### **Cop** Land and Soil Management Community of Practice



## 2015 International Year of Soils



## Warning over vulnerability of soil carbon to warming



By Matt McGrath Environment correspondent, BBC News



Colder soils are more vulnerable to releasing extra carbon in a warmer world

The huge stores of carbon locked in the world's soils are more vulnerable to rising temperatures than previously thought.

**Related Stories** 

Researchers found that microbes in the soil were more likely to enhance the release of CO2 in a warming world.

Soils from colder regions and those with greater amounts of carbon were seen to emit more as temperatures went up.

Meadow protection plan 'backfires' 'Largest' coastal scheme completed UK seeks extra power for winter

http://www.bbc.com/news/science-environment-29050800

# U.S. Geologist Discovers Earth-Like Soils on Mars

22 Aug 2014 by Sci-News.com

Paleosols (ancient fossilized soils) filling the Yellowknife Bay geologic formation within the 3.7-billion-year-old Gale Crater on Mars are strong evidence that the planet was once much warmer and wetter, says geologist Dr Gregory Retallack of the University of Oregon, based on images recently released by NASA.



Paleosols found inside Gale Crater on Mars are evidence of habitable environments, but have yielded no conclusive evidence of life. Image credit: Gregory J. Retallack.

"The images, taken by NASA's Curiosity Mars rover, reveal Earth-like soil profiles with cracked surfaces lined with sulfate, ellipsoidal hollows and concentrations of sulfate comparable with soils in the Antarctic Dry Valleys and the Chile's Atacama Desert," Dr Retallack said.

http://www.sci-news.com/space/science-earth-like-soils-mars-02113.html

## Managing water resources in forest restoration

14 hours ago



Frances O'Donnell, Ph.d., works with flowtography equipment in the forest.

Hundreds of thousands of acres on the Coconino National Forest are slated for thinning during the next 20 years. Two NAU researchers want the forest restoration efforts to result in better water quality and quantity, a shift that could reduce wildfire risk, prevent post-fire flooding and save cities money in water treatment costs.

Read more at: <u>http://phys.org/news/2014-09-resources-forest.html#jCp</u>

### Greenhouse gases: A new group of soil micro-organisms can contribute to their elimination

#### 28 Aug 2014

INRA research scientists in Dijon have shown that the ability of soils to eliminate N2O can mainly be explained by the diversity and abundance of a new group of micro-organisms that are capable of transforming it into atmospheric nitrogen (N2).

Read more at: <u>http://phys.org/news/2014-08-greenhouse-gases-group-soil-micro-organisms.html#jCp</u>



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#### Pre-crop practices key to water efficiency

31 Aug. 2014 04:00 AM 🚭 A+ A-

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IMPROVEMENTS in the efficiency of rainfall capture and soil water management promise to deliver valuable productivity benefits to growers in the northern cropping region.

Research being undertaken as part of the Grains Research and Development Corporation's (GRDC) water use efficiency initiative is showing that pre-crop management is more important than in-crop management in lifting the water use efficiency (WUE) and yield of wheat cropping systems.



demand drops

http://www.queenslandcountrylife.com.au/news/agriculture/cropping/general-news/precroppractices-key-to-water-efficiency/2708987.aspx

## **Research team probes climate's impact on groundwater quality**

16 hours ago by Gillian Klucas



An interdisciplinary University of Nebraska-Lincoln team is studying how climate and agricultural changes influence groundwater quality. From left: Yusong Li, civil engineering; Zhenghong Tang, community and regional planning; Shannon ...<u>more</u>

Climate change and increasing food production demands both influence groundwater quality. To better understand the links between climate, agriculture and groundwater, University of Nebraska-Lincoln researchers will investigate climate's impact on groundwater contamination from chemicals used in crop and animal production.

Read more at: <u>http://phys.org/news/2014-09-team-probes-climate-impact-groundwater.html#jCp</u>



LIMING is a fundamental step in improving and maintaining soil fertility. Over the last four decades, lime usage has declined from an average of 1.7m tonnes in the 1980s to an average of 725,000 tonnes in the 2000s.

http://www.independent.ie/business/farming/liming-is-key-to-unlocking-your-soils-real-potential-30535279.html

### Salt Levels Increasing in ND Soils



Our wet weather is taking it's toll on many acres across the state. Naeem Kalwar is an NDSU Extension Specialist in Langdon.

Kalwar says our wet weather has increased both sodium and salt levels in the soil. He says 5.8 million acres in North Dakota were affected by soil salinity in 2000. He says that number has continued to increase over the past 14 years. A white, salt crust on the soil surface is often the most common symptom, as well as stunted plant growth. <u>http://www.kxnet.com/story/26393974/salt-levels-increasing-innd-soils</u>



Soils are classified to establish classes that allow scientists to understand important properties, relationship between different soil types, and as a means of communication. The classification system developed in the U.S. is called Soil Taxonomy (ST). It is commonly used around the world and was the mapping and classification system used in several Middle Eastern countries, including the United Arab Emirates.

The twelfth edition of the Keys to Soll Taxonomy has recently been released, which highlights the addition of classes for soils dominated by the mineral, anhydrite. The cover page of the twelfth edition depicts six images including the anhydrite soil profile (2nd from left bottom).

The USDA-NRCS presented anhydrite profile in the cover image and also mentioned in the Foreword. The excerpts are shown below.

#### http://www.biosaline.org/FeaturesDetails.aspx?id=146

#### New publication:

#### The United Arab Emirates Keys to Soil Taxonomy

ICBA and the Environment Agency - Abu Dhabi (EAD), announce the publication of the United Arab Emirates Keys to Soil Taxonomy. This publication – a result a joint cooperation between ICBA, EAD, and United States Department of Agriculture – Natural Resources Conservation Service (USDA-NRCS) provides information for keying out the soils of the United Arab Emirates and the arid Gulf Cooperation Council countries into separate classes and to provide a guide to associated laboratory methods.

"The book specifically addresses soil taxonomy in the UAE; however, it is equally good for use in the GCC, which have major common soil orders. (Aridisols and Entisols)" said Dr Shahid principal author of the publication, who added "I believe soil researchers in future will benefit from this valuable resource in their endeavor to assess soil resources in the UAE and the Gulf Region. This will lead to transfer of technologies established on similar soils and environmental conditions in the region where such soils may exist, and accordingly save significant investment." Shabbir A. Shahid Mahmoud A. Abdelfattah Michael A. Wilson John A. Kelley Joseph V. Chiaretti

United Arab Emirates Keys to Soil Taxonomy

2 Springer

#### http://www.biosaline.org/pdf/Biosalinity-News-April-2014.pdf

## New study shows how conversion of forests to cropland affected climate

9 hours ago by Kevin Dennehy



The conversion of forests into

cropland worldwide has triggered an atmospheric change that, while seldom considered in climate models, has had a net cooling effect on global temperatures, according to a new Yale study.

Read more at: <u>http://phys.org/news/2014-09-conversion-forests-cropland-affected-</u> <u>climate.html#jCp</u>

# 'Widespread methane leakage' from ocean floor off US coast



By Matt McGrath Environment correspondent, BBC News



A sonar image of a new methane plume discovered off

the US east coast

Researchers say they have found more than 500 bubbling methane vents on the seafloor off the US east coast.

The unexpected discovery indicates there are large volumes of the gas contained in a type of sludgy ice called methane hydrate.

http://www.bbc.com/news/science-environment-28898223

### International variety trial will help brew better future for global coffee industry

Sep 05, 2014 by Paul Schattenberg



This map shows the locations in coffee-producing regions of the world which have been identified for the International Multi-Location Variety trial of coffee varieties to be conducted by scientists and others working on conjunction with World ...<u>more</u>

The first shipment of coffee plantlets from World Coffee Research to test farms in 19 coffeeproducing countries will go out before the end of summer, said researchers involved in the new International Multi-Location Variety Trial.

Read more at: <u>http://phys.org/news/2014-09-international-variety-trial-brew-future.html#jCp</u>

## Wide, brown land becomes a home to carbon farming



Farming's tree change Peter Yench of Bulgoo property Cobar NSW receives carbon credits for established forests on his property that will not be cleared for 100 years.

On Peter Yench's sheep farm the buildozers are ready. When they surge forward, trees will be ripped from the earth, cleaning the land for grazing and crops.

Elsewhere another vast stretch of sparse, dry native forest stands on Mr Yench's land. It is hardly the Daintree, but like all forests it is a sink for carbon dioxide. If it too is brought down then the CO2 stored in the trees will be released, exacerbating climate change.

#### http://www.theage.com.au/national/wide-brown-land-becomes-a-home-to-carbonfarming-20140816-104t0v.html

#### Rock-eating microbes found buried in Antarctic lake

#### Irene Klotz Discovery News

A large and diverse family of hearty rock-eating bacteria and other microorganisms live in a freshwater lake buried a halfmile beneath Antarctic ice, new research confirms.

The finding not only adds another extreme environment where life thrives on Earth, but raises the prospect that similar species could have lived or are still living on Mars.

NASA's ongoing Curiosity rover mission, for example, already has found that the planet most similar to Earth in the solar system once had the chemical constituents needed to support microbial life.

The new research, published in this week's *Nature*, confirms initial studies 20 years ago that found microbes in refrozen water samples retrieved from Lake Vostok, the largest subglacial Antarctic lake.

Scientists at that time were not on a life-hunting expedition

Thursday, 21 August 2014



Electron microscope image showing a coccoid shaped microbial cell with an attached sediment particle from the subglacial Lake Whillans water column (Trista Vick-Majors) http://www.abc.net.au/science/articles/2014/08/21/4071556.htm

# Textbook theory behind volcanoes may be wrong

8 hours ago



A small eruption of Mount Rinjani, with

volcanic lightning. Location: Lombok, Indonesia. Credit: Oliver Spalt, Wikipedia.

In the typical textbook picture, volcanoes, such as those that are forming the Hawaiian islands, erupt when magma gushes out as narrow jets from deep inside Earth. But that picture is wrong, according to a new study from researchers at Caltech and the University of Miami in Florida.

Read more at: http://phys.org/news/2014-09-textbook-theory-volcanoes-wrong.html#jCp

## A blueprint for global soil governance

**19**AUG2014



At its very productive Second Plenary Assembly (22-24 July, Rome), the Global Soil Partnership endorsed the Plans of Action of four of its five pillars of action (Pillar 3 is still under development), the result of which can be seen as an "almost complete blueprint for action"<sup>1</sup> for the international soil community. The Assembly also discussed the updating of the World Soil Charter, and approved the logos, communication strategy and themes for the 2015 International Year of Soils and the 2014 and 2015 World Soil Day (December 5).

https://ec.europa.eu/jrc/en/news/blueprint-global-soil-governance

#### Soil Biology Masterclass

Tweet 25

Providing the core principles and cutting-edge knowledge in soil biology to drive the next advance in soil productivity.



- . Wednesday 8th and Thursday 9th October 2014
- . 9.30am to 4.30pm
- Hawkesbury Institute for the Environment, University of Western Sydney Hawkesbury, Richmond NSW 2754



The two-day Soil Biology Masterclass will give participants:

- · Advanced understanding of the concepts, theories and latest research on soil biology
- Insights into how soil biology can be explicitly managed to improve nutrient availability and carbon storage, and reduce pest and disease susceptibility.

#### http://www.uws.edu.au/hie/events and seminars/hie masterclass series/soil biology masterclass?utm\_source=uwsurl&utm\_medium=uwurlsoilbiology&utm\_campaign=SoilBiology-Masterclass

#### Biochar doubling-up the benefit:

Soil functions improvement and carbon sequestration value 38 August 2014

Biochar is a solid fine-grained material obtained from the carbonization of biomass under oxyger-limited conditions. Biochar may be applied directly to solis with the intention to improve soli functions and to reduce emissions from biomass. Due to its stability, biochar has an important role in carbon sequestration (the process of capturing CO2 before it escapes into the atmosphere).

This 2,000 year-old practice converts agricultural waste into a soil enhancer that can hold onthen, boost food security, and increase soil biodiversity, and discourage deforestation. The process creates a fine-grained, highly porces charcoal that helps soils retain nutrients and water as the international Biocher initiative explained.

Biochar is found in suits around the world as a result of vegetation flees and historic sull management practices. Intensive study of biochar-rich dark earths in the Amezon (terre prete), has led to a wider appreciation of biochar's unique properties as a soll enhancer.



Dr. Abdullah Alshankiti, Soll Scientist at XCBA, said that Biocher can be an important tool to increase soil productivity in areas with severely depleted softs, scarce organic resources, and inadequate water and nutrient supplies. Sandy soil could benefit the most.

## Kenya: Healthy Soils, Better Yields, Says Report

By Agatha Ngotho

Improved soil health, embracing best farm practices and better access to fertilisers has helped million of farmers double and triple crop yields according to a new report.

This is despite the steady drain of essential nutrients from African soils looming as a major threat to food security across the continent. The report released last week by the Alliance for a Green Revolution in Africa (AGRA) states that over the last five years, 1.7 million African farmers in 13 countries have embraced farming practices that have rejuvenated 1.6 million hectares that has helped increase yields. http://allafrica.com/stories/201408260545.html

### New plan avoids mud dumping in Barrier Reef Park

18 hours ago



In this Nov. 2002 file photo provided by Queensland Tourism, an unidentified woman snorkels on the Great Barrier Reef off Australia's Queensland state. The government of Australia's Queensland state approved a plan Monday, Sept. 8, 2014, that ...<u>more</u>

The government of Australia's Queensland state approved a plan Monday that will prevent 3 million cubic meters (106 million cubic feet) of seabed mud from being dumped in the Great Barrier Reef Marine Park.

Read more at: <u>http://phys.org/news/2014-09-mud-dumping-barrier-reef.html#jCp</u>



An erupting volcanic island that is expanding off Japan could trigger a tsunami if its freshly-formed lava slopes collapse into the sea, scientists said Tuesday.

The small, but growing, island appeared last year and quickly engulfed the already-existing island of Nishinoshima, around 1,000 kilometres (620 miles) south of Tokyo. It now covers 1.26 square kilometres (0.5 square miles).

http://www.geologypage.com/2014/08/japan-volcanic-isle-may-collapse-create.html

# Water allocation an issue at fracking locations across US and globally

8 hours ago by Neela Banerjee, Tribune Washington Bureau

Extracting natural gas for energy from shale rock deep underground requires lots of water, but much of the world's shale gas is in regions where water is already scarce, including part of California, according to a study issued Tuesday.

Read more at: <u>http://phys.org/news/2014-09-allocation-issue-fracking-globally.html#jCp</u>

#### Northern California earthquake is area's strongest in 25 years

By Josh Levs, Susanna Capelouto and Joshua Berlinger, CNN August 25, 2014 – Updeted 1421 GMT (2221 MRT)



#### STORY HIGHLIGHTS

Editor's note: Are you there? Share your images if you can safely

One hospital treats more than 170 people, most suffering bruises and cuts

(CNN) -- The strongest earthquake in 25 years in Northern California struck early Sunday, injuring dozens of people, damaging historic

round child in critical condition buildings in downtown Napa and turning fireplaces into rubble teen out fir treatment,

#### http://edition.cnn.com/2014/08/24/us/california-earthquake/index.html

## Website highlights Soil Renaissance

Stakeholders interested in being part of the Soil Renaissance can now do so electronically via a new website: www.soilrenaissance.org.

"The new website is a tool for people involved in the Soil Renaissance to stay up-to-date on the work of our focus groups, as well as a great way for people new to this vital effort to learn what we're all about," says project coordinator Brook Gaskamp.

Launched on World Soil Day 2013, the Soil Renaissance brings attention to the critical role of healthy soils in vibrant natural resources systems. The project is a collaboration of Farm Foundation, NFP and the Samuel Roberts Noble Foundation.

Read more: http://www.ardmoreite.com/article/20140824/News/140829833#ixzz3Cgd3FcvL

## **Rapid-growth plantations eyed for water** management

14 hours ago by Rob Payne



Researcher Stan Sochacki in 3 year old plots of Eucalyptus occidentalis at Corrigin. Credit: Richard Harper

Utilising rapid-growth tree plantations could support water management in dryland farming systems while producing feedstock for bioenergy, new research contends.

http://phys.org/news/2014-09-rapid-growth-plantations-eyed.html

# Earth Wise: Restoring soil could cut carbon

POU 2:12 p.m. EDT 2 September 2014



(Photo: Getty Images/amana images RF) 14 connecttweetLinkedIncommentemailmore

The effort to reduce the amount of carbon in the atmosphere is primarily focused on the sources of carbon, such as emissions from the burning of fossil fuels. This can be called a supply-side approach. However, there is also the important issue of carbon sinks, which are termed demand-side approaches to the problem. The greatest sink for carbon is soil. Estimates are that 2,500 billion tons of carbon resides in soil, compared with 800 billion tons in the atmosphere and 560 billion tons in living things. However, the dramatic reduction of carbon-rich environments such as the vast North American tall grass prairie has greatly changed how much carbon is stored in the soil. In all, the world's cultivated soils have lost between 50-70 percent of their original carbon content, most of which has oxidized to form CO2. http://www.poughkeepsiejournal.com/story/tech/science/environment/2014/09/02/ear th-wise-carbon-soil/14973269/

#### Identifying Soils that "Seal" and Improving Irrigation Application Efficiency in "Sealing" Soils

By Jason Krutz, Irrigation Specialist, Dan Roach, Ext. Associate and Bobby Golden, Agronomist, Delta REC, Mississippi State University, on September 4th, 2014

This summer we had multiple conversations with producers that either irrigated or had significant rainfall events on their field, but the soil moisture sensors below the 6 inch depth never "detected" the irrigation or rainfall event (see <a href="http://www.mississippi-crops.com/2014/06/26/is-my-soil-moisture-sensor-broke/">http://www.mississippi-crops.com/2014/06/26/is-my-soil-moisture-sensor-broke/</a> ). The producer assumed the sensors were "broke", but we attributed the phenomenon to "surface sealing". Surface sealing in the Mississippi Delta typically occurs in soils that have a low clay and organic matter content but have a high silt fraction, i.e., most of our silt loam soils. Surface sealing, from an irrigation management standpoint, is problematic because it can drastically reduce rainfall or irrigation infiltration rates. Following is a list of means to determine if you have a soil that is prone to surface sealing:

- 1) Soil classified as Silt Loam
- 2) Battle "crusting" problems

3) PHAUCET or Pipe Planner indicates 24 hrs to apply 2 acreinches but you reach the tail-ditch in half the time, i.e., 1 acreinch applied

4) Platy soil structure present in the top quarter inch of soil surface (see pictures(s) below, click to enlarge)







http://www.mississippi-crops.com/2014/09/04/identifying-soils-that-seal-and-improving-irrigation-application-efficiency-in-sealing-soils/

#### Soil Health Across the Nation

A growing number of America's farmers are using soil health management systems to improve the health and function of their soil—and we're working hand-in-hand with these producers through our technical and financial assistance programs and services to help ensure their success. Click on the interactive map below and find out what's happening in your state regarding soil health and learn more about some of the farmers who are unlocking the secrets in the soil.



#### http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/health/?cid=stelprdb12 50888

Marginal Lands Status: Challenges and Potential Contribution to the World Food and Income Security 21 July 2014



Increasing global population, degradation and depletion of natural resources and the impact of climate change all present challenges to agricultural production. To solve these challenges will require innovative thinking about sustainable management of both high productive agricultural environments and other areas that show less potential. Currently more than 800 million poor farmers cultivate marginal land, barely making a living with inadequate financial or capital resources available to commercialize agriculture or create off farm employment opportunities.

Marginal lands can have, however, a big potential in complimenting agricultural production, poverty alleviation, improved livelihoods, job opportunities, and gender issues.

http://www.biosaline.org/FeaturesDetails.aspx?id=145

## WATCH: Expedition to Vanuatu's explosive lava lake

BEC CREW TUESDAY, 12 AUGUST 2014

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New Zealand filmmaker Geoff Mackley takes you closer to the Marum Volcano lava lake in Vanuatu than any other human has ever been.



After more than a decade of planning, New Zealand filmmaker Geoff Mackley became the first person ever to get this close to the famed lava lake of Vanuatu's **Marum Volcano**. Situated on the tiny and remote volcanic island of Ambrym - itself the remnant of an enormous, ancient volcano - this seething lava lake is about the size of 2.5 football fields. And as the video above shows, Mackley got within 30 metres of its glowing orange mouth.

http://sciencealert.com.au/features/20141208-26007-2.html

## **Farmers See Saline-Sodic Soil Issues**

HURON — Farmers across South Dakota, especially in the east and the James River Valley, are seeing an increase in salinity and sodic soil problems. Out on the landscape, the white spots on the soil surface without vegetation are identified as saline soils that have high salts, while sodic soils have high sodium levels.

At a July field day near Pierpont, farm groups hosted experts from the USDA Natural Resources Conservation Service (NRCS), South Dakota State University (SDSU)

and about 120 farmers to take a close look at what is happening with water movement within the soils of those problem areas. As part of a Conservation Innovation Grant from NRCS, North Dakota State University and SDSU are exploring salinity and sodicity treatment practices. The universities are tracking soil performance under various management options and researching alternatives such as using amendments to improve infiltration, especially in the affected areas that are tiled. Much of SDSU's research and the discussions that day where about successes. <u>http://www.yankton.net/neighbors/article\_831217fc-2a69-11e4-8b99-</u>0019bb2963f4.html

# New discovery: Microbes can create dripstones

According to new research humble, microscopic organisms can create dripstones in caves. This illustrates how biological life can influence the formation of Earth's geology - and the same may be happening right now on other planets in space.



According to traditional textbooks dripstones are

created by geological or geochemical processes with no influence from living organisms. But now scientists report that formation of dripstones can be a lot more complex than that: Sometimes microbes are responsible for the formation of these geological features.

The researchers from Denmark, Sweden and Spain have investigated dripstone formation in a Swedish cave and conclude that microbes play an active part in their formation. http://sdu.dk/en/Om\_SDU/Fakulteterne/Naturvidenskab/Nyheder/2014\_08\_18\_dripstones

## Lime Need and Value

BY LARRY OLDHAM, EXTENSION SOILS SPECIALIST AND KEITH CROUSE, ON 3RD SEPTEMBER 2014

Acid soils often need liming to aid crop growth and development. Fall applications provide more time for the lime to react with the soil, less stress on the human component, and better field conditions for equipment operation. Soil acidity problems rarely have dramatic visual symptoms. Affected areas are less hardy or vigorous in growth; the size of the areas increases within fields over several growing seasons. If lime is needed, the benefits include:

- preventing aluminum and/or manganese toxicity,
- increasing phosphorus and molybdenum availability,
- improving nitrogen fixation by legume crops,
- improving the efficiency of applied phosphorus and potassium fertilizers, and
- increasing the volume of soil explored by roots.

Vendors of liming products are subject to the Mississippi Agricultural Liming Materials Act of 1993 and the regulations under that law. Those regulations were amended in 2005 to eliminate a previous grading system for calcitic and dolomitic materials (aka 'hard limes'), and to require a minimum 63% Relative Neutralizing Value (RNV). The RNV "must be shown prominently on the front face of the label, sales invoice, delivery ticket, or bulk ticket". http://www.mississippi-crops.com/2014/09/03/lime-need-and-value/

## Effort to confront Africa's soil health crisis helps millions of farmers triple yields

#### 22 Aug 2014

With the steady drain of essential nutrients from African soils looming as a major threat to food security across the continent, a new report released today finds that over the last five years, 1.7 million African farmers in 13 countries have embraced farming practices that have rejuvenated 1.6 million hectares and helped them double or even triple crop yields.

Read more at: <u>http://phys.org/news/2014-08-effort-africa-soil-health-crisis.html#jCp</u>



Fossil Hallucigenia sparsa from the Burgess Shale Credit: M. R. Smith / Smithsonian Institute

One of the most bizarre-looking fossils ever found -- a worm-like creature with legs, spikes and a head difficult to distinguish from its tail -- has found its place in the evolutionary Tree of Life, definitively linking it with a group of modern animals for the first time.

The animal, known as Hallucigenia due to its otherworldly appearance, had been considered an 'evolutionary misfit' as it was not clear how it related to modern animal groups. Researchers from the University of Cambridge have discovered an important link with modern velvet worms, also known as onychophorans, a relatively small group of worm-like animals that live in tropical forests. The results are published in the advance online edition of the journal Nature.

http://www.geologypage.com/2014/08/misunderstood-worm-like-fossil-finds.html

## Scientists Create Map of Martian Surface Properties

A group of planetary scientists using data from the Thermal Emission Imaging System (THEMIS) onboard NASA's Mars Odyssey orbiter has created the most detailed global map yet made of Red Planet's surface properties.



Unlike an ordinary daytime photo, this nighttime image of Martian surface shows how warm various surface areas are: brighter tones mean warmer temperatures, which indicate areas with rockier surface materials; darker areas indicate cooler and dustier terrain. Image credit: NASA / JPL-Caltech / Arizona State University.

The new map uses nighttime temperature images to derive the thermal inertia -a calculated value that represents how fast a surface heats up and cools off - for areas of Mars, each the size of a football field.

"We used more than 20,000 THEMIS nighttime temperature images to generate the highest resolution surface property map of Mars ever created," explained team member Dr Robin Fergason at the U.S. Geological Survey's Astrogeology Science Center in Flagstaff, Arizona. <u>http://www.sci-news.com/space/science-map-martian-surface-properties-02068.html</u>

## NMSU researcher's carbon sequestration work highlighted in 'The Soil Will Save Us'

By New Mexico State University on 21 August 2014in Research



NMSU scientist David C. Johnson stands in a field at Leyendecker Plant Science Center with a cutting from a sesbania plant grown on his compost system. Johnson's compost work suggests that the solution to global warming lies in the soil. (Courtesy photo)

Date: 07/08/2014 Writer: <u>Emily C. Kelley</u>, 575-646-1957, ekelley@nmsu.edu

A <u>New Mexico State University</u> scientist's work in carbon sequestration is turning heads – not just here in New Mexico, but also in Austria and Australia. His work suggests a potential

solution for dealing with the carbon dioxide-related problems that seem to be causing global warming.

http://nmsu.scienceblog.com/2014/08/21/nmsu-researchers-carbon-sequestrationwork-highlighted-in-the-soil-will-save-us/



Read an excerpt of the book at scifri.me/1sJHgF3

https://soundcloud.com/#scifri/is-healthy-soil-the-low-tech-solution-to-climate-change

#### Severe Drought is Causing the Western U.S. to Rise

Scientists use GPS technology to track uplift from recent massive loss of water, estimated at 63 trillion gallons

Aug 21, 2014

Embargoed By: Science



A GPS station in the Inpu Mountains, Galit. Credit: Shawn Lawrence, UNAVCO

#### EMBARGOED BY SCIENCE FOR RELEASE: 11 A.M., U.S. PACIFIC DAYLIGHT TIME, AUGUST 21, 2014

The severe drought gripping the western United States in recent years is changing the landscape well beyond localized effects of water restrictions and browning lawns. Scientists at Scripps institution of Oceanography at UC San Diego have now discovered that the growing, broad-scale loss of water is causing the entire western U.S. to rise up like an uncolled spring.

https://scripps.ucsd.edu/news/severe-drought-causing-western-us-rise







#### Deliverable 2.3. Changes in soil organic matter content in time as impacted by different farming systems

Due date of deliverable: 31/10/2013 Actual submission date: 30/05/2014

**Revision:** Final

Organization name of lead contractor for this deliverable: The University Court of the University of Aberdeen

Dissemination level: PU

Starting date: 01/11/2011 Duration: 48 months Project number: 209094

The project Smart(OE, (Gran Agreement N<sup>2</sup> (2010)) is co-denied by the European Committion, Directories General for Essantish & Donastian, within the Th Promework Programme of ECD, These 2 – Binactivologies, Agriculture & Fand. The views and options appreciad in this report are parely those of the senters and may not in any concentration be regarded as training an official passion of the European Committees.

#### http://smartsoil.eu/fileadmin/www.smartsoil.eu/Deliverables/D2\_3\_Final.pdf

#### Salt accumulation zones under different irrigation systems – Technical note

Under irrigated agriculture the water requirement of crops is offset through irrigation using different irrigation systems, such as flood, border, basin, furrow, sprinkler, drip (surface and subsurface), and bubbler. The irrigation method, water application rate, frequency of irrigation, field condition (leveling), bed shape, and uniformity of irrigation water application determines depth of wetted zone, and subsequent zones (surface and sub-surface) of salts accumulation. The surface accumulation of salts can be observed visibly. However, it is not easy to observe subsurface salts accumulation in



#### Low Medium High Very high Relative salt-accumulation zones

Figure 2: Relative salt accumulation zones under sprinkler and basin impation systems (a) drip irrigation (b) and sub-surface irrigation system (r) Modified from Chhabra (1996)

ridges between furrows. These patterns guide the best seed placement to minimize the salinity affects. Seed placement at safe site is essential to avoid high salt concentration affects to plants. It should be noted that post harvest plowing of furrow at surface due to capillary rise and evaporation [Figure 2(c)]. Salt-accumulation is faster when saline/ brackish water is used, and when the soils are fine textured. Only rainfall and/or switch over from sub-surface to sprinkler irrigation

can leach salts, otherwise salts will accumulate to toxic levels. The use of fresh water for irrigation may be an ideal choice for sub-surface irrigation.

Modern irrigation systems save significant

http://www.biosaline.org/pdf/Biosalinity-News-April-2014.pdf



## **Conservation at Work**

Photos of conservation on farms & other private lands across the nation. These photos may be used with attribution ("Courtesy USDA-NRCS" and photographer name). Editing is not permitted. Blog following ≠ endorsement.



#### Without Carrot or Stick

Back to school time is the perfect time to dig in to the science of soil.

Soil health practices, like cover crops, can improve farmers and ranchers' businesses without regulations and subsidies. This short video will help you understand the science of soil health.

http://usda-nrcs.tumblr.com/post/95130053695#

## Dwindling waterways challenge desert fish in warming world

3 Sep 2014 by Sandra Hines



Oak Creek, part of the Verde River Basin of Arizona, dries up during parts of the year. With a warming climate, the frequency and duration of streams drying up will increase causing hardships for desert fish. Credit: K Fritschie

(Phys.org) —One of Arizona's largest watersheds – home to many native species of fish already threatened by extinction – is providing a grim snapshot of what could happen to watersheds and fish in arid areas around the world as climate warming occurs.

Read more at: <u>http://phys.org/news/2014-09-dwindling-waterways-fish-world.html#jCp</u>

## Neanderthals walked among us - study

Species now thought to have

held out alongside modern humans in Europe for thousands of years but extent of mixing is unclear



A Neanderthal model on display in the Prehistoric

Museum of Halle, eastern Germany. Photograph: AFP/Getty Images

Modern humans and Neanderthals may have coexisted in Europe for more than 5,000 years, providing ample time for the two species to meet and mix, according to new research.

Using new carbon dating techniques and mathematical models, researchers examined about 200 samples found at 40 sites from Spain to Russia, according to a study published in the journal Nature. They concluded with a high probability that pockets of Neanderthal culture survived until between 41,030 and 39,260 years ago.

http://www.theguardian.com/science/2014/aug/21/neanderthals-lived-amongus-study?CMP=soc\_567

## Treat the earth well: it was not given to you by your parents, it was loaned to you by your children.

--- Ancient Indian Proverb ---