

General Education Annual Course Assessment Form

Course Number/Title: METR12/Global Warming

GE Area: B1

Results Reported for: AY 15-16

of sections: 2

of instructors: 2

Course Coordinator: Alison Bridger (as department chair)

email: Alison.Bridger@sjsu.edu

Department Chair: Alison Bridger

College: Science

Instructions: Each year, the department will prepare a brief (two page maximum) report that documents the assessment of the course during the year. The report will be electronically submitted by the department chair to the Office of Undergraduate Studies, with an electronic copy to the home college by October 1 of the following academic year.

Part 1

To be completed by the course coordinator:

- (1) What SLO(s) were assessed for the course during the AY?

SLO#3: A student should be able to apply a scientific approach to answer questions about the Earth and environment.

What were the results of the assessment? What were the lessons learned from the assessment?

The department philosophy, instituted at a faculty retreat in January 2012, is to hold an "assessment week", during which all GE classes would be assessed. In AY 2014-2015, this week was April 6-10.

The faculty prepared a series of questions to assess SLO#3 in the core GE class MET-12. In all, the students were asked to provide eight answers. First the students were given the following preface to the questions:

This assessment refers to the graph on the last page. Shown on the graph are: Carbon Dioxide (CO₂) Concentration (top), Global Average Temperature Anomaly, i.e. change from the mean (middle), and Sea Level Anomaly (bottom). The time is thousands of years before the present with the present on the right.

Students were then asked questions about the graph provided to them. Questions included: (1) There are several peaks in the CO₂ concentration, the temperature anomaly, and the sea level anomaly. Estimate the mean period (number of years) between the most prominent peaks. (2) How large is the difference between a peak and a low in the CO₂ concentration? (3) Briefly explain the apparent relationships among the three variables and the implications for climate.

Data was gathered for the two sections of MET 12. The students were graded on the five questions, correct (1) or incorrect (0) for each question. The scores were then tabulated. A score of "5" means the student got all questions correct.

Table showing number of **correct** student responses (N)

Section	#responses and scores	5	4	3	2	1	0
A	45	1	5	17	13	7	2
B	22	3	3	3	10	3	0
Total	67	4	8	20	23	10	2
		6%	12%	30%	34%	15%	3%

Looking at scores, students in section A scored 2.4 on average, while students in section B scored slightly higher at 2.6. Generally, about two-thirds (64%) of students from both sections were in the middle of the distribution (scored 2-3 out of 5). Only a relatively small fraction scored zero or 1/5, which is promising. Section-to-section differences are probably not newsworthy.

The graph that the students were asked to analyze is critical for understanding the science of climate and climate change over the last ½ million years. In particular, it helps to separate natural variability from anthropogenic influence on global warming. On the other hand, the graph is difficult for people without science backgrounds to understand and interpret. This is a primary reason for the continued confusion in the public sphere regarding climate change.

We believe there are several reasons for the large number of students who were only able to answer two or fewer of the questions correctly.

1. The time label for the graph was in thousands of years before the present (many answered 100 rather than 100,000 years).
2. The major peaks for CO₂, Global Temperature, and Sea Level were consistent, but there is more noise in the Sea Level Record, leading to confusion about where the major peaks were.
3. Several students reported the maximum values rather than the difference between the maximum and minimum values, likely assuming the minimum is zero.
4. Several students explained the relationships among the three variables, but were not able to explain the implications.
5. A few students did not answer the questions quantitatively (with numbers, as requested).

In general, the assessment was successful. The graph, often presented in scientific lectures, is a difficult one for the average person to interpret. The questions were designed to get students to examine the graph, and find the most important features. A majority of the students *were* able to identify some of the key features. Further, many of their mistakes were in misinterpreting details (e.g. as mentioned, the time scale, or reporting the maximum value instead of the difference).

- (2) What modifications to the course, or its assessment activities or schedule, are planned for the upcoming year? (If no modifications, the course coordinator should indicate this.)
 - a. None planned
- (3) Are all sections of the course still aligned with the area Goals, Student Learning Objectives (SLOs), Content, Support, and Assessment? If they are not, what actions are planned.
 - a. The course meets the area Goals, Student Learning Objectives (SLOs), Content, Support, and Assessment.