

Vermont EPSCoR

Center for Workforce Development and Diversity (CWDD)



Progress in Year 3 and Projections for Next Year

Lindsay Wieland, CWDD Director at Saint Michael's College

My Experience with Vermont EPSCoR

Veronica Sosa-Gonzalez, former Streams Project intern,
current PhD student at UVM

Water Analysis Labs at Saint Michael's College and Johnson State College

Dr. Declan McCabe, Professor of Biology at Saint Michael's
College





**Goal: To increase the Vermont STEM workforce
in size and diversity**

Education and Outreach
Workforce Development
Service to the State
Broadening Participation

Private Sector Technology Internship Program



vttechcouncil.org/internships_search.html

<http://vermont.internships.com/>

FIND INTERNSHIPS & JOBS IN VERMONT

Send Me Internships

Refine Search

Show me

- ☐ All Opportunities
- ☒ Internships
- ☐ Entry Level Jobs
- ☐ Student Jobs

Keyword/Major

Location

Search Radius

[Show more fields](#)

Search

☒ Full-Time
☐ Part-Time

Results 1 — 10 Sort By: **Most Recent**

Innovative Training Development and Administrative

Vermont Association for Mental Health and Addiction Recovery — *Montpelier, VT*

The Vermont Association for Mental Health and Addiction Recovery has a new Innovative project, The Integrated Recovery Project (IRP). This project is run by Hannah Rose and Jared Haage and is creating...

Husky Summer Institute - CNC Machining Paid Internships

Vermont HITEC — *Milton, VT*

The program will consist of creating a Summer Institute Program to be delivered over two consecutive summers. The first year of the Summer Institute will enroll students into the CNC Machinist Fundame...

Outreach Intern (Burlington, VT)

Planned Parenthood of Northern New England — *Burlington, VT*

Planned Parenthood of Northern New England provides comprehensive reproductive health care to men, women and teens at 21 health centers throughout Maine, New Hampshire and Vermont. Our mission is to p...

Reproductive Health Organizing Intern (Burlington, VT)

Planned Parenthood of Northern New England — *Burlington, VT*

Planned Parenthood of Northern New England provides comprehensive reproductive health care to men, women and teens at 20 health centers throughout Maine, New Hampshire and Vermont. Our mission is to p...

Filter Results

Top Locations

- ☒ All Locations
- ☐ Burlington (16)
- ☐ Norwich (4)
- ☐ Montpelier (3)
- ☐ Colchester (2)
- ☐ East Thetford (2)
- ☐ Williston (2)
- ☐ Ludlow (1)
- ☐ Milton (1)
- ☐ Morrisville (1)
- ☐ Rutland (1)

Location Type

- ☐ All
- ☒ Local (35)

Employer Type

- ☒ All
- ☐ Non-Profit (20)

Funding Support to GIV Institutes

- Scholarships for girls to participate in STEM institutes
- Need-based awards for economically-disadvantaged students

The GOVERNOR'S INSTITUTES *of* VERMONT



VT EPSCoR Student Scholarships

Students pursuing a STEM major in Vermont:

- **First Generation Students**

5 in Yr3

11 in Yrs 1-3

- **Native American Students**

1 in Yr3

4 in Yrs 1-3





RACC

Research on Adaptation
to Climate Change

Integrate students and teachers into EPSCoR
research program

Middle Level Teachers & Students
High School Teachers & Students
Undergraduate Students

Integrate **Middle School Teachers** into RACC Research

- Field research trips on Lake Champlain
- Macroinvertebrate Workshop
- Classroom modules:

Climate change in Vermont

Hydrological Modeling

Snow Depth Study

Macroinvertebrate Biodiversity in Streams



Integrate **Middle School Teachers** into RACC Research

Middle School Teachers:

9 in Yr3

16 in Yrs 1-3

>250 students (in-classroom visits)



Integrate **High Schools** into RACC Research

Experience in Active Research

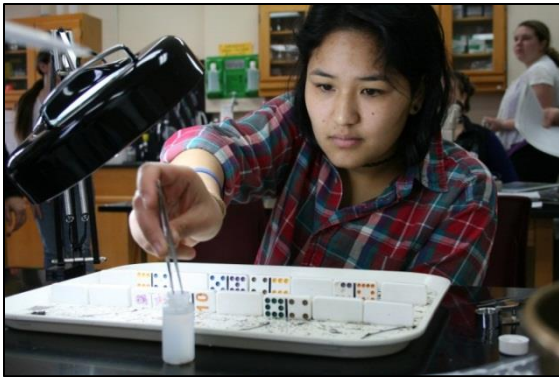
- Training in June
- Collect data in summer – fall
- Analyze data in winter
- Present research in April



Integrate **High Schools** into RACC Research

Experience in Active Research

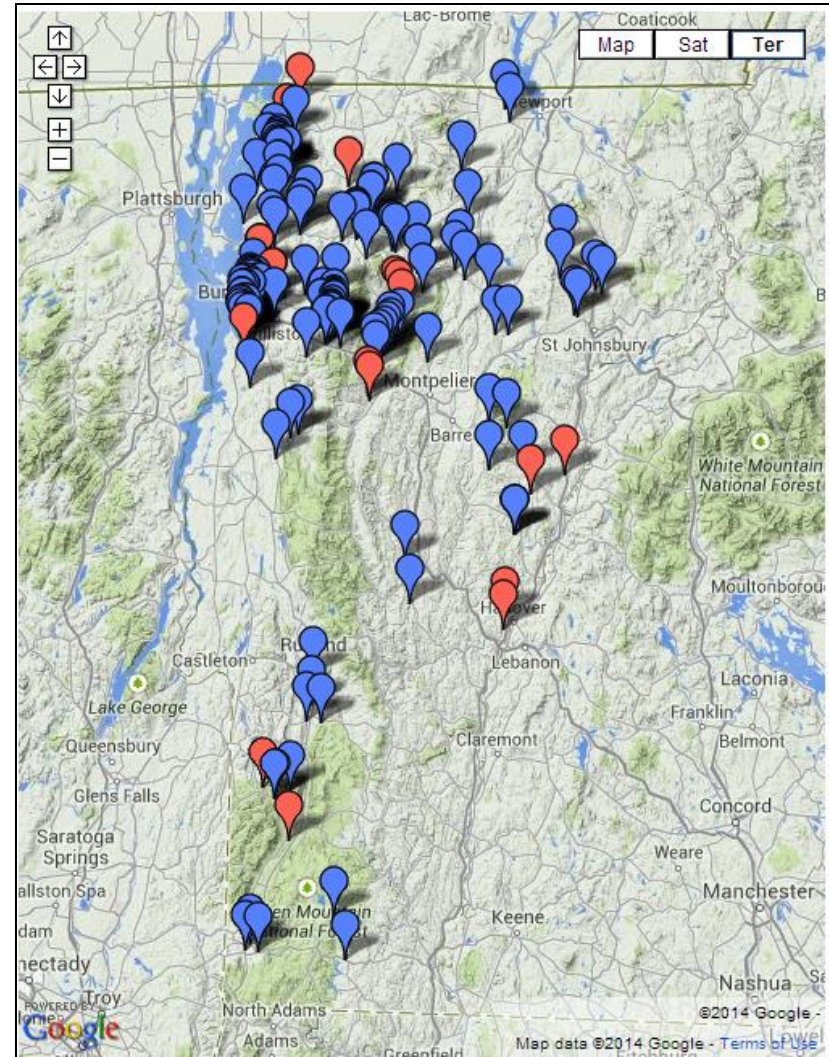
- **The Streams Project – Distributed network**
 - Monitor stream water quality through biweekly grab sampling for nutrient and TSS analysis
 - Collect and ID macroinvertebrate community samples
 - Collect riparian soil samples
 - Steward stage and temperature sensors



Data Generated from Streams Project Network

Year 3

- 300 grab samples:
 - TSS analysis
 - TP and TN analysis
- 160 riparian soil samples from 14 stream sites
- Macroinvertebrate community characterization from 14 stream sites, 2-4 sampling dates
- Continuous stream stage and temperature



Data Generated from Streams Project Network

The Streams Project

Experimental Program to Stimulate Competitive Research



VT EPSCoR :: UVM



Phosphorus & Nitrogen

Click on the variable titles below to view a definition of that variable.

Export to Excel File

Site Code	Location	Type	Participating Organization	Date Collected	Replicate	Phosphorus (µg/L)	Nitrogen (µg/L)	Comments
LCD_IndBrk_323	Essex, VT	Riffle	Colchester High School	2013-07-22	1	20.465	1203.083	
LCD_IndBrk_323	Essex, VT	Riffle	Colchester High School	2013-07-22	2	19.256	1155.899	
LCD_IndBrk_323	Essex, VT	Riffle	Colchester High School	2013-07-22	3	18.884	1194.888	
LCD_IndBrk_323	Essex, VT	Riffle	Colchester High School	2013-08-05	1	17.397	1044.278	
LCD_IndBrk_323	Essex, VT	Riffle	Colchester High School	2013-08-05	2	13.586	943.268	
LCD_IndBrk_323	Essex, VT	Riffle	Colchester High School	2013-08-05	3	0.000	815.258	
LCD_IndBrk_323	Essex, VT	Riffle	Colchester High School	2013-08-19	1	21.783	1544.075	
LCD_IndBrk_323	Essex, VT	Riffle	Colchester High School	2013-08-19	2	0.000	1399.870	
LCD_IndBrk_323	Essex, VT	Riffle	Colchester High School	2013-08-19	3	0.000	1396.490	

Integrate **High Schools** into RACC Research

Experience in Active Research



➤ **Other RACC-related research**

- Monitoring local weather data and comparing to regional data
- Effects of blue green algae on fatty acids in fish
- Groundwater and physical geology
- Water quality comparisons in burned and un-burned sections of forest
- Small lake temperature profiling
- Effects of nutrient loading on phytoplankton growth

Integrate **High Schools** into RACC Research

2014-15 High School Teams:

20 teams: one teacher and two⁺ students

Teachers 60% female; 20% under-represented;

Students: 63% female; 24% under-represented



Years 1-3 (2011-2015):

75 teams (Vermont, Puerto Rico, New York, Delaware)

Teachers 51% female; 15% under-represented;

Students: 66% female; 16% under-represented



Integrate **Undergraduates** into RACC Research - Internships

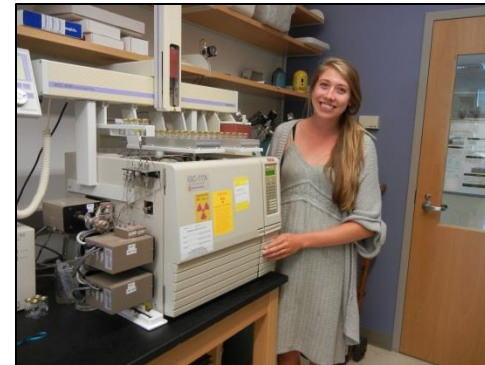
Research: 20 faculty mentors
Q1, Q2 and Q3

In-Lake Processes: 9 interns
(at UVM and Middlebury)

Watershed Processes: 22 interns
(at UVM, SMC, and JSC)

Climatology: 2 interns
(at UVM and JSC)

Policy and Management:
11 interns (at UVM)



Integrate Undergraduates into RACC Research

Year 3

44 students from 14 institutions

57% female; 27% under-represented;

9 VT institutions:

Castleton State College
Community College of VT
Johnson State College
Middlebury College
Southern Vermont College
St. Michael's College
University of Vermont
Vermont Technical College

5 outside VT institutions:

NYC College Of Technology
Texas A&M University
University Of Notre Dame
Universidad Metropolitana
University of Puerto Rico



Integrate **Undergraduates** into RACC Research

Year 3

- 4 CCV students
- 2 military-connected
- 2 students with disability
- 9 first-generation college students

Years 1-3

- 124 students from 20 institutions
- 9 CCV students

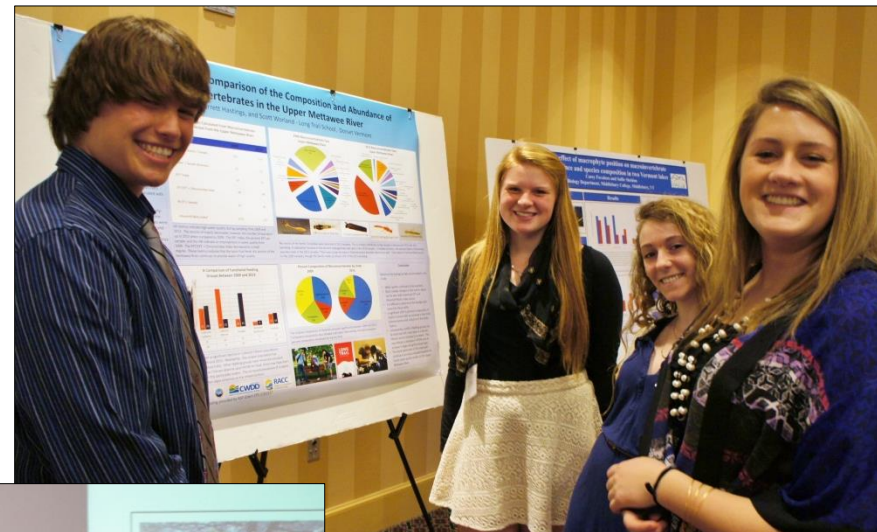
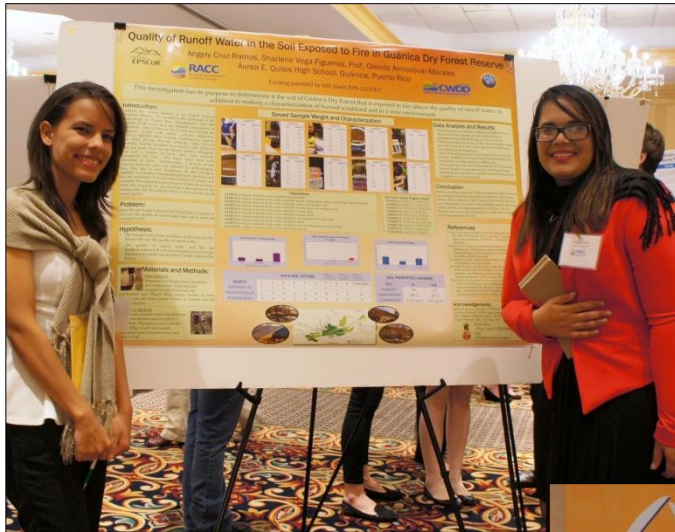
12 VT institutions:

- Castleton State College
- Community College of Vermont
- Green Mountain College
- Johnson State College
- Lyndon State College
- Middlebury College
- Norwich University
- Saint Michael's College
- Southern Vermont College
- Sterling College
- University of Vermont
- Vermont Technical College

6th Annual Student Research Symposium

April 2nd, 2014

Undergraduate and high school student presentations



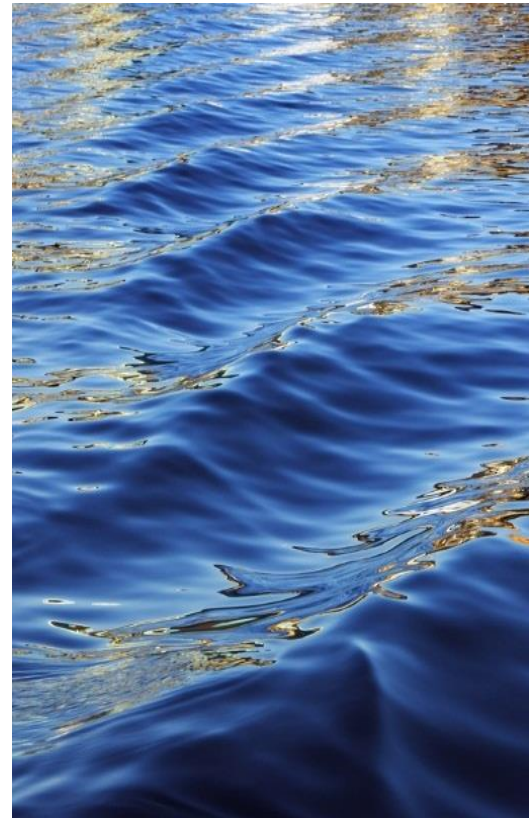


“The Streams Project was the gateway to hands-on interdisciplinary research on water resources. Interning with the Project was an eye-opener and a great experience. I am currently working on my PhD in water resources. I am grateful for the experience I got with the Streams Project as it is paramount to my performance in graduate school.”

– Veronica Sosa-Gonzalez, former Streams Project Intern ‘09-’10

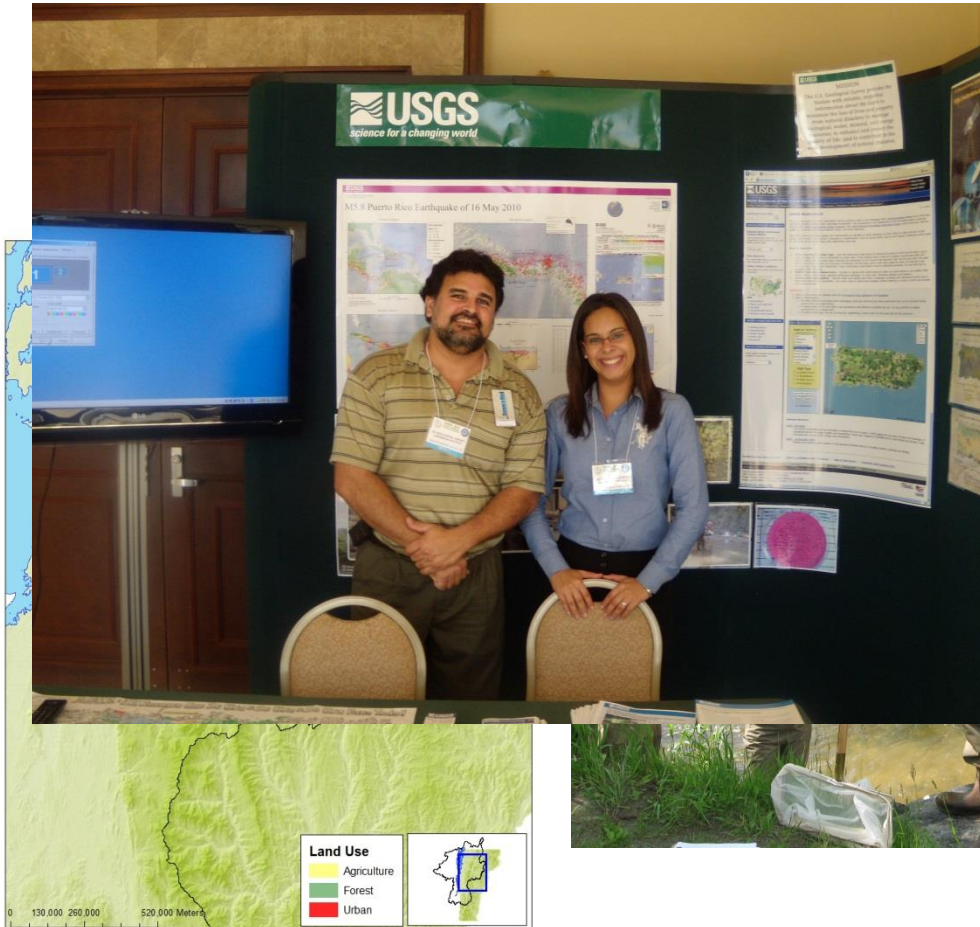
My experience with VT EPSCoR

Veronica Sosa-Gonzalez, M.Sc.



Vermont EPSCoR Streams Project

- Summer 2009 – Intern
 - GIS
 - Field work



Rubenstein School - UVM

- Fall 2010 – M.S. in Natural Resources
 - Concentration: Aquatic ecology and watershed science
 - Degree completed October 2012
 - Thesis title: Determining long-term erosion rates in Panama: an application of ^{10}Be



Rubenstein School - UVM

- Fall 2012 – Ph.D. in Natural Resources
 - Dissertation title: Erosion patterns in BRIC countries: case studies from SE Brazil, and SW China
 - Background erosion rates in Brazil, analysis of debris flow sediments, framework for PES
 - Background and modern erosion rates in China, and their correlation with land use changes and policies implemented



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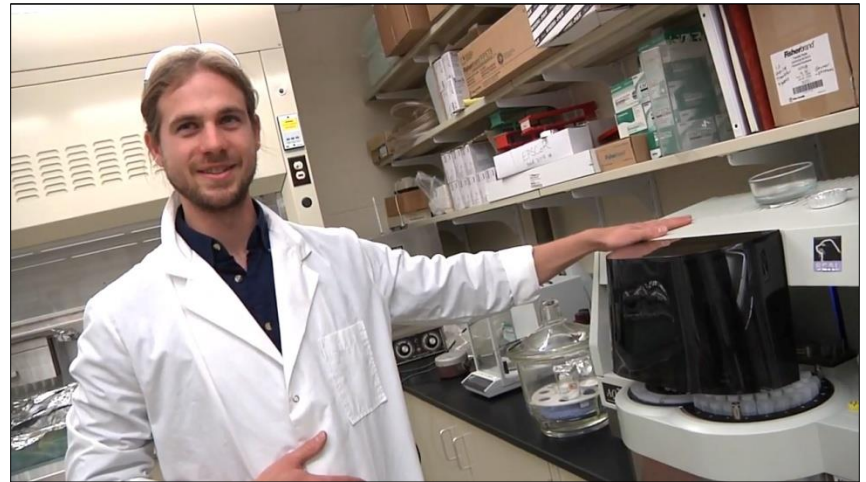
Thanks for your attention

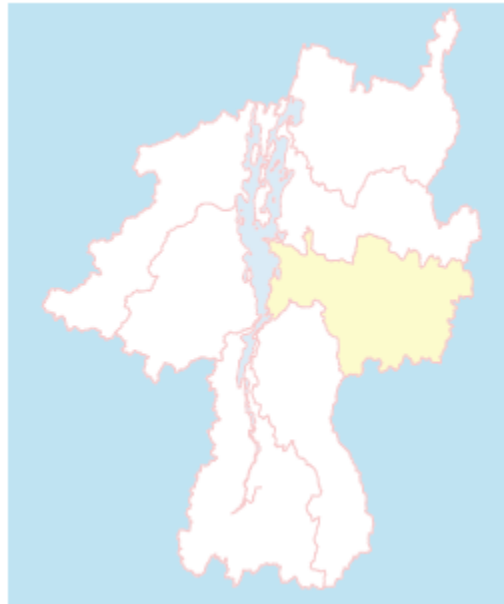
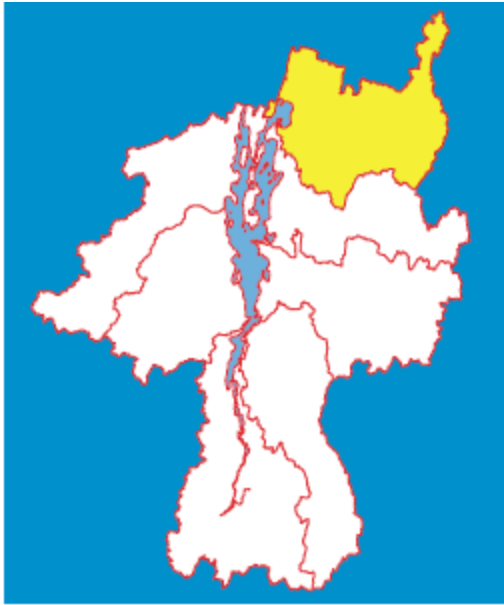


Water Analysis Labs

St. Michael's College – TSS analysis (Katie Chang)

Johnson State College – Nutrient analysis (Saul Blocher)

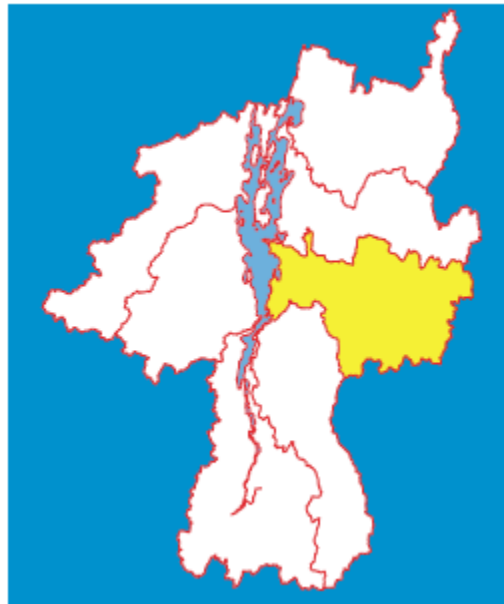




Missisquoi



Slide credit: C Giles

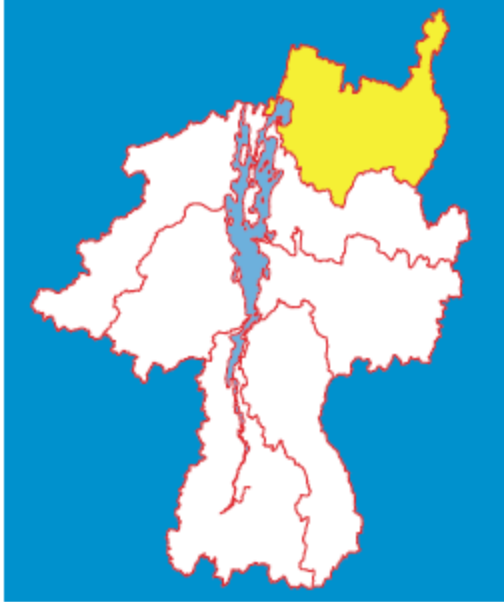


Winooski

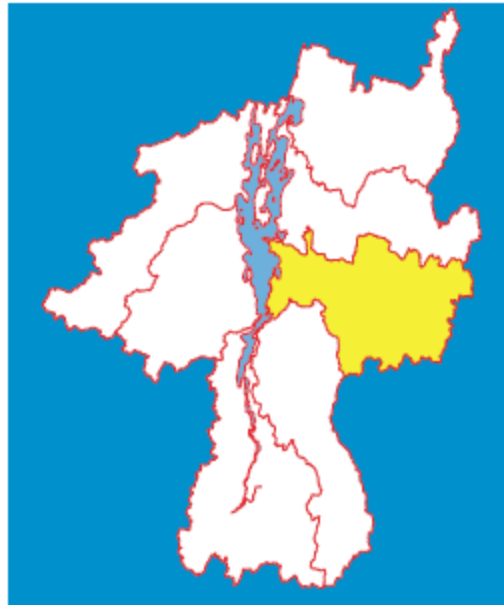
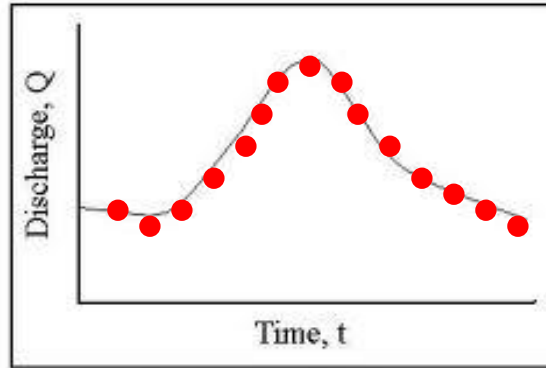
Urban/ Mixed Land-use



Slide credit: C Giles



River ISCOs



Lake ISCO



Saint Michael's College Laboratory - TSS

Year 3: 1,924 TSS samples

Fall 2013:

732 TSS samples (273 lake; 347 watershed, 111 high school stream)

Spring/Summer 2014:

1,192 TSS (445 from lake, 565 watershed, 182 high school streams)



High School Streams Project

14 stage sensors, 22 temp sensors

Johnson State College Laboratory - nutrients

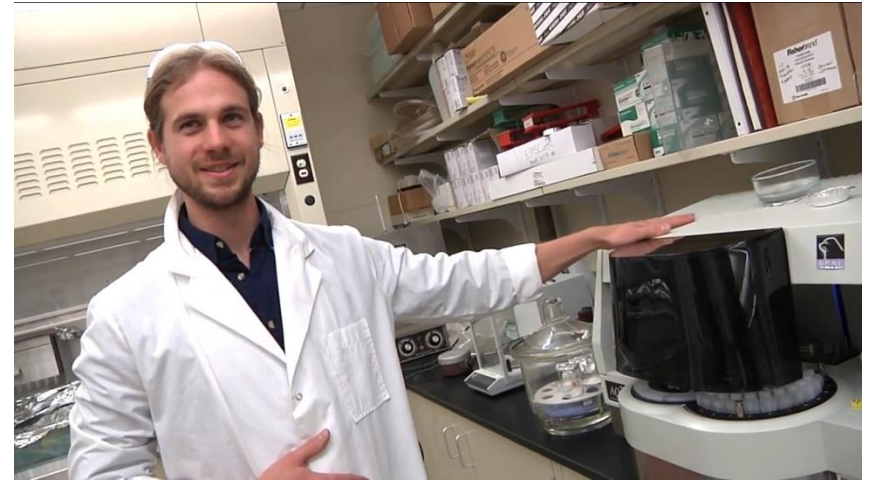
Analytes

– Phosphorus

- Total P
- Total dissolved P
- Soluble reactive P

– Nitrogen

- Total N
- Total dissolved N
- Ammonia
- Nitrate



Seal AQ2

Johnson State College Laboratory - nutrients

Year 3: 6,907 samples

Fall 2013: 1,705

Lake ISCO/grabs: 1,000

River ISCO/grabs: 325

HS samples: 380

Spring/Summer 2014: 5,202

Lake ISCO/grabs: 2,298

River ISCO/grabs: 2,584

HS samples: 320





Missisquoi Bay macroinvertebrate Sampling

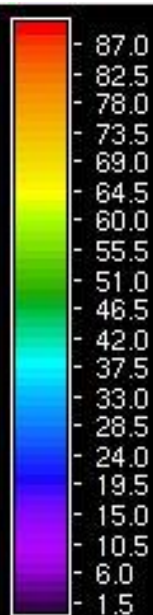
- Petite ponar samples on a 500m grid
- Environmental data:
 - Sediment Trend Analysis; Pat Manley (Middlebury College)
 - Bathymetry and current flow; Tom Manley (Middlebury College)
- Biological data:
 - 375 identified samples



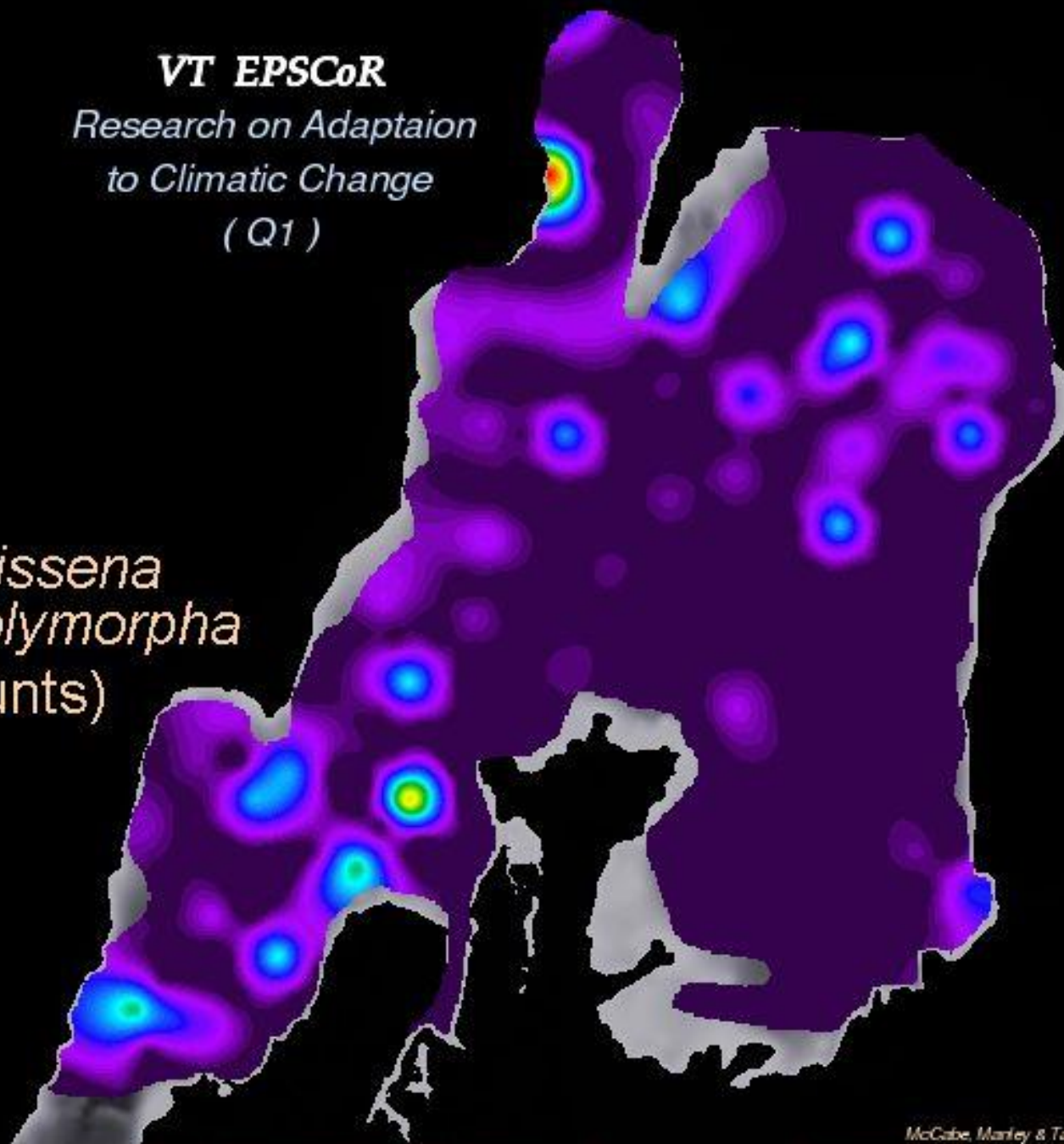
Sediment Trend Analysis Field Program

VT EPSCoR

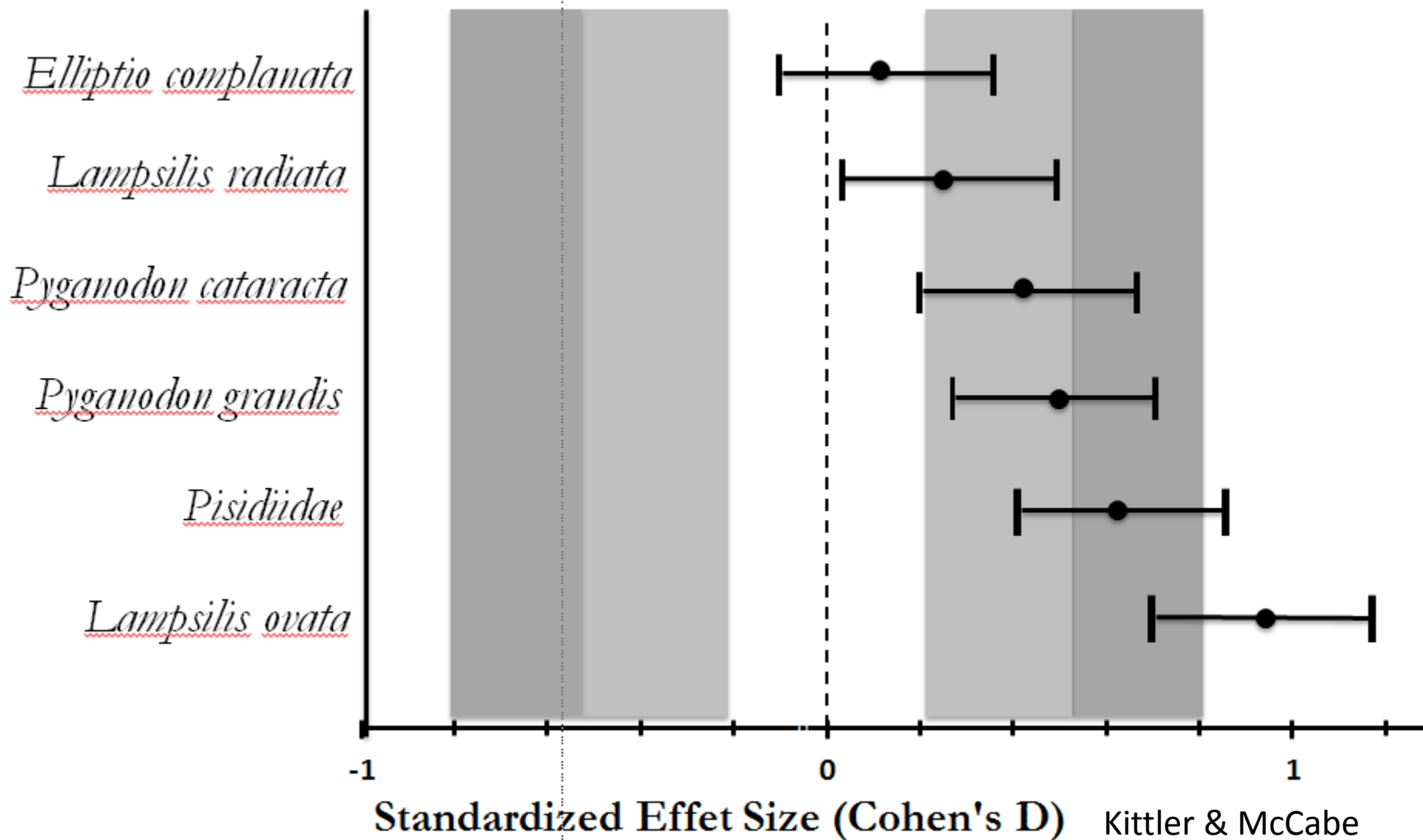
*Research on Adaptation
to Climatic Change
(Q1)*



*Dreissena
polymorpha*
(counts)



Native mussels associated with zebra mussels



Zebra mussels and benthic richness

