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What is so special about Appalachian Geological and Environmental Sciences?

Appalachian Geological and Environmental Sciences provides a solid foundation for a successful career in the earth and environmental sciences that goes beyond these stereotypes of the disciplines that are listed previously. aGES has one of the nation’s largest undergraduate-only departments focusing exclusively on Earth and the Environment. Many of our faculty are internationally recognized experts in their fields of research and have conducted research on all seven continents, in over 50 countries, and from the peaks of the Himalayas to the Pacific Ocean’s floor.

We have chosen to focus entirely on high-quality, undergraduate instruction, rather than split our time between undergraduate and graduate students. This devotion to undergraduate education and research goes back a long way. Appalachian’s first geology major graduated in 1949. Since then, we have awarded more than 450 degrees in Geology/Earth Science. Since 2017, the Environmental Science Program has been part of aGES. We look forward to graduating an equal number of these students in the years to come.

Special privileges, such as dedicated computer facilities, 24/7 student access to a variety of labs, and the world-class natural setting of the Boone region make Appalachian a great place to study the earth and environmental sciences. Close personal interactions between faculty and students provide many opportunities for independent research; we actively involve our undergraduate students in research, and many students typically author or co-author presentations at regional, national and international meetings, and publish peer-reviewed manuscripts with faculty members in top-tier journals. Explore more about the research our faculty are doing at our website.

The fundamental goal of aGES is to promote a scientific understanding of earth and environmental systems - an awareness essential to an environmentally sound and sustainable future for the human race. Our specific goals are:

- To provide all students with the opportunity to learn about the nature of science and basic scientific principles through the study of geology and environmental science.
- To introduce students to the many ways in which geology and the environment are interwoven into the fabric of modern civilization.
- To provide students with an understanding of the interrelationships of the basic parts of Earth systems.
- To provide students who seek a career in geology and/or environmental science with the sound background for productive work in the profession and in graduate studies.
- To provide present and future teachers with the knowledge and methods necessary for competent instruction in earth and environmental sciences.
- To provide members of the public with the opportunity to gain a better understanding of the Earth systems of which they are a part.
**Degree Programs in Appalachian Geological and Environmental Sciences**

aGES provides students with a solid foundation on which to build a successful career in the geology/earth science and environmental science disciplines. We are the largest undergraduate earth and environmental sciences department in the UNC system, and we have been successful in establishing a program that is arguably among the best Bachelor degree programs available in the southeastern United States.

The aGES Geology Program offers both a Bachelor of Arts and Bachelor of Science degrees in geology. Students may also opt to concentrate in a specific sub-discipline within geology/earth science, such as:

- B.S. Geology, Concentration in Paleontology
- B.S. Geology, Concentration in Environmental Geology
- B.S. Geology, Concentration in Quantitative Geoscience
- B.S. Geology, Concentration in Earth and Environmental Science Secondary Education

The aGES Environmental Science Program offers a Bachelor of Science degree in Environmental Science. Students may also opt to concentrate in:

- B.S. Environmental Science, Concentration in Environmental Professional
Why study Geology? Why study Environmental Science? Why study at Appalachian Geological and Environmental Sciences (aGES)? What degree is right for me?

These are questions that we receive all of the time from prospective students, current Appalachian students considering one of our degrees, and even students who are already in the department! Below we consider all of these questions and make an attempt to answer them. Two things to keep in mind, however, are:

Geology/Earth Science is about more than just rocks.

Environmental Science is about more than just ecology, policy, or regulations.

Keeping track of the various environmentally-related and other degree tracks at Appalachian can be confusing. Below we answer typical questions that we get about degrees in aGES versus others available at Appalachian.

(1) I want to work in the environmental industry. I want to work for the U.S. Environmental Protection Agency or the U.S. Geological Survey. What degree should I get?

We strongly recommend the BS Geology – Concentration in Environmental Geology or Concentration in Quantitative Geoscience. These degree tracks are designed to provide students with the hands-on, field-based training in demand by the environmental industry. Students in these programs receive considerable field-based training as well as GIS coursework, and typically find employment in the environmental industry immediately upon graduation. We have developed a strong alumni network in the environmental science industry in the southeast in the last several years, and Appalachian Geology graduates are in high demand. Moreover, students in these tracks will have the background to begin the licensure process to become a Professional Geologist (PG), which is a necessary licensure for career advancement in the environmental industry (companies with licensed PGs on staff are more competitive for contracts and grants). Students in our program are encouraged to take Part I of the Association of State Boards of Geology (ASBOG) licensure exam their senior year. The BS Environmental Science degree is also an option, and these graduates may also be eligible for PG licensure if they have at least 30 hours of geology courses as part of their degree. This is possible, and if interested, students should discuss those options with their academic advisor.

If you aren't 100% sure you want to work in the environmental industry, but want to keep your options open, note that all geology degrees (except for the Geoscience Education track) in aGES make you eligible for a Professional Geologist (PG) license after you have five years of work experience and pass both the Geologist in Training exam upon graduation and the PG exam after you earn your experience.
(2) *I am interested in environmental policy or environmental law. What degree should I get?*

Students who are interested in working in environmental policy while desiring a strong science background typically choose the **BS Environmental Science – Concentration in Environmental Professional.** These students will be prepared for regulatory rather than technical jobs in environmental fields, but will still receive intense training in the natural sciences and in mathematics. Students are typically employed in environmental policy positions and state/local government.

Students who wish to study the environment from a social justice angle may be better served by the **BS Sustainable Development – Concentration in Environmental Studies** degree, where students are prepared for careers that help build connections between environmental scientists, policy makers, and the general public. Graduates of this program tend to look for work with non-profit environmental organizations, advocacy groups, some government agencies, and private businesses, but do not receive the scientific/field training required for employment by environmental consulting firms.

For those who are interested in the role that business practices and economics plays on the environment, a **BA Economics - Concentration in Environmental Economics and Policy** may be what you are looking for. Students who go into this program typically find work with government or non-profits with a focus on environmental issues.

(3) *I am interested in doing some type of environmental work, but I do not like math or science. What degree should I get?*

All of our degree tracks require at least Calculus I, and nearly all require Calculus II, too. Additionally, all of our degree tracks require two semesters of chemistry and at least one, but mostly two, semesters of physics. For severely math-phobic students, the Geology and Environmental Science degree tracks are probably not your best choice of major. In our experience, though, many incoming students who think they hate math actually like it a lot once they come to college. Some students know they want to major in something associated with the environment but prefer a more hands-on degree involving sustainable building systems and sustainable technologies rather than studying the natural sciences. These students typically major in programs within the **Department of Sustainable Technology and the Built Environment.** Other students have found that the programs in the **Department of Recreation Management and Physical Education** better suit their needs, particularly those who want to lead outdoor education programs or work in adventure tourism. Students who are interested in agriculture and its role in the environment may be interested in the agroecology program in the **Department of Sustainable Development.**

(4) *I want to work as a park ranger at a national or state park. I want to work for an agency like the U.S. Fish and Wildlife Service. What degree should I get?*

For those with an interest in the environment from a biological perspective, the **BS Biology – Concentration in Ecology, Evolution and Environmental Biology** is the degree track
for you. Upon graduation, students in this degree track typically work with state and local
governments or go into graduate programs.

(5) I am interested in going to graduate school to study geology/earth science or environmental
science instead of going directly into the workforce. What degree should I get?

About 40% of our students go on to graduate school. Our students typically receive full
tuition waivers and stipends to attend graduate programs, so paying for graduate
school is not usually a problem in the geosciences. For students who wish to go on to
graduate school in the earth/environmental sciences rather than directly into industry, we
highly recommend the BS Geology – Concentration in Quantitative Geoscience degree.
This is one of our most intense (and popular) degree tracks, which provides students with a
math minor and a variety of computational coursework. For those less interested in math,
the BS Geology also provides an excellent gateway to graduate school, as does the BS
Geology – Concentration in Paleontology degree for those interested in paleontology and
earth history.

(6) I want to work in a government or commercial laboratory doing environmentally-related
work, such as water testing, toxicity analysis, etc. What degree should I get?

Other students are interested in concentrating on the chemistry side of the environmental
sciences. For these students, the BS Chemistry – Concentration in Environmental
Chemistry degree is for you. Students in this program typically go on to graduate school or
directly into laboratory positions within industry or government.

(7) I am interested in instrumentation used in environmentally-related research. What degree
should I get?

Students who are more interested in physics, electronics, and developing instrumentation
can get a BS Applied Physics – Concentration in Environmental Physics degree.
Students in this program typically go on to graduate school or are employed in industry
laboratories upon graduation.

(8) I want to be a paleontologist or work in museums. What degree should I get?

The BS Geology - Concentration in Paleontology is the track for you. We are one of the
only schools in the country with a dedicated paleontology degree track!

(9) I want to be a middle school or high school earth and environmental science teacher. What
degree should I get?

The BS Geology – Concentration in Earth/Environmental Science Secondary
Education degree track qualifies graduates for double licensure in Earth/Environmental
Science and Comprehensive Science in all NC schools.
Awards and Financial Support in the Department and College

aGES Awards and Scholarships

Departmental awards and scholarships are presented by the aGES faculty at the department's annual awards banquet in April. To be eligible for these merit-based awards, a student must be taking a full-time load of aGES courses and be making reasonable progress toward graduation. Substantial factors in determining scholarship and award winners are enthusiasm, academic achievement, and promise as a professional. Definitions of academic class (i.e. freshman, sophomore, etc.) are those specified in the Undergraduate Bulletin. Please note that several of these scholarships require applications.

aGES Scholarships

aGES gives a number of scholarships to Geology and Environmental Science majors. The number of scholarships and the amount that is awarded varies year-to-year due to variations in the output of the endowment. The following paragraphs list the name of each scholarship and a brief description of the requirements of each scholarship.

Lloyd L. Hobbs Scholarship

This scholarship goes to rising juniors or seniors majoring in an area of the physical sciences within the College of Arts and Sciences. GES awards two of these scholarships, one to a geology major and one to an environmental science major. Nominations are made by aGES faculty, who also vote on the recipients. Nominees must demonstrate and maintain satisfactory academic progress and have at least a 3.0 GPA. The award amount varies in accordance with investment performance.

Loren A. Raymond Research Grant

This scholarship goes to support field-based research by a junior or senior in the broad fields of petrology, structural geology, stratigraphy and geologic mapping. The awardee must supply a project proposal, a budget and a letter of support from a faculty member, who will be the student’s research advisor. The award amount varies in accordance with investment performance.

Fred Webb, Jr. and Barbara Haynes Webb Endowed Scholarship for Summer Field Course

This award goes to a junior or senior geology major who is attending a field geology course outside of North or South America. The student must have a GPA or 2.8 or higher, have significant academic potential, and demonstrated sustained dedication to the profession of geology. The awardee must submit a letter of application. The award amount varies in accordance with investment performance.

McKinney Paleontology Scholarship

The McKinney Paleontology Scholarship was established in 2011 in honor of Dr. Ken McKinney’s contributions to paleontology and the Department of Geology at Appalachian. The award varies based on fund availability.
Mark DeBroder Memorial Scholarship

This scholarship was started by Mr. Glen DeBroder in memory of his son, Mark, who opened the EspressoNews coffee shop in downtown Boone. Geology faculty, staff and students were such regulars at the shop when it opened in 1994 that Mark was named an honorary member of the department. The scholarship is typically awarded to a rising senior. The award amount varies in accordance with investment performance.

aGES Undergraduate Research Assistantships

aGES offers undergraduate research assistantships to Geology and Environmental Science students. Awards are made based on nominations by faculty members of aGES, who vote on the recipients of the awards. The number of funded URAs varies by year based on funding, and awards may be given to an aGES student at any point in their career. URAs are awarded primarily on the basis of superior academic performance and promise as a professional. Awardees are given $1000 per semester and are expected to (1) do mentored research for at least 5 hours per week, (2) attend the weekly aGES seminar, and (3) be active in the department. Awardees must also remain in good academic standing while holding the URA. Once supported by a URA, awardees typically hold these assistantships until graduation as long as expectations are met.

aGES Awards

aGES gives a number of awards to Geology and Environmental Science majors. The awards are presented at the spring banquet. Awards vary year-to-year, but usually include some sort of appropriate prize. The following categories list a description of each scholarship.

Promising New Major Award for Geology and Environmental Science Majors

This award goes to new aGES majors who have completed GLY 2250 – Evolution of the Earth and who show promise of being a successful major in GES. An overall GPA of 3.0 or greater, and performance in introductory geology, environmental science, GLY 2250 and other science courses, including independent research, will be the criteria on which this award will be based. The non-cash award varies year-to-year.

Outstanding Field Geology Student Award

This award goes to a geology student with a geology GPA of greater than 2.70. Performance in field work in GLY 2745 – Preparation of Geologic Reports, GLY 3150 – Principles of Structural Geology and Tectonics and GLY 3800 – Introduction to Stratigraphy and Sedimentology are major criteria on which this award is based. The award varies year-to-year in accordance with investment performance.

Outstanding Junior Environmental Science Student Award

This award is meant for an environmental science major who shows promise of being an outstanding senior. An overall GPA greater than 3.0, and performance in ENV 3105 (WID) and ENV 3560 will be the main criteria on which this award is based. The award amount varies in accordance with funding availability.
Geology Transfer Student Award

This award goes to a student majoring in geology who has transferred 28 student credit hours or more to Appalachian from other colleges or universities, not including any AP credits. This student will have completed a minimum of 14 student credit hours at ASU, and in these courses the student will have a cumulative GPA of greater than 3.00. This award will also look at academic achievement, participation in extra-curricular departmental activities, financial need, and promise, potential and intent for a career in geology. The award amount varies in accordance with funding availability.

Quantitative Geoscience Major Award

This award goes to a student with a geology GPA greater than 2.7. Performance in GLY 3160 – Introduction to Geophysics, GLY 3455 – Quantitative Data Analysis for Earth and Environmental Scientists, GLY 4630 – Hydrogeology and GLY 4705 – Advanced Environmental and Engineering Geology and other quantitative science courses, including independent research, will be the criteria on which this award is based. The awardee receives a student edition of MATLAB.

Mineralogy Award

This award is determined on the basis of the awardee’s performance in GLY 3220 – Fundamentals of Mineralogy and/or GLY 3715 – Petrology and Petrography. The student must be participating in research related to mineralogy, geochemistry, petrology or a related field. The awardee receives an Estwing rock hammer.

Outstanding Leadership Award in Environmental Science

This award recognizes students with the highest potential for successful leadership in an academic or professional career. Winners hold leadership position(s) in academic, intramural, and/or extramural organization(s). They also served as examples of a strong scholarly ethic with the demonstrated ability to lift a group of peers to a higher level.

Geology Distinguished Senior Award

This award is given to the seniors who have distinguished themselves through academic achievement, service to student colleagues and the department or other meritorious activities. To be eligible, students must have an aGES GPA greater than 3.00.

Environmental Science Distinguished Senior Award

This award is given to the seniors who have distinguished themselves through academic achievement, service to student colleagues and the department or other meritorious activities. To be eligible, students must have an aGES GPA greater than 3.00.

Roy Sidle Award for Outstanding Achievement in Environmental Science Research

This award recognizes a senior student who has a GPA of greater than 3.0 and has demonstrated exceptional achievement in student research, as demonstrated through active, positive, and sustained membership in a research team or teams at Appalachian or elsewhere (e.g. REU, International, etc.). This
is purely an academic achievement award and should be heavily weighted to the student’s potential for productive and valued research at the graduate level and beyond.

Environmental Science Academic Achievement Award

This award is given to the graduating environmental science senior who, while at ASU, has (1) completed at least 40 credit hours of science and mathematics courses, (2) taken a load of at least 12 credit hours in each semester in which science or mathematics courses were completed, and (3) earned the highest GPA among his or her classmates in science and mathematics courses.

Geology Academic Achievement Award

This award is given to the graduating senior in any non-teaching GLY degree track who has (1) completed at least 40 hours of science and mathematics courses, (2) taken a load of at least 12 hours in each semester in which science or mathematics courses were completed, (3) completed 12 or more hours of geology courses above the 1000 level, (4) earned a GPA of 3.0 or greater in science and mathematics courses, and (5) earned the highest GPA amongst her or his peers in science and mathematics courses.

Outstanding Senior in Environmental Science Award

This award is meant to recognize students with strong academic performance and achievement in research, service, internships, work abroad, outreach, and/or other forms of engagement or leadership. Award winners have their names placed on a granite plaque on the wall outside the McKinney Museum.

Outstanding Senior in Geology Award

This award is given to a student who has an overall GPA greater than 3.0, has taken an average of 14 hours per semester, has placed a higher priority on geological rather than other activities, has participated in extra-curricular geology activities such as field trips, has attended professional meetings, and has demonstrated a level of interest in the profession beyond that expected in formal classes. Those eligible for the award must have graduated in the December prior to the banquet, or will graduate in May or August following the banquet. Award winners have their names placed on the granite plaque on the wall outside the McKinney Museum.

aGES Employment Opportunities

Undergraduate Teaching Assistantships

Undergraduate Teaching Assistantships (UTAs) are competitive awards available to geology majors who have completed Geology 2250 with a C or better. These awards of $300/semester provide majors with the opportunity to gain experience in assisting professors in introductory geology laboratories. Service required of recipients consists of approximately two (2) hours per week during laboratory and 0.5 to 1 hour of preparation. Duties include answering students’ questions, aid in test administration, and other tasks associated with preparation of and teaching laboratories.
**Answersphere**

The Answersphere is the in-house tutoring system in the Department of Geological and Environmental Sciences and the McKinney Teaching Museum. The Department hires aGES majors to assist students in introductory geology classes. All sessions are held in the McKinney Teaching Museum located on the first floor of Rankin Science South. Working in the Answersphere is excellent experience for aGES majors planning to attend graduate school, planning a career in secondary education, or polishing those interpersonal communication skills that are so important.

**College of Arts and Sciences (CAS) Scholarships**

There are a couple of scholarships that are available specifically for STEM students through CAS. Details are listed below.

**The Jonathan K. Perryman Memorial Scholarship for the Sciences**

This endowed scholarship was established in memory of Jonathan K. Perryman by family members, friends and colleagues. Applicants must be full time students, rising juniors and seniors and majoring in either Biology, Chemistry, Geology, Physics and Astronomy, Mathematics or Computer Science. Applicants must demonstrate satisfactory performance of at least a 3.0 grade point average. The award is renewable based upon reapplication and reselection. The Office of the Dean of the College of Arts and Sciences collects applications and nominations, then conducts the selection process according to established guidelines. For additional information, please contact Dr. Dru Henson (hensonda@appstate.edu), Assistant Dean, College of Arts and Sciences at (828) 262-3078.

**The Richard A. Thomas Memorial Scholarship for Arts and Sciences**

This endowed scholarship is established as a memorial to Richard A. Thomas. The scholarship guidelines specify that applicants must demonstrate a verifiable need for financial support and that a financial aid form must be on file. Applicants must have completed the freshman year at Appalachian and must be pursuing a major within the College of Arts and Sciences. In addition, applicants must display success and progress in academics, leadership potential, and co-curricular activities. The award is directed to be renewable based upon reapplication and reselection. Mrs. Alice T. Thomas, the donor who established this scholarship endowment, would genuinely appreciate a letter from scholarship recipients detailing their background and ambitions. The Office of the Dean of the College of Arts and Sciences collects applications and nominations and then conducts the selection process in accordance with established guidelines. For additional information, please contact Dr. Dru Henson (hensonda@appstate.edu), Assistant Dean, College of Arts and Sciences at (828) 262-3078.