CSU CHICO

ASSESSMENT SUMMARY UPDATE

PROGRAM: BS in Environmental Sciences

Year of review	Student Learning Outcome	Describe assessment activity done this year for this SLO	Findings	Based on the results or evidence, what action was taken regarding program improvements?
2016-2017	For the AY 2016-17 we chose to assess the student learning Goal 5: Improve skills in communicating scientific results with the following SLOs: SLO 5a: Access and reference published scientific information; SLO 5b: Apply computer skills in communication (e.g., presentation, graphs, etc.); SLO 5c: Communicate technical information.	The three SLOs were assessed in 3 different courses: GEOS 250, GEOS 265, and GEOS 575. Overall, only SLO 2a was assessed at the introductory level in GEOS 250, all other SLOs were also assessed at the practise and mastery level. Each course used their unique, and course specific assessment tools. But all these assessment tools have in common that they needed to plot and interpret scientific data. In GEOS 250 a term project was used to assess SLO 5a at the introductory level. The requirements for this term paper was to write computer code to graph data of the student's choice and to interpret the data. For the assessment of SLOs 5a-5c at the practice level in GEOS 265, and mastery level in GEOS 575 a lab report and the senior project was used for assessment purposes, respectfully. As the lab report and the senior project report were assessed using a similar rubric, improvement from practice to mastery level has been assessed.	In general, the assessment of Goal 5 showed that students improve from a lower level of proficiency to a higher level of proficiency. 100 % of students achieved mastery level, if a mastery level is defined as a good or better performance. The most difficulty for students writing reports is to write an abstract and to discuss project data with scientific knowledge. Hence these are two areas which could be improved if more offer of such work would be available.	Implementation of new tools to enhance student performance is difficult because a new curriculum for Environmental Science has been submitted.

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2015-2016	SLO3a. Qualify human alterations of Earth's natural processes and their consequences	Four courses (GEOS 120, GEOS 165/198, GEOS 300, and GEOS 365) were used to assess SLO 3a through class-specific measures. These courses address SLO 3a at the Introduce (GEOS 120 and 165/198), Practice (GEOS 300), and Master (GEOS 365) levels.	Student performance on exam and quiz questions addressing SLO 3a averaged 75% (GEOS 300, Practice level), 82% (GEOS 120, Introductory level), 86% (GEOS 365, Mastery level), and 92% (GEOS 165/198, Introductory level). Considering a C grade or higher (70-100 %) as a satisfactory performance, 70% of GEOS 120 students and 92% of GEOS 165/198 students qualified human alterations of Earth's natural processes and their consequences (SLO 3a) in a satisfactory manner. Only 56% of GEOS 300 students performed satisfactorily on SLO 3a-related questions. These results are likely affected by the limited number of questions used for assessment purposes (n=1). 86% of GEOS 365 students performed at a C grade level or better (70-100%) on SLO 3a. This high performance on five questions at the "Master" level indicates that Environmental Science juniors and seniors have gained mastery of key concepts related to the impact of human activity on natural ecosystems (SLO 3a) as they near completion of their BS degree.	The assessment of the Environmental Sciences program is still in its early stage of reinstatement but it will inform the major curriculum remodel effort that GEOS faculty have initiated in Spring 2016. Several department meetings have been dedicated to the ES curriculum re-design and faculty teaching core program courses have presented course overviews to the department in an effort to familiarize everyone with course content and teaching styles. We expect that assessment data will play a central part in "closing the loop" of the ES curriculum re-design process. We also expect to regularly update our assessment methods to better represent newly created courses for the remodeled ES curriculum.
2014-2015	No specific SLO was assessed this academic year. Instead, the department reviewed and updated the Environmental	An assessment matrix for the Environmental Science program was created, identifying which SLOs were addressed by each	No assessment result to report for 2014-15.	No specific action taken in 2014-15, other than re-drafting the program goals and SLOs.

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	Science program mission statement, goals, and SLOs. Significant changes were made to reflect the fact that the program has not been assessed since 2007. These changes were voted on and approved by the department.	core program course and at which skill level (Introduce, Practice, Master). This draft matrix was completed after meeting individually with course instructors.		
2013-2014	No report on file	No report on file	No report on file	No report on file
2012-2013	This year, we assessed Goal 5 again as well as a variety of SLO's within previously-assessed goals. Synthesize varied types of field information and apply these to developing conceptual and mathematical models. Use analytical skills to process observational and numerical data in order to test hypotheses and reach sound conclusions. Students will demonstrate that they can observe the various types of rocks and transcribe those observations into proper field-note descriptions. Students will demonstrate that they can correctly use the Brunton compass to measure strikes and dips and place that data on a geologic map. Student will demonstrate that they can identify contacts between lithologic units on the ground and accurately and	Courses (GEOS 360, 361, 471, 572) were assessed through class-specific measures. Participation in the survey ranged from 82% to 100% per class. y choosing these courses, we have assessed student work at various stages of their academic development. Since mapping skills and writing skills in Goal#5 cannot be probably assessed until students have received the basic first and second-year course, we only assessed 300 and higher-level courses. GEOS 360 and 361 are a junior-level courses; GEOS 471 and 572 are advanced senior-level courses. We also chose these courses to emphasize our field program; both GEOS 360 and 471 are both 2-week intensive field courses taken in successive years, and GEOS 572 is a capstone course that attempts to incorporate all of the basic skills learned throughout the major.	In general, the students demonstrated adequate ability in interpreting geological field data and synthesizing it into a report. Most students benefitted greatly from rewriting using guidelines and comments.	**GEOS 360:** At this stage in their education, we expect students to struggle with aspects of geologic cross sections. It is, after all, the first time that these students are asked to construct a geologic cross section based on their own geologic mapping. Given their lack of experience, we are quite pleased with the results. **GEOS 361:** A common problem in their writing is that the students need to take more time to edit their documents – catching mistakes and tightening up their writing by improving the flow of their ideas and eliminating awkward statements. **GEOS 471:** Results indicate that students have the information they need to construct a geologic interpretation (e.g. their maps) but have the need for additional practice towards mastery, which is consistent with the Course Alignment

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	precisely plot those contacts on a map. Students will demonstrate that they can make field observations, describe those observations accurately in field notes, and be able to interpret the data and synthesize it into a proper field report. Students will demonstrate that they can construct a proper geologic map based on their field observations. Students will demonstrate that they can construct geologic cross-sections and geologic columns.			Matrix (in which GEOS 471 is designed to give students practice in SLOs 1-5. As planned, students will gain additional practice in elective courses (e.g. GEOS 570) and subsequent required courses (GEOS 555) and mastery of SLO#5 in GEOS 572 and GEOS 580. Geology Program Assessment 2012-13 Page 7 of 15 **GEOS 572:** In order to address the problems revealed by the assessment, we will The lithologic descriptions appear to have been written in great haste long after leaving the field instead of being carefully recorded in the field. In the future, we will insure that, in GEOS 572 as well as in the field courses that serve as prerequisites for GEOS 572, students will always be required to write complete detailed rock descriptions in the field, turn them in to their instructors, and then rewrite them in response to the instructor's feedback. Clearly, our students need more guidance in the proper interpretation of geologic contacts. We have already begun to address this issue. In GEOS 408 (structural geology)

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				we have incorporated activities into the course that explicitly require students to distinguish among these different types of contacts on geologic maps. We will also provide more explicit instruction and practice in all of our field courses on the methods for distinguishing different types of contacts, focusing especially on the specific types of field observations to use for this purpose. Our students also need more guidance in the interpretation of the strain significance of fault patterns. In GEOS 408, students will spend more time practicing this skill and in clearly articulating their interpretations in writing and with diagrams. In GEOS 572, students will be required to submit illustrated written interpretations of fault patterns in the field. After receiving feedback, they will be required to resubmit their work. This process will be repeated as often as necessary until a satisfactory result is achieved. In GEOS 408, students will repeatedly be required to construct their own topographic profiles using vertical scales that they must calculate and construct for themselves (Prior

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				students were given pre-made topographic profiles and/or premade vertical scales on the erroneous assumption that students already possessed these skills and that, thus, such tedious work was unnecessary.). In GEOS 408 a greater emphasis will be placed on the proper construction of plausible cross sections. Students will receive more explicit instruction and get more practice constructing cross sections with greater degrees of complexity. In GEOS 471 and 572, we will require that the cross section work be more iterative—that students submit multiple drafts while still in the field until they achieve a satisfactory result.