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FAIRBANKS, AK  
PERMIT NO. 3

# COLLEGE OF NATURAL SCIENCE & MATHEMATICS

# MATTERS



Above: Graduate students Izzy Muller and Jane Suhey are mapping the bedrock geology of Hatcher Pass, southern Talkeetna Mountains. *Photo: Sean Regan.*  
Front cover: Professor Mark Conde instructs a class using Zoom, in an on-campus studio constructed for the purpose of distance delivery. *Photo: Jana Canary.*





# Message from the Dean

*Kinchel C. Doerner*

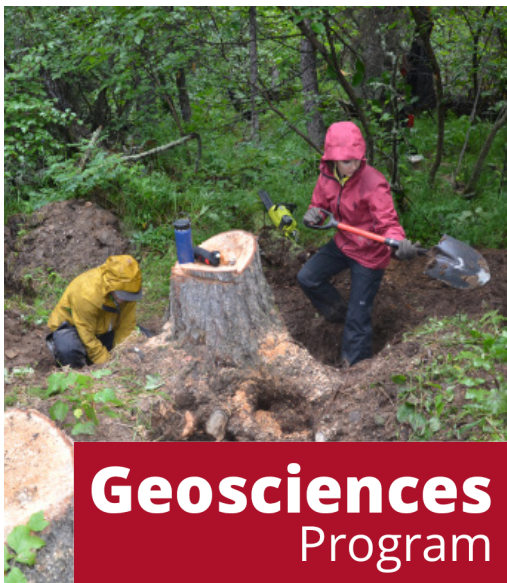
Hello CNSM Supporter,

It has been quite a year! The pandemic sent all of our students home at Spring Break last March and our faculty scrambling to convert all of our courses to distance delivery. This is unprecedented in the history of the college. The Fall semester has brought a little normalcy back to campus with many classes returning to face-to-face delivery but with a lot fewer students allowed in the classroom. However, we are still principally teaching at a distance. Our faculty and students have resumed much of their research in the labs and the field. Campus is buzzing again. Spring semester will be similar to this Fall as we will need to keep our hygiene procedures in place.

These last few months have been trying for everyone, faculty, staff and students alike. In times like these you find out where the weak spots are and I can honestly say that everyone rose to the challenge. And we are very thankful for the contributions each and every one of you has made toward our success.

This newsletter is to let you know what we are up to! Enjoy. Everyone here at CNSM is wishing you and your family a joyous upcoming holiday season.

Stay safe!



UAF undergraduates Mary Webb (in red) and Phillip Wilson (in yellow), excavate a 500-year old tree in order to determine the age of an ancient glacial outburst flood in the Delta River valley.

*Photo courtesy Dan Mann*



**Department of Mathematics and Statistics** Professor Ed Bueler has just published a new book on computational mathematics with the Society for Industrial and Applied Mathematics (SIAM) Press. This textbook, the first to cover programming using the PETSc software library

for nonlinear partial differential equations, provides an on-ramp for graduate students and researchers to a major area of high-performance computing for science and engineering.



*Lloyd Davis photo*

## Ocean Monitoring in Kake, AK

**Partnership provides data sovereignty and workforce development in Kake**

During the summer of 2020, the Organized Village of Kake, Kake Tribal Corporation, the City of Kake, and the Alaska Center for Climate Assessment and Policy at the University of Alaska Fairbanks began an ocean monitoring program in Kake, AK. Team members collected samples of ocean water and mussel tissue in and around Kake and tested for climate and pollution indicators. The project topic and design of this work came from the local leadership in Kake. Fourteen of the fifteen total members of the (paid) field sampling team during 2020 were Kake residents. Data is being archived for use with future comparisons. In these ways, this partnership is able to conduct high quality climate research while upholding data sovereignty for the tribe and providing workforce development opportunities in rural Alaska.

## K-12 Outreach goes the distance

**Remote service development accelerated**



*JR Ancheta photo*

K-12 Outreach Offices manages: Alaska Statewide Mentor Project (ASMP), Alaska Teacher Placement (ATP), Educators Rising Alaska, and Teacher Ambassadors Sharing Knowledge (TASK). All programs are fluent in remote/distance education, mentoring and recruitment. The K-12 Office has systematically developed and implemented remote services over the past four years and has successfully accelerated this shift to remote services in the last six months.



*Hyunju Connor photo*

## Exploration of aurora & power outages

**UAF will partner with high schools across Alaska in citizen science investigation**

UAF scientists started an educational outreach program named Space Weather UnderGround (SWUG). Under this program, undergraduate

and graduate students are building magnetometers and will deploy them across Alaska for investigating potential impacts of the aurora on power outages. The UAF SWUG program will be expanded to high schools throughout Alaska.



*JR Ancheta photo*

**The UAF School of Education** has 76 student teachers interning throughout Alaska during the 2020-2021 academic year. These future educators are earning their certificates to teach in Elementary (K-8), Secondary (7-12), or Special Education (K-12) classrooms.

## UAF researchers use genetic code in Arctic soil bacteria in search for novel antibiotics



*JR Ancheta photo*

Antibiotics are essential agents for the treatment of bacterial pathogens. Our current dependence on commonly used antibiotics, and lack of new drug development, contributes to the rise in untreatable pathogens. There is an urgent need for the discovery of new antibacterial therapies or classes of antibiotics. Soil, one of the most diverse microbial ecosystems, harbors an abundance of antibiotic producing bacteria as a result of competition for limited metabolic resources. In this study, we screened soil bacteria isolated from subarctic soils in Fairbanks, Alaska for antimicrobial activity. We investigated the genetic code of bacteria that showed some antibiotic activity and are currently using this information to continue our search for novel antibiotics.