

Supervising Scientist

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notes

MAPPING AND MONITORING THE ALLIGATOR RIVERS REGION

The **Supervising Scientist Division (SSD)** uses data from a range of sources to map and monitor land cover and condition across the **Alligator Rivers Region (ARR)** and northern Australia.

Applications of spatial technologies

Specific applications for spatial analysis include: mapping the geomorphic landscapes and features of the region; mapping and monitoring the health of aquatic and woodland communities; assessing the impact of climatic events such as cyclones on the landscape; assessing and monitoring rehabilitation and revegetation of mine sites; and modelling extent of erosion from mine landforms.

Data types

Different applications often require different types of data. The SSD has invested in a range of remote sensing technologies which are tailored to specific applications. The types of data acquired include aerial photographs, satellite-based Very High Resolution (VHR) optical imagery, satellite-based radar imagery and high resolution digital elevation models. For some data types, such as aerial photography, SSD has records which stretch back more than 50 years. This archive provides a unique insight into changes in landcover condition and use over time in the ARR.

What can we map?

Recent VHR images produced by the World-View 2 satellite have the capacity to detect features on the ground at a resolution of 0.5 x 0.5 metres. Radar satellites are able to penetrate through cloud and smoke (unlike optical sensors such as Landsat and World-View 2), providing the capacity to map the full extent of flooding or inundation over the course of a year. High-resolution digital elevation models



Tarpaulins (or 'ground control targets') were laid out to assist with the acquisition of the World View-2 imagery. Their locations were recorded with differential Global Positioning System (dGPS) instruments.



Hand-held spectrometers are used to capture the spectral characteristics of different surfaces and are matched with the spectral characteristics of satellite images.



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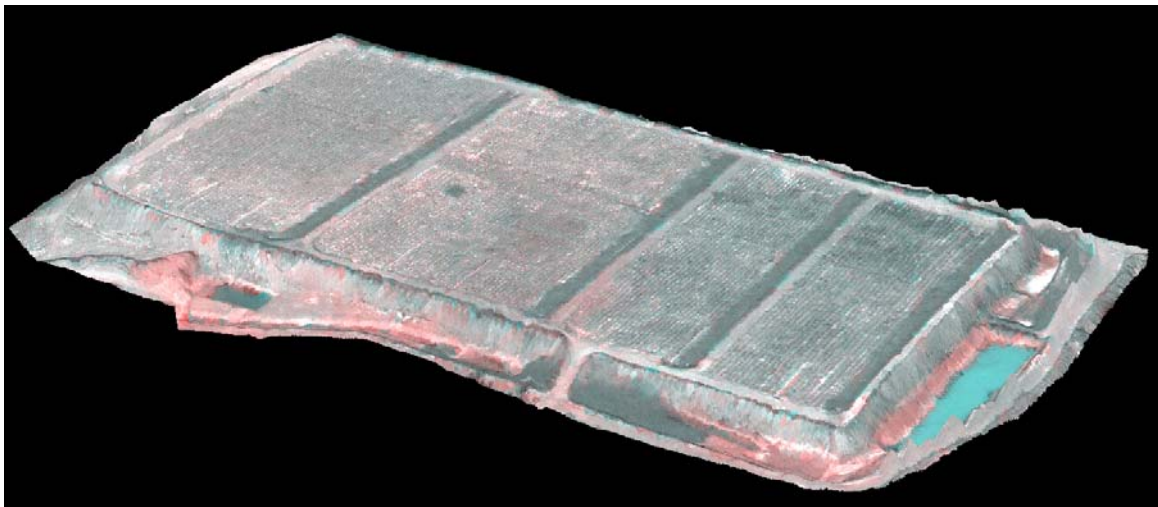
acquired from satellite or ground-based laser surveys are required to estimate potential rates of erosion from a range of surface types.

Mapping the Magela catchment

The most recent acquisition (May 2010) of VHR imagery was the World-View 2 satellite image of the Magela Creek floodplain, including the Energy Resources of Australia (ERA) mineral leases and the town of Jabiru. This image will be used to map aquatic and woodland communities within the Magela

catchment; to assess the health of the vegetation in the area, and to provide a record of the landcover conditions at the time it was acquired.

The panchromatic (black and white) band has a resolution of 0.5 metres, enabling individual shrubs and cars to be identified from space! There are an additional seven multi-spectral bands at a resolution of 2 metres, including from the Near Infrared part of the electromagnetic spectrum. These bands are particularly useful for mapping vegetation.



Digital elevation models (DEMs) are used to represent the surface of the earth. They can be used to model potential erosion pathways on a landform surface.



The World View-2 VHR satellite image of the Jabiru airport and SSD field station.