Spatial Data and Capacity Building

across the Queensland Regions

"I enjoyed the program and got a good start to using GPS as a property management tool. Everyone involved was extremely helpful."

Spatial Imagery across Queensland

The Qld Regional NRM Groups Collective has been coordinating the purchase of the largest single spatial imagery capture in Australia and training of regional NRM body staff and on-ground land managers to enhance the delivery of projects and programs.

The Spatial Imagery Capture Project was developed from an identified need for imagery capture coordination, capacity building amongst the Regional NRM Bodies and general information coordination between the Regional NRM Bodies, stakeholders and government agencies.

SPOT5 earth observation satellite imagery with license uplift provides improved technology for Regional NRM Bodies, land managers and whole of government use. Regional Geographical Information System (GIS) staff believe the positional accuracy is excellent and has exceeded expectations. Natural colour mosaics have been provided to Regional NRM Bodies, who are distributing this imagery to landholders as requests are received.

Thirteen NRM regional bodies have participated in Global Positioning System (GPS) and GIS training provided by the Qld Regional NRM Groups Collective. Across the state 285 people have been trained in GPS and 218 people trained in GIS since the project commenced in 2006.

Standards for capturing property infrastructure have been developed and sent out to GIS users and stakeholders for feedback. These standards have been in use by the Queensland Murray Darling Committee and Condamine Alliance for three years and have expanded to suit current needs for state-wide implementation. A GIS tool has been developed to assist with this process and has been released for trial and comment. The process is designed to complement the Queensland Governments' OnePlan initiative.

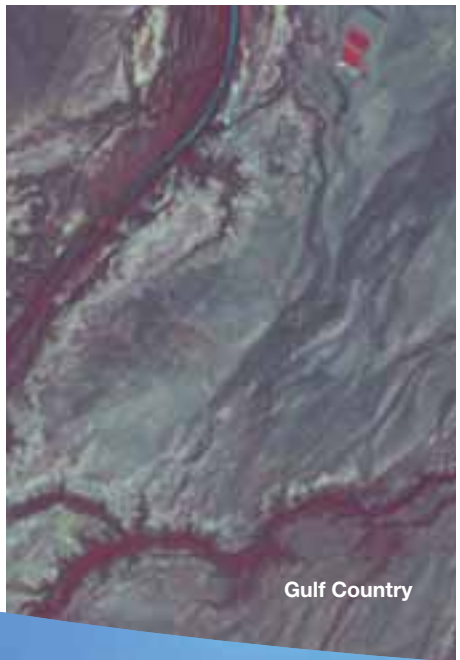
The state-wide imagery capture process has allowed cost savings for Regional NRM Bodies. These savings have so far been reinvested as value added products for the following regional bodies: Queensland Murray Darling Committee; Terrain NRM; Condamine Alliance; Fitzroy Basin Association; and SEQ Catchments.

A strategic plan for Regional NRM Body Information Management and GIS activities is used to identify the future needs of the Regional NRM Bodies and ways to address them.

Queensland has the largest single spatial imagery capture in Australia.

Previous Landsat imagery could only provide resolution to 25 metres. By contrast, the latest satellite imagery allows users to distinguish ground features as small as 2.5 metres. The 2.5m resolution imagery shows land managers water tanks, houses and sheds, roads, riparian corridors, fence lines, contour banks, streams, flooding areas and grazing pressure.

The Spatial Imagery Capture project team works to build the capacity of Regional NRM Bodies by coordinating joint spatial imagery purchases; six-monthly state GIS workshops to share skills and information; and provides one-on-one technical advice and support to staff.



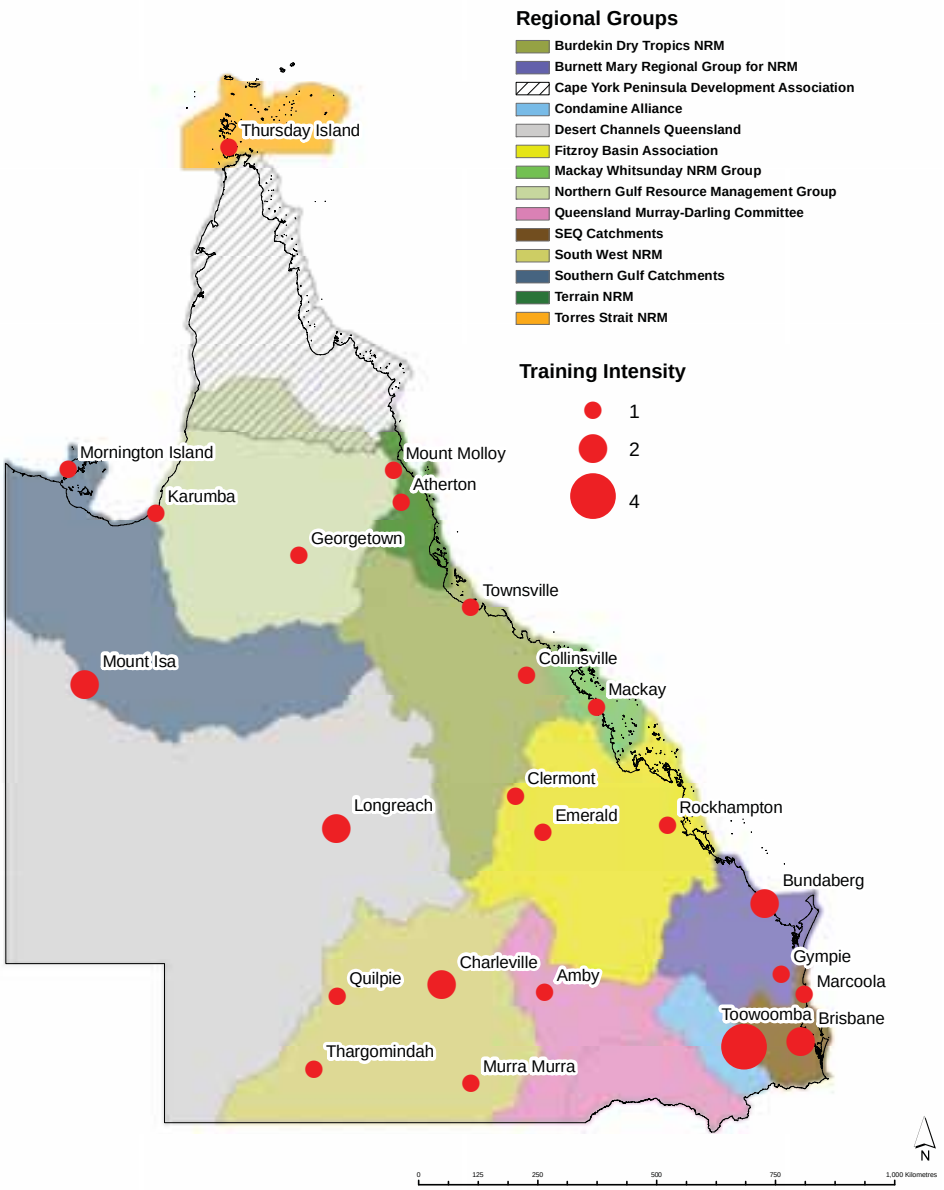
Gulf Country

"This has been the best training I have ever attended."

Taking GIS training to a new level

SPATIAL IMAGERY AQUISITION PROJECT

GIS and GPS Training Delivery



Goondiwindi irrigation country

The accuracy of the imagery makes it ideal for analysis and planning at the individual property level. For property planning, a range of data layers can be added on top of the imagery to give a complete picture of conditions on the ground.

Examples of data layers include:

- property boundaries
- soil type
- gully and stream-bank erosion
- land management such as cropping areas
- property infrastructure
- cleared areas
- remnant vegetation
- weed infestation
- wildlife corridors

GIS/GPS training

Using GIS/GPS skills to assess catchment priorities

Shannon Van Nunen
Field Officer
Coastal and Marine Program, Fitzroy Basin Association (FBA)

Shannon Van Nunen, Fitzroy Basin Association (FBA), has extended his skills learnt from the Regional Groups Collective GPS/GIS training to assist his colleagues develop a desktop assessment method for neighbourhood catchment prioritisation.

The Priority Neighbourhood Catchment process involves rating the health and status of sub-catchments within the Fitzroy Basin in order to determine which catchments would benefit most from on-ground projects. The method involved three main components:

1. Regional ecosystems (vegetation) composition
2. Presence of important marine species and habitat such as seagrass, coral reefs, dugong protection zones, turtle rookeries and two rare species of dolphins, the Indo-pacific humpback dolphin and the Snubfin dolphin
3. An estuary rating from the OzEstuaries database of significant estuaries along the coast

Since Shannon's training in September 2007, he has collated all relevant datasets and used ArcMAP to intersect, union, clip, analyse and run statistics on these datasets. This produced a rating for each of the coastal neighbourhood catchments within the Fitzroy Basin.

The top ranking catchments were suggested to each sub regional body within FBA for selection to focus staff efforts for protection and rehabilitation projects for the next three years. These developments can enhance:

- fencing riparian areas
- weed eradication
- re-vegetation of degraded areas
- ground cover in agricultural areas to reduce sedimentation
- wetlands protection
- research into important species and habitat
- habitat mapping
- community engagement
- cultural heritage projects

The outcome of Shannon's efforts is a desktop assessment method that FBA's Coastal and Marine Program can use as a solid and reproducible method to prioritise coastal neighbourhood catchments. This will act as a support to FBA's Priority Neighbourhood Catchment process, which aims to gain better results for the amount of effort exerted into designated areas. This method can now be improved upon as a foundation for future involvement of the coastal and marine program in FBA's Priority Neighbourhood Process.

Prioritising coastal neighbourhood catchments

Fitzroy River Delta

ArcGIS software is available through our ESRI Australia partners at a heavily discounted price to all landholders and not-for-profit organizations working in partnership with Regional NRM Bodies Australia-wide. The ArcGIS software works hand-in-hand with the geo-database.

Those interested need to obtain a letter of support from their local Regional NRM Body and send it ESRI Australia.

Training at Mt Isa

Young talent merging spatial imagery with cultural heritage

Juelisa Nash
GIS Trainee
Burdekin Dry Tropics NRM

Juelisa Nash, Burdekin Dry Tropics NRM, has developed her technical skills to care for local cultural heritage since her training with the Qld Regional NRM Groups Collective GPS/GIS training in June 2007. Prior to the training Juelisa had no experience with GIS and now she is a full-time GIS trainee. The Burdekin Dry Tropics NRM is sponsoring her to undertake a Certification 3 in Spatial Information Services.

Juelisa's efforts in GIS have led to some impressive achievements, including:

- disturbance monitoring/reporting after cyclone Larry;
- SPOT5 imagery requests and processing;
- metadata composition;
- writing user guides for geo-tagging software; and
- map production for Burdekin Dry Tropics NRM project staff and Traditional Owners

Juelisa participates in a working group which works to build capacity within the Traditional Owner groups of the Burdekin Catchment (Jangga).

Juelisa plans to use the skills she has gained to teach the local Traditional Owners how to capture their own data using GPS and download information to a computer, so they can safely store and back-up the data they collect. The local Traditional Owners collect information on:

- Artefacts
- Engravings and paintings
- Meeting places
- Fish traps
- Camp sites

Juelisa will also help the local Traditional Owners to collate the data they already have, and if necessary, she will convert data into an ArcMAP compatible format. With these developments she can create maps to be display the cultural heritage information collected.

This partnership benefits the Traditional Owners by building local technical skills so they can collect their own data. Independent data collection allows older generations of Traditional Owners to pass on technical skills and important cultural heritage knowledge to the younger generation, ensuring the culture of their ancestors is not lost. Juelisa believes that she will also benefit greatly from this project as she knows she will gain an enormous amount of cultural heritage knowledge from the Traditional Owners.

Magnetic Island

Clairemont

Training at Mornington Island

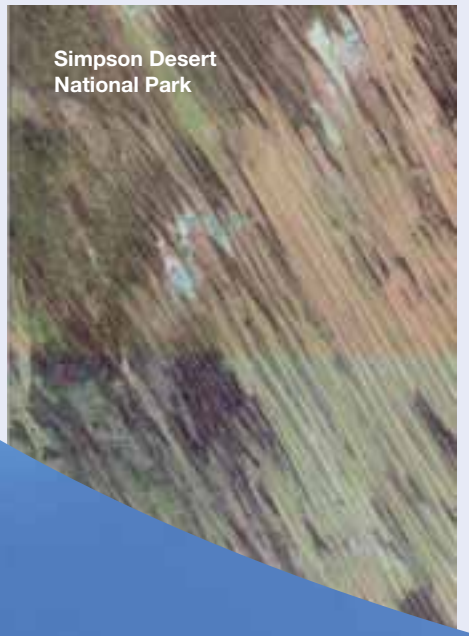
"Great GPS day, very relevant to my indigenous site recordings."

Making a difference in Central Queensland

The GIS and GPS training provided in Central Queensland to staff and community partners of the Fitzroy Basin Association (FBA) has made real differences to the local people and environment.

FBA's Biodiversity Field Officer, Rhys Kellow, is using GPS and GIS in Emerald to calculate and map vegetation of high biodiversity value in priority areas. Rhys now downloads VMA and BAMM information to assist in his technical analysis for property owners.

FBA's Water Quality Field Officer, Nick Kirby, uses Arc View GIS and satellite imagery to select suitable locations for water monitoring stations. Nick downloads data from the bureau of meteorology and uses Arc View GIS to develop average rainfall rasters, providing background information for the Regional Water Quality Monitoring Network.



Simpson Desert National Park

The Central Highlands Regional Resource Planning Coop. (CHRRUP) has put their staff through the training for their field work with local farmers and graziers. CHRRUP field officers, Vicki Kuhn and Susie Bates, help landholders with property planning and natural resource management project applications by creating GPS versions of proposed and current property infrastructure. This information is digitised and provided as a base map with other useful information such as topography and land suitability.

Several landholders participated in the training as an introduction to increase their mapping skills to help improve their property planning skills. Farmers and graziers utilise GPS and computer mapping skills to develop property plans for resources such as PMAV's, Land and Water Management Plans. The implementation of programs like rotational and cell grazing or control traffic farming particularly require accurate mapping of paddocks and topography.

Some applications are a little left field as demonstrated by Gina O'Sullivan, FBA's Land Management Officer. Gina takes photos of 1m on-ground quadrates then rectifies them to a digital grid. Gina analyses the grid to calculate ground cover for land condition assessments.

There are many applications for GPS and GIS skills in today's agricultural and natural resource management industries. Without the subsidised training provided by the Qld Regional NRM Groups Collective, many of these people could not do what they are doing now without investing large amounts of time and money in professional training.

A set of standards to capture property data is being integrated into a geo-database and a set of tools to simplify the capture and edit process. These standards will be available for all to use by September 2008!

Land managers' experiences

"The Stanbroke Pastoral Company has become involved with Northern Gulf Resource Management Group and Southern Gulf Catchments in the last two years and we have been very happy with the satellite imagery data and the mapping program to date.

The training component was well received by Stanbroke staff and has been most helpful in our preliminary stages of the mapping program that is taking place on all stations. The infrastructure mapping phase has been completed and we are very pleased with the effort and expertise of Northern and Southern Gulf staff involved.

We are very excited about the future and the information we will be able to access will make planning of infrastructure and the implementation of sustainable grazing practices a lot more structured and scientifically based in the future. These technologies would also mean an integrated management approach with future consideration of conservation areas, soil management, pest management and grass budgets.

In light of the current weather events, we also would like to obtain more information on our river systems in flood times for management purposes. The need for more flood recording stations is now most notable, no one really knows where floods go at certain heights or when rivers meet what happens below this point, more info needs to be gathered and made available to all concerned in the gulf."

Jack Morris
Pastoral Manager

"Geographical Information Systems and SPOT5 satellite imagery has been very valuable in mapping, infrastructure, land types, vegetation types and water grazing circles from water points for better pasture utilization. Additionally these technologies have instilled sound conservation practice into our property management planning for a sustainable future.

We have also found that the benefit of having the mapping technology available at Georgetown has been very helpful in correct information being collated for use in environmental management submissions such as:

- Enviro Fund (Grazing Land Management)
- Enterprise Management Plan
- Nature Assist
- Vegetation Management Plan
- Pest Management Plan

Barry & Tammy Hughes
North Head Cattle Co

Spatial imagery is being used in Queensland to show changes in land use and landscapes over time. These two satellite images show the distinct differences in the capacity of the Ross River Dam near Townsville and surrounding vegetation growth before and after major flood times.

"We have been involved with the Northern Gulf Resource Management Group (NGRMG) in GIS training and the use of satellite imagery for the past four years.

We can't imagine any land manager or other stakeholders in this industry not having access to this technology. We use it or refer to it on a daily basis. For instance all of our property infrastructure, land types, significant sites, pest sites, roads, walking tracks (tourism) and potential boundary alignments are collated into the software for easy reference.

This makes for sound decision making when planning infrastructure or calculating environmentally sustainable grazing pressure before leaving the office.

We also utilize GIS for Integrated Property Management Planning and the upcoming lease renewal process by way of land condition monitoring.

Of course the success of this has been due to field training and familiarisation of software by NGRMG, who have been dedicated to the cause."

Simon and Gaye Terry
Robin Hood Station
Cobbold Gorge Tours

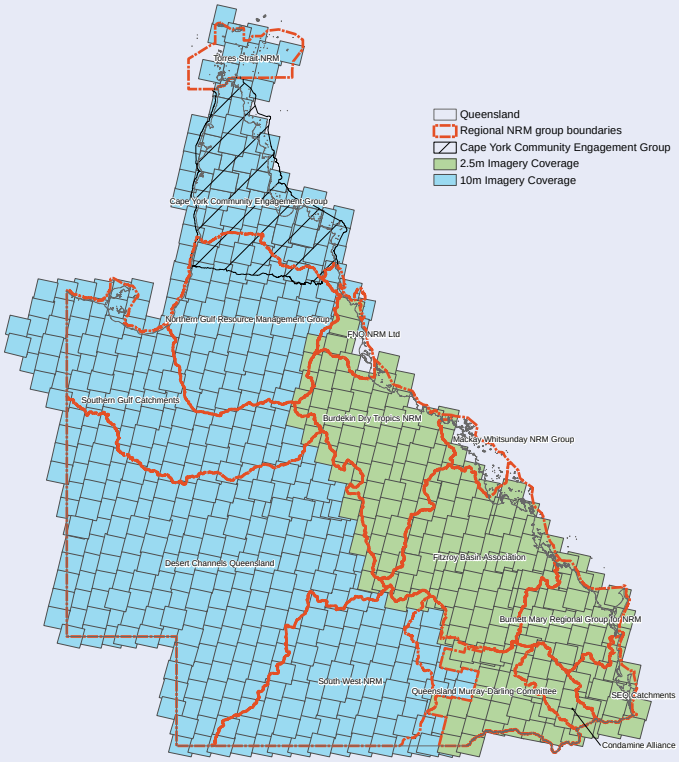
SPOT5 Earth Observation Satellite Imagery

Queensland has the largest single capture of spatial imagery in Australia. This area is 1.72 million km2, stretching from the Torres Strait, west of Townsville to the Qld/NSW border and across the NT border. This data was captured between July 2005 – December 2006. This single capture has 10m imagery coverage. Imagery coverage at 2.5m is also available at a discounted rate over this area of Queensland.

Sediment Plume near Townsville

Only by expanding our perspective can we see the collective effect that small changes have on our natural resources.

QUEENSLAND SPOT5 IMAGERY COVERAGE AND RESOLUTION



10 meter resolution, Multi-Spectral imagery is available for both the blue and green shaded area.

2.5 metre resolution, False Color is available for the green shaded area only

Each polygon represents a 60 X 60 kilometre tile of imagery. There are a total of 741 tiles.

http://www.spot.com

0 250 500 1,000 Kilometers
1:12,000,000

Qld Regional NRM Groups Collective
Lee Blacklock
NRM Regional GIS Training Coordinator
Email: lblacklock@rgc.org.au
Phone: 07 5451 2212
Fax: 07 5450 8713
Mobile: 0427 223 774

ESRI Australia Client Services
James Hatton
Client Relationship Manager – NRM
ArcGIS Coordinator
Email: jhatton@esriaustralia.com.au
Phone: 07 3218 4103
Mobile: 0438 392 872

EnviroCare 100% Recycled Paper

Qld Regional NRM GROUPS COLLECTIVE

Supported by ESRI Australia

Australian Government Geoscience Australia

Queensland Government

Leica Geosystems

GDA