

**2022 Distinguished Scientist Seminar**  
*Semester in Environmental Science*  
**MBL ECOSYSTEMS CENTER, WOODS HOLE,  
MA**

**Dr. Morris Johnson**  
**Research Fire Ecologist**  
**US Forest Service**  
**Pacific Northwest Research**  
**Station, Pacific Wildland Fire Sciences**  
**Laboratory**

***Managing Forest Structure and Wildfire  
Behavior in the Western United States***

**September 30<sup>th</sup>— 3:00 PM, Speck  
Auditorium, MBL**



Wildfires are becoming more frequent and severe across the western U.S. and worldwide. Combining science with management is essential to understanding how best to manage forest structure and wildfire behavior and to influence the trajectory of future wildfire hazards. Working in several interdisciplinary teams of federal and tribal forest managers on long-term studies in previously burned areas improves the science of postfire management decision-making by quantifying risks and hazards associated with no action with alternative management actions.

Morris C. Johnson is a research fire ecologist at the US Forest Service, Pacific Northwest Research Station, Pacific Wildland Fire Sciences Laboratory located in Seattle, WA. He grew up in a small northeastern Louisiana town located on the banks of the Mississippi River named Waterproof, LA. His research focus is quantifying silvicultural treatment effects on changing wildfire behavior and understanding post-wildfire forest and fuel succession following large stand-replacing wildfires. He began his Forest Service career on the Rogue River-Siskiyou national forest on the Prospect Ranger District in Prospect, OR. He was a member of both the Redmond (Redmond, OR) and Redding (Redding, California) interagency hotshot crews. He earned a B.S. degree in Urban Forestry from Southern University (Baton Rouge, LA) and M.S. degree in Silvicultural and Forest Protection and Ph.D. degree in Ecosystem Analysis (Fire Ecology) both from the University of Washington (Seattle, WA). He is a Gates Millennium Scholar. Johnson is an affiliate assistant professor at the University of Washington (Seattle, WA), School of Environmental and Forest Sciences.

**Suggested readings:**

- Kirkland J and Johnson M. 2022. Passive or Active management? Understanding Consequences and Changes after large Stand-Replacing Wildfires <https://www.fs.usda.gov/pnw/science/scifi247.pdf>
- Johnson M.C. et al. 2020. Effects of post-fire management on dead woody fuel dynamics and stand structure in a severely burned mixed-conifer forest, in northeastern Washington State, USA. *Forest Ecology and Management* 470-471:118190.
- Kennedy M.C. et al. 2020. Fuel succession and fire behavior are sensitive to fuel dynamics parameters. *Forest Science* 67:30-42 <https://doi.org/10.1093/forsci/fxaa036>
- Kennedy, MC. Johnson, MC. 2014. Fuel treatment prescriptions alter spatial patterns of fire severity around the wildland-urban interface during the Wallow Fire, Arizona, USA. *Forest Ecology and Management*. 318: 122-132

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**Dr. Ilka (Candy) Feller**  
Scientist Emeritus  
Smithsonian Institution  
Smithsonian Environmental Research Center

***Mangroves and the Mangrove Finch:  
A Story from the Galapagos***

**October 14<sup>th</sup>— 3:00 PM, Speck Auditorium,  
MBL**



Dr. Candy Feller is an insect and plant ecologist at the Smithsonian Environmental Research Center (SERC). For more than 25 years, she has been carefully studying mangroves to understand how excess nutrients—like those from industrial, residential, and agricultural sources—affect mangrove ecosystems. The health of mangroves has ripple effects into marine food webs that use these mangroves as nurseries or feeding grounds, as well as for people who depend on mangroves for subsistence. She has published more than 100 scientific papers and has been project leader on multidisciplinary research programs focused on understanding the biocomplexity of mangrove ecosystems. With her collaborators, she has established a network of 30 or so long-term fertilization experiments along latitudinal and tidal gradients to investigate interactions between nutrient over-enrichment and climate change, including experimental research sites in the Caribbean, Australia, New Zealand, Belize, Panama, Florida and the Gulf of California, Bangladesh and Myanmar. She is currently working on a new project on mangroves in the Galapagos. Candy is a member of the International Union for Conservation of Nature (IUCN) Species Survival Commission (SSC) Mangrove Specialist Group, organized to share mangrove knowledge and develop conservation plans. This group will gather research and develop a global conservation strategy for mangroves based on conservation needs. Candy earned her B.A. in Biology from University of North Carolina, Greensboro, and her Ph.D. in Ecology from Georgetown University.

**Suggested readings:**

- Feller IC, Ball MC, Ellis JI, Lovelock CE, Reef R. (2017) Interactive effects of climate and nutrient enrichment on patterns of herbivory by different feeding guilds in mangrove forests. *Global Ecol Biogeogr.* 26:1326–1338. <https://doi.org/10.1111/geb.12644>
- Dangremond EM, Simpson LT, Osborne TZ, Feller IC (2020). Nitrogen Enrichment Accelerates Mangrove Range Expansion in the Temperate–Tropical Ecotone . *Ecosystems* 23(4): 703-714. <http://dx.doi.org/10.1007/s10021-019-00441-2>
- Cavanaugh K, Dangremond E, Doughty C, Williams, A, Parker, J, Hayes, M, Rodriguez W, Feller I. (2019). Climate-driven regime shifts in a mangrove–salt marsh ecotone over the past 250 years. *Proceedings of the National Academy of Sciences.* 116. 201902181. 10.1073/pnas.1902181116.

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**Dr. Timothy Ford**  
**Chair, Professor, Associate Director for the Center for**  
**Pathogen Research and Training**  
**University of Massachusetts Lowell**

***Water: Linking Environmental Science***  
***with Human Health***

**October 21st— 3:00 PM, Speck Auditorium,**  
**MBL**



Born and educated in the UK, Timothy Ford earned his B.S. in Biochemistry at the University of Sussex, and his Ph.D. in Aquatic Microbiology at Bangor University. He did his postdoctoral training at Harvard University before taking a faculty appointment at the Harvard School of Public Health, where he served as an assistant and then an associate professor and both founded and chaired their program in water and health. Much of his biofilm and international work on the epidemiology of waterborne diseases started at Harvard. Ford then served as Head of Microbiology at Montana State University for several years, leading the NIH-funded Montana Idea Networks for Biomedical Research Excellence Program (MT-INBRE). This five-year program built research and training infrastructure in infectious disease and environmental health research throughout the state of Montana, and included all seven of Montana's reservation communities. He also continued water and health work in India and developed partnerships in China, with a concurrent professorship at Nanjing University. Ford went on to serve as VP for Research and Dean of Graduate Studies at the University of New England, and then Dean of Health Professions at Shenandoah University before returning to environmental research as Chair of Environmental Health Sciences and Director of the Institute for Global Health at UMass Amherst. Now, at UMass Lowell, he plans to continue building multi-investigator research and training programs both locally and internationally.

**Suggested readings:**

- Ford T, Jay J, Patel A, Kile M, Prommasith P, Galloway T, Sanger R, Smith K, Depledge M. (2005) Use of Ecotoxicological Tools to Evaluate the Health of New Bedford Harbor Sediments: A Microbial Biomarker Approach *Environmental Health Perspectives* 113:2 CID: <https://doi.org/10.1289/ehp.6934>
- Ford TE, Colwell RR, Rose JB, Morse SS, Rogers DJ, Yates TL. Using satellite images of environmental changes to predict infectious disease outbreaks. (2009) *Emerg Infect Dis.* 2009;15(9):1341-1346. doi:10.3201/eid1509.081334
- Cummins C, Doyle J, Kindness L, Lefthand MJ, Bear Dont Walk UJ, Bends AL, Broadway SC, Camper AK, Fitch R, Ford TE, Hamner S, Morrison AR, Richards CL, Young SL, Eggers MJ. (2010) Community-based participatory research in Indian country: improving health through water quality research and awareness. *Fam Community Health.* Jul-Sep;33(3):166-74. doi: 10.1097/FCH.0b013e3181e4bcd8. PMID: 20531097; PMCID: PMC3070444
- Roy MA, Arnaud JM, Jasmin PM, et al. A Metagenomic Approach to Evaluating Surface Water Quality in Haiti. (2018) *Int J Environ Res Public Health.* 15(10):2211. doi:10.3390/ijerph15102211

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**Dr. Kathleen Weathers**  
**G. Evelyn Hutchinson Chair in Ecology**  
**Cary Institute of Ecosystems Studies**

***Ecological Puzzles and a Passion for  
Lakes: How Cyanobacteria, Sensors, and  
Cyberinfrastructure Helped Launch  
Scientists and Community Members into a  
21<sup>st</sup> Century Experiment***



**November 11th— 3:00 PM, Speck Auditorium,  
MBL**

Dr. Kathleen Weathers studies ecosystem processes within and among aquatic, airborne, and terrestrial systems. Weathers is an expert on fog, which carries nutrients, pollutants, and sometimes disease-causing pathogens. She studies links between ocean, air, and fog-dominated forests and recently, how fog may affect transfer of pathogens from water to land. She was co-Chair of the Global Lake Ecological Observatory Network (GLEON) for 10 years, guiding GLEON from its infancy to adulthood. GLEON is a world-wide grassroots collaboration of 800 research partners studying 150 lakes in 53 countries. Their aim: understand, predict, and communicate lakes' response to environmental change using data from lake-based sensors. This work encompasses impacts from human activities such as road salting, agriculture, and climate change. Weathers and her colleagues have created a new model for collaborative research that explicitly empowers early career scientists. Kathleen Weathers received her B.A. in English at Albion College, her M.F.S. in Forest Science at Yale University, and her Ph.D. in Ecology at Rutgers University. She received the Eugene P. Odum Education Award from Ecological Society of America (ESA) in 2017 and served as President of ESA in 2020-2021.

**Suggested readings:**

- Ewing HA, Weathers KC, Cottingham KL, Leavitt PR, Greer ML, Carey CC, Steele BG, Fiorillo AU, and Sowles JP. (2020) “New” cyanobacterial blooms are not new: two centuries of lake production are related to ice cover and land use. *Ecosphere* 11(6):e03170. DOI:10.1002/ecs2.3170
- Weathers KC, Ponette-González AG, Dawson TE. (2020) Medium, vector, and connector: Fog and the maintenance of ecosystems. *Ecosystems* **23**, 217–229. DOI:10.1007/s10021-019-00388-4
- Farrell KJ, Weathers KC, Sparks SH, Brentrup JA, Carey CC, Dietze MC, Foster JR, Grayson KL, Matthes JH, and SanClements MD. (2021) Training macrosystems scientists requires both interpersonal and technical skills. *Frontiers in Ecology and Environment* 19:39-46. DOI: 10.1002/fee.2287.