

ANDS celebrates our partners' work

Ross Wilkinson, ANDS



Image courtesy of Stephen Gunby via flickr (CC BY-SA 2.0)

The Australian National Data Service commenced operations in 2009 to deliver a Research Data Commons for Australia. Early on it was determined that while ANDS could deliver some of the national services needed, much of the work would have to occur within Australia's research institutions. And so ANDS partnered with 68 institutions to conduct 382 projects to transform the research data landscape of Australia. In this issue of *share*, we celebrate the fruits of the labours of many people around the country. And we congratulate everyone who was involved in the 382 projects.

Down in the engine room of research data, there are new tools for capturing and exploiting data; at the helm, institutions have new policies, procedures, and technology to manage their research data. Partnering with other research infrastructure providers, new data exploration becomes possible. Researchers are publishing their data and can be cited using their data.

New research is possible as a result of this changed research data environment. Collectively we celebrate the increased value of research data to researchers, research institutions and the nation!

Inside Issue 17 – A celebration of all completed ANDS-funded projects

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VIC completed projects

Australian Catholic University: Seeding the commons ARK project

CSIRO: BioSecurity collaboration platform (a National eResearch Architecture Taskforce project)

Deakin University: Description and discovery of research data collections at Deakin University

Deakin University: Enhancing filtration membrane fouling data collection for water treatment research

Deakin University: Crystal orientation data collection for conversion to a general data type

La Trobe University: Archaeological database development: The People and Place project

La Trobe University: CMSS RLI metadata capture and publication

La Trobe University: La Trobe metadata stores

Monash University: Capture and publication of data on the history of adoption

Monash University: Seeding the commons project

Monash University: Development of metadata store infrastructure with a large research data store

Monash University: Biomedical data platform (molecular biology)

Monash University: Capture and publication of Australian ecosystem data from a network of measurement sites

Monash University: Data publication to Interferome (MIMR/ Interferome)

Monash University: Research data management of the Monash Climate and Weather program

Monash University: Comprehensive data management for microscopy research database

Monash University: Tools for curating and publishing research data in the form of media collections (multimedia collections and ARROW)

Monash University: Human Chr7 Proteomics Integration Project

Monash University: Multi-modal kidney image

Monash University: Remote tomography – remote computed tomography reconstruction, simulation and visualisation (a National eResearch Architecture Taskforce project)

Public Record Office of Victoria: Government archives metadata project

RMIT University: Data capture from high-performance computing multi-user environments

RMIT University: Screen media research archive

RMIT University: Online decision support toolkit for climate resilient seaports (Climate Smart Seaports)

Swinburne University: Watering the garden for the seeds to grow: building Swinburne research data management capability

Swinburne University: Swinburne metadata stores project

University of Ballarat: Seeding the commons

University of Melbourne: Seeding the commons

University of Melbourne: Capturing multi-modal data to support research in cardiovascular and neurological medicine

University of Melbourne: Youth research centres life patterns project: longitudinal qualitative and quantitative survey data capture and reuse

University of Melbourne: Federated neuroimaging collections in the national data commons

University of Melbourne: Founders and Survivors project

University of Melbourne: Optimising metadata capture, data sharing procedures and long-term reuse of video data in social sciences

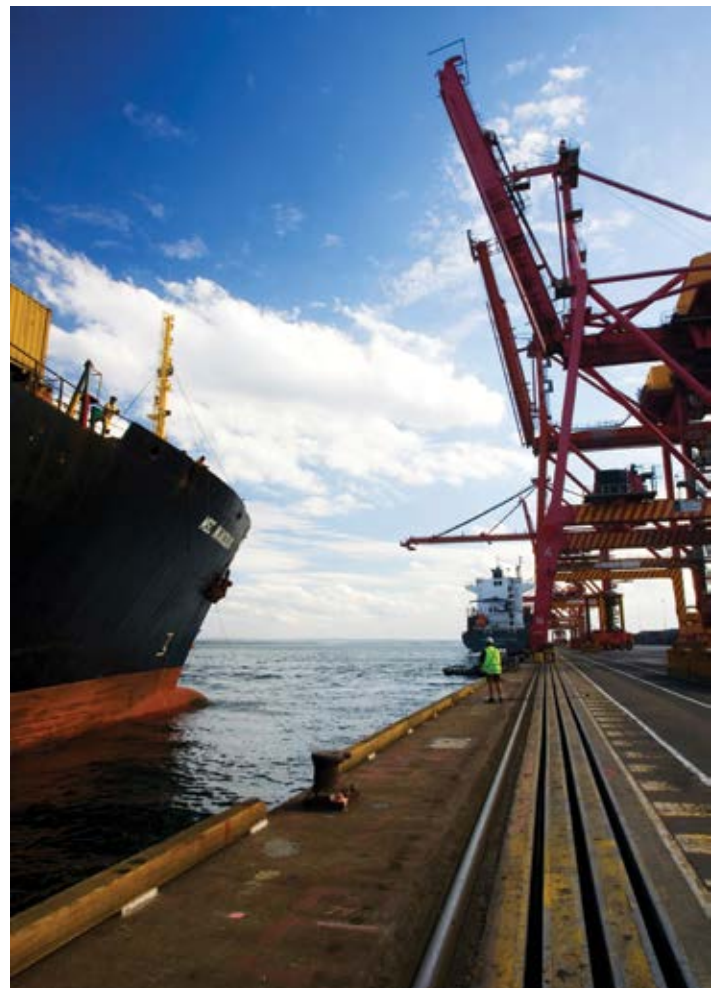
University of Melbourne: Humanities and social science data at the University of Melbourne

University of Melbourne: Melbourne Neuropsychiatry Centre bioinformatics development project

University of Melbourne: Turnkey research data registry

University of Melbourne: Australian node of the human variome project (a National eResearch Architecture Taskforce project)

Victoria University: Research data framework



RMIT University: Online decision support toolkit for climate resilient seaports (Climate Smart Seaports). Image courtesy of DIBP Images via Flickr (CC BY 2.0)

WA/SA/TAS completed projects

WA

CSIRO: SISS – Spatial Information Services Stack (a National eResearch Architecture Taskforce project)

Curtin University: AusCover workflow – workflow services to enable a large-scale temporal-spatial ecosystem digital information service (a National eResearch Architecture Taskforce project)

Edith Cowan University: Data management plan and policy

Murdoch University and QFAB Bioinformatics (QLD): Bioflows – bioinformatics workflows (a National eResearch Architecture Taskforce project)

University of Western Australia: Deployment and configuration of an institutional metadata repository

University of Western Australia: UWA Rock Art Metadata Store

University of Western Australia: Marine ecology video capture and storage

University of Western Australia: Integrated data capture for characterisation and analysis

University of Western Australia: Research data registry

University of Western Australia: National Criminal Justice Research Data Network (a National eResearch Architecture Taskforce project)

SA

Flinders University: Automated measurement of the responses of wildlife populations to climate change

Flinders University: Reformatting the AusStage dataset to support access and reuse by researchers

Flinders University: Aus-e-Stage – collective intelligence and collaborative visualisation for creative eResearch (a National eResearch Architecture Taskforce project)

Flinders University: Reforming the movies

University of Adelaide: Showcasing research data

University of Adelaide: Genomics data capture

University of Adelaide: Research metadata store project

University of South Australia: Taking Australian architectural and built environment records into the commons

TAS

University of Tasmania: Publication of collections into RDA by TPAC and IMAS of UTAS

University of Tasmania: Data capture of statewide hydrological datasets

University of Tasmania: Research data discovery service

University of Tasmania: MACDDAP – Marine and Climate Data Discovery and Access Project (a National eResearch Architecture Taskforce project)

Metadata store preserves WA Indigenous rock art

For those who consider a digital collections database as a mere 'back-up tool', a project manager in Western Australia has news for you.

Mary White, in Information Services at the University of Western Australia, has grand visions for the UWA Rock Art Metadata Store (researchdataonline.research.uwa.edu.au) her team and the university's Centre for Rock Art Research and Management developed and completed this year as part of the ANDS-funded metadata stores program.

The metadata capture and storage system is a repository for the centre's rock art research data collections, and provides linked and contextual information about research grants, associated researchers and projects, and other key metadata.

White would like to see the repository provide extensive coverage of the university's rock art achievements via worldwide discovery services to highlight these unique collections.

"This will assist users to better research outcomes by providing unprecedented research guidance in this field," says White.

"We want to share data to bring together indigenous communities worldwide and multi-disciplinary researchers, such as archaeologists, chemists, fine arts specialists, indigenous artists and historians. We will strive towards creating a more holistic understanding and awareness of the cultural significance of WA's Indigenous rock art.

"We also want to protect WA's Indigenous rock art by advocating, to government and industry, its heritage value, and by developing partnerships with relevant Indigenous groups and organisations to create sustainable heritage strategies," says White.

The UWA Rock Art Metadata Store was instigated as part of the university's institution-wide approach to best practice storing and showcasing of research data and metadata.

"It is important to build a brand for the system and grow a culture that embraces university research data management tools and services," says White.

The UWA Rock Art Metadata Store did meet some resistance at first from researchers. "Initially, people's attitude was 'What's in it for me?' and a tendency to view the system as just a back-up tool."

Through improved communication about the project's purpose, features and benefits; hands-on assistance with the first data uploads; and an approach of continuous user involvement in the incremental development of the system – responding to changing user requirements and specifications – this attitude was turned around.

"One researcher in a survey said he was excited about the notion of better exposure and access to his research in perpetuity, and that's great to hear," says White.

The UWA Rock Art Metadata Store is due for full implementation in late October/early November 2013.



NSW/ACT completed projects

NSW

Australian Nuclear Science and Technology Organisation: ANSTO scientific information architecture

ANSTO: MeCAT – Metadata Capture and Storage at the Australian Synchrotron and ANSTO

Macquarie University: Glycomics repository

Powerhouse Museum: The Museum Metadata Exchange

University of New South Wales: The Centre for Health Informatics – an international antibiotic-resistance gene cassette database

University of New South Wales: Data capture and integration across multiple platforms for science research instrumentation

University of New South Wales: ARC Centre of Excellence for Climate System Science (CoESCC): Climate Model Downscaling Data for Impacts Research (CliMDDIR)

University of New South Wales: Metadata stores project

University of Newcastle: Newcastle research online

University of Newcastle: Newcastle research data online: stage 2

University of Newcastle: Data capture project

University of Sydney: ExSite9 – field research data capture system

University of Sydney: Seeding the commons

University of Sydney: Platforms for collaboration in the Australian Microscopy and Microanalysis Research Facility (a National eResearch Architecture Taskforce project)

University of Technology Sydney: Community tools and processes for effective data management planning

University of Western Sydney: Seeding the commons project

University of Western Sydney: Climate change and energy research facilities

University of Wollongong: Identifying and locating UOW datasets

ACT / NATIONAL

Australian National University: Seeding the commons, data capture, and metadata stores projects

Australian National University: ASeSS – ASSDA (Australian Social Science Data Archive) Services for e-Social Science (a National eResearch Architecture Taskforce project)

Australian Plant Phenomics Facility: PODD – Phenomics Ontology Driven Data Management (a National eResearch Architecture Taskforce project)

CSIRO: Seeding the Commons – enabling CSIROs biological collections for the Australian Research Data Commons

CSIRO: The Australian Spatial Research Data Commons (ASRDC)

CSIRO: Data access portal and organisation metadata central

(Continued on page 6)

Soils to Satellites aids ecosystem research

Shannon Lindsay, ANDS

A project combining biodiversity, genomic and environmental data from a number of different sources could lead to significant changes in how we are able to support ecosystems research.

The Atlas of Living Australia/TERN Eco-informatics project 'Soils to Satellites' (S2S), completed in June this year, brings together data from three disparate yet complementary sources into a single web interface.

The sources include biodiversity and environmental spatial data from the Atlas of Living Australia; and from TERN, remote sensing data from AusCover, and ecological monitoring data stored in AEKOS (Australian Ecological and Knowledge Observation System) from Ausplots and TREND (Transect for Environmental Monitoring and Decision Making).

Prof Andrew Lowe, Director of the Australian Centre of Evolutionary Biology and Biodiversity at the University of Adelaide, says he is proud to sponsor S2S (soils2sat.ala.org.au:8080), which he calls "a really innovative data tool."

"Once you've got those different data types from different sources, you're able to combine those to make better decisions on environmental variables, but also to combine those data for new scientific analyses that can lead to advances in our fundamental understanding of how ecosystems work... I see it as a project that can potentially advance the way that we do environmental data analysis."

Martin Pullan, TERN Eco-informatics Project Manager, says the key to S2S is how the application presents visualisations of the different data, combining these different data in charts and graphs. These tools are implemented through web services and presentation APIs (application programming interfaces).

"The key benefit to researchers and users of Soils to Satellites is being able to go to one place and visualise patterns and relationships across different data, that if the user had looked at the individual databases they came from, they just wouldn't be able to see."

The project also has value for data publishers. As Stefan Caddy-Retalic, TREND Coordinator at TERN Australian Transects Network Facility, says: "Here we can combine the vegetation structure and soils data that we've collected through TREND with climate and environmental spatial layers that are available through The Atlas of Living Australia.

"We can now visualise in real-time and run mathematical models on how climate affects the structure and distribution of vegetation. Bringing together these data, spatial layers and tools in a single web interface allows us to display the data and manipulate variables to explore potentially unexpected patterns in complex data."

Importantly, for users, the portal also provides the ability to create and download datasets for further reuse. And data reuse can support further advances in ecological research.



QLD completed projects

Central Queensland University: CEM (Centre for Environmental Management) core data curation

Griffith University: Data capture project – Smart Water

Griffith University: Adult stem cell and neurobiological microscopy instrumentation and research data management

Griffith University: Australian National Corpus

Griffith University: RDA gold standard record exemplars

Griffith University: Griffith Research Hub

Griffith University: Data citation infrastructure establishment program

James Cook University: Tropical Data Hub collection, discovery and description

James Cook University: Research data catalogue

Queensland Cyber Infrastructure Foundation (QCIF): ReDBox project

Queensland University of Technology: B150 Big Jam

Queensland University of Technology: Biodiversity

Queensland University of Technology: Greenhouse gas emissions from Australian soils (N2O)

Queensland University of Technology: RDA gold standard record exemplars

Queensland University of Technology: Research data finder

University of Queensland: The aquatic species-tracking project (OZTrack)

University of Queensland: The Institute for Molecular Bioscience – linking the EMBL Australia Mirror with the Australian Research Data Commons

University of Queensland: Spatially integrated social science

University of Queensland: Cancer genomics linkage application

University of Queensland: Microscopy Image Repository (Mirage)

University of Queensland: Diffraction Image Experiment Repository (DIMER)

University of Queensland: 3D anthropological and archaeological collection repository

University of Queensland: UQ Data Collections Registry (UQ-DCR)

University of Queensland: Seeding the commons

University of Queensland: Brain mapping national resource / TissueStack

University of Queensland: Aus-e-Lit – collaborative integration and annotation services for Australian literature communities (a National eResearch Architecture Taskforce project)

Photo by Jim Bendon via Flickr (CC BY-SA 2.0)

Web tool far from bird brained

A James Cook University web portal enabling users to explore the potential impact of future climate change on Australian birds could prove to be a valuable tool in making decisions about conservation.

The 'Edgar' website (tropicaldatahub.org/goto/Edgar), named after the Edgar Allan Poe poem 'The Raven', shows locations in Australia where a bird species has been observed and shows current and future species ranges for Australian birds under multiple climate change scenarios.

Edgar enables scientists, the public, and policy-makers to see what is likely to happen to an Australian bird species in the future and can therefore assist them in making decisions regarding conservation and climate change action.

Edgar uses bird observation records from the Atlas of Living Australia database to generate the current and future species distribution models.

Obviously, errors creep into the data and so the website allows other experts and birdwatchers to help improve the accuracy of Edgar's projections by classifying observations, triggering re-running of models.

This is a giant leap in communication of both the potential impacts of climate change on Australian birds and the value of models for projecting likely impacts of climate change.

Stephen Garnett, Professor of Conservation and Livelihoods, Charles Darwin University, says Edgar is also providing research efficiencies.

"Most of my team will have checked the birds [on Edgar] they know well, but we don't know all the birds, so the good thing about [Edgar] is you can send the website [URL] to someone and they can look up their bird to see if their bird is correct.

"It means it's all done just once. There's many [other] databases [in the past] I've been over and over, because the corrections aren't added in, the comments aren't included or passed on. [Edgar provides] the chance to do it once, and properly, and have a dataset that will be valid for many years."

Prof Garnett says Edgar will be a "valuable tool" in judging how a species' habitat will change in the future. It will also help people look at important questions arising from climate change about conservation, such as whether to take an endangered species into captivity forever or introduce the genetics of a stronger strain of the species to a weaker one.

"If we want to keep the biodiversity we've got, we've got some very tough, philosophical and moral questions to answer," says Prof Garnett. Edgar project lead Assoc. Prof Jeremy VanDerWal, James Cook University, says there are plans to use the web tool for other species too – not just birds.

"It will allow people, not only birdwatchers, but those people who are interested in mammals, amphibians, reptiles, and also plants, to see where things have been reported and where they're likely to be in the future."



Event reports

The fast-track to global data sharing

Shannon Lindsay, ANDS

The key driver of the Research Data Alliance is the need to quickly achieve global consensus on how data can be shared rapidly across borders.

So said ANDS Executive Director Dr Ross Wilkinson in the webinar he hosted on Tuesday, 1 October 2013.

More than 30 people Australia-wide joined the webinar to hear Ross's feedback from the RDA Second Plenary, which was held in Washington DC in September 2013. More than 360 people from 53 countries attended the plenary.

Ross said the plenary was a working meeting with working groups tasked with a short, sharp effort to devise solutions to problems, with interest groups focusing on longer-term issues.

Plenary meetings are a small part of the work of the RDA, with most work occurring through its discussion groups. ANDS has a strong presence in several of these groups.

Ross discussed how the RDA's work aligns with what's being done in Australia, and how easy it would be for other Australian stakeholders to get involved in the RDA's groups (just visit the RDA website: rd-alliance.org).

"This is not only an opportunity to get involved in existing groups, but if there's something not currently represented in the RDA, you should create a group. ANDS will work with you to support your involvement.

"Australia has lots to offer and heaps to benefit from this international engagement. This is a chance for Australia to test an approach being used at a particular institution to see if it will stand up in the global environment," said Ross.

"Australia has some of the best data infrastructure in the world, but to enable Australia to do what it most wants to do, we need to partner with other players in that space."

ANDS, in partnership with Ireland, will host the RDA Third Plenary in Dublin in March 2014 (rd-alliance.org/rda-third-plenary-meeting.html).

Listen to Ross's webinar on the ANDS YouTube channel ([youtube.com/watch?v=BJUUVjfAyCI&feature=c4-overview&list=UUIbZWqlv8Si0siuizaxAS1A](https://www.youtube.com/watch?v=BJUUVjfAyCI&feature=c4-overview&list=UUIbZWqlv8Si0siuizaxAS1A)).



ANDS/Intersect roundtables bring philosophic moments

Ingrid Mason, ANDS

The NSW research data management community has spent time together this year in roundtables discussing life cycle models, data citation, metadata management, the digital humanities, technical vocabularies, and believe it or not, philosophy!

Moments were shared of great achievement and challenge on cultural and technological fronts.

Talk for some moved from being project oriented to next steps. For others, those first vital and careful steps are still being trod.

This year we were joined on occasion by colleagues from the NSW Office of Environment and Heritage, and attempted remote link-ups to those onsite who wished to join us online. That brought a subtle but important dimension to thinking about the broader research data management landscape.

Early in the year we trekked very lightly into a couple of life cycle models for scientific research and data curation. People were keen to know more and learn about local uptake of these models. The ANDS team took this as a very positive sign.

When the conversation moves from, "What do we need to do?" in taking initial steps in project mode, to "This is a way we could look at doing this", with an interest in models, then that is productive and shows progress.

The pace of change and approaches being undertaken across the public sector and in universities in NSW could be a study unto itself. Community outreach has enabled people working in different roles and contexts to enrich each other's understanding.

At the NSW roundtables, there is always plenty for all to take away and mull over – which has been great.

ACT / NATIONAL completed projects

(Continued from page 4)

CSIRO: CSIRO research data service multi-source data capture via generic configurable automated deposit

CSIRO: DIAS-B – Data Integration and Access Services for Biodiversity (a National eResearch Architecture Taskforce project)

To read more about all of the ANDS-funded completed projects, visit: ands.org.au/news/andsnapshot.html

Chair's report

Infrastructure, culture, and capability

Ron Sandland, ANDS' Steering Committee Chair

I recently gave an invited talk at the International Statistical Institute Congress in Hong Kong. It was titled 'Data partnerships for major research challenges', in a session called 'Sharing data, code and publications: Making research reproducible'.

Despite being in the dead session (after lunch on the last Friday of the congress), the ensuing discussion was spirited and interesting. Finally the Chair, Dr Murray Cameron, had to close off with considerable clamour for more discussion.

Interestingly, some discussants, and one of the speakers, were prepared to write off the challenge of open data, data and code sharing as being just too hard. The nub of the problem, as they saw it, was a set of gaps in three significant areas: infrastructure, culture, and capability.

Since its inception, ANDS has been working to create the infrastructure to fill these gaps for Australian researchers. The Australian Research Data Commons (ARDC) is an important part of that infrastructure which addresses many of the gaps described above.

The work ANDS has been doing in creating the ARDC has been focused on working with institutions under far-sighted investments made by the Australian Government. And we have worked with more than 60 of them.

Although our brief was quite explicitly to create the infrastructure to provide shareable collections – with descriptions of them and the infrastructure that underpins this requirement – it has been an inevitable consequence that a research data culture has been created. Many examples of this culture in action have been described over the years in this publication.

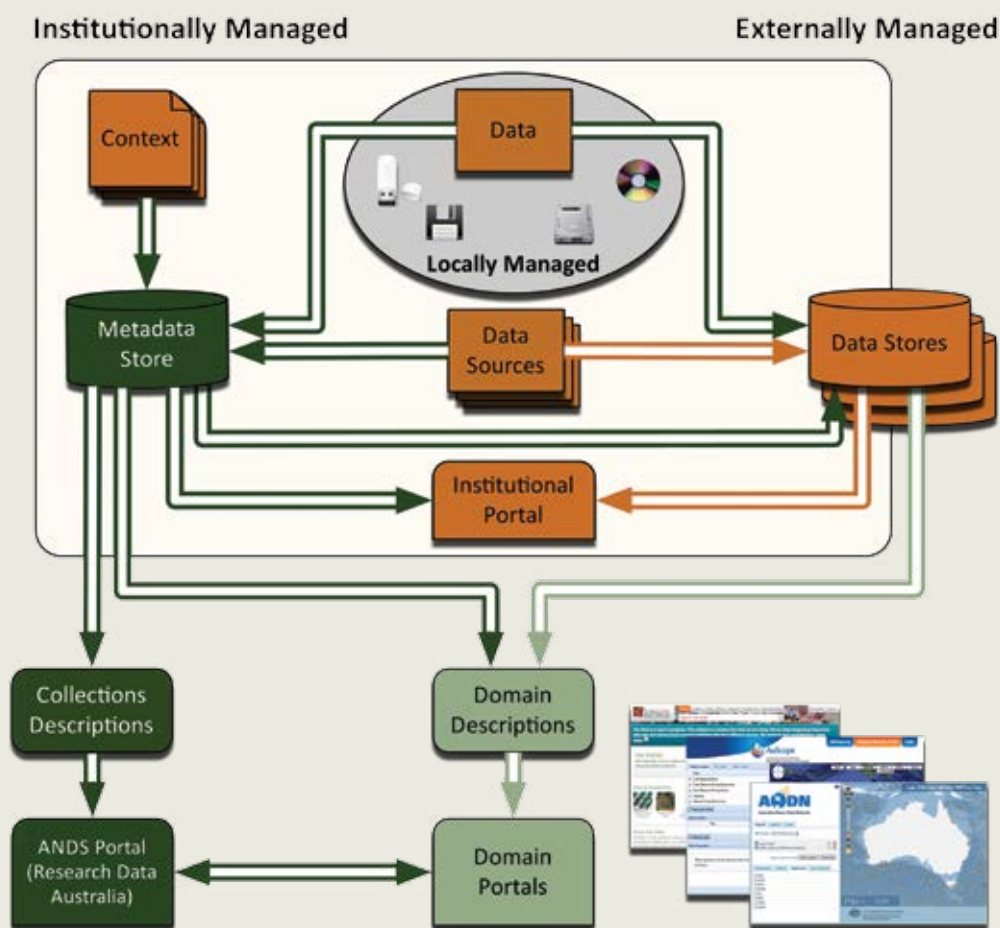
In working on these projects, the infrastructure has supported researchers in collecting, storing, accessing, sharing, linking, aggregating, analysing and interpreting their data. So the infrastructure investments have

also been making an important contribution to the development of capability in this area, which will increasingly become a defining competitive advantage for our research community.

The work of ANDS is well aligned with the National Research Investment Plan and the 2011 National Research Infrastructure Roadmap, in both of which the role of research data infrastructure is strongly recognised.

The role of ANDS is part of a greater research infrastructure enterprise aimed at radically transforming the productivity of Australian researchers (and indeed the nation). It includes capabilities related to data storage (RDSI), virtual laboratories and the research data cloud (NeCTAR), high performance computing (NCI) and a number of capabilities aimed at providing specialist data for researchers in ocean science (IMOS), public health (PHRN) and urban research (AURIN), to name just a few.

ANDS has played a seminal role in providing research data environments for Australia's researchers. Its efforts are very well recognised internationally through its links with the Research Data Alliance. There is a great deal more to be done if the gaps described in Hong Kong are to be fully overcome. In the meantime, there is a very good reason to celebrate the achievements of ANDS to date and to thank all of our many collaborators who have helped to make this possible.



Join ANDS at eResearch Australasia 2013



**Brisbane Convention and Exhibition Centre,
20–25 October**

Here's where you can hear what ANDS staff and collaborators have to say about all things research data-related:

Monday, October 21

2pm–2:20pm: Ross Wilkinson, ANDS Executive Director, joins fellow paper authors Jane Hunter, Rhys Francis and Mustapha Mokrane on a panel to discuss: 'How many Global Data Initiatives do we need?'

2:25pm–2:45pm: Mat Wyatt, ANDS Perth, will talk about: 'The CATAMI Story – the key to unlock the potential of marine imagery.'

2:50pm–3:50pm: Richard Ferrers, ANDS Melbourne, joins Lyle Winton and former ANDS staffer David Groenewegen in a Birds of a Feather session on: 'User-facing Data Services and Capability Building – Institutional Development'.

4:20pm–4:40pm: Mingfang Wu, ANDS Melbourne, will talk on the paper produced by her and ANDS colleagues Stefanie Kethers and Andrew Treloar about: 'Getting from Managed to Reused: Making it easier for researchers to do something useful with data'.

Tuesday, October 22

2:35pm–2:55pm: Former ANDS director Cynthia Love of CSIRO will present the paper written by her and Xiaobin Shen, ANDS Melbourne, and Catherine Brady, ANDS Canberra, about: 'Collecting with Intent: ANDS National Collections Program'.

3pm–3:20pm: Adrian Burton, Director of Services, and Project Manager Amir Aryani, both of ANDS Canberra, will speak to

their paper: 'ORCID integration: A case study from ANDS and international development'.

3:50pm–4:50pm: Andrew Treloar, ANDS Technology Director, joins fellow presenters Nigel Ward and Glenn Moloney in their Birds of a Feather session: 'Demonstrating the Research Value of Software Infrastructure'.

Thursday, October 24

9am–12:30pm: Andrew Treloar, ANDS Technology Director, co-convenes a workshop with Lesley Wyborn, Rahul Ramachandran and Ben Evans on:

'Big Data' in Earth and Environmental Sciences: what are the real challenges?'

1:15pm–4:45pm: Karen Visser, ANDS Canberra, and Gerry Ryder, ANDS Adelaide, join co-conveners Natasha Simons, Sam Searle, Dave Connell, Siddeswara Guru, Dominic Hogan and Anne Stevenson in their workshop: 'Connecting the dots: data citation from planning to reward'.

For more information visit: conference.eresearch.edu.au

Forthcoming events

Data Citers Catch-up

When: Tuesday, 12 November, 12:30pm–1:30pm AEST

Where: online

What: Gerry Ryder and Karen Visser of ANDS will facilitate this first virtual meeting for 'The Data Citers Catch-up'. Please register: eventbrite.com.au/event/8485425135

ANDS/Intersect Data Citation Roundtable

When: Tuesday, 26 November, 9:30am–4pm AEST

Where: Australian Technology Park, Sydney

What: Join this networking event. Please register:

sydneydatacitation.eventbrite.com.au

For more information and the full list of events visit:

ands.org.au/events/index.html

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