

College of Agriculture, Food and Environmental Sciences
NATURAL RESOURCES MANAGEMENT
EMPLOYER SURVEYING: INDUSTRY PERSPECTIVES

PROJECT BACKGROUND

THREE PHASE ASSESSMENT PLAN

The Natural Resource Management Department collaborated with Career Services in assessing the academic programs related to Forestry & Natural Resources and Environmental Management & Protection through employer surveying. A three phase plan was established. Phase I included assessing:

- Quality of NRM Graduates
- Industry Readiness, Performance and Promotion
- Student Learning Outcomes
- Employer Value on Student Learning Outcomes
- Salary Scale Information

An Employer Survey Instrument was designed to specifically assess these areas. Under Phase I, a pilot program was established to test the instrument utilizing the FNR/ENVM Advisory Council members. The student learning outcomes were aligned with accreditation standards which will be used for upcoming program review and self-study.

Under Phase II, the instrument could be used to assess a broader base of employers and industry representatives. Under Phase III, the instrument could be modified to assess student perceived learning. All these efforts would support program review and accreditation.

OTHER UNIVERSITY ASSESSMENT EFFORTS

Career Services has also collaborated with the Colleges of Business, Engineering, Education and Architecture & Environmental Design in assessing the quality of graduates and student learning outcomes. These college-wide assessments have been aligned with accreditation standards. Career Services has recently expanded assessment to include the CAFES Graduate Programs, and now the Natural Resource Management Department.

OBJECTIVES

The following objectives were established for this report:

1. Graduate Qualities
Measure the quality of graduates, industry readiness, performance and promotion capabilities of NRM graduates (FNR & ENVM Programs).
2. Student Learning Outcomes
Measure skill attainment related to student learning outcomes established by the department, in alignment with accreditation standards.
3. Employer Values
Measure the importance employers place on the student learning outcomes.
4. Salary Information
Determine the salary scales information on graduates.

PROGRAM DESIGN

The Natural Resource Management Department and Career Services developed an employer survey that was tailored to meet the unique and specific needs of the academic programs. The survey was broken into two sections as indicated below:

Section 1: Graduate Assessment

Quality	Satisfied with the quality of FRN and ENVM graduates
Industry Readiness	Able to make an immediate contribution to the workplace
Performance	Able to take on increase responsibilities after one year of employment
Promotion	Possess the skill sets to be promoted within three years

Section 2: Student Learning Outcomes

NRM Fundamentals	Demonstrate competency in scientific and technical knowledge related to forestry and environmental management
Specialization Knowledge	Demonstrate depth of knowledge, skills, and perspectives within their selected natural resource management specialization
Quantitative Knowledge	Demonstrate proficiency in quantitative skills and information management
Problem Solving	Able to use traditional and non-traditional approaches to define a problem, identify potential alternatives, gather appropriate knowledge and information to formulate and articulate a solution
Communication	Demonstrate effective speaking skills
Writing	Demonstrate effective writing skills
Diversity	Understand diverse perspectives and generate solutions that incorporate them
Leadership	Demonstrate effective peer leadership
Ethics	Understand professional and ethical responsibilities as foresters, natural resource managers and environmental managers including the societal impact of FNR/ENVM
Interdisciplinary Teamwork	Demonstrate effective participation in teams
Life-Long Learning	Engage in continuous education and keep current within the field

Refer to Appendix A for the survey form.

STUDY PROFILE

The employers who participated in this survey were members of the FNR/ENVM Advisory Council. Surveys were collected Fall Quarter of 2008. The surveys were completed by industry leaders, managers, and supervisors.

<i>NRM Programs</i>	<i>Employers</i>	<i>Surveys</i>
Forestry & Natural Resources	14	15
Environmental Mgmt & Protection	11	11

Refer to Appendix B for a detailed breakdown of employer participation by department.

PROJECT FINDINGS

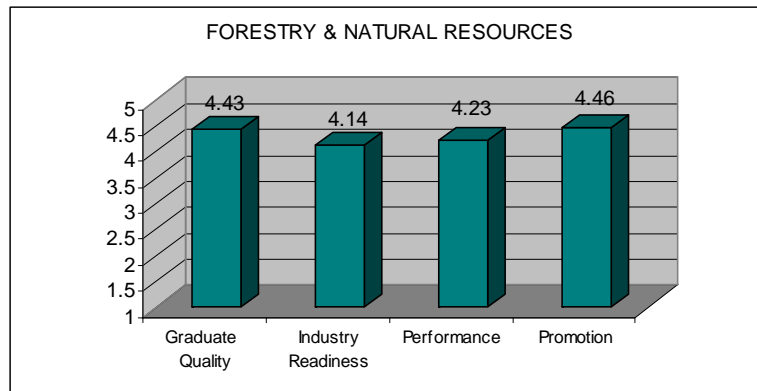
1. GRADUATE QUALITIES

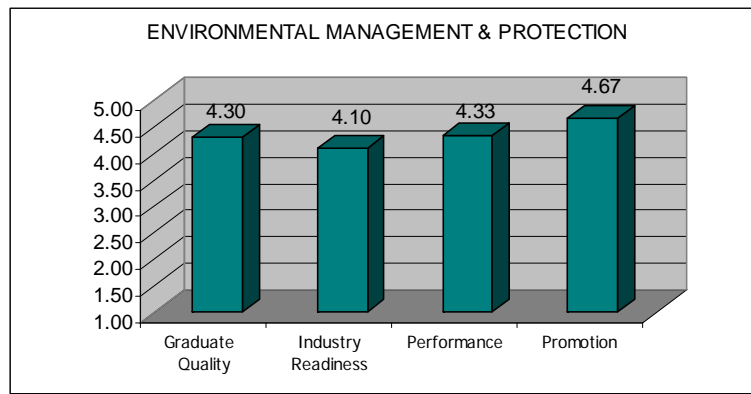
OBJECTIVES: Measure the quality graduates, industry readiness, performance and promotion capabilities of NRM graduates (FNR & ENVM Programs). Measure the importance employers place on the student learning outcomes.

METHODOLOGY: Surveys were completed by employers to evaluate NRM graduates using a 5-point scale (*1 = lowest; 2 = low; 3 = medium; 4 = high; 5 = highest*).

FINDINGS: Employers reported the following findings:

QUALITY OF GRADUATES – The survey assessed graduate quality, industry readiness, performance and promotion capabilities. The chart below is a graphical presentation of scale score averages for each of the majors.





Employers were satisfied with the quality of NRM graduates, with an overall scale score average of 4.43 for Forestry & Natural Resources and 4.15 for Environmental Management & Protection.

The following chart reports the same data, but it has been formatted differently, reporting numerically on each of the scale score categories. This provides a breakdown of responses and is particularly helpful in analyzing the data.

QUALITY OF GRADUATES – The survey assessed overall quality (*My company is satisfied with the quality of NRM graduates*).

QUALITY OF GRADUATES	Survey Responses	Lowest	Low	Medium	High	Highest	Scale Scores
<i>Scale Scores</i>		1	2	3	4	5	Average
Forestry & Natural Resources	14	0	0	1	6	7	4.43
Environmental Mgmt & Protection	10	0	0	1	5	4	4.30

INDUSTRY READINESS – The survey assessed industry readiness (*NRM graduates are able to make an immediate contribution to the workplace*).

INDUSTRY READINESS	Survey Responses	Lowest	Low	Medium	High	Highest	Scale Scores
<i>Scale Scores</i>		1	2	3	4	5	Average
Forestry & Natural Resources	14	0	0	3	6	5	4.14
Environmental Mgmt & Protection	10	0	0	3	3	5	4.10

PERFORMANCE – The survey assessed performance (*NRM graduates are able to take on increase responsibility after one year of employment*).

PERFORMANCE	Survey Responses	Lowest	Low	Medium	High	Highest	Scale Scores
<i>Scale Scores</i>		1	2	3	4	5	Average
Forestry & Natural Resources	13	0	0	2	6	5	4.23
Environmental Mgmt & Protection	9	0	0	1	4	4	4.33

PROMOTION – The survey assessed promotion capabilities (*NRM graduates possess the skill sets to be promoted within three years*).

PROMOTION	Survey Responses	Lowest	Low	Medium	High	Highest	Scale Scores
<i>Scale Scores</i>		1	2	3	4	5	Average
Forestry & Natural Resources	13	0	0	1	5	7	4.46
Environmental Mgmt & Protection	9	0	0	0	3	6	4.67

2. STUDENT LEARNING OUTCOMES

OBJECTIVE: Measure skill attainment related to student learning outcomes established by the department, in alignment with accreditation standards.

STANDARDS: The NRM Department identified the student learning outcomes that may be applied to Forestry & Natural Resources and Environmental Management & Protection. Each student learning outcomes is fully defined within the survey instrument to assist employers in the scoring process.

METHODOLOGY: Surveys were completed by employers to measure the success of business graduates based on student learning outcomes, using a 5-point scale (*1 = lowest; 2 = low; 3 = medium; 4 = high; 5 = highest*).

FINDINGS: The following charts indicate the scale score averages and the numeric value for each of the student learning outcomes.

Employers reported the following findings:

Natural Resource Management		Lowest	Medium	High	Highest	Total	Scale
Forestry & Natural Resources						Surveys	Score
LEARNING OUTCOMES		1/2	3	4	5		Average
1	NRM Fundamentals	0	1	10	3	14	4.18
2	Specialization Knowledge	0	5	8	0	13	3.62
3	Quantitative Knowledge	0	2	11	1	14	3.93
4	Problem Solving	0	2	7	4	13	4.15
5	Communication	0	2	11	1	14	3.93
6	Writing	0	2	9	3	14	4.07
7	Diversity	0	5	7	1	13	3.69
8	Leadership	0	4	10	0	14	3.68
9	Ethics	0	3	7	4	14	4.07
10	Interdisciplinary Teamwork	0	2	7	5	14	4.21
11	Life-Long Learning	0	6	6	1	14	3.62

Natural Resource Management		Lowest	Medium	High	Highest	Total	Scale
Environmental Mgmt & Prot						Surveys	Score
LEARNING OUTCOMES		1/2	3	4	5		Average
1	NRM Fundamentals	0	1	6	3	10	4.15
2	Specialization Knowledge	0	0	5	4	9	3.44
3	Quantitative Knowledge	0	1	8	1	10	4.00
4	Problem Solving	0	1	5	3	9	4.22
5	Communication	0	2	8	0	10	3.80
6	Writing	0	2	7	1	10	3.90

7	Diversity	0	3	5	1	9	3.78
8	Leadership	0	4	6	0	10	3.55
9	Ethics	0	3	4	3	10	4.00
10	Interdisciplinary Teamwork	0	2	4	4	10	4.20
11	Life-Long Learning	0	5	3	1	9	3.56

Although the scale score averages indicate overall strength in all learning outcome areas, it is important to note the breakdown of responses, specifically in the neutral and medium areas where there is less agreement. The purpose of the assessment process is to provide useful information from an industry perspective to the department and academic programs to evaluate the academic programs, strengthen the curriculum, support accreditation and assist the university in assessing institutional effectiveness and performance.

3. EMPLOYER VALUES

Employers also assessed the importance they place on each of the learning outcome areas. For employer value, the importance factor is the ranking of the scale score averages, not necessarily the scale score itself. The learning outcomes are ranked in order of importance from an employer perspective.

NATURAL RESOURCE MANAGEMENT		FNR	FNR
Forestry & Natural Resources		Scale Score	Employer
IMPORTANCE		Average	Importance
1	Writing	4.07	4.73
2	Interdisciplinary Teamwork	4.21	4.60
3	Communication	3.93	4.53
4	Problem Solving	4.15	4.50
5	Ethics	4.07	4.40
6	Life-Long Learning	3.62	4.21
7	NRM Fundamentals	4.18	4.13
8	Quantitative Knowledge	3.93	4.13
9	Leadership	3.68	4.11
10	Diversity	3.69	3.54
11	Specialized Knowledge	3.62	3.43

NATURAL RESOURCE MANAGEMENT		EMP	EMP
Environmental Mgmt & Protection		Scale Score	Employer
IMPORTANCE		Average	Importance
1	Writing	3.90	4.73
2	Interdisciplinary Teamwork	4.20	4.64
3	Communications	3.80	4.55
4	Ethics	4.00	4.27
5	Life-Long Learning	3.56	4.10
6	Leadership	3.55	4.05
7	NRM Fundamentals	4.15	4.00
8	Quantitative Knowledge	4.00	4.00
9	Problem Solving	4.22	4.00
10	Diversity	3.78	3.95
11	Specialized Knowledge	3.44	3.50

4. SALARY INFORMATION

Employers were asked to provide the starting salary and what they pay employees after 5 years of experience. The results are indicated below:

Academic Programs	Starting Salary	5 Years Experience
Forestry & Natural Resources	\$ 40,167	\$ 51,786
Environmental Mgmt & Protection	\$ 41,591	\$ 55,250

SUMMARY

REPORT SUMMARY

The Natural Resource Management Department collaborated with Career Services to design an Employer Survey instrument to assess the quality, industry readiness, performance and promotion capabilities of NRM graduates. The instrument also assessed student learning outcomes that aligned with accreditation standards. In addition, employers were asked to assess the importance or the value they place on the student learning outcomes. Under Phase I, A pilot program was established utilizing the Industrial Advisory Council members to test the instrument. Employers reported:

- **GRADUATE QUALITY**
Employers reported they were satisfied with the quality of NRM graduates with a scale score average range of 4.30 - 4.43 using a 5-point scale. Employers also reported that NRM graduates were industry ready (4.10 - 4.14), able to take on increased responsibilities after one year of employment (4.23 - 4.33), and possess the skill sets to be promoted within three years (4.46 - 4.67).
- **STUDENT LEARNING OUTCOMES**
Employers reported scale scores averages for Forestry & Natural Resources in interdisciplinary teamwork, NRM fundamentals, writing, and ethics, with lower scale score averages in specialized knowledge, life-long learning and diversity.
Employers reported scale score averages for Environmental Management & Protection in interdisciplinary teamwork, problem solving, ethics, and quantitative knowledge, with lower scale score averages in specialized knowledge, leadership and life-long learning. The data will be useful to the FNR/ENVM Advisory Council and faculty in evaluating the curriculum.
- **EMPLOYER VALUES**
Employers reported the top learning outcomes were writing, interdisciplinary teamwork, communications and ethics. The data will be useful to the FNR/ENVM Advisory Council and faculty in relating the curriculum to industry needs.
- **SALARY INFORMATION**
Employers reported the starting salary for Forestry & Natural Resources was \$40,167, with a salary of \$51,786 after five years experience. Employers also

reported the starting salary for Environmental Management & Protection was \$41,591, with a salary of \$55,250 after five years experience.

The assessment process reflected a NRM commitment towards program review. Program review is designed to generate discussion with faculty and university constituents to enhance and strengthen the curriculum, and better prepare NRM graduates for success in industry.

FUTURE PLANS

There are two other future plans associated with this assessment effort.

- Phase II: The survey will be used across a broader base of employers and industry representatives over Winter and Spring Quarters 2009. This will involve faculty participation in soliciting employer participation. Data will be compiled during Summer Quarter 2009 along with a final report.
- Phase III: The survey may be modified to assess student perceived learning through senior seminar courses during Spring Quarter 2009. Data will be compiled during Summer Quarter 2009 along with a final report.

Phase II and Phase III would support program review and accreditation using both direct and indirect sources to assess student learning.

APPENDIX A

CAL POLY

California Polytechnic State University
 College of Agriculture, Food & Environmental Services
 Natural Resource Management Department (NRM)

Career Services
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 (805)756-5726 / Fax: (805)756-1593

NRM EMPLOYER SURVEY

Instructions: The thoughts and opinions of our employers are important to us in evaluating the quality of our NRM programs and effectiveness of our NRM graduates. Your response will be treated confidentially. Please complete the survey for Cal Poly graduates for whom you have information. Thank you.	
Name/Title	Telephone Number:
Company Name	Email Address:
Please indicate the majors you hire	
<input type="checkbox"/> Forestry & Natural Resources <input type="checkbox"/> Environmental Management & Protection	
Attainment: Indicate the degree to which Cal Poly graduates have achieved the following learning objectives: NA = not applicable, 1 = lowest, 2 = low, 3 = medium, 4 = high, 5 = highest	
Importance: Rate how important the following learning objectives are to your company: NA = not applicable, 1 = lowest value, 2 = low value, 3 = medium, 4 = high value, 5 = highest value	

Learning Objectives – Society of American Foresters (SAF)		Attainment					Importance						
		NA	1	2	3	4	5	NA	1	2	3	4	5
1.	NRM Fundamentals - Demonstrate competency in scientific and technical knowledge related to forestry & environmental management	□	□	□	□	□	□	□	□	□	□	□	□
2.	Specialized Knowledge – Demonstrate depth of knowledge, skill, and perspectives within their selected natural resource management specialization	□	□	□	□	□	□	□	□	□	□	□	□
3.	Quantitative Knowledge – Demonstrate proficiency in quantitative skills and information management	□	□	□	□	□	□	□	□	□	□	□	□
4.	Problem Solving – Able to use traditional and non-traditional approaches to define a problem, identify potential alternatives, gather appropriate knowledge and information to formulate and articulate a solution	□	□	□	□	□	□	□	□	□	□	□	□
5.	Communication – Demonstrate effective speaking skills	□	□	□	□	□	□	□	□	□	□	□	□
6.	Writing – Demonstrate effective writing skills	□	□	□	□	□	□	□	□	□	□	□	□

7.	Diversity – Understand diverse perspectives and generate solutions that incorporate them	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
8.	Leadership – Demonstrate effective peer leadership	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
9.	Ethics – Understand professional and ethical responsibility as foresters, natural resource managers and environmental managers including the societal impact of FNR/ENVM	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
10	Interdisciplinary Teamwork – Demonstrate effective participation in teams	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
11	Life-Long Learning – Engage in continuous education and keep current within the field	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

Attainment: Indicate the degree to which Cal Poly graduates have achieved the following standards:
NA = not applicable, 1 = lowest, 2 = low, 3 = medium, 4 = high, 5 = highest

Other Standards		Attainment					
		NA	1	2	3	4	5
1.	Overall Quality – My company is satisfied with the overall quality of NRM graduates	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	Industry Readiness – NRM graduates are able to make an immediate contribution to the workplace	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	Performance – NRM graduates are able to take on increase responsibilities after one year of employment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	Promotion – NRM graduates possess the skill sets to be promoted within three years	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Using the salary scale below, please indicate what you pay new graduates. Also indicate what you pay employees with five years experience. Check only the disciplines that apply.

Disciplines	\$30 to \$35K	\$35 to \$40K	\$40- \$45K	\$45 to \$50K	\$50 to \$55K	\$55 to 60K	\$60 to 65K	\$65K +
Forestry & Natural Resources New Graduate Salary Range	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Forestry & Natural Resources 5 Years Experience Salary Range	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Environmental Mgmt & Protection New Graduate Salary Range	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Environmental Mgmt & Protection 5 Years Experience Salary Range	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Do you have any suggestions on how the Natural Resource Management Department might improve its academic programs?

APPENDIX B

EMPLOYER SURVEYS (2008)		FNR	EMP	Total
1	Board of Forestry & Fire Protection	1		1
2	CA Forest Products Commission	1	1	2
3	City of Glendale	1	1	2
4	Collins Pine Company	1		1
5	County of Los Angeles Fire Department	1	1	2
6	Dudek	1	1	2
7	ESRI, Inc	1	1	2
8	Green Diamond Resource Company	1		1
9	Humboldt Redwood Company	1	1	2
10	Newhall Land & Farming	1	1	2
11	Sequoia & King Canyon NP's	1	1	2
12	Sierra Pacific Industries	1		1
13	URS Corporation	1	1	2
14	USDI, Bureau of Land Management	1	1	2
15	USDI, Bureau of Land Management	1	1	2
	TOTAL SURVEYS	15	11	26