Cary Institute of Ecosystem Studies

Request for Proposals for 2022 Catskill Research Fellowships

Purpose of RFP: The purpose of this RFP is to solicit proposals for Catskill Research Fellowships, which are student research projects, mentored by a more senior scientist, that address the research needs of natural resource managers in the Catskill region, while providing a positive research experience to a student.

About the Catskill Science Collaborative: The Cary Institute of Ecosystem Studies hosts the Catskill Science Collaborative, a program funded by the NY State Environmental Protection Fund through a grant from the New York State Department of Environmental Conservation and with further support for research from the New York City Department of Environmental Protection. The Catskill Science Collaborative facilitates and communicates environmental science in the Catskill Region through sharing science with the public, promoting science-informed resource management, and enabling data- and idea- sharing among scientists working in the Catskills. The Catskill Science Collaborative's website can be found here: www.catskillscience.org

Catskill Research Fellowships are offered by the Catskill Science Collaborative to generate scientific information to inform natural resource management while providing students applied scientific training in an experiential learning environment. More broadly, the program is intended to strengthen relationships between natural resource managers and researchers and to attract new scientists to research in the Catskills.

Who can apply: College professors and other professional scientists with a student interested in conducting research in the Catskills. The Fellows may be either graduate or undergraduate students.

Number of fellowships available: A minimum of 3, or more depending on availability of funding.

Funding available per fellowship: $15,000 -- see budget stipulations below. Please note that fellowship awards are contingent on available funding.

Research Needs: Appendix 1 lists research needs that have been identified by natural resource managers. All proposals should be targeted to address one of these research needs. Professors and sponsoring scientists may submit more than one proposal and sponsor more than one student.

Timeline:

- **Applications are due by Tuesday, February 1, 2022.**
- Notifications about selections will be made on or around January 31st 2022.
- It is expected that projects will begin around the end of May 2022.
- It is hoped that the fellow will present their results at the Catskill Environmental Research and Monitoring Conference in October 2022, at a location in the Catskills, location TBA.
- The project must be completed and the final report submitted by December 31st 2022.

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Application: The fellowship is intended to help build relationships between resource managers and researchers, therefore professors/sponsoring scientists are required to contact the resource manager associated with their research need of interest, as noted in Appendix 1. The purpose of this contact is to gather more information and collaborate on developing a preliminary proposal. It is expected that some refinement of the preliminary proposal may be required prior to awarding the fellowship. Preliminary proposals should contain the following:

1) Cover page including:
- Project Title
- Professor/sponsoring scientist's name
- Student/Fellow name
- College or University Name
- Natural resource manager contact name and agency
- Research need addressed by the proposal (from Appendix 1)
- Certification that the proposal was reviewed and approved by the institution's sponsored programs or grants office prior to submission

2) Proposal narrative (maximum 4 pages) including:
- Background on research question
- Goals and objectives
- Methods
- Outcomes and Deliverables
- Timeframes for data collection, analysis and written report (see Timeline and Expectations/Stipulations)

3) Budget with line items for allowable budget categories as discussed in "Budget Stipulations" below. Please also include a budget narrative to describe proposed expenses, fringe benefits rates, etc.

4) Professor/Sponsoring scientist's CV

5) Student's Resume

Email your proposal **as one PDF file** to petersonk@caryinstitute.org with the subject line**: Catskill Research Fellowship Proposal**.

Application Evaluation Criteria: Applications will be evaluated based on the following criteria:
- Degree to which research design meets the research need
- Evidence of partnership with resource management agency
- Potential for positive research experience for student
- Feasibility of project within the time frame specified
- Degree to which professor's expertise meets research need
- Qualifications of the student

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- Safety measures

Budget stipulations:

- **Maximum award request: $15,000**
- Fellows will be awarded at least $7,000
- Professor compensation allowed up to $2,000
- Indirect costs capped at 20% of total direct costs
- Other allowable budget categories include: Fringe benefits at rates approved by the submitting institution, supplies, travel, communications

Other Stipulations:

- The Fellow will be covered by college/institutional insurance and workers compensation.
- The Fellow will attend an orientation at the start of the field season.
- The Professor/sponsoring scientist and Fellow will participate in regular check-in meetings during the field season with the resource manager and Catskill Science Collaborative in person, by video conference, or by phone to promote a team culture and ensure all parties are informed about the progress of the project.
- The Fellow will regularly check email and voice messages to facilitate communication between the Catskill Science Collaborative and Fellowship program operation.
- Fellows working in locations without cell phone service will be required to have a satellite communication device for emergency contact.
- The professor/sponsoring scientist will be the primary supervisor of the Fellow.
- The professor/sponsoring scientist will be supportive of and encourage a team culture and collaborative spirit.
- The professor/sponsoring scientist will be responsible for deliverables.
- Data generated from the fellowship will be formatted and made available for the Catskill Science Collaborative to place on the Catskill Data Portal (https://www.uvm.edu/femc/catskill#home), pending data sensitivity and data sharing policies of resource management agencies
- Fellows will be required to find their own housing, though every effort will be made by the natural resource manager and Catskill Science Collaborative to help connect them to affordable housing opportunities.

Email Kira Peterson, Program Officer for the Catskill Science Collaborative, at petersonk@caryinstitue.org regarding any questions.

Natural Resource Manager Role:

Natural resource managers are expected to participate in the study design and refinement process. They are expected to be available throughout the study to answer questions that the professor and Fellow may have. They will provide any necessary and agreed upon agency or organizational resources for the study. They will provide an orientation to the fellow and introduce them to others they may work with. Past fellows have remarked on the value of meeting and working with professionals in their field and that it was a highlight of their fellowship. Depending on the project, it may be helpful for the resource manager to occasionally visit the fellow to check in on fieldwork. Resource managers are expected to

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attend an orientation and presentation of the Fellow's work. They are also expected to participate in regular check-in meetings with the professor, Fellow, and Catskill Science Collaborative.

Catskill Science Collaborative/Cary Institute of Ecosystem Studies Role:

The Catskill Science Collaborative (CSC) assists in the proposal selection process and the Cary Institute of Ecosystem Studies (Cary Institute) Grants Office awards the contract to the College or University. The CSC coordinates events and meetings for the Catskill Research Fellowship to ensure communication between all parties and ensure a positive learning experience for the Fellow.

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Appendix I

Natural Resource Manager Research Needs

1. Synoptic monitoring of disinfection byproduct (DBP) precursors in the Neversink watershed

The export of dissolved organic carbon (DOC), a precursor for DBPs, in the Neversink watershed of the NYC water supply is greater and disproportionate to the watershed drainage area when compared to other watersheds in the region. Synoptic monitoring for surrogates of DBP formation potential e.g., absorbance at 254 nm (UV-254), spatially across the watershed could provide additional information on the spatial sources of precursor loading, its seasonal variability, and instream degradation. Such data are valuable for watershed scale modeling of DOC and other precursors of DBPs. Some historical data are available for DBP formation potential and water quality parameters such as UV-254 and fluorescent dissolved organic matter (fDOM, excitation wavelength 365 nm, emissions wavelength 480 nm). Additional wavelengths for absorbance or fluorescence proxies could be considered for this study. The sponsoring professor would need to have a background in Hydrology and/or Biogeochemistry and have access to portable field equipment and a laboratory facility for water sample analysis. A prospective student should have an interest in water quality monitoring and field research and expect to gain experience in water quality sampling and data analysis.

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Karen Moore
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New York City Department of Environmental Protection

2. Impact of winter cover crops on dissolved phosphorus loading in the Cannonsville watershed.

Winter cover cropping has become a widely adopted conservation practice in recent years to reduce soil erosion and improve water quality in the Cannonsville watershed of the NYC water supply. While cover cropping is in general, considered a beneficial practice to improve water quality, recent studies have identified that this practice tended to elevate dissolved P loss relative to bare soils. However, the specific impacts of cover crops on dissolved phosphorus loss are unclear. The goal of this project is to identify and confirm if this is a phenomenon occurring in the Cannonsville watershed using a case study from a tributary sub-basin, focusing on saturated and wetter areas of the landscape that accumulate sub-surface lateral flow. The sponsoring professor would need to have a background in Agricultural Engineering, Soil Science, or Hydrology and have access to field equipment and a laboratory facility for water sample analysis. A prospective student should have an interest in water quality monitoring and field research and expect to gain experience in water quality sampling and data analysis.

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3. Determination of sign-in rate at various trailheads in the Catskill Forest Preserve.

In 2017 and 2019, data was collected through student intern projects to determine sign-in rates at various trailheads within the Catskill Forest Preserve. More information is necessary to solidify a sign-in rate that can be applied to trail register tallies. The research objective for the 2022 field season is to identify the percentage of visitors signing into various trailhead registers within the Catskill Forest Preserve. The data collected will be used to establish a sign in rate that determines actual visitation compared to the amount of visitors that sign in to the register boxes. This information will help NYSDEC better understand visitor use patterns and genuine visitation figures in wilderness and wild forest areas. A better understanding of the genuine visitation figures can help determine a more realistic baseline for usage versus the box registration papers only.

The field work will be concentrated in Ulster and Greene County Forest Preserve trailheads. Register boxes will be monitored inconspicuously to determine the amount of people who have signed in versus those that did not. Data collection can be paired with a visitor use survey to determine factors that influence whether or not sign-ins have occurred. Previous surveys have concentrated on visitors' perception of risk influencing sign-ins at trail registries. Possibilities for additional qualitative observations could be number of automobiles, average number of hikers per vehicle, average number of fully equipped hikers, etc.

This is a 12 week internship that will require observational data collection, analysis, and organization. Data collection will require materials such as a tally counter clicker, paper and writing utensils to record qualitative observations along with the final tally of registration paper of the day and time block that sign-in data was collected. This project will require significant travel from trailhead to trailhead, and applicants will need to provide their own transportation.

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New York State Department of Environmental Conservation Region 3 Office

4. Impact of Human Visitation on Breeding Bird Populations.

The Catskill High Peaks are a very popular hiking destination and levels of use and popularity of the peaks increase annually. More research is needed on whether bird populations (particularly at-risk species such as Bicknell's Thrush) are negatively affected by current levels of human visitation. Data on breeding bird abundance on peaks with different levels of human use could help inform future recreational management decisions. Existing data from Mountain Birdwatch and DEC's trail use database could be supplemented with bird surveys on peaks not covered by Mountain Birdwatch. This project is suitable for a graduate student.

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5. Recreational Impacts on the Environment

In 2019, the first baseline data collection effort was undertaken on the informal trail networks on 17 Catskill Peaks over 3,500' in the Catskill Mountains. The objective of this effort was to document the spatial extent and lineal distribution of the informal trail (IT) networks in areas that historically were managed as "trail-less". To begin to understand more about these IT networks, STRAVA heat map data was used to determine where people were traveling and where to focus monitoring efforts. During 12 weeks in summer of 2019, over 40 miles of IT's were assessed using an informal trail monitoring protocol that was developed by the National Park Service.

The research objective for the 2022 field season project is to continue the monitoring effort to evaluate the visitation that occurred during the pandemic while assessing the acceptability or unacceptability of impacts to natural resources. Field work will involve assessing the largest and most established IT'S and identifying which sections of those ITs have sustainable trail characteristics. At the same time, on those same ITs, the locations with poor or extremely unsustainable IT features will be documented. This information will inform where field work should occur should the decision to establish formal trails in adversely impacted areas is made.

Ultimately, the data collected will be used to determine if a management interventions are required to prevent future adverse impacts from occurring. The 2022 field work will also use STRAVA to investigate areas where new IT's have become established that were not included in the 2019 monitoring effort.

The field work will be concentrated in but not limited to, the following areas: the Big Indian Wilderness, Slide Mountain Wilderness, Hunter-West Kill Wilderness and Kaaterskill Wild Forest.

This is a 12-week internship that will require frequent and strenuous hiking, implementation of monitoring protocols, data collection, GPS and GIS work. Master students are encouraged to apply.

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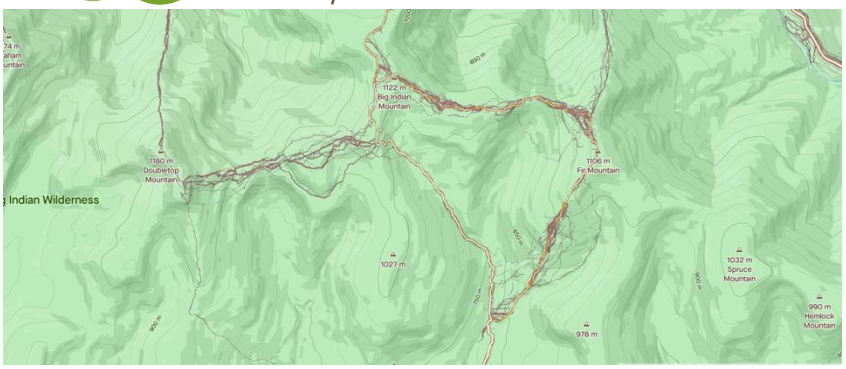

Ex: STRAVA heat map for IT network on the summits of Big Indian and Fir in the Big Indian Wilderness.

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Land and Forests

6. Catskill Forest Preserve Primitive Tent Site Monitoring Study

A pilot primitive tent site monitoring program was developed through a partnership between the Region 5 NYSDEC and the Adirondack Park Agency during the summer of 2019. This monitoring effort could be easily replicated in Region 4 and could provide valuable baseline data for the Department regarding the condition of primitive tent sites in high use areas. Currently, Region 4 does not have a comprehensive database or monitoring program for primitive tent sites in the Catskills. If this project was selected, an intern would need to have access to an I-pad and Survey 1,2,3 would need to be installed on that device. Additional information pertaining to the study design and the monitoring protocols used by the monitoring team in Region 5 can be found here: https://www.dec.ny.gov/docs/lands_forests_pdf/tentsites.pdf. This project is suitable for an undergraduate student.

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7. Catskill Catskill Forest Preserve Carrying Capacity Study

Recreational use of Catskill Forest Preserve lands has been trending upward for many years. During the summer season, many trailhead parking areas reach capacity and begin overflowing onto local roadways. In addition to the Department's responsibility to be good stewards of

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Forest Preserve land, we want to ensure that public safety is maintained. In response to the consistent upward trend in visitation, land managers must consider options to address parking issues. Is it appropriate to increase size of a parking area to accommodate the level of use an area is receiving or should other management strategies be employed to mitigate the negative impacts of increasing visitation? There are many environmental and social factors that impact the level of use a specific unit and network of trails can tolerate that must be taken into consideration before making that decision. A study which considers those factors for Forest Preserve units where the current size of the trailhead parking area(s) is(are) not accommodating peak visitation would give land managers the data necessary to determine whether increasing the size of parking area is appropriate or if some other intervention is necessary. Evidence from this study would be vital for the public review process of any UMP amendment or regulation change.

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Inland Fisheries

8. Reconnection of artesian seeps to streams

Many streams in the Catskills have roads paralleling them for miles and as such, can have interference between coldwater artesian sources and their destination streams. The result is warming as these recently daylighted waters are ditched for distances sufficient to warm them prior to being culverted under the road to access the paralleling stream. Given climate change conditions, remedying this interference could ensure that coldwater species are able to continue to thrive into the future.

A study could be conducted to both identify these artesian sources and to develop methods of connecting them to streams w/o incurring warming. Tools such as topographic indexing via GIS software can help identify potential artesian seeps that could be ground truthed and mapped. Engineering methodologies would need be explored for means of reconnection under roads in a fashion that made more sense than installation of thousands of standard ditch culverts. Ideally, NYSDOT would become a partner in such a project.

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9. Determine Outreach associated with helping private landowners understand the best methods to protect their property from high stream flows

The Catskills has many “flashy” streams that provide challenges to a landowner’s ability to maintain driveways or other property features. Most landowners could use some basic training as to how to go about protecting or repairing their property and obtaining the required permits for such work. Many county Soil and Water Conservation offices provide such training to municipalities and may be able to help expand the outreach to private landowners.

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