

CHWA CESU Application - Shepherd University

A. Expression of desire to enroll in CHWA CESU as a new partner institution/organization.

Shepherd University is submitting the accompanying material to support an application to join the Chesapeake Watershed Cooperative Ecosystem Studies Unit (CHWA CESU) as a new nonfederal partner institution/organization. Shepherd University has a distinguished history of collaborating with local, state and regional partners in support of initiatives advancing goals and objectives of the CHWA CESU and its partners. We believe that these application materials will demonstrate our commitment to the mission of CHWA CESU and the importance of collaborative partnerships in advancing basic research, education and outreach as it relates to federal CESU members.

B. Confirmation that institution/organization has read the CESU agreement and agrees to support the CESU mission and goals and fulfill the roles and responsibilities of a nonfederal partner, as described in the CESU agreement.

President Mary J. C. Hendrix is supportive of this application. Through her endorsement she is providing assurance that Shepherd University is willing and able to meet the responsibilities and roles of a nonfederal partner and to support the CESU mission and goals. The primary contact, Dr. Colleen Nolan, will also work with faculty, students and staff to ensure that Shepherd University meets these expectations while fulfilling the roles and responsibilities of a nonfederal partner.

C. Description of the institution/organization, its mission and the primary focus of collaborative activities to be supported through the CHWA CESU in in the context of the CESU mission.

Located in Shepherdstown and founded in 1871, Shepherd University (SU) is a public, liberal arts institution comprised of a diverse community of learners. Shepherd serves as a gateway to opportunities and ideas for traditional and non-traditional college students. Enrolling approximately 3,800 undergraduate, graduate and part-time students pursuing degrees in the arts, business administration, teacher education, nursing, and social and natural sciences Shepherd is the only public baccalaureate granting college in the West Virginia's Eastern panhandle. As described in our mission and vision statements (<http://www.shepherd.edu/about-shepherd/shepherd-mission-and-vision-statement>) Shepherd University is a community of learners engaged in the pursuit and advancement of knowledge. The University's core values (<http://www.shepherd.edu/about-shepherd/shepherd-core-values>) of learning, engagement, integrity, accessibility, and community infuse all aspects of academic life and provide a framework to guide collaborative efforts between Shepherd and external partners. In April of 2016 Dr. Mary J C Hendrix was

inaugurated as Shepherd's sixteenth president. President Hendrix is committed to supporting innovation, opportunity and excellence and believes that these are important not just for external stakeholders but in educating the next generation of leaders, researchers, teachers and scholars. Shepherd University faculty and staff will develop proposals in response to solicitations through the CHWA CESU and other CESUs. If awarded competitive funding from these solicitations, Shepherd's faculty, students and staff will complete projects to support the missions of many different stakeholders – the federal partner, the CHWA CESU and Shepherd University.

Shepherd is well situated to meet the mission of the CHWA CESU. There are dedicated faculty committed to increasing the knowledge in their fields of expertise while engaging, mentoring and training students to enter the work force or pursue graduate and/or professional training. While not all faculty have previous experience partnering with a federal agency, all have established research programs that would contribute to the research interests and needs of different partners. We are located within the geographic region served by the CHWA CESU and are in close proximity to the Potomac and Shenandoah rivers as well as the North Central portions of the Appalachian mountain range. Shepherd is proud of its history of placing undergraduate student interns in different paid and unpaid positions at national parks such as Catoctin Mountain Park, Antietam National Battlefield, Harper's Ferry National Park, the C&O Canal National Historic Park and Shenandoah National Park. Shepherd University has also partnered with the Appalachian Fruit Research Center, the National Conservation Training Center, the National Center for Cool and Cold Water Aquaculture in Leetown, WV, the Veterans Administration Hospital in Martinsburg, WV and the United States Coast Guard Training Center in Martinsburg, WV. Through our Historic Preservation Program we have partnered with Historic Shepherdstown and the Ferry Hill Plantation Visitor Center (part of the C&O Canal National Historic Park) to provide interpretive guides and historic re-enactors for multiple events over the course of the year. As the home to the George Tyler Moore Center for the Study of the Civil War, there is an emphasis on the study of the civil war and an ongoing project to develop a database of Civil War soldiers.

These past actions and the strength of Shepherd's faculty, students and staff coupled with our location and commitment to our state and region position Shepherd as a strong partner for federal and nonfederal partners in the CHWA CESU. We also believe that our strengths would position us to work well with federal partners from other CESUs.

D. Description or list of the primary programs, departments, or other institutional divisions of the relevance to federal land management, environmental, and research agencies that will be engaged in CHWA CESU activities.

The majority of programs and departments that would house faculty, students and staff with expertise relevant to federal land management, environmental and

research agencies are housed within the Schools of Natural Sciences and Mathematics (<http://www.shepherd.edu/snsm>) and Arts and Humanities (<http://www.shepherd.edu/arts-and-humanities>) These two schools house departments and programs that include:

- Environmental Studies – includes environmental geomatics, resource management, aquatics, sustainability, physics of energy, aquaponics, hydrology, paleozoology, astronomy, astrophysics
- Biology – includes genomics, ecology, ornithology, herptology, botany, genetics, microbiology
- Chemistry/Biochemistry – includes proteomic, analytical chemistry, biochemistry, inorganic chemistry
- Data Analytics – includes big data analysis from science and nonscience fields, bioinformatics, statistical analysis
- Computer Information Systems/Information Technology – includes robotics, mathematical modeling, cybersecurity, programing
- History/Historic Preservation – includes historic reenactment, preservation of artifacts, documents and sites, database development, educational outreach
- FASTNeR Lab (Art), GIS Lab (ENVS) and Robotics Lab (CME) – the departments housing these lab facilities have agreed to collaborate with faculty and/or external partners to support research, outreach and teaching activities.

In addition to these academic programs two other institutional units have the potential to enhance the relationship between Shepherd and the CHWA CESU. These are the Shepherd Entrepreneurship and Research Corporation (SERC), a 501c3 non-profit organization and the Center for Regional Innovation (CRI). The CRI is a structured to provide opportunities for partnerships between Shepherd University and external stakeholders while the SERC provides support for grant development, submission, management and reporting and a mechanism for collaborative sponsored research and projects. These institutional units will provide additional support for faculty and staff specific to any funded projects or collaborations that may arise through the CESU.

- E. *A list of and brief description of the staff or faculty with the expertise in disciplines and subject areas of relevance to federal land management, environmental and research agencies (do not submit CVs).*

Dr. Keith Alexander, Assistant Professor of History has research interests include cemetery preservation, green historic preservation, environmental history, and service learning in historic preservation education. Along with Dr. Julia Sandy, Dr. Alexander co-directs the Historic Preservation and Public History concentration within the history major.

Dr. James Broomall, Assistant Professor of History and Director of the George Tyler Moore Center for the Study of the Civil War is a distinguished Civil War historian with experience in organizing public programs that focus on bringing history to life. He is active in maintaining both the Center's Civil War soldier data base and library.

Dr. Jacquelyn Cole, Assistant Professor of Chemistry is trained in proteomics and metabolomics. She is establishing a research program exploring the area of plant proteomics and steroid analysis using liquid chromatography mass spectrometry (LC/MS/MS), particularly pertaining to plant life found natively in the local area and other areas surrounding the Potomac River. Quantitative analyses will be performed using labeled internal standards of key proteins and steroids. Eventually, interest towards toxicity of local plants would be explored using pollutants found in the area.

Dr. Ruth Conley, Associate Professor of Biology has training in examining neural systems and behavior using invertebrate models. Her work examines both the communication and neural encoding of communication and other sensory signals as well as the role of biogenic amines, social experience, and the environment in the development and maintenance of social behaviors.

Dr. Dan DiLella, Chair and Professor of Chemistry has a variety of research interests that include a project developing methods to quantify biologically important monoamines (octopamine, tyramine, serotonin, and the metabolism products of these amines - typically their N-acetyl derivatives) in hemolymph using high performance liquid chromatography with electrochemical detection.

Dr. Jonathan Gilkerson, Assistant Professor of Biology is broadly trained in cell and molecular biology. His research lab studies the mechanisms by which cells communicate with each other, specifically pathways that directly control their size and shape. The primary objective of his research program is to understand the molecular mechanisms by which the peptide hormone Rapid Alkalinization Factor (RALF) antagonizes plant growth, specifically cell elongation

Dr. Jeffery Groff, Associate Professor of Physics research interests include using computational models to study complicated phenomena such as neural communication and population dynamics, and applying low-cost sensors and electronics for gathering environmental data. Dr. Groff has expertise in distributed renewable energy systems including residential solar photovoltaics. During his upcoming sabbatical (fall 2017) he will work with SkyTruth to develop computational tools for using satellite imagery to monitor environmental threats.

Dr. Sher Hendrickson, Assistant Professor of Biology applies genome level analysis to biological phenomena to many species including condors, feral horse populations and big cats, Sher uses techniques that include genome assembly and gene annotation followed by in-depth studies of genes associated with phenotypes. With expertise in ornithology she is working with different state and local agencies on owl banding projects.

Dr. Jordan Mader, Assistant Professor of Chemistry specializes in organic and polymer chemistry. Her research program is focused on the application of small molecules and polymer synthetic techniques to the design of molecules with targeted applications. S current project uses polymer foams to target inorganic contaminants in water supplies. The goal of this project is to develop of functionalized monomers and polymer foams that can be used to remove toxic arsenic species from groundwater sources.

Dr. Sytil Murphy, Assistant Professor of Physics will mentor students with interests in taking a scientific approach to the teaching and learning of physics and science. A current project is in the development and refinement of a blended – part traditional, part online – physical science course for non-science majors which is required for Elementary Education majors. In this project, a set of materials was developed and delivered to the students. This is an iterative process, employing feedback and performance data to further and continually refine the course. This project and process could serve as a model for the development of other courses or smaller, single topic modules within the science disciplines.

Dr. Colleen Nolan, Professor of Biology and Dean, School of Natural Sciences and Mathematics has developed a collaborative research program with Dr. Carol Plautz that leverages Dr. Nolan's expertise in reproductive biology, endocrinology and toxicology.

Dr. Carol Plautz, Associate Professor of Biology has extensive training in developmental biology and has established a research program examining the effects of water contaminants of local significance on the embryology, growth, fecundity, and mortality as well as learning and memory of the pond snail *Lymnaea palustris* as a model system for water borne contaminants and pollutants. In addition to this work she continues to study the molecular mechanisms of embryonic eye development and formation.

Laura Robertson, Assistant Professor of Biology has developed a strong research program that focuses on the effects of environmental change on the health of aquatic organisms. Using molecular techniques and working in collaboration with field biologists, I have investigated the effects of exposure to salt, pesticides, and estrogenic chemicals on the immune and reproductive health in frogs, fish, and freshwater mussels.

Steven Shaffer, Lecturer in the Institute for Environmental Sciences with a specialization in Geomatics at Shepherd University. He is interested in remote sensing and data visualization and his research interests include the analysis of LiDAR, RADAR and photogrammetric data. He previously worked as a Sr. Project Manager on GEOSAR, and has conducted geographic research projects for the Navy, NGA, USDA, and multinational organizations. Steve has taught GIS at Shepherd since 2004.

John Steffen, Assistant Professor of Biology has extensive experience in herpetology. His research foci include sexual dimorphism of lizards and turtles and the effects of temperature on metabolism. Dr. Steffen will be joining the Shepherd University faculty in August 2017. At Shepherd he will establish a research program that complements his past activities and builds upon his recent work.

Dr. Ed Snyder, Professor of Geology is an acknowledged expert in paleobiology and paleoecology as well as the study of the regional geologic history. Dr. Snyder's specific research area focuses on Paleozoic marine invertebrates, more specifically members of the *Bryozoa*, and their application to broader areas of geologic research. The abundance and diversity of Paleozoic *Bryozoa*, common in rocks dating from 400 to 225 million years before present, makes this group of fossils extremely useful in answering difficult questions regarding the tectonic history and depositional environments of this time.

Dr. Qing Wang, Associate Professor of Mathematics is working at the intersection of mathematics, computer science and biochemistry. Her work examines the statistical modeling of disease spread and tumor growth. In analyzing disease spreading and tumor growth models, nonlinear differential equations will be used to investigate the spread of infectious diseases such as SARS and H1N1 and tumor growth in response to therapy, magnitude of infection or therapy will be predicted, and different control methods will be proposed based on the analysis of the equilibrium, reproductive ratio of the system, etc., to improve estimates of severity and informing policies such as the distribution of vaccines and antiviral drugs. Population growth models and application in harvest management can be completed through the use of two or three-species population growth models to demonstrate the effect of impulsive control based on the idea of controlling the population dynamics by adding or removing some members of one or more species.

Dr. Robert Warburton, Professor of Biochemistry is a biochemist with expertise in a wide variety of techniques that support research in molecular immunology. His current research projects seek to expand the understanding of the sensitivity of cytotoxic T-cells to subtle changes in the structure of the MHC ternary complex and to enhance the understanding of cancer treatment by developing an in vivo spheroid cancer model.

Dr. Ralph Wojtowicz, Associate Professor of Mathematics directs the Data Analytics program and his research studies category theory and its applications to understanding how to represent and reason about knowledge and how to derive knowledge from data sets that may be large, distributed and heterogeneous. The theory of sketches, developed by the French school of category theorists, provides a mathematical foundation for this work and a graphical framework for relating knowledge representations and their models. In his recent papers he 1) related sketches to OWL2 ontologies and 2) described applications of category theory to analogical reasoning. His research program gives rise to a variety of activities for students at different stages of their careers, and students will explore the use of the Map-Reduce programming model (as implemented in Hadoop) to formulate algorithms and conduct statistical queries on large data sets.

F. For academic institutions, include a description of the student demographics and the institution’s status as a minority-serving institution (e.g., as defined by the U.S. Department of Education)

Student demographics for the 2014-15 reporting year are shown in the tables below (http://www.shepherd.edu/wordpress-1/wp-content/uploads/2017/03/IPEDSDFR2016_237792.pdf). These data are reported annually as part of Shepherd’s IPEDS report and other documents. When compared to the institutional peers identified by the West Virginia Higher Education Policy Commission Shepherd University most often has higher enrollment, better retention and degree completion and awards more aid. As can be seen in these tables Shepherd has a relatively high proportion of students eligible for, and receiving financial assistance. Many of our students are the first in their family to attend college. Shepherd University is not classified as a minority-serving institution.

Table 1. Enrollment and Degrees Awarded

Unduplicated head count (total)	4,738
Unduplicated headcount (undergraduate)	4,261
Number of Bachelor’s degrees awarded	775
Number of Master’s degrees awarded	71

Table 2. Student enrollment demographics

Female students (%)	59
American Indian or Alaska Native (%)	1
Asian (%)	2
Black or African American (%)	9
Hispanic/Latino (%)	3
Two or more races (%)	2
Unknown race/ethnicity (%)	2
White (%)	82

Table 3. Undergraduate financial aid

Any grant aid (%)	78
Pell grant (%)	33
Federal loans (%)	55

Table 4. Retention Rates

Full-time student retention (2014 cohort; %)	66
Full-time student retention (2014 cohort; %)	38

Table 5. Bachelor's degree graduation rates for full-time, first-time undergraduate students

4 years (2007 cohort; %)	18
6 years (2007 cohort; %)	38
8 years (2007 cohort; %)	39

- G. *Description or a list of facilities, equipment, centers, or institutes that would provide support to research, technical assistance, or educational activities of relevance to federal land management, environmental, and research agencies that will be engaged in CHWA CESU activities.*

The ability of Shepherd University to establish and design research programs, especially those that meaningfully incorporate undergraduate students and provide outreach to our stakeholders, relies upon our ability to develop research spaces and purchase equipment. There are over twenty different laboratories in the science buildings (Robert C. Byrd Science and Technology Center, Snyder Hall, Stutzman-Sloanker Hall) that house the facilities for the departments within the School of Natural Sciences and Mathematics. Equipment available to for faculty and students includes, but is not limited to chromatographs, atomic absorption spectrometer, fluorescence compound microscope, flow cytometer, microinjection apparatus, gel electrophoresis and imaging equipment, GPS units, radio collars and tracking equipment, cell culture hoods, tissue and plant incubators, nuclear magnetic resonance spectroscopy, RT-PCR, ultracold freezers, centrifuges, CNC machine shop, robotics equipment, computer

hardware and software, 3-D printers, dedicated servers and computers. Three traditional greenhouses and accompanying head spaces provide space to grow and house plant species requiring different conditions. A dedicated GIS lab is available as is a drone equipped with a camera for use in developing three-dimensional maps and conducting visual, near Earth assessments of specific locations. The 15-foot dome of the Shepherd University Observatory houses a permanently mounted 14-inch diameter telescope, along with dedicated research charged-coupled device cameras, spectrographs, and filters. The School of Natural Sciences and Mathematics is also home to a teaching and outreach site containing a wind turbine, different photovoltaic panel arrays, marine storage batteries, a biodiesel generator, an aquaponics system and a greenhouse utilizing green energy. This site is also home to dedicated organic beds that are used for teaching and research applications. Additional laboratories and research space are found across campus, for example the FASTNeR in the Department of Contemporary Art and Theater is available for faculty and student use. This work space has equipment that is not found in other labs on campus.

- H. Description or list of past research, technical assistance and educational services supported through federal financial assistance awards that are of relevance to federal land management, environmental, and research agencies that will be engaged in CHWA CESU activities.*

Shepherd University faculty have not participated in sponsored research or provided technical assistance or educational services related to federal land management or environmental management in more than 10 years. The bulk of these activities have been completed through student internships at federal and nonfederal agencies described below. Dr. James Broomall, Assistant Professor of History and Director of the Civil War Center concluded a historic resource study for the National Park Service. This particular project involved a partnership between the Chesapeake and Ohio Canal National Historical Park and the Organization of American Historians. Dr. James Broomall recently conducted a two-year study of the C&O during the American Civil War and produced a written report as well as other supplemental materials.

- I. Description or a list of current formal agreements and informal relationships with federal agencies that are of relevance to federal land management, environmental, and research agencies that will be engaged in CHWA CESU activities.*

Shepherd does not have any formal agreements with federal agencies at this time. There are numerous informal relationships, many of which include placing students at federal agencies as paid or unpaid interns. Information about the different internship opportunities across campus as well as specific points of contact are found on the Shepherd University Internship web page

(<http://www.shepherd.edu/internships/internships-by-department>). Departments in the School of Natural Sciences and Mathematics established internship relationships with federal and nonfederal agencies that include, but are not limited to, the U.S. Geological Survey, Appalachian Fruit Research Station, Cool and Cold Water Aquaculture Research, U.S. Department of Agriculture, National Cancer Institute, USDA Appalachian Fruit Research Lab, Catoclin Mountain Park, the Western Maryland Research and Education Center, the Freshwater Institute, the National Cancer Institute, U.S. Coast Guard Operations Systems Center, U.S. Veterans Affairs Hospital, the Internal Revenue Service, the National Institute of Standards and Technology, the National Park Service, Leetown Science Center, Mountain View Solar, Antietam National Battlefield, Blue Ridge Environmental Center, GAI Engineering, The Capacon Institute, Skytruth, USDA Natural Resources Conservation Service, National Conservation Training Center. Within the History department internships are commonly conducted at the following federal and non-federal agencies/organizations: Antietam National Battlefield, the Baltimore Museum of Industry, the Robert C. Byrd Center for Congressional History and Education, the C&O Canal National Historical Park, the Crime Museum in Washington, D.C., the Jefferson County Historic Landmarks Commission, the National Conservation Training Center, the Vieux Carré Commission in New Orleans, and the Virginia Department of Historic Resources, the George Tyler Moore Center for the Study of the Civil War, the National Park Service, Antietam National Battlefield, and Harpers Ferry National Park. Students complete these internships as part of their graduation requirements and many present their work at regional/national meetings as well as during the capstone courses at Shepherd. Mentors at these federal and nonfederal agencies/organizations comment on the preparedness and professionalism of Shepherd students and frequently agree to serve as mentors for students year after year.

- J. *Confirmation of the institution's/organization's willingness to accept a limited overhead rate of 17.5% and cost items to which the rate is applicable for activities conducted through the CESU, including research, technical assistance, and educational services (this overhead rate applies to the entire institution/organization for CHWA CESU activities).*

President Mary J C Hendrix supports this application and acknowledges that the maximum overhead rate for all work will be 17.5% and that there can be limitations on the cost items where the overhead rate can be applied. As part of Shepherd University's commitment to this partnership we consider the difference between this rate and our federally negotiated overhead cost rate (44%) to be an in-kind contribution and supportive of the collaborative work that would be completed by Shepherd University faculty, students and/or staff.

- K. *Designation of a technical representative (with full contact information –name, title, full address, phone, fax, email) to serve on the CHWA CESU steering committee.*

Colleen J. Nolan, Ph.D. will serve as the technical representative for Shepherd University and serve as on the CHWA Steering Committee. Her contact information is as follows:

Colleen J. Nolan, Ph.D.
Dean, School of Natural Sciences and Mathematics
Shepherd University
PO Box 5000
Shepherdstown, WV 25434-5000
Phone (direct line): 304.876.5106
Fax: 304.876.5028
Email: cnolan@shepherd.edu

- L. *Participation in the CESU annual/semiannual partner meetings and facilitation of internal and external communication, promotion and response to CESU correspondence and administrative actions (e.g., announcement, new member applications, processing agreements/amendments, five-year reviews).*

Shepherd University will attend and actively participate in partner meetings. We will relay all internal and external communications to the targeted groups and respond to correspondence and administrative actions from the CESU in a timely manner. The primary responsibility for ensuring that Shepherd completes these tasks will be assumed by Colleen J. Nolan who serves as Dean of the School of Natural Sciences and Mathematics. Dr. Nolan will work closely with other academic deans, faculty and staff to ensure that there is appropriate dissemination of material between the CESU and Shepherd stakeholders. She will also work closely with Jessica Kump, Director of Grant Support to ensure that any dissemination related to funded work is done so in a timely and correct manner.

- M. *Agree to relay agency-specific research, technical assistance and educational needs and associated funding opportunities to other institutional/organizational members (e.g., faculty, students)*

As part of her responsibilities Dr. Nolan will communicate information to appropriate stakeholder groups at Shepherd. As part of the efforts to disseminate information about funding opportunities she will engage other academic deans, members of the Shepherd University Executive Leadership Team and the Director of Grant Support. Dr. Nolan will also work directly with faculty in the School of Natural Sciences and Mathematics to develop grant proposals in response to announcements of funding opportunities.

N. Signature (or endorsement) from an appropriate official, with authority to commit institutional resources in a binding multi-year federal cooperative and joint venture agreement (e.g., president, executive director, chief financial officer, vice president for research, director of sponsored programs).

President Mary J. C. Hendrix has provided a letter of support and endorsement as part of this application. In her letter she expresses her enthusiasm for Shepherd's membership as a means of contributing to the good work of the CHWA CESU and partner agencies.

O. Letter(s) of support from one or more CESU federal agency partners sponsoring the new partner's application, including a description of successful past collaborative work supported through federal financial assistance awards.

Letters of support for this application has been received from Mr. Kevin D. Brandt, Superintendent, Chesapeake & Ohio Canal National Historic Park and Mr. Rick Slade, Superintendent, Catoctin Mountain Park . Mr. Brandt's letter endorses Shepherd's application to the CHWA CESU and discusses the work completed by Dr. James Broomall for the C&O Canal Historic Park, the success of the project, the positive recommendation that Shepherd has and the potential for research opportunities. Mr. Slade's letter discusses the extensive and very successful internship program that exists between Shepherd University and Catoctin Mountain Park and his belief that a formal agreement and membership with in the CHWA CESU will serve to formalize relationships and expand opportunities for both partners.

May 8, 2017

Daniel M. Filer, M.B.A., Ed.D.
Chesapeake Watershed CESU Research Coordinator
National Park Service
University of Maryland Center for Environmental Science - Appalachian Laboratory
301 Braddock Road - Room 304
Frostburg, MD 21532

Dear Dr. Filer:

I write to express my enthusiastic support for Shepherd University's application for membership in the Chesapeake Watershed Cooperative Ecosystem Studies Unit (CHWA CESU).

Shepherd would be honored to contribute to this robust network of partners. Many of our dedicated faculty have devoted their careers to research and education that will improve ecological and cultural conservation for the future of our region and our state. As a primarily undergraduate institution, Shepherd focuses on the educational experience, which drives a tradition of engaging undergraduate students in meaningful faculty-mentored research. This has inspired generations of passionate Shepherd students to pursue careers that will contribute to improved awareness, protection and conservation of natural and cultural resources. Shepherd faculty culture is also infused with a long history of interdisciplinary collaboration that will bring value to the CHWA. Membership in the CHWA CESU would present another fantastic opportunity for our faculty and our students to make meaningful contributions to conservation on behalf of our unique region.

I believe our participation would bring particular value to the CHWA CESU as a partner in West Virginia's region of the Chesapeake Watershed, rounding out representation while increasing the reach of the CHWA CESU's work. I am confident that the work of Shepherd University faculty would provide valuable data and insights; many ecological studies and projects led by Shepherd faculty focus on factors specific to our immediate region, likely offering valuable information to support a full picture of the Chesapeake Watershed region.

Shepherd University strives to lead by example with campus practices aimed at environmental sustainability and natural resource conservation, aiming to inspire wider adoption of similar practices throughout the state. Becoming a research institution partner in CHWA CESU would further reinforce our commitment to supporting environmental stewardship and conservation.

I am pleased to offer my full endorsement of this application for membership.

Sincerely,



Mary J.C. Hendrix
President



United States Department of the Interior

NATIONAL PARK SERVICE
C&O Canal National Historical Park
1850 Dual Highway, Suite 100
Hagerstown, Maryland 21740

IN REPLY REFER TO:
A9031 (CHOH)

May 3, 2017

To Whom It May Concern:

I am writing in support of the application by Shepherd University to join the Chesapeake Watershed Cooperative Ecosystem Studies Unit (CHWA CESU). As a unit of the National Park Service, the purpose of the Chesapeake and Ohio Canal National Historical Park (C&O Canal NHP) is to preserve and interpret the 19th century transportation canal from Washington, D.C. to Cumberland, Maryland, and its associated scenic, natural, and cultural resources; and to provide opportunities for education and appropriate outdoor recreation. Shepherd University recently assisted the park in its mission to educate the public and protect park resources by preparing a special history study about the canal during the Civil War. The project, conducted by Dr. James Broomall, Director of the Civil War Center at Shepherd University, resulted in a soon-to-be-printed narrative history and education materials which convey updated information on the significance, history, and historic characteristics of the park's Civil War-era resources. Additionally, documentation from the study was used by the park in commemorating the Sesquicentennial of the Civil War and also aids the park in making informed decisions about these important resources.

Based on the successful results of this project, the proficiency with which the project was conducted, the university's outstanding reputation within the local community, and the vast potential for cultural and natural research opportunities amongst the many National Parks in the region, I am recommending Shepherd University as a member of the CESU.

If you have questions, please do not hesitate to contact me at 301-714-2202 and kevin_brandt@nps.gov.

Sincerely,


Kevin D. Brandt
Superintendent



United States Department of the Interior

National Park Service
Catoctin Mountain Park
6602 Foxville Road
Thurmont, Maryland 21788



May 3, 2017

Mr. Daniel M. Filer
Chesapeake Watershed CESU Research Coordinator
National Park Service
University of Maryland Center for Environmental Science - Appalachian Laboratory
301 Braddock Road - Room 304
Frostburg, MD 21532

Dear Mr. Filer;

I am writing in support of the application by Shepherd University to participate in the Chesapeake Cooperative Studies Unit (CESU) network. In the past, Shepherd University faculty and students have played an important role in advancing our efforts to better understand and manage Catoctin Mountain Park's varied natural and cultural resources. Although we have successfully cooperated with individual departments to have Shepherd students complete internships with the park, I feel that a formal agreement and membership within the CESU is an important step to formalize the relationship and expand opportunities for mutually beneficial work. We have many untapped opportunities to work with Shepherd faculty and students to advance the park's natural and cultural resource programs. Therefore, I am recommending Shepherd University as a member of the CESU network.

If you have any questions please contact me at 301-663-9330 or rick_slade@nps.gov

Sincerely

Rick Slade
Superintendent