



**WORLD ASSOCIATION OF SOIL AND WATER CONSERVATION**

# **HOT NEWS**

Issue 09, 2018



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## WASWAC HOT NEWS No. 09, September, 2018

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Editors: Dr Du Pengfei, Contributors include Dr Amir Kassam and Dr Qu Liqin.

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WASWAC Website: [www.waswac.org](http://www.waswac.org)

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## **A Czech delegation visited IRTCES**

A Czech delegation included with Professor Borivoj Sarapatka from Palacky University, Professor Miroslav Dumbrovsky from Brno University of Technology and Professor Jana Podhrazska from Mendel University visited the International Research and Training Center on Sedimentation and Erosion (IRTCES) for technical exchange and future collaboration during September 17 to 18, 2018. The delegation was received by Mr. Ning Duihu, the Deputy Director of IRTCES, and Mr. Liu Xiaoying, the Deputy Chief of International Exchange and Information Division in IRTCES. Dr. Du Pengfei, the secretary of the World Association of Soil and Water Conservation (WASWAC), Dr Qu Liqin, the executive editor the International Research of Soil and Water Conservation (ISWCR), some graduate student representatives also attended the meeting.



A group photo

Mr. Ning Duihu extended a warm welcome to the Czech delegation and looked forward to enhancing mutual understanding and exploring further cooperation in international conference hosting, research cooperation and journal promotion. Prof.

Liu Xiaoying systematically introduced the organization, the latest research and technical solutions in the relevant fields, and activities concerning international cooperation of IRTCES. Dr. Du Pengfei introduced the works of the WASWAC secretariat involved. Dr. Qu Liqin overviewed the development of the journal in recent years. Professor Borivoj Sarapatka, Professor Jana Podhrazska, and Professor Miroslav Dumbrovsky, respectively introduced the research work of their respective teams and expressed the expectations in related activities joint hosting and research projects applications.

**Here's what agriculture of the future looks like:  
the multiple benefits of regenerative agriculture quantified**

*By Ricardo Salvador, director, Food & Environment Program*

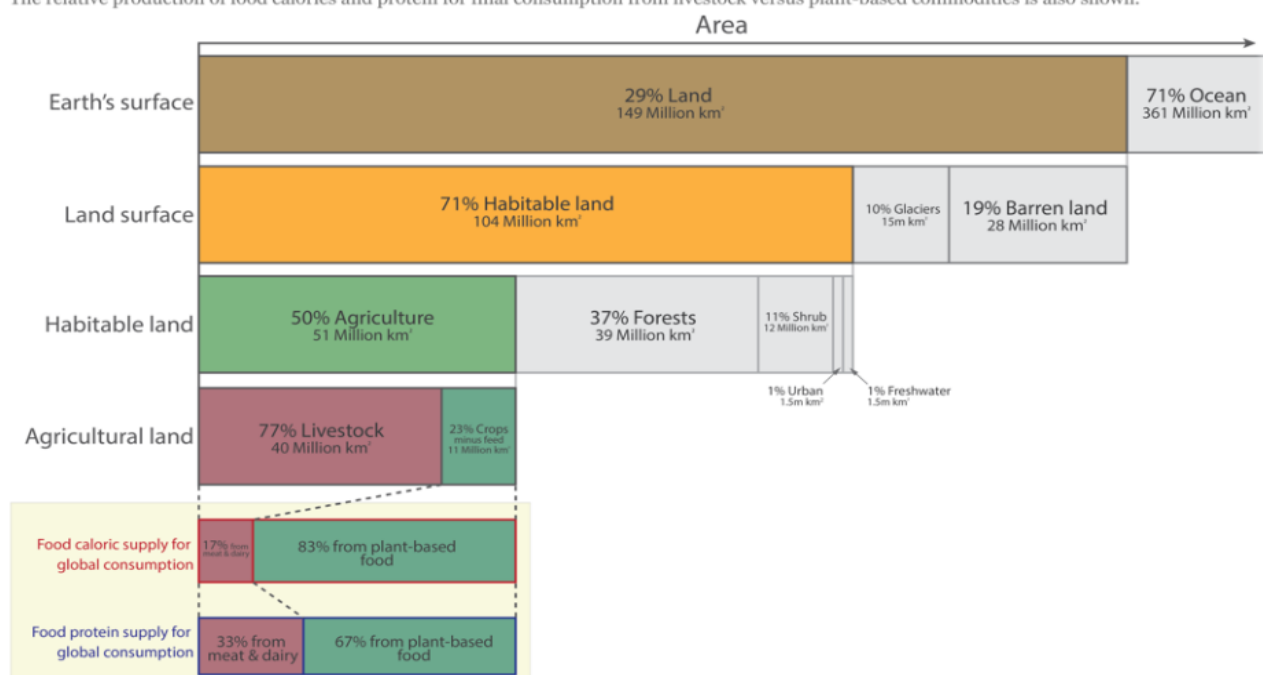
At the Union of Concerned Scientists, we have long advocated agricultural systems that are productive and better for the environment, the economy, farmers, farmworkers and eaters than the dominant industrial system. We refer to such a system as our Healthy Farm vision. Based on comprehensive science, we have specified that healthy farm systems must be multifunctional, biodiverse, interconnected and regenerative.

The scientific case for agricultural systems that renew rather than diminish resources is comprehensive, and research demonstrates the productivity and agronomic feasibility of such systems. Yet, economically viable real-world examples are necessary to spur acceptance and adoption of such schemes. Further, we need to overcome the limitations of economic thinking and measures that were developed in the 19th century—when it seemed that the Earth's resources and its capacity to absorb waste were inexhaustible—and improve them to create more modern assessments, appropriate for the 21st century and beyond. A new report from our colleagues at Farmland LP, Delta Institute and Earth Economics will make a major contribution toward this end.

## Global surface area allocation for food production

Our World in Data

The breakdown of Earth surface area by functional and allocated uses, down to agricultural land allocation for livestock and food crop production, measured in millions of square kilometres. Area for livestock farming includes grazing land for animals, and arable land used for animal feed production. The relative production of food calories and protein for final consumption from livestock versus plant-based commodities is also shown.



Data source: based on UN Food and Agricultural Organization (FAO) Statistics. The data visualization is available at [OurWorldinData.org](https://ourworldindata.org). There you find research and more visualizations on this topic.

Licensed under CC-BY-SA by the authors Hannah Ritchie and Max Roser.

Source: Our World in Data.

Economists view agriculture as a primary sector of the economy, meaning that without the activity of that sector, the remainder of the economy (such as manufacturing and service) could not be developed. Together with other primary economic enterprises such as mining and forestry, agriculture has generally been practiced and acknowledged as an extractive industry. Whereas mining is visibly extractive, agriculture is less so, because degradative processes such as soil erosion, fertility loss, and water and air pollution are not as obvious as mountaintop removal and strip mining. Yet, as practiced industrially, agriculture is both extractive and more extensive than mining.

Based on a comprehensive review of scientific literature examining the value of various ecosystem services, the researchers applied the rigorous methodologies of Ecosystem Services Valuation and Greenhouse Gas Accounting to assess the effects of farm management on items such as soil formation and quality, water capture and quality, pollination and seed dispersal, climate stability, disaster risk reduction, air

quality and biological control. Using Colorado State University's COMET-Farm model, and the USDA's Revised Universal Soil Loss Equation, the researchers evaluated the effect of regenerative techniques on farmed and non-farmed land under Farmland LP's management. They compared these model outputs with those from land managed conventionally to construct a comprehensive impact balance sheet.

This assessment affirms the concrete value and effectiveness of multifunctional regenerative approaches. Since many of these ecosystem services are not currently quantified—much less traded—on markets that would remunerate farmers, the benefits are primarily experienced by way of cleaner environment, lower costs of production and added value of agricultural land. This is because land managed with regenerative practices will produce bountifully, at lower cost and for an indeterminate period of time, whereas the value of industrially managed land depends on false and brittle economies, such as access to government subsidies and the availability of cheap industrial fertilizer.

In fact, the main business of Farmland LP, a real estate investment trust, is to add long-term value to agricultural land for landowners and investors. A remarkable aspect of this strategy and business model, in addition to more faithfully reflecting actual ecological economics, is how quickly Farmland LP management has been able to produce results. In addition to demonstrating the effectiveness of regenerative methods, these findings indicate the kinds of practices that should be more broadly adopted across all of agriculture to assure our livelihood at present and far into the future.

As long as reliable scientific information influences decisions and behavior, this report provides a beacon toward more viable, ethical and realistic agricultural practice for the long term.

Details at:

<https://blog.ucsusa.org/ricardo-salvador/heres-what-agriculture-of-the-future-looks-like-the-multiple-benefits-of-regenerative-agriculture-quantified>



# COMING MEETINGS



## 9th International Congress

Tirana (Albania) 26 - 28 September 2019

### Soil's Contribution to People: from Food to Life supporting Services

Distinguished Colleagues and Dear Friends,

On behalf of the ESSC (European Society for Soil Conservation) and the Organizing Committee, we are pleased to invite you to attend the 9th ESSC International Congress on 'Soil's Contribution to People: from Food to Life supporting Services'. The Congress will be hosted at the Agricultural University of Tirana (Albania) from 26 to 28 September 2019. The objective is to stimulate reflections on the importance of soil resources on man's existence and as a source of food and life supporting services. The Congress is open to soil scientists, students, educators, policy and decisionmakers. It will consist of invited lectures, scientific sessions with oral and poster presentations, and a scientific and cultural excursion. Further information on the Congress (registration, logistics, accommodation), will be distributed soon.

We look forward to meeting you in Tirana !

*Carmelo Dazzi*  
President of ESSC



UNIVERSITÀ  
DEGLI STUDI  
DI PALERMO

*Pandi Zdruli*  
Honorary President of the  
Organizing Committee



CIHEAM  
IAM BARI

*Fatbardh Sallaku*  
President of the  
Organizing Committee





## Welcome

On behalf of all in Geography at NUI Galway, may we extend a very warm welcome to you all to the 7th EUGEO Congress in conjunction with the 51st Conference of Irish Geographers, here in the west of Ireland – Galway City. The **theme** for the 2019 conference is Re-Imagining Europe's Future Society and Landscapes. The theme **focuses on** the centrality of the concepts of society and landscape within the Discipline of Geography and the importance of the relationship that exists between the physical and cultural landscape.

This conference will offer participants the opportunity to reflect on and re-imagine futures within the geographical boundary of Europe. The overarching theme will be reflected throughout the conference programme and themed fieldtrips.

The conference will take place over four days (May 15th – 18th 2019), calls for sessions and paper will become available over the coming days and weeks.

Kathy Reilly and Frances Fahy

Conference Co-Chairs

Email: [info@eugeo2019.eu](mailto:info@eugeo2019.eu)

## Important Dates

Monday 3rd Sept: Registration and call for sessions now open

Friday 30th November: Call for sessions closes

Monday 3rd December: Call for papers opens

Friday 1st February 2019: Call for papers closes; early bird registration closes

Friday 15th March 2019: Provisional programme published

## Official website

<https://www.eugeo2019.eu/>



## 7th International Conference on Earth Science, Climate Change & Space Technology

### Information

Earth Science 2019 is glad and proud to welcome you to attend the Conference on Earth Science, Climate Change & Space Technology 2019 during **May 22-23, 2019 Rome, Italy**. With a **theme** “New Revolution & Technology in Earth Science & Space Technology”. Earth Science 2019 its Open Access Initiative is committed to making genuine and reliable contributions to the scientific & Technology community.

Earth Science 2019 **aims** with a total of 25 tracks to discover advances in applied physics, Technology, Science & management and education in relation to the field as well as a breadth of other topics.

Earth Science 2019 Conference, offers a **unique opportunity for young scientists** starting their research activity in the Earth Science, climate change & Space Technology field across the world to present and recognize their achievements. It will be also a platform gathering the eminent scientists cordially welcome to participate in this prestigious event.

### Contacts

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## **A Thailand delegation visited IRTCES**

On November 5, 2018, a Thailand delegation leading by Ms. Juraiporn Kaewthip of the Thailand Land Development Department and Professor Wanwisa Pansak of Naresuan University with a group of 5 experts visited the International Research and Training Center on Erosion and Sedimentation (IRTCES). The aim of the visiting is to exchange and discuss related research and international exchange work on soil and water conservation between the two sides. The delegation was received by Prof. Ning Duihu, the Deputy Director of IRTCES, and Professor Li Rui, the president of World Association of Soil and Water Conservation (WASWAC). Dr. Du Pengfei, the secretary of the WASWAC, Dr Qu Liqin, the executive editor for the International Soil and Water Conservation Research (ISWCR), IRTCES staffs in Division of the Secretariat and graduate student representatives attended this meeting.



A group photo

Prof. Ning Duihu extended a warm welcome to the Thailand delegation and looked forward to continuing and enhancing our long-term cooperation tradition. Dr. Du Pengfei introduced the works developed by the secretariat of the WASWAC and the development of related researches. Dr. Qu Liqin delivered a brief introduction on IRTCES including the organization, the operation, and the routine works of this

center as well as the recent international exchange activities. Juraiporn Kaewthip introduced the Thailand Land Development Department and its offices set up in different regions, emphasized their efforts in soil erosion control and land conservation. Prof. Wanwisa Pansak described the research works of her team in erosion and nutrient loess in Hillside, presented the application of Unmanned Aerial Vehicle in erosion related studies.

Both parties expressed the strong willing in promoting cooperation not only in research projects but also in academic exchange, international conference hosting, and journal promotion.

### **Ancient volcanic eruptions disrupted Earth's thermostat, creating a 'Snowball' planet**

One of the most extreme climate episodes the Earth has experienced was during the so-called Snowball Earth, 720 million years ago. During this period glaciers spanned from the poles to the tropics, resulting in a planet entirely covered by ice. The Snowball Earth hypothesis has been the subject of scientific debate for around 20 years: scientists are both fascinated and perplexed about how the planet could descend into such a weird climatic state.

New research now points to spectacularly large volcanic eruptions as being key in this process. We suggest this happened because large amounts of carbon dioxide were pulled out of the atmosphere after huge eruptions, and this led to a loss of heat from the Earth's surface.

Surprisingly, the mechanism for this appears to be rock erosion.

#### **Long term climatic effects**

While some relatively small volcanic eruptions will have short term climatic effects, the long-term effects of LIP volcanoes may be profound.

The reason for this boils down to simple chemistry. Carbon dioxide in the atmosphere dissolves in rain, and falls to the ground where it reacts with silicate minerals in the rocks. Carbon dioxide forms bicarbonate, and ultimately becomes

locked away in limestones and shale rock formations.

Over hundreds of thousands of years the amount of carbon dioxide in the atmosphere is quite effectively regulated in this way. Scientists estimate that weathering of rocks consumes approximately 600 million tons of carbon dioxide per year.

LIP volcanic eruptions can also affect climate in another way: through triggering photosynthesis.

### Descent into Snowball Earth

Basaltic erosion just before the Snowball Earth, was more than 100% greater than what we see today.

This basalt was sourced from three prominent LIPs, which erupted in a cascading sequence beginning 830 million years ago in Australia, 780 million years ago in North America and 720 million years ago in northern Canada. All three of these

### Complex interactions in the Earth system

Atmospheric carbon dioxide levels and global climate are regulated over long periods of time by the weathering of rocks. Over geologic time (hundreds of thousands of years) this process acts as a negative feedback on increasing atmospheric carbon dioxide. When higher temperatures drive higher rates of weathering, it acts as a kind of thermostat for the Earth.

However, this work demonstrates that the Earth's thermostat can fail spectacularly at times: the eruption of LIPs resulted in a Snowball Earth.

This period of time lasted from 720 to 635 million years ago and is known as the Cryogenian. It is a time of continental breakup and marks a major transition from a world dominated by bacteria to a world dominated by more complex life.

This highlights the complexity of the earth system and the unexpected interactions between volcanism, climate and life.

Details at:

<https://theconversation.com/ancient-volcanic-eruptions-disrupted-earths-thermostat-creating-a-snowball-planet-82215>

## New Books

### Reorienting Indian Agriculture : Challenges and Opportunities



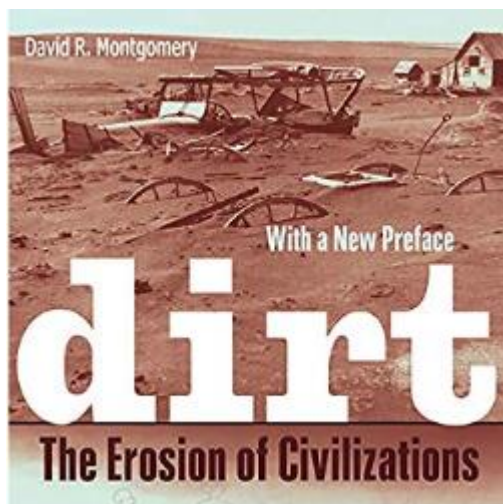
Author: Raj S Paroda, Trust for Advancement of Agricultural Sciences (TAAS), India

This book sketches a journey from green to an evergreen revolution through reorientation of Indian agriculture to address emerging challenges. It covers global agriculture, genetic resource management, crop breeding including biotechnology, seed production technology, agronomy, innovative extension, motivation of youth (including women), climate change and policy reforms for improving farmers' income. It provides insight into:

- ✚ India's agricultural scenario, and the strength of agricultural research for development.
- ✚ Better ways of managing natural resources for sustainable farming systems.
- ✚ Climate-smart, diversified and resilient agriculture for improved productivity and income.
- ✚ The need to reorient research, development and related policies concerned with agricultural research and innovation for development (ARI4D) to harness new opportunities.
- ✚ This book is for researchers, students and policymakers interested in agricultural policy, increased food production, rural development and natural resource management, especially: general agriculture, genetic resources, crop

breeding, seed development, agricultural biotechnology, agronomy, international agriculture, climate change and sustainable agriculture.

### **Dirt: The Erosion of Civilization**



Listening Length: 12 hours and 5 minutes

Program Type: **Audiobook**

Version: Unabridged

Publisher: Echo Point Books & Media, LLC

Audible.com Release Date: August 10, 2018

Language: English, English

ASIN: B07G9MNFKH

Dirt, soil, call it what you want, it's everywhere we go. It is the root of our existence, supporting our feet, our farms, our cities. This fascinating yet disquieting book finds, however, that we are running out of dirt, and it's no laughing matter. An engaging natural and cultural history of soil that sweeps from ancient civilizations to modern times, *Dirt: The Erosion of Civilizations* explores the compelling idea that we are, and have long been, using up Earth's soil. Once bare of protective vegetation and exposed to wind and rain, cultivated soils erode bit by bit, slowly enough to be ignored in a single lifetime but fast enough over centuries to limit the lifespan of civilizations. A rich mix of history, archaeology and geology, *Dirt* traces the role of soil use and abuse in the history of Mesopotamia, Ancient Greece, the Roman Empire, China, European colonialism, Central America, and the American push westward. We see how soil has shaped us and we have shaped soil?as society after society has risen, prospered, and plowed through a natural endowment of fertile dirt. David R. Montgomery sees in the recent rise of organic and no-till farming the hope for a new agricultural revolution that might help us avoid the fate of previous civilizations.



## **Countries across Europe make progress on tackling soil contamination**



A new report from the JRC finds that over 5,000 new sites are under remediation or risk-reduction measures since 2011.

At the same time, prevention and remediation remain a work in progress.

The new report estimates that polluting activities potentially took place in 2.8 million sites in the EU.

A significant effort is being made by Member States to identify which sites need urgent action and where remediation or risk reduction measures are required.

In most countries, the inventory process starts with the establishment of a register of sites where polluting activities have, or may have, taken place.

The report finds that there are more than 650k officially registered contaminated sites across Europe.

More than 170k sites still to be investigated , 68k are currently under investigation and more than 125k sites need or might need remediation. while 65 500 sites have already been remediated, or are under aftercare measures.

The status of soil contamination in Europe report is based on a questionnaire the JRC sent to 39 European countries in 2017, of which 29 replied.

Differences between data collection and management efforts are also highlighted.

The scientists call for a common European framework to help national governments in their efforts to prevent and remediate soil contamination.

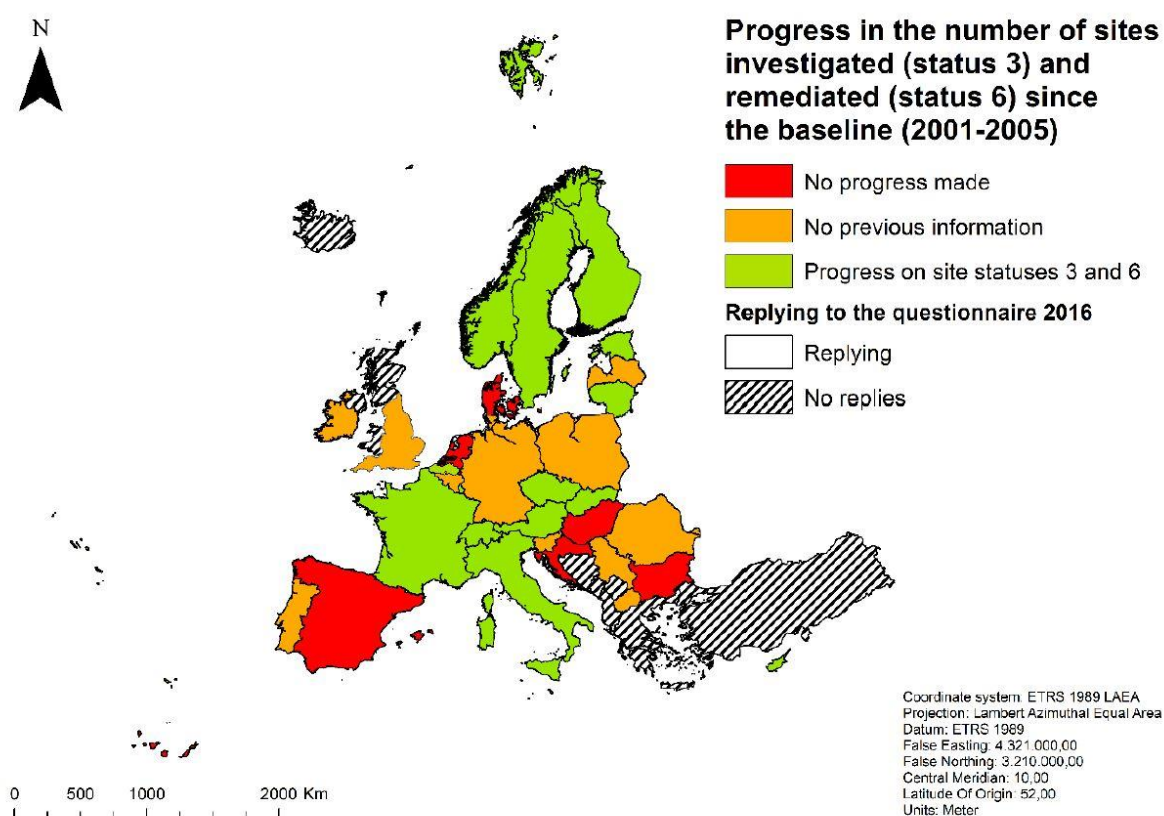
### **Tracking progress across Europe**

An average of 3.6 contaminated sites per square kilometre of artificial surface are registered in the country inventories of EU Member States.

More than 76 000 new sites have been registered since the latest survey conducted in 2011.

A significant effort is being made to remediate these identified contaminated sites, with more than 5,000 new sites under remediation or risk-reduction measures.

More than 65 500 sites have already been remediated, or are under aftercare measures: this represents an increment of more than 8 500 new remediated sites in the past 5 years.



## Differences in management approach

Countries like the Netherlands, Germany, the UK, and the Flanders region in Belgium who have been tackling the problem of soil contamination for at least three decades, are focusing their efforts on remediating those sites where they have identified that polluting activities took or are taking place.

Countries that have more recently started to address soil contamination are currently focusing on the identification of contaminated sites.

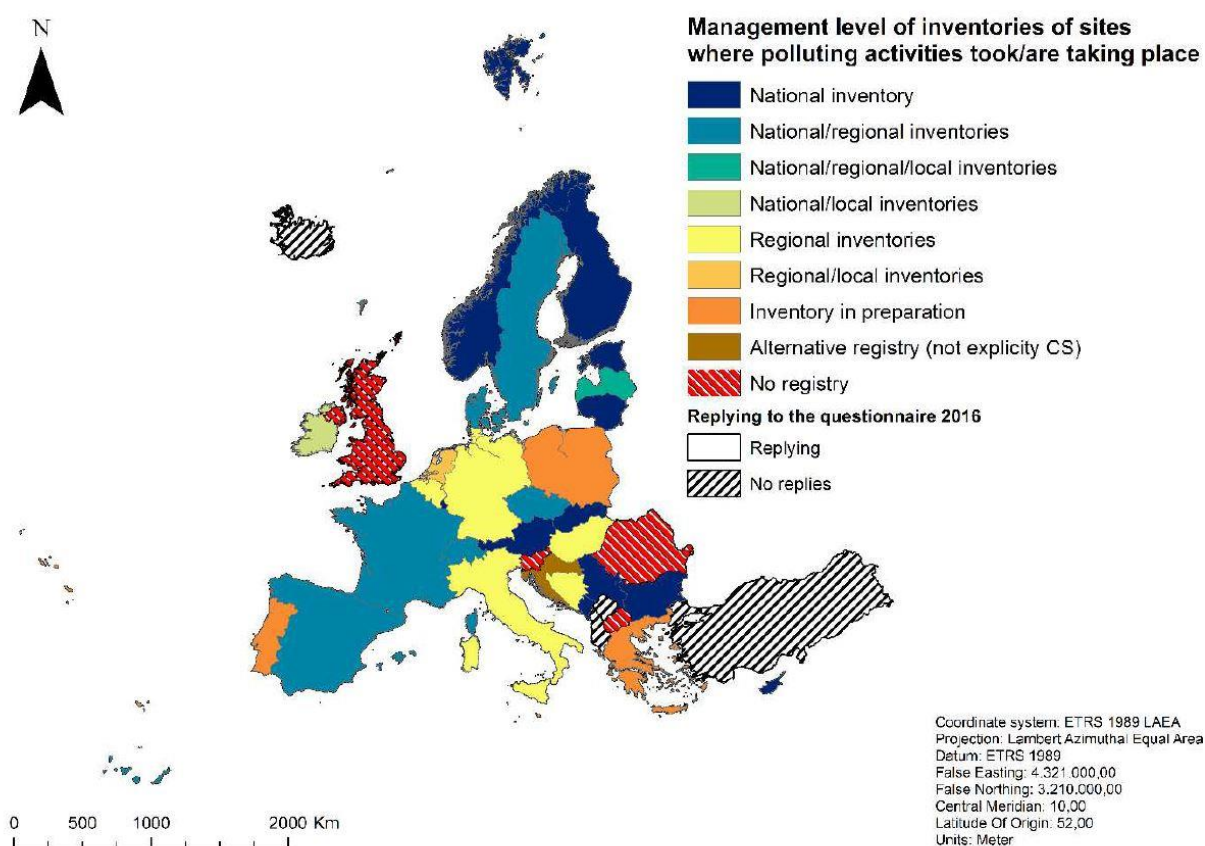
Of the 39 countries surveyed, 28 maintain inventories for contaminated sites at

different administrative levels - national, regional or local.

Most of the inventories are managed at national level, frequently by environmental agencies.

Poland and Portugal are preparing their inventory, which will be managed at regional and at national level, respectively.

Since 2011, Cyprus has developed its national register of contaminated sites and Malta is currently collecting information on contaminated sites.



Due to the wide variety of soil types, land uses, depths of groundwater tables and site and building characteristics, the most extensively used practice for dealing with soil contamination across Europe involves a combined approach. This allows flexibility in the tools used to for site-specific risk assessment.

However, the data collected by countries are not fully comparable, due to a lack of commonly accepted European terminology and guidelines.

This prevents scientists from being able to evaluate certain parameters at the

European scale, such as the total surface area contaminated per class of contaminant, the percentage of population exposed to the contamination and the environmental damage caused by contaminated sites.

The "polluter pays" principle and the cost of putting things right

On average more than 42 % of the total expenses come from public budgets for all countries that responded to the questionnaire.

This is mostly linked to the fact that the "polluter-pays" principle, while applied to all new cases, is rarely applicable to historical contamination.

Of all respondents, 26 countries have a national programme to deal with orphan sites – contaminated sites where the parties responsible for the contamination are unknown.

The responsibility for identification and remediation of these sites varies both within and between countries, as does the funding regime.

### Background

The EU's Seventh Environment Action Programme recognises that soil degradation is a serious challenge.

It provides that by 2020 land is managed sustainably in the EU, soil is adequately protected and the remediation of contaminated sites is well underway.

It also commits the EU and Member States to increasing efforts to reduce soil erosion, increase soil organic matter and to remediate contaminated sites.

The 'Progress in the management of contaminated sites in Europe' indicator has been used since 2001 to reflect how industrially polluted sites are remediated.

In 2017, the methodology to assess the status of contaminated sites was revised to accommodate the range of definitions used by countries.

The results of this new approach are presented in the JRC's report, which will form the basis of an updated indicator and will facilitate a more accurate reflection of trends in site remediation.

Details at:

<https://ec.europa.eu/jrc/en/news/countries-across-europe-make-progress-tackling-soil-contamination>

## Travel Award 2019 Application



We are inviting applications for a Travel Award for an early-career postdoctoral scientist and a PhD student to attend a conference of their choice in 2019. The nominations and applications will be assessed by an Evaluation Committee presided over by the

Editor-in-Chief,

Prof. Dr. Scott Fendorf

Candidates' Requirements:

- The candidates must be PhD students or early-career postdoctoral scientists.

Required Application Documents:

- An abstract describing the work that the candidate will present at the conference in oral or poster form
- Candidate's Curriculum Vitae
- Justification letter (Statement describing the significance of the research being presented and its importance to the candidate's professional goals)
- Letter of support from the candidate's mentor.

The Award will consist of 800 Swiss Francs.

Please send your applications to [soilsystems@mdpi.com](mailto:soilsystems@mdpi.com) **by 31 December 2018**.

The winners will be announced by 28 February 2019.

Details at: <https://www.mdpi.com/journal/soilsystems/awards>

Application here: <https://www.mdpi.com/journal/soilsystems/awards/submit/463>

## **Maps of soil research institutions and universities offering soil science in Africa**

Dr. Andrei Rozanov, Stellenbosch University, South Africa, provided maps of soil research institutions and universities offering soil science in Africa to IUSS. We are glad to share them with the soil science community.

There are two options to view the map files:

1. Install Google Earth Pro desktop on your PC form

<https://www.google.com/earth/>

2. Use <https://www.google.com/earth/> directly in Google Chrome browser. To read the KML file from Chrome:

<https://support.google.com/earth/answer/7365595?co=GENIE.Platform%3DDesktop&hl=en>

You can download the two map files from the IUSS website here:

<https://iuss.boku.ac.at/files/universitiesafrica1.kmz>

<https://iuss.boku.ac.at/files/researchafrica.kmz>

This map was compiled from the information available on-line. If you find that some of the information is incorrect (e.g. the exact location of the soil science department is incorrect, the department does not exist, the department exists, but does not appear on the map, the department is a research unit and does not offer a soil science degree programme, the link to the department website requires an update) please contact Dr. Andrei Rozanov, Stellenbosch University, South Africa by email: [dar@sun.ac.za](mailto:dar@sun.ac.za) to make the necessary corrections.