



1. From the Chair

Dear Pedometricians!

Welcome to the 17th newsletter of our group, the second since we are a Commission of the IUSS.

The most important event we had the past half year was the workshop on Digital Soil Mapping in Montpellier, organized jointly with the Soil Geography Commission and Division 1 of the IUSS. The workshop was a great success. So many activities and so much enthusiasm for Digital Soil Mapping, can you believe it? Personally, I was particularly satisfied with the closing discussion, in which so many valuable points were made and a challenging agenda was written. At the meeting it was also unanimously decided (well, to be honest, there was one vote against) that we should try to establish a working group on Digital Soil Mapping within the IUSS. A proposal to the IUSS is currently being prepared and will be submitted in the next few months.

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Our own struggle for becoming a Working Group within the IUSS dates back to the late 1980s. If you have not yet read the historic documents that Alex placed on the pedometrics website you should really have a look. How fortunate that Alex had kept these old documents! And how fortunate that Jaap de Gruijter, who was the first Secretary of our group, has also kept a file of documents from those early years. I share the office with Jaap at Alterra in Wageningen (it's a small world, the world of pedometrics!), and when Jaap was cleaning up last week he dug up his archive and handed it over to me. Among the documents are a copy of the official letter that Jaap and Dick Webster sent to the Secretary General of the ISSS on October 7, 1987, in which they propose that the ISSS establishes a working group on Pedometrics. The establishment did not go without struggle and required quite some additional work, but on October 20, 1988 the Secretary General replied in a letter that the ISSS had agreed the establishment of the Working Group, on a provisional basis, that is (still more work was required to become a 'true' Working Group). I will ask Sanjay to put both letters on our website.

Skimming through Jaap's archive, I also came across the returned ballot papers for the best pedometrics paper awards from the time that Jaap was secretary. I read these with great interest because a paper of mine was on the shortlist of five nominated papers for the year 1996. I did not win, but I now know that I ended second with only six points behind the winners, how close I was! As you will know in September this year in Florida we will vote for the best pedometrics papers of the years 2003 and 2004. The list of nominated papers will be announced before summer, so that you have ample time to read the nominated papers and rank them.

Let me also share with you a pleasant experience I had a few weeks ago. I was asked to review a soil physics project proposal that aimed at measuring, monitoring and mapping the soil water content and soil

salinity status in agricultural fields. The proposal mentioned the term 'pedometrics' at least ten times, also as a keyword. Perhaps this should not come as a surprise because the proposal had as one of its aims the mapping of soil properties from point observations, but I took it as a sign that pedometrics is steadily becoming a broadly recognised discipline within soil science. Obviously, I recommended that the project be funded.

Preparations for Pedometrics 2005 are well underway. We must keep Sabine busy, remember! Let me end with a tip: register soon, also for the post-conference tour in the Everglades (there are only 20 seats, one of them already taken by me!).

Gerard
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2. Pedometrics Logo

In 2004, the idea to develop a logo that represents our pedometrics commission was discussed. Tomislav Hengl used his artistic skills and imagination to generate a new logo shown in Figure 1. Please, send us your feedback. If you dislike it send us an alternative logo. We would like to use the logo on our pedometrics web site, as letterhead in correspondence with members, IUSS and others. Send your feedback to: Sabine Grunwald (SGrunwald@ifas.ufl.edu).

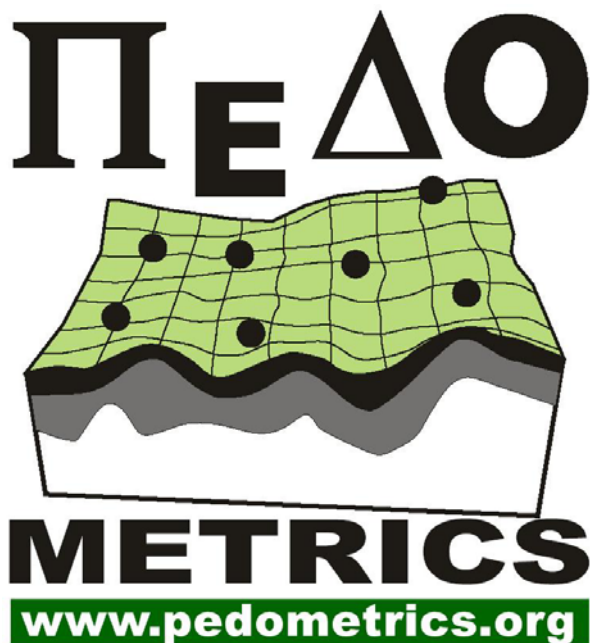


Fig. 1. Proposed pedometrics logo.

3. Highlights – Global Workshop on Digital Soil Mapping (DSM)



3.1. A Student's Perspective

When I was asked to write an impression about the first global digital soil mapping (DSM) workshop I gladly agreed. What follows here is an account of the events that happened around Montpellier during the third week of September, as observed through the eyes of a student. The red line of this story is formed by soils, maps, uncertainties, environmental covariates, wine, more wine, French cuisine, rain and sampling.....and that does not necessarily mean soil sampling.

Two busses full with soil scientists were making their way through the beautiful Languedoc landscape accompanied by rain and thunder. It was Tuesday morning, the day of the field excursion and the day with the worst weather of that week. The aim of this day was to give the participants an impression of the soils and landscape of the Herault valley and of the application DSM techniques in this area. It soon became clear that, during all these years of DSM related research, we might have overlooked one environmental covariate that can probably be used for soil attribute prediction in wine growing areas: the wine quality. It appears that soil influences wine quality. I hope to see a paper about this subject from the French or Australians soon. After five interesting stops and a nice lunch in a very atmospheric setting (the local sports hall), the excursion ended with a visit of a wine cooperative in the region where we had the opportunity to sample some of the wines (stratified in three strata) produced in the Languedoc.

On Wednesday the scientific program started. Phillippe Lagacherie and Alex McBratney opened the workshop with their keynote about perspectives for DSM. During the next days DSM was addressed in its broadest spectrum: sampling methods, quality assessment, representation of maps, new environmental covariates and mapping techniques, quantitative modeling for prediction of soil classes and attributes and multi-scale soil variations were discussed. There were seven different topics introduced by nine keynotes and

followed by in total 48 short five-minute (soil scientist have very long minutes, so it appeared) presentations. Each topic was concluded with a discussion. During these discussions it became clear that although a lot of research has been done the last decades, new research challenges keep raising. Sampling strategies, quality assessment, integration of DSM within GIS, (international) soil spatial databases and temporal and dynamic modeling of soil genesis and soil-landscape relationships, to name a few examples, are important new areas of research that need more attention. Tomislav Hengl presented six interesting (research) quests for the next decade. The Digital Soil Mapping era is just beginning.

Besides the scientific program there was of course the social part of the workshop, which appeared to me as important, or maybe even more important, as the scientific part. Several excellent lunches split up the daily programs. The Wednesday evening was ended with a musical buffet where we could not only witness (again) the wonders of French cuisine but also its cruelty. Accompanied by merry music of the band, a bowl of snails was fried alive in boiling oil. Although most people were a bit reluctant to sample some of the fried snails, at least more reluctant when there was a chance to sample some strong alcohol, the snails were eaten so the poor creatures didn't die their horrible deaths in vain. After this the table with food got heavily sampled with every soil scientist using a different strategy for this. The social part of the workshop ended on Thursday with a gala dinner where again some large quantities of wine were sampled. I observed a clear negative correlation, at least at the table with a few import Australians, some Dutch and a Croatian, between the academic level of conversation and the hour of the evening, i.e. the number of wine bottles emptied.

My last words in this newsletter I will use to thank the organizing committee for making this workshop such a successful event. The discussion sessions were appreciated by many of the participants and were a valuable source for new initiatives for future research. After four days in Montpellier, I think everybody could return home satisfied, with a full stomach and a head full of new research ideas. I think this promise much for Rio 2006!

Bas Kempen
Wageningen University, The Netherlands



Fig. 2. The musical buffet and boiling of snails at DSM in Montpellier, France.



Fig. 3. Field trip DSM workshop – Languedoc, France.



Fig. 4. DSM workshop in Montpellier, France.

3.2. A Scientist's Perspective

The Digital Soil Mapping Workshop 2004, held in Montpellier, France from 14-17th September 2004, gathered some 80 participants from more than 15 countries. Although some important regions such as India, China or African countries, were not covered, the DSM2004 can truly be called a Global workshop since it covers literally any form of soil mapping and brings together experience from different soil survey schools. What made this meeting special is that the organizers wanted on purpose to put more focus on the discussion blocks and summary reports.

The topics ranging from economics of soil data to visualisation and multi-scaling issues, were well selected and the discussion blocks have often proven to be too short as there were always hands in the air. Often the discussion went overtime as there were many open and important issues that participants felt that needed to be emphasized:

- is digital soil mapping more expensive (because of the training and equipment needed) than the traditional survey?
- is comprehensive sampling worthwhile considering the gains and processing needed?
- do users need to be informed about the uncertainty of the soil maps and how to help them use such information for decision making?
- is remote sensing usable for soil mapping if there is a significant vegetation cover?
- should we focus on mapping soil types or soil properties and do we need soil classification systems at all?
- how to bring together traditional surveyors and traditional soil maps and modern concepts (geostatistics, fuzzy classification, wavelet analysis etc.)?

The last day, Alex McBratney, Phillipe Lagacharie and Marc Voltz convened the workshop and asked for topics that need to be considered for the next DSM that will be held in two years in Rio de Janeiro, Brazil. One point from the summary meeting that I need to emphasize is a need to give more focus on applicable soil mapping products (soil pollution maps, suitability maps, erosion hazard etc.) and not the soil (class or property) maps as such. The DSM group will hopefully continue functioning as a Working group of the IUSS, under the Commission 1 Pedometrics. At the end, I should also mention that there were many original impressions from these four days: we have tasted

boiled snails, drunk a bottle of wine per day and discovered that Montpellier is not a place in the mountains.

Strong points of the conference

We could easily note that the organizers have spent a significant amount of time on preparing the meeting as the daily programme was booked until late in the evening. Especially strong points were: excellent auditorium where the workshop was held and well structured blocks of presentations and discussions. Also the social activities were well planned and selected. The workshop had a deductive character, which was nicely seen in the discussion blocks and later on in the reporting block where different problems were grouped and key points extracted. All discussants and rapporteurs were selected appropriately and discussions were very constructive.

What could have been better?

I will now try to be constructive and discuss some weaker organisation points. Note that my intention is not to criticise or condemn but to help future meetings to be even better. Although there were not many negative experiences from the workshop (as compared to my evaluation of the Pedometrics conference in Reading), I do need to emphasize the following five that have frustrated/disappointed me somewhat:

- Although the organizers do plan to produce a book out of the submitted papers, I still believe that they **could have prepared and printed the complete papers**, instead of giving us a print of the (outdated) abstracts and a CD. It appears that, with a little more effort, organizers could have printed and bound all papers (as for example in the case of the Accuracy conference), so that we could have followed the talks and make notes directly on the papers.
- The proposed limit of 5 minutes for presentations was often broken (and often doubled or tripled!). On one hand, the organizers had a good idea to focus on discussion rather than just one-way communication, but obviously **most of the participants did not accept to talk for only 5 minutes** after they have crossed thousands and thousands of kilometres to present their work.
- Organizers did not assist much in finding the accommodation for visitors. Many of us were

for the first time in Montpellier, and many had problems orienting themselves in the city. In my opinion, the organizers **could have booked the most suitable (closest) hotel** for a larger group of people already in June/July.

Technology 'rendezvous' organized by ANVAR on Wednesday from 15:30-18:30 could have been much more interesting, in my opinion. I was expecting an exhibition of DSM technologies (sensors, field equipment and similar gadgets) or at least demonstration of DSM tools/software. If at least, **a special session on "Software implementation" is considered in future** where interested participants could demonstrate data processing (e.g. give short training) in their software packages. Many of us would like both to purchase such tools and get some initial training.

Pluses and minuses of the DSM2004 conference:

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<ul style="list-style-type: none"> ▪ Excellent auditorium with excellent acoustics and visuals. ▪ More focus was given to discussions and making summary conclusions – the idea of having a chair, discussant and a rapporteur was proven efficient. ▪ Network access provided during the duration of the conference (2 PCs). ▪ Organizers (Phillipe and Veronique) were available 24 hours via their mobile phones. ▪ Book of abstracts, maps of the city and other usefull brochures were distributed at the beginning of the workshop. ▪ Social activities (dinner) were well selected and organized.
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<ul style="list-style-type: none"> ▪ Papers were distributed on a CD only. ▪ Technology 'rendezvous' organized by ANVAR on Wednesday from 15:30-18:30 was below expectations. ▪ Participants had to find accommodation themselves, which was proven frustrating. ▪ The proposed limit of 5 minutes for presentations was often broken. ▪ Preparation of the DSM book (instructions to authors) was not addressed. ▪ Although priority was given to discussions, the product of the workshop is still unknown.

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3.2. A U.S. Scientist Perspective

What's new this year at the world Digital Soil Mapping workshop in Montpellier, France? Well, as a first time participant I'd have to say that it is difficult to say what's new, but easy to say what's happening.

The conference began with an excellent field trip into the wine country of southern France. Apparently the weather didn't get the memo and wasn't cooperating. We had a little bit of rain, but the congeniality of group kept the outlook sunny. The field trip took us through the geology, geomorphology, and soil forming history of a small but delightful piece of France. The highlight was a visit to a local winery, complete with a sampling of the agricultural products of the area. The field trip was excellent, the food delicious, the camaraderie without peer, and as with other aspect of the conference, the planning was exceptional.

The lecture portions of the conference centered on short presentations; in most cases less than five minutes in length that highlighted the work of individuals or groups using digital soil mapping. This was truly a global conference and the nationalities of the participants reinforced that fact.

Talks were given on numerous subjects, but I felt that there were several key themes that came out of the conference. The first was the immense potential for digital soil mapping and the need to create and maintain cooperation between individuals and groups using this technology. Throughout the world it appears that there is a need for soils data to be produced with greater speed and/or accuracy. Although diverse methodologies exist for producing digital soil maps, all of these methods have commonalities in that they are used to develop quantitatively based predictions of soils or soil property distribution. Indeed we may say that the diverse nature and locations of the projects using the DSM technologies adds to the validity to the science.

This conference showcased the different scales at which DSM is used and the fact that different methodologies may be more or less appropriate when used at these different scales. These methodologies however do not appear to be incompatible, and in fact may in the future be used as part of a nested approach to analysis. Nationwide mapping leads to landscape level modeling, which at finer scales leads to field level

mapping. Following this same line of thinking, large scale polygon based mapping can be used in conjunction with landscape level modeling, with the final level being a field level map produced by kriging or fuzzy classification. The most powerful aspect of the DSM technology is the ability to produce a map at whatever level, and for whatever needs the end user desires.

The last theme that was apparent in the DSM meetings centered on the need for advancement in techniques, while maintaining cohesion and continuity in the direction of DSM. This was in no place more apparent than the discussion of accuracy assessment. DSM in a paradigm shift that requires us to think of soil mapping in a new way, and gives us the opportunity to express the accuracy and uncertainty involved in the mapping process. There is as yet no standard method universally accepted for testing and expressing this important information.

In all this meeting was a fabulous success. The participants were of the highest caliber and the whole of the meeting reflected that fact. Do not miss the next meeting. Special thanks should go to the wonderful hosts and host country. The organization was flawless. So thank you France for the delicious cuisine, the great company, and for helping further the capacity of DSM.

Nephi John Cole
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4. Highlights - Eurosoil Meeting



The 2nd Eurosoil meeting took place in Freiburg, Germany from September 4-12, attended by over 1,200 soil scientists. Participants came mainly from the

European Union, but also from all over the world. In 2004 this meeting was a major highlight featuring ongoing research and teaching activities in soil science. The program included 25 symposia covering a very large spectrum of topics in Soil Science, ranging from the study of soil processes to the role of soil management in sustaining society and environment.

At least, 4 symposia were committed to topics familiar to the pedometrics community. They were entitled: "Regionalisation of Soil Data", "Soil Information Systems", "Significance of Soil Forming Processes", and "Soil Monitoring"; complemented by a poster session "Soils in Space and Time".

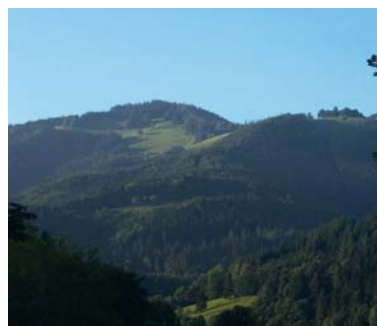


Fig. 5. Freiburg is located in south-western Germany in the Black Forest area. The highest peak in the Black Forest is the Feldberg (1,493 meters). The landscape of the southern region is characterized by eroded sandstone and limestone scarps. The lowland terraces of the Rhine river valleys, with their dry and warm climate, are suitable for agriculture and are highly productive. The loess and loam soils of the plains and valleys are cultivated extensively, and orchards and vineyards flourish.

If we accept the definition given by Gerard Heuvelink to pedometrics "the application of mathematical and statistical methods for the study of the distribution and genesis of soils" (Pedomatron N° 15), a very large number of presentations in Freiburg could be considered as research in pedometrics. For instance, spatial and temporal modelling approaches are developed by a very large number of research teams, focusing on GIS procedures, soil inventories from regional to continental scales, or soil monitoring in relation to new regulations intended to protect the soil resource. Eurosoil was therefore a good illustration of "applied pedometrics".

From a personal point of view, I found that validation procedures and uncertainty assessments were very often the weakest points of the studies presented. For

this reason, the working group on “Digital Soil Mapping” founded in Montpellier during the DSM workshop appears to me as a very timely initiative to strengthen the procedures involved in that area.

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5. Pedometrics 2005 “Frontiers in Pedometrics”

**Biannual Meeting of Commission 1.5 Pedometrics,
 Div. 1 of the IUSS
 September 12-14, 2005
 Naples, Florida, USA**

5.1. Overview and Theme of the Conference

Recent technological advances in soil mapping, data acquisition and management, and computational capabilities have had major impact on pedometrics. This conference will focus on **Frontiers in Pedometrics** highlighting trends and cross-discipline pedometrical applications. The conference is designed to bring together leading international scientists involved in pedometrics and those who have interest to improve our understanding of soil-landscapes. We will critically discuss emerging soil mapping concepts and quantitative methods that will shape the next generation of soil-landscape models.

Topics of Interest

- Soil sensor and remote sensor applications
- Interfacing GIS and geostatistics
- Pedometrics interfacing with other disciplines
- Environmetrics applications
- Advances in soil mapping
- Advances in soil sampling and monitoring
- Pedodynamic modeling
- Advances in soil information systems
- SCORPAN, CLORPT and hybrid applications
- Integration of pedometrics into routine soil surveying programs
- Reconstruction of soil-landscapes
- From point to globe – scaling issues
- Space-time modeling
- New concepts for soil-landscape modeling



Fig. 6. Map shows pre-conference, conference and field trip locations (Pedometrics 2005 meeting).

Information about registration, lodging, and more is available at:

<http://conference.ifas.ufl.edu/pedometrics/>.

Questions related to the meeting should be send to:

Sabine Grunwald (SGrunwald@ifas.ufl.edu) or Sharon Borneman, Office of Conferences & Institutes University of Florida/IFAS (SPBorneman@ifas.ufl.edu).

Program Committee:

- *Sabine Grunwald*
Soil and Water Science Department, University of Florida/IFAS, USA
- *Gerard Heuvelink*
ALTErrA and Laboratory of Soil Science and Geology, Wageningen University and Research Centre, the Netherlands
- *David Brown*
Dept. of Land Resource & Environmental Sciences, Montana State University, USA
- *Pierre Goovaerts*
PGeostat, LLC & Biomedware Inc., USA
- *Budiman Minasny*
Faculty of Agriculture, Food and Natural Resources,
The University of Sydney, Australia

5.2. Pre-Conference Workshop

Time: Sept. 9-10, 2005.

Location: University of Florida, Gainesville, Florida.

Theme: Quantitative Visible and Near-Infrared Diffuse Reflectance Spectroscopy (VNIR-DRS) for Soil Characterization.

The workshop covers the science, engineering and quantitative analysis techniques of soil VNIR-DRS. This will include: (a) the basic physical chemistry responsible for VNIR absorptions; (b) a discussion of the instruments used to measure VNIR reflectance; (c) standard spectral processing techniques; and (d) a range of quantitative analysis techniques which include Fourier analysis, chemometrics (PLS regression), data mining (e.g. CART), and continuum removal for mineral identification.

Bonus materials: Recognizing that many pedometricians do not have ready access to a spectroradiometer, we will provide all participants with a 4000+ sample spectral library and associated soil characterization data obtained from the U.S. Soil Survey archives. We will also provide R code for spectral processing, chemometrics and other analytical techniques as time allows. Participants should be able to leave the workshop with the data and tools to initiate their own work in quantitative VNIR-DRS.

Instructors: Dr. David Brown (Montana State University, Bozeman, MT; djBrown@montana.edu) and Dr. Fred McClure (North Carolina State University, Raleigh, NC).

(Transportation from Gainesville to Naples, FL will be provided).

5.3. Post-Conference Field Trip

Time: Sept. 15, 2005

Location: Greater Everglades, Florida, USA.

Instructor: Dr. Mark Clark, Soil and Water Science Department, University of Florida (clarkmw@mail.ifas.ufl.edu).

The Florida Everglades represents one of the largest and most distinct freshwater marshes in North America. Formed over limestone it extends over an area of about 15,000 km² with the Everglades National

Park encompassing 5,698 km². The wetland ecosystem is naturally phosphorus limited and includes endogenous vegetative communities characterized by strands of *Cladium jamaicense* (sawgrass) and open slough areas.

Join us on an adventurous field trip (limited to the first 20 participants).

6. Smithsonian Soil Exhibit

In the May/June 2004 issue of the Journal of Soil and Water Conservation, Executive Director Craig Cox noted the need for a strategic increase in funding and education for the conservation provisions outlined in the Farm Security and Rural Investment Act of 2002 (FRSI). The Agronomic Science Foundation (ASF) and the Soil Science Society of America (SSSA) are proud to announce the development of a new soil science exhibit to be featured in the Smithsonian Institution's National Museum of Natural History in 2006. The exhibit will be part of the Global Links Gallery which is the core of the museum's Forces of Change earth system science program. The Smithsonian National Museum of Natural History is the most visited museum in the world and it is expected that the exhibit will be viewed by 6–9 million visitors per year, for two or more years starting in 2006. Visitors leaving the exhibit will: understand and appreciate the myriad ways soil is essential to our lives; understand that healthy soils are linked to human health, economic strength, environmental health, and food security; and understand the human impacts on soil.

Provided adequate sponsorship can be obtained, Soils Exhibit modules will be loaned to museums, libraries, and institutions across the country for at least 5–7 years. SSSA members and NMNH staff with expertise in soils, module specialties, and education will develop complementary educational materials for grades 6–9. These materials, along with career information and resource lists, will be available indefinitely through the NMNH and SSSA Web sites.

The Smithsonian Soils Sustain Life! Exhibit will help fill a void in public education about soils and their many uses in our lives. An informal survey of a number of states' education standards finds almost no mention of

soils. States with strong agricultural sectors tend to place more emphasis on soils information in the curricula. The Smithsonian Soils Exhibit can help spur greater awareness of the importance of soils in our lives and greater attention to soils topics at the primary and secondary levels throughout the nation.

The greatest challenge that we are currently facing in undertaking the Smithsonian Soils Sustain Life! Exhibit is in raising sufficient support to fund the development and installation of the various modules in the Exhibit. Our strategy to overcome this challenge is to raise the funds up front, before the work to develop specific displays begins. We have the backing of some essential and powerful supporters but need additional support. For more detailed project information and information on how to make a pledge or gift, visit the web page www.soils.org/smithsonian.

Dr. Patrick Drohan
Assistant Professor, Soil Science
University of Nevada Las Vegas
and
William Ypsilantis
Soil Condition and Health Specialist
Bureau of Land Management

7. Western Regional Applied Technology Committee

The Applied Technology Committee was recognized as a standing committee of the biennial Western Regional Cooperative Soil Survey (WRCSS) Conference in June 2004. The objectives and purposes of the WRCSS Conference are to bring together western state representatives of the National Cooperative Soil Survey (NCSS) to discuss and resolve technical and scientific issues, recommendations, and proposals for the cooperative soil survey activities in the Western United States and the use of soil resource data and information.

The Applied Technology Committee was formed to promote the use of new technology in soil mapping and soil information delivery, disseminate information on new technology to West Regional NCSS members. A second charge is to provide recommendations to the National New Technology Committee on application of

new technology tools and resolution of barriers to the use of new technology. The Western United States is a vast region that still has tens of millions of acres that have not had an initial soil survey completed on them. The region is characterized by an astonishing diversity of soils and landscapes, rugged terrain, remote areas with limited access, and rapidly increasing populations and needs for soil information.

The use of emerging tools, such as remote sensing and GIS, is paramount to conducting soil surveys in a cost efficient, accurate, timely manner in the West. The users are also requesting that soil information be delivered in an innovative, interactive, digital format. The Applied Technology Committee has the opportunity to help foster these efforts. The committee has identified important new technology issues that need to be pursued, such as: 1) ensuring adequate staff and funding to maintain momentum for incorporating advanced technologies into the NCSS soil survey program, 2) developing a committee web site, 3) assist in development of metadata standards for the National Soil Survey Handbook describing application of new technology processes and procedures in soil surveys, 4) providing input and feedback to the National Soil Survey Center on new technology development, and 5) developing a catalog of applications of advanced technology to soil survey in the West.

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8. Upcoming Meetings and Workshops

Pedometrics 2005 – Frontiers in Pedometrics

<http://conference.ifas.ufl.edu/pedometrics>

Biannual Meeting of Commission 1.5 Pedometrics, Div. 1 of the IUSS in Naples, Florida, USA, Sept. 12-14, 2005. Abstracts due May 1, 2005.

Contact: Sabine Grunwald (SGrunwald@ifas.ufl.edu).

World Congress of Soil Science (WCSS)

<http://www.18wcoss.org>

Philadelphia, Pennsylvania, USA, July 9-15, 2006.

Abstracts due Sept. 15, 2005.

Symposia (co)organized by the Pedometrics

Commission:

- (1) Diffuse Reflectance Spectroscopy, Soil Sensing, Remote Sensing and Image Analysis
- (2) Soil Sampling in Space and Time
- (3) Interdependency of Soils and Soilscales.

9. Career Opportunities

9.1 Research in Soil-Landscape Modeling

Work is available for a recent PhD graduate in Soil Science (pedometrics or related subject) into Soil-landscape modelling at the University of Sydney. This will be a 1-year project providing great research experience in Australia. Most quantitative pedogenesis model treat the soil as a single entity with the processes of leaching, addition, and transformation of its constituents via chemical mass-balance. Meanwhile models in geomorphology only consider the evolution of landforms as a result of the processes of erosion and runoff. This project attempts to link the soil forming processes spatially in a landscape. It aims to develop a mechanistic model to simulate soil profile development in the landscape.

Skills in soil science, modelling, computer programming, and pedometrics are essential. For more information, e-mail Prof. Alex McBratney (Alex.McBratney@acss.usyd.edu.au)

9.2 Research in Digital Soil Mapping

Work is available for a recent PhD graduate in Soil Science (pedometrics or related subject) into Digital Soil Mapping at the University of Sydney. This will be a 1-year project and will provide a great opportunity to research Digital Soil Mapping in Australia. Soil mapping is a fundamental component of Land-Resource Management and sustainable agricultural production. Conventional soil surveys have been restricted by expensive methods and sampling techniques. This has resulted in low-resolution soil maps that are not applicable to Land-Resource Management. Therefore Australia and the rest of the

world require more information on soil at a finer scale. This project aims to develop a robust, quantitative and cost-effective methodology for Digital Soil Mapping. This research will be carried out in an area of eastern Australia and will focus on mapping soil classes and the distribution of soil properties.

Skills in soil science, GIS, geostatistics and pedometrics are essential. For more information, e-mail Prof. Alex McBratney (Alex.McBratney@acss.usyd.edu.au)

9.3. Researcher

Grade : CR2

Short title : Characterisation and modelling of soil evolution and spatial variability

Research sector of INRA :

Environment and Agronomy (EA)

Aim of the research project:

The aim of the research project is to understand and to model processes of soil formation that are responsible for (i) soil spatial variability and (ii) soil evolution with time as a function of climate change and land use (fourth priority of the third theme of the EA research sector of INRA: Soil evolution and soil protection).

Research skills: Specialised in soil science. Knowledge of some of the processes of water/chemical/particle transfers in soils and of mineral weathering. Application of this knowledge to the processes of soil formation and soil spatial variability. Demonstrated ability and enthusiasm for numerical modelling. Ability to perform multidisciplinary work and to synthesize of knowledge in order to develop a new modelling approach taking into account scales of time and space.

Address of the department where the researcher will be located

Name: Unité de Recherche de Science du Sol

Head: Guy RICHARD (in place of Dominique KING)

Centre: ORLEANS

Address: INRA Domaine de Limère Avenue de la Pomme de Pin - BP 20619; 45166 Olivet France

Research activities of the Unité de Recherche de Science du Sol: The department is studying the spatial organisation and functioning of soils at different scales e.g. agricultural field, watershed, and landscape. It has recently focused on the cumulative effects of agricultural practices on soil evolution and on

the consequences of this evolution on the environment (soil protection, water and air quality).

The department comprises 25 members of staff including 12 researchers and is associated with another department (InfoSol) of 10 engineers that specialises in GIS for soil cartography. Laboratory facilities include mineralogy determination, porosity analysis, chemical analysis of soil and water, hydraulic properties determination, rainfall simulator with laser profilemeter and a laser particle size analyzer. It mainly collaborates on a regional scale with the Universities of Orléans and Tours and with BRGM

(French organization for protection of natural resources). With InfoSol, this department participates in national and European networks dealing with mapping and monitoring of soils.

First research program

The researcher will work within a team on a small region chosen as being a natural model of the functioning of a large geographic region. His/her work will consist of (1) identifying the main pedological processes that occur

over time, (2) formalising these processes quantitatively using existing physical and/or chemical models. The time scales considered will mainly be those compatible with recent pedological processes that are largely influenced by human activities (e.g. several tens to hundreds of years).

Collaborations with geomorphologists and agronomists should be developed.

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Key-words: Soil, evolution, modelling, pedogenesis, spatial organisation, conservation.

9.4 Spatial Statistical Analyst

Fort Lauderdale Research and Education Center, University of Florida

The Ft Lauderdale Research and Education Center is seeking applicants for a technical analyst position on ongoing applied ecological research projects that looks at the entire Greater Everglades South Florida landscape and evaluates the effects of restoration alternatives on listed species, biological diversity and ecological integrity.

The successful candidate will assist with spatial and geostatistical problem solving to examine spatial issues of hydrological and land use characteristics and

wildlife habitat in the Everglades landscape, and landscape model integration with public and policy-maker decision support systems. Models will assist federal and state agencies in making restoration recommendations and decisions in south Florida. Preparation of documentation, metadata, and publications is expected.

Applicant should be well versed in spatial statistics, geostatistics and general programming. Experience with integrating statistical models in ArcGIS is desirable. Education and experience in ecology, conservation biology, or related field and experience with ecological models are a plus. Minimum salary is \$30,567 and depends upon education and experience. Salary includes a full benefits package. Position will be filled immediately. The appointment is for one year with additional years possible depending upon continued funding and successful performance of duties.

Please send letter of interest, and CV by mail or e-mail no later than March 1, 2005 to (electronic submission is preferred): Dr Leonard Pearlstine, University of Florida-IFAS, 3205 College Ave., Ft. Lauderdale, Florida, 33314-7799. pearlstn@ufl.edu.

AA/EA/EEO. If an accommodation is needed to apply for this position, please call (954) 577-6304.

9.5. Upcoming Vacancy of Full Professor of Earth Surface Processes

with focus on local scale interrelationships between geomorphological, soil and biotic processes.

FACULTY OF SCIENCE, UNIVERSITEIT VAN AMSTERDAM

Institute for Biodiversity and Ecosystem Dynamics (IBED)

The Chair of Earth Surface Processes is a chair in the field of Physical Geography within the Institute for Biodiversity and Ecosystem Dynamics of the Faculty of Science of the Universiteit van Amsterdam (UvA). The Chair's research of processes and properties of the terrestrial earth surface including the soil, at scales ranging from micro-scale up to hill slopes or landscapes, has a long and productive record. While this strength is to be continued, a more integrated approach will be adopted.

Scientific challenges

to quantify and model the interrelationships between geomorphological, soil and biotic processes, in relation

to their properties and their heterogeneity in space and time to develop models that predict the effect of environmental change on terrestrial earth surface processes at local scales to increase our understanding of the fate of natural and anthropogenic substances in terrestrial and adjacent aquatic systems to analyse, explain and reduce the discrepancy between laboratory and field observations to develop and improve techniques for measurement of key processes and properties at local and transcending scales.

Composition of the Chair

At present, the Chair includes 1 full professor (current chair holder), 2 part time professors, one associate professor, 4 assistant professors, 5 postdocs, and 7 PhD-students. The Chair has access to extensive laboratory facilities.

Because of the composition of the group, the chair holder must at least have affinity with the following scientific domains: earth surface and soil hydrology; geomorphological and soil processes and patterns; bio-geochemical cycles; the fate of natural and anthropogenic substances in ecosystems; measurement techniques for field and laboratory use; modelling.

Teaching

The Chair plays a major role in the BSc programme of "Earth Sciences – Physical Geography" and the MSc programmes of "Earth Surface Processes" and "Earth and Environmental Sciences". A general overview of Physical Geography and affinity and experience with scientific education is therefore a prerequisite.

More info: www.science.uva.nl/ibed/fg

The current professor of "Earth Surface Processes" of the Institute for Biodiversity and Ecosystem Dynamics of the Universiteit van Amsterdam will retire. This position will therefore be available soon.

A search committee makes an inventory of potential candidates. If you know any candidates, please let us know. If the position may be of interest for yourself, we invite you to express your interest by sending a CV or asking for more information. Depending on the response, we will either start a selection procedure on the basis of this inventory or announce the vacancy in some journals. Prof. Dr. Ir. Willem Bouten,

w.bouten@science.uva.nl, tel +31-20 5257412 / +31 20 5257451.

9.6. Workshop

Introduction course to the Bayesian Maximum Entropy (BME) approach

The course will take place at the **Université catholique de Louvain in Louvain-la-Neuve, Belgium, on September 14-16, 2005**. It is intended as an introduction to the concepts driving the BME approach for scientists that are already familiar with the traditional geostatistical methods. The basic concepts will be illustrated through real case studies using an interactive software (the [BMElib](#) library of comprehensive computer programs, written in Matlab®). For more information, please visit the course web site at <http://www.enge.ucl.ac.be/bmecourse/>

10. Themes for Pedomtron 18 (Next Issue)

To stimulate the discussion for our next pedomtron newsletter here are few topics. If you like to write a small contribution (MS Word; no PDFs !) please send your material to the editor (SGrunwald@ifas.ufl.edu).

(Topic 1). Methods to separate/model spatial autocorrelation and spatial covariation of a soil dataset. What are the pros and cons of different methods.

(Topic 2). Soil sensors – share your experience with sensor applications (both, good and bad experiences are welcome); problems of mixing soft and hard datasets.

We also like to feature the profile of a young pedometrician in our next newsletter. Share your background, what you do (your current pedometrics project), career goals and others with us. Send contributions to SGrunwald@mail.ifas.ufl.edu.