SAMPLE: GEOS Undergraduate Research Award Application Proposal

Student name
Student ID
Research Title
Geochemistry-focused (only if applicable)
Focused on the Geology of the Colorado Plateau or Rocky Mountains (only if applicable)

George H. Davis Undergraduate Research Fund Proposal

Scientific Justification

The Coast Mountains have progressively been growing larger as various terranes are accreted over their history. The boundaries of these terranes have been obscured by the intrusion of the Coast Mountains batholith during the subduction of the Farallon plate starting in the Cretaceous. The rocks that once contained information on the location of these terrane boundaries have been re-melted to form the Coast Mountains.

This project focuses on the age constraints and provenance of a narrow belt of metasedimentary rocks in the southern Coast Mountains Batholith (SCMB) of British Columbia. The mechanisms behind the growth of continental margins by the addition of accreted terranes are poorly understood. By studying the metasedimentary rocks found between Wrangellia and Stikine terrane, we can define the terrane boundaries and the role of these boundaries in the overall evolution of the Coast Mountains.

The expected outcomes of this project include providing U-Pb geochronologic and Hf isotopic data for metasedimentary rocks found in Knight, Bute, and Loughborough Inlets of British Columbia. There is no previous data collected or research done on the rocks within these inlets, so this project will be providing new age constraints and provenance information on detrital samples within this area.

Broader Impacts: This project is part of a larger scale study that promotes inter-institutional collaboration and provides students the opportunity to engage in fieldwork, laboratory analysis, data interpretation and presentation of results both written and orally. More specifically, it allows students involved to gain experience and insight of the scientific process required to conduct research and then be able to make meaningful contributions by providing new information and scientific knowledge to the public through publication. Geochronologic data will be added to NSF-funded databases, such as NAVDAT, in order for the public to have access to.

Advice and Mentoring

The student will be advised and mentored by Dr. FacultyName by meeting on a weekly/bi-weekly basis in order to discuss project progress. Mentoring for this project has included exposing the student to a professional setting in order for the student to experience hands-on learning on how to conduct boat-based field work within the fjords of British Columbia. The student was also trained to participate in comprehensive research process involving rock processing, sample preparation, and data analysis. The focus for the remainder of this project is to successfully guide the student towards writing their first publication in order to eloquently present the results of the study to the public.

Relationship to educational goals and experience

Undergraduate research is the ultimate way to bridge the gap between what is being taught in the classroom and what is actually practiced out in the field. No matter what field of geology you go into, there will undoubtedly be a point in your career where you'll have to gather data and be able to critically analyze and articulate the meaning of that data in order for the public to understand. Being immersed in undergraduate research, and especially in this project in particular, has prepared me for my future career

SAMPLE: GEOS UG Research Proposal Continued

Student name

outside of the classroom by providing me with transferrable skills such as field work (mapping, rock identification, sample planning and collecting), lab work (LA-ICP-MS, SEM, mounting, rock crushing, mineral separation), outstanding presentational skills, teamwork and leadership, and effective communication. Using the experience gained through working on advanced research projects, collaborating at national conferences, and working in various settings, I plan to make a measureable contribution in my future career as a geologist.

This research was supported by the training acquired as an employee at the Arizona LaserChron Center. The remainder of this project will consist of working on the manuscript in order to publish the findings of this project and make the data available to the public.

Budget outline

The costs associated with the remainder of the project come from publishing the manuscript. Although GSA Bulletin is the cheapest journal to publish with, there will be steep costs associated with colored figures. Each color page will cost $800, and although some of the figures can be in black-and-white, some of our figures will need to be in color in order to most effectively express the relationship between our data sets and other data sets. Also, GSA Bulletin charges $125 per page after 10 pages of text. The text will be as concise as possible, but sometimes it's inevitable to go over the 10-page limit in order to provide all the necessary information and explanations to back up the research clearly and concisely.

We are asking for an award of $1000 in order to be able to pay for at least one color page. This support will hopefully be complemented with other research funds, such as the M. Lee Allison Scholarship, in order to reduce the load of the costs associated with publishing.

Advisor statement

Sample statements below.

Sample1:

"Dear Committee members:

I should start off by pointing out that submitting this proposal was entirely StudentName's idea, and that I have not done any editing of her request…..

Background is that StudentName conducted the field work for this project in 2015, did the analyses in 2016, and has been working this year on a manuscript presenting her results. StudentName sent me a manuscript draft a few days ago that has all of the descriptive text and figures, and it's in pretty good shape! She also blew me away by stating that she wanted to publish the paper in GSAB, and wanted to have the essential figures in color, so was it OK if she submitted some proposals to cover the publication costs? I found this astonishing – never have I had an advisee take the initiative to do this! So YES, I am very supportive of StudentName proposal, mainly as a way of rewarding a student who has shown exceptional initiative! And of course the assistance with publication costs will be much appreciated given that the NSF award for this project expired last March.

Thanks for your consideration!

FacultyName"

SAMPLE: GEOS UG Research Proposal Continued

Student name

Sample2:

"I, Faculty Name, support Student FullName's proposal to the GHD URF for his/her project studying the geochemical consequences of reactive transport of hydrocarbons through red beds. This process is widely invoked to explain a wide variety of observations in this and other regions, but extremely few experimental observations have attempted to test basic hypotheses. This project would provide some of the first deliberate and well controlled data and would be extremely useful for a subsequent phase of geochemical modeling that I also hope StuFirstName will be involved in. StuFirstName has been working in my lab learning a variety of geochemical analytical skills that will help him with this project, and he is eager to complement his class training with real research experience. This work will dovetail nicely with the objectives of a larger research project on the subject, and the leaders of the project will involve StuFirstName in other parts of the project as well. StuFirstName is an outstanding student who will benefit from this work and I look forward to working with him and providing advice and mentoring to promote a successful outcome."

Sample3:

"I recruited StudentName for an REU fellowship to work on fossil Galapagos corals, based on her strong earlier performance as a lab assistant in my group. She is already running elemental samples from a fossil Galapagos coral that shows great promise for paleo-ENSO reconstruction. Adding isotopic data to this project will strengthen our interpretations; even the partial set of analyses supported here will let us know whether this is a promising approach for additional samples. I meet with StudentName regularly, either remotely or in person. In between our meetings, she participates in our lab group enthusiastically, and gains support from other students and my lab manager in her day to day work. A grant from the Davis fund will broaden her knowledge of coral geochemistry and multivariate paleoclimate reconstruction."

Faculty are welcome to email their Advisor Statement directly to Shawna Matteson < smatteson@arizona.edu > for inclusion in their student researcher's proposal application.