Soils ain't soils: Farmers learn about soil from the ground up

NSW Country Hour
By Sally Bryant
Posted 10 Jun 2016, 12:00pmFri 10 Jun 2016, 12:00pm

Photo: A handful of soil tells farmers a lot about its capacity to hold water and how exposed it is to erosion. (Sally Bryant)
Map: Cobbora 2844

Farmers work with facts they can see, but one of the prime drivers of their farm's long-term viability is right under their feet and therefore out of sight.

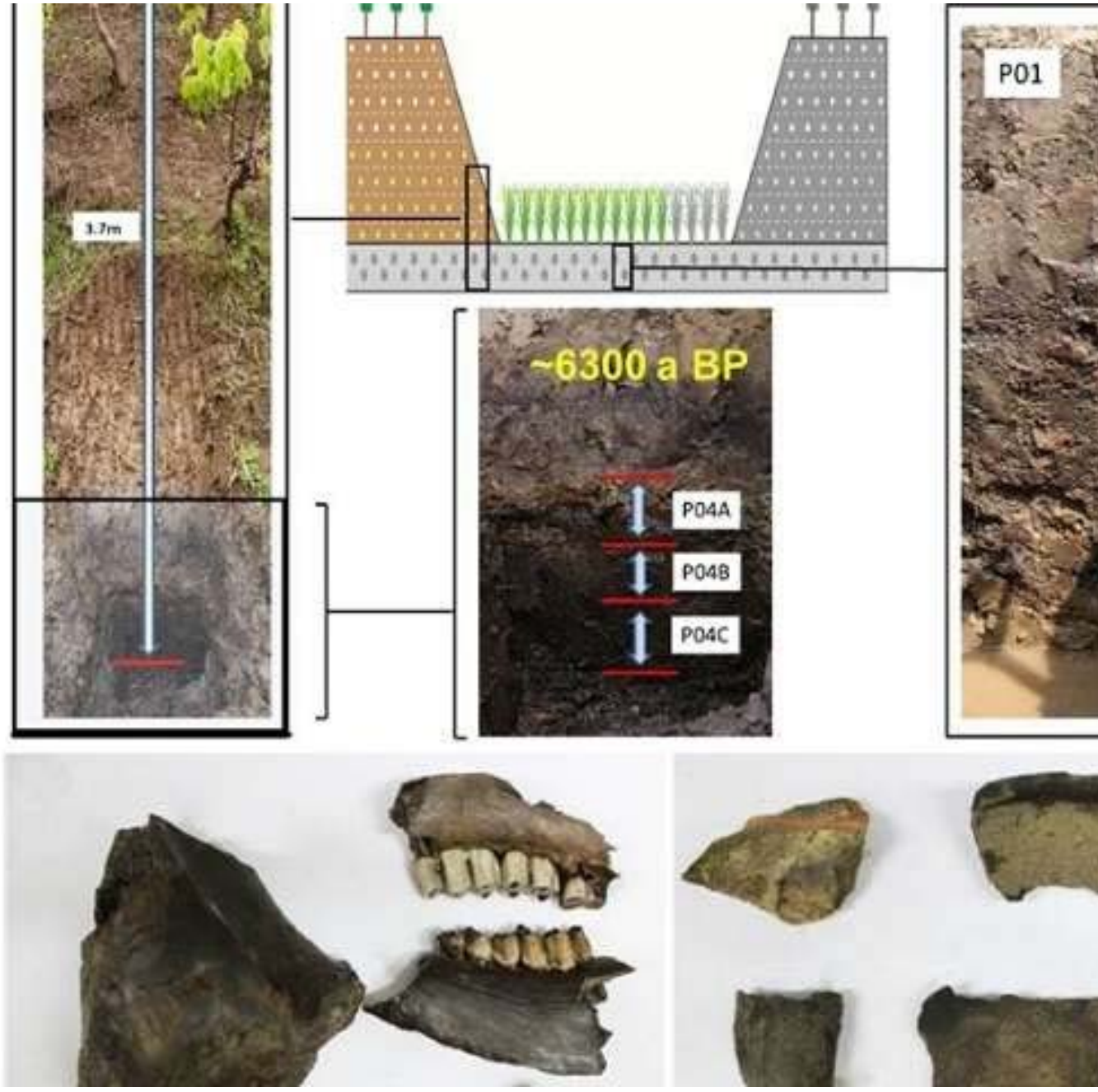
The key to a farm's profitability, like crops and pasture, has its roots in the health of its soil.

Farmers in central-west New South Wales can now sign up for a program to learn some basic science to help them get on top of what is going on under their feet.

Photo: Farmers see a slice of soil profile, as John Lawrie walks them through an on farm soil analysis 'pit'. (Sally Bryant)

'Soil Pits and Kits' is rolled out as a series of on-farm workshops with take-home resources to give farmers an understanding of what it is like to be a citizen scientist. http://www.abc.net.au/news/2016-06-10/pits-and-kits-soil-conservation-workshops/7492748

Neolithic paddy soil reveals the impacts of agriculture on microbial diversity



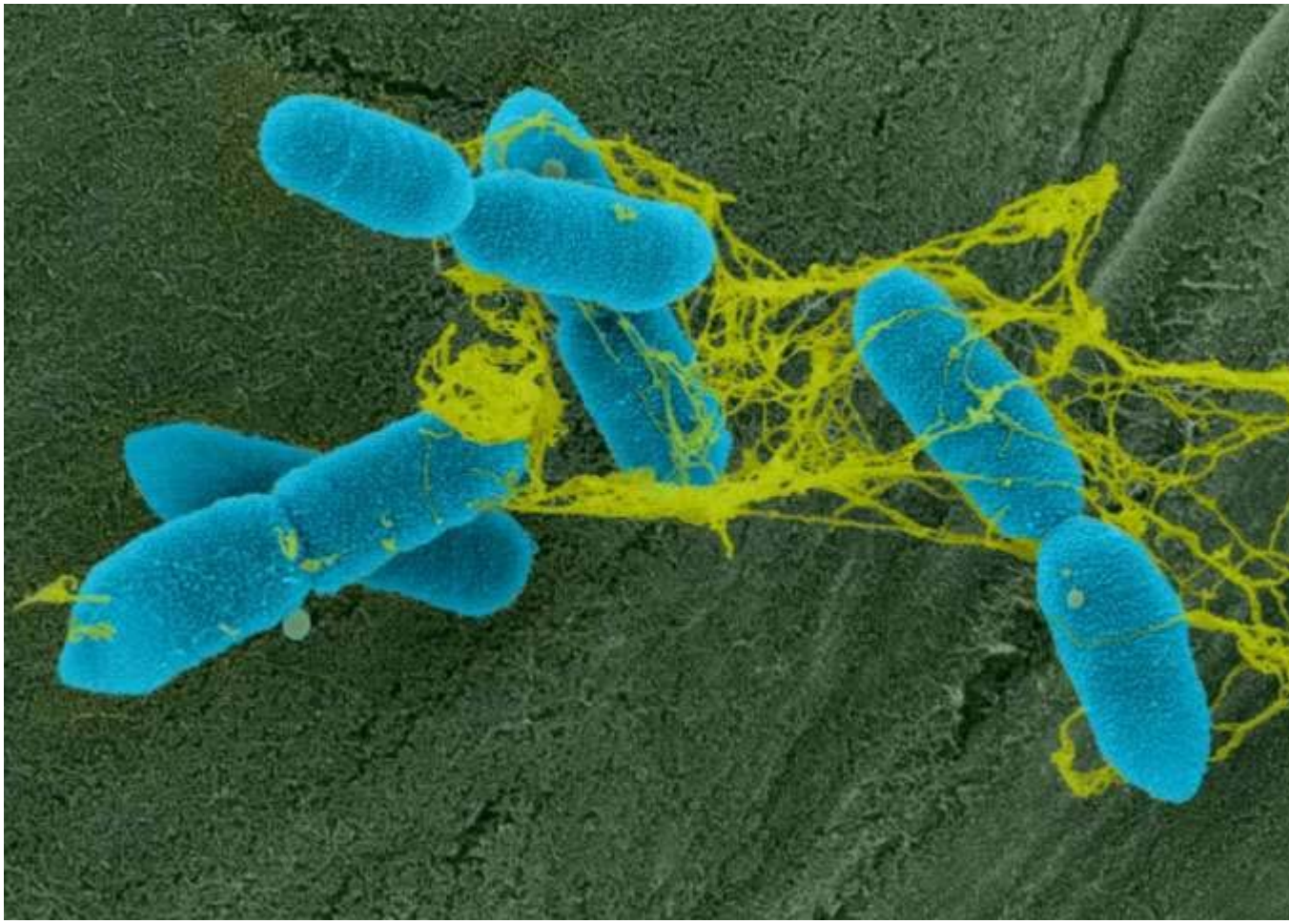
This image shows buried Neolithic paddy soil, animal remains and pottery shards from Luojiajiao site in Tongxiang, Zhejiang province, eastern China. Credit: ©Science China Press

Modern intensive agriculture has generally led to a decline in farmland biodiversity, such as plants and animals. However, information on the impacts of human activities on soil microbial diversity is scarce and often inconclusive. This paucity is due partly to the difficulties in obtaining appropriate contrast samples for comparison.

Read more at: http://phys.org/news/2016-06-neolithic-paddy-soil-reveals-impacts.html#jCp

http://www.abc.net.au/radionational/programs/offtrack/image/7549774

The arms race at the plant root: How soil bacteria fight to escape sticky root traps



A false-color electron micrograph depicting bacteria (blue) and the DNA-based trap (yellow). Credit: Tran et al.

Soil is full of microbes. Specialized border cells at the outer surface of plant roots fight off these microbes as the roots penetrate the soil in search of water and nutrients. A study published on June 23rd in *PLOS Pathogens* reveals how plant pathogens fight back against entrapment by sticky root border cell secretions.

Read more at: http://phys.org/news/2016-06-arms-root-soil-bacteria-sticky.html#jCp

Better soil data key for future food security

INTERNATIONAL INSTITUTE FOR APPLIED SYSTEMS ANALYSIS

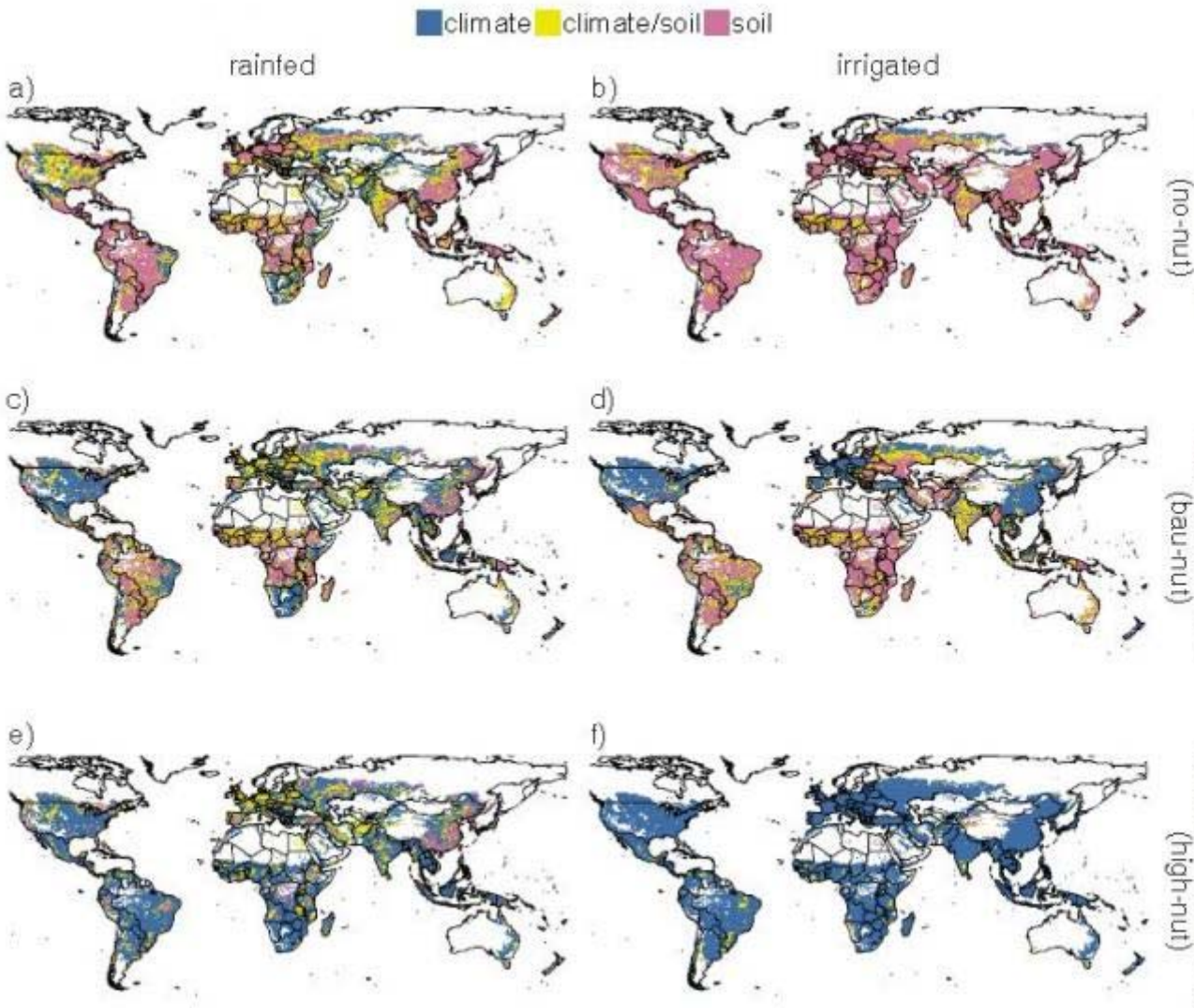
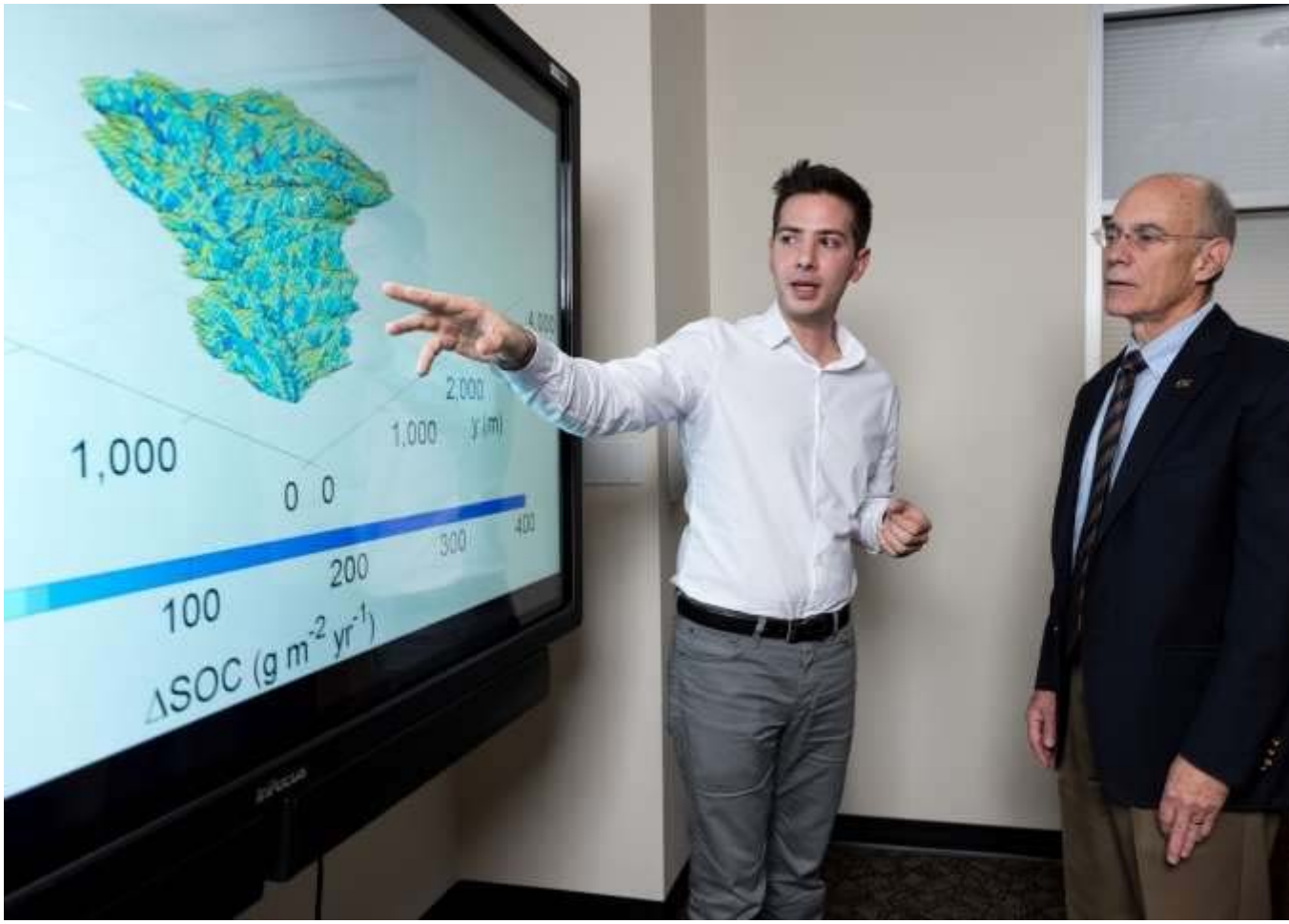


IMAGE: This map shows the relative importance of soil compared to climate in models of crop yield, for different scenarios of fertilizer or irrigation use. view more

Credit: © Folberth et al 2016

To project how much food can be produced in the future, researchers use agricultural models that estimate crop yield, or how much of a crop can be produced in a certain amount of space. These models take into account factors like climate and weather variability, irrigation, fertilizer, and soil type. A new study published in the journal *Nature Communications* shows that the type of soil used in such a model can often outweigh the effects of weather variability--such as year to year changes in rainfall and temperature. http://www.eurekalert.org/pub_releases/2016-06/iifa-bsd062016.php

High-resolution model explains role of soil erosion in carbon budgets



Yannis Dialynas, a hydrology Ph.D. student in Georgia Tech's School of Civil and Environmental Engineering, and Georgia Tech Provost Rafael L. Bras, discuss a model of soil erosion. This research is studying the role of erosion on carbon cycling. Credit: Rob Felt, Georgia Tech

A high-resolution model of how soil erosion impacts the carbon cycle of a small South Carolina watershed may help explain an apparent imbalance in the world's carbon budget. Explaining that apparent imbalance is necessary for understanding and predicting the course of global climate change.

Read more at: http://phys.org/news/2016-06-high-resolution-role-soil-erosion-carbon.html#jCp

Massive Open Online Soil Course

On May 10 the first Massive Open Online Course (MOOC) dedicated to the topic of soils has started. ISRIC has been contributing to this unique learning and awareness-raising event with modules on soil

If you want to learn why soil is so important, how it's being threatened and what we can do to protect this natural resource so vital to our lives, join the free online course 'Soil4Life' on edX here: http://bit.ly/WURSoilx

Neutralizing acidic forest soils boosts tree growth, causes spike in nitrogen export

Unexpected results took a decade to emerge, shed new light on watershed dynamics

A legacy of acid rain has acidified forest soils throughout the northeastern US, lowering the growth rate of trees. In an attempt to mitigate this trend, in 1999 scientists added calcium to an experimental forest in New Hampshire. Tree growth recovered, but a decade later there was a major increase in the nitrogen content of stream water draining the site. So reports a new paper in the *Proceedings of the National Academy of Sciences* by a team of

scientists from the Cary Institute of Ecosystem Studies, Duke University, and Syracuse University.

Gene Likens, President Emeritus of the Cary Institute and co-author on the paper, participated in the calcium addition in 1999. It took place at Hubbard Brook Experimental Forest, a 7,800-acre living laboratory in New Hampshire's White Mountains. Calcium concentrations in forest soils at the site had been depleted due to prolonged exposure to acid rain. The goal of the large-scale experiment was to test if restoring calcium to these soils would result in improved forest growth.

Journal Reference:

1. Bérangère A. Leys, Gene E. Likens, Chris E. Johnson, Joseph M. Craine, Brice Lacroix, Kendra K. McLauchlan. **Natural and anthropogenic drivers of calcium depletion in a northern forest during the last millennium**. *Proceedings of the National Academy of Sciences*, 2016; 113 (25): 6934 DOI: 10.1073/pnas.1604909113

https://www.sciencedaily.com/releases/2016/06/160622110013.htm

Immense species richness of bacterial-eating microorganisms discovered in soil

The photo of a testate amoeba's shell (Euglypha) was taken using a scanning electron microscope. If the amoeba was alive, it would protrude from the open end. The shell is approximately 0.04 mm long. Testate amoebae are large Cercozoa. …more

Millions of microorganisms play a major role in the decomposition of soil matter. A group of researchers has just shown that there is an enormous diversity among a group of bacteria-eating microorganisms known as Cercozoa. The research suggests that a drier climate in the years ahead due to climate change will contribute to a shift in the number of soil microorganisms, and thus, a shift in the decomposition of soil matter, with as of yet to be known consequences.

Read more at: http://phys.org/news/2016-06-immense-species-richness-bacterial-eating-microorganisms.html#jCp

Treating soil acidity at depth

Is it better to surface apply lime or incorporate lime?

This is the question faced by farmers with increasing amounts of acidity being detected at 10 to 20 centimetres soil depth.

Sustainable Farming Systems' (SFS) Lisa Miller is working on soil acidity projects and said one trial site located on the Bellarine Peninsula, which had a soil pH (Ca) in the topsoil of 4.2 and a subsurface soil pH of 4.4, was facing a dilemma.

"We surface applied lime at 3 tonnes a hectare and found lime had changed the pH to 5cm depth in the first year but then lime movement slowed to about 1cm/year in the loamy soil," Lisa said. http://www.stockandland.com.au/story/3864659/treating-soil-acidity-at-depth/

NSW soils to feature in Anzac artwork

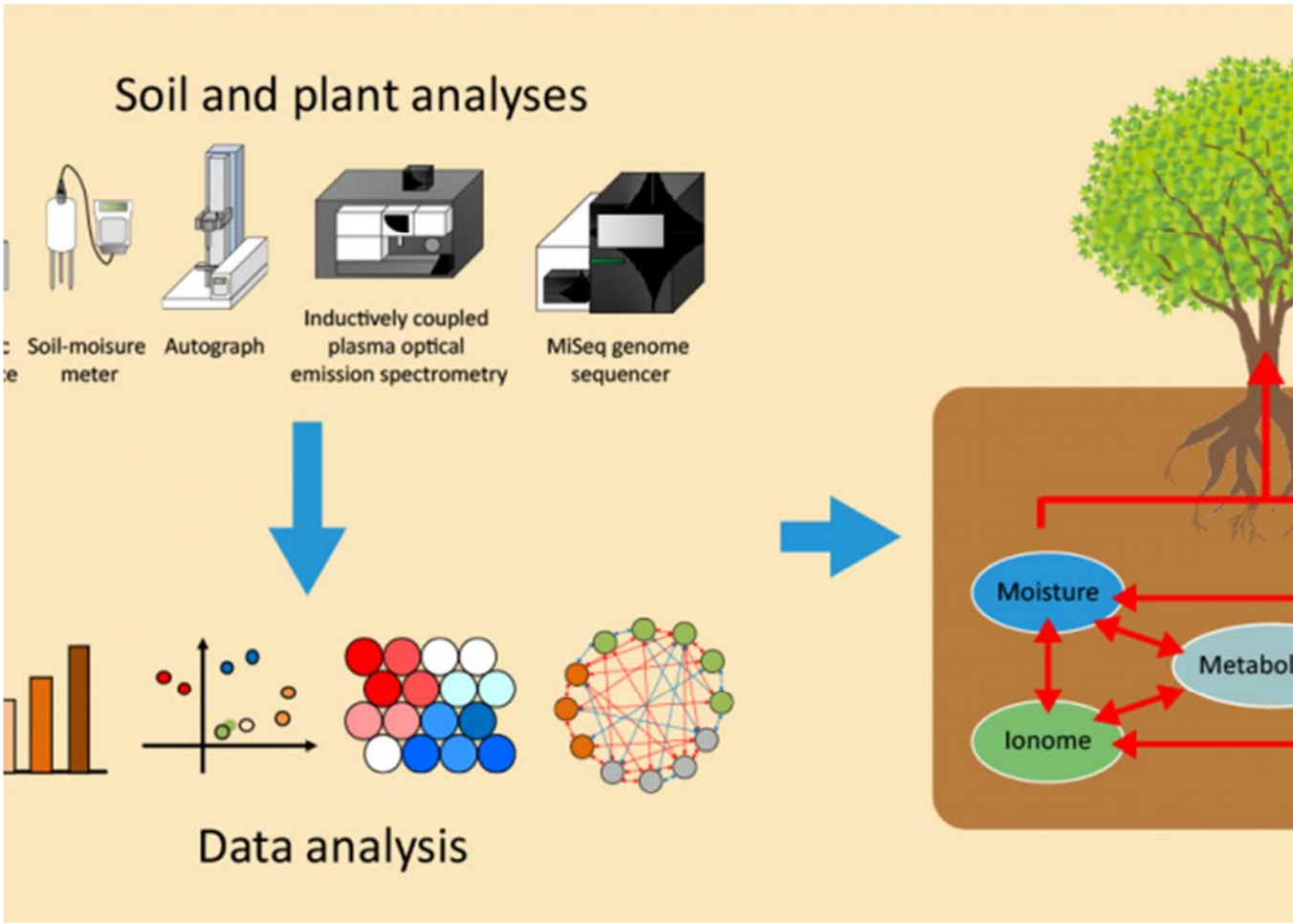
26 JUNE 20169:37PM

NSW soils to feature in Anzac artwork

A striking new public artwork at Sydney's Anzac Memorial will list significant sites of military service in NSW alongside handfuls of soil from each location.

The walls of the Hyde Park memorial will display about 1600 NSW towns, cities and hamlets from where people enlisted for the Great War, as well as soil taken from each location.
http://www.news.com.au/national/breaking-news/nsw-soils-to-feature-in-anzac-artwork/news-story/6d685a621631551b68ba514ec18b8248

Improving poor soil with burned up biomass



Several soil properties were analyzed after mixing soil with torrefied biomass and compared with control. Water retention and structural integrity, along with metabolites, the microbiome, ion absorption, and plant growth were all improved …more

Researchers at the RIKEN Center for Sustainable Resource Science in Japan have shown that torrefied biomass can improve the quality of poor soil found in arid regions. Published in *Scientific Reports*, the study showed that adding torrefied biomass to poor soil from Botswana increased water retention in the soil as well as —the amount of plant growth.

Read more at: http://phys.org/news/2016-06-poor-soil-biomass.html#jCp

Global Soil Biodiversity Atlas Maps

Resource Type: Datasets
Soil Threats Data

Registration is requested: Yes

Author:

Year: 20

Description | Request Form

This dataset contains 2 maps from the Global Soil Biodiversity Atlas

Soil Biodiversity map

This map is presented on pages 90-91 of the Global Soil Biodiversity Atlas. The map shows a simple index describing the planet. In order to make this preliminary assessment, two sets of data were used:

- distribution of microbial soil carbon developed by Serna-Chavez and colleagues (2013). This dataset was used as a
- distribution of the main groups of soil macrofauna developed by Mathieu (unpublished data). This dataset was us

References

- Serna-Chavez, H.M., et al., 2013. Global drivers and patterns of microbial abundance in soil, Global Ecology and Bi

Soil Biodiversity threats map

http://esdac.jrc.ec.europa.eu/content/global-soil-biodiversity-maps-0#tabs-0-description=0

Bacteria in soil affect farming and global climate

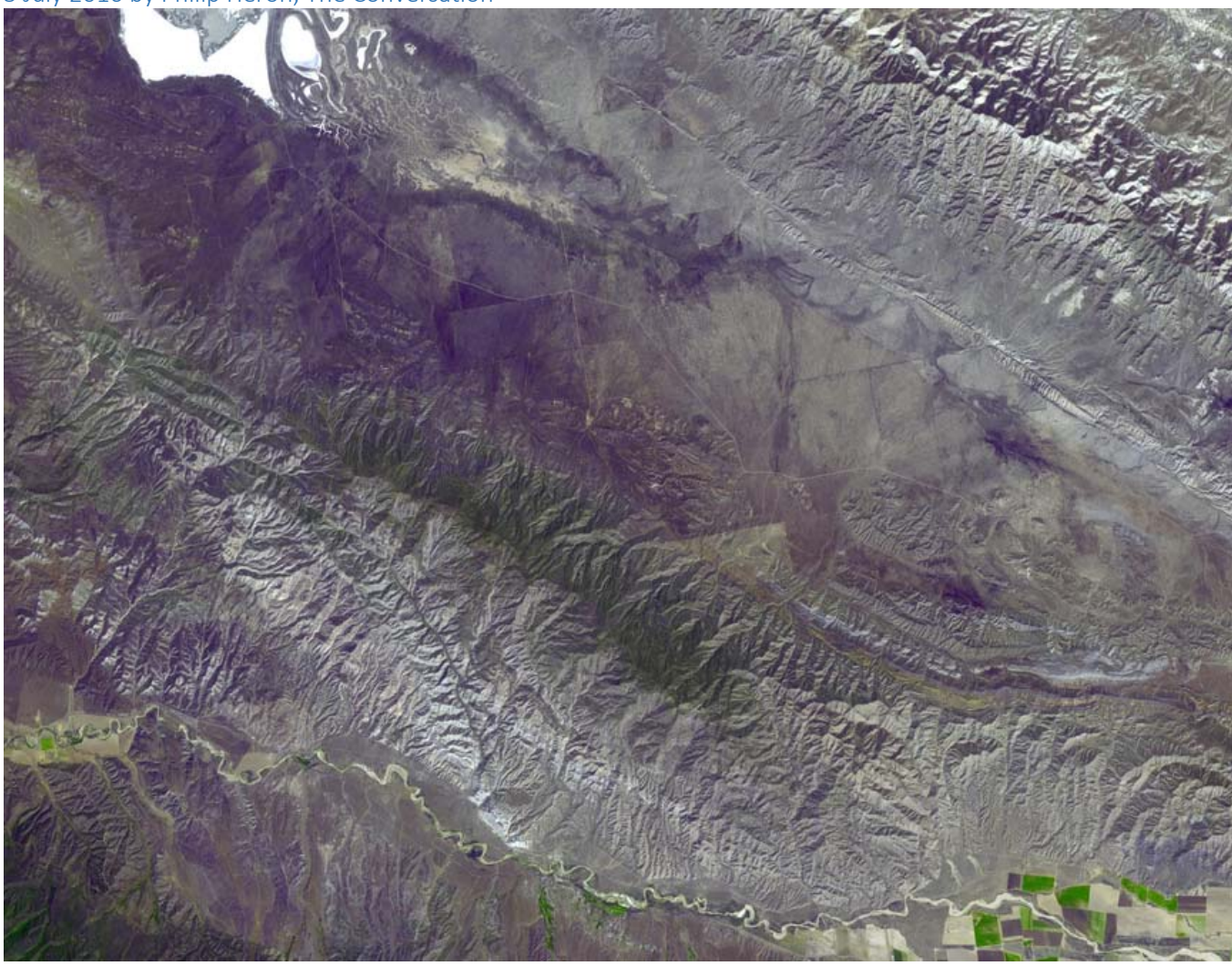
Credit: University of Reading

Scientists have found for the first time how common bacteria found in the soil have far-reaching effects on farming and the global climate.

Read more at: http://phys.org/news/2016-06-bacteria-soil-affect-farming-global.html#jCp

Plate tectonics: new findings fill out the 50-year-old theory that explains Earth's landmasses

5 July 2016 by Philip Heron, The Conversation



Satellite image of California's San Andreas fault, where two continental plates come together. Credit: NASA/GSFC/METI/ERSDAC/JAROS, and U.S./Japan ASTER Science Team

Fifty years ago, there was a seismic shift away from the longstanding belief that Earth's continents were permanently stationary.

Read more at: http://phys.org/news/2016-07-plate-tectonics-year-old-theory-earth.html#jCp

Drying Arctic soils could accelerate greenhouse gas emissions

Gas bubbles are released from a saturated part of the Barrow Environmental Observatory.

Credit: Oak Ridge National Laboratory

A new study published in *Nature Climate Change* indicates soil moisture levels will determine how much carbon is released to the atmosphere as rising temperatures thaw Arctic lands.

Journal Reference:

1. Christina Schädel, Martin K.-F. Bader, Edward A. G. Schuur, Christina Biasi, Rosvel Bracho, Petr Čapek, Sarah De Baets, Kateřina Diáková, Jessica Ernakovich, Cristian Estop-Aragones, David E. Graham, Iain P. Hartley, Colleen M. Iversen, Evan Kane, Christian Knoblauch, Massimo Lupascu, Pertti J. Martikainen, Susan M. Natali, Richard J. Norby, Jonathan A. O'Donnell, Taniya Roy Chowdhury, Hana Šantrůčková, Gaius Shaver, Victoria L. Sloan, Claire C. Treat, Merritt R. Turetsky, Mark P. Waldrop, Kimberly P. Wickland. **Potential carbon emissions dominated by carbon dioxide from thawed permafrost soils**. *Nature Climate Change*, 2016; DOI: 10.1038/nclimate3054
https://www.sciencedaily.com/releases/2016/06/160613164953.htm

Focus on Soil Health Now to Be Competitive Later

By Laura Barrera posted on 5 July 2016 | Posted in Seeding & Planting, Soil Health

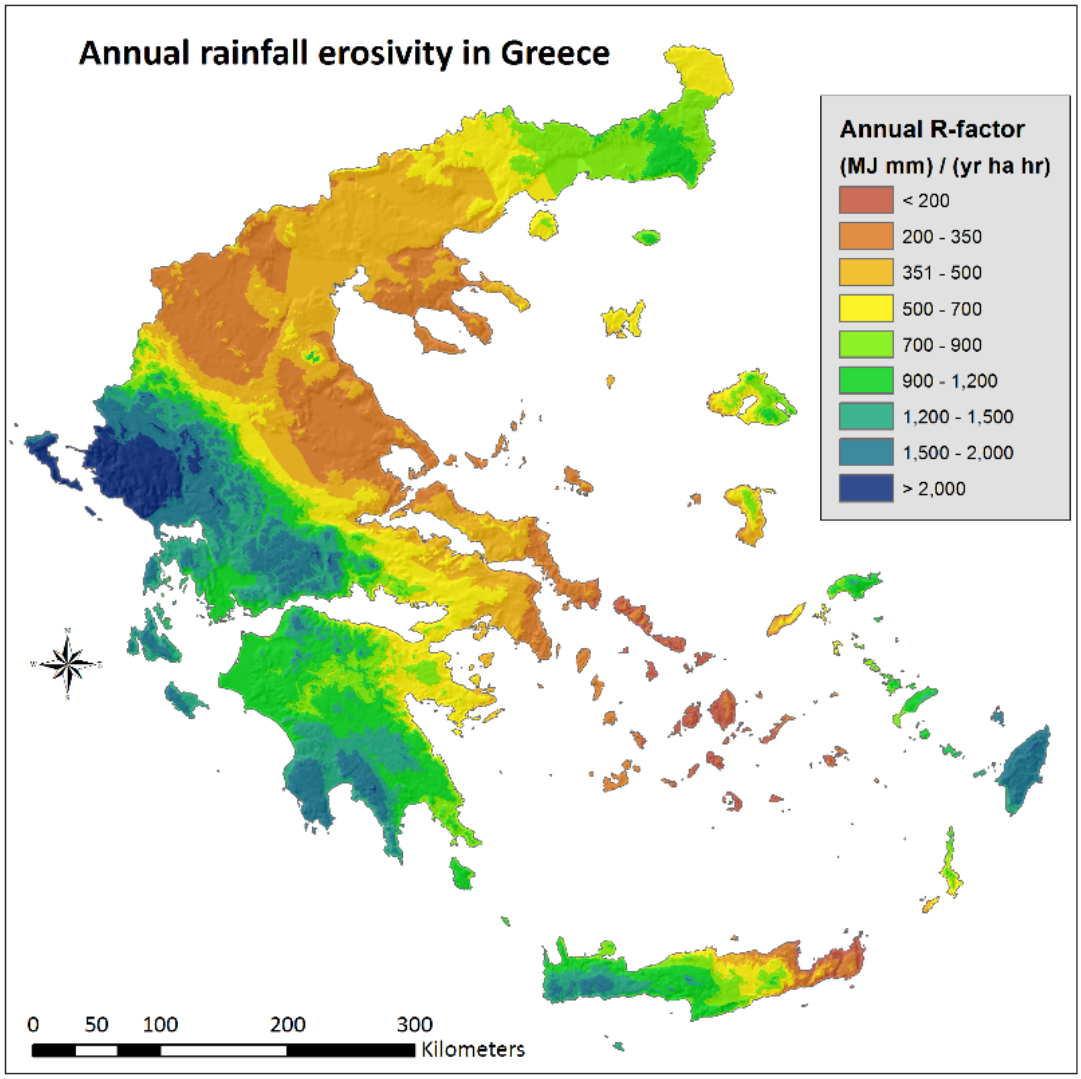
Dean Baas believes that we may see crop yields plateau soon if there isn't more of a focus on soil health.

Despite genetic improvements to corn hybrids and soybean varieties, without soil health — especially soil organic matter — genetics may soon surpass the soil's capacity to support the improvements, he said during a recent Partnership for Ag Resource Management webinar.

- See more at: https://www.no-tillfarmer.com/blogs/1-covering-no-till/post/5882-focus-on-soil-health-now-to-be-competitive-later#sthash.tOwCMTvG.dpuf

R-factor and Erosivity Density in Greece

Rainfall erosivity considers the effects of rainfall amount and intensity on soil detachment. Rainfall erosivity is most commonly expressed as the R-factor in the Universal Soil Loss Equation (USLE) and its revised version, RUSLE. Several studies focus on spatial analysis of rainfall erosivity ignoring the intra-annual variability of this factor. This study assesses rainfall erosivity in Greece on a monthly basis in the form of the RUSLE R-factor, based on 30-minutes data from 80 precipitation stations covering an average period of almost 30 years. The spatial interpolation was done through a Generalized Additive Model (GAM). The observed intra-annual variability of rainfall erosivity proved to be high. The warm season is 3 times less erosive…



http://esdac.jrc.ec.europa.eu/themes/r-factor-and-erosivity-density-greece

FAO Launches Intl. Summit on Global Soil Threats

Food and Agriculture Organization of the United Nations

Wed 4 May 2016 - 20:47 - News ID: 3616925

TEHRAN, 04 May (MNA) – FAO Representation in the Islamic Republic of Iran has launched International Summit of Health and Lifestyle: Global Soil Threats hosted by the Faculty of Geography of University of Tehran with participation of global experts from the Intergovernmental Technical Panel .(on Soils (ITPS

The two-day summit (May 4-5 2016), organized in collaboration between the Representation of the Food and Agriculture Organization of the United Nations (FAO) in the Islamic Republic of Iran, University of Tehran and Secretariat for the Advancement of Science and Technology in the Islamic World, focused on issues such as soil threats, assessment and evaluation methods, strategies for rehabilitation and sustainable soil management, .and soils, ecosystems and human well-being

http://en.mehrnews.com/news/116345/FAO-Launches-Intl-Summit-on-Global-Soil-Threats

Soil moisture important to quality water on farm: Cradle Coast NRM

Caitlin JarvisJune 14, 2016, 5:09 p.m.
With recent rain and the onset of winter, attention is turning to farm water quality and storage. Equally important is an awareness of healthy soil's natural capacity to hold great volumes of moisture, which is essential to productivity, according to Cradle Coast Natural Resource Manager (NRM), in north-west Tasmania
http://www.stockandland.com.au/story/3968801/trial-on-soil-moisture-structure-is-underway/

Soils bureau to inventory spending on irrigation

Posted on 1 **July 2016**

THE government is in the process of drawing up a database of financial investment poured into small-scale irrigation projects (SSIPs) nationwide.

A farmer prepares rice seedlings for planting. The government is in the process of drawing up a database of financial investment poured into small-scale irrigation projects to facilitate the identification of landholdings
suitable for crop production. -- *AFP*

In a statement released by the agency, the Bureau of Soils and Water Management (BSWM) said that the database "shall serve as basis for the government to locate the investments made nationwide, since these irrigation facilities are being provided by the government, most often, without any financial responsibility on the part of farmer beneficiaries."

http://www.bworldonline.com/content.php?section=Economy&title=soils-bureau-to-inventory-spending-on-irrigation&id=129781

Serpentine plants survive harsh soils thanks to borrowed genes

JOHN INNES CENTRE

IMAGE: An international team of scientists, which included Dr. Kirsten Bomblies and Dr. Levi Yant from the John Innes Centre, has taken advantage of advances in genomics to work out which... view more

Credit: The John Innes Centre

Scientists from the John Innes Centre have analysed the genomes of plants that grow in harsh, serpentine soils to find out how they survive in such conditions. It appears that they have used two strategies: adapting to their environment through natural selection that acted on genetic variants which arose locally, as well as by borrowing useful variants from a related plant growing nearby.

If a plant could choose where it wanted to grow, it probably wouldn't choose serpentine soil.

Derived from serpentinite rocks, serpentine soil is dry, low in nutrients, and typically contains metals like nickel and chromium in concentrations that would be toxic to most
http://www.eurekalert.org/pub_releases/2016-06/jic-sps062416.php

More Science-Society interfaces for a global soil security

Paris, France, 5-6 December 2016

The 2nd Global Soil Security Conference aims to demonstrate that soil, this highly pressurized and crucial resource, is indispensable partner to meet **sustainable development goals**. The demonstration will be done by linking businesses, practitioners, policymakers and researchers on **soil security dimensions** through good working practices, business solutions, scientific outcomes and international initiatives that enhance protection and sustainable management of soils.
https://gssparisen.wordpress.com/

THE THIRD WORLD CONFERENCE OF WORLD ASSOCIATION OF SOIL AND WATER CONSERVATION

NEW CHALLENGES AND STRATEGIES OF SOIL AND WATER CONSERVATION IN THE
CHANGING WORLD SUSTAINABLE MANAGEMENT OF SOIL AND WATER RESOURCES

August 22-26, 2016
Belgrade/ Serbia

3RD WASWAC 2016

THE THIRD WORLD CONFERENCE OF WORLD ASSOCIATION OF SOIL AND WATER CONSERVATION

Belgrade * Serbia * August 22-26

Topic: New challenges and Strategies of soil and water conservation in the changing World Su-stainable Management of soil and water resources. The aim of this conference is to provide output regarding deep plenary sessions based on issues collected from the sessions with the conference main topics. Selected and reviewed papers could be published in International Soil and Water Conservation Research (ISWCR), Bulletin of Forestry, or other journals.

Venue: Belgrade, Serbia, 22-26 August 2016 http://3rdwaswacconference.sfb.bg.ac.rs/

Ecologists compile huge soil fungi database

5 July 2016 by Helen Metella

ALES forest ecologist Justine Karst is the co-author of the world's largest database of research analyzing how mycorrhizal fungi affect plant productivity. She says there's a push in the scientific community to make data more accessible as …more

Forest ecologist Justine Karst is a co-author of a significant new resource—the world's largest database of research analyzing how mycorrhizal fungi affect plant productivity.

Read more at: http://phys.org/news/2016-07-ecologists-huge-soil-fungi-database.html#jCp

Hauraki inspections show dairy effluent a problem on some soils

Last updated 14:25, July 4 2016

Waikato Regional Council inspections have revealed some farmers are irrigating cow effluent onto high risk soils.

Undersized effluent storage, as well as irrigation onto high risk soils, have shown up as relatively common themes during recent dairy farm inspections along the western flank of the Hauraki Plains.

The inspections from Kaiaua to Tahuna are part of a programme by Waikato Regional Council's farming services team to work proactively with dairy farmers on improving effluent management.

http://www.stuff.co.nz/business/farming/81580563/hauraki-inspections-show-dairy-effluent-a-problem-on-some-soils

Researchers to study how to reduce carbon dioxide in ranch soil

University of Florida Institute of Food and Agricultural Sciences researchers hope to reduce possible pollutants emanating from soils in Florida cattle ranches by using a $710,000 federal grant to study soil microbes.

Credit: Tyler Jones, UF/IFAS photography

University of Florida Institute of Food and Agricultural Sciences researchers hope to reduce possible pollutants emanating from soils in Florida cattle ranches by using a $710,000 federal grant to study soil microbes.
https://www.sciencedaily.com/releases/2016/06/160622104930.htm

Photographer creates spectacular tornado of fire with images of a bright-red river bed flowing through Spanish mining zone

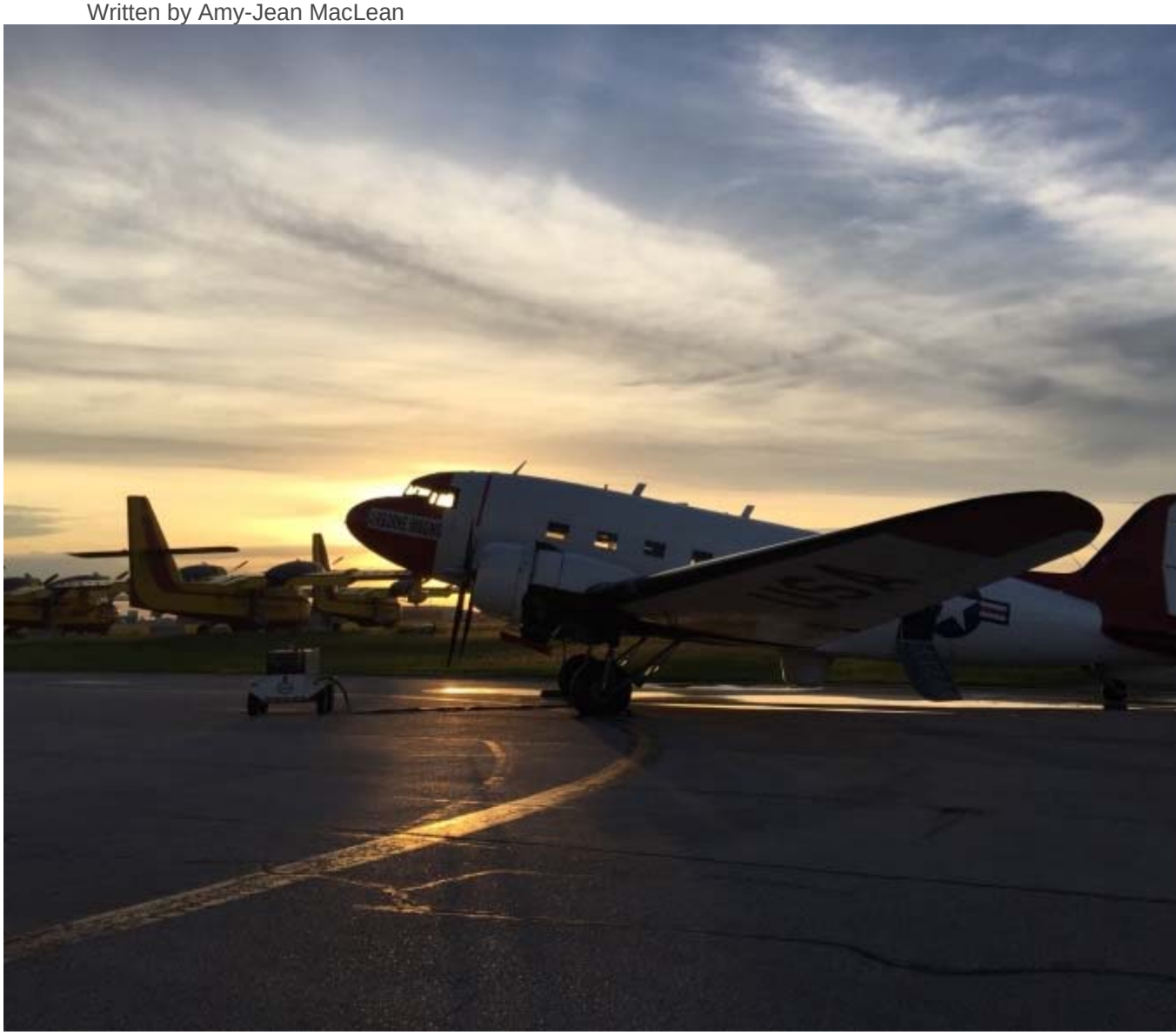
BY **CHRISTINE ROBERTS**
NEW YORK DAILY NEWS

A bright red tornado of fire or a stunning optical illusion? Spanish photographer Tomas Bogonez created the spectacular fake twister by rotating images of a vibrant river bed.

(TOMAS BOGONEZ/SOLENT NEWS/REX)
http://www.nydailynews.com/news/world/photographer-captures-tornado-fire-river-bed-article-1.1292217

Next phase of soil moisture experiment takes flight

Written by Amy-Jean MacLean



The DC3 airplane will be flying over Carman to collect soil moisture data for NASA and AAFC.

(Photo courtesy of Agriculture and Agri-Food Canada)

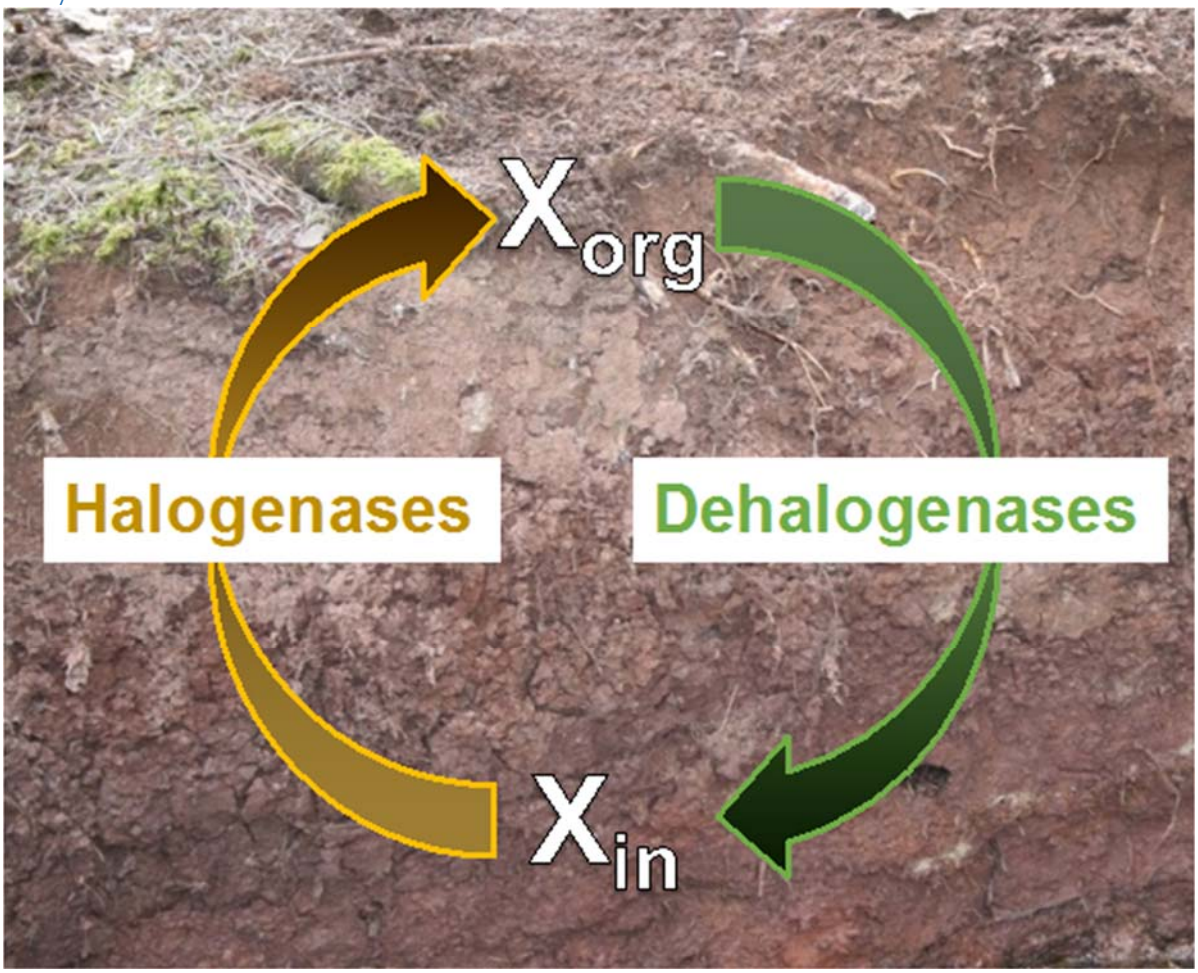
If you live in the Carman area, you may notice a DC3 airplane flying frequently overhead the early part of summer.

The U.S. National Aeronautics and Space Administration (NASA) along with Agriculture and Agri-Food Canada (AAFC) are moving into the next phase of an experiment to measure soil moisture from space. Last year, NASA launched its Soil Moisture Active Passive (SMAP) satellite as a tool to build global soil moisture maps. Now, AAFC research scientist Dr. Heather McNairn says they've teamed up with NASA and will be using this aircraft to carry a radiometer instrument over the Carman area to measure soil moisture through microwave emissions from the earth, similar to pre-satellite launch research that was done in 2012.

http://www.pembinavalleyonline.com/ag-news/50920-next-phase-of-soil-moisture-experiment-takes-flight

Geomicrobiologists show that many bacteria and fungi in soil make organohalogens

1 July 2016



Schematic representation of microbial halogen cycling in soil. Xorg: organohalogen; Xin inorganic halogen, e.g. chlorine or bromine. Credit: Weigold, Kappler, Behrens/University of Tübingen

Organohalogens like perchloroethene and trichloroethene are prominent groundwater pollutants due to their industrial use as dry cleaning and degreasing agents and their widespread release into the environment. Volatile organohalogens like chloromethane strongly influence atmospheric chemistry and thereby Earth's climate by causing ozone depletion when released into the atmosphere. For a long time it was assumed that these compounds are only produced and released by human activity. However, in recent years, over 5,000 naturally-occurring organohalogen compounds have been identified, and evidence suggests that the cycling of halogens e.g. chlorine, bromine in soils is largely driven by microbial processes.

Read more at: http://phys.org/news/2016-07-geomicrobiologists-bacteria-fungi-soil-organohalogens.html#jCp

DA to produce new soils map in 45 days

3 July 2016 9:36 pm

by James Konstantin Galvez

Agriculture Secretary Emmanuel Piñol has set a 45-day deadline for a nationwide soil-mapping scheme after reprimanding officials of the Department of Agriculture (DA) for the continued use of outdated soil analysis data.

In a statement entitled “Wrong data, wrong planning,” Piñol said that DA personnel admitted to still using 40-year-old soil samplings in their programs to prepare for the effects of climate change and identification of land suitable for cropping. http://www.manilatimes.net/da-to-produce-new-soils-map-in-45-days/271496/

Clear-cutting destabilizes carbon in forest soils, study finds

Patches of clear-cut mountain (stock image). Clear-cutting loosens up carbon stored in forest soils, increasing the chances it will return to the atmosphere as carbon dioxide and contribute to climate change, a Dartmouth College study shows.

Credit: © spiritofamerica / Fotolia

Clear-cutting loosens up carbon stored in forest soils, increasing the chances it will return to the atmosphere as carbon dioxide and contribute to climate change, a Dartmouth College study shows.

The findings appear in the journal *Soil Science*.

Journal Reference:

1. Lacroix, Emily M.; Petrenko, Chelsea L.; Friedland, Andrew J. **Evidence for Losses From Strongly Bound SOM Pools After Clear Cutting in a Northern Hardwood Forest**. *Soil Science*, April 2016 DOI: 10.1097/SS.0000000000000147

https://www.sciencedaily.com/releases/2016/04/160415125925.htm

New farming strategies can help prevent soil runoff while maintaining high crop yields

Soil and nutrient loss and runoff from agricultural fields are major problems environmentally and economically in the U.S. and globally. After heavy spring rains, soil and water runoff containing fertilizer and pesticides is washed downstream, carrying the sediment and chemicals to the Gulf of Mexico. This process creates a large oxygen-starved area which is toxic to aquatic organisms and damages the commercial fishing and tourism industries. Tree-based buffers are an effective method for preventing runoff, however they can negatively affect crop yields. Based on years of research, University of Missouri scientists suggest farmers use buffers between crops and trees; this technique reduces soil runoff and maintains good growing conditions, creating economic benefits for farmers and, ultimately, for society in general.

Read more at: http://phys.org/news/2016-06-farming-strategies-soil-runoff-high.html

Alpine soils storing up to a third less carbon as summers warm

The top metre of the world's soils contains three times as much carbon as the entire atmosphere. This means that losing

carbon from the soil can quicken the pace of human-caused climate warming.

A new paper, published today in Nature Geoscience, finds this is already happening in the forests of the German Alps. Soils there are losing carbon as summer temperatures rise, the researchers say. http://www.carbonbrief.org/alpine-soils-storing-up-to-a-third-less-carbon-as-summers-warm

Agroforestry helps farmers branch out

6 July 2016

An alley cropping system at Empire, MN in June 2013. Alternating blocks of willow (foreground) and poplar can be seen, with four herbaceous perennial biomass crops nested within each block of woody crops. Credit: Joshua Gamble.

Imagine an agriculture field. Most are planted with row upon row of tidy cash crops. Now imagine that same field with rows of trees between the rows of crops. This forested field concept is called alley cropping. Alley cropping helps farmers diversify by growing long-term tree crops alongside short-term cash crops like wheat.

Read more at: http://phys.org/news/2016-07-agroforestry-farmers.html#jCp

Near Congo volcano that blew in 2002, soils are rich but new eruption threatens

In this 29 March 2010 file photo, a resident walks past banana trees near the base of Mount Nyiragongo, one of Africa's most active volcanos, in Goma, Congo. Traumatized farmers are slowly returning to fields decimated by the 2002 eruption of Mount Nyiragongo in eastern Congo. Flowing lava flattened more than 30 percent of the city of Goma, 20 kilometers away. (AP Photo/Rebecca Blackwell,File)

GOMA, Congo — Hacking away in the midday sun, 49-year-old farmer Daniel Lazuba remembers vividly his life before one of Africa's most active volcanos erupted 14 years ago.

"All of this was corn before," he said as he pointed to rows of new banana trees pushing up between black stones. "My cabbage seems to be growing better than ever these days, but in this area, I still have to start from zero."

Traumatized farmers like Lazuba are slowly returning to fields decimated by the 2002 eruption of Mount Nyiragongo in eastern Congo. Flowing lava flattened more than 30 percent of the city of Goma, 20 kilometers away. Nearly 150 people died, and 400,000 fled into neighboring Rwanda.
http://www.greenfieldreporter.com/view/story/2c6661aef158449e83f83dc3372e00b0/AF--Congo-Lava-Farming

What did Earth's ancient magnetic field look like?

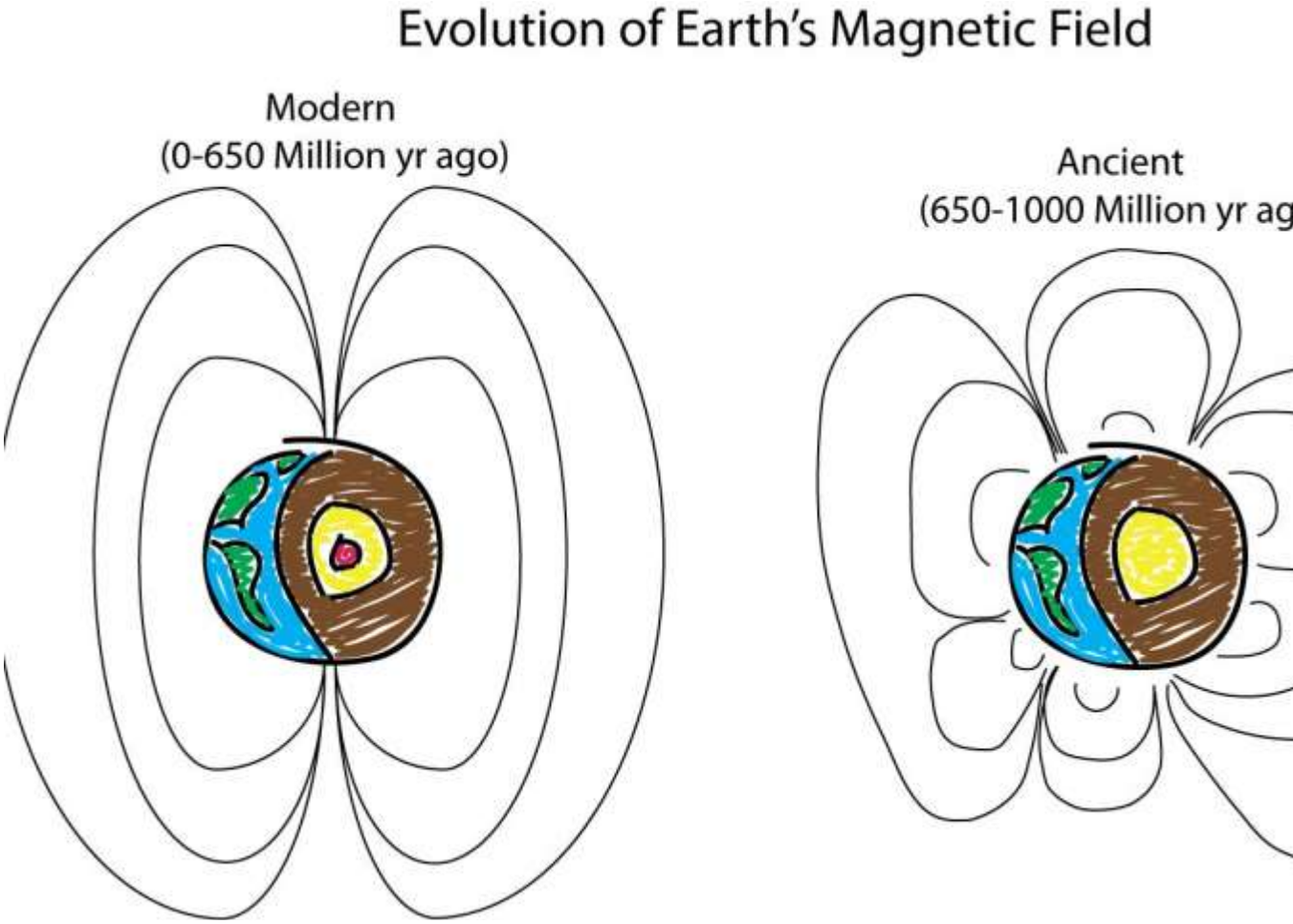
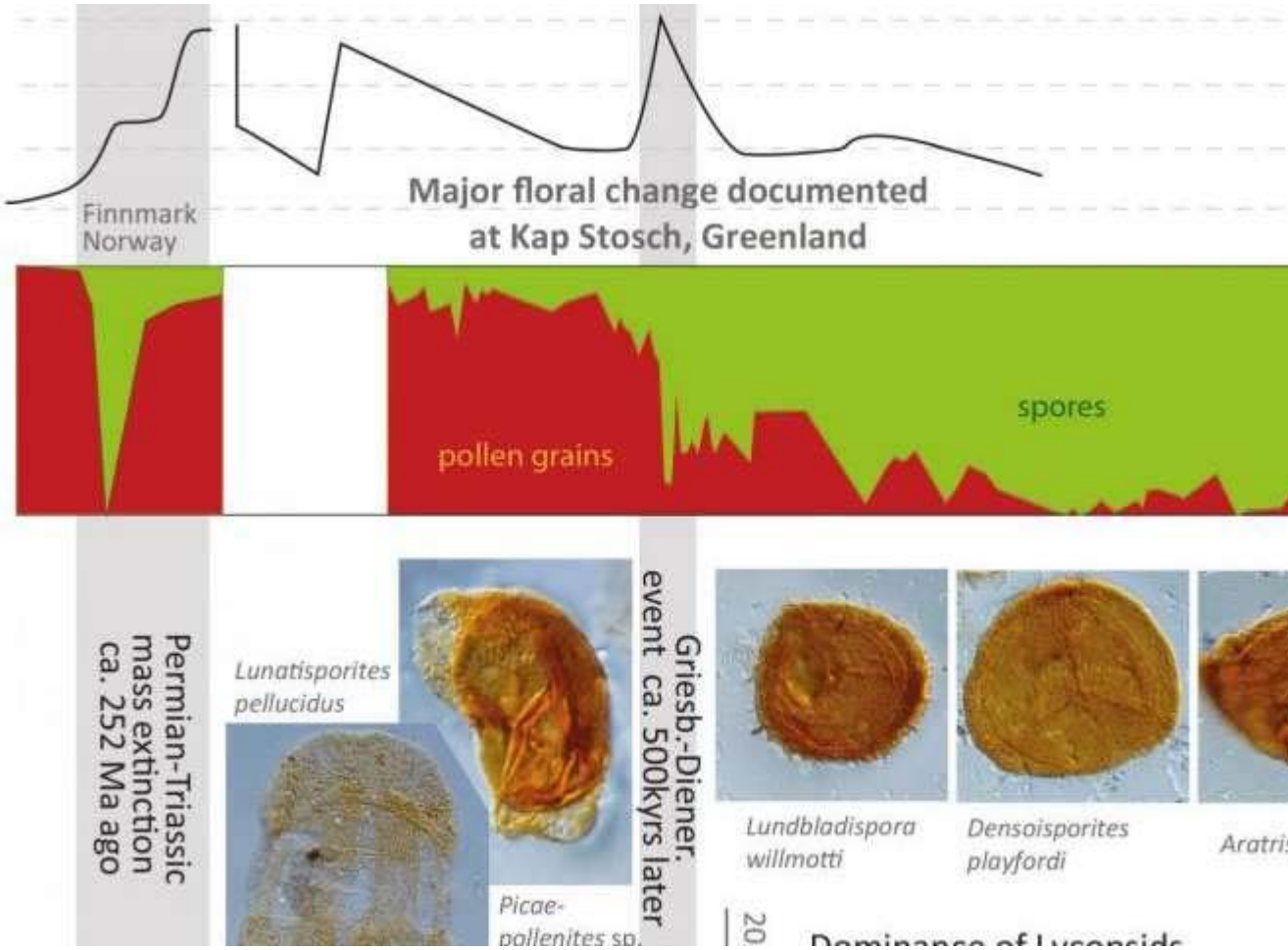


Illustration of ancient Earth's magnetic field compared to the modern magnetic field. Credit: Peter Driscoll

New work from Carnegie's Peter Driscoll suggests Earth's ancient magnetic field was significantly different than the present day field, originating from several poles rather than the familiar two. It is published in *Geophysical Research Letters*.

Read more at: http://phys.org/news/2016-06-earth-ancient-magnetic-field.html#jCp

Previously unknown global ecological disaster discovered



Approximately 500,000 years after the major natural disaster at the boundary between the Permian and the Triassic another event altered the vegetation fundamentally and for longer. Credit: UZH

There have been several mass extinctions in the history of the earth with adverse consequences for the environment. Researchers from the University of Zurich have now uncovered another disaster that took place around 250 million years ago and completely changed the prevalent vegetation during the Lower Triassic.

Read more at: http://phys.org/news/2016-06-previously-unknown-global-ecological-disaster.html#jCp

Scientists Prepare to Eat a Radish Grown in Martian Soil

Last year, NASA released evidence of flowing water on Mars—"conveniently" during the same week that Ridley Scott's *The Martian* arrived in theaters. Then we all watched Matt Damon fight to survive when his jerk astronaut buddies abandoned him on the red planet. One of the most intriguing aspects of his strategy for survival actually has real-life implications: can we grow food on Mars?
http://nerdist.com/scientists-prepare-to-eat-a-radish-grown-in-martian-soil/

For a greener Green Revolution, restore s health in Africa

by Esther Ngumbi

Tuesday, 14 June 2016 06:55 GMT

Nigeria is launching a "Soil Doctor" programme after decades of declining soil health and mounting malnutrition

Africa's most populous country is launching a long-overdue national program for its millions of small-scale family farmers: a soil test kit linked to the digital cloud. The program by the government of Nigeria follows decades of declining soil health and mounting malnutrition. http://news.trust.org/item/20160614065602-osduy/?source=hpMostPopularBlogs

Ethiopia: Soil Fertility Information Is Transforming Agriculture

ANALYSISBy Tekalign Mamo

Degraded soils have historically inhibited successful food production - better fertilisers can help change that

Ethiopia has continually attempted to shake its association with widespread hunger and poverty. In 2003, 15 million people in the country were estimated to be food insecure. This year, once again, widespread drought induced by the strongest El Niño on record has forced 10.2 million people to rely on food aid.

But a quiet transformation has been taking place in recent years that has allowed Ethiopia to contain the effects of this drought to a greater extent than before. Despite the harsh setbacks of recent months, Ethiopia is still on track to become a middle-income country in the next ten years. http://allafrica.com/stories/201606170813.html

700-year-old West African soil technique could help mitigate climate change

Ancient farming practice could be the answer to offsetting carbon dioxide emissions, preventing food shortages

A farming technique practised for centuries by villagers in West Africa, which converts nutrient-poor rainforest soil into fertile farmland, could be the answer to mitigating climate change and revolutionising farming across Africa.

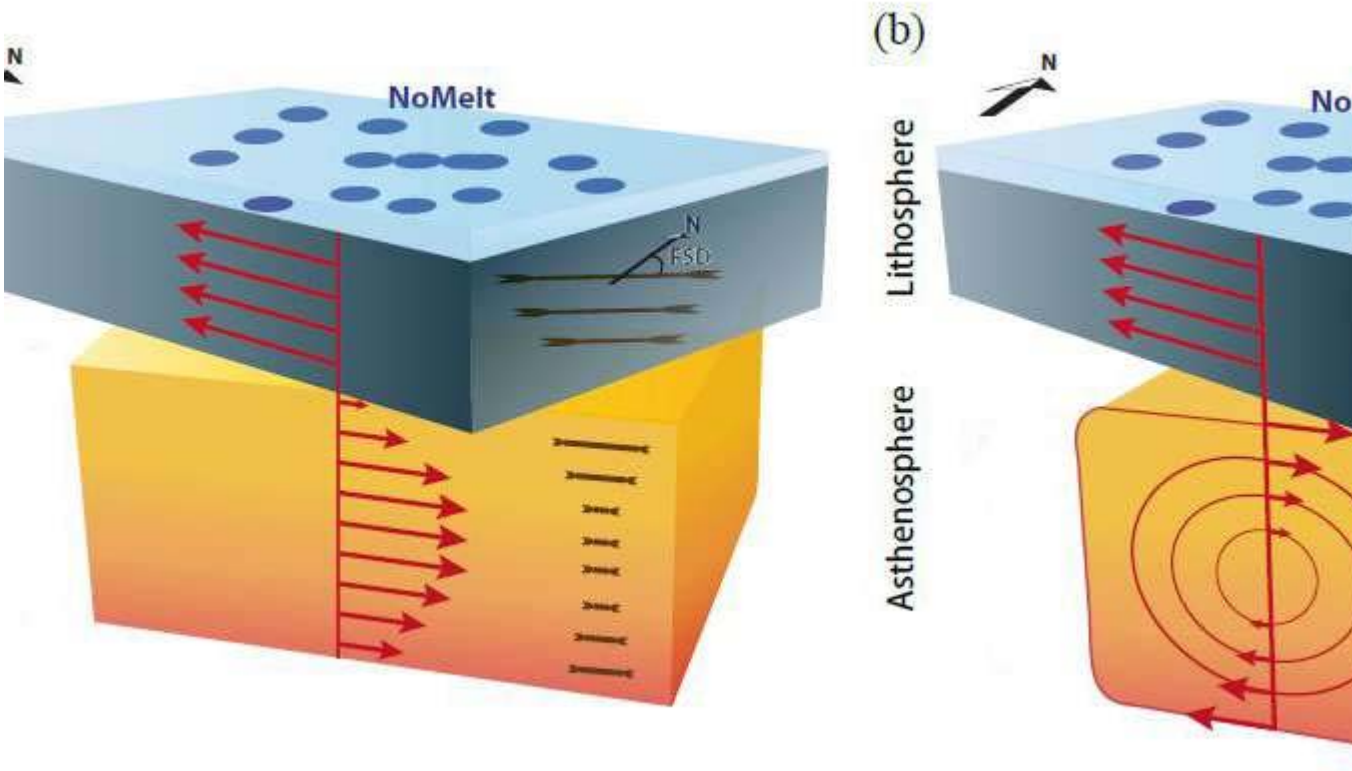
Journal Reference:

1. Dawit Solomon, Johannes Lehmann, James A Fraser, Melissa Leach, Kojo Amanor, Victoria Frausin, Søren M Kristiansen, Dominique Millimouno, James Fairhead. **Indigenous African soil enrichment as a climate-smart sustainable agriculture alternative**. *Frontiers in Ecology and the Environment*, 2016; 14 (2): 71 DOI: 10.1002/fee.1226

https://www.sciencedaily.com/releases/2016/06/160616105901.htm

New study upends a theory of how Earth's mantle flows

6 July 2016

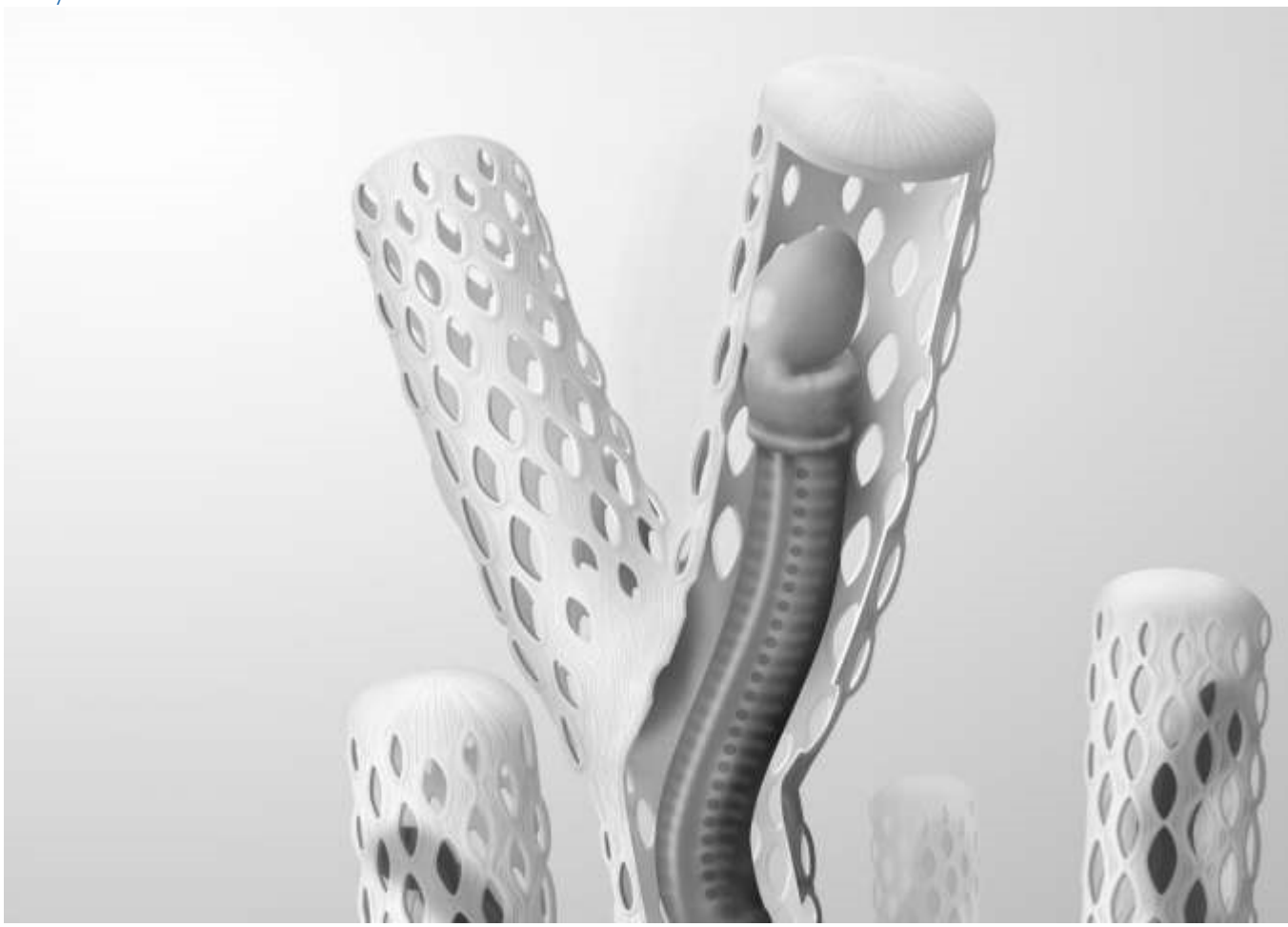


Illustrations show how (a) pressure gradient-driven flow and (b) density-driven small-scale convection could work in the asthenosphere. At the top is the surface view showing the locations of the No Melt seismometers. The red arrows indicated the flow direction. Credit: Lin et al., Nature 2016

A new study carried out on the floor of Pacific Ocean provides the most detailed view yet of how the earth's mantle flows beneath the ocean's tectonic plates. The findings, published in the journal *Nature*, appear to upend a common belief that the strongest deformation in the mantle is controlled by large-scale movement of the plates. Instead, the highest resolution imaging yet reveals smaller-scale processes at work that have more powerful effects. http://phys.org/news/2016-07-upends-theory-earth-mantle.html

The secret to an Oesia life: Prehistoric worm built tube-like 'houses' on sea floor

6 July 2016



Artist's impression of *Oesia* in the perforated tube that scientists believe it inhabited. Credit: Drawing by Marianne Collins

The fossilised remnants of tube-like "dwellings" which housed a primitive type of prehistoric sea worm on the ocean floor have been identified in a new study.

Read more at: http://phys.org/news/2016-07-secret-oesia-life-prehistoric-worm.html#jCp

Soils support our planets biodiversity and they host a quarter of the total UNFAO 2015