



South Mountain Research Corps and Science Summit

Year One Pilot- Findings and Recommendations

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All of the deliverables developed by the CLUS in collaboration with the SMRC Steering Committee are maintained in shared folders and provided in a separate Appendix.

South Mountain Research Corps and Science Summit

Year One Pilot- Findings and Recommendations

0.0 Executive Summary

This report outlines Year One of the [South Mountain Research Corps](#) and Science Summit (SMRC) Pilot Program, supported by the South Mountain Partnership, one of Pennsylvania's Conservation Landscapes, (administered by the Appalachian Trail Conservancy) with Environmental Stewardship Fund money from the Pennsylvania Department of Conservation and Natural Resources. Work during this initial phase was completed by the [Center for Land Use and Sustainability](#) (CLUS) at Shippensburg University with support from the SMRC Steering Committee.

0.1 Program Overview

The concept of a South Mountain Research Corps was first articulated by the [South Mountain Partnership](#) (SMP) in a 2013 concept paper that introduced the idea of a South Mountain GIS (geospatial information systems) Corps. In December 2016, this proposal was reintroduced to the South Mountain Leadership Committee, where discussion led to the current vision of a broader research corps while recognizing that GIS will still play a central role. The establishment of a Corps and science summit was also identified as one of the budgeted goals of SMP. At that time, Katie Hess, SMP Director, and Dr. Claire Jantz, CLUS Director, began to discuss how partnerships could make SMRC a reality.¹

From 2018-2020, SMP partnered with the CLUS to pilot the SMRC. SMRC endeavors to build an implementable, collaborative research program that supports existing and emerging natural and cultural resource conservation efforts of land owners and land managers throughout the South Mountain landscape. Program components include:

- **The South Mountain Science Summit:** Strengthens channels of communication and builds a collaborative network of property owners, land managers, researchers, and university students throughout the South Mountain region;
- **The South Mountain Research Corps:** Develops, builds, and sustains a highly regarded applied research program that supports existing and emerging natural and cultural resource conservation efforts of land owners and land managers throughout the South Mountain landscape;
- **A Research Catalog:** Catalogues the research that has previously occurred and develops a comprehensive understanding of the amount and focus of research being conducted on the South Mountain landscape;
- **Highly regarded experiential applied research opportunities** to college students throughout the region, as well as provide a network to connect them with researchers and practitioners for internship and career opportunities.²

¹ Excerpt from "A Working Proposal: South Mountain Research Corps & Science Summit- Facilitating a network of research and management to steward the South Mountain Landscape." Last updated March 2, 2020.

² Outlined in the Science Summit Summary Document, last modified January 29, 2020; Expanded upon in the SMRC website: <https://southmountainpartnership.org/initiatives/research-corps>. Last updated June 2020.

CLUS proposed collaborative development of the SMRC in four phases from 2019-2021, as follows:

- Phase 1 (2019): Building Networks and Research Databases
- Phase 2 (2019): Research Pilot Program
- Phase 3 (2020): Research Corps Program Launch
- Phase 4 (2021): Research Corps Program Establishment

Given the budget and identified needs for program development, Year One activities were focused on Building Networks and Research Databases (Phase 1) and Research Pilot Program (Phase 2).

0.2 Year One Accomplishments

The first year of the SMRC pilot program focused on building connections between landowners (private and public, large and small)/land managers (private and public, large and small) and researchers (academic institutions, university students and partners, conservation organizations and partners). Specific accomplishments include the following: creation of an Inaugural Science Summit in 2019; development of a South Mountain Research Catalog; development and administration of surveys to solicit information from landowners, researchers, and leadership committee; establishment of a steering committee with monthly to quarterly meetings; development of specific research projects through conversations and site visits; and the development of materials to guide the application process and reporting.

0.2.1 Building Networks

Over the course of Year One, landowners, land managers, and researchers were engaged using a variety of methods: a survey, the Inaugural Science Summit , phone calls, and site visits. Over a series of months, SMRC learned about research interests and information needs of property owners in the region. While many landowners were interested in inventories and technical assistance, most did not have defined research needs or specific interests. Landowners were interested in a variety of topics and willing to work with local students and open their land for research.

Primary challenges expressed by landowners, regardless of ownership type (public, private, nonprofit organizations), were related to natural resource management (such as deer browsing, invasive plant species, and forest health). Private land owners expressed interest in developing habitat for game and nongame (i.e. song birds) species. Public land managers are challenged by the impacts on natural resources by diverse forms of recreation.

Through conversations with researchers, it is clear that most researchers have established research agendas that may or may not be focused in the South Mountain Landscape. Science Summit attendees expressed local research interests that included understanding foraging communities (e.g. non-timber forest products such as edible mushrooms), evaluating plant species and species diversity, mapping of songbirds, use of drones for terrain analysis, connecting health with the land, and evaluating wildlife population movement and connectivity. Researchers were interested in learning about the needs of land owners and managers and open to diverse project ideas and needs.

0.2.2 Research Pilot Program

Three research projects were formed in the initial phase of this pilot program. Conversations and site visits were essential to develop projects that addressed property manager needs while providing research opportunities for students and faculty. These projects represent diverse land management types, with private property and public property, as well as individual and class research project design. While Coronavirus Disease 2019 (COVID-19) and contracting delays pushed the start date of the initial projects supported by the first round of funding, it is anticipated that all three projects will move forward in 2020-2021:

- **Ecological Evaluation of Stream Impacts Due to Unplanned Trail Use**- Dr. Christine Proctor, Harrisburg University; Michaux State Forest, Department of Conservation and Natural Resources. This project is to be conducted on state forest land, working with DCNR staff on an identified land management issue, and initially proposed as a class project.
- **Use of Fluorescence techniques, passive samplers, and geochemical parameters to monitor source characteristics and organic loading to Ebbert Spring**- Dr. Todd Hurd, Shippensburg University; Ebbert Spring Archaeological Preserve and Heritage Park, The Archaeological Conservancy. This project is to be conducted on private land, working with a conservation organization, and proposed as a student-faculty research project.
- **Macro and Chemical Parameters of an unnamed stream flowing by [private cabin owner]'s cabin**- Dr. Gene Wingert, Dickinson College; Private Land Owner, Michaux State Forest. This project is to be conducted on state forest land, working with a private campsite leasehold, and was designed as a class project (with no funding required).

In parallel with the development of landowner/manager-researcher partnerships and initial projects, CLUS assisted in developing a draft Request For Proposal (RFP) process and supporting documents including the RFP template, research project application, and other supporting materials (See Appendices). Outstanding questions must be addressed before finalizing these materials for future years, including the types of projects supported by SMRC, forming the ideal process to gather information from landowners and managers, and pairing of projects with researchers.

0.2.3 Research Catalog

CLUS compiled and launched a research catalog to begin identifying what projects have been completed in the region and what organizations have actively participated in local research. By compiling these resources, the ultimate intention is to reduce overlap in research, encourage related studies, and foster new collaborations. The [South Mountain Research Catalog](#) currently contains 136 items, including student theses, white papers, and published research papers. The catalog is intended to be inclusive and comprehensive, with themes ranging from natural resource management, to food access, recreational impacts, species inventories, and hydrology. The catalog is publicly available through Zotero: https://www.zotero.org/groups/2331790/south_mountain_research_catalog/library.

0.3 Lessons Learned and Next Steps

Year One of the South Mountain Research Corps Pilot Program generated many lessons learned.

Interest: It is clear that there is high interest in a regional research program, but that both researchers and landowners and managers are not sure how to engage.

Communications: While this program has great potential, there is a continued need to develop messaging and articulate a clear vision.

Academic Institutions: For this program to succeed, it is crucial to increase participation and buy-in from academic institutions to help facilitate time efficient research projects. Feedback indicates that the concept of SMRC is of interest and valued; additional time to develop “the pitch” is necessary.

Strategic Planning: It may be beneficial to focus on one land management type, private or public, for the initial phases of this program. Steering Committee members support tying research projects to landscape level planning efforts, and recommend articulating the types of research supported by this program. It can be difficult to reconcile rigorous research with the semester-long projects that most undergraduate students are able to support, and this will take time to develop. In addition, the opportunity to place this pilot alongside or within the South Mountain Ecoregional Research and Monitoring Coalition needs to be explored.

Outstanding Questions: Many questions need to be resolved to refine the SMRC vision and guide program development. Key questions are related to:

1. What types of research should be supported by this program and what is the target audience for land management entities (public or private)? For example, would technical assistance or inventories be considered research under this program, or only rigorous studies driven by a scientific question? Developing the research vision of SMRC will influence how information is gathered from landowners or property managers, outreach to research institutions, how researchers and landowners are connected to develop specific projects, and guide the project application process. It takes significant time to develop research projects that meet landowner needs within the expertise of local researchers. While it is understood that a pilot program may require more intensive pairing of researchers and land owners, it is important to develop a system that can become more efficient over time. For example, a system that allows ongoing submission of interests by landowners and direct connection to landowners by researchers rather than finding and connecting individuals would reduce the time investment.

2. Should the development of a regional data repository follow in subsequent years? While there is much interest in the South Mountain Research Catalog, it is clear that a regional data repository would also facilitate research in the region. Considering data sharing agreements, standardized data collection methodologies, and a management entity to organize and maintain regional data would be needed to support longitudinal research studies and collaboration.

South Mountain Research Corps and Science Summit

Year One Pilot- Findings and Recommendations

1.0 Background and Purpose

The concept of a South Mountain Research Corps was first articulated by the [South Mountain Partnership](#) (SMP) in a 2013 concept paper that introduced the idea of a South Mountain GIS (geospatial information systems) Corps. In December 2016, this proposal was reintroduced to the South Mountain Leadership Committee, where discussion led to the current vision of a broader research corps while recognizing that GIS will still play a central role. The establishment of a Corps was also identified as one of the budgeted goals of the South Mountain Partnership. At that time, Katie Hess, the director of the South Mountain Partnership, and Dr. Claire Jantz, director of the Center for Land Use and Sustainability at Shippensburg University, began to discuss how partnerships could make the South Mountain Research Corps a reality.³

SMP, the [Pennsylvania Conservation Landscape Initiative](#) located in Southcentral Pennsylvania and a collaboration between the Pennsylvania Department of Conservation and Natural Resources and the Appalachian Trail Conservancy, partnered with the [Center for Land Use and Sustainability](#) (CLUS) at Shippensburg University (SU) to propose the establishment of the [South Mountain Research Corps](#) and Science Summit (SMRC) from 2018-2020. As refined over the last two years, SMRC is envisioned as a program that will:

- Develop and sustain a responsive, applied research program that empowers the natural and cultural resource conservation efforts of the SMP;
- Build collaborative relationships amongst property owners, land managers, researchers, and students within the South Mountain region;
- Build collaborative relationships amongst institutions of higher education within the South Mountain Region;
- Provide authentic, high impact, and experiential learning opportunities to college students within the region.

Acknowledging that the development of an effective and sustainable SMRC would require investment in foundational work, CLUS initially proposed collaborative development of the SMRC in four phases from 2019-2021, as follows:

- Phase 1 (2019): Building Networks and Research Databases
- Phase 2 (2019): Research Pilot Program
- Phase 3 (2020): Research Corps Program Launch
- Phase 4 (2021): Research Corps Program Establishment

³ Excerpt from "A Working Proposal: South Mountain Research Corps & Science Summit- Facilitating a network of research and management to steward the South Mountain Landscape." Last updated March 2, 2020.

Reflecting on Year One of the SMRC pilot, this scope and report focuses on tasks associated with Building Networks and Research Databases (Phase 1) and Research Pilot Program (Phase 2). This work was conducted from December 2018 through June 2020.

As a new initiative, the focus of the South Mountain Research Corps (SMRC) was the steady development of an implementable program built upon a true understanding of land management needs and logistics, academic institution capacity, and calendars. Year One of the SMRC pilot program was focused on building connections between landowners (private and public, large and small) and land managers (private and public, large and small) and researchers (academic institutions, university students and partners, conservation organizations and partners).

1.1 Program Components

The South Mountain landscape offers an intrinsically valuable, yet underutilized asset for place-based research and applied education. Establishment of the SMRC can encourage academic research within this landscape by:

- Providing researchers, at all education levels, insight on the real challenges and questions experienced by land owners and land managers;
- Providing land owners and managers access to high quality research that addresses site specific land use and management issues; and
- Empowering research to have an impact on land stewardship practices within the South Mountain landscape.

The South Mountain Research Corps endeavors to build an implementable, collaborative research program that supports existing and emerging natural and cultural resource conservation efforts of land owners and land managers throughout the South Mountain landscape. This will be accomplished by offering the following:

- **The South Mountain Science Summit:** Strengthens channels of communication and builds a collaborative network of property owners, land managers, researchers, and university students throughout the South Mountain region;
- **The South Mountain Research Corps:** Develops, builds, and sustains a highly regarded applied research program that supports existing and emerging natural and cultural resource conservation efforts of land owners and land managers throughout the South Mountain landscape;
- **A Research Catalog:** Catalogues the research that has previously occurred and develops a comprehensive understanding of the amount and focus of research being conducted on the South Mountain landscape;
- **Highly regarded experiential applied research opportunities** to college students throughout the region, as well as provide a network to connect them with researchers and practitioners for internship and career opportunities.⁴

⁴ Outlined in the Science Summit Summary Document, last modified January 29, 2020; Expanded upon in the SMRC website: <https://southmountainpartnership.org/initiatives/research-corps>. Last updated June 2020.

1.2 Year One Accomplishments

From 2018-2020, the CLUS and Leadership Team accomplished the full scope of work outlined for this project. The main focus was on Phase I, Building Networks and Research Databases. Deliverables included a draft survey, Inaugural Science Summit, and drafting supporting documents (Steering Committee Charter, website text, flyers, Request for Proposals, reporting guidelines, program timelines, and reporting template; see Appendices). In support of Phase II, the Research Pilot Program, this contract also included visiting engaged land managers to develop research focus around their needs and challenges, discussions with academic researchers to understand capabilities and interests, development of a research catalog to compile regional research, and facilitating the development of pilot research projects.

To support program development, individuals who attended the Inaugural Science Summit or showed intense interest were asked to volunteer on a steering committee. This group met quarterly in 2019 and monthly in 2020 to discuss progress, problem solve, and discuss next steps. Representation included the following:

- Katie Hess (facilitator)- Director, South Mountain Partnership
- Antonia Price (facilitator)- Project Manager, CLUS, Shippensburg University
- Dr. Claire Jantz- Professor of Geography-Earth Science, Shippensburg University; CLUS Director
- Wayne Kober- Former Researcher (retired), National Academy of Sciences Transportation Research Board
- Patricia Newdeck- Environmental Planner, PennDot; CLUS Graduate Student Fellow and alumna
- Aura Stauffer- Wildlife Biologist (forestry), Department of Conservation and Natural Resources

2.0 Inaugural Science Summit

The Inaugural Science Summit was held on April 11, 2019, at Norlo Park in Fayetteville, PA. During this event, the concept of the SMRC was introduced and attendees were encouraged to share information through facilitated break out sessions. To support the launch of the SMRC pilot program, the Science Summit focused on learning about how the needs of landowners/land managers interface with regional research capacity. This understanding was used to guide program development and facilitate successful research performance for the initial phase of the pilot program.

2.1 Preparation and Logistics

2.1.1 Initial Survey

In March 2019, an initial survey was disseminated through SMP and CLUS contacts to solicit input on SMRC and SMSS. The purpose of this survey was to understand who might be interested in the development of SMRC, in what ways they would like to be involved, and what resources they had to offer. A total of 33 responses guided planning for the April 2019 Science Summit.

A survey summary was developed to identify major findings, with highlights summarized below:

- 11 responses were from private landowners, with 6 representing other land ownership types

- Five respondents manage fewer than 25 acres, four manage 25-100 acres, four manage 100-1,000 acres, and four manage 1,000 acres or more
- The most common land use reported for these lands are conservation easements or forest reserves, followed by agricultural
- The largest land management issues confronted include habitat enhancement and invasive species management, followed by natural resource management
- Most respondents (70 percent) have not had research or studies on their land, were interested in learning about academic resources to help address land management issues (88 percent), and were willing to collaborate with a local college student on a study (94 percent)
- Landowners and managers were most interested in land cover analysis (invasive species management, impervious surfaces); broad interest was shown across categories
- 16 researchers responded to the survey, representing 19 organizations, including 8 local Colleges and Universities (Figure 1)
- The most common academic resources they can provide were related to biological surveys (plant inventory, benthic inventory); expertise was across all categories except terrain analysis, such as sediment run off.
- Most institutions reported previous research in the South Mountain Landscape (63 percent), an interest in learning about research needs of land managers (100 percent), and were willing to support student research on land management issues (94 percent). All were interested in learning about potential funding opportunities in the South Mountain Landscape.⁵

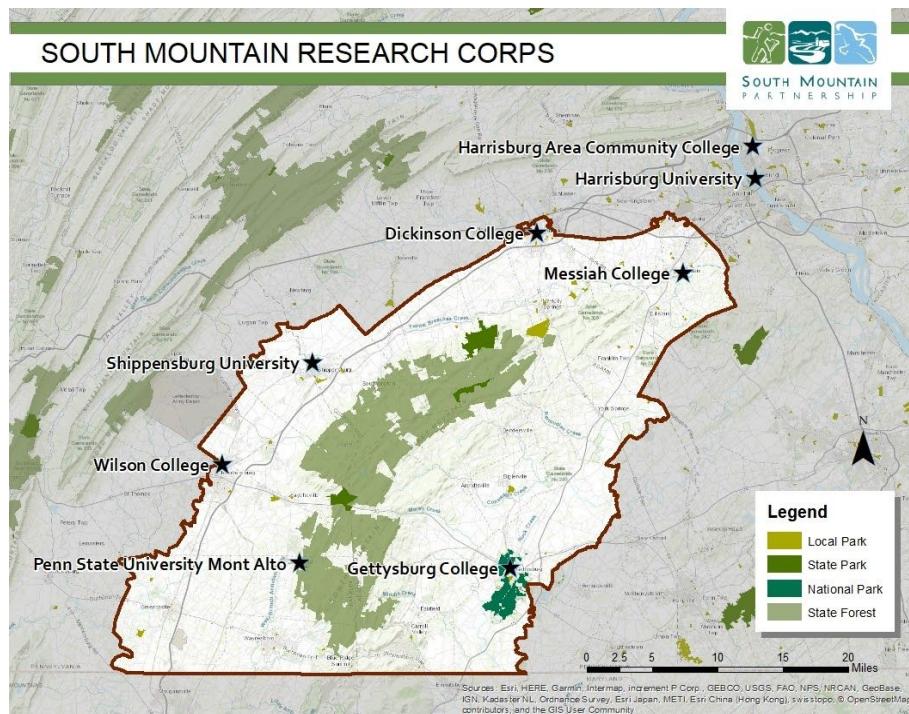


Figure 1. Researchers from eight local Colleges and Universities responded to the initial survey or registered for the Inaugural Science Summit. The sixteen researchers that responded to the initial survey represented local organizations, nonprofits, and research institutions across the South Mountain Region, as identified by SMP (red outline).

⁵ South Mountain Partnership Research Corps and Science Summit- Final Survey Summary. Center for Land Use and Sustainability. Updated April 5, 2019.

2.1.2 Attendees and Format

Twenty individuals attended the Inaugural Science Summit. Of the attendees, nine represented landowner/land manager and 11 represented researcher (eight professors, three students) interests. Many others expressed interest in the summit, but schedule conflicts prevented their attendance. The Inaugural Science Summit was developed as a venue for listening and sharing. CLUS first shared survey results. This was followed by two breakout sessions. The first session offered an opportunity for land owners to share their concerns and logistical considerations while researchers shared their interests, capacities and schedule restrictions. The second session offered an opportunity for land owners and researchers to discuss project ideas surrounding specific themes and feasibility.

Through input from the survey and the honest contributions from Science Summit attendees, the SMRC team gained valuable insight to help design an implementable program. Below is a summary of stakeholder interests, logistical considerations, and concerns in the development of SMRC.

2.2 Regional Research Interests

At the Inaugural Science Summit, the following regional research interests were discussed.

2.2.1 Landowner and Land Manager Interests

The primary challenges expressed by landowners, regardless of ownership type (public, private, nonprofit organizations), were related to natural resource management (such as deer browsing, invasive plant species, and forest health). Private land owners expressed interest in developing habitat for game and nongame (i.e. song birds) species. Public land managers are challenged by the impacts on natural resources by diverse forms of recreation.

Additionally, private land owners/managers raised concerns about the inadequacy of personal knowledge and resources on handling their concerns about natural or cultural resources on their lands. Land owners expressed a struggle with their personal awareness of cultural resources and their lack of expert knowledge about handling those resources. In attempts to obtain information about their cultural or natural resource concerns, land owners have felt dismissed by some agencies (e.g. Cooperative Extensions, US Department of Agriculture).

2.2.2 Researcher Interests

Science Summit attendees expressed research interests that included understanding foraging communities (e.g. non-timber forest products such as edible mushrooms), evaluating the range of plant species, mapping of songbirds, use of drones for terrain analysis, connecting health with the land, and evaluating wildlife population movement and connectivity. Researchers were interested in learning about the needs of land owners and managers and open to diverse project ideas and needs.

2.3 Considerations for SMRC Implementation

2.3.1 Landowner and Land Manager Considerations

State managed lands, such as State Forests and Parks, have well-established protocols for performing research on public lands. Private landowners were interested in an initial site visit with the researcher

and student(s) to allow review of site specific concerns (i.e. potential conflicts/considerations of neighbors, clarification of property boundaries and exclusion areas). Regardless of site specific access agreements provided by each land owner, all land owners requested a courtesy call of at least 24 hours prior to subsequent visits.

Both public and private land owners/managers expressed concern that the research focus would shift away from their original question. Historically, research performed on state managed lands has been driven by the researcher. Development of a SMRC landowner's rights document may help.

It was also suggested that private landowners may be able to financially support research with the allocation of a donation or grant monies that can offer tax benefits.

2.3.2 Researcher Considerations

Most institutions in the region focus on undergraduates; therefore, research projects can fall into two categories. Some professors parse large projects into manageable short-term (semester-long) student projects. In some cases, student driven research can be supported by year long courses, where students develop proposals (spring), collect/mine data (summer-fall) and present results (following spring). This is more typical of graduate projects. Another option for consideration includes a professor incorporating a research question into class curriculum.

Researchers anticipate a 12 month cycle for proposal development, implementation and reporting; therefore, it is best to receive Request for Proposals (RFPs) prior to the fall semester. This allows time for researchers to recruit students and implement research in the academic year. Projects that require field work are most easily implemented over the summer; however it can be easiest to involve students during the academic year.

Presentation of completed research at future Science Summits might be challenging due to student and professor schedules. Holding the Science Summit on a Saturday in late April-Early May may offer the best opportunity for success. Rolling out a new RFP directly after the Science Summit may maintain program momentum and capture new projects stimulated by the Science Summit.

Some research institutions can provide housing and stipends for students, but struggle to offer students assistance with research costs; therefore, institutions are in need of monies that support research expenses (mileage, transportation, labor).

Researchers feel that they lack knowledge of work that has been completed in the South Mountain landscape and there is not a venue or method for communication among researchers about regional research. Without background knowledge of completed research and a connection to the region, it can be challenging to develop research projects/ideas. Development of a research database and/or communication network may support research in the South Mountain region. Students see value in a research database as a method to introduce new ideas and concepts for future student research.

2.4 Example Projects

Participants discussed the following potential projects to initiate the South Mountain Research Corps:

- **Impacts on Streams Due to Trail Events in Michaux State Forest**
Trail races, either on foot and by bike, are gaining popularity within public lands. This study seeks to understand the impact of these races on the surface water quality by comparing baseline conditions with post-event conditions.
- **Land Management Plans for Songbirds on Private Land**
Local researchers have utilized unmanned aerial vehicles (drones) to study songbirds in the South Mountain Region. These techniques could also be applied on private lands.
- **Historic Land Use Evaluation and Stream Assessment**
A local cabin owner is interested in the history of their cabin, located on a leased campsite in Michaux State Forest. This project could explore cultural and natural resources in our region and be approached from a number of disciplines.
- **How to Develop a Riparian Buffer and/or Waterfowl Management Plan**
Private landowners were interested in learning about riparian buffers, in one case, specific to waterfowl management.
- **Soil and Water Monitoring Testing Projects**
Local organizations maintain lists of interested landowners and property owners for various projects relating to soil and water monitoring. There are opportunities to collaborate with partners.

3.0 South Mountain Research Catalog

To support research in the South Mountain region, it is important to understand what projects have already been completed and what organizations have actively participated in local research. Year One of this pilot study included the development of a research catalog to help develop a comprehensive understanding of the amount and focus of research being conducted on the South Mountain landscape.

The [South Mountain Research Catalog](#) is publicly available through Zotero and the small annual fee is currently hosted by the Center for Land Use and Sustainability.⁶ This resource currently lists 136 items, from student theses and white papers to published research papers. The vision for the catalog is to document previous and ongoing research, potentially including projects of interest, as a detailed and searchable research list for those interested in conducting research in the South Mountain Region. By compiling these resources, the intention is to reduce overlap in research and encourage related studies.

Propagating the research catalog relies on participation from research institutions. In the initial survey prior to the Inaugural Science Summit, participants were asked to share any research they have previously conducted in the region. This information, along with internet searches, provided direction to gather resources. The [Department of Conservation and Natural Resources Research Database](#) includes research completed on state lands.⁷ CLUS students began integrating all of these resources into the South Mountain Research Catalog, but hundreds of projects have been conducted in the

⁶ South Mountain Research Catalog,
https://www.zotero.org/groups/2331790/south_mountain_research_catalog/library

⁷ Department of Conservation and Natural Resources Research Database. <https://research.dcnr.pa.gov/Search>

region, and it will take significant time to add them all. DCNR does not have a way to export the research projects, or store the projects in another format. Maintaining the catalog will be an ongoing initiative, and will require regular review to capture new research.

Protecting sensitive data and research is of particular concern to SMRC, following DCNR policies to restrict data access regarding sensitive resources (e.g. orchids, reptiles/amphibians, cultural resources). In the development of the research catalog, sensitive studies have been excluded for the time being. It may be valuable to maintain a separate list of sensitive research, or refer to DCNR for related studies.

In conversations with researchers, there was much interest in developing a regional database allowing the storing and extraction of data in addition to a research catalog listing studies. While it is valuable to understand the research that has been conducted, vast amounts of data for the South Mountain Landscape have been collected by various researchers that are inaccessible to the public or other researchers. Developing resources to host and share data, with ways to limit access to sensitive data, would be of great interest to researchers in the region. Access to previous data would allow for comparisons across time and potentially the development of longitudinal studies, supporting information from species abundance to climate change impacts.

4.0 South Mountain Research Corps

4.1 Landowner and Land Manager Engagement

The South Mountain landscape is rich in public lands such as local parks, state parks and state forests; however, most of the region is privately owned. Through this pilot program, SMRC engaged with public and private landowners and land managers. The 2019 Inaugural Science Summit and initial survey were designed to gather information from landowners to gauge interest in participating in future research. Site visits to develop the three pilot projects occurred in Summer and Fall 2019. A second survey and follow-up phone calls surrounding future research began in January 2020 with the Annual 'Power of the Partnership' Celebration event.

The SMRC contact list currently includes 53 property owners and land managers that are interested in participating in this program. Many of these individuals have voiced an interest through numerous contacts, such as through the survey, in person, or by phone.

4.2 Research Institution Engagement

The South Mountain Region has a wealth of research institutions, state and federal organizations, and nonprofit entities with a wealth of knowledge. Through the Inaugural Science Summit, initial survey, follow-up conversations and site visits, the CLUS learned about regional interest and capacity in participating in this program. The current contact list includes 78 individuals that self-identified as researchers, interested and willing to connect SMRC with landowners in their contact lists or develop research projects and partnerships.

The current contact list includes over 50 organizations that range from individual county contacts to regional agencies and institutions. Researchers interested in the program represent a wide range of disciplines. The Steering Committee discussed that it will likely be more efficient to rely on landowner

contact lists from partner agencies than to build a separate list for SMRC alone. The current list is limited to those that have participated in meetings and responded to surveys.

The Year One pilot program was intended to include site visits to the regional institutions of higher education to solicit interest in the program. This outreach was delayed due to a number of factors. First, focus was placed on forming the initial pilot research awards for 2020, and interaction with the research institutions and landowners took significantly more time than anticipated. Second, internal visioning of SMRC took more time than anticipated, and it became clear that consistent messaging was necessary before large-scale outreach. Third, the Coronavirus Disease 2019 (COVID-19) pandemic caused higher education institutions to transition to online courses in Spring 2020. Travel bans and priority focus on handling the pandemic made outreach impossible.

4.2.1 Recommendations from Shippensburg University

Prior to COVID-19, SMRC was able to meet with Dr. James Mike, Dean of the Colleges of Arts and Sciences at Shippensburg University, to discuss outreach to higher education institutions and ask for recommendations. The intention was to use this information to reach out to other institutions in Spring 2020, but the pandemic delayed research institution outreach. Key points from this conversation are summarized below:

- This is a very attractive program that would increase the ability of institutions to attract and retain students.
- For outreach to regional institutions, first focus efforts on what contacts are already in place. Identify key faculty that can be a prime mover for the program, or Deans, Sponsored Projects and Institutional Advancement to direct toward engaged faculty and raise constituencies prior to meeting with a university president or administration.
- Need to develop a 30 second elevator pitch as to why this program needs to occur and what the benefit is to the institution and region.
 - This program is valuable from a number of perspectives. With **local** research, institutions do not have to invest in high travel costs; a **network** is already in place with regional employers; there is an **engaged** faculty network; and small **grant funds** are available. This can be an opportunity to attract students and retain talent.
 - Key items to focus on should be the **vision** of what the program and resource is, **mission** of what we are trying to accomplish, and **advantages** to students and faculty of affiliating (e.g. large partner network and opportunities to disseminate work to reach a broader audience; field experience for students, outside of the classroom).
 - For institutional leadership, focus on student benefits and links to the workforce. If the work is not directly tied to research, tie the value to other initiatives. (i.e. a student supporting the development of a management plan, is involved in a valuable governmental process)
 - When engaging with faculty, focus on how local research is accessible, and the grant monies available to support these minimal costs for research.
 - Have easy ways for faculty and students to engage; small grant funds will encourage participation

- It can be difficult to start a pilot and find sustainable funding for long term sustainability. If there will be the potential for a consortium model and fees, it is important to build relationships before making the ask; however, it is also important to have conversations about fees from the beginning so that institutions have an idea of what to expect. Ballpark figures of what it may take to participate in the future are important to develop. In the messaging, focus on wanting institutions to participate, that there is enormous value, and that one day SMRC may need to ask for financial support.

4.3 Pilot Research Awards

The Science Summit initiated discussions about several research projects. In Year One of the pilot program, SMRC facilitated conversations between researchers and landowners to learn, adapt, and design the SMRC concept based upon real needs and logistical considerations. After initial conversations at the Science Summit, the CLUS had follow-up discussion with landowners and property owners to gather more information about their needs and interests. Potential research needs were then sent within the SMRC contact list to solicit interest from researchers. The goal was to further develop research projects discussed during the Summit for Spring 2020 research.

Through engagement with interested landowners and researchers, three site visits were conducted and research proposals were submitted and approved for 2020. Two contracts tied to research funds were approved for Shippensburg University and Harrisburg University. Research funds were not requested for the third project with Dickinson College, and thus, a contract was not prepared. While Coronavirus Disease 2019 (COVID-19) and contracting delays pushed the start date of the initial projects supported by the first round of funding, it is anticipated that all three projects will move forward in 2020-2021:

- **Ecological Evaluation of Stream Impacts Due to Unplanned Trail Use-** Dr. Christine Proctor, Harrisburg University; Michaux State Forest, Department of Conservation and Natural Resources. This project is to be conducted on state forest land, working with DCNR staff on an identified land management issue, and initially proposed as a class project.
- **Use of Fluorescence techniques, passive samplers, and geochemical parameters to monitor source characteristics and organic loading to Ebbert Spring-** Dr. Todd Hurd, Shippensburg University; Ebbert Spring Archaeological Preserve and Heritage Park, The Archaeological Conservancy. This project is to be conducted on private land, working with a conservation organization, and proposed as a student-faculty research project.
- **Macro and Chemical Parameters of an unnamed stream flowing by [private cabin owner]'s cabin-** Dr. Gene Wingert, Dickinson College; Private Land Owner, Michaux State Forest. This project is to be conducted on state forest land, working with a private campsite leasehold, and was designed as a class project (with no funding required).

4.3.1 Site Visits

Over spring and summer 2019, CLUS attempted to connect landowners and researchers for in-person meetings. Facilitating the scheduling of these meetings were difficult; there are very limited times during which both landowners and researchers are available. Site visits were not held until Fall 2019. During site visits, researchers had the opportunity to see natural and cultural resources at the location and discuss potential research in more detail. CLUS facilitated conversations and documented the visits

by taking photographs and some additional notes. Site visits allowed insight on logistical considerations for the future such as facilitating research on private land, for the development of the SMRC Research Agreement, a need identified during the Inaugural Science Summit. Site visits were also informative for specific project development, as both land managers and researchers thought of new ideas while on site. This step was also key for relationship building and developing trust between land owner and researcher.

4.3.2 Proposals and Contracting

SMRC worked with all three researchers to develop the research projects and proposals. Detailed proposals were submitted by researchers, using our drafted 2019/2020 South Mountain Research Corps Overview and Application document that mirrors the South Mountain Mini-Grant Project Application and requires a research question, project information, final project deliverables, timeline, budget, and research team. Projects on State Forest Land were also required to submit requests for research as per DCNR Bureau of Forestry Research Policy.

The project proposals generally requested funding to cover materials/supplies and travel. Some of these projects included requests for equipment needed to facilitate continued research in the region. The committee questioned acceptable use of funds, given the source for 2019-2020, demonstrating a disconnect between what funds were initially offered (travel, student support) and researcher needs to facilitate continued research (e.g. equipment). While facilitators and the steering committee anticipated awarding funds to cover travel and student support, researchers often requested funding to cover equipment that would facilitate continued research. In the past, DCNR has discouraged funding small equipment purchases. Clarity is needed from DCNR regarding the ability of this program to award money for small equipment purchases that make field research possible. Examples include TRAFx trail use counters, sampling material, and data logging sonds/probes.

Given the academic demands on researchers, the initial RFP process needs to be streamlined to encourage future participation in the program. Consideration of the amount of funding available for projects and acceptable budget items also needs to be clarified.

Contracting with research institutions was delayed because a new and simplified contract template needed approval from the Appalachian Trail Conservancy. Once the template was approved, it was unclear who was responsible for drafting the contract. Clarity is needed regarding who will have the responsibility and capacity for drafting contracts in the future. Further, it was unclear when researchers had received formal approval from DCNR to conduct research; the go-ahead to commence research was withheld until DCNR approval could be confirmed.

4.3.3 Project Initiation and Current Status

Although research was to be conducted for all of these projects in Spring 2020, contracting delays and the COVID-19 pandemic prevented researchers from beginning work. At least two of the projects will still move forward as planned; however, this will likely be with a new group of students. It is not clear whether or not the work with Dickinson College (Macro and Chemical Parameters of an unnamed stream) will proceed at this time.

5.0 Lessons Learned

The Steering Committee was asked to share feedback from Year One of the SMRC pilot. CLUS and committee member findings are summarized below.

5.1 Steering Committee Feedback

5.1.1 Overall Successes from Year One

Many successes were identified by Committee members from the first year of the pilot program.

Confirmed Regional Interest and Need

- There is interest and enthusiasm in a regional research corps and supporting student work. The research catalog is needed in the region, as is the development of a regional database, data collection standardization, and/or data clearinghouse and management entity.
- The Inaugural Science Summit generated awareness of SMRC and interest in the program.

Gained Insights to Support SMRC Development

- Academic researchers have limited capacity. The level of effort in research proposal development should be proportional to the level of funding and timelines of the research; program processes must facilitate use of the program and grant monies and not become a hurdle to participation.
- Some researchers are willing to support landowner needs, but are less interested in developing research statements or problems to fit specific landowner needs. Establishing research questions or priorities could facilitate more easily pairing researchers with potential projects.
- The primary focus of landowners is management of land (invasive species, wildlife habitat) and water (surface water features and aquatic health). They are concerned that research project objectives can shift to meet researcher interests rather than serving landowner needs.
- Although landowner needs for activities like monitoring or technical reports are not the traditional concept of an "academic research project," there are opportunities for practical learning experiences for students.

Identified Strengths and Gaps in Organizational Structure

- Having a contractor to provide administrative support for program development was essential to forming the SMRC Steering Committee, drafting processes and template documents, soliciting potential research projects, and receiving research proposals.
- Committee members met regularly and added capacity and expertise; the steering committee defined questions that should guide the program's development. For example: what substantiates a research project; what is the role of SMRC in defining a research agenda; how can research projects be aligned with management plans; should the development of research project proposals continue to rely on research institution capacity or landowner interests?
- Challenges and uncertainties that were encountered affirm that the pilot study was/is needed.

5.1.2 Overall Challenges from Year One

Committee members submitted challenges and suggestions below.

Need to Strengthen Internal Structures

- Clarity is needed regarding the steering committee's role in the following areas: development of this program; short and long-term development of research projects. Clearly articulate the identity, scope, and breadth of this initiative. [Note: A draft committee charter and roles and responsibilities document was created but not finalized in Year 1.]
- Continue developing best practices for engaging such different audiences (academic institutions and private landowners). Consider facilitating a South Mountain Research Needs Conference to generate research problem statements, identify research sponsors, identify funding, and identify researchers.

Need to Strengthen Research Vision and Communications

- It was difficult to reconcile the concept of research versus technical assistance when engaging with private landowners and discussing research interests. Better articulate what research is supported by this program.
- There is a need to increase academic institution representation on the Steering Committee to provide diverse perspectives from our regional institutions. The committee also discussed establishing a South Mountain Research Coordinating Committee composed mainly of university researchers to prepare and fund a multi-year South Mountain Research Program.

COVID-19 Impacts

- Coronavirus Disease 2019 (COVID-19) introduced significant delays in research institution outreach and initial pilot research projects, essentially freezing the program.

5.1.3 Engagement with Landowners

Observations from Committee members regarding landowner and land manager engagement include:
Strong Interest

- Landowners are interested in supporting student research and many private landowners are willing to open their land for research activities.
- Private landowners are interested in a variety of ideas and it takes much effort and time to understand their land management needs in order to refine a potential project. The Science Summit was an effective format to gain insight into landowner interests.

Need for Technical Assistance

- When developing specific projects with private landowners, it was apparent that they are largely interested in technical assistance (e.g. inventories and management plans) and learning how to better steward resources on their property. For the most part, private landowners cannot easily articulate academic research problem statements and proposals.
- Although landowner needs for activities like monitoring or technical reports are not the traditional concept of an "academic research project," there are opportunities for practical learning experiences for students.

Opportunities to Collaborate

- The technical assistance requested by landowners in this program is not a priority of this program but there is an opportunity to connect landowners with those other programs, organizations, or agencies that may offer services to fulfill landowner technical needs. However, the large number of such programs makes it difficult to identify which ones are a good fit for the property characteristics (acreage, soil, use, flora and fauna species), and

alternatives if the landowner does not qualify for assistance. Some landowners are not able to pay standard rates for services, but may be interested in paying lower rates to support student work.

- Landowners may not realize what resources are available to them and it may be useful to develop a resource list to guide them toward, such as the Penn State Extension Service, the DCNR Bureau of Forestry Service Forester, or the Pennsylvania Game Commission Wildlife Diversity Biologist.
- South Mountain Ecoregional Research and Monitoring Coalition has prioritized research agendas; Michaux State Forest also has areas of research tied to Climate Change and the Forest Management Plan.

5.1.4 Research Institution Engagement

Key Committee member observations from engaging with Research Institutions are below.

Researchers

- Researchers are busy and many have established research agendas; however, many are willing to support landowners and student researchers on related topics
- Professors are over-tasked and not always able to dedicate significant time toward developing proposals for small grants; Limited funding through this program may not be worth the effort; consider significantly increasing the funding for research through this program, increasing funding size and reducing the number of projects, or significantly streamlining the proposal process so it is "quick and easy."
- There is a need to establish a South Mountain Research Coordinating Committee composed mainly of university researchers, or otherwise include diverse research institutions in planning; there is enthusiastic support from researchers at Harrisburg University; consider fostering one or two institution level relationships and build from there. This approach could be replicated at other institutions.

Students

- With the short time spans of undergraduate student time available, it is difficult to conduct in-depth research or longitudinal studies. Studies are usually completed over the course of a semester.
- There is a need to identify the regional research capacity for graduate and undergraduate students. There may be a need to prioritize work with one of these groups. Question of capacity may inform the type of research supported by SMRC in the future, and grant funds available. Working with graduate students is likely to require larger sources of funding.

5.2 Steering Committee Recommendations

5.2.1 Immediate Next Steps

Committee members were asked to identify the next steps that should be taken by CLUS and SMP to make the South Mountain Research Corps and Science Summit successful, summarized below.

Summarize Findings and Conduct Background Research

- Prepare Year One Pilot Report and coordinate Steering Committee review of the report; Coordinate DNCR Review of Year One Pilot Report.

- Understand regional academic capacity (Number of graduate programs and students vs. undergraduate programs and students) and current research requirements (one semester projects, year long projects) to prioritize this program's research focus (project duration, size, and type of research). Use this information to tailor SMRC research requirements (RFP process, grant sizes).
- Understand where SMRC efforts overlap the efforts of others. (e.g. Alliance for Aquatic Resource Monitoring (ALLARM) at Dickinson College, South Mountain Ecoregional Research and Monitoring Coalition, Michaux Forest Management Plan, PA Wildlife Action Plan, county comprehensive plans); align or diverge focus depending on findings.

Strategic Planning

- Establish a prioritized/strategic focus for the development of the program. (i.e. focus on public versus private landowners, focus on a specific region or a specific topic, individual student research or collective classroom research); once a focus is established (first few years), start to expand the program.

In terms of what next steps the committee should take, the following was shared:

- Review and Comment on the Year One Pilot Report; participate in meeting with the DCNR Conservation Landscape Initiative (CLI) lead to discuss the lessons learned from the pilot; and recommend how to best proceed with advancing the mission and goals of the SMRC.
- Establish the roles and objectives of the committee; objectives should be to support the SMRC Program Manager and provide feedback throughout program development.

5.2.2 Steering Committee Administration

Members suggested how facilitators could improve facilitation of the committee:

Clarify Roles and Expectations

- Clarify roles and expectations between the Steering Committee and SMRC Program Manager. One way of functioning could be a top down, rather than collaborative approach: the SMRC program manager reports to the committee, provides status updates, provides future direction, and solicits feedback from the committee members. The program manager could consider input from members to create actionable items with timelines. In this example, the steering committee could function as a sounding board and one professional and one researcher could co-chair the committee.
- Clarify how the SMRC Steering Committee interfaces with the SMP Leadership Committee and Subcommittees. There was discussion about formalizing the SMRC Steering Committee as a subcommittee of SMP, but that requires adopting established protocols and expectations (e.g. term limits, attendance requirements, participation in SMP events) and committee members would need to accept these structural changes.
- Formalize the role of the committee in program development and administration.
- Create a strategic plan and action plan.

5.2.3 Committee Effectiveness

Members suggested the following ways to improve the effectiveness of the Steering Committee:

Determine Research Priorities

- Identify the focus of SMRC Research Projects, what research should be funded under this program, and what they should provide to students. For example, determine whether the value gained from student experience and networking is sufficient for projects that may not involve traditional research (i.e. providing technical support or inventories), or if the committee prefers developing a robust research program that specifically provides a venue to practice research skills (i.e. longitudinal studies, articulated research question).

Improve Meeting Structure

- Formalize the expectations and standards for serving on the steering committee. For example, seeking input, utilizing connections or skills. Articulate what skills or connections are valued from each member. While committee members are prepared to contribute, they may not understand what value they added to the committee.
- Consider starting each meeting by reviewing the mission/objectives/goals of the SMRC to frame the conversation and actions toward those goals, followed by review of the budget, progress since the last meeting, discussion items, and action items/timelines.

5.2.4 Considerations for Year Two

Suggestions for how to summarizing Year One and considerations for planning Year Two follow:

Research Focus and Alignment

- Perhaps the original idea of a South Mountain GIS corps was lost. It is worthwhile to revisit the idea of reestablishing a GIS focus to hone future efforts and distinguish the program from others.
- If the focus of research is within Michaux State Forest, consider: advocating to DCNR for a statewide cooperative research program and budget that administers the program and assists in prioritizing research to align with the Michaux Forest District Management Plan. Integrate the South Mountain Ecoregional Research and Monitoring Coalition and this program and committee.
- Align management plan of property with proposed research (e.g. statewide management plan, wildlife management plan, district management plan).
- Work toward a statewide cooperative research program and coordinate with other state and federal agencies.

Organizational Support:

- Secure funding for program administration to include committee facilitation, capacity, and partnership building.
- Research award amounts should reflect the level of effort to obtain the request.
- Clarify committee roles and responsibilities.
- Set actionable items for a working committee and ensure current members are prepared for that commitment.

6.0 Recommendations for Year Two

CLUS and SMP program facilitators present the following summarizations from Year One and considerations for planning Year Two:

6.1 Strategic Planning

6.1.1. Committee Roles and Objectives

- Finalize the draft charter and committee roles and responsibilities document.
- Plan, share, and execute a clarified committee structure with clear expectations.
- Fill the academic and professional representative gaps on the Steering Committee.
- Committee members suggested an additional need for an academic advisory committee. The structure, role, and capacity for facilitation of this committee and how it interfaces with the Steering Committee needs to be clarified prior to conducting research institution outreach and recruitment for this potential second committee.

6.1.2. Background Research

- Task committee members to conduct background research related to academic capacity, overlap with other regional research efforts.
- Facilitate background research and overlap with the South Mountain Ecoregional Research and Monitoring Coalition.
- Answer the Outstanding Key Questions identified below.
- Articulate the type of research supported by SMRC in order to clarify the research process and identify key partners to engage. Understanding current research initiatives within Michaux State Forest and by regional organizations will be key to establishing a prioritized and strategic focus.

6.1.3. Research Agenda and Audience

Applied or Academic: The Steering Committee must articulate a more focused definition of research. During Year One, facilitators focused on serving landowners and, while this created trust and built relationships with landowners, it skewed conversations to focus on technical assistance rather than pursuing rigorous landscape research questions. Not considered to be traditional research, committee members questioned whether technical assistance, such as assessments or management plans, should be supported by this program. The feasibility of limiting research to long-term longitudinal studies was also questioned given the current size of grant funding available through SMRC and academic institution capacity for providing students with the time or expertise necessary.

Graduate versus undergraduate research: Being able to articulate a focus of research supported by this program is also tied to a focus on undergraduate or graduate students. Graduate students are more likely to complete research over multiple years, and one large research project is feasible. If undergraduate students are involved, the research is often tied to receiving research credit for the semester or academic year.

Longitudinal and short term studies: In determining the types of research projects funded through SMRC, it is important to consider the range of timeframes and formats under which research may be completed. Prioritization is still sought. Small-scale projects completed by one or more undergraduate students during a semester or class structure are an option. Large-scale projects or longitudinal studies over a longer timeframe would require multiple students over time and are likely to require consistent

funding. Some researchers were also interested in incorporating research into a course, involving many students in data collection during one or more site visits and over many years.

During Year One, it appeared that the committee favored rigorous research projects over providing technical expertise and services; however, it appears that the committee is supportive of providing diverse experiences for students that meet landowner needs rather than limiting the program to specific research areas or themes. There is consensus that, as long as the data is consistently collected by one researcher or program that the program could support it.

Collaboration: Committee members also appear to be supportive of collaborating with DCNR to achieve prioritized research needs and agendas within Michaux State Forest. Clarifying the landowners or land managers eligible for support under this program is also of need. Year One was focused on supporting private landowners, but the Steering Committee recognized that it may be more efficient to first focus on developing research projects in Michaux State Forest that could later be applied to private lands.

6.2 Administration and Considerations

6.1.2 Process

Pairing researchers and landowners: It is difficult to pair researchers and landowners virtually and the COVID-19 pandemic has halted action on Fall 2020. The in-person Science Summit and Site Visits were both crucial for building understanding, partnerships, and trust. Creating opportunities for in-person meetings and facilitating discussions is time consuming, but crucial in program development.

Messaging: The need for messaging was clear throughout Year One. The Science Summit was a good opportunity to share a vision of the Research Corps and how specific projects could fit landowner needs using local researcher expertise; however, it will take time to build the network and help a wider audience understand the potential for this program.

Research Project Development: One of the largest challenges encountered was the flow of project development. In Year One, landowners were approached first to ask about research interests and needs. The requests were wide-ranging, but generally focused on inventories of plants or other species and management plans. Landowners did not articulate specific research questions, and it was difficult to find researchers to support projects without a clear project statement. The CLUS spoke with landowners to develop project ideas prior to reaching out to academic researchers. Although the response was limited, the researchers that came forward for the specific research projects had the expertise needed by the landowners. The large amount of time invested in this process was valuable, but needs to be made more efficient.

Conversations with private landowners were more valuable in developing research concepts than complicated surveys. If administrative time is available to support this process, a simple survey and follow-up phone call is recommended. Alternatively, a more detailed survey with identified research projects or examples may be more effective than asking about interest in vague research themes, as currently addressed in the survey.

The Steering Committee will need to consider what specific information is needed from landowners prior to approaching researchers. An easy method for researchers to see specific projects and learn the details, such as in a subsection of the research catalog, would facilitate communication and help solicit student and researcher interest in the program. To maintain landowner privacy, this will still require record keeping with private information that is not visible to the public, but is tied to the research catalog. The balance is not wasting landowner time by gathering too much information for a project that researchers may not have the expertise for or interest in, while gathering sufficient information for interested researchers to come forward and participate.

6.1.3. Future Events

Science Summits: The Inaugural Science Summit was key to building understanding and support for the program and connecting landowners and researchers. There are various venues to continue building networks throughout the year, including the SMP Annual “Power of the Partnership” Celebration, Spring and Fall Meetings, and Speaker Series; however, these events have established flows and do not allow for sufficient time to discuss SMRC and solicit input and discussion. While it is important to attend these events and continue collaborating with SMP, the need for stand-alone meetings or future science summits is clear. While biennial science summits were proposed to reduce the administrative requirement, annual summits may help to maintain interest in the program and momentum. Depending on the format for pairing landowners and managers with researchers, an annual Science Summit may be required for facilitating in-person research pairings.

Bioblitz: The concept of pairing a Bioblitz or Stream Blitz with the Science Summit was also discussed with the Steering Committee. This event is envisioned as an opportunity for students from multiple research institutions to be involved in data collection efforts on a single day or weekend. This would require a key contact from each academic institution, collaboration with DCNR to develop the research priorities, and the development of policies and protocols to inform consistent data collection. This event could bring significant media and public attention, which would be seen as positive by the universities. If conducted in the same way every year, this would also present an opportunity for longitudinal research that would directly benefit Michaux State Forest.

6.3 Outstanding Key Questions

Through discussions with committee members, the following key questions remain related to the SMRC Steering Committee and the SMRC. Before continuing programming, it is important to clarify the following questions.

1. What is the role of a potential academic advisory committee? How will the development of this committee add to or take away from partnership building and capacity?
 - a. Help to build vision (help “fact find”) and RFP process? Review applications?
 - b. Participate in carrying out a vision developed by SMRC steering committee?
 - c. Would this committee need to be separate? How often would it meet?
2. What is the academic capacity within the South Mountain Landscape? How many schools have graduate programs? How many have research programs or focus? What is the total undergraduate enrollment in our region?

- a. Need to resolve questions about duration of studies- long term, longitudinal studies involving graduate students or multiple undergraduate students over time vs. semester long projects with one student?
 - b. RFP and effort needs to mirror project extent- current process we are developing may be too cumbersome for the current size of grants available
 - c. If trying to target graduate students, need to increase grant funding
3. What is the SMRC definition of a research project? Does our definition of research reflect capacity in the region? Align RFP process with research definition and duration.
 4. Where do SMRC efforts overlap established organization efforts? How are we to make SMRC distinct from CLUS, ALLARM at Dickinson College, Climate Commitment group, etc?
 5. Determine the ideal model for the research corps. Do we envision more projects on public lands or private lands? At this development stage, is it appropriate to focus one land type?
 - a. If we focus on private land owners, how do we develop a list of landowner concerns? Does developing an invasive species management plan qualify as a research project? If so, who would be best to oversee such a project?
 - b. If we are looking at public land research, do we start with encouraging institutional research on the lands through developing classroom curriculum that will lead to multiple data points, with the ability to become a long term research project?
 6. Given clarification on the questions above, what is the role of this committee, working group versus advisory, and who else should be asked to participate?

7.0 Summary

Through Year One of the SMRC Pilot Program, it is clear there is great interest and potential in this concept. However, there are outstanding questions of the leadership committee and both researchers and landowners and managers are not sure how to engage. There is a continued need to develop a vision for the program and develop messaging to increase understanding and program support.

For this program to succeed, it is crucial to increase participation and buy-in from academic institutions. It may be beneficial to focus on one land management type, private or public, for the initial phases of this program. SMRC Steering Committee members support tying research projects to landscape level planning efforts, and recommend articulating the types of research supported by this program.

Many outstanding questions need to be resolved to refine the SMRC vision and guide program development. Key questions related to the types of research supported by this program and land management entities influence research institution outreach, how information is gathered from land owners, how researchers and landowners are connected to develop specific projects, and the project application process. While it is understood that a pilot program may require more intensive pairing of researchers and land owners, it is important to develop a program that can stand alone.

High standards for research, and the need to tie projects to regional management plans are both strong priorities of the SMRC Steering Committee. These standards can be difficult to maintain when considering short-term research projects tied to one semester for undergraduate students. The

committee will need to reconcile this vision with research institution capacity to develop a successful program and generate the associated systems for applying and convening researchers.

While there is much interest in the South Mountain Research Catalog, it is clear that a regional data repository would also be of value. Considering data sharing agreements, standardized data collection methodologies, and a management entity to organize and maintain regional data would support longitudinal research studies and collaboration.