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EUROPEAN SOCIETY for SOIL CONSERVATION

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Rill erosion in the pre-Alpine area of Austria (photo by Peter Strauss, Petzenkirchen, Austria).

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CONTENTS

This issue of the ESSC Newsletter presents the 21st of our 'Guest Editorials.' This is an opportunity for leading authorities in the soil science community to offer their perspectives on issues relating to soil conservation. This contribution is from Peter Strauss (Petzenkirchen, Austria and ESSC Vice-President).

Catena Verlag has kindly agreed to publish a book based on Guest Editorials. This will be entitled **'Global Perspectives on Soil Conservation.'** This will form part of the Catena 'Advances in GeoEcology' series. In principle, it is agreed that there will be future volumes, associated with the four year cycle of Congresses of the ESSC. Work on Volume 1 is progressing well.

A century of changes in perspectives on soil use and soil protection in Austria

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Human activities during the last century have had dramatic impacts on natural resources world-wide. While the demand and pressure on natural resources has increased tremendously during this period, there has also been a huge increase in awareness concerning protection of natural resources, including soil protection issues. The intention here is to briefly describe how the role of soil in public and scientific awareness changed throughout this period. Coverage cannot be comprehensive, but only offer selected glimpses. While the described developments are for conditions in Austria and some developments may be unique to Austria, many facets are similar within other countries of the European Union.

During the first decades of the 20th century, soil was mainly seen as a means to enable crop production and research supported this goal. Strong emphasis was given on increases of crop yield using improved fertilization and the theoretical backgrounds to this (Mitscherlich, 1909). This resulted in several fertilization trials. As an example one of the oldest fertilizer trials was the so called 'Ewig-Roggen Experiment Großenzersdorf,' which was established in 1906. The trial tested the effects of different types and application rates of fertilizers on crop yields (Steineck and Ruckenbauer, 1976) and is still ongoing.

Similarly to the activities of soil chemists, soil physical improvement aimed at improving the productive basis of soils. Improvement of soils by drainage was, therefore, a major issue. In 1936 an experimental field trial on agricultural water management was established in Petzenkirchen with the aim of studying the effects of drainage on improved soil productivity (Kar, 1947).

Several books on agricultural water management practises had been written already in the second half of the 19th century and the first decades of the 20th century (Kar, 1947; Kopecky, 1901). This was strongly connected to the foundation of the 'Hochschule für Bodenkultur' in 1872, which is now 'Universität für Bodenkultur.'

Mechanization of agricultural practises had already started in the early 20th century. However, due to the small size of farm units in Austrian agriculture, it was not before the end of World War II that this occurred on a broad basis (Bruckmüller *et al.*, 2002). Besides mechanization, an important step towards agricultural industrialization was the invention of the Haber-Bosch process in 1908 (the way to produce mineral fertilizers from atmospheric nitrogen). However, while use of mineral fertilizers was established from the mid-1920s, the amounts used were still quite low, due to the generally small size of farms (Figure 1).

Figure 1: Use of mineral fertilizer nitrogen (N) in Austria between 1920 and 2010.

In the years after World War II intensification of agricultural production greatly accelerated. The main concern of people involved in agricultural production during this time was building up a national food supply. Fertilizer application rates increased steadily (Figure 1), horses were replaced by tractors and nationally concerted action on physical improvement of wet and poorly drained soils was initiated by the establishment of the Federal Agency of Technical Soil Science in Petzenkirchen. The main task of this Institute was to improve the physical conditions of soil in order to increase food production. The total area for improvement was estimated to be ~500,000 ha, an area which could be called the '10th federal province of Austria' (Ramsauer, 1949).

Intensification of agricultural production brought several attendant problems which, at a scientific level, were recognized quite quickly. However, the public perception of these problems needed decades longer. Soil erosion may here act as a surrogate for the development of awareness for soil protection.

Soil erosion by water had been recognised as a threat to agricultural production since the early 1960s and the first activities on collection of knowledge on erosion quantities and measures to reduce the problem commenced. Focus of these first activities was on erosion control in vineyards. Plate 1 presents typical erosion plots of this time.

Plate 1: Erosion plots in Pössnitz, Styria, 1965.

Soils at risk of erosion were also classified by the Austrian soil mapping system since 1955 (Schwarz *et al.*, 2001). However, the first attempts to classify and map soil had been undertaken already in 1923 (Till, 1923) and 1937 (Ramsauer and Till, 1937). During the 1970s initial attempts to obtain a spatial picture of the extent of soil erosion were undertaken. In co-operation with the Austrian tax soil evaluation system, a map of erosion risk areas was developed on the basis of visible soil erosion features on agricultural land (Klaghofer, 1987). In addition, counter-measures to combat erosion were already developed and tested since the early 1970s. Unfortunately, the problem was generally recognized only at the level of researchers and technicians; therefore, activities to reduce soil erosion remained concentrated around few people.

This situation improved somehow at the beginning of the 1990s when soil protection laws were developed at the level of the nine different federal provinces of Austria; soil protection laws are part of regional legislation in Austria. These laws were mainly created to protect soils against uncontrolled application of sewage sludge, but also contained at least the phrase *"soil erosion should be prevented"*. They can also be considered as an expression of the awareness to protect our natural resources, which have increased since the 1970s. At the national scale one major visual outburst of increasing awareness in ecological protection could be attached to the discussions about the construction of a new hydropower plant in the area of Hainburg east of Vienna during the early 1980s. Activities around this issue eventually led to the foundation of a new ecologically-oriented political party ('Die Grünen'), which remains active.

Alongside with increased ecological awareness within the general public, an increase in interest in sustainable agricultural production was evident. This can be deduced, for instance, from the number of published papers that contain the word "sustainable" or "sustainability" along with "soil". While the 'Web of Science' returned only one paper containing these phrases for the years 1980-1989, for the period 1990-1999, 1124 papers were identified and for between 2000-2009, 3469 papers containing these items were published.

In 1995, Austria joined the European Union. Setting up of a programme for sustainable agriculture (ÖPUL) for the first time also involved measures to protect soil against erosion at the national scale. Since 1995, participation levels for measures against soil erosion have steadily increased. However, the desired levels of participation are still not reached if we consider that only ~11 % of the total arable land and 30 % of the land cultivated with crops associated with high erosion-risk crops (maize, sugar beet, sunflowers and potatoes) are actually managed using conservation tillage techniques. Alongside the implementation of these measures within ÖPUL, there were demands to estimate their effectiveness, which led to increased efforts to estimate soil erosion at the national scale (Strauss, 2007).

Nowadays, erosion is only one of a bundle of possible threats to soil protection. Major problems do, for instance, also exist in terms of urban soil sealing. Only 37 % of Austria's land surface is suitable as permanent land settlement area (Umweltbundesamt, 2013), due to the alpine environments. This considerably increases land use conflicts between agricultural land and urban sealed areas within alpine valleys. Today, we face an increase in sealed land (at the expense of productive agricultural land) of ~15 ha/d. Unfortunately, legislation has not yet fully responded to this threat.

In summary, it appears that the historical development of public awareness towards soil protection during the last century or so was not a linear progression. Two-thirds of the last century's activities focused on the issue of increasing agricultural production, and raising public awareness of soil protection issues only occurred during the last 20 – 30 years. This led to legal actions on the one hand, but also to initiatives such as the European Society for Soil Conservation (founded in 1989) and the European Land and Soil Alliance (founded in 2002). However, consideration of the present status of soil protection in Austria reveals that we are only at the beginning of really protecting our soils and much (in terms of science as well as public awareness) remains to be done, in order to protect our soils in a long-term sustainable way.

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At the ESSC Council meeting in Průhonice (Czech Republic) on 23/06/2009, it was agreed that ESSC Newsletters should carry reports on soil erosion and conservation in specific countries. It is proposed that scientists at the country hosting the next ESSC conference/ meeting/congress be invited to prepare a report on soil erosion and conservation in that country before the meeting. Edoardo Costantini has kindly prepared a report on Italy for this Newsletter issue, which precedes the next ESSC meeting, to be held in Imola, (Italy) in May 2014.

Soil Degradation in the Soil Regions of Italy

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Soil degradation in Italy is an important issue. Some figures summarize the impacts of the most threatening soil degradation processes. The territory directly covered by settlements is currently 4.9 % of Italy (ISPRA, 2013). It is estimated that >20 % of Italian agricultural land is within the moderate to severe risk classes for soil erosion by water (OECD, 2001). The Institute for Environmental Protection and Research has mapped some 485,000 landslides in Italy, covering 6.9 % of the Country (ISPRA, 2013). Different authors estimate almost 23 % of Italian soils have <1 $g.100g^{-1}$ of organic carbon. About one-third of Italian soils are believed to be affected by compaction (APAT, 2007). The total area of salt-affected soils totals almost 32,000 km^2 (Costantini *et al.*, 2013).

Unfavourable soil and climate conditions, coupled with poor environmental management, improper land planning, poor agricultural husbandry, and population growth are the main drivers determining vulnerability to soil and land degradation in Italy (Salvati *et al.*, 2011). Among them, careless soil and land management of fragile environments by both public administrators and farmers is the most important cause of soil degradation (Terribile *et al.*, 2013). According to four different scenarios, in 2015 an estimated 18 – 27 % of Italy will be affected by various degrees of land degradation (Salvati and Carlucci, 2013).

Soil degradation processes in Italy have characteristics specific to both north European and Mediterranean countries. In fact, if the impacts of urban soil sealing, soil organic matter (SOM) decline, and soil compaction are generally comparable to many other countries, landslides (involving/evolving on soils), soil erosion and soil salinization are often more problematic in Italy than in most parts of Europe (Costantini and Lorenzetti, In Press). On the other hand, the fight against soil degradation is certainly more difficult in Italy than in other European countries, because of the high environmental variability, which requires fine-tuned application of soil and water conservation systems (Corti *et al.*, 2013). Variability is a typical feature of the Italian landscape (Costantini *et al.*, 2013). This paper outlines the main soil degradation processes in Italy, according to their occurrence in the Italian soil regions; the broadest geographic generalization level of soilscapes.

The Italian National Center for Soil Mapping (CNCP, located by CRA Consiglio per la ricerca e la sperimentazione in agricoltura) has created and manages the national soil database (Soil Information System of Italy, SISI), in collaboration with the Ministry of Agricultural, Food and Forestry Policies, the soil bureaux of the Italian Regional Administrations, and the soil chairs of some Universities. SISI is a Spatial Data Infrastructure which stores geographic and descriptive information about soils and soil forming factors, including climate, geology, relief and land use, at different scales (Table 1, Costantini *et al.*, 2012, 2013). Currently, SISI stores information on 10 soil regions, 47 sub-regions, 2,184 systems and ~4,200 subsystems. There are over 48,000 stored soil plots, 72,000 analysed horizons, and 14,000 soil profiles linked to the Soil Typological Units (STU). Available maps and geodatabases can be downloaded from:

http://www.soilmaps.it/

or browsed in the web GIS at:

http://aginfra-sg.ct.infn.it/sisi

SISI is constituted of a hierarchy of geodatabases storing geographic and descriptive information of soilscapes at different reference scales. Specific software was created, able to store and correlate data of soil profiles and STU from different sources. The geography of the soil region, in particular, was created by taking into consideration the climate, morphology, and lithological factors influencing pedogenesis, and allocating main soils by means of a spatial statistic approach (Figure 1). The soil region data base is the first information level for the soil map of Italy and, as the same time, is the tool for soil correlation at the continental level.

Table 1. Hierarchy of soilscapes and databases of Italy

Soilscape level	Reference scale	Reference polygon size (hectares, ha)
Soil regions	1:5,000,000	10^5-10^6
Soil sub-regions	1:1,000,000	10^4-10^5
Soil systems	1:500,000	10^3-10^5
Soil subsystems	1:250,000	10^2-10^5
Soil units	1:50,000	10^1-10^2
Soil element	1:10,000-25,000	10^{-1}-10^1

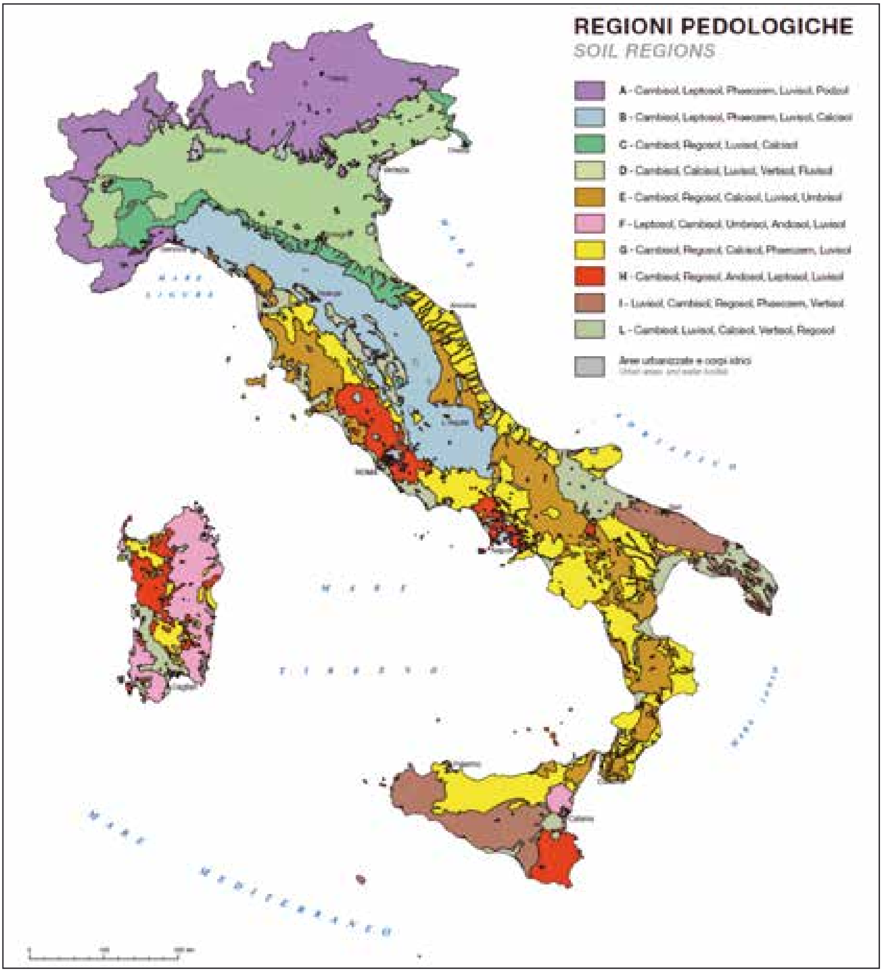

Figure 1: The soil regions of Italy.

Soils and the main degradation processes in the soil regions of Italy

A[1] Soils of the Alps, 50,226 km[2], 16.6 % of Italy[2]. *Main soils:* Cambisol, Leptosol, Phaeozem, Luvisol, Podzol (IUSS-ISRIC-FAO, 1998). *Main land capability classes:* Class 4 – 8 soils on slopes, 2nd and 3rd class soils in the valleys. *Main limitations:* climate, slope, thickness, rockiness, stoniness and acidity.

[1] Code of soil region on the map.
[2] Major water bodies and urban areas are excluded.

Main soil degradation processes: the high potential water erosion and landslide risks are limited by the dominant land cover (i.e. forest and permanent meadow, which cover ~70 % of the area). Landslides, on the other hand, can also affect meadows and woodlands, but they generally occur only on the steepest slopes and highest elevations, or due to critical meteorological events. Tree cultivation (especially vines and apple trees) is the most common of the other agricultural uses (~9 % of the area). Vineyards and many apple orchards are traditionally cultivated on human made-terraces. The extent to which these are maintained or subjected to mass movements largely depends on the financial support provided by different local administrations. Furthermore, vine cultivation is often associated with copper contamination of soils (Costantini, 2000). Bare or scarcely covered lands (e.g. glaciers, rock outcrops, talus) cover an average of 14 % of the surface. They reach 25 % in the central-western part, whereas they are 7.5 % in the central-eastern part. Settlement distribution shows the opposite trend: it covers as a whole 1.8 %, but only a 1.3 % in the central-western part, and 3.7 % in the central-eastern one. However, in both cases it is a major cause of soil sealing, because it is concentrated in the few plain surfaces (valley bottoms and terraces). In the lower part of the area (the pre-Alps) the recurrence of fires, which has increased in recent years, impairs soil quality and triggers water erosion in otherwise preserved areas. Finally, localized soil degradation phenomena are related to several processes. These include: i) due to soil erosion related to ski slopes, ii) nitrate contamination of intensively pastured meadows, and iii) due to soil acidification in the most elevated forest and meadow lands on acidic lithotypes.

B Soils of the Apennines with temperate climate, 35,182 km^2, 11.7 % of Italy. *Main soils:* Cambisol, Leptosol, Phaeozem, Luvisol, Calcisol. *Main land capability classes:* 6th, 7th and 8th class soils. *Main limitations:* climate, steep slopes, soil thickness, stoniness and rockiness, water and mass erosion, locally for clayey texture or acidity; 1st and 2nd class soils in flat lands.

Main soil degradation processes: the soil region has a relatively small population and land uses are mostly extensive. In fact, >70 % of this soil region is covered by woodland and permanent meadows. The extensive use and the scarcity of human activities limit the main soil degradation processes to water erosion and mass movements.

C Soils of the hills of northern Italy formed on Neogene marine deposits and limestone, 10,857 km^2, 3.6 % of Italy. *Main soils:* Cambisol, Regosol, Luvisol, Calcisol. *Main land capability classes:* 3rd and 4th class soils. *Main limitations:* thickness, stoniness, clayey texture, water erosion and mass movements, and slope.

Main soil degradation processes: water erosion, superficial and deep-seated mass movements are frequent and widespread, often exacerbated by the practise of land levelling, particularly the establishment of tree crops (vineyards), and slope reshaping, which is common in lands prone to superficial mass movements.

D Soils of the Po plain and associated hills, 47,856 km^2, 15.8 % of Italy. *Main soils:* Cambisol, Calcisol, Luvisol, Vertisol, Fluvisol. *Main land capability classes:* 1st and 2nd class soils. *Main limitations:* local limitations for acidity, stoniness, excess water, clay-rich texture and peat.

Main soil degradation processes: the high potential agricultural productivity of soils conflicts with other forms of utilization. These other soil uses have been steadily occupying the territory during recent decades. Some 10 % of the soil region is now occupied by extra-agricultural uses (e.g. urban areas, industrial settlements, quarries and human infrastructure) with maximum concentration in the high plain (12.5 % of land area) and on moraine hills (17 %). Soils are generally fertile, although often deficient in SOM. The intensive agricultural use

Plate 1: Soil of the Po Plain with compacted and hydromorphic subsurface horizon (plough pan).

(60 % of the surface is utilized as row and close-grown crops and only 7 % as meadow or woodland) can cause degradation of soil physico-chemical properties, and ground-water contamination, especially where soil organic carbon (SOC) and pH values are low or very low (mainly in the western part of the soil region). Degradation of soil physical quality (namely compaction, Plate 1) is evident in many places and attributed to intensive agricultural exploitation and to the low SOM content (Pagliai *et al.*, 2004). In addition, continuous conventional tillage itself decreases SOM content. In turn, this decreases aggregate stability and increases the formation of surface crusts, with increased runoff and erosion risk, even on gentle slopes.

Ground-water pollution risk is particularly high in irrigated land (7.4 % of the soil region, concentrated in the medium and high plain), especially in rice cultivated lands (western part of the soil region), and in the reclaimed territories of the eastern part. Some 8.4 % of the soil region is covered by water bodies, which are more widespread near the Po Delta. In the reclaimed area, both subsidence and soil salinization occur.

E Soils of the central and southern Apennines, 29,862 km^2, 9.9 % of Italy. *Main soils:* Cambisol, Regosol, Calcisol, Luvisol, Umbrisol. *Main land capability classes:* 3rd–7th class. *Main limitations:* soil thickness, stoniness, rockiness, slope, clay-rich texture, water erosion and mass movements.

Main soil degradation processes: in spite of the large extent of forests and permanent meadows, superficial soil erosion and landslides are frequent and occupy much of the area. Besides natural factors, the spatial incidence of current and past degradation phenomena has and is related to: i) the destruction of forest cover caused by fire, ii) the abandonment of traditional hydraulic agrarian practises, especially terracing, iii) the increased extent of more intensively cultivated crops and deep ploughing, and iv) the spread of excessive land levelling and slope reshaping in advance of specialized tree plantations. The importance of soil erosion in these soil regions is testified by the fact that a large part of agricultural soils have low or very low SOM contents. In addition to the increase in soil losses, the expansion of the aforementioned practises caused the loss of the traditional mixed agricultural landscape and, in many cases, an impairment of land capability and suitability for quality crops, such as grape and olive oil production (Costantini and Barbetti, 2008).

F Soils of the mountains of Sardinia and Sicily on magmatic and metamorphic rocks, 13,131 km^2, 4.4 % of Italy. *Main soils:* Leptosol, Cambisol, Umbrisol, Andosols, Luvisol. *Main land capability classes:* 2nd and 4th class soils on cultivated lands, 7th and 8th in grazing and forestry lands. *Main limitations:* soil thickness, high erosion risk, slope, stoniness and rockiness, drought and acidity.

Main soil degradation processes: these are among the most degraded soils in Italy. The incidence of pastures and woodlands is ~60 %, but it has been estimated that >50 % of pastures are severely degraded, because of the prolonged history of sheep overgrazing and the succession of wildfires. Moreover, ~20 % of the region is utilized for tree cultivation, mainly cork oak (*Quercus suber*), which is often overgrazed. The soils are prone to soil compaction, soil erosion and decreased SOM contents, caused by agricultural practises and repeated use of fire for clearing pastures. Another major cause of soil degradation is heavy metal contamination of soils, especially in the now inactive mining areas. Contamination affects extensive areas, also because fluvial sediments emanating from waste dumps are eroded and deposited in lower valleys.

Soils of the volcanic mountain system of Etna have specific properties. They are very erodible, due both to the presence of the main active volcano of Europe and to intensive land use, both agricultural and extra-agricultural. Despite the rugged terrain, settlements cover a considerable portion of the territory (~10 %) and are continuously threatened by lava eruptions and ash deposition. Bare surfaces occupy >21 %. Of the remaining part of this area, woodland and permanent meadows are only 27.6 %, while orchards occupy 39 %.

G Soils of the hills of central and southern Italy formed on Neogene marine deposits and limestone, with tufa surfaces, occupies 47,545 km^2, some 15.7 % of Italy. *Main soils:* Cambisol, Regosol, Calcisol, Phaeozem, Luvisol. *Main land capability classes:* 3-8 in sloping lands. *Main limitations:* clay-rich texture, drought, salinity, thickness, stoniness, slope and erosion.

Main soil degradation processes: water erosion and mass movements are frequent and enhanced by land bulldozing and slope reshaping, which is common practise before tree plantation. Severe and long-lasting soil erosion is one of the major causes of the low SOC contents of many soils of this region (Plate 2). In many areas of the territory, the substitution of the traditional mixed farming (small fields with simultaneous cultivation of close-grown and row crops, vegetables, orchards and other tree plantations) by alternating large fields with specialized tree plantations and close-grown or row crops, causes the loss of an attractive traditional landscape, as well as of the cultural value of soils (Costantini and L'Abate, 2009; Plate 3). The intensive agricultural use of the region, which in the past also occupied steep slopes, is testified by the widespread presence of terraces, which are now usually abandoned, and prone to erosion.

Plate 2: Soil structure destruction due to excessive land levelling (Central Tuscany, photo during winter 2003).

(a) *(b)*

Plate 3: The attractive traditional landscape and the cultural value of soils are threatened by the saturation of landscape with a single form of specialized cultivation. (a) San Gimignano (Siena) southern slope, with a preserved landscape, contrasts with (b) the northern slope.

H Soils of the hills of central and southern Italy formed on volcanic deposits and limestone, 15,880 km^2, 5.3 % of Italy. *Main soils:* Cambisol, Regosol, Andosol, Leptosol, Luvisol. *Main land capability classes:* 1st and 2nd class soils in valleys, 6-8 on sloping lands. *Main limitations:* erosion, slope, clay-rich texture; locally soil acidity.

Main soil degradation processes: these lands have good suitability for both agricultural and forest uses, but suffer from heavy extra-agricultural exploitation, which is the main cause of soil degradation. The strong urbanization, concentrated along the coasts, occupies ~10 % of the region, but can exceed 50 % in the Province of Naples. Localized, but important, cases of soil pollution occur. These can be sometimes attributed to over-intensive agricultural use and especially to illegal spreading of different kinds of wastes. Water erosion and mass movements are common, and particularly affect the characteristic landscapes of the human-terraced slopes, which are in many cases abandoned.

I Soils of the hills and marine terraces of southern Italy, formed on calcarous sediments, 17,417 km^2, 5.8 % of Italy. *Main soils:* Luvisol, Cambisol, Regosol, Phaeozem, Vertisol. *Main land capability classes:* variable, from 1st to 3rd class soils on level land, from 3-7 in hills. *Main limitations:* slope and water erosion, clay-rich texture, drought and salinity; locally thickness, rockiness and stoniness.

Main soil degradation processes: the soil region has rather intensive land use, both for agricultural and non-agricultural uses. Specialized or mixed tree cultivation (citrus, vineyards, orchards, olive and almond tree plantations) are widespread, while meadows and forests cover <10 %. It is estimated that some 2,500 km^2 of soils, generally with high production potential and located on plains, are affected by salinity. A large part of the area is constituted by terraces on which palaeosols, often deficient in SOM, are widespread. Where these soils are deeply ploughed and impressive phenomena of soil compaction have been observed (hardsetting). The spread of specialized tree cultivation on these palaeosols, namely vineyards for wine and table grape production, has disturbed both soil horizonation and the landscape of large areas, with attendant loss of pedodiversity and the traditional characteristics of the cultural landscape (Dazzi and Monteleone, 2007). The intensive cultivation is also blamed for soil contamination, produced by overuse of pesticides and the burning of plastic covers (Dazzi, 2001).

In the Apulia region, the smooth morphology favours the spread of urban, tourist and industrial sites, especially along the coast. The dryness of the climate and the scantiness of water resources provoke strong competition between their different uses. The utilization of poor-quality water for irrigation is common. Consequently, almost 4,000 km^2 are affected by salinization and alkalinization (Costantini *et al.*, 2013). The soils of the region are frequently shallow, and soil losses due to water erosion are particularly serious in the higher hills. The risk of soil erosion, up to complete denudation to the underlying hard rock, is sometimes increased by a particular kind of 'reclamation' of shallow soils on limestone. The operation consists of chopping the rock with particularly heavy machinery, so to increase soil depth, and by surface levelling (Plate 4). The resulting soil is silty, poorly structured and very vulnerable to water and wind erosion. These practises, in addition to earth movements and backfill, have already affected hundreds of hectares. Previously, these often constituted traditional landscapes, formed by picturesque red-coloured palaeosols alternating with white rocks. In these cases, both the loss of the cultural value of soils and impairment of the attractiveness of the landscape were observed.

Plate 4: Rock chopping to increase soil depth can increase its vulnerability to both water and wind erosion.

Besides soil erosion and compaction, salinization is a major problem. In Italy, salinity and sodicity are commonly believed to affect only marginal land (Tóth *et al.*, 2008), and to be concentrated along some coastlines and in Sicily (Dazzi, 2006). However, studies on gypsiferous soils and on soils with parent materials rich in sodium (Dazzi *et al.*, 2005; Busoni *et al.*, 1995) have demonstrated that the presence of soils with salic or sodic horizons might be more extensive than currently estimated, and in particular much larger than that of Solonchak and Solonetz. In addition to the scientific results, regional soil surveys have reported the presence of saline and sodic soils in different parts of the central and southern regions, and in northern

Italy. However, the occurrence of soils influenced by topsoil salinity or sodicity is much less widespread than that of soils which are only affected at depth.

L Soils of the plains and low hills of central and southern Italy, 26,884 km^2, 8.9 % of Italy. *Main soils*: Cambisol, Luvisol, Calcisol, Vertisol, Regosol. *Main land capability classes:* 1st, 2nd and 5th class soils. *Main limitations:* drought, flood-risk, excess water, clay-rich texture; locally for acidity, stoniness, salinity, peat and the presence of petrocalcic horizons.

Main soil degradation processes: this soil region also experiences major conflicts between different land uses. The region is mainly utilized with row and close-grown crops (~50 % of the total surface), which are widespread in the plains. The hills are mainly covered by Mediterranean macchia and meadows. The most important soil degradation processes are attributed to the competition between agricultural and non-agricultural uses of water. The competition is due to the scarcity of water bodies and to the dry Mediterranean climate, and it is particularly harsh in the plains, where most settlements are concentrated. Consequently, localized, but often severe, soil degradation occurs, due to the use of brackish water. In addition, ground-water pollution is evident on the intensively cultivated plains of the region. In this soil region palaeosols are particularly abundant. These are often rather acid, deficient in SOM, somewhat poorly drained and with the presence of hardened petrocalcic horizons. These soils are particularly sensitive to degradation when irrigated with water which is brackish or rich in calcium carbonate. In the latter case, salt tends to accumulate within the profile and within a few years develop a petrocalcic horizon, which farmers usually need to break to allow crop root penetration.

Conclusions

The most harmful soil degradation process in Italy is certainly the irreversible loss of land caused by urbanization and other non-agricultural uses, which often affects the most fertile soils of the plains. At present, among the different services that are lost with soil sealing, the diminished capability to produce food is particularly relevant, as it decreases national self-sufficiency in food. Other less devastating and perceivable, but widespread, processes threaten Italian soils. Among them, soil compaction is assuming a prominent role, as a consequence of the increasing employment of heavy machinery for many agricultural practises on soils with deficient SOM contents. The risk of soil salinization and sodification is also believed to be increasing, as a consequence of both intensified competition among different water uses and due to the widespread adoption of excessive land levelling in soils formed from marine sediments. Finally, installations of photovoltaic devices to produce electricity occupy agricultural soils, particularly in flat areas or valley floors with high productive value.

Many other still less perceived and studied soil degradation processes affect the soil resources of Italy. Among them, the loss of the cultural value of soil, which is often accompanied by decreased pedodiversity (Lo Papa *et al.*, 2011), and the loss of traditional landscapes (Dazzi and Lo Papa, 2013). The process is mainly caused by crop intensification, practised on unsuitable soils or with improper agro-techniques, and accompanies increased hydrological disorder and geomorphological risk. This process also manifests itself in the impairment of the aesthetic value of landscapes and in the deterioration of soil suitability for quality crops. The degradation process is often underestimated, since Italy is still one of the richest places in the world in terms of soil and landscape diversity. However, the rapid impairment of the cultural value of soil renders Italian landscapes progressively less attractive.

Driving forces of soil degradation act at different scales; from the country, to the region, the municipality, and the farm. Therefore, effective responses to land degradation require integrated policy measures conducted at different spatial levels (Salvati *et al.*, 2011).

The European Commission has recognized urban soil sealing, soil erosion and SOM decline as the soil degradation processes on which Member States should concentrate their main efforts, in consideration of their economic and environmental relevance (Resource Efficiency Roadmap: COM 571, 20.9.2011). In that respect, the following objectives for the year 2020 are recommended:

i) Reducing annual land take (i. e. the increase of artificial land should not exceed 800 km^2 per year within the EU).
ii) The area of land in the EU that is subject to a soil erosion rates of >10 tonnes per hectare per year should reduce by ≥25 %.
iii) Soil organic matter levels should not decrease overall and increase for soils currently with <3.5 % SOM.

Under current trends of soil degradation, Italy will probably fail to achieve the European objectives for 2020. Complying with them, and restoring the fertility of Italian soils, implies both a major effort to launch a nation-wide campaign, and specific new legislation, dedicated to the reduction of land sealing and the implementation of specific, locally-tailored agro-techniques, in all agricultural land uses.

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The term 'Vertisolization' indicates the process that converts a soil into a Vertisol. In all soil classification systems, Vertisols are recognized as those soils that contain ≥30 % clay, show the presence of slickensides and large wedge-shape peds, and are affected by cracks that periodically open and close. The parent materials of these soils are mainly marine, fluvial or glacial sediments, and calcareous and basic rocks. In Vertisols, deep and wide cracks open when clay shrinks after they have swelled and this may occur in areas experiencing climatic conditions consisting of well alternated rainy and dry periods. Because of this, Vertisols are mainly found in Australia, India, central and southern Africa, eastern China, the southern States of the USA and Brazil. Extensive areas with these soils are also present in the Mediterranean basin, from southern Europe to the Near East. Where Vertisols are present, they are responsible for damage to roads and buildings, as the energy developed during swelling and shrinking is considerable and infrastructures usually succumb. Furthermore, Vertisols represent a hindrance for agriculture, as many perennial plants cannot survive the stresses induced by the pedo-climatic conditions. During crack formation, roots are often broken, and root breaking decreases tolerance to drought and increases infections. In addition, during the rainy season, swelling strongly reduces gas exchange. Yet, natural Vertisols are usually covered by savannah vegetation, indicating that not-irrigated Vertisols can be used for grass crops, even though such lands are unusable for grazing during the dry period. Somehow, Vertisols also play a positive role by regulating climate: by combining grassland and high clay contents (with expandable clay minerals), they tend to accumulate non-labile organo-mineral complexes, in which the organic matter is protected from biological degradation. With this system, Vertisols subtract CO_2 from atmosphere and, in the medium to long-term, they contribute to decreased global warming.

Because of these considerations, the question raises: should we be concerned about Vertisolization?

The answer is not simple and needs details, here below grouped into two points.

1) To be classified as a Vertisol, taxonomic systems require the soil has ≥30 % clay content, with little regard to the clay type. In central and southern Italy, for example, there are soils with a marvellous *vertic* behaviour and that crack to depths of 1 m, but contain only 20 – 25% clay. The reason of the deep cracking is that much of this clay is made of expandable minerals (smectites and vermiculites). However, because of the <30 % clay content, these soils cannot be classified as Vertisols but only as *vertic* intergrades. For this point, an International Committee would be desirable to solve this classification weakness.

2) In many areas of Southern Europe, many soils have clay contents >30 %, but they are submitted to *aquic, udic* or *ustic* soil moisture. Also in this case, the soils cannot be classified as Vertisols, but here the reason is that they are too moist to considerably shrink and, consequently, they only crack a little at shallow depths. As a consequence, soils exhibit their *vertic*

behaviour only during specific years. Yet, in these areas the predicted climate change should bring less rain and warmer summers than presently experienced, changing the soils with *vertic* behaviour into Vertisols. As an example of this, Figures 1 and 2 show the 50-year trends of temperatures and precipitation at two sites in Central Italy that are ~43° N: in 50 years we have lost ~100 mm of rain and the mean temperature has increased by ~1 °C. Should these tendency be maintained, the soils of these areas will become Vertisols in 2035. More south (from 42 – 38° N) this could happen some years before, while in other places Vertisols might form a decade later.

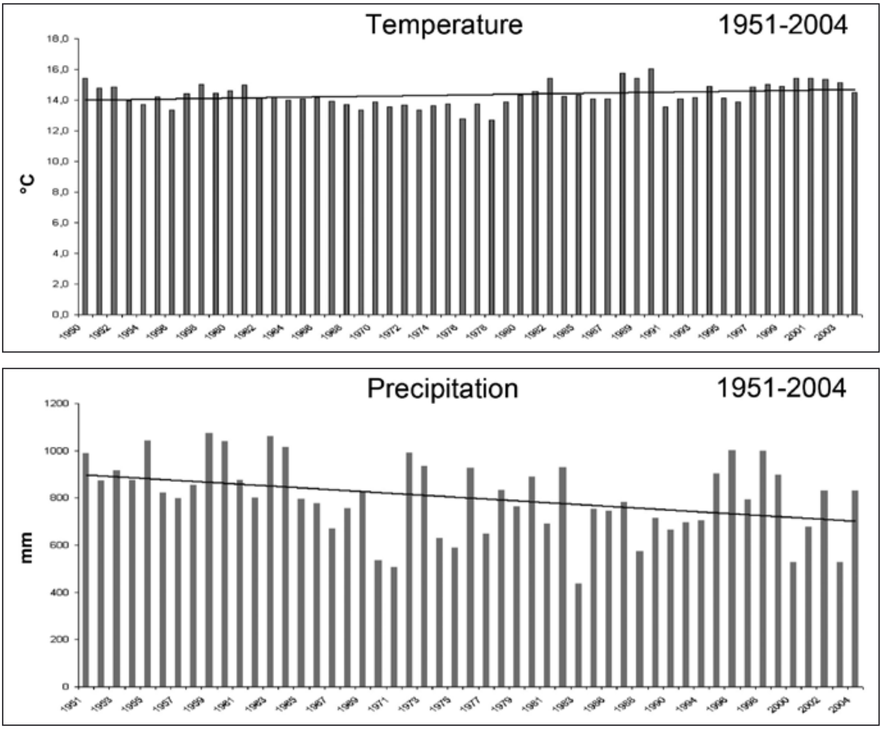

Figure 1: Temperature and precipitation means, and relative tendency lines, of the period 1951-2004 for Jesi, a hilly environment in Ancona Province (Italy) at 149 m above sea level (co-ordinates: 43°32’39” N, 13°13’56” E).

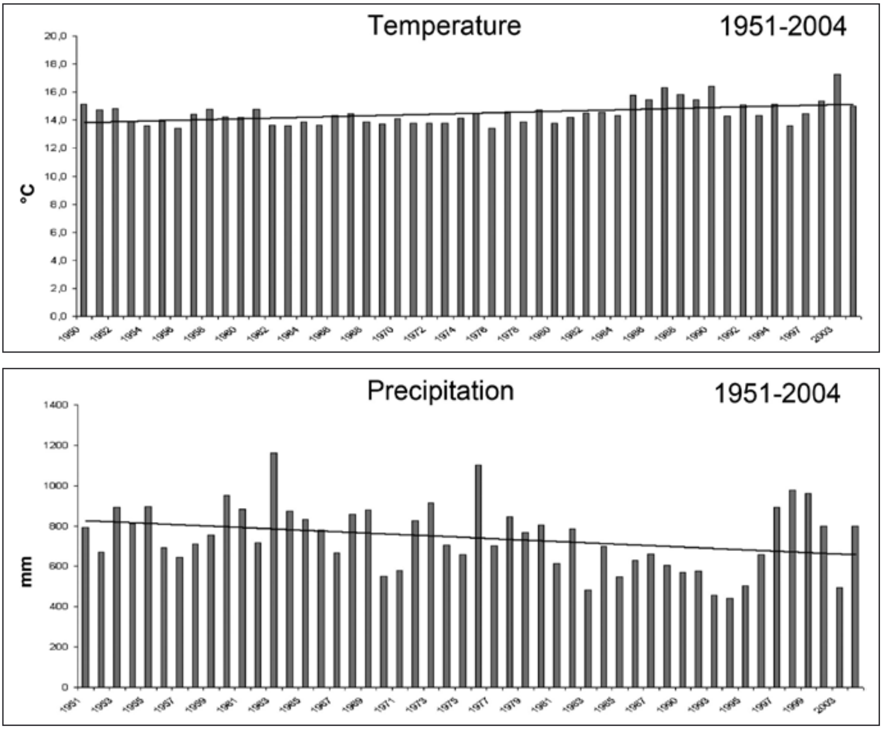

Figure 2: Temperature and precipitation means, and relative tendency lines, of the period 1951 – 2004 for Lornano, a hilly environment in the Municipality of Macerata (Italy) at 235 m above sea level (co-ordinates: 43°17'18" N, 13°25'19" E).

If we consider that it is estimated that by 2045 the global human population will be 9 billion and at that time we will need more food and fibre, we have to realize that: i) we still do not have a proper inventory of the surfaces covered by Vertisols and soil with vertic behaviour, and ii) we will have less soil to cultivate than presently available.

Again, should we concern ourselves over Vertisolization?

In an even more overpopulated Planet, the reply is a convinced 'yes' and the why is that the agricultural management of Vertisols is one of the crucial points to solve so to allow us using these soils in a sustainable way, which include maintaining their role in carbon-sequestration. Indeed, this will be insufficient to fight against food and energy squandering, or to save water so we can use it for irrigation. In a drier environment, it will be mandatory that soil scientists collaborate with agronomists, plant breeders, hydrologists and economists so to devise locally appropriate soil management systems that may help with wise management of the Planet's future.

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6th International Symposium on Gully Erosion in a Changing World (6th ISGE) held in Iași (Romania), 6 – 12 May 2013

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From 6 – 12 May 2013, the Department of Geography of the 'Al. I. Cuza' Univesity of Iași (Romania) hosted the '6th International Symposium on Gully Erosion.' This excellently organized Conference brought together over 50 scientists from all continents to discuss the latest advancements and challenges of gully erosion research. The well-balanced scientific programme and interesting field excursions, combined with the exceptional Romanian hospitality, made this Conference a great success. This would have been impossible without the tremendous efforts of Professor Ion Ionita (also known as 'Papa' during the Conference) and his dedicated team.

The Conference consisted of two days of scientific presentations (7 and 9 May) and two days of excursions (8 and 10 May; Plates 1 – 3), followed by a post-conference excursion (11 May). This report intends to briefly reflect on some of the main themes and subjects of the presentations and excursions. More information and a comprehensive programme of the Conference can be found at: **www.gullyerosion2013.com.**

Plate 1: Group photo during field trip to the gullies on the Barlad Plateau (8 May 2013).

The Scientific Programme

The highly international character of this Conference was clearly reflected by a large number of presented field, laboratory, review and model studies from all over the world, including Australia, Belgium, Brazil, China, D.R. Congo, Hungary, India, Iran, Italy, Japan, Latvia, Madagascar, Mongolia, Morocco, Poland, Russia, Slovakia, South Africa, Spain, Tanzania, the USA and, of course Romania. The many oral and poster presentations provided a comprehensive view on the state-of-the-art on gully erosion research, showing that our understanding about this process has significantly increased over recent decades.

Several compelling case studies showed that gully erosion is still a major problem in many environments. For example, in Kinshasa (D.R. Congo) where urban mega-gullies form an important cost for infrastructure and even human lives. A presentation from Northern Queensland (Australia) convincingly showed that gully erosion is a major contributor to the sediment flux entering the ocean, posing significant threats to the Great Barrier Reef. On the other hand, a study from eastern Poland illustrated that gullies may also provide interesting opportunities, as forested gully systems form an attractive geo-touristic attraction in this region.

Surprisingly, few presentations focused on potential measures or their effectiveness to mitigate problems related to gully erosion. An exception was a study conducted in Morocco, showing that land-levelling and the resulting decrease in vegetation cover, compaction of the topsoil and infilling of old channel systems clearly led to increased gully erosion, due to both the re-activation of old gully systems and the formation of new (ephemeral) gullies.

Other presentations focused more on the geomorphic aspects of gully erosion and presented intriguing results on gully erosion over longer time scales (e.g. in the USA, north-east Poland and Slovakia). An important challenge that became apparent from several of these presentations is better comprehension of the interactions between gully erosion and other processes, such as piping erosion and landsliding. Whereas piping erosion is often neglected as an erosion process, a study from Belgium highlighted that the soil losses associated with piping can be considerable. Furthermore, many gully systems are initiated by pipe collapses. Studies from Romania and Brazil showed associations between gully erosion and landslides, leading to problems of high soil losses and damage to infrastructure. Likewise, an interesting review on Lavakas (Madagascar) illustrated that these large gully-like features are most probably the result of interactions between erosion due to concentrated flows and mass movements. Nonetheless, the formation process of Lavakas remains poorly understood.

The Conference clearly identified the need to better comprehend the factors controlling gully erosion at various spatial and temporal scales. This was also indicated in the keynote lecture by Professor Jean Poesen (Leuven, Belgium) on the occasion of the honorary doctoral degree conferred on him by the 'Al. I. Cuza' University of Iași during the Conference. A compilation of annual gully headcut retreat rates showed that for a given contributing area, volumetric headcut retreat rates world-wide can vary over seven to eight orders of magnitudes. The relative importance of topography, climate, land use and soil properties in explaining this variation in gully erosion are currently poorly understood. Moreover, presentations from Romania and India indicated that tectonic activity should also be considered in this context.

Tackling these research challenges will require continued efforts to collect data on gully systems for a wide range of environments. Several studies presented during the Conference made important contributions to this aspect by coming up with innovative ways to map and monitor gully systems (e.g. by using stereoscopic satellite images, remotely controlled miniature airplanes or by combing low resolution DEMs and field measurements) (Plate 2). Such techniques may provide promising alternatives for (often expensive) high resolution satellite imagery and intensive field survey campaigns.

Nonetheless, several presentations also highlighted some important challenges and problems when mapping and measuring gully properties. A study from Belgium showed that identifying gullies from satellite images poses problems, as important differences emerge when several experts are asked to map gullies on the same set of satellite imagery. As a result, mapping gullies is often associated with important uncertainties. Similarly, presentations from Spain and Italy revealed the need for clear definitions of gully properties, such as gully width (i.e. how do we define the width of a gully with irregular cross-sections?) and the contributing area of a gully. These issues have important implications for our estimates of gully erosion rates and the determination of slope-area thresholds for gully initiation.

Apart from detailed field studies, several presentations reported interesting findings based on laboratory experiments and modelling exercises. For example, a contribution from the USA presented intriguing results on the development of gully networks in response to base-level changes. Apparently, these resulting networks are remarkably predictable. A study from Italy made a world-wide compilation of topographical thresholds for gully development, showing that the coefficient of the relationship between the critical slope and critical contributing area strongly depends on land use. However, the exponent of this relationship seems constant. This is a promising result, as it could mean that gully initiation could be modelled more simply than previously assumed. Studies from Spain and Iran also presented promising advancements in our abilities to model gully erosion, using both physically-based and stochastic model approaches.

The Excursions

During the first excursion (8 May), Professor Ion Ionita and his team took us to the Barlad Plateau to show us some of the most impressive gullies of Europe (Plates 1 and 3). During this excursion, the suggestion was raised that some of these gullies should be protected as geo-heritage sites. This would not only be justified by their sheer size. They also testify to the tremendous impacts that land use changes can have on soil erosion and sediment fluxes, with measured sediment concentrations ≤300 g/l. Although the lithology (loess) and climate (frost heave and snow-melt) are crucial to explain the exceptionally high erosion rates of these gullies, their initiation was most probably caused or enhanced by inappropriate land management (especially farm consolidation, starting in the 18^{th} Century).

Plate 2: Reviewing gully development using time-series maps on the Barlad Plateau.

Another interesting aspect of these gully systems is their interaction with other erosion processes, such as landsliding. The large depth of these gullies (>10 m) causes major undercutting of the often steep hillslopes, resulting in large mass movements. If these gully systems were indeed initiated by human activities, the gullied catchments of the Barlad Plateau probably represent some of the most important worst-case scenarios of human impacts on soil erosion in Europe.

The second excursion (10 May) was to the Holm Catchment in the Rolling Plain of Jijia (northern part of the Moldavian Plateau). This catchment was also characterized by many landslides and gullies. However, these differed clearly in size from those on the Barlad Plateau. Differences in soil texture are probably the major factor explaining this difference: whereas the gullies in Barlad were mainly formed in silty loess, the Holm Catchment consists mainly of clay-rich soils. Despite their smaller size, the gullies of Jijia Rolling Plain also captivated excursion members. One important aspect in the formation of these gullies is the presence of Solonchacks in this region. The high salt content of these soils poses major challenges to stock breeding and agriculture in this region, as they limit fresh water availability. They also contribute to the dispersion of clays, leading to an important increase in erodibility. Pipe erosion also plays an important role in gully formation. After this visit to the Holm Catchment, participants were indulged with Romania's finest wines (Cotnari) and foods in one of the country's largest wine factories.

The Post-conference excursion led to the Moldovian Subcarpathians and represented a wonderful blend of Romanian culture and geomorphology. After visiting several Medieval Orthodox monasteries and a delicious barbecue, the trip continued with a stop at Romania's largest reservoir, the impressive Bicaz Gorges and Lacu Rosu (Red Lake). This lake formed in 1837 as a combined result of landslides and rockfalls that dammed a valley. Lacu Rosu provides further testimony to the rapidity of many geomorphological changes within the landscapes of Romania.

On behalf of all Conference participants I give my heart-felt thanks to Professor Ionita and his dedicated team for arranging this excellent and informative Conference.

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Plate 3: Gully erosion on the Barlad Plateau (photo by Mike Fullen, Wolverhampton (UK) on 8 May 2013).

International Conference on Soil Carbon Sequestration for Climate, Food Security and Ecosystem Services held in Reykjavík (Iceland), 27 – 29 May 2013

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How can we make soil sexy? How can we build bridges over the gap between science, policy and action? Over 200 international experts from over 40 countries gathered in Iceland to ponder these questions in a Conference on soil carbon sequestration. Soils sustain life and are an essential natural resource. *"There is no life without soil"* said Anne Glover (Chief Scientific Advisor to the European Commission) and *"while soil is invisible to most people it provides an estimated 1.5 to 13 trillion dollars in ecosystem services annually,"* and 99 % of calories for human consumption come from the soil.

Soil carbon sequestration has an important global role. Andrés Arnalds (Assistant Director of the Soil Conservation Service of Iceland and co-host of the Conference) emphasized the linkages between science, policy and action to mitigate climate change by the restoration of land quality as a timely subject. Andrés commented *"there is an urgent need to return as much as possible of a misplaced resource, the carbon molecule in CO_2, back to Earth where it belongs, where it can be stored in soils and vegetation. By doing so, we will strengthen the pillars for sustainability: the economic, environmental, social and cultural foundations for our future."*

Land degradation, manifested in the loss of carbon from the terrestrial ecosystem, is one of the major contributors to the buildup of greenhouse gases in the atmosphere. We need to emphasize soils as our new soldier to fight climate change stated Mr. Ólafur Ragnar Grímsson (President of Iceland) in his opening speech to the Conference. *"Soils are the current policy gap in climate policy"* said Asger Olesen (DG Climate Action of the European Commission). The general consensus at the meeting was that global leadership on solutions is needed.

"Mitigation of climate change through improved management of land and increased soil carbon sequestration is important, however, it does not reduce the need to make major reductions in fossil fuel emissions" said Guðmundur Halldórsson, a Research Co-ordinator at the Soil Conservation Service of Iceland. Asger Olesen (European Commission) concurred with this view that all sectors of the economy must contribute to climate change mitigation.

"Soils are like a bank account. You should only draw out what you put in" said Rattan Lal (Ohio State University). The unknowns of carbon sequestration include data and trend analysis, an updated global inventory of soil organic carbon (SOC) is currently still missing. Monitoring could detect changes over time, but only few national actions are occurring, according to Luca Montanarella (European Commission). Throughout the Conference dialogue continued on how knowledge on temporal dynamics, the key processes and stability of sequestered SOC could improve land use management and how restoration of severely degraded land could rise to the potential for large increases in stored soil carbon in various types of ecosystems.

Increased soil carbon sequestration is a 'win-win strategy,' as healthy soils equal healthy crops, healthy livestock and healthy people. Marginal land creates marginal living which creates unstable societies. José L. Rubio (Centro de Investigaciones sobre Desertificación (CIDE), Spain) discussed how crises develop if the soil capacity to provide goods and benefits is disrupted and it implies societal, economic and environmental security dimensions. With ever growing population, we need new ways to increase food production such as sustainable intensification, conservation agriculture, disease suppression and many more, said Rattan Lal. He added *"behaviour change is needed, we need to put life ahead of lifestyle".*

The limited natural resources of the Earth and requirements to produce sufficient food, fibre and energy for a growing population places urgency on the need to grow food on even less land, with less water, using less energy, fertilizers and pesticides. On the last day of the Conference participants discussed ways to ensure that soils are part of the solution to the global goals. Or, more simply, how to make the soil sexy!

The SCS Conference was hosted by the Soil Conservation Service of Iceland and the Agricultural University of Iceland, in collaboration with several international and Icelandic organizations and was sponsored by the Nordic Council of Ministers, the Icelandic Ministry for the Environment and Natural Resources, the Icelandic Ministry of Industries and Innovation, the Icelandic Ministry for Foreign Affairs, the EC-Joint Research Centre and the European Society for Soil Conservation.

Field trip

Over 150 participants travelled on a field trip in south Iceland, experiencing first-hand the history of ecological degradation of vegetation and soils in Iceland since human settlement, about 1100 years ago, and saw how the processes of desertification can render fertile ecosystems into barren wastelands (i.e. deserts) in a humid environment. In Gunnarsholt, at the Headquarters of the Soil Conservation Service of Iceland, visitors enjoyed an exhibition at the Sagnagarður Education Centre, where the unique centennial story of soil conservation and land reclamation in Iceland was demonstrated. The field trip participants travelled the southern lowlands of Iceland, experiencing lava fields, greenhouses (where even bananas are grown with the help of geothermal heat!), villages and farming communities, extensive plains of volcanic ash, wet deserts, woodlands and Thingvellir, a UN World Heritage site.

SoilTrEC Training event

After the SCS Conference, a training event by the FP7 Environment funded SoilTrEC Project was held at the Sólheimar eco-village in southern Iceland. Here the Project is expanding knowledge of farming approaches and their impacts on farming sustainability.

More information can be accessed at:
http://scs2013.land.is/
http://www.land.is/

Conference presentations are available at:
http://scs2013.land.is/?page_id=1561

Media

The Conference was attended by Stephen Leahy (international environmental journalist and co-winner of the 2012 Prince Albert/United Nations Global Prize for Climate Change Reporting). The Conference received extensive media coverage, both in Iceland and globally. Examples include:

Inter Press News Network:
http://www.ipsnews.net/2013/05/peak-water-peak-oilnow-peak-soil/

Al Jazeera global news network:
http://www.aljazeera.com/indepth/features/2013/05/201353115522917361 5.html

Reuters Alert Net:
http://www.trust.org/item/20130531154627-q1fcy

Iceland
RÚV, Icelandic radio interviews:
Anne Glover, **http://www.ruv.is/frett/brynt-ad-baeta-jardveg**
Guðmundur Halldórsson **http://www.ruv.is/mannlif/moldin-er-mikilvaeg**
Newspapers: Morgunbladid, 1 June 2013 Blikur taldar á lofti í fæðuöryggi heimsins, **http://www.mbl.is/greinasafn/dagur/2013/06/01/**
Major US News websites:
http://www.dailyclimate.org/causes/
http://www.commondreams.org/headline/2013/06/01
http://www.truth-out.org/news/item/16722-peak-water-peak-oil-now-peak-soil

Other countries:

Pakistan

http://www.nation.com.pk/pakistan-news-newspaper-daily-english-online/international

Ireland
http://www.irishsun.com/index.php/sid/214912441/scat/96909ff930280175

Indonesia (Jakarta Globe)

http://www.thejakartaglobe.com/international/peak-water-peak-oil-now-peak-soil/

Progressive Radio Network:

http://prn.fm/2013/06/03/stephen-leahy-peak-water-peak-oilnow-peak-soil/#axzz2VEcjVNN0

In German: **http://www.ipsnews.de/news/news.php?key1=2013-06-03%20 15:01:29&key2=1**

Photos from the pre-Conference field trip:

Director of Research at the Soil Conservation Service of Iceland, Dr Magnús Jóhannsson, welcomes guests to Gunnarsholt (photo: Soil Conservation Service of Iceland).

Lunch in the forest, in the centre Dr José Rubio (Valencia) and Dr Andrés Arnalds (SCSI) (photo: Soil Conservation Service of Iceland).

Opening Address by His Excellency Mr. Ólafur Ragnar Grímsson, President of Iceland (photo: Soil Conservation Service of Iceland).

The final session of SCS2013, Soils and global goals: How to ensure that soils are part of the solution? (Photo: Soil Conservation Service of Iceland).

Overview during presentations at the Soil Carbon Sequestration 2013 Conference for Climate, Food Security and Ecosystem Services (photo: Soil Conservation Service of Iceland).

South Iceland, photo-stop for a mountain view of barren land resulting from past ecological degradation (photo: Soil Conservation Service of Iceland).

Visiting Þingvellir, a UN World Heritage site, the National Park where the Althing, an open-air parliamentary assembly representing the whole of Iceland, was established in 930 AD and continued to meet until 1798. Þingvellir also has geological importance as the terrestrial manifestation of the rift valley that marks the crest of the Mid-Atlantic Ridge, where the continents of the North American and Eurasian tectonic Plates drift apart (photo: Beth Wenell, University of Minnesota, USA).

Participants of the Post-Conference SoilTrEC course on land use and sustainability led by Dr Kristín Vala Ragnarsdóttir (University of Iceland), taste the soil to feel its texture and feel the tephra grinding their teeth, as Icelanders have felt for centuries when the wind blows their soil away (photo: Beth Wenell, University of Minnesota).

E-mail: **annamaria@land.is**

Editor's note:

At the ESSC Council meeting in Lleida (Spain) in September 2006, the interactions between the ESSC and younger soil scientists were discussed (see Newsletter 2006/3, p. 5 – 8). It was decided that the ESSC should be more proactive in its support of younger scientists. As part of that initiative, we welcome articles from both Ph.D. researchers and supervisors. We would like to hear from recent Ph.D. graduates; what advice and experience do you have which you would like to share with your colleagues in earlier stages of their research? We would also like to hear from current Ph.D. researchers; what are the factors which both encourage and limit progress? What are the particular challenges facing part-time Ph.D. researchers? We also invite contributions from experienced Ph.D. supervisors. What experience would you like to share with less experienced colleagues? If you are a less experienced Ph.D. supervisor, what supervisory issues do you find challenging? In short, please tell us "what I know now, which I wish I knew then!"

Editor's note:

The citation details of Ph.D. theses by ESSC members since and including 2004 have been added as an additional page to the ESSC web site. To date, 51 Ph.D. theses are quoted. On the ESSC web site, please look under 'Publications.' Please forward the citation details of any additional Ph.D. thesis completed since the year 2000 by an ESSC member to any of the Editorial team. We will then add the thesis citation details to the web site.

Recent publications by ESSC members

Included are the citation details of papers and books produced by ESSC members. These provide a growing resource for exchange of valuable information to both research and teaching. The cumulative citation list is being added to and updated on the ESSC web site. Students of ESSC members (both undergraduate and postgraduate) are increasingly accessing this facility in their literature searches. Currently, the number of quoted publications cited on the web page is 679. Please e-mail the citation details of papers in international refereed journals since and including the year 2000 to any member of the Editorial team.

Publications

Crosby, C.J., Booth, C.A., Appasamy, D., Fullen, M.A. and Farr, K. (2013). Mineral magnetic measurements as a pollution proxy for canal sediments (Birmingham Canal Navigation Main Line). Environmental Technology 2013, 1-14. DOI: 10.1080/09593330.2013.831460

Geißler, C., Kühn, P., Böhnke, M., Bruelheide, H., Shi, X. and Scholten, T. (2012). Splash erosion potential under tree canopies in subtropical SE China. Catena 91, 85-93. DOI:10.1016/j.catena.2010.10.009

Geißler, C., Lang, A.C., von Oheimb, G., Härdtle, W., Baruffol, M. and Scholten, T. (2012). Impact of tree saplings on the kinetic energy of rainfall - The importance of stand density, species identity and tree architecture in subtropical forests in China. Agricultural and Forest Meteorology 156, 31-40. DOI:10.1016/j.agrformet.2011.12.005

Geißler, C., Nadrowski, K., Kühn, P., Baruffol, M., Bruelheide, H., Schmid, B. and Scholten, T. (2013). Kinetic energy of throughfall in subtropical forests of SE China - Effects of tree canopy structure, functional traits, and biodiversity. Plos One 8(2), e49618. DOI:10.1371/journal.pone.0049618

Iserloh, T., Ries, J.B., Cerdá, A., Echeverría, M.T., Fister, W., Geißler, C., Kuhn, N.J., León, F.J., Peters, P., Schindewolf, M., Schmidt, J., Scholten, T. and Seeger, M. (2013). Comparative measurements with seven rainfall simulators on uniform bare fallow land. Zeitschrift für Geomorphologie. DOI: 10.1127/0372-8854/2012/S-00085

Scholten, T., Geißler, C., Goc, J., Kühn, P. and Wiegand, C. (2011). A new splash cup to measure the kinetic energy of rainfall. Journal of Plant Nutrition and Soil Science 174(4), 596-601. DOI:10.1002/jpln.201000349

Wu, Y.T., Gutknecht, J., Nadrowski, K., Geißler, C., Kühn, P., Scholten, T., Both, S., Erfmeier, A., Böhnke, M., Bruelheide, H., Wubet, T. and Buscot, F. (2012). Relationships between soil microorganisms, plant communities and soil characteristics in Chinese subtropical forests. Ecosystems 15, 624-636. DOI:10.1007/s10021-012-9533-3

Yang, X., Bauhus, J., Both, S., Fang, T., Härdtle, W., Kröber, W., Ma, K., Nadrowski, K., Pei, K., Scherer-Lorenzen, M., Scholten, T., Seidler, G., Schmid, B., von Oheimb, G. and Bruelheide, H. (2013). Establishment success in a forest biodiversity and ecosystem functioning experiment in subtropical China (BEF-China). European Journal of Forest Research. DOI: 10.1007/s10342-013-0696-z

Announcements

Collaborative (Crowd Sourcing) Erosion Processes Database

Dino Torri
Istituto Ricerca Protezione Idrogeologica
Hydro-geological Protection Research Institute
IRPI-CNR
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06128 Perugia
Italy

Information on natural hazards, including erosion processes, is heterogeneous and often incomplete. Collecting this information is costly and highly time-demanding (e.g. spatial distribution of land use and land management in gully catchments, time series of land use changes, and measurements of soil characteristics relevant to the studied processes). Approaches based on crowd sourcing proved efficient in collecting information in many fields. A similar collaborative effort could help in collecting information on natural hazards, in particular on erosion processes. For this purpose we prepared a web interface (**http://natural-hazards.irpi.cnr.it/)** helping to collect and share information. This effort is aimed at realizing a database that archives data about erosion processes and all relevant factors and parameters.

The interface integrates a specific section to collect information (reports) on different erosion process parameters: erosion type (gully, rill, piping), depth, length, volume, cross-section area, cross-section shape, contributing area, slope and land use. Suggestions are invited to improve the list. The interface allows users to input data from mobile devices (Android based, iOS). Information uploaded by registered users can be easily reviewed and approved. We propose a specific Data Use Policy to guarantee to users who upload significant datasets (tentatively 30 reports) to be included as co-authors in each publication which exploits information from the dataset. This issue is open to discussion in order to define proper rules.

We encourage experts to contribute to data collection, to contribute to the identification of parameters to be included in the database and to the specification of the Data Use Policy.

The site is available at:
http://natural-hazards.irpi.cnr.it/

For further information, please visit:
geomorfologia@irpi.cnr.it

Mauro Rossi (e-mail: **mauro.rossi@irpi.cnr.it**)

Ivan Marchesini (e-mail: **ivan.marchesini@irpi.cnr.it**)

Dino Torri (e-mail: **dino.torri@cnr.it**)

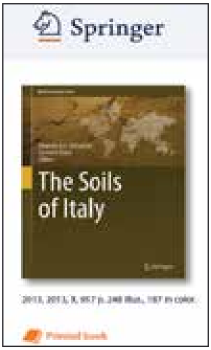
For further information on Istituto Ricerca Protezione Idrogeologica (IRPI-CNR; The Hydro-Geological Protection Research Institute), please visit:
www.irpi.cnr.it
http://geomorphology.irpi.cnr.it/

Book review

The Soils of Italy

Editors: Edoardo A.C. Costantini and Carmelo Dazzi
(11 chapters, 354 pages, 243 figures, 59 tables by 33 authors)
World Soils Book Series, Springer, Berlin, Germany.
ISSN: 2211-1255.
ISSN: 2211-1263 (electronic).
ISSN: 2211-1255.
ISSN: 2211-1263 (electronic).
ISBN: 978-94-007-5641-0.
ISBN: 978-94-007-5642-7 (e-Book).
DOI 10.1007/978-94-007-5642-7.,
Series Editor Professor A.E. Hartemink.

Cost: €142.79 (a 20% discount is available for ESSC Members).



As mentioned by the Editors in their **Preface** (6 pages, v-x), this book on the soils of Italy is part of an international series aimed at spreading knowledge on soils of different European and non-European countries. The Book was compiled by mature and young soil scientists from several Italian universities and research centres, simultaneously giving it both retrospective and prospective qualities. This introduction to the content and the main outputs, from which the following text is partly inspired, is clear and constitutes in its last sentences a real plea for a reassessment of the relationship between man and soil in Italy, based on the full awareness of what soil truly is. This plea which is valid for the whole of Europe.

Structured in 11 chapters, Chapter One **(1)** entitled 'Research in Pedology: A Historical Perspective' by C. Calzolari (pages 1-17, 4 figures) delivers a comprehensive history of pedological research in Italy. The Chapter reviews the different scale soil maps available since the first complete one, dated 1928 and published at a scale of 1:2,000,000. This Chapter is presented in an innovative way as an interview with Professor Fiorenzo Mancini, presented as the father of modern Italian pedology, through a set of questions and answers.

Then come in a classical order and as a first part, four chapters which review the characteristics in Italy in terms of the main soil forming factors. **(2)** In 'Climate and Pedoclimate of Italy,' E.A.C. Costantini, M. Fantappié and G. L'Abate (pages 19-37, 19 figures, 3 tables) present the great local climatic variations of this elongated peninsula, embracing 14 of the 35 climatic regions of Europe. Conclusively, they observe that a general change has occurred since 1961 with an overall decrease in mean annual precipitation and the number of rainy days, and a general increase in mean air temperatures. They suggest that the decreasing soil organic contents, even if still slight, could be a soil indicator of the extension of the Mediterranean subtropical climatic regions within Italy.

(3) In 'Geology and Geomorphology,' C. Bini (pages 39-56, 16 figures) presents the diversity of parent rocks and landforms in this geologically young land from the Alpine region to the Southern Apennines. The discussion includes the pre-Alpine fringe, the Po plain and the Northern and Central Apennines.

(4) A. Giordano, in 'Vegetation and Land Use' (pages 57-91, 40 figures, 5 tables) discusses the impact of these factors (including humus integration) on soil formation and reviews them and the associated soil types, region by region (including the two main islands of Sardinia and Sicily). Vegetation altitudinal belts and human impacts are given due consideration.

(5) S. Carnicelli and E.A.C. Costantini, in 'Time as a Soil Forming Factor and Age of Italian Soils' (pages 93-104, 3 figures, 3 tables), tackle this question at different timescales from Alpine orogenesis to Holocene soil formation. Evidence is collated from sedimentation rates, erosion rates, Quaternary climatic oscillations, dated palaeosols, and the extent (time, distribution and intensity) of anthropogenic influences. The authors conclude that Italian soils represent a huge, and mostly as yet untapped, palaeo- and archeo-environmental record.

Chapter Six **(6)** entitled 'Pedodiversity' by E.A.C. Costantini, R. Barbetti, M. Fantappié, G. L'Abate, R. Lorenzetti and S. Magini (pages 105-178, 74 figures, 16 tables): (i) summarizes the state of the art in terms of systematic pedology and the Soil Information System of Italy, (ii) gives an example of reports automatically created by the national soil database, (iii) presents (at reduced scale) the maps of the soil regions and the soil systems of Italy and maps of the dominant reference soil groups of the WRB and the dominant orders of Soil Taxonomy... both derived from the soil systems database of Italy, (iv) systematically reviews the distribution and characteristics of the major and typical soil taxa. Thereby, this Chapter constitutes the central part of the Book, a kind of atlas which reveals that most soils, according to the WRB and Soil Taxonomy, are identified in Italy. Nearly 90% of them belong to only nine Reference Soil Groups (Cambisols, Luvisols, Regosols, Phaeozems, Calcisols, Vertisols, Fluvisols, Leptosols and Andosols). A similar statement could be established about the occurrence of the WRB qualifiers and show that next to the most common qualifiers (that is Calcaric, Haplic, Skeletic, Eutric) related to the nature of parent materials, a modest second group of them (namely Chromic, Calcic, Stagnic and Luvic) indicates the main soil forming mechanisms that typify current Italian pedogenesis.

Coming as a third part, the following five chapters are more concerned with management impacts and the future. **(7)** In 'Soil Functions and Ecological Services,' A. Benedetti, M.T. Dell'Abate and R. Napoli (pages 179-203, 25 figures, 11 tables) present case studies of the management and diversity of biotic resources in soils and environments typical of Italian landscapes. They stress the role of soil organic matter content as a soil quality factor and highlight the way in which soil micro-organisms can provide essential services. They also report the results of biological fertility monitoring and mapping programmes (concept of Index of Biological Fertility or IBF) and identify the depletive impact of some anthropogenic activities and some natural pressures on biological soil functions.

(8) In 'Soil Threats,' C. Dazzi and G. Lo Papa (pages 205-245, 24 figures, 9 tables), after an introduction referring to the decline and fall of the Roman Empire in the West (in 476 AD) as a lesson to bear in mind and examine the degradation processes which affect Italian soils. These include soil erosion, soil sealing and consumption, soil contamination, soil salinity, soil organic matter decline, loss of pedodiversity (defined as "entisolization" or "anthrosolization"), forest fires and landslides.

(9) G. Corti, S. Cocco, G. Brecciaroli, A. Agnelli and G. Seddaiu in 'Italian Soil Management from Antiquity to Nowadays' (pages 247-293, 25 figures, 3 tables) present historical perspectives. These include discussions on European Directives on soil and land management. They review the different soil and water management systems practised in Italy and present the management specificity of the main physiographic agro-systems. Besides deforestation, ploughing, liming, manuring and fertilizing, some practises that particularly characterize Italian soil management are change of relief by levelling, terracing and burying of the previous surface, modification of the soil moisture regime through irrigation and/or drainage, and frequent and intensive cultivations which enhance soil erosion.

(10) F. A. Marsan and E. Zanini in 'Soils in Urban Areas' (pages 295-302, 4 figures, 2 tables) reveal that, notwithstanding the fact that systematic urban soil studies remain sporadic, data on urban soil contamination are now available for several cities and they summarize selected examples. But a common trait of all cities is the high spatial variability of their soils together with high levels of contamination. They conclude that numerical classification systems appear to be preferable to the classic systems for application in urban areas.

(11) The eleventh and final chapter is devoted to 'Future Soil Issues' in which F. Terribile, A. Basile, A. Bonfante, A. Carbone, C. Colombo, G. Langella, M. Iamarino, P. Manna, L. Minieri and S. Vingiani (pages 303-348, 9 figures, 7 tables) review the basic facts and figures of Italy. These include country limitations and potentialities, spatial planning of the landscape (oriented to urban planning), archaeology and natural heritage, agriculture and forestry, hydrogeological risks, integrated landscape management and educating soil scientists, through soil literacy. For each item, a paragraph deals with new needs and potential contributions from soil scientists.

The Book concludes with a 'Short Curricula in Alphabetical Order' (pages 349-351) of the 33 authors who contributed to the Book and an index (pages 353-354) of the main soil concepts and definitions.

The Book is well structured and nicely illustrated. The Book is a testament of the enthusiasm and conviction of the authors in delivering, with both technical competence and cultural and social sensitivity, the state of the art about the soils of Italy and perspectives for their sustainable management.

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ESSC membership list and contact details

Web Based Bulletin Board

The ESSC wishes to rapidly disseminate information to its members. Please forward information to the ESSC web site to be placed on our ESSC Bulletin Board. These could include searches for potential collaborators for research proposals, calls for research proposals, job opportunities, research studentship opportunities, impending conferences and other items of important information for rapid dissemination. Of course, we will also continue the regular circulation of information via our Newsletter. The ESSC web site is:
http://www.essc.sk

ESSC Membership List and Contact Details

The full ESSC membership list is held on the ESSC web site. Under 'members' you can obtain a full listing. Also under 'members' you can click on any member country and find a listing of members in the selected country.

We are trying to keep the membership list on the web site up-to-date. Please check your details and let us know if there are any necessary correction(s). If your details change, also please let us know. Some members have requested that we do not add their e-mail addresses to the web site, to avoid uninvited 'spam' e-mails. Of course, we respect this request. Therefore, while we retain a list of the e-mail addresses of ESSC members, this list will not be available on the web site.

Editorial matters in Bratislava are handled by Ing Karol Végh. In terms of membership lists, contact details and the ESSC web site, please send updated information to Karol at:

E-mail: **k.vegh@vupop.sk**

Please also use and refer to the '**Directory of European Organizations and Persons Working on Soil Protection'** as a reference source for European colleagues, both members and non-members of the ESSC. This publication contains the e-mail addresses of most ESSC members and will be subject to periodic updates. The reference citation is:

Rubio, J.L., Imeson, A.C., Bielek, P., Fullen, M.A., Pascual, J.A., Andreu, V., Recatala, L. and Ano, C. (2006). **Directory of European Organizations and Persons Working on Soil Protection.** Soil Science and Conservation Research Institute, Bratislava, 190 pp. (plus CD-Rom).

This document is available as a pdf document on the 'Publications Archive' on the ESSC web site.

Forthcoming dates for your diary

ESSC EUROPEAN SOCIETY for SOIL CONSERVATION

INTERNATIONAL CONFERENCE AND FIELD EXCURSION

Biogeochemical Processes at Air-Soil-Water Interfaces and Environmental Protection

Expression of Interest in Participation

Imola, Italy, 23 – 26 June 2014

Short rationale:

Knowledge of the complex processes occurring at the Air-Soil-Water interfaces contributes to the sustainable use of natural resources and is essential for the protection of the environment. The feedback mechanisms and rates of biogeochemical processes must be empirically studied in different natural environments, in the laboratory and in controlled environments, and through validated models. Our ability to investigate both natural and anthropogenic soil features, and their relationships with air and water, is advancing rapidly, particularly through new techniques. For instance, recent advances in geophysical probes now allow high-spatial resolution field measurements. Isotopic analysis permits to us to follow the water cycle inside soil and ground-water. However, this considerable improvement in our knowledge and ability is insufficient. Improved biogeochemical understanding in natural and anthropogenic soils also depends on accurate conceptual models able to take into account both the interactions of the various components and the fluxes of matter and energy influencing the quality of water and air, thus ultimately the quality of the environment.

Organizing Committee:

G. Vianello (Co-ordinator); C. Dazzi; E. Costantini; G. Corti; L. Vittori Antisari; G. Falsone; G. Lo Papa; S. Cocco; A. Buscaroli.

Scientific Secretariat:

G. Falsone:
E-mail: **gloria.falsone@unibo.it**
G. Lo Papa:
E-mail: **giuseppe.lopapa@unipa.it**

Biogeochemical Processes at *A*ir-*S*oil-*W*ater Interfaces and *E*nvironmental *P*rotection

Expression of Interest in Participation

CONFERENCE AND FIELD EXCURSION 2014

Dates: 23 – 26 June 2014

Please return this form at your earliest convenience via e-mail to: **secretariat.aswep@unibo.it.**

First name: ....

Family name: ....

Address: ....

Contact e-mail: ....

Telephone: ....

Fax: ....

Position, department (or unit), and institution: ....

Are you interested in the tour on 26 June?...

Do you plan to present a scientific paper at the Conference 23 – 26 June? ....

If yes, oral or poster presentation? ....

Comments (optional): ....

(Note that this is not a formal registration, but intended to aid us in sending you more information, planning the Conference and reserving sufficient hotel space for participants).

The Geomorphology of Natural Hazards: Mapping, Analysis and Prevention
30 June – 3 July 2014, University of Liege, Belgium

The primary aim of this informal meeting is to promote discussion and future scientific co-operation among groups of researchers sharing scientific interests in natural hazards and to promote field experience on the geomorphic signature of past hazardous events and mitigation measures.

Registration: Please send all details through the registration form available at:

http://www.17th-jgm-liege2014.org

Venue

University of Liege, Institute of Geography, Sart Tilman Campus, Building B11, 4000 Liege, Belgium

Contact

Dr Eric Hallot: Tel. 00 32 4 366 52 82
Mr. Arnaud Beckers: Tel. 00 32 4 366 52 55
E-mail: **info@17th-jgm-liege2014.org**

Deadlines

- 31 January 2014: deadline for abstract submission.
- 15 February 2014: notification of abstract acceptance.
- 28 February 2014: deadline for field trip registration.
- 1 April 2014: deadline for registration with reduced fees.
- 1 June 1 2014: deadline for field-trip fee payment.

Promoted by:

BAG, Belgian Association of Geomorphologists; AGR, Associata Geomorfologilor din Romania; AIGeo, Associazione Italiana di Geografia fisica e Geomorfologia; GFG, Groupe Français de Géomorphologie; HCGE, Hellenic Committee for Geomorphology and Environment.

ISAR

International Society for Aeolian Research

8TH INTERNATIONAL CONFERENCE ON AEOLIAN RESEARCH (ICAR VIII), LANZHOU, P.R. CHINA, 20-25 JULY 2014

The '8th International Conference on Aeolian Research (ICAR VIII)' will be held at the University of Lanzhou, P.R. China, from Sunday July 20 to Friday 25 July 2014. The Conference will include technical sessions on the following themes:

1. Mechanics of aeolian processes.
2. Aeolian geomorphology: desert, coastal and planetary.
3. Aeolian deposits and loess.
4. Palaeo-aeolian systems, aeolian systems and the environment and responses to global change.
5. Aeolian dust and health.
6. Desertification and its control: Anthropogenic interactions with aeolian systems.
7. Modelling aeolian transport.
8. Extra-terrestrial aeolian research.

The registration fee includes conference abstracts, a CD with full submitted texts, welcome and farewell banquets, a one-day and a mid-conference field trip (including lunch) to the Badain Jaran Desert (the location of the highest mega-dunes on Earth).

We invite you to submit a poster or oral paper for presentation at the Meeting.

Please visit the Conference web site:
http://www.2014icar8.com

This meeting is sponsored by the International Society for Aeolian Research:
http://www.aeolianresearch.org

For further information please contact:
Dr Zhibao Dong
Key Laboratory of Desert and Desertification of the Chinese Academy of Sciences
E-mail: **zbdon@lzb.ac.cn**

AGROecological assessment and Functional-environmental Optimization of Soils and TERrestrial ecosystems

Dear colleagues,

We are pleased to announce that 7th International Congress under the umbrella of the **EUROPEAN SOCIETY for SOIL CONSERVATION** will be held in Moscow (Russian Federation) from 18 – 22 May 2015.

The general subject of the Congress will be: 'Agroecological assessment and functional-environmental optimization of soils and terrestrial ecosystems.' The Congress will focus on fundamental and applied aspects of studying, analysis, assessment and modelling of soils and terrestrial ecosystems, experiencing anthropogenic influence and global changes.

The principal issues of the scientific discussions will include impact of soil erosion, degradation, sealing and pollution on the environment as well as adaptation of agricultural and urban ecosystems and land-use to dynamical environmental conditions at multiple scales. Special emphasis will be devoted to the development of sustainable and environmental-friendly anthropogenic soils and ecosystems, climate-smart agriculture and best management land-use practises.

The Congress is open to soil scientists and ecologists, educators and agronomists, stakeholders and policy-makers. It will consist of invited lectures and scientific sessions with oral and poster presentations and a field excursion and will attempt to advocate interest in the importance of the knowledge of soil forming and degradation processes for environmental protection. Selected papers will be published in international and Russian journals. Special attention will be given to five technical meetings, focused on applied issues following the main issues of the Congress.

The general subject of the Congress is split into the following main 10 sessions:

S1. Policies and strategies to support and maintain soil agroecological quality.
S2. Soil quality agroecological assessment and modelling.
S3. Monitoring of the anthropogenic impacts, soil protection and risk assessment.
S4. Climate-smart agriculture: scientific, practical and political aspects.
S5. Soil ecological functions and ecosystem services: from concepts to application.
S6. Agricultural soil management in organic farming.
S7. Biodiversity in managed soils and ecosystems.
S8. Spatial-temporal variability of soil features and processes: in maps and models.
S9. Environmental impact assessment and soil environmental quality certification.
S10. Bioremediation and reclamation of degraded or contaminated lands.

We welcome suggestions from prospective participants that may be of general interest as well as for Topical Meetings, Training Schools and Workshops inside the AGROFOSTER general subject.

Technical meetings

T1. Advanced techniques in agroecological and urban monitoring.

T2. GIS and geostatistics in soil agroecological analysis.

T3. Urban soil management and engineering.

T4. DSS in agricultural and urban planning.

For further information please visit the Congress web site:
www.essc-congress2015.ru

Summary of Forthcoming Conferences

Information on forthcoming conferences will be presented both in the ESSC Newsletter and on the ESSC web site. Below are the essential details of forthcoming conferences which have already been announced in the ESSC Newsletter.

18th Nitrogen Workshop, 30 June – 3 July 2014, Lisbon, Portugal

Conference website:
www.nitrogenworkshop.com

50th Anniversary Congress of the International Association of Engineering Geology

15 – 19 September 2014, Turin, Italy

Conference website:
www.iaeg2014.com/

Articles, reports, letters, views or comments on any aspect of soil erosion and conservation in Europe are always welcome.

We invite proposals for special thematic issues of the Newsletter. We also welcome any comments on the ESSC Newsletter and suggestions on how it can be improved and developed.

Do not forget to send in your details of the following information:

(i) Reviews of recent conferences.
(ii) Recent grant awards.
(iii) The citation details and abstracts of completed Ph.D. and M.Sc. theses.
(iv) Newly enrolled Ph.D. research students, title of their research topic and names of research supervisors.
(v) Recent staff institutional movements/promotions.
(vi) A reference list of your 'new' international refereed scientific journal papers, which have been published recently (since and including the year 2000).
(vii) At the ESSC Council at Průhonice (Czech Republic) in June 2009, it was agreed that the Newsletter will present a series of national reports on soil erosion and soil conservation activities in individual European countries. If you would like to volunteer a contribution, please contact any member of the Editorial team.

Send these details to either:
Professor Mike Fullen: **m.fullen@wlv.ac.uk**
or
Dr Colin Booth: **colin.booth@uwe.ac.uk**

and they will include this information in the next issue.

PLEASE NOTE:
We publish two Newsletter issues per year. The deadlines are:
1 March and 1 September.

The following four verses are a selection of translated ancient songs (ballads) of the Hani minority people of Yuanyang, Yunnan Province, south-west China. The Hani are world-famous as the builders and guardians of the rice terraces of Yuanyang. Until recently, the Hani had no written language. These ballads were collated by Hongzhen Zhang, based on meetings with the Mopi (elders of the Hani). The verses were abstracted from:

Hongzhen Zhang (2010). Interpretations of the Hani Seasonal Production Ballads. Yunnan Press Group Company and Yunnan Art Press Company, Kunming, 248 pp. (ISBN 978-7-5489-0034-4).

II. On the Arrival of the Three Months of Spring

Verse 62

Spring wind blows down,
Lifting the weathered leaves like flying birds seen from afar;
Spring wind blows up,
Stirring the dust in the air.

The spring wind blows in the gap of the Quifang house
On the verge of the village,
Declaring the arrival of a windy season;
When the spring wind blows into the fields and woods,
The branches sway to greet people.

Spring is the farming season and everyone should hurry up.
The old cannot relax at home,
And the young should not oversleep the golden time.
(Note: the Quifang house is the abattoir).

Verse 100

To make a ship,
People have to cut trees,
But trees cannot be cut freely.
The mark tree of Dai people cannot be cut,
And the peach tree in front of the houses of Han people should be left
To forecast seasons.
The chestnut tree in the village cannot be cut.
Since it is the resting place for the birds;
The Longan in the village cannot be cut,
For it is the resting place of the cicada;
The best material for making a ship is the Bachi tree,
For the trunk is high and wide.
One has to pay before taking a ship ride,
And if someone is too poor to pay,
Sweet words can play the role of money.

Verse 128

Dozens of days are needed in building nests,
Dozens of nights are needed before eggs can be hatched;
A litter of birds are hatched finally,
The one near the top of the nest is a male,
And the one in the bottom is a female.
The female has a smaller head,
And the male has a bigger head.
Bingu bird is the seasonal bird to guide farming,
And cuckoo is the seasonal bird to forecast the farming season;
Hearing their sounds,
People have to hurry to plough and rake fields.

When Bingu bird and cuckoo sing,
If the farmers do not plough and rake the fields in time,
How can they get in crops
At the time when cicada sing in autumn!

Verse 132

Girls are good at counting months,
With the girl beside, there is no mistake in counting months;
Men are good at counting years,
With the men inside, there is no mistake in counting years.

The seeds in the house do not bud, for lack of water,
Just like mother's nursing baby,
Springs should be found to water seeds.

Since seeds bud on soil,
And soil plays the role of father;
Seeds at home should find their nest,
In the mountain depressions;
After three nights of marinating,
The seeds finally bud.

Editor's Note:

Thanks to Professor Li Yong Mei (Yunnan Agricultural University, P.R. China) and Dr Wang Weiguang (The University of Wolverhampton, UK) for their editorial help with the Hani ballads.

No line fractures the bog –
Fenn's, Whixall, Oaf's Orchard…
the given names for one being.
No margins in the mosses,
kingdom of sphagnum
where space and time interweave.
Border here is where
air meets earth, light meets landscape.

I come alone, savouring solitude,
seeking to slice through time,
feel inner frost melt,
reinhabit my own space.
The past is an eye blink away –
the peat an archive, ages packed
underground; a tangible reservoir.

From: Kingdom of Sphagnum, p. 9-22 In: Gladys Mary Coles (2001). The Echoing Green, Flambard Press, Hexham (UK), 71 pp. (ISBN: 1-873226-48-9).

The thin layer of soil that forms a patchy covering over the continents controls our own existence and that of every other animal of the land.

(Rachel Carson, Silent Spring, 1962)

The fabric of human life is woven on earthen looms – it everywhere smells of the clay

(J. H. Bradley, 1935)

Guidance in all things comes as the still small voice within. It reveals all.

(Brian Adams, 1984)

Even though moments of insight last only an instant, they are touchstones of something eternal.

(Deepak Chopra, 1997)

A day needs to begin in a settled state, free of the residues and eddies of yesterday's activity

(Deepak Chopra, 2004)

AIMS OF THE SOCIETY

The ESSC is an interdisciplinary, non-political association, which is dedicated to investigating and realizing soil conservation in Europe. The ESSC pursues its aims in the scientific, educational and applied sectors by:

Supporting investigations on soil degradation, soil erosion and soil conservation in Europe.

Informing the public about major questions of soil conservation in Europe.

Collaborating with institutions and persons involved in practical conservation work in Europe.

The ESSC aims at co-ordinating the efforts of all parties involved in the above cited subjects: research institutions; teachers and students of geosciences, agriculture and ecology; farmers; agricultural planning and advisory boards; industries and government institutions.

ZWECK DER VEREINIGUNG

Die ESSC ist einer interdisziplinäre, nicht politische Vereinigung. Ihr Ziel ist die Erforschung und Durchführung des Schutzes der Böden in Europa. Die ESSC verfolgt dieses Ziel auf wissenschaftlichem, erzieherischen und angewandtem Gebiet:

Durch Unterstützung der Forschung auf den Gebieten der Boden-Degradierung, der Bodenerosion und des Bodenschutzes in Europa.

Durch Information der Öffenlichkeit über wichtige Fragen des Bodenschutzes in Europa.

Durch Zusammenarbeit mit Institutionen und Personen, die an der Praxis des Bodenschutzes in Europa beteiligt sind.

Die ESSC will alle Personen und Institutionen zusammenführen, die sich für die genannten Ziele einsetzen: Forschungsinstitutionen, Lehrer und Studenten der Geowissenschaften, der Landwirtschaftswissenschaften und der Ökologie, Bauern, landwirtschaftliche Planungs- und Beratungsstellen, Industrieunternehmen und Einrichtungen der öffentlichen Hand.

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L'ESSC est une association interdisciplinaire et non politique. Le but de l'association est la recherche et les réalisations concernant la conservation du sol en Europe. L'ESSC poursuit cette finalité dans les domaines de la recherche scientifique, de l'éducation et de l'application:

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En informant le public des problemes majeurs de la conservation du sol en Europe.

Par la collaboration avec des institutions et des personnes impliquées dans la pratique de la conservation du sol en Europe.

L'ESSC souhaite favoriser la collaboration de toutes les personnes et institutions poursuivant les buts définis ci-dessus, en particulier: institutions de recherche, professeurs et étudiants en géosciences, des agriculteurs, des institutions de planification et des conseil agricole, de l'industrie, et des institutions gouvernementales.

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La ESSC es una asociación interdisciplinar, no-politica, dedicada a la investigación y a la realización de acciones orientadas a la conservación del suelo en Europa. La ESSC persigue sus objectivos en los sectores cientificos, educacionales y aplicados, en al ámbito europeo:

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