

Program Proposal – Forms C & D

**Bachelor of Applied Science Environmental Conservation
BASEC**



**Submitted to
State Board for Community and Technical Colleges
Washington**

**by
Skagit Valley College**

25 February 2014

Table of Contents

1. Curriculum demonstrates baccalaureate level rigor.....	5
(1.1) Program learning outcomes.....	5
(1.2) Program evaluation process and criteria:.....	6
(1.3) Course preparation needed:.....	8
(1.4) General education components.....	9
(1.5) Course work needed at junior and senior levels.....	10
Sample Schedule BAS Environmental Conservation (BASEC), SVC.....	11
2. Qualified faculty.....	12
3. Selective admissions process, if used for the program, consistent with an open door institution.....	14
(3.1) Entry Process:.....	15
(3.2) Prerequisites:.....	16
(3.3) Students applying from other colleges.....	16
4. Appropriate student services plan.....	17
(4.1) Academic Advising.....	18
(4.2) Career Advising.....	19
(4.3) Academic Early Alert Service.....	20
(4.4) Library Services.....	20
(4.5) Learning labs (Writing & Math centers).....	21
(4.6) Veterans Services.....	21
(4.7) Financial Aid.....	21
(4.8) Campus Community (student programs).....	21
(4.9) Access Services.....	22
(4.10) Hours of service.....	22
5. Commitment to build and sustain a high quality program.	22
(5.1) Funds to be used to support the program.....	22
(5.2) Program Expenses.....	24
(5.3) College facilities.....	25
(5.4) Program Facilities, Equipment, Technology, and Instructional Resources.....	25
(5.5) College Commitment to the Environmental Conservation Program.....	26

6. Program specific accreditation.	26
7. Pathway options beyond baccalaureate degree.	28
8. External expert evaluation of program.	29
Appendix A	30
Appendix B	33
Appendix C	34
Appendix D	38
Appendix E	39
Appendix F	41
Weekly class schedule per Quarter	41
Appendix G	44
Course descriptions & learning outcomes.....	44

Form C

**COVER SHEET
NEW DEGREE PROGRAM PROPOSAL**

Program Information

Program Name: Bachelor of Applied Science – Environmental Conservation

Institution Name: Skagit Valley College

Degree: BAS in Environmental Conservation Level: Bachelor Type: Science CIP Code: 030101
(e.g. B.S. Chemistry) (e.g. Bachelor) (e.g. Science)

Contact Information (Academic Department Representative)

Name: Kenneth Lawson, Ph.D.

Title: Vice President for Instruction

Address: 2405 E. College Way, Mount Vernon, WA 98273

Telephone: (360) 416-7732

Fax: (360) 416-7941

Email: kenneth.lawson@skagit.edu



Chief Academic Officer

February 12, 2014

Date

Proposal criteria

Please respond to all 10 areas listed in proposal criteria Form D

NEW DEGREE PROGRAM PROPOSAL

1. Curriculum demonstrates baccalaureate level rigor.

<p>1. Curriculum demonstrates baccalaureate level rigor.</p>	<p>Describe curriculum including: (1) program learning outcomes; (2) program evaluation criteria and process; (3) course preparation needed by students transferring with a technical associate degree; (4) general education components; and (5) course work needed at junior and senior levels in the BAS.</p>
--	--

Ph.D. faculty within the Environmental Conservation Department at SVC initially developed the curriculum for the BAS in Environmental Conservation. The program advisory committee also provided input and guidance to the course content to ensure an appropriate level of rigor commensurate with an applied environmental and natural sciences at the baccalaureate level. Faculty members who serve on the steering committee for Curriculum for the Bioregion Initiative have also reviewed the curriculum. The Curriculum for the Bioregion Initiative is organized by the Washington Center at The Evergreen State College and has 19 community college campuses in the Puget Sound Region involved as well private universities such as Antioch University Seattle, Northwest Indian College, Pacific Lutheran University, Seattle Pacific University, and Seattle University. In addition, the region’s public four-year universities: The Evergreen State College, University of Puget Sound, University of Washington, Bothell, University of Washington Seattle, University of Washington Tacoma, and Western Washington University participate. Faculty members teaching in the STEM fields all reviewed the curriculum and provided valuable feedback.

Finally, the two program reviewers—Dr. John Marzluff, School of Environmental and Forestry Sciences, College of the Environment, UW and Dr. Grace Wang, Huxley College of the Environment, WWU —found that the curriculum is of junior and senior university quality.

(1.1) Program learning outcomes

Students will be able to:

- Understand and apply federal, state, and tribal policies driving natural resource policies.
- Use landscape ecology principles and technology to analyze ecological scenarios for management decisions at the watershed level.
- Apply forest ecology and silvicultural techniques to develop management scenarios for working forests.

- Use salmon biology to inform and to make management decisions regarding individual salmon stocks and outline ecological restoration measures.
- Contribute to natural resource decision-making groups utilizing effective communication techniques.
- Apply conservation biology strategies and community ecology principles in the management of biodiversity at the landscape level.
- Incorporate watershed management science in management strategies for managing watersheds sustainably for ecosystem services and natural resources.
- Develop and implement management actions for aquatic habitats.
- Develop and demonstrate leadership skills within the environmental sciences and natural resources management.

(1.2) Program evaluation process and criteria:

Program review is embedded in the college's strategic and annual planning process. The planning process uses an instructional dashboard to review data related to various program components. The dashboard contains common data measures such as student geography, demographic elements, completion rates, and relevant student information. In addition, we will develop BASEC program specific evaluation tools to gauge the effectiveness of the program. The annual cycle begins with each professional/technical department chair reviewing data related to dimensions of program quality which include:

- Faculty development
Faculty are required to maintain a professional development plan and to document completion of professional development and industry certifications.
- Advisory committee makeup and involvement
Advisory committee composition is monitored to assure state guidelines are met and that committee membership is reflective of area economic needs. Attendance is monitored.
- Industry accreditation
Status of program-specific accreditation is monitored and action taken when required by accrediting body.
- Learning outcomes and curriculum revision
Student learning is assessed at various levels, including course outcomes, program outcomes, and general education outcomes. In order to assure that baccalaureate students graduate with appropriate professional competencies, students are required to complete a capstone project (ENVC 422) and an internship placement with supervisory experience (ENVC 499). Program learning outcomes are assessed in these courses, including leadership skills. With faculty guidance and direction, the students design the project, complete it, and reflectively assess their work. Faculty members will collect data on student performance in the capstone project to identify program strengths and weaknesses in producing required student learning. Supervisors of student interns will also evaluate performance.

Faculty and supervisor input will be gathered and analyzed on a two-year cycle. In cooperation with the BASEC Lead and core faculty, the program Advisory Committee will continuously monitor this data to modify and adjust course curriculum to ensure that it provides the current skills and knowledge needed by industry.

- **Articulation and pathways**
Articulations and transfer agreements to/from other colleges and universities are created, reviewed and maintained.
- **Enrollment**
Actual versus targeted enrollment data is reviewed and strategies developed in response to trends in enrollment.
- **Efficiency**
Student/faculty ration and cost per FTE data is reviewed and strategies developed in response to trends in efficiency.
- **Access**
Special population and nontraditional composition of cohort data is reviewed and strategies developed in response to trends in access.
- **Retention and completion**
Cohort retention and completion data is reviewed and strategies developed in response to trends in student achievement.
- **Employment results and wages of graduates**
Prior to the graduation of the first cohort of students, a survey will be developed to gauge employer satisfaction with program graduates to see where curriculum can be improved. Program staff will track wages upon hiring and career advancement, as well as job retention at six months and one year, through a custom survey sent to program graduates.
- **Labor market data**
SVC staff will also monitor sector-specific economic trends and labor market analyses to ensure that there are internship and employment opportunities for students and graduates and report their findings to the Program Advisory Committee.
- **Innovation/program development**
Program advisory committee and professional development activities by faculty will inform qualitative assessment of curriculum and pedagogy for continued program development and innovation.
- **Equipment/labs meet industry standard**
The certification through Washington Department of Ecology will require that lab and field equipment be maintained to perform within the required precision and accuracy standards. The program advisory committee will provide ongoing input on industry trends for instrumentation.
- **Certification of laboratory**
The certified lab will receive quarterly quality control as required by the certification through Washington Department of Ecology.

In addition to these standard data elements, programs may request assessment data for any goal stated in the annual planning process. The department chair and dean meet to identify goals and

activities to address college core themes and strategic priorities and address any concerns or new opportunities identified in data analysis. Advisory committees comprised of industry professionals within the region also review annual plans and provide input. Plans are proposed in January, approved in March and implemented in the following academic year.

(1.3) Course preparation needed:

Generally, the AAS-T degrees within the Environmental Conservation Program at SVC is one of the primary gateway degrees:

**AAS-T in ENVIRONMENTAL CONSERVATION
AQUATIC/TERRESTRIAL EMPHASIS
13-14 Catalog**

CIP: 03.0101; EPC: 165

Program	Course Number	Title	Credits
FIRST YEAR - FALL			
ENVC	101	Introduction to Watershed Management	5
ENVC	102	Invertebrate Biology and Identification	4
ENVC	104	Introduction to Natural Resources	1
ENVS&	101	Intro to Environmental Science	5
Total:			15
FIRST YEAR - WINTER			
ENVC	112	Limnology	5
ENVC	123	Fish Biology, Taxonomy, and Life History	5
ENGL&	101	English Composition I	5
PE	200	First Aid, Safety, and CPR	2
Total:			17
FIRST YEAR - SPRING			
ENVC	122	Stream Ecology	5
ENVC	140	Plants of Western Washington	5
ENGL&	235 or	Technical Writing	5
ENGL	104	Composition III (Research)	5
MATH&	146	Introduction to Stats	5
Total:			20
SECOND YEAR - SUMMER			
ENVC	199	Cooperative Education	6
Total:			6
SECOND YEAR - FALL			
ENVC	201	Watershed Restoration	5
ENVC	202	Wildlife Biology	5
GIS	101	Introduction to Geographic Information Systems	5
Total:			15
SECOND YEAR - WINTER			
ENVC	210	Fish Ecology and Management	5
ENVC	211	Ecological Sampling and Monitoring Design	4

ENVC	Electives	Various	5
LC/GE		(Learning Community or Gen. Ed. course)	5
			Total:
			19
SECOND YEAR - SPRING			
ENVC	220	Wetlands in Managed Landscapes	4
ENVC	221	Ecology of Ecosystem Edges/Ecotones	3
ENVC	222	Field Project	3
CMST&	210 or 220	Interpersonal Communication or Public Speaking	5
GIS	105	Introduction to Global Positioning Systems (GPS)	2
GIS	106	Advanced Global Positioning Systems	2
			Total:
			19
TOTAL CREDITS:			111

In order to facilitate student articulation to SVC we will provide our peer institutions clear guidelines for core course requirements for entry into the BASEC program. (Specific entry requirements and potential articulation agreements are presented below in Part 3.) This will ensure that students who wish to transfer are well prepared and they can transfer without delay due to additional course requirements.

The courses are all offered in the hybrid format (Appendix F). This format allows the largest flexibility for students enrolled into the BASEC. Hybrid courses takes advantage of face-to face instruction and student group work combined with on-line activities. Students are also able to participate in other interactions including fieldtrips and laboratory exercises.

The minimal scheduled class time offered during early morning hours will allow students to attend work (Appendix F). This is particularly important for students who already have graduated with an associate's degree in Environmental Conservation from SVC or another community college. These place bound students will have the opportunity improve their education, which will help them achieve upward career mobility.

(1.4) General education components

The degree will provide students with the needed knowledge and skills in general education as well as an applied emphasis on topics such as environmental chemistry, advanced writing in science, and communication and leadership development for the natural resource fields. The curriculum contains applied general education courses specifically geared towards the workforce in natural resources and environmental sciences. A service-learning experience is also required to provide practical knowledge and hands-on experience in the field.

Students graduating with a BASEC degree at SVC will have a minimum of 20 credits of communication skills, 15 credits of natural sciences, 13 credits of humanities, and 10 credits of social sciences.

Course Number	Course Title	Credits
COMMUNICATIONS (20 credits)		
ENGL&101	English Composition I	5
ENGL 103 OR 104	English Composition II or III	5
COMST 210 OR 220	Interpersonal Communication or Public Speaking	5
ENGL 324	Advanced Writing in Science	5
QUANTITATIVE/SYMBOLIC REASONING (5 credits)		
MATH& 146	Introduction to Statistics	5
NATURAL SCIENCES (15 credits)		
ENVS& 101	Introduction to Environmental Sciences	5
ENVC 202	Wildlife Biology	5
CHEM 301	Environmental Chemistry	5
SOCIAL SCIENCES (10 credits)		
ENVC 412	Natural Resource Policy Analyses	5
ENVC 499	Internship—Service-Learning	2
CMST 413	Leadership Development in Natural Resources	3
HUMANITIES (13 credits)		
CMST 303	Communication in Natural Resources	3
ENVC 410	Conservation Biology	5
Recommended: ENVC 130: Environmental Interpretation, or Humanities Distribution	Humanities Elective	5
GENERAL EDUCATION ELECTIVES (7 credits)		
PE 200	First Aid, Safety, and CPR	2
Recommended: CHEM& 121 or Humanities, Social Sciences Distribution	Integrated Learning Elective	5
Total		70

In addition to general education courses, students will also be exposed to general education outcomes embedded throughout the program. For example, CMST 303 will emphasize diversity and ENVC 315 & 420 will emphasize public speaking. Quantitative thinking will be emphasized in landscape ecology (ENVC 320) and community ecology (ENVC 424). Writing skills are built into the salmon ecology (ENVC 405) and capstone project (ENVC 422) courses. Finally, sustainability will be incorporated into natural resource policy analyses (ENVC 412).

(1.5) Course work needed at junior and senior levels

The curriculum gives students a sophisticated understanding of ecological and conservation biology principles, watershed management sciences, and exposes them to traditional topics including the significance of community practices and landscape ecology. The junior and senior level courses combine natural resource management areas with rigorous ecological topics such as soil ecology, forest ecology, landscape ecology, conservation biology, and estuarine and near-shore ecology.

Contrary to the traditional route in math for academic students, which concentrates on routing students through calculus, the applied science degree at SVC will concentrate on building skills in quantitative science with the workforce in mind. Students will concentrate on quantitative

analysis of the environment (QSCI 318) and ecological sampling and biometry (QSCI 408), which contain high-level descriptive and quantitative statistics. These courses in combination with environmental chemistry will prepare students for rigorous sampling in the field and conduct advanced laboratory analysis.

The curriculum is deliberately interdisciplinary in its composition. Today's workforce in natural resources and environmental sciences must navigate within and among multiple disciplines and utilize knowledge and concepts regarding several topics. For example, management of watersheds requires managing for salmon, wildlife, endangered species, livestock grazing, and silvicultural practices. On top of that, watershed managers must consider water quality issues for drinking water and water quality for near-shore habitat with forage fish and shellfish growers.

Rather than a traditional upper level wildlife course, students enrolled in the BASEC program will be exposed to conservation biology that, by definition, is an applied science that considers socio-economic factors when creating conservation plans for biodiversity and endangered species. This course also fits excellently with landscape ecology, which analyzes ecosystems at various spatial and temporal scales.

Finally, for students to be successful once they enter the workforce, they must also understand how natural resource policies directly influence the possible management strategies on the ground. This is an important applied component of the degree that provides additional breadth to the knowledge and skills to be attained by the students.

Sample Schedule BAS Environmental Conservation (BASEC), SVC

Program	Course Number	Title	Credits
FIRST YEAR - FALL			
CHEM	301	Environmental Chemistry*	5
ENVC	304	River Ecology & Watershed Management*	5
CMST	303	Communication in Natural Resources	3
ENVC	302	Data Management	2
Total:			15
FIRST YEAR - WINTER			
ENVC	310	Soil Ecology*	5
ENVC	315	Limnology & Reservoir Ecology*	5
QSCI	318	Quantitative Analysis of the Environment†	5
			15
FIRST YEAR - SPRING			
ENVC	320	Landscape Ecology*	5
ENGL	324	Advanced Writing in Science	5
ENVC	327	Advanced Wetland Ecology*	5
			15

SECOND YEAR - FALL

ENVC	405	Pacific Salmon Ecology & Behavior*	5
ENVC	407	Forest Ecology*	5
QSCI	408	Biometry & Ecological Sampling	5
Total:			15

SECOND YEAR - WINTER

ENVC	424	Applied Population and Community Ecology*	5
ENVC	412	Natural Resource Policy Analyses*	5
ENVC	499	Internship - Service Learning	3
CMST	413	Leadership Development in Natural Resources	2
Total:			15

SECOND YEAR - SPRING

ENVC	420	Estuarine & Nearshore Ecology*	5
ENVC	410	Conservation Biology	5
ENVC	422	Capstone Project	5
Total:			15

TOTAL CREDITS: 90

*Lab Fee for this course

† Math 146& Introduction to Statistics is a prerequisite

2. Qualified faculty.

2. Qualified faculty.	<p>Provide a profile, including education credentials, of anticipated faculty (full-time, part-time, regular, continuing) that will support the program for each year (junior and senior). Include faculty needed to cover the technical course work, general education courses and electives. In addition, provide the total faculty FTE allocated to the program.</p> <p>Faculty and administrators responsible for technical courses must meet certification requirements for professional and technical administrators and instructors in the Washington Administrative Code.</p>
-----------------------	---

The following faculty will be teaching in the BASEC program:

- 1) Claus R. Svendsen, Ph.D. Dept. Chair, ENVC program; BASEC lead† (1.0 FTE), tenured.
- 2) Steven Glenn, Ph.D. Environmental Conservation† (1.0 FTE), full-time adjunct.
- 3) Roxanne Hulet, Ph.D. Chemistry instructor (0.1 FTE), tenured.
- 4) Lynn Dunlap, Ph.D. English instructor (0.1 FTE), adjunct, retired from SVC.
- 5) Ernest Tutt, D. Ed. Communications instructor (0.1 FTE), tenured

- 6) Laura Cailloux, Dean of Workforce Education. Chief Professional-Technical Administrator for faculty vocational certification. Supervises the BASEC lead and the BASEC program within the Environmental Conservation program.

† Teaching ENVC courses.

The total faculty FTE teaching the BASEC degree is 2.3 FTE.

1) Dr. Svendsen has worked with ecology and natural resource management issues for the past 30 years. He has experience working in Arctic and Boreal ecosystems, northern temperate forest biomes in Europe and Eucalyptus forests in Australia. Most of his work has been in terrestrial ecosystems focusing on herbivory, biodiversity, conservation biology, and wildlife management. In addition, he has worked with salmon and their habitat in the Puget Sound region, and freshwater studies in Denmark. He has been teaching college level environmental and natural resource courses since 1989. Dr. Svendsen came to SVC in 1992 to build the Environmental Conservation program.

2) Steven Glenn worked for 5 years as a forester, primarily for Washington Department of Natural Resources. For the past decade Glenn has done environmental education through the North Cascades National Park Services Complex Environmental Learning Center. In addition, he continues to do educational outreach for the park as well as the Snoqualmie National Forest. He has worked for the Department of environmental Conservation for the past two years.

3) Dr. Hulet has a doctorate degree in environmental chemistry. She has been teaching chemistry for more than a decade.

4) Dr. Dunlap, although semi-retired, has been teaching English at SVC since 1979. She has a long history of teaching English in the context of the sciences.

5) Dr. Tutt has been teaching communications for more than a decade. While at SVC, he has been very involved in delivering communication skills within the context of learning communities, which provide excellent subject matter context.

6) Laura Cailloux is Dean of SVC's Professional-Technical Unit and is the Chief Professional-Technical Administrator for faculty vocational certification. Supervises the Dept. Chair and oversees the BASEC program.

Short bios of faculty are available in Appendix B.

3. Selective admissions process, if used for the program, consistent with an open door institution.

3. Selective admissions process, if used for the program, consistent with an open door institution.	Describe the selection and admission process. Explain efforts that will be used to assure that the program serves as diverse a population as possible.
---	--

For the BASEC, the only admission requirement is an AAS-T degree in Environmental Conservation or equivalent with an appropriate GPA. Consequently, the open-door policy and efforts to recruit a diverse population and help underserved communities really is in recruitment and support for the associates degree level. These efforts are already in place. As a note, the Environmental Conservation Program at SVC currently has around 50% female with increasing Latino and Native American student populations.

The SVC service district is diverse, and the College actively recruits at local high schools that include significant numbers of students of color. These include Mount Vernon High School (46% Latino), Burlington-Edison High School (27% Latino), Sedro-Woolley High School (13% Latino), and Oak Harbor High School (9% Latino). The Admissions Office also recruits students of color by attending local and national college fairs that directly target Latino students such as the National Hispanic College Fair.

The vision statement for Skagit Valley College commits to equity and one way this is measured through core themes for "access" and "achievement" both of which set a target of student body composition mirroring the demographics of our service area. The college has established five strategic priorities, one of which is Latino Community Engagement in response to the rapidly increasing Latino population in our community. To support this strategic priority, a Special Assistant to the President position has been established, and plans for increasing enrollment, engagement, and achievement of Latino students have been created and funded. The college is focusing on retention from area high schools with high percentages of Latino students. Articulations between high school and skill center classes in to the Environmental Conservation AAS-T degree are in progress. The college district also has five tribes within its region. The President is personally establishing relationships with each tribal government and beginning to build plans for increasing the number of Native American students in college programs.

SVC has a long-standing strategy to reach out to diverse populations within the local high schools. Programs participate in career days at local high schools. The College also hosts 'Try A Trade Day' event where local high school students visit three workforce programs. Every year 12-15 schools participate with around 200 students. Every year, the SVC Environmental Club

hosts environmental clubs from the high schools for a mini conference with speakers and lunch socials.

Generally, the BAS in Environmental Conservation (BASEC) is intended for students graduating from SVC's AAS-T in Environmental Conservation. Most of these students are place bound and have little or no opportunity for attending a four-year university.

The Environmental Conservation Program at SVC serves a high percentage of working adults who are returning to college for a second career. The proposed BAS in Environmental Conservation will ensure continued learning for place-bound adult students. Likewise, rural students graduating from high school who are place-bound for economic or social reasons will also be afforded an opportunity for a baccalaureate degree. Table 30 outlines possible career paths for graduating students.

In addition, many students of all ages need to supplement their income by working part- or full-time. We have designed the curriculum to be in the hybrid format. Consequently, students enrolled full time only need to get to the college 4 days per week. Each class has 40% of the content delivered in an on-line format, thereby increasing flexibility around work schedules and family obligations. A typical 5-credit lab class will have two contact hours per week, one lab/fieldtrip, and 2 contact hours on-line.

Creating a BAS in Environmental Conservation at SVC would provide a number of students the opportunity to achieve a bachelor's degree in ecology and natural resource management. Northwest Washington will continue to experience a disproportionate demand for scientists in the ecology-related field. The BAS in Environmental Conservation at SVC would provide a pathway for place bound students who typically require access to a baccalaureate in proximity to their home (SBCTC 2010). The production of additional baccalaureate graduates would also fill the gap between projected employment needs and current projections for the NW region.

Students interested in the BASEC program will be required to attend an orientation during spring quarter at SVC, Mount Vernon Campus. Topics covered in the orientation include: entry requirements, the admission process, costs, application deadlines and relevant services available to students accepted into the program. For students not able to come to campus, a phone/Skype meeting will be arranged. Before the fall start date to explain the BASEC program, all students will be advised by a counselor (Dr. Bruce) and by a faculty member (Dr. Svendsen).

(3.1) Entry Process:

- Admission date is generally Fall Quarter start.
- Applications are due by June; applications arriving later will be considered if space is available.
- Student submits a resume and college transcripts.
- Applications will be reviewed to ensure that minimum requirements and prerequisites have been met.

- Two letters of recommendation attesting to the student's ability to succeed at the baccalaureate level are required, preferably from an instructor and an employer.
- Students will be notified of acceptance by July.
- Start dates other than autumn will require departmental approval and is only recommended for part-time students.
- Sequencing and scheduling will be done in consultation with a BASEC advisor (Dr. Claus Svendsen, Dept. Chair) or BASEC counselor (Dr. Gail Bruce).
- Students may enroll into individual classes on a space available basis if they meet entry qualifications.

(3.2) Prerequisites:

- AAS-T or ATA degree in an environmental- or ecology-related field from a community college. Degree must include 10 college-level English Composition, proficiency in intermediate algebra (MATH& 146), 5 credits of statistics, 5 credits of communication, and 5 credits of chemistry (CHEM& 121).
- Associate of Applied Science (AAS) in an environmental- or ecology-related field, including 10 college-level English Composition, proficiency in intermediate algebra (MATH& 146), 5 credits of statistics, 5 credits of communication, and 5 credits of chemistry (CHEM& 121).
- Associate in Technical Arts (ATA) in an environmental- or ecology-related field, including college-level courses: 10 credits of English composition, proficiency in intermediate algebra (MATH& 146), 5 credits of statistics, 5 credits of communication, and 5 credits of chemistry (CHEM& 121).
- AS degree with a biology emphasis including 10 college-level English Composition, proficiency in intermediate algebra (MATH& 146), 5 credits of statistics, 5 credits of communication, and 5 credits of chemistry. Transcript evaluation by Dept. Chair. Remedial ecology courses may be needed.
- Two years of university or college courses equivalent to an AAS degree including 10 college-level English Composition, proficiency in intermediate algebra (MATH& 146), 5 credits of statistics, 5 credits of communication, and 5 credits of chemistry (CHEM& 121).
- Minimum GPA 2.5
- At least one course in Geographic Information Systems (GIS) – preferably using ArcView/ArcInfo software and one course in Global Positioning Systems (GPS) interfacing with GIS.

(3.3) Students applying from other colleges

Students graduating from other community colleges with an AAS-T or ATA Associate's degree in natural resource management or natural science will also be encouraged to apply. Currently, Spokane CC, Grays Harbor CC, Green River CC, Walla Walla CC, Olympic Peninsula CC, and Wenatchee CC are offering degrees in the natural sciences area that could articulate well with the BASEC at SVC. The Environmental Conservation Program has regular contact with its peer programs across the state (Appendix E). The total FTE per year is 236.46 (appendix D). In addition, the Center of Excellence in Agriculture will disseminate degree information to all the

agricultural and natural resource programs across the state. It should be noted that the BASEC degree at SVC would offer students a much more rigorous degree in natural resource management compared to the upside/down degrees offered at The Evergreen State College and Fairhaven College, WWU. Transition of students to SVC is further eased by the availability of very affordable student housing on campus.

In order to facilitate student articulation to SVC, we will provide our peer institutions clear guidelines for core course requirements for entry into the BASEC program. This will ensure that students who wish to transfer are well prepared and they can transfer without delay due to additional course requirements.

4. Appropriate student services plan.

4. Appropriate student services plan.	Describe services that will be needed by the students admitted to the degree program and the college plan for providing those services. Include a description of financial aid services and academic advising for students admitted into the program.
---------------------------------------	---

SVC’s Guiding Principles, Core Themes, and Objectives emphasize the importance of student success and effective student support services. The College offers a wide range of services in support of student success:

- Admissions: An efficient online admissions process supports students getting started.
- Placement Assessment: Tests are provided to determine readiness for college-level work in mathematics and English.
- New Student Advising/Orientation: New degree- and certificate-seeking students learn about College programs, resources, and policies through a mandatory small-group advising session and a new student orientation.
- Financial Aid: Financial support including federal and state need-based aid and private scholarships are available to eligible students.
- Campus Housing: Campus View Village, a contemporary dorm for students, is available for all students, including international and domestic students.
- Counseling and Career Services: Students receive support deciding on a career, choosing a major, selecting a college or university, creating quarterly schedules, making an educational plan, accessing online advising, and/or finding resources to solve personal conflicts.
- Academic Advising: Academic advisors assist students with accurate information of College policies, course and program requirements.
- Disability Support Services: Students receive counseling and reasonable accommodations to support their learning.
- Multicultural Student Services: Traditionally under-represented students achieve academic success support through counseling and programming activities.

Conceptually, our student services plan is shaped around an institutional commitment to integrate our BAS programming fully into our existing governance structures, services, and academic department roles. We anticipate that, at capacity, the BASEC program will have at least 40 students. In order to support program students and ensure a highly functioning department, the current Department Chair will have an additional five weeks of administrative time similar to our current Division Chairs. In addition, the college will support two new program support positions: one full-time, nine-month lab technician and one full-time, nine-month program assistant. In year 2 an additional full-time faculty member is proposed which will allow the advising load to be split between two full-time faculty.

In addition to these positions and extra administrative time for the department chair, the college will provide 1 FTE in Student Services — 0.5 in Admissions and Records and 0.5 in Financial Aid — in order to provide support in those areas for BASEC students.

As part of the network of coordinated services that the department chair will facilitate for BASEC students, the college has enlisted help from a variety of campus resources to support BASEC student success.

(4.1) Academic Advising

Advising availability and accuracy are critical to BASEC student success:

- During the academic year, there will be information sessions for prospective BASEC students. These sessions will cover the admissions requirements for the EC program, application deadlines, learning format, funding sources, and other pertinent program information. They will be co-hosted by the department chair and the counselor liaison.
- Drawing from what has proven to be a successful strategy with our two-year professional-technical programs, BASEC students will be assigned a faculty advisor within the BASEC program. Faculty advisors in the professional-technical departments review and approve initial applications for graduation. With a faculty advisor, BASEC students will consistently receive the most complete, accurate and current information not only on graduation requirements, but also on industry trends and connections. Further, this faculty-driven advising model leverages classroom relationships between students and their instructors, providing yet another avenue for engagement and retention. The college uses a high-touch advising model where faculty typically meets at least once per quarter with each student, and more often if indicated by Early Alert system (see below). Faculty teaching in the BASEC degree advises those students while faculty teaching the AAS-T students advises those students. This will be an ongoing model.
- Our BASEC students will also have the seamless support made possible by the Counseling Center. While faculty will handle in-program student advising, the Counseling Center will work closely with the instructional department in order to offer advising to students when faculty are away from campus as well as support students who are seeking admission into the program. The majority of the advising for BASEC students will be handled by the counseling liaison, Dr. Gail Bruce.

(4.2) Career Advising

BASEC students will gain valuable work experience through our internship program. Students will meet with the department chair and the internship coordinator to review the requirements and process. Students will employ their networking skills and participate in securing the internship, with the coordinator providing the framework for the experience and support for the student and his/her site supervisor. In order to facilitate networking for students, the program will maintain a list of possible internship sites as well as internship solicitations that the program receives. In cooperation with the site supervisor, students will develop learning objectives. These will be approved by the coordinator, monitored throughout the quarter, and evaluated by the internship team. Finally, department faculty will make a minimum of one site visit each quarter and meet with the student and the site supervisor.

Skagit Valley College is prepared to serve BASEC students with resources and guidance to support their transition:

- The Environmental Conservation Program will identify appropriate resources for BASEC candidates whose intentions are to continue further on their academic path, including bridges to Master's level programs. Career Services will provide GRE preparation workshops and specific help in choosing graduate programs and assembling application materials.
- SVC's BASEC faculty will develop articulation agreements with specific graduate programs and communicate this to students during advising sessions. As with all of our transfers, the faculty advisors will guide the students in what classes they need to focus on for their chosen career path. Currently, one transfer agreement with the school of Environmental and Forestry Sciences, College of the Environment, University of Washington, Seattle has been secured (MS in Environmental Horticulture, MS in Forest Resources, and MS in Forest resources (Peace Corps Master's International). We are currently working with Dr. Steven Hollenhorst, Dean of Huxley College of the Environment, Western Washington University on a transfer option to a new Professional Master's degree in the works.
- To successfully assist program graduates with placement, our Counseling Center is acquiring resources about placement opportunities relevant to these new career pathways. These resources will be available in individual sessions and in curriculum for career exploration courses.

BASEC students tend to be older students with more challenges and needs than traditional student populations. Along with the general services for BASEC support, we will provide care for students in the BASEC program who are struggling and for special populations that might need additional attention. Toward this end, the BASEC department chair will meet one-on-one with students who need special consideration. If needed, he will set follow-up appointments with faculty, counseling, access services and/or veteran's services. Along with our department

chair's response to students in need, we have designated several services to address retention and success for our BASEC cohorts such as academic early alert services, Veteran's services, and the academic support center with general and specialized tutoring services.

(4.3) Academic Early Alert Service

Our program design emphasizes close contact between the students and their lead instructors, who will act as the students' academic advisors. During the first week of the quarter, students missing class will get a phone call to check on the reason they are missing school. They will be advised on any resource that may be available to resolve their issues. At the midterm of the first quarter, a grade check will go to each student and primary faculty advisor. Students who have earned below a 2.5 in any of their core classes will be required to meet with their advisor. An appropriate plan for additional support will be developed between student and advisor. In addition, regardless of their GPA, all students will also be required to meet with their advisor at the end of their first quarter, as well as at their 45-credit threshold, to assess their progress. Generally, students are advised to check in with their advisor at least once every quarter.

(4.4) Library Services

For library services to students and faculty in the BASEC program, the SVC librarians are tenured faculty with advanced degrees and the practice and skills to work with BASEC students on high level research projects. In addition to working with individual students and providing classes in information literacy, librarians routinely assist faculty members on research projects or in their studies for advanced degrees. The SVC Library has a reference librarian on duty whenever it is open as well as a librarian on-line. In addition to the usual services, the Library provides study rooms, interlibrary loan, a quiet study area. It has over 40 computers available to students, with full search capabilities and Microsoft Office software (Word, Excel, PowerPoint, etc.). Regarding information resources, the library is using additional collection development institutional funds to actively select and acquire monographs directly related to the BASEC program, with the intent to build a collection to support study and research at the undergraduate level. A reference librarian has been appointed to act as a liaison to the BASEC program faculty, collaborating with them to select relevant titles. These selections are based on the curriculum that has been developed for the degree. The SVC library has also received \$20,000 to upgrade their holdings for baccalaureate-level course offerings.

In addition, the library has databases that directly supporting the Environmental Conservation Program. These databases are EBSCOhost Environmental Complete and JSTOR. These data bases will supplement our existing data bases Science Direct, EBSCOhost and ProQuest.

(4.5) Learning labs (Writing & Math centers)

SVC's English Department has developed a Writing Center to support writing assignments at all levels in the college. Students can drop in or make appointments. Tutors and faculty will assist students in crafting their writing assignments. Similarly, the Math Department offers math tutoring from developmental math courses to advanced calculus and statistics. This level of math tutoring will be appropriate for the BASEC students to succeed in their math assignments.

(4.6) Veterans Services

In Enrollment Services, Veterans Services is the liaison between the federal Veterans Affairs (VA) and veterans and dependents, helping veterans use their VA benefits for their education at SVC. This office connects students with on and off-campus resources to meet needs that may be affecting their academic performance. Students can also access one-on-one counseling or support in a group setting through Dropzone, which is an informal social gathering of veterans, dependents, and allies to discuss anything of concern or interest to the students. A veterans club through Student Leadership will provide more opportunities for advocacy and community-building. Counseling Services supports veterans by providing ongoing counseling for issues related to adjustment to college, PTSD symptoms, stress management, and symptom management. Our counseling department also provides referrals to appropriate long term services such as VA, counseling for disability accommodations, and other specialized support.

(4.7) Financial Aid

SVC will provide a comprehensive financial aid package to all admitted and eligible BASEC students. The Financial Aid Office will work to ensure that students have access to as wide a variety of funding options as possible and will consider the unique needs of special populations, such as veterans. Required documents and deadlines will be consistent for all SVC students. Aid will be packaged based on eligibility and availability of funds. Financial Aid staff will be present at BASEC orientations. The Financial Aid Director and his staff are committed to helping students understand the financial aid application process and guidelines. Our Financial Aid office is preparing for the unique needs, experiences and situations of the BAS student. Our Financial Aid Office has been in contact with the Department of Education and Department of Veterans' Affairs. We are prepared to submit the required program updates to those entities as soon we receive approval of our Substantive Change Prospectus from the Northwest Commission on Colleges and Universities (NWCCU).

(4.8) Campus Community (student programs)

Part of the campus community is the Environmental Conservation Club. The club integrates all the program students as well as other campus students creating a social fabric that is supporting

students, thereby increasing student success. The club meets weekly where they organize fieldtrips, guest speakers, and develop fundraisers for significant fieldtrips, such as wolf expeditions to Yellowstone National Park and Banff National Park.

(4.9) Access Services

The BASEC department chair will work with the college’s Disability Support Services to provide students with counseling and reasonable accommodations to support their learning.

(4.10) Hours of service

Generally, SVC operations are available all weekdays from 8 AM to 5 PM. Student services are as follows:

- Library Monday to Thursday 8 AM to 8 PM; Friday 8 AM to 3 PM
- Advising & Counseling Monday to Friday 8 AM to 5 PM. Plus online asynchronous service.
- Admissions Monday to Friday 8 AM to 5 PM.
- Computer labs Monday to Thursday 8 AM to 9 PM; Friday& Saturday 8 AM to 8 PM; Sunday 12 PM to 5 PM.

5. Commitment to build and sustain a high quality program.

<p>5. Commitment to build and sustain a high quality program.</p>	<p>Provide a financial plan for the first five years of program operation. This plan should include (1) types of funds to be used to support the program; (2) projected program expenses; (3) appropriate facilities to be used; (4) equipment, technology, and instructional resources needed for the program.</p> <p>Document the college’s ability to sustain the program over time.</p>
---	---

(5.1) Funds to be used to support the program

The Environmental Conservation BAS Program is designed as a self-support program sustained by BAS level tuition from Environmental Conservation students and student fees. Skagit Valley College has also committed to fund the costs associated with program launch through funding from College local fund reserves of \$ 52,000 in 2013-14 and \$21,890 in 2014-15.

Revenue assumptions include:

- Initial enrollment will be at 20 FTES and will grow to 45 FTES by Year 5. See Table 1.
- A new cohort of students will start every fall.

- SVC will provide additional support for the first two years of program funding from college local funds reserves as shown in the Projected Program Expenses table under “College Support”.
- The operating fee portion of tuition and fees is assumed as revenue support to the program and is based on 2013-14 Upper Division rates as published by the SBCTC. Revenue is calculated at \$2,175 per 15-credit student per quarter. A conservative approach has been taken and no future tuition increases are currently factored into expected revenues.
- This budget assumes that all students pay resident tuition rates.
- The College is committed to divert the BAS tuition revenue in order to provide necessary support to the BAS degree program.
- “Full-time” students are defined as taking 45 credits per year; “part-time” students are defined as taking 15 credits per year.
- A \$40 lab fee per course is also assumed. A full-time (45 credits/year) student will pay \$320 per year in lab fees (8 courses). A part-time student will pay \$120/year.

Table 1 Enrollment and Revenue Projections

Students Enrolled	Spring 2014	Year 1 2014-15	Year 2 2015-16	Year 3 2016-17	Year 4 2017-18	Year 5 2018-19
Cohort 1: Full time 15cr		15	13			
Part time 5 cr †		5	3	3	3	
Cohort 2: Full time 15 cr			15	13		
Part time 5 cr			5	3	3	3
Cohort 3: Full time 15 cr				15	13	
Part time 5 cr				5	3	3
Cohort 4: Full time 15 cr					20	16
Part time 5 cr					5	3
Cohort 5: Full time 15 cr						20
Part time 5 cr						5
Tuition revenue	0	\$114,220	\$208,859	\$228,439	\$234,966	\$249,020
Lab fieldtrip fee		\$5,400	\$9,920	\$10,280	\$10,960	\$11,600
Initial College Support	\$52,000	\$21,890				
Total revenue	\$52,000	\$141,510	\$218,779	\$238,719	\$245,926	\$259,620

(5.2) Program Expenses

The financial plan assumes the following:

- Pre-program launch costs include expert evaluators; library acquisitions and equipment (see Appendix B for equipment list).
- Faculty and staff fringe benefits have been separately calculated for each position on the same bases as are used in the college budget. All positions are assumed to be benefited.
- No dean oversight or clerical support will be charged to the program.
- No overhead or indirect charges will be assessed against the program.

Table 2 Program Expense Projections

Category	Spring 2014	Year 1 2014-15	Year 2 2015-16	Year 3 2016-17	Year 4 2017-18	Year 5 2018-19
Backfill current AAS-T instruction		48,500	48,500	48,500		
New full-time faculty AAS-T					65,000	65,000
New full-time faculty BASEC			68,000	68,000	68,000	68,000
Lab expenses incl certification fee for Ecology incl. 1 st year proficiency test costs		7,000	10,000	10,500	12,500	13,500
Equipment (see appendix B) & labware upgrade	28,000	4,000	4,000	4,000	4,000	4,000
Library support	20,000	6,870	6,870	6,870	6,870	6,870
BASEC Dept. chair stipend		7,140	7,140	7,140	7,140	7,140
Lab assistant - 9 months		37,000	37,000	37,000	37,000	37,000
Program assistant - 9 months		35,000	35,000	35,000	35,000	35,000
Expert evaluators	4,000					
Total expenses	\$52,000	\$141,510	\$216,150	\$217,010	\$238,510	\$247,510
Balance	0	0	\$2,269	\$21,709	\$7,416	\$12,110

(5.3) College facilities

In support of the above-mentioned curriculum, the BASEC will primarily be housed in Angst Hall at SVC's Mount Vernon Campus. Angst Hall was finished in the autumn of 2009 and is a state of the lab science and allied health building (see letter from Schreiber, Appendix A). The chemistry lab facilities will accommodate the Environmental Chemistry course. The chemistry department is also supported by a lab tech.

The Environmental Conservation lab is the largest and most versatile one in the building and is a dedicated space for the Environmental Conservation Program. The dedicated space is critical for maintaining Ecology accreditation. Students will be able to conduct all necessary water and forage quality analyses during lab sessions as well as student projects. The ENVC lab is well stocked with new equipment, which is also upgraded regularly. In addition, students will have the capacity to key out most biota they will encounter (phyto- and zooplankton, aquatic and terrestrial macroinvertebrates, vascular and cryptogamic plants, and vertebrates). Also, students will be able to investigate plant and animal (mostly salmonids) tissue using various coloring techniques and high-powered microscopes. Finally, the lab is equipped with standard soil testing equipment for physical, biological, and chemical analysis.

Besides the lab capabilities, the Environmental Conservation Program has all the necessary sampling equipment to conduct field sampling of terrestrial, aquatic, and marine near-shore habitats.

(5.4) Program Facilities, Equipment, Technology, and Instructional Resources

The lab facilities that will house the BASEC program are housed in Laura Angst Hall, which has the most up-to-date instructional resources (such as Moticam) available to instructors facilitating laboratory exercises. Angst labs will support GIS (ArcGIS), as well as landscape and conservation biology modeling necessary for their lab exercises.

The accreditation of the laboratory facility will be a great teaching tool for showcasing proper laboratory procedures, documentation as well as emphasizing precision and accuracy. Graduating students will have experienced a modern lab facility preparing them to work in both the private and public sectors.

The Dean of Workforce Education Laura Cailloux (projected Ed.D. June 2014) and Vice President for Instruction Kenneth Lawson, PhD will supervise the Department chair of Environmental Conservation. A full-time program administrator and lab manager will support the program faculty and ensure that students have meaningful lab and fieldtrip activities. The BAS in Environmental Conservation (BASEC) builds on a current workforce program that has been successful for more than two decades. The program will be housed in SVC's new premier science building, which has superb laboratory and teaching space. Furthermore, SVC is

committed to upgrade the library resources and continue funding to ensure a baccalaureate level of service for the BASEC students.

(5.5) College Commitment to the Environmental Conservation Program

SVC is committed to develop and maintain the BAS degree in Environmental Conservation. There is a strong need for graduating students with skills acquired in the BASEC program. There is strong support from local and regional employers, advisory and stakeholder committee members, and students. The College has been working on development of the BASEC degree for several years. The BASEC program will greatly help current and future employment needs for applied environmental scientists and natural resource workers in the Northern Salish Sea region. SVC is highly committed to continue to support the proposed BASEC degree into the future.

6. Program specific accreditation.

6. Program specific accreditation.	Indicate whether the institution will seek specialized program accreditation. If so, describe plans for accreditation and identify appropriate accrediting body.
------------------------------------	--

There are specialized accreditation standards in the natural resources—such as the Society of American Foresters, Wildlife Society of America, etc.—yet these are fairly discipline specific and are meant for more typical academic programs. Due to the strong interdisciplinary and applied nature of the curriculum for the BASEC, there is currently no program specific accreditation that is appropriate.

The junior and senior year of the BASEC follow the composition of the AAS-T degrees, which it builds on. The current AAS-T does not have any accreditation, but students are successfully employed as technicians in the field. The applied nature of our AAS-T degree is what has made it a long-term success (see letter from Stevenson, Appendix A).

However, it would be necessary to certify our lab to Washington Department of Ecology's standards in these categories:

- Nitrogen †
- Phosphate †
- Chlorophyll *a* †
- pH †
- Turbidity †
- Fecal coliform †

† (Rice, EW, RB Baird, AD Eaton, & LS Clesceri, eds. 2012. Standard methods for the examination of water and wastewater. 22nd Ed. American Public Health association, Washington, DC.)

In addition to these parameters, our laboratory facility will be able to handle the following analyses:

- Micro-Kjeldahl analysis for protein and total nitrogen of plant tissue and soils
- Forage quality as measure by fiber content; NDF,ADF, Cellulose, hemicellulose, lignin, and condensed tannins.
- Capability to key aquatic organisms (zoo and phytoplankton, macroinvertebrates, and amphibians) from PNW rivers, lakes, wetlands, estuaries, and marine nearshore habitat.
- Biomass estimation, nutrient content, pH, and biota determination of soils.

Students will be required to follow strict procedures and reporting of results to meet the standards of an accredited laboratory environment. This will ensure that the results obtained through lab analyses are reliable. Students who graduate with proper laboratory etiquette will be equipped with the requisite skills to be successful in the workplace. In addition, it will be possible for instructors to conduct field sampling for courses where the results can be shared with the community. This will provide a unique opportunity to conduct fieldwork over relatively long time periods. Students conducting their capstone projects will likewise be able to collect data that has real applications and can be shared with local entities such as local tribes, city, and county natural resource departments.

The academic year 2014-15 will be used to develop laboratory procedures and documentation requirements. At the end of the year, proficiency test samples will be submitted to a Department of Ecology accredited lab. This lab will also test the samples and compare them to the results from SVC to evaluate our accuracy and precision. After passing the proficiency tests, an application to Lab. Accreditation Unit, Dept. of Ecology will be submitted (Procedural manual for the environmental laboratory accreditation program, Pub. No. 10-03-048). For costs see BASEC budget.

SVC will submit an application to the Northwest Commission on Colleges and Universities outlining the substantive change as a result of the proposed BASEC degree offering. The application will be submitted before the spring meeting. We expect approval in the spring of 2014.

7. Pathway options beyond baccalaureate degree.

7. Pathway options beyond baccalaureate degree.	Describe opportunities and articulation agreements for the place-bound BAS graduates to continue their education onto a graduate (Master's) degree program.
---	---

If students choose to continue their education beyond a baccalaureate degree, BASEC graduates from SVC have several options.

Students will have at least three options to matriculate into a master's degree at School of Environmental and Forestry Sciences, College of the Environment, University of Washington, Seattle (Appendix D), including the Masters in Environmental Horticulture, Masters in Forest Resources, or Masters in Forest Resources (Peace Corps Master's International)

In addition, students will potentially have the option of obtaining a professional Master's degree from Huxley College of the Environment, Western Washington University, Bellingham. The degree is in the developmental stages at this point. Dr Svendsen is working with Dr. Hollenhorst, Dean at Huxley College of the Environment, WWU on transferability of their new degree offering. Currently, the new degree is projected to be offered starting Fall Quarter 2015.

Other options include transferring to Master of Environmental Studies, The Evergreen State College in Olympia, or Antioch University Seattle into their master's program of Environment & Community (MA).

These options will provide students with upward mobility and an increase in earnings potential.

8. External expert evaluation of program.

8. External expert evaluation of program.	<p>The institution will select two external experts to review the program. External experts should come from a university level institution, i.e. departmental professor, academic dean or department head. The expert should be a practitioner/instructor from within the content area of the proposal.</p> <p>In a separate document, provide copies of external evaluators' reports or letters. Summarize the institution's responses and subsequent modifications to the proposal based upon evaluator's recommendations. Attach a short bio of the evaluators.</p>
---	---

See separate attached document regarding the two external evaluation reports and SVC's response.

External evaluators:

Dr. John Marzluff, PhD, professor of wildlife sciences, School of Environmental and Forestry Sciences, College of the Environment, University of Washington, Seattle.

Dr. Grace Wang, Associate Professor, Huxley College of the Environment, Western Washington University, Bellingham.

Appendix A



Stillaguamish Tribe

Natural Resources Department

February 22, 2013

Claus Svendsen-Dept. Chair
Dept. of Environmental Conservation
A218 Laura Angst Hall
Skagit Valley College
Mt. Vernon WA 98273

Dear Claus,

As per our recent conversation I am writing this letter in regards to your BAS application with the State Board for Community and Technical Colleges. Since I am very familiar with your program and the quality of the graduates in the Environmental Conservation Program under its current format I feel I can offer some observations related to your desire to expand the program to a four year bachelor degree.

I have been employed by the Stillaguamish Tribe as the Environmental Manager since 1988. I have seen our Natural Resource Department expand from a team of three biologists in 1988 to a staff of nearly twenty in 2012. Myself, and our Natural Resource Manager both graduated from Huxley College in the late seventies, early eighties. We found the quality of education was excellent at the time with a focus on interdisciplinary studies in both social and biological sciences. Not only were you trained in the biological impacts and solutions to the problems we caused but the roots of why we were in the dire straits we were in. Today the interdisciplinary nature of Huxley has changed to the point where students choose one or the other. It has been my observation of students graduating from the Environmental Conservation Program at Skagit College that they are well-rounded and understand both where issues arise and what practical solutions can be employed to solve problems. I can envision that adding two more years to their training would only enhance their abilities.

Over the past decade or more we have hired several graduates from the Skagit College Program. We have been very impressed with their ability to hit the ground running. They understand how to go out in the field and assess water quality or habitat without a steep learning curve. It is obvious the training they get currently prepares them well for placement into a natural resource position at a Tribe, other government agency or non-profit. The addition of some exposure to GIS mapping and data gathering has been very useful to our department. In many cases students have had previous careers, which only adds to their overall experience. Many are also local residents who have a connection to where they work and live. Both of these traits make many of your students unique from the typical four year biology or environmental program.

22712 6th Avenue NE
360 435 2755

Arlington WA 98223
Fax: 360 435 3605

PO Box 277
Scan: 425 257 1628



Stillaguamish Tribe

Natural Resources Department

February 22, 2013

In conclusion I would just say we have been very pleased with the students graduating from your Environmental Conservation Program that we have hired and put right to work. In fact very few of them have left or moved on until either retirement or another great opportunity has pulled them away. I can only see positive benefits to potential natural resource employers from expanding what is already a great two year program to a four year degree. We will continue to work closely with your program and graduates to fill needs as they arise in our natural resource department at the Stillaguamish Tribe.

Sincerely,

A handwritten signature in cursive script that reads "Pat Stevenson".

Pat Stevenson
Environmental Manager
Stillaguamish Tribe
P.O. Box 277
Arlington WA 98223
360-631-0946
pstevenson@stillaguamish.com

Schreiber Starling & Lane



02 October 2012

Claus R. Svendsen, Ph.D.
Department Chair
Department of Environmental Conservation
A218 Laura Angst Hall
Skagit Valley College
Mt. Vernon, WA 98273

Subject: Academic Technology Capabilities
Laura Angst Hall, Skagit Valley College

Dear Dr. Svendsen

For the past 25-years, our firm has specialized in the design of academic facilities for higher education throughout the State of Washington including the design of remodeled and new facilities at University of Washington, Washington State University, Central Washington University, and Western Washington University.

As the designers of Laura Angst Hall, I can state that the labs, classrooms, and supporting facilities provided in this building are at least equal to, and in many ways superior to similar facilities at the State 4-year institutions. Specifically, the labs constructed in Angst Hall provide technical capabilities and resources needed to support a 4-year degree in the ecological and environmental sciences.

Respectfully,


Keith J. Schreiber, AIA
Principal

185 University St. T: 206/682-8300
Seattle, WA 98101 F: 206/682-8375

Appendix B

Lab equipment

List of additional lab equipment needed to be able to get to the necessary precision required for Ecology accreditation.

Equipment	Test parameter	Price
	Water quality/nutrients	
Sartorius - pH-Meter, Conductivity Meter, Ion Meter PP-50 (all in one)	pH/mV/Conductivity Ion/TDS/Salinity/NaCl	\$2,420
YSI 5000	DO	\$1,500
YSI 5010 BOD Probe	BOD	\$600
Spectrophotometer (0.5 – 2.0 nm band width required) Thermo Scientific; GENESYS 10S UV-Vis; Spectral bandwidth: 1.8nm including Fluorometer -Promega [Fisher Scientific]	Chlorophyll- <i>a</i> Nitrates Alkalinity Phosphate	\$5,100
LaMotte™ 2020we Turbidity Meters	Turbidity	\$2,000
Water bath Circulator Bath; Isotemp; 10° to 100°C Fisher Scientific	Fecal coliform	\$1,100
Incubator - Digital, 0.7 cu ft (Carolina)	Fecal coliform	\$1,500
Drying oven - Quincy Lab Inc (Fisher) Up to 232 degrees C		\$600
Magnetic stirrer/hot plate; Stir speed: 60-1500 rpm; Temp: 5-380C (Carolina)		\$900
Muffle furnace Thermo Scientific Thermolyne; Small Benchtop; 100 to 1100°C (Fisher Scientific)	For cleaning organic glassware	\$400
Titrator	Acid/base titration, redox titration, Water hardness, alkalinity, Ammonia/Kjeldahl titrations, all end point titrations	\$1,650
Misselaneous lab- & glassware		\$6,200
Total		\$1,500
Total with WA sales tax 9%		\$25,470
		\$27,762

Appendix C

Bios of Faculty:

Ecology and Quantitative science classes:

Claus R. Svendsen, Ph.D.

Department Chair, Senior Ecologist

Ph.D. in Wildlife Ecology, University of Washington, Seattle 1992. Dissertation Title: *Ecological Relationships Between Elk and Deer: Behavior and Plant-Herbivore Interactions.*

Cand. scient. (M.S.) in Wildlife Management and Conservation Biology, Copenhagen University, Copenhagen, Denmark. 1987 (jointly with Institute of Arctic Biology, University of Alaska Fairbanks, AK). Thesis Title: *Selected Aspects of Patterns of Browsing by Moose, Muskoxen, Reindeer, and Snowshoe and Arctic Hare in Riparian Willow Stands on the Seward Peninsula, Alaska.*

Claus Svendsen, serves as department chair for and developer of the Environmental Conservation Program at Skagit Valley College, a program that he conceived and developed approximately 20 years ago. The program is interdisciplinary by nature, combining ecological and biological disciplines with applied sciences for managing natural resource lands as well as nearshore habitat. Dr. Svendsen has been an active member of Curriculum for the Bioregion since its inception. For the past decade, Svendsen has been working on infusing sustainability and climate change issues into the program curriculum as well as campus wide. In addition, he has been a co-developer of a learning community entitled “The Endangered Planet” emphasizing climate change and sustainability on a global scale.

Steven Glenn, Ph.C. (Ph.D. spring 2014), instructor:

Bachelor of Science in Forestry (Forest Ecology emphasis) University of Washington
Master of Education (Environmental Education) Western Washington University
Graduate Certificate in Leadership and Nonprofit Administration, North Cascades Institute and
Western Washington University
PhD Ecology (in progress), Prescott College, anticipated graduation: May 2014

Employment with Washington DNR (1) Land Exchange Crew: Duties included timber cruising/check cruising on forest land, and wild-land evaluation on rangeland. Was involved with land exchanges in all seven DNR geographic areas.

Employment with Washington DNR (2) Ahtanum Local Unit Fire Crew Supervisor and resident “ranger.” worked at the Ahtanum DNR State Forest work center and from late spring through mid-autumn, I supervised a forest lookout, a tanker truck crew, a twenty-person crew, and

miscellaneous other fire crew related personnel. I was responsible for hiring and training the crew members. Between fires, I supervised groups of firefighters as they built or renovated recreational trails; conducted back-country restoration projects in forest, riparian, subalpine, and shrub-steppe ecosystems; maintained front-country and back-country structures; and performed timber stand improvement. I also did fuels analysis and supervised several small-scale prescribed burns.

For the rest of the year, I did off-season mapping and resource analysis of local forest and rangeland; I had responsibilities for wildlife census in the forest and adjacent sub-alpine lands. I was responsible for maintaining several campgrounds in the area, public information for a wide array of visitors, natural resources education at the Yakima School District Environmental Education Center, and project planning for the following fire season. In my spare time, I did a little snowmobile and ski trail grooming.

As part of my Master's program, I lived for a year at the North Cascades National Park Service Complex Environmental Learning Center. I developed and taught curriculum for environmental education in indoor/outdoor settings for 5th, 7th, 9th, and 11th grade students from regional public and private elementary and secondary schools. I organized and taught several adult education sessions and assisted specialist instructors on other day and multi day seminars in the North Cascades. I volunteered for Forest Service stewardship programs in the winter with the Skagit River Eagle Watchers, and in the summer with Mt. Baker Mountain Stewards.

After receiving my Masters, I taught Community Ecology for two quarters at Western Washington University as a substitute for a professor who was on sabbatical.

I continue to volunteer my stewardship time. Each year I also train program participants in alpine ecology (for the Mountain Stewards); and riparian ecology, and eagle-salmon biology (for the Eagle Watchers).

Chemistry:

Roxanne Hulet, Ph.D., Division Chair & instructor

BA & BS The Evergreen State College, Olympia, WA

MS in chemistry, WWU, Bellingham, WA

Ph.D. in chemistry, University of Northern Colorado, Greeley, CO

Received concurrent Bachelor's of Liberal Arts and Science from The Evergreen State College in 1999. At Evergreen, I worked for one year with the National Science Foundation ChemLinks organization. During that time, I developed curricula for an interdisciplinary analytical chemistry / soil chemistry course. I co-authored a textbook to support the course.

After leaving Evergreen, I enrolled immediately in the Masters of Science in Chemistry program at Western Washington University. I worked for two years in a synthetic inorganic chemistry

lab, developing molecules with independent molecular properties (as opposed to ferromagnets which require a network in order to display magnetism). With this project, I received funding from Western's Bureau for Faculty Research. In addition, I developed inquiry-based laboratory curriculum for general chemistry.

After receiving my MS in Chemistry, I taught at Edmonds Community College for a year.

I then enrolled in the PhD program in Chemistry at University of Northern Colorado. While I was there, I worked for the National Science Foundation Center for Learning and Teaching in the West, which supported my research in science education (development of expertise in chemistry). I then began working at Skagit Valley College and spent one more year with the NSF CLT-W, where my work was selected twice for recognition by the American Chemical Society. I then received fellowship from the Hach Scientific Foundation to complete my PhD in chemical education (2008). I received the Graduate Dean's Citation of Excellence and graduated with a 4.0 GPA.

Communication:

Ernest Wayne Tutt, EdD. instructor

Ed.D. in communications, Texas A&M University, College Station, Texas
MS in communications, Texas A&M University, College Station, Texas
BA in political science, University of Texas, Austin, Texas

He received his Associate of Science Degree from Grayson County Community College in 1980, and completed a Bachelor of Arts in Political Science and Communications from the University of Texas at Austin in 1985. He served as a full-time instructor in Communication Studies at Grayson County Community College in Denison, Texas from 1990 through 2000. Courses taught at GCC were limited to Public Speaking. While teaching full-time at GCC, Dr. Tutt completed graduate coursework in Communications at Southwestern Oklahoma State University. In 1996, he completed his Master of Science Degree in Education at Texas A&M University-Commerce, with Speech Communications and Sociology as minor degree emphasis. As part of his graduate degree requirements, Dr. Tutt taught upper division communication courses including Communication Theory, Organizational Communication, Small Group Communication, as well as Public Speaking. Upon receiving his Masters degree, he enrolled in the Doctoral Program for Education at A&M-Commerce, and accepted the dual position of Special Assistant to the President and part-time Communications faculty. He received his Ed.D. in 2001 and served in this dual capacity until 2003, at which time he moved to Anacortes, Washington. He currently serves as a full-time, tenured instructor in the Department of Communication Studies, teaching Public Speaking, Small Group Communication, Interpersonal Communication, Professional Communication and Multicultural Communication, as well as courses in Ethnic Studies.

Lynn Dunlap, Ph.D., instructor

Master's and Ph.D. in English from the University of Washington, Seattle.
BA in English from Smith College

Lynn Dunlap has taught English composition and literature at Skagit Valley College since 1979, with a strong emphasis on discipline-based writing and student learning outcomes. She has taught writing specific to a variety of disciplines, including sciences (botany, chemistry, geology, and astronomy), social sciences (sociology, anthropology, political science, and history), and the arts and humanities (art, music, philosophy and literature). Dunlap is also responsible for the design and development of coursework specific for science and technology majors, including integrative courses for science majors and the English department's 200-level technical research and writing course modeled on the writing required for the University of Washington's engineering program. In addition to her teaching responsibilities, Dunlap designed and facilitated Skagit Valley College's New Faculty Seminars, a year-long series of presentations and workshops that included sessions on designing curriculum based on student learning outcomes.

She facilitates faculty retreats and workshops at colleges both regionally and nationally and regularly serves as a resource faculty member for the annual National Summer Institute on Learning Communities, organized by the Washington Center for Improving the Quality of Undergraduate Education. In addition to a monograph about the role of learning communities in community colleges, she has co-authored a number of articles about assignment design and assessing student learning.

Gail Bruce, Ph.D., Counselor

Ph.D. in Interdisciplinary Leadership Studies from Gonzaga University and was completed in May, 2010. The title of her research is *Attributes of Latina Success at Skagit Valley College*.
BA & M.Ed. Whitworth College, Spokane, WA

Having served as both an administrator and a faculty member at Skagit Valley College (SVC) and Whitworth University, Gail Bruce has worked in college student services for almost 30 years. Currently the Chair for Counseling and Career Services at Skagit Valley College, she oversees advising, counseling programs, and women's, disabled, multicultural, and veteran student services, as well as Running Start programs. She has also served as the interim Student Services Coordinator at the Whidbey Island Campus of SVC. Prior to Skagit, Gail worked at Whitworth University, as Director for Career Advising, where she was the administrator for tutoring, advising, study skills, testing, student employment and an innovative "provisional admittance" program to support at risk students. In addition, Gail teaches in classrooms every quarter promoting student learning, and success skills and strategies.

Appendix D



**School of Environmental
and Forest Sciences**

UNIVERSITY of WASHINGTON
College of the Environment

December 18, 2013

Dear Professor Svendsen,

Thank you for meeting with me about the BAS degree with a major in Environmental Conservation that you are proposing to offer at Skagit Valley College. I strongly support the program, and find that there are several ways that students may continue into our professional master's programs, which I have outlined below.

Masters in Environmental Horticulture

The proposed curriculum prepares students well for this program, especially with the emphasis on restoration ecology. This professional master's prepares students well for leadership in the workforce related to horticulture.

Masters in Forest Resources (Forest Management)

The proposed curriculum, with some additions, would prepare students well for this one year professional master's program, which is SAF Accredited. The additions would be a Silviculture course and an economics course, which could be fit in fairly easily.

Masters in Forest Resources (Peace Corps Master's International)

The proposed curriculum prepares students well for this unique master's program, which also requires Peace Corps service as a part of the degree. This four quarter program is especially good for those interested in international environmental issues.

If you need any additional information, feel free to contact me directly.

Sincerely,



Michelle Trudeau
Director, Student & Academic Services
michtru@uw.edu
206-616-1533

Appendix E

Natural resource FTEs for the academic year 2012-2013 at all Washington CCs within the natural resource fields that could transfer to SVC (Source SBCTC 2013).

COLLEGE	CIP	CIP TITLE	FTES
BELLINGHAM	30301	FISHING & FISHERIES	31.87
CLARK	30601	WILDLIFE/WILDLANDS MGMT	8.87
EDMONDS	30101	NATURAL RESOURCES/CONSERV	1.42
GRAYS HARBOR	30501	FORESTRY, GENL	5.91
GRAYS HARBOR	30511	FOREST TECH	1.51
GREEN RIVER	30511	FOREST TECH	56.47
GREEN RIVER	30601	WILDLIFE/WILDLANDS MGMT	3.29
OLYMPIC	30101	NATURAL RESOURCES/CONSERV	9.13
SKAGIT VALLEY	30101	NATURAL RESOURCES/CONSERV	31.12
SPOKANE	30101	NATURAL RESOURCES/CONSERV	39.8
SPOKANE	30101	WATER, WETLANDS & MARINE	33.69
SPOKANE	30101	FISHING & FISHERIES	1.22
WALLA WALLA	30101	NATURAL RESOURCES/CONSERV	8.27
WENATCHEE VALLEY	30101	NATURAL RESOURCES/CONSERV	4.29
Total			236.46

Email from Todd Bates, Grays Harbor College, 4/6/2011 tbates@ghc.edu
Greetings Claus

We have approximately 10 students graduating a year from our program with an AAS in Natural Resource Technology. We have an emphasis on forest technology and they can go on to become technicians in the field. Approximately half of these students continue to pursue a BS. I believe we would have a few each year that would be interested in more information about Skagit Valley College. These are students that have typically transferred to The Evergreen State College in Olympia.

I would be happy to post information about your program for potentially interested students.

Todd Bates

Forestry Instructor

Grays Harbor College

Aberdeen, Washington

360-538-2517

Spokane Community College
Environmental Sciences

MS 2080 ■ 1810 N Greene St ■ Spokane WA 99217-5399
(509) 533-7256 ■ TTY (509) 533-7482



January 23, 2012

Claus R. Svendsen, Ph.D.
Department Chair
Department of Environmental Conservation
Skagit Valley College
Mt. Vernon, WA 98273

Dear Dr. Svendsen,

The Natural Resources program at Spokane Community College is pleased to hear that Skagit Community College is considering offering a B.A.S. in Environmental Conservation. While our program is intended to be one that offers employability after completing the A.A.S., we recognize that many students wish to or need to continue their education in order to achieve their education and career goals. The program at Skagit offers students another way to achieve these goals. The more intimate, familiar community college setting and relatively lower cost may further enhance their access to this sort of opportunity and their chances of success.

We would actively want to negotiate a written articulation agreement between our program and the B.A.S. program, would advertise and advise students of this additional opportunity as part of a palette of transfer possibilities as well as ensure that any articulation agreement is posted on the CCS website.

If you need further assistance or support in this endeavor, please don't hesitate to contact us.

Sincerely,

Monica Spicker

Monica Spicker
Department Chair
Environmental Sciences Department
Spokane Community College
1810 North Greene Street, MS 2080
Spokane, Washington 99217

Appendix F

Weekly class schedule per Quarter

Junior Year

Fall Quarter

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
7:30		ENVC 304		ENVC 302		
8:30	ENVC 304	ENVC 304	ENVC 304	CMST 303		
9:30	CHEM 301	CHEM 301	CHEM 301	CMST 303		
10:30	CHEM 301					
11:30	CHEM 301					
12:30						

CHEM 301 Environmental Chemistry* 5, 2 h. lec., 1 lab, DE

ENVC 304 River Ecology & Watershed Management* 5, 2 h. lec., 1 lab, DE, 3 Sat Fieldtrips

CMST 303 Communication in Natural Resources 3, 2 hour class, DE

ENVC 302 Data Management 2, 1 hour class, DE

Winter Quarter

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
7:30	ENVC 310	ENVC 315	ENVC 310	QSCI 318		
8:30	ENVC 315	ENVC 315	ENVC 315	QSCI 318		
9:30		ENVC 315		QSCI 318		
10:30						
11:30						
12:30						

ENVC 310 Soil Ecology* 5, 2 h. lec., DE, 4 Sat. Fieldtrips

ENVC 315 Limnology and Reservoir Ecology* 5, 2 h. lec., 1 lab, DE

QSCI 318 Quantitative Analysis of the Environment 5, 1 hour class, 1 lab, DE

Spring Quarter

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
7:30		ENVC 327		ENVC 320		
8:30	ENVC 327	ENVC 327	ENVC 327	ENVC 320		
9:30	ENVC 320	ENVC 327	ENVC 320	ENGL 324		
10:30				ENGL 324		
11:30						
12:30						

ENVC 320 Landscape Ecology* 5, 2 h. lec., 1 lab, DE
 ENVC 327 Advanced Wetland Ecology* 5, 2 h. lec., 1 lab, DE
 ENGL 324 Advanced Writing in Science 5, 2 hour class, DE

Senior Year

Fall Quarter

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
7:30						
8:30	ENVC 405	ENVC 405	ENVC 405	QSCI 408		
9:30	ENVC 407	ENVC 405	ENVC 407	QSCI 408		
10:30		ENVC 405		QSCI 408		
11:30						
12:30						

ENVC 405 Pacific Salmon Ecology & Behavior* 5, 2 h. lec., 1 lab, DE
 ENVC 407 Forest Ecology* 5, 2 h. lec., 4 Sat. Fieldtrips, DE
 QSCI 408 Biometry & Ecological Sampling 5, 1 hour class, 1 lab, DE

Winter Quarter

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
7:30						
8:30	ENVC 410	ENVC 410	ENVC 410	ENVC 412		
9:30	ENVC 499	ENVC 410	CMST 413	ENVC 412		
10:30				ENVC 412		
11:30						
12:30						

ENVC 410 Conservation Biology* 5, 2 h. lec., 1 lab, DE
 ENVC 412 Natural Resource Policy analyses* 5, 1 hour class, 1 lab, DE
 CMST 413 Leadership Development in Natural Res. 3, 1 hour class, DE
 ENVC 499 Internship – Service Learning 2, 1 hour

Spring Quarter

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
7:30						
8:30	ENVC 420	ENVC 424	ENVC 420	ENVC 420		
9:30	ENVC 424	ENVC 424	ENVC 424	ENVC 420		
10:30	ENVC 422	ENVC 424		ENVC 420		
11:30						
12:30						

ENVC 420 Estuarine & Nearshore Ecology* 5, 2 h. lec., 1 lab, DE
 ENVC 424 Community Ecology* 5, 2 h. lec., 1 lab, DE
 ENVC 422 Culminating Project 5, 1 hour class, Field/lab work, DE

* Lab fee for this course

Appendix G

Course descriptions & learning outcomes

CHEM 301 Environmental Chemistry

Study of the source, fate, and reactivity of compounds in natural and polluted environments. Emphasis will be placed on climate change, air pollution, stratospheric ozone depletion, pollution and treatment of water sources, and the utilization of insecticides and herbicides.

Learning outcomes

Students will be able to:

- Analyze the chemistry of the stratospheric ozone layer and of the important ozone depletion processes.
- Analyze the chemistry of important tropospheric processes, including photochemical smog and acid precipitation.
- Understand the basic physics of the greenhouse effect. Evaluate the sources and sinks of the family of greenhouse gases, and the implication for climate change.
- Analyze the nature, reactivity, and environmental fates of toxic organic and inorganic chemicals.
- Analyze the chemistry of natural waters and of their pollution and purification.

ENVC 302 Data Management

Development of a data management strategy from field collection, processing to data storage. Emphasis will be given to the use of PDAs and cell phones for field collection to server storage. Prerequisite: Admission to BASEC or Department Chair permission.

Learning outcomes

Students will be able to:

- Identify appropriate data collection devices and transfer mechanisms for natural resource data collection.
- Identify an appropriate data storage solution for a natural resource project.
- Select an appropriate communication application for data management.
- Develop an appropriate strategy for collecting, send, and store natural resource data.

CMST 303 Communication in Natural Resources

Provide an overview of communication processes involved in small group interactions and collaborative decision making related to natural resource management. Focuses on applications

of group dynamics, decision-making, problem solving, and conflict resolution. Prerequisite: Admission to BASEC or Department Chair permission.

Learning outcomes

Students will be able to:

- Effectively meet planning and facilitation of participatory group discussions.
- Strategically plan: develop projects and goals; analyze processes and outcomes.
- Identify and develop communication strategies for various target audiences.
- Use appropriate forms of mass media.
- Use feedback analysis to improve individual and group performance, and program success.

ENVC 304 River Ecology & Watershed Management

Watershed perspective to learn about rivers and streams with special emphasis on the Pacific Northwest coastal ecoregion. Topics include hydrology, hyporheic flow, geomorphology, stream classification, riparian ecology,, and biogeochemical cycles. Development of watershed and ecosystem management at the appropriate spatial and temporal scales including adaptive management processes incorporating cultural values and philosophies allowing successful watershed management. Prerequisite: Admission to BASEC or Department Chair permission.

Learning outcomes

Students will be able to:

- Utilize stream classification systems to inventory stream conditions.
- Understand and quantify stream hydrology.
- Quantify and evaluate the biotic integrity of streams using primary production and macroinvertebrate communities.
- Quantify and evaluate fish communities in various stream habitats.
- Quantify and evaluate riparian conditions for wildlife.
- Evaluate current landscape processes responsible for hydrology and quantify management recommendations for ecological restoration.
- Understand and utilize stream systems as sentinels; especially when providing management recommendations.
- Develop an understanding of various cultural values associated with rivers and their riparian zones in the past and present.
- Assess anthropogenic changes to riverine ecosystems.

ENVC 310 Soil Ecology

Fundamental principles of soil ecology in relation to physical, nutrient cycling dynamics, biogeochemical cycling, belowground biomass, biodiversity of soil organisms, and soil food webs and ecological processes. Prerequisite: Admission to BASEC or Department Chair permission.

Learning outcomes

Students will be able to:

- Quantify the physical aspects of soils.
- Measure and describe soil profiles and their utility for soil conservation.
- Measure soil primary production of higher plants.
- Investigate how microbes influence soil processes and structure.
- Develop community ecology flow charts to illustrate how soil fauna influences soil processes and structure.
- Measure nutrient cycling in soils by measuring nutrient flows between trophic layers.
- Measure soil biodiversity parameters .
- Manage soil biodiversity.
- Understand and measure soil chemistry.
- Assess anthropogenic landuse influences on soils ability to perform ecological processes.

ENVC 315 Limnology & Reservoir Ecology

Structure and function of lakes, ponds, and reservoirs. Includes physical, chemical, and biological controls of productivity and species composition of aquatic flora and fauna, and effects of pollution on water quality. Prerequisite: Admission to BASEC or Department Chair permission.

Learning outcomes

Students will be able to:

- Identify the landscape context and dynamic patterns of a lake or reservoir.
- Quantify the water budget of a lake or reservoir.
- Understand how light and temperature influences the ecological processes in a lake or reservoir.
- Understand the water movements of a lake or reservoir and shoreline impacts.
- Quantify and evaluate a lake's biotic structure and productivity.
- Measure and evaluate a lake's oxygen budget spatially and seasonally.
- Quantify and evaluate water quality parameters for lakes and reservoirs.
- Measure and evaluate lake plankton.
- Quantify and develop a fish management plan for a lake or reservoir.
- Quantify, evaluate and manage land-water interfaces.
- Evaluate specific anthropogenic influences to limnetic ecosystems in response to various watershed land uses.

QSCI 318 Quantitative Analysis of the Environment

Applications to environmental and natural resource problems stressing the formulation and interpretation of statistical tests. Course includes random variables, expectations, variance,

binomial, hypergeometric, Poisson, normal, chi-square, 't' and 'F' distributions. ANOVA, and regression analysis included. Prerequisite: Admission to BASEC or Department Chair permission.

Learning outcomes

Students will be able to:

- Understand biological data and populations and samples.
- Determine measures of central tendency, variability, and dispersion.
- Determine and interpret probabilities.
- Understand the properties of a normal distribution.
- Outline sample hypotheses.
- Outline multisample hypotheses and analysis of variance (ANOVA).
- Perform data transformations.
- Calculate linear regressions.
- Conduct testing for goodness of fit.

ENVC 320 Landscape Ecology

The science and art of studying and influencing the relationships between spatial pattern and ecological processes across different spatio temporal scales and levels of biological organization. Prerequisite: Admission to BASEC or Department Chair permission.

Learning outcomes

Students will be able to:

- Understand the importance of landscape scales.
- Quantify landscape patterns.
- Learn that landscape ecology is a multi-disciplinary subject including economics and sociology, the earth sciences and geography.
- Construct computer models in landscape ecology.
- Critically work with ecosystem processes in a landscape.
- Understand and quantify how organisms utilize landscape patterns.
- Evaluate underlying processes responsible for landscape patterns.
- Define landscape ecology.
- Quantify human fragmentation of landscapes at different spatial and temporal scales.
- Quantify metapopulations in fragmented landscapes.

ENGL 324 Advanced Writing in Science

Focuses on the skills necessary to write in the natural sciences. Students will discuss problems common to all technical writing and will develop effective ways to describe equipment, processes and procedures; to classify, analyze, and present information; explain principles, laws,

and concepts. Intensive peer review is a strong component. The course includes a significant research component. Prerequisite: Admission to BASEC or Department Chair permission.

Learning outcomes

Students will be able to:

- Recognize and use the conventions governing the dissemination of scientific knowledge;
- Learn to define the context for different kinds of scientific writing—lab and research reports, reviews of literature, scientific arguments, etc.—and develop the appropriate written response;
- Write concisely, concretely, and accurately to present complex scientific ideas clearly for scientific and lay audiences;
- Demonstrate the ability to find, evaluate, synthesize, and integrate necessary information for the completion of a project;
- Effectively and ethically incorporate appropriate scientific exhibits (graphs, charts, etc.) as part of textual communication;
- Analyze own writing strengths and areas for improvement and develop strategies for ensuring effective completion of written assignments;
- Increase ability to workshop: respond effectively to peers' work in progress, to revised own texts in response to feedback, and participate in collaborative learning activities.

ENVC 327 Advanced Wetland Ecology

Wetland hydrology, biogeochemistry, and biological adaptations to wetland conditions. Including global wetland issues, wetlands and climate change, international management of wetlands, and human interface with wetland in different socio-economic settings. Course includes advanced wetland delineation. Prerequisite: Admission to BASEC or Department Chair permission.

Learning outcomes

Students will be able to:

- Understand the science, regulatory environment, and history of wetland management.
- Classify a wetland within North America.
- Quantify and evaluate the hydrology of wetlands.
- Measure and quantify critical biogeochemistry parameters of wetlands.
- Evaluate the successional development of a wetland.
- Understand and quantify ecosystem processes of coastal wetlands at various trophic levels.
- Understand and quantify ecosystem processes of inland wetlands at multiple trophic scales.
- Understand and communicate values and valuation measures of wetland ecosystems.
- Develop a wetland restoration plan.

- Assess competing landuse values influencing the conservation and restoration efforts of wetlands.
- Measure and Quantify amphibian use of wetlands at different developmental stages.

Measure and quantify wildlife habitat by Cowardin classes.

ENVC 405 Pacific Salmon Ecology & Behavior

Examines the ecology and behavior of Pacific salmon, including homeward migration, reproduction, egg and larval behavior, juveniles in streams, and out migration as well as marine migration patterns. Management practices of Pacific salmon sensitive to cultural interests. Prerequisite: Admission to BASEC or Department Chair permission.

Learning outcomes

Students will be able to:

- Understand how salmon migrate from the ocean to their natal stream.
- Understand and quantify the ecological implications of homing and straying.
- Contrast the different reproductive strategies that has evolved in different salmon species and stocks.
- Understand and quantify the ecology of dead salmon.
- Measure and understand the incubation phase of salmon.
- Quantify and measure alevin and fry movements in streams.
- Measure and understand sockeye ecology in lakes.
- Quantify and measure juvenile salmon in streams.
- Quantify out migration of juvenile salmon.
- Understand the ecological and management consequences of marine migration patterns.
- Understand the importance of the cultural values of salmon.
- Develop management strategies for a salmon population.

ENVC 407 Forest Ecology

Forest ecology includes the development of forestry, biogeochemistry, nutrient cycling, transfer and storage of energy, and the physical environment. Forest management as a renewable resource, including fire ecology, forest succession, and functioning of forest ecosystems. Prerequisite: Admission to BASEC or Department Chair permission.

Learning outcomes

Students will be able to:

- Understand how forestry practices and forest ecology must be matched.
- Quantify and evaluate nutrient cycling and energy transfer in forest ecosystems.
- Understand the importance of management of forest genetics as a forest management component.

- Understand how solar radiation, temperature and wind must be part of sustainable forest management.
- Measure and evaluate forest soil components; including water.
- Understand the importance of fire ecology in forest ecology and its sustainable management.
- Quantify fuel loads and susceptibility to fire risks.
- Quantify and understand community ecology of forests and its importance for sustainable management of forests.
- Quantify and understand forest succession.
- Assess and evaluate ecosystem services provided by forested ecosystems at local and regional scales.

QSCI 408 Biometry & Ecological Sampling

Statistical inquiry of biological data. Experimental design and data analysis. Encouraging students to think critically and quantitatively about how data are collected, analyzed, and interpreted. Prerequisite: Admission to BASEC or Department Chair permission.

Learning outcomes

Students will be able to:

- Estimate abundance of an organism.
- Determine spatial patterns and indices of dispersion.
- Determine sample sizes and calculate statistical power.
- Correctly select appropriate sampling design.
- Outline experimental designs for sampling.
- Calculate similarity coefficients and cluster analysis.
- Calculate species diversity measures.
- Calculate niche measures and resource preferences.

ENVC 410 Conservation Biology

Exploring the world's biological diversity including a wide range of species, complex ecosystems, and the genetic variation within species. Conservation biology is an interdisciplinary science that includes not only biological and ecological solutions, but includes socio-economic aspects. Includes ecological modeling. Prerequisite: Admission to BASEC or Department Chair permission.

Learning outcomes

Students will be able to:

- Define and use the conservation biology discipline.
- Utilize ecological software to model ecological parameters.

- Develop a working understanding of biodiversity at several ecological and population levels.
- Understand and quantify the value of biodiversity in various cultural settings and its global patterns.
- Understand the anthropogenic causes of extinction in different socio-economic settings.
- Create conservation plans for populations or species that consider the local cultural values and socio-economic settings.
- Establish protected areas in various socio-economic settings and consider local cultural values.
- Understand how socio-economic aspects influence conservation biology practices across the world.
- Perform population growth models.
- Model viability analysis of endangered populations.

ENVC 412 Natural Resource Policy Analyses

Course evaluates and analyses a broad range of contemporary natural resource policies, case studies, and controversies using bioeconomic resource management models. Topics include wildlife and fisheries policies, forestry policies, tropical deforestation, water rights/management policies, endangered species and nature preservation a, and sustainable development. Prerequisite: Admission to BASEC or Department Chair permission.

Learning outcomes

Students will be able to:

- Trace the development of environment of thought and describe how terms like wilderness, conservation, and ecosystem science have changed in the past 150 years.
- Describe how the natural resource and environmental policy making process works.
- Differentiate between natural resource management agencies and regulatory agencies.
- Explain the role of interest groups, administrative agencies, and Congress in the policy making process.
- Apply basic analytical concepts and tools to systematically analyze and evaluate consequences of natural resource and environmental policy decisions.
- Evaluate the consequences of federal and state policies on natural resource and environmental issues.

ENVC 499 Internship – Service Learning

Supervised work experience in the field. Internship positions must include an interview process. Part of the work experience must include a leadership component. Prerequisite: Admission to BASEC or Department Chair permission.

Learning outcomes

Students will be able to:

- Participate in an interview process in the natural resource field.
- Evaluate project success.
- Perform a meaningful self-analysis.
- Develop leadership skills for building successful work teams in the field and lab.

CMST 413 Leadership Development in Natural Resources

Provide organizational management theory, communication and team building skills to strengthen leadership development in the field of natural resource management. Prerequisite: Admission to BASEC or Department Chair permission.

Learning outcomes

Students will be able to:

- Identify the strengths and limitations of dominant approaches to organizational management and their implications for communication, leadership and followership.
- Recognize the primary forms of formal and personal social power and their associated means of control.
- Identify personal leadership habits and tendencies.
- Identify and apply appropriate leadership styles contingent upon situations.

ENVC 420 Estuarine & Nearshore Ecology

Provide an integrated view of the ecological processes in estuaries and nearshore environments. Special emphasis will be on the Salish Sea and the Pacific Northwest coastal environments. Prerequisite: Admission to BASEC or Department Chair permission.

Learning outcomes

Students will be able to:

- Understand coastal and estuarine ground ecology.
- Quantify estuarine chemistry.
- Develop flow charts outlining abiotic and biotic controls of nutrient cycling.
- Calculate primary and secondary production in estuaries and nearshore habitats.
- Quantify detrital food webs in estuaries.
- Measure trophic parameters to understand saltmarsh functions.
- Measure seagrass bed components to understand how they function.
- Quantify tidal flat hydrology, COM, and plankton dynamics.
- Understand and quantify oyster reef dynamics and production by measuring plankton and detrital inputs to the reef.
- Quantify anthropogenic changes to estuarine and nearshore habitat types.
- Assess hydrological and geomorphic changes in estuarine and nearshore habitats.

- Assess biological changes in estuarine and nearshore habitats

ENVC 422 Capstone Project

Carry out a field project including all aspects of documentation. Includes initial proposal, peer review processes, data collection and analysis, secondary research, time estimates, and report writing. Prerequisite: Admission to BASEC or Department Chair permission.

Learning outcomes

Students will be able to:

- Master synthesizing and applying prior knowledge to designing and implementing a field project.
- Be competent in outlining a research project.
- Be competent in evaluating sampling alternatives.
- Capable of manipulate results statistically both descriptive and inferential.
- Be familiar with researching and evaluating necessary secondary research.
- Be competent with deadline driven projects in a team setting.
- Be competent with presenting work to a group of peers and upper audiences.
- Evaluate how the results and conclusions may impact the local people in which student conducted the study.

ENVC 424 Applied Population and Community Ecology

Principles of population dynamics and ecosystem functioning. Key issues in the study of biodiversity and ecosystems, including functional complementarity, food web stability and complexity, material cycling, and meta-communities. Prerequisite: Admission to BASEC or Department Chair permission.

Learning outcomes

Students will be able to:

- Model and evaluate maintenance of species diversity and functional groups.
- Measure and evaluate how biodiversity influence ecosystem functioning.
- Measure and evaluate how material cycling influence the functioning of ecosystems.
- Model and evaluate how stability and complexity influence ecosystems.
- Through modeling, quantify and evaluate the spatial dynamics of biodiversity and ecosystem functioning.
- Measure and quantify biotic and abiotic factors influencing animal populations.
- Understand biogeography global distribution of taxa.
- Quantify population growth of animal populations.
- Describe and measure regulation factors of populations.
- Quantify population growth for different life history patterns of organisms.