

## CURRICULUM VITAE ET STUDIORUM

### DATI PERSONALI

Nome e cognome: Emanuele BARCA

Luogo di nascita:

### TEMATICHE DI RICERCA

- Metodologie matematiche e statistiche per il supporto alle decisioni;
- Analisi di dati spaziali;
- Metodologie per l'ottimizzazione del campionamento spaziale con strumenti geostatistici;
- Ottimizzazione statistica del setup sperimentale di laboratorio;
- Metodi statistici di calibrazione per sensori innovativi.
- Remote sensing e machine learning.

### PROGETTI EUROPEI E NAZIONALI

Progetto HarmonIT del 7° programma quadro.

Progetto HarmoniRIB del 7° programma quadro.

Progetto Tiziano: monitoraggio dei corpi idrici pugliesi

Progetto Maggiore: monitoraggio dei corpi idrici pugliesi.

### PAPERS

In the following are reported the most relevant results reached within the period **2010 – 2018** and published in ISI journals.

1. Terzi, M., Barca, E., Cazzato, E., D'Amico, F. S., Lasorella, C., & Fracchiolla, M. (2021). Effects of Weed Control Practices on Plant Diversity in a Homogenous Olive-Dominated Landscape (South-East of Italy). *Plants*, 10(6), 1090.
2. Bagarello, V., Barca, E., Castellini, M., Iovino, M., Morbidelli, R., Saltalippi, C., & Flammini, A. (2021). A plot-scale uncertainty analysis of saturated hydraulic conductivity of a clay soil. *Journal of Hydrology*, 596, 125694.
3. Altieri, V. G., De Sanctis, M., Sgherza, D., Pentassuglia, S., Barca, E., & Di Iaconi, C. (2021). Treating and reusing wastewater generated by the washing operations in the non-hazardous plastic solid waste recycling process: Advanced method vs. conventional method. *Journal of Environmental Management*, 284, 112011.
4. Barca, E., De Sanctis, M., Altieri, V. G., & Di Iaconi, C. (2021). Thermal energy recovery from a sequencing batch biofilter granular reactor (SBBGR) on a pilot scale: Evaluation of the effects of

- energy extraction on the depuration process, process effectiveness, and results scalability. *Energy Conversion and Management*, 228, 113582.
5. Buffagni, A., Erba, S., Cazzola, M., Barca, E., & Belfiore, C. (2020). The ratio of lentic to lotic habitat features strongly affects macroinvertebrate metrics used in southern Europe for ecological status classification. *Ecological Indicators*, 117, 106563.
  6. Buffagni, A., Erba, S., Cazzola, M., Barca, E., & Belfiore, C. (2020). The ratio of lentic to lotic habitat features strongly affects macroinvertebrate metrics used in southern Europe for ecological status classification. *Ecological Indicators*, 117, 106563.
  7. Barca, E., Castrignanò, A., Ruggieri, S., & Rinaldi, M. (2020). A new supervised classifier exploiting spectral-spatial information in the Bayesian framework. *International Journal of Applied Earth Observation and Geoinformation*, 86, 101990
  8. Persia, M., Barca, E., Greco, R., Marzulli, M. I., & Tartarino, P. (2020). Archival aerial images georeferencing: a geostatistically-based approach for improving orthophoto accuracy with minimal number of ground control points. *Remote Sensing*, 12(14), 2232.
  9. Buffagni, A., Barca, E., Erba, S., & Balestrini, R. (2019). In-stream microhabitat mosaic depicts the success of mitigation measures and controls the Ecological Potential of benthic communities in heavily modified rivers. *Science of The Total Environment*, 673, 489-501.
  10. De Girolamo, A. M., Miscioscia, P., Politi, T., & Barca, E. (2019). Improving grey water footprint assessment: Accounting for uncertainty. *Ecological Indicators*, 102, 822-833.
  11. Castellini, M., Stellacci, A. M., Barca, E., & Iovino, M. (2019). Application of multivariate analysis techniques for selecting soil physical quality indicators: A case study in long-term field experiments in Apulia (southern Italy). *Soil Sci. Soc. Am. J.*
  12. Barca, E., De Benedetto, D., & Stellacci, A. M. (2019). Contribution of EMI and GPR proximal sensing data in soil water content assessment by using linear mixed effects models and geostatistical approaches. *Geoderma*, 343, 280-293.
  13. Barca, E., Bruno, D. E., Lay-Ekuakille, A., Maggi, S., & Passarella, G. (2018). Retrospective analysis: A validation procedure for the redesign of an environmental monitoring network. *Measurement*, 113, 211-219.
  14. Pastore, C., Barca, E., Del Moro, G., Di Iaconi, C., Loos, M., Singer, H. P., & Mascolo, G. (2018). Comparison of different types of landfill leachate treatments by employment of nontarget screening to identify residual refractory organics and principal component analysis. *Science of The Total Environment*, 635, 984-994.
  15. Identifying a reliable method for estimating suspended sediment load in a temporary river system (2018). AM De Girolamo, R Di Pillo, A Lo Porto, MT Todisco, **E Barca**. *CATENA* 165, 442-453.
  16. Linear and evolutionary polynomial regression models to forecast coastal dynamics: Comparison and reliability assessment (2018). Delia Evelina Bruno, **Emanuele Barca**, Rodrigo Mikosz Goncalves, Heithor Alexandre de Araujo Queiroz, Luigi Berardi, Giuseppe Passarella. *Geomorphology* 300, 128-140.
  17. Identification of the faecal indicator *Escherichia coli* in wastewater through the  $\beta$ -D-glucuronidase activity: comparison between two enumeration methods, membrane filtration with TBX agar, and Colilert®-18 (2017). P Vergine, C Salerno, **E Barca**, G Berardi, A Pollice. *Journal of Water and Health* 15 (2), 209-217

18. An automated decision support system for aided assessment of variogram models (2017). **Emanuele Barca**, Emilio Porcu, Delia E. Bruno, Giuseppe Passarella. *Environmental Modelling and Software*. DOI: 10.1016/j.envsoft.2016.11.004
19. Bruno, D. E., Lombardo, G., Di Sipio, E., Galgaro, A., D'Arpa, S., Destro, E., **Barca, E.** & Manzella, A. (2016). Mo.nalis.a: a methodological approach to identify how to meet thermal industrial needs using already available geothermal resources. *Energy Efficiency*, 1-17. ISSN: 1570646X Source Type: Journal Original language: English DOI: 10.1007/s12053-016-9481-4. Springer Netherlands
20. Cross-Calibration of Two Independent Groundwater Balance Models and Evaluation of Unknown Terms: The Case of the Shallow Aquifer of "Tavoliere di Puglia"(South Italy) (2016). G Passarella, **E Barca**, D Sollitto, R Masciale, DE Bruno. *Water Resources Management*, 1-14
21. Optimal redesign of environmental monitoring networks by using software MSANOS. **Emanuele Barca**, Delia E. Bruno, Giuseppe Passarella. July 2016, *Environmental Earth Sciences*.
22. Characterising the hydrological regime of an ungauged temporary river system: a case study. Ersilia D'Ambrosio, Anna Maria De Girolamo, **Emanuele Barca**, Maria Cristina Rulli. July 2016, *Environmental Science and Pollution Research*. DOI: 10.1007/s11356-016-7169-0
23. Simulating ecologically relevant hydrological indicators in a temporary river system. Anna Maria De Girolamo **Emanuele Barca** Giuseppe Pappagallo Antonio Lo Porto. *Agricultural Water Management* June 2016. DOI: 10.1016/j.agwat.2016.05.034
24. Similarity indices of meteo-climatic gauging stations: definition and comparison. **Emanuele Barca** Delia Evelina Bruno Giuseppe Passarella. *Environmental Monitoring and Assessment* July 2016.
25. Managing the touristic pressure: Performances prediction of an advanced biological system by means of regression trees. **E. Barca**, G. Del Moro, M. De Sanctis, G. Mascolo, G. Passarella, C. Di Iaconi. *Biochemical Engineering Journal* July 2016.
26. GTest: a software tool for graphical assessment of empirical distributions' Gaussianity. **E. Barca**, E. Bruno, D. E. Bruno, G. Passarella. *Environmental Monitoring and Assessment* June 2016.
27. Gross parameters prediction of a granular-attached biomass reactor by means of multi-objective genetic-designed artificial neural networks: touristic pressure management case. (2016). Del Moro G, Barca E, De Sanctis M, Mascolo G, Di Iaconi C. *ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH INTERNATIONAL*, vol. 23, p. 5549-5565, ISSN: 0944-1344, doi: 10.1007/s11356-015-5729-3.
28. Integration of electromagnetic induction sensor data in soil sampling scheme optimization using simulated annealing. **E. Barca**, A. Castrignanò, G. Buttafuoco, D. De Benedetto, G. Passarella. *Environmental Monitoring and Assessment* June 2015.
29. Recoverable and reusable aluminium solvated species used as a homogeneous catalyst for biodiesel production from brown grease. C. Pastore, **E. Barca**, G. Del Moro, A. Lopez, G. Mininni, G. Mascolo. *Applied Catalysis A: General*. Available online 1 May 2015.

30. Gross parameters prediction of a granular attached biomass reactor through evolutionary polynomial regression. **E. Barca**, G. Del Moro, G. Mascolo, C. Di Iaconi. *Biochemical Engineering Journal* (**02/2015**); 94:74-84.
31. MSANOS: Data-Driven, Multi-Approach Software for Optimal Redesign of Environmental Monitoring Networks. **E. Barca**, G. Passarella, M. Vurro, A. Morea (**10/2014**). *Water Resources Management*; 10/2014; 29(2).
32. Landfill wall revegetation combined with leachate recirculation: a convenient procedure for management of closed landfills. G Del Moro, **E. Barca**, D Cassano, C Di Iaconi, G Mascolo, G Brunetti (**04/2014**), *Environmental Science and Pollution Research*.
33. Calibration of a Novel Impedance Sensor for Water Content Measurement in Rocks. M. C. Caputo, R. Masciale, **E. Barca** (**11/2013**), *Vadose Zone Journal* 11/2013; 12(4).
34. Predicting Shallow Water Table Depth at Regional Scale: Optimizing Monitoring Network in Space and Time. **E. Barca**, M. C. Calzolari, G. Passarella, F. Ungaro (**01/2013**). *Water Resources Management*; 27(15):5171-5190.
35. Imputing censored data with desirable spatial covariance function properties using simulated annealing. L. Sedda, P. M. Atkinson, **E. Barca**, G. Passarella (**06/2012**). *Journal of Geographical Systems*; 14(3):265-282.
36. Multiobjective Optimization of an Electrooxidation Process of Biologically Pre-Treated Landfill Leachate by Response Surface Methodology and Desirability Function Approach. G. Del Moro, **E. Barca**, C. Di Iaconi, F. Palmisano, G. Mascolo (**01/2012**). *Journal of Advanced Oxidation Technologies*; 15(2):242-253.
37. Data Mining in the development of predictive models for the integrated management of sustainable agriculture. **Emanuele Barca**, D'arpa Stefania, Uricchio Vito Felice. *Italian Journal of Agrometeorology* 08/2011; 16(2):42-47.
38. A methodology for rapid assessment of the environmental status of the shallow aquifer of "Tavoliere di Puglia" (Southern Italy). R. Masciale, **E. Barca**, G. Passarella (**07/2011**). *Environmental Monitoring and Assessment*; 177(1-4):245-61.
39. Barca E, Passarella G, Uricchio V (2008). Optimal extension of the rain gauge monitoring network of the Apulian Regional Consortium for Crop Protection. *Environmental Monitoring and Assessment*, vol. 145, p. 375-386, ISSN: 0167-6369, doi: 10.1007/s10661-007-0046-z
40. A methodology for treating missing data applied to daily rainfall data in the Candelaro River Basin (Italy). R. Lo Presti, **E. Barca**, G. Passarella (**01/2010**). *Environmental Monitoring and Assessment*; 160(1-4):1-22.
41. Spatial evaluation of the risk of groundwater quality degradation. A comparison between disjunctive kriging and geostatistical simulation. **E. Barca**, G. Passarella. *Environmental Monitoring and Assessment* 03/2008; 137(1-3):261-73.
42. **E. Barca**, R. Giordano, G. Passarella, V.F. Uricchio (2003): 'An hybrid-DSS for the groundwater pollution risk assessment', Environment Informatics Archives;

## 2. Proceedings with Referee

- Evolutionary polynomial regression model for the prediction of coastal dynamics. D. E. Bruno, **E. Barca**, R. M. Goncalves, A. Lay-Ekuakille, S. Maggi, and G. Passarella. 6th EnvImeko – IMEKO TC19 – Second Edition Workshop on Environmental Instrumentation and Measurements October 28, 2016, Reggio Calabria, Italy.
- Physical model of a coastal aquifer based on stratigraphic and thermal field reconstruction. **Emanuele Barca**, Delia Evelina Bruno, Maria Dolores Fidelibus, Giuseppe Passarella and Donatello Sollitto. EuroKarst 2016, **Neuchâtel**.
- Environmental Monitoring of Sea: Optical Fiber Sensor Design. A. Lay-Ekuakille, Griffo G, S. Maggi, Passarella G, **E. Barca**. Conference: 6th EnvImeko, IMEKO TC19 Symposium on Environmental Instrumentation and Measurements, June 24-25, 2016, At Reggio Calabria, Italy.
- Optimal resizing of groundwater monitoring networks: a retrospective analysis of a reduced configuration. **E. Barca**, D. E. Bruno, A. Lay-Ekuakille, S. Maggi, and G. Passarella. 6th EnvImeko - IMEKO TC19 Symposium on Environmental Instrumentation and Measurements June 24-25, 2016, Reggio Calabria, Italy.
- Heuristic rules for a reliable variogram parameter tuning. **E. Barca**, D. E. Bruno, A. Lay-Ekuakille, S. Maggi, and G. Passarella. 6th EnvImeko - IMEKO TC19 Symposium on Environmental Instrumentation and Measurements June 24-25, 2016, Reggio Calabria, Italy.
- C. Pastore, **E. Barca**, G. Del Moro, A. Lopez, G. Mascolo, (**2015**). Biofuel from wastewater brown grease: Optimisation and scalability studies of an efficient process. 7th European Meeting on Chemical Industry and Environment, Tarragona.
- **E. Barca**, MC Caputo, L De Carlo, R Masciale, G Passarella, (**2015**). Data-driven and multi-approach sampling scheme optimization: the Alimini Lakes aquifer case. Graspa 2015 Bari.
- **E. Barca**, G Passarella (**2015**). Similarity indices of meteo-climatic gauging stations for missing data handling: definition and comparison with the MICE method. Graspa 2015 Bari.
- **E. Barca**, L Berardi, D Laucelli, G Passarella, O Giustolisi, (**2015**). Evolutionary Polynomial Regression application for missing data handling in meteo-climatic gauging stations. Proceedings of the GRASPA 2015 Conference. Bari (IT), 15-16 June 2015.
- Integration of EMI sensor data in soil sampling scheme optimization using continuous simulated annealing. A. Castrignanò, **E. Barca**, G. Buttafuoco, D. De Benedetto, D. Palumbo, G. Passarella (07/2014), 10th International Conference on Geostatistics for Environmental Applications Paris, France. GeoEnv **2014** (Jeannèe N. and Romary T., eds), Paris, Presses des Mines, collection Sciences de la terre, pp. 34-35. ISBN: 978-2-35671-136-6.
- Optimal Redesign of Groundwater Monitoring Networks: a Data-Driven Multi-Approach Software. **E. Barca**, G. Passarella, M. Vurro, A. Morea (**06/2013**), 8th International Conference of EWRA: Water Resources Management in an Interdisciplinary and Changing Context, Porto (PT). Rodrigo Maia, António Guerreiro de Brito, Abílio Seca Teixeira, José Tentúgal Valente and João Pedro Pêgo ISBN: 978-989-95557-8-5 Published by: FEUP

- A new software for the optimal Redesign of Environmental Monitoring Networks. **E. Barca**, G. Passarella, A. Morea (**06/2013**), IX Congress of the International Biometric Society – Italian Region (SIB2013), Bressanone. – abstract a convegno.
- Mascolo G, Del Moro G, **Barca E**, Di Iaconi C, Palmisano F (2012). municipal landfill leachate treatment using electrooxidation coupled with a biological reactor. In: (a cura di): Società chimica italiana divisione di chimica dell'ambiente e dei beni culturali, ATTI DEL CONGRESSO. Taranto, 10-14 Settembre 2012
- A software for optimal information based downsizing/upsizing of existing monitoring networks. **E. Barca**, Giuseppe Passarella, Michele Vurro, Alberto Morea (**09/2011**). Spatial Data Methods for Environmental and Ecological Processes – 2nd Edition, Foggia (IT); Conference: Spatial Data Methods for Environmental and Ecological Processes – 2nd Edition, At Foggia (IT), Volume: Spatial2: Spatial Data Methods for Environmental and Ecological processes. Proceedings. Cafarelli, Barbara (Eds.)

### 3. Book Chapters with Referee

- Passarella, G., Masciale, R., Sollitto, D., Caputo, M. C., & **Barca, E. (2016)**. Assessment of Groundwater Balance Terms Based on the Cross-Calibration of Two Different Independent Approaches. In **Emerging Issues in Groundwater Resources** (pp. 159-186). *Springer International Publishing* Emerging Issues in Groundwater Resources Editors: Fares, Ali (Ed.) ISBN 978-3-319-32008-3 Part of the series Advances in Water Security pp 159-186. ISBN: 978-3-319-32006-9 (Print) 978-3-319-32008-3 (Online)
- Groundwater Exploitation as Thermal Fluid in Very-Low Enthalpy Geothermal Plants in Coastal Aquifers (2016). Masciale Rita, Caputo Maria Clementina, De Carlo Lorenzo, Barca Emanuele, Passarella Giuseppe. In *Emerging Issues in Groundwater Resources* (pp. 383-406). Springer International Publishing
- Reusing Landfill Leachate Within the Framework of a Proper Management of Municipal Landfills G. Del Moro, C. Pastore, **E. Barca**, C. Di Iaconi, G. Mascolo, G. Brunetti, and V. Uricchio. D. Fatta-Kassinos et al. (eds.), *Wastewater Reuse and Current Challenges*, series *The Handbook of Environmental Chemistry* pp 1-5 (2016) 44: 239–256, DOI 10.1007/698\_2014\_325, © Springer International Publishing Switzerland 2014, Published online: 11 September **2015**.
- Monitoring Information Systems to Support Adaptive Water Management. Giordano R., Passarella G., **Barca E.**, *Environmental Monitoring* Chapter 24, 11/2011; ISBN: 978-953-307-724-6. edited by Ema O. Ekundayo, ISBN 978-953-307-724-6, Published: November 4, 2011
- Barca, E., Passarella, G., and Vurro, M.: Climatological data, in: *Guidelines for assessing data uncertainty in river basin management studies*, edited by: van Loon, E. and Refsgaard J. C., HarmoniRiB report, <http://www.harmonirib.com>, 2005.

#### 4. Conferences

- Multi-sensor data fusion for supervised land-cover classification through a Bayesian setting coupling multivariate smooth kernel for density estimation and geostatistical techniques. The 2017 PEDOMETRICS Conference – Wageningen.
- 6th **EnvImeko** - IMEKO TC19 - Reggio Calabria – **2016**; Symposium on Environmental Instrumentation and Measurements;
- GRASPA 2015, Bari 15-16 June 2015;
- GeoEnv - 10<sup>th</sup> Conference on Geostatistics for environmental application – Paris, July 9 - 11 **2014**.
- IX Congress of the International Biometric Society – Italian Region (**SIB2013**), Bressanone.
- Spatial2 Conference: Spatial Data Methods for Environmental and Ecological Processes. Foggia (IT), 1-2 September **2011**;
- Convegni AIAM - Bari 2010 8 - 10 giugno Il data mining nello sviluppo di modelli previsionali per la gestione integrata dell'agricoltura sostenibile - D'Arpa S., Uricchio V. F., Barca E. Sessione I - Modellistica nella gestione integrata 978-88-555-3081-1
- EGU – European Geosciences Union. General Assembly **2009** – Vienna 19 – 24 April 2009..  
**Collana:**
- MESAEP October 7 to 11, **2009** Bari – Italy 15th International Symposium on Environmental Pollution and its Impact on Life in the Mediterranean Region.
- SPATIAL – Spatial Data Methods for Environmental and Ecological Processes, Foggia, 14-15 Sept. **2006** BARCA E., CASTRIGNANÒ A., MASCIALE R., PASSARELLA G., SEDDA L. - UNCERTAINTY

#### 5. ARTICOLI IN ITALIANO:

- Previsioni a scala regionale del livello piezometrico della falda ipodermica. Ottimizzazione della rete di monitoraggio nel tempo e nello spazio. **E. Barca**, M. C. Calzolari, G. Passarella, F. Ungaro. (**2014**) *Rivista L'ACQUA* – rivista dell'associazione idrotecnica italiana (4).
- R. Lopresti, **E. Barca**, G. Passarella, 'Metodo speditivo per il trattamento dei dati mancanti e sua applicazione ai dati pluviometrici giornalieri del bacino del Candelaro (Puglia)', **L'Acqua (2006)**;
- **E. Barca**, N. Lopez, G. Passarella, V.F. Uricchio, 'Ampliamento ottimale della rete di monitoraggio pluviometrica del consorzio di difesa', **Riv. di Ing. Agr.** (2005), 3, 87-95;
- **Barca E.**, Passarella G., Giuliano G., D'agostino V., 'Valutazione spazio-temporale del rischio di degrado qualitativo di una falda idrica', **L'ACQUA 2004 (2)** 53-63;
- **Barca E.**, Passarella G., Giuliano G., Vurro M., **GIORNATA DI STUDIO SULLA CONSERVAZIONE DEL SUOLO**

Il sottoscritto autorizza al trattamento dei dati personali, secondo quanto previsto dall' Art.23 – D.Lgs. 30/06/03 n. 196, consapevole del fatto che, in caso di mendace dichiarazione e di falsità in atti e di uso di atti falsi verranno applicate, ai

sensi degli artt. 75 e 76 del DPR 445/2000, le sanzioni previste dal codice penale e dalle leggi speciali vigenti in materia, oltre alle conseguenze amministrative previste per la partecipazione alle procedure di gara.

16/06/2019

Firma