
Centre for Remote Sensing and Spatial Information Sciences

Monthly Centre Newsletter #7

Covers activities for: April - August 2007

Compiled by: S.Phinn and B.Price

Please send any new contributions to Stuart, Bronwyn or Clive

Past versions kept on the CRSSIS website

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(I) Introduction

Second semester is well underway and our teaching and research activities are going through the busiest time of year, with lots of actual work happening and students finishing their programs (as opposed to writing proposals and attending meetings).

Thanks to everybody who attended the “Spatial Information for Water Resources” Seminar series in mid-July; we had over 100 attendees and lots of follow on discussions between participants.

We are also fortunate to have several new postdoctoral appointments commencing work with us, Dr Jonathan Rhodes (CSIRO and UQ), is working with Dr Clive McAlpine on conservation planning modelling in peri-urban landscapes, and Dr Lara Arroyo Méndez (Universidad Politécnica de Madrid, Spain) will be working with Assoc.Prof. Phinn on a number of high-spatial resolution image processing projects. Our new postdocs will expand the centre’s high-level research-only staff to 10 and also assist with a number of new projects, such as: (1) a Slade foundation project being led by Assoc. Prof Armando Apan at USQ on Fine-scale habitat mapping of threatened reptiles in the Queensland Brigalow Belt using new generation radar remote sensing and high spatial resolution imagery; and (2) an evaluation project for the Victorian Department of Environment and Sustainability assessing the measurement of riparian vegetation and physical form metrics by remote sensing.

The centre has also commenced a number of small and large scale research initiatives which will shape the work we do and how it is delivered to and used by government and industry. The largest and most significant is a formal agreement between the University and the Remote Sensing Centre of the Queensland Dept. of Natural Resources and Water (including the SLATS and QLUMP programs) to establish a joint remote sensing research program. This establishes the largest applied remote sensing research centre in Australia with a unique combination of infrastructure, skilled personnel, image archives and operational procedures for acquisition and processing of large volumes of image data, and for the development, calibration and validation of image processing routines. The program will liaise closely with government and private industry once it is formally established. Its first initiative will be a joint project with Geosciences Australia to develop correction and processing approaches for hyper-temporal data sets over Australia based on the entire ACRES Landsat TM/ETM archive and the expanding MODIS archive. We will also be expanding our high-level image calibration and validation programs through improvement of our full-range spectrometer resources and development of sun-photometer sites. These data will be used to develop a national image calibration database collaboratively with ACRES.

CONGRATULATIONS!!!

Finalised doctoral degrees to:

Dr Andrew Robson

Dr Leonie Seabrooke

Dr Harriet Preece

Dr Jenni Garden

PhD thesis submissions in review and revision:

Justin Ryan

Mehrdad Khanmohammadi

The Centre has just had five PhD students graduate from our program area, most of whom used high spatial resolution image data for projects ranging from development of a standard land-use mapping program for Indonesia, monitoring riparian zone condition and modelling koala habitat. This was balanced by an intake of new PhD students, Charles Hu is modelling landscape change in the brigalow bioregion; while Owen Powell is looking at Indigenous cultural landscapes in Queensland), while three are focussing on coral reef and algal bloom dynamics in Australia and parts of south-east Asia (David Blondeau-Paissier, Tran Van Dien and Robert Canto).

Grants:

Victorian Department of Sustainability and Environment

Johansen, K., and Phinn, S. Pilot application to assess the measurement of riparian vegetation and physical form metrics by remote sensing

UQ New Staff Research Start-Up fund: Kasper Johansen, \$12,000

Grants still under review:

ARC Discovery

McAlpine, McGowan, J. Syktus (NRW), G. McKeon (NRW) B. Henry (NRW) and R. Pielke (Colorado State University)

Developing more comprehensive climate change simulations for Australia by including the role of past and future land cover change.

ARC Linkage

McAlpine, Rhodes, Price, Seabrook, D. Lunney (NSW Dept of Environment and Climate Change), G. Baxter (NRAVS Gatton) and A. Bradley

The conservation of widely distributed species: implications of differences between western and eastern koala populations.

ARC Linkage International – with US Office of Naval Research

Phinn, Dekker, Brando, Roelfsema, Lynch (Curtin), Mumby and Hedley (Exeter), Mobley (Sequoia Scientific), Bissett (Florida Env. Research Institute), Lee (Naval Research labs)

International Evaluation of Algorithms for Mapping in Optically Shallow Waters

NCRIS

Queensland Consortium, including Phinn, S., Possingham, H, and McAlpine, C.

A Queensland-based National Terrestrial Ecosystem Research Network

Dairy Australia

J.Ryan

'Integrated plant-based systems to enhance on-site water recycling and buffer extremes in micro-climate on sub-tropical dairy farms'

New People to the centre:

Robert Canto (rm 503) – was a research associate and a graduate student as well at the Marine Science Institute of the University of the Philippines-Diliman. Robert has worked on various research projects involving oceanography, marine remote sensing and coral reef survey and monitoring. The last project he was involved in identified productive zones around Philippine waters using ocean color and sea surface temperature data. For his PhD, Robert plans to investigate on the mechanisms of algal growth in coral reefs and how it can be modeled and predicted using parameters which can be derived from remote sensing data.

Tran van Dien (rm 543) - My name is Tran Van Dien. I come from Institute of Marine Environment and Resources, Hai Phong City, Viet Nam. I graduated engineering degree in hydro-geology from Hanoi University of Mining and Geology, Vietnam and master degree in remote sensing and GIS from Asian Institute of Technology, Thailand. I have implemented researches in field of remote sensing for coastal ecosystem, environment and hazards monitoring, ocean colour remote sensing and spatial modelling since 1996. I am working on developing the method for mapping and monitoring of coral reef habitat in coastal waters from remote sensing images."

Jonathan Rhodes - UQ Postdoctoral Research Fellow (started June 2007). Working on biodiversity conservation planning tools for peri-urban landscapes.

Michael Hewson - Nearly completing an MGIS, Michael has joined CRSSIS for a short term research assistant contract to help Kasper Johansen complete riparian zone mapping against established criteria as a trial for the Victorian Department of Sustainability and Environment. Michael is making a change from previous experience in information systems project and services management (mining, public and not for profit sectors) and RAAF Air Traffic Control.

(2) Related Centre and School seminars (TEC/SEL, CMS, etc)

School of GPA: EVERY WEDNESDAY AT 1PM IN RM414 – LUNCHTIME SEMINARS!

THE SCHOOL OF GEOGRAPHY, PLANNING & ARCHITECTURE
SHOWCASE & EXHIBITION

Wednesday 19 September 2007

Exhibition Space - Zelman Cowan Building # 51

From 5pm – 6.30pm

As part of the University's Research Week, the School will be hosting a research showcase event which will include the official launch of the School's Research Profile as well as the annual RHD Student Poster exhibition. This event will bring a number of people from within the wider University community as well as representatives from government and industry to examine our research.

The Ecology Centre/Spatial Ecology Lab :

Title	Date	Place	Speaker
<i>Chloroplast - Nuclear Communication: Systemic and Intracellular Signalling</i>	7 th September (Friday) 1pm	UQ St Lucia room 388 Goddard (Building 8)	Barry Pogson ANU, Canberra
<i>The good, the bad and the beautiful: evolution, ecology & economics of plant nitrogen relations</i>	14 th September (Friday) 1pm	UQ St Lucia room 388 Goddard (Building 8)	Susanne Schmidt The School of Integrative Biology, The University of Queensland
<i>TBA (behavioural ecology)</i>	12 th October (Friday) 1pm	UQ St Lucia room 388 Goddard (Building 8)	Andrew Cockburn ANU, Canberra
<i>TBA (cosepeciation)</i>	19 th October (Friday) 1pm	UQ St Lucia room 388 Goddard (Building 8)	Sonja Scheffer USDA, Maryland
<i>TBA (phylogeog/sepeciation)</i>	26 th October (Friday) 1pm	UQ St Lucia room 388 Goddard (Building 8)	Kevin Omland UMBC, University of Maryland

Centre for Marine Studies :

Others :

(3) Academic staff movements/contact details

Stuart Phinn

Around most of the time except Thursdays, and away Sept 22- 30.

Clive McAlpine

Around most of the time. Field Sept 24-27.

David Pullar

TBA

Pramod Sharma

Retired - but still working!

Gerd Dowideit

TBA

Chris Roelfsema

Away April 6-14, April 29 - May 7

Bronwyn Price

Scarla Weeks

(4) Student Meeting times

Stuart Phinn – please contact me to schedule a time

Clive McAlpine

Available most days – contact for time

David Pullar

Gerd Dowideit

Pramod Sharma

Scarla Weeks

(5) Visitors to the centre and affiliated centres

CRSSIS :

Noam Levin 2007 <http://www.math.tau.ac.il/~levin/noam.html>

Professor Peter Mumby – University of Exeter (22-23/8)

Dr Roy Hughes – Australian Defence Science Technology organisation (15/8)

Dr Paul Wilson – Victorian DSE

Dr Serge Andrefouet and Dr Pascale Chabanet, IRD Noumea, (20-21/9)

The Ecology Centre/Spatial Ecology Lab :

Salit Kark 2007 http://biodiversity-group.huji.ac.il/SalitKark/Salit_Homepage.html

Satu Ramula 2007-2008 Post-doc who will be visiting Yvonne Buckley. She works on
plant models (lots of work on stochastic matrix models)

(6) Fieldwork and Conference movements

Fieldwork

Stuart Phinn, Chris Roelfsema, Julie Scopelitis, Ian Leiper and Robert canto to Heron Reef for Sept 22- 30 for Quickbird image acquisition and reef survey.

Conferences

Who? Noam Levin

When? September 2-5 2007

Where? Perth

What? MEDECOS XI 200: The International Mediterranean Ecosystems Conference

Who? Kasper Johansen and Chris Roelfsema

When? November 12-16 2007

Where? Kuala Lumpur

What? Asian Conference on Remote Sensing

What? Ecological Society of Australia

Who? C. McAlpine, B. Price, C.Hu

Where? Perth

When? Early Dec

What? MODSIM

Who? Ravinesh Deo

Where? Christchurch NZ

When? Early Dec.

(7) Any relevant shared resource news

Hardware

Tim Danaher's group has received approval for the purchase and installation of a new sun-photometer at Wivenhoe Dam. This system (http://www.cimel.fr/photo/sunph_us.htm) will fill a critical gap in the Aeronet sun-photometer network (<http://aeronet.gsfc.nasa.gov/index.html>) and provide us with data for correcting our images and for the study of irradiance and atmospheric aerosols.

Software

No new items

Website

The website is currently being redesigned and will be revamped in the near future. Keep an eye out for changes and your opportunities for input.

Check out the new online tool kits: <http://www.gpa.uq.edu.au/CRSSIS/tools/>

- ArcGIS Tool: Land Use Data Miner (LUDM)
- Coastal Remote Sensing Toolkit

The new **fieldwork forms** and **induction manual** are now available on the CRSSIS website

CHECK OUT THE NEW ON-LINE TOOLKITS:

<http://www.gpa.uq.edu.au/CRSSIS/tools/>

ArcGIS Tool: Land Use Data Miner (LUDM)

Coastal Remote Sensing Toolkit

Please update your personal and project details at

<http://www.gpa.uq.edu.au/CRSSIS/> CRSSIS internal

Manuals on CRSSIS website (<http://www.gpa.uq.edu.au/CRSSIS/publications/>)

Updated field spectrometry manual

Updated benthic photo survey manual

Updated UW-spec manual

Thales kinematic GPS unit

Image processing log example file

PDF library updates

See Atlas2\Crassis\Draft PDF Library for CRSSIS use

Endnote Library updates

See Atlas2\Crassis\Endnote Libraries for CRSSIS notes

Publications database

See for listing of all Tier 1 journals and publication experiences

Atlas2\Crassis\Documentation\CRSSIS_Journal_Evaluations

BRG Metadata

Quickbird images from Moreton Bay and Heron reef from July 2007

Atlas2\Crassis\metadata\ BRG_Data_ Inventory.xls

HIGH PERFORMANCE COMPUTING File Store & Processing

Users guide has been placed on the CRSSIS website - See Tony Gill if you have any questions!

(8) Recent publications and awards

Publications

- Bino, G., N. Levin, S. Darawshi, N. van der Hal, A. Reich-Solomon, and S. Kark. in press. Landsat derived NDVI and spectral unmixing accurately predict bird species richness patterns in an urban landscape. *International Journal of Remote Sensing*.
- Bowen, M. E., McAlpine, C. A., House, A., Smith, G., (in press). Regrowth forests on abandoned agricultural land: a review of their habitat values for recovering forest fauna. *Biological Conservation*
- Fox, J. C., H. Q. Bi, and P. K. Ades. 2007a. Spatial dependence and individual-tree growth models I. Characterising spatial dependence. *Forest Ecology and Management* **245**:10-19.
- Fox, J. C., H. Q. Bi, and P. K. Ades. 2007b. Spatial dependence and individual-tree growth models II. Modelling spatial dependence. *Forest Ecology and Management* **245**:20-30.
- Kutser, T., E. Vahtmäe, C. M. Roelfsema, and L. Metsamaa. in Press. Photo-Library Method For Mapping Seagrass Biomass. *Estuarine, Coastal and Shelf Science*.
- Levin, N., G. J. Kidron, and E. Ben-Dor. in press-a. A field quantification of the adaptations of coastal dune plants to erosion and deposition of sand. *Sedimentology*.
- Levin, N., and A. Shmida. in press. Determining conservation hotspots across biogeographic regions using rainfall belts: Israel as a case study *Israel Journal of Ecology and Evolution*.
- Levin, N., A. Shmida, O. Levanoni, H. Tamari, and S. Kark. in press-b. Predicting mountain plant richness and rarity from space using satellite-derived vegetation indices. *Diversity and Distributions*.
- McAlpine, C., Syktus, J., Deo, R., McGowan, H., Phinn, S., and Lawrence, P.J., (2007) Modelling the Impact of Anthropogenic Land Cover Change on Australia's Regional Climate. *Geophysical Research Letters*, In press 08/07.
- Nightingale, J.M. Hill, M. Phinn, S.R. Davies, I. Held, A.A., and Erskine, P. (2007) Use of 3-PG and 3-PGS to Simulate Forest Growth Dynamics of Australian Tropical Rainforests. I. Parameterisation and Calibration for Old-Growth, Regenerating and Plantation Forests. *Forest Ecology and Management*. In press 03/07
- Nightingale, J.M. Hill, M. Phinn, S.R., and Held, A.A. (2007) Comparison of Australian Tropical Rainforest Productivity Derived from the 3-PG Forest Growth Model and MODIS Productivity Products. *Canadian Journal of Remote Sensing*. In press 03/07.
- Phinn, S.R., Roelfsema, C.M., Brando, V.B., Dekker, A.G. and Anstee, J. (2007) Mapping Seagrass Species, Cover and Biomass in Shallow Waters: An Assessment of Satellite Multi-spectral and Airborne Hyper-spectral Imaging Systems. *Remote Sensing of Environment*. In press 09/07.
- Pople, A.R., Phinn, S.R., Grigg, G.C., Possingham, H.P., Menke, N. and McAlpine, C. (2007) Spatial patterns of kangaroo density over 26 years: aggregation during drought and suggestions of long distance movement. *Journal of Applied Ecology*, In press 04/07.
- Robson, A., G. Wright, and S. Phinn. 2007. Remote sensing applications in Peanuts- The assessment of crop maturity, yield, disease, irrigation efficiency and best management practices using

temporal images. *in 7th CTF Controlled Traffic Farming and Precision Agriculture conference*, Perth, W.A.

Ryan, J. G., J. A. Ludwig, and C. A. McAlpine. 2007a. Complex adaptive landscapes (CAL): a conceptual framework of multi-functional, non-linear ecohydrological feedback systems. *Ecological Complexity* **4**:113-127.

Ryan, J. G., C. A. McAlpine, and J. A. Ludwig. 2007b. GLAMS: a graphical method for capturing land and water management practices in agroecosystems. *Ecosystems* **10**:432-447.

Smith, C. S., A. L. Howes, B. Price, and C. A. McAlpine. *in press*. Using a Bayesian belief network to predict suitable habitat of an endangered mammal - The Julia Creek dunnart (*Sminthopsis douglasi*). *Biological Conservation* **In Press, Corrected Proof**.

Rhodes, J.R., Callaghan, J, Clive A. **McAlpine, C.**, de Jong, C., Bowen, M.E., Mitchell, D., Lunney, D., and Possingham, H. (accepted 8/07) Regional Variation in Habitat-Occupancy Thresholds: a Warning for Conservation Planning. *Journal of Applied Ecology*.

McAlpine, C.A, Rhodes, J., Lunney, D., Callaghan, J., Bowen, M., Mitchell, D., Possingham, H. [Accepted 8/07] Can Multi-scale Models of a Species' Distribution be Generalised from Region to Region? A Case Study of the Koala. *Journal of Applied Ecology*.

Garden J.G., McAlpine C.A., Possingham H.P., Jones D.N. 2007 Using multiple survey methods to detect terrestrial reptiles and mammals: What are the most successful and cost efficient combinations? *Wildlife Research*. **34**: 218-227.

Seabrook, L., McAlpine, C. and Fensham, R. (*in press*). What influences farmers to keep trees? A case study from the Brigalow Belt, Queensland, Australia. *Landscape and Urban Planning* (accepted for publication 26 August 2007)

Jenni G. Garden, Clive A. McAlpine, Hugh P. Possingham and Darryl N. Jones (2007). Habitat structure is more important than vegetation composition for local-level management of native terrestrial reptile and small mammal species living in urban remnants: A case study from Brisbane, Australia. *Austral Ecology* **32**(6):669-685

McAlpine, C. Heyenga, S., Taylor, B., Peterson, A. and McDonald, G. 2007. Regional Planning in Queensland's Rangelands: Challenges and Prospects for Biodiversity Conservation. *Geographical Research*, **45**(1): 27-42.

McAlpine, C.A., Spies, T. and Norman, P. 2007. Sustaining forest biodiversity: Lessons from forest conservation agreements in Southeast Queensland (Australia) and the Pacific Northwest. *Biological Conservation*. **134**:580-592.

Peterson, A., C. McAlpine, D. Ward, and S. Raynerb. 2007. New regionalism and nature conservation: lessons from South East Queensland (Australia). *Landscape and Urban Planning*. **82**: 132-144.

Murray, J.V., Low Choy, S., Goldizen, A.W., **McAlpine, C.A.**, Possingham, H.P., [Accepted July 2007]. The importance of ecological-scale to wildlife conservation: A case study of the brush-tailed rock-wallaby (*Petrogale penicillata*) habitat. *Biological Conservation*.

In preparation:

Seabrook, L.M. and McAlpine C.A.. (in preparation). Using a statutory duty of care to encourage native vegetation recovery: a case study from the Brigalow Belt, Queensland, Australia. *Society and Natural Resources*.

Rhodes, J. R., C. A. McAlpine, et al. In prep. Modelling the spatial distribution of koalas in a fragmented landscape using generalised linear mixed-effects models. in Zuur, Ieno, Walker, and Smith. (eds.) *Analysing ecological data using GLMM and GAMM in R*, Springer.

Rhodes, J. R., D. Lunney, A. Matthews, C. Moon, C. A. McAlpine. In prep. Koala faecal pellet decay: implications for using dung surveys to determine wildlife presence/absence. For *Wildlife Research*.

Callaghan, J. C., J. Thompson, D. Mitchell, C. McAlpine, C. de Jong, M. Bowen, R. Sternberg, J. Rhodes, A. Scott. In prep. Koala habitat preferences and habitat mapping in Noosa Shire, southeast Queensland. For *Wildlife Research*?

Rhodes, J. R., S. A. Condie. In prep. Understanding Marine Climate Change Impacts using Qualitative Models. For *EOS*.

Rhodes, J. R., E. G. Grist, K. W. H. Kwok, K. M. Y. Leung. In prep. Estimation of copper (Cu) toxicity on reproductive output of the harpacticoid copepod *Tigriopus japonicus* using a Bayesian mixture model approach. For a marine pollution journal.

Murray, J., Low Choy, S., McAlpine, C., Possingham, H. and Goldizen, A. Extrapolating species distribution models to neighbouring regions: A cautionary note. For *Diversity and Distributions*.

McAlpine, C. A., Deo, R. C, Syktus, J., Ryan, J, McKeon, G. M, McGowan, H A and Phinn, S. R. An Australian Continent under Stress: A conceptual overview of processes and risks associated with interaction between a changing climate and increased land use pressures. For *Global Change Biology*.

McAlpine, C.A. Etter, A., Laurance, W., Seabrook, L. and Heyenga, S. Can the global environment sustain the increasing world consumption of beef? -A Synthesis of case studies from Queensland, Colombia and Brazil. For *Global Environmental Change*.

Crowther, M.S., McAlpine, C. Lunney, D. Shannon, I. and Bryant. J. Using broad-scale survey data for quantifying habitat relationships in fragmented forest landscapes at a large catchment scale? A case study of the koala (*Phascolarctos cinereus*) in New South Wales. For *Biological Conservation*

Syktus, J. Deo, R., McAlpine, C., McGowan, H. and Phinn. S. Impact of land cover change on climate and El Nino events. For *MODSIM 2007*

Bowen, M. E., McAlpine, C.A., House, A.P.N., Smith, G.C., Forest patch configuration determines mistletoe (*Amyema quandong*) abundance with important consequences for nectarivorous and frugivorous birds in narrow linear Brigalow remnants. For *Landscape Ecology*

Price B., McAlpine C.A., Phinn, S.R., Pullar, D.V. and Ludwig, J. Are continuous habitat gradients more important than discrete patches for woodland birds in intact and variegated landscapes? For *Ecology Letters*

Levin, N., McAlpine, C., Phinn, S, Price, B., Pullar, D, Kavanagh, R. and Law. B
Isolated trees in agricultural landscapes and bird richness: what can we learn from remotely sensed
derived landscape metrics? For Ecography

(9) Upcoming conferences and professional activities

CONFERENCES:			
Conference Name	Date	Location	Website
Australasian Wildlife Management Society	December 2-5 2007	Canberra	http://www.awms.org.nz/conference2007.html
9th International Conference on the Ecology and Management of Alien Plant Invasions	17 - 21 September 2007	Perth, Western Australia	http://www.congresswest.com.au/emapi9
Norway/United Nations Expert Conference on Biodiversity	29 th October – 2 nd November 2007	Trondheim, Norway	www.dirnat.no
ForestSat'07 International Conference on Remote Sensing, GIS, and Forestry	November 5-7	Montpellier, France	http://forestsat.teledetection.fr/
ESA (Australia) 2007 conference	November 25-30	Perth, WA	http://www.ecolsoc.org.au/ESA2007Conference.htm
6th European Conference on Ecological Modelling, ECEM'07	November 27-30, 2007	Trieste (ITALY)	http://www2.ogs.trieste.it/ecem07/
Australasian Ornithological Conference	December 3-5 2007	Perth, Western Australia	www.birdswa.com.au/aoc2007
MODSIM07	10-13 December 2007	Christchurch, New Zealand	http://modsim.lincoln.ac.nz
2008 Ocean Science Meeting	2-7 March 2008	Orlando, Florida, USA	http://www.aslo.org/meetings/orlando2008/
Landscape Patterns and Ecosystem Processes 2008 Us-IALE Symposium	April 6-10 2008	Madison, Wisconsin, USA	http://www.usiale.org/madison2008/index.htm
Studying, Modeling and Sense Making of Planet Earth	1-6 June 2008	University of the Aegean Mytilene, Lesbos, Greece	http://www.aegean.gr/geography/earth-conference2008/

World Conservation Congress	October 2008	Barcelona	http://www.iucn.org/congress/2008/
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(10) Miscellaneous

THANKS FOR READING THIS FAR!!