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SADCO

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Items on the SADCO work plan, 2008/2009

The following activities were considered by the Steering Committee as part of the work plan for the data centre for 2008/9. They exclude the routine activities executed in terms of database management and maintenance, promotion, newsletters, etc (which will be undertaken anyway), but only include items that are related to the development of the data centre's capabilities.

Not all the data sets referred to below under "Data handling" have been submitted to SADCO yet, and the list of activities should be seen as somewhat of a "wish list" (also depending on the rate of progress). The loading sequence will focus on data sets that are considered important, are available and are not foreseen to be problematic (e.g. the quality is assured, formats are uniform and clear, etc).

System development

- Modify software to include extraction of quality flags with data
- Upgrade the SADCO Web site and Inventory interface
- Implementation of SADCO strategy (see Article this Newsletter)

Data handling

- Data transfer to WDC
- Selected cleanup of profiles based on outcome of quality control process

Load the following data:

Moored data

- Moored ADCP data (Namibia)
- Wave buoy data (till 1990)
- Moored ADCP data (MCM)

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- Namibian Ministry for Fisheries & Marine Resources

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Items on the SADCO work plan, 2008/2009 continued...

Profile data

- CTD data (Namibia)
- DEIMEC CTD data (UCT)
- DDS data (UCT)
- CLIWOC data (1750 – 1850)
- Melville data (Lisa Beal)
- Underway ADCP data (Alfred Wegener Institute)
- Continuous and discrete CTD data (MCM)
- ARGO float data (WDC)
- CITHER data (France)
- Underway ADCP data (MCM)

Weather data

- AWS data, Robben Island (SAWS)
- AWS data, Roman Rock (IMT)
- VOS data (SAWS)
- Mozambique/NANSEN wind data
- AWS data, update of coastal stations (SAWS)
- AWS data, C Columbine (Monteiro)
- AWS data, coastal stations (MCM)

More data from Automatic Weather Stations around the coast

In the Newsletter of February 2008 it was reported that the South African Weather Service (SAWS) has provided updated data (till 2007) to SADCO from its extensive series of automatic weather stations (AWS) around the South African coast. This data still needs to be loaded.

A set of AWS data collected in South African ports (see table below) has now also been received from the CSIR. Most of the stations are located inside the various ports at Port Control (excluding the station on Jahleel Island). The "1" and "2" in some station names indicate that the station had been moved. The period of this data set coincides more or less with the data received from SAWS mentioned above.

The spatial coverage of the holistic data set (see Fig. 1) should make it very useful for studies involving time variations of atmospheric conditions around the coast.

Table: Summary of AWS data from South African ports

Location	Recording interval [min]	Period
Saldanha Bay	20	1994-2005
Table Bay	20	1995-2005
Ben Schoeman Dock	20	2000-2005
Coega	60	1997-2000
Coega Harbour	60	2000-2001
Jahleel Island 1	60	1998-2005
Jahleel Island 2	60	2004-2005
Port Elizabeth	20	2002-2005
East London	20	1995-2005
Durban 1	20	1995-2002
Durban 2	20	2002-2005
Richards Bay	20	1993-2005
Richards Bay south breakwater	20	1994-2005

More data from Automatic Weather Stations around the coast continued...

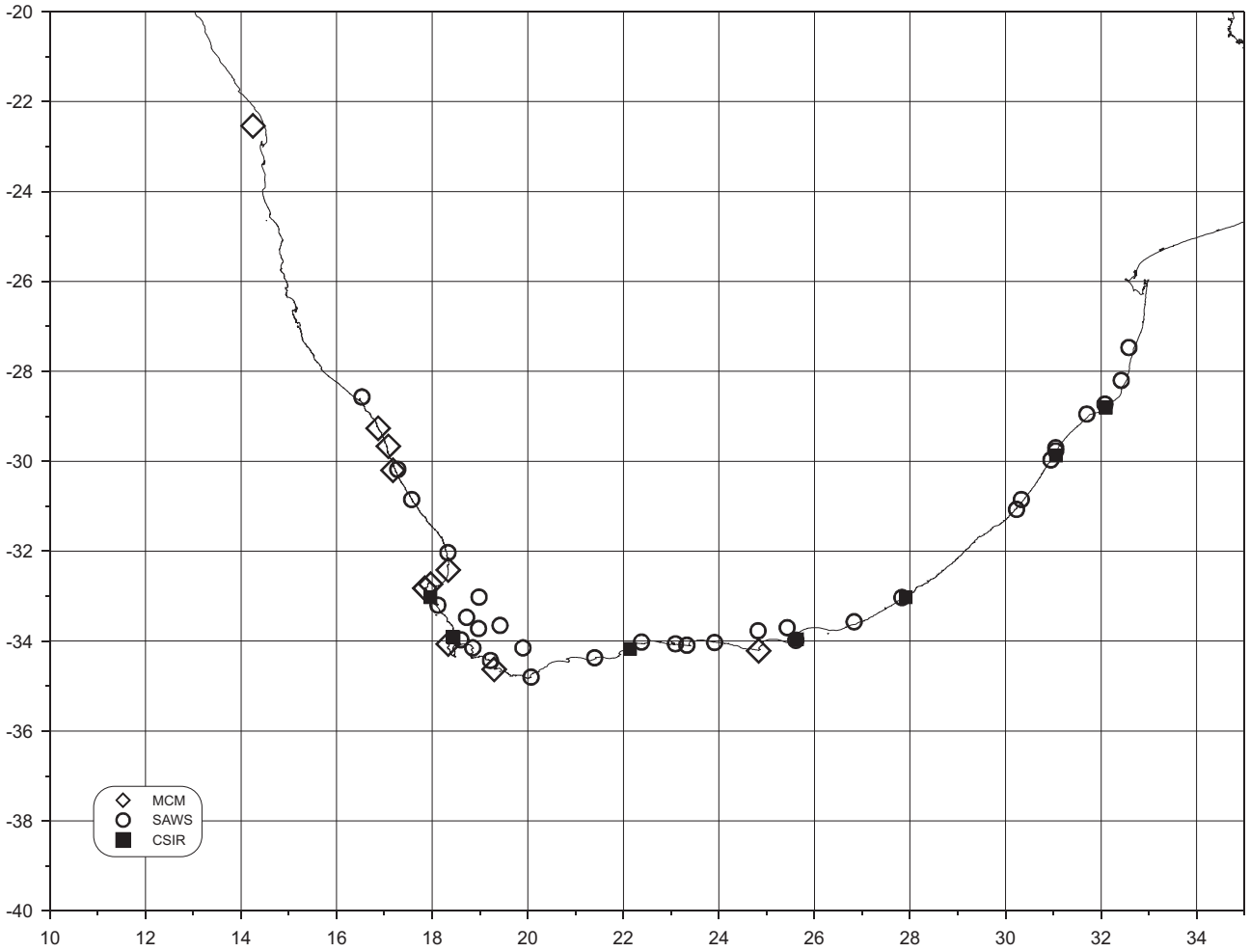


Fig. 1 Position plot of coastal weather stations data received from Marine and Coastal Management, South African Weather Service and CSIR.

ARGO FLOAT DATA IN SADCO

More than 20 000 vertical profiles collected by 539 ARGO floats in SADCO's target area have been loaded

ARGO floats

An ARGO float is a cylindrical instrument that is easily deployable from any vessel (see Fig. 2; from www.argo.ucsd.edu)

The float is meant to operate in a free-drifting mode, and will sink over about 6 hours to a pre-set depth of neutral buoyancy (say,1 000 m depth).

After arriving at this depth the float will drift for about 9 days. Through a pumping system an external bladder on the instrument can be inflated or deflated, thereby changing the volume of the instrument without changing the mass. The resulting change in buoyancy causes the instrument to rise or sink.

After 9 days the bladder is inflated and the increased buoyancy causes the float to rise to the surface at ~10 cm/s (this is termed the "simple mission operation"), or first sink deeper (2 000 m) before rising to the surface (the "park and profile mission operation"). During the upward traverse an on-board CTD records temperature and salinity. For practical reasons the float data is not at the same resolution as high-resolution CTDs, and typically about 50 depths are recorded per profile.

The float stays at the surface for 6-12 hours while transmitting the data to a satellite and fixing the position of the float. It then automatically sinks to the pre-set depth again and the cycle is repeated. Floats are meant complete about 150 of these 10-day cycles.

Loading ARGO float data into SADCO.

Data can be downloaded from web sites as "real time mode" or as "delayed mode" data. While the real time data is used in global models, the delayed mode data has been checked and corrected as much as possible. SADCO opted to extract the data from the WOD05 supplied as delayed mode data by the World Data Centre.

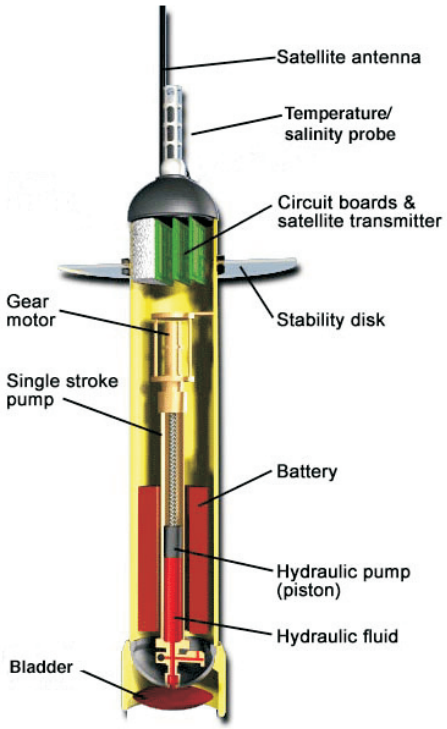
Profile data from a particular float was treated as a "survey" (= cruise), so that the data set could be extracted and analysed coherently. The float surveys can easily be seen (SADCO Home page http://sado.csir.co.za, select Cruise Inventory, click on "Surveys" and enter 2008/0001. The list will then show all the floats (with SurveyIDs starting at 2008/0001 and continuing to 2008/538). Click on a particular SurveyID to see the track.

Altogether 22 140 stations, from 539 floats, were loaded. There are presently about 3 000 ARGO floats adrift globally.

Fig. 3 shows examples of the vertical profiles while Fig. 4 provides examples of the cruise tracks.

ARGO FLOAT DATA IN SADCO CONTINUED...

Fig. 2 Diagram of an ARGO float (from http://www.argo.ucsd.edu/csection_high_res.jpg)



ARGO 10502 (2008/0011)

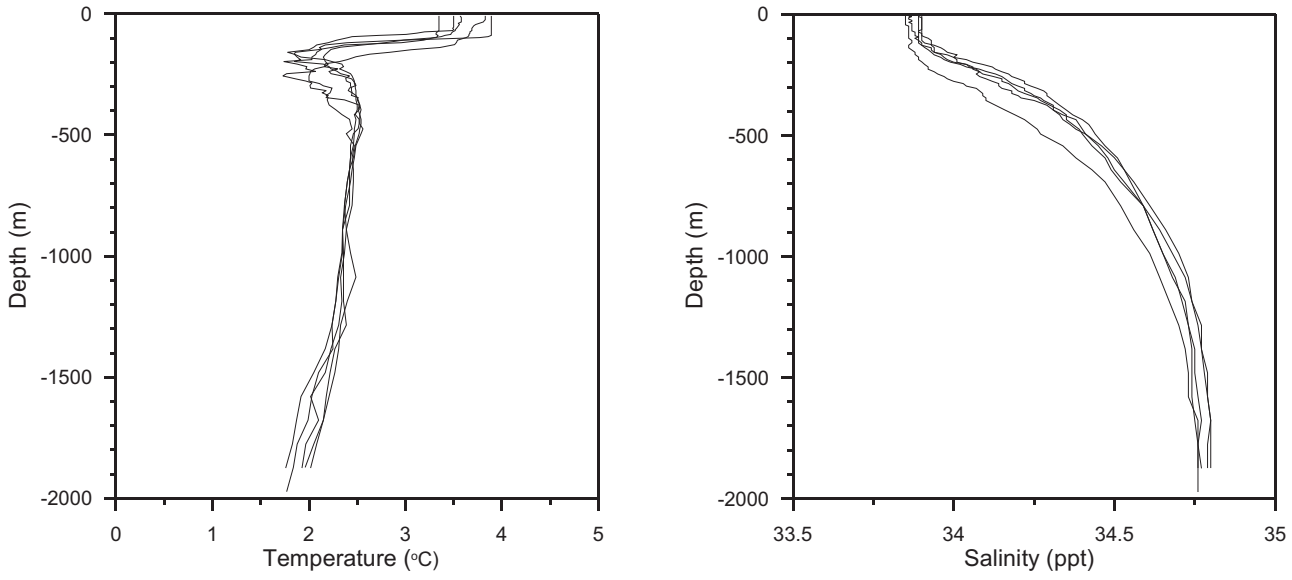


Fig. 3 Examples of temperature and salinity profiles collected at the first 5 stations by the ARGO float depicted in the top left corner of Fig. 4.

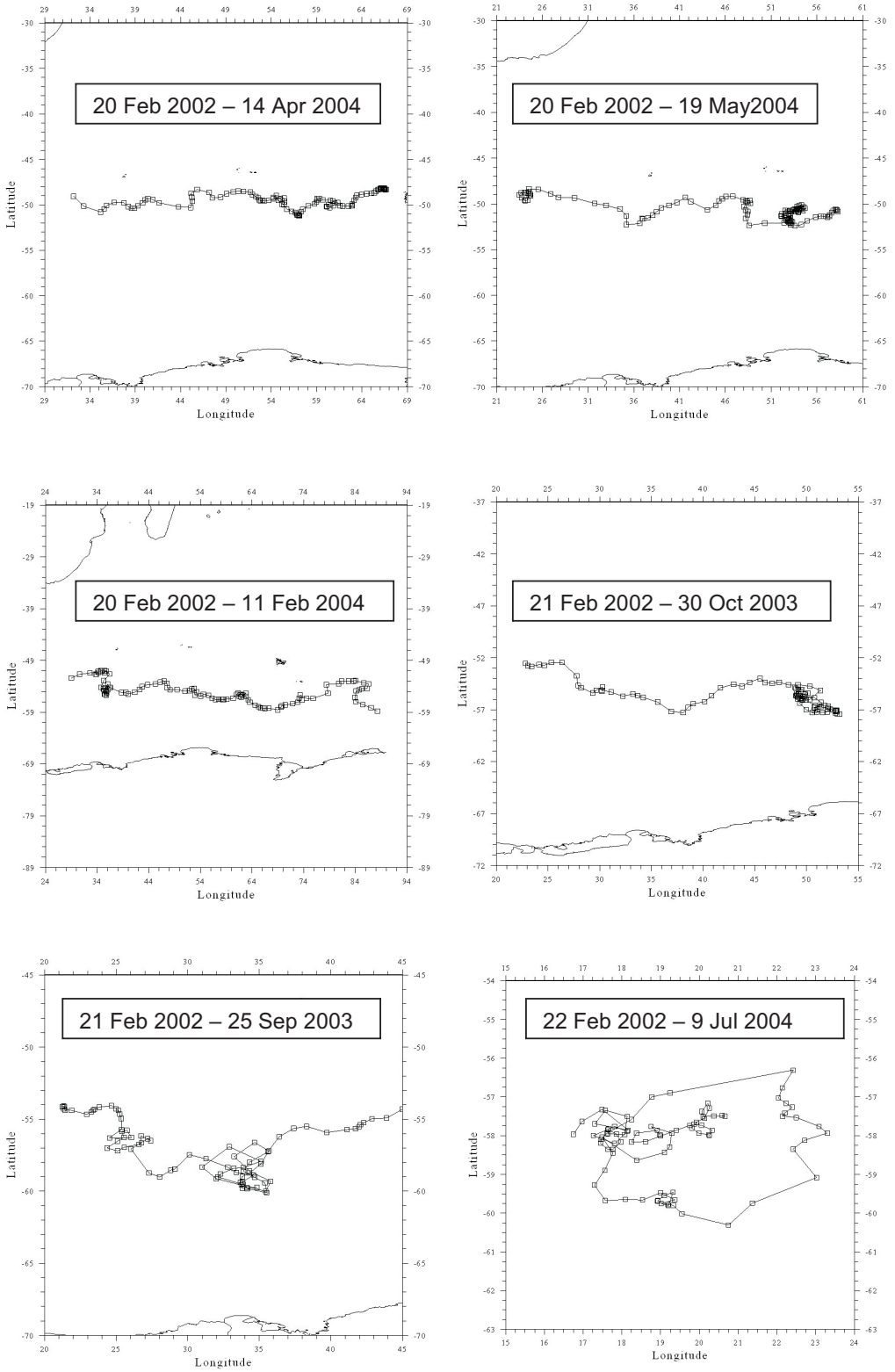


Fig. 4 Examples of ARGO float tracks from the data loaded. The floats were deployed by AWI at about 49°S (top 2), 52°S (centre 2), 54°S (bottom left) and 58°S (bottom right). The drift directions of all the floats were from west to east, and mainly clockwise in the bottom right.

Highlights from the Annual Report 2007-08

The regular SADCO Newsletters contain articles on specific activities, data sets loaded etc. However, it is only at the end of a year that one gets an overview of the manifold things that have been undertaken. Collectively, these activities, comprising system developments, added data sets and other achievements, constitute the growth in the Data Centre.

The activities for 2007/8 formed part of the agreed Work Plan, and the outcomes were presented to (and accepted by) the SADCO Steering committee at the meeting in May.

Of primary interest in managing data is that the databases must all be maintained in good working order. This was achieved.

Specific "developmental" activities of 2007 include the following:

- The SADCO MoU, articulating the relationship between the SADCO stakeholders and indicating their support for SADCO, was finally approved by all the signatories, and distributed.
- SADCO's Strategy Plan was finalised (this was presented to the Steering Committee in May 2008, and accepted).
- Probably the largest activity of the year was an extensive audit of the quality of all profiles stored in SADCO. In the process, quality flags were designed, programmed and allocated to 243 566 stations of 5 172 surveys.
- XBT, MBT and CTD data was extracted from the World Ocean Database 2005 in SADCO's target area, and 18 882 stations from 330 cruises loaded.
- ARGO float data was loaded for the first time, with 22 140 profiles from 539 floats added to the data base.
- DeBeers Marine donated 48 current meter deployments (1994 - 1996) and these were loaded. IMT kindly assisted with the quality assessment of the data.
- For the first time data collected by moored wave buoys off the South African coast has been loaded for three stations up to 1985 (about 25 000 records).
- VOS data obtained from the South African Weather Service from April 2007 to March 2008 (40 633 records) was loaded.
- Automatic Weather Station data of Gough Island (South African Weather Service) was loaded for April 1963 - October 2006, while Roman Rock AWS data (IMT) was kept up to date.
- Automatic Weather Station data at coastal ports from 1995 - 2005 has been loaded.

The members of the Steering Committee are thanked for their continued support and guidance, and help to ensure the success of SADCO.

SADCO's revised strategy: some main elements

SADCO has adopted a revised strategy to address issues of on-line access and "popular" products

SADCO will soon be starting to implement some revisions in its strategy. Initiated in 2005 by the Steering Committee, a new strategy has been formulated but has, for various reasons, taken almost 3 years to get all the details sorted out.

It has been recognised for some time that many databases in the marine domain have adopted a policy of on-line accessibility for all users, something only partly in place with SADCO. It has also been felt that SADCO is missing an opportunity of reaching out to interested members of the public (e.g. schools) and in that way, promoting oceanography in South Africa.

The main elements of the new strategy are:

- On-line access will continue for the sponsoring organisations, but now expanded to include the South African Weather Service, University of Cape Town and the Institute for Maritime Technology.
- On-line access will now also be provided to other users (who will need to register) for non-commercial use of data. Limitations will be in place on extraction sizes to avoid overloading of the system (for unitiated users). At the same it is felt that these users may not really want to have large tables of scientific data per se, but would rather prefer graphs and products. This is addressed below.
- Off-line extractions by SADCO staff will continue as before.
- In collaboration with SAEON (South African Environmental Observation Network's) Egagasini Node a set of pre-generated, static graphs/products will be established, as well as other information, to address the needs of non-research users and to promote oceanography. Examples of such products could be:
  - chart of southern Africa showing mean summer and winter sea surface temperature
  - same for salinity, wind, waves
  - typical vertical profiles of temperarure and salinity
  - selected satellite images (SST, colour, radar), showing the Agulhas Current, meanders, Benguela upwelling, etc.
  - photographs of oceanographic equipment, research vessels
  - aspects of marine pollution
  - information on climate change, the ocean's role, El Nino
  - information on the various marine organisations in southern Africa
  - careers in oceanography

  In each case with links to web sites for more information.
- The present system of flagging (not for data quality but for data accessibility) will be continued (and expanded). Data transfer to the World Data Centre will continue as before.
- The portfolio of data types will be expanded where appropriate. [SADCO started in 1990 with a "core" set of two data types, namely hydrographic profiles and surface weather observations from ships of opportunity. While these sets have been maintained and enlarged significantly, the parameter list has been expanded over the years to include large amounts of time series data (currents, temperature, weather, waves), and chemical data. With additional funding SADCO has also undertaken the establishment of AFROBIS, a marine biogeographic database for Africa.]
- The SADCO web site for information, inventory access and data extraction will be upgraded.

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