

DEPARTMENT OR PROGRAM: Geology, Paleontology & Oceanography

DIVISION: Math/Science

I. DESCRIPTION OF PROGRAM

Geology, paleontology and oceanography are all small programs, each primarily offering one lecture course (Geol 100, Paln 110 and Ocen 100) and geology offering one lab course (Geol 101) each semester and paleontology offering one lab course (Paln 111) during spring semesters. All courses are CSU/UC transferable and fulfill GE requirements in science. Geol 100, Geol 101, Paln 110 and Paln 111 are required for the AS in Geological Sciences and the AS-T in Geology.

II. STUDENT LEARNING OUTCOMES (SLOs)

- a. Please list the courses, if any, for which SLOs have not been assessed. What assessment is planned for these courses? What assistance or resources would help to complete assessment?

3 of the 5 SLOs for Paln 111 have not been assessed because this semester (spring 2012) is only the second time the course has been offered. No assistance or resources are required.

- b. Please list any degrees offered. Have SLOs been identified for each degree?
Degree SLOs have been identified for both the AS in Geological Sciences and AS-T in Geology.

Briefly describe the department's plan for assessment.

Degree SLOs are also course SLOs that will have been met upon successful completion of Geol 100, Geol 101, Paln 110 and Paln 111. Assessment by survey upon application for the degree is also being considered.

- c. Please list any certificates offered. Have SLOs been identified for each certificate?
Briefly describe the department's plan for assessment.
no certificates

- d. Based on assessment results, 1) what changes will the department consider or implement to improve student learning; and 2) what, if any, resources will the department or program require to implement these changes? (Please itemize these resources in section VII of this document.)

1) Recommendations for both Geol 100 and Paln 110 included an increase in "thinking-out-loud" commentary during modeling of the problem solving process in class. Recommendations for Ocen 100 included the use of more classroom examples to improve quantitative and graphical problem solving. The use of iclickers was introduced

in all sections of these lecture courses this semester. Using iclickers, the students respond to an increased number of classroom examples and engage in peer discussion as they work to answer questions. From the responses, the instructor can immediately identify which concepts or problems warrant a "thinking-out-loud" commentary of the problem solving process. Unfortunately, the students who don't have iclickers (for whatever reason) feel ostracized and attend class less frequently.

2) Continued use of iclickers is contingent on positive student feedback, very low costs to the students and integration with our course management system, moodle.

- e. Below please update the program's SLO Alignment Grid below. The column headings identify the General Education (GE) SLOs. In the row headings (down the left-most column), input the course numbers (e.g. ENGL 100); add or remove rows as necessary. Then mark the corresponding boxes for each GE-SLO with which each course aligns.

If this *Program Review and Planning* report refers to a vocational program or a certificate program that aligns with alternative institutional-level SLOs, please replace the GE-SLOs with the appropriate corresponding SLOs.

GE-SLOs→ Program Courses ↓	Effective Communication	Quantitative Skills	Critical Thinking	Social Awareness and Diversity	Ethical Responsibility
Geol 100	1a, 1b, 1c	2a, 2b	3a, 3b		
Geol 101	1a, 1b	2a, 2b	3a		
Paln 110	1a, 1b, 1c	2a, 2b	3a, 3b		
Paln 111	1a	2a, 2b	3a, 3b		
Ocen 100	1a, 1b, 1c	2a, 2b	3a, 3b		

III. DATA EVALUATION

- a. Referring to the Enrollment and WSCH data, evaluate the current data and projections. If applicable, what programmatic, course offering or scheduling changes do trends in these areas suggest? Will any major changes being implemented in the program (e.g. changes in prerequisites, to-be-arranged hours (TBA), lab components. etc.) require significant adjustments to the Enrollment and WSCH projections?

The Enrollment and WSCH data appear to have changed primarily due to the changes in course offerings, so no major changes are suggested or intended.

GEOLOGY	2008-9	2009-10	2010-11
Enrollment	185	125	272
WSCH	734.3	531	1142.4

PALEONTOLOGY	2008-9	2009-10	2010-11
Enrollment	85	110	57
WSCH	351.2	457.4	239.4

OCEANOGRAPHY	2008-9	2009-10	2010-11
Enrollment	290	302	114
WSCH	1236.6	1268.4	478.8

- b. Referring to the Classroom Teaching FTEF data, evaluate the current data and projections. If applicable, how does the full-time and part-time FTEF affect program action steps and outcomes? What programmatic changes do trends in this area suggest?

One full-time faculty member currently teaches all of the fall and spring sections in geology, paleontology and oceanography. The one summer course, Ocen 100, continues to be taught by adjunct faculty. No programmatic changes suggested.

GEOLOGY	2008-9	2009-10	2010-11
Full-time FTEF	0.77	0.56	1.12
Part-time FTEF	0.1	0.0	0.0
Percent full-time	88%	100%	100%

PALEONTOLOGY	2008-9	2009-10	2010-11
Full-time FTEF	0.6	0.76	0.4
Part-time FTEF	0.0	0.0	0.0
Percent full-time	100%	100%	100%

OCEANOGRAPHY	2008-9	2009-10	2010-11
Full-time FTEF	0.8	0.8	0.4
Part-time FTEF	0.82	0.67	0.0
Percent full-time	49%	54%	100%

- c. Referring to the Productivity (LOAD) data, discuss and evaluate the program's productivity relative to its target number. If applicable, what programmatic changes or other measures will the department consider or implement in order to reach its productivity target? If the productivity target needs to be adjusted, please provide a rationale.

Geology LOAD has consistently increased over the last 3 years.

GEOLOGY	2008-9	2009-10	2010-11
LOAD	847	948	1020

Paleontology LOAD has hovered between the 585 - 602 for the last 3 years. Paln 110 consistently fills the earliest of all the classes in all 3 programs and generates the largest waitlist. This popularity may be due to the abundance of hands-on learning experiences in the course.

PALEONTOLOGY	2008-9	2009-10	2010-11
LOAD	585	602	599

Oceanography LOAD has consistently increased as the number of sections decreased.

OCEANOGRAPHY	2008-9	2009-10	2010-11
LOAD	763	861	1197

The 2010-11 LOAD numbers for all 3 programs are well above the LOAD averages for the Math/Science Division (548) and the college (576) as well as the State's productivity target (525).

IV. STUDENT SUCCESS EVALUATION AND ANALYSIS

- a. Considering the overall "Success" and "Retention" data, briefly discuss how effectively the program addresses students' needs relative to current, past, and projected program and college student success rates.

Geology retention and success rates dropped slightly this year, possibly due to more stringent TBA requirements.

GEOLOGY	2008-9	2009-10	2010-11
Retention %	84%	87%	82%
Success %	66%	74%	63%

Paleontology retention rates are consistently in the 80's, but the success rates vary from mid 60's to low 70's. Fewer students in the program would account for some of this variation since paleontology sections enroll 30 students, while geology and oceanography sections commonly enroll 60 students.

PALEONTOLOGY	2008-9	2009-10	2010-11
Retention %	87%	80%	88%
Success %	70%	64%	72%

Oceanography retention rates and success rates have consistently dropped as the number of sections offered decreased. 2009-10 was the last year that the lab class was offered; 2 sections in fall, one section in spring. Generally, students who are concurrently enrolled in lecture and lab are more successful in lecture and have more incentive to persevere than those in lecture only. The drop in retention and success rates probably reflects the reduction in the number of lab sections offered.

OCEANOGRAPHY	2008-9	2009-10	2010-11
Retention %	81%	75%	74%
Success %	61%	56%	54%
# of lab sections	4	3	0

Information from student surveys indicates that many of the students in all 3 programs are not striving to earn a C since they can fulfill a CSU general education transfer requirement with a D. The student success data is based on earning a C or better, and therefore differs from the students' perception of success.

Discuss distance education (online and hybrid modes) success and retention data and, where possible, compare with data for on campus sections.
not applicable

If applicable, identify unmet student needs related to student success and describe programmatic changes or other measures the department will consider or implement in order to improve student success. (Note that item IV b, below, specifically addresses equity, diversity, age, and gender.)
see II d

- b. Briefly discuss how effectively the program addresses students' needs specifically relative to equity, diversity, age, and gender. If applicable, identify unmet student needs and describe programmatic changes or other measures the department will

consider or implement in order to improve student success with specific regard to equity, diversity, age, and gender.

All three programs are small, and therefore many of the demographic statistics are based on too few samples to be statistically valid. At this point, the small numbers of students and lack of data from other years is insufficient for the determination of trends that might require attention, but the lowest numbers are presented here.

In the geology courses, the demographic groups that have less than a 50% success rate are the Pacific islander (38%), and black (17%) populations. These percentages are based upon 13 and 6 students, respectively.

In the paleontology courses, the demographic groups that have less than a 50% success rate are the Filipino (33%), and black (0%) populations. These percentages are based upon 3 and 1 students, respectively.

In the oceanography course, the demographic group that has less than a 50% success rate are the multi-racial (43%), other (42%) and Pacific islander (33%) populations. These percentages are based upon 14, 12 and 3 students, respectively.

V. REFLECTIVE ASSESSMENT OF INTERNAL AND EXTERNAL FACTORS AND PROGRAM/STUDENT

- a. Using the matrix provided below and reflecting on the program relative to students' needs, briefly analyze the program's strengths and weaknesses and identify opportunities for and possible threats to the program (SWOT analysis). See page 10 for definition of SWOT). Consider both external and internal factors. For example, if applicable, you might consider changes in our community and beyond (demographic, educational, social, economic, workforce, and, perhaps, global trends); look at the demand for the program; program review links to other college and District programs and services offered; look at similar programs at other area colleges; and investigate auxiliary funding.

	INTERNAL FACTORS	EXTERNAL FACTORS
Strengths	<p>Every course in these 3 programs provide students with options for fulfilling the CSU/UC GE transfer requirements, and CSM natural science AA/AS degree requirements. The geology and paleontology courses are required for the AS in geological sciences and AS-T in geology.</p> <p>Closest community colleges offering historical geology and/or paleontology are CCSF and Evergreen College.</p> <p>Excellent instructor.</p>	<p>Geology and oceanography are very pertinent to people living in the Bay Area.</p>
Weaknesses	<p>With only one full-time faculty member, growth would require adjunct faculty.</p>	<p>Earth science is not offered at most of the local high schools, and some students are reluctant to take a course if they have had very little or no prior exposure to the material.</p>

<p>Opportunities</p>	<p>Course offerings could be expanded to include an environmental science course if the need should arise.</p>	<p>A new high school course, entitled Honors Earth Science, has been approved by the UC Academic Senate Board on Admissions and Relations with Schools (BOARS), and also by the UC Office of the President as meeting the UC laboratory science "d" requirement for UC admissions.</p> <p>According to the Dept. of Labor, employment of geoscientists and hydrologists is expected to grow faster than the average for all occupations. In March 2009, the Federal Government's average salary was \$94,085 for geologists, \$108,118 for geophysicists, \$89,404 for hydrologists, and \$105,671 for oceanographers.</p> <p>A sizable earthquake, volcanic eruption, landslide or tsunami might boost geology enrollments.</p>
<p>Threats</p>	<p>Enrollment minimums could affect the offering of the lab courses, causing geology majors to go elsewhere.</p>	<p>Changes in state requirements for TBAs could result in lower WSCH and LOAD.</p>

- b. If applicable, discuss how new positions, other resources, and equipment granted in previous years have contributed towards reaching program action steps and towards overall programmatic health. If new positions, equipment, or other resources have been requested but not granted, discuss how this has impacted overall programmatic health. (You might reflect on data from Core Program and Student Success Indicators for this section.)

VI. Goals, Action Steps, and Outcomes

- a. Identify the program's goals. Goals should be broad issues and concerns that incorporate some sort of measurable action and should connect to CSM's *Educational Master Plan, 2008 (EMP); Data Updates to EMP, 2011-12; College Index, 2008/9-2011/12; Institutional Priorities, 2008-2011; 5 & 5 College Strategies; GE-SLOs; SLOs.*
 Recommendations for both Geol 100 and Paln 110 included an increase in "thinking-out-loud" commentary during modeling of the problem solving process in class.
 Recommendations for Ocen 100 included the use of more classroom examples to improve quantitative and graphical problem solving.
- b. Identify the action steps your program will undertake to meet the goals you have identified.
 The use of iclickers was introduced in all sections of these lecture courses this semester. Using iclickers, the students respond to an increased number of classroom examples and engage in peer discussion as they work to answer questions. From the responses, the instructor can immediately identify which concepts or problems warrant a "thinking-out-loud" commentary of the problem solving process. Unfortunately, the students who don't

have iclickers (for whatever reason) feel ostracized and attend class less frequently. Continued use of iclickers is contingent on positive student feedback, very low costs to the students and integration with our course management system, moodle.

- c. Briefly explain, specifically, how the program’s goals and their actions steps relate to CSM’s *Educational Master Plan, 2008 (EMP); Data Updates to EMP, 2011-12; College Index, 2008/9-2011/12; Institutional Priorities, 2008-2011; and 5 & 5 College Strategies*. The use of SLOs to improve student learning is a college goal.
- d. Identify and explain the program’s outcomes, the measurable “mileposts” which will allow you to determine when the goals are reached.
Improvement in SLO success rates in next assessment cycle for the appropriate SLOs.

VII. SUMMARY OF RESOURCES NEEDED TO REACH PROGRAM ACTION STEPS

- a. In the matrices below, itemize the resources needed to reach program action steps and describe the expected outcomes for program improvement.* Specifically, describe the potential outcomes of receiving these resources and the programmatic impact if the requested resources cannot be granted.

* *Note:* Whenever possible, requests should stem from assessment of SLOs and the resulting program changes or plans. Ideally, SLOs are assessed, the assessments lead to planning, and the resources requested link directly to those plans.

Full-Time Faculty Positions Requested	Expected Outcomes if Granted and Expected Impact if Not Granted	If applicable, <u>briefly</u> indicate how the requested resources will link to achieving department action steps based on SLO assessment.
none	Input text here.	Input text here.

Classified Positions Requested	Expected Outcomes if Granted and Expected Impact if Not Granted	If applicable, <u>briefly</u> indicate how the requested resources will link to achieving department action steps based on SLO assessment.
none	Input text here.	Input text here.

- b. For instructional resources including equipment and materials, please list the exact items you want to acquire and the total costs, including tax, shipping, and handling. Include items used for instruction (such as computers, furniture for labs and centers) and all materials designed for use by students and instructors as a learning resource (such as lab equipment, books, CDs, technology-based materials, educational software, tests, non-printed materials). Add rows to the tables as necessary. If you have

questions as to the specificity required, please consult with your division dean. Please list by priority.

Resources Requested	Expected Outcomes if Granted and Expected Impact if Not Granted	If applicable, <u>briefly</u> indicate how the requested resources will link to achieving department action steps based on SLO assessment.
Item: iclicker/moodle integration Number: Vendor: Unit price: Total Cost: \$5000 Status*: new	Continued use of iclickers is contingent on positive student feedback, very low costs to the students and integration with our course management system, moodle.	Recommendations included an increase in "thinking-out-loud" commentary and more examples in class. Using iclickers, the students respond to an increased number of classroom examples and engage in peer discussion as they work to answer questions. From the responses, the instructor can immediately identify which concepts or problems warrant a "thinking-out-loud" commentary of the problem solving process.

*Status = New, Upgrade, Replacement, Maintenance or Repair.

VIII. Course Outlines

- a. By course number (e.g. CHEM 210), please list all department or program courses included in the most recent college catalog, the date of the current Course Outline for each course, and the due date of each course's next update.

Course Number	Last Update Date	Six-year Update Due Date
Geol 100	Jan 08	Jan 14
Geol 101	Nov 11	Nov 17
Ocen 100	Jan 08	Jan 14.
Paln 110	Nov 11	Nov 17
Paln 111	Jan 08	Jan 14

IX. Advisory and Consultation Team (ACT)

- a. Please list non-program faculty who have participated on the program's Advisory and Consultation Team. Their charge is to review the *Program Review and Planning* report before its submission and to provide a brief written report with comments, commendations, and suggestions to the Program Review team. Provided that they come from outside the program's department, ACT members may be solicited from faculty at CSM, our two sister colleges, other community colleges, colleges or universities, and professionals in relevant fields. The ACT report should be attached to this document upon submission.

List ACT names here.

Attach or paste ACT report here.

b. Briefly describe the program's response to and intended incorporation of the ACT report recommendations.

X. PROGRAM REVIEW PARTICIPANTS AND SIGNATURES

Date of Program Review evaluation:

Please list the department's *Program Review and Planning* report team:

Primary program contact person: Linda Hand
Phone and email address: 650 574-6633, hand@smccd.edu
Full-time faculty: Linda Hand
Part-time faculty:
Administrators
Classified staff:
Students:

Primary Program Contact Person's Signature *Date*

Full-time Faculty's Signature *Date*

Part-time Faculty's Signature *Date*

Classified Staff Person's Signature *Date*

Student's Signature *Date*

Dean's Signature *Date*

**Comprehensive Program Review
RESOURCES FOR SUPPORTING DOCUMENTATION**

Section 1

This section contains a listing of sources for data and key documents referred to in Section 2 along with other resources. Contact information for relevant people is also included.

Academic Senate

<http://www.collegeofsanmateo.edu/academicsenate/>

Contact: csmacademicsenate@smccd.edu

James Carranza, Academic Senate President, carranza@smccd.edu, (650) 574-6568

College Catalogs and College Class Schedules are archived online:

<http://collegeofsanmateo.edu/schedule/archive.asp>

Course Outlines are found at:

<http://collegeofsanmateo.edu/articulation/outlines.asp>

Committee on Instruction

<http://collegeofsanmateo.edu/committeeoninstruction/>

Contact: Teresa, Morris, morrist@smccd.edu, (650) 574-6617.

Program Review Resources (includes forms, data, and completed program reviews for both instructional and student services program review)

Note: PRIE has a new website as of 2/15/2012; Program Review resources will temporarily be housed at "old" site as we make the transition to a new site:

http://collegeofsanmateo.edu/prie/program_review/program_review.php

Core Program and Student Success Indicators (See links for "Quantitative Data for Instructional Programs")

Distance Education Program Review Data

Glossary of Terms for Program Review

Listing of Programs Receiving Program Review Data from PRIE

Rotation Schedule for Instructional Program Review, 2008-2014

http://collegeofsanmateo.edu/prie/program_review/program_review.php

Office of Planning, Research, and Institutional Effectiveness (PRIE)

(Note: PRIE has a new website as of 2/15/2012; the URL will remain the same.)

<http://collegeofsanmateo.edu/prie/>

Contact: John Sewart, Dean, sewart@smccd.edu, (650) 574-6196

Contact: Milla McConnell-Tuite, Coordinator, mcconnell@smccd.edu, (650)574-6699

At PRIE Website

College Index, 2008/9-2011/12,

<http://collegeofsanmateo.edu/institutionalresearch/collegeindex.asp>

Educational Master Plan, 2008, <http://collegeofsanmateo.edu/prie/planningdocs.asp>

Educational Master Plan, Data Updates, 2011-12

<http://collegeofsanmateo.edu/institutionalresearch/>

Institutional Priorities, 2008-2011

<http://collegeofsanmateo.edu/prie/planningdocs.asp>

Five in Five College Strategies, <http://collegeofsanmateo.edu/prie/planningdocs.asp>

Student Learning Outcomes (SLOs) website:

<http://www.collegeofsanmateo.edu/sloac/>

Contact: David Locke, SLO Coordinator, Locke@smccd.edu, (650)574-6624

Also see PRIE site for SLO assessments' support: <http://collegeofsanmateo.edu/prie/slos.asp>

Section 2

This section contains the references that serve as data sources for the individual sections of the Comprehensive Program Review Form. Explanatory notes are included.

DEPARTMENT OR PROGRAM:

To identify programs on the comprehensive program review cycle, see *Rotation Schedule for Instructional Program Review, 2008-2014* at PRIE website:

http://collegeofsanmateo.edu/prie/program_review/programReview_forms.php

Also see *Listing of Programs Receiving Program Review Data from PRIE*.

I. DESCRIPTION OF PROGRAM

- "Number of Sections" data from *Core Program and Student Success Indicators* (published by PRIE for each program)
- CSM Course Catalog
- Department records

II. STUDENT LEARNING OUTCOMES

- SLO records maintained by the department
- CSM SLO Coordinator
- SLO Website: <http://collegeofsanmateo.edu/sloac>
- The definitions for the General Education (GE) SLOs can be found on the CSM SLOAC website.

III. DATA EVALUATION

- Enrollment, WSCH, FTEF, and productivity data for each program can be found in *Core Program and Student Success Indicators*. (Published by PRIE.)
- Productivity is also commonly known as "LOAD." See *Glossary of Terms for Program Review* for definitions of key terms.
- Faculty Load: the ratio of the weekly contact hours (WSCH) of enrolled students and a faculty's hours of instruction per week. In other words, WSCH divided by FTE. ?
- The College's general target productivity will be recommended by the Budget Planning Committee.

IV. STUDENT SUCCESS EVALUATION AND ANALYSIS

- *Educational Master Plan, 2008*
- *Educational Master Plan, Data Updates, 2011-12*
- *College Index, 2008/9-2011/12*
- *Five in Five College Strategies*
- *Institutional Priorities, 2008-2011*
- *Student Success (course completion and retention) data from the "Core Program and Student Success Indicators";*
- *Other reports published by PRIE regarding student success*

- Previous Program Review and Planning reports
- other department records

V. REFLECTIVE ASSESSMENT OF INTERNAL AND EXTERNAL FACTORS AND PROGRAM/STUDENT SUCCESS

- Educational Master Plan, 2008
- Educational Master Plan, Data Updates, 2011-12
- College Index, 2008/9-2011/12
- Five in Five College Strategies
- Institutional Priorities, 2008-2011
- Student Success (course completion and retention) data from the "Core Program and Student Success Indicators";
- Other reports published by PRIE regarding student success
- Previous Program Review and Planning reports
- Other department records

a. About SWOT Analysis:

SWOT Analysis is a strategic planning tool used to evaluate the **S**trengths, **W**eaknesses, **O**pportunities, and **T**hreats involved in a project or initiative. It involves specifying the objective of the venture or project and identifying the internal and external factors that are favorable and unfavorable to achieving that objective. SWOT analysis considers both internal and external conditions.

Strengths: attributes of the organization that are helpful to achieving the objective.

Weaknesses: attributes of the organization or that are harmful to achieving the objective.

Opportunities: external conditions that are helpful to achieving the objective.

Threats: external conditions that are harmful to achieving the objective

b. Reflect on data from "Core Program and Student Success Indicators"

VI. Action Steps and Outcomes

- Educational Master Plan, 2008
- Educational Master Plan, Data Updates, 2011-12
- College Index, 2008/9-2011/12
- Five in Five College Strategies
- Institutional Priorities, 2008-2011
- GE- or Certificate SLOs
- College Index, 2009-2010
- Course SLOs
- Department records
- Core Program and Student Success Indicators
- Previous Program Review and Planning reports
- Division work plan

VII. SUMMARY OF RESOURCES NEEDED TO REACH PROGRAM ACTION STEPS

- Educational Master Plan, 2008
- Educational Master Plan, Data Updates, 2011-12
- College Index, 2008/9-2011/12
- Five in Five College Strategies
- Institutional Priorities, 2008-2011
- GE- or Certificate SLOs
- Course SLOs

- *Department records*
- *Core Program and Student Success Indicators*
- *previous Program Review and Planning reports*

VIII. Course Outlines

- *Department records*
- *College Catalog*
- *Committee On Instruction*
- *Course Outlines (online)*
- *Office of the Vice President of Instruction*
- *Division Dean*