

NRM on farms



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

December 2016

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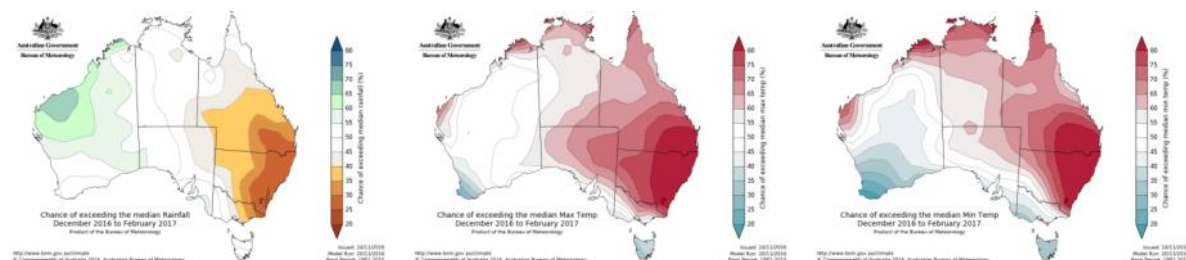
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CLIMATE

NSW seasonal outlook



NSW's outlook for the next three months is for below average rainfall and warmer than average temperatures, reflecting the influence of a negative [Southern Annular Mode](#).

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

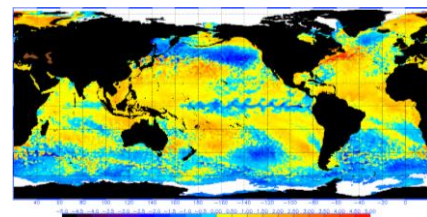
<http://www.bom.gov.au/climate/outlooks/#/overview/video>

Ocean temperatures

Sea surface temperatures are within ENSO-neutral range in the central tropical Pacific Ocean, and remain warmer than average in the far western Pacific, across South East Asia, and around northern Australia. Warm anomalies to the northwest of Australia have weakened.

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

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



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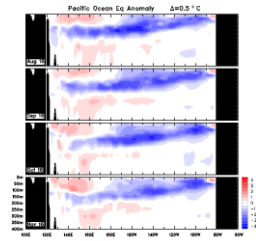


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Pacific subsurface cooling

Sub-surface waters of the central to eastern equatorial Pacific Ocean are close to average, with weak warm anomalies in the west.

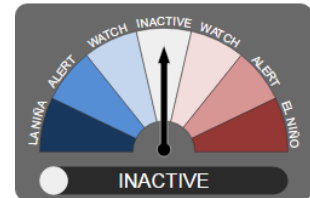
<http://www.bom.gov.au/climate/enso/>



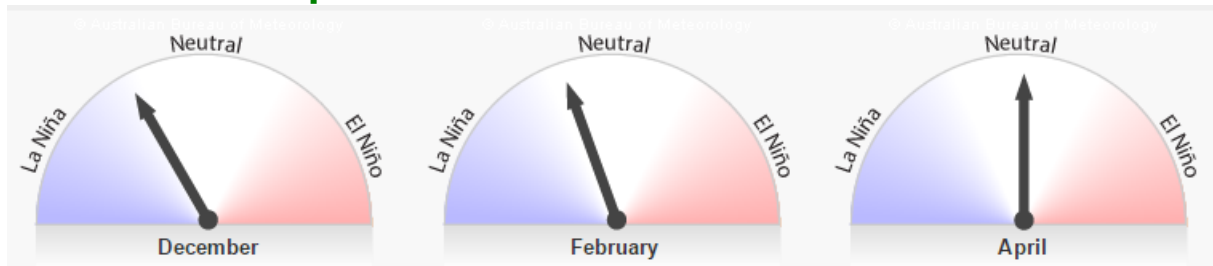
ENSO outlook: Inactive

Most climate models indicate sea surface temperatures in the tropical Pacific Ocean will remain in the neutral range throughout the southern summer and autumn, so the ENSO Outlook status has shifted from La Niña watch to inactive. Inactive status means there is little sign of El Niño or La Niña developing in the coming months.

<http://www.bom.gov.au/climate/enso/outlook/>

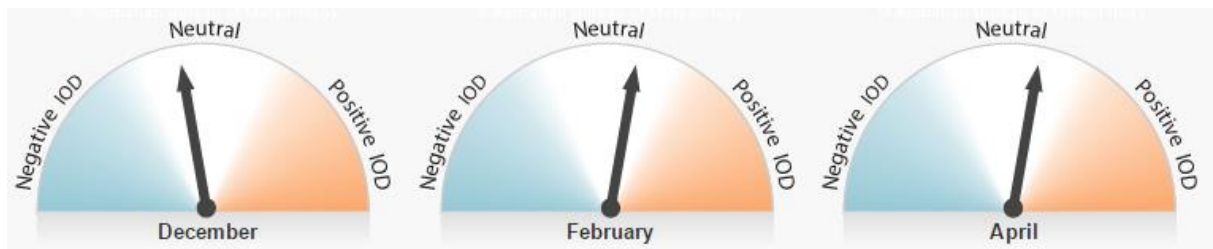


Model outlook points to neutral ENSO



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

IOD returns to neutral levels



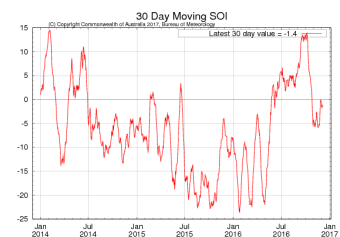
IOD is now within the neutral range. It typically has no impact on Australian climate at this time of year when the monsoon trough becomes active in the southern hemisphere. The 2016 negative IOD event is considered one of the strongest such events in at least 50 years and has had a significant impact on winter and spring rainfall.

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

SOI

The Southern Oscillation Index (SOI) has been negative since late October but remains in neutral range.

<http://www.bom.gov.au/climate/enso/#tabs=SOI>



Explainer: The Southern Annular Mode (SAM)

Australia's climate is currently dominated by a negative SAM, leading to drier weather. This article explains why, with thanks to Andrew Watkins, BoM.

The Southern Annular Mode describes the north-south movement of the Southern Ocean weather systems that circle Antarctica (below left). Annular means relating to, or forming, a ring. This system is sometimes known as the Antarctic Oscillation.

Positive SAM

A positive SAM occurs when these weather systems move further south (towards the pole) than normal. A positive SAM was a significant contributor to the 'big dry' observed in southern Australia from 1997 to 2010.

Negative SAM

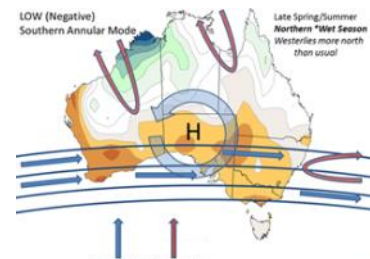
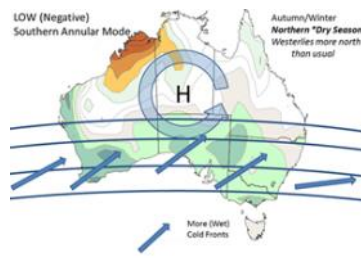
A negative SAM occurs when the Southern Ocean weather systems move further north (towards the equator) than normal.

Negative SAM in winter

In winter a negative SAM brings more rain than normal as more fronts and cut off lows are drawn up and over southern Australia (below centre).

Negative SAM in summer

But in summer, a negative SAM leads to drier than normal conditions. This is because the big rain events in southern and eastern Australia are caused by the intrusion south of big, moist, northern "wet season" weather. A negative SAM acts like a barrier, stopping this wet northern weather reaching as far south as normal (below right).

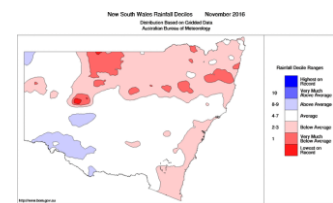


<http://www.bom.gov.au/climate/outlooks/#/overview/influences>
<https://www.youtube.com/watch?v=G-S-YmE-Lkc>

NSW relatively dry in November

November was a relatively dry month, with below average rainfall across much of northern and eastern NSW. Daytime temperatures were warmer than average, particularly near the coast, while nights remained cool in inland regions.

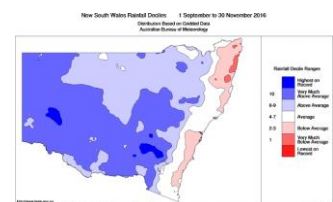
<http://www.bom.gov.au/climate/current/month/nsw/summary.shtml>



Overall, a cool wet spring for NSW

NSW experienced a cool, wet spring with record-breaking rain across much of the inland in September. Both daytime and overnight temperatures were below average for the state, particularly in inland areas, with statewide average spring temperatures the coolest in over 20 years.

<http://www.bom.gov.au/climate/current/season/nsw/summary.shtml>



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.

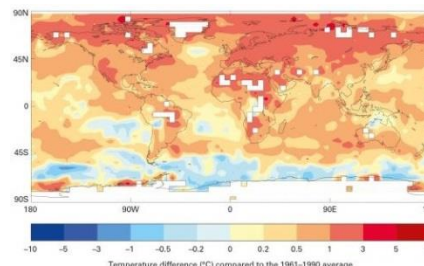
<http://www.dpi.nsw.gov.au/agriculture/emergency/seasonal-conditions/regional-seasonal-conditions-reports>

GLOBAL CLIMATE

Global climate 2011-2015

Analysis by the World Meteorological Organisation has found that the period 2011-15 is the warmest five-year period on record globally, with 2015 the warmest year on record to date, and 2016 likely to exceed this.

<http://public.wmo.int/en/media/press-release/global-climate-2011-2015-hot-and-wild>



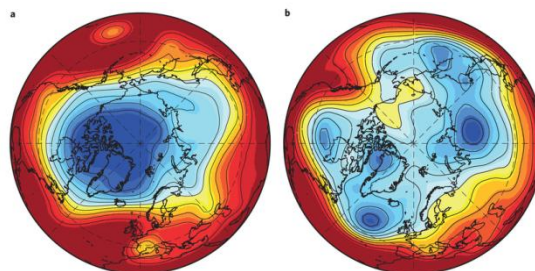
2015's record heat will be normal in 2030

A new study in the Bulletin of the American Meteorological Society finds that on the current greenhouse gas emissions trajectory, global temperatures like 2015 will be normal by 2030, and Australia's record-breaking 2013 summer will likely be an average summer by 2035.

<https://theconversation.com/2015s-record-breaking-temperatures-will-be-normal-by-2030-its-time-to-adapt-68224>

Severe northern winters may be due to jet stream changes

Recent extremely cold winters in US and Britain may be due to climate change intensifying the effects of the northern polar jet stream. Jet streams are small meandering air currents that flow about 9-16 km (roughly 5 to 10 miles) above Earth's surface. When the jet stream is flowing in a straight, strong line from west to east (left), normal winter weather conditions prevail. Wavy jetstreams (right) seem to bring more episodes of severe cold weather. The warming Arctic may be amplifying the effects of the wavy patterns.



<http://www.nature.com/nclimate/journal/v6/n11/full/nclimate3121.html>

What's warming the world

This interactive graphic shows the influence of a number of factors on global warming.

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

CLIMATE IMPACTS

Farmers survey calls for more climate change action

A survey of 1300 primary producers across states and agricultural sectors has found 88 per cent of respondents want rural and regional politicians to start advocating for stronger climate change action. Two thirds have seen changes in rainfall over their time on the land and half have seen an increase in droughts and floods. Nine in 10 are concerned about damage to the climate and eight in 10 support Australia moving towards 100 per cent renewable energy. The survey, conducted by advocacy group Farmers for Climate Action with the co-operation of the National Farmers Federation, found respondents were most concerned about less reliable rainfall, higher temperatures that increase evaporation, heatwaves, pollution from mining, bushfires, rising costs and invasive species.

<http://www.farmersforclimateaction.org.au/survey>

NFF updates its climate change policy

The National Farmers Federation has updated its climate change policy, recognising that climate change poses a significant challenge for Australian farmers, but also a great opportunity for the agriculture sector to contribute to national emissions reduction goals.

<http://www.nff.org.au/policy/nrm.html>

Climate is key research area in draft agriculture plan

Coping with climate variability and change is one of six key research areas that are most likely to contribute, either individually or more likely in collaboration, to the advancement of Australian agriculture, according to the draft Decadal Plan for Australian Agricultural Sciences 2017-26. Future research opportunities in climate include:

- regional level climate modelling integrated with farming systems approaches
- realising the potential of robotics, automation and climate science
- need for continuing investment in pests, diseases and weeds.

Feedback on the draft is due by 19 December.

<https://www.science.org.au/files/userfiles/support/reports-and-plans/in-progress-decadal-plans/decadal-plan-agricultural-sciences-final-draft-nov16.pdf>

Review of Australia's climate change policies

The Australian Government has announced a review of its climate change policies. The review will commence in early 2017 with the release of a discussion paper and call for public submissions, and conclude by the end of 2017. The terms of reference include the role of R&D, and opportunities and challenges of reducing emissions on a sector-by-sector basis.

<http://www.environment.gov.au/climate-change/review-climate-change-policies>

Victorian Climate Change Bill 2016

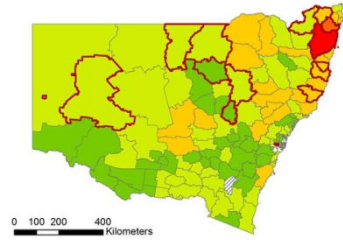
The Victorian Government is considering a Climate Change Bill 2016 to create a new Climate Change Act, which will give effect to the majority of commitments set out in the Government's response to the 2015 Independent Review of the Climate Change Act 2010.

<http://www.delwp.vic.gov.au/environment-and-wildlife/climate-change>

NSW disaster declarations

Analysis of disaster declarations associated with NSW bushfires, floods and storms between 2004 and 2014 has found that bushfire disaster declarations were much more common during El Niño, and flood disaster declarations were five times more common during La Niña phases. The NSW northeast is a declaration 'hot spot'.

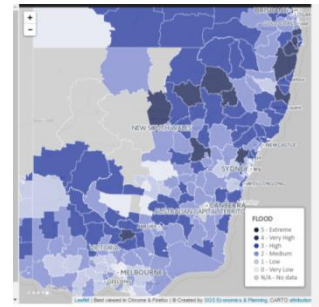
<http://www.nature.com/articles/srep36369>



NSW natural hazards by LGA

A new report and mapping tool from IAG identifies LGAs with the greatest natural hazard risks, their economic activity and community resilience. Storm damage, hail and flooding caused 70 per cent of natural hazard insurance losses in NSW between 1970 and 2013. Insurance losses from hail damage in that period were nine times more than bushfire losses in the state.

<http://www.iag.com.au/shared-value/what-cost>



Supercharged storms in Australia

This new report from the Climate Council says extreme rainfall events are projected to increase in intensity across most of the continent, but the trend may be less prominent in southwest WA, where large reductions in mean rainfall are projected.

<https://www.climatecouncil.org.au/uploads/3ca765b1c65cb52aa74eec2ce3161618.pdf>

Climate change and the NSW and ACT bushfire threat

The Climate Council has updated its previous report on bushfire risk and NSW and the ACT. The economic cost of bushfires in the NSW and ACT is approximately \$100m this year, with annual bushfire costs projected to more than double by 2050. 'Above normal' fire potential is expected in most of NSW for the 2016-17 bushfire season, because of high grass growth experienced during spring and predicted above average temperatures during summer.

<https://www.climatecouncil.org.au/nsw-act-bushfires-report-2016>



NSW bushfire outlook

Spring grass growth in the NSW southern border regions has resulted in an amended outlook for this area, with above normal fire potential now indicated. Most of central NSW has above normal fire potential, with prolific grass growth experienced during the spring, and a forecast tending towards above average temperatures for summer. These temperatures are likely to result in accelerated grass curing and increased fire danger.

<http://www.bnhcrc.com.au/hazardnotes/23>

SOUTHERN AUSTRALIA SEASONAL BUSHFIRE OUTLOOK 2016-17: NOVEMBER UPDATE



Role of climate change on Australia's natural hazards

This special edition of the journal Climatic Change summarises current science, and discusses future research priorities for floods, droughts, storms (including wind and hail), heatwaves, extreme bushfire, frost and sea level rise.

<http://link.springer.com/journal/10584/139/1/page/1>

Coastal ecosystems reduce storm damage

US research into the value of coastal ecosystems found that coastal wetlands reduced hurricane flood damage by 10 percent on average, saving \$625 million in flood damages during Hurricane Sandy. Salt marshes reduced annual expected storm damages by more than 20 percent, but are threatened by rising sea levels and coastal development.

<http://blog.nature.org/science/2016/10/24/how-much-do-wetlands-reduce-property-damage-during-storms-and-hurricanes/>

Many ecological processes under climate stress

A new study has found 80 percent of 94 ecological processes that form the foundation for healthy marine, freshwater and terrestrial ecosystems already show signs of distress and response to 1°C of warming. Impacts to humans include increased pests and disease outbreaks, reduced productivity in fisheries, and decreasing agriculture yields. Many of the adaptive responses observed in nature could be applied to our crops, livestock and fisheries.

<https://www.sciencedaily.com/releases/2016/11/161110115540.htm>

CLIMATE TOOLS

Feedback wanted on NSW climate change framework

The NSW Government is seeking feedback on its NSW Climate Change Policy Framework to develop investment plans for three priority areas: accelerating advanced energy, national leadership in energy efficiency, and preparing for a changing climate. Up to \$500 million will be available over five years. Submissions close on 16 December 2016.

<http://www.environment.nsw.gov.au/.../climat.../policy-framework>

Southern Gippsland agricultural climate resilience project

This summary of a three year project shows how regional farmers gained skills and practical solutions to deal with the threats and opportunities that climate change presents.

<http://sustainabilitygippsland.com/uploads/2cf3a07dbf6d54f9c1eb019afd876998.pdf>

Minimising the impacts of extreme heat

This NSW guide for local government provides information on preparing for extreme heat events, and clarifies roles and responsibilities.

<http://climatechange.environment.nsw.gov.au/Adapting-to-climate-change/Local-government>

BoM heatwave service

The heatwave service operates between November and March, and shows the location and severity of heatwaves for the previous two three-day periods and the next five three-day periods. Users need to refer to BoM forecasts for actual temperatures.

<http://www.bom.gov.au/australia/heatwave/index.shtml>

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CoastAdapt

CoastAdapt, an online tool to understand and manage coastal climate risks, such as sea-level rise, storm surges and other coastal hazards, is now available before release of the final version in early 2017.

coastadapt.com.au

Earth systems and climate change hub

The Earth systems and climate change hub is a partnership of Australia's leading Earth systems and climate change research institutions to improve our understanding of past and current climate, and how the climate may change in the future. You can subscribe to the hub newsletter Teleconnections.

<http://nespclimate.com.au/>

Adapting agriculture to climate change

This FAO infographic outlines policies for securing sustainable food and agriculture for the future.

<http://www.fao.org/3/a-i6398e.pdf>



What is a thunderstorm?

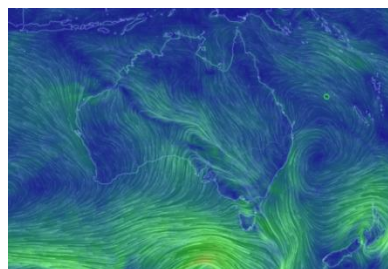
A YouTube animation from UNSW explains why and how summer thunderstorms form.

https://www.youtube.com/watch?v=voCl7GC6Q2A&feature=em-subst_digest

Global wind map

This global wind map is updated every three hours from supercomputer forecasts drawn from multiple sources of global satellite data.

<http://apod.nasa.gov/apod/ap161010.html>



How to calculate the size of a rainfall event

This useful article from NOAA explains how climatologists use statistics to calculate whether an extreme rain event is a one in a hundred or one in a thousand year event.

<https://www.climate.gov/news-features/event-tracker/how-can-we-call-something-thousand-year-storm-if-we-don%E2%80%99t-have-thousand>

Talking climate

This new book from Climate Outreach offers five principles for communicating climate science: learn from previous campaigns; start from peoples' values; tell stories that shift climate change to social reality; build climate citizenship; and promote new voices.

<http://www.springer.com/us/book/9783319467436>

EMISSIONS

Global emissions stabilise

Global carbon emissions from burning fossil fuels did not grow in 2015 and are projected to rise only slightly in 2016, marking three years of almost no growth. Decreased use of coal in China is the main reason behind the 3-year slowdown.

<https://www.sciencedaily.com/releases/2016/11/161114082243.htm>

Methane emissions rising

Methane concentrations in the atmosphere are growing faster than any time in the past 20 years, largely driven by the growth in food production, according to the 2016 global methane budget.

<https://theconversation.com/methane-from-food-production-might-be-the-next-wildcard-in-climate-change-69894>

Fourth ERF auction results

Twenty-four vegetation projects and three agriculture projects are among the successful bids in the fourth Emissions Reduction Fund auction last month. The average price per tonne of abatement was \$10.69, compared with \$10.23 in April, \$12.25 in November 2015, and \$13.95 in April 2015. NSW has the largest number of contracts over the four auctions, most of them related to vegetation and landfill/waste.

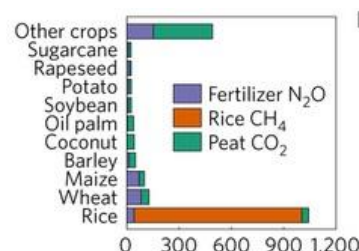
<http://www.cleanenergyregulator.gov.au/ERF/Auctions-results/November-2016>



Greenhouse gas emissions intensity of global croplands

Analysis of global cropland emissions has found that peatland drainage, concentrated in Europe and Indonesia, accounts for 32% of cropland emissions despite peatlands producing just 1.1% of total crop kilocalories. Methane emissions from rice, a crucial food staple supplying 15% of total crop kilocalories, contribute 48% of cropland emissions, particularly in Vietnam. N₂O emissions from N fertiliser application generate 20% of cropland emissions.

<http://www.nature.com/nclimate/journal/vaop/ncurrent/full/nclimate3158.html>



Fresh food emissions table

A fresh food carbon footprint table developed by UK and Australian researchers found that grains, fruit and vegetables had the lowest impact, followed by nuts and pulses. Chicken and pork (non-ruminant meat) had a medium impact. Fish also had a medium impact on average, although results between species varied significantly. Meat from beef and lamb had the highest impact. The paper reviewed 369 published studies that provided 1718 global warming potential values for 168 varieties of fresh produce including vegetables, fruit, dairy products, staples, meat, chicken and fish.

<https://www.sciencedaily.com/releases/2016/11/161102075950.htm>

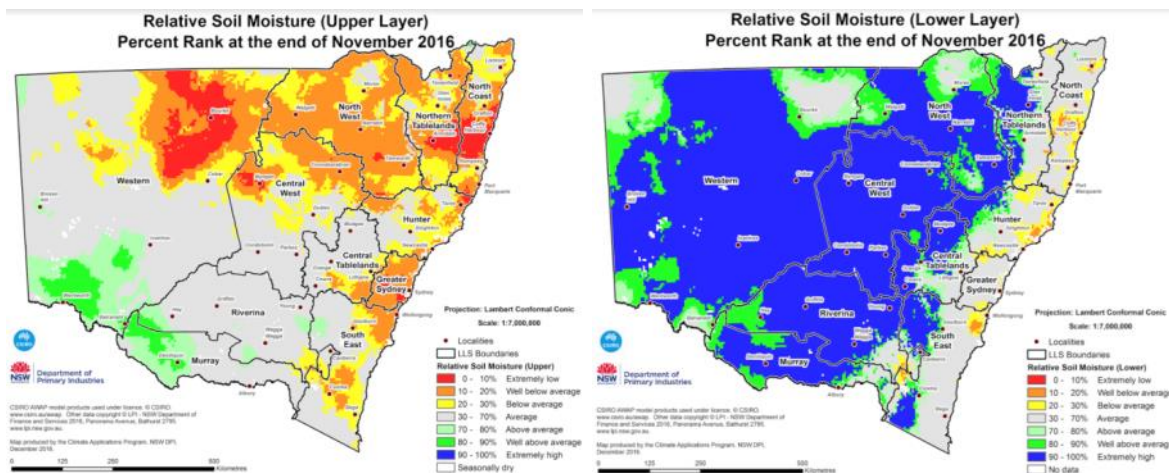
Link between our emissions and Arctic sea ice

The average westerner's carbon emissions destroy 30 square metres of Arctic sea ice every year, according to new research. For every tonne of CO₂ emitted into the atmosphere, summer sea ice cover in the Arctic shrinks by three square metres.

<https://www.carbonbrief.org/arctic-summer-sea-ice-to-disappear-with-2c-warming>

SOILS

Soil moisture maps for November



<http://www.dpi.nsw.gov.au/climate-and-emergencies/droughthub/information-and-resources/regional-seasonal-conditions-reports>

Organic amendments show results but are not economic

A four year study into the effect of organic amendments to increase carbon in cropping soils in southern Victoria found that while application of compost and chicken litter can increase organic carbon, crop biomass and yield, it is not currently economic to do so.

<http://www.wqcm.vic.gov.au/for-landholders/gippsland-soil-trials/organic-amendments-to-increase-carbon-in-cropping-soils>

Benefits of soil organic matter in WA

A WA study into organic matter in cropping soils found that it increased available nitrogen and crop yields, and slightly increased nitrous oxide emissions. Land management practices such as no-till, reduced tillage or residue retention all increased soil organic matter.

<http://www.liebegroup.org.au/wp-content/uploads/2016/08/Barton-et-al.-2016-AEE.pdf>

Direct evidence that microbes produce soil organic matter

US researchers have provided the first direct evidence that soil microbes produce chemically diverse, stable soil organic matter (SOM). SOM accumulation is driven by distinct microbial communities more so than clay mineralogy; microbial-derived SOM accumulation is greatest in soils with higher fungal abundances and more efficient microbial biomass production.

<http://www.nature.com/articles/ncomms13630>

Soil carbon Q&A with Gupta Vadakattu

This article from CSIRO scientist Gupta explains benefits of soil carbon and ways to build it. <https://grdc.com.au/Media-Centre/GRDC-E-Newsletters/WithTheGrain/November-2016/Soil-carbon-A-Q-and-A-with-Gupta-Vadakattu>

Soil film: Lands for freedom

The Innsbruck Nature Film Festival's 2016 award for the best film on the topic of soil is the European documentary, Lands for freedom, giving insight into the motivation and success of family-led farming businesses.

<https://www.lesliberterres.com/EN/press.html>

WATER

NSW water resource plans roadmap 2016–2019

DPI Water is developing 22 water resource plans for consumptive water use. The plans will be developed from 2016 to 2019. Status and issues paper will be issued for each catchment. Comments on the Lachlan and Macquarie-Castlereagh are due on 11 January.

<http://www.water.nsw.gov.au/water-management/water-resource-plans>

NSW water storages

NSW water storages are at almost 80% capacity, compared with 50% in December 2015.

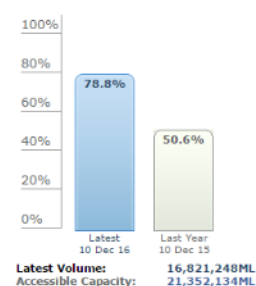
<http://water.bom.gov.au/waterstorage/awris/>

Proposed amendments to MDB Plan

The Murray–Darling Basin Authority (MDBA) is calling for submissions about three proposed Basin Plan amendments: reducing the water recovery target in the northern basin from 390 GL to 320 GL; raising Sustainable Diversion Limits in three groundwater areas from 3334 GL to 3494 GL per year; and implementing minor amendments to enable consistent implementation of the Basin Plan. Submissions close on 10 February 2017.

<http://www.mdba.gov.au/publications/mdba-reports/basin-plan-amendments>

New South Wales



Drinking water guidelines updated

The Australian drinking water guidelines have been updated. The guidelines define safe, good quality water, and how it can be achieved and assured.

<https://www.nhmrc.gov.au/guidelines-publications/eh52>

Water market trends in northern Victoria 2001-2015

This report identifies water trading trends in the context of market reform, climate conditions, changes in demand and environmental water recovery.

<http://waterregister.vic.gov.au/water-trading/trade-reports>

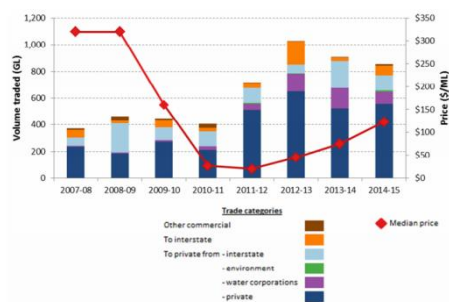


Figure 9. Commercial allocation trade by seller & buyer type, & price, northern Victoria

Water for Victoria

The Victorian Government will invest \$537 million over four years to deliver its Water for Victoria plan. Of this, \$222 million will help improve the health of waterways and catchments. Other investments include irrigation modernisation and improving on-farm water use (\$59.6 million), upgrades of rural water systems (\$58 million), preparing for floods and emergencies (\$25 million), and support for Aboriginal participation in water decisions and access to water (\$9.7 million).

<http://haveyoursay.delwp.vic.gov.au/water-for-victoria>

BIODIVERSITY

New biodiversity legislation

The Biodiversity Conservation Bill 2016 has been passed in Parliament. Further consultation on more detailed components of the package will take place before the proposed legislation commences on 1 July 2017.

www.landmanagement.nsw.gov.au

Pollination Plus for Australian horticulture

Pollination Plus is a new project to enhance and support existing pollinators, and identify the most effective pollination methods for various horticulture crop types.

<http://horticulture.com.au/how-we-invest-2/pollination-plus-partnership/>

UK mustard farmers collaborate to feed their pollinators

Eighteen UK mustard farmers have joined forces for a ten year project to protect and boost pollinator populations crucial for their crops. The growers have so far planted 21,000 bulbs, as well as shrubs, hedges and wild flowers across 10,000 ha of farmland, to ensure pollinators have enough nectar and pollen supply before winter. By mapping the availability of pollen and nectar on individual farms on a monthly basis, each farmer can identify where the availability gaps are - usually during early spring and late autumn - and take measures to enhance supply during these times.

<http://www.farminguk.com/News/Mustard-farmers-join-forces-to-protect-British-hon-44598.html>

Ten policies to protect pollinators

Promoting integrated pest management, recognising pollination as an agricultural input, and supporting diversified farming systems are among ten policies recommended by UK scientists to protect pollinators.

<https://www.uea.ac.uk/about/-/scientists-propose-ten-policies-to-protect-vital-pollinators>

FeralScan wins Banksia award

FeralScan, the program that helps farmers and communities use social media to monitor and map introduced pest animal sightings and control campaigns, has won a Banksia Award for research and science excellence.

<http://banksiafdn.com/2016-winners/>

Weeds have role in integrated pest management

Cornell University agricultural scientists are calling for a return to integrated pest management which recognises benefits of all species in the crop field crops, weeds and cover crops. Weeds can be part of a restorative cycle, offering ecosystem services such as soil erosion protection and pollination services for the benefit of insects.

<http://www.news.cornell.edu/stories/2016/11/pest-control-wicked-weeds-may-be-agricultural-angels>

Recording plant and animal finds

Riverina Landcare has compiled a useful list of websites where you can record plant and animal finds.

<https://riverinalandcaredotorgdotau.files.wordpress.com/2016/10/where-to-record-your-plant-and-animal-finds.pdf>

ENERGY

Solar battery calculator

NSW Farmers has developed a calculator to help small and medium enterprises and residential consumers determine the potential savings and financial case for installing a grid-connected solar PV system and/or a grid-connected battery.

<http://www.aginnovators.org.au/initiatives/energy/information-papers/solar-battery-calculator>

Victorian government aims to ban fracking

The Victorian Government has introduced the Resources Legislation Amendment (Fracking Ban) Bill 2016 to permanently ban all onshore unconventional gas exploration and development, including hydraulic fracturing ('fracking') and coal seam gas, and extend the moratorium on conventional onshore gas exploration and development to 30 June 2020.

<http://www.premier.vic.gov.au/banning-fracking-for-good/>

IEA focuses on renewables and natural gas

Renewables and natural gas are the big winners in the race to meet energy demand growth until 2040, according to the latest edition of the International Energy Agency's World Energy Outlook. Government policies, and cost reductions across the energy sector, enable a doubling of both renewables and improvements in energy efficiency over the next 25 years.

<http://www.iea.org/>

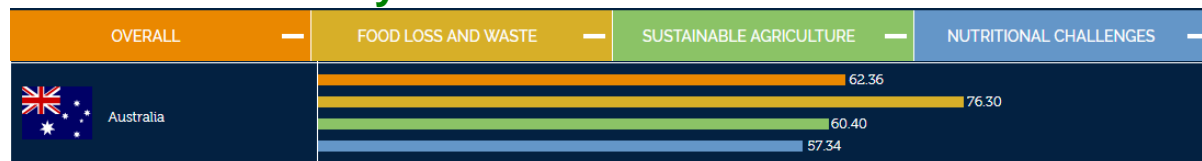
AgInnovators

AgInnovators is an online magazine to showcase innovations in agriculture, particularly energy and digital technologies. It is published by NSW Farmers and supported by NFF and a range of peak innovation bodies and agencies.

<http://aginnovators.org.au/>

FOOD

Food sustainability index



Australia ranks highly for management of food loss and waste in an international food sustainability index developed by The Economist magazine, but less highly in sustainable agriculture and nutritional challenges.

<http://foodsustainability.eiu.com/>

Provenance of Australian food products

This RIRDC report recommends the design of a Geographic Indication registration scheme for Australia's food sector as a branding option given the increasing importance of branding in domestic and export agricultural markets.

<https://rirdc.infoservices.com.au/items/15-060>

New vision for Melbourne's foodbowl

The final report of the Foodprint Melbourne project envisions highly perishable foods grown close to the city; city waste streams harnessed to build soil moisture and fertility, and delivery of recycled water. The report urges city planners to make food a central focus of city planning that addresses land use and water availability, and links city fringe farmers and urban consumers.

http://www.ecoinnovationlab.com/project_content/melbournes-food-future-planning-a-resilient-city-foodbowl/



Central Coast food collective

Central Coast food collective is an online gateway to local producers, processors, restauranteurs and vendors, all working together to promote the region's food.

<https://centralcoastfoodcollective.wordpress.com/>

Getting healthy food on the table

This information sheet from Charles Sturt University outlines strategies for regional NSW communities to combat food insecurity and food stress.

http://www.csu.edu.au/_data/assets/pdf_file/0005/2622173/Tackling-Food-Insecurity.pdf

Environmental impacts of dietary change

A review of 63 studies into sustainable diets shows that GHG emissions, and land and water use can all be reduced by dietary changes. The authors suggest that future work should assess dietary changes against environmental, economic, health, and sociocultural factors to more comprehensively assess their sustainability.

<http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0165797>

Measures to reduce food consumption emissions

Shifting food consumption to mitigate climate change is critical to fulfilling the Paris Agreement. This CGIAR assessment of available measures reveals opportunities, particularly through linking with public health and other policy areas, and some limitations.

<https://cgspace.cgiar.org/rest/bitstreams/82959/retrieve>

Fix food metrics

Current patterns of crop and livestock production and of processing, transport and consumption, are not delivering healthy, nutritious food to society, according to a recent Nature paper. Food systems are now the source of 60% of terrestrial biodiversity loss, 24% of greenhouse gas emissions, 33% of soil degradation and 61% of fish stock depletion.

<http://www.nature.com/news/fix-food-metrics-1.21050>

Global research agenda for food

International food system researchers have identified ten research priorities for a new global food agenda, including the role of food chain length and accounting for climate.

<http://www.nature.com/news/a-new-global-research-agenda-for-food-1.21052>

Peas please: A pledge for more veg

Peas please is a UK initiative to make it easier for everyone to eat vegetables, exploring opportunities along the supply chain to increase vegetable consumption sustainably. Its booklet Veg Facts benchmarks the UK's low vegetable consumption and possible reasons.

<http://foodfoundation.org.uk/peasplease/>

LAND USE

Intensification leads to fewer ecosystem services

European research has found that where humans use grasslands intensively, species diversity decreases, the landscape becomes more monotonous, and ultimately the same species remain everywhere. This results in nature no longer being able to provide its 'services', which range from soil formation for food production to pest control.

<https://www.sciencedaily.com/releases/2016/11/161130133911.htm>

National environmental monitoring sites register

This register brings together a diverse range of Australian monitoring networks in one database and on one interactive map. It ingests, stores and displays key attributes or metadata, for each monitoring network, and links users to observations where possible.

<http://www.neii.gov.au/nemsr/how-use>

Land use statistics

ABS statistics for land management in farming in Australia in 2014-15 found 82% of land was used for grazing. The area of improved pastures decreased by 25%; the area of land used for crops decreased by 2.8%. Agricultural businesses applying lime, dolomite and other types of soil enhancers in Australia increased 19 per cent.

<http://www.abs.gov.au/ausstats/abs@.nsf/Latestproducts/4627.0Main%20Features12014-15>

SUSTAINABILITY

Metrics for agricultural sustainability

This new CSIRO book provides an inventory of the metrics for sustainable agriculture such as change in soil organic carbon as an integrating metric for soil health, change in groundwater level as a metric of over-withdrawal, current and change in land use diversity as an integrating metric for biodiversity, and farm worker education as an integrating metric of social prosperity.

<http://www.publish.csiro.au/book/7484/>

Ministers agree to national environmental accounts

Commonwealth, State and Territory environment ministers have agreed to a national approach to environmental accounts in 2017, following a joint presentation by the Wentworth Group last month. The decision follows the Group's five year trial of regional environmental accounts, including central west NSW. Trial results are available online.

<http://wentworthgroup.org/programs/environmental-accounts/>



Netherlands natural capital

This report presents and investigates how government authorities, businesses and non-governmental organisations value natural capital in their strategic decision-making. Seven projects investigated the ecosystem services involved, how they could be valued, and the possibilities for capturing this value. Researchers found that the valuation of nature appeared to be a process of awareness of the significance of specific ecosystem services; monetary valuation played a limited role.

<http://themasites.pbl.nl/natuurlijk-kapitaal-nederland/wp-content/uploads/2014/pbl-2016-natural-capital-in-the-netherlands-2406-1.pdf>



EVENTS

February 5-9 2017 Restoring ecological processes, ecosystems and landscapes, Armidale
<http://conferencecompany.com.au/revegconf2017/>

May 1-4 Australasian Vertebrate Pest Conference, Canberra
<http://avpc.net.au/>

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