Alexey Katin

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Professional interests:

- Water quality, hydrologic and hydraulic modeling
- Storm- and wastewater management
- Data analysis and visualization (maps, tables, and figures)

Software Experience

Modeling: R, Stan, ArcGIS, GRASS, MATLAB, QUAL2K, WEAP, IRIC, Lindo, Minteq

Web: HTML, Gauss, First spirit, Joomla, Bitrix, WordPress

Graphics: Photoshop, Illustrator, InDesign, Corel, GIMP

Education

- **Ph.D**. Civil, Construction, and Environmental engineering (2016-present)
  North Carolina State University (NCSU) (Raleigh, NC, USA)
  Advisor: Daniel R. Obenour
  Dissertation: Bayesian Modeling of Coastal Eutrophication to Inform Management Solutions for Hypoxia and Algal Blooms

- **M.S.** Hydro Science and Engineering (2013-2015)
  Technische Universität Dresden (Dresden, Germany)
  Advisors: Mitsuyo Saito, Kenji Okubo, Rudolf Liedl
  Thesis: Quantitative evaluation of submarine groundwater discharge in granitic coastal area with the use of ^{222}Rn as a natural tracer including diffusive flux from the benthic sediment

- **B.S.** Economics (2006-2010)
  National University of Science and Technology (MISIS) (Moscow, Russia)
  Advisor: Theodor B. Rubinshtein
  Thesis: Bank credit risk management at OAO “ALFA-BANK”

- **B.S.** Environmental Engineering (2004-2009)
  National University of Science and Technology (MISIS) (Moscow, Russia)
  Advisor: Yuri M. Kochnov
  Thesis: Development of recommendations for improving gas purification system for arc shaft furnace “Severstal” in order to reduce energy costs

Positions held

Research Assistant. NCSU Department of Civil Engineering (2016-present)

- Developed novel Bayesian mechanistic biogeochemical model to predict dissolved oxygen concentration for the Neuse Estuary, NC
- Leveraged model for short-term hypoxia forecasting to inform fisheries and watershed managers in advance about the expected conditions
- Developed Bayesian empirical and process-based predictive models to understand how environmental factors control phytoplankton in the river-dominated estuary. Tested the system sensitivity to nutrient loading variations in order to comply with state water quality standard
- Used R to process and analyze data, produce figures, and code all models
- Provided annual forecast for the Gulf of Mexico (GoM) hypoxia. Suggested updates to the existing model to include the long-term effect of nutrient loadings in the predictions of the GoM hypoxic zone

Graduate Teaching Assistant. CE 383 – Hydrology and Urban Water Systems, NCSU Department of Civil, Construction, and Environmental Engineering (2018-present)

- Graded biweekly student asignments
- Assisted students with questions during regular office hours

Intern. Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany (2014)

- Converted technical documentation into html version with equations embedded using LaTeX

Marketing Executive. Bosch Rexroth, Moscow, Russia (2010-2013)

- Planned and organized company representation at exhibitions and conferences (full event management)
- Analyzed local industrial hydraulics market and competitors
- Administrated and managed corporate website
- Designed sales brochures according to corporate style. Worked with printing agencies

Scholarly works

1. Katin, A., Del Giudice, D., Obenour, D.R. (2019). Modeling biophysical controls on hypoxia in a shallow estuary using a Bayesian mechanistic framework. Environmental modeling and software, 120.
2. Scavia, D., Bertani, I., Obenour, D.R., Turner, R.E., Forrest, D.R., Katin, A. (2017). Ensemble modeling informs hypoxia management in the northern Gulf of Mexico. Proceedings of the National Academy of Sciences, Vol. 114, 8823-8828.

Other related experience and unpublished works

- Assisted in collecting water quality samples and CTD profiling at University Lake, NC (2017)
- Collected water quality samples (nutrients, chlorophyll a) at the Neuse River, NC as a part of monitoring project (2016)
- Sampled sediment and deployed sensors (temperature, salinity) at the Ikuchijima island, Hiroshima area, Japan (2015)
- Accomplished study project during Masters: Testing the performance of spatial interpolation techniques for mapping precipitation fields in Saxony, Germany (2014). Interpolation and output figures were performed in R

Presentations

1. Katin, A., Obenour, D.R., Del Giudice D “Contrasting nutrient management implications from statistical and process-based estuary phytoplankton models”, 25th Biennial Conference of the Coastal and Estuarine Research Federation (CERF). Mobile, AL. November 2019.
2. Katin, A., Obenour, D.R., Del Giudice, D. “Development and application of a probabilistic hypoxia forecasting model for the Neuse Estuary”, Water Resources Research Institute (WRRI) Annual Conference. Raleigh, NC. March, 2019.
3. Katin, A., Del Giudice D., Paerl, H.W., Obenour, D.R. “Modeling biophysical controls on hypoxia for the Neuse River Estuary using a Bayesian framework”, Estuarine and Coastal Modeling Conference (ECM15). Seattle, WA. June 2018.
4. Katin, A., Obenour, D.R. “Hypoxia and algal bloom modeling for the Neuse River estuary”, North Carolina Sea Grant Conference. Raleigh, NC. April 2017.

Publications at North Carolina Sea Grant Coastal Watch

1. Forecasting Hypoxia, Algal Blooms for the Neuse River Estuary (https://ncseagrant.ncsu.edu/currents/2016/10/forecasting-hypoxia-algal-blooms-for-the-neuse-river-estuary/), 2016
2. Model Forecasts Severe Hypoxia through August in Neuse Estuary (https://ncseagrant.ncsu.edu/news/2018/07/model-forecasts-severe-hypoxia-through-august-in-neuse-estuary/), 2018
3. Tropical Systems Disrupt Neuse River Oxygen Levels (https://ncseagrant.ncsu.edu/currents/2019/01/tropical-systems-disrupt-neuse-river-oxygen-levels/), 2018
4. Researchers Forecast Healthier Neuse River Oxygen Levels (https://ncseagrant.ncsu.edu/news/2019/06/researchers-forecast-healthier-neuse-river-oxygen-levels/), 2019

Honors

- Full tuition fellowship at North Carolina State University (2016-2020)
- Full travel DAAD stipend covering two semesters in Japan (2014-2015)