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– ARTICLE –

# Community Relationships and Integration at a Small-Island Scale

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ABSTRACT

Most pre-European polities in Polynesia were constituted by multiple interacting communities, some of which were centers while others were hinterlands. The relationship between these communities was mediated by the nature of power in these societies and the economic and ideological foundations of that power. Different relationships leave different material traces across landscapes. The identification of communities in the archaeological record and the analysis of material variation between communities aid in elucidating different forms of group consolidation and hierarchical organization within the region. Using a case study from the Manuʻa Group, Sāmoa, I compare and contrast a series of communities to identify points of variation. These points of variation are then used to highlight the organization of settlement in these societies and the nature of power that supported that organization. I demonstrate that different dimensions of power can be identified by comparing the archaeological record of communities, and such comparison provides insights into the dynamics of political structures in the Manuʻa group.

*Keywords*: communities, Samoa, power strategies, landscapes.

## INTRODUCTION

Archaeologists examine the different scales at which people interact (Flannery 1976), ranging from the household to the region. In investigations of the latter, communities and their constituent parts are the unit of analysis (Peterson & Drennan 2005), and comparison between communities is a mechanism to investigate the structure of regional-level political, ideological, and economic relationships (Kowalewski 2008). Such investigations require the identification of inter-community variation. The nature of variation, whether related to markers of inequality or the occurrence of specialized activities, for instance, may inform on the nature of relationships between communities (e.g., who holds power and what kind of power is centralized). Ideally, regional analysis in this framework enables an examination of different forms of regional consolidation and hierarchy that speak to the size, structure, and role of political units (see Beck 2003).

Documenting variability related to the nature and structure of community relationships can be accomplished through the measurement of several variables for each identified community. One useful variable is community size (Peterson & Drennan 2005; Underhill *et al.* 2008). Centers of power or opportunity attract people, which increases the spatial size of the center over time. The presence and size of monumental and status architectural features are also used as a marker of variable power and regional specialization (Flannery 1998; Rosenwig & Lopez-Torrijos 2018). Construction of architecture both reaffirms and transforms cultural norms while at the same time being structured by dominant social relationships (Stone 2016). Defining architectural markers useful for understanding power relationships is place-specific within the analyzed groups. Variability of residential forms in each community might speak to differing levels of inequality while more specialized kinds of archaeological features, such as defensive features or communal production technologies, may also hint at differences in the strength of integration within and between communities.

Several of these community elements (e.g., specialized architecture, political centers) are similar to what Kohler *et al.* (2018: 297) referred to as urban functions or central features. The functions served by these elements extend across larger areas than individual settlements, often into what archaeologists define as hinterlands. In this case, the hinterland is defined by a lack of features or institutions necessary to carry out all required cultural activities to maintain the societal *status quo* (e.g., maintenance of political organization, the legitimization of ritual worldview, etc.). This definition of hinterlands contrasts with others that rely on the identification of economic dependency or exploitation (see Cowgill 2004). In any case, hinterlands are relational; in other words, researchers need to compare communities or settlements, and variation between communities or settlements needs to be documented. A

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location in a marginal zone alone is not a sufficient characteristic defining a hinterland as spatial distributions alone provide limited evidence of the relationships between social communities.

Regional-level investigations of landscapes have figured prominently in the history of Polynesian archaeology (Weisler and Kirch 1985), but the evaluation of relationships between communities has been limited (see Kahn *et al.* 2016; Morrison 2012). The lack of research is surprising in a location historical known for chiefdoms (Kirch 1984), defined as political units that integrate communities at a regional scale. While ethnography and historic-era descriptions of political systems are certainly enlightening, they can be limited by their ahistorical nature (Thomas 1989). Political systems described ethnographically may be the outcome of European contact, as some have suggested for the Sāmoan archipelago (Meleisea 1995). In these contexts, the use of other lines of evidence is necessary and the archaeological manifestation of community differences offers one avenue to understand the scale, integration, and hierarchy of Oceanic political systems.

Small islands can be useful starting places to evaluate inter-community relationships since a larger proportion of land area can be put under some form of archaeological inquiry. The geographical constraints of small islands reduce the complexity of defining a 'region' (see Kantner 2008) as the area so defined is constituted by a single or set of islands in proximity. Some traits, such as areas suitable for human habitation bounded by drastic topography (e.g., valleys), make identification of communities easier given the limits of social interaction caused by such environmental barriers. And, finally, sets of small islands, in particular, offer the potential for regional analysis given that each island might be thought of as a separate community. In this way, small islands provide opportunities to explore nested social communities within a more confined archaeological space, and the relationship between communities at different scalar levels might differ.

Like elsewhere in Oceania, the lack of large-scale survey datasets in the Sāmoan archipelago limits investigation of community-level relationships (Morrison and O'Connor 2018). Some of the earliest settlement pattern research in Oceania was undertaken in Sāmoa (Green & Davidson 1969, 1974), but few projects have been conducted subsequently in the western half of the archipelago and research is spatially restricted in the eastern half given its frequent association with cultural resource management. The settlement pattern surveys that have been completed have sampled areas (Clark & Herdrich 1993; Davidson 1974; Holmer 1980; Martinsson-Wallin 2016; Pearl 2004), though to what degree these sampled areas reflect one or more communities is unknown.

The cases of Ofu and Olosega island typify this situation. No systematic survey had been conducted in the interior of either island before 2010 (but see discussion of spot checks in Hunt and Kirch 1988). The lack of survey is a product of both accessibility and efficiency. The interiors of each are densely vegetated and separated from the coastlines by steep cliffs. These limitations hamper large-scale survey efforts by increasing costs and reducing visibility. Since 2010, however, multiple small surveys have been completed in the interior sections of Ofu and Olosega. These surveys are complemented by the availability of lidar datasets that provide an opportunity to expand survey through digital means to otherwise inaccessible areas. The joint field and digital surveys have created a dataset from which to better understand how populations positioned themselves in space. The pedestrian surveys have provided precise data on local areas of each island and highlighted the components of the archaeological landscape not visible through digital means. The digital survey creates an opportunity to examine patterning in the distribution of architecture (e.g., terraces, ditches) at a coarse island-wide scale. The combination is useful in constructing datasets that provide insights into the structure and nature of interaction between populations in different communities.

## OFU AND OLOSEGA

The islands of Ofu and Olosega (Fig. 1), separated by a 100 m channel, are twins in many respects. Coastal plains skirt a small volcanic landmass (7.3 km² and 5 km², respectively) with narrow fringing reefs extending offshore. These fringing reefs and coastal plains are more developed on the western shorelines of each island. In each case, relatively flat tablelands are found in the interior and steeper slopes are encountered the nearer one gets to each island's central ridgelines. These interior uplands are separated from the coast by remnant sea cliffs that measure some 30–75 m asl on Ofu and over 100 m asl on Olosega. Permanent water sources are restricted as only intermittent and seasonal streams flow on each island, though water is generally available given that each receives over 3,000 mm of rain annually. This high rate of precipitation results in a dense mix of vegetation. The nature of much of this vegetation, economic and secondary growth forest, is hypothesized to be the product of long-term human land use (Quintus 2011, 2018b).

Initial human settlement occurred in the early- to mid-1st millennium BC along the western and southern coastal plains of both islands (Clark *et al.* 2016; Petchey & Kirch 2019; ASPA site files). Evidence of occupation is scant for the 1st millennium AD, owing to a lack of stratified coastal deposits that include material from this period. Sites dating to this time are found only along the western coastline (represented by a single date, Quintus 2018b) and the southern coastline (Kirch 1993a) of Ofu. The situation is confounded by geomorphological changes that led to the aggradation and progradation of the coastal plain (Kirch 1993b; Quintus *et al.* 2015b).

By the early 2nd millennium AD, however, the archaeological record is dominated by spatially extensive built

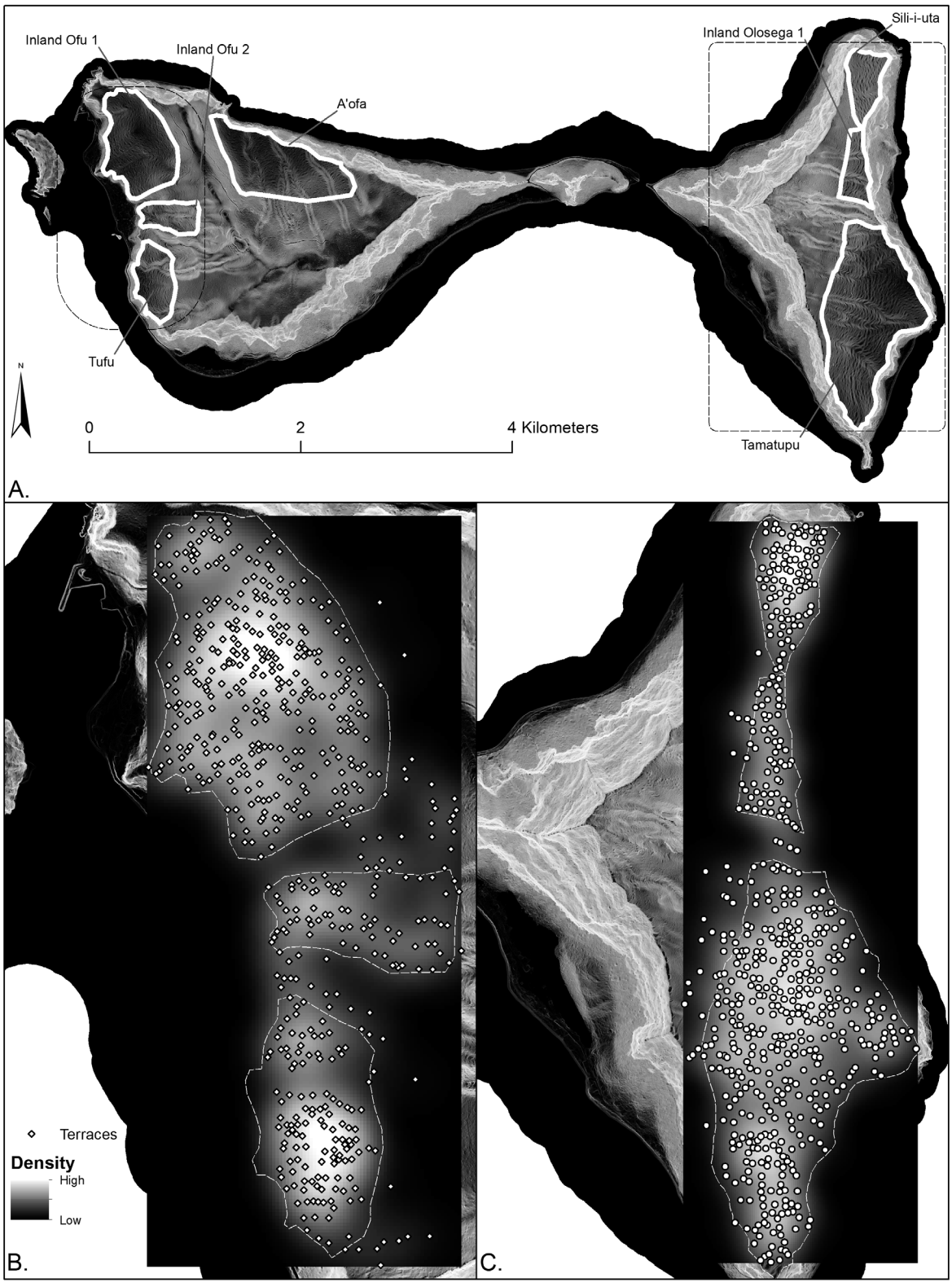


Figure 1. Ofu and Olosega Island with communities discussed in text labelled (A), the feature density map and terrace identifications for the western slopes of Ofu (B), and the feature density map and terrace identifications for the eastern slopes of Olosega (C). Each point is interpreted as a single terrace. Note that terracing does exist outside of community boundaries but in a more dispersed pattern. The upper size ranges of communities used in the analysis would encapsulate some of these more dispersed terraces. The analysis reported herein focusses largely on four communities: Tamatupu, Sili-i-uta, Tufu, and A'ofa.

features in the interiors of each island, a pattern suggestive of population growth and expansion just before or at the beginning of the 2nd millennium AD (Quintus *et al.* 2015b). The archaeological record in these locations is constituted by several feature types, though the most common is terracing. These terraces are earthen structures that largely lack visible retaining walls. On the surface of the majority is situated coral and water-worn basalt manuports, along with less frequent curbing stones and other alignments, attesting to the residential function of most. Depressions and ditches are interspersed between these terraces, as are more specialized composite features termed ditched-terraces (Quintus & Clark 2012). A specialized feature class, star mounds, is also found along the ridges of both islands, though their distribution is better known for Olosega than for Ofu. These interior settlement landscapes are the focus of this paper. Building on previous analysis of productive strategies and population size (Quintus 2018a), the structure and nature of regional power is considered here through the lens of community variation.

## CONCEPTUALIZING AND COMPARING COMMUNITIES IN MANUʻA

Elucidating regional community relationships requires units of comparison. Ideally, the unit of comparison would be independent and contemporaneous social communities. These social communities are defined as emergent and place-based social institutions comprised of a group of people larger than an individual household that interact with each other more than they interact with those further afield (see Yaeger & Canuto 2000). Archaeologically, the identification of these communities relies on distance-interaction principles in that it assumes those households living in proximity are more likely to interact with each other than with households outside the cluster (Peterson & Drennan 2005). While this general assumption often holds, the spatial scales at which to draw community boundaries are variable and arbitrary. Information on self-identification, specifically that which creates a sense of membership, can aid in clarifying the presence and scale of communities (Kolb & Snead 1997: 611). Ethnographic evidence from Manuʻa suggests the presence of multi-scalar geographical identity-making, wherein individuals thought first of their village, then of their island, and then of Manuʻa as a whole separated from the rest of the archipelago (Mead 1969). Each of these levels is a social community, defined as interacting groups with a sense of shared membership, and the combination can be thought of as a set of vertically nested communities (see Peterson and Drennan 2005 for similar discussion).

While a definition of island-level communities is simple, the identification of village-level groups is more difficult. One result of the combined pedestrian and digital surveys is recognition of a nearly continuous distribution of archaeological features, mostly terracing, across much of each island's interior (Fig. 1). In this context, the identification of village-level communities relies on the investigation of changing densities of feature types as well as environmental characteristics that limit the extent of settlement.

Areas conducive to human settlement are roughly bounded by ridgelines and dissected streams that would prohibit either social contact or the continued construction of terraces. On Ofu, Aʻofa[1] is separated from the rest of the interior by ridgelines formed of an ancient caldera rim and, on Olosega, steep drainages separate the northern and southern halves of the island. The continuous distributions of archaeology along the western slopes of the interior of Ofu and the northeastern slopes of Olosega are more difficult to separate (Fig 1; see methods and additional figure in online SI). Reductions in terrace density are apparent across the two island interiors based on the analysis of features conservatively but coarsely identified using the lidar dataset (Fig. 1; see also Quintus *et al.* 2015a). This digital survey method is not perfect, as false positives and negatives have been demonstrated on adjacent islands (Quintus *et al.* 2017) and are likely present within the Ofu and Olosega datasets. Most changes in feature density correspond to drainages or cliffs that serve as useful edges for communities. These natural edges do not exist in two areas and the edge of the community is drawn where feature density decreases abruptly. Again, these edges are ambiguous, as threshold values of terrace density that could be used to define community edges are arbitrary. The size of communities is offered as ranges because of this.

The results of this exercise produce seven communities across the two islands, three on Olosega and four on Ofu. Oral traditions support the view that these communities represent village-level social communities to some extent, as three of the areas (Aʻofa, Sili-i-uta, and Tamatupu) are pre-contact villages documented in oral tradition (Clark 1980; Mead 1969). Unfortunately, very little is known of these communities from oral tradition other than their location but archaeological evidence suggests that these were interacting nucleated agro-residential settlements (Quintus 2012, 2015); to what extent they were independent is the subject of this analysis. These communities represent the primary area of residence on the island in the 2nd millennium AD, as the use of the coast at this time appears to be limited to dispersed households. Not surprisingly, all but one community are located in areas of low natural slope (under 20 degrees); the exception is Sili-i-uta on Olosega (Quintus 2018a). Four communities have been the subject of intensive investigation and will be the subject of more focused village-level comparison in this manuscript: three

1 The poor ground return coverage in Aʻofa limits the assessment of changing feature densities through analysis of lidar datasets. As such, the entire area where terraces are identifiable in this area of the island is grouped as one community. This is consistent with oral traditions that indicate this region was a single named village.

through pedestrian and digital surveys and one through digital survey alone.

While precise chronological information for each settlement zone is lacking, a general chronological framework can be proposed. The chronology of terrace and ditch development on Ofu speaks to continuous construction beginning in the 11th or 12th century and extending until historic contact (Quintus 2018b). The range of feature types recorded for Olosega is similar, suggesting a similar chronological development. Contemporaneity is further supported by dates from across the archipelago wherein the built environment in general, and interior landscape modification more specifically, dates to the 2nd millennium AD with increasing construction in and after the 15th century (Clark 1996; Green & Davidson 1974; Jennings & Holmer 1980 Martinsson-Wallin 2016; Pearl 2004). The interior of each island was largely abandoned by the early historic period. Given this evidence, the patterning of archaeology on the landscape today relates to social activities in the latter half of the 2nd millennium AD.

## Variation between village-level communities

The basic point of variation across the village-level communities of Ofu and Olosega is the size of each community and the size of terraces that constitute those communities (Table 1). Even with the ambiguity in defining boundaries described above, the degree of difference between Tamatupu and other communities is clear. The size of the settlement zone is nearly double that of any other. These differences in community size parallel differences in the size of terracing that constitute the communities. Data on terrace size is derived from field surveys, as distinct boundaries of individual terraces are difficult to identify through digital surveys other than where natural slope values are quite high (Sili-i-uta). While the lower range of terrace sizes in all sites is similar, the upper ranges are only similar for three of the four areas. This pattern, wherein Tamatupu is unique, is reflected also in the median and mean terrace sizes for each community.

Such differences between communities in the size of constituent features speak to the size of populations (Quintus *et al.* 2018a) but also differences in labor expenditure and the degree of inequality between and within each community. How inequality is materialized can be quite complex, though the assessment of variation in house or house foundation size has been used widely (Kohler *et al.* 2017). This is particularly apt for Sāmoa where house size is known to reflect status differences at European contact (Davidson 1969). Two measures were used to assess differences that might reflect different degrees of inequality for the three communities of Ofu and Olosega for which pedestrian survey data is available (Tufu, Aʻofa, Tamatupu): the degree to which the largest terrace is an outlier and the Gini coefficient (see Methods in online SI).

The Gini coefficient is a measure of wealth distribution employed by modern economists and more recently used by archaeologists to investigate social inequality (Kohler *et al.* 2018). Measured on a scale from zero to one, metrics closer to zero indicate that wealth is more equally distributed amongst members of the society while a result closer to one indicates that wealth is unequally distributed. The calculation of a Gini requires input datasets of archaeological phenomena that are regionally comparable and reflective of wealth; previous researchers highlighted houses and foundations of houses as ideal archaeological features for such analysis (Kohler *et al.* 2017). The measurement of the extent to which the largest terrace in each community is an outlier uses traditional statistical definitions. Specifically, this metric was measured as the number of interquartile ranges the size of the largest terrace is away from third quartile of the terrace dataset associated with each community. Attempts were made to include in both these calculations only terraces for which a residential function was likely; only terraces that measured more than 100 $m^2$ in size and on which coral was found, indicative of possible former paving, were included in this analysis (Tufu = 23; Aʻofa = 30; Tamatupu = 96).

Using this sub-sample, the degree to which the largest terrace in Tamatupu (5.3) is an outlier is twice that of Tufu

Table 1. *Major points of variation between the different communities on Ofu and Olosega.*

| | Estimated Settlement Size Range (ha)[2] | Terrace Sample Size[3] | Mean Terrace Size in Sample[3] | Median Terrace Size in Sample[3] | Largest Terrace in Sample[3] | Terraces with Coral Mean Size (Sample Size)[5] | Gini (80% CI) |
|---|---|---|---|---|---|---|---|
| Tamatupu[1] | 110–120 | 186 | 291[4] | 232 | 2035 | 350 (109) | 0.320 (0.291–0.370) |
| Sili-i-uta[1] | 15–20 | 104 | 184 | 162 | 701 | — | — |
| Tufu | 15–20 | 49 | 174 | 144 | 636 | 215 (33) | 0.220 (0.185–0.269) |
| Aʻofa[1] | 50–60 | 50 | 194 | 168 | 650 | 221 (35) | 0.239 (0.209–0.296) |

1 Named pre-contact village
2 Based on digital survey alone
3 Based on pedestrian survey and digital survey (Sili-i-uta)
4 Based on pedestrian survey alone
5 This is slightly different than the mean presented in Quintus *et al.* 2017. Two terraces from that dataset without precise locations are not included here.

(2.4) and nearly twice that of A'ofa (2.8). It is conceivable that the largest terrace at Tamatupu is functionally different (not residential), though this is unlikely given the presence of house curbing alignments and coral and basalt paving on the terrace surface. The use of a Gini coefficient (Kohler *et al.* 2017) illustrates general differences in the scale of inequality between these communities as well. The coefficient calculated for Tamatupu is larger than both A'ofa and Tufu (Table 1), though the 80% confidence intervals of Tamatupu and A'ofa overlap slightly. This combined evidence suggests that the level of inequality present in the sample from Tamatupu is higher than that present in the samples from either A'ofa and Tufu, though subtler inequality is apparent in the latter two communities as well.

### Variation between island-level communities

Island-level community differences are also reflected in the distribution of unique feature types, some of which qualify as monumental architecture. Ditching is found on both islands, though the scale of ditching is markedly different (Quintus 2018a). On Olosega, in Tamatupu and potentially in Sili-i-uta, a single ditch feature stretches across the entire or close to the entire length of settlement zones (over 1 km in the case of Tamatupu). In contrast, ditching on Ofu is more localized. Such a difference is suggestive of variation in either the degree of individual community integration or the ability of individuals or groups to exercise practical village-level authority. The level of community authority, or at least prestige, may also be reflected in the distribution of star mounds, a type of monumental architecture found on the ridgelines of these islands. While they likely served multiple functions, the conventional view is that most if not all star mounds were used as platforms for the chiefly sport of pigeon catching (see Herdrich 1991; Quintus & Clark 2019). Thus, they reflect both the degree of labor organization and the potential power of elites to engage in restricted activities. Twenty-three of these features are documented along the ridgeline upslope of Tamatupu (Quintus & Clark 2012) with several more known for the ridge upslope of Sili-i-uta. The exact number of star mounds is unknown for Ofu, but only three have been identified in the field and, based on analysis of the lidar datasets, the total is unlikely to exceed ten. Finally, ditched terraces, terraces around which a ditch has been dug, are found at a much higher frequency in the sample from Tamatupu (n = 22) on Olosega than any other site, with two examples from A'ofa the only other ditched terraces documented for the two islands. The function of these features is unknown, although some of their characteristics, notably the flat coral paving unique to these features, upright stones on some, and their ditched boundary limiting access, hint at a specialized function tied to ritual activity.

Unique architectural types are known also for Ofu. The primary ridgeline of the island includes ring-ditch, bank, terrace, and depression architectural components with no apparent equivalent on the ridgelines of Olosega. A series of depressions, located downslope of two ring-ditch and bank features, covers an estimated total area of around 16,000 m². These features are morphologically most similar to interpreted *masi* (fermented breadfruit) storage pits in A'ofa and Tufu, suggesting the potential storage of resources in defensible locations but could plausibly be remnants of other activities (e.g., digging out of cobbles for tool manufacturing). The first ring-ditch feature on the Ofu ridgeline is located roughly 400 m from the upper edge of these depressions and is defined by two ditches that surround a relatively flat area (Fig. 2). The inner ditch, which measures 60 m in diameter, is narrower than the outer ditch but encapsulates the entirety of the flat area. The outer ditch is semi-circular with multiple causeways, creating the boundary for an area that measures some 6,200 m². Roughly 100 m up the ridge from this feature is another that exhibits steep banks nd ditches, though no complete ring ditch, as well as terracing (Fig. 2). At least one star mound falls within the boundaries of the feature-defining banks and ditches, which are present on each side of the complex. Causeways are present in areas where ditching was dug giving access to the central flat area on the ridgeline, which measures roughly 2,500 m². Additional terracing is present outside of the primary ditch and bank structure. The total area within which contiguous modification is found measures roughly 35,000 m². While functionality is difficult to interpret, the morphology and location of this architecture are reminiscent of defensive features (cf. Best 1993).

## DISCUSSION

Polynesian political systems are known and used as comparative cases across the world (Kirch 1984). Still, the nature and scale of power that enables the integration of communities within these political entities in Polynesia are poorly researched for some areas. A lack of regional survey data across island landscapes hampers comparative research as does the dispersed nature of the archaeological record in many island groups. Recent field research has filled some of these gaps (Field 2010; McCoy & Codlin 2016; Morrison 2012; Mulrooney 2012; Kahn *et al.* 2016), but analyses still tend to focus on intra-community patterning rather than inter-community comparison.

The advent and coming-of-age of digital survey methods aids in generating datasets that are useful for regional comparisons when the archaeological landscape is visible as topographic contrast. This is especially the case when digital surveys are paired with pedestrian survey data. Digital surveys allow an efficient large-scale, albeit coarse-grained, evaluation of differences across archaeological landscapes while precise attributes of settlement not easily recorded using digital means are documented through sample pedestrian surveys. A larger number of intersecting points of variation can be analyzed using such

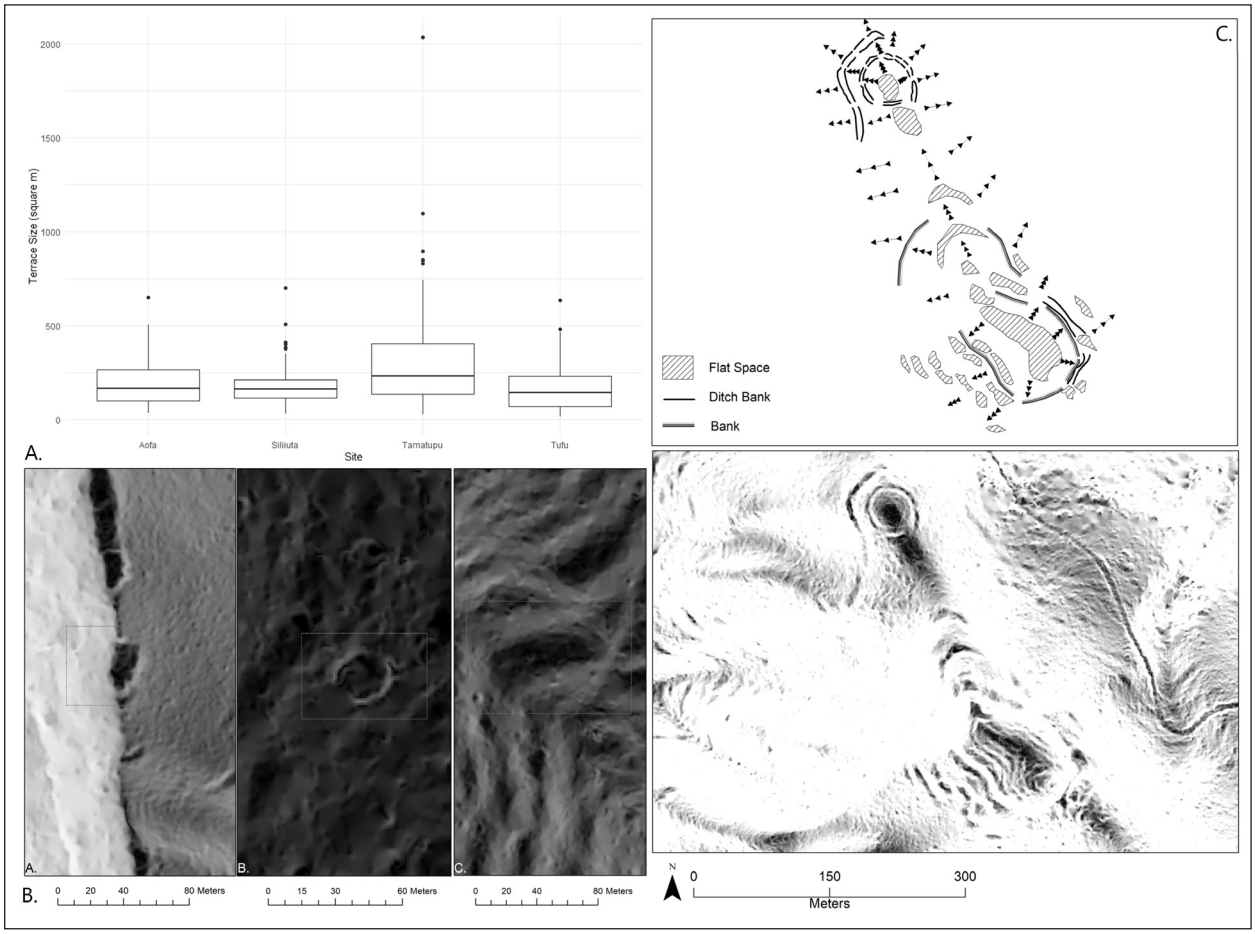


Figure 2. The distribution of terrace size in four communities (A), the morphology of feature types discussed in text as visible in a lidar-derived slope map (B), and the schematic (mapped from the lidar dataset) (top) and stretched slope (bottom) maps of possible defensive features on the primary ridgeline of Ofu Island (C). Lighter colors in the slope maps are areas of high slope. Darker colors note flatter spaces.

multi-scale data, useful in understanding in what ways and by how much these communities and islands differ. Even with incomplete datasets, as is the case here, the use of multiple proxies adds additional levels of certainty in identifying and interpreting variation.

The paired use of lidar datasets and targeted sample survey on Ofu and Olosega has allowed the documentation of communities. The communities identified showed marked variation in several attributes, ranging from terrace size to the qualitative nature of the archaeological record. The combination of measures marks the community of Tamatupu on Olosega as unique, featuring characteristics associated with increased levels of inequality and centralized power. Not only does there appear to have been a larger population associated with Tamatupu (Quintus 2018a), but more specialized activities appear to have been practiced within it evidenced by an increased density of monumental (star mounds) and potentially ritualistic (ditched-terraces) architecture. The lone measure by which settlement on Ofu was different was the presence of apparent defensive features on the primary ridgeline of the island.

The pattern of settlement on Ofu and Olosega is consistent with a two-tiered settlement hierarchy. The degree of inequality present within Tamatupu seems to imply the presence of a regional political figure in the former. In contrast, the presence of community leaders is suggested by subtler inequality present in Aʻofa, Tufu, and, probably, Sili-i-uta. Such a power structure is consistent with the presence at Tamatupu of monumental and specialized architecture related to ritual and ceremonial activities. Ethnographically, the sacredness of Sāmoan chiefs and Polynesian chiefs more generally (Marcus 1989) led to a monopoly of certain ritual actions. Such a monopoly is one mechanism that maintained and, at times, transformed power relations between individuals and groups.

Even though Tamatupu possesses several attributes that speak to both an increased degree of inequality and more centralized power, the nature of power relationships on Ofu and Olosega remains ambiguous. More specifi-

cally, their degree of administrative consolidation is unclear. Failure to adequately address these questions stems from a lack of more localized data, specifically comparative household excavation data, that could serve to elucidate further points of economic variation. What is uncertain is to what extent the material manifestations of power in the archaeological record (e.g., monumental architecture, specialized architecture, status architecture) translated to real practical influence and, perhaps, regional exploitation or control. At least some forms of monumental architecture in regionally integrated political systems mark ceremonial and ritual authority rather than real practical power (Junker 1999:75–78), and the evidence at hand hints that this is the case across Ofu and Olosega. Such patterning is characteristic of constituent political systems wherein some power, largely ceremonial and ritual, is ceded by local communities to a regional authority, though local autonomy and authority are kept relatively intact (Beck 2003). A level of administrative autonomy is evidenced across Ofu and Olosega by slightly different patterns of local production (Quintus 2018a).

The materialization of power relations through built landscapes speaks to at least some level of transgenerational continuity in these power relations. Furthermore, the presence of defensive features on Ofu hint at a sometimes contentious relationship, an interpretation supported by oral narratives of conflict between the two islands (Kramer 1902–03 [Vol. 1]: 597–598; Williams 1837: 414). The constrained nature of island environments might have resulted in attempts at regional administrative integration through coercive action as settlement continued to expand on Olosega. That Sili-i-uta is the only settlement in what is generally considered a marginal zone (high slope) seems to indicate that populations on Olosega were reaching an expansive state (Quintus 2018a). The scale of conflict seems minimal when assessing the size of defensive features, but the cliffs adjacent to these communities might have served as more effective systems of defense.

Hinterlands are generally thought of as contributing economically to the heartland, or at least being dependent in some way, though distinctions are also drawn based on differential power holdings. Some researchers have argued that hinterlands are impossible without cities (Cowgill 2004); certainly, even Tamatupu would not qualify as a city. Nevertheless, the relationships materialized on Ofu and Olosega do speak to uneven distributions of power. Tamatupu seems to include elements that are best described as urban functions or central features that identify it as a center and other communities as hinterlands to some extent (after Kohler *et al.* 2018). These elements serve purposes that extend outside the local community and across the region, creating a relationship of activity dependency between Tamatupu and other communities. There are no clear indications at present of regular resource extractive activities (tribute or taxation) that would be indicative of economic exploitation, but that does not preclude Tamatupu from being a centralizing node in the community network of the two islands. At the least, Tamatupu seems to have concentrated social capital if not material capital.

## CONCLUSIONS

The islands of Ofu and Olosega offer an opportunity to explore variation between communities given the ecological and social boundaries apparent between different settlement zones. The use of multiple proxies, including community size, terrace size, the Gini coefficient, the distribution of monumental architecture, and the nature of settlement on each individual island, allows the recognition and assessment of patterns that might detail the social relationships between different scales of human groups in the past. For instance, the relationship between Tamatupu and other communities seems to relate to the centralization of ritual practice while the relationship between Ofu and Olosega at an island scale seems to imply a relationship defined by direct coercive action impacted by the geographic characteristics of each island (Quintus 2018). Such multiscalar analyses here are enabled by the small size of Ofu and Olosega, which allows recognition of clearly defined variability across both intra- and inter-island scales.

The patterns identified in Manuʻa seem to indicate a pattern and level of community hierarchy not previously recognized, namely the integration of these islands under what appears to be an apex community. Not surprisingly, measures of the Gini coefficient from Manu'a fall firmly within the range of other 'regional political systems' associated with horticulture (Kohler *et al.* 2017). At a globally comparative scale, the inequality in these communities seems characteristic of regional-level political systems. This analysis of power relations across Ofu and Olosega through regional analysis illustrates an important point of variation in Polynesian political systems rarely considered outside a few case studies in more intensively researched island groups. While previous research has focused largely on economic potential or status rivalry to understand the scale of political systems, analysis of community relationships allows a more nuanced assessment of how different kinds of power was centralized, used, and maintained throughout the region. The analysis of regional variation in community structure and composition offers an opportunity to more thoroughly understand the divergence and variability of political entities in Polynesia beyond broad categorization. There were numerous ways to consolidate and organize power in Polynesian political systems and there was no one typical pattern.

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