

**Name** FABRIZIO A. UNGARO  
**Nationality** Italian  
**Date of birth** 15 NOVEMBER 1965  
**Gender** MALE



## WORK EXPERIENCE

- Dates December 2001 - present
- Name of employer National Research Council of Italy, Institute for BioEconomy (CNR IBE)
- Type of sector Public Research Body
- Position held Permanent Research Scientist
  
- Main activities and responsibilities
  - Research, teaching
    - Full time research scientist responsible for carrying out and coordinating research activities (including administration of research funds), fund raising, student tutoring and teaching.
  
  - Main research interests and applications:
    - spatial analysis of agro-environmental resources and pedometrics for soil characterization, analysis, prediction and mapping;
    - probabilistic and deterministic modelling for natural resources characterization, land use changes evaluation, and environmental risk assessment;
    - regionalized variables analysis applicable to agro-environmental research and field technology;
    - integration of soil related aspects of land management into microeconomic analysis of farming systems for multi functionality assessment;
    - soil based ecosystem services assessment and mapping; Landscape services
    - environmental and applied soil physics; simulation models for water-heat, solutes (nitrates) and pollutants (pesticides) transport in field soils;
    - indirect methods for estimating soil physical and hydrological properties: pedotransfer rules and functions, statistical networks, neural networks
  
  - Participation in international programmes
    - 2003-2005 “**VINVAL**”, EU- FP5, INCO2 contract no: ICA4-CT-2001-10047: “Land use changes in inland valley of Ghana and Burkina Faso”
    - 2004-2007 “**RECONDES** - Conditions for restoration and mitigation in desertified areas using vegetation”, EU- 6 FP, n° GOCE-CT-2003-505361
    - 2004-2007 “**MEASCOPE** -Micro-economic instruments for impact assessment of multifunctional agriculture to implement the Model of European Agriculture”, European Union 6th framework program
    - 2008-2012 “**DESIRE**” - European Union 6th framework program, thematic priority 6: Sustainable Development, Global Change and Ecosystems
    - 2012-2014 **CLAIM** - Supporting the role of the Common agricultural policy in Landscape valorisation: Improving the knowledge base of the contribution of landscape Management to the rural economy’ European Union 7th framework program,

<ul style="list-style-type: none"><li>• Dates</li><li>• Name of employer</li><li>• Type of sector</li><li>• Position held</li><li>• Main activities</li></ul>	<p>2012-2014</p> <p>ZALF - Leibniz-Centre for Agricultural Landscape Research, Müncheberg, Germany</p> <p>Research</p> <p>Post Doc Researcher in Spatial modelling and agricultural policies</p> <p>Application of spatial analytical methods to analyse the relationships between drivers, determinants of landscape valorisation and impacts in their temporal and spatial dimension within the framework of the EU-project 'CLAIM - Supporting the role of the Common agricultural policy in Landscape valorisation: Improving the knowledge base of the contribution of landscape Management to the rural economy'.</p>
<ul style="list-style-type: none"><li>• Dates</li><li>• Name of employer</li><li>• Type of sector</li><li>• Position held</li><li>• Main activities</li></ul>	<p>2006-2008</p> <p>University of Florence – Faculty of Mathematics, Physics and Natural Sciences</p> <p>Higher education and research</p> <p>Contract Professor – Pedology</p> <p>Teaching</p>
<ul style="list-style-type: none"><li>• Dates</li><li>• Name of employer</li><li>• Type of sector</li><li>• Position held</li><li>• Main activities and responsibilities</li></ul>	<p>July 1997 - December 2001</p> <p>CNR IGES Institute for Soil Genesis and Ecology (Istituto per la Genesi e l'Ecologia del Suolo) - Firenze</p> <p>Public Research Body</p> <p>Temporary Research Scientist</p> <ul style="list-style-type: none"><li>○ <u>Main research interests and applications:</u></li></ul> <p>All the research activities between 1997 and 2001 were carried out within the framework of the project “ <b>National Information System for the Environment (SINA) - Soil Mapping in Areas at High Environmental Risk</b>” funded by the Italian Ministry of Environment and coordinated by the Geological, Seismic and Soil Survey Office of Regione Emilia Romagna. The main activities focused on:</p> <ol style="list-style-type: none"><li>1. Use of simulation model(s) for water-heat and solute transport in layered soils focused mainly on <b>soil hydrological properties</b>, allowing the evaluation of their influences on soil protection from chemicals and pollutants under different cultivation and climatic scenarios;</li><li>2. Definition and evaluation of <b>pedotransfer functions</b> (PTFs) to quantify soil hydrological properties to be used as input for the simulation model(s) whenever direct measurements of such properties are not available;</li><li>3. Edition of a survey protocol aimed to the description of soil characters and field evidences affecting hydrologic behaviour and necessary for PTFs application;</li><li>4. Evaluation of models outputs and PTFs by comparison with experimental data;</li><li>5. Compilation of a soil hydraulic properties data base within the framework of the SINA project - Soil Mapping and Groundwater Vulnerability.</li></ol> <ul style="list-style-type: none"><li>○ <u>Partnership in international programmes:</u></li></ul> <p>1997-1999 '<b>TERON</b> - Tillage Erosion, current state, future trends and prevention', EU- FP5, n° FAIR3- CT96- 1478</p>
<ul style="list-style-type: none"><li>• Dates</li><li>• Name of employer</li><li>• Type of sector</li><li>• Position held</li><li>• Main activities and responsibilities</li></ul>	<p>October 1996 - June 1997</p> <p>CNR – Centro di Studio per la Genesi, la Cartografia e la Classificazione del Suolo - Firenze</p> <p>Public Research Body</p> <p>Post doctoral fellowship</p> <p>Compilation of a meta data-base of the most commonly used models for <b>simulation of solutes and pollutants transport in soils and critical evaluation of the input parameters</b> required to run the models. The research is preliminary to the SINA (National Information System for the Environment) project - Soil Mapping and Groundwater</p>

	Vulnerability.
<ul style="list-style-type: none"><li>• Dates</li><li>• Name of employer</li><li>• Type of sector</li><li>• Position held</li><li>• Main activities and responsibilities</li></ul>	<p>April 1996 - June 1996</p> <p>Land, Water and Air Resources Dpt., University of California , Davis.</p> <p>University</p> <p><b>Post-doctoral fellowship</b></p> <p>Assessment of the influence of stochastic properties of precipitation on daily potential and actual evaporation through conditional and Monte Carlo simulations for different climatic scenarios for the California Central Valley climate. Tutor: Prof. M. B. Parlange</p>
<ul style="list-style-type: none"><li>• Dates</li><li>• Name of employer</li></ul>	<p>October 1995 – April 1996</p> <p><b>OECD</b> (Organization for Economic Cooperation and Development), within the “Co-operative Research Programme: <b>Biological Resource Management for Sustainable Agricultural Systems</b>”, theme 4: “<b>Surface and Ground Water Quality and Agricultural Practices: Mathematical Modelling of Water Quality and Evaluation of the Data</b>” - Land, Water and Air Resources Dpt., University of California, Davis.</p>
<ul style="list-style-type: none"><li>• Type of sector</li><li>• Position held<ul style="list-style-type: none"><li>• Main activities and responsibilities</li></ul></li></ul>	<p>University</p> <p><b>Post-doctoral fellowship</b></p> <p>Post-doctoral fellowship in the framework of the "Co-operative Research Programme: Biological Resource management for sustainable Agricultural Systems", theme 4 : " Surface and Ground Water Quality and Agricultural Practices: mathematical modelling of water quality and evaluation of the data"</p> <p>Object of the work has been the modelling of the complex interaction of heath-water-solute transport in the unsaturated zone considering the inherent heterogeneity of soils over both space and time domains as the greatest source of uncertainty of any measurement method, heavily affecting a more comprehensive knowledge of field dynamics using a state-space approach integrating Kalman filter and geostatistics. Tutors Prof M. Parlange and Prof. D. Nielsen.</p>
<ul style="list-style-type: none"><li>• Dates</li><li>• Name of employer</li><li>• Type of sector</li><li>• Position held</li><li>• Main activities and responsibilities</li></ul>	<p>March 1995 - September 1995</p> <p>CNR, Study Centre for Soil Genesis, Cartography and Classification, Florence</p> <p>Public Research Body</p> <p><b>Research fellowship</b></p> <p>Geo-morphometric description of erosion forms in central Tuscany badlands and geostatistical elaboration of data.</p>
<ul style="list-style-type: none"><li>• Dates</li><li>• Name of employer</li><li>• Type of sector</li><li>• Position held</li><li>• Main activities and responsibilities</li></ul>	<p>October 1994 – February 1995</p> <p>University of Florence, Italy</p> <p>University</p> <p><b>Post graduate fellowship</b></p> <p>Field survey and research activities within the EEC Research Contract STD3-CT92-0076 “Land Resources Inventory, Environmental Changes Analyses and Their Application in the Abaya Lake Region - Ethiopia”, including: digitisation of contour levels of topographic maps 1:50.000 to build a soil DEM as first step in the compilation of a GIS using a Digital/Geosys software package; API for landscape units maps 1:250.000 and 1:50.000; soil survey and field work planning for soil fertility assessment under different management practices; interviews to the farmers in order to get historical information on local land uses following a PRA approach; undergraduate students supervision during laboratory and field working Ethiopia.</p>
<ul style="list-style-type: none"><li>• Dates</li><li>• Name of employer</li></ul>	<p>November 1987 – January 1988</p> <p>University of Florence, Italy</p>

• Type of business or sector	Soil Science and Plant Nutrition Dpt, University of Florence
• Position held	<b>Field Assistant</b>
• Main activities and responsibilities	Soil survey and analyses of chemical and physical properties of the soils of the Ewaso N'giro river floodplain. The soil survey was preliminary to the realisation of an irrigation scheme in the area and aimed to select the most suitable soils to be cultivated under irrigation and to identify proper management strategies considering the notable soil constraints, namely soil salinity, low permeability and impeded drainage. As a PhD student, from 1991 to 1994, collaboration with the project coordinators and with the agronomists in the field to the monitoring activities of salinity levels in both soils and irrigation waters, planning surveys for data collection, data analysis and evaluation of the results.

### EDUCATION AND TRAINING

• Dates	November 1991 – October 1994
• Name and type of organisation	University of Florence, Italy – Department of Soil Science and Plant Nutrition
• Principal subjects	Soil Physics, Soil conservation, Geostatistics
• Title awarded	<b>PhD in Soil Science</b>
• Dates	November 1984 – April 1991
• Name and type of organisation	University of Florence, Italy – Faculty of Forest and Agricultural Sciences
• Principal subjects	Soil Science, Crop science, Agricultural economics, Animal husbandry, Ecology, Land management
• Title awarded	<b>Master Degree in Tropical and Subtropical Agricultural Sciences</b>
• Level in national classification	Score 110/110 <i>cum laude</i>

### PERSONAL SKILLS AND COMPETENCES.

MOTHER TONGUE      **ITALIAN**

### OTHER LANGUAGES

	<b>ENGLISH</b>	<b>FRENCH</b>	<b>SPANISH</b>	<b>GERMAN</b>
• Reading skills	EXCELLENT	GOOD	GOOD	GOOD
• Writing skills	EXCELLENT	BASIC	BASIC	BASIC
• Verbal skills	EXCELLENT	GOOD	GOOD	GOOD

### ORGANISATIONAL SKILLS AND COMPETENCES

#### Teaching activities

2001 Regional Environmental Protection Agency of Veneto – Course for Soil Survey and Mapping experts; topics : 1) hydrodynamics, saturated and unsaturated flux; 2) Water cycle, water balance and climatic indexes ; 3) introduction to applied geostatistics in soil science, Castelfranco Veneto, December 4<sup>th</sup> – 6<sup>th</sup> (20 hours)

2002 Post graduate course on "UTILISATION DES DONNÉES SOLS ET CLIMAT POUR LA DÉRIVATION D'INPUTS POUR LA MODÉLISATION ET L'ANALYSE SPATIALE POUR LA

GESTION DES RESSOURCES NATURELLES" Centre Regional Agrhymet "Projet de formation en gestion des ressources naturelles et securite alimentaire" Nyamey, Niger, 23<sup>rd</sup> Oct. – 8<sup>th</sup> Nov (70 hours).

2003 Analysis and Interpolation of Spatial Data part II: Kriging: Theory and practice", Region Piedmont – Directorate for Agricultural Development. Turin March 3<sup>rd</sup> -5<sup>th</sup> (18 hours).

2003 " MACRO soil water balance and solute tran sport" Regione Emilia Romagna, Geologic, Seismic and Soil Service, Bologna May 19<sup>th</sup>-21<sup>st</sup> (18 hours).

Academic years 2006-2007 and 2007- 2008 Pedology Contract Professor at the Faculty of mathematical, Phisycal and Natural Scinces , University of Florence, Master Degree in Natural Resources Conservation and Managment (4 CFU, 40 hours)

2008 Post doctoral lectures on Geospatial Data Modelling at the Leibniz-Zentrum für Agrarlandschaftsforschung (ZALF), Institute of Socio-Economics, Müncheberg, Germany, May 26<sup>th</sup> – 30<sup>th</sup> 2008

2015 2016 training course on "Applied geostatistics with R" organised by Regional Environmental Protection Agency of Veneto (ARPAV), Treviso 9-10/3 e 23-24/3 (30 hours)

### Others

2002 - 2009 Acting and play writing activities, Compagnia Teatro Binario 16 – Centrale Produzioni, Florence

2006 2012 Volunteer activities at the Ngo Ireos, Florence Queer Community Centre (counselling, fund raising, social campaigns, cultural events)

2009 -2012 President of the Ngo Ireos

2008 -2011 Florence Queer Festival – festival programmer

2014 – today Kundalini Yoga Instructor, KRI certificate L1

### TECHNICAL SKILLS AND COMPETENCES

Working knowledge of the following softwares:  
MS OFFICE, Q-GIS, STATSOFT, MODELQUEST, @RISK; GEO-EAS, VARIOWIN 2.3.1, WINGSLIB, TOOLBOX, GS-PLUS, ARCMAP, ARCVIEW, GEODA, FRAGSTAT, SURFER , R, RSTUDIO

SOIL SURVEY AND SOIL SAMPLES ROUTINE ANALYSIS

### LIST OF PUBLICATIONS:

#### Articles in journals

1. Calzolari, C., Tarocco, P. Lombardi, N., Marchi, N, Ungaro, F., 2020. Assessing soil ecosystem services in urban and peri-urban areas: from urban soils survey to providing support tool for urban planning. Land Use Policy, 99C (2020) 105037, *in press*.
2. Calzolari, C., Ungaro, F., Vacca, A. 2021. Effectiveness of a soil mapping geomatic approach to predict the spatial distribution of soil types and their properties. Catena, 196, 104818. doi.org/10.1016/j.Catena.2020.104818
3. Ugolini, F., Kamalaki, V., Izquierdo, C.G., Vaccari, F.P., Calzolari, C., Ungaro, F. Examining the bentonite produced in a biodiesel refinery process as soil amendment in a well-draining soil. Clean Technologies and Environmental Policy,

- doi.org/10.1007/s10098-020-01925
4. Ugolini, F., Baronti, S., Lanini, M., Maienza, A., Ungaro, F., Calzolari, C., 2020. Assessing the influence of topsoil and technosol characteristics on plant growth for the green regeneration of urban built sites. *Journal of Environmental Management*, 273, 111168. doi.org/10.1016/j.jenvman.2020.111168
  5. Ambrosone M., Matese A., Di Gennaro S., Gioli B., Tudoroiu M., Genesio L., Miglietta F., Baronti S., Maienza A., Ungaro F., Toscano P., 2020. Retrieving soil moisture in rainfed and irrigated fields using Sentinel-2 observations and a modified OPTRAM approach. *International Journal of Applied Earth Observation and Geoinformation*, 89, 102-113
  6. Abdallah A.M.; Ugolini F.; Baronti S.; Maienza A.; Ungaro F.; Camilli F., 2019. Assessment of Two Sheep Wool Residues from Textile Industry as Organic Fertilizer in Sunflower and Maize Cultivation. *Journal of soil science and plant nutrition*, 19, 793-807.
  7. Fazi S., Ungaro F., Venturi S., Vimercati L., Cruz Viggi C., Baronti S., Ugolini F., Calzolari C., Tassi F., Vaselli O., Raschi A., Aulenta F., 2019. Microbiomes in soils exposed to naturally high concentrations of CO<sub>2</sub> (Bossoleto Mofette Tuscany, Italy). *Frontiers in microbiology*, 10, 1-17
  8. Abdallah A.; Ugolini F.; Baronti S.; Maienza A.; Camilli F.; Bonora L.; Martelli F.; Primicerio J.; Ungaro F., 2019. The potential of recycling wool residues as an amendment for enhancing the physical and hydraulic properties of a sandy loam soil. *International Journal of Recycling of Organic Waste in Agriculture*, 8, 131-143
  9. Häfner K., Zasada I., van Zanten B., Ungaro F., Koetse M, Piorr A., 2018. Assessing landscape preferences: a visual choice experiment in the agricultural region of Märkische Schweiz, Germany, *Landscape Research*, 43:6, 846-861, DOI: 10.1080/01426397.2017.1386289
  10. Ungaro, F., Zasada, I., Piorr, A., 2017. Turning points of ecological resilience: Geostatistical modelling of landscape change and bird habitat provision. *Landscape and Urban Planning*, 157, 297-308.
  11. Ungaro, F., Häfner, K., Zasada, I., Piorr, A., 2016. Mapping cultural ecosystem services: Connecting visual landscape quality to cost estimations for enhanced services provision. *Land Use Policy*, 54, 399-412.
  12. BT van Zanten, I Zasada, MJ Koetse, F Ungaro, K Häfner, PH Verburg, 2016. A comparative approach to assess the contribution of landscape features to aesthetic and recreational values in agricultural landscapes. *Ecosystem Services* 17, 87-98
  13. Calzolari C., Ungaro F., Filippi N., Guermandi M., Malucelli F., Marchi N., Staffilani F., Tarocco P., 2016. A methodological framework to assess the multiple contributions of soils to ecosystem services delivery at regional scale. *Geoderma*, 261, 190-203.
  14. Pistocchi A., Calzolari C., Malucelli F., Ungaro F. 2015. Soil sealing and flood risks in the plains of Emilia-Romagna, Italy. *Journal of Hydrology* 4(B), 398-409.
  15. Ungaro F., Zasada I., Piorr A., 2014. Mapping landscape services, spatial synergies and trade-offs. A case study using variogram models and geostatistical simulations in an agrarian landscape in North-East Germany. *Ecological Indicators*, vol. 46, p. 367-378.
  16. Ponge J.F., Sartori G., Garlato A., Ungaro F., Zanella A., Jabiol B., 2014. The impact of parent material, climate, soil type and vegetation on Venetian forest humus forms: A direct gradient approach. *Geoderma*, 226-227, 290-299.
  17. Ungaro F., Calzolari C., Pistocchi A., Malucelli F., 2014. Modelling the impact of increasing soil sealing on runoff coefficients at re-gional scale: a hydropedological approach. *J. Hydrol. Hydromech.*, 62, 2014,1, 33-42
  18. Magaldi D., Arfaioi P., Ungaro F., Benedetti G., Centofanti M., Ferrante F., Ranalli D., 2013. Natural uranium content of Fe/Mn nodules from some old soils of Central Italy and relationship with the soil trace elements. *Agrochimica*, 2, 2013.
  19. Barca E., Calzolari C., Passarella G., Ungaro F., 2013. Predicting Shallow Water Table Depth at Regional Scale: Optimizing Monitoring Network in Space and Time. *Water Resources Management*, 27, 5171-5190.
  20. Calzolari C., Ungaro F. 2012. Predicting shallow water table depth at regional scale from rainfall and soil data. *Journal of Hydrology*, vol. 414-415 (2012), 374-387
  21. R. Scalenghe, F. Malucelli, F. Ungaro, L. Perazzone, N.Filippi, A. C. Edwards, 2011. Influence of 150 Years of Land Use on Anthropogenic and Natural Carbon Stocks in Emilia-Romagna Region (Italy). *Environmental Science & Technology* 45 (12), 5112-5117.
  22. Magaldi D., Ranalli D., Ungaro F. 2011. The climatic effect of weathering intensity on soils: a methodological proposal. *Georgian Annals of Agrarian Science* vol 9. (2), 2011, 77 - 86.
  23. S. Uthes , A. Piorr, P. Zander, A.J Kedziora, F. Ungaro, T. Dalgaard, M. Stolze, H. Moschitz, C.Schader, K. Happe, A. Sahrbacher, M. Damgaard, V. Toussaint, C. Sattler, F.-J. Reinhardt, C. Kjeldsen, L. Casini, K. Müller, 2011. Regional impacts of abolishing direct payments: An integrated analysis in four European regions. *Agricultural Systems*, 104 (2011), 110-121.
  24. F. Ungaro., F. Staffilani, P. Tarocco, 2010. Assessing and mapping topsoil organic carbon stock at regional scale: a scorpan kriging approach conditional on soil map delineation and land use. *Land Degradation and Development*, 21, 565-581.
  25. G. Fait, M. Balderacchi, F. Ferrari, F. Ungaro, E. Capri, M. Trevisan, 2010. A field study of the impact of different irrigation practices on herbicide leaching. *European Journal of Agronomy*, 32, 280-287.
  26. Piorr, A., Ungaro, F., Ciancaglini, A., Happe, K., Osuch, A., Sattler, C., Uthes, S., Zander, P., 2009 Integrated assessment of future CAP policies: land use changes, spatial patterns and targeting. *Environmental Science & Policy*, 12 (2009) 1122-1136.

27. Ungaro, F., ragazzi, F. Cappellini, R., Giandon, P., 2008. Arsenic concentration in the soils of the Brenta Plain (Northern Italy): mapping the probability of exceeding contamination threshold. *The Journal of Geochemical Exploration*, 96/2-3, 117-131.
28. Ungaro, F., Calzolari, C., 2007. Contenuto in sostanza organica nei suoli della pianura emiliano-romagnola: quantificazione dell'incertezza spaziale attraverso l'utilizzo di simulazioni condizionali sequenziali. *Bollettino della Società Italiana di Scienza del Suolo*, 63-70.
29. Ungaro, F., Calzolari, C., Tarocco, P., Giapponesi, A. and Sarno, G. 2005. Quantifying spatial uncertainty of soil organic matter indicators using conditional sequential simulations: a case study in Emilia Romagna plain (Northern Italy). *Canadian Journal of Soil Science*, 85, 499-510.
30. Ungaro, F., Calzolari, C., Busoni, E., 2005. Development of pedotransfer functions using a group method of data handling for the soil of the Pianura Padano-Veneta region of North Italy. *Water retention properties*. *Geoderma*, 124, 193-217.
31. B.O. Gaouna, D. Stroppiana, P. Sarfatti, F. Ungaro, 2003. Crop yield reduction estimation using the FAO-CROPWAT model: a case study in Southern Chad. *Journal of Agriculture and Environment for International Development*, 97, 139-164.
32. Calzolari, C., Torri, D., Borselli, L., Ungaro, F., Bartolini, D., De Alba, S., 2003. Definizione ed utilizzo di modellistica dei processi erosivi in ambiente collinare e montano della regione Emilia Romagna. *Bollettino della Società Italiana Scienza Suolo*, 52, 477-492.
33. Ungaro, F. and Calzolari, C., 2001. Using existing soil databases for estimating water-retention properties for soils of the Pianura Padano-Veneta region of North Italy. *Geoderma*, 99, 99-112.
34. Cahill, A., Ungaro, F., Parlange, M. B., Mata, M., Nielsen, D. 1999. Combined spatial and Kalman filter estimation of optimal soil hydraulic properties. *Water Resource Research*, 35, n.4, 1079-1088.
35. Ungaro, F., 1998. Cartografia di suoli salino e salino-sodici nella Piana dell'Albegna (GR): definizione della varianza locale di krigaggio in presenza di distribuzioni asimmetriche ed effetto proporzionale. *Bollettino della Società Italiana di Scienza del Suolo*, anno XLVII, 3, 455-471.
36. Calzolari, C. and Ungaro, F. 1998. Geomorphic features of a badland (biancane) area (Central Italy): characterization, distribution and quantitative spatial analysis. *Catena*, 31, 237-256.
37. Ungaro, F., Ferrari, G. 1992. Preliminary investigations on pedogenesis in the Ewaso N'giro riverine deposits (Eastern Province - Kenya). *Rivista di Agricoltura Tropicale e Subtropicale*, I.A.O. - Firenze, 4, 745 - 764.
38. Ungaro, F., Busoni, E. 1992. Spatial variability of soil salinity in the Merti plain, North-East Kenya: the geostatistical approach. *Rivista di Agricoltura Tropicale e Subtropicale*, I.A.O. - Firenze, 4, 765 - 779.

#### **Papers in international conference proceedings**

1. Ungaro F., Calzolari C. 2011. A data driven model for spatio-temporal estimation of shallow water table depth in soils. in: B. Caffarelli (Ed.) *Proceedings of the 2nd Conference Spatial data Methods for Environmental and Ecological Processes*, Foggia 1-2 Sept. 2011, ISBN 9788896025123, pp. 237-240
2. Ungaro, F., Calzolari, C., Tarocco, P., Giapponesi, A. and Sarno, G., 2003. Soil organic matter in the soils of the Emilia-Romagna Plain (Northern Italy): knowledge and Management policies. pp. 113-126. In Smith, C.A.S. (ed.) *Soil Organic Carbon and Agriculture: Developing Indicators for Policy Analyses*. Proceedings of an OECD expert meeting, Ottawa Canada. Agriculture and Agri-Food Canada, Ottawa and Organisation for Economic Co-operation and Development, Paris. 329 pp.
3. Bazzoffi, P., Calzolari, C., Costantini, E.A.C., Pellegrini, S., Torri, D., Borselli, L., Del Sette, M., Salvador Sanchis, P., Ungaro, F., Yanez, M., Busoni, E., Monaci, F., 2003. Field Trip Guide to Val D'Orcia. OECD Expert Meeting on Soil Erosion and Soil Biodiversity Indicators, 25-28 March 2003, Rome.
4. Calzolari, C., Ungaro, F., Busoni, E., 2000. The SINA project in the Padano-Veneto basin. In *Proceedings of the International Congress Soil Vulnerability and Sensitivity*, Florence, October 18-21 1999; 287-307
5. Ungaro, F., Calzolari, C., 2000. Integration of GIS derived soil information with geostatistical estimation of pedotransfer functions inputs for soil modelling applications. In *Proceedings of the 4th International Symposium on Spatial Accuracy Assessment in Natural Resources and Environmental Sciences*, Amsterdam, 12-14 July 2000, 663-670.
6. Ungaro, F., Calzolari, C., 2000. Soil water content estimation: performance of available pedotransfer functions for predicting the water retention properties in areas at high environmental risk of the Pianura Padano-veneta (Northern Italy). In *Atti del 7° Convegno Internazionale ICCTA Computer Technology in Agricultural Management and Risk Prevention*, Firenze, 15-18 novembre 1998, 147-154.
7. Marchetti, R., Ponzoni, G., Spallacci, P., Ceotto, E., Ungaro, F., Calzolari, C., 2000. Simulating water flow in areas at environmental risk with the MACRO model. Model evaluation with data from lysimeter studies. *Atti del Congresso Internazionale "Vulnerabilità e Sensibilità dei Suoli"*, Firenze 18-21 ottobre 1999, 323-330.
8. Calzolari, C., Ungaro, F., Busoni, E., Filippi, N., Guermandi, M., Tarocco, P., Brenna, S., Michelutti, G., Piazzi, M., Vinci, I., 2000. The SINA project in the Padano-Veneto basin. *Atti del Congresso Internazionale "Vulnerabilità e Sensibilità dei Suoli"*, Firenze 18-21 ottobre 1999, 287-307.
9. Ungaro, F., Cahill, A., Parlange, M. B., Mata, M., Nielsen, D. 1999. Determination of field-scale hydraulic parameters using a nonlinear filter with quantitative spatial analysis. In *Proceedings of the International workshop "Characterization and*

Measurement of the Hydraulic Properties of Unsaturated Porous media", International Workshop, Riverside , California, 22nd - 24th October, 1997; part 2, 1367 - 1375.

### **Papers in national conference proceedings**

1. Calzolari C., Ungaro F., 2011. Previsione dell'andamento temporale della profondità della falda ipodermica nei suoli della pianura emiliano-romagnola. In: Le modificazioni climatiche e i rischi naturali. Polemio M. (ed.) ISBN 9788890508806, CNR IRPI Bari 2011, pp. 117-120
2. Ungaro, F., Staffilani, F., Guermandi, M., Tarocco, P., 2008. A parametric simulation approach conditional on soil map delineations to map soil carbon stock at regional scale (Emilia Romagna, Italy). *Rendiconti Online della Società Geologica Italiana*, Vol. 2 (2008), 766 – 768.
3. Giandon, P., Ragazzi, F., Ungaro, F. Linea guida per la determinazione del valore di fondo naturale e naturale-antropico dei suoli agrari per metalli e metalloidi. 14° Convegno di igiene industriale, Corsara (BZ) 1-4 aprile 2008.
4. Sartori, G., Garlato, A., Obber, S., Ungaro, F., Vinci, I. 2007. Humus forms in the forest soils of Veneto. Congresso Nazionale della Società Italiana di Scienza del Suolo Imola, 27- 30 giugno 2006, *Bollettino della Società Italiana di Scienza del Suolo*, in stampa
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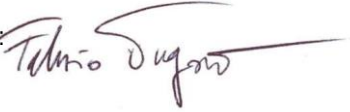
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2. Ungaro, F., Ciancaglini, A., Sattler, C., Uthes, S., Damgaard, M., Happe, K., Osuch, A. 2009. Spatial characteristics of land use patterns in Mugello (Central Italy) and policy impacts on their environmental outputs. Springer-Verlag, in press.
3. Calzolari, C., Ungaro, F., 2006. Capacità protettiva dei suoli nei confronti dell'inquinamento. *Manuale di Valutazione delle Terre*, Franco Angeli Ed., 21pp., 63-83.
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5. Torri, D., Borselli, L., Guzzetti, F., Bazzoffi, P., Calzolari, C., Ungaro, F., Bartolini, D., 2006. Soil Erosion in Italy: an overview. In Boardman and Poesen (Eds.), *Soil Erosion in Europe*, Wiley, U.K., pp 243-261

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6. Calzolari C., Ungaro, F., 2004. "Utilizzo della geostatistica a supporto della cartografia pedologica" e "Primi risultati di valutazione della capacità protettiva dei suoli", in Regione del Veneto- ARPAV, Carta dei suoli del bacino scolante in laguna di Venezia, 56-72. Ponzano (TV), 399 pp.
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Signature:

A handwritten signature in dark ink, appearing to read 'Fabrizio Ungaro', with a long horizontal flourish extending to the right.

Date: 27.08.2020