

### NEW HAMPSHIRE VIEW 2021 - 2022 ACTIVITIES

New Hampshire View began two high impact activities in 2021 that will continue through the 2022-2023 grant year. The first of these activities is to use high-spatial resolution remotely sensed imagery to measure levels of cyanobacteria in New Hampshire waterbodies. High levels of cyanobacteria can cause sickness to those who swim or recreate in the impacted lakes (Figure 1). In the first year of the project, lakes with and without high levels of cyanobacteria were sampled from both high-resolution imagery and simultaneously, water samples were collected (Figure 2). The water samples were analyzed in a lab to measure the levels of cyanobacteria (Figure 3). The remotely sensed imagery will be processed, and an analysis performed in the second year of the project to determine the relationship between the water samples and the imagery to determine if the imagery is an accurate predictor of cyanobacteria in the water.



Figure 1. Lake advisory for cyanobacteria.



Figure 2. Sampling lakes using a canoe and collecting water samples for analysis in the lab.



Figure 3. Analyzing the water samples in the lab.

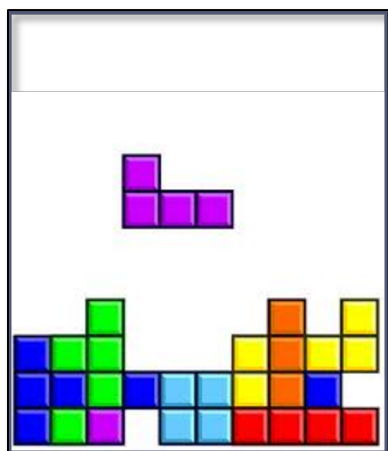


Figure 4. An example of spatial thinking.

The second high impact activity is also a two-year project and involves the development of a series of education videos and exercises to introduce and demonstrate the concept of Spatial Thinking. Everyone has the ability to think spatially, and this ability can be enhanced with awareness and practice. For example, playing the game, Tetris, is a very good way to improve spatial thinking as it encourages the player to fit the random shapes into the right position to complete the row (Figure 4). Often this process speeds up as the game continues forcing the player to make quicker decisions. In the first year of this project, a review of the spatial thinking literature was conducted and used to produce an introductory video (in 2 20-minute sessions) along with an introductory exercise/learning activity. Also, a plan was developed for the videos and exercises to be created in the second year. These videos and exercises will build on the introductory material and demonstrate the power of spatial thinking using a variety of real-world examples.

## BENEFITS TO NHVIEW

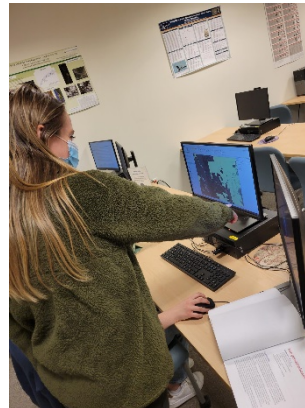
- NHView participated in the development of StoryMaps as part of the Earth Sensors and Research (ESRC) committee of AmericaView. Two StoryMaps were produced; one on NHView member's expertise in earth remote sensors and the other in research expertise.
- NHView Director, Russ Congalton, presented two seminars by zoom during this year. One was on Loons in New Hampshire and the other was on Forest Characterization.
- NHView celebrated 10 years of contributing to the University GeoSpatial Support Center (GSC). This facility provides consulting and workshops on remote sensing and geospatial analysis to students, staff, and faculty. Most, but not all, of the consulting and workshops were conducted virtually, but successfully.
- NHView funded an undergraduate intern, Isabelle Lopez, to work in the Basic and Applied Spatial Analysis lab (BASAL) to aid our research. As a result, Izzy was awarded a Summer Undergraduate Research Fellowship to continue her research with us.



*Cyanobacteria collection.*



*Izzy Lopez, undergraduate intern.*



*Consulting in the GeoSpatial Support Center*



## NHVIEW CONSORTIUM MEMBERSHIP

- **Department of Natural Resources & the Environment, UNH**  
The Basic and Applied Spatial Analysis Lab (BASAL) conducts basic research on spatial data uncertainty/map accuracy and applied research applying the tools of remote sensing, GIS, and spatial data analysis to solve natural resource problems.
- **NH GLOBE Partnership, UNH**  
Carries out GLOBE teacher training in atmosphere, land cover, hydrology, soil and earth system science with a focus on land cover mapping and geospatial technologies.
- **EOS-EarthData, UNH**  
A digital library of Earth science data that serves scientists, educators and the public.
- **NH GRANIT GIS Repository, UNH**  
A cooperative project to create, maintain, and make available a statewide geographic data base serving the information needs of state, regional, and local decision-makers.
- **Diamond Library, UNH**  
The library maintains an extensive map and aerial photo collection for NH and houses the GeoSpatial Support Center.
- **Forest Watch, UNH**  
A New England environmental education activity using field, lab, and satellite data analysis methods for assessing the state-of-health of local forest stands.
- **Cooperative Extension, UNH**  
Offers short courses in geospatial technologies including GIS, GPS, and field mapping.
- **Dartmouth College**
- **NH Planning Commissions**

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