**Michael J. Lawson**

**Education and Training**

Ph.D. Mechanical Engineering, The Pennsylvania State University, 2010

M.S. Mechanical Engineering, Virginia Tech, 2006

B.S. Mechanical Engineering, Virginia Tech, 2005

**Professional Experience**

2010 - Present National Renewable Energy Laboratory, Wind Technology Center, Boulder, CO, Engineer III

* Co-lead development of WEC-Sim, an open-source wave energy wave energy converter numerical modeling tool developed by NREL and Sandia National Laboratories
* Developed high- and mid-fidelity numerical models of tidal and ocean current turbines.
* Worked with a Department of Energy research team to design and analyze a twin rotor horizontal-axis tidal current turbine

2007 – 2010 Penn State Gas Dynamics Lab and U.S. Navy Applied Research Lab, University Park, PA, National Defense Science and Engineering Graduate Fellow

* Investigated the fluid dynamics and chemical transport phenomena involved in canine olfaction for a project funded by DARPA and T.S.A
* Developed a multi-phase CFD model for simulating odorant transport and in the dog’s nose
* Designed and fabricated a model of the canine nasal cavity using rapid prototyping techniques for use in flow visualization experiments
* Developed seedless particle image velocimetry (PIV) techniques using Schlieren optics for use in compressible flows

**Publications**

1. Lawson, M.; Garzon, B.; Wendt, F.; Yu, Y.; Michelen, C. (2015). COER Hydrodynamic Modeling Competition: Modeling the Dynamic Response of a Floating Body using the WEC-Sim and Fast Simulation Tools. No. OMAE2015-42288, Proceedings of the 34th International Conference on Ocean, Offshore, and Arctic Engineering.
2. Coe, R.; Lawson, M.; Neary, V.; Yu, Y. (2014). Wave Energy Converter Extreme Conditions Modeling Workshop Report.; NREL report TP-5000-62305
3. Lawson, M.; Yu, Y. H.; Ruehl, K.; Michelen, C. (2014). Implementing Nonlinear Buoyancy and Excitation Forces in the WEC-Sim Wave Energy Converter Modeling Tool. Paper No. OMAE2014-24445. Proceedings of the 33rd International Conference on Ocean, Offshore and Arctic Engineering.
4. Beam, M.; Kline, B.; Elbing, B.; Fontaine A.; Lawson M.; Thresher, R.; and Li, Y, (2012). ”Marine Hydrokinetic Turbine Power-Take-Off Design for Optimal Performance and Low Impact on Cost-of-Energy”. No. OMAE2012-84074, Proceedings of the 31st Inter- national Conference on Ocean, Offshore, and Arctic Engineering.
5. Lawson, M.; Li, Y.; Sale, D. (2011). Development and Verification of a Computational Fluid Dynamics Model of a Horizontal-axis Tidal Current Turbine. No. OMAE2011-49863, Proceedings of the 30th International Conference on Ocean, Offshore, and Arctic Engineering.

**Synergistic Activities**

* CFD experience: Code development, Simulations with complex geometries, RANS, Multiphase
* CFD software competency: OpenFOAM, Acusolve, Fluent, STAR-CD, STAR-CCM+, Pointwise
* Experimental methods: PIV, Schlieren, Shadowgraph, Flow visualization, High-speed videography
* Programming languages: C++, FORTRAN, MATLAB, LabVIEW, Shell scripting, Python
* Visualization software: TecPlot, Paraview, EnSight