Santa Rosa Junior College
Program Resource Planning Process

Earth and Space Sciences 2017

1.1a Mission

Updated every third spring; 2017, 2020, 2023 – not updated in 2015

The primary purpose of the Earth and Space Sciences' (ESS) varied programs is to provide an interdisciplinary approach to studying the Earth, Earth processes, the environment, and astronomical bodies and phenomena. We strive to promote awareness of the human impact on our surroundings and the relevance of ESS disciplines to our lives.

We strive to generate interest in science and to provide a foundation in the Earth and Space Sciences which students can ultimately apply towards an ESS-related major, GE-transfer, and/or towards pursuing personal interest goals.

Finally, ESS courses attempt to connect the academic realm with the real world, providing students with the theoretical and hands-on skills and knowledge to take what they learn in the classroom and apply it to their daily lives. We work to ensure that our students become responsible and informed global citizens.

The ideals that the ESS Department endeavors to attain include:

- Academic excellence from students and faculty
- A wide range of course offerings district-wide
- Faculty who maintain currency in their field(s)
- Making available equipment and high quality educational opportunities
- Attracting and serving a diverse student body and fostering diversity within our department

1.1b Mission Alignment

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How is the program/unit mission consistent with the District's Mission and Strategic Plan Goals?

The ESS Department Mission is consistent with the District's Mission, Institutional Goals and College Initiatives in that we are committed to promoting student learning in order to serve our diverse community. See *Ideals* above. The Department is developing strategies to support the District's Strategic Plan this academic year.

1.1c Description

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The ESS Department houses multiple disciplines, including Astronomy, Environmental Science, Geography, Geology, and Meteorology. Up until Fall 2011, the Department also included Aeronautics. However due to budget cuts the remaining aeronautics classes were transferred to the Community Education Department. The department primarily serves general education (GE) transfer students. During the 2012-13 AY, 4289 students enrolled in ESS classes. This represents a 5% decrease from the 2011-12 academic year and is likely related to District-wide cuts. The majority of these classes were GE science transfer primarily taken by non-science majors.

Courses are offered in several different formats. Lecture, laboratory, online, and field-based courses are offered to serve transfer students, students seeking a two year degree, students working towards professional development (including teachers), and self-enrichment students. We also seek to successfully prepare students who intend to major in Earth or space science fields.

The ESS Department has 5 full time faculty: 3 at the Santa Rosa campus and 2 at the Petaluma campus. The department has between 12 and 15 adjunct faculty teaching per semester. The Department is committed to offering a wide variety of GE transfer classes at the Santa Rosa and Petaluma campuses, and online.

1.1d Hours of Office Operation and Service by Location

Updated every third spring; 2017, 2020, 2023 – not updated in 2015

Santa Rosa Campus:
Earth and Space Sciences instructor hours vary, but typically Monday through Thursday from 9 AM to 5 PM, and most evenings in the ESS Department offices. Typically administrative support is available Monday through Thursday from 10 AM to 5 PM, in 1813 Baker Hall. The ESS Department shares administrative support with the Life Sciences Department. The former AAII left SRJC employment in Spring 14. Hiring is in process and a new employee will be starting in September 2014.

Equipment Technician is available Monday through Friday from 8 AM to 4 PM, in 2034 Lark Hall.

Petaluma Campus:
Earth and Space Sciences instructor hours vary, but typically Monday through Thursday from 8 AM to 5 PM, and some evenings in the Call Building. Laboratory Coordinator is available Monday through Thursday from 9 AM to 3 PM, in Room 314A.

1.2 Program/Unit Context and Environmental Scan

Updated every third spring; 2017, 2020, 2023 – not updated in 2015

Courses within the ESS department primarily serve GE-transfer students. We are looking to improve our programs to better serve the student population by exploring alternate educational formats, such as increasing our online offerings and offering additional field trip opportunities. We see a growing need for knowledge and skills particularly in environmental and water-related subjects. All Earth science related disciplines provide necessary skills and knowledge for a variety of in-demand career fields. We hope to meet many of these trends by updating existing courses and developing new offerings, and creating ESS-related majors.

Have there been any changes in the transfer requirements for this major, particularly at CSU or UC campuses or at other common transfer destinations in this discipline? If so, describe those.
Currently the ESS Department does not have any majors or programs. The Department would like to develop an Earth Science transfer major and will verify transfer requirements at both CSU and UC before finalizing the major. TMC majors have been finalized at the state level for geography and geology. We are moving forward with a geography major as we currently offer the required courses. We are currently not moving forward with the geology TMC major, as we do not offer all of the required courses and do not foresee being able to add them in the near future. A TMC major for environmental science is in development at the state-level. An ESS faculty member is serving in the C-ID Faculty Discipline Review Group (FDRG) for environmental science.

Are there trends in industry or technology that could affect this discipline or major?
None

Are there new trends in general education or basic skills that affect courses in this discipline or major?
The Department is developing Earth Science / Physical Science curriculum to support the Elementary Teacher Education TMC major that was finalized in April 2012. The Department created an Earth Science course (PHYSC 21) that was approved in September 2013. It is anticipated that we will begin offering this course in Spring 2014.

What partnerships or cooperative ventures exist with local employers, transfer institutions, or other community colleges?
N/A

2.1a Budget Needs

Updated in Spring 2017

Describe areas where your budget might be inadequate to fulfill your program/unit's goals and purposes.
The study of Earth and Space is most effective when students experience the subject outside the classroom by attending field trips. Field trips are currently offered in several classes including geology, environmental science and astronomy. In most cases, students are required to provide their own transportation in order to participate in field trips. The Department would like to provide transportation for class field trips, in addition to expanding

our field trip offerings. Additional funds are needed for vehicle expenses, which cannot be charged to students according to the California Code of Regulations.

The Department has a lot of older equipment, including telescopes and microscopes that need regular repair and maintenance. The department has also just purchased ten brand new telescopes. Half the telescopes are now out-of-date and the manufacturer no longer supports these models. In order to maintain our aging equipment and protect our investment in new equipment, we need to establish a maintenance and repair budget so that spare parts can be purchased and repairs can be made, as needed.

The department has 6-7 petrographic microscopes in need of refurbishment. Six of the 7 do not turn on at all, and all of them are out of visual alignment. Instructors would like to incorporate microscope based activities into laboratory for GEOL 1L, and currently these microscopes cannot be used at all.

<u>If you need additional funds, please explain.</u>
Additional funds are needed to cover vehicle expenses and to augment student costs for existing and future field trips. A maintenance fund that could be used to maintain telescopes, microscopes and other equipment needs to be established.

2.1b Budget Requests

Rank	Location	SP	M	Amount	Brief Rationale
0001	ALL	00	00	$2,000.00	2,000 per year. Expand field trip offerings for ENVS 12, GEOL 1L, GEOL 7 (additional sections / different locations), GEOL 11, ASTRON 12 (different locations)
0002	ALL	00	00	$2,000.00	2000 per year. Maintenance budget for telescope maintenance.
0003	Santa Rosa	00	00	$1,000.00	Repair of petrographic microscopes for GEOL lab activities.

2.2a Current Classifed Positions

Position	Hr/Wk	Mo/Yr	Job Duties
Science Equipment Specialist	40.00	12.00	Maintains and repairs equipment, planetarium and greenhouse maintenance, circuitry/electronics, computer repair
Coordinator, Science Labs	15.00	12.00	Supply ordering, equipment organization, helps with facilities, lab, and classroom setup (Petaluma).
Administrative Assistant II	10.00	12.00	Purchasing/ordering, assists with curriculum, department meetings and student evaluations, faculty/department support, financial/budget/expenditures, etc.

2.2b Current Management/Confidential Positions

Position	Hr/Wk	Mo/Yr	Job Duties
Department Chair	13.20	10.00	Budget/financial, scheduling, hiring, faculty and staff evaluations, facilitate regular department meetings, coordinate adjunct faculty, etc.
Department Chair (summer)	2.50	2.00	Budget/financial, scheduling, hiring, faculty and staff evaluations, facilitate regular department meetings, coordinate adjunct faculty, etc.

2.2c Current STNC/Student Worker Positions

Position	Hr/Wk	Mo/Yr	Job Duties
ASTRON Lab Assistant (student)	3.00	12.00	Monitor equipment, instruct students in use of ASTRON equipment

2.2d Adequacy and Effectiveness of Staffing

Updated in Spring 2017

Does the program have adequate classified, management, STNC staff, and student workers to support its needs? If not, explain program/unit needs.

No. Additional department chair hours are needed during the Summer. The required summer departmental work could not be completed in 2016 in 2.5 hours per week.

Does your program/unit have any unfilled vacancies or positions that have been eliminated? If so, how are you accomplishing the work that must be performed? What impact does this have on your program/unit?

No.

2.2e Classified, STNC, Management Staffing Requests

Rank	Location	SP	M	Current Title	Proposed Title	Type

2.3a Current Contract Faculty Positions

Position	Description
Geology Instructor	Rebecca Perlroth, GEOL at the Santa Rosa campus.
Geography / Environmental Science Instructor	Katie Gerber, GEOG and ENVS at the Santa Rosa campus.
Astronomy Instructor	Keith Waxman, ASTRON at the Santa Rosa campus.
Astronomy Instructor (Petaluma)	Laura Sparks, ASTRON at the Petaluma campus. Current department chair.
Earth Science Instructor (Petaluma)	David Kratzmann, GEOL and ENVS at the Petaluma campus.

2.3b Full-Time and Part-Time Ratios

Discipline	FTEF Reg	% Reg Load	FTEF Adj	% Adj Load	Description
ASTRON	1.5700	40.0000	2.3700	60.0000	Astronomy has a FT percent of 40 which is in line with the district average of 40.
ENVS	0.4100	50.0000	0.4000	50.0000	Environmental science had 50% of classes taught as part of contract load. This is somewhat lower than normal due to a contract environmental science instructor being on sabbatical leave in fall 2016.
GEOG	0.0000	0.0000	1.4200	100.0000	Geography had 100% of classes taught by adjuncts in fall 2016 because the contract geography faculty member was on sabbatical in fall 2016. The usual split would be about 42% FT / 58% part time.
GEOL	1.5000	82.0000	0.3300	18.0000	Geology has a FT percent of 82 compared to the district average of 40.
METRO	0.0000	0.0000	0.3500	100.0000	All meteorology classes are taught by adjunct instructors. There is no full time instructor with meteorology subject matter expertise.

2.3c Faculty Within Retirement Range

Updated in Spring 2017

No full-time faculty members are within retirement range. There are 3 adjunct faculty members within retirement range (55+ years).

2.3d Analysis of Faculty Staffing Needs and Rationale to Support Requests

Updated in Spring 2017

ASTRON – Historically, it has been difficult to staff classes in this discipline due to a lack of available qualified instructors. Specifically, very few people possess a graduate degree in Astronomy and/or Physics, and SSU does not offer a graduate degree in these disciplines. We generally conduct adjunct interviews whenever a qualified candidate applies for the pool. Interviews were last conducted in December 2015 and two people were added to the pool. We currently have three adjunct astronomy instructors that regularly teach for us, and we have lost 2 key adjuncts in the past year to other job opportunities. We are planning to conduct adjunct interviews in May 2017, but have no local applicants at this time.

ENVS – Both faculty members that teach ENVS have split assignments (e.g ENVS/ Geog or ENVS / Geol). The minimum qualifications for ENVS are broad and instructors in geology and geography are often able to teach ENVS as well. We currently have adequate adjuncts available for this discipline. Interviews were conducted in December 2016, and three instructors were added to the pool. Additional interviews will be conducted in May 2017.

GEOG –Sections of geography were cut due to the budget and we were able to staff all offered sections with existing faculty. Adjunct interviews were last conducted in April 2016 and we were able to add three candidates to our pool. Additional interviews will be conducted in May 2017. to avoid canceling sections during an upcoming sabbatical leave.

GEOL – Interviews were most recently conducted in Fall 2016 and four people were added to the geology pool. We now have adequate staffing in this discipline. Adjunct interviews will be conducted in May 2017 to add staff to the pool.

METRO – We have no contract faculty in meteorology. Adjunct instructors in meteorology are largely working professionals, who are available to teach evening classes, but day classes are difficult to staff with adjuncts. Due to budget cuts and reduced meteorology offerings, we have adequate coverage with our existing meteorology pool. Adjunct interviews were last conducted in Summer 2005. In the future, we would like to have a full-time instructor to serve as coordinator for curriculum, faculty, facilities, equipment, and students in this important discipline. Adjunct interviews will be conducted in May 2017.

2.3e Faculty Staffing Requests

Rank	Location	SP	M	Discipline	SLO Assessment Rationale

2.4b Rationale for Instructional and Non-Instructional Equipment, Technology, and Software

Updated in Spring 2017

INTRUCTIONAL EQUIPMENT

ASTRONOMY

Upgrade Planetarium. The SRJC planetarium needs equipment upgrades and refurbishment. This facility is integral to the Astronomy program here at SRJC, as well as serving community outreach efforts. Planetarium technology in general is beginning a transition from analog to digital. As this occurs over the coming years the ability to obtain replacement parts for the older analog technology will become more difficult to the point of requiring the purchase of newer replacement units.

Change fixed chairs to rolling chairs. Room 2039 is primarily used by our department for Astronomy lab classes. We would like to replace the stationary chairs with rolling chairs. Instructors often have students work in small groups and this would facilitate classroom activities. Students in Astronomy 12 classes use the room for up to 8 hours at a time.

Telescopes for Astronomy labs. The department is currently using 10 new telescopes that were purchased this year and 10 outdated telescopes that are used for Astronomy lab classes at both campuses. In addition to breaking down, the older telescopes are becoming increasingly hard to repair. The telescope technology is outdated and in need of upgrading. We need funds to complete our transition from old outdated technology to new equipment.

Personal solar telescopes for Astronomy labs. Solar telescopes would enable us to view the Sun safely in our Astron 4L, Astron 3L, and Astron 12 labs without setting up the larger bulkier telescopes with a large footprint. Also, students could study solar features not visible in our current neutral density filters such as small prominences and photosphere granularity.

Digital SLR Cameras for Astronomy labs. A set of used Digital SLR cameras was purchased several years ago using funding from the Friends of the Petaluma Campus trust. Older, used cameras were purchased to save money. These will need to be replaced with newer models within the next five years as they become outdated and begin to fail. These cameras will also need to be modified for astrophotography. The modification price is included in the estimate. This supports Student Learning Outcomes for Astronomy. $10@1,100 = $11,000

Laptops for Astronomy labs. Astronomy recently upgraded to Digital SLR cameras. Laptops are needed to support labs conducted with the digital cameras. This supports Student Learning Outcomes for Astronomy.

GEOLOGY

New rolling chairs for Geology Lab. Room 2042 is primarily used for geology lecture and lab. Rolling chairs would increase the flexibility of this room. The current chairs are outdated, some are damaged, and uncomfortable for students.

PHYSICAL / EARTH SCIENCE

Lab Equipment for Physical Science 21 (Earth Science lecture and lab): Miscellaneous lab equipment for physical Science lab / lecture course including digital scales, beakers, thermometers, sling psychrometers, heat lamps and clamps, and other demonstration equipment.

GEOGRAPHY

3D Visualization Sandbox augmented reality tool for visualizing topographic maps and stream flow overlaid on a real sandbox. This would be used in geography, geology, and environmental science courses.

Demonstration devices for geography and meteorology. Various devises to demonstrate density, air flow, and condensation.

GENERAL CLASSROOM

Weather Station. ESS maintains a weather station that is used to support its meteorology and geography courses. The weather station is antiquated and parts are increasingly difficult to find or to repair.

NON-INSTRUCTIONAL EQUIPMENT

None at this time

2.4c Instructional Equipment and Software Requests

Rank	Location	SP	M	Item Description	Qty	Cost Each	Total Cost	Requestor	Room/Space	Contact
0001	Santa Rosa	03	04	MEAS H: PLANETAR. Replace/upgrade console wiring	1	$400,000.00	$400,000.00	L. Sparks	Lark	E. Megill
0002	Santa Rosa	03	04	MEAS H: PLANETAR. Replace GOTO Star Projector	1	$650,000.00	$650,000.00	L. Sparks	Lark	E. Megill
0003	Santa Rosa	03	04	MEAS H: PLANETAR. Upgrade to digital projection	1	$200,000.00	$200,000.00	L. Sparks	Lark	E. Megill
0004	ALL	04	01	3D Visualization Virtual Sandbox	2	$7,000.00	$14,000.00	L. Sparks	Lark	K. Gerber & D. Kratzmann
0005	Santa Rosa	02	01	Lab Equipment (scales, beakers, thermometers)	10	$500.00	$5,000.00	L. Sparks	Lark	K. Gerber
0006	Santa Rosa	04	06	Rolling chairs for room 2042	30	$350.00	$10,500.00	L. Sparks	Lark 2042	L. Sparks
0007	Santa Rosa	04	06	Rolling chairs for room 2039	40	$350.00	$14,000.00	L. Sparks	Lark 2039	L. Sparks
0008	Santa Rosa	04	01	Demonstration equipment (density, condensation)	1	$1,000.00	$1,000.00	L. Sparks	Lark 2049	K. Gerber
0009	ALL	02	01	Coronado Personal Solar Telescopes	10	$700.00	$7,000.00	L. Sparks	Lark	K. Waxman & L. Sparks
0010	ALL	04	01	Replacement telescopes and accessories	10	$2,500.00	$25,000.00	L. Sparks	Lark	K. Waxman & L Sparks
0011	ALL	04	01	Digital SLR Cameras (including modification)	10	$1,100.00	$11,000.00	L. Sparks	Lark	K. Waxman & L. Sparks
0012	Santa Rosa	04	01	Weather Station	1	$15,000.00	$15,000.00	L. Sparks	Lark	K. Gerber
0013	ALL	04	01	Laptop computers for Astron 12 labs	11	$1,000.00	$11,000.00	L. Sparks	Lark	K. Waxman & L. Sparks

2.4d Non-Instructional Equipment, Software, and Technology Requests

Rank	Location	SP	M	Item Description	Qty	Cost Each	Total Cost	Requestor	Room/Space	Contact

2.5a Minor Facilities Requests

Rank	Location	SP	M	Time Frame	Building	Room Number	Est. Cost	Description
0001	Santa Rosa	03	05	Urgent	Lark Planetarium	Planetarium	$0.00	(MEASURE H) Planetarium: Remove existing wiring and rewire for replacement console.
0002	Santa Rosa	03	05	Urgent	Lark Planetarium	Planetarium	$0.00	(MEASURE H) Planetarium: Remove existing wiring and rewire for replacement projector.

0003	Santa Rosa	02	01	Urgent	Lark Hall	2009	$0.00	(Part of Remodel) Replace existing carpet and countertop, improve ventillation, and clean/update walls to remove unpleasant odors and unsightly stains.
0004	Santa Rosa	02	06	Urgent	Lark Hall	2046	$0.00	Create adequate and safe storage for telescopes in ESS work area.
0005	Santa Rosa	06	07	Urgent	Lark Hall	all	$0.00	Paint exterior and interior of building. Replace rotted wood trip.
0006	Santa Rosa	02	01	1 Year	Lark	2042, 2046	$0.00	Replace existing display cases with ones with lighting and glass doors
0007	Santa Rosa	06	04	1 Year	Lark Hall - offices	2021-2030	$8,000.00	Install solar tubes to provide natural light inside ESS offices and work area. 8 solar tubes at ~$1000 per tube.
0008	Santa Rosa	06	07	1 Year	Lark Hall	all areas	$0.00	Update HVAC system. Allow greater control in classrooms and offices so that HVAC can be turned down or up as needed. Current system creates cold and hot areas and is not effective.
0009	Santa Rosa	02	01	1 Year	Weather Station		$15,000.00	Replace existing weather station. Opportunity to partner with Facilities.
0010	Santa Rosa	02	01	2-3 Yr	Lark Hall	Room 2030	$0.00	Convert room to a demonstration classroom outfitted for interactive learning with movable tables and chairs, whiteboards around the room, etc.
0011	Santa Rosa	04	06	Urgent	Lark Hall	Lab/Storage space	$0.00	Repair and replace SAREX equipment for communicating with Astronauts on board the International Space Station (used in outreach and potentially in planetarium shows)

2.5b Analysis of Existing Facilities

Updated Spring 2017

The ESS Department is located in the southern wing of Lark Hall. Facilities that the Department regularly uses include a 90-person lecture hall (2009), four lab and or lab/lecture classrooms (2030, 2039, 2042, and 2049), and a storage and work area. The Department offices include 6 offices and an open work space. These offices are shared with Planetarium staff. Although there is adequate space at current staffing and class offering levels, the building and its associated equipment are out-of-date. The ESS Department will unfortunately not be included in the STEM science building(s). With that in mind, there are upgrades that the Department would like to make in the meantime.

Upgrade Planetarium. The SRJC planetarium needs equipment upgrades and refurbishment. This facility is integral to the Astronomy program here at SRJC, as well as serving community outreach efforts. Planetarium technology in general is beginning a transition from analog to digital. As this occurs over the coming years the ability to obtain replacement parts for the older analog technology will become more difficult to the point of requiring the purchase of newer replacement units. We hope to obtain funding to rennovate the planetarium in the near future. A planetarium upgrade can be completed for under 2 million dollars. When compared to the cost of building a new planterarium (in the neighborhood of 10 million dollars), this is a great deal.

Lecture Classroom 2009: This classroom is used for lecture-based courses by ESS and other departments. The classroom lacks adequate ventilation and smells. The smell may be attributed to the carpet and chair cushions. The Department would like to replace the existing carpet with either new carpet or some other form of flooring. The chair cushions also need replacement. The countertop is unsightly and badly worn and there are stains on the back walls. The room is in need of rennovation.

Telescope Storage: Currently telescopes are stored in stacked boxes in the ESS work area. Because of the area design and fixed shelving, the telescopes are cumbersome to store. A better storage mechanisms needs to be designed in the ESS work area. This would likely involve removing existing shelf storage.

New Paint and Building Maintenance: The outside of the building is in serious need of cleaning and painting. There are areas where the wood trim is decayed and needs to be replaced. The interior offices and classrooms are also in need of painting.

HVAC controls: The current HVAC system set up does not allow for adjustments within various sectors of the building. There are times when one side of the building is too cold and the other side is too hot. The HVAC system for the building needs to be reevaluated.

Rock Displays. New efforts are being made to beautify the ESS/Geology area as a result of recent donations. We would like to display and highlight the department's collection (especially the new fluorescing samples) in lighted display cases. These could be installed in 2042 to replace the existing display cases, and in 2046 to replace open shelves and to better utilize space.

Natural Daylighting: The ESS offices and classrooms have limited or no access to natural daylight. There are studies that link access to natural light with increased productivity for both workers and students. Installing solar tubes within the ESS offices would be a relatively inexpensive method of providing access to some level of natural light within the offices. To incorporate natural light in the classroom would likely require extensive classroom renovations.

Weather Station. ESS maintains a weather station that is used to support its meteorology and geography courses. The weather station is antiquated and parts are increasingly difficult to find or to repair. ESS would like to partner with Facilities to install a new weather station on the Santa Rosa campus. Facilities could use the weather station for their water management system.

Bathrooms. The Lark hall bathrooms resemble a dungeon. They often flood, have an unpleasant odor, and poor lighting. They are in need of replacement.

3.1 Develop Financial Resources

Not needed until Spring 2017 (according to PRPP instructions) - not updated S15

***Future funding**: What programs or concepts do you want to seek grant funding for?*

The ESS Department is interested in expanding funding for field programs, equipment, and facilities upgrades. Many of these items are also included within the budget request section.

Fund for Field Programs / Field Trips. ESS currently offers field trips and/or programs through geology, environmental science and astronomy classes. Because vehicle costs cannot be passed on to students, the Department pays for these costs out of our normal operating budget. In addition to providing funding for transportation, we would like to expand field trip offerings to other classes.

Astronomy Equipment upgrades. The Department needs to update our astronomy observational equipment, including telescopes, cameras and computer, to keep up with changes in technology. We recently switched to using digital cameras for astrophotography. In order to complete that transition, the camera's need to be retrofit to remove an infrared filter. In addition, the Department needs to upgrade its telescopes.

Equipment for Lab classes. A long term goal of the Department is to develop lab components for Physical Geography (Geog 4) and Environmental Science (ENVS 12). The labs would require new equipment for the Department including weather related equipment (thermometers, sling psychrometers), mapping equipment (compasses), pollution testing equipment (water / air), energy related equipment (solar cells, other), etc.

Student Assistant funding. Readers are now being reinstated in some classrooms. Instructors that teach larger lecture classes are interested in having student assistants within the class to facilitate with group work and in-class activities. This would be different than reader funding.

Planetarium upgrades. The Planetarium is in need of serious upgrades to its facilities and equipment.

Expand the Outdoor classroom. Expanding the use of SRJC's facilities and grounds as outdoor classrooms would greatly enhance student learning. Ideas for this include the following.

- Install native plant gardens around the campus to study climate change (e.g. STEM / Pepperwood grant). These could be incorporated into physical geography, environmental science, and meteorology classes.
- Create geology structures on campus. David Kratmann at Petaluma is interested in installing rock features throughout the Petaluma campus that can be used to illustrate geologic structures. This would support geology lecture and labs.
- Sustainability campus map. Create a sustainability map for the campus that identifies the various sustainability features (e.g. solar panels, energy conservation, recycled materials, etc.). Katie Gerber regularly takes students on a sustainability tour of the Santa Rosa campus but would like to create signage and a more permanent map that can be posted on the school's webpage.

- Student-run garden. David Kratmann is interested in establishing a student-run garden at the Petaluma campus. He submitted a grant to the State Fund Youth Advisory Board in Spring 14 but has not yet heard back from them.

***Current Grant Funding**: In order to capture SRJC's diverse partnerships and funding please provide the following information on funding or grant partnerships your department currently receives.*

None. The ESS Department does not have any existing grant funding. David Kratzmann at the Petaluma campus has submitted two grants.

3.2 Serve our Diverse Communities

Not needed until Spring 2017 (according to PRPP instructions) - not updated S15

Goal C: Serve our Diverse Communities
Serve our diverse communities and strengthen our connections through engagement, collaboration, partnerships, innovation, and leadership.

- Identify the educational needs of our changing demographics and develop appropriate and innovative programs and services with a focus on the increasing Latino/a population.
- Contribute the richness of our multicultural community by promoting cultural initiatives that complement academics and encourage the advancement and appreciation of the arts.
- Meet the lifelong educational and career needs of our communities (e.g. seniors, merging populations, veterans, re-entry students).
- Provide relevant career and technical education that meets the needs of the region and sustains economic vitality.

SRJC is committed to serving our diverse communities. One way to do this is by having a workforce of persons from diverse backgrounds that are sensitive to the diversity of our students and culturally competent and responsive.

How does the program/unit recruit faculty and/or staff, who are sensitive to the diversity of our students?

Our position announcements (both faculty and staff) stress the importance of sensitivity to diversity. During our screening and interview processes, we strive to assess each candidate's sensitivity and experience with diversity.

What 'best practices' does the program/unit use to affirmatively attract a diverse pool of candidates for openings?

The Department follows best practices outlined through the Human Resources Department.

In what other ways does the program/unit promote cultural competence and responsiveness among faculty and staff?

Lack of diversity is an issue within the sciences in general. Progress has been made in encouraging greater participation by women in science. The composition of our Department is indicative of that

change. Up until nine years ago, there were no full-time female instructors in the Department. Currently there are three and several female adjunct instructors. Although progress has been made with gender diversity, there traditionally has not been a lot of ethnic or cultural diversity within our fields. There are organizations that are working on the national and regional level to encourage greater participating in the science from other cultural and ethnic groups.

3.3 Cultivate a Healthy Organization

Not needed until Spring 2017 (according to PRPP instructions) - not updated S15

Goal F: Cultivate a Healthy Organization

Cultivate an inclusive and diverse organizational culture that promotes employee engagement, growth, and collegiality.

- Foster an environment focused on collegiality and mutual respect in regards to cultural and individual perspectives.
- Recruit and hire outstanding faculty and staff and implement an exemplary Professional Development Program for all employees.
- Establish robust programs to improve the health and wellness of students and employees.
- Increase safety planning, awareness, and overall emergency preparedness.

What is your program/unit doing to support the professional development of your classified staff, faculty, and/or managers?

The department supports professional development of our staff by encouraging them to complete health, hazards, and safety trainings.

What professional development activities would be of benefit to your program/unit?

Professional development related to teaching pedagogy and technology.

3.4 Safety and Emergency Preparedness

Not needed until Spring 2017 (according to PRPP instructions) - not updated S15

IInjury and Illness Prevention Program (IIPP)

The District's Injury and Illness Prevention Program is found in District Policy 6.8.2 and Procedure 6.8.2P. This program needs to be reviewed with each employee at least once per year. Identify the steps that have been taken to review this program with employees in your department this year. Contact Environmental Health and Safety if you need assistance (524-1656).

Will be addressed in a Department meeting in 15/16 Academic Year.

Safety Trainings

Per the District Injury and Illness Prevention Program (IIPP), what safety trainings does your department require? Contact Environmental Health and Safety if you need assistance (524-1656).

The Department offers off campus courses and field trip courses that are offered in remote locations. CPR and First Aid Training should be required for instructors that participate in field trips and off campus courses. Ideally the District would offer training to faculty and staff or provide reimbursement. In June of 2013, two faculty members, Katie Gerber and Rebecca Perlroth, participated in First Aid and CPR Training through the District prior to leaving on a geology field course.

Building and Area Safety Coordinators

List your Building and Area Safety Coordinators below. Include Name, Building, Building Safety Coordinator (BSC) Area, Area Safety Coordinators (ASC) Area, Department, and any specific areas of responsibility.

ESS is not aware of having an active BSC or ASC.

Building	BSC Area	ASC Area	Name	Department	Responsible Area	Management Support
Lark Hall				Earth & Space Sciences		STEM Dean

3.5 Establish a Culture of Sustainability

The ESS Departments continues to address sustainability within our offices and classrooms by reducing paper use, recycling in our office area and in select ESS classrooms, and buying recycled office products when available. Below is an update of Department efforts over the past year.

Reducing Paper Use: The ESS Department encourages faculty to reduce their paper use in response to budget cuts. The Department sends out a list of paper reduction ideas to faculty at the beginning of each semester. An effort is underway to quantify paper reductions within the Department. Our network printer is set up to print double-sided and faculty is encouraged to use this function. In addition, we encourage the use of reused paper in the printer for draft copies.

Office Supplies: The department gives preference to products made with recycled content including paper products, manila folders, hanging file folders, staplers, scissors and even tape. In general, the department is frugal in their buying habits and does not buy unnecessary goods.

Recycling. The Department participates in the campus recycling program for office paper, cardboard, and bottles and cans. In addition, members of the department have adopted recycling bins for three classrooms. These are emptied by faculty and students on a regular basis into the outside recycling containers around campus. Other recycling opportunities both on campus and off are also utilized by department staff. Batteries, toner cartridges, old compact discs are collected and recycled. An ESS Department member takes home plastic bags and certain other recyclables to recycle at home.

Curriculum: Environmental topics such as water, resource use, energy, climate, and human impact on the environment are a natural fit within many of the Earth Science courses. These topics are discussed to varying degrees in Astronomy, Environmental Science, Geography, Geology and Meteorology. Environmental Science is one of the core courses in the Environmental Studies major. Although not housed in the department, an ESS of faculty member oversees the Environmental Studies major and advises students. Currently the same faculty member teaches the Environmental Forum (ENVST 40) class.

Involvement with District Sustainability: A faculty member from the department is involved with environmental committees on campus including the Institute for Environmental Education (IEE) and the Integrated Environmental Planning Committee (IEPC). As a result they are involved with District-wide sustainability initiatives at both campuses.

4.1a Course Student Learning Outcomes Assessment

Updated Spring 2016 (Update to Assessment Plan only: Spring 2017)

All SLO assessments that have been finalized as of April, 2016 are posted on the SLO Share Point site. The Department currently has 83 SLO assessments on the Share Point website. The ESS Department has assessed at least one SLO in all classes that are currently offered except for Geol 20. This class was offered for the first time this year, and an SLO assessment will be entered by the end of the academic year. Many classes have had all SLOs assessed at least once.

Classes with all SLOs assessed at least once as of 4/18/16: Astron 3, Astron 3L, Astron 4, Astron 4L, Astron 12, ENVS 12, ERTHS 49, ERTHS 85.2/BIO 85.2, Geog 7, Geol 1, Geol 1L, and Geol 11.

Classes where at least one SLO has been assessed as of 4/18/16: ERTHS 85.1/BIO 85.1 (3 of 5), ENVST 40 (1 of 3), Geog 3 (2 of 5), Geog 4 (4 of 5), Geol 7 (1 of 5), Metro 10 (4 of 5), PHYSC 21 (2/7)

Majors assessment: Environmental Studies (Fall 2014) and Natural Sciences (Fall 2014)

The classes that are behind in SLO assessments are generally those that are taught exclusively by adjunct instructors. We are working with our adjuncts to assess SLO's. These classes taught exclusively by adjuncts include: Geog 3, Geog 7, Metro 10, Metro 10L, and ERTHS 85.2 (BIO 85.32).

How have course SLO assessment results last year and this current year been used to improve student learning at the course level?

SLO assessments are used by individual instructors to monitor their classes and to make changes as needed. In some cases the assessments provide baseline data and no specific changes are made. In other cases, the instructor is attempting to assess a particular technique or topic and uses the information to make changes within their classes. The Department discusses SLO Assessments regularly at department meetings. One of the ESS full-time faculty members, Rebecca Perlroth, is serving as an SLO coordinator and engages the Department in regular SLO discussions.

If the curriculum is sequenced through prerequisite relationships, do course SLOs align from one course to the next in the sequence? Has this sequence or any part of a sequence been assessed in the past year and this current year? If so, describe how the results have been used to improve student learning.

The ESS Department has prerequisite or concurrent enrollment requirements for lab classes. The SLOs of lab courses align with the related lecture. There are no sequenced courses within the department.

SLO Assessment Plan - Updated Spring 2017

Course	SLO	Fall 17	Spring 18	Fall 18	Spring 19	Fall 19
ASTRON 3	1. Critically analyze arguments …	P				
	2. Recognize, differentiate, and …	P				
	3. Summarize the processes which …	P				
ASTRON 3L	1. Describe methods used to …			P		
	2. Use astronomical tools to make …			P		
	3. Employ critical thinking to …			P		
ASTRON 4	1. Critically analyze arguments …					P
	2. Recognize, differentiate, …					P
	3. Explain why some astronomical …					P
	4. Recognize the factors affecting …					P
ASTRON 4L	1. Describe and use methods to …					
	2. Use astronomical tools to make …					
	3. Employ critical thinking to …					
ASTRON 12	1. Calculate properties ….					
	2. Explain the difference between …					
	3. Explain terrestrial and celestial …					
	4. Utilize the right ascension and …					
	5. Utilize small aperture telescopes, …					
BIO / ERTHS	1. Describe the role of science in ..			P		
85.1	2. Relate knowledge of natural …			P		
(Fall)	3. Integrate knowledge about …			P		
	4. Demonstrate skills in making ..			P		
BIO / ERTHS	1. Describe the role of science ..	*Not assessed by ESS instructors*				
85.2	2. Relate knowledge of natural …	*Not assessed by ESS instructors*				
(Spring)	3. Integrate knowledge about …	*Not assessed by ESS instructors*				
Life Sci	4. Demonstrate skills in making ..	*Not assessed by ESS instructors*				
ENVS 12	1. Identify and describe major …	P				
	2. Analyze the scientific basis of …	P				
	3. Show relationships between …	P				
	4. Use scientific methodologies …	P				
	5. Correctly use information …	P				
ENVST 40	1. Critically evaluate, analyze, and ...		P			
(Spring)	2. Identify connections between …		P			
	3. Identify potential environmental ..		P			
ERTHS 49	1. Expand acquired classroom …	*P - Assessed as offered 1x per six years*				
GEOG 3	1. Compare and contrast major…			P		
	2. Recognize and explain the role …			P		
	3. Utilize geographic methods ...			P		

	4. Analyze world events and …			P		
	5. Recognize the role humans play …			P		
GEOG 4	1. Describe fundamental …					P
	2. Use, analyze and interpret maps.					P
	3. Examine the dynamic ….					P
	4. Explain the structure …					P
	5. Recognize and interpret …					P
GEOG 7	1. Utilize and apply geographic …					
	2. Observe and measure the …					
	3. Recognize patterns and interpret ...					
	4. Synthesize information …					
	5. Describe how human actions …					
GEOL 1	1. Critically analyze scientific …					
	2. Describe and identify Earth …					
	3. Identify and explain processes …					
	4. Make informed decisions in the ….					
GEOL 1L	1. Apply scientific techniques …					
	2. Recognize, identify and …					
	3. Interpret evidence of tectonic …					
	4. Utilize maps and other data to …					
GEOL 7	1. Organize field notes …	*P - Assessed in Summer as offered 1x per six year*				
(Summer)	2. Classify rock samples in the field.					
	3. Identify prominent geologic …					
	4. Apply knowledge of geologic …					
GEOL 11	1. Critically analyze scientific arguments …			P		
(Fall)	2. Describe, recognize and identify …			P		
	3. Recognize, identify and locate …			P		
	4. Identify and explain processes that …			P		
	5. Apply geological principles and …			P		
GEOL 20	1. Apply scientific techniques to answer …	P				
	2. Critically analyze information about …	P				
	3. Explain the complex interplay …	P				
METRO 10	1. Describe fundamental meteorological …					
	2. Explain the interactions between the …					
	3. Examine Earth/Sun relationships …					
	4. Analyze and interpret weather …					
METRO 10L	1. Apply scientific techniques to …					
	2. Locate, analyze and interpret …					
	3. Compare and contrast weather …					
	4. Examine how geography affects …					
PHYSC 21	1. Apply scientific techniques to solve …					P
	2. Relate concepts, principles and …					P
	3. Practically apply concepts of Earth's …					P
	4. Differentiate among and classify …					P
	5. Identify and characterize surface …					P
	6. Interpret how the universe, …					P
	7. Communicate complex course …					P

X – completed during semester
P – Planned for semester indicated.

4.1b Program Student Learning Outcomes Assessment

Updated Spring 2016

What programs (certificates, majors, pathways, or student services) has the program/unit assessed over the past three years?

Assessments were completed for the Environmental Studies and Natural Science majors by ESS faculty. Both majors are interdisciplinary and include courses across departments and clusters.

4.1c Student Learning Outcomes Reporting

Type	Name	Student Assessment Implemented	Assessment Results Analyzed	Change Implemented
Course	ASTRON 3 - #1 (LS)	Fall 2012	Spring 2013	Fall 2012
Course	ASTRON 3 - #1 (LS)	Fall 2013	Spring 2014	Spring 2014
Course	ASTRON 3 - #2 (LS)	Spring 2011	Spring 2011	Fall 2011
Course	ASTRON 3 - #2	Spring 2014	Summer 2014	Fall 2014
Course	ASTRON 3 - #2 (KW)	Fall 2015	Spring 2016	N/A
Course	ASTRON 3 - #3 (LS)	Fall 2010	Fall 2010	N/A
Course	ASTRON 3 - #3 (LS)	Fall 2011	Spring 2012	Spring 2012
Course	ASTRON 3 - #3 (KW)	Fall 2011	Fall 2011	N/A
Course	ASTRON 3 - #3 (KW)	Fall 2014	Fall 2014	N/A
Course	ASTRON 3L - #1	Spring 2014	Spring 2014	Fall 2014
Course	ASTRON 3L - #2	Spring 2014	Spring 2014	Fall 2014
Course	ASTRON 3L - #3	Spring 2014	Spring 2014	Fall 2014
Course	ASTRON 3L - #3	Fall 2013	Fall 2013	Spring 2014
Course	ASTRON 3L - #3	Fall 2013	Fall 2013	Spring 2014
Course	ASTRON 4 - Waxman	Spring 2009	Spring 2009	Spring 2010
Course	ASTRON 4 - #1 (LS)	Spring 2013	Summer 2013	Fall 2013
Course	ASTRON 4 - #2	Fall 2014	Fall 2014	Spring 2015
Course	ASTRON 4 - #3	Spring 2014	Spring 2014	Fall 2014
Course	ASTRON 4 - #4 (LS)	Fall 2010	Fall 2010	Spring 2011
Course	ASTRON 4 - #4 (LS)	Spring 2011	Summer 2011	Fall 2011
Course	ASTRON 4 - #4 (LS)	Fall 2011	Spring 2012	Spring 2012
Course	ASTRON 4L - #1 (LS)	Spring 2011	N/A	N/A
Course	ASTRON 4L - #2 (AP)	Fall 2014	Fall 2014	N/A
Course	ASTRON 4L - #2 (AP)	Fall 2014	Spring 2015	Fall 2015
Course	ASTRON 12 - #1 (LS)	Spring 2011	Summer 2011	N/A
Course	ASTRON 12 - #1 (KW)	Spring 2011	Summer 2011	N/A
Course	ASTRON 12 - #1 (KW)	Fall 2011	Spring 2012	Spring 2012
Course	ASTRON 12 - #1 (LS/JF)	Fall 2011	Spring 2012	Spring 2012
Course	ASTRON 12 - #2 (KW)	Fall 2012	Fall 2012	N/A
Course	ASTRON 12 - #3 (LS)	Fall 2013	Fall 2013	Spring 2014
Course	ASTRON 12 - #4	Spring 2014	Spring 2014	Fall 2014
Course	ASTRON 12 - #5	Spring 2014	Spring 2014	Fall 2014
Course	ASTRON 12 - #5 (LS)	Fall 2014	Fall 2014	Spring 2015
Course	ENVS 12 - #1	Fall 2013	Spring 2014	Spring 2015
Course	ENVS 12 - #2	Fall 2013	Spring 2014	Spring 2014
Course	ENVS 12 - #3	Spring 2014	Summer 2014	Fall 2014
Course	ENVS 12 - #4	Fall 2013	Spring 2014	Spring 2014
Course	ENVS 12 - #5	Spring 2014	Summer 2014	Fall 2014
Course	ENVST 40 - #1	Spring 2014	Summer 2014	Spring 2015
Course	ERTHS 49	Spring 2014	N/A	N/A
Course	ERTHS 85.1 - #1	Fall 2014	Fall 2014	Fall 2015
Course	ERTHS 85.1 - #2	Fall 2013	Fall 2013	Fall 2014
Course	ERTHS 85.1 - #3	Fall 2014	Fall 2014	Fall 2015
Course	ERTHS 85.1 - #4	Fall 2012	Spring 2013	Fall 2013
Course	ERTHS 85.1 - #5	Fall 2014	Fall 2014	Fall 2015

Course	ERTHS 85.2 - #1	Spring 2014	Spring 2014	Spring 2015
Course	ERTHS 85.2 - #2	Spring 2014	Spring 2014	Spring 2015
Course	ERTHS 85.2 - #3	Spring 2014	Spring 2014	Spring 2015
Course	ERTHS 85.2 - #4	Spring 2011	Spring 2011	Spring 2012
Course	GEOG 3 - #2	Fall 2015	Spring 2016	N/A
Course	GEOG 3 - #5	Fall 2014	Fall 2014	Spring 2015
Course	GEOG 4 - #2	Spring 2014	Summer 2014	Fall 2014
Course	GEOG 4 - #3	Spring 2010	N/A	N/A
Course	GEOG 4 - #3	Spring 2011	Summer 2011	Fall 2011
Course	GEOG 4 - #3	Spring 2011	Summer 2011	Fall 2011
Course	GEOG 4 - #4	Fall 2013	Spring 2014	Fall 2014
Course	GEOG 4 - #5	Spring 2014	Summer 2014	Fall 2014
Course	GEOG 7 - #1	Spring 2014	Spring 2014	N/A
Course	GEOG 7 - #2	Fall 2014	Spring 2015	Fall 2015
Course	GEOG 7 - #3	Fall 2014	Spring 2015	Fall 2015
Course	GEOG 7 - #4	Spring 2014	Spring 2014	N/A
Course	GEOG 7 - #5	Fall 2014	Spring 2015	Fall 2015
Course	GEOL 1 - #1	Spring 2014	Spring 2014	Fall 2014
Course	GEOL 1 - #2	Fall 2013	Fall 2013	Spring 2014
Course	GEOL 1 - #3	Spring 2012	Summer 2012	Fall 2012
Course	GEOL 1 - #4	Spring 2014	Summer 2014	Fall 2014
Course	GEOL 1L - #1	Spring 2012	Spring 2012	Fall 2012
Course	GEOL 1L - #1	Spring 2012	Spring 2012	Fall 2012
Course	GEOL 1L - #2	Spring 2011	Spring 2011	Fall 2011
Course	GEOL 1L - #2	Fall 2011	Summer 2011	Spring 2012
Course	GEOL 1L - #2	Spring 2013	Spring 2013	Fall 2013
Course	GEOL 1L - #3	Spring 2014	Summer 2014	Fall 2014
Course	GEOL 1L - #4	Spring 2014	Summer 2014	Fall 2014
Course	GEOL 11 - #1	Fall 2014	Spring 2015	Spring 2015
Course	GEOL 11 - #2	Fall 2013	Fall 2013	Spring 2014
Course	GEOL 11 - #3	Fall 2012	Fall 2012	Spring 2013
Course	GEOL 11 - #4	Fall 2014	Fall 2014	N/A
Course	GEOL 11 - #5	Fall 2014	Fall 2014	Fall 2015
Course	GEOL 7 - #1	Summer 2014	Summer 2014	Summer 2015
Course	GEOL 20	N/A	N/A	N/A
Course	METRO 10 - #1	Fall 2014	Fall 2014	N/A
Course	METRO 10 - #3	Fall 2014	Fall 2014	N/A
Course	METRO 10 - #4	Spring 2014	Spring 2014	Fall 2014
Course	METRO 10 - #5	Fall 2015	Spring 2016	N/A
Course	METRO 10L	N/A	N/A	N/A
Course	PHYSC 21 - #1	Spring 2015	Spring 2015	Spring 2016
Course	PHYSC 21 - #4	Spring 2015	Spring 2015	Spring 2016
Certificate/Major	Environmental Studies	Fall 2014	Fall 2014	Fall 2015
Certificate/Major	Natural Sciences	Fall 2014	Fall 2014	Fall 2015

4.2a Key Courses or Services that address Institutional Outcomes

Course/Service	1a	1b	1c	2a	2b	2c	2d	3a	3b	4a	4b	5	6a	6b	6c	7
ASTRON 3	X		X					X		X	X					
ASTRON 4	X		X					X		X	X					
ENVS 12	X		X	X			X	X	X	X	X	X	X			X
GEOG 4	X	X	X					X	X	X	X					X
GEOL 1		X	X					X		X	X					X

4.2b Narrative (Optional)

The courses listed above are highly enrolled, GE transferrable courses. These seek to meet the fundamental critical analysis and foundational skills based portions of the institutional learning outcomes.

5.0 Performance Measures

Not Applicable.

5.1 Effective Class Schedule: Course Offerings, Times, Locations, and Delivery Modes (annual)

Update every third spring 2014, 2017, 2010 – data below was updated in 2013

Is the program offering a balanced class schedule convenient to students with day, evening, Friday, and weekend courses? Explain.

The ESS department traditionally offers an array of day and evening sections within each of our disciplines. In Fall 2014, we are offering an Astronomy lab on Friday's and a 30 student section of Astronomy 3 on Saturday, as part of the Weekend College.

Is the program offering a good geographic distribution of classes, at Santa Rosa, Petaluma, and other sites? Explain.

Our department is committed to offering courses in all disciplines but Meteorology at both the Petaluma and Santa Rosa campuses. We have offered Meteorology at the Petaluma campus in the past but cut classes because of budget cuts and staffing. In the 12-13 AY, 27.1% of ESS students were enrolled at the Petaluma campus (according to student headcount), the remainder were in Santa Rosa or online. This represents a value higher than the district average of 19.3% for the 12-13 academic year. The Department also offers two courses at the Pepperwood Preserve: ERTHS 85.1/85.2. In addition, field courses are offered in astronomy and geology, in Sonoma County and the Sierra Nevada.

Does the program effectively use alternative delivery modes such as online, online hybrid, or telecast? Explain.

Currently Meteorology 10 and 10L are the only classes that are offered online. Other courses (GEOG 3 and ENVS 12) are being considered for online delivery but have not been developed. The Department could consider hybrid courses. Under current budget constraints, any increase in online offerings would require a decrease in in-person offerings.

Is there demand for specific courses that is not being met? If so, what is the plan to address this?

Beginning in Fall 2013, the Department began rebuilding the schedule to better meet student demand. Additional sections were offered in astronomy lab, environmental science and world regional geography.

Can the program do a better job of serving students, and if so, how? State specific recommendations.

Improvements that could be made to better serve students:

- Offer Friday and/or weekend sections to serve working students.
- Offer more courses in an online or hybrid format.
- Re-establish sections impacted by budget cuts, as warranted to meet demand.
- Offer additional laboratory options district-wide.

Describe any marketing efforts or outreach activities geared to increasing enrolments, if applicable.

Our classes are generally taken for GE transfer or as part of a major. The Department has not made an effort to additionally market the classes. Classes are full and additional could be offered.

5.2a Enrollment Efficiency

Update every third spring 2014, 2017, 2010 –updated in 2014

Overall efficiency for all ESS disciplines at all locations was 104.5% in Fall 2012 and 101.3% in Spring 2013. All but one of our disciplines were above the 95% efficiency goal for the District. During Spring 2013, geology dipped to 93.8%. Classes at the Petaluma campus generally have lower efficiency than at the Santa Rosa campus. Overall efficiency for the Department at the Petaluma campus was 96% in Fall 2012 and 97.5% in Spring 2013.

Summer efficiency was 92.5% for 2012 and 78.8% for 2013. The summer2013 figures are below the District goal of 85%. In this case, Santa Rosa sections were all 90% and above. Efficiency in Petaluma was down significantly from previous summers (49.2%).

These classes are all GE transfer classes and are generally highly enrolled. We continually make adjustments to our schedule as enrollments and budgets warrant. The Department added sections of environmental science and world regional geography to meet increased demand. Sections of physical geography and astronomy were reduced.

<u>If your enrollment efficiency is above the efficiency goal, explain briefly how you maintain that efficiency</u>.
Like most departments, ESS was forced to cut classes which increased overall efficiency. As we add classes back into the schedule, our efficiency is likely to decrease.

<u>If your enrollment efficiency is **very near 100% or over 100%,** it is quite possible that courses or programs are impacted. Consider the following questions</u>:
Because our enrollment efficiency is over 100%, it appears that our classes are impacted. Environmental Science had an efficiency of 140% during Fall 2012 and 125.5% during Spring 2013 at the Santa Rosa campus. The Department added a section of ENVS 12 to meet demand.

Can more courses be added to serve student needs? Yes. ESS is rebuilding their schedule to better meet students' needs.

Is the discipline impacted for lack of instructors? No. ESS hired an additional full time earth science faculty member in Petaluma in 2013.

Is the discipline impacted for lack of space? No.

Is the discipline impacted because it is a high demand field? Our courses fulfill GE transfer requirements, and are therefore in demand across the district for transfer students.

5.2b Average Class Size

Update every third spring 2014, 2017, 2010 – data below was updated in 2014

Class sizes in the Department range from 25 to 200. Astronomy and Geology lecture sections generally have larger class limits, particularly at the Santa Rosa campus. The Department offers

two large sections of Astronomy, one at each campus. Lab classes typically have enrollments of less than 30. Environmental Science, Geography and Meteorology have limits of 30 at both campuses. ESS instructors generally add students on waiting lists and attempt to accommodate additional students.

Average enrollment for 12-13 AY:

	SR & Online	Pet	All Locations
ASTRON	80.3	63.3	74.4
ENVS	34.8	30.5	32.2
GEOG	31.8	32.0	31.9
GEOL	48.1	26.5	40.5
METRO	34.3	0.0	34.3

Note that the Santa Rosa campus and online classes are combined. The data provided did not accurately separate out online sections from Santa Rosa data. The few online classes we offer generally maintain their maximum class size of 35.

5.3 Instructional Productivity

Update every third spring 2014, 2017, 2010 –updated 2014

If your program's productivity ratio is **lower than 18.7**, explain any circumstances that contribute, such as limitations of facilities, regulations, special pedagogy, or scheduling challenges.

Environmental Science, Geography and Metrology generally have lower productivity than other ESS classes because they have lower class limits. These classes have limits of 30 and a wait list of 4 at both campuses. Based on this class size, these disciplines will never attain the 18.7 productivity goal for the District.

ENVS had a productivity ratio of 17.0 for the 12-13 AY. Although these classes are below the productivity goal, they are however efficient. We increased the number of sections of ENVS over the years and this impacts productivity as well.

Productivity figures for GEOG increased to 16.7 for the 12-13 AY. We reduced the total number of geography sections at both campuses to account for changes in enrollment and to also offset adding an additional section of environmental science. The class limit for geography is 30 at both campuses. These classes are held in the same rooms as the ENVS classes and hold a maximum of 34 students.

METRO consistently has productivity below the District goal and had an average productivity of 15.8 during the 12-13 AY. These classes are typically small, averaging 30 students (for lecture and lab), and enrollments have been increasing. Because we have no full-time anchor faculty, there is no one to coordinate the program, mentor students, or advocate for the needs of the program.

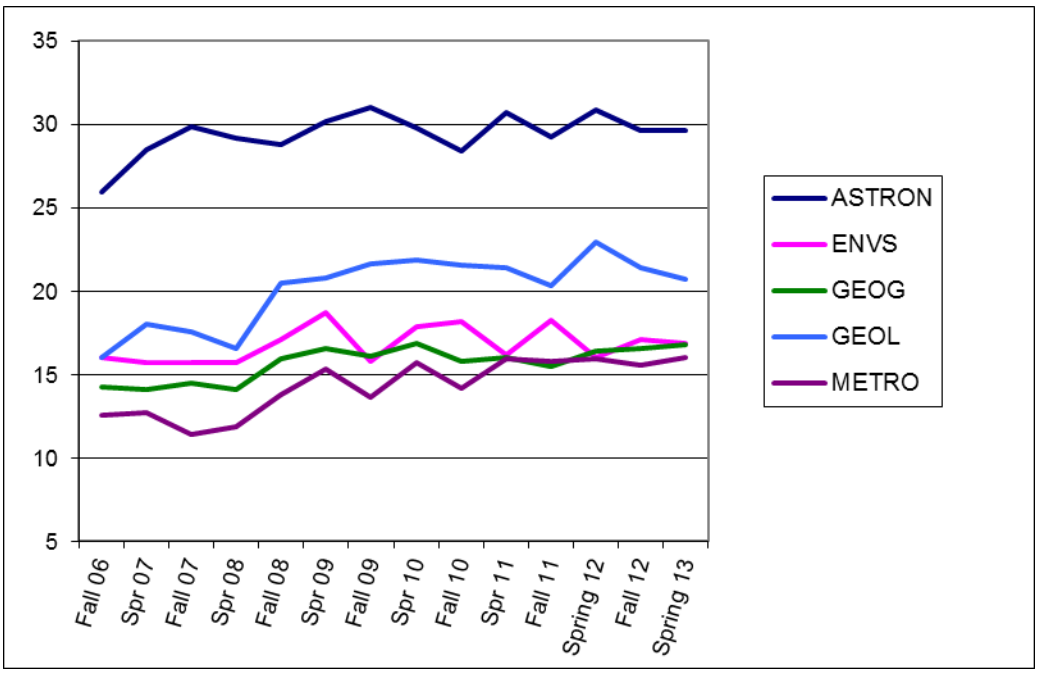
While we recognize that increasing class limit would increase productivity for all of these classes, pedagogically, we are opposed to doing so.

If your program's productivity ratio is **18.7 or higher**, describe how you maintain that productivity.

ASTRON has high productivity. Lecture class limits are high for astronomy (90 for most sections, 198 for two sections). The average productivity for 12-13 AY was 29.6 district-wide which was down slightly from the previous year.

GEOL productivity was 21.1 for the 12-13 AY, which is slightly lower than the previous year. Class sizes in geology range from 25 to 90. We offer lecture classes with up to 90 students at the Santa Rosa during the day. Lab classes, night classes and Petaluma classes all have limits ranging between 25 and 30. These class limits are based on classroom size.

Explain any trends that you see in productivity.
Productivity has increased across all disciplines since Fall 2006 (see chart below). This is due to a reduced number of sections serving an increased number of students. There have been fluctuations in productivity over the past three years. This is likely due to cuts in offerings District-wide. We continue to make adjustments to our class offerings and any additions or cuts affect productivity.



Recommend ways the program could improve productivity.
- Better coordinate Petaluma and Santa Rosa class offerings.
- Consider increased class sizes (would require using different rooms)
- Work with instructors to increase retention.
- Hire anchor faculty for METRO

5.4 Curriculum Currency

Update every third spring 2014, 2017, 2010 **–updated 2014**

As of Spring 2014, all ESS curriculum is up-to-date. We keep track of courses and update as they come up for six-year review.

5.5 Successful Program Completion

Update every third spring 2014, 2017, 2010 –updated 2014

The ESS department does not currently have any majors.

5.6 Student Success

Update every third spring 2014, 2017, 2010 – not updated 2013

How does student retention at the discipline level compare to the overall District **retention** rate?

Retention rates vary by discipline (see chart below). Department averages are above the district average of 77.3% for both Fall 2012 Spring 2013.

Retention %

	F2012	S2013
ASTRON	80.3	80.0
ERTHS	70.0	75.0
ENVS	82.1	70.4
GEOG	81.2	75.3
GEOL	82.7	76.6
METRO	80.4	89.3
ALL	81.0	78.4

How does student success at the discipline level compare to the overall District **success** rate?

The chart below shows success rates for each of the ESS disciplines. Overall ESS success rates were 73.2% in Fall 2012 and 70.1% in Spring 2013. For Fall 2012, ESS rates were slightly higher than the District average of 72.6%. However ESS rates in Spring 2013 were lower than the District average of 72.0% in Spring 2013. In most cases, ESS saw a decrease in success between fall and spring that was only somewhat evident in the District average.

Success %

	F2010	S2011
ASTRON	71.0	69.1
ERTHS	70.0	75.0
ENVS	73.5	63.0
GEOG	75.8	71.8
GEOL	75.7	69.8
METRO	78.3	85.0
ALL	73.2	70.1

How does the average student GPA within your discipline compare to the overall District GPA?

The chart below shows the each discipline in the ESS department with GPA for the past academic year. The District GPA was 2.64 in Fall, and 2.63 in Spring. The GPA of our students has, by and large, been lower than the district average. It is our opinion that students taking ESS classes are underprepared for college-level science courses when compared to other disciplines within the district.

	GPA	
	F2010	S2011
ASTRON	2.28	2.21
ERTHS	2.00	3.67
ENVS	2.42	2.41
GEOG	2.71	2.43
GEOL	2.35	2.26
METRO	2.73	2.93
ALL	2.39	2.32

5.7 Student Access

Update every third spring 2014, 2017, 2010 –updated 2014

Do students from diverse ethnic backgrounds enroll in the disciplines at rates equal to their participation rates in the District as a whole?

As a general trend, our science-based classes are dominated by students who claim "white" as their ethnic background. The "white" enrollment in our classes ranged from 58-68% during the 2012-13 academic year. This percentage is higher than the district-wide average of 53% in Spring 2013. Based on data in the *SRJC Factbook 2013*, the number of students claiming "white" as their ethnicity is declining within the District while the number of students identifying as Hispanic is increasing.

The rate of growth in Hispanic students in the District has increased significantly and was approximately 30% in Spring 2013. ESS enrollments of Hispanic students are lower than the District average, ranging from 10.1% (meteorology) to 17.1 (astronomy). Although lower than the District average, the number of Hispanic students taken ESS classes, particularly GE transfer classes, has increased. There are a few specialized classes (e.g. Pepperwood class and Environmental Forum) that have lower enrolment of Hispanic students.

Do male or female students constitute 75% or more in this discipline? If so, what strategies are being used or planned to increase enrollment of the non-traditional gender?
No – none of the ESS disciplines have male or females students accounting for more than 75% of the class. The numbers vary significantly and by year. Astronomy, Geology and Geography had slightly more males than females during 2012-13 while Environmental Science and Meteorology had greater numbers of females.

Has the program/unit experienced changes to its student population or changes in the needs of students in the last four years?
No

What types of outreach or retention efforts are occurring or should be implemented to better serve underserved or under-represented populations in this program?
To date, no efforts have been made to increase the enrollment of under-represented populations. These populations have historically been under-represented in science disciplines in other academic settings as well as the professional realm. These discussion are occurring at the state and national level within professional organizations.

How does this program/unit serve students that are often underrepresented in college including various ethnic groups, lower socioeconomic groups, English language learners?
To date, no efforts have been made to better serve under-represented populations.

5.8 Curriculum Offered Within Reasonable Time Frame

Update every third spring 2014, 2017, 2010 –updated 2014

Within the ESS Department, we do not currently have majors. As a result, this question is not applicable.

The Environmental Studies major includes a variety of courses that students can take to meet the core requirements. It is being updated in Fall 14 to include additional courses. Students are required to take 4 of the 7 core courses. Most of these courses are offered every semester with two exceptions. SOCS 12 is offered every spring and ENGL 10 is not currently being offered due to budget cuts.

5.9a Curriculum Responsiveness

Update every third spring 2014, 2017, 2010 –updated 2014

How does the program/unit curriculum respond to changing student, community, and employer needs?
We attempt to offer a variety of courses that students can take to meet their GE requirements that include lecture and lab components. As budgets and staffing allow, we are adding back in sections of in-demand courses such as environmental science.

Has your program/unit fully complied with the State requirement that every general education course that transfers to a CSU or UC campus must include objectives (content) related to gender, global perspectives, and American cultural diversity? If not, describe the plan to bring the curriculum into compliance.
As we continue to update curriculum, we will ensure that these GE objectives are included.

How does the curriculum support the needs of other programs, certificates, or majors?
Several of our courses are included as parts of other majors, or electives for certificates.

Offer recommendations and describe plans for new directions in the curriculum.

We offer standard science curriculum, however, we are looking for ways to expand our curriculum so that it better aligns with certificates in other departments.

5.9b Alignment with High Schools (Tech-Prep ONLY)

Update every third spring 2014, 2017, 2010 –updated 2014

Not applicable.

5.10 Alignment with Transfer Institutions (Transfer Majors ONLY)

Update every third spring 2014, 2017, 2010 – updated 2014

We do not have a major, so this is not currently applicable. We are working on Transfer Model Curriculum for geography and environmental science majors. These majors will line up with C-ID and TMC guidelines.

5.11a Labor Market Demand (Occupational Programs ONLY)

Update every third spring 2014, 2017, 2010 – updated 2014

Not applicable.

5.11b Academic Standards

Update every third spring 2014, 2017, 2010 – updated 2014

<u>Does the program regularly engage in dialogue about academic standards? If so, describe any conclusions or plans.</u>
Within our individual disciplines, there is dialogue between instructors regarding academic standards, grading, assignments, etc. We are fortunate that instructors agree on academic rigor, and course standards.

6.1 Progress and Accomplishments Since Last Program/Unit Review

Rank	Location	SP	M	Goal	Objective	Time Frame	Progress to Date
0001	ALL	02	01	Geography TMC major	Align SRJC major with Geography TMC. Finalize major SLO's; identify structure of the major, including relevant courses; submit paperwork.	Spring 2017	Postponed. Estimated timeline: Fall 2017
0002	ALL	02	06	Participate in ENVS TMC at state-level	Work with the State Academic Senate to establish a ENVS-TMC major.	Fall 2016	This was completed in Spring 2017.
0003	ALL	02	01	ENVS TMC major	Align SRJC major with ENVS TMC (once completed). Finalize major SLO's; identify structure of the major, including relevant courses; submit paperwork.	Spring 2017	The major was just completed at the statewide level. Estimated timeline, Fall 2017.
0004	ALL	02	01	Develop SLO assessment plan for PHYSC 21 & Geol 20	Coordinate among instructors to add PHYSC 21 & Geol 20 to our six-year assessment plan.	Fall 2016	This was completed in Spring 2017.
0005	ALL	02	06	Develop lab components for GEOG 4 and ENVS 12	Develop SLO's and objectives, write COR, submit paperwork.	2016-2017	Postponed. We decided to prioritize development of Geog 10 (to cross-list with Metro 10) first. Geog 4 estimated timeline: Fall 2017. Envs on hold for now.
0006	ALL	02	06	Develop online / hybrid courses in GEOG 3, ENVS 12, and Astron 12	Submit paperwork for distance education. Develop courses.	2016-2018	Decided to develop hybrid Geol 20 (Natural disasters) first. Discussion ongoing for other courses.
0007	ALL	02	01	Explore additional ESS course offerings to meet student needs (astrobiology, astrophysics, oceanography)	Develop format, SLO's and COR for new courses.	2016-2019	Ongoing discussions.

6.2a Program/Unit Conclusions

Location	Program/Unit Conclusions
Other	Based on last year's PRPP, we received new lab stools for room 2030 and a few for room 2042 which will make these rooms much safer and more comfortable for students. We have completed development of a new course (Geog 10) which will be cross-listed with Metro 10 to increase our staffing flexibility. We have also completed the steps to offer Geol 20 in a hybrid format. The State approved the ENVS TMC in Spring 2017. ESS faculty will submit SRJC's TMC for ENVS and Geography in Fall 2017. Now is the time to envision the future of the Planetarium - we have reached a critical moment. We are making progress on our curriculum goals for ENVS and Geography, and we will continue to work toward those goals.

6.2b PRPP Editor Feedback - Optional

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6.3a Annual Unit Plan

Rank	Location	SP	M	Goal	Objective	Time Frame	Resources Required
0001	ALL	02	01	Geography TMC major	Align SRJC major with Geography TMC. Finalize major SLO's; identify structure of the major, including relevant courses; submit paperwork.	Fall 2017	Staff time.
0003	ALL	02	01	ENVS TMC major	Align SRJC major with ENVS TMC. Finalize major SLO's; identify structure of the major, including relevant courses; submit paperwork.	Fall 2017	Staff time.
0005	ALL	02	06	Develop lab components for GEOG 4	Develop SLO's and objectives, write COR, submit paperwork.	2017-2018	Staff time. Supplies and Equipment for labs (~$5,000).
0006	ALL	02	06	Develop online / hybrid courses in GEOG 3, ENVS 12, and Astron 12	Submit paperwork for distance education. Develop courses.	2017-2020	Staff time.
0007	ALL	02	01	Explore additional ESS course offerings to meet student needs (astrobiology, astrophysics, oceanography, climate change)	Develop format, SLO's and COR for new courses.	2017-2020	Staff time. Lab equipment supplies.