**Essay for InTeGrate Workshop on
Geoscience and the 21st Century**submitted by
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The College of Geosciences at Texas A&M University offers a comprehensive set of programs in the geosciences including a full suite of degrees from the bachelors through the doctorate in every department. Most degrees are offered through one of the College’s four departments: Atmospheric Sciences, Geography, Geology and Geophysics, and Oceanography. The College also offers interdisciplinary bachelors degrees in environmental geosciences and environmental studies, and oversees interdisciplinary graduate degrees in Water Management and Hydrological Sciences.

The vision of the College is to lead in establishing the geosciences as the most important and impactful scientific discipline of the 21st century. The sustainable human society of the future depends more on innovation and application of discovery in the geosciences than on any other discipline. Our field is essential to solving society's grand challenges – global climate change, air and water quality, and adequate energy and food supplies.

By lead, we mean:

* produce graduates of diverse backgrounds who rise to be leaders in private industry, government, and education.
* produce interdisciplinary, innovative, technologically advanced research that is widely translated and communicated for the benefit of a global society.
* prepare all students for thoughtful, life-long participation in public issues related to science, technology, and society.

The mission of the College is to advance new understandings of the Earth System and apply them to the needs of society. To prepare the next generation of geoscientists to conduct research, to find and develop natural resources, and to measure and respond to environmental change.

In this document I describe how our bachelors-level programs prepare students for the workforce, including a discussion of the areas in which our alumni are employed and the knowledge and skills that have been most important in supporting success.

Most graduates of our *Meteorology program*, choose one of four career paths, each of which requires somewhat different skills for success. Graduate who enter the national weather service or similar organization find forecasting skills and a strong knowledge of basic meteorology to be the most important assets for success. Those who choose broadcast journalism find strong communication skills, practical training through our broadcast journalism course, and participation in a variety of internship opportunities to be the most helpful. Those who enter graduate school need a strong foundation of math skills and competency in atmospheric dynamics, physics and chemistry. Anecdotal evidence suggests that students who are most successful in graduate school are those who also had the opportunity to conduct independent undergraduate research projects. Finally, a growing number of our undergraduates are finding jobs as environmental consultants for consulting agencies or government positions such as with the Texas Center for Environmental Quality (TCEQ). These students benefit from elective courses in air quality and from participating in undergraduate research in laboratory or field measurements.

Graduates of our *Environmental Geosciences* program typically enter careers related to environmental consulting or graduate school, for which their background in math, science, and other technical coursework is very beneficial. The program encourages participation in internships and undergraduate research through course credit, and these are important to career success. Gaps in our technical curriculum that we know would benefit our graduates early in their career include material related to licensing, field work, and health and safety regulations.

Graduates of our *Environmental Studies* pursue some of the same career paths as those from Environmental Geosciences, but more often work in areas such as environmental law and sociology, frequently with non-profit organizations. While a strong science background is still important for them, courses in economics, policy and regulations, and sociology are also very beneficial. Internships and study abroad opportunities are encouraged for these students as well.

Graduates of both of these programs leave with strong written and oral communication skills as well as teamwork and leadership skills, all of which are incorporated into their degree plans. Many of our graduates choose to delay entering the workforce and instead pursue graduate or professional studies in areas such as geography, water management, environmental policy, urban planning, law, and oceanography.

Most graduates of our *Geography* programs find employment with environmental consulting firms or with the oil and gas industry. Other types of employment include government agencies, education, and various businesses. It is clear that students with courses or training in GIS, GPS, aerial photography, satellite remote sensing, image processing, GIS programming and geo-computational skills (basically all geospatial technologies) are in great demand in a wide range of fields. Additionally, GIS skills, statistical analysis, business and geospatial tools are also in demand by employers who deploy urban and business oriented technologies. Finally, some graduate pursue graduate studies in geography or related disciplines.

Graduates of our G*eology and Geophysics programs* tend to follow three career pathways: the petroleum industry, academia and government. Most enter industry. For these graduates, employers value their superior quantitative and analytical skills, research experience, their knowledge and skills in field mapping, and their training in both geology and geophysics. In addition employers tell us that our graduates are valuable because of their strong work ethic, loyalty and first-class leadership skills. These attributes may be traceable to the “Aggie” traditions and core values of the university. For graduates who pursue employment in academia, the most important tools we provide for their toolbox are the ability to conduct research at the cutting edge and the quantitative and analytical skills.