

EPA fellow studies effect of mercury in toads

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Christine Bergeron of Old Orchard Beach, Maine, a doctoral student in Virginia Tech's College of Natural Resources, received a fellowship from the Environmental Protection Agency's National Center for Environmental Research for her research on the reproductive success of American toads. Credit: Bill Hopkins, Virginia Tech

Christine Bergeron of Old Orchard Beach, Maine, a doctoral student in Virginia Tech's College of Natural Resources, received a fellowship from the Environmental Protection Agency's (EPA) National Center for Environmental Research for her research on the reproductive success of American toads.

Bergeron's fellowship, part of the EPA's Science to Achieve Results (STAR) program, will support her research for the next three years. The highly competitive STAR fellowship encourages students to pursue advanced degrees and environmentally related careers by providing recipients with \$111,000 over a three-year period for tuition, stipend,

and research expenses. "I have been supported by teaching assistantships in the past, and the EPA STAR fellowship will allow me to concentrate on my research and conduct more studies than I had originally planned," Bergeron commented.

Bergeron's research focuses on the effects of [mercury](#) on the [reproductive success](#) of adult American toads and development of their offspring from eggs through metamorphosis. "Christine's work is exciting because it combines two of the biggest conservation issues we face today — global [mercury pollution](#) and the worldwide decline of amphibians. Her work will provide vital information that will influence public policy and [conservation](#) efforts for this critically endangered group of animals," said Bill Hopkins, fisheries and wildlife sciences associate professor and Bergeron's adviser.

Female amphibians, like other egg-laying wildlife, pass nutrients, hormones, and energy to their eggs to support the early development of their young. Unfortunately, females can accumulate contaminants in their tissues; when they reproduce, these contaminants are transferred to their eggs. Bergeron examines this process of maternal transfer of contaminants in American toads to document the effects of maternal transfer of mercury on early embryos, larva, and juveniles, with implications for local population health.

On rainy nights in early spring, the research team collects breeding pairs of toads when they congregate in wetlands. The animals are taken back to the field lab and allowed to reproduce there under controlled conditions. The eggs are collected immediately after the mothers lay them, and adults are then returned unharmed to their habitats.

Virginia Tech is collaborating with researchers at the University of Kentucky to quantify the amount of mercury and other contaminants transferred to the eggs. The researchers conduct a wide array of

descriptive bioassays and experimental tests to determine the viability of the offspring and how many of the offspring experienced adverse effects from the contaminants.

Data from the past field seasons confirm that female toads do transfer mercury to their eggs. "Even though females pass only a small percentage of the mercury in their bodies to their eggs, we observed lower hatching success from egg clutches with the highest mercury concentrations," Bergeron said in an interview last year. "Our next step is to determine if the mercury passed from the mother affects the hatchlings later in life, especially as they undergo metamorphosis [the transition of a tadpole into a toad]. These measurements are important because they may indicate how well [toads](#) do once they enter the terrestrial environment."

Of her future plans, Bergeron says, "I am interested in continuing in academia after completing my Ph.D. with an emphasis on teaching and providing research experiences for undergraduates."

Source: Virginia Tech ([news](#) : [web](#))

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