COLUMBUS STATE UNIVERSITY
Department of Chemistry and Geology

Geology Degree Program
Self-study

Introduction
Description of the Program

Columbus State University's Undergraduate Geology Degree Program was begun in 1974 and since then has graduated over 85 geology majors (see list in Appendix A), many of whom are employed in geology-related fields. Several have achieved graduate degrees up to the doctorial level. The degree program has changed a number of times in the years since 1974, but several principal goals have remained the same.

First, the Geology Degree Program stresses a broad-based background in geology. The basic core of courses required for a geology degree reflects the major geoscience disciplines: Mineralogy, Igneous and Metamorphic Petrology, Sedimentary Geology, Invertebrate Paleontology, Structural Geology, Field Methods, Hydrology, and Environmental Geology.

Second, the Geology Degree Program features sufficient flexibility to allow the individual student to craft a program that suits his or her own interests and personal career goals. Geology program electives include: Stratigraphy and Basin Analysis, Geochemistry, Oceanography, Physical Anthropology, Vertebrate Paleontology, and Geomorphology. In addition, there are "special topics" courses, which involve more detailed analysis of specific subjects and which allow instructors to offer one-time-only courses to interested students. There are also senior seminar courses that give students the chance to conduct primary geological research, working with individual faculty members.

Third, the program emphasizes the ability of the student to function outdoors in the field. Necessary field skills include but are not limited to: 1) bring able to read and understand topographic and geological maps; 2) being able to make field observations relevant to a particular geological problem; 3) being able to display field observations on a map; and 4) being able to interpret field data as they relate to the geological problem under study. A recent addition to field-related skills includes the ability to us Geographic Information Systems (GIS) and Global Positioning Satellite (GPS) equipment and software.

Fourth, the degree program stresses the importance of interdisciplinary learning. Geology itself is an eclectic science and CSU's geology instructors interact with faculty from other disciplines to foster courses that emphasize interaction with other disciplines. Such studies include paleoanthropology and archaeology (both with faculty in Sociology), analysis of biological and geological environments in the Bahamas (with faculty in Biology), the role of geology in strategy and tactics of the American Civil War (with faculty from History), and the influence of bedrock geology and volcanism on tropical ecosystems in Panama (with Biology faculty).

Finally, the geological program offers a large number of courses at the introductory level for students from others majors. While this is not exactly a function of the baccalaureate degree program, many of our courses are taken by students from other parts of campus. This constitutes a significant service to the overall population of Columbus State University. Program courses taken by non-majors include: Physical Geology, Historical Geology, Mineralogy, Sedimentary Geology, The Fossil Record, Vertebrate Paleontology, Geochemistry; Physical Anthropology, Oceanography, Hydrology, Environmental Geology, and Geomorphology.

An important example of this cross-pollination between Geology and other disciplines around campus is the significance of our courses in the College of Science's new Environmental Master of Science Program. Two of the six required core of Environmental Science courses are from the Geology Degree Program (Hydrology; Environmental Geology); in addition, Environmental Science program electives include Geochemistry, Land Use

and Waste Management, and Vertebrate Paleontology. Individual faculty members from the Geology Degree Program serve as thesis advisors for a number of Environmental Science Masters candidates.

1. Mission

The Program

1. Mission

The mission of the baccalaureate degree program in geology includes the following three objectives:

1. to prepare graduates for entry into the practice of professional geology; or

2. to prepare graduates for further training in geologically related fields; or

3. to prepare graduates for further training in geologic education

Relevant to objective 1, the Geology Degree Program provides the curricular requirements for registration by the Georgia Board of Registration for Professional Geologists and a number of our graduates are working as geologists in Georgia and Alabama, including several who are Registered Geologists.

Relevant to objective 2, the Geology Degree Program includes instruction in a wide range of geological and paleontological disciplines. Graduates are prepared for further studies in the geological sciences as well as in science education, environmental sciences, natural-resource evaluation and development, and regional planning.

In order to achieve these objectives, graduates of the Geology Degree Program are expected to be proficient in a number of areas of geoscience. These expectations and the means by which they are evaluated are as follows:

1. Students are expected to be able to demonstrate a working knowledge of the major fields of geology, particularly mineralogy, petrology, paleontology, sedimentary geology, structural geology, environmental geology, hydrology, and geomorphology. Evaluation is by 1) tests in individual courses; 2) successfully passing the "Exit" exam; and 3) feedback from graduates on their performance in professional employment or graduate school.

2. Students are expected to be able to communicate geological data, concepts, and interpretations to others. Evaluation is by: 1) required, written reports and reviews in individual courses; 2) oral presentations in classrooms; 3) oral presentations on senior thesis studies, given to the entire department; and 4) oral and poster presentations at professional meetings (e.g., Southeastern Section, Geological Society of America).

3. Students are expected to be able to collect, analyze and interpret geological data in the field, applying both traditional methods such as field mapping as well as modern technologies such as data bases, the GPS system, and GIS software (e.g., ArcView). Evaluation is by: 1) successful completion of the Field Methods course; and 2) field work in other Geology program courses.

4. Students are expected to be able to demonstrate ability to assemble diverse geological data into environmental, economic, and regional geological interpretations. Evaluation is by: 1) performance in upper-level program courses such as: Stratigraphy and Basin Analysis; Structural Geology; Geomorphology; and Environmental Geology; and 2) senior thesis research.

5. Students are expected to be able to perform the tasks required for entry-level geologic employment or acceptance to graduate school. Evaluation is by: 1) questionnaires sent to employers of recent program graduates; 2) feed-back from graduates.

The mission of the Geology Degree Program fits well into this overall University mission.

Relationship of Geology Degree Program Mission to the Overall Mission of Columbus State University

Columbus State University's general mission is to "serve the educational needs of a diverse region by providing a mixture of liberal arts and professional programs leading to certificate, associate, baccalaureate, and

graduate degrees. … The University will maintain a strong core of general education as the foundation of all its academic programs. … The University will serve the educational, cultural, and economic needs of its region by providing credit and non-credit outreach programs. (p. 6, CSU 2001 – 2002 Catalog)."

The mission of the Geology Degree Program fits well into this overall University mission. Program courses are intended not only to educate students in the University's service area to become professional geoscientists but also to provide local business, industrial, and consulting firms with well-trained employees. On campus, the Geology Degree Program offers one of the most popular Science Core courses and so elevates the geological knowledge of CSU's student body. The Geology Program has done much over many years to provide a variety of programs to improve knowledge of geology in our region; these include talks and presentations to area schools, museums, civic organizations, and clubs. The Geology Program has been able to give advice on area geology to local businesses and educators.

In addition to its general mission, Columbus State University promotes the following as "centers of excellence": The fine and performing arts; science, mathematics, and technology education; regional economic and community development; and international education and exchange.

The Geology Degree Program is a component of three of these centers of excellence. First, a number of our graduates are science teachers in the Chattahoochee Valley area and many others teachers have taken Geology Program courses. In addition, Geology faculty members work with faculty from the College of Education to improve the quality of science education here at CSU.

Second, the Geology Degree Program has had considerable impact on economic development in the Columbus region. Several local engineering and geological consulting firms employ our graduates. These graduates work locally on such wide-ranging endeavors as: protecting, and when necessary, rebuilding elements of the local infrastructure (for example, one of our graduates has been involved in repair of sinkholes in some city roadways); evaluating the potential of area sites for industrial or commercial development projects (for example, evaluating the suitability of some property on Pine Mountain for development of a bottled-water production facility); recommending strategies for cleaning up properties damaged by toxic or hazardous chemicals (one of our graduates had consulted on remediation of gasoline pollution of groundwater in south Columbus); and providing expert assistance on a variety of individual projects.

Finally, faculty of the Geology Degree Program are closely involved with international education. Geology is a global science and geological processes are understood as being both universal and uniformitarian. Thus, broad knowledge of the Earth enhances the ability of an instructor to understand and instruct aspects of both physical and historical geology. One of our faculty members (Dr. Schwimmer) has made a number of trips to Canada, Mexico, Argentina, and France in order to evaluate and collect vertebrate fossils both in the field and in museums. Dr. Hanley has become involved in several overseas projects, particularly a study of the geological structure and volcanism in a region of Panama. Dr. Frazier has traveled with several CSU biologists to Andros Island in the Bahamas in order to teach a course in the ecology and geology of the Bahamas.

How the Geology Degree Program Meeting the Needs of Students

Since its formation in 1974, the Geology Degree Program has undergone a number of curricular changes, both additions and deletions of specific courses as well changes in degree requirements. These changes were undertaken in order to suit the changing role of Geology in society and the changing nature of employment in the geosciences. Originally, the Degree Program focused mainly on traditional geological education. Over the years, the focus has gradually shifted to an emphasis on environmental geology. This shift may be seen in the development of courses such as Environmental Geology; Land Use and Waste Management; and Hydrology. In addition, the focus of individual courses has shifted to more environmental topics. For example, the Geochemistry course used to stress both high-pressure, high-temperature processes (magmatism, metamorphism, etc.) and low-temperature processes; currently, Geochemistry enrolls a number of students from the Environmental Studies Masters Program and the emphasis has shifted mainly to low-temperature, Earth-surface processes and the chemistry of aqueous solutions.

Another aspect of the Geology Degree Program's attempt to meet the needs of the students is the outside speakers program. Professional geologists from other institutions are brought to campus to give talks on their areas of expertise as well at to recruit students for their graduate programs.

2. Teaching

2. Teaching

As part of their annual review faculty describe their accomplishments in terms of teaching, scholarship and service. Many faculty make student class evaluations part of this package. The chair writes an evaluation of what the faculty member provides. This document is the basis for the annual evaluation interview. During the annual interview, the positives and negatives that show up in this document and from work-of-mouth are discussed. Salary increments are not discussed at this time. Near the end of the Semester, the Chair is told how much money is available to divide among the faculty. The Chair tries to apportion raises according to the earlier evaluation of the faculty member's performance. A formula does not exist at this time that separates raises according to the three main categories of performance. The previous chair used such a formula in the past and the present chair has been asking other Chairs about instituting such a formula for the 2001-2002 academic year.

Advising in not actively assessed and rewarded at the present. Part of this is because the Chair does most of the hold-clearing and tricky registration situations. The faculty discuss both formally and informally courses that students need to be taking at any given semester. Faculty also spend time informally with students discussing careers, and other more trivial subjects.

Interaction with students outside the classroom means several things in Geology. First, it means instruction in the field. This takes place in a far less structured and formal setting than in the classroom. Second, it means collaborating with faculty on projects that may or may not be reflected in course work. Third, it means socializing with faculty outside the classroom. Over the last three years, students have accompanied faculty on field trips, off campus field experiences and to regional meetings of the Southeastern Section of the Geological Society of America. These are summarized in the following table.

Student	Faculty member	Event	Reason
Marta Clepper	Dr. Hanley	SEGSA, Charleston, SC	Poster session coauthored with Dr. Frazier
Pat Baird	Dr. Hanley	SEGSA, Athens, GA	Poster session coauthored with Dr. Hanley
Pat Baird	Dr. Hanley	SEGSA, Athens, GA	Post meeting field trip in the Blue Ridge led by Bob Hatcher and Garrihan.
Paleontology field trip	Dr. Schwimmer	Course Fieldtrip to NW Georgia Fall, 2000	class
Paleontology field trip	Dr. Schwimmer	Course Fieldtrip to NW Georgia Fall, 1999	class
Paleontology field trip	Dr. Schwimmer	Hannahatchie Creek vertebrate site, Spring 2001	class
Mineralogy Fieldtrip (Carr, Hall)	Dr. Hanley	Visit Blue Circle quarry, Fall, 2000.	class
Mineralogy Fieldtrip (Johnson, Wheat, Bingham, Knight)	Dr. Hanley	Visit Florida Rock Industries quarry, Fall, 2001.	class
Petrology Field trip	Dr. Hanley	Spring 2001.	class
Structural Geology (Baird, Commander, Clepper)	Dr. Hanley	1999 Martin Marietta quarry, Junction City, GA	class
Connie Harris	Dr. Frazier	199? Eutaw Formation on Fort Benning	Field work for Senior research project
Marta Clepper	Dr. Frazier	2000 Tuscaloosa Formation localities in Georgia and Alabama	Field work for Senior research project
Tracy Hall	Dr. Schwimmer	2001 Hannahatchee Cr. Vertebrate locality.	Field work for Senior research project

A recent survey of graduates indicates that these experiences were beneficial and should be increased in the future.

Though tutoring is not available for Geology major courses, faculty are very accessible to students when they have problems with course material. One faculty member will in some cases help students with material in a colleague's course.

For the last several years, the Department of Chemistry and Geology has helped conduct Science Olympiad at CSU. Part of this activity has been a fossil identification exercise (dropped by the State in 2001) and a map reading exercise. Dr. Schwimmer and Dr. Hanley produced and staged these events for a number of years. In the Spring of 2001, Ms. Diane Carr, a BS Ed. in Geology student, staged the map-reading event based on Dr. Hanley's preparation. Ms. Janet Dockery, B.S. Geology, an employee of Vulcan Performance Chemicals and its predecessor, Callaway Chemicals, has helped organize and participated in Science Olympiad and it predecessor, Chemistry Day, for more than a decade.

One of our Geology students, who graduated with a general studies degree with a concentration in environmental studies, worked with the Olympic Committee on environmental impact issues.

This year, Fall of 2001, Dr. Frazier is administering a contract with the Georgia Department of Natural Resources involving technicalities related to the Flint River Basin water auction program. Students are observing flow in streams on properties using well water to irrigate crops. They are noting well and stream locations on orthophotoquad maps, locating their positions with GPS and using ArcView loaded on laptop computers to update data files. This is giving some of our students an introduction to the field of Environmental Geology, as well as experience with state of the art software and GPS hardware. It also involves communicating with the public.

3. Curriculum

3. Curriculum

Some of the following topics involving curriculum are illustrated by our Major Field Assessment matrix (MFAM). MFAM for the last few years are in Appendix B. Because most of the curriculum points described below involve work done in the Columbus and other nearby areas, our students develop a deep understanding of the local Geology and, along with the faculty, become experts in the Geology of this area.

What is the relationship between the program's curriculum and its outcomes?

The relationship between the goals of our BS in Geology and the courses we teach to attain these goals are shown in the middle of the B. S. in Geology Major Field Assessment matrix. These courses are, in general, the standard courses of a B.S. in Geology at most United States colleges and universities. For the last several years we have administered written and oral tests to our graduating seniors to see if they are graduating with the skills and knowledge we hope to impart. The results of these tests and curriculum improvements they have engendered are incorporated in the last two columns of the MFAM. For instance, we have decided to incorporate more working with geologic maps into Igneous and Metamorphic Geology and in Structural and Field Methods to overcome a weakness we saw in one of the tests in interpreting geologic maps.

We have also chosen to ask local industry what they need in BS Geology graduates, and we have asked recent graduates about their experiences in industry and in graduate school. Responses to these questions are discussed below.

How are technological skills incorporated into the program of study?

There are many kinds of technological skills needed now in Geology. One is the kind of skill developed in laboratory and field experiences in Geology and other science classes. These range from techniques and instruments long used in Geology to modern field and laboratory techniques using modern instruments. The other is the kind of skill related to the rise in importance of computers in accessing information from electronic sources, in reducing data that are gathered in the field and laboratory, and in presenting information effectively to others. The discussion that follows mentions some of the ways in which

Most of our courses have associated labs in which students handle the material and tools that dominate much of practical Geology. Labs in Mineralogy and Igneous and Metamorphic Geology involve mineral and rock samples. Students make thin sections to investigate the minerals and rocks and learn the techniques of thin section petrography. Mineralogy students use a textbook that includes a CD Rom as a resource.

Sedimentary Geology labs involve detailed sedimentary rock identification as well as determining grain size distributions and characterization of grain shapes through sieving and measurements. Students now use EXCEL to keep track of this data, tabulate it and make graphs for analysis and presentation.

Our fossil collection has been carefully maintained and expanded over the years and our students in Paleontology classes use these collections constantly during their labs. They are introduced to fossil preparation, preservation and curating in an active Paleontogical lab. Students in Structural Geology use standard techniques for visualizing structures in 3-dimensions (projections, cross sections, and the stereonet). Students are also introduced to downloading and using structural geology software. They also use a CD Rom that is independent of the text but an excellent teaching resource.

In Geomorphology, students are introduced to on-line aerial photograph and topographic map resources as well as images available on CD.

Hydrology students use topographic maps, on-line stream flow data, and EXCEL to handle data. This Spring, newly acquired software, MODFLOW, will be introduced in exercises related to groundwater flow. In a contract project now underway, Geology students are learning to use GPS, orthophotoquads and ARCVIEW to ground-truth intermittent streams in the Flint River Basin.

How is the program relevant to student needs?

Twenty-five years ago Geology was very much aligned with the petroleum and mining industries. Those fields have been joined by the environmental industry. It is the latter in which most of our graduates have gained employment. Our developing the courses in Hydrology, Environmental Geology, and our growing association with the Environmental Sciences program reflect this shift in emphasis and represents realignment of our curriculum to fit the needs of our majors.

Conversations with people in the environmental industry indicate a need for graduates with the geological skills we develop in our students. Environmental industry people often need to read geologic as well as topographic maps. They must be able to understand the significance of various rock names and recognize them in the field. They must have an appreciation for processes at work on the surface of the Earth over both short time spans as well as time spans approaching Geologic time. They must have an understanding of the subsurface environment of the Earth. It is the Geologist who best blends the scientific knowledge of the Chemist and the Physicist with an understanding of surface and subsurface processes in the environmental industry.

Both our knowledge of the shifting nature of Geology and the responses to surveys have prompted these modifications.

How are students challenged to think across disciplines?

Geology as a discipline draws from all of the other sciences. Because of this, students majoring in Geology are required to take the introductory sequences in both Chemistry and Physics. Aspects of Physics are used in Physical Geology as well as extensively in Structural Geology. Mineralogy, Igneous and Metamorphic Geology and Sedimentary Geology draw heavily on Chemistry and Mathematics. Physical Anthropology, Human Origins, Introduction to Paleontology and Vertebrate Paleontology all draw heavily on and support Biology and Sociology.

What is the frequency of course offerings in the program?

The table below shows the various courses in our Geology curriculum. Some of these are cross-listed Undergraduate/Graduate or with more than one department, reflecting the importance of Geology to a broad set of disciplines. This point is elaborated on in the next section. The disciplines most affected by this cross listing are Education, Environmental Science and Anthropology/Archeology. Note the large number of sections devoted to instruction in the core.

	Number of sections in each year			
Course	1998-1999	1999-2000	2000-2001	Su/Fall, 2001
Physical Geology *	6	8	8	6
Historical Geology *	2	2	2	1
The Fossil Record *				1
Human Origins *		1	1	1
Mineralogy	1		1	1
Igneous and Metamorphic Processes	1		1	
Environmental Geology	1 U/G	1 U/G	1 U/G	1 U/G
Invertebrate Paleontology	1	1	1	
Vertebrate Paleontology	1 U/G	1		
Physical Anthropology	1 U/G	1 U/G	1 U/G	
Sedimentary Geology	1	1	1	1
Stratigraphy and Basin Analysis	1			
Structural Geology		1		1

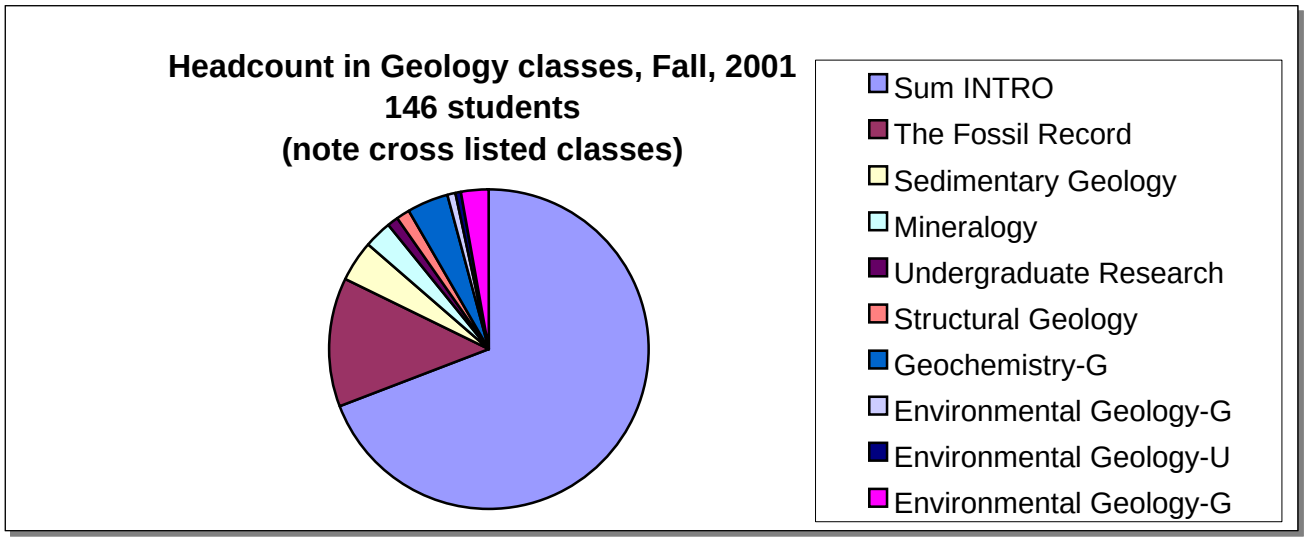
	Number of sections in each year			
Course	1998-1999	1999-2000	2000-2001	Su/Fall, 2001
Oceanography		1 U/G	1	
Field Methods	1			
Geomorphology		1 U/G		
Geochemistry	1 U/G			1
Hydrology	1 U/G	1 U/G	1 U/G	
Land Use and Waste Management		1		
Senior Seminar				2
totals	19	21	19	15
* approved for the core				

As the above table indicates, most of these courses are on a one to two year rotation.

What role does the geology program play in general education and in serving other programs?

Through the core, through elective courses, and through graduate courses, the Geology program contributes significantly to the breadth of courses available to general education and to other programs. Pie charts included in the text below and in the Appendix illustrate this contribution. A fuller description of the contribution of Geology courses to the core, and to other programs, both undergraduate and graduate, are also tabulated below.

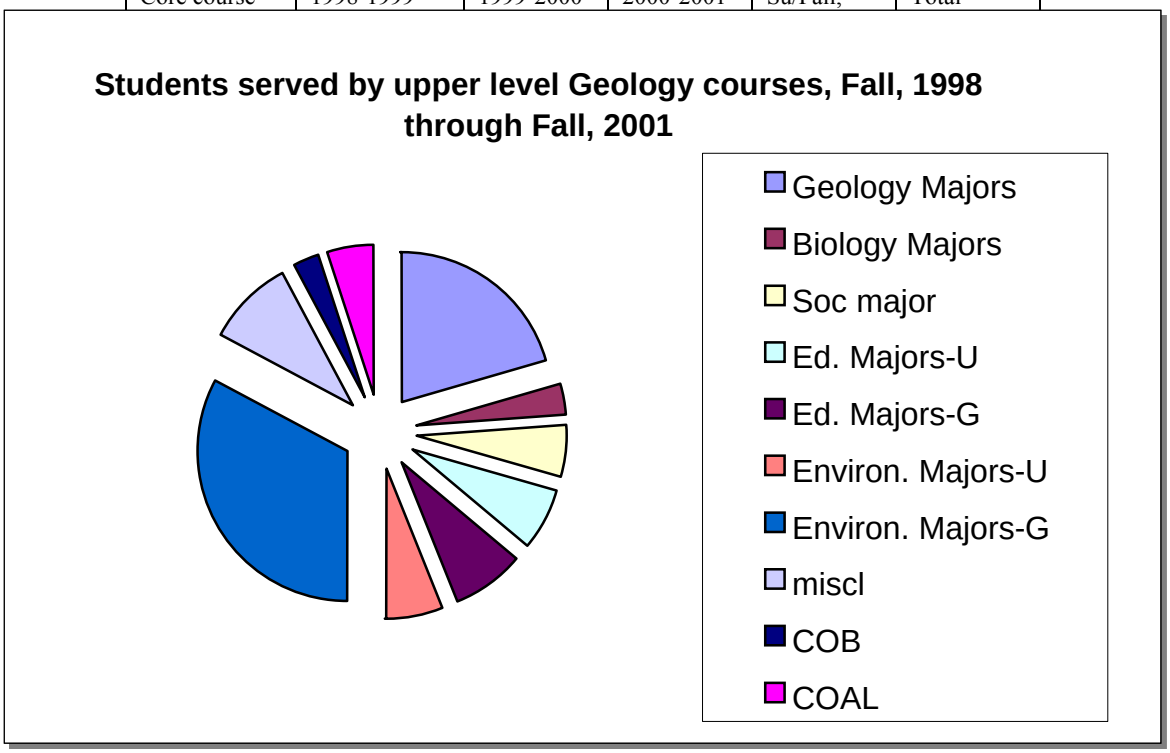
The first pie chart represents the enrollment for the current (Fall, 2001) semester. It shows the numbers of students in each of the courses now being taught. Note that there are several cross-listed with Environmental Sciences in both undergraduate and graduate designations. More than 75% of the students are enrolled in core Introduction to Geology 1 and The Fossil Record. This Fall's Headcount data is typical of other regular semesters: delivery of core courses dominates the Geology program and a broad spectrum of courses that other programs find useful are also in the mix. Headcounts for other semesters are in Appendix C.



The second pie chart shows the diversity of programs that contribute to our enrollment. It summarizes the backgrounds of students who have taken our upper level courses over the last 3.5 years. The courses included both those with "GEOL" designation as well as those with ENVS and ANTH designations taught by Geology faculty. The largest group is the Environmental Sciences undergraduate and graduate students; second largest is the geology students. Education, Biology and Sociology majors are also important and there are students from the College of Business and the College of Arts and Letters. From this we can conclude that the upper level Geology curriculum is useful to a wide group of students that crosses both departmental and College boundaries. Charts illustrating

populations of Geology courses by major on a semester basis are in Appendix D. The source of the data are the class enrollment lists on ISIS. Summer courses are not included because upper level Geology courses have not been taught during the summer for some time.

	Enrollment in core courses since the academic year, 1997-1998				
Core course	1998-1999	1999-2000	2000-2001	Su/Fall,	Total



Core

Courses offered by the Geology program are important contributors to the core as well as graduate programs at CSU. In the last three years, 715 students have taken Physical Geology, and 157 have taken Historical Geology, one of the established core science sequences for a number of years. Human Origins, has contributed 83 students to the core since it was first offered in the Summer of 1999. A newly developed course, The Fossil Record, is contributing 19 students to the core this Fall. The last two courses, especially, relate to the Anthropology/Archeology sequence and to Biology.

The chart below shows the enrollments in these core courses.

	Enrollment in core courses since the academic year, 1997-1998				
Core course	1998-1999	1999-2000	2000-2001	Su/Fall, 2001	Total student enrollment
Physical Geology	Su 98 F98 127 Sp99 50	Su99-50 F99 130 Sp00-27	Su00-31 F00-128 Sp01-51	Su01-19 F01-102 Sp02	715
Historical Geology	Sp99 57	Su99-14 Sp00-31	Su00-22 Sp01-25	Su01-8 Sp02	157
The Fossil Record				F01-19	19
Human Origins		Su99-26	Su00 F00	Su01-23 F01	83

			Sp01-34	Sp02	
totals	234	278	291	171	

General elective course

Over the past several years, a number of courses have been used extensively by students as general electives and program electives in fields other than Geology. These include Vertebrate Paleontology, Physical Anthropology and Archeology, Mineralogy, Sedimentary Geology and Special Topics in Geology. Though most summer offerings have been strictly core courses over the last several years, this past summer an honors course in Introduction to Geology 1 and two seminars dealing with the role of Geology in warfare contributed significantly to an Honors sequence of courses focused on the Civil War. This was a collaborative effort with the History Department.

The chart below shows the numbers of non-geology majors who have taken upper level Geology courses over the last few years. This data compliments the exploded pie chart above.

	Geology courses used as electives by non-Geology students since the academic year, 1998-1999				
Course	1998-1999	1999-2000	2000-2001	Fall, 2001	totals
Invertebrate Paleontology		F99-2			
Vertebrate Paleontology	Sp 99 3 non-majors	Su99 F99 Sp00	Su00 F00 Sp01		3
Physical Anthropology	Sp 98 1	Su99 F99 Sp00-6	Su00 F00 Sp01-12		19
Mineralogy			F00-1		1
Sedimentary Geology			Su00 F00-5 Sp01	Su01 F01-6 Sp02	11
Oceanography		Sp00-8	Su00 F00-5 Sp01-12		28
Senior Seminar				Su01-18	18
totals	4	26	35	24	

Graduate courses

A number of upper-level Geology courses are used by students in graduate programs in Environmental Sciences and Education. These include Oceanography, Environmental Geology, Hydrogeology, and Geochemistry. Land Use and Waste Management is strictly a graduate course made possible by the expertise of the Geology faculty.

The chart below shows the numbers of graduate students taking upper level Geology courses

	Geology courses used as electives in graduate programs in Environmental Science and Education				
Course	1998-1999	1999-2000	2000-2001	Fall, 2001	totals
Oceanography		Sp00-5 grad	Sp01-1 grad		6
Environmental Geology	F 98 9 grad	F99 9 grad	F00-8 grad	F01-5	31
Hydrology	Sp 99 11	Sp00-2 grad	Sp01-6 grad	Su01 F01	19
Geochemistry	F 98 2 grad			F01-6	8
Physical Anthropology	Sp 98 3 grad Sp 99 4 grad	Sp00-1 grad			8
Vertebrate Paleontology	Sp 99 1 grad				1
Geomorphology		Sp00-1			1
Land Use and Waste Management		Sp00-3			3
totals	30	21	15	11	

How does the program include diversity, multiculturalism, and international perspectives?

Geology is a field that transcends national boundaries. In fact, Geology indicates that even continents have changed considerably over Geologic time. For example, when the Physical Geology course deals with Plate Tectonics, many of the major mountain ranges of the world are located and described. The trans-continental nature of the Alpine-Himalayan chain and the American Cordillera are used repeated to make points about their relationship to the plate tectonic mechanism. Fossil distribution and questions related to Paleontology are not related to national boundaries and transcend continents, as well. The geography and geology of Africa and the Middle East are constantly being invoked in the context of Plate Tectonics. The extent of the circum-Pacific "ring of fire" and the largely matching zones of earthquake incidence are used repeatedly in the discussions of the origins of various rock types and hazards. The relation of economic deposits of metals and energy supplies to these distributions are also discussed in these contexts. The history of the origin of Plate Tectonics in Europe and the importance of Japanese and Russian contributions to Seismology are also part of textbook and lectures.

Upper level courses also utilize international examples in lectures and lab studies. Dr. Hanley has traveled to India, The British Isles, Canada and Panama on Geology related excursions. Dr. Schwimmer has studied invertebrate and vertebrate locales in western Canada, northern Europe and Argentina, and Dr. Frazier has studied the Geology in eastern Canada and The Bahamas. All of these experiences find their way into our lectures. Our fossil collection as well as our collection of igneous, sedimentary and metamorphic rocks contain suites from overseas. Many of these were collected by the faculty on these trips, some have been given to the faculty by students and some have been traded for. Many are used in our mid to upper level Geology classes.

4. Students

4. Students

What is the diversity of students in the Geology program?

Geology graduates and majors have been mixed relative to age and gender. With the exception of an American Indian in the current group of majors noted elsewhere in this report, Geology graduates have been almost exclusively white. Dr. Hanley has been involved in setting up the Carver High School PEPP seismic instrument. Carver is a historically black high school, now the MCSD Technology Magnet. It is hoped that this and other efforts such as appearance at Oxbow Meadows and the Coca-Cola Space Science Center will act as an outreach mechanism to improve racial diversity.

	age	student	race	Gender
Graduates 1997-1998	mid 20's late 20's mid 50's late 20's	Anissa Langbecker Ed James Bobby Francis Jeramie Sheets	W W W W	F M M M
Graduates 1999-2000	Early 30's mid 20's mid 20's	Marta Clepper Cason Commander Pat Baird	W W W	F M M
Current students	Information in data section.			

Describe student learning, satisfaction, and evidence of success in meeting student needs and learning outcomes as reflected by major assessment.

Information on student learning, meeting student needs and learning outcomes is found in the major field assessment. Part of this assessment consists of an exit exam. We have also surveyed an employer about our program and have surveyed recent graduates on their opinions of the program after they have spent a limited time in graduate school or employment. The results of these instruments are incorporated in the Major Field Assessment matrices accompanying this report. Students have generally expressed satisfaction with the results of our BS in Geology program. Graduates have suggested increasing field experience, meeting other geologists, and increasing exposure to software. We have moved to implement these suggestions. Employers tell us that we are teaching the right kinds of material. Deficiencies in performance by students noted by faculty in the exit exam are being addressed and will continue to be monitored.

Please see the MFAM in Appendix B.

5. Faculty

5. Faculty

All of the instructors in the Geology Degree Program are full-time members of CSU's faculty. All have earned the Ph.D. degree from major institutions (State University of New York at Stony Brook; Indiana University; University of North Carolina at Chapel Hill) and all hold professorial rank. All are members of the Graduate Faculty. We have no part-time faculty, a fact that makes the Geology Degree Program unusual on the Columbus State University campus. Course responsibilities are listed in the table below.

Course	**Faculty**		
	F	**S**	**H**
GEOL 1121 Introductory Geo-sciences 1: Physical Geology	●	●	●
GEOL 1122 Introductory Geo-sciences 2: Historical Geology	●	●	●
GEOL 2225 The Fossil Record		●	
GEOL 3215 Igneous and Metamorphic Geology			●
GEOL 3235 Sedimentary Geology	●		
GEOL 3245 Invertebrate Paleontology		●	
GEOL 3265 Stratigraphy and Basin Analysis	●		
GEOL 3266 Mineralogy			●
GEOL 3275 Mapping and Field Geology			●
GEOL 4175 Undergraduate Research	●	●	●
GEOL 4275 Structural Geology			●
GEOL 4795 Senior Geology Seminar	●	●	●
GEOL 5115 Geochemistry	●		
GEOL 5135 Introduction to Oceanography	●		
GEOL/ENVS 5165 Introduction to Hydrology	●		
GEOL/ANTH 5175 Physical Anthropology and Archeology		●	
GEOL 5215 Geomorphology			●
GEOL/ENVS 5255 Environmental Geology		●	
GEOL 5275 Vertebrate Paleontology		●	
GEOL 5555 Selected Topics in Geology	●	●	●
GEOL 7565 Selected Topics in Environmental Geology	●	●	●
ENVS 7145		●	

Course	Faculty		
Land Use and Waste Management			
ANTH 1145 Human Origins		●	

The adequacy and diversity of the Geology faculty may be seen in their Curriculum Vitae, which are presented in Appendix E.

Professional Development has been supported by the Faculty Development program with institutional and Columbus State University Foundation funds. These funds have provided start-up expenses for some projects. They have also been used to pay partial expenses for travel to carry out projects and to present results at professional meetings. Travel for presentations is usually partially covered by these funds. Departmental and college funds have in some cases made up all or part of the differences. On some occasions, faculty have paid some of these expenses themselves.

Dr. Hanley took advantage of the first Faculty Development Workshop on Instructional Media held at UGA in the summer of 1995.

6. Facilities

6. Facilities

Description of Available Space

Summary:

The physical space occupied by the Geology program is adequate, but not excessive. The configuration and fitting of most laboratories used by the program were incorporated into the building design of LeNoir Hall, and have generally proven to be well thought-out. For example, ventilation hoods and map cabinets are incorporated into many of the geology labs, and heavy ceiling hooks were built into both paleontology labs for purposes of suspending specimens for display and study. The specific needs of geology include rock preparation, ample storage for heavy specimens, and strong cabinets and tables for the same.

The Geology program is physically housed in approximately one-third of Lenoir Hall, plus there is frequent use of several (and varying) lecture halls in Stanley Hall and Clearview Circle II for introductory classes with more than 35 students.

There are four laboratory areas typically or wholly used for the Geology program: rock preparation and student-research unit, with attached storage area and two small preparation labs; paleontology unit, consisting of conjoined preparation/research and teaching labs; petrology/mineralogy unit, consisting of large teaching lab with attached storage and preparation area; sedimentology/oceanography teaching laboratory.

Two larger teaching laboratories, holding 35 students each, are used primarily by geology classes; they are also in use by chemistry and math classes. These teaching labs include map storage cases, rock storage and display cases, and introductory lab student rock, mineral, and fossil kits along with introductory lab materials (acid bottles, mineral sample equipment).

Description of Laboratories, Equipment, and Library Resources

Summary:

As described above, the introductory teaching laboratory spaces are shared with other subjects, whereas the four laboratory areas noted are almost exclusively used by the Geology program. As long as classes are held at no more than 30 students per lab section, the present facilities in LeNoir Hall are adequate. The paleontology teaching laboratory was designed to hold 20 students and is adequate exactly at that limit. The sedimentology/oceanography laboratory holds no more than 15 students and to date has been adequate for the demands. Likewise, the mineralogy laboratory can hold about 15 students and has been adequate for the demand.

Technical laboratory equipment is marginally adequate for present needs, but repairs, upgrades, and additions are needed. Since moving to LeNoir Hall, the program has received no funds for purchasing larger equipment or major repairs.

The Geology program features the following basic equipment:

Rock cutting saws both large (slab) and small (trim)
Thin-section machine and finishing equipment
Lapidary machines for cutting and polishing
Fully-equipped darkroom and industrial-grade copystand
ASTM standard brass sieves in ¼-Φ intervals and sieve-shakers
Atomic absorption spectrophotometer and lamps
Student-grade seismograph
Research-grade polarizing microscopes (3)
Student-grade polarizing microscopes (10)
Research-grade stereomicroscopes (2)
Student-grade stereomicroscopes (10)

Pneumatic air scribes for fossil preparation

Field equipment is a substantial component of the Geology program's properties since many aspects of the program are field-oriented. In addition to the usual rock hammers, Brunton compasses, measuring tapes, map holders, ropes, chisels, trowels, etc., among the more specific field equipment are:

Gasoline-powered rock saw
Manual jack-hammer
Soil samplers
Shallow-rock augers
Hand-held GPS
FM and CB walkie-talkies
Plane table and alidaid
Leitz total station

Geology program software includes several sophisticated systems for mapping, sedimentary analysis, and museum fossil cataloging including:

DeLorme 3-D Topoquads, with full-state coverage for Georgia and Alabama
Waterloo Hydrologic Visual MODFLOW for Windows
Geobase Catalog System
ArcView and ArcInfo GIS software are available

There are adequate computer facilities in the program for all current program needs and the basic infrastructure of the facilities (i.e. utilities, building maintenance, etc.) are adequate for all needs to date.

Rock and fossil collections are a very important (and difficult to acquire and replace) resource for teaching and research. The collective Geology program collections of minerals, rocks, sediments, and fossils include:

Extensive mineral teaching collections
Extensive rock collections, including a significant research collection of Piedmont metamorphic rocks
Extensive sedimentary rock and sediment collections, including an international collection of detrital and carbonate sand samples
Museum-grade vertebrate and invertebrate fossil collections. These include vast teaching collections and the most extensively published and significant Cretaceous vertebrate collection in Georgia.

Library resources in Geology at CSU are modest in terms of both books and journals. In practice, the library holdings are supplemented by personal journal subscriptions and extensive reprint holdings of Geology faculty. Interlibrary loans are used heavily by both students and faculty to do serious research and the system seems to work well. Unfortunately, interlibrary loans, on-line data-bases, and other surrogates do not allow the type of browsing that truly inspires and supports research. Further, data-bases available at CSU typically cover only recent literature (post-1990). Geology research benefits greatly from access to older literature.

Students have abundant opportunities to interact with faculty on a one-to-one basis, and are able to use the personal libraries of faculty for their research needs. Since all Geology faculty are at once experienced and research-oriented, the collective personal geology library in Lenoir Hall offices is a great help to students. Combining faculty collections and the university library, the available geology literature on campus is adequate for general student needs. An efficient interlibrary loans program largely supplements the gaps.

A critical infrastructural resource for Geology program activities has been Instructional Technology Services (formerly Media Services). Nearly all Geology professional publications and presentations have extensively relied on photographic and reproduction services through this source, as do many classroom presentations. An equally critical resource for research has been funding through Faculty Development grants. These funds have been the lifeblood of our Geology program's research success.

Improvements in Infrastructure Support

Summary:

We can see ways in which additional equipment and more intense public relations and outreach could benefit the Geology program. A new public relations officer has shown an interest in publicizing our work. We are making an intense effort to keep him advised on aspects of what we do that we think newsworthy. We are making an effort to work with university outreach programs such as the Probe fair and Visitation days. We will also be attending more Georgia Academy meetings. We intend to continue and develop Earth Science Week through field trips and public meetings.

Additional infrastructural needs that would increase the quality of our program include:

Field vehicle capable of transporting eight or more students for off-road field trips (e.g. a 4-wheel drive Suburban or equivalent) - this would complement the capabilities of the new 4x4 dually pick-up recently bought by the College of Science.

Earth drill capable of reaching groundwater depths (~10m) - would be transported by the new 4x4 dually pick-up

Research-grade stereomicroscope with enhanced photographic capability (e.g. Nikon FMZ or equivalent)

Ready-access to a scanning electron microscope (perhaps by agreement with a neighboring university)

7. Research and Scholarship

7. Research and Scholarship

Summary:

The Geology program at CSU, including both faculty and student contributions, has produced an extraordinary amount of prime research; in fact, the attached list of publications will indicate that the collective 20-year departmental bibliography includes seven books, 47 scholarly papers, and 63 published abstracts of research. Much of this literature (but not all of it) focuses on the regional geology of western Georgia and vicinity and it is common knowledge in the larger geology profession that faculty of CSU (and their graduates) are the primary authorities on the geology of this broad geographic region. It is reasonable to claim that the total published professional output of the small CSU Geology department, considering subjects researched and published in residence at CSU, exceeds that of any other academic unit in the University regardless of size.

Many studies and publications authored from the CSU geology faculty appear in national and international flagship geological journals and academic presses, and have significance outside the region. The combined publication list will indicate authorship in first-tier technical journals such as Geology, Journal of Geology, Palaios, Journal of Paleontology, and The Journal of Vertebrate Paleontology.

Student involvement:

Among the many scholarly research efforts by geology faculty at CSU, some involve students as co-researchers, a few involve students as primary researchers, and most are solely faculty endeavors. However, even the last category affects students directly and positively because faculty studies invariably reach the classroom. Geology, as a discipline, is especially noteworthy for this effect because it is a material and visual subject and specimens and photographs taken during research typically wind up as teaching aids.

Research is also a significant component of many upper-level geology courses which include a research paper as part of the curriculum. An undergraduate research course (GEOL 4175), with variable credit options, has been in place as a vehicle for students seeking to do extensive research beyond a typical semester course component. Many such student projects, some resulting in professional publications (along with many more unpublished student projects), began as adjunct studies related to faculty research and evolved into student-led independent projects. Examples of publications of this type are: Clepper and Frazier, 2000; Hall, in prep.; Hansel, et al., 2001; Schwimmer and Stutts, 1984.

Finally, since all geology faculty at CSU are field-oriented geologists, student involvement in research typically initiates from accompanying faculty in field studies. Faculty field research sites are generally put to multiple-use as teaching aids and student research stations.

Research viz. Program Mission

In simple terms:

- Research is an inherent part of the program mission
- The program mission specifies that Geology faculty are to be resources of expertise for the regional businesses and school. Such expertise develops only through field and laboratory research
- Geology is a dynamic discipline with constantly changing paradigms. Keeping abreast with the subject requires research and this currency is an inherent part of teaching. Unless faculty are actively engaged in their field, the material taught inherently ages and deteriorates. No modern geologist can teach the subject as learned in graduate school because it is inherently out-of-date by the time he/she is employed.

Mentoring and Professional Opportunities

Since the publication list below indicates that geology departmental faculty have been extraordinarily successful in research activity, it is evident that opportunities for research abound. On a material basis, the University's internal Faculty Development grant system has been invaluable in funding research opportunities. In addition, departmental faculty have received numerous grants from The National Science Foundation and The National Geographic Society.

Professional collaborations with outside colleagues have been the real key to our collective research success. In general, CSU geology faculty have integrated research opportunities with colleagues at major universities by contacts at regional and national meetings (the number of multi-authored papers in the departmental bibliography will testify to that fact). In addition, departmental faculty initiate and conduct research by networking through personal contacts with colleagues from graduate school and professional societies. It is fair to say that each CSU geologist has a personal reputation in his respective discipline that opens many opportunities. For example, we are contacted frequently by professional colleagues and students from literally around the world for access to our expertise. As long as we remain active and attend professional conferences and field trips, our research opportunities will remain ample.

Professional Publications by Geology Faculty and Students (All research originating at Columbus State University/Columbus College)

Faculty: W. J. FRAZIER, T. B. HANLEY, D. R. SCHWIMMER

Students: P. BAIRD, C. COMMANDER, R. F. FREEMAN, T. L. HALL, M. KLEPPER, G. D. WILLIAMS, C. HARRIS

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SCHWIMMER, D. R. 1981. Paleontology of a large-oyster bioherm and related strata, Blufftown Formation, Stewart County, Georgia. Geological Society of America, Abstracts with Programs, Southeastern Section, 13(1): 34.

BEYER, P. J., W. J. FRAZIER, T. M. HANLEY, and D. R. SCHWIMMER. 1980. Coastal Plain and Piedmont geology of Muscogee County (Columbus), Georgia, and vicinity. Geological Society of America, Abstracts with Programs, National Meeting, 12(7): 387.

Public Lectures
(Additional to the professional presentations abstracted above)

W. J. Frazier

2000 Talk on Chattahoochee Valley geology as seen along the Columbus River Walk; to a teacher-training class at Coca Cola Space Science Center

1999 In-service training course for Muscogee County School system teachers, on Chattahoochee Valley geology

Led field trip for Dr. Charles Savarda, Auburn University, and his graduate students

1998 Led field trip for the Atlanta chapter of the U. S. Environmental Protection Agency's geological society, examining facies patterns and paleoenvironments of the Eutaw Formation in western Georgia and eastern Alabama

1996 Led field trip for Dr. Richard Davis, University of South Florida, and graduate students, on facies stratigraphy of the Eutaw and Blufftown Formations

1994 Talk for the Twentieth Anniversary Celebration for the Elizabeth Bradley Turner Center for Continuing Education, on geological history of the Chattahoochee Valley region

1992 Presentation on rocks and minerals for the Georgia Science Teachers Association

1991 Presentation on Coastal Plain geology for the Columbus Museum's Docent Training Program

1989 Talk on Coastal Plain geology to the Chattahoochee Valley Chapter of the Phi Delta Kappa honorary society

1988 Presentation on Coastal Plain geology for the Columbus Museum's Docent Training Program

Talk on the mechanics of sandstone dike emplacement, to the Geology Department of Auburn University

1987 Presented a 4-week short course on geology for a Staff Development course, for the Muscogee County School District

1982 Presented workshop on local geology for the Patterson Planetarium

Presented symposium on local Coastal Plain geology for the Georgia Academy of Sciences

1980 Led a field trip for Dr. Michael Katuna, College of Charleston, and students, on the stratigraphy of Cretaceous Coastal Plain strata

Led a field trip for the Columbus Audubon Society, dealing with regional geology of Muscogee County

T. B. Hanley

1998 With Mark Steltenpohl of Auburn, ran fieldtrip for the Atlanta Geological Society, February 21,1998. Title of Trip: "Mylonites and other fault-related rocks of the Pine Mountain and Uchee belts of western Georgia and Alabama."

1997 With Mark Steltenpohl of Auburn, ran fieldtrip for more than 20 geologists in connection with the 1997 meeting of the Southeastern Section of the Geological Society of America held in Auburn. Title of Trip: "Mylonites and other fault-related rocks of the Pine Mountain and Uchee belts of Alabama and western Georgia."

Presided at SEGSA meeting Theme Session on Geological Education K-12 and College held at the meeting of the Southeastern Section of the Geological Society of America held in Auburn.

1990, 1991 Organized annual GSTA District VI In-Service day program for GSTA and VAST held at Columbus College.

1991 Inservice course for Coweta County Middle School teachers dealing with rocks and minerals and other aspects of the geology of the Fall line, Columbus, GA.

Geology of the Fall line, Columbus, Georgia: Georgia Science Teachers Association meeting in Columbus, GA.

1987 as co-leader with S. Kish of the University of Florida and S. Schamel of the University of North Carolina: "Geology of the Southwestern Piedmont of Georgia: Geological Society of America 98th Annual Meeting pre-meeting field trip; see Books below.

1980 as co-leader with Professors S. Schamel of the University of North Carolina and J. Sears of Auburn University; see Books below.

D. R. Schwimmer

2000: Lecture for Geology Department, Georgia State University, on Cambrian soft-bodied fauna

Talk at Hardaway High School for County Science teachers on Creation and Evolution

1999: Taught short-course on Creationist rhetoric, for Paleontological Society, at Geological Society of America Annual Meeting, Denver, CO.

Presentation on Georgia paleontology, at the Coca Cola Space Science Center.

Debate (contra Ken Hovind) on Creation-Evolution, CSU Fine Arts Hall.

1998: Talk at the Weinmann Mineral Museum, Cartersville, on Georgia paleontology.

1996: Led field trip and presentation on Georgia paleontology for Fernbank Museum, Atlanta.

1995: Filmed television presentation "The Great Dinosaurs of China" for broadcast on Georgia Public Television (GPTV).

1994: Lecture on marine scavengers and predators of the Southeastern Late Cretaceous, Department of Geology, Auburn University, AL.

Presentation on dinosaur research in Georgia, Georgia Science Teachers Assoc., Savannah.

Lecture on dinosaur research, Atlanta Geological Society.

Lecture on dinosaur research, Geology Department Georgia State University, Atlanta.

1992: Presentation on dinosaur research, Georgia Science Teachers Conference, Atlanta.

1991: Lecture on dinosaur research, Clayton State College Distinguished Lecture Series, Morrow GA.

Lecture on dinosaur research, Zoo Atlanta.

1990: Presentation on dinosaur research, Department of Geology, University of Tennessee, Knoxville, TN.

1989: Lecture on dinosaur research, Geology Department, University of Georgia, Athens.

1988: Lecture on dinosaur research, Geology Department, Emory University, Atlanta.

Lecture on dinosaur research, Geology Department, Auburn University, Auburn AL.

Lecture on dinosaur research, Fernbank Science Center, Atlanta.

1986: Debate on "Scientific Creationism," (contra Duane T. Gish), University of Georgia, Athens.

1984: Presentation and Session Chair, State-of-the-Art-in Biology (S.O.T.A.B.) meeting, University of GA, Athens.

1982: Presentation on "Scientific Creationism" at S.O.T.A.B. meeting, Athens.

Presentation on "Scientific Creationism" at Georgia Academy of Sciences Meeting, Columbus.

Lecture on Cretaceous paleoecology, Geology Department, Georgia State University, Atlanta.

1981: Debate on "Scientific Creationism," (with W. J. Frazier, contra Henry Morris and Harold Slusher), at Columbus College.

8. Service

8. Service

It is our feeling that projects or other types of activities that are of service to the community or region are also of great use to the program, department, college and institution through enhancing profiles of these units.

Because we are experts in local geology, we are often the first ones people call with questions about the local Geology or the environment. These calls range from questions about meteorites and mysterious substances found in fields and forests through fossils and gold, to problems related to surface processes like erosion or sedimentation. Some of these calls are interesting and some of them are crackpots, but all involve making sure the caller feels fairly treated by a state institution. In addition, we are also called to speak to school groups or arrange for groups of students to visit our labs.

Recognizing our expertise in local Geology, Mr. Billy Winn of the Columbus Ledger Enquirer asked both Dr. Frazier and Dr. Hanley to meet with other interested parties in the Spring of 2000 to discuss listing and describing local areas of great natural beauty and environmental interest.

Dr. Frazier, Dr. Schwimmer and Dr. Hanley have all presented programs on local Geology at the Columbus Museum, Oxbow Meadows and at the Coca-Cola Space Science Center, as well as to local Lower, Middle and High Schools. These are among the most important of our activities as they make our expertise available to help educate pre-college students and the general public.

Projects and Activities With Community and Regional Impact

Dr. Frazier:

Over the last five years, Dr. Frazier has exerted a great deal of energy in projects and activities related to the governance of CSU through three major committee assignments, one less major assignment and one enjoyable self-imposed assignment. These are beyond his normal participation in undergraduate and graduate governance and academic programs. He was Chair of both the Search Committee for Vice-President for Academic Affairs and is the current chair of the General Education Assessment Committee. Furthermore, Dr. Frazier is a member of the Students Rights and Responsibilities Committee (SRRC).

An assignment that is minor relative to the above is his serving as chair of the Parking Ticket Appeals Subcommittee. Minor to some but in the particulars, very important to specific students, faculty and staff. Dr. Frazier makes sure that people feel that they have been treated fairly by one of the less attractive bureaucratic arms of CSU. In doing so, he helps maintain respect for Public Safety.

Dr. Frazier is a valuable member of these committees because he is conscientious, deliberative, fair minded, attentive to detail, a good listener, an effective leader and generally a person who enjoys the give and take incumbent in those assignments. These assignments are loaded with responsibility, lots of homework and lots of stress. There are deadlines that must be met and consequences for all of us if the work is not done well.

Dr. Frazier has been faculty advisor for the David Centa Freethought Society for several years. In that time the society has been very active in exploring a number of controversial issues. Student leadership contributes a lot to the success of such a society, but the active interest of a faculty advisor is really the thread that keeps activities going from year and the inspirational light that keeps members interested and focused.

This current year, Dr. Frazier has taken on the responsibility of managing a state contract related to the Flint River Basin water auction. The importance of this project to students is noted elsewhere. In addition, it enhances the reputation of our institution as a player in the field of water management and environmental science.

Dr. Hanley:

Some of the following might appear to be simply the duties of the Acting Chair; however, most were started before Dr. Hanley became Acting Chair.

Organized and spoke at Engineering Night for the last five years to recruit students to the Pre-Engineering Program at CSU.

Recording Secretary for the Engineering Advisory Committee since its inception (about eight years).

Acted as advisor to the installation of the Carver High School seismograph and have promoted its existence to the media.

Helped plan and participated in Science Olympiad and before that in the TEAMS competition and Chemistry Day at CSU to encourage students to become involved in Science and Engineering.

Attended PROBE fair and high school visitation days to promote departmental offerings to prospective CSU students.

Organized Earth Science Day activities in the Fall of 1999 and 2000 to encourage the Earth Sciences at Columbus State. The First Earth Science Day activity involved an afternoon at CCSSC at which visitors asked Dr. Schwimmer about fossils, Dr. Ed Albin (a Geology graduate of CSU and current employee of Fernbank Museum of Natural History) about meteorites and Dr. Hanley answered questions about rocks and minerals. The afternoon culminated with a short hike to the rocks below the Eagle and Phenix dam. In Fall of 2000 Dr. Hanley led a group of people on a short hike along the Pine Mountain trail, and a visit to the historic springs at Warm Springs. Dr. Hanley has been available for Honors Program activities and classes. The former include Geology/Biology hikes/picnics to Providence Canyon and to the Pine Mountain Trail and the historic rehabilitation springs at Warm Springs. Dr. Hanley, along with Mr. Don Cope of History, also taught an innovative set of classes dealing with the military history, the geology of Civil War battlefields and the control geology exerts on tactics and the availability of raw materials. This included a field trip to the battlefields and other locations in Virginia, Maryland, West Virginia and Pennsylvania.

Dr. Schwimmer:

2000-2001

Represent the Chemistry and Geology Department for CSU Annual Fund Drive since 1995.

Donated fossil materials and consulted on exhibit at Fernbank Museum of Natural History (FMNH) on Ancient Marine Life of the South (on current display)

Research, travel and design advisory for FMNH on the Giant Dinosaurs of Argentina on permanent display

(Currently) preparing fossil materials for donation and reproduction for the Weinmann Mineral Museum

1999-2000

Advised Georgia State Capitol Museum on identifying their fossil resources and arranged for several new specimens for the state collections.

1998-1999

Debated a national spokesman on “Creation Science” at CSU by invitation of a student group.

Spoke on Georgia’s paleontology at the Coca-Cola Space Science Center.

1996-1997

Researched, documented and submitted recommendations to the Governor's "Rivercare 2000" project to preserve valuable riparian sites from loss of fossil resources.

Dr. Schwimmer has often been available to discuss the topic of evolution with various campus groups (including the Freethought Society), classes and off-campus groups. He has even acted as advisor to both sides in a High School debate.

Dr. Schwimmer has been a judge for Science Fair projects ever since he arrived in Columbus.

Columbus State University Comprehensive Program Review

Department of Chemistry and Geology

Program: BS Geology

Quantitative Measures

Measure	**1998/1999**	**1999/2000**	**2000/2001**	**2001/2002**
Number of Declared Majors - Fall Semester				
Full-Time	6	3	5	9
Part-Time	0	2	3	4
Total	6	5	8	13
Number of Degrees Conferred - Fiscal Year	3	1	3	
Credit Hour Production - Fall Semester				
Below 1000 Level Courses	0	0	0	0
1000 Level Courses	508	520	512	404
2000 Level Courses	4	0	0	76
3000 Level Courses	12	28	36	40
4000 Level Courses	0	12	0	14
5000U Courses	24	4	4	4
5000G Courses	42	36	32	22
6000 Level Courses and Above	0	0	0	0
Average Course Enrollment - Fall Semester				
Below 1000 Level Courses	0	0	0	0
1000 Level Courses	31	26	26	25
2000 Level Courses	1	0	0	19
3000 Level Courses	2	7	3	5
4000 Level Courses	0	3	0	2
5000U Courses	4	1	1	1
5000G Courses	6	9	8	4
6000 Level Courses and Above	0	0	0	0
Number of Faculty/Staff by EFT - Fall Semester				
Full-Time Faculty	3/12 @ .75	3/11 @ .75	3/11 @ .75	3/11 @ .75
Part-Time Faculty	0.0	0.0	0.0	0.0
Full-Time Staff	0.3	0.3	0.3	0.3
Part-Time Staff	1 stu assist	1 stu assist	1 stu assist	

Measure	1998/1999	1999/2000	2000/2001	2001/2002
Prorated Departmental Budget - Fiscal Year				
State Funds	$234,778	$244,051	$254,373	$260,804
Private\Grant Funds	$229	$3,438	$48,916	$9,357
Total	$235,007	$247,489	$303,289	$270,161
Prorated Personal Service Budget - Fiscal Year	$225,868	$238,279	$242,433 *	$251,632 *
Prorated Operating Expense Budget - Fiscal Year	$8,805	$9,210	$9,241 *	$8,299 *
(Includes Travel)				
Prorated Equipment Expenditures - Fiscal Year	$334	$0	$2,699 *	$0
Cost per Major - Fiscal Year	$39,168	$49,498	$31,797 *	$20,062
(Total Expenditures/Number of Declared Majors)				
Credit Hours Taught Fall and Spring Semesters	1,140	919	934	
Cost per Credit Hour Fall and Spring Semesters	$206	$269	$272 *	
Program-Specific Scholarship Funds Awarded				
Fall Semester	$0	$0	$0	$0
Spring Semester	$0	$0	$0	
Percent of Non-Productive Grades (i.e., W, WF, F, & U)				
Lower Division Courses	22%	18%	19%	
Upper Division Courses	0%	18%	30%	
Graduate Courses	9%	0%	0%	
Averages for Declared Majors - Fall Semester				
Average SAT Verbal Score	380, n=2	330, n=1	573, n=4	528, n=8
Average SAT Math Score	530, n=2	560, n=1	515, n=4	520, n=8
Average Undergraduate GPA	2.77	2.98	3.4	
* Computed for 2000/2001 and 2001/2002 using state funds only				