

NRM on farms



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

June 2015

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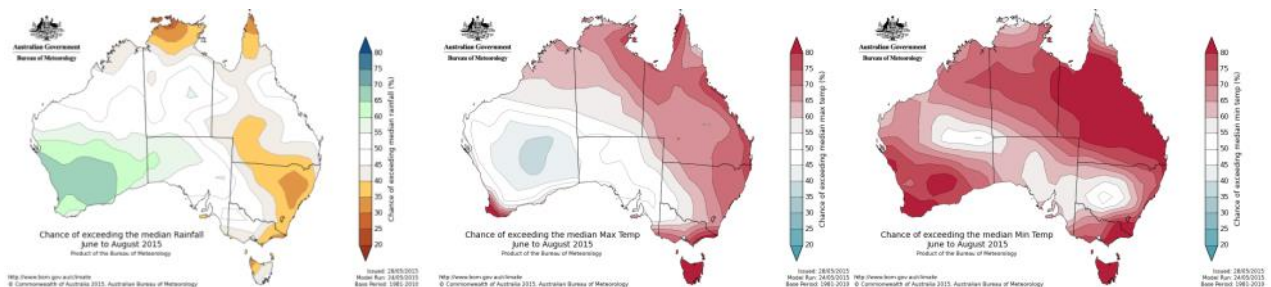
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CLIMATE

Seasonal outlook



NSW's weather over the next three months will be drier and warmer than normal, due mainly to the impact of the strengthening El Niño in the Pacific.

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

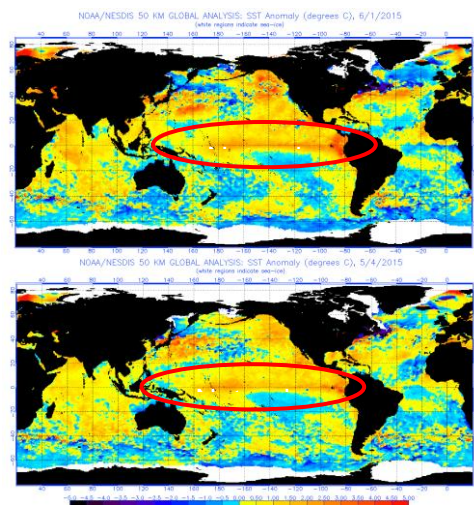
Video: <http://www.bom.gov.au/climate/outlooks/#/overview/video>

Ocean temperatures

Surface temperatures have increased in the eastern Pacific (top) since last month (below). Water in the far eastern Pacific is more than 5°C warmer than average.

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

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



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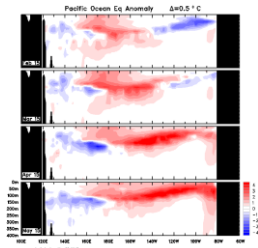


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Subsurface warmth moves east

Sub-surface temperature anomalies show eastward movement of warm temperatures and their gradual rise towards the surface. Anomalies across small areas of the central and eastern equatorial Pacific reached more than +4°C in May.

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



El Niño continues to strengthen

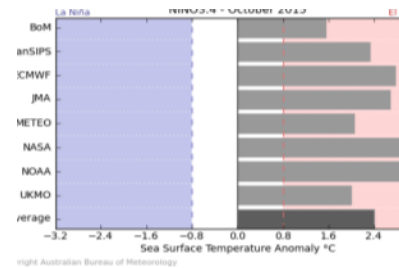
El Niño continues to strengthen with sea surface temperatures expected to remain well above El Niño thresholds into spring. Next El Niño update is expected on 9 June 2015

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

Model outlook

Model forecasts for NINO3.4 in October average a high +2.4°C, a value only observed during the 1982-83 and 1997-98 El Niño events. Individual model outputs for October range between +1.6 and +2.9°C, all well above the El Niño threshold.

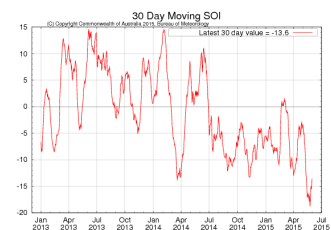
<http://www.bom.gov.au/climate/ahead/model-summary.shtml#tabs=Pacific-Ocean>



SOI returns to neutral

The Southern Oscillation Index remained firmly within El Niño values below -7 during May, reaching -17.4 on 24 May. The 90-day SOI has also dropped below -10; indicative of a persistent three-month period of higher atmospheric pressure in the western Pacific.

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



Possible positive IOD this year

The Indian Ocean Dipole (IOD) is currently neutral, with the majority of the Indian Ocean being warmer than average. Three of five international models that monitor the IOD suggest a positive IOD event is likely later in 2015. A positive IOD is typically associated with reduced winter and spring rainfall over parts of southern and central Australia.

<http://www.bom.gov.au/climate/ahead/model-summary.shtml#tabs=Indian-Ocean>

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

The rise of the 2015 El Niño

The warm anomaly over the eastern equatorial Pacific has exceeded 1°C, which is unprecedented during the autumn of developing El Niño years since the early 80s. The ocean heat is now rivalling that during the development of the 1997 super El Niño. With 2014 having broken the record in global temperatures, an impending El Niño will make it more likely that 2015 will beat the 2014 record. This impending El Niño, and the associated back-to-back 2014-15 El Niño events, could mark the switch into a positive Interdecadal Pacific Oscillation that would see global warming accelerate.

<https://theconversation.com/the-rise-and-rise-of-the-2015-el-niño-41616>

El Niño poster

BoM has produced this poster explaining El Niños and their impacts on Australia.

<http://www.bom.gov.au/climate/enso/images/El-Niño-in-Australia.pdf>

Monthly global average of CO₂ passes 400 ppm

The monthly global average concentration of this greenhouse gas surpassed 400 parts per million in March 2015, a first for the global average. The average growth rate of carbon dioxide concentration in the atmosphere from 2012 to 2014 was 2.25 ppm per year, the highest ever recorded over three consecutive years.

Caption: The red line shows monthly mean values and the black line the same seasonally corrected.

<http://www.esrl.noaa.gov/gmd/ccgg/trends>



Australian wine climate

A new document from South Australia's Wine Innovation Cluster's highlights the cross fertilisation of issues faced by the sector, including climate, market and regulatory challenges, research initiatives with in the vineyard and at the winery, impacts on regions and wine styles, and emissions management. The cluster includes the Australian Wine Research Institute, CSIRO, University of Adelaide, SARDI and services supplier Provisor.

http://www.wineinnovationcluster.com/pdf/WIC_Climate_Change_Brochure.pdf

Climate adaptation for the ACT region

This paper identifies adaptation challenges and opportunities for the ACT region and offers several adaptation principles including an integrated approach, precautionary principle, risk management and scenario planning, governance arrangements, community engagement, capacity building and 'learning by doing'.

<http://www.curf.com.au/storage/8-Climate%20adaptation%20sector%20review%20WP4.pdf>

Regional climate workshops

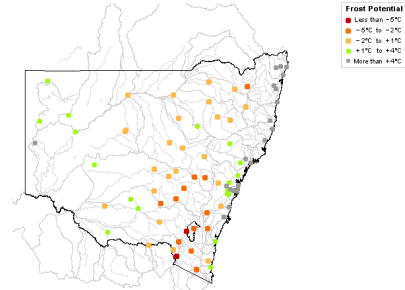
OEH is running a series of free workshops across NSW to present projections on future regional climates, and ask people how they want to receive, use and share climate change information. The workshops feature the NSW and ACT Regional Climate Model (NARClIM) projections and ways to use this in regional, industry and personal climate planning. June workshops are at Wagga Wagga, Albury, Wollongong and Newcastle. If you would like to see a workshop hosted in your region, please email Kate Nairn at OEH to discuss.

<http://www.eventbrite.com.au/e/adapt-nsw-wagga-wagga-climate-change-information-session-tickets-17179395033?aff=es2>
kate.nairn@environment.nsw.gov.au

Feedback on frost potential service

BoM is looking for feedback from farmers about the usefulness of its Frost Potential service and whether to continue its support and development. BoM is particularly interested in feedback relating to specific frost events.

<http://www.bom.gov.au/jsp/watl/weather/frost.jsp>



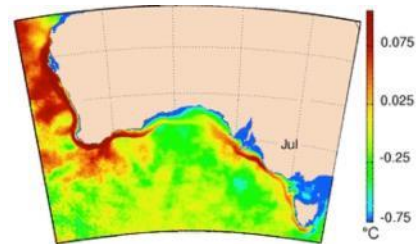
AdaptNRM

AdaptNRM is a national initiative led by CSIRO to support NRM groups in climate adaptation planning. It currently includes modules on weeds and biodiversity.

<http://adaptnrm.csiro.au/>

Understanding the WA Leeuwin Current

The warm Leeuwin Current flows south along the WA coast from Indonesia, powered by easterly winds over the Pacific Ocean. The winds pile warm water up on the western side of the ocean basin which increases the sea level through the Indonesian archipelago. The high sea level signal is then transferred down the coast of WA, creating pressure gradients that draw in warm water and push it southward, forming the Leeuwin Current. The sea level near Indonesia tends to be higher in La Niña years and lower in El Niño, so in El Niño years there tends to be a weakening in the Leeuwin Current and cooler water temperatures along the WA coast.



<https://theconversation.com/the-good-news-el-nino-story-for-western-australias-oceans-41744>

Climate change challenges to health

A new National Food and Water Commission to plan for control of future health problems related to food and water is one of 22 recommendations in a new report from the Australian Academy of Science on climate challenges to health. The five major pressures on health that Australia will face as global temperatures rise and climates change are extreme weather events, changing patterns of disease, disruptions to food and water supplies, loss of livelihoods and increased threats to security.

<https://www.science.org.au/news/climate-change-will-affect-vulnerable-people%E2%80%99s-health-most-academy>

World Weather Attribution

This project will perform 'extreme weather autopsies' immediately after extreme weather such as storm surges, heat events, heavy rainfall events/flooding, and drought to ascertain whether the event was caused by human-induced climate change. The project will use seasonal forecasts to compare extreme weather events as they happen with the very same weather events in a world that might have been without climate change.

<http://assets.climatecentral.org/pdfs/Attribution-PressRelease.pdf>

Cooling Atlantic may bring drier UK summers

A new UK study implies that the global climate is on the verge of broad-scale change that could last for a number of decades. The change is associated with a cooling of the Atlantic, and is likely to bring drier summers in Britain and Ireland, accelerated sea-level rise along the northeast coast of the United States, and drought in the Sahel region.

<http://www.southampton.ac.uk/news/2015/05/28-ocean-circulation-study.page>

Central England heat boosted by climate change

In 2014 central England experienced its warmest year since 1659, when records began. Scientists calculate that man-made climate change has boosted the chances of record hot years in the region by a factor of at least 13. In 1914 the return period for the 2014 heat was 2500 years. In 2014, however, the return period for such a warm year was about 25 years.

<http://environmentalresearchweb.org/cws/article/news/61073>

\$2.7 billion cost of Californian drought to date

Agricultural losses in California's record-breaking drought have cost the state \$2.7 billion to date.

<http://www.climatecentral.org/news/drought-cost-california-agriculture-19061>

Drought Impact	Loss Quantity
Water Supply	
Surface water reduction	8.7 million acre-feet
Groundwater pumping increase	6.2 million acre-feet
Net water shortage	2.5 million acre-feet
Statewide Costs	
Crop revenue loss	\$856 million
Additional groundwater pumping cost	\$595 million
Livestock revenue loss	\$100 million
Dairy revenue loss	\$250 million
Total direct agricultural costs	\$1.8 billion
Total statewide economic cost	\$2.7 billion
Total job losses	18,600

US climate resilience toolkit

This US Government website uses a five step program to help individuals, businesses, and plan and implement resilience-building projects: Identify the problem, determine vulnerabilities, investigate options, evaluate risks and costs, and take action.

<https://toolkit.climate.gov/>

Role of ocean heat in 1930s Dust Bowl

Two ocean hot spots have been found to be the potential drivers of the hottest summers on record for the Central US in 1934 and 1936. The research may also help modern forecasters predict particularly hot summers over the central US many months out.

<https://www.climatescience.org.au/content/868-warm-oceans-caused-hottest-dust-bowl-years>

Participatory adaptation handbook

This South African handbook offers insights, practical approaches and tools to help communities adapt more effectively.

<http://www.indigo-dc.org/research.html>

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EMISSIONS

Beef and land use change LCA needs better data

Recent life cycle assessment research in Australian beef production concludes that investment in deriving spatially- and temporally consistent datasets and information on management history is urgently needed to improve confidence in assessment of direct land-use change in the life cycle assessment for agricultural systems, and particularly for livestock production, so that this important contribution can be integrated into the global warming potential impact of products.

http://www.publish.csiro.au/view/journals/dsp_journal_fulltext.cfm?nid=202&f=RJ14112

Three step plan to zero emissions

A new World Bank Group report lays out three steps countries can follow to reduce net emissions of greenhouse gases to zero and stabilise climate change: Plan for the end goal, not just the short-term; get prices right as part of a broad policy package that triggers changes in investment and behaviour; and smooth the transition for those most affected.

<http://www.worldbank.org/en/news/feature/2015/05/11/decarbonizing-development-zero-carbon-future>

Rangelands affect global carbon cycle

New research shows that rangelands may be a key to understanding and predicting inter-annual to decadal variations in the global carbon cycle. Biological productivity in these semiarid regions is water-limited and strongly associated with variations in precipitation, unlike wetter tropical areas. Understanding carbon uptake by these marginal lands may help to improve predictions of variations in the global carbon cycle.

<http://www.lunduniversity.lu.se/article/savannahs-slow-climate-change>

Improving energy efficiency is the key

Faster improvements in energy efficiency are a key enabling factor to limit future global temperature rise to less than 1.5°C by 2100 according to a new study published in *Nature Climate Change*. In addition, carbon emissions would have to become negative at a global scale this century. This could occur through technological solutions such as bioenergy use combined with carbon capture and storage, or through efforts to grow more forests, sequestering carbon in tree trunks and branches. Afforestation would have to be carefully balanced against other land use requirements, most notably food production.

<http://www.iiasa.ac.at/web/home/about/news/150521-15-scenarios.html>

Rivers' role in sequestering carbon

Scientists estimate that the world's rivers annually transport 200 megatons of carbon to the ocean, about .02 percent of the total mass of carbon in the atmosphere. About 80% of the carbon is in soil and decomposing plant and animal material; the remainder is in eroded rock particles. The more erosion that occurs along the river, the more carbon it transfers to sea and sequesters from the air. Out at sea, some of the carbon settles to the seafloor and is buried and disconnected from the atmosphere for millions of years, eventually making its way back to the surface in the form of rocks.

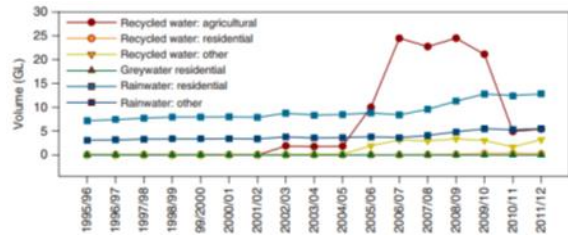
<http://www.whoi.edu/page.do?pid=50242&tid=3622&cid=215489>

WATER

Melbourne's water management in the Millennium Drought

A US-led review of Melbourne's water management during the Millennium Drought found that the most helpful factor was integrated water management, with power to force water utilities, reservoir managers and city agencies to work together. Distributed harvesting and use of stormwater will continue to enhance the city's resilience to drought and reduce its vulnerability to climate variability for years to come. However use of highly treated sewage water used on crops, while deemed safe, was discontinued once normal rainfall returned due to stunted plants and reduced harvests. The challenge is how to sustain these achievements in light of anticipated population growth and continued climatic change.

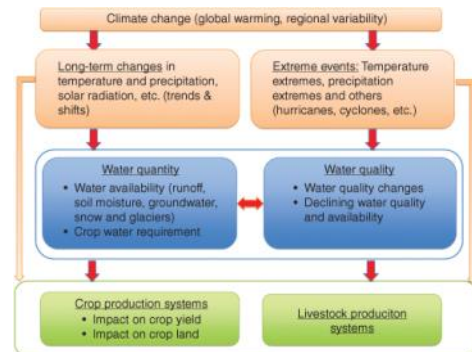
<http://news.uci.edu/press-releases/blueprint-for-a-thirsty-world-from-down-under/>
<http://onlinelibrary.wiley.com/doi/10.1002/wat2.1087/pdf>



Impacts of climate change on agricultural water

This study looks at the impacts of climate change on agricultural water requirement, water availability and water quality, and the transition of those impacts to crop yield, agricultural land suitability and livestock production systems, considering both long-term trends of climate and extreme climatic events.

<http://wires.wiley.com/WileyCDA/WiresArticle/wisId-WAT21089.html>



Private sector participation in water sector

This paper examines a number of the regulatory barriers to greater private sector participation in the sector. It includes a set of recommendations to governments to facilitate increased private sector investment in the short term and broader reform in the longer term.

http://www.awa.asn.au/uploadedfiles/AWA_Discussion_Paper-Promoting_Investment_in_the_Water_Sector.pdf

2015 Floodplain conference

Papers from the 2015 national floodplain conference held in Brisbane in May are now available online. Papers of interest to agriculture include a NSW DPI paper on flood-ready agriculture.

<http://www.floodplainconference.com/papers2015.php>

Water for food security and nutrition

This international report explores ways to improve food security and nutrition through better water management in agriculture and food systems and improved water governance. Australian water management is cited several times in the report, including our water governance system.

http://www.fao.org/fileadmin/user_upload/hlpe/hlpe_documents/HLPE_Reports/HLPE-Report-9_EN.pdf

Water challenges and policy instruments

This IMF paper examines global water challenges and economic policy instruments and suggests that reforming water pricing can encourage more efficient water use and support needed investment, while protecting the poor. It also discusses pricing reform options and emphasises an integrated and holistic approach to managing water.

<http://www.imfbookstore.net/ProdDetails.asp?ID=SDNEA201511&PG=1&Type=RLA1>

Water pricing experiences and innovations

This new book presents practices and implementation experiences from many countries that face water scarcity conditions similar to those faced by California and elsewhere, and introduces a wide set of water-pricing methods that California agencies might consider as they address the state's historic drought.

<http://ucrtoday.ucr.edu/29598>

SOILS

Rangelands soil carbon depends on vegetation

NSW DPI assessment of rangelands soil carbon has found greater levels in soils associated with trees and perennial groundcover, emphasising the importance of understanding vegetation distribution when measuring soil carbon.

<http://www.publish.csiro.au/nid/202/paper/RJ14119.htm>

DPI You tube webinar on nitrogen in pastures

DPI's Soils Network of Knowledge (SNOK) produces a monthly webinar explaining current soils research. The latest webinar from Dr Warwick Dougherty on the nitrogen economy in pasture systems is now available to watch on DPI Agriculture's You Tube channel. It covers pasture responses, key loss pathways and opportunities to improve nitrogen use efficiency.

<https://www.youtube.com/watch?v=qw2CRNTLaSM>

Crop sequences in Australian farming systems

Crop & Pasture Science journal has published a special issue on break crops in Australian farming systems. Meta-analysis has found that wheat growing after break crops exceeds the yield after wheat, due to reduced root disease, more residual water and nitrogen, better weed control, H₂ fertilisation by legumes and possible effects on mycorrhizae. The main research challenge is to deliver economically viable break crop and pasture choices that address the biotic stresses at hand and identify under what circumstances these break crops will have the most impact.

<http://www.publish.csiro.au/nid/40/issue/7411.htm>

Crop response to legume and fertiliser N

GRDC research into the effect of legumes or canola break crops in cereal-dominated cropping systems found that on average pulse crops fix 19 kg of N per tonne of shoot dry matter, with lower fixation when fertiliser N was applied at sowing. Pulse legumes grown for grain generally resulted in lower fixed N because of N removal at harvest.

<http://grdc.com.au/Research-and-Development/GRDC-Update-Papers/2015/02/Legume-effects-on-soil-N-dynamics--comparisons-of-crop-response-to-legume-and-fertiliser-N>

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The soil water bucket

Plant available water capacity (PAWC) is the soil's total water-holding capacity or 'bucket'. It depends on soil texture and crop type and is independent of seasonal conditions. Plant available water (PAW) is currently available soil moisture, ie how much is in the bucket. More than 1000 Australian soils have been characterised for PAWC and can be obtained through SoilMapp. CSIRO research in collaboration with state agencies, consultants and growers continues to add soils of regional agricultural significance to this database.

<https://wiki.csiro.au/display/soilmappdoc/SoilMapp+Home>

Lead solder contaminates soils

A Macquarie University study has found the use of lead solder joints in an above ground water supply pipeline in the Hunter Valley has resulted in soil contamination linked to toxicity and mortality in several farm animals and elevated contamination of grass fodder close to the pipeline.

<http://phys.org/news/2015-05-widespread-contamination-central-nsw-areas.html>

Updated fertiliser calculator

The WA Department of Agriculture and Food has upgraded its online fertiliser calculator tool. The free calculator is designed to guide decisions on which fertilisers represent the best value for money while meeting crop nutrient requirements.

<https://www.agric.wa.gov.au/fertiliser-calculator>

Threats to soil productivity threaten food security

A new review of the state of the world's soil resources and the possible ramifications for human security outlines threats to soil productivity and, in turn, food production, due to soil erosion, nutrient exhaustion, urbanisation and climate change.

<http://www.sciencedaily.com/releases/2015/05/150507165404.htm>

Enhancing soil health to mitigate soil degradation

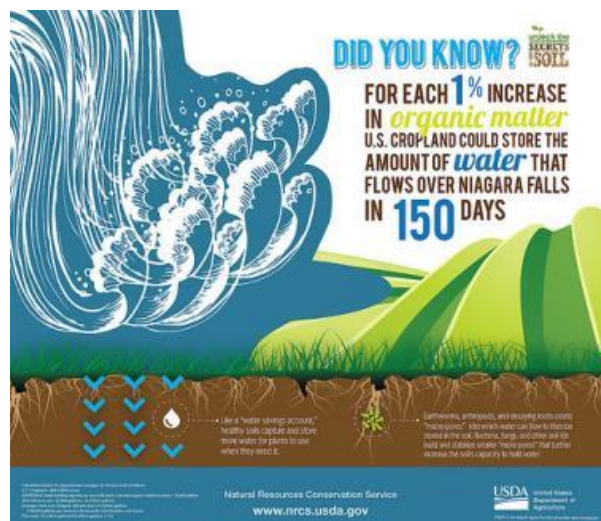
This special issue of the journal Sustainability includes articles on soil triage in Australia, an article by Rattan Lal on restoring soil quality, and a review of soil biology research needed to reverse soil degradation.

<http://www.mdpi.com/2071-1050/7/1/988>

Unlock the secrets in the soils

This campaign by USDA's Natural Resources Conservation Service aims to get more farmers and ranchers to adopt soil health management systems for a wide range of on- and off-farm benefits, including drought resilience.

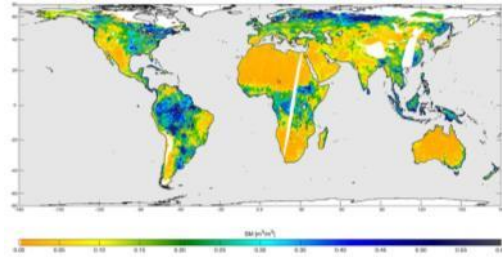
<http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/home/?cid=stelprdb1048783>



Soil water from space

SMAP (Soil Moisture Active Passive) is a new orbiting observatory that measures the amount of water in the top 5 cm of soil everywhere on Earth's surface. The image here was acquired in May during SMAP's commissioning phase.

<http://www.jpl.nasa.gov/spaceimages/details.php?id=PIA19337>



Impact of soil animals on emissions

An international study into the impacts of soil life on greenhouse gas emissions has found that in a healthy and diverse soil community, insects and worms feed on the microorganisms that can trigger increased carbon emissions, but where soil animals are not present, the feedback between climate change and microbial carbon production is strong.

<http://environment.yale.edu/news/article/diverse-soil-communities-can-help-offset-impacts-of-global-warming/>

Biochar definitions

The International Biochar Initiative has published a list of terms and definitions related to biochar, including biochar, hydrochar, pyrogenic carbonaceous material (PCM), char, charcoal, ash, activated carbon, black carbon and soot.

<http://www.biochar-international.org/definitions>

Biochar classification tool now online

The new biochar classification tool is now available online. The tool classifies biochar materials including carbon storage value, fertiliser value, liming value and particle size distribution, based on laboratory test results.

http://www.biochar-international.org/classification_tool

Soil: The life-supporting skin of Earth

A European soils initiative has published an ebook to help students and teachers think in a holistic way about soil and encourage students to study soil science or natural resource economics and/or policy at University.

http://eussoils.jrc.ec.europa.eu/projects/Soiltrec/Documents/SoilTrEC_SoilSchoolBook_FINAL.pdf

Let's talk about soil

This animated film emphasises human dependence on soils and describes how sustainable development is threatened by trends in the management of soils and governance of land.

<https://vimeo.com/53618201>

Soil functions infographic

FAO has produced this infographic to explain how soils deliver ecosystem services.

<http://www.fao.org/resources/infographics/infographics-details/en/c/284478/>



BIODIVERSITY

Monocultures minimise pollinators

Australian research into pollinator populations has found that in a landscape dominated by almond plantations, native bees and hoverflies were only found near almond trees within 100 metres of native mallee vegetation. In a landscape of small mosaic patches of many different crops, gardens and remnant native vegetation, native bees and hoverflies were found at almond trees further than 100 metres from native vegetation. The critical difference was the diversity of resources available to the pollinators throughout the year. In the more complex landscapes food, water and nesting resources were all available to pollinators within their typical home range (usually less than 1-2 km).

<https://theconversation.com/single-crop-farming-is-leaving-wildlife-with-no-room-to-turn-38991>

US bee colonies down 40% in 2014-15

US beekeepers lost more than 40 percent of their honey bee colonies in 2014-2015. Varroa mite affected non-commercial colonies, but reasons for commercial colony losses are less clear. Winter loss rates decreased from 23.7 percent last year to 23.1 percent this year, while summer loss rates increased from 19.8 percent to 27.4 percent.

<http://cmns.umd.edu/news-events/features/3020>

The science of bees

The journal Nature has produced a supplement on the importance of bees in our ecosystems and economy. While the common honeybee is the most well-known and studied species, thousands of wild bee species also pollinate crops and wildflowers. The widely reported threats to honeybees, which cause their colonies to collapse, also jeopardise the lives of these lesser-known species.

<http://www.nature.com/nature/outlook/bees/>

Senate report slams invasives response

A new Senate report says Australia is ill-prepared, ill-equipped and neglectful when it comes to protecting its borders from a multitude of devastating new weeds, diseases and invasive animals. Response efforts are hampered by delays in initial detections, delays in obtaining and maintaining funding, and incomplete implementation of threat abatement plans. The report makes 26 recommendations.

http://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Environment_and_Communications/biosecurity/Report

Research confirms freezing cane toads is humane

University of Sydney research has confirmed that the most humane way to kill cane toads is to first refrigerate them and then freeze them. The researchers implanted small data-loggers in the brains of cane toads to measure pain responses. They then put the toads into a refrigerator for a few hours, before transferring them to a household freezer. The toad drifts into torpor as it cools down, and its brain is no longer functioning by the time its body begins to freeze. Their brains did not register any evidence of pain during the process.

<http://sydney.edu.au/news/science/397.html?newscategoryId=61&newsstoryid=15016>

FOOD

The future of food: growing more with the same land

This article from The Conversation canvasses the issues facing sustainable intensification of agricultural land. One approach for poorly resourced farmers is to improve production efficiencies with information on best fit crop agronomy, livestock husbandry and climate risk management. Better resourced and skilled farmers can invest in more profitable and risk-efficient practices and enterprise mixes. Where productivity gaps are already narrow, more significant or transformation changes might be required such as design of new farming systems that can further intensify the use of land and water or add value to existing produce. All productivity increases will have to be judged against gains in environmental and ecosystem services to protect critical factors such as water quality, environmental flows, pollination services, soil quality and natural fisheries.

<https://theconversation.com/the-future-of-food-growing-more-with-the-same-land-35559>

Population-food supply balance increasingly unstable

A US review of food supply available to more than 140 nations demonstrates that food security is becoming increasingly susceptible to population changes, as humanity places increasing pressure on use of limited land and water resources. Countries that strongly depend on trade for their food supply appear to be more susceptible to instability and episodic food crises than exporting countries.

<http://news.virginia.edu/content/study-world-population-food-supply-balance-becoming-increasingly-unstable>

EAT Initiative: Transforming the global food system

EAT Initiative was established in 2013 as an international platform for interaction between stakeholders across science, policy, civil society and business. EAT believes that productive food systems, global health, and a sustainable environment are all prerequisites for human development. The vision of EAT is a transformation of the global food system to sustainably feed a healthy population of nine billion people by mid-Century.

<http://www.eatforum.org/eat-initiative/what-is-eat/>

Crawford Fund conference on food security

The Crawford Fund, an Australian not-for profit organisation promoting research and development for world food security, is offering awards to assist young Australian agricultural scientists to attend its 2015 conference, 'The business of food security: Profitability, sustainability and risk' on August 10-12 in Canberra. This conference will focus on the critically important roles for both the public and private sectors in meeting future food demand within the limits of the earth's natural resources.

www.crawfordfund.org

School grown vegetables encourage consumption

US research has found that when school-grown vegetables were incorporated in the cafeteria school lunch, students are four times as likely to take a salad.

http://foodpsychology.cornell.edu/OP/school_gardens

Wasted

If global food waste was a country, it would rank third in terms of greenhouse gas emissions! This two part video on food waste looks at reasons for and impact of food waste in the US and shows what people in South Korea are doing. Seoul residents deposit food waste in bins, where the amount of food they toss out is weighed by household using a key-card system. People disposing of too much food are fined. The leftover food is sorted, crushed and dried for animal feed or fertiliser, or burned to generate electricity. The goal is not only to drastically curtail food waste, but also to process or incinerate all of South Korea's remaining leftover food, thus keeping it out of landfills where it would decay and emit methane, a potent greenhouse gas.

http://e360.yale.edu/feature/in_south_korea_an_innovative_push_to_cut_back_on_food_waste/2875/

Agriculture in education resources

The Primary Industries Education Foundation Australia has produced educational resources on food and fibre production for the Agriculture in Education Initiative for students in primary and secondary schools up to Year 10.

<http://www.piefa.edu.au/units/index.html>

LAND USE

Agricultural land use

ABS land use statistics report that in 2013-14, the area of land used for agriculture in Australia increased by 2% from 2012-13 to 406 million hectares, driven by increases in Queensland and SA and partially offset by decreases in the NT and WA. Land planted to crops fell by 5%, land planted to vegetables remained steady, less than 1% of total agricultural land in Australia, while land used for grazing accounted for 84%.

<http://www.abs.gov.au/ausstats/abs@.nsf/mf/7121.0?OpenDocument>

SUSTAINABILITY

Apple tree row treatments benefit soil and trees

Swedish research into cool climate apple orchards found beneficial effects from 'sandwich systems' featuring annual or perennial crops sown in a narrow strip within the tree row with tilled soil each side of the strip. When used year round the strips eliminated groundcover competition, increased soil respiration, improved leaf and fruit calcium content and resulted in moderate leaf and fruit nitrogen content and tree growth reduction. Apples from these trees also had good quality and high storability. The main challenge is to choose living mulch mixtures that have minimal tree and fruit impact, and avoid rodent problems.

<http://www.ashs.org/news/233647/Sandwich-system-found-effective-in-organic-apple-orchards.htm>

Food, soil and water and change are research priorities

Food, soil and water, environmental change and energy are some of the Federal Government's nine science priorities announced last month. The others are transport, cybersecurity, resources, advanced manufacturing and health. The priorities and

corresponding research challenges aim to increase investment in areas of immediate and critical importance to Australia and its place in the world.

<http://www.science.gov.au/scienceGov/ScienceAndResearchPriorities/Pages/ThePriorities.aspx>

Natural resource protection is a global megatrend

Rising demand for and increasing scarcity of natural resources is one of seven megatrends that will affect farmers' futures according to the new CSIRO book *Global megatrends*. Producers positioned to deliver food cost-effectively, without depleting the resources on which further production depends, stand to profit in coming decades. There is also an increasingly narrow window of opportunity to help protect biodiversity, habitats and the world's climate. On farm action includes avoiding overplanting and overgrazing; planting suitable indigenous vegetation for groundcover, grazing fodder and nitrogen-replenishing crops; implementing sustainable farming methods and technology; and considering renewable energy options.

<http://www.aginnovators.org.au/news/7-global-megatrends-every-farmer-should-prepare>

EVENTS

June 12	Biodiversity in rural landscapes, Ballarat http://www.csu.edu.au/_data/assets/pdf_file/0003/1297524/2015-BAB-Conference-Flyer.pdf
July 7-10	National Carbon Farming Conference Expo, Albury carbonfarmingconference.com.au
July 14	Agriculture and environment research symposium, Sydney “ Uta.stockmann@sydney.edu.au
July 15-17	Australian Meteorological and Oceanographic Society conference, Brisbane http://www.amos.org.au
July 23-24	Current issues for soil science. Moree woodlots3@bigpond.com .
September 7-9	WA Soils Conference, Mandurah http://www.soilscienceaustralia.org/component/content/category/43-wa-state-conference-blog?layout=blog
September 20-24	17th Australian Agronomy Conference Hobart http://www.agronomy2015.com.au/index.html
Nov 30-Dec 2	Bioenergy Australia 2015, Launceston http://www.bioenergyaustralia.org/

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