

NATURE TERRITORY

July 2012

Newsletter of the Northern Territory Field Naturalists Club Inc.

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Club web-site: <http://ntfieldnaturalists.org.au/>

Meetings are generally held on the second Wednesday of every month, commencing at 7:45 PM, in Blue 1.14 (Business Faculty Building) on the Casuarina Campus of Charles Darwin University.

Subscriptions are on a financial-year basis and are: Families/Institutional - \$30; Singles - \$25; Concessions - \$15. Discounts are available for new members – please contact us.



The Top End is currently hosting an influx of Nankeen Kestrels, with these birds being observed in most suitable grassland patches in and near Darwin. This is speculated to be a result of good breeding conditions and a ready supply of small mammals in inland Australia in the last two years, with the birds now dispersing throughout the mainland and beyond. Large numbers of kestrels have also been reported at Christmas Island. The image at left shows four of a clutch of five kestrels that successfully fledged in Canberra recently.

Photo Geoffrey Dabb

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Disclaimer: The views expressed in *Nature Territory* are not necessarily those of the NT Field Naturalists Club Inc. or members of its Committee.

Club activities

July meeting. Wednesday July 11, 7:45 PM. Blue 1.14 (Business Bldg.), CDU Casuarina.

Anke Frank

Northern Australia's current dramatic small mammal declines – can we stop the next wave of extinctions?

Since European settlement about 200 years ago, Australia has lost over 20 species of mammals – the worst mammal extinction record in the world. Only



*A Pale Field Rat (Rattus tunneyi) fitted with radio collar.
Photo by Dene Steinberg*

about 20 years ago, the tropical northern savannas were still considered intact and harboured a rich mammal fauna. However, in the last two decades, most mammals in northern Australia have declined dramatically and it looks like in the next 10-20 years Australia will face another wave of extinctions in which it may lose as many, if not even more, mammal species than it already has lost in the last 200 years. The current dramatic small mammal declines in the tropical savanna show some similarities to the earlier declines and extinctions in arid and temperate Australia: impacts of changes in fire regimes, introduced predators and introduced herbivores. For a few species of mammals the invasion of introduced cane toads has also added to their demise. All these factors are currently under intensive investigation using many innovative technologies, long-term monitoring data and modelling approaches, and broad-scale indigenous knowledge which I will briefly report on in the first part of my presentation.

My current research focuses on the role of feral cats in the small mammal declines. Disease, which has been little investigated, might also play a role in the current declines, and this is one of the first projects investigating small mammals for toxoplasmosis. In the second and major part of my presentation I will present the most recent results from my study area, Wongalara Sanctuary, south of Arnhem Land, where I monitor the effects of feral cats on populations of a re-introduced native rat using a cat exclusion experiment.

So far, no reptile species has become extinct in Australia, but several species have declined, some for the same or similar reasons as mammals. Elsewhere in the world some reptile species have become extinct (at least locally) due to the impact of cats. Therefore, in the third part of my presentation I will outline the potential threats of feral cats on reptiles after mammals may have disappeared.



What is the role of feral cats in small mammal reductions in northern Australia?

In the last part, I will discuss the future challenges for the conservation of northern Australian small mammals and our options for preventing a next wave of extinctions.

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August 2012 meeting. Wed August 8. **Craig Reid:** Victorian Brush-tailed Rock-wallaby Recovery Project

Club activities

July field trip. Sunday July 15, 8.00AM at intersection of Stuart Highway and Marrakai Road.

Marrakai Road – a surprise packet. Led by John Rawsthorne

The Marrakai Road is an oft-cited birding destination and it features in the Top End birder's bible, McCrie & Watson's "Finding Birds in Darwin, Kakadu & the Top End". But it offers much more than birding, providing a neat sampler of a range of habitats from savanna woodland to monsoon thicket to grassy floodplain to billabong and riparian vegetation within a relatively short drive. The unsealed road runs between the Arnhem and Stuart Highways, and while it features several river crossings we will restrict our excursion to the south-western end between the Stuart Highway and the Adelaide River crossing. While McCrie & Watson note that the best birding is at the other end of the road, I find the Stuart Highway end of the road to be a remarkably varied and provident place for viewing bush and waterbirds and reptiles.

We will meet at the Stuart Highway end of the road (NOTE: NOT THE ARNHEM HIGHWAY END) before 8am. This intersection is 75km down the Stuart Highway from Darwin, on the left just past the Manton Dam Recreation Area turnoff. We will then head down the Marrakai Road at 8am, stopping at various habitats to explore, ending our excursion at the first Adelaide River crossing, about 20km along the road. A high clearance vehicle is recommended as the road is a bit rough in a couple of places (although there are no water crossings unless you choose to carry on through to the Arnhem Highway).

Bring binoculars, field guides, camera, hat, sunscreen. Also bring plenty of water and something for morning tea. It would be sensible to car pool – John or Tissa can act as a central contact point for car pooling. Contact John Rawsthorne on 0412 899 051 or Tissa Ratnayeke on 8921 8226 to express your interest, or for more details of this excursion.

Membership subscription renewal notice

Annual subscriptions are due at the end of June. However, if you joined the club during 2012 your subscription will be valid until the end of June 2013 so does not need to be renewed at this time.

If you receive your newsletter by post, your subscription expiry date will appear beneath the panel containing your name and address on this newsletter. A membership form is on the same page.

If you receive your newsletter by email you will find your subscription expiry date in the email to which this newsletter was attached. If your subscription is due soon, you should also find attached to the email a membership form that you can complete and forward to NTFNC with your subscription. EFT payment can be arranged by contacting John Rawsthorne at treasurer.ntfnc@gmail.com

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Need a Club membership form? Go to: <http://sites.google.com/site/ntfieldnaturalists/downloads>.
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Leanyer Ponds: Access to Leanyer Ponds is generally available after induction through PAWC. Go to <https://www.rapidinduct.com.au/powerwater/waterservices> to commence the induction process. A key to the ponds may be obtained on payment of a \$50 deposit. Only those who have undertaken the induction and signed an indemnity can enter Leanyer Ponds.

Leanyer Sewage Ponds will be **temporarily closed** to birdwatchers from 1 May 2012 until September 2012 due to major works being undertaken by Power and Water. This work will involve significant mobile plant and equipment on-site to remove accumulated sludge in order to enhance the treatment process. Closure of the entire lagoon site to non-Power and Water staff will be required during this time. Power and Water will advise when the ponds will be re-opened to birdwatchers possessing a permit to access the site.

Bryan Baker has keys for the Alice Springs Sewage Ponds, available for collection in Darwin by members before they head south. Bryan can be reached in Darwin on 8948 2196.

Club notices

Welcome to new members: Harvey Cooper-Preston, Roger & Annie Kelly, Les Bauer, Michael Robinson, Ilona & Laurie Barrand

Thank you: the previous issue was proof-read by Erica Garcia, printed by Jason Craige, and collated and mailed by Anne Highfield. It was printed using equipment kindly made available by Michael Gunner MLA at his Fannie Bay electoral office.

Newsletter contributions welcome: Sightings, reports, travelogues, reviews, photographs, sketches, news, comments, opinions, theories , anything relevant to natural history. Please forward material to Tissa at tissa@imprintdesign.com.au or the Club's postal address, or contact him on 8921 8226.

Deadline for the August newsletter: Friday July 20.

Club library: The Club's journal and book collection is available to members. Lists of holdings can be found on our web-site: <http://sites.google.com/site/ntfieldnaturalists/library>. The library is housed in two sections:

Books, reports and CDs: at the medical clinic of Dr. Lyn Reid in the Rapid Creek Business Village. This can be accessed directly between 9 AM and 2:30 PM Tuesday to Thursday, and 4–6 PM on Tuesday, or indirectly by phoning Lyn at work on 8985 3250.

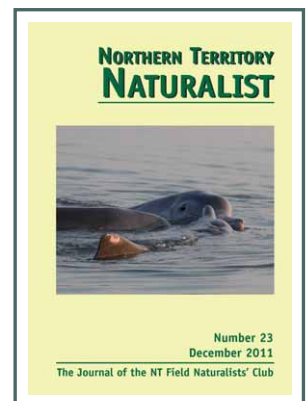
Journals: in the office of Stuart Young at the Biodiversity Unit at Berrimah. These can be accessed by ringing Stuart on 8995 5026 (w).

Northern Territory Naturalist: The Editorial Committee of the Club's journal, the *Northern Territory Naturalist*, is now calling for manuscripts for issue no. 24. The journal publishes works concerning any aspect of the natural history and ecology of the Northern Territory or adjacent northern Australia, and may include Reviews, Research Articles, Short Notes, Species Profiles and Book Reviews.

The *Northern Territory Naturalist* is a registered, peer-reviewed journal (ISSN 0155-4093). Author instructions may be downloaded from our web-site: <http://sites.google.com/site/ntfieldnaturalists/journal>.

If possible, manuscripts should be submitted in digital form by email to michael.braby@nt.gov.au. Manuscript editors are Drs Michael Braby, Lynda Prior and Anke Frank. Louis Elliott is the production editor.

Originals are available of most back issues, some are available as photocopies only, and several recent issues are out-of-print but individual papers are available as pdfs. The journal page of the Club's web-site has an order form for back issues. Free pdfs of papers from issue 18 (2005) onwards are available from the authors or by contacting Lou Elliott, email louis.elliott@nt.gov.au.



Top End Native Plant Society activities

July meeting. July 19, Seasonal Calendars - Emma Woodward

July field trip. July 22, Land for Wildlife Field Day at the Greening Australia facility 125 Thorak Rd Knuckey's Lagoon

General meetings are held on the 3rd Thursday of the month at the Marrara Christian College, corner Amy Johnson Ave. and McMillans Road, and commence at 7:30 PM (speaker at 8 PM). Visit <http://www.topendnativeplants.org.au/index.php> or contact Russell Dempster on 8983 2131.

A new view of Central Australia

Report on Paul Arnold's June meeting presentation

John Rawsthorne

Paul Arnold is a Bush Photographer with a great eye for light and colour. When I first met Paul last year I recognised a sense of adventure and a great ability to tell a yarn - Paul is the archetypal Australian larrikin. But I also recognised in Paul a thirst for knowledge, and a desire to understand more of Australia's natural features. So I was delighted when I heard that Graham Brown had invited Paul to speak to the NT Field Naturalists Club. This would be an opportunity for us to learn more about Paul's landscape photography techniques, travel adventures and passion for nature. But it would also be a chance for Paul to learn more about our wildlife and flora from our group - a win for all.



Paul has recently completed a trip through southern NT, chasing the unusual and rarely seen "first response" of the desert to rain. From the sharp edges of sand ripples in still-damp sandy creek beds, to the green swards contrasting with red soils and clear blue skies, and the jarring views of water through the gorges of the West MacDonnell Ranges, Paul shared with us a range of images of scenery that most Australians will never see first hand. It was Paul's enthusiasm for adventure, and his preparedness to set off on a seven week odyssey through central Australia on two hours notice, that allowed him to capture so many incredible images

Above: Ormiston Gorge responds to rain as only central Australia can; right: Paul's ready-to-go troopy, home for seven weeks.

Images Paul Arnold

For me photography is a matter of amateur record rather than professional expertise, although certainly our club is blessed with several excellent nature photographers. But Paul's focus is a little different - capturing landscapes (rather than wildlife) requires different equipment, techniques and focus. I was also struck by the difficulties of the

pursuit. Seven days at Big Red in the Simpson Desert was not long enough to allow Paul to figure out how to get the perfect "full moon rising over Big Red" shot. I was initially surprised when Paul said that it was too hard to try to take landscape and wildlife photos on the same seven week trip. However when he described standing perfectly still in shallow water in the predawn light for 45 minutes, waiting for ripples to stop bouncing back and forth, I realised the focus and singlemindedness that is required to capture truly excellent landscape shots.

Thanks to Paul for sharing his images, techniques and stories of travel with us. I look forward to the next instalment, whenever that might be.



A Nature Walk in the Digital Age

Trip report on our club excursion to Leanyer Swamp, 17 June

By Kit Edwards, Temporary Territorian

A stroll last Sunday through Leanyer's back blocks off Hodgson St made me realise how technology has changed our field trips since I became a Temporary Territorian.



Excursionistas follow "the pipe" to the bowels of Leanyer Swamp. Photo by Tissa Ratnayeke

Using my phone applications I found the route from the map, recorded voice memos to help remember comments from our participants, took photos, consulted a field guide to identify a bird, while another of us checked bird calls on another application. Does Michael Morcombe's Field Guide to Australian Birds work on an iPad as well as an iPhone? One member of our group was visually impaired, and his tablet has exciting accessibility options, which would make future excursions even more enjoyable.

By chance three of us twitchers mislaid the main group towards the conclusion of the walk. We knew where we were by the little blue pulsing dot on the phone map, but didn't know where Tissa was because we hadn't coordinated the "Find Friends" app. Consequently I have nothing to report on the stand of paperbarks. On the up side, Peter Holbery observed his first male Mangrove Golden Whistler. We observed the Leaden Flycatcher, Zitting Cisticola and a White-bellied Cuckoo-shrike. There were others whose names escaped me (Arthur and Sheryl, where were you?)

The area is Savannah Woodland with a stormwater drain functioning as a creek, and tidal wetland by the Leanyer Sewerage Ponds (currently closed). There was a discussion about the sandpaper fig*; (was it or

wasn't it?) its proper name requiring sampling the leaves. As there are a number of "sandpaper figs" in tropical and subtropical Australia, I guess it would best be called a Creek Sandpaper Fig. Jawoyn

knowledge includes using rough leaves to apply to ringworm before applying medicine, according to *Jawoyn Plants and Animals*.

The seeds from the fallen fruit of the Kakadu Plum trees *Terminalia fernandiana* had been neatly split open and the small kernels

expertly removed by the Red-tailed Black Cockatoos. On a previous excursion we'd tried the green fruit, which has an exceptionally high concentration of vitamin C. It is collected in the wild, and also cultivated. There is a Darwin company producing an extract. Dr Ian Cock and his PhD student Shimony Mohanty from Griffith University are studying its many beneficial properties. Thanks to our search engines for the above information.



Cricket burrows were numerous, one every few metres, and were a feature of the groundscape. Photo Kit Edwards

The mounds and vertical burrows created by the cricket *Apterogryllus* sp. appear at this time of year. Graham speculated that they would probably come out if water were poured in the burrow. He also



At the Leanyer Sewage Ponds the Pied Herons seemed to be feeding on a regular supply of cockroaches. Photo Laurie Barrand

agreed that if I were to place my finger in the funnel shaped spider web that the spider would come out....attached to me! Can't trust anyone wearing a T-shirt with a Red Backed Spider on the shoulder. Wouldn't want to scare *any* insect.

At the Sewerage Ponds there were lots of Pied Heron and a juvenile White-faced Heron. Looking

back to the distant Shoal Bay Waste Disposal Site, the kites rode the thermals. At the conclusion of our walk, as the heat evaporated the heavy dew, scores of Black Kites accompanied by lesser numbers of Whistling Kites glided high overhead.

*Plant identified from photographs by Ben Stuckey as a Sandpaper Fig *Ficus aculeata*

Other birds of interest on Leanyer Field Trip– contributed by Tissa Ratnayake

Large flocks of Red-tailed Black Cockatoos, Black-faced Cuckoo-shrikes, Rainbow Bee-eaters, Forest Kingfisher, Peaceful Doves, Bar-shouldered Doves, Double-barred Finches, Crimson Finches, Lemon-bellied Flycatchers, Green-backed Gerygone, White-winged Trillers, Blue-winged Kookaburra, Brown Honeyeaters, Whiskered Terns, White Ibis, White-faced Heron (adult & immature), Great Egret.



Two of Darwin's more spectacular birds, Rainbow Bee-eater and Whistling Kite, were both snapped by Tissa Ratnayake on an earlier trip to Leanyer Swamp. The long thin tail plume on the bee-eater indicates a male (females have shorter plumes).

Yellow Oriole at Finch Nest

Tissa Ratnayeke

My neighbour's lime tree has been a favourite nesting site for Double-barred Finches for over ten years. I was at home in early June and in the background I could hear the alarm chatter of a pair of these finches. I took little notice as the calls usually mean one of the many local cats is usually wandering past. However, as the chatter persisted for several more minutes I went to investigate.

Perched near a finch nest was a pair of Yellow Orioles, one of whom was systematically pulling the nest apart. The observing Oriole flew off while its mate watched me for a few moments and on coming to the conclusion I wasn't a threat, it resumed its



*Top right, a yellow oriole raids a double-barred finch nest in a lime tree; above, the finch inspects the damage.
Photos Tissa Ratnayeke*

task. For several minutes it continued grasping beakfuls of nesting material and flicking it aside before it flew off.



Yellow Orioles are usually fruit eaters however they are known to feed on nestlings. I have previously seen Orioles sticking their heads in to these finch nests. I assume in this instance the entrance to the nest was not easily accessible to the much larger Oriole and as such it had resorted to this method of attempting to gaining access. My neighbour didn't think there were eggs or young in the nest but perhaps the Orioles had observed the finches visiting the nest and decided to investigate.

Immediately on the Oriole's departure the agitated finch pair returned to assess the damage. It's now several weeks since the event and I still see the finches that seem to breed all year round fly in and out of that lime tree, so no doubt the Orioles too will be back one day.

Upcoming Event

Casuarina Coastal Reserve Landcare Group invites you to **WALK & TALK** with us about dune vegetation and what Landcare volunteers do

Followed by **SUNSET DRINKS & NIBBLES**

Sunday 15 July 4.30-6.00pm

Nigel Weston, the Regional Chief Ranger, will be there to talk about Parks and Wildlife Service's priorities for the Reserve.

Meet at the CCR beach planting site (100m past the carpark at the end of Daribah Road). For enquiries phone Deborah. Mobile: 0400 546 818.



Interesting bird sightings

25 May to 27 June 2012

Compiled by Peter Kyne

Sightings are as reported (unvetted, unconfirmed) and have been compiled from emails sent to the NT Birds forum (<http://groups.yahoo.com/group/ntbirds>) moderated by Niven McCrie, postings on Birdline Northern Territory (<http://www.ereamaa.com/>) and from correspondences with birdwatchers. Bird names follow the IOC world checklist.

Species	Date	Location	Observer/s	Numbers/comments
Waterbirds, Seabirds & Shorebirds				
Eurasian Coot	13/6/12	Buntine Hwy	Marc Gardner	2
Glossy Ibis	26/5/12	Corroboree Billabong	Stephen Garnett	1000+
Great-billed Heron	10/6/12	East Arm, Darwin Harb.	John Rawsthorne	1
Spotless Crake	6/6/12	Alice Springs SP	Chris Watson	2
Birds Of Prey				
Grey Falcon	11/6/12	Emily Gap, East MacDonnell Ranges	Shane Green	& Heath Rd, Alice Springs
Grey Falcon	16/6/12	Newhaven Reserve	Jenny Spry	2
Little Eagle	13/6/12	70km N of Kalkaringi	Marc Gardner	Dark morph
Spotted Harrier	10/6/12	Marrakai Road	Marc Gardner	1 immature
Square-tailed Kite	13-14/6/12	Buntine Hwy	Marc Gardner	2 sightings
Wedge-tailed Eagle	13-14/6/12	Various loc'ns Buntine & Victoria Hwys	Marc Gardner	7+
Other Non-Passerines				
Black-eared Cuckoo	12/6/12	Mamukala, Kakadu NP	Mike Jarvis	2; adult & immature
Channel-billed Cuckoo	14/6/12	Tiwi, Darwin	Ian Hance	
Chestnut-backed Buttonquail	10/6/12	Marrakai Road	Marc Gardner	1
Diamond Dove	12/6/12	Marrakai Road	Mike Jarvis	20
Princess Parrot	26/6/12	Newhaven Reserve	Edward Smith & Bob Sothman	++ subsequent by various observers
Princess Parrot	5/6/12	Stuart Hwy, 26km S of Alice Springs	Mark Anderson	Small flock
Spotted Nightjar	1/6/12	TIO Stadium, Marrara	John Rawsthorne	1
Rufous Owl	14/6/12	Mataranka Cabins	Gavin Goodyear & Ashley Banwell	1 seen; 2 heard Bitter Springs 15/6/12
Passerines				
Buff-sided Robin	2/6/12	Margaret River, Marrakai Rd	Peter Kyne & Micha Jackson	3; also Mike Jarvis 12/6/12
Cicadabird	15/6/12	Fogg Dam	Mike Jarvis	1 male
Crimson Chat	13/6/12	15km north of Kalkaringi	Marc Gardner	2 female, 1 male
Gouldian Finch	11/6/12	Jatbula Track, Katherine R	Jon Clark	Black-faced males
Gouldian Finch	12/6/12	Marrakai Road	Mike Jarvis	20+
Grey Honeyeater	25/5/12	Tanami Track	Murray Lord & Bruce Wedderburn	1
Grey Honeyeater	31/5/12	Simpsons Gap	Brendan Sheean	1
Ground Cuckoo-Shrike	13/6/12	Buntine Hwy	Marc Gardner	
Masked Woodswallow	9/6/12	Goldfields (Grove Hill) Rd	Peter Kyne & Micha Jackson	3 groups at various loc'ns along road
Masked Woodswallow	13-14/6/12	Buntine Hwy	Marc Gardner	Several thousand
White-browed Woodswallow	9/6/12	Goldfields (Grove Hill) Rd	Peter Kyne & Micha Jackson	6+ with Masked Woodswallows

Princess Parrots at Newhaven

John Rawsthorne

Princess Parrots (*Polytelis alexandrae*) are one of our most mysterious desert birds, drifting in and out of any given site in SW Northern Territory from time to time. Although PPs are a regular cage bird, most Australian birders have never seen these birds in the wild.

Last year an influx was recorded near Kings Canyon, SW of Alice Springs, and this year they have appeared at Newhaven Reserve off the Tanami Road. Newhaven was operated as a cattle station before being purchased by Birds Australia, then handed on to Australian Wildlife Conservancy.

While Newhaven is a long way off the beaten track, quite a few birders have taken the opportunity to visit in the last few weeks, hoping to encounter this desert ghost. If you are thinking of a visit, contact Joe or Danae (rangers at Newhaven, 08 8964 6000) for more details.

Recent literature about Top End natural history

CLIMATE & WEATHER

Compiled by Don Franklin

North Australian climate & weather

- Bouya Z, Box GP. 2011. Seasonal variation of aerosol size distributions in Darwin, Australia. *Journal of Atmospheric and Solar-Terrestrial Physics* 73: 2022-2033.
- Cook GD, Nicholls MJ. 2012. Comments on "Estimation of tropical cyclone wind hazard for Darwin: Comparison with two other locations and the Australian Wind-Loading Code" Reply. *Journal of Applied Meteorology and Climatology* 51: 172-181.
- Erskine WD, Saynor MJ, Townley-Jones M. 2011. Temporal changes in annual rainfall in the "Top End" of Australia. *Hydro-Climatology: Variability and Change* 344: 57-62.
- Harper BA, Holmes JD, Kepert JD, *et al.* 2012. Comments on "Estimation of tropical cyclone wind hazard for Darwin: Comparison with two other locations and the Australian Wind-Loading Code". *J. Appl. Meteorol. Climatol.* 51: 161-171.
- Hendon HH, Lim E-P, Liu G. 2012. The role of air-sea interaction for prediction of Australian Summer Monsoon rainfall. *Journal of Climate* 25: 1278-1290.
- May W. 2012. Assessing the strength of regional changes in near-surface climate associated with a global warming of 2 degrees C. *Climatic Change* 110: 619-644.
- Moise AF, Colman R. 2009. Tropical Australia and the Australian Monsoon: general assessment and projected changes. In *18th World IMACS Congress and MODSIM09 International Congress*, ed. RS Anderssen *et al.*, pp. 2042-2048.
- Notaro M, Wyrwoll K-H, Chen G. 2011. Did aboriginal vegetation burning impact on the Australian summer monsoon? *Geophysical Research Letters* 38: L11704.
- Shaik H. 2010. The tropical circulation in the Australian and Asian region - November 2009 to April 2010. *Australian Meteorological and Oceanographic Journal* 60: 277-288.
- Smith IN, Collier M, Rotstayn L. 2009. Patterns of summer rainfall variability across tropical Australia - results from EOT analysis. In *18th World IMACS Congress and MODSIM09 International Congress*, ed. RS Anderssen, RD Braddock, LTH Newham, pp. 2056-2063.
- Stohl A, Seibert P, Wotawa G, Arnold D, Burkhardt JF, Eckhardt S, Tapia C, Vargas A, Yasunari TJ. 2012. Xenon-133 and caesium-137 releases into the atmosphere from the Fukushima Dai-ichi nuclear power plant: determination of the source term, atmospheric dispersion, and deposition. *Atmospheric Chemistry and Physics* 12: 2313-2343.
- Zeschke B. 2010. Identifying early morning fog and low cloud predictors for northern parts of the Northern Territory of Australia, utilising satellite-derived data. *Australian Meteorological and Oceanographic Journal* 60: 249-263.

Weather processes (studies using data collected from or near Darwin)

- Chen B, Yin Y. 2011. Modeling the impact of aerosols on tropical overshooting thunderstorms and stratospheric water vapor. *Journal of Geophysical Research-Atmospheres* 116: D19203.
- Evan S, Alexander MJ, Dudhia J. 2012. Model study of intermediate-scale tropical inertia-gravity waves and comparison to TWP-ICE campaign observations. *Journal of the Atmospheric Sciences* 69: 591-610.
- Franklin CN, Jakob C, Protat A, Roff G. 2012. Assessing the performance of a prognostic and a diagnostic cloud scheme using single column model simulations of TWP-ICE. *Quarterly Journal of the Royal Meteorological Society* 138: 734-754.
- Hoyle CR, Marecal V, Russo MR, Allen G, Arteta J, Chemel C, Chipperfield MP *et al.*, 2011. Representation of tropical deep convection in atmospheric models - Part 2: Tracer transport. *Atmospheric Chemistry and Physics* 11: 8103-8131.
- Lin Y, Donner LJ, Petch J, Bechtold P, Boyle J *et al.* 2012. TWP-ICE global atmospheric model intercomparison: Convection responsiveness and resolution impact. *Journal of Geophysical Research-Atmospheres* 117: Art. No. D09111.
- May PT, Bringi VN, Thurai M. 2011. Do we observe aerosol impacts on DSDs in strongly forced tropical thunderstorms? *Journal of the Atmospheric Sciences* 68: 1902-1910.
- Morrison H, Grabowski WW. 2011. Cloud-system resolving model simulations of aerosol indirect effects on tropical deep convection and its thermodynamic environment. *Atmospheric Chemistry and Physics* 11: 10503-10523.
- Nousiainen T, Lindqvist HM, Greg M, Um J. 2011. Small irregular ice crystals in tropical cirrus. *Journal of the Atmospheric Sciences* 68: 2614-2627.
- Ploeger F, Fueglistaler S, Grooss J-U, Guenther G, Konopka P, Liu YSM, R, Ravegnani F *et al.* 2011. Insight from ozone and water vapour on transport in the tropical tropopause layer (TTL). *Atmospheric Chemistry and Physics* 11: 407-419.
- Protat A, McFarquhar GM, Um J, Delanoe J. 2011. Obtaining best estimates for the microphysical and radiative properties of tropical ice clouds from TWP-ICE *in situ* microphysical observations. *J. Appl. Meteorology & Climatology* 50: 895-915.
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- Russo MR, Marecal V, Hoyle CR, Arteta J *et al.* 2011. Representation of tropical deep convection in atmospheric models - Part 1: Meteorology and comparison with satellite observations. *Atmospheric Chemistry and Physics* 11: 2765-2786.
- Thorsen TJ, Fu Q, Comstock J. 2011. Comparison of the CALIPSO satellite and ground-based observations of cirrus clouds at the ARM TWP sites. *Journal of Geophysical Research-Atmospheres* 116: Art. No. D21203.
- Varble A, Fridlind AM, Zipser EJ, Ackerman AS *et al.* 2011. Evaluation of cloud-resolving model intercomparison simulations using TWP-ICE observations: Precipitation and cloud structure. *J. Geophys. Res.-Atmospheres* 116: Art. No. D12206.
- Yeh H-C, Fu X. 2011. Incorporating additional sounding observations in weather analysis and rainfall prediction during the intensive observing period of 2006 TWP-ICE. *Terrestrial Atmospheric and Oceanic Sciences* 22: 421-434.

The northern climate: past change and an uncertain future

Review of Recent Literature from page 10 by Don Franklin

Whether Aboriginal burning over past millennia could have influenced the strength of the monsoon and induced a drying of northern and central Australia remains the subject of debate. Notaro *et al.* (2011) modelled the effect of the changes to vegetation that are postulated to have occurred and driven the change in climate. They concluded that there could have been little or no effect of these vegetation changes on the strength of the monsoon, but a significant effect on the “pre-monsoon season (austral spring), with decreases in precipitation, higher surface and ground temperatures, and enhanced atmospheric stability”. The enhanced atmospheric stability, it is suggested, could have had profound ecological consequences.

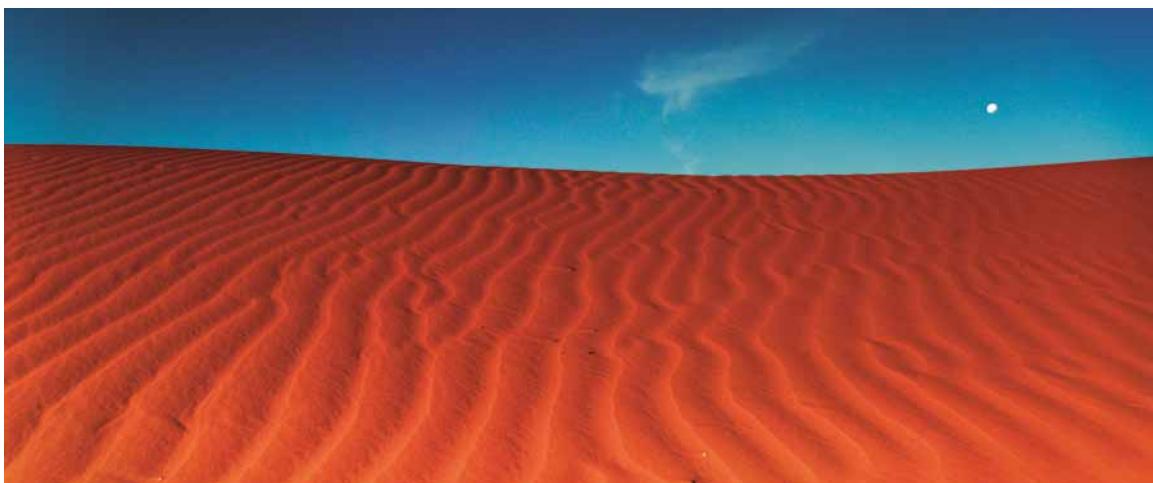
At a much shorter time scale, there have been runs of wet and dry years in the north Australian climate, patterns in which have been analysed by Erskine *et al.* (2011) based on 136 years of data from 15 rainfall stations in the Top End. Overlaying these runs is a longer-term (decadal) trend of increasing rainfall in the Top End and Kimberley (Smith *et al.* 2009). This trend has previously been argued to be driven by processes unrelated to global climate change (increase in temperature), but Smith *et al.* (2009) argue that the link to increased temperature is plausible and might be an indicator of further change in the future. Moise & Colman (2009) argued, however, that the effect of climate change on the monsoon is likely to be weak, with a possible later retreat of the monsoon in north-western Australia. In contrast yet again, May (2012) compared the extent of likely climate change globally using an index that combines changes in temperature and rainfall across both the wet and dry seasons, comparing land masses divided into 26 regions. May found that northern Australia, along with southern Australia, the Sahara and Amazonia, is predicted to suffer the greatest changes to climate on earth but didn't report in what direction the change was predicted to be (hotter, cooler; wetter, drier).

Meteorologists have found it easier to produce medium-term (several months ahead) forecasts of rainfall in the Top End for the Build-Up than for the monsoon. Hendon *et al.* (2012) provide a (rather technical) explanation for this, in which rainfall in the Build-Up is more strongly related to ENSO (El-Nino – La Nina) and sea surface temperature readings than is rainfall during the monsoon period.

Shaik (2010) provided a detailed analysis of rainfall in northern Australia for the 2009-10 wet season. The monsoon arrived late (Jan. 5) and departed early (mid Feb.), but a resurgence of the monsoon in April boosted rainfall and Darwin received above-average rainfall for the season. Finally, Zeschke (2010) provided a detailed meteorological analysis of early morning fog and low cloud in the Top End based on observations from a number of meteorological stations during the dry season of 2004.

Fukushima Dai-ichi

What, you might wonder, is a paper about the Japanese nuclear reactor that was badly damaged in the 11 March 2011 tsunami doing in a Top End literature summary? The answer is disturbing: “Radioactive clouds reached North America on 15 March and Europe on 22 March. By middle of April, Xe-133 was fairly uniformly distributed in the middle latitudes of the entire Northern Hemisphere and was for the first time also measured in the Southern Hemisphere (Darwin station, Australia)” (Stohl *et al.* 2012). Xe-133 is the noble isotopic gas xenon-133 which is produced during nuclear fission but also occurs naturally and is used in medical science.



Another beautiful image from the Simpson Desert – Big Red under a big blue sky. Image Paul Arnold