

MISSION STATEMENT

The Department of Geosciences emphasizes research and education in the Solid-Earth and Atmospheric Sciences and Geography, through an understanding of the physical processes that govern the state and evolution of the earth-atmosphere system, the recognition of the impact these systems have on society, and the interactions between humans and the natural world. Students graduating from our degree programs will have the knowledge and skills to be strongly competitive for jobs in private, academic and government positions within their respective disciplines. In addition, we provide high-level integrated science literacy to students from other disciplines, so that they may become informed decision makers of the future.

VISION STATEMENT

The Department of Geosciences aspires to the highest standards of excellence in all aspects of teaching, research, and service. It recognizes that the subdisciplines of the Geosciences serve as the basis for any fundamental understanding of environmental processes, natural resources, and natural hazards. These subdisciplines include Geology, Geophysics, Atmospheric Science and Geography. As such, the Department strives to maintain a faculty that is recognized nationally and internationally for their research and teaching contributions and to maintain our existing and emerging programmatic strengths. Our goal is to build a foundation for healthy, long-term scientific enterprise that focuses on transformational shifts in understanding, conveyed to students in classroom and research settings.

To this end, our vision is three-fold for the next decade. First, we are dedicated to maintaining our current programmatic strengths. Second, we look to address emerging long-term regional and national needs for water and energy resources analysis and management. Third, we wish to increase our research and teaching emphasis in the interdisciplinary realms of climate science and unconventional energy resources.

PRIORITY 1: INCREASE ENROLLMENT AND PROMOTE STUDENT SUCCESS

Objective 1.1: Increase graduate and undergraduate quality, diversity, and numbers.

Strategies

General:

- Recruit graduate and undergraduate students internally, regionally, nationally, and internationally.
- Place graduate recruiting emphasis in strategic research areas within Atmospheric Sciences, Solid Earth Geosciences, and Geography.
- Continue existing recruitment efforts at the conferences of the American Geophysical Union, the Geological Society of America, the American Meteorological Society, the American Association of Petroleum Geologists, the Association of American Geographers.
- Continue honors courses in Geography and Atmospheric Science, and develop additional honors courses in Geology.
- Pursue the development of an undergraduate B.S. in Atmospheric Sciences.
- Pursue the improvement of graduate RA and TA stipends.

Local & Regional Recruiting:

- Participation in local science fairs.
- Offer faculty lecture presentations to local and regional colleges.
- Invite local high school students to Department of Geosciences Research Day.
- Promote department at local K-12 school events (Career and Technical Educational Showcase events).
- Develop and supervise summer research projects for high school students and science teachers.

National & International Recruiting:

- Utilize Graduate Enrollment Enhancement Program (GEEP) funds to attract the high-quality graduate student applicants.
- Maintain existing student exchange programs with international universities.
- Utilize existing and new national and international collaborations to promote Departmental expertise to potential graduate students.

Assessments:

- Track student applications and admittance numbers resulting from recruitment activities.
- Track retention rates.

Objective 1.2: Promote Student Success.

Strategies:

- Evaluate and, where appropriate, revise the graduate Geosciences curriculum to improve the quality, duration, and rigor of graduate education.
- Revise and implement Department policy for graduate student admissions and evaluation at both MS and Ph.D. levels.
- Maintain and improve Primary Trait Analysis procedure as a means to assess Senior Thesis, Masters Thesis and Doctoral Dissertation progress.

- Evaluate and, where appropriate, revise the undergraduate Geosciences curriculum to promote greater use of higher mathematics, chemistry, physics, biology, and computers.
- Consider development of an “earth-system science” emphasis in the Geosciences B.A. degree.
- Continue to monitor student curricula, with emphasis on students completing course work in sequence.
- Pursue the development and growth of an undergraduate program in Geographic Information Science and Technology (GIST).
- Develop a graduate certificate program in GIST.
- Present departmental awards for excellence in undergraduate and graduate research.
- Increase participation in Center for Undergraduate Research Activities.
- Maintain the annual Department of Geosciences Research Day.
- Encourage student membership and participation in professional societies.
- Continue faculty participation in Tech Transitions (formerly Freshman Seminar).
- Provide research training in all geography upper-level courses.
- Require each undergraduate senior in Geography to present a research project, based on the capstone course, at either the Center for Undergraduate Research Conference or the Department of Geosciences Research Day.
- Increase undergraduate student involvement in funded research endeavors.

Assessments:

- Track number and types of degrees awarded (as part of program review).
- Track general enrollment, retention, and graduation numbers through matriculation.
- Track the number of majors as determined by enrollments in GEOL 2303.
- Undergraduate committee and advisors monitor GPA of incoming majors.
- Evaluate student projects on the basis of the extent to which they demonstrate research techniques.

Key Performance Indicator for Priority 1: Increase number enrolled in graduate programs by 2 per program per year for next three years.

PRIORITY 2: STRENGTHEN ACADEMIC QUALITY AND REPUTATION

Objective 2.1: Attract and retain faculty, staff and professionals and increase job satisfaction for all employees.

Strategies:

- Pursue the development and funding of endowed Chairs in the Department of Geosciences.
- Advertise staff openings in local and regional minority media.
- Encourage staff to participate in Staff Senate and other appropriate groups.
- Facilitate spousal/partner accommodation when possible and appropriate.
- Strengthen mentoring programs for faculty, staff, and professionals.
- Network with graduate programs to identify quality Ph.D. graduates/postdoctoral students eligible to fill new faculty lines.
- Identify peer institutions and advocate for pay and resources that meet or exceed those offered by our peers.

- Pursue the development of a Departmental Faculty & Staff Handbook.

Assessments:

- Number of applications for faculty positions.
- Number of new dedicated faculty lines.
- Diversity of applicant pools using EEO and Personnel office data.
- Diversity of hired faculty, academic professionals, and staff.
- Frequency/amount of merit raises for faculty, staff and professionals.

Objective 2.2: Promote and recognize productive faculty.

Strategies:

- Pursue the development and funding of endowed Chairs in Geosciences.
- Maintenance of fair, constructive and rigorous review processes, such as in annual reviews, tenure and promotion reviews and post-tenure reviews.
- Nominate faculty for University and National awards for scientific/teaching achievement.

Assessments:

- Number of faculty in department receiving internal recognition awards.
- Number of faculty in department receiving external recognition awards.
- Number of faculty in department receiving nationally-recognized awards.

Objective 2.3: Enhance teaching and learning excellence.

Strategies:

- Maximize and simplify instructor access to technology within the classroom.
- Integrate results of research in pedagogy into the curriculum.
- Consider development of an “earth-system science” emphasis in the Geosciences B.A. degree.
- Nominate exemplary faculty for teaching awards.
- Utilize teaching development tools and workshops provided by the TTU Teaching Learning and Professional Development (TLPD) Center.
- Utilize cross-disciplinary courses to better integrate geography, solid Earth, and atmospheric sciences through expanding 3-dimensional visualization capabilities, digital map facilities, and increasing usage of Geographic Information Science and Technology (GIST), remote sensing and satellite and airborne imagery in teaching and research.
- Hire 2 part-time instructors in Geographic Information Science and Technology (GIST).
- Pursue the development and implementation of an exit evaluation for graduate and undergraduate students.

Assessments:

- Attendance at TLPD workshops.
- Number of faculty in department receiving internal recognition awards.
- Number of faculty in department receiving external recognition awards.
- Number of faculty in department receiving nationally-recognized awards.

- Number of faculty engaged in undergraduate research supervision.
- Numbers of cross-disciplinary students.
- Numbers of cross-disciplinary students continuing to graduate school.
- Number of abstract submissions to annual Geosciences Research Day volume.

Objective 2.4: Increase the national recognition of our programs.

Strategies:

- Pursue the development and funding of endowed Chairs in Geosciences.
- Prioritize the placement of graduates within desirable positions related to their major and/or minor in post-baccalaureate and post-graduate positions.
- Increase student-coauthored publication in peer-reviewed national and international journals.
- Maintain existing and foster new research collaboration with other universities.
- Increase faculty attendance at national conferences to disseminate research.
- Volunteer for leadership roles in national conference planning and administration (e.g., professional conference convener, conference/session chairs, etc.).
- Volunteer for service roles related to the mission of professional organizations (e.g., policy development, editorships, etc.).
- Increase external contracts for analytical facilities.

Assessments:

- Track post-baccalaureate and post-graduate student placement.
- Number of new out-of-state graduate students.
- Number of collaborative inter-university proposals submitted/funded.
- Number of national service positions held by faculty (editorships, Society counsel positions, etc.).
- Peer-reviewed publications and conference proceedings in national and international journals.
- Number of faculty in conference/society administrative roles.
- Number of external contracts and resulting publications.

Key Performance Indicator for Priority 2: Increase number of peer reviewed publications by 10% in at the end of three years.

PRIORITY 3: EXPAND AND ENHANCE RESEARCH
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Objective 3.1: Enhance multidisciplinary research.

Strategies:

- Seek new faculty appointments in the broad, interdisciplinary fields of atmospheric sciences, energy and water resources. These may include appointments in: (a) Earth materials, fluid flow, geomechanics and/or related fields pertaining to fundamental understanding of earth materials in the development of unconventional energy resources. (b) Geographic Information Science and Technology. (c) Observational and computational atmospheric fluid dynamics to support a newly developed B.S. degree program in Atmospheric Science. (d) Numerical climate modeling studies and/or paleo-climate analysis of the geologic record. (e) Stable and radiogenic

heavy isotope geochemistry and their application to understanding processes in Geosciences.
(f) Hydrogeology and related fields pertaining to physical, chemical and mathematical understanding of groundwater evolution, with special emphasis on the Southern High Plains.
(g) Human-environment interaction modeling.

- Pursue the development and funding of three endowed chairs across Atmospheric Sciences, Solid Earth geosciences, and Geography.

Assessments:

- Number of faculty hires.

Objective 3.2: Maintain and enhance current collaborations with other TTU units.

Strategies:

- Continue Department of Geosciences collaborations with the following TTU units: Wind Science and Engineering Research Center, TIEHH and biohazards program, Water Resources Center, Center for Applied Petrophysical Studies, the Museum of Texas Tech University, the College of Education, and the TTU High Performance Computing Center, as well as various TTU Departments.
- Explore collaborative opportunities with new Climate Science Center.

Assessments:

- Numbers of collaborative peer-reviewed papers submitted/published.
- Number of collaborative proposals submitted/funded.

Objective 3.3: Maintain existing and develop new collaborations with units external to TTU.

Strategies:

- Maintain facilities that encourage visiting faculty, scholars, and researchers.
- Maintain and expand collaboration with the petroleum industry.
- Continue collaboration with government agencies including N.I.S.T., National Laboratories (National Severe Storms Laboratory, National Center for Atmospheric Research, National Hurricane Center, Oak Ridge National Laboratory), and the USDA Agricultural Research Service.
- Continue collaboration with domestic universities including the University of Wyoming, UT-El Paso, Texas A&M, Woods Hole Oceanographic Institute, UT-Austin, University of Oklahoma, University of California at Santa Barbara, the Pennsylvania State University, University of Illinois, and others.
- Continue collaboration with international universities and agencies including the University of Montpellier (France), University of Lausanne (Switzerland), Norwegian University of Science and Technology, Norwegian Geological Survey, Indian Statistical Institute (Calcutta), Institute of Vertebrate Paleontology and Paleoanthropology (Beijing), National Museum of Natural History (Buenos Aires), University of St. Andrews (Scotland), and others.
- Continue collaboration with regional analytical consortium with NMSU, NM Tech.

Assessments:

- Numbers of collaborative peer-reviewed papers submitted/published.
- Number of collaborative proposals submitted/funded.

Objective 3.4: Increase the available analytical and experimental facilities for teaching and research.

Strategies:

- Improve funding for laboratories and facilities that is comparable to other equivalent research universities.
- Pursue the development and implementation of a plan for routine maintenance and upgrades of existing equipment and facilities.
- Improve funding and resources for laboratory and analytical support staff and involve staff in collaborative research endeavors.

Assessments:

- Number of equipment users.
- Numbers of collaborative peer-reviewed papers citing lab data submitted/published.
- Number of collaborative proposals citing lab data submitted/funded.
- Number of contracts per year.

Objective 3.5: Pursue opportunities that would facilitate all sub-units of the Department of Geosciences to be housed together.

Strategies:

- Continue to engage in discussion with University administration regarding housing of department.
- Identify possible major donors for such construction and engage in fund-raising and marketing for construction.

Necessary facilities of a new building would include:

- State-of-the-art geochemistry laboratory facilities for experimental aqueous geochemistry, stable isotopic geochemistry, LA-ICP-MS and IA-ICP analysis.
- Information Technology laboratories for research and teaching of GIST, remote sensing, 3-dimensional visualization.
- Core laboratory facilities and storage.
- Field equipment storage facilities, both for the atmospheric sciences and geology.
- West Texas Mesonet offices.
- Office, technology (including high-reliability communication and power infrastructure) and laboratory space to allow for integration with the National Weather Service and local USGS offices.
- Sufficient faculty and staff office and research space.
- Visiting researcher offices.
- Graduate student offices.
- Conference space.

Assessments:

- Note level of interaction and any commitment from University administration.
- Number of fund-raising events and donors and amounts.

Key Performance Indicator for Priority 3: Continue to increase funded research as measured by 3-year running average.

PRIORITY 4: FURTHER OUTREACH AND ENGAGEMENT
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***Objective 4.1: Curricular Engagement.* Provide teaching, learning, and scholarly activities that engage faculty, students and community in mutually beneficial collaboration, addresses community needs, deepen student’s civic learning, enhance well-being of community, and enrich scholarship of institution.**

Strategies:

- Promote applied and service-learning projects
- Further develop and promote GIST education, petroleum geology education, hydrogeology education, and atmospheric science education.
- Provide education in personal and social responsibility (Social and Behavioral Core curriculum courses: Human Geography and World Regional Geography).

Assessments:

- Number of internal participants (e.g., students, faculty, staff).
- Number of external participants.

***Objective 4.2: Outreach and Partnerships.* Provide institutional resources for community uses; Pursue scholarly collaborations that constitute beneficial exchange, exploration, discovery, and application of knowledge, information and resources.**

Strategies:

- Promote course- and research-related science exhibitions at the TTU museum.
- Promote science education in the local and national community through participation in science fairs, National Science Day activities, Earth Week activities, Science: It’s a Girl Thing, Saturdays, Mother-Daughter Science Day, science teacher training, Storms Awareness Week.
- Sponsor local panel discussions on various Geoscience-related topics.

Assessments:

- Compile *geographic area served* information from OEMI.
- Compile *area of concern* and *form* information from OEMI (including all activities that benefit the community in water resources, land use / land cover change, planning, weather/climate/climate change forecasting, alternative resources, and traditional oil and gas).
- Compile *collaborative relationships* information from OEMI (with the petroleum industry,

national and state agencies, regional analytical consortium, domestic universities, and international universities and agencies).

Key Performance Indicator for Priority 4: Increase in the number of engagement events and the proportion of faculty and students involved in engagement.

PRIORITY 5: INCREASE AND MAXIMIZE RESOURCES

Objective 5.1: Improve Alumni relations and support

Strategies:

- Develop and implement a plan for outreach and fund-raising to alumni and friends of the department. Coordinate with Office of Development.
- Continue to increase emphasis on interacting with alumni at professional meetings, particularly AAPG, SEG, GSA, AUS, AMS, AAG, and AGU.
- Develop talking points to guide faculty when discussing fund-raising with alumni and friends.
- Involve appropriate senior faculty, emeritus faculty, alumni, etc. (e.g., Don Haragan, George Asquith, etc.).
- Expand web page for alumni to post news and other information.
- Utilize social media to increase Department outreach.
- Continue publication of the Geoscience newsletter. Distribute news about accomplishments and events to alumni and friends.
- Coordinate news of alumni accomplishments with the Ex-Students Association.
- Initiate a fundraising campaign with specific financial and capital goals.

Assessments:

- Amount of donations from alumni, industry.

Objective 5.2: Improve departmental governance and committee structure.

Strategies:

- Revise and implement model for Geosciences governance.
- Codify committee mandates.
- Evaluate and revise staff job descriptions.

Assessments:

- Variety and number of faculty in various Departmental administrative positions.

Key Performance Indicator for Priority 5: Increase donations to department by 10% at the end of three years.