

Responses of gray treefrogs to acid mine drainage

Luis A. Bonachea
Pitt Johnstown, Natural Sciences

Motivation

- Amphibians are highly sensitive to environmental pollutants like AMD from coal mining.
- Amphibians play a crucial role in both aquatic and terrestrial ecosystems, so effects on their populations are widely felt.
- Just as their dual life cycle exposes most amphibians to both terrestrial and aquatic contaminants, the population level effects of those pollutants are then felt by both the terrestrial and aquatic communities that amphibians interact with.

Project Description

- The proposed funds will support broadly focused, integrated studies of the effects of acid mine drainage on the development, metabolism, stress physiology, and ecological interactions of gray tree frogs, *Hyla versicolor*.

Context

- Past work has focused narrowly on specific aspects of developmental toxicity or on population level effects
- Pitt Johnstown currently does not have a facility for housing vertebrate animals
- These funds will allow me to set up such a lab, providing year-round research opportunities for students



Fig 1: A male gray treefrog (*Hyla versicolor*), one of the most widespread and abundant amphibians in the state of Pennsylvania. Photo by Aaron Capouellez.

Assessing the impacts of acid mine drainage on the development, metabolism, and ecological interactions of gray treefrogs

Project Deliverables

- The short scale (within 2 years) publication plan is to produce three publications:
 - 1) A description of the developmental effects of AMD on larval development,
 - 2) A comparison of pre- and post-metamorphic metabolic rate of AMD exposed larvae, and
 - 3) A description of the effects of AMD exposure on corticosterone levels in larval, post-metamorphic, and adult frogs.

Potential Impact

- My ability to involve students in my own research has been largely limited by the lack of a facility to house live vertebrates and a short field season, most of which occurs in the summer when students are not available.
- My goal here is to establish a lab where 5-8 students can participate in research year-round and develop their own projects.
- This would greatly expand the research opportunities available to our students.

References and/or Acknowledgements

- I would like to thank Aaron Capouellez, an undergraduate student whose passion for amphibian conservation has been a major source of inspiration for this work

