

Satellites and Remote Sensing

New and innovative techniques to assess and monitor Australia's arid lands.

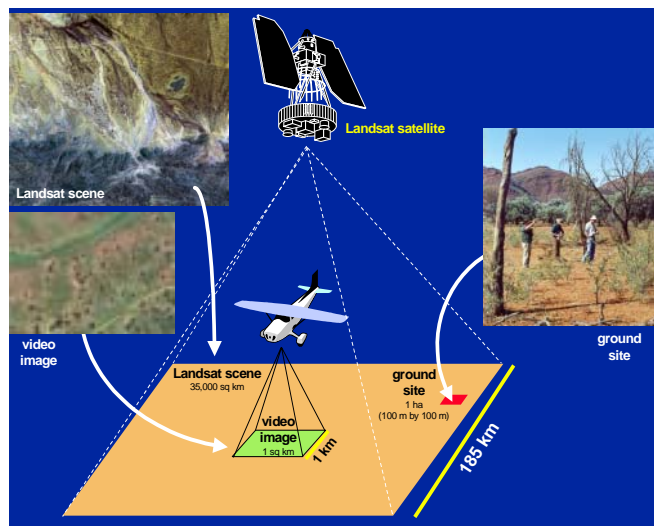
Due to the vastness of the arid lands and the relatively high cost of field surveys the Centre for Arid Zone Research has been extensively involved in the use and development of remote sensing techniques for the study of Australian landscapes for many years. Remotely sensed data from satellites and aircraft are used to monitor and assess larger areas than previously possible with ground-based methods, and in a cost effective and repeatable way. We utilise several different remote sensing methods depending on the nature of our research.

Broadscale patterns of plant growth after rain or seasonal vegetation changes are frequently apparent in NOAA's Advanced High Resolution Radiometer (AVHRR) satellite data. These data, with a resolution of approximately 1 km², can provide us with information on the plant growth across the entire continent and allows us to predict the amount of plant growth across vast regions or fuel loads for assessing the risk of bushfires.

The LANDSAT series of satellites provide us with finer resolution data with a 30 metre footprint - allowing us to study smaller scale features such as vegetation cover and soil erosion. Monitoring changes in plant cover over several seasons or years can be used to assess the impact of grazing animals (e.g. the grazing gradient technique).

To provide even more detail about characteristics and state of arid landscapes CSIRO has an airborne video camera system providing high spatial resolution from 2 metres down to 20 centimetres. At this scale we are able to distinguish the form of individual trees and shrubs and even individual grass clumps. The airborne video system has been successfully

used as a sampling tool to "ground-truth" satellite-derived indices of vegetation cover and is presently being used to determine the extent to which landscapes "leak" or conserve water and nutrients which are essential for plant growth.



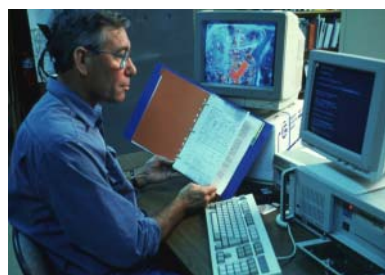
(ACRES- NOAA11 AVHRR satellite image of Australia)

The spatial complexity of the large areas analysed means that it is difficult to check the results of grazing gradient analyses using conventional ground-based measurement. [Details of this are on CD-ROM. And can be purchased from CAZR].

As new promising airborne and satellite instruments become available to the environmental community,



CSIRO acquires data at a range of sites to test their suitability for environmental research. Hyperspectral (high spectral resolution) sensors have been flown over one of our study sites in Central Australia and we are currently exploring potential applications for information from these new sensors. We are also involved in testing data from the new Hyperion satellite which was launched late 2000.



More information on CSIRO's earth observation research is available from CSIRO Earth Observation Centre [<http://www.eoc.csiro.au/>]



Researchers at the Centre for Arid Zone Research actively promote, and are involved in, the transfer of these technologies to state, federal and educational agencies - providing them with new and innovative techniques to assess and monitor Australia's arid lands.



(ACRES-Portion of Landsat 10277 view of Finke River)

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