EOAS 2021: A Vision for Integrated Earth Science

P. Tortell, Dec 7, 2021

The UBC Department of Earth, Ocean and Atmospheric Science (EOAS) is the largest and most intellectually-diverse of its kind in Canada, and widely recognized as a global leader in research, education and training. Over the past 25 years, since the formation of EOAS in 1996, Earth Sciences have been revolutionized by new measurement technologies and computing power, and a growing awareness of the complex interactions linking different components of the Earth System. We now have tools and methods to observe, understand and predict coupled Earth System processes across unprecedented space and time scales. At the same time, the last quarter century has seen a rapidly growing imprint of human activities on planet Earth, from global climate change to impacts on fresh water, marine systems and mineral resources. Motivated by these grand challenges, and inspired by a curiosity about the natural world, ***we seek to advance fundamental Earth Science knowledge, and guide informed application of this knowledge for broad societal benefit***.

EOAS 2021: A Vision for Integrated Earth Science represents our collective aspirations for EOAS during its 25th anniversary year, and a strategic plan outlining priorities, goals and actions to achieve this vision. We seek to ***build on our existing core strengths*** in the geological sciences (geology, geochemistry, geophysics), geological engineering, oceanography and atmospheric science, while ***fostering new interdisciplinary collaborations*** in teaching and research. We also seek to engage with civil society, ***informing public debate and driving science-based solutions*** to the environmental challenges of the Anthropocene.

Using advanced laboratory and field-based analytical tools, combined with computational and mathematical methods, we aim to stimulate new research collaborations examining the dynamics of planet Earth in a number of ***thematic areas, including climate change, geohazards, and mineral, water and renewable energy resources***. We will continue to ***innovate in the development of new research tools and infrastructure***, exploring the natural laboratories of British Columbia, with an eye to understanding global-scale processes.

We strive to further enhance our world-class teaching programs, using evidence-based pedagogical methods built on active and experiential learning. We will place a ***greater emphasis on field-based education*** across our undergraduate specializations, and ***expand the use of quantitative and open-source computational methods*** to address a range of Earth Science questions through advanced data analysis and modelling methods. Our teaching efforts will target both specialists and non-majors students, providing foundational understanding of core scientific concepts underlying the dynamics of planet Earth and its sensitivity to a range of perturbations. We will also ***expand opportunities for training of off-campus professionals through micro-credentialing and the development of certificate programs***. Through this work, we will train the research pioneers of tomorrow, while also providing a pool of highly skilled graduates to support evolving needs of our non-academic partners. Closer interaction with these partners will provide our trainees with expanded mentoring opportunities, and exposure to a wide range of career paths beyond academia.

We seek to increase the impact of our research and teaching by ***engaging broadly with public audiences***. Our goal is to inspire curiosity about the Earth System, and inform meaningful debate about the wise stewardship of its resources. We also seek to ***build equitable and mutually beneficial partnerships with Indigenous groups***, embracing their unique and valuable perspectives on Earth Science education and research. Strengthened public outreach and educational programs will help us improve scientific literacy and attract a wider diversity of applicants to our programs. Through this and other initiatives, we seek to ***address a systemic under-representation of marginalized groups in Earth Sciences***, and to identify and eliminate historical barriers to success in our field.