NRM on farms

A monthly news summary about climate and natural resources in agriculture. November 2015

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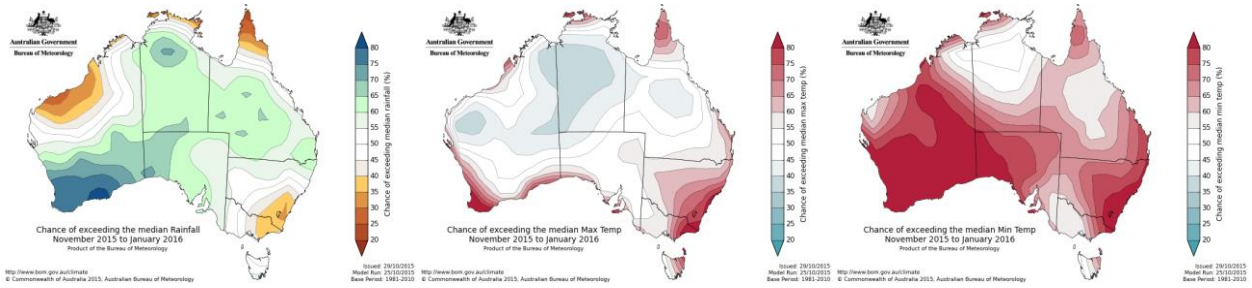
CLIMATE

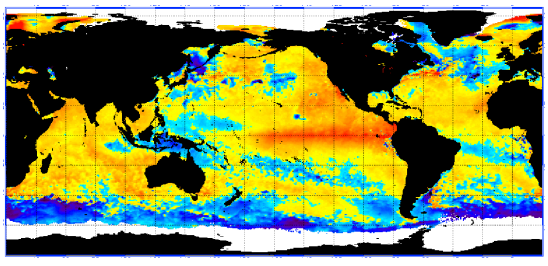
NSW seasonal outlook



The three month period from November to January is likely to be drier than average across parts of NSW, reflecting the strong El Niño in the Pacific, the decaying positive Indian Ocean Dipole, and very warm Indian Ocean temperatures. NSW temperatures are likely to be warmer than average, particularly along the south coast.
http://www.bom.gov.au/climate/outlooks/#/overview/summary/
Video: http://www.bom.gov.au/climate/outlooks/#/overview/video

Ocean temperatures

Surface temperature anomalies in late October exceeded +2° C across the equatorial Pacific east of 170°W and parts of the northeast Pacific. Warm anomalies have increased around Australia, except in the north, and persist across the Indian Ocean.
http://www.ospo.noaa.gov/Products/ocean/sst/anomaly/index.html
http://www.bom.gov.au/climate/enso/



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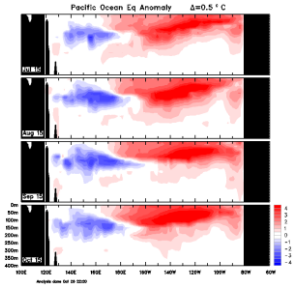
Subsurface temperatures

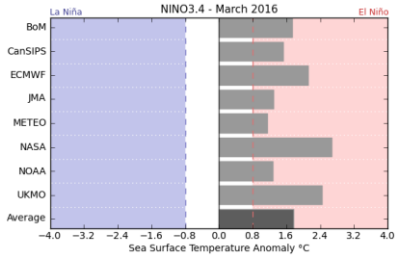


Subsurface anomalies across large areas of the eastern half of the equatorial Pacific reached more than +4°C in October, while cool anomalies persisted in the western equatorial Pacific.
http://www.bom.gov.au/climate/enso/

El Nino will persist into 2016

A strong El Niño in the Pacific and a positive Indian Ocean Dipole are dominating the climate of countries that border the Pacific and Indian oceans. All models indicate that the strong El Niño is likely to persist until the end of the year, before a marked decline during the first quarter of 2016.
http://www.bom.gov.au/climate/enso/

Model outlook



The latest NINO3.4 forecasts indicate that sea surface temperatures across the central tropical Pacific Ocean are likely to peak in November or December, followed by a rapid weakening in autumn 2016.
http://www.bom.gov.au/climate/ahead/model-summary.shtml#tabs=Pacific-Ocean

SOI remains negative

In late October the Southern Oscillation Index remained strongly negative, but rose slightly. The 30-day SOI value to 25 October was −19.6. Sustained negative values below −7 may indicate El Niño.
http://www.bom.gov.au/climate/enso/#tabs=SOI

Positive IOD will persist in November, then decline

International climate models suggest the positive Indian Ocean Dipole will persist into November, but then decline rapidly once the monsoon trough shifts south, changing wind patterns over the IOD region. In October the IOD index averaged over +1°C; the last month this occurred was in 2006.
http://www.bom.gov.au/climate/ahead/model-summary.shtml#tabs=Indian-Ocean

Exceptional hot spell affects southern NSW

An exceptional hot spell affected southern NSW in early October during an early season heatwave which set new records for much of southern Australia. The event was unusual for its unseasonal intensity and duration, with temperatures of 35°C or more. The timing of the event occurred after a particularly dry September across most of the continent, the third driest September on record.
http://www.bom.gov.au/climate/current/statements/scs52.pdf

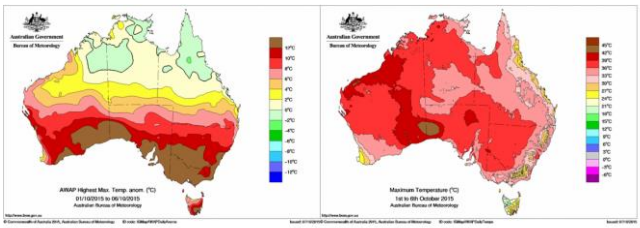


Figure 2. (Left) Maximum temperature anomalies of hottest day in the 1−6 October 2015 period. (Right) Highest daily maximum temperatures during this period.

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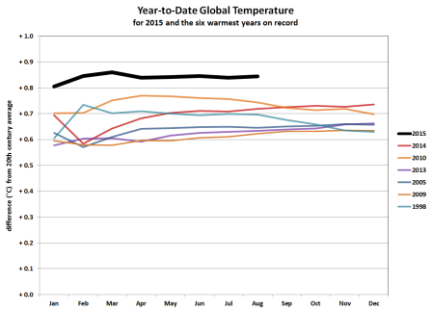
NSW DPI seasonal conditions report

Subscribe to NSW DPI's seasonal conditions report, and the climate summary which provides a snapshot of the monthly report in an easy to read four-page format with additional graphs and charts.
http://www.dpi.nsw.gov.au/agriculture/emergency/seasonal-conditions/regional-seasonal-conditions-reports

CLIMATE RESOURCES

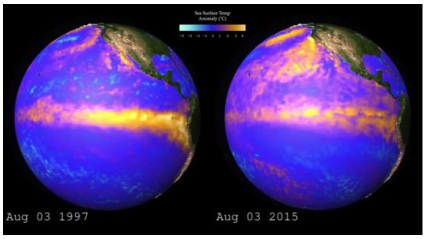
How the 2015 global temperature compares

This graphic from the US National Oceanic and Atmospheric Administration compares the year-to-date temperature anomalies for 2015 (black line) to the six warmest years on record: 2014, 2010, 2013, 2005, 2009, and 1998. Each month along each trace represents the year-to-date average temperature. In other words, the January value is the January average temperature, the February value is the average of both January and February, and so on.
https://www.ncdc.noaa.gov/sotc/briefings/201509.pdf



Comparison of El Nino sea temperatures in 1997 and 2015

This animation shows the development of the 1997 and 2015 El Ninos from January to August.
http://www.climatecentral.org/news/animation-compares-blockbuster-el-ninos-19408

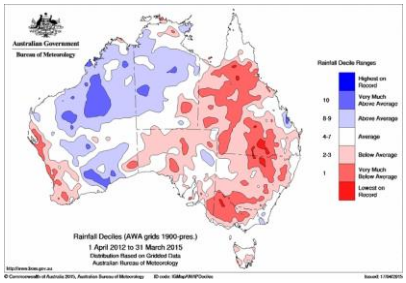


Pacific temperatures influence the globe

Modelling by Monash scientists has found that the global land temperature can be altered simply by changing the temperature of the tropical Pacific Ocean. This article explains why this occurs.
https://theconversation.com/the-tropical-steam-engine-how-does-el-nino-warm-the-entire-globe-47865

Significant long term rainfall decline in southern Australia

Southern Australia has now experienced significant longer-term rainfall decline for decades, accompanied by much larger reductions in streamflow. Southwest WA has experienced a 10 to 20 per cent drop in winter rainfall since 1970, while the southeast of the continent has experienced a similar decline in late autumn and early winter rainfall since the mid-1990s. It seems likely that the cool season drying is due to contraction of storm tracks to southern latitudes, and movement of the subtropical and polar jetstreams.
http://www.bom.gov.au/climate/updates/articles/a010-southern-rainfall-decline.shtml



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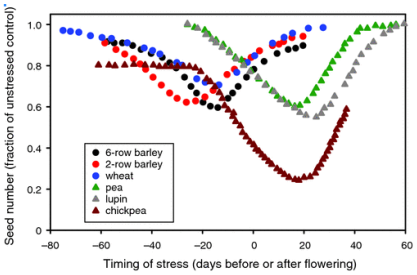
El Niño and the threat to food security

Oxfam has warned that the current El Niño has implications for food security in 2016. El Nino has already reduced the Asian monsoon over India, and is raising the odds of a prolonged drought in East Asia, coinciding with the planting and early development of the main rice crop in Indonesia. In Papua New Guinea, 1.8 million people are already affected by drought.
https://www.oxfam.org/sites/www.oxfam.org/files/file_attachments/mb-el-nino-uncharted-waters_1.pdf

Impact of temperature on yield

This paper outlines the direct and indirect effects of temperature on crop traits and develops a conceptual framework to assess thermal effects on crop yield and adaptive practices and traits, based on seed number.
http://www.publish.csiro.au/nid/40/paper/CP15129.htm



Wheat yield will drop with warming

UK Rothamsted research scientists predict that global wheat production will drop by 6% for each degree centigrade of global warming together with increased variability of yield across regions and seasons. Breeding for late maturing cultivars with longer grain filling to recapture the temperature-induced loss of biomass and grain yield could be beneficial as long as exposure to heat stress and terminal drought does not become counter-productive.
http://www.farmingfutures.org.uk/blog/losses-wheat-yields-are-predicted-due-rising-temperatures

Cotton production in a changing climate

Recent analysis of the response of Australia's irrigated cotton to the changing climate showed that crop water-use, lint yield and WUE would all increase. In rain-fed cotton, cotton water-use would increase at Emerald and Narrabri and decrease at Dalby and Moree; and lint yield and WUE would increase.
http://www.agronomy2015.com.au/papers/agronomy2015final00090.pdf

Research into climate and photosynthesis wins medals

ANU plant scientist Graham Farquhar has been awarded the 2015 Prime Minister's Prize for Science and the 2016 Macfarlane Burnet Medal for research into photosynthesis. His models have shown how the process operates under different environmental conditions and how plants can actually affect the weather. Seventy percent of water that falls on land is evaporated, mostly through vegetation. The evaporation cools the leaves, which affects the local weather and climate. He also believes that carbon emissions have already changed agricultural productivity and is now researching how plants cope with higher temperatures and different rainfall pattern.
http://photosynthesis.org.au/2015-pmprize-professor-graham-farquhar/

Agronomy conference papers on climate impacts

The recent national agronomy conference featured several papers on climate impacts on agriculture. Many of the papers are available online at the site below.
http://www.agronomy2015.com.au/program

Trial data needed to verify new drought indicator system

NSW DPI is developing a new Enhanced Drought Indicator System (EDIS) that will combine rainfall, soil moisture, and modelled pasture and crop growth data to better assess drought onset, severity and recovery. The project team is looking for data from current and historic grazing, pasture and crop trials to verify and improve EDIS's accuracy. Data from paddock-scale trials is particularly valuable for this project. If you have data that you would like to contribute to the project, or know of suitable data, please contact Belinda Hackney by email or on 6850 1623. All data contributions will be acknowledged.
belinda.hackney@lls.nsw.gov.au

Different types of drought

This article from ANU's Michael Roderick explains the differences between droughts in wet and dry regions, and more complex agricultural drought caused by insufficient rainfall, soil moisture, frost due to lack of cloud cover, and a range of socioeconomic factors such as commodity prices and debt levels.
https://theconversation.com/el-nino-is-here-and-that-means-droughts-but-they-dont-work-how-you-might-think-47866

Proxies show lengthy dry and wet periods in MDB

Paleoclimate research shows that in the MDB, dry and wet periods longer than a decade are at least 10 times more likely than current instrumental records suggest.
http://onlinelibrary.wiley.com/doi/10.1002/2015WR017059/full

How to use seasonal forecasting tools effectively.

This 40 minute Youtube presentation from Victorian climate specialist Graeme Anderson is an excellent guide for all landholders on understanding climate information and using it to manage climate risk.
https://www.youtube.com/watch?v=C_Hbmql4XGA&feature=youtu.be

ClimateWatch: Citizen science

ClimateWatch was developed by Earthwatch with the Bureau of Meteorology and the University of Melbourne to understand how changes in temperature and rainfall are affecting the seasonal behaviour of Australia's plants and animals. It is a citizen science project where every Australian can collect and record data that will help shape the country's scientific response to climate change. Changes in rainfall and temperature are already triggering changes in flowering times, breeding cycles, migrations and distributions of the country's flora and fauna, both native and introduced.
http://www.climatewatch.org.au/

Simple climate model anyone can use

Monash University has developed a simple climate model for students and the public to do their own climate simulations. It provides a simple model of the average global climate and its response to external factors such as changes in sunlight or CO2 concentration. You can take the climate apart and see how it responds to different climate change scenarios. The website also provides educational tutorials about the climate, climate models and climate change.
http://monash.edu/research/simple-climate-model/mscm/index.html

The impact of climate change on insurance

A Bank of England report into the impact of climate change on British insurers identifies three main impacts: physical risks such as damage to property and disruption of global supply chains from weather-related events; financial risks as insurance firms' transition to a lower carbon economy; and liability risks from parties who have suffered loss and damage to climate change.
http://www.bankofengland.co.uk/pra/Documents/supervision/activities/pradefra0915.pdf

Transformational adaptation

This paper from the UK Climate Impacts Program reviews the literature on transformational adaptation and provides a skills-based framework for more effective transformative action.
http://www.ukcip.org.uk/wp-content/PDFs/UKCIP-transformational-adaptation-final.pdf

Climate feedback website

Climate Feedback organises scientists from around the world to comment on the accuracy of a variety of climate change media articles. Scientists' comments are layered directly onto the original texts allowing readers to easily identify where and why the coverage is consistent (or inconsistent) with state-of-the-art thinking and knowledge in climate science.
http://climatefeedback.org/

EMISSIONS

Beef cattle herd management method approved

The Emissions Reduction Fund has approved a new land sector method to credit emissions reductions from pasture-fed beef cattle. Crediting is based on how many emissions are cut through efficiency gains while beef production is maintained or increased. Examples of practices include using high-quality feed and managing the breeding herd to ensure calves are born when pasture is at its best.
http://environment.gov.au/climate-change/emissions-reduction-fund/methods/beef-cattle-herd-management

Explaining ERF aggregation agreements

The Department of the Environment has produced information on the risks, benefits and obligations involved in joining an aggregated Emissions Reduction Fund project. The materials include a guide to aggregation agreements and case studies about aggregated industrial energy efficiency and environmental plantings projects.
https://www.environment.gov.au/climate-change/emissions-reduction-fund/aggregation-agreement

Impact of rising CO2 on grain crops

Victoria's Wimmera Project AGFACE is investigating the impact of elevated CO2 levels on crops. This series of three videos explains the impacts of elevated CO2, trial methodology, research into reduced protein under elevated CO2, and what's ahead for grain growers.
http://bit.ly/1WVTRBp

Retaining stubble reduces emissions

A WA study of on farm emissions mitigation found that retaining stubble or adding additional organic matter decreased the net global warming potential without reducing gross margins. Using a lower nitrogen fertiliser rate than the baseline resulted in a decrease in yield and profitability with little effect on net global warming potential.
http://www.agronomy2015.com.au/1145

Carbon storage in restoration plantings

Tasmanian research has concluded that biodiversity benefits of tree plantings probably outweigh carbon sequestration benefits given that it could take more than 100 years for plantings to store carbon similar to that in uncleared forest.
http://www.publish.csiro.au/nid/202/paper/RJ14129.htm

More emissions in feed oil than biodiesel

Victorian research has found that, in general, feeding canola oil or cottonseed oil to cattle results in a net increase in GHG compared with converting either oil into biodiesel. However, transport distance is a major determinant in GHG reduction, with the break-even estimated at 381 km.
http://www.piccc.org.au/research/wfsam/subproject/cotton-canola-byproducts

State and trends of carbon pricing 2015

This report reviews existing and emerging carbon pricing instruments around the world, and the impact of competitiveness and carbon leakage,.
http://apo.org.au/research/state-and-trends-carbon-pricing-2015

WATER

Increasing CO2 is reducing river flows

Rising carbon dioxide concentrations are causing vegetation across large parts of Australia to grow more quickly, in turn consuming more water and reducing flows into river basins. River flows have decreased by 24-28% in a large part of Australia due to increasing CO2 levels, which have risen by 14% since the early 1980s. This could exacerbate water scarcity in several populated and agriculturally important regions.
https://theconversation.com/river-flows-drop-as-carbon-dioxide-creates-thirstier-plants-49371

Groundwater models need to incorporate geology

A recent study into the geology of the Liverpool Plains has found that current groundwater models use a simplistic model of paleovalley-filling sediments to forecast the impact of mining and agriculture on the groundwater resources. To achieve better assessment of local scale impacts, future groundwater models need to incorporate more geologically realistic aquifer architecture (palaeochannel belts, floodplain deposits, etc.). Modelling local scale impacts will become more important given the impacts of climate variability, agriculture, coal mining, and coal seam gas developments.
http://www.sciencedaily.com/releases/2015/10/151023084510.htm

Research into injection of purified CSG water

CSIRO research is investigating the impacts of injecting water purified after coal seam gas extraction back into the groundwater system. Modelling shows that some of this water can be safely reinjected into wells after it has been purified using reverse osmosis.
https://blogs.csiro.au/ecos/restoring-coal-seam-gas-water-to-ancient-underground-rocks-for-future-use/

California sinking due to groundwater pumping

California's water supplies remain desperately low but agricultural production has been maintained through the use of groundwater. Pumping has caused parts of the state to sink by 33 centimetres in less than a year but efforts to regulate water use are being hampered by a lack of data on groundwater withdrawals.
http://www.nature.com/news/california-agriculture-weathers-drought-at-a-cost-1.18457

New irrigation AgGuide

Tocal College, in collaboration with NSW DPI's water and irrigation unit, has released a third publication in its series of irrigation AgGuides. The guides cover system and pump selection, measuring and monitoring, and scheduling. A fourth guide on centre pivot and linear move systems, will be released at the end of 2015.
http://www.tocal.nsw.edu.au/publications

AWA 2015 survey results

The Australian Water Association has released results of its 2015 surveys on the state of the water sector and the water consumer outlook.
http://www.awa.asn.au/Research_Reports_.aspx

SOILS

Rainfall, not management, determines SOC in Victoria

Measurement of soil organic carbon at 615 sites in pasture and cropping systems in Victoria explored relationships between the C stocks and environment, soil and management. The results showed an extremely wide range from 2 to 239 t C/ha. Almost 80% of the variation was related to annual rainfall or vapour pressure deficit. After accounting for climate, differences in SOC between management classes were small and often not significant. Management practices such as stubble retention, minimum cultivation, perennial pasture species, rotational grazing and fertiliser inputs were not significantly related to SOC stock. The results suggest that, across Victoria, there is a general hierarchy of influence on SOC stock: climate > soil properties > management class > management practices.
http://www.publish.csiro.au/view/journals/dsp_journals_pip_abstract_scholar1.cfm?nid=84&pip=SR15008

Techniques for measuring soil organic carbon

A new review of analytical techniques for measuring total soil organic carbon outlines what the methods actually measure and their advantages, limitations and research opportunities.
http://www.publish.csiro.au/nid/84/paper/SR14339.htm

Management options for water-repellent soils

Economic analysis of water-repellent soils suggests that small patches are best ameliorated with claying, deep cultivation or soil inversion, but large areas should be treated initially with mitigation strategies such as furrow-seeding, application of wetting agents (surfactants), no-till with stubble retention, on-row seeding, and stimulating natural microbial degradation of waxy compounds.

http://www.publish.csiro.au/nid/84/paper/SR14330.htm

Carbon loss linked to climate change

UK research has found that climate change accounted for 9–22% of carbon declines in organic soils in semi-natural habitats throughout England and Wales from 1978–2003. Carbon changes in organo-mineral/mineral soils could be weakly linked to rainfall but not temperature changes, whereas carbon declines in organic soils were strongly related to rising temperatures but insensitive to changes in rainfall.

http://ec.europa.eu/environment/integration/research/newsalert/pdf/loss_of_soil_carbon_linked_to_climate_change_in_England_and_Wales_431na5_en.pdf

Forage crops change soil fauna

A UK study comparing the effect of growing different forage crops on soil faunal diversity and abundance found that earthworm abundance and biomass was higher within the white clover treatment, specifically anecic earthworm; there were greater numbers of fungal feeding nematodes in the clovers and chicory treatments; and herbivores had the greatest abundances in the two ryegrass treatments. Overall, the findings indicate a relationship between ryegrass and herbivorous invertebrates, whilst the other forages have a stronger relationship with decomposer invertebrates.

http://www.farmingfutures.org.uk/blog/assessing-impact-agricultural-forage-crops-soil-biodiversity-and-abundance

Wheat variety affects subsequent root health and yield

UK scientists have found that different varieties of wheat have distinct and lasting impacts on the health of the soil in which they are grown. What is going on in the soil long after harvesting the initial wheat crop determines the subsequent year's root health and yield.

http://www.farmingfutures.org.uk/blog/wheat-variety-choice-has-lasting-effect-soil-health-wheat-yield

Soil degradation poster

FAO has released a poster on soil degradation and sustainable management practices that can reverse it.

http://www.fao.org/3/a-mn997e.pdf

Useful soil videos

The US has produced a range of useful soils videos.

NRCS International Year of Soils monthly series

https://www.youtube.com/playlist?list=PL4J8PxoprpGZ3gPDXRfa_DNBYXoF-ruG2

NRCS science of soil health series

http://www.nrcs.usda.gov/wps/portal/nrcs/detail/mt/soils/health/?cid=stelprdb1245890

Soil Science Society of America International Year of Soils series

https://www.youtube.com/playlist?list=PLZVYohuIygMqtilTezSHbzveYUj3WLjdm

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The amazing world of plant roots

US photographer Jim Richardson has been working with agroecologist Jerry Glover to develop ways to photograph the extraordinary roots of wild prairie grass which can grow over four metres beneath the soil surface. They grow the grasses in PVC pipes for one to two years, split the pipes, and wash and photograph the roots.
http://proof.nationalgeographic.com/2015/10/15/digging-deep-reveals-the-intricate-world-of-roots/

BIODIVERSITY

Plant diversity stabilises ecosystems in extreme weather

A study of 46 grasslands in North America and Europe has found that increasing plant diversity decreases the extent to which extremely wet or dry conditions disrupt grassland productivity. Overall, productivity of communities with only one or two species changed an average of 50 percent during events, while those with 16 to 32 species changed only half that much.
http://discover.umn.edu/news/science-technology/biodiversity-stabilizes-ecosystems-during-climate-extremes

Genetic diversity improves grassland stability

A French study looking at the diversity of crop species in grasslands found that species diversity improved the production of cumulated biomass, and genetic diversity significantly improved stability, with more regular production through the year regardless of water supply.
http://www.farmingfutures.org.uk/blog/diversity-breeds-healthy-grasslands

Weather extremes harm arid grasslands

An Arizona study has found that when unpredictable weather patterns create alternating wet and dry years, ecosystem productivity in arid zone grasslands declines -- mostly because grasses diminish, which allows shrubs to flourish. The effect of precipitation variability increased over the six years the experiment lasted, with dramatic changes to the grasslands late in the study.
https://asunow.asu.edu/20150928-weather-extremes-harm-grasslands

Widespread woodland losses due to heat and drought

In the past decade, large stands of Ribbon Gum (E. viminalis) in the Monaro region have died. The deaths seem to be due to the (native) Eucalyptus Weevil (Gonipterus sp.), but the underpinning reasons are complex, possibly due to the Millennium drought. The gums normally grow in the wetter areas and the drought and ongoing climate change may have pushed the trees beyond a critical threshold. Similarly, WA woodlands are experiencing widespread collapse due to extreme temperatures and drought.
https://theconversation.com/death-of-a-landscape-why-have-thousands-of-trees-dropped-dead-in-new-south-wales-48657

Myrtle rust is impacting rainforest species

A global study of myrtle rust in natural ecosystems reveals local extinction of key rainforest species is inevitable. Myrtle rust was detected on the Central Coast in NSW in April 2010 and is now established along the east coast from Batemans Bay to far north Queensland. Repeated damage can kill rainforest trees in less than four years, and within two years in severe cases.

http://link.springer.com/article/10.1007%2Fs10530-015-0996-y

The state of Australia's birds

This report assesses the state of Australia's bird population and includes a ground breaking longitudinal study to track regional trends in terrestrial bird population over 15 years – the Terrestrial Bird Index.

http://birdlife.org.au/documents/SOAB-2015.pdf

NSW rice bitterns go international

Last month, NSW's Bitterns in Rice Project featured at the Global Food Security Conference in New York with a presentation on co-management of water for rice production and wetland biodiversity. Project leaders then toured the rice fields of California to look at strategic flooding of harvested bays, widening of banks and creation of islands for migratory waterfowl and shorebirds.

http://www.bitternsinrice.com.au/latest-news/
http://calrice.org/pdf/waterbirdhabitatbro_web.pdf

Feral cat management workshop

Proceedings of the 2015 feral cat management workshop are now available online. The workshop concluded that management should focus on eradication of feral cats on priority islands and fenced reserves, and the influence and role of predators, baiting, fire, grazing and rabbits on widespread feral cat populations.

http://www.pestsmart.org.au/2015-national-feral-cat-management-workshop-proceedings/

Land for habitat increases yields at field edges

A six year UK study of a 56 field farm growing wheat, oilseed rape and field beans looked at the impact of setting aside habitat along the field edges for birds, pollinators and other wildlife. The study found that the wildlife seemed to boost yields at the edges by increasing the productivity per unit area. In fields without any habitat set aside, yields at the edges were poor. For beans, the yield was 35% higher in the fields where the most land was set aside.

http://rspb.royalsocietypublishing.org/content/282/1816/20151740

Wild bees harmed by pesticides, protected by habitat

A US study into the effect of conventional pesticide use on the wild bee community visiting apple orchards found that bee community abundance and species richness decreased linearly with increasing pesticide use in orchards one year after application; however, pesticide effects on wild bees were buffered by increasing proportion of natural habitat in the surrounding landscape.

http://mediarelations.cornell.edu/2015/06/04/bee-warned-study-finds-pesticides-threaten-native-pollinators/

Bats assist corn crops

A US study into the role of bats in agricultural systems found that bats initiated strong and surprising ecological interactions in corn fields. They not only suppressed crop pest numbers and crop damage but also indirectly suppressed the presence of pest-associated fungus and a toxic compound produced by the fungus.
http://www.pnas.org/content/early/2015/09/09/1505413112

Climate change and invertebrate diversity

Analysis of four decades of data has found that 11 of 26 invertebrate groups in English cereal fields were sensitive to extreme weather events but only two took longer than a year to recover. However, by far the most important factor in invertebrate abundance was pesticide use.
http://www.farmingfutures.org.uk/blog/effects-extreme-weather-climate-and-pesticides-farmland-invertebrates

What do dung beetles do with dung?

Well, they eat it, roll it, lay eggs in and under it, attract mates with it, and use it to cool off.
https://theconversation.com/five-things-dung-beetles-do-with-a-piece-of-poo-47367

Introduced dung beetles in Australia

This CSIRO field guide covers all species found in Australia, including two newly introduced species. It will enable farmers, Landcare workers and the interested public to identify and learn about the basic biology of these beetles found in cattle dung.
http://www.publish.csiro.au/nid/18/pid/7207.htm/

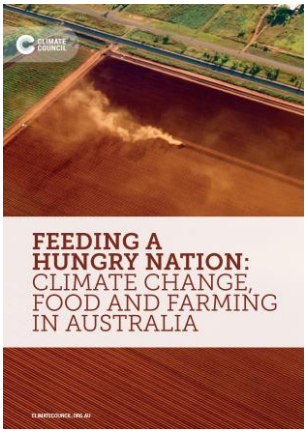
Build your own wildlife nest boxes

Greater Sydney Local Land Services has published a construction guide for nest boxes customised for different wildlife species.
http://www.wires.org.au/wildlife-info/wildlife-factsheets/LLS%20Wildlife%20Nest%20Box%20Final%20Web.pdf

FOOD

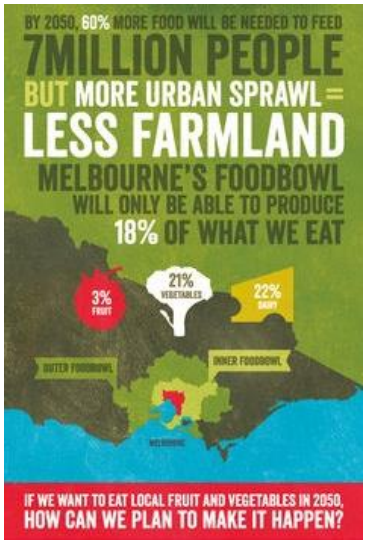
Food, farming and climate change

Key findings from this new review are that climate change is making weather patterns more extreme and unpredictable, affecting the quality and seasonal availability of many foods in Australia. Australia is extremely vulnerable to disruptions in food supply through extreme weather events; more frequent and intense heatwaves and extreme weather events are already affecting food prices in Australia. This means Australia's international competitiveness in many agricultural markets will be challenged by the warming climate and changing weather patterns. At the current rate of climate change, adaptation to food production challenges will be increasingly difficult and expensive.
http://www.climatecouncil.org.au/uploads/7579c324216d1e76e8a50095aac45d66.pdf



Melbourne's food bowl

Early findings from a study of food production on Melbourne's city fringe indicate that Melbourne's food bowl has the capacity to supply a significant proportion of the city's food needs across a wide variety of foods, including poultry, eggs, red meat, dairy, fruit and vegetables. By 2050, 60% more food will be needed to feed the city, but at the current rate of development the city's foodbowl will only be able to meet around 18% of the city's food needs.
http://www.ecoinnovationlab.org/project_content/melbourne-urban-sprawl-infographic/



What are food ethics?

Food ethics require that we take into account the different values and consequences in our food choices. UK's Food Ethics Council outlines what is involved in making ethical food choices.
http://www.foodethicscouncil.org/society/what-is-food-ethics.html

Swiss potato waste

A study of the fate of Swiss-grown potatoes has found that around half are wasted. Producers, traders and processors recycle most discarded potatoes into animal fodder or feedstock for biogas plants. Most of the wastage is due to consumers' high quality standards and health protection.
http://www.sciencedaily.com/releases/2015/10/151023105848.htm

Food production efficiency and sustainability

This UK paper explores the efficiency and sustainability of food production systems, and how stakeholders think about efficiency in relation to animal production and consumption.
http://www.fcrn.org.uk/sites/default/files/fcrn_lmgo.pdf

LAND USE

Government response to Crown Lands submissions

The NSW Government has published its response to the 2014 Crown Lands Legislation White Paper. The majority of submissions supported the idea of new consolidated legislation and repealing the existing Acts. Few comments were received in relation to the proposed repeal of the Western Lands Act 1901, or the Wentworth Irrigation Act 1890 and the Hay Irrigation Act 1902. There was overwhelming support for protection of environmental, cultural heritage and social values, and concern at the focus on economic values of Crown land.
http://www.lpma.nsw.gov.au/__data/assets/pdf_file/0004/206680/response-to-crown-lands-legislation-white-paper.pdf

Travelling Stock Routes planning framework

Local Land Services has released a draft NSW Travelling Stock Reserves State Planning Framework 2016-19 for public comment. The document provides an overarching framework for TSRs and will support the development of regional plans.
http://www.lls.nsw.gov.au/livestock/stock-routes

Competing demands for UK land

This paper explores how current land uses and related policies affect UK resilience, and considers a framework for prioritising 'land-use' among competing demands.
http://www.thenexusnetwork.org/wp-content/uploads/2014/08/Sharmina-et-al-2015.pdf

SUSTAINABILITY

Vegetation buffers around poultry sheds

RIRDC has published a guide to vegetation buffers around poultry sheds to improve air quality on and around their farms. The densely planted trees and shrubs filter, intercept and absorb dust, odour and ammonia from shed exhaust fans.
https://rirdc.infoservices.com.au/items/14-063

EVENTS

November 6	NSW climate change adaptation conference, Sydney https://www.eventbrite.com.au/e/adaptnsw-2015-nsw-climate-change-adaptation-conference-tickets-18012709499
Nov 7-8	National biological farming conference and expo, Lismore NSW http://www.soilcare.org/national-biological-farming-conference-and-expo-2015.html
Nov 10-13	NSW coastal conference, Forster http://www.coastalconference.com/
November 18-19	Climate change research strategy in primary industries conference, Sydney http://www.ccrspi2015conference.com/program.php
November 25-26	Soil health workshops, Quirindi, Manilla, Gunnedah and Narrabri felicity@trla.com.au
Nov 30-Dec 2	Bioenergy Australia 2015, Launceston http://www.bioenergyaustralia.org/
December 4-8	International nitrogen initiative conference, Melbourne http://www.ini2016.com/
February 14-18 2016	6th Greenhouse gas and animal agriculture conference, Melbourne http://www.ggaa2016.org/
14-16 February 2016	2nd National EcoArts Australis Conference, Wollongong http://www.ecoartsaustralis.org.au/events-and-projects/conference-2016
May 1-3	PIEFA food and fibre matters conference, Canberra http://www.piefa.edu.au/conference2016/
July 5-7	Climate change adaptation 2016 conference, Adelaide http://climate-adaptation.org.au/events/climate-adaptation-2016/

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