



# “Let Us All Enjoy the Fish”: Alternative Pathways and Contingent Histories of Collective Action and Governance Among Maritime Societies of the Western Peninsular Coast of Florida, USA, 100–1600 CE

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Ethnographers have ably documented the great extent and diversity of social institutions that contemporary fishers and shellfishers employ to collectively manage common property resources. However, the collective action regimes developed among ancient maritime societies remain understudied by archaeologists. We summarize research into the development and form of collective action among the maritime societies of the western peninsular coast of Florida, USA, drawing on our own recent work in the Tampa Bay area and previous work elsewhere in the region, especially the Calusa area to the south. Archaeological evidence suggests that collective action became more important in Tampa Bay in the first centuries CE, probably owing to a marine transgression that resulted in more productive estuaries. Groups here staked claims to productive estuarine locations through the founding of villages, the building of mounds, and the construction of relatively simple marine enclosures. Historically, these changes resulted in societies of relatively small scale and limited authoritarian government. In contrast, collective action developed later in the Calusa area, may have begun in relation to resource scarcity than plenty, and may have been founded in kinship rather than in public ritual. Collective action in the Calusa area resulted in projects of greater scale and complexity, providing a foundation for more hierarchical and authoritarian social formations.

**Keywords:** collective action, common property, maritime societies, good governance, mass capture

## INTRODUCTION

Acheson (2015, p. 1) has noted that oceans “are almost always held as common property” owing to the fact that marine resources are typically low in value relative to the costs to defend them. Still, property is best conceived as a “bundle of rights” (North, 1990, p. 47) and, as Schlager and Ostrom (1992, 1993) observe, the property-rights regimes of fishers vary with regard to rights of access, withdrawal, management, exclusion, and alienation (i.e., transfer of ownership). These rights also vary individually with regard to social position; Schlager and Ostrom (1993, p. 16–19) define four classes of property-rights related to fishers based on increasing collective-choice rights: from users, to claimants, proprietors, and owners.

Consistent with the understanding of variability in rights to fisheries, ethnographers have documented great diversity in the common property regimes associated with contemporary maritime societies, from open access to territorial and exclusive (e.g., McCay, 1980, 1998, 2001; Cordell and McKean, 1986; Begossi, 1995; Aswani, 1999, 2002; Acheson, 2003, 2015; Aswani and Hamilton, 2004). These studies suggest that the character of common property regimes established among maritime groups varies with physical factors, such as the relative abundance and mobility of the resource and the physiography of the habitat (e.g., inshore vs. off-shore), as well as social factors, including the size and homogeneity of the population, the effectiveness of political leadership, and cultural values toward sharing (Wilson et al., 2013; Acheson, 2015, p. 37–39). By extension, we might expect maritime societies to display variation with regard to the dimensions of good governance identified by Blanton et al. (2021): public goods, bureaucratization, and controls exercised over governing principals. To date, however, discussions of good governance have focused almost exclusively on agrarian states.

Archaeological evidence suggests that early humans began fishing and shellfishing at least 150,000 years ago (Marean et al., 2007; Colonese et al., 2011; Cortés-Sánchez et al., 2011). Some researchers have suggested that shellfish gathering may have been key to the evolution of cooperation and modern human behavior (Jerardino and Marean, 2010). Shell middens—often of extensive size—appear around the world in contexts dating to the late Pleistocene and early Holocene (Waselkov, 1987, p. 124–126; Erlandson, 2013, p. 26). Marine resources appear to have been key to the later development of hierarchical societies across a number of regions of the planet (Mosely, 1975; Erlandson, 2001; Pearson, 2007; Grier et al., 2017). The fishing industry was also critical to the development of mercantile economies in Europe (Holm et al., 2019). Yet the variability of collective action regimes developed among ancient maritime societies remains understudied by archaeologists, as are the historical implications such variability holds for governance.

We summarize research into the development and form of collective action among the maritime societies of the western peninsular coast of Florida, USA, drawing on our own recent work in the Tampa Bay area and previous work elsewhere in the region, especially the Calusa area to the south. We emphasize variability in pathways to collective action, focusing especially on sea tenure and the construction of systems for the mass capture of marine life (i.e., traps or enclosures) but also the relation of these to other collective-choice projects such as aggregation into villages and the construction of mounds. We also consider the contingent histories of resource governance that flowed from variability in the form and ecology of collective property regimes.

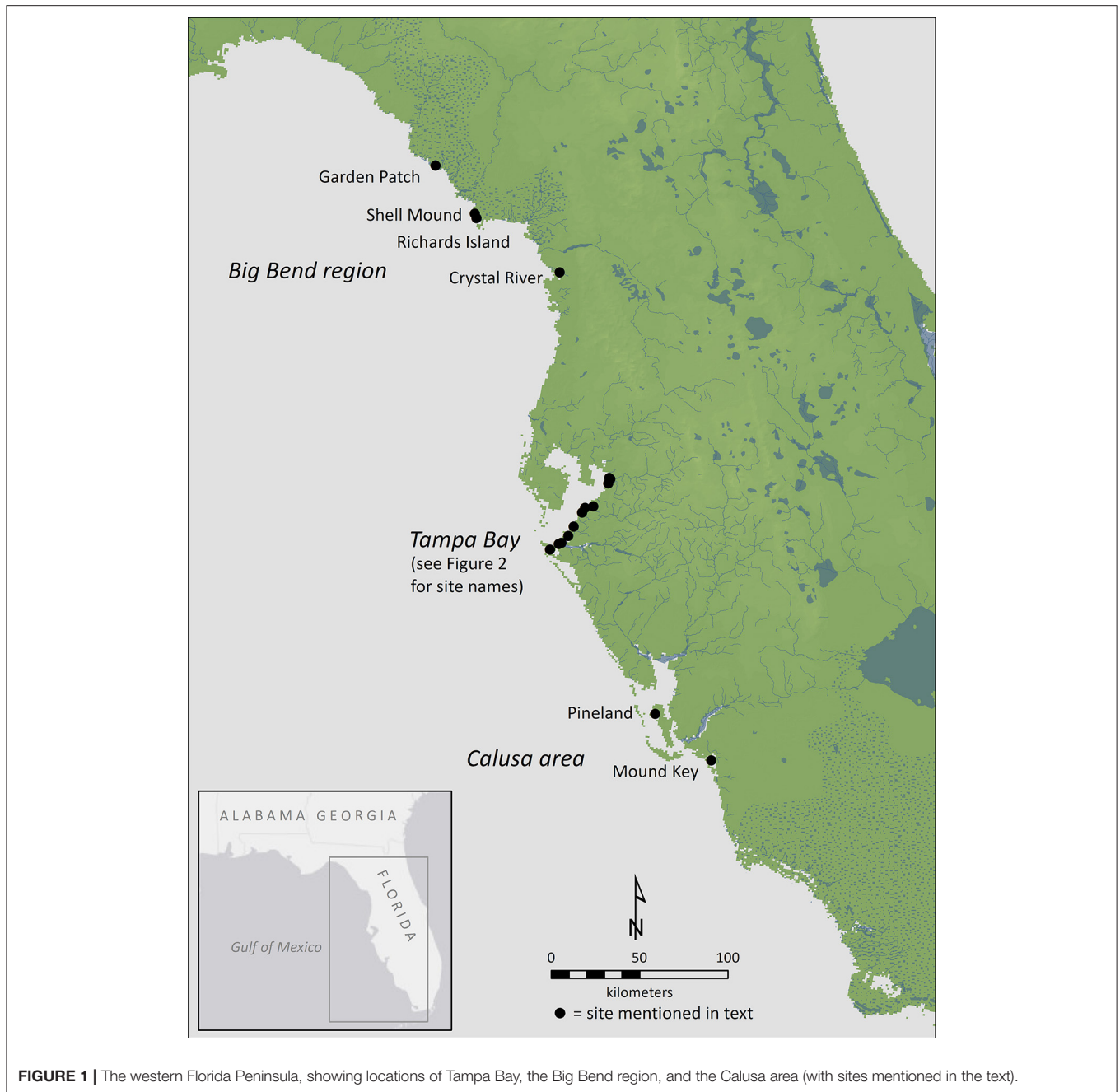
## PALEOECOLOGICAL AND ARCHAEOLOGICAL CONTEXTS

Tampa Bay, Florida's largest open-water estuary, covers an area of  $\sim 1,300 \text{ km}^2$  (499  $\text{mi}^2$ ) on the west-central coast of the Florida Peninsula (**Figures 1, 2**). The Y-shaped embayment, comprised

of several sub-basins, is oriented on a roughly northeast-southwest axis that extends approximately 60 km (37 mi) from its heads in Old Tampa Bay and Hillsborough Bay to its mouth in Lower Tampa Bay (Morrison and Yates, 2011, p. 17; Yates, 2011, p. 1). The bay is extremely shallow, with an average depth of only about 4 m (Brooks and Doyle, 1998) and with 90% of its area shallower than 7 m (Orlando et al., 1993). Tides are small in amplitude, with a diurnal range of 70 cm. Freshwater input is low, with  $\sim 85\%$  of the inflow to the estuary coming from four principal tributaries: the Alafia, Hillsborough, Little Manatee, and Manatee Rivers.

Once assumed to be a drowned river valley, recent geological findings indicate that the bay is underlain by a number of sinkholes (Brooks and Doyle, 1998; Donahue et al., 2003; Hine et al., 2009). With the melting of ice in the warming that ended the most recent glacial period, the gulf shoreline migrated inland as sea level rose, such that by around 2000 BCE the physiography of the region evolved into something resembling the configuration of modern Tampa Bay (Donahue et al., 2003; Cronin et al., 2007). Pollen records from local sediment cores and interior upland lakes document the expansion of mesic and hydric forests after  $\sim 2000$  BP, consistent with continued elevation of aquifers and increasing precipitation (Watts, 1969, 1975, 1980; Willard et al., 2007; Van Soelen et al., 2010). Analyses of stable isotopes (Alvarez-Zarikian et al., 2005; Wang et al., 2011, 2013) and speleothem accumulation (Van Beynen et al., 2008) corroborate this signature and suggest warm and wet climate through  $\sim 600$  CE, a local manifestation of the broader warm and wet climatic episode widely referred to as the Roman Optimum (Crumley, 1987; Ters, 1987; Lamb, 1995). These same proxies, as well as pollen data (Willard et al., 2007; Jackson and Pluckhahn, 2020), suggest that generally cooler and drier conditions prevailed from 600 to 850 CE, corresponding with the broader Vandal Minimum that brought cool aridity to much of the globe (Stothers, 1984; Crowley and North, 1991; Meese et al., 1994; Gunn, 2000; Curtis et al., 2001). Peninsular paleoclimate records suggest the return of warm and wet climatic conditions after ca. 900 CE, a pattern that aligns well with the broader Medieval Optimum period (Crumley, 1987; Lamb, 1995; Gunn, 2000). The most recent (and apparently the mildest) cool and arid reversal, known as the Little Ice Age, began around 1300 CE and lasted variably into the Spanish contact period (Alvarez-Zarikian et al., 2005; Walker and Surge, 2006; Van Beynen et al., 2008; Jackson and Pluckhahn, 2020).

Archaeological evidence indicates initial human settlement of Florida before the end of the last ice age, by at least 14,000 years ago (Dunbar and Webb, 1996; Dunbar, 2006; Halligan et al., 2016). However, the earliest evidence of human settlement in Tampa Bay dates to the Paleoindian period (11000–8000 BCE) (Daniel and Wisenbaker, 1987). Settlement increased over the course of the subsequent Archaic period (8000–1000 BCE). Elsewhere on the Florida peninsula, Native peoples began substantial fishing and shellfishing by 5000 BCE, sometimes using food waste to construct massive mounds and midden complexes (Russo, 1991, 1994; Saunders and Russo, 2011; Randall, 2013, 2015; Gilmore, 2016; Randall and Sassaman, 2017). However, extensive shell middens and



**FIGURE 1** | The western Florida Peninsula, showing locations of Tampa Bay, the Big Bend region, and the Calusa area (with sites mentioned in the text).

mounds do not appear in the archaeological record of Tampa Bay until the subsequent Woodland period (ca. 1000 BCE to 1050 CE). Villages expanded in number, size, and permanence during this period (Pluckhahn and Thompson, 2018) and, with contemporaneous Hopewellian societies across eastern North America, the Native peoples of Tampa Bay region began constructing small burial mounds (Moore, 1900, 1903). Platform mounds were constructed at several sites along the western Gulf Coast (Wallis et al., 2015; Pluckhahn and Thompson, 2017, 2018), including—as we discuss below—at sites in Tampa Bay. Excavations at a few of the burial mounds in the region produced

artifacts of extra-local materials and styles typical of the Hopewell tradition of the American midcontinent (Moore, 1903, p. 409–410; Greenman, 1938), although the bulk of the exchange appears to have been items of local origin (Seeman, 1979; Thompson et al., 2018).

After a period of reorganization late in the Woodland period that included reductions in mound building, trade, and ceremony (McElrath et al., 2000), a new Mississippian way of life emerged from a “Big Bang” at the Cahokia site in the American midcontinent (Pauketat, 1994, 2004). Carried through trade and migrations, Mississippian identity spread from Cahokia to



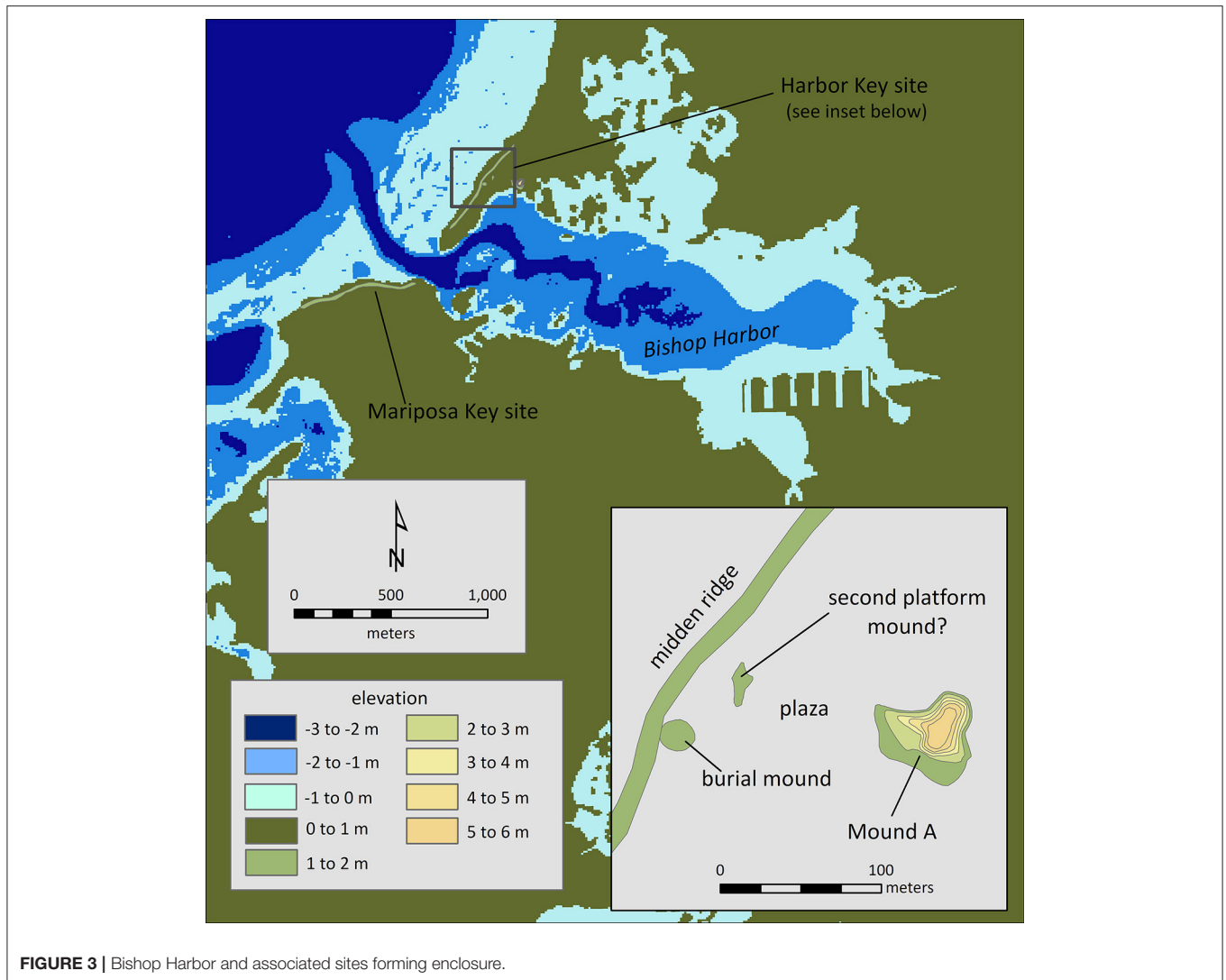
**FIGURE 2 |** Tampa Bay (with additional sites mentioned in the text).

much of the Southeast US, including the Florida peninsula. But the markers of this identity—including hierarchical social organization, larger villages, platform mounds, maize agriculture, and iconographic depictions of cosmological and warrior themes in shell, stone, and pottery—were differentially adopted and reinterpreted locally (Alt, 2006; Blitz, 2010). Mississippian societies in Tampa Bay remained focused on maritime resources rather than maize, and were only weakly integrated into the wider networks of exchange in prestige goods (Griffin and Bullen, 1950; Mitchem, 1989). Nevertheless, ethnohistoric sources from the 1500s describe a socio-political landscape not unlike elsewhere

in the Mississippian Southeast, with territorially circumscribed polities led by hereditary “caciques”, or chiefs (Milanich and Hudson, 1993; Milanich, 1995; Hudson, 1998).

## EVIDENCE FOR COLLECTIVE ACTION

Ethnohistoric sources from the colonial-era Southeast US, while limited in detail and obviously biased in perspective, suggest that land tenure among the Native societies was largely communal (Swanton, 1911, p. 75, 166; Hudson, 1976, p. 295; Muller, 1997,

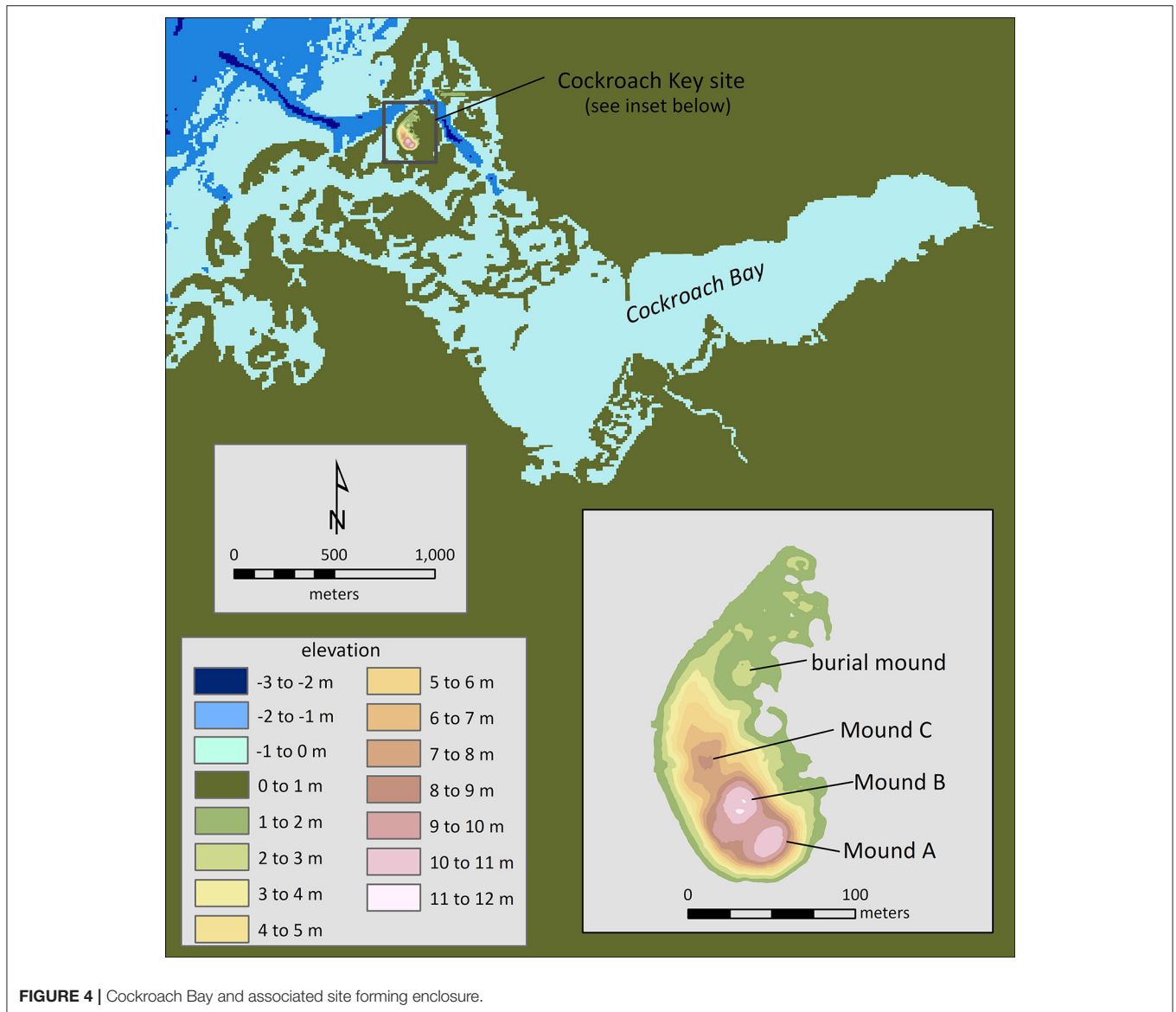


p. 268). Large fields were sometimes divided into individual allotments by household or lineage, but the planting of fields was done collectively. In some accounts, chiefs stood on mounds or plazas to call people to work, and imposed fines on those who failed to attend.

Unfortunately, the systems of marine tenure that were employed by coastal- and riverine-dwelling residents of the Native Southeast US were less commonly noted. However, the sparse accounts suggest that fish were sometimes caught en masse in traps or canals. For example, the French explorer René Laudonnière, in his chronicle of a 1562 voyage to the Atlantic coast of Florida, described the traps there as “weirs, or enclosures, made out of reeds like a maze” and capable of “speedily” loading up the French with “trout, mullet, flounder, turbot, and a multitude of other species” (Laudonnière, 2001, p. 20). Laudonnière does not describe how the fish traps he observed were owned or managed. However, an account of the earlier (1539–1542) expedition of Hernando de Soto expedition suggests the chief of a town in the Mississippi River Valley “had there for

his recreation and pleasure” a canal capable of producing copious quantities of particularly large and delectable fish (Elvas, 1993, p. 117–118). De Soto was sometimes often offered large quantities of fish as “aid or prestation” to feed his army (Muller, 1997, p. 236). In some cases, tributary offerings of fish may have served mainly as a supplement for maize as supplies dwindled with time since harvest. However, in some portions of the Southeast, fish—rather than maize—constituted the major form of tribute extracted from commoners and exchanged between chiefs (Elvas, 1993, p. 117–118; Rees, 1997).

The archaeological remains of ancient and historic-era fish weirs—while not common—have been identified at a number of sites in the region (Connaway, 1982, 2007). The majority of these were constructed in shallow interior rivers and streams and consist of linear, diagonal, or V-shaped dams, usually formed of rock but sometimes of wooden stakes with withes of cane, and sometimes with a central trap (Connaway, 1982, p. 148). Another form consists of “longshore traps” consisting of straight fences running perpendicular to a river’s



**FIGURE 4** | Cockroach Bay and associated site forming enclosure.

edge and leading to an impoundment structure, designed to trap fish feeding along a bank or spawning upstream (Connaway, 2007, p. 6). A final basic form consists of tidal weirs constructed of wooden stakes or rocks with a trap at the center, built in bays and tidal inlets to catch fish on outgoing tides.

Until recently, no ancient fish trap sites had been identified archaeologically on the coasts of the Florida peninsula. The paucity of evidence for such technologies is hardly surprising, despite the obvious importance that marine resources held for the region’s Native inhabitants. The sandy substrate of the region’s coasts and estuaries, combined with the frequency of intense storms, are not conducive to the preservation of intertidal structures of relatively ephemeral construction. Extensive modern development of the coastline further reduces the likelihood

that the archaeological remains of such technologies remain preserved.

Nevertheless, recent evidence suggests that fish traps were constructed by precolonial Native peoples in areas both to the north and south of Tampa Bay on the western Florida peninsula. For the Calusa area of southwest Florida, Thompson et al. (2020, p. 8374) present evidence that so-called “watercourts”—“subrectangular arrangements of shell and other sediments around centralized inundated areas”—functioned for the mass-capture and storage of fish. At the Mound Key site, Native people constructed two such impoundments, connected to a “Grand Canal” to form a “single hydrologic system” (Thompson et al., 2020, p. 8377). The authors suggest that the Calusa would have strung nets across the end of the canal to corral fish into the watercourts through openings that could then be likely closed by nets (Thompson et al., 2020, p. 8380). Radiocarbon

dating suggests that construction of the fish trap and storage system began with the Grand Canal sometime around 900 CE (Thompson et al., 2020, p. 8377), and concluded with the addition of the impoundments between 1300 and 1400 CE (Thompson et al., 2020, p. 8380).

For the marsh dominated “Big Bend” area to the north of Tampa Bay, Sassaman et al. (2020, p. 43–44) present evidence that Native peoples built a tidal fish trap consisting of a seawall of oyster shell and muck enclosing a series of tidal pools. While the fish trap could not be directly dated, a nearby midden produced a date of ~550–650 CE. Sassaman et al. relate the fish trap to summer feasting at Shell Mound, a civic-ceremonial complex around 2 km to the north dating to the interval from around 400–600 CE.

We can’t yet point to direct archaeological evidence for the use of similar mass-capture techniques for ancient Tampa Bay. This may simply reflect poor preservation relative to these areas of the coast; certainly, the Tampa-St. Petersburg metropolitan area is more heavily developed. Alternatively, or additionally, it may reflect the lack of concerted attention to the archaeology of Tampa Bay, especially (until recently) using modern methods. However, we suggest another explanation: mass capture technologies employed in Tampa Bay were of a different form, built to take advantage of the numerous small nearshore bayous and embayments along landward margins of the estuary.

Ethnohistoric evidence for this is provided by Garcilaso de la Vega, a chronicler of the Soto expedition which landed in Tampa Bay in 1539. We quote De la Vega’s account at length for both its description of the weir and for the hints it provides regarding its collective ownership and management:

You should know that these Indians had constructed great enclosures of dry rock in the Bay of the Holy Spirit so as to be able to enjoy the skates and many other fish that came in with the high tide and remain there trapped and almost dry when the tide was low. In this manner they caught many fish which the Castilians with Captain Pedro Calderón likewise enjoyed. Thus, it came to pass that 1 day two Spaniards, Pedro López and Antón Galván...desired very earnestly to go fishing, and although they had no permission from the Captain to do so, they set forth in a small canoe, carrying with them a...boy named Diego Muñoz...While these men were fishing in a great enclosure, twenty Indians approached them in two canoes, and in the meantime many others waited for them on the land. Entering the enclosure these twenty men addressed the Christians kindly, some speaking in Spanish and some in their own tongue. “Friends, friends,” they said, “let us all enjoy the fish.” Pedro López, who was a crude and arrogant individual, replied: “Dogs! We don’t have to traffic with dogs.” With that he grasped his sword and wounded an Indian who had come near. Then the other Indians, on perceiving the unreasonableness of these Spaniards, hemmed them in from all sides, and striking them with their bows and arrows as well as their oars, they killed Pedro López, who had caused the fracas, and left Galván for dead with his head laid open and his whole face torn by the force of the blows. Diego Muñoz, they took prisoner but did him no further harm because of his extreme youth (De la Vega, 1988 [1605], p. 229–230).

Assuming the veracity of this report,<sup>1</sup> and at the risk of over-interpreting an account of such brevity, we take a number of lessons from De la Vega’s relation. First, and most obviously, the late precolonial Native peoples of Tampa Bay constructed systems for capturing marine resources en masse. De la Vega’s reference to these in the plural suggests the Spaniards may have seen more examples than the one where this incident occurred. In addition, some of these systems of mass-capture were of relatively large size, as attested to by his description of the feature as a “great enclosure” capable of capturing “many” fish, and apparently large enough to hold at least three canoes at a distance.

The description of the trap as constructed of “dry rock” does not reconcile with the paucity of stone in the region; it is possible that the traps could have been constructed of fossilized coral or limestone, but even these materials are uncommon in the area’s surficial deposits. We therefore think it more likely that the enclosures De la Vega describes were comprised of piled shell, which could easily be confused with limestone from a distance, based only on casual observation, or through retelling of the story. Of course, this does not preclude the use of other materials in combination or in place of shell.

Combining these inferences regarding size and material, we suggest that the Native systems of mass capture that the Spanish observed in Tampa Bay may have consisted of small embayments, the mouths of which were artificially restricted by the deliberate piling of shell. By placing nets or stakes at the relatively narrow openings to these embayments, the features could have functioned as tidal fish traps, as the Spanish accounts suggest. However, these artificially enhanced embayments also enclosed other important forms of marine resources, including oyster reefs, clam beds, seagrass meadows, and marshes. For this reason, we refer to these as “corrals” or “enclosures” (borrowing from the Spanish), rather than simply as fish weirs.

De la Vega’s account suggests to us that these enclosures were collectively owned and managed. This is most obvious in the Native entreaty to “let us all enjoy the fish,” which seems to imply at least collective rights of access and withdrawal. This inference is also supported by the Spaniard’s descriptions of the “great” size of the structures and the “many” people who watched the incident unfold from adjacent land. It is possible, and perhaps likely, that smaller traps or cultivation facilities were in place within these larger enclosures. It also seems probable that much fishing and shell-fishing production took place in open waters of the bay beyond these enclosures. For example, among the Native fishers of California and the Northwest Coast, the largest fisheries involved weirs and stone fish-trap enclosures, but much of the

<sup>1</sup>De la Vega, of Spanish and Quechua descent, likely relied on the recollections of expedition-member Gonzalo Silvestre in writing his history; it is thus generally considered a source of uneven reliability (Hudson, 1998, p. 448–453). However, several factors suggest we may be in a position to lend greater credence to this anecdote. First, the incident occurred very early in the expedition, where De la Vega’s account most closely approximates the details provided by other chroniclers (Hudson, 1998, p. 450). Next, owing to the fact that Galván survived the attack but with diminished mental capacity, the other soldiers “made this man repeat his tale many times” for their amusement (De la Vega, 1988 [1605], p. 230). We also note that fish weirs were likely familiar to Europeans, given archaeological evidence for their long history on the continent (O’Sullivan, 2004; Viveen et al., 2014).

production came from smaller reef-net fisheries and temporary dams targeting seasonal runs of specific species (mainly salmon) (Swezey and Heizer, 1977; Claxton, 2003). We lack evidence for net fishing technologies in Tampa Bay, but it seems likely that these would have been employed at least seasonally, when species like mullet run in dense quantities. Likewise, we expect that much of the shellfish production must have focused on the larger oyster reefs and clam beds beyond enclosures.

Finally, De la Vega's account also makes it clear that the enclosures were actively defended, suggesting collective rights of exclusion. In this regard we note that the Indians did not allow the Spanish to finish fishing before confronting them, but instead appear to have sent two canoes to intervene. The active defense of territory is consistent with Spanish descriptions of well-defined polity boundaries in Tampa Bay, as we noted above.

Based on reconstructions of the De Soto entrada, De la Vega's account is presumed to refer to the southeastern portion of Tampa Bay (Milanich, 1995, p. 71–75; Hudson, 1998, p. 69–71). Although the archaeology of this area is poorly developed, we know that mound sites were established at the mouths of nearly every river and embayment in this portion of the estuary (see **Figure 2**). Proceeding from the southern entrance to Tampa Bay, these include the mound complexes at the Perico Island site at the mouth of Palma Sola Bay; at the Shaws Point and Portavant sites at the west and east ends of the mouth of the Manatee River; at the Madeira Bickel site between Miguel and Terra Ceia Bays; at the Harbor Key site at the mouth of Bishop Harbor; at the Cockroach Key site at the mouth of Cockroach Bay; at the Little Cockroach Key site near the entrance to Little Cockroach Bay; at the Thomas site near the mouth of the Little Manatee River; at the Bullfrog Mound site at the mouth of Bullfrog Creek; and, finally, at the Shell Bluff and Mill Point sites at the mouth of the Alafia River.

At a minimum, the siting of these mounds in conspicuous locations suggests an imperative to claim particular resource locales. But in several cases, the placement of mounds and associated middens also seems to have functioned to further restrict the naturally constricted mouths of small embayments. Perhaps the best example of this is at Bishop Harbor, where linear shell ridges—each at least 700 m long and reaching a maximum elevation of around 1.5 m—were constructed at the Harbor Key and Mariposa Key sites to either side of the mouth of the embayment, restricting the entrance to a channel only about 100 m wide (**Figure 3**). A weir or net across this ca. 1.5 m-deep channel would enclose an area of nearly 2 square kilometers with a maximum depth of only around 1 m below MSL. The modern diurnal tide range in this area of around 0.66 m (NOAA, 2021) is enough to leave portions of the embayment exposed at low tides, perhaps resembling the sort of “great enclosure” described by Vega. At the Harbor Key site, which constricts the northern side of the narrow channel described above, Native peoples erected a platform mound ~6 m high, with a narrow, rectangular summit measuring about 18 m long and 6 m wide. A ramp extends ~30 m west-northwest from the summit of the mound to an apparent plaza, bordered on the opposite side by a smaller mound (possibly also a platform, about 1 m high) and a burial mound (roughly 1 m high and 21 m in diameter) (Bullen et al., 1952; Burger, 1979;

Wheeler, 2002).<sup>2</sup> Recent radiocarbon dating suggests the larger platform mound was likely initiated around 200–300 CE, with the final mound surface utilized between around 400 and 550 CE.

A second example comes from slightly further north at Cockroach Bay, a ca. 1.5-square kilometer embayment with a maximum depth of around 1 m (**Figure 4**). Recent archaeological work at the Cockroach Key site, building on prior work in the early twentieth century (Moore, 1900, p. 359–361; Willey, 1949, p. 158–172; Bullen, 1952, p. 20–25) indicates that Native peoples began occupying a shoal on the southern bank of the narrow channel leading to this embayment by around the first century CE. Over the following six centuries, the settlement was transformed into a substantial civic-ceremonial complex comprised of a ca. 4-m tall shell midden, three platform mounds (Mounds A and B reaching ca. 10-m tall, Mound C around 5-m high), and a large burial mound. At low tides, the mound complex at Cockroach Key, combined with a series of low islands, effectively limits access to the embayment to the main channel, again approximating the sort of fishing enclosures described for this region by the Spanish in the 1500s.

Ongoing analysis of faunal remains from Harbor Key and Cockroach Key may eventually provide additional archaeological evidence for the catching of fish in enclosures. At present, we can only report that fish and shellfish remains are common, constituting the vast majority of the sediment on the sites. We also note that in their work in a now-submerged portion of the midden at the Cockroach Key in the 1930s, WPA crews noted the presence of “deposits of almost pure fish scales” and interpreted this as evidence for the processing of fish prior to cooking (Bullen, 1952, p. 24).

## ALTERNATIVE PATHWAYS AND CONTINGENT HISTORIES

Archaeological evidence—while not conclusive—supports the ethnohistorical account of ancient systems of mass-capture of marine resources in Tampa Bay, complementing the recent identification of such systems in areas to both the north and south (Thompson et al., 2018; Sassaman et al., 2020). However, the pathways that led to these systems varied, and the resultant facilities took on different physical forms and ecological functionalities. These factors, in turn, also influenced local histories of governance.

Thompson et al. (2018, p. 39) provide a model for the development of collective action in the Calusa area that focuses on the appearance of larger corporate kin groups and their ability to transform surplus labor into the construction of large-scale public works, especially in the context of environmental change. Briefly, they suggest the process began sometime soon after 500 CE as households reorganized from single to multi-family units, evidenced archaeologically by the appearance of larger dwellings, in response to an inferred episode of sea level regression and climatic instability ca. 650–800 CE (the Vandal Minimum) (Thompson et al., 2014, 2018, p. 39). As

<sup>2</sup>Milanich, J. T. (unpublished report). *The Bishop Harbor Archaeological Complex. Report on File, Florida Master Site File*. Tallahassee, FL.



more favorable climatic conditions returned ca. 800–900 CE, multi-family households came together to form co-resident communities, aggregations that were facilitated through their cooperation in the construction of canals within and between settlements. Eventually, as noted above, some communities also constructed systems for the mass capture and storage of fish (Thompson et al., 2020).

The pathway to collective action seems to have been much different on the stretch of coastline to the north of Tampa Bay. Here, a series of marine transgressions around the beginning of the first millennium appear to have prompted aggregations of small households into villages around the first or second century CE (Pluckhahn et al., 2015; Wallis et al., 2015; Pluckhahn and Thompson, 2018; Sassaman et al., 2020), well-before such aggregations appeared to the south in the Calusa area. Many of these villages seems to have developed in locations where burial mounds had already been established; evidence from the Crystal River site suggests that sea level rise may have prompted residents of the coast to congregate more permanently in better protected locations where they had formerly gathered seasonally for mortuary ceremonies (Thompson et al., 2015; Lulewicz et al., 2017). Sassaman et al. (2020, p. 27) (see also Sassaman et al., 2019) suggest that the early village at Shell Mound was established on a “solstice-oriented dune”, reflecting a new temporality that emphasized cycles of renewal in the face of landscape change. In their telling, beginning around 400 CE and continuing for at least 250 years, these cycles were marked by ritual feasting at the summer solstice, provisioned—at least in part—by the mass capture of mullet and other fish (Sassaman et al., 2020, p. 43).

Perhaps not surprisingly, given its intermediary location, the history of collective action in Tampa Bay finds both intersections and divergences from these case studies. As with areas to the north, there is evidence that collective action here increased in the first or second century CE with aggregation into villages at sites such as Cockroach Key and Harbor Key. Also like the areas to the north, the initial impetus for population aggregation may have been a pulse in sea level rise; recent sediment coring in several areas of Tampa Bay (see also Gerlach et al., 2017) suggests a marine transgression also occurred here around the first century CE, causing a relatively rapid replacement of marsh by sand flats and seagrass beds. Both sites contain burial mounds but we are unable to say if these predate the period of village formation, as seems to have often been the case to the north. Ongoing isotopic studies of oysters may clarify if the settlements grew more permanent over time.

Whatever the circumstances of their founding, the villages at Harbor Key and Cockroach Key expanded over the course of the next few centuries, corresponding with the favorable conditions of the Roman Optimum. This trajectory closely parallels mound sites to the north at Crystal River (Pluckhahn and Thompson, 2018), Garden Patch (Wallis et al., 2015), and Shell Mound (Sassaman et al., 2020). As at these other sites, copious quantities of shell from oysters and marine gastropods, as well as the bones of fish and other marine vertebrates, were deposited as a result of both daily subsistence and ritual feasting.

Unfortunately, we have little record of rituals specifically relating to fishing in the US Southeast; ethnohistoric accounts are biased to the agricultural-related rituals of later pre-colonial

interior societies. Still, one account from the 1700s is suggestive of the possibility that these might have been more common than evidence allows; James Adair described Native peoples of the region driving fish into traps, after which “they make a town feast, or feast of love, of which every one partakes in the most social manner, and after which they dance together, singing...their usual praises to the divine essence, for his bountiful gifts to the beloved people” (Adair, 1986, p. 432–433). Archaeologically, we know that feasting debris was commonly used to construct platform mounds, which were enlarged in a series of stages that evoke rituals of renewal, as described by Sassaman et al. (2020) for Shell Mound but as seem to have been common for the public monuments of the Woodland period more generally (Knight, 1990, 2001; Kassabaum, 2021; see Claassen, 2010 for discussion of rites of renewal in earlier periods).

Fishing-related feasting and ritual, by satisfying social and cosmological debts (Cobb and Stephenson, 2017, p. 160) and by encouraging cooperative behaviors (Carballo et al., 2014; Miller, 2021), may have been the primary social institutions for mitigating collective action problems. McNiven (2004) describes how the public rituals of indigenous fishers of Australia, by invoking spirits of the sea and the dead, mediated marine tenure at various scales of inclusiveness, from household to clan and larger communities. Pluckhahn and Thompson (2018, p. 116) likewise suggest that public ritual at Crystal River served in part to regulate access and conflicts over resources such as shellfish beds and fishing locations. As DeMarrais and Earle (2017, p. 191) observe, “face-to-face interactions sustained over years, kinship, and shared cosmologies foster trust, reciprocity, and reputation, which, in turn, facilitate cooperation” (see also DeMarrais, 2016, p. 3). The modular organization of small-scale societies facilitates the transfer of cooperation from one form or context to another (Roscoe, 2009; Miller, 2021; see also Carballo et al., 2014, p. 112). This may help explain how cooperation in the context of ritual transferred to greater collective action in subsistence production, as evidenced by the fish traps documented by Sassaman et al. (2020). We suggest the same may hold in Tampa Bay, as Native peoples employed the food remains from collective rituals to construct enclosures for collective subsistence production.

Sassaman et al. (2020, p. 22) see ecology and economy playing a secondary role to cosmology in the development of fish traps in the area of Shell Mound. However, we see the economic motivations as equally important for the development of collective action among the Native societies of Tampa Bay. Specifically, the siting of villages and mounds in highly visible locations at the mouths of small embayments with high resource potential suggests to us that sea tenure became more exclusive. As Roscoe (2006, 2009, 2017) notes, village formation is often predicated on collective interests in subsistence and defense, even in the absence of offensive warfare. Territoriality typically develops “when the benefits of holding a bounded area are higher than the costs of defending it” (Acheson, 2015, p. 30). This “economic defendability” is influenced by a number of factors but especially the abundance and predictability of resources (Dyson-Hudson and Smith, 1978, p. 23; Cashdan, 1983, p. 47). Shoreline retreat and the onset of optimal climate during the first centuries CE may have made estuarine resources both more abundant and predictable, incentivizing aggregation and the staking of claims

to productive territories. The construction of enclosures further augmented the “economic defendability” of key areas.

In sum, collective action in Tampa Bay and the Big Bend region to the north seems to have progressively ramped up across the first half of the first millennium CE, in a period of relatively favorable climate: from aggregation into villages, to the construction of mounds, and on to the establishment of enclosures and more exclusive systems of sea tenure. There are differences between the two areas—we have suggested that competition may have been a greater factor in motivations behind the development of more exclusive property rights in Tampa Bay—but their histories are more similar than different.

The same cannot be said for the Calusa area to the south. Marquardt and Walker (2013, p. 877) report little evidence for mound construction in the region before 1000 CE. Thompson et al. (2018, p. 39) suggest that collective action here began with the drier and cooler conditions of the Vandal Minimum (ca. 650 CE), as single families responded to environmental challenges by combining to form multi-family units that resided together in larger structures (up to 20 m a side) and cooperated in resource extraction (Thompson et al., 2014, p. 67; Thompson et al., 2018, p. 35). Collective action thus came to be structurally embedded in Calusa society through kinship and residence patterns (Thompson et al., 2018, p. 39), consistent with Miller (2021, p. 166) observation that “cooperation begins at home.” As more favorable climatic conditions returned ca. 850 CE, multi-family households came together to form larger communities and began cooperating in larger collective action projects, including the construction of mounds and canals. Eventually, as noted above, some communities also constructed systems for the mass capture and storage of fish (Thompson et al., 2020).

If the pathways to collective action were different in the Calusa area than they were for Tampa Bay and the Big Bend, so too were the forms of collective action projects. Specifically, although collective action may have been slower to develop in the Calusa area, may have formed more in relation to resource scarcity than plenty, and may have been founded more in kinship than in public ritual, it eventually resulted in projects of greater scale and complexity. To an extent, these differences may simply reflect differences in physiography, one of the factors Acheson (2015, p. 37–39) identifies for variation in sea tenure. The enclosures and traps in the Tampa Bay and Big Bend regions, in that they took advantage of natural embayments, likely required less labor.

However, as Acheson further notes, the character of sea tenure also varies with social factors, including the effectiveness of political leadership. In this regard, it seems apparent that Calusa leaders were able to mobilize and manage labor more effectively than their counterparts to the north. For example, the main canal at Pineland in the Calusa area ran ~4 km and would have required the excavation of some 30,000 cubic meters of sediment (Marquardt and Walker, 2013, p. 880–881), dwarfing the labor invested in the construction of even the largest (10-m tall) mounds in Tampa Bay at the Cockroach Key site. Likewise, the facilities for trapping and storing fish that the Calusa developed—while relatively small in areal extent—would seem to have required more planning and greater coordination than the simple tidal traps identified by Sassaman et al. (2020) at Richards Island

or the large enclosures inferred by us for Tampa Bay. Beyond the greater labor required for their construction, Calusa canals and fish traps would also seem to have required more maintenance, since they would have been prone to sedimentation.

Sea tenure is also influenced by the size of population (Acheson, 2015, p. 37–39), and it seems likely that the greater complexity of the Calusa systems of mass capture was both product and factor in the higher density of people there relative to Tampa Bay and the Big Bend area to the north. Certainly, at least the Calusa towns appear to have been more densely packed. Historical accounts indicate that the capitol town of Calos at the Mound Key site was home to ~1,000 people, residing in 16 very large houses that held an average of 63 people each (Marquardt and Walker, 2013, p. 853–854). The chief’s house was said to be capable of holding 2,000 people. In contrast, a Spanish account from the sixteenth century describes the Native town of Ucita—presumably among the larger communities in Tampa Bay—as consisting of “seven or eight houses” in addition to the chief’s house on top of a mound (Robertson, 1993, p. 57). The houses in Tampa Bay are generally described as small “huts,” although there is one mention of a structure that could hold “more than three hundred people” (Worth, 2014, p. 92). Archaeological evidence of domestic architecture in Tampa Bay, while limited, is consistent with these descriptions of smaller houses (Willey, 1949, p. 167–168; Woods and Austin, 1995).

As we noted above, Schlager and Ostrom (1993) have observed that property rights may vary with regard to access, withdrawal, management, exclusion, and alienation. Thompson et al. (2018, p. 39) see the Calusa canals and fish traps as intended “for broad-scale benefit, not restricted in their use.” Certainly, this must have been true, broadly speaking; canals likely made travel into the interior safer and more efficient, enhancing connections to other population centers (Marquardt and Walker, 2013, p. 881; Thompson et al., 2018, p. 39–40). Likewise, the construction of systems for trapping and storing fish required “coordinated effort and collective buy-in from larger segments of society” and may have enhanced food security for the population at large by a more permanent and less seasonally variable supply of fish (Thompson et al., 2020, p. 8380).

But there are reasons to suggest that the rights to the access, withdrawal, and management of collective infrastructures was more restricted among the Calusa. For example, canals were located in close proximity to mounds associated with the most prominent lineages, suggesting that they may have been controlled locally by Calusa elites (Thompson et al., 2018, p. 39). The proximity of elite household or lineage groups to canals would have made it far easier for them to monitor who was extracting what and where resources were going to, making it more difficult for commoner households to resist hegemonic obligations. At a broader scale, while the canals may have fostered “inter-community cooperation” (Thompson et al., 2018, p. 39–40), they likely also functioned to move tribute to political centers (Luer, 1989; Thompson et al., 2018, p. 39–40). In addition, while the fish trapping and storage facility at the Calusa capital of Mound Key probably provided resources for community feasting, some elite households—by way of their closer proximity and the addition of restricted ramps—seem to have enjoyed

privileged access to these facilities and their products (Thompson et al., 2020, p. 8380). In the terminology developed by Schlager and Ostrom (1993) to describe the rights of fishers, Calusa elites may have come to serve more as owners or proprietors of collective-choice rights than simply claimants or users.

The comparative analysis of pre-modern states undertaken by Blanton and Fargher (2008, p. 14) indicates that controls on ruler agency are predicated on their bargaining with “taxpayers,” whose position depends largely on the extent to which rulers are dependent on them for achieving their revenue goals. It would thus not be surprising if the more restricted nature of Calusa fish impoundments had important ramifications for governance. Marquardt and Walker (2013, p. 886) and Marquardt (2014, p. 14) has previously suggested that state-level governance emerged among the Calusa only in the 1500s, when their leaders began monopolizing the people and treasures recovered from Spanish shipwrecks. However, he and his colleagues now suggest that Calusa “kings” emerged several centuries earlier, as individual lineages gained greater prominence through the control of surplus fish stocks (Thompson et al., 2020, p. 8380; Marquardt et al., 2022, p. 2). Abetted by its control of canals that facilitated interregional connections from the capital at Mound Key (Marquardt and Walker, 2013, p. 880–881), the Calusa developed into a weak-tributary state governed by a hereditary king who ruled a population divided into nobles and commoners (Hann, 1991; Marquardt, 2014). The introduction of Spanish goods and people in the sixteenth century may thus have only amplified elite proprietor rights to the access, withdrawal, and management of collective infrastructures. In any case, by the 1500s, the Calusa king held sway over much of the southern Florida peninsula, collecting tribute from more than 20,000 subjects across 50–60 communities (Marquardt et al., 2022, p. 1). Marquardt et al. (2022) note that the Calusa king and his closest kin “held strictly guarded religious knowledge” (see also Marquardt, 2014, p. 14, 16). This, coupled with the oversized proportions of Calusa ritual structures suggests that ritual here possibly leaned to forms that Blanton (2016, p. 24) terms “constitutive” and defines as intended to affirm the legitimacy of monarchical rule through spectacle.

In contrast, the political landscape of Tampa Bay remained more heterarchical, as evidenced by Spanish descriptions of smaller territorial polities with shifting boundaries, often speaking different languages, and frequently at war with one another (Mitchem, 1989, p. 594; Milanich, 1995, p. 72–73; Hudson, 1998, p. 69–85). Chiefs here appear to have had relatively limited authority, with no evidence of the pronounced status distinctions that seem to have held among the Calusa. As in the Calusa area chiefs here may have played a prominent role in public rituals but these rites seem to have centered on broadly-held principles of renewal (as described above), rather than the sort of esoteric knowledge controlled by Calusa kings. Spanish accounts suggest that villages in the Tampa Bay area often included small temples and charnel houses, typically placed on the central plaza opposite the chief’s house (Robertson, 1993, p. 23; Milanich, 1995, p. 75–76). The apparent visibility and inclusivity of ritual calls to mind the rites of inclusion and “doing together”

that Blanton (2016) associates with more collective forms of governance.

Eventually, after Spanish invasions destabilized many of these polities, one group—the Tocobaga—appears to have consolidated power over many of its former rivals, at least for a short interval (Milanich, 1995, p. 74; Mitchem, 1989, p. 596). Spanish accounts attest to the chief’s ability to organize a force of an estimated 1,500 warriors over the course of a few day (Solís de Merás, 2017, p. 178), suggesting that Tocobaga may have been able to consolidate power over a larger area. As in the Calusa case, some of Tocobaga’s power may have been tied to the control of precious materials and people salvaged from Spanish shipwrecks (Milanich, 1995, p. 74). But Tocobaga’s reign would soon end at the hands of their Calusa rivals (Hann, 1991, p. 262).

Given the paucity of historical records and the limited state of archaeological knowledge, we would be hard pressed to systematically compare the Native sociopolitical systems in Tampa Bay and the Calusa area with regard to variables of good governance (Blanton and Fargher, 2008, p. 133–248). In a qualitative sense, Calusa collective action projects seem to have provided more in terms of public goods, including transportation infrastructure (e.g., canals), public safety (e.g., establishment of a regional hegemony that suppressed internecine conflict), and support of ritual events and religious institutions. But the Calusa also seem to have exhibited fewer controls over authoritarian governance, with principals exercising a greater degree of control over material resources (e.g., fish, Spanish gold and slaves) and more differentiation with regard to standard of living (e.g., oversized houses).

## CONCLUSION

Feinman (2017, p. 463) observes that “cooperation dilemmas are met through the implementation of problem-oriented innovations or ‘social contracts’ that serve to negotiate or establish the bases for specific, yet variable, arrangements of leadership, power, and religious behavior.” This variability of arrangements is true as much for maritime societies as any other, a fact well-documented by ethnographic studies of contemporary fishers but rarely addressed by archaeologists for past maritime societies.

Our comparison of the Native maritime societies of the western Florida peninsula identifies variation in pathways to collective action, the resultant development of the property-rights regimes, and the contingent histories of governance. Specifically, collective action became more important in Tampa Bay in the first centuries CE, as groups staked claims to productive estuarine locations through the founding of villages and the construction of mounds and enclosures for the capture of marine resources. In contrast, collective action was slower to develop in the Calusa area, may have formed more in relation to resource scarcity rather than plenty, and may have been founded more in kinship than in public ritual. However, it eventually resulted in projects of greater scale and complexity, which we suggest were also more exclusive with regard to collective-choice rights and more authoritarian with regard

to governance. As with the Native peoples of Tampa Bay described by the Spanish, the Calusa may have collectively “enjoyed the fish,” but some may have enjoyed more fish than others.

## DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

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## AUTHOR CONTRIBUTIONS

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