

SEMINAR ANNOUNCEMENT

February 24th, 2023, 11.30 am, room 155_1

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GROUNDWATER MODELLING AT VARIOUS SCALES USING FIELD DATA SETS AND OPEN DATA

Abstract

Numerical models for the quantification and management of groundwater fluxes in aquifers have been more and more frequently applied since the advent of computers and their continually increased computational capabilities. Nowadays, groundwater numerical models are pivotal tools to manage groundwater resources, and to forecast the possible impacts of management practices. The broad availability of graphical user interfaces allowed hydrogeologists and environmental engineers to implement complex numerical codes like MODFLOW 6, FEFLOW and HYDRUS. In fact, in the last decade groundwater flow models have been used to disentangle complex flow patterns with variable boundary conditions and subsequently to assess the fate and transport of contaminants in the subsurface. Nevertheless, flow and transport numerical models often require a large amount of data that also vary with the extent of the modelled domain (e.g., lab, plot, field or aquifer scale). Accordingly, this presentation shows different examples of groundwater flow and solutes transport models implemented at increasing spatial scales, where a mixture of field data collected on this purpose and data retrieved from open data repositories have been used to increase the robustness of both model input and output.

Key words: saturated unsaturated modelling, spatial scales, groundwater flow, remote sensing, solute transport.

Short Bio

1997-2002 Master's Degree in Earth Sciences, Georesources and Geological Risk

2008-2011 Ph.D. in Applied Geology (04/A3, GEO/05)

2012-2015 Ph.D. in Environmental Sciences: protection and management of natural resources (04/A1, GEO/08)

My main research activities focuses on: (i) the characterization and monitoring of contaminated sites via different assessment methods (hydrogeological, geophysical and hydrochemical) and via groundwater flow and solute transport modeling; (ii) water resources management and protection of coastal alluvial plains via salinization processes and origins delineation and via water and nitrogen balance quantification, to face environmental issues induced by intensive anthropogenic activities.

From 2002 to date, I have authored 110 scientific papers published in peer review journals, 5 book chapters and 84 contributions in national and international conference proceedings. From 2009 Dr. Colombani Nicolò appears in SCOPUS (ID: 24536888600) with 127 results, 2004 citations and HI 27.

RESEARCH ACTIVITIES ABROAD

2016 Attribution of a research assignment at the School of Natural Sciences of the University of Addis Ababa (Ethiopia) for the definition of a model of percolation of fluoride in the subsoil (ESDP-PGP Project)

2015 Attribution of a research assignment at the School of Natural Sciences of the University of Addis Ababa (Ethiopia) for the definition of a model of percolation of fluoride in the subsoil (ESDP-PGP Project)

2010 Collaboration with the Council for Scientific and Industrial Research (CSIR) of Stellenbosh (Western Cape Province - SA) for the definition of a percolation model of inorganic contaminants in the unsaturated sector of the (ENVIREN Project)

2004 Collaboration with the Land and Water Department - CSIRO of Perth (WA) for the calibration of a numerical model for the simulation of the reactive transport of a hydrocarbon plume on the operation of the (CORONA Project).

I have participated to 12 among National and International projects since 2002 and I am involved in the following Editorial activities:

Member of the Editorial Board of Geofluids, Hindawi OnLine ISSN 1468-8123 (from 2018 to present).

Member of the Editorial Board of Geology, Ecology, and Landscapes, Taylor & Francis OnLine ISSN 2474-9508 (from 2017 to present).

Member of the Editorial Board of GEOSCIENCES, MDPI, ISSN 2076-3263 (from 2018 to present).

Member of the Editorial Board of WATER, MDPI, ISSN 2073-4441 (from 2019 to present)

Member of the Editorial Board of Frontiers in Marine Science, Frontiers, ISSN 2296-7745 (from 2022 to present)

Reviewer for 28 peer review international journals with 118 reviews (<https://publons.com/author/510437/nicolo-colombani#profile>)