**OVERVIEW**

**Geology Program Quality Enhancement Plan**

**ver. Dec. 4th 2009**

The major tenets of WCU’s QEP are already embodied in many of the activities of the Geology program. Implementation of several new initiatives, aligned with both the QEP and also recommendations from the recent program review, will allow the program to better serve its students. The outline and resources required for the Geology QEP are below.

**1st Year QEP Focus - Synthesis & Application Field Trip in Geology 150 Methods in Geology**

Resources Required: $1580.00 for two field trips per year.

**2nd Year QEP Focus – Service Experience related to Discipline**

Resources required: faculty release time to coordinate service experiences

**3rd Year QEP Focus – Career Planning and Goals Course**

Resources required: $1000 for speaker travel fund per year. New one-credit course.

**4th Year QEP Focus – Capstone Research Project**

Resources required: $3000 for travel, equipment, and supplies to support undergraduate research.

**Geology Program Quality Enhancement Plan**

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**Overview Statement from Western Carolina University’s Quality Enhancement Plan**

*“Synthesis: A Pathway to Intentional Learning at Western Carolina University initiates new and enhances current connections among existing programs to create a more holistic approach to educating students. WCU faculty and staff recognize that a major challenge of higher education is the need for students to synthesize their curricular and co-curricular (outside of courses) college experiences. The Quality Enhancement Plan (QEP) uses synthesis – the ability to integrate knowledge from different areas into an original whole – as the driving framework for teaching and learning. This emphasis on synthesis enhances students’ educational journey and helps prepare them for life beyond college. Many students may view their courses and co-curricular experiences as isolated activities to be approached in check-list fashion. The QEP fosters synthesis across the disciplines, coordinating curricular and co-curricular experiences to facilitate students’ development of a clearer purpose at the university. The plan’s implementation will impact academics, residential life, service learning, student leadership, study abroad, and career planning/education. The outcome of the plan will be students who are intentional participants in their own educational journey.”*

**Geology Program QEP Overview**

The major tenets of WCU’s QEP are already embodied in many of the activities of the Geology program. In a recent (2008) program review, external reviewers found that “The Geology Program is an outstanding program in which the faculty have developed a teacher-scholar model with a research capstone requirement for all students. This is an excellent fit for the QEP.” While synthesis and integration are already key components of the curricular experience in Geology, the Geology program faculty always strives to enhance the educational experience of its students. To this end, implementation of several new initiatives, aligned with both the QEP and also recommendations from the recent program review, will allow the program to better serve its students and will allow students to recognize the synthesis of their university experiences so that they will be prepared for their future educational and career goals. The following pages explore the Geology program’s mission, goals, expected outcomes through implementation of the QEP, means by which these outcomes will be achieved, resources required for implementation, and assessment of the outcome. In some places, we have included potential curricular changes we may pursue, even if not directly part of our QEP plan, to provide a context for how we hope to improve our program.

**Mission of the Program**

The Geology program subscribes to the teacher-scholar model alluded to in the University’s mission statement:

*“…Teaching and learning constitute the central mission of Western Carolina University. The University seeks to create a community of scholarship in which the activities of its members are consistent with the highest standards of knowledge and practice in their disciplines. The commitment of the community to service, research, and creative activities complements the central mission and extends the benefits of its scholarship to society. As a major public resource for western North Carolina, the university promotes regional economic development through its teaching, research and service. Western Carolina University seeks to provide an environment in which students, faculty, and staff jointly assume responsibility for learning, where free exchange of ideas, intellectual challenge, and high standards of scholarship prevail.”*

It has been shown that the amount of time faculty devote to scholarly activities and working with undergraduates on research have significant effects on the degree to which faculty encourage students to engage in deep-learning activities such as analysis, synthesis, and integration of ideas (American Council of Learned Societies, 2007. http://www.teaglefoundation.org/learning/pdf/2006\_acls\_ whitepaper.pdf.). The Geology faculty, therefore, devote much time in working directly with students on research activities so that the benefits of the teacher/scholar model can be fully realized.

Geology is a science built upon the direct observation of nature, governed by the physical laws of the universe, and advanced by techniques of inquiry unique to the discipline, as well as those rooted in other natural and physical sciences. An understanding of the processes active within the Earth and on the Earth’s surface is critical to meeting many of our societal needs: water resources, natural hazard evaluation and mitigation, waste disposal, energy and mineral resources evaluation and extraction, climate change and environmental protection. A thorough understanding of the field of Geology and Earth history gives us a reference frame for understanding hazards, slow but important processes, and climate change also allows us a deeper admiration for the natural beauty of the WCU area and thousands of other places to which we travel during our lives. The Southern Appalachians represent one of the most magnificent locations to study geology and our program capitalizes on this unique setting for our QEP. In this way, our majors leave the university with a more rewarding experience than they would receive at many peer institutions.

The mission of the Geology program is to impart a sound understanding of the forces and processes that shape the planet to our students. Understanding Earth’s composition, structure, evolution, and surficial processes is crucial to any understanding of our society’s environmental problems and responsible extraction and use of geologic resources, on which much of our society and economy will depend for many decades to come. Our geology students leave Western with a unique, interdisciplinary perspective that allows them to become leaders on environmental issues within their communities. Geology majors receive an education that will set them on the courses to becoming competent professional geologists, environmental scientists, or academicians. Upon graduation, our students should have the confidence to solve problems in the field and in the lab and will thus be well prepared to enter the professional work force or graduate school.

**Desired Outcomes**

The Geology program accomplishes its mission through its formal course offerings, which serve undergraduate geology majors, liberal studies students, and majors in associated disciplines, as well as through numerous field and laboratory experiences inside and outside the organized course structure. We strive to introduce students to the field and laboratory investigative methods used by earth scientists to address environmental and geological problems and research topics. In addition to on-campus *instruction*, the program provides regional and statewide *service* to public schools, community organizations, private and governmental agencies, and geological professional organizations. The geology faculty actively pursue *research* and scholarly activities. These efforts benefit instruction and service functions, enhance professional development and intellectual vigor, enrich our understanding of the earth, and lead to significant engagement with the local community and beyond. The Geology program has established lower and upper-level learning goals for its students in order to fulfill this mission.

Foundational Student Learning Goals

1. Students become familiar with Earth’s internal and surface processes and properties (earth materials, mountain building processes, tectonics, streams, groundwater, glaciers, landslides, volcanism, seismiscity, sedimentation, climate, etc.).

2. Students know the basic concepts of historical geology and understand geologic time. Students should comprehend knowledge gained from the rock record, stratigraphic principles, and how relative vs. absolute age is determined.

3. Students know the history of science and the development of the plate tectonic theory.

4. Students are aware of human interaction with earth processes related to human interdependence and control.

5. Students demonstrate the ability to think creatively and to critically evaluate data and interpretations.

6. Students are able to access and utilize geologic literature.

7. Students demonstrate abilities in oral and written communication and are comfortable with the language of geology.

8. Students have the ability to do quantitative and analytical analyses, including the ability to evaluate and succinctly communicate data and observations using spreadsheets, graphical and/or spatial analysis tools.

9. Students have the ability to read topographic and geologic maps, and use these maps in the field for location, data collection, and compilation.

10. Students are able to use simple and sophisticated field tools in an appropriate manner.

11. Students have the skill to recognize and distinguish between different geologic materials in the field, and to describe and evaluate the physical or geometric and temporal relationships between different materials.

12. Students are able to create geologic maps and cross sections as part of the process of recording and communicating field observations.

Higher-Level Student Learning Goals

Our higher-level learning goal is for students to be able to USE the knowledge and skills they have developed through course requirements and apply them towards understanding complex geologic problems as well as to develop a deeper understanding of the foundational goals. This goal encompasses four intended learning outcomes:

1. Students have effective written, oral, and graphic *communication* skills in general and within geology.
2. Students *synthesize* what they have learned and are able to *integrate* it so that they can carry out geological research, including problem definition, study design, analytical procedures, analysis of results, and communication of results.
3. Students have broad understanding of geological knowledge and supporting field, laboratory, and computer skills.
4. Students have the confidence to *solve problems* independently in the field and in the lab.

Many of the lower level (goals 4, 5, 8, 9, 11 and 12) and all of the higher-level learning goals mesh nicely with the intention of WCU’s QEP because they require students to synthesize information across different geology courses and also across other disciplines. Our adoption and implementation of the QEP will allow for a more complete realization of these goals within our program. Students in the Geology Program will be expected to synthesize at all levels, integrating knowledge and skills from academic and co-curricular experiences and expanding in scale as they progress. Students will also have the opportunity to participate in civic engagement activities. Specifically, from the university’s QEP, students in our program will:

*1. identify their aptitudes, abilities, and interests and articulate their future goals and aspirations;*

*2. modify behaviors and values in response to knowledge and skills gained from their academic and co-curricular experiences; and*

*3. regognize the synthesis of their university experiences and evaluate those experiences relative to their future education and career plans.*

**Methods for Achieving Outcomes**

When students first enter the major, they will be assigned an advisor in the Geology Program and will formulate a learning plan with their advisor at the first meeting. At this point, students will be introduced to the QEP and QEP-focused courses that they will be taking in the major. In this way, students begin their journey in the major with the knowledge that they are taking part in an integrative experience. Students will write complete a standard worksheet before seeing their advisor where they answer a series of questions identifying their aptitudes, abilities, and interests and articulate their future goals and aspirations. These paragraphs will be placed in the students’ educational briefcase and will allow for a more productive first meeting with their advisor.

The Geology program proposes a strategy where students have a QEP-focused experience at each step of their track through the program. Geology majors will have their first experience in GEOL 150: Methods in Geology, which is the first course required in the major. A class fieldtrip into the Great Smoky Mountains National Park towards the end of the semester will allow students to integrate information from different components of the course in a real-world scenario. Through this activity students will begin to understand the importance of becoming stewards of place. Majors at the sophomore level will have a service learning requirement where their academic experience is utilized in a real life scenario. Students will participate in a research project, recruiting event (e.g. WCU Open House), mentoring/tutoring, or other service activity and then will reflect on this civic engagement experience. At the junior level students will begin thinking about their post-college lives. A required planning and goals course will allow students to formally develop a resume and explore future careers and/or graduate school. Finally, at the senior level, students will synthesize their educational experience in our program by completing a research capstone project.

***1st Year QEP Focus - Geology 150 Methods in Geology: Synthesis & Application Field Trip***

The Methods in Geology course is the first class that is required of all Geology Majors and is therefore an ideal avenue to introduce the QEP into the Geology Program. In the course, students study topics related to earth materials and solid and surficial earth processes. These topics are explored through field, analytical, and computing methods and students learn investigation and communications skills. Students enrolled in the course will attend a weekend field trip to a location like the Great Smoky Mountains National Park (GSMNP) for their QEP experience and will demonstrate synthesis. Using GSMNP as an example, the purpose of this trip will be to take the class to the GSMNP in order to study the geology of the park first hand. We will also integrate information on park history and significance as well as federal conservation and preservation policies so that students understand why it is important to have natural systems available for enjoyment and study. Most of the geology faculty will attend the trip and this field trip will be an opportunity for a synthesis and integration experience for the students and will allow our students to explore directly many of the tectonic, sedimentologic, and environmental issues that are affecting the park that are touched on in the course.

The Geology 150 course offers a broad overview of many topics in geology and these themes can all be studied experientially in a ‘real world’ scenario in the Great Smoky Mountains N.P. Since the course covers such a wide variety of topics in geology, having the majority of the geology faculty participating on the trip will better allow students to integrate information from various contexts of the course and will introduce the students to the faculty that will be guiding them in their university experience. Students will be required to solve complex problems on the trip and will apply the material learned in lecture and especially in lab to scientifically study real world phenomena. To give one example of this approach, students will be required to calculate the gradients of different streams that we visit in the park and will measure and describe streambed sediments and will analyze water quality. Students will have to relate the size of the sediments and the water chemistry to the stream gradient and the local rock types. This exercise will draw on the diverse background of the geology faculty where expertise in geomorphology, sedimentology, petrology, geochemistry, and structural geology will all be used and integrated.

Students will be required to work in groups on the different parts of these exercises and the groups will have to come together to synthesize the various forms of data into a coherent whole. In this way they will learn effective communication skills that will be important in their future careers as professional scientists.

The geology program will also work towards integrating more synthetic labs into the GEOL 150 course. In one example of this approach, students enrolled in GEOL 150 participate in an exercise where they construct a geologic map. This type of exercise requires students to synthesize seemingly disparate portions of the course into a single, consistent whole. Creating a geologic map requires students to use skills in mineralogy, rock identification, structural geology, landscape analysis, construction of cross sections, and orienteering. These topics are normally covered in a sequence of lectures and five or so labs. A project devoted to construction of a geologic map would allow students to integrate these separate sections of the course and will show students that these different aspects of the course are closely related.

This type of mapping experience can be done in a number of ways but a common method in an introductory level course is to set up a scenario in the lab that the students can use for mapping. For example, different types of rocks can be placed in different areas of the lab. These rocks can be oriented so that some are folded, faulted, etc. Students must look at the big picture, must map what they see at an appropriate scale, and draw conclusions regarding the underlying structure based upon what they have mapped. This type of assignment is easy to grade as there is a correct answer, so in this respect it will be possible to evaluate the degree to which students have synthesized their experiences in the course.

Necessary Resources (This course is taught twice annually):

Bus transportation to and from GSMNP (Young Transportation) $800.00 x 2 = $1600.00

40 Geologic Maps of the Park $40.00 x 2 = $80.00

Total Resources Required Annually = $1680.00

***2nd Year QEP Focus – Service Experience***

Students will be required to participate in a service experience as their second QEP focus in the Geology Program. In this way students will connect the academic and student life components of their experience. Students will be required to take part in a co-curricular activity such as a research project, recruiting event (e.g. WCU Open House or classroom outreach at local school), mentorship/tutoring experience, or another type of service activity (e.g. science fair judging). This activity will relate directly to their discipline in some way and will require students to use their time to improve their discipline, environment, community, etc.

Students will work with a faculty coordinator to select an appropriate service experience, will then participate in the service experience, and then write a reflective essay as a product synthesizing their experience and commenting on its civic importance. The program’s website will also eventually have a page that is designed to facilitate this assignment by providing various leads for the students to pursue. After completion of the service activity, the reflective essay will address how the experience they participated in is related to discipline, why their chosen service activity is important, how the activity connected them to and benefited the community, what changes they will make as a result of this experience, and how participation in the experience has advanced their education. In addition, students will address how they will modify behaviors and values in response to the knowledge and skills gained from their coursework and other experiences at WCU.

Necessary Resources:

Release time for one faculty member will be necessary to oversee the student projects. This faculty member will meet with the students, describe possible service experiences and provide contact information if necessary, assist the students (if needed) in beginning their experience, and will collect, read, and comment on the reflective essays that the students write upon completion of their service activity. This essay will also be put into the educational briefcase where it can be reviewed by the student’s advisor.

***3rd Year QEP Focus – Career Planning and Goals Course***

Students in their 3rd year will be provided the opportunity to develop a resume, explore different careers in their field, and learn about graduate school, and plan what to do with their senior capstone experience as part of a required one credit hour career planning course. A course similar to the one described herein was successfully taught during the Fall, 2007 semester. Students taking this course will learn about how to research and find careers in geology using resources on campus and online, and meet geologists in a variety of jobs. These geologists will talk about what they do for their job, the type of geology they work in, and their career path. Seminar participants will also develop examples of graduate school and job applications to use as templates. Specific learning objectives for students in the course will include a working knowledge of career resources, job listings, and graduate school listings both on and off campus, an online familiarity with a wide range of career options stemming from an undergradute geology major, and complete examples of graduate school and job applications.

Students will complete several independent exercises outside of class, such as visiting Career Services, doing a web search, etc., to help them learn about resources they may need for researching graduate schools or potential employers. Students will turn in written reports detailing what they have learned through completion of these activities. Students will also have the opportunity to conduct a job search, pick a job and a graduate program to “apply” to, and work on these materials over the course of the semester. As part of this exercise, students will have to develop a resume, which will be uploaded to their educational briefcase. This exercise will encourage the students to reflect on their entire experience at WCU so that they see how these academic and co-curricular experiences are related to their future career and educational choices. Speakers in the Fall, 2007 course included the following:

Rebecca Latham, NC Geologic Survey (geological engineer)

Arthur Merschat, University of Tennessesee graduate student (field geology & graduate school)

Rick Wooten, NC Geologic Survey (slope stability, hydrology, structural geology & petrology)

Dr. Chris Sweezey, US Geologic Survey energy resources (stratigraphy, sedimentology)

Although this list of speakers will likely not be duplicated exactly in the future, our intention is to bring speakers in that cover the breadth of available careers in the geosciences and also bring in several speakers from regional graduate programs in the geosciences as well as recent graduatess who can speak about their first year outside of the university. Students enrolled in the course will thus have the opportunity to make professional contacts that could potentially benefit them in the future. During our recent program review the reviewers suggested that we find ways to better utilize alumni for a variety of purposes. Our intention is to utilize our alumni for some of these seminars so that we can maintain a strong connection with these former students so that current students will directly see where their education can potentially take them. Increased networking with alumni can be achieved through maintaining a current list of alumni and their contact information, including information on whether the alumnus is available for service activities such as speaking during the careers course, development of an alumni page on our website, continuing an annual alumni newsletter, and maintaining a geo-jobs networking list where we can send job-related information to upper-level and former students. Finally, as an additional assessment tool for the program, we would like to develop an alumni survey where we solicit feedback from alumni 2, 5, and 10 years out.

Towards the end of the semester, students enrolled in the course will write a reflective essay where they discuss how they will modify behaviors and values in response to the knowledge and skills gained from their experiences. As part of the essay, they will also discuss their future educational and career plans with emphasis on how these plans have been modified as a result of what they have learned in the careers course. This assignment will be reviewed by the course instructor, which will be helpful for their assessment of the success of the course, and this assignment will also be put into the educational briefcase where it can be reviewed by the student’s advisor.

Necessary Resources:

The costs of bringing in outside speakers can be high, but the rewards are great for our students. We will primarily draw from a pool of regional speakers in order to minimize costs, but anticipate needing $1000 for costs associated with travel when the course is taught.

The Geology program, as part of on-going curricula review, would also like to identify other areas where the quality of education can be enhanced for our students at all levels of their experience at WCU. Currently, the program offers several 1 credit topic-focused 3 to 4 day field trips. Because these trips have been largely successful (in enrollment, learning, and fun), we hope to expand these types of opportunities. As an example, during their junior year, we would like to move towards having Structural Geology and Sedimentation and Stratigraphy taught concurrently. Students in these courses would participate in a 4-6 day field trip designed for geologic mapping in the Appalachian Basin (TN or WV) at either of the following locations:

Site 1: Smoke Hole Gorge, WV(Cave Mountain Anticline) near Franklin, WV

Site 2: Sequatchie Valley (Sequatchie Valley thrust) south of Crossville, TN, and also possibly the Dunlap, TN, area

Travel and camp setup can happen in one day, so either the Tennessee or West Virginia location work well logistically, and trips to these sites have previously been run successfully. The geological features in both sites require mapping and analysis of outcrop-scale structures to be synthesized over the field area to assemble a sedimentological history (stratigraphy) and to identify the major structure (5km2 area covered by a large fold or major fault). In both sites, students have safe areas in which to do their work, can access outcrops needed to construct their mapping with reasonable physical effort (forest road and country road cuts and hiking), and have campgrounds near by. The course instructors could also collect data and samples to use here on campus in their courses.

Having a combined field trip would require us to adjust the current course schedule. Some of our classes have required weekend field trips, plus other research and/or field trip courses. We have started merging field trips to keep students’ schedules from getting overbooked, and also to combine resources in terms of van drivers and equipment. For these reasons, it makes the most sense to make this a combined field trip during one semester when sed/strat and structure are both being offered. This affords excellent pedagogical advantages outlined below as well.

As part of our recent external program review, the external review committee suggested that our majors receive a field-camp-like experience before graduating. Field camp training synthesizes major concepts in sedimentology/stratigraphy, structure, petrology and tectonic history, and geomorphology as expressed in large-scale geologic features. Both the suggested field sites are located in the Appalachian Basin, which formed during the Appalachian tectonic events. It also has been identified as an important domestic natural gas reservoir that the USGS recommends being developed this century. Tectonic events and gas exploration requires integration of stratigraphy to understand paleoclimate, depositional setting and therefore potential for hydrocarbon materials and tectonic history to understand sediment sources, depositional rates affecting the burial history, and subsequent deformation creating faults and folds which trap the hydrocarbons before they can be lost to the surface. Therefore a mapping project in the Appalachian basin not only helps our students build the field and geological skills needed in the workforce and in geological research, but also provides a fantastic opportunity for integrating different fields of geology and applying it to natural resource assessment. This is exactly the type of training government and private agencies look for in potential employees. Further, having two sites that can be alternated, means that the project will be “fresh” for every class of geology majors. The cost of the Structure/Sed. – Strat. field trip would come from transportation, food and campground fees. This could be shared by the department and small fees paid by the students ($50).

***4th Year QEP Focus – Capstone Research Project***

Our current senior capstone research requirement fits nicely into the QEP model. A geology capstone experience is required of all geology majors during their senior year; it is the culmination of the geology degree and requires the application of knowledge and skills towards a geologic investigation. Each student, individually or as part of a small team, completes an original research project, under the guidance of faculty, that demonstrates to employers and graduate schools the ability to complete a major assignment, to work independently, analyze and synthesize information, and to write and speak effectively.

The senior Capstone requirement (3 to 6 credits) may be achieved in several ways, reflective of the diverse interests and background of the student body: 1) a senior thesis (Geol 499; 4 or 6 credits), 2) a Senior Seminar in Geology (Geol 495; 3 credits), 3) an internship with research responsibilities, or 4) a summer research program. In each case, there must be approval of the experience as a Capstone course prior to the beginning of the project from the faculty member overseeing the project. The requirements of the Capstone course vary with the type of experience chosen, but all have several essential requirements.

Each student conducts the investigation under the guidance of a faculty member—the Capstone advisor. The Capstone advisor and a second faculty member, who serves as a Capstone reader, evaluate the final research paper and presentation. Students must submit a professional research project proposal by the end of the third week of the semester. In many cases the research proposal is completed and approved in the semester prior to the main research. The proposal defines the research problem, provides background to the problem based upon the literature, and details the proposed methodology. If the research is being completed as part of a group, then the individual responsibilities must be clearly defined, and the form of the proposal varies as directed by the faculty mentor.

Upon completion of field and lab work, students must complete a significant scientific research paper that defines the problem, the significance of the research topic, the approach and methodology of the investigation, a sophisticated analysis of the study data and observations, and a discussion of the study results in the context of professional literature. The precise requirements vary with the type of Capstone experience. Students completing their capstone requirement frequently have quality scientific data and outcomes that are of interest to other professional geologists. As a result, we commonly have students that present results of their research at regional and international meetings. Between 2002 and 2007, 80 percent of geology graduates had presented research a such a meeting. Occasionally we have students publish the results of their research in scientific journals.

The senior capstone project is a nice fit for the QEP because students recognize the synthesis of their university experience and they begin to think of these experiences in light of their future education and career plans. The product of the capstone experience, a complete scientific report, provides a tool that the geology faculty can use to assess overall student synthesis and performance since the capstone requires students to integrate what they have learned from their academic experiences at WCU. We would also like to move towards assessing the research capstone with a before and after survey of the students’ understanding of research methodology. At least initially, we will likely use SURE -- Survey of Undergraduate Research Experiences, developed by David Lopatto (2004[[1]](#footnote-1)), Grinnel College with support of a grant from the Howard Hughes Medical Institute. This survey could be included in the educational briefcase. Towards the end of the course, students will write a reflective essay where they discuss the synthesis of their university experiences and evaluate those experiences relative to their future education and career plans. Students will also specifically discuss what skills, both within and outside of their major, the capstone course has required them to draw on. The students will also be asked to discuss their perceptions of the strengths and weaknesses of the Geology Program. This essay will be reviewed by the course instructor and will also be put into the educational briefcase where it can be reviewed by the student’s advisor. The essay can also be used as an assessment tool for the program.

*Research and Travel Funding for Students*

There is a need in our program for research funding and travel support since the Geology Program favors a research-intensive, field-based model for its students. The department maintains a student enrichment fund that students can access as a source of funding for conference attendance and research support. While it is nice that we are able to offer some support for students, we are usually able to cover only a fraction of the costs required for students to attend conferences. As a result, we certainly have some students that do not attend and present results of their research. Professional conferences also lead to employment opportunities for our students. For example, we recently sent two students to the national Geologic Society of America meeting (Fall, 2008) and both students received and accepted job offers as a result. Costs directly associated with research can also be high. Travel to field sites and use of equipment and supplies add up quickly. The recent program review thought that in order “to facilitate support of the QEP, the budget needs to be increased dramatically for this department of 14 active faculty members. Increased funding for travel to professional meetings and transportation for student field trips is especially needed.” An addition of $3000 to our base budget for implementation would allow for this initiative to move forward. During our recent external program review the reviewers stated that “the faculty have done an outstanding job obtaining external funding, but some areas of the program warrant additional resources.” We still intend to pursue external funding (the GNR department expended over $300,000 in external funds in 2008), but this addition to our base budget would allow for a consistent experience for our students and would allow us to cover costs that grant monies cannot pay.

Necessary Resources: $3000 for travel, equipment, and supplies to support undergraduate research

**SUMMARY**

The Geology Program views WCU’s QEP as an opportunity to further the educational opportunities for our students, better position them for their desired employment, and foster an academic community between faculty, alumni and students. With the university’s support and the program’s hard work, this initiative will allow students to recognize the synthesis of their university experiences so that they will be prepared for their future educational, career, and life goals.

1. Lopatto, D. 2004. Survey of Undergraduate Research Experiences (SURE): First findings. Cell Biology Education, 3, 270-277. [↑](#footnote-ref-1)