

## Elena Volpi, Ph.D.

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### CURRICULUM VITAE

EDUCATION	<p>2003, Ph. D. in Civil Engineering, University of Roma Tre          1999, M.S. in Civil Engineering, University of Roma Tre (cum laude)</p>
ACADEMIC POSITION	<p>2002 – present, Assistant Professor, Department of Engineering, University of Roma Tre</p>
PRINCIPAL RESEARCH INTERESTS	<p>Analysis and modeling of rainfall fields, space-time variability and its effects of the hydrologic response          Statistical analysis of extreme events in a univariate and bivariate context, also based on historical (non-systematic) information          Uncertainty in hydrological modeling and model selection</p>
ACTIVITIES	<p>1<sup>st</sup> June – 29<sup>th</sup> August 2013, Visiting Scholar at the University of California Irvine, Department of Civil and Environmental Engineering          Member of the Organizing Committee for the Kos 2013 international conference "Facets of Uncertainty" (<a href="http://kos2013.org/">http://kos2013.org/</a>)          2013 IAHS Tison Award for young hydrologists, with the paper: Lombardo F., Volpi E. and D. Koutsoyiannis, 2012. Rainfall downscaling in time: theoretical and empirical comparison between multifractal and Hurst-Kolmogorov discrete random cascades – Hydrological Science Journal, 57(6)          Member of the European Geophysical Union          Referee for the International Journals: Journal of Hydrology, Hydrological Science Journal, Hydrology and Earth System Sciences, Physics and Chemistry of the Earth, Natural Hazards, Meteorology and Atmospheric Physics</p>
TEACHING EXPERIENCE	<p>Teaching experience at the University of Roma Tre          ✓ <u>Teaching</u>          2005-present, Flood risk assessment and management, M.S. in Engineering for Natural Risk Assessment          2005-2008, Statistical hydrology, M.S. in Engineering for Natural Risk Assessment          2004-2008, Hydraulic infrastructures, water supply, B.S. in Civil Engineering          2003-2004, Flood risk assessment and management, B.S. in Civil Engineering</p>

✓ Teaching assistant

2008 – present, Hydraulic Infrastructures (B.S. in Civil Engineering)

✓ Advising Activity

Thesis advisor and co-advisor for several students, B.S. and M.S. in Civil Engineering

Federico Lombardo, “Stochastic downscaling models” Ph.D. expected in 2013.

Teaching experience at University of Rome Sapienza

2011-present, Flood risk assessment (three lectures), Master program in Hydro-geological risk assessment and mitigation, Centre of Research CERI, University of Rome Sapienza.

FUNDED RESEARCH  
PROJECTS  
(partecipation)

2012-2015, Project of National Interest<sup>1</sup>, Costs of the lack of prevention in Italy. A research project for the safety of people and the correct distribution of public resources

2008-2010, Project of National Interest: Flow and solute transport modeling at the hillslope scale, based on residence time distribution

2009-2012, Sim.COAST: Numerical Simulation Tools for Protection of Coasts against Flooding and Erosion, EU Marie-Curie Actions EU-China (FP7-PEOPLE-2009-IRSES), WP 3: Climate Change and extreme events

2009-2012, Mediterranean precipitation – Calibration and validation activities in Italy for the GPM mission, NASA’s Global Precipitation Mission Invitation for International Ground Validation Participation

2005-2007, Project of National Interest: Drop dissipaters for combined sewer systems

2002-2004, Project of National Interest: Storm water pollution in the metropolitan area of Rome

1999-2001, Hydro-meteorology and quasi-deterministic forecast of the effects of the extreme events at land surface, funded by the National Group for Defense from Hydro-geological Disasters of the National Research Council (GNDCI-CNR)

2002-present, participation in several applied research projects funded by local public administrations and mainly related to flood risk assessment and mitigation strategies.

<sup>1</sup> Project of National Interest (PRIN), funded by the Italian Minister for University and Research.

## Publications

### INTERNATIONAL JOURNALS

- Lombardo, F., Volpi, E., Koutsoyiannis, D. and Papalexiou S. M., 2013. Just two moments! A cautionary note against use of high-order moments in multifractal models in hydrology. *Hydrol. Earth Syst. Sci. Discuss.*, 10, 4627–4654, 2013, [www.hydrol-earth-syst-sci-discuss.net/10/4627/2013/doi:10.5194/hessd-10-4627-2013](http://www.hydrol-earth-syst-sci-discuss.net/10/4627/2013/doi:10.5194/hessd-10-4627-2013).
- Volpi, E., Di Lazzaro, M. and A. Fiori, 2013. Analytical modeling of the hydrologic response under moving rainstorms: Storm-catchment interaction and resonance. *Journal of Hydrology* 493 (2013) 132–139, <http://dx.doi.org/10.1016/j.jhydrol.2013.04.025>.
- Volpi, E., Di Lazzaro, M. and A. Fiori, 2012. A simplified framework for assessing the impact of rainfall spatial variability on the hydrologic response, *Advances in Water Resources*, 46, 1-10, doi: 10.1016/j.advwatres.2012.04.011.
- Volpi, E. and A. Fiori, 2012. Design event selection in bivariate hydrological frequency analysis, *Hydrological Science Journal*, 57(8), 1506-1515, doi:10.1080/02626667.2012.726357.
- Fiseha B. M., Melesse A.M, Romano E., Volpi E. and Fiori A., 2012. Statistical Downscaling of Precipitation and Temperature for the Upper Tiber Basin in Central Italy, *International Journal of Water Sciences*, Vol. 1, 3:2012, DOI: 10.5772/52890.
- Fiseha, B.M., Shimelis, G.S., Melesse, A.M., Volpi, E. and A. Fiori, 2012. Hydrological Analysis of the Upper Tiber Basin, Central Italy: A Watershed Modeling Approach, *Hydrological Processes*, doi: 10.1002/hyp.9234.
- Lombardo, F., Volpi, E. and D. Koutsoyiannis, 2012. Rainfall downscaling in time: Theoretical and empirical comparison between multifractal and Hurst-Kolmogorov discrete random cascades. *Hydrological Science Journal*, 57, 6, 1052-1066, doi:10.1080/02626667.2012.695872.
- Di Lazzaro, M. and E. Volpi, 2011. Effects of hillslope dynamics and network geometry on the scaling properties of the hydrologic response, *Advances in Water Resources* 34, 1496–1507, doi:10.1016/j.advwatres.2011.07.012.
- Calenda, G., C.P., Mancini and E. Volpi, 2009. Selection of the probabilistic model of extreme floods: the case of the River Tiber in Rome, *Journal of Hydrology* 371, 1–11, doi:10.1016/j.jhydrol.2009.03.010.
- Calenda G., E. Gorgucci, F. Napolitano, A. Novella and E. Volpi, 2005. Multifractal analysis of radar rainfall fields over the area of Rome, *Advances in Geosciences*, 2, 293–299.
- Calenda, G., C.P., Mancini and E. Volpi, 2005. Distribution of the extreme peak floods of the Tiber River from the XV century, *Advanced Water Research*, 28, 615-625.

### PAPERS IN REVIEW

- Volpi, E. and Fiori, A., 2013. Hydraulic structures subject to bivariate hydrological loads: Return period, design and risk assessment, submitted to *Water Resources Research*.

### PUBLICATIONS ON BOOKS

- Calenda, G., Di Lazzaro, M., Fiori, A., Prestininzi, P. and Volpi, E., 2009. Drop dissipators: a comparison between CFD simulations and experimental observations, in “Results of the MIUR-PRIN 2005 on the standardization of urban drainage manholes”.
- Lombardo, F., Montesarchio, V., Napolitano, F., Russo, F. and E. Volpi, 2009. Operational applications of radar rainfall data in urban hydrology, *IAHS Publ.* 327, 258-266.

## PUBLICATIONS AND COMMUNICATIONS IN INTERNATIONAL CONFERENCES

- Lombardo, F., Volpi, E. and D. Koutsoyiannis (2013), How to parsimoniously disaggregate rainfall in time, Statistical Hydrology STAHY 2'13 in Facets of Uncertainty, Kos (Greece), 17-19 October, 2013. (abstract)
- Volpi, E. and A. Fiori (2013), Can we use a single hydrological event for hydraulic structure design? Statistical Hydrology STAHY 2'13 in Facets of Uncertainty, Kos (Greece), 17-19 October, 2013. (abstract)
- Lombardo, F., Volpi, E. and D. Koutsoyiannis (2013), Effect of time discretization and finite record length on continuous-time stochastic properties, IAHA-IAPSO-IASPEI Joint Scientific Assembly, Goteborg (Sweden), 22-26 July, 2013. (abstract)
- Volpi, E., Di Lazzaro, M. and A. Fiori, 2012. Exploring the variability of the hydrologic response due to rainfall spatial heterogeneity: Analytical derivations and numerical simulations, Geophysical Research Abstracts, Vol. 14, 2012 EGU General Assembly. (abstract)
- Romano, E., Volpi, E. and F. Stefanucci, 2012. Analysis of temperature trends, heat and cold waves in Central Italy (1952-2008), Geophysical Research Abstracts, Vol. 14, 2012 EGU General Assembly. (abstract)
- Lombardo, F., Volpi, E., Papalexiou, S.M., and D. Koutsoyiannis, 2012. Multifractal downscaling models: A crash test. 3rd STAHY International Workshop on Advances in Statistical Methods for Hydrology and Water Resources Management, Tunis, October 1-2, 2012. (abstract)
- Volpi, E., Di Lazzaro, M. and A. Fiori, 2012. Influence of rainstorm movement on basin hydrographs: theoretical analysis of resonance conditions, AGU Fall Meeting, San Francisco, 3-7- December 2012. (abstract)
- Lombardo F., Volpi, E. and D. Koutsoyiannis, 2011. Theoretical and empirical comparison of stochastic disaggregation and downscaling approaches for rainfall time series, Geophysical Research Abstracts, Vol. 13, EGU2011-854-1, 2011 EGU General Assembly. (abstract)
- Volpi, E., Fiori, A., Mancini, C.P. and G. Calenda, 2011. Identification of hydrological design events using copulas, IUGG XXV General Assembly, Melbourne, Australia (STAHY Workshop). (abstract)
- Volpi, E., Napolitano, F., Russo, F. and F. Lombardo, 2010. Study on multifractal modeling of spatial rainfall, Geophysical Research Abstracts, Vol. 12, EGU2010-14956-1, 2010 EGU General Assembly. (abstract)
- Volpi, E., Napolitano F. and F. Lombardo, 2010. Investigating the scaling regimes of rainfall time series from a dense rain gauge network, 2nd STAHY International Workshop on Advances in Statistical Hydrology, Taormina, May 23-25, 2012. (abstract)
- Baldini, L., Gorgucci, E., Romaniello, V., Russo, F., Montesarchio, V., Sebastianelli, S., Napolitano, F., Volpi, E. and F. Lombardo, 2010. Dual polarization radar observations of precipitation events in the area of Rome, HyMeX workshop, Bologna, Italy. (abstract)
- Calenda, G. and E. Volpi, 2009. Efficiency of model selection criteria in flood frequency analysis, Geophysical Research Abstracts, Vol. 11, EGU2009-9031-2, 2009, EGU General Assembly. (abstract)
- Volpi, E., Napolitano F. and F. Lombardo, 2009. Scaling properties of rainfall time-series in the urban area of Rome, Geophysical Research Abstracts, Vol. 11, EGU2009-8964-1, 2009, EGU General Assembly. (abstract)
- Lombardo, F., Napolitano, F., Russo, F. and E. Volpi, 2007. Scaling properties of rainfall time series, IUGG XXIV General Assembly, Perugia, Italy, July 2-13 2007. (abstract)
- Calenda, G., Mancini, C.P. and E. Volpi, 2007. The extreme peak flow series of the River Tiber in Rome, IUGG XXIV General Assembly, Perugia, Italy, July 2-13 2007. (abstract)
- Napolitano, F., Russo, F., Trovarelli D. and E. Volpi, 2003. A statistical approach for rainfall events classification, 5th EGS Plinius Conference, Mediterranean Storms, Ajaccio, France, October 2-4.
- Calenda, G., Calvani, L., Mancini, C.P. and E. Volpi, 2002. Reconstruction of the extreme flood series of the Tiber river in Rome from the XV century, XVII EGS General Assembly, Nizza, France, April 21-26. (abstract)

- Calenda, G., Napolitano, F. and E. Volpi, 2002. On space-time rainfall multifractal modelling, 4th EGS Plinius Conference, Mediterranean Storms, Mallorca, Spain, October 2-4.
- Calenda, G., Cerri, M., Di Lazzaro, M. and E. Volpi, 2002. Reliability of a hydrometeorological flood forecasting procedure. XVII EGS General Assembly, Nizza, France, April 21-26. (abstract)

PUBLICATIONS IN ITALIAN

- Lombardo, F., Volpi, E., Koutsoyiannis, D., 2012. Downscaling temporale della precipitazione: un modello a cascata stocastica discreta. XXXIII Convegno Nazionale di Idraulica e Costruzioni Idrauliche, Brescia, 10-15 settembre 2012.
- Volpi, E., Di Lazzaro, M., Fiori, A., 2012. Effetti della variabilità spaziale del campo di precipitazione sulla risposta idrologica: un'indagine attraverso modelli analitici e numerici semplificati. XXXIII Convegno Nazionale di Idraulica e Costruzioni Idrauliche, Brescia, 10-15 settembre 2012.
- Volpi, E., Di Lazzaro, M. e Calenda, G., 2010. Sample Quantile Criterion (SQC): un criterio per la selezione dei modelli probabilistici, XXXII Convegno Nazionale di Idraulica e Costruzioni Idrauliche, Palermo, 4-9 settembre.
- Di Lazzaro, M e E. Volpi, 2010. Effetto delle dinamiche di versante sulle proprietà di invarianza di scala nei bacini naturali, XXXII Convegno Nazionale di Idraulica e Costruzioni Idrauliche, Palermo, 4-9 settembre.
- Calenda, G., Di Lazzaro, M., Fiori, A., Prestininzi, P. e E. Volpi, 2009. Dissipatori a risalto: confronto tra osservazioni sperimentali e simulazione numerica, Atti della VI giornata studio sul drenaggio sostenibile, L'Acqua, 4.
- Lombardo, F., Margaritora, G., Napolitano, F., Russo, F. e E. Volpi, 2007. Applicazioni della radarmeteorologia nella gestione dei manufatti di drenaggio urbano: il caso di Roma. Acqua e Città - II Convegno nazionale di idraulica urbana, Chia (CA), 25-28 settembre.
- Calenda, G., Mancini, C.P. e E. Volpi, 2007. Analisi statistica di una lunga serie di massimi colmi annuali, L'Acqua, 5, 31-38.
- Calenda, G., Mancini, C.P. e E. Volpi, 2006. Analisi statistica di una lunga serie di massimi colmi annuali. XXX Convegno di Idraulica e Costruzioni Idrauliche, Roma 10-15 settembre.
- Volpi, E., 2004. Analisi multifrattale di campi di precipitazione osservati da rete pluviometrica sull'area metropolitana di Roma, XXIX Convegno di Idraulica e Costruzioni Idrauliche, Trento 7-10 settembre.
- Volpi, E., 2003. Sull'inferenza delle proprietà multifrattali di campi di precipitazione spazio-temporali da rete pluviometrica, Giornata di Studio: metodi Statistici e Matematici per le Analisi Idrologiche, Roma, 9 Maggio.
- Calenda, G. e E. Volpi, 2001. Pianificazione territoriale quale prevenzione dell'emergenza, L'acqua: elemento del territorio, Rimini, 6 maggio.
- Benedetto, A., Calenda, G., Cosentino, C., Di Virgilio, F. e E. Volpi, 2000. Preannuncio di Piena Basato su Previsione Meteorologica con un Modello Idrologico a Parametri Distribuiti, XXVII Convegno di Idraulica e Costruzioni Idrauliche, Genova.