



March 4, 2010

To: CGC Student Research Grant Review Committee

I am writing this letter in support of Joshua Holbrook's application for a Student Research Grant from the Center for Global Change. Josh is the first successful applicant the new Integrated M.S.-degree program in Mechanical Engineering. The standards for acceptance into this program are higher than the traditional graduate program, and only highly motivated and accomplished students capable of conducting research simultaneous with a full graduate-level course load are admitted.

I have reviewed the latest draft of Josh's grant proposal for Determining Anisotropic Thermal Conductivity of Snow with Needle Probe Measurements, and am pleased to serve as his research advisor for this project. My area of research expertise is in heat and mass transfer in freezing soils, and can say with confidence that the proposed research project is both pertinent and feasible. It is difficult to over stress the importance of such a fundamental property as the conductivity of snow for accurate local and regional climate models. The complexity of the physical processes occurring throughout the winter lead to a snow pack with properties that are surprisingly difficult to characterize. Josh is proposing to conduct a novel and systematic study that involves both analytical and physical measurements. Although some aspects of this proposal appear ambitious, Josh has an atypically strong background in Mathematics that gives him an exceptionally strong background for this project.

My current research program is composed of a couple closely related, but more applied engineering projects on the North Slope and Arctic Coast, and I will be pleased to supervise and provide expertise to this project. I have reviewed the budget and it appears adequate to accomplish the proposed goals. I do not have any current funding for this particular project due to its more fundamental nature, and the proposed stipend is necessary for Josh to continue working through the summer. I do have the requisite laboratory facilities for conducting the lab experiments and some standard measurement equipment, but the specialized probes and acquisition equipment will need to be purchased as indicated in the budget. I highly support graduate student participation in presenting their work at research conferences, and attending AGU or a related conference is well justified.

I therefore highly support Josh's proposal to the 2010 Global Change Student Research Grant Competition and look forward to working with him on this project if his proposal is successful.

A handwritten signature in black ink, appearing to read 'Rorik A. Peterson', is positioned above the typed name.

Prof. Rorik A Peterson, Ph.D.
Dept. of Mechanical Engineering
University of Alaska, Fairbanks
rapeterson@alaska.edu
(907) 474-5593