Programma Nazionale di Ricerche in Antartide (PNRA)

Final project report

Project ID	2004/3.06
Title	WANDA (Web-based Antarctic Seismic Data Archive)
Principal investigator	Nigel Wardell
Institution	Istituto Nazionale di Oceanografia e di Geofisica Sperimentale - OGS
Email	nwardell@ogs.trieste.it
Duration	3 years
Assigned funding	75.000,00 Euro

Activities and results

The aims of this project were more technological than scientific; to make available to the scientific community the great quantity of seismic reflection data acquired in Antarctica in the last 30 years. The project was sub-divided into three main parts: the recovery and archiving of field data; the distribution of stack data on DVD/CD-ROM in the framework of the SDLS initiative; the creation of a relational database, implementing new web technologies, to allow easy dynamic access to the data via a simple web browser.
Between 1987 and 2002, during the PNRA campaigns, OGS acquired over 38,000 km (more than 8,000 field tapes) of seismic reflection data in the Antarctic. Recovery and conservation of these data had already started in the PNRA project RECONDAS (PEA 2002-3). The remaining one third of these data was transcribed from the original field format on ½ inch, 9-track tapes to trace sequential SEG-Y format on 3480/90 cartridges, permitting more efficient storage of the data and guaranteeing the conservation of the data for re-processing in future research projects.
More than 350,000 km of MCS (Multichannel Seismic) data have been acquired by the various national Antarctic research programmes over the last 30 years. The SDLS (Seismic Data Library System for cooperative research) was established in 1991 under the auspices of SCAR and the ACTM to collect and distribute digital stack sections of these data to 13 Library Branches worldwide. In the current project, 115,000 km of MCS data have been collected and distributed on CD-ROM and the higher capacity DVD. At the end of the project, 70% (228,000 km) of the total MCS data acquired in Antarctica by the individual national research programmes had been made available to the larger scientific community.
A prototype web portal to disseminate digital seismic data had already been developed. New web technologies were implemented to create maps and seismic images dynamically using the open source software GMT and Seismic Unix (SU). The static raster images of the original graphic user interface were changed to use SVG (Scalable Vector Graphics) to allow the user to display the seismic more interactively. Clicking the seismic line on the map directly displays the associated seismic image. SVG objects are scalable and permit zoom and pan functions without loss of resolution which facilitates the identification of individual lines in areas of a high concentration of data.
The structure of the web portal has been used to implement the website for the SDLS where 130,000 km of MCS data have been loaded, allowing the scientific community direct access to these data via the internet. The URL for the site is: http://www.scar-sdls.org which is linked to the actual site hosted at OGS. The seismic data on the site are openly viewable as a guest, but advanced features such as zooming sections, and downloading seismic or navigation data are only available after registration.

Products

A – papers in scientific magazines

1. **Diviacco P.**, "An open source, web based, simple solution for seismic data dissemination and collaborative research", Computers and Geosciences Vol 31/5 pp 599-605.

B – book chapters

--

C - proceedings of international conferences

1. **Wardell N.**, Diviacco P., 2004, "A Web-based Interactive Seismic Database", Frontiers and Opportunities in Antarctic Geosciences, Siena.
2. **Diviacco P.**, 'Snap: A web based Open Source solution for collaborative research in seismic data analysis.', International Marine Data and Information Systems (IMDIS) Conference, Brest, May 2005
3. **Diviacco P.**, 'Snap: A web based Open Source solution for collaborative research in seismic data analysis.', 67th EAGE Conference & Exhibition, Madrid, June 2005
4. **Wardell N.,** Childs J., Cooper A., Diviacco P., The Antarctic Seismic Data Library System for Cooperative Research (SDLS). SCAR Open Science Conference, SCAR XXIX/COMNAP XVIII 2006, Hobart, Tasmania, 12-14th July 2006
5. **Cooper, A. K.**, and N. Wardell (2006), Report on the Workshop for the Antarctic Seismic Data Library System for Cooperative Research (SDLS), Hobart, Australia, July 9, 2006, SCAR Report 28,
6. **Wardell, N,** J. R. Childs, and A. K. Cooper, "Advances through collaboration: Sharing seismic reflection data via the Antarctic Seismic Data Library System for Cooperative Research (SDLS), in Antarctica: A Keystone in a Changing World" – Online Proceedings of the 10th ISAES, edited by A. K. Cooper and C. R. Raymond et al., USGS Open-File Report 2007.
7. **Wardell, N.,** Childs J.R., Cooper A.K., Diviacco P., "Advances through collaboration: Sharing seismic reflection data via the Antarctic Seismic Data Library System for Cooperative Research (SDLS). XXX SCAR St.Petersburg, Russia 2008
8. **Cooper A.K.**, Wardell N., O'Brien P., Breitzke M, Childs J.R., " The Antarctic Seismic Data Library System for Cooperative Research (SDLS): New research projects for IGY and beyond", XXX SCAR OSC St. Petersburg, Russia 2008

D – proceedings of national meetings and conferences

--

E – thematic maps

--

F – patents, prototypes and data bases

1. The Antarctic Seismic Data Library System for Cooperative Research (SDLS)
2. SDLS Website (http://www.scar-sdls.org)

G – exhibits, organization of conferences, editing and similar

1. **Wardell N.**, Co-convenor, Workshop for the Antarctic Seismic Data Library System for Cooperative Research (SDLS), SCAR XXIX/COMNAP XVIII 2006, Hobart, Tasmania, Australia, July 9, 2006,
2. **Wardell N.** Co-Convenor Workshop 'Antarctic Seismic Data Library - SDLS', during the 10° ISAES, Santa Barbara, 26 August 2007.

H - formation (PhD thesis, research fellowships, etc.)

--

Research units

Date: 7/2/2011

Notes