

# Florida Board of Governors Program Review 2014

## Geology Program: University of Florida

### 1. Mission and Purpose of the Program

The Geology Program at the University of Florida aims to provide a comprehensive understanding of Earth materials and processes, train students who will excel in the geoscience workforce, and create sustainable solutions to Earth-related societal needs. These aims are critical for all of society's institutions, and life in general, as non-renewable resources (hydrocarbons, metals) are depleted, renewable resources (water, soils) are increasingly contaminated, global environmental change threatens our current standard of living, and geological hazards (tsunamis, earthquakes, floods, volcanoes, landslides, climate change, sea level rise etc.) become increasingly costly and deadly as populations grow and expand into hazardous areas. Successfully addressing such issues requires a clear understanding of the evolution of the Earth system and the natural forces that have influenced it over geologic time, and how those processes operate in the modern Earth. The Program's educational mission is enhanced through world-class research; around 95% of faculty support student education and research with external grant funds. Improvements to the program resulted in an increase in National Research Council ranking from 75<sup>th</sup> in 1992 to 20<sup>th</sup> out of 144 Ph.D.-granting geosciences programs last year. These improvements also mean the Geology Program is providing exceptionally well-trained graduates to industry, governmental and non-governmental, and academic workforces and generating new knowledge needed to understand Earth processes and materials.

### 2. Description of the Program

The Program is housed in the Department of Geological Sciences in the College of Liberal Arts and Sciences (CLAS) and awards the following undergraduate and graduate degrees:

- **Bachelor of Science:** This specialization is designed for students who plan to take the professional geology (PG) licensure exam and/or to continue on to graduate study in geology. It emphasizes a core understanding of mineralogy and petrology, structural geology, sedimentology, field methods and paleontology, and it requires substantial coursework in mathematics, chemistry and physics.
- **Bachelor of Arts:** This degree is suited for students interested in careers for which knowledge of earth science is vital. These careers include STEM education (K-12), environmental policy, environmental law, environmental medicine, and geography.
- **Bachelor of Arts - Environmental Geosciences:** Co-offered with the Department of Geography, this specialization is designed for students who are interested in land and water aspects of the environment. It can be tailored to focus on water and mineral exploration and management, geological hazards, environmental planning, resource sustainability or earth science education.

- **Minor in Geology:** The minor requires 17 hours of directed and elective coursework in the Geological Sciences (GLY, ESC, OCE prefixes)
- **Additional Programs:** An Interdisciplinary Studies degree in the Marine Sciences allows students to specialize in Geological Sciences via coursework and independent research projects (housed in CLAS).
- **Master of Science:** This thesis-based degree is designed for students who are interested in pursuing a Ph.D. or a professional career in an earth science related field. This degree is the primary means by which we fulfill our role as a Land Grant University, offering the most efficient path to professional licensure, while providing students a research-intensive, problem-solving oriented, graduate education.
- **Master of Science Teaching:** This specialized graduate degree is targeted at students interested in careers in education (K-14). The cornerstone of this degree is the completion of an educationally based research project. A minor in Education is required.
- **Doctor of Philosophy:** This degree provides the highest level of academic and research training, and prepares students for professional and scholarly careers. Emphasis is placed on expertise in analytical techniques, data interpretation, critical thinking and self-directed investigation. These students acquire a comprehensive knowledge of their field and related fields, and the skills needed to be a successful teacher, researcher, and administrator in the public or private sector.

The Program's research and education are in three core areas: **Earth Surface Processes**, **Solid Earth Science**, and **Sedimentology-Paleontology**. Research in **Earth Surface Processes** cuts across marine and terrestrial systems and includes studies of natural processes as well as interactions between humans and the environment. Sub-specialties include: 1) Hydrology, which is focused on surface and ground water flow and transport of material in terrestrial and marine hydrologic systems, and 2) Coastal processes, beach stability (including storm-impacts), and the consequences of sea level rise, which have important implications for Florida's economy. **Solid Earth Science** researchers use geophysical and geochemical methods to examine past and current tectonic plate movements and hazards (seismic and volcanic), and the evolution of continental and oceanic crust. Investigations into deep-earth processes include mantle flow and the geodynamo. Researchers in the **Sedimentology-Paleontology** group use records within sediment strata to infer past changes in earth's climate, oceans, environment, tectonic history, and biosphere over a broad range of timescales.

### 3. Program goals and objectives for teaching, research, and service

- Advance understanding of our changing world by addressing fundamental problems in geosciences through integrative research and excellence in education;
- Be the top geoscience program in the southeast through leadership in:
  - *Earth Surface Processes* (hydrogeology, paleoclimatology, physical geomorphology, oceanography, stable isotope geochemistry, biogeochemistry, environmental geoscience, and coastal systems),

- *Solid Earth Science* (tectonophysics, geodynamics, petrochemistry, geochronology, seismology, geological hazards, and non-renewable resources),
- *Sedimentary systems and Paleontology* (sedimentology, stratigraphy, paleontology, and paleoecology);
- Support the University of Florida’s goal of becoming a top ten public university by producing highly regarded research and Ph.D. graduates who are ready to train the next generation of geoscientists and solve the most vexing geoscience challenges, and by continuing the recent increase by 55 places (out of 144) in national rankings of geoscience departments;
- Fulfill the land-grant mission by providing quality B.S. and M.S. education that promotes application of fundamental geoscience principles to the environmental, industrial, and regulatory needs of society;
- Educate a variety of B.A. majors through flexible and distance learning environments to prepare them for STEM teaching, policy, legal, and finance related careers;
- Leverage the cross-disciplinary aspects of the geosciences to strengthen cooperation across the UF campus, and to promote educational and research links with geoscience programs in developing nations.

#### **4. Criteria and measures for knowing when the goals and objectives are achieved or not achieved**

- Continue the upward trajectory of the Program in national and international rankings
- Further increase the number of undergraduate majors to about 130 in five years.
- Increase the number of enrolled and funded Ph.D. students by 30% in five years and reduce time to graduation to an average of 5 years.
- Continue to engage students in research as evidenced by student-authored peer-reviewed publications and completion of independent research projects.
- Increase the total external funding by 30% and diversify the sources of funding through collaborative cross-disciplinary projects.
- Increase the proportion of undergraduate students who complete senior theses.
- Develop an online Geology BA degree that will produce its first graduates in the next 4 years
- Participate in development of cross-college General Education courses including a component of the UF Core.

#### **5. Student learning goals for each degree offered**

See Appendix for current Student Learning Goals for the degrees.

#### **6. Assessment of:**

##### **a. Sufficiency of resources and support services to achieve the program goals/objectives;**

Years of budget cuts have reduced OPS, OE, and support staff to levels that significantly challenge the Program. The OE budget is sufficient for only the phones, copying/printing, minor repairs to office equipment, and limited support for outside speakers. Funds to

maintain and replace outdated teaching equipment have not been available from UF resources. Reductions in OPS funding for TAs have forced us to cut sections of General Education courses. Geology is almost exclusively a “found major,” so the Program relies on strong enrollment in 1000 and 2000-level courses to attract students. Cuts to office staff (loss of the fiscal/grants position) and staff across campus, in general, coincided with further grant compliance and auditing requirements, which have forced more administrative duties onto faculty, decreasing their time for teaching and research. The Program relies on endowments to support its office manager and to support many of the meaningful educational experiences it provides to students, particularly field training, which is a major component of the program.

**b. How well program goals/objectives are being met;**

The Program goals and objectives are incrementally being met to the extent possible with current funding, because of the efficiency and sustained efforts of faculty and staff. Not all of the goals listed above will be met without replacement of anticipated faculty departures/retirements (about 25% in next 5 years), without increased support for fiscal oversight of grants, and without an increase in the OPS and OE budgets.

**c. How well students are achieving expected learning outcomes;**

Students completing courses and graduating from the Program are achieving the expected learning outcomes. Nearly 100% of the Program graduates find employment within their fields or matriculate into graduate programs.

**d. How the results of these assessments are used for continuous program improvement.**

Learning outcomes are reviewed annually to ensure students achieve expectations. The Program revises content and teaching methods annually to ensure student success.

**7. For baccalaureate programs, a review of lower level prerequisite courses to ensure that the program is in compliance with state-approved common prerequisites**

The General Education course ESC1000 meets one of the course requirements in the revised state approved common electives. All other prerequisites for upper division courses are compliant.

**8. The date of the last review and description of changes made since last review.**

The Geology Program and Department of Geological Sciences underwent an extensive external review in spring 2006. The review was performed by a distinguished group of external geoscientists who concluded that the Program was capable of achieving national and international distinction and moving into the upper echelons of AAU public geoscience departments with modest investment by UF in faculty, OPS and staff. A proposal by CLAS to eliminate the undergraduate program in 2007-08 derailed the momentum gained in the external review, resulted in the departure of a very high profile

researcher, and negatively impacted the peer review of large instrument proposals and project proposals at NSF for the next several years. A fiscal/grants specialist was hired after the review, but this position was eliminated during more recent budget cuts. The OPS budget has declined since 2007, which combined with required increases in TA stipends, has resulted in a significant decrease in the numbers of TAs supported by UF. Faculty numbers have remained about the same because most junior faculty decided to weather the storm, retention packages were accepted by two senior faculty members in 2013, and a major gift resulted in establishment of an endowed professorship in 2013. The Marine Science IDS degree and Environmental Geoscience (BA) track were implemented since the last review. Changes implemented following the external review were in part instrumental in the high ranking the Program achieved in the most recent NRC review..

**9. A summary of the findings of the current review, including strengths, weaknesses, opportunities, and threats (SWOTs) that support or impede achievement of program goals and student learning outcomes.**

The Program provides strong earth science research and education. Dedicated faculty members are efficient in teaching and research, and provide extensive service to the college, university and geoscience community. Almost all faculty members have externally funded research programs that support graduate students. The Program culture remains supportive and strong, which has facilitated adjusting to changes in staffing levels and duties. The research laboratories are the best and most comprehensive in the southeast, offering analytical facilities for research and teaching that are unique to the region, and in some cases the nation. These facilities suffer from limited personnel support in technical and fiscal areas. Graduates of the Program compete extremely well in the workplace against students from peer universities and at highly ranked graduate programs worldwide. Aging teaching labs and equipment, especially for field trips, limits educational experiences and hampers recruitment.

**Highlights:**

- Undergraduate and graduate enrollments, numbers of students graduating, awards to faculty and students, the breadth of world-class research laboratories, and national ranking continue to grow.
- Although the number of faculty members is smaller than our public and AAU peer departments nationally, we remain competitive at raising research funds, resulting in funds/faculty ratios that are higher than most of our peer departments.
- Endowments continue to grow, which enable meaningful educational, training, and field experiences for our students that would not be possible at the current level of university support. These funds provide the only support for activities within the geoscience community that increase outreach, visibility, and enhance graduate recruiting.
- Growth in resource and environmental industries, and gradual turnover in academic positions, has resulted in nearly 100% employment within the geosciences for graduates and fed a growing demand for enrollment.

As a result of three retirements and two departures over the past six years the Program has lost a member of the National Academy, a world-class researcher, and an active program in economic geology and mineralogy. We added three Assistant Professors, along with a prominent senior Professor (Bianchi) as the Jon and Beverly Thompson Endowed Chair. Over the next one to five years at least two, and likely three faculty members will retire, including the only paleontologist not in the Museum (Ciesielski), a prolific researcher (Distinguished Professor Channell), and one tenure-track faculty member will not continue through promotion and tenure. In order to achieve our goals, and teach the breath of undergraduate courses required for the PG license and to prepare students for pursuit of advanced degrees, we need to replace key retiring faculty. An important strategy for success of the Program is the addition of endowed professors as a means to improve the Program's reputation, which will require close collaboration with staff at the foundation. Given support from foundation staff, development should be successful, considering our past track record at development and the number of alumni employed by the mineral and environmental industries.

The number of UF allocated teaching assistantships (TAs) has dropped significantly over the past 10 years. This decrease in TA funding is partly offset by Distance Learning TAs, although these are less predictable from year to year, so cannot be used as a basis for recruiting new students. The value of TA stipends is as much as 25-40% lower than competitive programs. Combined with increasing University required fees, the result is a loss of opportunity for recruitment of the best graduate students. The numbers of graduate students supported by research assistantships (RAs) has increased over the past 7 years. RA funds, however, now make up the single most expensive item in most research grant budgets, as a result of rising stipends and tuition charges, so that further increases challenge the practical limits of funding agencies. Endowments provide assistantships for a small number of graduate students and "top-ups" to base TA or RA salaries are used to recruit high-caliber students. Unless funding for graduate support from UF increases, current endowments grow, and/or more endowments are established, the inability to make nationally competitive graduate assistantship offers will stifle future growth in graduate education.

For the Program to achieve its goals in geoscience research and education in Florida, nationally and internationally, we must replace departing faculty with new faculty within our focus areas, grow by adding additional endowed professorships, provide nationally competitive assistantships for graduate students, and provide valuable educational experiences for our students (e.g., field trips, field camp, modern teaching laboratory equipment, professional development, social events, seminars, and short courses). These needs must be met from University allocations combined with strong external support in the form of donations.

Ongoing changes in General Education in the State and at UF pose a serious threat to the undergraduate programs in Geology. As in other CLAS departments, the large number of Gen Ed credits that incoming freshman transfer from IB, AICE, and AP has reduced enrollment in lower division, non-major courses. The State common Gen Ed courses due to be implemented in 2015 along with the pending adoption of the UF Core courses will

also alter the demand for the Program's lower division courses. ESC1000 is one of the State common-core Gen-Ed courses, which will likely require the Program to offer an increasing number of sections (including online sections) in the coming years. This should yield an increase in SCHs, although the increase will be offset by reductions in GLY courses. The UF Core will pull students from GLY, ESC and OCE lower division courses. Involvement in UF Core teaching will offset this drop, but it is unclear how the SCHs will be allocated. A greater threat stems from the fact that more than 95% of the undergraduate majors in the Geological Sciences are "found majors". With fewer students enrolled in lower-division GLY, OCE, or ESC courses, it will become increasingly difficult to recruit undergraduate students.

### **10. The program's top five achievements and top five impediments to attaining its goals.**

Achievements since the last review

1. Attracted a large private donation for the first endowed professorship. This endowed position is elevating the reputation of the Program, and attracting new graduate students and post-doctoral fellows.
2. Raised the number and proportion of Ph.D. students enrolled and graduating from the Program, and more than tripled the number of undergraduate majors in the past 7 years.
3. Maintained an external funding percentage for tenure-track and tenured faculty of over 90% with over \$11.8 million in grants supporting research and education over the past 7 years.
4. Achieved nearly 100% job placement or graduate admission for undergraduate and graduate students in their chosen fields within 6 months of graduation.
5. In the most recent National Research Council evaluation of 144 Ph.D.-granting geoscience programs, the Program ranked 20<sup>th</sup> among all public institutions. This new ranking is a vast improvement to our previous ranking of 75<sup>th</sup> in 1992, reflecting the increasingly high quality of the Program's faculty and educational and research emphases.

Impediments to attaining goals

1. The foremost impediment is lack of funding for graduate teaching assistants and OE from the University. Our ability to recruit more and higher-quality Ph.D. students is limited by the OPS budget. The OPS budget also limits the number of undergraduate sections of Gen Ed courses that we can offer.
2. It is impossible to run the Program on an OE budget of \$26,000. Without access to endowment funds, the required field-training components of our Program would not be possible, our teaching equipment would quickly become unusable, and support for graduate student participation in national and international professional conferences would not be possible.
3. Lack of faculty in the areas of economic/resource geology.
4. Limited space in Williamson Hall. Lab space in Williamson Hall is completely occupied and several faculty members only have shared lab space for their research programs. Much of the first floor of Williamson Hall remains under the control of Physics. Any replacement of faculty will require new lab space because retiring/departing faculty all use shared space, so no additional space will be freed.

5. Restricted teaching laboratory space and poor conditions. Our growing numbers of undergraduate majors and lower-division enrollments require multiple sections for laboratory courses. Larger and more modern teaching laboratory space would allow reasonable-size sections with the numbers of TAs the Program has available.

#### **11. Data on the program's enrollments (SCH and FTE), majors, degrees granted, faculty, and financial profile from 2007-2014.**

Tenured and tenure-track faculty are composed of 18 (in 2013-2014) traditional academic faculty members (Appendix 1). Non-tenure track faculty in the Program include 1 full-time senior lecturer and 1 part-time lecturer; 2 full-time Associate and Senior Associate-Ins and 2 part-time Associate-Ins; and post-doctoral associates (grant supported).

The number of declared undergraduate geology majors has grown from 43 in Spring 2007 to about 90 in 2014 (Appendix 2). Growth occurred in both the BS and BA degree tracks. On the basis of verbal commitments from lower-division students, growth will continue at a rate of 5-10 majors per year. Total undergraduate SCHs dropped from a high of nearly 13,000 in 2007-08 to 7100 in 2012-13 (Appendix 4). This drop reflects the overall lower numbers of students taking lower-division courses, and reductions in sections that resulted from OPS cuts. Graduate SCHs and FTEs have remained constant with about 45 active students from 2007 to 2013 (Appendix 3). The ratio of Ph.D. to MS students increased from 0.8 to 3 over this interval reflecting the University mandated emphasis on doctoral-level education. An average of 21 BA/BS degrees were awarded per year between 2007 and 2012 (Appendix 5). This number increased to 33 in 2013 reflecting the increase in majors. Graduate students awarded masters degrees averaged 7/year. The number of doctoral degrees has varied, but growth of the Ph.D. program is reflected by 7 Ph.D. graduates in 2012-13 and 2013-14. The financial profile is summarized in Appendix 6.

#### **12. A description of the academic culture of the program.**

The Program benefits from an extremely strong and supportive academic culture. Faculty members enjoy a collegial relationship with each other and with students. Freshman to junior-level undergraduate students are advised primarily by the undergraduate advisor and members of the undergraduate committee. Interactions between faculty, graduate students and these undergraduate students are common because of lab- and field-based projects and class field trips. This camaraderie builds a strong sense of belonging for the students. Senior undergraduate students typically are involved in research projects or employed in one of the research labs, and are mentored by both faculty and graduate students. The capstone summer field course for the BS program results in very close ties between students that endure years beyond graduation. These ties can be extremely helpful in development as shown by links between faculty and the donor for the John and Beverly Thompson endowed chair. The graduate students experience frequent interactions with mentors and advisors, thanks to open laboratory environments, field studies, and new graduate committee practices implemented in recent years. Most graduate students interact with faculty mentors on a weekly basis. There is also a high level of interaction between faculty members in teaching, research and committee



situations. A number of the graduate courses are team-taught or have visiting lectures. Most of the research laboratories are open to all users and major instruments are shared. The committee structure in the Department produces a culture of shared governance and inclusion. Faculty have a strong commitment to shared governance across the University as well (e.g., Faculty Senate, CLAS finance committee (chair and members), CLAS faculty council (chair and members), CLAS tenure and promotion, CLAS curriculum committee, Senate finance committee, Senate budget council, academic personnel board, VP's special committee on research policies and procedures, VP research search and screen, research policy council, etc.

The Program benefits from numerous collaborations across UF, for example:

- Affiliate Faculty with the School of Natural Resources and Environment, Center for Latin American Studies, Center for African Studies, UF Florida Climate Institute, UF Water Institute, and Florida Museum of Natural History.
- Members of CLAS - BA in Sustainability Studies, UF Carbon Resources Science Center, Water Institute Advisory Committee, SEA Change Program, Ocean and Coastal Sciences Research Group, CLAS and UF Sustainability Committees, UFTeach, Hydrologic Sciences Academic cluster, UF representative for Consortium of Ocean Leadership, UF Water Institute Graduate Fellows Program
- Teaching collaborations include Partnership in the Marine Sciences ISD major with Biology and CALS and coordinating department of GLY3083: Introduction to Marine Sciences; Environmental Geosciences BA with Geography; course in Perspectives in Florida Lake Management (SWS 6932/4932) with Soil and Water Science
- Research collaborations include MRI-NSF proposal to acquire an EMP in Engineering; Astrobiology Initiative with Astronomy and Chemistry; Development of LIB-ICP methods (Chemistry, Engineering); Leading Phase III of the Gulf of Mexico Research Initiative (GOMRI) BP grant proposal with partners in CLAS and IFAS; collaborating on new NSF proposals to study: biotic controls on carbonate landscapes (with IFAS), hydrology of low-relief carbonate systems (with IFAS), sea level changes and hurricane landfalls (with Anthropology); Springs Ecosystem Supergroup (with IFAS and Engineering); Coastal SEES (with Engineering, DCP, IFAS); ICP-MS and stable isotope lab collaborations with faculty and graduate students from Anthropology, Biology, Florida Museum of Natural History, and IFAS for radiogenic isotope, stable isotope, and trace element analyses.

**13. A link to the Academic Learning Compact for each reviewed baccalaureate program**

<https://catalog.ufl.edu/ugrad/current/liberalarts/alc/geology-ba.aspx>

<https://catalog.ufl.edu/ugrad/current/liberalarts/alc/geology-bs.aspx>

<https://catalog.ufl.edu/ugrad/current/agriculture/ALC/marine-sciences.aspx>

**14. A summary of the recommendations and/or proposed action plans made as a result of the review, including changes at the academic, departmental, college or institutional level.**

- Replace or add faculty positions in Remote sensing (neotectonics/environmental geology/hazards), Radiogenic isotopes (environmental/geochronology/solid earth/economic), and Stratigraphy – Paleontology (timescales/chemostratigraphy/magneostratigraphy/sequence stratigraphy) over the next four years:
- Seek private donations for endowed senior faculty positions in: 1) Coastal geology, surface processes, and shallow subsurface geology to address sedimentary environments and resources at the land-sea interface, and 2) Economic geology, resource exploration, non-renewable resource economics, and resource sustainability to address resource exploration and extraction (including Florida's vast mineral resources).
- Develop modern integrative educational experiences and data intensive activities in labs, field projects, short courses, and internships by seeking funds for new teaching equipment and industry-supported instruction.
- Development a distance-learning BA for teacher training, pre-professionals, general education, and expanded access.
- Fully support teaching and research leading to B.S. and M.S. degrees that include field training and lead to professional employment in geoscience industries and the public sector.
- Support Ph.D. students with nationally competitive graduate stipends and fellowships.
- Seek private donations for new graduate fellowships to enhance opportunities for under-represented groups, recruit the best students, and increase the number of the graduate students enrolled in the program.
- Promote participation of faculty and students in outreach and broader impacts of research and higher education.
- Establish partnerships with geoscience programs in developing countries to promote shared field and laboratory experiences, and recruit students.
- Refill the fiscal/grants staff position to keep up with Federal and UF auditing requirements and provide proactive budget development for the increasing numbers of grants and contracts.
- Replace the aging van fleet (several vehicles are over 12 years old and have almost 200,000 miles) for safety and reliability during student field trips.
- Fund renovations to teaching lab space in Williamson Hall by 1) converting room WH101 into a microscopy lab that will accommodate more students per lab sections, 2) expanding WH202 or WH210 to allow larger laboratory lectures, and 3) converting virtually unused space occupied by the Physics Department on the first floor to Geological Science teaching labs.
- Provide state funding for scientific staff in timescales and environmental geology.

**15. Signature of the University Provost certifying that the program review included all of the processes included in the BOG regulation and was conducted according to approved institutional policies and procedures.**

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Joseph Glover, Provost

Appendix 1: Faculty FTE for Geological Sciences 2007-2014

**COLLEGE-LIBERAL ARTS/SCIENCES**

**LS-GEOLOGY**

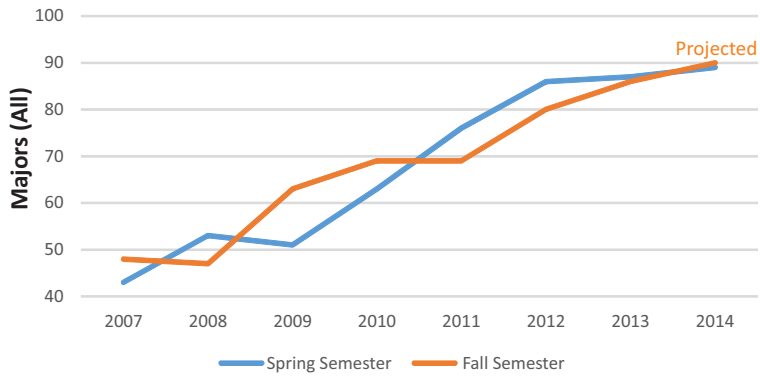
| Academic Year | FULL-TIME |              |                  | PART-TIME |                  | Total |
|---------------|-----------|--------------|------------------|-----------|------------------|-------|
|               | Tenured   | Tenure-Track | Non Tenure-Track | Tenured   | Non Tenure-Track |       |
| 2007-08       | 13        | 5            | 3                | 1         | 2                | 24    |
| 2008-09       | 11        | 4            | 5                |           | 2                | 22    |
| 2009-10       | 11        | 5            | 6                |           | 3                | 25    |
| 2010-11       | 12        | 4            | 5                |           | 3                | 24    |
| 2011-12       | 13        | 4            | 6                |           | 4                | 27    |
| 2012-13       | 13        | 4            | 5                |           | 4                | 26    |
| 2013-14       | 13        | 5            | 5                |           | 3                | 26    |

Source: HR Snapshot

Appendix 2: Undergraduate Geology Majors 2007-2014

## Undergraduate Enrollment

Major Count Geology



| <b><i>Geology</i></b> | <b><i>Spring</i></b> | <b><i>Fall</i></b> |
|-----------------------|----------------------|--------------------|
| <b>2007</b>           | 43                   | 48                 |
| <b>2008</b>           | 53                   | 47                 |
| <b>2009</b>           | 51                   | 63                 |
| <b>2010</b>           | 63                   | 69                 |
| <b>2011</b>           | 76                   | 69                 |
| <b>2012</b>           | 86                   | 80                 |
| <b>2013</b>           | 87                   | 86                 |
| <b>2014</b>           | 89                   | 90*                |
|                       |                      | *Projected         |

Appendix 3: Graduate Students and Degree Track 2007-2014

| A.Y.      | M.Sc. | M.ST. | Ph.D. |
|-----------|-------|-------|-------|
| 2007-2008 | 25    | 1     | 20    |
| 2008-2009 | 15    | 1     | 33    |
| 2009-2010 | 10    | 1     | 29    |
| 2010-2011 | 19    | 0     | 25    |
| 2011-2012 | 16    | 0     | 29    |
| 2012-2013 | 14    | 0     | 28    |
| 2013-2014 | 11    | 0     | 33    |

## Appendix 4: Undergraduate and Graduate SCH and FTE 2007-2014

| Data from Institutional Research Fundable SCH and FTE Management System |                     |                     |                |                |           |
|---|---------------------|---------------------|----------------|----------------|-----------|
|   | undergrad total SCH | undergrad total FTE | grad total SCH | grad total FTE | total SCH |
| 2014 spring prelim  | 2730.0              | 68.3                | 385.0          | 12.0           |           |
| 2013 fall   | 3102.0              | 77.6                | 379.0          | 11.8           |           |
| 2013 summer   | 1272.0              | 31.8                | 59.0           | 1.8            |           |
| 2013-2014 total   | 7104.0              | 177.6               | 823.0          | 25.7           | 7927.0    |
| 2013 spring   | 3224.0              | 80.6                | 349.0          | 10.9           |           |
| 2012 fall   | 3434.0              | 85.9                | 380.0          | 11.9           |           |
| 2012 summer   | 1686.0              | 42.2                | 93.0           | 2.9            |           |
| 2012-2013 total   | 8344.0              | 208.6               | 822.0          | 25.7           | 9166.0    |
| 2012 spring   | 3779.0              | 94.5                | 438.0          | 13.7           |           |
| 2011 fall   | 2973.0              | 74.3                | 383.0          | 12.0           |           |
| 2011 summer   | 1572.0              | 39.3                | 85.0           | 2.7            |           |
| 2011-2012 total   | 8324.0              | 208.1               | 906.0          | 28.3           | 9230.0    |
| 2011 spring   | 3823.0              | 70.6                | 422.0          | 13.2           |           |
| 2010 fall   | 3069.0              | 76.7                | 402.0          | 12.6           |           |
| 2010 summer   | 697.0               | 17.4                | 77.0           | 2.4            |           |
| 2010-2011 total   | 7589.0              | 164.7               | 901.0          | 28.2           | 8490.0    |
| 2010 spring   | 3178.0              | 79.5                | 417.0          | 13.0           |           |
| 2009 fall   | 4752.0              | 118.8               | 350.0          | 10.9           |           |
| 2009 summer   | 1048.0              | 26.2                | 114.0          | 3.6            |           |
| 2009-2010 total   | 8978.0              | 224.5               | 881.0          | 27.5           | 9859.0    |
| 2009 spring   | 2838.0              | 71.0                | 454.0          | 14.2           |           |
| 2008 fall   | 6122.0              | 153.1               | 374.0          | 11.7           |           |
| 2008 summer   | 894.0               | 22.4                | 108.0          | 3.4            |           |
| 2008-2009 total   | 9854.0              | 246.4               | 936.0          | 29.3           | 10790.0   |
| 2008 spring   | 5473.0              | 136.8               | 414.0          | 12.9           |           |
| 2007 fall   | 5861.0              | 146.5               | 395.0          | 12.3           |           |
| 2007 summer   | 1456.0              | 36.4                | 87.0           | 2.7            |           |
| 2007-2008 total   | 12790.0             | 319.8               | 896.0          | 28.0           | 13686.0   |

Appendix 5: Degrees Awarded by Geological Sciences 2007-2014

**COLLEGE-LIBERAL ARTS/SCIENCES**

**LS-GEOLOGY**

|                      | <b>Bachelor's</b> | <b>Master's</b> | <b>Doctoral</b> |              |
|----------------------|-------------------|-----------------|-----------------|--------------|
| <b>Academic Year</b> | <b>Degrees</b>    | <b>Degrees</b>  | <b>Degrees</b>  | <b>Total</b> |
| 2007-08              | 25.0              | 11.0            | 0.0             | 36.0         |
| 2008-09              | 17.0              | 7.0             | 2.0             | 26.0         |
| 2009-10              | 18.5              | 8.0             | 3.0             | 29.5         |
| 2010-11              | 23.5              | 5.0             | 5.0             | 33.5         |
| 2011-12              | 19.5              | 4.0             | 1.0             | 24.5         |
| 2012-13              | 33.5              | 9.0             | 7.0             | 49.5         |
| 2013-14              | 23.0              | 4.0             | 7.0             | 34.0         |

Appendix 6: Financial Profile Geological Sciences 2007-2014

| <b>Academic Year</b> | <b>Salaries</b> | <b>OPS</b> | <b>OE</b> | <b>Special</b> |
|----------------------|-----------------|------------|-----------|----------------|
| 2007-08              | 2,339,623       | 215,020    | 40,000    | 0              |
| 2008-09              | 2,441,770       | 343,448    | 26,000    | 0              |
| 2009-10              | 2,230,597       | 218,900    | 26,000    | 0              |
| 2010-11              | 2,003,350       | 221,900    | 26,000    | 0              |
| 2011-12              | 2,480,854       | 209,764    | 26,000    | 0              |
| 2012-13              | 2,419,489       | 210,000    | 26,000    | 0              |
| 2013-14              | 2,807,969       | 179,024    | 26,000    | 0              |



Appendix 7: SLOs for the degree programs