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# Camp Davis

## Rocky Mountain Field Station

Earth and Environmental Sciences

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## Proposal to Renovate Camp Davis Student Residence Facilities

### Introduction

The Camp Davis Rocky Mountain Field Station is an off-campus residential field station devoted to undergraduate education in the natural sciences and humanities. The location of Camp Davis, on 129 acres in a rural valley about 20 miles from Jackson Hole, Wyoming, makes it one of the premier university-owned and operated field stations in the country. The Camp property sits astride the Hoback National Wild and Scenic River, and abuts the Bridger Teton National Forest, the third largest National Forest outside of Alaska. Camp is less than one hour from Grand Teton National Park, and the geologic marvels of Yellowstone, the world's oldest National Park, are less than two hours away. Fossil Butte Monument in the nearby Green River Basin contains a world-class paleontological record of pre-historic life in Wyoming, and the Greater Yellowstone region preserves the largest intact northern temperate ecosystem left on Earth, containing the greatest mammalian diversity in the lower 48 states.

The educational experience at Camp Davis, in this extraordinary natural environment, is unique and impactful. With small class sizes, an immersive learning environment, and close relationships built between faculty and students, most students who attend Camp Davis recognize the significant role Camp has had played in their personal, professional and intellectual growth (see Camp Davis experiences of recent graduates, at right).

### Educational Offerings

Camp Davis is unique among natural science-oriented field stations in offering courses that engage students from pre-freshman, experiencing their first college course, to last-term seniors, completing their final upper-level course prior to moving on to industry and graduate school. Each summer Camp offers six courses in the natural sciences. These include *Introductory Field Geology in the Rockies* and *Introductory Environmental Science in the Rockies* at the freshman and sophomore level; *Sustainable and Fossil Energy: Options and Consequences* (developed with the Graham Institute) aimed at upper-level non-science majors; and *Ecosystem Science in the Rockies*, *Geology Field Course* and *Field Geology Project*, offered as capstone courses for majors in the Department of Earth and Environmental Sciences and Program in the Environment. Camp also offers *History and Literature of the Rockies*, a 300-level course in the humanities. The courses at Camp fill a variety of educational needs: Area Distribution Requirements in the Natural Sciences and Humanities; Field Experience Requirements and electives in Earth and Environmental Sciences; and Natural and Earth Systems Science Core, Practical Experience, and Specialization requirements in PitE.

### Department Demographics and Future Needs

For the past decade or so, Camp has offered eight courses each summer: two sections of *Introductory Field Geology in the Rockies*, and one section of each of the courses described above. During this time, Camp enrollments have steadily grown from fewer than 40 students (prior to 2004) to ~140 student during the past four years (Figure 1). This growth has been driven, in part, by a significant increase in the number of undergraduate majors in our Department (Figure 1), but interest in all of our courses has steadily grown, and many of our classes are taught at capacity (24 students) and have waiting lists.

The unprecedented growth in the number of majors in our department has had several undesired consequences on the education opportunities that we can offer at Camp Davis. First, we have had to reduce the number of non-major courses that we offer at Camp Davis to provide opportunities for our majors to fulfill their degree requirements. To do this, we have added an additional section of our 400-level *Geology Field Course*. Second, because our 400-level courses are filled entirely with Earth and Environmental

Any student will tell you that Camp Davis offers so many more lessons than those printed on the course syllabus. We asked questions during the hike to the day's lesson site, hikes that were no less interesting than the planned projects; we forged strong bonds with old and new friends; we got daily one-on-one career and life advice from some of the best geologists in academics; we learned to work with people we might not otherwise choose to work with; we pushed ourselves physically beyond our comfort zones; we became more responsible adults; and, most importantly, we became more impassioned about the way our planet works. Daily life in Ann Arbor has too many distractions to get these sorts of lessons sitting in a classroom for a few hours. I got my photo published in the Ann Arbor news when I graduated in 2008 because on my mortarboard, I wrote the words that were our morning mantra at Camp Davis, said each day before leaving for the field, "Oh, joy! Another day to excel!" That is what Camp Davis was for me, a place that taught me how to excel in academics and in life. I am about to complete my PhD in Geological Sciences this year, and I literally owe much of my success to my time at Camp Davis.

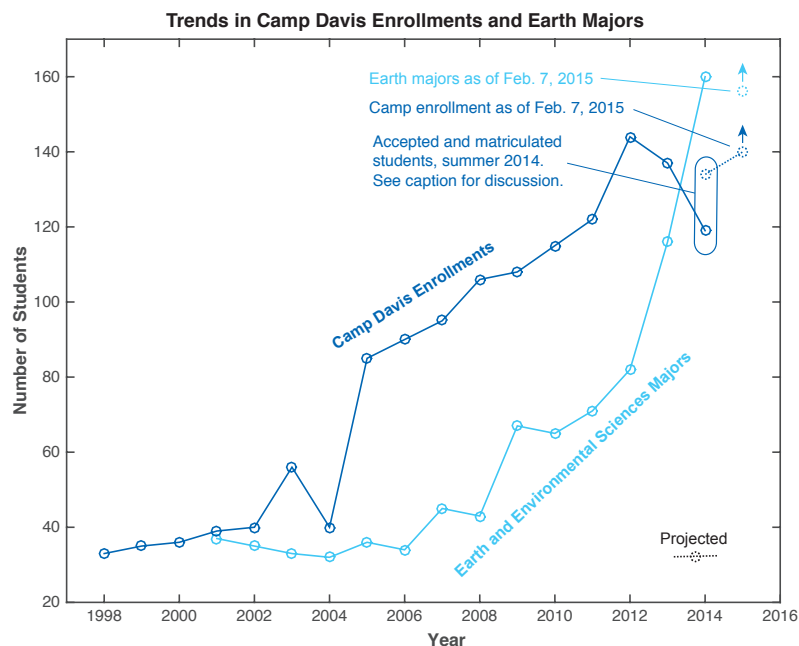
– Eric Portegna (BS '08) - Ph.D. Student

The skills I learned at Camp Davis - applying 4-dimensional reasoning, interpreting with limited data, and developing a holistic approach to geology - have directly translated to my work as a geologist for a major energy company. In a world where field camps are vanishing, Camp Davis offers students what no other geology field camp can provide: a varied, first-rate education of fundamental field skills in a small class setting with high caliber experts. There is no replacement for field geology skills and how they transfer to the working world of a geologist, and the University of Michigan offers the best in its class.

– Kelly Umlauf (BS '07), Geologist

I love Camp Davis! Not only are the classes fantastic, but the professors are great and very knowledgeable and approachable. My Camp Davis experience allowed me to have a much better understanding of geological processes by transcending the very simplified textbook examples and actually seeing how these processes shape the Earth. This not only allowed me to do better in my classes following my Camp Davis classes, but ultimately give me an edge in my job for a major oil company.

– Ada Dominguez (BS'10, MS'12), Geophysicist



**Figure 1.** Camp Davis enrollments and Earth and Environmental Science majors. Camp enrollments have increased by 300% since 2004, and are currently ~140 students each summer. Camp has typically accommodated more total students than the Department has had majors, but our number of majors now exceeds typical Camp enrollments, and we are reducing introductory level courses to accommodate this growth. In 2014, we experimented with not requiring a course deposit, and experienced significant attrition in the last week before classes began. The number of accepted students in 2014 was similar to the previous two years, but we matriculated fewer students. We have reinstated the course deposit for 2015. The 2015 numbers are students accepted as of February 7, 2015, and majors enrolled as of that date. Enrollment in 100 and 200-level courses peaks in March, and the department continues to enroll majors through the winter term. We are on track to have both our highest enrollments ever at Camp Davis in summer 2015 and our largest number of majors ever at the end of the term.

Science majors, we have no capacity for PitE students who have depended on this course as an opportunity to fulfill their Field Experience requirement. Third, we are able to offer only two sections at the introductory level this summer, instead of three. Our introductory level courses have been popular gateway courses for pre-freshman interested in STEM fields and for upper classmen fulfilling their natural science requirements through an immersive experience. Unfortunately, this summer, we will serve fewer of these students. Looking forward, we project the need for an additional upper-level section next summer to keep up with continuing growth in our major, which will likely come at the expense of another introductory-level course.

We are committed to maintaining the relationship that Camp Davis and the Department have built with PitE, and to our mission to serve all undergraduates at the University of Michigan who seek an immersive off-campus experience in the natural sciences. We also see exciting new opportunities for Camp Davis to engage a broader audience. Interest in using Camp facilities has been expressed by other departments on campus (including Astronomy and SNRE), and the opportunity exists to lay the groundwork for new innovative programs at Camp, such as a potential fall semester “abroad” in Wyoming. Our plans, however, are limited by Camp infrastructure, which tightly constrains our capacity.

### Camp Capacity

The student capacity at Camp is currently limited by three factors. First, the size of Camp’s dining hall limits the number of students we can feed each day to 90 students, or the equivalent of three 24-student classes, with instructors. The second factor is our Use Agreement with the City of Jackson, which prevents us from constructing more or larger buildings on Camp property. The third factor is weather. Student cabins are unheated, uninsulated, and have water pipes above the frost line. The weather, in combination with the need for our upper-level field courses to spend 10-12 hours each day out-of-doors, constrains these courses to a two-month window between mid-June and mid-August, during which Camp runs at almost 90% capacity (Figure 2). Camp has student capacity in early June (Figure 2), and the potential for significant capacity throughout the month of May. Courses are currently not scheduled this early in the season because the student

The eight-week program at Camp Davis taught me more about practical geology and field work than any course in Ann Arbor. The exposure to the entire American West inspired my interest in geology.

– Joe Murphy (BS '07) - MBA student

(Joe is a second generation Camp Davis attendee; his grandfather, Thomas Weyland (BS '53) also attended)

I was at Camp Davis twice as a Michigan student- in 2003 for Earth 116 before my freshman year and 2006 for Earth 341[now Earth 450] before my senior year, and also once as an Earth 116 GSI in 2009. I spent time there as an incoming freshman with an undecided major, a confident senior applying to graduate geology programs, and a graduate student about to begin a career in environmental consulting. The impact Camp Davis has had on my life is indescribable- it is directly responsible for where I am today.

Camp Davis is a unique learning experience - the setting is rustic but the faculty are world class.

– Jess Malone (BS'06, MS '09), Environmental Consultant

I was fortunate to be able to attend both Earth 116 and Earth 440 at Camp Davis. The educational experiences that Camp Davis provides to students in various degree programs are unlike anything they can receive on main campus. Camp Davis facilitates physical and mental growth, teamwork, and camaraderie with other students and professors. It gives students first hand exposure to the treasures that are our National Parks and Forests. My tenure at Camp Davis had a direct impact on my decision to pursue a career in conducting and coordinating scientific research in the field that supports conservation.

– Lt. JG Jared Halonen (BS '08), NOAA Corps

My experience at Camp Davis, in addition to providing me with practical field knowledge which has been invaluable to my research, caused an enduring shift in how I think about deep earth processes. Being able to walk along folded layers of bedrock and then applying my observations to reach a set of conclusions about the history of an area is a completely unique way to take learning out of the abstract. My time at Camp Davis in particular, from its location to the professors that run the camp, helped me make connections between field observations and geologic theories that have made me both a better teacher and a better scientist.

– Mary Peterson (BS '09), PhD student

accommodations are insufficient to comfortably house students during this time. Upgrades to the student accommodations could expand the educational offerings at Camp by up to 40% in the spring and summer terms, and open up the possibility of fall term courses at Camp. The early season is particularly ideal for growing our introductory level courses, which have lecture, lab and field components, and thus are less impacted by variability in early season weather.

### Camp Davis Facility

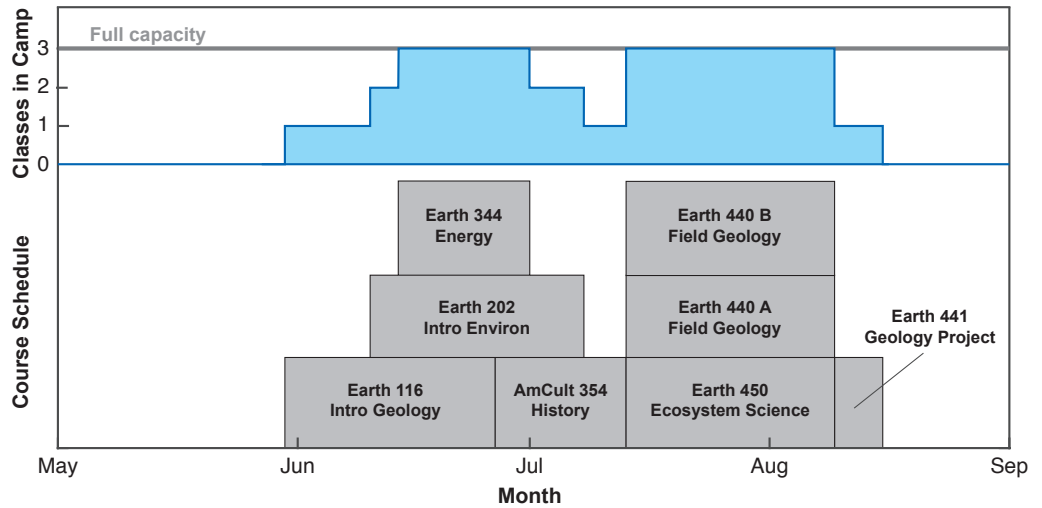
Residence cabins at Camp Davis are nearly a century old. Many of the cabins were constructed from 1908–1919 at the original Camp Davis, which was located on Douglas Lake, about a quarter mile from the University of Michigan Biological Station. The cabins were disassembled and relocated by train to Wyoming when the current Camp property was purchased in 1929. The cabins are sheet-metal structures (Figure 3) built on concrete slabs with open-flap windows and doors. The age and construction of the cabins offers many challenges: heating units are banned by the fire marshal over safety concerns; electrical supply wires are knob-and-tube, and outdated to the point of obsolescence; water and wastewater plumbing are both buried above the frost line, leading to frequent disruptions to water supply and wastewater discharge; and, years of frost heave have cracked almost all of the concrete slabs, leaving large cracks and steps on the cabin floors. The City of Jackson has forbidden Camp from any repair or renovation work on the cabins that would not bring the structures into compliance with modern building codes. In addition to the residence cabins, Camp has a number of bath and shower outbuildings, three of which are nearly 80 years old, and one of which is about 30 years old. One of these facilities is currently inoperable, and one so unappealing that students avoid using it at all costs, leaving two functional restroom and shower facilities.

Five years ago, Camp embarked on a renovation project funded by the College, the Department, and Camp, to replace the residence cabins. Renovations began on the east wing of cabins (the “faculty cabins”) because there were fewer cabins to replace, the restroom facilities were in greater disrepair, and the water and sewer systems were experiencing more frequent problems. These renovations resulted in a significantly improved standard of living, yielded substantially reduced annual maintenance costs, and greatly improved the underlying infrastructure on the east side of Camp.

In order to continue offering the comprehensive educational program that makes Camp Davis unique among university-operated residential field stations, and to prepare for the increased wear and tear on our facilities from our growing number of majors, we propose a renovation of student residential facilities to expand their usefulness into spring and fall terms, upgrade the accommodations to international construction and safety codes, and improve the Camp infrastructure.

### Description of Proposed Renovation Project

The proposed project includes the replacement of 30 student residence cabins and three free standing restroom buildings at Camp with 28 new student residence cabins and 2 new ADA compliant residence cabins. The new cabins will have en suite restroom facilities, and will be tied into a new septic system and leach field, replacing the current combination of septic system and open-pit cesspool. A new bathroom/laundry building is also planned as part of the renovation. This facility will be located adjacent to the three classroom buildings at Camp. Currently, one male and one female



**Figure 2.** A typical course schedule at Camp Davis, with classes concentrated between mid-June and mid-August (lower panel). Capacity at Camp Davis is three 24-student courses at any given time, along with GSIs and faculty. The blue graph (upper panel) illustrates the available capacity at Camp. Camp operates at 90% from mid-June to mid-August, but expansion of course into May, early June, and late August with upgraded cabins could increase Camp capacity by 40%.



**Figure 3.** Cabin 1F, a representative student residence cabin at Camp Davis with sheet-metal siding and roof, open-flap window and rough door. Electricity is strung from cabin to cabin on overhead wires via knob and tube connections. Chimney was for coal stove heat, which has been removed. Cabins are on ground-level slabs that are broken by frost heave and which are susceptible to animal entry.

restroom are available to accommodate up to 72 students near the classrooms and computer labs. This new building will provide additional restroom facilities adjacent to the classrooms, along with a new student laundry.

The majority of the cabins will sleep four students each, maintaining the capacity of Camp at 114 people, our current capacity, and the limit to which we are held by agreement with the City of Jackson. The new cabins will have insulation and heat, allowing us to extend the Camp season and accommodate more students.

### *Project Objectives*

The replacement of student cabins at Camp Davis and the renovation of Camp infrastructure will improve and expand the educational opportunities afforded at Camp in the following ways:

- ***Increase student participation at Camp Davis***

Because our current cabins are not insulated or heated, use of the cabins is limited to a two-month window from mid-June to mid-August. Water lines that supply the current bathhouses are not buried below frost line, also placing limits on the useful season of the Camp. With new insulated and heated cabins with integrated bathrooms and properly buried utilities, the Camp season can be extended to the entire four-month spring and summer term session of the University, allowing us to potentially double our capacity through longer use, while staying within the student capacity of Camp mandated by the City of Jackson. Expansion through the fall term would also be a long-term possibility.

- ***Improve student safety***

The proposed cabins will be built of fire-retardant materials, will have fire alarms, and sprinkler fire suppression systems. All windows will be large enough to allow for egress in case of fire.

- ***Improve student quality of life***

The new cabins will be built on poured concrete foundations, minimizing rodent inhabitations and preventing frost heave. En suite bathroom facilities will provide more total fixtures for student use. Cabins will be insulated and heated with integrated electric wall heaters to improve student comfort. Two new ADA cabins will accommodate students with disabilities.

- ***Reduce the environmental impact of operating Camp Davis***

Sinks in current cabins empty directly in to French drains outside each cabin; current bathroom facilities and the laundry drain to outdated septic systems or a cesspool. The proposed renovation would direct wastewater from cabin bathrooms into an underground septic system and leach field. Metal siding from existing cabins will be recycled, and wood will be re-used for other Camp projects. Hazardous materials (i.e. window glazing) will be removed by licensed contractors and safely disposed of.

- ***Lower operating costs through energy efficiency and maintenance***

On-demand water heaters in each cabin will reduce energy use over large-volume water heaters currently used in the bathhouses, and existing filament light bulbs will be replaced with compact fluorescent or LED bulbs. New cabins with weather-resistant exteriors, doors, and windows, will require significantly less annual maintenance than existing cabins.

### *Status of Renovation Plans*

Architectural and engineering diagrams for the project have been completed by Greg Mason of Krikor Architecture in Jackson, Wyoming, in consultation with Bill Johnson and Bill Weber in LSA Facilities, Mark Klein, an Assistant Design Project Manager in the University Architect's Office, Nathan Niemi, Director of the Field Station, and Chris Malvica, Field Station Manager.

### **Funding Request**

The total cost of the proposed renovation has recently been estimated at \$3.78 million. This estimate is \$750,000 lower than one made a year ago, and reflects a softening construction market in Wyoming, as low oil prices suppress oil and gas industry work. We propose to take advantage of this opportunity to initiate the Camp renovation project beginning in the fall of 2016, for occupancy and use by the summer of 2017.

As of September 2015, we have raised just under \$1 million towards the renovation of the student residence facilities at Camp Davis, and have a commitment from the College to cover approximately another \$1 million towards the construction costs. We are actively seeking to raise the final \$1.75 million towards this project. This can be accomplished in a variety of ways, including gifts, long-term giving commitments associated with the Capital Campaign or letters of bequest. We are incredibly excited to begin this renovation process and hope to secure commitments to this project so that we can expediently set a path for the next 100 years of student learning at Camp Davis.