

## JCADM Review 2008

### Highlights:

The external review of JCADM (attached) is very positive. Significant progress has been made in the past 2 years. JCADM's membership has increased to 31 SCAR Member nations. There has been a 20% increase in metadata datasets submitted to the Antarctic Master Directory (AMD), and downloads from the AMD have increased to from 500 per month to 3000 per month. In addition JCADM is far more engaged than it was with the scientific community, and has developed a strategic plan to paint a picture of what is possible in Antarctic data management. These are all highly commendable developments. JCADM is carrying out an essential task.

### Shortcomings:

The external review points to some key shortcomings.

- (i) SCAR needs to work more closely with operators and National Antarctic Data Centres (NADCs) to pursue adequate funding for Antarctic data management by all Members, so that all Members become effective stewards of Antarctic data - for the benefit of the entire scientific community. The Executive Director wrote to National Committees and Delegates about this by e-mail on 25/10/2006, but with little evident result.
- (ii) There is a need for JCADM to work with the AMD and operators of NADCs to improve the AMD system so that access to metadata on the AMD leads in all cases to national data sets (recognising that the disconnect is a problem not with JCADM but at the national level).
- (iii) The removal of COMNAP funds is a serious blow, and it is hoped that SCAR can make up the difference (\$3300/year).
- (iv) Implementing the data and information management strategy will require resources from SCAR or elsewhere. It is suggested that SCAR Members work amongst themselves to find a person to post to the SCAR Office to work on implementing the data and information strategy.

**JCADM REVIEW 2008**

**SCAR/COMNAP Standing Committee on Antarctic Data Management (STADM)**

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## 1. Summary

In June 2008, the SCAR/COMNAP Standing Committee on Antarctic Data Management (STADM) conducted a review of the SCAR/COMNAP Joint Committee on Antarctic Data Management (JCADM) on behalf of SCAR and COMNAP. STADM comprises two independent members, three representatives from SCAR Scientific Steering Groups (SSGs) and two members from COMNAP. This review was carried out by e-mail rather than by a face-to-face meeting. Unfortunately, several members of STADM were unable to provide input on the short time scale available. Taco de Bruin (NIOZ), Chief Officer JCADM, and NADC manager for Netherlands was consulted for input on the current status of JCADM. The task of this review has been to look at the latest JCADM report and supporting documentation, compare it with the recommendations from the JCADM Review Report from 2005 and the interim Review Report from 2006, and report on this to SCAR and COMNAP at the July 2008 meetings of the SCAR and COMNAP Executives.

This report documents the review and presents the findings and recommendations of STADM. The STADM Terms of Reference are given below. Following the Hobart meetings in July 2006, SCAR and COMNAP agreed on a revised set of Terms of Reference for JCADM. These are given in Annex 1.

It should be noted that at the meeting in Hobart, July 2006, COMNAP decided to stop providing funding JCADM in 2009. In one respect this is positive as the reason given was that “The group now showed maturity and seemed to have reached the point where it could sustain itself”. In other respects it is disappointing as the whole Antarctic data management activity is grossly under-funded. Thus from 2009 onwards, JCADM will become a SCAR (-only) Standing Committee on Antarctic Data Management, funded by SCAR. When this takes place, SCAR may need to reconsider the arrangements for reviewing JCADM.

STADM concluded the review with a generally very positive evaluation of JCADM. STADM feels that JCADM performs a necessary function and should be continued. STADM judged that JCADM is meeting its new Terms of Reference. The achievements of JCADM since the 2005 Review and 2006 Interim Review are noted in Section 3. STADM has assessed progress on the recommendations from the 2005 and 2006 reviews (Section 4). Finally, further recommendations are given that should help to improve the performance of JCADM and its value to the scientific community (Section 5).

It should be noted that there are major challenges for JCADM as a (voluntary) organisational body, in the long term stewardship and management of Antarctic data. These include resourcing of JCADM member NADCs at the national level and building an efficient internal organisation, resulting in an active involvement of all JCADM members

One major new task to have been completed has been the development of a draft SCAR Data and Information Management Strategy. Although the purpose of this document is to review JCADM, a short comment on the draft strategy is provided.

## 2. STADM Terms of Reference

The current Terms of Reference for STADM are as follows:

- Oversee the work of the Joint SCAR/COMNAP Committee on Antarctic Data Management (JCADM) to ensure that the Antarctic Master Directory (AMD) will meet the needs of the scientific community and is progressively achieving increased utilization.
- Evaluate and provide the SCAR and COMNAP Secretariats prior to the SCAR and COMNAP Meetings in St Petersburg in June/July 2008 with feedback on the JCADM reports, including recommendations on the future direction and funding of the project.
- Advise the SCAR/COMNAP executive committees (meeting in St Petersburg in June/July 2008), through the SCAR and COMNAP Secretariats, on whether to continue to make provision for payments to the GCMD according to their delivery against JCADM requirements.

The ultimate objective is to facilitate the achievement of Antarctic Treaty article IIIc (Contracting Parties agree that, to the greatest extent feasible and practicable: c. scientific observations and results from Antarctica shall be exchanged and made freely available.)

## 3. Update on JCADM Achievements

JCADM achievements since the last review are given below. A more detailed review and comparison with the status at the two previous reviews are provided in Annex 2.

### *Recruitment of new NADCs*

- JCADM has welcomed the representative from Pakistan.
- JCADM has now membership from the following 31 nations: Argentina, Australia, Belgium, Bulgaria, Canada, Chile, China, Estonia, Finland, France, Germany, India, Italy, Japan, Korea, Malaysia, Netherlands, New Zealand, Norway, Pakistan, Peru, Poland, Russia, Spain, South Africa, Sweden, Switzerland, Ukraine, United Kingdom, United States, and Uruguay.

### *Capacity building workshops*

- JCADM organised international capacity building workshops, during the JCADM-10 meeting in Hobart, Australia, July 2006 and the JCADM-11 meeting, Rome, Italy, September 2007.
- The capacity building workshop in Rome was a two day workshop, prior to the JCADM-11 meeting. This workshop (and the JCADM-11 meeting) was attended by a record number of representatives from 20 countries. Financial support by the Italian government and the Partnership for Observation of the Global Ocean (POGO) is kindly acknowledged.
- The reports of these meetings, including lists of action items, were provided to STADM.

***Provision of advice on standards and policies***

- This continues to be good; information on web site showing how to set up and run and NADC, add metadata to AMD/GCMD, etc.

***Communication between NADCs***

- This continues to be good through an annual meeting of JCADM, a work plan and action list from the meeting with tasks distributed amongst members, and an active Chief Officer.
- New rules of procedure have been developed to ensure smooth running of JCADM

***Antarctic Master Directory (AMD) and the Global Change Master Delivery (GCMD)***

- The Antarctic Master Directory (AMD) is the world's largest on-line directory of Antarctic data set descriptions (DIFs = Data Interchange Format directory records).
- The number of data set descriptions has grown from 3907 in July 2006 to 4673 in May 2008. See Figures 1 and 2.
- The number of nations contributing their data set descriptions has grown from 23 nations in July 2006 to 25 nations in May 2008. Also, the SCAR-MarBIN project and large (Remote-Sensing) organisations also contribute.
- The statistics show a tremendous increase in usage of the AMD since the start of the International Polar Year (IPY) in March 2007. The number of downloads (of data set descriptions -DIFs) has grown from a steady 500 per month since January 2004 to about 3000 per month since March 2007 – see Figures 3 and 4.
- Nineteen countries have set up national portals; these are accessed from the AMD web-site.
- Using a specialised GCMD portal (Antarctic Master Directory) continues to be a cost effective solution
- The relationship with GCMD continues to be good, and GCMD staff are helpful; they attend JCADM meetings and participate in capacity building

***JCADM made a major contribution to IPY Data and Information Strategy published in the IPY framework document***

- JCADM as a data infrastructure is part of the IPY Data and Information Service (IPYDIS)
- The JCADM Chief Officer is one of the two co-chairs of the IPY Subcommittee on Data Policy and Management.
- Individual JCADM members are active in a whole suite of IPY projects.

***Draft SCAR Data and Information Strategy***

- JCADM and SC-AGI (Standing Committee on Antarctic Geographic Information) have prepared a comprehensive draft SCAR Data and Information Strategy
- The first version was provided to the SCAR Executive Director for comments
- Subsequently an updated version has been made available to the SCAR Executive and the SCAR Delegates, for discussion and adoption at the St. Petersburg and Moscow meetings in July 2008.
- A poster has also been designed to provide an overview of the strategy.

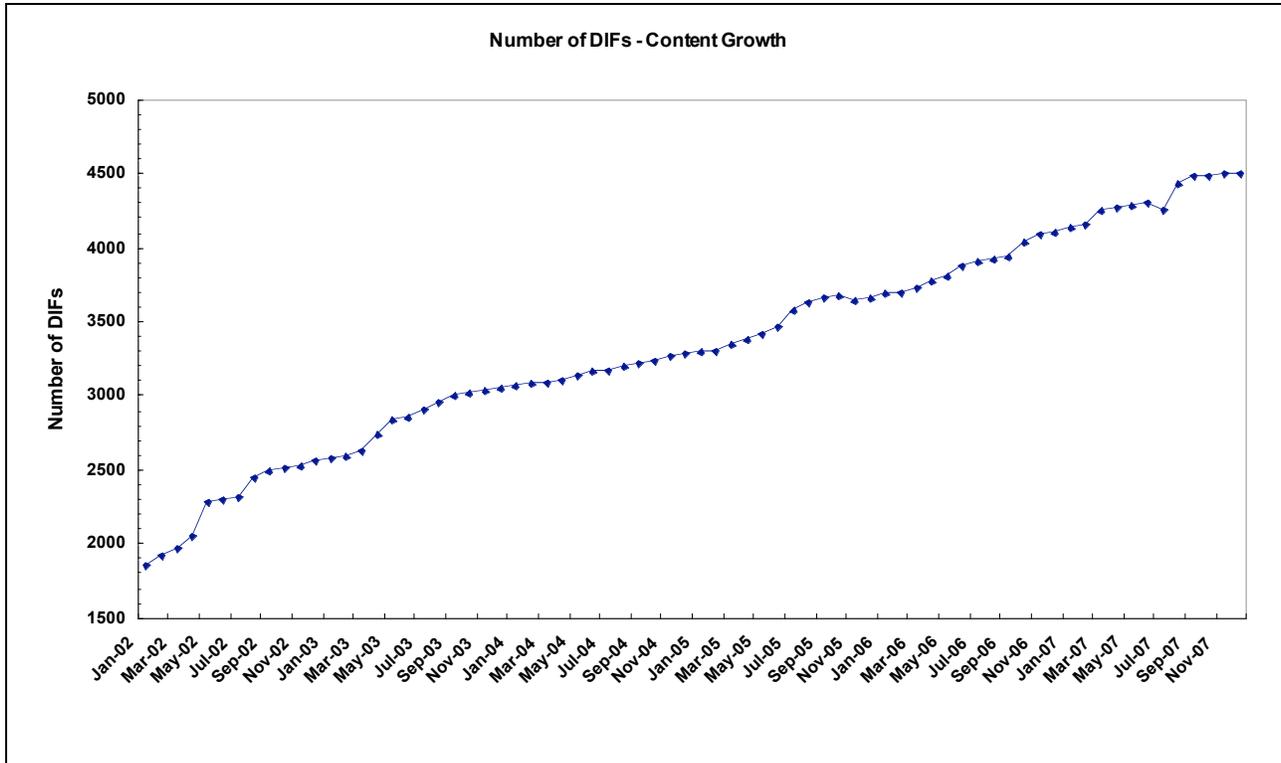


Figure 1: Growth in Number of DIFs (data set descriptions) in AMD between January 2002 and December 2007

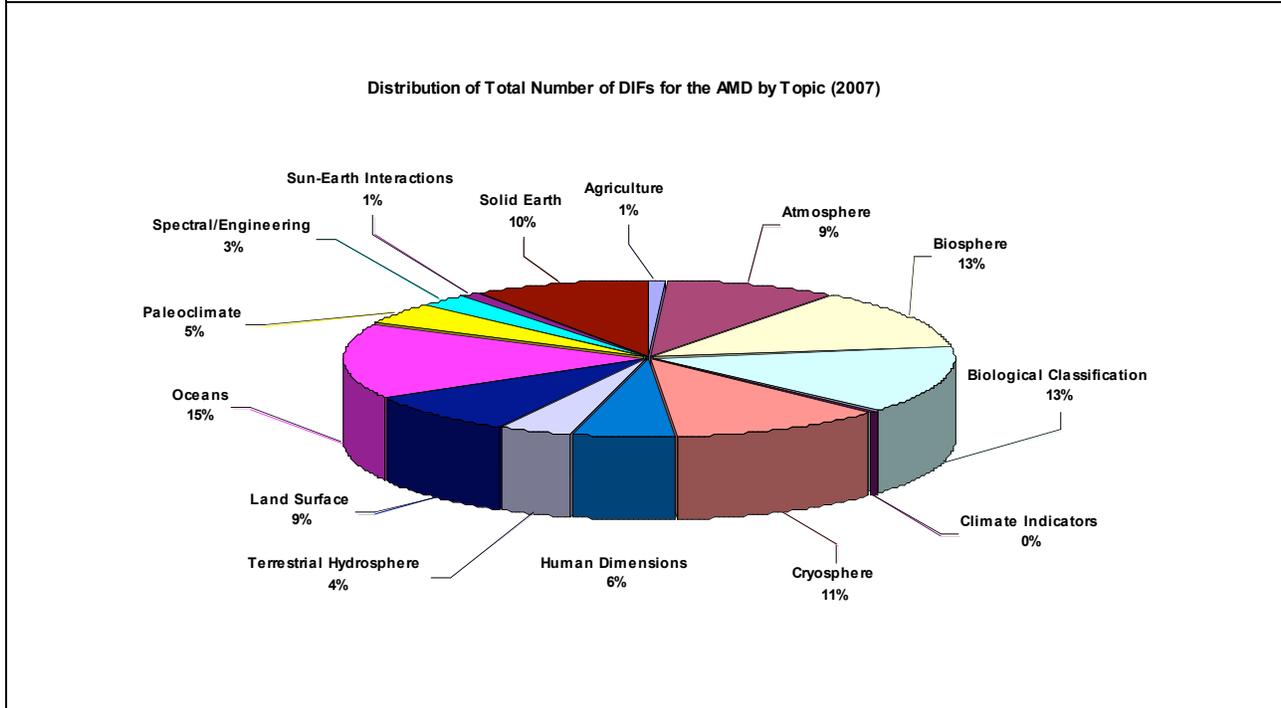


Figure 2: Distribution of total number of DIFs (data set descriptions) included in the AMD by Topic

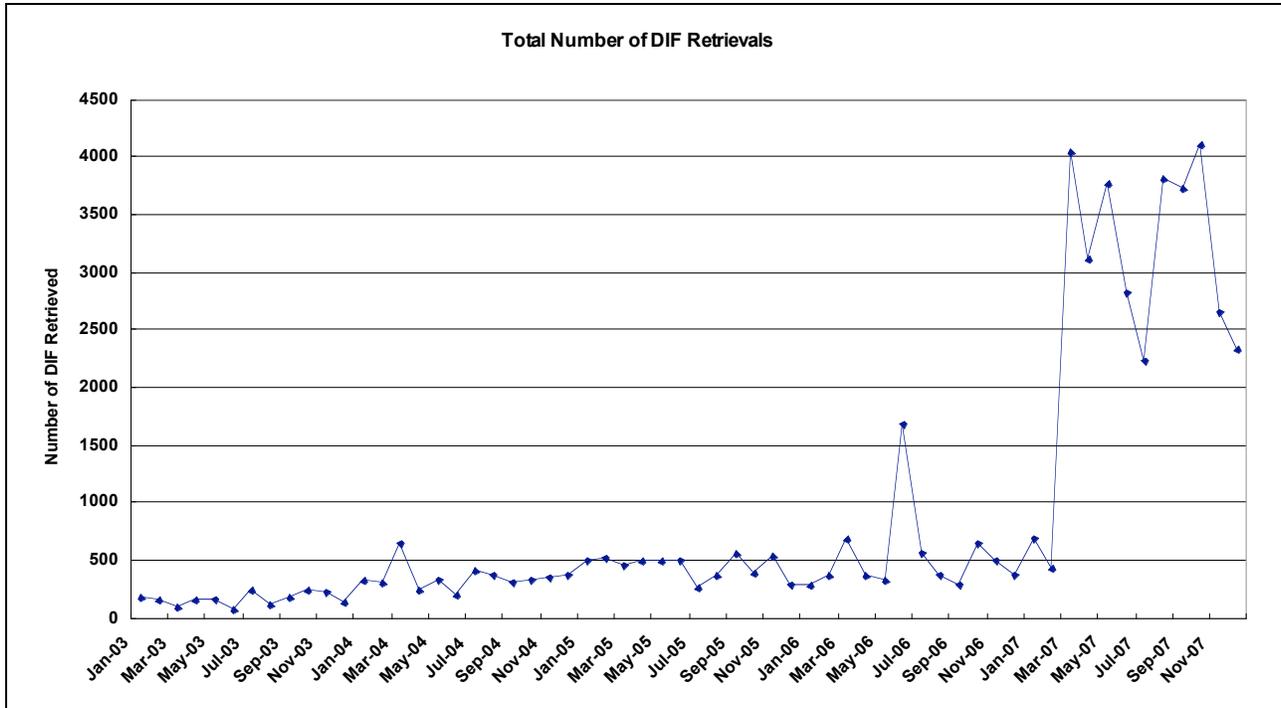


Figure 3: Number of DIFs (data set descriptions) retrieved per month between January 2003 and December 2007

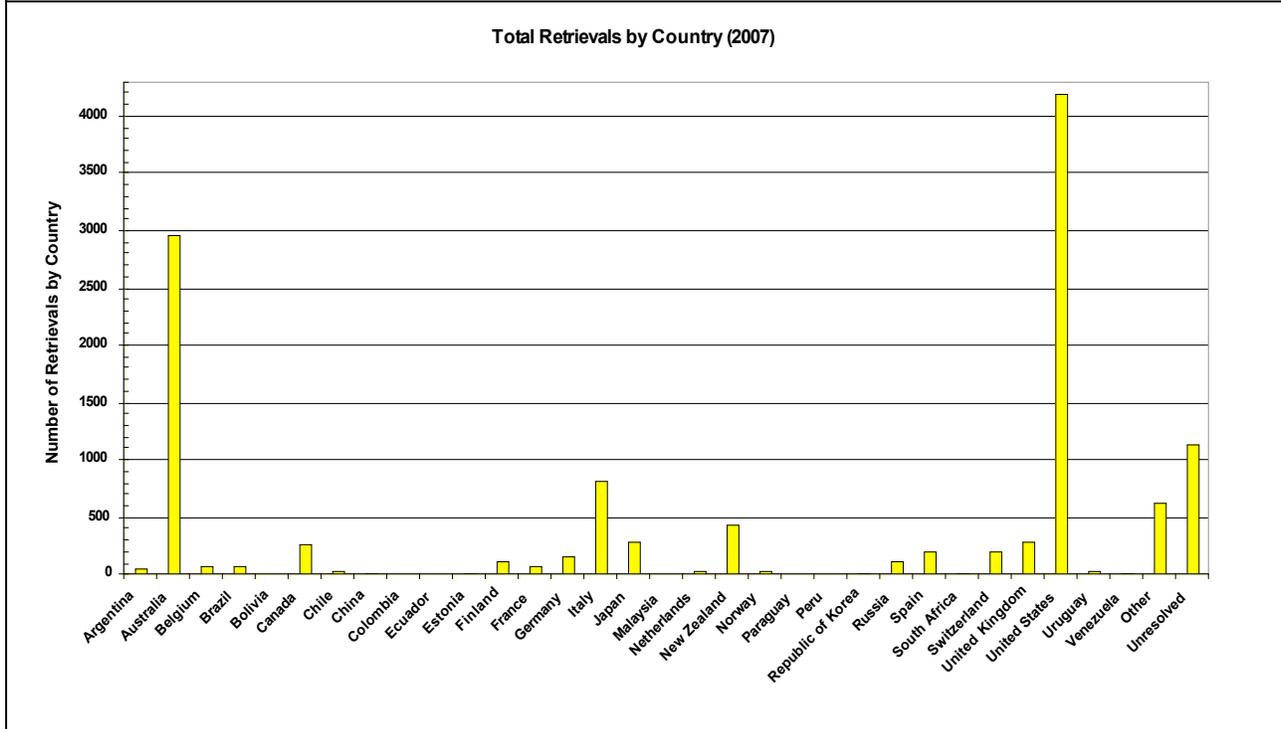


Figure 4: Number of DIFs (data set descriptions) retrieved by country during 2007

## **4. Update on 2005 and 2006 recommendations**

STADM has worked through the 28 recommendations from the 2005 JCADM Review, where still appropriate, and assessed the progress of each one. This is given in detail in Annex 3. Below some brief comments are provided on progress divided into the same sections as in the original (2005) report. Comments on the four new recommendations from the 2006 Review are also provided.

### **4.1 To JCADM**

#### **Antarctic Master Directory (AMD)**

Thirteen of the 2005 recommendations related to the AMD. A number of these (1-4, 7, 12, 13) relate to ongoing activities and as the figures above show, there is a healthy increase in submission to and retrieval from the AMD. The activities of JCADM have resulted in an increase of data descriptions of about 20% since 2006. This provides a clear sign that Antarctic scientists are increasingly aware of the importance of the AMD and the necessity to enter metadata. The AMD is actively used, increasingly so since the start of IPY. More metadata descriptions (45%) are now linked to data sets available online.

Other recommendations relating to including links with other metadata catalogues and data set described elsewhere in GCMD (4, 8-11) have made some progress, as has investigation of adding further keywords (5-6), but there is further work to do here.

#### **Communication**

Good progress has continued with recommendations 14-16 relating to communication. JCADM is now much more engaged with the scientific community, through participation in the meetings of the Chief Officers of the SSGs and of the SCAR Executive Committee. Opportunities are taken where ever possible to promote JCADM by presentations, posters, etc.

A new web site has been developed, which is attractive, clear and easy to navigate. However, the News items are old – the most recent one is from a year ago. STADM suggests that the News section be removed if it is not regularly updated.

#### **Organisational**

The three recommendations (17-19) relating to JCADM reporting are ongoing activities – however these recommendations have been acted upon and the reporting is operating smoothly. A work plan is available for 2007-08, with action items linked to the JCADM terms of reference. Each action item has one or more people allocated responsibility for that item. It remains to be seen how realistic the work plan has been (i.e. what percentage of the items have been addressed) within the limited resources available.

Links continue to be developed with other organisations. Capacity building in terms of training and setting up new NADCs is good; however capacity in terms of extra resources being available at the national level to carry out data stewardship remains in need of improvement.

## 4.2 To SCAR and COMNAP

Seven recommendations (22-28) were made to SCAR and COMNAP in the 2005 review. Some progress has continued to be made on all of these. One outcome was the creation of an advisory structure comprising the Chief Officers of the SCAR SSGs, experts in data management and COMNAP representatives, to provide guidance to JCADM and to evaluate its reports (i.e. STADM). This has worked fairly well, but SCAR may wish to revisit this arrangement following the withdraw of COMNAP support for JCADM and, for example, nominate others to STADM. If STADM remains in some form and there is to a further review in two years, it would be beneficial if this was a face to face meeting to ensure that all members of STADM have proper opportunity to give their views and recommendations.

Apart from the SSG link through STADM, further relationships are being forged with the SSGs. JCADM is now much more engaged with the scientific community, through attending meetings of the Chief Officers of the SSGs, by adding a JCADM representative to the Steering Committee of each Scientific Research Project (SRP), and by making presentations to and listening to the requirements of the SSGs and SRPs during their meetings in Hobart (July 2006) and Rome (September 2007). This needs to continue in the future - with presentations being made to the SSGs where possible.

JCADM members have continued to work with the IPY Data and Information Service (IPYDIS) as is evident from the work plan and reports. JCADM as a data infrastructure is part of the IPYDIS. The JCADM Chief Officer is one of the two co-chairs of the IPY Subcommittee on Data Policy and Management. Individual JCADM members are active in a whole suite of IPY projects. However this link is not visible on either the JCADM or IPYDIS web site and this should be addressed.

A high level data link has been added to the SCAR web pages which both raises the visibility and makes for easier access to the JCADM web-site. There is no obvious link to JCADM or the AMD from the COMNAP web-site; but perhaps this is no longer so relevant.

The removal of COMNAP funding is a serious blow. The AMD has proved a very useful mechanism for describing the wealth and variety of Antarctic data. STADM hope that SCAR will be able to find funds to cover the cost of the AMD.

There is little or no evidence that SCAR and COMNAP have encouraged managers of National Antarctic programmes to consider developing and applying methods to ensure submissions to AMD at the national level within a specified time frame (possibly following the Australian and USA examples). STADM would like to be updated as to whether there is a panorama of actions being undertaken in the various countries to ensure that metadata (and data) is submitted.

JCADM, together with Standing Committee on Antarctic Geographic Information (SC-AGI), has taken forward the recommendation to SCAR and COMNAP to develop a Data and Information Strategy. Further comments on this can be found below.

### 4.3 Additional recommendations from 2006 review report

#### To JCADM:

- Provide a series of metrics annually to measure progress with AMD.

STADM notes that information from the AMD has been extracted relating to new input and downloads. Some of this is included in Figures 1 to 4. This is useful and should be continued. Some of the figures could be included on the JCADM web site. It would be helpful if the figures and statistics could be made into a brief report.

- Develop the action list, which includes the 2005 Review recommendations, into a forward look or plan of activities for the next 2-3 years, which could include joint projects with IODE or SCAR-MarBIN/OBIS. This will allow ongoing activities and reporting to be seen separately from one-off tasks.

STADM notes that a work plan has been developed for 2007-08, in line with the new Terms of Reference. In addition, the draft SCAR Data and Information Policy has been written, which gives priorities for the future direction for both JCADM and SC-AGI. The Draft Plan suggests:

“To create focus for JCADM and SC-AGI, particularly given the limited resources that each group can mobilise, it is suggested that the work of both groups be bounded by an annual or two-yearly work-plan, informed primarily by the strategic recommendations made in this document and the terms of reference for each group. It is anticipated that these work-plans will be relatively detailed, with actions prioritised around those bodies of work that require attention in the short (within year 1), medium (within years 2-3) and long-term (within 3+ years).

The execution of these plans will rely to a large degree on the SCAR Executive also taking a lead role in several of the initiatives raised within this document.”

- Update the JCADM web-site – for example the latest news item is from 2004. STADM understands that a new web site is under development and recommends that it is launched as soon as possible.

The new web site was launched in 2006: it is attractive and easy to navigate with much useful information. However the news items are out of date. Links with IPYDIS are not clear: there is no mention of IPY on web site. It is evident that much work has been done with IPYDIS from action lists, but it is puzzling that there is apparently nothing on the website. Equally there is nothing about JCADM on IPYDIS website either. The 2007-2008 work plan has as an item “Develop an FAQ section on the JCADM web site”. The first version was due on 1 November 2007: this is not yet visible on the web site. So although good progress has been made, there is further work to do.

#### To SCAR and COMNAP:

- To work with JCADM to pursue adequate funding/resourcing for NADCs to allow them to move from managing metadata to the long-term stewardship of data where appropriate.

It could be argued that this is the most important recommendation, but little progress is evident. STADM notes that an official letter was sent from SCAR to all national SCAR Committees urging them to ensure that NADCs are staffed and equipped to appropriate levels, and that NADC managers have sufficient resources to participate in annual JCADM meetings. However, this does not appear to have resulted in any improvement. There is also a move to urge funding agencies to provide additional funding for online access to data sets, although there are probably issues other than funding here.

## **5. Comments and recommendations from the 2008 Review**

A number of issues come out of the 2008 review, which are outlined below. JCADM has made much progress over the year on implementing the recommendations of the 2006 (and 2005) review. All of the recommendations to JCADM have either been addressed or are well underway. It should be noted that a number of these relate to ongoing activities which need to be monitored from year to year. The majority of the recommendations to SCAR and COMNAP have also been addressed.

The Antarctic Data Management System as a whole is evolving slowly, especially in the effort of populating the metadata database. JCADM are to be congratulated on their plans of trying to steer the development of JCADM from metadata to direct access to the data. It is a formidable task for a group that is under-funded, and STADM does not expect this will evolve rapidly – although it is to be encouraged.

STADM notes that progress with AMD has continued to be good, but there are still issues with the GCMD, and thus AMD, names used to describe data categories. STADM wishes to stress again the need to introduce keywords and fields for the astronomy community, which is going to grow within SCAR when the International Astronomical Union joins SCAR as a member Union in St. Petersburg. STADM understands that some progress has been made in this field, for example, some metadata have been entered and are retrievable in the system. However, the general directory that appears when you enter the AMD does not show this. We understand that the keywords are an issue with GCMD rather than JCADM, but we would encourage JCADM to take some action to resolve this.

It is very commendable that the JCADM Officers put so much effort in advising national data centres on how to preserve their data and in encouraging SCAR members to establish data centres and providing advice on how to operate these.

STADM also commends JCADM for their provision of ample information about its activities both on its website and, in the near future, with a newsletter. Again, information about the activities of JCADM is of the utmost importance but it will take time to compile and edit a newsletter, time that is in short supply to the JCADM Officers. With the financial input of COMNAP terminating next year, STADM is concerned as to whether JCADM will have the means to sustain such a newsletter. Whatever budget is left to JCADM should be used for the priority task of populating the AMD and instructing newcomers how to do this.

STADM's greatest concern about the Antarctic Data Management at present is not so much the fact the metadata continues to come in at a slow pace, especially with non-physical data, but that – although the situation is improving - it is still rather difficult to find the actual data. One member of STADM comments: “Many metadata exist but when clicking on 'get data' I am directed to a website that cannot be found, or it is in a language that I don't speak, or the data are so well concealed that they cannot be found. I exaggerate only a little bit. I wonder whether it is not possible that the actual data can be addressed using a uniform procedure. I know that this puts a heavy burden on the shoulders of the data managers of JCADM and the NADCs, but I think it is the only way to get easy access.”

This is even more important now that we are in the middle of the IPY. STADM notes that we promised ourselves and the world that the 4th IPY would leave a database as a legacy.

STADM notes a further problem that exists is that many scientists can become overwhelmed with the request to submit data to a database from various sides and by the fact that it seems not simple to submit any data. Some data sets could easily be submitted to five or six different databases. These may all be related already, so it would be helpful if scientists knew that their data, once submitted, can be addressed automatically *via* the websites of international projects, programmes or whatever. If submission of data is made extremely simple an increased number of people may submit their (meta)data more readily.

STADM suggests that JCADM develops a system whereby the scientist is put through to the data submission facility in as few steps as possible. In summary: the system of data submission has to be 'idiotensicher' (German for idiot proof!).

With the support from COMNAP being terminated soon, this activity is likely to be even slower. STADM questions whether SCAR might expand its support. However, as SCAR's resources are not large, this would appear to be unlikely. Unless other sources of funding become available, STADM would advise JCADM to confine their task to the continued population of the AMD and the support to NADCs. It does not seem possible to extend the JCADM assignment in a time of shrinking support. However, JCADM are encouraged to continue to seek increased national funding and investigate other funding sources.

We note that there is a report produced by JCADM updating STADM on JCADM activities up to and including the JCADM-10 meeting, together with a review of the JCADM Work Plan for 2006-2007 (from the JCADM-11 meeting in September 2007). There is no separate report of the JCADM-11 meeting, but the work plan refers to notes from the day (e.g. in relation to performance indicators). This could have provided useful extra information. The 2007-2008 work plan is very useful as an indication of the work being undertaken currently. However, due to the timing of the Review - coming prior to the SCAR and JCADM meetings - STADM is not fully up to date with developments. Hence the progress noted above is likely to be an underestimate. Perhaps in the future, the status of items on the work plan could be indicated.

STADM notes various new activities since the last review, in particular (i) discussions on the future collaboration between JCADM and EGGI/SC-AGI, (ii) development of links with other organisations and projects including, for example, the Committee on Environmental Protection

(CEP), the planned Southern Ocean Observing System (SOOS) and the SCAR-MarBIN project, and (iii) production of a draft SCAR Data and Information Strategy, jointly with SC-AGI.

STADM notes the draft SCAR Data and Information Strategy document produced by JCADM and SC-AGI and complements them on such a comprehensive document which sets into perspective the major task ahead. Obviously implementing such a strategy will require significant resource. Data management plans should be part of any scientific project or grant proposal - and it should be carefully noted that data management is too important to be left to data managers alone. It should be part of good scientific practice. SCAR should not - and the draft strategy does not suggest this - set up another data centre system, but utilise the NADCs alongside the World Data Centre System, however this evolves in the future. It is also important to pursue the concept of instituting a dataset citation system.

Extra staff resource is fundamental to assist in implementing the strategy. Obviously SCAR does not have the resources to fund this, but investigation of other funding sources, including perhaps, the Sloan Foundation, the Partnership for Observing the Global Ocean (POGO) or the Nippon Foundation. Alternatively a SCAR member could second a member of staff for a period of time. The STADM Chair recommends this post be located alongside the SCAR Executive Director - following the example of the IOC and its Technical Secretaries. Thus there is no problem when one JCADM Chief Officer completes their term of office and a new one takes on this role.

#### **New recommendations:**

##### **To JCADM**

1. Short report of metrics, perhaps added to the web site annually
2. Add astronomy keywords and investigate the best mechanism to link astronomical data in the GCMD
3. Ensure that the links to NADC web sites do indeed lead to NADC web pages these and not to the home page of the organisation which hosts the NADC
4. Develop NADC portals on the AMD portal page for those NADCs who currently do not have them
5. Provide higher visibility of JCADM within IPYDIS (i.e. mention on the web site of JCADM role)
6. Complete the FAQ section of JCADM web site
7. Distribute to STADM results of review of the AMD by JCADM and its user community
8. Work with SCAR to pursue adequate funding/resourcing for NADCs to allow them to move from managing metadata to the long-term archival and stewardship of data where appropriate

##### **To SCAR**

9. Determine the future of STADM (and its composition)
10. If there is to be a further review carried out by STADM it should be face to face
11. Work with JCADM to pursue adequate funding/resourcing for NADCs to allow them to move from managing metadata to the long-term archival and stewardship of data where appropriate

## 6. Conclusions

STADM notes that the emphasis of the work of JCADM continues to cover three main activities:

- Metadata (populating the Antarctic Master Directory), including providing online access to data where ever possible
- Recruitment of new NADCs
- Capacity building for all NADC

It is the view of STADM that JCADM has operated well since 2006 and is pleased to note that JCADM has built on the progress made between the 2005 and 2006 reviews and taken the recommendations of the 2006 review to heart and (re)acted accordingly. In particular the work plan 2007-2008 gives a good overview of the activities of the committee.

The new Terms of Reference for JCADM, which will put more emphasis on facilitating access to scientific data, including reference to the relevant Antarctic Treaty obligations, are helpful. In future reviews it might be useful to review progress against each of these.

STADM concludes that JCADM is an active group, led by an enthusiastic and hard working Chief Officer, supported by two Deputy Chief Officers and NADC representatives. The Report on their activities to STADM is proof of that. Examples include:

- JCADM has recruited new NADCs
- JCADM has been active in the field of capacity building
- JCADM has been actively involved in IPY activities
- The number of data set descriptions in AMD has grown by 20% since 2006
- An increasing number of data set descriptions (45%) are linked to on-line data
- The AMD is being increasingly used
- Connections with SSGs and the SC-AGI have been developed and strengthened
- Links with other organisations have been intensified

STADM is of the view that JCADM has made very good progress with the recommendations made by the Review Team in 2005 and 2006. Over the last few years, under the leadership of Chief Officer Taco de Bruin JCADM has developed very well. The progress is impressive given the limited resources available.

However, there is still much to be done, in particular moving from compiling metadata for AMD to ensuring long-term stewardship of the data and ensuring proper resourcing for the NADCs to carry out this activity. An action to adopt a resolution at the SCAR and COMNAP Delegates meetings in Hobart, July 2006, led to an official letter from SCAR to all National SCAR Committees, requesting these to resource their NADCs adequately. Unfortunately this letter did not lead to any tangible results.

JCADM has managed to make considerable progress over the last three years. However, it must be careful not to be over ambitious and spread the limited resources too thinly. STADM feels it is important to focus on the high priority activities and hopefully the draft SCAR Data and Information Strategy will provide the framework for future development.

## **Annex 1: JCADM Terms of Reference**

### **Terms of Reference of JCADM (as agreed by SCAR and COMNAP in 2006)**

1. To promote long-term preservation and accessibility of scientific data relating to Antarctica and the Southern Ocean in sustainable repositories,
2. To assist in establishing Antarctic scientific data management policies, priorities and best practices,
3. To support the establishment and ongoing work of National Antarctic Data Centres, in accordance with ATCM XXII Resolution 4.1 (1998),
4. To encourage submission of scientific metadata and data to the Antarctic Data Management System,
5. To further improve and populate the AMD and provide guidance to the AMD host,
6. To provide linkages to other relevant data management systems and thereby enhance the ADMS,
7. In partnership with EGGI [=SC-AGI] to work with SCAR SSGs, COMNAP and the Antarctic Treaty Secretariat to identify and develop fundamental scientific datasets of value to the Antarctic Community.

**Annex 2: Comments on JCADM achievements**

<i>JCADM Achievements (2005 Review Report)</i>	<i>2006 Review</i>	<i>2008 Update</i>
<ul style="list-style-type: none"> <li>Recruitment of new NADCs (1997 – 15; 2004 – 26)</li> </ul>	<ul style="list-style-type: none"> <li>Now 30 NADCs, an increase by 4, due to active recruiting at COMNAP meeting in Sofia (July 2005)</li> </ul>	<ul style="list-style-type: none"> <li>JCADM has welcomed the representative from Pakistan.</li> <li>JCADM has now membership from the following 31 nations: Argentina, Australia, Belgium, Bulgaria, Canada, Chile, China, Estonia, Finland, France, Germany, India, Italy, Japan, Korea, Malaysia, Netherlands, New Zealand, Norway, Pakistan, Peru, Poland, Russia, Spain, South Africa, Sweden, Switzerland, Ukraine, United Kingdom, United States, Uruguay.</li> </ul>
<ul style="list-style-type: none"> <li>Capacity building workshops (1998, 1999, 2003, 2005 - planned)</li> </ul>	<ul style="list-style-type: none"> <li>Comprehensive capacity building workshop held in Buenos Aires alongside 2005 JCADM meeting</li> </ul>	<ul style="list-style-type: none"> <li>JCADM organized international capacity building workshops, during the JCADM-10 meeting in Hobart, Australia, July 2006 and the JCADM-11 meeting, Rome, Italy, Sept 2007.</li> <li>The capacity building workshop in Rome was a two day workshop, prior to the JCADM-11 meeting. This workshop (and the JCADM-11 meeting) was attended by a record number of representatives from 20 countries. The financial support by the Italian government and POGO is kindly acknowledged.</li> <li>The reports of these meetings, including lists of action items, were provided to STADM.</li> </ul>
<ul style="list-style-type: none"> <li>Provision of advice on standards and policies</li> </ul>	<ul style="list-style-type: none"> <li>Continues to be good; information on web site showing how to set up and run and NADC, add metadata to AMD/GCMD, etc.</li> </ul>	<ul style="list-style-type: none"> <li>Continues to be good; information on web site showing how to set up and run and NADC, add metadata to AMD/GCMD, etc.</li> </ul>
<ul style="list-style-type: none"> <li>Communication between NADCs good</li> </ul>	<ul style="list-style-type: none"> <li>Continues to be good through annual meeting of JCADM; action list from meeting with tasks distributed amongst members; active Chief Officer</li> </ul>	<ul style="list-style-type: none"> <li>Continues to be good through annual meeting of JCADM; action list from meeting with tasks distributed amongst members; active Chief Officer</li> <li>New rules of procedure developed to ensure smooth running of JCADM</li> </ul>

<ul style="list-style-type: none"> <li>• Brochure describing JCADM</li> </ul>	<ul style="list-style-type: none"> <li>• No further action required</li> </ul>	
<ul style="list-style-type: none"> <li>• Initial contact made between NADCs and NODCs</li> </ul>	<ul style="list-style-type: none"> <li>• The JCADM Chief Officer gave a presentation to IODE-XVIII (April 2006) and 2 subsequent meetings have been held between the JCADM Chief Officer and IODE Chair and cooperation was discussed at IODE Officers meeting.</li> <li>• This now needs to be taken further, perhaps in terms of a joint project. Possibilities could be – developing a (distributed) Southern Ocean Database; developing an Ocean Data and Information Network (ODIN) for the Southern Ocean; 3-way link with CoML/CAML through SCAR-MarBIN/OBIS.</li> </ul>	<ul style="list-style-type: none"> <li>• No evidence seen of further developments other than further links with SCAR-MarBIN</li> </ul>
<ul style="list-style-type: none"> <li>• Cost effective use of specialised GCMD portal (Antarctic Master Directory)</li> </ul>	<ul style="list-style-type: none"> <li>• Continues to be a cost effective solution</li> </ul>	<ul style="list-style-type: none"> <li>• Continues to be a cost effective solution</li> </ul>
<ul style="list-style-type: none"> <li>• Good relationship with GCMD</li> </ul>	<ul style="list-style-type: none"> <li>• Continues to be good, and GCMD staff are helpful; attend JCADM meetings and participate in capacity building</li> </ul>	<ul style="list-style-type: none"> <li>• Continues to be good, and GCMD staff are helpful; attend JCADM meetings and participate in capacity building</li> </ul>
<ul style="list-style-type: none"> <li>• Over 3000 entries in AMD (1326, July 2001; 2116, July 2002; 2544, April 2003; 2966, June</li> </ul>	<ul style="list-style-type: none"> <li>• Number of entries in AMD continues to increase; 3940 in June 2006.</li> </ul>	<ul style="list-style-type: none"> <li>• The Antarctic Master Directory (AMD) is the world’s largest on-line directory of Antarctic data set descriptions.</li> <li>• The number of data set descriptions has grown from 3907 in July 2006 to 4673 in May 2008. See Figures 1 and 2.</li> </ul>

2004; 3094, March 2005)		<ul style="list-style-type: none"> <li>• Links to online data are available for 2116 data sets.</li> </ul>
<ul style="list-style-type: none"> <li>• Number of countries adding metadata has increased, from 9 in 2002 to 19 in 2005</li> </ul>	<ul style="list-style-type: none"> <li>• Number of countries adding metadata continues to increase; currently 23 countries add metadata to AMD</li> </ul>	<ul style="list-style-type: none"> <li>• The number of nations contributing their data set descriptions, has grown from 23 nations in July 2006 to 25 nations in May 2008. Also, the SCAR-MarBIN project and large (Remote-Sensing) organizations contribute.</li> </ul>
<ul style="list-style-type: none"> <li>• Number of users growing 100/month Jan 2003 to 450/month March 2005</li> </ul>	<ul style="list-style-type: none"> <li>• The number of downloads (of data set descriptions) grew from about 100 per month in July 2003 to about 500 per month in the first quarter of 2006, and has now steadied at ~400 per month</li> </ul>	<ul style="list-style-type: none"> <li>• The statistics show a tremendous increase in usage of the AMD since the start of the IPY in March 2007. The number of downloads (of data set descriptions) has grown from a steady 500 per month since January 2004 to about 3000 per month since March 2007. – see Figures 3 and 4.</li> </ul>
<ul style="list-style-type: none"> <li>• A number of countries have set up national portals with AMD (2 in 2002 to 15 in Mar 2005)</li> </ul>	<ul style="list-style-type: none"> <li>• The number of countries setting up national portals with AMD has increased to 17</li> </ul>	<ul style="list-style-type: none"> <li>• 19 national portals are now available.</li> </ul>
<ul style="list-style-type: none"> <li>• JCADM made a major contribution to IPY Data and Information Strategy published in the IPY framework document</li> </ul>	<ul style="list-style-type: none"> <li>• JCADM continues to contribute, e.g. JCADM Chief Officer co-chairs the IPY Sub-committee on Data Policy and Management.</li> </ul>	<ul style="list-style-type: none"> <li>• JCADM as a data infrastructure is part of the IPY Data and Information Service (IPYDIS)</li> <li>• The JCADM Chief Officer is one of the two co-chairs of the IPY Subcommittee on Data Policy and Management.</li> <li>• Individual JCADM members are active in a whole suite of IPY projects.</li> </ul>
		<p><b>SCAR Data Strategy</b></p> <ul style="list-style-type: none"> <li>• JCADM is in the process of drafting a SCAR Data Strategy.</li> <li>• A first version was sent to the SCAR Executive Director for comments.</li> <li>• An updated version will be sent to the SCAR Executive and the SCAR Delegates, for discussion and adoption of the SCAR Data Strategy at the St. Petersburg and Moscow meetings in July 2008.</li> </ul>

### Annex 3: Additional recommendations from 2006 review report

**To JCADM:**

<i>Recommendation</i>	<i>STADM comment on progress 2006</i>	<i>STADM comment on progress 2008</i>
<b>Antarctic Master Directory (AMD)</b>		
1. JCADM should continue to encourage managers of NADCs and the scientific community to submit entries to AMD to improve coverage (it is believed that about one third/no more than 40% of data sets are described in AMD?)	<p>This recommendation has been addressed as the figures below indicate. However, there is still further work to be done</p> <ul style="list-style-type: none"> <li>• The 2005 JCADM meeting included training on compiling entries for the AMD</li> <li>• Entries to the AMD have increased from 3503 (July 2005) to 3940 (June 2006) – i.e. an increase of over 10%</li> <li>• The number of nations contributing has increased from 19 (July 2005) to 23 (May 2006)</li> </ul>	<p>Progress has continued:</p> <ul style="list-style-type: none"> <li>• In 2007 JCADM held its annual meeting in Rome (3-7 September), which included training for NADC operators. The meeting was attended by representatives from 20 countries and from the Global Change Master Directory (GCMD).</li> <li>• Entries to the AMD have increased to 4673 (an increase of over 30% since 2005, and almost 20% since 2006)</li> <li>• The number of nations contributing has increased to 31</li> </ul>

<p>2. All nations should continue to submit metadata sets to AMD, for example</p> <ul style="list-style-type: none"> <li>JCADM to continue to find out more about what is going on at the national level outside the NADCs (for example <i>via</i> SCAR National Committees), and</li> <li>JCADM and NADCs to encourage metadata submissions to AMD from university groups</li> </ul>	<p>The situation is very variable from country to country. It would be useful to see statistics of how NADCs act with respect to institutions outside the national Antarctic programs. Statistics on university contribution to the AMD could be produced. For example:</p> <p>Currently the AMD has 534 entries from 161 academic departments or institutions.</p>	<p>The situation continues to be very variable from country to country. It would be useful to see statistics of how NADCs act with respect to institutions outside the national Antarctic programs. Statistics on university contribution to the AMD could be produced. For example:</p> <p>Currently (June 2008) the AMD has 778 entries from 204 academic departments or institutions.</p>
<p>3. In order to meet the requirements of Treaty Article IIIc it is highly desirable that the metadata in AMD do contain links to the original data (and JCADM should encourage links to the data sets themselves through AMD)</p>	<p>Providing access to data is linked with the need of increased funding, and correctly so.</p> <p>Although the 9<sup>th</sup> JCADM meeting report notes that over 30 million data records have been placed online by NADCs, it also acknowledges that there is still a large volume of data that are not easily accessible.</p> <p>Thus further work needs to be carried out. However, as funding for most NADCs covers only a part-time post and there is little funding for travel, for example to attend JCADM meetings, then this does not bode well for the future. This is particularly crucial if JCADM is to have significant impact in</p>	<p>Work is underway to increase the amount of data available online and also on the most appropriate (efficient way) to connect data to GCMD – this currently happens in several ways.</p> <p>An on-line data sets link is available on the AMD home page which will provide a list of the 2116 data sets which lead to online data (45%). Obviously this leads to the originators web sites and many different ways of accessing data, but nevertheless it is a good start.</p> <p>Varies a lot by country – Australia has 60-70% DIFs linked to online data. Others have very few or may have none available.</p> <p>An action to adopt a resolution at the SCAR and COMNAP Delegates meetings in Hobart, July 2006, led to an official letter from SCAR to all National SCAR Committees, requesting these to resource their NADCs</p>

	<p>JCADM is to play a significant role in meeting the data management needs for IPY.</p> <p>This needs to be urgently addressed by the national funding authorities. In the oceanographic community it is generally agreed that ~5% of funding for a data collecting project or programme should be assigned for data management.</p> <p>It is encouraging to see that JCADM through its Chief Officer has drafted a resolution on NADCs. STADM strongly supports this action.</p>	<p>adequately. However, this letter did not lead to any tangible results.</p>
<p>4. JCADM should establish and/or improve linkages with other (compatible) metadata directories (e.g. EDMED, MEDI)</p>	<p>This work is in progress. The Global Change Master Directory (GCMD) (AMD host) and the British Oceanographic Data Centre (BODC) are collaborating to expand the AMD to include results from similar existing oceanographic metadata directories (EDMED and MEDI) pertaining to Southern Ocean data sets. The emphasis of the current activities is on (the major task of) harmonizing keyword lists. The IOC/IODE's MEDI Steering Group on is due to meet later this year so this activity will make further progress then as GCMD and BODC are both involved in this group.</p>	<p>Continuing for EDMED and GCMD – also Pangaea</p>
<p>5. JCADM should work with</p>	<p>Not completed; but understood to be in</p>	<p>Some astrophysics data sets are available but not in the</p>

<p>GCMD to investigate the addition of astronomy categories and key words.</p>	<p>progress although nothing is visible yet.</p>	<p>main AMD directory (alongside other data sets) but in another category from the menu – just like the online data sets. This shows some progress but more is needed, especially as International Astronomical Union joins SCAR as a member Union in St. Petersburg.</p>
<p>6. JCADM should work with GCMD to add additional key words where appropriate (e.g. sea surface temperature)</p>	<p>No evidence that this has taken place yet. Review of the keywords may take place in part through the SG-MEDI meeting. GCMD are willing to revise keywords and have a procedure for this, but JCADM and relevant experts will need to provide input from in the appropriate disciplines.</p>	<p>GCMD have reviewed and revised keywords and are open to this; new keywords have been added.</p>
<p>7. Put all 26 NADC portals with their logos on the portals page of AMD</p>	<p>Some progress has been made, but only 17 NADC portals are shown, and there are now 30 NADCs. In addition, there are some problems with the current portals, for example:</p> <ul style="list-style-type: none"> <li>• More than one portal does not include the logo.</li> <li>• Clicking on the logo does not always take you anywhere</li> <li>• In at least one case the NADC web site is impossible to use: it shows the main institution web site and there is no way of understanding where the Antarctic data are to be looked for.</li> </ul> <p>Thus although some progress has been made, there is more work to do.</p>	<p>19 NADC portals are shown on the portals page, all with logos, and linking uniformly to the AMD entries for those countries. Notable countries are not included (where for e.g. are Germany, Norway, South Africa and the UK). The problems noted in 2006 have been resolved.</p>

	This is linked to recommendation 13.	
8. JCADM, in cooperation with GCMD, should expand AMD to be a window into all possible data sets – e.g. global maps of piston cores including those from the Southern Ocean, JCOMMOPS (e.g. Argo, VOS, SOOP, Drifting Buoys, GLOSS), GBIF, OBIS, SuperDarN, WDCs etc. this would achieve a step function increase in population and utility.	This does not appear to have been done yet. STADM notes that there are many data sets that are relevant for Antarctica, which should be linked as noted in the recommendation.	This still needs to be done
9. JCADM, in conjunction with the Review Team Chair and Executive Secretary SCAR, should consider reviewing GOSIC entries in GCMD and flag those relating to Antarctic data sets, so that these are available through the AMD. Similarly, JCADM should provide GOSIC with information on those AMD entries which should be accessible through GOSIC.	No news of any action, however the STADM Chair will initiate this action during August 2006.	This still needs to be done.
10. Use satellite experts to evaluate what entries are in	No news of action taken, but the 9 <sup>th</sup> JCADM meeting report indicates that	No news of progress

the GCMD that relate to the Antarctic region, and what should be added (and flagged in the AMD part of the GCMD).	this action has been placed on one of the JCADM Deputy Chief Officers in collaboration with GCMD.	
11. JCADM should review what <i>in situ</i> data set descriptions are missing from AMD but already included in GCMD (e.g. global data sets with an Antarctic component) and ask GCMD to flag these in AMD	No news of any action taken, it does not appear to have been done, but is included on the action list from the 9th JCADM meeting.	No news of progress
12. JCADM to ensure that international Antarctic region data collection activities are included in AMD	No news of any action taken, but is included on the action list from the 9th JCADM meeting.	SCAR programmes have been added to a separate section of the AMD. Note: <a href="#">Subglacial Antarctic Lake Environments (SALE)</a> link does not work)
13. JCADM should review and check existing AMD entries periodically	No news of any action taken, but is included on the action list from the 9th JCADM meeting as a continuing activity.	Continuing activity with information exchange at JCADM meetings

<b><i>Recommendation</i></b>	<b><i>STADM comment on progress 2006</i></b>	<b><i>STADM comment on progress 2008</i></b>
<b>Communication</b>		
14. JCADM to improve communication with data collecting scientists and users	This is being addressed. Progress includes:	JCADM is now much more engaged with the scientific community, through participation in the meetings of the Chief Officers of the SSGs and of the SCAR Executive

<p>(including SSGs, SRP Steering Committees, SCAR Expert and Action Groups), through provision of clear information about use of and input to AMD, including examples (from scientists) of what research can be done using data from AMD, and guidance for searching</p>	<ul style="list-style-type: none"> <li>• JCADM Chief Officer attended the SCAR cross-linkages workshop.</li> <li>• JCADM members have been given responsibility for linkage with SCAR Scientific Research Programme steering groups.</li> </ul> <p>However it is not clear to STADM if examples (from scientists) of research done from using data found through AMD are available.</p>	<p>Committee and also through the JCADM liaison persons, who are members of the Steering Committees of the Scientific Research Projects (SRP). JCADM took part in the planning meeting for the Southern Ocean Observing System (Bremen, October 2007), presenting the outline for a SOOS Virtual Observatory. Ideas for this were further discussed at an ad-hoc meeting of JCADM and SCAR officials at the British Antarctic Survey in November.</p>
<p>15. JCADM to use opportunities such as conferences and newsletters to make the scientific communities more aware of opportunities offered by/benefits of the AMD, the NADCs and JCADM.</p>	<p>This is an ongoing activity, but opportunities have been utilised. The JCADM Chief Officer has given a number of presentations and posters during the year. In the near future he will attend the ICES Annual Science Conference, Maastricht (September 2006) and the 20<sup>th</sup> CODATA International Conference, Beijing (October 2006) and give presentations. A variety of posters from JCADM will be presented at the 2<sup>nd</sup> SCAR Open Science Conference alongside the SCAR XXIX and COMNAP XVIII meetings in Hobart, July 2006.</p>	<p>Still being done, as far as possible within limited resources available</p>
<p>16. JCADM to establish communications and collaboration with EGGI, starting with JCADM-9, and continuing with intersessional</p>	<p>The report of the SCAR cross-linkages workshop held in November 2005 noted that JCADM and EGGI were recommended to cooperate closely to provide the entire SCAR community</p>	<p>The JCADM executive worked closely with the executive of the EGGI (now renamed Standing Committee on Antarctic Geographic Information (SC-AGI) to establish a model for collaboration between the groups including establishing formal executive</p>

<p>meetings to discuss areas of mutual interest, including the EGGI sub-project Antarctic Data Linkages and liaison regarding geospatial information activities</p>	<p>with access to GI metadata and catalogues. A two day EGGI meeting is planned for Hobart before the Open Science Conference. The JCADM Chief Officer is invited to attend in order to establish links and collaboration between EGGI and JCADM. In addition, one of the JCADM Deputy Chief Officers also has close links with EGGI.</p>	<p>connection and the development of a partnership to create fundamental datasets of benefit to the Antarctic community.</p> <p>The draft SCAR Data and Information Strategy has been jointly written by JCADM and SC-AGI.</p>
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<i>Recommendation</i>	<i>STADM comment on progress 2006</i>	<i>STADM comment on progress 2008</i>
<b>Organisational</b>		
<p>17. An annual written report should be made available for the Executive Committees (by end May)</p>	<p>Annual Report is available for meetings in Hobart, July 2006</p>	<p>Done for 2007</p>
<p>18. As part of its annual report JCADM should produce a quantified plan of what will be done over the year, e.g. estimate of likely additions to AMD.</p>	<p>There is some information provided in the action lists for each country in terms of the number of additions to AMD and setting up portals, etc. This is a good start and if these can be put in the context of an overall JCADM plan that would be very helpful. Perhaps this will become clearer when the SCAR Data and Information Strategy has been developed.</p>	<p>Action list/work plan available for 2006/07 and 2007/08 – linked to Terms of Reference.</p> <p>Action lists for each NADC are produced, Some information has been quantified (e.g. number of data set descriptions to be added to the AMD). Some items which are not achievable with the current resource have been removed.</p> <p>The SCAR Data and Information Strategy will provide a framework for future activities and lists priorities items.</p>

19. JCADM to formally report to the SCAR and COMNAP Executive Committees (one year) and the Delegates (intervening year).	Formal reporting will take place in July 2006 to the SCAR and COMNAP delegates meetings.	Working and ongoing
20. Consider developing a network of allied data centres (e.g. WMO, NODCs, GBIF, OBIS, CCAMLR, etc.) through bilateral partnerships.	Links are being developed with NODCs and OBIS, but are still at an early stage. This needs to be pursued vigorously.	Slow progress, but links with SCAR-MARBIN; JCADM to become an associate member of GBIF
21. Improve capacity for long term data stewardship, including compiling data sets	Building capacity in terms of training and setting up new NADCs is good; however capacity in terms of extra resources being available at the national level to carry out data stewardship remains in need of improvement. It is crucial that this is addressed, especially with IPY so close.	Same as in 2006 – training is very good; resources at the national level in need of improvement in almost all countries.

**To SCAR and COMNAP:**

<i>Recommendation</i>	<i>STADM comment on progress 2006</i>	<i>STADM comment on progress 2008</i>
22. SCAR should invite JCADM to make specific presentations to each SSG, focusing on individual SSG scientists needs, during their biennial meetings, starting in 2006.	This will take place at the meetings in Hobart, July 2006.	Presentations were made in Hobart – and are planned for St Petersburg where feasible within the timetable.

<p>23. Create an advisory structure comprising the Chief Officers of the SCAR SSGs, experts in data management and COMNAP representatives, to provide guidance to JCADM and to evaluate its reports. This body should meet biennially prior to (and report to) the joint meetings of the SCAR and COMNAP executives. <i>[This body should replace STADM.]</i></p>	<p>The team carrying out this interim review has been established to be the new STADM.</p>	<p>STADM still in place – but perhaps needs some revision with COMNAP dropping out? Recommend a face-to-face meeting next time.</p>
<p>24. SCAR and COMNAP should encourage the involvement of JCADM in the further development of IPY Data and Information Management plans.</p>	<p>This has been addressed.</p>	<p>JCADM continues to be involved in the IPY Data and Information Service.</p>
<p>25. SCAR and COMNAP should encourage managers of National Antarctic programmes to consider developing and applying methods to ensure submissions to AMD at the national level within a specified time frame, possibly following the Australian and USA examples</p>	<p>No information available. STADM would like to be updated as to whether there is a panorama of actions being undertaken in the various countries to ensure that metadata (and data) is submitted?</p>	<p>Same comment as for 2006</p>

<p>26. SCAR and COMNAP should make the link to data more obvious on their web pages</p>	<p>The SCAR web-site includes a link to ‘Science and Data’ from its home page. This provides access to the AMD, but you need to know that this is through the link to JCADM. There is no obvious link to JCADM or AMD from the COMNAP web-site. Using the COMNAP web-site search facility to look for JCADM gives 2 results – both refer to a recommendation from an NSF/COMNAP/ SCAR Workshop Report - Practical Biological Indicators of Human Impacts in Antarctica (March 2005) – see Annex 3. It would be helpful if a high level link to Data and/or JCADM could be included.</p> <p>Note: There is also no reference to STADM on the COMNAP web pages.</p>	<p>A high level data link has been added to the SCAR web pages.</p> <p>There is no obvious link to JCADM or AMD from the COMNAP web-site – presumably not needed any more.</p>
<p>27. SCAR and COMNAP should develop a data and information strategy for the future, as recommended in the SCAR strategic plan.</p>	<p>STADM believe this is under discussion and is planned to follow on from the development of the IPY data and information management strategy.</p>	<p>JCADM and SC-AGI have produced a draft data and information strategy</p>
<p>28. SCAR and COMNAP should continue funding of AMD</p>	<p>This is an ongoing requirement and should continue.</p>	<p>SCAR must continue to fund the AMD – it is still a cost effective solution. COMNAP will no longer fund.</p>