

## Tracing Megafauna Mobility in Beringia using Strontium Isoscapes

CLEMENT BATAILLE<sup>1</sup>, MATTHEW WOOLLER<sup>2</sup>,  
JULIETTE FUNCK<sup>2</sup> AND JEFFREY RASIC<sup>3</sup>

<sup>1</sup>University of Ottawa

<sup>2</sup>University of Alaska Fairbanks, Fairbanks

<sup>3</sup>National Park Service

Presenting Author: [cbataill@uOttawa.ca](mailto:cbataill@uOttawa.ca)

Numerous paleoecological questions concern the mobility of ancient fauna in Beringia. Strontium (Sr) isotope ratio ( $^{87}\text{Sr}/^{86}\text{Sr}$ ) analysis has emerged as a powerful tracer for determining the provenance of ancient biological materials. We measured the  $^{87}\text{Sr}/^{86}\text{Sr}$  composition of teeth from present-day, herbivorous rodents ( $n = 162$ ) sampled from across eastern Beringia to estimate bio-available  $^{87}\text{Sr}/^{86}\text{Sr}$  values. We then used this dataset and a machine learning, random-forest regression to predict bio-available  $^{87}\text{Sr}/^{86}\text{Sr}$  variations across eastern Beringia. We also develop a novel isoscape describing oxygen isotope values ( $\delta^{18}\text{O}$ ) during the last glacial maximum. As a case study using our new  $^{87}\text{Sr}/^{86}\text{Sr}$  isoscape, we measured the  $^{87}\text{Sr}/^{86}\text{Sr}$  and  $\delta^{18}\text{O}$  of a series of radiocarbon-dated megafauna from eastern Beringia and compared these to our  $^{87}\text{Sr}/^{86}\text{Sr}$  isoscape and a  $\delta^{18}\text{O}$  isoscape to estimate the probable landscape use of these ancient fauna. Our model and isoscape provide important foundations for a wide range of additional applications, including studies of the paleo-mobility of other fauna, ancient people and present-day fauna in eastern Beringia.