Dario Del Giudice, PhD

+1 650 864 2978
ddelgiu@ncsu.edu
orcid.org/0000-0002-6375-8527
2501 Stinson Dr., Raleigh, NC 27695

PROFESSIONAL SUMMARY

Nine years of experience in analyzing and predicting human impacts on aquatic ecosystems by leveraging process-based models and Bayesian statistics. Expert in developing and evaluating stochastic methods for uncertainty quantification in environmental predictions. Successfully completed research projects aiming at improving water quantity and quality modeling while leading international research teams across Europe, Asia, and the US.

EDUCATION

PhD, Environmental Engineering, Institutes of Technology (ETHZ, Eawag), Switzerland. 2011 – 2015
Thesis: Improving output and input statistical error descriptions in urban hydrological modeling.

MSc, Environmental Sciences and Engineering, Institute of Technology (EPFL), Switz. *Summa cum laude*. 2009 – 2011

BSc, Environmental Sciences, Università di Bologna, Italy. *Summa cum laude*. 2006 – 2009

PROFESSIONAL EXPERIENCE

Postdoctoral Researcher, North Carolina State University, US. since 2018

Postdoctoral Researcher, Carnegie Institution at Stanford University, US. 2015 – 2018

PEER-REVIEWED PUBLICATIONS

1. D. Machac, P. Reichert, J. Rieckermann, **D. Del Giudice**, C. Albert. Accelerating Bayesian inference in hydrological modelling with a mechanistic emulator. *Environ. Modell. Soft.* (2018), doi:10.1016/j.envsoft.2018.07.016.
2. **D. Del Giudice**, M. Kalcic, R. Muenic, N. Bosch, D. Scavia et al. On the practical usefulness of least squares for assessing uncertainty in hydrologic and water quality predictions. *Environ. Modell. Soft.* (2018), doi:10.1016/j.envsoft.2018.03.009.
3. **D. Del Giudice**, Y. Zhou, E. Sinha, A. Michalak. Long-term phosphorus loading and springtime temperatures explain interannual variability of hypoxia in a large temperate lake. *Env. Sci. Tech.* (2018), doi: 10.1021/acs.est.7b04730.
4. **D. Del Giudice**, C. Albert, J. Rieckermann, P. Reichert. Describing the catchment-averaged precipitation as a stochastic process improves parameter and input estimation. *Water Res. Res.* (2016), doi: 10.1002/2015WR017871.
5. A. Sikorska, **D. Del Giudice**, K. Banasik, J. Rieckermann. The value of streamflow data in improving TSS predictions - Bayesian multi-objective calibration. *J. Hydrol.* (2015), doi:10.1016/j.jhydrol.2015.09.051.
6. **D. Del Giudice**, R. Löwe, H. Madsen, P. Mikkelsen, J. Rieckermann. Comparison of two stochastic techniques for reliable urban runoff predictions by modeling systematic errors. *Water Res. Res.* (2015), doi: 10.1002/2014WR016678.
7. **D. Del Giudice**, V. Bares, C. Albert, P. Reichert, J. Rieckermann. Model bias and complexity - understanding the effects of structural deficits and input errors on runoff predictions. *Environ. Modell. Soft.* (2015), doi:10.1016/j.envsoft.2014.11.006.
8. D. Dürrenmatt, **D. Del Giudice**, J. Rieckermann. Dynamic time warping improves sewer flow monitoring. *Water Res.* (2013), doi: 10.1016/j.watres.2013.03.051.
9. **D. Del Giudice**, M. Honti, A. Scheidegger, C. Albert, P. Reichert, J. Rieckermann. Improving uncertainty estimation in urban hydrological modeling by statistically describing bias. *Hydrol. Earth Syst. Sci.*, (2013), doi:10.5194/hess-17-4209-2013.
10. S. Coutu, **D. Del Giudice**, L. Rossi, D. Barry. Parsimonious hydrological modeling of urban sewer and river catchments. *J. Hydrol.* (2012), doi:10.1016/j.jhydrol.2012.07.039.
11. S. Coutu, **D. Del Giudice**, L. Rossi, D. Barry. Modeling of facade leaching in urban catchments. *Water Res. Res.* (2012), doi:10.1029/2012WR012359.

OTHER PUBLICATIONS

D. Del Giudice, A. Davies. A few words can make a big impact. *Nature* (2017), doi: 10.1038/541030e.
D. Del Giudice. Evidence-based critical thinking. *Science* (2016), doi: 10.1126/science.354.6308.46.

TEACHING & MENTORING

Invited Speaker for the Academic Chats Program (Stanford U.) – help students aspiring to faculty careers. 2017

Facilitator for Science Communication Workshops (Stanford U.) – mentor grad students and postdocs to effectively present their research; ∼30 students. 2016 – 2017

Supervisor for: R. Fu, C. Rachelly (ETHZ), P. Kornberger (U. Rapperswil), D. Eilertz (U. Freiburg) T. Doppler (Eawag), E. Grava (U. Neuchatel), T. Rossboth (U. Vienna), S. Fang, A. Katin (NCSU) 2012 – 2018

TA for Environmental Systems Analysis (Eawag) – summer school on Bayesian inference, model predictions, and uncertainty quantification with R; ∼30 students. 2012 – 2015

TA for graduate and undergraduate courses (ETHZ): 2012 – 2014

- Urban water management (essentials) – water supply, rainfall analysis, and dimensioning the sewer system. I assisted in the design and grading of the exams; ∼100 students.
- Urban water management (advanced) – urban hydrology and hydraulics and pollutant transport computation. I assisted in the design and grading of the exams; ∼20 students.

TA for graduate and undergraduate courses (EPFL): 2010 – 2011

- Water Quality Modeling – hydrogeochemical computation, contaminant degradation, and reaction kinetics. I led the exercise sessions and graded the assignments and exams; ∼20 students.
- Quantitative Methods II – analysis of mathematical models for environmental engineering. I led the exercises with Matlab and graded the assignments and exams; ∼40 students.
- Air Pollution Modeling – emission and dispersion forecasting. I led the exercise sessions and graded the assignments; ∼30 students.
- Informatics – provided IT support for students on software and computational issues.

HONORS & AWARDS (SELECTED)

Travel Award, EGU Conference, Austria. 2013

Best Paper Award, Urban Drainage Modeling Conference, Serbia. 1 prize awarded over > 170 papers 2012

Veolia Award for the **most innovative** project in water sciences, France. 1 prize awarded over > 50 candidates. 2011

Société de géomatique Prize for the **best grade**, Switzerland. 1 prize awarded over ~ 50 students. 2011

"Mention of excellence", École polytechnique fédérale de Lausanne, Switzerland. 2011

Environment Prize for an **excellent thesis**, Switzerland. 1 prize awarded over ~ 50 students. 2011

Grivat Scholarship for the **most meritorious** student, Switzerland. 1 grant awarded over ~ 150 students 2010

Award for **outstanding performance** during an internship, Switzerland. 2010

Excellence Scholarship for outstanding performance, Switzerland. ~10 grants awarded over ~1000 students 2009

European Union **Scholarship** to study at Universidad de Granada, Spain. 1 grant awarded over ~ 100 students 2008

"Graduated with highest honors", Alberti High School, Italy. 2006

FUNDING

Contributed to writing a grant for the Swiss National Science Foundation; PI: J. Rieckermann; Nr: 152824 (∼$130000).

CONFERENCE PRESENTATIONS (SELECTED)

A. Katin, **D. Del Giudice**, H. Paerl, D. Obenour. Modeling biophysical controls on hypoxia for the Neuse River Estuary using a Bayesian framework. *Coastal Modeling Conference*, Seattle, US. 2018

Michalak, A.M., V. Balaji, **D. Del Giudice**, et al. Are extreme hydrometeorological events a prerequisite for extreme water quality impacts? *AGU Meeting (Invited)*, New Orleans, US. 2017

D. Del Giudice et al. Balancing the stochastic description of uncertainties as a function of hydrologic model complexity. *AGU Meeting (**Invited**)*, San Francisco, US. 2016

D. Del Giudice et al. Beyond rainfall multipliers: describing input uncertainty as an autocorrelated stochastic process improves inference in hydrology. *AGU Meeting*, San Francisco, US. 2015

K. Villez, **D. Del Giudice**, M. Neumann, and J. Rieckermann. The statistical description of model bias. *Watermatex Symposium on Systems Analysis*, Gold Coast, Australia. 2015

R. Löwe, **D. Del Giudice**, H. Madsen, P. Mikkelsen, and J. Rieckermann. Probabilistic modelling in urban drainage. *Conference on Urban Drainage*, Kuching, Malaysia. 2014

D. Del Giudice, V. Bares, C. Albert, P. Reichert, and J. Rieckermann. Selecting optimal hydrodynamic model complexity. *AGU Meeting*, San Francisco, US. 2013

D. Del Giudice, P. Reichert, M. Honti, A. Scheidegger, C. Albert, and J. Rieckermann. Improving prediction uncertainty estimation in urban hydrology. *EGU Conference*, Vienna, Austria. 2013

D. Del Giudice, S. Coutu, L. Rossi, and A. Barry. Modelling the behavior of facade biocides. *Urban Drainage Conference*, Belgrade, Serbia. 2012

INVITED TALKS

Impacts of climate variability on hydrology and water quality. *Temple U.*, *Rice U.* and *U. Florida*, US. 2018

Predicting the impacts of climate change on hydrological systems. *Sandia National Labs*, US. 2017

Improving estimation and predictions in hydrology and water quality. *UC Irvine*, US. 2017

Combining modeling and statistics to predict hydrologic and water quality dynamics. *Stanford U.*, US. 2017

How to get reliable predictions despite model bias? *Met Office*, UK. 2014

Impacts of input and structural errors. *U. Lausanne* and *Institute for Forest Research*, Switzerland. 2014

Give me a model and I will tell you what its uncertainty is. *U. Tübingen* and *U. Stuttgart*, Germany. 2014

Bayesian uncertainty analysis accounting for bias. *DTU*, Denmark and *U. Innsbruck*, Austria. 2013

Modeling biocides leaching at basin scale. *Forschungszentrum Jülich*, Germany and *TU Wien*, Austria. 2011

JOURNAL REVIEWER

Water Resour. Res., Stoch. Env. Res. Risk A., Environ. Modell. Softw., Water Sci. Technol., J. Hydrol., Hydrol. Earth Syst. Sc., Computat. Geosci., Environ. Sci. Technol., Geophys. Res. Lett.

SKILLS

- **Software**: R (mcmc, ncdf4, dplyr, rgdal, xts), Python (sklearn, pandas, keras), Matlab, Office (esp. Excel), LaTeX, SQL.
- **Languages**: Italian (native), English (fluent), French (fluent), Spanish (fluent), German (fluent), Latin (intermediate), Portuguese (intermediate).