# NRM on farms

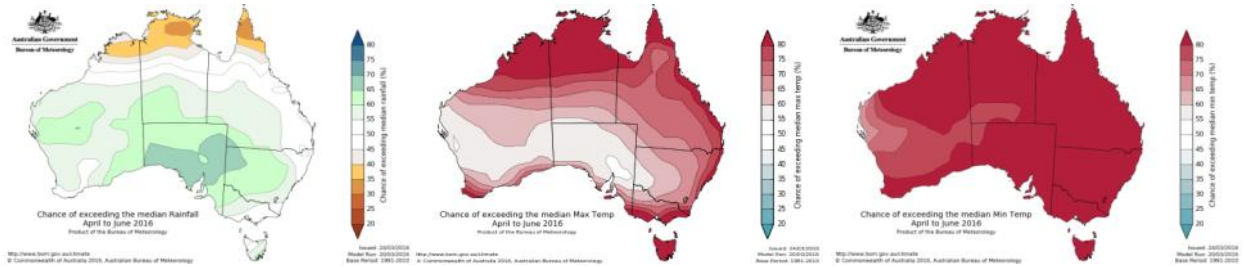
A monthly news summary about climate and natural resources in agriculture. April 2016

## CONTENTS



## CLIMATE

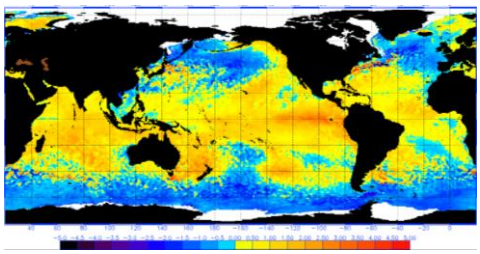
### NSW seasonal outlook




NSW is likely to experience average to above average rainfall for the next three months, along with warmer than average days and nights. Climate influences include a warm Indian Ocean, weakening El Niño and warm sea surface temperatures around much of Australia.
http://www.bom.gov.au/climate/outlooks/#/overview/summary/
http://www.bom.gov.au/climate/outlooks/#/overview/video

### Ocean temperatures

Warm anomalies have decreased along the equator, increased east of Australia, and persist over much of the Indian Ocean.
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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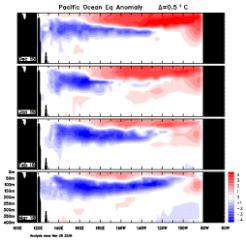
## Subsurface temperatures

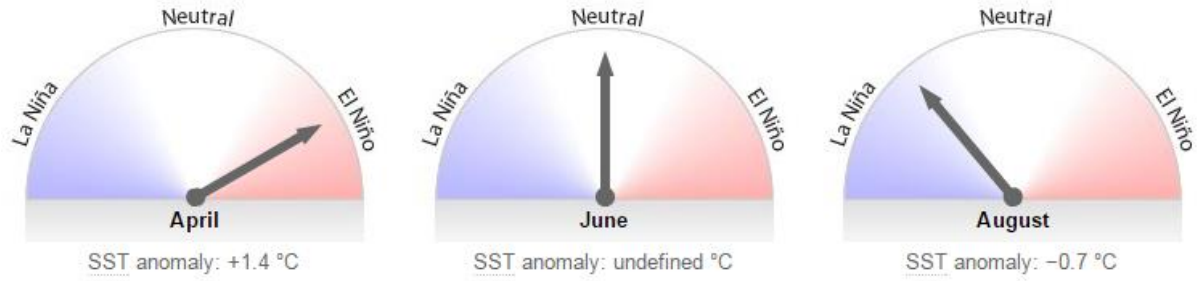


Sub-surface temperature anomalies continue to show a cooling trend in the central and eastern Pacific.
http://www.bom.gov.au/climate/enso/

## El Niño continues to decline

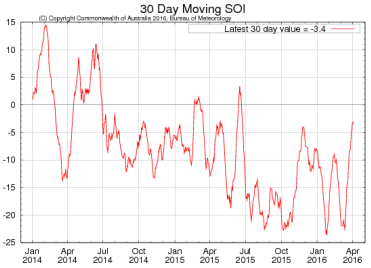
El Nino continues to decline, and international climate models suggest it will weaken during the southern autumn, returning to neutral levels by mid-2016. Neutral levels and La Niña are equally likely in winter and spring. Accuracy of forecasts at this time of year is lower than at other times, so caution should be exercised. The record warm temperatures in the Indian Ocean may provide extra moisture for rain systems as they cross Australia during the southern autumn.
http://www.bom.gov.au/climate/enso/

## Model outlook indicates waning El Nino




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

## SOI fluctuating but still negative




The SOI is much closer to neutral values, but fluctuations during Australia's northern wet season (October-April) are not unusual because tropical systems near Darwin and Tahiti affect atmospheric pressure. During this period 90-day values can provide more reliable guidance. The current 90-day SOI is −15.3.
http://www.bom.gov.au/climate/enso/#tabs=SOI

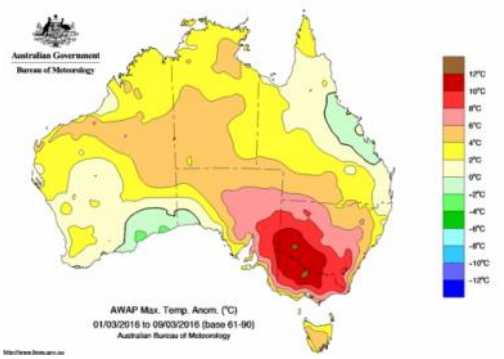
## Possible negative IOD by August

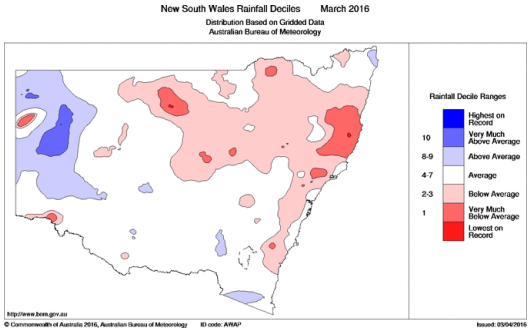
The IOD is currently neutral as is usual at this time of year, but three of five international models monitored by BoM indicate negative IOD conditions (wetter) are possible by August.
http://www.bom.gov.au/climate/enso/#tabs=Indian-Ocean

## Hot and dry March for NSW

NSW's March rainfall was 45% below average with parts of the east and north experiencing their driest March on record. Average mean and minimum March temperatures were the warmest on record. A prolonged heatwave early in the month broke March records for extended warm periods. The persistence of the heat in northern Victoria and inland New

South Wales exceeded any previous event in March, and in some areas has been approaching record levels for any time of year.




http://www.bom.gov.au/climate/current/statements/scs55.pdf
http://www.bom.gov.au/climate/current/month/nsw/summary.shtml#maps

## NSW DPI seasonal conditions report

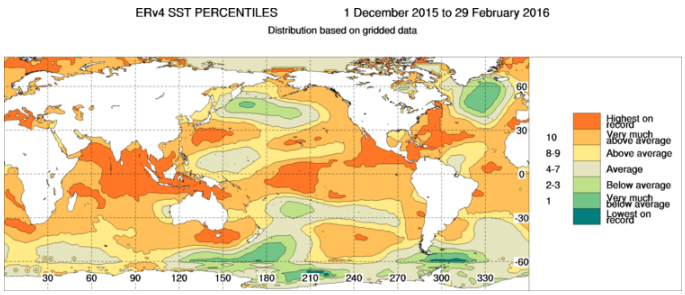
Subscribe to NSW DPI's seasonal conditions report, and the climate summary which provides a snapshot of the monthly report in an easy to read four-page format with additional graphs and charts.
http://www.dpi.nsw.gov.au/agriculture/emergency/seasonal-conditions/regional-seasonal-conditions-reports

# CLIMATE RESOURCES

## SE Aust heat smashes records


South-eastern Australia's exceptionally long and hot warm spells in early March smashed records. Over the period from 1 to 4 March, maximum temperatures were 8-12°C above average over most of south-eastern Australia. Sydney experienced a record breaking 39 consecutive days over 26°C, smashing the previous record of 19 days. Prolonged hot temperatures contributed to a major algae bloom in the Murray River.
https://www.climatecouncil.org.au/marchheatreport

## Summer sea temperatures Australia's hottest on record




Australia experienced record ocean temperatures over summer. In the north, reduced cloud cover during the recent weak monsoon season allowed more sunshine to heat the ocean surface, and weak trade winds failed to stir up the water and disperse the heat deeper into the ocean. In the south, the East Australian Current extended south to Tasmania. This current is getting stronger due to the southward movement of high



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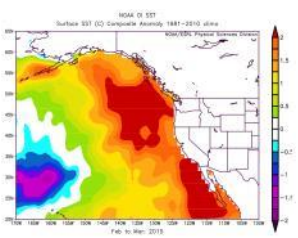
pressure systems towards the pole. Warm sea temperatures this summer and in the past have seen declines in coral reef health, and strains on commercial fisheries and aquaculture. Surface temperatures over the entire Indian Ocean and coastal Australian waters are likely to remain well above average for the next few months. There are also signs that surface currents are moving warm El Niño waters from the eastern Pacific over to the western Pacific, towards Australia. There is potential for the East Australian Current to continue to transport this warmth to southern waters as far as Tasmania. Warm water could also be transported through Indonesia and travel south along the Western Australian coast via the warm Leeuwin Current, potentially causing further warming of already record warm waters.
https://theconversation.com/this-summers-sea-temperatures-were-the-hottest-on-record-for-australia-heres-why-56906

## Ocean heatwaves are increasing



US research has found that marine heatwaves in the north Atlantic and Pacific oceans have become more common since the 1970s. They are more likely during an El Niño year and when the Pacific Decadal Oscillation brings warmer temperatures off the west coast of North America. Two recent US marine heatwaves similar to others seen in the historical record were pushed into new territory by the overall warming of the surface oceans. The hot water 'blob' in the northeast Pacific (right) had surface temperatures 1.5 C above normal for 17 months.
https://www.sciencedaily.com/releases/2016/03/160330184418.htm

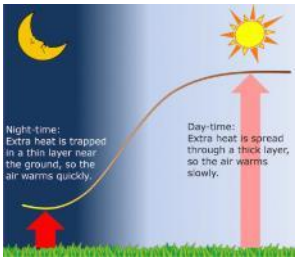
## Supercomputer to improve BoM seasonal outlooks

Thanks to a new supercomputer, BoM is working to enhance the frequency of its seasonal outlooks from monthly to weekly, and increase outlook resolution from 250 kilometres to 60 kilometres to make the outlooks more localised and relevant to individual farmers.
http://www.agriculture.gov.au/about/water/water-matters/issue-38#1

## US strategies to improve seasonal forecasting

A new report from the US outlines four strategies to improve seasonal forecasting. Engage the community that uses forecast products, to match what is scientifically feasible with what users find useful. Increase the skill and accuracy of sub-seasonal to seasonal forecasts. Improve the forecasts of extreme and disruptive events and the consequences of unanticipated events such as volcanoes, meteor impacts, and oil spills. Develop more sophisticated models to include variables such as air quality and sea-ice characteristics.
https://www.sciencedaily.com/releases/2016/03/160329113306.htm

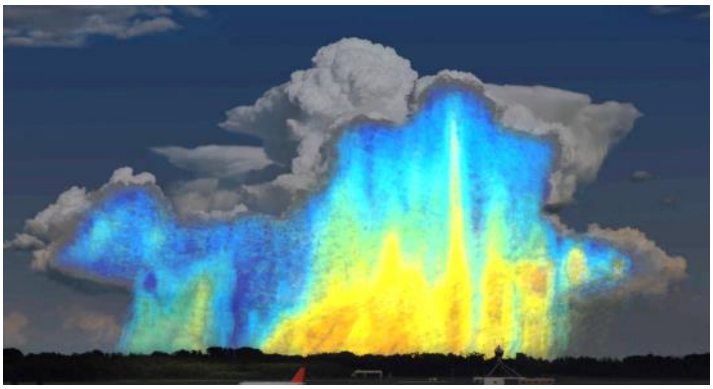
## Why night-time temperatures are warming faster




Global night-time temperatures are warming much faster than daytime temperatures and this has been attributed to changes to cloud cover, precipitation or soil moisture. However a new study suggests that it is due to differences in the boundary layer, the layer of air just above the ground. At night this layer is very thin, just a few hundred meters, so warms up very quickly compared with the daytime boundary layer which grows up to a few kilometres.
http://phys.org/news/2016-03-nights-warmer-faster-days.html

## Raindrop size determines storm severity

Satellites show that drop size distribution helps determine how big a storm will grow, how long it will last and how much rain it will ultimately produce. In general, drops tend to be bigger in the cores of clouds because they collide with each other and aggregate as they fall towards Earth, while smaller droplets occur at the edges and higher altitudes. Drops tend to be small when they miss colliding into others or break apart. Smaller drops tend to evaporate faster and subsequently cool the air more. This leads to stronger flow of downward moving air that can cause damaging winds when they reach the ground.



**Above: Conceptual image showing the size and distribution of raindrops within a storm. Blues and greens represent small raindrops up to 3mm. Yellows, oranges, and reds represent larger raindrops 4-6mm in size. A storm with a higher ratio of yellows, oranges, and reds will contain more water than a storm with a higher ratio of blues and greens.**

However, these same downdrafts can interfere with the upward flowing air that fuels the storm and cause the storm to weaken or dissipate. Understanding of raindrop distribution will improve weather models and forecasts.

http://www.nasa.gov/feature/goddard/2016/size-matters-nasa-measures-raindrop-sizes-from-space-to-understand-storms

## Blocking highs are deflecting California's storms

The atmospheric patterns associated with California's record breaking drought have become more common in recent decades. California's driest and warmest years are almost always associated with blocking ridges of high atmospheric pressure that deflect the Pacific storm track away from California. A review of seasonal conditions has found that California is having fewer 'average' years, and more extreme wet and dry years.

http://advances.sciencemag.org/content/2/4/e1501344

## Hotter summers changing French grape harvests

A recent study in Nature Climate Change has found that French grape harvests have shifted forward by days or even weeks over the last few decades. Temperatures are climbing so high that grapes now mature even if conditions are wet.

http://www.carbonbrief.org/climate-change-brings-early-grape-harvests-for-french-wine

## Plant behaviour has implications for global temperatures

Australian research into the role of plant stomata, small pores on plant leaves that take in carbon dioxide and lose water to the atmosphere, has found that many plants release less water than expected which has important implications for global temperatures. If plants release less water there is more warming and a consequent increase in heat wave intensity. The biggest temperature changes were projected to occur over needle leaf forests, tundra and agricultural land used to grow crops.

https://www.sciencedaily.com/releases/2016/03/160321200327.htm

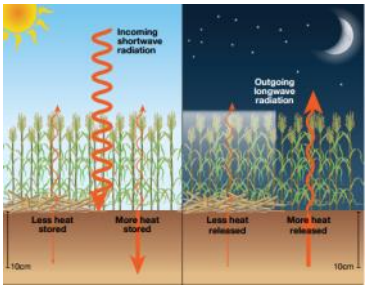
http://www.nature.com/articles/srep23418

## Grain farming after drought

Grain farming after drought workshops being run in Victoria focus on what growers can do at little expense to minimise risk and reduce costs going into the cropping season. Activities include soil testing, checking for root diseases, knowing herbicide residue levels, changing sowing times of some crops, eliminating summer weeds, choosing rotations, and running livestock in containment areas.
http://www.grdc.com.au/Media-Centre/Media-News/South/2016/03/Workshops-supporting-growers-after-drought-years

## Managing frost risk

GRDC has produced a technical fact sheet on tactics for managing frost risk, including increasing the capacity of the soil heat bank to radiate heat overnight to minimise frost damage.
http://elibrary.grdc.com.au/ark!!33517/x4vcv2x/yaabyha




## Climate · Action · Farming website

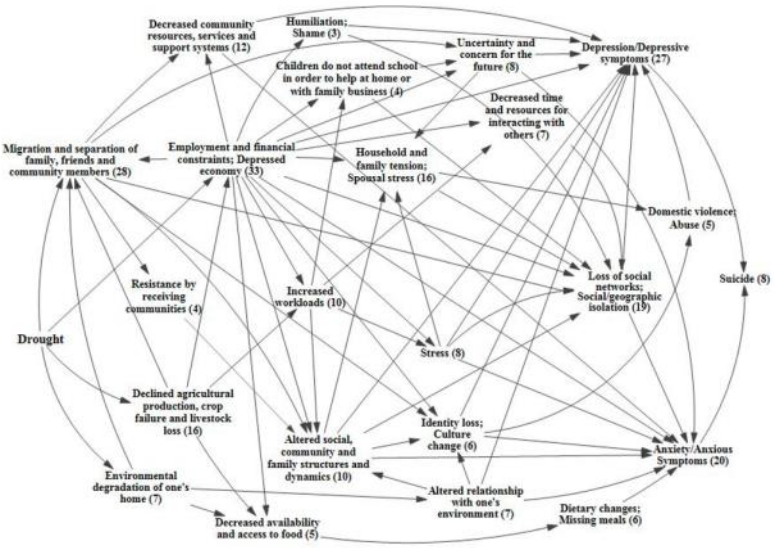
WA's South Coast NRM group has developed this website to help the community to understand some of the challenges of a changing climate in a region where rainfall has decreased 10-20% in the past 30 years and there has been an overall warming of temperatures. Further declines in rainfall are predicted. The website provides information on climate predictions for the region, farming enterprise impacts and risk management.
http://climateactionfarming.com.au/


## CoastAdapt online forum

As the first step in launching CoastAdapt later this year, NCCARF has opened an oline forum for practitioners and researchers with an interest in adaptation to discuss issues, learn from one another, and find out about the latest news in adaptation
www.nccarf.edu.au

## Mental health and drought

A US literature review of the mental health effects of drought has created this diagram to illustrate the pathways linking drought effects to mental health outcomes.
http://www.mdpi.com/1660-4601/12/10/13251/htm



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# EMISSIONS

## Mitigation potential of the livestock sector

A new study reports that livestock accounts for up to half of the technical mitigation potential of the agriculture, forestry and land-use sectors through management options that sustainably intensify livestock production, promote carbon sequestration in rangelands and reduce emissions from manures, and through reductions in the demand for livestock products. The economic potential of these management alternatives is less than 10% of what is technically possible because of adoption constraints, costs and numerous trade-offs. More research and investment are needed to increase the affordability and adoption of mitigation practices, to moderate consumption of livestock products where appropriate, and to avoid negative impacts on livelihoods, economic activities and the environment.
https://theconversation.com/to-reduce-greenhouse-gases-from-cows-and-sheep-we-need-to-look-at-the-big-picture-56509
http://www.nature.com/nclimate/journal/vaop/ncurrent/abs/nclimate2925.html

## Food emissions need attention

A new paper from Nature concludes that the greenhouse gas footprint of food is growing, and the role of the food system in climate mitigation is not receiving the attention that it urgently needs.CO2 emissions from deforestation together with methane and nitrous oxide emissions are mainly associated with the process of making land available for food production and the growing of food in croplands and rangelands. Opportunities for mitigation in this sector are plentiful, but they can only be realised with a concerted focus.
https://theconversation.com/global-food-production-threatens-to-overwhelm-efforts-to-combat-climate-change-55946

## Livestock emissions and energy videos

The Tasmanian Farming Futures project is working with industries to help farmers understand and reduce emissions, and increase energy efficiency. Two recent videos cover energy in livestock and nitrogen in livestock.
Energy in livestock: https://youtu.be/ZRUrlCPdS8Q
Nitrogen in livestock: https://youtu.be/7tOYzzM_IUc

## CH4 and N2O emissions are twice CO2 land sequestration

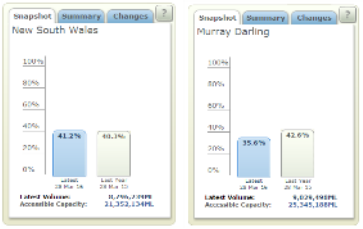
US research has found that human-induced emissions of methane and nitrous oxide overwhelmingly surpass the ability of the land to soak up carbon dioxide emissions, which makes the terrestrial biosphere a contributor to climate change. Emissions vary considerably by region. The human-induced emissions in Southern Asia, including China and India, had a larger net warming effect compared to other areas, with 90% of the world's rice fields and more than 60% of the world's nitrogen fertiliser use. The methane emissions are largely from rice cultivation and livestock, while human-made fertilisers are a major source of nitrous oxide.
https://www.sciencedaily.com/releases/2016/03/160309135706.htm

# WATER

## NSW inquiry into rural and regional water supply

The New South Wales Government will hold an 18 month inquiry into the augmentation of water supply for rural and regional New South Wales. Its terms of reference include the management of the water supply to Broken Hill and the management of the Menindee Lakes, flood mitigation, efficiency and sustainability of environmental water, and inter-valley water transfers. Closing date for submissions is Sunday, 19 June 2016.
http://www.parliament.nsw.gov.au/prod/parlment/committee.nsf/0/9FC5C8231EFCD9BDCA257F7E007D46DE

## NSW water storages




At the end of March NSW water storages were at 40% of capacity and MDB storages at 35%.
http://water.bom.gov.au/waterstorage/awris/

## Organic vs conventional irrigation water use in MDB

Comparison of certified-organic and conventional irrigation water-use in the MDB suggests a need to reorientate irrigation policy towards practices that promote better soil conditions and water management, rather than focussing on subsidies for technology adoption. The study found that, overall, organic irrigation farms use less absolute water than conventional farms; use a smaller percentage of water received; and are more water-use productive.
http://www.sciencedirect.com/science/article/pii/S092180091500066X

## Post flood farming videos

Hunter LLS has produced four videos on flood readiness, and post-flood pastures and stocking density, animal health and giant reed control.
https://www.facebook.com/HunterLLS/videos/916295658428270/

## Water for Victoria

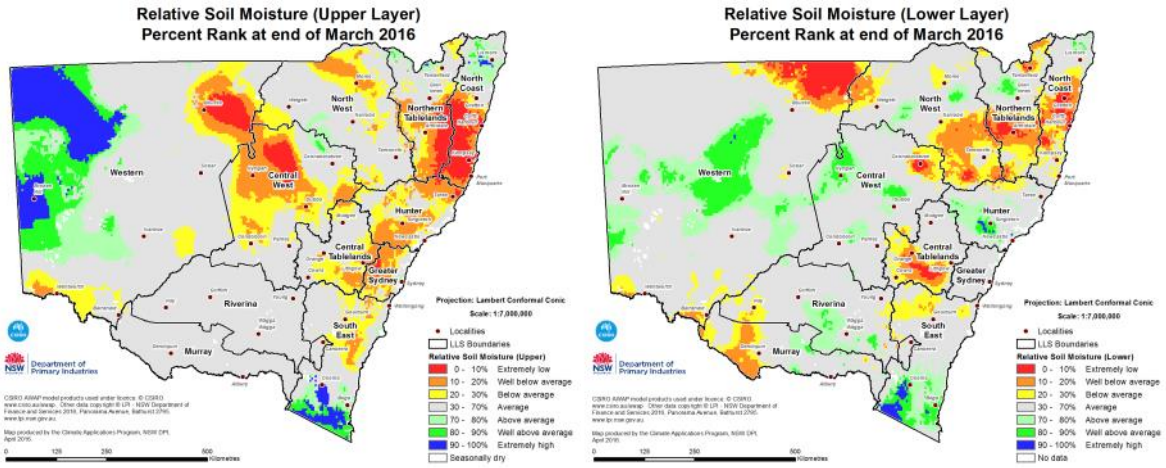
The Victorian Government has released its draft water plan 'Water for Victoria' for consultation. The draft plan's agricultural objectives include adapting to reduced water availability and reliability, realising local opportunities to bring more water into production, ensuring viable investments in water infrastructure, and managing the impacts of irrigation. The draft is open for public consultation until 29 April 2016, with the final Water Plan expected to be released in mid-2016.
http://haveyoursay.delwp.vic.gov.au/water-for-victoria

## Floodplain planting can reduce flood severity

Strategic planting of trees on floodplains could reduce the height of flooding in towns downstream by up to 20 per cent, according to UK modelling. Forest and river restoration in 20-25 per cent of the total river length resulted in a reduction in flood peak height of up to 20 per cent. As the trees age and the forests become more mature and complex there are larger reductions in flood peak height.
https://www.sciencedaily.com/releases/2016/03/160310214139.htm

# SOILS

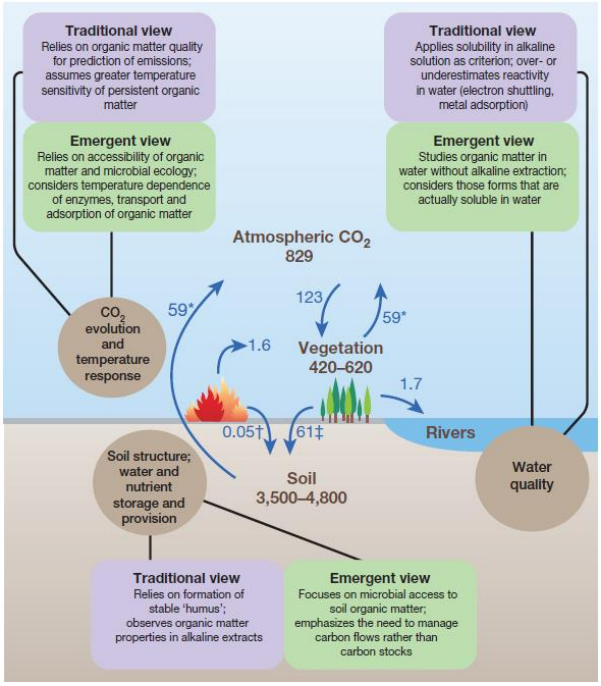
## NSW soil moisture at the end of March




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

## New theory of organic matter

A new theory of organic matter argues that available evidence does not support the formation of large-molecular-size and persistent 'humic substances' in soils. Instead, soil organic matter is a continuum of progressively decomposing organic compounds.
http://www.nature.com/nature/journal/v528/n7580/abs/nature16069.html




## Soil carbon influences at surface and at depth

Recent research into soil carbon in eastern Australia has found that while surface SOC is influenced by climate, particularly seasonal rainfall, subsurface SOC is influenced by site factors, inlay bulk density and soil type. The depth distribution of SOC was most influenced by land use, with site and climate factors being approximately equally important.
http://onlinelibrary.wiley.com/doi/10.1002/ecs2.1214/full

## Monaro Farming Systems soil carbon case studies

Monaro Farming Systems and DPI have published two e-books documenting the findings and key messages to come out of the MFS Soil Carbon Project which used paired-paddock



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case studies to compare the influence of soil type, rainfall and land management on carbon stocks. The project established useful soil carbon baselines and has answered some key questions regarding soil carbon sequestration and the effects of management practices on soil carbon profiles. Economic comparison modelling of emissions profiles and production outputs for all the different systems was included in the trial.
http://www.monarofarmingsystems.com.au/wp-content/uploads/2013/11/MFS-Soil-Carbon-Project_FINAL-E-PUBLICATION.pdf
http://www.monarofarmingsystems.com.au/wp-content/uploads/2013/11/MFS-Soil-Carbon-Project_Emissions-Modelling-Key-Messages.pdf

## Soil organic carbon research database

A Swedish review of the impacts of arable farming practices on soil organic carbon has identified four broad categories of arable farmland practices: soil amendments, crop rotations, fertiliser and tillage. The review has produced a report, a searchable database of soil carbon studies included in the review, including several NSW studies, and a web-based geographical information system (GIS) that displays the studies on a geographical map.
http://www.eviem.se/en/projects/Soil-organic-carbon-stocks/

## Widely used soil tests match crop yield responses

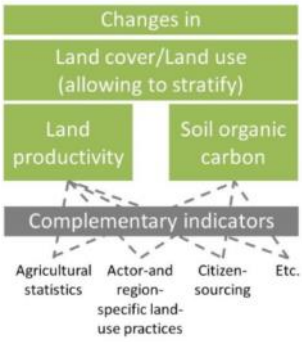
Widely used soil test methods have come out on top in a University of Adelaide review of soil testing procedures that best correlate with crop yield responses. Best correlated tests were potassium exchangeable K and Colwell K for potassium; and monocalcium phosphate ( MCP-S) test and KCL-S tests for available sulfur. Mid-infrared technology (MIR) enabled prediction of mineralisation of organic sulfur, an important source of crop sulfur. Deep soil testing is recommended for sulfur and potassium, as significant reserves can lie below the conventional 0-10 cm soil testing depth.
http://www.extensionaus.com.au/older-soil-test-methods-hold-ground/

## Farmer use of soil tests

A review of farmer participation in gathering soil information reports that the level of participation in soil testing and farm planning has remained stable in the last two decades, with only 25% of Australian landholders participating. There is, however, strong farmer interest in procuring soil health benefits through changes in farm practices such as conservation tillage or cover crops, even if they are unable to demonstrate these soil health benefits through soil testing. Many farmers report the use of observation in lieu of laboratory testing.
http://www.mdpi.com/2071-1050/8/4/304/htm

## Global land and soil indicators

An international expert workshop has identified three global land and soil indicators: land cover/land use change, land productivity change and soil organic carbon change. It supports the monitoring of these indicators but also suggests that they must be accompanied by nationally and sub-nationally developed indicators to obtain a more comprehensive overview of the state of land and soil resources.
http://www.iass-potsdam.de/sites/default/files/files/land_and_soil_indicators_proposal.pdf



## Fairy rings optimise soil water

Australia's outback 'fairy rings' are circular patches of dry soil that occur with great regularity within a narrow rainfall belt. One hypothesis is that the circles form naturally as plants organise themselves to get the most amount of water available. The barren patches of desert allow water to permeate further, which means the same amount of liquid can support the most plants possible.
http://www.sciencealert.com/scientists-have-discovered-mysterious-fairy-circles-in-the-australian-outback

## WA soil FAQs

This DAFWA webpage provides answers to frequently asked questions from growers and advisors about soil organic matter, soil biology and the relationship to other topics such as nutrient cycling, stubble management and water repellence.
https://www.agric.wa.gov.au/soil-carbon/soil-organic-matter-frequently-asked-questions-faqs

## GRDC soil water FAQs

This GRDC paper answers commonly asked questions about soil water and soil management.
https://grdc.com.au/Research-and-Development/GRDC-Update-Papers/2016/02/Commonly-asked-questions-about-soil-water-and-soil-management

## Future soil management in NZ

Recommendations of this new report from the NZ government include: establish a national soil management group, develop a national soil and land management strategy, and quantify the actual and total potentially realisable economic value of our soils.
http://www.landcareresearch.co.nz/__data/assets/pdf_file/0003/109326/Future_Requirements_Soil_Management_NZ.pdf

# BIODIVERSITY

## Positive and negative effects of wild animals on yields

An Australian review of 281 papers that evaluated increases or reductions in crop yields due to wild birds or insects on farms, found that 53% focused on identifying and managing the species that reduced yields, 38% focused on species that enhanced production such as pollinators, and only 9% considered both costs and benefits of a species within a single system. Considering the social and environmental contexts of crop production across the entire growing season, and looking at the interplay between positive and negative effects, may provide a more realistic estimate of how crop yields are affected by wild animals.
https://theconversation.com/goodies-v-baddies-why-labelling-wild-animals-as-pests-or-friends-is-holding-farming-back-54832

## Diverse forests provide multiple ecosystem services

An EU study has found that forests with many different tree species are better able to perform multiple ecosystem services such as timber production, carbon storage and

resistance to pests and diseases, than forests with fewer species. The researchers also used computer simulations to show that this 'jack-of-all-trades' effect is likely to be widespread throughout the Earth's ecosystems, the implications being that conserving and promoting biodiversity will ensure that many ecosystem services are provided at moderate levels at the very least.
http://www.nature.com/ncomms/2016/160324/ncomms11109/full/ncomms11109.html

## Nitrogen deposition reducing plant diversity

US researchers have found that increased nitrogen deposits from human activities such as fossil fuel combustion, agricultural fertiliser application and livestock waste are reducing plant diversity. Ecosystems with open vegetation (grasslands, shrublands and woodlands) had lower critical loads of nitrogen deposition than ecosystems with closed-canopy forest vegetation.
https://ucrtoday.ucr.edu/36096

## Diversity needed to support pollinators

An international assessment concludes that over 75% of the world's food crops are at least partly dependent on pollination, and in many regions over 40 percent of the bees and the butterflies are threatened with extinction. The report recommends maintaining or creating greater diversity of pollinator habitats in agricultural and urban landscapes, supporting traditional practices that manage habitat patchiness, crop rotation, and coproduction, and reducing pesticide usage and impact.
http://www.ipbes.net/article/press-release-pollinators-vital-our-food-supply-under-threat

# ENERGY

## Agricultural energy resources

Several agricultural industries have information on energy efficiency.
Dairy: http://frds.dairyaustralia.com.au/wp-content/uploads/2013/05/Smarter_Energy_Use_booklet_final-artwork_LR.pdf
http://www.westvicdairy.com.au/Projects/EnergySavingonDairyFarms.aspx
Horticulture: http://www.growcom.com.au/land-water/energy-efficiency/
Irrigation: http://eegai.nceastg.usq.edu.au/eegai/
Cotton: http://www.cottoninfo.com.au/energy-use-efficiency

## ARENA resources

The Australian Renewable Energy Agency (ARENA) has reports, studies and tools to guide investment in renewable energy projects.
http://arena.gov.au/resources/

# FOOD

## Victoria releases its food and fibre strategy

The Victorian Government has released its Food and Fibre Sector Strategy. Victoria's food and fibre sector contributes around 4.9 per cent to gross domestic product and is Australia's largest food and fibre exporting state. In 2013-14, the sector was worth $11.8 billion in

exports and employed more than 191,000 people. Victoria accounts for 30 per cent of Australia's total food processing output.
http://yoursay.business.vic.gov.au/futureindustries/food-and-fibre

## What is a climate friendly diet?

This article from The Conversation sifts through the emissions involved in eating different diets and concludes that there is no simple answer. You have to consider the soil types and farming practices in the places where your food is produced.
https://theconversation.com/veggie-is-the-most-low-carbon-diet-right-well-it-depends-where-you-live-54897

## Netherlands: Towards a food policy

Dutch national food policy has been aimed at increasing agricultural productivity, but this report advises the Dutch government to develop a comprehensive food policy that is responsive to global challenges and that creates a resilient food system.
http://www.wrr.nl/fileadmin/en/publicaties/PDF-samenvattingen/Synopsis_WRR-report_93_Towards_a_Food_Policy.pdf

## UK Eatwell guide

The UK's updated dietary guidelines show a lower environmental impact than the current UK diet due to increasing potatoes, fish, wholemeal & white bread, vegetables and fruit, and reducing dairy, meat, rice, pasta, pizza and sweet foods.
https://www.gov.uk/government/publications/the-eatwell-guide

# LAND USE

## Options for Australia's agricultural land

CSIRO analysis of Australia's agricultural land use to 2050 has found substantial potential for land-use transition from agriculture to carbon plantings, environmental plantings, and biofuels cropping under certain scenarios. With strong global abatement incentives complemented by biodiversity-focussed domestic land-use policy, land-use responses can substantially increase and diversify economic returns to land and produce a much wider range of ecosystem services such as emissions abatement, biodiversity, and energy, without major impacts on agricultural production. However, better governance is needed for managing potentially significant water resource impacts.
https://theconversation.com/farming-in-2050-storing-carbon-could-help-meet-australias-climate-goals-54899

## Land use change needed to meet water quality targets

New technologies, innovative practices and land use change are needed to meet water quality targets on the Great Barrier Reef according to the reef's 2014 report card. Cattle grazing, cane farming and horticulture are the main sources of nitrogen, sediment and pesticides into the reef. Modelled reductions in nitrogen and sediment are only 17% and 12% respectively compared to a 2009 baseline, indicating that water quality targets will not be achieved even with full adoption of current best management practices for the sugarcane and cattle grazing industries.
http://www.gbr.qld.gov.au/documents/gbrwst-interim-report-executive-summary.pdf

# EVENTS

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| April 27-28 | Climate Change Research Strategy for Primary Industries, Sydney<br>http://www.ccrspi.net.au/event/ccrspi-2016-primary-industries-striving-climate-resilience |
| May 1-3 | PIEFA food and fibre matters conference, Canberra<br>http://www.piefa.edu.au/conference2016/ |
| May 24-26 | Irrigation Australia International Conference and exhibition, Melbourne<br>http://irrigationaustralia.com.au/ |
| June 6-8 | 6th National NRM Knowledge conference, Coffs Harbour<br>http://conference.nrmregionsaustralia.com.au/ |
| July 5-7 | Climate change adaptation 2016 conference, Adelaide<br>http://climate-adaptation.org.au/events/climate-adaptation-2016/ |
| September 28-30 | Bushfire 2016, Brisbane<br>http://www.bushfire2016.org/ |
| December 4-8 | 7th International Nitrogen Initiative Conference, Melbourne<br>http://www.ini2016.com/ |

# SUBSCRIBE

NRM on Farms is a monthly 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.