

Worldwide small holder farmers represent democratizing principles within their communities, creating employment and reducing poverty. Yet such forms of subsistence are understudied, particularly their relationship to culturally managed landscapes. We propose a multidisciplinary study to track the sustainability of irrigated taro farming on Rurutu, Austral Islands, French Polynesia. Our integrated anthropological and biological analysis will examine if and how Rurutuan farmers developed sustainable farming practices in the pre-European contact, post-contact, and modern periods. We will examine traditional agricultural practices over the *longue durée* to understand how Rurutuan subsistence farmers created anthropogenic niches for sustainable agriculture, and how those anthropogenic niches might be affected by shifts to non-traditional commercial farming practices.

Rurutu is a small isolated island in the Austral Islands of Eastern Polynesia. The region was settled ~1,000 years ago by voyagers who brought crops, like taro (*Colocasia esculenta*), a starchy tuber best grown under irrigated conditions (like rice paddies). Rurutu is one of the last places in Eastern Polynesia to practice intensive, irrigated taro agriculture; indeed, taro remains the main subsistence crop. Recent excavations by Kahn of the island's taro terraces document intensive taro cultivation for an 800-year sequence, providing an excellent context for anthropological and biological study of the intertwined histories of plants and humans. Taro is still farmed on Rurutu using traditional practices, without pesticides or non-traditional mulching. However, this is changing. Little is understood about the biological components of these intensively cultivated irrigated systems or how they have changed through time. Our goal is to document the drivers of farming sustainability on Rurutu, whether based in Polynesian cultural templates, environmental factors, genetic variability, farmer agency, or more likely, combinations thereof. Our project will speak to broader questions in human evolution and cultural anthropology, such as the role of homogenization or isolation in cultural and biological evolution. It will also speak broadly to sustainable agriculture and food security in the context of climate change and the transition of traditional farming to commercial farming. Our project connects on William & Mary's campus to themes of water, democracy, data, and careers.