WICHITA STATE UNIVERSITY

Program Review Self-Study Template

Academic unit: Geology

College: Fairmount College LAS

Date of last review 2018

Date of last accreditation report (if relevant) NA

List all degrees described in this report (add lines as necessary)

Degree: BS Geology CIP* code: 40.0601

Degree: MS EEPS CIP code: 40.0601

Degree: CIP code:

*To look up, go to: Classification of Instructional Programs Website, http://nces.ed.gov/ipeds/cipcode/Default.aspx?y=55

Certificate (s):

Faculty of the academic unit (add lines as necessary)

Name	Signature
Dr. William Bischoff	WDB
Dr. Collette Burke	CNB
Dr. Keith Gray	03/28/18
Dr. William Parcell	WCP
Dr. Andrew Swindle	
	03/25/18

Submitted by: Date 3/30/18
(name and title)

In yellow highlighted areas, data will be provided

1. Departmental purpose and relationship to the University mission (refer to instructions in the WSU Program Review document for more information on completing this section).

a. University Mission:

The mission of Wichita State University is to be an essential educational, cultural, and economic driver for Kansas and the greater public good.

b. Program Mission (if more than one program, list each mission):

Geology BS Program

The mission of the Department of Geology program is to prepare students with the scientific knowledge to proceed to geologic careers in industry, government, or to be admitted to a geology graduate program. Students are prepared for certification/registration on a state or national level where appropriate. Students are prepared with the background and skills to enable them to continue to learn, develop and adapt to changing conditions throughout their careers.

EEPS MS Program

The mission of the EEPS Program is to train scientists, professionals, and educators who will be well equipped with general knowledge and skills in methodology, critical and creative thinking in scientific research, and advanced knowledge and skills in geology, environmental science, or physics.

c. The role of the program (s) and relationship to the University mission: Explain in 1-2 concise paragraphs.

The degree programs offered through the Department of Geology include a Bachelor of Science in Geology and a Master of Science in EEPS which support the mission of the College of Liberal Arts and Sciences to "cultivate intellectual curiosity and foster contemplation of the human experience and the natural world," through teaching (1) a curriculum covering the theoretical and applied fields of geology and allied sciences, (2) supporting scholarly research, and (3) supporting professional service.

In similar ways, we support the mission of the University in (1) preparing students with the scientific knowledge expected for geologic careers in national or international industry, government, or academia, (2) transmitting a high quality training of students in sustainable approaches to energy, water and mineral resource exploration and management, and (3) continuing a long history of collaboration with and staffing of local petroleum and environmental companies.

d. Has the mission of the Program (s) changed since last review? ☐ Yes ☒ No

i. If yes, describe in 1-2 concise paragraphs. If no, is there a need to change?

e. Provide an overall description of your program (s) including a list of the measurable goals and objectives of the program (s) (programmatic). Have they changed since the last review?

☐ Yes ☒ No

If yes, describe the changes in a concise manner.

Description of Undergraduate BS Geology Program

The Department's BS in Geology program is based on a traditional applied geoscience education format. There are no regional or national accreditation requirements for the program. The BS degree provides comprehensive training in geology and allied natural sciences, prepares graduates for applied professional work in industry or government, as well as for graduate study in any field of geoscience or environmental sciences. The BS curriculum requires a minimum of 45 hours in geology. In addition, students are required to complete Calculus I and II, Elementary Statistics, General and Inorganic Chemistry, and General College Physics I and II or University Physics I and II. Therefore, the department recommends that students who expect to earn the BS in geology should enter the program with a strong background in geometry, trigonometry, algebra, and chemistry.

The program goals include:

- Prepare individuals for employment in geologic careers in industry, government or academia
- Foster professional growth and commitment to lifelong learning for students and faculty
- Support and encourage scholarly research in the geological sciences
- Ensure efficient and effective program operations consistent with the college, University and profession.

Please see attached **Appendix I** for elaboration of the above goals.

Currently, the main outcome measure of student learning is performance is through the department's geology courses as described further in section 3c.

Description of Masters EEPS Program

The EEPS program offers students an opportunity for faculty-directed, multidisciplinary, graduate education and research to investigate Earth processes. It emphasizes knowledgeable development and utilization of our planet's resources and the consequences of human activity on the environment. The EEPS curriculum requires 30 – 36 hours in EEPS, Geology, Physics or related disciplines. The department recommends that students entering the MS in EEPS should have completed college-level Chemistry and Physics on entering the program. To meet the requirements of differing career goals, students may choose a thesis, internship or non-thesis option. The EEPS program is designed to:

- Prepare individuals for employment in applied environmental, geologic and physics careers in industry, government or academia
- Foster professional growth and commitment to lifelong learning for students and faculty
- Support and encourage independent scholarship and develop competence in research in the physical and environmental sciences

Please see attached **Appendix I** for elaboration of the above tools used to assess the above objectives.

Currently, the main outcome measure of student learning is performance in the required EEPS courses. This will be addressed further in section 3c.

2. Describe the quality of the program/certificate as assessed by the strengths, productivity, and qualifications of the faculty in terms of SCH, majors, graduates, and scholarly/creative activity (refer to instructions in the WSU Program Review document for more information on completing this section).

Complete the table below and utilize data tables 1-7 provided by the Office of Planning Analysis (covering SCH by FY and fall census day, instructional faculty; instructional FTE employed; program majors; and degree production).

Scholarly Productivity	Number Peer Reviewed Publications		Number Presentations		Number Conference Proceedings		Performances			Number of Exhibits		Creative Work		No. Books	No. Book Chaps.	No. Grants Awarded or Submitted	$ Grant Value
	Ref	Non-Ref	Ref	Non-Ref	Ref	Non-Ref	*	**	***	Juried	****	Juried	Non-Juried				
Year 1 (2015)	5		1		4											2	$34,488
Year 2 (2016)	3		4		7											2	$38,923
Year 3 (2017)	7		3		7											5	$2.1 mil

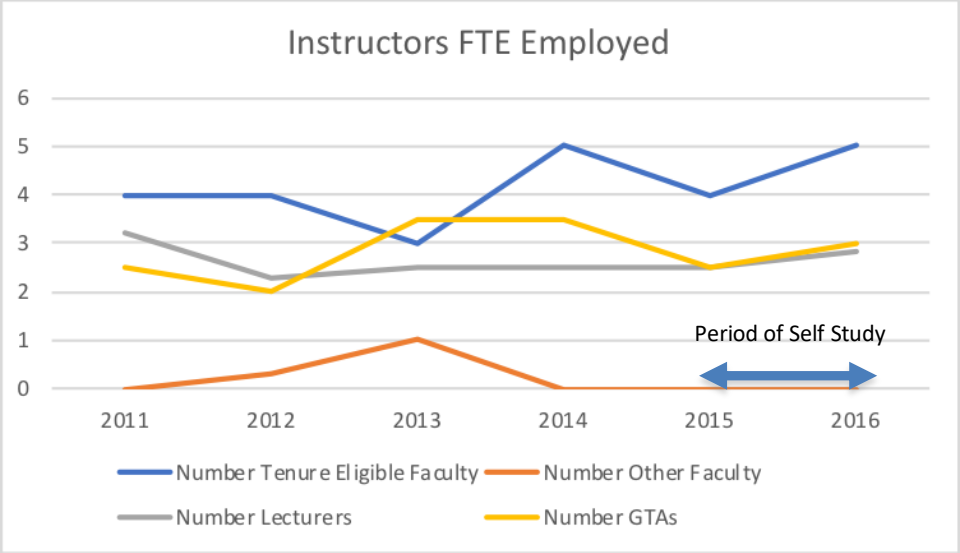
* Winning by competitive audition. **Professional attainment (e.g., commercial recording). ***Principal role in a performance. ****Commissioned or included in a collection.

- Provide a brief assessment of the quality of the faculty/staff using the data from the table above and tables 1-7 from the Office of Planning Analysis as well as any additional relevant data. Programs should comment on details in regard to productivity of the faculty (i.e., some departments may have a few faculty producing the majority of the scholarship), efforts to recruit/retain faculty, departmental succession plans, course evaluation data, etc.

  Provide assessment here:

The Geology Department hired two new faculty in Fall of 2014 after unexpected faculty losses in 2013 (see FTE employment Graph 2a below). With restoration of five full-time tenure and tenure-track faculty in 2014 (Bischoff, Burke, Gray, Parcell, Swindle), the department has continued to build its research and grant activity. Currently, all professors hold doctoral degrees and department instructors hold either doctorate or masters degrees. In 2015, the department faculty produced five peer-reviewed publications, four abstracts at conference proceedings, and about $35,000 in grant support. In 2016, the department faculty produced three peer-reviewed publications, seven abstracts at conference proceedings and $39,000 in grants. In 2017, the faculty produced seven peer-reviewed publications, seven abstracts at conference proceedings, and $2.1 million in grants and software donations.

INSTRUCTIONAL FTE EMPLOYED IN GEOLOGY DEPARTMENT

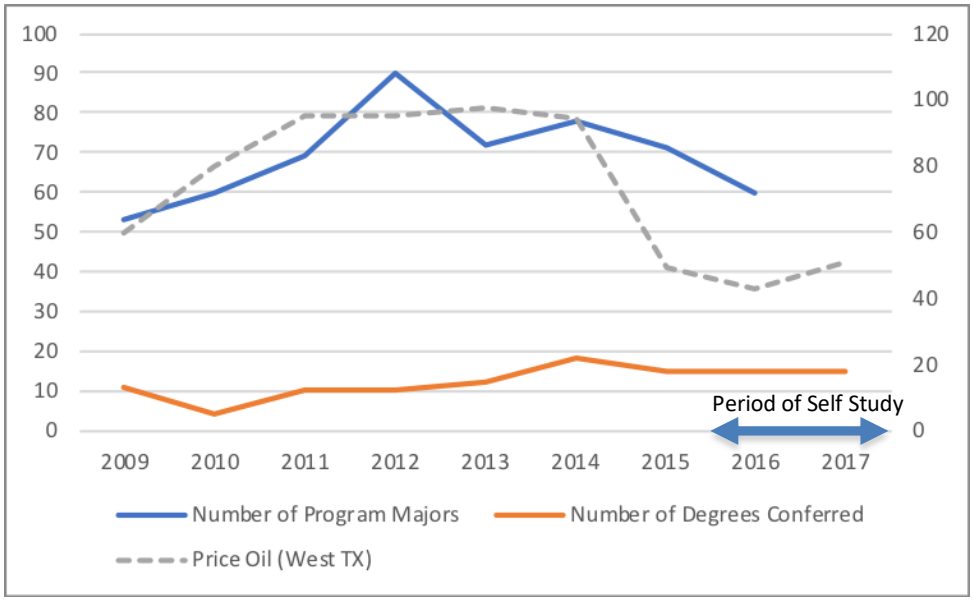


Graph 2a: Geology Instructional FTE Employed (by Fall Census Day)

The undergraduate geology major enrollment is closely tied to the student perception of employment opportunities. Historically, a large number of our alumni have entered the oil and gas sector. Before summer of 2014, the undergraduate major enrollment reached 90 students, reflecting high oil prices. Enrollment began to fall after the drop in oil prices in the summer 2014 (see comparison in Graph 2b below). The resulting reduction in regional employment in the oil and gas sector continues to put a drag on number of department majors (60 in 2016). Trends in petroleum industry are famously cyclical (i.e. “boom and bust”), and the employment opportunities reflect this.

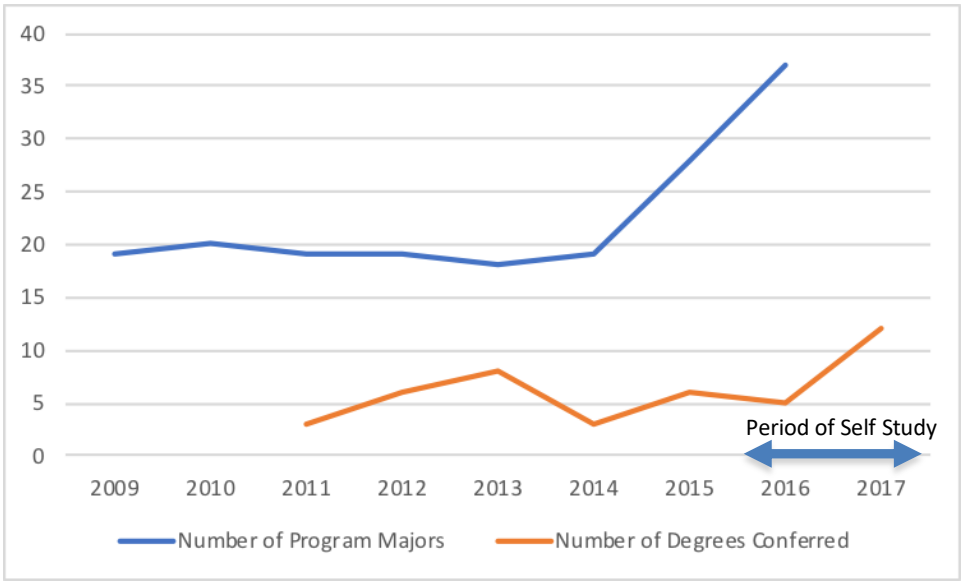
Conversely, the EEPS graduate student enrollment has increased over the program review period, which reflects both (1) more faculty mentoring opportunities for employment in environmental fields as well as (2) modified prerequisite courses required for the entering graduate students. The EEPS program also has seen an increase in graduation rates, from six in 2015 to twelve in 2017.

NUMBER OF UNDERGRADUATE PROGRAM MAJORS AND DEGREES CONFERRED COMPARED TO PRICE OF OIL



Graph 2b: Geology Undergraduate Degree Enrollment (by Fall Census Day)

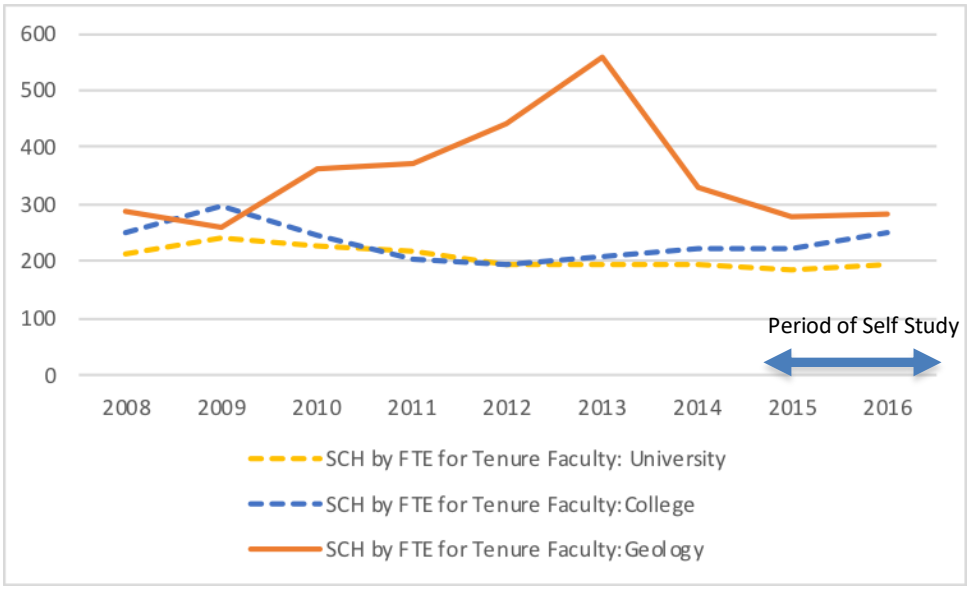
NUMBER OF GRADUATE (EEPS) PROGRAM MAJORS AND DEGREES CONFERRED



Graph 2c: EEPS Graduate Program Enrollment (by Fall Census Day)

During the review period, the average SCH production by FTE for geology faculty has returned to levels that, while still above average for college and university faculty, are much more in line than in 2013 (see Graph 2d below), when two to three tenured faculty were covering heavy loads after the loss of two faculty members (Gries and Mazzullo). The addition of two new faculty in 2014 has helped stabilize the SCH by FTE for geology faculty.

COMPARISON OF SCH by FTE for TENURED AND TENURE-ELIGIBLE FACULTY



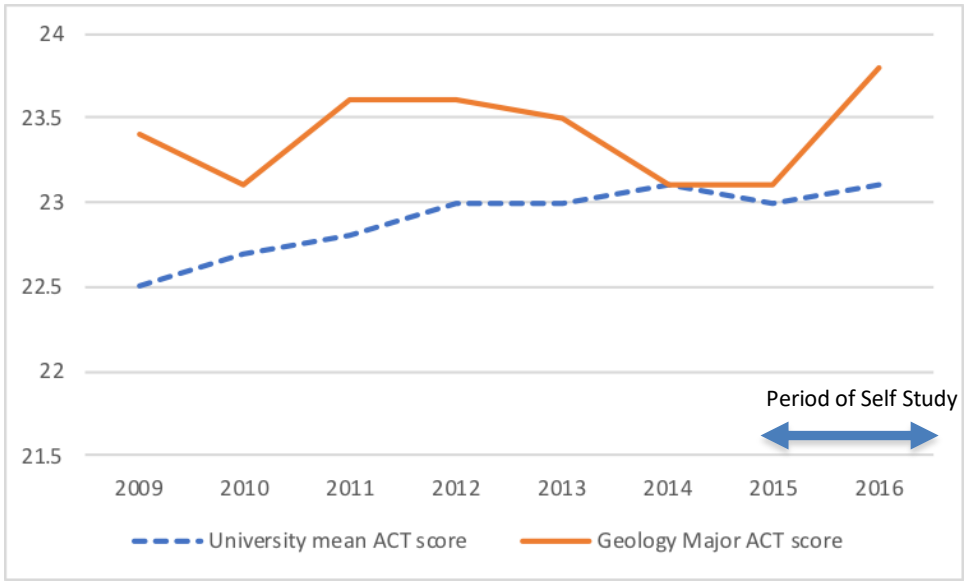
Graph 2d: Student Credit Hour (SCH) production by FTE for Tenure Eligible Faculty

3. **Academic Program/Certificate: Analyze the quality of the program as assessed by its curriculum and impact on students for each program (if more than one). Attach updated program assessment plan (s) as an appendix (refer to instructions in the WSU Program Review document for more information).**

a. For undergraduate programs, compare ACT scores of the majors with the University as a whole. (Evaluate table 8 [ACT data] from the Office of Planning and Analysis).

The Geology undergraduate students have ranked higher in ACT scores than the university average.

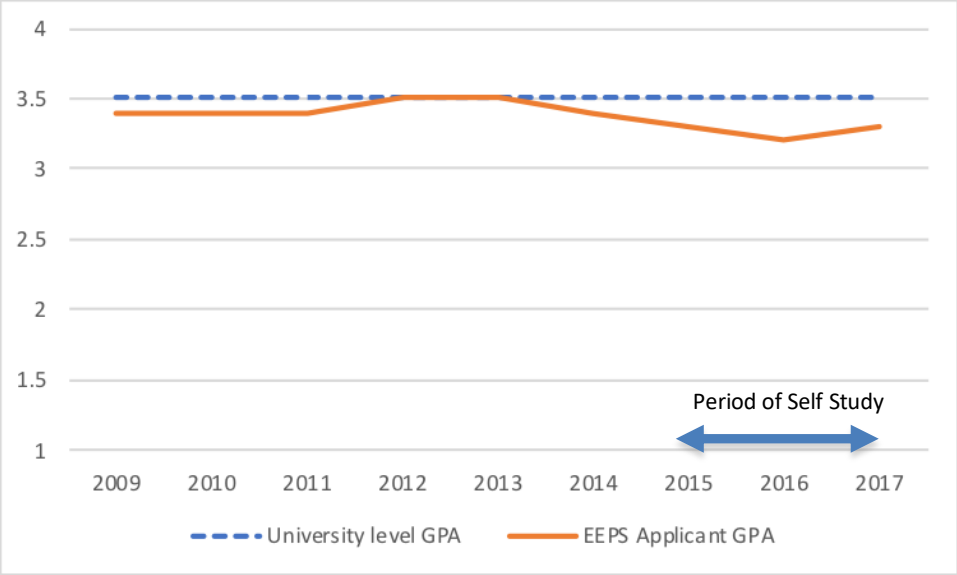
COMPARISON OF
MEAN ACT SCORES FOR GEOLOGY JUNIOR AND SENIORS



b. For graduate programs, compare graduate GPAs of the majors with University graduate GPAs. (Evaluate table 9 [GPA data] from the Office of Planning and Analysis)

The GPAs of incoming graduate students in the EEPS program continue to rank above 3.0.

COMPARISON OF GPA OF EEPS AND UNIVERSITY GRADUATE GPA



c. Identify the principal learning outcomes (i.e., what skills does your Program expect students to graduate with). Provide aggregate data on how students are meeting those outcomes in the table below. Data should relate to the goals and objectives of the program as listed in 1e. Provide an analysis and evaluation of the data by learner outcome with proposed actions based on the results.

See tables below:

Learning Outcomes: Geology BS Program

Learning Outcomes (most programs will have multiple outcomes)	Assessment Tool (e.g., portfolios, rubrics, exams)	Target/Criteria (desired program level achievement)	Results	Analysis
The Geology B.S. program will foster comprehensive training among students in geosciences that will enable them to demonstrate skills in integrating sedimentary/paleontology, igneous and metamorphic rocks.	Option 1: Lab project in GEOL 324 "Petrology"	Target is a 90% passing assignments; minimum 70% passing assignments	2015: 91.6% passed project, n= 12	Target surpassed; no course content to be modified.
			2016: 87.5% passed project n = 24	Target surpassed; no course content to be modified.
			2017: 100% passed project n = 11	Target surpassed; no course content to be modified.
	Option 2: Final exam in GEOL 570 "Biogeology"	Target is a 90% passing assignments; minimum 70% passing assignments	2015: see results from option 1	NA
			2016: see results from option 1	NA
			2017: see results from option 1	NA
The Geology B.S. program will foster comprehensive training among students in geosciences that will enable them to demonstrate skills in application of mapping to solve geologic problems.	Mapping project in capstone course Geol 640 "Field Geology."	Target is a 90% passing assignment; minimum 70% passing assignments	2015: 91% passed project, n=22	Target surpassed, changed student intro orientation for 2016 mapping project
			2016: 100% passed project n = 18	Target surpassed; no course content to be modified.
			2017: 100% passed project n = 22	Target surpassed; no course content to be modified.

Learning Outcomes: EEPS MS Program

Learning Outcomes (most programs will have multiple outcomes)	Assessment Tool (e.g., portfolios, rubrics, exams)	Target/Criteria (desired program level achievement)	Results	Analysis
Students in the EEPS MS program will demonstrate knowledge in basic concepts in physical environments and earth resources	Option 1: Result on final exam in GEOL 650: Hydrogeology	Target is a 90% passing assignment; minimum 70% passing exam	2015: 100% passed; n=4	Target surpassed; no course content to be modified.
			2016: 100% passed; n=2	Target surpassed; no course content to be modified.
			2017: 100% passed; n=3	Target surpassed; no course content to be modified.
	Option 2: Written report in EEPS 721: Current Issues in Global Env. Science	Target is a 90% passing assignment; minimum 70% passing assignment	2015: 93% passed project; n=15	Target surpassed; no course content to be modified.
			2016: 100% passed project n = 13	Target surpassed; no course content to be modified.
			2017: 86% passed project; n=14	Target surpassed; no course content to be modified.
Students in the EEPS MS program will review multidisciplinary scientific techniques associated with global issues that enable them to demonstrate understanding of Earth's physical environments and resource	Option 1: Written report in EEPS 710: Great Discoveries and Controversies in Science	Target is a 90% passing assignment; minimum 70% passing report	2015: see results from option 2	See below
			2016: see results from option 2	See below
			2017: see results from option 2	See below

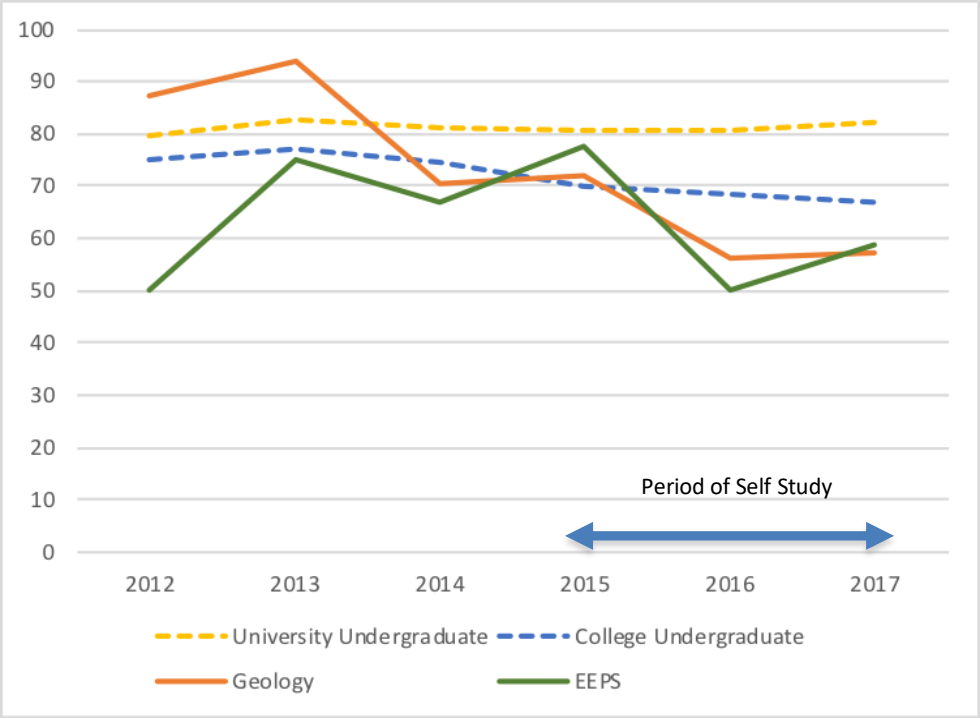
problems at different spatial and temporal scales.	Option 2: Written report in EEPS 721: Current Issues in Global Env. Science	Target is a 90% passing assignment; minimum 70% passing assignment	2015: 87% passed project; n=5	Target surpassed; no course content to be modified.
			2016: 92% passed project; n=5	Target surpassed; no course content to be modified.
			2017: 93% passed project; n=5	Target surpassed; no course content to be modified.
Students in the EEPS MS program will be able to design and analyze lab and field experiments in geosciences and physical sciences	Option 1: Lab project in GEOL 720: Geochemistry	Target is a 90% passing assignment; minimum 70% passing assignment	2015: see results from option 2	See below
			2016: see results from option 2	See below
			2017: see results from option 2	See below
	Option 2: Result on class project in GEOL 698: Independent Study in Geology	Target is a 90% passing assignment; minimum 70% passing assignment	2015: 100% passed project n = 3	Target surpassed; no course content to be modified.
			2016: 100% passed project n = 3	Target surpassed; no course content to be modified.
			2017: 100% passed project n = 2	Target surpassed; no course content to be modified.

d. Provide aggregate data on student majors satisfaction (e.g., exit surveys), capstone results, licensing or certification examination results (if applicable), employer surveys or other such data that indicate student satisfaction with the program and whether students are learning the curriculum (for learner outcomes, data should relate to the outcomes of the program as listed in 3c).

Before 2014, the student satisfaction survey for the Geology undergraduate program ranked above the average of both the university and LAS. Since 2016, student satisfaction for both undergraduate and graduate students dropped below the college average. At the beginning of the review period, the department had just added two faculty and increased mentoring and research opportunities for students. Based on student survey comments, the drop in satisfaction is attributed to the student perception of employment opportunities for geologists in the oil/gas industry.

COMPARISON OF AVERAGE STUDENT SATISFACTION

GEOLOGY, EEPS, COLLEGE, AND UNIVERSITY



e. Provide aggregate data on how the goals of the *WSU General Education Program* and *KBOR 2020 Foundation Skills* are assessed in undergraduate programs (optional for graduate programs).

Outcomes: ○ Have acquired knowledge in the arts, humanities, and natural and social sciences ○ Think critically and independently ○ Write and speak effectively ○ Employ analytical reasoning and problem solving techniques	Results	
	Majors	Non-Majors
Geol 300 Energy, Resources and the Environment. Goal of 70% passing. 1) thinking critically and independently 2) analytical reasoning and problem solving techniques through field work, lab experiments and examination of theoretical knowledge		2015: 96% passed 2016: 93% passed 2017: 91% passed
Geol 526 Sedimentology: required of all undergraduate majors. Goal of 70% passing. Addresses: 1) thinking critically and independently 2) analytical reasoning and problem solving techniques through field work, lab experiments and examination of theoretical knowledge	2015: 96% passed 2016: 91% passed 2017: 100% passed	

Note: Not all programs evaluate every goal/skill. Programs may choose to use assessment rubrics for this purpose. Sample forms available at: http://www.aacu.org/value/rubrics/

f. For programs/departments with concurrent enrollment courses (per KBOR policy), provide the assessment of such courses over the last three years (disaggregated by each year) that assures grading standards (e.g., papers, portfolios, quizzes, labs, etc.) course management, instructional delivery, and content meet or exceed those in regular on-campus sections.
Provide information here:

* NA; Program does not participate in concurrent enrollment courses.

g. Indicate whether the program is accredited by a specialty accrediting body including the next review date and concerns from the last review.
Provide information here:

* NA; Program not accredited by a specialty body

h. Provide the process the department uses to assure assignment of credit hours (per WSU policy 2.18) to all courses has been reviewed over the last three years.
Provide information here:

The department faculty meet to review the assignment of credit hours and discuss any changes to be made before curriculum changes are sent to be reviewed by the College Curriculum Committee.

i. Provide a brief assessment of the overall quality of the academic program using the data from 3a – 3e and other information you may collect, including outstanding student work (e.g., outstanding scholarship, inductions into honor organizations, publications, special awards, academic scholarships, student recruitment and retention).
Provide assessment here:

The Geology BS program offers a comprehensive curriculum, which is demonstrated in its regular course offerings, its capstone field course and course evaluations. Quality of undergraduate students in the program has remained high over this reporting period. In the past five years, our undergraduate students have had consistently at or above average university ACT scores (see table 3a). The undergraduate and graduate programs in the Geology Department provide a rigorous and challenging program for students. Students at both the undergraduate and graduate level have been involved in faculty research and make presentations at regional and national meetings with their faculty advisors. Faculty grant-funded research has produced peer-reviewed articles and products that continue to support our students.

The program has had strong alumni support through the years and maintains the second-highest graduate and undergraduate scholarship support in the College of Liberal Arts and Sciences (2017 total scholarship funds awarded was over $30,000).

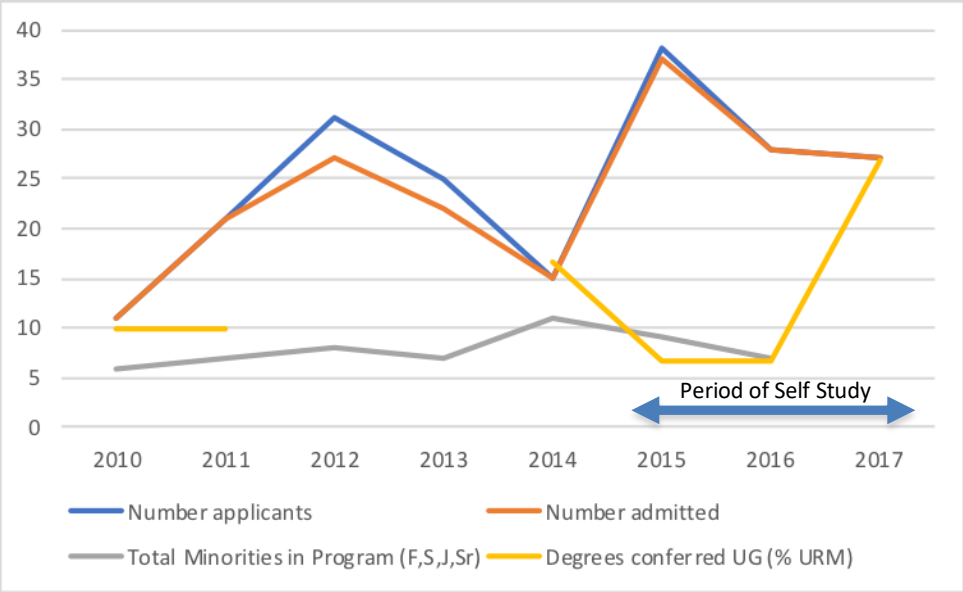
Since its inception in 2006, the EEPS program has developed a more diversified curriculum, cultivated a more diverse student population, while graduating geoscientists trained in skills for regional employment. The EEPS master program assesses training in inter- and multidisciplinary scientific concepts, expectations and techniques associated with relevant global environmental issues.

4. Analyze the student need and employer demand for the program/certificate. Complete for each program if appropriate (refer to instructions in the WSU Program Review document for more information on completing this section).

a. Evaluate tables 11-15 from the Office of Planning Analysis for number of applicants, admits, and enrollments and percent URM students by student level and degrees conferred.

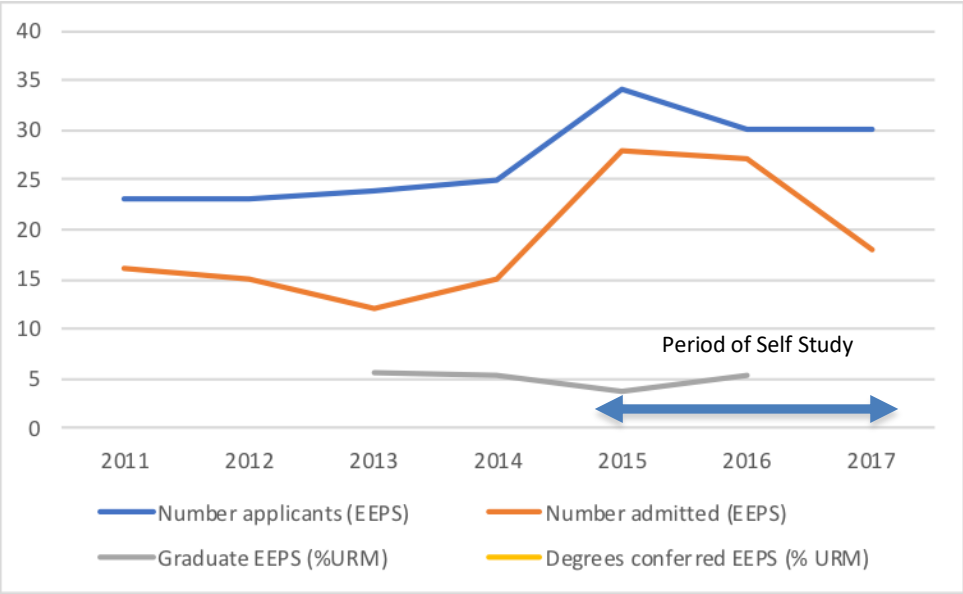
The number of undergraduate applicants to the geology program has remained high during the review period. There was a drop in applicants during the 2014-15 year related to fall in oil prices. While employment in the oil and gas sector is currently dampened, the U.S. Bureau of Labor Statistics continues to project growth for the geosciences faster than average (at 14%; see table 4b below). More under-represented minorities have also been attracted to the geology program, raising the percentage of URM in the program between 19 to 26% during 2015-17. Minority ethnicities included black, hispanic, native american, and multi-race. URM in the EEPS graduate program varied between 3.6 and 5.4% during the same period.

UNDERGRADUATE APPLICATIONS AND UNDER-REPRESENTED MINORITIES (URM) IN UNDERGRADUATE PROGRAM



No data on degrees conferred %URM UG for 2012 - 2013

UNDERGRADUATE APPLICATIONS AND UNDER-REPRESENTED MINORITIES (URM) IN EEPS MS PROGRAM



b. Utilize the table below to provide data that demonstrates student need and demand for the program.

Employment of Majors*							
	Average Salary	Employ-ment % In state	Employment % in the field	Employment: % related to the field	Employment: % outside the field	No. pursuing graduate or profes-sional educa-tion	Projected growth from BLS** Current year only.
Year1*	$73,333	33%	100%	100%	100%	>5	
Year2*	$77,777	78%	88%	100%	10%	>5	
Year3*	$71,111	66%	100%	100%	100%	>5	14% (faster than average)

* May not be collected every year

** Go to the U.S. Bureau of Labor Statistics Website: http://www.bls.gov/oco/ and view job outlook data and salary information (if the Program has information available from professional associations or alumni surveys, enter that data)

- Provide a brief assessment of student need and demand using the data from tables 11-15 from the Office of Planning and Analysis and from the table above. Include the most common types of positions, in terms of employment graduates can expect to find.

  Provide assessment here:

In the last internal survey of recent graduates, the department asked questions related to salary range, employment location, job relevance to the geosciences and information on continuing and higher education. Overall, our alumni, now employed, have an average salary of $74,000. Those with a bachelor's degree from our program have an average salary of $73,333, and those with a MS degree from our EEPS program have an average salary of $88,571. Historically, the majority of our graduates have entered the petroleum exploration and production or environmental remediation fields. Respondents are currently employed as geoscientists in the petroleum industry, environmental companies and in government regulatory agencies. On average, 68% of our recent alumni are employed in the state of Kansas and 32% are employed out of state.

Our undergraduate alumni also indicated that they pursued graduate geoscience education primarily because they were interested in advancing within their companies and increasing salary. The department continues to provide graduate education to many of our undergraduate alumni. In recent years, some of our graduates have also matriculated at University of Kansas, University of Maryland, Oklahoma State, University of Missouri – Rolla and Fort Hays State for graduate studies in areas of the geosciences and petroleum engineering.

5. **Analyze the service the Program/certificate provides to the discipline, other programs at the University, and beyond. Complete for each program if appropriate (refer to instructions in the WSU Program Review document for more information on completing this section).**

Evaluate table 16 from the Office of Planning Analysis for SCH by student department affiliation on fall census day.

a. Provide a brief assessment of the service the Program provides. Comment on percentage of SCH taken by majors and non-majors, nature of Program in terms of the service it provides to other University programs, faculty service to the institution, and beyond.

Provide assessment here:

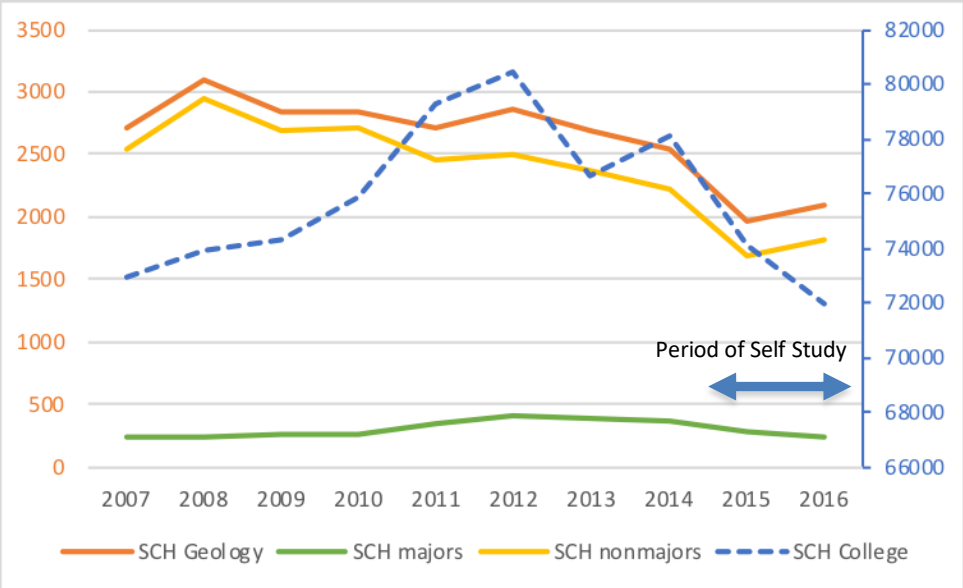
Over the review period, the department has produced between 1,956 and 2,075 SCH each fall semester. These numbers are lower than previous years when employment in the oil and gas sector drew more students. Trends in petroleum industry are famously cyclical and a rise in SCH and majors would be expected in the future.

The department expends much of its resources towards teaching non-majors in multiple sections of large GenEd courses (including GEOL 102, 111, 235, 300, 302, 310, and 312). All tenured and tenure-track faculty are expected to teach these general education courses from which we have raised SCH and attracted new majors to the program. Since 2010, the department has been offering online sections of GEOL 102 and 235, which helped lift enrollment and SCH. In Fall of 2018, the department is planning on offering new online sections of GEOL 300 and 310 to help boost SCH production.

The remainder of faculty time is devoted to upper level undergraduate and graduate teaching, advising, research, as well as providing service to the department, college and university. Faculty service to the university has included various college and university committees, including tenure and promotion, college curriculum, faculty senate, college council, and grievance. Each faculty member also serves on thesis and dissertation committees in other programs across the university.

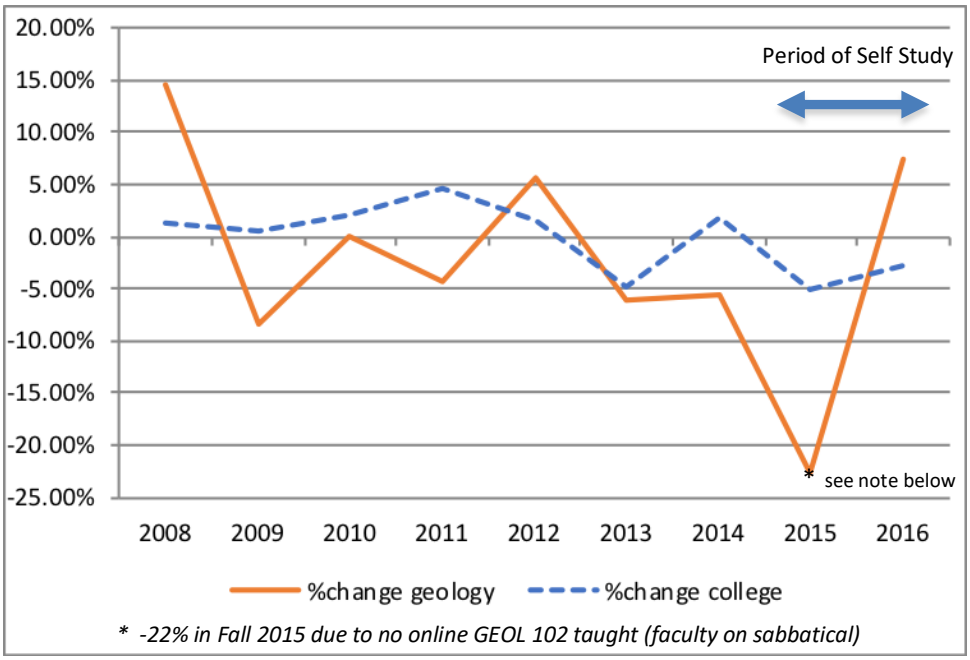
COMPARISON OF SCH PRODUCTION

GEOLOGY AND COLLEGE



COMPARISON OF PERCENT CHANGE IN TOTAL SCH FROM PREVIOUS YEAR

GEOLOGY AND COLLEGE



6. Report on the Program's/certificate's goal (s) from the last review. List the goal (s), data that may have been collected to support the goal, and the outcome. Complete for each program if appropriate (refer to instructions in the WSU Program Review document for more information on completing this section).

In 2015, the Geology Department set three goals for its undergraduate program. The department's goals were to:

- Successfully recruit 15 new majors at the freshman and sophomore level each year
- Maintain the number of juniors and seniors at greater than 25 each year
- Maintain the number of graduates at greater than 10 each year

The department exceeded all goals for the review period.

The department set the following goals for EEPS MS program:

- Successfully recruit 10 new students to the program each year
- Maintain a minimum of 20 majors in the program each year
- Graduate a minimum of 5 each year

The EEPS MS program has met or exceeded all goals as well as exceed the KBOR minima for the number of faculty and number of enrolled students. The EEPS MS program has also met or exceed the minimum graduation number each year of this program review.

The Department of Geology establishes the tools to measure and determine if program objectives are being met. The tools and timeline for assessment of the BS program and EEPS MS objectives are presented in **Appendix 1.**

7. Summary and Recommendations

a. Set forth a summary of the report including an overview evaluating the strengths and concerns. List recommendations for improvement of each Program (for departments with multiple programs) that have resulted from this report (relate recommendations back to information provided in any of the categories and to the goals and objectives of the program as listed in 1e). Identify three year goal (s) for the Program to be accomplished in time for the next review.

Provide assessment here:

Geology BS and EEPS Programs Strengths:

1. High-quality graduates in applied discipline. Our graduates have been in high demand from petroleum and environmental industry, federal and state government agencies, and universities offering advanced degrees. Our students are highly competitive in academics.

2. Comprehensive and focused curriculum. In addition to the standard geology core curriculum, we offer elective courses that cover a wide variety of topics in geological, atmospheric, oceanographic, geophysical, space, natural resources, and environmental sciences not only for geology majors, but for non-major science and non-science majors. International and global learning is a special strength of our program, in comparison with many other larger programs in the nation. All of our faculty and staff have been active in many campus, state and international activities, and have done so in various ways, such as volunteering in the WSU Green Group, state and national Science Olympiads, the Kansas Academy of Science, Exploration Place, regional journal editorships, and national and international lectureships. In the modern world of environmental and climatic crises, our curriculum provides the much-needed core scientific information and knowledge for future activists and leaders. Our faculty has participated in the Honor's Program. The department offers the required course (GEOL 102: Earth Science and the Environment) for future earth-science secondary teachers.

3. Alumni support. Financial, equipment, and employment support from our alumni and friends to our programs are extremely strong. We have the second largest scholarship funds among all programs in LAS (recently over $30,000 each year). Professional geologists from independent and major corporations teach lower and upper-division courses, providing much-needed applied learning and further strengthening our ties to the Wichita and national geoscience community.

4. Collaboration with LAS, university, state, national, and international universities and institutions. Collaborations with Chemistry, Biology, Philosophy, Communication, Mathematics, and Anthropology on campus, Texas A&M University, University of Alabama, South Methodist University, University of New Mexico, Boise State University, Missouri State University, UNLV, University of Wisconsin-Oshkosh, Oklahoma State

University, US Geological Survey, University of Oklahoma, and University of Kansas, greatly enhance the research and teaching and student recruitment of our programs. As a result, the faculty has achieved external grant awards and gifts exceeding $1 million from organizations such as the Department of the Interior (USGS) STATEMAP and EDMAP programs, Geological Society of Maine, IHS Kingdom Suite, and IHS Geographix.

Geology BS and EEPS Program Concerns:

1. Lack of support staff. We have to resort to faculty and student volunteers to maintain our lab equipment, field vehicles, and departmental computer lab. All the volunteers have so far done an admirable job. Nevertheless, usage and maintenance could be more effective if funding were available for support staff.

2. Cyclic nature of the petroleum industry. Historically, the petroleum industry has been the largest employer of geology graduates. The industry is tied to the cyclic nature of the price of oil and natural gas. Thus, student enrollment and graduation numbers fluctuate due to the changes of petroleum industry. The fall in oil prices in summer of 2014 has meant reduction in both undergraduate and graduate majors. We are offsetting this with continued emphasis on opportunities in the groundwater remediation and hydrogeology fields.

3. Non-traditional student base and graduation rates. In an urban setting, many WSU students, including geology students, have work, family, and financial obligations, in addition to their coursework. Although we work with students to create a program of study that fits their needs, external commitments prohibit many of them from completing their degrees in a traditional 4-year pattern (undergraduate) or 2-year pattern (graduate) that may be implied by KBOR graduation standards. In addition, we strongly encourage both Geology undergraduates and EEPS graduate students to gain real-world experience through internships or traditional employment while enrolled. While this is essential to their later career success, it often slows their progress through the degree programs.

Undergraduate and EEPS Opportunities/Improvements:

1. Growth of environmental geosciences. The geology faculty has recognized the increased interests and job opportunities in environmental sciences at the state, national, and international levels. With our recent faculty hire in the area of hydrogeology, the department is building on current curriculum to enhance the environmental sciences areas of the program.

2. Increasing research productivity. Equipment, including an X-ray diffractometer (XRD), petrographic microscopes, and new classroom and research computers allow us to enhance undergraduate and graduate research.

4. Continue increasing student enrollment and graduation rates. Increased awareness of the general public on environmental pollution, alternative energy, and climate change is raising student interests in earth and environmental sciences. The local petroleum industry and local geology foundations (such as the Kansas Geology Foundation) have provided financial, data, and equipment support for our students and faculty for several decades, helping students graduate more quickly. In addition to scholarship funds, these institutions have given funds towards purchase of lab equipment (microscopes, XRD), funds for student travel and research, and geologic data for student research projects.

Undergraduate Geology BS goals

The Geology BS program has exceeded or met KBOR minima for number of J/S level majors. For all three years in review, the BS program met or exceeded the minimum for students graduated.

The department's goals for the BS program are to maintain the goals from the previous review period, which include:

- Successfully recruit 15 new majors at the freshman and sophomore level each year
- Maintain the number of juniors and seniors at greater than 25 each year
- Maintain the number of graduates at greater than 10 each year

Graduate EEPS MS goals

The EEPS MS program (joint program between Geology and Physics programs, has met or exceeded KBOR minima for the number of faculty and number of enrolled students. The Geology Department faculty sustain the program by teaching all EEPS courses and advising the vast majority of students. The EEPS MS program has met or exceeded the minimum graduation number each year during this program review.

The department maintains as its goal for the EEPS MS program in the next review period to:

- Successfully recruit 10 new students to the program each year
- Maintain a minimum of 20 majors in the program each year
- Graduate a minimum of 5 each year

APPENDIX I

"Tools to Measure Program Objectives"
GEOLOGY BS AND EEPS MS PROGRAMS

Department of Geology

Goal 1: The Geology BS and EEPS MS programs seek to prepare individuals for employment in geologic careers in industry, government or academia.

Program Objective	Assessment Data Analyzed	Outcome 2015	Outcome 2016	Outcome 2017
1.1 The program will ensure a high quality curriculum which remains current and relevant to industry, government and academia.	The program will conduct annual review of: -IDEA evaluations -Current occupational trends -Mission statement review	Reviewed February: occupational trends are +16% for geosciences; reviewed mission statement to meet new KBOR requirements	Reviewed February: occupational trends are +14% for geosciences; reviewed mission statement to meet new KBOR requirements	Reviewed February: occupational trends are +14% for geosciences; reviewed mission statement to meet new KBOR requirements
1.2 The program will maintain a minimum of 25 students	The program will monitor results of recruitment activities -monitor outreach to local schools and community colleges -review recruitment media and material for introductory courses -review of brochures and information about department -confirm enrolled students are confirmed majors	Reviewed September: department continues outreach schools and tours of department; confirmed enrolled students are confirmed majors or appropriately enrolled (approx. 90 UG majors; 27 EEPS majors)	Reviewed September: department continues outreach schools and tours of department; confirmed enrolled students are confirmed majors or appropriately enrolled (approx. 70 UG majors; 37 EEPS majors)	Reviewed September: department continues outreach schools and tours of department; confirmed enrolled students are confirmed majors or appropriately enrolled (approx. 60 UG majors; EEPS not reported)
1.3 The program will improve graduation rates and retention rates.	Review trend in majors': -enrollment -number of graduates -graduation rates -student failure rate in courses -review advising process	Reviewed September 2015: (pre-20th day enrollment #'s): enrollment steady for past three years; graduation rates holding steady	Reviewed September 2016: (pre-20th day enrollment #'s): enrollment dropping over past three years; graduation rates holding steady in the UG program and rising in the EEPS program	Reviewed September 2017: (pre-20th day enrollment #'s): enrollment dropping over past three years; falling retention, rising failure rate in some GEOL102 sections; graduation rates holding steady in the UG program and rising in the EEPS program

Goal 2: The Geology BS and EEPS MS programs seeks to foster professional growth and commitment to lifelong learning for students and faculty

Program Objective	Assessment Method/Data Sources	Outcome 2015	Outcome 2016	Outcome 2017
2.1: The program will seek to hire and maintain a highly qualified faculty to teach and advise undergraduate students	Faculty records will be reviewed annually: -FAR -Disciplinary actions -Faculty attrition -Faculty publications and grants	Reviewed February 2016: FARs reviewed; no disciplinary action necessary	Reviewed February 2016: FARs reviewed; no disciplinary action necessary	Reviewed February 2017: FARs reviewed; no disciplinary action necessary
2.2 The program will partner with University and broader community in order to promote continuing education for students, faculty and alumni	The program will monitor faculty participation in service activities. Students will be encouraged to attend off-campus professional and technical talks.	Reviewed February: Faculty attended 4 professional meetings; students attended 2 professional meetings	Reviewed February: Faculty attended 3 professional meetings ; students attended 3 professional meetings	Reviewed February: Faculty attended 3 professional meetings; students attended 3 professional meetings

Goal 3: The Geology BS program seeks to support and encourage scholarly research in the geological sciences
The EEPS MS program will graduate students active in the development and utilization of our planet's resources with due concern

Program Objective	Assessment Method/Data Sources	Outcome 2015	Outcome 2016	Outcome 2017
3.1 The program will encourage student participation in professional conferences, including the WSU research forums	The program will assess student participation in research conferences. -Number of students participating in professional conferences -Number of students publishing results from research	Reviewed February: Four students attended professional meetings; three students presented at meetings; three students publishing abstracts from conferences; one student preparing manuscript for publication	Reviewed February: Three students attended professional meetings; two students presented at meetings; one student preparing published manuscript for publication	Reviewed February: Three students attended professional meetings; three students presented at meeting; one student preparing manuscript for publication
3.2 The program wil support faculty engagement in research	The program will assess faculty engagement in research activities: -number of faculty publications -number of faculty grants -number of conferences attended	Reviewed February: Faculty produced 5 publications; 2 grants; 4 conference presentations	Reviewed February: Faculty produced 3 publications; 2 grants; 7 conference presentations	Reviewed February. Faculty produced 7 publications; 5 grants; 7 conference presentations

Goal 4: The Geology BS program will ensure efficient and effective program operations consistent with the college, University and the profession.

Program Objective	Assessment Method/Data Sources	Outcome 2015	Outcome 2016	Outcome 2017
4.1 The program will develop and maintain student, faculty and program policies consistent with the standards of the college, University and profession.	The program will review: -program curriculum -management of faculty records -fair practicies policies -undergraduate catalog edit review	Reviewed February: program curriculum reviewed, management of faculty records and policies. No changes deamed necessary.	Reviewed February: program curriculum reviewed, management of faculty records and policies. No changes deamed necessary.	Reviewed February: program curriculum reviewed, management of faculty records and policies. No changes deamed necessary.
4.2 The program will maintain program operations to ensure program effectiveness and efficiency	The Geology BS program will assess personnel, financial and physical resources annually	Department is meeting its financial obligations	Department is meeting its financial obligations	Department is meeting its financial obligations