

Report as of FY2008 for 2008VT36B: "Improvement of Phosphorus Load Estimates through the use of Enzyme-Hydrolysis Measures of Phosphorus Bioavailability"

Publications

- Articles in Refereed Scientific Journals:
 - ◆ Hill, Jane, 2009. Spatial and temporal timing of organic phosphorus transformation under till and no-till conditions for a poultry manure-applied Vermont soil. In Preparation.
- Conference Proceedings:
 - ◆ Hill, Jane. 2008. Lake Champlain Watershed: from the Missisquoi Bay to the Lake (Poster; October 2008)
- Other Publications:
 - ◆ Hill, Jane. 2009. Oral presentation accepted for the American Chemical Society annual meeting August 16, 2009 in Washington D.C. (session: organic phosphorus transport, fate, and impact on the Chesapeake Bay).

Report Follows

VERMONT WATER CENTER ACTIVITY/ACCOMPLISHMENT DESCRIPTIONS

Project: Improvement of Phosphorus Load Estimates through the use of Enzyme-Hydrolysis Measures of Phosphorus Bioavailability

PI(s): Jane Hill

Research Performance Metrics

R1. Faculty participation in water research projects

Title: Improvement of Phosphorus Load Estimates through the use of Enzyme-Hydrolysis Measures of Phosphorus Bioavailability

Narrative:

Microorganisms alter the forms of phosphorus in soils and sediments over time. Some forms, such as orthophosphate, are more available to cyanobacteria and crop plants. We need to be able to measure phosphorus bioavailability in order to improve crop soil fertility as well as decrease the phosphorus in runoff from agricultural fields. Our present soil analysis methods for phosphorus forms are either very expensive or do not adequately reveal the amount of bioavailable phosphorus in the sample. This lack of knowledge hinders our ability to manage our agricultural soils and thus the watershed. In the past decade, scientists studying animal manures have developed a method for analyzing the bioavailable phosphorus in the manures using enzymes. The first objective of this study is to modify this enzymatic method so that it can be applied to characterize Vermont soil systems. The second objective of this study is to employ the new enzymatic method to a Vermont soil system within the Lake Champlain Watershed area, where we are most concerned about phosphorus pollution entering the Lake.

Number of faculty involved: 1

R2. Peer reviewed publications

(In preparation: spatial and temporal timing of organic phosphorus transformation under till and no-till conditions for a poultry manure-applied Vermont soil)

R3. Non-peer reviewed reports

None to report.

R4. Professional and scholarly conference presentations.

1. Lake Champlain Watershed: from the Missisquoi Bay to the Lake (Poster; October 2008)
2. Oral presentation accepted for the American Chemical Society annual meeting August 16, 2009 in Washington D.C. (session: organic phosphorus transport, fate, and impact on the Chesapeake Bay)

R5. Research conferences/symposia organized by the institute

None to report.

R6. External grants and contracts

None to report.

R7. Research awards and other recognitions

None to report.

R8. Patents and copyrights granted

None to report.

Educational Performance Metrics

E1. Water-related degrees awarded

None to report.

E2. Post-graduate placement in a water profession

None to report.

E3. Student support on water research grants

1. Nicholas Johnson, MS candidate (project title: Improvement of Phosphorus Load Estimates through the use of Enzyme-Hydrolysis Measures of Phosphorus Bioavailability)
2. Joshua Tyler, BS candidate (project title: Improvement of Phosphorus Load Estimates through the use of Enzyme-Hydrolysis Measures of Phosphorus Bioavailability)

E4. Student awards for water research, teaching, or service

None to report.

E5. Water teaching assistants

None to report.

E6. Student attendance at professional water conferences

1. Lake Champlain: Our Lake, Our Future (Lake Champlain Research Consortium; 2 students, January 2008)
2. Lake Champlain Watershed: from the Missiquoi Bay to the Lake (Ad hoc research group; 2 students, October 2008)
3. Oral presentation accepted for the American Chemical Society annual meeting August 16, 2009 in Washington D.C. (1 student, session: organic phosphorus transport, fate, and impact on the Chesapeake Bay)

Outreach Performance Metrics

O1. Publications (e.g., fact sheets, newsletters, etc.)

Reflections on Water submission, Spring 2009

O2. Training seminars and workshops

Fall 2008, Phosphorus in the Watershed. A 12 week, 3 credit class on how to assess the fate of phosphorus in a watershed from the macro (e.g., watershed) to micro (e.g., sediment water interface) contexts. 12 students were enrolled in the class.

O3. Technology and BMP demonstrations

None to report.

O4. Technology transfer activities

None to report.

O5. Water planning activities (field trips, water tours, etc.)

Canoe field trip with students of the Phosphorus in the Watershed class from Charcoal Creek to Campbell Bay (October 2008)

O6. Meetings with external advisory board
None to report.

O7. Website hits
Data not collected.

O8. Service on water committees and task forces
None to report.