

CONTENTS

The European Society for Soil Conservation: the first fifteen years <i>by José L. Rubio</i>	2
Geosystem concept of erosion process modelling <i>by N.V. Kutsenko</i>	4
ESSC Council Meeting, Budapest, 5 July 2003	9
Elections of the ESSC Council 2004-2008	13
Honour to ESSC President	14
ESSC Awards	15
New PhD Theses	
Soil erosion and slope in primary and selectively logged rain forest, Danum Valley, Malaysia <i>by Michelle A. Clarke</i>	16
Cultivation practices, maize and soybean productivity and soil properties on fragile slopes in Yunnan Province, China <i>by Wang Shu Hui</i>	16
Forthcoming Meetings	19
Membership list (updates to October 2003)	28

THE EUROPEAN SOCIETY FOR SOIL CONSERVATION THE FIRST FIFTEEN YEARS

Fifteen years ago in Leuven, Belgium, the European Society for Soil Conservation was founded as a result of the initiative of Professor Jan De Ploey. The founder members comprised some eighteen experts from Belgium, Denmark, France, Germany, Greece, Italy, Portugal, Spain and the United Kingdom. At the time of its foundation in November 1988, it was recognised that there was a need to:

- raise consciousness on soil degradation as a European problem;
- increase scientific knowledge on soil and related problems;
- develop soil conservation policies; and
- increase society's perception of the subject in general.

The situation at that time was that soil conservation was of interest only to a few academic groups.

Over the years, the ESSC has been very active, becoming a European Network with around 500 members from 46 countries which represents a permanent forum for scientists interested in investigating soil degradation and soil conservation problems. In my view, we have made much progress. One important aspect is that we now contribute substantially to public opinion about soil problems, increasing perception and pushing policies and attitudes to deal with soil protection and conservation. One proof of this is the existence today of an emerging soil conservation industry with many products commercially available in many countries. Also, we have contributed by increasing the number of individuals and research groups dedicated to soil degradation. In some countries, like Spain, this growth has been spectacular in recent years.

During this period we have learnt more on the mechanisms, processes and sub-processes of soil erosion. We have abandoned some wrong approaches and some old established concepts and replaced them with a very rich and very wise range of new approaches and hypotheses which are imaginative and creative and, most important, which provide new information and understanding of the complex multidisciplinary puzzle which represents soil erosion processes.

The Society has been very active in organising and sponsoring workshops, seminars, conferences and congresses in the field of soil degradation and soil conservation all over Europe. Meetings have been held in Germany, Italy, Portugal, Belgium, France, Hungary, Spain, Slovakia, Poland, Romania, Norway, Austria, Greece and the United Kingdom. As examples, we have recently had two interesting meetings organised by ESSC members. One was the *International symposium on the sustainability of dehesas, montados and other agrosilvopastoral systems* (21-24 September 2003, in Caceres, Spain), organised by Susana Schnabel and her team; the other was *25 years of assessment of erosion* (22-26 September 2003, in Ghent, Belgium), organised mainly by Donald Gabriels and his team. In both meetings, we enjoyed good organisation,

hospitality and excellent presentations on new approaches, new concepts, applications of new technologies, modelling exercises and recapitulative presentations. These activities indicate that the early ideas behind the ESSC are alive and that the Society is actively participating in and promoting scientific endeavour.

The ESSC has also created its own Awards to honour major individual contributions to soil conservation. Two distinctions are awarded every four years at the Society's Congresses: the Gerold Richter Award and the Young Person's Award.

Although we have made good progress, there are still many problems to be faced, including:

- the lack of good basic data on soils, climate and socio-economies;
- the lack of long-term experimental work;
- the need for more attention to some erosion processes like those generated from torrential rain which produces massive soil displacement;
- the need to consider the economics of soil erosion;
- the lack of success in attracting farmers, planners and managers; and
- the weakness of erosion predictions.

In this context, the Ghent symposium provided a good review of the problems but both this and similar meetings show that we have an interesting path in front of us with important challenges and opportunities, for example:

- incorporating new technologies and approaches;
- the concept of soil quality for multi-uses and multi-functions;
- soil as a crucial link in the global environment for problems like desertification, climatic change, water management and loss of biodiversity; and
- the need to develop new approaches to soil conservation, like bioengineering, which are more ecologically adapted.

Finally, at the level of the European Union, we have the opportunity to work with the EU Commission in order to develop a much-needed and adequate Soil Protection Strategy. We are already engaged in this task and the ESSC could provide many positive inputs to the EU Soil Policy. Some Council members and other ESSC members are actively participating on the different Working Groups and on the Advisory Forum of the EU Soil Policy.

Fifteen years after its foundation, the ESSC can feel that it has made significant contributions. For the future, I wish all of you the best success in your individual activities and in your participation in the fulfilment of the ESSC's aims and goals.

José Luis Rubio
President, ESSC

GEOSYSTEM CONCEPT OF EROSION PROCESS MODELLING

Soil erosion prediction models produce considerable errors which limit their implementation in practice (Alberts and Ghidry 1997). Empirical modelling does not satisfy requirements due to lack of universality and the impossibility of taking into account the non-linear character of erosion processes. Theoretical models, which involve a large number of random parameters of the environment, are also not universal because, as the number of random independent parameters increases, the probability of modelling erosion events successfully decreases. When predicting and estimating erosion, the regularities in the organisation of the erosion geosystem should be considered. This creates the precondition for the development of the geosystem-based concept of erosion process modelling.

Concepts and models

The geosystem concept of erosion modelling is based on the following statements:

(1) The erosion geosystem is considered as an integral unity of two-phase fluvial flow and the relief developed by the flow. Geosystems are formed through the self-regulating interaction of relief and flow as the system aims to reach maximum stability. The development of erosion geosystems is determined by internal system-forming links.

(2) Erosion is a non-linear process for the following reasons: (a) running flow is saturated with sediment, and therefore sediment concentration in the flow has an influence on erosion; and (b) changes in relief caused by erosion have an influence on flow energy. Consequently, to model erosion processes adequately, differentiated estimation is required of flow and relief characteristics along the whole flow route. Assuming initially that flow saturation along the flow route changes linearly, the following equation of sediment increment can be derived:

$$\Delta r_{i-1,i} = U (R_{i-1,i} - r_{i-1}) \quad (1)$$

where $\Delta r_{i-1,i}$ is the sediment discharge increment on segment $\Delta l_{i-1,i}$ of the sediment vector tube, $R_{i-1,i}$ is the mean value of the flow transport capacity on this segment, r_{i-1} is the sediment discharge at the upper inlet of segment Δl_{i-1} , and

$$U = \begin{cases} 0 & \text{when } R_{i-1,i} > r_{i-1} \text{ and } V_{i-1,i} < V_{pi-1,i} \\ \Delta l_{i-1,i} / \Delta x & \text{when } R_{i-1,i} > r_{i-1}, V_{i-1,i} > V_{pi-1,i} \text{ and } \Delta x > \Delta l_{i-1,i} \\ 1 & \text{when } R_{i-1,i} > r_{i-1}, V_{i-1,i} > V_{pi-1,i} \text{ and } \Delta x \leq \Delta l_{i-1,i} \\ \Delta l_{i-1,i} / \Delta x' & \text{when } R_{i-1,i} < r_{i-1} \text{ and } \Delta x' > \Delta l_{i-1,i} \\ 1 & \text{when } R_{i-1,i} < r_{i-1} \text{ and } \Delta x' \leq \Delta l_{i-1,i} \end{cases} \quad (2)$$

where $V_{i-1,i}$, $V_{pi-1,i}$ are mean values of actual and scouring flow velocity respectively on

segment $\Delta l_{i-1,i}$ of a vector tube; Δx is the distance at which flow would reach sediment saturation if transport capacity equals $R_{i-1,i}$ and sediment delivery through the upper inlet of segment $\Delta l_{i-1,i}$ is r_{i-1} ; and Δx is the distance at which complete deposition occurs of a portion of the sediment which exceeds $R_{i-1,i}$.

(3) Erosion prediction is only possible through simulation of erosion as a self-regulating system.

(4) The interaction between relief and sediment flow complies with the principle of minimal energy dissipation and leads to the adjustment of ratios between the characteristics of the erosion geosystem. These ratios determine relief, constitute the structure of geosystem and control its behaviour.

(5) Changes in river bed slopes are determined by the ratio between the sediment increment and flow transport capacity in various parts of a catchment. If the sediment increment exceeds the transport capacity increment, accumulation occurs and the change in ground level is positive. If the ratio between these characteristics is inverse, erosion occurs and the change in level is negative. From this, the equation is derived describing the relationship between river bed processes and soil erosion:

$$\Delta J_i = K(\Delta r_i - \Delta R_i) \quad (3)$$

where ΔJ_i is an increment of lengthwise slope of the river bed at section i ; Δr_i is an increment of sediment discharge, and ΔR_i is an increment of flow transport capacity depending on catchment characteristics in the section, and K is a proportionality factor.

Expressing Δr_i , ΔR_i in the terms of morphometric characteristics, we derive the equation which links the elevations of a river profile in dynamic equilibrium with the characteristics of the structural elements of the river catchment:

$$H_j = \sum_{i=1}^j l_{i-1,i} \left\{ J_0 + \sum_{v=1}^p [a_v z_v - b_v (S_v - S_{v-1}) J_{v-1}] \right\} \quad (4)$$

where H_j is the profile elevation in the section j ; $l_{i-1,i}$ is the distance between sections $i-1$ and i ; i is a sequential section number starting from a river mouth; J_0 is the slope of the topmost segment of a the river profile; p is the number of discrete catchment elements (hillslopes between sections, gullies) located above the section J ; a_v and b_v are the coefficients derived from the following equations:

$$a = AU \frac{(kI)^{1.6}}{gWn^{2.4}}; \quad b = Ag^{-1}W^{-1}n^{-2.4}$$

where A and g are constant values; U is derived from equation (2); l is mean slope length; k is a runoff factor; W is the hydraulic particle size of the sediments; n is a roughness factor; v is the sequential number of a valley segment starting from the river mouth; p is the number of catchment structural elements located above the section J ; and J_{v-1} is the slope of the previous section of valley profile.

Parameters z_v and S_v of the equation (4) are expressed by the following equations:

$$z_k = (B^{-0.6}F^{1.6}J^{1.2})k; \quad S_v = (B^{-0.6}F^{1.24})k$$

where B is the width of river flow having a probability of exceedance of 10%; F is the area of the portion of the catchment located above the current section; and J is the lengthwise slope of river bed. In equation (4) $b_v (S_v - S_{v-1})J_{v-1}$ is the increment of flow transport capacity in the v^{th} element of the catchment structure.

We have developed implementations of the geosystem concept of erosion processes for modelling (a) the estimation of soil erosion risk; (b) the self-regulation of the erosion process and the relief developed by this process; and (c) the estimation of the system-forming links in the fluvial geosystem. Soil erosion risk is assessed by the following index:

$$I_e = \frac{V}{V_p}$$

where V is the the mean velocity and V_p is scouring velocity of a flow.

Discussion of modelling results

Model adequacy is verified through natural and cartographic studies. Compared to other methodologies, the geosystem model for soil erosion risk, using the soil erosion risk index, displayed the best results for predicting scour erosion caused by spring snowmelt in 2003 (Figure 1). The best approach was obtained using the Chézy and Manning coefficients when the ratio between catchment area and flow width is adopted instead of the slope length parameter.

To verify the adequacy of the erosion geosystem self-regulation model and to study various forms of hillslope erosion process equilibrium, a number of experiments were conducted on modelling the self-regulating function of erosion systems. Modelling was based on data from 30 plots of typical erosion-denudation hillslopes in the Poltavskaya Plain, Ukraine. Estimation of model parameters was based on the hypothesis of inherited development of erosion-denudation processes in natural conditions. Adjacent hillslopes were surveyed which differed from each other only in their morphology. Model parameters were selected so that, if being constant for current conditions, they would provide maximal inheritance of modelled hillslopes in time, i.e. they would provide the maximum possible general stability of relief. This requirement follows from the universal principle of systematic organization which demands the minimization of dissipated energy. Initially, erosion geosystem behaviour was studied in natural conditions, then under the effect of agricultural activity. As a result, it was found out that in the course of the development of erosion geosystems, stable relations are established between the characteristics of relief elements that are linked by common lithodynamic flow, thereby setting the equilibrium balance of

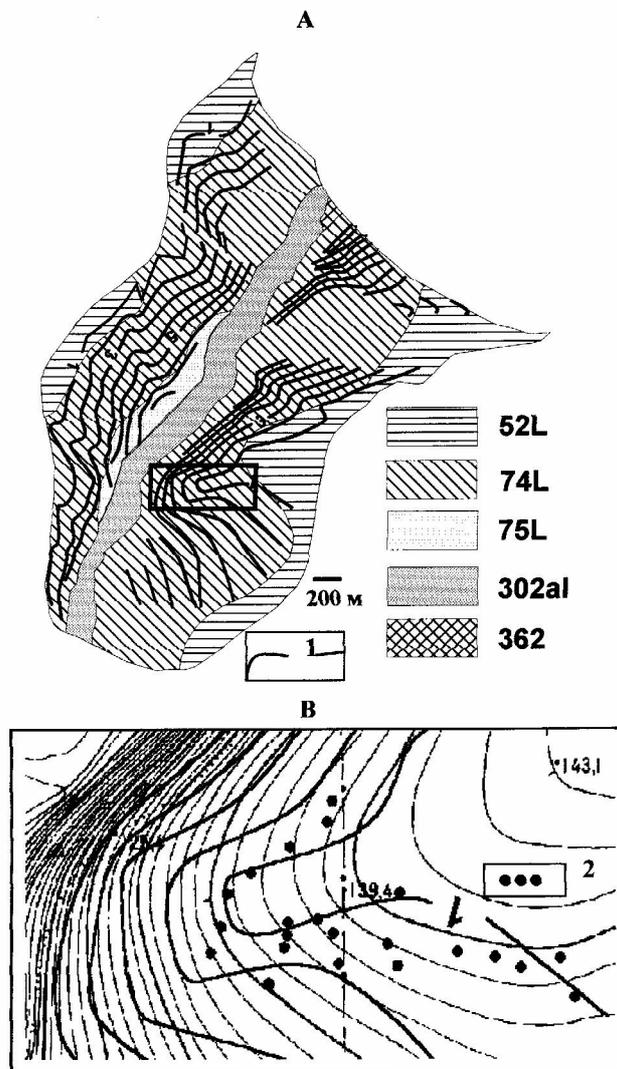


Figure 1. Assessment of soil erosion risk for part of the Pechenezhskoe Pole Landscape Park, Kharkiv Region, Ukraine. A. Results of the assessment. B. Verification.

1. Index of soil erosion risk. 2. Positions of erosion scores in Spring 2003. Soils: 52L - typical chernozem, thick, low humus content. 74L - typical chernozem, moderately eroded. 75L - typical chernozem, severely eroded. 302al and 362 - solonetzic and saline soils in swamp.

sediment in the flow. On short hillslopes and in proximity to water divides on long hillslopes, where flow did not reach scouring velocities, flattening of hillslope tops occurred as a result of long-term development. This caused the formation of convex slopes with an increase of total sediment discharge and decrease of runoff detachment from top to bottom. When streamflow velocities exceeded the critical value, accelerated erosion occurred in which “waves” were distributed regressively upwards towards the watershed area. Hillslopes took a convexo-concave shape. Minimum erosion occurred when runoff deposition from watershed to hillslope bottom decreased linearly. After that, partial accumulation occurred in concave portions of hillslopes and the landscape was gradually reshaped from convexo-concave into convex. Where soil was more resistant, accelerated erosion caused the formation of terraces. In this, the greater the soil resistance and the higher the flow transport capacity, the higher were the terraces and the flatter were slopes between them. Kinetic energy of flow is diminished immediately near the terrace foot, whereas on the slopes between terraces the transport capacity adjusts to accord with the actual sediment discharge. This complies well with the synergistic principles of the self-regulation of systems.

Conclusions

With the application of the geosystem concept, modelling adequacy is achieved as a result of the more complete consideration of system-forming links, which are expressed as specified ratios between the morphometric characteristics of erosion geosystems.

References

Alberts, E.E. and Ghidry, F. 1977. Comparison of WEPP Model predictions to measured erosion losses for large events. *Pochvovedenie* 5: 642 – 646.

N V Kutsenko
Institute for Soil Science and Agrochemistry
Chaikovski 4
Kharkiv 310024
Ukraine

ESSC COUNCIL MEETING, BUDAPEST, 5 JULY 2003

Present: J.Poesen (Belgium), K.Helming (Germany), M.Fullen (UK), P.Bielek (Slovakia), M.Coutinho (Portugal), A.Kertész (Hungary), L.Øygarden (Norway), A.Klik (Austria), C.Dazzi (Italy), G.Govers (Belgium).

Apologies: J.Rubio (Spain), D.Torri (Italy), P.Schjønning (Denmark), N.Fohrer (Germany), W.Blum (Austria), R.Shakesby (UK), R.Morgan (UK), R.Kõlli (Estonia), D.Nistur (Romania), L.Stroosnijder (The Netherlands), B.Jankauskas (Latvia), G.Zalidis (Greece).

1. Treasurer's Report

Detailed information on the financial status of ESSC can be found in the report below (thanks to K. Helming).

Year	1999	2000	2001	2002
Budget, 1 January (€)	3643.14	5437.03	4960.01	9680.91
Income				
Membership contributions	7176.86	5571.65	7823.35	2138.00
Interest (bank account)	10.09	12.16	19.29	27.82
Books sold		33.23	15.34	298.90
Conferences			2784.48	9557.79
Other income				200.00
Total (€)	7186.95	5617.04	10642.46	12222.51
Expenses				
Newsletters	4702.98	5276.39	2330.04	2821.59*
Bank account	16.16	0	0	2.56
Mailing costs	200.94	497.95	1018.96	1081.80
Money transfers	312.09	235.04	285.36	80.86
Conferences	0	0	2256.23	6653.93
Other expenses	160.89	84.68	31.00	191.42
Total (€)	5393.06	6094.06	5921.58	10831.53
Budget, 31 December (€)	5437.03	4960.01	9680.89	11071.89

* During the financial year 2002, Newsletters were produced for 3+4/2001, 1/2002, 2/2002. Newsletter 3+4/2002 was produced in 2003.

Newsletters 2002

Issue	Date	Printing costs (€)	Mailing costs (€)	Total costs (€)	Pages
3+4/2001	12.02.02	862.42	252.53	1114.95	20
1/2002	15.07.02	1096.75	332.67	1429.42	32
2/2002	21.11.02	862.42	300.16	1162.58	20
3+4/2002	10.02.03	1476.60	398.33	1874.93	52

Conference

(COST 623, ESSC, DBG, ZALF) Soil erosion patterns (Müncheberg, October 2002)

Income:	€ 9557.79
Expenses:	€ 6653.93
Surplus:	€ 2903.86

- The budget of the ESSC shows a moderate surplus and there are no immediate problems. This is to some extent due to the successful conference that was organised in Müncheberg.
- It is suggested that, if the surplus were to increase further, the money could be used to support scientists who lack financial means to attend ESSC meetings.
- The council formally accepts the report of the Treasurer.

2. Secretary's report

The Secretary had no particular matters to report.

3. Soil protection policy of the European Union

- The EU wants to move the issue of soil protection forward : a stakeholder's meeting on soil protection was organised in Brussels on February 10, 2003. José Rubio, Jean Poesen and Mike Fullen participated in this meeting as representatives of the ESSC.
- Various subgroups and an advisory forum have been set up to prepare the EU policy on soil protection. The subgroups deal with soil contamination, organic matter, soil erosion, soil monitoring and research on soils. The aim of these subgroups is to prepare soil policy in their respective domains. Adam Kertész and José Rubio participate in the advisory forum. The ESSC is not represented in the working group on soil erosion.
- The working group on soil erosion is presided over by Dr. L. Vandekerckhove (Belgium).
- A dedicated website (the CIRCA website) has been established to allow those interested to follow up and contribute to the discussions (<http://forum.europa.eu.int/Public/irc/env/soil/home>)
- A concerted action (SCAPE : soil conservation and protection in Europe, led by Dr. A. Imeson) has been funded and is now operational. The aim of SCAPE is to provide the EU with scientific information for a soil protection strategy (www.scape.org).
- The ESSC clearly desires that its point of view on soil conservation in Europe is taken into account in this policy preparation process. Considering the fact that various initiatives have already been taken, it does not seem appropriate to develop a whole new initiative. Rather, ESSC will establish contacts with scientists and other persons involved in these initiatives so that it can make sure that the views and perspectives of ESSC are known. K. Helming will provide information about the ESSC to the

CIRCA forum. Lillian Øygarden will compile a short report on the whole process and will provide this information to ESSC.

4. International congress of the ESSC, Budapest, 2004

- The congress will be held in Budapest from May 25 to May 28, 2004. More details can be found on http://www.zalf.de/essc/Budapest_2004_1st_announcement.doc
- Important note : the congress organisers want to publish the papers BEFORE the conference, so potential participants should keep track of the time schedule.
- The organisers will investigate to what extent a special registration fee can be offered to scientists from countries that are not part of the EU in 2004.

5. Council elections

- In Budapest elections will be held for the ESSC Council and Executive Committee for the period 2004-2008. The Secretary will establish the procedure for these elections and make sure that it is published (see elsewhere in this volume). Council members should invite potential candidates to apply for positions.
- It is necessary to consider, at the same time, the legal status of ESSC. At present, ESSC is registered as a society of public utility in the District Court of Trier, Germany. It needs to be investigated whether we should switch to become an organisation under European law.

6. ESSC awards

- At the ESSC international congress in Budapest, the Gerold Richter Award and the Young Person's Award will be announced. The procedure for the submission of applications is published elsewhere in this volume of the newsletter. Council members should actively invite applications from suitable individuals.

7. Review of recent and future activities

- In recent years a large number of meetings have been organised in the framework of COST action 623 (Soil erosion under Global Change). This COST action has now ended with a concluding meeting in Budapest. However, a new COST action has been proposed (led by Dr. A.V. Auzet, Strasbourg) on 'On and off-site environmental impacts of runoff and erosion' and will very probably be approved by the EU. The ESSC strongly appreciates the efforts of those who put the proposal together as it will allow the continuation of an important scientific effort.
- Various meetings that are planned in the near future and co-sponsored by ESSC are listed below (thanks to K. Helming).

2003

9-12 September	Silsoe, UK	Soil erosion and sediment redistribution in river catchments: measurements, modelling and management (Cranfield University, ESSC)
22-24 September	Caceres, Spain	Sustainability of <i>dehesas</i> , <i>montados</i> and other agrosilvopastoral systems (ESSC)
22-26 September	Ghent, Belgium	25 years assessment of erosion (University of Ghent, ESSC)
15-17 October	Digne, France	Mountain erosion studies (Cemagref, ESSC)
17-19 October	Tucson, Arizona USA	GCTE soil erosion network: soil erosion under climate change: rates, implications and feedback (GCTE, ESSC)
2-5 December	Valencia, Spain	NATO-CCMS and Science Committee Workshop on desertification in the Mediterranean region

2004

24-26 March	Silsoe, UK	Conference to honour the retirement of Prof R Morgan. The role of vegetation in environmental protection: theory and practice
28 April-1 May	Oxford, Mississippi, USA	3 rd International symposium of gully erosion (USDA-ARS NSL, ESSC)
25-28 May	Budapest, Hungary	4th ESSC International Congress
4- July	Brisbane, Australia	ISCO 2004 - 13 th International Soil Conservation Organisation Conference: Conserving soil and water for society: sharing solutions
2-6 August	Moscow, Russia	International symposium on sediment transfer in fluvial systems (University of Moscow, ESSC)
6-12 September	Freiburg, Germany	Eurosoil 2004
13-17 September	Thessaloniki, Greece	International conference on eco-engineering use of vegetation to improve slope stability
20-24 October	Udine, Italy	Agroenviron 2004. Role of multi-purpose agriculture in sustaining global environment

8. Other issues

The Ethical Corporation (<http://www.ethicalcorp.com/>) organises a conference on food supply chains in Brussels on 5-6 November 2003 with the central theme 'Does the structure of Europe's food supply chain work for or against our environment objectives?'. Bob Evans will represent the ESSC at this meeting to illustrate how policy on food supply and related issues may negatively or positively affect sustainable land use.

Gerard Govers
ESSC Secretary

ELECTIONS OF THE E.S.S.C. COUNCIL 2004-2008

The following regulations are based on the ESSC Statues and on the rules laid down by the first ESSC Council (see Newsletter 4/1989). They are the same as the regulations used to elect the ESSC Council for the period 2000-2004.

Regulations

Every European country with 5 or more members of the ESSC may be represented on Council. Those countries with 20 or more members of the ESSC may be represented by two council members.

The Executive Committee of the ESSC hereby publishes the call for nominations.

Every ESSC member may nominate either him/herself or other members as a candidate. Nominations must be sent in writing to the Secretary of the ESSC by February 29, 2004:

Prof. Dr. Gerard Govers
Laboratory for Experimental Geomorphology
Redingenstraat 16
B-3000 LEUVEN
Belgium
e-mail: gerard/govers@geo.kuleuven.ac.be

The list of nominated candidates for each country will be published on an ESSC Notice Board at the Fourth International Congress to be held in Budapest, 25-28 May 2004.

Elections for the Council will be organised at the ESSC General Assembly in Budapest during the ESSC conference. Elections will be conducted in the following way:

1. The Council members for each country will be elected by the ESSC members of that country who are present at the General Assembly.
2. If only one candidate (or two candidates in the case of those countries eligible for two members of Council) has been nominated as a country's representative on Council, that (those) candidate(s) will be the elected member(s).
3. If no members from a country are present at the General Assembly, the Assembly will elect a representative for that country from the list of nominated members.
4. In addition to the country representatives on Council, the former Council will nominate up to six members to serve on the new Council.
5. After the country elections have been held, the complete list of members for the new Council will be presented to the General Assembly for ratification. The Assembly will decide to accept or reject the new Council

- in its entirety by a simple majority of votes.
6. The Council has the right to co-opt additional representatives on Council in the period between General Congresses.
 7. No country can have more than four members on Council.

Duties of members of Council

1. Contribute to the collective wisdom of the Council in reaching decisions on matters relating to the Society.
2. Promote the Society within their country, e.g. encouraging new members, publishing its activities.
3. Report to the President on activities within their country which are of interest to the Society and its members.
4. Attend Council meetings.

Before standing for Council, candidates should ensure that they have sufficient time to undertake these activities and that they have sufficient funds to attend the majority of the Council meetings (held annually). It is very important that the Society has an active Council.

Deadline for nominations: February 29, 2004

* * * * *

HONOUR TO ESSC PRESIDENT

Dr José Luis Rubio, President of the European Society for Soil Conservation, was granted the Golden Award of the Polish Society of Soil Science on 9th September 2003.

ESSC AWARDS 2004

Nominations are invited for the ESSC Awards to be presented at the Third International Congress in Budapest May 25-28, 2004

The Gerold Richter Award for outstanding contributions to soil conservation and protection within Europe

This is awarded to a person (exceptionally a corporate body) who has, over the period of his or her career, made significant and internationally recognized contributions to the investigation and/or promotion of soil conservation in Europe. The contributions may be in research, practice, policy-making or any other activity deemed appropriate. The recipient need not be a member of the ESSC.

Previous recipients

1996 Professor Giancarlo Chisci
2002 Professor Roy Morgan

The Young Person's Award for the understanding and promotion of soil conservation in Europe

This is awarded to a member of the Society, aged 35 years or under, who over the previous four years has made an important contribution to soil conservation in Europe through research, practice, policy-making or any other activity deemed appropriate.

Previous recipients

1996 Dr Jürgen Schmidt
2002 Dr Stefan Doerr

Nominations

Any member of the Society may propose a person (exceptionally a corporate body for the Gerold Richter Award). Individuals may propose themselves. Nominations should state the name and address of the person being proposed followed by a 500-1000 word statement describing the contribution on which the nomination is based.

Nominations for the Awards should be sent to:

Dr. J.L. Rubio
Centro de Investigaciones sobre Desertificación
Cami de la Marjal s/n, Apartado Oficial
E-46470 Albal-Valencia
Spain
e-mail: jose.l.rubio@uv.es

Deadline for nominations: February 29, 2004.

NEW PhD THESES

Soil erosion and slope in primary and selectively logged rain forest, Danum Valley, Malaysia

Michelle A Clarke

Department of Geography, University of Wales Swansea

Slopewash, a combination of rainsplash and overland flow erosion, is one of the principal soil erosion processes in rain forest areas. Conventional theory suggests that slopewash in rain forest environments should increase systematically with increasing slope angle. If soil and ground cover variables themselves change with slope angle, however, relationships between erosion and slope angle may be more complex. When rain forest is logged, whether and for how long rills and gullies initiated on heavily disturbed and compacted terrain components continue to enlarge is critical. This thesis examines these issues on slopes of 0-40° in primary and selectively logged (in 1988-89) rain forest at Danum Valley, Sabah (Malaysian Borneo). Measurements were made of: (a) actual erosion, deposition and changes in surface roughness at over 100 pre-existing and new sites over periods of 1-9 years using the erosion bridge (microprofiler) technique; (b) infiltration capacity, overland flow, splash detachment and overland flow erosion at small (30 x 30 cm) plots at key sites using a rainfall simulation programme; (c) ground cover and soil properties; and (d) overland flow occurrence at free-standing slope sites under natural rainfall conditions. Overland flow on primary forest slopes was found to be more widespread and frequent than previously thought. Tentative relationships between overland flow, erosion and slope angle, to higher degrees than previous studies and theory have proposed, are presented. The dominance of extreme rainstorms in the temporal pattern of both primary forest and post-logging erosion is demonstrated. Eight to twelve years after logging, landslides along logging roads in higher slope areas and roads (particularly when unsurfaced) are the main sediment sources to the stream network. Erosion rates at skid trails and logged slopes, however, are now close to those in primary forest. Results highlight the importance of organic carbon within the soil to maintain structure and aggregate stability, and, therefore, to increase soil resistance to erosion.

Cultivation practices, maize and soybean productivity and soil properties on fragile slopes in Yunnan Province, China

Wang Shu Hui

University of Wolverhampton

Sustainable agriculture in China is highly threatened by rapid urbanization, land degradation and high population. Yunnan Province, south-west China, is 94 per cent

mountainous and lacks flat land. Food shortages and inappropriate cultivation have led to intensive cultivation of steep, marginal and fragile land and have increased soil erosion. To curb this situation and assist with poverty alleviation, it is crucial to develop more productive and sustainable cropping systems.

An experiment was conducted on sloping areas from 1999 to 2001 in Wang Jia Catchment, Yunnan Province. The project aim was to evaluate the effects of five selected cultivation practices on maize productivity and soil properties. The treatments were: (1) downslope cultivation without mulch, (2) contour cultivation without mulch, (3) contour cultivation with polythene mulch, (4) contour cultivation with polythene and wheat straw mulch (Integrated Contour with Plastic and Straw Mulch Treatment, INCOPLAST), and (5) contour cultivation with polythene mulch and intercropping, wide and narrow row spacing, with soybean in wide row spacing. Crop growth parameters and soil physical properties were measured throughout the cropping seasons.

Considering three years data, contour cultivation with polythene mulch generally increased soil temperature by a mean of 1-2°C. The polythene retained considerably more soil moisture during dry weather. However, during wet weather, polythene prevented rainfall directly falling on the soil, which led to less soil moisture content. The soil temperature and moisture regimes under polythene mulch made plants grow faster and canopies develop well, leading to higher final yields. The benefit of polythene was 33-54 per cent more yield than downslope cultivation without mulch treatment over three seasons. Contour cultivation plus polythene and straw mulch retained significantly higher soil moisture levels. The yield of this treatment in 1999 was ranked second, but in 2000 it had the highest yield and in 2001 it was also more effective than contour cultivation with polythene mulch treatment. Contour cultivation with polythene mulch and intercropping improved maize yield. The soybean harvest also contributed to net income, the crop had a similar function to straw mulch and increased N availability. Contour cultivation increased yields over the range 7.2-11.2 per cent over three seasons compared with downslope cultivation, equivalent to ~500-1000 kg/ha more grain produced.

There were few clear trends in soil properties over the 1999-2001 period. However, N concentrations increased in the contour cultivation with polythene mulch and intercropping treatment. Both contour cultivation with polythene and straw mulch and contour cultivation with polythene mulch and intercropping gave apparent increases in total K, probably resulting from both decayed straw and decomposed soybean leaves.

In terms of simple cost-benefit evaluation, downslope cultivation had the lowest input and output, while contour cultivation had a similar input, but a higher output. Contour cultivation with polythene had the highest net return. Contour cultivation with polythene and straw had a high output but did not give a higher net return than contour cultivation with polythene. Contour cultivation with polythene mulch and intercropping generally had the highest input and output and could give a higher net

return than contour cultivation with polythene when the soybean harvest was successful, but over three years this treatment had the greatest risk from crop failure.

It is recommended that replacing downslope cultivation with contour cultivation can increase crop yields and this simple action could contribute to the development of more sustainable cropping systems in Yunnan. Polythene mulch achieved higher maize yields but its environmental impact requires further study. It is considered that contour cultivation with polythene and straw mulch or soybean intercropping could contribute towards more productive and sustainable cropping systems where soil conservation is high priority. The technique could assist with long-term soil, water and nutrient conservation and improved crop productivity.

FORTHCOMING MEETINGS

2-5 December 2003

Valencia, Spain

NATO-CCMS and Science Committee Workshop on Desertification in the Mediterranean region: a security issue

The purpose of the workshop is to establish an expert working group of NATO member and partner nations in combination with representative members from the Mediterranean Dialogue countries (Algeria, Egypt, Israel, Jordan, Mauritania, Morocco and Tunisia) to exchange information on the issue of desertification in the Mediterranean region. The challenge to the working group is to identify regional causes of desertification and examine the consequences of past and future land use and physical processes. The workshop will provide the opportunity to apply new technologies and integrate both natural and social sciences within a framework for mutual international cooperation. The focus of the workshop will be on work accomplished at regional and national level which emphasizes community or societal interests and involvement. A proceedings, book or special issue of a journal of the workshop will be prepared.

Researchers, scientists, land managers, policy makers, government and non-government representatives interested in desertification, especially within the Mediterranean region, are encouraged to attend.

Themes: soil and vegetation monitoring techniques and programmes; land use and human demographic change; country reports; consequences of degradation on social, economic and political issues, especially food security and migration; regional cooperation and information-sharing mechanisms; forecasting techniques, early warning systems and alternative futures analysis; advanced technologies.

The mid-conference field trip will illustrate landscape diversity from the l'Albufera Natural Park, the Mediterranean coast, the mountainous landscape of Font Roja and the degraded lands of the Monnegre basin.

Meeting organised by NATO Science Committee and Committee on the Challenges of Modern Society; United Nations Convention to Combat Desertification; United States Environmental Protection Agency (Office of Research and Development); CIDE (CSIC, Universitat de València, Generalitat Valenciana); Desert Research Institute (Division of Earth and Ecosystem Sciences). Collaborating institutions: Ministry of the Environment, Spain; Generalitat Valenciana; ESSC.

Deadlines: Abstracts should be received by 1 July 2003.

Further details from: Dr José Luis Rubio, CIDE, Camí de la Marjal s/n, Apartado

Oficial, E-46470 Albal (Valencia) Spain.
Tel: + 34-96-122-05-40
Fax: + 34-96-1263908 / 96-1270967
e-mail: jose.l.rubio@uv.es
<http://www.epa.gov/nerlesd1/land-sci/desert/index.htm>

21 January 2004
Controlling the loss of soil to water
London, United Kingdom

The excessive movement of soil from land to water represents one of the main environmental problems within the UK. On site, soil erosion generates a range of negative impacts, including decreased soil biodiversity and productivity, and economic losses associated with the loss of fertilizers and soil nutrients. Off-site impacts such as increased siltation in watercourses, and the transfer of sediment associated contaminants, pathogens and nutrients, lead to implications for water quality, infrastructure, fish stocks and biodiversity in both freshwater and marine environments. Future changes in climate, land use and management will exacerbate these problems.

The meeting aims to provide a forum for all those involved in the practical control of soil erosion to:

- exchange practical research experiences
- present innovative erosion control technologies, and
- identify and discuss future research needs to control of soil loss from land to water.

Venue: The Geological Society, Burlington House, Piccadilly, London W1J 0BG.

Registration: Complete the registration form available from the web-site and then fax or mail to the organisers.

Deadline: Abstracts to the organisers by 30 September 2003. Registration by 31 October 2003.

Further details from: Michelle Clarke, National Soil Resources Institute, Cranfield University at Silsoe, Silsoe, Bedfordshire MK45 4DT, UK; and Marianne McHugh, National Soil Resources Institute, Cranfield University, North Wyke, Okehampton, Devon EX20 2SB, UK.

e-mails: michelle.clarke@cranfield.ac.uk; marianne.mchugh@bbsrc.ac.uk

24-26 March 2004

Silsoe, Bedfordshire, UK

The role of vegetation in environmental protection: theory and best practice

This ESSC-sponsored conference marks the retirement of Professor Roy Morgan (former President of the ESSC) from Cranfield University at Silsoe. The theme of the meeting will reflect the contributions made by Professor Morgan in the field of erosion control using vegetation. Presentations on the role of vegetation in the control of hillslope erosion, shallow slope movements and river bank failures are welcomed. Key themes will include physical processes, modelling, bioengineering, the development and design of vegetative solutions, and implementation of best practice. An edited volume of selected, peer-reviewed papers is proposed.

Deadlines: Abstracts (200 words maximum) for both oral and poster presentations to j.rickson@cranfield.ac.uk by 31 August 2003 (deadline now extended).

Further details from: Dr R.J.Rickson, National Soil Resources Institute, Cranfield University, Silsoe, Bedfordshire MK45 4DT, UK.

26-28 March 2004

Lahore, Pakistan

International seminar on Salinity mitigation for water resources management

Further details from: Prof. Dr. Muhammad Latif, Chairman / Dr M.Mazhar Saeed, Secretary (mazhar_cewre@yahoo.com) / Eng. Sajid Mahmood Azeemi, International Coordinating Secretary (smahmoodpk@yahoo.com) / Seminar Secretariat, Centre of Excellence in Water Resources Engineering, UET Lahore, Pakistan (center@xcess.net.pak)

15-20 May 2004

Solsona, Catalonia, Spain

International conference on river / catchment dynamics: natural processes and human impacts

The conference, which will take place at the Forestry Institute of Catalonia, Pujada de Seminari s/n, E-25280 Solsona, is in honour and on the occasion of Professor Maria Sala's retirement. The theme is river and catchment processes with particular reference to Mediterranean environments. The focus will be on the linkages between human impacts, catchments and river dynamics, as a basis for environmental management. Contributions are invited in any field of process geomorphology but particularly on:

- sediment sources and transfer to the fluvial system
- fluvial processes and sediment transport
- erosion processes and land degradation in drainage basins
- human impacts on Mediterranean fluvial environments
- water and sediment management.

Participants are encouraged to address one or more of the following issues: the last two decades of progress in process geomorphology and future prospects; understanding anthropic impacts on the environment causing land degradation; present-day diagnosis and future key strategies of environmental management in Mediterranean river catchments; and linking process geomorphology with other earth and environmental science disciplines.

Conference sponsored by: COMLAND, IGU, ICCE (IAHS), ESSC, Forestry Technology Centre of Catalonia, University of Lleida, University of the Balearic Islands and the University of Barcelona.

Mid-conference tours will visit the Ribera Salada Experimental Watershed and the Tordera River.

Post-conference tours (optional) to Ebro River (1 day), Anoia Watershed (1 day), Mallorca (2 days).

Language: The official language of the Conference will be English.

Deadlines: Expression of interest and abstracts by 1 October 2003.

Publication: The International Association of Hydrological Sciences has agreed to publish a Conference volume of papers (Red Book). The volume will be made available to conference participants at a favourable price. Conference participants are invited to submit the final version of their paper either at the Conference or no later than 31 July 2004.

Registration: Early registration (before 1 March 2004): € 300 / students € 50
Late registration: € 400 / students € 100

Registration fee covers conference documentation, abstracts, excursion guides, reception, coffee-breaks and lunch during sessions, farewell dinner and excursions to the Tordera and Ribera Salada rivers. The Conference Organisation with the support of the International Geographical Union will assist the participation of young scholars by awarding two grants. Candidates are requested to submit their short cv together with their expression of interest and abstract.

Accommodation: Residence cost is estimated at € 65 per person (single occupancy). This includes five nights and breakfast in a very quiet residence attached to the

Forestry Institute of Catalonia. Since there is a limited number of rooms, booking is on a first-come first-served basis; to reserve accommodation in the residence, a € 30 deposit is required by 1 March 2004.

Hotel accommodation is estimated at € 110 per person (single occupancy) for five nights and breakfast at a new 'hostal' in Solsona. To reserve accommodation in the hotel, a € 55 deposit is required by 1 March 2004.

Payment details: Service available from November 2003.

Identification: Centre Tecnològic Forestal de Catalunya

Code: V-01/04.

Bank: Caixa de Manresa. Account: 2041-0090-11-0040010419

Supplementary information (foreign participants only):

Swift Code: CAIX_ES_BB_654

IBAN. ES27 2100 0081 9502 0028 9305

Payment by Visa Card will also be possible.

Further details from: Ramon J. Batalla, University of Lleida / Forestry Institute of Catalonia (rbatalla@macs.udl.es); Celso Garcia, University of Balaeric Islands (celso.garcia@uib.es); Moshe Inbar, University of Haifa (inbar@geo.haifa.ac.il).

14-18 June 2004

Sustainable agriculture on tropical steeplands - SATS 2004

Mérida, Venezuela

The event is being organised as both a technical and scientific meeting and an open forum, directed to political, social and economic discussion. The aim is to analyse, enrich and disclose knowledge and experiences accumulated during recent years related to the development of sustainable agriculture on tropical mountains. The main objectives of the meeting are:

- to bring together scientists, researchers, agricultural extension workers, policy makers and professionals of different disciplines and institutions related to agriculture and the environment, as well as farmers and land users, with the purpose of exchanging ideas, information and experiences related to recent advances and successful approaches for sustainable agriculture on tropical steeplands;
- to contribute methodological and practical solutions to reduce land degradation in tropical mountains, optimising environmental protection and food production; and
- to identify strategies and mechanisms for the future participation and cooperation among the different institutions and communities involved in agriculture on tropical steeplands.

The symposia are:

- (1) The role of agriculture for sustainable development on tropical steepplands: importance and impacts of agriculture on economy, food security, health, poverty and environment on tropical steepplands; land quality indicators on steepplands; land degradation in context of agricultural use; evaluation of agro-environmental goods and services.
- (2) Sustainable land management on tropical steepplands: sustainability indicators; soil management and conservation for sustainable agriculture on steepplands; agroforestry as an alternative land use; importance of agrobiodiversity; ancestral, indigenous or traditional knowledge for sustainable agriculture; agriculture and watershed management for water production; decision-support systems, models and information technologies for land use planning in tropical steepplands.
- (3) The role of actors in managing sustainability of agriculture on tropical steepplands: community and inter-institutional participation; the farmer's experiences in sustainable land use; gender focus; human capabilities and technology transfer; institutional support and global assistance for international cooperation.

Further details: <http://www.cidiat.ing.ula.ve/sats2004>

General information: satsinfo2004@cidiat.ing.ula.ve

4-9 July 2004

Brisbane, Queensland, Australia

13th International Soil Conservation Organisation Conference. Conserving soil and water for society: sharing solutions

The conference, at the Brisbane Convention and Exhibition Centre, will cover activities from research to facilitation, from modelling to measurement, from science to policy and practice which moves us forward in meeting society's needs. In addition to the ISCO conference traditional themes, we expect that there will be increased emphasis on: the role of women and indigenous groups in conservation; the management and conservation of arid and semi-arid lands; conservation in urban and infrastructure development; and rehabilitation and management of mining and other extractive industries. Depending on the interest of participants, carbon sequestration is expected to be one of the topics covered when considering knowledge and strategies for maintenance or rehabilitation of land use systems.

The conference sessions will be organised under: (1) scientific and practical knowledge for creating solutions; (2) effectively sharing knowledge; (3) application of solutions; (4) roles for international organisations.

Mid-conference tours: a variety of tours will cover land use and management issues in south-east Queensland including soil erosion, salinity and acid sulphate soils. The impact of development on biodiversity, water management and good quality

agricultural land will also be featured.

Pre-conference tours: Tasmania (4 days); Outback Queensland (6 days); South west of Western Australia (3 days).

Post-conference tours: Queensland subtropical agriculture (5 days); Tropical rain forest, reef and the outback (3 days).

Deadlines: Submission of abstracts by 12 September 2003 (on line at conference website www.isco2004.org). There is no provision for abstract submission by mail, fax or e-mail. Abstracts must be submitted in English with the text no more than 2000 characters and must be based on previously unpublished data. Registration brochure released in November 2003. Final papers due by 31 March 2004. Early registration deadline by 31 March 2004. Accommodation booking deadline by 28 May 2004.

Further details: ISCO 2004 Conference Secretariat, C/- ICMS Pty Ltd, P O Box 3496, South Brisbane, Queensland 4101, Australia.

Tel: + 61-7-3844-1138

Fax: + 61-7-3844-0909

e-mail: isco2004@icms.com.au

www.isco2004.org

4-12 September 2004
Freiburg im Breisgau, Germany
EUROSOIL 2004

Meeting sponsored by Ministerium für Umwelt und Verkehr Baden-Württemberg, Gesellschaft für Umweltmessungen und Umweltermessungen (UMEG), Bundesanstalt Geowissenschaften und Rohstoffe (BGR) and German Soil Science Society. Some 25 symposia will take place over four days (Monday, Tuesday, Thursday and Friday) with up to 20 volunteer papers and one keynote in each symposium. Symposia cover: soil as a living space; education in pedology - soil education and public awareness; soil protection; preferential flow; gas exchange in soils; soil and society; organo-mineral interactions in soils; regionalization of soil data; forest soils; remediation of polluted soils; soil deformation; soil erosion; soil and water; desertification and salinization; soil information systems; knowing and mapping soil associations and pedological systems; buffering functions of soils; international soil politics; significance of soil forming processes; beneficial plant and microorganism interactions; functional genomics of soil organisms; soil organic matter; soil monitoring; urban soils and land resources; and soil indicators.

In addition dedicated two-hour poster sessions will be held on themes related to the

Divisions of the International Union of Soil Science: soils in space and time; soil properties and processes; soil use and management; and the role of soils in sustaining society and environment.

Two-day excursions to: (1) South German cuesta landscape and Alpine Foreland; (2) the Rhine Valley from west to east; (3) The Hegau and Lake Constance.

One-day excursions to: (1) Soils of the Black Forest foothill zone; (2) the Kaiserstuhl Volcano; (3) Tuttlingen Field Research Station; (4) Northern Switzerland with theme of carbon cycling in terrestrial ecosystems.

Half-day excursions to: (1) Mediæval Black Forest mining and soil pollution; (2) the Conventwald forest ecosystem study; (3) soil and water conservation of the Kleine Kinzig drinking water dam; (4) Kaiserstuhl Volcano: nature and culture; (5) soil and land use in Freiburg and its region; (6) the Feldberg Nature Preserve and the House of Nature.

Conference language: English.

Deadlines: Abstracts (200-300 words) for oral and poster presentations by 31 December 2003. Submission on line via: <http://www.forst.uni-freiburg.de/eurosoil> or sent on floppy disk or CD to Kongress & Kommunikation gGmbH, Hugstetter Straße 55, D-79106 Freiburg, Germany. Details of format for abstract are contained on the web-site. Each participant can submit only one abstract as first-author. Authors will be notified by 1 May 2004 whether their paper has been accepted.

Registration: Only registered participants may present papers or poster. Authors of accepted papers are not automatically registered and must therefore register themselves. Registration is online: www.forst.uni-freiburg.de/eurosoil or by sending/ faxing registration for to: Kongress & Kommunikation gGmbH, Hugstetter Straße 55, D-79106 Freiburg, Germany.

Registration fees cover one copy of complete conference material, admission to all sessions, exhibits, posters, coffee breaks, and free access to the public transport system of Freiburg-im-Breisgau (VAG). Registration fees may be paid by credit card (Euro/ Mastercard, Visa, American Express), cheque or bank transfer

Payment by 1 December 2003: € 135 / students € 80

Payment between 1 December 2003 and 1 May 2004: € 150 / students € 90

Payment after 1 May 2004: € 180 / students € 110.

A cancellation fee of € 50 will be charged for cancellations received before 1 August 2004. After that date, no refund is possible.

Meals and accommodation are not included in the Registration Fee.

Further details from: Conference organisers, Institute of Soil Science and Forest Nutrition, University of Freiburg, Kongress und Kommunikation gGmbH. Details of the convenors of each symposium, the poster sessions and excursions can be found on <http://www.forst.uni-freiburg.de/eurosoil>.

29 September - 1 October 2004

Rhodes, Greece

2nd International conference on waste management and the environment

The meeting will be of interest to environmental engineers, local authority representatives, waste disposal experts, research scientists in the area of waste management, civil engineers and chemical engineers. Papers are encouraged on the following topics: landfills, design construction and monitoring; waste pre-treatment; hazardous waste disposal and incineration; waste separation and transformation; waste reduction and recycling; metal and ceramic recycling; advanced waste treatment technology; methodologies and practices of waste degradation; high volume waste, storage and compaction; clean technologies; biosolids, composting and agricultural issues; biological treatment of waste.

Further details: <http://www.wessex.ac.uk/conferences/2004/waste04/index.html>

MEMBERSHIP LIST (updates to October 2003)

Estonia

Kanal, Arno: Department of Geography;
University of Tartu; Vanemuise 46;
EE - 51014 Tartu
Fax: +37-27 37 58 25;
akanal@ut.ee

Germany

Volk, Martin: Centre for Environmental
Research; UFZ; Permoserstr. 15;
D-04318 Leipzig;
Tel.: +49-03 41 235 28 56;
Fax: +49-03 41 235 28 51;
martin.volk@ufz.de

Fohrer, Nicola: Fachabteilung Hydrologie
und Wasserwirtschaft; Ökologiezentrum
der Universität Kiel; Olshausenstr. 40;
D-24098 Kiel
Tel.: +49-43 18 80 40 30;
+49-43 18 80 12 76;
Fax: +49-43 18 80 46 07
nfohrer@hydrology.uni-kiel.de

Schmidtchen, Gabriele: Am Klingelberg 17;
D-76855 Annweiler
Tel.: +49-06 34 69 89 99 82;
mail@frauschmidtchen.de

Great Britain

Lang, Andreas: Department of Geography;
University of Liverpool;
GB-Liverpool L69 7ZT;
Tel.: + 44-15 17 94 28 42;
Fax: + 44-15 17 94 28 66;
lang@liv.ac.uk

Greece

Floras, Stamatios: Institute of Soils Mapping
and Classification; National Agricultural
Research Foundation; 1, Theofrastos Str.;
GR-41335 Larissa
Tel.: +30-41-66 05 70;
Fax: +30-41- 66 05 71;
sfloras@nagref.gr

The Netherlands

Mulder, Paul:
Zuringvaart 26;
NL-2724 VZ Zoetermeer;
Tel.: + 31-33 24 523 30
Mulderpaul@compuserve.com

Kwaad, Frans: Physical Geography;
University of Amsterdam; Reigerpark 44;
NL-1444 AC Purmerend
Tel.: +31-20 525 74 51;
Fax: +31-20 52 574 31;
frans.kwaad@tiscali.nl

Spain

Lopez-Bermudez, Francisco:
Avda. de los Pinos, 9-2 B;
E-30009 Murcia
Tel.: +34-96 83 63 132
lopber@um.es

Switzerland

Tobias, Silvia: Institut für Kulturtechnik;
ETH Hönggerberg HIL H28.2;
Ch-8093 Zürich
Tel.: +41-16 33 36 08;
Fax: +41-16 33 10 84;
silvia.Tobias@wsl.ch