University of Alaska Fairbanks

New Degree Program Request: Format 3

ENVIRONMENTAL STUDIES CERTIFICATE

34 Credits minimum

Submitted by
UAF BBC
College of Rural and Community Development
October 2008

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I. COVER MEMORANDUM

A. NAMES OF PERSONS PREPARING REQUEST

This request prepared by Dr. Debi McLean, Director of University of Alaska Fairbanks (UAF) Bristol Bay Campus (BBC), Dr. Todd Radenbaugh, Assistant Professor of Environmental Studies at the UAF BBC, Jodie Anderson, Term Instructor for the School of Natural Resources and Agricultural Sciences (SNRAS)/Agricultural and Forestry Experimental Station (AFES), UAF and science faculty for UAF BBC.

B. BRIEF STATEMENT OF PROPOSED PROGRAM

Overview:

Bristol Bay Campus designs educational opportunities in partnership with regional entities and communities to empower residents and address economic development. The Environmental Studies (ENVI) certificate will not specifically train a student for one career path but will teach the students a universal skill set that will be used for a broad range of careers. These skills obtained by an ENVI certificate holder will then serve as a foundation for any realm of environmental technician work available in their communities. Training local students in these skills will not only give employers an opportunity to hire locally for technician work that is traditionally completed by non-local technicians, but will also support local economic development.

The following Bristol Bay region communities employ two Tribal Environmental Program employees each. There is a correlation between environmental training and employability in those positions within these communities: Aleknagik, Clark's Point, Ekwok, Manokotak, New Stuyahok, Togiak, Levelock, Pilot Point, and Dillingham.

A partnership has developed between the Bristol Bay Native Association Tribal Environment Program and the Bristol Bay Campus' offering of pilot ENVI courses. Twenty-eight villages in the Bristol Bay region have 45 positions available as Environmental Coordinators or Environmental Assistants. Tribal Environment Program employees are encouraged to participate in pilot ENVI courses to broaden their technician skill set and to improve their knowledge of environmental systems and natural resource dynamics.

In Alaska, landscape level changes are taking place due to both climate change and human activities such as mining, oil exploration, toxicology, tourism, and environmental remediation. The Bristol Bay Advisory Committee for this certificate met in 2006 and recommended the development of a program to address community-level environmental issues. Input from the Committee as to specific employment skills needed in technician-level careers in environmental sciences and natural resources were incorporated into all of the ENVI courses. In 2008, the Committee voted on continued support for the development of this educational program.

Employability needs precipitating the development of this program came from analysis of surveys from 2002 to 2005 conducted by CRCD and UAF BBC indicated that there is need in rural Alaska for more graduates in the environmental sciences. Another area of need recognized during this program development was the American Indian/Alaska Native unemployment rate is about three times as high as the unemployment rate for the non-Native population. The National Center for Educational Statistics (NCES) (2003) reports that

American Indians/Alaska Natives students were more likely to have dropped out of school than non-Native students and scored lower, on average, than non-Native students on the SAT and the ACT in 2004. It has been the UAF BBC experience that rural Alaskan high school students are even less prepared than urban students for the academic rigor of science at the university level. Thus, responding to these employability and community needs, the UAF BBC's proposed ENVI certificate will work to provide the preparation needed for students to enter into a science-related associate or baccalaureate degree while gaining the basic academic preparation and sought after vocationally related skills necessary for entry-level careers in the environmental studies.

The mission of the ENVI certificate program is to provide students, including Alaska Native and rural students, with quality academic instruction and training responsive to community needs. This program will help empower graduates and their communities to adapt to the overwhelming social, ecological, and economic changes presently occurring while protecting and enriching local culture.

The ENVI certificate is a 34-36 credit program and is offered through the UAF BBC of the CRCD and will be a stepping-stone for students pursuing a science-related associate or baccalaureate program.

Objectives:

a) Objectives

- To expose the students to a broad-based, environmental studies background.
- To prepare students to address specific community-based environmental issues.
- Learn the basic interdisciplinary skills needed for general laboratory and field-based work in the environmental sciences such as inventorying biota or monitoring a few key water quality indicators.
- To prepare students to advance into a science or policy related Associate or Baccalaureate program or other undergraduate course work in the sciences.
- To prepare students academically and vocationally for entry-level employment in the field of natural resources and environmental science.
- To develop basic academic skills and gain essential knowledge in environmental studies that is integrated with a community-based environmental perspective.
- To introduce students to the established UAF BBC student support system that will provide tutorial, mentorship, and academic support.
- To provide students with the tools necessary for successful employment.
- To introduce students to university science programs that encourages academic development into advanced degrees.
- To promote skill development that integrates wellness, self-sufficiency, and community development.

C. APPROVALS

Director, UAF BBC	**Date**
Math/Science Division Coordinator **College of Rural and Community Development**	**Date**
Curriculum Council Chair, **College of Rural and Community Development**	**Date**
Dean, College of Rural and Community Development	**Date**
President, UAF Faculty Senate	**Date**
Chancellor, UAF	**Date**
President, University of Alaska	**Date**
Board of Regents	**Date**

II. IDENTIFICATION OF THE PROGRAM

A. DESCRIPTION OF THE PROGRAM

1. **Program Title:** Environmental Studies (ENVI)
2. **Level of the program:** Certificate
3. **Admission Requirements and Prerequisites**:
   The Environmental Studies (ENVI) program is a one and a one-half year certificate and represents a broad course of study that is culturally relevant both locally and statewide. This certificate provides the basic academic preparation and sought after vocationally related skills necessary for entry-level careers in the environmental sciences while also serving as a stepping-stone into science-related associate or baccalaureate programs such as: the UAF A.S. degree, UAF's Geography B.S. (Option 1: Environmental Studies) degree, a UAA Minor in Geography and Environmental Studies, the UAS Environmental Science B.S. degree, and the UAS Sitka Campus' A.A.S. in Environmental Technology degree. Holders of the ENVI certificate will have earned at least 34 credits and been exposed to hands-on science projects.

   Admission is open to all individuals, especially those interested in entering into a science-related field.

   Students should have a high school diploma or GED. Due to the science focus of this certificate, it is noted that students seeking admission to this certificate will benefit from having completed a high school, lab-based science course preferably in biology, chemistry, or physics as well as math through the algebra level. Students also should be familiar with computer applications, such as word processing, spreadsheets, database, and operating systems.

   Students planning to articulate into an associate or baccalaureate program need to work closely with their advisors and are encouraged to select courses meeting core requirements in the associate or baccalaureate disciplines and UAF courses with an X designator.

   Students whose ACT/SAT scores are not high enough to place them into regular college level classes will be required to take the ASSET or COMPASS test and will be placed into the appropriate developmental level course.

   To remain in good standing students must:
   a) Maintain an overall 2.0 grade point average
   b) Maintain a 2.0 grade or higher in all Math and Science courses

4. **Program Outline and Course Descriptions**

ENVIRONMENTAL STUDIES (ENVI) CERTIFICATE OUTLINE

1. Complete the general university requirements

2. Complete the following general Certificate requirements 9 cr

a. Communication…..(complete one of the following).....3 cr:

1) ENGL 111X – Introduction to Academic Writing .....3 cr OR

2) ABUS 170 – Business Writing .....3 cr

b. Computation……...(complete one of the following).....3 cr:

1) Any course at the 100-level or above in mathematical sciences (computer science, math, or statistics).....3 cr OR
2) DEVM 105 – Intermediate Algebra.....3 cr

c. Human Relations…...(complete one of the following).....3 cr;
1) ANTH 100X/SOC 100X – Individual, Society & Culture .....3 cr OR
2) ABUS 154 – Human Relations.....3 cr OR
3) Other program approved discipline-based human relations course or discipline-based with embedded human relation content to total 3 credits

3. Complete the following ENVI requirements 22-23 cr

a. Science Foundation Courses…(complete one from each of the following) 8 cr;
1) BIOL 103X – Biology and Society.....4 cr OR
2) BIOL 104X – Natural History of Alaska.....4 cr OR
3) BIOL 115X – Fundamentals of Biology I .....4 cr ******

AND

4) CHEM 103X – Basic General Chemistry.....4 cr OR
5) CHEM 105X – General Chemistry I .....4 cr *****

*****Course requires placement in ENG 111 and MATH 107X
******Course requires CHEM 105X as a pre- or co-requisite, and placement in ENG 111 and MATH 107X

b. Environmental Studies Core Courses…(complete all seven below)**14-15** cr;
1) ENVI 101 – Introduction to Environmental Science.....3 cr
2) ENVI 110 – Introduction to Water Quality I: Measurement .....1 cr
3) ENVI 130 – Introduction to National Environmental Protection Act (NEPA) .....1 cr
4) ENVI 160 – Internship in Environmental Studies .....1-2 cr
5) ENVI 260 – Field Techniques for Environmental Technicians...2 cr
6) ENVI 265 – Introduction to Methods in Environmental Studies Reporting .....2 cr
7) GEOG 211X – Earth Systems: Elements of Physical Geography 4 cr

4. **Complete 3 or 4 credits from the following elective courses 3-4 cr**

a. BIOL 104X – Natural History of Alaska.....4 cr
b. BIOL 115X – Fundamentals of Biology I .....4 cr
c. CHEM 104X – Beginnings in Biochemistry .....4 cr
d. CHEM 105X – General Chemistry I .....4 cr
e. DEVS 100 – Introduction to Science.....4 cr
f. FISH 101 – Introduction to Fisheries .....3 cr
g. HLRM 130 – Research Field Logistics .....2 cr
h. NRM 101 – Natural Resources Conservation and Policy.....3 cr

i. RD 250 – Grant Writing for Community Development .....1-3 cr
j. STAT 200X – Elementary Probability and Statistics*** .....3 cr
k. Advisor Approved Elective****.....1-3 cr

(*** if used for Computational Credit above, cannot be used for elective credit)

(**** of similar level and subject matter to the listed elective courses)

Total .....minimum of 34 credits, maximum of 59 credits

Course Descriptions

Except for specific ENVI courses, this degree relies on existing UAF courses to meet its requirements.

General Certificate Requirements (9 credits)

ABUS 154 – Human Relations (3 credits) – Attitudes, self-concepts, personal communication styles, motivation, interactions, positive reinforcements, team building and leadership development.

ABUS 170 – Business Writing (3 credits) – Comprehensive review of grammar, punctuation, capitalization and spelling, with emphasis on business and office occupations.

ANTH/SOC 100X – Individual, Society and Culture (3 credits) – An examination of the complex social arrangements guiding individual behavior and common human concerns in contrasting cultural contexts.

DEVM 105 – Intermediate Algebra (3 credits) – Second year high school algebra. Operations with rational expressions, radicals, rational exponents, logarithms, inequalities, quadratic equations, linear systems, functions, Cartesian coordinate system and graphing. To matriculate to MATH 107X from DEVM 105 a grade of B or higher is required.

ENGL 111X – Introduction to Academic Writing (3 credits) – Instruction and practice in written inquiry and critical reading. Introduction to writing as a way of developing, exploring and testing ideas. Concentration on research methods and techniques.

ENVI Requirements (22-23 credits)

General Science Foundation Courses (8 credits) One from each of the following groups - courses must include lab.

BIOL 103X – Biology and Society (4 credits) – Fundamental principles of biology; emphasis on their application to humans in the modern world. Lectures, laboratory demonstrations, experiments and discussions of contemporary biological topics. For non-science majors; cannot be used as a biology elective by biological science majors.

BIOL 104X – Natural History of Alaska (4 credits) – The physical environment peculiar to the North and important in determining the biological setting; major ecosystem concepts to develop an appreciation for land use and wildlife management problems in both terrestrial and aquatic situations. May not be used as biology elective credit for a major in biological science.

BIOL 115X – Fundamentals of Biology I (4 credits) – Introduction to the principles of biology for science majors, with emphasis on chemistry of life, cell structure, metabolism, genetics and animal form and function. Students for whom this course is required for their major will

be given preference when space is limited. Prerequisites: High school algebra or equivalent; placement in ENGL F111X or higher; placement in DEVM F105 or higher; or permission of instructor. Prerequisite/co-requisite: CHEM F105X. Recommended: High school biology.

CHEM 103X – Basic General Chemistry (4 credits) – Fundamentals of chemistry including historical and descriptive aspects as well as basic mathematical concepts. Fulfills the laboratory part of the natural science requirement and prepares the student for CHEM 105X. Note: This course satisfies elective credit only. Materials fee: $60. (Prerequisite: Placement in ENG111X or higher; placement in DEVM 105 or higher; **or permission of instructor**)

CHEM 105X – General Chemistry I (4 credits) – CHEM F105X-F106X, together, constitute the standard one-year engineering and science-major general chemistry course with laboratory. Major subjects include measurements, calculations, atomic and molecular structure, gas laws, stoichiometry, an introduction to organic chemistry, chemical reactions and related energy changes. Special fees apply. Prerequisites: Placement in ENGL F111X or higher; placement in MATH F107X or higher; or a B or better in CHEM F103X; or permission of instructor and department chair.

<u>ENVI Core Courses</u> (14-15 credits)

ENVI 101 – Introduction to Environmental Science (3 credits) – This interdisciplinary course introduces the interconnected topics that make up environmental science. By exploring Earth's systems, environmental questions are investigated such as how to sustainably use natural resources and influence of population growth on ecosystems. The course takes a holistic approach to reinforce scientific principles. Key topics covered include ecosystem functions, energy, biodiversity, resource management, landscape alteration and climate change.

ENVI 110 – Introduction to Water Quality I: Measurement and Calibration (1 credit) – This course introduces students to standard water quality methods used in the field and applies them to rural Alaska. Students will become familiar with EPA water quality standards and programs that help preserve water quality in rural communities. Key topics covered include: stream ecology, wastewater management, storm water runoff, and data analysis.

ENVI 130 – Introduction to National Environmental Protection Act (NEPA) (1 credit) – This course provides a brief introduction to the National Environmental Protection Act (NEPA). This course will explain what community members need to do to be heard in the NEPA process with special emphasis on public involvement and Environmental Impact Analysis (EIA). The course covers the roles and the content of scoping and Environmental Assessments in relation to key natural resource development projects in rural Alaska.

ENVI 160 – Internship in Environmental Studies (1-2 credits) – Under the guidance of a UAF Bristol Bay Campus approved agency or business (public or private) students gain supervised pre-professional experience in environmental studies. The intern will explore the interdisciplinary aspects of field or laboratory research, build practical expertise, and make contacts. Internships make one to ten weeks of full time commitment to the agency or business and when completed make public presentations on the experience.

ENVI 260 – Field Techniques for Environmental Technicians (2 credits) – This course provides hands-on instruction in interdisciplinary field and laboratory techniques used by environmental technicians. Basic methods for sampling and studying terrestrial or aquatic

ecosystems will be introduced. Students will participate in data collection and analysis procedures as part of an independent research project.

ENVI 265 – Introduction to Methods in Environmental Studies Reporting (2 credits) – Introduces basic data collection methods used in environmental studies then concentrates on research skills necessary to analyze, interpret, and document field and laboratory data and the scientific reporting processes. The course is designed to integrate raw environmental data into a research report that can be presented in scientific meeting format.

GEOG 211X –Earth Systems: Elements of Physical Geography (4 credits) – Interdisciplinary analysis of the processes that form Earth's physical environment, and how those processes condition the human environment. Includes system interactions among weather, climate, landforms, soils, water resources and vegetation, including world and regional patterns.

ENVI Elective Courses (Minimum of 3-4 credits)

BIOL 104X – Natural History of Alaska (4 credits) – The physical environment peculiar to the North and important in determining the biological setting; major ecosystem concepts to develop an appreciation for land use and wildlife management problems in both terrestrial and aquatic situations. May not be used as biology elective credit for a major in biological science.

BIOL 115X – Fundamentals of Biology I (4 credits) – Introduction to the principles of biology for science majors, with emphasis on chemistry of life, cell structure, metabolism, genetics and animal form and function. Students for whom this course is required for their major will be given preference when space is limited. Prerequisites: High school algebra or equivalent; placement in ENGL F111X or higher; placement in DEVM F105 or higher; or permission of instructor. Prerequisite/co-requisite: CHEM F105X. Recommended: High school biology.

CHEM 104X – A Survey of Organic Chemistry and Biochemistry (4 credits) – Fundamentals of chemistry as applied to biological systems. Bridges the gap between a general chemistry course and biochemical concepts of other health-related sciences. Recommended for health-science degree candidates and non-science majors interested in the central role of chemistry in life. May be used to meet the general laboratory science requirement or for preparation for CHEM F105X. Special fees apply. Prerequisites: CHEM F103X; placement in ENGL F111X or higher; placement in DEVM F105 or higher; or permission of instructor.

CHEM 105X – General Chemistry I (4 credits) – CHEM F105X-F106X, together, constitute the standard one-year engineering and science-major general chemistry course with laboratory. Major subjects include measurements, calculations, atomic and molecular structure, gas laws, stoichiometry, an introduction to organic chemistry, chemical reactions and related energy changes. Special fees apply. Prerequisites: Placement in ENGL F111X or higher; placement in MATH F107X or higher; or a B or better in CHEM F103X; or permission of instructor and department chair.

DEVS 100 – Introduction to Science (4 credits) – Introduction to skills needed to succeed in core science courses. Topics include scientific terminology, scientific mathematical notation, and the fundamentals of chemistry, physics and biology. Includes basic scientific lab techniques and the skills needed to learn scientific material. Prerequisites: Elementary algebra and college reading level.

FISH 101 – Introduction to Fisheries (3 credits) – A survey of the values, habitats, biology, ecology and management of fishes with particular reference to Alaskan fisheries and issues.

HLRM 130 – Field Logistics (2 credits) - Learn the skills, techniques, and equipment used in remote scientific fieldwork in Alaska. Course includes methods for processing and storing animal/plant tissue samples, orienteering, GPS, wilderness first aid, arctic survival, bear safety, aviation safety, as well as ATV, boat, and snowmachine operation, maintenance and repair.

NRM 101 – Natural Resources Conservation and Policy (3 credits) – Conservation of natural resources including history, ecological and social foundations. Examines principles of sustained yield, carrying capacity, supply and demand, and world population growth as applied to agriculture, range, forest, wildlife, fisheries, recreation, minerals and energy management. A wide range of perspectives is presented to help students develop a personal philosophy toward natural resources. Prepare a multiple resource observation plan for an underdeveloped area on campus. Optional all-day field trips take place the first two Saturdays of the semester. (Prerequisite: Placement in ENGL 111X.)

RD 250 – Grant Writing for Community Development (Levels 1-3)(1-3 credits) – Focuses on basic elements of grant proposals and processes of preparing proposals for governmental and private funding sources. Emphasis on applied skills through preparation of actual grant proposals.

STAT 200X – Elementary Probability and Statistics (3 credits) – Descriptive statistics, frequency of distributions, sampling distributions, elementary probability, estimation of population parameters, hypothesis testing (one and two sample problems), correlation, simple linear regression and one-way analysis of variance. Parametric and nonparametric methods. Also available via Independent Learning. (Prerequisites: MATH 107X, 161X, 181 or permission of instructor.)

5. **Requirements for the ENVI Certificate:**

To receive an ENVI Certificate, students must attain at least 34 credits of lower division (100-200 level) courses. Nine credits will be met through general university requirements. Eighteen to twenty credits will be met through the ENVI required courses: ENVI Core Courses (14-16 credits) and the General Science Foundation Courses (8 credits). The remaining three to four credits will be met through completion of electives.

Sample Course of Study for Full-time Students

Full-Time Course of Study for the ENVI Certificate

Year 1

Fall		**Spring**	
Communication	3 credits	Human Relations	3 credits
Computation	3 credits	Science Foundation II	4 credits
Science Foundation I	4 credits	ENVI 101	3 credits
GEOG 211	4 credits	ENVI 110	1 credit
		ENVI 130	1 credit
Fall total	14 credits	Spring total	12 credits

Year 2

Summer		**Fall**	
ENVI 160	1-2 credits	ENVI 265	2 credits
ENVI 260	2 credits	Elective	3-4 credits
Summer total	3-4 credits	Fall total	5-6 credits

TOTAL = 34-35 credits for completion of ENVI Certificate

Sample Course of Study for Part-time Students

Part-Time Course of Study for the ENVI Certificate

Year 1

Fall		**Spring**	
Communication	3 credits	Science Foundation II	4 credits
Science Foundation I	4 credits	ENVI 101	3 credits
Fall Total	7 credits	Spring Total	7 credits

Year 2

Summer		**Fall**	
ENVI 160	1-2 credits	ENVI 265	2 credits
ENVI 260	2 credits	Computation	3 credits
		Human Relations	3 credits
Summer Total	3-5 credits	Fall Total	8 credits

Spring	
ENVI 110	1 credit
ENVI 130	1 credit
Elective	3 credits
GEOG 211	4 credits
Spring Total	9 credits

TOTAL = 34-35 credits for completion of ENVI Certificate

Sample Course of Study for Full-time Rural Students

Full-Time Course of Study for the ENVI Certificate

Year 1

Fall		**Spring**	
Communication	3 credits	Human Relations	3 credits
Computation	3 credits	Science Foundation II	4 credits
Science Foundation I	4 credits	ENVI 101	3 credits
GEOG 211	4 credits	ENVI 110	1 credit
		ENVI 130	1 credit

Fall total	14 credits	Spring total	12 credits

Year 2

Summer		**Fall**	
ENVI 160	1-2 credits	ENVI 265	2 credits
ENVI 260	2 credits	Elective	3 credits
Summer total	3-4 credits	Fall total	5 credits

TOTAL = 34-35 credits for completion of ENVI Certificate

Sample Course of Study for Part-time Rural Students

Part-Time Course of Study for the ENVI Certificate

Year 1

Fall		**Spring**	
Communication	3 credits	Science Foundation II	4 credits
Science Foundation I	4 credits	ENVI 101	3 credits
Fall Total	7 credits	Spring Total	7 credits

Year 2

Summer		**Fall**	
ENVI 160	1-2 credits	ENVI 265	2 credits
ENVI 260	2 credits	Computation	3 credits
		Human Relations	3 credits
Summer Total	3-5 credits	Fall Total	8 credits

Spring	
ENVI 110	1 credit
ENVI 130	1 credit
Elective	3 credits
GEOG 211	4 credits
Spring Total	9 credits

TOTAL = 34-35 credits for completion of ENVI Certificate

3-Year Campus Core Course Cycle

COURSE	Fall 2009	Spring 2010	Summer 2010	Fall 2010	Spring 2011	Summer 2011	Fall 2011	Spring 2012	Summer 2012

ENGL 111X	X	X	X	X	X	X	X	X	X
ABUS 170	X	X		X	X		X	X	
DEVM 105	X	X	X	X	X	X	X	X	X
ANTH/SOC 100X	X	X		X	X		X	X	
ABUS 154	X	X		X	X		X	X	
ENVI 101		X			X			X	
ENVI 110		X			X			X	
ENVI 130		X			X			X	
ENVI 160			X			X			X
ENVI 260			X			X			X
ENVI 265	X			X			X		
GEOG 211X	X	X		X	X		X	X	
BIOL 103X	X			X			X		
BIOL 104X		X			X			X	
BIOL 115X	X			X			X		
CHEM 103X	X			X			X		
CHEM 105X	X			X			X		

3-Year Rural Delivered Core Course Cycle

COURSE	Fall 2009	Spring 2010	Summer 2010	Fall 2010	Spring 2011	Summer 2011	Fall 2011	Spring 2012	Summer 2012
ENGL 111X	X	X		X	X		X	X	
ABUS 170	X	X		X	X		X	X	
DEVM 105	X	X		X	X		X	X	
ANTH/SOC 100X	X	X		X	X		X	X	
ABUS 154	X	X		X	X		X	X	
ENVI 101		X			X			X	
ENVI 110		X			X			X	
ENVI 130		X			X			X	
ENVI 160			X			X			X
ENVI 260			X			X			X
ENVI 265	X			X			X		
GEOG 211X	X			X			X		
BIOL 103X	X			X			X		
BIOL 104X		X			X			X	
BIOL 115X	X			X			X		
CHEM 103X	X			X			X		
CHEM 105X	X			X			X		

Proposed Catalog Description

Environmental Studies (ENVI) Certificate Requirements
Environmental Studies Certificate

College of Rural and Community Development, Bristol Bay Campus (907) 842-5109
http://www.uaf.edu/bbc/

Minimum Requirements for Certificate: 34 credits

This certificate addresses many of the environmental issues that influence Alaskan communities and provides the basic academic preparation for entry-level vocational environmental careers. Further it serves as stepping-stone into science-related associate or baccalaureate programs. Admission is open to all individuals, including those employed by, or interested in employment with state, federal or tribal agencies or other groups providing natural resource management services. Due to the science focus of this certificate, it is noted that students will benefit from having completed a high school, lab-based science biology or chemistry course as well as algebra.

As Alaska continues to develop it natural resources, there is an increasing need for qualified environmental specialists.

To remain in good standing students must:

a) Maintain an overall 2.0 grade point average or higher
b) Maintain a 2.0 grade or higher in all Math and Science courses

ENVIRONMENTAL STUDIES (ENVI) CERTIFICATE OUTLINE

1. Complete the general university requirements

2. Complete the following general Certificate requirements 9 cr

Communication…..(complete one of the following).....3 cr:
ENGL 111X – Introduction to Academic Writing .....3 cr OR
ABUS 170 – Business Writing .....3 cr

Computation……...(complete one of the following).....3 cr:
Any course at the 100-level or above in mathematical sciences (computer science, math, or statistics).....3 cr OR
DEVM 105 – Intermediate Algebra.....3 cr

Human Relations…...(complete one of the following).....3 cr;
ANTH 100X/SOC 100X – Individual, Society & Culture .....3 cr OR
ABUS 154 – Human Relations.....3 cr OR
Other program approved discipline-based human relations course or discipline-based with embedded human relation content to total 3 credits

3. Complete the following ENVI requirements 22-23 cr

Science Foundation Courses…(complete one from each of the following) 8 cr;

BIOL 103X – Biology and Society.....4 cr OR
BIOL 104X – Natural History of Alaska.....4 cr OR
BIOL 115X – Fundamentals of Biology I .....4 cr *****

AND

CHEM 103X – Basic General Chemistry.....4 cr OR
CHEM 105X – General Chemistry I .....4 cr ******

*****Course requires placement in ENG 111 and MATH 107X
******Course requires CHEM 105X as a pre- or co-requisite, and placement in ENG 111 and MATH 107X

Environmental Studies Core Courses…(complete all of the following) . 14-15 cr;

ENVI 101 – Introduction to Environmental Science.....3 cr
ENVI 110 – Introduction to Water Quality I: Measurement and Calibration .....1 cr
ENVI 130 – Introduction to National Environmental Protection Act (NEPA) .....1 cr
ENVI 160 – Internship in Environmental Studies .....1-2 cr
ENVI 260 – Field Techniques for Environmental Technicians...2 cr
ENVI 265 – Introduction to Methods in Environmental Studies Reporting .....2 cr
GEOG 211X – Earth Systems: Elements of Physical Geography4 cr

4. Complete 3 to 4 credits from the following elective courses 3-4 cr

BIOL 104X – Natural History of Alaska.....4 cr
BIOL 115X – Fundamentals of Biology.....4 cr
CHEM 104X – Beginnings in Biochemistry .....4 cr
CHEM 105X – General Chemistry I .....4 cr
DEVS 100 – Introduction to Science .....4 cr
FISH 101 – Introduction to Fisheries .....3 cr
HLRM 130 – Research Field Logistics .....2 cr
NRM 101 – Natural Resources Conservation and Policy.....3 cr
RD 250 – Grant Writing for Community Development .....1-3 cr
STAT 200X – Elementary Probability and Statistics*** .....3 cr
Advisor Approved Elective****.....1-3 cr
(***if used for Computational Credit above, cannot be used for elective credit)
(****of level and subject matter similar to the listed electives)

Minimum credits required..... 34-35

B. PROGRAM GOALS

1. Objectives and Outcomes-Based Evaluation:

The Environmental Studies certificate provides students with quality academic instruction needed to progress or obtain employment in entry-level, science-related fields as well as for graduates to continue for an associate, baccalaureate, or other advanced degrees in the sciences.

The goal of this ENVI certificate is to provide the preparation needed for students to enter directly into the workforce or into a science-related associate or baccalaureate degree.

a) Objectives
- To expose the students to a broad-based, environmental studies background.
- To prepare students to address specific community-based environmental issues.
- Learn the basic interdisciplinary skills needed for general laboratory and field-based work in the environmental sciences such as inventorying biota or monitoring a few key water quality indicators.
- To prepare students to advance into a science or policy related Associate or Baccalaureate program or other undergraduate course work in the sciences.
- To prepare students academically and vocationally for entry-level employment in the field of natural resources and environmental science.
- To develop basic academic skills and gain essential knowledge in environmental studies that is integrated with a community-based environmental perspective.
- To introduce students to the established UAF BBC student support system that will provide tutorial, mentorship, and academic support.
- To provide students with the tools necessary for successful employment.
- To introduce students to university science programs that encourages academic development into advanced degrees.
- To promote skill development that integrates wellness, self-sufficiency, and community development.

b) Evaluation
- Academic Performance - Accumulated learner GPA in core courses and electives
- Directed Individual Project (Capstone Project)
  - Learn the basic scientific reporting methods and research skills necessary to analyze, interpret, and document field and laboratory data.
- Academic Involvement
  - Actively participate above and beyond academic course work
- Cooperative learning
  - Be reflective and be open to feedback from others
  - Motivated to work with others on projects
  - Eager to learn from others
- General Conceptual Understanding of Environmental Studies
  - Dedicated to being a “lifelong learner”
  - Professional and ethical behavior
  - Flexible in their thinking and exhibit creative ideas
- Job Preparedness
  - The student acquired the necessary skills for entry-level natural resources or environmental science career.

2. **Relationship to UAF mission**

The University of Alaska Fairbanks, as the nation’s northernmost Land, Sea, and Space Grant university and international research center, advances and disseminates knowledge through creative teaching, research, and public service with an emphasis on Alaska, the North and their diverse peoples.

The ENVI certificate was created by the UAF BBC, in cooperation with community leaders, and is focused on preparing students for entry into science-related employment and continued post-associate education. This program is focused on preparing students for immediate jobs and for subsequent education. This program relates to and supports the goals of the UAF 2005 Strategic Plan by:

- Serving as the premiere higher educational center for Alaska Natives by both increasing the number of Alaska Native students at UAF and by increasing the proportion of degrees awarded to Alaska Native students.
- Providing high quality undergraduate education for traditional and non-traditional students by increasing the numbers of students who enroll in and successfully complete their 100-level and above coursework and degrees.
- Forming active collaborations with communities, organizations, businesses, and government to meet identified state, national, and global needs through increased numbers of students graduating with degrees in science related fields.

3. **Occupational or Other Competencies to be achieved:**

Unlike a certificate in auto mechanics, there are no employment opportunities in the areas of environmental or natural resource technician that require a specific program of study to qualify for the position. Employment opportunities have increased throughout rural Alaska and the demand for relevant education within rural Alaska continues to grow as more money from state and federal legislation is being funneled through local governments to address local needs. The skills and techniques students will master through the ENVI program represent an area of technical expertise that is increasingly desired and needed by rural Alaska's industrial demands. This degree will provide students the opportunity to develop the training skills necessary for employment in environmental and natural resources fields.

4. **Relationship of Courses to Program Objectives:**

Courses directly serve program objectives by:

a) Providing culturally appropriate opportunities for development of applied skills and techniques, which validate and draw upon traditional knowledge and principles.
b) Providing opportunities to increase student knowledge, skills, and techniques used by environmental science and natural resources industry in Alaska.
c) Making extensive use of statewide and local Native resources.
d) Providing coursework that is relevant to student needs for environmental science and natural resources related careers.

III. PERSONNEL DIRECTLY INVOLVED WITH PROGRAM

A. FACULTY INVOLVED

University Fairbanks Faculty

a) Todd Radenbaugh, Assistant Professor, Environmental Studies, UAF BBC, Dillingham
b) Jodie Anderson, Term Instructor with School of Natural Resources and Agricultural Sciences (SNRAS)/Agricultural and Forestry Experimental Station (AFES), Palmer

c) Greg Finstad, Assistant Professor, Reindeer Research Program Manager, SNRAS/AFES, Fairbanks

Other University and Rural Campus Faculty

Name	**Campus**	**Position**
a. Jane Allen	KC	Assistant Professor of Mathematics
b. Nancy Ayagarak	KC	Instructor of Developmental English
c. Bob Brown	KC	Assistant Professor of Mathematics
d. Hector Douglas	KC	Assistant Professor of Biology
e. Kevin Jernigan	KC	Assistant Professor of Ethnobotany
f. Theresa John	KC	Assistant Professor of Rural Development
g. Benjamin Kuntz	KC	Assistant Professor of English
h. Martin Leonard III	KC	Assistant Professor of CIOS Manager
i. Rose Meier	KC	Assistant Professor of Ethnobotany
j. Richard Taylor	KC	Assistant Professor of Computer Appl.
k. Claudia Ihl	NWC	Assistant Professor of Biology
l. G. Joe Mason	NWC	Associate Professor of Comp. App.
m. Susan Andrews	CC	Professor of Humanities/Journalism
n. John Creed	CC	Professor of Humanities/Journalism
o. George Guthridge	BBC	Professor English & General Studies
p. Michael E. Davis	BBC	Associate Professor/ Eco. Development
q. Brian Rasley	BBC	Assistant Professor Chemistry
r. Victor Zinger	BBC	Assistant Professor Math & General Studies
s. Carrie Aldrich	IAC	Asst. Professor Developmental English
t. Jodi Bailey	IAC	Instructor CIOS
u. Carol Lee Gho	IAC	Assistant Professor Math and Science
v. Ronald Illingworth	IAC	Professor Developmental Studies
w. Julie Maier	IAC	Assistant Professor Math and Sciences
x. Sandra Wildfeuer	IAC	Assistant Professor Mathematics

Campus Key
BBC = Bristol Bay Campus
CC = Chukchi Campus
IAC = Interior and Aleutian Campus
KC = Kuskokwim Campus
NWC = Northwest Campus

B. ADMINISTRATIVE AND COORDINATING PERSONNEL

Resumes for key personnel attached as Appendix A.

1. Dr. Debi McLean, Director, UAF BBC, Dillingham
2. Dr. Todd Radenbaugh, Assistant Professor, Environmental Studies, UAF BBC, Dillingham
3. Jodie Anderson, Term Instructor, SNRAS/AFES, and Curriculum Developer, UAF BBC, Palmer

C. CLASSIFIED PERSONNEL

1. Environmental Technician, Sarah Wingert, UAF BBC (50% from USDA grant)
2. Web Technician, Jim Jones, UAF BBC
3. Staff support from the UAF BBC will be available to the ENVI program as needed for tutoring, facilitation, and other student needs

IV. ENROLLMENT INFORMATION

A. PROJECTED ENROLLMENT

UAF BBC student population is representative of CRCD student enrollment across the state. In the academic year 2007-2008, women accounted for 62 percent of the students at the campus and Alaska Natives accounted for 58 percent of the student population. The students at UAF BBC were significantly older than the national average; 21 percent were under 29 years of age, and 68 percent were age 30 or older. Nationally, 75 percent of students were under age 29 and 21 percent of students were over age 30 in 2005 (NCES, Digest of Education Statistics, 2005).

This ENVI certificate program is designed to attract a diverse student population whose interests are broad-based and interdisciplinary. Based on past numbers, projections show that 80 percent of the ENVI students will be part-time and 16 percent will be full time. Uniquely, few students will be from out of state; most likely, 98 percent of students will be Alaskan.

Information gathered by UAF BBC through a region-wide survey conducted in Summer 2003 shows a high interest in an ENVI certificate for the potential of skill development relating to job requirements. In addition to the survey, the UAF BBC has developed and offered 35 special topics courses directly related to the ENVI certificate. These piloted courses reached a total of 375 (duplicated headcount) students: 73% of the students enrolled in the pilot classes were Alaska Native and 2% were high school students. Using data gathered in the surveys and the piloted courses as well as observations taken from historical enrollment data (UA in Review and BBC Registration), an approximate enrollment expectation is 8-10 students in Fall 2009 from the Bristol Bay region.

Rural extended campuses and nonprofit organizations involved in academic education are located in Anchorage, Southeast, Interior-Aleutians Campus/Fort Yukon/Galena/McGrath/Nenana/Tok/Aleutians/Unalaska, Kodiak, Bristol Bay/Dillingham, Kuskokwim/Bethel, Northwest/Nome, Chukchi/Kotzebue, and Barrow. Additionally, there will be a number of students who attend the Fairbanks campus; initial estimates would only predict a small percentage but gradually growing, which may begin their journey toward an associate or baccalaureate degree via an ENVI certificate.

Using a growth rate of about one to two students per year, either from the same communities or from other villages each year and from increased Fairbanks enrollment, the program could serve as many as 30 students by Spring of 2013.

B. ENVIRONMENTAL STUDIES SURVEY

A survey for the CRCD USDA grant was sent to 220 high schools in rural Alaskan communities. The survey queried students, high school counselors, principals, and teachers in a series of questions involving student interest in science degrees and careers in science. This survey identified needs and issues for science-related areas that this certificate can begin

to address. Needs identified included requests for more science classes and access to science-specific degrees locally.

Questions regarding interest areas from previously developed new degree surveys identify the educational needs of potential employees in rural Alaska. Respondents indicated interest in the following science related areas where two of the three highest responses are directly connected to the ENVI certificate curriculum: environment (12%), natural resources (11%), and health (9%).

C. MINIMUM ENROLLMENTS NEEDED

The minimum enrollment to maintain the program is eight students per year for the next four years.

D. MAXIMUM ENROLLMENTS

The maximum enrollment for this program will be dependent upon faculty availability to teach ENVI 260: a weeklong summer intensive course. Currently, one instructor is designated to teach this course at 15 students per year. If demand necessitates more course offerings, faculty will be hired to teach the courses in demand and program enrollment may increase.

E. SPECIAL RESTRICTIONS

None.

V. NEED FOR THE PROGRAM

A. REQUIRED FOR OTHER PROGRAMS

While the ENVI certificate is not required by any other program, it is an upward articulation track for students beginning their academic career in a science-related pathway and who subsequently decide that they want to advance to a either an associate or bachelor degree. It also serves to develop student skills directly for workforce requirements in entry-level environmental science and natural resources careers. While not a required program, the ENVI certificate has the potential to influence the decisions of students to enroll in other programs within the University of Alaska Fairbanks' educational system. With academic guidance, mentor support, and a clear plan for skill development and knowledge gain, each student will be encouraged to aim their education toward either an Associates or a Bachelors and Masters degree in a number of different science related fields of interest to the student.

Face to face meetings with Dr. Carol Lewis and Dr. Stephen Sparrow, Dean and Associate Dean of the School of Natural Resources and Agricultural Sciences (SNRAS), respectively, have resulted in their strong support for this program and the potential it brings for non-traditional students to enroll in SNRAS degree programs. They both agree there is a need for an opportunity for rural students to begin their science degrees from their home campuses. Because the ENVI certificate is offered both via distance education and on the CRCD cross-regional schedule, SNRAS views this certificate program as a natural feeder certificate into their natural resource management programs as well as other UA science degrees.

Discussions and meetings with Dr. Michael Sfraga, Geography Department Chair, have resulted in his strong support for the ENVI certificate program. Currently, one track within the geography Bachelor of Science (BS) degree is subtitled "Environmental Studies." The

program provides the foundation necessary for understanding the natural and social environment, the analysis of environmental issues from an interdisciplinary geographic perspective, a diverse technical and scientific approach to environmental issues, and the ability to find balanced solutions to environmental problems. Dr. Sfraga envisions the ENVI program as a potential bridge for rural students into the geography department. With the advice and support of the Geography Department Chair, this ENVI certificate will enhance the geography BS degree as well as other programs to build upon the foundation of environmental studies.

The University of Alaska Southeast (UAS) Natural Sciences Department and UAF Geography Program, under the aegis of a cross-MAU UA Geography Program (UAGP), have created parallel BS Geography degrees with a shared core curriculum and options that allow students to move seamlessly across MAUs. UAS has just proposed a BS in Environmental Resources (equivalent to BS Geography: Environmental Studies at UAF) and a BA in Environmental Studies with focuses more on society and environment. Together, UAF and UAS have proposed an addition "Regents Semester" where students go to their sister campus to gain regional experience and expertise via a planned series of courses. The development of the ENVI certificate program at Bristol Bay will prepare students to enter the new environmental tracks shared between UAF and UAS, but more importantly will add to the cross-campus collaboration and integration of programs that UAGP has made a priority. The inclusion of GEOG 211X in the curriculum at BBC helps make that transition even more seamless for students interested in continuing their studies at either UAF or UAS.

B. EMPLOYMENT MARKET NEEDS

Information gathered by UAF BBC through a region-wide educational needs assessment survey conducted in Summer 2003 showed a high interest in an Environmental Studies certificate for the potential of skill development relating to job requirements. The majority of survey participants were between 36-56 years of age, had some college education, and were Yup'ik Alaska Native males living in Dillingham or Togiak. This study suggested that village leadership is impacted by education level.

In the survey, 45% of the participants took a class through UAF BBC to either get a degree or for job skill improvement. The survey participants understand the need for education as 75% of those surveyed said education was "Very Much" necessary to finding a better job and additionally that 81% of those surveyed agreed "Very Much" that increasing their educational level would provide them with a higher paying job.

Agencies in the Bristol Bay region, as well as statewide (Dillingham City Council, Bristol Bay Borough, Bristol Bay Native Association, Bristol Bay Economic Development Corporation, Wood-Tikchik Land Trust, Alaska Department of Fish and Game, U.S. Fish and Wildlife Service, and National Park Service), upon review of this program have commented on the need for a skill-based, environmental studies education program for their entry-level positions. Historical impacts and state statistics show there is a need for a statewide practical education program in Alaska. Finally, entry into and completion of a subsequent associate or baccalaureate science-related degree will qualify individuals for immediate employment in fields varying from teaching to field research and from village-based to urban arenas.

Preliminary marketing and research of the idea for the new ENVI program shows a strong interest of both potential students and local employers. Therefore it should be noted that the market is already preparing to take advantage of the coursework.

State statistics

State statistics from the Department of Labor substantiate workforce and skill development needs in rural Alaska. Figures provided by the Department of Labor Website (http://almis.labor.state.ak.us) project, by 2012, a 12.1% increase in jobs in Professional, Scientific, and Technical Services, a 50% increase in jobs in Waste Management and Remediation, and a 32.2% increase in jobs in Health and Social Services. The ENVI certificate will either prepare the student to directly enter this high demand workforce in entry-level science careers or will prepare the student for either an AAS in Renewable Resource, Associate of Science degree, or a Bachelors degree that will provide the potential for higher-level science professions.

VI. OTHER

This proposal is the result of an ongoing initiative by rural campuses, rural residents, local nonprofits, and communities concerned about the lack of quality educational opportunities available to the rural Alaska workforce. The guiding force behind the proposed program is the UAF BBC and local ENVI certificate Program Council of Advisors.

Kyle Belleque	Bristol Bay Economic Development Corporation
Tina Carr	UAF BBC Student Representative, Aleknagik
Daniel Chythlook	Aleknagik Traditional Council
Andy deValpine	Bristol Bay Coastal Service Area, Dillingham
Sue Flensburg	Environmental Program Coordinator, Bristol Bay Native Association
Martha Fox	Togiak Middle School
Gregory Kingsley	Pilot Point Tribal Environmental Staff, Alaska Peninsula Area
Paul Liedberg	US Fish and Wildlife Service, Togiak Wildlife Refuge
Billy Maines	Tribal Environmental Program Coordinator, Curyung Tribal Council
Tim Sands	Alaska Department of Fisheries and Game, Dillingham
Pearl Strub	Dillingham Business Owner

The purpose of the ENVI certificate is to offer a rural-specific, culturally relevant accredited certificate through UAF BBC and the CRCD. This effort will build upon the work and initiative of respected organizations throughout Alaska. This collaboration will develop a strong statewide program under the assumption that for successful learning to take place for the student, it is vital that the traditional ways of learning is followed and the strengths possessed by Alaska Native peoples be acknowledged.

The overall goals of the ENVI certificate are to meet the skill-development and workforce needs of rural and urban Alaska and to encourage rural residents to attain university credits and degrees that relate to the rural economy and cultural systems.

The ENVI certificate will provide the impetus necessary for many programs throughout the state to address rural higher education needs. The Council of Advisors has guided the development of the program from the inception: development of the core competencies and basic skills required of ENVI staff, and creation of the process for rural Alaskan delivery.

The UAF BBC and the Council of Advisors will continue to plan, guide, monitor, and assess the ENVI certificate.

Based on the commitment of rural environmental staff and leaders, as well as local businesses and local organizations and the critical need within rural Alaska for adequate and accessible education, enrollment for this certificate is expected to grow. This certificate directly addresses the University's stated commitment to serve the Alaska Native population and emphasizes recruitment of Alaska Native students in an underserved academic area.

VII. RESOURCE IMPACT

A. BUDGET

Resource Commitment Form is attached as Appendix B.

ENVI program development and implementation is directly supported by the United States Department of Agriculture (USDA), Cooperative State Research, Education, and Extension Service Alaska Native/Native Hawaiian (CSREES AN/NH) Serving Institutions Higher Education Grants program. This project addresses the USDA goal of increasing the number of AN/NH students engaged in USDA careers. These careers include environmental science, among others. This certificate will serve these requirements by not only increasing the number of students entering a certificate program, stepping up to either an AAS degree, AS degree or a Bachelor degree but by also preparing students for entry-level science employment.

Because the USDA's interest is, ultimately, bringing more AN/NH students into USDA careers at the bachelors and masters level, the above mentioned grant will fund the current effort until at least 2012, USDA support currently stands at one full-time science faculty member who helped develop the program plus funding for a total of eight Alaska Native students to complete the ENVI certificate within approximately three years.

While the UAF BBC has developed this new program, other fund 1 faculty and staff from all campuses, both urban and rural, will potentially be involved with this program. The program will generate $33,440 per year with a minimum of eight full-time students. As student participation increases, tuition income will increase gradually replacing grant funding.

While the current effort is supported for the next three years (through 2012), the long-term sustainability (up to ten years) of this program through the USDA Alaska Native/Native Hawaiian Serving Higher Institutions Education Grants program is very promising. For example, the University of Hawaii is similarly funded by the USDA and has developed long-term projects with other universities in the American Pacific (Agricultural Development in the American Pacific Project). These collaborative projects, which work to develop agriculture in a sustainable, culturally appropriate and economically viable way, have been funded since 1988. While there is no absolute guarantee that the ENVI program will have funding past 2012, the USDA grant program is greatly committed to developing higher education and developing local sustainability in places like rural Alaska and rural Hawaii while utilizing local knowledge and culture, for the long term.

If USDA funding does not continue beyond 2012, scholarship dollars are often available for Alaska Native students through their respective native corporations to assist with tuition and travel costs. These native corporations are the largest landowners in the Bristol Bay Region

and have a vested interest in having more locally trained land managers in the region knowledgeable of the local resources. In addition, students who are already employed by a natural resources agency (such as the Natural Resources Division of Bristol Bay Native Association) may be able to receive assistance with tuition for courses that will greatly improve knowledge and skills in environmental studies techniques and methods to make them competitive for higher-level positions.

B. FACILITIES/SPACE NEEDS

Office and classroom space will be provided by existing University urban and rural campuses throughout Alaska. Some of the rural communities with available facilities include Galena, Fort Yukon, Tok, Nenana, McGrath, Unalaska, Dillingham, Bethel, Nome, Kotzebue, Barrow, and Sitka. In villages without a University facility, training space can be found in the local schools and businesses and are reasonably supported by student tuition fees. No new facilities or space will be required.

As the University continues to upgrade its capacity to address the growing need for adequate education in rural Alaska, specifically with regard to the distance delivery processes and audio/visual equipment, and computer delivery platforms the ENVI certificate will be made readily available to more students.

C. CREDIT HOUR PRODUCTION

The program will provide an increase in credit hours for the University and will draw new students from an untapped pool by providing expanded course delivery, and culturally relevant and skills-based education. Based on an average enrollment projection of eight students per semester taking three credits and three students taking 15 credits per semester, the ENVI will generate 75 credit hours per semester in AY2010. Projected enrollment increases will result in an increase to 32 students and 225 credit hours by 2013.

D. FACULTY

The primary faculty are employees of the University. Dr. Todd Radenbaugh has been hired through the USDA Higher Education Grant specifically to coordinate the ENVI program as well as teach required ENVI and other appropriate science courses. Current faculty comes from the CRCD as will Fairbanks-based UAF faculty. SNRAS faculty will also participate in development and instruction of some ENVI certificate courses. Fairbanks-based classes may show a slight increase in student registrations.

ENVI program information and course requirements were sent out for comments two times, once via email in September 2006, and a second time in September 2008. A solicitation of concerns was made to University departments due to increased course enrollments resulting from the required science courses and the elective credit options ENVI students may take. The department contact names included:

September 2006

<u>Concerning Required Science, Communication, Computation, and Human Relations Courses:</u>

Rich Boone, Biology
Tom Clausen, Chemistry
Michael Whalen, Geology

Judy Atkinson, CRCD Developmental Math
Susan Andrews, CRCD Humanities Division Chair

Concerning Elective Credit Options:

Rich Boone, Biology
Tom Clausen, Chemistry
Michael Whalen, Geology
Steve Sparrow, School of Natural Resources and Agricultural Sciences
Denis Wiesenburg, School of Fisheries and Ocean Sciences
Gordon Pullar, Alaska Native and Rural Development Department
Dana Thomas, Math and Statistics

September 2008

Concerning Required Science Courses:

Rich Boone, Biology
John Keller, Chemistry
Mike Sfraga, Geography
Carol Lewis, Natural Resources and Agricultural Sciences

No negative comments were received and all raised concerns were addressed. Department responses were favorable. Enrollment increases will be minimal as well as the demand on department faculty.

E. LIBRARY IMPACT

Pauline Wilson of UAF Library Resources reviewed the certificate on September 8, 2006 and concluded that there will be minimal impact on resources and materials. Most of the information for this program has been created and developed by participating UAF programs and local nonprofit organizations.

On September 9, 2008 Susan Hahn, Assistant Professor and Off-campus Librarian was asked to review the courses for the ENVI certificate in terms of resource use by the University Library. She and Karen Jensen, Collection Development Officer at the UAF Rasmuson Library, concluded minimal additional impact on library resources needed to support the certificate courses. The existing library budget should also be able to accommodate some additional monograph acquisitions, if needed. The impact on library resources will include Internet-based resources and some additional acquisitions with information transmission and book mailing done by library staff.

VIII. RELATION OF PROGRAM TO OTHER UNIVERSITY PROGRAMS

A. EFFECTS OF ENROLLMENT ELSEWHERE IN THE SYSTEM

This program has the potential of impacting student enrollment in other programs within the University of Alaska system. Students who complete the certificate will be encouraged to continue their education in an associates or baccalaureate program. A majority of the students are non-traditional students who are not otherwise enrolled in University programs or courses.

ENVI program information and course requirements were sent out for comments two times, once via email in September 2006, and a second time in September 2008, to specific University departments that may have increased course enrollments due to the required

science courses and the elective credit options ENVI students may take. Also discussed was the possibility of students eventually bridging over to other science degree programs. The department contact names include:

September 2006

Concerning Required Science, Communication, Computation, and Human Relations Courses:

Rich Boone, Biology
Tom Clausen, Chemistry
Michael Whalen, Geology
Judy Atkinson, CRCD Developmental Math
Susan Andrews, CRCD Humanities Division Chair

Concerning Elective Credit Options:

Rich Boone, Biology
Tom Clausen, Chemistry
Michael Whalen, Geology
Steve Sparrow, School of Natural Resources and Agricultural Sciences
Denis Wiesenburg, School of Fisheries and Ocean Sciences
Gordon Pullar, Alaska Native and Rural Development Department
Dana Thomas, Math and Statistics

September 2008

Concerning Required Science Courses:

Rich Boone, Biology
John Keller, Chemistry
Mike Sfraga, Geography
Carol Lewis, Natural Resources and Agricultural Sciences

No negative comments were received and all raised concerns were addressed. Department responses were favorable. Enrollment increases will be minimal as well as the demand on department faculty.

B. DUPLICATION/APPROXIMATION OF OTHER UNIVERSITY PROGRAMS

There are other existing and proposed programs dealing with environmental studies and sciences, but none includes a certificate that concentrates on a rural, community-based curriculum. Other existing curriculum includes:

1) Associate of Applied Science (AAS) in Environmental Technology (ENVT) offered at the University of Alaska Southeast-Sitka campus. The AAS offers students a fundamental background in environmental technology and an emphasis in the operations of water and wastewater facilities. Successful completion of the AAS degree provides the education necessary to meet the post secondary education requirements for State of Alaska Level 3 operator certification.

2) Bachelor of Science (BS) degree in Environmental Science offered by the University of Alaska Southeast. UAS also offers a minor in Environmental Science. UAS's Environmental Science curriculum draws from a variety of disciplines including: the earth sciences, chemistry, physics, biology, math, and

spatial analysis. Students learn biological principles and skills in lecture, laboratory, and field courses. Because this is a BS degree, by design, the in-depth nature of the science courses and the need for four years to complete the degree make the UAS program very different from the proposed ENVI certificate program with BBC. Their program is heavy in math, chemistry, and physics and this focus has resulted in a low student retention rate.

3) Bachelor of Science degree in Environmental Studies offered by UAF-SNRAS (Geography). The BS in Geography at UAF offers three "options" or tracks of study. Option 1: Environmental Studies provides the foundation necessary for understanding the natural and social environment, the analysis of environmental issues from an interdisciplinary geographic perspective, a diverse technical and scientific approach to environmental issues, and the ability to find balanced solutions to environmental problems.

Students who have completed their ENVI certificate will be well aligned to continue the Environmental Studies BA/BS option at UAF, as many of the core and majors courses will have been completed. UAF offers two other BS Geography Options, one in Landscape Analysis and Climate Change Studies and another in Geographic Information Sciences and Technology. BBC students interested in more field science-focused programs or GIS technology may continue in these tracks, again with many core and major requirements completed. The ENVI program at BBC will complement and not compete with UAF Geography Programs.

4) A minor in Geography and Environmental Studies is offered by UAA Geography and Environmental Studies Department. This department is also proposing BS and degrees in Geography and Environmental Studies. This program presently concentrates more on the humanities side of environmental studies. Contact has been made with Dorn Van Dommelen, Chair of the Department, and he is willing to work together toward greater integration of the programs.

This proposed ENVI certificate will work closely with these programs and share information with department chairs as well as the Dean and Associate Dean of SNRAS. This ENVI certificate has been given strong support by SNRAS and the Geography program at UAF as a potential bridge for rural students into the geography department. With the advice and support of the UAF Geography Department Chair, this ENVI certificate will enhance the geography BS degree as well as other programs build upon the foundation of environmental studies.

Compared to the ENVI Certificate, there is no duplication or approximation of other programs statewide. At present there is no environmental studies program designed specifically to serve students who desire to meet the skill-development and workforce needs of rural and urban Alaska and to encourage rural residents to attain university credits and degrees that relate to the rural economy and cultural systems.

Therefore, this certificate will support many programs and will not duplicate any other programs in the University of Alaska system.

C. RELATION TO RESEARCH AND SERVICE ACTIVITIES

1. Research

   Research is a component of this ENVI program. A key student outcome is a capstone research project where the students will design, collect and analyze data, and present results in a scientific format. This program will produce a wealth of information in student outcomes assessments, changes in academic programs and teaching style, and other information relating to workforce and skill development in rural Alaska. This ENVI certificate encourages transfer through higher education into either an associates or a Baccalaureate program that will allow for increased scientific inquiry and research opportunities on a local basis. Stronger collaboration between the scientific community and local entities is an expected result from this program.

   This program will be an individual model in the academic community of rural university education, producing information from student outcomes assessments, teaching styles, and information related to skill and workforce development in rural Alaska. Results of the individual student outcomes assessment and graduate rubric (Appendix D) will be compiled by the ENVI Program Coordinator and shared with peers, students, the UAF community, the ENVI Advisory Board and stakeholders through written reports, oral presentations, and meetings.

2. Service

   The ENVI certificate is part of a comprehensive plan to spread academic education throughout the state and into every rural community. The certificate will provide a much needed and sought-after service to rural Alaska's tribal and local government employer base and workforce as well as to urban and State employers.

   UAF submitted the UAF Interim Accreditation Report 2006 and in that report Recommendation Five is focused on better integration of teaching, research, and service activities between the Fairbanks campus and the CRCD campuses. This certificate program as well as the CES/CRCD USDA Higher Education Project has served as a catalyst of change and collaboration between the Fairbanks-based SNRAS, the Reindeer Research Program within SNRAS, the Geophysical Institute, the College of Natural Sciences and Mathematics, and the CES.

   Standard Two, Section Two of the Interim Report responds to the development of new programs that is the main goal of the newest phase of this certificate program. The ENVI certificate is working to develop place-appropriate science to bring traditional ecological knowledge together with Western science at the rural campuses. This development is not only bringing rural students to science in their communities but it is also bringing Fairbanks-based programs to CRCD campuses.

IX. IMPLEMENTATION/TERMINATION

A. DATE

The program is expected to be in the UAF catalog and available in the fall semester of 2009. Courses already exist at the pilot stage as well as general core certificate courses and students will be able to start work on components of this certificate immediately.

B. PLANS FOR RECRUITING STUDENTS

The promotion of this new program will be done throughout the state in cooperation with local and tribal governments, local for-profit and nonprofit Native corporations, rural University campuses and centers, and the urban Fairbanks campus. Upon approval, the UAF BBC is prepared to market the program with brochures, a website, and other conventional methods of student recruitment. BBC also recruits high school students interested in environmental studies by hiring them as laboratory and field assistants.

Rural tribal councils, local nonprofits, and local for-profit corporations will be encouraged to organize and support students in this recruitment endeavor. Organizations such as Bristol Bay Native Association, Tanana Chiefs Conference, and Kawarak, Inc. will continue to bring groups of students together for academic education and skill development. Additionally, UAF BBC runs a National Oceanic and Atmospheric Science Association (NOAA) funded program for bridging high school students interested in STEM (Science, technology, engineering, and math) into related degrees. It is expected these organizations will also continue to provide financial support to these students as well. Through this NOAA funding and other local funds, BBC also recruits high school students interested in environmental studies by hiring them as laboratory and field assistants.

Preliminary marketing and research of the idea for the new program shows a strong interest in this program. The Bristol Bay community is supportive of an educational program that works to develop local environmental technicians and possibly to help successfully transition more community members into higher education. It should be noted that the market is already preparing to take advantage of the coursework.

C. TERMINATION DATE

This is an ongoing program with no termination date anticipated.

D. PLANS FOR PHASING OUT PROGRAM IF UNSUCCESSFUL

As this program does not involve new equipment or other major program investment, the phasing out process should only involve the assurance of program completion by existing students. If it becomes necessary to close the program, ENVI certificate students will be provided the opportunity to complete the University requirements for the Certificate.

E. ASSESSMENT OF THE PROGRAM

The program will be assessed through ongoing and periodic student and faculty evaluation. This evaluation will consist of both student progress while in the program and the results of the program as seen by students, alumni, and employers.

In September 2007 the ENVI Student Outcomes Assessment Plan was sent to Jennie Carroll, Associate Dean at the CRCD. The full Student Outcomes Assessment Plan follows this section in Appendix D.

F. PROGRAM MANAGEMENT

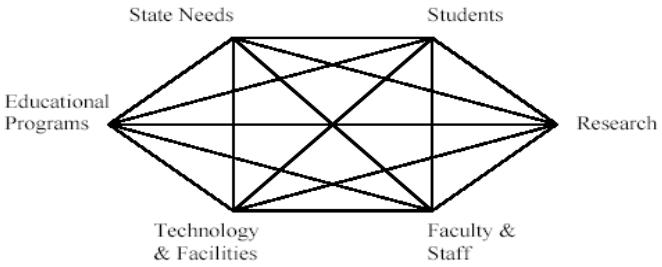
This certificate will be incorporated within the normal academic structure of the CRCD Math/Science Division as well as UAF BBC. Academic program oversight and program coordination will be housed at the UAF BBC. They will provide the necessary staff support as well.

The BBC support staff will be responsible for:

- student advising, support, and recruiting,
- program advertising and marketing both internally and externally,
- course scheduling and content consistency,
- instructor review and approval,
- credit for prior learning evaluation (CPL),
- petition and waiver review and approval
- continual review of both human and fiscal resource sufficiency to ensure that necessary faculty and student support is available to meet program growth
- coordination of on-going internal management, evaluation, and revision
- provide advising and other support as needed from their in-house student support functions and from existing faculty
- hire adjunct instructors using the existing CRCD and university approved policy

X. REGENTS GUIDELINES

University of Alaska Board of Regents



Program Approval Summary Form

MAU: UAF
Title: Environmental Studies (ENVI) Certificate
Target admission date: Summer 2009

How does the program relate to the **Education Mission** of the University of Alaska and the MAU?

The ENVI certificate was created by the UAF BBC, in cooperation with employers and educators, and will not specifically train a student for one career path but will teach the students a universal skill set that will be used for a broad range of careers. Training local students in these skills will not only give employers an opportunity to hire locally for technician work that is traditionally completed by non-local technicians, but will also support local economic development.

This program relates to and supports the Education Mission of the University of Alaska by:

- Serving as a program of higher education for traditional and non-traditional Alaska Native students by using the local resources and traditional knowledge of the region to teach skills and techniques desired by employers without requiring students to change or leave their culture or heritage (UA Strategic Plan 2010, Goal 1 and 2).
- Providing high quality undergraduate education in entry-level coursework, increasing the number of Alaska Native students, and increasing the number of degrees awarded to Alaska Native students with particular consideration given to the needs of permanent residents and students in non-traditional settings who seek skills and degrees suited to rural communities (UA Strategic Plan 2010, Goal 3).
- Collaborating with organizations, state and federal agencies, communities, and governments to meet rural Alaska needs in the field of natural resources (UA Strategic Plan 2010, Goal 4).

What **State Needs** are met by this program?

Upon review of this program, agencies in the Bristol Bay region, as well as statewide, (Dillingham City Council, Bristol Bay Borough, Bristol Bay Native Association, Bristol Bay Economic Development Corporation, Wood-Tikchik Land Trust, Alaska Department of Fish and Game, U.S. Fish and Wildlife Service, and National Park Service), have commented on the need for a skill-based, environmental studies education program for their entry-level positions. Finally, entry into and completion of a subsequent associate or baccalaureate science-related degree will qualify individuals for employment in fields varying from teaching to field research in both rural and urban settings.

State statistics

State statistics from the Department of Labor (http://almis.labor.state.ak.us) substantiate workforce and skill development needs in rural Alaska. The ENVI certificate will either prepare the student to directly enter this workforce or will prepare the student for an associate or baccalaureate degree which will provide entry to these high demand jobs.

What are the **Student** opportunities and outcomes?

The mission of the Environmental Studies (ENVI) certificate program is to provide students, including Alaska Native and rural students, with quality academic instruction and training responsive to community needs. This program will help empower graduates and their communities to adapt to the overwhelming social, ecological, and economic changes presently occurring while protecting and enriching local culture.

Enrollment projections?

Information gathered by UAF BBC through a region-wide survey conducted in Summer 2003 shows a high interest in an ENVI certificate for the potential of skill development relating to job requirements. Piloted courses reached a total of 375 (duplicated headcount) students: 73% of the students enrolled in the pilot classes were Alaska Native and 2% were high school students. Using data gathered in the surveys and the piloted courses as well as observations taken from historical enrollment data (UA in Review and BBC Registration), an approximate enrollment expectation is 8-10 students in AY2010 from the Bristol Bay region and 32 students by 2013.

Describe **Research** opportunities:

Research is a component of this ENVI program. A key student outcome is a directed individual study (capstone project) where the students will design, collect and analyze data, and present results in a scientific format. Stronger collaboration between the scientific community and local entities is an expected result from this program such as the 2008 Western Alaska Interdisciplinary Science Conference in Dillingham.

Describe Fiscal Plan for development and implementation:

ENVI program development and implementation is directly supported by the United States Department of Agriculture (USDA), Cooperative State Research, Education, and Extension Service Alaska Native/Native Hawaiian (CSREES AN/NH) Serving Institutions Higher Education Grants program. This project addresses the USDA goal of increasing the number of AN/NH students engaged in USDA careers. These careers include environmental science, among others. USDA support currently stands at one full-time science faculty member who helped develop the program plus funding for a total of eight Alaska Native students to complete the ENVI certificate within approximately three years.

While the UAF BBC has developed this new program, other fund 1 faculty and staff from all campuses, both urban and rural, will potentially be involved with this program. The program will generate $33,440 per year with a minimum of eight full-time students. As student participation increases, tuition income will increase gradually replacing grant funding.

The primary teaching faculty are already employees of the University. Current faculty are housed within the CRCD as well as Fairbanks-based UAF faculty. Cooperative Extension Service faculty will also participate in development and instruction of some ENVI certificate courses

CRCD campuses will provide classroom space for ENVI certificate courses. In communities without a local university facility, training space can be found in the private sector and reasonably supported by tuition fees through partnership arrangements. In addition, collaboration with school districts will provide space to teach some university courses. Therefore, through community and school district partnerships, the impact on existing UAF and CRCD technology resources and facilities are limited to existing resources and no new facilities or space will be required.

XI. APPENDICES

Appendix A: Resumé

1. Dr. Debi McLean, Director, UAF BBC, Dillingham
2. Dr. Todd Radenbaugh, Assistant Professor, Environmental Studies, UAF BBC, Dillingham
3. Jodie Anderson, Term Instructor, UAF-SNRAS/AFES, and Curriculum Developer, UAF BBC, Palmer

Appendix B: Resource Commitment Form

Appendix C: Program Prospectus

Appendix D: Student Outcomes Assessment Plan, Rubric, and Learning Matrix

APPENDIX A1. Deborah L. McLean

a. Professional Preparation

Memphis State University
Ed.D. Curriculum and Instruction (December, 1992)
Oklahoma State University
M.S., Applied Behavioral Studies in Learning Disabilities (May, 1989)
University of South Florida
B.A., Early Childhood/Elementary Education (May, 1979)
State of Alaska Type A Teaching Certificate, 1998-2003
Endorsement areas:

Elementary Education	grades 1-6
Special Education (Learning Disabilities)	grades 1-6
Early Childhood Education	grades N-3

b. Appointments

2002-present	Director, Bristol Bay Campus, University of Alaska Fairbanks
2001-present	Associate Professor, School of Education, UAF
1994-present	Assistant Professor, School of Education, University of Alaska Fairbanks. Rural/Elementary/Early Childhood Education Teach courses in Early Childhood and Education.
1993-1994	Program Coordinator, Early Childhood Education, University of Alaska Fairbanks, Bristol Bay Campus.
1992-1993	Assistant Director, Barbara K. Lipman Early Childhood School and Research Institute, Memphis State University.
1991-1992	Teaching Assistant, Memphis State University, Early Childhood
1989-1992	Graduate Research Assistant, Lipman Early Childhood Research Institute, Department of Curriculum and Instruction, Memphis State University.

c. Publications

McLean, D. L. (November, 2002). Honoring traditions: Making connections with mathematics through culture. *Teaching Children Mathematics*, 9(3), 184-188.

McLean, D. L. (Spring, 1997, accepted Fall, 1998). Alaska Native perception of cultural transmission in rural Alaska: Implications for education. *Journal of American Indian Education* 36(3) 16-26.

McLean, D. L. (1997). Lessons in living: Incorporating folklore into young children's lives. *Resources in Education.* ERIC document 404 962.

McLean, D. L. (September, 1995). Tribal Children's Services program: Forging links between home, school, and community. Electronically published in conjunction with the Australian Association of Special Education. Dept. of Education, Darwin, NT.

McLean, D. L. (January, 1992). Cooperative learning: Theory to practice in the young child's classroom. *Resources in Education*. ERIC Document 343 667.

Other publications and creative products

McLean, D. L. (Winter, 2002). Helping Aaron Navigate: The child with disabilities enters preschool. *Dimensions of Early Childhood,* 30(1), 9-15.

McLean, D. L. (Summer, 1993). [Review of Blueprint for Action: Achieving Center-based Change Through staff Development]. *Dimensions of Early Childhood,* 21 (4).

McLean, D. L. (1992). Review of the Social Skills Rating System (SSRS). *Journal of Psycho-Educational Assessment. JPA,* 10(2).

McLean D. L. & Johnston, J. M. (1992). The history of early childhood teacher education. In Leslie R. Williams & Doris P. Fromberg, (Eds.). *Encyclopedia of early childhood education* (pp. 420-421). New York: Garland.

McLean, D. L. & Feng, J. (1991). The relationship between self-concept and cognitive abilities on black, low-income preschool children. Paper presented at the Annual meeting of the Mid-South Educational Research Association, New Orleans, LA. *Resources in Education.* ERIC Document 327 289.

c. Synergistic Activities

My area of expertise is in teaching young children mathematics and literacy, and using the home, culture and parental perceptions in rural Alaska to develop lesson plans. My research has shown that parental teaching styles are an important tool for informing teachers of cultural factors and teaching practices of the home culture. I have also worked with children with diverse and exceptional needs and use an ecological approach to training teachers of young children in rural Alaska.

I have written several grants that develop student interest in environmental careers, help prepare students for STEM degrees, and develop partnerships with local, state, federal, and industry partners. These grants have aided the UAF, BBC in developing an environmental chemistry lab for experiments and field trips and for analyzing data collected in the field.

a. USDA 2007-2008 (PI) "Alaska Native Science Education", Dillingham, AK ($395,000)

b. NOAA Educational Partnership Program (PI 2005-2008) "High School Pipeline Grant", Dillingham, AK ($360,000)

c. NOAA Educational Partnership Program (PI 2003-2006) "Watershed and Community Mapping of the Nushagak Mulchatna Drainage", Dillingham, AK ($360,000)

d. NOAA Educational Partnership Program (PI 2002-2004) "Rural Alaska Science Project", Dillingham, AK ($100,000)

I am responsible for the regional operations of the University of Alaska Fairbanks' extended campus based in Dillingham. The campus serves 32 remote, primarily Alaska Native villages in southwest Alaska. Specific duties include academic and vocational program development, campus administration, budget development, program delivery and evaluation. I supervise permanent and temporary faculty and staff. This includes the hiring, workload development and faculty members' evaluations, and tenure and promotion review for bargain unit members. I coordinate and supervise other University of Alaska programs on the campus and their faculty: the Rural Development Program of the College of Rural Alaska, UAF and the teacher training program of the UAF School of Education. I coordinate the campus's many programs with other major units of the university, such as the Marine Advisory Program and the Early Childhood Education Program. I also serve as principle investigator for grants awarded to the campus such as USDA, NOAA program and the Title III Minority Serving Institution Program.

d. Collaborators and other Affiliations

(i) Collaborators
Dr. Jerry Lipka, Professor of Education, University of Alaska Fairbanks

(ii) Graduate and Postdoctoral advisors
Dr. John Johnston, Professor of Education, University of Memphis
Dr. Carol Etheridge, Professor of Cultural Studies, University of Memphis
Dr. Bruce Bracken, Professor of Psychology, University of Memphis

(iii) Thesis Advisor and Postgraduate-Scholar Sponsor
None at this time

APPENDIX A2. Todd A. Radenbaugh

a. Professional Preparation

Undergraduate Institutions

University of North Carolina at Wilmington	BSc. - Marine Biology	1987
Appalachian State University, Boone, NC	Geology coursework	1987-88

Graduate Institutions

Appalachian State University, Boone, NC	MSc. – Biology/Paleontology	1992
University of Regina, Saskatchewan, Canada	PhD. - Earth Environmental. Science/CPS	2004

b. Appointments

Assistant Professor, Earth and Environmental Science. 2/2006 -Present – University of Alaska Fairbanks, Bristol Bay Campus, Dillingham, AK.
Research Fellow. 10/2004-10/2007 – Canadian Plains Research Center, Regina, SK,
Community Science Instructor. 1/2005-2/2006 – Opendoors, Albemarle County Schools Community Education Program. Charlottesville, VA.
Adjunct Faculty. 8/2004-2005 – Marymount University, Arlington, VA.
Collegiate Assistant Professor, Science. 10/2003-8/2004 - University of Maryland University College – European Division, Heidelberg, Germany.
Visiting Assistant Professor. 8/2001-8/2003 - Department of Geology, University of Regina, Regina SK.
Visiting Assistant Professor. 8/2000-8/2001 - Department of Earth and Environmental Sciences, The George Washington University, Washington, DC.
Lecturer II. 8/1999-8/2000 - Department of Geology, University of Regina, Regina SK.
US Fisheries Observer. 12/1994-4/1995 - Saltwater Inc, Anchorage, Alaska, Dutch Harbor, AK.
Wetlands Research Technician. 9/1994-12/1994 - Savannah River Ecology Lab, University of Georgia, Congaree Swamp National Monument and Savannah River Site. Aiken, SC.
Ecological and Environmental Education Officer. 2/1992 - 7/1994 - United States Peace Corps.. Falmouth, Jamaica, West Indies
Research Technician. 2/1989 - 8/1991 - Appalachian State University with US Environmental Protection Agency. Boone, NC.

c. Courses Taught

Environmental Science

Introduction to Environmental Science
Environmental Issues
Energy After Petroleum (Alternative Energy)
Introduction to Water Quality I: Measurement and Calibration
National Environmental Protection Act (NEPA)
Practicum in Natural Resources
Internship in Environmental Studies
Field Techniques for Environmental Studies
Report Writing for Environmental Studies

Geography

Elements of Physical Geography
Geohazards in Land-use Planning

Geology

Invertebrate Paleontology: (Featured in NSF Starting Point)
Environmental Geology
Historical Geology
Internal Processes of the Earth
Environments of the Past
Physical Geology
Charlottesville Rocks
Virginia Gold

Biology

Natural History of Alaska
Concepts of Biology I
Concepts of Biology II

d. Consultant and Committee Work

Energy Taskforce Chair – Southwest Alaska Municipal Conference, develops action items to address energy issues in rural Alaska.
Saskatchewan Environment and Resource Management (SERM), Regina, Saskatchewan, 1997. Ecological research report describing plant associations and wildlife in the ecoregions of Saskatchewan.
Canadian Geological Survey, Palliser Global Change Project. Calgary, Alberta, 1997. Interdisciplinary research report and archived historical images.

e. Grants

Education and research grant. US Department of Education Title III: Sustainable Energy Program Development for Bristol Bay Environmental Science Lab, $2.5 million over 5 years.

Education and research grant. Alaska Native Education and Community Development: Within a Changing Landscape, USDA Rural Development. $446,631+ $73,000 supplement

Education and research grant. Teaching introductory ecology field methods. UAF College of Community and Rural Development: $5,000

Conference and publishing grant. Plain as the Eye Can See Public Forum, 2003. Prairie Adaptation Research Collaborative, Canadian Plains Research Center, and University of Regina, CN$8,500.

Conference and publishing grant. Plain as the Eye Can See Public Forum, 2000. Canadian Plains Research Center and Friends of the Environment, Canada Trust, CN$7,000

Research Grant. Environmental Foundation of Jamaica, Kingston, Jamaica. 1994. Wetland management project for the Martha Brae Estuary, Falmouth, Jamaica. JA$90,000

f. Selected Publications

Radenbaugh, T. A. 2008. Sustaining the Capital of the Nushagak Watershed using an Interdisciplinary Science Approach. *American Association for the Advancement of Science Arctic Science Conference Program and Abstracts*. Fairbanks, AK

Radenbaugh, T. A. and M.Fox (student). 2007. Bridging Native Culture and Environmental Science: Changing Higher Education Methods in the Bristol Bay Region of Southwestern Alaska. *Canadian Aboriginal Science and Technology Society*, Calgary, Alberta.

Chythlook, Daniel, (student), T. Radenbaugh, and B. Rasley. 2007 Water quality of the Nushagak/Mulchatna Watershed in Western Alaska. Association of Canadian Universities for Northern Studies student conference Saskatoon, SK.

Radenbaugh, T.A. with J. Anderson and G. Finstad. 2006. The influences of global change on rural Alaska: The role of place-appropriate science education in facilitating adaptation. *American Association for the Advancement of Science Arctic Science Conference Program and Abstracts*. Fairbanks, AK. Session: Arctic Health and Education.

Radenbaugh, T. A. 2005 Managing changing landscapes on the northern prairies: using functional groups and biotic guilds. In: *Managing Changing Prairie Landscapes.* Radenbaugh, T. A. and G. S. Sutter (eds). CPRC Press, Regina, SK.

Radenbaugh, T. A. 2005. Circuit Riding Students and Professors: Higher Education in the US Military. *Prairie Perspectives* 8:61-73

Radenbaugh, T. A. 2005. Paleontology in decline – Making fossils live again. *Geological Society of America Program and Abstracts*, Salt Lake City, 117th Annual Meeting. Session T114. We Can Continue to Do Better: More Alternatives to the Same Old Lab Lecture Format in the College Classroom, GSA, Denver, CO.

Radenbaugh, T. A. and G. S. Sutter (editors). 2005. *Managing Changing Prairie Landscapes*. Prairie Forum (Special Issue) Volume 30.

Radenbaugh, T. A. 2003. Ecosystem level functional changes in breeding bird guilds in the Mixed Grassland since agricultural settlement. Pp. 1117-1202. In: *Managing for Ecosystem Health*, D. Rapport, W. Lasley, D. Rolston, O. Nielsen, C. Qualset, and A. Damania (editors.) International Congress on Ecosystem Health . CRC/Lewis Press, New York.

Radenbaugh, T. A. 2003. Book Review - *Conserving Living Natural Resources - In the Context of a Changing World* by B. Josephson Weddell, Cambridge University Press, 2002. in *Biodiversity* 4:28

Radenbaugh, T. A. and P. C. Douaud. 2000. Changing landscapes of the Northern Great Plains In: *Changing Prairie Landscapes*. Radenbaugh, T. A. and P. C. Douaud (eds). CPRC Press Regina, SK.

Acton, D. A., G. A. Padbury, C. T. Stuchniff, L. Gallagher, D. A. Gauthier, L. Kelly T. A. Radenbaugh, and J. Thorpe . 1998. *Ecoregions of Saskatchewan*. Canadian Plains Research Center and Saskatchewan Environment and Resource Management, Regina, SK.

Radenbaugh, T. A. and F. K. McKinney. 1998. Comparisons of the structure of a Mississippian and Holocene pen shell assemblage. *Palaios*. 13(1):52-69.

Radenbaugh, T. A. 1998. Saskatchewan's Prairie Plant Assemblages: A Hierarchical Approach. *Prairie Forum* 23:31-48

Radenbaugh, T. A. and A. A. Seaborne. 1996. The status of plant communities in the Duncan's Bay area on Jamaica's north coast. *Caribbean Geography* 7(2):97-112.

APPENDIX A3. Jodie M. Anderson

Education

University of Alaska Fairbanks – Fairbanks, Alaska
Interdisciplinary Doctorate of Philosophy: Soil Biochemistry, Present

Brown University – Providence, Rhode Island
Master of Arts in Teaching Biology, May 1994

University of North Carolina at Chapel Hill – Chapel Hill, North Carolina
Bachelor of Science in Science Teaching/Biology, May 1992

Employment

Instructor, School of Natural Resources and Agricultural Sciences and Bristol Bay Campus, University of Alaska Fairbanks, Palmer, AK, August 2007 – Present

- Support applied commercial horticultural research, educational, and outreach activities.
- Manage the Alaskan Potato Project – a collaborative potato disease research project with USDA/ARS.
- Taught NRM 107, 108, 109 and a soils/composting course face-to-face and Fundamentals of Biology I and II to 12 distance students for Bristol Bay Campus via Blackboard, twice weekly audio lectures, and four-day face-to-face laboratory intensives.

Curriculum Coordinator for USDA Higher Education Grant, Cooperative Extension Service, University of Alaska Fairbanks, Palmer, AK, November 2003 – August 2007

- Identified and made assessable culturally relevant natural resource curriculum resources for rural secondary Alaska educators.
- Wrote and edited newsletter, presentations, and formal progress and final reports.
- Coordinated direct to educators' mini-grants to 25 rural educators.
- Developed RFP for mini-grants as well as online guide to educators to help them apply.
- Served as faculty liaison to extended campus Directors, CES faculty and science faculty for certificate curriculum development.

College Biology Instructor, Piedmont Community College, Roxboro, NC, Aug 1999–Nov 2003

High School Science Instructor, Bartlett Yancey High School (BYHS), Yanceyville, NC **and Person High School (PHS),** Roxboro, NC, BYHS Fall 1995 – Spring 1999, and Fall 1992 – Spring 1993, PHS Fall 1994 – Spring 1995

Coordinator, Science Integration Workshop for Elementary Teachers, Caswell County School Board, Yanceyville, NC, Summer 1998

Developed K-6 teacher workshop to encourage mathematics, reading, writing, critical thinking, and science curricula integration.

Staff Member, Cherokee Scout Reservation, Old North State Council, Boy Scouts of America, Yanceyville, NC, Summer 1994 – 1997

Program Commissioner, 1996 & 1997
Director, High Adventure Program, 1995
Director, Nature Studies, 1994

Athletic Trainer/Coach, Men's and Women's Varsity Cross Country, Bartlett Yancey High School, Fall 2001
Athletic Trainer/Coach, Varsity and Junior Varsity Wrestling, Bartlett Yancey High School, Fall 2000 – Spring 2001, and Fall 2001 – Spring 2002
Athletic Trainer/Coach, Varsity and Junior Varsity Football, Bartlett Yancey High School, Fall 1996

Head Coach, Women's Varsity Softball, Bartlett Yancey High School, Spring 1996

Institutional Service

Senator, University of Alaska Fairbanks Faculty Senate, May 2005 – May 2007

Member, Curricular Affairs Committee, University of Alaska Fairbanks Faculty Senate, May 2005 – May 2007

Chair, Associate in Arts, Associate in Science, and Associate in General Education Program Review, Piedmont Community College, Fall 2002 – Spring 2003

Program Developer/Director, Laboratory Technology Program, Piedmont Community College, Spring 2001 – Fall 2003

Foundation Mini-Grant Recipient, Piedmont Community College, Fall 2000 and Fall 2002

Technology

Instructional Technology: Elluminate Live, BlackBoard, Document Camera, SmartBoard, Interactive Video Teleconferencing, PowerPoint LCD, Science Courses Web Enhanced
Software Applications: Microsoft Office, Keynote, iMovie, InDesign, Photoshop
Operating Systems: Windows 95, Windows 98, UNIX, Mac OS X

Research

Graduate Research Assistant, Department of Biology, Brown University, Roger Williams Park Zoo, Providence, Rhode Island, Fall 1993 – Spring 1994

- Assisted adviser with research study observing and documenting base-line behavioral characteristics of captive White Faced Saki Monkeys (*Pithecia pithecia*).
- Collected and analyzed daily urine samples of the female primates, documented biweekly behavioral observations of the female primates within their family groups specifically noting the pair bond relationship between the males and females, and analyzed observation data to correlate specific behaviors with the female hormone levels as detected by the urinalysis.

Industry

Laboratory Assistant, Carolina Power and Light, Hyco Plant, Roxboro, NC (Summer 2000)

Distinctions

Piedmont Community College Foundation Teaching Excellence Award, 2000, 2002
Piedmont Community College Teaching Excellence Award, 2000
Conestee District Award of Merit Recipient for Boy Scouts of America, 1999
North Carolina Teaching Fellows Scholarship Recipient, 1988-1992

Academic Presentations

Alaska Greenhouse and Nursery Conference, 2008, Poster presented on Manufactured Soils of Southcentral Alaska, Jeff Smeenk, Jodie Anderson

American Association for the Advancement of Science, Arctic Science Conference, 2006, Influences of Global Change on Rural Alaska: The Role of Place-Appropriate Science Education in Facilitating Adaptation, Jodie Anderson, Todd Radenbaugh, Greg Finstad

National Oceanic and Atmospheric Association, Education and Science Forum, 2006, Promotion of Regional Adaptation to Landscape Level Change Through Environmental Science Education in Southwest Alaska, Todd Radenbaugh, Jodie Anderson

National Indian Education Association, National Meeting, 2006, Place-Appropriate Science Certificate Development for Rural Alaskan Students, Alaska Native/Native Hawaiian USDA Higher Education Grant – UAF Collaboration

Professional Activities

Member Alaska Natural Resources and Outdoor Educators Association (ANROE)
Member National Association of County Agricultural Agents (NACAA)
Member of United Academics Union
Alaska State Teaching License, Spring 2007
Completed Junior Master Gardener Coordinator Training, College Station, TX, March 2007
Competed iDesign Workshop Course, Fairbanks, AK, Spring 2005

Completed Grants 101: Professional Grant Proposal Writing course, Anchorage, AK, September 27-29, 2004

APPENDIX B Resource Commitment to Proposed Degree Program

Resources	Existing	New		Total
	College/School	College	Others (USDA Grant 50%, Title III 50%)	
Regular Faculty (FTE's & dollars)	CRCD: In excess of 10 additional faculty members per semester will be involved in providing courses which will be used by students in this program. The amount of effort will vary per instructor based on the number of ENVI students in their classes.		Faculty 100% **$**70,055	**$**70,055
Adjunct Faculty (FTE's & dollars)				
Teaching Assistants (Headcount)				
Instructional Facilities (in sq. footage)	10 ft x 30 ft = 300 ft^2			
Office Space (Sq. footage)	12 ft x 8 ft = 96 ft^2			
Lab Space (Sq. Footage)	10 ft x 30 ft = 300 ft^2			
Computer & Networking (in dollars)				
Research/instructional/office Equipment (in dollars)	$50,000.00			$50,000
Support Staff (FTE's & dollars)	Environmental Technician @ 50% (1846.4 biweekly) $22710.50		Environmental Technician @ 50% (1846.4 biweekly) $22710.50	$45,421
Supplies (in dollars)			$5,000	$5,000
Travel (in dollars)			$5,000	$5,000
Totals				$175,476

Signature_____ _____
Executive Dean of College Date

Proposing the New Degree Program

Appendix C Prospectus for Environmental Studies (ENVI) Certificate Program

University of Alaska Fairbanks

Bristol Bay Campus, Dillingham

A. Mission and Goals:

The mission of the Environmental Studies (ENVI) certificate program is to provide students, including Alaska Native and rural students, with quality academic instruction and training responsive to community needs. This program will help empower graduates and their communities to adapt to the overwhelming social, ecological, and economic changes presently occurring while protecting and enriching local culture.

The ENVI certificate is a 34-credit program and is offered through the UAF BBC of the CRCD and will be a stepping-stone for students pursuing a science-related associate or baccalaureate program.

The ENVI certificate provides students with quality academic instruction needed to progress or obtain employment in entry-level, science-related fields as well as for graduates to continue for an associate, baccalaureate, or other advanced degrees in the sciences. This certificate provides the basic academic preparation and sought after vocationally related skills necessary for entry-level careers in the environmental sciences while also serving as a stepping-stone into science-related associate or baccalaureate programs such as: the UAF A.S. degree, UAF's Geography B.S. (Option 1: Environmental Studies) degree, a UAA Minor in Geography and Environmental Studies, the UAS Environmental Science B.S. degree, and the UAS Sitka Campus' A.A.S. in Environmental Technology degree.

The ENVI certificate will not specifically train a student for one career path but will teach the students a universal skill set that will be used for a broad range of careers. These skills obtained by an ENVI certificate holder will then serve as a foundation for any realm of environmental technician work available in their communities. Training local students in these skills will not only give employers an opportunity to hire locally for technician work that is traditionally completed by non-local technicians, but will also support local economic development.

a) **Objectives**

- To expose the students to a broad-based, environmental studies background.
- To prepare students to address specific community-based environmental issues.
- Learn the basic interdisciplinary skills needed for general laboratory and field-based work in the environmental sciences such as inventorying biota or monitoring a few key water quality indicators.
- To prepare students to advance into a science or policy related Associate or Baccalaureate program or other undergraduate course work in the sciences.
- To prepare students academically and vocationally for entry-level employment in the field of natural resources and environmental science.

- To develop basic academic skills and gain essential knowledge in environmental studies that is integrated with a community-based environmental perspective.
- To introduce students to the established UAF BBC student support system that will provide tutorial, mentorship, and academic support.
- To provide students with the tools necessary for successful employment.
- To introduce students to university science programs that encourage academic development into advanced degrees.
- To promote skill development that integrates wellness, self-sufficiency, and community development.

Evaluation

- Academic Performance - Accumulated learner GPA in core courses and electives
- Directed Individual Project (Capstone Project)
  - Learn the basic scientific reporting methods and research skills necessary to analyze, interpret, and document field and laboratory data.
- Academic Involvement
  - Actively participate above and beyond academic course work
- Cooperative learning
  - Be reflective and be open to feedback from others
  - Motivated to work with others on projects
  - Eager to learn from others
- General Conceptual Understanding of Environmental Studies
  - Dedicated to being a "lifelong learner"
  - Professional and ethical behavior
  - Flexible in their thinking and exhibit creative ideas
- Job Preparedness
  - The student acquired the necessary skills for entry-level natural resources or environmental science career.

B. Authorization:

The University of Alaska Fairbanks (UAF) is one of four individually accredited universities within the University of Alaska system. UAF has been continuously accredited since 1934 by the Northwest Commission on Colleges and Universities.

The Constitution of the State of Alaska establishes the University of Alaska as the state university, governed by a Board of Regents appointed by the governor. Alaska Statutes provide for a board of eleven voting members, including one student, with authority to carry out the mission of the university system and its constituent units, including the determination and regulation of the university's course of instruction and the conferring of degrees. Members of the board have no contractual, employment, or financial interest in the university. The chair is elected from among the board. The board appoints the president of the university system, who in turn appoints the chancellor of UAF. Both officers are full-time employees whose only responsibility is to the institution.

Relationship to UAF mission

> *The University of Alaska Fairbanks, as the nation's northernmost Land, Sea, and Space Grant university and international research center, advances and disseminates knowledge through creative teaching, research, and public service with an emphasis on Alaska, the North and their diverse peoples.*

The ENVI certificate was created by the UAF BBC, in cooperation with local leaders, and is focused on preparing students for entry into science-related employment and continued post-associate education. This program is focused on preparing students for immediate jobs and for subsequent education. This program relates to and supports the goals of the UAF 2005 Strategic Plan by:

- Serving as the premiere higher educational center for Alaska Natives by both increasing the number of Alaska Native students at UAF and by increasing the proportion of degrees awarded to Alaska Native students.
- Providing high quality undergraduate education for traditional and non-traditional students by increasing the numbers of students who enroll in and successfully complete their 100-level and above coursework and degrees.
- Forming active collaborations with communities, organizations, businesses, and government to meet identified state, national, and global needs through increased numbers of students graduating with degrees in science related fields.

C. Educational Offerings:

1. Descriptive information of the educational offering(s):

Program Outline and Course Descriptions

ENVIRONMENTAL STUDIES (ENVI) CERTIFICATE OUTLINE

Complete the general university requirements

Complete the following general Certificate requirements 9 cr

a. Communication…..(complete one of the following).....3 cr:
   1) ENGL 111X – Introduction to Academic Writing .....3 cr OR
   2) ABUS 170 – Business Writing .....3 cr

b. Computation……...(complete one of the following).....3 cr:
   1) Any course at the 100-level or above in mathematical sciences (computer science, math, or statistics).....3 cr OR
   2) DEVM 105 – Intermediate Algebra.....3 cr

c. Human Relations…...(complete one of the following).....3 cr;
   1) ANTH 100X/SOC 100X – Individual, Society & Culture .....3 cr OR
   2) ABUS 154 – Human Relations.....3 cr OR
   3) Other program approved discipline-based human relations course or discipline-based with embedded human relation content to total 3 credits

Complete the following ENVI requirements 22-23 cr

d. Science Foundation Courses…(complete one from each of the following) 8 cr;

1) BIOL 103X – Biology and Society.....4 cr OR
2) BIOL 104X – Natural History of Alaska.....4 cr OR
3) BIOL 115X – Fundamentals of Biology I .....4 cr **

AND

4) CHEM 103X – Basic General Chemistry.....4 cr OR
5) CHEM 105X – General Chemistry I .....4 cr *

*Course requires placement in ENG 111 and MATH 107X

**Course requires CHEM 105X as a pre- or co-requisite, and placement in ENG 111 and MATH 107X

e. Environmental Studies Core Courses…(complete all seven below)**14-15** cr;
1) ENVI 101 – Introduction to Environmental Science.....3 cr
2) ENVI 110 – Introduction to Water Quality I: Measurement .....1 cr
3) ENVI 130 – Introduction to National Environmental Protection Act (NEPA) .....1 cr
4) ENVI 160 – Internship in Environmental Studies.....1-2 cr
5) ENVI 260 – Field Techniques for Environmental Technicians...2 cr
6) ENVI 265 – Introduction to Methods in Environmental Studies Reporting .....2 cr
7) GEOG 211X – Earth Systems: Elements of Physical Geography 4 cr

Complete 3 or 4 credits from the following elective courses 3-4 cr

l. BIOL 104X – Natural History of Alaska.....4 cr
m. BIOL 115X – Fundamentals of Biology I .....4 cr
n. CHEM 104X – Beginnings in Biochemistry .....4 cr
o. CHEM 105X – General Chemistry I .....4 cr
p. DEVS 100 – Introduction to Science.....4 cr
q. FISH 101 – Introduction to Fisheries .....3 cr
r. HLRM 130 – Research Field Logistics .....2 cr
s. NRM 101 – Natural Resources Conservation and Policy.....3 cr
t. RD 250 – Grant Writing for Community Development.....1-3 cr
u. STAT 200X – Elementary Probability and Statistics*** .....3 cr
v. Advisor Approved Elective****.....1-3 cr

(***if used for Computational Credit above, cannot be used for elective credit)

(****of similar level and subject matter to the listed elective courses)

Total.....minimum of 34 credits, maximum of 59 credits

Course Descriptions

Except for specific ENVI courses, this degree relies on existing UAF courses to meet its requirements.

General Certificate Requirements (9 credits)

ABUS 154 – Human Relations (3 credits) – Attitudes, self-concepts, personal communication styles, motivation, interactions, positive reinforcements, team building and leadership development.

ABUS 170 – Business Writing (3 credits) – Comprehensive review of grammar, punctuation, capitalization and spelling, with emphasis on business and office occupations.

ANTH/SOC 100X – Individual, Society and Culture (3 credits) – An examination of the complex social arrangements guiding individual behavior and common human concerns in contrasting cultural contexts.

DEVM 105 – Intermediate Algebra (3 credits) – Second year high school algebra. Operations with rational expressions, radicals, rational exponents, logarithms, inequalities, quadratic equations, linear systems, functions, Cartesian coordinate system and graphing. To matriculate to MATH 107X from DEVM 105 a grade of B or higher is required.

ENGL 111X – Introduction to Academic Writing (3 credits) – Instruction and practice in written inquiry and critical reading. Introduction to writing as a way of developing, exploring and testing ideas. Concentration on research methods and techniques.

ENVI Requirements (22-23 credits)

General Science Foundation Courses (8 credits) One from each of the following groups - courses must include lab.

BIOL 103X – Biology and Society (4 credits) – Fundamental principles of biology; emphasis on their application to humans in the modern world. Lectures, laboratory demonstrations, experiments and discussions of contemporary biological topics. For non-science majors; cannot be used as a biology elective by biological science majors.

BIOL 104X – Natural History of Alaska (4 credits) – The physical environment peculiar to the North and important in determining the biological setting; major ecosystem concepts to develop an appreciation for land use and wildlife management problems in both terrestrial and aquatic situations. May not be used as biology elective credit for a major in biological science.

BIOL 115X – Fundamentals of Biology I (4 credits) – Introduction to the principles of biology for science majors, with emphasis on chemistry of life, cell structure, metabolism, genetics and animal form and function. Students for whom this course is required for their major will be given preference when space is limited. Prerequisites: High school algebra or equivalent; placement in ENGL F111X or higher; placement in DEVM F105 or higher; or permission of instructor. Prerequisite/co-requisite: CHEM F105X. Recommended: High school biology.

CHEM 103X – Basic General Chemistry (4 credits) – Fundamentals of chemistry including historical and descriptive aspects as well as basic mathematical concepts. Fulfills the laboratory part of the natural science requirement and prepares the student for CHEM 105X. Note: This course satisfies elective credit only. Materials fee: $60. (Prerequisite: Placement in ENG111X or higher; placement in DEVM 105 or higher; **or permission of instructor**)

CHEM 105X – General Chemistry I (4 credits) – CHEM F105X-F106X, together, constitute the standard one-year engineering and science-major general chemistry course with laboratory. Major subjects include measurements, calculations, atomic and molecular structure, gas laws,

stoichiometry, an introduction to organic chemistry, chemical reactions and related energy changes. Special fees apply. Prerequisites: Placement in ENGL F111X or higher; placement in MATH F107X or higher; or a B or better in CHEM F103X; or permission of instructor and department chair.

ENVI Core Courses (14-15 credits)

ENVI 101 – Introduction to Environmental Science (3 credits) – This interdisciplinary course introduces the interconnected topics that make up environmental science. By exploring Earth's systems, environmental questions are investigated such as how to sustainably use natural resources and influence of population growth on ecosystems. The course takes a holistic approach to reinforce scientific principles. Key topics covered include ecosystem functions, energy, biodiversity, resource management, landscape alteration and climate change.

ENVI 110 – Introduction to Water Quality I: Measurement and Calibration (1 credit) – This course introduces students to standard water quality methods used in the field and applies them to rural Alaska. Students will become familiar with EPA water quality standards and programs that help preserve water quality in rural communities. Key topics covered include: stream ecology, wastewater management, storm water runoff, and data analysis.

ENVI 130 – Introduction to National Environmental Protection Act (NEPA) (1 credit) – This course provides a brief introduction to the National Environmental Protection Act (NEPA). This course will explain what community members need to do to be heard in the NEPA process with special emphasis on public involvement and Environmental Impact Analysis (EIA). The course covers the roles and the content of scoping and Environmental Assessments in relation to key natural resource development projects in rural Alaska.

ENVI 160 – Internship in Environmental Studies (1-2 credits) – Under the guidance of a UAF Bristol Bay Campus approved agency or business (public or private) students gain supervised pre-professional experience in environmental studies. The intern will explore the interdisciplinary aspects of field or laboratory research, build practical expertise, and make contacts. Internships make one to ten weeks of full time commitment to the agency or business and when completed make public presentations on the experience.

ENVI 260 – Field Techniques for Environmental Technicians (2 credits) – This course provides hands-on instruction in interdisciplinary field and laboratory techniques used by environmental technicians. Basic methods for sampling and studying terrestrial or aquatic ecosystems will be introduced. Students will participate in data collection and analysis procedures as part of an independent research project.

ENVI 265 – Introduction to Methods in Environmental Studies Reporting (2 credits) – Introduces basic data collection methods used in environmental studies then concentrates on research skills necessary to analyze, interpret, and document field and laboratory data and the scientific reporting processes. The course is designed to integrate raw environmental data into a research report that can be presented in scientific meeting format.

GEOG 211X –Earth Systems: Elements of Physical Geography (4 credits) – Interdisciplinary analysis of the processes that form Earth's physical environment, and how those processes condition the human environment. Includes system interactions among weather, climate, landforms, soils, water resources and vegetation, including world and regional patterns.

ENVI Elective Courses (Minimum of 3-4 credits)

BIOL 104X – Natural History of Alaska (4 credits) – The physical environment peculiar to the North and important in determining the biological setting; major ecosystem concepts to develop an appreciation for land use and wildlife management problems in both terrestrial and aquatic situations. May not be used as biology elective credit for a major in biological science.

BIOL 115X – Fundamentals of Biology I (4 credits) – Introduction to the principles of biology for science majors, with emphasis on chemistry of life, cell structure, metabolism, genetics and animal form and function. Students for whom this course is required for their major will be given preference when space is limited. Prerequisites: High school algebra or equivalent; placement in ENGL F111X or higher; placement in DEVM F105 or higher; or permission of instructor. Prerequisite/co-requisite: CHEM F105X. Recommended: High school biology.

CHEM 104X – A Survey of Organic Chemistry and Biochemistry (4 credits) – Fundamentals of chemistry as applied to biological systems. Bridges the gap between a general chemistry course and biochemical concepts of other health-related sciences. Recommended for health-science degree candidates and non-science majors interested in the central role of chemistry in life. May be used to meet the general laboratory science requirement or for preparation for CHEM F105X. Special fees apply. Prerequisites: CHEM F103X; placement in ENGL F111X or higher; placement in DEVM F105 or higher; or permission of instructor.

CHEM 105X – General Chemistry I (4 credits) – CHEM F105X-F106X, together, constitute the standard one-year engineering and science-major general chemistry course with laboratory. Major subjects include measurements, calculations, atomic and molecular structure, gas laws, stoichiometry, an introduction to organic chemistry, chemical reactions and related energy changes. Special fees apply. Prerequisites: Placement in ENGL F111X or higher; placement in MATH F107X or higher; or a B or better in CHEM F103X; or permission of instructor and department chair.

DEVS 100 – Introduction to Science (4 credits) – Introduction to skills needed to succeed in core science courses. Topics include scientific terminology, scientific mathematical notation, and the fundamentals of chemistry, physics and biology. Includes basic scientific lab techniques and the skills needed to learn scientific material. Prerequisites: Elementary algebra and college reading level.

FISH 101 – Introduction to Fisheries (3 credits) – A survey of the values, habitats, biology, ecology and management of fishes with particular reference to Alaskan fisheries and issues.

HLRM 130 – Field Logistics (2 credits) - Learn the skills, techniques, and equipment used in remote scientific fieldwork in Alaska. Course includes methods for processing and storing animal/plant tissue samples, orienteering, GPS, wilderness first aid, arctic survival, bear safety, aviation safety, as well as ATV, boat, and snowmachine operation, maintenance and repair.

NRM 101 – Natural Resources Conservation and Policy (3 credits) – Conservation of natural resources including history, ecological and social foundations. Examines principles of sustained yield, carrying capacity, supply and demand, and world population growth as applied to agriculture, range, forest, wildlife, fisheries, recreation, minerals and energy management. A wide range of perspectives is presented to help students develop a personal philosophy toward natural resources. Prepare a multiple resource observation plan for an underdeveloped area on campus. Optional all-day field trips take place the first two Saturdays of the semester. (Prerequisite: Placement in ENGL 111X.)

RD 250 – Grant Writing for Community Development (Levels 1-3)(1-3 credits) – Focuses on basic elements of grant proposals and processes of preparing proposals for governmental and private funding sources. Emphasis on applied skills through preparation of actual grant proposals.

STAT 200X – Elementary Probability and Statistics (3 credits) – Descriptive statistics, frequency of distributions, sampling distributions, elementary probability, estimation of population parameters, hypothesis testing (one and two sample problems), correlation, simple linear regression and one-way analysis of variance. Parametric and nonparametric methods. Also available via Independent Learning. (Prerequisites: MATH 107X, 161X, 181 or permission of instructor.)

2. Evidence of approval by the appropriate academic policy body of the institution:

Senate signature page and BOR approval from the minutes will be provided by the Office of the Provost.

D. Planning:

1. Evidence of need for the change and the students to be served:

UAF BBC student population is representative of CRCD student enrollment across the state. In academic year 2007-2008, women accounted for 62 percent of the students at the campus and Alaska Natives accounted for 58 percent of the student population. The students at UAF BBC were significantly older than the national average; 21 percent were under 29 years of age, and 68 percent were age 30 or older. Nationally, 75 percent of students were under age 29 and 21 percent of students were over age 30 in 2005 (NCES, Digest of Education Statistics, 2005).

This Environmental Studies certificate program is designed to attract a diverse student population whose interests are broad-based and interdisciplinary. Based on past numbers, projections show that 80 percent students will be part-time and 16 percent will be full time. Uniquely, few students will be from out of state with 98 percent of students being from Alaska.

Information gathered by UAF BBC through a region-wide educational needs assessment survey conducted in Summer 2003 showed a high interest in an Environmental Studies certificate for the potential of skill development relating to job requirements. The majority of survey participants were between 36-56 years of age, had some college education, and were Yup'ik Alaska Native males living in Dillingham or Togiak. This study suggested that village leadership is impacted by education level.

In the survey, 45% of the participants took a class through UAF BBC to either get a degree or for job skill improvement. The survey participants understand the need for education as 75% of those surveyed said education was "Very Much" necessary to finding a better job and additionally that 81% of those surveyed agreed "Very Much" that increasing their educational level would provide them with a higher paying job.

Upon review of this program, agencies in the Bristol Bay region, as well as statewide (Dillingham City Council, Bristol Bay Borough, Bristol Bay Native Association, Bristol Bay Economic Development Corporation, Wood-Tickchick Land Trust, Alaska Department of Fish and Game, U.S. Fish and Wildlife Service, and National Park Service), have commented on the need for a skill-based, environmental studies education program for their entry-level

positions. Historical impacts and state statistics show there is a need for a statewide practical education program in Alaska. Finally, entry into and completion of a subsequent associate or baccalaureate science-related degree will qualify individuals for immediate employment in fields varying from teaching to field research and from village-based to urban arenas.

Preliminary marketing and research of the idea for the new ENVI program shows a strong interest of both potential students and local employers. Therefore it should be noted that the market is already preparing to take advantage of the coursework.

State statistics

State statistics from the Department of Labor substantiate workforce and skill development needs in rural Alaska. Figures provided by the Department of Labor Website (http://almis.labor.state.ak.us) project, by 2012, a 12.1% increase in jobs in Professional, Scientific, and Technical Services, a 50% increase in jobs in Waste Management and Remediation, and a 32.2% increase in jobs in Health and Social Services. The ENVI certificate will either prepare the student to directly enter this high demand workforce in entry-level science careers or will prepare the student for either an AAS in Renewable Resource, Associate of Science degree, or a Bachelors degree that will provide the potential for higher-level science professions.

2. The procedures used in arriving at the decision to change[1]:

This proposal is the result of an ongoing initiative by rural campuses, rural residents, local nonprofits, and communities concerned about the lack of quality educational opportunities available to the rural Alaska workforce. The guiding force behind the proposed program is the UAF BBC and local ENVI certificate Program Council of Advisors.

Kyle Belleque	Bristol Bay Economic Development Corporation
Tina Carr	UAF BBC Student Representative, Aleknagik
Daniel Chythlook	Aleknagik Traditional Council
Andy deValpine	Bristol Bay Coastal Service Area, Dillingham
Sue Flensburg	Environmental Program Coordinator, Bristol Bay Native Association
Martha Fox	Togiak Middle School
Gregory Kingsley	Pilot Point Tribal Environmental Staff, Alaska Peninsula Area
Paul Liedberg	US Fish and Wildlife Service, Togiak Wildlife Refuge
Billy Maines	Tribal Environmental Program Coordinator, Curyung Tribal Council
Tim Sands	Alaska Department of Fisheries and Game, Dillingham
Pearl Strub	Dillingham Business Owner

The purpose of the ENVI certificate is to offer a rural-specific, culturally relevant accredited certificate through UAF BBC and the CRCD. This effort will build upon the work and initiative of respected organizations throughout Alaska. This collaboration will develop a strong statewide program under the assumption that for successful learning to take place for the student, it is vital that the traditional ways of learning is followed and the strengths possessed by Alaska Native peoples be acknowledged.

The overall goals of the ENVI certificate are to meet the skill-development and workforce needs of rural and urban Alaska and to encourage rural residents to attain university credits and degrees that relate to the rural economy and cultural systems.

The ENVI certificate will provide the impetus necessary for many programs throughout the state to address rural higher education needs. The Council of Advisors has guided the development of the program from the inception: development of the core competencies and basic skills required of ENVI staff, and creation of the process for rural Alaskan delivery. The UAF BBC and the Council of Advisors will continue to plan, guide, monitor, and assess the ENVI certificate.

Based on the commitment of rural environmental staff and leaders, as well as local businesses and local organizations and the critical need within rural Alaska for adequate and accessible education, enrollment for this certificate is expected to grow. This certificate directly addresses the University's stated commitment to serve the Alaska Native population and emphasizes recruitment of Alaska Native students in an underserved academic area.

3. The organizational arrangements that must be made within the institution to accommodate the change[2]:

The primary faculty are employees of the University. Dr. Todd Radenbaugh has been hired through the USDA Higher Education Grant specifically to coordinate the ENVI program as well as teach required ENVI and other appropriate science courses. Current faculty comes from the CRCD as will Fairbanks-based UAF faculty. SNRAS faculty will also participate in development and instruction of some ENVI certificate courses. Fairbanks-based classes may show a slight increase in student registrations.

ENVI program information and course requirements were sent out for comments two times, once via email in September 2006, and a second time in September 2008. A solicitation of concerns was made to University departments due to increased course enrollments resulting from the required science courses and the elective credit options ENVI students may take. The department contact names included:

September 2006

Concerning Required Science, Communication, Computation, and Human Relations Courses:

Rich Boone, Biology
Tom Clausen, Chemistry
Michael Whalen, Geology
Judy Atkinson, CRCD Developmental Math
Susan Andrews, CRCD Humanities Division Chair

Concerning Elective Credit Options:

Rich Boone, Biology
Tom Clausen, Chemistry
Michael Whalen, Geology
Steve Sparrow, School of Natural Resources and Agricultural Sciences
Denis Wiesenburg, School of Fisheries and Ocean Sciences
Gordon Pullar, Alaska Native and Rural Development Department
Dana Thomas, Math and Statistics

September 2008

Concerning Required Science Courses:

Rich Boone, Biology

John Keller, Chemistry
Mike Sfraga, Geography
Carol Lewis, Natural Resources and Agricultural Sciences

No negative comments were received and all raised concerns were addressed. Department responses were favorable. Enrollment increases will be minimal as well as the demand on department faculty.

LIBRARY IMPACT

Pauline Wilson of UAF Library Resources reviewed the certificate on September 8, 2006 and concluded that there will be minimal impact on resources and materials. Most of the information for this program has been created and developed by participating UAF programs and local nonprofit organizations.

On September 9, 2008 Susan Hahn, Assistant Professor and Off-campus Librarian was asked to review the courses for the ENVI certificate in terms of resource use by the University Library. She and Karen Jensen, Collection Development Officer at the UAF Rasmuson Library, concluded minimal additional impact on library resources needed to support the certificate courses. The existing library budget should also be able to accommodate some additional monograph acquisitions, if needed. The impact on library resources will include Internet-based resources and some additional acquisitions with information transmission and book mailing done by library staff.

RELATION OF PROGRAM TO OTHER UNIVERSITY PROGRAMS

EFFECTS OF ENROLLMENT ELSEWHERE IN THE SYSTEM

The primary faculty are employees of the University. Dr. Todd Radenbaugh has been hired through the USDA Higher Education Grant specifically to coordinate the ENVI program as well as teach required ENVI and other appropriate science courses. Current faculty comes from the CRCD as will Fairbanks-based UAF faculty. SNRAS faculty will also participate in development and instruction of some ENVI certificate courses. Fairbanks-based classes may show a slight increase in student registrations.

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Gordon Pullar, Alaska Native and Rural Development Department
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September 2008

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Rich Boone, Biology
John Keller, Chemistry
Mike Sfraga, Geography
Carol Lewis, Natural Resources and Agricultural Sciences

No negative comments were received and all raised concerns were addressed. Department responses were favorable. Enrollment increases will be minimal as well as the demand on department faculty.

DUPLICATION/APPROXIMATION OF OTHER UNIVERSITY PROGRAMS

There are other existing and proposed programs dealing with environmental studies and sciences, but none includes a certificate that concentrates on a rural, community-based curriculum. Other existing curriculum includes:

1) Associate of Applied Science (AAS) in Environmental Technology (ENVT) offered at the University of Alaska Southeast-Sitka campus. The AAS offers students a fundamental background in environmental technology and an emphasis in the operations of water and wastewater facilities. Successful completion of the AAS degree provides the education necessary to meet the post secondary education requirements for State of Alaska Level 3 operator certification.

2) Bachelor of Science (BS) degree in Environmental Science offered by the University of Alaska Southeast. UAS also offers a minor in Environmental Science. UAS's Environmental Science curriculum draws from a variety of disciplines including: the earth sciences, chemistry, physics, biology, math, and spatial analysis. Students learn biological principles and skills in lecture, laboratory, and field courses. Because this is a BS degree, by design, the in-depth nature of the science courses and the need for four years to complete the degree make the UAS program very different from the proposed ENVI certificate program with BBC. Their program is heavy in math, chemistry, and physics and this focus has resulted in a low student retention rate.

3) Bachelor of Science degree in Environmental Studies offered by UAF-SNRAS (Geography). The BS in Geography at UAF offers three "options" or tracks of study. Option 1: Environmental Studies provides the foundation necessary for understanding the natural and social environment, the analysis of environmental issues from an interdisciplinary geographic perspective, a diverse technical and scientific approach to environmental issues, and the ability to find balanced solutions to environmental problems.

Students who have completed their ENVI certificate will be well aligned to continue the Environmental Studies BA/BS option at UAF, as many of the core and majors courses will have been completed. UAF offers two other BS Geography Options, one in Landscape Analysis and Climate Change Studies and another in Geographic Information Sciences and Technology. BBC students interested in more field science-focused programs or GIS technology may continue in these tracks, again with many core and major requirements completed. The ENVI program at BBC will complement and not compete with UAF Geography Programs.

4) A minor in Geography and Environmental Studies is offered by UAA Geography and Environmental Studies Department. This department is also proposing BS and degrees in Geography and Environmental Studies. This program presently concentrates more on the humanities side of environmental studies. Contact has been made with Dorn Van Dommelen, Chair of the Department, and he is willing to work together toward greater integration of the programs.

This proposed ENVI certificate will work closely with these programs and share information with department chairs as well as the Dean and Associate Dean of SNRAS. This ENVI certificate has been given strong support by SNRAS and the Geography program at UAF as a potential bridge for rural students into the geography department. With the advice and support of the UAF Geography Department Chair, this ENVI certificate will enhance the geography BS degree as well as other programs build upon the foundation of environmental studies.

Compared to the ENVI Certificate, there is no duplication or approximation of other programs statewide. At present there is no environmental studies program designed specifically to serve students who desire to meet the skill-development and workforce needs of rural and urban Alaska and to encourage rural residents to attain university credits and degrees that relate to the rural economy and cultural systems.

Therefore, this certificate will support many programs and will not duplicate any other programs in the University of Alaska system.

4. Timetable for implementation[3].

The program is expected to be in the UAF catalog and available in the fall semester of 2009. Courses already exist at the pilot stage as well as general core certificate courses and students will be able to start work on components of this certificate immediately.

E. Budget:

1. The budget projections (revenue and expenditures) for each of the first three years of operation:

ENVI program development and implementation is directly supported by the United States Department of Agriculture (USDA), Cooperative State Research, Education, and Extension Service Alaska Native/Native Hawaiian (CSREES AN/NH) Serving Institutions Higher Education Grants program. This project addresses the USDA goal of increasing the number of AN/NH students engaged in USDA careers. These careers include environmental science, among others. This certificate will serve these requirements by not only increasing the

number of students entering a certificate program, stepping up to an AAS, an AS or a Bachelor degree but by also preparing students for entry-level science employment.

Because the USDA's interest is, ultimately, bringing more AN/NH students into USDA careers at the bachelors and masters level, the above mentioned grant will fund the current effort until at least 2012, USDA support currently stands at one full-time science faculty member who helped develop the program plus funding for a total of eight Alaska Native students to complete the ENVI certificate within approximately three years.

While the UAF BBC has developed this new program, other fund 1 faculty and staff from all campuses, both urban and rural, will potentially be involved with this program. The program will generate $33,440 per year with a minimum of eight full-time students. As student participation increases, tuition income will increase gradually replacing grant funding.

While the current effort is supported for the next three years (through 2012), the long-term sustainability (up to ten years) of this program through the USDA Alaska Native/Native Hawaiian Serving Higher Institutions Education Grants program is very promising. For example, the University of Hawaii is similarly funded by the USDA and has developed long-term projects with other universities in the American Pacific (Agricultural Development in the American Pacific Project). These collaborative projects, which work to develop agriculture in a sustainable, culturally appropriate and economically viable way, have been funded since 1988. While there is no absolute guarantee that the ENVI program will have funding past 2012, the USDA grant program is greatly committed to developing higher education and developing local sustainability in places like rural Alaska and rural Hawaii while utilizing local knowledge and culture, for the long term.

If USDA funding does not continue beyond 2012, scholarship dollars are often available for Alaska Native students through their respective native corporations to assist with tuition and travel costs. These native corporations are the largest land-owners in the Bristol Bay Region and have a vested interest in having more locally trained land managers in the region knowledgeable of the local resources. In addition, students who are already employed by a natural resources agency (such as the Natural Resources Division of Bristol Bay Native Association) may be able to receive assistance with tuition for courses that will greatly improve knowledge and skills in environmental studies techniques and methods to make them competitive for higher-level positions.

2. Revenue and expenditures associated with the change itself:

CREDIT HOUR PRODUCTION

The program will provide an increase in credit hours for the University and will draw new students from an untapped pool by providing expanded course delivery, and culturally relevant and skills-based education. Based on an average enrollment projection of eight students per semester taking three credits and three students taking 15 credits per semester, the ENVI will generate 75 credit hours per semester in AY2010. Projected enrollment increases will result in an increase to 32 students and 225 credit hours by 2013.

FACULTY

University Fairbanks Faculty

a) Todd Radenbaugh, Assistant Professor, Environmental Studies, UAF BBC, Dillingham

b) Jodie Anderson, Term Instructor with School of Natural Resources and Agricultural Sciences (SNRAS)/Agricultural and Forestry Experimental Station (AFES), Palmer
c) Greg Finstad, Assistant Professor, Reindeer Research Program Manager, SNRAS/AFES, Fairbanks

Other University and Rural Campus Faculty

Name	Campus	Position
Jane Allen	KC	Assistant Professor of Mathematics
Nancy Ayagarak	KC	Instructor of Developmental English
Bob Brown	KC	Assistant Professor of Mathematics
Hector Douglas	KC	Assistant Professor of Biology
Kevin Jernigan	KC	Assistant Professor of Ethnobotany
Theresa John	KC	Assistant Professor of Rural Development
Benjamin Kuntz	KC	Assistant Professor of English
Martin Leonard III	KC	Assistant Professor of CIOS Manager
Rose Meier	KC	Assistant Professor of Ethnobotany
Richard Taylor	KC	Assistant Professor of Computer Applications
Claudia Ihl	NWC	Assistant Professor of Biology
G. Joe Mason	NWC	Associate Professor of Computer Applications
Susan Andrews	CC	Professor of Humanities/Journalism
John Creed	CC	Professor of Humanities/Journalism
George Guthridge	BBC	Professor English & General Studies
Michael E. Davis	BBC	Associate Professor/ Economic Development
Brian Rasley	BBC	Assistant Professor Chemistry
Victor Zinger	BBC	Assistant Professor Math & General Studies
Carrie Aldrich	IAC	Assistant Professor Developmental English
Jodi Bailey	IAC	Instructor CIOS
Carol Lee Gho	IAC	Assistant Professor Math and Science
Ronald Illingworth	IAC	Professor Developmental Studies
Julie Maier	IAC	Assistant Professor Math and Sciences
Sandra Wildfeuer	IAC	Assistant Professor Mathematics

Campus Key
BBC = Bristol Bay Campus
CC = Chukchi Campus
IAC = Interior and Aleutian Campus
KC = Kuskokwim Campus
NWC = Northwest Campus

3. Institutional financial support to be reallocated to accommodate the change:

While the current effort is supported for the next three years (through 2012), the long-term sustainability (up to ten years) of this program through the USDA Alaska Native/Native Hawaiian Serving Higher Institutions Education Grants program is very promising. For example, the University of Hawaii is similarly funded by the USDA and has developed long-term projects with other universities in the American Pacific (Agricultural Development in

the American Pacific Project). These collaborative projects, which work to develop agriculture in a sustainable, culturally appropriate and economically viable way, have been funded since 1988. While there is no absolute guarantee that the ENVI program will have funding past 2012, the USDA grant program is greatly committed to developing higher education and developing local sustainability in places like rural Alaska and rural Hawaii while utilizing local knowledge and culture, for the long term.

If USDA funding does not continue beyond 2012, scholarship dollars are often available for Alaska Native students through their respective native corporations to assist with tuition and travel costs. These native corporations are the largest land-owners in the Bristol Bay Region and have a vested interest in having more locally trained land managers in the region knowledgeable of the local resources. In addition, students who are already employed by a natural resources agency (such as the Natural Resources Division of Bristol Bay Native Association) may be able to receive assistance with tuition for courses that will greatly improve knowledge and skills in environmental studies techniques and methods to make them competitive for higher-level positions.

4. The budgetary and financial implication of the change for the entire institution:

ENVI program development and implementation is directly supported by the United States Department of Agriculture (USDA), Cooperative State Research, Education, and Extension Service Alaska Native/Native Hawaiian (CSREES AN/NH) Serving Institutions Higher Education Grants program. This project addresses the USDA goal of increasing the number of AN/NH students engaged in USDA careers. These careers include environmental science, among others. USDA support currently stands at one full-time science faculty member who helped develop the program plus funding for a total of eight Alaska Native students to complete the ENVI certificate within approximately three years.

While the UAF BBC has developed this new program, other fund 1 faculty and staff from all campuses, both urban and rural, will potentially be involved with this program. The program will generate $33,440 per year with a minimum of eight full-time students. As student participation increases, tuition income will increase gradually replacing grant funding.

The primary teaching faculty are already employees of the University. Current faculty come from the CRCD as will Fairbanks-based UAF faculty. Cooperative Extension Service faculty will also participate in development and instruction of some ENVI certificate courses

CRCD campuses will provide classroom space for ENVI certificate courses. In communities without a local university facility, training space can be found in the private sector and reasonably supported by tuition fees through partnership arrangements. In addition, collaboration with school districts will provide space to teach some university courses. Therefore, through community and school district partnerships, the impact on existing UAF and CRCD technology resources and facilities are limited to existing resources and no new facilities or space will be required.

F. Student Services:

PROGRAM MANAGEMENT

This certificate will be incorporated within the normal academic structure of the CRCD Math/Science Division as well as UAF BBC. Academic program oversight and program coordination will be housed at the UAF BBC. They will provide the necessary staff support as well.

The BBC support staff will be responsible for:

- student advising, support, and recruiting,
- program advertising and marketing both internally and externally,
- course scheduling and content consistency,
- instructor review and approval,
- credit for prior learning evaluation (CPL),
- petition and waiver review and approval
- continual review of both human and fiscal resource sufficiency to ensure that necessary faculty and student support is available to meet program growth
- coordination of on-going internal management, evaluation, and revision
- provide advising and other support as needed from their in-house student support functions and from existing faculty
- hire adjunct instructors using the existing CRCD and university approved policy

G. Physical Facilities:

FACILITIES/SPACE NEEDS

Office and classroom space will be provided by existing University urban and rural campuses throughout Alaska. Some of the rural communities with available facilities include Galena, Fort Yukon, Tok, Nenana, McGrath, Unalaska, Dillingham, Bethel, Nome, Kotzebue, Barrow, and Sitka. In villages without a University facility, training space can be found in the local schools and businesses and are reasonably supported by student tuition fees. No new facilities or space will be required.

As the University continues to upgrade its capacity to address the growing need for adequate education in rural Alaska, specifically with regard to the distance delivery processes and audio/visual equipment, and computer delivery platforms the ENVI certificate will be made readily available to more students.

H. Library and Information Resources:

LIBRARY IMPACT

Pauline Wilson of UAF Library Resources reviewed the certificate on September 8, 2006 and concluded that there will be minimal impact on resources and materials. Most of the information for this program has been created and developed by participating UAF programs and local nonprofit organizations.

On September 9, 2008 Susan Hahn, Assistant Professor and Off-campus Librarian was

asked to review the certificate in terms of resource use by the University Library. She concluded verbally that the library could easily handle the additional load the certificate may have on library resources. The impact on library resources will include Internet-based resources and some additional acquisitions with information transmission and book mailing done by library staff.

I. Faculty and Staff:

FACULTY

University Fairbanks Faculty

a) Todd Radenbaugh, Assistant Professor, Environmental Studies, UAF BBC, Dillingham

b) Jodie Anderson, Term Instructor with School of Natural Resources and Agricultural Sciences (SNRAS)/Agricultural and Forestry Experimental Station (AFES), Palmer

c) Greg Finstad, Assistant Professor, Reindeer Research Program Manager, SNRAS/AFES, Fairbanks

Other University and Rural Campus Faculty

Name	Campus	Position
Jane Allen	KC	Assistant Professor of Mathematics
Nancy Ayagarak	KC	Instructor of Developmental English
Bob Brown	KC	Assistant Professor of Mathematics
Hector Douglas	KC	Assistant Professor of Biology
Kevin Jernigan	KC	Assistant Professor of Ethnobotany
Theresa John	KC	Assistant Professor of Rural Development
Benjamin Kuntz	KC	Assistant Professor of English
Martin Leonard III	KC	Assistant Professor of CIOS Manager
Rose Meier	KC	Assistant Professor of Ethnobotany
Richard Taylor	KC	Assistant Professor of Computer Applications
Claudia Ihl	NWC	Assistant Professor of Biology
G. Joe Mason	NWC	Associate Professor of Computer Applications
Susan Andrews	CC	Professor of Humanities/Journalism
John Creed	CC	Professor of Humanities/Journalism
George Guthridge	BBC	Professor English & General Studies
Michael E. Davis	BBC	Associate Professor/ Economic Development
Brian Rasley	BBC	Assistant Professor Chemistry
Victor Zinger	BBC	Assistant Professor Math & General Studies
Carrie Aldrich	IAC	Assistant Professor Developmental English
Jodi Bailey	IAC	Instructor CIOS
Carol Lee Gho	IAC	Assistant Professor Math and Science
Ronald Illingworth	IAC	Professor Developmental Studies
Julie Maier	IAC	Assistant Professor Math and Sciences
Sandra Wildfeuer	IAC	Assistant Professor Mathematics

Campus Key
BBC = Bristol Bay Campus
CC = Chukchi Campus
IAC = Interior and Aleutian Campus

KC = Kuskokwim Campus
NWC = Northwest Campus

APPENDIX D

Student Learning Outcomes Assessment

Environmental Studies (ENVI) Certificate, University of Alaska Fairbanks, Bristol Bay Campus
September 2008

Expanded Statement of Institutional Purpose	Intended Objectives/Outcomes	Assessment Criteria and Procedures	Implementation (what, when, who)
MISSION STATEMENT: The Environmental Studies Certificate (ENVI) of UAF's College of Rural & Community Development, Bristol Bay Campus will provide rural students with quality academic instruction and training responsive to local needs. This program will help empower students and their communities to adapt to the overwhelming social, ecological, and economic changes presently occurring while protecting and enriching Alaska Native culture. **GOAL STATEMENT:** ENVI Certificate holders will learn the necessary interdisciplinary skills needed for general laboratory and field-based work in the environmental sciences such as inventorying and monitoring environmental conditions. Further, the program combines these contemporary scientific studies with traditional knowledge to better prepare graduates for rural entry-level natural resources jobs statewide or to continue their formal education in the natural sciences, resource policy, or administration.	1. Students completing the Environmental Studies Certificate will be prepared academically and vocationally for entry-level employment in the field of natural resources and environmental science.	1a. Assessment of Directed Individual Study (capstone project) as a product of coursework (primarily ENVI 101, 260, and 265). 1b. Individual student Learning Outcomes Assessment Rubric (see following page) 1c. Employer perception of interns and student hires	1a. Assessment by instructor of ENVI 205 1b. Rubric completed by ENVI Program Coordinator 1c. Survey delivered by ENVI student employers.
	2. Students completing the ENVI Certificate will be prepared to advance into a science or policy related Associate or Baccalaureate program or other undergraduate course work in the sciences.	2a. Assessment of Directed Individual Study (capstone project) as a product of coursework (primarily ENVI 101, 260, and 265). 2b. Individual student Learning Outcomes Assessment Rubric (see following page) 2c. Employer perception of interns and student hires	2a. Assessment by instructor of ENVI 265 2b. Rubric completed by ENVI Program Coordinator 2c. Survey conducted by ENVI student employer.
	3. Students completing the ENVI Certificate program will develop basic academic skills and gain essential knowledge in environmental science that is integrated with a local environmental perspective.	3a. Student interest/desire to work in rural Alaska based on exit interview	3.a Exit interview conducted by ENVI Program Coordinator

Environmental Studies (ENVI) Certificate Learning Outcome Assessment Rubric

Outcomes	Expectations	Rating
Academic Performance - Accumulated student GPA in core courses and electives	A Grade Point Average of 'C' (2.0) or above in ENVI Certificate courses (Rating scale: C=1, B=2, A=3)	
Directed Individual Project (Capstone Project) • Learn the basic scientific reporting methods and research skills necessary to analyze, interpret, and document field and laboratory data.	Satisfactorily completed environmental science investigation (Directed Individual Study - ENVI 265) involving literature search, data collection, analysis and reporting.	
Academic Involvement • Participation above and beyond academic course work	Actively debates topics in environmental science during class or community events Presents oral or poster presentations at academic conferences or meetings Participate in environmental science internships.	
Cooperative Learning • Reflective and open to feedback from others • Motivated to work with others on projects • Eager to learn from others	Complete projects with other students Willingness to involve other students in independent research projects Cooperative behavior indicated in internships or job performance.	
General Conceptual Understanding of Environmental Science • Dedicated to being a "lifelong student" • Professional and ethical behavior • Flexible in their thinking and exhibit creative ideas	Reads environmental science literature Attends environmental science conferences Join professional associations	
Job Preparedness • The student acquired the necessary skills for entry-level natural resources or environmental science career.	Students have: • Received environmentally related internship **or** • Interviewed for an environmental science job **or** • Successfully employed in an environmental science job	
Score (Total =18, score greater than 13 or 70% suggests learning objectives for student were met)		

Rating: Scale
0 = student does not exhibits this characteristic
1 = student rarely exhibits this characteristic
2 = student occasionally exhibits this characteristic
3 = student typically exhibits this characteristic

Environmental Studies (ENVI) Certificate Course Learning Matrix

	Environmental Studies: Course Matrix	ENVI 101	ENVI 110	ENVI 130	ENVI 160	ENVI 260	ENVI 265	GEOG 211	Science Foundation 1st semester	Science Foundation 2st semester	ENGL 111 or ABUS 105	100 level Math	ANTH/ SOC 100 or ABUS 154
Cat. A.	**Apply basic environmental concepts to Alaska**												
A.1	Acquire knowledge environmental issues in rural Alaska	X	X		X	X		X	X	X			X
a.	Know different habitat types of Alaska					X		X					
b.	Understand the issue of biodiversity.	X											
d.	Evaluate how external factors that affect ecosystems	X				X	X	X					
e.	Be familiar with data analysis.		X		X	X	X	X	X	X		X	
f.	Be familiar with environmental monitoring techniques.		X		X	X	X	X					
A.2	Understanding Ecosystems	X			X			X	X	X			
A.3	Acquire knowledge of cultural issues	X		X	X			X					X
A.4	Acquire knowledge of biochemical cycles.	X	X					X	X	X			
A.5	Acquire knowledge of ecological issues	X	X					X					
A.6	Demonstrate awareness of wildlife population dynamics.	X						X					

A.7	Acquire knowledge of natural disturbances e.g. as hurricanes, volcanoes, fires	X						X					
A.8	Demonstrate ability to apply chemicals in a safe and appropriate manner.		X										
A.9	Acquire basic knowledge of hydrology.	X						X	X	X			
a.	Know the effects of natural flooding on resources.	X						X					
b.	Understand surface water protection.	X		X				X					
c.	Understand ground water protection.	X		X				X					
A.10	Know basic wildlife dynamics.							X					
A.11	Understand habitat for aquatic animals.	X	X					X					
A.12	Identify wetlands properties.							X					
A.13	Understand edges and corridors.							X					
A.14	Learn about environmental assessments.			X				X					
A.15	Understand basic biology, chemistry or Geography							X	X	X			
A.16	Be familiar with water quality and chemistry.	X		X				X					
Cat. B.	**Understand general science concepts.**												
B.1	Understand how		X					X	X	X		X	

	science uses math.												
B.2	Science to include biology, chemistry or geography					X	X	X	X	X			
a.	Understand the scientific method	X	X			X	X	X	X	X			
b.	Apply simple experimental designs.					X	X	X	X	X			
c.	Analyze simple experimental data.					X	X	X	X	X			
B.3	Scientific writing concepts					X	X	X	X	X	X		
Cat. C.	**Understand environmental laws and regulations**												
C.1	Identify applicable regulations.	X		X				X					
C.2	Comply with regulations.			X									
C.3	Keep current on laws and regulations.			X									
C.4	Communicate with regulatory agencies and/or supervisor.			X									
C.5	Apply chemicals in a safe and appropriate manner.		X										
C.6	Know endangered species act and impact of implementation.	X		X									
C.7	Know permitting procedures.			X									
C.8	Understand the effects of manipulation on species composition.												
C.9	Be aware of population dynamics.			X									

C.10	Know coastal zone management law.			X				X					
C.11	Understand special protection zones.			X									
C.12	Be familiar with access use of land.			X									
C.13	Be aware of jurisdictional rights.			X									
C.14	Understand how ENVI rules are made and amended.			X									
Cat. D.	**Apply effective interpersonal and communication skills**												
D.1	Demonstrate leadership skills.			X	X								
a.	Develop persuasive skills.										X		
b.	Understand conference presentations.					X							
c.	Practice audience appropriate communication.					X					X		
g.	Design educational materials.					X					X		
h.	Construct presentation slides/posters.					X					X		
D.2	Be able to write reports, correspondences, etc.					X	X	X	X		X		
D.3	Give effective oral presentations.						X	X					
D.4	Demonstrate computer literacy.					X	X	X	X	X		X	

Cat. E.	**Recognize, collect and interpret field data**												
E.1	Inventory natural resources.		X			X		X					
E.2	Demonstrate field techniques.		X			X							
a.	Water quality analysis		X			X							
E.3	Use GIS and other modeling programs in analyses.					X	X						
a.	Explore GIS as a resource tool.					X	X	X					
b.	Learn to input data.					X	X	X	X	X			
c.	Define GPS and its functions.					X	X	X					
E.4	Produce reports on data analysis (both oral and written).					X	X	X	X	X	X	X	
E.5	Analyze and summarize data.					X	X	X	X	X		X	
E.6	Knowledge of field id of plants and animals					X	X						