WASHINGTON STATE UNIVERSITY
Department of Anthropology

February 19, 2017

Environmental Archaeology Search Committee
Department of Archaeology
Simon Fraser University
Education Building 9635
8888 University Drive
Burnaby, BC V5A 1S6

Dear members of the search committee:

I am applying for the Assistant Professor in Environmental Archaeology position. I am an archaeologist who specializes in computational approaches to studying human dimensions of climate change, with a particular focus on sustainable, high-elevation agricultural systems on the Tibetan Plateau in southeastern Asia and the Colorado Plateau in the southwestern United States. I completed my PhD at Washington State University in 2014 under Tim Kohler, and was a post-doctoral researcher at WSU as part of an interdisciplinary, National Science Foundation-sponsored project to make paleoenvironmental data more widely available to researchers and the public. I am currently a research associate at the Crow Canyon Archaeological Center in Cortez, Colorado, and adjunct research faculty in the Department of Anthropology at WSU.

I use computational analyses of ecosystems, landscapes, and climate to help understand cultural patterns and transitions in prehistory.[1,2] My past research projects are diverse: assessing landscape and site defensibility on the Northwest Coast of North America to study prehistoric warfare;[3] developing a new method for reconstructing high-resolution spatiotemporal climate fields from networks of regional tree-ring chronologies, with applications across the Southwestern US;[4–6] statistical downscaling of global climate models to understand agricultural changes across Asia;[7–9] exploring the importance inter-visibility in the Chacoan world using region-scale view-shed analysis;[10] and defining the complex history of the domestication of turkey in the Southwest.[11,12]

My primary research focus is on the sustainability of traditional agricultural systems, and traditional ecosystem management and niche construction more generally. I am particularly interested in the coevolution of cultivar landraces and the selection contexts in which they arise—both natural and cultural. In one of my current projects I am using phenological simulations to model the potential yields of over one hundred varieties of Pueblo corn across the Southwest US under modern and simulated past climate/weather scenarios. I hope to identify the environmental conditions under which each of these modern varieties will thrive—and, by extension, the conditions in which each may have evolved. I am also co-directing research in southwestern China and eastern Africa to explore similar processes for traditional varieties of millet, wheat, and barley.[7–9] I am a Co-PI on a proposal to the *Dynamics of Coupled Natural and Human Systems* program of the NSF for which I will lead agricultural, geomorphological, and agent-based modeling efforts to understand high-elevation agriculture on the Tibetan Plateau (awards should be announced in May). All of my crop modeling research documents phenological diversity among contemporary traditional cultivars—diversity that is a key to the resilience of small-scale, traditional agricultural communities, and diversity that will likely be useful to future populations in light of projected climate change. This research has brought me into collaboration with agronomists, agricultural modelers, maize geneticists, and climatologists, as well as contemporary traditional farmers.

My ongoing research collaborations focus on large-scale environmental, GIS, and agent-based modeling. Since 2015, I've been a researcher with the SKOPE project—*Synthesizing Knowledge of Past Environments*—where I have expanded the geographic reach of my paleoclimate reconstructions[4] to encompass the entire US Southwest. This resulted in a high-profile publication defining periods of environmental exploration and exploitation in Pueblo prehistory.[6] Our team was recently awarded an NSF cyber-infrastructure implementation grant (NSF SMA-1347973) to further expand the geographic extent of SKOPE and make it a tool for model inter-comparison and reproducible research. I'm a Co-PI on that grant focusing on expanding our database of paleoenvironmental models. As a research associate at Crow Canyon, I am leading data analysis for the *Pueblo Farming Project*—an eight-year experimental gardening collaboration with the Hopi tribe in northern Arizona. I've been developing an interactive exploratory data analysis website to be used primarily by students to learn about traditional agricultural techniques and crop landraces. I'm also the PI on a proposal to the National Endowment for the Humanities—the *Crow Canyon Digital Archaeology Tools and Access* (CC-DATA) project—to modernize Crow Canyon's research database and enable diverse forms of access for researchers, descendent communities, and the broader public. The project focuses on integrating legacy archaeological datasets with born-digital data, and will serve as an open-source model for other institutions that wish to bring their archaeological data holdings to diverse audiences.

Simon Fraser University offers many opportunities for expanding my research collaborations. Dr. Driver's and Dr. Muir's research on faunal use in the southwestern US has for many years been a key resource for my work, and I would look forward to collaborating with them—especially on developing large, regional faunal databases. I'm interested in extending Dr. Lepofsky's work on traditional ecosystem and niche management as part of my research on adaptation to high-elevation environments on the Tibetan Plateau. My emphasis on evolutionary processes aligns closely with the Dr. Collard's research program, and I would look forward to engaging him and his students. I seek to enhance public understanding of science and archaeology, and would surely benefit from tapping into Dr. Winter's expertise. I also plan to continue my most productive current research collaborations: with Tim Kohler and Jade d'Alpoim Guedes (focusing on the Neolithic on the Colorado and Tibetan plateaus, respectively), and with my colleagues at Crow Canyon (modeling selection processes contributing to contemporary maize diversity in the southwestern US).

Thank you for considering my application, and please contact me if I can be of any assistance.

Sincerely,

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—and—

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