PORTLAND COMMUNITY COLLEGE
GEOGRAPHY SAC

PROGRAM REVIEW
2007-2008 Academic Year

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Executive Summary

According to Portland Community College academic policy, all academic programs must undergo a program review every three to five years in order to improve quality of instruction. The last program review for the PCC Geography Department was completed in 2003. Since then, there have been many personnel changes at both the faculty and administrative level, new courses have been added, and the Geography SAC has completed the shift from three- to four-credit classes. The current program review, which began in September 2007, is at least in part an attempt to evaluate these changes and assess where our department and discipline are headed in the near future.

This current program review contains input from many sources, including students, full-time and adjunct faculty, geography educators throughout the region, department heads, and instructional deans. Data were obtained through the completion of student surveys, meetings with the geography SAC committee, correspondence with faculty from universities and colleges throughout Oregon, and individual meetings. This approach allowed the department to recognize and respond to the individual needs specific to the geography program.

The geography program at Portland Community College is small, currently consisting of one full-time instructor and five adjunct faculty (see Table 1). All of our instructors have extensive teaching experience, and all have practical experience in applied geography, industry, and government. Despite our small size, there is the potential for significant growth in the near future.

Full-Time	**Part-Time**
Matt Constantino (75% RC, 25% Syl)	Kerry Pataki (Syl, split with Anthropology)
	Margaret Campbell-McCrea (Syl, Casc)
	Masoud Kheirabadi (online)
	Christina Friedle (RC)
	Elizabeth McAuliffe (SE)

Table 1. Current geography instructors at Portland Community College.

This program review will assess the geography program at PCC as follows:

1. Provide a background of geography as a discipline and outline why geographic education is necessary
2. Outline the goals and outcomes of geography at PCC and assess them since completion of the last program review
3. Recognize the strengths and achievements of the program
4. Identify areas in need of attention, including promotion of future plans and goals
5. Identify already-existing programs at universities and colleges in Oregon and compare them to the PCC program.

The Role of Geography

The word "geography" is derived from the Greek roots geo- (earth) and –graphein (to write). Thus, the most basic definition of geography is "writing about (or describing) the Earth." While this is an incredibly broad definition, geography is an incredibly broad discipline. From the time of the Greeks, geographers have been interested in three separate but related themes. The first theme relates to the distribution of humans over the Earth's surface, with regards to culture, religion, politics, and language. The second theme relates to the distribution of natural features on the landscape, such as rivers, volcanoes, and glaciers. The third theme relates to the tools we use (such as maps or computer software) to understand the human and natural processes outlined above. These three themes relate to the current geographic sub-fields of **human geography, physical geography, and geotechniques**, respectively. What unifies these sub-fields together into "geography" is the focus on space-based (spatial) relationships and patterns, as well as the relationship between humans and their environment.

The Need for (Better) Geographic Education in the United States

Globally, geography is a vibrant and ever-expanding discipline, both in the academic and private sectors. Geography programs are often large and well-funded, even at medium-sized colleges and universities. For example, the University of St. Andrews in Scotland (enrollment 6,900 as of 2006-2007) houses The School of Geography and Geosciences, which consists of 27 academic faculty, 22 research faculty, 35 supports staff, 22 post-graduates, and more than 500 undergraduates. Research and teaching at St. Andrews cover a wide variety of topics, from trends in climate change to the effects of environmental pollution on health to patterns of refugee migration. While this is an example of a very large geography program, many foreign colleges and universities do have multiple geography faculty and offer both undergraduate and post-graduate degrees in geography.

As an academic discipline, geography in the United States lags far behind the rest of the world. In the 1800s and early 1900s, there were many vibrant geography programs at institutes of higher learning, including many Ivy League schools and the University of Chicago. Unfortunately, since geography is such a wide-ranging discipline that attracts people from many different backgrounds, there was often significant disagreement as to how geography programs should be directed. The inability for many geography departments to unify under a common purpose led to the dissolution of many prestigious programs, including the program at Harvard University in 1948.

Eventually (and partly due to the lack of trained geographers), geographic studies were incorporated into "social studies" curricula at the secondary school level. More often than not, social studies courses (which include components of geography, history, and civics) are taught by instructors who have no formal coursework or training in geography. When geography is taught at either the elementary- or secondary-school level, it usually focuses on the memorization of places.

Unfortunately, studies of Americans' "geographic knowledge" often perpetuate the myth that the sole purpose of geography is to memorize and identify places on a map. A 1989 *National Geographic Project* was the first nationwide study to raise concern about the lack of geographic knowledge in the United States. This study compared Americans' map-identifying abilities with those of nine other countries. Among 18-24 year olds, American students came in dead last when asked to identify sixteen places on a world map (14% of American students weren't even able to identify the United States!)

Despite its somewhat-flawed methodology (equating the identification of places with geographic knowledge), the *National Geographic* report sparked a renewal in geographic education. The 1994 publication of the National Geography Standards, by the National Council of Geographic Education, outlined eighteen themes that were considered essential to the successful implementation and instruction of geography at a secondary school level (see Appendix A for the list of themes). While many school boards have been reluctant to adopt geography as a core course in secondary schools, there have been some successes, most notably the successful creation and implementation of an Advanced Placement (AP) Human Geography course. In 2007, a total of 29,005 students nationwide took this exam at 1,083 high schools across the United States.

Despite these recent successes, the average student at PCC (and elsewhere) still has a relatively weak understanding of geographic themes and principles. To test geographic background and knowledge, more than 250 students enrolled in GEO 105 have taken a "quiz" developed by PCC geographer Matt Constantino. The average score of this three-part quiz (an Oregon section, a United States section, and a world section) was less than 15%. The questions and results are listed in Appendix B.

Current status of the PCC Geography Department

Assessment of Goals and Outcomes (from 2005 to 2008)

Goals

The goals of the PCC Geography Department are as follows:

1. Maintain quality courses that provide geographic instruction to a diverse group of students
2. Maintain quality courses that prepare students for a major in geography at a four-year university
3. Maintain quality courses that prepare students for employment in geography and/or Geographic Information Systems
4. Provide services to the local community with an interest in geography

Assessment of Goals

1. Maintain quality courses that provide geographic instruction to a diverse group of students

The geography department provides lower-division courses in a range of geographic fields. The courses can be divided into four main core areas:

Human Geography explores the patterns and processes of language, religion, population, ethnicity, and culture, and also explores the spatial relationships between humans and their environment.

Physical Geography explores the patterns and processes of the natural environment, which includes examining the relationships between the hydrosphere, biosphere, lithosphere, and atmosphere.

Regional Geography explores the patterns and processes of specific areas of the world, and is usually associated with descriptive analyses of both human and physical environments.

Geographic Techniques (or Geomatics) are tools used to gather, store, and interpret geographic information. Examples include land surveying, remote sensing, and geographic information systems (GIS).

Currently, thirteen standard geography courses are listed in the course catalog, plus two independent study and one seminar course. Eight of the thirteen standard courses are offered on a regular basis. While divisions between the four core areas are somewhat fluid, a general breakdown of courses is shown in Table 2:

Focus on Human Geography:	**Focus on Physical Geography:**
GEO 105 – Intro to Human Geography	**GEO 209 – Weather and Climate**
GEO 106 – Geography of the Developed World	GEO 210 – The Natural Environment
GEO 107 – Geography of the Developing World	
GEO 239 – Geography of Race and Ethnic Conflicts	
Focus on Regional Geography:	**Focus on Geographic Techniques:**
GEO 204 – Geography of the Middle East	GEO 230 – The Local Landscape
GEO 206 – Geography of Oregon	**GEO 265 – Introduction to GIS**
GEO 250 – Geography of Africa	**GEO 266 – GIS Analysis**
	GEO 267 – GIS Applications

Table 2. Geography Courses Grouped By Core Areas.
(Note: Courses in bold are offered regularly)

As Table 2 demonstrates, there is an imbalance in courses offered among the four core areas. This is in part due to the classification of geography at PCC as a social science. This illustrates one of the major problems associated with geography in academia, especially with smaller departments: how do you provide a well-rounded geographic education?

Of all the courses offered, Introduction to Human Geography (GEO 105) is the only course offered on all PCC campuses. The other courses are distributed between Rock Creek, Sylvania, and SE Center, with an additional number being offered online. As of Spring 2008, there are no physical geography or geotechniques courses offered beyond the Rock Creek campus, although there are plans to offer a GIS section at Sylvania during Fall 2008.

The diversity of students is reflected in several statistics taken from PCC college-wide data on enrollment and student characteristics, tracked by department. Tables 3 and 4 below show the percentage of students enrolled in geography courses as by full-time and degree-seeking status, and also by age and gender.

Enrolled Number of Credits at PCC (in all coursework)*	Full Time Student: 12+ credits	Half Time Student: 6-11 credits	Part Time Student: < 6 credits
Geography	58.7%	28.6%	12.7%

Degree Seeking Status*	Degree Seeking Student	Non-Degree Seeking Student
Geography	88.1%	11.9%

Table 3. Geography Enrollment by Student Status, 2004-2007

Age Distribution	14-17	18-20	21-25	26-30	31-40	41-50	51-60	61+
Geography	0.7%	22.3%	34.1%	21.2%	14.1%	4.4%	2.8%	0.4%

Gender Distribution	Female	Male
Geography	47.5%	52.5%

Table 4: Geography Enrollment by Age and Gender, 2004-2007

The majority of part-time and non-degree seeking students are those enrolled in the evening GIS classes, many of whom work full-time jobs during the day and are either seeking to further their current careers or switch to a GIS- or geography-related field. These students also tend to be older than the average daytime student.

2. Maintain quality courses that prepare students for a major in Geography at a four-year university

Like most departments at PCC, several geography courses are accepted for transfer at both Portland State University as well as many other universities within the state of Oregon. From informal student surveys conducted in the past several years, more than 80% of students indicate their intention to continue at a four-year university, with Portland State being the most common transfer destination.

At Portland State, all PCC geography classes are applicable as general social science credits (for non-geography majors) or geography elective credits (for geography majors). In addition, specific PCC courses are directly transferable to specific classes or degree tracks at PSU. These include GEO 206 (Geography of Oregon) at PCC, which can be used for the Regional Geography track at PSU, or GEO 265 (Introduction to GIS), which is one-to-one transferable with GEO 380 (Maps and Geographic Information) at PSU. For those students transferring to the University of Oregon (the second most common destination after PSU), GEO 105, 210, 265, and 266 are accepted at a one-to-one ratio.

From all accounts, the transfer process has gone smoothly for those students that choose geography as a major upon transfer. As discussed later in this document, one of the major successes of PCC's geography program in the past three years has been improved communication with programs across the state, both at four-year universities and other community colleges.

In the near future, we will be working closely with universities for which (as of now) no discipline-specific articulation agreement exists. One potential concern for establishing transfer requirements is the lack of up-to-date Course Content and Outcome Guides (CCOGs) for some of the infrequently-taught courses at PCC (most of which are presently deactivated). Some of these descriptions need to be reviewed and updated to reflect the current goals and objectives of the course.

3. Maintain quality courses that prepare students for employment in Geography and/or Geographic Information Systems

In the past few years, at least ten former students have obtained employment in geography-related fields. Several of these jobs have been related to GIS, and include agencies and companies such as Oregon Fish & Wildlife Service, the City of Beaverton, and Peerbolt Consulting.

In informal surveys and correspondence, many students have indicated that their geographic education at PCC has prepared them for entry into fields where knowledge of world, regional, and local geography is essential. Specific examples of academic programs and careers include those in International Business, Environmental Sustainability, and Urban/Regional Planning.

Due to the lack of adequate resources (both financial and personnel-related), the GIS program at PCC is not serving students adequately. Currently, the only GIS sections offered are evening classes at the Rock Creek campus. Student surveys indicate that the Rock Creek location is not ideal, as most students live closer to other campuses and the rush hour commute makes travel to Rock Creek difficult. In the past three years, more than 15% of first-week enrolled GIS students have dropped GEO 265 or 266, often due to transportation or time issues. In addition, by offering only evening sections, traditional daytime students (many of whom work evenings) are unable to enroll.

4. Provide services to the local community with an interest in Geography

Once again, due to the lack of personnel, our ability to serve the local community is somewhat limited currently. A working relationship exists with the Washington County Historical Society and Washington County Museum, mostly with regard to material in the Geography of Oregon (GEO 206) class. There are many on-campus organizations linked with geography faculty that could be expanded to the local community with some effort; these include the Sustainability program, Green Building efforts, and International Education programs.

Outcomes

The desired outcomes of PCC geography courses are as follows:

1. Define geographic problems and issues and determine the nature and extent of information needed to solve geographic problems.
2. Increase global awareness and understanding of a diversity of cultures and peoples.
3. Demonstrate an understanding of geographic issues at various scales, and various geographic concepts and approaches.
4. Integrate multidisciplinary perspectives to interpret the physical and cultural landscape.
5. Develop skills such as problem solving, critical thinking, reasoning, and observation in preparation for employment and/or continued education at a university.

Assessment of Outcomes

Unlike many vocational or strictly science-based disciplines, assessing outcomes is much more difficult for academic programs involving the social sciences, especially when it comes to quantitative assessment. As such, many of the outcome assessments are based on follow-up correspondence with students as well as analysis of CCOGs by geography faculty outside of PCC.

1. Define geographic problems and issues and determine the nature and extent of information needed to solve geographic problems.

As geography is a discipline focused on space and place, the most important analytical tools for geographers are maps. As the prior geographic education of most students enrolled in PCC's geography courses is minimal, it is essential that students learn how to think geographically. Instead of facts and numbers, geography is concerned with relationships and patterns. Without a clear understanding of how we represent data spatially, understanding geography-related problems and issues becomes much more difficult. Therefore, the first geography course in the Human Geography sequence (GEO 105) covers basic mapping techniques, including concepts of scale, topography, and how maps can be used to more easily convey spatial information.

One successful activity that has been completed in GEO 105 is a group assignment in which students read and analyze maps that have been created throughout history, from early Chinese and Greek maps to those rendered using GIS and other computer programs. This allows students to see how our perceptions of the world have changed throughout human history, in both overall coverage and detail. In addition, students learn that maps are not always created for navigational purposes; for example, map propaganda printed by both the Allied and the Axis Powers during World War II.

2. Increase global awareness and understanding of a diversity of cultures and peoples.

This outcome has probably been achieved most successfully, again partly due to the relative lack of geographic knowledge students have upon entering a geography class. GEO 106 and GEO 107 cover "The Developed World" (industrialized regions) and "The Developing World" (non-industrialized regions) respectively. Often, students have very poor understanding of peoples in both the developed and the developing world, including here in the United States! For example, a survey of more than 200 students enrolled in geography classes from 2006 to 2008 indicates that fewer than 10% know that German is the most-commonly reported ancestry in the United States. Globally, students often fare even worse. For example, very few students are able to explain who the Kurdish people are, where they live, what religion they practice, and why they are an important group to the United States presently. Similarly, although most students have at least heard of the humanitarian crisis in Darfur, very few know what the conflict is about, who it involves, where it is located, and why it continues to be unresolved. In a world that seems to be growing smaller due to technology and ease of travel, this lack of knowledge is troublesome, but it is definitely not limited to PCC students; it is a nationwide problem. To remedy this, course content in GEO 106 and GEO 107 focuses on specific geographical regions and the peoples that inhabit them, while still remembering that interactions between different regions and cultures continue to increase at a steady rate.

3. Demonstrate an understanding of geographic issues at various scales.

Relationships that may be true at a global scale are not always applicable at regional or local scales. One very important current topic that demonstrates this is the discussion and debate about "global warming" or "climate change." The current geographic, climatological, and meteorological literature has largely replaced the "global warming" term with that of "climate change." This is largely due to a more complete understanding of how human and natural processes could be affecting global temperature. Specifically, "global warming" has become a less-used term because at local and regional scales, some places could actually experience a <u>decrease</u> in overall temperature (due to weakening of ocean currents, for example). Unlike how this is often portrayed by human-caused climate change skeptics, small-scale cooling and large-scale warming are <u>not</u> mutually exclusive.

Scale is one of the most important concepts in mapping. In the lecture accompanying the GEO 105 activity outlined above, students are shown two population density maps detailing different-size areas in Africa: one of the entire continent and another of Johannesburg, South Africa. The class discusses what information can be obtained from each map, and in what situations each map would be put to best use. Almost all geographic concepts, whether human, physical, or a mix of both, require consideration of scale.

4. Integrate multidisciplinary perspectives to interpret the physical and cultural landscape.

Geography is quite possibly the ultimate "integrated" discipline. Geographers are trained in a wide variety of social and physical sciences, and these other fields enhance our understanding of spatial processes. Figure 1 on the next page shows the relationship between geography and other disciplines, as seen by noted physical geographer Robert Gabler.

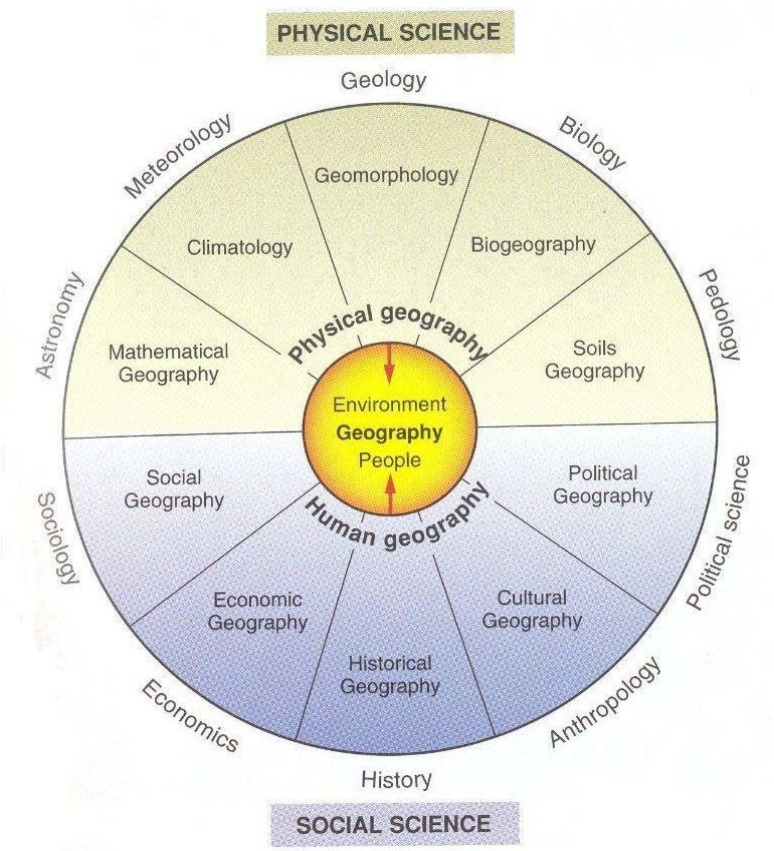

Figure 1. Relationships between geography and other disciplines, from Gabler, Petersen, and Trapasso, Essentials of Physical Geography, 7th ed.

It is important to remember that while the above disciplines all contribute to geography, what makes our field unique is the focus on spatial relationships, along with an emphasis on the human-environment relationship.

5. Develop skills such as problem solving, critical thinking, reasoning, and observation in preparation for employment and/or continued education at a university.

The state of Oregon is one of the leaders in both geographic education and employment, especially for environmental and urban planning issues. Many of the challenges that the state faces are related to population growth and resource depletion. These problems are likely to continue into the near future, so the field of geography should continue to prosper in the area. The geography courses offered at PCC have already prepared students for employment in the natural resources and city planning industries. For those continuing on to a four-year university, the variety of courses offered at PCC provide a solid basis for further study in a social or physical science.

Strengths of the PCC Geography Program

The geography program at PCC, despite its small size, has much to offer PCC students. The following list outlines the program strengths, many of which have been referenced above:

1. Commitment to our students, both during their time at PCC and in future educational endeavors
2. Commitment to the social sciences, physical sciences, and relationships between the two
3. A diverse faculty that is well-trained in all aspects of geography
4. Commitment to district-wide goals of enhancing diversity and promoting sustainability

One easily-quantifiable way to judge a program's success is look at total enrollments. For the 2005-2006 academic year, a total of 731 students enrolled in a geography course at any PCC campus. In 2006-2007, that number jumped to 830, a 13.5% increase over the previous academic year. For 2007-2008, total enrollment was 904, an 8.9% increase over 2006-2007 enrollment. In addition, more students are taking multiple geography courses than in years past. From the 2005-2006 academic year through the 2007-2008 academic year, more than 30% of students who took one geography course enrolled in a second course (and in many cases, a third or a fourth).

An additional measure of gauging the success of geography at PCC is to follow students' progress after they complete their education at PCC. In the past three years, there have been at least fifteen students that have gone from taking a PCC geography course to major in geography at a four-year university. In addition, several other students have chosen geography as a minor to supplement their education in a related social or physical science. Finally, there are a number of former PCC geography students that are now employed in geography-related fields, including urban planning, sustainability, and geographic consulting.

Beyond the classroom, the geography program is committed to district-wide issues of diversity and sustainability. Portland Community College has recently affirmed its commitment to promoting awareness of diversity. Through our discipline's study of different cultures and peoples, we are directly promoting both the Rock Creek Campus Diversity Advocacy Board's Mission as well as the district-wide Philosophy Statement of Diversity. All of our instructors are well-traveled and have been exposed to a wide variety of cultures, religions, and languages, and we are able to use these experiences to further our students' understanding of diverse peoples. PCC has also recently demonstrated its commitment to sustainability through the Carbon-Energy Leadership Taskforce, Carbon Emissions Audit Team, and the Rock Creek Learning Garden. As one of the key principles of geography is human-environment interaction, we are in a unique position to explore and advocate the current campus-wide efforts to reduce our environmental footprint.

Improvements Needed to Further Strengthen the Geography Program

Many of the current "problems" in the geography department at PCC are directly related to the lack of personnel and funding. More specifically, the following issues need to be addressed in the near future:

1. Improve campus communication and connections
2. Integrate geography courses into Career Pathways; develop a GIS certificate program.
3. Add additional faculty and expand course offerings

As mentioned earlier, geography is an integrated discipline, which means that there are many other disciplines and departments that we could share resources with. At Rock Creek, geography is part of the Social Sciences & College Prep division, so we have close working relationships with disciplines such as History, Psychology, and Sociology. We do not, however, have a very good link with any of the physical sciences, including the biological, geological, and environmental sciences. In the past, a Weather and Climate course offered through the geography department has overlapped with a meteorology course offered through the general science department. In the past, geography instructors have provided some introductory GIS lessons to students enrolled in environmental studies courses, although the instruction is somewhat limited in scope and uses an old version of the GIS software. It will be necessary in the near future to build a much stronger link between the social science and physical science faculty, as this should help enrollment for both areas. One potential area for a link between the two could involve the Rock Creek Natural Area, which is currently monitored by an environmental studies class on campus. Data are collected at permanent study sites throughout the area; this could then be mapped using GIS software to provide a more accurate and easy-to-read representation of the area, along with the ability to continually update the data and monitor how water quality or chemistry changed over time.

Geographers at PCC must also do a better job at connecting with academic advisors to promote awareness of our courses and programs. There are have been several instances where students have been steered away from a geography course in favor of a "more mainstream" social science, despite our ongoing efforts to show geography is indeed an essential discipline. In addition to encouraging enrollment through advisors, we must also take advantage of on-campus advertising opportunities. For example, there is a "Geography Display Case" located outside of the Computer Resource Center in Building 2 at Rock Creek campus. This is a high-traffic area, and one where a continually-updated geography display could easily attract the attention of student passers-by. Advertising fliers have also attracted attention in the past, specifically for specialty courses such as Geography of Oregon and Weather & Climate. What we have found is that once students actually enroll and begin their geographic education, they often are very enthusiastic and much more likely to take additional courses at later dates. The biggest challenge currently is getting students to enroll in the first place.

A final way to develop better campus communication and connections is to work on updating and monitoring articulation agreements with other colleges and universities throughout Oregon. While the transfer process to Portland State University is well-established, many of our students go on to universities outside of the Portland metropolitan area. These students are often unsure as to how geography classes will transfer to these other institutions, and while we do have good connections with many programs statewide (see later section for more details), there is a relative lack of formal, streamlined transferability to these places.

The Career Pathways initiative at PCC prepares high school and PCC students for careers in vocational and technical fields. While the majority of our geography students transfer to four-year universities, there is a definite link between many of the emerging geospatial technologies (such as GIS and remote sensing) and employment in vocational and technical fields. One of our short-term goals is to work with the Career Pathways program to potentially develop a GIS certificate program that would serve mainly as a professional technical program to gain skills for employment.

This desire for a GIS certificate program is due largely to the lack of a geography-based undergraduate or community college GIS program anywhere in the Portland metropolitan area. Similar certificate programs have been recently started at Lane Community College (Eugene), Clackamas Community College (Oregon City, offered through the drafting department), Central Oregon Community College (Bend), and Treasure Valley Community College (Ontario). From interviews with faculty at these institutions (see section on geography programs statewide), it is clear that these programs have been highly successful at training students for employment in the rapidly-growing GIS and geotechniques sector. We are in the early stages of developing a certificate program at PCC, although there first needs to be funding for additional faculty and equipment, and a commitment from both other disciplines and the PCC administration that our efforts will be supported. Appendix D outlines a proposal for incorporating a GIS certificate program into the geography department at PCC.

Our most immediate concern is the ongoing need for additional full-time faculty. Geography is not a static discipline; as the world changes, so too must our teaching. It is simply impossible for one full-time faculty (split among two campuses) to be able to update course and program content, create administrative documents, and promote the program all at the same time. At the very least, a second full-time geographer is needed so that a wider variety and number of sections can be offered.

As mentioned above, the geography department offers eight classes regularly. There is a need to extend course offerings that focus on the importance of global and local understanding and awareness, as well as the growing demand in the workplace for GIS skills. Dependent upon staff and funding, the department must offer more regional geography courses, which typically transfer easily to Oregon universities. Another necessity is to increase the number of campuses and times of day that GIS courses are offered, as well as provide an overall better variety of courses across campuses. A former PCC part-time instructor, Shaun Houston, said, “I think that the profile of geography on campus, and the strength of the program, would be helped by having a full time geographer at Sylvania, the main campus for the system.”

Putting the PCC Geography Program into a Statewide Context

Since most students enrolled in geography classes at PCC will eventually transfer to a four-year university, it is important to place the PCC geography program into a statewide context. The following provides an overview of geography and/or GIS programs offered at four-year universities, as well as any transfer agreements between PCC and the stated university. Other community college programs in the state are also listed, for comparison purposes.

Four-Year Universities

Portland State University

Currently, the transition from PCC to PSU is almost seamless, due to a cooperative agreement between the two colleges. A majority of transfers into the geography department are from PCC and are well-prepared to continue their studies and pursue a bachelor's degree. The PSU Geography Department allows 3 classes to transfer for automatic credit, while all others are transferable as general geography credits but do not count towards “major” credits. Under recommendation from Martha Works, PSU Geography Department Chair, an articulation agreement should be established to more clearly state and

ease the transfer from PCC to PSU. In addition, PSU will create a checklist "Steps to transferring into the Geography Department at PSU" to distribute to students and academic advisors.

Due to increased demand for additional GIS training, PSU just recently began offering a GIS minor, to complement the already-existing GIS graduate certificate.

Western Oregon University

WOU has received several transfers from PCC in recent years into the 4-year Geography program. The transition between the two schools could be improved; currently, course numbers are not in sync, creating confusion when trying to offer credit for courses previously taken at PCC. It is recommended that the PCC geography department work with the WOU Geography Department to address this problem and move towards creating better compatibility between the two schools.

University of Oregon

Most community college transfers to UO are from Lane Community College in Eugene, although a number each year do transfer from PCC. Currently, three PCC geography courses are transferable to UO: GEO 105, 210, and 265. These courses correspond to UO courses as follows: Intro to Human Geography, Intro to Physical Geography, and Maps & Geospatial Concepts. Any other additional classes (e.g. regional geography or additional human geography) are reviewed on a case-by-case basis. In the past, most of these additional courses have been accepted as transfer credits. The UO Geography Department lists all the undergraduate course requirements on their website for students interested in transferring. Additionally, the University Registrar office keeps specific records about what classes from PCC (and other schools) have transferred successfully into their program in the past.

Susan Hardwick, Geography Professor at UO, is impressed with the variety of courses listed in the PCC Geography curriculum. Hardwick points out that this comprehensive list of course offerings is uncommon for geography programs at the community college level and gave words of encouragement to continue preparing students to transfer to four-year programs. She also recommended that PCC provide students with more information about potential careers in geography. It is common for students interested in geography as a career to have little guidance and information for post-graduation employment options.

Oregon State University

OSU offers numerous geography-related majors and minors, most of which favor the physical science aspects of geography. As a Geology, Geography, or Earth Sciences major, a student can choose to minor in Environmental Geosciences, Geology, Regional Studies, or Resource Geography and Rural Planning. Additionally, OSU is the only Oregon university that offers an undergraduate certificate in Geographic Information Science. They are also the only university that offers three GIS certificates – undergraduate, graduate, and professional.

Similarly to UO, the Geography Department at OSU accepts a few PCC transfers each year. Some requirements for their program match directly with classes offered at PCC, including Geography of the Developing World and Geography of the Developed World. As with UO, other courses are accepted on a case-by-case basis.

Community Colleges

Clackamas Community College

CCC offers a certificate and Associates Degree in GIS through the Drafting department. There are currently 8 -10 students a year that participate and complete the program. The focus of the program is to prepare students for GIS technician positions, mostly in planning-related fields. The success of their program is rooted in an Advisory Committee that maintains a pool of instructors, community partners for Cooperative Work Experience, and future employers for graduates. They work closely with Portland State University and George Fox University to simplify the transfer into a four-year program.

Lane Community College

LCC is in its first year of offering a four-course sequence for a GIS certificate. With a grant from the National Science Foundation and the Advanced Technology Fund, instructors developed a series of web-based modules and a curriculum that gives students the opportunity to work through real-world GIS projects. Similar to CCC, Lane brought together a group from the local GIS community to serve as an Advisory Committee to develop the curriculum, act as community mentors for projects in the GIS application course, and possibly become employers for graduates.

The LCC program is multidisciplinary, with instructors and contributions from the Geography, Environmental Science and Computer Science departments. The program does have an official "certificate" designation; instead, students are required to keep a portfolio with samples of their work, which should help students gain employment after completion of the program. There are plans to create a "mini-certificate" in the near future that will serve as a more "official" proof of successful completion. For those students transferring to universities, LCC faculty have worked to create articulation agreements that will ensure successful credit transfers for their students.

Since the program started offering night courses, a larger percentage of their students are full-time employees and entering the program for work-related training. This is a consideration for any program that might develop at PCC, as the student demographics will likely change depending on when during the day courses are offered.

Central Oregon Community College

The geography program at COCC offers a GIS certificate and Associate of Applied Science, in addition to a suggested course of study for those interested in pursuing a Bachelor's degree in geography. There are two options for the GIS certificate – a one-year and a two-year program. The two-year program is geared towards students with little or no technical background, while both programs have comprehensive GIS course offerings that includes geodatabase design, remote sensing application and interpretation, cartography, data collection and documentation, and spatial data analysis.

The GIS certificate program is based on computer-aided mapping and surveying technology. Although the program is housed in the geography department, there are no geography prerequisites, nor are any geography courses listed in GIS certificate requirements. The geography department does offer a

number of introductory courses that includes physical, cultural, economic, and environmental geography, as well as research skills in preparation for students to pursue a bachelor's degree in geography.

The Geography Department chair, Mike Holtzclaw, attributed the program's success to its focus on employable skills, small class size for individualized attention, and an association with the Professional Technical program. The biggest challenge faced so far has been the cost of developing the curriculum and program, especially costs related to software and technical equipment. However, it is also one of the most successful programs on campus, with a high percentage of student employment upon completion. Holtzclaw believes that a GIS program at PCC would be an "excellent choice."

Transfer Through the Oregon University System

The Oregon University System consists of Eastern Oregon University, Oregon Institute of Technology, Oregon State University, Portland State University, Southern Oregon University, University of Oregon, Western Oregon University, and Oregon Health & Science University. Through this system, several measures have been implemented to facilitate transfers between community colleges and universities. These measures include the Oregon Transfer program, dual enrollment between institutions, and ATLAS (Articulation Transfer Linked Audit System). Each of these systems is designed to build partnerships between community colleges and the Oregon University System and ease the transfer process.

Currently, Portland Community College takes advantage of these partnerships and has dual enrollment agreements with PSU, OSU, OIT, and WOU, as well as Marylhurst and Concordia. It also provides the option for students to enroll in the Oregon Transfer program in the Arts, Sciences, and Business. As part of the Social Science requirement for these degrees, geography courses are accepted as one of eight subject areas.

Both the PCC and Oregon University System websites provide information on the Oregon Transfer program. To increase the number of students looking to transfer to a four-year university with a focus in geography, it would be wise to create links to university geography programs on the PCC website. Currently, there are links to other programs (such as business and environmental science), but not to any geography programs.

Summary and Conclusions

The need for geographic education in the United States is just now being fully realized, as concerns about human-environment relationships and globalization continue to mount. Furthermore, as technology continues to improve, there will be more available jobs in the geotechniques industry. Based on this, it would seem that the PCC Geography Department is primed for rapid growth in the near future. Data from recent years seem to show this trend, as enrollment in geography classes has increased by 23.7% in two years, from 731 students in the 2005-2006 academic year to 904 in 2007-2008. As PCC continues to grow and more students become aware of geography through both world events and active promotion of geography on-campus, we only expect these numbers to continue to climb. We will need at least a second full-time faculty member in order to accommodate this growth as well as for expansion of our GIS and geotechniques program. The creation of a GIS certificate program would likely cause further growth, allowing for additional faculty and resources to eventually be brought in to PCC. However, this growth will only happen with a solid commitment from administration that programs will be well-funded, both in terms of hiring additional faculty and providing for the expansion of technology and software in the classroom. Without this commitment, we will continue to lose potential geography students to other programs, as well as continue the trend of geographic illiteracy that has plagued our students for so long.

According to student evaluations, students that enroll in geography classes at PCC generally are extremely positive about their class experiences, and many look forward to continuing with more geography classes, either at PCC or elsewhere. We must make sure to provide additional courses and sections to cater to students' needs; otherwise we are not fulfilling the mission of PCC. In fact, as topics of internationalization and sustainability continue to be addressed district-wide, it is clear that geography is an ideal discipline for both issues. By providing additional avenues for students to explore these issues at PCC, we will only be preparing them for future successes, whether it is at universities or in the job market.

Appendix A: The National Geography Standards themes
Source: National Council for Geographic Education

The geographically informed person knows and understands...
The World in Spatial Terms
1. How to use maps and other geographic representations, tools, and technologies to acquire, process, and report information.
2. How to use mental maps to organize information about people, places, and environments.
3. How to analyze the spatial organization of people, places, and environments on Earth's surface.

Places and Regions
4. The physical and human characteristics of places.
5. That people create regions to interpret Earth's complexity.
6. How culture and experience influence people's perception of places and regions.

Physical Systems
7. The physical processes that shape the patterns of Earth's surface.
8. The characteristics and spatial distribution of ecosystems on Earth's surface.

Human Systems
9. The characteristics, distribution, and migration of human populations on Earth's surface.
10. The characteristics, distributions, and complexity of Earth's cultural mosaics.
11. The patterns and networks of economic interdependence on Earth's surface.
12. The process, patterns, and functions of human settlement.
13. How forces of cooperation and conflict among people influence the division and control of Earth's surface.

Environment and Society
14. How human actions modify the physical environment.
15. How physical systems affect human systems.
16. The changes that occur in the meaning, use, distribution, and importance of resources.

The Uses of Geography
17. How to apply geography to interpret the past.
18. To apply geography to interpret the present and plan for the future.

Appendix B: Geography knowledge "quiz" responses from students, 2006-2007

GENERAL QUESTIONS:

Have you lived in Oregon for the majority of your life?
2006: Yes (58), No (24)
2007: Yes (59), No (17)

Have you ever taken a course (whether in middle school, high school, or college) that had the word "geography" in its title? If so, when, and where?
2006: Yes (46), No (36)
2007: Yes (44), No (32)

QUESTIONS ABOUT OREGON **(Format of data – Year: # correct, % correct)**

City profiles:

1) This city is located near the final stop of Lewis and Clark's journey in 1806. In 1812, a fort was founded here, and it became the first permanent U.S. settlement on the Pacific coast. The new community's economy centered on the fur trade; indeed, the settlement took its name from the fur company's owner. In 1876, the community was legally incorporated, and soon after it attracted a host of immigrants from Norway and Sweden; even today the city boasts a large Scandinavian population. Over time, this city's economy has changed from fishing and lumber to tourism, art, and light manufacturing.

Astoria
2006: 23, 28.1%
2007: 29, 38.2%

2) This city is located in a region called the "Western Treasure Valley". It was founded in 1883, and named after the province where the city's founder came from. The city's economy is based on agriculture, especially the cultivation of russet potatoes, sugar beets, and onions. Much of the city's agricultural production is processed in the large Ore-Ida factory; in fact, the company got its name due to this city's location on the Oregon-Idaho border. Due to very strict land use laws, the city's growth is restricted, and many employees of the Snake River Prison (one of the city's largest employers) live in Idaho and commute across the state line every day. This city also has a very distinct Basque cultural heritage (Basques = residents of northern Spain, but not related to Spaniards at all).

Ontario
2006: 12, 14.4%
2007: 9, 11.1%

3) This city was founded in 1876 and named after the founder's hometown in Tennessee. It is known amongst UFO enthusiasts for being the location of various "unexplained sightings", and is home to a museum that houses the world's largest propeller-driven airplane. The lands around this city are dominated by agriculture, including many grass seed and turkey farms. Perhaps this city's most common nickname is "The Wine Capital of Oregon", as numerous vineyards are located nearby, specializing in Pinot Noir wines.

McMinnville
2006: 17, 20.7%
2007: 21, 27.6%

Political Geography:

4) Oregon borders four other states. What are they?
2006: California (81), Washington (81), Idaho (78), Nevada (45)
2007: California (76), Washington (76), Idaho (75), Nevada (41)

Physical Geography:

5) Oregon has a large area of land that is classified as desert. Which part of the state is it in (Circle the correct answer)

Northwest	North-Central	Northeast	West	Central	East	Southwest	South-Central	Southeast
1	0	3	1	16	28	1	5	21 (25.6%)
0	0	4	0	17	29	1	8	17 (22.4%)

6) Oregon has numerous volcanic mountains, although none have erupted in the last few centuries. In the space below, name as many of Oregon's volcanoes as you are able.
2006: Mt. Hood (66), 3 Sisters (25), Mt. Bachelor (23), Mt. Jefferson (17), Crater Lake (14)
2007: Mt. Hood (66), 3 Sisters (31), Mt. Bachelor (18), Mt. Jefferson (16), Crater Lake (14)

QUESTIONS ABOUT THE UNITED STATES

City profiles:

7) This city was founded in 1836 and named after a famous American soldier, who later became a governor. When the state in which it was located became its own republic, this city was temporarily named the capital. While much of the original economy was based around trade and shipping, the discovery of oil in 1901 would eventually transform this city into a major metropolis. This city is prone to environmental disasters, most notably flooding caused by Tropical Storm Allison in 2001. After Hurricane Katrina, this city became the #1 relocation spot for displaced persons from Louisiana and Mississippi.

Houston
2006: 35, 42.7%
2007: 19, 25.0%

8) This city's name is derived from the Dakota word for "water" and the Greek word for "city", a reflection of the numerous lakes found within its borders. Becoming a city in 1867, the original economy was based around milling, shipping, and trade – expected, given its location on the Mississippi River. Today, many large companies are headquartered within its borders, most notably Honeywell, 3M, and Target. Many people consider this city to be the most important center of arts and entertainment in the Midwest next to Chicago, as it is home to famous musical acts Prince, Hüsker Dü, the Replacements, the Suburbs, and Soul Asylum.

Minneapolis
2006: 22, 26.8%
2007: 23, 30.3%

9) The origin of this city's name is unclear – it could be a mispronunciation of the French phrase for "beautiful river". Located on Lake Erie, this city is famous for being the location where President William McKinley was assassinated in 1901. Originally a city dominated by heavy industry and manufacturing, in recent years attempts have been made to revitalize the economy by expanding the educational and medical fields. In addition, the city has attempted to use a famous natural scenic attraction located nearby in order to lure tourists, many of whom traditionally cross the border into Canada in order to view the sights.

Buffalo
2006: 3, 3.7%
2007: 5, 6.6%

Physical Geography:

10) Consider the following states: Oregon, Arkansas, Vermont, New York, South Dakota, Minnesota, Colorado. In the space below, identify in which state you would find each mountain range/sub-range (you will use each state exactly once).

Vermont	Green Mts.	**2006: 29, 35.4%**	**2007: 27, 35.5%**
S. Dakota	Black Hills	**2006: 41, 50.0%**	**2007: 42, 55.3%**
Colorado	Sangre de Cristo Mts.	**2006: 29, 35.4%**	**2007: 34, 44.8%**
Oregon	Wallowa Mts.	**2006: 40, 48.8%**	**2007: 48, 63.2%**
Arkansas	Ozark Mts.	**2006: 28, 34.1%**	**2007: 28, 36.8%**
Minnesota	Iron Range	**2006: 23, 28.0%**	**2007: 15, 19.7%**
New York	Adirondack Mts.	**2006: 34, 41.5%**	**2007: 26, 34.2%**

Cultural Geography:

11) The city of **Miami** has the highest percentage of foreign-born population of any major city in the world.
2006: 3, 3.7% **2007: 3, 3.9%**

12) According to the 2000 United States Census (a survey taken every ten years by the United States government), the most common ethnicity/ancestry reported among the American population was **German**. By the year 2010, that ancestry will be replaced in the #1 spot by **Hispanic.**
German: 2006: 7, 8.5% **2007: 6, 7.9%**
Hispanic: 2006: 55, 67.1% **2007: 50, 65.8%**

Population Geography:

13) The following list consists of the largest 25 metropolitan areas in the United States (metropolitan area = city population + all suburbs), ranked from largest to smallest (figures from the 2000 Census): New York City, Los Angeles, Chicago, Philadelphia, Dallas-Fort Worth, Miami, Houston, Washington D.C., Atlanta, Detroit, Boston, San Francisco-Oakland, Phoenix, Seattle, Minneapolis, San Diego, St. Louis, Baltimore, Tampa-St. Petersburg, Pittsburgh, Denver, Cleveland, Portland, Cincinnati. (CORRECT ANSWERS ARE CAPITALIZED AND UNDERLINED)

Which two metro grew the fastest (in terms of percentage of population) between 1990 and 2000?
2006: LA 29, NYC 19, PHOENIX 15 (18.3%), Seattle 10, Denver 7... ATLANTA 1 (1.2%)
2007: LA 19, Portland 17, PHOENIX 15 (19.7%), NYC 12... ATLANTA 4 (5.3%)

Only one of these 25 metro areas actually lost population between 1990 and 2000. Which one?
2006: Detroit 9, Wash. DC 8, NYC 5, Minneapolis 5, Cincinnati 5, PITTSBURGH 4 (4.7%)
2007: Detroit 8, St. Louis 8, PITTSBURGH 8 (10.5%), LA 6, Cleveland 5, Cincinnati 4

Which metro area has the highest percentage of senior citizens within its borders?
2006: Miami 20, TAMPA-ST.PETERSBURG 19 (23.2%), Phoenix 17
2007: TAMPA-ST.PETERSBURG 24 (31.6%), Miami 22, Phoenix 9

Which metro area has the highest percentage of people of Asian descent?
2006: SAN FRANCISCO 27 (32.9%), Seattle 11, NYC 8, San Diego 6, LA 4
2007: SAN FRANCISCO 29 (38.2%), NYC 7, LA 7, Portland 6, San Diego 4

Which metro area has the highest percentage of residents with a college degree?
2006: Boston 19, Wash. DC 13, SEATTLE 12 (10.2%), NYC 6, Portland 5
2007: Wash. DC 17, NYC 9, SEATTLE 8 (10.5%), Boston 6, Portland 5

Economic Geography:

14) The United States imports most of the oil that it consumes. In terms of total amounts, the two countries that export the most oil to the United States are **Canada** and **Mexico.**
2006: Saudi Arabia 34, Iraq 27, Iran 18, Kuwait 10… MEXICO 2 (2.4%), CANADA 1(1.2%)
2007: Saudi Arabia 40, Iran 26, Iraq 21, Kuwait 5… MEXICO 3 (3.9%), CANADA 1 (1.3%)

15) The two most-grown agricultural crops in the United States are **corn** and **soybeans**. The Midwestern state that leads production in both crops is **Iowa**.
2006 crops: CORN 53 (64.6%), Wheat 38, Potatoes 10, Tobacco 4, SOYBEANS 2 (2.4%)
2007 crops: CORN 58 (76.3%), Wheat 47, Potatoes 12, Tobacco 3, SOYBEANS 3 (3.9%)

2006 state: No Answer 27, Nebraska 14, IOWA 9 (11.0%), Kansas 8, Idaho 5
2007 state: Nebraska 21, No Answer 17, Kansas 13, Idaho 6, IOWA 3 (3.9%)

Political Geography:

16) The 2000 presidential election came down to the state of **Florida**, while the 2004 presidential election came down to the state of **Ohio.**
2006 answer for 2000 elections: FLORIDA 53 (64.6%), No Answer 18, California 7
2007 answer for 2000 elections: FLORIDA 47 (61.8%), No Answer 16, California 4

2006 answer for 2004 elections: No Answer 24, OHIO 22 (26.8%), Florida 13, Texas 5
2007 answer for 2000 elections: No Answer 22, OHIO 16 (21.1%), Florida 13, Iowa 6

QUESTIONS ABOUT THE WORLD

City profiles:

17) This city is the larges tin Africa and the 17th largest city in the world. It was originally the site of a Roman fort, located here in about 150 AD. A town consisting of mostly Coptic Christians grew around the fort, and even today this city has a large Christian population. The growing city was conquered by the Shi'a Muslim Fatimid Dynasty in 972, and the large Al-Azhar mosque built here became one of the world's leading centers of education. From 1200 to 1450, this city may have been the most important intellectual and artistic center in the world. After Napoleon temporarily conquered this city in 1798, the era of Westernization began, and many British, French, and American interests can still be seen here. Despite a desert climate, a major river provides water for irrigation and personal use, and today the city is a regional leader in business and tourism.

Cairo, Egypt
2006: 16, 19.5%
2007: 21, 27.6%

18) In terms of city (not metropolitan) population, this West Asian city on the Arabian Sea is the second largest city in the world. While the actual city's history is relatively recent (only about 200 years), the surrounding area is known to be the site of one of the first agricultural civilizations in the world. The growth of this city is truly staggering: the population has grown from 400,000 in 1947 (the year it was designated capital of its country, although today it is no longer the capital) to nearly 15 million today. Currently, there is a significant divide between people who are pro-Western (which includes the national government) and conservative Islamic followers.

Karachi, Pakistan
2006: 0, 0.0%
2007: 2, 2.6%

19) This European city is the second-largest metropolitan area in its country, surpassed only by the capital (a city that was divided into two from 1945 to 1990). In addition, it is the wealthiest city in Europe, and home to numerous financial and service industries. Located on the Main River, this city has long been a center of transport and trade. The city's wealth is all the more remarkable considering it was bombed heavily by the Allies during World War II. Famous natives included comedian Martin Lawrence (born on a nearby US military base), Olympic swimmer Michael Gross, Anne Frank, and Dr. Ruth.

Frankfurt, Germany
2006: 3, 3.7%
2007: 5, 6.6%

Cultural Geography:

20) Although this European country has only a small (but rapidly growing) population that practices Islam, several hundred years ago the religion could be seen and practiced in much of the country. This country, which still has extensive architectural and cultural Islamic influences, is **Spain (or Portugal).**
2006: No Answer 58, SPAIN 9 (11.0%), Turkey 5
2007: No Answer 41, SPAIN 8 (10.5%), Turkey 6, PORTUGAL 3 (3.9%)

Population Geography:

21) As of 2005, the country with the world's largest population is **China**. However, in the next 30 or so years, that country will be replaced by **India** as the world's most populous.
2006 answer for today: CHINA 48 (57.8%), No Answer 20, India 7, United States 4
2006 answer for today: CHINA 47 (61.8%), No Answer 16, India 6, Japan 4

2006 answer for in 30 years: No Answer 31, INDIA 25 (30.5%), United States 11, China 9
2007 answer for in 30 years: INDIA 30 (39.5%), No Answer 23, China 9, United States 5

22) In terms of population, the world's largest metropolitan area (with 35,000,000 people, almost double the second largest metro area) is **Tokyo.**
2006: No Answer 36, TOKYO 11 (13.4%), Mexico City 6, Beijing 5, NYC 5
2007: No Answer 24, Beijing 13, TOKYO 9 (11.8%), Mexico City 8, NYC 6

Political Geography:

23) There are fifteen independent countries, all former British colonies, that still separately recognize Queen Elizabeth II of Britain as their monarch – the political term for these countries are the Commonwealth of Realms. Many of these countries are small island nations (for example, Jamaica and Grenada in the Caribbean), however there are three major countries represented in the Commonwealth of Realms. These countries are **Canada**, **Australia**, and **New Zealand**.
2006: AUSTRALIA 18 (22.0%), CANADA 15 (18.3%), England 11, NEW ZEALAND 10 (12.2%)
2007: AUSTRALIA 21 (27.6%), CANADA 17 (22.4%), NEW ZEALAND 10 (13.1%), England 7

24) There are five European countries that have expressed by law the desire to stay neutral – they do not take sides in any war, nor contribute troops to international conflicts. Two of these countries, Austria and Liechtenstein, are surprising to most people, since the laws were adopted fairly recently. The other three countries have a much more well-known policy in place. These three neutral European countries are **Switzerland**, **Sweden**, and **Finland**.
2006: SWITZERLAND 30 (36.6%), SWEDEN 25 (30.5%), France 10… FINLAND 5 (6.1%)
2007: SWITZERLAND 27 (35.5%), SWEDEN 23 (30.2%), Norway 10… FINLAND 6 (7.9%)

25) In 1999, the overseas colony Hong Kong reverted back to Chinese rule. It has been under the jurisdiction of **Great Britain** since 1842. In addition, the territory of Macau also went back to Chinese rule in1999. It had been under the jurisdiction of **Portugal** since 1670. (Both answers are countries)
2006 for Hong Kong: No Answer 40, GREAT BRITAIN 26 (31.7%), China 4
2007 for Hong Kong: No Answer 36, GREAT BRITAIN 30 (39.5%), Japan 4

2006 for Macau: No Answer 49, France 8, Great Britain 4… PORTUGAL 0 (0.0%)
2007 for Macau: No Answer 45, France 10, Great Britain 4, PORTUGAL 3 (3.9%)

26) From 1945 to 1991, the United States main "enemy" was **the Soviet Union**, which had a Communist government. There are still five Communist national governments in existence today. One is not very well-known (Laos) but the other four are. They are **China**, **Cuba**, **North Korea**, and **Vietnam**.
2006 for "enemy": SOVIET UNION 51 (62.2%), No Answer 20, Germany 5, N. Korea 4
2007 for "enemy": SOVIET UNION 53 (69.7%), No Answer 10, Cuba 3, Japan 3

2006 for now: China 43 (52.4%), N. Korea 35 (42.7%), Cuba 30 (36.6%), Vietnam 21 (25.6%)
2007 for now: China 49 (64.5%), N. Korea 39 (51.3%), Cuba 32 (42.1%), Vietnam 17 (22.4%)

Economic Geography:

27) Lately, there has been much talk about alternatives to fossil fuels such as oil and coal. Many people point to one country as a model for reducing dependence on oil, as it has replaced a significant portion of its oil consumption (especially in automobiles) with ethanol. This Latin American country is **Brazil**; in this country, the main crop grown to supply ethanol is **sugarcane.**
2006 for country: No Answer 43, BRAZIL 15 (18.3%), Venezuela 7, Argentina 4
2007 for country: No Answer 33, BRAZIL 17 (22.4%), Venezuela 7, Mexico 6

2006 for crop: No Answer 45, Corn 25, SUGARCANE 4 (4.9%)
2007 for crop: Corn 33, No Answer 24, SUGARCANE 9 (11.8%)

One question about Oregon, United States, and the world:

28) The sources of electrical power (i.e. power plants) in the United States are wide and varied, and are quite different than what might be found in other parts of the world. Answer the following (hint: each answer is a different source, and none of the answers are "oil"):

The main source for electrical power in Oregon and Washington is **hydroelectric.**
2006: HYDROELECTRIC 53 (64.6%), No Answer 27, Wind 2
2007: HYDROELECTRIC 48 (63.2%), No Answer 15, Wind 10

The main source for electrical power in much of the northeastern United States, and also China, is **coal.**
2006: No Answer 43, COAL 20 (24.4%), Hydroelectric 8, Nuclear 6, Wind 4
2007: No Answer 25, COAL 22 (28.9%), Nuclear 12, Wind 9, Hydroelectric 6

The main source for electrical power in many parts of Europe, especially France, is **nuclear.**
2006: No Answer 46, Wind 21, NUCLEAR 7 (8.5%), Solar 4, Hydroelectric 3
2007: No Answer 34, Wind 17, NUCLEAR 10 (13.2%), Coal 6, Solar 5

The main source for electrical power in the island country of Iceland is **geothermal.**
2006: No Answer 51, Wind 10, Solar 7, GEOTHERMAL 7 (8.5%), Hydroelectric 3
2007: No Answer 40, Solar 12, GEOTHERMAL 8 (10.5%), Wind 5, Hydroelectric 4

Finally, a general political question (more on this later in the course):

29) The president of the United States, George W. Bush, was born and went to college in the state of:
2006: Texas 32, No Answer 29, Massachusetts 6, CONNECTICUT 4 (4.9%)
2007: Texas 26, No Answer 26, CONNECTICUT 4 (5.3%)

The senior (longest-serving) U.S. senator of Oregon is **Ron Wyden**; he is a (**Democrat** / Republican)
2006: No Answer 67, RON WYDEN-DEMOCRAT 8 (9.8%)
2007: No Answer 61, RON WYDEN-DEMOCRAT 5 (6.6%)

The junior (shortest-serving) U.S. senator of Oregon is **Gordon Smith**; he is a (Democrat / **Republican**)
2006: No Answer 72, GORDON SMITH-REPUBLICAN 3 (3.6%)
2007: No Answer 66, GORDON SMITH-REPUBLICAN 4 (5.3%)

Appendix C: SAC Committee Contribution

All Geography Subject Area Committee (SAC) members were given a questionnaire and an opportunity to provide suggestions and feedback to be incorporated into the Program Review Process. Three part-time faculty responded to the questionnaire and their comments are summarized below.

Strengths of program

1. Providing students with global knowledge and understanding diverse peoples and cultures.
2. Providing students an opportunity to learn about current world issues and world regions through their physical and cultural characteristics.

What needs improvement

1. Communication with other departments for cross-discipline courses and projects.
2. Increase the variety of Geography courses offered college-wide, to bring attention to the broad applications of geography.

Future Recommendations

1. Considerations on the placement of the Geography Department – Is Social Science the right place?
2. Place a larger emphasis on Human and World Regional Geography, increasing the number of courses offered including regional courses on Latin America, Africa, Middle East, Asia, Religions, and Race and Ethnic Relations.
3. Make Geography courses required as part of all PCC Student Diversity Training
4. Creating a GIS Certificate Program (see GIS Program Proposal for details).

Appendix D: Geographic Information Systems (GIS) Program Proposal

Background

Geographic Information Systems is a "computer-based system to aid in the collection, maintenance, storage, analysis, output and distribution of spatial data and information" (Bolstad 2005). It began within the discipline of geography, but has grown to support a large range of disciplines and professions. These disciplines include resource management, environmental science, business and marketing, urban and regional planning, infrastructure development, real estate, and engineering. Locally and nationally, the labor market for GIS practitioners is strong and growing. Students trained in GIS can fill jobs such as GIS Technician, Engineering Aide, GIS Analyst, Cartographer, and many other planning and management positions that involve GIS-related technologies.

The Portland Metropolitan area is one of the centers of GIS industry activity nationwide, and was a pioneer in the use of technology and application development. Over time, local chapters of professional regionally- and nationally-based GIS organizations have emerged, such as the Oregon chapter of URISA (Urban and Regional Information Systems Association), ASPRS (American Society of Photogrammertry and Remote Sensing), GITA (Geographic Information Technology Association), and the APA (American Planning Association). Portland is also the regional headquarters for several federal agencies, such as the US Forest Service, Bureau of Land Management, US Geological Service, US Fish and Wildlife Service, and Army Corps of Engineers, all of which adopted GIS technology at an early date. Portland's regional planning agency, METRO, relies on GIS technology to manage land use and the Portland Urban Growth Boundary (UGB). Many private and non-profit agencies also make use of GIS technology, including David Evans and Associates, CH2MHill, Ecotrust, and the Nature Conservancy. All of these organizations have actively recruited GIS specialists in recent years.

As computer-based GIS is a fairly new technology, there are relatively few well-established programs at universities and colleges in Oregon. Therefore, the hiring of employees with GIS skills often requires an extensive search, often from areas outside of Oregon. Currently, there are no GIS programs at the community college level that are run by a geography-related discipline. Central Oregon Community College, Chemeketa Community College, and Clackamas Community Colleges all offer GIS programs that are based in Computer Aided Drafting or Forestry; none of these programs require training in geography. In the Portland Metropolitan area, Portland State University is the only four-year university that offers a GIS program, and it is only offered as a graduate level certificate and undergraduate minor. As the largest post-secondary educational institution in the area, and with few options for prospective GIS students, Portland Community College is in an excellent position to offer a comprehensive and multi-disciplinary GIS program.

During the last Geography Department Program Review in 2003, a GIS program was proposed and a prospectus for the program was provided. Since then, due to a lack of funding and personnel, there are still no official programs or certificates to complement the GIS course offerings. A commitment from the administration of increased funding and staff is necessary for the success of the program. The following is a revised and updated proposal for a GIS Certificate program at Portland Community College.

Goals

The proposed GIS program has the following goals:

1. Gain skills in geographic tools and technologies to communicate geographic information, verbally and graphically, to a variety of audiences
2. Critically analyze geographic problems and questions
3. Collect, create, analyze, and document geographic information for various applications and disciplines
4. Apply geographic concepts and GIS technologies to input, store, query, and retrieve spatial and attribute data
5. Incorporate a multidisciplinary approach to learning GIS applications

Objectives

The proposed GIS Program will have the following objectives:

1. Build community partnerships for internship and employment opportunities through a GIS Program Steering Committee
2. Create multidisciplinary program with Environmental Science and Computer Science departments
3. Offer effective instruction with small classes and student cooperative work experience
4. Provide opportunities for students to gain job skills that meet changing needs of the community
5. Provide students with GIS skills to qualify for local employment opportunities
6. Prepare students to transfer to geography, planning, environmental science or other related programs at four-year Universities
7. Offer a GIS Certificate or Associates Degree that demonstrates an advanced knowledge of GIS applications and principles.

This proposed program directly addresses the 2007-2010 Rock Creek Campus goals, which are to

1. Foster community partnerships to diversify learning opportunities for our students
2. Offer responsive and effective instruction
3. Increase shared responsibility for student learning and retention
4. Establish an environment to ensure employee success
5. Develop and improve campus communication and connections
6. Provide and maintain facilities to support the changing needs of our diverse community.

Audience & Curriculum Considerations

Student demographics at the community college level requires an approach that can accommodate a range of student and community needs.

1. College freshmen: These students are typically available for daytime classes and are interested in GIS as part of a broad exposure to all social and physical sciences, business, and/or engineering.

2. Returning Students: Returning students are often seeking a career change and become interested in GIS as part of additional professional training. Students in this category may enter the program with a large range of computer skills and geographic background. Family and work obligations may require many of these students to seek courses that are offered only at night.
3. Professional Credibility: Students in this category are seeking a certificate to improve their professional skills. Since this group is usually employed and already familiar with GIS technologies, they are best served by evening classes, as well as weekend workshops and/or short duration courses that address technology upgrades and applications.

Currently, two GIS classes are consistently offered – Introduction to GIS (GEO 265) and GIS Analysis (GEO 266). This is a solid foundation for a GIS certificate program and a GIS course sequence. To make the program comprehensive and meet the requirements for a certificate, additional classes must be offered. Below is a list of potential GIS class offerings with a brief description. A GIS Steering Committee (discussed in the next section) will provide guidance for the selection of GIS certificate course offerings.

- *Cooperative Work Experience* – Students apply GIS through an internship with a local community agency using GIS
- *GIS in Natural Resources* – Applications course with a focus on using GIS in geology, conservation, environmental science, climate change, among others
- *GPS & GIS* – GPS fundamentals, integrating GPS data collection with GIS analysis
- *GIS & Cultural Applications* – Applications in history, sociology, demographics, economics, and other social sciences
- *GIS and Spatial Imagery* – Integration of remote sensing imagery and interpretation
- *Open Source GIS* – Exploration into GIS technologies that are focused on public-license software, such as uDig, gvSig, GRASS, and BASINS
- *GIS in K-12 Education* – Focus on incorporating GIS principles into K-12 curriculum
- *GIS in Water Resources* – Watershed analysis with raster data, modeling stream flow, groundwater, floodplains, and other applications
- *Geodatabase Design and Implementation* – Spatial database design and representation

Program Steering Committee

Since the GIS program should be multidisciplinary and connected to the needs of the community and local employers, the geography department should organize a body of local GIS professionals that represent a variety of agencies and businesses. This group would serve as a steering committee to review and offer suggestions on curriculum design, course offering, internships, and collaborative projects. This committee would meet regularly to build the program foundation and to stay engaged with students and faculty. A close working relationship with local employers and GIS users will help provide students with real-world applications, projects, and internship opportunities. In addition, GIS and database development projects could benefit local agencies and businesses. Additionally, committee members could be teaching adjuncts in the program, possibly offering courses or workshops specific to their work and in partnership with their organization.

Contacts with individuals at local agencies, organizations, and businesses need to be established to begin the formation of a steering committee. There has already been an interest expressed by our current GIS adjunct faculty, who is a working GIS professional. Additional recruiting will need to occur for this program to be successful.

Considerations for Implementation

One of the largest obstacles in developing a GIS certificate program is cost. Some of that cost is already included in the geography department's annual budget, as we already own the primary software, ArcGIS by the ESRI Corporation. In addition, the department has an annual subscription to Metro GIS data, computer labs with sufficient requirements for GIS processing, and a plotter for printing large format maps and outputs.

For successful implementation of a GIS certificate, additional software will need to be purchased, including remote sensing programs such as ERDAS IMAGINE or RSI ENVI. It will likely be necessary to purchase GPS units for georeferencing as well. There may be additional software or equipment necessary; these costs will be addressed further as when a more complete program outline is established.