



# CLIVAR/CLIC/SCAR Southern Ocean Panel

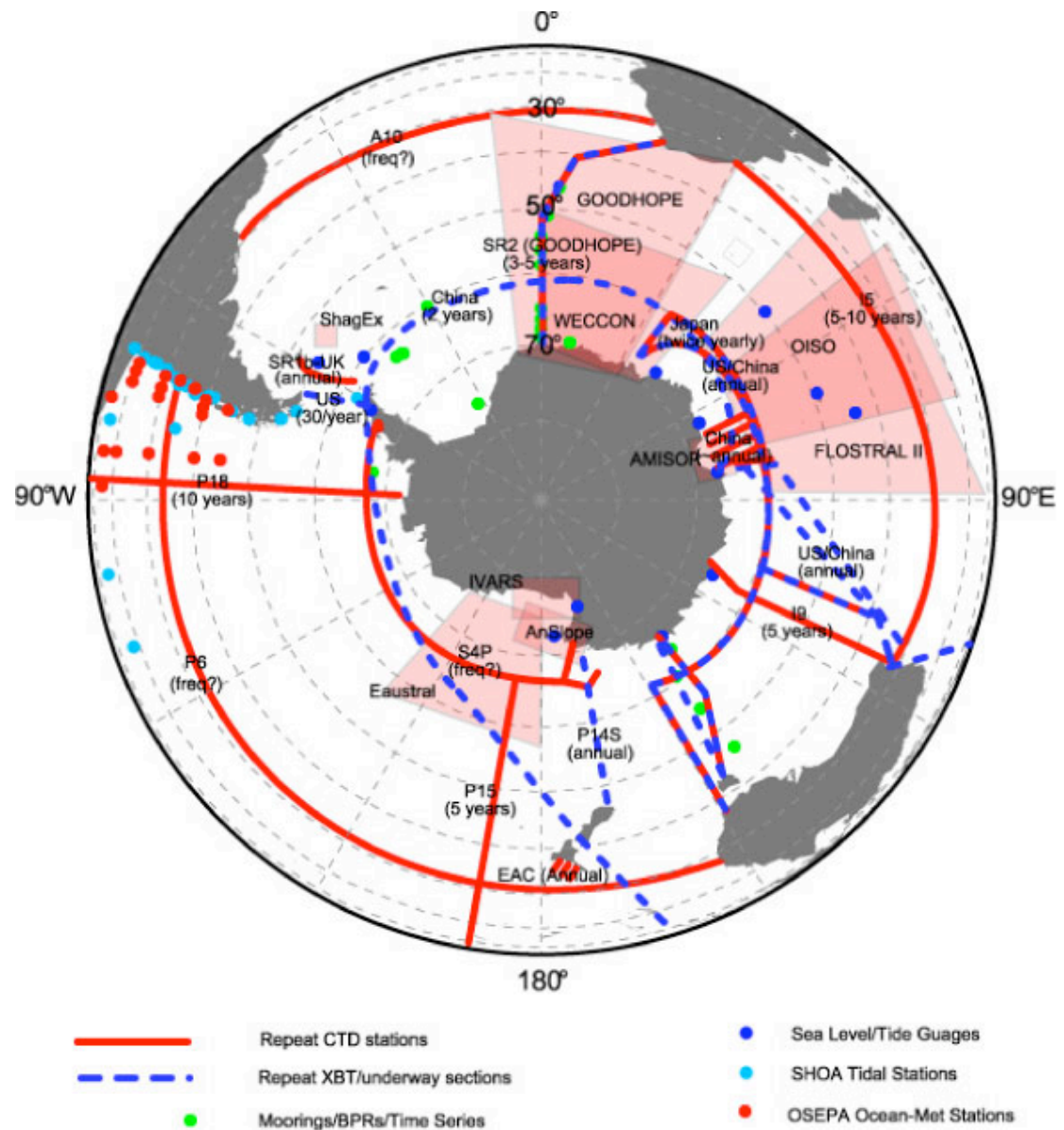
Kevin Speer and Steve Rintoul,  
via Albert Fischer

OOPC-X, Geneva, 11 May 2005

## Research questions with sustained observing component

- ACC transport variation, relation to the AAO/SAM and other patterns, and the transmission of anomalies between oceans
- Vertical structure of T/S anomalies and transport processes
- Dense water formation and transmission of signals by boundary currents
- Ice shelf stability and the balances of the ocean-ice system
- Role of the Southern Ocean and ice system in setting the ocean's background state and mean ocean-atmosphere-ice seasonal cycle
- Intrinsic variability and teleconnections of modes of variability
- Coupled response of atm, ocean, ice to ENSO and other variability
- Carbon uptake, biogeochemistry, and the CO<sub>2</sub> feedback
- Support of process studies and model development

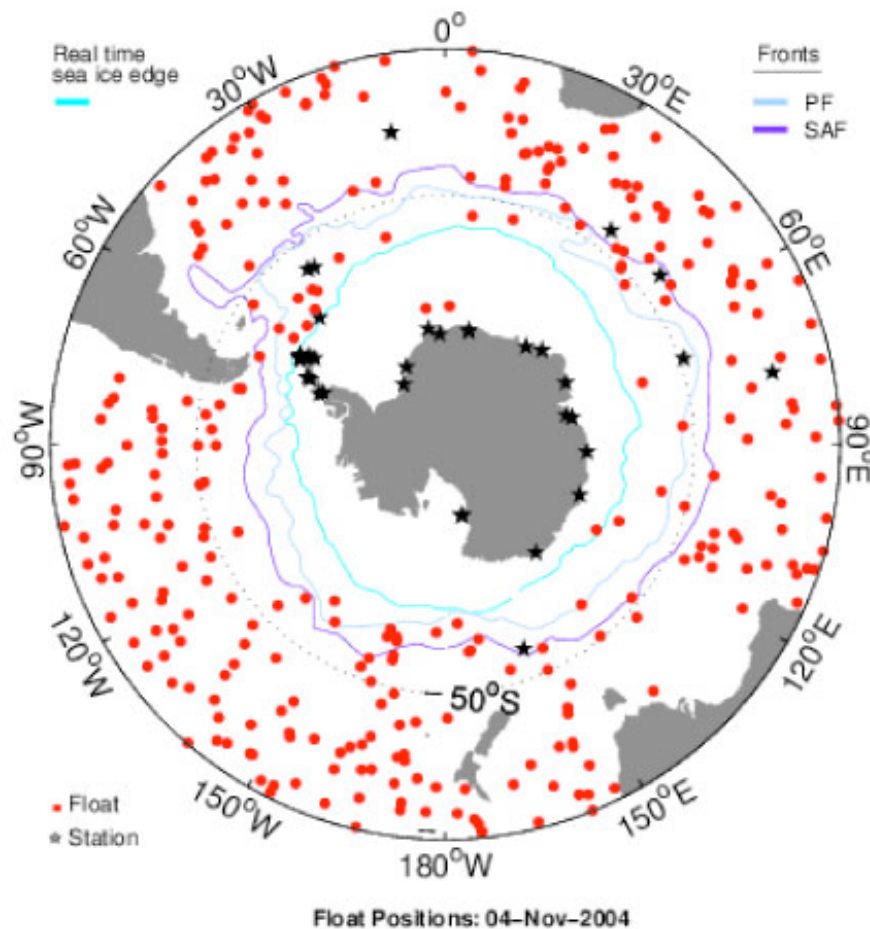
## Sustained observations in Southern Ocean



## Argo

Nov 2004

- enhancements in Weddell Sea (Germany), south of Australia (Aus.), South pacific (US)
- in seasonal ice area remains experimental



## Transport monitoring (current meter moorings)

- Would like the ‘choke points’: Drake Passage, line south of Africa, line south of Australia
  - only Drake Passage is approaching adequate sampling
- Would like outflow arrays to measure bottom water formation: Weddell Sea, Ross Sea, P. Elizabeth trough, Adelie
  - two (Weddell and Ross) are planned as part of process experiments

## Other sustained observations

- **Repeat XBT sampling:** Given limitations of ship tracks, the sampling is quite good.
- **Repeat hydrography:** Good shape, with all recommended lines done or with firm plans, largely due to carbon community.
- **Bottom Pressure Recorders:** to monitor ACC
  - in Drake passage in good shape, with sustained obs by UK since 1988 and additional obs coming online
- **Tide gauges:** gaps in Ross Sea area and Antarctic Peninsula - logistical challenges

## Other sustained observations (cont'd)

- Limited progress in determining **sea-ice thickness** in sustained manner for Southern Ocean
- **Surface drifting buoys**: sea ice zone and deployment challenges continue to limit coverage
- **IPAB marginal ice zone buoys**: measure ice motion, pressure, temperature, met data - limited by resources (about 50 of desired 100 per year)
- **Time series stations**: will require some technological buoy development for survivability

## IPY as an opportunity

- observations in sea-ice zone - Argo and met buoys
- Air-sea flux improvements via IMET (VOS), time series stations
- Simultaneous transport arrays for internal modes of ocean variability, synoptic sections around Southern Ocean
- Not yet clear what will actually get funded

## Data management and synthesis

- Data management is an area the S.O. panel has identified as weak in CLIVAR, basic tracking of what observations are taken at ICPO
- again, IPY provides one opportunity, other small initiatives
- Data analysis/synthesis: need systematic comparisons