

## SJSU Annual Program Assessment Form 2018 Report

### Instructions

1. Complete the attached form and submit it as an email attachment to *Graduate and Undergraduate Programs* ([academicassessment@sjsu.edu](mailto:academicassessment@sjsu.edu)) on or before **March 15, 2018**.
2. Please copy your college's Associate Dean and [Assessment Facilitator](#) on the email submission. Assessment Facilitators are also available to provide support - please feel free to contact them with any questions or concerns.
3. Completed forms will be posted on your [Program Records webpage](#).

This report is organized into three sections designed to organize your annual assessment efforts and to inform your department's Program Planning. Here is the rationale behind each section.

### Part A – The Big Picture

- This section will likely only need to be prepared once at the beginning of your assessment cycle, although it should be reviewed each year and updated as necessary. This information should be included in each annual report, even if it has not changed.
- This section lists your Program Learning Outcomes (PLOs) and, more importantly, how they connect with your curriculum within the program and the [University Learning Goals](#) (ULGs).
- Finally, this section presents your assessment plan for the current planning cycle in the form of a multi-year schedule (usually 5 years, updated as part of Program Planning). This schedule should indicate which PLO(s) will be assessed each year, as well as your plans for implementing changes based on assessment results, and re-assessment after changes have been given time to take effect.

### Part B – What We Did This Year

- This section details your assessment efforts over the last year (Spring and Fall 2017).
- Which PLO(s) were assessed, how was the data collected, and what do the data tell you with regard to student achievement on this PLO? What do you plan to do, if anything, to improve future achievement levels (i.e., “close the loop”)?

### Part C – Keeping Track of the Changes (“Closing the loop”)

- This section is meant to keep a running record of your efforts to improve your students' outcomes. This table should grow throughout your assessment cycle and will be an important part of your next Program Plan.
- Create a new row in the table each time you propose a change as a result of your assessment efforts. Then be sure to keep track of your change efforts in subsequent years.

**SJSU Annual Program Assessment Form  
Academic Year 2017-2018 Report**

<b>Department: Meteorology &amp; Climate Science</b>
<b>Program: <a href="#">MS Meteorology</a></b>
<b>College: Science</b>
<b>Program Website: <a href="http://www.sjsu.edu/meteorology">www.sjsu.edu/meteorology</a></b>
<b>Link to Program Learning Outcomes (PLOs) on program website: yes of course we have!</b>
<b>Program Accreditation (if any): N/A</b>
<b>Contact Person and Email: Alison Bridger (Chair), <a href="mailto:alison.bridger@sjsu.edu">alison.bridger@sjsu.edu</a></b>
<b>Date of Report: 4/6/18</b>

**Part A**

**1. List of Program Learning Outcomes (PLOs)**

The PLOs for the Meteorology and Climate Science program follow the standards accepted by the American Meteorological Society ([AMS: BS in Meteorology recommendations](#)). The roadmap for the MS in Meteorology is consistent with most universities that grant graduate degrees. Beginning graduate students are strongly encouraged to take METR 202 (Research Methods in Meteorology). The students take three required courses: METR 205 (Advanced Atmospheric Dynamics), METR 215 (Advanced Physical Meteorology), and METR 240 (Numerical Modeling). The department periodically offers a wide range of elective courses, which include topics such as turbulence, fire weather, parameterization in numerical models, and advanced synoptic meteorology. The program requires each student to complete a thesis based on research.

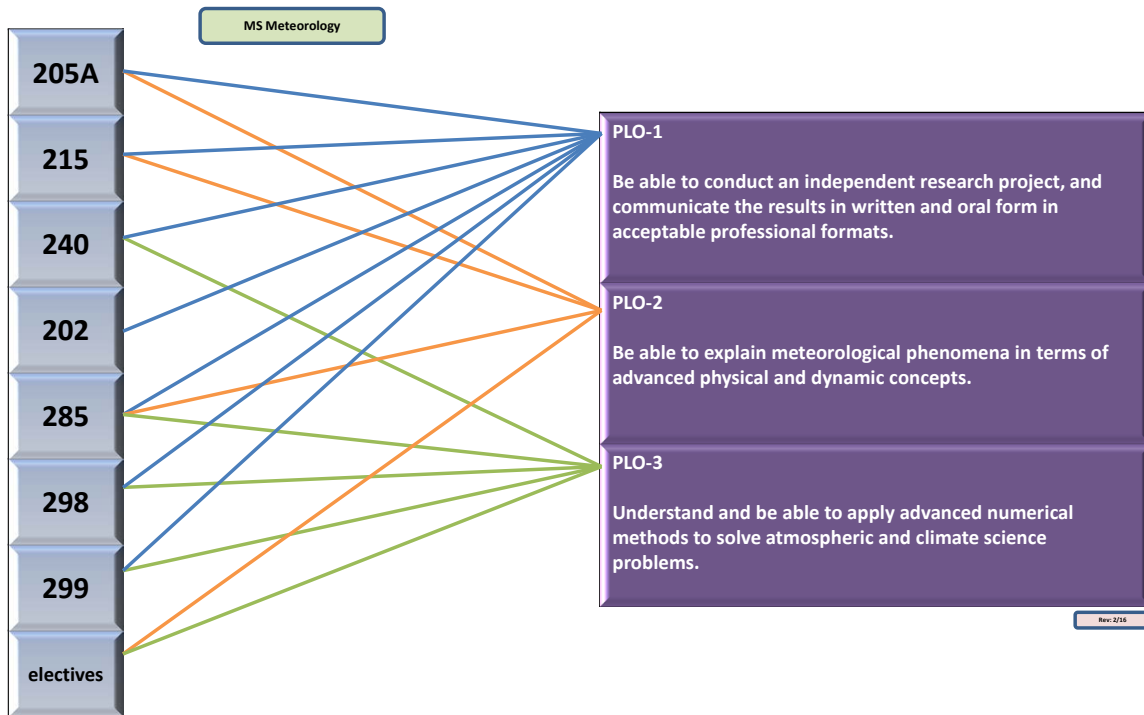
The PLOs for the MS Meteorology are:

1. Be able to conduct an independent research project, and communicate the results in written and oral form in acceptable professional formats.
2. Be able to explain meteorological phenomena in terms of advanced physical and dynamic concepts.
3. Understand and be able to apply advanced numerical methods to solve atmospheric and climate science problems

2. Map of PLOs to [University Learning Goals \(ULGs\)](#)

	MS METEOROLOGY					
university	program	PLO-1 independent research project	PLO-2 explain met phenomena	PLO-3 numerical methods		
ULG-1	1.1	X	X	X		
ULG-2	2.1	X	X	X		
	2.2		X			
	2.3		X			
ULG-3	3.1	X	X	X		
	3.2	X	X	X		
ULG-4	4.1	X	X	X		
	4.2	X	X	X		
	4.3	X	X	X		
ULG-5	5.1		X			
	5.2					
courses		thesis!!	205,215	240		

a. Alignment – Matrix of PLOs to Courses



b. Planning – [Assessment Schedule](#) (per [posted schedule](#) )

	AY 13-14	AY 14-15	AY 15-16	AY 16-17	AY 17-18
PLO 1					
PLO 2					
PLO 3					

c. Student Experience

- a. All PLOs are posted online (**NEW THIS YEAR:** they are now 1 click away. This is a major assessment improvement.) Please find them at <http://www.sjsu.edu/meteorology/>
- a. Faculty continue to be encouraged by the chair to include language in our syllabuses that mentions the existence of department PLOs; and (b) includes the URL.
- b. Almost all faculty use the CANVAS system, in which PLOs, rubrics etc. can be easily and readily shared with students.
- d. **NEW THIS YEAR:** we conducted a survey to see whether students have found this information. Survey results will be discussed in a future report.

## Part B

### e. Assessment Data and Results

*In the 16-17 cycle, we assessed PLO 1: Be able to conduct an independent research project, and communicate the results in written and oral form in acceptable professional formats.*

In previous years, we have gathered data by handing out a survey instrument during in-house thesis defense seminars. Lately, we have forgotten to do this. Thus for this report we have attempted to recreate the data as follows:

- Every student admitted to the MS program is presumed capable of completing the program. We have an incomplete list of names (no idea how to get them from PeopleSoft).
- Completion of the program requires: (a) completing all required courses (9 units); (b) completing electives (15 units); (c) completing research units (6 units).
- The completion of the research component (i.e., of the 6 units of 298 and 299) involves: (a) selecting a research topic and research advisor/guide; (b) working on and completing the research topic; (c) writing up the results in the form of a thesis which meets faculty expectations and GAPE/GUP requirements; (d) presenting their research project and results in a department seminar in front of faculty and students.

Thus “data” consists of a list of names of students who have been admitted, a subset of whom have successfully defended and submitted a thesis (or are expected to this Spring). **These students by definition WILL have satisfied PLO-1 for this program.**

From time-to-time, an MS student will complete the classwork, but not complete the thesis and thus not graduate. **These students by definition will NOT have satisfied PLO-1 for this program.** These students are the subject/object of this report.

A list of students admitted to the MS program who “could” have graduated in or before the calendar year 2017 was examined. These include:

- The “youngest” cohort, students admitted for Fall 2015 who would have completed 4 semesters by summer 2017 (we generally do not have students graduate any faster).
- Students admitted for Fall 2014 (or earlier) who have lagged in completion of the MS.

The data looks like this for students about to complete (top rows) and yet to complete (lower rows):

Student	#semesters at SJSU	Comments	Expected outcome re: PLO-1
BR	4	Has a job waiting with the National Weather Service, pending defense in May 2018	will almost certainly satisfy in Sp18
AG, CL, MR, JS	4	2 expected to defend May 2018, 1 in Fall 2018, 1 uncertain	2 will probably satisfy in Sp18, 1 will probably satisfy in Fa18, 1 uncertain
JC, JD, KS, LB	6	3 expected to defend in May 2018	2 will probably satisfy in Sp18, 1 will probably satisfy in Fa18, 1 uncertain
KM, CB, SC, AI	6+	1 expected to defend in May 2018 and has a job pending defense in May, 1 "finishing", 1 left, 1 on leave	1 will probably satisfy in Sp18, 1 will maybe satisfy in Fa18, 1 uncertain, 1 has left town and is not expected to complete
SB, FD, NF, BD, DH, RO, DT	6+	SB stopped working the program; KD moved to LA and stopped working on the thesis; NF is employed and stopped working on the thesis; BD was almost done but moved to Texas; BD was well along on the thesis work but moved to Florida; RO moved to LA and stopped working the program; DT stopped working the program.	Low expectations for all

Data for students who completed (PLO-1 satisfied):

Student	Comments
CC	Got a job with the Naval Research Laboratory in Monterey
DB	Got a job with the Los Alamos Lab in New Mexico
RB	Got a job with PG&E and is also teaching at SJSU
AF1	Got a job with the Los Alamos Lab in New Mexico
AF2	Working with Bay Area Air Quality Management District
ML	Working at US Army Dugway facility in Utah
PM	High school chemistry teacher
CM	Completed and moved to Texas

A note about the data. We have poor skills at navigating PeopleSoft. We do not know the full range of what is offered, and we do not know which subset we are allowed to access. The data above are assembled based on a spreadsheet used to track MS student progress, memory, and a search of email. Although it may be incomplete, the data are sufficient to illustrate our issue, as discussed below.

#### **f. Analysis**

Ideally, we would like for every student admitted to the MS program to graduate. Also, we would like this to happen in about 4 semesters. The data indicate that neither of these is the case. Some points:

- Up to roughly 10 years ago, the majority of students admitted did finish the MS. There would be never more than one student per year who did not complete the thesis and graduate.
- In the last decade, the number of students who appear to be “on track” to graduate – and then leave without graduating – has risen. This has led to a significant drop in our graduation rate.

#### **How can this change be explained?**

- Student quality? We have, in fact, raised the required GPA for admission from 2.5 to 2.75, so it’s hard to argue that our dropout rate is a result of admitting weaker students.
- Time to completion? This is suspected to be an issue with our program.
  - Over the years, very few students are able to complete the MS in 4 semesters, meaning start in Fall 2018 (say), and defend in Spring 2020 in time for Spring 2020 graduation. The fastest student might defend at the end of Spring 2020 in time for Summer 2020 graduation. More likely, they would be completing in summer in time for Fall 2020 graduation (5 semesters).
  - In the last decade, the concept of “Professional Masters” has arisen. These can be completed in 12-18 months. More broadly, non-research MS degrees are designed to be completed in 12-24 months. Hence, our “longer than 24 months” program looks less appealing, and might cut into numbers of students applying.
  - Related to longevity, students completing 24 months in-program, may feel pressured into leaving to join the workforce and start earning money.
  - Related to earning money, as we all know, the cost of housing is stratospheric here, and this is having an impact on enrollments and on the ability and willingness of students to stay beyond 24 months. We are finding that we can offer scholarships of up to \$5K for incoming students, but they are not enticed - \$5K does not go very far.
  - Related to earning money, some research-active faculty are able to offer a GRA to 1-2 students each, covering salary and tuition. However, even some of these students have left prematurely w/o completion.
- Faculty standards? Perhaps faculty are setting the bar a bit too high, meaning that students need to stay longer to complete the MS thesis. Our faculty a highly research-active. In the absence of a PhD program, it might be that faculty are requiring a high level of MS research, which takes several semesters.

#### **Why have students left early?**

Looking over the list of students who did not satisfy the PLO (i.e., who left), they have left for reasons including: got a good job out of state w/o MS completed; moved with spouse to another state; retired to another state; moved down to LA and lost contact.

### **How can we improve performance?**

Improving performance means making changes so that many more students do complete the MS.

1. We believe that the best path to achieving this is to speed up the path to completion, so that most students would defend at the end of their 4<sup>th</sup> semester and graduate in summer.

We did in fact take steps during this cycle to enact this change...we petitioned to reduced the number of electives from 15 to 12 (5 classes to 4), and at the same time increase the number of research units from 6 to 9. This will better recognize the significant component that research plays in our MS degrees.

Good old SJSU lost the paperwork. It's already a nightmare getting curricular changes enacted – the process is so achingly slow. This loss added a year to the process. However, we believe that the fix has now been implemented. Thus, in the arena of “closing the loop”, at the end of the next cycle we can review the student success rate and see whether it has changed.

2. Perhaps a more aggressive research advising process will help? This will be discussed with faculty.
3. Pay students. It's generally easier to push students along when you can threaten to end their assistantship (as has been done for underperforming students). The national standard in our field is to pay graduate students, and we already struggle to come up with assistantships of \$25K+ per year, plus tuition, for multiple years and students. A number of students choose to get full time jobs after about 2 years in the program, and this significantly slows their progress. Both situations would be improved by speeding up time to graduation.
4. Writing issues. A large fraction of early leavers have completed all classwork and conducted a research project. All that remains is to write a thesis. This seems to be too big a hurdle for many students, especially those who don't write well or easily. Faculty will discuss what we could do about this.

**g. Proposed changes and goals (if any)**

We discussed above suggestions to improve retention and ultimate graduation and success in our MS program. The main one is to work to reduce time to graduation. This will require buy-in from the faculty, since we are asking that they push students through their research activities quicker.

Closing the loop: as mentioned above, during the program planning cycle which is about to start, we will test the hypothesis that reducing “time to graduation” will improve retention and graduation rate.

**Part C**

**h. Program Learning Outcomes**

**What are your proposed closing-the-loop action items and completion dates?**

**Describe the progressive changes and the status in the table below.**

<b>Proposed Changes and Goals</b>	<b>Status Update (what’s being done and results observed)</b>	<b>Date reported</b>
Work aggressively to ensure that MS students can finish in either 4 semesters or in 24 months.	This will be reviewed in three years.	Today 4/6/18

**i. Program planning action items**

**What is the direct web link to the program's latest action plan?**

The last plan (2013) is posted at:

[http://www.sjsu.edu/gup/ugs/faculty/programrecords/Science/Meteorology/METR\\_Docs/METR\\_Action\\_Plan\\_2013.pdf](http://www.sjsu.edu/gup/ugs/faculty/programrecords/Science/Meteorology/METR_Docs/METR_Action_Plan_2013.pdf)

The current plan is working thru the system (external reviewer has visited and commented, report is going up the pipeline).

**Describe the action items and the status in the table below.**

<b>Action item description</b>	<b>Status Update (what's being done and results observed)</b>	<b>Date reported</b>
#1	Done	Report?
#2	Done	Report?
#3	Thanks!	
#4	Thanks!	
#5	Done!	Fall 17