EASTERN ILLINOIS UNIVERSITY *report summary form updated: 1/26/2022*

Eight-Year Program Review IBHE Report Summary: see attached Resources page

PROGRAM REVIEW REPORT SUMMARY

1. Eastern Illinois University

2. B.S. in Geology (40.0601)

3. January 21, 2025

4. Dr. James Davis

4.1. (217) 581-2626

4.2. jadavis2@eiu.edu

5. OVERVIEW

The Geology Program aims to provide a high-quality undergraduate education, achieve excellence in research, and interact with society and citizens through research and outreach.

The University Learning Goals are reflected in the goals of the program. Students are expected to engage in **Critical Thinking** throughout their curriculum. Many of our classes require papers and/or presentations demanding that students find sources, evaluate them, mine useful information, and present their argument(s), thus supporting the University Learning Goal of **Writing and Critical Reading**. For presentations, students gain skills in **Speaking and Listening**, such as organizing information in a logical manner, showing their skills at scientific discourse, demonstrating poise and good communication skills. Our students must show some mastery of **Quantitative Reasoning**, as well; students take math through Calculus I and many lab activities also require our student to use quantitative reasoning. Last, but not least, **Responsible Citizenship** is at the core of the program in learning about stewardship of Earth and conservation. In addition, there are also a number of program goals that assess discipline specific knowledge and skills (i.e. knowledge about Earth History, or Earth Materials, etc.).

There are many Geology Programs in the state of Illinois. Our program is unique because we do not have a graduate program and we are a state institution. The culture at Eastern Illinois University is very different from that at the University of Chicago, Wheaton College, or the University of Illinois at Urbana-Champaign. The students we attract are looking for a medium-sized school that is affordable and has faculty that are focused on undergraduates.

Our graduates are employed at companies/organizations such as AECOM (St. Louis), ISGS, University of IL, Rochester High School, People's Natural Gas, and Geosyntech Consultants and have pursued graduate degrees at University of Alabama, University of Nevada, Reno, University of Arizona, Washington University, Western Michigan and University of IL to name a few. We have a small number (3) of dedicated faculty. Over the years we have been successful in securing both internal and external grants, in publishing research, presenting faculty and student research at regional and national professional meetings, and in winning various university accolades and awards. Geology majors who actively seek employment directly after graduation or who pursue admission to graduate school are 100% successful and have been for over a decade. In recent years, we have also established on-going internships with organizations such as the IL EPA and Eagle Mine as our students have performed so well in those positions.

6. MAJOR FINDINGS AND RECOMMENDATIONS

a. Description and assessment of any major changes in the program.

Changes in the overall discipline or field. In the last few decades, many programs have moved away from being called Geology. Traditional geology programs have been replaced by earth and environmental science, geoscience, or earth systems science programs. This reflects a drive to broaden the field to include climatology, environmental science, and oceanography.

Student demand. Nationally, enrollment was highest in the late 1970s/early 1980s due to world events surrounding the oil embargo. Numbers crashed in the mid to late 1980s. However, due to the oil shale boom in the mid 2010s, numbers again rose. However, that peak is behind us (~2016) and with it has come a decline in numbers of students majoring in Geology nationally. This has led to decline that equal those seen in the 1980s. With regard to EIU in particular, in the last 10 years, our major numbers have ranged from 26 in the fall of 2015 to 9 in the fall of 2021. During the last 10 years, enrollment at EIU has dropped overall from 6535 to 3543 undergraduate students. Over the last 3 years, we have averaged 12 majors. Since the last IBHE review in 2017, our major numbers have declined slightly. Western Illinois University and Southern Illinois University have seen similar downward trends. SIU-Carbondale has a few more majors than we do (19-25). WIU is hovering at about the same numbers as us.

Societal Need. There continues to be a societal need for geologists/geoscientists. According to the Bureau of Labor Statistics, the highest levels of employment are in: 1) Architectural, Engineering, and Related Services, 2) Management, Scientific, and Technical Consulting Services, 3) Federal, State and Local Government, and 4) Oil and Gas Extraction. The highest concentration of employment is in 1) Oil and Gas Extraction, 2) Metal Ore Mining, 3) Architectural, Engineering, and Related Services. Employment for geoscientists is expected to grow by about 5% between 2023-2033 according to the Bureau of Labor Statistics.

Institutional Context for Offering the Degree. The Geology degree has a long, proud history at EIU. We offer courses that can be attractive to students outside the major, as well, particularly general education offerings (GEO 2450G Oceanography and GEO 1300G Introduction to Earth Sciences). We often have graduate students from the Sustainability program enrolled in GEO 4850 Environmental Geology. GEO 2450G serves as an elective for Geography majors. We have a number of classes which Science Teacher Licensure students must take within their degree program, even more if you include those majoring in Earth Science with Teacher Licensure. GEO 3275 Planetary Geology is part of the Astronomy major offered through Physics.

Other Elements. We have had the same enrollment rate or better for over a decade; our major is fairly LOW cost as we have 2 full time Unit A (one does teach 1 or 2 classes a year for the Science Teacher Licensure program in addition to geology program classes) and ONE full time Unit B faculty members. Additionally, all experiments, travel, research costs, etc. are either born by the faculty member (through grants/awards) or utilize pre-existing materials in most cases. Geology majors who actively seek employment directly after graduation or who pursue admission to graduate school are 100% successful and have been for over a decade. In recent years, we have also established on-going internships with organizations such as the IL EPA and Eagle Mine as our students have performed so well in those positions.

b. Description of major findings and recommendations, including evidence of learning outcomes and identification of opportunities for program improvement

Assessment of Student Learning Outcomes for the B.S. in Geology Program is done using a number of different methods. One of our best assessment tools for discipline specific knowledge (earth materials, plate tectonics, internal processes, major physical and historical events, interactions among spheres, and surface processes) is a pre and post test administered in GEO 1300G (Introduction to Earth Sciences). Our goal was to see a gain in knowledge (increase in number of correct answers from pre-test to post-test. Using that instrument, we found that all discipline-specific goals were met, except that with regard to interactions between major processes occurring within the major spheres (this includes recycling of materials and majors cycles, like the hydrological cycles, the carbon, cycle, etc. This SLO was not met in the fall of 2022. However, in the following 2 semesters (Spring ’23, Fall ’23) the SLO was met. In Spring of ’24 no questions pertaining to this

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SLO were used on the instrument. Overall, we are seeing gains in knowledge due to our teaching according to the results of the post-tests compared with the pre-tests given in GEO 1300G.

In addition to the pre/post test instrument used in GEO 1300G, we also use embedded exam questions and various assignments in upper-level classes within the major. One of the SLOs focuses on Equity, Diversity, Inclusion and Global Citizenship. An assignment from GEO 4850, Environmental Geology, is used to assess whether this SLO is met; it is a research project focusing on Waste, Health and Pollution. Student must then relate it to a community. While the students did a great job researching the specific problems, they did not always investigate and evaluate the issues of environmental justice and its impacts on different groups. Our target was that 75% of the students would, but only 31% of the students completely met this goal. When the SLO was evaluated using a final exam question from the same class (about the Flint Water Crisis or Mercury Poisoning in Minamata Bay in the mid-20th century), the goal was met by the whole class.

Our majors easily met SLOs related to Scientific Inquiry/Critical Thinking and Discourse and Communication. Our majors are engaging in scientific inquiry and critical thinking skills to question, examine, evaluate, and respond to problems or arguments. To assess this SLO assignments from core major classes were evaluated. Our core major classes often require papers and presentations. Those were used to assess the SLO focusing on Discourse and Communication. Our expectation was that students would be able to clearly express and communicate geological concepts and present information in written, oral, and/or graphic format and that students would incorporate vocabulary specific to geology.

c. Actions taken since the last review

Since our last IBHE review in 2017, we have not made many changes to our curriculum. We have added GEO 3275 Planetary Geology, an upper-level elective, to our curriculum. We have also streamlined a few classes. In Fall 2019/Spring 2020 we transitioned from requiring majors to take GEO 1430 Historical Geology (not a lab class) and GEO 4490 Invertebrate Paleontology (a lab class) to having them only take GEO 2200 History of Earth (a lab class) which incorporates elements of historical geology and paleontology.

Since 2017, EIU has changed the process for departmental assessment, thus requiring us to reconstruct our assessment plan. We used to use student portfolios which students would turn in and all faculty would assess according to our SLOs; the assessment chair would synthesize the data. Now it is up to the professors to collect, analyze, and interpret data. We were using graduating senior and alumni surveys, which is mentioned in the last IBHE report. We did implement them, but then in the redesign, they were left out.

A faculty member who consistently works with independent study students has received an upgraded camera for her microscope/computer setup. In addition, computers are being replaced every 5 years.

d. Actions to be taken as a result of the review

For assessment, we will design and incorporate both graduating senior and alumni surveys to help evaluate whether we are meeting our Student Learning Outcomes. While we are meeting our SLOs, our process needs some refinement. Input from the Dean's Office, based on the submitted assessment report (using data from the last 2 years), suggests that, "it relies too heavily on student course and assignment grades to measure the majority of the defined SLOs." This is something we have resolved to fix for the next report.

Comments from the College Dean:

The B.S. in Geology remains a successful program at EIU. The number of students majoring in Geology has declined slightly from 14 in Fall 2017 to 12 in Fall 2024. This pattern is consistent with EIU's in-state peer institutions. The program remains comparatively low cost and very efficient with two Unit A and one Unit B Geology faculty currently on staff. In terms of the anticipated societal need, employment for geoscientists is expected to grow by about 5% between 2023-2033. Geology has made several curricular changes since the last report with a focus on streamlining program requirements. It's worth noting that Geology majors who actively seek employment directly after graduation or who pursue admission to graduate school are 100% successful and have been for over a decade.

We recommend a decision of **Program in Good Standing**

VPAA Decision:

- (●) Program in good standing
- ( ) Program flagged for priority review
- ( ) Program enrollment suspended

VPAA Explanation:

40.0601 B.S. in Geology

The summary above describes several key developments within the B.S. in Geology program. Beginning with a brief contextual explanation of the spikes and declines in student enrollment (12 on average over the past three years), tied to major energy crises through the decades, the program articulates its emphasis on attention to undergraduate education and career success. The program has streamlined course requirements, aligned surveys in first-year and advanced courses to student learning outcomes, and started conversations on implementing a senior exit survey and an alumni survey. Of particular note are the Geology program's important focus on environmental stewardship and its longstanding work with community and corporate internships for its students.

EASTERN ILLINOIS UNIVERSITY

Resources for Completing the Eight-Year IBHE Program Review Report

Section 5. Overview

This section will focus the review for your reader.

In no more than half a page, please explain your program's mission and its relationship to Eastern's mission (and, if applicable, to the mission of graduate education). Identify similar programs in the state; distinguish your program from them. You also should identify your program's student learningobjectives and career/further education objectives, and summarize significant changes, achievements (byfaculty and students and the program itself), and plans for the future.

Section 6. Major Findings and Recommendations

These are the standard IBHE questions:

a. Description and assessment of any major changes in the program:

(1) changes in the overall discipline or field
(2) student demand
(3) societal needs
(4) institutional context for offering the degree
(5) other elements appropriate to the discipline in question

What, if any, internal or external events have affected your program since the last review? Have enrollments, degree production, costs, student satisfaction, job placement, etc. changed significantly? Has the discipline's governing body approved a new name for the programs it represents; updated/revised curricular requirements; identified new markets; developed new emphases? Have nationwide demographic changes or social policies affected enrollments or requirements for good or for ill?

In addition to the items included in the "Accountability" section of the VPAA website (see the left-hand navigation box at http://castle.eiu.edu/~acaffair/), the resources listed below may help you to respond toitem 6.a:

1. The IBHE Data Bank http://www.ibhe.state.il.us/Data%20Bank/default.htm includes the *Data Book*, which provides statewide discipline-based data on enrollments, degree production, and costs; as well as a variety of other data on statewide enrollments, degree production, credit hour production, and costs.

2. The Institutional Research web page available at https://www.eiu.edu/ir/ houses EIU's Data Books and the IBHE Alumni survey results, as well as a great deal of information about EIU students (ACT scores, degrees awarded, retention rates, etc.)

3. Occupational projections are available from many professional journals and organizations, as well as:

a. the Bureau of Labor Statistics http://stats.bls.gov/
b. ISBE's Educator Supply and Demand Report http://www.isbe.state.il.us/research/htmls/supply_and_demand.htm
c. the Illinois Workforce Information Center http://www.ides.illinois.gov/Pages/Workforce_Information_Center.aspx

4. Staff members in the Office of Institutional Research also are available to aid you in assembling and analyzing administrative data.

b. Description of major findings and recommendations, including evidence of learning outcomes and identification of opportunities for program improvement

While 6.b also asks you to discuss other significant findings, it is basically the assessment section of the program review. As such, the responses here are crucial to your review's success. Departments that cannot demonstrate that their assessment programs meet the established guidelines will be expected to revise those programs within six months of the final review deadline. The IBHE's **assessment guidelines are appended to this document.**

Since your overview already identifies your student learning objectives, focus here on the assessment program and its results. What measures are you using to assess learning? How well are students achieving the objectives identified for them? What are their specific strengths and weaknesses? What changes have you made and will you be making as a result of assessment? Emphasize direct assessment, but mention the indirect measures you are using as well. Support your generalizations with specific data/evidence. And be sure to include feedback from key stakeholders—students, alums, employers, peer reviewers, etc.—since the IBHE requires it.

c. Description of actions taken since the last review, including instructional resources and practices, and curricular

d. Description of actions to be taken as a result of this review, including instructional resources and practices, and curricular

6.c and 6.d are straightforward. However, by this point, you already may have mentioned the most significant actions your department has taken/is planning to take. Do not repeat yourself. Merely refer the reader to a previous section or sections.

Section 7. Outcome

After consultation with the College Dean, the Provost's Office will indicate whether the program will be deemed "in good standing" or "flagged for priority review." The latter category is used to identify programs experiencing serious concerns—significantly low enrollments, high costs, negative accreditation findings, below-average pass rates on statewide exams, below-average employment placement rates, a continuing lack of satisfaction among students or employers, etc. Departments will be asked to examine and address the identified concern(s) and report the results in an interim review, due in 1-3 years.Typically, however, the IBHE program review results in a positive decision, and the next review is due in eight years.