

## SCAR WG-GGI POSITION PAPER ON THE DISTRIBUTION OF DIGITAL GEOGRAPHIC DATA

### INTRODUCTION

With the steadily increasing number of Antarctic maps available in digital format the need has arisen for WG-GGI to discuss how national Antarctic Mapping agencies dealing with digital geographic information should distribute the maps they are producing.

Because of printing costs some organisations may not be so keen to go the down the conventional printing route and make 500 copies of a map that may only be used for 2 years before it is updated. An increasing number of maps will be available in digital form and the question is "How could we best send these type of digital maps out to GGI members?"

Policies on the use and distribution of digital geographic data vary from country to country. Some countries charge for both data and its distribution. Others make it available to any person or organisation at no charge – usually via the World Wide Web – in accordance with the Antarctic Treaty.

### CURRENT SITUATION

At the moment each national authority is responsible for the distribution of Antarctic maps it produces, as and when the hardcopy maps are printed. To date there is no formal distribution mechanism for digital data. Below are the email text responses from 4 member countries – the UK, Australia, the USA and Italy – with minor alterations to ensure it reads correctly.

### THOUGHTS FROM THE UK (Janet Thomson – BAS)

One hard copy should be distributed to all Antarctic Mapping Centres on the GGI list and to individual GGI members if there is no national Antarctic Mapping Centre in their country. The hardcopy is important as it provides a reference sheet for further plots from any digital data supplied, and it defines the copyright product on behalf of the producer.

2. There are several issues to consider regarding the transfer of digital map data:
  - a. CD versus web options. Both will have cost overheads in terms of staff time and funding,
  - b. Formats for exporting data,
  - c. Maintenance of intellectual property rights,
  - d. Procedures for producers advising users when up-dates are available.

I have discussed the data exchange issues by e-mail with Paul Cooper, my GIS Manager at BAS. He created the web site for ADD Version 2.0 and he has a good feel for the time involved in creating and maintaining a web site, and the potential costs of CD production. A summary of his comments are:

**Distribution by CD:** Each CD takes about 1 hour to produce, depending on the volume of data. Costs would arise from staff time because the CD-writer (assuming you have one) needs to be monitored during CD production. Alternatively, a master CD could be made.

Set-up costs for the master would be 500-1000 GBP, and CDs would be pressed at an additional 1 GBP per CD. Viability of a master CD for quantities less than 100 pressings is questionable.

**Distribution via the Web:** Providing a user-friendly means of downloading data is not a trivial process, and there has to be an on-going commitment to administer the web site after initial set-up. More effort is needed if accounting and user information is to be gathered from the site, but the way this has been done for the ADD web site means that the intellectual property rights could be affirmed and controlled. A cheaper alternative is to place files on an anonymous FTP site, and e-mail people to inform them of data availability. This allows little or no accounting and user information to be gathered.

**Data format:** Exchanging data will be a problem until OpenGIS and ISO TC211 are fully operational. Some national standards will probably be incorporated in the new standards but support for them is minimal in most GIS systems. Paul can import data in SDTS format, for example, but he cannot work with SDTS without conversion. However, it is hoped that we can work directly with data in OpenGIS/TC211 compliant formats, once those formats have been agreed. Paul notes that the envisaged OpenGIS and TC211 are broad standards, and that clear routes between the common software packages used by GGI members should be identified. In my view, our GGI work on data standards should aim to provide appropriate translation software as well as TC211 compliant data descriptions, to ensure smooth data transfer between GGI members.

## **THOUGHTS FROM AUSTRALIA (Lee Belbin – AAD)**

I fully concur with this issue being raised. The Australian Antarctic Data Centre is anticipating that digital versions of maps will be an increasingly common form of map distribution and we have planned accordingly. You may say we think we know the 'goal posts' and it is just a matter of some repetitive work to get it all operational. AADC's digital geographic data is now available at the following URL

<http://www-aadc2.antdiv.gov.au/gis/areamap/>

In some cases it may be possible that a hard copy map could be produced by ink-jet printing. A drawback of this is that the overall quality of ink-jet printed maps is not as good as conventional printing.

Perhaps ink-jet copies (ie hardcopies) should still be done and if country want the digits (or in the case of orthophotos, an image) to create their own maps then they could request a CD, or it could be made available for downloading on the web.

We are currently in the process of releasing Adobe Acrobat versions of both one-off maps produced from ArcInfo / ArcView and those that we have had drafted by other means. We have tried a number of other formats (jpeg, gif, eps) but find that Acrobat format (pdf) -

1. Retains far superior image, particularly font and palette, yet
2. Achieves excellent compression
3. Has the added ability of prohibiting direct editing of the underlying data. People can scribble over it, but not change the basic image, and

4. The Adobe Acrobat reader can be downloaded as freeware from <http://www.adobe.com/prodindex/acrobat/readstep.html>

This format is easy to produce from other graphic formats such as EPS-level 2 (I believe). This is the format that can be produced from a number of graphic packages including ArcView3. 1. Added to this, we have developed two other complementary approaches -

1. Interactive maps on the Web. We use ArcView Internet Map Server which basically provides zoom, pan, scale dependent layering, layer on/off, hotlinks by clicking map features and the ability to search for features in the ArcView tables. We are hoping that scientists can use this approach to produce base maps for publication without resort to anything but a web browser.

2. Download via ftp of GZIP'ed version of ESRI's ASCII E00 format files. Proprietary formats such as ESRI E00 seem to provide reasonable probability of being read by other applications or translators. Being ASCII the E00 files form the basis of our archival strategy.

### **SITUATION IN USA (Cheryl Hallam – USGS)**

USGS plans to make digital data available on both CD-ROM and the WWW site – US Antarctic Resource Centre (USARC) <<http://usarc.usgs.gov/>>. As the digital data becomes available USGS will set up download sites and put the data out on CD-ROM for those who cannot download large files. USGS will also continue to distribute the paper copies.

The current plan is to use ARC/INFO E00 export files for the vector data and compressed TIFF for the digital raster graphics (DRG's). Some of the DRG's will be available for viewing and downloading via the Atlas of Antarctic Research <[http://usarc.usgs.gov/antarctic\\_atlas/](http://usarc.usgs.gov/antarctic_atlas/)> (remember that it is under development and much is not yet added and not all functions are operational yet). Also there is no FTP site yet for the data that we can distribute. *[USGS does have an FTP site, currently it contains no Antarctic data – GJ]*

Scientists in the US are always mapping areas using USGS data, but the standards for the resulting data is not clear. If that becomes something significant, USGS might begin to work with these scientists to develop standards.

Currently on the USARC there are only textual lists of the topographic maps available from USGS <<http://mapping.usgs.gov/mac/isb/pubs/forms/anarctic.pdf>>. These cover a fairly small area of Antarctica and are mostly at the 1:250 000 or 1:500 000 scale. These lists will be combined with the graphics capabilities of the on-line atlas when the atlas reaches that point in its development. At the moment the lists meet an immediate need for assistance in ordering the hard copy maps.

The only sort of data of Antarctica currently residing in the Global Land Information System (GLIS) web site <<http://edcwww.cr.usgs.gov/webglis>> is a metadata record for aerial photography – a paper copy of which can be ordered from USGS.

## **SITUATION IN ITALY (Roberto Cervellati – PNRA)**

Most Antarctic research institutions in Italy are now working on digital databases. ARC/INFO is the product most used. The hard copies are obtained from the databases through creating a master copy and taking it to commercial printers to get a larger print run done.

The distribution of hard copy maps to SCAR nations will be continued by PNRA. They will also take care of the printing process and distribution - as in the past.

Topographic data distribution via CD-ROM or made available on the Web is not seen as imminent.

Distribution by the Web is rather new. The feeling is that procedures for distribution and further refinements to data availability on-line will evolve rapidly. The example of what other countries are doing will certainly influence PNRA's approach.

## **SUMMARY**

Those countries providing comments to this paper acknowledge hard copy or printed maps are still required by GGI members. Australia, the UK, the USA and Italy will continue to print and distribute paper copies for those members requiring it.

For those countries that have the capability to distribute digital data the following points can be made:

1. The preferred format for digital data is ARC/INFO – ASCII E00 export format and generally compressed using an industry standard algorithm.
2. Both CD-ROM and the World Wide Web are the two media preferred to physically distribute the data. The web side of distribution is being developed for those users that have easy and quick access to the internet. For those members that are still developing web sites the CD-ROM method of distribution is preferred. Both these methods enable the distributor to keep reasonably accurate accounting and user information which may be an important consideration when requesting funding for further development.
3. Australia and the USA are currently developing interactive maps on the web. This form of information dissemination will expand, as members become more familiar with internet technology.

There may be an opportunity for those countries leading the way in distribution via the web to assist those members just starting or thinking about using this kind of media to share its digital geographic data.

## **ACTIONS??**