

Assessment Cycle: 2019 Reporting

Overall Review: Report Approved

COMPLIANT

Mission Statement

The mission of the USF School of Geosciences is to facilitate student success through the delivery of high-quality, skills-based undergraduate, graduate, and professional programs in environmental science and policy, geography, and geology; to generate knowledge and foster intellectual development by undertaking high-impact scholarship focusing on local, state, national, and global problems; and to develop community, industrial, and professional partnerships to advance career and service opportunities for a diverse student body.

Goal 1: Discipline-Specific Knowledge

Six students will receive their PhD from the Geology Program, after having successfully completed all of the program requirements.

1a. Student Learning Outcome Statement

Audit Review: AC

The School of Geosciences Geology Ph.D. graduates are expected to be able to orally present and defend their original research work.

1b. Method of Assessment

Audit Review: AC

As a graduation requirement, each geology Ph.D. student is required to take a Qualifying Exam (written and oral) and develop a maximum 10-page dissertation proposal in order to become a **doctoral candidate**. Each Ph.D. student has a graduate committee comprised of at least 4 faculty members in the student's disciplines or/and related fields (one member should be from a different department or outside USF). The committee will assess student's performances after completing the qualifying exams using a scoring rubric that evaluates: 1) General and Discipline specific Knowledge, 2) Problem Solving, 3) understanding methodology, 4) organization/communication, and 5) support/background, each on a scale from 5 (highest) to 1 (lowest). If differences in rating are larger than 2 points for any given criterion, the committee members will be asked to re-evaluate their scores.

1c. Performance Targets

Audit Review: AC

Program implementation will be considered a success if 87% of students earn an average of 19 points or more from each member of the committee with not less than 3 on each element of the rubric.

1d. Assessment Results

Audit Review: AC

Seven PhD students have taken their Qualifying exams in 2019 and were evaluated on all five scoring rubrics listed under **1b**. Six of them successfully passed this exam, but one student within this group was rated 17 by one of the reviewers, thus not meeting the performance target. The 7th student failed the exam (scored below 19 at all committee members) and received a conditional pass that implies additional requirements (i.e., take or re-take specific courses) before they retake this exam. Since only 4 of the students met the performance target (19 points or above), the program implementation for 2019 is 71.5%, it implies that the success threshold was not reached and the program underperformed.

1e. Use of Assessment Results

Audit Review: AC

In order to provide time for meaningful reflection on "Use of Assessment" results, we used the 2018 academic year data. The assessment results are used to evaluate the ability of Geology PhD students to implement modern research methods in their studies in order to produce quality scientific results and write a compelling dissertation proposal. The changes implemented based on the previous assessment cycles were not producing the expected outcomes. Thus, apart from a new protocol introduced in September 2018 that monitors the satisfactory academic progress of all PhD students on the basis of a complex Annual Evaluation (in which they are rated and receive feedback from all their committee members), the Graduate Committee now proposed to SGS the following additional steps: 1) continue creating a better and efficient structure of the PhD curricula and 2) improve students performance on all rubrics where they scored 3 by developing and introducing quantitative and critical-thinking based assignments in the syllabi of all PhD level courses. The latter concretizes in the launching of two new classes that are required to all PhD students prior to taking their Qualifying exam. These are: **History of Geology** and **Scientific Writing and Research**. Achieving these goals is essential in enhancing the program within the next 3 years, as the SGS's plans to keep the Performance Target at 87%, but rise the average to 20 points or more, meaning we expect scores of 4 or above at each rubric evaluated.

Plan Review Comments

Report Review Comments

2a. Student Learning Outcome Statement

Audit Review: AC

The School of Geosciences Geology Ph.D. graduates will demonstrate mastery of their research area.

2b. Method of Assessment*Audit Review: AC*

Each member of the doctoral dissertation committee will conduct a comprehensive written exam in his field of expertise that is relevant to candidate's research topic. Students will be given three complex questions to respond to and a follow-up oral exam will be administered not later than 2 weeks after the written tests. The exam will be scored based on completeness and the understanding of the subject using a scoring rubric with 5 (highest) and 1 (lowest). The scoring rubric assesses: 1) the completeness of **Support/Background** information acquired by the student in order to pursue her/his research and 2) the breadth and depth of the **General and Discipline specific Knowledge**. If differences in rating are larger than 2 points for any given criterion, the committee members will be asked to re-evaluate their scores. Since the goals were not achieved last year, we reached to our faculty and requested to add additional workload (e.g., bibliographic and discipline specific reviews) so that the PhD students improve in these fields.

2c. Performance Targets*Audit Review: AC*

If 85% of all PhD candidates considered in the annual evaluation scored 7 or more from each committee member with the lowest being 3 in one of the two criteria, the program will be considered successful.

2d. Assessment Results*Audit Review: AC*

The vigorous action taken after the program failed to meet the Performance Targets, in 2019, all twelve students were scored 7 or above for the two criteria under evaluation (see 2b).

2e. Use of Assessment Results*Audit Review: AC*

Although the program did very well in 2019, three students showed some weaknesses in both rubrics considered, receiving only 7. These students were not taking the newly offered (beginning with Spring 2019) *Scientific Writing and Research* class that among other topics, include reference-specific assignments in which students will have to read and prepare a detailed literature review for three of the most influential papers in each student's field. We anticipate that continuing to offer this class and making it required (it was actually decided in Fall 2019 to be one of the graduate core courses), will improve the performances of our program for the evaluated criteria to the point that the Performance Target can be raised so that 85% of the students will achieve 4 or more on each criterion.

Plan Review Comments

Report Review Comments

3a. Student Learning Outcome Statement*Audit Review: AC*

Geology PhD graduates in the School of Geosciences will demonstrate their ability to use modern research methods to conduct in-depth studies in their field of research.

3b. Method of Assessment*Audit Review: AC*

The graduate committee of each Ph.D. student will use a scoring rubric to assess the quality of their research with the aim of identifying areas of weaknesses. Candidates will be scored in three areas, using a 5 (highest) to 1 (lowest) scale. The rubric is similar to the one they used for their qualifying exam. The scoring rubric evaluates: 1) to what degree students are understanding **Specific Methodologies**, 2) how well she/he developed the **Problem Solving Skills**, and 3) assess the successfulness of **Organizing and/or Communicating the scientific results** by evaluating the publication record and presentations at scientific meetings. If differences in rating are larger than 2 points for any given criterion, the committee members will be asked to re-evaluate their scores.

3c. Performance Targets*Audit Review: AC*

Organizing and/or Communicating the scientific results Program implementation will be considered a success if 85% of the PhD students sample will achieve a score of 11 or higher from each committee member.

3d. Assessment Results*Audit Review: AC*

Twelve PhD defenses were assessed on the following three criteria: 1) Problem solving, 2) Understanding methodology, and 3) Organization/Communication of results. In 2019, all but two of the Geology PhD students evaluated scored 11 or higher on each of the above criteria. However, two students were rated 3 in two of the rubrics, causing the program implementation under this learning outcome to achieve only 83%, thus slightly underperforming.

3e. Use of Assessment Results*Audit Review: AC*

In order to provide time for meaningful faculty reflection on "Use of Assessment Results" we used academic year 2018 data. Although all twelve students graduated, we noticed weaknesses in the areas of Problem Solving and Understanding Methodology. Following our 2017 assessment report, we suggested implementing the following actionable changes (e.g., attending and presenting research at professional scientific meetings, provide review narratives of methodologies to be used in their research, etc.), in order that the PhD students improve in the 3 scoring criteria under

consideration. Analyzing the results, it became clear that increasing the participation in scientific meetings did improved the Organization/Communication skills, but the other actionable changes were not fully successful. Thus, the Graduate Committee and its Director proposed SGS to to require all PhD students to give an oral presentation within the Department or any of the Research Groups exiting within SGS. Also, the Graduate Committee proposed and was agreed that the *Scientific Writing and Research* class becomes a core course for all graduates beginning with Fall 2020. This class includes 3 critical-thinking based assignments in which students will have to pick and dissect research methodologies used in their dissertation. In addition, two other assignments within this class tackle the problem solving topic by requiring students to learn how to handle and solve various computational question while using large datasets. We anticipate that continuing to implement the previously suggested changes and those put forward in this "Use of Assessment", will improve the performances of our program for the evaluated criteria. The assessment is also providing a good feedback since the School of Geosciences is willing to increase the rigor of its PhD program within the next 3 years by rising the expectations of program success if 85% of students achieve 12 or more on each element of the scoring rubric from all committee members.

Plan Review Comments

Report Review Comments

Assessment Methods

Course Related Assessments

Cumulative Assessments

Comprehensive Exam
Faculty Designed Comprehensive or Capstone Examination and Assignment

Performance Related Assessments

Professional Judged Performance or Demonstration of Ability in Context

External-course Assessments

Standard Assessments
