

## Comprehensive Program Review – ENVIRONMENTAL SCIENCE

### General and Overview

#### **1. Describe your program's most significant opportunities and significant challenges. (Narrative)**

Some of our most significant opportunities are also our most significant challenges. ENV SCI has been identified as one of the 4-year B.S. degrees that will be offered at UW-Green Bay|Manitowoc. We consider this to be both a unique opportunity and a challenge. We would love to be able to offer the ENV SCI degree at the Manitowoc campus; the facilities adjacent to campus (Lake Michigan, farming communities, forested acres, feeder streams in the watershed, small urban setting) offer extraordinary opportunities for outdoor, hands-on learning as well as research opportunities. The challenge is the lack of a critical mass of students at the Manitowoc campus to enroll in the courses. It is a catch-22 scenario, we can't offer the needed courses until we have a critical mass of students and we won't get a critical mass of students until we can consistently offer the needed courses. Some supporting courses for the ENV SCI major can (and are) offered at the Manitowoc campus (e.g., BIOL 201/202, BIOL 203/204, CHEM 211/213, CHEM 212/214, ENV SCI 102), however, some still fall short of a critical mass (e.g., GEOSCI 202), as a result they end up being canceled. Most of the ENV SCI core courses (ENV SCI 302, 305, 336, 337, 338, 339, and 467) are difficult to offer because they are typically in-person courses and half of them have lab components. The same holds true for the upper-level ENV SCI electives.

Another opportunity/challenge is recruiting diverse students into the program, especially from the immediate Green Bay area. With the coming change in the federal administration (one that will presumably try to protect the environment), job opportunities will hopefully flourish in the fields of environmental sciences and renewable energy. I believe we can capitalize on that momentum.

Retaining faculty/staff is sometimes a challenge, especially in certain areas. We had one statistics position that seemed to turn over particularly frequently (much to the chagrin of the other statistician in the program). Our statisticians are vital to the ENV SCI program because they contribute both by teaching statistics courses that are part of our core curriculum and by consulting with faculty and graduate students on their research.

#### **2. What are some things that would help make your program and its students more successful? (Narrative)**

One skill many employers are expecting from their new hires (our recent graduates) is a knowledge of Geographic Information Systems (GIS). For many years now one of the top priorities listed by ENV SCI in terms of personnel is a faculty line dedicated to GIS. For the past six years or so, Post-Doctoral Research Associate Dr. Christopher Houghton (hired by Prof. Patrick Forsythe) has been teaching all UWGB's GIS courses (PU EN AF 250, PU EN AF 350, ENV SCI 337, and ET 391). Recently, Dr. Houghton was given a 75% Lecturer/25% Researcher line. That move provided some security for Dr. Houghton (and UWGB). However, if he were offered the security of a tenure-track position at

some other institution, his departure would put Public and Environmental Affairs, Environmental Sciences, and Engineering Technology in deep trouble. This position is critical! UWGB desperately needs to create a tenure-track Assistant Professor line for a GIS specialist, three different programs are depending on this. This is an interdisciplinary position, three programs/two colleges could split the cost of the position. Better yet, we should create two tenure-track lines, hire two GIS specialists, and offer a GIS minor. Because GIS is such a highly sought-after skill by employers in many different areas, it would easily (and quickly) become one of our most popular minors. Any/all courses in GIS would fill rapidly.

Growing the number of opportunities for students to learn outside-the-classroom is critical for the success of the student once they graduate. ENV SCI constantly stresses that all students in the program pretty much receive the same classroom experience, where students are going to separate themselves from their “competition” once they enter the job market is through the outside-the-classroom experiences they have completed. Therefore, students need to seek out internships, independent studies, research with faculty, independent research projects, and participation in international travel courses. Most of these outside-the-classroom activities still require the involvement of faculty on some level. However, as pointed out in previous Program Reviews, these activities are seldomly compensated. Therefore, many faculty feel they no longer have adequate time to supervise these outside-the-classroom activities without some type of compensation (course reassignments, monetary compensation, etc.). If we really want to help students, we need to provide those critical outside-the-classroom experiences which will require a commitment of support/compensation for the faculty who make these experiences possible.

### **3. What are some program accomplishments worth highlighting? (Narrative)**

Environmental Science is an incredibly active program, strong in all three fundamental areas: teaching, scholarship, and service. As such, the faculty and students have been honored with numerous accolades, including:

- UWGB Founders Award for Excellence in Scholarship:
  - 2013 – Michael Draney
  - 2014 – Amy Wolf
  - 2015 – Matthew Dornbush
  - 2017 – Robert Howe
  - 2019 – Patrick Forsythe
- UWGB Founders Award for Excellence in Community Outreach
  - 2015 – John Luczaj
- UWGB Founders Award for Excellence in Institutional Development
  - 2016 – Steve Meyer
  - 2018 – Patricia Terry
- UWGB Founders Award for Excellence in Collaborative Achievement
  - 2013 – Environmental Management and Business Institute (EMBI)
  - 2017 – Vicki Medland & Natural and Applied Sciences, Heirloom Plant Sale
- UWGB Student Nominated Teaching Award
  - 2015 – John Katers (Experienced Teacher)

- 2017 – Megan Olson Hunt (Early Career)
- 2018 – Mandeep Bakshi
- 2018 – Ryan Currier
- 2018 – Tetyana Malysheva
- 2019 – Patrick Forsythe
- Professorships
  - Frederick E. Baer Professorship: John F. Katers (2014 – 2017; relinquished early when he became CSET Dean)
  - Barbara Hauxhurst Cofrin Professorship of Natural Sciences: Kevin Fermanich (2014-2019)
  - Barbara Hauxhurst Cofrin Professorship of Natural Sciences: Michael Draney (2019-present)
  - Herbert Fisk Johnson Professorship in Environmental Science: Robert Howe (2012-2017)
  - Herbert Fisk Johnson Professorship in Environmental Science: Amy Wolf (2017-present)
- Student Awards
  - Numerous University Student Leadership Award recipients
  - Several Chancellor Medallion recipients
- Faculty Publications
  - Over the seven-year period, ENV SCI faculty have published hundreds of journal articles
- Faculty Research Proposals
  - Over the seven-year period, ENV SCI faculty have brought in multi-million dollars in grant funding
- Contributions to University Service
  - Cofrin Center for Biodiversity Director, Bob Howe (2013-present)
  - Chancellor Search Committee Member, Michael Draney (2013-14)
  - UWGB Faculty Representative, Steve Meyer (2013-15)
  - University Committee Chair, Steve Meyer (2014-15)
  - Secretary of the Faculty and Staff, Steve Meyer (2015-present)
  - University Committee Chair, Patricia Terry (2017-18)
  - Provost Search Committee Member, Michael Draney (2018-19)
  - Chancellor Search Committee Vice-Chair, Michael Draney (2019-20)

**4. Have there been any significant changes that have affected your program?**

**(Narrative)**

Primarily because of the growth of the Engineering Technology Program, the start of the Mechanical Engineering program, and the transfer of the Computer Science Program, the number of faculty in Natural and Applied Sciences (NAS) grew to approximately 60. At this point the Resch School of Engineering (RSE) was created and faculty from Engineering, Computer Science, and Mathematics moved under the umbrella of the RSE; faculty from Biology, Chemistry, Environmental Science, Geoscience, Physics, and (the newly created Water Science) remained in NAS. Now, faculty contributing to the ENV SCI program are split between two units (RSE and NAS). This makes the creation and organization of the timetable particularly challenging.

Despite NAS splitting into NAS/RSE, the size of the NAS Unit still necessitated a change in unit leadership structure. The NAS chair no longer automatically chairs the ENV SCI program. This is doubly true now as, with the addition of Water Science, NAS has two interdisciplinary programs. This complicates the administration of ENV SCI somewhat, because faculty are not hired into an interdisciplinary unit. We used to make ENV SCI curricular changes at the NAS level, but now we need to have separate ENV SCI faculty meetings. This takes additional time and effort on the part of participating faculty.

When Faculty Senate voted to eliminate the requirement that all students have either an interdisciplinary major or minor, this posed a challenge to all interdisciplinary programs. Without the requirement that disciplinary majors must take an interdisciplinary minor, the number of students declaring an ENV SCI minor has decreased dramatically. While the number of minors has decreased, the number of ENV SCI majors has held its own.

As alluded to, our assigned task of rolling out the Environmental Science major on the Manitowoc campus is a challenge. This will be a major focus of a distance education grant we are applying for through the Provost Office. Biology and Chemistry faculty are looking forward to broadening their teaching assignments for this new major, but at the moment, we lack the capacity to initiate many courses. Manitowoc instructors are already fully engaged in teaching the courses they've been assigned to a growing number of students. Ultimately, we are going to need additional instructor capacity at Manitowoc (including, hopefully, a Geoscience faculty or lecturer) in order to increase capacity and breadth of expertise there.

**5. Where do you want your program to be 5 to 7 years from now? (Narrative)**

We would like to grow our enrollment to back to and stabilize at 120-150 students depending on administration's commitment to increasing the number of faculty lines.

We want ENV SCI to be a major that students can enter at any campus and finish on two campuses. We want to be a program with a more diverse faculty mentoring a more diverse set of students. We want to see growth in the number of research/internship opportunities for students. We want to see a larger university that would result in more highly resourced ENV SCI infrastructure, including more lab space, a remodeled greenhouse, and resources that would make the Cofrin Arboretum a proper outdoor laboratory facility.

We look forward to the creation of the National Estuarine Research Reserves (NERR) which will generate resources as well as opportunities for UWGB faculty and students to collaborate with other institutions involved in freshwater research on the Great Lakes.

We would like to see growth in the number and dollar value of scholarships in the environmental sciences. It would help recruitment if some scholarships were targeted toward underclassmen, using the scholarships as a recruiting tool for high school seniors and incoming freshmen. Ideally, these would include a mix of need-based and merit-based scholarships.

We would like to develop a high-impact ENV SCI summer program for high school juniors and seniors. A program, rich in hands-on field activities, could be developed such that students would get credit for ENV SCI 102 “Intro to Environmental Sciences” if they were to come to UWGB. It would be an excellent recruitment tool for the major. CSET has recently hired Samantha Betancur, a Summer Camps/Internships Coordinator who could help facilitate such as effort.

We would like to develop GIS into its own minor. As previously mentioned, GIS is a skill/tool that employers are demanding from their new hires. At the minimum, we need one GIS tenure-line just to maintain the ENV SCI major. Two GIS tenure-lines would be needed to develop a minor. All GIS tenure-lines would service three different programs: Environmental Science, Engineering, and Public and Environmental Affairs.

### **Demand**

*All data in this area is provided with the materials. (Graduates, majors, minors, etc.) This space is for any commentary you would like to apply to that material. (Narrative)*

The number of declared majors has roller coasted just a bit over the seven-year timetable. There were 93 declared majors in 2013-14, that dipped to 69 in 2015-16, rebounded to 132 in 2018-19, and in 2019-20 stood at 112. With our current staffing, it would be good to shoot for 120-150 declared majors. Perhaps with a more environmentally focused federal administration more students will look to declare a major in ENV SCI.

The number of declared minors has steadily decreased over the past three years. This is not surprising. In a faculty senate vote in December 2017, the requirement that all students have an interdisciplinary major or minor was removed. As ENV SCI fulfilled the interdisciplinary minor requirement, many of our declared minors were lost as a result of that change.

### **Internal**

#### **1. Program goals (Mission, vision, learning outcomes; present as narrative/lists)**

ENV SCI contributes to the University select mission through high quality instruction, student collaborations with faculty on research projects, and faculty/staff/student collaborations with community-based partners. ENV SCI teaches students to think critically in order to solve problems. Environmental sustainability is at the core of pretty much everything the faculty and staff do in the ENV SCI program.

#### Environmental Science Learning Outcomes

1. Understand the natural environment and its relationships with human activities.
2. Characterize and analyze human impacts on the environment.
3. Integrate facts, concepts, and methods from multiple disciplines and apply to environmental problems.

4. Acquire practical skills for scientific problem-solving, including familiarity with laboratory and field instrumentation, computer applications, statistical and modeling techniques.
5. Understand and implement scientific research strategies, including collection, management, evaluation, and interpretation of environmental data.
6. Design and evaluate strategies, technologies, and methods for sustainable management of environmental systems and for the remediation or restoration of degraded environments.

## 2. Curriculum development (Lists, brief narrative if appropriate)

Environmental Science has made the following changes to its curriculum to help streamline students' progression through the major:

- ENV SCI 102 "Introduction to Environmental Science" was added to the list of Required Supporting Courses for the ENV SCI major (2014)
- ENV SCI 407 "Modeling of Environmental Systems", a 4-credit core course, was replaced with two newly developed 2-credit courses (ENV SCI 336 "Environmental Statistics" and ENV SCI 338 "Environmental Modeling") (2014)
- ENV SCI 454 "Remote Sensing and GIS", a 4-credit core course, was replaced with two newly developed 2-credit courses (ENV SCI 337 "Environmental GIS" and ENV SCI 339 "Scientific Writing") (2014)
- BIOL 202 "Principles of Biology: Cellular and Molecular Processes" (3 credit lecture, 1 credit lab) was split into BIOL 201 (3 credit lecture) and BIOL 202 (1 credit lab). If a student failed the lecture portion of the class but passed the lab portion of the class, they would only need to retake the lecture. This removed a bottleneck that prevented some students from enrolling in BIOL in a timely fashion. (2015)
- BIOL 203 "Principles of Biology: Organisms, Ecology, and Evolution" (3 credit lecture, 1 credit lab) was split into BIOL 203 (3 credit lecture) and BIOL 204 (1 credit lab). If a student failed the lecture portion of the class but passed the lab portion of the class, they would only need to retake the lecture. This removed a bottleneck that prevented some students from enrolling in BIOL in a timely fashion. (2015)
- ENV SCI 303 "Environmental Sustainability" was shifted from the list of upper-level core courses to an upper-level elective course (2016)
- ENV SCI 336 "Environmental Statistics" changed from a 2-credit, 7-week course to a 3-credit, 14-week course based on the amount of course content and workload for students. (2020)
- ENV SCI 337 "Environmental GIS" changed from a 2-credit, 7-week course into a "normal" 3-credit, 14-week course; the PU EN AF 250 prerequisite was removed and that introductory material was added to ENV SCI 337. (2020)
- ENV SCI 339 "Scientific Writing" changed from a 2-credit, 7-week course to a 3-credit, 14-week course based on the amount of course content and workload for students. (2020)
- POL SCI 101 "American Government and Politics"/POL SCI 202 "Introduction to Public Policy" was removed from the list of required ENV SCI Supporting Courses. One reason for this decision was to make up for increasing ENV SCI 336/337/339 from 2-credit courses to 3-credit courses (2020)

- Upper-level ENV SCI elective requirements can now be satisfied by enrolling in any 300-400 level ENV SCI course not required in the core curriculum (previously, only selected courses with the ENV SCI prefix could be counted as upper-level electives). GEOSCI 325, PU EN AF /POL SCI 301 or PU EN AF 378, and WATER 321 could also be taken as upper-level electives. (2020)
- Added a new “Accelerated Emphasis;” admitted students may enroll in up to 12 graduate credits toward the Environmental Science and Policy Master’s Degree while pursuing their Bachelor of Science Degree in Environmental Science (2020)

**3. Connections to other programs (Lists, brief narrative if appropriate)**

It comes as a surprise to many outside the sciences that UWGB has never hired an ENV SCI faculty member. The ENV SCI program is made up of contributions from faculty whose home units are in Biology, Chemistry, Engineering, Geoscience, Math, and Water Science. As a result, the program is inherently interdisciplinary and the ENV SCI program contributes to each of the academic programs that constitute ENV SCI. However, that interdisciplinary nature of the program extends outward beyond the sciences, as ENV SCI shares a connection to:

- EMBI (Environmental Management and Business Institute) Sustainability Certificate – ENV SCI contributes to the Environmental Science Element
- Environmental Engineering Technology Major
- Environmental Policy and Planning Major
- Global Studies Minor – ENV SCI contributes to the Global Environmental Sustainability thematic category of the Global Studies Minor
- Sustainability Minor – contributes to the Environmental Science Element

**4. Number of courses offered (Overall number provided in materials. Chairs: short commentary if appropriate. Provide a sub-grouping of various modalities by percentage. For example, what percentage of your program is available online, hybrid, etc.?)**

In addition to ENV SCI 497 “Internship,” ENV SCI 498 “Independent Study,” and ENV SCI 499 “Travel Course,” the ENV SCI program currently has 29 courses on the books.

The vast majority of ENV SCI courses have traditionally been taught face-to-face. Prior to COVID-19, only three courses with the ENV SCI prefix (ENV SCI 260, ENV SCI 303, and ENV SCI 339) were regularly taught through online methods.

**5. Diversity of students, faculty, and curriculum (Overall number provided in materials. Chairs: short commentary if appropriate; provide examples from curriculum if appropriate.)**

The gender diversity of ENV SCI graduates over the seven-year time period is nearly evenly split (46% female, 54% male). Slightly more than half (53%) of our ENV SCI graduates are first generation students. We have little diversity in terms of the ethnic background of our students, 93% of ENV SCI graduates were white.

The gender diversity of the 20 ENV SCI faculty is skewed toward males 60/40. There is little ethnic diversity among ENV SCI faculty. Pretty much any ethnic diversity the ENV SCI had was significantly reduced when the Resch School of Engineering was created.

## 6. Gen Ed, FYS/GPS, CCIHS (Lists)

- Gen Ed Courses offered by ENV SCI
  - ENV SCI 102 “Introduction to Environmental Science” (Natural Sciences)
  - ENV SCI 198 “First Year Seminar” (FYS)
  - ENV SCI 260 “Energy and Society” (Sustainability)
  - ENV SCI 301 “Radioactivity: Past, Present, Future” (Sustainability)
  - ENV SCI 303 “Environmental Sustainability” (Natural Sciences/Sustainability)
  - ENV SCI 334 “Solid Waste Management” (Sustainability)
  - ENV SCI 460 “Resource Management Strategies” (Sustainability)
  - ENV SCI 469 “Conservation Biology” (Sustainability)
- FYS/GPS Courses offered by ENV SCI
  - ENV SCI 198 “First Year Seminar: The Science and History of Monsters” (offered every Fall semester since 2012, and Spring 2015)
- CCIHS Courses offered by ENV SCI
  - ENV SCI 102; Ms. Vicki Howell, Menominee High School
  - ENV SCI 102; Ms. Cathy Smiley, Marinette High School

## 7. Program support and staffing (Chairs: History, trends, and future needs.

### **Depending on program, could be connected to accreditation.)**

In terms of ENV SCI academic support and staffing, there are two immediate needs. First, the staffing of our GIS instruction is shaky at best. The person currently serving as our only GIS instructor is a 75% ad hoc Lecturer/25% Post-Doctoral Research Associate. If this individual ever decided to leave UWGB, there is no one else on campus who could teach the university’s GIS courses (which are required by three different units – Environmental Sciences, Engineering, and Public and Environmental Affairs). Making this position more secure by converting this ad hoc GIS Lecturer position into a GIS tenure-track position is critical. And, as mentioned earlier, creating two tenure-track GIS positions would allow us to create a new minor for a skill that is in high demand. Second, we will need additional staffing if we are to successfully offer a 4-year ENV SCI Bachelor’s degree at the Manitowoc campus. In particular, a broadly-trained Geoscientist who could teach Physical Geology, Soils, and Environmental Systems is needed. Although the Geoscientist is the greatest need at the Manitowoc campus, their Biology and Chemistry faculty are already teaching full loads, so that would also create a staffing issue.

Our recent track record for hiring and keeping Statistics faculty has not been good. With the hire of Prof. Dhanamalee Bandara in 2019, hopefully we have found our statistician for the foreseeable future, but only time will tell.

ENV SCI/NAS and Human Biology share the fourth floor of Lab Sciences. For a number of years now, we have shared the services of two Academic Department Associates – one

who focuses on budgets and contract, the other who sees to the administration of all other departmental duties. This arrangement has worked out well for both units.

## **8. Cost per credit hour (TBD)**

### **External**

As the ENV SCI program is made up of faculty from Biology, Chemistry, Engineering, Geoscience, Mathematics, and Water Science, more specific information on outreach efforts, contributions to regional infrastructure, and scholarship activity can be gleaned from their individual Comprehensive Program Reviews.

1. Outreach: student/faculty partnerships, collaborations, participation with organizations or individually (Lists)
  
2. Contributions to regional infrastructure (Lists)  
ENV SCI faculty, staff, and students have developed working relationships with federal, state, local, and private organizations, such as:
  - Baird Creek Preservation Foundation
  - Bay Beach Wildlife Sanctuary
  - Brown County Extension
  - Brown County Parks and Facilities Department
  - Door County Soil and Water Conservation Department
  - Green Bay Botanical Gardens
  - NEW Water
  - NEW Zoo
  - UW-Sea Grant
  - Wisconsin DOT
  - Wisconsin DNR
  - Great Lakes Coastal Wetlands Monitoring
  - NOAA-NERR
  - US Fish and Wildlife Service
  - US Forest Service
  - Chicago Botanic Garden
  - Smithsonian Institute
  - Foth
  - Oneida Indian Tribe of Wisconsin
  - Sanimax
  - Schreiber Foods
  - Tilth Agronomy
  - Trees for Tomorrow
  - Trout Unlimited
  
3. Scholarly activity of faculty (Lists that are not all-inclusive; maybe seek to highlight the different areas/types of activity)

- Over the seven-year period, ENV SCI faculty have published literally hundreds of journal articles and presented their research at state, national, and international conferences
- Over the seven-year period, ENV SCI faculty have brought in multi-million dollars in grant funding; grant funds provide graduate and undergraduate students the opportunity to work beside faculty on environmental research projects (often paid positions); overhead/indirect costs from this grant funding helps support research efforts across campus such as the Research Council's "Grants in Aid of Research" program
- ENV SCI faculty serve as major advisors for on graduate students' theses projects and as members of graduate students' graduate committees

### **Student Success**

#### **1. High-impact practices and individualized-learning opportunities (Some data provided; lists and/or brief narrative)**

ENV SCI has a strong reputation for providing students with an array of high-impact practices and individualized-learning opportunities, such as:

- Research with Faculty
  - Grant-funded and non-grant-funded opportunities are provided to students to become involved in research at many of the University-owned research sites including the Cofrin Arboretum (on campus), Point Au Sable (5 miles northeast of campus on 54/57), Toft's Point (one mile north of Bailey's Harbor in Door County), and Kingfisher Farm (near Sheboygan)
  - Not only does ENV SCI have excellent outdoor areas to facilitate research opportunities for students, faculty have procured vehicles and equipment to provide hands-on experiences for the students. This includes a fleet of research boats and electrofishing equipment.
  - Incredibly important to students planning to attend graduate school or M.S. students planning to continue on for their Ph.D. is the establishment of a publication record. ENV SCI faculty pride themselves not only in including students in their research, but also including them as co-authors on their publications.
  - Examples of Faculty Funded Research Projects that have included students during the past seven-year period include:
    - Forest Dynamics Plots in the Wabikon Forest
    - Fish Habitat and Ecosystem Restoration on the Bay of Green Bay
    - Soil Quality Assessment and Monitoring
    - Environmental and Water Quality Sensors on the Fox River Watershed
    - Anaerobic Digester/Treatment Studies for Dairy Farms (Tinedale Farms, Green Valley Dairy, Suring Community Dairy, Pagel's Ponderosa Dairy)
- Independent Research
  - Cofrin Center for Biodiversity Student Research Grants. Through the Cofrin Center for Biodiversity and with funding from the 1923 Fund, students have the opportunity to experience the entire research process, from the germ of an idea to the presentation of their results. Under the supervision of a faculty member,

students create a proposal to conduct a research project. They develop their rationale, complete a literature review, state their objectives, determine what materials/equipment they need and what methods they will use, develop an equipment budget, procure the equipment, place equipment in the field, collect their data, analyze their data, state their results, and draw their conclusions. They then present their research before faculty, staff, and fellow students.

- Heirloom Plant Sale Proposals. Graduate and undergraduate students develop and submit proposals to compete for funding derived from the Heirloom Plant Sale to conduct and/or present their independent research.
- Academic Excellence Symposium and Posters in the Rotunda. Dozens of ENV SCI students have presented their independent research on campus at the Academic Excellence Symposium. A subset of those are often selected to present their research in Madison at Posters in the Rotunda.
- Independent Studies – Allow students to pursue research, learn about specialized topics, or learn a new skill. Although these are revenue-generating courses for the university (over 200 independent studies were offered in the seven-year period), they are not part of the faculties teaching load and faculty are not compensated in any way. Yet they remain an important high impact educational experience.
- Internships – Similar to independent studies, internships offer students a fantastic hands-on experience. ENV SCI faculty have supervised dozens of internships over the seven-year period, not as part of their teaching load and without compensation.
- International Travel Courses
  - Chile. A sustainability course to Chile was offered twice, in august of 2015 and 2017.
  - Costa Rica. An introduction to tropical ecosystems and tropical conservation course to Costa Rica was offered several times during winter break.
  - Panama. An ecological fieldwork course to Panama was offered annually during winter break.

**2. Retention (TBD. Note: if program-level data is not provided, maybe list some things your program does that you believe aid in retention.)**

ENV SCI/NAS has had a strong departmental scholarship program for years. For the most part, these are merit-based scholarships for students who have shown their passion and dedication to the environmental sciences. [Need-based scholarships are primarily handled through Financial Aid]. The Scholarship Committee looks to recognize and honor what we call “the complete student,” evaluating the students’ applications on academics, research, and campus and community service and involvement. Over the time period, we received an average of 28 applications each year, we awarded an average of 19 scholarships each year, and awarded an average of \$20,800 each year (scholarships averaged approximately \$1,100 each).

**Mission Relevant**

**1. Relevance to mission (Narrative or lists as appropriate)**

The growing human population has an immense impact on the world’s environment (e.g., deforestation, global warming, degradation of land and water resources, depletion of vital

resources through overconsumption, etc.). It will require a generation(s) of students trained to think critically about the problems that must be solved to combat the environmental issues we are creating for ourselves. The ENV SCI program contributes directly to the University's select mission through its commitment to excellence in classroom instruction, research directly related to environmental matters of critical importance at the local, state, nation, and international level, and serving the community in numerous ways.

The ENV SCI program prepares students to analyze, understand, and solve environmental problems. As an interdisciplinary major, it emphasizes the integration and application of biology, chemistry, engineering, geoscience, mathematics, and physics. Students gain expertise in the major through hands-on field experiences, lab work, field trips, internships, practicums, independent research, and travel courses. Sustainability is always at the forefront of an environmental scientists thinking.

**2. Cultural enrichment (Narrative or lists as appropriate)**

ENV SCI faculty have given numerous presentations to citizens who believe learning continues throughout one's life no matter what their age. For example, a number of ENV SCI faculty (Draney, Luczaj, Meyer, et al.) have presented to the Lifelong Learning Institute and other similar outreach activities.

In addition to educating life-long learners, ENV SCI faculty dedicate quite a bit of their time, energy, and skills to educating K-12 audiences through hands-on activities and demonstrations. This includes large events that reach hundreds, if not thousands of individuals, such as the Einstein Expo, to smaller events that reach dozens of individuals, such as "Water Badge Day" for the Girl Scouts.

ENV SCI faculty involved with the Cofrin Center for Biodiversity manage the Arboretum and other UWGB natural areas. These areas contribute to outdoor recreation and tourism opportunities in our region, from the upper Door peninsula to Marinette to Sheboygan. Once the NERR is established, this will be another important cultural enrichment opportunity for ENV SCI faculty.

**3. Access (Does the program have any agreements with other institutions? For example, a transfer agreement with a technical college.)**

We are currently in the process of developing an articulation agreement between UW-Green Bay (Environmental Science Major – General Emphasis) and NWTC (Environmental Engineering Technology – Associate of Applied Science).