Outline

- Purpose
- Study Areas: Lake Matoaka and Jolly Pond
  - Geology overview
- Methods
  - Field work
  - Heavy Metals
  - C:N
- Preliminary results and interpretations
- Future work
Purpose

- Determine whether increased development of a watershed causes increases in heavy metal concentrations
  - Extent of impact
- Examine changes in organic matter deposited with sediments through time
Study Areas: Lake Matoaka and Jolly Pond
Study Areas

Lake Matoaka

Jolly Pond
Study Area: Lake Matoaka

Rochambeau map of Matoaka, 1782

Matoaka, 1862

Matoaka, 1860

Library of Congress
Study Areas

Map of Lake Matoaka, 1863

Jolly Pond, 1860
## Geology of Coastal Plain

<table>
<thead>
<tr>
<th>Formation</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Alluvium, 20 ft.</td>
<td>Chiefly organic silts and clays with some sand</td>
</tr>
<tr>
<td>Norfolk Formation, 20 ft.</td>
<td>Interbedded sands, clays, and organic silts.</td>
</tr>
<tr>
<td>Windsor Formation, 40 ft.</td>
<td>Poorly sorted sand, silt, and clay.</td>
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<tr>
<td>Baxton Castle Formation, 45 ft.</td>
<td>Intertongued sands and clays, prominent red coloration.</td>
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<tr>
<td>Sadie Formation, 15 ft.</td>
<td>Brown sands and clays.</td>
</tr>
<tr>
<td>Yorktown Formation, 50 ft.</td>
<td>Highly fossiliferous clays and sands.</td>
</tr>
<tr>
<td>St. Mary's Formation, 15 ft.</td>
<td>Highly fossiliferous interbedded sands.</td>
</tr>
</tbody>
</table>
Geology of the Coastal Plain

Geologic map, Williamsburg Quadrangle, 1999

Geologic map, Norge Quadrangle, 1988
Land use

Jolly Pond

Both sites were chosen for their relative level of development.

From Nielsen et al. 1990
Methods: field work
Heavy metals are among the most persistent because they are difficult to destroy or break down.

It is anticipated that more developed watersheds will have higher concentrations of these heavy metals.
Methods: Heavy Metals

- Metals measured by graphite furnace atomic absorption spectroscopy: Pb, Cd, Cr
Methods: C:N
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