

Brennan T. Smith

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PROFESSIONAL EXPERIENCE

Program Manager, Wind and Water Power Technologies, January 2008 - present
EERE Program, Oak Ridge National Laboratory

Water Resources Engineer, April 2005 - present

Environmental Sciences Division, Oak Ridge National Laboratory

Research focusing on energy, water, and environmental optimization in hydropower-thermal systems:

- Energy-water interdependencies in regulated river basins
- Water use optimization for integrated river systems
- Effect of hydropower and wind power coordination on water availability and riverine ecosystems
- Nonlinear techniques for improved ambient and mixed water temperature forecasting for cooling water systems
- Effects of climate change and variability on hydropower and thermoelectric generation.

Water Resources Engineer, 1995 – April 2005

Tennessee Valley Authority (TVA), River Operations, Knoxville, TN

Primary function was providing hydrology and hydraulics expertise to engineering design and operations groups within the TVA power generation system and river system:

- Development of reservoir models (e.g. EFDC-based models) and field data collection schemes for integrated hourly forecasting and scheduling of hydropower flows and thermoelectric cooling water operations
- Support of regulatory compliance at TVA nuclear and fossil plant cooling water intakes and outfalls through detailed prototype flow field measurements in rivers, three-dimensional computational fluid dynamics (CFD) modeling of local flow fields, and empirical modeling
- Diagnosis and solution of sediment and debris accumulation problems at TVA hydro and thermal plant cooling water intakes through computational and physical modeling
- Physical modeling of hydraulic structures, including navigation locks and approaches, spillways, and cooling water intakes
- Optimization of hydroturbine performance through model and prototype testing, including environmental performance testing of aerating hydroturbines and measurement of flow-induced vibration in turbine draft tubes
- Representation of TVA River Operations in forums involving sediment transport through the Tennessee River system, including fate and transport of point-source mercury contamination.

Graduate Research Assistant, 1990 – 1995

Iowa Institute of Hydraulic Research, University of Iowa, Iowa City, IA

- Laboratory flume studies of sediment transport and bedform development
- Measurement of velocities in physical models of hydroturbine and cooling water intakes.

Nuclear Waste Management Intern, Summer 1989

Westinghouse Hanford Company, Richland, WA

- Compilation of hydrogeologic data for studies of tritium migration at the Hanford Site.

EDUCATION

Ph.D., Civil and Environmental Engineering (Hydraulics), University of Iowa, 1995

Thesis: Ice-cover influence on flow and bedload transport in dune-bed channels

M.S., Civil and Environmental Engineering, University of Iowa, 1992

B.E., Civil and Environmental Engineering, Economics, Vanderbilt University, 1990

LICENSURE

Professional Engineer, State of Tennessee, License No. 00105293.

SYNERGISTIC ACTIVITIES

Member, Hydro Foundation for Research and Education, Board of Directors

Member, American Society of Civil Engineers

Member, American Society of Mechanical Engineers

Member, International Association for Hydraulic Research

Member, Tau Beta Pi National Engineering Honor Society

PUBLICATIONS

Smith, B. T., and R. Ettema. 1997. Ice-cover influence on flow structure over dunes. *Journal of Hydraulic Research* 35(5): 707-19.

Smith, B. T., and R. Ettema. 1997. Flow resistance in ice-covered alluvial channels. *Journal of Hydraulic Engineering* 123(7): 592-599.

Lin, F., G. E. Hecker, P. N. Hopping, and B. T. Smith. 2003. Innovative 3-D numerical simulation of thermal discharge from Browns Ferry multi-port diffusers. *Proceedings of the International Joint Power Generation Conference*, June 16-19, 2003, Atlanta, GA.

Smith, B. T., D. T. Darby, R. L. Dinkins, and P. B. Loiseau. 2002. Use of acoustic-Doppler velocimeters to measure hydroturbine draft tube and tailrace turbulence. *Proceedings of the ASCE/IAHR International Conference on Hydraulic Measurements and Experimental Methods*, July 28-August 1, 2002, Estes Park, Colorado.

Hopping, P. N. and B. T. Smith. 2002. Measurement of flow patterns using GPS drogues. *Proceedings of the ASCE/IAHR International Conference on Hydraulic Measurements and Experimental Methods*, July 28-August 1, 2002, Estes Park, Colorado.

Smith, B. T., and R. Ettema. 1994. Floating cover influence on sediment transport in dune-bed channels. *Proceedings of the ASCE National Conference on Hydraulic Engineering*, Buffalo, New York, August 1994.

Selected Internal Reports

Wolff, P. J., B. T. Smith, and P. N. Hopping. 1997. Aeration performance tests for the new auto-venting turbines at Norris Dam, TVA Report WR97-1-2-120.

Smith, B. T. 2000. Shawnee Fossil Plant intake channel improvement study final report. TVA Report WR2000-1-35-119.

Kerley, B. L., B. T. Smith, and G. Brodie. 1997. Zebra mussel control options at Sequoyah Nuclear Plant, TVA Technology Advancements Closure Report.