

**Minutes of the SDSM&T GGE Advisory Board Meeting
October 6, 2018**

SD Mines Campus

GGE Advisory Board Members Present: Janet Carter (Chair), Sherwin Artus, John Chandler, Andrew Farke, David Hammond, and Steve O'Rourke

GGE and Museum Faculty and Staff Present: Laurie Anderson, Zeynep Baran, Arden Davis, Ed Duke, Kurt Katzenstein, Sarah Keenan, Liangping Li, Tim Masterlark, Darrin Pagnac, Chris Pellowski, Curtis Price, Foster Sawyer, Dan Soeder, Gokce Ustunisik, and Kevin Ward

Others Present: Jim Rankin (SD Mines President), Joel Kincart (SD Mines Foundation President)

Meeting called to order by Laurie Anderson at 9:00 a.m.

A motion to approve the minutes from the May 2018 meeting was made by Gokce Ustunisik and seconded by Steve O'Rourke. The motion passed unanimously.

Introduction and Remarks: President Rankin

- Campus updates:
 - The Alumni Foundation Center is under construction with an estimated completion date of August 2019.
 - The Foundation has purchased the land (with a former convenience store) across the street from campus on St. Joseph Street.
 - The future use of the building that now houses the Foundation is not clear at this time.
 - MI Building:
 - Renovations are not on the Regent's priority funding list this year. Their priorities are need-based scholarship, maintenance funds, and increased salaries.
 - SD Mines plans to go directly to the legislature to propose a bond issue with payments coming from a portion of the precious mineral tax (\$1.25 million/yr). The remaining costs will be raised via the Foundation and from the SD Mines budget. Whether the project will be a renovation of the existing building or a new construction is still being decided. The location of a new construction has not been selected.
 - Surbeck expansion is also a priority with \$2.7 million raised toward a ~\$5 - \$5.5 million need.
 - There is support in place to remodel the library first floor.

- The DUNE project at SURF is progressing and developing as a test facility for instrumentation (\$10M).
- The business incubator on campus has been named Ascent Innovation.
- Enrollments are down by 4.5% this year, with new freshmen enrollment even with last year.
- The university is engaged in strategic planning and strategic enrollment planning this year.
- The placement rate for 16-17 was 97% campus wide.
- Athletics has added eSports.
- Computer Science and Computer Engineering are going to be united into a single academic department starting in Fall 2019.

Introduction and Remarks: President Kincart

- \$8.3 million was raised this year for campus (goal was \$8 M), with \$2.8 million for scholarship support.
- There were over 2000 donors, 11% of alumni are donors, and 68% of alumni donors were retained.
- Priorities for fund raising are:
 - Scholarships
 - Surbeck Center
 - MI
- The new University Strategic Plan will help the Foundation set priorities.
- The Alumni Center will have seating for 100 people, include small conference rooms, which could be used for a teleconferencing facility.

Department and Museum Updates:

- Faculty and staff news:
 - Hires: Sarah Keenan (assistant professor, paleontology), Curtis Price (lecturer, geospatial, Kevin Ward (assistant professor, geophysics).
 - Kurt Katzenstein received the Bernard A. Ennenga Award.
- Alumni and Friends awards and news:
 - Janet Carter (GEOE 1992) was named the 2018 J.P. Gries Geologist of the Year by the South Dakota section of AIPG.
 - Steve O'Rourke (GEOE 1983) received an Honorary Doctorate (Public Service) from SD Mines in December 2017.
 - Kenny Brown (PRL Volunteer) was nominated for a 2018 Spirit of Volunteerism Rapid City Award.
 - Michelle Hall (GEOE 1981) will be participating in PolarTREC IceCube Science Education Solutions in Antarctica.
 - Scyller Borglum (GEOE 2018) was appointed to the SD Legislature.
- Student/Club External Awards

- Broc Kokesh (MS PALE 2018) received a Fulbright Fellowship to Jamaica for 2019.
- Kyle Hazelwood (PhD GEOL) received the NAGT Outstanding Teaching Assistant Award for his work with the BHNSFS.
- The SD Mines Student Chapter of SPE received the Outstanding Student Chapter Award from the SPE.
- Alex Rogaski (MS GEOL) received a NASA Lunar & Planetary Inst. Exploration Science Internship in 2018.
- Taran Bradley (MS GEOL) received ASD Students in Mining & Energy Inst. support.
- Ryan Puzel (MS GEOL) received the MGWA Gil Gabanski Scholarship.
- Fleford Redoloza (MS GEOE) received a 2nd place poster award from the Western SD Hydrology Conference.
- Jordon Mason (BS GEOL) received an NAGT-USGS Internship.
- Student SD Mines Awards
 - Wyatt Tatge (BS GEOE) received the RESPEC Research Grant for 2018-19.
 - Bobbi Strange (BS GEOE, MINE) was selected for the 2018 Leadership Hall of Fame.
 - Brooke Long (PhD GEOL) received the Joseph Nelson Fellowship.
 - Colton Medler (MS GEOL) received the Kate Simmons Teskey Fellowship.
 - Desiray Wilson (BS GEOL) received the John P. Wold Scholarship.
 - Kristen Pratscher (BS GEOL) received the 3rd place poster award for the SD Mines Research Symposium.
 - Stephanie Loose (MS GEOL) received the GWS Outstanding Student. Organization Member award for 2018.
- GGE Awards and Scholarships
 - Redden Award (Outstanding GEOL Senior):
 - Hallie Bower
 - Jordan Mason
 - Tullis Award (Outstanding GEOE Senior):
 - Todd Anderson
 - Outstanding GGE graduate students:
 - MS GGE: Zhendan Cao, Robert Huber
 - MS PALE: Broc Kokesh
 - PhD GGEME: Scyller Borglum
 - Scholarships (*indicates new students)
 - *Artus* (BS GEOE): Dominic Krause, Wyatt Tatge, Regan Wess
 - *Artus Petroleum Systems*: Miranda Berg (BS GEOE), Mollie Hunt (BS GEOE), Justine Langas (BS GEOE), Jacob Truxal (BS GEOE)
 - *Baresh*: Michael Nieland (BS GEOL)
 - *Barrick Gold*: Ryan Peyton (BS GEOE), Desiray Wilson (BS GEOL)
 - *Bauer*: Peter Daly (BS GEOL)

- *Bell*: Ryan Bozer (BS GEOL)
- *Bittner/Campbell*: Michael Nieland (BS GEOL)
- *GGE Department* (Multiple Donors): Jacob Adams (BS GEOL), Jimmy Bradford (BS GEOL, Colton Mumma (BS GEOE), Perrin Salonek (BS GEOE)
- *Darton Society* (Field Camp): Mollie Hunt (BS GEOE), Dominic Krause (BS GEOE), Aaron Kusch (BS GEOE), Max Southbloom (BS GEOE)
- *Davis*: Dominic Krause (BS GEOE)
- *French*: Alexander Rogaski (MS GEOL)
- *Gleason-Hammond*: Haley Noteboom (BS GEOE)
- *Hammond Family Memorial*: *Emma Rogers (MS Geology)
- *Heinemann Petroleum Systems*: Jessica Lohrenz (BS GEOE), Abhishek Ray (BS GEOE)
- *Holmes*: Brittany Coupe (BS GEOE); Seth Vandenberg (BS GEOL)
- *Kulik*: John Murzyn (BS GEOL)
- *Kulik Field Station*: Dominic Krause (BS GEOE), Tristan Walker (BS GEOL)
- *Gries* (undergrads): *Coleton Deitz (BS GEOE), *Corrine Cranor (BS GEOL), *Richard Lim (BS GEOE), *Alice Morris (BS GEOL), *Hunter Schroeder (BS GEOL), *Samantha Schmidt (BS GEOL)
- *Gries* (grads): Julie Driebergen (MS PALE), Jared Fox (MS GEOL), Shannon Harrel (MS PALE), Kayleigh Johnson (MS PALE), *Brian Lauters (MS PALE), *Kristen Lewis (MS GEOL), Brooke Long (PhD GEOL), Nichole Ridgwell (PhD GEOL), *Patrick Wilson (PhD GEOL)
- *Lemley* (field camp): Tristan Walker (BS GEOL)
- *Lisenbee* (BS GEOL): Hannah Duncan
- *Mickelson*: Kyle Hazelwood (PhD GEOL)
- *Newmont*: Jacob Adams (BS GEOL), *Chloe Jungwirth (BS GEOE), Dominic Krause (BS GEOE), Regan Wess (BS GEOE)
- *Roadifer*: *Marissa Holinka (BS GEOL), *Joshua Sarver (BS GEOE), *Claudia DeBlieck (BS GEOL), *Grace Lickteig (BS GEOL)
- *Surbeck-Connolly*: Michael Nieland (BS GEOL)
- *Schaefer*: Tristan Walker (BS GEOL), Maxwell Southbloom (BS GEOE)
- *Stickler*: Anthony Gordon (BS GEOL)
- *Roberts* (UG): Joseph Durst (BS GEOL), Gabriel Poteet (BS GEOL)
- *Roberts* (Western Gem and Mineral Society): Victoria Karnes (BS GEOL)
- *Roberts* (Grad): *Disha Gupta (MS GEOL)
- *Whiting Scholarship/Fellowship*: *Todd Anderson (MS GEOE), Taren Bradley (MS GEOL), Kyle Hazelwood (PhD GEOL), Mike Baranowski (PhD GEOL), Zhendan Cao (MS GEOL), Ryan Puzel (MS GEOL), Colton Medler (MS GEOL), Fleford Redolozza (MS GEOE)

- *Whiting Student Enrichment* (13 students, 9 destinations): Taren Bradley (AMNH), Zhendan Cao (AGU), Andrew Clift (RMR, GSA), Michael Day (GSA, Goldschmidt 2018), Robert Huber (AEG), Kayleigh Johnson (AMMP), Lilly Jones (CUAHSI), Broc Kokesh (GSA), Devin Last (RMR), Brooke Long (mothur workshop), Kristin Pratscher (GSA), Nichole Ridgwell (AMMP), Alex Rogaski (GSA, AMNH)
- Student data:
 - Undergraduate enrollments are down (56 GEOE, 76 GEOL for Fall 2018), although graduations are stable (17 GEOE, 23 GEOL for 2017-18). Graduate enrollments are stable (23 MS GGE, 8 MS PALE, 13 PhD for Fall 2018), although graduates were down somewhat (2 MS GGE, 3 MS PALE, 1 PhD).
 - Placement rates for 2016-17 are 96% for GEOE BS, 93% for GEOL BS, and 100% for all graduate degree programs. Note that 1 in 3 companies participating in the 2017 Fall Career Fair have direct ties to MI programs (GEOE, GEOL, MEM or MET).
- Grants and Contracts:
 - In FY18 submissions of research grants with a GGE PI or co-PI were \$7,847,419. Grant expenditures were down slightly, and new awards increased.
- Museum of Geology:
 - In FY18, the Museum had 24,356 visitors, made \$70,372 in sales, led 65 tours (for 1,650 participants), participated in 15 teaching events, and responded to 236 requests for fossil and rock IDs. In addition, 34 volunteers logged 3,457 hours, 3,096 specimens were loaned for teaching, research and outreach activities, and 10 research visitors were hosted in the PRL. Further, 246,706 specimens were entered/updated in the collections data base, 13 MS and PhD projects and 4 undergraduate research projects were supported. Federal agencies served included the BLM, BoR, NPS, USACE, and USFS. A new repository agreement was developed and approved by SD Mines and USFS. Students employed included 17 RAs and student workers in the PRL and 22 student workers on the public floor.
 - The Museum will undergo a site visit for accreditation review through the American Alliance of Museums in FY19.
- Development activities in FY18:
 - The department received \$329,329 in unendowed gifts, including support for ERI, student/department support, student clubs, research, and the BHNSFS. In addition, \$1,750 were added to endowments (scholarships/fellowships).
 - The museum received \$2,410 in unendowed support in FY18.
 - The top 5 goals in development for each unit are:
 - Department:
 - Mineral Industries Building
 - Graduate fellowships

- Funds to support faculty start up
 - Field station for BHNSFS
 - 2 endowed chairs: Mineral Resources, Petroleum Geology/Engineering
 - Museum:
 - Mineral collections curation and housing
 - Exhibits renovation
 - Endowment support for staff salary in public programs/outreach
 - Endowment support for staff positions in collections
 - Student professional development (research) fund
- Budget requests for FY19:
 - Department:
 - Hire 2 assistant professors: funded and completed
 - Increase operations support: not funded
 - Upgrade MEM/GGE computer labs: funded and completed
 - Add new microscopes for student labs: funded and completed
 - Address salary compression and inversion: not funded
 - Museum:
 - Salary support for database manager: not funded
 - Increase MSM education and outreach activities: not funded
- BHNSFS updates 2018:
 - Total number of courses offered: 21
 - Number of locations: 13
 - Total number of students: 279
 - Total number of credits: 1,384
 - Total Revenue: \$1.338 Million
 - Number of schools represented: 91
 - Priorities for FY19:
 - New field station building in Black Hills. Plan approved, land being sought.
 - Assistant Director/Instructor position. Approved to search, hire to take place in spring 2019.
 - New camps for 2019:
 - Utah, New Zealand, France
- ERI
 - **Petrophysical Engineering and Research Laboratory (PEARL).**
 - University research capability development to investigate fluid movement through ultra-low permeability rocks.
 - Engineering and Mining Experiment Station (EMES) participating
 - Nanoscience and Nanoengineering program interested
 - Whiting Petroleum and RESPEC also interested – lab space at RESPEC

- Potential funding source: NSF Earth Sciences Instrumentation and Facilities Program; encouraged to submit a proposal; currently in process.
- **Drilling Simulator: Need help from AB to set this up.**
 - Industry consortium to cover capital and operating expenses of simulator.
 - Consortium member use as needed for crew training.
 - SD Mines student use when not otherwise occupied.
- **Pierre Shale Stratigraphy and Resource Evaluation**
 - New effort with Foster Sawyer, Janet Bertog, and Sarah Keenan
 - Potential funding from DOE Fossil Energy program.
- **Methane in Groundwater near Gas Wells**
- **Geothermal Resources on Pine Ridge Reservation**
- **New Horizons Energy Conference: October 25-26**
 - 37 attendees have signed up as of October 6 – probably more last minute.
 - One sponsor has pledged support (RESPEC) – thanks!
 - Speakers who have committed include Walter Guidroz of USGS to talk about their new Williston Basin assessment, and Will Gosnold of UND to talk about geothermal resources in the Williston.
 - New Horizons field trips: SURF trip is full; Black Hills trip still has room.
 - New Horizons PTTC Short Course: Volumes and Risk Assessment for Conventional and Unconventional Plays and Prospects by Dr. Alexei Milkov, Colorado School of Mines. Only one person has signed up so far.
 - Help from the AB to promote this conference would be welcome.
 - Sponsorship appeal sent out September 4 to Williston Basin operators and ND Oil & Gas Association.

Discussion of Undergraduate Curricula: what does a Geological Engineer/Geologist need to know and need to be able to do:

GGE faculty/staff and advisory board members worked in teams to develop lists. A summary of the results are:

- Geological Engineers Need to Know
 - Physical Principles
 - Math
 - Computing
 - Risk Assessment
 - Environmental Components
 - Basic Engineering:
 - Math, Physics

- Mechanics of Materials, Statics Fluids, Rock, Soil
 - Teamwork
 - Project Management
 - Communication
 - Chem + Geochem
 - Water Quality
 - Surveying
 - Geophysics
 - Groundwater
 - Hydrology
 - Basic Geology: Structure, Strat Sed
 - Ethics
 - Citizenship (society impacts)
 - Production Engineering (Drilling, Logging)_
 - Engineering Design (Integrating)
 - Engineering Analysis (Economics)
 - Field Competence
 - QA/QC
 - Speaking
 - Global perspective (impacts)
 - Forefront – “State of the art” (Keeping up with industry)
 - Qualitative and Quantitative Skills
 - Analysis, Synthesis
 - Resource Assessment: Geostats, probability
 - Material Science
 - Thermodynamics
- Geologists Need to Know
 - Links between fields
 - Quantitative Qualitative thinking (graph -> relations)
 - Broader Impacts
 - Communicating with broad group
 - Physical laws (chem, Bio, etc)
 - Math skills
 - Field and lab skills
 - Data Analysis / interpolate / extrapolate
 - Spatial relations
 - Plate tectonics
 - Deep Time
 - Relevant Materials / Relevant Processes
 - Computing and Modeling
 - Assumptions, Error
 - Mapping, including subsurface (cross section, 3D)

- GIS
- Field Camp skills
- Rock and Mineral identification
- Stratigraphy and Sedimentology
- Historical Geology
- Research Develop and Design (methodology)
- Economics and Ethics
- Genesis of mineral deposits (oil, ...)
- Observational and Analytical Skills
- Technology – data collection
- Data processing / data management
- Problem solving capability
- Geologists Need to Do
 - Think outside the box (open to other disciplines)
 - Be socially aware
 - Understand industry / academia
 - “Getting work out there”
 - Develop and design research projects
 - Teamwork, communication, “do technology”
 - Become a subject matter expert
 - Do basic skills, well rounded in fundamental physics, chem, math + communication
 - Learn fundamentals behind tech
 - Be globally aware
 - Use knowledge resources well
 - Read science effectively
 - Do critical thinking: is it correct?
 - Identify knowledge gaps Research
 - Understanding significant figures and error
 - Broader impacts
- Geological Engineers Needs To Do
 - Present knowledge, work, findings (speaking, writing, web content)
 - Resource Assessment
 - Water, gold
 - Quantitative + Qualitative Analysis
 - Do Risk, uncertainty
 - Economic Analysis (eg Resource vs Reserve)
 - Work in multidisciplinary teams (Diverse team including non-scientists [lawyers etc])
 - Problem solve
 - Quantitative Assessment eg Rock properties

- Design on y our feet
- Speak different (technical) languages; example: “sorting” (geol) vs “grading” (engineering)
- Social implications of projects
- Do modeling
- Speak write to lay (public) audience
- Use latest technology
- Analyzing “big data”
- Engineering design
- Do Project Management
- Leadership Skills
- Ethics
- Leadership is not the same as supervising
- Critical thinking

Discussion that followed included questions about a faculty position in economic geology, whether to poll alumni with these questions, the need for an assessment of what the majors do and do not cover from the above lists, and a request to send the list to the advisory board for a chance to think about overarching themes.

ABET:

David Hammond provided an overview of ABET and the accreditation of geology programs as well as changes to ABET criteria.

Board Business Meeting:

Janet Carter called the meeting to order. A quorum of advisory board members were not present.

Laurie Anderson presented a nomination of Barb Nielsen (GEOE 1985) as a board member. Hammond moved to approve the nomination and Artus seconded the motion. The board asked that the vote be held via email. (Subsequently passed unanimously.)

Two new committees were suggested, one for each undergraduate program. Carter, Hammond, and Chandler volunteered to serve on the GEOE committee, and Farke volunteered to serve on the GEOL committee.

The next advisory board meeting was tentatively scheduled for April 27th, and Anderson will check for a quorum via email. (Subsequently confirmed.)

The advisory board members liked having the research updates from faculty over lunch and would like to continue the practice. They also appreciated the exercise and discussion

of the curricula. They would like to have another conversation with faculty about what else the board could provide to the department.

O'Rourke moved to adjourn, seconded by Chandler.

The meeting ended at 2:40 p.m.

Following the meeting the following committees met: ERI, Museum.

Minutes Approved April 27, 2019