**PROJECT MANAGER QUALIFICATIONS**

This project will be led by Professor Lian Shen as program manager. Prof. Shen is the Director of the St. Anthony Falls Laboratory and a Professor in the Department of Mechanical Engineering at University of Minnesota, Twin Cities. He earned his Doctor of Science degree from Massachusetts Institute of Technology (MIT) in 2001. After three years of postdoctoral training at MIT, he joined the faculty of Johns Hopkins University (JHU) in 2004. At JHU, he performed extensive research on environmental water and air flows. In 2012, he was recruited by University of Minnesota to join its faculty.

Prof. Shen is a world expert on the study of environmental fluid flows. He is currently serving on the national committee of ASCE Environmental & Water Resources Institute on CFD Applications in Water and Wastewater Treatment. He is also on the editorial boards of three internal academic journals. Prof. Shen has been active in professional societies, including American Geophysical Union, American Society of Civil Engineers, American Society of Mechanical Engineers, and Association of Environmental Engineering and Science Professors. He has organized several national and international conferences and symposiums.

**ORGANIZATION DESCRIPTION**

This project will be performed at the St. Anthony Falls Laboratory (SAFL, http://www.safl.umn.edu) at University of Minnesota. SAFL is an interdisciplinary fluid mechanics research and educational institution. It has 22 faculty members and 35 research and administrative staff members. SAFL is a world-renowned research laboratory specialized in environmental and engineering fluid mechanics. SAFL researchers have been performing many innovative environmental studies for the state of Minnesota. Some of the projects were/are funded by the Minnesota Environment and Natural Resources Trust Fund.

The proposed research leverages on the advanced capability of measuring environmental flows at SAFL, which has 16,000 ft2 of research space dedicated to physical modeling and experimentation. The facility, which has recently been upgraded with a $16M renovation, has a wind tunnel and 15 general purpose flumes, tanks, and channels readily configurable to the needs of projects. SAFL field research is as broad as its laboratory work and includes establishing long-term monitoring sites as well as developing new methods and techniques for observing, measuring, logging, and communicating environmental processes. SAFL has tremendous experience in developing a field approach for a range of applications, such as remoting measurement of atmospheric and aquatic fluid flows and temperature.

The powerful cluster computers equipped at SAFL support the numerical modelling in the proposed research. Driven by the exponential growth of computational power, scientific computing is now radically transforming our research philosophy by enabling the simulation of many complex flow phenomena across a broad range of scales in natural and engineered systems with an unprecedented degree of realism. Coupled with the state-of-art measurement techniques and unique experimental facilities, SAFL’s simulation-based expertise has uniquely positioned the laboratory to make far-reaching advances in the major societal problems in energy, the environment, and human health. SAFL has two High Performance Computing (HPC) Beowulf-style computer clusters with execution and compute nodes connected by low-latency/high-throughput local interconnects (InfiniBand).