Soil Treatability Study

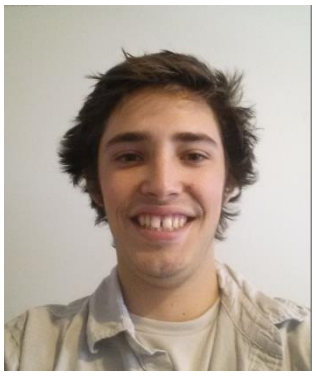
Energy Technology Engineering Center • U.S. Department of Energy

Introducing Our Researchers for Phase II – California Polytechnic State University

Bioremediation, Phytoremediation and Natural Attenuation Studies

Yarrow Nelson is a Professor of Environmental Engineering at California Polytechnic State University (Cal Poly). Dr. Nelson will be the Senior Scientist for three soil treatability studies at Santa Susana: Bioremediation, Phytoremediation and Natural Attenuation. He has conducted extensive environmental research for 30 years in the areas of bio- and phyto- remediation, toxic metal fate and transport, and production of biofuels from algae. His graduate degrees are from Cornell University where he studied biodegradation of chlorinated compounds and biological interactions with trace metals. He currently teaches courses in environmental engineering, environmental chemistry and pollution prevention. Yarrow lives on a small ranch near Santa Margarita with his wife and horses.

Mackenzie Billings is an environmental engineering graduate student at Cal Poly. She will be conducting research on biodegradation of soil contaminants at the Santa Susana Field Laboratory (SSFL) as part of the Bioremediation and Natural Attenuation Soil Treatability Studies. Mackenzie became interested in site remediation through her internships with the Central Coast Regional Water Quality Control Board and the U.S. Environmental Protection Agency. She aspires to focus her career on soil and groundwater remediation after graduation. When not studying, Mackenzie enjoys running, cycling, hiking, gardening, photography, and cooking.



Adam Caughey is a senior in Microbiology at California Polytechnic State University (Cal Poly). He is assisting with the literature reviews for the Natural Attenuation and Bioremediation Treatability Studies and the microbial and genetic components of the Bioremediation Treatability Study. After graduating from Cal Poly, Adam plans to attend a clinical laboratory science program at the University of California, San Diego with the eventual goal of becoming a pathologist.

Kenny Croyle is a Biochemical Engineering graduate student at the Cal Poly. He received his BS in Biology with a minor in Biotechnology from Cal Poly in June 2012, and has completed 1 year of work in his master's program, including courses focuses on natural attenuation, bioremediation, and phytoremediation. He also has laboratory experience in microbiology and research experience in microbiology and molecular biology. Other lab experience includes molecular and cellular biology, biochemistry, water chemistry, and organic chemistry. He previously worked in the San Luis Obispo Wastewater Treatment Plant laboratory for 2 years. Currently, he works part-time for GEI Consultants in the Water/Energy Sustainability Program part time.

Michael Curto has spent the last thirty-five years working for government agencies, universities, and engineering corporations, learning skills related to statistics, GIS, and graphic communication to enhance his focus on taxonomy, ecology, and re-vegetation potential of grasses and graminoids native to Western North America, especially California. For over a decade, Michael served as key consultant to Caltrans statewide regarding re-vegetation using native plants. Michael earned an MS degree in Biology from Cal Poly for native re-vegetation work at the former Guadalupe Oil Field and will be an integral part of the Phytoremediation Soil Treatability Study team.

Alice Hamrick is a research technician in the Center for Applications in Biotechnology at Cal Poly. She will be overseeing the molecular biology tests to characterize the microbial/fungal communities in the soils from SSFL as part of Bioremediation and Natural Attenuation Soil Treatability Studies. Alice has extensive lab experience in microbiology and molecular biology, particularly in the use of terminal restriction fragment (TRF) assays of microbial community structure. Alice conducted many years of research on the bioremediation and natural attenuation of petroleum hydrocarbons at the Guadalupe Dunes Restoration Project with Chris Kitts and Yarrow Nelson.

Chris Kitts is Professor and Chair of the Biological Sciences Department at Cal Poly. Dr. Kitts is a co-investigator on the Bioremediation and Natural Attenuation Soil Treatability Studies at the SSFL. He has extensive research experience in the area of molecular biology, including ten years studying biodegradation of petroleum hydrocarbons at the former Guadalupe Oil Field. He independently developed an analysis method for characterizing the genetic fingerprints of microbial communities (known as terminal restriction fragment analysis). Chris conducts regular "board meetings" with Yarrow Nelson in the surf at Morro Bay.

Matt Poltorak will be conducting the Phytoremediation Soil Treatability Study under the guidance of Dr. Yarrow Nelson. He is pursuing his M.S. degree in Environmental Engineering at Cal Poly in San Luis Obispo. Matt is an Engineer-in-Training and HAZWOPER certified and has implemented innovative remedial solutions as an intern with ENVIRON International Corporation. Matt is a first generation college student and a role model for his five younger siblings. Matt has a passion for learning and years of laboratory experience. His eagerness and talents will be a great addition to the Soil Treatability team.

Peter Waldburger, a new member of our phytoremediation treatability study team, is a biologist and horticulturist with over thirty years' experience in site restoration, revegetation, exotic weed control, land management and biological monitoring. He received his BS in Biology from Cal Poly in 1979, and has worked as a restoration specialist and horticultural consultant for consulting firms and state agencies since then. Pete is currently working through Cal Poly as the coordinator for land rehabilitation and area management at Camp San Luis, where he is responsible for the restoration and ecological management of approximately 6,000 acres of habitat. His extensive experience with California native plant propagation will be particularly useful for the phytoremediation treatability study. He will provide oversight of the propagation of plant species from Area IV for use in the Phase 2 greenhouse studies.