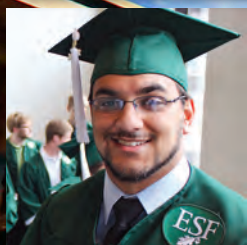
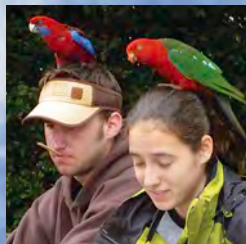


Assessment Progress Report

April 2013

MSCHE Reaccreditation



Cornelius B. Murphy, Jr., Ph.D.
President



State University of New York
College of Environmental Science and Forestry



State University of New York
College of Environmental Science and Forestry



Assessment Progress Report

MSCHE Accreditation

April 2013

Contents

Contents	2
Executive Summary	4
Introduction.....	5
Middle States Commission Action	5
Organization of this Report.....	6
Overview of Assessment at ESF	8
Institutional Effectiveness - Policies, Tools, and Practices.....	8
Assessment of Academic Programs – Policies, Tools and Practices	9
Institutional Planning and Assessment Support at ESF.....	10
Institutional Effectiveness	11
Introduction	11
Definition of Institutional Effectiveness	11
Synopsis of Institutional Effectiveness Assessment Practice	11
Outline of the Institutional Effectiveness Narrative.....	12
Institutional Priorities and Goals	12
Goal 1: Enrich academic excellence in both undergraduate and graduate education.....	13
Goal 2: Provide an outstanding student experience	14
Goal 3: Be the “go-to” institution with a strong and visible reputation.....	16
Goal 4: Become financially secure and independent	18
Goal 5: Strategically build and enhance partnerships and collaborative relationships	19
Goal 6: Respond to the needs of society.....	21
Goal 7: Invest in ESF’s human resources and physical infrastructure	23
Planning and Coordination	26
Annual priorities and goal setting:	26
Budget development:.....	27
Administrative Commitment to and Support for Assessment:.....	27
Communication of Assessment Data	27
Evaluation of Institutional Assessment Apparatus	28
Assessment of Student Learning	29
Introduction	29

Curriculum Oversight	29
Faculty Responsibility	29
Faculty Governance Processes	30
Academic Assessment Processes	33
Results – Examples of Effective Change.....	34
Example-Teaching and Learning	39
Examples-Curriculum	39
Sharing Assessment Results.....	43
Inside ESF	44
Outside ESF	45
Conclusions.....	46
Summary of Current Status.....	46
Planned Improvements	47
Appendix 1 – ESF Assessment Policies	48
Institutional Effectiveness Assessment Policy at ESF.....	48
Student Learning Outcome Assessment Policy at ESF	48
Appendix 2 – Case Studies of Assessment of Institutional Effectiveness	52
Appendix 3 – Examples of Course-Level Assessment Reports	58
Appendix 4 – Examples of a Program Assessment Report	72
Appendix 5 – Examples of Using TracDat for Program Assessment	91

Executive Summary

SUNY-ESF's assessment program ensures a well-functioning institution with rich, excellent academic programs in which students and graduates have knowledge, skills and competencies consistent with our educational goals. This report describes the foundation, process and outcomes of our assessment program for the achievement of institutional effectiveness and student learning outcomes as related to MSCHE Standards 7 and 14. Specifically, we exhibit the communication and use of assessment data in decision-making and resource allocation in administrative and academic program efforts as requested by MSCHE in March 2012 upon reaffirmation of accreditation of the institution.

ESF has clearly articulated goals through the development of the *Vision 2020* strategic plan. The seven goals have provided the framework for the College's strategic directions from 2003 to the present. In this report, key indicators show the progress toward the achievement of these goals. In addition, the processes used in institutional planning and resource allocation to achieve these goals are discussed, particularly with respect to the use of assessment data to guide these planning decisions.

The implementation of a campus-wide assessment management system has allowed for the systematic documentation of assessment processes at ESF. In addition, the reports generated by the system allow easier dissemination of the assessment results to the appropriate constituencies particularly through the College website. This report discusses the student learning information that is available and how it is disseminated and used for assessment and planning. Examples are given, primarily through links to the ESF assessment website, that document the institutional and program learning outcomes and goals, the relationship between courses and the student learning outcomes, the measurements of student work as evidence of achieving the learning outcomes, how the assessment information is disseminated, and how the information is used in academic planning. The assessment process at ESF is continually evolving, with continuing improvements in the review of assessment-based changes, the linking of course-level outcomes to the program student learning outcomes, and the articulation and assessment of program and department-level goals.

Introduction



The 2009 *Assessment of Institutional Effectiveness and Student Learning at ESF* Report to Middle States documented our assessment process including academic program and administrative assessment plans, data collection, reporting and sharing within the institution. The parallel assessment processes for administrative units and academic programs flow into the institutional planning and resource allocation process as seen in Figure 1. The figure shows that feedback loops exist at a number of levels. For example, within the Academic Departments, shorter-term feedback is available through the administration review of the assessment plans as well as through the periodic assessment of the Student Learning Outcomes. Similar feedback is received by the Administrative Units. Longer-

term feedback goes through the Institutional Resource Allocation process directly to the Academic Departments and through even longer-term processes through the SUNY Mission Review and the SUNY Board of Trustees as they reflect on the ESF Mission and Strategic Planning Goals.

Middle States Commission Action

In March 2012, the Middle States Commission on Higher Education acted:

To commend the institution on the quality of the self-study process. To reaffirm accreditation and to request a progress report, due April 1, 2013, documenting (1) that assessment results are shared and discussed with appropriate constituents and used in institutional planning, resource allocation, and renewal to improve and gain efficiencies in programs, services, and processes, including activities specific to the institution's mission (Standard 7); and, (2) that student learning assessment information is shared and discussed with appropriate constituencies and is used to improve teaching, learning, and curriculum, in both educational offerings and general education (Standard 14). The Periodic Review Report is due June 1, 2017.¹

¹ Letter to Dr. Cornelius B. Murphy, Jr. from R. Barbara Gitenstein, Ph.D., Middle States Commission on Higher Education, dated 2 March 2013.

Organization of this Report

This report represents the current status of assessment on the SUNY-ESF campus. It demonstrates the progressive evolution of assessment practices that characterizes our view of assessment. Institutional effectiveness and assessment of student learning are presented in separate sections to most effectively exhibit the communication and use of assessment data for improvement of programs, services and processes. We conclude with a self-assessment of assessment culture and practice at ESF.

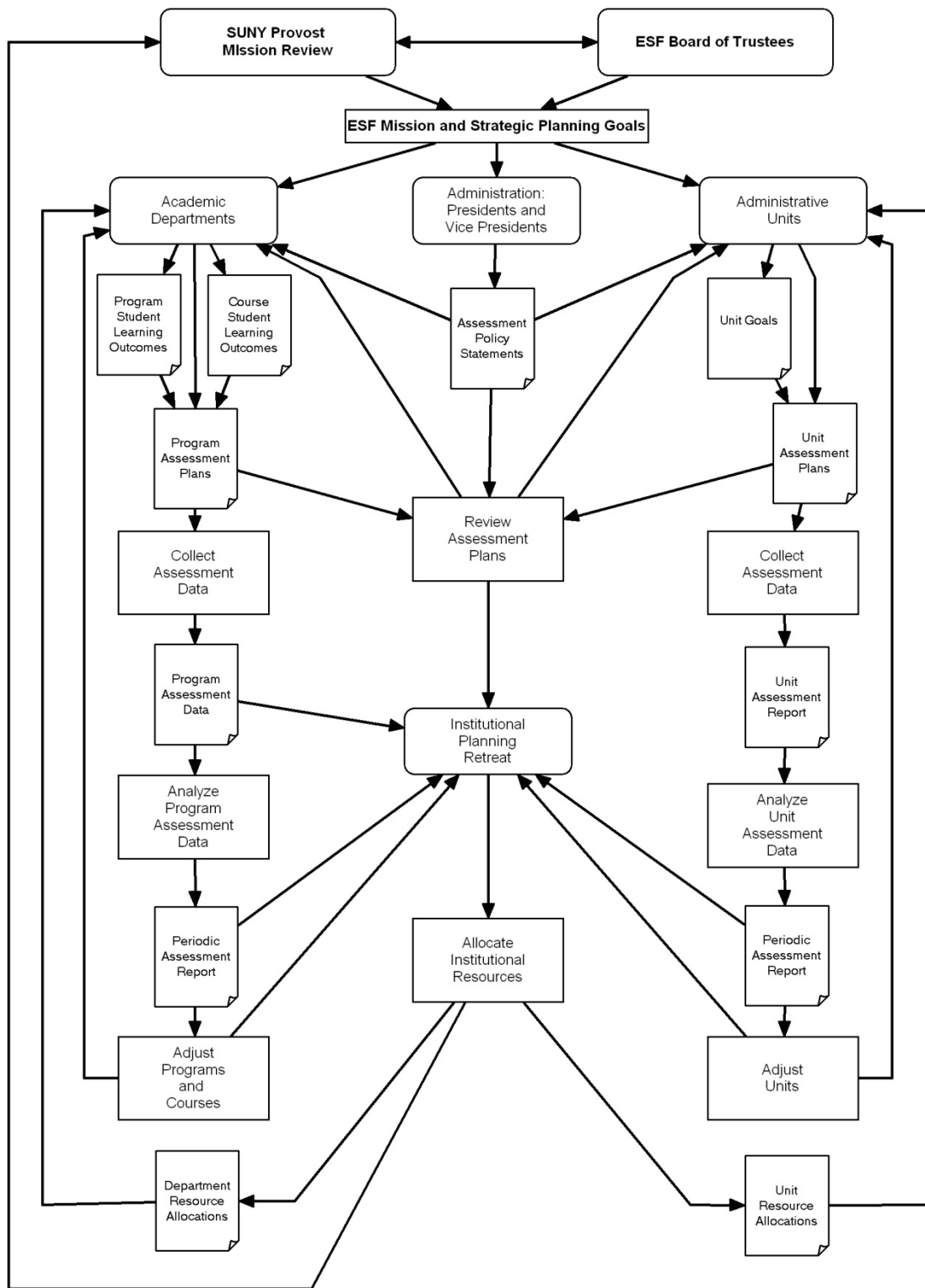


Figure 1. Assessment data and decision flow at SUNY-ESF illustrates the parallel process of assessment of academic programs and administrative units flowing into the institutional decision-making process.



Overview of Assessment at ESF

Figure 1 provides an overview of the assessment process at ESF. The processes and data flow with respect to the academic departments are shown in the left-hand track of the diagram with the parallel processes for administrative units shown on the right. Central to the process, especially with respect to institutional planning, is the review and planning process at the institutional level. Assessment at SUNY-ESF is overseen by the Assistant Provost for Assessment and Academic Initiatives who reports to the Provost and Vice President for Academic Affairs (<http://www.esf.edu/facstaff/org/provost.pdf>).

Institutional Effectiveness - Policies, Tools, and Practices

Institutional assessment is an ongoing process at the College. The College's Institutional Effectiveness Assessment Policy (

Appendix 1 –) along with the ESF Cabinet Annual Institutional Planning Retreat and President's Mid-Year Cabinet Retreat (Figure 1) guide institutional assessment.

The College's strategic plan, *Vision 2020*, provides the foundation for institutional assessment. All administrative unit goals are aligned with institutional priorities and the seven goals of *Vision 2020*; assessment plans and reports are revised and reviewed annually. Units collect assessment data throughout the year and draw from regularly administered faculty, staff, and student surveys including an annual faculty and staff assessment survey, the SUNY Student Opinion Survey, the National Survey of Student Engagement and the Annual Graduated Student Placement Survey. These data are collected and used to determine effectiveness of achieving annual targets of unit goals. Institutional and unit level data are also used collectively to assess institutional priorities and the goals of the Vision 2020 strategic plan on an annual basis. Administrative unit assessment goals, targets, measures and outcome reports are posted on the ESF Assessment website (<http://www.esf.edu/assessment>).

Assessment of Academic Programs – Policies, Tools and Practices

The Student Learning Outcome Assessment Policy at ESF is communicated by the Provost directly to all faculty, staff and students and guides student learning outcomes assessment at the College (*Appendix 1 – ESF Assessment Policies*). ESF's assessment of student learning helps to ensure that our students and graduates have knowledge, skills and competencies consistent with our educational goals. SUNY-ESF has an established, well-functioning process for assessment of academic programs that includes the requirement for all programs to include student learning outcomes and a plan for assessing them. All undergraduate programs collect data annually and evaluate the multiple years of data on a three-to-four- year cycle to recommend program adjustments. One of the most common types of changes based on assessment data involves adding or removing courses within programs based on regular academic department assessment. All program and course changes are reviewed by the College Faculty Committee on Curriculum (CoC) using forms and processes that require multiple levels of review before formalization (See *Faculty Governance Processes* later in this report).

Additional assessment requirements are established and met through accreditation visits for many of our academic programs including Landscape Architecture, Engineering, and Forestry. The Academic Program Assessment Plans and Annual Reports are discussed in meetings with Department Chairs and the Provost and shared among all departments to improve teaching and outcomes-based learning; these are posted on the ESF Assessment website (<http://www.esf.edu/assessment>).

In addition to ongoing internal program assessment, all undergraduate programs at ESF undergo external review on a six-to-10-year-cycle following SUNY system policies (http://www.suny.edu/sunypp/documents.cfm?doc_id=174). External program reviews include assessment of programs by external experts to determine their societal relevance in addition to the details of curriculum, assessment and management of the program internally. Reports of external program reviews are incorporated into institutional assessment practices through the Associate Provost for Instruction and the Provost reporting on institutional goals. More information on external assessment is located on the ESF Assessment web page, (<http://www.esf.edu/assessment/external.htm>).

Incentives for implementing meaningful assessment of student learning outcomes include the use of these results in the determination of allocation of resources to departments. Additionally, assessment efforts are considered in the determination of discretionary raises for individual faculty members.

Institutional Planning and Assessment Support at ESF

The SUNY-ESF Assessment Office is a resource to the entire campus community for assessment and program improvement. The assessment team applies nationally recognized practices, strategies, and standards to support the University's commitment to academic and operational excellence through promoting and providing support for accreditation and assessment of student learning outcomes and programs. Specifically, the Assessment Office:

- Coordinates academic and administrative assessment at the University
- Provides resources and support to faculty and staff engaged in the internal assessment process
- Serves as the document home for all assessment results

The Assessment Office is part of the Office of the Provost and managed by the Assistant Provost for Assessment and Academic Initiatives.

In 2012, the College began using TracDat® software by Nuventive, LLC (<http://www.nuventive.com>). The software provides for an integrated management system for assessment of academic programs and administrative units. The system provides the following benefits:

- A systematic approach establishes common understanding and language
- Defines and aligns goals among all levels of the institution
- Documents how results are used to improve programs
- Easy access to supporting data and evidence
- Robust reporting for real-time visibility and documentation
- Data stored in a single location for security and accessibility

The software is accessed through a dedicated website specific to the ESF campus (<https://esf.tracdat.com/tracdat/>). The system allows multiple users to access and upload data, while maintaining data security by restricting users to those parts of the system to which they need access. Users can upload assessment data, evaluate achievement of the student objectives, and produce the necessary reports for assessment. System administrators have full access to the system, which is easily configurable to produce new reports. As the implementation of TracDat® continues in 2013, course instructors will be able to upload assessment data directly to the system.



Institutional Effectiveness

Introduction

Definition of Institutional Effectiveness

Assessment of institutional effectiveness includes assessment of all aspects of university operations that impact defined outcomes other than student learning outcomes. Thus it includes assessment of the effectiveness of administrative units individually and collectively, as well as assessment of various aspects of academic programs including, for example, curriculum relevancy (which affects student recruitment and student placement following graduation), effectiveness of academic advising, and research productivity.

Synopsis of Institutional Effectiveness Assessment Practice

The assessment machinery at ESF involves a combination of annual and periodic components. Annually, administrative units collect data on progress toward unit and institutional goals. These data are used in the development of unit annual plans (which include updates of the unit assessment plans) and budgets for the following year. Draft plans are shared with the College's senior administration and with other unit heads at the President's Cabinet Retreat each summer. Plans are then modified and finalized based on discussions at the Retreat. Documentation of this process is found in:

- The annual President's Cabinet Retreat reports,
- The annual unit assessment reports,
- The academic department annual reports (which contribute data),
- The College's Annual Reports (which highlight progress in select areas).

A number of other assessments are conducted on a regular basis, but at intervals greater than one year. Principal examples are:

- Retention Committee Assessments,
- Assessments of student satisfaction and engagement, such as the National Survey of Student Engagement (NSSE) and the SUNY Student Opinion Survey (SOS),
- External reviews of academic departments.

Each of these activities results in reports in which data collection, analysis and responsive actions are recorded.

Documents from the annual and periodic assessment activities are posted on the College's assessment web page.

Outline of the Institutional Effectiveness Narrative

In this section of the report we seek to establish that:

- The College has clearly defined and well-communicated institutional goals,
- Administrative units have goals which are related to the institutional goals,
- Progress toward institutional and unit goals is assessed annually through data collection and analysis,
- Assessment results are used to inform planning (including identification of new tasks and milestones) and resource allocation, and
- Assessment results are shared publicly.

To demonstrate compliance with Middle States assessment expectations regarding institutional effectiveness, we review below the goals articulated in the College's strategic plan, providing a brief narrative of the data collected to assess progress, some actions taken to achieve the goals, and outcomes that have been achieved. In doing so, it is evident that there has been focused effort on achieving defined objectives and that resources have been allocated to support those efforts.

The reader is directed to documents on the College's assessment web page for detailed information about data collection, analysis and subsequent planning. These documents also establish the connection between unit goals and the broader College goals. Two case studies of improved effectiveness through application of the assessment process are provided in Appendix 2 – Case Studies of Assessment of Institutional Effectiveness as in-depth examples of assessment at work at ESF.

Following review of how assessment data has been used to help the institution prioritize and meet its strategic goals, there are sections which describe in greater depth how assessment data is used in institutional planning, how the institution fosters a culture of assessment throughout the organization, and how assessment results are communicated to appropriate stakeholders. A brief appraisal of the current status of institutional effectiveness assessment at ESF is provided at the end.

Institutional Priorities and Goals

Assessing institutional effectiveness begins with setting institutional priorities and goals. When the sitting President, Dr. Cornelius B. Murphy, Jr. took office in the fall of 2000, he began a campus-wide strategic planning process that culminated in the publication of *Vision 2020* (<http://www.esf.edu/vision2020/vision2020.pdf>), in January 2003. *Vision 2020* identified seven strategic goals and these continue to provide the basic roadmap for

institutional direction. For each, key indicators have been monitored providing tangible evidence of progress. Key indicators include overall measures of success as well as measures of progress on specific initiatives. Below is a synopsis of the College's strategic goals, key indicators and results:

Goal 1: Enrich academic excellence in both undergraduate and graduate education

Key Indicator 1. Student satisfaction with education

Key Actions and Outcomes: The primary measurements of student satisfaction come from the National Survey of Student Engagement (NSSE) and the SUNY Student Opinion Survey (SOS). The former has been administered approximately every two years since 2001 and the latter every third year. Results from the 2011 NSSE show that for the two overall measures of student satisfaction, ESF exceeded its peer institutions at the highest level of statistical significance. Results from the 2012 SOS show that ESF ranks first among SUNY institutions in student satisfaction with the quality of their education and in perceived value of the educational experience. The Student Life Committee of Faculty Governance has been charged with review of the NSSE and SOS results and for recommending actions to improve the education received by students.

Key Indicator 2. External assessment of academic programs

Key Actions and Outcomes: A principal means of assessing educational quality is periodic external evaluation of academic programs. For programs having professional accreditation, the accrediting body determines the length of the assessment cycle. Programs in half of our eight academic departments are reviewed by professional accrediting bodies (ABET, LAAD, and SAF). For other programs, external reviews are conducted on a six-year-cycle. The reports have been overwhelmingly laudatory, though each has identified areas for improvement, many of which have been acted upon. A prime example is the 2012 external review of the Construction Management program in which the review team recommended a revision in the curriculum to meet accreditation standards of the American Council for Construction Management Education. The department has responded by preparing a significant curriculum revision, which places increased emphasis on learning outcomes related to business practice, which is now before the College's Committee on Curriculum for approval.

Key Indicator 3. Placement of students after graduation

Key Actions and Outcomes: The Office of Career Services is charged with conducting an annual survey of post-graduate placement one year following graduation. Results, available at <http://www.esf.edu/consumer/>, show that 20-25 percent of students are enrolled in advanced degree programs and nearly all other students who have sought employment are employed, about two-thirds in

positions related to their college education. To assist in student recruitment and to better understand academic program outcomes, the Career Office has begun this year to survey career placement five years out from graduation.

Key Indicator 4. Academic qualifications of entering students

Key Actions and Outcomes: The ability to attract students with strong academic qualifications is an indicator of applicants' perceptions about academic excellence. Further, the presence of academically capable students, in and of itself, contributes to a campus climate of academic excellence. Like most institutions, ESF tracks multiple measures of academic achievement in the applicant pool and the entering class. These are reviewed annually at the President's Cabinet Retreat and are detailed in the Retreat report. Through enrichment of many facets of the ESF academic experience (including augmentation of the Honors Program, enhancement of study-abroad opportunities and the introduction of competitive athletics) and improved dissemination of information about ESF programs, mean SAT scores for the entering class have risen from 1130 to 1200 from 2006 to 2012. Over the same period, the mean high school grade average has risen from 88 to 92.

Key Indicator 5. Research publication rate

Key Actions and Outcomes: Research publications have long been the supreme arbiter of excellence in scholarship. The National Research Council (NRC) reported in 2005 that the average annual publication rate for ESF faculty members was 1.2. The College faculty set a goal of increasing the rate to 2.0 publications per faculty member per year by 2012. This would place ESF in the top 100 research universities nationally. The Research Office and the Library staff collaborate to collect standardized data every May. In May 2012 the publication rate per faculty member had increased to 1.7 for the previous year.

Goal 2: Provide an outstanding student experience

Key Indicator 1. Student satisfaction with experience

Key Actions and Outcomes: The NSSE and SOS have questions that ask broadly about satisfaction with the overall student experience. In parallel with results concerning satisfaction with their college education, students at ESF report significantly higher satisfaction with their total college experience than do students at peer institutions. The Student Life Committee of Faculty Governance reviews the NSSE and SOS results and recommends actions to improve the student experience. Summaries of the results from the NSSE and SOS surveys can be found at <http://www.esf.edu/welcome/nsse.htm> and <http://www.esf.edu/assessment/documents/SOS2012Charts.pdf>.

Key Indicator 2. Student retention and graduation rate

Key Actions and Outcomes: High student retention and graduate rates are two expectations of a program that offers an outstanding student experience. A Retention Committee, co-chaired by the Dean of Student Affairs and the Vice President for Enrollment Management and Marketing, was created in 2005 to monitor retention and graduation rates and to recommend actions for enhancing both. The committee's most recent report recommended several changes, most of which have been implemented. These include improvements in freshman math placement, enhancements to freshmen and transfer orientation programs, and stronger actions to assist students placed on academic probation. Since the initiation of the Committee, retention and graduation have climbed modestly: in the case of first-year retention from 84 percent to 86 percent; in the case of six-year graduation from 66 percent to 68 percent. Graduation and retention rates are reported to the National Center for Education Statistics (<http://nces.ed.gov/ipeds/>).

Key Indicator 3. Study-abroad rate

Key Actions and Outcomes: While an outstanding student experience is composed of myriad elements, fostering greater exposure to other lands and peoples was identified early in the strategic planning process as a particularly significant imperative given the low participation in study-abroad by ESF students and the reality of an ever-flattening world. In 2006 ESF hired its first dedicated International Education Coordinator responsible in part for fostering and monitoring study-abroad participation. New or enhanced ESF study-abroad programs are now operating in Russia, Germany, Namibia, China, and Jamaica. Meanwhile, at graduation nearly 20 percent of ESF students have had an international education experience, up from 15 percent in 2006. Assessment of study-abroad activities is contained within the assessment report of the Associate Provost for Instruction to whom the International Education Coordinator reports. This report will be available on the College Intranet and is available upon request.



Key Indicator 4. Honors Program completion rate

Key Actions and Outcomes: A robust Honors Program providing the most academically talented and ambitious students with extra opportunities to test and stretch their abilities was also identified during the development of *Vision 2020* as a critical need for enhancing the student experience. In 2005 only three graduating seniors had completed the Honors Thesis required for completion of the program. In 2008 the Honors Program was expanded from an upper division program to a four-year program. A new director was named and an Honors

Council of faculty representing the academic departments was established. This May, approximately 35 students will graduate “With Honors,” having completed an Honors Program with expanded educational elements and more rigorous requirements. Assessment of Honors Program activities is contained within the assessment report of the Associate Provost for Instruction to whom the Honors Program reports. This report will be available on the College Intranet and is available upon request.

Key Indicator 5. Community Service Hours

Key Actions and Outcomes: A core institutional value expressed in developing Vision 2020 was the importance of community service. Consequently, the College has moved deliberately to increase community service opportunities for students, including service learning courses and course modules. In 2007 a Community Service Coordinator position, reporting to the Dean for Student Affairs, was added to facilitate and monitor a wide assortment of community service. Between 2005 and 2012 the number of hours of community service performed by ESF has risen from 40,000 to 75,000. No student graduates from ESF without having performed at least 10 hours of community service.



Goal 3: Be the “go-to” institution with a strong and visible reputation

Key Indicator 1. Number of applicants for admission to undergraduate and graduate programs

Key Actions and Outcomes: ESF is the premier institution in the nation focused exclusively on environmental science and management. The number of applications for admission to our academic programs is one important measure of recognition of the College’s uniqueness and expertise. External reviews of the College and its programs frequently brought the comment: “ESF is a gem in hiding.” To remedy the situation, a new Vice President for Enrollment Management and Marketing position was created and filled in 2006. Further, the College’s graduate program was given “School” status and increased emphasis was placed on recruitment of graduate students. Between 2005 and 2012 the number of applications for freshman and graduate programs has nearly doubled and undergraduate transfer applications have increased by 40 percent. Moreover, applications from outside New York State have increased nearly four-fold. A substantial increase in direct mail marketing to high school students and an overall enhancement of the College’s visibility has driven much of the increase in freshman applications.

Key Indicator 2. Receive recognition in U.S. News and other popular press rankings

Key Actions and Outcomes: While popular press rankings of colleges and universities are of dubious accuracy, in today's milieu inclusion in such rankings is an essential element of recognition for the College to fulfill its mission. In 2003 ESF was included in no popular press rankings. Today, ESF appears prominently in the U.S. News college rankings as the 32nd best public national university and the 42nd best college value. ESF also appears in all other major popular press college ranking publications (including Princeton Review, Kiplinger's, and Forbes) receiving high marks.

**Key Indicator 3. Column inches of press and stories carried by news syndicates**

Key Actions and Outcomes: Another measure of visibility is presence in the popular news media. Initially, to assess progress in increasing media presence column-inches of press was the metric employed. Between 2003 and 2009, this number tripled as a result of new personnel and an infusion of funds. With the changing nature of the news industry, it has become clear that column inches of newspaper and magazine space is no longer a useful measure of media presence. A suite of metrics are now used to measure media presence, the most important of which is the number of stories and the number of outlets that pick up stories featuring ESF or its faculty, staff, and students. New metrics also measure the College's visibility in social media.

Key Indicator 4. External research funding

Key Actions and Outcomes: The ability to obtain external funding for research recognizes excellence in scholarship which is central for a research university to fulfill its mission. It also is a key element in assessing achievement of several of the other seven institutional goals. The Office of Research Programs (ORP) is responsible for monitoring research expenditures and for developing strategies to grow this critical metric. In the last seven years staff have been added to help faculty identify potential funding sources and to help in proposal preparation; investments have been made in seed grants and research instrumentation to enhance competitiveness for extramural support; sharing of indirect cost recovery revenue with departments and investigators has been increased to incentivize the search for sponsored research funding and to facilitate exploratory research in new unfunded arenas. ORP annual plans and evaluations are available on the ESF assessment page and on the Research page (www.esf.edu/research/). Since 2001, research expenditures have grown from \$7M to \$15.2M per year. The latter figure corresponds to \$130K per faculty member placing ESF third among SUNY institutions (behind Stony Brook University and Downstate Medical Center).

ESF takes pride in having a 43 percent success rate in federal grant applications, the highest among SUNY institutions.

Key Indicator 5. Faculty recognitions by external agencies

Key Actions and Outcomes: The heart of a university is its faculty, and the reputation of the institution is dependent upon the reputation of this group. The College's Faculty Governance created a SUNY and ESF Awards Committee in its most recent By-Laws revision to facilitate the nomination of ESF faculty for state and national awards. Funds available to departments for merit salary increases are explicitly tied to departmental performance, which includes honors and awards won by faculty and students in the department. Faculty honors and awards are recorded in the annual academic department reports produced each July and included in the College's Annual Report. Both are posted on the College's assessment web site at <http://www.esf.edu/assessment/learning.htm>. A recent notable and well-deserved honor was earned by landscape architecture Professor George Curry who was named Carnegie Professor of the Year for New York State in 2010.

Goal 4: Become financially secure and independent

Key Indicator 1. Increase endowment

Key Actions and Outcomes: In *Vision 2020* the College set a goal of having \$100M in total assets by 2020. A timetable for achieving that goal was produced and we are currently on track to achieve the 2020 goal thanks to the College's first capital campaign (currently in progress), the expansion of the College Foundation Board, and the addition of staff to the Development Office. Foundation assets currently stand at \$58M, up from \$9.9M in 2003.

Key Indicator 2. Increase external research funding

Key Actions and Outcomes: Please see comments under Goal 3, Key Indicator 4.

Key Indicator 3. Increase funding from licenses and royalties

Key Actions and Outcomes: Intellectual property developed by College faculty is potentially valuable not only to society but to College finances as well. For many years ESF relied on the SUNY Research Foundation for assistance in identifying, patenting, and licensing commercially valuable intellectual property developed at ESF. In 2011, with encouragement from the SUNY Research Foundation, we dedicated additional resources to engage the Technology Transfer group at Binghamton University to provide these services. Royalty income remains modest, not yet covering the cost of our technology transfer investment, but we expect that this investment will yield a return over the next few years.

Key Indicator 4. Increase tuition and fee revenue primarily through enrollment growth

Key Actions and Outcomes: Because of economies of scale, it is financially advantageous to grow enrollment, and *Vision 2020* calls for modest annual enrollment growth in both undergraduate and graduate populations. A new SUNY resource allocation model that rewards enrollment growth is under development, further increasing the incentive to expand. A number of actions have been taken to facilitate enrollment growth, including those mentioned under Goal 3, Key Indicator 1 and Goal 6, Key Indicator 1. Another important step was the construction of the College's first residence facility which opened in 2011. From 2003 to 2012 undergraduate enrollment grew from 1,300 to 1,750 and graduate enrollment grew from 530 to 590. Particularly notable is the increase in out-of-state students and self-funded graduate students who contribute tuition above the College average.

Key Indicator 5. Minimize administrative overhead costs

Key Actions and Outcomes: The College has always been administratively lean and as a small public research university must remain so. Despite new mandates for accountability and higher service expectations from students, administrative headcount has declined over the past 20 years. We actively seek opportunities to share staff with neighboring institutions, particularly Syracuse University, Upstate Medical University, and Oswego State University. We have entered into shared services agreements for online course development, library services, and specialized trades needs. We do not monitor our administrative costs compared to peer institutions on an annual basis, but a recent study conducted by the Goldwater Institute (2010) placed ESF 10th among 194 national public and private universities in their index for least "administrative bloat."



Goal 5: Strategically build and enhance partnerships and collaborative relationships

Key Indicator 1. Strengthen relationships with state agencies

Key Actions and Outcomes: As a public research university, part of our mission is to serve the research needs of state agencies whose purview includes environmental protection and natural resources management. We also play an integral role in fulfilling their employment needs. A concerted effort has, therefore, been made to build strong connections with the New York State Departments of (1) Environmental Conservation, (2) Parks, Recreation, and Historic Preservation, and (3) State. Since 2005, we have signed a series of increasingly broader MOU's with these agencies to provide research, outreach,

and intern support. Assessment of these activities indicates that the annual dollar value of these services has increased from \$500K to \$2M.

Key Indicator 2. Partner with regional public and private entities to enhance community welfare

Key Actions and Outcomes: As expressed in Vision 2020, a core theme of ESF's efforts is contributing to community welfare. To effectively act on that theme requires partnering with other public and private organizations committed to economic and social development. The list of new community partners since 2003 is long and continues to grow through the focused efforts of the Outreach and Community Services offices as well as several of ESF's institutes and centers. Partnerships include service-learning, economic development grants, and direct community service by students, staff and faculty. Most recently, ESF partnered with Upstate Medical University to build and manage the Central New York Bioaccelerator to assist start-ups in bioscience and biomedical businesses. Documentation of growth in community partnerships is provided in the annual Cabinet Retreat metrics and in unit departmental reports.



Key Indicator 3. Develop new partnerships that expand research capacity

Key Actions and Outcomes: Increasingly, high impact research requires consortial efforts that bring together teams of scientists who collectively possess the multifarious capabilities needed to investigate complex problems. ESF has conscientiously sought to build partnerships with other universities as well as industrial, government, and non-profit organizations to tackle research problems that are beyond the scope of a single university research team. Particular emphasis has been focused on biofuels development, biodiversity assessment, ecological restoration, ecological engineering, and nanotechnology of biomolecules. Partnerships established in just the last two years have added \$2M annually to ESF's research portfolio. Results are documented and assessed annually in the reports of the Office of Research Programs (www.esf.edu/research/) and during the President's Cabinet Retreat.

Key Indicator 4. Develop new partnerships to expand educational outreach

Key Actions and Outcomes: With the completion of *Vision 2020*, ESF recommitted itself to education beyond its matriculated students. A particular focus has been on K-12 education. The centerpiece of this effort is *ESF in the High School*, a program in which ESF provides curricular materials, teacher training, and oversight to partner high schools to deliver three ESF designed courses in environmental science. Since 2003, the number of high schools offering *ESF in the High School* courses has increased from five to 30 with all parts of New York State

now represented, including most recently, Harlem in New York City. A full accounting of educational outreach partnerships is documented at the annual President's Cabinet Retreat and within the Outreach Office annual reports (<http://www.esf.edu/assessment/administrative.htm>).

Key Indicator 5. Develop new partnerships that expand opportunities for students

Key Actions and Outcomes: Building strategic partnerships is tightly connected to most of the other goals in *Vision 2020*, including Goal 2, proving an outstanding student experience. Partners are especially needed to grow opportunities for student international experiences, community service, internships, and access to educational programming not offered by ESF. In the past five years ESF has invested in new staff to grow the study-abroad, community service, and internship programs. This has resulted in new functioning student exchange programs in Germany, Ukraine, and China, and a greater utilization of the SUNY network of study-abroad programs. The number of community service partners has increased from 22 to 38 over the past five years, while development of internship partners is under way. Syracuse University (SU) has been a longstanding partner but financial circumstances over the last several years had begun to erode ESF student access to SU courses. An agreement concluded in January 2013 expands access by ESF students to SU courses at an affordable rate. New agreements with Upstate Medical University (UMU) permit ESF students to move directly from B.S. programs to UMU M.D. and M.P.H. programs. Similarly, ESF students interested in teaching now have a direct pipeline to Oswego State's M.Ed. program. Documentation of these efforts can be found in the annual reports of the offices of Instruction and Graduate Studies and Student Affairs as presented at the annual President's Cabinet Retreat. This report will be available on the College Intranet and is available upon request.



Goal 6: Respond to the needs of society

Key Indicator 1. Increase enrollment

Key Actions and Outcomes: A significant measure of societal relevance is student enrollment. Since 2003 there has been a plan for annual growth in both the undergraduate and graduate populations. The College created a new cabinet-level position, the Vice President for Enrollment Management and Marketing, and invested in additional admission staff, financial aid, and marketing to meet the enrollment goals. The outcome has been an increase in undergraduate enrollment that has exceeded the targets (and produced a more qualified entering class). Presently ESF enrolls 1,750 matriculated undergraduates

compared to 1,300 in 2003. Graduate enrollment has also grown, from 530 to 590 during this same period, falling just short of the targets. A limitation to further growth at the undergraduate level is dormitory space. The College Foundation is investing in additional student residence space to be completed by fall 2014, alleviating that constraint on future enrollment growth. Documentation of enrollment growth can be found in the College's annual reports (<http://www.esf.edu/welcome/annualreport/>).

Key Indicator 2. Increase diversity in student and staff populations

Key Actions and Outcomes: As the U.S. population continues to diversify and global forces increasingly influence domestic life, creating a community representing the range of backgrounds and perspectives in contemporary society is essential for relevancy. The Enrollment Management and Human Resources Offices track diversity in the student and employee populations, respectively. The Business Office tracks payments to Women and Minority Owned Businesses. These are reviewed and new goals set annually as documented in the President's Cabinet Retreat reports. Investments have been made in recruiting students from under-represented groups in the United States and in recruiting international students. The percentage of both groups has substantially increased over the last five years, although the College is still below its *Vision 2020* goal of 15 percent domestic minority enrollment. Meanwhile, enrollment of women has steadily increased so that women now account for 45 percent of the total matriculated student number. Women also account for nearly half of the faculty hires in the past seven years, pushing the female faculty fraction to 28 percent. The portion of the faculty from under-represented groups has also increased, but only modestly, and is below the desired goal. Substantial progress has been made in supporting women and minority-owned businesses.

Key Indicator 3. Create new academic programs that attract students

Key Actions and Outcomes: ESF began in 1911 as a forestry school. It has continually evolved to meet contemporary educational and research needs in the environmental arena so that forestry now comprises only 12 percent of the student enrollment. The College continues to review its programs in light of contemporary and future societal needs, adding,



subtracting and modifying programs to maintain relevance. In the last seven years, new undergraduate majors have been added in Biotechnology (B.S.), Bioprocess Engineering (B.S.), Sustainable Energy Management (B.S.), Environmental Health (B.S.) and Natural Resources Conservation (A.A.S.). The Construction Management program was modified to emphasize sustainable construction practices and the Forest Engineering program was transformed into

Environmental Resources Engineering. The administration of the interdisciplinary Graduate Program in Environmental Science was overhauled to allow faculty groups to develop new option areas. In the last five years five new option areas have been created, each attracting new graduate students. In this same period, the B.S. program in Wood Products Engineering was reduced to a minor for lack of enrollment. Departmental annual reports document these changes and the basis for them.

Key Indicator 4. Increase external research funding

Key Actions and Outcomes: Please see comments under Goal 3, Key Indicator 4.

Key Indicator 5. Increase participation in ESF outreach programs

Key Actions and Outcomes: Included within ESF's mission is providing educational services to populations beyond our matriculated students. Principal audiences that ESF has targeted include K-12 students and teachers, environmental professionals, and the general public. The number of high school students enrolled in the College's *ESF in the High School* program has increased from 290 in 2003-2004 to 535 in fall 2012. As part of our community service focus, we have also proactively sought to partner with local and regional agencies to create and execute workforce training programs. Numbers served in each category are reviewed and new goals are set annually at the President's Cabinet Retreat. Programming initiatives that are planned and implemented to expand outreach clients are documented in the Outreach Office annual reports. A few highlights include: creation of graduate certificate programs in Bioprocess Engineering and in Radiation Curing as part of workforce development programs; the creation and annual execution of a national Green Building Conference and a regional Biotechnology Conference; and, the opening of the Adirondack Interpretive Center at our experimental forest in Newcomb, New York.

Goal 7: Invest in ESF's human resources and physical infrastructure

Key Indicator 1. Increase faculty salaries; ensure equity in pay

Key Actions and Outcomes: ESF's goal is to maintain faculty salaries above the mean of its Carnegie class peers. At the same time, ESF seeks to proactively issue salary increases to reward outstanding performance and to ensure equity in pay among all classes of faculty. On a periodic basis Human Resources conducts analyses to compare the salaries of ESF faculty to Carnegie peers and to assess equitability of pay for women and members of under-represented groups. These have consistently shown the absence of class disparities. On an annual basis, the Provost, working with unit heads, reviews the unit salary structure to identify individuals deserving of salary increases to reward performance or correct past inequities. Over the last seven years, perceived inequities have largely been addressed. Most salary increases, other than mandated across-the-board

increases, are now performance based. Documentation of salary increases is maintained in Human Resources personnel files.

Key Indicator 2. Increase faculty/staff training opportunities

Key Actions and Outcomes: One of President Murphy's core beliefs is the importance of ongoing employee training for institutional advancement. From the time of his arrival he charged Human Resources with the responsibility of developing at least two new training programs for faculty and staff each year. Attainment of this goal is reviewed annually at the President's Cabinet Retreat. The President's Cabinet Retreat is also used as a forum to discuss new campus training needs. The effectiveness of the training sessions is assessed by Human Resources through participant surveys. New training programs offered this year, provided here as examples, include a series of lectures on understanding sustainability and workshops on recognizing mental health problems and responding appropriately to them. In addition to the President's Cabinet Retreat Reports, the Human Resources annual assessment reports document track attainment of the training goals.

Key Indicator 3. Provide on-campus housing for students

Key Actions and Outcomes: In 2003, ESF was fully reliant on neighboring Syracuse University (SU) to provide "on-campus" housing for our students. This arrangement was a constraint on institutional plans to increase enrollment. Over a period of five years the ESF Foundation purchased a block of properties adjacent to the campus and, in 2011, ESF opened its first residence facility. Planning is now complete for an addition to open in fall of 2014. Planning for design and construction of the residence facility is documented in non-public College Foundation files.

Key Indicator 4. Add green infrastructure to become carbon neutral

Key Actions and Outcomes: As the nation's only institution of higher education focused specifically on the environment, the College is obliged to be a leader in sustainable practices – to literally practice what it preaches. The most recent Middle States Accreditation Report (2012) details the vision, the accomplishments, and the plans the College has to continually move toward more sustainable practices and to achieve carbon neutral operation by 2015. ESF President Murphy signed the American College and University Presidents' Climate Commitment in 2009 and established a campus Climate Action Committee which he chairs. That committee, including student representation from the Green Campus Initiative, plans for and assesses progress toward the goal of carbon neutrality. Progress and plans are reviewed annually at the President's Cabinet Retreat. Among the many projects devised and completed in part or in full to achieve carbon neutrality are: establishment of a campus power plant that

operates primarily on renewable fuel (wood pellets), installation of solar panels and wind turbines, energy audits in improved energy management in existing buildings, planning new buildings and building renovations to meet or exceed LEED Gold standards, and management of College forest lands to double annual carbon sequestration. The College has already documented a reduction in its carbon footprint of 1,000 mt CO₂ annually. Measurement and assessment of the College carbon footprint is conducted each year.

Key Indicator 5. Add and renovate space to meet the needs of a growing institution

Key Actions and Outcomes: With institutional plans to grow and to provide an outstanding environment for teaching, learning, and discovery, both space addition and space renovation were high priorities coming out of *Vision 2020*. The College has made good on that commitment. In 2008 a major renovation of ESF's largest academic building, Baker Laboratory, was completed. This winter ESF opened the new Gateway



Center (designed for LEED Platinum+ certification) which houses the Outreach and Admissions offices, a café, a student bookstore, and meeting space. In its lower level is the College's new wood-burning combined-heat-and-power plant, which provide 60 percent of the campus' thermal energy and 20 percent of its electrical energy. Plans are currently in progress to add a student fitness center within the next two years. A new academic building is currently in design which will house the Department of Environmental and Forest Biology and create "surge" space needed for the renovation of other campus buildings. The sequence of future renovations and building additions is outlined in a Facilities Master Plan that was completed in 2012 by the State University Construction Fund and Mitchell-Giurgola architecture firm.

Key Indicator 6. Upgrade information systems to meet contemporary data management needs

Key Actions and Outcomes: This key indicator is a recent addition to the College's strategic priorities, being added last year at the President's Cabinet Retreat. The present "home-grown" data management system cannot accommodate the necessary linkages to SUNY data systems and third-party support for the current system will end in the near future. With SUNY's assistance, ESF has begun assessment of system requirements which will establish the investment required to install the Banner administrative software system. The Director of Information Technology is leading a College taskforce to identify the capabilities required of the new system and plan for its installation. Their work is documented in the administrative unit assessment plans available on the ESF assessment web page (<http://www.esf.edu/assessment/administrative.htm>).

Planning and Coordination

Annual priorities and goal setting:

The goals outlined in *Vision 2020* have provided the framework for the College's strategic directions from 2003 to the present. Each year, however, progress toward meeting these goals is reviewed and new targets are set. At the same time, College priorities are reviewed and modified to address the circumstances of an ever-changing social, political, and economic climate.

The President's Cabinet Retreat, held each August, is the organizing activity for assessing progress toward goals and for setting priorities and updated targets for unit objectives. In preparation for the Retreat, each administrative unit prepares a preliminary unit assessment report that examines progress toward the targets that it identified the previous year. In addition, each unit proposes new targets for the upcoming year. Many of the targets are defined in metrical terms; others are defined as project milestones. Among the metrics, many are tracked on a continuing basis. Others change over time to reflect evolving priorities. The unit objectives are tied to the broad goals outlined in *Vision 2020*, and, where appropriate, to specific key indicators.

At the Cabinet Retreat, unit objectives and targets, past and proposed, are reviewed and discussed. College priorities identified by Executive Cabinet are reviewed to further focus unit efforts. Time is also devoted to group identification of additional high priority institutional initiatives. Some priorities/initiatives are discussed in great detail by the Full Cabinet to develop College-wide strategies for achieving success. This includes determination of the coordination among units necessary for success.

Following the Cabinet Retreat, each administrative unit finalizes its unit assessment report to reflect the conversations and decisions occurring during the Retreat. These reports are posted individually on the College's assessment web page. Portions of the reports plus summaries from group discussions on College-wide priorities and initiatives are aggregated to produce the President's Cabinet Retreat report which is also posted on the College's assessment web page.

These reports document a continuous process of (i) goal establishment, (ii) identification of objectives with defined targets to measure success in meeting institutional goals, (iii) annual assessment of unit progress at the unit level and at higher administrative levels, (iv) annual re-evaluation and adjusting of objectives and targets, (v) functioning processes for top-down and bottom-up determination of institutional priorities, and (vi) coordination among units to achieve College-wide objectives.

Documentation of these processes has improved and continues to improve since the Middle States Response to ESF's Periodic Review Report in 2007.

Budget development:

Units develop operating budgets designed to accomplish unit missions and achieve unit targets at the same time they are preparing their annual assessment reports. These are reviewed and approved by the Executive Cabinet member (President or Vice President) to whom the unit reports. The President's Cabinet Retreat plays a key role in defining institutional priorities as a prelude to budget preparation.

The College budget is developed from the budget requests of the Vice Presidents. Generally, the starting point is funding levels equal to the previous year. In years where revenue is known or expected to increase or decrease significantly, Executive Cabinet will determine how to invest new funds or reallocate existing resources. Modest investments are possible even in years of reduced revenue for high need purposes.

Administrative Commitment to and Support for Assessment:

Following ESF's most recent Periodic Review Report, the College began augmenting its assessment apparatus. We first created a new position to oversee assessment College-wide: the Assistant Provost for Assessment and Academic Initiatives. We further developed College policies governing student learning assessment and institutional effectiveness and are provided in the appendix. These are posted on the College's assessment web page. The Institutional Effectiveness Assessment Policy was introduced in the first section of this report.

The College has seen that all administrative units have meaningful assessment plans and that they are the basis for the review and discussion that takes place at the President's Cabinet Retreat. Assessment plans are posted on the ESF assessment web page.

In 2012 the College invested in assessment management software (TracDat®) to assist the units in reporting assessment results and actions taken in response, and to help the institution monitor and report assessment practices and improvements resulting from assessment. Unit heads and assessment coordinators have been trained in the use of the software, and the unit assessment reports found on the assessment web page for the current year were created by the TracDat® software information entered by each unit.

Communication of Assessment Data

Communication of assessment practices and results is largely handled by posting of information to the ESF assessment web page, information sharing at Faculty Governance meetings, and discussion at Cabinet and Academic Council meetings. Information includes a variety of documents referenced in the text above. Some of the important documents are the President's Cabinet Retreat reports, unit assessment plans, unit assessment reports, and ancillary reports used by units in their assessment work, such as the NSSE, SUNY Student Opinion Survey, and the Goldwater Institute Policy Report on Administrative Bloat at American Universities.

Assessment data are also communicated internally at the President's Cabinet Retreat and to the ESF Board of Trustees three times each year.

The Admissions Office uses assessment results in developing recruiting materials. Recent examples can be found at the following web site: <http://www.esf.edu>.

Evaluation of Institutional Assessment Apparatus

The strategic planning exercise that resulted in the *Vision 2020* strategic plan included development of metrics to assess progress toward College goals. Every year since completion of the plan in 2003, the metric values have been determined and used to inform annual planning and budgeting. Short-term goals are set annually to achieve stepwise progress toward the longer-term 2020 goals. This process is well-documented in the President's Cabinet Retreat Reports.

In addition, systematic review of academic programs has been a longstanding practice that has resulted in numerous curricular and administrative actions. Recommendations stemming from the reviews are recorded self-study reports, the external review team reports, and (prior to 2010) institutional reports to SUNY. However, until recently, documentation that clearly shows actions taken as a result of the reviews and the effects of those actions has been insufficient. Likewise, until recently, most of the assessment and planning work of the administrative units has not been centralized and thoroughly documented.

Beginning in 2007, the College began a significant effort to upgrade its practices. The primary objectives of this effort were to assure that best practices in assessment were being used and to document the continuous improvement cycle which is the ultimate aim of assessment. As mentioned above, the College has made investments in assessment training, coordination and documentation to achieve these objectives. The College's assessment web page is a good reflection of the current state of assessment at ESF. Additional refinements are still required to take full advantage of the benefits that well-conducted assessment affords. Among the areas requiring additional attention are documentation of the connections between assessment data and resource allocation, improvement of the assessment plans to enhance efficiency and value, and further strengthening of documentation and dissemination of assessment-related activities and results.

Optimizing the assessment apparatus for effectiveness and efficiency is a work in progress. The Assistant Provost for Assessment and Academic Initiatives has leadership responsibility for advancing assessment practices at all administrative levels. The Assistant Provost accomplishes this primarily through annual feedback to unit heads following review of assessment plans and their execution. Institutional changes in assessment practice, such as the campus-wide implementation of assessment management software, are discussed and approved by the full Cabinet and the Academic Council.



Assessment of Student Learning

Introduction

The process for the assessment of student learning at ESF is summarized in Figure 1, page 7. As this figure shows, the departments have the primary responsibility for the oversight and assessment of the academic programs which can be broken down into a number of key activities:

- Development of academic programs and the program student learning outcomes
- Development of the courses and the course student learning outcomes in support of the program student learning outcomes
- Development of the program and course assessment plans
- Collection and analysis of the program and course assessment data
- Based on the assessment data and external constituencies, modify the academic programs and courses
- Assess the effectiveness of the programs and the changes made to the program

This section of the report articulates the responsibilities of the departments and the processes established to assess and improve the academic programs at ESF. In addition, examples at each step of the process are included in this report or referenced to the College's assessment website (<http://www.esf.edu/assessment/>).

Curriculum Oversight

Faculty Responsibility

The primary responsibility for the development and management of the educational programs at ESF resides with the faculty as defined by the policies of the SUNY Board of Trustees:

Responsibilities. The University faculty shall be responsible for the conduct of the University's instruction, research and service programs.²

² Article VI (University Faculty), section 3 of *The State University of New York, Policies of the Board of Trustees*, November 2009.

Responsibility. The faculty of each college shall have the obligation to participate significantly in the initiation, development and implementation of the educational program.³

Within the various departments of the College, the Department Chair is responsible for the academic programs that reside within each department:

Responsibilities. The chairs of departments and divisions of a college shall, in consultation with their respective faculties, be responsible to the chief administrative officer of the college for the supervision of the personnel and educational program of the departments or divisions for which they serve. They shall have such other powers, duties and responsibilities as may be assigned by the chief administrative officer of the college.⁴

Faculty Governance Processes

Each academic unit at ESF takes primary responsibility for the programs within the department. While program changes generally originate in the host department, the review process involves a campus-wide committee, the Committee on Curriculum (CoC), and, for curriculum proposals, an approval by the College Faculty. This committee, composed of faculty members only, in order to exercise its responsibility for the conduct of the College's instructional program, shall be concerned with

- a. the policies regarding instructional development, support and administration including the library and instructional technology;
 - b. the structure, content, and interrelationship of courses, curricula and degree requirements;
 - c. the compliance with the General Education policies as set by the Board of Trustees of the State University of New York;
- the review and approval of petitions for course replacements by students.⁵

The voting members consist of a representative from each academic department, the library, the Faculty President, and the Faculty Chair. The non-voting members consist of the Associate Provost for Instruction, student representatives, the Registrar, the Director of Admissions, the Associate Provost for Outreach, and the Assistant Dean. The current membership is given in Table 1 on next page.

³ Article X (College Faculty), section 4 of *The State University of New York, Policies of the Board of Trustees*, November 2009.

⁴ Article IX (College Officers and Organizations), Title C (Chairs of Departments and Divisions), section 4 of *The State University of New York, Policies of the Board of Trustees*, November 2009.

⁵ Part IV (Committees of the Faculty), Section E (Scope and Responsibilities), Section 2.A (Standing Committees-Curriculum) of the *Faculty Governance Bylaws, State University of New York, College of Environmental Science and Forestry*, May 2012.

Table 1. Members of the SUNY-ESF Committee on Curriculum.

Name	Representing
Voting Members	
John Hassett	Chemistry, CoC Chair
Siddharth Chatterjee	Paper and Bioprocess Engineering
Douglas Daley	Environmental Resources Engineering
Kelley Donaghy	Faculty Chair
Jo Anne Ellis	Library
Neil Murphy	Faculty President
William Smith	Sustainable Const. Mgt. and Wood Science
John Wagner	Forest and Natural Resources Management
Christopher Whipps	Environmental Forest Biology
Benette Whitmore	Environmental Studies
Jamie Vanucchi	Landscape Architecture
Nonvoting Members and Observers	
Scott Shannon	Associate Provost for Instruction
Stephen Balogh	GSA Representative
Ariana Muca	USA Representative
Mary Chandler	Registrar
Susan Sanford	Director of Admissions
Chuck Spuches	Associate Provost for Outreach
Suzette Vandeburg	Assistant Dean, Instruction and Graduate Studies

The process for approval of curriculum and course changes is summarized in Figure 2, on next page. The details of the process including the instructions and deadlines can be found on the college website (<http://www.esf.edu/coc/ccc.asp>). During this process, there are multiple opportunities for feedback on proposed changes at several levels including within the proposing department as well as all faculty members at SUNY-ESF. The CoC is charged with seeing that the comments received during the process are addressed by the proposing department. At the faculty meetings, where curriculum issues are reviewed and approved, the Provost, Associate Provost for Instruction, and the President regularly attend.

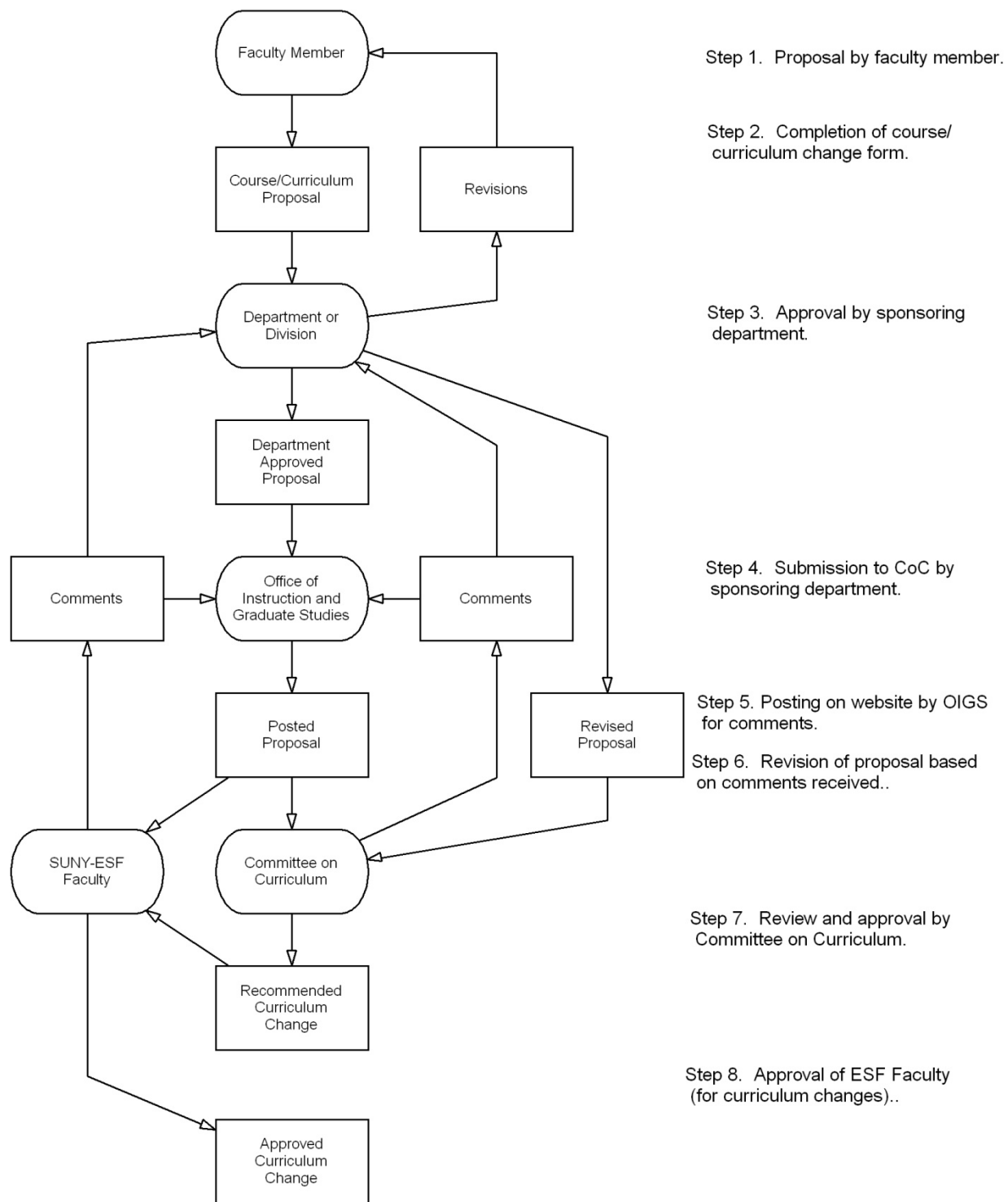


Figure 2. Course and curriculum approval process at SUNY-ESF.

Academic Assessment Processes

Figure 1, page 7, summarizes the institutional assessment processes at SUNY-ESF. The left column of processes illustrates the assessment processes used by the academic departments. The figure shows that the academic departments are responsible for the creation of student learning outcomes consistent and supportive of the ESF mission and strategic planning goals. The departments must also implement a plan to collect data for assessment of the student learning outcomes. Based on this assessment, adjustments are made to the programs and/or courses to continuously improve the delivery of the programs. Together with the appropriate constituents, the departments can assess the appropriateness of the student learning objectives and make adjustments as necessary.

Each academic department has a coordinator who has full access to the data for the department's academic programs. The academic department representatives are trained in the use of TracDat® and are responsible for maintaining the information for their programs within the department. The representatives for each department are given in Table 2.

Table 2. Academic Department Representatives for Assessment⁶.

Academic Department	Name
Chemistry	Ted Dibble
Environmental Forest Biology	Kim Schulz
Environmental and Resources Engineering	Lindi Quackenbush
Environmental Science	Tim Knight
Environmental Studies	Theresa Selfa
Forest and Natural Resources Management	Eddie Bevilacqua
Landscape Architecture	Robin Hoffman
Paper and Bioprocess Engineering	Shijie Liu
Sustainable Construction Management and Engineering	Sue Anagnost

All academic programs on campus are assessed on a periodic basis. In some cases, the assessment is determined by professional accrediting bodies. Programs without an external accreditation body are externally reviewed by selected peers. Table 3 summarizes the current status of external accreditation of programs at SUNY-ESF. The interval between accreditation visits varies depending on the accrediting body. For example, ABET typically accredits on a six-year cycle. For those being reviewed by peer groups, the accreditation will take place on a six-10-year-cycle.

⁶ <http://www.esf.edu/assessment/>

Table 3. Program accreditation of the A.A.S., B.L.A., and B.S. programs at SUNY-ESF⁷.

Program	Accrediting Body	Review Schedule
(CHEM) - Chemistry BS	American Chemical Society	2013
(EFB) - Aquatics and Fisheries Science BS	Selected Peer Group	2013
(EFB) - Biotechnology BS	Selected Peer Group	2013
(EFB) - Conservation Biology BS	Selected Peer Group	2013
(EFB) - Environmental Biology BS	Selected Peer Group	2013
(EFB) - Forest Health BS	Selected Peer Group	2013
(EFB) - Natural History and Interpretation BS	Selected Peer Group	2013
(EFB) - Wildlife Science BS	Selected Peer Group	2013
(ENS) - Environmental Science BS	Selected Peer Group	2013
(ERE) - Environmental Resources Engineering BS	Accreditation Board for Engineering and Technology	2012
(ES) - Environmental Studies BS	Selected Peer Group	2011
(FNRM) - Forest Ecosystem Science BS	Selected Peer Group	2014
(FNRM) - Forest Resources Management BS	Society of American Foresters	2003
(FNRM) - Natural Resources Management BS	Selected Peer Group	2014
(FNRM-RS) - Environmental and Natural Resources Conservation AAS	Selected Peer Group	2014
(FNRM-RS) - Forest Technology AAS	Selected Peer Group	2011
(FNRM-RS) - Land Surveying Technology AAS	Accreditation Board for Engineering and Technology	2010
(LA) - Landscape Architecture BLA	American Association of Landscape Architects	2012
(PBE) - Bioprocess Engineering BS	Accreditation Board for Engineering and Technology	2012
(PBE) - Paper Engineering BS	Accreditation Board for Engineering and Technology	2012
(SCME) - Construction Management	Society of Wood Science and Technology, Society of American Foresters	2009

Results – Examples of Effective Change

The initial effort of using TracDat® concentrated on entering the data for the student learning outcomes for the B.S. programs at SUNY-ESF. In the reports (<http://www.esf.edu/assessment/>), each program enumerates the student learning outcomes for the program, the measure-ments for each outcome, and the results of the measurements. Examples of the use of the system are given in Appendix 5 – Examples of Using TracDat for Program Assessment.

⁷ <http://www.esf.edu/assessment/external.htm>

Based on this information, the department through its departmental processes determines the action that will be taken, particularly if the desired outcome is not being satisfied. The proposed actions are reviewed with the Provost through the Department Annual Report preparation and review process. Table 4 summarizes the current status of the assessment plan as entered into the assessment reporting system. It is important to note that ongoing efforts are being made to enter the information since TracDat® was made available in late November 2012. As can be seen from the table, most programs are well in compliance with having measurements associated with their learning outcomes.

Table 4. Current status of assessment by program at SUNY-ESF⁸.

Assessment Unit	Total Learning Outcomes	Total Measurement Scales	Learning Outcomes Without Measurement Scale
(CHEM) - Chemistry BS	7	16	0
(EFB) - Aquatics and Fisheries Science BS	6	0	6
(EFB) - Biotechnology BS	7	21	0
(EFB) - Conservation Biology BS	6	1	5
(EFB) - Environmental Biology BS	8	14	2
(EFB) - Forest Health BS	9	0	9
(EFB) - Natural History and Interpretation BS	8	7	1
(EFB) - Wildlife Science BS	8	0	8
(ENS) - Environmental Science BS	11	23	0
(ERE) - Environmental Resources Engineering BS	11	34	0
(ES) - Environmental Studies BS	5	15	0
(FNRM) - Forest Ecosystem Science BS	9	0	9
(FNRM) - Forest Resources Management BS	9	0	9
(FNRM) - Natural Resources Management BS	9	0	9
(LA) - Landscape Architecture BLA	13	26	0
(LA) - Landscape Architecture MLA	15	30	0
(PBE) - Bioprocess Engineering BS	12	41	0
(PBE) - Paper Engineering BS	12	64	0
(PBE) - Paper Science BS	12	46	0
(SCME) - Construction Management BS	33	31	9

Changes in the educational programs can take place through different mechanisms depending on the scope of the change being made. At the widest scope, changes are made at the program level in the curriculum. Over the past three years, a number of changes were made to the curricula of the programs at SUNY-ESF (Table 5, page 37 and 38). The table

⁸ Summary data from the TracDat system.

shows the name of the program that was changed, the department of the program, and the date it was approved by the ESF Faculty. As was discussed above, these changes must go through a process that involves the Faculty Governance Committee on Curriculum and be approved by the ESF Faculty as a whole.

In addition to curricular changes, changes can also be made at the course level. If the changes involve the scope of the course, the course outcomes, or other significant changes in the course, the proposal must be approved by the College Committee on Curriculum. This is especially important when the course is taken by students from multiple programs or from other departments.

Finally, within the scope of the approved course description, instructors are expected to continuously improve the delivery and effectiveness of teaching. This can include updating examples and materials with new information or implementing new instruction methodologies. Changes that would impact other courses (e.g., if this course were a prerequisite for another course) are discussed within the department's curriculum committee. Documentation is collected to determine the effectiveness of the changes made.

Discussed, beginning on next page are some samples of changes made at various levels.

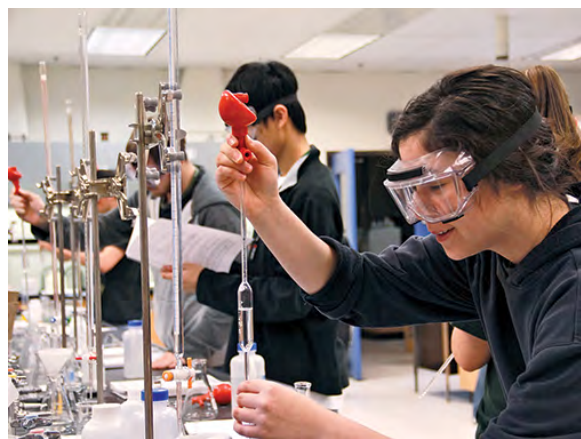


Table 5. Curriculum changes in A.A.S. and B.S. programs at SUNY-ESF for 2009-2012⁹.

Program change	Department	Date Approved
Cover Memo - BLA Courses/Catalog Description (Revised) BLA Proposal and Curriculum Sheet (Revised)	LA	current
Cover Memo - Modification to Const. Mgmt. Curriculum 2012-13 Curriculum Proposal - Construction Management	SCME	5/2/2012
Proposed New Minors in EFB (2) and Curriculum Chg. in Biotechnology Curriculum Change in Biotechnology	EFB	5/18/2012
Cover Memo - Natural History and Interpretation Program Revisions Natural History and Interpretation Natural History and Interpretation Plan Sheet Changes Natural History and Interpretation Directed Electives Natural History and Interpretation Typical Schedule Natural History and Interpretation Letter of Support	EFB	5/18/2012
Cover Memo - Curriculum Proposal for ES Curriculum proposal for ES	ESci	2/15/2012
Cover Memo - ERE Proposals (9) and Catalog Changes (2) ERE Undergrad curriculum proposal and catalog description ERE Graduate curriculum proposal and catalog description	ERFEG	5/2/2012
Cover Memo - ES Curriculum Proposal EST 4xx Rhetorical Practices course proposal and detailed course description Curriculum Proposal form - Environment, Communication and Society Catalog narrative - Environment, Communication and Society	ES	4/16/2012
Cover Memo - NRM Curriculum Proposal Curriculum Proposal - Natural Resources Management Comparison of Course/Credit Hours Btwn Old and Proposed Curriculum Catalog Description of BS in Natural Resources Management	FNRM	5/2/2012
Cover Memo - SCME Curriculum Changes SCME Construction Management Curriculum Changes	SCME	3/9/2011

⁹ <http://www.esf.edu/coc/>

<p>EFB Curricular Changes (7)</p> <ul style="list-style-type: none"> Aquatic and Fisheries Science Biotechnology Conservation Biology Environmental Biology Forest Health Natural History and Interpretation Wildlife Science 	EFB	4/13/2011
<p>Cover Memo - BS in Environmental Health</p> <ul style="list-style-type: none"> Curriculum Proposal for BS in Environmental Health Proposed Schedule for EH Degree 	EnvSci	5/11/2011
<p>Cover Memo - FCH General Education Modifications</p> <ul style="list-style-type: none"> FCH Curriculum Proposal and Catalog Description 	FCH	3/1/2011
<p>Cover Memo - BS in Sustainable Energy Mgmt. Curriculum and 2 Courses</p> <ul style="list-style-type: none"> Curriculum Proposal - Sustainable Energy Management 	FNRM	5/11/2011
<p>Cover Memo - 3 Curricular Proposals from FNRM</p> <ul style="list-style-type: none"> Forest Ecosystem Science Degree Program, Bachelor of Science 	FNRM	2/9/2011
<p>Cover Memo - 2 Curriculum Proposals and 8 Course Proposals for PBE</p> <ul style="list-style-type: none"> (BS) Bioprocess Engineering Curriculum Proposal (BS) Paper Engineering Curriculum Proposal 	PBE	3/9/2011
<p>Memo Re: CMWPE Curriculum Change</p> <ul style="list-style-type: none"> Construction Management Justification Statement Construction Management Curriculum - Updated 3/15/10 	CMWPE	3/3/2010
<p>Memo re: Curriculum Proposal for ERFEG</p> <ul style="list-style-type: none"> ERFEG Curriculum Proposal BS Environmental Resources Engineering Curriculum 	ERFEG	4/7/2010
<p>Ranger School Program Changes--Originating Memos/Proposals</p> <ul style="list-style-type: none"> Environmental and Natural Resource Conservation Program Ranger School Curriculum Updates Ranger School Courses w/New Descriptions by Degree Program 	FNRM	3/3/2010
<p>Memo Re: BLA Curriculum and Course Proposals</p> <ul style="list-style-type: none"> BLA Curriculum and Course Revisions BLA Curriculum 	LA	3/3/2010

Example-Teaching and Learning

Course Level Changes in PSE 370

In the Department of Paper and Bioprocess Engineering, course instructors are required to provide Faculty Course Assessment Reports (FCARs) at the conclusion of each semester. These reports document the performance of the students in the course, their attainment of the course objectives, program student learning outcome assessment if the course is a key assessment point for the program, as well as documenting the changes that were made in the delivery of the course, an evaluation of the course for the year, and plans for improvement for the upcoming offering of the course.

As an example, several years of FCARs for PSE 370 (Principles of Mass and Energy Balances) are provided in

Appendix 2 – Case Studies of Assessment of

Institutional Effectiveness. Five years of reports are provided covering the offering of the course from Fall 2007 through Fall 2011. As can be seen, the reports indicate the changes that are made from previous offerings and provide reflections on the course after its completion. A number of changes are highlighted below:

1. In 2007, an optional recitation section was reestablished after not being offered the previous year. This change was based on the performance of the students in the course in 2006. An improvement in the grades of those students that availed themselves of the recitation section was noted.
2. In 2009, a formal rubric was developed for the grading of the homework based on technical content and communication content. This provided students with a clearer understanding of the expectations of the homework.
3. In 2010-2012, greater emphasis was placed on the use of computer solutions and modern engineering tools. Over these three years, students were encouraged to use Excel, Matlab, and Mathcad to solve their homework and take-home problems. In addition, modern engineering simulators were introduced in 2011 and 2012.
4. In 2012, Blackboard@SU was used for course management and communication with students. This provided students with a repository of course information that was standardized across all their courses. In previous years, the instructor provided information through a custom website.

Examples-Curriculum

Table 5 summarizes the curricular changes that were made over the past three years.

Changes to curricula can take place for a number of reasons. If it is found that the student learning outcomes are not being met, this would trigger a need for changes. These changes can be taken at a number of levels:

- Changes at the course delivery level. Improvements in the delivery of the course can impact the attainment of the student learning outcomes. These types of changes will usually occur within the department and are reflected in the TracDat® data.

- Changes at the course content level. In this case, the course content needs to be revised in order to better attain the student learning outcomes. Changes will be proposed at the department level for approval by the Committee on Curriculum.
- Changes at the curriculum level. In this case, changes in the curriculum need to be made (e.g., new courses required, courses removed, the order of courses changed) to better attain the student learning outcomes. Changes are then proposed at the department level for approval by the Committee on Curriculum and the College Faculty.

While the non-attainment of student learning outcomes is one factor driving changes to the curriculum, other factors must also be considered when contemplating curriculum changes. In some cases, these factors can be a primary driving force for changes in the curriculum. For example, these considerations can arise from the needs of the program constituents (e.g., employers of the graduates) or a change in the resources available. These changes could be reflected in the changing of the program Student Learning Outcomes, but also may be reflected at the course level.

Curriculum Changes in Environmental Resources Engineering

The environmental resources engineering program has been in transition for the past several years. The most recent curriculum change reflects the final piece of the transition from the older forest engineering program to the new environmental resources engineering program. The assessment of the student learning outcomes for this program are clear and generally indicate that the students are meeting the stated outcomes. The exceptions noted are addressed with appropriate actions. In this case, there were department goal-driven changes made to the program as indicated in the justification for the change:

The Department of Environmental Resources and Forest Engineering has undergone a number of changes that have preceded the decision to change the name of our undergraduate program. In our last strategic plan developed in the fall of 2010, we redefined our departmental goals as follows:

- 1) Continue to develop innovative and diverse educational approaches to enhance our ability to train engineers to meet changing needs
- 2) Strengthen our engineering and scientific research through increased publications, research funding, and collaborative relationships
- 3) Integrate service with teaching and research to address local to global needs
- 4) Expand the professional capabilities of ERFEG Faculty and Staff to enhance our teaching, research, and outreach

Under Goal 1, part of our implementation plan was to “facilitate the change of department and degree name at the undergraduate and graduate level.” This curriculum proposal addresses the change in the undergraduate degree program.

In addition, in the fall of 2007 we implemented a new curriculum in our department which has a greater focus on issues related to Environmental Resources Engineering,

removing required courses in Dendrology and Harvest Systems, and replacing them with courses such as Ecological Engineering and Solid Waste Management. Currently our freshmen, sophomore, and junior classes are following this new curriculum, while our senior class is on our old curriculum. We are proposing the change in our undergraduate degree program name to be in place to coincide with the May 2011 graduation of the first class following this new curriculum.

We are also pursuing changes in our Engineering Accreditation consistent with this undergraduate program change. Currently our Forest Engineering program is accredited through Agricultural and Biological Engineering. Our new program will be accredited through Environmental Engineering, which is a much closer match to our curriculum and the types of employment our graduates typically seek. We recently performed an alumni survey that not only provides additional support to change the name of the undergraduate program, but also indicated the continued focus of our graduates in the areas of Civil and Environmental Engineering.

Finally, we have recently had a change in our department's name from Environmental Resources and Forest Engineering to Environmental Resources Engineering. The proposed change in our undergraduate program is consistent with this new departmental name (as will be the new name of our graduate program). This will help avoid the current confusion regarding the differences in our department, undergraduate, and graduate program name, as they will all be the same. This will allow us to better market our program, and will provide our students with a more modern and understandable degree name.

Curriculum Changes in Environmental Science

The assessment of the student learning outcomes, in addition to some external factors, determined the changes to the environmental science program. In this example, the changes were determined by general education (GE) changes promulgated by the SUNY Board of Trustees in addition to changes identified through program assessment. The following, taken from the justification for the changes, identifies the issues and the proposed changes. Specifically, the changes were the reduction in GE areas required to meet SUNY demands (from 9 to 7) and the addition of EWP405 Writing for Science Professionals and one additional Advanced Science or Math (in addition to the two currently required). The rationale in the curriculum change indicated:

Issue (i). Limited competency in technical writing has been a continuing challenge for students in our Division. Since all of our students are required to complete 5 credits of senior synthesis (which typically involves execution and presentation of a research project) this is particularly vexing, requiring excessive faculty mentor input in the writing process. In order to improve this situation, we are requiring a technical writing course. This course was tailored for ESC. We are meeting periodically with the director of the writing center to develop a section of technical writing that would specifically

address our needs and we recommended a specific text book. The person assigned to teach this section is sensitive to our needs and objectives and will work in concert with program assistant to insure that the course outcomes meet our needs. In addition, this course will incorporate planning for the senior research project, with a research proposal as the final project in the course. In this way students will improve their technical writing as well as gain guidance in planning their projects.

Issue (ii). Our curriculum is science based. The addition of an advanced science or math (defined as having a prerequisite or a 300 level course) strengthens the program.

Curriculum Changes in Paper and Bioprocess Engineering

For the two engineering programs in the Department of Paper and Bioprocess Engineering — Paper Engineering and Bioprocess Engineering — the changes made were primarily driven by the considerations other than the attainment of the student learning outcomes. For the engineering programs accredited by ABET, the student learning outcomes are specified as the well-known ‘a-k’ student learning outcomes of ABET. However, not currently reflected in the TracDat® system, the programs are also driven by program objectives, which are more general statements of the goals of the programs. For the case of the bioprocess engineering program, these objectives are:



1. To achieve rewarding careers in bioprocess engineering and related fields after graduation.
2. To demonstrate advancement in their careers through increasing professional responsibility and continued life-long learning.

Similar objectives are published for the paper engineering program. While still being able to meet the general engineering ‘a-k’, curricular changes occasionally need to be made for the program to meet its objectives. These changes are always made in close communication with the program advisory board as represented by the Syracuse Pulp and Paper Foundation (SPPF). In the curriculum changes to the bioprocess engineering program, the changes were also driven by the following:

1. The changes made in the general education requirements were made by the SUNY Board of Trustees;
2. The addition of GNE 330 (Professional Engineering Skills) was made to better attain and assess six of the ‘a-k’ ABET student learning outcomes.
3. The addition of BPE 300 (Introduction to Bioprocessing), BPE 435 (Unit Process Operations), and PSE 477 (Process Control) were made to better achieve the program objectives of providing specific skills to the students to use in their careers.

Similar changes and rationale were made to the paper engineering program. The efficacy of these changes will be assessed in the upcoming years.

Sharing Assessment Results

SUNY-ESF is committed to providing assessment results to all constituents both within the College and external to the College. Beginning in November 2012, the College has adopted the TracDat® system to manage the reporting of assessment data for both educational programs and administrative departments. The system, based on a relational database, allows multiple users to enter and extract data, analyze results, and produce reports. A sample program assessment report is provided in

Appendix 4 – Examples of a Program Assessment Report. Assessment results are shared in three primary ways using the system with the various constituents of the College (Figure 3):

- Interacting directly with TracDat® and generating necessary reports.
- Receiving reports generated by TracDat®.
- Accessing posted assessment data from the College website.

The details of the distribution of assessment results are detailed on next page.

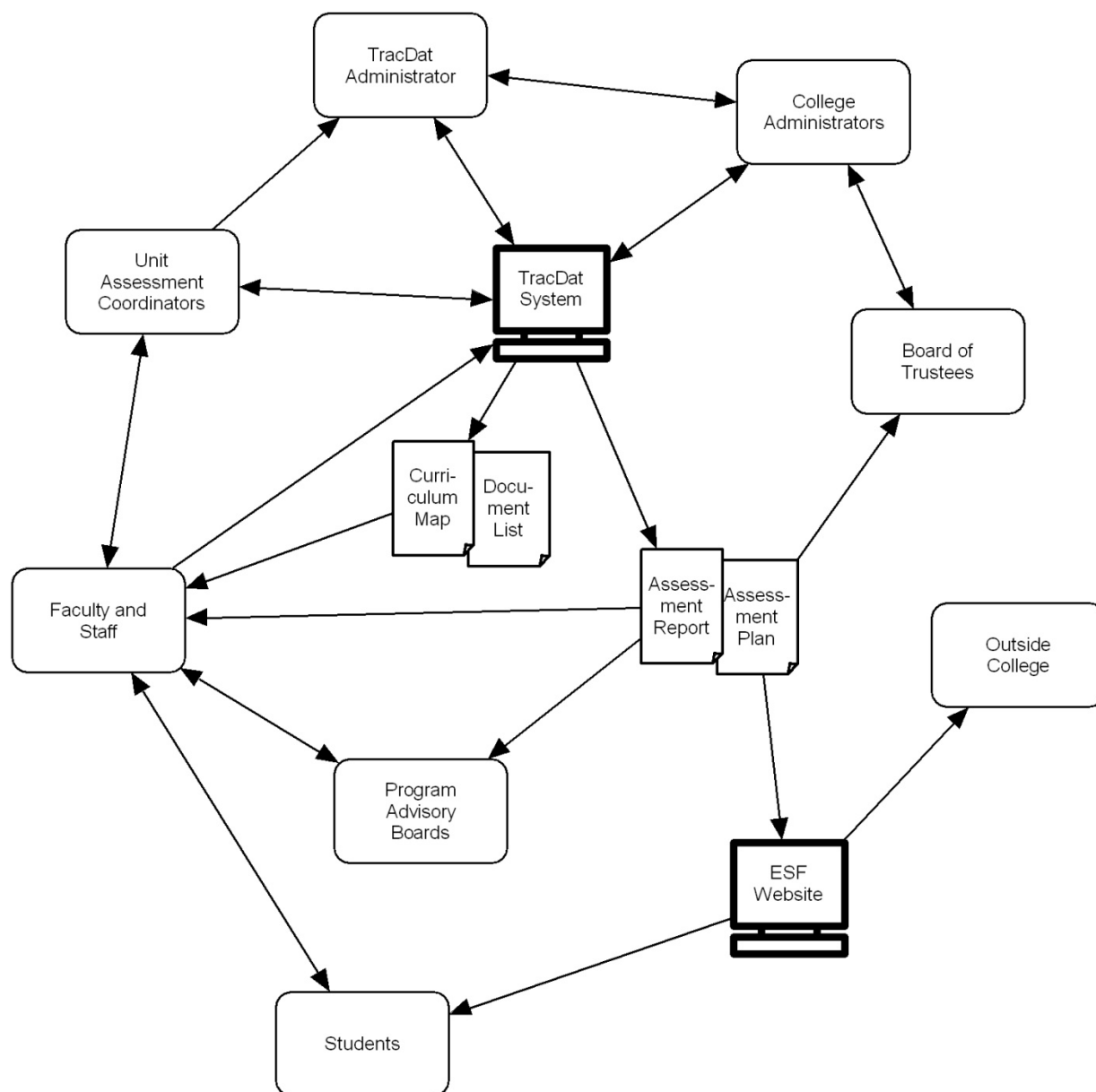


Figure 3. Schematic of the sharing of assessment data within the College and to other constituents.

Inside ESF

College Administrators

Administrators at the College, including the TracDat® Administrator and the Unit Assessment Coordinators, have direct access to the system for the units and/or programs for which they are responsible. Using the system, they can directly access the data as well as generate any of the appropriate reports necessary for reporting and analyzing the data. In addition, special reports or new reports can be created.

Board of Trustees

The Board of Trustees will be primarily provided with standard reports, as part of the Provost's presentations at Board meetings, generated by the TracDat® system, particularly,

the Assessment Reports and the Assessment Plans for the units and programs. Additional information not provided by the reports can be retrieved directly from the TracDat® system through the College Administrators.

Faculty and Staff

Faculty and staff can generally access the TracDat® system to provide the necessary data for the assessment process. Their direct access will be limited to those courses and assessment processes related to their courses and activities. They will have access to additional reports (generated through their Unit Assessment Coordinators) including the Curriculum Map and the Document List. The Director of Institutional Planning will harvest rich information from reports for institutional perspectives and decision making.

Students

The Assessment Plans for each unit are posted on the College Assessment website (<http://www.esf.edu/assessment/>). The assessment reports are annually posted on the same website. In addition, links from each academic unit will point to the appropriate assessment plans and reports. Students will be informed when the new reports are posted.

Outside ESF

The Assessment Plans and Reports for each unit are posted on the College Assessment website (<http://www.esf.edu/assessment/>).



Conclusions

Summary of Current Status

In the action of the Middle States Commission on Higher Education with respect to the affirmation of the accreditation of ESF, a progress report documenting that assessment results are shared, discussed, and used to improve the institution was requested. The actions taken that are documented in this report address standards 7 and 14.

Assessment of institutional effectiveness includes the assessment of all aspects of the College's operations including the assessment of program student learning outcomes as well as the effectiveness of the administrative units that support the institution. Through the *Vision 2020* campus-wide strategic planning process, seven goals were identified to provide the basic roadmap for institutional direction. Key indicators used demonstrate the overall measure of success as well as progress on specific initiatives. The processes used to meet these goals and the documentation of these processes continue to improve over the past several years.

To help standardize the collection, analysis, and reporting of program assessment, ESF has adopted the use of TracDat®, an assessment management software system, to provide the framework for the assessment processes. Through the use of this system and the standard operating processes outlined in this report, the student learning outcomes of the various programs have been clearly articulated and the measurements to demonstrate the achievement of the outcomes are clearly defined. This assessment information shows that the programs are meeting their stated student learning outcomes. In addition, as indicated in the report, the assessment results are disseminated to the appropriate stakeholders and used for documenting success and in identifying the need for changes in the student learning outcomes, the curriculum, and course-level pedagogy to achieve the student learning outcomes.

Planned Improvements

The implementation of TracDat® has only recently begun on the ESF campus. There are several opportunities for improvement and enhancement of the assessment process that could be implemented over the next several years. Some of these are described below.

Review for Assessment-Based Changes

Proposed curricular changes need to be explicitly justified based on assessment and other data. The needs for the change should be clearly documented in the TracDat® Assessment System. As the system implementation continues and faculty members fully engage in its use, this will become standard operating procedure. In the short term, curricular proposals submitted to the Committee on Curriculum need to be comprehensively reviewed using the compiled assessment data. The procedures for the review of curriculum changes will be revised to reflect this additional review step.

Using TracDat® to link Course Outcomes to Student Learning Outcomes

We have only recently been using a management system to track the assessment processes at SUNY-ESF and continue to explore its capabilities and expand its use. All courses at SUNY-ESF are required when reviewed and approved by the CoC to have measurable course outcomes as part of the course proposal. The step in the fuller implementation is to map the courses to the student learning outcomes for the program through curriculum mapping. When instructors report on the attainment of the course outcomes, the information can be directly related to the student learning outcomes for the programs. In this way, all assessment data, from the course level to the program level are available and accessible in the system.

Using TracDat® to assess Program and Department Goals

Some accrediting agencies (e.g., ABET) require programs to also have program objectives, which are broader statements relating to the achievements of the graduates of the program after graduation. TracDat® will be used to track the achievement of these objectives, and more generally, document and track the achievement of more general departmental goals.

Appendix 1 – ESF Assessment Policies

Institutional Effectiveness Assessment Policy at ESF

Assessment is an integral part of ESF's commitment to the continuous improvement of all functions that contribute to fulfilling the institution's mission -- "to advance knowledge and skills to promote the leadership necessary for stewardship of both the natural and designed environments."

Assessment specifically measures success in meeting defined goals at the institutional and administrative/academic unit levels. Unit level goals should be directly linked to and support the larger institutional goals to ensure that all campus elements are working with common purpose.

Assessment results should be obtained and evaluated through thoughtfully planned processes. They should be used to develop annual work plans that move the institution forward in meeting its mission and goals.

As a research university, in which objective empirical observations are valued as the foundation of knowledge, we recognize that data-based assessment is necessary for self-understanding and advancement, and thus essential for the growth and vibrancy of the institution.

At ESF the following specific statements guide our efforts.

- All administrative units shall have a mission statement, goals, outcomes and a plan to assess them.
- All assessment plans shall conform to Middle States Higher Education Commission standards.
- All assessment plans shall conform to the Mission and Goals of the SUNY-ESF strategic plan.
- All administrative units shall articulate assessment efforts to be reviewed annually. It is expected that data collected, assessments conducted, response to assessments, and adjustments to assessment plans will be discussed annually with the respective Vice Presidents overseeing each unit.
- All assessment plans and results shall be made publicly available on the ESF assessment web page.

Student Learning Outcome Assessment Policy at ESF

Assessment of student learning outcomes at the course, program, and institutional level benefits ESF and its patrons by encouraging thoughtful identification of educational objectives concordant with our mission -- to advance knowledge and skills to promote the leadership necessary for stewardship of both the natural and designed environments – and by

ensuring that our graduating students have mastered the educational material embodied in those objectives.

Effective student learning outcomes assessment requires regular collection and examination of data that directly measure student proficiency in all learning outcomes. Moreover, effective assessment plans are efficient, achieving reliable results without unnecessary effort.

Assessment is part of a cycle that fosters continuous improvement in educational outcomes. In this cycle assessment results reveal opportunities for improvement in student performance; curricular and/or pedagogical changes are instituted to enhance performance; efficacy of the changes is evaluated by subsequent assessment. Through the assessment-improvement cycle we demonstrate ESF's institutional ethos expressed in our motto – Improve Your World.

At ESF the following policies guide student learning outcomes assessment practice.

- The Faculty creates, manages, and assesses all curricular efforts at ESF.
- All academic programs shall have explicit learning outcomes and a plan to assess them.
- All assessment plans shall conform to Middle States Higher Education Commission standards.
- All course syllabi shall include student learning outcomes.
- Learning outcomes in required courses shall link with learning outcomes of the program(s) for which the course is required.
- All departments shall document assessment efforts in their annual reports of activity including data collected, assessments conducted, response to assessments, and adjustments to assessment plans.
- All assessment plans and results shall be made publicly available on the ESF assessment web page.

Appendix 2 – Case Studies of Assessment of Institutional Effectiveness

Case Study No. 1: Increasing Sponsored Research

Increasing sponsored research is a key element in several of the College's strategic goals. The Office of Research Programs (ORP) takes the lead role in setting sponsored research goals and in formulating and executing strategies to achieve them. Sponsored research expenditures is the primary measure of performance, but other measures such as number of proposals submitted, proposal success rate, and new award amounts, are monitored to achieve a fuller understanding of the College's efforts to secure sponsored research funding.

ORP performs a number of specific tasks required to conduct sponsored research and support the overall goal of increasing sponsored research. These form the basis for ORP's assessment plan with each major task having performance indicators and annual and longer-term targets. ORP's first assessment plan was written in 2006. It has been reviewed and revised annually at the ORP's summer retreat. The current assessment plan identifies the following objectives:

1. Provide the technical capacity and expertise to submit an increasing number and diversity of successful, competitive proposals by the majority of faculty in support of high quality research.
2. Maintain and analyze essential records in coordination with the SUNY Research Foundation to ensure regulatory compliance and financial rectitude.
3. Facilitate the breadth and depth of ESF research.
4. Highlight and clarify research accomplishments and technological innovation.
5. Manage and strategically increase the budget derived from indirect returns, agency service fees, investment income and license fees to operate the Office of Research Programs and directly fund research initiatives.
6. Draft and recommend policies to facilitate and enhance research activities.
7. Provide a visible and accessible set of technical services in support of research (e.g. Analytical and Technical Services, Institutional Review Board, etc.).

Many actions have been taken to improve performance in each of the tasks with a view to the larger goal of growing sponsored research. Some of the more significant ones include investments in:

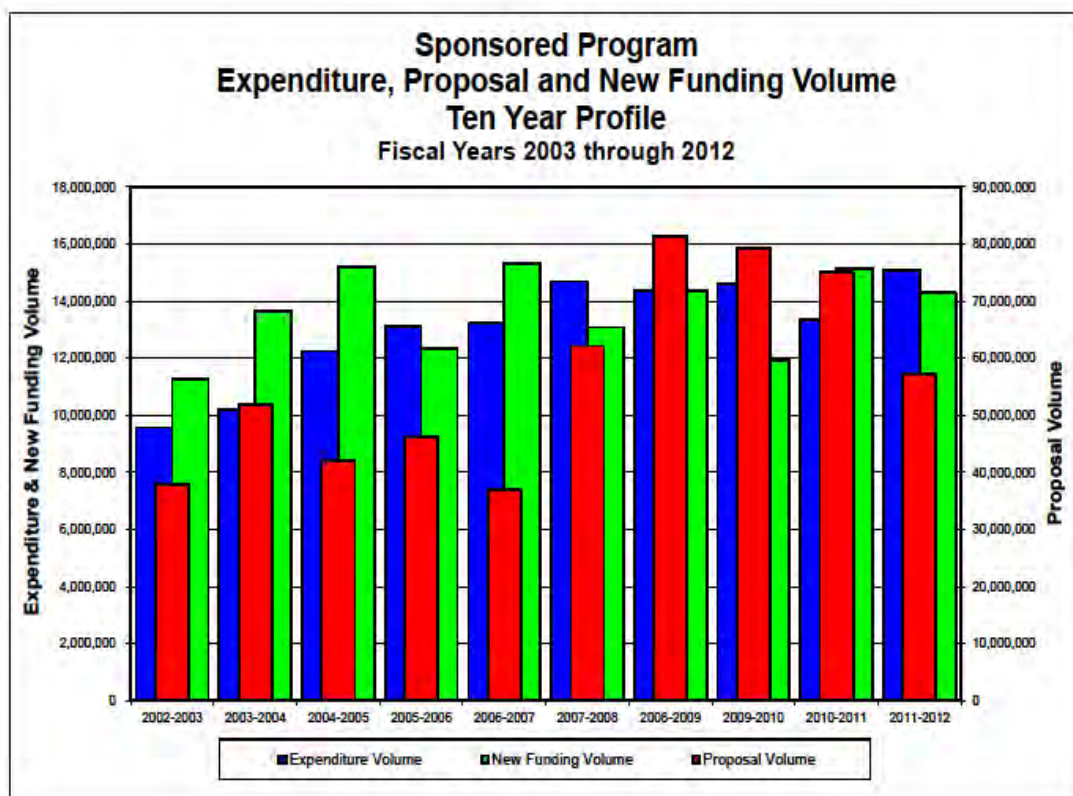
- A shared position with the Library for the purpose of identifying grant opportunities and communicating them to the faculty,
- An additional position in ORP to provide the faculty with greater assistance in proposal preparation,
- Establishment of multiple seed grant programs,
- Establishment of an Exemplary Researcher Award to incentivize sponsored research through recognition and financial reward,
- Increased return of indirect cost recoveries to academic departments and initiation of indirect cost recovery return to faculty members conducting sponsored research to incentivize and facilitate sponsored research.

A sense of the many other actions taken to improve performance in each of the ORP tasks and in achieving the larger goal of increasing sponsored research activity can be obtained from the 2012 ORP

Assessment Report, a portion of which is included at the bottom of this case study. The full report can be accessed on ESF's Assessment web page. Note that each of the unit goals is connected to the College's broad long-term strategic goals and to current institutional priorities articulated at the President's Cabinet retreat.

Resources required to accomplish ORP goals and to execute its action plan are allocated during ORP budget development which takes place in June as part of the annual assessment and planning exercise. The ORP budget is largely based on revenues from indirect cost recoveries so that planning and budget preparation requires estimates of revenues for the year ahead. ORP budgets for 2012-2013 and early years are available upon request.

The figure below shows the 10-year trend in sponsored research activity, the ultimate arbiter of ORP's success. Especially evident is the increase in proposal volume after 2006. Expenditures also show an upward trend from \$9.6M in 2002-2003 to \$14.7M in 2011-2012. Expenditures will be greater than \$16M in 2012-2013. Although not evident in the chart below, new funding volume is up significantly when government "earmarks" are excluded.



Office of Research Programs 2012 Assessment Report (Unit Goals 1 and 2)

Unit Goal	Vision 2020 Goal	*Inst. Priority	Actions Planned	Performance Indicator	Target(s)
1. Provide technical support to submit an increased number of competitive proposals for sponsored funding	3 4 5 6	C D	a. Quantify proposal submissions and outcomes monthly b. Broaden diversity of funding sources at state and federal levels c. Augment proposal preparation and compliance and auditing responsibilities	a. Number of proposals b. Number of funding sources c. Hiring new staff	a. Increase by 4%; increase success rate from 17.6% to 25% b. Secure funds from NIH, NYSTAR, and NSF/ARRA c. Hire & train 1 additional staff
2. Maintain and analyze essential records in coordination with the SUNY Research Foundation to assure regulatory compliance and financial rectitude.	4 5	D	a. Utilize new technology for pre-award set-up and records b. Determine ratings of audits at state and federal levels. c. Document level of achievement as viewed by faculty and staff	a. COEUS implementation b. Audit ratings c. Faculty survey of satisfaction with ORP service	a. Implement COEUS system at level comparable to other SUNY doctoral institutions b. Achieve "A" ratings in future audits c. High level of satisfaction

*Institutional Priority Codes: A=Lead in sustainability practice and education; B=Increase enrollment and student quality; C=Improve visibility; D=Financial stability; E=Community Engagement; F=Strengthen assessment practices; G=Augment human and physical resources; H=Evolve academic programs to address needs of a changing society; I=Enhance information technology capabilities; J=Increase diversity of students and staff.

Continuation of Office of Research Programs 2012 Assessment Report (Goals 1 and 2)

Unit Goal	Results from 2011-2012	Actions Planned 2012-2013	Performance Indicator	Target(s)
1. Provide technical support to submit an increased number of competitive proposals for sponsored funding	a. Proposal submission increased 7%; success rate was 25% b. Hill Collaboration is preparing NIH grants; none yet submitted. NYSTAR-CAT proposal was not successful \$1.47M NSF/ARRA grant is underway c. New grants officer was hired and trained, improving ORP pre-proposal and post-proposal services	a. VP Research will review research opportunities with selected faculty member twice each month. b. Hill Collaboration will be expanded to include Warrior Research and greater ESF participation	a. Number of proposals resulting from VPR contacts b. Number of Warrior Research proposals submitted; number of ESF faculty members on Hill Collaboration proposals	a. 12 proposals attributable to VPR contacts. b. One Warrior research proposal; an ESF faculty member on each Hill Collaboration proposal.
2. Maintain and analyze essential records in coordination with the SUNY Research Foundation to assure regulatory compliance and financial rectitude	a. Most features of COEUS have now been implemented. b. ESF received high marks from an unexpected federal audit in 2011-2012 c. The faculty survey was not conducted as ESF develops plans to coordinate faculty surveys across campus	a. ORP personnel to continue training in using COEUS; will train faculty b. PI proposal checklist will be modified to include acknowledgment of all funding agency requirements c. Survey of faculty satisfaction with ORP services will be conducted	a. Training of ORP staff b. PI proposal checklist modification c. Survey results	a. 8 ORP staff members will complete COEUS training b. 85% of submitted proposals will have completed new checklist c. High level of satisfaction

Case Study No. 2: Student Satisfaction with Their College Experience

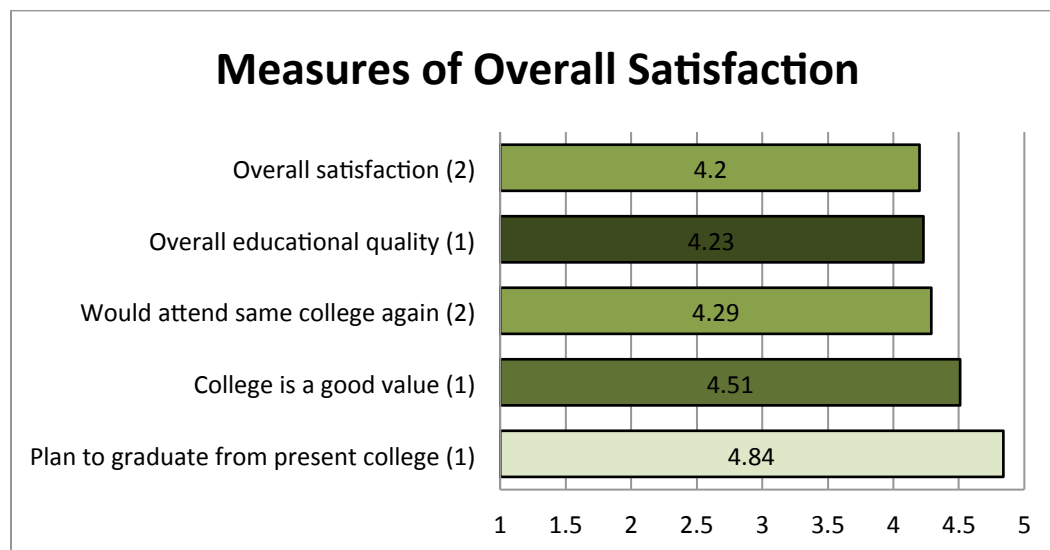
Most of ESF's units contribute in a significant way to students' satisfaction with their college experience. It is not the province of a single unit. As a result, assessment of student satisfaction and development of recommendations for improving it have been placed in the hands of the Faculty Governance Committee on Student Affairs. This committee includes faculty, students, and staff members from Student Affairs and other administrative units.

Their assessments are based largely on data collected from the National Survey of Student Engagement (NSSE) and the SUNY Student Opinion Survey (SOS). At ESF, the NSSE is administered approximately every two years (2001, 2002, 2005, 2007, 2008, 2011). The SOS is administered every third year (last in 2012).

The Committee reviews these reports approximately every three years to identify opportunities for improving student satisfaction through improved service or education and for assessing improvement in areas previously targeted for attention. They will have data from the most recent SOS and one or more NSSEs.

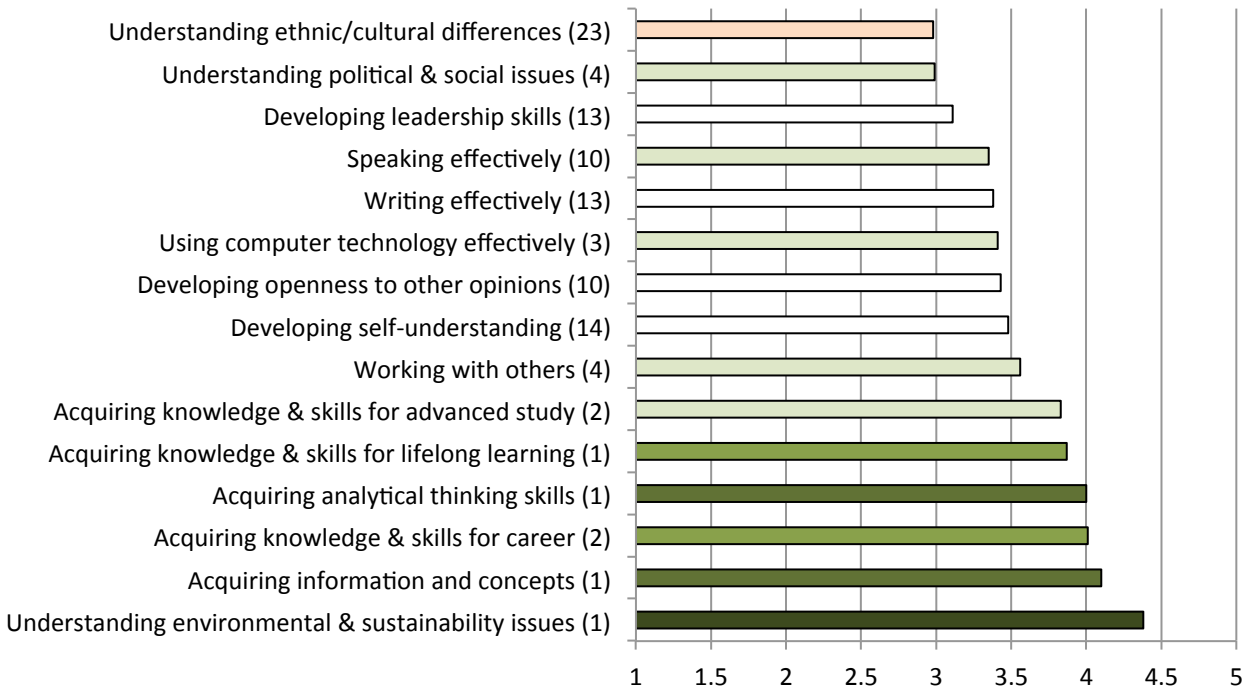
The Assistant Provost for Assessment has budgetary responsibility for the surveys. The Dean for Student Affairs is the administrative liaison to the Committee, providing guidance and ensuring that the assessment is completed in a timely and effective manner. Committee recommendations are forwarded to the Provost from the Dean for Student Affairs for action.

Overall, and in most specific areas, students report an extremely high level of satisfaction with their experience at ESF as the following data from the 2012 SOS demonstrates.



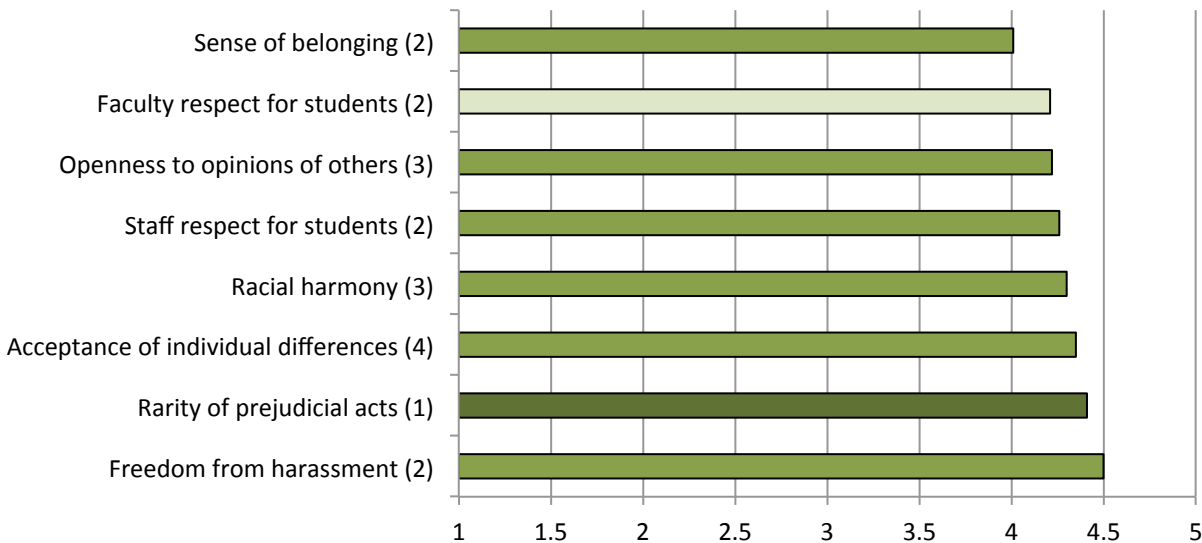
Numbers in (parentheses) are rank among the 28 SUNY 4-year institutions; a green bar indicates the ESF mean is significantly above the SUNY mean; darker shading indicates increasing departures from the SUNY mean.

College Contribution to Growth & Learning



Numbers in (parentheses) are rank among the 28 SUNY 4-year institutions; a green bar indicates the ESF mean is significantly above the SUNY mean; orange is significantly below the SUNY average; darker shading indicates increasing departures from the SUNY mean.

Sense of Community



Numbers in (parentheses) are rank among the 28 SUNY 4-year institutions; a green bar indicates the ESF mean is significantly above the SUNY mean; darker shading indicates increasing departures from the SUNY mean.

Using data from the 2011 NSSE and the 2012 SOS the Student Affairs Committee filed an assessment report in December 2012 with the Provost. The report, begun before the SOS data were available, concentrates on the NSSE data. The SOS data were largely corroborative. The Executive Summary of that report is copied here.

Executive Summary

The ESF Faculty Governance Committee for Student Life was asked to review ESF survey data for the 2011 National Survey of Student Engagement (NSSE) and to identify areas of achievement and concern, and to propose possible actions to achieve desired improvements. ESF has participated in the survey six times since 2001 and was one of 673 US colleges and universities to participate in 2011. A total of 120 first-year and 151 senior ESF students took the survey in April 2011. This report provides comparisons of responses by ESF students to other peer institutions (particularly other institutions in the RU/H Carnegie classification), and tracks responses by ESF respondents over time since 2001.

The 2011 survey reveals the following about ESF student experiences here.

ESF students are academically challenged by the faculty - Our students report experiencing a high overall level of academic challenge. ESF ranks in the top 10% of all NSSE institutions for first-year students, and in top 50% for seniors.

ESF appears to be providing students with a sound technical and analytical education and meaningful pre-professional development experiences – Compared to RU/H peers, ESF students more frequently integrate ideas and concepts; synthesize and organize information; think critically and analytically; analyze quantitative problems, basic ideas and theories; solve complex real-world problems; and contribute to the welfare of their community. ESF students recognize they are not acquiring as broad an education as RU/H peers, but they also acknowledge they are receiving more job and work-related knowledge and skills than RU/H peers.

ESF seems to be falling short in preparing students to work on a global stage to solve environmental problems and manage natural resources – ESF students are less likely than RU/H peers to include diverse racial, religious, gender or political perspectives in class discussions or writing assignments; or to report that they are acquiring an understanding of people of other racial and ethnic backgrounds. ESF seniors report having serious conversations with students of different races or ethnicities at rates lower than RU/H seniors. Although roughly the same percentage of ESF (18%) and RU/H (14%) seniors report participation in study abroad programs, it is likely that ESF students are participating in relatively short field-trip courses as opposed to semester-long experiences with meaningful cultural immersion. Only 22% of ESF seniors complete foreign language coursework, compared to 41% of RU/H students.

Service opportunities should be enhanced for upper-division students – ESF freshmen participate in service learning activities at rates substantially higher than RU/H peers. While 80% of ESF freshmen participate in service learning activities, participation drops to 60% for ESF seniors. Furthermore, 84% of ESF freshmen report participating in some form of community service, while 71% of seniors report having participated in service at some point during their academic program. These data suggest that the vast majority of community service programming takes place during the freshman year and is not sustained throughout all four years of most students' college careers.

ESF offers an enriching academic environment – ESF freshmen and seniors report higher level of educational enrichment than RU/H peers, and ESF falls within the top 10% of all NSSE 2011 schools for providing enriching educational experiences to freshmen. Seventy-seven percent of ESF seniors report participation in an internship, field experience, or co-op experience compared to 49% of students at other RU/H institutions. Fifty-three percent of ESF seniors participate in some form of a culminating senior experience compared to 32% of RU/H students.

ESF offers a supportive campus environment for students – ESF ranks in the top 50% of all NSSE 2011 schools for freshmen and seniors for the supportive campus environment benchmark. Compared to RU/H peers, ESF freshmen and seniors suggest the ESF students are more friendly and supportive, and express a sense of belonging; and that the institution provides the support needed for academic success.

Overall, ESF students are satisfied with their experience - ESF freshmen and seniors rate their overall level of satisfaction at 3.5 on a scale of 1-4, a level slightly higher than RU/H peers.

The report finds that ESF is succeeding in serving it's students well in most respects. However, it recommends further efforts to provide cross-cultural experiences for ESF students and additional emphasis on community service in the upper division. The Dean for Student Affairs is currently working with her staff to develop a plan for enhancing community service in the upper division. The Provost is working with Academic Council to forge a cohesive plan to increase cross-cultural experiences. Some elements of the latter are already evident and are being implemented. These include providing greater access to Syracuse University courses which focus on cross-cultural themes, strengthened efforts to provide cost-effective study-abroad opportunities, and forging additional dual diploma agreements with foreign universities thereby adding diversity to the on-campus student population.

Notable in the Committee report (and in the NSSE data) is absence of concern about academic advising. Following the 2008 NSSE survey, academic advising was identified as an area in need of improvement. Subsequently, the Provost discussed advising with the academic departments each of which then developed a plan for strengthening effectiveness. In some cases staff advisors were added. In other cases, the best faculty advisors took greater responsibility. In many cases, advising materials were augmented. In the 2011 NSSE, ESF students rated advising above the average for peer institutions.

Appendix 3 – Examples of Course-Level Assessment Reports

The following contains examples of course level assessment that is done in the Department of Paper and Bioprocess Engineering. Provided are five years of Faculty Course Assessment Reports (FCARs) for the course PSE 370 (Principles of Mass and Energy Balances).

Faculty Course Assessment Report
Faculty of Paper Science and Engineering
PSE 370 / ERE 570 – Principles of Mass and Energy Balance (3 credits)
Fall 2007 – Scott, G.M.

Catalog Description:

Three hours of lecture per week. Conservation of mass and energy applied to steady-state and dynamic process units and systems. Problem analysis and solution; computational techniques. Thermodynamic data and their use; real vs. perfect gases; steam properties; psychrometry. Fall.

Prerequisites: FCH 152, PHY 211

Corequisites: MAT 296

Grade Distribution:

A,A-	B+,B,B-	C+,C,C-	D	F	W,drop	Total
3	3			1	3	10

Modifications Made to Course:

1. Formal recitation sessions with the teaching assistant were reestablished this year as it seemed that student performance from the previous year suffered from the lack “organized” contact.

Course Objectives Assessment:

(Discuss how students are doing on a course objectives basis. There should be a section for each course objective explaining what exam questions, homework, exercises, etc. addressed that objective.)

1. To explain the concepts of dimensions, units, psychrometry, steam properties, and conservation of mass and energy;
Exam #1 primarily focuses on this objective covering concepts from chemistry and basic engineering. The average score on this section of the test was 65/100.
2. To solve steady-state mass and energy balance problems involving multiple process units and recycle/bypass/purge streams;
Exam #2 focused on problem solving especially involving multiple units. The average on the first exam was 71/100.
3. To solve and understand simple unsteady-state mass and energy balances;
Homework #10 evaluated the students performance on non-steady state balances. The average score on this homework was 53/100.
4. To assess the quality and quantity of data given in engineering problems and discuss the quality of the solutions derived from the data given;
In the Design Problem, students are asked to evaluate the appropriateness of using psychrometric charts when the pressure deviates from 1 atmosphere.
5. To solve more complicated problems using the software appropriate to the problem;
In the Design Problem, students solve a simple engineering design problem using Excel or other appropriate mathematical software. The average score on this project was 94.2, ranging from 75 to 100.
6. To present the solutions to engineering problems in both oral and written form in a clear and concise manner.
In the design problems, students must articulate in written form their solution and analysis.

Relation to Program Outcomes:

Paper Engineering

1. [X] a sound knowledge of science and engineering as applied to paper science and engineering (sound knowledge);

Course Objective #1 relates directly to this program outcome. In addition, students take a preliminary exam during the first week of the course to assess their proficiency in the basics of chemistry, math, and physics. The average score on this exam was 61, ranging from 36 to 85.

2. [X] the ability to conceptualize problems in terms of unifying principles, design and conduct experiments, and analyze and interpret data (conceptualize);
Course Objective #2, #3, and #4 support this outcome. As noted above the ability to solve problems on the take-home exams and the design problem demonstrate this outcome.
3. [X] the ability to solve a real engineering problem in a team environment using appropriate design techniques (team problem solving);
Course Objective #5 supports this outcome. The students are able to use software to analyze a problem and make a decision based on the solution. The students are allowed to work in teams to accomplish this task.
4. [] an ability to engage in life-long learning (life-long learning);
5. [X] well-developed written and oral communication skills (communication);
Course Objective #6 supports this outcome.
6. [] the ability to work in an industrial position within the pulp, paper, or allied industries (industrial experience);
7. [] understand the professional and ethical responsibility of an engineer (ethics);
8. [] a knowledge of the broad, contemporary issues facing the engineer in global and societal contexts (contemporary issues).

Student Feedback:

Student feedback was received on both the mid-semester and end-of-course evaluations for PSE 370. The students reported having difficulty understanding the material.

Reflection:

The students appear to be looking for solutions which they can memorize and repeat. They seem to be having difficulty with understanding problem solving concepts. However, it appears that the students this year had a wider range of abilities, especially based on the preliminary exam. They also appear to be having difficulty with bringing in concepts from previous courses and that their preparation might have been weaker than average.

Proposed Actions for Course Improvement:

1. The use of the take-home exam will be continued as it gave students the opportunity to display their problem solving abilities with a lessened time constraint.
2. Increase emphasis on the need for synthesis, especially with knowledge from previous courses.

Faculty Course Assessment Report
Faculty of Paper Science and Engineering
PSE 370 / ERE 570 – Principles of Mass and Energy Balance (3 credits)
Fall 2008 – Scott, G.M.

Catalog Description:

Three hours of lecture per week. Conservation of mass and energy applied to steady-state and dynamic process units and systems. Problem analysis and solution; computational techniques. Thermodynamic data and their use; real vs. perfect gases; steam properties; psychrometry. Fall.

Prerequisites: FCH 152, PHY 211

Corequisites: MAT 296

Grade Distribution:

A,A-	B+,B,B-	C+,C,C-	D	F	W,drop	Total
10	5	2	2	2	5	26

Modifications Made to Course:

1. Formal recitation sessions with the teaching assistant were reestablished this year as it seemed that student performance from the previous year suffered from the lack “organized” contact.

Course Objectives Assessment:

(Discuss how students are doing on a course objectives basis. There should be a section for each course objective explaining what exam questions, homework, exercises, etc. addressed that objective.)

1. To explain the concepts of dimensions, units, psychrometry, steam properties, and conservation of mass and energy;
Exam #1 primarily focuses on this objective covering concepts from chemistry and basic engineering. The average score on this section of the test was 37.5/60 with only one student receiving less than 33 (55%). Students had a self understanding rating of 4.5/5.0 on this objective.
2. To solve steady-state mass and energy balance problems involving multiple process units and recycle/bypass/purge streams;
Exam #1 (Take Home) and Exam #2 (Take Home) focused on problem solving especially involving multiple units. The average scores on these exams were 30.9 and 32.5, respectively. Students had a self understanding rating of 3.9/5.0 on this objective.
3. To solve and understand simple unsteady-state mass and energy balances;
Homework #10 evaluated the students performance on non-steady state balances. The average score on this homework was 81/100. Students had a self understanding rating of 3.5/5.0 on this objective.
4. To assess the quality and quantity of data given in engineering problems and discuss the quality of the solutions derived from the data given;
In Design Problem #1, students are asked to evaluate the appropriateness of using psychrometric charts when the pressure deviates from 1 atmosphere. Most students were able to use the results of their project to determine appropriate bounds for their use. Students had a self understanding rating of 3.9/5.0 on this objective.
5. To solve more complicated problems using the software appropriate to the problem;
In Design Problem #2, students solve a simple engineering design problem using Excel or other appropriate mathematical software. The average score on this project was 94.7, ranging from 70 to 100. Students had a self understanding rating of 3.5/5.0 on this objective.
6. To present the solutions to engineering problems in both oral and written form in a clear and concise manner.
In the design problems, students must articulate in written form their solution and analysis. Students had a self understanding rating of 3.9/5.0 on this objective.

Relation to Program Outcomes:

Paper Engineering

1. [X] a sound knowledge of science and engineering as applied to paper science and engineering (sound knowledge);
Course Objective #1 relates directly to this program outcome. In addition, students take a preliminary exam during the first week of the course to assess their proficiency in the basics of chemistry, math, and physics. The average score on this exam was 78, ranging from 45 to 98. The exam demonstrated adequate preparedness in the fundamentals of science.
2. [X] the ability to conceptualize problems in terms of unifying principles, design and conduct experiments, and analyze and interpret data (conceptualize);
Course Objective #2, #3, and #4 support this outcome. As noted above the ability to solve problems on the take-home exams and the design problem demonstrate this outcome.
3. [X] the ability to solve a real engineering problem in a team environment using appropriate design techniques (team problem solving);
Course Objective #5 supports this outcome. The students are able to use software to analyze a problem and make a decision based on the solution. The students are allowed to work in teams to accomplish this task.
4. [] an ability to engage in life-long learning (life-long learning);
5. [X] well-developed written and oral communication skills (communication);
Course Objective #6 supports this outcome.
6. [] the ability to work in an industrial position within the pulp, paper, or allied industries (industrial experience);
7. [] understand the professional and ethical responsibility of an engineer (ethics);
8. [] a knowledge of the broad, contemporary issues facing the engineer in global and societal contexts (contemporary issues).

Student Feedback:

Student feedback was received on both the mid-semester and end-of-course evaluations for PSE 370. The greatest deficiency noted from the mid-semester exam was the use of the required reading from the textbook. This was reiterated in the end-of-course surveys, that the textbook is sometimes difficult to understand. Additional comments indicated the need for more examples and solutions and a greater amount of practice in solving problems interactively. Based on the students self-assessment of their understanding, greater emphasis is needed on the “big picture” of the problem solving, rather than the rote solving of known problems.

Reflection:

The feedback received in this course often points to a paradigm shift in the thinking of the students. Often, it seems that this is the first course in which they are asked to provide solutions to problems rather than simply reiterate known solutions (e.g., in calculus). This often results in students struggling to understand the concept of problem solving as they try to memorize solutions. There is a greater need to emphasize the development of the higher concepts in engineering; that is, learning the concepts of problem solving rather than solving problems. Based on the assessment and feedback discussed briefly above, greater emphasis should be placed on achieving Course Objectives #3 and #5. This will be done through a greater emphasis and more intermediate discussions of the design problems and a greater distinction between “tool” lectures (e.g., psychrometry) and “problem solving” lectures.

Proposed Actions for Course Improvement:

1. The use of the take-home exam will be continued as it gave students the opportunity to display their problem solving abilities with a lessened time constraint. However, students will be informed that a portion of the grade will be based on the clarity of their presentation in addition to the correctness of the solution. In addition, students will be more strongly encouraged to work on the exam throughout the week that it is available and not put it off until the last minute.

Faculty Course Assessment Report
Department of Paper and Bioprocess Engineering
PSE 370 / ERE 570 – Principles of Mass and Energy Balance (3 credits)
Fall 2009 – Scott, G.M.

Catalog Description:

Three hours of lecture per week. Conservation of mass and energy applied to steady-state and dynamic process units and systems. Problem analysis and solution; computational techniques. Thermodynamic data and their use; real vs. perfect gases; steam properties; psychrometry. Fall.

Prerequisites: FCH 152, PHY 211

Corequisites: MAT 296

Grade Distribution:

A,A-	B+,B,B-	C+,C,C-	D	F	W,drop	Total
12	9	3	1	2	7	34

Modifications Made to Course:

1. Formal recitation sessions with the teaching assistant were continued this year. In addition, homework was graded based on technical content and communication content according to a rubric provided to the students.

Course Objectives Assessment:

(Discuss how students are doing on a course objectives basis. There should be a section for each course objective explaining what exam questions, homework, exercises, etc. addressed that objective.)

1. To explain the concepts of dimensions, units, psychrometry, steam properties, and conservation of mass and energy;
Exam #1 primarily focuses on this objective covering concepts from chemistry and basic engineering. The average score on this section of the test was 44/60 with only two students receiving less than 33 (55%). Students had a self understanding rating of 4.3/5.0 on this objective.
2. To solve steady-state mass and energy balance problems involving multiple process units and recycle/bypass/purge streams;
Exam #1 (Take Home) and Exam #2 (Take Home) focused on problem solving especially involving multiple units. The average scores on these exams were 37.8 and 32.1, respectively. Students had a self understanding rating of 4.3/5.0 on this objective.
3. To solve and understand simple unsteady-state mass and energy balances;
Homework #10 evaluated the students performance on non-steady state balances. The average score on this homework was 87/100. Students had a self understanding rating of 3.4/5.0 on this objective.
4. To assess the quality and quantity of data given in engineering problems and discuss the quality of the solutions derived from the data given;
In Design Problem #1, students are asked to evaluate the appropriateness of using psychrometric charts when the pressure deviates from 1 atmosphere. Most students were able to use the results of their project to determine appropriate bounds for their use. Students had a self understanding rating of 4.1/5.0 on this objective.
5. To solve more complicated problems using the software appropriate to the problem;
In Design Problem #2, students solve a simple engineering design problem using Excel or other appropriate mathematical software. The average score on this project was 89.4, ranging from 50 to 100. Students had a self understanding rating of 3.6/5.0 on this objective.
6. To present the solutions to engineering problems in both oral and written form in a clear and concise manner.
In the design problems, students must articulate in written form their solution and analysis. Students had a self understanding rating of 4.0/5.0 on this objective.

Relation to Program Outcomes:

Paper Engineering

1. [X] a sound knowledge of science and engineering as applied to paper science and engineering (sound knowledge);
Course Objective #1 relates directly to this program outcome. In addition, students take a preliminary exam during the first week of the course to assess their proficiency in the basics of chemistry, math, and physics. The average score on this exam was 81, ranging from 45 to 95. The exam demonstrated adequate preparedness in the fundamentals of science.
2. [X] the ability to conceptualize problems in terms of unifying principles, design and conduct experiments, and analyze and interpret data (conceptualize);
Course Objective #2, #3, and #4 support this outcome. As noted above the ability to solve problems on the take-home exams and the design problem demonstrate this outcome.
3. [X] the ability to solve a real engineering problem in a team environment using appropriate design techniques (team problem solving);
Course Objective #5 supports this outcome. The students are able to use software to analyze a problem and make a decision based on the solution. The students are allowed to work in teams to accomplish this task.
4. [] an ability to engage in life-long learning (life-long learning);
5. [X] well-developed written and oral communication skills (communication);
Course Objective #6 supports this outcome.
6. [] the ability to work in an industrial position within the pulp, paper, or allied industries (industrial experience);
7. [] understand the professional and ethical responsibility of an engineer (ethics);
8. [] a knowledge of the broad, contemporary issues facing the engineer in global and societal contexts (contemporary issues).

Student Feedback:

Student feedback was received on both the mid-semester and end-of-course evaluations for PSE 370. The greatest deficiency noted from the mid-semester exam was the use of the required reading from the textbook. This was reiterated in the end-of-course surveys, that the textbook is sometimes difficult to understand. Additional comments indicated the need for more examples and solutions and a greater amount of practice in solving problems interactively. Based on the students self-assessment of their understanding, greater emphasis is needed on the “big picture” of the problem solving, rather than the rote solving of known problems.

Reflection:

The feedback received in this course often points to a paradigm shift in the thinking of the students. Often, it seems that this is the first course in which they are asked to provide solutions to problems rather than simply reiterate known solutions (e.g., in calculus). This often results in students struggling to understand the concept of problem solving as they try to memorize solutions. The students in general see the usefulness and benefits of the course, but still struggle because of the paradigm shift. From the end-of-course comments, it appears that students struggle to extend the lecture and homework material to the exams; they expect the exams to be the same problems as the homework.

The reintroduction of the TA-led review sessions seemed to be extremely helpful to those who took advantage of them.

Proposed Actions for Course Improvement:

1. The use of the take-home exam will be continued as it gave students the opportunity to display their problem solving abilities with a lessened time constraint. In addition, students will continue to be strongly encouraged to work on the exam throughout the week that it is available and not put it off until the last minute. This will also apply to the homework problems.

Faculty Course Assessment Report
Department of Paper and Bioprocess Engineering
PSE 370 / PSE 570 – Principles of Mass and Energy Balance (3 credits)
Fall 2010 – Scott, G.M.

Catalog Description:

Three hours of lecture per week. Conservation of mass and energy applied to steady-state and dynamic process units and systems. Problem analysis and solution; computational techniques. Thermodynamic data and their use; real vs. perfect gases; steam properties; psychrometry. Fall.

Prerequisites: FCH 152, PHY 211

Corequisites: MAT 296

Grade Distribution:

A,A-	B+,B,B-	C+,C,C-	D	F	W,drop	Total
5	9	4	2	1	3	24

Modifications Made to Course:

1. Formal recitation sessions with the teaching assistant were continued this year. In addition, homework was graded based on technical content and communication content according to a rubric provided to the students.

Course Objectives Assessment:

(Discuss how students are doing on a course objectives basis. There should be a section for each course objective explaining what exam questions, homework, exercises, etc. addressed that objective.)

Note that the student self-assessment rubric was changed this year since it was given separately from the college-wide course assessment process. With the new rubric, a score of 3 indicates meeting expectations.

1. To explain the concepts of dimensions, units, psychrometry, steam properties, and conservation of mass and energy;
Exam #1 primarily focuses on this objective covering concepts from chemistry and basic engineering. The average score on this section of the test was 41/60 with only four students receiving less than 33 (55%). Students had a self understanding rating of 3.9/5.0 on this objective.
2. To solve steady-state mass and energy balance problems involving multiple process units and recycle/bypass/purge streams;
Exam #1 (Take Home) and Exam #2 (Take Home) focused on problem solving especially involving multiple units. The average scores on these exams were 32.8 and 22.2, respectively. While this is slightly down from last year, it still reflects that the majority of the students are meeting this objective. Students had a self understanding rating of 3.6/5.0 on this objective.
3. To solve and understand simple unsteady-state mass and energy balances;
Homework #10 evaluated the students performance on non-steady state balances. The average score on this homework was 94/100. Students had a self understanding rating of 3.1/5.0 on this objective.
4. To assess the quality and quantity of data given in engineering problems and discuss the quality of the solutions derived from the data given;
In Design Problem #1, students are asked to evaluate the appropriateness of using psychrometric charts when the pressure deviates from 1 atmosphere. Most students were able to use the results of their project to determine appropriate bounds for their use. Students had a self understanding rating of 3.7/5.0 on this objective.
5. To solve more complicated problems using the software appropriate to the problem;
In Design Problem #2, students solve a simple engineering design problem using Excel or other appropriate mathematical software. The average score on this project was 95.5, ranging from 85 to 100. Students had a self understanding rating of 2.6/5.0 on this objective. The self-understanding score was below the minimum, so greater emphasis will be put on computer-based solutions of the problems.

6. To present the solutions to engineering problems in both oral and written form in a clear and concise manner. In the design problems, students must articulate in written form their solution and analysis. Students had a self understanding rating of 3.7/5.0 on this objective. In addition, the homeworks are given a communication score. The average communication score for each homework ranged from 4.2 to 5.0, with improvement being shown from the beginning of the class to the end.

Relation to Program Outcomes:

Paper Engineering

- (a) ☐ [FA] an ability to apply knowledge of mathematics, science, and engineering

Course Objectives #1 and #3 relate directly to this program outcome. A prerequisite exam was given covering material from Chemistry, Physics, and Mathematics, the three prerequisites for the course. The average scores on the chemistry section was 33/40, the physics section was 11.7/20, and the mathematics section was 35.3/40. The average score on the exam was 79.7 with a range from 63 to 97. The exam demonstrated adequate preparedness in the fundamentals of science.

- (b) ☒ [X] an ability to design and conduct experiments, as well as to analyze and interpret data

Course Objectives #2 and #4 support this outcome. As noted above the ability to solve problems on the take-home exams and the design problem demonstrate this outcome.

- (c) ☐ [F] an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability

Course Objective #5 supports this outcome. The students are able to use software to analyze a problem and make a decision based on the solution.

- (d) ☐ [F] an ability to function on multidisciplinary teams

Course Objective #5 supports this outcome. The students are allowed to work in teams to accomplish this task.

- (e) ☒ [X] an ability to identify, formulate, and solve engineering problems

- (f) ☐ [] an understanding of professional and ethical responsibility

- (g) ☒ [X] an ability to communicate effectively

Course Objective #6 supports this outcome.

- (h) ☐ [] the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context

- (i) ☐ [] a recognition of the need for, and an ability to engage in life-long learning

- (j) ☐ [] a knowledge of contemporary issues

- (k) ☐ [F] an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Course Objective #4 supports this outcome. The Design Problems given have the students utilize the engineering tools to solve a problem.

- (l) ☐ [] the ability to work in an industrial position within the [pulp, paper, and allied] [bioprocess industry] (industrial experience);

Student Feedback:

Student feedback was received on both the mid-semester and end-of-course evaluations for PSE 370. The greatest deficiency noted from the mid-semester exam was the use of the required reading from the textbook. The textbook was the lowest rated aspect of the class in the end-of-course assessment and in informal feedback from the students. However, the instructor-provided steam table reference material was the highest rated aspect of the course. This seems to indicate the need for a textbook that is written more in line with the learning styles of the students. Students seem to be grasping the concepts of the course.

A summary of the end of course feedback on the outcomes and activities is attached to this report.

Reflection:

The TA-led review sessions seemed to be extremely helpful to those who took advantage of them (rated 4.0/5.0). In addition, while there are many complaints about the amount of homework for the course, it is highly rated as promoting the understanding of the material (4.5/5.0) by the students. The availability of the lecture slides and the use of a course website also seem to increase the effectiveness of the course. It may be that a new textbook is needed for the course.

Proposed Actions for Course Improvement:

1. The use of the take-home exam will be continued as it gave students the opportunity to display their problem solving abilities with a lessened time constraint. In addition, students will continue to be strongly encouraged to work on the exam throughout the week that it is available and not put it off until the last minute. This will also apply to the homework problems.
2. The use of more advanced and industry-specific software will be included in the course. The software will then be utilized more fully in subsequent courses.

Outcomes Assessment		Distribution				
Summary	Average	1	2	3	4	5
1	3.9	0	1	3	7	4
2	3.6	0	1	8	2	4
3	3.1	1	2	8	3	1
4	3.7	0	0	7	5	3
5	2.6	1	5	8	1	0
6	3.7	0	0	6	8	1

Activities Assessment		Distribution				
Summary	Average	1	2	3	4	5
Homework	4.5	0	0	2	4	9
Design 1	3.6	1	0	7	3	4
Design 2	3.2	2	2	5	3	3
Website	4.1	1	0	3	4	7
Grade Access	3.7	2	0	3	5	5
Steam Tables	4.7	0	0	1	2	12
Textbook	2.3	3	6	5	1	0
Lecture Slides	4.1	0	1	4	3	7
Review Sessions	4.0	1	3	0	1	9
Office Hours	3.6	1	2	1	3	4

Faculty Course Assessment Report
Department of Paper and Bioprocess Engineering
PSE 370 / PSE 570 – Principles of Mass and Energy Balance (3 credits)
Fall 2011 – Scott, G.M.

Catalog Description:

Three hours of lecture per week. Conservation of mass and energy applied to steady-state and dynamic process units and systems. Problem analysis and solution; computational techniques. Thermodynamic data and their use; real vs. perfect gases; steam properties; psychrometry. Fall.

Prerequisites: FCH 152, PHY 211

Corequisites: MAT 296

Grade Distribution:

A,A-	B+,B,B-	C+,C,C-	D	F	W,drop	Total
10	17	3	2	1	3	36

Modifications Made to Course:

1. The lecture material was reorganized on a topical basis rather than a lecture basis. This allowed the posting of the slides grouped by topic regardless of the number of lectures it took to cover the topic. The result was less duplication of slides (as slides were posted in anticipation of covering material during a particular lecture) and making it easier to find slides on a particular topic (no need to search through lecture slides by days to find the topic). The more administrative material (announcements, etc.) were still posted by lecture day.
2. Greater emphasis was put on computer solutions to problems. Students were encouraged to use Excel and other software to solve the homework, take-home exams, and projects. Multiple examples of computer solutions were distributed to the course.

Course Objectives Assessment:

(Discuss how students are doing on a course objectives basis. There should be a section for each course objective explaining what exam questions, homework, exercises, etc. addressed that objective.)

The student self-assessment rubric was given separately from the college-wide course assessment process. With this rubric, a score of 3 indicates meeting expectations. The table below summarizes the students' self-assessment on their understanding of the course objectives. With the exception of objective #3, students felt that they met the expectations of the objective. Objective #3 deals with the introduction to non-steady state balances, which is presented at the end of the semester. However, the majority of the students have not had differential equations yet, making understanding of the material difficult. It is expected that their understanding increase after taking differential equations (APM 485) and process control (PSE 477). The improvement in objective #5 shows that the students are more comfortable using software to solve engineering problems.

Course Objective	Previous Average	Current Average	1 Needs Improvement	2	3 Met expectations	4	5 Exceeded Expectations
1	3.9	3.8			9	18	3
2	3.6	3.5		4	12	9	5
3	3.1	2.9	2	8	14	4	2
4	3.7	3.4		2	17	9	2
5	2.6	3.2	2	7	9	8	4
6	3.7	3.5		1	17	7	5

In the narrative to follow, the previous years results are indicated in brackets (e.g., [44/60]).

1. To explain the concepts of dimensions, units, psychrometry, steam properties, and conservation of mass and energy;

Exam #1 primarily focuses on this objective covering concepts from chemistry and basic engineering. The average score on this section of the test was 44/60 [41/60] with only one [four] student receiving less than 33 (55%).

2. To solve steady-state mass and energy balance problems involving multiple process units and recycle/bypass/purge streams;
Exam #1 (Take Home) and Exam #2 (Take Home) focused on problem solving especially involving multiple units. The average scores on these exams were 37.8 [32.8] and 31.8 [22.2], respectively. The improvement from the previous year shows that students are better understanding the problem solving aspects of the course.
3. To solve and understand simple unsteady-state mass and energy balances;
Homework #10 evaluated the students performance on non-steady state balances. The average score on this homework was 76/100 [94/100]. This data is consistent with the students' self-assessment of objective #3. This material is an introduction which is reinforced in subsequent courses.
4. To assess the quality and quantity of data given in engineering problems and discuss the quality of the solutions derived from the data given;
In Design Problem #1, students are asked to evaluate the appropriateness of using psychrometric charts when the pressure deviates from 1 atmosphere. Most students were able to use the results of their project to determine appropriate bounds for their use.
5. To solve more complicated problems using the software appropriate to the problem;
In Design Problem #2, students solve a simple engineering design problem using Excel or other appropriate mathematical software. The average score on this project was 93.7 [95.5], ranging from 30 to 100. The students' self-assessment improved for this objective.
6. To present the solutions to engineering problems in both oral and written form in a clear and concise manner.
In the design problems, students must articulate in written form their solution and analysis. In addition, the homeworks are given a communication score. The average communication score for each homework ranged from 4.5[4.2] to 4.9 [5.0], with improvement being shown from the beginning of the class to the end.

Relation to Program Outcomes:

Paper Engineering

- (a) [RA] an ability to apply knowledge of mathematics, science, and engineering

Course Objectives #1 and #3 relate directly to this program outcome. A prerequisite exam was given covering material from Chemistry, Physics, and Mathematics, the three prerequisites for the course. The average scores on the chemistry section was 33.5/40 [33.0/40], the physics section was 21.8/25 [11.7/20], and the mathematics section was 30.3/35 [35.3/40]. The average score on the exam was 85.6 [79.7] with a range from 51 [63] to 100 [97]. The exam demonstrated adequate preparedness in the fundamentals of science.

- (b) [I] an ability to design and conduct experiments, as well as to analyze and interpret data

Course Objectives #2 and #4 support this outcome. As noted above the ability to solve problems on the take-home exams and the design problem demonstrate this outcome.

- (c) [R] an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability

Course Objective #5 supports this outcome. The students are able to use software to analyze a problem and make a decision based on the solution.

- (d) [R] an ability to function on multidisciplinary teams

Course Objective #5 supports this outcome. The students are allowed to work in teams to accomplish this task.

- (e) [I] an ability to identify, formulate, and solve engineering problems

- (f) ☐ an understanding of professional and ethical responsibility
 (g) ☒ an ability to communicate effectively

Course Objective #6 supports this outcome.

- (h) ☐ the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
 (i) ☐ a recognition of the need for, and an ability to engage in life-long learning
 (j) ☐ a knowledge of contemporary issues
 (k) ☒ an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Course Objective #4 supports this outcome. The Design Problems given have the students utilize the engineering tools to solve a problem.

- (l) ☐ the ability to work in an industrial position within the [pulp, paper, and allied]bioprocess industry] (industrial experience);

Student Feedback:

Student feedback on various aspects of the course was solicited from students on a separate course activity assessment at the end of the course. The results of this survey are summarized in the table below:

Activity	Previous Average	Current Average	1 No information	2	3 Adequate Information	4	5 Exceptional Information
Homework Exercises	4.5	4.1		1	6	11	12
Design Problem #1	3.6	3.6	1	1	13	9	6
Design Problem #2	3.2	3.6		2	15	5	7
Course Website	4.1	4.1			9	9	12
Course Grade Access System	3.7	4.0	1	1	7	7	12
Steam Table Supplement	4.7	4.6			2	7	21
Textbook Readings	2.3	2.6	5	6	10	6	
Lecture slides	4.1	3.8	1		12	8	9
Review Sessions	4.0	3.4	1	2	14	7	4
Office Hours	3.6	3.2	2		16	3	3

As in the past, the textbook is the lowest rated aspect of the course. However, the chosen textbook is an excellent reference book for future courses. Additional comments provided by students include:

- More worked out examples provided
- Longer and more review sessions
- More indepth coverage of non-steady state problems
- More design problems
- Incorporate an exercise that collects “real-world” data
- Bring Mathcad more into the course
- More information from the bioprocess engineering side
- Less homework and more design projects
- More thorough overview of the problem solving techniques
- More coverage of energy balances

Reflection:

The course went well this year. The textbook continues to be an issue, but this is the first engineering course taken by the students and the choice of textbook is a balance between providing a learning text and a reference text. I tend to lean towards the reference text as more useful in the long run. Supplemental material for learning

can be provided through other means. It may also be better for the students to shift from using isolated homework problems to using homework problems that are more integrated into bigger systems. This would encourage students to think more broadly about problems rather than solving them as isolated instances. Perhaps the problems can be integrated into a “problem map” that shows more of the relationships amongst problems and concepts of the course.

Proposed Actions for Course Improvement:

1. The use of the take-home exam will be continued as it gave students the opportunity to display their problem solving abilities with a lessened time constraint.
2. The use of more advanced and industry-specific software will be included in the course. The software will then be utilized more fully in subsequent courses.
3. Provide more instructor-written material to supplement the textbook.
4. Use Blackboard@SU for course management.

Appendix 4 – Examples of a Program Assessment Report

The TracDat® assessment management system has the ability to produce reports on the assessment of the academic programs. The attached report represents an example of one such report, in this case, for the Environmental Resources Engineering program.

Program Assessment Report - 4 Column

SUNY College of Environmental Science and Forestry Program (ERE) - Environmental Resources Engineering BS

Program Learning Outcomes	Measures & Targets / Tasks	Results	Action & Follow-Up
<p>Program (ERE) - Environmental Resources Engineering BS - ABET - a. - An ability to apply knowledge of mathematics, science, and engineering</p> <p>Outcome Year(s): 2011 - 2012</p> <p>Start Date: 08/01/2010</p> <p>Outcome Status: Active</p> <p>PLO Target Met?: 3 - Met expectations</p>	<p>Measurement Scale: Exit Survey: Students were asked to indicate their agreement/disagreement level with the statement "I have the ability to apply knowledge of mathematics, science, and engineering." Strongly Agree (5 points) Agree (4 points) Neither Agree nor Disagree (3 points) Disagree (2 points) Strongly Disagree (1 point)</p> <p>Assessment Method: Survey of Students</p> <p>Target: Average score at or above 4.0</p> <p>Rubric: No rubric used</p>	<p>05/01/2012 - Average = 4.8</p> <p>Target Met: Evaluation - Met Target</p> <p>Reporting Period: 2011 - 2012</p>	
	<p>Measurement Scale: APM 395: Assessment considers the first four levels of Bloom's Taxonomy: Knowledge, Comprehension, Application and Analysis. Each level is assessed using a quantitative rubric of 0, 1, and 2 points. 2 points - student has fully achieved the expected performance criteria 1 point - some but limited ability to address the performance criteria 0 points - little or no ability to address the performance criteria.</p> <p>Assessment Method: Final Project</p> <p>Target: An average score of 1 should be obtained for each level</p> <p>Rubric: Rubric attached in Related Docs</p>	<p>06/01/2012 - Knowledge - Average = 1.4 Comprehension - Average = 1.5 Application - Average = 1.6 Analysis - Average = 1.5</p> <p>Target Met: Evaluation - Met Target</p> <p>Reporting Period: 2011 - 2012</p>	

Program Learning Outcomes	Measures & Targets / Tasks	Results	Action & Follow-Up
	Related Documents: Rubric - Outcome a - APM 395 Rubric - Outcome a - APM 395		
	Measurement Scale: ERE 371: Assessment considers the first four levels of Bloom's Taxonomy: Knowledge, Comprehension, Application and Analysis. Each level is assessed using a quantitative rubric of 0, 1, and 2 points. 2 points - student has fully achieved the expected performance criteria 1 point - some but limited ability to address the performance criteria 0 points - little or no ability to address the performance criteria. Assessment Method: Exam/Quiz - In Course Target: An average score of 1 should be obtained for each level Rubric: Rubric attached in Related Docs Related Documents: Rubric - Outcome a - ERE 371	06/01/2012 - Knowledge - Average = 1.3 Comprehension - Average = 1.5 Application - Average = 1.7 Analysis - Average = 1.7 Target Met: Evaluation - Met Target Reporting Period: 2011 - 2012	
Program (ERE) - Environmental Resources Engineering BS - ABET - b. - An ability to design and conduct experiments, as well as to analyze and interpret data Outcome Year(s): 2011 - 2012 Start Date: 08/01/2010 Outcome Status: Active PLO Target Met?: 3 - Met expectations	Measurement Scale: Exit Survey: Students were asked to indicate their agreement/disagreement level with the statement "I have the ability to design and conduct experiments, as well as to analyze and interpret data." Strongly Agree (5 points) Agree (4 points) Neither Agree nor Disagree (3 points) Disagree (2 points) Strongly Disagree (1 point) Assessment Method: Survey of Students Target: Average score at or above 4.0	05/01/2012 - Average = 4.3 Target Met: Evaluation - Met Target Reporting Period: 2011 - 2012	

Program Learning Outcomes	Measures & Targets / Tasks	Results	Action & Follow-Up
	Rubric: No rubric used Measurement Scale: APM 395: Assessment considers the first six levels of Bloom's Taxonomy: Knowledge, Comprehension, Application, Analysis, Synthesis, and Evaluation. Each level is assessed using a quantitative rubric of 0, 1, and 2 points. 2 points - student has fully achieved the expected performance criteria 1 point - some but limited ability to address the performance criteria 0 points - little or no ability to address the performance criteria. Assessment Method: Final Project Target: An average score of 1 should be obtained for each level Rubric: Rubric attached in Related Docs Related Documents: Rubric - Outcome b - APM395	06/01/2012 - Knowledge - average = 1.4 Comprehension - average = 1.5 Application - average = 1.8 Analysis - average = 0.9 Synthesis - average = 1.5 Evaluation - average = 1.1 Target Met: Evaluation - Did Not Meet Target Reporting Period: 2011 - 2012	06/01/2013 - Target was not met for one level evaluated. Given this is the first time this outcome produced a trigger, the initial response will be to allocate more time in APM395 to course related student learning outcomes and to reassess this outcome next year.
	Measurement Scale: ERE 365: Assessment considers components of outcome using overall grade on various labs to evaluate ability to: - design experiment - conduct experiment - analyze experiment - interpret data Assessment Method: Lab Project Target: Average score of 75% for each component Rubric: No rubric used	06/01/2012 - Design experiment - Average 94% Conduct experiment - Average 96% Analyze experiment - Average 92% Interpret Data - Average 84% Target Met: Evaluation - Met Target Reporting Period: 2011 - 2012	

Program Learning Outcomes	Measures & Targets / Tasks	Results	Action & Follow-Up
<p>Program (ERE) - Environmental Resources Engineering BS - ABET - c. - An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability</p> <p>Outcome Year(s): 2011 - 2012</p> <p>Start Date: 08/01/2010</p> <p>Outcome Status: Active</p> <p>PLO Target Met?: 3 - Met expectations</p>	<p>Measurement Scale: Exit survey: Students were asked to indicate their agreement/disagreement level with the statement "I have the ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability." Strongly Agree (5 points) Agree (4 points) Neither Agree nor Disagree (3 points) Disagree (2 points) Strongly Disagree (1 point)</p> <p>Assessment Method: Survey of Students</p> <p>Target: Average score at or above 4.0</p> <p>Rubric: No rubric used</p>	<p>05/01/2012 - Average = 4.3</p> <p>Target Met: Evaluation - Met Target</p> <p>Reporting Period: 2011 - 2012</p>	
	<p>Measurement Scale: ERE 275: This assessment is done at the first two levels of Bloom's Taxonomy: knowledge and comprehension Points were assigned to each student based on the following criteria Evaluation 1 (1 point): Students in groups articulated a problem relevant to ecological engineering and Syracuse, NY that could be resolved during the course of the semester. Evaluation 2 (1 point): Students in groups systematically considered and chose among three or more possible and reasonable solutions to resolve this environmental problem. Evaluation 3 (1 point): Students created a design from this solution that could be constructed using current ecological engineering tools.</p>	<p>06/01/2012 - Evaluation 1: Average = 4; Evaluation 2: Average = 4; Evaluation 3: Average = 4; Evaluation 4: Average = 4</p> <p>Target Met: Evaluation - Met Target</p> <p>Reporting Period: 2011 - 2012</p>	

Program Learning Outcomes	Measures & Targets / Tasks	Results	Action & Follow-Up
	<p>Evaluation 4 (1 point): Students clearly presented their design using written and CADD presentation.</p> <p>Assessment Method: Group Project</p> <p>Target: Average for each evaluation should be at or above a 3.0</p> <p>Rubric: No rubric used</p>		
	<p>Measurement Scale: ERE 489: Assessment of each team's performance in oral report across seven categories rated as</p> <ul style="list-style-type: none"> - Did Not Meet Expectations (score of 0) - Met Expectations (score of 1) - Exceeded Expectations (score of 2) <p>Assessment Method: Presentation/Performance</p> <p>Target: Average for each category of 1.0</p> <p>Rubric: Rubric attached in Related Docs</p> <p>Related Documents: Rubric - Outcome c - ERE 489</p>	<p>06/01/2012 - 1. Provided description - Average = 1.2</p> <p>2. Identified design constraints - Average = 1.1</p> <p>3. Analyzed alternatives - Average = 1.3</p> <p>4. Analysis used sound knowledge - Average = 1.2</p> <p>5. Developed cost/economic analysis - Average = 1.2</p> <p>6. Addressed impacts in various contexts - Average = 1.2</p> <p>7. Solution appropriate for stated problem/constraints - Average = 1.1</p> <p>Target Met: Evaluation - Met Target</p> <p>Reporting Period: 2011 - 2012</p>	
<p>Program (ERE) - Environmental Resources Engineering BS - ABET - d. - An ability to function on multi-disciplinary teams</p> <p>Outcome Year(s): 2011 - 2012</p> <p>Start Date: 08/01/2010</p> <p>Outcome Status: Active</p> <p>PLO Target Met?: 3 - Met expectations</p>	<p>Measurement Scale: Exit survey: Students were asked to indicate their agreement/disagreement level with the statement "I have the ability to function on multi-disciplinary teams."</p> <p>Strongly Agree (5 points)</p> <p>Agree (4 points)</p> <p>Neither Agree nor Disagree (3 points)</p> <p>Disagree (2 points)</p> <p>Strongly Disagree (1 point)</p> <p>Assessment Method: Survey of Students</p> <p>Target: Average score at or above 4.0</p>	<p>05/01/2012 - Average = 4.7</p> <p>Target Met: Evaluation - Met Target</p> <p>Reporting Period: 2011 - 2012</p>	

Program Learning Outcomes	Measures & Targets / Tasks	Results	Action & Follow-Up
	Rubric: No rubric used		
	Measurement Scale: ERE 275: This assessment is done at the Introductory Level for knowledge and comprehension. Points are assigned based on the following criteria 1 point: Student actively participates in group work. 1 point: Student can describe and discuss the role of other disciplines in sustainable engineering solutions. 1 point: Student is in a group that can name and describe at least three other chapters that relate to the chapter which they are evaluating. 1 point: Student is in a group that is able to complete the tasks required in the allotted time. Assessment Method: Presentation/Performance Target: Class has average score of at least 3 points. Rubric: No rubric used	06/01/2012 - Average score was 3.8 Target Met: Evaluation - Met Target Reporting Period: 2011 - 2012	
	Measurement Scale: ERE 489: Peer assessment is performed using eight criteria based on a Leikert scale, with 3 meaning the student meets the minimum expectation. We expect that the mean class rating will be greater than 3.5/5.0 for each criterion. Teamwork performance criteria - Materially participates in all team activities - Able to reach consensus, or compromise, to resolve conflict - Able to perform within assigned functional team role - Meets deadlines - Respectful of team members	06/01/2012 - Class averages: - Materially participated in all team activities: 4.25 - Able to reach consensus, or compromise (resolve conflict): 4.34 - Performed within assigned functional team role: 4.33 - Met deadlines: 4.02 - Respectful of team members: 4.50 - Behaved ethically: 4.70 - Contributed to design improvement: 4.49 - Speaks clearly to convey ideas and information accurately: 4.31 - Listens well: 4.28 Target Met:	

Program Learning Outcomes	Measures & Targets / Tasks	Results	Action & Follow-Up
	<ul style="list-style-type: none"> - Behaved ethically - Contributed to design improvement - Speaks clearly to convey ideas and information accurately - Listens well Rubric: No rubric used	Evaluation - Met Target Reporting Period: 2011 - 2012	
Program (ERE) - Environmental Resources Engineering BS - ABET - e. - An ability to identify, formulate, and solve engineering problems Outcome Year(s): 2011 - 2012 Start Date: 08/01/2010 Outcome Status: Active PLO Target Met?: 3 - Met expectations	Measurement Scale: Exit survey: Students were asked to indicate their agreement/disagreement level with the statement "I have the ability to identify, formulate, and solve engineering problems." Strongly Agree (5 points) Agree (4 points) Neither Agree nor Disagree (3 points) Disagree (2 points) Strongly Disagree (1 point) Assessment Method: Survey of Students Target: Average score at or above 4.0 Rubric: No rubric used	05/01/2012 - Average = 4.5 Target Met: Evaluation - Met Target Reporting Period: 2011 - 2012	
	Measurement Scale: ERE 440: Assessment considers three levels of Bloom's Taxonomy: Comprehension, Application and Evaluation. Each level is assessed using a quantitative rubric of 0, 1, and 2 points. 2 points - student has fully achieved the expected performance criteria 1 point - some but limited ability to address the performance criteria 0 points - little or no ability to address the performance criteria Assessment Method: Course Assignment Target:	06/01/2012 - The class average was above the trigger for all of the three levels assessed. Target Met: Evaluation - Met Target Reporting Period: 2011 - 2012	

Program Learning Outcomes	Measures & Targets / Tasks	Results	Action & Follow-Up
	<p>A trigger is any class average score below 1.5</p> <p>Rubric: Rubric attached in Related Docs</p> <p>Related Documents: Rubric - Outcome e - ERE440</p>		
	<p>Measurement Scale: ERE 335: Assessment considers the first three levels of Bloom's Taxonomy: Knowledge, Comprehension, and Application. Each level is assessed using a quantitative rubric of 0, 1, and 2 points. 2 points - student has fully achieved the expected performance criteria 1 point - some but limited ability to address the performance criteria 0 points - little or no ability to address the performance criteria</p> <p>Assessment Method: Exam/Quiz - In Course</p> <p>Target: For each performance criterion, an average score of 1 should be obtained.</p> <p>Rubric: Rubric attached in Related Docs</p> <p>Related Documents: Rubric - Outcome e - ERE335</p>	<p>06/01/2012 - Knowledge: 1.7 Comprehension: 1.2 Application: 1.8</p> <p>Target Met: Evaluation - Met Target</p> <p>Reporting Period: 2011 - 2012</p>	
<p>Program (ERE) - Environmental Resources Engineering BS - ABET - f. - An understanding of professional and ethical responsibility.</p> <p>Outcome Year(s): 2011 - 2012</p> <p>Start Date: 08/01/2010</p> <p>Outcome Status: Active</p> <p>PLO Target Met?:</p>	<p>Measurement Scale: Exit Survey: Students were asked to indicate their agreement/disagreement level with the statement "I have an understanding of professional and ethical responsibility." Strongly Agree (5 points) Agree (4 points) Neither Agree nor Disagree (3 points) Disagree (2 points) Strongly Disagree (1 point)</p> <p>Assessment Method: Survey of Students</p>	<p>05/01/2012 - Average = 4.7</p> <p>Target Met: Evaluation - Met Target</p> <p>Reporting Period: 2011 - 2012</p>	

Program Learning Outcomes	Measures & Targets / Tasks	Results	Action & Follow-Up
3 - Met expectations	Target: Average score at or above 4.0 Rubric: No rubric used		
	Measurement Scale: ERE 430: Assessment considers the first five levels of Bloom's Taxonomy: Knowledge, Comprehension, Application, Analysis, and Synthesis. Each level is assessed using a quantitative rubric of 0, 1, and 2 points. 2 points - student has fully achieved the expected performance criteria 1 point - some but limited ability to address the performance criteria 0 points - little or no ability to address the performance criteria. Assessment Method: Course Assignment Target: 80% of the class should have a total score of at least 7 Rubric: Rubric attached in Related Docs Related Documents: Rubric - Outcome f - ERE430	06/01/2012 - It appears that the students generally know, comprehend and apply the engineering code of ethics Target Met: Evaluation - Met Target Reporting Period: 2011 - 2012	
	Measurement Scale: ERE 430: The instructor uses a six-item opinion survey with a Leikert Scale to assess students' opinions about engineering practice. Numerical scores relate to opinion as follows: 5: Strongly Agree 4: Agree 3: Neutral 2: Disagree 1: Strongly Disagree Assessment Method: Survey of Students Target:	06/01/2012 - Four of six items had a non-neutral score; two items were closer to neutral. Target Met: Evaluation - Met Target Reporting Period: 2011 - 2012	

Program Learning Outcomes	Measures & Targets / Tasks	Results	Action & Follow-Up
	<p>For statements with which students should agree, the mean score should be at least 4.0. In similar fashion, for statements with which students would disagree, the mean score should be at most 2.0. We are looking for students to have a clear position (as opposed to a neutral score of 3)</p> <p>Rubric: No rubric used</p>		
<p>Program (ERE) - Environmental Resources Engineering BS - ABET - g. - An ability to communicate effectively</p> <p>Outcome Year(s): 2011 - 2012</p> <p>Start Date: 08/01/2010</p> <p>Outcome Status: Active</p> <p>PLO Target Met?: 3 - Met expectations</p>	<p>Measurement Scale: Exit Survey: Students were asked to indicate their agreement/disagreement level with the statement "I have the ability to communicate effectively." Strongly Agree (5 points) Agree (4 points) Neither Agree nor Disagree (3 points) Disagree (2 points) Strongly Disagree (1 point)</p> <p>Assessment Method: Survey of Students</p> <p>Target: Average score at or above 4.0</p> <p>Rubric: No rubric used</p>	<p>05/01/2012 - Average = 4.5</p> <p>Target Met: Evaluation - Met Target</p> <p>Reporting Period: 2011 - 2012</p>	
	<p>Measurement Scale: ERE 371 - graphics: Assessment considers the first four levels of Bloom's Taxonomy: Knowledge, Comprehension, Application and Analysis. Each level is assessed using a quantitative rubric of 0, 1, and 2 points. 2 points - student has fully achieved the expected performance criteria 1 point - some but limited ability to address the performance criteria 0 points - little or no ability to address the performance criteria.</p> <p>Assessment Method: Course Assignment</p>	<p>06/01/2012 - Average scores: Knowledge: 1.7 Comprehension: 1.7 Application: 2.0 Analysis: 1.0</p> <p>Target Met: Evaluation - Met Target</p> <p>Reporting Period: 2011 - 2012</p>	

Program Learning Outcomes	Measures & Targets / Tasks	Results	Action & Follow-Up
	<p>Target: For each performance criterion, an average score of 1 should be obtained</p> <p>Rubric: Rubric attached in Related Docs</p> <p>Related Documents: Rubric - Outcome g - ERE371</p>		
	<p>Measurement Scale: ERE 489 - oral: Assessment of team and individual performance using the following scale: - Did Not Meet Expectations: score of 0 - Met Expectations: score of 1 - Surpassed Expectations: score of 2</p> <p>Assessment Method: Presentation/Performance</p> <p>Target: Average and median score for all criteria of 1.0</p> <p>Rubric: No rubric used</p>	<p>06/01/2012 - Averages for team criteria: - Introduction told audience purpose of presentation: 1.1 - Used a logical approach to present material: 1.2 - Conclusion summarized important points of design: 1.2 - Visual Aids were appropriate and supported oral presentation: 1.2</p> <p>Averages for individual criteria: - Convey knowledge: 1.6 - Maintained eye contact: 1.4 - Displayed enthusiasm: 1.4 - Spoke clearly: 1.6</p> <p>Target Met: Evaluation - Met Target</p> <p>Reporting Period: 2011 - 2012</p>	
	<p>Measurement Scale: APM 395 - Written: Assessment considers the first five levels of Bloom's Taxonomy: Knowledge, Comprehension, Application, Analysis, and Synthesis. Each level is assessed using a quantitative rubric of 0, 1, and 2 points. 2 points - student has fully achieved the expected performance criteria 1 point - some but limited ability to address the performance criteria 0 points - little or no ability to address the performance criteria.</p> <p>Assessment Method: Final Project</p>		

Program Learning Outcomes	Measures & Targets / Tasks	Results	Action & Follow-Up
	Target: For each performance criterion, an average score of 1 should be obtained Rubric: Rubric attached in Related Docs Related Documents: Rubric - Outcome g - APM395		
	Measurement Scale: ERE 399 - written: Assessment considers two levels of Bloom's Taxonomy: Application and Analysis. Each level is assessed using a quantitative rubric of 0, 1, and 2 points. 2 points - student has fully achieved the expected performance criteria 1 point - some but limited ability to address the performance criteria 0 points - little or no ability to address the performance criteria. Assessment Method: Final Project Target: 95% of the class should attain a minimum of 1 in all categories and a minimum score of 3 overall. Rubric: Rubric attached in Related Docs Related Documents: Rubric - Outcome g - ERE339	06/01/2012 - All students scored a minimum of 1 in each category All students received a total score of at least 3 Target Met: Evaluation - Met Target Reporting Period: 2011 - 2012	
Program (ERE) - Environmental Resources Engineering BS - ABET - h. - The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context Outcome Year(s): 2011 - 2012 Start Date: 08/01/2010	Measurement Scale: Exit Survey: Students were asked to indicate their agreement/disagreement level with the statement "I have the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context." Strongly Agree (5 points) Agree (4 points) Neither Agree nor Disagree (3 points)	05/01/2012 - Average = 4.2 Target Met: Evaluation - Met Target Reporting Period: 2011 - 2012	

Program Learning Outcomes	Measures & Targets / Tasks	Results	Action & Follow-Up
Outcome Status: Active PLO Target Met?: 3 - Met expectations	Disagree (2 points) Strongly Disagree (1 point) Assessment Method: Survey of Students Target: Average score at or above 4.0 Rubric: No rubric used		
	Measurement Scale: ERE 340: Assessment considers the first four levels of Bloom's Taxonomy: Knowledge, Comprehension, Application and Analysis. Integer points are awarded, and as complexity of criteria increases, the maximum points rises from 1 to 2. Assessment Method: Course Assignment Target: The class average for each criterion should be at least 75% of the total possible score. All student averages should be above 70% of the total possible score. Rubric: Rubric attached in Related Docs Related Documents: Rubric - Outcome h - ERE340	06/01/2012 - Average scores: - Knowledge: 100% - Comprehension: 100% - Application: 82% - Analysis: 90% One individual was below the 70% average. Target Met: Evaluation - Met Target Reporting Period: 2011 - 2012	
Program (ERE) - Environmental Resources Engineering BS - ABET - i. - A recognition of the need for, and an ability to engage in life-long learning Outcome Year(s): 2011 - 2012 Start Date: 08/01/2010 Outcome Status: Active PLO Target Met?:	Measurement Scale: Students were asked to indicate their agreement/disagreement level with the statement "I recognize the need for, and have the ability to engage in life-long learning." Strongly Agree (5 points) Agree (4 points) Neither Agree nor Disagree (3 points) Disagree (2 points) Strongly Disagree (1 point) Assessment Method: Survey of Students	05/01/2012 - Average = 4.5 Target Met: Evaluation - Met Target Reporting Period: 2011 - 2012	

Program Learning Outcomes	Measures & Targets / Tasks	Results	Action & Follow-Up
3 - Met expectations	Target: Average score at or above 4.0 Rubric: No rubric used		
	Measurement Scale: ERE 133: Assessment considers the first three levels of Bloom's Taxonomy: Knowledge, Comprehension, and Application. Each level is assessed using a quantitative rubric of 0, 1, and 2 points. 2 points - student has fully achieved the expected performance criteria 1 point - some but limited ability to address the performance criteria 0 points - little or no ability to address the performance criteria. Assessment Method: Course Assignment Target: For each performance criterion, an average score of 1 should be obtained. Individuals should have an aggregate score of at least 3 with at least 1 in each category. Rubric: Rubric attached in Related Docs Related Documents: Rubric - Outcome i - ERE133	06/01/2012 - Average scores: - Knowledge:1.6 - Comprehension: 1.7 - Application: 1.4 Two individuals fell below minimum targets and had follow up discussion. Target Met: Evaluation - Met Target Reporting Period: 2011 - 2012	
Program (ERE) - Environmental Resources Engineering BS - ABET - j. - A knowledge of contemporary issues Outcome Year(s): 2011 - 2012 Start Date: 08/01/2010 Outcome Status: Active PLO Target Met?: 3 - Met expectations	Measurement Scale: Exit Survey: Students were asked to indicate their agreement/disagreement level with the statement asked was "I have knowledge of contemporary issues." Strongly Agree (5 points) Agree (4 points) Neither Agree nor Disagree (3 points) Disagree (2 points) Strongly Disagree (1 point) Assessment Method: Survey of Students	05/01/2012 - Average = 3.8 Target Met: Evaluation - Did Not Meet Target Reporting Period: 2011 - 2012	05/01/2012 - Average was below target level. Need to monitor this outcome to evaluate if lack of attainment related to lack of understanding on part of individual students. Direct assessment of outcome using other measures suggests outcome is being attained.

Program Learning Outcomes	Measures & Targets / Tasks	Results	Action & Follow-Up
	Target: Average score at or above 4.0 Rubric: No rubric used		
	Measurement Scale: ERE 340: The performance criteria scale with Bloom's Taxonomy, from Knowledge to Application. For each performance criteria student blog work was judged and points were awarded. Knowledge: 1pt for title, 1pt for source, 1pt for date. 3pt max. Comprehension: 1pt for issue, 1pt for newsworthy item Application: 1pt for detailed news Assessment Method: Course Assignment Target: The class average for each criterion should be at least 75% of the total possible score. All student averages should be above 70% of the total possible score. Rubric: No rubric used	06/01/2012 - Class averages: - Knowledge: 85% - Comprehension: 100% - Application: 100% One individual was below the 70% threshold. Target Met: Evaluation - Met Target Reporting Period: 2011 - 2012	
	Measurement Scale: ERE 440 - Assessment considers two levels of Bloom's Taxonomy: Comprehension and Application. Each level is assessed using a quantitative rubric of 0, 1, and 2 points based on assignment grade. 2 point: Applied correctly (> 80%) 1 point: Some difficulty (30-80%) 0 points: Significant issue (< 30%) Assessment Method: Course Assignment Target: Class average should be at least 1.5 for each level considered. Rubric:	06/01/2012 - Class averages: - Comprehension: 2.0 - Application: 1.7 Target Met: Evaluation - Met Target Reporting Period: 2011 - 2012	

Program Learning Outcomes	Measures & Targets / Tasks	Results	Action & Follow-Up
	No rubric used		
	Measurement Scale: ERE 468: Assessment considers the first four levels of Bloom's Taxonomy: Knowledge, Comprehension, Application and Analysis. Each level is assessed using a quantitative rubric of 0, 1, and 2 points. 2 points - student has fully achieved the expected performance criteria 1 point - some but limited ability to address the performance criteria 0 points - little or no ability to address the performance criteria. Assessment Method: Course Assignment Target: For each learning category, the total average score should be 1 or greater. Rubric: Rubric attached in Related Docs Related Documents: Rubric - Outcome j - ERE468	06/01/2012 - Class average: - Knowledge: 1.94 - Comprehension: 1.94 - Application: 1.89 - Analysis: 1.89 Target Met: Evaluation - Met Target Reporting Period: 2011 - 2012	
Program (ERE) - Environmental Resources Engineering BS - ABET - k. - An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice Outcome Year(s): 2011 - 2012 Start Date: 08/01/2010 Outcome Status: Active PLO Target Met?: 3 - Met expectations	Measurement Scale: Students were asked to indicate their agreement/disagreement level with the statement asked was "I have the ability to use the techniques, skills, and modern engineering tools necessary for engineering practice." Strongly Agree (5 points) Agree (4 points) Neither Agree nor Disagree (3 points) Disagree (2 points) Strongly Disagree (1 point) Assessment Method: Survey of Students Target: Average score at or above 4.0 Rubric:	05/01/2012 - Average = 4.2 Target Met: Evaluation - Met Target Reporting Period: 2011 - 2012	

Program Learning Outcomes	Measures & Targets / Tasks	Results	Action & Follow-Up
	No rubric used		
	Measurement Scale: ERE 440: Assessment considers the first four levels of Bloom's Taxonomy: Knowledge, Comprehension, Application and Analysis. Each level is assessed using a quantitative rubric of 0, 1, and 2 points. 2 points - student has fully achieved the expected performance criteria 1 point - some but limited ability to address the performance criteria 0 points - little or no ability to address the performance criteria. Assessment Method: Lab Project Target: Class average for each level should be at least 1.5 Rubric: Rubric attached in Related Docs Related Documents: Rubric - Outcome k - ERE440	06/01/2012 - Class averages: - Knowledge: 2.0 - Comprehension: 1.8 - Application: 1.95 - Analysis: 1.84 Target Met: Evaluation - Met Target Reporting Period: 2011 - 2012	
	Measurement Scale: ERE 335: Assessment considers four levels of Bloom's Taxonomy: Comprehension, Application, Analysis, and Synthesis. Each level is assessed using a quantitative rubric of 0, 1, and 2 points. Each level is assessed using a quantitative rubric of 0, 1, and 2 points based on assignment grade. 2 point: Applied correctly (> 80%) 1 point: Some difficulty (30-80%) 0 points: Significant issue (< 30%) Assessment Method: Course Assignment Target: An average score of 1 should be attained for each performance level. Rubric:	06/01/2012 - Average scores: - Comprehension: 1.8 - Application: 1.8 - Analysis: 1.4 - Synthesis: 1.4 Target Met: Evaluation - Met Target Reporting Period: 2011 - 2012	

Program Learning Outcomes	Measures & Targets / Tasks	Results	Action & Follow-Up
	No rubric used		

Appendix 5 – Examples of Using TracDat for Program Assessment

The three figures in this appendix show a sample of the ways that the program assessment coordinators can use the management system to coordinate and document the activities in the academic departments. Figure 4 shows the summary page for the Environmental Science program indicating the number of student learning outcomes, the number of results, and the number of actions taken. Figure 5 shows the student learning outcomes for the program. Figure 6 shows the results for one of the student learning outcomes. Figure 7 shows the actions taken as a result of the assessments done.

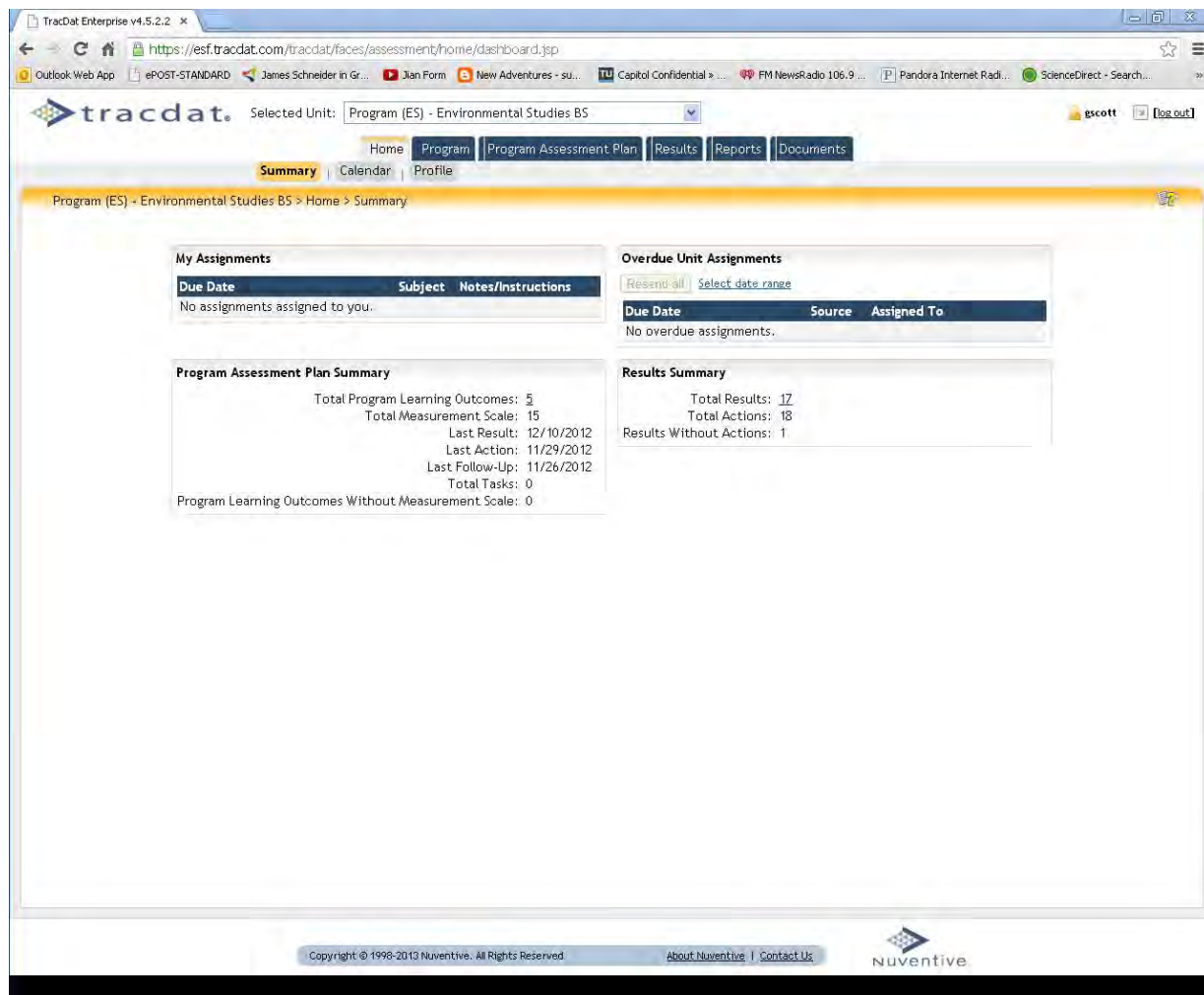


Figure 4. Summary page for the Environmental Studies program.

TracDat Enterprise v4.5.2.2

https://esf.tracdat.com/tracdat/faces/assessment/assessment_plan/objectives.jsp

Outlook Web App | ePOST-STANDARD | James Schneider in Gr... | Jian Form | New Adventures - su... | Capitol Confidential > ... | FM NewsRadio 106.9 ... | Pandora Internet Radi... | ScienceDirect - Search...

tracdat. Selected Unit: Program (ES) - Environmental Studies BS

Home | Program | Program Assessment Plan | Results | Reports | Documents

Program Learning Outcomes | Measures | Related Courses | Related Items

Program (ES) - Environmental Studies BS > Program Assessment Plan > Program Learning Outcomes

Program Learning Outcome Name	Program Learning Outcome	Outcome Status	
⊖ Critical Thinking	Demonstrate critical thinking skills in relation to environmental affairs	Active	edit copy delete
⊖ Communication	Demonstrate knowledge and application of communication skills and the ability to write effectively in a variety of contexts.	Active	edit copy delete
⊖ Interdisciplinary Synthesis	Demonstrate an ability to integrate the many disciplines and fields that intersect with environmental concerns.	Active	edit copy delete
⊖ Ecological Literacy	Demonstrate an awareness, knowledge, and appreciation of the intrinsic values of ecological processes and communities.	Active	edit copy delete
⊖ Sustainability	Demonstrate an integrative approach to environmental issues with a focus on sustainability.	Active	edit copy delete

Add New Program Learning Outcome

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Figure 5. Program learning outcomes for the Environmental Studies program.

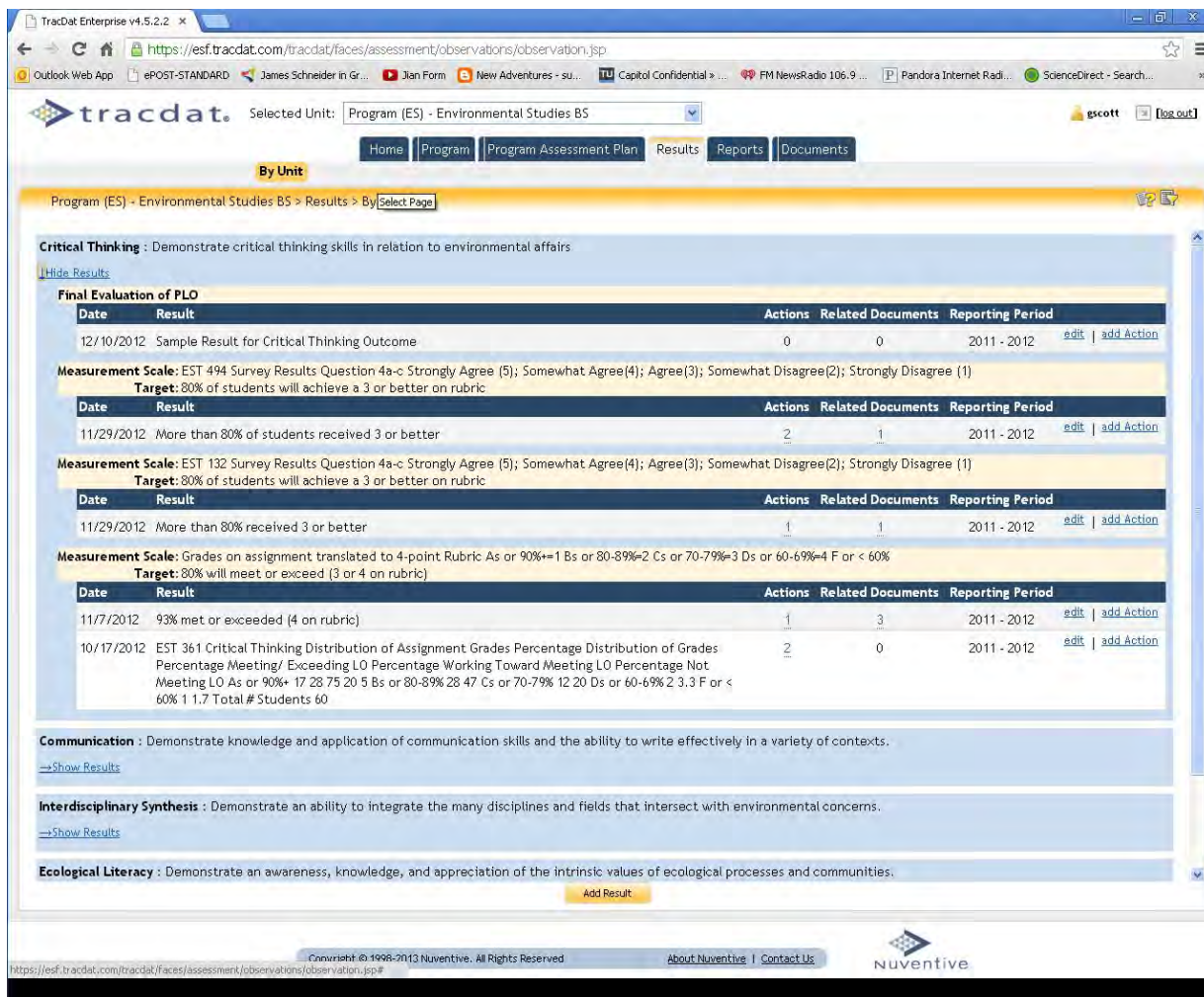


Figure 6. Results for the critical thinking student learning outcome for the Environmental Studies program.

TracDat Enterprise v4.5.2.2

https://esf.tracdat.com/tracdat/faces/assessment/observations/editObservation.jsp

Selected Unit: Program (ES) - Environmental Studies BS

Home Program Program Assessment Plan Results Reports Documents

By Unit

Program (ES) - Environmental Studies BS > Results > Edit Result

Program Learning Outcome: Critical Thinking : Demonstrate critical thinking skills in relation to environmental affairs

Measurement Scale: Survey of Students - EST 494 Survey Results Question 4a-c Strongly Agree (5); Somewhat Agree(4); Agree(3); Somewhat Disagree(2); Strongly Disagree (1)

Target: 80% of students will achieve a 3 or better on rubric

* More than 80% of students received 3 or better

Result:

Result Date: * 11/29/2012 Target Met: * Evaluation - Met Target

Reporting Period: * 2011 - 2012

Action Plan Related Documents

Action Date	Action	Follow-Up	
11/29/2012	Continue program as is but also develop more precise survey instrument	0	edit add Follow-Up
11/29/2012	Work on developing a more precise survey instrument to measure Los	0	edit add Follow-Up

Save Changes Discard Changes Return Change Association Delete Result

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Figure 7. Example of actions taken in response to assessment results.