

Update on South River Biota Studies

E. E. Mack, DuPont

And a cast of thousands who actually do the work (or serve as samples)...

2008 Projects

Amphibians

- Individual and Interactive Effects of Maternally- and Trophically-Derived Mercury on Development of Amphibian Larvae
 - Hopkins (VA Tech)

Mammals

- Pilot Furbearer Mercury Assessment
 - Yates/Evers (BRI)
- Bat Mercury Assessment
 - Yates/Evers (BRI)

Trophic Modeling

- South River Mercury Trophic Transfer: Aquatic & Floodplain Food Webs
 - Newman (VIMS)

2008 Projects (cont)

Avians

- Completion of Swallow Lifetime Reproductive Success Study
 - Cristol (College of William & Mary)
- Preliminary Work for Mercury Dosing Study on Captive Wrens and Sparrow to Determine Sub-Lethal Effects of Relevant Dietary Levels of Mercury
 - Cristol (College of William & Mary)
- Study to Identify the Source of Dietary Mercury: River or Floodplain
 - Cristol (College of William & Mary)
- Modeling Study to Determine the role of Foraging Behavior and Habitat Structure on Exposure Risk
 - Cristol (College of William & Mary)
- Endocrine and Immune Disruption as Potential mechanistic Links Between Mercury Exposure and Reduced Survival in Tree Swallows Along the River
 - Hopkins (VA Tech), Cristol (College of William & Mary),
- Mallard Mercury Assessment
 - (Savoy, Evers, BRI)

Amphibians

- Hopkins
- Individual and Interactive Effects of Maternally- and Trophically-Derived Mercury on Development of Amphibian Larvae
 - Intense field collection season
 - Toads – in progress and on track
 - Microscopy on 2007 samples in progress
 - 2008 Maternal transfer / dietary studies
 - Lab expts set up
 - Outdoor Mesocosms communities set up (periphyton is established)
 - Diet has been designed and confirmed
 - Hg content
 - No Hg leaching
 - Palatable to amphibians
 - Collections of reproducing toads is underway
 - Sites are not synchronized so two sites are set up, waiting on third site (Grand Caverns)

Avians – Swallows & Floodplain Birds

- Cristol:
 - Field season underway, swallows have arrived early and in large numbers
 - 150 new and replacement nest boxes installed in field to support 3yr return and biomarker studies.
 - Preliminary periphyton samples have been collected at 2 water treatment sites for stable N isotope analysis in support of the spider Hg forensics expt.
 - Science paper : “Movement of Aquatic Mercury Through Terrestrial Foodweb” out in 2 weeks.
 - SRST support acknowledged

Avians - Mallards

- Savoy
 - One week into field collection
 - Traps in place at:
 - Basic Park
 - Dooms
 - New Hope- Crimora
 - Forestry Center
 - Renkin Farm
 - Grand Caverns
 - Bradburn Park
 - 15 mallards caught
 - 4 hens equipped with radio transmitters
 - 3 nests located
 - 20 eggs collected to date (as of last week)

Mammals (flying and otherwise)

- Yates
- Bat assessment
 - Scope of work established
 - Planned to start in June
 - Focus on bats with the highest Hg levels in 2007
 - Eastern Pipistrelle
 - Northern Long-Eared
 - Biomarker and reproductive success measurements
- Furbearers
 - Scope of work established
 - Planned to start in September
 - Focus on Muskrat and Shrews
 - Opportunistic collection if possible
 - Sample on South River only

Trophic Modeling

- Newman
- South River Mercury Trophic Transfer: Aquatic and Floodplain Webs
- Scope of work established
 - Relation of suspended/settleable solids and periphyton mercury concentrations
 - Probabilistic risk analysis for selected piscivorous species
 - Examine isotope/Hg data and design terrestrial modeling effort