

Professor Marco Borga - CV and list of publications

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Address

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CURRENT POSITION

Full Professor at the Department of Land, Environment, Agriculture and Forestry of the University of Padova, where I am teaching Hydrology, Hydraulics and Forest Hydrology.
Member of the European Geosciences Union, American Geophysical Union, and IAHS.

RESEARCH INTERESTS

- Water resources management: climate impacts and feedbacks, risk management, water and society, water and energy;
- Hydrological predictions and modelling: runoff models, rainfall estimates from radar and satellite for runoff modelling, flood and flash flood forecasts;
- Forest and Catchment hydrology: flow and transport processes, soil moisture, water transport in the soil-vegetation-atmosphere system, snow and glaciers;
- Geomorphology: prediction of shallow landsliding and debris flows; integrated hydro-geomorphic modelling of hillslopes.

PERSONAL STATUS

CITIZENSHIP

EDITORIAL ACTIVITY

Editor-in-Chief of the Journal of Hydrology, Elsevier (since 2017) and Member of the Editorial Board of the Journal of Flood Risk Management, Wiley (since 2008). Guest Editor for the following issues of scientific journals:

1. Special Issue of *Hydrological Sciences Journal*, « *Panta Rhei Symposium on modeling hydrological processes and changes* », Vol. 64, 2019.
2. Special Issue of *Journal of Hydrology*, "*Flash floods, hydro-geomorphic response and risk management*", Vol. 54, 2016.
3. Special Issue of *Geomorphology*, "*Modeling Land Dynamics in mountainous environments* ", Vol. 133, 2011.

4. Special Issue of *Journal of Hydrology*, "Flash floods: observations and analysis of hydrometeorological controls", Vol. 394, 2010.
5. Special Issue of *Advances in Water Resources*, "Weather Radar and Hydrology", Vol. 32, 2009.

METRICS OF RESEARCH IMPACTS

SCOPUS citation metrics at September 6, 2020:

Total Articles in SCOPUS Publication List: 176, Sum of the Times Cited: 7667, h-index: 50.

REVIEWER ACTIVITY

Grant Proposal Reviewer Activity:

Program Framework Environment and Climate, 1994-1998, EC DGXII; Israel Science Foundation (Israel) (2004-2010); United States-Israel Binational Science Foundation (U.S.-Israel) (2006-2009); Natural Environment Research Council (NERC) (UK) (2006-2016); Netherlands Organisation for Scientific Research (NWO) (Netherlands), (2006); Swiss Science Foundation (2009-2016) (Switzerland); NSF (2010) (USA); Polish-Swiss Research Programme, PSPB-153_2010, 2010 (Switzerland); Agence Nationale de la Recherche (ANR) 2012-2015 (France); AXA 2010-2013 (France).

Academic reviewer for the following Journals (decreasing order of total number of reviews):

Journal of Hydrology; *Hydrological Processes*; *Geomorphology*, *Journal of Hydrometeorology*; *Natural Hazards*; *Advances in Water Resources*; *Natural Hazards and Earth System Sciences (NHES)*; *Water Resources Research*; *Hydrological Sciences Journal*; *Journal of American Water Resources Association*; *Hydrology and Earth System Sciences (HESS)*; *Environmental Geology*; *Water Science and Technology*; *Journal of Atmospheric and Oceanic Technology*; *Atmospheric Research*; *Stochastic Environmental Research and Risk Assessment*; *Computers and Geosciences*; *Journal of Hydrologic Engineering (ASCE)*; *Science*.

COORDINATION OF INTERNATIONAL RESEARCH PROJECTS

- 2013-2015: General Coordinator for the EU 'Marie-Curie Research and Training Grant' FP7-PEOPLE-2011-IEF: *HYDROMETEOROLOGICAL CONTROLS AND WARNING PROCEDURES FOR SHALLOW LANDSLIDES IN AN ALPINE REGION – HYLAND*.
- 2006-2009: General Coordinator for the EU FP6-2005-GLOBAL-4 project: *HYDROMETEOROLOGICAL DATA RESOURCES AND TECHNOLOGIES FOR EFFECTIVE FLASH FLOOD FORECASTING (HYDRATE)*. The project includes 17 partners, (14 from Europe, 1 from US, 1 from South-Africa and 1 from China).

PARTICIPATION TO INTERNATIONAL RESEARCH PROJECTS (LAST TEN YEARS)

- 2016-2019: LIFE15-GIC/IT/000030: *FLOOD RISK ANTICIPATION AND COMMUNICATION IN THE ALPS (FRANCA)*, Scientific Leader U.R. University of Padova.
- 2012-2016: FP7-ENV_2012: *KNOWLEDGE BASED CLIMATE MITIGATION SYSTEMS FOR A LOW CARBON ECONOMY (COMPLEX)*, Scientific Leader U.R. University of Padova.
- 2010-2013: FP7-CIRCLE 2: *ASSESSMENT OF RISKS ON TRANSPORTATION NETWORKS RESULTING FROM SLOPE INSTABILITY AND CLIMATE CHANGE IN THE ALPS (ARNICA)*, Scientific Leader U.R. University of Padova.
- 2004-2013: FP6-2002-GLOBAL-1: *INTEGRATED FLOOD RISK ANALYSIS AND MANAGEMENT METHODOLOGIES (FLOODsite)*, Scientific Leader U.R. University of Padova.

PUBLICATIONS (LAST FIVE YEARS)

2020

1. STERGIADI et al., 2020: Impact of geology on seasonal hydrological predictability in alpine regions by a sensitivity analysis framework. *Water*, 12, 8, Article number 2255.
2. MARCHINA C., ZUECCO G., PENNA D., CHIOGNA G., BIANCHINI G., CARTURAN L., COMITI F., ENGEL M., NATALI C., **BORGA M.**, 2019, 2020: Alternative methods to determine the $\delta^2\text{H}$ - $\delta^{18}\text{O}$ relationship: An application to different water types. *Journal of Hydrology*, 587, Article number 124951.
3. PÉREZ CIRIA, T., PUSPITARINI, H.D., CHIOGNA, G., FRANÇOIS, **BORGA, M.** 2020: Multi-temporal scale analysis of complementarity between hydro and solar power along an alpine transect. *Science of the Total Environment* 741, 140179.
4. PUSPITARINI, H.D., FRANÇOIS, B. ZARAMELLA, M., BROWN, C., **BORGA, M.** 2020. The impact of glacier shrinkage on energy production from hydropower-solar complementarity in alpine river basins. *Science of Total Environment*. 719, 137488.
5. AMIN, A., ZUECCO, G., GERIS, J., SCHWENDENMANN, L., MCDONNELL, J.J., **BORGA, M.**, PENNA, D., 2020. Depth distribution of soil water sourced by plants at the global scale: a new direct inference approach. *Ecohydrology*, 13, 2, e2177.
6. SCORPIO et al., 2020 : Restoring a glacier-fed river: Past and present morphodynamics of a degraded channel in the Italian Alps. *Earth Surface Processes and Landforms*, in press.
7. MONDINO, E, SCOLOBIG, A., **BORGA, M.**, ALBRECHT, F., MÁRD, J. , WEYRICH, P., DI BALDASSARRE, G., 2020: Exploring Changes in Hydrogeological Risk Awareness and Preparedness over Time: A Case Study in North-eastern Italy. *Hydrological Sciences Journal*, 65, 7, 1049-1059.
8. WEYRICH, P., et al., 2020: A flood risk oriented dynamic protection motivation framework to explain risk reduction behaviours. *Natural Hazards and Earth System Sciences*, 20, 1, 287-298.
9. MONDINO et al., 2020: The role of experience and different sources of knowledge in shaping flood risk awareness. *Water*, 12, 8, Article number 2130.
10. DI MARCO, N., et al., 2020: Comparison of MODIS and Model-Derived Snow-Covered Areas: Impact of Land Use and Solar Illumination Conditions. *Geosciences*, 10, 4, Article number 134.

2019

11. ZUECCO, G., RINDERER, M., PENNA, D., **BORGA, M.**, VAN MEERVELD, H.J., 2019: Quantification of subsurface hydrologic connectivity in four headwater catchments using graph theory. *Science of the Total Environment*, 646, 1265-1280.
12. CARTURAN, L., DE BLASI, F., CAZORZI, F., ZOCCATELLI, D., BONATO, P., **BORGA, M.**, DALLA FONTANA, G., 2019: Relevance and scale dependence of hydrological changes in glacierized catchments: insights from historical data series in the Eastern Italian Alps. *Water* 2019, 11, 89; doi:10.3390/w11010089.
13. ZUECCO et al., 2019: Understanding hydrological processes in glacierized catchments: evidence and implications of highly-variable isotopic and electrical conductivity data. *Hydrological Processes*, 33, 5, 816-832.
14. DERIN, Y., et al., 2019 : Evaluation of GPM-era Global Satellite Precipitation Products over Multiple Complex Terrain Regions. *Remote Sensing*, 11, 24, Article number 2936.
15. BLÖSCHL et al., 2019: *Changing climate both increases and decreases European river floods. Nature*, 573, 108–111.
16. **BORGA, M.**, F. COMITI, I. RUIN, F. MARRA, 2019: Forensic analysis of flash flood response. *Wiley Interdisciplinary Reviews: Water* 6 (2), e1338.
17. CHEN, Y., **BORGA, M.**, YANGWEN JIA, 2019: Preface, *Hydrological Sciences Journal*, 64:16, 1943-1943, DOI: 10.1080/02626667.2019.1691810
18. ZARAMELLA, M., **BORGA, M.**, D. ZOCCATELLI, L. CARTURAN, 2019: TOPMELT 1.0: A topography-based distribution function approach to snowmelt simulation for hydrological modelling at basin scale. *Geosci. Model Dev.*, 12, 5251–5265, <https://doi.org/10.5194/gmd-12-5251-2019>.

2018

19. ZUECCO, G., RINDERER, M., PENNA, D., **BORGA**, M., VAN MEERVELD, H.J., 2019: Quantification of subsurface hydrologic connectivity in four headwater catchments using graph theory. *Science of the Total Environment*, 646, 1265-1280.
20. DI BALDASSARRE, G., et al., 2018: HESS Opinions: An interdisciplinary research agenda to explore the unintended consequences of structural flood protection. *Hydrol. Earth Syst. Sci.*, 22, 5629-5637, <https://doi.org/10.5194/hess-22-5629-2018>.
21. FRANÇOIS, B., B. HINGRAY, M. **BORGA**, D. ZOCCATELLI, C. BROWN, J.D. Creutin, 2018: Impact of climate change on combined solar and run-of-river power in Northern Italy. *Energies*, 11(2), 290; doi:10.3390/en11020290.
22. ZUECCO, G., D. PENNA, M. **BORGA**, 2018: Runoff generation in mountain catchments: long-term hydrological monitoring in the Rio Vauz Catchment, Italy. *Geographical Research Letters*, 44, 2, 397-428.
23. DESTRO, E., W. AMPONSAH, E.I. NIKOLOPOULOS, L. MARCHI, F. MARRA, D. ZOCCATELLI, M. **BORGA**, 2018: Coupled prediction of flash flood response and debris flow occurrence: application on an alpine extreme flood event. *J. Hydrol.*, 558, 225-237.
24. EFTHYMIOS I. NIKOLOPOULOS E.I., E. DESTRO, M. EHSAN BHUIYAN, M. BORGA, E.N. ANAGNOSTOU, 2018: Evaluation of predictive models for post-fire debris flow occurrence in the western United States. *Nat. Hazards Earth Syst. Sci.*, 18, 2331-2343, <https://doi.org/10.5194/nhess-18-2331-2018>.
25. SCORPIO, V., S. CREMA, F. MARRA, M. RIGHINI, G. CICCARESE, M. **BORGA**, M. CAVALLI, A. CORSINI, L. MARCHI, N. SURIAN, F. COMITI, 2018: Basin-scale analysis of the geomorphic effectiveness of flash floods: a study in the northern Apennines (Italy). *Science of the Total Environment*, 640-641, 337-351.
26. AMPONSAH et al., 2018: Integrated high-resolution dataset of high-intensity Euro-Mediterranean flash floods. *Earth Syst. Sci. Data*, 10, 1783-1794, <https://doi.org/10.5194/essd-10-1783-2018>.
27. ANAGNOSTOU, M., E.I. NIKOLOPOULOS, J. KALOGIROS, E.N. ANAGNOSTOU, F. MARRA, E. MAIR, G. BERTOLDI, U. TAPPEINER, M. **BORGA**, 2018: Advancing precipitation estimation and streamflow simulations in complex terrain with X-band dual-polarization radar observations. *Remote Sensing*, 10, 8, Article number 1258.

2017

36. FRANÇOIS, B., D. ZOCCATELLI, M. **BORGA**, 2017: Assessing small hydro/solar power complementarity in ungauged mountainous areas: a crash test study for hydrological prediction methods. *Energy*, 127, 716-729.
37. RIGHINI, M., N. SURIAN, E. WOHL, L. MARCHI, F. COMITI, W. AMPONSAH, M. **BORGA**, 2017 : Geomorphic response to an extreme flood in two Mediterranean rivers (northeastern Sardinia, Italy): analysis of controlling factors. *Geomorphology*, 290, 184-199.
38. MAGGIONI, V., E. NIKOLOPOULOS, E. ANAGNOSTOU, M. **BORGA**, 2017: Modeling Satellite Precipitation Uncertainty over Mountainous Terrain: The Influence of Gauge Density, Seasonality, and Temporal Resolution. *Transactions on Geoscience and Remote Sensing*, 55(2), 4130-4140, doi : 10.1109/TGRS.2017.2688998.
39. PENNA, D., G. ZUECCO, S. CREMA, S. TREVISANI, M. CAVALLI, L. PIANEZZOLA, L. MARCHI, M. **BORGA**, 2017: Response time and water origin in a steep nested catchment in the Italian Dolomites. *Hydrol. Processes*, 31 (4), 768-782.
40. ENGELAND, K., **BORGA**, M., CREUTIN, J.D., FRANÇOIS, B., RAMOS, M.H., VIDAL J.P., 2017: Space-time variability of climate variables and intermittent renewable electricity production - a review. *Renewable and Sustainable Energy Reviews*, 79, 600-617.
41. DESTRO, E., F. MARRA, E.I. NIKOLOPOULOS, D. ZOCCATELLI, J.-D. CREUTIN, M. **BORGA**, 2017: Spatial estimation of debris flows-triggering rainfall and its dependence on rainfall severity. *Geomorphology*, 278, 269-279.
42. BLÖSCHL, G., J. HALL1, J. PARAJKA1, R.A. PERDIGÃO, B. MERZ, B. ARHEIMER, G.T. ARONICA, A. BILIBASHI, O. BONACCI, M. **BORGA**, I. ČANJEVAC, A. CASTELLARIN, G.B. CHIRICO, P. CLAPS, K. FIALA, N. FROLOVA, L. GORBACHOVA, A. GÜL, J. HANNAFORD, S. HARRIGAN, M. KIREEVA, A. KISS, T.R. KJELDSSEN, S. KOHNOVA, J.J. KOSKELA,

- O.LEDVINKA, N.MACDONALD, M. MAVROVA-GUIRGUINOVA, L. MEDIERO, R. MERZ, P. MOLNAR, A.MONTANARI, C.MURPHY, M.OSUCH, V. OVCHARUK, I.RADEVSKI, M.ROGGER, J.L. SALINAS, E.SAUQUET, M.ŠRAJ, J. SZOLGAY, A. VIGLIONE, E.VOLPI, D.WILSON, K.ZAIMI, N. ŽIVKOVIC, 2017: Changing climate shifts timing of European floods. *Science*, 357, 588–590.
- 43 ABERA, W., G. FORMETTA, M. **BORGA**, R. RIGON, 2017: Estimating the water budget components and their variability in a Pre-Alpine basin with JGrass-NewAGE. *Adv. Water Resour.*, 104, 37-54.
- 44 ROGGER, M., et al., 2017: Land-use change impacts on floods at the catchment scale – Challenges and opportunities for future research. *Water Resour. Res.*, 53, 7, 5209-5219.
- 45 MARRA, F., E. DESTRO, E. I. NIKOLOPOULOS, D. ZOCCATELLI, J.D. CREUTIN, F. GUZZETTI, M. **BORGA**, 2017: Effect of rainfall spatial aggregation on the identification of debris flow occurrence thresholds. *Hydrology and Earth System Sciences*, 21, 9, 4525-4532.
- 46 NIKOLOPOULOS, E.I., E. DESTRO, V. MAGGIONI, F. MARRA, M. **BORGA**, 2017: Satellite-rainfall estimates for debris flow prediction: An evaluation based on rainfall depth - duration thresholds. *J. Hydromet.*, 18, 8, 2207-2214.
- 2016**
- 47 AMPONSAH, W., L. MARCHI, D. ZOCCATELLI, G. BONI, M. CAVALLI, F. COMITI, S. CREMA, A. LUCÍA, F. MARRA, M. **BORGA**, 2016 : Hydrometeorological characterisation of a flash flood associated to major geomorphic effects: Assessment of peak discharge uncertainties and analysis of the runoff response. *J. Hydrometeorology*, 17(12), 3063-3077.
- 48 CEOLA at al., 2016: Adaptation of Water Resources Systems to Changing Society and Environment: A statement by the International Association of Hydrological Sciences. *Hydrol. Sci. Jour.*, 61 (16), 2803-2817.
- 49 DERIN, Y., E.N. ANAGNOSTOU, A. BERNE, M. **BORGA**, B. BOUDEVILLAIN, W. BUYTAERT, C.H. CHANG, G. DELRIEU, Y. HONG, Y. CHIA HSU, W. LAVADO-CASIMIRO, B. MANZ, S. MOGES, E.I. NIKOLOPOULOS, D. SAHLU, F. SALERNO, J.P. RODRIGUEZ SANCHEZ, H.J. VERGARA, K.K. YILMAZ, 2016: Multiregional Satellite Precipitation Products Evaluation over Complex Terrain. *J. Hydromet.*, 17, 6, 1817-1836.
- 50 DROBINSKI, P., et al., 2016: Scaling precipitation extremes with temperature in the Mediterranean: past climate assessment and projection in anthropogenic scenarios. *Climate Dynamics*, doi:10.1007/s00382-016-3083-x.
- 51 BRAUD, I, M. **BORGA**, J. GOURLEY, M. HÜRLIMANN, M. ZAPPA, F. GALLART, 2016 : Flash floods, hydro-geomorphic response and risk management. *J. Hydrol.*, 541, 1-5.
- 52 MARRA, F., E. I. NIKOLOPOULOS, J.D. CREUTIN, M. **BORGA**, 2016: Space-time organization of debris flows-triggering rainfall and its effect on the identification of the rainfall threshold relationship. *J. Hydrol.*, 541, 246-255.
- 53 LUTOFF, C., J.D. CREUTIN, I. RUIN, M. **BORGA**, 2016: Anticipating flash-floods: multi-scale aspects of the social response. *J. Hydrol.*, 541, 626-635.
- 54 SURIAN, N., M. RIGHINI, A. LUCÍA, L. NARDI, W. AMPONSAH, M. BENVENUTI, M. **BORGA**, M. CAVALLI, F. COMITI, L. MARCHI, M. RINALDI, A. VIERO, 2016: Channel response to extreme floods: insights on controlling factors from six mountain rivers in northern Apennines, Italy. *Geomorphology*, 272, 78-91.
- 55 MARCHI, L., M. CAVALLI, W. AMPONSAH, M. **BORGA**, S. CREMA, 2016 : Upper limits of flash flood stream power in Europe. *Geomorphology*, 272, 68-77.
- 56 CARTURAN L., G. ZUECCO G., R. SEPPI R., T. ZANONER, M. **BORGA**, A. CARTON, G. DALLA FONTANA, 2016: Catchment-scale permafrost mapping using spring water characteristics. *Permafrost and Periglacial Processes*, 253-270.
- 57 PENNA, D., H.J. van MEERVELD, G. ZUECCO, G. DALLA FONTANA, M. **BORGA**, 2016: Hydrological response of an Alpine catchment to rainfall and snowmelt events. *Journal of Hydrology*, 537 (2016) 382–397.
- 58 RINALDI, M., W. AMPONSAH, M. BENVENUTI, M. BORGHA, F. COMITI, A. LUCÍA, L. MARCHI, L. NARDI, M. RIGHINI, N. SURIAN, 2016: An integrated approach for investigating geomorphic response to extreme events: Methodological framework and application to the October 2011 flood in the Magra River catchment, Italy. *Earth Surface Processes and Landforms*, 41 (6),

- 835-846.
- 59 MEI, Y., E.I. NIKOLOPOULOS, E.N. ANAGNOSTOU, M. BORGA, 2016: Evaluating Satellite Precipitation Error Propagation in Runoff Simulations of Mountainous Basins. *J. Hydrometeorology*, 15 :5, 1407-1423, DOI: <http://dx.doi.org/10.1175/JHM-D-15-0081.1>.
 - 60 MEI, Y., E. NIKOLOPOULOS, E. ANAGNOSTOU, D. ZOCCATELLI, M. **BORGA**, 2016: Error Analysis of Satellite Precipitation-Driven Modeling of Flood Events in Complex Alpine Terrain. *Remote Sensing*, 8 (4), 293, doi:10.3390/rs8040293.
 - 61 ZUECCO, G., D. PENNA, M. **BORGA**, H.J. VAN MEERVELD, 2016: A versatile index to characterise hysteresis between hydrological variables at the runoff event timescale. *Hydrological Processes*, 30, 9, 1449-1446.
 - 62 FRANÇOIS, B., M. **BORGA**, J.D. CREUTIN, B. HINGRAY, M.H. RAMOS, D. RAYNAUD, J.F. SAUTERLEUTE, 2016: Complementarity between Solar and Hydro Power: Sensitivity study to climate characteristics in Northern-Italy. *Renewable Energy* 86, 543-553.
 - 63 FRANÇOIS, B., B. HINGRAY, D. RAYNAUD, M. **BORGA**, J.D. CREUTIN, 2016: Increasing Climate-Related-Energy penetration by integrating run-of-the river hydropower to wind/solar mix. *Renewable Energy*, 87, 686-696.
 - 64 HLAVCOVA, K., S. KOHNOVA, M. **BORGA**, O. HORVAT, P. ŠTASTNÝ, P. PEKAROVA, O. MAJERCAKOVA, Z. DANACOVA, 2016 : Post-event analysis and flash flood hydrology in Slovakia. *J. Hydrol. Hydromech.*, 64, 4, 304-315.

Legnaro, September 28, 2020

Marco Borga