Personal Statement – Gregory Dumond

Since the late 1960s, the plate tectonics paradigm has laid the foundation upon which all modern studies of the Earth system are built. One of the most dramatic findings of the 21st century thus far has been an increased awareness of the fundamental interactions between all aspects of our unique planet: the atmosphere, the hydrosphere, the lithosphere, and life itself. For the Earth's lithosphere, and the continental crust that resides upon it, the mm- to cm-scale rates of plate motions each year translate into hundreds of kilometers of movement over geologic time scales (tens to hundreds of million years). These dramatic shifts of the Earth's plates have left a remarkable imprint on the continental crust, particularly in North America – one of the Earth's largest plates with over four billion years of geologic history.

Having been a student of rocks and the outdoors since my first family camping trip, it was seemingly inevitable that I would discover a sincere desire to understand what the naturalist Colin Fletcher described as "the meaning behind the beauty." Since 1997, I have pursued that desire unceasingly from the perspective that the Earth's crust holds many of the secrets to that "meaning." This desire has led me to seek a broad knowledge of how the Earth's plates deform at all levels – from the sub-micrometer- to hundreds of kilometer-scale. I am particularly interested in how the continental crust accommodates deformation and the dynamic thermal effects of magmatism and metamorphism. This goal requires a depth-dependent approach to plate tectonics, i.e. plates respond to deformation differently depending upon how far below the Earth's surface a volume of rock resides. This response is fundamentally influenced by several parameters: pressure, temperature, composition, and strain rate. I employ a multi-disciplinary approach to this problem that is rooted in detailed fieldwork and mapping. This approach includes kinematic and micro-structural analysis, thermobarometry, petrologic modeling, electron backscatter diffraction, and *in situ* monazite and zircon geochronology. The ultimate result is an exciting, well-constrained Pressure-Temperature-time-Deformation (P-T-t-D) history for each volume of the Earth's crust that I have been studying – from rocks in the Grand Canyon and central Norway that were deformed at 25 km-depths to rocks in the Canadian Shield that were deformed at depths greater than 50 km.

My ultimate aspiration is to share this excitement of discovery with students and colleagues on the university-level as a tenure-track assistant professor. The Earth sciences are poised for great advances in light of recent geological and geophysical research initiatives in the U.S. and Canada (e.g. the interdisciplinary NSF-Continental Dynamics BATHOLITHS project to understand arc processes in the world's largest continental magmatic arc – the Coast Mountains batholith of Alaska and British Columbia, the multi-million dollar EarthScope initiative to produce a 4-dimensional image (X-Y-Z-time) of U.S. lithosphere and upper mantle with the USArray seismograph network, and Canada's similar POLARIS project). It is my sincere desire to be a part of this tremendous period of discovery as a researcher, teacher, and public educator.