

Mineral resources represent a significant source of export earnings for many developing countries. **Dave Greenbaum** describes how the BGS has been helping the Department of Mining in Papua New Guinea to make the most of the country's mineral wealth.

Rejuvenating mining in PNG

In recent years the World Bank has funded a major programme aimed at improving Papua New Guinea government capabilities and rejuvenating international interest in the country's mining sector. Between 2002 and 2004, the BGS, in association with CSA Group Ltd., operated four of the programme's subprojects in the Geological Survey of Papua New Guinea (GSPNG) — part of the Department of Mining.

The Papua New Guinea Department of Mining (DoM) is responsible for the regulation and promotion of mineral exploration and mining activity in PNG — an industry that contributes significantly to the nation's gross domestic product and which, together with the petroleum sector, accounts for over 70% of export earnings. The BGS-CSA subprojects were:

- training-needs analysis;
- integrated information system and website;
- geophysical data compilation and assessment;
- remote sensing image capability and regional geological interpretation.

Business and training-needs analysis

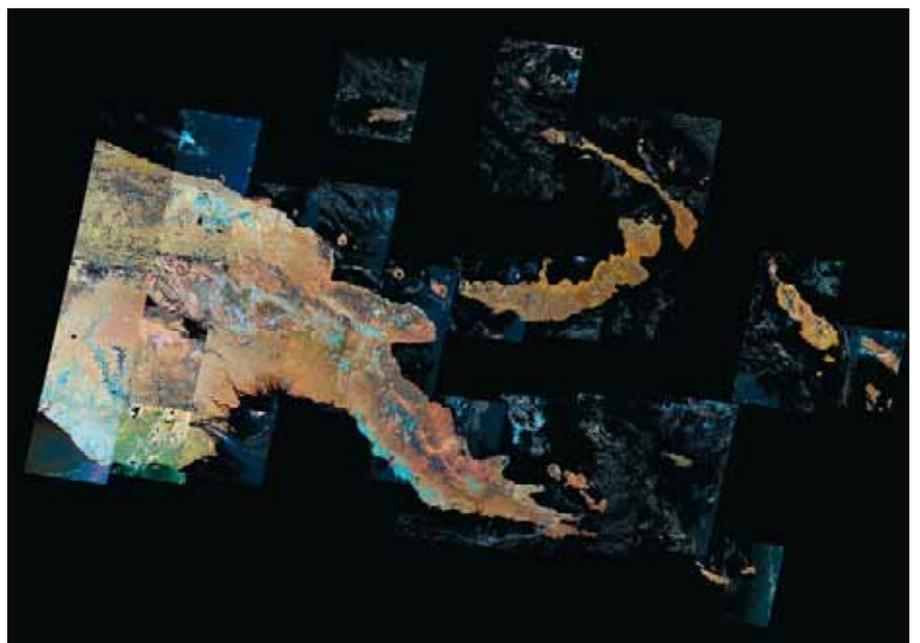
Many national geoscience organisations experience difficulty in recruiting and retaining staff, coping with change and carrying out the tasks that government, the public and the private sector expect. The technique of 'business and training-needs analysis', developed by the BGS, enables such organisations to focus training objectives and programmes on business needs. Such analyses lead to a 'sustainable

training system' that can be run and maintained by local geoscientists and human resources personnel, building on established local structures. The approach ensures that business need controls training and development, and that ongoing modification of the programme is

further informed by such review.

Implemented correctly, a sustainable training system tuned to business need will help an organisation cope with change.

In PNG, the project first determined the needs of the DoM through an analysis of business plans and staff records, together with interviews with selected customers and all staff. Based on this, a 'skills gap' was identified and a five-year training plan developed. The plan distinguished between corporate transferable (personal



Landsat Thematic Mapper satellite image mosaic of Papua New Guinea.

development, IT and health and safety) skills and professional/ technical skills. It also recommended cost-effective delivery strategies.

The main outcome is a new sustainable training system which will allow the DoM to monitor business need continually and tailor training to cope with change. Over the longer term, it will enable all training to be subject to cost/benefit analysis by managers and trainees, and will ensure that the evaluation of training results in improved quality of training.

Integrated information system and website

The IT assistance component was aimed at helping the DoM design a network solution to accommodate the current and future information management needs of the Department, including the GSPNG. It included advice on hardware and software for storage and manipulation of data, and the preparation of guidelines and procedures on information policy and security matters. The project also required the design and installation of a DoM intranet and website. The website is intended to serve as a gateway for investors interested in the mineral sector in PNG. This can be found at www.mineral.gov.pg

Despite some delays, the project achieved all of its major objectives. All systems were installed and training was provided to staff in the GSPNG to enable them to manage the system. The new system serves all components of the World Bank programme and other functions of the DoM.

Geophysical data compilation and assessment

A variety of geophysical survey data of PNG exists but prior to this project they were poorly organised and difficult to access. The aim of this two-year component was to install appropriate computer systems, gather and organise data holdings and provide specialist training to enable the GSPNG to make full use of existing sources of geophysical data.

Initial work involved an assessment of available data and needs, specification and supply of appropriate geophysical software, development of a programme of training, and development of a work plan for the main phase of the project. This was followed by a databasing phase in which existing data were integrated into a coherent information system together with an indexing system to enable proper management of the information.

The final stage of the project was data interpretation and map production. This included training in geophysical data processing and modelling, database and GIS management, and interpretation of data in co-operation with a geological mapping programme being undertaken within the Wau area.

Remote sensing image capability and regional geological interpretation

The overall aim of this subcomponent was to develop an independent capability within the GSPNG to process and interpret satellite imagery, primarily to help with interpretation of the regional geology and structure for use in the geological mapping programme.

Remote sensing in tropical areas is difficult both because the surface is typically covered by dense vegetation and soils, and because such areas are frequently cloud-covered. Radar is useful in this regard because of its cloud-penetrating capability but, due to the lack of direct ground observation, ultimately both types of data rely on interpretation of textural information to make sense of the geology.

The initial task was to acquire computing systems and image processing and GIS software to establish a remote sensing facility. Various datasets were obtained to provide regional coverage of the country, notably Landsat and Radarsat. Processing and interpretation of the data were carried out in conjunction with formal and on-the-job training and field verification. Images were processed covering the whole of PNG as well as for a designated mapping-training area in the Wau catchment area. Processed imagery was interpreted and data incorporated into a GIS for use in the mapping programme. Fieldwork was undertaken to verify the nature of some of the main interpreted units and structures, and used to compile a stratigraphical legend. Overall, the project produced a world-class processing facility, a trained staff and a national digital image database.

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Training at the new image processing laboratory in the GSPNG.