

International Council for Science

SCAR report

No 28
December 2006

Contents

Report on the Workshop for the
Antarctic Seismic Data Library System for Cooperative Research (SDLS)

9 July 2006 - Hobart, Australia



SCIENTIFIC COMMITTEE ON ANTARCTIC RESEARCH

at the

Scott Polar Research Institute, Cambridge, United Kingdom

SCAR Report

SCAR Report is an irregular series of publications, started in 1986 to complement SCAR Bulletin. Its purpose is to provide SCAR National Committees and other directly involved in the work of SCAR with the full texts of reports of SCAR Standing Scientific Groups and Group of Experts meetings, that had become too extensive to be published in the Bulletin, and with more comprehensive material from Antarctic Treaty meetings.

SCAR Bulletin

SCAR Bulletin, a quarterly publication of the Scientific Committee on Antarctic Research, carries reports of SCAR meetings, short summaries of SCAR Standing Scientific Groups, Action Groups and Groups of Experts meetings, notes, reviews, and articles, and material from Antarctic Treaty Consultative Meetings, considered to be of interest to a wide readership.

REPORT ON THE WORKSHOP FOR THE ANTARCTIC SEISMIC DATA LIBRARY SYSTEM FOR COOPERATIVE RESEARCH (SDLS)

9 July 2006 - Hobart, Australia

Alan K. Cooper, Workshop Convener
U.S. Geological Survey, 345 Middlefield Road, Menlo Park, CA 94025, USA,
acooper@usgs.gov

Nigel Wardell, SDLS Coordinator
Istituto Nazionale di Oceanografia e di Geofisica Sperimentale, Borgo Grotta Gigante 42/c,
34010 Sgonico, Trieste, ITALY, nwardell@ogs.trieste.it

INTRODUCTION

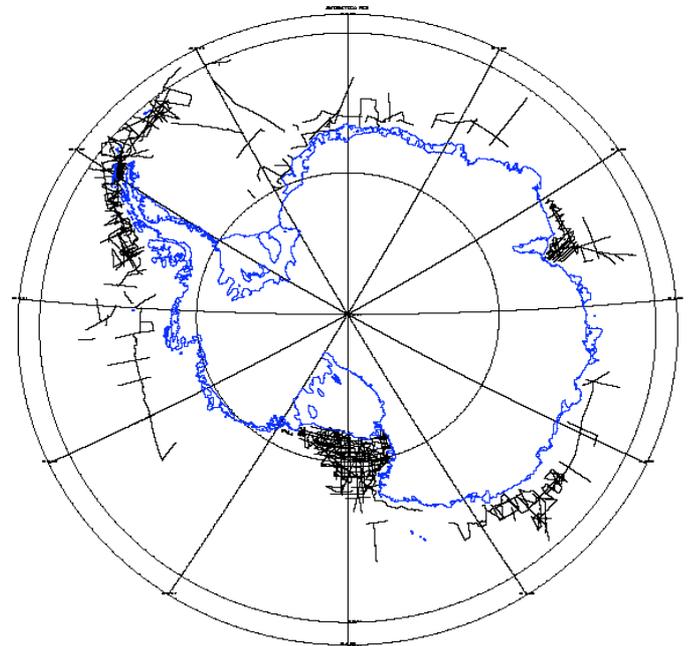
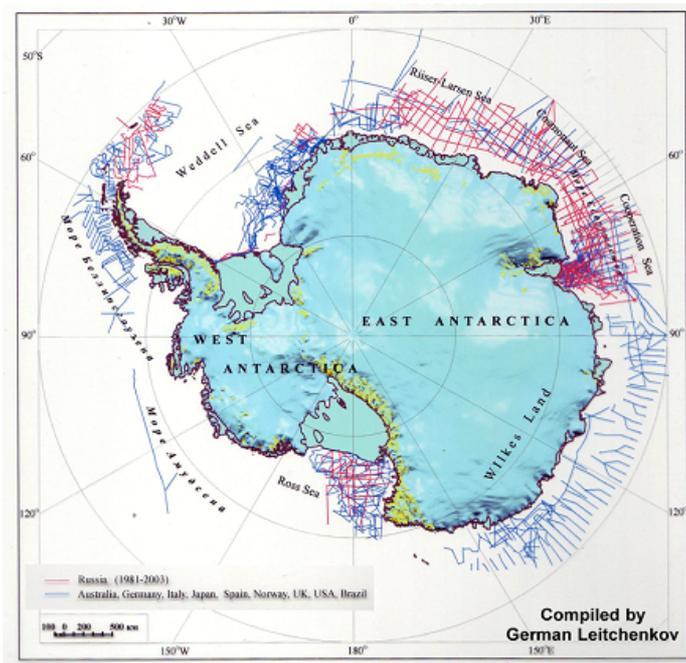
The SDLS operates under the aegis of SCAR and the ATCM (Recommendation XVI-12) with guidelines outlined in SCAR Report #9. The SDLS holds workshops routinely to review Antarctic multichannel seismic reflection (MCS) operations, to review SDLS operations and procedures, and to set directions for future SDLS operations. In the past three years, the SDLS has held workshops in 2003 in Potsdam (Germany) in conjunction with the 9th International Symposium on Antarctic Earth Science (ISAES) and in 2006 in Hobart, Australia in conjunction with the 20th annual SCAR meeting and SCAR Open Science Conference. The next SDLS workshop will be held in August/September 2007 in conjunction with the 10th ISAES in Santa Barbara, California.

This report summarises the discussions and recommendations of the Hobart workshop, and includes a brief summary of the Potsdam workshop for which a formal workshop report was not written.

HIGHLIGHTS OF THE POTSDAM (GERMANY) 2003 SDLS WORKSHOP

The agenda for the one-day Potsdam workshop, and list of participants attending, are given in Appendix A. The workshop discussions centered around reviews of recent and future MCS operations; new procedures for accessing MCS data on the web; policies and procedures for submission of MCS data to the SDLS; discussions of hydroacoustics and MCS surveys related to the Law of the Sea; and submissions of MCS cruise navigation data to the SDLS. The following are the main highlights of the workshop:

1. A large amount of MCS data had been submitted to the SDLS. The two maps show the approximate amount of existing MCS data in 2003 (compiled by German Leitchenkov) and the amount of data in the SDLS on SDLS CD-ROMs 1-58 (map on right):



2. All SDLS branches were being used - principally by students and project planners;
3. Workshop participants agreed that the SDLS should go forward with developing websites for display of and access to MCS data at no additional cost to users;
4. There was agreement by the data collectors present to move forward on submission of MCS data to the SDLS.
5. A consensus agreement was reached regarding the display of cruise navigation data: "The SDLS workshop participants strongly recommend that navigation data for MCS surveys be provided immediately after each survey for publication of the track map on the SDLS web site. These maps should be used to plan surveys to facilitate cooperation and minimise repeat surveys in consecutive seasons."

HOBART SDLS WORKSHOP (9 JULY 2006)

All of the information in the sections below pertain to the Hobart workshop. The agenda for the one-day Hobart workshop, and list of participants are given in Appendix B. A brief summary of the discussions is given for each agenda item, and the report concludes with a list of the recommendations and proposed actions of the workshop. A verbal summary report of the SDLS workshop was given to the plenary of the SCAR Geosciences working group, and a recommendation regarding the SDLS was approved by the plenary to be forwarded to SCAR delegates for action. The text of the Geosciences recommendation is given in the summary section of this report.

SDLS REVIEW

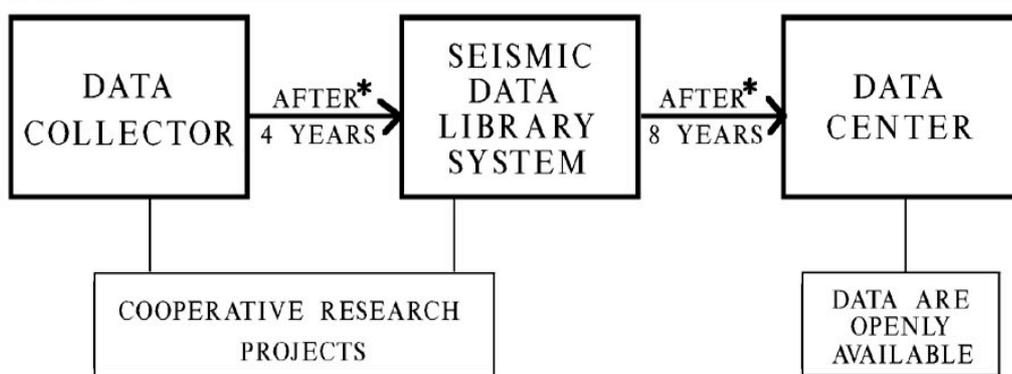
Workshop participants were reminded that the principal reason that the SDLS was established in Oslo, Norway in 1991 was to bring the Antarctic MCS community into full compliance with Article III of the Antarctic Treaty. There were several other reasons that included:

- to foster, promote and facilitate earth science research;
- to facilitate coordination of Antarctic MCS field and laboratory operations;
- to assist in promoting Antarctic research drilling operations;
- to eliminate the perception by some that MCS data were being used for commercial exploration purposes, and to thereby protect the rights of research scientists to conduct MCS operations in Antarctica;
- and to provide the MCS research community with guidelines for, and more direct control over, their MCS data distribution -- to help ameliorate "outside" controls.

The SDLS was implemented to be a research tool for earth scientists – it was not implemented to be a data bank. The guidelines for the SDLS operations, as developed by consensus of the MCS community, are outlined in SCAR Report #9. ATCM Recommendation XVI-12 authorises implementation of these guidelines.

The SDLS currently has 12 branches in 10 countries, and each branch is overseen by a senior Antarctic research scientist. MCS data are submitted to the SDLS by data collectors along with the funds to produce the CD-ROMs/DVDs by which the MCS data are distributed to the SDLS branches. There are currently three websites for the SDLS – one master website (www.walrus.wr.usqs.gov/sdls) and two prototype websites now in review.

The SDLS is unique in its data access guidelines, which were designed and implemented to help protect the intellectual property rights of data collectors while still making data openly



* Times start directly after data collection

accessible for research. These guidelines are best illustrated in the diagram from SCAR Report #9:

The SCAR Report #9 guidelines (<http://www.scar.org/publications/reports/9/>) state:

1. MCS data collectors are to submit their MCS data to the SDLS within 4 years of the time of collection. During this first 4 years, data collectors have exclusive use of their data.

2. While MCS data are in the SDLS (i.e. are less than 8 years old), they can only be used by other investigators for cooperative research projects with the data collector. There are other important restrictions during the 4-8 year period:
 - MCS data can only be used for research, and not for commerce; Data can be used only in cooperative research studies with the data collector;
 - Copies of MCS data can only be made and removed from the SDLS branch with the consent of the data collector;
 - The data collector must be offered authorship on papers using these data;
 - The data collector must be given a copy of all research products based on these data including copies of reprocessed data;
 - The source of data must be properly cited in all reports; and MCS data at each SDLS branch will be overseen by a librarian and a senior Antarctic research scientist residing at that branch.

Also from Scar Report #9: “The above guidelines give the data collectors some “rights” to control the use of their data. These “rights” come with the implicit understanding that access to MCS data for cooperative research projects proposed by other scientists will only be denied when the proposed research project directly conflicts with active research projects currently being conducted by the data collector. Such “rights” and restrictions on use of data in the SDLS will encourage timely contributions of data to the SDLS and will promote greater involvement in cooperative Antarctic seismic studies.”

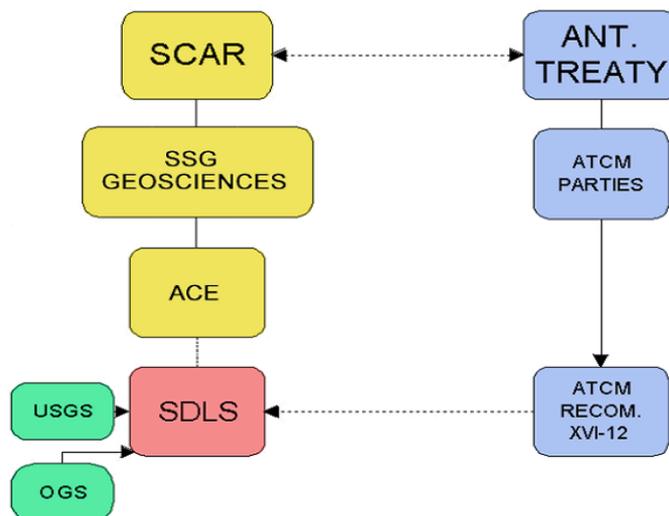
Data older than 8 years are sent to the World Data Center or other archives for distribution without formal restrictions on their use. But, these data have an implied professional ethical guideline of proper citation to the source of the data if they are used by someone other than the data collector.

CURRENT STATUS OF THE SDLS

With the recent reorganisation of SCAR, the SDLS as a science research tool is housed with the Antarctic Climate Evolution (ACE) programme, which is currently one of the five major programmes in SCAR. The diagram below illustrates this structure:

SDLS ORGANIZATIONAL STRUCTURE

July 2006

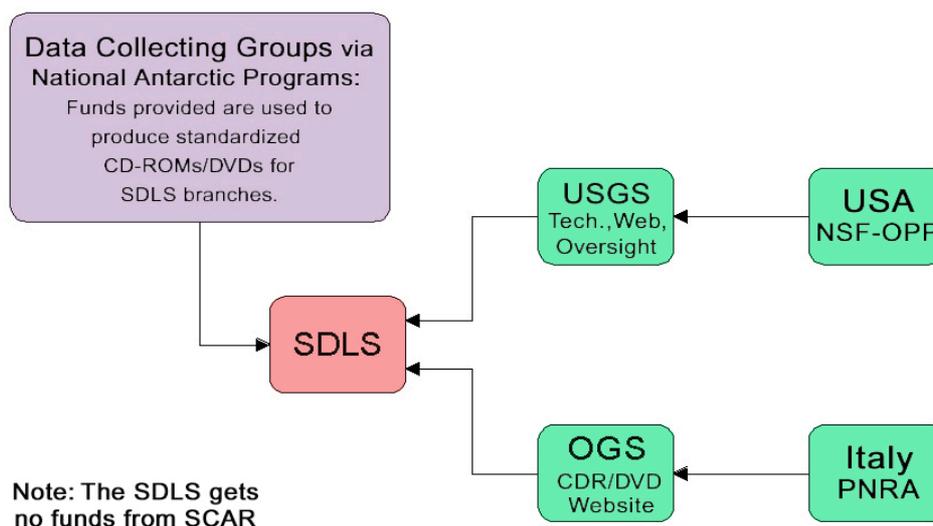


The SDLS is overseen by an Executive Committee that currently includes
 Chair, Executive Committee: Dr. Alan K. Cooper (no-salary position)
 SDLS Coordinator (OGS, Italy): Mr. Nigel Wardell
 SDLS Coordinator (USGS, U.S.): Mr. Jon Childs

The funding sources for the SDLS are illustrated below:

SDLS FUNDING SOURCES

July 2006

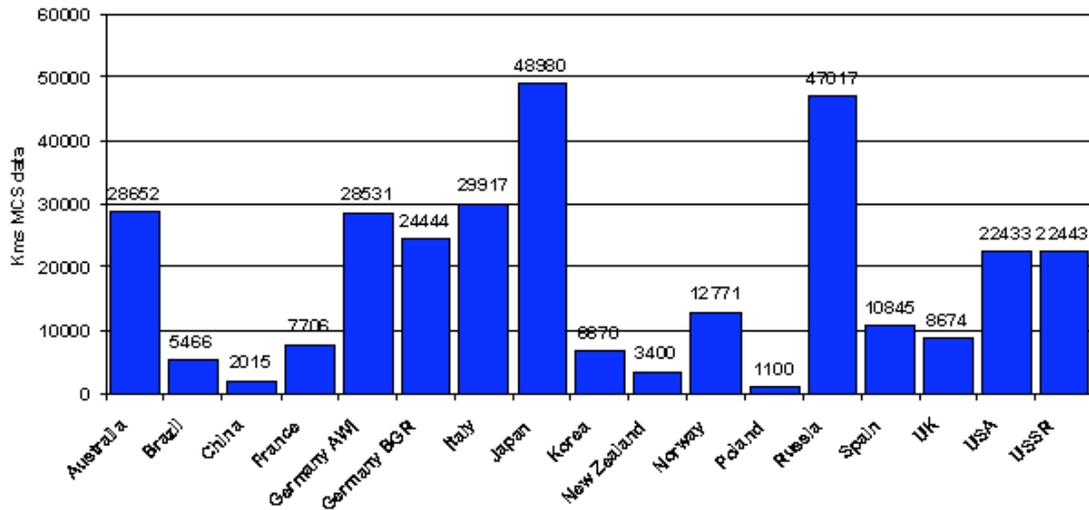


The SDLS receives all of its funds from the following sources, as shown in the diagram:

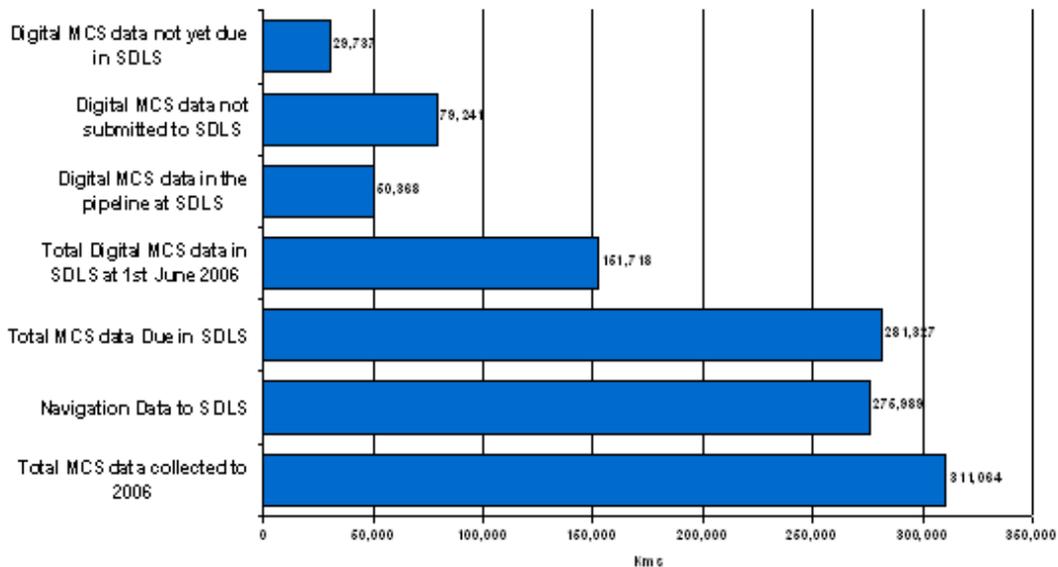
1. Data collecting groups, as outlined in SCAR Report #9 and its Addenda; These groups provide the principal funds needed for MCS data editing, quality control, and production of CD-ROMs/DVDs.
2. U.S.: NSF provides small funds for SDLS technical developments (e.g. website), SDLS management expenses (other than salary), and submission of MCS data collected by U.S. investigators. The USGS provides small funds for SDLS coordinator salary and SDLS technical developments.
3. Italy: PNRA provides funds for the development and maintenance of the SDLS web-site, SDLS coordinator expenses (other than salary) and submission of MCS data collected by Italian investigators. OGS provides funds for the SDLS coordinator's salary and SDLS technical developments.

Current SDLS data holdings:

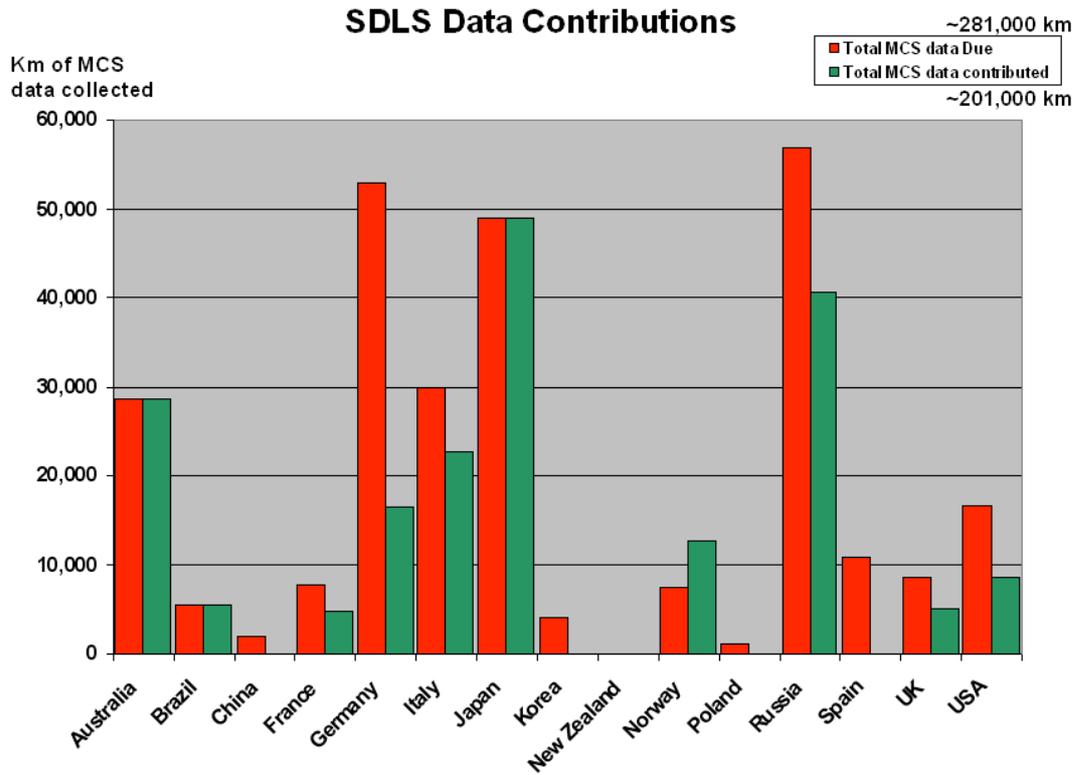
The SDLS website has a table (now under revision) that lists all known Antarctic MCS cruises. The breakdown of known MCS data by country is as follows:



The status of MCS data in the SDLS based on timelines of SCAR Report #9 is:



The comparison of MCS data contributed to the SDLS by each country versus data that are now due (i.e., over four years old) is as follows. For this diagram, the “data in the SDLS”(i.e., on CD-ROM/DVD) and “data in the pipeline”(i.e., at the SDLS but not yet on CD-ROM/DVD) have been combined.



Data submission pricing structure:

When a MCS data collector submits their data to the SDLS, the following is required before the CD-ROMs/DVDs can be made and then distributed to SDLS branches:

- Stack data in SEG-Y format
- Navigation data in UKOOA format
- General information (cruise report)
- Acquisition parameters
- Processing parameters
- List of publications using cruise data
- Appropriate funding

The last item “Appropriate funding” is determined based on the number of megabytes of data being submitted. On November 15, 2005, the SDLS Executive Committee approved a new pricing structure based on using DVDs (rather than CD-ROMs) to distribute MCS data to SDLS branches. The new pricing structure is given below:

SDLS DVD Pricing Structure

Approved by the SDLS Executive Committee on November 15, 2005

1 Survey / 1 DVD	US \$
0 < 1.5 Gbytes	\$5,000
1.5 - 3.0 Gbytes	\$6,250
> 3.0 Gbytes	\$7,500
1 Survey / Multiple DVDs	
1st DVD	\$7,500
Additional DVDs	
0 < 1.5 Gbytes	\$1,500
1.5 - 3.0 Gbytes	\$2,750
> 3.0 Gbytes	\$4,000
1 DVD / Multiple Surveys (Surveys < 1.5 Gbytes, Same Area)	
1st Survey	\$5,000
Additional Surveys	\$2,500
Multiple DVDs / multiple related cruises (i.e., a set of cruises in the same region, with homogenous data and all data submitted together)	
1st DVD	\$7,500
Additional DVDs	
0 < 1.5 Gbytes	\$1,500
1.5 - 3.0 Gbytes	\$2,750
> 3.0 Gbytes	\$4,000

The SDLS has been striving to reduce costs for MCS data collectors, and the new pricing structure will have large cost savings in most cases – the example below shows a cost savings of 70%:

Comparison of SDLS Pricing Structures

One Survey of 3.2 Gigabytes of seismic data:

Original CD costing: 5 CDs x \$ 5000 = \$ 25,000
SCAR Report #9

Revised CD costing: 1 CD x \$ 5000
SCAR Report #9 Addendum

4 CDs x \$ 1500 = \$ 11,000

DVD costing: 1 DVD = \$ 7,500
Nov. 15, 2005 revision

A Cost Reduction of 70 % !!

MCS FIELDS PROGRAMMES REVIEW

Data collectors or their appointed representatives from several countries gave brief summaries of recent and planned field operations. The following reports were given:

Howard Stagg (Australia): The MCS data from the extensive surveys of the East Antarctic margin that were conducted in 2001 and 2002 were submitted to the SDLS in November 2005 before the four year deadline. The navigation data for these cruises had been submitted in late 2003. The new MCS data have been used in 4 Ph.D. and 1 Honours degrees that are completed or underway within Australia and in other countries.

German Leitchenkov (Russia): Russia has completed several gridded surveys around the Antarctic margin as part of their ongoing Antarctic geologic and crustal mapping programme. In the coming year, they will conduct a survey off of Wilkes Land and then do a two-ship deep crustal experiment in Prydz Bay, in cooperation with Germany.

Yngve Kristoffersen (Norway): There are no recent MCS surveys or plans next year for such surveys. They are working to get all prior MCS data processed and into a format readable by the SDLS. Norway is working with Russia to submit ~8000 km of MCS data this year (before due).

Luiz Gamboa (Brazil): Brazil has not conducted MCS cruises in the Antarctic since 1978 and only plans to do high resolution single channel seismic work in cooperation with Spain in the coming year.

Stuart Henrys (New Zealand): They have recently collected MCS data in the Ross Sea region, and have collected MCS data onshore over ice. They have also collaborated with the U.S. in 2004 on collecting and processing the Palmer MCS data.

Jong Kuk Hong (Korea): They have multiple prior MCS cruises in the Antarctic Peninsula region since 1993. In 2008, they will have a new ice breaker and MCS system and will be seeking collaborators for MCS studies.

Tara Deen (U.K.): The U.K. has not collected Antarctic MCS data since the mid 1990's, and has no plans in the coming 5 years to collect such data.

Karstan Gohl (Germany): The BGR group has not collected MCS data since 1996, but the AWI group continues to do MCS work. They will cooperate with the Russians in Prydz Bay in March 2007 to conduct two-ship MCS studies.

Alan Cooper (USA): The U.S. has conducted two MCS cruises in 2003 and two in 2004 in the Ross Sea and has plans for an MCS cruise in 2007 and an MCS cruise in 2008. All cruises are on the M/V Palmer.

Nigel Wardell (Italy): The OGS Explora returned to the Antarctic in 2006 but, apart from a small amount of MCS data with a short (600 m streamer) in the Western Ross Sea, acquired primarily multibeam data. No acquisition is planned for the 2006/2007 season. OGS plans to acquire a 3000 m streamer to acquire MCS data in the 2007/2008 season, with projects and areas under discussion.

WEB-BASED SYSTEMS

Based on prior workshop discussions, the SDLS has been developing two new “dynamic” websites to soon replace the current “static” site. At the new websites, the trackline and MCS data can be interactively displayed, and the navigation and seismic data can be downloaded following the SDLS guidelines. The reasons for developing two websites are that they operate using different technologies. Both websites were demonstrated and discussed at the workshop. After the discussions, the following suggestions were made:

Following the website development phase, there will be only one website, hosted at OGS (Italy). This site would:

- have interactive and searchable trackline navigation (based on SVG graphics).
- have two operating modes: guest user and registered user. Each mode would allow different levels of access to the data. Anyone can register at no cost. The information provided during registration would be used exclusively for compiling statistics on website usage and would not be used to limit user access to the data. In guest mode, users can see what data are available with a fixed seismic image, but cannot zoom or modify the scales of the seismic image, or download data. Whereas, in the registered mode these options are enabled. The SDLS may shift to a single registered user mode in the future.
- provide access to digital navigation for all cruises shown at the website.
- provide access to digital MCS data older than 8 years in SEGY format and in CGM and/or TIFF formats, where available.
- NOT provide online access to MCS data collected less than 8 years ago.
- display MCS data in real time using user-specified parameters to recall the desired MCS data directly from the SEGY data, and provide screen plots.
- ask users to “accept” three professional courtesy conditions before the downloading of MCS data (older than 8 years) is permitted – two of these conditions are the same as requested at the U.S. Marine Geoscience Data Management System (<http://www.marine-geo.org/>). The three conditions are that the user agrees
 - to acknowledge the data collecting group in all publications or other uses of the downloaded data;
 - to acknowledge the SDLS website as the source from which the data were downloaded; and
 - to the greatest extent feasible and practicable, ask the data collector if they wish to be involved as a collaborator in the project that will use the data; This request provides a higher level of acknowledgment of intellectual property rights for the data collector, but does not permit the data collector to restrict access to the data.

MCS data from 4-8 years old at the website

Workshop participants discussed whether “thumbnail” images of MCS data collected between 4-8 years ago should be shown on the web, as a way to get researchers interested in going to SDLS branches to view the MCS sections. It was decided that additional study was needed of what resolution a “thumbnail” image should and could have if it were to be put on the website (i.e., what resolution would be used for the seismic images of the wide variety of trackline lengths). The topic would be discussed at the next SDLS workshop in September 2007 (or before by e-mail), and a decision would be made then.

Web address

Once the transition to the new website is made, the prior web address at USGS would be kept, with a forwarding link, until the major web search engines found the SDLS site and gave it high visibility. Currently, a Google search on “SDLS” puts the seismic library at either position 1 or 2 on the list, and it would be desirable to keep this position. In the future, the new website address for entry into the SDLS would be the generic www.scar-sdls.org.

SDLS BRANCHES

Currently SDLS branches are only hosted at research organisations that have collected Antarctic MCS data and have submitted their MCS data to the SDLS. Because there are no minimum amounts of data that must be submitted and there is a continuing need to promote and facilitate collaborative Antarctic research, especially to encourage young scientists, the topic of possibly opening SDLS branches at other institutions with active Antarctic research programmes was discussed. If an SDLS branch were to be opened at an institution that does not collect and submit MCS data to the SDLS, then that institution would be required to pay a setup fee and annual subscription fees to the SDLS for the privilege of hosting the branch. The funds raised would be used by the SDLS to cover expenses in providing the CD-ROMs/DVDs to that branch and for helping second- and third-world countries with costs of submitting MCS data to the SDLS, to benefit all SDLS users and be in accord with the general philosophy of SCAR.

There was some concern among MCS data collectors that groups and individuals in other countries that do not collect Antarctic MCS data may not fully understand and appreciate the sensitive issues surrounding the collaborative restricted uses of MCS data in SDLS branches and hence might not explicitly follow ATCM guidelines for data use and protecting intellectual property rights. It was suggested that restrictions be placed on which groups could host a library branch. However, it was noted that under the general operating philosophy of SCAR and the Treaty, if use guidelines are implemented (e.g., change in SDLS branch hosting) then these guidelines must equitably apply to all groups and countries. Because there were questions and uncertainties remaining, the issue was tabled until the next workshop. In the interim, further discussions can be held via e-mail.

SDLS IN SCAR: SCIENCE VERSUS DATA MANAGEMENT

It was reiterated in the workshop discussions that as originally envisioned, the SDLS is a research tool to promote and facilitate collaborative research. As such, workshop participants agreed that the SDLS is better housed under a science programme (now ACE) than under a data management group. The unique link of the SDLS within SCAR to the ATCM (via Recommendation XVI-12) in promoting collaborative research further emphasizes the research tool aspect of the SDLS.

DISCUSSION ITEMS

Hydroacoustics

Phil O'Brien reviewed the issues and report surrounding Antarctic hydroacoustics and potential environmental impacts. Phil noted that the SDLS is recognised as a helpful tool in mitigating risks because:

- the existence of the SDLS illustrates that the MCS community is organised and is taking steps to share information about MCS cruises and thereby helping to minimise duplication of data collection and reduced potential impacts;
- navigation data for MCS cruises will be available at the website to help investigators with cruise planning and help managers with risk assessments. The SDLS site is the only location where such information is readily accessible; and
- the SDLS is research-based and MCS scientists are actively involved in working with environmental groups to setup procedures to safely acquire seismic data in the Antarctic.

During the discussion, three additional items were identified that could further help scientists and managers with hydroacoustic assessments:

1. A pre-survey form for MCS cruises should be implemented so that information about the location of operating areas (and tracklines where possible) for upcoming cruises could be posted at the SDLS website for planning purposes.
2. The SDLS should ask MCS data collectors for additional detailed information on the parameters of the seismic sources used in their MCS surveys (e.g., gun sizes, array configuration, towing depths, etc.).
3. The SDLS should ask that start/end times of MCS tracklines be routinely provided with the navigation data. Such information would be helpful for required risk assessment studies.

Law of the Sea MCS Surveys

Recognising that several countries are collecting (and have collected) MCS data in support of potential Antarctic submissions under the Law of the Sea (LOS), a discussion was held on the potential benefits and detriments of such geopolitically-motivated MCS surveys to the science community.

- *Benefits:* The clear benefit of these MCS surveys is the acquisition of high-quality MCS data in largely unsurveyed regions. In the case of Australia's regionally extensive LOS surveys, the added benefit was that they submitted their complete data set to the SDLS (with the required funds) before the four-year deadline – in full compliance with ATCM Recommendation XVI-12.
- *Detriments:* Those that were identified for the LOS surveys are minor compared to the benefits. One detriment is that the location and orientation of MCS tracklines is set by geopolitical objective and not by science objectives. In the large unsurveyed areas of the Antarctic margin such data however give a "first look" at the geology. A further detriment is that LOS navigation and MCS may have added short-term restrictions (i.e., within 4 years of collection) placed on them, and thereby restrict their use in science planning, seismic risk assessment studies, research investigations and science publications. To date, this latter detriment is more speculative than real, and the benefits of LOS surveys to the overall Antarctic MCS science programme far outweigh the detriments.

DATA SUBMISSIONS TO THE SDLS

The heart of the SDLS is the willingness and ability of the data collectors to submit their data to the SDLS with the required funds within four years of the time of data collection. From the graph below that shows contributions of data that are now due at the SDLS

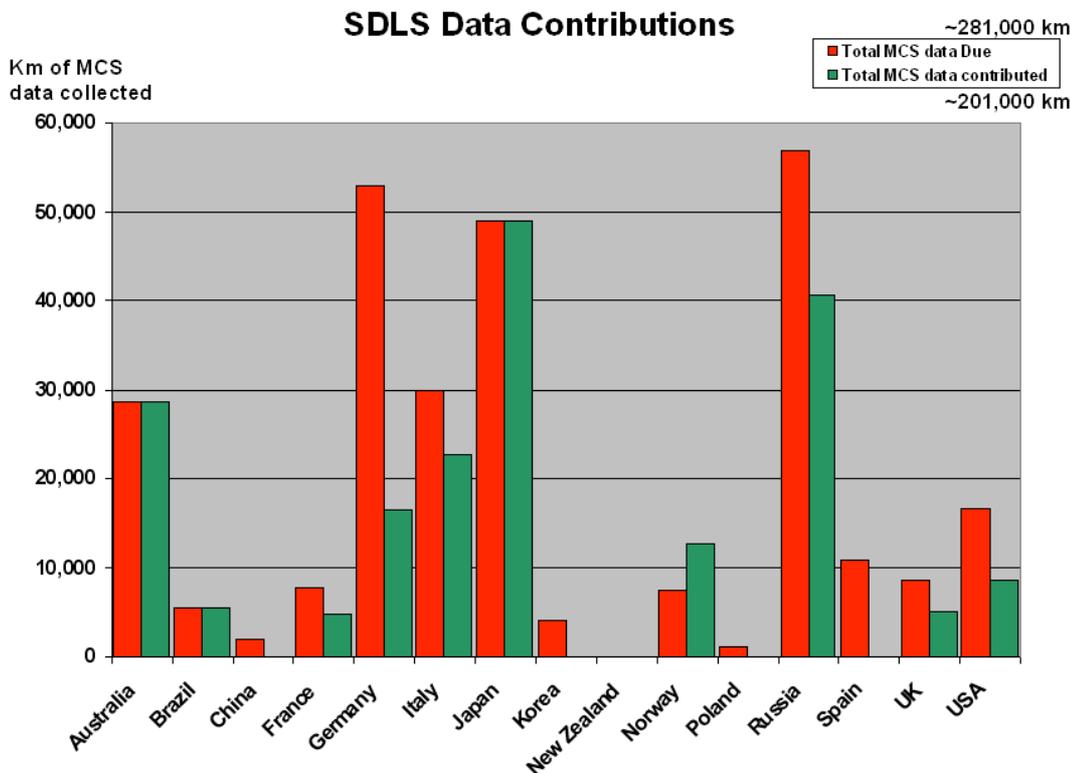
- one country (Norway) is in the process of submitting more MCS data than are now due.
- three countries have submitted all of their navigation and MCS data (e.g., Australia, Japan, Brazil);
- six countries have submitted part of their data; and
- four countries have not yet submitted any data.

Currently, ~201,000 km of MCS data have been submitted to the SDLS, but 80,000 km are overdue and are yet to be submitted.

It was noted that the most common reason cited for not submitting MCS data is that data collectors do not have the funds needed to submit the data. In the discussion it was also noted that part of this problem is because cruise proposals do not include requests for funds to submit data to the SDLS. MCS data commonly cost "millions" to acquire, process, and analyze but only a few "thousand" to submit to the the SDLS (i.e., ~one-tenth of a percent of the total cost to submit).

Informal recommendation

It was suggested in the discussions that for future cruise, MCS collectors include the costs of data submission to the SDLS in their proposals.



A proposal to give data collectors the option of making installment payments for their data submissions over a several year period was discussed. The proposal received strong negative comments because such an option is not a viable solution from a funding manager’s perspective and because cost is not always the real reason that MCS data are not submitted. Further, a question was asked as to why the SDLS currently does not have a larger percentage of the existing and now overdue MCS data, given the technological advances in data exchange protocols and hardware. It was noted that in view of the large difficulty of gaining access to some >4-year-old MCS data and recognizing the rapid rate of new MCS data collection, the overall input of data now into the SDLS is reasonably good and is improving. In several cases, specific steps are underway to encourage data collectors and institutions in the submission of their MCS data. One encouragement is adoption of the SDLS IPY goal outlined in the next paragraph. Another encouragement is the implementation of a new collaborative science project that requires the use of all existing MCS and other digital seismic data (see the workshop postscript below). The SDLS relies on the cooperation of all data collectors to ensure success.

The International Polar Year (IPY) with its focus on concerted collaborative efforts provides a opportunity for the SDLS to become an even more useful geoscience tool – by setting and achieving a goal of getting all delinquent MCS data (i.e., data older than 4 years from time of collection) into the SDLS before the end of IPY, which ends in March 2009. The MCS data once in the SDLS will foster and promote additional collaborative efforts. In support of this goal, discussions with individual MCS data collectors with overdue data are underway, to help set and facilitate, where possible, realistic processes by which their data can be submitted to the SDLS. The text of the SDLS’s goal for IPY is given in the summary section of this workshop report.

MATTERS ARISING

Submission of MCS data to the World Data Center (WDC)

Under SDLS guidelines, MCS data are to be sent to the WDC or other archive eight years after data are collected, for general dissemination. With one exception, data collectors do not have other national archives to disseminate their Antarctic MCS data in lieu of the WDC. Such archives also tabulate who is requesting data. Now that the SDLS will soon provide downloading capability to registered users at the SDLS website, MCS data collectors felt that the SDLS could be the archive (in lieu of the WDC) at which Antarctic MCS data could be disseminated. By doing such, users would gain unrestricted access to the data while being reminded of proper data citations and being invited to collaborate on Antarctic science projects with the data collectors. Such reminders and opportunities are not provided at WDC. Hence, it was suggested that the WDC cite or direct users to the SDLS website, for access to Antarctic MCS data. In this case, CD-ROMs and DVDs would henceforth not be sent to the WDC.

Use of MCS data in the SDLS

It was noted that the large existing MCS database from around the Antarctic now provides further incentive and opportunity to put forward proposals for scientific drilling of the Antarctic continental margin. Such drilling is needed to provide age control and stratigraphic information for use in compiling paleobathymetric maps, which in turn are needed for paleoclimate reconstructions. A recommendation was prepared to emphasize this point – see the summary section of this report for the text of the recommendation.

Including SCS data in the SDLS

The question was raised – should single channel seismic reflection data (SCS) be included in the SDLS. These data are equally useful in many regional paleoclimate and tectonic studies, and there currently is no easy way to access these data. It was noted that the same question was asked when the SDLS was initiated and at later SDLS workshops. The answer has previously been that SCS should not be in the SDLS because:

- there is a massive volume of such data;
- the data come in many formats and resolutions;
- the SDLS has very limited staff;
- the costs associated with quality control and likely reformatting would be large; and
- there is technically another repository for these data at the World Data Center.

Because there is a specific need for SCS data (RossMap project) and there may be a need of other SCS data in compiling paleobathymetry maps as part of the ACE programme, Stuart Henrys (New Zealand) agreed to do a feasibility study on what would be required to incorporate SCS data into the SDLS. He will report the findings at the next SDLS workshop.

Including onshore and ice-shelf MCS data in the SDLS

Several MCS lines have been recorded onshore and over ice shelves in the Antarctic. It was suggested that these data be included in the SDLS. Similar discussions have been held on this topic at past SDLS workshops and previously the decision was to not include the data due to the extra work and cost of including them. In recognition of the additional efforts being taken in IPY to ensure that seismic data are preserved and used for collaborative studies, and in view of the small amount of existing data (i.e., all such profiles might fit onto one DVD), it was agreed that these data should be included in the SDLS. MCS collectors who have acquired these data were requested to submit details of their datasets to the SDLS coordinators so that the best submission procedure can be identified for the inclusion of these types of data in the SDLS.

Navigation data for MCS cruises

At the Potsdam workshop, it was agreed that the digital navigation data for MCS cruises should be displayed at the SDLS website. Since that time, the navigation data for nearly 90% of all existing MCS cruises have been submitted to the SDLS, and we have promises from investigators for the outstanding navigation data. Because the SDLS has received requests for all digital navigation data for use in risk assessment studies and cruise planning, it was suggested that navigation data routinely be made available for download at the SDLS site. There were no reasons presented not to do this, and participants agreed to the download of navigation data. See the summary section of this report for the text of the agreement.

Field data from MCS cruises

Reprocessing of seismic data from original field tapes is of interest to some investigators to improve stack data now in the SDLS. This is also a way for researchers to get involved in collaborative research projects with data collectors. To promote reprocessing, it was suggested that additional information about the existence (and availability and condition) of the original field data be included in the cruise table. Such metadata are not readily available from other sources. A collective decision was not made on this suggestion, and for the moment, it was left up to data collectors to submit this information if they wished. If provided, the information would be added to the SDLS website.

SUMMARY OF WORKSHOP AGREEMENTS

The workshop concluded with the following consensus agreements, with the most important being the SDLS Goal for IPY, which runs from March 2007 to March 2009:

SDLS Goal for IPY

In the spirit of Antarctic Treaty Article III and ATCM Recommendation XVI-12, the SDLS seeks to have all Antarctic multichannel seismic reflection data collected more than four years ago [i.e., collected before 2005] submitted to the SDLS before the end of IPY, to further enhance, facilitate and promote cooperative geoscience research efforts in offshore Antarctic regions. The goal is realistic and achievable with the concerted help of the Antarctic MCS community.

The text in brackets was added for clarification after the workshop.

Navigation for MCS cruise

Workshop participants reaffirm the consensus agreement of the 2003 SDLS Workshop (Potsdam) that navigation data for every MCS cruise should be sent to the SDLS immediately after the cruise. These data will be posted at the SDLS website and can be downloaded and used for cruise planning and other projects beneficial to the science community.

Science use of MCS data

A vast amount of MCS data on the Antarctic margin are now available at the SDLS. The workshop participants urge that these data be actively promoted and used by the scientific community for drilling proposals and other collaborative research projects.

In addition, the following items were agreed to during the workshop discussions. These items are described in more detail above and are repeated here for clarity.

SDLS in SCAR: The SDLS as a research tool remain under the ACE science programme.

Funding for submitting data to SDLS: For future MCS cruises, data collectors should include the costs of MCS data submission to the SDLS in their funding proposals for the science programme.

SDLS Website: The current “static” website will be replaced with one “dynamic” website at which MCS data older than 8 years will be made available to registered website users for display and download. However, data younger than 8 years will not be available at the website and must be accessed via SDLS library branches. The future “dynamic” website will have the entry address of www.scar-sdls.org and will be hosted at OGS (Italy).

SCS data in the SDLS: Stuart Henrys (NZ) will do a feasibility study on possibly including SCS data in the SDLS. He will report findings at the next SDLS workshop.

Onshore and ice-shelf MCS data in the SDLS: These data may now be included in the SDLS.

The next SDLS workshop will be in Santa Barbara, California in late August, 2007 in conjunction with the Tenth International Symposium on Antarctic Earth Sciences.

POSTSCRIPTS

Report and recommendation to SCAR

Two days after the workshop, Alan Cooper gave a talk at the SCAR SSG Geosciences plenary session summarizing the highlights of the SDLS workshop. A recommendation was submitted by the SDLS and approved by the plenary for action by SCAR delegates. The text of the approved recommendation is:

Recommendation: SCAR delegates work with their national Antarctic programme managers and MCS data collectors to ensure that all multichannel seismic reflection data collected by their country are submitted to the SDLS according to the timelines outlined in ATCM Recommendation XVI-12, to ensure that all MCS data collected more than 4 years ago [i.e., collected before 2005] are received at the SDLS before the end of IPY.

The text in brackets was added for clarification after the plenary session. IPY runs from March 2007 to March 2009.

A new science project within ACE

A few days after the SDLS workshop, science discussions at the SCAR Open Science Conference led to a proposal being made for a new science project, within the ACE programme, that will extensively use all available MCS data from the SDLS. The project, titled “Paleo-stratigraphy and –bathymetry of the Antarctic Continental Margin” will use modern digital stratigraphic mapping tools to create a unified circum-Antarctic paleostratigraphic model and paleobathymetry maps based on all existing MCS data, digital SCS data, and drilling/coring data. A copy of the project summary is available upon request from Alan Cooper (acooper@usgs.gov) or Fred Davey (F.Davey@gns.cri.nz), who are currently organising the project.

Appendix A: Agenda and participant list for the 2003 Potsdam SDLS workshop

Agenda

Introductions

SDLS review

MCS field programme review

SDLS future directions

- Policies and procedures
- New web-based system

---Break---

MCS data collector issues/suggestions

MCS data submissions

SDLS matters arising

Discussion items

- The effect of hydroacoustics on marine life and consequences for future seismic work in Antarctic waters.
- Other]

Participants

Name	e-mail	Country
John Behrendt	John.Behrendt@colorado.edu	USA
Giuliano Brancolini	gbrancolini@ogs.trieste.it	Italy
Steve Cande	scande@ucsd.edu	USA
Jon Childs*	jchilds@usgs.gov	USA
Alan Cooper**	acooper@usgs.gov	USA
Paulo Diviaco	pdiviaco@ogs.trieste.it	Italy
Karsten Gohl	kgohl@awi-bremerhaven.de	Germany
Young-keun Jin	ykjin@kordi.re.kr	Korea
Yngve Kristoffersen	yngve.kristoffersen@ifff.uib.no	Norway
German Leitchenkov	german_leitchenkov@hotmail.com	Russia
Andres Maldonado	amaldona@ugr.es	Spain
Hideki Miura	miura@nipr.ac.jp	Japan
Yoshifumi Nogi	nogi@nipr.ac.jp	Japan
Phil O'Brien	Phil.O'Brien@ga.gov.au	Australia
Javier H. Rolina	jjhernan@uuigo.es	Spain
Howard Stagg	Howard.Stagg@ga.gov.au	Australia
Nigel Wardell*	nwardell@ogs.trieste.it	Italy
Ho-ill Yoon	hiyoon@kordi.re.kr	Korea

* SDLS Coordinator

** SDLS workshop convener and chair, SDLS Executive Committee

Appendix B: Agenda and participant list for the 2006 Hobart SDLS workshop

Agenda

Welcome and workshop objectives

SDLS review

Highlights of Potsdam SDLS workshop: September 2003

SDLS Current Status

MCS field programme review

SDLS future directions

- New web-based systems: OGS and USGS
- Policies, procedures, and proposals:
 - Cost structure for DVDs and CD-ROMs
 - Variable payment plans
 - New policy on SDLS branches and usage
 - SDLS in the overall SCAR structure: science vs data management

MCS discussion items

- The effect of hydroacoustics on marine life and consequences for future seismic work in Antarctic waters. (Led by Phil O'Brien)
- LOS surveys – their impacts on Antarctic marine science programmes.
- MCS data submissions

MCS data collector issues/suggestions

SDLS matters arising

Consensus statements

- SDLS goal for IPY
- Reaffirmation of Potsdam agreements on navigation and SDLS activities

Participants

<u>Name</u>	<u>e-mail</u>	<u>Country</u>
John Behrendt	John.Behrendt@colorado.edu	USA
Scott Borg	sborg@nsf.gov	USA
Alan Cooper**	Acooper@usgs.gov	USA
Fred Davey	F.Davey@gns.cri.nz	New Zealand
Tara Deen	TDE@bas.ac.uk	U.K.
Karsten Gohl	kgohl@awi-bremerhaven.de	Germany
Luiz Gamboa	gamboa@petrobras.com.br	Brazil
Stuart Henrys	S.Henrys@gns.cri.nz	New Zealand
Jong Kuk Hong	jkhong@kopri.re.kr	Korea
Yngve Kristoffersen	yngve.kristoffersen@ifff.uib.no	Norway
German Leitchenkov	german_leitchenkov@hotmail.com	Russia
Jerry Mullins	jmullins@usgs.gov	USA
Yoshifumi Nogi	nogi@nipr.ac.jp	Japan
Phil O'Brien	Phil.O'Brien@ga.gov.au	Australia
Ross Powell	ross@geol.niu.edu	USA
Frank Rack	?frack@mail.brook.edu	USA
Howard Stagg	Howard.Stagg@ga.gov.au	Australia
Tom Wagner	twagner@nsf.gov	USA
Nigel Wardell*	nwardell@ogs.trieste.it	Italy
Terry Wilson	twilson@mps.ohio-state.edu	USA

* SDLS Coordinator

** SDLS workshop convener and chair, SDLS Executive Committee