



## **NATIONAL ENDOWMENT FOR THE HUMANITIES**

### **Division of Research Programs**

#### **Narrative Section of a Successful Application**

The attached document contains the grant narrative of a previously funded grant application, which conforms to a past set of grant guidelines. It is not intended to serve as a model, but to give you a sense of how a successful application may be crafted. Every successful application is different, and each applicant is urged to prepare a proposal that reflects its unique project and aspirations. Prospective applicants should consult the application guidelines for instructions. Applicants are also strongly encouraged to consult with the NEH Division of Research Programs staff well before a grant deadline.

Note: The attachment only contains the grant narrative, not the entire funded application. In addition, certain portions may have been redacted to protect the privacy interests of an individual and/or to protect confidential commercial and financial information and/or to protect copyrighted materials.

Project Title: A Pattern of Islands: Ethnography, Remote Sensing, and  
Community Archaeology in Kosrae and Pohnpei, Micronesia

Institution: University of Hawaii

Project Director: John Peterson

Grant Program: Archaeological and Ethnographic Field Research

## Statement of Significance and Impact

Ancient Malayo-Polynesian navigators traversed great distances and settled amongst widely scattered islands from the Sulu Sea, to the Solomon Islands, and ultimately to Hawai'i and New Zealand. They shared a common language and island lifeways as well as a transported landscape of domesticated plants and animals. Their knowledge of navigation and island living has survived into the present, and indigenous people of the western Pacific Ocean retain lifeways, legends, and oral history about their migrations in the region. Western enlightenment theories of Pacific migration persist in describing this migration as a wave or diffusion of peoples seeking new lands. However, among islanders, it is perceived as more of a mosaic or nodal pattern, with movement among islands connecting kin groups, fishing resources, or ritual exchange networks. The difference in these views of migration illustrates the divide between etic, western views and indigenous perceptions of space, time, and the islanders sense of habitus. In the western Pacific, specifically in what is now known as Micronesia, islanders have lived for more than 2,000 years in a pattern of islands that first emerged from the ocean after falling sea level exposed atolls and made them available for settlement. High islands in Micronesia such as Pohnpei and Kosrae, Yap and in Palau could thus be connected by thousands of new low atoll islands scattered throughout the region. This inter-island travel and settlement flourished and Micronesian sailors and their families enjoyed a thrifty and sustainable lifeway. But the settlement history does not appear to have been a gradual wave, rather it seems to have been a pointillist movement of many small settlements scattered throughout the region. In recent years western archaeologists have begun to document sites in the region, and provide data on housing, village layouts, and dating, but there is no systematic knowledge of this, nor has there been in indigenous contribution to this knowledge. In this project we propose to connect archaeological data in Pohnpei and Kosrae in Micronesia with village ethnography and active participation of villagers in the archaeological survey of their own communities. Furthermore, we propose to enhance the search for sites and features using drone-mounted lidar that can produce very highly detailed images and that can eliminate vegetation and modern construction from the view. These enhanced images will provide a tool for villagers to visualize their own homescapes and coastal terrain in hopefully new ways of viewing the landscape. In turn, villagers will regularly meet in ethnographic sessions to consider how the archaeological landscape compares with their cultural knowledge of their island's settlement and migration throughout the region. Recent migration histories suggest that it is not a simple wave process, but instead is pulsed and sporadic, with settlement from dispersed regions from Polynesia as well as from within Micronesia or from the south in the Solomon island chain. This research project will contribute to identifying these prior migrations through archaeological comparison articulated with community knowledge through legends, lore, and language linking contemporary communities in a mosaic of settlement decisions over the last two millennium. The project will contribute to current scholarship on indigenous knowledge in the face of western and colonial interpretation, and will provide a forum for islanders and western scholars to compare and contrast archaeological and ethnographic data as a space within which to co-produce knowledge of their migration history in the region.

## **A Pattern of Islands: Ethnography, Remote Sensing, and Community Archaeology in Kosrae and Pohnpei, Micronesia**

### **Argument for intellectual significance**

Pacific Islanders are fleeing rising seas and seeking opportunity in the developed world. They are migrating from small villages and traditional lifeways to join extended family living in opportunity zones in places like Northwest Arkansas where Micronesians are the major workforce in the frozen chicken industry. This mosaic or nodal pattern of migration is rarely included in migration models, and yet it may be a fundamental mechanism with very deep roots in premodern and even very early hominin lifeways (Reynolds et al 2015). Karl Butzer (1972) and Glyn Isaac (1975) first proposed in the 1970s that migration among early hominins exiting Africa consisted of a mosaic or nodal pattern. Small bands moved among patches or niches in the environment. Therefore, what might be characterized as a “wave” at one scale actually consists of a myriad of small decisions made by individuals and small groups operating as agents within a field of ecological niches and opportunities.

Theories of human migration focus on the reasons for people to move from place to place, but rarely on the process. Explanations enumerate the pushes and pulls of factors like poverty and opportunity, flight from oppression or toward freedom, and efforts to encourage or to control the flow of migrants (Lee 1966; Anthony 1990). Migration is viewed from the heights as waves or pulses. Even so, migration has always been the sum of many individual decisions forged together into movement of many people from place to place. Theories of migration, have been based on economic explanations of movement along the path of least resistance. Wave theories of migration were applied to the first farmers from Anatolia into Europe (Renfrew 1987, see Anthony 1990 for a critique of the wave-advance model), the peopling of Island Southeast Asia (Beyer 1949), the colonization of the New World (Boogaart and Emmer 2006), and to explain the Austronesian “out-of-Taiwan” migration in the late Neolithic period in western Oceania (Bellwood 1997). However, wave theories have little explanatory power especially if they do not also account for the particulate character of movement as a general theory of migration must accommodate. In Butzer’s adaptation of his earlier model of ancient hominin migration, “the Spanish dispersed across one and a half continents by nodal or mosaic migration establishing several clusters of settlements” (1991).

Maritime people in the Asian littoral and the western Pacific sailed in what appear to be stochastic networks at a more granular scale and not in streams or waves despite the oceanic context (Donohue and Denham 2011; Koki Seki 2004). Despite their appearance as multidirectional, these movements are not random, just as they are not exploratory ventures into brave new worlds, but instead are expanding networks of social and resource connections in a “pattern of islands” that include kinship, ritual exchanges, migratory movements of fish, and changing opportunities along coastlines transformed by variable climate and rising and falling sea levels, among other factors. A robust theory of migration must accommodate this nodal or mosaic character of migration as one of several fundamental explanations for migrational process. Contemporary and future climate change will challenge contemporary global population distributions and will demand adaptive responses world (Brown 2008). A modern theory of migration must be responsive to what may become explosive and uncontrolled social change. Thus far research has focused on the historical *contexts* of migration. This is a current and urgent theme, and our proposal to consider the *processes* of migration will make a significant contribution to recent studies of migration from archaeological contexts (Aldenderfer et al. 2020).

The island nations of the western Pacific in what is now known as Micronesia provide a setting where a pattern of nodal or mosaic migration can be observed over the long history of the islands as well as in the modern world. Oral histories and community knowledge have preserved accounts of early migration among islands over vast distances, and contemporary villagers in Kosrae and Pohnpei can contribute to the co-production of knowledge of prior settlements and connections among islands and islanders. Maa-Ling Chen examined Paiwan village proxemics, oral histories, and short-distance migrations in southern Taiwan to understand how settlement was influenced by spatial and cultural

cognition, and the mapping onto landscapes of cultural patterns of habitation. She proposed parameters to evaluate the social use of space in southern Paiwan villages successively abandoned over a 500-600 years period and found consistency and continuity, in contrast to village plans for northern Paiwan villages. Her findings from archaeological and ethnographic triangulation showed the landscapes to be consistent and continuous over this long period. This congruence is based on the proposition that “cultural cognition is figurative and metaphorical” as well as materialized in the landscape (Ortman 2000; Tilley 1999). Micronesian villagers share with Paiwan from Taiwan an Austronesian language and concepts of spatial perception and provide an excellent context within which to consider the articulation of their oral history and archaeological landscapes. Further, this articulation in the western Pacific is also an opportunity to compare and contrast with migration stories with material culture to examine the concept of mosaic migration in the Pacific oceanscape.

At the same time, modern archaeological technology is contributing what may be fresh observations about features and patterns of prior settlement. In this proposed project Unmanned Aerial Systems (UAS) equipped with lidar and multispectral imagery will survey along modern shorelines in the vicinities of contemporary villages and known archaeological sites. The remote sensing technology has been shown to be highly effective at imaging subtle historical landscape features (Kuo et al. 2017). These images will be employed as “visualizations” that may reveal obscure or unknown features to villagers who will then explore the archaeological implications in the context of their extraordinarily rich oral traditions. The outcome is anticipated to provide insights into islanders’ origins, maritime navigational practices, and the networking character of island migrations over the past two millennia since first settlement of Micronesia. Their origins and development appear to have been very complex, with migrations from the Solomon Islands in the south 2,000 years ago as well as westward migrations from among Polynesian outlier settlements more recently (Irwin 1992; Athens 2018). Migration models for the Pacific have largely been western constructs proposed by archaeologists and historians, not islanders themselves. Migration narratives have seldom included community voices especially in the process of discovering and interpreting landscape and material culture findings in the light of community knowledge. Those that have been reported, however, suggest that these migrations were not wave or linear migrations such as have characterized western intellectual models. They appear to have been networked within mosaic island opportunities and kin and linguistic affinities (Petersen 2009).

Three different sites will be included in this study in an effort to examine cultural affiliations and migration histories across the islands. Sokehs Village in Pohnpei is at the base of the Sokehs Rock that rises dramatically above Kolonia Harbor. Sokehs was settled by Pingelapese islanders as well as a community from Kapingamarangi Island, a remote part of the Polynesian Outlier Islands. The second site consists of two villages, Yekula and Wiya villages, on Kosrae. Archaeological research in Kosrae has not been systematic and field survey will complement documentation of village sites and monumental architecture at sites such as Lelu. There has been extensive oral history and ethnographic documentation that will provide an exceptional context for remote sensing visualizations and archaeological findings. Oral tradition on Kosrae shares a variety of migration stories, affectionately referred to as the “migration period.” These stories describe times of hardship when Kosraeans came to the rescue of visitors, at times presumably warring, from other islands. The third site is the World Heritage monument of Nan Madol. The famous mythical brothers of Olisipa and Olisopa who helped build Nan Madol found their way to Sokehs first where they built a place of worship and then gained support to the extent of the island and built Nan Madol with their supporters (Ayres, Haun, Mauricio 1983:208-209).

The results of these investigations will consist of a set of products for each village site as well as a context for which they may be connected. 1. lidar and other UAS imagery will be compiled as an extant documentation of archaeological landscapes and possible sites; 2. results of ground-truthing activities linking community participation with field survey and test excavation; 3. a narrative account of community co-production of knowledge through observations using photogrammetric imagery for visualization of archaeological landscapes in the context of oral history and community ethnography. The fourth and final product of the project will be the integration through community-based discussions of comparative results from each village in a search for emergent patterns across the island sites. If successful, this documentary

process and ethnographic dialogue will produce a case study of cultural memory and materiality in the western Pacific, as well as contributing to a model for the mosaic character of maritime migration, possibly applicable to other settings as well. Included in islanders' narratives may also be accounts of nodal migration today that contribute to strategies to forecast and better accommodate the impacts of migration in a world of changing climate and shifting global alliances.

## **Research design and methods**

There are some grand narratives proposed for migration *across* the Pacific, but little is known or documented about myriad migrations *within* this vast region. Human migration in the Pacific Ocean has spread language and culture throughout a vast region in a brief period. Malayo-Polynesian speaking peopled sailed from mainland and island Southeast Asia as early as 4,000 years ago and within a few thousand years had settled islands from the Sulu Sea to the Solomon Islands to Hawai'i, Polynesia and eventually even New Zealand. Within this expansive migration have been the continuing interactions of smaller-scale voyaging. By 2000 years ago emergent atoll islands provided settlement nodes for an emergent network of matrilineal clan-based villages. These were quickly colonized with transported landscapes of plants and animals in a characteristic early Micronesian village that supported widespread and networking occupancy of the region. These were sustainable lifeways that spread across a vast region for over 2,000 years.

Examining these patterns through archaeological, ethnographic, and linguistic data will contribute to an understanding of the linkages of people in an oceanic environment as well as patterns of migration in contrast with the western models of wave or linear migration. Maritime migration is networked with seafarers visiting a mosaic of nodal settlement to access resources and kin-based residency, and this model has been thrifty and adaptive for the past 2000 years. A weakness of wave and linear models of migration is the poor fit with sailing behavior in an oceanic environment that is conditioned and opportunized by deep knowledge of ocean currents, wind and weather patterns, marine biology, and celestial orienteering. These movements, while purposeful and knowledgeable, may appear random at some scales of observation, particularly through the lens of western theory. Investigations in indigenous communities exploring their origin stories and community histories will provide phenomenological knowledge of sustainable settlement and migration in an oceanic world. This will contribute to historical and anthropological knowledge as well as predictive models for migration and patterns of sustainability that will prove useful in the near future in response to calamity and climate change impact on the region.

Western models of migrations have not been sensitive to very different cultural experience in the Pacific where great distances are traversed routinely by navigators travelling within a universe that is very differently known to navigators and islanders. Language contains some keys to understanding these very different world-views, and consequently native participation and oral history are crucial to understanding patterns of settlement. The sharing of indigenous knowledge and modern technology such as lidar and radiocarbon dating can provide a meaningful nexus to explore these cultural histories, much as villagers in Papua New Guinea contributed their knowledge to archaeological project in Orokolo, As archaeologist Chris Urwin remarked of his survey, "But in the weeks that followed, I became aware that we were covering old ground. Our archaeological surveys were not revealing previously unknown archaeological sites. Rather, locals introduced us to their ancestral places."(Urwin 2020).

We propose a community archaeology project using unmanned aerial systems (UAS) will conduct lidar and other imagery surveys of village and coastal landscapes to document cultural features. This imagery will provide visualizations for villagers to assess in the light of their cultural knowledge of their home environments. Are features observed that were not obvious before? Have they any cultural relevance such as house platforms or fields, or perhaps of changing relations to marine and forest environments? Ethnographic sessions using the aerial imagery as a point of reference will engage the community in discourse of their home landscapes and cultural knowledge and oral history of their relationship to these possible memories and histories.

## **Unmanned Aerial Systems and Remote Archaeological Sensing**

Unmanned Aerial Systems (UAS), unmanned aerial vehicles (aka drones) and sensors, are becoming a popular tool for archaeological research. It is difficult to get specialized planes and equipment to these remote islands making airborne image and lidar data collection cost-prohibitive. The versatility of sensors, dropping costs of technology, and the accuracy they can provide make UAS ideal for research in Micronesia.

Lidar (light detection and ranging) is being used to find lost archaeological sites and features all over the world (for Mesoamerica: Chase et al 2011; Europe: Bewley et al 2005; Asia: Evans et al 2013; and Australia: Davies et al 2016). In the Pacific, lidar data has been used in archaeological contexts in Tonga (Parton et al. 2018), Vanuatu (Bedford et al. 2018), and Pohnpei (Comer et al. 2019). In both Vanuatu and Pohnpei the lidar revealed land modifications indicative of a complex irrigated cultivation system and agriculture production, while in Tonga defensive structures were identified. Recently, the technology piqued the interest of mainstream media when volunteers and amateur archaeologists confined at home during the Covid-19 pandemic found dozens of archaeological sites in the U.K. using lidar generated images (Fox 2020).

Lidar is an active remote sensing technique that sends out laser pulses and calculates the return time from reflecting off a surface. One of the benefits of using remote sensing imagery is being able to have an overview of an area, and the elevated perspective can lead to archaeological discoveries. An additional benefit of using lidar is that it can penetrate vegetation, which is a major obstacle for archaeological fieldwork in tropical places like Micronesia.

Other sensors are RGB and multispectral cameras that can be used to create Structure-from-Motion (SfM) photogrammetry 3D models. The RGB 3D models can be used to create an orthomosaic (geometrically corrected) with accurate color detail (Figure 1). The multispectral imagery can be used to identify different plant types from their spectral signatures better than RGB imagery alone. The multispectral imagery can also be used to assess the health of native plants. These UAS will help us see through jungle and land-use patterns that have obscured archaeological landscapes.



Figure 1 Orthomosaic created from Structure-from-Motion photogrammetry of Nan Madol World Heritage Site in Pohnpei produced by Dr. Andrea Jalandoni and Maria Kottermair from UAS.



## Applications of Visualizations from Remote Sensing to Community Archaeology

Forest and coastal waters as well as generations of disturbance and change in the landscape obscure landscape features that might reveal archaeological deposits such as burials or house platforms. Villagers are keenly aware of their home environment and landscapes and many generations of land use are incorporated into their cultural knowledge and oral histories and sensual experience. This project seeks to elicit community participation in archaeological investigations using remote sensing and ground-truthing to compare and contrast indigenous knowledge with findings from western science and technology. UAS surveys with lidar will provide visualizations to introduce into community focus groups to elicit community memory, linguistic, and ethnographic commentary on the images. Further, the community will actively participate in the UAS flights and subsequent archaeological ground-truthing in order to fully engage them and the archaeological researchers into community dialogue of the process and the results.

This project will begin with an already impressive portfolio of oral histories compiled by several investigators as well as our community ethnographer Ms. Ashley Meredith. The communities selected for this project already have experience with ethnographic and oral history focus groups such as proposed here, but have rarely if ever collaborated on the application of this community knowledge with archaeological investigations. This will have significant impact on storytelling and legend and may contribute to knowledge of prior settlement and migration that is poorly known from the perspective of western science and theory. For example, in the village of Wiya, one of the target villages for this project, Citel Nazuenziap (thunder god) lived in Kosrae at Loal and was honored by the placing of a long wand in the corner of each house, along with conch shells used as marine trumpets, announcing him as a warrior. His wife was known as Kajoua-sin-liaga/Kasoa Sinläka (lady Sinlaka), known today as Sinlaka the goddess of vegetation harvesting, and breadfruit (Sarfert 1917:409). She had four children with Nazuenziap, named Rin, Aourierie, Naitouolen, and Seouapin (Sarfert 1917:40) who are named in the kava recitation associated with Nazuenziap as documented by Lütke. Sinlaka's dwelling places included Yap (Sarfert 1917:409), Wiya (Üia) and Sialat (Sarfert 1917:251), and region of Fenkol (maybe includes Menke, Fäl, and/or Tafonkol (Sarfert 1917:354, 398) which she left for her favorite place which was Wiya (Sarfert 1917:396). Within this story that is deeply linked to place is legend about origins as well as the principal and sacred foods and plants of the region, and the connections within the region travelled by Micronesians. With these legends migration patterns can be linked with material culture to test models of settlement from the Solomons or from Polynesian outliers to the east. Within the context of migration, consider the Kosraean story about a boy named Selpas (sometimes spelled Selbas; Beardsley 2005) on Kosrae (similar to Salapat on Pohnpei), also called Nepartak (maybe a Pohnpeian title), later referred to as Isokelekel, who left Katau peidak (presumably Kosrae) to Pohnpei and defeated the Saudeleurs with more than 300 Kosraeans. According to the Nan Madol dossier, the thunder good Nahn Sapwe (in Pohnpeian) or Çensap (from the Panname clan; in Kosraean Citel/Sitel Nazuenziap—the “sitel” and “na” have been identified as honorifics, Sarfert 1917: 302-303; the latter “ni” or “ne” are used in contemporary Kosrae) “impregnated a woman from his own Dipwinpahnmei” (Nan Madol Dossier 2016:22) to whom a son, Isokelekel was born—”The godly boy grew up hearing stories of the Saudeleurs, leading him to sail to Pohnpei with 333 companions to overthrow the Saudeleur” (p.22 of Nan Madol dossier). This marked the beginning of the Nahnmwarki. These stories relate the emergence of complex systems of polity and kinship and emergence of the paramount chiefdoms in Pohnpei. With this project we will strive to link them to place and place-making and to their origins from among a “pattern of islands.”

Following Quintus et al (2015a,b), we will combine pedestrian survey and lidar data to discern spatial patterning of settlements and perhaps uncover differences in settlement patterns among different Pacific village sites. We may be able to identify signature style settlements that will help us differentiate migrating peoples. Archaeological reconnaissance survey will be conducted by the co-PIs, HPO staff from Pohnpei and Kosrae and participating community members in areas of lidar surveys. Prior archaeological survey reports will be consulted in the locality and adjacent areas to assess possible feature discovery in the target areas such as house platforms, walls, trails, terraces, shrines, community structures, breadfruit storage pits, or other distinct features (Ayres et al. 2009, 2015). These conventional archaeological signatures will

be compared with any new images from lidar survey to assess possible landscape evolution with obscured or subordinate features, or newly observed patterns in the lidar visualizations. Archaeological mapping and lidar mapping will be georectified and compiled in a Geographic Information System, to include prior archaeological mapping in FSM and elsewhere in the western Pacific. In turn, community participants will assess features to share their interpretations of the features and their community relevance. Where features are obscured or intact subsurface features are anticipated, 1x1 meter test units will be excavated to grade or “sterile”. These units will provide testing of feature morphology but also possible chronological data such as diagnostic pottery. The findings of these combined sets of observations will then be compared with village landscapes from around Micronesia including Quintus et al (2015) lidar/archaeological surveys from Samoa and from site recordings in possible source locations for migration into Pohnpei and Kosrae. Criteria for these observations will be based on categories such as Chen (2019) discerned in Paiwan villages from archaeological survey and oral histories. These “conceptual metaphors” were socially constructed onto landscapes: directionality, superordinate, invariance, constitution, blended sources, and experientiality. Directionality is the mapping of old village patterns onto new sites; the social use of space is “superordinate” on the landscape; invariance is the mapping of household onto the material structures; the constitutive is the mental map that transfers older patterns on new landscapes; blended sources adjust to variability in the new landscape; and the last, experiential, is the actual occupation of the new land (Chen 2019:402-403) “Together,” she proposes, derived from Ortman (2000), “these six dimensions reflect the metaphorical, figurative and conceptual nature of spatial construction.” These properties, or a similar set emergent from oral history and village proxemics in Micronesia, link the material with the conceptual in Pohnpeian and Kosraean landscapes. They also provide phenomenological links with archaeological landscapes found and described throughout the western Pacific that might provide the material keys to discerning patterns of migration in the region. Articulating these three dimensions of space, culture, and archaeology will be addressed by remote sensing with lidar, archaeological survey to assess imaging and compare with features on the ground, and testing these findings with the active participation of Micronesian villagers within their own cultural and historical landscapes will insights into community stories, settlement evolution, and links within a mosaic of settlement opportunities and trajectories in the region.

The organization of this project will entail five phases, 1. initial organization of the focus groups; 2. UAS surveys in Sokehs on Pohnpei and Wiya; 3. Sharing of visualizations from the lidar imagery with focus groups; and 4. Ground-truthing of visualizations with archaeological investigations at sites of discovery; and 5. Ethnographic community meetings to discuss visualizations, archaeology, and connection to legends and oral history. Community groups to be recruited into this program are already organized and are familiar with ongoing FSM programs to elicit, document and preserve community knowledge and oral history. Ms. Meredith will convene regular weekly meetings with these communities and the student rapporteurs in advance of field investigations for lidar and photogrammetric surveys, and biweekly meetings throughout the 24 months grant period. During Field Session 1, with all co-PIs in FSM, Co-PI Jalandoni will introduce the community groups to UAS technology and investigations who will then actively participate in this phase of the project. As data and images are acquired student rapporteurs will coordinate access to the field surveys as well as data management for the project as landscape visualizations are developed. In Field Session 2, during June in the first month of the second year of the 24 months grant program, the co-PIs will then meet in FSM to assess imagery, and will visit field sites to do field archaeological ground-truthing survey in order to compare and contrast imagery with landscapes. The group with assistance of HPO staff in Pohnpei and Kosrae will share data and results from prior archaeological projects in the vicinity and will conduct modest test excavations to ground-truth imagery and assess any buried archaeological deposits. Co-PIs Bayman and Peterson will participate in a final Field Session 3 in January near the end of the second year of the 24 months project in order to participate in community meetings with participants, the Ethnographer, the Rapporteurs, and field archaeological staff of the Pohnpei and Kosrae HPO. Video conferencing will be scheduled monthly among co-PIs and principals for the project to discuss progress and possible need to adjust schedules or activities, and for ongoing community dialogue on the articulation of community vision with imaging and archaeological documentation. Reporting, image analysis, and integration of knowledge results will be conducted in the final phase of the



project with assistance of the student rapporteurs and final virtual meetings with all personnel for the project. Reporting will be coordinated by Project Director Peterson with active participation of the co-PIs, Ms. Meredith, student rapporteurs, and HPO and FSM staff who have participated in the project.

### **Project director and collaborators**

We propose three co-Principal Investigators (PI) for this project to represent the three integral components into a working management team. Dr. John A. Peterson will serve as Project Director and co-PI. He has over 40 years of experience leading research teams and community heritage projects, with over 20 years in the Pacific region. He will coordinate with the other two co-PIs research agendas and outcomes, and with project collaborators to accomplish the goals and objectives for the project. Peterson has been affiliate graduate faculty in the Department of Anthropology, University of Hawai'i at Mānoa since 2004. He will provide liaison with the National Archive for Culture and History in FSM and the Kosrae and Pohnpei HPO for research permitting and local and regional support. Dr. Peterson will coordinate field activities in Pohnpei and Kosrae with the co-PIs and with staff of NACH and HPO in Pohnpei and Kosrae. Dr. Peterson is an anthropological archaeologist specializing in historical ecology and landscape studies. He has worked in the American Southwest, Texas, northern Mexico, China, Congo-Brazzaville, Ecuador, and, currently, in the Philippines. Peterson has worked with environmental justice projects in the US borderlands of the Lower Rio Grande Valley of El Paso, on archaeological surveys for tribal groups, and community archaeology projects including the restoration of the historical Socorro Mission in Socorro, Texas, where he organized funding and collaboration with at-risk students of the Texas criminal justice system, the Meadows Foundation, and Cornerstones, Inc. a non-profit organization engaged in adobe restoration. In the Philippines he has conducted community archaeology programs through the University of San Carlos Department of Anthropology, Sociology and History community mapping and heritage preservation program, and has worked extensively on heritage programs with the Freely Associated States of Micronesia in Pohnpei, Yap, the Marianas and also in Guam. He has served on the State of Texas State Board of Review, the State of Hawai'i Historic Preservation Board, the Guam Historical Preservation Board, and landmark commissions in San Elizario, El Paso, and Socorro, Texas. Peterson is currently President of the International Committee for Archaeological Heritage Management, a scientific committee of ICOMOS in support of the World Heritage program. He is a visiting professor at the University of San Carlos and an affiliate faculty with the Department of Anthropology, University of Hawai'i.

Co-PI Dr. James Bayman, is Professor of Anthropology and Coordinator of the *MA Track in Archaeology in the Pacific and Asia* at the University of Hawai'i at Mānoa (UHM). The MA Track at UHM provides advanced training for archaeologists from the Pacific and Asia so they can strengthen their efforts to document, preserve, and celebrate their ancestral cultural heritage. Dr. Bayman has directed archaeological field schools and research programs in the Pacific for more than two decades in partnership with educational and cultural institutions including (but not limited to) the University of Guam, the Micronesian Area Research Center (MARC), the Guam Preservation Trust (GPT), Kamehameha Schools (KS), the National Park Service (NPS), and the University of Hawai'i at Hilo (UHH). Dr. Bayman's archaeological training programs for students, historic preservation professionals, and community volunteers have been conducted in Guam, Tinian, O'ahu, Hawai'i Island, and American Samoa (i.e., Ta'u, Tutuila, Ofu). Most recently Dr. Bayman was a principal in the North Shore Archaeological Field School in Hawai'i that sponsored indigenous community-based archaeology (Lima et al. 2018).

Co-PI Dr. Andrea Jalandoni is a geospatial analyst who has worked previously in Pohnpei using UAS imagery to document landscapes. She along with colleague Maria Kottermair has been highly successful adapting these technologies to the heavy vegetation canopy and coastal marine environments to compile DEM and multi-spectral imagery to penetrate canopies and contribute to nearshore bathymetry. This project using drone-mounted lidar will increase the capability of the technology and will contribute capacity to the National Archives for Culture and History in FSM and the Historic Preservation Office in Pohnpei with new skills for staff and researchers in Pohnpei and Kosrae. Dr. Jalandoni is a Research Fellow at Griffith University on Prof. Paul Tacon's Laureate Fellowship project "Australian Rock Art History,

Conservation and Indigenous Well-Being.” She brings personal knowledge of the region, the technology, and institutional engagement by a premier Australian University into the project.

Ethnographer Ashley Meredith, National Anthropologist at NACH and Kosrae HPO will serve as ethnographic coordinator for the project. She has been participating in village and community oral history and ethnographic meetings for four years in Kosrae, and has deep community connections in Pohnpei as well. She has participated in the Nan Madol World Heritage development as well, focusing on community heritage documentation and interpretive planning. She has compiled ethnographic focus group reports on various aspects of Kosraean culture and is widely accepted in the Kosrae community. Ms. Meredith will organize community meetings at each of the two key sites of Sokehs and in Kosrae. She will identify students in the Cultural Anthropology program at the College of Micronesia in Pohnpei to serve as rapporteurs for each community project. These students will receive stipends from this proposed funding for six months to assist them in completing their Associates degree at COM. Ms. Meredith will coordinate the results of the community meetings and the collaboration with archaeologists and the visualization exercises. She serves as National Anthropologist in the Federated States of Micronesia and has conducted community ethnography projects in Yap, Pohnpei and well as principally in Kosrae.

Maria Kottermair is a researcher at Griffiths University in Australia and has over 20 years of experience with GIS and remote sensing. She has worked in Micronesia since 2007 and has pioneered applications of coastal UAS surveys to collect data for ICESat-2 and SAR correlations in the Republic of the Marshall Islands and in Pohnpei and Yap. She and Jalandoni conducted Structure-from-Motion UAS surveys of Nan Madol and will build from that field research to incorporate UAS-mounted lidar as well as multi-spectral data for this project.

Bayman and Peterson have collaborated on several prior projects in Guam and co-authored articles for journals and book chapters. Jalandoni and Peterson have collaborated on several prior projects in Guam, the Marianas and the Philippines and have co-authored journal articles and a book chapter. Jalandoni, Bayman and Peterson have collaborated on the Ritidian Wildlife Refuge, Guam archaeology project where Jalandoni did her master’s degree research and they are co-authors. Meredith and Peterson collaborated with Marjorie Fahlanruh on vegetation analysis of the Nan Madol monument (unpublished notes).

## **Plans for dissemination**

Outcomes of the project will include documentation of the ethnographic sessions, interpretive materials for FSM heritage interpretation programs, and collaborative articles on the project for scientific journals (e.g. Remote Sensing, Asian Perspectives, as well as for general readership in SAPIENS or similar venues on the co-production of knowledge in island communities.) Inter-Island Pacific migration will be a principal theme as well as settlement patterns and histories in the region.

These documents and products such as video and aural recordings will be archived at the National Archives for Culture and History, Federated States of Micronesia, College of Micronesia special collections, Micronesian Area Research Center at the University of Guam, and at the special collections of the Hamilton Library, University of Hawai‘i at Mānoa, and in the virtual archives of the Micronesian Seminar, formerly in Pohnpei. By spreading duplicate reports and materials throughout the islands we will be spreading the risk among a pattern of islands for the long-term preservation of these record much as Micronesians have done for millennia to preserve their culture and societies.

Student outcomes will consist of the recruitment of four Associates degree students at the College of Micronesia from the Cultural Anthropology program who will be appointed to serve as rapporteurs of ethnography sessions led by Ashley Meredith. Other students will be encouraged to participate and in addition will be tasked to document the sessions as part of their ongoing video documentation projects of FSM culture and history. The four rapporteurs will be provided stipends for their intensive participation, the others will be encouraged to apply for programs at the University of Hawai‘i at Mānoa Department of Anthropology, the University of Guam Department of Anthropology, and the Pacific Islands Program at the East-West Center. Co-PIs Bayman and Peterson will support their nominations for these programs and for financial assistance.

Community participants will be provided a modest stipend for attending the sessions and will be co-producers of the knowledge content for the project. They will contribute to documentation, mentoring and partnering with students, and reporting to the ethnographer and archaeologists the community findings of the project. The documentation will be provided in the form of a geospatial database and distributed to the National Archives of Culture and History of FSM as well as to the local Kosrae and Pohnpei Historical preservation offices. All video documentation will be archived in those offices as well as at the College of Micronesia along with copies of all reports and publications.

Journal articles for publication will target at least one article for submittal to the *Journal of Community Archaeology & Heritage* or similar journal. A journal article will be prepared for publication presenting our model for community co-production of knowledge in the online journal *SAPIENS* or *Advances in Archaeological Practice*. A journal article will be prepared for publication on the novel and innovative use of UAS platforms for community-based lidar studies and their relevance for coastal and village scale landscape studies in *Remote Sensing* or similar.

The process of community participation in remote sensing and archaeological discovery will in itself be a significant product as it will provide a focal point for community memory and settlement landscapes and their history.

## Work Plan

June 2021	Key Personnel kickoff with Video Meetings to plan project, conduct monthly VCT meetings until June 2023
June 2021	Meredith recruits rapporteurs and community participants
September 2021	Field Session 1 – Bayman, Peterson, Jalandoni, Kottermair travel to FSM, meet community participants, conduct UAS surveys in Sokehs, Kosrae
July 2021 – May 2023	Community groups meet biweekly with Meredith, rapporteurs, video meetings to discuss results of meetings, discuss results of UAS imagery
January 2023	Field Session 2 – Bayman, Peterson, Jalandoni, Kottermair travel to FSM to conduct additional ground-truthing and meet with community groups
June 2022- January 2023	Weekly community meetings, rapporteurs prepare reporting
January - May 2023	Key personnel develop articles and compilation of reporting results
May 2023	Produce articles, archive materials, ethnographic reports and documents, final report on project to NEH

Project Director, Co-PIs, and Ethnographer will communicate biweekly by Zoom or equivalent to assess notes from ongoing ethnography sessions and to develop outlines and narrative for draft articles and reports. Ethnographer will share with communities and rapporteurs at next weekly meeting for feedback to continue process of co-production of knowledge in the research program.

Targeted articles as outcomes for dissemination of project findings and process will be in draft stages of production by conclusion of the grant period in May 2023. Authors and co-authors will be responsible to complete articles based on receipt of review comments from the research group as well as from journal reviewers for submitted articles. All research notes, documents, recordings and reports will be provided to repositories at conclusion of grant period in May 2023.

## Archaeological and Ethnographic Field Research

	June 2021	September	January 2022	March	June	September	January 2023	March	May 2023
<b>All Hands Meetings</b>	Launch project with VCT meeting	Field Trip to Pohopei/Kosrae for co-PIs	Monthly VCT meetings	Monthly VCT meetings	HPO archaeological survey of lidar survey terrain, intensive VCT	Monthly VCT meetings	Field Trip to Pohopei/Kosrae for co-PIs	Monthly VCT meetings	Monthly VCT meetings
<b>Ethnography Sessions</b>	Recruitment for Rapporteurs and Community Participants	Begin biweekly meetings July to September	September to December community meetings with UAS imagery	January to June ongoing community meetings	June to September community meetings with Archaeological Research	September to January community meetings to prepare reporting.	January to May community meetings to focus on articles	January to May community meetings to focus on articles	January to May community meetings to focus on articles
<b>Remote Sensing Field Session</b>		UAS Field Research Session with co-PIs Field Trip	Results of UAS survey reported to community meetings						
<b>Archaeological Field Sessions</b>					Archaeological investigations by HPO support.	Results of archaeological field work reported to community			
<b>Reporting and Publications Schedule</b>	Ongoing reporting by rapporteurs	Ongoing reporting by rapporteurs	Ongoing reporting by rapporteurs	Ongoing reporting by rapporteurs	Ongoing reporting by rapporteurs	Ongoing reporting by rapporteurs	Focus on articles	Focus on articles	Focus on articles