PERSONAL INFORMATION

Alena Bartosova

Hydrology Research Unit
SE - 601 76 NORRKÖPING
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RESEARCH INTERESTS

- Surface water quality; assessments and modelling at catchment, basin, and large scales
- Biogeochemistry; relations among water column concentrations, sediment, habitat, flow regime, biota
- Effects of anthropogenic activities and changing environment on hydrology and surface water quality
- Climate impact on surface water quality and hydrology

EDUCATION AND TRAINING

18.5.1998-19.5.2002 **Doctor of Philosophy** Ph.D. awarded May 2002

Marquette University, Milwaukee, WI, U.S.A

- Major: Water Resources/Environmental Engineering
- Minor: Mathematics
- Dissertation title: Estimation of Ecological Risk to Aquatic Biota from Physical and Chemical Impairment due to Urbanization
- Advisor: Prof. Vladimir Novotny, Ph.D., P.E.

15.8.1996-17.5.1998 **Master of Science** M.Sc. awarded May 1998

Marquette University, Milwaukee, WI, U.S.A

- Major: Water Resources/Environmental Engineering
- Thesis title: Algorithms for Winter Urban Diffuse Pollution
- Advisor: Prof. Vladimir Novotny, Ph.D., P.E.

1.9.1989-31.5.1994 **Diploma Engineer** Dipl. Ing. awarded May 1994

Brno University of Technology, Brno, Czech Republic

- Major: Water Management and Water Engineering Structures
- Thesis title: Study of Local Sewer System in the City of Brno, Subcatchment D07, Modelling of Sewer Systems (MOUSE)
- Dean's award for Best Thesis of the Year
- Advisor: Ing. Petr Prax, Ph.D.

LEADERSHIP TRAINING

- Understanding Group and Leader Training (UGL), December 2022
- Programme logic (Verksamhetslogik), 3-part training, October – November 2022
- Equality training (Jämställdighetsintegrering), 4-part training, March – October 2021
- Communication in leadership (Den kommunikativa ledare), 4-part training, 2020
- Communication planning (Kommunikationsplanering), January 2020
- Leading without being a boss (Att leda utan att vara chef) training in leadership, communication and group dynamics; April 2018
- PPS Project Leadership Training (Praktiskt Projekt Styrning), January 2017
- Illinois Mandatory Ethics Training, annual training in business ethics and anti-discriminatory practices, 2007-2015

CURRENT POSITION

1.1.2023 - present: Head of Environment and Climate Section in Hydrology Research

Research and Development, Swedish Meteorological and Hydrological Institute, Norrköping, Sweden.

- Leading a group of 12 researchers in the area of hydrology and climate research for societal planning
- Leading development and applications of water quality aspects in HYPE, a hydrologic simulation model
- Coordinating hydrological research related to environmental and climate, incl. regular reporting on progress of activities and reaching organizational goals
- Planning, resourcing, and conducting research projects as a PI and co-PI
- Regular coordination with other Swedish agencies
- Activities:
  - Lead PI of DIRT-X (https://dirtx-reservoirs4future.eu/), Bilateral Cooperation with South Africa and Vietnam, Transport of microplastics in surface waters
  - WP leader in FOCCUS
  - Simulating and analysing hydrology and surface water quality at various scales and on various continents, incl. climate/socioeconomic impacts, measure assessments

Business or sector Scientific institution/academia

PRIOR RESEARCH EXPERIENCE

1.12.2015 – 31.12.2022: Senior Researcher

Research and Development, Swedish Meteorological and Hydrological Institute, Norrköping, Sweden.

- Scientific Leader in the area of Water Quality Modelling
- Leading development and applications of water quality aspects in HYPE, a hydrologic simulation model
- Leading a team of 9, coordinating research related to water quality in the Hydrological Research and Development department, incl. regular reporting on progress of activities and reaching organizational goals
- Planning, resourcing, and conducting research projects as a PI and co-PI
- Regular coordination with other Swedish agencies
- Activities:
  - Lead PI of DIRT-X (https://dirtx-reservoirs4future.eu/), Bilateral Project with South Africa, Transport of microplastics in surface waters
  - WP leader in HYPOS (https://hypos-project.eu/), BONUS SOILS2SEA (http://www.soils2sea.eu/), BONUS MIRACLE
  - Researcher in several EU-funded project (BONUS MIRACLE, SWITCH-ON, SWICCA, INSURE, etc.)
  - Simulating and analysing hydrology and surface water quality at various scales and on various continents, incl. climate/socioeconomic impacts, measure assessments

Business or sector Scientific institution/academia

22.9.2002-23.11.2015: Assistant Professional Scientist /Principal Investigator (PI)

Illinois State Water Survey, University of Illinois at Urbana-Champaign, Champaign, IL-61820, U.S.A.

- Planned, resourced, and conducted research projects as a PI and co-PI
- Secured $3,490,600 in funding from federal, state, and local sources during last 10 years
- Lead and supervised teams of 2 to 6 researchers (full time scientific staff, research assistants, doctoral candidates, and/or hourly employees)
- Published 17 scientific reports for sponsors and funding agencies
- Presented 14 papers at 11 professional conferences
- Provided analyses and technical expertise to aid in state's litigations/law suits and regulatory activities
- Activities:
  - Designed monitoring programs to study surface water quality processes (sediment, nutrients, dissolved oxygen regime, atrazine, ethanol)
  - Developed a suite of watershed and receiving water models to analyze surface water quality and to address land and water management impacts on stream and lake water quality (HSPF, QUAL2K, WASP, GWLF, CE-QUAL-W2)
  - Evaluated impact of ethanol spill from train derailment on fish kill and developed a methodology to account for uncertainty
  - Analyzed spatial and temporal patterns of nutrient loads contributing to eutrophication of Great Lakes
  - Developed hierarchical model for linking Index of Biotic Integrity (IBI) to watershed stressors in Illinois
  - Developed a method for a state regulatory agency to assess the importance of point sources vs. nonpoint sources and their impact on nutrient impaired waters
  - Evaluated land management actions ranging from agriculture practices through alternatives on point sources and combined sewer overflows to urban Best Management Practices
  - Developed several GIS applications in water resources, analyzed water quality data, identified existing and potential water quality issues, and developed an approach to address these issues
  - Developed and managed environmental database, incl. quality assurance procedure and grading system
  - Provided online scientific and technical support to local stakeholders: access to reports, data, tools, etc., with over 37,000 individual downloads since April 2007
  - Lead discussions with stakeholders and conducted presentations to provide technical expertise and support in integrated watershed planning

Business or sector Scientific institution/academia

1.1.1998-30.6.2002: Research Assistant

Marquette University, Milwaukee, WI, U.S.A.

- Research projects:
  - Understanding the Impact of NPS Snowmelt on Urban Receiving Waters [sponsor - Water Environment Research Foundation]
  - Risk Based Urban Watershed Management: Integration of Water Quality and Flood Control Objectives [sponsor - US Environmental Protection Agency]
  - Optimization of the Central Control System [sponsor – Milwaukee Metropolitan Sanitary District
- Developed risk based methodology of habitat evaluation linking watershed stressors to biotic indexes
- Developed and calibrated water quality models (both deterministic and stochastic)
- Evaluated water quality data (sampling, data analysis, compliance with water quality standards)
- Developed and calibrated GIS models (hydrology, floodplain analysis, erosion, pollution loads)
- Developed custom ArcView extensions (floodplain expansion, erosion, data conversion and modification scripts) and Excel applications (Index of Biotic Integrity, IBI; Ecological risk calculation - toxicity of heavy metals)
- Participated in Use Attainability Analysis study (statistical analyses, site-specific standards, toxicity evaluation)
- Participated in evaluating ecological integrity (macroinvertebrate and fish sampling, calculation of IBIs, habitat evaluation)
- Supervised graduate students at a Master's of Science level in the Institute for Urban Environmental Risk Management, Marquette University

Business or sector Academia

1.9.1995-14.8.1996: Researcher/Principal Investigator

Water Research Institute T.G.M. Brno, Czech Republic

- Planned, resourced, and conducted research projects
  - Nutrient Balances in Danube Countries and Options for Surface and Ground Water Protection; project funded by European Union through Consortium of Vienna and Budapest Universities of Technology, Danube Applied Research Programme (PHARE)
  - Morava Project, Diffuse Sources of Pollution; project funded by Czech Ministry of Environment
  - Watershed Management in the Morava River Basin: Collaborative Study VUV Brno and International Institute for Applied System Analysis (IIASA), Laxenburg, Austria; project co-sponsored by Czech Ministry of Environment & IIASA
- Developed model of oxygen regime, organic matter, and nutrients for Morava River
- Analyzed effect of landuse on water quality
- Developed and evaluated landscape management alternatives at a basin scale
- Identified nutrient sources, fluxes and sinks and their change in time, developed nutrient balance at a basin scale
- Identified cost-effective pollution control strategies (both point and non-point sources) to control nutrients
- Cooperated on evaluating agriculture policies and their implications in reduction of diffuse pollution
- Participated in development of non-point pollution model

Business or sector Scientific institution

1.7.1995-31.8.1995: Visiting Scientist

International Institute for Applied Systems Analysis (IIASA), Laxenburg, Austria

- Cooperated on “Water Quality Management of Degraded River Basins in Central and Eastern Europe” project with a focus on the Czech Republic

Business or sector Scientific institution

1.9.1994-31.8.1995: Researcher

Water Research Institute T.G.M. Brno, Czech Republic

- Developed and calibrated surface water quality model (organic matter, dissolved oxygen, phosphorus, ammonia); QUAL2E
- Evaluated effects of wastewater treatment alternatives on water quality .Identified ‘hot-spot’ point sources
- Evaluated water quality and compliance with water quality standards

Business or sector Scientific institution

TEACHING EXPERIENCE

1.1.2014-30.5.2014 / 15.8.2011-31.12.2011 Lecturer

Department of Natural Resources and Environmental Science, University of Illinois at Urbana-Champaign, Champaign, IL-61820, U.S.A.

- NRES 401: Watershed Hydrology (online graduate level course)

Business or sector Academia

1.1.2000-30.6.2000 / 1.1.2001-30.6.2001 / 1.1.2002-30.6.2002 Lecturer

Marquette University, Milwaukee, WI, U.S.A.

- “Geographical Information Systems in Engineering and Planning” course (both undergraduate and graduate students)

Business or sector Academia

1.8.1996-31.12.1997 Teaching Assistant

Marquette University, Milwaukee, WI, U.S.A.

- Assisted with the following courses: Environmental Laboratory - Analysis, Urban Hydrology and Stormwater Management, Water Resources Engineering, Environmental Engineering

PERSONAL SKILLS

Mother tongue(s) Czech

Other language(s)

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C2	C2	C2	C2	C2
Swedish	B2	B2	B2	B2	B2

Communication skills

Excellent communications skills gained through research, teaching, and outreach incl. 13 years working directly with stakeholders. Conference presenter, author, and reviewer. Supervisor. Familiar with presenting own work as well as the work of others to various audiences.

Organisational / managerial skills

- Near 30 years of experience as a Principal Investigator and a project leader (teams of 2-6 researchers)
- Co-supervised 2 Ph.D. theses and 3 postdoctoral researchers, co-organized conference sessions, workshops, and volunteer events
- Coordinator of an EU-funded project (6 partner institutions from 5 countries)
- Scientific leader (team of 9 researchers)
- Various scientific and service committees
- PI and co+PI on international, interdisciplinary projects
- Group manager (10-12 researchers)

Job-related skills

- Near 30 years of research experience in hydrology and surface water quality, watershed and stream modelling and assessments, biogeochemistry, effects of anthropogenic activities, water quality monitoring design
- Provided analyses and technical expertise to aid in state's litigations/law suits and regulatory activities
- Experiences with sediment, nutrients, oxygen regime, pathogens, heavy metals, pesticides, plastics
- Land use impacts, climate change, agriculture and urban management practices
- Writing and coordinating research proposals

Digital competence

SELF-ASSESSMENT				
Information processing	Communication	Content creation	Safety	Problem solving
Proficient	Proficient	Proficient	Proficient	Proficient

Hydrologic/Water Quality Models: - HYPE, HSPF, QUAL2K, WASP, GWLF, CE-QUAL-W2, BASINS, MapShed, HEC-RAS

Other - MS Office, GIS, databases and data processing, statistics, programming in R

ADDITIONAL INFORMATION

Publications 41 scientific reports (of which 10 peer-reviewed), 19 peer-reviewed journal articles

Conferences /Presentations 62 presentations, 17 invited presentations

Projects PI or co-PI on 18 projects over last 10 years

Memberships EGU, IAHS

Honours and awards Marquette University: Reverend John P. Raynor, S.J., Fellowship Recipient, 2000; Brno University of Technology: graduated Magna cum Laude, 1994; Brno University of Technology: Dean's award for best thesis, 1994

PROFESSIONAL ACTIVITIES

Conferences organization

- Organized a session H14 “Improving Understanding of Hydrological Processes Through Water Quality” within The 28th IUGG Conference in Berlin, Germany, 2023
- Co-organized a session H05 “Climate Change and The Water Quality” within The 28th IUGG Conference in Berlin, Germany, 2023 (upcoming)
- Co-organized a session S26 “Emerging contaminants and legacy pollutants in freshwater ecosystems” within the IAHS 2022 Conference, Montpelier, France, 2022
- Co-organized a session H09 “Water quality in operational water resource management” within The 27th IUGG Conference in Montreal, Canada, 2019
- Co-organized a session H06 “Longterm spatiotemporal evolution of catchment water quality and sedimentation” within The 27th IUGG Conference in Montreal, Canada, 2019
- Co-organized a session on “Monitoring to Modeling: Total Maximum Daily Load” within Illinois Waters 2014 Conference in Champaign, IL
- Co-organized a session on “An Integrated Approach to Resource Management: The Fox River Watershed Effort” within Illinois Waters 2010 Conference in Champaign, IL
- Moderated several sessions at national conferences of American Water Resources Association (2012, 2008, 2006)
- Organized and taught one day workshop on “GIS in Diffuse Pollution & Watershed Management” within International Water Association 5th International Conference, Diffuse/Nonpoint Pollution and Watershed Management, June 2001, Milwaukee, WI

Doctoral committees and supervision

- Ph.D.
  - Siddhartha Verma: “Predictability and trends of annual pollutant loads in Midwestern watersheds”, Department of Agricultural and Biological Engineering, University of Illinois at Urbana-Champaign, Urbana, IL ; Ph.D. awarded in December 2013.
  - Emily Jenkins: “Estimating sediment load using dimensionless rating curve”, Department of Agricultural and Biological Engineering, University of Illinois at Urbana-Champaign, Urbana, IL . Dissertation defence passed in June 2015.
- Post-Docs
  - Jude Musuuza (2018-2019)
  - Alban De Lavenne (2018-2020)
  - Conrad Brendel (2020-2022)

Other Professional Service

- Secretary of International Committee on Water Quality, International Association of Hydrological Sciences (IAHS) (2023-present), elected office
- Co-leading an IAHS Working Group on “WATER & HEALTH - Integrated water pollution solutions to tackle the water & health nexus”, IAHS Scientific Decade HELPING (2023-present)
- Vice-President of International Committee on Water Quality, International Association of Hydrological Sciences (IAHS) (2019-2023), elected office
- Representing SMHI at Swedish National Coordination Meetings on Plastics Reduction (2021-present)
- Participant in Action Platform for Source-to-Sea Management (S2S Platform)
- Chair or a member of 8 staff hiring committees at Illinois State Water Survey (2004-2014) and 4 at SMHI (2017-2022)
- Member of Nutrient Standards committee for the Illinois EPA, 2010-2015
- Chair of Nutrient subcommittee, Illinois State Water Survey, 2006-2008
- Member of Database subcommittee for the Illinois State Water Survey Water Quality Plan (2006-2007)
- Reviewer for Journal of Hydrology, Journal of Environmental Informatics, HESS, Frontiers Earth Science