FEATURES

8 For the sake of our children

10 Researcher explores risk factors in mouth, throat cancer

12 Endangered turtle finds friends in the NT

14 Taking the bounce out of Rubber Bush

16 Yolŋu sign language preserved in print

18 Recording an epic ecological journey

21 Quake hits home for engineer

22 Low tide reveals classroom – NT style

REGULARS

3 From the Vice-Chancellor

4 Snapshot

26 Q and A

28 CDU publishing achievements

29 CDU art collection

30 Charles Darwin University professorial lecture series

31 Art exhibition: Made to last

32 Limited edition
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Cover: Sugar Glider (Petaurus breviceps) at the Territory Wildlife Park, photographer Hayley Richmond
Inside cover: Rubber Bush (Calotropis procera), photographer Patrick Nelson

CONTRIBUTORS

LOUISE ERRINGTON
In this edition of Origins Louise Errington looks at rebuilding efforts on the Philippine island of Bohol after it was struck by a devastating earthquake.

LEANNE COLEMAN
From prawns to turtles and clams, in this edition Science Communicator and Senior Media Officer Leanne Coleman covers a range of conservation research. She follows an epic ecological journey and reveals some vital research to help protect the endangered Hawksbill turtle. She also looks into the adaptation of a training program to suit a remote outdoor classroom.

PATRICK NELSON
Based at the Alice Springs campus, staff writer Patrick Nelson has been writing about Territorians, telling their stories and taking their photos for the past 30 years. In this edition, Patrick catches up with Enock Menge who is investigating the invasive properties of Rubber Bush, and Jenny Molyneux, who is hot on the trail of the Outback’s elusive desert-dwelling mulgara.

HAYLEY RICHMOND
CDU photographer Hayley Richmond is an accomplished practitioner whose work is characterised by a creative eye and distinct personal touch. Among her work in this edition of Origins is the stunning front-cover image of a sugar glider.
Charles Darwin University has an extraordinary record of achievement that belies its size. This has become increasingly apparent to me since I took up the role of Vice-Chancellor in late March. It’s with a good deal of pride that I write my first editorial for Origins and welcome you into the world of CDU to discover some of the ways we are impacting knowledge and lives.

Although I’ve been Vice-Chancellor for just two months, I have had a deep association with the Northern Territory for 20 years as a member of the Governing Board of the Menzies School of Health Research and as its Chair for the past 10 years. This experience has made me very familiar with the challenges that face the NT as well as the enormous opportunities here.

I look forward to leading this great university as we rise to the challenges and make the most of the opportunities.

You will read about some of these in this edition.

Coming from a background of agricultural science, I am particularly interested in the article on the work of one of our PhD candidates, Enock Menge, who is investigating an exotic plant – the Rubber Bush – which is invading drier parts of Australia. Responding to the call for help from landowners in the Barkly Tablelands of the Northern Territory, Enock’s research focuses on developing control measures. Success in this work will have a significant impact in Western Australia, in the north of South Australia, and in the NT’s Victoria River District and the Barkly, where the Rubber Bush has taken hold and is competing with native pastures.

One of our graduates from the Master of Engineering Management, Eustaquio Caliao, has a very personal as well as professional mission as he leads a team of engineers to rebuild the Philippine island of Bohol. When a 7.2 magnitude earthquake hit the area in mid-October 2013, hundreds of people were killed or injured, 16,000 homes were destroyed and tens of thousands of others were damaged. Eustaquio grew up on Bohol.

And closer to home, Darwin-based Dr Kate Golebiowska is leading a research team that is working to propose solutions to some of the stresses in the Top End’s burgeoning early childhood education and care sector. The team has found that the overseas-born early childhood workforce could hold the key to the continued delivery of quality services to children in their vital early years.

I hope you enjoy this edition of Origins, which clearly reflects how CDU is positively impacting lives.

Professor Simon Maddocks
Vice-Chancellor
**Alice Springs unveils big rig**

Charles Darwin University’s new $300,000 prime-mover has been unveiled at Alice Springs campus.

The gleaming 10-tonne big rig is enhancing CDU’s capacity to deliver courses to remote communities throughout the Red Centre.

Driver Peter Rose said the Caterpillar CT630LS was the perfect vehicle for towing the university’s mobile classrooms over long distances across rough terrain.

"Its first journey was to retrieve one of our MALUs (mobile adult learning units) from Arlparra (260 km north east of Alice Springs)," Mr Rose said.

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**Educator wins prestigious scholarship**

One of the Northern Territory’s most prominent education academics has been awarded the prestigious 2014 Fulbright Northern Territory Scholarship in the Senior Scholarship category.

One of only 30 recipients throughout Australia, Charles Darwin University’s Head of the School of Education Professor Peter Kell is a life-long educator with a research focus on global education.

He will travel to the United States in early 2015 to explore questions on internationalising the learning experience of postgraduate education in the Northern Territory as part of a research project entitled “Reaching Out to the Globe: Internationalising masters postgraduate learning in education”.

“I will spend six months at the University of Illinois (Champaign-Urbana) researching how we can use new technologies to develop collaborative transnational learning experiences in postgraduate education,” Professor Kell said.

The data would be used to start a global network in postgraduate learning in education.

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**Attack database to inform croc conservation**

A new database compiling information about crocodilian attacks world-wide could help with future conservation efforts of the species.

Researchers at CDU’s Research Institute for the Environment and Livelihoods (RIEL) have launched “CrocBITE, the Worldwide Crocodilian Attack Database”.

RIEL senior research associate Dr Adam Britton said crocodile conservation in Australia has been a victim of its own success and the database would improve understanding of crocodile and human conflict.

“Crocodile conservation has come back to bite itself,” Dr Britton said.

“With the protection of crocodiles since 1971 in the Northern Territory, the species has recovered remarkably well, making way for more crocodile and human interaction. There are similar stories from around the world.”

“Human-crocodile conflict is increasing each year as crocodile populations recover from decades of overhunting, and human populations continue to grow and encroach upon crocodile habitat.”

Dr Britton said that to better understand this interaction, researchers first needed to study the trends associated with crocodile and human interaction.

Working alongside crocodile management organisations worldwide and trawling through decades of archives and media articles, the team has built a database of more than 2000 records since 2011.

To contribute to the database, contact the CrocBITE team via W: crocodile-attack.info.
Endangered finch food going up in flames

A research project investigating how fire affects the food source of one of North Australia’s most iconic bird species could provide clues to its future conservation.

Once one of Australia’s most common wild finches, the Gouldian Finch is now listed as endangered under The Environment Protection and Biodiversity Conservation Act 1999. Charles Darwin University PhD candidate Anna Weier is looking closely at how bushfires are affecting breeding rates.

“The landscape is changing,” Ms Weier said. “Previous research suggests that areas where fires once burned sporadically in patches now burn with an extended front over large areas. These altered fire patterns can have a big impact on seed-eating birds because they burn the grass and grass seeds that the birds depend upon.”

In collaboration with Save The Gouldian Fund, and the Department of Parks and Wildlife WA, Ms Weier is investigating the impact of fire on sorghum grass seed availability for Gouldian Finches and how this affects breeding.

“We know that feral cats are highly effective hunters that eat a very wide range of prey including insects, reptiles, birds and mammals. Stomach content analysis has revealed a feral cat can eat up to 30 animals in one night.”

CDU Sydney centre opens

Charles Darwin University has opened a centre in the heart of Sydney.

Pro Vice-Chancellor Academic Professor Martin Carroll said the centre, which focused on business and finance studies, included “Collaborate” teaching spaces that integrated online and in-room class interaction.

“Courses including Bachelor of Commerce, Bachelor of Accounting and Master of Business Administration are available to international and domestic students.” Master classes, workshops and seminars also are held at the centre.

CDU Sydney is located at Level 10, 815 George Street, Haymarket, the international student precinct.
Rain helps researcher close in on desert dweller

Summer rains are likely to enhance conditions for a CDU researcher who has been hot on the trail of an elusive Central Australian marsupial for the past two years.

PhD candidate Jenny Molyneux is expecting conditions will be ideal when she next ventures to the Newhaven Wildlife Sanctuary in search of the brush-tailed mulgara (Dasycercus blythi).

“We didn’t catch any in February probably because of the scattered rain we’ve had, which increased food, making the baited traps less appealing,” Mrs Molyneux said.

“But it should be different later in the year when resources are lower and energy needs increase with breeding activity.” Mrs Molyneux has been gathering data at Newhaven, a property north-west of Alice Springs owned and managed by Australian Wildlife Conservancy.

“I’m gathering information about the effects of fire on faunal communities such as the brush-tailed mulgara.” Their movement patterns will be combined with other data to develop recommendations for more effective fire management within the region.

Fitted with a tiny transmitter, this mulgara is about to be released back into its habitat in the Great Sandy Desert. Image courtesy Josef Schofield, Australian Wildlife Conservancy.

Jenny Molyneux and research volunteer Kristie Dawes measure and record details of a mulgara.

Volunteer Kristie Dawes and Jenny Molyneux find a burrow, typical of the sort inhabited by mulgara in the Great Sandy Desert.

Jenny Molyneux inspects one of the mulgara caught among the spinifex plains on Newhaven Sanctuary.

Fitted with a tiny transmitter, this mulgara is about to be released back into its habitat in the Great Sandy Desert. Image courtesy Josef Schofield, Australian Wildlife Conservancy.
For the sake of our children

TEXT
Patrick Nelson

IMAGES
Hayley Richmond
Research led by KATE GOLEBIOWSKA may have uncovered a solution to some of the stresses in the Top End’s early childhood education and care sector.

Overseas-born early childhood workers living in the Top End may hold the key to easing the workforce stresses in the Northern Territory’s early childhood sector. With rapid population growth in the capital city Darwin and satellite city of Palmerston, and new national service standards in early childhood education and care, questions have been raised about the sector’s capacity to continue delivering quality services to children in their vital early years.

But research headed by Dr Kate Golebiowska, of the Northern Institute at Charles Darwin University, into the characteristics of workers already in the sector suggests a solution may be close at hand. In the Australian Bureau of Statistics 2011 Census, overseas-born people comprised nearly one-third of the Territory’s 1515 early childhood workforce. Dr Golebiowska’s research documents the demographic, economic and educational characteristics of 27 individuals working in the industry in Darwin and Palmerston, and suggests that most of these people intend to stay in the NT and most intend to remain in the sector.

“Our interviews suggest that they are likely to be stable rather than transitory, which contradicts the widely held view that immigrant workers in peripheral areas are highly mobile,” Dr Golebiowska said.

“Some 85 per cent of those interviewed said they intend to remain in the NT for the long term and 81 per cent intend to stay in the early childhood sector. This may help address the retention problems in a small workforce where a high turnover would have a negative effect on the quality of service and potentially on child development.”

Dr Golebiowska said the research was believed to be the first of its kind in Australia. “The findings inform two of the primary challenges confronting the sector noted in the Northern Territory Early Childhood Workforce Plan 2011–2021: workforce stability and the need for a qualified workforce.

“It provides data where virtually none existed previously about the characteristics of the NT’s overseas-born early childhood workforce.”

Dr Golebiowska said a series of ongoing national reforms was designed to enhance the level of professionalism within the early childhood workforce. “The most recent reform, which came into effect on 1 January [2014], raises the minimum qualification to a Certificate III in Early Childhood Education and Care. “In our study 67 per cent of the overseas-born staff interviewed met or exceeded this standard and an even higher percentage (70 per cent) aspired to achieve higher levels of education.

“The overseas-born cohort offered a high degree of stability to services in the face of changes that might have had a dramatic impact on the workforce.

“Overseas-born workers are passionate about working with babies and children, which points to the retention potential of these staff,” Dr Golebiowska said. “It is helpful to understand their professional motivations, particularly in light of the infamously low salaries that the sector pays.”

Dr Golebiowska said a range of measures could be implemented to improve the appeal of a career in the industry to both Australian-born and overseas workers. “Promoting permanent contracts, which were held by almost all of our participants, and offering scholarships tailored toward an early childhood qualification, are two examples. Another would be to promote the greater likelihood of reaching management level in the NT rather than elsewhere in Australia.

“Overseas-born workers already play a large and important role in the sector and the prospect of creating opportunities for more would mitigate some of the difficulties in a sector under considerable pressure.”

The research team comprises Dr Golebiowska, Ms Alicia Boyle, also of the Northern Institute, and Ms Denise Horvath of VET Health, Community and Children’s Services. 

Of the 1515-strong early childhood education and care workforce in the NT, 419 people were born overseas.

Of the overseas-born workers interviewed:

• 85 per cent intend to live in the NT long term
• 81 per cent intend to remain in the early childhood sector
• 96 per cent hold permanent employment contracts
• 59 per cent work as assistants/ aides
• 67 per cent hold Certificate III in Early Childhood Education and Care or a higher level ECEC qualification
• 70 per cent are interested in upgrading their qualifications
• 85 per cent migrated to the NT to join family.

Figures were derived from the 2011 Census; the research was supported by CDU’s Faculty of Law, Education, Business and Arts.

Overseas-born workers are passionate about working with babies and children.
Most new cases of head and neck cancer reported in the Northern Territory each year can be attributed to smoking and drinking, but it is the rising incidence of another risk factor that has piqued the interest of Top End researchers.

The emerging risk factor is the sexually transmitted Human Papilloma Virus Type 16 (HPV), which is being detected in increasing numbers among patients with cancer of the oropharynx (mouth and throat).

While the Territory reports about 70 cases of oropharyngeal cancer (OPC) each year at a rate three times the national average, it was the lack of clinical data about the incidence of HPV that prompted the call for research.

Honours student Methinee Intarapanya, a clinical nurse specialist at Royal Darwin Hospital, sought to bridge some of the knowledge gap in a research project to determine the incidence of HPV in patients with oropharyngeal cancer.

“Several international researchers had suggested that patients with oropharyngeal cancers caused by HPV appear to have better clinical outcomes in terms of survival,” Ms Intarapanya said. “We were looking to test this theory by attempting to diagnose HPV in our patients with OPC to determine if they had better survival rates.”

Under the supervision of Royal Darwin Hospital’s Director of Head and Neck Services Dr Mahiban Thomas and Charles Darwin University’s Clinical Sciences Senior Lecturer Dr Rama Jayaraj, Ms Intarapanya analysed the tumour samples of 51 Top End patients.

“The cohort included an over-representation of Indigenous patients, more men than women and a larger number of patients aged 50 years or under,” Ms Intarapanya said. “We used immunohistochemistry, a method used to detect proteins in cells of biological tissue.

“We were looking for p16, a tumour suppressor protein that is widely regarded as a biomarker for HPV. An antibody specific for detecting p16 was applied to slides that contained tumour cells. We observed them under a light microscope. A widespread brown stain indicated that p16 was present.”

Ms Intarapanya said it was the first time anyone had used immunohistochemistry to look at HPV within a group of oropharyngeal cancer patients in the Northern Territory.

“Twenty-four samples came back p16 positive, but interestingly our results were varied when we compared them to survival rates. We had hoped that those who were p16 positive and hence regarded as HPV positive would survive longer than those who were p16 negative, but that was not so.

“We later learned of other researchers who had found that p16 can occur without the presence of HPV, giving reason to question the reliability of p16 as the test to confirm that HPV caused the cancer.

“While we succeeded in confirming that p16 is an important diagnostic marker in head and neck cancer research, the evidence suggests it’s not reliable as a sole indicator. It gives rise to questions about whether the solution rests with two-phase testing.

“We will need to undertake further research to identify what is best practice in terms of standard methods in diagnosing HPV mediated OPC. The study may also help steer future research in fine tuning treatment regimes specifically for these patients whilst current therapies involving surgery, chemotherapy and radiotherapy can be debilitating in some circumstances.”

The cohort included … a larger number of patients aged 50 years or under.
Honours student Methinee Intarapanya: “We were looking for p16, a tumour suppressor protein that is widely regarded as a biomarker for HPV.”

CDU Clinical Sciences Senior Lecturer Dr Rama Jayaraj said the research undertaken by Methinee Intarapanya would help doctors provide better predictions of clinical outcomes for cancer patients.

“It is one of three exciting clinical research projects that our students have undertaken in collaboration with Royal Darwin Hospital into areas where little is known, particularly among people in the Northern Territory,” Dr Jayaraj said.

“Jagtar Singh has completed his Masters by research project into the identification of molecular and immune diagnostic cancer markers in surgical margins on victims of oropharyngeal cancers in the NT. “And PhD candidate Dr Sheela Joseph, a clinical pathologist, is conducting a prospective analysis of surgical margins with two molecular markers to investigate the ability to prognosticate recurrence in patients with head and neck cancer in the NT and Tamil Nadu (India).”
Endangered turtle finds friends in the NT

XAVIER HOENNER is working with Indigenous communities on the islands off Groote Eylandt to preserve a critically endangered species.

The first detailed study of the hawksbill turtle (Eretmochelys imbricata) in the Northern Territory means that the critically endangered species is one step closer to a secure future.

Centuries of harvesting the turtle for its colourful shell, highly prized by jewellery makers, has decimated numbers globally, with Australia now boasting the largest remaining populations of this protected species.

Dr Xavier Hoenner, who gained a PhD from Charles Darwin University, said he chose to research hawksbill turtles in a remote archipelago in the Gulf of Carpentaria because, in spite of their critically endangered status, their marine life cycle was inadequately documented to support information-based conservation measures. His research was the first detailed study of hawksbills in the Northern Territory.

“The cause of the dramatic decline in hawksbills was due to the intense commercial exploitation of their shell,” Dr Hoenner said. He said there was also concern about the ongoing trade of their shells in neighbouring countries and increasing marine activity in Northern Australia.

“To preserve them, we needed to find out more about their nesting ecology and migratory behaviour. We knew that Groote Eylandt was a major hawksbill turtle nesting rookery, with hundreds using the archipelagos as a nesting site.”

By attaching satellite transmitters to the turtles to record their movements and behaviour, and conducting night patrols on the beach with the Indigenous Anindilyakwa Land and Sea Ranger Unit in search of nesting turtles, Dr Hoenner discovered just how important the site was.

“We used Argos (a worldwide tracking and environmental monitoring system that uses satellites to relay data from ocean buoys and animal tags) and GPS positions relayed by satellite transmitters when turtles surfaced,” Dr Hoenner said. “We found that 600 hawksbill turtles were nesting annually on a small group of islands off Groote Eylandt.”

During his research, Dr Hoenner also developed a novel processing approach for wildlife tracking research, which allowed him to refine turtle home range estimates and migratory pathways computed from relatively inaccurate Argos positions.

“We wanted to determine where the turtles remained in between nesting and revealed the migratory corridors they used to travel to their feeding areas once the nesting season was over,” he said.

“Post-breeding, the turtles migrated to foraging sites on the Australian continental shelf, primarily in coastal areas and offshore near coral reef platforms. Water temperature, light, seafloor depth and reproductive events...
THE IMPORTANCE OF TEMPERATURE

A mature hawksbill could lay between two and six clutches of up to 180 eggs each nesting season, lasting from June to November, Dr Xavier Hoenner said. “Some breeding seasons are better for the hawksbills,” he said. “We think the difference from last year might be related to the humidity of the sand, which can disrupt the nesting process. To avoid high mortality rates in sea turtle eggs the sand temperature has to be between 27 and 31 degrees.” Temperature also determined the gender of hatchlings. “Eggs incubated in temperatures at the lower end of the scale will generally produce male offspring, while for temperatures above 29 degrees mostly females are produced.”

Before Dr Hoenner began his research very little was known about the at-sea ecology of hawksbill nesting populations in Northern Territory waters. His findings will be crucial in helping to protect this internationally significant breeding population and preserve hawksbill turtle habitat. “The program will be a valuable tool in the design of marine protected areas,” he said.

Dr Hoenner’s PhD thesis was entitled: “Spatial and Behavioural Ecology of Hawksbill Turtles Nesting on Groote Eylandt, Northern Australia”. The outcomes of this research project will be used for education purposes in local Indigenous schools and to provide data for the conservation and management of hawksbill turtle habitats in the Northern Territory.
Taking the bounce out of Rubber Bush

ENOCK MENGE is investigating an exotic plant that is invading drier parts of Australia in a bid to develop control measures.

With petals tipped in pink and purple, and its waxy leaves in the shape of a heart, Calotropis procera may well have made a favourable first impression on Australia’s early gardeners. But it was quick to fall from grace.

Said to have been introduced as a garden specimen about 100 years ago, few home gardeners would have anticipated that the ornamental shrub with its summertime blooms would one day be classified as a weed, hungrily consuming great swathes of the Australian interior.

Rubber Bush, as it is otherwise known, is native to tropical Africa and Asia, and was first reported in the Northern Territory in the Katherine and Mataranka regions where it took root along the Roper River in the early 1940s. It has since spread into Western Australia and the north of South Australia, and poses a risk to valuable grazing land in the Barkly Tablelands and Victoria River District of the Northern Territory, where it competes with native pastures.

Following a call by landowners in the Barkly, Charles Darwin University PhD candidate Enock Menge has been investigating aspects of the plant’s biology as part of a broader project to develop control measures. “The assessment of its invasiveness covers reproductive and seed biology, dispersal processes, competitive ability, the effects of grazing practices on its establishment, pollination biology and population ecology,” Mr Menge said.

“We know that there are about 440 seeds in each fruit, that they are easily dispersed by wind and that their ‘shelf-life’ diminishes after about 18 months. We also know that there are many species of native wasps, especially below Katherine, that pollinate the flowers. Previously that had been a mystery, although it was known that the Carpenter Bee and the Honey Bee were active pollinators further north and elsewhere in the world.”

Based in Tennant Creek, 500 km north of Alice Springs, and studying through CDU’s Research Institute for the Environment and Livelihoods, Mr Menge has tested the germination rates in plots characterised by varying levels of soil disturbance. “The trial showed that the more disturbed the soil, the higher the germination rate and any treading that buries the seeds helps greatly in the process,” he said.

The result is consistent with other observations in the field where Rubber Bush, which can grow to four metres high, is quick to germinate in ground loosened by cattle or other animals. In the right conditions, including warmth, water and oxygen, it is an efficient pioneer plant that achieves high germination rates in a couple of days, although most will perish before they mature.

“Just a single plant is enough to start a new colony, which can achieve varying densities over time,” Mr Menge said. “We have seen up to 1800 plants per hectare in the Barkly, a little less near Katherine but as many as 7000 plants per hectare in Queensland’s Gulf Country.

“Parts of the Australian interior are a paradise for Rubber Bush, which is problematic to those for whom it is a curse.”

Mr Menge said that monitoring of seasonal trends in flowering and fruiting has been going on for two years at three sites in the Barkly and three sites in Queensland, with additional data from one site in the Victoria River District for comparison.

The findings generated by the CDU research will be combined with findings of collaborative research on control options, being undertaken by Biosecurity Queensland, to develop efficient strategies for the plant’s control.

“A solution can’t come soon enough for those in places where it has taken over,” he said.
Parts of the Australian interior have been like paradise for Rubber Bush, which continues to spread at an alarming rate when conditions are favourable.

The Rubber Bush grows to up to four metres high.
A unique collaboration between two leading linguistic authorities from very different worlds has resulted in a first-of-its-kind documentation of Indigenous Australian sign language.

Sign language used by the Yolŋu people of Arnhem Land in the Northern Territory is unlike many others because of one distinctive feature: it is used as much by hearing people as it is by people who are hearing-impaired.

One of the specialists is an Indigenous elder from the remote Elcho Island community of Galiwin’ku.

The other is a linguistic expert from a leading university in one of Europe’s largest cities.

Senior Research Fellow at Charles Darwin University (CDU), Dr Elaine L. Maypilama has contributed to Yolŋu-related projects in the university’s Centre for Health and Wellbeing and the Menzies School of Health Research for the past 21 years.

Widely respected for her expertise in conducting culturally responsive research, Dr Maypilama has collaborated with both Indigenous and non-Indigenous partners throughout her career.

University of Cologne Chair of Applied Linguistics, Professor Marie Carla Dany Adone has 25 years’ experience in linguistic fieldwork in locations as diverse as Jamaica, the Seychelles, Mauritius, Germany, France, the Netherlands and Australia. Her research has largely involved investigations into sign languages, first language acquisition, bilingualism, language contact and language endangerment.

Yolŋu sign language preserved in print

Linguistic specialists ELAINE L. MAYPILAMA and DANY ADONE are preserving a sophisticated sign language from remote Australia.
Professor Adone worked as a linguist in North Australian Indigenous communities throughout the early 1990s, and became interested in Yolŋu Sign Language (YSL) after visiting Galiwin’ku for the first time in 1992. In 1994, she co-authored the first article on YSL, and when she met Dr Maypilama in 2009, their shared academic interests were obvious and from here, their collaboration began.

“It is interesting that Europe is now encouraging bilingualism and multilingualism, while Yolŋu have been multilinguals for a long time,” Professor Adone said. “In Australian Indigenous culture we have a rare case of bimodal bilingualism, whereby people use both spoken and signed languages to communicate. Indigenous Australians have been practising bimodal bilingualism for a long time. Unfortunately, in many places, these sign languages are severely endangered.”

Along with Professor Adone, Dr Maypilama undertook three years’ research to produce the book, “A Grammar Sketch of Yolŋu Sign Language”, which reveals that an elaborate gestural language forms a fundamental part of the communication system used by Yolŋu. The book provides an account of YSL and documents this endangered communication system through a collection of images of Yolŋu, including Dr Maypilama, making the language’s sophisticated signs.

Dr Maypilama said YSL deserved to be acknowledged and respected as a language in its own right, and the book contributed to raising awareness and promoting public appreciation of the language.

“From birth, Yolŋu acquire both spoken and sign languages simultaneously,” Dr Maypilama said. “This means hearing-impaired people are very much a part of the social and cultural fabric of Yolŋu life.

“Yolŋu use sign language on a daily basis not only to communicate with hearing-impaired people, but also when communicating silently in public or over long distances, or for purposes such as discretion, hunting and gossiping. We also use it in situations where cultural rules prohibit speaking, such as in times of mourning when we cannot speak the name of the deceased.”

Used in conjunction with speech and facial expressions, YSL, like other sign languages, has a structure, rules and conventions. Within YSL, gestures vary with the various clan groups, as well as between the signs used by men and women. Stylistic variations also occur according to context, such as between day-to-day interactions and in restricted cultural contexts, in which spoken communication is deemed inappropriate.

“It is a very rich and elaborate communication system,” Dr Maypilama said. “Sign language is part of all facets of Yolŋu life, and all Yolŋu use sign language to make meaning together, whether they are hearing-impaired or not. It has been done forever. Always.”

The next phase in the collaboration to preserve YSL is the development of a dictionary of the language.
Recording an epic

Even while marooned on the river bank with just a tarpaulin between him and gale-force storms for days at a time, the North’s river systems retained their fascination for Peter Novak, who said that during most of his fieldwork he felt privileged to be undertaking the study.

The work evoked memories of playing in the wetland near Bunbury in Western Australia as a young boy, fishing and collecting aquatic animals in jars. “Sometimes I had to pinch myself realising where I was actually working,” he said.

“I do it because I love the work but also because we need to protect the rivers of the Northern Territory,” he said. “There is still so much to learn, and without accurate baseline data to assess potential impacts, we cannot ensure the best conservation management strategies are put in place for the future.”
As a two millimetre-long newborn, the freshwater prawn \textit{(Macrobrachium spinipes)} faces an epic and perilous journey to adulthood, navigating hundreds of kilometres along one of the Northern Territory’s most hazardous rivers.

Famed for its massive barramundi and even larger crocodiles, the Daly River is located 222 km south of Darwin and is one of Northern Australia’s vital freshwater veins. Supporting a rich array of biodiversity, the river provides a passageway to the Timor Sea and the nursery and breeding grounds required to replenish the entire system each year.

With little known about the ecological role and life history of the North Australian freshwater prawn, referred to locally as cherabin, and with concern that populations were declining, possibly due in part to human harvesting for bait and food, Charles Darwin University PhD candidate Peter Novak has spent the past three years following their every move.

“It was only in 2011 that researchers realised what they thought was the species known as \textit{Macrobrachium rosenbergii} inhabiting Northern Territory rivers was actually a new species called \textit{Macrobrachium spinipes},” Peter said. “We thought it was \textit{rosenbergii}, the more common species that is extensively found and farmed throughout Indonesia, Malaysia and India. We needed to start from scratch because very little information was actually known about \textit{spinipes}.

Braving the crocodile-infested waters, Peter and his team of volunteers laid traps at seven sites along the 400-km stretch from Katherine to the mouth of the Daly River and through the Edith and Ferguson tributaries, over a 14-month period. Surveying more than 4500 adult prawns and tens of thousands of juveniles and larvae, Peter’s work would be the first study on the lifecycle of \textit{Macrobrachium spinipes} and would provide valuable baseline data about the species.

“To understand their natural history, we needed to find out more about their annual migration and where and when they breed,” he said. Armed with the knowledge that like many other iconic...
species including barramundi, the prawns required saltwater as part of their life-cycle, he set to work to find out more about their annual journey to the saltwater nursery grounds downstream, where the river meets the sea.

“We thought that the adult females may have been making the trip downstream to deposit the newborns into the estuary. What we found was completely new.”

Peter said that adult female cherabin have many small swimmers (pleopods) on the underneath of their abdomens where they store their eggs. “We found the berried females (with eggs) did not move downstream to release their larvae. Instead they hatched wherever the females were on the river,” he said. Flicked from the security of the pleopods, the larvae were left to fend for themselves and find their way downstream. For some, this could be a journey of up to 400 km from the estuary.

“After finding berried females hundreds of kilometres from the estuary, we wanted to find out the importance of saltwater to their development and survival. It raised questions as to whether the prawn even needs the saltwater to develop or does it complete its full life cycle in the freshwater?”

Peter set up some tests in the laboratories at CDU’s aquaculture facility to find out more. “We collected females with egg clutches of ready-to-hatch larvae and tested the survival rates of the larvae in freshwater over a period of days in the lab,” he said. “We found that for a larva to survive it needed to reach the saltwater nursery grounds within seven days of hatching. Without their annual migration downstream this species would not survive.”

Peter began to piece together elements of their natural history. The next step was to find out about the part they played in river connectivity and estuarine food webs. He said their annual journey was timed according to river flow and season. In Northern Australia, this migration was timed with the rains of the wet season from December to March.

“Once the larvae made the journey downstream, they stayed in the saltwater throughout the wet season growing to around two centimetres before migrating back upstream into the freshwater towards the end of the wet season after the rains,” he said.

“We observed up to one million juvenile cherabin every night for about 30 days in April/May, moving back up the river after the rains, along with other iconic species like the barramundi and mullet. The migration was like a replenishing of nutrients and food for the river system. Previous research has found that cherabin are an important part of the diet of up to 80 per cent of fish species in the area. And although it is hard to quantify, cherabin appear to be a very important food source and demonstrate the importance of maintaining the linkage between freshwater and estuarine food webs.

“We have also discovered valuable information such as size at first maturity, length of breeding season, length/weight ratios, animal condition and sex ratios, which are all important variables and could assist with fisheries management.”

The journey of tiny larvae may seem but a ripple in the vast body of knowledge needed to understand one of the NT’s iconic rivers. But Peter said he believed it was a step in the right direction to understanding the system as a whole and working to preserve these vital systems for the future.

“Now we not only know how important river flow is to the survival of these cherabin populations, but also how vital the species is in the linkage between freshwater and estuarine food webs,” he said. “Any developments that might impede the migratory behaviour of cherabin could have significant impacts at an ecosystem scale.”

Helping to improve the understanding of the natural history of this Macrobrachium has assisted Peter to fulfil a lifelong dream to research the rivers of North Australia. His research about their annual migration will now be used to improve the management of cherabin populations in the NT.

This project is a collaboration with the National Environment Research Program – Northern Australia Hub, and funded through a Northern Territory Government Research and Innovation Post Graduate Scholarship, and Holsworth Wildlife Research Endowment.
A magnitude seven earthquake has the energy equivalent to 32 Hiroshima atom bombs. The resort town of Tagbilaran City, 630 km southeast of Manila, endured this enormous shock and more when a 7.2 magnitude tremor caused widespread destruction on the Philippine island of Bohol on 15 October 2013.

Charles Darwin University Master of Engineering Management graduate Eustaquio Caliao has been leading a team of engineers tasked with rebuilding his childhood home of Bohol following the deadly earthquake. The quake, which fractured the land, razed centuries-old churches, and left lives destroyed in its wake, was followed by 4026 aftershocks that tormented the victims for weeks. The Philippine Institute of Volcanology and Seismology said the earthquake was so powerful it moved Bohol Island 55 cm to the west towards Cebu.

Engineers with the Bohol Provincial General Services Office, led by Mr Caliao, have been coordinating the response by managing repairs and undertaking the construction of temporary office and hospital facilities.

Mr Caliao said damage to infrastructure was substantial, as was the devastating human cost.

“People have lost their lives, their loved ones, their homes and their livelihoods,” Mr Caliao said. “More than 200 people were reported dead, 723 were injured and eight are still missing. Some 16,015 residences have been totally destroyed while a further 53,851 residences were partially damaged. The total rehabilitation cost is estimated at nine billion Philippine pesos.”

In the days following the disaster, Mr Caliao accompanied a team from the Philippine Institute of Civil Engineers and the Association of Structural Engineers of the Philippines to conduct quick-response assessments of infrastructure ravaged by the earthquake.

“We have been conducting assessments of buildings for possible rehabilitation, developing engineering plans, conducting repairs and undertaking the construction of temporary office and hospital facilities,” he said. Although Mr Caliao and his team have been working tirelessly to salvage what is left of their broken town, they still have plenty of hard work ahead, with rebuilding expected to take at least four years.
Low tide reveals classroom – NT style

Beginning with trepang (sea cucumber), the species for the pilot program have grown to include blacklip oysters and giant fluted clams.

TEXT
Leanne Coleman

IMAGES
Fiona Morrison
A trade that began more than 200 years ago between the Macassans and the Indigenous “Saltwater People” of Northern Australia underpins a pilot aquaculture program on Goulburn Island.

The community of Warruwi on remote Goulburn Island is home to one of the most spectacular classrooms in the world. Lying off the rugged coastline of West Arnhem Land, the island is 290 km north east of Darwin in the Northern Territory and surrounded by the Arafura Sea.

The 500-strong Warruwi community has always worked the Arafura Sea for its rich harvest of shellfish, crocodiles, dugong, turtles and tropical fish, but they have not always been alone. For several hundred years, Macassans from the Indonesian island of Sulawesi to the north-west, made annual visits to the area to trade with the local Indigenous people for the highly valued trepang (sea cucumber). This trade continued until 1906.

Now the Warruwi community is returning to these roots and drawing on expertise from across the Territory to establish aquaculture enterprises on the island. The fledgling Aquaculture Training Program, which is designed to build the skills of traditional owners to run commercial aquaculture programs, is a collaboration between Charles Darwin University (CDU), the Aquaculture Unit of Northern Territory Fisheries, Yagbani Aboriginal Corporation and the West Arnhem Shire.

The Aquaculture Unit began ranching trials of trepang in the waters around the Warruwi community in 2010. Since then the species for the pilot program have expanded to include blacklip oysters and giant fluted clams.

It was Wayne Tupper, from the West Arnhem Shire, who approached lecturers in the Certificate II in Aquaculture at CDU to help build the necessary skills within the Warruwi community.

“The community was looking at ways to utilise their sea country and develop skills to create enterprises as part of the Community Development Employment Projects program,” Mr Tupper said. “Living on an island, fishing and aquaculture are like the cattle industry of the sea.”

He said records show that trade between the Macassans and Northern Australia date back to as early as 1740. “This trading had a significant impact on the community’s history and culture. It is present in stories, art and ceremony. The elders in the community remember collecting shellfish and trepang as kids when there was a significant seafood industry on Goulburn Island.”

With their history steeped in marine harvesting, the elders wanted to learn more about NT Fisheries’ research and the possibility of developing a community-based aquaculture enterprise. While the communities had experience in wild-harvesting shellfish, this ceased 30 years ago. As a result, the population needed to rebuild their skills to support commercially viable enterprises.

CDU Aquaculture lecturers Daniel Costa and Chadd Mumme arrived on site early in 2012 when the Aquaculture Unit introduced the third species in the trials, 500 juvenile giant clams. For Daniel Costa, who has family on the Tiwi Islands off Darwin, travelling to remote areas of the Northern Territory to deliver training to Indigenous people was a dream come true. While Mr Costa has been delivering training at CDU’s Casuarina campus for more than two years, he is now working with his supervisor Chadd Mumme to customise the Certificate II in Aquaculture for delivery on site in remote Indigenous communities including Warruwi.

“On CDU’s campus in Darwin, the Certificate II in Aquaculture is normally delivered two days a week for one year,” Mr Costa said. “I travel to Goulburn (Island) every six weeks to deliver the...
course remotely. When I travel is all dependent on the tides. There are no classrooms out there, so the teaching takes place on site, often on a low tide when we can walk out to check on the shellfish.”

Chadd Mumme’s passion is to continue training and education to ensure the viability and sustainability of the seafood industry for future generations. He said the course was unique in that it was the first time it had been offered remotely by CDU. Indigenous students have been enthusiastic from the start, even assisting the team to set up the pilot program.

“One of our major roles at CDU is to build skills, knowledge and experience with Indigenous communities to assist them to maintain their aquaculture programs,” Mr Mumme said. “In this case, we needed to adapt the course to suit the environment, customising the course so it was accessible to remote students, and taking on a more practical mode.” The remoteness of the on-site teaching means that the course takes a little longer for delivery, but many of the students are about half-way through their Certificate II.

Mr Mumme said the course provided the local people with an entry point into the aquaculture sector of the seafood industry. “Along with the course curriculum, there have been many other aspects involved in their training due to the unique nature of the program. What makes it so special is that they are learning how to set up aquaculture programs first-hand, on site, while completing the course requirements such as monitoring and animal husbandry.”

The training now includes children from the local school. Mr Mumme is working with the school and its students to develop a Vocational Education and Training (VET) in School program so the youngsters can be involved in the aquaculture trials.

Wayne Tupper, from West Arnhem Shire, said that developing a plan for the program had brought the community together. “An umbrella organisation, ‘Yagbani Aboriginal Corporation’, has been formed with representatives from all five groups of Indigenous people from Warruwi community and will support the development of a future community enterprise,” he said.

The next phase of the program will include CDU contributing expertise from a wide range of disciplines including molecular ecology, Indigenous policy, socio/cultural research, workforce training, and culturally aligned business planning and organisation.

“This program shows that working with the community to build capacity from the ground up has the potential for exciting things to happen. The community of Warruwi is determined not to let this opportunity skip another generation,” Mr Tupper said.

NT Fisheries Aquaculture Unit manager Dr Ann Fleming has been leading the aquaculture trials on Goulburn Island since they began. She said work has focused on identifying suitable grow-out methods and locations for the species of interest to the community. Dr Fleming has been working with CDU’s molecular ecology unit to monitor heavy metals in oysters. “This work will ensure shellfish are safe for human consumption, a necessary food safety aspect for sales through commercial channels,” Dr Fleming said.

“When the community has gained the qualifications and skills through their certificate with CDU, we will pass the monitoring aspects on to them. Being able to conduct routine food safety testing will be crucial to the enterprise becoming commercially sustainable. We have already had interest from a local seafood supplier, who wishes to supply local restaurants with small volumes of niche market seafood sourced from Indigenous aquaculture enterprises.”

Dr Fleming said developing capacity in governance and business management would be vital to the future of the project. “We are working with CDU’s Research Institute for the Environment and Livelihoods and the Northern Institute to assist in this area, including working with individual clans to develop trepang enterprise plans for their sea country, in partnership with the commercial trepang fishing sector,” she said.

NT Fisheries Aquaculture Unit manager Dr Ann Fleming has been leading the trials on Goulburn Island since they began.
There is a special place in artist Jennifer Taylor’s heart for Alhîrntarlpe (Ross River) in Central Australia’s East MacDonnell Ranges. The Creative Arts PhD candidate has spent the past three-and-a-half years exploring the cultural, ecological and social history of the region and reflecting the shared histories of its inhabitants in an extensive series of oil paintings.

Some 80 works, including landscapes of the spectacular Eastern Arrernte country and portraits of people who have lived there during the past 100 years, are gathered in the studio at Ms Taylor’s Alice Springs home.

“Based on memoirs, photographs and personal conversations, I have attempted to preserve some of their stories through painting,” Ms Taylor said. “They document the continuity of relationships between people and place in the face of dislocation and change.

“Relationships between Aboriginal and non-Aboriginal workers and families are complex and long-lasting, and often grounded in place. Arrernte people have worked hard to stay close to their land in extremely difficult conditions. They have a proud history of skilled labour in the pastoral industry.”

Ms Taylor, the first Nan Giese Scholarship recipient, said she hoped to build a composite portrait of Alhîrntarlpe/Ross River. "Perhaps these paintings will preserve cross-cultural stories, make them accessible, and help people connect with this place.”

Ms Taylor will exhibit her work in Alice Springs in August and in Darwin at the Cross Cultural Art Exchange in September.

JENNIFER TAYLOR uses painting to tell stories of social and ecological change at Ross River.

JENNIFER TAYLOR uses painting to tell stories of social and ecological change at Ross River.

Portraits of place – in Arrernte country

They document the continuity of relationships between people and place in the face of dislocation and change.

Text
Patrick Nelson
Images
Patrick Nelson

Artist and PhD candidate Jennifer Taylor captures and preserves life in Eastern Arrernte country.

Roy McFadyen, Toby, and dog, summer 1939.

Towards Artunga 1.
How did you become a professional illustrator and cartoonist?

After completing a Bachelor of Arts in Visual Communication at the University of Technology Sydney, I found it difficult getting a job in graphic design. It was at the height of the recession and I resorted to doing murals and small freelance jobs, labouring, kitchen work, and started doing art for myself. I attempted to develop a style, based on a caricature I did of a fellow student and a lecturer, all inspired by Hergé’s style of depicting faces such as Tintin. Everyone and everything had to have the Tintin effect. Later I had enough work to present as a folio of work and began the process of knocking on publishers’ doors.

What’s your earliest memory of art?

I was fascinated by the art in children’s books. Richard Scary was a favourite, and signage and logos that I saw from the back seat of the family car. The Marshall from Marshall’s Batteries was always a thrill. It seemed like such a grandiose work, a masterpiece. How did they make it glow? Then I found Asterix and Tintin books. I wondered how someone could draw so precisely at such a tiny scale.

What has surprised you most about working as a cartoonist?

The importance of being honest and keeping to one’s own standards is imperative; not allowing too much compromise. Finding work is also the long-term battle as a freelancer and can knock you around. Getting paid is another hoary subtext.

What do you find most challenging about your profession?

How has the print industry’s move to electronic delivery impacted the demand for illustrations and cartoons?

I don’t think the print media in its shift has embraced the art as much as it could. It should be easier and cheaper to utilise, but cartooning and illustration particularly go in and out of style so I don’t fret about the situation. Most illustrators and cartoonists revel in the developments allowed by technological progress, simply taking a drawing and digitising it can improve certain qualities in the image. You just have to think about how formatted the content is right now in digital publications; it is mimicking print media to an extent. Surely it deserves a new format?

What do you find most challenging about your profession?

The importance of being honest and keeping to one’s own standards is imperative; not allowing too much compromise. Finding work is also the long-term battle as a freelancer and can knock you around. Getting paid is another hoary subtext.

What would you tell someone who is thinking about becoming a cartoonist?

Go and be a cartoonist. Don’t talk about it; do it.

What interests you apart from your work?

I am not entirely interested in my work! I like the motto “live to work, not work to live!” In saying that, I find all kinds of things interesting. Curlews are a current favourite. What a magnificent personality. Baby plovers are very cute although their parents are mongrels. I also think there is ample room to develop an online media journal in the NT that focuses on in-depth investigative journalism. We’re kept in the dark about many things. Some good old fashioned muck raking and associated accountability wouldn’t go astray.

What is the best advice you have received and who offered it?

“Shut up and paint” is a pretty good one. A ratbag outsider friend from News Limited says it frequently. It is, as I understand, a (David) Hockney quote. My Dad has a good one too: “You know what thought did? He only thought he did”. Can’t argue with that.

What does inspirations you?

Picasso blows me away, but I think Monet was/is the greatest painter ever. I love the idea of art not pandering to political influences. Long live decoration. Political cartooning is a depressing activity. I think political cartooning is myopic in itself as it is a self-perpetuating same joke, the same thing over and over. You really need to think outside the concept of a cartoon in itself to improve the form. Having said that, I was always inspired by Bruce Petty and Patrick Cook whose humour is sublime. I’m more interested in beauty now. I love the graphic styles of the French masters Raymond Savignac and Jean Colin, and looking at vintage Graphis magazines. Aesthetically pleasing work.
as an artist, while providing practical
will dispel romantic notions about life
book that explores what it takes to

Looking at Art: Charles Darwin University Art Collection
Anita Angel, Curator CDU Art Collection and Art Gallery
Published November 2013, Uniprint NT, Darwin 2013, ISBN 9781921576850
Looking at Art reproduces 37 works of art from the CDU Art Collection. This is the first in a planned series of books to offer a valuable, scholarly contribution to our understanding and appreciation of art in our region and of the many individuals and communities Charles Darwin University serves – locally, regionally, nationally and internationally. It is appropriate that a book dedicated to the Charles Darwin University Art Collection be published during the year that the University’s printmaking studio, Northern Editions, celebrates its 20th anniversary.

Ecology of Australian Freshwater Fishes
Edited by Paul Humphries and Keith Walker
Contribution by David A. Crooks, Research Institute for the Environment and Livelihoods, CDU, Chapter 5: ‘Movements and Migration’ by John D. Koehn and David A. Crook & Chapter 8: ‘Age and Growth’ by David A. Crook and Bronwyn M. Gillanders
Published April 2013, CSIRO Publishing, Victoria Australia, ISBN 9780643097438
This edited volume reviews our past and present understanding of the ecology of Australian freshwater fishes. It compares patterns and processes in Australia with those on other continents, discusses the local relevance of ecological models from the northern hemisphere and considers how best to manage our species and their habitats in the face of current and future threats.

The Multivariate Algorithmic Revolution and Beyond
Edited by Hans L. Bodlaender, Rodney Downey, Fedor V. Fomin, Daniel Marx
Parameterized complexity is currently a thriving field in complexity theory and algorithm design. A significant part of the success of the field can be attributed to Michael R. Fellows. This Festschrift has been published in honour of Mike Fellows on the occasion of his 60th birthday. It contains 20 papers that showcase the important scientific contributions of this remarkable man.

Sustainable Retrofitting of Commercial Buildings: Warm Climates
Edited by Richard Hyde, Nathan Groenhout, Francis Barram and Ken Yeang
Contribution by Dr Edward Halawa, Research Fellow/Senior Research Fellow– Renewable Energy, CDU, Chapter: ‘Design for improving the sustainability of existing commercial buildings’.
Published September 2012, Earthscan Ltd, United Kingdom, Hardcover, ISBN 978184712910, eBook ISBN 9780203119846
Despite recent improvements in energy efficiency being made in new builds, it is important that the existing commercial building sector also takes action to meet emission reduction targets. The objectives and challenges of such action will reduce the risk of the sector becoming obsolete due to high energy use and poor environmental performance.

The GCC Economies: Stepping Up to Future Challenges
Edited by Mohamed A. Ramady
Contribution by Professor David Price, School of Law, Chapter: The GCC Intellectual Property Regimes: Global Harmonization or Regional Integration?
The “Arab Spring” of 2011 has affected the countries of the region to varying degrees, including the Gulf Cooperation Council (GCC) members, comprising Saudi Arabia, Kuwait, Qatar, the United Arab Emirates, Oman and Bahrain. The GCC has become a significant regional bloc, playing a vital economic and political role far beyond its shores. This volume brings together 30 renowned academics and specialists to examine a range of multifaceted social, political and economic issues facing the GCC in key areas.
The Oyster Fishermen 10

Distinguished artist, curator and scholar Fiona Foley has played a leading role in the promotion and recognition of Indigenous identity, fostering greater public respect for, and official acknowledgement of, Indigenous rights. She describes her art as “putting Indigenous people up front in the world, in every way – in fashion, in exhibitions, and in the gallery system”.

Foley’s practice encompasses paintings, drawings, photography, printmaking, sculpture and major installations. She has drawn inspiration from the natural environment of her hometown in Hervey Bay, south-east Queensland, and her Badtjala heritage, to develop a distinct and evolving iconography where often mundane or everyday objects become multivalent symbols, conveying deeper meanings of political, social and universal import.

The Oyster Fishermen 10 is one of a suite of 16 hand-tinted, sepia toned photographs chronicling the history of exploitation and brutality during early contact between colonial fishermen in Queensland and Indigenous women. The series is emotionally and morally unsettling: human cruelty and senseless violence counterpoised by moments of quiet intimacy, conviviality and introspective contemplation. The main protagonist is at one with her country – in this work, holding a conch shell in a poetic extension of her own body.

Foley has presented, published and exhibited nationally and internationally, undertaking numerous residencies, research projects, sculptural commissions and installations in regional, remote and metropolitan Australia and abroad. She was a co-founder of the Boomalli Aboriginal Artists Co-Operative, Sydney, in 1987. She is represented in all major State galleries and many regional and university collections, as well as national and international private, public and corporate collections.

Fiona Foley
Born 1964, Maryborough, Queensland
Badtjala, Fraser Island


Anita Angel
Curator, Charles Darwin University Art Collection and Art Gallery

Anita Angel
Curator, Charles Darwin University Art Collection and Art Gallery
SYNOPSIS

Civilisations have risen on the back of mankind’s ability to supply safe drinking water and, crucially, dispose of wastewater and sewage safely. The biggest future challenge facing the engineering profession may well be the provision of safe drinking water and the disposal of sewage for the 2.5 billion people for whom such improved sanitation is an undreamt of luxury. Pipes, ducts, conduits, drains, and sewers not only carry water and remove waste: increasingly they carry data over fibre optic links. In the developed world, the true impact of the digital age on our need for ducted infrastructure is yet to be seen: what we may now call a data explosion will soon be looked back on with fond headshaking at our naivety.

There are about 580,000 km of sewers and a similar length again of water pipes valued at c. £200 billion in the UK alone. Add 19,000 km of gas pipes, 9540 km of oil or other hydrocarbon carrying pipes, and 115,000 km of cabled ducting and the UK’s utilities/pipeline infrastructure is worth about £500 billion.

This lecture focuses on Professor Fairfield’s research in the UK into sewers, drains, ducts, and pipelines. Optimising their design for durability, stiffness, and minimal waste of raw materials leads into the analysis of the effects of their immediate surroundings upon their behaviour. Strategies for the future of our essential utilities are pondered from a range of viewpoints: philosophical, political, economic, environmental and technical.

About Professor Charlie Fairfield

Professor Fairfield is a Chartered Engineer. His reputation stems from his work in sustainability, soil-structure interaction, trench reinstatements and plastic pipes.

His research at CDU encompasses the modelling of sewers, hydrology, the eco-engineering of wetland/river systems, and sediment transport around the Top End.

His aim at CDU is to focus the best research and development efforts on the management and engineering of that most precious resource: water.

He aims to collaborate with government, international NGOs, business and academics to seek solutions to both regional and global water-related problems.

RSVP Thursday 24 July
E: rsvp@cdu.edu.au T: 08 8946 6554
W: cdu.edu.au/about/professorials
Made to last: the conservation of art

Until 27 June 2014

A respected museum ceramics conservator, artist and human rights advocate, Penny Byrne’s first encounters with ceramic objects and porcelain figurines were as a child in her mother’s antique shop in Mildura, Victoria. Byrne holds a Bachelor of Laws, a Graduate Diploma in Ceramics and Glass Conservation and Restoration, and a Bachelor of Fine Arts – Ceramics. Byrne has exhibited widely in Australia and abroad, and her work is held in major public and private collections, nationally and internationally.

Byrne’s conversion of discarded or marred vintage materials into contemporary object-agents of political change is based on their ability to last, carrying their messages – through subversive and satirical means – into the future. Delicate and theatrically posed 18th Century figurines, at first blush conveying the mannered sweetness of a courtly era, are transformed through creative intervention into contemporary “political cartoons in 3D”, with an air of charmed menace. Byrne deploys their arts of seduction to compel close observation. Once the visual net is cast, her works reveal their unsettling and thought-provoking agenda. Byrne’s skills as a conservator and sensibilities as an artist are at the heart of her practice, in a material and an ethical sense.

Penny Byrne’s work is featured in Made to last: the conservation of art, a NETS Victoria exhibition in partnership with The Centre For Cultural Materials Conservation at the University of Melbourne and supported by Latrobe Regional Gallery, showing at the CDU Art Gallery until 27 June 2014.

Penny Byrne
Born 1965, Mildura, Victoria
Resides and works in Melbourne
Gitmo Bay Souvenirs. Closing Down Sale, All Stock Must Go! 2010
Altered vintage porcelain figurines, metal chains, epoxy resin, powder pigments, retouching medium
34 x 65 x 15cm
City of Yarra Collection, Melbourne
Image © and courtesy of the artist

TEXT
Anita Angel
Curator, Charles Darwin University Art Collection and Art Gallery
Using the medium of Japanese-style woodblock printing for the first time, Helicopter Joe Tjungurrayi has painted some of his country located far to the south of the remote community of Balgo. This is the country where Helicopter was born and where he spent his formative years. The central circles of the painting are a number of water sources. These tjurrnu (soakwater) are places Helicopter would visit as a young man. Most of the painting depicts the tali (sand hills) that dominate this country.