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SADCO SADSO

ADCP data from Marine and Coastal Management

Marine and Coastal Management (MCM) is South Africa's largest collector of underway (ship-borne) ADCP (acoustic Doppler Current Profiler) data. A backlog of > 140 cruises of ADCP data exists, and a start will be made next year to reduce this backlog.

At the same time MCM also deploys ADCPs in a fixed, moored mode, in support of research into various oceanographic phenomena off the coasts of southern Africa.

The first set of moored ADCP data has now been submitted to SADCO by Mike Roberts. These deployments will be reformatted and loaded into the Current Meter database (see Table below). This data set augments the rest of the MCM current meter data which has also been transferred to SADCO over the past two years.

The moored ADCP data will be flagged, to allow proper validation and analysis by the submitter.

Location	Period
Sordwana Bay	March 2001 – August 2003
St Francis	April 2000 – January 2001
Tsitsikamma	April 1998 – ongoing

Southern African Data Centre for Oceanography
P O Box 320, Stellenbosch 7599
South Africa

Email: mgrundli@csir.co.za

Website: http://sadco.csir.co.za/

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Extraction of "chemical" data from SADCO

In some marine surveys, metal concentrations have been derived in seawater samples, plankton, tissue and sediment.

The metals include:

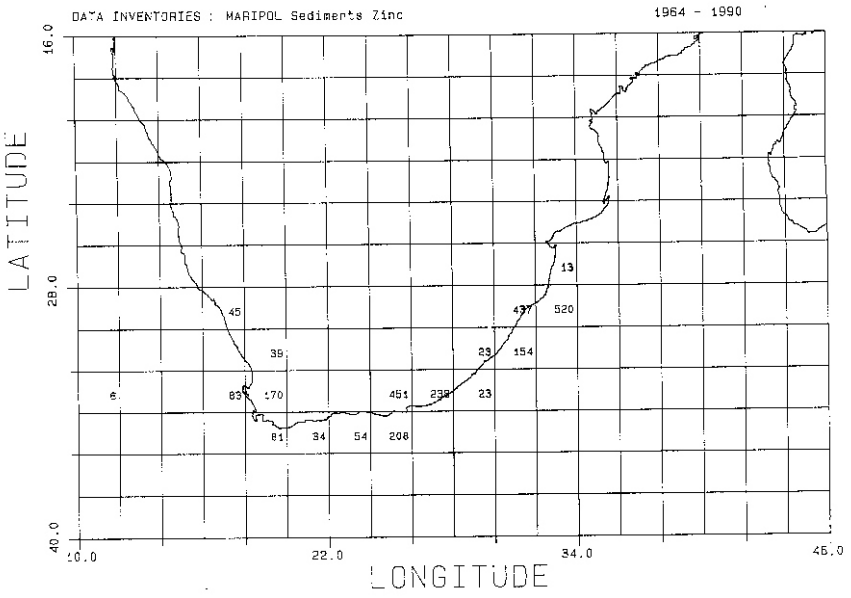
- Calcuim
- Magnesium
- Arsenic
- Cadmium
- Copper
- Iron
- Lead
- Nickel
- Zink
- And others

The demand for the data is not very high, largely because the data has already been analysed and the information extracted into reports. But the data has also remained dormant for about 15 years, even without the ability to extract the data from the databases.

A recent request for the data made us realise that an extraction routine was called for, which would also make the data more accessible and useful. It turned out that such a routine would not be all that difficult to generate (based on existing routines for other parameters).

Ursula von St Ange wrote the extraction routines, and an example of the data coverage of **zink** in **sediments** is shown in the figure.

The data coverage is not extensive (in time and space) as can be seen on the attached example chart, so that, apart from the raw data tables, there are no (graphic) products in existence.



Use of the WOD2001 Atlas for quality control

Over the past years the World Data Centre (WDC, Washington) produced regular editions of the World Ocean Database (WOD) on CD ROM.

The size of the editions grew continuously, partially due to the large amount of hydrographic data emanating from the GODAR (Global Oceanographic Data Archiving and Rescue) project.

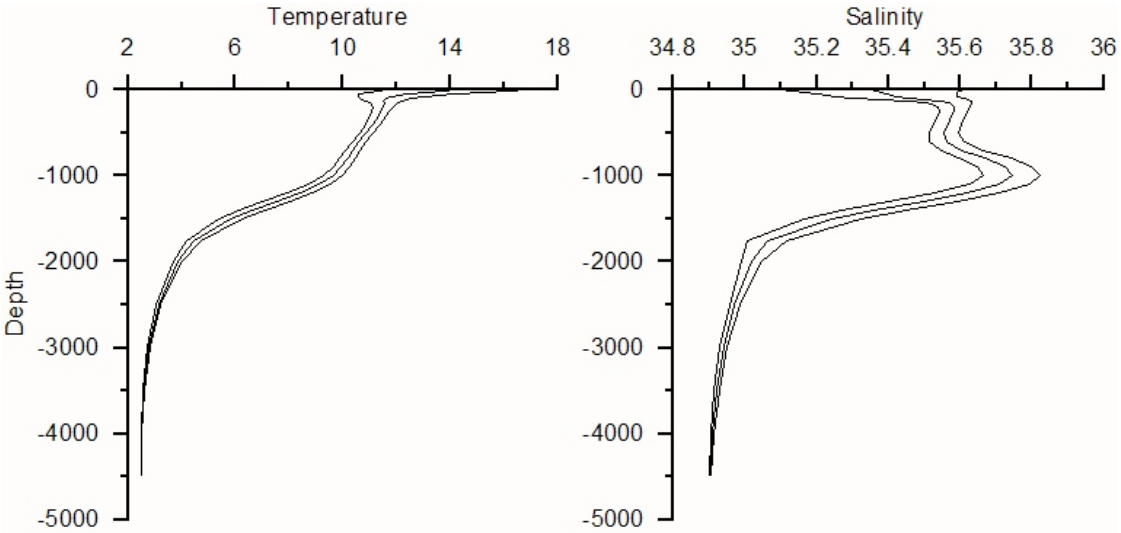
SADCO has selectively extracted data from the WOD for loading into SADCO (this has been reported in previous Newsletters).

In parallel to WOD on CD, WDC produces the World Ocean Atlas, which has analysed fields on a global basis of parameters such as temperature, salinity, nutrients, etc.

SADCO has written software to extract data from the CDs in such a way that average vertical profiles resemble the format of hydrographic stations, and this allows them to be manipulated in the normal way.

An example of such a "station", in the area 48° N, 8° W, is shown in the Figure.

It is planned to employ profiles and their standard deviations such as these as independent baselines with which to compare data submitted to SADCO, so that suspect data can be identified. Presently, SADCO's quality control relies heavily on the checking done by the data collector, while submitted data is checked visually only.



Average vertical profile of temperature and salinity, in a block 48º N, 8º W. Included in the profile are the average-STD, and the average ± STD envelopes. The data was extracted from the World Ocean Atlas (produced by WDC, Washington).

Checking the quality of VOS data in SADCO (2) *(following an article in the September 2002 Newsletter)*

VOS (Voluntary Observing Ships) data is often the only data set available in remote areas, or over longer periods (SADCO's VOS data goes back to the middle 1800s).

In the absence of other data, the VOS data set remains valuable, even though the measurements were not taken by scientists, and not measured/reported at high resolution.

In a previous Newsletter (Sept 2002) it was indicated that the WMO (World Meteorological Organisation) filters for acceptable data are so wide that spurious values may "slip through" for some parameters. These values represent less that 1% of the total data set, but may become relevant for some statistics.

In a detailed exercise, all the VOS values were analysed to determine the distribution, maxima & minima, spread, etc.

It was found that:

- While newer data is screened with the WMO criteria, older data has not. Some benefit may therefore be obtained by applying the WMO or other screening process retroactively.
- Some parameters (like sea surface temperature) show a systematic latitudinal variation, and it would make sense to apply a filter that shows corresponding spatial characteristics (see section below).

Table 1 indicates the various parameters, and the limits that will be used in the screening process.

The values that will be eliminated through the screening process will be stored in a separate file, in case there are any queries. However, values falling outside the WMO limits will not be retained. The whole database will be screened retro-actively, and henceforth for all incoming data.

Table 1: Parameter limits

Parameter	WMO limits	SADCO
SST	-2 to 37 deg C	See section below
Drybulb	-25 to 40 deg C	See section below
Wetbulb	-25 to 40 deg C, < Drybulb	See section below
Dewpoint	-25 to 40 deg C, < Wetbulb	See section below
Atmospheric pressure	930 to 1050 kPa	Same as WMO
Wind speed	0 to 40 m/s	Same as WMO
Wave height	0 to 17.5 m	Same as WMO
Wave period	0 to 20 s	Same as WMO
Swell height	0 to 17.5 m	Same as WMO
Swell period	0 to 25 s	Same as WMO

Specific filters for temperature

For the various temperature values, the filters were designed according to the method of multiples of standard deviation, taken relative to the mode value. A nominal value of 5 times the standard deviation was selected as a relatively conservative measure, and this was iterated twice. The limits were then smoothed latitudinally (to avoid jumps caused by changes in the number of observations), and to obtain consistency between the various air temperatures.

These criteria were translated to the limits indicated in Table 2.

It is believed that, although only a relatively small number of observations will be eliminated, the database will now be significantly "cleaner" than before, and will allow more stringent limits to be designed in future (should this be desired).

Table 2: Acceptable values for various temperature parameters

Latitude	Sea surface temperature [°C]		Drybulb [°C]		Wetbulb [°C]		Dewpoint [°C]	
	west	east	west	east	west	east	west	east
10 – 05 N	18 to 37	15 to 37	19 to 38	17 to 37	16 to 38	17 to 37	16 to 38	16 to 37
05 – 00 N	19 to 37	18 to 36	19 to 37	19 to 35	16 to 37	17 to 35	14 to 37	16 to 35
00 – 05 S	16 to 37	20 to 36	16 to 38	19 to 35	15 to 38	17 to 35	12 to 38	14 to 35
05 – 10 S	12 to 36	19 to 37	12 to 40	19 to 37	12 to 40	17 to 37	10 to 40	14 to 37
10 – 15 S	8 to 33	19 to 37	7 to 33	19 to 37	8 to 33	16 to 37	7 to 33	11 to 37
15 – 20 S	7 to 33	19 to 37	7 to 33	14 to 36	4 to 33	13 to 36	3 to 33	9 to 36
20 – 25 S	7 to 33	15 to 36	7 to 33	13 to 37	4 to 33	7 to 37	0 to 33	3 to 37
25 – 30 S	7 to 33	13 to 35	7 to 33	9 to 35	3 to 33	6 to 35	0 to 33	2 to 35
30 – 35 S	6 to 33	6 to 34	2 to 30	5 to 33	2 to 30	2 to 33	-3 to 30	-2 to 33
35 – 40 S	5 to 33	7 to 30	0 to 28	2 to 30	-1 to 30	0 to 34	-7 to 28	-5 to 30
40 – 45 S	-2 to 28	-2 to 28	-10 to 27	-10 to 25	-10 to 27	-10 to 27	-10 to 27	-10 to 27
45 – 50 S	-2 to 20	-2 to 20	-15 to 25	-15 to 25	-15 to 25	-15 to 25	-15 to 25	-15 to 25
50 – 55 S	-2 to 18	-2 to 18	-15 to 17	-15 to 17	-15 to 19	-15 to 19	-15 to 19	-15 to 19
55 – 60 S	-2 to 16	-2 to 16	-19 to 17	-19 to 17	-19 to 17	-19 to 17	-19 to 17	-18 to 17
60 – 65 S	-2 to 14	-2 to 14	-25 to 15	-25 to 15	-25 to 15	-25 to 15	-25 to 15	-25 to 15
65 – 70 S	-2 to 8	-2 to 8	-25 to 15	-25 to 15	-25 to 15	-25 to 15	-25 to 15	-25 to 15
70 – 75 S	-2 to 8	-2 to 8	-25 to 15	-25 to 15	-25 to 15	-25 to 15	-25 to 15	-25 to 15
75 – 80 S	-2 to 8	-2 to 8	-25 to 15	-25 to 15	-25 to 15	-25 to 15	-25 to 15	-25 to 15

Data inventory and scouting

SADCO's Inventory is used in 2 modes:

- **Mode 1**: The inventory is used by external users to locate a specific survey (e.g. a cruise). The search mechanisms allow this process to employ any one of a few key indicators of the survey (e.g. the vessel, the chief scientist, the date, etc). The parameter used depends on what *a priori* information is at the disposal of the searcher.
- **Mode 2:** The inventory is also used to identify data that has not been submitted to SADCO yet. Surveys are often entered on the Inventory before the survey is executed. In addition, some surveys, we know, will not collect, or have not collected, data that will eventually be submitted to SADCO (i.e. data that would fall outside our "core data set", such as fisheries data, biological observations, etc). Where data was collected that could be submitted, SADCO contacts the collector to enquire about the availability of the data set. In this way, the Inventory becomes an aid to scouting for data.

In Mode 2, the Inventory was recently scanned for surveys of which the data has not been submitted to the data centre. Approximately 400 such surveys were located (about 10% of the surveys in the Inventory).

As can be expected, a significant number of the surveys were for biological data, which would not be submitted to SADCO anyway.

Those cruises of which the data should have been loaded on the data centre, were identified, and the responsible organisations were contacted to enquire about the whereabouts of the data.

The surveys that were kindly provided by Nolwenn Carn of the French Data Centre (SISMER) are indicated in Table 1.

Bottle Data			
Cruise name	**Vessel**	**Dates**	**Project**
RECIF CAP 7314 NANSEN	CAPRICORNE	18/10/1973 30/10/1973	
CIVA 1 - MD 74	MARION DUFRESNE	22/01/1993 13/03/1993	TOGA/WOCE SUBSURFACE
CITHER 2 LEG 1	MAURICE EWING	04/01/1994 13/02/1994	WOCE/CITHER
CITHER 2 LEG 2	MAURICE EWING	17/02/1994 21/03/1994	WOCE/CITHER
CITHER 3 LEG 1	ATALANTE	13/01/1995 16/02/1995	WOCE/CITHER
CITHER 3 LEG 2	ATALANTE	21/02/1995 02/04/1995	WOCE/CITHER
CIVA 2 - MD 103	MARION DUFRESNE	01/02/1996 31/03/1996	TOGA/WOCE SUBSURFACE
EQUALANT 99	THALASSA	12/07/1999 22/08/1999	CLIVAR-ECLAT
ANTARES 4	MARION DUFRESNE	04/01/1999 23/02/1999	JGOFS
CTD Data			
Cruise name	**Vessel**	**Dates**	**Project**
RECIF CAP 7314 NANSEN	CAPRICORNE	18/10/1973 30/10/1973	
SUZIL - MD 68	MARION DUFRESNE	12/04/1991 20/05/1991	
CIVA 1 - MD 74	MARION DUFRESNE	22/01/1993 13/03/1993	TOGA/WOCE SUBSURFACE
CITHER 2 LEG 1	MAURICE EWING	04/01/1994 13/02/1994	WOCE/CITHER
CITHER 2 LEG 2	MAURICE EWING	17/02/1994 21/03/1994	WOCE/CITHER
CITHER 3 LEG 1	ATALANTE	13/01/1995 16/02/1995	WOCE/CITHER
CITHER 3 LEG 2	ATALANTE	21/02/1995 02/04/1995	WOCE/CITHER
MICROTHON 07	ANDRE NIZERY	20/01/1995 30/01/1995	PICOLO
MICROTHON 08	ANDRE NIZERY	28/03/1995 08/04/1995	PICOLO
MICROTHON 09	ANDRE NIZERY	30/06/1995 11/07/1995	PICOLO
MICROTHON 10	ANDRE NIZERY	06/09/1995 20/09/1995	PICOLO
CIVA 2 - MD 103	MARION DUFRESNE	01/02/1996 31/03/1996	TOGA/WOCE SUBSURFACE
EQUALANT 99	THALASSA	12/07/1999 22/08/1999	CLIVAR-ECLAT
PIRATA -FR3	ANTEA	23/01/1999 01/02/1999	
PIRATA -FR5	ANTEA	25/10/1999 04/11/1999	

Table 1: Data obtained from the French Data Centre for Oceanography (SISMER)

The data kindly supplied by the Japan Oceanographic Data Centre, is indicated in Table 2 (more data is expected in January):

Table 2: Data supplied by the Japan Oceanographic Data Centre

Cruise name	Vessel	Date		Project
JARE	Fuji	1982/04/20	1982/12/09	TIDAL CURRENT
JARE 4	Soya	1959/11/01	1960/04/30	JARE 4
JARE 32	Shirase	1990/11/01	1991/04/30	JARE
JARE 31	Shirase	1989/11/01	1990/03/31	JARE
JARE 30	Shirase	1988/11/01	1989/03/31	JARE
JARE 29	Shirase	1987/11/01	1988/03/31	JARE
JARE 28	Shirase	1986/11/01	1987/04/30	JARE
JARE 27	Shirase	1985/11/14	1986/04/20	JARE
JARE 26	Shirase	1984/11/14	1985/04/20	JARE
JARE 25	Fuji	1983/11/14	1984/04/19	JARE
JARE 24	Fuji	1982/11/25	1983/04/20	JARE
JARE 23	Fuji	1981/11/25	1982/04/20	JARE
JARE 22	Fuji	1980/11/25	1981/04/20	JARE
JARE 21	Fuji	1979/11/01	1980/04/30	JARE

The Oceanography Department of the University of Cape Town submitted the following data:

Table 3: Data supplied by the University of Cape Town

Cruise name	Vessel	Dates		Project
KRILL 012	SA Agulhas	1980/03/24	1980/04/01	KRILL
Marion 025	SA Agulhas	1982/04/22	1982/04/29	Marion 25
Cruise 84	SA Agulhas	1997/05/03	1997/05/16	Mios2
Cruise 087		1998/04/08	1998/04/19	Mios3
Marion 014	SA Agulhas	1980/05/22	1980/05/24	MIRR
Cruise 90	RS AGULHAS	1999/04/17	1999/04/24	Moes4
Cruise 70	SA Agulhas	1993/01/16	1993/02/21	SAAMES2
SANAE 022	SA Agulhas	1980/12/31	1981/01/15	SANAE22
SANAE 023	SA Agulhas	1981/12/30	1982/01/27	SANAE23
Cruise 077		1994/12/12	1995/01/14	sodfs

Other organisations will also be contacted to try and locate data thatcan be loaded into SADCO.

It is planned to submit a large number of outstanding cruises to the World Data Centre (Oceanography) soon.

Internet access to AWS & CM data

In the previous newsletter it was announced that information on the current meter (cm) deployments and automatic weather stations (AWS) can now be found in the Inventory.

The data from the deployments themselves is now also accessible to on-line users.

The process is quite simple:

- Obtain the Survey ID of the specific deployment from the Inventory (see previous Newsletter).

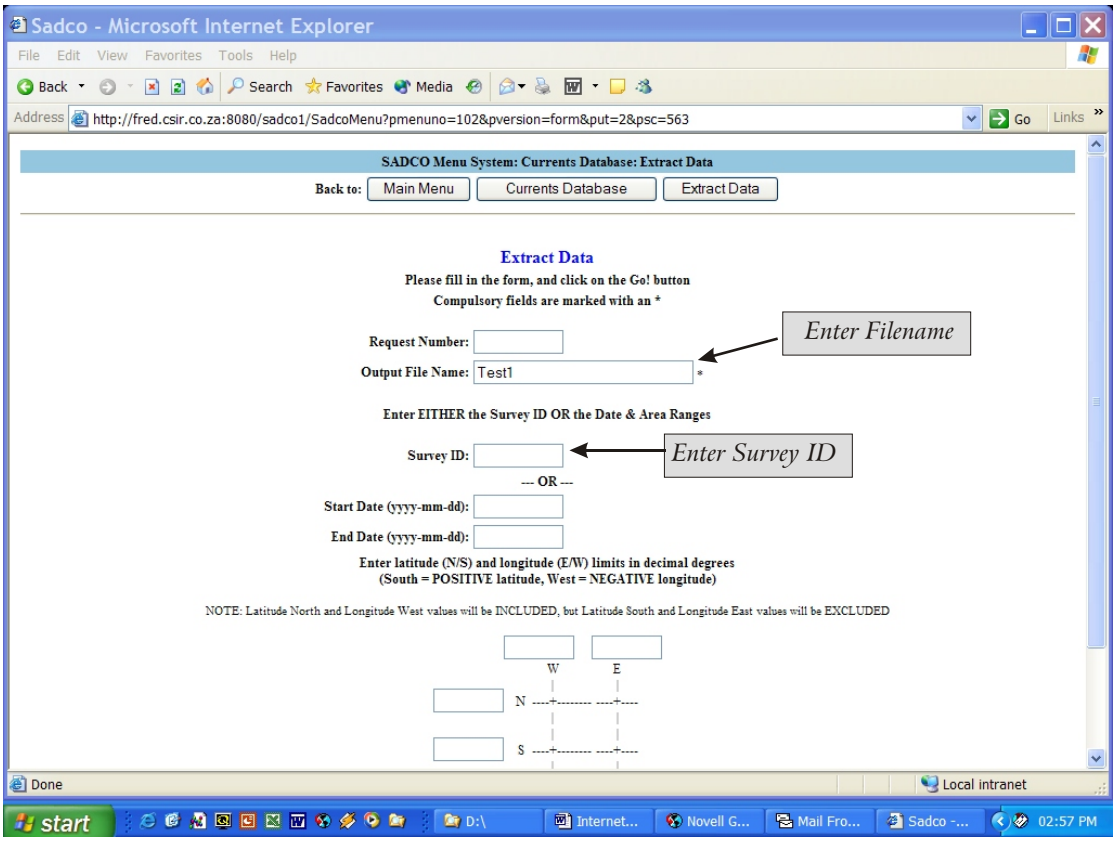


Fig. Extraction screen for current meter data

Go to the Current Meter database
Click on Extractions
The screen shown on the enclosed figure, opens. Only two entries are required:

- Give the file a name in which you want to store the data (this is still in the server)
- Enter the Survey ID

A screen will tell you when the data has been extracted. Extraction time depends on the size of the deployment, and typically takes about 1- 2 minutes. Data is then easily downloaded from the server to your PC (instructions provided on screen).

On-line access

When the Steering Committee approved the web-enablement of the SADCO data bases, the plan was that this would allow a wider on-line use of the data bases by consortium members.

A number of users have already requested and been given on-line access.

We would like to use the opportunity to invite consortium members to make use of the on-line facility.

Who are the "consortium members"?

These are staff members of the funding organisations of SADCO, namely:

Marine and Coastal Management of the Department of Environmental Affairs and Tourism.
The South African Navy
The CSIR
All staff members and students at universities in South Africa
The Namibian Ministry for Fisheries and Marine Resources.

If you are such a possible user, and would like direct access, please drop an e-mail to the SADCO Manager (mgrundli@csir.co.za) to get a UserID and Password.

What can on-line users do?

Extract data personally from all the data bases. This includes

- Hydrographic surveys on a survey-by-survey basis, or hydrographic stations in a given area.
- Current meter data
- Weather station data
- Construct products (e.g. means) from extracted data
- Download products (in HPGL) to their PCs, for incorporation into reports.

Off-line users submit request via e-mail etc, and SADCO staff handle the output.

Inventory access made faster

The SADCO inventory can be accessed indirectly via the SADCO Home page

sadco.csir.co.za

or directly via

sadcoinv.csir.co.za.

Because of the relatively small size of the inventory (about 3000 entries), access is normally quite fast.

The access has now been improved even more, by moving the Inventory to a larger workstation with large amounts of memory (2 Gbyte).