

## EXPERTISE

Advanced Numerical Modeling - Field Hydrogeology - GIS - Geostatistics - Uncertainty Analysis - Scientific Research - Training

## PROFESSIONAL CARRIER

2023 - present: Vice-President of Kataclima S.r.l Società Benefit

2021 - present: Founder and CEO of SYMPLE S.r.l Innovative Start-up (School of Hydrogeological Modelling)

2014 - present: Kataclima S.r.l Società Benefit - Partner and Head of the Hydrogeology Division

2008 - present: Università di Camerino - Adjunct Professor

2001-2014: Università della Tuscia - Researcher in Hydrogeology

## TRAINING ACTIVITIES

2021 - present: Scientific and Teaching Director of SYMPLE - School of Hydrogeological Modelling and Project-related Strategies (<https://hydrosymple.com/en/school/>).

2014 - present: Adjunct Professor of Geostatistics, Università di Camerino (7 cfu), MSc "Geoenvironmental Resources and Risks", School of Science and Tecnology.

2011 - present: Lecturer in "Well Hydraulics" and "Spatial analysis of data", II Level Master's Degree "Characterization and Technologies for Remediation of Polluted Sites", University of Rome Sapienza.

2005 - present: Tutor / Cotutor of more than 20 thesis (MSc, PhD).

2018-2021: Organizer and Trainer of the yearly course "Groundwater numerical models and how to make them useful" with John Doherty (author of the numerical calibration code PEST) and Giovanni Formentin (HPC Italia).

2018: Co-organizer and Trainer of the course "Groundwater Model Calibration using PEST" at Fondazione Ordine degli Ingegneri Milano, September 24-27.

2017: Co-organizer and Trainer of the course "Model Calibration and Predictive Uncertainty Analysis using PEST", Università degli Studi della Tuscia, September 11-15, University of Southampton, September 4-8.

- 2015-2016: Adjunct Professor of "Dynamics of pollutants and environmental monitoring and remediation techniques" (6 cfu), Università della Tuscia, Environmental Sciences.
- 2014-2016: Lecturer: "Tecnologie innovative nella bonifica delle acque sotterranee: sostenibilità, metodologie, dimensionamento ed esercitazioni su casi reali" FAST, Milano.
- 2015-2016: Lecturer "Falde acquifere, flusso in mezzi porosi saturi e insaturi" at the II level Master "Tecniche e controlli ambientali (MUTECA)", Università di Tor Vergata.
- 2014: Trainer of the course "Groundwater Numerical Modelling" for the PhD Course in Ecology and Management of Biological Resources at the University of Tuscia.
- 2014: Responsible for Working Placement, in collaboration with the University of Southampton, concerning geostatistical data processing and groundwater flow modeling.
- 2009-2014: Adjunct Professor at the University of Camerino of the course "Groundwater Resources" (7 credits), International Master's Degree "Geoenvironmental Resources and Risks", School of Science and Technology.
- 2008-2009: Lecturer at the University of Camerino of the course "Hydrogeology" (6 credits), Bachelor's degree "Geological Sciences", School of Science and Technology.
- 2006 Lecturer of the Integrative Course in Applied Geology "Exercises in Hydrology, Applied Geomorphology and Technical Geology through dedicated software", University of Tuscia.

Participation in dozens of national and international conferences, both as oral presentation and as Key Note Speaker, organizing committee, session chairing, etc.

## EDUCATION

- 2005: PhD in "Applied Geology, Geomorphology and Hydrogeology", Perugia University: "Hydrogeological and steady-state flow model of the Cimino-Vicano volcanic aquifer (Lazio)".
- 2001: Degree in Environmental Sciences (indirizzo terrestre, orientamento chimico) 110/110 cum Laude, Università degli Studi della Tuscia
- 1995: Languages high school graduation (60/60), Viterbo

## AFFILIATIONS

Member of IAH (International Association of Hydrogeologists) since 2012.

Associated Editor of the scientific journal *Hydrogeology Journal* since 2020.

Associated Editor of the scientific journal *Acque Sotterranee – Italian Journal of Groundwater* since 2012.

## PUBLICATIONS

Piscopo, V.; Sbarbati, C.; Dinagde, T.D.; Lotti, F. (2023) Practical Approach for Defining the Sustainable Yield of Wells in Low-Permeability Fractured Rocks. *Sustainability*, 15, 10706. <https://doi.org/10.3390/su151310706>

Piscopo, V.; Sbarbati, C.; Lotti, F.; Lana, L.; Petitta, M. (2022) Sustainability Indicators of Groundwater Withdrawal in a Heavily Stressed System: The Case of the Acque Albule Basin (Rome, Italy). *Sustainability*, 14, 15248. <https://doi.org/10.3390/su142215248>.

Hugman, R., Lotti, F. and Doherty, J. (2022), Probabilistic Contaminant Source Assessment—Getting the Most Out of Field Measurements. *Groundwater*. <https://doi.org/10.1111/gwat.13246>

Pretto, P., Sanseverino, I., Demichelis, F., Lotti, F., Lahm, A., Garcia, A., Ricci, R. and Lettieri, T. (2022) Bioremediation of a Polluted Groundwater: Microbial Community Comparison of Treated and Untreated Aquifer through Next Generation Sequencing, *WATER*, ISSN 2073-4441 (online), 14 (16), p. 2456, JRC121359

*Recognition of "Best Article" of the Malta mean Sea Level Aquifer paper. In Voss, C.I. Editor's Message: The 2021 Editors' Choice articles. Hydrogeol J 30, 1–2 (2022).*  
<https://doi.org/10.1007/s10040-022-02457-w>

Barbagli A, Guastaldi E, Conti P, Giannuzzi M, Borsi I, Lotti F, Basile P, Favaro L, Mallia A, Xuereb R, Schembri M, Mamo JA, Sapiano M (2021) Geological and hydrogeological reconstruction of the main aquifers of the Maltese islands. *Hydrogeology Journal* 29, 2685-2703. <https://doi.org/10.1007/s10040-021-02406-z>

Lotti F, Borsi I, Guastaldi E, Barbagli A, Basile P, Favaro L, Mallia A, Xuereb R, Schembri M, Mamo JA, Sapiano M (2021) Numerically enhanced conceptual modelling (NECoM) applied to the Malta Mean Sea Level Aquifer. *Hydrogeology Journal* 29, 1517-1537. <https://doi.org/10.1007/s10040-021-02330-2>

V Piscopo, F Formica, L Lana, F Lotti, L Pianese, M Trifuoggi (2020) Relationship Between Aquifer Pumping Response and Quality of Water Extracted from Wells in an Active Hydrothermal System: The Case of the Island of Ischia (Southern Italy). *Water* 12, 2576; doi:10.3390/w12092576

V Piscopo, F Lotti, F Formica, L Lana, L Pianese (2019) Groundwater flow in the Ischia volcanic island (Italy) and its implications for thermal water abstraction. *Hydrogeology Journal* 28, 579-601 (2020). <https://doi.org/10.1007/s10040-019-02070-4>

A Baiocchi, F Formica, F Lotti, L Pianese, V Piscopo, G Summa (2019) Occurrence, management and protection of mineral and thermal waters in some volcanic areas of Italy: Current knowledge and future directions. *Sustainable Water Resources Management* 5 (4), 1495-1509

Viaroli S, Lotti F, Mastrocillo L, Paolucci V, Mazza R (2019) Simplified two-dimensional modelling to constrain the deep groundwater contribution in a complex mineral water mixing area, Riardo Plain, southern Italy. *Hydrogeology Journal* <https://doi.org/10.1007/s10040-018-1910-3>

Piscopo V, Di Luca S, Dimasi M, Lotti F (2018) Sustainable Yield of a Hydrothermal Area: From Theoretical Concepts to the Practical Approach. *Groundwater* doi: 10.1111/gwat.12833

Baiocchi A, Lotti F, Piscopo V, Sammassimo V (2018) Hard-rock aquifer response to pumping and sustainable yield of wells in some areas of Mediterranean Region. Geological Society, London, Special Publications 479

Viaroli S, Mastrocillo L, Lotti F, Paolucci V, Mazza R (2018) The groundwater budget: A tool for preliminary estimation of the hydraulic connection between adjacent aquifers. *Journal of Hydrology* 556, 72-86

Piscopo V, Baiocchi A, Lotti F, Ayan EA, Biler AR, Ceyhan HA, Cüylan M, Dişli A, Kahraman S, Taşkın M (2017) Estimation of rock mass permeability using variation in hydraulic conductivity with depth: experiences in hard rocks of western Turkey. *Bull Eng Geol Environ*. DOI 10.1007/s10064-017-1058-8

- Lotti F, Doherty J (2016) The role of numerical models in environmental decision-making. *Acque Sotterranee - Italia Journal of Groundwater*. DOI 10.7343/as-2016-231
- Baiocchi A, Lotti F, Piscopo V (2016) Occurrence and flow of groundwater in crystalline rocks of Sardinia and Calabria (Italy): an overview of current knowledge. *Acque Sotterranee - Italian Journal of Groundwater*. DOI 10.7343/as-2016-195
- Fazi S, Crognale S, Casentini B, Amalfitano S, Lotti F, Rossetti S (2016) The arsenite oxidation potential of native microbial communities from arsenic rich freshwaters. *Microbial Ecology* - DOI: 10.1007/s00248-016-0768-y
- Baiocchi A., Lotti F., Piscopo V. (2016) Reply to Comment on "Impact of groundwater withdrawals on the interaction of multi-layered aquifers in the Viterbo geothermal area (central Italy)": report published in *Hydrogeology Journal* (2013) 21:1339-1353, by Antonella Baiocchi, Francesca Lotti and Vincenzo Piscopo. *Hydrogeol J* DOI 10.1007/s10040-016-1374-2
- Baiocchi A., Dragoni W., Lotti F., Piacentini S.M., Piscopo V. (2015) A Multi-Scale Approach in Hydraulic Characterization of a Metamorphic Aquifer: What Can Be Inferred about the Groundwater Abstraction Possibilities. *Water* 2015, 7, 4638-4656; doi:10.3390/w7094638
- Lotti F. (2015) Modelli al servizio dell'Idrogeologia o Idrogeologia al servizio dei Modelli? *Acque Sotterranee - Italian Journal of Groundwater*; ASr13078:69-70, DOI 10.7343/AS-112-15-0139
- Fazi S., Amalfitano S., Casentini B., Davolos D., Pietrangeli B., Crognale S., Lotti F., Rossetti S. (2015) Arsenic removal from naturally contaminated waters: a review of methods combining chemical and biological treatments. *Rend. Fis. Acc. Lincei*, DOI 10.1007/s12210-015-0461-y
- Armiento G., Baiocchi A., Cremisini C., Crovato C., Lotti F., Lucentini L., Mazzuoli M., Nardi E., Piscopo V., Proposito M., Veschetti E. (2015) An Integrated Approach to Identify Water Resources for Human Consumption in an Area Affected by High Natural Arsenic content. *Water* 2015, 7, 5091-5114; doi:10.3390/w7095091
- Baiocchi A., Dragoni W., Lotti F., Piscopo V. (2014) Sustainable yield of fractured rock aquifers: the case of crystalline rocks of Serre Massif (Calabria, southern Italy). *IAH Selected Papers, Fractured Rock Hydrogeology*, CRC Press-Taylor&Francis Group, 386 pp; ISBN 978-1-138-00159-6
- Baiocchi A., Lotti F., Piacentini S.M., Piscopo V. (2013) Comparison of pumping at constant head and at a constant rate for determining the sustainable yield of a well. *Environ Earth Sci* 72:989-996 DOI 10.1007/s12665-013-3016-5
- Baiocchi A., Lotti F., Piacentini S. M. (2013) Numerical simulation of groundwater flow to determine the sustainable yield of a well. *Rendiconti Online della Società Geologica Italiana*, 24:19-21
- Baiocchi A., Lotti F., Piscopo V. (2013) "Impact of groundwater withdrawals on the interactions between overlapping aquifers in the Viterbo geothermal area (Central Italy). *Hydrogeology Journal*, 21:1339-1353, DOI: 10.1007/s10040-013-1000-5
- Baiocchi A., Coletta A., Esposito L., Lotti F., Piscopo V. (2013) "Sustainable Groundwater Development in a Naturally Arsenic-contaminated Aquifer: the Case of the Cimino-Vico Volcanic Area (Central Italy)". *Italian Journal of Engineering Geology and Environment*, 1:5-18 DOI: 10.4408/IJEGE.2013-01.O-01
- Baiocchi A., Lotti F., Piscopo V. (2012) "Conceptual Hydrogeological Model and Groundwater Resource Estimation in a Complex Hydrothermal Area: The Case of the Viterbo Geothermal Area (Central Italy)". *Journal of Water Resource and Protection*, 4, 231-247

- Lotti F., Baiocchi A., D'Onofrio S., Piscopo V. (2012) "Caratterizzazione idrogeologica di rocce calcareo-silico-marnose attraverso rilievi di superficie delle discontinuità e prove di pompaggio", *Acque Sotterranee*, 1:27-36. DOI 10.7343/AS-002-12-0002
- Valigi D., Di Matteo L., Dragoni V.U., Frondini F., Cambi C., Boscherini A., Checcucci R., Lotti F. (2012) *Carta Idrogeologica del Monte Cucco (Umbria Nord-Orientale). Bilancio idrogeologico dei complessi giurassici e cretacico inferiori. Carta idrogeologica stampata dalla Regione dell'Umbria nell'ambito del "Progetto Regione Umbria: Piano Ambientale 2006 (DAP 2006-2008). DPCM 13.11.2000"*
- Cambi C.; Di Matteo L.; Dragoni V.U.; Frondini F.; Valigi D.; Boscherini A.; Checcucci R.; Lotti F. (2012) *Carta Idrogeologica dei Monti di Gualdo (Umbria Nord-Orientale). Bilancio idrogeologico dei complessi giurassici e cretacico inferiori. Carta idrogeologica stampata dalla Regione dell'Umbria nell'ambito del "Progetto Regione Umbria: Piano Ambientale 2006 (DAP 2006-2008). DPCM 13.11.2000"*
- Baiocchi A., Lotti F., Piscopo V. (2011) "Influence of hydrogeological setting on the arsenic occurrence in groundwater of the volcanic areas of central and southern Italy", *AQUA Mundi* 2(2):131-142
- Baiocchi A., Di Paola A., Lotti F., Piscopo V., Spaziani F. (2010) "Intrusione marina negli acquiferi carbonatici: il caso del fronte sorgivo di Castellammare di Stabia (Napoli)", *Italian Journal of Engineering Geology and Environment* 2:33-48
- Baiocchi A., Lotti F., Piscopo V., Rocchetti I. (2008) "Interazioni tra acque sotterranee e fiume Marta (Italia centrale) e problematiche connesse con la determinazione del deflusso minimo vitale", *Italian Journal of Engineering Geology and Environment*, 1:37-55
- Dragoni W., Piscopo V., Di Matteo L., Gnucchi L., Leone A., Lotti F., Melillo M., Petitta M. (2006) "Risultati del progetto di ricerca PRIN "Laghi 2003-2005"" *Giornale di Geologia Applicata* Vol.3/2006, p. 39-46
- Baiocchi A., Di Paola A., Frascchetti A., Lotti F., Piscopo V. (2005) "Valutazione delle risorse idriche in un'area urbanizzata: l'esempio del bacino dell'Urcionio", *Giornale di Geologia Applicata* Vol.2/2005, p. 393-398
- Baiocchi A., Lotti F., Piscopo V., Chiocchini U., Madonna S., Manna F. (2005) "Hydraulic Interactions between aquifers in the Viterbo area (Central Italy)"; *Matthias Eiswirth Memorial Volume IAH*, p. 223-238, Ken Howard ed., Toronto
- Baiocchi A., Dragoni W., Lotti F., Luzzi G., Piscopo V. (2005) "Outline of the Hydrogeology of the Cimino and Vico Volcanic Area and of the Interaction between Groundwater and Lake Vico (Lazio Region, Central Italy)" *Bollettino della Società Geologica Italiana*, p. 187-202
- Piscopo V., Baiocchi A., Fantucci R., Lotti F. (2005) "La risposta al pompaggio di acquiferi vulcanici: alcuni esempi delle aree napoletana e viterbese", *Italian Journal of Engineering Geology and Environment*, vol. 1, p. 21-35
- Lotti F., Prota A., Vulcano G. (2002) "Il bilancio idrologico del bacino del Rio Fratta (Viterbo-Lazio): implicazioni per un uso sostenibile delle risorse idriche", *Geologia Tecnica & Ambientale*, vol. 3, p. 49-58

## **MAIN PROJECTS**

### **Italy, Rome | Evaluation of the interference of mining activities with the ancient thermal springs Acque Albule, Tivoli (2022)**

Hydrogeological and modelling study aimed at the definition of useful indicators to evaluate the sustainability of the abstraction in the Acque Albule basin of Tivoli, in collaboration with the University of Tuscia.

### **Italy, Frosinone | Renewal of concession in thermal area (2022)**

Hydrogeological study to supplement the request for renewal of the Spa of Santa Maria Maddalena, Ferentino (FR).

### **Italy, Bari | Tutoring for the reconstruction of a contamination plume (2022)**

Training and support to professionals for the development and calibration of a numerical model aimed at the reconstruction of the contamination plume of the Modugno plain, Bari.

### **Italy, Macerata | Management of water resources in carbonate aquifers, pilot study of the Upper Chienti Valley (2021-2022)**

Hydrogeological study for the Central Apennine District Basin Authority (ABDAC) in collaboration with University Roma Tre and University of Camerino including analysis of historical data, hydrogeological surveys, numerical modelling and uncertainty analysis at different scales and with different numerical codes, for the definition of innovative modelling approaches aimed at the management of complex aquifers with few data such as carbonate ones. The project also provided for the training of 10 public officials from both the Basin Authority and regional authorities of central Italy on the use of models produced.

### **Italy, Cagliari | Groundwater resource management tutoring (2021-2022)**

Training and support to researchers of the University of Cagliari for the development and calibration of a numerical model aimed at the management of water resources in the plain of the River Flumendosa, Muravera.

### **Italy, Milan | EIA of a geothermal plant in Santa Giulia (2020-2022)**

Numerical modelling in support of the EIA of the new district of Milano Santa Giulia, with reference to the assessment of the interference of the geothermal plant with respect to the ongoing remediation processes, to the existing water catchments, to underground landfills and buildings.

### **Italy, Lecco | Optimization of hydraulic barrier pumping rates (2021)**

Flow and transport modeling with transient calibration to evaluate various assumptions of hydraulic barrier operation.

### **Turkey | Open pit dewatering interference and prediction of water quality impacts (2020-2021)**

Revision of the basin-scale crystalline aquifer conceptual model, data analysis and interference modeling between open pit dewatering and natural springs collected for drinking water; Assessment of the possible impacts of contamination generated by the storage and washing of rocks.

### **Turkey | Open pit Dewatering (2020)**

Quality check and revision of the conceptual model of the crystalline aquifer at the basin scale and its numerical model aimed at sizing the dewatering of open pit.

**Italy, Pavia | Sources of contamination (2020)**

Numerical modeling of flow and transport aimed at identifying sources of historical contamination of the Municipality of Pavia.

**Italy, Pavia | Evaluation of pump&treat plant efficiency (2020)**

Numerical model of the Creval site in Santa Maria della Versa (PV) aimed at evaluating the effectiveness of the pump&treat plant.

**Malta | Modelling study of the islands of Malta (2018-2020)**

Key expert in the tender for "Development of Groundwater Models to Support Groundwater Management in the Maltese Island (CT3068/2018)" in collaboration with TEA SISTEMI S.p.A.. Numerical models of the main Maltese aquifers aimed at the revision of the conceptual model, the assessment of salt intrusion and optimal management of water resources. The project involved the training of 8 public officials of the EWA (Energy and Water Agency of Malta).

**Italy, Ferrara | Evaluation of the effectiveness of the hydraulic barrier (2019)**

Examination of the barrier effect determined by the realization of underground works.

**Italy, Caserta | Evaluation of the effectiveness of the hydraulic barrier (2019)**

Assessment of the variation of the efficiency of a hydraulic barrier due to the installation of reinforced concrete poles and stands falling in the capture zone of wells in a contaminated site in Aversa.

**Italy, Rome | Evaluation of the effectiveness of the hydraulic barrier (2018)**

Flow modelling and mass transport with transient calibration to verify the existing hydraulic barrier efficiency at ENI Rewind contaminated site in Ponte Galeria, Rome.

**Italy | Geothermal plant dimensioning and impact assessment (2017-2022)**

Numerous numerical models of flow and heat transport at different levels of complexity aimed at the sizing and evaluation of the thermal and hydraulic impacts of geothermal plants located prevalently in the municipality of Milan, Lombardy, Emilia Romagna, Tuscany.

**Italy, Latina | Evaluation of the effectiveness of the hydraulic barrier and GCW dimensioning (2018)**

Flow modelling and mass transport with transient calibration to verify existing hydraulic barrier efficiency at Ex Evotape contaminated site in Latina province. Design and sizing of Groundwater Circulating Wells, in collaboration with Marco Petrangeli Papini, Sapienza University of Rome.

**Italy, Milan | Evaluation of the effectiveness of the hydraulic barrier and hydrogeological investigations (2018)**

Conceptual model revision, hydrogeological investigations and flow modeling and transport of the site Ex-Chimica Bianchi, Rho.

**Italy, Naples | Evaluation of the effectiveness of the hydraulic barrier and containment of ISCO injections (2017)**

Variable-density flow model and mass transport, calibrated in transient conditions taking into account freshwater-salt water interface, aimed at the evaluation of existing hydraulic barrier and of a new hydraulic barrier aimed at containing the effects of injections ISCO, Bacoli, Naples.

**Italy, Latina | Identification of sources of contamination (2017)**

Flow and transport model calibrated in transient conditions aimed at the identification of the source of contamination of the site Novartis and definition of the surface water-groundwater relationship.

**Italy, Riardo | Tutoring for the modelling of the volcanic aquifer of Roccamonfina (2017)**

Support to researchers of the University of Roma Tre for the modelling of the Roccamonfina volcanic aquifer aimed at estimating the recharge from the deep carbonate aquifer.

**Italy, Lecco | Optimization of remediation technologies in contaminated sites (2017)**

Flow modeling and reactive transport with transient calibration to evaluate various hypotheses of reactive permeable barrier installation.

**Italy, Naples | Hydraulic barrier dimensioning (2017)**

Flow and transport model calibrated in transient conditions for the dimensioning of the hydraulic barrier in the contaminated site Alenia, Pomigliano d'Arco.

**Turkey | Hydrogeological model of the İvrindi mining site (2017)**

Processing of hydrogeological field data, characterization of the mining site, understanding of the hydrogeological conceptual model of the area. Support in planning pumping tests and hydrogeological monitoring. Numerical modeling and transient calibration, dewatering simulation and open pit lake formation. Transport model of contamination of the rock deposit area. Definition of discharges and location of water production wells. Evaluation of the depression cone of the open pits along the 10 years of excavation operations.

**Italy, Ischia | Management of groundwater resources on the Island of Ischia (2017)**

Flow model, mass transport, heat transport, variable density of pilot areas in the Island of Ischia, aimed at the sustainable management of the thermal resource and the management of seawater intrusion.

**Italy, Rieti | EIA of a hydroelectric plant on the Velino River (2016)**

Modelling in MODFLOW with calibration of different stationary scenarios aimed at assessing the impact of a flowing water hydroelectric plant on the aquifer.

**Italy, Lecco | Tier 3 Risk Analysis (2016)**

Flow modeling with transient calibration, particle tracking, transport in MT3DMS, use of PEST for uncertainty analysis via Monte Carlo simulations (risk analysis tier 3), for the verification of CSRs calculated in risk analysis tier 2.

**Italy, Lecco | Design of hydraulic barrier in contaminated site (2016)**

MODFLOW flow modeling with transient calibration, particle tracking, transport in MT3DMS for evaluation of various hypotheses of hydraulic barrier functioning in a contaminated site.

**Italia, Barberino del Mugello | Assessment of the contamination of highway embankments (2014-2015)**

Hydrogeological study of highway embankments and river basins in collaboration with Tor Vergata University.

**Italy, Viterbo | Numerical evaluations of the contamination in the basin of Lake Vico for ARPA Lazio (2012-2015)**

Conceptual model and numerical flow and transport modeling for the assessment of arsenic geogenic contamination of the Lake Vico basin.

**Italy, Rome | Pilot open-loop geothermal plant of the Rectorate of Tor Vergata University (2012-2015)**

Evaluation by flow and heat transport model of the impacts of the geothermal plant of the University Rectorate and the General Services on the hydrogeology and on the physical, chemical and microbiological properties of the aquifer, in collaboration with the University of Tuscia and Tor Vergata.



#### **Turkey | Hydrogeological model of the mining site Kestanelik (2015)**

Processing of hydrogeological field data, characterization of the mining site, understanding of the hydrogeological conceptual model of the area. Support in planning pumping tests and hydrogeological monitoring. Numerical modeling and transient calibration, dewatering simulation and open pit lake formation. Transport model of contamination of the rock deposit area. Definition of discharges and location of water production wells. Evaluation of the depression cone of open pits along the 10 years of excavation operations. Assessment of interference with local springs and water supply wells.

#### **Italy, Catanzaro | Evaluation of the sustainable yield of the Staletti wells (2015)**

Flow model of a fractured aquifer, calibrated in transient conditions, aimed at defining the sustainable yield of wells (Well field Staletti, Calabria).

#### **Italy, Naples | Comparison through modelling of containment works in the SIN of Bagnoli (2015)**

Preliminary flow model SIN Bagnoli, NA, aimed at the evaluation of draining trench in replacement of existing hydraulic barrier.

#### **Italy, Mantova | Dewatering numerical modeling in a SIN (2014)**

Flow modeling with transient calibration and particle tracking for dewatering project aimed at removing pile piling in the SIN of Mantova, Area Collina.

#### **Italy, Cagliari | Hydrogeological characterization of the Medau Zirimillis reservoir, Siliqua (2014)**

Flow model calibrated on pumping tests aimed at the hydrogeological characterization of the site where the Medau Zirimillis dam is located, Sardinia.

#### **Italy, Viterbo | Search for sources of water supply without arsenic (2013)**

Project "As-Well Corchiano" on behalf of Regione Lazio and water manager Talete spa. Research and investigation of water resources alternative to the existing ones (naturally contaminated by arsenic) for the supply of drinking water in the municipality of Corchiano.

#### **Italy | PRIN Project (2010-2013)**

PRIN project "Hydrogeology of fractured and/or karst systems: theoretical research and applications to groundwater management in the context of current climate change" with the University of Tuscia.

#### **Italy, Viterbo | Definition of geosites in the province of Viterbo (2010)**

Project Geosites, census, survey and description of the geological sites of the Province of Viterbo.

#### **Italy, Viterbo | Definition of the sustainable yield of a thermal spa (2009-2010)**

Numerical modelling, hydrogeological investigations, pumping tests, geochemical investigations of thermal spa "Oasi, Fenis S.r.l." for the definition of the sustainable extraction rate in the hydrothermal area of Viterbo, based on possible interference with other users.

#### **Italy, Viterbo | Delineation of the protection areas of the springs and thermal water catchments of Viterbo (2007-2008)**

Hydrogeological surveys, numerical modeling of the flow and heat transport through different codes and scales of the thermal area of Viterbo on behalf of the Lazio Region in collaboration with the University of Tuscia.

#### **Italy, Lazio | Participation in PRIN project on lakes in Central Italy (2004)**

Research aimed at "Integration of hydrogeological modelling with the spatial planning of the basins of the lakes of Vico and Bracciano (Lazio) as a contribution to the management and protection of water resources" under the PRIN "Impact of human activities and climatic variations on the hydrogeological balance of the most important lakes in central Italy: modelling processes and possible management strategies", PRIN project with University of Tuscia.

**Italy, Viterbo | Sustainable management of water resources at basin scale (2003)**

Hydrological and hydrogeological problems of the Rio Fratta basin (municipality of Corchiano, VT); implications for the sustainable management of water resources, University of Tuscia.

**Italy, Viterbo | Hydrogeological characterization of the Cimino-Vicano aquifer and numerical modelling (2001-2003)**

Flow model of the aquifer Cimino Vicano aimed at estimating the hydrogeological balance and exchanges groundwater surface.

*I authorize the processing of personal data on the basis of art. 13 of Dlgs 196/2003 and art. 13 GDPR 679/16*