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## New satellite imagery SPOT-on

By Gary Alcorn

Imagine being able to confidently identify water storages and erosion activity or plan precision farming layouts from 386 km away.

Farmers, agricultural engineers and regional planners will have this ability with the recent release of new satellite imagery which delivers 2.5-metre pixel resolution.

Natural resource mapping and integrated catchment planning in the Condamine catchment of southern inland Queensland will be accelerated by the recent public-access release of SPOT-5 imagery.

Rectified imagery from the French SPOT 5 (Satellite Probatoire pour L'Observation de la Terre) orbiting 386 km above the Earth delivers higher resolution than Landsat and can provide stereoscopic (3-D) imagery.

The SPOT constellation consists of three satellites which are capturing imagery daily over most of the world's surface. Each image covers a 60 km x 60 km area.

This visionary project, commissioned by the Condamine Alliance, a regional natural resources management organisation, mapped the entire 2.75 million hectare drainage system which forms the headwaters of the Darling River system.

Land use varies from high-density urban in the cities of Toowoomba and Warwick to intensive irrigation, feedlotting, forestry and extensive dryland farming.

As Condamine Alliance geographic information systems specialist and local government liaison officer Mark Schuster said, "Land managers previously relied on aerial photographs or other satellite imagery.

"None of which had been compiled to form a composite and geographically accurate picture of a whole catchment."

Senior Lecturer in Remote Sensing and GIS at the University of Southern Queensland, Dr Armando Arpan agrees the improved resolution will help planning at both farm and catchment scales.

"SPOT 5 imaging is an improvement on the previous SPOT (1, 2, 3, and 4) systems. One of the key improvements is in spatial resolution — that is the ability to sharply and clearly define the extent of objects or features within an image.

"With SPOT 5, the panchromatic band (black and white image) has a five metre

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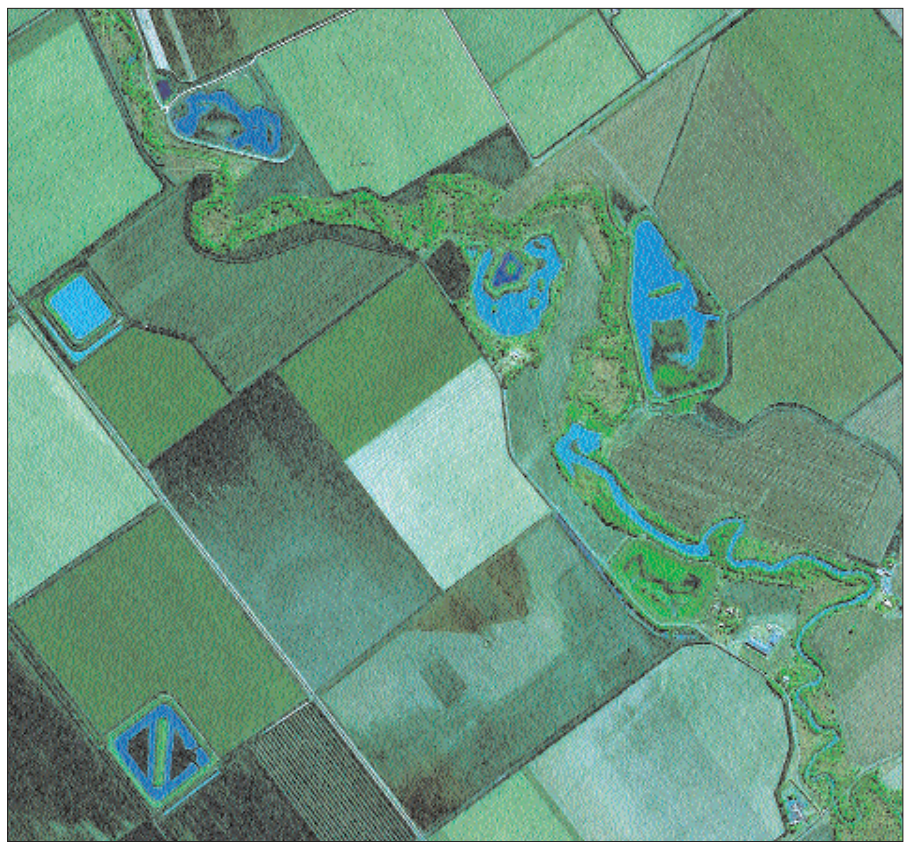
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SPOT5 satellite imagery will enable landholders to clearly define features just 2.5 metres across.

spatial resolution. This can be improved to 2.5 metres, with some data acquisition and image processing techniques applied.

“At this resolution, it means that an object larger than 2.5 m x 2.5 m will be visible as an individual item on that image — for example, farm sheds, roads, houses, small dams, clump of trees, creek lines, etc.

“With Landsat, having a typical 30 m x 30 m resolution, many of these objects or features were difficult to map,” he said.

This new imagery, acquired jointly with GeoScience Australia, the national agency for geoscience research and geospatial information, cost more than \$240,000.

But it will be made available at heavily discounted rates, up to 80 per cent, after a decision by the Alliance to share the data as part of its charter for managing natural resources in the catchment.

All seven Landcare groups and 11 of

12 councils in the catchment have taken up the offer to acquire the imagery, and the Alliance is encouraging landholders to approach their local councils or Landcare groups to acquire the data for their properties.

“Digital images on this scale generally eliminate a requirement for ground truthing, allowing the Alliance and clients such as Landcare and local government to use the imagery as a baseline for planning and monitoring landscape change.

“Alliance staff, armed with GPS receivers, have validated the satellite imagery with ground-control readings taken at more than 300 locations in the Condamine catchment,” Mark said.

‘Big picture’ planning has become easier and more time-efficient says Armando.

“Improved spatial resolution offers better ability to map objects or features of

interest. For catchment management, imagery from high-resolution sensors can be useful in many ways.

“This is particularly true if the focus of investigation or area of interest requires detailed levels of mapping.

“For instance, mapping of native vegetation at the level of individual trees or clumps could be more valuable for riparian management or salinity mitigation, say, in precise targeting of areas to be revegetated.”

Scientists seeking even higher resolution have not been forgotten. The QuickBird satellite has a 0.6 m spatial resolution for black-and-white image, while the IKONOS system has a one metre resolution, he said.

For more information on SPOT technology visit <http://sun1.ct.usgs.gov/glis/hyper/guide/spot> or browse SPOT imagery at <http://www.coresw.com>

