I. INTRODUCTION

The current Student Learning Outcomes Assessment program for courses in the UAF Core Natural Sciences was implemented in 2004 by then Associate Dean John Aspnes following a committee’s development of a streamlined assessment process. (Committee members were Susan Henrichs, Doug Schamel, Rainer Newberry, and John Aspnes.) First use of this assessment model was for GEOS 101X in 2004. These three events remain the formative activities that have underpinned the assessment work since then. The current descriptive material for the assessment process is available at http://www.uaf.edu/provost/assessment-review/assessment/core-assessment/.

Beginning in 2009, assessment reports are fully reviewed by the CNSM associate dean and copies of the resulting review notes for each course are distributed to the instructor, department chair, and CNSM dean, and a copy is attached to the assessment report’s notebook or electronic file, which is then electronically archived in the CNSM Dean’s Office (REIC 358).

Notebooks from 2004 onward have been scanned to create digital versions, and electronic submissions are being encouraged in the future. Each academic department is urged to keep a copy of reports for their courses and the CNSM hard copies are returned to the departments after an electronic copy is created.

Assessments Planned for AY2009-2010

Core natural science courses scheduled for assessment in this year were:

- **Fall 2009**: BIOL 111X, PHYS 211X
- **Spring 2010**: CHEM 105X, GEOS 120X, MSL 111X, PHYS 212X.

Assessment reports received to date are:

- **Fall 2009**: BIOL 111X
- **Spring 2010**: MSL 111X

In addition, reports were received for three of the four courses scheduled for assessment in AY2008-2009 or earlier; BIOL 104X, CHEM 106X, and GEOS 101X. The fourth course, PHYS 175X, was not assessed, nor was it assessed five years earlier. These were discussed in the previously submitted report for AY2008-2009.

Assessments Planned in AY2010-2011

There is no record of assessments being carried out in the past at the rural campuses through CRCD. Courses assessed at the Fairbanks campus (FC) and other campuses are identified in parentheses; e.g., BBC denotes the Bristol Bay Campus and NWC the Northwest Campus. No campus indicator is used if FC only. DD denotes FC course by e-delivery.

- **Fall**: BIOL 112X (NWC), GEOG 111X (FC,BBC), PHYS 213X, PHYS 102X (BBC)
- **Spring**: ATM 101X, BIOL 100X (CTC), BIOL 112X (FC,CTC), CHEM 104X, GEOS 112X, PHYS 102X (deferred to AY2011-1012 due to dept. error)
II. ASSESSMENT REPORT FORMAT AND OBJECTIVES

A Core Natural Science assessment report for a course typically comprises 3-8 pages plus supporting graphs, tables, etc. to provide the following;

1. **A brief general discussion** that outlines the course objectives, student numbers, composition, etc. so one can gain an overall impression of the enrolled students and the instructional philosophy. This should include the instructor’s approach to satisfying the three core expectations given next.

2. **Expectation 1 is training in the scientific method.** Much of this work is frequently left to the laboratory TA, but the course instructor responsible for course content is encouraged to aid in the training as part of the lectures. Assessment is via a brief writing exercise in which students are asked to study the description of an intentionally flawed laboratory effort (from design through measurements to conclusions) and to identify things inconsistent with the scientific method. The instructor is asked to study the students’ work and assess the degree to which they gained a working understanding of the scientific method.

3. **Expectation 2 is the impact of science on public policy.** Impacts of science (positive or negative) on public policy are discussed within the lectures and the laboratory setting in order to link scientific information and inquiry to the formation of informed public policy. An objective is to improve students’ abilities to discern bogus from factual arguments. Assessment is through the preparation of a 1-2 page paper in which a subject of current public policy debate is discussed with regard to scientific evidence. Wide latitude is given in how instructors carry this out. Again, the instructor is asked to study the students’ submissions and assess the degree to which they have been successful.

4. **Expectation 3 begins with a six-question survey** that was designed by the 2004 committee (really a questionnaire) to gain student perceptions of the course’s two assessment objectives (scientific method and science and public policy) and their perceptions of their learning outcomes. The students are presented with six questions and asked if they strongly agree, agree, are neutral, no not agree or strongly do not agree. Nearly all courses succeed in getting students to complete the survey, for which an expanding database of results now exists. Again, the instructor is asked to study the results and comment.

5. **Summary.** Reports should end with a summing up, comments on the course, and areas in the core objectives identified for improvement. Personal views about assessment itself are sometimes offered.

In lieu of reading the lengthy notes prepared while reading an assessment report, the objective here is to simply report on the degree to which an instructor’s report satisfies the five areas discussed here. Should additional information be required or desired, the original report and the reviewer’s notes are available in the CNSM Dean’s Office. The expectation is that “lessons learned” from the assessment activity will be discussed by each department’s faculty, but there is little information in support of my aspiration.
III. SUMMARY FOR REPORTS RECEIVED TO DATE

BIOL 111X Human Anatomy and Physiology I, Fall, 2009, Prof. Abel Bult-Ito

1. Introduction Additional information could have been provided about student composition. Otherwise, it was a good introduction. The syllabus clearly outlined Core Natural Science expectations.

2. Scientific Method The instructor’s intentions were very good, with some lecture time allocated on three occasions for examples and interactive discussions about the key elements of the scientific method and implications of policy decisions. The brief writing exercise (to answer several questions about an experiment design, etc.) was attempted by only 70 percent of the class, with mean course grades of B for those who participated and C- for those who didn’t, suggesting the outcome is biased towards the more engaged students. This Core expectation was satisfied. No examples of the student’s work were submitted for inspection. The instructor’s assessment is that additional work is warranted in instruction about the scientific method. I concur but interpret the submitted data in a more positive light than did he, and note that this instructor has created a useful instrument that should be used again when the course is next assessed (by whom ever the instructor is) in order to compare the outcomes. The core natural science assessment met the Core requirement.

3. Science and Social Policy The instructor allocated time on three occasions for examples and interactive discussions about the key elements of policy decisions. Only 42 percent of the students participated in the essay exercise, where they were given wide latitude in the subject material for consideration. No examples of the student’s work were submitted for inspection. While this Core expectation was satisfied, greater student participation should be an objective at the next assessment. The instructor’s assessment after reading and scoring all submitted essays was that “…the majority of the students had a reasonable understanding of the disconnect between scientific evidence and public policy or public behavior…” I concur, based on the data submitted, and note again that this instructor has created a useful instrument that should be used again when the course is next assessed (by whom ever the instructor is) in order to compare the outcomes. This course assessment met the Core requirement.

4. Questionnaire (Survey) The questionnaire was completed by 83 percent of the students who completed the course, with the outcome summarized in the table below. But for Question 2, this student assessment of the course ranks nicely above the averages for 16 reports reviewed to date. The result for Question 2 provides further evidence that the efforts on instruction in the scientific method need to be increased. ). The assessment requirement was met.

Table 1. Summary of Student Survey (Percent that Strongly Agree or Agree).

<table>
<thead>
<tr>
<th>Question Asked</th>
<th>BIOL 111X, %</th>
<th>Average of 16 reports, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Improved scientific knowledge</td>
<td>96</td>
<td>90</td>
</tr>
<tr>
<td>2 Improved knowledge of how scientists conduct investigations</td>
<td>62</td>
<td>69</td>
</tr>
<tr>
<td>3 Improved ability to understand science in the media</td>
<td>84</td>
<td>75</td>
</tr>
<tr>
<td>4 Improved understand how science impacts policy</td>
<td>71</td>
<td>61</td>
</tr>
<tr>
<td>5 Increased desire to learn more science</td>
<td>89</td>
<td>64</td>
</tr>
<tr>
<td>6 Agreed that the course was useful</td>
<td>98</td>
<td>79</td>
</tr>
</tbody>
</table>

5. Summing Up The instructor has set clear goals for improvements, primarily with regard to the scientific method, and suggests that some fine tuning is required for discussions of science impact on public policy. This course with this instructor is fulfilling all expectations outlined for a course in the Core natural sciences and he understands where efforts should be directed to improve the outcomes and participation.
III. SUMMARY FOR REPORTS RECEIVED TO DATE
CONTINUED

MSL 111X  The Oceans,  Spring  2010, Assoc. Prof. Peter Winsor

1. Introduction  Additional information could have been provided about student composition. The course as described in the report showed some inconsistencies with the course syllabus.

2. Scientific Method  Specific laboratory exercises emphasized the scientific methodology but there was no indication if the scientific method was the subject of any lecture time. This Core expectation was satisfied but more information on how it was handled within lectures would have been appreciated. The brief writing exercise (to answer several questions about an experiment design, etc.) was assigned and assessed qualitatively. No examples of the students’ work were submitted for inspection. The Core assessment requirement was satisfied.

3. Science and Social Policy  Although identified in the syllabus, the report provided no direct evidence for meeting this expectation and the required assessment writing exercise was not assigned. Only the end-of-semester student questionnaire provided any indication that the students appreciated this issue. This Core expectation was not satisfied and it can only be inferred that the issue was part of the course curriculum. The Core assessment requirement was not satisfied.

4. Questionnaire (Survey)  The questionnaire was completed by 65 percent of the students who completed the course, with the outcome summarized in the table below. Averages were equal or better by one standard deviation than those for the previous 18 core natural science assessments evaluated to date. The assessment requirement was met.

<table>
<thead>
<tr>
<th>Question Asked</th>
<th>MSL 111X, %</th>
<th>Average of 18 reports, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1   Improved scientific knowledge</td>
<td>96</td>
<td>91</td>
</tr>
<tr>
<td>2   Improved knowledge of how scientists conduct investigations</td>
<td>82</td>
<td>71</td>
</tr>
<tr>
<td>3   Improved ability to understand science in the media</td>
<td>93</td>
<td>76</td>
</tr>
<tr>
<td>4   Improved understand how science impacts policy</td>
<td>86</td>
<td>63</td>
</tr>
<tr>
<td>5   Increased desire to learn more science</td>
<td>89</td>
<td>65</td>
</tr>
<tr>
<td>6   Agreed that the course was useful</td>
<td>89</td>
<td>79</td>
</tr>
</tbody>
</table>

5. Summing Up  The instructor’s summary did not address the assessment but focused on student comments on the course. A conflict between the course syllabus and course practice was noted. This is the first time this SFOS course has been assessed (for reasons unknown) and the assessment demonstrates that some work is needed to fully meet the Core Natural Science requirements. Instructors for the fall and spring courses are urged to consider the comments herein and to work together to fully implement the missing core expectation. Student assessments of the course were very good.
IV. ASSESSMENT REPORTS NOT RECEIVED TO DATE

PHYS 211X  General Physics, Fall 2009, Prof. John Olson (non-responsive and a report is not anticipated). ASSOC. PROF. CURT SZUBERLA CARRIED OUT AN ASSESSMENT OF THE EVENING CLASS IN FALL 2011, BUT NO REPORT HAS BEEN RECEIVED AS OF THIS UPDATE.


GEOS 120X  Glaciers, Earthquakes, and Volcanoes: Past, Present, and Future, Spring 2010, Prof. Doug Christensen et al. PROF. CHRISTENSEN WAS SCHEDULED TO CARRY OUT AN ASSESSMENT OF THE CLASS IN SPRING 2012, BUT NO REPORT HAS BEEN RECEIVED AS OF THIS UPDATE.

PHYS 212X  General Physics, Spring 2010, Prof. John Olson (non-responsive and a report is not anticipated) ASSOC. PROF. ATAUR CHOWDHURY WAS SCHEDULED TO CARRY OUT AN ASSESSMENT OF THE EVENING CLASS IN SPRING 2012, BUT NO REPORT HAS BEEN RECEIVED AS OF THIS UPDATE.