

LARA M. ASTON
Research Scientist II

EDUCATION:

2004 M.S. Environmental Science, University of Washington, Seattle, WA

1999 B.S. Environmental Science, Western Washington University, Bellingham, WA

Short Bio

Ms. Lara Aston is a research scientist/ecologist for the Coastal Ecosystem Research group at Battelle Marine Research Operations, Pacific Northwest National Laboratory in Sequim since 1999. Ms. Aston has a strong background in ecological assessment and restoration with a focus on the soil rhizosphere and plant/microbial interactions as they relate to restoration and bioremediation/biodegradation of toxic and/or hazardous chemicals in the environment. Recent research has been focused on microbiological research to investigate the potential for fungi (select basidiomycetes) to degrade 1,4-Dioxane and chlorinated solvents in groundwater. Past work includes DNA extraction/purification, PCR, and various molecular techniques for various biodegradation/remediation projects as well as for the development of a marine fungal-based biosensor to detect pathogens in the marine environment. Another past project tested the use of native filamentous fungi and companion plants to remove fecal coliform bacteria and excess nutrients from dairy farm runoff. Ms. Aston has five years experience as a Terrestrial Ecology Subject Matter Expert (SME) and a Non-radiological Human Health SME and Resource Coordinator for National Environmental Policy Act (NEPA) Compliance for Nuclear Regulatory Commission and has contributed to multiple environmental reviews and subsequent draft and final Environmental Impact Statements. Over the last twelve years with Battelle Ms. Aston has been a key contributor to many interdisciplinary programs involved with site assessment and characterization, dredged material evaluations, and basic and applied research to support both classified and unclassified projects. Ms. Aston has helped develop and maintains a fungal culture collection at the lab, which includes both marine and terrestrial species. Ms. Aston has developed novel field collection techniques to target specific focus areas in the coastal environment. The techniques utilized have enabled the lab to increase the fungal library to include several novel strains that are in the process of identification as well as one strain that produces a unique fluorophore. These discoveries have led to several invention reports for which she is listed as co-inventor.

Research Interests

- The use of mycorrhizal fungi (and other soil microbes) to enhance restoration efforts.
- The use of select fungi and bacteria to decontaminate soils, sediments, and groundwater.
- Conducting environmental reviews for NEPA and ESA compliance as part of the process for permitting large energy projects throughout the United States.

Selected Research Experience

- **Terrestrial Ecology Subject Matter Expert for National Environmental Policy Act (NEPA) Compliance for Nuclear Regulatory Commission:** Ms. Aston conducts terrestrial and wetlands ecological analyses for NEPA documentation of impacts to those resources for nuclear power plant

license renewal and new applications. Ms. Aston contributes to draft and final NEPA documentation for reactors in Florida, South Carolina, and North Carolina.

- **Non-radiological Human Health Subject Matter Expert and Interim Resource Coordinator for National Environmental Policy Act (NEPA) Compliance for Nuclear Regulatory Commission:** Ms. Aston conducts non-radiological human health analyses for NEPA documentation of impacts to members of the public and workers for nuclear power plant license renewal and new applications. Ms. Aston contributes to draft and final NEPA documentation for reactors in South Carolina, North Carolina, Maryland, New York, and Pennsylvania. As a resource coordinator, Ms. Aston mentors a team of nonradiological human health specialists working on various NEPA documents.
- **Innovative Permeable Reactive Barrier for Treatment of 1,4-Dioxane and Mixed Plumes (IR&D with BCO):** The purpose of this ongoing study is to test biodegradation of 1,4-Dioxane and PCE with various fungal species. Ms. Aston is the Principal Investigator for this project.
- **EPA Targeted Watershed Initiative:** Dungeness River Watershed: This program focused on providing innovative solutions to solving complex watershed water quality issues. The project was a collaboration between the Jamestown S'Klallam Tribe, the Battelle Marine Sciences Lab, the Clallam Conservation District, and Clallam County. Ms. Aston led one aspect of the Battelle task involving the use of an innovative best management practice (BMP) to reduce fecal coliforms and excess nutrients from dairy farm runoff into the watershed. The study included effectiveness monitoring to compare the various BMPs for technical and cost effectiveness.
- **Wind and Water Power Program:** Ms. Aston provides support to the program manager and is responsible for the Annual Operating Plan deliverables for both the Wind Program and the Water Power Program as well as the Quarterly Reports deliverables for both programs.
- **Environmental Biomarkers Initiative LDRD:** Characterization of microbial communities present in environmental samples from the Hanford site and lab bioremediation studies. Ms. Aston was co-PI on this project and conducted the molecular portion of the work on samples provided by PNNL Richland.
- **ATP TAS Research Study:** Fluorophore studies for potential commercialization of a novel fluorophore produced by a fungal species isolated from eelgrass in late 2002.
- **Coastal Environmental Effects:** Development of a marine fungal-based biosensor designed to detect biological pathogens in the near-shore environment. Ms. Aston was responsible for all lab tasks associated with this project including microbiological and molecular studies as well as collecting fungi from the marine environment from various locations in the Pacific Northwest.
- **Pogonip:** Classified project involving the use of specific fungal strains to degrade various petroleum hydrocarbons. Ms. Aston was responsible for all laboratory studies and contributed to final reports.
- **Toxicity Testing using *Leptocheirus plumulosus*:** Provided technical support for two high-profile remedial investigations, both of which use the 28-day chronic *Leptocheirus* toxicity test. The work included collaboration of several private consultants, industrial company interests, and state and federal agencies. The outcome from one investigation was the creation of a decision matrix that combines the results of all toxicity testing and determines further courses of action needed.
- **Toxicity Testing of Drilling Fluids:** Laboratory technical support for a study to evaluate the impact of drilling fluids used on offshore drilling rigs to the seafloor community. Project objective was to screen many different types of drilling fluids, both natural and synthetic, and to determine which one has the least impact to the seafloor community.
- **New York District Projects:** Laboratory Task Lead for New York District projects. The New York District work was a multi-year effort and culminated in the publication of 17 technical reports. Responsibilities included preparation for all laboratory work, organizing technical teams in the lab, conducting all aspects of lab work, data entry and quality control tasks, and contributing to technical reports.
- **USACE New England District:** Lab Task Lead and/or lab technical support for the toxicity testing and bioaccumulation analysis tasks of numerous dredged material evaluations for the New England

District of the US Army Corps of Engineers in 1999-2001. Specific projects were Providence River, Rhode Island; Guilford and Norwalk Harbors, Connecticut; New Haven Harbor, Connecticut; and Boston Harbor and Weymouth Fore River, Massachusetts.

- **Endocrine Disruptor Screening Program (EDSP):** Because of growing concern that chemicals in the environment disrupt the endocrine systems that govern growth and reproduction in humans and wildlife, Battelle is identifying and developing sensitive and reliable tests to determine both the presence of endocrine disrupting chemicals (EDCs) in the environment and the degree to which there is a biological response. Ms. Aston provided technical support for several tasks in the development of test methods using fish to identify endocrine disruptive qualities.
- **Department of Natural Resources Phase TBT study:** This research program was a two-phased effort designed to conduct acute and chronic toxicity tests and bioaccumulation research to measure TBT in Puget Sound. The studies were performed according to the method developed by Battelle for the U.S. EPA, "Method for Assessing the Chronic Toxicity of Sediment Associated Contaminants with *Leptocheirus plumulosus*," First Edition, August 1998 Draft. The study objectives were to 1) measure the chronic toxicity of TBT and TBT-contaminated sediment, 2) develop tissue-residue-based, dose-response curves for bioaccumulated TBT and chronic lethal and sublethal responses, and 3) compare the TBT sensitivity of the chronic *Leptocheirus* test with the standard suite of PSSDDA toxicity tests (*Eohaustorius*, *Neanthes*, and echinoderm larval tests). These tests represent a promising approach for estimating the ecological risk posed by TBT to populations of estuarine and marine benthic species. The referenced EPA protocol is currently in the stages of final review and will be officially released this year.

Selected Publications

Stegen A, and LM Aston. 2011. Environmental Information Volume: Biological Resources Section. PNWD-4274, Battelle—Pacific Northwest Division, Richland, WA.

2008-2011: EISs and other NEPA documents prepared for the NRC but not 'published' by PNNL are not allowed to be listed on resumes of individual contributors. However, all final EISs published by NRC are publicly available on NRC's Agency-wide Documents Access and Management System, <http://www.nrc.gov/reading-rm/adams.html>

Judd C, JM Brandenberger, and LM Aston. 2010. "Statement of Qualification Compensatory Mitigation for Impacts to Aquatic Resources in the Puget Sound Area ." PNNL-SA-76991 Pacific Northwest National Laboratory, Richland, WA.

Thomas SA, LM Aston, DL Woodruff, VI Cullinan 2009. Field Demonstration of Mycoremediation for Removal of Fecal Coliform Bacteria and Nutrients in the Dungeness Watershed, Washington. Prepared for the Jamestown S'Klallam Tribe in fulfillment of Task 2a (Mycoremediation Demonstration) of the Dungeness River Watershed Final Workplan for the EPA Targeted Watershed Grant Program (2004) under a Related Services Agreement with the U.S. Department of Energy under Contract DE-AC05-76RL01830 by Battelle Pacific Northwest Division PNWD-4054-1

Professional Affiliations

Society for Ecological Restoration

Air and Waste Management Association