

Information for the Climate Control Curriculum Sub-Committee Regarding Majors in Environmental Sciences and Environmental Studies

I. Purpose

In order to carry out the mission of a regional university, VSU is considering expanding its program offerings to include a Bachelor of Science (or Arts) degree with a major in Environmental Sciences or Environmental Studies. This report, prepared by the Office of Strategic Research and Analysis, contains summaries of data describing the current situation and need for this degree in Georgia and the VSU service area. Information is derived from the University System of Georgia, Georgia Department of Labor, and published literature to assist the evaluation of need, current providers, and capacity of a bachelor's degree in Environmental Sciences/Studies.

II. Definitions

Some fields are closely related to Environmental Studies and Environmental Sciences therefore the following definitions are provided for informational purposes.

- “*Environmental science* is the study of the myriad interactions between humans and the world around them, living and non-living” (Lander University, 2008). “A bachelor’s degree in environmental science offers an interdisciplinary approach to the natural sciences, with an emphasis on biology, chemistry, and geology” (Occupational Handbook, 2008).
- “The *environmental studies* major will provide students with an educational specialty grounded in the subjects and issues related to the natural environment and the relationship of the human being to the natural environment” (Eckerd College, 2008).
- “*Environmental engineers* are the technical professionals who identify and design solutions for environmental problems” (Case Western Reserve University, 2008).
- “*Environmental horticulture* is a field of study that deals with the art and science of breeding, propagating, installing and maintaining plants that are used to enhance and improve the human environment” (University of Florida, 2008).

III. Georgia Institutions Offering Environmental Studies or Similar Degrees

According to EnviroEducation.com, there are 475 institutions with programs in Environmental Science and 257 institutions with programs in Environmental Studies. Some institutions offer only minors or certificate programs in these fields. The delivery options range from traditional to online. Table 1 contains University System of Georgia (USG) institutions and other institutions in Georgia which offer related majors.

Table 1: Georgia Institutions Offering Environmentally-Related Majors

Type of Degree	Major	School/University
Associate of Applied Science in Services	Environmental Horticulture	Gainesville State College
Associate of Applied Science in Services	Environmental Horticulture	Valdosta State University
Associate of Applied Science in Services	Environmental Horticulture	Georgia Highlands College
Associate of Applied Science	Environmental Horticulture	Abraham Baldwin Agricultural College

Type of Degree	Major	School/University
Associate of Applied Science in Technology	Environmental Horticulture	Bainbridge College
Associate of Science	Environmental Science	Darton College
Bachelor of Science	Environmental Science	Georgia College & State University
Bachelor of Science	Environmental Studies	Savannah State University
Bachelor of Science	Environmental Geosciences	Valdosta State University
Bachelor of Science	Environmental Science and Studies	Spelman College
Bachelor of Science	Earth and Environmental Science	Mercer University
Bachelor of Arts	Earth and Environmental Science	Mercer University
Bachelor of Science	Environmental Studies	Emory University
Bachelor of Science	Environmental Science	Wesleyan College
Bachelor of Science	Environmental Science	Berry College
Bachelor of Science	Biology with Environmental Concentration	Covenant College
Bachelor of Science in Geology	Earth and Environmental Science Education	Georgia Southwestern State University
Bachelor of Science in Environmental Engineering	Stand-alone Degree	Georgia Institute of Technology
Bachelor of Science in Environmental Engineering	Stand-alone Degree	University of Georgia
Bachelor of Science in Environmental Health	Stand-alone Degree	University of Georgia
Bachelor of Science in Environmental Science	Stand-alone Degree	University of West Georgia
Bachelor of Science in Environmental Sciences	Environmental Economics and Management	University of Georgia
Bachelor of Science in Environmental Sciences	Environmental Chemistry	University of Georgia
Bachelor of Science in Environmental Sciences	Environmental Resource Science	University of Georgia
Bachelor of Science in Environmental Studies	Stand-alone Degree	University of West Georgia
Certificate of Less than One Year	Environmental Science	Gainesville State College
Certificate of Less than One Year	Environmental Studies	Gainesville State College
Certificate of Less than One Year	Environmental Ethics	University of Georgia
Doctor of Philosophy	Environmental Engineering	Georgia Institute of Technology
Master of Environmental Planning and Design	Stand-alone Degree	University of Georgia
Master of Environmental Management	Stand-alone Degree	Oglethorpe University (offered jointly with Duke University)
Master of Public Health	Environmental Health	Fort Valley State University
Master of Science	Environmental Science	Columbus State University
Master of Science	Environmental Engineering	Georgia Institute of Technology
Master of Science	Environmental Engineering	University of Georgia
Master of Science	Environmental Health	University of Georgia

Source: USG Degrees and Majors (2009) <https://app.usg.edu/portal/page/portal/DMA> and institution websites.

In addition to institutions in Georgia listed in Table 1, neighboring institutions award these degrees. Florida State University (Tallahassee), 80 miles from Valdosta, offers the undergraduate major in Environmental Studies and graduate major in Aquatic Environmental Science. Florida Agricultural and Mechanical University (Tallahassee), 81 miles from Valdosta, offers a Bachelor of Science in Environmental Sciences and graduate programs in the same field. The University of Florida (Gainesville), 114 miles from Valdosta, offers a Bachelor of Science in Environmental Science and a Bachelor of Arts in Environmental Science. The University of North Florida (Jacksonville), 124 miles from Valdosta, offers a Bachelor of Science in Biology in Applied Coastal Environmental Science.

IV. USG Enrollment Trends

Forty percent (40%) of USG institutions offer some form of an environmentally-focused major (as listed in Table 1). The most recent program enrollment available, from Fall 2004, places System enrollment in these majors at 500, as displayed in Table 2. The enrollment in these programs over a five year period grew at an average of 13% per year, so one could forecast current enrollment to be approximately 816 students throughout the System. The USG headcount in Fall 2008 was 282,978; students in Environmental Science/Studies programs represented 0.28% of total System enrollment.

Table 2: USG Enrollment in Environmentally-Related Degrees, 2000-2004

USG Program	Enrollment					Average
	Fall 2000	Fall 2001	Fall 2002	Fall 2003	Fall 2004	
Environmental Economics (UG)	4	4	11	11	9	8
Environmental Engineering (GR)	106	101	91	103	98	100
Environmental Geography (UG)	51	49	37	23	35	39
Environmental Health (UG)	89	75	67	79	79	78
Environmental Health (GR)	0	9	30	29	32	20
Environmental Horticulture (UG)	19	74	117	119	127	91
Environmental Science (UG)	1	13	17	63	80	35
Environmental Science (GR)	20	18	15	15	11	16
Environmental Studies (UG)	17	19	25	30	29	24
Total	307	362	410	472	500	411

Source: USG Five-Year Enrollment Trends 2000-2004.

V. USG Degrees Conferred by Program and Year

The fourteen USG institutions offering some form of an environmentally-focused major have awarded 252 undergraduate and graduate degrees during the past three fiscal years for an average of 84 degrees per year.

Table 3: USG Degrees Conferred by Level, 2006-2008

Program (CIP)	FY 2006		FY 2007		FY 2008		Total
	UG	GR	UG	GR	UG	GR	
Environmental Health (51.2202)	21	9	19	5	12	9	75
Environmental Health Engineering (14.1401)	0	27	0	31	1	23	82
Environmental Science (03.0104)	14	3	18	2	23	0	60
Environmental Studies (03.1033)	10	0	8	0	17	0	35
Total	45	39	45	38	53	32	252

Source: USG Degrees Conferred Report, FY 2006-2008.

VI. Potential Employers/Careers/Occupations

Environmental Studies graduates could obtain scientific and policy-oriented positions in the following fields:

Air Quality Engineer	Environmental Protection Specialist	Production
Biostatistician	Fund Raiser	Public Health Educator
Botanical/Theme Park Gardens	Government Service	Public Health Inspector
Chemist	Grass Roots Coordinator	Publisher
Communications	Grower Services	Research Assistant
Community Relations Manager	Hazardous Materials Specialist	Risk Manager
Contract Administrator	Hydrogeologist	Safety Engineer
Ecologist	Industrial Hygienist	Science Librarian
Environmental Affairs Manager	Lobbyist	Soil Scientist
Environmental Educator	Natural Resources Manager	Teaching
Environmental Engineer	Naturalist	Technical Sales Representative
Environmental Impact Analyst	Photojournalist	Technical Writer
Environmental Lawyer	Physician	Toxicologist
Environmental Manager	Planner	Water Quality Specialist

VII. Occupational Outlook

An extensive explanation about environmental scientists and hydrologists, including employment and earnings, is featured in the *Occupational Outlook Handbook 2008-09* at <http://www.bls.gov/oco/ocos050.htm>. This four-page document is attached to this document and includes information on the nature of work, training, employment, job outlook, projections, and earnings for the listed positions.

VIII. National Employment and Outlook (2006 to 2016)

The *Occupational Outlook Handbook* (2008) stated “Environmental scientists and hydrologists often work in offices, laboratories, and field sites....About 35 percent of environmental scientists were employed in state and local governments; 21 percent in management, scientific, and technical consulting services; 15 percent in architectural, engineering and related services; and 8 percent in the Federal Government. About 2 percent were self-employed...Employment of environmental scientists is expected to increase by 25 percent between 2006 and 2016, much faster than the average for all occupations [shown in Table 4]. Median annual earnings of environmental scientists were \$56,100 in May 2006. The middle 50 percent earned between \$42,840 and \$74,480. The lowest 10 percent earned less than \$34,590, and the highest 10 percent earned more than \$94,670” (p. 2-3).

Table 4: Projections Data from the National Employment Matrix, 2006 to 2016

Occupational Title	Employment, 2006	Projected Employment, 2016	Change, 2006-16		Detailed Statistics
			Number	Percent	
Environmental scientists and hydrologists	92,000	114,000	23,000	25	---
Environmental scientists and specialists, including health	83,000	104,000	21,000	25	PDF
Hydrologists	8,300	10,000	2,000	24	PDF

Source: Occupational Outlook Handbook 2008-09, <http://www.bls.gov/oco/ocos050.htm>

IX. Georgia Labor Demand and Wages

The Georgia Department of Labor produces a variety of industry data for Georgia, both statewide and regional. In *Georgia Workforce Trends: An Analysis of Long-term Employment Projections to 2014*,¹ the Department of Labor forecasts the Professional, Scientific, and Technical Services industry subsector to add 53,420 new jobs; 270 new jobs for environmental engineering technicians alone. Although there will be new jobs created and some demand, environmental scientist positions do not appear in the list of needed short-term employment projections, fastest growing occupations, Georgia's Hot Careers list, or fastest growing industries. However, national predictions for growth and need offer some offset to Georgia's predictions.

Current wages for occupations in which environmental science majors could work have been extracted from the *2008 Georgia Wage Survey*, published by the Department of Labor, and displayed in Table 5. Wages for the South Georgia area are typically less than the Georgia average.

Table 5: Georgia Wage Survey (November 2008)

Life, Physical, and Social Science Occupations	Entry Wage	Average Wage	Median Wage	Middle Range	
				25 th %	75 th %
Atmospheric and Space Scientists	\$22.77	\$35.88	\$32.89	\$24.34	\$44.34
Biological Scientists, All Other	\$24.00	\$32.99	\$32.34	\$27.01	\$38.45
Chemists	\$22.07	\$34.51	\$33.68	\$25.56	\$42.66
Conservation Scientists	\$15.04	\$28.91	\$29.84	\$17.45	\$37.72
Environmental Engineering Technicians	\$14.98	\$17.49	\$16.70	\$15.38	\$18.25
Environmental Engineers	\$23.00	\$33.71	\$31.56	\$25.64	\$42.99
Environmental Science and Protection Technicians, including Health	\$11.67	\$17.13	\$16.16	\$13.52	\$19.91
Environmental Scientists and Specialists, including Health	\$19.20	\$28.83	\$26.91	\$20.96	\$35.03
Food Scientists and Technologists	\$18.35	\$28.01	\$27.58	\$20.68	\$32.02
Geoscientists, except Hydrologists and Geographers	\$19.76	\$28.42	\$26.68	\$21.33	\$32.56
Hydrologists	\$33.07	\$40.44	\$40.22	\$35.35	\$46.65
Life, Physical, and Social Science Technicians, All Other	\$10.97	\$18.45	\$15.52	\$12.58	\$23.47
Life Scientists, All Other	\$24.78	\$53.95	\$53.48	\$33.80	n/a
Market Research Analysts	\$18.72	\$30.57	\$28.08	\$21.07	\$37.86

¹ <http://explorer.dol.state.ga.us/mis/Current/gaworkforcecurrent.pdf>

Life, Physical, and Social Science	Entry	Average	Median	Middle Range	
Materials Scientists	\$31.92	\$39.37	\$40.71	\$34.59	\$46.04
Physical Scientists, All Other	\$31.43	\$45.42	\$44.48	\$37.78	\$50.00
Soil and Plant Scientists	\$17.86	\$32.06	\$33.56	\$19.81	\$40.54
Survey Researchers	\$8.55	\$15.54	\$11.58	\$9.08	\$16.23

Source: Georgia Department of Labor, <http://explorer.dol.state.ga.us/mis/Current/wagesurveycurrent.pdf>

X. Summary

Environmental Science is an important and emerging industry subsector where most graduates will find employment with local, state, and federal government entities. Several private institutions in Georgia and institutions within the USG offer programs in Environmental Science/Studies, but enrollment in these types of programs is not overwhelming. Because Valdosta State University currently offers the minor in Environmental Studies, it may be conceptually and programmatically less burdensome and less expensive to upgrade this minor to a major. There is predicted demand for environmental scientists nationally but to a lesser extent in Georgia.

XI. Additional Resources

- Careers in Environmental Sciences and Related Occupations
<http://careerservices.rutgers.edu/Menvironment.html>
- Environmental Health
http://www.who.int/topics/environmental_health/en/
- Environmental Science Major (career and degree information)
<http://www.worldwidelearn.com/online-education-guide/science/environmental-science-major.htm>
- Environmental Studies Enrollment Soars
<http://greeninc.blogs.nytimes.com/2009/02/24/environmental-studies-enrollments-soar/>
- What is Environmental Engineering?
http://ecivwww.cwru.edu/civil/overview_environ.html
- What is Environmental Horticulture?
<http://hort.ifas.ufl.edu/aboutus/whatis.htm>
- What is Environmental Science?
<http://webs.lander.edu/dpardieck/Whatisenvironmentalscience.html>
- What is Environmental Studies?
<http://www.eckerd.edu/academics/environmentalstudies/>
- USG Degrees Conferred Report, FY2008
http://www.usg.edu/research/students/degrees/07-08/deg_conferred08.pdf