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CHAPTER

Archaeological Survey as Participatory Counter-Mapping: Indigenous Sovereignty and Epistemic Change in Darién, Panama

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Abstract

This chapter discusses the epistemic value of a community-based, participatory mapping approach to archaeological survey, based on research co-created with the Indigenous Emberá tribe in Darién Province, Panama. Rather than initiating survey with preconceived criteria for identifying archaeological sites, we mapped landscapes of place-based knowledge, as envisioned by our community partners. This collaborative approach represents an innovation in purposive (as opposed to statistical) archaeological survey, an essential phase of research—especially in low-visibility environments—that has been neglected by literature on archaeological method. Our method centers local conceptions of place and (often fluid) boundaries, as well as history and story. We highlight the role that participatory mapping can play in the development of critical Indigenous cartographies, as well as its value in supporting Indigenous-led movements for sovereignty and long-term ecological stewardship, including gathering evidence for use in land claim cases.

Keywords: Archaeological survey, collaborative archaeology, Emberá, Indigenous sovereignty, land claims, Panama, participatory mapping, place-based knowledge

Subject: History and Theory of Archaeology, Archaeological Methodology and Techniques, Archaeology

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1. Introduction

Collaborative and community-based research methods have recently gained ground in archaeology primarily for their ethical merits, an essential shift for a discipline structured by and complicit in colonialism. However, the "dynamic pluralisms" that collaboration can engender—in which archaeologists engage the knowledge held by their community partners to inform archaeological practice—also have significant epistemic value for archaeology as a discipline (Wylie 2015, 195). In this chapter, we argue that co-designing research with community members, based on both archaeological and community knowledge, has not only ethical but also profound epistemic consequences, especially for phases of archaeological research often dismissed as unscientific, such as purposive survey (also commonly referred to as "prospection").

Our research in the Darién Province of Panama proceeds from interlinked efforts in support of Indigenous sovereignty, ecological sustainability, and archaeological scholarship in the region, all of which have been negatively impacted by the conceptualization of the region as a "gap" in terms of human settlement. Despite the 145 archaeological sites we documented during one field season through pedestrian survey and archival research (Gill and Donner n.d.), Darién is often portrayed as a blank space on archaeological maps of Panama. This self-sustaining void of archaeological scholarship has posed problems for Indigenous communities seeking to claim titles to their ancestral lands (Velásquez Runk 2012, 2015), because the national government can easily deny that their occupation could have any significant time depth in such a "no-man's land." This dispossession prohibits Indigenous ecosystem stewardship and facilitates the encroachment of extractive industries, even in ostensibly protected areas.

In this context, especially given the low visibility of this tropical forest environment and lack of systematic previous research, employing a robust purposive survey design as an initial phase of research is essential. This type of survey, in contrast to statistical (sampling) survey, has long been denigrated as unscientific by archaeologists drawing on the processual tradition (but see Banning 2002). Such initial stages of research have likewise been little treated by the collaborative archaeology literature. Nominal collaborations between archaeologists and local "informants" have been commonplace in the poorly described but widely practiced tactic of ethnographic survey, but these approaches suffer both ethical and epistemic deficits, because the knowledge of local communities is typically applied extractively to research questions and aims determined by archaeologists (Sanjek 1993).

To rectify these issues, we developed an approach to archaeological survey in collaboration with local communities, based on their place-based knowledge of cultural landscapes, so that Indigenous knowledge not only supplied the information guiding our survey, but also determined the research questions and objects of analysis that survey sought to explore. We draw on Indigenous archaeologies (Atalay 2006; Nicholas 1997), archaeological ethnography (Brady and Kearney 2016; Hamilakis 2011, 2016), community-based participatory research (Atalay 2012; Strand et al. 2003), and a longstanding tradition of Indigenous-led participatory mapping in the Darién Province of Panama in order to theorize archaeological survey as the mapping of landscapes of place-based knowledge.

Our approach has yielded significant results for archaeological scholarship (in the form of many newly mapped sites and enhanced understandings of sociopolitical interactions and technological developments), as well as contemporary ecological stewardship (monitoring programs) and Indigenous sovereignty (mapping of traditional lands and cultural landscapes, and even indirect effects related to COVID-19). All of these benefits derive ultimately from the Indigenous place-based knowledges held by many communities around the Gulf of San Miguel, whose traditional landscapes overlap and interpenetrate, as do our community-based survey areas.

By surveying landscapes of place-based knowledge in collaboration with the communities that steward them, we aim to bring archaeological prospection closer to internal consistency of the objects and methods of inquiry. In addition to redressing and preventing harms caused by the discipline of archaeology and supporting Indigenous sovereignty and associated ecological stewardship, this approach to collaborative survey offers substantial theoretical and methodological insights for the field of archaeology itself, particularly during the phase of prospection but with implications for collaborative research designs in any context.

2. Survey in Archaeological Research Design

Survey plays a pivotal role in all archaeological research, from determining archaeological objects of interest to producing knowledge about those entities. Archaeological survey is traditionally subdivided into two categories: prospection and sampling, or purposive and statistical survey. Purposive survey refers to the process of locating sites in a landscape, thereby ascertaining the variability of site types and their spatiotemporal distribution in a particular area. This type of survey *does not* seek to produce a representative sample of some statistical population of archaeological entities; rather, prospection "takes advantage of any information available that may improve the chances of discovering the archaeological remains of interest" (Banning 2002, 28). By contrast, statistical survey seeks to generate a sample from which inferences may be drawn about the parameters characterizing some imagined population of entities, including hypothesis testing. In practice, this is generally achieved by traversing evenly spaced transects in some predetermined geometry. Depending on the research aims, both types of survey may be necessary and, in areas where archaeological exploration has been scant, purposive survey is usually a necessary precondition for designing any appropriate statistical sampling protocol (Banning 2002; Schiffer et al. 1978).

Rather than being treated as two necessary phases of research, however, purposive survey is often disparaged as unscientific. This dismissal has resulted in little discussion of this method within archaeological literature, despite its essential role as the first phase of work in almost every archaeological project. For example, Dancey critiques the use of purposive survey in any research design, equating it with antiquarianism and describing it as "an aimless walk in an unbounded area" (1974, 100). Most publications about survey methodology come from the "New Archaeology" era and tend to emphasize designs for statistical hypothesis testing, to the exclusion of purposive approaches, often implying that these latter lack any characterizable method (e.g., Ammerman 1981; Plog et al. 1978; Redman 1973).

The statistical survey methods that most archaeologists employ were developed in areas with high ground and parallel visibility and favorable survey conditions (Ammerman 1981). In tropical forest environments that are densely vegetated, especially if they are understudied to begin with, sampling is often unsuccessful at locating sites (Neves 2018). Site detection using sampling methods also may be difficult in regions without monumental architecture or where sites have been buried by depositional processes. Yet, the prestige accorded statistical survey often has led archaeologists to employ it even in settings where a purposive approach is more appropriate.

2.1. Ethnoarchaeology and Ethnographic Survey

In high-visibility settings, it is inefficient to use a sampling design for prospection; in low-visibility settings, or where the archaeological record is little known, such a methodological choice is detrimental. From a purely practical standpoint, then, prospection is necessary in Darién. Additionally, the combination of a self-propagating publication bias in Panamanian archaeology and the modern conception of Darién as a "pristine wilderness" has created an *archaeological* Darién "Gap." This artificially constructed void has adversely impacted Indigenous sovereignty, environmental stewardship, and archaeological scholarship in the region, which our project aims to correct. Taking Banning's formulation seriously, what information do archaeologists consult when seeking to improve their chances of encountering archaeological "targets"?

One purposive survey strategy that archaeologists frequently employ is known as "ethnographic survey." It has not been well-characterized or theorized, but it is often mentioned in site volumes as an essential technique. Confusingly, this term is used to refer to two different survey techniques: (1) asking locals about site locations because of their experience in a particular geographic area and (2) looking for archaeological sites in places on the landscape frequented by specific locals, presumed by the archaeologist to practice analogous subsistence strategies to the archaeological population. The first strategy has been commonplace in archaeology since antiquarian ventures (Schiffer et al. 1978), but it has been criticized for its tendency to exacerbate subsistence digging and looting, because it involves demonstrated interest in archaeological materials by comparatively wealthy strangers without any community engagement or even clarity about their goals (Harrington 1991; Vitelli 1984).

The second of these strategies emerged from the larger framework of ethnoarchaeology, which arose as a form of hypothesis testing to substantiate middle-range theory (Binford 1978; Stiles 1977). In the context of ethnoarchaeology, ethnographic survey involves interviewing or engaging in participant observation with contemporary occupants of a landscape and using their present-day strategies to infer the locations of archaeological sites. As Hole writes, these methods "can enable one quickly to spot suitable places for camps and, on the assumption that nomadism is ancient and reasons for siting camps have not changed drastically, one should be able to find sites" (1979, 201). This type of false equivalency primitivizes living communities by situating them within a fictitious ethnographic present (Fabian 1983), with correspondingly deleterious implications for research based on such ideas. As a result, ethnoarchaeology has been widely critiqued for its implicitly evolutionary and racialized ideology and ignorance of historical and cultural specificity in favor of generalized trends and models (Gosselain 2016).

Unfortunately, ethnographic survey in both senses has not been subjected to the critiques of ethnoarchaeology, despite succumbing to many of the same ethical and logical lapses. Typically, ethnographic survey involves asking local community members for information about site locations but circumscribing their involvement to cursory "informants" rather than involving them in the process of research design. Therefore, it is often an extractivist practice. In addition to these ethical issues, it is also epistemically flawed. By narrowly delimiting community involvement, archaeologists have failed to appreciate the full extent of community knowledge about sites, including local taxonomic systems, cartographies, and histories of significance. This exclusion of "biased" data adversely affects the accuracy of archaeological interpretation, leading to erroneous decision-making in subsequent phases of research. Thus, the process of defining the "archaeological remains of interest" themselves is crucial. If the archaeological "targets" of survey are determined by archaeologists alone, then the information that local communities might bring to bear on the research will be less impactful than it should be. If, instead, archaeologists and communities co-produce the research, including identifying the objects of inquiry, then local communities (which hold more knowledge about cultural landscapes than archaeologists new to the area) are better able to guide purposive survey toward fruitful ends.

3. Archaeology With, For, and By Descendant Communities

Within the past two decades, three subdisciplines in archaeology have emerged that promise to fundamentally alter relationships between archaeologists and descendant communities: Indigenous archaeology, archaeological ethnography, and community-based participatory research. Indigenous archaeology, first defined by Nicholas and Andrews as archaeology that is "with, for, and by Indigenous peoples" (1997, 3), centers Indigenous voices in archaeological theory and practice. In Canada and the United States, it emerged as a direct result of the American Indian Movement and other Indigenous-led activism protesting the desecration of Indigenous cemeteries and other sacred sites in the name of archaeological research (Echo-Hawk and Echo-Hawk 1994; Hammill and Cruz 1989). Although the fights against development-related destruction and for the return of ancestors are ongoing, tribes have increasingly initiated their own archaeological projects, often pioneering minimally invasive methods (see Atalay 2006; Laluk 2021; Nelson 2020; Silliman 2008; Watkins 2000). As discussed by our fellow authors in this volume, Indigenous archaeologists design research collaboratively with community partners, braiding Indigenous knowledge systems and their ethical entailments with traditional archaeological practices (Atalay 2012).

Archaeological ethnography emerged in the context of the decolonial shift (Dussel 2020). Defined as "(. . .) a shared, trans-cultural space of coexistences and interactions among people and communities of diverse origin and background" (Hamilakis 2016), archaeological ethnography cannot be reduced to a single conceptual framework. Instead, it is an exercise in critical epistemology, initiating a multivocal dialogue about how we learn to know and understand things (Brady and Kearney 2016). Archaeological ethnography focuses on materiality and temporality and emphasizes the inherently political nature of archaeological research (Hamilakis 2011). In particular, it stresses the importance of recording contemporary material traces using archaeological methods.

Community-based participatory research is not a unique framework to archaeology, emerging as separate but related practices from popular education, action research, and participatory research (Strand et al. 2003). Although many discipline-specific definitions exist, community-based participatory research can be broadly defined as "the systematic creation of knowledge that is done with and for the community for the purpose of addressing a community-identified need" (Strand et al. 2003, 8). Atalay identifies five principles common to archaeological projects that employ community-based participatory research: "(1) They utilize a community-based partnership process; (2) they aspire to be participatory in all aspects; (3) they build community capacity; (4) they engage a spirit of reciprocity; and (5) they recognize the contributions of multiple knowledge systems" (2012, 63).

Community-based participatory research and archaeological ethnography are employed in a wide variety of settings, while Indigenous archaeology is typically restricted to contexts where archaeologists collaborate with communities that identify as Indigenous (but see Atalay 2007). While similar, the different origins and contexts of application of these frameworks make them complementary and not equivalent (see Atalay 2012, 2014; Castañeda 2009; Watkins 2020). In our collaborative project with Indigenous Emberá communities in the Darién Province, we draw on all three frameworks, emphasizing community partnership in all phases of the research design and execution; reciprocity in research products; and respectful engagement with Indigenous knowledge, ontologies, and ethics.

3.1. Collaborative Archaeological Survey

While archaeological ethnography is centered around archaeological discourses and decolonizing epistemologies, the majority of methodological scholarship from Indigenous archaeology and community-based participatory research has concentrated on how these commitments have influenced excavation methodology. This focus makes sense given that destructive, invasive excavation without prior and informed consent of living descendant communities prompted the activist movements that led to the development of Indigenous archaeology.[1] Another focus of methodological reform has been bioarchaeological research involving human ancestors themselves, particularly aDNA research (Bader et al. 2020; Bardill et al. 2018; Tsosie et al. 2020; Wagner et al. 2020).

However, little attention has been paid thus far to how Indigenous archaeology, archaeological ethnography, and community-based participatory research can reform our methods of archaeological survey, a critical phase of research with implications for maintaining confidentiality of sacred places and community access, as well as all subsequent phases of research where knowledge co-production is a primary objective. Just this year, new consideration has been given to how an Indigenous archaeology perspective can contribute to geophysical survey methodologies (Wadsworth et al. 2021a, 2021b), including the provision of ethical guidelines for collaborative remote sensing work with Indigenous communities (Davis and Sanger 2021; Sanger and Barnett 2021). This attention has arisen from collaborative work with tribal communities that use geophysical methods to locate unmarked graves of Indigenous children who passed away at residential schools in the United States and Canada, as part of an ongoing mission to bring these children home. Nelson (2020) discussed the value of intensive surface survey from an Indigenous archaeology perspective, describing how it elucidated unexpected materials and contributed to a minimally invasive approach. The catch-and-release surface collection strategy developed by the Kashaya Pomo Interpretive Trail Project, in which artifacts from surface and near-surface contexts found during survey are collected and analyzed in the laboratory before being returned to their original contexts, was also an important innovation in survey methods that originated from Indigenous, community-based participatory archaeology (Gonzalez 2016; Gonzalez et al. 2006).

We argue, however, that attention to the prospecting phase of pedestrian survey, which typically precedes the more targeted and delimited geophysical or sampling transect survey, is particularly important given that purposive survey is often the first phase of archaeological research and has an important role in shaping the research trajectory that follows. Therefore, it is critical that members of descendant and local communities—in this case, Indigenous communities—be involved as true partners in this phase of research design. In our approach, community members and archaeologists determine through dialogue what constitutes a "site" or other material culture worthy of recording, how these locations should be recorded, and how these data should be stored. This partnership with community members also incorporates the idea that archaeological materials are multitemporal, and traces of even very recent practices are scrutinized through archaeological lenses (Hamilakis 2011). The remainder of this chapter reflects on best practices for a collaborative archaeological survey, based on our ongoing partnership with Indigenous Emberá communities in the Darién Province of Panama.

3.2. From Archaeological Sites to Landscapes of Place-Based Knowledge

By replacing standardized regional or global taxonomies of archaeological entities with local understandings of cultural landscapes, we adopt a place-specific method of organizing knowledge of the human past. Inspired by a critical cartography approach (Kim 2015), we partnered with Emberá communities to develop an expansive approach to survey, integrating ecological and archaeological techniques to document the varied material manifestations of human-environment relationships. These included traditional archaeological sites, but community members used the term *lugar* (place) rather than *sitio* (site) when referencing these locations.

Therefore, rather than describe our spatial data as archaeological sites, we consider them to be important points within a broader landscape of place-based knowledge. Drawing on Alfred and Corntassel's description of Indigeneity as a "place-based existence" (2005, 597), TallBear theorizes the primacy of place in Indigenous articulations of identity and social relationships (2013). The Indigenous knowledge systems that emerge from these relationships are thus also place-based. In dialogue with TallBear and conversations with community research partners, we use the term *place-based knowledge* to refer to "relational ideas and practices that emerge and evolve through long-term human engagements with particular lands" (Gill n.d.). Although some place-based knowledge might coalesce in features that are recognizable as traditional archaeological sites, it is a more inclusive concept that can be adapted to reflect the knowledge system and transmission mechanism of any community. This concept is advantageous for archaeological practice, as defining an archaeological "site" has always been fraught (Dunnell 1992; Dunnell and Dancey 1983), particularly as we continue to learn the extent to which many landscapes are anthropogenic (Erickson 2008; Ford and Nigh 2009; Lightfoot and Lopez 2013). By using the framework of place-based knowledge, we can design surveys based on community standards for determining places of importance.

Place-based knowledge includes but is not limited to the more commonly referenced Traditional Ecological Knowledge (TEK). The most-cited definition of TEK comes from Berkes (1993).[2] An obvious critique of this definition is the author's use of the phrase "less technologically advanced," which reflects a Rostowian view (Rostow 1959) of "technology" as mechanical and production-based. A more anthropological approach instead argues that the practices that constitute TEK or place-based knowledge are themselves advanced technologies. Technologies are not just about making, but also about doing (Franklin 1992; Leroi-Gourhan 1964).

In addition to this conspicuous limitation, Indigenous scholars and community members have taken issue with the term TEK. In Nunavut, for example, many Inuit community members rejected TEK as a descriptor of their traditional knowledge because their ways of knowing encompassed more than the narrow definition of TEK employed by non-Inuit scientists (Wenzel 2004). They thus developed an Indigenous term—*Inuit Qaujimajatuqangit* (IQ)—to describe these teachings, which comes from the verb root *qaujima-* (glossed as 'to know') and can be translated as "'Inuit knowledge, institutions, or technologies." It encompasses "values, world-view, language, life skills, perceptions and expectations" (Nunavut Social Development Council 1999, 79). Although IQ does extend back to "time immemorial," it is a "living technology" that includes the present and even the future (Arnakak 2000, 1).

We use the term place-based knowledge here, not as a replacement for Indigenous, community-driven terms such as IQ, but as a general category or heuristic concept for such knowledge systems, which should be community-defined and specified within individual projects. It allows common discourse to be established among collaborative projects, providing structural similarity without generalization, reductionism, or essentialism in content. Our choice of this descriptor is inspired by the work of scholars within the field of Native American and Indigenous Studies, particularly their critiques of academic appropriation of Indigenous knowledge. As Watts (2013) points out, Indigenous knowledge within the academy is often abstracted from its inherent connection to place and employed as metaphor rather than

taken literally. Sundberg (2014) also promotes the importance of place-based, situated knowledges and argues that the Western tendency to universalize is inherently colonial. Therefore, we think it is important to foreground the "place-based" nature of the knowledge we document so that it cannot be divorced from its association with a particular landscape and community.

4. Archaeological Survey as Participatory Mapping

In developing our approach to this work, we drew on the field of participatory mapping for inspiration, defined as "the multiple ways humans create and communicate knowledge, experience, and aspirations about the world in maps. A consistent aspiration of participatory mapping has been to engage and empower marginalized, minoritized, or under-represented groups in society through the use of spatial technologies" (International Society for Participatory Mapping 2021). This approach blends participatory learning and action methods—which heavily influenced the development of community-based participatory research—with cartographic practices, including the employment of geographic information systems (Chambers 2006). As we will discuss in greater detail, we view participatory mapping as a type of countermapping (Peluso 1995) that contests dominant governance structures and advances progressive social changes. In this case, it challenges usurpation of land by the settler colonial nation state in order to further Indigenous-led efforts for sovereignty over land, water, and cultural heritage.

In alignment with Atalay's (2012) criteria for community-based participatory research projects in archaeology, participatory mapping incorporates community research questions and facilitates community input in research design, making the practice truly participatory. Community members are involved in data collection and decision-making concerning data storage, which builds community capacity and recognizes communities, rather than archaeologists, as stewards of both physical landscapes of place-based knowledge and the data they generate. These responsibilities may be shared with archaeologists or other specialists at the behest of communities, but communities should be empowered in initiating consultation with researchers rather than, as often happens, researchers following perfunctory consultation procedures that do not reflect a true research partnership.[3] Because community members determine the criteria for documentation of place-based knowledge in conversation with archaeologists, a participatory mapping approach recognizes the contribution of multiple knowledge systems, foregrounding community expertise. Finally, archaeologists and communities design the final products of research together, which engages a spirit of reciprocity. These products may be multifaceted and targeted toward different aims, including publications like this one written for a primarily academic audience, presentations at government and community meetings, and maps and other documentation for use in legal cases.

4.1. Intellectual Property and Knowledge Appropriation

As co-holders of some place-based knowledge shared with us by community partners, we are aware that the increasing popularity of Indigenous knowledge within academic and political spheres can be problematic for Indigenous communities. Although Indigenous philosophies are not monolithic, Indigenous sociopolitical systems tend toward communal ownership that does not privilege the individual and therefore do not conform to most Western property law (Herz 1993; Holder and Corntassel 2002). Thus, there is an incommensurability between Indigenous value of landscapes and Western commodification. After much intellectual theft, Indigenous groups have had some success claiming proprietary interests in genetic plant resources due to their economic potential (Bodeker 2003; Cleveland and Murray 1997; McGonigle 2016; Posey 2002). However, much place-based knowledge provides less clear economic reward, and intellectual property law typically only adjudicates cases that involve economic consequences for plaintiffs. Therefore, many groups have been unable to contest the appropriation of place-based knowledge through intellectual property rights because there is no obvious profit motive (see Arewa 2006; Battiste and Youngblood Henderson 2000; Brown 1998; Duerden and Kuhn 1998; Oguamanam 2008; Stabinsky and Brush 1996).

As such, many Indigenous Peoples have raised concerns about the potential for appropriation and commercialization of place-based knowledge. As Battiste and Youngblood Henderson write:

> As Indigenous knowledge and heritage become more intensely attractive commercially, the cognitive heritage that gives Indigenous peoples their identity is under assault from those who would gather it up, strip away its honored meanings, convert it to a product, and sell it. Each time that happens, the heritage and knowledge die a little, and with them, the people (2000, 12).

These authors also state that many teachings are intended to be shared outside of internal, tribal contexts and that the goal should be mutual respect and dialogue between European and Indigenous knowledges rather than segregation. They argue, however, that until the power dynamic between these two trajectories of knowledge is more balanced, Indigenous groups must protect their heritage and knowledge from being defined in Eurocentric terms and exploited. It is therefore essential that community members are involved in designing infrastructure for data storage and control data dissemination. Although our workflow is always a work in progress, we feel that it is important to foreground these concerns with appropriation and consider them in developing our methodology.

5. Survey in *Darién Profundo*

The remainder of this chapter describes our approach to participatory mapping as archaeological survey based on our ongoing project in the Darién Province of Panama. Although our focus here will be collaborations with Indigenous Emberá communities, we also collaborate with descendants of formerly enslaved African people and *interioranos* in the Province, which has also shaped our research methodology.[4]

The name of our archaeological project, *Darién Profundo*, comes from a statement by Noé Alvarado, a Darienita of African descent from the community of Chepigana, now living in Guayabillo. A former Olympic athlete and politician, he hosts a popular morning radio program called *Despertando al Darién* (Waking up Darién) and is an authority on the history, politics, and contemporary society of the Province. In our conversations, he emphasized Darién's deep but unadorned and underappreciated local history. Like many of our collaborators, he feels this absence of national and international appreciation acutely and hopes that our collective project will counter prevailing Western narratives about the Province, which focus on its status as a border with Colombia and emphasize its dangers, from narcoterrorism to environmental hazards that migrants face while traveling through the so-called Darién Gap. The national narrative of Panama also has contributed to this Othering and primitivization of Darién and the communities who call it home;

Panamanian scholars and governmental employees working in the Province often describe the imagined versus real distance between Darién and Panama City (Almanaque Azul 2019). Although it takes only three hours to drive on a paved road from the nation's capital to the Darién border, Darién is commonly referred to as though it were another country altogether, and people from Darién almost always refer to themselves as *Darienitas* rather than Panamanians.

Along with the concentration of national archaeological expertise in Panama City and the logistical complication of accessing certain parts of the Province, this Othering has contributed to a dearth of archaeological scholarship in Darién. The little archaeological work that has been done exists in the form of unpublished, one-off studies written up only as *informes* (reports) on file with the Panamanian government or, more recently, environmental impact studies carried out in advance of development projects. This lack of collated and published archaeological work has resulted in the fictitious construction of an archaeological "Darién Gap," perpetuated by maps published until at least 2015 that portrayed the existence of only one archaeological site within the entirety of Darién Province (Velásquez Runk 2015). Our project was established in an initial attempt to rectify this bias (see Gill and Donner n.d.), which has resulted in the construction of imagined geographical narratives of Darién as a virgin forest devoid of human history, erasing Indigenous Peoples from the landscape. This erasure has been suspiciously instrumental to neoliberal conceptions of development. Based on the interests of our community partners, the initial goal of our project is to construct the first chronology of human–environment relations in Darién Province, with particular attention to landscape stewardship and with important implications for ongoing legal claims.

5.1. Mapping the Darién "Gap"

The "Darién Gap" we describe is not unique to archaeological mapping; many communities in the Province remain entirely undocumented on official government maps (Moutinho 2021). Most recently, this has posed a problem for responses to COVID-19. While communities effectively self-enforced quarantines, unmapped communities did not receive essential supplies like food and medicine from governmental distributions and had to break quarantine to obtain them, putting themselves and their communities at elevated risk (Baudilio, Eduardo, and Ismael, personal communications).[5] Especially since hospitals are scarce within the Province, often requiring a journey of several hours by boat, and because Indigenous communities have been disproportionately impacted by COVID-19 throughout the Americas (Power et al. 2020), this lack of data about community locations could have had deadly effects.

Luckily, there is a substantial tradition of Indigenous-led participatory mapping efforts in Darién. Local community members trained in drone and GPS mapping, the Coordinadora Nacional de Pueblos Indígenas de Panamá, and the Rainforest Foundation US joined forces to create a real-time COVID-19 map that documents hotspots and facilitates government response (Rainforest Foundation 2021). These mapping efforts, which have become essential in mitigating this crisis, were started by Indigenous communities seeking legal titles to their ancestral lands (Bilbao 2019; Guillemette et al. 2017; Herlihy 2003). Ecological conservation efforts also have contributed to Indigenous sovereignty movements. For example, a team from McGill University trying to mitigate deforestation partnered with the community of Manené in a participatory mapping initiative that culminated in the *Macua Balsa*, a map of Emberá communities along the Balsas River labeled with Emberá toponyms and family histories, which will hopefully aid Indigenous land claims in the near future (Potvin, personal communication). Participatory mapping has been incorporated in recent land claim efforts because previous titles granted to Indigenous communities in Darién have included only a limited amount of the land used by Indigenous Peoples in their daily lives (Velásquez Runk 2012).

A detailed description of the various categories of Indigenous land title possible under Panamanian law is outside the scope of this chapter (see Gill and Donner n.d. and Velásquez Runk 2012). However, in order to

obtain any form of title, whether that be status as a semiautonomous *comarca*, internally governed by Indigenous systems, or the less autonomous *tierras colectivas* (collective lands), Indigenous communities must carry out extensive mapping campaigns in order to submit detailed territory maps to the Autoridad Nacional de Administración de Tierras. Communities must demonstrate that they are, in fact, Indigenous, which is defined by the Panamanian national government as groups of people descended from the inhabitants of Panama at the time of colonization who have conserved their unique social, economic, cultural, linguistic, and political institutions (Law 72, Article 2 of 2008). They also must have maintained practices of "'traditional occupation," defined as the possession, use, conservation, and management of their ancestral lands. Archaeology provides one suite of methods that can be used by tribes in Panama to incorporate time depth into their applications to avoid the delimitation of their territories according to Western perceptions of places and borders, while also drawing connections (if warranted) between older sites of place-based knowledge and contemporary material culture.

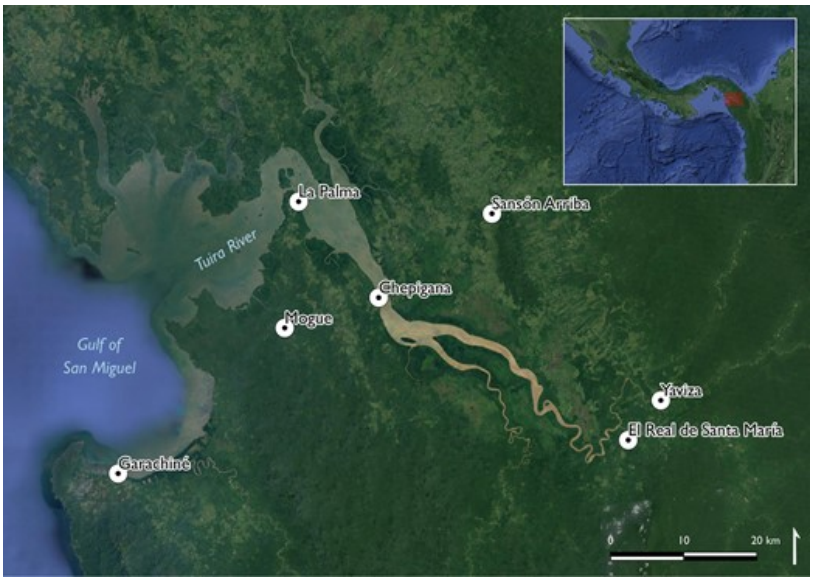
Although Law 72, Article 16 of 2008 promised to fund the necessary delimitation of territories as part of the titling process, and Article 5 stated that the Dirección Nacional de Reforma Agraria would promptly attend to and prioritize the titling process, this law was never enforced, and Indigenous groups have grown impatient with the national government after waiting decades for titles, to no avail (Halvorson 2018). Some government mapping efforts have artificially constrained ancestral lands, resulting in the titling of lands that encompass in some cases only 11 percent of the tribe's actual lands (Arghiris 2018). In addition to the temporal dimension that our work can elicit, we can provide necessary resources and labor toward ongoing but underfunded Indigenous-led cartography efforts in Darién that aim to rectify this governmental negligence.

Panama is currently home to seven Indigenous groups: the Ngöbe, Buglé, Guna, Emberá, Wounaan, Bribri, and Naso Tjër Di. Some 12 percent of Panamanians (~0.5 million people) identify as Indigenous, but this percentage is much higher in Darién, which is home to only 48,000 people (1 percent of Panama's population) but covers 22 percent of the country's total land area (Instituto Nacional de Estadística y Censo 2010).[6] Darién also includes the majority of Panama's extant tropical rainforest—in the most heavily forested country in Latin America—and is home to Darién National Park, the largest protected area in Panama and one of the largest remaining tropical forests in all of Central America (UNESCO 2021). A significant portion of this state-controlled rainforest overlaps with Indigenous ancestral lands; the government has used this overlap to deny the rightful sovereignty of Indigenous groups over these areas (Halvorson 2018). Studies have shown, however, that Indigenous governance has been more successful than state management at preventing deforestation in Panama (Nelson et al. 2001) and in other countries in Central America (Hayes and Murtinho 2008; Nepstad et al. 2006). Preventing deforestation is urgent; between 2001 and 2019, Panama lost 414,000 hectares (7.3 percent) of its tree cover, 104,000 hectares of which was located within Darién Province. By contributing to Indigenous land claim cases, we can work toward rectifying the human rights issues of Indigenous dispossession and cultural genocide while also supporting carbon sequestration and ensuring future habitats for Darién's many endemic species (UNESCO 2021).

Our study area is centered around the Gulf of San Miguel watershed, dominated by the Tuira River and feeding into the Pacific Ocean (Figure 1). By defining our unit of study according to an ecosystem rather than a predefined culture area, we were able to partner with multiple communities. As previously mentioned, this has included Indigenous Emberá, Afro-descendant, and *interiorano* communities. This chapter focuses primarily on our partnerships with the Emberá, living in both entirely Indigenous settlements and in multiethnic towns. Other Emberá communities have solicited archaeological consultation concerning the documentation and interpretation of cultural heritage (Mendizábal and Theodossopoulos 2012), and although this partnership lasted only one season, it provided a strong foundation for our work. Through *Darién Profundo*, we hope to establish a long-lasting tradition of Indigenous archaeology to document the

storied history of this Province and employ it in the service of Indigenous sovereignty, to sustain the place-based knowledge these communities hold into the future.

Figure 1.



Map of study area and the communities collaborating with *Darién Profundo* in 2019.

Credit: Lucy Gill.

5.2. Cartographies of Place-Based Knowledge in Darién

After an initial visit to meet with community members in January of 2019, we carried out our first season of archaeological fieldwork in June and July of 2019. Rather than organize our survey according to a predetermined rectangular grid, we planned a series of surveys alongside the communities of Yaviza, Sansón Arriba, El Real de Santa María, Chepigana, La Palma, Mogue, and Garachiné (Figure 1). Initially, all sites were recorded in ArcGIS Collector, which allowed us to iteratively construct maps in the field and permitted geolocated attachments in multiple media formats (images, audio files, text). The proprietary nature of this application, however, makes it difficult for community members to access, modify, and use the data once it is recorded. We have since redesigned this process using an open-source system that allows remote recording by anyone with an Internet connection, which we will discuss later in the chapter. Prior to beginning the survey and on an ongoing basis thereafter, we discussed with community members which places have important historical value and how we should prioritize site visits. This commitment meant that our survey criteria differed from place to place based on changing community norms. We documented many traditional archaeological sites (shellmounds, petroglyphs, ceramic scatters) but also many nontraditional sites (recent historical cemeteries, recent historical structures, contemporary material culture, ethnobotanically significant plants).

Relying on community-driven criteria to identify locales containing historical place-based knowledge facilitated storytelling and knowledge production throughout the survey process. As a result, our itineraries were not linear transects and were more reflective of human cultural landscapes. For example, community members typically chose to follow well-traveled paths or boat routes, some of which were maintained by the community due to the ongoing importance of the places they traversed (Figure 2). Without drawing any direct historical analogy between our community partners and the landscape's previous inhabitants, adhering to modes of transit more representative of the human experience allows archaeologists to internalize a more accurate representation of how a place may be understood by human occupants. This

explicit incorporation of the embodied experience echoes Sundberg's (2014) praxis of decolonization through the bodily gesture of walking (see also Horton and Freire 1990), which emphasizes its circuitous nature as well as its lack of a teleological endpoint. Although we can literally "take steps" to decolonize our practice, "decolonization is something to be aspired to and enacted rather than a state of being that may be claimed" (Sundberg 2014, 39). However, by "walking with" Indigenous communities and individuals as "colleagues in the practices of producing worlds" (Sundberg 2014:41), we can both understand each other's modes of constructing knowledge and co-create "worlds and knowledges otherwise" (Escobar 2008, 12).

Figure 2.

Traveling around the community of Mogue by *piragua* (dugout canoe).

Credit: Lucy Gill.

These routes were more thematically oriented than traditional archaeological survey, whether purposive or statistical. For example, our community partners in Mogue led us to one place, Quebrada Seca, named for its location alongside a seasonally dry ravine. The material culture present on the surface consisted of chipped stone debitage comprising the entire process of lithic reduction, as well as one complete chert arrowhead. According to one of our community partners, whose family uses a portion of the site to cultivate maize, he and his family found historical metal tools for maize milling in the area (Antonio, personal communication). Therefore, he hypothesized that the site was recent in origin, despite the occurrence of stone tool production, and thought community members may have manufactured this technology as recently as one or two centuries ago.

The site also contained large fragments of ceramic vessels, likely remnants of receptacles used for collecting and storing water from rains and the nearby creek. Our discussions about the potentially recent production of these vessels led us to work with another community member, whose mother until recently produced ceramic pottery using traditional methods (Bélgica, personal communication). Although she did not produce this pottery herself, she continues to use her mother's pots for cooking and storage, and we discussed the differences and similarities between the ceramic technologies her mother used versus those used to produce the sherds from Quebrada Seca (Figure 3). From this one day of survey, we were able to formulate hypotheses concerning not only where and how ceramics were used historically, but also how these practices have both persisted and changed in the contemporary community.

Figure 3.

Ceramics documented (a) at Quebrada Seca and (b) in the home of Doña Bélgica.

Credit: Lucy Gill and Natalia Donner.

5.3. Counter-Mapping and Place-Based Internationalisms

The stories that emerge from the participatory mapping of place-based knowledge are a better representation of Indigenous conceptions of place and territorial boundaries than the products of traditional Western archaeological survey. They can contest both archaeological culture areas and the borders imposed by contemporary nation states. For example, our community partners in Mogue led us along a path maintained by the community to a place known as La Mola, a large igneous boulder covered in anthropomorphic, zoomorphic, phytomorphic, and geometric designs (Figure 4). Its name, given by the contemporary inhabitants of Mogue, refers to an elaborate textile art form created using reverse appliqué, which is unique to the Guna and is not practiced by the Emberá. The use of fabric may be a postcolonial transition from painting these motifs directly on the skin (Marks 2016). So far as we know, this nomenclature has never been used by the Guna to refer to artistic renderings in stone. This act of naming, however, indicates a clear association that the people of Mogue have drawn between this site of place-based knowledge and the Guna, confirmed by subsequent conversations with community members, whether or not it was created by Guna ancestors. Nevertheless, it remains an important place for the Emberá people of Mogue, who maintain a path to it and have seemingly painted it recently. We are reminded here of Betasamosake Simpson's concept of place-based internationalism, which refers to Indigenous traditions of building and maintaining international relationships and solidarities, while remaining grounded in place (2016, 2017).

Figure 4.

The petroglyph of La Mola.

Credit: Lucy Gill.

This association challenges property ownership norms set by the modern nation state, which rely on unchanging, nonoverlapping borders.[7] This schema is not unlike the traditional archaeological concept of culture areas, a geographic unit characterized by a homogenous complex of material culture, assumed to result from a homogenous complex of activities (Kroeber 1931, 1939; Wissler 1923). Although the concept has existed for over a century, archaeologists continue to draw these artificial boundaries, which echo ethnonationalist ideologies and often do not accord with oral histories and other Indigenous place-based knowledges. Such oversimplified archaeological interpretations have been exploited by nation-states to disenfranchise Indigenous groups from their ancestral lands (Martindale 2014).

In 1976, Richard Cooke published a map dividing Panama into three cultural areas: Gran Chiriquí, Gran Coclé, and Gran Darién. These divisions were intended as heuristics; nevertheless, they have become entrenched as this map continues to be reprinted, and archaeologists tend to situate their work with respect to one of these predefined groups. Static culture areas that incorporate no temporal dimension into their model cannot account for the palimpsestic landscape implied by the coexistence of La Mola and other sites that are claimed as ancestral by the community of Mogue, despite the fact that such pluralistic histories—place-based internationalisms—are commonplace. Without conducting participatory mapping in partnership with contemporary heirs to the place-based knowledge resident in this site, however, we would likely have associated it with the direct ancestors of Mogue's inhabitants or the abstract Gran Darién culture area. Neither of these designations would be accurate, and they would ignore the repository of knowledge about this site that already exists.

5.4. Integrative Eco-Archaeological Survey

Our approach to mapping itineraries of place-based knowledge also led us to document places that typically would not be viewed by archaeologists as material culture. For example, we mapped the location where a ceiba tree *(Ceiba pentranda)* was felled and being carved into a *piragua*, a traditional type of dugout canoe constructed from a single hollowed-out tree trunk (Figure 5). Community members chose to show us medicinal plants and describe their uses, which we geolocated.[8] By taking this Indigenous archaeology approach, grounded in community conceptions of what constitutes place-based knowledge with historical significance, we were able to gain a deeper understanding of human–environment relations and their manifestations in material culture (see Sigona et al. 2021 for employment of a similarly integrative eco-archaeological approach). Including these resources in maps presented in land claim cases is critical, because ancestral territories encompass far more than sites of active occupation yet contain resources that are critical to the community's ability to carry out cultural practices.

Figure 5

Lucy, Antonio, and Segundo documenting the in-progress traditional carving of a *piragua*.

Credit: Natalia Donner.

Community members also took us to places where important ecological and cultural resources have been decimated by extractivist practices. For example, we took a boat to one locale along the Tuira River called El Real la Vieja, the site of an Indigenous village destroyed to build a Spanish military fort, which was constructed to protect gold coming from the Cana mine farther south. More recently, the site served as a port used to transport trees, mostly *cativo* (*Prioria copaifera*), logged from the riverbanks (Eduardo, personal communication). This integrative ecological and cultural approach that community members took to survey also led us to document an invasive freshwater mollusk species (*Corbicula fluminea*) in the Tuira River, previously unrecorded in Panama outside of the Canal Zone. Unmanaged, it could outcompete native freshwater mollusks and contribute to the eutrophication of freshwater ecosystems (Lauritsen and Mozley 1989; Sousa et al. 2008). Therefore, the participatory mapping of place-based knowledge has the potential to inform approaches to ecological conservation and contribute to landscape stewardship and monitoring.

5.5. Indigenous Sovereignty

Participatory mapping has a substantive history of supporting Indigenous-led sovereignty movements (see Chapin et al. 2005 for a global review of this relationship). As previously mentioned, participatory mapping has been used for decades by Indigenous groups in Darién seeking titles to their ancestral lands, with some success. Unfortunately, the national government has not met its legal obligation to fund these efforts, preventing some communities from even submitting title applications, and as of 2018, twenty-four *tierras colectivas* remained untitled in spite of completing the application process (Halvorson 2018). The community of Mogue, for example, applied for official title to its ancestral lands but was denied sovereignty over its territory because it "failed to follow administrative procedure," after its application was stalled for years (ANATI 2018).

Fortunately, the national government has recently loosened some of its restrictions on title applications. For example, Resolution No. DM-0612-2019 allows communities to apply for titles to lands that overlap with nationally protected areas, meaning that Mogue and other communities are newly eligible. Only one group, the Naso, has successfully received a title as a result of this new regulation thus far, because their case was already pending before the COVID-19 pandemic (Kennedy 2021). As vaccination rates climb in Panama and the effects of COVID-19 subside nationally, more groups will seek to exercise their right to title over their lands, necessitating increased participatory mapping work. Collaborative archaeology is particularly helpful because, in order to receive titles, communities not only have to map their contemporary territories but also have to submit evidence concerning the historicity of their relationship to their ancestral lands. Therefore, archaeological techniques such as radiocarbon dating and the construction of material culture chronologies are essential, especially when put into dialogue with oral histories and genealogies.

5.6. Remote Participatory Mapping

We were supposed to return to Darién in March of 2020 to continue this participatory mapping work. However, our plans, like those of the rest of the world, were derailed. Neither of us have traveled to Darién since the emergence of COVID-19, even as we were vaccinated and borders reopened, due to the lack of access to health care in the Province and our concern for the safety of our community partners. In spite of this, we have maintained open lines of communication through WhatsApp and other social media with our collaborators who have sent us photographs of material culture and GPS coordinates taken with their phones. We realized that we had an opportunity to create a mapping infrastructure that would be even more participatory, whereby community members could upload location information and accompanying media to a free, open-source platform.

We therefore transferred our mapping forms from ArcGIS Collector to KoboToolbox, an application created by the Harvard Humanitarian Initiative for use in data collection during humanitarian crises. Designed to work in remote areas, data can be collected both online and offline (and uploaded later) using any phone, tablet, or browser. Like ArcGIS Collector, it enables the attachment of multimedia data, which is synchronized and encrypted via SSL. In collaboration with Kristin Carlson (Illinois State University) and graduate students in the Program in Creative Technologies, we designed a website (available so far in English and Spanish) through which data can be submitted, as well as a textable QR code that links directly to the submission form (Carlson et al. 2021). The data is uploaded immediately and does not require administrator approval; however, location data is disaggregated by community, and specific geographic coordinates are accessible only with a passcode. We are interested in formalizing this sovereignty-based approach to data management through the use of technologies such as the Traditional Knowledge labels pioneered by Mukurtu and Local Context (Christen 2015). We will discuss this system in more detail with our community partners when we are able to return in person and will adjust it accordingly; in the meantime,

those interested in continuing the mapping process have a user-friendly way to do so that does not rely on our presence in Darién.

6. Conclusion

We view data sovereignty as an important step toward the ideal of collaborative research, in which local communities drive research from design to dissemination. When the targets of prospection, as well as the kinds of information used to guide their discovery and study, are determined by local communities, purposive survey rests on a firmer epistemic footing. Rather than imposing a regional or global taxonomy of archaeological site types, a participatory mapping approach to collaborative archaeological survey derives the principles for studying local archaeological landscapes from modern Indigenous place-based knowledge of natural and cultural landscapes, without drawing an essentialist analogy between contemporary and past Indigenous communities.

This focus on landscapes of Indigenous knowledge also corrects the biases inherent in archaeological sampling designs, which often explicitly aim to estimate an inventory of 'cultural resources" in a region, to weigh their preservation against the expansion of extractivist landscapes, oriented toward patterns of consumption defined by Western capitalism. Such inventories are typically conducted with reference to a supposedly objective standard of archaeological research value, with little concern for the aspects of archaeological landscapes that local communities value. Ironically, traditional transect-based statistical survey in the Global South is usually only possible in places already heavily impacted by "development."

In our participatory mapping approach, it is fundamental to not only change *how* we map, but *what* we map. We propose moving from mapping the archaeological site to mapping landscapes of place-based knowledge. Mapping archaeological sites as typically conceived limits co-creative approaches. Recording sites of place-based knowledge as a practice of counter-mapping initiates a dialogue between different knowledge systems, while taking power asymmetries into account. Mapping landscapes of place-based knowledge allows us to co-create narratives of the embodied experience of living in a place.

Critical cartographies of Darién involve problematizing imagined geographies, which have created a fictitious pristine, wild, and empty Darién. This erasure of people from the region has erected obstacles for Indigenous communities seeking rights to their ancestral lands, now viewed as a valuable commodified resource. Mapping Darién is therefore an exercise with implications well beyond traditional archaeological survey. As demonstrated throughout this text, the legal particularities of Indigenous land tenure in Panama have created an opportunity for archaeologists and Indigenous communities to work together. Archaeological survey provides temporal depth to the legal process of land claims, evidencing the historicity of Indigenous sovereignty alongside oral histories and genealogies.

This partnership between archaeologists and Indigenous communities in Darién has resulted in cartographies of place-based knowledge that challenge the traditional culture-historical model, with its static borders, atemporality, essentialist cultural characterization, and limited definition of archaeological sites. The results of our exercise with the community of Mogue, for example, inform us of Emberá internationalism, a paradigm through which people are grounded in place but at the same time conceive landscapes as international. This simultaneously place-based and international existence contests many Western views, especially those related to property, borders, identity, and place.

Expanding the itineraries of archaeological survey to sites of place-based knowledge also broadened the epistemic potential of this approach. Cartographies of place-based knowledge are inherently multidisciplinary; Indigenous agency in the survey process in Eastern Panama resulted in the integration of archaeological and ecological survey. As a consequence, we recorded data that is relevant to other

disciplines and is normally overlooked in archaeological research. The potential of place-based knowledge, accordingly, goes beyond challenging national borders; it also blurs disciplinary boundaries and has relevance for ecological and cultural conservation and landscape stewardship. As a response to the global challenges posed by the COVID-19 pandemic, the development of remote participatory mapping techniques has the potential to aid both mapping and conservation efforts, in light of the exacerbated deforestation rates of the last decade.

As archaeologists partnering with Indigenous Emberá communities, we are working to make our research process and results reflective of how our community partners interact with the landscape. In the survey phase of research, this has meant considering archaeological sites as monuments to place-based knowledge, which has both specified and expanded our corpus of material for archaeological study. Although this perspective arose from our work in the particular Indigenous landscape of Darién, we believe that place-based survey and community-defined site taxonomies address common Indigenous concerns about the decontextualization and appropriation of knowledge and are therefore useful approaches for all practitioners of Indigenous archaeology to consider.

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Notes

1 In spite of the growing prominence of Indigenous archaeology within academia, demolition of sacred sites and unearthing of ancestors due to construction projects continues to affect Indigenous communities. Even in California, where development is regulated by the relatively progressive California Environmental Quality Act (CEQA), excavation of ancestors and belongings is considered an appropriate "mitigation" for the planned destruction of sites. Although the Native American Graves Protection and Repatriation Act (NAGPRA) requires the return of ancestors held in collections by repositories receiving federal funding, it only requires "consultation" with the tribes or Native Hawaiian organizations likely to be culturally affiliated with any ancestors or remains to be excavated in the course of a development project.

2 "Traditional ecological knowledge or TEK is a cumulative body of knowledge and beliefs, handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment. Further, TEK is an attribute of societies with historical continuity in resource use practices; by and large, these are non-industrial or less technologically advanced societies, many of them Indigenous or tribal" (3).

3 Following Atalay et al. (2014) and Watkins (2015), this idea contradicts the current first Principle of Archaeological Ethics according to the Society for American Archaeology, which self-appoints archaeologists as the primary stewards of the archaeological record, regardless of the wishes of descendant and local communities. Local communities are evidently the stewards of their own place-based knowledge, while archaeologists are perhaps welcome aids in its study.

4 *Interiorano* is a term used by largely non-Indigenous Latinx settlers in Darién from the western interior provinces to refer to themselves.

5 Surnames are omitted to maintain privacy.

6 According to participatory mapping work conducted in 1993, some 14,749 Indigenous-identifying people lived in Darién Province or in semi-autonomous *comarcas* within it (73 percent Emberá, 16 percent Wounaan, 10 percent Guna, 1 percent other; Herlihy 2003). This number cannot be directly compared with the 2010 census, as the population of the Province has increased in the intervening two decades, but these statistics indicate that the proportion of Indigenous people within Darién is likely at least twice as high as the national average.

7 In addition to overlaps with state-protected areas hindering Indigenous groups from obtaining titles to their ancestral lands, overlaps in territories between groups also has posed a problem, because the government will not title the same land to multiple groups, despite the existence of inter-Indigenous treaties permitting shared fishing, hunting, and so on, on the same lands (Herlihy 2003).

8 Although we have not published any specific site locations and will not do so without the explicit request of the community, we are particularly wary of publishing any information concerning medicinal plants because of the intellectual property implications described earlier.