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ENVISION

## Session 1: Greenhouse gas removal through carbon sequestration in vegetation and soils

**Organiser:** Pete Smith (University of Aberdeen)

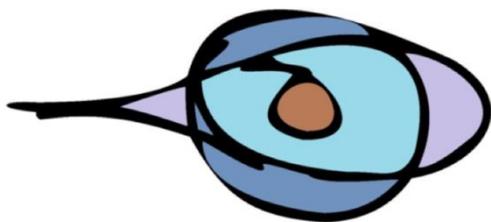
### **Abstract**

A majority of IPCC scenarios show that often very significant amounts (20 Gt CO<sub>2</sub>e/yr) of Greenhouse Gas Removal technologies (GGRs) are required to reach a 2°C target by 2100. Given that most models fail to reach a 2°C target without GGRs, it seems impossible that the aspirational target of 1.5°C of the Paris Agreement could be met without GGRs. The global potential, feasibility, barriers and impacts of GGRs need to be assessed.

The global implications of widespread implementation of GGRs on land competition, greenhouse gas emissions, physical climate feedbacks (e.g. albedo), water requirements, nutrient use, energy and cost, have recently been assessed. It appears that sequestration in soils and vegetation have significant potential for GGR, and may do so with much less competition for land, water and nutrients than, for example, Bioenergy with Carbon Capture and Storage (BECCS). In addition, soil and vegetation-based GGRs could help deliver other Sustainable Development Goals (SDGs), particularly 1, 2, 13 and 15 (poverty, hunger, climate and life on land). Yet constraints due to high uncertainties about the level of GGR achievable, the need for site-specific options and incentives, social and ecological impacts, and the risk of impermanence have limited the implementation of soil and vegetation-based GGR to date. This session will examine the potential for carbon sequestration in vegetation and soils as GGR options, and assess their impacts, the biophysical, economic and social limits to their implementation and possible synergies with delivering the UN SDGs.

### **Format**

Oral/poster



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## Session 2: Organic matter, the key to climate change mitigation?

**Organiser:** Heike Knicker, University of Seville, Spain

### **Abstract**

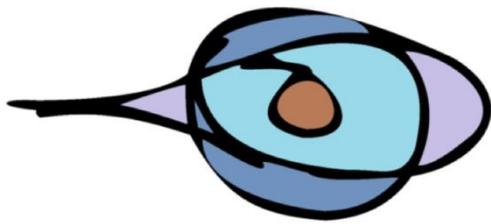
The availability of soil organic nitrogen (SON) determines soil fertility and biomass production to a great extent. SON and SOC are coupled via biomass production and degradation and the narrow C/N ratio of mature soil organic matter (SOM) shows that SON is a major contributor to the humified SOM, determining not only the size of this pool but also its chemical composition. More and more evidences are published showing that black nitrogen (BN) produced during natural and prescribed fires represents an additional source which affects the nature and amount of SON and the turnover rates of SOC in fire-prone regions. Although there is increasing awareness of the impact of the nitrogen (N) cycle on the carbon (C) cycle, the extent of this interaction and the implications for SOM dynamics are still under debate. Comparably, the direct impact of SON on plant growth has become an area of high interest. Therefore, in the present session, we intend to discuss advances concerning the knowledge about the inter-relationships of the soil cycles of C and N, the interaction between SON and plants as well as current ideas about the nature of SON and the mechanisms of its stabilization. The discussed subjects will include progress in:

- i. Methodologies to reveal the nature of SON
- ii. The impact of different N-sources (microbial, plant, fire, fertilizer) on size and nature of SON
- iii. The role of SON for C-sequestration
- iv. Understanding the mechanisms controlling the interaction between C and N cycling in soil
- v. Understanding the role of SON for the N-competition between plants and microorganisms
- vi. Modeling the interrelationship between C sequestration and N availability and vis-versa

It is expected that this session will not only add to a better understanding of the N cycle in soils but also contribute to improved evaluation of soils as C-sinks.

### **Format**

Will be decided depending on the number of abstracts



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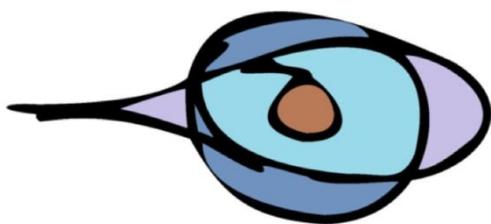
## Session 3: Impacts of climate change on soils in drylands: recent advances and challenges ahead

**Organisers:** Fernando T. Maestre (Universidad Rey Juan Carlos, Móstoles, Spain), César Plaza (Instituto de Ciencias Agrarias, Consejo Superior de Investigaciones Científicas, Madrid, Spain) and Carlos García (Centro de Edafología y Biología Aplicada del Segura, Consejo Superior de Investigaciones Científicas, Murcia, Spain)

### **Abstract**

Drylands in dry-subhumid, semiarid, arid, and hyperarid zones are of paramount importance because of their extent, covering more than 45% of the global land surface, and the number of people living there, approximately 38% of the world's population. Soils are essential for the ability of drylands to provide ecosystem services. In fact, one of the major environmental, economic, and social challenges facing us today is the protection of dryland soils from degradation and erosion processes, which are greatly intensified by the ongoing climate change. The objective of this session is to provide a forum for presentation and discussion of recent studies on the effects of climate change on dryland soils and their biota in both natural and agricultural ecosystems. We aim to include studies from multiple disciplines, and particularly welcome contributions discussing management strategies to combat soil degradation due to climate change. This session will consist of oral or poster communications and will be open to researchers from any disciplines and career levels.

**Session format:** Oral and/or poster.



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## Session 4: Analysis and Fate of Emerging Contaminants in Water, Soil and Plants

**Organisers:** Yolanda Picó<sup>1</sup> and Damià Barceló<sup>2,3</sup>

<sup>1</sup> Environmental and Food Safety Research Group (SAMA-UV), Desertification Research Centre CIDE (CSIC-UV-GV), Faculty of Pharmacy, University of Valencia, Burjassot, Valencia, Spain

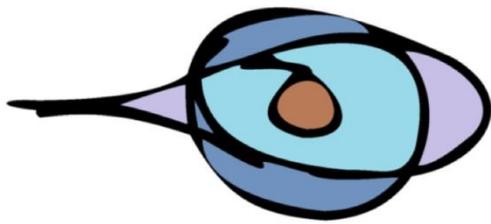
<sup>2</sup> Water and Soil Quality Research Group, Department of Environmental Chemistry, Institute of Environmental Assessment and Water Research (IDAEA-CSIC), Jordi Girona 18–26, E-08034 Barcelona, Spain

<sup>3</sup> Catalan Institute for Water Research (ICRA), H2O Building, Scientific and Technological Park of the University of Girona, Emili Grahit 101, 17003 Girona, Spain

### **Abstract**

Occurrence of emerging contaminants (ECs) in the environment could be related to the rise of anthropic pressure on water resources together with changes in the Earth system (from climate to ecosystems) as well as to the actual practices to manage these situation, such as the use of wastewater for irrigation (arid regions) and application of biosolids on soils. Wastewater effluent disposal, sludges, biosolids and/or biochars are today's main sources of non-regulated trace of ECs to the environment. These compounds include, but are not restricted to, the following: human and veterinary pharmaceuticals, personal care products (PCPs), artificial sweeteners, polybrominated diphenyl ethers (PBDEs), perfluoroalkyl substances (PFASs), pesticides, PAH-derivatives, benzotriazoles, benzothiazoles, plasticizers, surfactants, disinfection by products and engineered nanomaterials (ENMs). The presence of these chemicals in the environment is more concerning considering that (i) they do not appear individually, but as a complex mixture, which could lead to unwanted synergistic effects and (ii) there is an extensive lack of knowledge on their distribution and accumulation from wastewater and sludge into soil and plant, as well as, on their hazards when applied to agricultural crops for food production. This situation is aggravated by global change and water scarcity, whose effects are unpredictable. In this context, the session emphasizes on ongoing studies on ECs sources and their incorporation, metabolization, accumulation and translocation into vegetables linking with the ecological effects they produce. Contributions on the following areas of new or expanding EC environmental impact knowledge will be welcome: i) wide screening of an extensive range of emerging contaminants including their transformation products and/or metabolites, ii) potential and shortcomings of high-resolution mass spectrometry (HRMS) to identify metabolites and transformation products formed in the environment, iii) how their intrinsic properties, such as environmental persistence, resistance to metabolism in organisms, and tendency to accumulate could contribute to their ubiquity in environmental media and induce concern for their toxic effects after prolonged exposure, iv) progresses in understanding their transport, transformations, and fate in environment, and v) proposes of approaches to support the decision-making process related to risk-management measures. Summarizing, this session aims at focus on the most understudied areas of EC research in wastewaters and the environment and devised priorities for the future water scarcity scenario in a multi-disciplinary forum.

**Format:** Oral/poster



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## Session 5: Data-mining and methods for modeling and assessing state and fate of soil water

**Organisers:** Ioannis Daliakopoulos, daliakopoulos@hydromech.gr

### **Abstract**

Soil water is a key component of the Earth System as it plays a vital role in modulating storage and runoff generation, both on-site and off-site, and by extension the ecohydrological and biogeochemical cycles, all the way from plant and plot to watershed and global scale. While the value of soil water has been appreciated since the advent to modern agriculture, many details are still partly understood, mainly due to the vast heterogeneity and the poor connectivity of soil properties across scales. Soil water monitoring has seen major advances through techniques developed in other disciplines: discreet or continuous point and section inference of soil moisture via time domain reflectometry (TDR) and electromagnetic induction, plot and watershed isotope-based assessment of ecohydrological separation, and large-scale mapping based on remotely deployed multispectral sensors and radars. These new techniques have allowed for the collection of large volumes of data pertaining soil moisture or its proxies across time and space, which have greatly advanced our understanding of the role of soil water in the Earth System.

However, beyond monitoring, examining spatial patterns provides an alternate means of inferring processes and moving across scales, since spatial variation rarely corresponds to random components, but is instead a product of site characteristics and other dependences. By considering space, time, and the interaction between the two, we can advance our understanding of the processes that control the dynamics of soil water at each scale, as well as downscale or generalize. Scientific questions are thus dispersed over all spatial and temporal scales. A better understanding of soil water fluxes from the subsurface to the atmosphere will provide a firmer grasp of runoff sources and sinks, residence times and evaporation/transpiration partitioning. A better understanding of spatial variability will provide new insight on monitoring and mapping possibilities from the point scale to the global earth observations sensors. Advances such as these are critical to tie the soil component into climate and earth system models and to support integrated water management, food security, and hydrological risk mitigation goals.

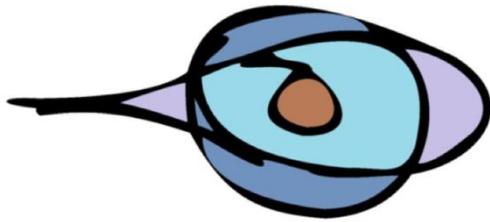
With the rapid development of distributed sensors and the internet of things, social networking and reporting, remote sensing and broadcasting, spatio-temporal data are more ubiquitous and richer than ever before. In addition, increased availability of computing power facilitates the use of computationally-intensive methods for the analysis of such data. With the enormous potential of big-data and processing power come great challenges in data analysis and interpretation, thus, new methods are needed to take advantage of these opportunities and understand soil water distribution variability in time, area, and depth, as well as resulting implications. This Special Issue in the Science of the Total Environment aims to address this topic.

Contributions could include:

- Machine learning methods
- Pattern vs process analysis

- Stochastic analysis
- Bayesian modeling
- Spatiotemporal statistics
- Advanced GIS and data visualization
- Telemetry and Satellite/UAV Remote Sensing
- Network and connectivity analysis
- Multi-scale study designs
- Decision support and risk assessment systems

This list is not exhaustive and enquiries about possible submissions are welcome. Methods are defined in the widest terms and may be analytical, practical or conceptual, with relevant applications in real world case studies or study metadata. A key aim of this special issue is to boost the awareness and use of innovative methods/techniques and therefore reviews or simple application of classic statistical methodologies without adequate improvement are not encouraged. To that end we strongly encourage contributors to upload their computer code, example applications or demonstrations of methods.



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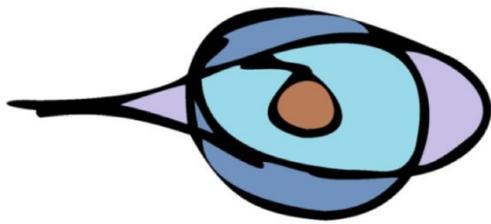
## Session 6: Land degradation and restoration: the State of the Art

**Organisers:** Artemi Cerdà, University of Valencia, Spain

**Abstract**

Land Degradation faces complex challenges at the beginning of the XXI century, with environmental, social, economic and political dimensions. Although the topic was originally focused on the arid, semiarid, and dry sub-humid regions, land degradation is increasingly seen as a worldwide threat. This session provides a platform for papers that discuss biophysical (soil erosion, soil degradation, climate change, flora and fauna, water resources, ecosystem services...), social (gender, community research approaches, farmers perceptions, land use decision making...), economic (land management, poverty, investments in sustainable land management...) and political aspects (new and old policies, land rights, governance...) at different temporal and spatial scales. A selection of papers from this session will be published in Science of the Total Environment prior a peer review process.

**Format:** Oral/Poster



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## Session 7: Course on Landscape restoration with the 4 returns approach

**Organisers:** Simon Moolenaar, COMMONLAND, [simon.moolenaar@commonland.com](mailto:simon.moolenaar@commonland.com)

### **Abstract**

In this short training we will explain the Commonland approach on landscape restoration for healthy landscapes and water systems which are the basis of our life.

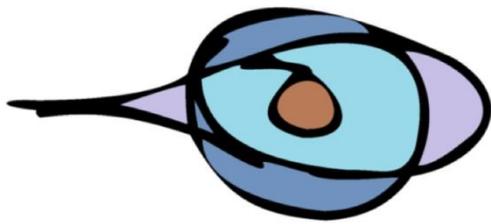
Landscapes provide food, water, clean air, a stable climate, biodiversity, good health, security and happiness. However, one-fourth of the world's land mass is seriously degraded from centuries of human activity.

Commonland® believes that landscape restoration offers tremendous untapped opportunities for sustainable economic development. To demonstrate this potential, we develop landscape restoration projects that are based on business cases.

Multidisciplinary teams actively involve investors, companies and entrepreneurs in long-term restoration partnerships with farmers and land-users. Long-term commitment is important as it takes approximately 20 years – or one generation – to restore a landscape. Our holistic restoration approach combines and connects natural and economic landscape zones and delivers 4 returns®.

Our goal is to realize large-scale landscape restoration with local farmers, land-users and experts, based on sustainable 4 returns business cases. Our mission is to contribute to a large-scale landscape restoration industry, aligned with international policies and guidelines.

**Format:** Short training on the COMMONLAND Approach



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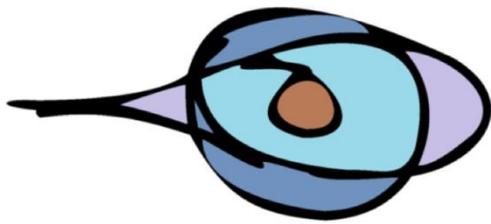
## Session 8: Landscape Based Urban Adaptation: developing a systemic view on climate resilient cities

**Organisers:** Gerben Mol, Wageningen Environmental Research, The Netherlands, [Gerben.Mol@wur.nl](mailto:Gerben.Mol@wur.nl),  
Hasse Goosen, Wageningen University, The Netherlands. [Hasse.Goosen@wur.nl](mailto:Hasse.Goosen@wur.nl)

### **Abstract**

Many cities have lost their functional connection to the landscape and soil-water system that surrounds them. Solutions for urban climate adaptation, however, can often be found in using these natural assets in a smart way. E.g. by making use of the geomorphological structure of the subsurface for promoting infiltration and providing temporary water retention. Currently this is often impossible because of soil sealing and city design that is out of sync with the landscape of the city. The Landscape Based Urban Adaptation approach aims to find solutions for improving the resilience of cities by optimally using the connection of cities to their surrounding landscape.

In this session we will explore this new approach with many examples and discuss it with experts from various professional networks on climate adaptation and resilient cities such as the *C40 Cities* and *100 Resilient Cities*.



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## Session 9: Urban land management challenges

**Organisers:** Sandra Boekhold, RIVM National Institute for Public Health and the Environment, the Netherlands, [sandra.boekhold@rivm.nl](mailto:sandra.boekhold@rivm.nl)

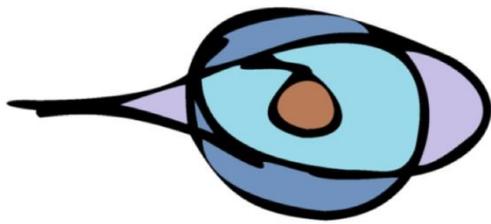
### **Abstract**

This session will focus on urban challenges, the quality of life in urban environments and how land and water management can facilitate a healthy urban living- Issues like soil sealing, the benefits of open soil and green land, and urban sprawl, land consumption and urbanisation are welcomed to this session.

We aim to talk about potential land use management and spatial planning based in nature based solutions, ecosystem health and human well-being.

In addition, we also want to link to societal issues that take place also in urban setting such as: climate change adaptation, water management, heat island effect, urban farming.

**Format:** Session format may depend on the number of abstracts that will be submitted.



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## Session 10: Nature-based solutions for environmental, social and economic challenges

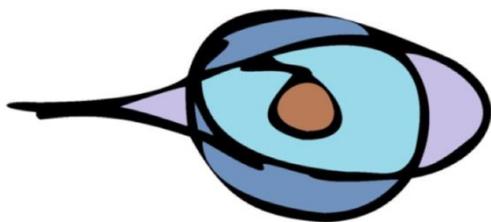
**Organisers:** Zahra Kalantari, Carla S.S. Ferreira, David C. Finger, Saskia Keesstra

### **Abstract**

Nature-based solutions (NBS) for land and water management can be flexible and multi-beneficial not only to prevent and mitigate climate-related risks, but also improve human well-being and further pave the way towards a more resource efficient, competitive and greener economy. Developing climate change adaptation and mitigation using NBS can provide more resilient responses and enhance the storage of carbon. However, adequate proof-of-concept for economic, social, and environmental benefits provided by NBS is needed to promote their inclusion in planning and decision-making processes. This session aims to give an overview of case studies and developments of new theoretical/analytical tools and methods to demonstrate the effectiveness and sustainability of (different types of) NBS depending on local conditions. The session seeks to:

- Better understand advantages and disadvantages of NBS, based on field applications.
- Discuss opportunities and challenges associated with the development and systematic use of NBS in cities, landscapes and seascapes.
- Identifying opportunities and barriers driven by current regulatory frameworks and management practices, and how the former can be reaped and the latter overcome, for sustainable implementation of effective NBS.
- Developing a NBS proof-of-concept regarding environmental, social and economic challenges for sustainable development.
- Promote low carbon and circular economy concepts based on NBS for sustainable and prosperous development

**Key words:** nature-based solutions, land and water management, climate change mitigation and adaptation, disaster risk reduction.



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## Session 11: Modelling erosion by water

**Organisers:** Panos Panagos - Panos.PANAGOS(at)ec.europa.eu, JRC. ISPRA, Italy

### **Abstract**

This workshop will address issues regarding how local/regional modelling results can be upscaled (or applied) to the European scale. The workshop also serves as a follow-up of recent JRC modelling developments and published maps on soil erosion by water and wind and the workshop held in ISPRA in March 2017. The workshop will focus on how various project or local/regional modelling applications can improve “know-how” at the European scale. Emphasis will also be given to management practices that can reduce soil erosion.

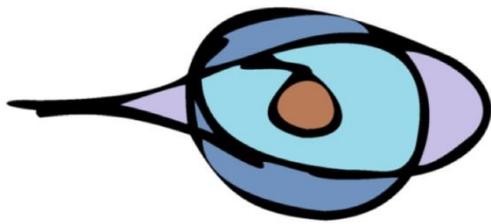
The organisers invite pan-European projects (e.g RECARE) to show the best management practices to reduce erosion and to demonstrate their research work in study sites.

Scientists dealing at the small scale are invited to present the possibilities and limitations of upscaling their results. Scientists operating at the large scale are invited to consider how their modelling/ mapping can be validated with small scale data.

The workshop focusses on five issues is:

- Large-scale soil erosion modelling
- Small-scale soil erosion modelling
- Conservation practices to control erosion
- Sediment transport – Radionuclides
- Various (wind erosion modelling, policies in soil conservation, coupling with carbon modelling)

**Format:** will depend on the number of submissions, but will be interactive.



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## Session 12: Connectivity in hydrology and sediment dynamics: concepts, measuring, modelling, indices and societal implications

**Organisers:** Saskia Keesstra, Wageningen University, The Netherlands, [Saskia.keesstra@wur.nl](mailto:Saskia.keesstra@wur.nl)

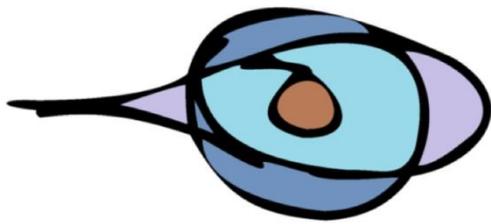
### **Abstract**

Hydro-geomorphic connectivity has emerged as a significant conceptual framework for understanding the transfer of surface water and sediment through landscapes. The concept has had particular success in the field of catchment hydrology and fluvial geomorphology, but has also been employed in, for example, explaining rates of soil erosion by water and sediment export across landscapes in the study of aeolian processes and in fire propagation. However, despite these successes, the concept has resulted mostly in case studies, with little progress made to date on general conceptual models. This may be the result of an evident lack of knowledge and concepts of the different processes involved at different temporal and spatial scales. As a result, experimental work in the lab and in the field has been developed to, furthermore, integrate the effects of static and dynamic features on connectivity. But this needs both more thorough theoretical underpinning and methodological development to measure and model the temporal variation of connectivity.

This session invites contributions from all areas of soil science, hydrology, geomorphology, ecology and geochemistry illustrating or identifying the role of connectivity for ecology and geochemical cycles on a local, regional or global scale. Specific themes we would like to promote are:

- advancement of the theory of connectivity, including sound and unambiguous definitions of connectivity and related parameters,
- methodology development for measuring connectivity in field and laboratory settings, having a special focus on experiments for conceptualizing the different processes involved,
- the development of suitable indices of connectivity,
- to evaluate how human-landscape connectivity relationships determine the resilience/sensitivity/trajjectory of managed catchment systems to change
- determining how the concept can be used to enable sustainable land and water management.

We hope to use the session to develop a debate that brings together hydrologists, ecologists, geomorphologists and agronomists to generate the basis for an integrated experimental, theoretical and conceptual framework and to find out how we can develop this knowledge into a piece of useable science.



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## Session 13: Mapping for soil sustainable management

**Organisers:** Paulo Pereira<sup>1</sup>, Anna Brook<sup>2</sup>, Igor Bogunovic<sup>3</sup>, Juan Martinez-Murillo<sup>4</sup>, Sebastiano Trevisani<sup>5</sup>

<sup>1</sup>Mykolas Romeris University, Lithuania

<sup>2</sup>University of Haifa, Israel

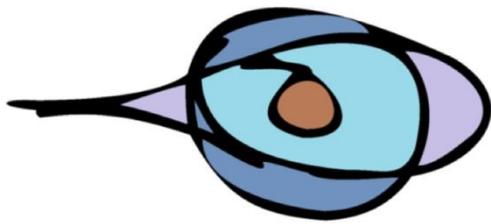
<sup>3</sup>University of Zagreb, Croatia

<sup>4</sup>University of Malaga, Spain

<sup>5</sup>University IUAV of Venice, Italy

### **Abstract**

Maps synthesise information, easy to understand and to be used for a sustainable use of the territory. Independently of the scale, maps are fundamental for a better understanding of the landscape and the processes that influence it. In this context, better quality maps are necessary to have a detailed knowledge about soil properties spatial variability. Remote/proximal sensing and advanced statistical methods (e.g. data mining, machine learning, geostatistics, etc.) increased data availability and the accuracy of the predictions. These new technologies and methodologies are important to be applied in soil sustainable management; in fact, these contribute to identify, assess, monitor, mitigate and restore soil and land degradation in different environments, such as agricultural, forest and urban areas. Soil ecosystem services (e.g. carbon storage, food provision, water infiltration and purification) provide important benefits to the society and the identification of their spatial distribution is a key aspect of a correct territorial planning and reduce the potential human impact on their capacity to provide services in quality and quantity. Moreover, advanced spatial data analysis approaches permit to explore environmental data according to an integrated perspective, permitting to shed light on the interconnections between the many geoenvironmental processes and factors influencing soil properties. This session aims to bring together works focused on soil mapping for sustainable development.



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## Session 14: Grazing as a management tool to build cultural landscapes

**Organisers:** Manuel Pulido<sup>1</sup>, Miguel Cortés Tamayo<sup>2</sup>, Ali El-Keblawy<sup>3</sup> and Tobias Plieninger<sup>4</sup>

<sup>1</sup>GeoEnvironmental Research Group (GIGA), University of Extremadura, 10071 Cáceres, Spain

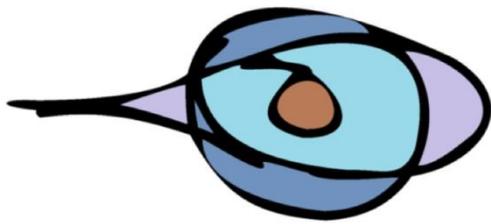
<sup>2</sup>Ovino del Suroeste (OVISO) Sociedad Cooperativa Limitada, 06700 Villanueva de la Serena, Spain

<sup>3</sup>Department of Applied Biology, University of Sharjah, 27272 Sharjah, United Arab Emirates

<sup>4</sup>Department of Geosciences and Natural Resource Management, University of Copenhagen, Denmark

### **Abstract:**

Pastoralism is a human activity practiced worldwide by more than 500 million people. Its role as a modifier of land has been crucial throughout history either as a forest/shrub clearing or as one of the driving forces behind of many land degradation processes. The effects of grazing on environment are context-dependent on climate, topography and land management. This latter is usually adapted both to local physical conditions (rainfall, soil, slope, etc.) and to time-dependent cultural, economic and political factors. So, we intend, on the one hand, to expand the knowledge of different past and existing land management systems, ranging from subsistence farming to much more complex ways based on innovation and market strategies. And, on the other hand, we aim to better know how conservationist paradigms (e.g. European Union agri-environmental measures) as well as restoration strategies (e.g. fencing exclusion) have influenced, or are influencing, on the past/current land management at different territories/biomes. Therefore research and management experiences throughout the world which grazing be dealt as the most important factor are very welcome. This session is aimed at gather multidisciplinary works from different perspectives (applied or pure science): history, economy, society, policy, land planning, cultural legacy, animal welfare, ecology or geomorphology.



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## Session 15: A biophysical and socio-economic approach to the fate of the Terroir

**Organisers:** Jesús Rodrigo Comino<sup>1,2</sup>; Serge Delrot<sup>3</sup>; Gregory V. Jones<sup>4</sup>; Stefanos Koundouras<sup>5</sup>

(1) Instituto de Geomorfología y Suelos, Department of Geograpy, University of Málaga, 29071, Málaga, Spain.

(2) Physical Geography, Trier University, 54286 Trier, Germany. Mail: [rodrigo-comino@uma.es](mailto:rodrigo-comino@uma.es); [geo.jrc@gmail.com](mailto:geo.jrc@gmail.com)

(3) UMR Ecophysiology and Grape Functional Genomics, Institut des Sciences de la Vigne et du Vin, University of Bordeaux, Villenave d'Ornon, France. [serge.delrot@inra.fr](mailto:serge.delrot@inra.fr)

(4) Environmental Science and Policy, Southern Oregon University, Ashland, OR, 97520, USA. Mail: [gjones@sou.edu](mailto:gjones@sou.edu)

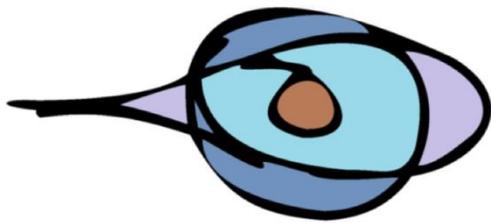
(5) Laboratory of Viticulture, School of Agriculture, Aristotle University of Thessaloniki, 541 24, Thessaloniki, Greece. Mail: [skoundou@agro.auth.gr](mailto:skoundou@agro.auth.gr)

### Abstract

It is common knowledge that the quality of the grape harvest is a major factor in the quality of the final product. Scientists, farmers and wine enterprisers each have their own perceptions about how to manage the vineyards in order to optimise the quality. Against the background of a changing climate, land management plays an integral role in the production and quality which can fetch high economic returns. However, when managed properly, vineyards can also provide other environmental benefits aimed at reducing carbon emissions and enhancing biodiversity in the landscape. Governments are noticing this and acting to stimulate environmentally conscious land stewardship.

While this is positive news for society as a whole, the challenges faced by land managers are great; vineyard soils are well known for having high erosion rates as well as being biologically degraded due to the accumulation of soil pollutants and contaminants. The situation on the field level is further complicated by heterogeneity in the state of soils due to landscape complexity and affects of microclimates. Given the scale and complexity associated with vineyard pedological and biological restorations, the quest to find new and effective management strategies has become an indispensable task.

Thus, we propose a constructive interdisciplinary scientific session, which allows improving the fate of the terroir throughout the scientific knowledge and the traditional farmer's management. Biophysical and socioeconomic and perceptions on based research are very welcome. Holistic approaches to the terroir functioning will be also welcome.



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## Session 16: Fire effects on fluxes in the landscape

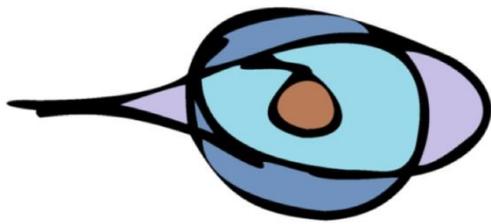
**Organisers:** Stefan Doerr, Swansea University, UK, [s.doerr@swansea.ac.uk](mailto:s.doerr@swansea.ac.uk)

### **Abstract**

Fires represent one of the most important natural- and human-caused perturbations in the Earth system. They affect ~4% of the entire global vegetated surface every year and lead to the (i) rapid release and redistribution of carbon stored in the vegetation and soil to the atmosphere and within the landscape; (ii) the production of ash layers containing nutrients and potential pollutants; and (iii) changes in the runoff and erosional dynamics of landscapes. These and other fire-related effects can lead to profound changes in the fluxes and geochemical cycling of key elements, compounds and materials in the landscape ranging from carbon through water, nutrients and pollutants, to sediments.

This interdisciplinary session aims to bring together the scientific and management communities in order to highlight and evaluate important advances, and the current scientific and management gaps, regarding the effects of fires on these fluxes in the landscape. I will focus not only on new knowledge, but also on methods, models and products to understand and predict these impacts of fire.

The session will comprise of keynotes summarizing the state-of-the-art in relevant sub- disciplines followed by specific research presentations. Special attention will be given to overarching new knowledge, assessment methodologies, advances in models for predicting and, where relevant, mitigating the environmental impacts and risks to population and infrastructures.



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## Session 17: Wildfires in urban area

**Organisers:** Anna Brook, Lea Wittenberg, University of Haifa, Israel.

### **Abstract**

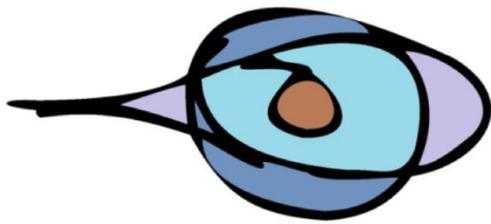
The frequency and extent of wildfires in the Mediterranean have been steadily increasing over the past decades. These fires not only cause loss of life and damage to properties but also carry serious environmental and economic repercussions. Climate extremes, land-use changes and human population growth are the most prevailing and common determinant of wildfire occurrence and impacts. The combination of extreme dry spells, high fuel loads and increased anthropogenic pressure on the open spaces result in an overall amplified wildfire risk, and in many cases, severe damage to forests and infrastructures.

Today, many metropolitan centers, towns and villages are embedded within the urban/rural interface. Possible climate changes, socio-economic trends, and intense land use pressures are contributing factors in a challenge to deal with forest fires along these areas. The transitional zones between wildlands and urbanized spaces, generally defined as wildland–urban interface (WUI), represents an increasing fire-risk factor in Mediterranean areas. The WUI have unique landscape and typological elements that require a specific planning and fire management approaches.

The Mediterranean settlement mosaic is composed of a unique combination of green and built infrastructures. The built infrastructures are sparsely distributed and intervened with green infrastructures which create long and winding zones of interactions with the built-up environment. Accordingly, wildfires that break out in open areas on the outskirts of the city may develop into complex urban fires accompanied by extensive damage to human life and property.

Better understanding of wildfire regime, dynamics and behavior within the WUI, requires a deep theoretical understanding of the compound interaction between physical and anthropogenic forces, operating in the complex urban fabric. This understanding may serve as a basis for the development of tools and approaches for 'fire-sensitive' urban planning.

This session aims at bringing all researches with an interest in urban-wildland wildfires together to foster new ideas and share research experience. Studies emphasizing cross-disciplinary approaches: experimental, modeling, the use of new technologies and practical implementation are very welcome.



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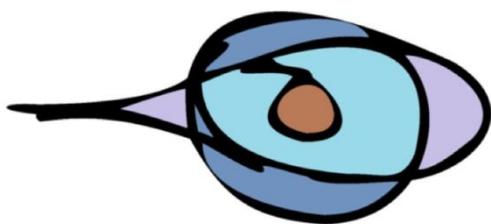
## Session 18: Effects of pre- and post-fire management on vegetal recovery

**Organisers:** Marcos Francos, Paulo Pereira and Xavier Úbeda.

### **Abstract**

Pre- and Post-fire management is a global action, above all in Mediterranean ecosystems. According to the type of management and the time between fire and management can determine the post-fire vegetation. Pre-fire management can influence in fire severity changing in vegetal richness, evenness, density and diversity. Post-fire vegetation can be influenced by the type of management and the time between fire and management. These studies can be done taking into account the quantity and the quality of vegetation. This kind of management can determine the prevalence of one or other species. More studies about this topic are necessary to understand how affect the pre- and post-fire management on different vegetal index and in species recovery.

**Session format:** This session could be a good [tool](#) to show new studies about the vegetation in burned areas. About the format, could be a **poster session** or an oral presentations session. In second case each study can be exposed in 10 minutes and after each three presentations will be time to questions.



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## Session 19: Policy actions to implement the Voluntary Guidelines for Sustainable Soil Management and prevent and minimize soil contamination

### Organisers:

Ms. Lucrezia Caon, Global Soil Partnership (GSP) Secretariat, FAO, [Lucrezia.caon@fao.org](mailto:Lucrezia.caon@fao.org)

Mr. Luca Montanarella, Joint Research Centre of the European Commission, JRC-EC,  
[luca.montanarella@ec.europa.eu](mailto:luca.montanarella@ec.europa.eu)

Mr. Ronald Vargas, Global Soil Partnership (GSP) Secretariat, FAO, [Ronald.vargas@fao.org](mailto:Ronald.vargas@fao.org)

### Abstract

The Status of the World Soil Resources (SWSR) report (FAO and ITPS, 2015) stressed the need for establishing effective policies on soil in order to halt soil degradation processes and ensure sustainable development. Up to date, policy formulation in soil has been weak in most parts of the world because of (a) the lack of access to the evidences needed for policy action, (b) the challenge of dealing with property rights (land tenure), (c) the long-time scales involved in soil change, and (d) the progressive disconnection between our urbanized society and the soil. International agreements on soil and land resources such as the endorsement of the Revised World Soil Charter (FAO, 2015) and the Voluntary Guidelines for Sustainable Soil Management (FAO, 2016) are helpful but they are all to no avail unless there are complementary policies and coordinated activities at national, district and local levels.

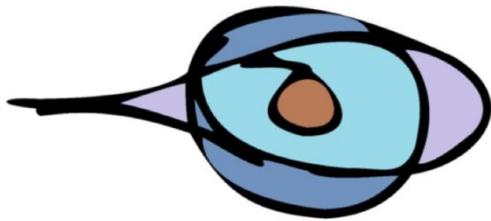
Appropriate and effective policies require to apply general approved scientific concepts and criteria to the local context so to set up locally appropriated benchmarks in terms of the natural resources issues, cultural acceptability and economic feasibility. This would allow to monitor the achievement of the targets and address malfunctions in the system due to, for instance, the lack of either education or technical knowledge. The recognition that soil resources are a cross-cutting issue and may originate conflicts among land users when mismanaged, is also needed to receive sufficient policy support.

It is the purpose of this session to discuss the implementation of the Revised Soil Charter and the Voluntary Guidelines for Sustainable Soil Management (VGSSM) in national and local policy systems, and how this connects to the need for establishing thresholds on soil degradation and indicators of soil quality. To this end, the session links the implementation of the VGSSM to the achievement of the Sustainable Development Goals, paying attention especially to one of the main soil threats identified in the SWSR, soil contamination. In this context, the session will have a follow up at the Global Symposium on Soil Contamination and Pollution, which will be held at the Food and Agriculture Organization of the United Nations in Rome in April 2018.

### Format

Opening by the keynote speakers: Mr. Luca Montanarella (ITPS Chair) and Ms. Lucrezia Caon (GSP Secretariat), Presentation of a few selected posters, Panel discussion, Conclusions

In parallel: Poster session



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## Session 20: Sustainable Development Goals and Soil policy and practical implementation

**Organisers:** Margot van Cleen and Co Molenaar, Ministerie van IenM, RWS WVL, The Netherlands, [margot.de.cleen@rws.nl](mailto:margot.de.cleen@rws.nl), [co.molenaar@rws.nl](mailto:co.molenaar@rws.nl)

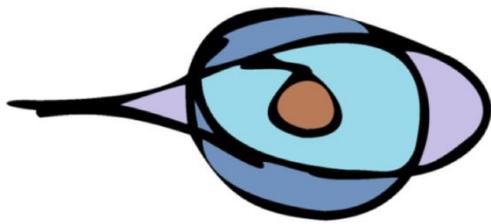
### Abstract

The UN Sustainable Development Goals (SDG's), approved in 2015 by the UN, present an opportunity for soil science research because at least four SDG's, relating to food security, water quality, climate mitigation and biodiversity preservation, have direct links with the soil. This has been pointed out clearly by now and the next step is to present results of inter- and transdisciplinary research, with a prominent role of soil science, showing specific examples in practice where significant advances have been made towards achieving SDG's. We invite researcher, policy makers and practitioners to show how the SDGs play a role in their work.

Special attention should be paid to:

- (i) how inter- and transdisciplinary research was realized;
- (ii) existing soil research ideas for future additional research;
- (iii) how separate SDG's can be addressed simultaneously using a systems approach
- (iv) relations between existing policies and regulations on land use and environmental quality.

This session will show the significance of soils and soil science in many existing soil based land-use studies to illustrate to non-soil scientists and policy makers and this discipline can help to realize specific SDG's in a more holistic way.



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## **Session 21: Stakeholder interaction and innovative governance arrangements in sustainable (rural and urban) development**

**Organiser:** Sandra Boekhold, RIVM National Institute for Public Health and the Environment, the Netherlands, [sandra.boekhold@rivm.nl](mailto:sandra.boekhold@rivm.nl)

### **Abstract**

This session will focus on governance, science-policy-practice interactions, stakeholder interaction, communities of practice, co-creation and awareness building.

We would like to invite presentations of practical methodologies for and exchanging experiences with stakeholder interaction and innovative governance arrangements in sustainable (rural and urban) development projects. This theme connects with the general goal of this conference to promote interdisciplinary collaboration: How to do this effectively?

This session also aims at connecting the biophysical science community to the social sciences.

**Session format:** A key note will clarify the background of this topic. Then we want to give the floor to several field examples. With a forum discussion afterwards to identify what works (and why) and what can be improved (and how).