# NRM on farms

A monthly news summary about climate and natural resources in agriculture. **February 2017**

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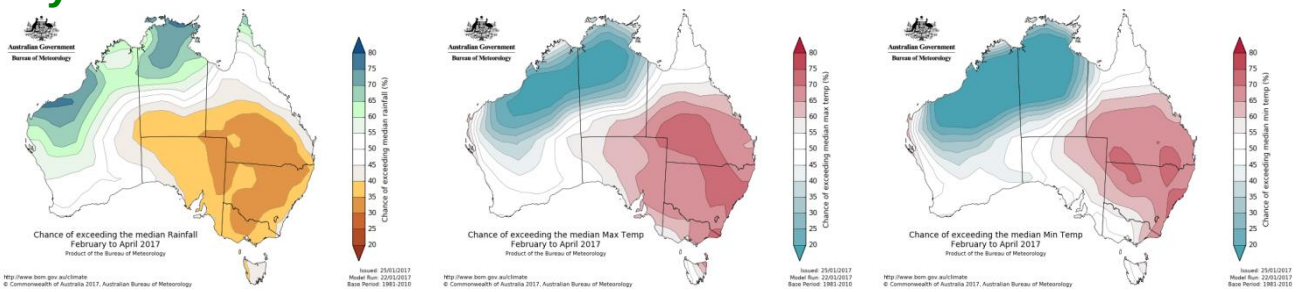
## CLIMATE

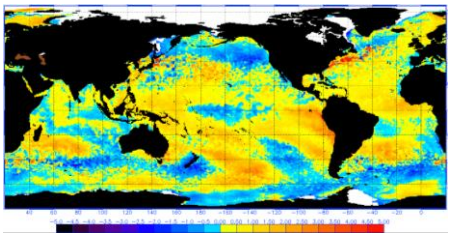
### Dry and warm outlook for NSW




NSW is likely to be drier and warmer than average over the next three months, influenced by a persistent sub-tropical ridge (higher than average pressure across the continent) with fewer low pressure systems and lower latitude cold fronts.
http://www.bom.gov.au/climate/outlooks/#/overview/summary/
http://www.bom.gov.au/climate/outlooks/#/overview/video

### Ocean temperatures

The equatorial Pacific is close to average. Waters in the southern and western Pacific and off the east coast of southeast Australia also remain warmer than average.
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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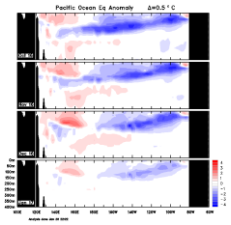
## Pacific subsurface cooling



Cooler than average water in the central to eastern equatorial Pacific has been progressively warming and shrinking, while warm anomalies in the west have decreased during January.
http://www.bom.gov.au/climate/enso/

## ENSO outlook: Inactive

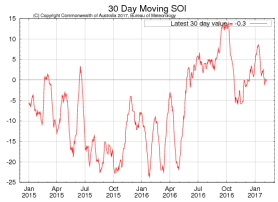
There is little sign of El Niño or La Niña developing in coming months.
http://www.bom.gov.au/climate/enso/outlook/

## Model outlook points to neutral ENSO

The El Niño-Southern Oscillation is expected to remain neutral for the remainder of the summer and autumn, with most climate models suggesting sea surface temperatures will remain near the long-term average until at least May 2017.
http://www.bom.gov.au/climate/model-summary/

## IOD remains neutral

Current outlooks suggest a neutral IOD for the end of autumn, due to the monsoon trough shifting south over the tropical Indian Ocean and changing the overall wind circulation, which in turn prevents an IOD ocean temperature pattern from forming.
http://www.bom.gov.au/climate/enso/#tabs=Indian-Ocean



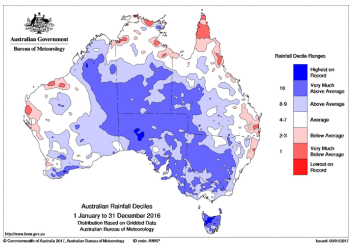

## SOI remains neutral

SOI values have generally been neutral since mid-October.
http://www.bom.gov.au/climate/enso/#tabs=SOI

## Third warmest January for NSW

NSW recorded its third-warmest January on record, the average temperature 3.34°C above the historical average. Temperatures reached 35°C at Moree for 36 consecutive days between 27 December and 31 January, more than double the record spell of 17 hot days set between 28 December 1981 and 13 January 1982. The warm conditions are due to persistence of dry weather and warm northerly winds in eastern NSW, absence of cooler outbreaks associated with southerly winds or heavy rainfall, and persistently warm sea surface temperatures in the Tasman. Rainfall was 41.6% below the January average.
http://www.bom.gov.au/climate/current/month/nsw/summary.shtml

## A year of extreme weather events



2016 was a year of extremes, including bushfires early in the year, a nation-wide heatwave in February-March, record warm autumn, widespread drought, east coast low in June, wettest ever May-September, and flooding in many states. It was the fourth-warmest year on record, and annual rainfall was 17 per cent above average. Sea surface temperatures around Australia were the warmest on record.
http://www.bom.gov.au/climate/current/annual/aus/



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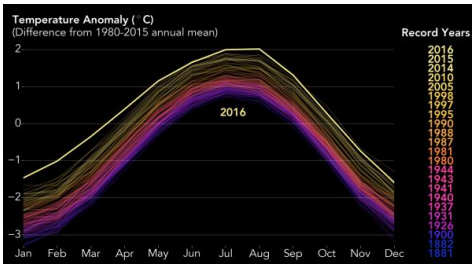
## NSW DPI seasonal conditions report

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

# GLOBAL CLIMATE

## 2016 warmest year on record globally

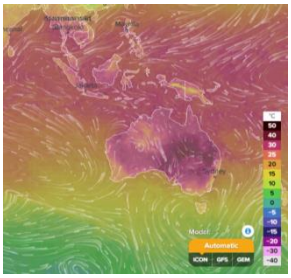



Earth's 2016 surface temperatures were the warmest since modern recordkeeping began in 1880, according to independent analyses by NASA and the National Oceanic and Atmospheric Administration (NOAA). Globally-averaged temperatures in 2016 were 1.78 degrees Fahrenheit (0.99 degrees Celsius) warmer than the mid-20th century mean. This makes 2016 the third year in a row to set a new record for global average surface temperatures.
https://www.nasa.gov/press-release/nasa-noaa-data-show-2016-warmest-year-on-record-globally/

## Climate Council review of 2016

This review from the Climate Council summarises global and Australian climate statistics for 2016. Australian climate impacts included the worst coral bleaching event in the Great Barrier Reef's history, largescale mangrove dieback in northern Australia, and a major algal bloom in the Murray River.
http://www.climatecouncil.org.au/2016-hottest-year-report

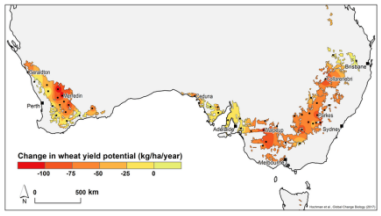
## Ventusky global weather



Ventusky is a real-time animation of global weather. It displays the development of pressure, wind, cloud cover, precipitation, and temperature, and the interactions of weather systems across oceans and continents.
https://www.ventusky.com/

# CLIMATE IMPACTS

## Changing climate stalls wheat yields

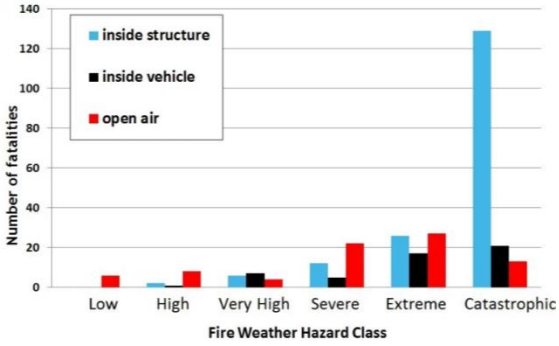



CSIRO research shows that rising temperatures and reduced rainfall, in line with global climate change, have stalled Australia's wheat yields since 1990. On average, the amount of rain falling on growing crops declined by 2.8mm per season, or 28% over 26 years, while maximum daily temperatures increased by an average of 1.05°C.
https://theconversation.com/changing-climate-has-stalled-australian-wheat-yields-study-71411

## Climate change and extreme weather

A new report from the Climate Council concludes that climate change is influencing all extreme weather events in Australia, and these are projected to worsen as the climate warms further.
https://www.climatecouncil.org.au/cranking-intensity-report

## Most bushfire losses occur in catastrophic conditions




CSIRO analysis of Australian bushfires between 1901 and 2011 found that on days where lives and properties were lost, 60-70 per cent of these losses happened on days that would now be classified as catastrophic; buildings are currently not designed to withstand these conditions. Over the period, 733 civilians and 92 firefighters lost their lives in bushfires, and just over 11,000 homes were destroyed. More than 60 per cent of people who perished outdoors did so within 100 metres of their home, and 80% occurred within 500 metres of home, mainly due to late evacuation. The findings reinforce the importance of making plans to get out of the area well before weather worsens, and sticking with those plans.
https://blogs.csiro.au/ecos/bushfire-loss-data/

## Resilience beyond bushfires

This study of the impacts of the Black Saturday and related bushfires of February 2009 on community members' physical and mental health and wellbeing highlights the influence on resilience and recovery of close friends, family, social networks, community groups and the natural environment.
http://beyondbushfires.org.au/__data/assets/pdf_file/0010/2198134/V3_Beyond-Bushfires-Final-Report-2016.pdf

## CO2 fertilisation of vegetation is affecting streamflow

Remotely sensed vegetation and water-balance measurements from 190 river basins across Australia show that sub-humid and semi-arid basins are 'greening' due to CO2 fertilisation, thereby increasing water consumption and reducing streamflow. Results suggest that projected future decreases in precipitation are likely to be compounded by increased vegetation water use, further reducing streamflow in water-stressed regions.
http://www.nature.com/nclimate/journal/v6/n1/full/nclimate2831.html

## Climate change, farm exits and regional economies

This paper reports on research which follows farm families preparing for and subsequently leaving farming. The period of exit covers the millennium drought of 2000-2010 in four case study areas in Victoria, Australia.
http://apo.org.au/files/Resource/08f._kent.pdf

## Rural communities under climate change

This policy information brief from the National Climate Change Adaptation Research Facility (NCCARF) outlines the key climate and related social impacts facing rural communities, and the policy implications for adaptation actions.
https://www.nccarf.edu.au/sites/default/files/attached_files/Rural_PIB_WEB.pdf

## Climate impact research summaries

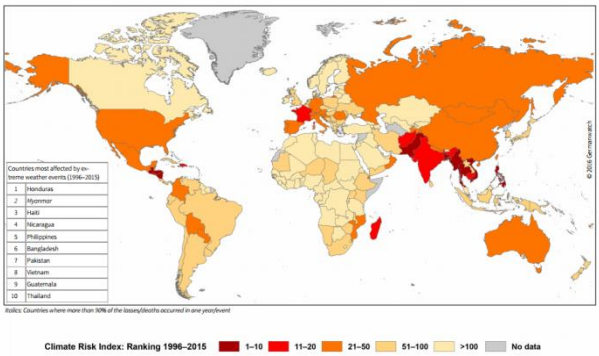
These short summaries from NCCARF cover research into a number of climate impacts including, heatwaves, floods, cyclones, bushfires and ecosystems.
https://www.nccarf.edu.au/synthesis/

## 2015 weather events and influence of climate change

The American Meteorological Society's review of extreme weather and climate events in 2015 highlights two events in Australia that were exacerbated by climate change: bushfires and crop losses in October 2015, and record low October rainfall in Tasmania.
https://theconversation.com/infographic-climate-change-and-2015s-year-of-wild-weather-70485

## Australia ranks 20th on Global Climate Risk Index 2017

This Germanwatch analysis of global weather events for the 1996-2015 period estimates that nearly 11,000 extreme weather events caused over 528,000 deaths, resulting in associated losses of US$3.08 trillion. In 2015, the main causes of damage were precipitation, floods and landslides, supporting scientific expectations of accelerated hydrological cycles caused by climate warming. Australia is ranked 20th on the index.
http://germanwatch.org/de/download/16411.pdf




## Changing climate making it harder to grow coffee

Rising global temperatures and shifting precipitation patterns are making it increasingly difficult to grow coffee economically. In Tanzania, where coffee is the country's third-largest agricultural export, night time warming has depressed productivity by about 50 percent since 1960. By 2050, forecasters say, the amount of land suitable for growing coffee globally could decline 50 percent. Scientists warn a new climate-resilient species of the crop must be developed if the world hopes to sustain its two billion cup-a-day habit.
http://e360.yale.edu/feature/on_slopes_of_kilimanjaro_climate_shifts_hit_coffee_harvest/3065/

## The cost of extreme weather

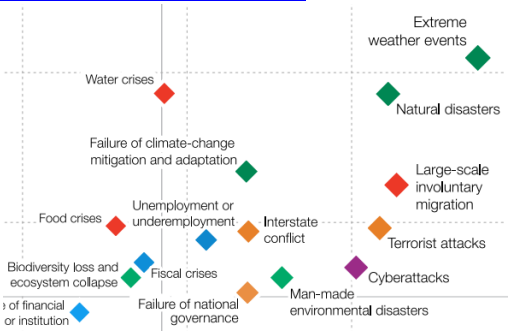
The European Environment Agency reports that extreme weather has cost Europe more than £330bn and the lives of 85,000 people since the 1980s.
http://www.eea.europa.eu/publications/climate-change-impacts-and-vulnerability-2016

## Natural disaster losses of $175 billion in 2016

Insurers paid out around $US50 billion for natural disaster claims in 2016, almost double 2015's payout of $US27 billion. Losses totalled US$175bn, with some $US125 billion uninsured. Costliest catastrophes were the Japanese earthquake, floods in China, US and Europe, and US/Caribbean hurricane. North America was hit by more loss events in 2016 than in any other year since 1980, with 160 events recorded, and accounted for 33% of natural catastrophe losses worldwide.
https://www.munichre.com/us/property-casualty/press-news/press-releases/2016/natcat-2017/index.html

## Changing climate is one of the world's main risks

The World Economic Forum's 2017 global risks report says extreme weather events, natural disasters, water crises and food crises are among the largest risks facing the world according to the World Economic Forum.
http://www3.weforum.org/docs/GRR17_Report_web.pdf




# CLIMATE TOOLS

## Climate change and governance

The Australian Institute of Company Directors has released a report on climate change risks and governance. It covers global and corporate context for climate change risks, good practice, and governance challenges.
http://aicd.companydirectors.com.au/advocacy/governance-leadership-centre

## National review of climate change policies

The Australian Government is reviewing its climate change policies. The terms of reference include the role of R&D, and opportunities and challenges of reducing emissions on a sector-by-sector basis. A discussion paper and call for public submissions will be announced soon.
http://www.environment.gov.au/climate-change/review-climate-change-policies

## Future landscapes in Central Victoria

A two year Future Landscapes project tin central Victoria has highlighted where the region can capitalise on potential future agricultural production while planning for land use and the protection of biodiversity assets.
https://futurelandscapes.cultivate.org.au/

## Agricultural climate webinars

Agriculture Victoria runs free webinars on a range of topics including seasonal risk and climate change projections and impacts, adaptation opportunities and innovative farming practices and soil moisture monitoring. You can access past webinars and register for future seminars.
http://agriculture.vic.gov.au/agriculture/farm-management/weather-and-climate/climate-webinars

## Building in bushfire prone areas

CSIRO and Emergency Management Victoria have developed new guidelines to address bushfire vulnerabilities and challenges faced by steep coastal towns under tree canopy such as Wye River which lost 80% of its houses in December 2015 fires. These bushfire protection measures take into account not just building design and construction, but also water supply, gas supply, landscaping, defendable space, and building location and separation.
http://wyesepconnect.info/building-guideline/


## Flood ready flood safe

The Queensland Government has produced a series of factsheets to assist rural and urban-fringe landholders to prepare for, and recover from, flood events.
http://www.rgc.org.au/publications/

## Dealing with uncertainty

The Academy of Science has released recommendations from a recent think-tank on dealing with uncertainty, including the need for governments to adopt evidence-based and proactive adaptation and risk mitigation strategies.
https://theconversation.com/listen-up-a-plan-to-help-scientists-get-their-research-heard-by-decision-makers-71627

# EMISSIONS

## Fifth ERF auction in April

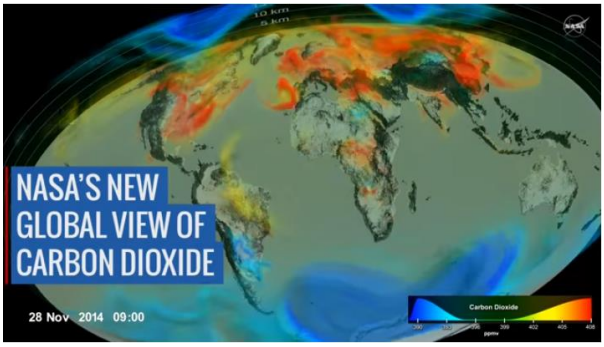
The Clean Energy Regulator has announced a fifth Emissions Reduction Fund auction will be held on 5-6 April 2017. Deadline for project registration applications is 21 February.
http://www.cleanenergyregulator.gov.au/ERF

## The growing role of methane in climate change

Methane emissions are rising faster than at any point in the last twenty years. In 2007 atmospheric methane concentrations started to rise at a rate ten times that in 2000 to 2006, reaching 1834 parts per billion in 2015. The reasons for this renewed growth are still unclear, but it is most likely from agriculture, with smaller contributions from fossil fuel use and possibly wetlands.
http://iopscience.iop.org/article/10.1088/1748-9326/11/12/120207

## A year in the life of Earth's CO2

This NASA visualization shows how carbon dioxide moves and changes at different heights in the atmosphere over 12 months.
http://www.climatecentral.org/news/nasa-new-co2-visualization-20978



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## 10 ways to remove carbon emissions


This useful graphic outlines 10 ways to remove carbon emissions, including biochar, soil carbon sequestration, bioenergy crops, building with biomass and forests.
https://www.carbonbrief.org/explainer-10-ways-negative-emissions-could-slow-climate-change

# SOILS

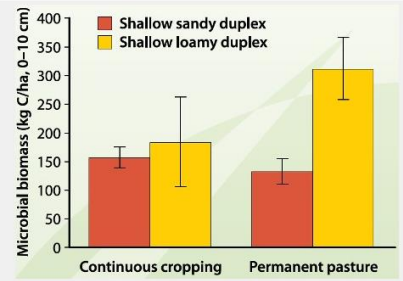
## Grazing stubble increases crop nitrogen

A seven year trial at Temora to quantify tradeoffs between grazing stubbles, resource capture and subsequent crop performance, found that grazing wheat and canola stubbles increased mineral N of the subsequent wheat crop by 19 kg/ha, and grain N uptake by 7 kg/ha N. This could be due to rapid mineralisation of N in livestock excreta, and/or reduction in stubble carbon inputs to soil due to grazing lowering rates of N immobilisation.
http://www.ini2016.com/pdf-papers/INI2016_Hunt_James.pdf

## NSW soil organic carbon stocks under climate change

Researchers using climate change models to predict soil organic carbon found that most models showed a decline, but some predicted an increase. The variation is attributed to uncertainties within the models. Soil organic carbon changes varied across soil types, current climate, and land use regimes. For example, the projected average decline of soil organic carbon was less than one ton per hectare for sandy, low-fertility soils in dry conditions under cropping regimes. It was 15 times as much for clay-rich, fertile soils in wet conditions under native vegetation regimes.
https://www.sciencedaily.com/releases/2017/01/170111133851.htm

## Soil microbes respond to summer rain

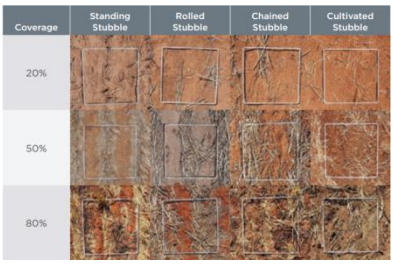



Summer rainfall can lead to significant flush of soil microbial activity due to plentiful moisture and substantial root and shoot material available for microbes. Extra biomass in the system also increases microbial species diversity.
Compared to sandy soils, clay soils have a better microbial response to rainfall over summer because soil organic matter levels tend to be greater and, as water retreats into the small pores present in clay, microbial activity continues for a longer period.
https://grdc.com.au/Media-Centre/GRDC-E-Newsletters/WithTheGrain/January-2017/What-is-happening-to-my-soil-microbes-over-summer

## Bacterial diversity driven by C:N:P ratios

Scottish research has found that bacterial diversity and composition are primarily driven by variation in C:N:P ratios linked to different land uses, and secondarily driven by drivers such as climate, soil spatial heterogeneity, soil pH, root influence (plant-soil microbe interactions) and microbial biomass (soil microbe-microbe interactions).
http://onlinelibrary.wiley.com/doi/10.1111/1462-2920.13642/full

## North Central CMA soil health guide

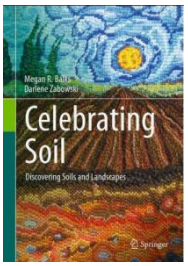



Victoria's North Central CMA has released a practical guide to understanding the region's soil types combined with a soil health scorecard to complement laboratory test results.
http://www.nccma.vic.gov.au//Publications/StrategiesPlans/index.aspx?itemDetails=9573&objectType=kms&searchfields=cs_ItemName

## New book: Soils and pulses

This book explains the role of pulses in improving soil health, adapting to and mitigating climate change, and ultimately contributing to food security and nutrition. The book also discusses the role of pulses in restoring degraded soils and their contribution to pursuing the practice of sustainable soil management.
http://www.fao.org/3/a-i6437e.pdf

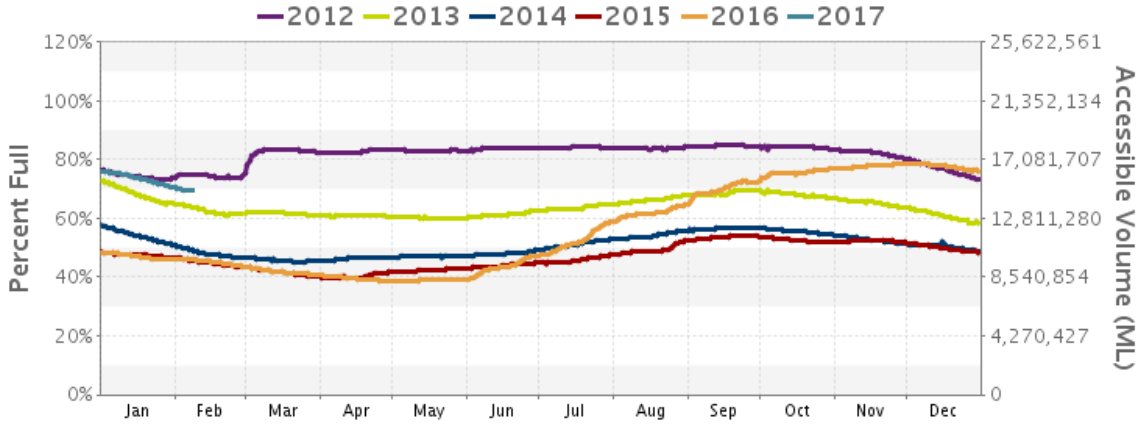
## Celebrating soil: Discovering soils and landscapes




This richly illustrated book helps readers understand how soils are related to the landscapes in which they form. It celebrates the diversity, importance, and intrinsic beauty of soils around the world.
http://www.springer.com/gp/book/9783319326825

# WATER

## NSW water storages




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

## NSW Sustaining the Basin: Round 9 funding is now open

Irrigators with eligible entitlements in the NSW Border Rivers and Lower Namoi catchments can now apply for funding under Round 9 of Sustaining the Basin program. Irrigators can submit an infrastructure funding application any time until 30 June 2017; funding is no longer contingent on having a compliant water meter.
http://www.dpi.nsw.gov.au/land-and-water/water/sustaining-the-basin

## New ATO register for foreign held water entitlements

Foreign investors now have to register when purchasing water entitlements in Australia. Under legislation passed in December, foreigners with registrable water entitlements or contractual water rights have to notify the ATO each year. The ATO will make summary statistics on foreign ownership of water entitlements available on its website.
http://minister.agriculture.gov.au/joyce/Pages/Media-Releases/delivering-clarity-on-water-ownership.aspx

## New irrigation app for vineyards

A new smartphone app that promises to help wine-grape growers measure the water status of their vines is currently being trialled in vineyards prior to release later this year. The app allows a grower to take images of the grapevine canopy with a thermal camera attached to a smartphone. The app then analyses the images to calculate the vines' water status.
http://www.aginnovators.org.au/news/can-smart-new-app-help-quench-vines-thirst

## New rainfall intensity estimates available

New Intensity–Frequency–Duration (IFD) design rainfall estimates have been released for use in flood estimation and water infrastructure design. The new IFDs more accurately estimate rainfall intensity, frequency and duration in specific locations, and are to design water infrastructure such as gutters, culverts, roofs, stormwater drains, flood levees and retarding basins.
http://www.bom.gov.au/water/news/article.php?id=150

## Australian rainfall and runoff guidelines updated

The Australian rainfall and runoff guidelines have been updated, taking into account over 100,000 storm events to enable engineers and consultants to produce more accurate and consistent flood studies and mapping. The guidelines incorporate BoM's new IFD rainfall estimates and are free to all users.
http://arr.ga.gov.au/news

## Landscape Water Balance model available

The model behind BoM's Australian Landscape Water Balance is now available to the hydrological community. The modelling system estimates water fluxes and stores in the Australian landscape including daily 5 km by 5 km gridded soil moisture, runoff, evapotranspiration and deep drainage values, back to 1911. BoM will be conducting training workshops on the system in early 2017.
http://www.bom.gov.au/water/news/article.php?id=147

## Onfarm flood intervention

Farmers in the UK's Upper Aire catchment have introduced several natural flood management interventions on their farms, including woodland to reduce runoff and increase the rate that rainwater soaks into the soil; hedges (50m of hedge can store between 150 and 375m3 of water); leaky dams in headwater streams to provide temporary storage in times of high flow; and grassland aeration to reduce runoff and improve grass growth.
http://www.farmingfutures.org.uk/blog/farming-water

# BIODIVERSITY

## Beeconnected app


CropLife Australia, in partnership with the Australian Honey Bee Industry Council, has launched BeeConnected to enable collaboration between farmers and beekeepers. Registered farmers and beekeepers are notified of spraying activities and hive locations and can message each other. The app is free.
http://www.croplife.org.au/industry-stewardship/ppi/beeconnected/

## LLS survey on pest animal management

LLS is surveying NSW landholders on pest animal management tools and barriers. The survey is open until Friday 17 February 2017.
http://open.lls.nsw.gov.au/pestsurvey

## Preparing a property weed management plan

This guide from South East LLS assists landholders to develop a plan that will consider how weed management can fit in with their overall property management decisions.
http://southeast.lls.nsw.gov.au/__data/assets/pdf_file/0011/685460/integrated-weed-management-plan-guide.pdf

## NZ dairy farmer attitudes to stream plantings

A NZ research study of dairy farmers who had fenced and planted riparian margins found they increased both farm performance and environmental enhancement, compared with farmers who only fenced their creek banks and did not think there were any additional benefits to be gained by planting.
http://decision-point.com.au/article/stream-side-plantings-and-ecosystem-services/

## Birds and butterflies struggle with climate change

UK researchers analysis of 114 bird and 63 butterfly species at 613 sites over the past 30 years has found that both warm and cold-weather bird species have declined in total abundance and species richness, but cold-weather species numbers have declined much faster. There is concern that some species could become extinct where there is not enough natural habitat to adapt to warming temperatures.
https://www.ceh.ac.uk/news-and-media/news/birds-and-butterflies-struggle-climate-changeUK

## Biodiversity adaptation competition

The National Adaptation Network for Natural Ecosystems is offering prizes for original case studies that demonstrate activities that minimise the impacts of climate change on Australia's biodiversity and ecosystems. Up to four winners will be awarded $3000 each to support their conservation initiatives. Deadline is 24 March.
https://climatechangeresearch.network/nccarf/case-study-competition

## Solutions to farming for biodiversity

'Farming for Biodiversity' is a global contest to reward efforts for biodiversity conservation on farms. It focuses on behaviour changes in agriculture suitable for broad adoption. After the contest concludes, a series of workshops aims to spread the most promising approaches around the world.
http://www.solutionsearch.org/contest/farming-biodiversity#enter

## What works in conservation

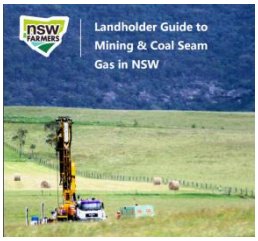
This UK book provides an assessment of the effectiveness of 763 conservation interventions based on summarized scientific evidence.
http://www.openbookpublishers.com/product/552

# ENERGY

## New wind energy framework

The NSW Government has released a new wind energy framework to provide greater clarity, consistency and transparency for industry and the community regarding ssessment and decision-making on wind energy projects.
http://www.planning.nsw.gov.au/Policy-and-Legislation/Renewable-Energy

## Landholder guide to mining and CSG in NSW




This new guide from NSW Farmers provides up to date and comprehensive information on mining and coal seam gas activity and legislation in NSW.
http://www.miningandcsginfo.org/landholder-guide

## 2016 Queensland CSG survey

A CSIRO survey of residents affected by the Western Downs CSG industry finds that 68% either tolerate or accept it; 19% approve or embrace it; and 13% reject it. The 2016 survey showed a tendency towards more negative views than the 2014 survey. The biggest change in wellbeing from 2014 was the decrease in satisfaction in relation to jobs and employment opportunities. The biggest improvements were in roads and the quality of the environment (such as dust and noise levels).
https://theconversation.com/queensland-communities-remain-lukewarm-about-coal-seam-gas-csiro-survey-70709

## 'Digeponics' reduces energy use and carbon emissions

Norwegian researchers have developed a greenhouse insulated by soap bubbles and powered by biogas from food and garden waste. Digestate produced by the biomass digester fertilises plants in the greenhouse. The 'digeponics' system reduces heat energy demand by 80% and carbon emissions by 95%. Issues that need to be resolved include optimisation of digestate treatment methods and up-scaling the system to supply vegetables at reasonable prices for local consumption.
http://www.fcrn.org.uk/research-library/high-yields-realised-pilot-bubble-insulated-%E2%80%98food-waste-food%E2%80%99-growing-system-while

# FOOD

## New VCE food studies curriculum

The Victorian Education Department has introduced a new VCE food studies curriculum for Years 11&12 covering past and present patterns of eating, Australian and global food production systems, and physical and social functions and roles of food.
http://www.vcaa.vic.edu.au/Documents/vce/technology/FoodStudiesSD_2017.pdf

## Building future food leaders

This guide is designed to help young people understand the food system and ways to make it more sustainable and inclusive.
https://www.hivos.org/sites/default/files/building_future_food_leaders_2016.pdf

# LAND USE

## CSIRO CSG land value study

A CSIRO study has estimated that Queensland farmers lose money through loss of productive land when CSG mining moves into farming areas. According to the model used in the study, a sample area averaged a loss of $2.17 million over 20 years when CSG mining activity was present.
http://www.abc.net.au/news/2016-12-16/coal-seam-gas-mining-costs-farmers-millions-csiro-study-finds/8124834

## SEED: Sharing and Enabling Environmental Data

This new portal has been developed with and for the community of NSW, as a central place for everyone to find data about the environment. The portal enables users to visualise data without requiring scientific expertise or specialist mapping software.
https://www.seed.nsw.gov.au/

## Prospects for intercropping

This review of intercropping opportunities to benefit mechanised rain-fed farming systems found a number of prospects and several important research issues.
http://www.publish.csiro.au/cp/CP16211

# SUSTAINABILITY

## Economic benefits of landcare: case studies

These three case studies, covering liming in the WA grains industry, riparian management in the cotton industry, and nutrient/effluent management in the Victorian dairy industry, highlight some of the on-farm and off-farm economic impacts of Landcare.
http://www.nrm.gov.au/publications/economic-benefits-landcare

## Strategic importance of soil, water and food

This paper from Julian Cribb argues that soil and water will be increasingly critical elements in global, regional and national security and must be factored into defence, security and sustainability planning at all levels.
http://www.futuredirections.org.au/publication/strategic-importance-soil-water-food-early-mid-21st-century/

## Future Earth to be established in Australia

Australia's Academy of Science is establishing an Australasian node of the global program Future Earth to integrate physical sciences with the social sciences and humanities to address some of humanity's most complex problems, such as climate change, food security and water supply. The establishment phase is expected to last 12-24 months.
https://www.science.org.au/academy-newsletter/dec-2016-106/sustainability-focus-future-earth-australia

## 40 important research questions for business sustainability

This report from University of Cambridge highlights business concerns around the sustainable management of food, energy, water and the environment. For instance, businesses want to know risks to sustainability and business of low food-crop diversity (dominance of wheat, maize and rice), risk hotspots for retailers based on the impact of primary production, and energy and food implications of peak phosphorus as a critical yet finite natural resource.
http://www.cisl.cam.ac.uk/publications/natural-resource-security-publications/nexus2020-the-most-important-research-questions-for-business-sustainability

# EVENTS

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| Feb 4-28 | Sustain: Urban agriculture series, nationwide<br>http://www.uaf.org.au/aboutslf2017/ |
| May 1-4 | Australasian Vertebrate Pest Conference, Canberra<br>http://avpc.net.au/ |

# 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.
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