

PhD Dissertation
Department of Environmental Science and Policy
College of Science
George Mason University

Candidate: Peter Jacobs

Defense Date and Time: August 5, 2020, 2:00-4:00pm

Defense Location: WebEx

Title: Interrogating Late Cenozoic Proxy-Model Agreement Through Novel Climate and Ecological Model Simulations

Dissertation Director: Dr. Kim de Mutsert

Committee: Dr. Harry Dowsett, Dr. Natalie Burls, Dr. Bette Otto-Bliesner

ABSTRACT

Understanding the climate of the past can help us better understand our present and future climate. This dissertation uses ecological and climate simulations to compare proxies and climate model output in a more coherent, like-for-like framework, with an emphasis on Late Cenozoic climates (e.g. the Pliocene, Last Glacial Maximum, mid-Holocene, etc.) and planktic foraminifera as a proxy. Results include habitat change for foraminifera taxa over the past 20,000 years; changes in carbon isotopes, foraminifera, and ocean biogeochemistry in a Pliocene-like ocean; and constraining a source of error in a widely used ocean temperature reconstruction method.