

CURRICULUM VITAE

PERSONAL INFORMATION

Name: Boano Fulvio

Date of birth: 06 November 1978

Nationality: Italian

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EDUCATION

Feb 2007 Ph.D. in Hydraulic Engineering (Thesis title: Solute transport in rivers and hyporheic zones) at Dept. of Hydraulics and Civil Infrastructures, Politecnico di Torino, Italy.

Oct 2003 Master degree in Environmental Engineering (Thesis title: Stochastic dynamics of reactive solutes in rivers) at the First Faculty of Engineering, Politecnico di Torino, Italy

CURRENT POSITION

2015 – now Associate Professor in Hydraulics at Dept. of Environment, Land, and Infrastructure Engineering, Politecnico di Torino, Italy

PREVIOUS POSITIONS

2008 - 2015 Assistant Professor in Hydraulics at Dept. of Environment, Land, and Infrastructure Engineering, Politecnico di Torino, Italy

2007 – 2008 Postdoc Research Assistant (Research project: Influence of exchange between stream, hyporheic zone, and aquifer on stream water quality and riparian ecosystems) at Dept. Of Hydraulics and Civil Infrastructures, Politecnico di Torino, Italy.

Jul-Aug 2006 Visiting student at Northwestern University, IL (USA). Research project: Transport of solutes in streams and hyporheic zones (1 paper published on Water Resour. Res., 2007).

RESEARCH INTERESTS

My main research interest is to understand how natural processes can be harnessed to improve water quality and reduce anthropic impact on the environment. I am particularly interested in self-depuration processes that remove contaminants and nutrients from the water cycle, and in how we can employ these processes to limit the excessive presence of these compounds in water bodies while reducing the need for more energy-consuming treatment options. I believe that the use of natural self-depuration processes will constitute a key element in our strive to attain a sustainable balance between human population growth and its impact on the environment, which represents the fundamental challenge of our times.

My research activity has focused in particular on how nutrient and contaminant removal is controlled by the interactions between water transport and biogeochemical reactions in hotspots at the stream-aquifer interface. This knowledge basis is necessary to control watershed self-depuration processes, and since my PhD I have developed an expertise in employing modeling approaches to quantify the role of reaction and transport processes in river corridors and to predict how these processes respond to changes in system properties.

PUBLICATIONS:

Since 2005, I have published a total of 45 papers in international peer-reviewed ISI journals. These publications have attracted 847 citations (excluding self-citations) with h-index of 17 (source: ISI Web of Knowledge, 22 Feb 2018).

List of publications:

1. J. D. Drummond, **F. Boano**, E. R. Atwill, X. Li, T. Harter, A.I. Packman (2018), Cryptosporidium oocyst persistence in agricultural streams – a mobile-immobile model, accepted for publication in *Scientific Reports*.
2. S.B. Grant, M. Azizian, P. Cook, **F. Boano**, M.A. Rippy (2018), Factoring Stream Turbulence into Global Assessments of Nitrogen Pollution, accepted for publication in *Science*.
3. Maticchiera F., Manes C., Beaven R.P., Rees-White T.C., **Boano F.**, Mønster J., Scheutz C. (2018), AERMOD as a Gaussian dispersion model for planning tracer gas dispersion tests for landfill methane emission quantification, accepted for publication in *Waste Management*.
4. **Boano F.**, N. De Falco, S. Arnon (2018), Modeling chemical gradients in sediments under losing and gaining flow conditions: The GRADIENT code, *Advances in Water Resources* 112, doi: 10.1016/j.advwatres.2017.12.002
5. **Boano F.**, Rizzo, A., Samsò R., García J., Revelli R., Ridolfi L. (2018), Changes in bacteria composition and efficiency of constructed wetlands under sustained overloads: A modeling experiment, *Science Of The Total Environment* 612, doi: 10.1016/j.scitotenv.2017.08.265
6. Caruso A, **F. Boano**, L. Ridolfi, D.L Chopp, A.I. Packman (2017), Biofilm-induced bioclogging produces sharp interfaces in hyporheic flow, redox conditions, and microbial community structure, *Geophysical Research Letters* 44, doi: 10.1002/2017GL073651
7. Azizian M., **F. Boano**, Cook P.L.M., Detwiler R.L., Rippy M.A., Grant S.B. (2017), Ambient groundwater flow diminishes nitrate processing in the hyporheic zone of streams, *Water Resources Research* 53, doi: 10.1002/2016WR020048
8. Roche K.R., Drummond J.D., **Boano F.**, Packman A.I., Battin T.J. (2017), Benthic biofilm controls on fine particle dynamics in streams, *Water Resources Research* 53, doi: 10.1002/2016WR019041.
9. **Boano F.**, N. De Falco, S. Arnon (2016), Biodegradation of labile dissolved organic carbon under losing and gaining streamflow conditions simulated in a laboratory flume, *Limnology And Oceanography* 61, doi:10.1002/lno.10344
10. Caruso A., L. Ridolfi, **F. Boano** (2016), Impact of watershed topography on hyporheic exchange, *Advances in Water Resources* 94, doi: 10.1016/j.advwatres.2016.06.005.
11. Fiore S., **F. Boano**, R. Revelli (2016), Chlorate formation in water distribution systems: a modeling study, *Journal of Hydroinformatics* 18, doi: 10.2166/hydro.2015.079.
12. Rizzo, A., **F. Boano**, R. Revelli, L. Ridolfi (2015), Groundwater impact on methane emissions from flooded paddy fields, *Advances in Water Resources* 83, doi: 10.1016/j.advwatres.2015.07.005.
13. **Boano F.**, M. Scibetta, L. Ridolfi, O. Giustolisi (2015), Water distribution system modeling and optimization: a case study, *Procedia Engineering* 119, doi: 10.1016/j.proeng.2015.08.925
14. **Boano F.**, J.W. Harvey, A. Marion, A.I. Packman, R. Revelli, L. Ridolfi, A. Wörman (2014), Hyporheic flow and transport processes: Mechanisms, models, and biogeochemical implications, *Rev. Geophys.*, 52, doi:10.1002/2012RG000417.

15. Grant S.B., K. Stolzenbach, M. Azizian, M.J. Stewardson, **F. Boano**, L. Bardini (2014), First-Order Contaminant Removal in the Hyporheic Zone of Streams: Physical Insights from a Simple Analytical Model, *Environ. Sci. Technol.*, 48, doi: 10.1021/es501694k.
16. Rizzo A., **F. Boano**, R. Revelli, L. Ridolfi (2014), Decreasing of methanogenic activity in paddy fields via lowering ponding water temperature: A modeling investigation, *Soil Biology and Biogeochemistry* 75, doi: 10.1016/j.soilbio.2014.04.016.
17. Rizzo A., G. Langergraber, A. Galvao, **F. Boano**, R. Revelli, L. Ridolfi (2014), Modelling the response of laboratory horizontal flow constructed wetlands to unsteady organic loads with HYDRUS-CWM1, *Ecological Engineering* 68, doi: 10.1016/j.ecoleng.2014.03.073
18. Fox A., **F. Boano**, S. Arnon (2014), Impact of losing and gaining streamflow conditions on hyporheic exchange fluxes induced by dune-shaped bed forms, *Water Resources Research*, 50, doi: 10.1002/2013WR014668.
19. Krause S., **F. Boano**, M.O. Cuthbert, J.H. Fleckenstein, J. Lewandowski (2014), Understanding process dynamics at aquifer-surface water interfaces: An introduction to the special section on new modeling approaches and novel experimental technologies, *Water Resources Research.*, 50, doi:10.1002/2013WR014755.
20. Scibetta M., **F. Boano**, R. Revelli, L. Ridolfi, (2014), Community detection as a tool for district metered areas identification, *Procedia Engineering* 70, doi: 10.1016/j.proeng.2014.02.167
21. **Boano F.**, S. Fiore, R. Revelli (2014), Modeling the Fate of Disinfection By-Products in Water Distribution Systems, *Procedia Engineering* 89, doi: 10.1016/j.proeng.2014.11.185
22. **Boano F.**, L. Berardi (2014), Comparison of WDN Segmentations Based on Modularity Indexes, *Procedia Engineering* 89, doi: 10.1016/j.proeng.2014.11.423
23. Rizzo A., **F. Boano**, R. Revelli, L. Ridolfi (2013), Can microbial fuel cells be an effective mitigation strategy for methane emissions from paddy fields?, *Ecological Engineering* 60, doi: 10.1016/j.ecoleng.2013.07.033
24. Fenoglio S., **F. Boano**, T. Bo, R. Revelli, L. Ridolfi (2013), The impacts of increasing current velocity on the drift of *Simulium monticola* (Diptera: Simuliidae): a laboratory approach, *Italian Journal Of Zoology* 80, doi: 10.1080/11250003.2013.820798
25. Scibetta M., **F. Boano**, R. Revelli, L. Ridolfi, (2013), Community detection as a tool for complex pipe network clustering, *EPL* 103, doi: 10.1209/0295-5075/103/48001
26. Butera I., **F. Boano**, R. Revelli, L. Ridolfi, (2013), Recovering the Release History of a Pollutant Intrusion into a Water Supply System through a Geostatistical Approach, *Journal Of Water Resources Planning And Management* 139, doi: 10.1061/(ASCE)WR.1943-5452.0000267
27. **Boano F.**, R. Revelli, L. Ridolfi (2013), Modeling hyporheic exchange with unsteady stream discharge and bedform dynamics, *Water Resources Research* 49, doi: 10.1002/wrcr.20322
28. Bardini, L., **F. Boano**, M.B. Cardenas, A.H. Sawyer, R. Revelli, L. Ridolfi (2013), Small-scale permeability heterogeneity has negligible effects on nutrient cycling in streambeds, *Geophys. Res. Lett.*, 40, doi:10.1002/grl.50224.
29. Rizzo A., **F. Boano**, R. Revelli, L. Ridolfi (2013), Role of water flow in modeling methane emissions from flooded paddy soils, *Advances in Water Resources* 52, doi: 10.1016/j.advwatres.2012.11.016
30. Bardini L., **F. Boano**, M.B. Cardenas, R. Revelli, L. Ridolfi (2012), Nutrient cycling in bedform induced hyporheic zones, *Geochimica et Cosmochimica Acta*, 84, 47-61.
31. **Boano F.**, R. Revelli, L. Ridolfi (2011), Water and solute exchange through flat streambeds induced by large turbulent eddies, *Journal of Hydrology* 402, doi: 10.1016/j.jhydrol.2011.03.023
32. **Boano F.**, R. Revelli, L. Ridolfi (2010), Effect of streamflow stochasticity on bedform-driven hyporheic exchange, *Advances in Water Resources* 33, doi: 10.1016/j.advwatres.2010.03.005

33. Fleckenstein J.H., S. Krause, D.M. Hannah, **F. Boano** (2010), Groundwater-surface water interactions: New methods and models to improve understanding of processes and dynamics, *Advances in Water Resources*, 33, 1291-1295.
34. **Boano F.**, C. Manes, D. Poggi, R. Revelli, L. Ridolfi (2010), Comment on "Pore water flow due to near-bed turbulence and associated solute transfer in a stream or lake sediment bed" by M. Higashino et al., *Water Resources Research* 46, doi: 10.1029/2010WR009185
35. **Boano F.**, C. Camporeale, R. Revelli, L. Ridolfi (2010), A linear model for the coupled surface-subsurface flow in a meandering stream, *Water Resources Research* 46, doi: 10.1029/2009WR008317
36. **Boano F.**, A. Demaria, R. Revelli, L. Ridolfi (2010), Biogeochemical zonation due to intrameander hyporheic flow, *Water Resources Research*, 46, W02511, doi:10.1029/2008WR007583.
37. **Boano F.**, D. Poggi, R. Revelli, L. Ridolfi (2009), Gravity-driven water exchange between streams and hyporheic zones, *Geophysical Research Letters* 36, doi: 10.1029/2009GL040147
38. **Boano F.**, R. Revelli, L. Ridolfi (2009), Quantifying the impact of groundwater discharge on the surface-subsurface exchange, *Hydrological Processes* 23, doi: 10.1002/hyp.7278
39. Revelli R., **F. Boano**, C. Camporeale, L. Ridolfi (2008), Intra-meander hyporheic flow in alluvial rivers, *Water Resources Research* 44, doi:10.1029/2008WR007081
40. **Boano F.**, R. Revelli, L. Ridolfi (2008), Reduction of the hyporheic zone volume due to the stream-aquifer interaction, *Geophysical Research Letters* 35, doi: 10.1029/2008GL033554
41. **Boano F.**, A.I. Packman, A. Cortis, R. Revelli, L. Ridolfi (2007), A continuous time random walk approach to the stream transport of solutes, *Water Resources Research*, 43, W10425, doi:10.1029/2007WR006062.
42. **Boano F.**, R. Revelli, L. Ridolfi (2007), Bedform-induced hyporheic exchange with unsteady flows, *Advances in Water Resources* 30, doi: 10.1016/j.advwatres.2006.03.004
43. **Boano F.**, C. Camporeale, R. Revelli, L. Ridolfi (2006), Sinuosity-driven hyporheic exchange in meandering rivers, *Geophysical Research Letters*, 33, L18406, doi:10.1029/2006GL027630.
44. **Boano F.**, R. Revelli, L. Ridolfi (2006), Stochastic modelling of DO and BOD components in a stream with random inputs, *Advances in Water Resources* 29, doi: 10.1016/j.advwatres.2005.10.007
45. **Boano F.**, R. Revelli, L. Ridolfi (2005), Source identification in river pollution problems: A geostatistical approach, *Water Resources Research* 41, doi: 10.1029/2004WR003754

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