SAARDC Workshop, Cape Town, 12 to 14 May 2005.

Observations in the Southern Oceans

Gerhard Schulze

South African Weather Service

Drifting Weather Buoys

- The SAWS participates in 3 international drifting weather buoy deployment programs.
  - ISABP: South Atlantic
  - IBPIO; Indian ocean.
  - IPAB: Antarctic ice zone.
- Other participants are mainly USA, UK, France, Argentina, Australia, Canada, New Zealand, India, Malaysia.

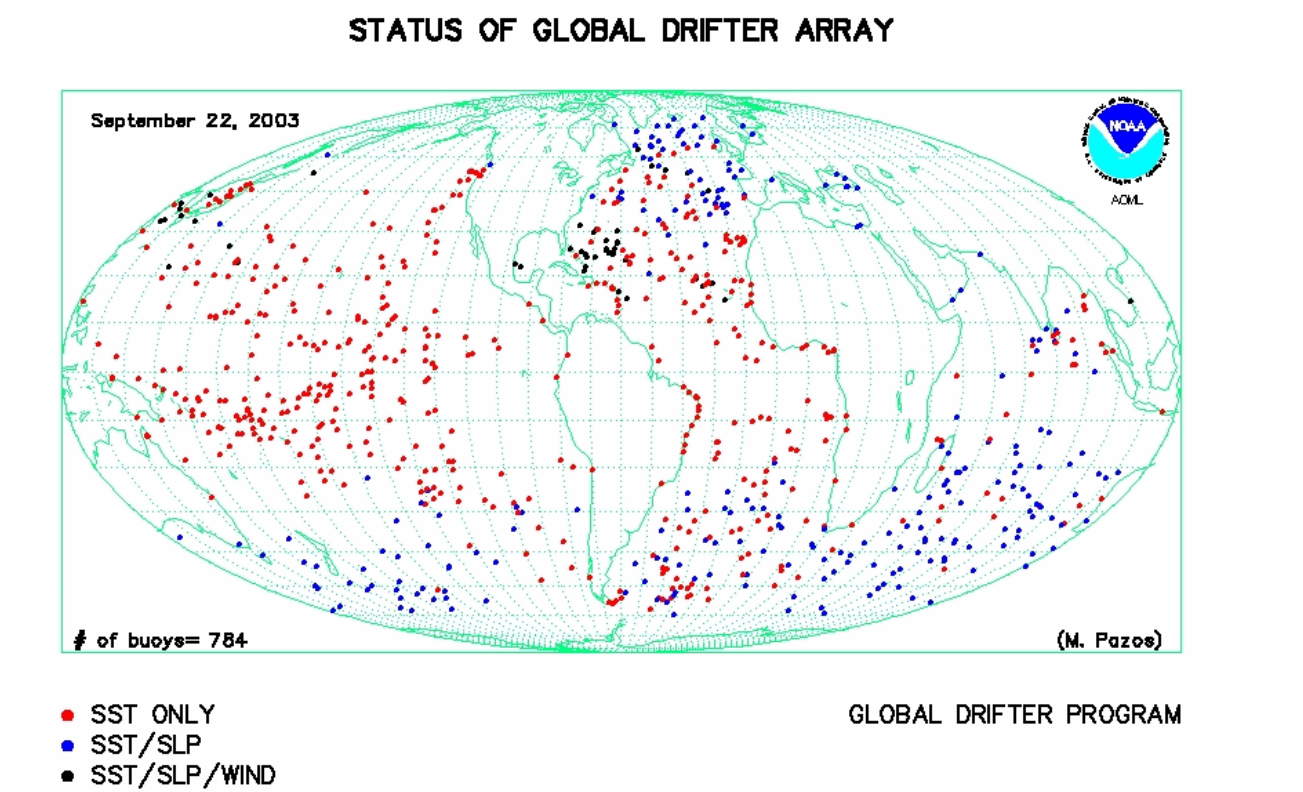
South African Weather Service

Drifting Weather Buoys

- The SAWS annually deploys 30-50 buoys, mainly on voyages to Gough and SANAE, and usually 2-4 on voyages to Marion.
- Also give buoys to ships of opportunity to deploy on commercial shipping routes, mainly to the east.
- Presently the USA purchases the buoys with SST only and we “Upgrade” by having a barometric sensor installed at our cost. This way we have roughly twice as many drifters as previously.

South African Weather Service

Global Drifter Array



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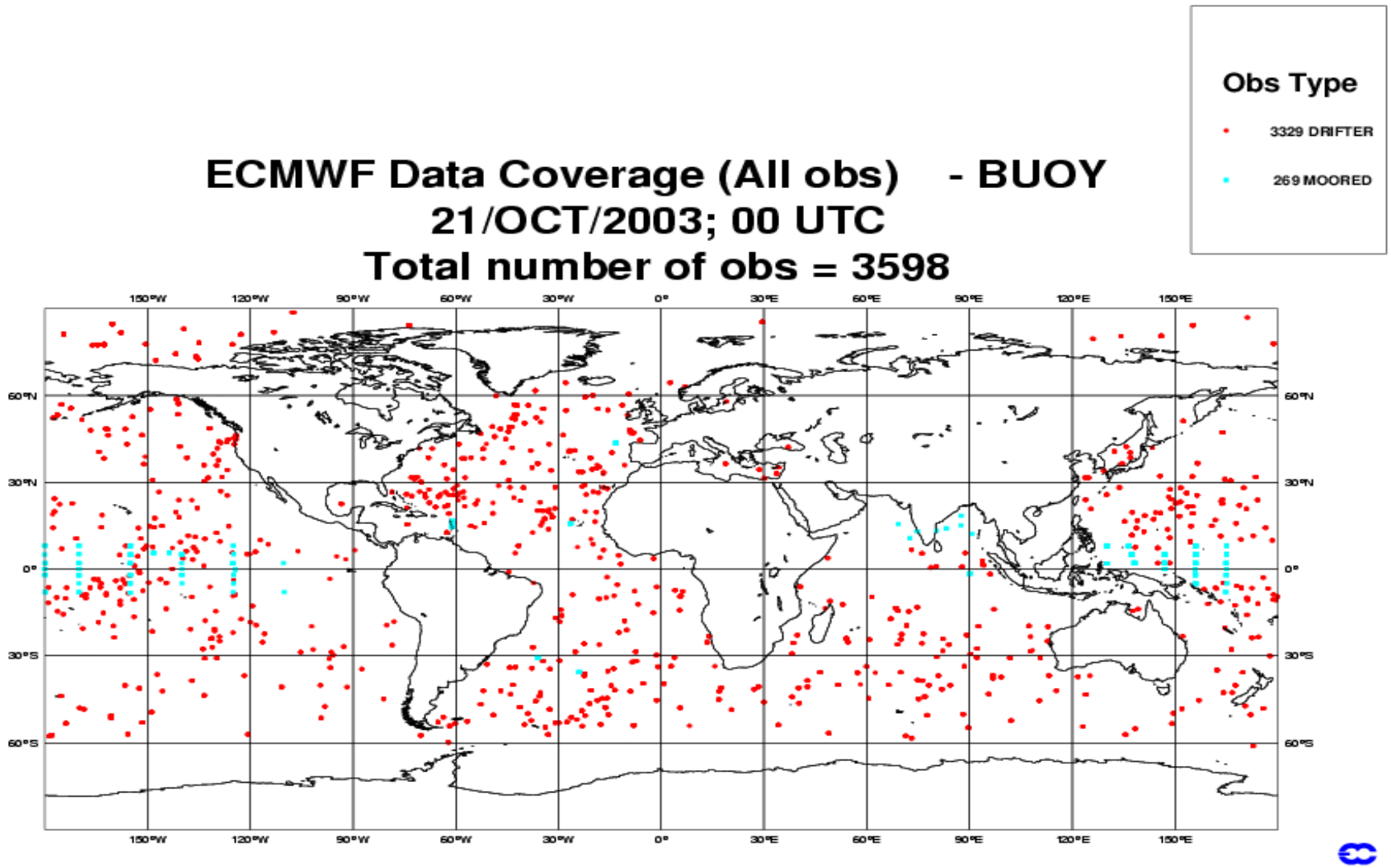
Drifting Weather Buoys

- Buoys are deployed as far west as possible.
- They transmit every 90 seconds. The data are collected by ARGOS, QC'ed, coded and disseminated on the GTS.
- On average the buoys last about 18 months. But we have had buoys which lasted up to three years. We had one that went right round the globe and we lost it just when it entered the Magellan Straits.
- Success rate with air deployment is about 60%-70%, compared to 96% deploying from ships..
- The SAWS also deploy XBT's
- We have no anchored buoys due to the deep oceans around us and costs.

South African Weather Service

October 2003



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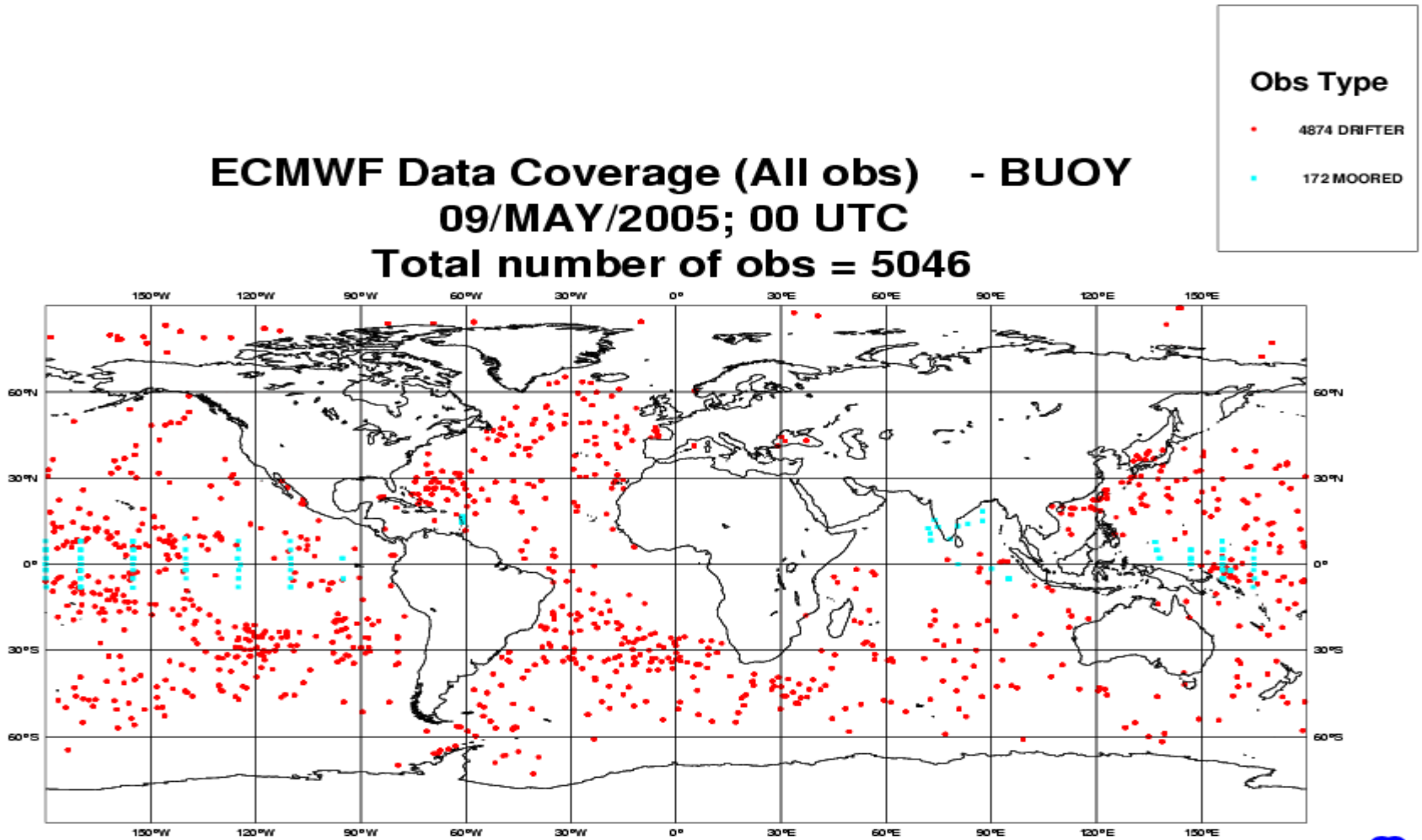
May 2005



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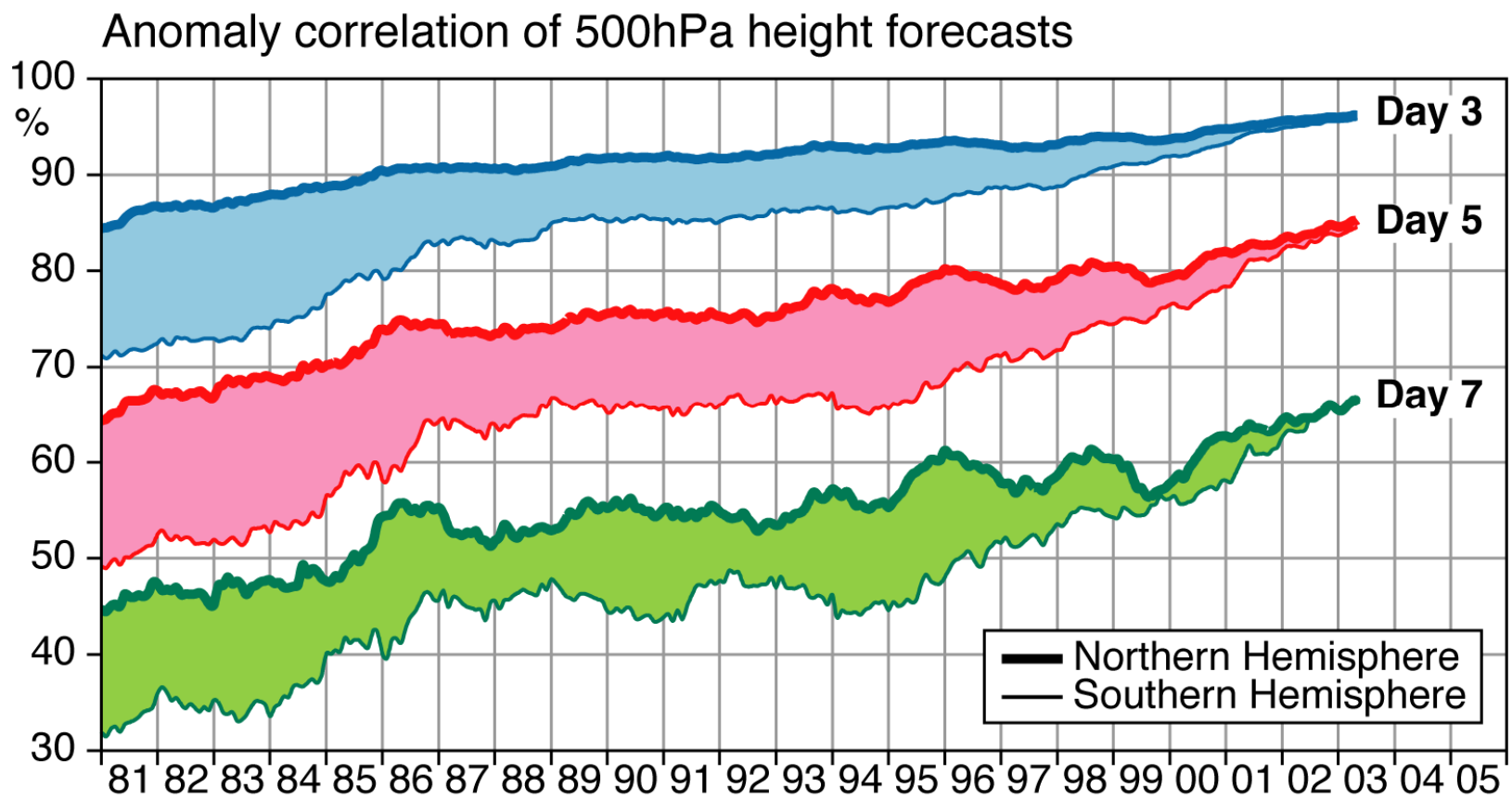
ECMWF model scores 1981-2003



Conclusions from "high resolution" OSEs

- The Sea surface observation network is important despite the growing impact of satellite observations
  - Results are statistically significant (not shown)
  - Larger impact in the Northern Hemisphere (specially in winter)
- Buoys and Ships seem to be equally important
  - Perhaps a slight advantage to the Ships
- Buoys and Ships can have a crucial impact synoptically
- Complementarity of the Space and Terrestrial network for global NWP

South African Weather Service

SAWS Re-Cap. Plan

- Expand the drifting weather-buoy programme in the south Atlantic and Indian Oceans.
- Deploy automatic weather stations at islands in the south Atlantic.

South African Weather Service

CBS recommendations

- Adequate coverage of wind and surface pressure observations from drifting buoys in the Southern Ocean in areas between 40S and the Antarctic Circle should be assured using an adequate mix of SVPB (surface pressure) and WOTAN technology (surface wind). The pressure observations are a valuable complement to the high-density surface winds provided by satellite.

- Recent studies have shown that 4D-Var data assimilation systems or analysis systems with frequent update cycles can make excellent use of hourly data, e.g. from SYNOPs, Ships, buoys, profilers, and other automated systems, in particular Automatic Weather Systems (AWS).