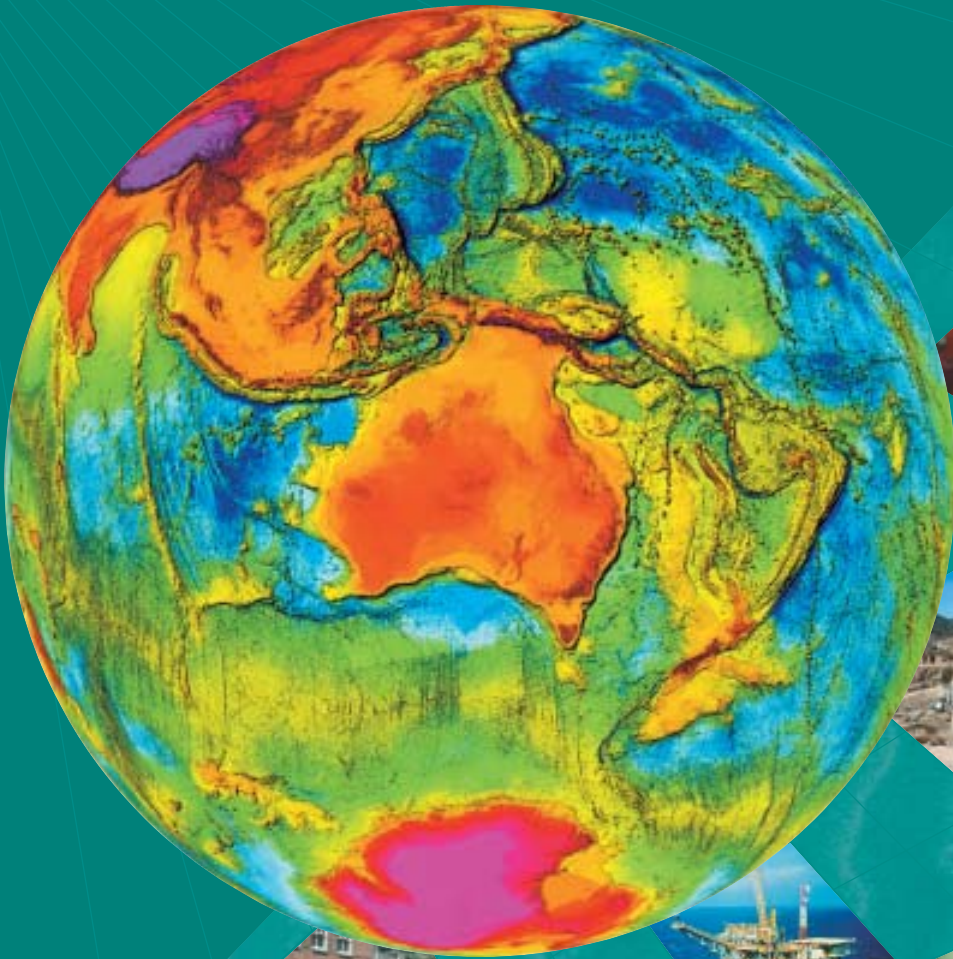


Work Program

2001 – 2002



AGSO – Geoscience Australia

Work Program

2001 – 2002

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A message from the CEO



A major challenge for society in the 21st Century will be the management of the impacts of human activities on the natural environment while maintaining access to the resources that underpin our modern lifestyles.

Geoscience is one of the major disciplines required to understand and manage these issues. Irrespective of whether the resources we consume are grown or dug up, the sustainability of consumption that supports our society rests firmly on a geological foundation. Similarly the quality of natural and built environments, and the impacts of human activity on these environments, also revolve around the same geological foundation, as does our understanding of the risks that geological hazards pose to our lives and our investments in property and agricultural lands.

This year sees our organisation “re-branded” as AGSO – Geoscience Australia. This name is a much better reflection of the scope of our work. For some time now we have been much more than a national geological survey. The broader scope is also reflected in our three new output groups: • geoscience for urban centres; • geoscience for oceans and coasts; and • geoscience for regional and rural areas.

As the national geoscience research and information agency, our challenge is to provide the geoscience input to the Government’s management decisions relating to our mineral and energy resources, our quality of life, our biological diversity, our soil and water quality and quantity, our marine zone and its resources, and our air quality.

We are uniquely placed to meet the challenge by providing at the continental to regional scales an understanding of Australia’s geological frameworks so that the necessary inputs to management decisions are provided in the context of the overall Earth system.

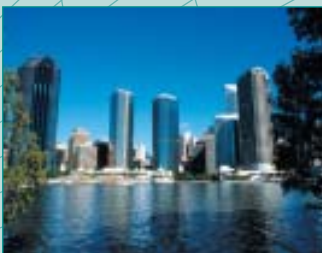
We will ensure that knowledge developed in individual projects is synthesised across the organisation to provide a better understanding of overall Earth systems. This information will be included in science forums, conferences and specific task forces. We have an integrated information management plan to facilitate access to our data and information for our clients and stakeholders. The data we acquire and the knowledge we develop should have application to a broad range of issues and be useful to many Australians.

We will then understand the on-going mineral, oil and gas prospectivity of Australia and the risks posed to communities, at the same time bringing our knowledge to bear on our understanding of the Earth as the overall support system. Then we can address a wider range of human and community impact issues through a risk-management approach.

Geoscience Australia already has strong partnering arrangements with a wide range of agencies. We will expand this network to ensure that our work is complementary to that of others and provides the contextual geoscience framework. While many of our on-going projects continue, we will also create specific task forces to investigate the effectiveness of new opportunities in urban development, transport, tourism, and the environment.

All in all I believe the year ahead will be an exciting and challenging one for Geoscience Australia.

Neil Williams
August 2001



Geoscience Australia is the national geoscience research and information agency. Our geoscientific research and information contributes to enhanced economic, social and environmental benefits to the community by informing decisions which impact upon resource use, management of the environment, and the safety and wellbeing of Australians.

Beneath this broad corporate outcome and output, we have in place a hierarchy of more specific outcomes and outputs. This hierarchy provides a link between the corporate level and the many projects that Geoscience Australia undertakes each year and the specific products and services that we deliver.

At the intermediate level (level 2), our planned outcomes are:

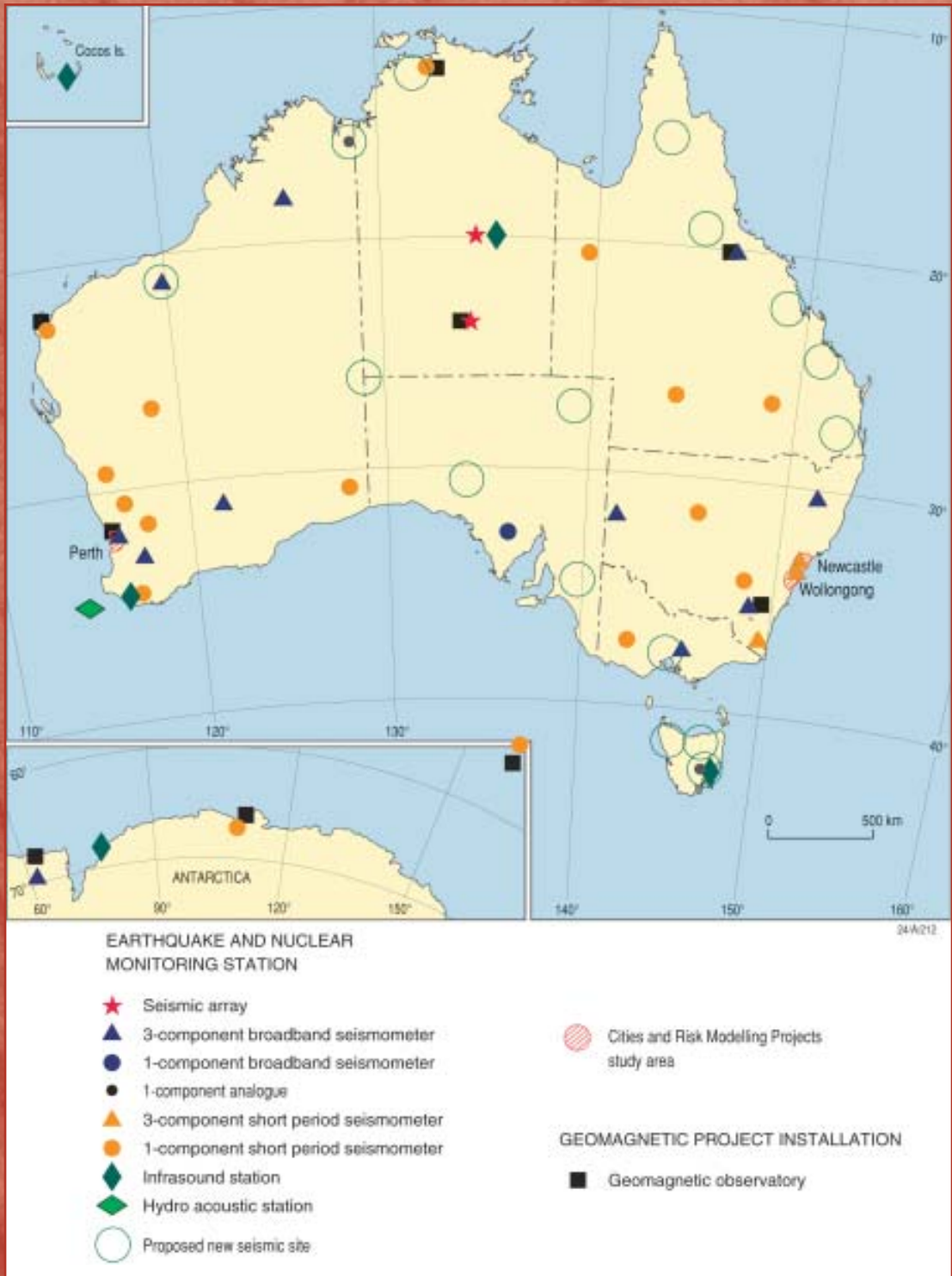
- Enhanced global attractiveness of Australia's offshore and onshore exploration
- Improved resource management and environmental protection
- Safer communities and transportation

Geoscience Australia's intermediate level (level 2) output groups are:

- Geoscience for urban centres
- Geoscience for oceans and coasts
- Geoscience for regional and rural areas

The third level in the hierarchy comprises the specific projects that Geoscience Australia undertakes, each of which has its own project-specific outcome and a series of products and services such as research reports, maps, datasets, and geoscientific advice to government and other clients. As well as achieving its own project-specific outcome each project contributes to the achievement of one or more of the intermediate outcomes and in turn to the corporate outcome.

This Work Program outlines the third level in the hierarchy.



Location of the earthquake and nuclear monitoring network, geomagnetic observatories and study areas for the Cities and Risk Modelling projects contributing to geoscience for urban centres.

1 Geoscience for Urban Centres

Australia is probably the most urbanised country on Earth. More than 60 per cent of its population lives in five coastal cities. Australia's current population of 19 million is expected to reach 25 million by 2050, and most of this growth will be accommodated in urban areas. Urban growth is spreading into hinterlands and placing pressure on Australia's coastlines and rivers as cities expand and join up.

Cities are built on geological materials and are affected by geological processes. Earthquakes, landslides, floods, storm surge, severe winds, and bushfires can greatly affect urban communities. These natural hazards can damage buildings and interrupt water, power, transport, and communication services, and cause loss of life.

Natural hazards in Australia are estimated to cost \$1.1 billion annually on average. The costs of individual hazards can be much greater though - for example, the 1989 Newcastle earthquake cost the community an estimated \$4.5 billion.

Natural hazards cannot be prevented. But governments can reduce their impact by identifying the potential risks and vulnerable areas, and recommending disaster-mitigation measures such as improving building codes.

Altering the landscape, and building along rivers and coastlines, means that city planners and developers need geoscience input. Geoscience research can also help cities cope with human-induced problems such as salinity, coastal erosion, ground subsidence, acid-sulphate soils, water contamination, and estuary damage.

Geoscience Australia's main function in urban geoscience is to monitor and assess all Earth-surface processes that pose a risk to Australia. It gathers data and develops tools that governments and others can use to make Australia as safe as possible from natural and human-induced hazards.

Through AusAID, Geoscience Australia is also called upon to help neighbouring countries such as Papua New Guinea manage natural hazards.

Geoscience Australia monitors nuclear explosions and carries out research into nuclear explosion discrimination in order to fulfil Australia's commitment to world peace in the region as a signatory to the Comprehensive Nuclear-Test-Ban Treaty.

Geohazards and Risk

Projects in this group focus on developing risk assessments and methodologies, data collection techniques, and information management and analysis.

1.1 RISK MODELLING

Outcome

Improved methodologies and techniques in risk assessment.

Outputs

- Report on collection of post-disaster data and development of collaborative work with key government and private stakeholders for critical geohazards events.
- Report and stakeholder communication on development of a probabilistic earthquake risk model and case study for 1989 Newcastle earthquake.
- Report on development of landslide hazard model and its application to Wollongong.
- Report on research and the development of models addressing geohazard and risk issues in Australian urban communities.

1.2 EARTHQUAKE HAZARDS AND NEOTECTONICS

Outcome

Reduced social and economic costs of the effects of earthquakes.

Outputs

- Advice and seismic information to government agencies and other clients, of potentially damaging earthquakes and tsunamigenic events in the Australian region.
- Additions to and development of an earthquake database so that comprehensive earthquake parameters are available to domestic and international clients for input to earthquake hazard studies of the Australian continent.
- Report on studies into neotectonics and ground-motion analyses for the development of improved earthquake hazard models of Australia.
- Advice and services to international clients.

1.3 NUCLEAR MONITORING

Outcome

Effective monitoring and discrimination of nuclear explosions.

Outputs

- Technical advice and information provided to the Departments of Foreign Affairs and Trade, Prime Minister and Cabinet, and Defence, and the Comprehensive Test Ban Treaty Organisation (CTBTO), and the media, to meet Australian national technical requirements and obligations to the Comprehensive Nuclear Test Ban Treaty (CTBT).
- Enhanced discrimination procedures developed for Australia and the international community to improve Australia's capability to discriminate nuclear explosions.
- Installation of CTBTO monitoring stations in Australia to meet Australia's CTBT obligations in building a global verification system.
- Report to the CTBTO on improved techniques to locate more accurately seismic events on the Australian continent.
- Provision of data to the CTBTO through operation of a National Data Centre for Australia's National Authority to meet Australian national technical requirements and obligations to the CTBT.

Cities and Geophysical Observatories

1.4 CITIES PROJECT PERTH

Outcome

Increased awareness and improved capability of communities to address the risks posed by natural hazards.

Outputs

- Report on workshop in Perth with technical experts, local and state government representatives, and collaborators, to address Perth risk-assessment issues and to determine approaches to risk-assessment methods, collaborative arrangements, and involvement of stakeholders.
- Integrated spatial data on demographics, census, building infrastructure, lifelines, and hazard phenomena, together with results from a microtremor field survey.
- Preliminary report on regional hazards in Perth, including earthquake, landslide, flood, severe wind, and storm tide, and a review of opportunities to address environmental issues such as coastal erosion and ground-water contamination.
- Publication and launch of the regional, southeast Queensland, multi-hazard risk assessment report.

1.5 GEOPHYSICAL NETWORK

Outcome

Increased national capabilities in risk assessment.

Outputs

- Seismic, geomagnetic, infrasound, and hydroacoustic data and information for the Commonwealth Government, States/Territories and international seismological and geomagnetic agencies, through the development of appropriate service level agreements and the operation of a state-of-the-art network and databases.

Projects in this group undertake holistic and comprehensive assessments and numerical modelling of risk from natural and man-made hazards in priority urban areas and address issues of concern to urban communities that require geoscientific information. The geophysical network carries out synoptic observations of earthquakes, nuclear explosions, the geomagnetic field and tsunamis.

1.6 GEOMAGNETISM

Outcome

Reduced risk of navigation (magnetic compass) errors, accurate directional drilling and direction finding, enhanced aeromagnetic exploration success, and a framework for solar-terrestrial physics research.

Outputs

- Geomagnetic data, indices of activity, numerical field and secular-variation models and charts, advice and information for the Australian and Australian Antarctic Territory regions from the national magnetic observatory and repeat station network, for government, industry, science and data centres worldwide.

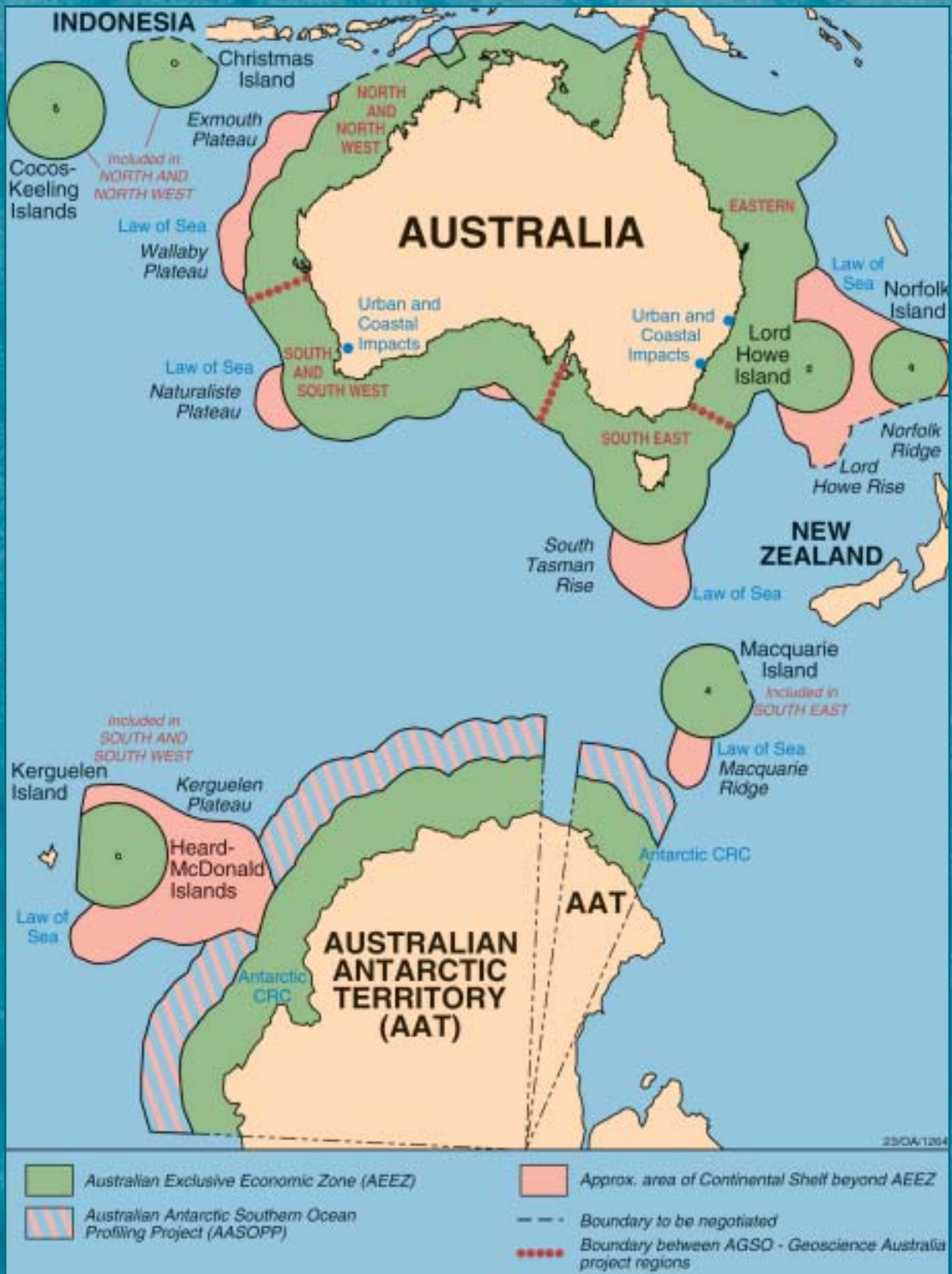
1.7 AUSTRALIAN DISASTER INFORMATION MANAGEMENT NETWORK

Outcome

Increased national capability for disaster mitigation and response.

Outputs

- Report on the establishment of a disaster information network.



Proposed Australian Marine Jurisdiction and location of geographically based projects contributing to geoscience for oceans and coasts.

2 Geoscience for Oceans and Coasts

Australia has more territory under the sea than land surface. It is an island continent with more than 35 thousand kilometres of mainland coastline and 964 estuaries that empty into coastal waters. Australian Marine Jurisdiction extends over 200 kilometres beyond its shores and includes a large area of Antarctica, as well as Heard, Macquarie, Norfolk, Lord Howe, Christmas and Cocos (Keeling) Islands, and waters around these territories.

These vast waters have a unique biodiversity, ecosystems and valuable fisheries. They also house most of Australia's oil and gas reserves. Under the United Nations Convention on the Law of the Sea, Australia has significant management responsibilities for its marine jurisdiction.

Australia needs to know the extent of its continental shelf, the shape and composition of its ocean floors, and where it has oil and gas resources. It also wants to know what effect estuaries, many of which are outlets for major rivers that traverse hundreds of kilometres through agricultural land and major towns, are having on coasts and ocean ecosystems. Australia is obtaining that data through Geoscience Australia's research in ocean and coastal geoscience.

Geoscience Australia provides technical data to define Australia's offshore boundaries, and geoscience knowledge for regional marine planning and environmental management of Australia's oceans and coasts.

Geoscience Australia also researches and advises government and industry on Australia's petroleum prospects, reserves and potential. Its work is used by the Australian Government to attract international exploration investment to search for petroleum and hence sustain Australia's indigenous oil supply.

Marine Geoscience and Environment

2.1 SEABED MAPPING AND CHARACTERISATION

Outcome

Improved understanding of the relationship between seabed geology and benthic habitats to assist in Regional Marine Planning, establishment of Marine Protected Areas and the management of the Australian Marine Jurisdiction.

Outputs

- Maps (GIS layers) of seabed bathymetry, seabed sediment types, sediment mobility due to waves and tides, and seabed character (based on interpretation of acoustic data), for National Oceans Office contracts and for general needs.
- A Geoscience Australia Record about the research expedition to Torres Strait on board the RV Franklin.
- A Geoscience Australia Record relating results of the Victoria Museum contract to compare biological communities with sediment data in Bass Strait.
- A report to the National Oceans Office describing bioregionalisation of the Southeast region using physical proxies (in collaboration with CSIRO).
- A report on the RV Franklin research expedition to offshore east Tasmania and Otway Basin region.

2.2 LAW OF THE SEA - AUSTRALIA AND ITS ISLAND TERRITORIES

Outcome

Definition of the outer limit of the extended Continental Shelf around Australia and its island territories, and the submission of the particulars of the outer limit and supporting information to the UN Commission on the Limits of the Continental Shelf (CLCS). The project is conducted in association with the Department of Foreign Affairs and Trade, the Attorney General's Department and the Australian Surveying and Land Information Group.

Projects in this group undertake studies to define Australia's Marine Jurisdiction under the UN Convention on the Law of the Sea, regional studies of the bathymetry and character of the seabed to underpin regional marine regional marine planning, and evaluate estuarine health for coastal management purposes.

Outputs

- Advice, reports and maps related to continental shelf definition and maritime boundary negotiations around Australia and its island territories.
- Reports and databases supporting continental shelf definition for: Great Australian Bight, Lord Howe Rise, Macquarie Ridge, Norfolk-Three Kings Ridge, South Tasman Rise, Naturaliste Plateau.
- A study of approaches to be used in making a submission to the CLCS.
- A draft CLCS submission package for an area of extended continental shelf.

2.3 AUSTRALIAN ANTARCTICA AND SOUTHERN OCEAN PROFILING PROJECT (AASOPP)

Outcome

Increased knowledge of the bathymetry, seabed characteristics and geology of the Southern Ocean adjacent to the Australian Antarctic Territory to underpin: definition of the outer limit of the extended Continental Shelf around the Australian Antarctic Territory, placing Australia in a position to make a submission to the UN Commission on the Limits of the Continental Shelf; and regional marine planning and environmental management under Australia's Oceans Policy.

The Department of Finance and Administration manages this project, Geoscience Australia carries out its component under a Service Level Agreement.

Outputs

- Database of processed seismic data from surveys 227 and 228.
- Geoquest database of interpretation of data from surveys 227 and 228.
- ARC/View database of Law of the Sea parameters from surveys 227 and 228.
- Seismic survey 229 off Antarctica planned and undertaken.
- Database of non-seismic data from survey 229.

2.4 MARINE GEOSCIENCE ADVICE

Outcome

Improved scientific resource management and environmental protection by provision and uptake of scientific advice on Marine Protected Areas and reserves.

Outputs

- Advice and information as required by client groups in relation to the establishment, management, and monitoring of Marine Protected Areas and Reserves.

2.5 URBAN AND COASTAL IMPACTS COOPERATIVE RESEARCH CENTRE FOR COASTAL ZONE MANAGEMENT

Outcome

Improved multidisciplinary and integrated (ecosystem sciences and geosciences) tools for assessment of Australian waterway conditions, increased access to data information and knowledge of Australia's waterways and community education of the coastal zone.

Outputs

- New conceptual models of waterway function.
- Interpreted spatial images of waterway features for condition assessment.
- A Report on indicators of estuarine and waterway condition.
- Release of the Australian Estuaries database (OZEstuaries) version 2.
- Presentations of a teacher training module on coastal waterway and estuarine functions.

2.6 URBAN AND COASTAL IMPACTS GEOSCIENCE FOR COASTAL WATERWAYS

Outcome

Improved decision making, because of new data, information and knowledge, for stakeholders and managers in the coastal zone concerned with resource management and environmental protection.

Outputs

- A report on the Swan River Estuary, sea floor processes.
- A report to the Waters & Rivers Commission. (WRC) on south-west Australian estuaries.
- A professional opinion on Lake Woollumboola, NSW.

2.7 ANTARCTIC CRC AND ANTARCTIC SCIENCE ADMINISTRATION

Outcome

The project contributes to the government goals of maintaining the Antarctic Treaty System and enhancing Australia's influence within the System; protecting the Antarctic environment; understanding the role of Antarctica in the global climate system; and undertaking scientific work of practical, economic and national significance.

Outputs

- Report on the environmental impacts of marine acoustic technology for the Scientific Committee on Antarctic Research (SCAR).
- Synthesis papers and scientific results of ODP Leg 188, Prydz Bay.
- Report on Australian geoscience research in Antarctica for AAD and ASAC.
- Report on Australian geoscience research in Antarctica for SCAR.
- Maps, GIS coverages, Analysis and interpretation of marine geoscience data collected during the RV Tangaroa expedition to Antarctica.
- Special issue of "Deep Sea Research" on the Mertz Glacier area.

2.8 OCEAN DRILLING PROGRAM

Outcome

Geoscience advice to Australian and international Ocean Drilling Program (ODP) committees to maximise Geoscience Australia's and Australia's benefits from ODP.

Outputs

- Ongoing planning and advice.
- Australian ODP Council meetings.
- A report on ODP Leg 189 in offshore Tasmanian region.

Petroleum and Regional Geology

2.9 SOUTH AND SOUTHWEST REGION

Outcome

An assessment of the current state of knowledge of the petroleum prospectivity of the southern and southwestern offshore region of Australia to underpin promotion of selected areas for petroleum exploration including an understanding of potential economic values, petroleum potential and aspects of exploration risks.

Outputs

- Scientific advice on the petroleum potential of the region to government and industry for the acreage release process and for planning purposes.
- Research into aspects of the petroleum geology of the Great Australian Bight to underpin future promotion of the area for petroleum exploration, and to provide an understanding of potential economic values.
- A desktop study integrating data and interpretive products for the SSW Region into corporate databases and a regional GIS.
- Geological framework studies of the Naturaliste and Kerguelen Plateaus to provide supporting information required to define the outer limit of Australia's Continental Shelf under Article 76 of UN Convention on Law of the Sea, and to provide an understanding of potential economic values.

2.10 SOUTHEAST REGION

Outcome

An assessment of the current state of knowledge of petroleum prospectivity of the southeast offshore region of Australia to underpin promotion of selected areas for petroleum exploration, including an understanding of potential economic values, petroleum potential and aspects of exploration risks.

Projects in this group undertake the regional studies to assess the geological risks of petroleum occurrence, and underpin assessment of petroleum potential and promotion of prospectively. They also provide regional studies to underpin definition of offshore boundaries under the United Nations Convention on the Law of the Sea.

Outputs

- Scientific advice on the petroleum potential of the southeast region to government and industry for the acreage release process and for planning purposes.
- Research on aspects of the petroleum geology of the Bass and Sorell Basins to underpin future promotion of the area for petroleum exploration, and to provide an understanding of potential economic values.
- A study of the geological framework of the South Tasman Rise to document critical information required to define the outer limit of Australia's Continental Shelf under Article 76 of UN Convention on Law of the Sea, and to provide an understanding of potential economic values.
- A desktop study integrating data and interpretative products for basins in the Southeast Region into corporate databases and a regional GIS project.

2.11 EASTERN REGION

Outcome

A geological overview of the east coast offshore basins in order that decisions can be made regarding petroleum exploration opportunities and acreage release.

Outputs

- East Australian Basin Symposium papers on the Gower Basin & Regional Lord Howe Rise interpretations.
- Records on the Gower Basin & Lord Howe Rise (north).

- A report on the regional geology and petroleum assessment of the Lord Howe Rise.
- A report on East Coast Basins.
- Advice to government and other clients.
- A desktop study integrating data and interpretative products for basins in the Eastern Region into corporate databases and a regional GIS project.
- A report on the RV Franklin research expedition to the Fairway Basin, east of the Lord Howe Rise.
- Isotope and biomarker analyses of 120 oil and condensate samples (Oils of Western Australia 2 Study).
- A report on the application of the SANS technique to identify effective source rocks.
- A set of regionally consistent subsidence and thermal models for the Browse-Bonaparte Basins.
- A report on geohistory modelling in the Browse Basin.

2.12 NORTH AND NORTHWEST REGION

Outcome

An assessment of the current state of knowledge of the petroleum prospectivity of the northern and northwestern offshore region of Australia to underpin promotion of selected areas for petroleum exploration and an improved understanding of petroleum potential and aspects of exploration risk

Outputs

- Scientific advice on the petroleum potential of the region to government and industry for the annual acreage release process and promotion of exploration investment.
- A desktop study integrating data and interpretative products for basins in the North and Northwest Region into corporate databases and a regional GIS project.
- A report of interpreted seismic horizon profiles for Geoscience Australia's regional deep seismic lines.
- A set of plate tectonic reconstructions of the NNW region.
- A report on the event history of the NNW region.
- A set of source rock maps for the NNW region.

2.13 BASEMENT AND CRUSTAL STUDIES

Outcome

An assessment of the role of the crystalline basement in the formation and development of individual sedimentary basins in Australia's offshore territories.

Outputs

- Improved maps of basement type and crustal type and thickness in the ESE and SSW regions.
- Seismic velocity characterisation of the crust in the ESE, SSW and NNW regions.
- First-pass classification of basement and crustal types in the ESE, SSW and NNW regions.

2.14 BATHYMETRY AND POTENTIAL FIELDS

Outcome

Improved bathymetric and potential field data, data manipulation and interpretation techniques.

Outputs

- Australian bathymetric grid 2nd edition (30 minute grid spacing).
- Magnetic anomaly grid of the Australian region.
- High-resolution bathymetry grids for selected regions of the shelf and deep-water areas of the Australian margin.

Petroleum Promotion and Specialist Studies

2.15 PETROLEUM GEOCHEMISTRY RESEARCH & DEVELOPMENT

Outcome

Improved geochemical understanding and practical techniques, including information management and expert data systems, for assessing exploration risk stemming from the distribution and characteristics of petroleum source rocks, migration pathways and reservoirised accumulations of hydrocarbons. This work in part contributes to the Australian Petroleum Cooperative Research Centre.

Outputs

- An Expert System to interrogate ORGCHEM for source rock information and establish web-based access.
- Report on standard analytical protocols used by the APCRC and clients: to allow interchange and common interpretation of existing and future geochemical data used in exploration.
- Protocols for new isotope capabilities to apply to environmental studies and resource exploration.
- Reports on novel geochemical techniques to reduce exploration uncertainty.

2.16 APCRC - GEOLOGICAL DISPOSAL OF CARBON DIOXIDE (GEODISC)

Outcome

Integration of research results from other GEODISC projects, notably reservoir engineering, with ESSCI (Environmentally Sustainable Site for CO₂ Injection) site data.

Outputs

- Report synthesising geological and engineering data for GEODISC, and detailed reports for specific sites.
- Data management and archiving of GEODISC Project 1/GEODISC and ESSCI database.
- Proposal for the next phase of the CRC for sequestration of CO₂ in Australia.

Projects in this group undertake formal assessments of petroleum potential, technical promotion of the annual acreage release round and specialist studies in geochemistry, biostratigraphy and geological disposal of carbon dioxide.

2.17 TIMESCALES - VIRTUAL CENTRE OF ECONOMIC MICROPALAEONTOLOGY & PALYNOLOGY

Outcome

Improved schemes for biostratigraphic correlation and improved resolution of the geological timescale.

Outputs

- Report on future directions for the Virtual Centre of Economic Micropalaeontology & Palynology (VCEMP): meet with Industry users and participants.
- Establishment of a VCEMP/Geoscience Australia Postdoctoral Research program, and revision of Campanian biozonation schemes used by industry on the NWS.
- Global reference studies - links to world Standard Geologic Stages.
- Report on pilot study to recover conodonts from the upper Permian of the Canning Basin.
- Report on proposed global reference section for the continental Permian/Triassic and application to Australian studies.
- Report on Sr/Sr dating project of Jurassic and Cretaceous shelly fauna from the NWS.
- Report on Mesozoic palynology of the Bight Basin.

2.18 PETROLEUM PROSPECTIVITY ASSESSMENT

Outcome

Effective assessment of petroleum potential of offshore Australia to underpin advice on petroleum prospectivity and planning purposes.

Outputs

- Updated North West Shelf undiscovered assessment using AUSTPLAY.
- Report on assessments using United States Geological Survey methodology on selected areas.

2.19 ACREAGE RELEASE AND PRESENTATION

Outcome

Broad awareness and acceptance of the technical opportunities of the acreage offered by the Australian government for petroleum exploration investment, coordination of the technical presentation to support the acreage release process under the Petroleum and Submerged Lands Act (PSLA).

Outputs

- A report and seminars on the 2002 acreage release to the Australian and international petroleum industry.

2.20 ONSHORE PETROLEUM GEOLOGY STUDIES

Outcome

To improve understanding of petroleum potential and decrease exploration risk by provision of specialist cooperation with State/NT studies of onshore basins.

Outputs

- Report of parameters of Australia's major source rock intervals.
- Report on analyses of vagrant oils and Devonian oils from onshore basins.
- Reports on biostratigraphic studies and time stratigraphic distribution of source rocks of the southern Georgina Basin.
- Updated work program for the Onshore Petroleum Promotion Group (OPPG) of State/NT governments.

Petroleum Technical Advice

2.21 EXPLORATION AND ENVIRONMENT ADVICE

Outcome

Improved scientific resource management and environmental protection.

Outputs

- Advice about exploration permits, award of vacant acreage, analysis of release data, exploration strategies and protocols relating to the P(SL)A.
- Advice about environmental and marine issues relating to the P(SL)A.

2.22 PETROLEUM ENGINEERING AND IDENTIFIED RESOURCES

Outcome

Improved resource management by provision of engineering and scientific advice on petroleum developments and the extent and rate of production of Australia's identified petroleum resources.

Outputs

- Advice about petroleum engineering issues and identified resources for the Department of Industry, Science and Resources and other agencies which administer the P(SL)A, Excise Tariff Act, Petroleum Resource Rent Tax Assessment Act and Trade Practices Act and the Joint Petroleum Development Area (JPDA).
- Engineering and production geological reports on Australian petroleum accumulations.
- Contribution of identified petroleum resources, development, production, forecasts and sufficiency components to Oil and Gas Resources Australia 2000.

Projects in this group provide technical advice to government on the administration of the petroleum industry in Australia. They are also responsible for the administration and availability of industry and Geoscience Australia geoscientific data.

2.23 INDUSTRY ASSESSMENT AND STATISTICS

Outcome

Enhanced global attractiveness of Australia's offshore exploration investment opportunities and effective management and regulation of the upstream petroleum industry.

Outputs

- Advice about upstream petroleum industry activity in Australia and internationally.
- Quarterly activity reports on the upstream petroleum industry.
- An annual map and key of Australian Petroleum Titles including new offshore release areas.
- Annual publication of Oil and Gas Resources of Australia.
- Weekly drilling reports and other reports as required.

2.24 MARINE AND PETROLEUM DATA AND INFORMATION

Outcome

Public access to Geoscience Australia's acquired seismic, navigation, bathymetry, potential field and related geoscience data including the development of new standards and processes for the preservation, public access and distribution of marine geoscience and petroleum exploration related data. This project also acts as the secretariat to the National Marine Data Group.

Outputs

- A collection of field and processed seismic data, with associated metadata, that is securely preserved and readily accessible for Geoscience Australia and external client use.
- An accessible database of processed navigation, bathymetry, gravity and magnetic data preserved on-line with full and standardised metadata.
- Publicly available products comprising grids and compilations of data prepared as standard products and special products.
- Contribution to the national and international standards development for information management.

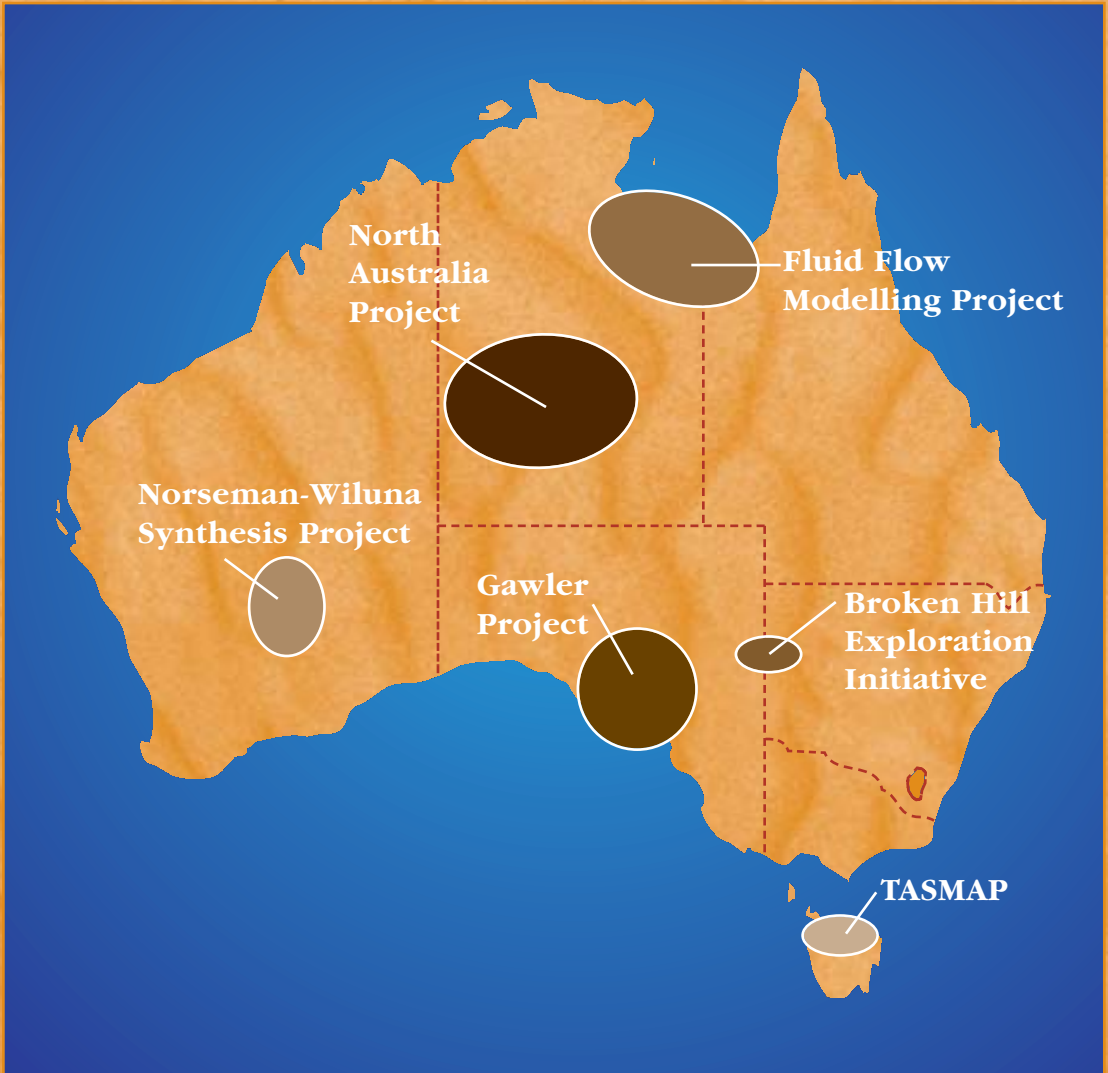
2.25 AUSAID - SOUTH PACIFIC APPLIED GEOSCIENCE COMMISSION (SOPAC)

Outcome

Enhanced understanding of the petroleum potential of Pacific Island countries. This project is undertaken under contract to the South Pacific Geoscience Commission.

Outputs

- Advice, information, data and reports and publicity related to South Pacific petroleum potential.



Location of geographically based projects contributing to geoscience for regional and rural areas.

3 Geoscience for Regional and Rural Areas

Australia's largest export earner is minerals, contributing about \$500 billion to Australia's wealth over the past 20 years. In 1999-2000 Australia's mineral exports were worth \$43.8 billion and the minerals industry gave Australia \$3.52 billion in taxes and royalties and \$1.23 billion in transport levies.

Most mines are found in regional and rural Australia. Mineral exploration and mining have built towns, roads and ports and opened up isolated and unproductive outback areas. New and economically feasible deposits must be found to maintain Australia's wealth as mines are exhausted. Regional and rural Australia needs geoscience input to attract international investment and help exploration companies find new mineral deposits.

Geoscience Australia reduces exploration risk and encourages investment in Australia through targeted geoscientific surveys and research to locate potential mineral areas. It advises the Government on mineral prospects and potential, resources and mining, and exploration trends. It promotes Australia's exploration opportunities internationally.

This research also provides a basis for sound land resource and environmental management.

A major issue for rural Australia is dryland salinity, which affects approximately six million hectares of Australian farmland. Each year it costs Australia \$270 million in lost production and damage to roads, railways and rural towns. Farmers and agricultural groups want to know where salt is located and its predicted movement through the landscape. Through its participation in the Cooperative Research Centre for Landscape Environment and Mineral Exploration, Geoscience Australia is mapping salinity in the sub-surface and developing salinity risk maps for river catchments.

3.1 MINERALS PROMOTION AND WEB

Outcome

Increased awareness of exploration opportunities in Australia and improved on-line access to data and information.

Outputs

- A coordinated Australian Governments' promotional display at Mining 2001.
- A coordinated conference program on mineral exploration, Exploring Australia, at Mining 2001.
- A coordinated Australian Governments' promotional display at Prospectors and Developers Association of Canada's (PDAC) Annual Convention and Trade Display 2002.
- Overview paper on Australian mineral exploration and mining for PDAC 2002.
- A report to Chief Government Geologists' Subcommittee of MCOM on Australia's international competitiveness in mineral investment.
- A report to Chief Government Geologists' Subcommittee of MCOM on the effectiveness of Australia's international mineral investment promotion program.
- A CDROM (also available online) to be provided to potential explorers with information designed to encourage exploration in Australia.
- A paper benchmarking mineral exploration expenditure in Australia.
- A paper on mineral exploration and discovery rates in Australia.

Regional Studies and Mineral Systems

3.2 FLUID FLOW MODELLING IN THE MT ISA AND MCARTHUR BASINS (AMIRA P552)

Outcome

Enhanced exploration strategies for, and the promotion of, the Mt Isa and McArthur Basins through a better understanding of the geochemical and physical characteristics, timing, origin, reactivity and flow history of fluids in the basins.

Outputs

- Four AMIRA quarterly reports containing an update of current research activities in AMIRA project P552.
- First draft of AMIRA year 3 final report containing the detailed results of research activities in AMIRA project P552.
- Two sponsors meetings to be delivered to AMIRA Project P552 industry sponsors.
- Geochemical sample locations and analyses entered into corporate Oracle databases for inclusion in the National Databases.

3.3 BROKEN HILL EXPLORATION INITIATIVE (BHEI)

Outcome

Enhanced exploration strategies for, and promotion of, the Curnamona province as an area of Cu-Au and Pb-Zn mineral potential through increased understanding of the regional structure and stratigraphy of the Olary sub-domain.

Outputs

- Geological map and report documenting the structure, distribution, and stratigraphy of key rock units for part of the Olary Domain, including the heavily sulphidic Bimba Formation.
- Papers and presentations of BHEI results at conferences and seminars to promote and stimulate interest in the Curnamona Province as an area with further mineral potential.

Projects in this group are primarily carried out under the National Geoscience Agreement (NGA) or through the Australian Minerals Industry Research Association (AMIRA). They are designed to provide pre-competitive geoscience information to promote exploration opportunities and include regional studies and specialist services.

3.4 TASMAR: UNDERSTANDING MAJOR GEOLOGICAL ELEMENTS AND MINERAL POTENTIAL

Outcome

Enhanced exploration strategies, and promotion of, Northern Tasmania through a better understanding of the tectonic evolution of the region.

Outputs

- Report on crystallisation ages of a suite of granites, and the age distribution of the inherited zircons within those granites, with data entered into OZCHRON database.
- Reports summarising the results of TASGO and TASMAR projects (geochronology, seismic data, and integrated geophysics) as contributions in a joint Mineral Resources Tasmania / Geoscience Australia publication.

3.5 NORTH AUSTRALIA PROJECT (NAP) MINERAL PROMOTION

Outcome

Increased exploration activity in and the promotion of the Northern Territory for mineral exploration.

Outputs

- Report(s), in collaboration with the Northern Territory Geological Survey (NTGS), documenting the age, structural timing, fluid characteristics, structural and geochemical controls and ore genesis of lode Au mineral system(s) in the Tanami Region.
- A gravity data set for the Tennant Creek area, in collaboration with NTGS.
- Report(s), in collaboration with NTGS, documenting the event chronology of mafic magmatism in the Arunta Province, and the geochemistry, petrology and Ni-Cu-PGE mineral potential of the associated orthomagmatic mineral systems.
- A preliminary report, in collaboration with NTGS, summarising the results of provenance studies of the Lander package and equivalents.
- Report(s), in collaboration with NTGS, summarising the results of geochronological investigations for the western Arunta and other areas.
- Geophysical interpretation, in collaboration with NTGS, of aeromagnetic data for the Lake MacKay and Mt Doreen 1:250 000 sheets.
- A scoped proposal, in collaboration with the NTGS, for land based seismic data acquisition, including scientific rationale, locations of target lines, modelling of magnetic and gravity data along these lines, and plans for access negotiation.
- Interpretation, in collaboration with NTGS, of the reprocessed seismic line across the south and central Arunta Province to determine the regional geological architecture and its

implications on potential for diamond, lode Au, and sediment-hosted Zn-Pb-Ag mineral systems.

- Preliminary mineral potential assessment (for selected provinces), in collaboration with NTGS, of VAMS, sediment-hosted Zn-Pb-Ag and orthomagmatic Ni-Cu-PGE deposits based on mineral system analysis.

3.6 NORSEMAN-WILUNA SYNTHESIS

Outcome

Enhanced mineral exploration strategies and the promotion of the eastern Yilgarn Craton through the provision of an improved geological framework of the region.

Outputs

Module 1 - Geological framework

- Reports on the structure and architecture of a selected portion of the Au-rich eastern Yilgarn Craton.
- Reports on the new and existing geochronological data in the Au-rich eastern Yilgarn Craton.
- Extended abstracts and presentations for the 4th International Archean Symposium.
- Report incorporating abstracts from the 4th International Archean Symposium in collaboration with the Geological Survey of Western Australia (GSWA).
- Report on geology of the Sir Samuel 1:250k map sheet.
- Report on integrated geophysical, geological and regolith mapping for exploring under cover in the Grants Patch region.

Module 2 - Geological, solid geology and geophysical interpretation maps

- NE Goldfields solid geology digital data in collaboration with GSWA.
- Geophysical interpretation map of the Yilgarn Craton in collaboration with GSWA.
- Geological map of the Leonora 1:250K sheet in collaboration with GSWA.

Module 3 - Geophysical acquisition

- Seismic reflection data across key structures in the Leonora-Laverton region to define the regional architecture of this Au-rich region of the Yilgarn Craton in collaboration with GSWA.

Module 4 - AMIRA Project P624 "Eastern Yilgarn synthesis"

- Quarterly reports on current research activities for sponsors of AMIRA P624.
- Sponsors' meetings to present scientific results to sponsors of AMIRA P624.
- Reports on research activities and scientific results for sponsors of AMIRA P624.

3.7 GAWLER MINERAL PROMOTION

Outcome

Enhanced mineral exploration strategies and the promotion of the Gawler Craton for mineral exploration.

Outputs

- Scoped proposal and workshop for a seismic program in the Gawler Craton.
- Gravity datasets for three areas of the Gawler Craton (Mulgathing, Harris and Olympic South surveys).
- Two reports and two GISs on interpretation of AEM data.
- Progress reports and digital datasets on lithostratigraphy, geochronology, alteration and mineralisation of the Olympic Cu-Au province.
- Preliminary model of crustal architecture for selected parts of the Olympic Cu-Au province.
- Preliminary assessment of komatiite Ni-Cu potential in the Harris greenstone belt.

3.8 GEOCHRONOLOGY LABORATORIES

Outcome

Improved age dating standards and methods for SHRIMP U-Pb geochronology.

Outputs

- Report on new standards for SHRIMP U-Pb geochronology.
- Report on the microstructural integrity of zircon U-Pb dating standards.

National Projects and Advice

Projects in this group are generally national in character. They include national databases, the provision of technical advice and the Cooperative Research Centre for Landscape Environment and Mineral Exploration.

3.9 MINERALS DIVISION DATABASES

Outcome

Improved accessibility to national geoscience data.

Outputs

- Updated and enhanced databases for government, industry and the wider community. Priority development of:
 - OZEVENTS (geological events database)
 - OZCHRON (geochronology database)
 - OZMIN (mineral deposits database)
 - DEVIANT (measured section and drill hole database).

3.10 MINERAL RESOURCES AND ADVICE

Outcome

Informed decision-making and improved resource management, land-use planning, and environmental protection.

Outputs

- High quality, independent scientific and technical advice on mineral resources, exploration and discovery (including offshore programs in Commonwealth waters, and uranium as required under the Atomic Energy Act), mining, processing, land access and use, environment protection, metals and the environment, and sustainable development.
- Publication of national resource assessments for 2001 by Geoscience Australia (online) and the Australian Bureau of Statistics (hardcopy).
- Information and analyses for Australia's contribution to OECD/NEA and IAEA publication "Uranium: Resources, Production and Demand".
- Publication of resource report entitled "Australia's Uranium Resources, Geology and Development of Deposits".
- Report on uranium developments in Australia for the Joint OECD/NEA-IAEA Uranium Group meeting, Paris.
- Report on the supplementary program dealing with environmental impact assessment and proposed development of the Honeymoon ISL (in situ leach) uranium mine.
- Commonwealth representation on, and reports for, ANZMEC's Conference of Chief Inspectors Mines.
- Preliminary online atlas of Australia's mineral resources, mines and processing centres, jointly with Minerals Council of Australia.
- CDs, manuals and webmaps of the Christmas Island and Cocos (Keeling) Island geographic information systems and client support in accord with MOUs.
- Updated Australian energy flows diagram for Australian Greenhouse Office (Energy Markets Program).
- Updated web-based maps of renewable energy and fossil fuel power stations for Australian Greenhouse Office (Renewable Energy and Energy Markets Programs).

3.11 MINERAL POTENTIAL OF AUSTRALIA

Outcome

Enhanced understanding of Australia's mineral potential and metallogeny for the promotion of exploration and land use decisions.

Outputs

- First version map and GIS of mineral potential of Australia based on geoprovince-scale assessment of selected deposit styles for selected geological regions.
- Scientific and technical advice on areas of Australia for land use decisions.

3.12 COOPERATIVE RESEARCH CENTRE FOR LANDSCAPE ENVIRONMENT AND MINERALS EXPLORATION (CRC LEME)

Outcome

Greater understanding of the three dimensional evolution of the Australian landscape.

Outputs

- Reports on the results of regolith related research.

3.13 NATIONAL MAPS

Outcome

Improved understanding of the geology of Australia and promotion of Australia for mineral and petroleum exploration investment.

Outputs

- Improved and updated national geoscience data sets.
- A digital 1:1million map and database (GIS) of geological provinces covering the Australian continent and surrounding marine jurisdictional area.
- A digital dataset of the 1:1 million geological map of North Queensland.

3.14 ANTARCTICA

Outcome

Improved coordination of the Antarctic geoscience effort in Australia.

Outputs

- Representation of Geoscience Australia's onshore Antarctic interests and responsibilities through the preparation and review of documents, provision of advice, and attendance at meetings.
- A Bulletin of the geology of the Prince Charles Mountains presenting the combined results of the last 40 years of Australian and Russian geoscience.

Geophysical Imaging

3.15 GEOPHYSICAL ACQUISITION AND DATABASES

Outcome

Enhanced exploration strategies and promotion of mineral exploration opportunities in Australia, and improved environmental management.

Outputs

- Gravity survey meta-data available on the Internet.
- Airborne geophysical datasets from the Kimberley.
- A catalogue (available on-line) of government airborne surveys and index maps.
- Information and data from National Airborne Geophysics Database and National Gravity Database.
- Report on automatic merging of aeromagnetic surveys.
- Report on application of filtering techniques for the reduction of noise in gridded gamma-ray data.

3.16 FUNDAMENTAL GRAVITY NETWORK

Outcome

Improved calibration of gravity surveys across Australia.

Outputs

- First order absolute gravity base station network.
- Online access to station attributes of Australian Fundamental Gravity Network stations.

Projects in this group manage geophysical data acquisition, processing and archiving. They include management of the Australian National Seismic Imaging Resource (ANSIR), a Major National research Facility (MNRF).

3.17 AUSTRALIAN NATIONAL SEISMIC IMAGING RESOURCE (ANSIR)

Outcome

As a Major National Research Facility (MNRF) funded by the Commonwealth Government, strategically develop the national science and technology infrastructure in the field of seismic imaging of the Earth in order to help keep Australia at the leading edge of key technological developments and so enhance its scientific and industrial competitiveness.

Outputs

- Seismic data sets imaging the Earth's crust for projects approved by the ANSIR access committee.
- Database of Seismic Survey meta-data for post 1976 BMR/AGSO Land Seismic Surveys.
- A report on the activities of ANSIR for the year 2000-01 for the ANSIR Board and MNRF Secretariat of the Department of Industry, Science & Resources.
- A report outlining the work program for ANSIR for the financial year 2002-03.

Information Management

This project reflects the need to improve access to the existing stock of Australian geoscience information to facilitate exploration and underpin informed decision-making.

3.18 WEB PORTAL TO AUSTRALIAN GEOSCIENCE AGENCIES

Outcome

On-line access to Australian geoscience.

Outputs

- A web portal for Australian geoscience agencies.

Structure 2001 – 2002



KEY:

RGL - Research Group Leader

SSS - Senior Scientific Specialist



Work Program

2001 – 2002

