

# Turning Lakemount Research into Policy

**There is often a large lag between important scientific research results and policy that may be needed to address those findings. UVM lakemount research is a perfect interdisciplinary case study.**

## OVERVIEW

Dr. Bianca Possamai and her team at UVM are researching lakemounts in Lake Champlain, and these areas are shown to be important biodiversity hotspots. Taking newfound research and addressing it with necessary policy is often a lengthy and fraught task. This lesson plan and subsequent deliverable is focused on understanding scientific research, communicating that research, utilizing leverage points, and exercising public participation in government.

## TIME REQUIRED

3 class periods; 60-75 minutes each

## MATERIALS

- Screen and projector—or a rendition of this setup—for videos and presentation slides.

## PREPARATION

- Teacher/professor to research whether any lakemount or seamount protections have been made recently.
- Teacher/professor to check in on whether Bianca Possamai has published any new research.

## LEARNING GOALS & OBJECTIVES

- understand what a 'lakemount' is and why it is vital to a lake's ecosystem.
- recognize the importance of biodiversity hotspots and how human impact is of concern.
- hypothesize why there is a lag between research and policy needed to address the research's findings.
- effectively communicate scientific research to a wider audience.
- identify ways to participate in policymaking.

## INTRODUCTION

Research emerging from UVM through Bianca Possamai and her team is showing that, similar to seamounts, there are natural abrupt structures that do not crest the surface of the water within Lake Champlain. Because of their abrupt nature, the steep incline causes the lake's currents to move upwards, bringing along nutrients that typically sink to the bottom of the lake. Due to this upwelling phenomenon, the photic layer

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## GRADE LEVEL

9-12, undergraduate

## ANCHORING PHENOMENON

Seamount ecology was explored by Rogers in 1994 and Clark et al. in 2010, showing seamounts as biodiversity hotspots. However, even now, less than 10% of seamounts of protected globally. We are now finding out that our lakes have lakemounts—a version of the sea's features.

## DRIVING QUESTION

Should policies be made to protect lakemounts, and, if so, how can we convince policymakers to do so?

## IMPORTANT VOCABULARY

- **Seamount:** an underwater mountain with steep sides rising at least 1,000m from the seafloor
- **Seamount effect:** the abrupt topography leads to upwellings that support disproportionately high productivity, biomass, and biodiversity on and around the seamount
- **Lakemount:** abrupt offshore reefs in lakes
- **Biodiversity hotspot:** regions that contain a high level of species diversity, many endemic species, and a significant number of threatened or endangered species
- **Petition:** asking the government to fix something we see as not working or to change a policy or

proves more productive than other off-coast areas without a lakemount. This results in biodiversity hotspots, with a Lake Champlain lakemount even found to be harboring an endangered lake sturgeon. Because these areas are so robust in species of all trophic levels, concerns over the management of lakemount ecosystems is prevalent. Should the Endangered Species Act, either federal or state, be applied to protect these habitats in Lake Champlain? Should fishing be allowed in and around these areas? Does anything different have to be done at all? That's what this lesson is encouraging students to consider.

## DELIVERABLE

Deliverable informational slides can be found [here](#). The goal is to have the students, individually or in groups, create a petition & proposal project addressing the lakemount research. These projects can take many forms: letter to government body and/or policymaker, petition that could be shared with the public to sign, a public testimony speech, video, zine, slideshow presentation, op-ed with a call to action, plan for a rally, PSA, etc. The overarching goal is that the project deliverable could theoretically be put into action/published/sent as is rather than merely something just to turn in for a grade.

practice we don't like, covered by the US Constitution's First Amendment

- **Proposal:** a plan or suggestion, especially a formal or written one, put forward for consideration or discussion by others

## STANDARDS

- Adaptable standards in accordance with grade level and state. Anywhere from science communication, civic engagement, scientific analysis, and place-based ecosystem management qualify.

## SUPPLEMENTAL RESOURCES

1. [Are lake mounts hotspots of productivity and biodiversity?](#) By Bianca Possamai, et al.
2. [Writing Public Policy](#), by Catherine Smith (2023)

## LESSON PROCEDURE

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### Class 1 topic: What are lakemounts?

- Address the vocabulary terms: seamount, seamount effect, lakemount, and biodiversity hotspot
- Discuss parallels between seamounts and lakemounts
- Go over the science of these underwater abrupt topographies and how they formed
- Discuss what effect humans are having on these ecosystems
- Take a place-based lens and focus on Lake Champlain, including research from Dr. Possamai
- Hypothesize what may be impacting the lakemounts in Lake Champlain

### Class 2 topic: Forms of marine protections

- Address ways that marine ecosystems can be protected in the US (relevant to lakemounts): Marine Protected Areas (MPAs) and the different types, Endangered Species Act critical habitats, National Marine Sanctuary System, fishing and bottom-trawling moratoriums, etc.
- Identify stakeholders who can influence policy as well as those who make the policy

### **Class 3 topic: Public participation & effective science communication**

- Address the vocabulary terms: petition and proposal
- Give tips and tricks for effective science communication with varying audiences: when to use jargon, when to explain concepts, how to persuade, etc.
- Discuss the question: what would it mean for other lakemounts if a Lake Champlain lakemount was granted protection?

#### **Optional add ons:**

- Hands-on activity developed by Sabrina Koetter: [lakemount nutrient upwelling activity](#)
- Reach out to [Bianca Possamai](#) at UVM for additional resources and/or a class visit
- Contact the Lake Champlain Sea Grant to schedule a potential boat ride, [seagrant@uvm.edu](mailto:seagrant@uvm.edu)

## **CONCLUSION**

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Science communication is a necessary consideration for emerging information that may be useful for policymakers. However, there often remains a gap between scientific reports and publications and those in the position to apply that information for management. Understanding how to take scientific data and findings and then essentially translate it for those who may not have a background in science is crucial to the application of what research finds. Alongside communicating the scientific background, determining whether the findings have implications on human use and proposing any changes is essential. In the case of lakemounts, because this research is quite new, the need for digestible data and findings is needed to set the stage for the importance of these ecosystems. Connecting the scientific method with the management application is when the science truly makes a difference.

## **SUPPORTING IMAGES/VIDEOS**

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[What are Seamounts?](#) (2:14 minute video)

Two images from the UVM research boat of the nearby Schuyler Reef in Lake Champlain. First image is of the side profile and second image is top down.

