

NRM on farms



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

August 2016

CONTENTS

[Biodiversity](#)

[Climate](#)

[Climate resources](#)

[Emissions](#)

[Energy](#)

[Events](#)

[Food](#)

[Land use](#)

[Soils](#)

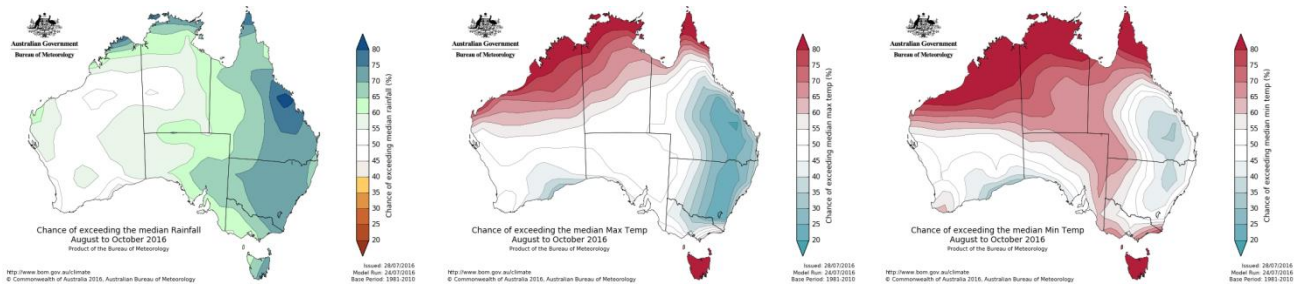
[Subscribe](#)

[Sustainability](#)

[Water](#)

CLIMATE

NSW seasonal outlook



NSW's seasonal outlook shows that above average rainfall is likely from August to October, with cooler days and mainly average night temperatures. Climate influences include a strong negative Indian Ocean Dipole, a continued cooling of tropical Pacific Ocean waters, and very warm sea surface temperatures surrounding northern and eastern Australia.

<http://www.bom.gov.au/climate/outlooks/#/overview/summary/>

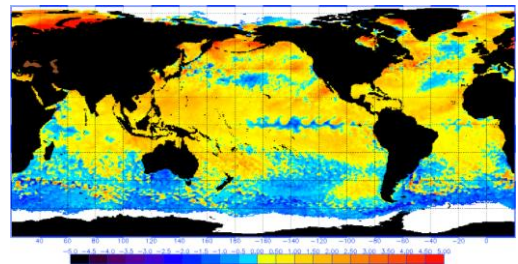
<http://www.bom.gov.au/climate/outlooks/#/overview/video>

Ocean temperatures

Surface temperatures remain neutral in the central tropical Pacific Ocean, warmer than average in the western Pacific and eastern Indian Ocean, and cooler in the northwest, consistent with a negative IOD.

<http://www.ospo.noaa.gov/Products/ocean/sst/anomaly/index.html>

<http://www.bom.gov.au/climate/enso/#tabs=Sea-surface>



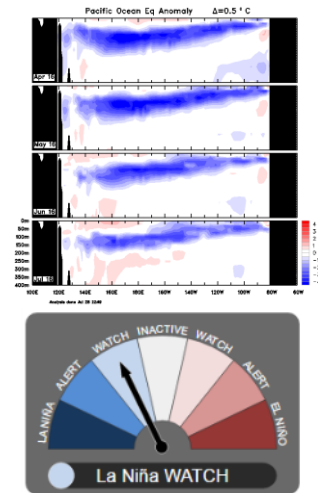
1



Department of
Primary Industries

Pacific subsurface temperatures

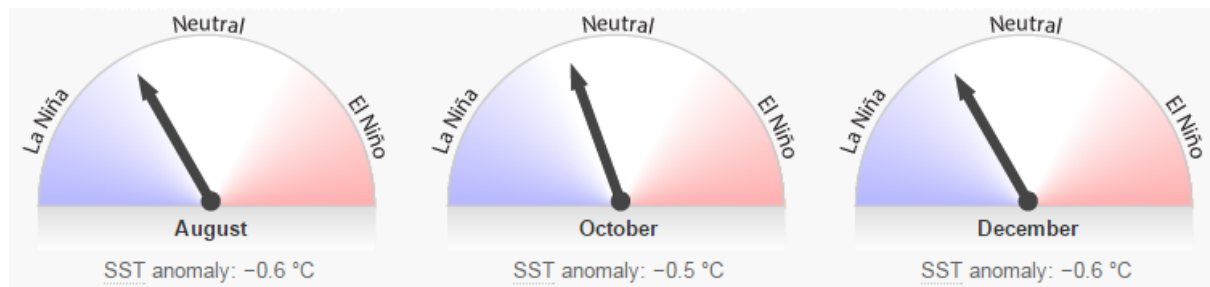
Cool anomalies span the equatorial Pacific Ocean, although temperatures in the top 50m in the western ocean are near average.
<http://www.bom.gov.au/climate/enso/>



Weak La Nina likely

The ENSO Outlook remains at La Niña watch which means there is approximately a 50% chance of La Niña developing in 2016. If a La Niña were to develop, it is likely to be weak and/or short-lived. Australia's climate for winter and spring is more likely to be dominated by the current strong negative IOD rather than ENSO.
<http://www.bom.gov.au/climate/enso/>

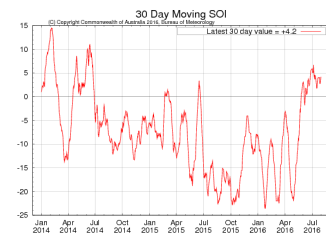
Model outlook



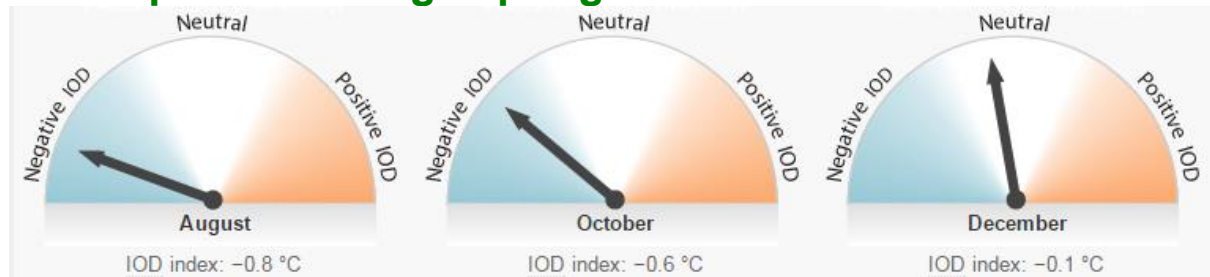
<http://www.bom.gov.au/climate/model-summary/>

SOI remains neutral

The 30-day SOI has remained within the neutral range during July, but may increase as older negative values are replaced by more positive values.
<http://www.bom.gov.au/climate/enso/#tabs=SOI>

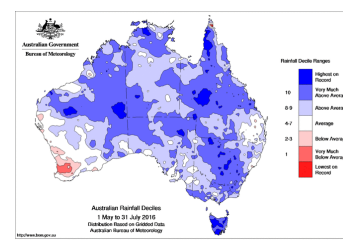


IOD to persist through spring



A strong negative IOD event continues, with ocean temperatures above average in the eastern Indian Ocean and below average near Africa. International climate models indicate the negative IOD will persist until the end of spring. May to July 2016 was Australia's third-wettest May-July on record (right).

<http://www.bom.gov.au/climate/enso/#tabs=Indian-Ocean>
<http://www.bom.gov.au/jsp/awap/rain/index.jsp>

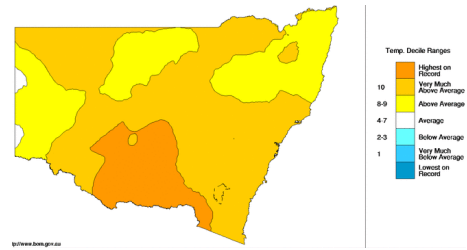


2

Wet and warm NSW July

NSW had a warm July despite two strong cold fronts, with a warm spell breaking records in several locations mid-month and the fourth-warmest July minimum temperatures on record (right). Rainfall was close to average for the State as a whole, with some parts of southern and central NSW recording their wettest July in over 20 years.

<http://www.bom.gov.au/climate/current/month/nsw/summary.shtml#maps>



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

2016 on track for warmest on record

The first half of 2016 puts the planet on track to surpass 2015 as the hottest on record.

Several months were among the first ever recorded to exceed 1°C above average. NOAA has now recorded 14 consecutive record hot months from May 2015 to June 2016. The heat is

partly due to the exceptionally strong El Niño, and mainly the result of excess heat that has built up in Earth's atmosphere due to accumulating greenhouse gases.

<http://www.climatecentral.org/news/first-half-of-2016-record-hot-by-far-20540>

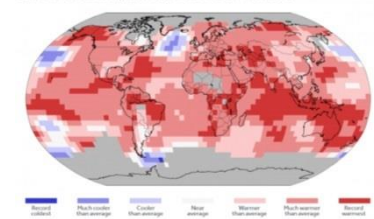
Blowing Away Heat Records

Global year-to-date anomalies from 1881-1910 baseline



2016: Hottest Year So Far

Land and ocean temperature percentiles Jan-Jun 2016

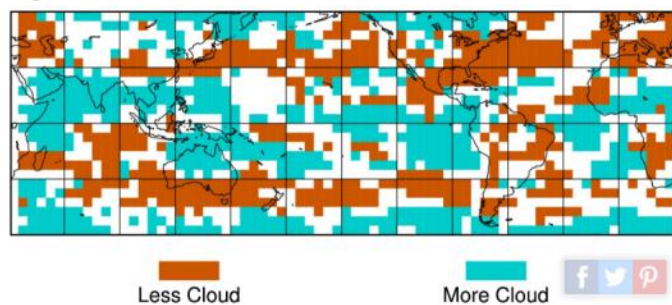


Climate change is changing clouds

Since the 1980s, global cloudiness has increased in the high latitudes, northwest Indian Ocean, and the northern Pacific and Atlantic oceans. There is less cloud across the mid-latitudes of the northern and southern hemispheres (eg southern Australia).

These patterns are due to the expansion of subtropical dry zones towards the poles, the shift of mid-latitude storm tracks towards the poles, and clouds rising higher.

<http://www.nature.com/nature/journal/vaop/ncurrent/abs/nature18273.html>



Summers are getting longer and winters shorter

The Twentieth Century Reanalysis Project has found that the northern hemisphere summer is now an average 13 days longer and winter an average 20 days shorter. Changes in seasonal transition dates have resulted in a longer growing season. However, in terms of crop yields, vegetation productivity depends on local prevailing climate, trends in precipitation, maximum and minimum temperatures, and the selected cultivar.

<http://link.springer.com/article/10.1007%2Fs10584-016-1704-3#CR27>

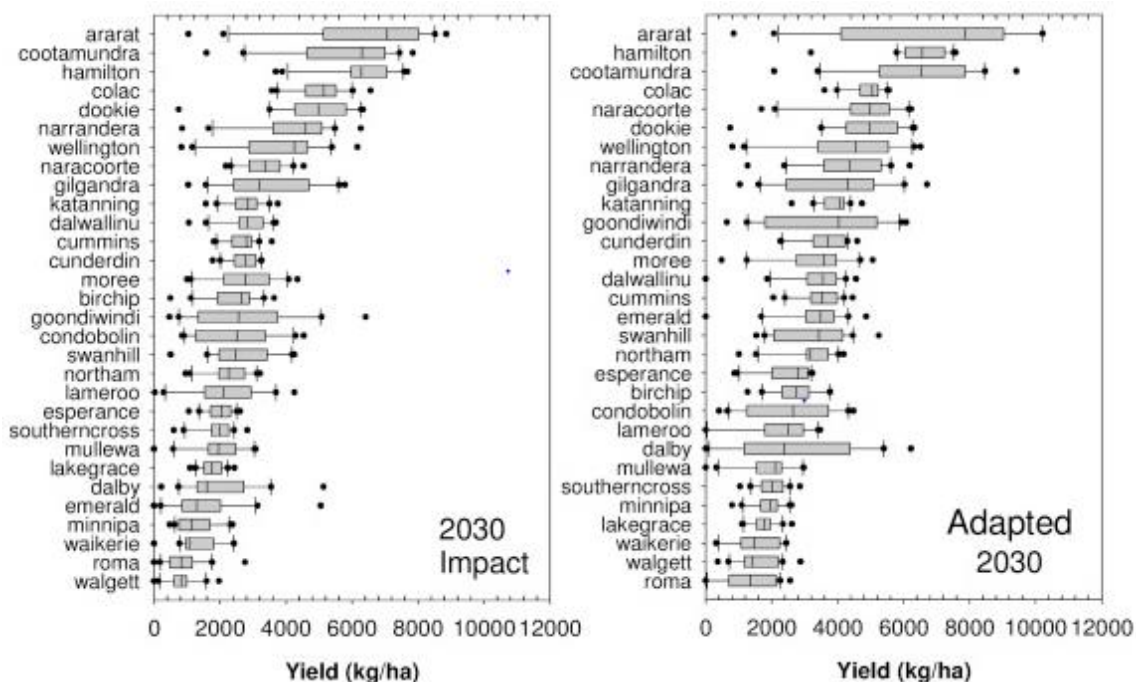
Frost occurrence and wheat risk

Frost season length has increased an average 26 days across southern Australia with some areas experiencing their last frost four weeks later than during the 1960s. As a result, frost-related production risk has increased by as much as 30% across much of the Australian wheat belt for a range of wheat maturity types.

http://www.publish.csiro.au/view/journals/dsp_journals_pip_abstract_scholar1.cfm?nid=40&pip=CP16056

Wheat yields in 2030

Climate modelling of Australia's wheat yield in 2030 has found that projected yields and gross margins did not change substantially compared to the baseline with current practices. However, there was significant negative impact of climate change in low rainfall zones even under elevated CO₂, with projected declines in production and gross margins at 55% of sites. Full adaptation of farm systems under current climate is not expected, so this will remain an on-going challenge. However, by 2030 there will be a greater opportunity to increase the overall water use and nitrogen efficiencies of the Australian wheat belt, mostly resulting from elevated atmospheric CO₂ concentrations.



<http://www.sciencedirect.com/science/article/pii/S0167880915001930>

Primary producers' capacity for transformational change

Investment in the capacity of producers to transform is likely to be an effective strategy to support Australian agriculture in the face of climate change. This study found that producers with a higher transformational capacity were more likely to have a mixed enterprise, an internal locus of control, and higher levels of trust in networks, government, researchers, agronomists and themselves.

<http://www.sciencedirect.com/science/article/pii/S0167880916300767>

Adaptation constraints and enablers in broadacre cropping

Farmers in Australia's broadacre cropping regions identify natural capital assets such as high soil productivity and low rainfall variability as the biggest enablers of adaptation, and financial issues such as low equity or limited capital as the biggest constraints. Common enabling factors include farmer education/experience, sense of community, and off-farm income.

Common constraints include isolation/rural decline, limited access to services, poor regional infrastructure, equity/debt, and the high cost of production. Actions to address these relate to farm management practices, training, community, technology/research, communication, funding and institutional arrangements. The study concluded that adapting to climate variability and change is more than just implementing a new technology; it is also about enhancing the broader resilience of the community to ensure its long term viability.

<http://www.sciencedirect.com/science/article/pii/S0308521X16301111>

SA pathways to adaptation

South Australia's regions are developing climate change adaptation plans for the different sectors in each region, including how and when the agriculture sector will transition to more viable practices in the face of warmer and drier conditions.

http://www.environment.sa.gov.au/Science/Science_research/climate-change/climate-change-initiatives-in-south-australia/adapting-to-climate-change/region-based-approach-adaptation/regional-adaptation-plans

Adapting to opportunities not problems

Focusing more on the opportunities of climate change rather than the problems is more likely to bring about better adaptation planning, according to Eyre Peninsula farmer Brian Foster. Changes in the region's rainfall and temperature have changed his farm system to a no till continuous cropping program with no livestock, which requires building up the soil profile, restoring soil carbon, sowing earlier and improving water use efficiency.

<https://blogs.csiro.au/ecos/opportunities-changing-climate/>

Comments sought on multi-peril crop insurance

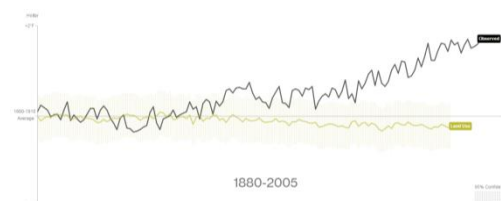
The Independent Pricing and Regulatory Tribunal (IPART) is seeking feedback on its draft review of multi-peril crop insurance incentives. Government measures to support multi-peril crop insurance could increase crop farmers' self-reliance during droughts, but not enough to reduce other government drought assistance.

<http://www.ipart.nsw.gov.au/Home>

What's warming the world?

This animation shows the contribution of various natural and industrial factors to global warming, based on NASA data.

<http://www.bloomberg.com/graphics/2015-whats-warming-the-world/>

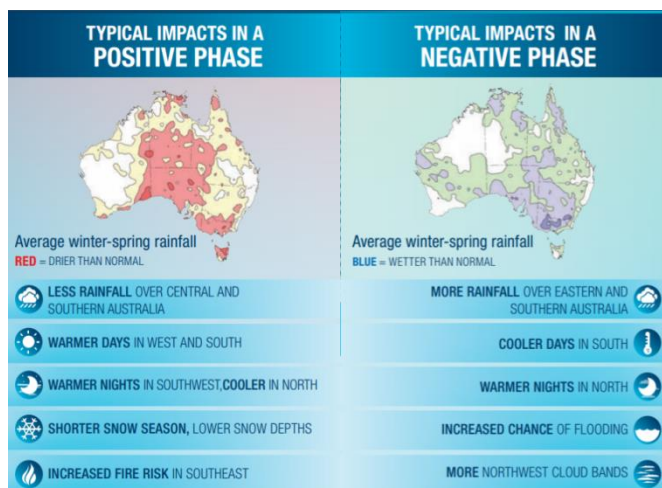


All about the IOD

BoM has updated its information on the Indian Ocean Dipole, one of the key drivers of Australia's climate. It can have a significant impact on agriculture because it generally coincides with the winter crop growing season. Positive or negative IOD events usually start around May or June, peak between August and October and decay when the monsoon arrives in the southern hemisphere around the end of spring.

<http://www.bom.gov.au/climate/iod/>

<https://theconversation.com/is-the-tropical-indian-ocean-to-blame-for-southern-australias-wet-winter-62817>



BoM online training in interpreting outlook maps

BoM is offering free online training in interpreting monthly and seasonal outlooks for use in decision-making. The lesson uses Wagga Wagga and Merredin WA examples to explore how Australia's main climate drivers can affect outlook maps and confidence in the outlook.

https://www.met.ed.ucar.edu/training_module.php?id=1247#.V57JUvI9672

NCCARF adaptation conference

NCCARF's fifth adaptation conference in Adelaide in July showcased the growing body of climate change adaptation knowledge in Australia and internationally. You can access the program and some of the presentations online.

<http://archive.climate-adaptation.org.au/events/climate-adaptation-2016/>

UK 2017 climate risk assessment

The UK's latest climate risk assessment calls for stronger policies to address flooding, health effects of heatwaves, water shortages, and risks to ecosystems, soils, biodiversity, and food supply.

<https://www.theccc.org.uk/UK-climate-change-risk-assessment-2017/>

















and infrastructure (Ch3, Ch4 Ch5, Ch6)	MORE ACTION NEEDED
Risks to health, well-being and productivity from high temperatures (Ch5, Ch6)	
Risk of shortages in the public water supply, and for agriculture, energy generation and industry (Ch3, Ch4, Ch5, Ch6)	
Risks to natural capital, including terrestrial, coastal, marine and freshwater ecosystems, soils and biodiversity (Ch3)	
Risks to domestic and international food production and trade (Ch3, Ch6, Ch7)	RESEARCH PRIORITY
New and emerging pests and diseases, and invasive non-native species, affecting people, plants and animals (Ch3, Ch5, Ch7)	
NOW -----> RISK MAGNITUDE -----> FUTURE LOW MEDIUM HIGH	

EMISSIONS

ERF update

At the end of June 2016 NSW had 251 registered ERF projects, the highest of any state, representing 40% of national total, more than 50% of all vegetation projects, and 33% of agriculture projects.

<http://www.cleanenergyregulator.gov.au/ERF/project-and-contracts-registers/carbon-abatement-contract-register>

New South Wales									
Projects by method									Total
	3	8	0	0	0	11	180	49	251
Cumulative registered projects by method type									
Method type									Total
Registered projects	energy efficiency	industrial fugitives	savanna burning	transport	facilities	agriculture	vegetation	waste	
	40	10	70	7	0	33	345	125	630

Nitrous oxide emissions from grain production

Australian research into nitrous oxide emissions in grain production has found that both emissions and emissions intensity increased with nitrogen fertiliser. Splitting N fertiliser applications to reduce emissions was found to be relevant only in the southern grain-growing region, where most rainfall occurs during the cropping season. Growing grain legumes in rotation with cereal crops has great potential to reduce mineral N fertiliser requirements and N₂O emissions. In general, N management strategies that maximise yields and increase N use efficiency showed the greatest promise for N₂O mitigation.

<http://www.publish.csiro.au/?paper=SR15376>

<https://grdc.com.au/Resources/Factsheets/2016/06/Nitrous-oxide-emissions-in-the-Grains-Industry-nitrogen-fertiliser-losses-from-soil>

Webinar: Managing land and fertiliser to reduce emissions

As part of the Fertcare carbon farming extension project Agriculture Victoria has developed resources for fertiliser advisors and users to reduce greenhouse gas emissions and enhance soil carbon. A one hour webinar will outline the various activities and resources produced through Fertcare, and their use, and provide key take home messages to optimise productivity and minimise GHG emissions. The webinar is open to all and will be held on Friday 2 September at 1:30. To register, go to the link below.

<https://attendee.gotowebinar.com/register/5976203414144329219>

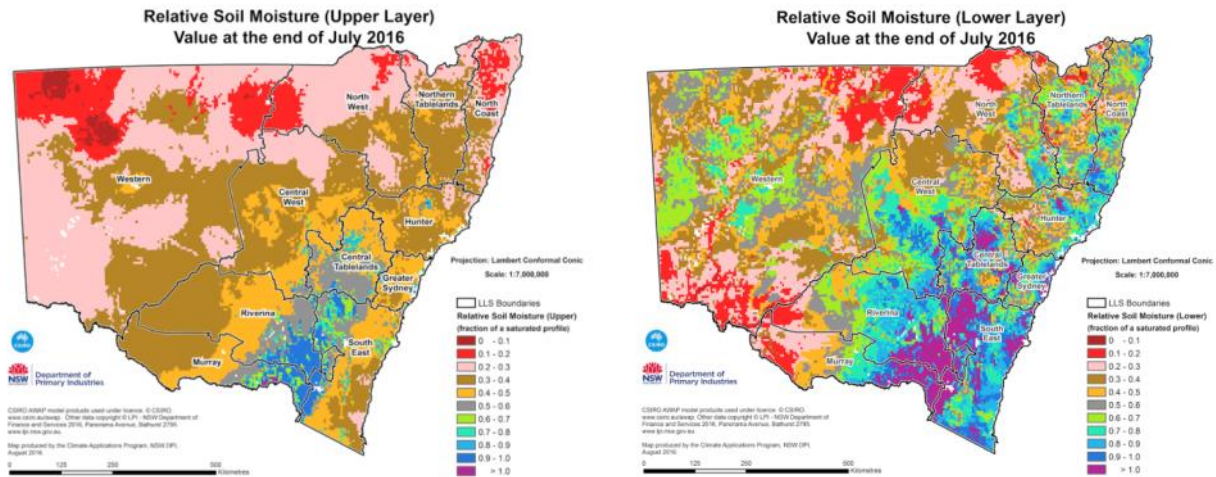
SOILS

Root diversity improves soil structure

European research has found that increasing plant species diversity can improve soil structure and soil health due to the diversity of root activity. Legumes get water into the soil quickly and maintain root-soil strength. Grasses' fine rooting systems make soil more resistant to erosion. Different combinations of roots can be used to engineer the soil.

<http://www.lancaster.ac.uk/news/articles/2016/mix-up-plant-species-to-keep-soil-healthy/>

NSW soil moisture



<http://www.dpi.nsw.gov.au/agriculture/emergency/seasonal-conditions/regional-seasonal-conditions-reports>

Soil inoculations hasten land restoration

A Netherlands trial found covering degraded land with a soil layer less than one centimetre-thick greatly speeded up restoration. The trial used grassland and heathland soils and added the same mix of grassland and heathland seeds to each plot. The inoculations changed both the abundance and the kind of bacteria, fungi and worms living in the soil, making them more like those of the donor ecosystem.

<https://www.newscientist.com/article/2096740-soil-organisms-alone-can-determine-which-plants-grow-where/>

Soil in food chains

Soil Science Australia has developed a booklet for Year 7 science students to extend their understanding of the role of soil in food chains and the natural world.

http://soilscienceaustralia.com.au/images/sampledata/schools/SoilScienceAustralia_TeacherGuide_SoilinFoodChain.pdf

WATER

Changes to DPI Water and WaterNSW

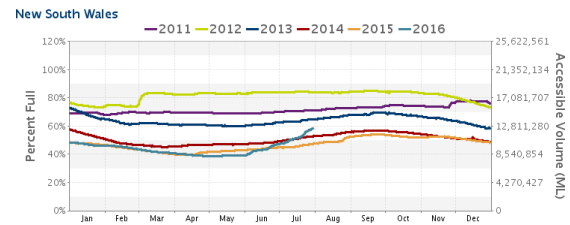
Since 1 July, all DPI Water customer functions, including management of groundwater and regulated and unregulated water, have been transferred to WaterNSW, creating a single contact point for the day-to-day business needs of rural water customers. WaterNSW now handles customer transactions, compliance investigations for customers, licensing administration and billing, water quality monitoring, hydrometric assessment and metering. DPI Water continues its policy, planning and regulatory role, including representing NSW's interest at the national level and implementing the Murray Darling Basin Plan.

<http://www.waterdirectoriate.asn.au/News/IndustryconsolidationforDPIWaterandWaterNSW.aspx>

NSW water storages

NSW's water storages have increased 11% over the past month to almost 60% of accessible capacity. Storages are also 11% higher than this time last year.

<http://water.bom.gov.au/waterstorage/awris/>



Review of WaterNSW operating licences

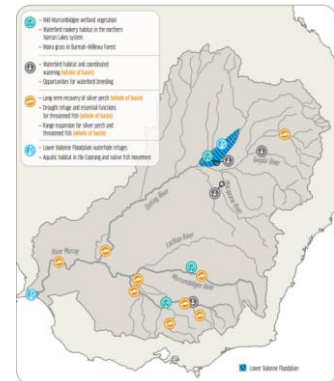
IPART is reviewing WaterNSW's operating licences and has released an Issues Paper as the first step in the process. Submissions on the paper are due by 16 August.

<http://www.ipart.nsw.gov.au/Home>

Environmental water destinations

Commonwealth environmental water this year will go to locations that have been under pressure due to drying conditions particularly in the Coorong, Barmah Millewa forests, mid-Murrumbidgee wetlands, Macquarie Marshes and Narran Lakes.

<http://www.environment.gov.au/water/cewo/publications/cewh-update/portfolio-mgt-plans-2016-17/>



NSW review of environmental water

NSW Minister for Primary Industries, Lands and Water Niall Blair has ordered a review of environmental water releases from inland regulated river storages to determine if environmental outcomes could be achieved with a more flexible approach. The rules were originally designed to mimic natural flows and improve river health and connectivity before large-scale water recovery in the Murray Darling Basin.

http://www.dpi.nsw.gov.au/_data/assets/pdf_file/0008/664406/translucent-flows-to-be-reviewed-20160706.pdf

Grasses' crown roots help manage water shortages

US research has found that water shortages suppress crown root growth in grasses which allows the plant to slow the extraction of water from soil, and bank soil water for the future. When moisture is reintroduced into the soil, crown root growth is quickly reactivated, allowing grasses to benefit from the crown's powerful water-drawing ability. Crown-root suppression is much less dramatic in domesticated grasses such as maize and millet than it is in wild, undomesticated versions of these same plants. This suggests that plant breeding has unintentionally affected these crop plants' abilities to cope with drought and makes crown root development a potentially interesting target for those trying to improve crop yields under water-limiting conditions.

<https://www.sciencedaily.com/releases/2016/07/160711155527.htm>

Australian water survey

The Australian Water Survey is asking for your views about water use, prices and types of water, and water supply protection. The survey is being conducted by the Australian Water Association and Arup. All individual data collected will be kept confidential and a report on the survey findings will be released in October 2016. The survey closes on 12 August.

<http://awasurvey.questionpro.com/>

Desalinated water not cost effective for SA irrigators

An independent cost-benefit study has confirmed that running the Adelaide Desalination Plant would not be a cost-effective way of boosting allocations for SA irrigators at the current market price for water.

www.environment.sa.gov.au/desalination-plant

Catchment management investment standard

The Catchment Management Investment Standard was developed in close collaboration with the Water Research Foundation and water utilities from both Australia and US to enable stronger business cases for catchment management as a viable alternative to more capital intensive investments.

<https://www.wsaa.asn.au/publication/source-catchments-water-quality-treatment-assets>

BIODIVERSITY

Environmental regulations in agriculture

The Productivity Commission's draft report on agricultural regulation recommends that governments should continue to develop market-based approaches to native vegetation and biodiversity conservation. Where the community is seeking particular environmental outcomes, governments could achieve them by buying environmental services (such as native vegetation retention and management) from existing landholders. The draft report covers several issues including land use and access, water regulation and animal welfare. Comments on the draft close on 18 August.

<http://www.pc.gov.au/inquiries/current/agriculture#draft>

<https://theconversation.com/government-needs-to-get-balance-right-in-regulating-agriculture-62785>

Global biodiversity falls below safe levels

An international study has found that levels of biodiversity loss are so high that if left unchecked, they could undermine efforts towards long-term sustainable development. Grasslands, savannas and shrublands are the most affected, followed closely by forests and woodlands. The ability of biodiversity in these areas to support key ecosystem functions such as nutrient cycling has become increasingly uncertain.

<http://www.ucl.ac.uk/news/news-articles/0716/140716-biodiversity-levels-unsafe>

Tropical species are replacing WA's temperate kelp forests

Kelp forests wiped out by a marine heatwave along 100km of WA's coast in 2011 show no signs of recovery. The fish, seaweed and invertebrate communities from these formerly temperate kelp forests are being replaced by subtropical and tropical reef communities.

Tropical fish species are now grazing the reef, preventing the kelp forests from recovering.

<https://theconversation.com/a-marine-heatwave-has-wiped-out-a-swathe-of-was-undersea-kelp-forest-62042>

Cost of wild dogs to agriculture

Australia's agricultural industry estimates the economic impact of wild dogs is between \$50 million and \$60 million per year. This ABC report examines the current state of the National Wild Dog Action Plan, which aims to improve the coordination of wild dog control programs.

<http://www.abc.net.au/am/content/2016/s4505219.htm>

10



Department of
Primary Industries

Plants respond to human touch

UWA laboratory research shows that touching an Arabidopsis leaf triggers a complex physiological response. Touching the leaves of the plants twice a day caused them to delay flowering which has implications for agricultural crops. Other research has found that regular touching can help plants become more resistant to certain pathogens.

<http://sciencewa.net.au/topics/environment-a-conservation/item/4265-plants-respond-to-the-human-touch>

Wildlife conservation in farm landscapes

This new book outlines the best ways to integrate conservation and agriculture in the temperate eucalypt woodland belt of eastern Australia. It is based on the large body of scientific literature in this field, as well as long-term studies at 790 permanent sites on over 290 farms extending throughout Victoria, New South Wales and south-east Queensland.

<http://www.publish.csiro.au/pid/7360.htm>

Bitterns in rice booklet

The Bitterns in Rice project has released an updated booklet about the project, including results from the 2015-16 prey sampling, and bittern-friendly rice growing tips.

<http://www.bitternsinrice.com.au>

National standards for ecological restoration

These standards identify the principles underpinning restoration, and outline the steps required for successful projects. The Standards are relevant to projects ranging from minimally resourced community projects to large-scale, industry or government projects.

<http://www.seraustralasia.com/standards/contents.html>

Diverse pastures produce more forage

US research has found that over nine years paddocks planted with chicory, orchard grass, tall fescue, white clover, and alfalfa produced 31% more forage than paddocks planted with only orchard grass and white clover, possibly due to storing more soil carbon.

<https://www.crops.org/news/media-inquiries/releases/2016/0720/800/>

Climate change reshuffles wildlife calendar

UK research into the impacts of climate change on wildlife has found that by 2050 seed-eating birds and herbivorous insects will have shifted their seasonal timing an average of 6.2 days earlier, while flowering plants and insect-eating birds, fish and mammals will only have shifted 2.5–2.9 days. These differences could affect breeding success and survival.

<http://www.ceh.ac.uk/news-and-media/news/uk-wildlife-calendar-reshuffled-climate-change>

Street trees provide \$1 billion in services

US research values the services provided by California's street trees at \$1 billion per year. They clean up atmospheric pollution, conserve rainwater, help communities to economise on air conditioning, boost property values, and soak up more than 560,000 tons of carbon dioxide from traffic exhausts every year. Every \$1 spent on planting or maintaining a street tree returns, on average, \$5.82 in benefits.

<http://climatenewsnetwork.net/california-trees-have-1bn-street-value/>

ENERGY

Solar pump cuts fuel costs

Installation of a solar diesel hybrid irrigation bore pump on a Narromine farm in 2015 has cut pumping costs from \$76 to \$41/ML and reduced diesel use by 45,000-55,000 litres a year. The new installation consists of 400 solar panels producing 100 kilowatts of power to run a 55kW submersible pump that is being driven by a 70kW variable frequency drive. The pump switches to a diesel generator when there is not enough sun.

<http://www.cottoninfo.com.au/sites/default/files/documents/Andrew%20Gill%20solar%20case%20study.pdf>

Mining the sun

Broken Hill is turning to solar energy for its future. The Broken Hill solar plant is expected to generate approximately 126,000 megawatt hours of electricity per year, enough to meet the needs of approximately 17,000 average NSW homes, and reduce greenhouse gas (GHG) emissions by over 105,840 tonnes of CO2 equivalent per annum.

<https://www.climatecouncil.org.au/mining-the-sun>

<https://www.agl.com.au/about-agl/how-we-source-energy/renewable-energy/broken-hill-solar-plant>

FOOD

Targets to reduce food waste?

Australian environment ministers will consider approaches to reduce food waste at the next meeting in 2016. This will include consideration of the role of targets in reducing food waste, and increasing engagement with industry and not for profit organisations to reduce food waste in Australia.

<https://www.environment.gov.au/protection/national-waste-policy/food-waste>

Transforming food waste into profit

A 14 month project is mapping agricultural and processing food loss and industry waste throughout the Riverland, Murraylands, and Murray Mallee area, to assess actual or potential waste transformation infrastructure in the region, and determine what valuable food and wine bioactives and industry waste can be turned into higher value-added products and/or bioenergy. It is intended that the project will lead to new business and product development opportunities, will further support the region's environmental credentials, and will enhance regional capabilities, investment and employment.

http://www.pir.sa.gov.au/regions/sarms/transforming_food_loss_industry_waste_into_profit_project

Food industry carbon and water footprints

This study of three Australian food businesses' carbon and water footprints identified physical, financial, regulatory and reputational hotspots related to climate change. A combination of diagnostic footprinting, downscaled climate projection and semi-quantitative value chain analysis is proposed as a practical and relevant toolkit for adaptation strategies.

<http://www.mdpi.com/2225-1154/4/2/26/htm>

Australia's role in feeding the world

Subtitled 'The future of Australian agriculture', this new book draws together the latest intelligence on the sustainable production and distribution of food and other products from Australian farms. It examines questions that policy-makers, farmers, politicians, agricultural scientists and the general public are asking about the potential productivity of our arable land, the environmental and economic impacts of seeking to increase productivity, and the value of becoming cleaner and greener in our agricultural output.

<http://www.publish.csiro.au/pid/7544.htm>

Food print of different diets

US research suggests that different diets would enable the US to feed significantly more people from existing agricultural land. A vegetarian diet that included dairy products could feed the most people from the area of land available. The baseline diet representing the country's current food consumption, higher in meats, grains, fats and sweeteners, had the lowest carrying capacity and required eight times more land than a vegan diet. Diets including some meat can feed more people than vegan diets, depending on estimates of how much land is suitable for crop cultivation.

<http://now.tufts.edu/news-releases/us-land-capacity-feeding-people-could-expand-dietary-changes>

Climate adaptation of food value chains

Based on the findings of this study, two main challenges are presented for food value chains: translating consumer needs and preferences to niche opportunities arising from adaptation, and communicating adaptation benefits. By addressing these challenges, synergies between adaptation goals and competitive strategies in food value chains may be achieved.

<http://link.springer.com/article/10.1007/s10113-016-0976-5>

LAND USE

Europe's land footprint

A new report from Friends of the Earth says the European Union requires almost 270 million hectares of agricultural land to sustain its food production and agricultural practices. Almost 40% of this land is outside Europe. Animal products account for over 70% of the overall land footprint. The second biggest grouping is vegetable oils, followed by other plant-based products; wheat; fruit, vegetables and spices; alcohol; and coffee, tea and cacao. The report recommends policies and incentives that reduce consumption of land intensive products or products that embody relatively high environmental impacts.

<http://www.db.zs-intern.de/uploads/1469685445-foee-true-cost-consumption-land-footprint.pdf>

SUSTAINABILITY

Sustainability of current government policies

The Australian and NSW governments have recently released five year inter-generational reports on the long-term sustainability of current government policies. The Australian Government report says more can be done to maintain the productive capacity of pastoral and agricultural land for future generations and to conserve Australia's unique biodiversity.

Responsibilities for environmental regulation will be consolidated and roles for federal, state and local governments will be clearer to ensure that issues do not fall through gaps, and to maintain high environmental standards.

<http://www.treasury.gov.au/PublicationsAndMedia/Publications/2015/2015-Intergenerational-Report>

<http://www.treasury.nsw.gov.au/intergenerational-report>

Factors influencing effectiveness of landholder incentives

Factors influencing effectiveness of incentives include availability of inexpensive maintenance or long-term funding, ease of maintenance, need for structural changes, flexibility of land use, and observability of environmental benefits. Successful programs provide extension support, build relationships and trust, are flexible, involve landholders, and offer contract times appropriate for the complexity of the NRM practice. There is a clear need for increased monitoring and evaluation to understand long-term impacts and effectiveness.

<https://journal.anzsog.edu.au/publications/36/EvidenceBase2016Issue2Version1.pdf>

Cost-effectiveness of agri-environment schemes

This review found only a small proportion of studies consider economics when measuring effectiveness. There is a growing awareness of the benefits of multidisciplinary evaluation of conservation programs and potential for substantial biodiversity gains from future schemes.

<http://www.sciencedirect.com/science/article/pii/S016788091630202X>

John Ralph essay: Farm stewardship

The topic for the Farm Institute's 2016 essay is 'Farm environmental stewardship programs are just subsidies in disguise and should not be adopted in Australia'. Entrants are asked to clearly explain whether they support or oppose this statement. The open category is open to all, while the novice category is open to people 25 or under. Entries close 5 September 2016.

<http://www.farminstitute.org.au/news-and-events/upcoming-events/JR-EssayCompetition2016>

National organic seal

Australia now has a national organic seal for organic products certified in Australia. It is owned by the Organic Industry Standards and Certification Council, and obtained through accredited certification bodies.

<http://www.beefcentral.com/trade/new-single-international-mark-for-certified-organic-product-from-australia/>



Complementary role of sheep in UK

This new report from the UK National Sheep Association argues that sheep farming in UK upland and hill areas provides a wide range of public goods and services, from food production and environmental stewardship to landscape management and cultural heritage.

<http://www.nationalsheep.org.uk/policy-work/>

Natural capital protocol

The Natural Capital Coalition has launched a Protocol that provides a framework for businesses to identify, measure, and value their impacts and dependencies on natural resources.

<http://naturalcapitalcoalition.org/protocol/>

EVENTS

August 29- Sept 1	Coast to Coast 2016, Melbourne http://www.coasttocoast2016.org.au/
September 21-23	National Landcare conference, Melbourne http://landcareaustralia.org.au/our-programme/national-landcare-conference/
September 28-30	Bushfire 2016, Brisbane http://www.bushfire2016.org/
October 28-30	Pay dirt: National biological farming conference, Cairns http://www.nationalbiologicalfarmingconference.org.au/welcome.html
December 4-8	7th International Nitrogen Initiative Conference, Melbourne http://www.ini2016.com/

SUBSCRIBE

NRM on Farms is a monthly NSW DPI newsletter that summarises recent information about climate and natural resource management relevant to agriculture to keep farmers and agricultural and NRM advisors and researchers up to date. It is freely available to anyone interested or involved in agriculture or NRM. To subscribe, email Rebecca Lines-Kelly at rebecca.lines-kelly@dpi.nsw.gov.au.