GEOBULLETIN
MARCH 6TH, 2009

Geobulletin is distributed weekly, on Friday by E-mail. Contributions are requested! Anything and everything (well almost) that you want to see in print. If you have a news item, a request, an announcement etc. email it to geodept@geology.wisc.edu. or leave it at the reception desk, Room 236 by noon on Wednesdays.

LECTURE SCHEDULE ---- All lectures (unless otherwise noted) are held on Fridays at 3:30 PM in AB20 (Laudon Lecture Hall). Coffee & cookies are served in the lobby starting at 3:15 PM.

Mar. 6 - Reserved for sed interview talk

DR. BOB KOPP
PRINCETON UNIVERSITY

THURSDAY, MARCH 5TH, 12 PM, RM. A259: WEEKS HALL

A NEW STATISTICAL APPROACH TO RECONSTRUCTING SEA LEVELS DURING THE LAST INTERGLACIAL: IMPLICATIONS FOR THE HAZARD AND RATE OF FUTURE SEA LEVEL RISE.

The Last Interglacial (LIG) stage (ca. 130--115 ka), with polar temperatures likely 3--5ºC warmer than today, serves as a partial analogue for low-end future warming scenarios. Multiple indicators suggest that LIG global sea level (GSL) was higher than at present; based upon a small set of local sea level indicators, the Intergovernmental Panel on Climate Change (IPCC)'s Fourth Assessment Report inferred an elevation of approximately 4--6 m. While this estimate may be correct, it is based upon overly simplistic assumptions about the relationship between local sea level and global sea level.

Sea level is often viewed as a simple function of changing global ice volume. This perspective neglects local variability, which arises from several factors, including the distortion of the geoid and the elastic and isostatic deformation of the solid Earth by shifting ice masses. Accurate reconstruction of past global and local sea levels, as well as ice sheet volumes, therefore requires integrating globally distributed data sets of local sea level indicators. To assess the robustness of the IPCC's global estimate and search for patterns in local sea level that are diagnostic of meltwater sources, we have compiled a comprehensive database that includes a variety of local sea level indicators from 47 localities, as well as a global sea level record derived from oxygen isotopes. We generate a global synthesis from these data using a novel statistical approach that couples Gaussian process regression to Markov Chain Monte Carlo simulation of geochronological errors.

Our analysis strongly supports the hypothesis that global sea level during the Last Interglacial was higher than today, probably peaking between 6--9 m above the present level. This level is close to that expected from the complete melting of the Greenland Ice Sheet, or from major melting of both the Greenland and West Antarctic Ice Sheets. In the period when sea level was within 10 m of the modern value, the fastest rate of sea level rise sustained for a 1 ky period was likely about 80--110 cm per century. Combined with the evidence for mildly higher temperatures during the LIG, our results highlight the vulnerability of ice sheets to even relatively low levels of sustained global warming.

FRIDAY, MARCH 6TH, 3:30 PM, RM 140: WEEKS HALL

"A MAGNETIC MYSTERY: THE TRANSFORMATION OF THE IRON CYCLE DURING SEVERE GLOBAL WARMING IN THE INITIAL EOCENE."

The Paleocene-Eocene Thermal Maximum (PETM), a ~5ºC global warming event associated with a sharp negative carbon isotope excursion that occurred during the initial ~100-200 ky of the Eocene epoch, has been studied by many as a partial analog for ongoing anthropogenic climate change, but its cause remains uncertain. The discovery of a magnetically anomalous, kaolinitic clay layer in PETM sediments deposited on the Atlantic Coastal Plain of New Jersey, in the northeastern United States of America, led Kent et al. (2003) to speculate that the warming was triggered by a cometary impact. In this hypothesis, the magnetic

properties indicating an unusual abundance of fine-grained, single-domain magnetite are produced by a phase that condensed from an impact ejecta plume. A more oxidized iron-rich nanophase has been found at several Cretaceous-Paleogene boundary sites.

Alternatively, these magnetic properties could be produced by an abundance of magnetite formed by magnetotactic bacteria. Whereas an impact condensate would likely produce roughly equidimensional iron-rich particles, either isolated or in clumps, magnetotactic bacteria typically produce chains of particles, often elongate. Ferromagnetic resonance (FMR) spectroscopy, which is uniquely sensitive to chain arrangement and particle elongation, is ideal for distinguishing between these two hypotheses.

FMR analysis, coupled with more conventional rock magnetic analyses and transmission electron microscopy, reveals that biology, not a bolide, is responsible for the magnetic properties of the New Jersey PETM kaolinite. The sediments were deposited during a prolonged interval during which magnetotactic bacteria and other iron biomineralizing microbes were exceptionally abundant and well-preserved. Based on the ecology of modern magnetotactic bacteria, we therefore infer that biogeochemical changes during the PETM led to the development of enlarged suboxic zones in the lower water column or sediments.

Meter-scale suboxic zones occur today within the mobile mud belts of tropical river-dominated continental shelves, such as the Amazon Shelf. We hypothesize that sedimentological and hydrological changes during this ancient episode of severe global warming fostered the development of analogous conditions in the continental shelf of North America. Our mapping of the extent of the magnetofossil anomaly through the Atlantic Coastal Plain in the Mid-Atlantic United States supports this model. Our discovery reflects the dramatic changes that global climate change can trigger in benthic ecology and biogeochemistry.

Mar. 13 - Reserved for sed interview talk

Mar. 20 - Spring break

Mar. 27 - Leigh Royden (MIT) (SPONSOR: DEMETS)
"Uplift, Evolution and Geodynamics of the Tibetan Plateau

Apr. 3 - Stephanie Prejean (USGS Anchorage) (SPONSOR: THURBER)

Apr. 8 Peter Cook, CSIRO, NGWA Darcy Lecturer
"Environmental Tracers in Modern Hydrogeology: Reducing Uncertainty in Ground Water Flow Estimation"

Apr. 10 - Joe Stoner Oregon State, Quaternary (SPONSOR: ANDERS)
"Climatic implications of abrupt geomagnetic change"

Apr. 17 - Board of visitor's meeting (OPEN)

Apr. 24 - Susanne Janecke (Utah State University) (SPONSOR: DEMETS)
"Reorganizing plate boundaries, evolving basins, pseudotachylyte, detachment faults, and crossing strike-slip faults: Southern California"

May 1 - Laurent Charlet, Univ. Grenoble (SPONSOR: NITA)

May 8 - Peter Visscher (SPONSOR: ERIC)
"Microbial mechanisms forming modern marine stromatolites - Using the present to predict the past"

Veterans Memorial Scholarship

The Rocky Mountain Association of Geologists Foundation will again grant a $2500 award to a graduate student in geology who is an active member of the United States Armed Forces, a reservist, or an honorably separated veteran. A pdf version of the application form can be downloaded from www.rmag.org/RMAG Foundation/Veternas' Memorial Scholarship/ Application.

Applications must be submitted electronically to laura.wray@williams .com pr by mail to:
Laura L. Wray
RMAG Foundation Chair
3747 South Jasmine Street
Denver, CO 80237

Application deadline is April 3, 2009.

Subject: Graduate summer internships in volcano seismology/geodesy

The University of Alaska Fairbanks (UAF) announces the availability of paid summer internships for U.S. graduate students from U.S. universities in seismology, crustal deformation, igneous petrology, and physical volcanology. Successful applicants will become members of a US-Russia-Japan team comparing the response of crustal magma systems to catastrophic decompression at Bezymianny and Shiveluch Volcanoes, Kamchatka, Russia, and Mount St Helens, Washington. The project is part of the National Science Foundation's program, Partnerships in International Research and Education (PIRE), which seeks to introduce US graduate students to internationally collaborative science.

The ideal student participant will be at an early or middle stage of her or his PhD program, be physically and mentally prepared for rigorous field investigations under difficult conditions, and have a strong interest in international collaboration and understanding. It is also desirable that the student's major advisor share an interest in the research and, although not a requirement, that the work can become a component of the student's PhD program. Complete announcement and application forms can be obtained at http://gps.alaska.edu/PIRE and by contacting the relevant science team leaders below. The deadline for application is March 1. Selections will be made by March 15. As required by the NSF, the competition is open only to US citizens or US permanent residents.

Seismology
Michael West (west@gi.alaska.edu)
Geodesy
Jeff Freymueller (jeff@giseis.alaska.edu)
Petrology/Volcanology
Pavel Izbekov (pavel@gi.alaska.edu)

POSITION OPENINGS:

- The College of Lake County is a progressive two-year community college located in suburban Chicago in northeastern Illinois - Instructor, Earth Science
- The Department of Earth & Planetary Sciences at Washington University in St. Louis is hiring a full-time research scientist to oversee a new stable isotope biogeochemistry facility
- PhD Position: Climate reconstruction in African Great Lakes region during the last millenium
- U.S. Geological Survey (USGS) Position Available -- Chemist/Physical Scientist
- GeoSciences: Edinburgh Materials and Micro-Analysis Centre (EMMAC) Research Fellow
- The Faculty of Geosciences at Ruhr-University Bochum (Department of Geology, Mineralogy, and Geophysics) seeks to appoint a junior-professor (W1) (approximately equivalent to the rank of an assistant professor / lecturer) in Petrology
- The U.S. Geological Survey (USGS) Florida Integrated Science Center in St. Petersburg, Florida (FISC-St. Pete), is recruiting highly motivated scientists in the field of coastal geology.
- Position Outreach-Forest Minerals Program Leader - Bridger-Teton National Forest - Pinedale, Wyoming

POSITION OPENINGS:

POSITION:	**Instructor, Earth Science**
STARTING DATE:	August 2009
DESCRIPTION OF POSITION:	Responsibilities for this position include teaching a variety of courses in geology, such as, Physical Geology, Environmental Geology, Field Geology and Oceanography. Courses are taught both day and evening primarily at the Grayslake campus. Other required faculty duties include participation of Science Outreach Program, academic advisement to students, curriculum development, and service on college committees
QUALIFICATIONS REQUIRED:	Master's degree in Geology, demonstrated success and academic experiences with diverse populations and diverse teaching methods.
QUALIFICATIONS DESIRED:	Knowledge of geology and oceanography; teaching experience in Physical Geology, Environmental Geology, Oceanography, Field Geology, and Historical Geology; experience with GIS and alternative delivery methods to include online and/or hybrid course delivery.
CONDITIONS OF EMPLOYMENT:	This is a full-time, tenure-track faculty position. Salary placement is commensurate with education and experience. The minimum 2009-2010 nine-month base salary ranges from $44,005 with a master's degree to $57,240 with a doctorate in the subject field. Because health insurance participation is mandatory for new faculty and health insurance premiums are deducted from the base salary, each new faculty member receives a flexible compensation allowance of $5,700 per academic year in addition to the base salary. This amount is intended to defray the cost of single medical insurance coverage. Optional contract for the summer session offers potential for significantly greater earnings. Faculty may be assigned to campuses other than Grayslake.
THE COLLEGE:	The College of Lake County is a progressive two-year community college located in suburban Chicago in northeastern Illinois, with a student enrollment of more than 16,000. Dedicated to excellence in teaching and learning, the College provides access to higher education, supports outreach to the community, and ensures accountability and continuous improvement. The College is committed to responding to the needs of its diverse community. The College offers courses in both day and evening at the Grayslake Campus, the Lakeshore Campus, the Southlake Campus, and other locations within the county as well as offering courses in various formats including offering courses online. Faculty are critical to the active governance structure at the College and opportunities to engage in activities outside the classroom are important to the professional development of individuals and the institution.
APPLICATION PROCEDURES AND DEADLINES:	For full consideration, applicants are expected to submit a completed application form, current resume, cover letter, three (3) letters of recommendation, and official transcripts of all degrees by **April 10th, 2009.** For an application form, please visit our website www.clcillinois.edu. The College of Lake County is an equal opportunity employer and has a strong commitment to the principle of diversity. In that spirit, it seeks a broad spectrum of candidates including minorities, women, and people with disabilities. *Applicants who will earn a Master's degree by June 2009 will be considered.

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Isotope Biogeochemistry Research Scientist

The Department of Earth & Planetary Sciences at Washington University in St. Louis is hiring a full-time research scientist to oversee a new stable isotope biogeochemistry facility under the direction of Assistant Professor David Fike. Laboratory research focuses on analysis of carbon and sulfur isotopes in modern and ancient systems (additional information at: http://biogeochem.wustl.edu). The laboratory will include two gas source mass spectrometers (Delta V and MAT 253), specifically configured for high-precision sulfur (SO2) and carbon (CO2) isotope analysis, and associated peripherals.

The successful candidate will be an integral part of the research group. Expected activities include: improving extraction/purification and/or developing novel applications for carbon/sulfur isotope mass spectrometry; operation and maintenance of mass spectrometers and associated peripherals/vacuum lines; training and day-to-day oversight of undergraduate students; and lab safety. Active participation in original research is encouraged. Salary will be commensurate with experience.

Applicants should have obtained a Ph.D. in isotope geochemistry (or related field) with prior experience using/maintaining gas source mass spectrometers. This is a non-faculty academic position not on the tenure track.

Washington University is an EO/AA Employer. To apply, please send cover letter, CV and names of 3 references to dfike@levee.wustl.edu. Application review will begin April 15, 2009 and will continue until the position is filled.

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PhD Position: Climate reconstruction in African Great Lakes region during the last millenium
A 3-year PhD position funded by the French Agency for Atomic Energy (CEA) is available at the Laboratoire des Sciences du Climat et de l'Environnement, Gif-sur-Yvette (South of Paris, France). The position is to be filled by automn 2009. Supervisors will be Christine Hatté (LSCE) and David Williamson (CEREGE, Aix-Marseille, France).
The research project focuses on both organic and isotopic geochemistry and modelling to reconstruct last millenium environmental changes around Massoko Lake (Tanzania). Additional information is available on:
http://www-instn.cea.fr/Publication_Sujet.php3?idSujet=939&langue=uk&lang=EN&id_rubrique=140
Precondition for the application is a master 2 or equivalent certificate in climatology, geochemistry, geology or .... We are looking for a person with a strong commitment to independent research. Experience in stable isotope geochemistry, organic geochemistry, statistics and/or inverse modeling are beneficial. Good language skills in English are required for Non-French applicants.
Applications including the common documents (CV, letter of intent, certificates, letters of reference) should be sent until **April 1st, 2009** electronically to:
Christine Hatté christine.hatte@lsce.ipsl.fr **David Williamson** davwill@cerege.fr

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U.S. Geological Survey (USGS) Position Available -- Chemist/Physical Scientist

The USGS, Central Energy Resources Team, is soliciting interest from qualified individuals for one Chemist/Physical Scientist position in Lakewood, Colorado. Successful applicants will have qualifying education and expertise in the concepts, principles, and practices of physical and analytical chemistry, mass spectroscopy, gas chromatography, elemental analysis, and high vacuum technology. Knowledge of petroleum/coal geology/geochemistry is highly desirable. He/she will be responsible for the operation and maintenance of three continuous flow (CF) stable isotope ratio mass spectrometers (IRMS) and related peripherals necessary to acquire stable isotopic data. The incumbent must additionally develop new techniques and procedures with an emphasis on compound-specific gas-chromatography (GC)-IRMS for stable carbon and hydrogen isotopes. Candidates must be able to work as part of an analytical laboratory team, and exchange technical information related to sample analysis, data interpretation, and QA/QC with analysts and other research scientists.

Applications (resume and application questions) for this vacancy must be received on-line via USAJOBS BEFORE midnight Eastern Time (Washington, D.C. time) on the closing date of this announcement. If you fail to submit a complete on-line resume, you will not be considered for this position. Requests for extensions will not be granted. If applying on-line poses a hardship for

you, please speak to someone in the Servicing Personnel Office listed on the announcement PRIOR TO THE CLOSING DATE. For assistance and questions contact the Office of Human Resources at 303-236-9586 or hdorsey@usgs.gov.

Effective February 27, 2009, USAJOBS can be accessed at http://www.usajobs.opm.gov. Announcement numbers are CR-2009-0237, CR- 2009-0238, CR-2009-0239, and CR-2009-0240. This is a full time permanent position (Chemist/Physical Scientist, GS-1320/1301-09/11/12) with a salary range of $49,970-$94,200 depending upon qualifications. The closing date is March 20, 2009.
U.S. Citizenship is required. USGS is an Equal Opportunity Employer.Technical questions related to this position may be directed to gsellis@usgs.gov.

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GeoSciences: Edinburgh Materials and Micro-Analysis Centre (EMMAC) Research Fellow
Vacancy details

* Vacancy Reference: 3010426
* Department: GeoSciences
* Job Title: Edinburgh Materials and Micro-Analysis Centre (EMMAC) Research Fellow
* Job Function: Academic
* Job Type: Full Time
* Live Date: 12-Feb-2009
* Expiry Date: 17-Mar-2009
* Salary Scale: £36,532 - £43,622
* Internal job: No. Anybody can apply for this position.
* Further Information: Further Information
* Conditions Of Employment: View Conditions of Employment

The School of GeoSciences, one of the largest in the UK, is currently seeking a Research Fellow to support the School's and the Research Council's (NERC) Ion Microprobe Facility. You will be involved in developing new analytical techniques, teaching and supervising Facility users, assisting in the maintenance of the two Ion Microprobes that are part of EMMAC and undertaking research. You should have a PhD in a relevant science discipline and a proven research record. Knowledge of Ion Microprobe instrumentation is not required but experience in the maintenance, development and use of related or similar analytical equipment is essential. You will work closely with the existing EMMAC staff in providing an analytical service and develop their own research programme.

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The Faculty of Geosciences at Ruhr-University Bochum (Department of Geology, Mineralogy, and Geophysics) seeks to appoint a junior-professor (W1) (approximately equivalent to the rank of an assistant professor / lecturer) in Petrology by October 1, 2009.

The successful candidate should have a Ph.D degree in a relevant field of science that was obtained not longer than five years ago. The position is not tenure track a priori, but possibility of getting tenure, subject to evaluation of performance, is not excluded. The Junior-professor will have a teaching obligation of four hours per week per semester at the B. Sc- and M. Sc levels within the Geoscience curriculum of the department. The candidate is required to be able to provide basic training in field work to students.

Research interest should preferentially cover some aspect of the quantitative investigation of large-scale processes in the Earth's interior with direct connection to field observations. It is expected that the successful candidate will be able to acquire external research funding. At the time of appointment, proficiency in German is a plus but not a requirement.

Ruhr-University Bochum seeks to increase the number of women in its faculty and thus explicitly invites applications from qualified women. We welcome applications from qualified academics with handicaps.

Applications should include a statement on current and planned research activities, teaching experience and a statement of teaching philosophy, a curriculum vita, and a list of publications. The deadline for application is April 30, 2009. Applications should be sent to Prof. Dr. Uta Hohn, Dean of the Faculty of Geosciences (Geowissenschaften), Ruhr-Universität Bochum, D-44780 Bochum. Email: geodekanat@rub.de

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The U.S. Geological Survey (USGS) Florida Integrated Science Center in St. Petersburg, Florida (FISC-St. Pete), is recruiting highly motivated scientists in the field of coastal geology. We are looking for candidates who demonstrate strong potential to become scientific leaders in their field. Recent graduates and scientists with established research programs will be considered.

The USGS FISC-St. Pete (http://coastal.er.usgs.gov/cfcg/) supports an integrated science team of 120 geologists, oceanographers, geochemists, engineers, microbiologists, biologists, ecologists, physical scientists, hydrologists, technicians, interns, students, and administrative staff. The FISC-St.Pete office has a $15 M annual budget primarily funded by five USGS Programs, including the Coastal and Marine Geology Program (http://marine.usgs.gov/), and multiple reimbursable projects. Our research facility consists of three buildings totaling more than 50,000 sq. ft. that are well equipped with state-of-the-art labs and outstanding field capabilities. We are located on the University of South Florida Bayboro Campus that provides ample collaboration opportunities with many partners: the USF College of Marine Science and Center for Ocean Technologies, USF St. Petersburg Department of Environmental Science and Policy, Florida's Fish and Wildlife Research Institute, NOAA National Marine Fisheries, and SRI International Marine Technology R&D Facility.

Scientific activities at FISC-St.Pete include:

- basic research in geology, hydrology, biology, ecology, and related sciences;
- evaluation of hazards including floods, droughts, hurricanes, and climate change;
- research on links between biodiversity, habitat, ecosystem processes, and health;
- mapping of onshore and offshore benthic habitat and geologic framework;
- assessment of mineral resources and development of techniques for their discovery;
- development of technologies for collection and interpretation of Earth science data;
- collection and archival of data and information for a variety of uses and users;
- development of technology to process and distribute geospatial information;
- provision of scientific support for legislative, regulatory, and management decisions;
- cooperation with academia, industry, and other Federal, State, and local agencies.

The successful applicant will participate in a broad research program that addresses coastal response to natural and human-induced processes. Processes of particular interest include geologic and societal impacts of climate change, sea-level rise, and extreme storms (http://coastal.er.usgs.gov/hurricanes/). In addition to leading new efforts, the applicant will contribute to ongoing research at the USGS that is aimed at understanding geologic processes that drive environmental change, decline of coral reef ecosystems, geomorphology, geology, stratigraphic framework, and aggregate resources. Our program currently supports major national and international field research projects in the Gulf of Mexico, southeastern United States, and U.S. Virgin Islands. The program utilizes remote sensing (such as lidar) and GIS capabilities, high-resolution seismic profiling, side-scan sonar, and bathymetric surveys as well as development and application of marine and land-based sediment sampling techniques. The northern Gulf of Mexico is expected to be an important focus area for future efforts (http://ngom.usgs.gov/).

The successful applicant is expected to collaborate with other Federal and academic researchers and apply state-of-the art analytical methods, which may include both observation and modeling. Research results must be published in peer-reviewed journals and USGS reports. In addition to having significant scientific impact, research results should also impact a broad range of societal issues including, for example, management of coastal resources, land use, and geologic hazards.

How to apply:
Detailed vacancy requirements and application procedures can be found at USAJOBS.com. This position is being advertised concurrently under the following vacancy announcement numbers: ER-2009-0103, ER-2009-0104 and ER-2009-0105 (e.g., http://jobsearch.usajobs.gov/ftva.asp?seeker=1&JobID=78837770). To be considered, applications must be submitted online by midnight Eastern Standard Time, February 27, 2009. This is an interdisciplinary position that is advertised as a 4-year term Research Geologist, Research Oceanographer, or Research Physical Scientist. Salary is $67,613.00 to $87,893.00 per annum (GS-1350/1360/1301-12). This position is being advertised as entry-level research at the Federal pay rate of GS-12, but exceptional candidates will be considered for a permanent position with a full promotion potential to GS-15.

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POSITION OUTREACH-FOREST MINERALS PROGRAM LEADER
GS-401/801-11
BRIDGER-TETON NATIONAL FOREST - Pinedale, Wyoming

GEOBULLETIN
MARCH 6TH, 2009

The Bridger-Teton National Forest will soon be re-advertising for a forest minerals program leader responsible for the operation of the Forest's minerals activities. This notification is being circulated to inform prospective applicants of the upcoming opportunity and to determine interest in the position. The location for this position is Pinedale, Wyoming. The successful applicant will work 50 percent for the forest and 50 percent for the Pinedale Bureau of Land Management. They will occupy offices at both Pinedale locations.

TOUR OF DUTY: Permanent, Full-time.
HOUSING STATUS: No housing is available.
OUTREACH RESPONSE: Interested applicants or those requiring further information should contact Steve Haydon at 307-739-5535 (shaydon@fs.fed.us). **Please send Steve an email if interested.**

ABOUT THE POSITION:

The position is responsible for the coordination of all forest minerals activities on the Bridger – Teton National Forest and specific minerals assignments from the BLM. Forest assignments include both our oil and gas program, gravel operations, required NEPA, and work on the forest plan revision team. BLM work includes NEPA, environmental review of activities, and other specific assignments. The position is a unique opportunity to work together with both organizations and help them both to implement their minerals programs. During field season, the incumbant will be required to spend some time in the field completing and coordinating projects. The position is located within the Engineering/ Minerals staff group of the forest.

ABOUT THE FOREST AND AREA:
The Bridger-Teton National Forest (BTNF) is part of the largest intact ecosystem in the lower 48 states. The 3.4 million acres stretch from the southern border of Yellowstone National Park, covering the entire eastern flank of Grand Teton National Park, wrapping around Jackson Hole valley, to the sage-brush prairies of southwest-central Wyoming.

The Greater Yellowstone Ecosystem is a loosely defined area characterized by high elevation coniferous forests, sage/grass steppes, mountain ranges and deep valleys, large expanses of wild lands and three wilderness areas, abundant wildlife, and internationally recognized scenic and natural features.

The Forest includes headwaters of three nationally significant rivers (Yellowstone, Snake and Green). Tributaries to these rivers are considered exceptional in trout habitat and home to native strains of cutthroat trout.

Some of the largest and most diverse populations of mammals in North America exist here. This ecosystem still includes all of the major carnivores, an indication of its ecological completeness. The area includes undisturbed habitat for threatened and endangered species including the grizzly bear.

Recreation opportunities and scenic quality are internationally renowned. The BTNF attracts over 3.6 million visitors each year. The three wilderness areas cover over 1.3 million acres; the Bridger, the Teton and the Gros Ventre totaling more than one-third of the BTNF acreage, and containing major migration routes for wildlife. The Forest offers some of the nations best opportunities for winter sports. The backcountry landscape contains a multitude of cross-country skiing trails and miles of trails for snowmobiling. The Forest also offers unique features such as the scenic and challenging Snake River Canyon, where more than 150 thousand visitors float through its whitewater each year; Periodic Springs on Swift Creek near Afton, which is one of the few coldwater geysers in the world; Fremont Lake, the second largest lake in the State of Wyoming, and one of the deepest in the U.S.; Kendall Warm Springs known as the only home for the Kendall Warm Springs Dace; and Gannett Peak (elev. 13,804) the highest point in Wyoming.

The BTNF also has important commodity resources as the biggest producer of helium in the world. Approximately 360,000 acres are open to oil and gas leasing. The Pinedale BLM is one of the most highly productive oil and gas offices in the state, working with many of the largest producers in the world. This is a highly complex program from which you will assigned individual projects, most of which complement your forest assignments.

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