

Survey of the Mercury Content of Earthworms on the South River VA Floodplain

Dean Cocking and Andrew Carnahan JMU
Bill Berti and Annette Guiseppi-Elie, DuPont



Objectives

- Carry out extensive literature search to support study
- Conduct a survey of earthworm Hg concentrations on the South River floodplain
- Evaluate earthworm and soil total Hg and MeHg concentrations.

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- Carry out extensive literature search to support study:
 - what other soil invertebrates have been studied for Hg and other constituents of concern in soils?
 - why focus on earthworms?
 - how they have been studied?
 - are there common practices or standardized procedures for research?
 - how have earthworm Hg data been used?
 - are there similarities in the role of Hg, other heavy metals, and inorganic and organic chemicals within terrestrial ecosystems that are pertinent to the South River?

Objectives

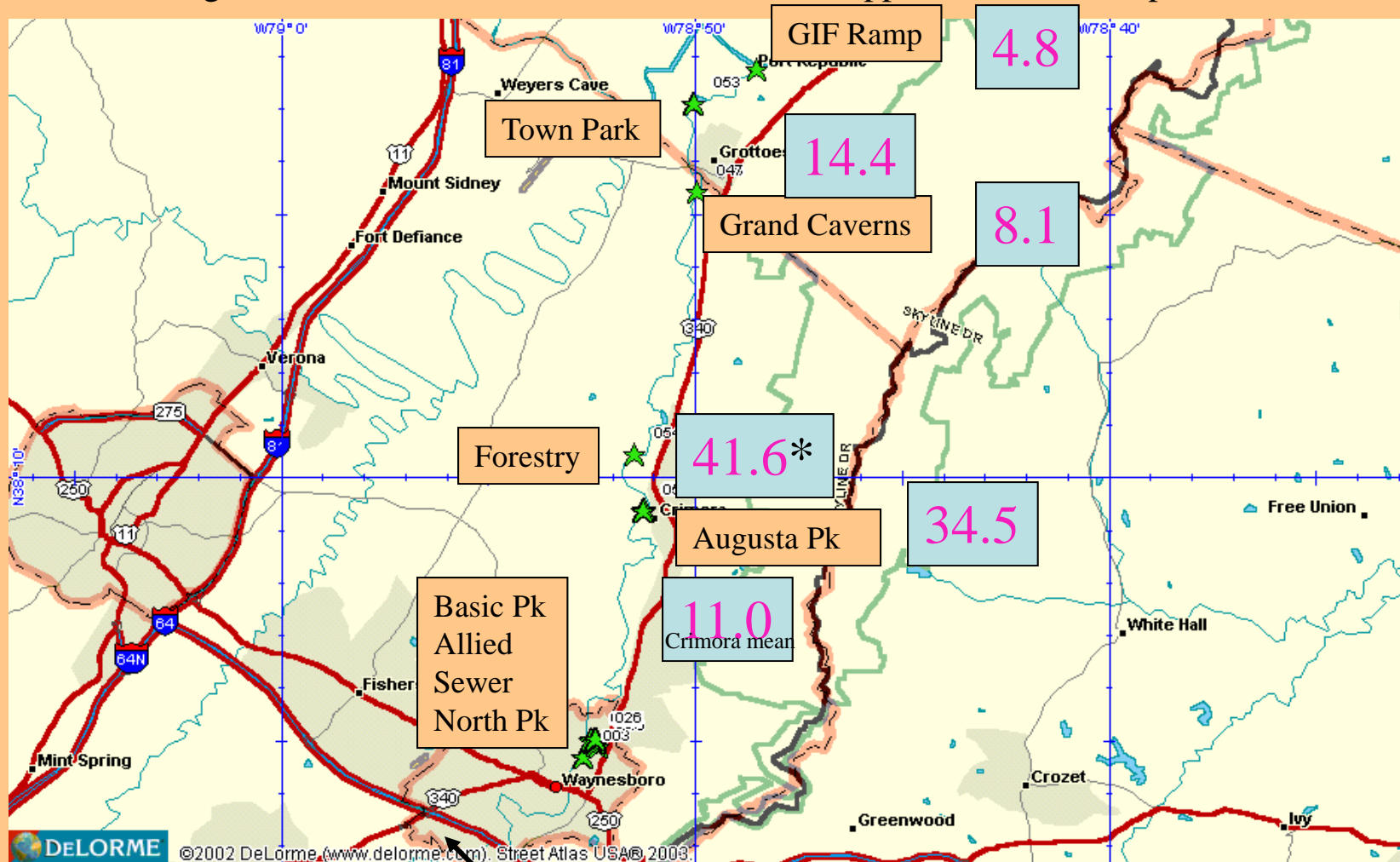
- Conduct a survey of earthworm Hg concentrations on the South River floodplain
 - use literature study information to develop protocols for sampling and analysis
 - try out these methods in the field at previously sampled floodplain locations
 - collect earthworm and soil samples, which will be sent to Studio Geochemica for total Hg and MeHg analysis.

Field survey

- Sampling methods to be determined through literature search
- Site selection criteria
 - 10 locations will be sites where soil samples have been obtained by Dick Jensen and Annette Guiseppi-Elie, including the floodplain garden at the Augusta Forestry Center
 - Range from upstream of the Waynesboro facility to Port Republic
 - Sample vegetated plots with minimum recent disturbance
 - Sample plots in areas where maximum total soil Hg levels in surface soil were identified

Floodplain Soil Sample Locations

Unweighted location means from Jensen and Guiseppi-Elie 2004 except for * and **



**Oak Lane. (least squares mean)
Pendleton & Cocking 1999

Draft 4-Aug-2005

* Berti and Cocking 2004

Potential field survey information

- Total and MeHg of earthworms
- Total and MeHg in soils where earthworms are collected
- Soil properties such as pH, organic carbon, texture, plant macro and micro nutrients, etc.
- Document vegetation composition at sample locations
- Define location parameters (GPS, relationship to South River, access, etc.)

Objectives

- Evaluate earthworm and soil total Hg and MeHg concentrations.
 - analyze data and prepare appropriate reports
 - compare results to literature
 - develop path forward

Current Status

- Mr. Andy Carnahan, a rising senior at JMU, will be assisting with the literature search and field work in 2005.
- Comprehensive literature review started
- Field reconnaissance is under way to select sampling plots within the field sites.

