



Director's Update

Dr. Deb Miller

Welcome to the inaugural UT OHI newsletter! We are so excited to use this venue to share current and upcoming happenings in One Health. Our intent for the newsletter is to provide quarterly updates, including overviews of events that took place in the preceding month, and to provide a glimpse at upcoming events. Additionally, we plan to feature a One Health Scholar, highlighting their One Health research, and provide updates on OHI seed grant awardees. There will also be updates on our outreach activities and education and training opportunities. Although we will focus on UT (and Tennessee in particular), we will also share information on our global activities.

I am thrilled to be serving as the Interim Director of the UT One Health Initiative! We have accomplished a lot in our first year, and we know that year two will be even more exciting as we put in motion the things for which we spent the first year laying the groundwork. We invite you to join us in building research teams, engaging the public by translating science into action, and training the future One Health workforce. Together we will unite disciplines to protect and promote the health of all life on Earth.

UTOHI Research

Transdisciplinary Diagnostic Investigation of Freshwater Mussel Mortality in the Clinch River

Investigators: Michelle Dennis, Rebecca Hardman, Gerry Dinkins, Augustin Engman, Justin Wolbert, Nina Fefferman

Freshwater mussels are keystone species for river basin ecosystem health and serve as a food source for aquatic and terrestrial animals across numerous trophic levels. As powerful filter feeders they provide crucial ecosystem services including biofiltration and nutrient cycling and deposition. However, their numbers have dramatically declined in North America, and mortality outbreaks of unknown cause are an increasing threat to their populations and ecosystem health.

In 2016, biologists started to observe episodic mass mortality events of freshwater mussels in the Clinch river. This local river is a freshwater biodiversity hotspot and home to one of the most abundant, unique, and imperiled mussel assemblages in the world. These "die-offs" were subsequently documented in upstream locations, typically occurring during late summer and fall. Several species are affected by mortality events, but a clear understanding of species susceptibility has yet to be determined. Some species, including the near-threatened pheasantshell (*Actinonaias pectorosa*), is especially affected and has declined by 40-90% at some impacted sites.

We are taking a transdisciplinary, One Health approach to tackle this challenge and provide a better understanding of the most likely causative drivers of die-offs and which mussels are at greatest risk to support improved future efforts to protect this critical resource.



To achieve this, we will be assessing sentinel mussels at sites where annual die-offs have occurred in late summer since 2016 by monitoring strategically placed silos at multiple sites within the main channel river before, during, and after anticipated seasonal mortality periods. We're going to be checking for changes in hemolymph health indices, pathology, and microbiome to see which factors might be good indicators of changes that correlate with die-offs. We will also be monitoring the growth and survivorship of the sentinel mussels for comparison with specimens from past die-off events brought to be archived in the malacology



collection at the McClung Museum. To investigate whether the spatiotemporal patterns in die-offs are more consistent with environmental contamination or in host-driven transmission by proximate contact, we'll be building mathematical models of population viability to contrast predicted scenarios of contact-based infection versus river-flow-based contamination.

Our One Health team is led by veterinary pathologist (Michelle Dennis), and brings together a malacologist (Gerry Dinkins), a fish ecologist (Augustin Engman), a mathematical disease modeler (Nina Fefferman), a microbiologist (Rebecca Hardman), and an aquatic restoration ecologist (Justin Wolbert). The synergy among these different research disciplines and perspectives will give us a unique set of tools to investigate how and why freshwater mussels are dying. We're very excited to tackle this problem of global concern by creating a better understanding of our own back yard here in Tennessee.



One Health in the News

- [Expanding Federal Antimicrobial Resistance Research into Animal and Environmental Health](#)
Leaders of the National Antimicrobial Resistance Monitoring System (NARMS) plan to expand drug resistance testing and analysis to include pathogens that affect animals, in addition to pathogens of concern for human medicine, as well as develop environmental surveillance programs. These changes will shift NARMS toward a One Health approach and support a vision of NARMS as a program that helps maintain antimicrobial effectiveness for treatment of infections in humans and animals.
- [Bat Rabies Education Initiative](#)
We often hear news about bats in the context of emerging infectious diseases; however, bats are crucial to the wellbeing of our natural ecosystems. The One Health Commission Bat Rabies Education Team (OHC BRET) works to raise awareness about bat rabies by promoting health education in a multi-strategic One Health approach.
- [Hot Spots of Human-Wildlife Interaction](#)
The Strategies to Prevent (STOP) Spillover project is a USAID-funded \$100M project out of Tufts University to understand and reduce zoonotic disease threats in global hot spots. Participants would increase surveillance where diseases are likely to spill over from animals to humans, design interventions to prevent that spillover, and assess the success of those interventions.
- [The Advancing Emergency Preparedness Through One Health Act](#)
The Advancing Emergency Preparedness Through One Health Act (S.861 /H.R. 2061) would establish a coordinated federal framework to: advance workforce development related to preventing and responding to disease outbreaks in animals and humans; improve coordination between federal agencies that study human, animal, and environmental health; and advance scientific understanding of the connections among human, animal, and environmental health. The American Veterinary Medical Association is asking members of the veterinary community to contact Congress and voice support for the bill.



One Health Job Postings

Organization	Position	Application Deadline	
World Bank	Program Assistant	April 15, 2021	https://unjobs.org/vacancies/1617042017016
State of Pennsylvania	Public Health Toxicologist	April 17, 2021	https://www.governmentjobs.com/careers/pabureau?keywords=toxicologist
University of Kent	Lecturer in Conservation Social Science	April 25, 2021	https://jobs.kent.ac.uk/Vacancy.aspx?ref=HSS-025-21
Miami University of Ohio	Assistant Teaching Professor Conservation Biology	May 25, 2021	https://careers.conbio.org/job/310594/assistant-teaching-professor/
American Public Health Association	Environmental Health Student Internship	Varies, see link	https://www.apha.org/Professional-Development/APHA-Internships-and-Fellowships/Environmental-Health
Public Health institute	Nutrition Data Advisor (GS 12/ GS 13 Equivalent)	Until Filled	https://www.phi.org/employment/current-opportunities/nutrition-data-advisor/
EcoHealth Alliance	Student Internship	Until Filled	https://www.ecohealthalliance.org/career/internships

One Health Events

One Health Lunch & Learn Seminar

April 29, 2021 | 12-1pm EST

Socio-Economic Epidemiology of Disease Risk in Wildlife Trade Networks

Dr. Matt Gray, UT Dept. of Forestry, Wildlife, and Fisheries

Zoom: <https://tennessee.zoom.us/j/92367859106>
Passcode: onehealth

Science of Team Science Workshop

May 21, 2021 | 9:30am-12:30pm EST

More info coming soon!

Event information and previous seminars can be viewed on our website: <https://onehealth.tennessee.edu/events/>

