NEWSLETTER 2 / 1993

E.S.S.C.

EUROPEAN SOCIETY FOR SOIL CONSERVATION

ESSC Executive Committee Meeting in Budapest - tasting of wine during a field trip after the meeting

E.S.S.C. NEWSLETTER 2 / 1993

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ESSC EXECUTIVE COMMITTEE MEETING

Budapest 5-6 November 1992

Members present: Boardman, Kertesz, Misopolinos, Poesen, Richter, Rubio, Vogt.

Summary of business

The Secretary-Treasurer reported that ESSC membership had grown since the Silsoe Congress from about 550 to 595. He also reported that membership payment by credit card would be possible very soon.

Professor Vogt reported on plans for the production by the Council of Europe of a reference book on soil protection. ESSC will cooperate in this production although the time allowed for comments on draft chapters of the book is very short.

The Executive Committee accepted the retirement of Professor Chisci and his replacement by Dr. Dino Torri. The next Council Meeting will decide upon the affiliation of a second Council member from Belgium and Italy.

It has been decided that the next ESSC Congress will take place at Freising-Weihenstephen in Germany in 1996. There will be a Workshop on soil erosion in semiarid Mediterranean areas in Taormina, Sicily, 28-30 October 1993. A conference on soil salinization is planned for 25-30 April 1994 in Hungary.

Leaflets on the aims, history and activities of the ESSC are to be prepared in four languages (English. French, German and Spanish).

John Boardman

RAPPORT SUCCINCT DU SYMPOSIUM INTERNATIONAL EROSION DES TERRES AGRICOLES EN MILIEU TEMPERE DE PLAINES SAINT-CLOUD, PARIS, 25-29 MAI 1992

Les mutations des systèmes de cultures en France et en Europe depuis une vingtaine d'années ont entraîné une spectaculaire aggravation de l'érosion des sols et une partie du capital agronomique est menacée ainsi que la qualité des eaux. La question posée "Comment évaluer les risques et quelles solutions adopter sans bouleverser radicalement les orientations socio-économiques des régions de grandes cultures?" a été au coeur des débats du Symposium international intitulé "Erosion des terres agricoles en milieu tempéré de plaines et de collines" organisé par le Centre de Biogéographie-Ecologie, E.N.S.-C.N.R.S.-U.R.A. 1514, à l'Ecole Normale Supérieure de Fontenay-Saint-Cloud, Paris, du 25 au 29 mai 1992, en coopération avec European Society for Soil Conservation (E.S.S.C.), International Geographical Union (I.G.U-COMTAG) et le Réseau Erosion (O.R.S.T.O.M.), sous le haut patronage du Ministre français de la Recherche et de l'Espace et du Ministre français de l'Agriculture,et de la Forêt. Le Comité Scientifique d'Organisation était composé par les professeurs suivants: P. Arnould, E.N.S. Fontenay-Saint-Cloud, France; R.B. Bryan, Université de Toronto, Canada; J. De Ploey (†), Université de Louvain, Belgique; W. Froehlich, Académie des Sciences, Cracovie, Pologne; E. Roose, Orstom, Réseau Erosion, Montpellier, France; Y. Veyret, Université Paris VII, France: S. Wicherek: Coordinateur et Organisateur, C.N.R.S.-E.N.S. Fontenay-Saint-Cloud, France. Le Secrétariat de rédaction a été assuré par Mme. M.O. Boissier avec l'aide de l'équipe technique: M.G. Chêne, Mme. M. Le Berre et Mme. M. Mekharchi.

Le Symposium a remporté un vif succés, 160 personnes sélectionnées, venant de 25 pays ont participé. On peut remarquer que dans le cadre de cette année européenne tous les pays de la CEE étaient représentés et nous avons pu également inviter des,scientifiques des Pays de l'Est et accèder à leurs connaissances dans ce domaine, ce qui a été très apprécié et fort enrichissant. Il ne faut pas oublier pour autant une forte représentation des grands pays agricoles (U.S.A., Canada). En ce qui concerne la France tous les grands Organismes français de Recherche ont participé à ce symposium bilingue: Centre National de la Recherche Scientifique (C.N.R.S.), Institut National de la Recherche Agronomique (I.N.R.A.), Bureau des Recherches Géologiques et Minières (B.R.G.M.), Centre National du Machinisme Agricole, du Génie Rural des Eaux et des Forêts (C.E.M.A.G.R.E.F.), Organisme de Recherche Scientifique des Territoires d'Outre-Mer (O.R.S.T.O.M.), Universités et Grandes Ecoles. Le Comité Scientifique d'Organisation avait sélectionné 65 communications pour une présentation orale, ainsi que 10 posters, sous les 5 thèmes suivants:

1. De la parcelle au bassin versant. Place des études stationnelles. Analyse des processus et établissement de bilans partiels. Président de Séance: Pr. R.B. Bryan, Université de Toronto; Rapporteu: Pr. F. Papy, INRA, Paris, Grignon.
2. Du géosystème à la région: essai de typologie visant à définir les sensibilités et les potentialités de l'érosion. Président de Séanc: Pr. G. Bertrand, Université de Toulouse, Rapporteu: Pr. Y. Veyret, Université Paris VII-E.N.S.
3. Méthodes et outils: évaluation des apports respectifs des études de terrain, télédétection, SIG, modélisation et Césium 137. Présidents de Séance: Dr. J. Boardman, Université d'Oxford; "Pr. J. Poesen, Université de Louvain; Rapporteurs: Pr. Cl. Bernard, Ministère de l'Agriculture, Québec; Pr. W. Froehlich, Académie des Sciences, Cracovie.
4. Autres exemples d'érosion exacerbée. Président de Séance: Pr. P. Sanlaville, C.N.R.S., Université Lyon II; Rapporteur: Pr. R. Néboit, Université de Clermont-Ferrand.
5. Appréciations des modifications actuelles et passées des structures agraires: incidence sur l'érosion. Stratégies traditionnelles paysannes et gestion de l'eau. Propositions pour une meilleure gestion de la ressource sol et lutte anti-érosive. Président de Séance: Pr. E. Roose, Orstom, Montpellier; Rapporteur: Pr. P. Arnould, E.N.S. de Fontenay-Saint-Cloud.

Pendant ce Symposium, on a pu constater dans ce domaine un progrès considérable des recherches fondamentales et appliquées qui font partie intégrantes des études environnementales. Les 2 journées de travail sur le terrain en Bassin parisien, sur les terres de grandes cultures (Laonnois-Soissonnais) ainsi que dans les vignobles de Champagne ont permis de rencontrer des utilisateurs, des décideurs, des gestionnaires des milieux, ce qui est peu habituel dans ce type de rencontre et cela a été apprécié. Ces liens entre les scientifiques et les utilisateurs de l'Espace sont indissociables et indispensables. Les problèmes au sens large ont été posés: relations entre Science et ses acquis, besoins de la Société dans ce domaine. L'étude des articulations entre les milieux physiques, biologiques et humains ainsi que les rapports entre exploitants agricoles et la CEE ont été privilégiés durant tout ce Symposium, qui s'est révélé opportun dans le contexte actuel européen et mondial. Parmi 65 communications présentées, 47 ont été retenues par le Comité de Lecture pour être publiées par Elsevier Science Publishers, Agricultural Sciences Section (Amsterdam, Pays-Bas; Editeur: S. Wicherek. Cet ouvrage de 550 pages est présenté en anglais, avec un résumé en français pour chaque article; il est composé des 5 chapitres énumérés ci-dessus. La parution est prévue pour avril 1993.

Pour tout renseignement, s'adresser à l'organisateur du Symposium: Stanislas WICHEREK ou Marie-Odile BOISSIER (Secrétariat du Symposium) Centre de Biogéographie-Ecologie, E.N.S. de Fontenay-Saint-Cloud-Grille d'Honneur du Parc, 92211-SAINT-CLOUD. Tél.: 47 71 91 11-Fax: 46 02 39 11.

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INTERNATIONAL SYMPOSIUM FARM LAND EROSION IN TEMPERATE PLAIN ENVIRONMENTS
SAINT-CLOUD, PARIS, 25-29 MAY 1992

Changes within agricultural systems in France and Europe over the past twenty years have led to a spectacular worsening of soil erosion and degradation; soil resources and water quality are threatened. "How can risk be evaluated, and what solutions should be adopted without radically disturbing the socio-economic orientation of major agricultural regions?" These were the principal questions for debate at the International Symposium on "Farm land erosion in temperate plain environments". This was organized by the Centre de Biogéographie-Ecologie, E.N.S.-C.N.R.S.-U.R.A. 1514, at the Ecole Normale Supérieure de Fontenay-Saint-Cloud, Paris, in cooperation with the European Society for Soil Conservation (E.S.S.C.), the International Geographical Union (I.G.U.-COMTAG) and the "Réseau Erosion" (Erosion Network of the ORSTOM) under the auspices of the French Minister of Research and Space and the French Minister of Agriculture and Forests.

The Scientific Organization Committee was made up of the following, Professors P. Arnould (E.N.S. Fontenay-Saint-Cloud, France); R.B. Bryan (University of Toronto, Canada); J. De Ploey (†) (University of Louvain, Belgium); W. Froehlich (Academy of Sciences, Cracow, Poland) ; E. Roose (ORSTOM, Erosion Network, Montpellier, France); Y. Veyret (University of Paris VII, France); S. Wicherek (Chairman, C.N.R.S. and E.N.S. Fontenay-Saint-Cloud, France). The Secrétariat was Mrs. M.O. Boissier with the help of the technical staff M. G. Chêne, Mrs. M. Le Berre and Mrs. M. Mekharchi.

Our international symposium was attended by 160 participants from 25 different countries. Within the framework of this "European Year" all member countries of the EC were represented. Also invited were scientists from the eastern European countries U.S.A. and Canada). As for France, every major French research organization was represented at this bilingual symposium (French/English): The Centre National de la Recherche Scientifique (C.N.R.S. - The National Centre for Scientific Research), Institut National de la Recherche Agronomique (INRA - National Institute for Research in Agronomy), Bureau de Recherches Géologiques et Minières (B.R.G.M. - The Geological and Mining Research Office), Centre National du Machinisme Agricole, du Génie Rural, des Eaux et des Forêts (CEMAGREF - National Center for Agriculture, Rural development, Water and Forests), Organisme de Recherche Scientifique des Territoires d'Outre-Mer (ORSTOM-Organisation for Scientific Research in the Overseas French Territories), as well as the French Universities and "Grandes Ecoles".

Sixty five papers among the best were selected for oral presentation, along with ten posters, covering the following five major themes:

1. From the field to the watershed. Role of station studies. Process analysis and establishing partial balances. Section Chairman: Prof. R.B. Bryan (Toronto). Rapporteur: Prof. F. Papy (Paris-Grignon).
2. From the geosystem to the regional level, typology, erosion sensitivity and potential. Section Chairman: Prof. G. Bertrand (Toulouse). Rapporteur: Pr. Y. Veyret (Paris).
3. Methods and tools. Evaluation of the respective contributions of field studies, remote sensing, GIS, modeling and Caesium 137. Section Chairmen: Dr J. Boardman (Oxford) and Prof. J. Poesen (Louvain). Rapporteurs: Prof. Cl. Bernard (Québec) and Prof. W. Froehlich (Cracow).
4. Other examples of intensified erosion. Section Chairman: Prof. P. Sanlaville (Lyon). Rapporteur: Prof. R. Neboit (Clermont-Ferrand).
5. Recent and past changes in agricultural structures: incidence of erosion. Traditional strategies for water management. Proposals for better and more efficient soil conservation. Section Chairman: Prof. E. Roose (Montpellier). Rapporteur: Prof. P. Arnould (Saint-Cloud).

During the symposium, the considerable progress made in fundamental and applied research was evident. Both of the excursion days in the Parisian Basin to major agricultural lands, Laonnois-Soissonnais regions and Champagne vineyard, led to direct contact with the "users" of the land, the decision-makers, the managers of the environment, which is fairly uncommon.

Among sixty five (65) papers presented orally, forty seven (47) were selected by the Scientific Organization Committee to be published by Elsevier (Scientific editor S. Wicherek). This book entitled "FARM LAND EROSION IN TEMPERATE PLAIN ENVIRONMENTS" is written in English with a French summary for each paper. It is composed of five sections (as above). The publication is planned for April 1993. For further information please contact Symposium Organization S. WICHEREK or M.O. BOISSIER, Centre de Biogéographie-Ecologie, E.N.S. de Fontenay-Saint-Cloud, Grille d'Honneur du Parc, 92211 SAINT-CLOUD, FRANCE. Tél: 47 71 91 11-Fax: 46 02 39 11.

Shortly before the date of the Symposium, Professor Jan De Ploey passed away. We have lost an internationally reknown scientist, one of the pioneers who succeeded in heightening awareness of the importance of the soil asset. He was particularly appreciated for his immense scientific competence and his remarkable human qualities.

Stanislas Wicherek
St. Cloud, France

SPATIAL APPROACHES AND EXPERIMENTAL ANALYSES OF RUNOFF PROCESSES AND SOIL EROSION: APPLICATION TO AGRICULTURAL SYSTEMS OF PRODUCTION IN THE CALVADOS REGION (FRANCE)

Thesis Summary

The erosion of cultivated soils in France occurs in morphological, climatological, pedological and agriculturally varied situations. Some regions are more predisposed to risks than others, notably in the Mediterranean, where aggressive climate and marked relief are combined, or on the intensely farmed loamy plains of the north (AUZET, 1987). Although less sensitive, the bocage of northwest France is also affected. Pasture contributes to soil protection and the dense network of hedges is also advantageous. However, its partial destruction has increased the erosion susceptibility of this environment. The Calvados Bocage is a good example of a region undergoing change. For the last twenty years reorganisation of the landscape has taken place, creating large fields (DELAHAYE, 1992). More than 9000 ha of pasture has been replaced by cultivated fields. There has also been a change in cultivation practices notably a move to continuous corn for four or even six years in the same place. These changes have resulted in widespread areas of bare soil in winter encouraging erosion. Similar changes have occurred in the bocage of Brittany (PIHAN, 1976; CARNET, 1979; C.E.R.E.S.A., 1987a & b).

The objectives of this study were as follows:

- to examine runoff processes and erosional features in Calvados;
- to build a hierarchy of erosional risks as a function of the physical and agricultural parameters, based upon field observation;
- to quantify the processes at the field scale;
- to propose solutions to the erosional problems encountered.

In terms of methodology, it was not possible to analyse all runoff and erosional processes in a given domaine without taking into consideration the change in scale (DELAHAYE, 1988). For this reason the work focused on an inventory of zones of risk. A range of scale from the field plot to the drainage basin was used. The investigation included rainfall simulation in the field and the laboratory, field experiments and socio-economic surveys of farmers.

The thesis consists of three parts. In the first part areas sensitive to erosion are identified and reasons for low susceptibility to erosion are examined particularly through comparison with neighbouring regions.

The second part is a study of processes under field conditions and in the laboratory. This has allowed the definition of the main erosive scenarios and the quantification of water and sediment transfers and losses. The region most sensitive to erosion in Calvados department is the bocage where the cultivation of maize is the main cause of runoff on plastic covered newly drilled fields and on compacted surfaces after harvesting. On these surfaces 15 to 20 % of total rainfall runs off. For individual rainfall events the runoff coefficient can reach 0.8. Such results underline the importance of runoff management: soil loss from plastic covered surfaces can reach as much as 4 t/ha/yr. On bare, compacted soil, losses are lower e.g. 1.2t/ha/yr. The principal problem in the modelling of processes is the transfer of results from one scale to another.

The third part of the study concerns conservation. To control runoff and erosion, preservation of soil porosity by avoidance of compaction is essential. This can be achieved by a single ploughing after harvesting of the maize. For plastic covered fields the solutions are more complex but include reduction of the length of plastic in order to increase the infiltration zones between rows.

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DEGRADATION OF SOIL PHYSICAL PROPERTIES UNDER IRRIGATION

The problem of soil degradation is real and complex. Its consequences affect the optimization of air-water conditions in the soil-plant-atmosphere system, and hence economic and management conditions. The factors and conditions of degradation are very different in different soil climate zones. This review will consider only one factor of degradation, the influence of sprinkler irrigation on chestnut soils (Haplic Kastanozems in the FAO-UNESCO classification) and chernozems (Haplic Chernozems), based in the main on the work of Soviet scientists.

During the last 20 to 25 years large areas have come under irrigation in the Steppe, Arid and Semi Arid zones (about four million hectares or 3% of arable chernozems). This irrigation has led to soil deterioration (Yegoroy, 1986; Kovda et al., 1986 etc) because of (1) compaction (2) decrease in infiltration (3) disaggregation, especially an increase in coarse water-unstable aggregates (4) an increase in shrinking and swelling and, as a consequence, an increase in fractures (5) formation of crusts 1 to 3 cm thick (6) increase in spatial variability of physical properties.

This review does not consider the problem of salinization which is a direct hazard to productivity (Kovda, 1988; Szabolcs, 1987).

In the south of Russia irrigation can result in alkalinization and intensive changes occur in the soil in the early years of irrigation. After five to ten years of irrigation with mineralized water, 1.0-1.5 g/l, the Exchangeable Sodium Percentage (ESP) can attain 3-5 % (Nikolayeva et al., 1985; Zborishchuk, 1990). Special attention must be paid to the dynamics of ESP and the mineral composition of the soil solution. In autumn-winter its concentration falls, soil aggregates are dispersed and the conditions for degradation of soil structure due to alkalinity are most acute. In the spring, under drying conditions, a soil crust is formed (Lutaev & Bayer, 1989). In summer, shrinking, swelling and cracking occur with increasing ESP. To control these processes high quality irrigation water should be used. The first criterion of good quality water is its salt concentration < 0.5-0.6 g/l, Na:Ca < 1 and Na:(Ca+Mg) < 0.6 (Minashina, 1987; Shishov et al., 1989). The second criterion is the ratio of pNa-0.5pCa in irrigation water to that in soil must be < 1. If it is greater than 1 the soil will become alkaline (Gogolev et al., 1989).

Changes in the soil structure of the upper horizon occurs in all irrigated chernozems. The most common feature is the increasing content of mobile acid humus. This transformation of organic matter is reflected not only in the increasing size of aggregates but in their forms; they become very compact, water unstable and blocky. It is necessary to emphasise that humus content in the upper horizons may not be changed (Shevchenko & Birukova, 1984). Translocation of soil

particles is sometimes noted under irrigation and this is one of the reasons for compact horizons (Bondarev et al., 1979). Some authors note that the quantity of eluviation of clay particles may attain 2250 kg/ha (Schröder et al., 1983). This process is important under alkaline conditions after autumn-winter wetting and irrigation using mineralized water.

Processes of soil degradation are very intensive in the first three to five years of exploitation until the soil system reaches homeostasis, but the fertility of the soil declines drastically compared to its condition before it was irrigated with mineralized water (Zborishchuk, 1990).

Scientific research in this area is concentrating on soil micromorphology, soil microstructure, the different types of soil structure, structural and textural porosity, transformations of soil structure, and the role of mineralogy in this process.

This short review mentions work on the upper horizons which are the most important for agriculture but there is also interest in modelling and prediction of air, water and solute transport in the soil and in agricultural catchments.

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SOIL EROSION IN AUSTRIA

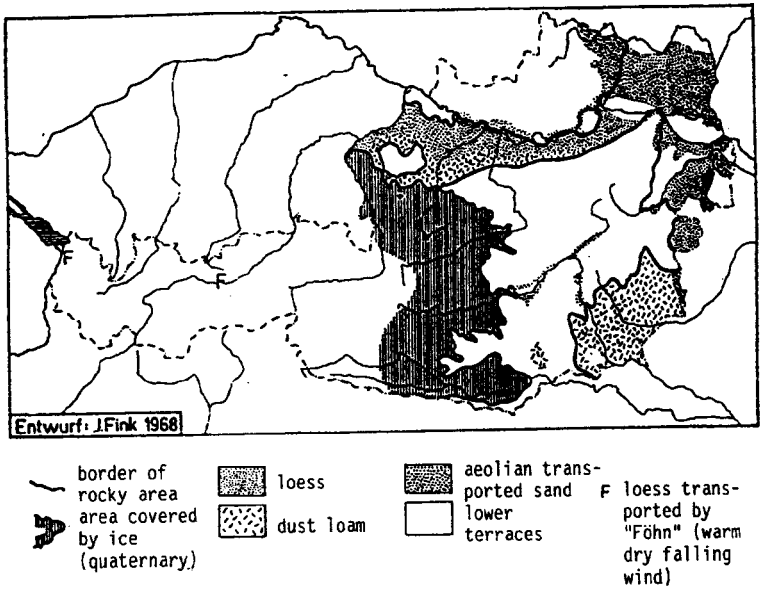
According to PRASUHN (1991) soil erosion can be understood as the process where soil is detached, transported and accumulated through either water and wind, accelerated mainly through human activities; soil erosion by running water can be classified into rill and interill erosion as well as by mass movement.

The total area of Austria is 83.859 km^2. The Austrian landscape falls into five sections:

Eastern Alps 63 %,
Alpine and Carpathian foothills 11 %,
Pannonian Lowlands 11 %,
Vienna Basin 5 %,
Granite and Gneiss Highlands (Bohemian Massif) 10 %.

The potential erosion risk can be roughly described by the high relief energy-the highest mountain "Großglockner" has a height of 3 797 m and the lowlands cover only 32 % of the total area of Austria - and the annual precipitation ranging from 500 mm to 3000 mm. In addition, in the NE part of Austria high wind velocities are responsible for soil erosion of the mainly sandy cultivated soil. In Figure 1 the sediment mainly tranported by wind is shown.

Figure 1: Aeolian sediments in Austria



About 300 000 ha with high erosion risk are situated on slopes greater than 30 % (GREIF, 1985) in the rocky area of the Alps as well as at the northern and southern foothills. High erosion risk by wind can be found in the "Wiener Becken in the "Tullner Feld" and in the NE-lowlands of Burgenland province. The main reason for high erosion risk on agricultural fields is the typical form of cropping. In the southern part of Austria, with high amounts of rainfall, vineyard soils are protected from soil erosion by grass, whereby the northern vineyard areas, with less than 600 mm annual rainfall grass mulch can only be used on soils with higher water capacities (loessial soils).

Summarising, a total area of 600 000 to 700 000 ha (DWORSKY, 1988) of arable land (about 20 % of the total arable area of Austria) is highly influenced by rainfall erosion. Only a few areas are protected by soil conservation measures. On the other hand investigation show the strong influence on surface water by sediment, nutrients and pesticides, therefore soil protection is a necessity. The private agricultural extension service as well as the government are making strong efforts to fight against these problems by starting to advise farmers and supporting them financially.

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RÉSEAU ÉROSION

Voici, par E. ROOSE, membre de l'ESSC, une présentation du "Réseau Erosion".

En 1981, naquit à l'ORSTOM un groupe de réflexion dont l'objectif principal était de faire circuler l'information dans le domaine de l'érosion, de la gestion de l'eau et de la fertilité des sols.

En 1983, l'ORSTOM créait le "Réseau EROSION sorte de "coopérative de l'information" reliant les nombreuses équipes de chercheurs travaillant en France et Outre-Mer. Un modeste budget a permis la réalisation d'un bulletin annuel, l'achat de quelques documents et l'organisation d'une réunion annuelle autour d'un thème technique.

En mars 1993, 610 chercheurs (45%), enseignants (21%) ou développeurs (34%) de diverses disciplines (agronomes, pédologues, forestiers, hydrologues, géographes, etc ...) adhèrent au réseau EROSION qui touche progressivement toutes les équipes francophones de 50 pays d'Europe (300), d'Afrique (250) et d'Amérique (50) et des pays qui en expriment le souhait. Les seules conditions d'adhésion consistent à répondre annuellement au questionnaire et à envoyer des informations bibliographiques ou régionales sur les problèmes posés par la recherche et le développement dans le domaine de l'érosion.

* Trois activités principales sont proposées aux participants:

1. **Le Bulletin du Réseau EROSION** qui comprend 5 parties:

- Une fiche auteur où une équipe expose ses premiers résultats sa problématique et ses méthodes;
- Une fiche présentant le compte-rendu de la dernière réunion;
- Une fiche bibliographique, résumés de thèses, d'ouvrages reçus au Réseau, d'articles sélectionnés;
- Une fiche compte-rendu des congrès ou des missions effectuées;
- Une fiche d'informations sur les congrès à venir, les programmes en cours, la situation dans divers pays et les débats sur les diverses démarches divergeantes concernant la lutte antiérosive, les derniers livres et revues parues et la liste des participants.

Il s'agit avant tout de permettre aux jeunes équipes de faire connaître leurs premiers résultats, de prendre contact avec d'autres équipes de pays éloignés et de corriger éventuellement

leur démarche sans attendre la publication de leurs résultats définitifs dans les grandes revues. Les 12 premiers numéros (50 à 460 pages) ont été diffusés en 200 à 600 exemplaires.

2. **Les réunions annuelles** ont lieu en principe la 2ème semaine de septembre en France. Elles réunissent 50 à 120 personnes d'une quinzaine de nationalités pour se rencontrer autour d'un thème
technique:

1984 - Simulation de pluies: étude de la naissance du ruissellement et de sa charge.
1985 - Efficacité des méthodes antiérosives (publié dans le Cahier ORSTOM Pédologie, 1986, 2).
1986 - Matières organiques et propriétés physiques des sols en relation avec l'érosion.
1987 - Erodibilité des sols, érodabilité des terrains (cf. Cahier ORSTOM Pédologie, 1989, 1).
1988 - Cartographie des risques d'érosion.
1989 - La dynamique de l'infiltration: mesure et amélioration.
1990 - Aménagement antiérosif de terroirs: effet d'échelle des mesures de ruissellement et d'érosion.
1991 - Lutte antiérosive en montagne: stratégies des forestiers et des paysans.
1992 - Influence de l'homme sur les paysages tropicaux humides et méditerranéens.
1993 - 15 au 18 septembre à Montpellier: contribution de l'élevage et l'agroforesterie à la restauration de la fertilité des sols à l'échelle d'un terroir.

Les thèmes les plus intéressants donnent lieu à la réalisation d'une synthèse, soit dans le bulletin du Réseau, soit dans un Cahier ORSTOM ou dans une autre Revue.

3. **La bibliothèque vivante** permet aux stagiaires de passage au Centre ORSTOM de Montpellier de discuter de leurs résultats avec des chercheurs de diverses disciplines et de consulter 5000 fiches, 150 dossiers et une centaine de thèses, livres et séminaires ayant trait à la gestion conservatoire de l'eau et de la fertilité des sols. Les liaisons avec la base Agris et les autres bases de l'ORSTOM, du CNEARC, du CIDARC et de l'ENGREF permettent d'avoir une bonne idée de la documentation existant sur ce sujet. Les membres ont donc tout intérêt à y envoyer leurs propres documents. Une base documentaire va permettre de mieux faire connaître les documents produits par les participants. Une base documentaire sur les experts et leur domaine d'expertise est en projet.

4. **L'organisation du réseau** se veut la plus souple possible. Elle comprend un animateur ORSTOM (E. ROOSE) et dix conseillers représentant les organismes de recherche français les plus concernés: MIETTON, pour l'Université, FEUVRIER du CEMAGREF, LE BISSONNAIS de l'INRA, BERTRAND du CIRAD, COSANDEY du CNRS, MOREL du LAMA de Grenoble, LILIN du Ministère de l'Environnement, PELTIER du CTFT de Nogent, PEYRE de l'INAPG et

WICHEREK de l'E.N.S. Par ailleurs, chaque pays coopérant est appelé à s'organiser autour d'un correspondant: POESEN en Belgique, HURNI en Suisse, BERGSMA aux Pays-Bas, ARABI en Algérie, KLEMM en Allemagne, DIATTA au Sénégal, RUBIO en Espagne, NGARAMBE au Burundi, etc ... .

5. **L'objectif du réseau** évolue avec sa maturité. Le réseau tente d'associer des équipes de recherche, de formation et de développement intéressées par les multiples facettes de l'érosion, principalement en milieu aménagé, en vue d'accélérer la diffusion de l'information, d'aider les jeunes chercheurs à se tenir informés et à publier leurs premiers résultats. Le réseau cherche enfin à favoriser l'extension de recherches dans certains domaines reconnus prioritaires dans les pays d'agriculture intensive comme dans les pays en développement (par exemple le coût économique de l'érosion et de la lutte antiérosive, la restauration de la fertilité des sols, l'amélioration des stratégies traditionnelles de gestion de l'eau et de la fertilité des terres, l'amélioration de la capacité de l'infiltration).

RÉSEAU ÉROSION - Responsable: E. ROOSE
Tél. (33) 67 61 75 65 ou 68
Fax: (33) 67 54 78 00
c/o ORSTOM-B.P. 5045
34032 MONTPELLIER Cedex-France

NOTICES RECEIVED

RUSSIAN-AMERICAN SEMINAR

There will be a seminar on Numerical Estimation of Soil Erosion at Moscow State University, 20-23 September, 1993.

Organiser: G. Larionov, Moscow State Univerity, Department of Geography, Moscow 119899, Russia, Tel: 095 245 56 49.

PLANNED VOLUME: EROSION AND SEDIMENTATION IN EUROPE

The Commission on the History of Erosion and Sedimentation Processes (COHESP) plan to compile a volume entitled "History of Erosion and Sedimentation in Europe During the Agricultural Period". This will be edited by Professor D. Walling (UK), Dr. R. Wasson (Australia) and Dr. A. Sidorchuk (Russia). The volume will be published by Progress Publishing Company (Moscow) in English not later than early 1995. It will be the first in a series of similar publications for each continent.

Offers of papers on the history of erosion-sedimentation processes (6000-7000 words and 4-5 figures) for specific regions should be sent to Professor D E Walling, Department of Geography, University of Exeter, Exeter EX4 4RJ, Uk or to Dr. A. Yu. Sidorchuk, School of Soil Erosion and Fluvial Processes, Geographical Faculty, Moscow State University, 119899 Moscow, Russia.

The paper should include a) factors of erosion and their variability b) histroy of erosion and sedimentation c) contemporary processes of erosion and sedimentation, and a sediment budget for the region.

Aleksey Sidochuk
Moscow State University
Moscow

E.S.S.C.

EUROPEAN SOCIETY FOR SOIL CONSERVATION

C.S.E.I.

CENTRO STUDI DI ECONOMIA APPLICATA ALL'INGEGNERIA

Workshop on

SOIL EROSION IN SEMI-ARID MEDITERRANEAN AREAS

28-30 October, 1993, Taormina, Italy

THEME: The Workshop aims to examine the historical and present state of soil degradation in semi-arid mediterranean areas and to focus on measures for soil erosion control.

SESSION: The Workshop will comprise two sessions. Each of them will begin with an invited lecture. *SESSION 1* - Assessment of soil degradation.
SESSION 2 - Perspectives on measures for soil erosion control.

OFFICIAL LANGUAGE: The official language of the Workshop is English, both for the presentations and the printed material. Translation into and from italian will be provided.

PAPER: Contributions are invited in English. The authors should submit a one one page abstract (up to 300 words) to the Secretary by the 31th of August and indicate the appropriate session number. Guidelines for paper submission will be sent to the authors. If accepted by the referees, papers will be published in the Workshop Proceedings.

TECHNICAL TOUR: The tour will be held on Saturday 30th October. It will include a visit to Pietranera site, in the center of Sicily, and a tour around Mount Etna. The return is forseen by the late afternoon. The cost of the tour will be LIT. 60,000 (italian lire). This will cover all transport and lunch costs.

BANQUET: The evening banquet will be held on Friday 29th October in a typical sicilian restaurant. The cost will be LIT. 60,000 (italian lire).

GENERAL INFORMATION: All the activities will take place at the Hotel Caparena, via Nazionale, 186, 98039 Taormina (ME) - Italy, phone 39-942-652033; fax 39-942-652033. The registration desk will be open on October 28th, from 3,00 p.m. A shuttle service from Catania International Airport to Hotel Caparena will be available.

ACCOMMODATION: Hotel accommodation will be arranged at a daily rate of LIT. 100,000 and LIT 130,000 (italian lire) for single and double rooms respectively, including breakfast and lunch or dinner, service and taxes.

REGISTRATION: Registration fees will be (italian lire):

- Members of E.S.S.C. ..... LIT. 150,000
- Non-Members of E.S.S.C. ..... LIT. 250,000

REGISTRATION FORM: Please write to C.S.E.I. Secretariat, Catania, Centro Studi di Economia applicata all'Ingegneria, via Ciofali, 27, 95123 CATANIA, Italy, phone 39-95-439181, fax 39-95-437671.

Dr. Paola Vella, secretary

EUROPEAN SOCIETY FOR SOIL CONSERVATION

Conference on
PROBLEMS AND MANAGEMENT OF SOIL SALINIZATION-ALKALIZATION IN EUROPE
Budapest and Karag (Hungary), 26-30 April 1994

First Circular

The main objective of the Conference is to give on open "Forum" for the discussion an exchange of experiences on the problems and management of soil salinity/alkalinity in Europe.

The main topics of the Conference are salinization-alkalization in relation to:

(a) other soil degradation processes, such as physical degradation of soil (structure destruction, compaction, surface sealing); water and wind erosion;
(b) agricultural water management (control of soil moisture regime, water conservation agro-technics; irrigation; drainage);
(c) sustainable land use and soil management;
(d) environment protection (soil pollution, toxicity, "chemical time bomb", etc.).

Background:

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 investigation on *soil degradation,* soil erosion and soil conservation in Europe;
- by informing the public about major questions of soil conservation in Europe;
- by 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; farmers; agricultural planning and advisory board; industries and governmental institutions (Statutes of the European Society for Soil Conservation, ESSC, 1990).

In the previous years ESSC had organized conferences on different topics of soil conservation in a board sense, e.g. soil degradation in the Mediterranean region; forest fires and soil degradation; soil conservation in vineyards; etc. This series will be continued by this Conference.

Host Institute:

Research Institute for Soil Science and Agricultural Chemistry (RISSAC) of the Hungarian Academy of Sciences (HAS), Budapest, Hungary.

Venue of the Conference: Budapest and Karcag.

Date of the Conference: 26 to 30 April, 1994.

Preliminary Programme

April 25 (Monday)	Arrival of participants (to Budapest) 16.00-20.00 p.m. Registration.
April 26 (Tuesday)	Opening Ceremony and Paper Session (Budapest)
April 27 (Wednesday)	Field trip to the Kiskunság Area. (Kiskunság National Park: sailne lakes, salt-affected soils and ecosystems) Bus trip: Budapest -> Kecskemét -> Kiskunság -> Budapest.
April 28 (Thursday)	Trip to Karacag. Paper Session at the Karcag Research Institute for Soil Tillage and Amelioration of Debrecen Agricultural University.
April 29 (Friday)	Field trip to the Nagykunság salt-affected area (heavy-textured solonetzes, lysimeter station, experimental station, practical management of alkali soils). Accomodation near Karcag.
April 30 (Saturday)	Field trip to the Hortobágy Puszta (salt-affected soils, extensive land-use practices; Museum of the National Park). Accomodation near Karcag.
May 1 (Sunday)	Return to Budapest (early morning) Departure of participants.

Additional Information

1. The Preliminary Registration Form should be returned by ***not later then*** ***<u>15 September, 1993</u>*** to the following address:

   Prof. Dr. G. Várally
   Director of RISSAC, Correspondent Member of the Hungarian Academy of Sciences
   Research Institute for Soil Science and Agricultural Chemistry of the Hungarian Academy of Sciences, H-1022 Budapest, Herman O. út 15.
   Telefax: (36-1) 155-8839

2. ***Call for papers:*** See the attached registration form.
   Deadline fpr Abstracts (one page): ***<u>31 January, 1994</u>***. The Abstract Volume will be available for the Conference participants during Registration.
   The Organizing Committe will try to find possibilities to publish the full text of the presentations. All details in this respect will be given in the next circular.

3. ***Expected costs of the Conference:***

Registration fee for ESSC members:	160 US $
Registration fee for non-ESSC members:	160 US $

Budapest, 14 June, 1993.

Prof. Dr. G. Várally
Director, Research Institut for Soil Science
and Agricultural Chemistry of the HAS
H-1022 Budapest, Herman O. út 15.

Prof. Dr. Adám KERTEZ
Head, Physical Geography
Geographical Research Institute of the HAS
H-1388 Budapest, P.O.B. 64.

EUROPEAN SOCIETY FOR SOIL CONSERVATION

Conference on
PROBLEMS AND MANAGEMENT OF
SOIL SALINIZATION-ALKALIZATION IN EUROPE
26-30 April 1994
Budapest and Karag
Hungary)

Registration Form

Name: .....

Adress: .....

.....

City: ..... Country: .....

E.S.S.C. member: Yes: ..... No: .....

I intend to submit a paper entitled: .....

.....

.....

I expect to be accompanied by ..... persons.

Signature ..... Date .....

Please return this form, by not later then ***15 September, 1993*** *to:*

Prof. Dr. G. Várally
Director, Research Institut for Soil Science
and Agricultural Chemistry of the HAS
H-1022 Budapest, Herman O. út 15.

Prof. Dr. Adám KERTEZ
Head, Physical Geography
Geographical Research Institute of the HAS
H-1388 Budapest, P.O.B. 64.

OVERLAND FLOW, Edited by A.J. Parsons & A.D. Abrahams (1993), UCL Press, London, 438 pp.

There has been a proliferation of research work on the subject of overland flow during the past two decades. Most of this research, as indeed the editors point out in the preface to this book, has been conducted by geomorphologists and agricultural engineers/hydrologists and has, to a large degree, been driven by the need to understand the causes and effects of soil erosion. However, whilst there has been considerable interaction among researchers within each of the disciplines, there has been hardly any at all between the disciplines. Thus in July 1991 an international workshop entitled "Hydraulics and Erosion Mechanics of Overland Flow" was organised and held at the University of Keele, UK, the specific aim of which was to promote interaction between modellers, field workers and laboratory experimentalists both within and between the disciplines of geomorphology and agricultural engineering/hydrology. The proceedings of the workshop are published in this volume.

The volume has been divided into two sections. The first nine papers are concerned primarily with the nature of overland flow-that is, its hydraulics. Chapters 1 and 2 begin at the small- scale by examining the theme of resistance to overland flow. In Chapter 1, Abrahams et al. report a series of field and laboratory experiments aimed at identifying the components and controls of resistance to interrill overland flow. They use the Darcy-Weisbach friction factor f to characterise resistance to flow, and show, for example, that resistance to flow on gravel-covered, semi-arid hillslopes is primarily a function of surface form, which acts through form resistance and wave resistance. Gilley et al. (Chapter 2) also use the Darcy-Weisbach f but attempt rather to identify the physical contributors to resistance (such as gravel and cobble materials or surface residue on croplands). They also develop equations to predict each factor. In Chapter 3 the attention shifts to issues important in understanding overland flow at the larger catchment scale, namely sources and routing. The author (Yair) examines the hydrometeorological conditions required for the initiation of overland flow on various geomorphic units within an arid experimental watershed, and from this examination identifies the relative contribution of each of these units to storm channel flow. Rocky headwater areas, for example, were found to be the dominant source for channel runoff in the study catchment. Chapters 4 through 9 deal with modelling. As with the first three chapters, these next six also "scale-up" from Lima's presentation of the numerical model KININF for overland flow on an infiltrating surface (Chapter 4), through Scoging and Scoging et al.'s description and application of a cell-based, distributed mathematical model for predicting dynamic overland flow hydraulics on hillslope segments (Chapters 5 and 6) to Grayson and Moore's discussion of a distributed parameter, physically based model which they apply to a 7 ha catchment in New South Wales, Australia (Chapter 7). In Chapter 8 Phillips investigates the

concept of chaos in deterministic modelling. This first section on overland flow hydraulics is then neatly rounded off by the paper by Baird et al. These authors identify three critical limitations to existing overland flow models: (I) that most assume a uniform water depth for overland flow and an average roughness over the slope under consideration; (II) that most have only been applied to geometrically very simple surfaces; and (III) that no attempt has been made to use models to simulate three-dimensional slope evolution by erosion. Baird et al. present two models in an attempt to overcome these limitations: the first, termed SAFMO, is designed specifically to simulate slope evolution in three dimensions; the second, termed RETIC, is based on reticular flow on hillslopes which, as the authors argue, provides an alternative approach to routing overland flow on slope surfaces with complex micro- and macro-topography.

The second half of the book consists of 8 chapters on the mechanics of sediment entrainment and transport in overland flow. The papers follow in a similar way to those in section one: the first four deal with laboratory and field experiments; the last four with modelling. Guy et al. (Chapter 10) report the results of a variety of experimental research into overland flow at various scales. Much of this deals with the questions of transport inception, and in particular the validity of applying the Shields transport inception criterion to overland flow, transport capacity and, importantly, the variation of transport capacity with rainfall and flow conditions. These authors also test the ability of fluvial sediment transport equations to predict the transport capacity of overland flow, a theme picked up and taken further by Govers (Chapter 11). Like Guy et al., Govers questions this approach on the grounds that the hydraulic conditions in overland flow are often totally different to those in channels. Govers tests the performance of a number of channel formulae in overland flow conditions and concludes that simple empirical equations based on shear stress, unit stream power and effective stream power can be more successfully used to predict the sediment transport capacity of overland flow. In Chapter 12 Poesen, summarises the results of a series of laboratory and field experiments which were aimed at a better understanding of overland flow and sediment production mechanisms operating at the micro- and macro-scale. He discusses the effects of soil properties and surface slope on surface sealing and Hortonian overland flow generation, and interrill and rill erosion. Particular attention is given to the occurrence of these processes on bare loamy and sandy soils without and with rock fragments in their surface layer which, as Poesen notes, have received relatively little attention in the literature. In Chapter 13 Parsons and Abrahams summarise and draw together several ideas from research conducted over the past few years in the Walnut Gulch Experimental Watershed, Tombstone, Arizona. This paper follows on well from the previous three in that the results of field investigations of sediment removal in interrill overland flow are presented. The paper focuses specifically on the relative importance of grain and form shear-stress in explaining the paradoxically low flow detachment by interrill overland flow, the inter-relationships of gradient, rock-fragment size and runoff coefficient, and the effects of flow routing on competence of overland flow to remove particles detached by raindrop impact. Chapter 14, by Simanton and

Renard, reports the results from a long-term project in the US examining upland erosion from brush and grass rangelands. The primary objective of this research has been to paramaterise rangeland conditions for use in the USLE, resulting in the development of a Revised Universal Soil Loss Equation (RUSLE). The authors also describe the USDA's dynamic, process-based Water Erosion Prediction Project (WEPP) erosion model which is being increasingly used to predict and assess erosion and sedimentation rates on rangelands. The WEPP model is also the focus of Chapter 15. In this somewhat shorter contribution, Lane et al. outline the main components of the WEPP model but also include a more detailed discussion of the erosion component. No results are presented in this chapter as the model is still in the process of being tested. In Chapter 16 Lea examines the link between models of overland flow generation and routing, such as that presented by Scoging in chapter 5, and those of sediment yield. The author presents an aspect-driven kinematic routing algorithm which predicts drainage paths and considers its utility for sediment routing in a river basin. The final chapter by Schmidt focuses on the modelling of long-term soil loss and landform change. Schmidt presents a physically based computer model (EROSION 2D) which describes the detachment, transport and deposition of soil particles per unit slope area, including the resulting changes in slope geometry. The author notes that in addition to practical applications and the simulation of long-term landform change, the model also permits the user to view the influence of individual parameters in isolation (i.e. sensitivity analyses), thus opening up new possibilities of understanding the complex processes involved.

Overland Flow is an impressive publication both in terms of content and technical production. Unlike many multi-authored volumes, which tend to vary considerably in terms of the quality of individual contributions and generally tend to lack coherence, this book succeeds on all fronts. Whether one considers this collection of contributions as 'state-of-the-art' or not, it nonetheless exemplifies where we presently stand in the field of overland flow research and as such provides some stimulating suggestions for future research. The volume is also superbly produced: diagrams are clear, equations are well presented and there are very few typographical errors although I did find some references missing in a couple of the chapters. One aspect of the book I found particularly useful was the inclusion in the preface of a summary of the main themes that arose during discussions at the workshop. One of the overriding themes was that of modelling and, in particular, whether physically-based erosion models yield better predicitions than better-established empirically derived models. The general consensus was that whilst process-based models did not appear to perform significantly better at the present time than their empirically - based counterparts, they do have the potential for incorporating new knowledge and thus for providing better predictions in the future.

Overall, I thoroughly enjoyed reading this volume. It is very definitely a specialist text but one which will prove an invaluable source for the graduate or research worker active in the field

and I recommend highly. At £60.00, however, it is certain to make a dent in the wallet! Nevertheless, the editors are to be commended on producing a volume of exceptional quality - this is one workshop I am sorry I missed!

Michael Slattery
School of Geography
University of Oxford

PAST AND PRESENT SOIL EROSION. Edited by Martin Bell and John Boardman. Oxbow Monograph No. 22. Oxbow Books, Oxford. ISBN 0 946897 46 8, £ 28.

Archaeological studies enable us to place our present-day concern about soil erosion in the context of a longer time span. At the same time, modern approaches to archaeology are benefitting from the interpretation of soils and sediments made by geomorphologists. The advantages of linking studies of soil erosion and archaeology were appreciated by the editors of this volume when coincidentally, one an archaeologist and the other a geomorphologist, found themselves working in the same area of the South Downs in southern England. In a desire to promote this linking of the two disciplines more widely, the editors convened a conference at the Institute of Archaeology, University College, London, in May 1991. The papers presented at that meeting are brought together here in one volume.

After an introductory chapter outlining the purpose of the volume, the papers are grouped together regionally covering, in turn, lowland Britain, France and Mediterranean Europe. The volume ends with four papers on analytical techniques. Emphasis throughout is at the field scale rather than at a catchment level; as a result, the concern is with hillslope processes rather than with the role of rivers in sorting sediment. The papers cover a range of themes from the role of historical land use change in contributing to soil erosion to the most suitable approaches and methodologies for attempting to understand the past. All the pepers have technical merit and provide valuable information not easily available from any other source. The book is extremely well produced and is excellent value for the money. I am pleased to add it to my collection of soil erosion texts.

R.P.C. Morgan
Silsoe College

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