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*SADCO is sponsored by ...*

Department of Environmental Affairs  
& Tourism  
SA Navy  
CSIR Environmentek  
NRF (SA Universities)  
Namibian Ministry for Fisheries & Marine

## SADCO at meetings in May-July 2002

### **CODATA**

Because of the constitution of the data centre, SADCO is focussed on providing an oceanographic service to the southern African oceanographic community.

At the same time, its experience in this domain may be of benefit to other data managers in the region. Similarly, the experience of data managers in other disciplines could provide guidance to SADCO on the management of its own affairs.

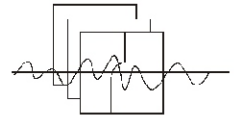
For these reasons, the NRF (National Science Foundation), one of the sponsors of SADCO on behalf of the universities, suggested that SADCO should participate in an upcoming conference of data management, CODATA. This is planned to take place in Pretoria during May.

Feedback will be provided in the next Newsletter.

### **SAMSS**

The South African Marine Science Society (SAMMS) will be having its tri-annual meeting in Swakopmund in July. Because of cost implications the SADCO manager will not be attending in person, but Mr Dawid Mouton, oceanographic data manager in the Namibian Ministry for Fisheries and Marine Resources and member of the SADCO Steering Committee, has been asked to "represent" SADCO at this important oceanographic conference. Other Steering Committee members will also be there.





# Summary from the Annual Report

## - 2001/2002 -

SADCO experienced a very busy year, especially in the data loading domain. The following points are some individual achievements:

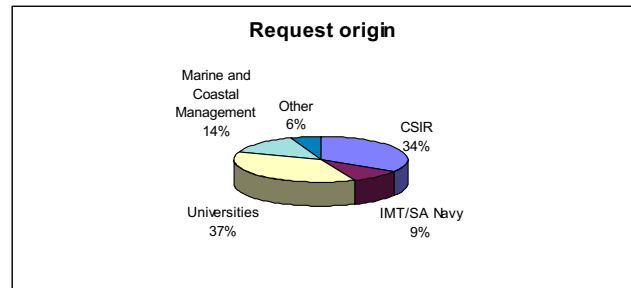
The **webenablement** of the databases has progressed considerably, with the VOS database completed and the marine database virtually complete. This signifies a major achievement in SADCO's history. The Steering Committee will be deciding about access to the databases, but provisionally only the sponsors will be provided with user IDs and passwords. Requests from other users are handled off-line).

The last amount (for the time being) of **continuous CTD** data (1607 stations) was received from Marine and Coastal Management (MCM) this year and loaded. This concludes the backlog in processing and loading of this data that had been built up over many years. SADCO provided financial support to MCM for manpower to assist with the processing of the data.

The process of transferring all (existing) **current meter** data from MCM to SADCO has been successfully concluded, with a total of 166 deployments handled. As reported in previous Newsletters, the data was completely reprocessed, recalibrated, plotted, checked and edited before being loaded.

An even larger number of current meter deployments (181), collected by overseas organisations in the area off the Southern African subcontinent, has been located and loaded onto SADCO's current meter database.

All off-line requests were handled successfully, and the request load comprised 15% of the total budget (16% last year). The largest request users were the CSIR and Universities (see graph).

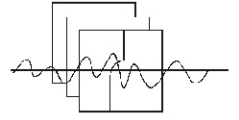


The inventory was kept up to date with surveys and track charts

After some staff losses in the area of data handling and management during 2000/01, the staff complement has now stabilised. It should be emphasised that all staff spend only between 10% and 40% of their time in SADCO.



*From left to right: Ursula von St Ange, Marten Gründlingh, Louise Watt. Front: Steven Pietersen*



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# Web-enablement of databases - some hardware/software issues

*Ursula von St Ange*

The web-enablement of the VOS and Marine databases has now been virtually completed (see previous newsletters). Unfortunately, it has been found that the rate at which the web pages are refreshed is not at the same speed as when the database resided on Informix before being web-enabled. This is obviously not acceptable.

Upon investigation, it was found that the following factors have an impact:

Insufficient CPU speed and amount of memory of the UNIX box on which the Oracle database management system (DBMS) resides.

Both the web-server and the Oracle DBMS reside on the same machine, straining the effective speed of data extraction and report production.

The web pages are generated by java applications, which are served via the java virtual machine (JVM) embedded within the Oracle Application Server (OAS). Java is not the fastest technology, and together with the above two factors, has an added impact on the speed of the web-site.

There are other software packages that can be used to generate web pages. Although java-generated web pages are not the fastest, there are two good reasons why we decided to use java as the language for serving the web pages. They are:

The language is portable. The same compiled code can run on PC's running

Microsoft operating system, as well as on UNIX boxes. Every operating system vendor has to supply a JVM that can run any compiled java code.

The DBMS is transparent to the user, and can be adapted to the java applications with minor changes. This was very important, as, for various reasons, we have had to move the SADCO database four times within a relatively short period. With every move, all the database applications had to be rewritten. A laborious task!

## **Possible solutions**

Aspects that will be looked at to increase the rate at which the web pages are refreshed, are the following:

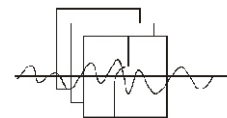
Increase the amount of memory of the UNIX box running the Oracle DBMS and the OAS. Move the OAS to a different UNIX box. This means that more memory will be available to the Oracle DBMS.

Use a different version of the OAS.

Use a different web-server, e.g. Apache, instead of the OAS.

Use java servlets instead of java applications.

The solution will probably be a combination of the above. It is planned that this improvement will be tackled as soon as possible, after some baseline tests so that the improvement can be assessed.



# VOS Data Quality Control



*Mario August, Database intern*

Data quality is of the utmost importance for any database.

SADCO runs screening tests on all incoming data to eliminate possible errors. Where errors are encountered, they are reported to the contributors for rectification but SADCO has no intrinsic control over the reliability of the submitted data.

All the fields in the SADCO VOS database have filters to prevent values exceeding certain limits to be stored in the database. E.g. these filters are employed by the data loading to filter out all **overland** data, by checking the position of the reported measurement against a coastline of the African continent. Data points that are identified as “overland” are normally discarded, because of the complex process of determining the real location.

Data filters must be sufficiently stringent to ensure that bad data is eliminated, but not too stringent to cause the resulting data to be biased. Ultimately, good data standards will ensure good quality data.

In the past, SADCO applied its own, rather lenient data filters. These performed a direct screen on the **maxima** of a particular parameter only, and are indicated in the table below. It is obvious that they would prevent only the VERY obvious errors to enter the database.

These screens were superimposed on quality control procedures applied by the suppliers of the original data, obtained from Europe in the late 1970s.

Since the early 1990s, SADCO has been receiving VOS data directly from the South African Weather Service. In terms of accepted WMO procedures, this data is subject to very little quality control (probably leaving more stringent QC procedures to the user of the data).

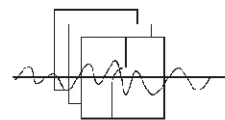
During a recent data request we realised that more stringent, “local” QC procedures (i.e. adapted for Southern African conditions) can and should be developed.

The number of data points that are expected to be identified in this way, is unknown at present. The first step will be to inspect the data, so that appropriate algorithms can be developed, before the data is screened.

Once these algorithms have been tested on existing data, they will be applied to all incoming data.

The following cut off values are used in the loading program:

Parameter	Present maxima
Wind Direction [deg]	360
Wind Speed [m/s]	99
Atmospheric Pressure [hP]	2000
Wave Period [s]	30
Wave Height [m]	99
Swell Direction [deg]	360
Swell Period [s]	30
Swell Height [m]	50
Surface Temperature [deg C]	50
Dry bulb [deg C]	50
Dew point [deg C]	50



# Loading of hydrographic data

As indicated in the summary of items from the Annual Report (in this Newsletter), an amount of “continuous” CTD data (nominally 1-m vertical resolution) has been loaded during 2001/2. This data originated from **Marine and Coastal Management** (DEA&T), and was processed by Raymond Roman, under the guidance of Marcel van den Berg and Chris Duncombe Rae.

This brings to an end the backlog that had been created in this data over the past years at MCM. It should now be possible to handle future collection of CTD data by in-house data processing.

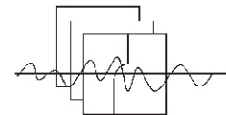
The table indicates the data that has been loaded during the past year.

**Note:**

*There may be “discrete” data (= bottle data) from the same stations that still need to be loaded. This process will be addressed in due course.*

Vessel	Voyage	Dates	Stations
Africana	075	Jul-Aug 89	95
Africana	088	Jan-91	59
Africana	102	Apr-92	95
Algoa	092	Feb-01	10
Algoa	093	Mar-01	81
Algoa	094	Apr-01	13
Nansen	2001401	Feb-01	98
Africana	036	Oct-85	15
Africana	097	Nov-91	48
Africana	121	May-94	23
Africana	122	Jun-94	121
Africana	153	May-99	16
Algoa	014	Jun-94	38
Algoa	020	Mar-95	51
Algoa	095	May-01	42
Algoa	096	Jun-01	13
Algoa	097	Jul-01	12
Algoa	098	Aug-01	14
Africana	047	Aug-86	91
Africana	125	Sep-Oct 94	88
Africana	126	Nov-94	32
Africana	127	Jan-Feb 95	108
Africana	073	Jun-89	14
Africana	078	Nov-89	31
Africana	081	May-90	14
Africana	087	Nov-90	55
Africana	092	May-91	26
Africana	160	Sep-01	61
Africana	067	Sep-88	47
Africana	090	Mar-91	56
Africana	163	Nov-01	70
Algoa	099	Oct-01	46
Algoa	101	Dec-01	24
		TOTAL	1607





## “Foreign” current meter data off southern Africa

Over the past two decades there have been a number of large oceanographic expeditions off the South African coast and further afield, during which current meters were deployed.

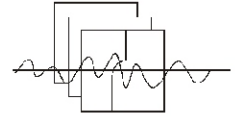
In most cases, the deployments were of such a nature (in terms of cost, water depths, distances from shore, oceanographic conditions, duration) that they would normally not be possible for South African researchers. In some cases (e.g. BEST) South African oceanographers participated in the research programmes that deployed the instruments.

This data has been made available internationally, for use by the oceanographic community (some of the deployments were done almost 2 decades ago).

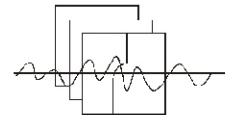
Because of the possible relevance to Southern Africa, SADC0 considered that it may be useful to have the data available closer to home. In addition, SADC0's move to ensure that a copy of all current meter data collected in South Africa is also stored on our data base, contributed to the feeling that the “international” data should also be part of this process.

The list below gives an indication of the extent of the data which has now been added to the “local” current meter data on SADC0's database. As always when one uses data collected by another organisation, good protocol suggests that the relevant organisations be contacted before use is made of the data. The data has most likely been analysed extensively, and proper reference to the published material can also be obtained in that way.

Location	From	To	Instr. Depth	Organisation
West Coast (BEST 2)	19-Jun-92	26-Oct-93	210	OSU/LDEO
West Coast (BEST 2)	19-Jun-92	26-Oct-93	515	OSU/LDEO
West Coast (BEST 2)	19-Jun-92	26-Oct-93	3020	OSU/LDEO
West Coast (BEST)	18-Jun-92	26-Oct-93	215	OSU/LDEO
West Coast (BEST)	18-Jun-92	26-Oct-93	520	OSU/LDEO
West Coast (BEST)	22-Jun-92	28-Oct-93	205	OSU/LDEO
West Coast (BEST)	22-Jun-92	28-Oct-93	505	OSU/LDEO
West Coast (BEST)	22-Jun-92	28-Oct-93	4950	OSU/LDEO
West Coast (BEST)	23-Jun-92	29-Oct-93	210	OSU/LDEO
West Coast (BEST)	23-Jun-92	29-Oct-93	510	OSU/LDEO
West Coast (BEST)	23-Jun-92	29-Oct-93	5130	OSU/LDEO
West Coast (BEST)	23-Jun-92	29-Oct-93	3010	OSU/LDEO
Agulhas Retroflection	23-Feb-85	16-May-86	741	WHOI
Agulhas Retroflection	23-Feb-85	14-Feb-87	3993	WHOI
Agulhas Retroflection	23-Feb-85	14-Feb-87	493	WHOI
Agulhas Retroflection	26-Feb-85	15-Feb-87	4209	WHOI
Agulhas Retroflection	26-Feb-85	15-Feb-87	408	WHOI
Agulhas Retroflection	26-Feb-85	15-Feb-87	1709	WHOI
Agulhas Retroflection	26-Feb-85	15-Feb-87	958	WHOI
Agulhas Retroflection	27-Feb-85	27-Nov-86	145	WHOI
Agulhas Retroflection	27-Feb-85	16-Feb-87	3947	WHOI
Agulhas Retroflection	27-Feb-85	16-Feb-87	1446	WHOI
Agulhas Retroflection	01-Mar-85	12-Feb-87	841	WHOI
Agulhas Retroflection	01-Mar-85	12-Feb-87	1539	WHOI
Agulhas Retroflection	01-Mar-85	12-Feb-87	4092	WHOI
Agulhas Retroflection	10-Mar-85	13-Feb-87	195	WHOI
Agulhas Retroflection	10-Mar-85	13-Feb-87	1497	WHOI
Agulhas Retroflection	10-Mar-85	13-Feb-87	3996	WHOI
Agulhas Retroflection	10-Mar-85	13-Feb-87	745	WHOI



Location	From	To	Instr. Depth	Organisation
Agulhas Retroflection	11-Mar-85	08-Feb-87	1451	WHOI
Agulhas Retroflection	11-Mar-85	03-Sep-85	3951	WHOI
Agulhas Retroflection	11-Mar-85	27-Oct-85	150	WHOI
Agulhas Retroflection	11-Mar-85	08-Feb-87	4055	WHOI
Agulhas Retroflection	12-Mar-85	07-Feb-87	744	WHOI
Agulhas Retroflection	12-Mar-85	07-Feb-87	1496	WHOI
Agulhas Retroflection	12-Mar-85	07-Feb-87	3995	WHOI
Agulhas Retroflection	12-Mar-85	15-Nov-86	194	WHOI
Agulhas Retroflection	15-Mar-85	05-Feb-87	1512	WHOI
Agulhas Retroflection	16-Mar-85	06-Mar-86	203	WHOI
Agulhas Retroflection	16-Mar-85	04-Feb-87	1505	WHOI
Agulhas Retroflection	15-Mar-85	05-Feb-87	4011	WHOI
Agulhas Retroflection	15-Mar-85	05-Feb-87	210	WHOI
Somalia (INDEX)	01-Apr-79	17-May-80	751	WHOI
Somalia (INDEX)	31-Mar-79	21-Mar-80	501	WHOI
Somalia (INDEX)	01-Apr-79	08-May-80	201	WHOI
Somalia (INDEX)	02-Apr-79	15-May-80	195	WHOI
Somalia (INDEX)	02-Apr-79	23-Nov-79	745	WHOI
Somalia (INDEX)	03-Apr-79	14-May-80	755	WHOI
Somalia (INDEX)	02-Apr-79	25-Mar-80	505	WHOI
Somalia (INDEX)	02-Apr-79	23-Aug-79	205	WHOI
Somalia (INDEX)	07-Apr-79	15-May-80	756	WHOI
Somalia (INDEX)	06-Apr-79	16-May-80	506	WHOI
Somalia (INDEX)	08-Apr-79	14-May-80	745	WHOI
Somalia (INDEX)	07-Apr-79	06-Jun-79	495	WHOI
Somalia (INDEX)	07-Apr-79	30-Dec-79	195	WHOI
Somalia (INDEX)	14-Apr-79	11-Mar-80	198	WHOI
Somalia (INDEX)	15-Apr-79	09-May-80	748	WHOI
Somalia (INDEX)	16-Apr-79	21-Feb-80	277	WHOI
Somalia (INDEX)	17-Apr-79	10-May-80	827	WHOI
Somalia (INDEX)	16-Apr-79	11-May-80	577	WHOI
Somalia (INDEX)	17-Apr-79	10-May-80	199	WHOI
Somalia (INDEX)	18-Apr-79	10-May-80	749	WHOI
Somalia (INDEX)	17-Apr-79	11-May-80	499	WHOI
Somalia (INDEX)	20-Apr-79	12-May-80	189	WHOI
Somalia (INDEX)	19-Apr-79	12-May-80	739	WHOI
Somalia (INDEX)	20-Apr-79	19-Jun-79	188	WHOI
Somalia (INDEX)	20-Apr-79	25-May-79	738	WHOI
Somalia (INDEX)	15-May-76	01-Dec-76	203	WHOI
Somalia (INDEX)	14-May-76	01-Jan-77	1500	WHOI
Somalia (INDEX)	21-May-76	29-Dec-76	551	WHOI
Somalia (INDEX)	20-May-76	30-Dec-76	3595	WHOI
Somalia (INDEX)	14-Jun-76	30-Dec-76	201	WHOI
Somalia (INDEX)	18-May-76	03-Jan-77	1500	WHOI
Somalia (INDEX)	18-May-76	03-Jan-77	3542	WHOI
Madagascar/Mauritius ICM3	01-Jun-95	16-Jan-97	2876	TAMU/ OSU/ WHOI
Madagascar/Mauritius ICM3	01-Jun-95	16-Jan-97	3193	TAMU/ OSU/ WHOI
Madagascar/Mauritius ICM3	01-Jun-95	16-May-96	2383	TAMU/ OSU/ WHOI
Madagascar/Mauritius ICM3	01-Jun-95	17-Jan-97	3527	TAMU/ OSU/ WHOI
Madagascar/Mauritius ICM3	01-Jun-95	17-Jan-97	3871	TAMU/ OSU/ WHOI
Madagascar/Mauritius ICM3	01-Jun-95	17-Jan-97	2505	TAMU/ OSU/ WHOI
Madagascar/Mauritius ICM3	31-May-95	17-Jan-97	3485	TAMU/ OSU/ WHOI
Madagascar/Mauritius ICM3	31-May-95	17-Jan-97	3988	TAMU/ OSU/ WHOI
Madagascar/Mauritius ICM3	31-May-95	17-Jan-97	4515	TAMU/ OSU/ WHOI
Madagascar/Mauritius ICM3	31-May-95	18-Jan-97	2491	TAMU/ OSU/ WHOI
Madagascar/Mauritius ICM3	31-May-95	18-Jan-97	3497	TAMU/ OSU/ WHOI
Madagascar/Mauritius ICM3	31-May-95	18-Jan-97	3999	TAMU/ OSU/ WHOI
Madagascar/Mauritius ICM3	31-May-95	18-Jan-97	4709	TAMU/ OSU/ WHOI
Madagascar/Mauritius ICM3	31-May-95	18-Jan-97	2480	TAMU/ OSU/ WHOI
Madagascar/Mauritius ICM3	31-May-95	18-Jan-97	3988	TAMU/ OSU/ WHOI
Madagascar/Mauritius ICM3	31-May-95	18-Jan-97	4828	TAMU/ OSU/ WHOI
Madagascar/Mauritius ICM3	31-May-95	18-Jan-97	3458	TAMU/ OSU/ WHOI
Madagascar/Mauritius ICM3	30-May-95	19-Jan-97	2473	TAMU/ OSU/ WHOI
Madagascar/Mauritius ICM3	30-May-95	19-Jan-97	3493	TAMU/ OSU/ WHOI
Madagascar/Mauritius ICM3	30-May-95	19-Jan-97	3996	TAMU/ OSU/ WHOI
Madagascar/Mauritius ICM3	30-May-95	19-Jan-97	4836	TAMU/ OSU/ WHOI
Madagascar/Mauritius ICM3	15-May-95	24-Jan-97	2004	TAMU/ OSU/ WHOI
Madagascar/Mauritius ICM3	15-May-95	24-Jan-97	3088	TAMU/ OSU/ WHOI
Madagascar/Mauritius ICM3	15-May-95	24-Jan-97	2521	TAMU/ OSU/ WHOI
Madagascar/Mauritius ICM3	15-May-95	24-Jan-97	3503	TAMU/ OSU/ WHOI
Madagascar/Mauritius ICM3	15-May-95	25-Jan-97	2513	TAMU/ OSU/ WHOI
Madagascar/Mauritius ICM3	15-May-95	25-Jan-97	3444	TAMU/ OSU/ WHOI



Location	From	To	Instr. Depth	Organisation
Durban ICM 1 (ACE)	03-Mar-95	21-Mar-96	216	Southampton Oc C ntr
Durban ICM 1 (ACE)	03-Mar-95	21-Mar-96	168	Southampton Oc C ntr
Durban ICM 1 (ACE)	03-Mar-95	21-Mar-96	264	Southampton Oc C ntr
Durban ICM 1 (ACE)	03-Mar-95	21-Mar-96	312	Southampton Oc C ntr
Durban ICM 1 (ACE)	03-Mar-95	21-Mar-96	360	Southampton Oc C ntr
Durban ICM 1 (ACE)	03-Mar-95	21-Mar-96	408	Southampton Oc C ntr
Durban ICM 1 (ACE)	03-Mar-95	21-Mar-96	424	Southampton Oc C ntr
Durban ICM 1 (ACE)	04-Mar-95	18-Apr-95	430	Southampton Oc C ntr
Durban ICM 1 (ACE)	04-Mar-95	15-Apr-95	56	Southampton Oc C ntr
Durban ICM 1 (ACE)	03-Mar-95	18-Apr-95	104	Southampton Oc C ntr
Durban ICM 1 (ACE)	03-Mar-95	19-Apr-95	152	Southampton Oc C ntr
Durban ICM 1 (ACE)	03-Mar-95	19-Apr-95	200	Southampton Oc C ntr
Durban ICM 1 (ACE)	03-Mar-95	19-Apr-95	248	Southampton Oc C ntr
Durban ICM 1 (ACE)	03-Mar-95	19-Apr-95	296	Southampton Oc C ntr
Durban ICM 1 (ACE)	03-Mar-95	19-Apr-95	344	Southampton Oc C ntr
Durban ICM 1 (ACE)	03-Mar-95	28-Nov-95	358	Southampton Oc C ntr
Durban ICM 1 (ACE)	03-Mar-95	07-Jun-95	789	Southampton Oc C ntr
Durban ICM 1 (ACE)	03-Mar-95	20-Apr-96	1156	Southampton Oc C ntr
Durban ICM 1 (ACE)	03-Mar-95	20-Apr-96	1967	Southampton Oc C ntr
Durban ICM 1 (ACE)	02-Mar-95	17-Apr-96	375	Southampton Oc C ntr
Durban ICM 1 (ACE)	02-Mar-95	17-Apr-96	855	Southampton Oc C ntr
Durban ICM 1 (ACE)	02-Mar-95	17-Apr-96	1955	Southampton Oc C ntr
Durban ICM 1 (ACE)	02-Mar-95	17-Apr-96	1191	Southampton Oc C ntr
Durban ICM 1 (ACE)	01-Mar-95	18-Apr-96	401	Southampton Oc C ntr
Durban ICM 1 (ACE)	01-Mar-95	18-Apr-96	804	Southampton Oc C ntr
Durban ICM 1 (ACE)	01-Mar-95	18-Apr-96	1201	Southampton Oc C ntr
Durban ICM 1 (ACE)	01-Mar-95	17-Dec-95	2028	Southampton Oc C ntr
Durban ICM 1 (ACE)	28-Feb-95	18-Apr-96	755	Southampton Oc C ntr
Durban ICM 1 (ACE)	28-Feb-95	18-Apr-96	1172	Southampton Oc C ntr
Durban ICM 1 (ACE)	28-Feb-95	21-Dec-95	1982	Southampton Oc C ntr
Durban ICM 1 (ACE)	28-Feb-95	16-May-95	365	Southampton Oc C ntr
Crozet Is SCM6 (ADOX)	04-Mar-93	08-Mar-94	1890	CEFAS
Crozet Is SCM6 (ADOX)	04-Mar-93	08-Mar-94	3519	CEFAS
Crozet Is SCM6 (ADOX)	05-Mar-93	07-Mar-94	1628	CEFAS
Crozet Is SCM6 (ADOX)	05-Mar-93	21-Aug-93	2796	CEFAS
Crozet Is SCM6 (ADOX)	05-Mar-93	07-Mar-94	4320	CEFAS
Crozet Is SCM6 (ADOX)	06-Mar-93	30-Aug-93	2047	CEFAS
Crozet Is SCM6 (ADOX)	06-Mar-93	07-Mar-94	3887	CEFAS
Crozet Is SCM6 (ADOX)	06-Mar-93	07-Mar-94	4414	CEFAS
Crozet Is SCM6 (ADOX)	06-Mar-93	21-Mar-94	315	CEFAS
Crozet Is SCM6 (ADOX)	06-Mar-93	21-Mar-94	2063	CEFAS
Crozet Is SCM6 (ADOX)	06-Mar-93	21-Mar-94	2166	CEFAS
Crozet Is SCM6 (ADOX)	06-Mar-93	21-Mar-94	2852	CEFAS
Crozet Is SCM6 (ADOX)	06-Mar-93	02-Dec-93	3668	CEFAS
Crozet Is SCM6 (ADOX)	06-Mar-93	21-Mar-94	616	CEFAS
Crozet Is SCM6 (ADOX)	06-Mar-93	21-Mar-94	1335	CEFAS
Crozet Is SCM6 (ADOX)	07-Mar-93	05-Mar-94	1673	CEFAS
Crozet Is SCM6 (ADOX)	07-Mar-93	16-Jan-94	2726	CEFAS
Crozet Is SCM6 (ADOX)	07-Mar-93	07-May-93	2779	CEFAS
Crozet Is SCM6 (ADOX)	07-Mar-93	05-Mar-94	4307	CEFAS
Crozet Is SCM6 (ADOX)	08-Mar-93	04-Mar-94	2263	CEFAS
Crozet Is SCM6 (ADOX)	08-Mar-93	04-Mar-94	3536	CEFAS
Crozet Is SCM6 (ADOX)	08-Mar-93	04-Mar-94	4064	CEFAS
Crozet Is SCM6 (ADOX)	09-Mar-93	03-Mar-94	2144	CEFAS
Crozet Is SCM6 (ADOX)	09-Mar-93	03-Mar-94	2672	CEFAS
Crozet Is SCM6 (ADOX)	09-Mar-93	03-Mar-94	3728	CEFAS
Crozet Is SCM6 (ADOX)	09-Mar-93	03-Mar-94	3200	CEFAS
Crozet Is SCM6 (ADOX)	10-Mar-93	04-Mar-94	1664	CEFAS
Crozet Is SCM6 (ADOX)	10-Mar-93	04-Mar-94	3299	CEFAS
Crozet Is SCM6 (ADOX)	11-Mar-93	27-Feb-94	2990	CEFAS
Prince Ed SCM9 (SWINDEX)	12-Apr-93	07-Jan-94	533	Southampton Oc C ntr
Prince Ed SCM9 (SWINDEX)	12-Apr-93	27-Jan-95	1360	Southampton Oc C ntr
Prince Ed SCM9 (SWINDEX)	12-Apr-93	27-Jan-95	2223	Southampton Oc C ntr
Prince Ed SCM9 (SWINDEX)	12-Apr-93	27-Jan-95	2818	Southampton Oc C ntr
Prince Ed SCM9 (SWINDEX)	12-Apr-93	20-Jun-94	330	Southampton Oc C ntr
Prince Ed SCM9 (SWINDEX)	12-Apr-93	27-Jan-95	634	Southampton Oc C ntr
Prince Ed SCM9 (SWINDEX)	09-Apr-93	30-Oct-94	311	Southampton Oc C ntr
Prince Ed SCM9 (SWINDEX)	09-Apr-93	26-Jan-95	612	Southampton Oc C ntr
Prince Ed SCM9 (SWINDEX)	09-Apr-93	26-Jul-93	1529	Southampton Oc C ntr
Prince Ed SCM9 (SWINDEX)	06-Apr-93	23-Jan-95	335	Southampton Oc C ntr
Prince Ed SCM9 (SWINDEX)	06-Apr-93	23-Jan-95	638	Southampton Oc C ntr
Prince Ed SCM9 (SWINDEX)	06-Apr-93	24-Jan-95	1364	Southampton Oc C ntr
Prince Ed SCM9 (SWINDEX)	03-Apr-93	20-Jan-95	683	Southampton Oc C ntr
Prince Ed SCM9 (SWINDEX)	03-Apr-93	20-Jan-95	1391	Southampton Oc C ntr
Prince Ed SCM9 (SWINDEX)	03-Apr-93	20-Jan-95	2661	Southampton Oc C ntr
Prince Ed SCM9 (SWINDEX)	03-Apr-93	20-Jan-95	4174	Southampton Oc C ntr
Prince Ed SCM9 (SWINDEX)	01-Apr-93	18-Jan-95	2681	Southampton Oc C ntr
Prince Ed SCM9 (SWINDEX)	01-Apr-93	18-Jan-95	5812	Southampton Oc C ntr
Prince Ed SCM9 (SWINDEX)	01-Apr-93	02-May-93	1411	Southampton Oc C ntr