

Seabed mapping in Antarctica

Many of Geoscience Australia's offshore surveys have demonstrated the value of integrated data sets in understanding the marine environment. This approach was applied to a survey in Antarctic waters which carried out multibeam bathymetry, video and sampling programs in the coastal waters of the Vestfold Hills, near the Australian station of Davis. The survey, which was a joint project with the Australian Antarctic Division and the Royal Australian Navy, was carried out during the summer of 2009–10.

The Vestfold Hills are an ice-free area of about 400 square kilometres on the coast of East Antarctica. They are composed of low hills of Precambrian basement up to 160 metres high separated by valleys, with a coastline of numerous small islands and shallow bays and fjords extending inland. The area is home to many penguin breeding colonies and its beaches are favoured as summer moulting sites by elephant seals. The shallow coastal waters support a seabed community different to those on the open Antarctic continental shelf. The lakes, fjords and landforms of the Vestfold Hills have also been studied to understand the interaction of sea level change and changes in the adjacent ice sheet.

The survey area also includes the Australian station at Davis. To date, only the area immediately off Davis, used by ships resupplying the station, has been charted. Therefore, the joint project aimed to provide a picture of seafloor topography and character to support studies of the sea floor habitats and develop an understanding of

the history of sedimentation and erosion in the area. These studies are also contributing to an assessment of any possible impact of the station at Davis; in particular whether effluent discharge from the station is having a measurable effect.

Geoscience Australia provided its Simrad EM 3002 multibeam echo sounder and underwater video camera which were mounted on the AAD's 8 metre long workboat *Howard Burton*. The bathymetric data were processed for sea floor character by Geoscience Australia and for hydrographic purposes by the Royal Australian Navy's Deployable Geospatial Survey Team. The Australian Antarctic Division conducted an extensive diving program, visiting 30 sites in the area where sediment and biological samples were collected and still photos of the sea floor taken to provide detailed point samples of the seabed environment.

Geoscience Australia's multibeam survey covered an area of 45 square kilometres and provides a picture of the sea floor based on at least one depth measurement every 40 centimetres. These data reveal a submarine landscape similar to that on shore but with basin areas accumulating sediment and abundant iceberg scours (figure 1). The data are of such high resolution that typical features of bedrock outcrops such as joints and resistant dykes can be seen. Some land areas of the Vestfold Hills are strewn with boulders. Adjacent areas offshore

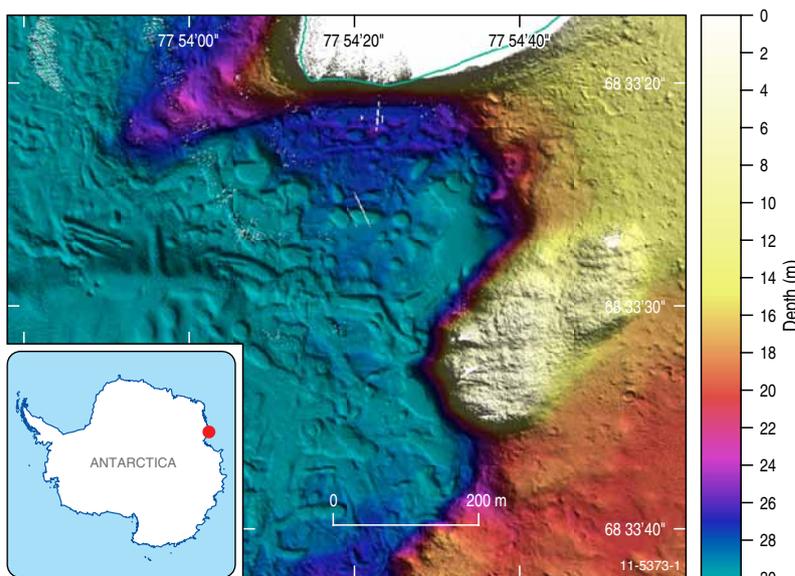


Figure 1. Selected multibeam imagery of the sea floor in Davis Harbour. In the east is a relatively shallow sediment-covered plain (about 10 to 20 metres water depth), with a bedrock high (rising to one to two metres depth). The plain is strewn with boulders, probably representing moraine debris. To the west is a steep drop-off (about 25 to 30 metres depth) to a sediment-covered plain characterised by large irregular scours and gouges probably caused by iceberg movements. Bluff Island is the white at the top of the image.

also show a speckled appearance indicating the boulder fields continue beyond the shore. Ice keel scours are abundant ranging from enclosed, rounded wallow marks 20 metres across through to meandering tracks. The predominant direction of larger scours is north to south and NNW to SSE, probably reflecting oceanic circulation in Prydz Bay which drives the icebergs.

Initial comparisons of the biological samples with the multibeam data shows the potential to predict the dominant biological communities across an area. Hard substrates are dominated by algae (*Himantothalpus* and *Iridea*) whereas sediment-covered areas are mostly inhabited by invertebrates such as sea pens and burrowing bivalves (*Laternula sp.*). Patches of algae are present in sediment covered areas but it is less widespread and may be displaced. Mobile invertebrates such as holothurians, echinoderms and nemertean are common in sediment areas.

For more information

email ausgeomail@ga.gov.au

New National Elevation Data Framework Portal

Digital elevation data which describes Australia's landforms and seabed is crucial for addressing the impacts of climate change, supporting emergency management and ensuring water security as well as environmental management, urban planning and infrastructure design.

The National Elevation Data Framework Portal (NEDF Portal) is a new online facility which provides users with access to existing elevation data holdings and metadata. The Portal has been developed to serve as a 'Virtual Data Repository' and is progressively being populated with data and links to national, state, local and commercial data custodians. It will also significantly improve the management and maintenance of elevation and related data within Geoscience Australia and across all levels of government.

The National Elevation Data Framework vision is to ensure that decision makers and the community have access to the best available elevation data. The mission of the NEDF is to optimise investment and access to existing and future data collections and ensure this investment supports policy and operational needs at national, state/territory and local levels.

The NEDF is hosted by Geoscience Australia. The development of the NEDF was coordinated by ANZLIC—the Spatial Information Council, the Australian Government Department of Climate Change and Energy Efficiency, the Cooperative Research Centre for Spatial Information and Geoscience Australia in partnership with federal state/territory and local government agencies and industry.

The NEDF will benefit the public sector at federal, state and local level as well as the private sector by:

- enhancing access to information across all levels of government, industry, academia and the community
- minimising duplication of effort
- increasing the utility of data by developing and promoting flexible standards that meet the needs of users and providers and 'future proof' the investment in data
- promoting industry development through the coordination of acquisition programs, adoption of standards, partnerships and development of appropriate licensing arrangements
- influencing the development of national and international capacity to mitigate and adapt to the impacts of climate change.

For more information

email elevation@ga.gov.au

Related websites/articles

National Elevation Data Framework
www.ga.gov.au/topographic-mapping/digital-elevation-data.html

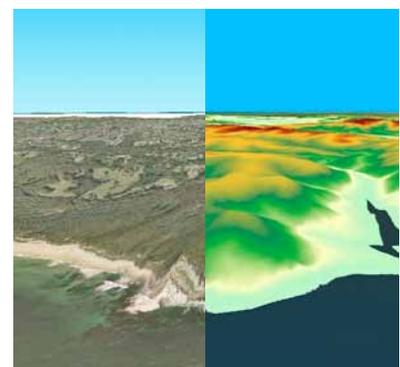


Figure 1. An example of digital elevation model data representation of elevation points, streamlines, cliff lines and water bodies.

Stratigraphic units database update

The Australian Stratigraphic Units Database (ASUD) has been the authoritative repository of all stratigraphic unit descriptions in Australia since 1949. The ASUD contains the names plus summary descriptions of almost 15 000 geological units which are currently approved for use in Australia. The database also includes a record of another 30 000 unit names which are obsolete, superseded, or have been erroneously published in the geological literature. Users of the database can track the history of a particular geologic unit name as well as find references to geological units in the geological literature and maps.

The database is available online and is free of charge. Users can browse the database and retrieve descriptive reports of geological units by using the Stratigraphic Search tool at the ASUD website. Following a recent upgrade, the reports now graphically display the location of a unit within a stratigraphic hierarchy (such as group, subgroup, formation) or chemical hierarchy (such as supersuite, suite), and its relationship to surrounding units. The online reports also contain hyperlinks to any available descriptions of geological provinces in which the unit occurs and/or formal unit definition data.

New feature

The ASUD website now includes a facility to download lists of all geological units within a particular state or territory (figure 1). The new lists comprise both current and non-current (that is, superseded or obsolete) geological units. The state/territory lists come in packages of several spreadsheets containing information about age and lithological description, published references and maps, related units, and formal definition data where available. These new state/territory lists are updated daily.

New website URLs

Users of the ASUD may need to update their bookmarks for some ASUD web pages as the URLs may have changed as a result of a recent website redevelopment at Geoscience Australia. The ASUD homepage includes links to the Whole State Lists and the online search tool, as well as the Australian Stratigraphy Commission and other useful stratigraphic links (see below).

Stratigraphic Unit Data by State/Territory

Display Stratigraphic Unit Summary Data by State/Territory

1. Choose states and territories from the list	2. Choose "Current unit names" or "Names not current"	3. Click Display Summary Results
<ul style="list-style-type: none"> Antarctica Australian Capital Territory New South Wales Northern Territory Offshore and islands Queensland South Australia Tasmania Victoria Western Australia <p style="font-size: small;">(Use Ctrl key to select more than one)</p>	<div style="border: 1px solid gray; padding: 2px;"> Current unit names Names not current </div>	<div style="border: 1px solid gray; padding: 5px; width: 100px; margin: 0 auto;"> Display Summary Results </div>

Download Stratigraphic Unit Data by State/Territory

Current Stratigraphic Units	Not Current Stratigraphic Units
<ul style="list-style-type: none"> • Antarctica • Australian Capital Territory • New South Wales • Northern Territory • Offshore and islands • Queensland • South Australia • Tasmania • Victoria • Western Australia 	<ul style="list-style-type: none"> • Antarctica • Australian Capital Territory • New South Wales • Northern Territory • Offshore and islands • Queensland • South Australia • Tasmania • Victoria • Western Australia

Note: right-click link and choose "Save ... As" to download the file.

Figure 1. Users can now download geological units for a whole state or territory.

For more information

email stratnames@ga.gov.au

Related websites/articles

Australian Stratigraphic Units Database home page

www.ga.gov.au/products-services/data-applications/reference-databases/stratigraphic-units.html

Stratigraphic Unit Definition forms

www.ga.gov.au/products-services/data-applications/reference-databases/stratigraphic-units/unit-definition-form.html

Update on 34th International Geological Congress—AUSTRALIA 2012

Australia, on behalf of the Oceania region, is hosting the 34th International Geological Congress (IGC) in Brisbane from 5 to 10 August 2012. The Congress is being held at the Brisbane Convention and Exhibition Centre.

The 34th IGC will feature a wide-ranging scientific program as well as field trips, a large exhibition, training workshops and an education and outreach program. The Congress will also be the venue for the 2012 meetings of the International Union of Geological Sciences' Commissions, Task Groups and Joint Programs. The 34th IGC will also incorporate the 2nd Young Earth Scientists (YES) Roundtable and has the benefit of UNESCO patronage.

The International Union of Geological Sciences is the scientific sponsor and Vale, the world's second largest mining company, is a major sponsor and geohost sponsor. The Australian Agency for International Development (AusAID) will also be providing support.

Scientific Program

The overall theme for the Congress is 'Unearthing our Past and Future—Resourcing Tomorrow' which recognises the crucial contributions of the geosciences in meeting societal needs and sustaining planet Earth. There will be approximately 210 Symposia under 36 Themes covering all facets of the geosciences. Details are included in the Second Circular, which was recently released, and can be accessed through the Congress website.

The program, which emphasises future mineral and energy supplies, is underpinned by Australia's experience in developing a strong and sustainable mineral and energy resources sector. Other major themes include climate change and its impacts on natural resource management and communities, and understanding and mitigating geohazards. The most advanced element of the program will be a geoscience information 'supersession' covering a range of topics from OneGeology (the online world geological map) to data standards.

Summaries of each Symposium are included on the Congress website and Communicating Convenors and most co-Convenors have now been appointed. Abstracts for the oral and poster presentations are now invited. Although full papers will not be published by the Congress, the symposium convenors may elect to arrange publication of papers presented during their symposia.

Field trips

The 34th IGC is planning more than 30 pre- and post-Congress field trips which will offer diverse opportunities to experience the fascinating geology of the region. These field visits will include all Australian states and the Northern Territory. In addition, field trips



to New Zealand, Malaysia, and New Caledonia and Papua New Guinea are being planned. There will also be a range of one-day tours available during the conference. Details of proposed field trips are also available through the Congress website.

Workshops

Workshop topics include sustainable mining, carbon sequestration, geohazards and groundwater. The Workshops held in conjunction with the IGC will be of two types: Professional fee-based workshops and training which will reflect Australian and New Zealand international assistance objectives and training workshops designed for participants from developing countries. Geoscience Australia is playing a key role in securing funding for and organising these workshops as well as contributing to them.

Congress registration

A Super Early Bird registration, aimed particularly at international delegates, will be available until the end of August 2011. A bulk rate of \$A850.00 per head applies to a minimum purchase of three registrations;



in brief

names of delegates can be confirmed until May 2012. Super Early Bird registration is also available to individuals at \$895.00. Readers who wish to register for the Congress or wish to receive regular updates by email can do so through the Congress website.

For more information

email ausgeomail@ga.gov.au
visit www.34igc.org

