

ANNUAL REPORT
January-June 2010



"Ready and timely access to spatial information – knowing 'where' people and objects are – is essential to Australia's continued development in the information age. It is a critical tool in informed decision-making on key economic, environmental and social issues."

CRC for SPATIAL INFORMATION

Established and supported under the Australian Government's
Cooperative Research Centres Program

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Essential Participants



national SME consortium



**Land & Property
Management Authority**



Department of
**Sustainability
and Environment**



Australian Government

Geoscience Australia

representing a Commonwealth consortium



**Queensland
Government**



Curtin University



**THE UNIVERSITY OF
MELBOURNE**



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CRC for Spatial Information

Statement of Purpose

CRCSI will bring rapid and powerful collaboration on all critical research and education issues that involve a spatial aspect, and by doing so accelerate the take up of spatial science in key end-users, and spawn major innovation and productivity advances in the five key industry sectors of

- Agriculture, Natural Resources and Climate Change
- Defence
- Energy & Utilities
- Health
- Sustainable Urban Development



The CRC for Spatial Information brings together \$100 million in cash and in-kind from our partners to identify the questions of our future spatial information needs - who needs spatial information, in what form, and when - and to seek innovative solutions to meet these needs.

Our aim is to create new wealth and benefits for our participants, and for the nation, through research innovation and commercialisation; through educational activities; and through powerful collaboration that builds institutional capacity.

Since 2003, our award winning CRC has commercialised intellectual property, generated spin-off companies, brought industry sectors together and helped galvanise the Australian spatial information community. Our key achievements to date underpin Australia's emerging spatial information industry which in 2006-07 had an estimated revenue of \$1.4 billion and contributed \$12.6 billion to GDP.

CRC for SPATIAL INFORMATION

EXECUTIVE SUMMARY

The CRCSI started its second term of eight and half years on 1 January 2010 following a successful extension bid in Round 11. The period January to June 2010 saw the transition from the first term of the CRCSI ("CRCSI-1") to its 2010-2018 term ("CRCSI-2"). This period involved the settling in of 110 signed up or intended participants, the establishment of the new seven person Board, formation of a new management structure, completion of an Operational Plan and establishment of the new research program.

The period involved substantial contractual arrangement and careful articulation between the governance structures of the two entities, CRCSI-1 and CRCSI-2. The Board of CRCSI-1 operated independently from the Board of CRCSI-2.

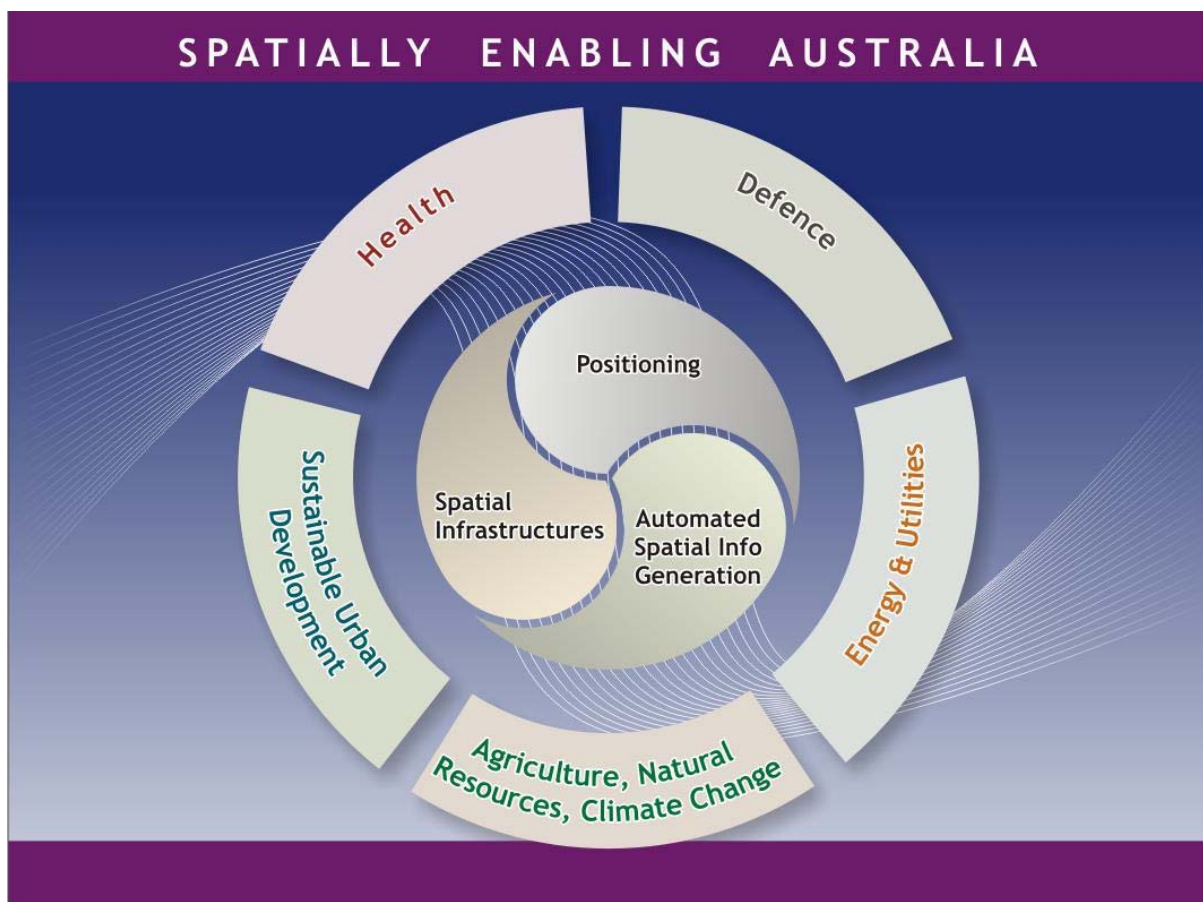
The transition period will be completed shortly and the name CRCSI shall come into common usage again for the next eight and half years.

Achievements

Research

The CRCSI-1 wound down its first term research activities in an orderly fashion during the period. Seventeen projects were continued from the 2009 Calendar year, all of which concluded by 30 June 2010. Many of the outcomes from these projects will underpin the new research activities of CRCSI-2.

The research framework of CRCSI-2 is represented by the diagram below. Good progress was made towards the formulation of research projects consistent with the bid and the Commonwealth Agreement with an initial group of seven projects being developed in detail for approval and commencement during calendar 2010.



Commercialisation / Utilisation

The Intellectual property from CRCSI-1 forms the background intellectual property to the research in CRCSI-2 by agreement with the 70 participants from CRCSI-1.

Scanalyse Pty Ltd, a spin out company of CRCSI-1, continues to expand overseas and now has 18 employees.

Integrate Systems Pty Ltd USA made its first North American sale to California ISO which serves 30 million customers.

Education

CRCSI-1 student scholarships were fully paid out to the respective enrolling universities for continuing students.

Obstacles

There were no specific impediments experienced during the period, which is in part attributable to the very strong support from the participant base and a willingness by the new Board to embrace a collaborative approach across the national stakeholders in the spatial information community during the critical set up phase.

Communication channels were established in CRCSI-2 with participants grouped into Colleges: government; research and education; and industry to facilitate the timely flow of information and to ensure the accountability of management to the participants.

End-user Environment

There were no major changes in the end-user environment that affected the CRCSI. Participants include most of those which were in CRCSI-1 but many new organisations as well.

Impacts

No research project impacts can be quantified at this time, but there has been impact of the new CRCSI on the spatial industry with a significant number of new partners being engaged; the inclusion of New Zealand; and increased contribution levels for all government and 43pl members:

- 12 of the former 14 Core Participants have chosen to participate in the new CRCSI as either Essential or Other Participants, and all former Support Participants have chosen to participate in CRCSI-2
- 33 of the 48 companies in 43pl have chosen to participate in CRCSI-2

The overall retention proportion from CRCSI-1 to CRCSI-2 was 86% for the Essential Participants, 73% for all participants and 69% for 43pl members only.

The peak government agency in New Zealand, Land information New Zealand (LINZ) has chosen to join the CRCSI-2 as an 'Other' Participant, and has announced its intention to upgrade to Essential Participant status. Five New Zealand companies have joined 43pl.

Governance and Management

Governance – Board, Committees and Key Staff

The CRCSI-2 is an unincorporated joint venture (UJV) under the terms and conditions set out in the Commonwealth Agreement and the Essential Participants Agreement.

The CRCSI-2 itself does not have a separate legal existence however it is governed, managed and operated by a single company, Spatial Information Systems Research Limited (SISR) which itself is owned by the UJV. SISR is a company limited by guarantee, which acts as trustee of the CRCSI Intellectual Property, employs the management staff, undertakes contract research work and otherwise manages the Centre's operations. The Board of the company is also the Board of the CRCSI UJV. Each Essential Participant has the right (but not the obligation) to be a member of SISR.

At present there are seven Essential Participants who are members of SISR: They are

- 43pl (43 Version 2 Pty Ltd)
- Curtin University
- Department of Sustainability and Environment, Victoria
- Land and Property Management Authority, NSW
- Landgate, WA (Land Information Authority, WA)
- Queensland University of Technology
- University of New England

Three Directors were initially appointed to SISR in late 2009 to facilitate the ASIC requirements for setting up a company. The fully functional skills based Board, appointed after an extensive College led nomination and selection process, comprises 7 members. The Board intends to meet five times per year and met formally three times in the January-June period.

The Board is advised by the Research Investment Committee, the Audit & Risk Committee and the Nominations and Remuneration Committee. A comprehensive suite of governance protocols, policies and guidelines have been implemented. The Board and supporting Committees will review these periodically to assess CRCSI performance and to ensure policies remain up to date with current regulatory requirements.

The college structure comprises 43pl (with over 60 SMEs), the Research and Education College, and the Government Agencies College managed by ANZLIC. Each college operates independently and confers amongst itself so that views of any participant can be brought to consideration by the Board.

Management comprises an Executive and support staff, several Science Directors, Program Managers, and Project Leaders. An internal review of the Research Program procedures and processes from CRCSI-1 has led to the implementation of a new level of project management being introduced into CRCSI-2 known as the Program Board (PB). A PB is a program-wide panel tasked with the responsibility of reviewing the strategic direction of existing research projects and making recommendations to the CRCSI Board with regard to the continuation, expansion, change in direction or termination of each project. The Essential Participant's Agreement requires that each PB be Chaired by a lead end-user. The PBs will meet at least annually. Project Management Groups will meet quarterly to review each project's progress and future, continuing a practice established in CRCSI-1.

Directors

The directors holding office at any time during the period were as follows.

| Director | Appointment Date | Affiliation |
|----------------------|-------------------------------|--|
| Mary O'Kane (Chair) | 22/3/10 | Chief Scientist & Engineer, NSW |
| Peter Woodgate | 11/12/09 | Chief Executive Officer, CRCSI |
| Bruce Thompson | 11/12/09, resigned 8/6/10 | Director, Vic Dept of Sustainability & Environment |
| Warwick Watkins | 11/12/09, Chair until 22/3/10 | CEO, Land & Property Management Authority |
| Graeme Wright | 22/3/10 | Dean, Curtin University |
| Andrew (Drew) Clarke | 8/6/10 | Secretary, Dept of Resources, Energy & Tourism |
| Tina McMeckan | 8/6/10 | Director, Riverview Consulting |
| Malcolm McCoy | 8/6/10 | Managing Director, Vekta (43pl member) |

Mary O’Kane

Mary O’Kane is a consultant and Company director. She is Executive Chairman of Mary O’Kane & Associates Pty Ltd, advising governments and the private sector on innovation, research, education and development. She is also NSW Chief Scientist and Scientific Engineer, Chair of the Development Gateway Board and Chair of the Board of the Australian Centre for Renewable Energy.

Professor O’Kane was Vice-Chancellor and President of Adelaide University from 1996-2001 and Deputy Vice-Chancellor (Research) from 1994-96. She was also Professor of Electrical and Electronic Engineering within the University and now holds the title of Professor Emeritus.



She has served on several boards and committees in the public and private sectors. She is a member of the Tax Concession Committee, the PSMA Ltd Board, the Australian Business Foundation Board and the Capital Markets CRC Board. She was a director of FH Faulding & Co Ltd and was a member of the Australian Research Council, the Cooperative Research Centres Committee and the Board of the Commonwealth Scientific and Industrial Research Organisation (CSIRO).

Mary O’Kane’s research was in the field of automatic speech recognition. She was awarded the Australian Telecommunications and Electronics Research Board (ATERB) Medal in 1990 for her work in this field and the Queensland Science Tall Poppy Award in 2001. She is a Fellow of the Academy of Technological Sciences and Engineering and a Fellow of the Institution of Engineers, Australia.

Peter Woodgate

In June 2003, Peter was appointed to the position of CEO of the Cooperative Research Centre for Spatial Information (CRCSI). Peter has over 20 years’ professional and academic experience in a range of disciplines spanning the pure and life sciences, engineering, business, public policy and administration.

Peter was previously CEO of RMIT’s Geospatial Science Initiative. During this period he was responsible for a number of developments that included helping establish RMIT University’s first spin off Company, Spatial Vision Innovations Pty Ltd; the creation of the Risk and Community Safety Research Centre in partnership with Emergency Management Australia and the Australian National University; and the establishment of RMIT’s Global Sustainability Institute.



Peter is currently the Deputy Chair of the Cooperative Research Centres Association of Australia, a member of the Executive Committee of the International Society of Digital Earth, Director of the Terrestrial Research Network, member of the Sustainability Council of Victorian Association of Forest Industries and a foundation member and Chairman of the Research Committee of UNESCO’s Mornington Peninsula and Westernport Biosphere Reserve which is a partnership between the commonwealth, state and local governments and many local community groups and businesses. He has a Doctorate in Business Administration from RMIT University, a Master of Applied Science from the University of New South Wales and a Degree in Forest Science from the University of Melbourne.

Drew Clarke

Drew Clarke was appointed Secretary of the Commonwealth Department of Resources, Energy and Tourism in April 2010. His previous position was Deputy Secretary with responsibilities across the three sectors. Drew’s earlier roles include Head of the Energy and Environment Division, where he was responsible for energy market reform, energy security and energy-related climate change policy, head of AusIndustry, the business program delivery agency, and leadership of science agencies.

Drew holds an MSc from Ohio State University, and was awarded a Public Service Medal in 2009 for his work in energy market reform and clean energy. He began his public sector career as a surveyor working in Australia and Antarctica.



Malcolm McCoy

Malcolm McCoy has over 20 years experience as a Director of survey and spatial companies and 35 years in the industry. He has been instrumental in undertaking two recent mergers of survey companies to form Vekta and prior to that to create Survey21. As part of this process he has been involved in lengthy due diligence procedures, and accordingly has been appointed Managing Director of Vekta, one of a few truly national survey and spatial consultancies. His role is to look at the strategic directions of the Company and to implement the Company Business Plan.

His areas of expertise are land and engineering surveying but also strategic planning, project management, financial management, contracts administration and QA and OHS. He is a member of the Audit Committee.

**Tina McMeckan**

Tina McMeckan has 20 years experience as a Company director and senior executive in corporate governance, enterprise development, equity investment and industry reform. Her specific skills are in the energy sector and commercialisation of science and technology.

She has extensive Board expertise in public and private utility infrastructure including power production, networks and retailing businesses in the gas and electricity industries. She is a Director of the Global Carbon Capture and Storage Institute, and an independent Director of SPAusnet. Her other appointments as a Director have included Alinta Limited, United Energy, Snowy Hydro Trading, the Westar and Kinetik Energy Group, Victorian Power Exchange, and Solaris Power.



Her significant experience in technology development includes current appointments as Chairman of the Centre for Eye Research Australia and NanoVentures Australia Ltd and a Director of Circadian Technologies Ltd, and the Vision Cooperative Research Centre. She is a past Member of the Funds Management Committee of the AusIndustry Research and Development Board. She is also a Council Member of Norton Rose Law Partnership. A Bachelor of Liberal Arts and Sciences from San Diego State University in California, Ms McMeckan also holds a Master of Business Administration from the University of Melbourne and is a Fellow of the Australian Institute of Company Directors. She is the Chair of the Audit Committee.

Bruce Thompson

Bruce Thompson is Director of the Spatial Information Infrastructure, Strategic Policy and Projects Group within the Victorian Department of Sustainability and Environment, which has responsibility for Victorian spatial information strategy and policies, and for the management of Vicmap, Victoria's spatial information infrastructure. Bruce's primary responsibility is for the development and implementation of Victoria's government spatial information policy and strategy, mostly through the Victorian Spatial Information Strategy 2003 2006 (VSIS). He is also involved with the development of national spatial policy, and national spatial information industry development through Victoria's participation in the Australia New Zealand Land Information Council (ANZLIC).



Prior to joining the Land Information Group in 1999, Bruce worked in Strategic Planning and Economic Services in Victoria's Department of Infrastructure, and in the Planning Division of the Queensland Department of Housing, Local Government and Planning.

Bruce has a Bachelors degree in Design Studies from the University of Queensland, and a Master of Business (Information Technology) from RMIT University. He is a member of ANZLIC and a director of PSMA Australia, Australia's national spatial data provider. Bruce is a member of the CRCSI Research Investment Committee.

Warwick Watkins AM

Warwick Watkins AM is the Chief Executive Officer of the Land and Property Management Authority of NSW, Surveyor General and Registrar General of NSW. Warwick received a Dip Ag with Honours from Hawkesbury Agricultural College (now UWS) and gained further postgraduate degrees and diplomas from the University of New England, including a Masters Degree in Natural Resources. He also studied at the Harvard Business School in Boston, USA.



Positions currently held include Norfolk Island Surveyor General; Deputy Chancellor of the University of Technology, Sydney; President of the Board of Surveying and Spatial Information; Chair of the Geographical Names Board; Chair of the Australian and New Zealand Land Information Council; Chair of the Australian Spatial Consortium; Advisory Board Member of the ARC Centre of Excellence for Ultra High Bandwidth Devices for Optical Systems; Deputy Chair of the CSIRO Water for a Healthy Country National Research Flagship Advisory Council; Member, National Land and Water Resources Audit Advisory Council; Member, Australian Government's Consultative Committee on Knowledge Capital; Honorary Associate of the Graduate School of Government; Fellow of the Australian Property Institute and Honorary Fellow of the Institution of Surveyors of NSW.

Graeme Wright

Professor Graeme Wright is Associate Deputy Vice-Chancellor, Research Training, Curtin University.

He has extensive knowledge and experience in education and research, engagement with higher education policy at strategic level. He has held appointments across vocational and higher education at executive level, and knows and understands the university research environment. Graeme has extensive experience on Boards and Committees of research centres and CRCs, liaison with industry and negotiation of funding agreements, and broad research knowledge in spatial information sciences.



He has been closely involved with the CRC for Spatial Information since the initial bid preparation in 2003 then as a member of the CRCSI's Research & Education Committee (REAC) and the CRCSI Board, and as the Research and Education College representative on the "CRCSI-2" Steering Committee. He chairs the Research and Education College. He is also the Board's appointment to the Chair of the Research Investment Committee. He is Chair of the Research Investment Committee.

Directors' Meetings

During the period the number of meetings of Directors held while each Director was in office and the number attended by each Director was:

| | DIRECTORS MEETINGS | |
|------------------------|--|------------------------------------|
| | Number of meetings held while in office | Number of meetings attended |
| Mary O'Kane (Chairman) | 3 | 3 |
| Peter Woodgate | 3 | 2 |
| Warwick Watkins | 3 | 3 |
| Graeme Wright | 3 | 2 |
| Andrew (Drew) Clarke | 1 | 1 |
| Tina McMeckan | 1 | 1 |
| Malcolm McCoy | 1 | 1 |

Audit and Risk Committee

The Audit and Risk Committee met once in the period. Its function is to provide assistance and advice to the Board on matters pertaining to financial reporting, audit and risk management. The initial appointment of two members to the committee will be expanded to three in the next period, when a candidate is being sourced who is independent from the CRCSI Board and has considerable accounting or auditing expertise. PKF Australia Ltd were appointed as the external auditors for the CRCSI, SISR and 43pl.

Research Investment Committee

The purpose of the Research Investment Committee is to advise the Board on investment decisions relating to the Research Program, including utilisation issues, market applications of the science and technology within the activities, and any technical, research and education issues.

Appointment to the committee is by the Board who have the right to vary membership numbers as required. The ten member committee did not meet in the period but held its inaugural meeting over 2 days on July 22nd and 23rd 2010 where the first round of new project proposals were reviewed. The RIC Chair is an appointment of the Board.

Nominations and Remuneration Committee

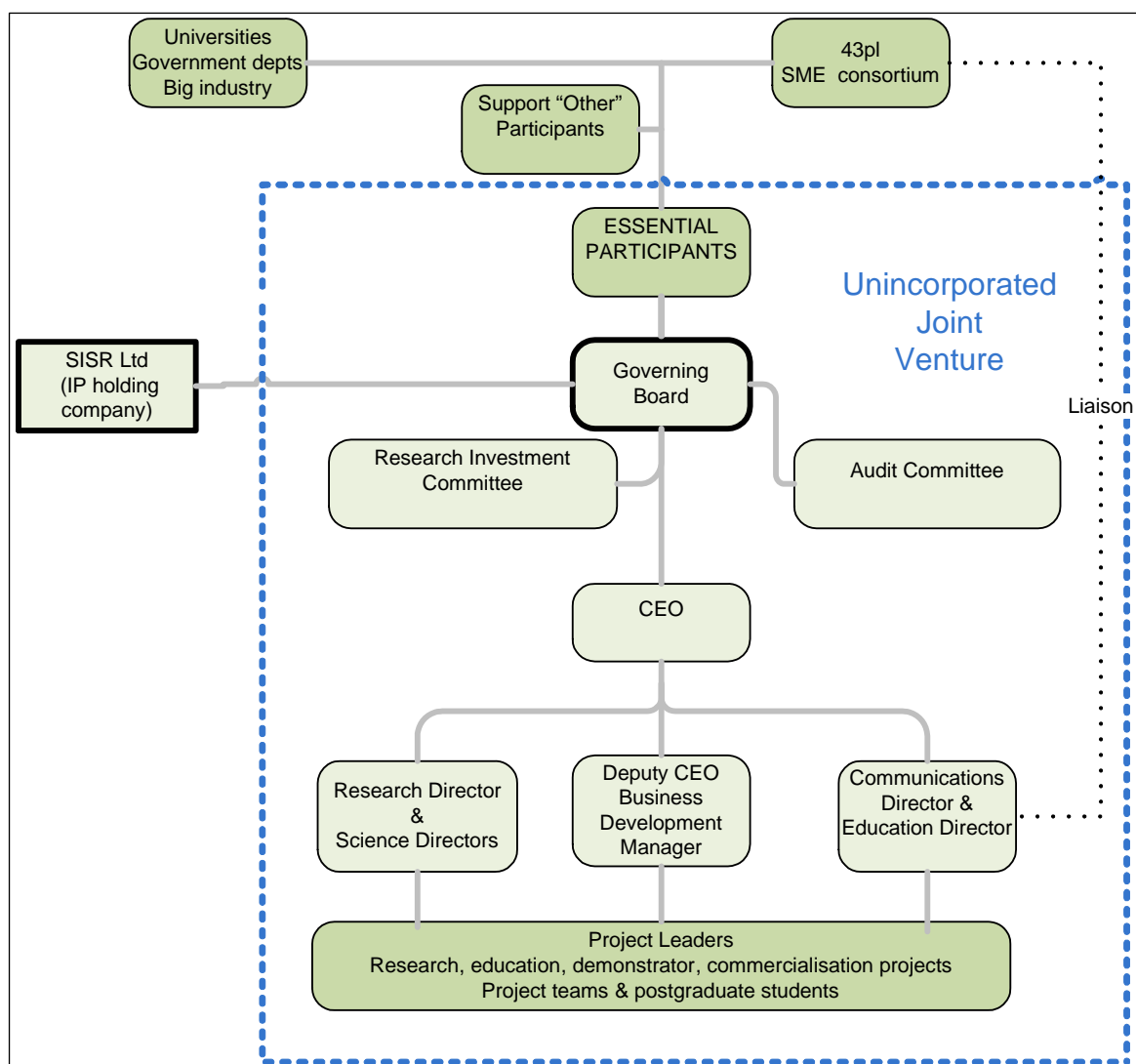
This Committee provides advice and recommendations to the Board on issues relating to Board composition and succession and for establishing and maintaining recruitment, retention and termination policies and practises for senior executives and independent directors. The Committee did not meet in the period, however intend to meet frequently as required but not less than once a year.

| Committee Name | | | |
|-------------------------------|--------|---|-----------------------------|
| Audit & Risk Committee | | | |
| Name | Role | Key skills | CRCSI Affiliation |
| Tina McMeckan | Chair | Board Director Corporate Governance, Intellectual Property Management and Capital Raising | Independent |
| Malcolm McCoy | Member | Board Director Current Spatial Industry experience from SME industry perspective, Corporate Governance | Vekta Pty Ltd (43pl member) |
| To be Appointed | Member | Financial | |
| Committee Name | | | |
| Research Investment Committee | | | |
| Name | Role | CRCSI Affiliation | |
| James Bangay | Member | Ergon Energy, Other Participant - Brisbane Qld | |
| Arthur Berrill | Member | Independent, DMTI Spatial – Toronto, Canada | |
| Mike Bradford | Member | Landgate, Essential Participant – Perth, WA | |
| Tony Cantoni | Member | Independent, UWA – Perth , WA | |
| Guy Perkins | Member | Independent, 1Spatial – Perth , WA | |
| Scott Ramage | Member | AAM Pty Ltd, 43pl participant – Sydney NSW | |
| Bruce Thompson | Member | Vic Dept of Sustainability & Env't, Essential Participant, Melbourne, VIC | |
| Graeme Wright | Chair | Curtin University, Essential Participant – Perth, WA | |

| Key Staff | Organisation | CRC Position / Role | Time committed |
|-----------------|-------------------------|---|----------------|
| Peter Woodgate | CRCSI | Chief Executive Officer | 100% |
| Graeme Kernich | CRCSI | Business Manager | 100% |
| Clive Fraser | University of Melbourne | Professor and Research Director | 50% |
| Phil Collier | CRCSI | Assistant Research Director | 100% |
| Peter Teunissen | Curtin University | Professor and Science Director (Research Program 1: Positioning) | 20% |
| Clive Fraser | CRCSI | Professor and Science Director (Research Program 2: Automated Feature Extraction) | 30% |

| | | | |
|---------------|-------------------|---|-----|
| Kim Lowell | CRCSI | Professor and Science Director (Applications Program 4.1: Agriculture, Natural Resources and Climate Change) | 20% |
| James Semmens | Curtin University | Professor and Science Director (Applications Program 4.4: Health) | 20% |
| Peter Newman | Curtin University | Professor and Science Director (Applications Program 4.5: Urban Sustainable Development) | 20% |

Note: Appointments are yet to be made to Research Program 3: Spatial Infrastructures, Applications Program 4.2: Defence, and Applications Program 4.3: Energy Utilities.



Roles and Accountabilities

| Board | Executive | Science Directors | Project Leaders |
|--|--|--|--|
| Strategic direction Policy Budget Strategic Plan Achievement CEO appointment | Strategic Planning Operational Management Business Development Commercialisation Communications (in & out) Ensuring programs interconnect and link to the market Member and client relations | Science and research excellence, Independent project input and advice (project development; work quality; technical and commercial networks) Internal links Market interface Research utilisation | Research leadership Project stakeholder communication and relations Project management (staff and budget), esp. meeting milestones & reporting Internal liaison |

Participants

Other Participants

| Name | Research Provider / End-user |
|--|------------------------------|
| Land Information New Zealand | End User |
| Swinburne University of Technology | Research Provider |
| Ergon Energy Corporation Limited | End User |
| Department of Health, Western Australia | End User |
| Western Australian Agricultural Authority | End User |
| Telethon Institute for Child Health Research | End User |
| NSW Department of Environment Climate Change & Water | End User |
| RMIT | Research Provider |

Changes to Essential Participants

| Participant's Name | Retiring / New | Department Approval Yes/No |
|--------------------|----------------|----------------------------|
| Nil | | |

Financial Management

Background

A large proportion of the period was spent administering the close out requirements of the carry over projects from CRCSI-1 and setting up the Financial and Administrative systems for the current Centre. An internal review of the financial management systems from the first centre led to the decision to upgrade to a new financial management system. The current tax structure for the new Centre is under review with the ATO..

Audit

PKF were appointed as external auditors for the period and the related Financial Reports and Statements have been prepared in accordance with the Corporations Act 2001, Australian Accounting Standards and Interpretations and Commonwealth guidelines where required.

Contributions and Expenditure

With the Research Program in set up mode, financial receipts for the period were largely restricted to the receipt of Participant Contributions, and contributions for ongoing contract research. Essential Participant Contributions were in line with budget expectations.

Sources of 'Other' Firm Cash

| Amount (\$'000) | Descriptor | Agency |
|-----------------|--------------------------|--|
| 66 | Contract Research | Department of Environment Climate Change and Water |
| 35 | Contract Research | China Peace International |
| 22 | Contract Research | State Bureau of Surveying & Mapping, China |
| 1 | Contract Research | Symbios Communications |
| 3 | Commercialisation Income | TafsirCo Consultant Engineers |
| 41 | Bank Interest | |
| 2,713 | Carry over funds | Carry over funds from CRCSI-1 |

The reporting of 'Other firm Cash' in excess of Commonwealth Targets by \$2.8M is predominantly due to the transfer of funds from CRCSI-1 of \$2,713,552. This transfer was approved by DIISR and is tied to the

completion of CRCSI-1 activities. Also included in this number are bank interest, some minor contract research monies and \$2.7k worth of Commercialisation Income relating to the licensing of Barista software.

There were no capital items purchased from the Account in excess of \$100,000.

Communications

A comprehensive Communications Plan was adopted by the Board at the outset of the CRCSI and continued to be successfully applied in the period. The independent industry survey conducted as part of the Third Year Review of CRCSI-1 in 2007 commented favourably on the CRCSI's performance in this regard and efforts have made to continue to strengthen this activity. For example the Review stated that: "The CRC's communications and networking are both a strength and a principal value".

Some of the communication strategies which the CRCSI has found particularly effective include

- Regular road shows, workshops and "get-togethers" in each state to bring all participants views into strategic planning, and to encourage understanding across sectors. Specific workshops are also held with participants and with sectors
- The Annual "stakeholder survey" to maintain and understand the engagement of parties, reflected in nearly all parties joining the CRCSI-2.
- Regular correspondence and newsletters which include summaries of board minutes immediately following Board meetings
- The encouragement of Project engagement by all participants. Projects must have representatives from each area of participants – government, corporate and academic. Project Management Groups of wide and diverse membership meet quarterly to discuss project progress and ramifications and potential applications. Dissemination of project progress reports through a closed web system allows appropriate information flows and encourages organisational interaction
- The Communications Director driving and resourcing these strategies through sound relationship management, and in particular nurturing relationships amongst the 43pl SME consortium and between member companies and the CRCSI. This has been effective in increasing the ability of the SME companies to collaborate with academia and with government – and vice versa.
- Encouraging the Research Director and Assistant Research Director to take a wide remit, draw parties together through program and project seminars and other activities
- Co-location of R&D and management personnel and activities in the CRCSI offices around Australia
- Reliance on a strong web platform for project and other communications. The website is now getting some 16 thousand visits per month and is top of the Google ranking for a global search on "spatial information" for the fifth year in a row.

Strategies for Developing SME Links

The CRCSI has a unique structure for its SME consortium: members purchase units in a unit trust through which each can participate in the CRC with appropriate flexibility. A resourced set of strategies to engage with these companies is implemented through the Communications Director position. New members of 43pl are encouraged and 64 companies signed up as foundation members of the 43 version 2 Pty Ltd trust, many of whom were members of the first CRCSI. Additional companies have expressed interest in joining as well.

From the outset it was recognised that there was a need for SMEs to be integrated into the CRCSI's activities. The Spatial Industries Business Association (SIBA), which has some 500 members, played a strong role in the formation of a unique CRCSI structure in 2003. A representative company 43 Pty Ltd, or "43pl", is the trust manager. This company is a CRCSI essential participant; companies wishing to participate in the CRCSI buy units annually (as their cash contribution through to the CRCSI). A beneficial interest in the trust assets of 43pl and hence of the CRCSI joint venture is held by each in proportion to their cash contribution each year. The structure provides limited liability and ease of entrance and exit, two important factors to the SME.

The CRCSI provides finance, administration and communications functions to the company and its board of directors. The consortium is a major platform for the CRCSI to achieve industrial development, which is a core outcome of the CRCSI and enunciated in the Strategic Plan.

The 43pl value proposition includes (but is not restricted to)

- Access to R&D initiatives and IP for commercialisation
- Growing the business (technical, professional development)
- Skills development and capacity building including the recruitment of CRCSI post-graduate students

- Meaningful networking into government & academia
- Market development; kudos
- Neutral ground to meet clients and suppliers

Intellectual Property Management

The effective management and commercialisation of intellectual property (IP) is fundamental to achieving the objectives of the CRCSI. In the first period following transition from CRCSI-1 the Board wished to consolidate and enhance the core principals of IP Management developed in CRCSI-1. These general principals include:

- the intention to facilitate rapid uptake (and capability) by end-user participants and stakeholders for national benefit
- innovative use of IP including partnering research providers having a ‘free’ licence to use the IP for their internal research purposes
- endeavouring to make a priori decisions about the commercial potential of investments in IP from the research. Where there is no commercial uptake (and no national security or privacy issues) then the IP will be put in the public domain
- operating an end-user uptake pathway with explicit emphasis on partnering SME’s and government organisations, supported by the research providers. This will not operate to the detriment of CRCSI’s large corporate participants
- Use of internal EOI process to seek commercialisation plans from CRCSI participants.
- Recognition of the substantial public benefits of the principle of open access
- Preferentially supporting end-user participants who have been active in research projects and who wish to utilise research outputs
- Exercising judgement at all times that maximises the collective benefit to the CRCSI as a whole

Centre IP is any IP developed by the essential participants in carrying out the activities of the CRCSI (normally via project agreements). Centre IP is beneficially owned by the Essential Participants as tenants-in-common in proportion to their respective equity. The management of CRCSI Centre IP is the highest priority of the CRCSI.

Each Essential Participant will have a non-exclusive, royalty-free licence to use Centre IP for the purposes of CRCSI Activities (other than for Utilisation purposes); and a non-exclusive, royalty-free, irrevocable right to use Centre IP to carry out internal research and development, and training or teaching.

The legal owner of Centre IP is Spatial Information Systems Research Ltd (SISR), which holds the IP on trust for CRCSI Participants. SISR is responsible for protecting, registering, patenting and utilising the Centre IP.

No CRCSI Participant can commercialise, dispose of or encumber any interests which it might hold in Centre IP, except where authorised.

Centre IP Register

The intellectual property register is a vital element in ensuring that information and methods generated by the CRCSI are recorded and where appropriate developed for commercial benefit. The CEO is responsible for maintaining a register of Centre IP.

The IP Register serves to facilitate the use of new developments either by way of commercialisation, or by contributing to other research activities within CRCSI. It also provides a mechanism which helps to identify material which is the property of the Centre and should be treated as confidential, and to identify material which should be protected.

The CRCSI IP Management Policy provides a framework for the CRCSI participants and researchers to permit the utilisation and commercialisation of research outcomes of the CRCSI. The policy sets out ownership rights and the responsibilities of researchers and participants. It provides guidance on the identification, protection and commercialisation of CRCSI IP. The policy is based upon the IP ownership and management principles outlined in the CRCSI Centre Agreement, Commonwealth Agreement, and Centre Intellectual Property Trust Deed.

Performance against Activities

Progress against the Key Challenge

The CRCSI-2 research program is designed to meet the two strategic objectives for spatially enabling Australia that have been developed by the Australia and New Zealand Land Information Council (ANZLIC) representing federal, state and territory government agencies, and endorsed by industry.

Objective 1: To facilitate the research to enable the creation of a coordinated national network of satellite system reference stations to permit real-time positioning to 2cm accuracy

The CRCSI, through its partners intends to conduct research to facilitate the creation of a coordinated national network of satellite system reference stations (to be known as the National Positioning Infrastructure) with real-time positioning of 2cm accuracy (in the 'x and y' dimensions and 6 cm accuracy in the 'z' dimension) ; that is to provide precise information on the positions of people, vehicles, built infrastructure and natural assets across the nation. Realising such a network requires substantial research (through CRCSI Program 1 Positioning) to optimise use of existing and new reference stations, including the 75 positioning satellites being launched by Europe, Russia, China, Japan and India over the next five years.

Progress against this objective has been facilitated by the completion of project work from CRCSI-1 which will underpin the new research programs. Projects in Program 1 (listed in detail under Research) have contributed to this objective and form the foundation for the new body of research work, planned to commence in 2010-11.

Objective 2: To establish a fully functioning market place for spatial information.

The development of the 'Australia and New Zealand Spatial Marketplace' will enable government agencies to lift the licensing, governance and technical restrictions on providing the vast stores of government-held spatial data to the open market and to encourage other users to trade and value-add their data as well. The National Innovation Systems Review documents the huge benefits to Australia in unlocking access to these data. Industry strongly supports this objective and CRCSI-2 research (through CRCSI-2 Program 3 "Spatial Infrastructures") is required for its realisation.

Progress against this objective has been significant, largely through the completion of the Creative Commons Project (Project 3.05) and its resultant impact that has lead to the peak government body for spatial information, the Australia New Zealand Land Information Council (ANZLIC), agreeing in-principle to adopt a creative commons licencing regime.

Research

Research Overview

The following table outlines the project transitions between the new CRCSI-2 work and CRCSI-1 projects either winding up or underpinning planned projects. Projects completed during the period are detailed at Appendix A.

| Project Number and Title | Transition arrangement Summary |
|--|---|
| 1.04. Integrating electricity, telecommunications and government infrastructure to deliver precise positioning services in regional areas. (CRCSI-1) | Completed June 30 2010 – Milestoned within CRCSI-2. Some outcomes intended to transition to a new CRCSI-2 Project. |
| 1.06. NSW Lands Professorial Fellow at UNSW. (CRCSI-1) | A continuing project - Project arrangements due for confirmation under CRCSI-2 with project participants. |
| 1.12 Quality Control Issues for Real-Time Positioning (CRCSI-1) | Completed June 30 2010 – Milestoned within CRCSI-2. Some outcomes intended to transition to a new CRCSI-2 Project. |
| 1.13 Vertical Datum Harmonization Across the Littoral Zone (CRCSI-1) | Originally due for completion June 30 2010. Project on hold until data obtained from providers for re-commencement. Planned completion now June 30, 2011. |

| | |
|---|--|
| 1.14 Reconciling height datums in Australia: the bathymetric component (CRCSI-1) | Completed March 31 2010. |
| 1.15 The Feasibility and Design of an Operational Real-Time GNSS CORS Analysis Capability for the Australian Region (CRCSI-1) | Completed March 31 2010. |
| 2.06 Automated analysis of terrestrial laser scanner in support of infrastructure asset management (CRCSI-1) | Completed June 30 2010 – Some outcomes intended to transition to a new CRCSI-2 Project, integrated with Project 2.11. |
| 2.11 Automated Mapping & Feature Extraction from Space, Aerial & Terrestrial Imagery (CRCSI-1) | Completed June 30 2010. Some outcomes intended to transition to a new CRCSI-2 Project. Milestoned within CRCSI-2. |
| 3.04. CRCSI GIS/ IT appointment in Spatial Information to Curtin University (CRCSI-1) | A continuing project - Project arrangements due for confirmation under CRCSI-2 with project participants. |
| 3.05. Enabling Real-Time Information Access in Both Urban and Regional Areas (CRCSI-1) | Completed June 30 2010 – Milestoned within CRCSI-2. |
| 4.09 New Technologies for Radar Interferometry (CRCSI-1) | Completed June 30 2010 – A CRCSI-1 project. PhD students will complete over next 18 months. |
| 6.07 Spatial Information Business Improvement Applications at Ergon Energy (CRCSI-1) | Completed June 30 2010. Some outcomes intended to transition to a new CRCSI-2 Project. Milestoned within CRCSI-2. |
| 6.08 Clever Cattle and Cropping Systems (CRCSI-1) | Completed June 30 2010 – Milestoned within CRCSI-2. Some outcomes intended to transition to new project. |
| 6.11 National Data Grid Project: Enhanced Platform for Environmental Modelling Support (CRCSI-1) | Development component due for completion June 30. Prototype will remain in operation through 2010-11. Milestoned within CRCSI-2. |
| 6.12: Spatial Health Pilot Project (CRCSI-1) | Due for completion June 30. Prototype will remain in operation through 2010-11. Some outcomes intended to transition to a new CRCSI-2 Project. |
| 6.13 Implementing Digital Licence Management in Queensland and Western Australia (CRCSI-1) | Completed June 30 2010. |
| 6.14 Extension Activity Support sYstem (EASY) – Design and Demonstrator Development (CRCSI-1) | Completed June 30 2010. |

Utilisation and Commercialisation

Utilisation of CRCSI Centre Intellectual Property

Spatial Information Systems Limited (SISR) is the legal owner of Centre Intellectual Property (CIP), with the beneficial rights of the property belonging to the Essential Participants of the Centre in proportion to the cash annual cash contributions. SISR is responsible for the commercialisation of CIP including marketing, seeking potential licensees and seeking other commercial applications.

If SISR intends to utilise any CIP, it must advise each CRC participant in writing and each participant has a period in which to express a desire to utilise or participate in the utilisation of the Centre Intellectual Property. Through the structure of 43pl, all of the SMEs involved can bid for commercialisation rights, as can any other participant in the CRCSI. If no participant desires to utilise then SISR is free to utilise the CIP in the manner it sees fit.

Projects

The technology transfer and utilisation strategy must be built into a proposal before the Board will approve CRCSI funding and enter into a CRCSI project agreement contract.

Criteria for project funding approval includes a requirement that prospective utilisers and/or end users have significant involvement in the project. There must be a clear and credible route to industry application. Moreover the work plan has to reflect an appropriate degree of commercialisation capability and awareness.

Every project is governed by a Project Agreement which details intellectual property ownership, the proposed route to application, and the role to be played by the entities involved. All parties to the project sign the Agreement. The agenda for the quarterly meetings of the Project Management Groups includes consideration of any potential commercialisation.

Where utilisation within a project is evident, the strategy is simple: identify potential technologies for utilisation early on through the project proposal process; develop a utilisation case with the guidance of the project management group, and prepare a case for the consideration of the Board. If approved, implementation occurs through the CRCSI commercial agent, SISR. An expression of interest to develop the commercial proposition is then sought from CRCSI participants.

Key Utilisation Activities

The Board is guided by two principles when selecting organisations to lead the utilisation of CRCSI research outputs. Firstly preference is given to those participants who have played a lead role in the research and development phase. And secondly the outcomes of the utilisation must be in the overall best interests of all CRCSI partners. The strength of the business case presented for utilisation is a key factor in helping the Board with its final decision.

The utilisation activities for the period were restricted to those which built on developments from CRCSI-1. Notable instances included:

Project 1.12 Quality Control Issues for Real-Time Positioning: Continued use by project partners including the Victorian Department of Sustainability and Environment (DSE), Landgate (Western Australia), the Land and Property Management Authority (New South Wales), and the Department of Environment and Resource Management (Queensland).

Project 3.05. Enabling Real-Time Information Access in Both Urban and Regional Areas has raised significant awareness about Creative Commons licensing and has directly influenced a number of government agencies in Australia and New Zealand to adopt this approach to licensing spatial and other government information.

Project 6.11 National Data Grid Project: Enhanced Platform for Environmental Modelling Support has been adopted by both Geoscience Australia (hosted at national computational infrastructure at ANU) and DSE.

Project 6.12: Spatial Health Pilot Project (HealthTracks)

The Western Australian Department of Health (DoH) has an active GIS Section in the Epidemiology Branch which spends a large proportion of its time preparing maps that depict health related data from internally held

epidemiology systems. DoH wished to broaden the accessibility of such data by providing a web mapping application that could satisfy the major mapping requirements of public health staff and professionals. HealthTracks delivers this capability with increased clarity; time savings and efficiency increases; and in reduced time. Subsequent roll out of HealthTracks is being planned for mental health, child health, environmental health, policy, country health service areas, and state-wide health planning.

Project 6.13 Implementing Digital Licence Management in Queensland and Western Australia. In Queensland the Digital Licencing Management (DLM) software is being progressively implemented in Government agencies through the Government. Information Service. Acceptance testing is underway in WA with implementation of a prototype DLM system to Government through Shared land Information Platform (SLIP) Enabler. The Project has also created increased awareness of DLM, and Creative Commons licencing and has emphasised the need for a whole of -Government Information Licensing Framework.

HazWatch and MillMapper

Australian company iintegrate Systems Pty Ltd has opened a USA office with several lead sales, and more trials for customers underway. The company is commercialising IndjiWatch™, a product based on “HazWatch” which was an outcome of one of the first CRCSI projects. The Project Leader was from the end-user organisation Landgate, and subsequently moved on into the start-up company.

- HazWatch™ – emergency management system (licensed to iintegrate Systems)



Scanalyse Pty Ltd, a spin out company of CRCSI-funded research, continues to expand overseas and now employs 18 people including 16 professionals. The company is commercialising “MillMapper”, a three-dimensional laser scanning and modelling technology and service for monitoring rates of wear in milling and other mining operations. It reduces maintenance costs, increases productivity, improves safety and offers greenhouse savings in the energy-intensive operations. The technology has further potential to provide other new services to the minerals processing sector.

- MillMapper™ – software (start up company Scanalyse)



Education and Training

There were no educational activities pursued in the period due to the concentration on establishing the Board and research programs and projects.

Only in the 2010-11 year will the CRCSI be able to track against its educational objectives, both traditional (e.g. scholarships and higher degree students) and responsive (e.g. industry capability up-skilling). The Research and Education College has commenced its planning in this regard.

The CRCSI Education Portal website was maintained in the period, accessed from across the world as shown by the activity map below:



SME Engagement

43pl – the SME consortium

43 Pty Ltd (43pl) is a company established as a construct to efficiently manage the large number of small to medium sized enterprises (SMEs) to participate in the CRC. It has a board that oversees the trust, in which member companies hold units proportional to their aggregate cash subscription. Board directors come from each jurisdiction involved in the CRCSI.

43pl is an Essential Participant in the CRC. The proprietary limited company brings together the SME companies through a unit trust deed. Each SME is a unit trust holder. A company from each jurisdictional area provides a Director for the Board of 43pl. At 30 June 2010 the 43pl Directors were Tony Wheeler (independent Chair), Jack de Lange (Queensland), Jim Curnow (SA and NT), Chris Earls (WA), Ed Garvin (NSW & ACT), Rob Rowell (Tasmania and Victoria) and Simon Jellie (International).



Industry is a key part of the CRCSI. 43 Pty Ltd (43pl) is a company set up to facilitate CRC participation by a large number of SMEs. Award-winning 43pl breaks new ground in small company engagement in the CRC Programme. 43pl now has 53 company members spread across the nation – over ten percent of

the number in the whole Australian Spatial Information Business Association. 43pl companies are embedded in all CRCSI strategic planning, governance, research, and commercialisation. Other interactions occur at the annual networking conferences and through special 43pl and user workshops.

“43pl gives us an unprecedented opportunity to bring the small corporates and researchers together in a rapidly growing industry”

A national road show was held to inform all 43pl members of progress and to allow discussion and establishment of expectations. This included trips to New Zealand.

A dedicated responsibility to support SME engagement is in place through the Communications Director.

“The CRCSI’s use of the innovative 43pl structure to engage a large number of SMEs is noteworthy within the CRC programme, as well as being of vital importance to the fledgling SI sector and to the CRCSI.”

“Most 43pl members would not have participated in large-scale, cooperative research programs without a 43pl-type mechanism. Thus, 43pl remains of paramount importance as a vehicle to gain SME engagement in the CRC’s research, to provide a path for adoption of the CRC’s research findings and to gain user input to the strategic planning and conduct of research.”

“At least ten organisations are implementing new ideas from the CRC.”

Quotes from our independent third year review survey of industry and government users

Collaboration

Research Collaborations

CRCSI has many participants across Australia. Over 60 companies had formal collaborative arrangements with CRCSI activities in the period, along with over a dozen government departments and six universities across the country. There is a great diversity in organisation type and size.

Respective organisational cultures differ between the various government agency structures, small service companies and manufacturers, R&D based enterprises, and universities, and these differences have been well managed by the CRCSI when judged by the number of organisations prepared to participate in the CRCSI. Fostering a CRCSI culture of excellence in cooperation is important to the Board and Management. CRCSI is above all a collaborative enterprise and this is practiced in various ways, as described in the following sections.

Internal collaborations

The CRCSI has achieved significant progress in developing collaborative linkages within the CRCSI. The CRCSI is vertically integrated in that leading edge customers are engaged with technology and service providers. In addition many of the customers are also suppliers of the data and infrastructure used by the market in devising new products.

Cooperation amongst geographically spread activities and entities is assisted through regular telephone and other conferences, coordination of physical meetings by the Board and the executive.

Other CRCs

Cooperative arrangements with other CRCs are selectively sought where resources allow and mutual interest is found. Over 30 CRCs have interests in and applications of spatial information. Close relationships exist with Bushfires CRC, and Desert Knowledge CRC (now Remote Economic Participant CRC) amongst others.

National

Strong links have been established with key stakeholder groups, notably the Spatial Industries Business Association (SIBA), the Surveying and Spatial Sciences Institute (SSSI) and the peak government body ANZLIC – the Land Information Council. Mechanisms include board invitations, joint board meetings, membership, committee representation, and invited presentations, shared web links, and collaborations on important initiatives such as the national Spatial Education Advisory Committee; leadership roles within the NCRIS AuScope and related activities; and the commissioning of joint projects. These relationships are important to give strategic advice and context to the CRCSI on the one hand and on the other to effectively convey the work of the CRCSI to the broader spatial and user communities.

International

International collaborative alliances were maintained during the period with strategic advantage sought for specific projects. International links are pursued for strategic reasons and to benefit to shareholders:

- GEOIDE Network based at the University of Laval in Quebec, Canada (analogous to a CRC, funded as a Canadian 'Networks of Centres of Excellence' (<http://www.geoide.ulaval.ca>))
- Chinese Academy of Sciences (CAS) - A collaborative research agreement underpins joint activities that are being developed, in particular through CASM's Centre for Earth Observation and Digital Earth
- Global "Network for networks" of which the CRCSI is a founding member. This new organisation, to be formally created later in 2010 and will have six founding members together with the CRCSI: Canada (GEOIDE), South Korea (Korean Land Spatialization Group), Mexico (Centro-Geo), Sweden (Future Position X) and Ireland (National Centre for Geocomputation). Several other organisations will also seek involvement.

End-user involvement and CRCSI impact on end-users

End-users are involved in all aspects of the CRCSI. Strong SME engagement is a particular strength of CRCSI and is reflected in all aspects of the CRC operation.

The Third Year Review's industry survey commented favorably on the CRCSI engagement with end users, noting that "end users are well satisfied with their engagement levels" and "SMEs are engaged through 43pl, which is both innovative and successful".

Furthermore it concluded that the CRCSI was "vital to the organisation of the fledgling SI industry, and creating a cross sectoral collaborative framework that will lead to economic and social benefits to the nation in the long term."

Other Activities

The Urban Digital Elevation Model Project and Development of a National Elevation Data Framework

About 85 per cent of Australia's population lives within 50 kilometres of the coast and so do significant natural and built assets. Australia is therefore highly vulnerable to the predicted impacts of climate change on the coast.

Governments at all levels are increasingly concerned about the risks and costs associated with potential damage to housing, infrastructure and natural ecosystems in vulnerable coastal areas. There is growing demand from decision-makers, particularly in local government but also in the planning, engineering and construction professions for better information to assess the risks to infrastructure, communities and natural systems from coastal inundation and other impacts as a result of projected climate change.

A key impediment to such an assessment has been the absence of high-resolution elevation data that enables government to effectively assess climate change risks and adequately inform adaptation efforts and investment decisions. The Department of Climate Change and Energy Efficiency commissioned the Urban Digital Elevation Modelling in High Priority Regions (UDEM) project to acquire ground surface topography data to provide a spatial assessment of the possible impact of inundation due to climate change.

During the first phase of the UDEM project priority urban coastal regions were mapped: Perth, Melbourne, Sydney, NSW Central Coast, Adelaide, Brisbane, Gold Coast and Darwin. Over 20,000 km² of elevation data were acquired and data licensing was negotiated to ensure ongoing access across all levels of government for non-commercial public good use.

High resolution digital elevation models (DEMs) were developed and hydrologically conditioned to accurately represent water flow across the land surface. Inundation layers were developed for each region at 20cm intervals up to 4m of elevation and thereafter at 1m intervals up to 10m. These inundation layers provided key inputs into two further products:

- 1) a web-based sea level rise visualisation tool, which allows users to display the inundation layers over an aerial map of the region, and
- 2) a series of static sea level rise maps that identify low-lying areas that are vulnerable to the impacts of climate change.

A web portal was also developed to provide access to the acquired digital elevation data and derived products for government and public good use. The portal allows users to search, discover, view, licence and take delivery of elevation and related data products. The portal not only provides a platform for improved data discovery and access, but will also significantly improve the management and maintenance of elevation and related data within and across government.

As a part of UDEM phase 1, research projects were undertaken to scope the design for a data management, processing and web-based delivery system of multi-resolution DEM data. In addition, work on the reconciliation of land and sea vertical datums was advanced.

The completion of UDEM phase 1 in the reporting period significantly improves the capacity of government to assess climate change risks in high priority urban areas of the coastal zone. It also makes a significant contribution to the development of the National Elevation Data Framework (NEDF) which will guide future government investment in elevation data. As a result DCCEE have commissioned Phase 2 of UDEM to help improve the relationship between the terrestrial elevation data and the bathymetric data, a critical interface for modelling sea level rise, the effects of tsunamis and coastal erosion.

International Forest Carbon Initiative (IFCI)

The IFCI forms a key part of Australia's leadership on reducing emissions from deforestation and forest degradation in developing countries (REDD). A critical component of the IFCI is the development of a global carbon monitoring system (GCMS) that has the capability to provide technical capacity to measure rates of deforestation and forest degradation by monitoring, reporting and verifying (MRV) emissions of greenhouse gases due to these activities. The GCMS will form a global network of compatible national forest monitoring and reporting systems that meet national reporting requirements, and can potentially be linked to support domestic and international carbon trading initiatives. Through the IFCI, the Australian Government is providing expert advice and assistance to developing countries on MRV issues. The CRCSI will assist to pool and coordinate the body of expertise in Australia to support these training, advice and assistance roles. To progress this objective it is necessary to complete the following:

- Securing unencumbered access to adequate and cost-effective satellite data
- Interoperable use of earth observation satellite sensor technologies
- Accuracy assessments of remote sensing and ground monitoring products
- Linking of remote sensing and ground forest data and models to provide emissions estimating tools

To cost-effectively achieve these objectives at an international level, Australia is working through the intergovernmental Group on Earth Observations (GEO) and the Committee on Earth Observation Satellites (CEOS). Under GEO, Australia, Norway and Japan are co-leads on a Forest Mapping and Tracking Program that aims to demonstrate a robust forest observations capability. As part of Australia's contributions to this effort, Australia nominated Tasmania as one of the global reference and demonstration sites. The demonstration site will show through practical demonstration that the above four objectives can be met, thereby influencing post 2012 climate change negotiations by demonstrating ongoing technical improvement to a globally applicable.

The IFCI project was commissioned by DCCEE in 2009. It is a joint venture with CSIRO.

The IFCI project will:

- Demonstrate, and document a methodology for processing of medium resolution, annual optical-SAR data into time-series of forest change
- Specify standards and protocols for ground validation procedures and accuracy estimates for remote sensing-derived products on forest change and associated carbon estimates.
- Document a methodology for linking wall-to-wall, multi-sensor time series remote sensing data to both ecosystem models and traditional forest inventories
- Provide strong international contribution to GEO Forest Carbon Tracking taskforce, including providing training and capacity building support to developing countries.
- Contribute research into the ongoing use of emerging remote sensing-derived biophysical parameters for improved forest characterization (forest type, structure, biomass, function), and identification of forest disturbance and degradation events.

FURTHER INFORMATION

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Glossary and Acronyms

| | |
|-------------|---|
| 43pl | 43 Pty Ltd, a company representing the CRCSI's national SME consortium |
| ACC | Audit & Compliance Committee |
| ANZLIC | ANZLIC - the Spatial Information Council ... formerly known as the Australia and New Zealand Land Information Council |
| ARGN | Australian Regional GPS Network |
| SIBA | Spatial Industries Business Association |
| ASC | Australian Spatial Consortium |
| CEODE | Centre for Earth Observation and Digital Earth |
| CORS | Continuously Operating Reference Station |
| CRC | Cooperative Research Centre |
| CRC Program | Secretariat of the DSIIR CRC Program |
| CRCSI | Cooperative Research Centre for Spatial Information |
| CRCSI-2 | Name given to the rebid of the CRCSI |
| DEM | Digital Elevation Model |
| DInSAR | Differential Interferometric Synthetic Aperture Radar |
| DIISR | Department of Innovation, Industry, Science & Research |
| GFI | Global Forests Initiative |
| GIS | Geographical Information Systems |
| G-NAF | Geocoded National Address File |
| GNSS | Global Navigation Satellite Systems |
| GPS | Global Positioning System |
| IACC | Industry Advisory & Commercialisation Committee of the CRCSI-1 |
| INS | Inertial Navigation Systems |
| InSar | Interferometric Synthetic Aperture Radar |
| MOU | Memorandum of Understanding |
| NfN | Network for Networks – an international consortium of CRCSI-like organisations |
| PSInSAR | Permanent Scatter Interferometric Synthetic Aperture Radar |
| REAC | Research & Education Advisory Committee of the CRCSI-1 |
| Round 11 | The 2009 CRC Program Funding Round |
| SDI | Spatial Data Infrastructure |
| SEAC | Spatial Education Advisory Committee of Australia |
| SISR | Spatial Information Systems Research Ltd |
| SME | Small to Medium [sized] Enterprises |
| SSSI | Surveying & Spatial Sciences Institute |

APPENDIX A

Projects completed during the period.

Project 1.04 Integrating electricity, telecommunications and government infrastructure to deliver precise positioning services in regional areas.

This project has been a significant success. The three objectives relating to commercial, operational and institutional enablers have all been achieved. Useful outcomes have been forthcoming, particularly in relation to the business and partnership models developed by the research team. The business model has informed a number of other initiatives at various levels, including being incorporated in the recently produced NPI Policy prepared by ANZLIC. Both the business and the partnership model will form the basis of DERM's approach to the future provision of NRTK positioning in Queensland and contributed to Auscope.

Three additional objectives of the project relate to the impact of future GNSS on precise positioning services in regional areas. The second of these objectives was largely superseded by international developments in relation to NTRIP, which developments solved most problems relating to the communications infrastructure needed to support GNSS reference stations working in remote regions. The first and the third objective became the focus of the efforts of the research team, resulting in three pieces of software. These now form the foundation for the software based research platform mentioned in Objective 3. The first piece of software, developed at UNSW, implemented a new approach to precise positioning, where the computations are carried out at the server rather than at the user end. QUT developed software for CORS network design and for sub-cm RTK positioning. Both pieces of software are likely to be further tested and developed during CRCSI2, with significant interest from the user community. The sub-cm positioning algorithm is potentially the subject of a patent application, pending the results of further empirical testing to confirm performance. The claim is that this new approach to positioning computation can consistently achieve sub-cm 3D RTK positioning results with very short spans of data.

Project 1.12 Quality Control Issues for Real-Time Positioning

This project has been a successful and productive follow-on to one of the original CRCSI projects (Project 1.2). All project objectives have been addressed, with the exception of Objective 3 which was initially postponed and ultimately dropped due to declining national and international usage of the RT-IGS format on account of almost universal uptake of the RTCM3 format. The only significant shortcoming in relation to the initial objectives relates to Number 7 where the evaluation of the new real-time stochastic model developed by the research team has been limited by technical difficulties around the integration of the new model into the RRTK algorithm developed by UNSW. This work is however continuing and will be completed by the two PhD students.

The project has enhanced and extended the capabilities of the RTQC software developed under Project 1.2. This software provides CORS network operators and mobile users performing NRTK positioning with an independent real-time quality indicator of positioning performance along with extended data quality information targeted specifically at the operators of CORS networks. The software is currently the subject of an Invention Disclosure Statement and may form the basis of a patent application in due course. Some commercial interest in the software has also been shown by Leica Geosystems who continue to work with the research team to prove its commercial value.

An additional outcome of this project has been the development of the so-called Shared Software Platform (SSP). This platform provides the foundation for future software development in relation to any GNSS data processing applications. Indeed the SSP has been used to accelerate some of the software development work done under CRCSI Project 1.04 and will be used to facilitate future GNSS research in CRCSI2.

Project 1.14 Reconciling height datums in Australia: the bathymetric component

Project completed with project results presented in April 2010 at FIG conference in Sydney. Report was finalised for distribution to project participants.

Project 1.15 The Feasibility and Design of an Operational Real-Time GNSS CORS Analysis Capability for the Australian Region

Project completed and results presented to Geoscience Australia with final report has been completed.

Project 2.06 Automated analysis of terrestrial laser scanner in support of infrastructure asset management

The project has developed a number of methods of a general nature that will have value for future research and potentially for commercial exploitation. e.g. calibration, segmentation and classification. An extensive software evaluation process has been completed using a number of private sector partners (including AAM, MAPS, Vekta, Lester-Franks). Some useful feedback has been received, allowing the research team to identify future improvements to the software.

The postgraduate researcher, David Belton is currently working on these modifications while waiting for new work to begin under CRCSI2. There is a plan to extend this project into Program 2 of CRCSI2, thereby capturing the developed IP and the software. Vekta is using the software to some extent, but requires further improvement in relation to more complete automation of the process.

Project 2.11 Automated Mapping & Feature Extraction from Space, Aerial & Terrestrial Imagery

The project has been completed and the objectives have fundamentally been met. There is a largely user driven requirement to continue the research and development work through CRCSI2, but with a focus that will shift from accommodating different high resolution space imaging sensors to a more sophisticated and automated approach to feature extraction that goes beyond buildings to other man-made and natural features.

In relation to the project objectives, the following may be said:

1. Development of appropriate imaging sensor calibration systems, with associated quality assurance and standards, to support metric feature extraction (Done through expansion of push broom model.)
2. Refinement of existing models and development of new models and systems for automated photogrammetric orientation, with emphasis being upon processes central to supporting robust and efficient feature extraction from high resolution satellite imaging systems. (Done through developed robust feature extraction process)
3. Development of new models and computational systems for 2D and 3D feature detection and extraction, with initial emphasis upon man-made objects (e.g. buildings and roads) and meeting the needs of automated detection. (Done through expanded methods to extract man-made features and improvements in speed and efficiency are continuing. Note only buildings have been done (not roads and other man-made features).
4. Development of systems for image-based automatic change detection and spatial database updating, especially from HRSI and digital aerial imagery, and transfer of these to industry. (Done. Cooperating with DSE to transfer this capability to government. Change detection specifically confined to buildings and DEMs.)
5. To embody developments into the software system, Barista, for photogrammetric processing of HRSI, which is attractive to users of satellite imagery. (Done and being used now by GA and will be used by DSE in the future.)

Project 3.05. Enabling Real-Time Information Access in Both Urban and Regional Areas

This project has raised significant awareness about Creative Commons licensing and has directly influenced a number of government agencies in Australia and NZ to adopt this approach to licensing spatial and other government information. Its impact has been a noteworthy success for CRCSI.

Project 4.09 New Technologies for Radar Interferometry

Objectives for this project have been largely satisfied. Some difficulties in getting airborne data have delayed progress so that the airborne component has not and will not be delivered. The ScanSAR element has not been done due to a lack of support from JAXA.

The final project report is pending but will be delivered by the end of October. The main output from the project is a set of software tools that do DEM generation and perform various processing tasks using data from a variety of satellite/RADAR sensors. The team has also developed a radar image search library to assist in finding relevant data quickly and with minimal effort.

Applications beyond DEM generation include subsidence monitoring for various applications including open pit and underground mining, oil and gas extraction and CO₂ sequestration. The InSAR processing software developed under this project supports four different RADAR sensors and seven different satellites.

Project 6.07 Spatial Information Business Improvement Applications at Ergon Energy

Some project outcomes have been evaluated by ERGON and resulted in a follow-on project and the PhD students will submit after end date of project.

Project 6.08 Clever Cattle and Cropping Systems

Project completed with all milestones less one achieved; end of activity reports being prepared.

Outputs include new knowledge and protocols – project partners have now been shown how the integration of PA can impact farm management practices. Significant Press has enabled the dissemination of results and outcomes further than the project and a follow-on project will further utilise the outcomes.

The project has contributed to the development of undergraduate and postgraduate units at UNE – developed material has been informed by CRCIS project work.

Project 6.11 National Data Grid Project: Enhanced Platform for Environmental Modelling Support

The NDG project has produced some interesting and potentially useful outcomes. The project has successfully demonstrated the value and viability of the NDG concept in a number of key agencies and application areas. The next phase for the NDG project is to seek additional to move from a prototype to an operational system. . Post project, demonstration application will continue to engage with future stakeholders. NDG has been adopted by both Geoscience Australia (hosted at national computational infrastructure at ANU) and DSE.

Project 6.12: Spatial Health Pilot Project

Test application software HealthTracks development by Spatial Vision completed. HealthTracks allows the user to spatially enable, model and visualise health information together with spatial data from external agencies. Its use will optimise resource allocation through better identification of high risk populations, placement of treatment services and improved strategic planning and policy formulation.

WA Department of Health has an active GIS Section in the Epidemiology branch which spends a large proportion of its time preparing maps that depict health related data from internally held epidemiology systems. DoH wished to broaden the accessibility of such data by providing a web mapping application that could satisfy the major mapping requirements of public health staff and professionals. HealthTracks delivers this with increased clarity; time savings and efficiency increases; and in reduced time. Subsequent roll out of HealthTracks is being planned for mental health, child health, environmental health, policy, country health service areas, and state-wide health planning.

Project 6.13 Implementing Digital Licence Management in Queensland and Western Australia.

Project Completed. In Queensland the Digital Licensing Management (DLM) software has been implemented into QLD Govt. Information Service and the QLD whole-of-govt.

The GILF policy has been approved,(www.gilf.qld.gov.au). The Government Information Licensing Framework (GILF) makes it easy for people who use public sector information (PSI) to understand the rights of use associated with PSI material. GILF comprises a simple open content licensing framework, designed to assist in the management of government intellectual property, and encourage the use of PSI through increased availability and accessibility.

Acceptance testing is underway in WA with implementation of a prototype DLM system to WA Government for implementation through SLIP Enabler. Project has also created Increased awareness of DLM, Creative Commons and emphasised the need for a Government Information Licensing Framework

Project 6.14 Extension Activity Support sYstem (EASY) – Conceptual Design and Demonstrator Development.

Project completed. EASY personnel consulted formally and informally with individuals representing organisations in Victoria, Western Australia, Queensland, and New South Wales. A review of existing farm information/management software was also done to ensure that any system that is eventually produced will build on the strengths of existing efforts.

To demonstrate some of the EASY concepts that can address some of the needs identified, a working software demonstrator was developed in the Adobe Flash environment. This demonstrator will be hosted by Spatial Vision until mid-2011 to enable individuals to provide additional feedback. The demonstrator is neither a functional GIS nor is it a fully operational prototype. However, it does provide working examples of four use cases.