UNIVERSITY of ALASKA
Many Traditions One Alaska

Board of Regents Program Action Request

Proposal to **Discontinue** a Program of Study
University of Alaska

1a. UA University	1b. School or College	1c. Department or Program
UAF	CNSM	Geosciences

2. Complete Program Title: BA in Earth Science

3. Type of Program:

Undergraduate Certificate		Associate		Baccalaureate	x
Master's		Doctorate		Post-Baccalaureate Certificate	

4. Type of Action: x Discontinue

Implementation Semester: Fall Year: 2020

5. Other programs affected by the proposed action, including those at other campuses (please list):

Program Affected	Anticipated Effect
none	nothing anticipated

Page number of attached summary where effects on other programs are discussed: _____

6. Specialized accreditation or other external program certification needed or anticipated. List all that apply or	7. Aligns with University or campus mission, goals, core themes, and objectives (list):
None	Core theme Educate.
	Page in attached summary where alignment is discussed:

8. Teachout Plan (attached) x

Submitted by: _____
Chancellor/Provost Date: 3/31/2020

Consensus support of AC X Not supported by AC

Recommend **approval** by VPASR — DocuSigned by: E807E63EC77D4B8... Date: April 6, 2020

Recommend **disapproval** by VPASR — Date:

Revised: 11/11/2019

University of Alaska – Fairbanks
College of Natural Science and Mathematics
Teach-Out Plan

Proposed Discontinuation: BA Earth Science

- The program will be closed to new admissions immediately upon approval of discontinuance. Students who have been accepted into the program but have not attended class will be encouraged to switch to another program.
- The teach-out period will be for four academic years, beginning in the Fall 2020 semester and ending with the conclusion of Summer 2024 semester.
- Course work will be managed as follows:
  - Current courses will continue to be offered (either face-to-face or by distance) throughout the teach-out period;
  - Courses offering will be scheduled as to allow all students to complete their degree requirements but will be phased out over the teach-out period;
  - Students will receive regular communications as to when courses will be offered and will have comprehensive advising from both faculty and college advisers;
  - Course substitutions will be allowed per University guidelines and the program requirements published in the UAF Catalog;
  - Individual studies or directed studies, per University policy, where necessary;
  - Students will be allowed to use transfer courses, per University policy, from other accredited institutions to meet program requirements;
  - Students will be offered the opportunity to switch to an interdisciplinary degree or another major with comparable outcomes. Advisers will ensure students experience a minimal loss of credit hours and time.
  - Students who do not accept the teach-out plan, do not follow the plan, or who cannot complete within the defined period will be advised into a different program.

Degree Program Name	Earth Science BA
PROGRAM DEMOGRAPHICS	
FY19 Majors	8
FY19 Graduates	0
FY19 SCH from degree program	1623 SCH in GEOS, 0 specific to this program
FY19 UGF allocated to the program	0
FY19 total program budget	0
$ UGF/ SCH	0
STAFFING	
Tenure-track FTE faculty impacted by program deletion	0
Non-tenure track FTE faculty impacted by program deletion	0
staff impacted by program deletion	0
-- for each of these describe reduction phase-in during teachout	
PROGRAM IMPACTS	
Potential for the program to obtain external funding	Low; faculty teach in other disciplines
Impacts on meeting state or workforce needs	Medium, this degree fills some workforce needs but could be replaced with other degrees
PROGRAM UNIQUENESS AND TEACH-OUT PLAN	
Is this program unique in the UA system? If no, describe duplicate or similar programs	No, BS Envrionment and Society (UAA), BS Geography, Environmental & Outdoor Studies (UAS), BS Environmental Science (UAA)
Are there other majors to which the students may transfer (at MAU and at other MAUs)?	No
What reasonable options within your university do students have ?	Geology, Natural Resources and Environment
What reasonable options do students have across the UA System?	BS Envrionment and Society (UAA), BS Geography, Environmental & Outdoor Studies (UAS), BS Environmental Science (UAA)
What reasonable options do students have for transfer to another university?	Many universities have Earth Science as a degree choice.
What are the on-line options within UA for completion?	None
PROGRAM REDUCTION SAVINGS	
Total UGF savings following teachout	0
Timeline for cost savings and faculty/staff reductions	N/A

COMMITTEE RECOMMENDATION FOR GEOSCIENCES

STRENGTHS:

- Programs meet science needs of the state.
- Offers GERs and required courses for other majors as well as courses for Geosciences majors.
- Strong graduate programs, representing a significant portion of UAF's PhDs.
- Faculty very productive in research and have proven success in competing for external grants.
- Most of the graduating students either continue on to higher education or find employment in the geosciences.
- Critical link with the Geophysical Institute: Research at the GI is led by GEOS faculty and carried out by graduate students in the PhD and MS programs (Geosciences, Geophysics).
- Close collaboration with The Alaska Division of Geological and Geophysical Surveys (DGGS) .

WEAKNESSES:

- Enrollment in Geoscience programs rises and falls with activity in the petroleum and mining industries.
- Reduction in numbers of faculty has limited the course offerings for students, and has directly affected the graduate programs since fewer faculty are available to supervise and support students.
- One of the staff positions that has not been replaced is the Director of the Advanced Instrumentation Laboratory (AIL).
- Enrollments are low at the undergraduate level, especially in Geography.

OPPORTUNITIES:

- Additional external funding may be available.
- Development of online courses to increase student credit hours and number of majors.
- Discussions with colleagues at UAA regarding an MOU that would allow UAA grad students to receive PhDs through the Geosciences Dept. at UAF.
- More field courses could increase enrollment, especially from out-of-state students.
- Increased RA support: Faculty in the department have been highly successful securing external funding and supporting graduate students on RAs.
- Geospatial and Remote Sensing Science Certificate.
- Alaska and national job demand for Geoscientists: At the national level demand for Geoscientists is expected to increase by 6% in the period 2018–2028.

THREATS:

- Continued reductions in state funding, leading to the inability to attract, hire, and retain faculty.
- Potential expansion of non-UAF programs.

CENTRALITY TO MISSION:

- Serves unique science needs of the state.

INDICATORS OF QUALITY:

- Faculty and students are highly productive in publication and external funding.
- Employment of graduates.

COST-EFFECTIVENESS:

- 9 FTEs for 172 students (94 undergraduates & 78 graduates) with unrestricted salaries and benefits cost of approximately $1.65 million.

	MAJORS	DEGREES
Earth Science BA	FY15: 6/ FY19: 8	FY15: 0/ FY19: 1
Geography BA	FY15: 11/ FY19: 8	FY15: 2/ FY19: 0
Geography BS	FY15: 18/ FY19: 10	FY15: 3/ FY19: 2
Geoscience BS	FY15: 91/ FY19: 68	FY15: 8/ FY19: 7
Geoscience MS	FY15: 25/ FY19: 36	FY15: 4/ FY19: 9
Geoscience PhD	FY15: 11/ FY19: 11	FY15: 0/ FY19: 0
Geophysics MS	FY15: 12/ FY19: 8	FY15: 3/ FY19: 1
Geophysics PhD	FY15: 25/ FY19: 23	FY15: 0/ FY19: 5

*Geoscience was formerly Geology.

COMMITTEE RECOMMENDATION FOR GEOSCIENCES

Earth Science BA:

RECOMMENDATION:	ADDITIONAL COMMENTS:	DATE FOR FOLLOW-UP:
Continuation w/ improvement plan (8 votes)	Improve enrollment and time to degree	Two years

Geography BA:

RECOMMENDATION:	ADDITIONAL COMMENTS:	DATE FOR FOLLOW-UP:
Revision or restructure (8 votes)	There is not demonstrated need for both the BA and BS. Department should decide which is needed in order to	One year

	focus efforts on students' success in that degree.	

Geography BS:

RECOMMENDATION:	ADDITIONAL COMMENTS:	DATE FOR FOLLOW-UP:
Revision or restructure (8 votes)	There is not demonstrated need for both the BA and BS. Department should decide which is needed in order to focus efforts on students' success in that degree.	One year

Geoscience BS:

RECOMMENDATION:	ADDITIONAL COMMENTS:	DATE FOR FOLLOW-UP:
Continuation (8 votes)		

Geoscience MS:

RECOMMENDATION:	ADDITIONAL COMMENTS:	DATE FOR FOLLOW-UP:
Continuation (8 votes)		

Geoscience PhD:

RECOMMENDATION:	ADDITIONAL COMMENTS:	DATE FOR FOLLOW-UP:
Continuation (8 votes)		

Geophysics MS:

RECOMMENDATION:	ADDITIONAL COMMENTS:	DATE FOR FOLLOW-UP:
Continuation (8 votes)		

Geophysics PhD:

RECOMMENDATION:	ADDITIONAL COMMENTS:	DATE FOR FOLLOW-UP:
Continuation (8 votes)		

CHANCELLOR'S OFFICE
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Daniel M. White, Chancellor

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March 23, 2020

TO James R. Johnsen, President, University of Alaska

FROM Daniel M. White, Chancellor, University of Alaska Fairbanks

RE UAF Expedited Academic Review

In accordance with Regents' Policy 10.06.10, and as required by University Regulation 10.06.10.C.2, UAF followed the following process for expedited, exceptional Program Review that was tailored to UAF's particular financial circumstances. The process and timeline are included on the Provost's web site (https://uaf.edu/assessment-review/expedited-review.php). The effort began last October and we are now nearing the final stages of the process. Remaining steps are as follows with this step constituting step number 1, below:

1. Monday, March 23 by 5pm - Chancellor recommendations will be sent to the UA President and VP of Academic, Students, and Research.
2. April 1, 2020 – President's recommendations go to the SW Academic Council
3. April 9, 2020 – BOR Public Testimony
4. April 13-14, 2020 – BOR Academic and Student Affairs committee meets to discuss recommendations
5. June 4-5, 2020 – Board of Regents meets to vote on any program changes, including eliminations.

My program review recommendations are based on my review of the committee's analysis and recommendations, dean's reviews, consultation with the Provost, faculty senate motions, public input, budget considerations, and our need to make vertical cuts rather than ongoing horizontal cuts. I did not ask the program review committee to reach a specific budget target because I wanted to make sure that the review committee members were given the latitude to evaluate all of the aspects of the programs and not pit programs against one another. As a result, and not surprisingly, very few program reductions were recommended by the committee. I think that is a reasonable result of the process to date. While it is true that all of our programs have value, history, and students, it is also true that some programs will need to be reduced. All aspects of the university will need to play a part in meeting our budget targets. Furthermore, I have received feedback imploring me to make some vertical cuts to programs, not just horizontal percentages from all units. As a result, my recommendations for program reduction are greater than what has been recommended by the committee. Even with greater reductions, academic programs are only one aspect of our overall reductions. I continue to focus on reductions in space, functions at the

edges of our mission, and reducing footprint. And we will continue to identify what work we can simply stop doing.

Per the review committee's recommendations we will proceed to deletion the following programs already suspended.

1. Chemistry
    a. BA Chemistry
    b. MA Chemistry
    c. MS Biochemistry
    d. MS Environmental Chemistry
2. Construction Trades Technology
    a. AAS Construction Trades Technology
3. Economics
    a. MS Resource and Applied Economics
4. Physics
    a. MS Computational Physics
    b. MS Space Physics
5. Power Generation
    a. Certificate in Power Generation
6. Process Technology
    a. Certificate in Mining Application and Technology
7. Renewable Resources
    a. AAS Renewable resources
8. Sociology
    a. BA Sociology
    b. BS Sociology
9. Veterinary Science
    a. Certificate in Veterinary Science

Per the review committee's recommendations we will reinstate the following program already suspended

1. Music
    a. Masters in Music, Music Performance

I agree with the review committee's new recommendations for suspension or deletion in the following programs:

1. AAS Drafting Technology – Suspension
2. MEd People, Place and Pedagogy – Delete
3. MEd Second Language Acquisition, Bilingual Education and Literacy – Delete
4. Certificate Safety, Health and Environment Awareness Technology – Delete
5. MS Water and Environmental Science – Delete

I concur with the committee's recommendations in all other areas of continuation or deletion except in the following where I have recommended a different path:

1. Atmospheric science – delete with opportunities for students in existing departments in similar areas (e.g., physics, chemistry, engineering) including possible alternative appointments at UAF for research intensive faculty
2. BA Earth Science – delete
3. BA in Arctic and Northern Studies – continue
4. Certificate in Ethnobotany – delete
5. Certificate Environmental Studies – delete
6. Masters of Education, Med Online Innovation and Design – delete
7. Geography – delete with opportunity to recombine with synergistic programs, including alternative appointments at UAF for research intensive faculty
8. Mining and Geological Engineering – Separate programs. Maintain Mining Engineering BS and MS. Merge Geological Engineering with Civil Engineering in order to offer the ABET accredited GE program with fewer resources than currently needed.

The programs above were selected because there are logical paths for many of the students in those programs to continue pursuing degrees at UAF. It is important to note that only half of our programs were considered this year. We will look at the other half next year. This means that our less expensive programs (on a per student basis) will have the same scrutiny.

If UAF's reduction is ~ $30 million over the next two years, how will these reductions get us there? We expect less than 10% of the cuts to come directly from academic programs. I do think that we will identify significant savings for this year as a result of our expedited administrative review, our shared services model, and continued strategic use of land, facilities and resources.

This is a difficult time within the university and within the state. No decisions made on program reductions or resource elimination are made lightly. As academic needs, wants and delivery strategies change, we have to change with them and understand that we are committed to a long-term strategy and looking to the future. Thank you.

DMW:jdp

DATE: 11 November 2019
TO: Expedited Program Review Committee
FROM: Kinchel C. Doerner, Dean College of Natural Science and Mathematics
SUBJECT: SWOT Analysis for Department of Geosciences

Introduction: The Department of Geosciences is an academically diverse department responsible for both undergraduate and graduate degrees. The educational services provided by the department are critical for Alaska and the wider society. As we are aware, state support is dramatically decreasing and university enrolment is flat increasing the urgency of resolving the fiscal challenges of insolvent units. This analysis is written to help the committee understand the specific fiscal challenges facing the department. The SWOT analysis provided by the department relays an accurate description of the breadth, depth, and scale of departmental initiatives and faculty so will not be repeated at length here.

Strengths: The department's strength lies in the scholarship of the faculty and the breadth of academic programs offered. The faculty produce many scholarly publications, write and are awarded many competitive grants, and teach across at least two distinct disciplines. The expertise of the faculty is critical to the industrial infrastructure of AK (e.g. study of oil and gas formations), the municipal needs (e.g. coastal erosion) of AK, and an understanding of the circumpolar north. The degrees programs prepare students in these critical areas for direct employment in Alaskan organizations and loss of the programs will be noticed by external stakeholders. I feel the strengths and relevance of this department are largely self-evident and are adequately illuminated in the department's report.

Weaknesses: The department's weakness is low enrolment in undergraduate programs. For FY19 the department had 174 total students (19.3 students/ faculty member). While this is a reasonable ratio for many departments, Geosciences is heavily oriented toward graduate programs (i.e., M.S., Ph.D.) which necessarily require fewer students per faculty member. If we consider the undergraduate and graduate enrolment separately we have 10.6 students per faculty (96/9.01) and 8.7 (78/9.01) students per faculty, respectively. Graduate enrolment is nearly equivalent to undergraduate enrolment. While the number of undergraduate students should be increased, geology and geography are not disciplines which tend to attract large numbers of students or provide service courses to other departments and colleges. Thus it is unlikely for Geosciences to quickly realize substantial increases in undergraduate students. Also, substantial increases in graduate students would not benefit to the department, as adding graduate students requires hiring additional faculty exasperating the situation.

Perhaps stated more clearly, the department currently manages its finances using an undergraduate-based model. That is, state support and tuition/ fees received from both non-majors and majors are used to subsidize the graduate programs. This model works well for departments with high undergraduate enrolments and modest research efforts; however the Department of Geosciences has the opposite structure with a modest undergraduate profile and an extensive research program. The current fiscal model is inappropriate and not sustainable.

Any increase in extramural funding received by faculty members will not benefit the department. Nearly all indirect cost recovery realized by Geoscience faculty (with few exceptions) is received by the university to be applied toward general overhead costs or received by the research institute to which the faculty member has sponsorship. Very little indirect cost recovery from extramural funded projects is available to the department to be applied toward academic salaries or other expenses. Similarly, extramural funding, to expand research, which pays for tenured or tenure-track faculty salaries for a few years should not be considered a viable solution to the fiscal problem of the department. Eventually, the extramural funding ends but the faculty salary costs continue, sometimes for decades. Thus, any claim that increasing levels of extramural funding will alleviate the fiscal challenges of the department must be disregarded.

Opportunities: While the fiscal condition is challenging, opportunities exist. For example, the department could place more courses online to increased the number of enrolled students. They have been pursuing this path with some success, details are provided in the departmental report. Also, their efforts to expand their course offering to UAA students and expand field course offerings are welcome and will help address the problem but these efforts will likely not lead to enough students to have a meaningful fiscal impact. The Geospatial and Remote Sensing Science Certificate is an excellent step toward substantially increasing student enrolment however this requires an increase in faculty salary expenditures.

Thus, to date, I am not convinced these efforts will lead to an effective resolution of the fiscal shortfalls of the department. The solutions currently considered are either 1) difficult to perform at a scale that will have a demonstrable positive impact or 2) modestly increase enrolment with concomitant increases in expenses.

Threats
Threats to the department are not atypical for an academic program. The major threats continue to be low or declining enrolment and declining state support for higher education.

SWOT ANALYSIS (DEPT. of GEOSCIENCES)

PREAMBLE:

Expertise within the UAF Department of Geosciences spans the fields of geology, geophysics, and geography. The Dept. of Geology & Geophysics merged with the Dept. of Geography to become the Dept. of Geosciences in 2014. The merger added 2.06 FTEs (Geography faculty) in 2014. The department currently has 9.01 FTEs; 6.95 FTEs are primarily involved with the Geoscience and Geophysics programs while the other 2.06 FTEs are primarily involved with the Geography undergraduate program and the Geoscience graduate program. The department has lost eight faculty (~ 3.94 FTE) and two staff positions since 2014, and our administrative assistant is now a part-time position. Only 0.94 FTEs have been replaced.

The Geology MS and PhD programs became the Geoscience MS and PhD programs (with concentrations in Geology and Geography) in 2015. Student numbers for the Geology and Geoscience MS and PhD should, therefore, be considered together, rather than as separate degree programs, since the Geology programs are no longer listed in the catalog and are being phased out as all incoming students enter the MS and PhD Geoscience programs.

STRENGTHS:

The department has 18 faculty, 10 of whom are jointly appointed with the Geophysical Institute, and one who serves as Director of the UA Museum of the North. We are international scientists who conduct science across the globe, with research primarily focused on the Arctic and circumpolar North. We are meeting the resource (oil and gas, mining), hazard awareness/mitigation/monitoring, climate change, and fundamental science needs of the State. We are assisting Alaskans to understand and cope with urgent environmental challenges related to climate change through research on past and current climate change and paleoclimate, coastal erosion, glaciers, permafrost, satellite-based environmental monitoring, and seismic and volcanic hazards. We also educate undergraduate and graduate students, and involve them in research, to meet the current and future geoscience needs of Alaska, the nation, and the globe. Thus, the Department of Geosciences is critically important to fulfillment of UAF's Mission, and is central to what we do as a university.

The department offers a variety of undergraduate degree programs including a Geoscience BS (concentrations in geology, paleontology, geospatial sciences, and geophysics), an Earth Science BA (concentrations in Earth systems science, geological hazards and mitigation, and secondary education), a Geography BS (concentrations in environmental studies, climate change studies, and geospatial sciences) and a Geography BA. The department also offers required courses for degree programs in Geological and Mining Engineering, Natural Resources Management, Arctic and Northern Studies, and Elementary and Secondary Education, as well as several GER natural science courses.

Graduate programs include an MS and PhD in Geoscience (with concentrations in Geology and Geography), and in Geophysics. Within the past 5 years, our graduates were a significant (12%) portion of PhDs awarded at UAF. The PhD program is long-established: the first PhD offered at UA was in Geophysics in the 1950s. A total of 43 UAF faculty, from other departments (physics, chemistry, etc) and

from research institutes, serve on our graduate student thesis committees as cooperating department faculty. 20 research faculty (primarily from GI) supervised graduate students who were enrolled in our MS and PhD degree programs.

Enrollment in the Geoscience MS program has increased despite overall reductions in faculty, reflecting, at least in part, the addition of the Geography concentration, but also the critical need for geoscientists in industry, government, and research. Our world-class research and education focusses on Alaska as a unique geological, geophysical, and geographical laboratory, often exposing students to operational settings not found elsewhere.

The department offers high-quality programs as indicated by the following metrics (2015–19):

1. ***Productivity of faculty in research:*** Geosciences faculty have collectively published 296 research articles in peer-reviewed journals. 2. ***Student co-authorship:*** Students in the department were co-authors with faculty on 148 research publications. 3. ***Success in competing for external grants:*** **Geoscience faculty have been awarded a total of 129 grants and contracts bringing in a total of $57,442,710 research dollars to UAF.** 4. ***Graduate students supported by external funding:*** Research grants obtained by faculty in the department supported 53 graduate students on Research Assistantships (RAs). 5. ***Student participation at conferences:*** Graduate and undergraduate students participated in 124 regional, national, and international research conferences. 6. ***Undergraduate research:*** 48 undergraduate students were actively engaged in research. 7. ***Placement of students:*** Employment data included in our 2016–18 SLOA reports indicate that most of our graduating students either continue on to higher education or find employment in the geosciences. BA Earth Science (66% graduate school; 33% employed in geosciences), BS Geoscience (33% graduate school; 50% employed in geosciences; 8% K-12 educators; 8% other employment), MS Geoscience (25% graduate school; 75% employed in geosciences), PhD Geoscience (100% post-doctoral fellows), MS Geophysics (90% employed in geosciences; 10% post-doctoral fellows), BA Geography (54% employed in fields directly related to degree; 23% other fields; 23% non-related work), BS Geography (7% graduate school; 73% fields directly related to degree; 20% other fields). 8. ***Fulfillment of SLOAs:*** Our 2016–18 Student Learning outcomes assessments demonstrate that most of our graduates leave our programs having mastered the learning outcomes that are important to success as a professional geoscientist. 9. ***Quality of teaching:*** Two of our faculty have received Usibelli teaching awards (one in the period 2015-19, and one previous to that), and 5 received departmental outstanding teaching awards from CNSM. 10. ***Interdisciplinary studies:*** Geography is an inherently interdisciplinary field that draws upon

> multiple natural science, social science, and cultural perspectives. The Geography BA and BS degrees thus offer critically needed interdisciplinary approaches to the environmental, political, and economic problems emerging in a world increasingly transformed by accelerating climate and environmental change.

We collaborate with public and private entities—local, state-wide, and nationally—to help develop and manage Alaska's resources and natural hazards. These include Alaska Division of Geological and

Geophysical Surveys, United States Geological Survey, Alaska Volcano Observatory, Alaska Earthquake Center, NOAA, NASA, and the International Ocean Discovery Program.

We educate students for jobs and careers, such as at Fort Knox, Pogo Mine, Alaska Department of Natural Resources, the Bureau of Land Management, major national and international oil and gas companies, environmental consulting firms (e.g. Shannon and Wilson), secondary education, and other government agencies.

The UAF Geophysical Institute (GI) and the UAF Department of Geosciences (GEOS) form a critical link that is vital for the success of both entities. Research at the GI is led by GEOS faculty and carried out by graduate students in the PhD and MS programs (Geosciences, Geophysics). GEOS faculty benefit from GI facilities (e.g., research computing, geochronology lab, Alaska Earthquake Center, Alaska Volcano Observatory, Alaska Satellite Facility) and from collaborations with GI (non-GEOS) faculty.

The Alaska Division of Geological and Geophysical Surveys (DGGS) forms a second critical link with GEOS. DGGS, which is located adjacent to campus, includes dozens of geologists who serve on graduate thesis committees of UAF students in geosciences. GEOS students are routinely hired for internships to conduct and support DGGS geological research for the state of Alaska. Many current employees at DGGS hold undergraduate and/or graduate degrees from the Dept. of Geosciences.

The GeoFORCE Alaska program was launched in 2012 at the request and expense of industry sponsors. Currently entering its 8th year, GeoFORCE continues to be funded by Alaska-based companies and Native Corporations, providing an important program to encourage and promote post- secondary STEM education and careers for rural Alaskans.

WEAKNESSES :

Geoscience is a cyclical industry and student enrollment in Geoscience programs across the country rises and falls with activity in the petroleum and mining industries. Our current lower student enrollments (in all programs except the MS Geoscience) reflect those factors here in Alaska as well.

We have lost eight faculty positions in Geology and Geophysics, and two staff positions since our last program review. Most of these faculty positions have not been replaced. The reduction in numbers of faculty has limited our course offerings for students, and has directly affected our graduate programs since fewer faculty are available to supervise and support students. The decreased enrollment in the MS and PhD Geophysics, and PhD Geoscience programs is directly attributable to fewer faculty in the department.

One of the staff positions that has not been replaced is the Director of the Advanced Instrumentation Laboratory (AIL). A series of short-term measures has so far maintained the lab with faculty service and student RAs. This is not a permanent solution and has resulted in an uncertain future for the lab, potentially putting faculty and student research in jeopardy (not just in Geosciences; departments across UAF depend on the lab). Additionally, classes and critical lab training that the AIL Director offered to faculty and students are currently unavailable.

Current uncertainty with respect to budget reductions has limited our ability to participate in opportunistic hires that result from new external funding sources at the Geophysical Institute.

OPPORTUNITIES :

Funding sources: Recent success in obtaining even more external funding by units at the Geophysical Institute (AEC,AVO, UARC, PREEVENTS) has resulted in funding being available to hire one new faculty member (1⁄4-time in the department) in Geophysics. Similar successes in the future would make funds available for other faculty hires, and for supporting graduate students through RAs.

Online courses: The department continues to increase its online course offerings, up to 10 undergraduate and graduate courses by fall 2020: Geodetic Methods, Basin Analysis, Geological Hazards, Geology of Alaska, Elements of Physical Geography, Introduction to Geography, Foundations of Geophysics, and Earthquakes, Glaciers, Volcanoes. The spring 2019 offering of Microwave Remote Sensing (GEOS 657) showcased some of the cutting-edge techniques that we are pursuing. This graduate course included computational labs and utilized Amazon Web Services to host both large data sets and also the computational resources. During fall 2019 GEOG 111x-Physical Geography (with lab) is being offered asynchronously. Classes in Basin Analysis and Microprobe have been offered via two-way classrooms. Expanding offerings using both of these formats should allow us to increase enrollment in our programs that do not have large field-based components. We plan to develop additional non-lab classes in the future.

Greater cooperation with UAA: At least 3 graduate and upper division classes have already been made available to undergraduate and graduate students in the Geology program at UAA. Thus far, enrollment increases have been small, but we expect numbers to increase, as we coordinate schedules and as UAA faculty continue to promote our courses for their students. This has potential in that more options would then be available for UAA undergraduate students, and more graduate courses would be available for UAA graduate students.
MOU with UAA: We have begun discussions with colleagues at UAA regarding an MOU that would allow UAA grad students to receive PhDs through the Geosciences Dept. at UAF. A similar MOU is already in place between the engineering programs at both campuses. The enrollment gains from this are likely to be modest but it would result in more tuition revenue for the department, and it would act as a disincentive for UAA to implement a PhD program of their own.

More field courses: Field courses in the Geology of Hawaii and Volcanology of Katmai and Kamchatka have been very successful, particularly in their ability to attract students from outside of Alaska. Adding more field courses, particularly during Wintermester, Summer, or Augustmester, may help to increase enrollment. Alaska-specific field courses might have added appeal to outside students. Our summer field geology course appeals to many more outside students than we have places for each time it is offered.

Increased RA support: Faculty in the department have been highly successful securing external funding and supporting graduate students on RAs. Continuing to secure funding for as many RAs as possible is a departmental priority.

Geospatial and Remote Sensing Science Certificate: Considerable effort has already laid the

foundation for this online certificate program. The establishment of an online GIS certificate would undoubtedly generate new enrollment as these skills are in constant demand by UA students and professionals from industry and federal and state agencies. New faculty currently being hired in GIS and Remote Sensing will provide the necessary effort and expertise to make this program a reality and offer cutting-edge opportunities for workplace development and student training at UA.

Alaska and National job demand for Geoscientists: Demand for geoscientists in the mining, and oil and gas industries in Alaska is projected to increase by 0.7% in the period 2016–2026. At the national level demand for Geoscientists is expected to increase by 6% in the period 2018–2028. Our graduates are also employed as educators and in government agencies and both sectors are expected to see some growth during the next ten years.

THREATS:

Continued reductions in state funding pose the greatest threat to our department. With >95% of expenditures dedicated to faculty salary, the remaining funds cover critical resources that are underfunded and struggling to meet the needs of the department. These include administrative support, recruiting, website support, and the Advanced Instrumentation Laboratory.

Reduced funding and declining departmental resources create challenges, as the department faces ***the inability to attract, hire, and retain faculty***. Some of our top-performing faculty have left UAF for (perceived) better opportunities, and other faculty have been asked to apply for jobs at competing institutions. Diminished funding is exacerbated by an overall negative news cycle (notably in 2019) identifying a lack of support from the state government, leading to a ***reduced ability to attract top-tier students*** to apply to our programs and, if accepted, to persuade these students to attend UAF over competing offers. Fewer and weaker students leads to diminished research productivity and outcomes.

While, overall, we see the UAA programs (BS geology, MS applied geology) as an opportunity, we also identify them as a threat, if UAA broadens their programs to overlap with our current programs and courses. Continued coordination and expanding online course offerings will benefit students at both UAA and UAF.

UAF Expedited Program Review, Fall 2019

CNSM Geosciences

part	label	fy2015	fy2016	fy2017	fy2018	fy2019	2018-2019 Change	2015-2019 Change
Majors	BA Earth Science	6	16	12	10	8	-20.00%	33.30%
	BA Geography	11	7	4	8	8	0.00%	-27.30%
	BI Premajor - Earth Science	1	1	0	0	0		-100.00%
	BI Premajor - Geography	2	2	1	2	1	-50.00%	-50.00%
	BI Premajor - Geoscience	4	3	4	1	1	0.00%	-75.00%
	BS Geography	18	13	17	14	10	-28.60%	-44.40%
	BS Geology	21	12	5	5	4	-20.00%	-81.00%
	BS Geoscience	70	76	62	79	64	-19.00%	-8.60%
	MS Geology	25	26	28	19	17	-10.50%	-32.00%
	MS Geophysics	12	11	12	9	8	-11.10%	-33.30%
	MS Geoscience	0	0	7	10	19	90.00%	
	PHD Geology	11	13	14	13	9	-30.80%	-18.20%
	PHD Geophysics	25	30	31	27	23	-14.80%	-8.00%
	PHD Geoscience	0	0	2	2	2	0.00%	
*A student seeking more than one degree, or changing major during a fiscal year, is counted more than once.								
Degrees	BA Earth Science	0	2	0	2	1	-50.00%	
	BA Geography	2	3	1	1	0	-100.00%	-100.00%
	BS Geography	3	1	1	6	2	-66.70%	-33.30%
	BS Geology	4	0	1	0	1		-75.00%
	BS Geoscience	4	13	5	14	6	-57.10%	50.00%
	MS Geology	4	3	5	2	8	300.00%	100.00%
	MS Geophysics	3	5	5	1	1	0.00%	-66.70%
	MS Geoscience	0	0	1	0	1		
	PHD Geology	0	0	0	3	0	-100.00%	
	PHD Geophysics	0	2	5	5	5	0.00%	
FTEs	Faculty FTEs	11.41	11.19	10.45	9.33	9.01	-3.40%	-21.00%

*For the faculty, staff, and student job classes, this table is based on the actual number of days each employee is in active status in each fiscal year, and on the organization code(s) responsible for paying each person's salary. Note that full-time faculty on 9-month contracts will be counted as only 0.75 FTEs each. Adjunct FTE has been approximated by counting the number of course hours taught by people who have adjunct contracts with each department and dividing by 40.

FY19 Salaries and Benefits		
CNSM Geosciences	**Restricted**	**$0.00**
	Unrestricted	**$1,668,376.32**
	Total	**$1,668,376.32**

FY19 Instructional Expenditures		
CNSM Geosciences	**Restricted**	**$0.00**
	Unrestricted	**$1,884,436.11**
	Total	**$1,884,436.11**

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