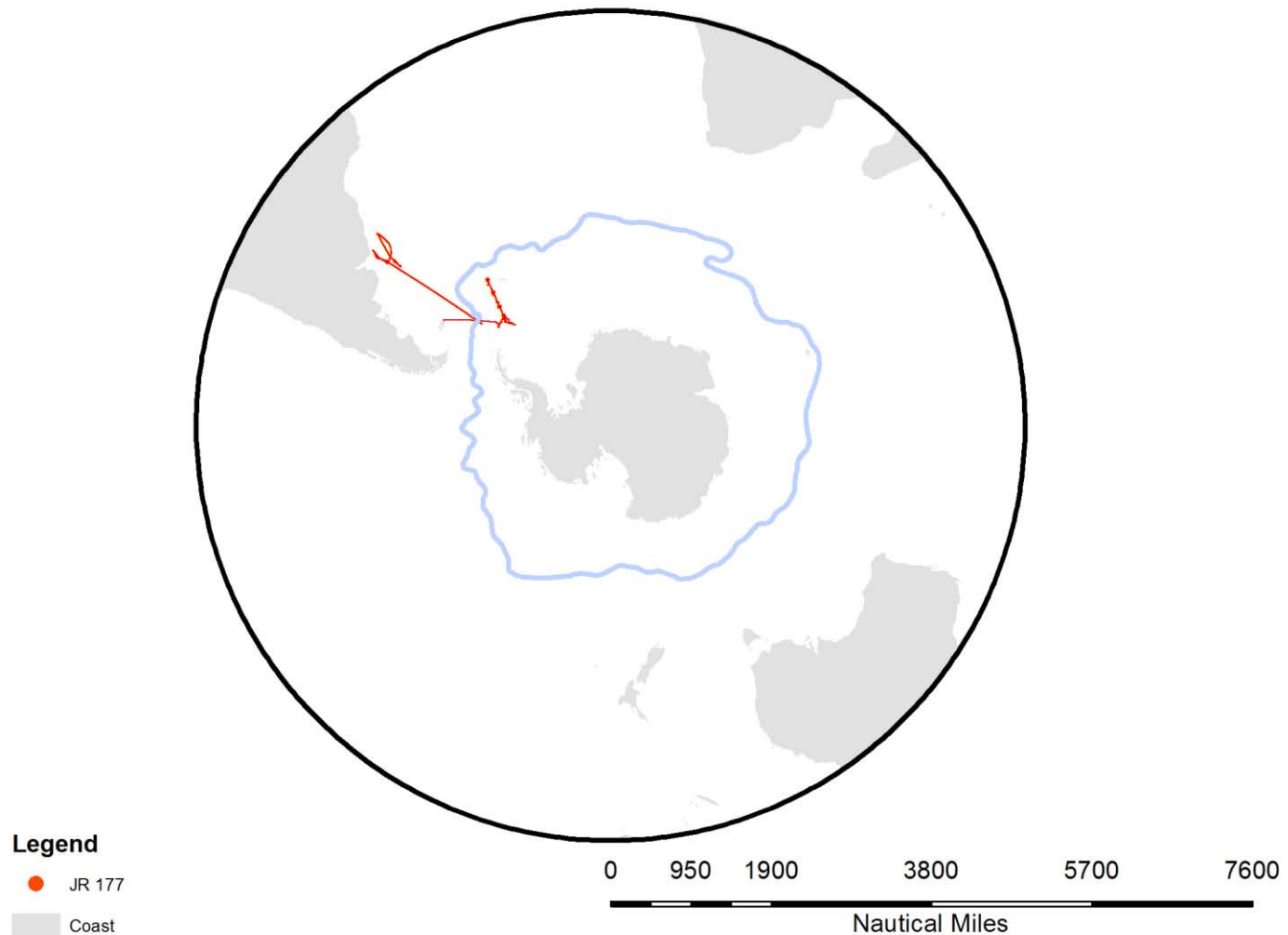


A problem for Southern Ocean Science

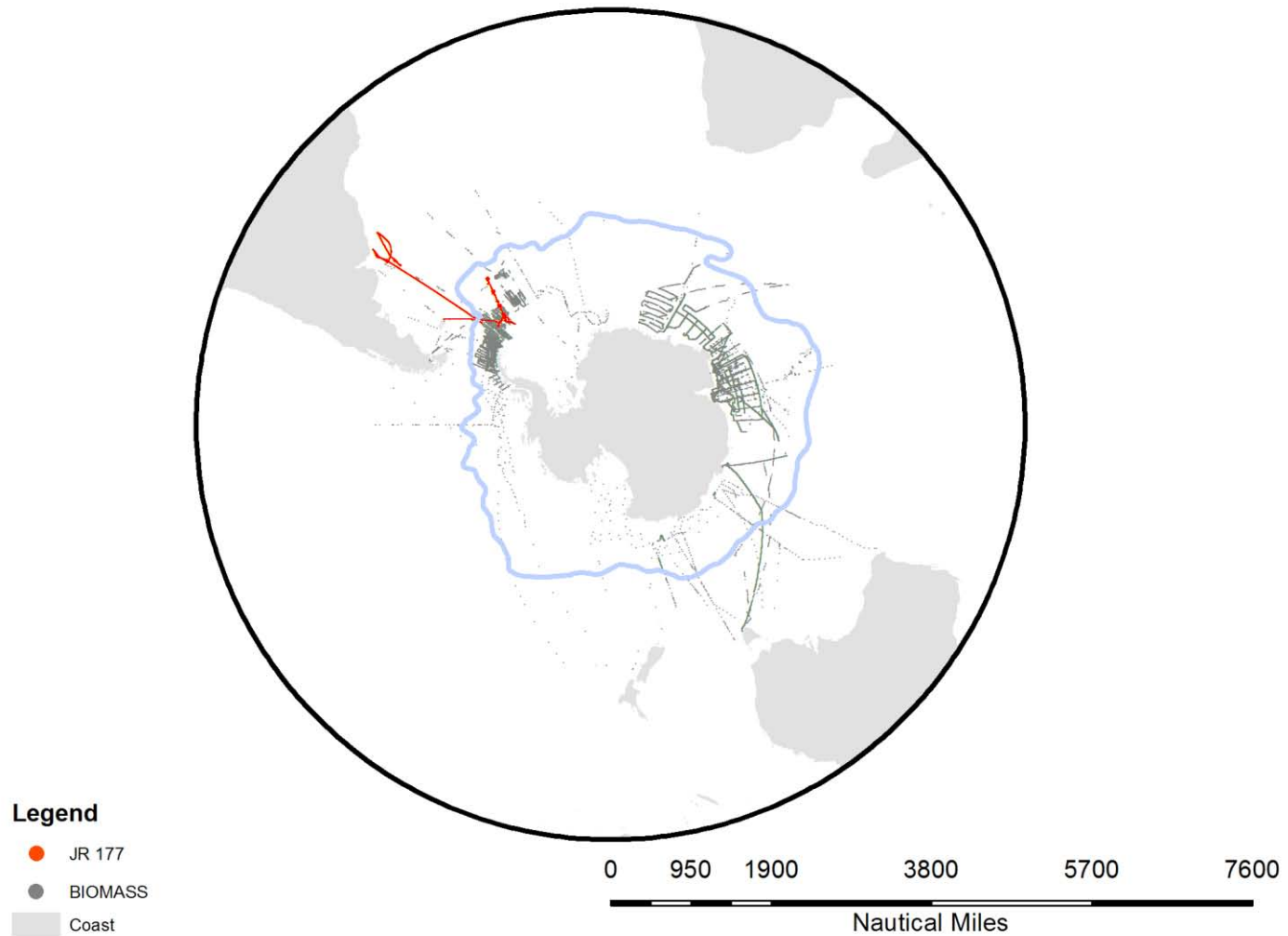
- Few long term circumpolar Antarctic datasets
- However this is not due to lack of data
- Numerous historic sources available



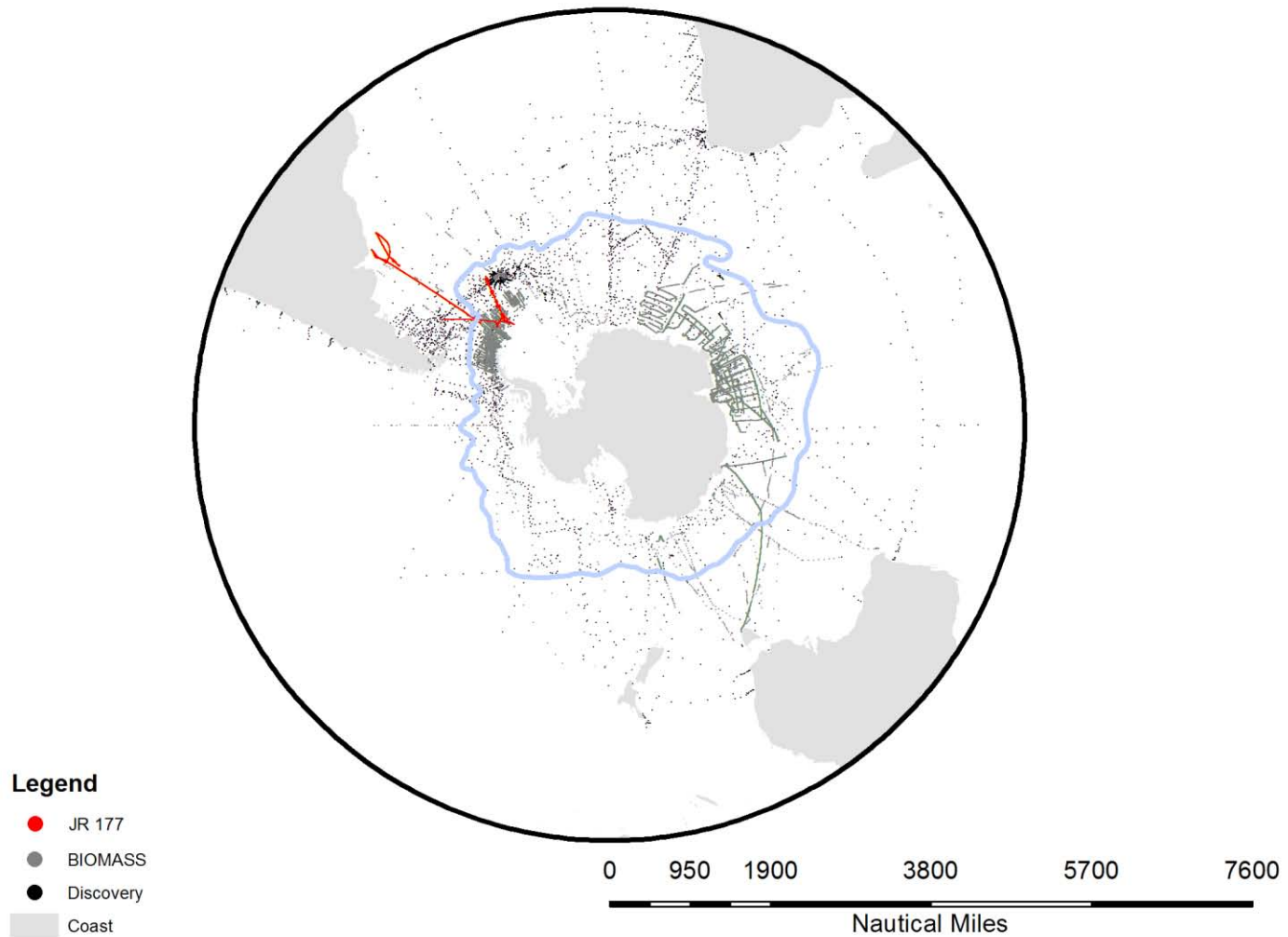
A problem for Southern Ocean Science



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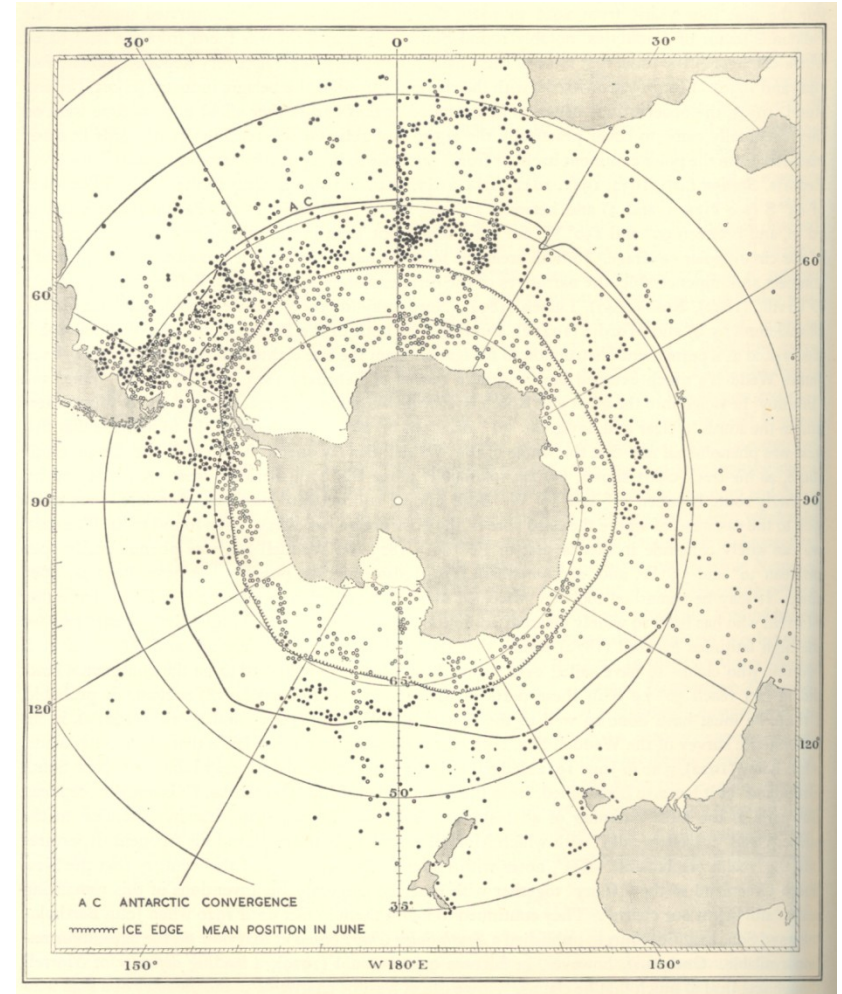


A problem for Southern Ocean Science



Data sources for the project

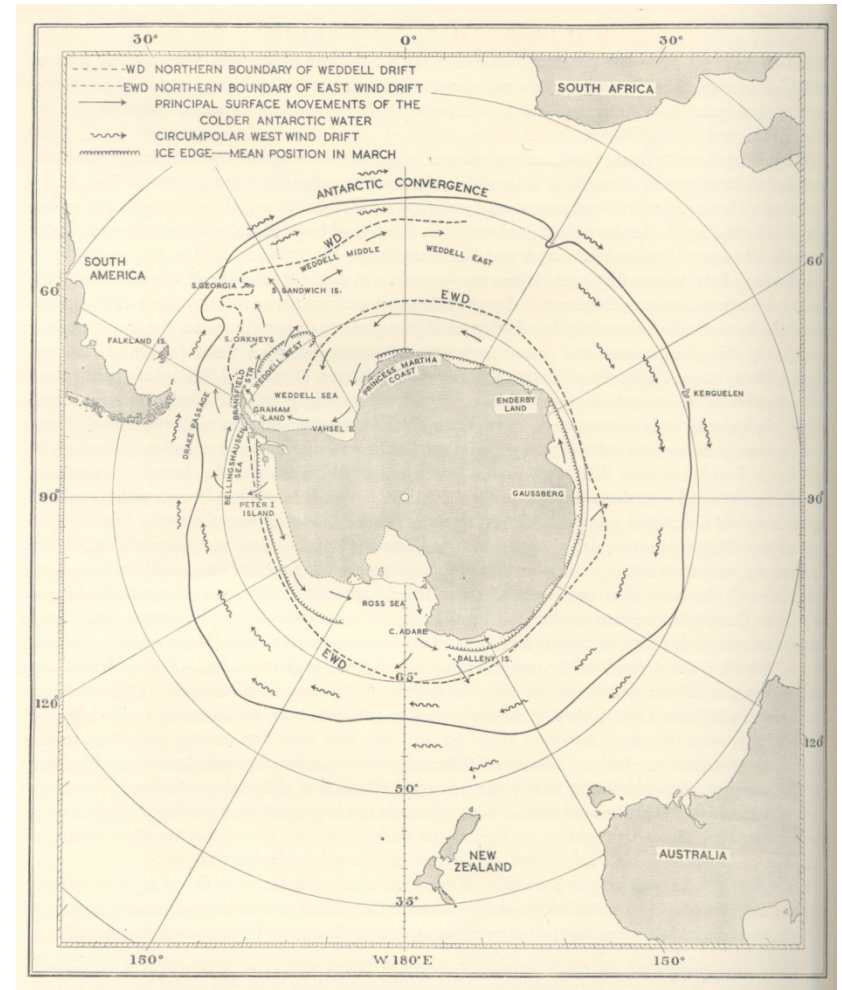
- Discovery reports (1925-51)
- Whaling investigations
- Discovered Antarctic convergence



Circumpolar observations made during Discovery Investigations

Data sources for the project

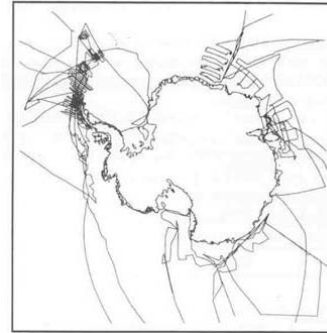
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Hydrological boundaries as mapped during Discovery Investigations

Data sources for the project

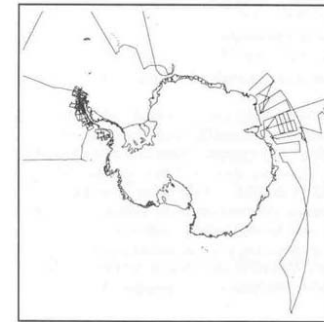
- BIOMASS (1981-85)
- Various other sources held in BAS
- Compliments existing work



FIBEX 1981-82



SIBEX 1983-84



SIBEX 1984-85

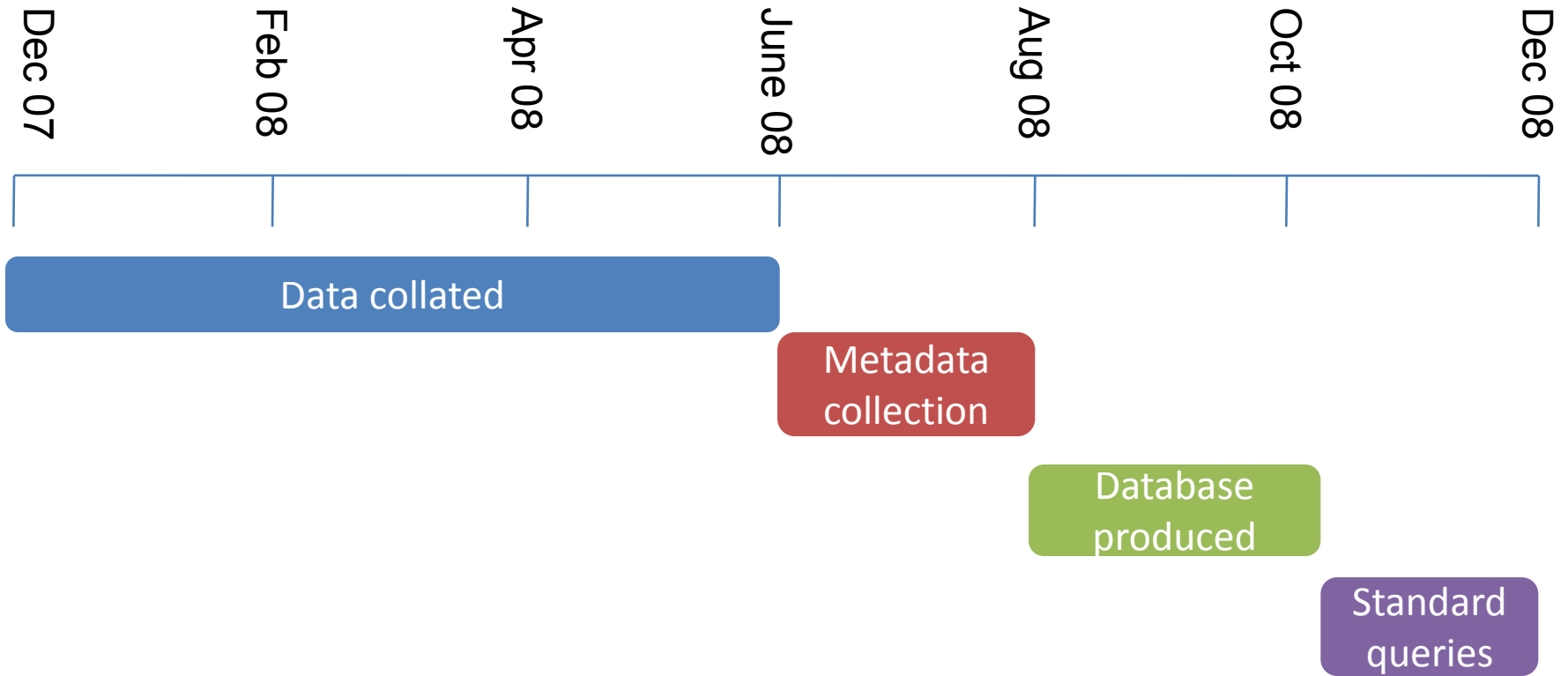
Cruise tracks of the various phases of the BIOMASS investigations

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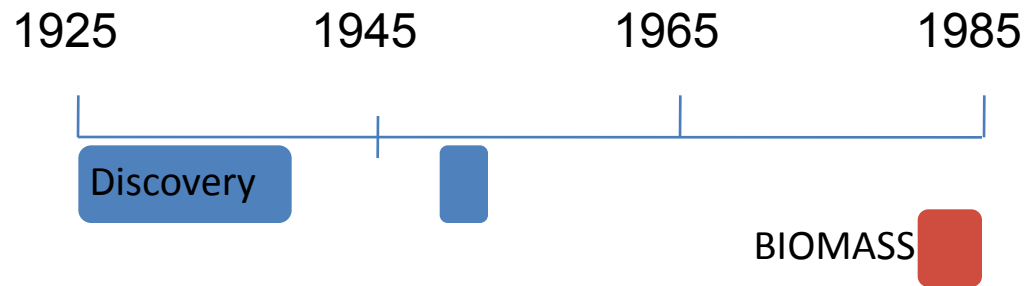


What did we do with the data?



Why is this database useful to scientists?

- Long time series
- Potential use to examine predator prey relationships
- Gives spatial and temporal context to Discovery samples.



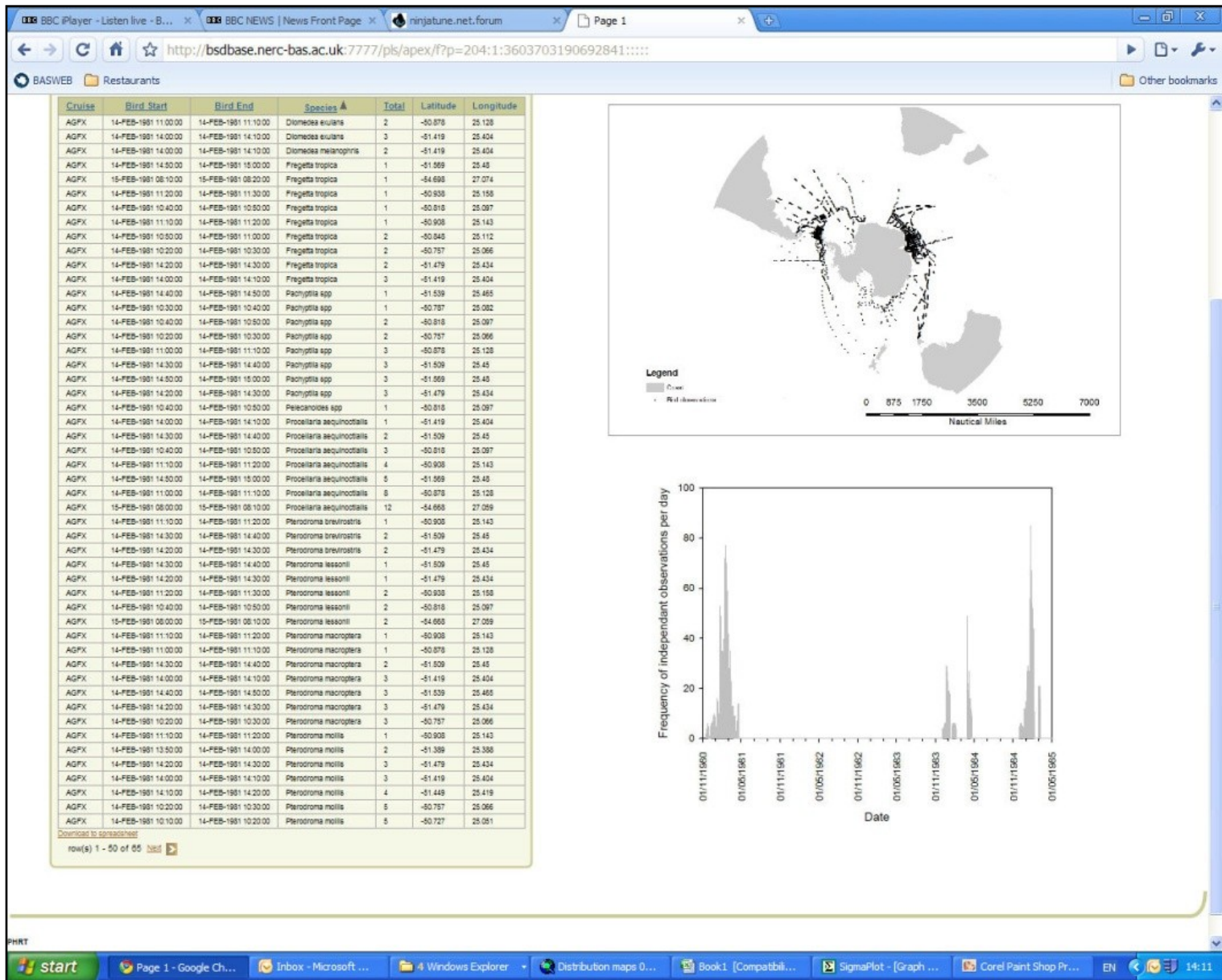
Data access

- Using a data portal to enable multi-disciplinary science
- Showcase example - Connecting scientists with the data
- Allows full control of data licensing and access

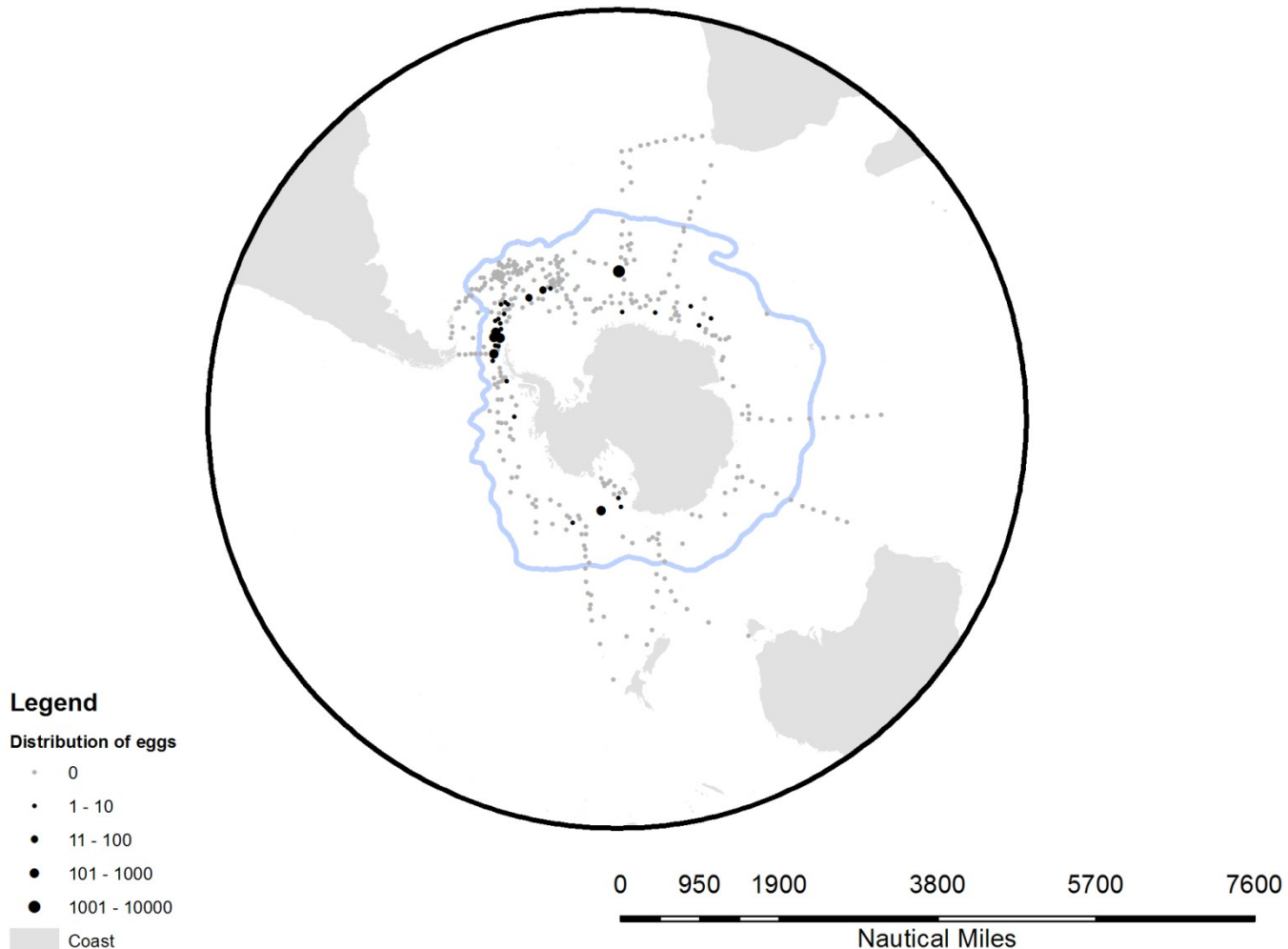


NERC Data Grid

Data portal development

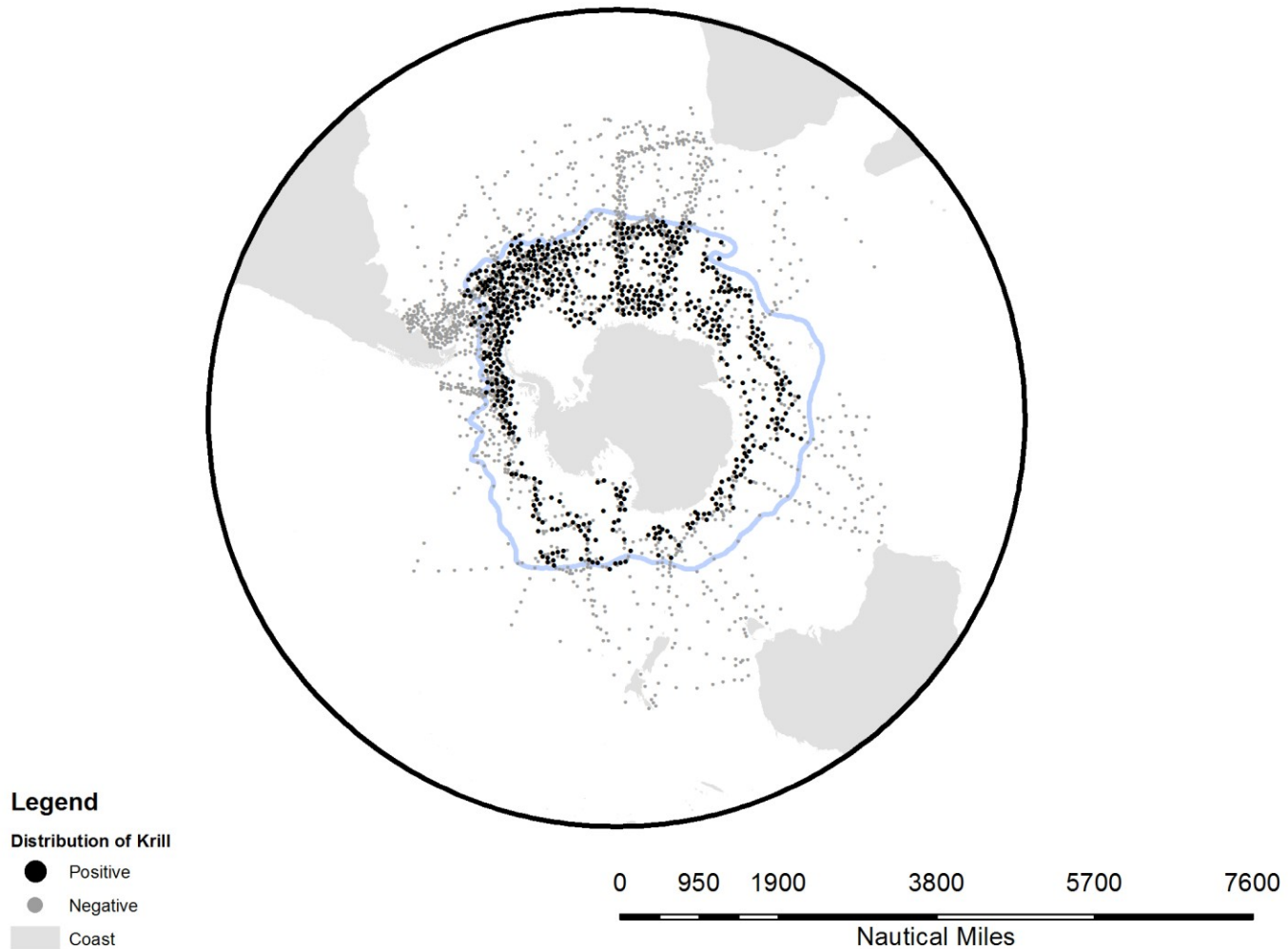


New Data portal visualisations



January and February Distribution of Krill eggs recorded during the
Discovery Investigations in the years 1950-51

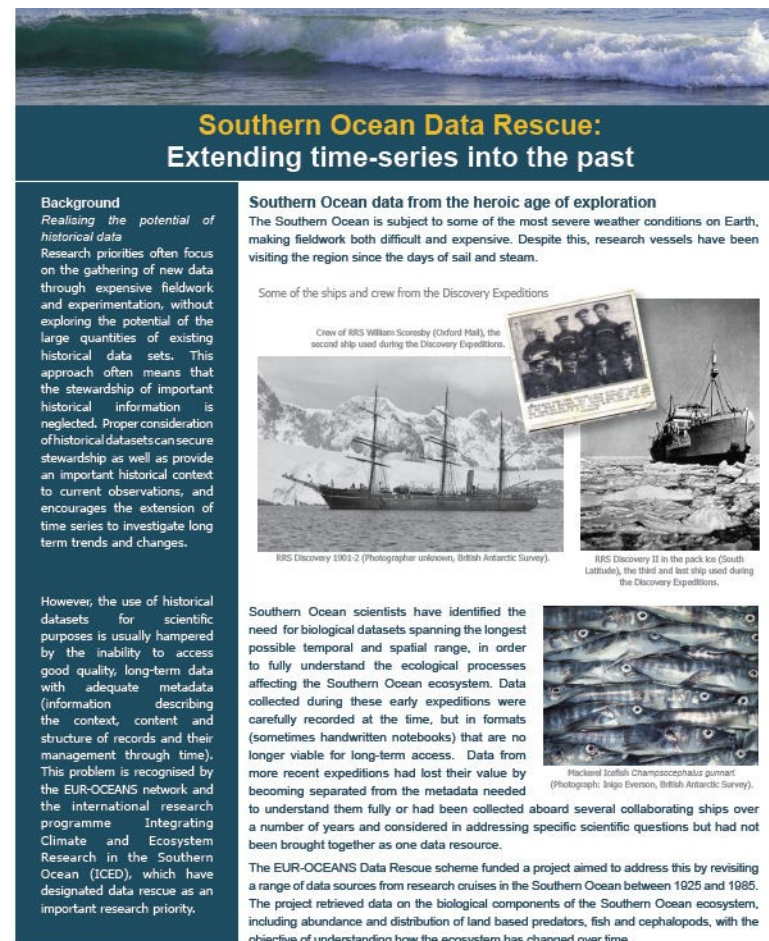
New Data portal visualisations



Distribution of krill recorded as part of Discovery Investigations

Wider scientific context

- ICED recognises historical data synthesis as key
- Concept developed under EUR-OCEANS
- Important component of new EUR-OCEANS consortium
- EUR-OCEANS factsheet distributed across the network and to policy makers



Southern Ocean Data Rescue:
Extending time-series into the past

Background
Realising the potential of historical data
Research priorities often focus on the gathering of new data through expensive fieldwork and experimentation, without exploring the potential of the large quantities of existing historical data sets. This approach often means that the stewardship of important historical information is neglected. Proper consideration of historical datasets can secure stewardship as well as provide an important historical context to current observations, and encourages the extension of time series to investigate long term trends and changes.

However, the use of historical datasets for scientific purposes is usually hampered by the inability to access good quality, long-term data with adequate metadata (information describing the context, content and structure of records and their management through time). This problem is recognised by the EUR-OCEANS network and the international research programme Integrating Climate and Ecosystem Research in the Southern Ocean (ICED), which have designated data rescue as an important research priority.

Southern Ocean data from the heroic age of exploration
The Southern Ocean is subject to some of the most severe weather conditions on Earth, making fieldwork both difficult and expensive. Despite this, research vessels have been visiting the region since the days of sail and steam.

Some of the ships and crew from the Discovery Expeditions


Crew of RRS William Scoresby (Oxford Hall), the second ship used during the Discovery Expeditions.

RRS Discovery 1901-2 (Photographer unknown, British Antarctic Survey).

RRS Discovery II in the pack ice (South Latitude), the third and last ship used during the Discovery Expeditions.

Southern Ocean scientists have identified the need for biological datasets spanning the longest possible temporal and spatial range, in order to fully understand the ecological processes affecting the Southern Ocean ecosystem. Data collected during these early expeditions were carefully recorded at the time, but in formats (sometimes handwritten notebooks) that are no longer viable for long-term access. Data from more recent expeditions had lost their value by becoming separated from the metadata needed to understand them fully or had been collected aboard several collaborating ships over a number of years and considered in addressing specific scientific questions but had not been brought together as one data resource.

The EUR-OCEANS Data Rescue scheme funded a project aimed to address this by revisiting a range of data sources from research cruises in the Southern Ocean between 1925 and 1985. The project retrieved data on the biological components of the Southern Ocean ecosystem, including abundance and distribution of land based predators, fish and cephalopods, with the objective of understanding how the ecosystem has changed over time.



What have we learnt?

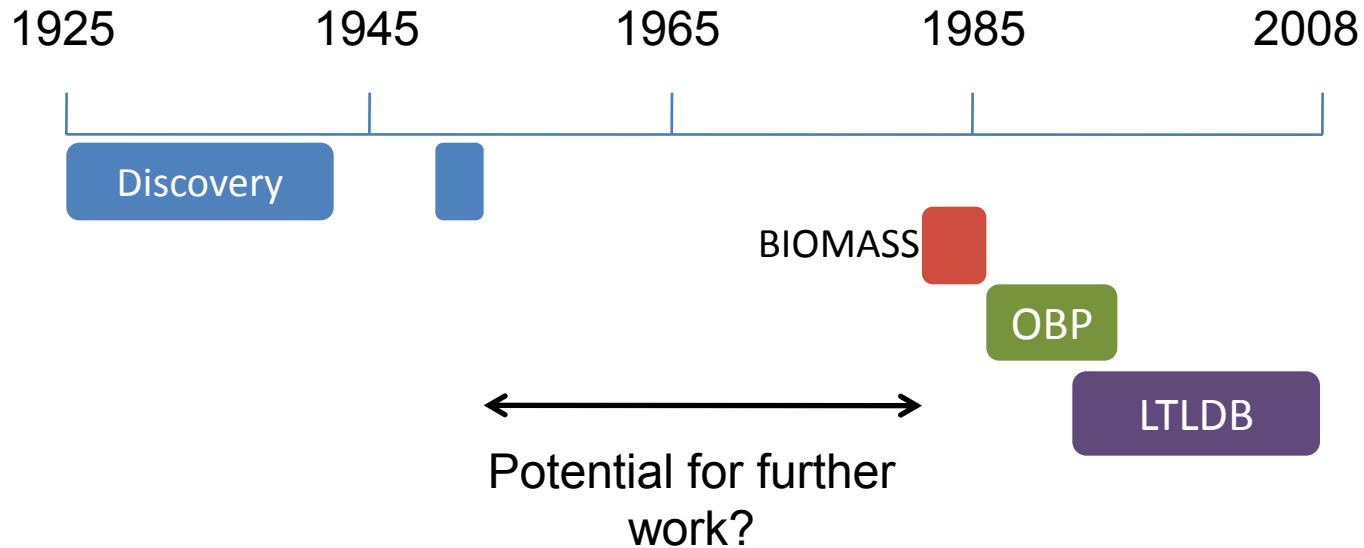
- It is possible to draw together disparate sources relatively quickly
- Visualisations allow more intuitive interaction with database
- Value in creating data resources from previously published data in papers

What next?



- Lots of potential for data rescue
- Krill acoustics data
- Visit to NOC Discovery archives
- Long term potential for integration of OBP and LTLDB

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Acknowledgements

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- Also everyone else who I've worked with as part of this project.

