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School of Earth and Ocean Sciences

Letter of Support for the Seismic Tomography experiment led by Toomey, Hooft and Wilcock on the Endeavour segment of the Juan de Fuca ridge August 2009

Dear Dr Toomey,

As an active researcher of mid-ocean ridge system, and a member of the NEPTUNE Canada scientific community, I am writing to express my whole-hearted support for your upcoming seismic tomography experiment. It is only through the type of study that you will be undertaking that we can better understand the integrated geological, hydrological and biological processes operating at and near mid-ocean ridges and in particular in the Endeavour MPA. The results of your group's previous seismic tomography experiment, at the East Pacific Rise, have had a profound impact on our understanding of how these systems work (and, to the best of my knowledge, this experiment had no detrimental impacts on the ocean ecosystem). I am sure the results of your up-coming experiment will make just as big an impact on the scientific community as a whole.

Your experiment will provide otherwise unobtainable insight into the deep-seated heat sources that power oceanic hydrothermal systems and without which the novel biological communities at hydrothermal vents could not exist (and without which there would be no Endeavour MPA). The data you will collect will prove critical in helping us to understand the temporal and spatial variability in these systems and potential help to locate previously unexplored areas of the seafloor where hydrothermal systems may exist. For example, there is much scientific discussion of the role of hydrothermal activity away from the ridge axis but, to-date, we don't know where to go to look for off-axis hydrothermal systems that may host different biological communities to the axial systems. Furthermore, I consider your experiment to be critical for the long-term success of the Endeavour node of the NEPTUNE Canada cabled observatory. This real-time observatory (www.neptunecanada.ca) will monitor the long-term, decadal-scale evolution of the vent fields and associated ecosystems. Without the understanding of the deep-heat sources, that your experiment will provide, the value of this monitoring will be severely compromised.

In addition to the undeniable scientific justification for your experiment in its own right, I see your experiment as being critically important to the study of the seismogenic zone along the Canadian west coast. The knowledge that will be gained from your study about the structure of the oceanic crust will aid in understanding the processes involved in the formation of devastating subduction zone earthquakes (so-called mega-thrust earthquakes). The recent discovery of silent-slip event (http://gsc.nrcan.gc.ca/geodyn/etschatter_e.php) along this plate boundary provides hope that it may one-day be possible to determine when mega-thrust events are more probable. This would be a major scientific advance that would have profound societal implications. However, this will require that we better understand the processes operating in subduction zones which, in turn, requires us to understanding the structure of the crust entering the subduction zone – knowledge that will come only from the type of experiment that you will undertake.

In summary, your experiment is critical to advancing our scientific understanding of a range of processes ranging from geological to biological and I look forward to seeing it successfully completed. Please do not hesitate to let me know if there is anything I can do to assist in the successful completion of this scientific experiment.

Yours,

A handwritten signature in black ink on a light gray background. The signature reads "LA Coogan" in a cursive style. The "LA" is written in a bold, slightly slanted font, followed by "Coogan" in a more fluid, cursive script. The signature ends with a long, horizontal flourish.

Laurence Coogan