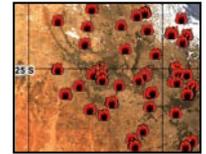


In Brief

SENTINEL finds a permanent home at Geoscience Australia



The Sentinel bushfire monitoring system has become a permanent feature at Geoscience Australia. After nearly three years as a Research and Development (R&D) demonstrator project, providing assistance to the fire management community, it was decided that Sentinel would eventually be located at Geoscience Australia. The operational Sentinel system was seen as a logical extension to Geoscience Australia's current remote sensing activities.

The Sentinel bushfire monitoring service is an internet based mapping tool. It was designed to provide timely information to emergency service managers on the location of bushfires throughout Australia.

The system was developed by CSIRO Land and Water and the Defence Imagery and Geospatial Organisation (DIGO) in collaboration with Geoscience Australia after the devastating bushfires during December 2001 and January 2002. CSIRO began operating the website as an R&D demonstrator project and Geoscience Australia's remote sensing data acquisition facilities in Alice Springs provided information on potential "hotspot" locations.

Hotspots from MODIS data

Sentinel hotspots are derived from Moderate Resolution Imaging Spectroradiometer (MODIS) sensors on board Terra (morning pass) and Aqua (afternoon pass) satellites. Images are captured, over a given point at least four times a day, between the two satellites, each with a ground swath of 2330 km and day/night coverage.

MODIS acquires data in 36 spectral bands, two of which are primarily thermal infrared channels at 4 and 11 μm and used for hotspot detection. The algorithm developed by the University of Maryland/NASA detects hotspots if $T_4 - T_{11} \geq 20\text{K}$ (10K for night passes) and $T_4 > 320\text{K}$ (315K for night passes), where, T_4 and T_{11} represent brightness temperatures in degrees Kelvin derived from MODIS bands 22 and 31 respectively.

Additionally, contextual information such as average background temperature and sun-glint factor is also considered when detecting hotspots.

The accuracy of MODIS data is considered to be superior to Advanced Very High Resolution Radiometer (AVHRR) data when detecting hotspots because it has higher sensitivity and fewer temperature saturation problems.

The new system offers a number of improvements over the original system.

The response time has been reduced when updating hotspot information on the web. Originally taking 60 to 90 minutes after acquisition to process, it now takes 45 minutes for daytime passes and 20 minutes for night passes, resulting in an improved website performance.

The quality of the MODIS colour imagery (500m) has also improved and is now updated within two hours of acquisition. There is also a choice of access from dial-up to broadband internet connection.

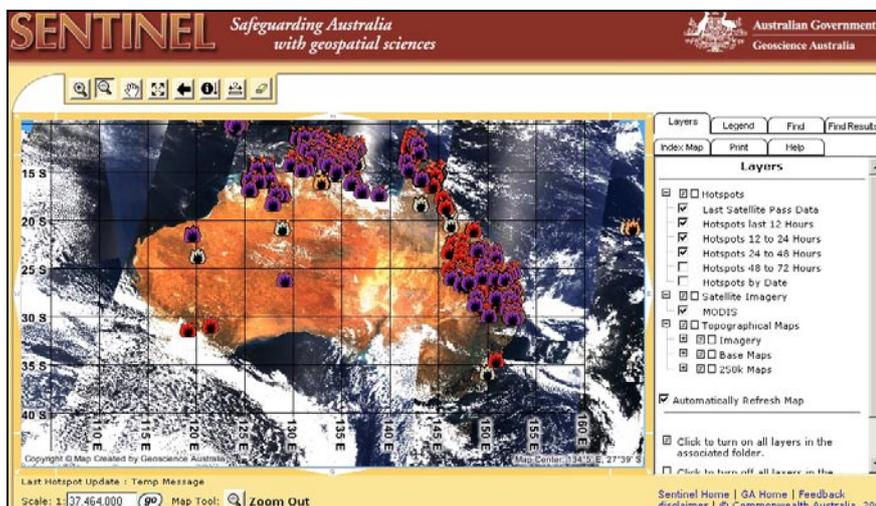
MODIS data acquired from the Hobart ground station is now integrated into the web service, which extends the Sentinel hotspot coverage to New Zealand. It also serves as a "backup" for South East Australia and is in addition to the Alice Springs coverage.

The new find/search facility will allow users to find the location of bushfires using the area name or other attributes such as lakes, airports, etc. Users can also search bushfires within a given buffer zone.

The system also supports additional topographic data (250K maps) and offers interoperable web mapping and feature service.

More satellite data and hotspot information from other satellites such as AVHRR will be added progressively by Geoscience Australia. Importantly, both CSIRO and Geoscience Australia's Sentinel web services will run in unison until at least January 2006. Once the operational capability of Geoscience Australia's system has been established, CSIRO will then withdraw its' Sentinel web service.

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New KARIJINI NATIONAL PARK MAP

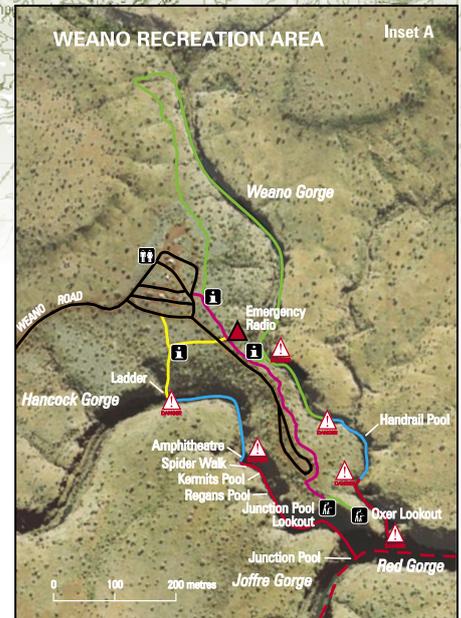
A new map and dataset covering the northern half of the Karijini National Park was launched in Perth on 28 October by the Hon Warren Entsch MP, Parliamentary Secretary to the Minister for Industry, Tourism and Resources together with the Western Australian Minister for Environment and Science, Dr Judy Edwards, MLA.

The Karijini National Park, located in the Pilbara region in the north-west of Western Australia, attracts around 100 000 visitors a year which equates to about 300 visitors a day. Underlying the natural beauty of the area with its sheer gorges, waterfalls and swimming holes is an extremely harsh and fragile environment.

The map is suitable for emergency management command and control, fire management, tourism management and rescue operations as well as visitors to the park. It uses high-resolution satellite imagery and aerial photography to highlight cultural features such as buildings, roads, mining infrastructure, dams and bores, terrain and major tourist sites. The map also provides important information relating to vegetation.

Karijini National Park was one of the areas identified by state emergency management and mapping agencies as being in urgent need of updating as part of the 1:100 000 scale national mapping pilot program being undertaken by Geoscience Australia. The map is the result of collaboration between Geoscience Australia, the Fire and Emergency Services Authority of WA, and the WA Department of Conservation and Land Management together with a number of local government agencies, community groups and local users.

For more information phone Phil Tickle on +61 2 6249 9769 (email phil.tickle@ga.gov.au). To order the map phone Freecall 1800 800 173 (in Australia) or +61 2 6249 9966 (email mapsales@ga.gov.au)



National soil website *launched*

The Australian Soil Research Information System (ASRIS) (www.asris.csiro.au), a product of the Australian Collaborative Land Evaluation Program (ACLEP), was officially launched by the Minister for Agriculture, Fisheries and Forestry, Peter McGauran, at Parliament House on October 12.

The new website, which is publicly available, has been tailored to meet the needs of anyone with an interest in natural resources. It provides the best available information on soil and land resources across Australia in a consistent format.

The system can be used to access information at seven different scales:

- the upper scales provide general descriptions of soil types, landforms and regolith across the continent
- the lower scales provide more detailed information in regions where mapping is completed. Information relates to soil depth, water storage, permeability, fertility, carbon and erodibility with most soil information recorded at five depths
- the lowest scale consists of a soil profile database with fully characterised sites that are known to be representative of significant areas and environments.

Information is displayed using coloured maps, satellite images, tables, photographs and graphs. The online geographic information system allows the user to zoom into a region of interest, produce customised maps and save the results to their computer.

Geoscience Australia's Dr. Colin Pain is a member of the National Coordinating Committee for Soil and Terrain (NCCST), which provides technical assistance and guidance to ACLEP. The national and regional map polygons of landforms and regolith are provided by the CRC Landscape Environments and Mineral Exploration's (LEME) physiographic regions project.



Peter McGauran, MP, Minister for Agriculture, Fisheries and Forestry, launching the new website at Parliament House.

Funding was provided by CSIRO Land and Water, and the Department of Agriculture, Forestry and Fisheries Australia (via the Natural Heritage Trust and National Land and Water Resources Audit). The collaborating state and territory agencies also provided substantial in-kind resources and technical support.

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MapConnect: The next generation of on-line mapping

In early 2006 Geoscience Australia will be launching its next generation of on-line mapping applications. 'MapConnect' will allow users to select and download datasets in a standard web browser environment without the need for any additional software. It will also access the most current data utilising user-defined areas, themes and formats.

Initially, MapConnect will be used to access the Topographic 250K Series 3 Geodata, a nationally consistent database and map series that covers the entire nation. Geodata 3 will contain data that has been updated, checked and validated within the last five years. It is optimised for a scale of 1:250 000 and will be used by the spatial information industry, as well as users involved in emergency management, resource management, tourism, education and recreation. All data available through MapConnect will be free of charge under the provisions of the Australian Government's Spatial Data Access and Pricing Policy (www.osdm.gov.au/osdm/spatial_data.html).

MapConnect will be a convenient and user-friendly way to access GeoData 3, allowing users to view the selected data as a map and download their areas of interest in various formats. The user will be able to define their own customised area boundaries or specify standard 1:250,000 scale map tiles. When downloading the data, users will be able to choose a format to suit their use. The dynamic and practical choices available are:

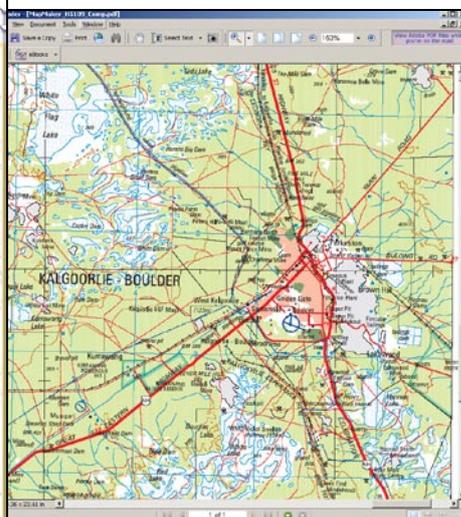
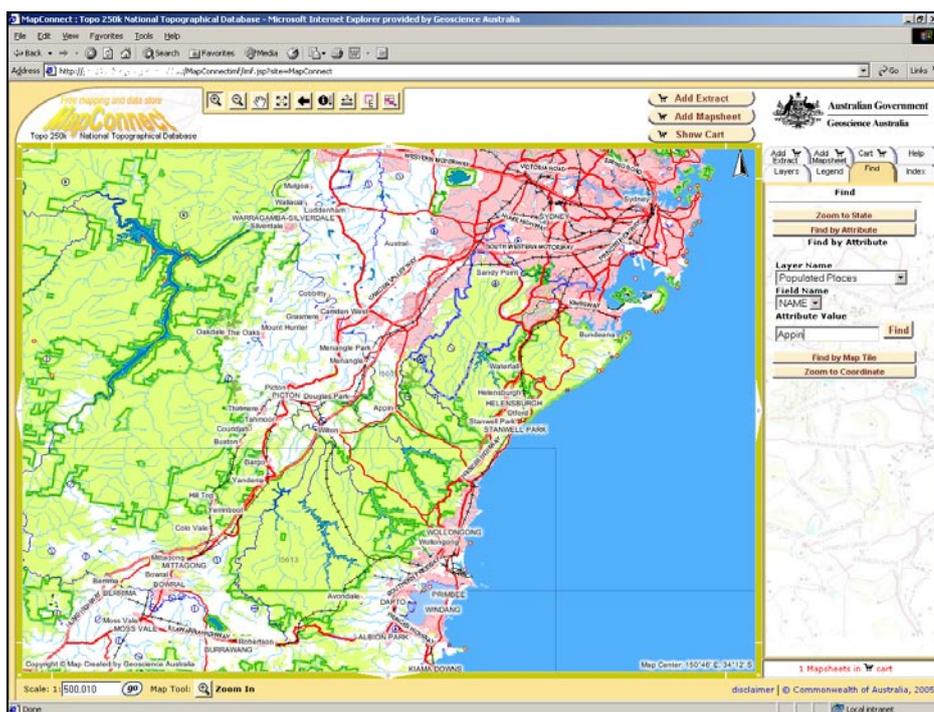
- image formats – ideal for use with GPS navigation systems in vehicle mounted or handheld devices
- GIS formats – attributes and symbology (pGDB, ShapeFile, Mid/Miff & GML formats) that are useful for input into software packages as well as analysis and advanced map production. Data can be selected by theme or as a single file before being compressed for download.
- screen based images – can be simply printed from the map window for use by the general public
- PDF maps – high quality cartographic maps, including legends and scales that can be used by emergency managers or field crew, or incorporated into publications and reports. These maps are in a vector format that allows them to be printed at high resolution or enlarged without loss of quality. Initially these will only be available to emergency management and government agencies.

Locating an area of interest will be as simple as entering a place name or map sheet name and zooming into the location. The extent of the download can be selected before choosing preferred formats. The data download is extracted directly from a database to ensure that the most recent data is available to the user. Alternately a data set on DVD covering the whole country is available in a 'seamless' format for the cost of transfer.

Future developments will include the ability to download only that data updated during a specified time frame. This methodology is known as 'incremental updates' and is a national standard specified by the Intergovernmental Committee on Surveying and Mapping (ICSM). It applies only to the GIS formats and reduces the amount of data transferred after the initial download. This also enables advanced users to analyse areas of change during a specified timeframe.

All downloads are registered and licensed with the Office of Spatial Data Management (OSDM) organisation before being downloaded from the Geoscience Australia website (www.ga.gov.au).

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Costing NATURAL DISASTERS in Queensland

The Council of Australian Governments (COAG) review of Australia's approach to natural disaster management has highlighted the importance of costing disasters as part of a fundamental shift in focus towards cost-effective, evidence-based disaster mitigation. Currently, there are considerable data and research gaps in identifying the total costs of disasters in Australia. At the national and state level, limited cost data are systematically collected and collated by hazard event or location. In addition, little empirical research has been done on the costs to society of different hazard events across jurisdictions (BTRE, 2001).

Geoscience Australia's Risk Research Group has established a pilot project in collaboration with Queensland state agencies to identify and collate existing cost data in order to develop maps, economic tools and models for estimating potential direct costs from natural hazards across jurisdictions. More broadly, the project contributes to COAG Reform Commitments 1 and 2, examining existing data collection systems at the state level and how these can be replicated and modified to facilitate the collection of consistent data for a national risk assessment.

The project will provide:

- better understanding of the type of cost data currently being collected at state level and hence the opportunity to more fully understand the type and extent of costs across jurisdictions for incorporation into a national risk assessment framework
- a series of recommendations for cost data collection to ensure a consistent approach across jurisdictions
- a stronger basis for evaluating risk management and mitigation projects and programs
- a stronger basis for allocating resources for disaster management
- the framework for a collaborative process with state stakeholders.

In its first phase, the project has provided a comprehensive historic Natural Disaster Relief Arrangements (NDRA) events database for Queensland along with maps showing the distribution of historical NDRA costs across the State. The database is an integration of three agency data sets, and provides information on the type of hazard event, the location and a breakdown of the major public costs incurred.

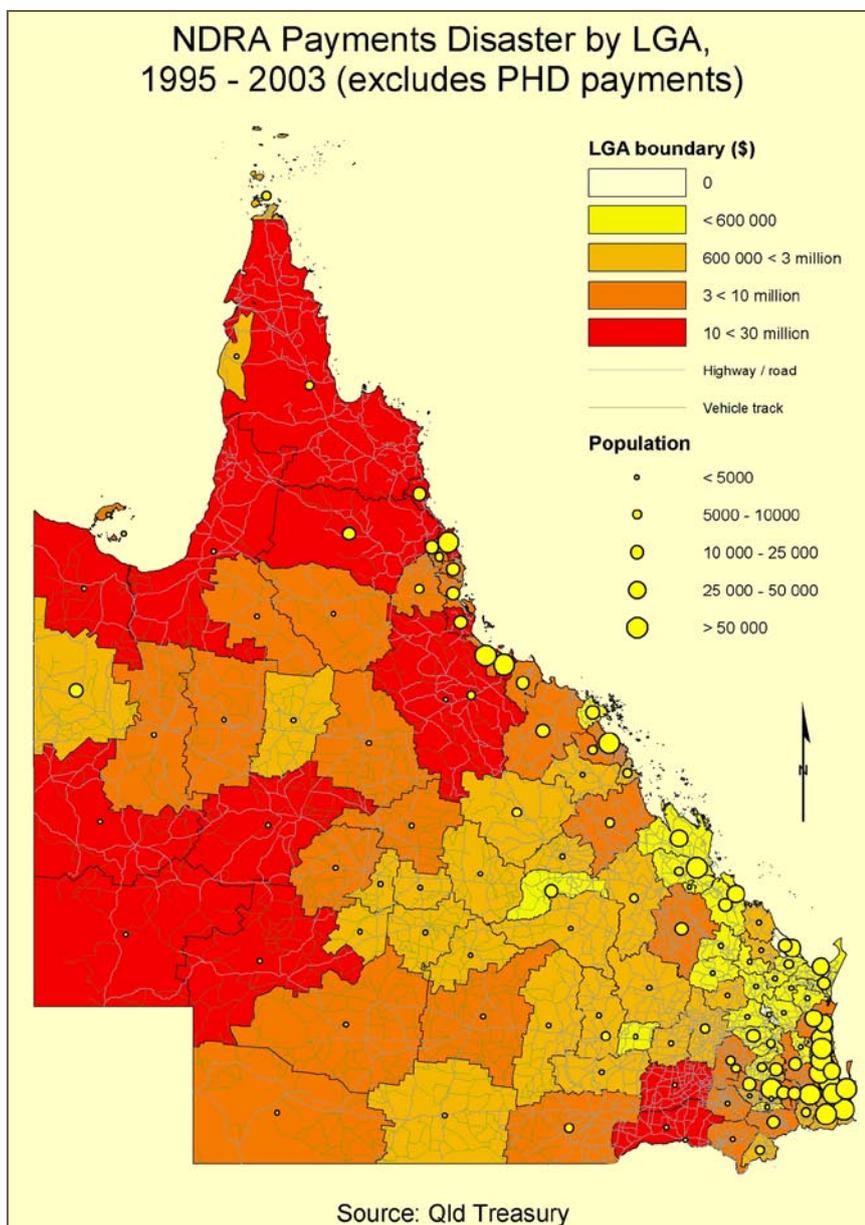
A major finding from the review of historical data is that 90 to 95 per cent of the annual claims on NDRA have been spent on recurrent flood damage to road infrastructure in west and north Queensland (see figure 1).

The project has led to a better understanding of the data required to undertake an assessment of the costs of natural disasters in Queensland and how this information can be used to assist in making decisions regarding mitigation spending. It has also examined the existing data collection systems at the state level and how they could be replicated across other states. This provided an insight into how existing systems could be modified to allow for the collection of relevant data to support risk assessment strategies at the national level. The project will conclude in June 2006.

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Related Websites:

Bureau of Transport and Rural Economics:
www.btre.gov.au/docs/reports/r103/r103.aspx



▲ **Figure 1.** Queensland Natural Disaster Relief Arrangements (NDRA) asset restoration costs by Local Government Area, 1995-2003