Survey Archaeology in the Mediterranean World: Regional Traditions and Contributions to Long-Term History

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Abstract

In this paper we describe the development and state of archaeological surface survey in the Mediterranean. We focus especially on surface survey as a means of documenting long-term settlement patterns at various scales, as an approach to the archaeology of regions, and as a pathway to the interpretation of past landscapes. Over the last decades, literature on Mediterranean survey has increasingly emphasized a distinct set of practices, viewed both favorably and critically by regional archaeologists in the Mediterranean and elsewhere. We show that Mediterranean survey in fact comprises several discrete regional traditions. In general, these traditions have much to offer to wider dialogues in world archaeology, particularly concerning sampling and research design, the interpretation of surface assemblages, and the integration of complex, multidisciplinary datasets. More specifically, survey investigations of Mediterranean landscapes provide comparative data and potential research strategies of relevance to many issues of global significance, including human ecology, demography, urban–rural dynamics, and various types of polity formation, colonialism, and imperialism.

Keywords: Settlement patterns, Surface survey, Regional analysis, Landscape archaeology, Sampling, Fieldwalking

Introduction

Archaeological survey in the Mediterranean has emerged as a distinct research tradition over the last 50 years (Alcock and Cherry 2004; Attema et al. 2020; Barker 1996; Cherry 1983, 2003; Galaty 2005). Our aims in this paper are three-fold: first, to explore the relationship between the diversity of survey practice across this zone and the dominant discourse (involving a more narrowly defined "Mediterranean" tradition of *intensive* survey); second, to identify common challenges and trends in the results of Mediterranean surveys; and third, to highlight intersections with other world archaeologies and theoretical and practical agendas for the future. Acknowledging that archaeological survey can mean many things in many contexts, we focus here on surface investigations carried out above the level of the individual site, often termed regional survey or landscape archaeology (an equally polysemic term).

We define the Mediterranean world as the climatic and biogeographical zone surrounding the Mediterranean Sea (Fig. 1), an area that has experienced cultural and historical commonalities across ecological landscapes that are also quite diverse (Braudel 1972; Broodbank 2013; Horden and Purcell 2000). The Mediterranean world thus includes modern nation states on three continents, as well as some countries—such as Jordan and Portugal—that do not border the Mediterranean Sea directly but have landscape, climatic, and historical connections that justify this grouping. We also include countries—such as France, Libya, and Syria—that have Mediterranean coastlines but also have considerable footprints in other bioclimatic zones. The diversity of modern political geography and ecology is emblematic of critiques of Mediterraneanism as an overarching paradigm, even if the shared intellectual history of Mediterranean studies makes this framework nearly inescapable (Herzfeld 2005; Morris

2003). We suggest a similar approach to Mediterranean survey, where elements of landscape and history suggest both unity and variety.

Globally, divergent viewpoints on regional survey reflect different goals, traditions, and affordances of studied landscapes. In the context of archaeological survey, American anthropological archaeology developed a particular tradition of regional settlement pattern studies, which viewed the region, rather than the site, as the fundamental unit for societal analysis—though how regions, sites, and methods are defined remains highly variable (e.g., Binford 1964; Kantner 2008; Kowalewski 2008). Surveys in the Mediterranean are often much smaller in areal extent, for reasons including governmental regulations, the intensity of long-term occupation, object-oriented research traditions, and the artifact-rich plow zones of many Mediterranean countries. Such landscapes are often considered ideal for and demanding of detailed surface documentation (Cherry 1983; Tartaron 2008). The questions posed and methods adopted are therefore typically microregional in scale. Survey projects in this tradition are defined by (1) fieldwalking as the primary mode of documentation; (2) focus on the artifact, rather than the site, as the minimum unit of analysis; and (3) attention also to off-site artifact scatters as an essential component of study (Bintliff 2000).

Previous overviews have traced the evolution of survey archaeology in the Mediterranean through publications trends (Alcock and Cherry 2004) or new projects (Cherry 1983). For this paper, in addition to reviewing the literature, we have collected data in two ways: through online databases of survey projects across the Mediterranean (Online Resource 1) and a "Survey of Mediterranean Surveys" (SoMS) for which we received submissions from 167 unique projects (Online Resource 2). This survey was of our own devising, and we aimed for wide distribution via email lists, websites, and professional networks related to Mediterranean archaeology. To

offset biases created by distribution networks and unknown response rates, we have also prepared a consolidated database of 743 projects from these datasets, which provides a larger sample to indicate projects per country, start year, and survey area (Online Resource 3). While the more detailed data we collected from the SoMS (mostly from recent projects) represent only 22% of this total dataset, the more detailed information nonetheless provides a useful bellwether of attitudes among self-identifying survey practitioners.

After providing some disciplinary context for the development of survey archaeology in the Mediterranean, we present a region-by-region synthesis of recent work and current trends in Mediterranean Europe, western Asia, and North Africa. We then turn to themes of pan-Mediterranean and wider relevance: research design and sampling; chronological and behavioral biases in the archaeological record; landscape archaeology as long-term history; and the impact of new technologies on data analysis, interpretation, and publication. Throughout, we emphasize how the results of survey projects in the Mediterranean world have advanced our understanding of the human past through recovering data and examining trends that would not have been revealed through other means. We also outline an agenda that emphasizes (1) integrative, rather than prescriptive, research design; (2) methodological transparency and data accessibility; and (3) research questions and strategies that produce results of broader historical and anthropological relevance.

Defining Mediterranean Survey

At the broadest level, Mediterranean survey (also Mediterranean landscape archaeology) is a common set of field methods grounded in the systematic documentation of surface remains using multitiered, multidisciplinary research strategies, often including pedestrian transect or grid-

based sampling, as well as geomorphological, geophysical, architectural, historical, and ethnographic components (Online Resource 4b). The SoMS responses clearly document the continued importance of team-based fieldwalking and surface sample collection and documentation as an independent endeavor, not necessarily linked to excavation. There is often a distinction identified between "site-level," "intensive," and "extensive" pedestrian survey, which has consequences for how results are analyzed, quantified, and presented (Online Resource 4a). "Intensive" surveys typically invest more time per unit of area and employ side-by-side transect or grid-based pedestrian fieldwalking to quantify artifact distributions across the landscape; the approach involves the identification of continuous (or discontinuous) scatters of artifacts whether to define sites or "off-site" distributions—for this reason it is sometimes called "siteless" survey (e.g., Caraher et al. 2006; Ebert 1992; Thomas 1975). Nevertheless, the term "intensive" is often used without reference to this specific tradition of systematic, spatially explicit, artifact collection, simply to denote detailed recording—some "intensive surveys" of sites, for example, focus simply on architectural mapping. "Site-level" surveys use similar techniques (especially detailed gridded collection) to map surface remains and artifact distributions at and around already identified sites. While we focus here on larger-scale projects, we note that site-level surveys have been particularly effective and innovative in Mediterranean contexts by extracting the maximum possible information from surface assemblages and deploying a suite of pedestrian, geophysical, and remote sensing techniques (e.g., Alcock 1991; Bintliff et al. 2017; Fachard et al. 2020; Vermeulen et al. 2012). By contrast, "extensive" survey focuses on the identification of sites, usually through more selective approaches (e.g., targeted reconnaissance or ground truthing of predicted site locations). One distinction between "extensive" and "intensive" survey is the minimal unit of analysis: the site versus the artifact, respectively.

Mediterranean landscapes are conducive to intensive techniques, not least since the rich artifactual record is continually exposed in the plow zone; "agricultural land" is the most common category of landscape feature to be included within project areas (Online Resource 5b). Artifact scatters in the plow zone are likely to be missed by more extensive techniques, and intensive surveys have demonstrated that such sites constitute our most widespread evidence for rural landscapes (e.g., de Haas 2012; Pettegrew 2001). While methods and intensity cannot be evaluated outside the context of a project's research questions and environmental setting, the direct correlation between number of sites found and amount of time invested in the landscape is a strong argument in favor of intensive approaches (Cherry 1983, p. 410, fig. 1).

Naturally, increasing survey intensity increases costs, or else decreases the spatial extent. This common problem of needing to balance cost, extent, and potential returns of archaeological information may partly explain the continued practical reality of widely varying spatial extent of survey projects, from 0.35 ha to 1.8 million km^2. No common metric of survey intensity exists, but we can read some spatial trends as proxies: in some countries, such as Greece and Cyprus, the trend is toward decreasing spatial extent through time, presumably a proxy for increasing intensity; in other countries, such as Israel, governmental administrative structures define survey region sizes (Fig. 2; Online Resource 5a). What proportion of that extent is subject to particular intensive or extensive methods (different types of coverage), and how that subarea is decided, remains project specific. One might expect to see an inverse relationship between survey extent and coverage expressed as a percentage. This is broadly the case for countries, like Greece, where discourse on spatial sampling has a long heritage; it is not evident, for example, in Italy or Israel (Fig. 3a; Online Resource 6). It is clear that 100% coverage does not mean the same thing in different research contexts, so apparent trends in spatial coverage must be viewed with caution

(Fig. 3b). Temporally, most Mediterranean surveys identify as being diachronic in scope, rather than focused on a particular period (83% of the submissions to SoMS, albeit 43% of those note a primary interest in particular time period). According to the SoMS, projects starting in the 1990s are the most avowedly diachronic, with a revival of single period surveys from the mid-2000s (Fig. 3c). This diachronic attitude stems from interest in (1) long-term history and the influential *Annales* school (Barker 1995a; Bintliff 1991; Braudel 1972; Knapp 1992); (2) systematic sampling in coverage and artifact collection; (3) an acknowledgement that projects do not control what they find and yet (4) have an ethical and professional obligation to deal with material of all periods encountered.

In short, Mediterranean survey is a method of minimally invasive surface investigation that is used to address a range of research questions, usually above the spatial level of the individual site and with a chronological scope encompassing multiple periods. In practice, however, there is relatively little uniformity in how these interests are pursued across different projects. Mediterranean survey also includes regional inventories of archaeological sites, work in the heritage management industry, and nonsystematic, exploratory research conducted by both academics and amateurs. There also are many practitioners of Mediterranean survey who would define the field in narrower terms. Whatever our views of how fieldwork *should* be carried out, we must start by acknowledging the variety of ways in which survey has been done in the past and continues to be done today.

The Study of Mediterranean Landscapes through the 20th Century

Regional archaeology also has important antecedents in topographic studies, inventories and gazetteers of archaeological remains, and colonial scientific expeditions (see, e.g., Cherry 2003;

Knodell and Leppard 2018). We focus here on the history of systematic, regional-scale surface survey, beginning in the mid-20th century.

In the 1950s and 1960s the South Etruria Survey in Italy (Potter 1979) and the University of Minnesota Messenia Expedition (UMME) in Greece (McDonald and Rapp 1972) were established under very different circumstances, but they eventually integrated systematic approaches to coverage and interests in climate, environment, physical geography, and long-term history. For UMME, the study, synthesis, and publication were influenced by developments in New World archaeology, most notably the Virú Valley Project (Willey 1953). Contemporary surveys in Mesopotamia were also influential (Adams 1965; Braidwood and Howe 1960). These projects were emblematic of the emergent field of settlement pattern studies, in which the region was emphasized as the key analytical unit for human social organization (Binford 1964; Steward 1960). While these developments, mostly in American anthropological archaeology, were introduced to the Mediterranean more in publication than in practice, by the mid-1970s the stage was set for the introduction of systematic regional survey. This was driven by broader interests in sampling and critical approaches to research design (Binford 1972; Clarke 1972, 1973; Plog et al. 1978; Redman 1973, 1987; Schiffer et al. 1978), the English-language publication of Braudel's (1972) *The Mediterranean and the Mediterranean World in the Age of Phillip II*, with its attention to environment, timescales, and long-term history (Bintliff 1991; Knapp 1992), and for Greece, at least, the simultaneous publication of Renfrew's (1972) *Emergence of Civilisation*, with its explicit focus on settlement patterns (Cherry 2003).

As a result, a "new wave" of archaeological surveys emerged in the 1970s and 1980s, particularly in Greece (Cherry 1994). These projects (1) emphasized the importance of the region over the individual site; (2) made a case for survey as an independent endeavor, not necessarily

tied to or dependent on excavation; (3) incorporated off-site data into research questions; (4) aimed to synthesize diachronic regional datasets to answer questions of historical and anthropological importance; and (5) were committed to the incorporation of multiple methods and new techniques (Cherry 1983, pp. 390–391).

In the 1990s a key development was the formation of the international POPULUS project. Working groups aimed to address five major themes: geographic information systems; remote sensing or nondestructive techniques; geoarchaeological and related environmental techniques; demographic modelling; and artifact studies (Barker and Mattingly 1999–2000; see also Blanton 2001; Cherry 2002). The concerns of the POPULUS project were largely methodological, and indeed one of the aims of the project (never realized) was to establish a set of "best practices" for Mediterranean survey. Several scholars have argued that such standardization is neither possible nor practical, given the wide variety of environmental, administrative, and research contexts in which survey occurs (see comments by Millett in Francovich et al. 2000, p. 93; see also Alcock and Cherry 2004, p. 6; Knodell and Leppard 2018, p. 9), yet this discussion persists (Attema et al. 2020; Banning et al. 2017). One critique of the POPULUS volumes characterized Mediterranean survey as "myopic" and overly focused on issues of intensity, environment, and methodology in ever smaller areas, with little to say about truly regional scales of past *social* organization (Blanton 2001; for rejoinders to this critique, see Caraher et al. 2006; Tartaron 2008, pp. 89–93). Another view is to embrace the microregional scope and intensive methodologies of many projects as a particular strength, which Parkinson (2018) has characterized as a new "new wave." By the end of the 20th century, literature reviews tracked a sevenfold increase in the number of survey papers published in 15 major journals between the 1960s and the 1990s (Alcock and Cherry 2004, fig. 1.1; Cherry 2003, p. 139).

Mediterranean Survey in the 21st Century

Since 2000, major collections of papers have focused explicitly on survey evidence to address issues of data comparability (Alcock and Cherry 2004), imperialism (Düring and Stek 2018), social complexity (Attema et al. 2010a; Knodell and Leppard 2018), urbanism (de Ligt and Bintliff 2020; Vermeulen et al. 2012), and land cover, demography, and environmental change (Bevan et al. 2019). These targeted volumes are accompanied by broader compilations of current issues (Athanassopoulos and Wandsnider 2004). The role of survey and landscape approaches for periods after antiquity is a particularly growing field (Athanassopoulos 2020; Gelichi and Olmo-Enciso 2019; Witmore 2020). Conferences regularly convene on the specific topic of survey in the Mediterranean (e.g., Attema et al. 2020). A further sign of disciplinary maturity is that many formative projects of the 1970s and 1980s have reached "final" publication since 2000. More recent projects are being published faster—at least in preliminary form—owing partly to developments in database and GIS technologies.

The result is a proliferation of literature that no single scholar could possibly master. This is part of a wider "data deluge" (Bevan 2015) that also involves growing interest in the online publication of datasets, in open formats that can be downloaded and integrated in broader analyses (e.g., de Haas and van Leusen 2020). While responses to the SoMS revealed that only 19% of projects have published their data in either an open or even downloadable form, 49% intend to do so, and only 24% said their data was unlikely to become available online (Online Resource 8c). Two types of online datasets are important (if imperfect) resources for Mediterranean regional studies: (1) online repositories for digital data generated by archaeological projects (Online Resource 7) and (2) compilations of archaeological survey and

site data (Online Resource 1). The two most comprehensive databases for Mediterranean survey projects are currently Fasti and MAGIS, which exhibit considerable divergence in the number of survey projects included by country (Fig. 4a; Online Resource 9). A relatively new effort is Fieldwalker.org, which aims to incorporate a very simple and open spatial directory of survey projects across the Mediterranean, with project website and data links that enable readers to find and connect quickly to data sources.

Dominant Discourses and "Schools" in Mediterranean Survey

Most reflective discussions of Mediterranean archaeological survey appear in academic publications and concern research carried out by foreign or domestic universities or other research institutions. The dominance of the academic context was captured in the responses to the SoMS, for which 48% relied on foreign, 35% relied on domestic, 9% on *both* foreign and domestic university or research institute support (Fig. 5a). The varying balance between local and foreign sponsorship per country may at least partially reflect the self-selecting respondents to our survey. For example, according to Turkish governmental permit lists, over 70–90% of surveys in Turkey have been led by Turkish researchers over the last 20 years, but of the SoMS responses, domestic research institutes are cited by only 26% of submitted projects. This kind of under-representation in the SoMS signals a wider gap between certain influential academic discourses on Mediterranean survey, primarily in Anglophone academic literature, and a variety of "hidden schools," which have produced a large corpus of archaeological fieldwork that is often overlooked in the context of international research agendas.

Certain projects and individuals have been particularly influential in the dominant Mediterranean schools of thought and practice. The "new wave" of projects in the Aegean in the

1970s was broadly influential, especially via projects in the Argolid, Boeotia, Melos, Kea, the Nemea Valley, and Pylos (Bintliff and Snodgrass 1985; Cherry 1982; Cherry et al. 1991; Davis et al. 1997; Wright et al. 1990). These resulted in several successor projects by former students or project participants, using a similar set of core methods and approaches, and in various parts of the Mediterranean (Bintliff and Rutter 2016; Loy 2020). At the same time, intensive survey techniques were deployed elsewhere in the Mediterranean, most notably Italy and North Africa (Barker 1996; Boyle et al. 2014). The most central institution in an early network of project genealogies was the University of Cambridge, where Anthony Snodgrass, Graeme Barker, and John Cherry held positions and organized regular, informal meetings through the 1980s and 1990s.

Since the 1990s a northern European school has emerged out of a consortium of scholars in the Netherlands and Belgium (but also with strong roots in the UK), beginning with Peter Attema, John Bintliff, and Douwe Yntema (Bintliff, pers. comm. 2020). This now much expanded group has held biannual meetings since 2000 as the International Mediterranean Survey Workshop. These meetings are especially focused on methodology and the presentation of preliminary results for active projects (Attema et al. 2020).

Most of what is described as "Mediterranean survey," especially *intensive* survey, can be tied to these two schools of thought, which themselves differ more in nuance than in fundamentals. Crucially, however, there is a great deal of survey work in the Mediterranean that has little to do with these schools, and much more to do with national or regional research traditions.

Cultural heritage professionals are often overlooked in discussions of archaeological survey practice (though see Banning et al. 2017). National archaeological services, ministries of

culture, and regional authorities or museums are responsible for maintaining inventories of archaeological sites and cultural resources, as well as managing fieldwork and issuing permits. These rarely emerge as considerations in describing survey methods or defining research questions. For archaeological survey specifically, governmental oversight affects everything from survey area size to whether or not finds can be collected, let alone sampled for archaeometric analysis or put into long-term storage. In the context of national and regional heritage management, archaeological surveys take place nearly constantly as "rescue" and assessment projects executed by private firms or national or regional public services for various types of construction efforts (roads, pipelines, and other infrastructure; residential and commercial construction). The results of this work are usually relegated to the gray literature of government-mandated reports, or to national or regional journals (Online Resource 10). These reports are therefore rarely considered in academic discussions of archaeological survey, even though they often provide baseline data for a variety of regional analyses. Another underrepresented group is amateurs and local enthusiasts, who often have deep knowledge of the landscapes they inhabit, occasionally also with rich documentation in personal archives or local publications (Barker 1996, pp. 160–162).

A final point about representation in Mediterranean survey is gender. In the directorship of Mediterranean survey projects there is a significant historical imbalance in which women are underrepresented. Out of the project directors listed in submissions to SoMS, only about 30% are female (Fig. 5b; Online Resource 11a). We suspect that this imbalance is also present in regional archaeology in other parts of the world. There is a long history, however, of contributions to survey work and regional studies by women (e.g., Alcock 1993; Fentress and Docter 2008; Foxhall 2014; Nixon et al. 1988), and landscape archaeology has proven fruitful ground for

studies of gender in past modes of social organization (e.g., Ashmore 2006). Women are also well represented in the archaeological services of many Mediterranean countries. Nevertheless, a male-dominated history of scholarship continues to create imbalances in the field, not least through professional networks and scholarly lineages (Erny and Godsey, in press). While we have seen a marked uptick of projects led by women in recent years (e.g., Murray et al. 2020; Fig. 5c; Online Resource 11b), more work is needed to rectify this imbalance.

Traditions and Trends around the Mediterranean

Contemporary classical archaeology has shaped the disciplinary priorities and trajectory of Mediterranean survey, particularly through its interests in topography, urbanism, pottery studies, and rural life. The archaeology of the Roman Empire is especially influential and is more or less coincident with the spatial remit of Mediterranean-style survey projects. Most diachronic surveys have evolved in places where Greek and Roman periods supply the most abundant surface material. We therefore acknowledge that the diachronic scope and fieldwalking base of most pedestrian survey projects is better suited to some periods than others when it comes to detecting and documenting material traces of human behavior. These periods tend to be characterized by urban or semi-urban, ceramic-producing societies of protohistoric and historical periods. Where possible, we highlight regional research on less-represented periods as well. We begin with Italy and work our way roughly clockwise around the Mediterranean. While such a review is necessarily selective, we focus on major developments and trends for each region that are also relevant to broader discussions.

Italy and the Adriatic

Survey archaeology in Italy is part of a long tradition of topographic and cartographic studies (Cambi and Terrenato 1994; see also Barker 1996; Potter and Stoddart 2001; Terrenato 1996; Witcher 2006). This tradition was (and is) largely concerned with understanding the location of sites and monuments and delineating their component features (e.g., Lugli 1930–1938). Such work was often undertaken with the goal of producing comprehensive resources for cultural heritage management (e.g., the *Forma Italiae*, now the *Carta Archeologica d'Italia*). This was the intellectual context in which the first British research in Italy with an explicitly landscape perspective was undertaken by Ashby and Ward-Perkins, whose work on the South Etruria Survey made explicit the goals of surface prospection and documentation between Rome and the *Ager Veientanus* (Barker 1996; Potter and Stoddart 2001; Smith 2018). In this case, methodical prospection at the regional scale emerged through the gradual realization of the volume and extent of archaeological material in the plow zone as modern agriculture was becoming increasingly mechanized. The outcome was a large-scale synthesis of diachronic settlement distribution (Potter 1979). By the time the South Etruria Survey reached its final form in the 1970s, its goal was the characterization of settlement patterns via systematic fieldwalking. Anglo-Italian survey methodology converged with wider trends in the New Archaeology. This influence can be detected in several major projects of the 1970s, for example, in the stratified sampling strategy for different landscape types in the *Ager Cosanus* survey (Cambi and Fentress 1988).

The Biferno Valley Survey (Barker 1995a, b) represented a major methodological innovation in framing its research universe according to environmental principles related to supposed or projected behavioral patterns, rather than because of expediency or in relation to the hinterland of a large classical settlement. The research design was diachronic and multilevel,

involving increasingly intensive methodologies at increasingly smaller scales. The project also incorporated geomorphological research, geophysical prospection, targeted excavation, and ethnography.

We necessarily gloss here much subsequent Anglo-Italian work, including the Tuscania project (Barker and Rasmussen 1988), the Gubbio Survey (Malone and Stoddart 1994), and the Sangro Valley Project (Lloyd et al. 1997)—the latter demonstrates the enduring impact of the Biferno Survey in being explicitly modeled on it. Several later surveys were implemented under the auspices of the Tiber Valley Project, a successor to the South Etruria Survey (Attema et al. 2021; Patterson 2004; Patterson et al. 2020). The northern hinterland of Rome is now one of the most thoroughly investigated areas in all of Italy, whose expansion and long-term history might be examined alongside other global mega-polities, such as Teotihuacan or Tenochtitlán (e.g., Smith 2017, 2020). This collection of survey work in the intensive tradition demonstrated the unique nature of a dense, comparatively early, and indigenous urban form, and the dynamics of this urbanism during the ascendancy of the Roman republic.

While these early projects were formative, Italy nevertheless exhibits a multiplicity of approaches to archaeological survey, including the contributions of Dutch-Italian teams in promoting innovative, high-intensity fieldwalking methodologies combined with detailed geoarchaeological work. An early yet explicitly diachronic project with high-resolution fieldwalking addressed issues of state formation in the Potenza Valley in Marche, away from the urban core zones of Etruria and Magna Graecia (Vermeulen et al. 2017; see also Yntema 1993). The results of this project showed complex, topography-tied trajectories of settlement change in a "transect" from the Apennine interior to the coast (mirroring the Biferno and Sangro projects), highlighting local patterns of landscape occupation during the integration of the area into—and

disintegration from—the Roman state. On the Tyrrhenian coast, in the marshes and low hills of southern Lazio, a series of projects have demonstrated the advantages of integrating intensive pedestrian survey with geomorphological survey and excavation, connecting expanding populations and agropastoral exploitation with landscape engineering and institutional intervention in a dynamic coastal environment (Attema 1993; Attema and van Leusen 2004; Attema et al. 2010b).

Long-lived, multimethod projects oriented around intensive survey have certainly not been the sole preserve of British, Italian, and northern European scholars; the enormous American-Italian project at Metaponto, for example, had at its core an intensive survey component (Carter and Prieto 2012), as did the related project at Croton (Carter and D'Annibale 1993). Complementing intensive, artifact-oriented work of this type, survey in the topographic tradition has continued, both in the lowlands of Tyrrhenian Italy and elsewhere in the peninsula (e.g., Carandini and Cambi 2002; Cardarelli et al. 1980; Cupitò 2007; Marchi and Muntoni 2018; Quilici and Quilici Gigli 2003). Often, work in the topographic tradition has informed more intensive and systematic research (e.g., Casarotto et al. 2016). Work of various methodological types is in part facilitated by Italian approaches to granting permits for survey archaeology; there is no upper limit on the number of projects that can run concurrently, and both survey and excavation activities can be included on the same permit. Integration of different traditions of survey and respective bodies of legacy data for new research endeavors (e.g., Casarotto 2017) is further facilitated by the retention and maintenance of online databases such as Fasti Online or the Forma Italia series.

Much of the ground surface of the Italian countryside has been subjected to archaeological survey: often by field walkers spaced very closely, and often supported by

detailed geoarchaeological and geomorphological research. This has led to two realizations, which are also true of Mediterranean survey more broadly. First, artifacts are distributed continuously (if varying in density) across much of the landscape, especially in agricultural zones. Second, the density and structure of this distribution changes from observation to observation. That is, plow-soil assemblages are both spatially and temporally dynamic even within the short timeframe of a multiyear archaeological project. This led Lloyd and Barker (1981, p. 291) to report, based on revisits to the Biferno Valley, that sites "…can come on and off like traffic lights…" This recognition of the vagaries of surface artifact distributions has fueled ongoing interest in taphonomic and post-depositional effects in order to better understand the creation of plow-soil artifact concentrations (e.g., Ammerman 1985; Terrenato and Ammerman 1996).

Throughout the 21st century, Italian survey has been particularly concerned with evaluation and affirmation of surface assemblages by way of comparable survey designs (Lloyd et al. 1997), formalized strategies of revisitation (García-Sánchez et al. 2017), work on legacy data (Ammerman et al. 2013; Cascino et al. 2012; Patterson et al. 2020; Thompson 2004), and formal comparison of survey results (Attema et al. 2020; de Haas and van Leusen 2020). Dissenting voices to increasing intensity and non-site approaches can also be heard. Fentress (2000) questioned the trade-off between increasing intensity of observation and resulting smaller areas surveyed—that is, that the goal of survey should be to identify sites, a category of phenomenon that she argues should be self-evident (see also Blanton 2001; Terrenato 2004). More recent work, however, has demonstrated the capacity of intensive, artifact-oriented survey to reveal otherwise invisible dimensions of Italian rural settlement (de Haas 2012; Waagen 2014; see also Caraher et al. 2006); and Witcher (2006) has shown how site versus non-site distinctions

are outcomes of method and observation, not actual phenomena that exist independent of observation.

While survey practitioners in Italy have a strong commitment to methodological transparency and rigor, there is less diversity in historical or archaeological research questions. Much Italian survey has orbited around the enormous transformations on the Italian peninsula during the first millennium BC, especially in relation to Roman expansion. Survey projects have focused on the indigenous emergence (Etruscan, in the north) and implantation (Greek, in the south) of various forms of urbanism and the subsequent proliferation of the urban tradition throughout peninsular Italy. This process reached its apogee following the expansion of the Roman state from 400 BC to the Social War. Integration into the growing Roman state is an intrinsically interesting process that has Mediterranean-wide implications. Nevertheless, these factors may reinforce a bias toward research agendas constructed around state emergence and urbanism. This bias is also suggested in the spatial distribution of projects within peninsular Italy (Terrenato 1996). This of course does not preclude other periods and questions also animating individual surveys as well as synthetic studies. As elsewhere in the Mediterranean, the study of medieval landscapes has seen substantial growth (e.g., Francovich and Valenti 2005).

Away from the peninsula, there are robust traditions of survey that tackle issues less relevant to Italian mainland archaeology. The role of the small Tyrrhenian islands and those in the Sicilian Strait as cultural fulcra and nodes of "connectivity" continues to prompt novel, landscape-focused archaeology (e.g., Martinelli et al. 2021; Vella and Spiteri 2021); but it is the massive islands of Sicily and Sardinia that have received most attention. Early integration into Late Bronze Age networks, Early Iron Age interaction and settlement, and processes of Punic and Greek "colonization" have all prompted surveys with a less obvious focus on Roman

archaeology (van Dommelen 1996)—although as the two earliest provinces to be incorporated, the Greco-Punic to Roman transition is nonetheless of profound interest (van Dommelen and Finocchi 2008). On Sicily, much attention has been paid to the hinterlands of Greek, Punic, and ultimately Roman cities (Belvedere et al. 2002; Blake and Schon 2010; Thompson 1999; Wilson and Leonard 1980). Sardinia, too, has witnessed surveys oriented around early urban sites (e.g., Botto et al. 2003), while major projects have also investigated diachronic patterning in rural settlement. Systematic surveys like the Riu Mannu Project (Annis et al. 1997) have illuminated complex pre-Roman settlement dynamics, patterns partly affirmed by newer, intensive projects, which have shown the existence of an extremely dense occupation of the landscape straddling the Punic-Roman transition, and thus seemingly unconnected with that transition (e.g., Murphy et al. 2019; Plekhov et al. 2020).

The opposite Adriatic coast consists of a narrow zone of islands and coastal plains sandwiched between the sea and the Dinaric Alps. The vast majority of this area is occupied by Croatian Dalmatia and Istria, with a small section of Montenegran coast before Albania. Methodological development in the northeastern Adriatic partly parallels that of Italy, although the political developments of the last century make for a regional archaeological tradition that blends various approaches.

Croatia has a long tradition of topographic or reconnaissance survey, largely oriented around locating and identifying individual sites for purposes of cultural heritage management, settlement pattern analysis, and facilitating further investigation by excavation (Chapman et al. 1996, pp. 1–15; Čučković 2012); comparable to Italy, this exists within a permitting structure that allows for fairly broad latitude in how multimethod projects are conceptualized and executed. Diachronic, systematic, and intensive methodologies were introduced into the area

beginning in the 1980s—most notably by two projects, the Neothermal Dalmatian Project and the Adriatic Islands Project, both Anglo-Croatian research ventures. The former, around Zadar, adopted an explicitly systematic and diachronic perspective (Chapman et al. 1996). The latter project, focused on the southern part of the Dalmatian archipelago and primarily on Hvar and Brač, combined systematic intensive survey with early GIS-led applications, influential elsewhere in the world as well (e.g., Gaffney and Stančič 1991; Gaffney et al. 1996). Recent projects in Dalmatia have tended to follow a "mixed" model, utilizing occasional intensive pedestrian observation with extensive topographic techniques and geospatial modeling, including important research on Rab and elsewhere (Bass et al. 2009; Konestra et al. 2019; Welc et al. 2019). Recent work in Istria, at the head of the Adriatic, has also relied on the targeted use of high-intensity fieldwalking methods (Čučković 2012).

Despite its introduction in the 1980s, intensive and systematic plow-soil archaeology of the type that is now prevalent in nearby Italy and Greece has not achieved ubiquity in the northern Adriatic. The politics of the Balkans in the 20th century certainly muted the impacts of foreign practice in the Former Yugoslavia, and the breakup of that country and the associated conflicts were disruptive for research (e.g., Chapman et al. 1996). Ancient politics—or at least cultural influence and urbanization—may also be pertinent, along with physiographic features. Dalmatia is dissected by karstic geology, with few large coastal plains associated with large-scale agricultural activity. Additionally, ancient urbanization and accompanying rural transformation, while evident in Dalmatia during the later Iron Age and after integration into the Roman Empire, was limited to key sites—the most significant being Split (Salona/Spalathos), Dubrovnik (Ragusa), and Zadar (Iader). These factors may render intensive survey less efficient in terms of data returns than in the southern Adriatic, where sites like Durrës/Dyrrachium in

Albania were an early focus of work, particularly influenced by developments in the Aegean (see below). The Dalmatian results, contextualized alongside those from the Italian peninsula and from the large Italian islands, underscore how intensive pedestrian survey (and to a lesser extent, extensive survey) can show highly localized processes of settlement change. These processes seem only loosely tethered to large-scale developments like imperial incorporation and urbanization—factors that we might otherwise have thought were the primary influencers of regional economic and demographic organization.

Greece, Cyprus, and Albania

We group Greece, Cyprus, and Albania together on the basis of shared research traditions and networks particular to archaeological survey and Greek classical archaeology. Several overviews describe the state of the field in each country individually (Greece: Bennet and Galaty 1997; Tartaron 2008; Cyprus: Cherry 2004; Kearns 2015, pp. 78–111; Chelazzi 2021; Albania: Lafe 2006).

The University of Minnesota Messenia Expedition set the stage for increasingly systematic and multidisciplinary projects in the Mediterranean (McDonald and Rapp 1972). Greece was also the "home base" for especially vocal exponents of intensive survey methodology from an early date (Bintliff and Snodgrass 1988; Cherry 1983). Many later reviews of Mediterranean-style pedestrian survey have focused especially on Greece or have been written by individuals with expertise and experience in this country (e.g., Alcock and Cherry 2004; Cherry 1994, 2003; Galaty 2005). Formative projects in the 1970s, 1980s, and 1990s, especially the Melos Survey (Cherry 1982), Northern Keos Project (Cherry et al. 1991), the Nemea Valley Archaeological Project (Wright et al. 1990), and the Pylos Regional Archaeological Project

(PRAP; Davis et al. 1997) have since produced a number of intellectual descendants (Loy 2020). Early projects in the Argolid (Jameson et al. 1994) and Boeotia (Bintliff et al. 2007, 2017) were also influential. Collectively, these projects developed a robust set of multidisciplinary, systematic methodologies for studying landscapes at microregional scales and produced results that highlighted the "busy countryside" of the Greek landscape, with a series of booms and busts in rural occupation. They demonstrated the significance and ubiquity of small-scale sites and the "continuous carpet" of artifactual densities that seemed to radiate out from larger sites as "haloes." This artifact-oriented, intensive survey demonstrated the utility of pedestrian fieldwalking across continuous blocks of the landscape by highlighting diachronic oscillations in the artifactual record, which signaled transitions in the organization of rural life that could only be documented at this scale of analysis. These projects also highlighted intensive survey as a way to collect large amounts of information through noninvasive means that were also relatively low cost, in situations where excavations were either impractical or impossible.

Intellectual networks developed initially in Greece extended also to Albania and Cyprus. Intensive archaeological survey was essentially imported to Albania from Greece in the 1990s. The first project in this tradition was the Butrint survey (Hodges et al. 2004; Pluciennik and Drew 2000), followed closely by the Malakastra Regional Archaeological Project and the Durrës Regional Archaeological Project, direct descendants in name, directorship, and participants from PRAP (Davis et al. 2003, 2021). Galaty (a PRAP participant) extended this genealogy to the Shala Valley Project (Galaty et al. 2013) and Projekti Arkeologjik i Shkodrës (Galaty et al. 2019).

The trend is similar in Cyprus, with an influx of intensive survey projects beginning in the 1980s and 1990s in the south of the island (Iacovou 2004; Kearns 2015). Several surveys had

intellectual connections to aforementioned projects in Greece or were deliberately designed in the same tradition (Given and Knapp 2003; Given et al. 2013; Manning et al. 1994; Todd 2004). Earlier surveys were more connected to traditions of Near Eastern settlement pattern studies (Chelazzi 2021). One characteristic of work in the later 20th and early 21st century has been to foreground environmental studies in archaeological surveys, with a special focus on the metallurgical past of Cyprus (Given and Knapp 2003; Given et al. 2013) and the integration of new paleoenvironmental and chronometric methods (Kearns 2019). The unresolved nature of the island's political structure has meant that the north has not received the same intensity of study by survey archaeologists (but see Şevketoğlu 2000 on the Kyrenia district).

Antiquities laws and permitting regulations have been important determinants in the design and scope of survey projects. In Greece, the maximum size of a permit request for a survey area is 30 km^2 (Online Resource 5a). It is also significant that permits for archaeological surveys are administered separately from excavation permits, making it impossible to conduct excavation and survey work in tandem, at least under the same permit and project design. This precludes certain types of multistage research involving test excavations, especially at small sites represented by surface scatters. It also precludes the type of wide-ranging excavation sampling that is necessary to better date and interpret certain types of surface assemblages. Cyprus, too, requires separate permits for any kind of excavation, though Albania allows for joint survey and excavation projects.

Permitting systems also affect research priorities. In Greece, foreign researchers typically apply for fieldwork permits through one of the foreign institutes, such as the American School of Classical Studies at Athens (ASCSA). Because each institute is granted six permits per year, (1) competition for permits varies widely between institutes (for example, the ASCSA has many

times the number of potential permit seekers as the Irish Institute of Hellenic Studies); (2) research design is contingent on permit availability and regionally specific attitudes toward collaboration; and (3) both foreign institutes and the Hellenic Ministry of Culture have to be selective in allowing a finite number of foreign projects. Most sites known from surface remains will never be subject to any type of excavation, due to the difficulty of obtaining permits and reluctance to expend an excavation permit on a minor site, let alone one for which it has not been demonstrated that excavation will be productive. Until this changes, and excavation sampling is allowed on archaeological survey projects, certain debates concerning the interpretation of surface assemblages in Greece are unlikely to make substantial progress.

A more integrated system is currently present in Albania, where there are no limits on the number of projects, but foreign projects must describe a team of roughly equal foreign and Albanian researchers. One feature of current survey work in Albania is the growing importance of developer-led projects; however, the scope, goals, and reporting of such projects varies widely. In the background of all of this are national dialogues concerning cultural heritage and the relationship between archaeology and the state (Bejko 2020). While the challenging politics of heritage management are manifest throughout the Balkans, they are particularly acute in Albania and Cyprus, with connections to various Greek pasts also as significant points of discussion and debate.

The southern Balkans and Cyprus have adopted a style of archaeological survey that is best characterized as microregional in scale, which is reflected in the declining mean and median project sizes for Greece and Cyprus (Fig. 4a), and by intensive methodologies and multiple modes of sampling (e.g., Kearns and Georgiadou 2021). This is partly due to permit regulations,

but it has developed also in recognition of the fragmentation that characterizes the southern Balkans in particular (Parkinson 2018).

Landscape archaeology as long-term history has been a core concern from the "new wave" onward (Cherry et al. 1991; Watrous et al. 2004). Rurality and the ancient Greek countryside were key themes, as researchers looked to survey for insights on the nonurban landscapes that were not well represented in texts, visual media, or architecture (e.g., Jameson et al. 1994; Mee and Forbes 1997; Osborne 1987). Intensive methodologies and artifact collection were also well suited to surveys of single sites, which has provided detailed chronological and functional information across large sites that provide contrasts in surface assemblages related to urban and rural life (e.g., Alcock 1991; Fachard et al. 2020; Foxhall 2014; Snodgrass and Bintliff 1991; Vermeulen et al. 2012). Some projects have also embraced thematic concerns such as political territory and movement. Recent studies of borders and borderlands, such as in the Mazi Plain on the borders of Attica and Boeotia, have overturned assumptions concerning the attribution of fortifications to one polity or another and highlighted shifting levels of engagement between larger polities and rural communities (Knodell et al. 2017b; Fachard et al. 2020). While regional survey began mainly with prehistorians leading the way (even if in classical contexts), many projects are now also concerned with the more recent past, employing approaches derived from documentary archaeology (especially Venetian and Ottoman tax documents and land records) and ethnography (e.g., Davis 1991; Erny and Caraher 2020; Galaty et al. 2013).

Targeted surveys of particular types of landscapes are also noteworthy. One trend is to focus on ecological zones that would have appealed to early humans and that meet conditions sufficient for the exposure of Pleistocene and early Holocene surfaces, and thereby Paleolithic and Mesolithic assemblages (Runnels 1988, 2009; Runnels et al. 2004; Strasser et al. 2010;

Thompson et al. 2018). Increased attention has also been paid to maritime environments, especially as interconnected "small worlds," following Broodbank (2000). Synthetic studies and survey projects in the Saronic Gulf (Tartaron 2013; Tartaron et al. 2011) and the seaways between Naxos and Keros (the Keros Island Survey and the Keros-Naxos Seaways Project) have shown that the sea is an important conduit in connecting "coastscapes" at a regional scale. Other recent projects on very small islands in the Ionian and Cycladic archipelagoes have shown that landscapes of settlement and use extend well beyond remains of long-term habitation—a type of evidence that is often overlooked or missed by larger-scale surveys (Galanidou 2015; Knodell et al. 2020).

The reevaluation of "legacy" data is another recent trend, especially through GIS-based spatial analysis (e.g., Bonnier et al. 2019), or the analysis of unpublished data collected by old field projects in the context of PhD dissertations (e.g., Cloke 2016; Kearns 2016). Integrating survey datasets from multiple sources has revealed dynamic, nonuniform trends across several regions, shedding new light on the intensification of social complexity in the Bronze Age Peloponnese and Crete (Cunningham and Driessen 2004; Wright 2004), regional variability and nonlinear trajectories across the Bronze and Iron Age transition (Knodell 2021), Classical period state formation (Bintliff 1997), and Hellenistic and Roman imperialism (Alcock 1993, 1994).

After some 50 years of regular and intensive survey work, the greater Aegean is one of the most densely surveyed parts of the Mediterranean (Fig. 4b). Projects in Greece were reported more frequently than from other countries in the SoMS, and only Italy is better represented in the MAGIS and Fasti databases (Fig. 4a). The Prehistoric Stones of Greece online database inventories 163 survey projects (Elefanti et al. 2015). Certain regions, such as Boeotia, southern Euboea, and eastern Crete, have now seen multiple generations of projects and widespread

intensive coverage (Bintliff et al. 2007; Spencer and Bevan 2018; Tankosić et al. 2021). Increasing numbers of projects and survey-related publications in Cyprus and Albania also signal continual growth. Despite these successes, however, the vast majority of the total landscape has only been documented through variously compiled gazetteers and inventories, which remain essential (if imperfect) tools for regional studies (Knodell 2021, pp. 33–37, map 3).

Anatolia and the Levant

Survey archaeology in the Mediterranean countries of western Asia straddles disciplinary traditions in both classical and Near Eastern studies (Glatz et al. 2015). Near Eastern settlement pattern archaeology has been especially influential, most notably through surveys covering large territories around major sites, which have also made important innovations in the use of various types of remote sensing to aid in site discovery and document inter-site features such as roads and canals (Ur et al. 2011; Wilkinson 2003). Political instability and colonialism in some parts of the region have played a significant role in the history of fieldwork.

Turkey

Interest in archaeological landscapes in Turkey reaches back to the late Ottoman period, when in the early decades of the 19th century German-trained archaeologists created detailed topographic maps of the hinterlands of classical cities such as Miletos, Pergamon, and Troy (e.g., Wilski 1906). From the 1900s until the 2000s, survey as practiced in Turkey could be classified into three schools. The first was primarily located within the German school of classical archaeology, with a focus on topographic survey, epigraphy, historical geography, and the identification and documentation of large monuments, particularly along the western Aegean and southern

Anatolian coasts (e.g., Tuna 2012). The second can be traced to work in the Amuq (Braidwood 1937) and schools of Near Eastern settlement pattern studies (Wilkinson 2004), including multiple international and domestic surveys conducted in advance of the massive hydroelectric projects along the middle Euphrates and Tigris Rivers from the 1970s (e.g., Özdoğan 1977; Whallon 1979). The third is a less methodologically unified group of extensive and multi-province surveys in central, northern, and eastern Anatolia, most aimed at cataloguing the large number of prehistoric *höyük* settlement mounds (e.g., Burney 1956; Mellaart 1954; Todd 1990), which documented the extent of pre-classical and pre-Hittite occupation of Anatolia; this chronological interest remains important in Turkey today (Düring 2016, pp. 26–27). Since 1983, brief summaries of work for nearly every survey undertaken in Turkey have been presented at the annual national archaeological symposium (see Online Resource 10).

Survey archaeology in Turkey is mostly undertaken under the auspices of research institutions (Fig. 5a), predominantly local or foreign universities, with foreign projects often supported or even directly administered by foreign research institutes. There are no independent CRM organizations in Turkey, and development-led archaeology is primarily linked to large dam-building or pipeline projects, with surveys and excavations directed by academic or museum-based archaeologists (e.g., Tuna and Öztürk 1999). Survey archaeology is explicitly organized as a separate permit track—"surface research"—by the Turkish General Directorate of Cultural Heritage and Museums, precluding any subsurface testing. The total number of survey permits has grown slowly over the last fifteen years, with an increasing proportion held by Turkish academic archaeologists: 70% in 2006 vs. 96% in 2019. All archaeological projects now demand a minimum of 51% of the participants to hold Turkish citizenship.

In contrast to surveys in Italy and Greece, the project areas of surveys in Turkey are often very large, extending over multiple provinces (the mean size of a province being currently around 9600 km^2). Today the upper limit is two entire provinces, and the responses from our SoMS point to an *increase* in average survey extent over the last decades (Online Resource 5a). The majority of survey projects undertaken in Turkey have thus depended primarily on extensive methods, focused on the enumeration of sites or documentation of significant monuments. Issues of sampling methods or taphonomy are often secondary to straightforward exploration of large areas of relative *terra incognita*. Since the 2000s, high-tech documentation techniques such as geophysical survey, photogrammetry, and drone-based survey have become widespread. An early digital platform that synthesized nation-wide site distributions was the Türkiye Arkeolojik Yerleşmeleri Project (Online Resource 1), which also highlighted the widespread threat of damage to archaeological remains. Some projects have begun to foreground cultural heritage and engagement with local communities (e.g., Crow and Turner 2009; Koparal 2020). Others have piloted continuous/open data publication (e.g., Strupler and Wilkinson 2017).

Projects employing "Mediterranean-style" fieldwalking or explicit sampling strategies have slowly grown in number, which has reduced the bias toward an archaeological record dominated by *höyükler* (settlement mounds). Projects that have applied intensive methods fall broadly into two main groups. The first comprises projects focused on the hinterlands of large sites that have usually been subject to excavation, for example, Aphrodisias, Avkat, Komana, Sagalassos, and Türkmen-Karahöyük (Newhard 2018; Osborne et al. 2020; Ratté and De Staebler 2012; Tatbul and Erciyas 2020; Vanhaverbeke and Waelkens 2003). The second includes landscape-oriented surveys in which intensive fieldwalking is applied across a more dispersed study area, with concentrations in the Mediterranean or Black Sea littorals (e.g.,

Doonan 2004; Koparal 2020; Wilkinson and Slawisch 2017). Intensive surveys have also been used in mountainous regions and across the central Anatolian plateau (e.g., Düring and Glatz 2015; Maner 2019; Şerifoğlu et al. 2014). Together, the results of these projects highlight the diversity of settlement trajectories within the Anatolian landmass, especially in the aftermath of the Late Bronze Age. In particular, they show how the coalescence of urban forms was highly contextual across this vast space, a process (or series of processes) that would have been comparatively invisible from the perspective of large-scale urban excavation in Anatolia or from extensive survey on its own.

Lebanon and Syria

Lebanon and coastal Syria remain understudied in terms of landscape or systematic survey, in part due to long-term civil wars (1975–1990 in Lebanon and since 2011 in Syria). In both countries, permissions to work are managed centrally by the respective Directorate General of Antiquities. Local agencies or museum archaeologists have been responsible for much of the ongoing survey and site management throughout difficult times. Lehmann (2002) provides a bibliography of survey projects undertaken in Syria and Lebanon before 2000.

Before 2011, non-Mediterranean areas of Syria hosted many archaeological field surveys, predominantly following extensive methods aimed at site discovery, for example, at Carchemish, Upper Lake Tabqa, and in the Balikh Valley (Wilkinson 1998, 2004; Wilkinson et al. 2016). An increasing number of landscape and intensive site-halo surveys were undertaken before the Syrian Civil War, for example, at Homs and at Tell Brak (Philip and Bradbury 2016; Ur et al. 2011). Since 2011, at least from an international perspective, survey has been limited to remote sensing, primarily undertaken for site monitoring or heritage protection; surveys of this type have

revealed widespread patterns of looting and destruction (e.g., Casana and Laugier 2017). Since 2015, the Endangered Archaeology of the Middle East and North Africa Project has worked to develop an extensive online database to coordinate documentation and research efforts, particularly through remote sensing and concern for archaeological sites and landscapes under threat (e.g., ten Harkel and Fisher 2021).

Archaeology in Lebanon suffered long interludes due to the civil war and ongoing political instability (Newson 2016). This has resulted in much less intensive study than in many similar landscapes around the Mediterranean. The number of research-led surveys in Lebanon has increased, especially since 2010, and now Lebanon has a relatively high density of projects (Fig. 4b). In the Bekaa Valley, following the influential extensive surveys of Marfoe in the 1970s, which methodologically followed in the tradition of Near Eastern extensive settlement archaeology, a long hiatus in studies was broken by new surveys in the Anti-Lebanon (Bonatz et al. 2002), around Baalbek (Fischer-Genz and Ehrig 2005), and in the central Bekaa (Newson 2016). These projects showed that settlement was more intense than had been documented via extensive work; additionally, zones that had been considered "marginal" in fact had comparatively high settlement loads over the last three millennia. More recently, survey has also begun in the southern coastal zone near Sidon as part of the Zahrani Regional Survey Project (Schmitt et al. 2019), which similarly revealed dense Roman and Mamluk/Ottoman period occupation. In the northern Chekka region, a large-scale lidar-led survey identified 590 mound sites of potential archaeological interest across an area of 290 km^2 (Rom et al. 2020). While ground truthing remains an essential component of any remote sensing study, the potential for mapping and initial discovery is clear, especially in areas that are difficult to access.

Israel, Palestine, and Jordan

Issues of topography, religion, territory, and nationalism are particularly acute in the southern Levant and have affected archaeological survey, especially its relationship to state antiquities authorities. As elsewhere in the eastern Mediterranean and North Africa, formal archaeological fieldwork was preceded by accounts by early travelers and antiquarians, who established a topographic tradition based on biblical and classical texts (e.g., Brünnow and von Domaszewski 1904; Burckhardt 1822; Glueck 1934–1939). This tradition has remained influential, in terms of periods of primary interest and approaches to archaeological survey that are mostly extensive and site-based, although recent years have seen an influx of new methods and techniques, which in turn have revealed new results and types of results.

Site identification and registration in Israel has been organized, since the 1960s, in a highly structured spatial manner and follow broadly consistent recording strategies. The nationally designed Archaeological Survey of Israel (ASI) divided the country into squares of 10 x 10 km, and archaeologists were licensed to produce a comprehensive record for a certain collection of these squares, through field survey and/or synthesis of previous work in the form of map sheets, associated gazetteers, and, more recently, digital databases (Online Resources 1 and 9).

Similarly organized but separately administered "emergency surveys" were also undertaken for the West Bank (as Judea and Samaria), and the (western) Golan. Israeli archaeologists undertook intensive surveys in the Palestinian West Bank from the 1970s onward, using broadly the same methodologies as for Israeli territory (Greenberg and Keinan 2009). In Israel itself, a large proportion of the country, perhaps 60–80%, has been studied by the constituent surveys that contributed to the ASI; of the projects submitted to the SoMS, all claim

close to 100% coverage (Online Resource 6a), although the survey intensity of most of these projects has been lower than in typical pedestrian intensive surveys. While these projects were undertaken at different times and with different methods and approaches to coverage, such a centralized system provides a valuable state structure for the collection and accessibility of archaeological data.

Research in Israel and Palestine is dominated by a focus on the Iron Age and the origins of "biblical" societies, with smaller clusters of research on Neolithic, Early Bronze, and classical periods (Levy 2010; Magness 2012); the biblical names given to subprojects (Manasseh, Ephraim, Benjamin, Judah, Amaziya), provide some insight into agendas of project organization (Greenberg and Keinan 2009). Geospatial and geophysical survey methods are also common (Eppelbaum 2010). One unusual recent methodological innovation is the mole-rat proxy method, which has helped map and date sites without excavation by identifying animal burrows and tracking finds around them (Sapir and Faust 2016).

Most survey-based fieldwork in Jordan has been carried out under the auspices of foreign institutes, especially the American Schools of Oriental Research (Banning 2001; MacDonald 2007). For the most part, survey projects have operated in the tradition of settlement pattern studies typical of Near Eastern archaeology. A boom of long-term projects beginning in the 1980s and 1990s sought to define settlement patterns and aspects of human-environmental interaction in various parts of the country, usually defined by dominant wadi systems, such as Wadi Ziqlab, or the presence of major sites, such as Jerash, Madaba, or Kerak (e.g., Clark et al. 2011; Lichtenberger and Raja 2018; Maher 2011; Miller 1991). Also significant were a series of surveys to document Bronze Age to Islamic period settlement patterns across much of the southern part of the country (MacDonald 2015). Since the 1990s, more intensive,

multidisciplinary methods have been deployed to address microregional, long-term research questions, for example, in the highly desertified copper-mining landscape of Wadi Faynan (Barker et al. 2007; Finlayson and Mithen 2007) and in the hinterlands of Petra (Knodell et al. 2017a; Kouki and Lavento 2013). Intensive fieldwalking revealed rich Paleolithic assemblages across those landscapes, indicating that "off-site" methods are particularly well suited to locating such finds in arid and semiarid conditions, especially on hillslopes bisected by wadis, which are likely to bring material to the surface seasonally. Long-term approaches to water and agricultural land management have also been key concerns in recent scholarship, which has documented widespread and sophisticated water management systems at large sites—such as Petra and Jerash—and in the hinterlands around them, allowing also for detailed studies of the social dimensions of water management on regional and microregional scales (e.g., Bienert and Häser 2004; Lichtenberger et al. 2019; Plekhov 2021).

Egypt

Although part of Africa, Egypt has often been more closely tied to western Asia in terms of political and archaeological history. At the same time, Egyptology is an independent field that is frequently overlooked in wider methodological comparisons and reviews; only eight survey projects were listed in MAGIS, and only one was submitted to our survey of surveys. Archaeological surveys nonetheless abound, with 35 in our current reckoning (Fig. 4, Online Resource 3).

All archaeological works in Egypt are undertaken with the permission and participation of the Ministry of Antiquities, many under the aegis of foreign research institutes (Egypt Exploration Society, Institut Français d'Archéologie Orientale du Caire, etc.). There are also

collaborative platforms such as the Egypt Exploration Society's Delta Survey, which now coordinates multiple survey projects, each of which has its own specific research focus (e.g., Grigoropoulos and Wilson 2009; Rowland and Phillipps 2012; Rowland and Tassie 2014; Rowland et al. 2017). Outside the Nile Delta, other regions have seen recent major new or renewed survey investigations, for example, in the Fayum oasis (Holdaway and Wendrich 2017), near Aswan (Gatto et al. 2018), and in highland Abydos (Olszewski et al. 2005). These projects have documented previously understudied prehistoric periods, though many also provided new settlement information about pharaonic and classical periods (e.g., Kleindienst 2020).

Both deltaic and desert Egyptian landscapes provide taphonomic and logistical challenges for survey (Trampier et al. 2017). Phillipps and colleagues (2016, p. 280) suggest, however, that there is much unrealized potential for landscape approaches as applied elsewhere in the Mediterranean, given the good surface visibility beyond heavily sedimented areas (see also Schiestl 2012). Though the focus of much archaeological survey in Egypt remains oriented around sites, hybrid survey and excavation methodologies are common, with many survey projects including aspects of small-scale excavation and subsurface investigation (Coulson 1996; Holmes and Friedman 1994; Spencer 2016; Stevens 2011); similarly, some site-oriented excavations undertake small-scale surface surveys as a matter of course. The application of geophysical and remote sensing techniques for subsurface feature detection is a common part of archaeological investigations in Egypt, for example, in the western Nile Delta (Trampier et al. 2017), at Thebes (Graham et al. 2017), at Saqqara (Mathieson et al. 1999), at Farafra (Fabiani and Lucarini 2010), and at macroregional scales for site monitoring (Parcak et al. 2016).

While at this point there is plenty of survey work being done in Egypt, archaeologists have been slower to synthesize this information than they have in other regions. Indeed, one

recent overview of Egyptian settlement archaeology has very little to say about the contributions of modern surveys, focusing on urban sites, towns, and domestic architecture (Moeller 2016). With the number of ongoing projects and recently published surveys, we expect that synthetic approaches to the rural archaeology of Egypt hold much potential, especially alongside rich documentary records and long-term excavations of large settlements.

The Maghreb

The Mediterranean countries of western North Africa (Morocco, Algeria, Tunisia, and Libya) occupy nearly three times the area of the countries of Mediterranean Europe, yet only a relatively small amount of systematic archaeological fieldwork has taken place in these countries. Several recent programs of study have emerged to synthesize existing evidence for North Africa and to launch new programs of research on prehistory and long-term demographic change (Broodbank and Lucarini 2019; Cheddadi et al. 2019; Lucarini et al. 2020). Regional survey and rural settlement archaeology has also been increasingly important for understanding the varied sets of local, colonial, and imperial dynamics that occurred in this region during historical periods (Fentress and Docter 2008; Fenwick 2020; Leone 2007; Mattingly and Hitchner 1995; Stone 2004).

The history of archaeology in North Africa is closely related to European colonialism, with archaeology often linked to military reporting and topographic survey (e.g., Effros 2018). Gazetteers and archaeological atlases constituted the main sources of settlement data for North Africa until the arrival of modern survey techniques in the late 1970s.

The UNESCO Libyan Valleys Survey, beginning in 1979, was the most influential survey project in North Africa in the last half century. This project adopted systematic,

diachronic survey techniques and applied them in a large-scale, multistage field project in northwestern Libya (Barker et al. 1996). This provided a model survey project and set agendas for survey archaeology in North Africa and elsewhere. Specific foci of regional studies in this tradition have been human-environment interaction, climate change, and the intersections of desert and semiarid landscapes, especially in Libya (Barker et al. 1996; Mattingly et al. 2006) and Egypt (Barich et al. 2014; Holdaway and Wendrich 2017). These are key themes in human-environmental dynamics throughout the Mediterranean (e.g., Barker et al. 2007; van der Leeuw 1998).

Projects in the tradition of multidisciplinary, intensive field survey have taken place across North Africa, including in Morocco in the Wadi Draa (Mattingly et al. 2018) and Loukkos Valley (Akkeraz et al. 2020); in Tunisia in the Segermes Valley (Dietz et al. 1995), on the island of Jerba (Fentress et al. 2009), and around the Roman city of Leptiminus (Stone et al. 2011); and in Libya (Barker et al. 1996, 2010). Important legacy datasets from older surveys have also been published, for example, around the major sites of Carthage in Tunisia (Sycamore and Buchanan 2016) and Jarma in Libya (Mattingly et al. 2003, 2013). New surveys around major sites that have been the long-term focus of excavations are also common in North Africa, for example, around the Greek and Roman cities of Cyrene and Leptis Magna (Munzi 2010; Saad et al. 2016; Schörle and Leitch 2010). Larger-scale projects have been undertaken as well, such as the *Rus Africum* project, carried out over 2000 km^2 in Algeria and Tunisia (de Vos Raaijmakers and Attoui 2013), and in the Setifian Plateau of Algeria, where work focused on the synthesis of mostly previously known sites in an area of c. 3500 km^2 (Merzoug et al. 2017).

As in other parts of the Mediterranean, comparing regional datasets is a key theme (Leone and Mattingly 2004; Stone 2004, 2020). Because of the relatively spotty coverage of

intensive surveys across North Africa as a whole, large-scale, synthetic projects on topics like neolithization, urbanization, and migration have to rely on settlement data drawn from a variety of sources of varying quality, which are only supplemented by systematic survey in certain cases (e.g., Hobson 2020). Nevertheless, such comparative projects have resulted in new syntheses of sedentarization and neolithization processes, which do not follow the relatively straightforward east-to-west pattern of the northern Mediterranean (Leppard 2021; Lucarini 2016); others have examined Punic, Greek, Roman, and Arab urbanization and state formation (Hobson 2020; Mattingly and Hitchner 1995; Stone 2004, 2020; Wilson 2020). Large-scale regional surveys and intensive microregional surveys have shown how North African landscapes were repeatedly transformed by successive episodes of urbanization linked to colonial or imperial interventions; at a smaller scale, the detailed documentation of floodwater farming systems has shown the opportunities and problems of cultivation in areas sensitive to overexploitation and landscape degradation on the fringes of the Sahara

A final matter of concern for survey projects across North Africa is cultural heritage management. Recent revolutions and conflict across the region have led to increased looting and unconstrained development in many places, leaving archaeological landscapes in considerable danger (Abdulkariem and Bennett 2014; Leone et al. 2020). In response, satellite imagery has been used to identify archaeological site degradation as part of the Endangered Archaeology of the Middle East and North Africa Project (Leone et al. 2020; Rayne et al. 2020).

Iberian Peninsula

Spanish and Portuguese academia were somewhat isolated from developments elsewhere in Europe during and to some extent after the Franco and Salazar dictatorships (González-Ruibal

2011; Ruíz Zapatero 2004). Theoretical and methodological discussions until the 1980s were minimal. Survey was considered secondary to the excavation of major sites and was restricted to site-based topographic surveys conducted by amateur archaeologists with the primary focus of locating sites. Although Portugal and Spain have similar trajectories (Díaz-Andreu 1997), in Spain the transfer of cultural heritage responsibilities to provincial governments during 1979–1983 prompted the creation of heritage catalogues, for which large-scale survey campaigns were necessary throughout the country (Ruíz Zapatero 1996). Although Portugal saw a similar attempt to decentralize archaeological management with the creation of regional archaeological services, these institutions were decommissioned in 1990 (Raposo 1993). Nevertheless, local archaeologists linked to city councils play the significant role of maintaining site catalogues linked to municipal boundaries, based on both formal survey and legacy data (e.g., Carneiro 2014).

Systematic approaches were implemented early on in Spain by Clark (1979) and in Portugal by Judice Gamito (1979). With the establishment of the Coloquios Internacionales de Arqueología Espacial (with meetings in both Spain and Portugal) and their publication in *Arqueología Espacial*, systematic survey became more widespread (García Sanjuán 2005; Mayoral-Herrera and Sevillano-Perea 2013).

Few foreign archaeologists have conducted surveys in Spain and Portugal, the best-known exceptions being the large-scale survey of the *Ager Tarraconensis* (Carreté et al. 1995) and the Ave Valley Survey in northern Portugal (Millett et al. 2000); the later Empordà survey used similar methods (Marzoli et al. 1998). The Iberian teams interested in developing survey methods started out from very different theoretical positions, interests, and needs than those of the Anglo-American intensive tradition.

Since 1997 many new surveys have begun in Spain as a result of municipal authorities' obligation to classify territory for urban planning purposes (Mayoral-Herrera and Sevillano-Perea 2013; Ruíz Zapatero 1996). A boom in construction resulted in the proliferation of developer-led archaeology in the 1990s and 2000s, and with the overwhelming volume of projects, heritage authorities had little control over quality or design (Cerdeño et al. 2005; Domínguez Alonso et al. 1994); survey methods and data were accordingly variable. Data collection usually focused on information to be included in site registers, and off-site material was typically ignored. The economic crisis halted this frenetic development and archaeological activity in 2008 in Spain (Parga-Dans 2010) and 2011–2012 in Portugal (Costa et al. 2014).

In the academic sphere, there is some consensus that intensive systematic survey is the more rigorous and perhaps more "correct" method of doing landscape-scale fieldwork (Ruíz Zapatero 1996, 2004). In practice, however, it remains restricted to a few specialized groups, while more traditional extensive surveys continue to grow in number. The survey standards established by the "new wave" of intensive surveys in the *POPULUS* volumes (Barker and Mattingly 1999–2000), and the recently published "guide to good practice" (Attema et al. 2020), are grounded in methodological innovations from Greece and Italy, promoted especially by foreign—particularly British and American—research institutions based in both countries. In contrast, Spain hosts only the French Casa de Velazquez and the Deutsches Archäologisches Institut in Madrid, whose research agendas have not typically included intensive pedestrian survey. Moreover, research and development grants from the Spanish Ministry of Science rarely provide more than minimal funding for survey, limiting types of projects to extensive work with smaller teams, or intensive work across a small area.

Most intensive surveys in the Iberian Peninsula are oriented around known sites, often as doctoral projects supervised by site directors. While the overall influence of intensive survey methodologies on Spanish and Portuguese archaeology remains slight (Mayoral-Herrera and Sevillano-Perea 2013), recent projects have focused on themes of interest elsewhere in the Mediterranean as well, such as the Iron Age-Roman transition and patterns of Roman colonialism (García-Sánchez and Cisneros 2013). Site-based surveys provide high-resolution views of the development of urban centers and their hinterlands, signaling varied pathways to community growth in pre-Roman times, followed by widespread patterns of landscape reorganization in the wake of Roman imperial occupation; these trends are often followed centuries later (in the medieval period) by agricultural expansion into landscapes that were not or could not be exploited in Roman times. At the same time, remote sensing surveys to document the presence and movement of Roman military camps provide new regional perspectives on a particular type of site that have promise elsewhere in the Mediterranean as well (Menéndez Blanco et al. 2020).

Certain French and Italian-derived research traditions have also been influential in the regional archaeologies of Portugal and Spain (Martínez Navarrete 1997–1998). French influence is visible in approaches to landscape derived from the Annales School and interdisciplinary archaeo-geographic studies, including *archéomorphologie*, *archéogéographie*, *archéologie agraire*, and *géographie rurale* (Martins and Carvalho 2010; Orejas 1991; Vicent 1991). Archaeomorphology, in particular, has witnessed a revival in the last 15 years, providing detailed studies of the origin and development of landscape macrostructures: roads, field systems, water distribution, drainage systems, and settlements (Carvalho 2012; Orengo and Palet 2016; Palet and Orengo 2011). French work in the Alps (Leveau 2004) and the Pyrenees (Rendu 2003) has

influenced several research groups in northern Spain specialized in these specific environments (Gassiot et al. 2016; Orengo et al. 2014). Together, these projects have demonstrated not only that mountain passes formed key components of supra-regional networks but also that long periods of continuous and seasonal occupation are linked to herding and domestic activities at altitudes typically thought to be unsuitable for human settlements.

Finally, the rich Iberian Palaeolithic record has generated interest (comparable to that in the Balkans) in environmentally targeted surveys, which have revealed new evidence for the extent and type of Palaeolithic occupation. Work on modern human settlement before and during the Last Glacial Maximum has been particularly successful in illustrating long-term settlement dynamism in the Pleistocene (Burke et al. 2021).

France

France is an outlier in terms of fieldwork traditions and disciplinary history. This can be attributed to intellectual traditions, the size and ecological diversity of France (see Fig. 1), and the current dominance of a single national institution—the *Institut National de Recherches Archéologiques Préventives* (INRAP)—in the practice of archaeological prospection.

Academic archaeology in France, particularly in relation to territorial, spatial or landscape approaches, has always been somewhat independent from foreign intellectual trends and linked closely to geography. Vidal de la Blache (1922) engendered interest in rurality, complemented by the *Annales* school (Bloch 1931; Dion 1934) and French historical geography (Gentelle 1995; Robert 2017). Long-term rural agrarian landscapes were in vogue in the 1970s and 1980s (e.g., Chevallier 1976; Clavel-Lévêque 1983; Leveau 1970). Since the 1980s most landscape archaeologists in France have made extensive use of aerial photography, cartography,

and written documentation, complemented by data from catalogued and excavated sites (Bazzana and Humbert 1983). Several French academics have implemented systematic survey campaigns in their research, especially in the context of the POPULUS project (Leveau et al. 1999; Pasquinucci and Trément 2000; Trément 2011). Even in these cases, however, intensive pedestrian survey was never a major component.

Although conferences on survey archaeology have taken place since 1982, discussions of survey methods have rarely appeared outside select academic circles (Ferdière and Rialland 1994; Février and Leveau 1982). Ferdière (1998) adopts a wide definition of pedestrian survey, covering test pitting, trench excavation, topographic survey, low-altitude aerial survey, photographic and cartographic interpretation, geophysical prospection, and soil survey of phosphate levels.

Since 2001 INRAP has retained responsibility for enacting archaeological evaluation for heritage management purposes and fulfills a large part of archaeological contracts in France itself (Depaepe 2016). While INRAP focuses on geophysical and lidar investigation (INRAP 2021), there is little interest in off-site data and its potential for the discovery of smaller sites.

The Mediterranean landscapes most conducive to side-by-side fieldwalking are only along the southern French coast, with which INRAP has only marginally engaged. Most examples of Mediterranean-style survey are restricted to academic experimentation (e.g., Bermond and Pellecuer 1997; Parodi et al. 1987; Raynaud 1989; Trément 2000). In the more common rescue archaeology and large public development projects, archaeomorphological approaches (involving aerial and satellite imagery and historical cartography), site catalogues, and soil studies are precursors to trench excavation (e.g., Bats et al. 2000; Chouquer 1996); pedestrian survey is typically limited to extensive prospection. France therefore represents a

potential growth area, where intensive pedestrian methods applied elsewhere in the Mediterranean might be deployed to achieve similar types of results concerning the long-term development of specific landscapes and larger patterns of shifting urban-rural dynamics in the face of larger-scale historical processes (neolithization, Greco-Roman colonization, medieval polity and territoriality, and modernization).

Pan-Mediterranean Issues and Global Perspectives on Regional Archaeology

Research Design, Sampling Strategies, and Coverage

Decisions concerning project area, fieldwalking coverage, the sweep width and distance between transects for individual field walkers, and artifact collection strategies all affect the results of archaeological surveys. Landscape type, vegetation, and fieldwork conditions (such as time of year) affect visibility, which must also be considered in survey design and sampling decisions, as do budgets, permits, and the research scope of a project. For example, some Mesoamerican surveys aim to document house mounds or architectural remains; many Mediterranean surveys document sites based on artifact scatters; shovel-test-pit surveys in parts of North America may be deployed in response to total lack of visible surface remains. The observable surface record therefore dictates certain methodological needs and choices. Hierarchical approaches to sampling and coverage are often adopted, with different strategies defined and applied for landscape, site, and feature-based documentation (e.g., Banning 2002; Banning et al. 2011). A longstanding issue with Americanist approaches to "full-coverage" survey is the implication that any project can *fully* cover a landscape (Cowgill 1990; Plog 1990; Tartaron 2008, p. 91). While it must be acknowledged that the "full-coverage" school emerged as a reaction to often over-wrought approaches to sampling (Fish and Kowalewski 1990; Kowalewski 2008), the decline in explicit

discussion of sampling in survey literature globally is concerning (Banning 2021). Defining sampling constraints and strategies in publication is an essential step in data interpretation, both for individual projects and for other researchers seeking to make use of the data collected.

While we do not seek to prescribe a single school of methodological thought, for example, concerning site-based or "siteless" surveys, we argue that good practice necessarily involves defining what that practice is, and that sampling—defining the *population* of the object of study (sites, artifacts, etc.), the *universe* (landscape, region, site) in which this population exists, and the *sample* being studied (counted, measured, dated, etc.)—is an element of research design that requires a high degree of specificity. We are also concerned that the embrace of particular "types" of survey methods can lead to research designs that take the issue of sampling for granted, based on the application of a particular toolkit, at the expense of answering historical or anthropological questions about past human behavior.

Coverage can be defined in both chronological and spatial terms. Mediterranean survey offers key contributions. The first is in the diachronic scope that characterizes many Mediterranean surveys, born of the truism that surveyors do not control what they find and are likely to find sites and artifacts of many different periods while conducting a systematic survey. The goal, then, should be detailed documentation and study of all periods as an explicit aim. While a diachronic scope is by no means universal, and there are sometimes good reasons for focusing on a particular period or periods, this principle of research design has wide applicability beyond the Mediterranean.

The second concerns spatial coverage, which refers to the sample of the survey universe that is inspected and *how* that sample is inspected. Mediterranean surveys typically cover relatively small areas or microregions intensively, or larger regions intensively or through

sampling (Online Resource 12). Based on available data in our consolidated database of Mediterranean survey projects, the median project size was about 50 km^2. This varied somewhat by country (Fig. 2 and 3a; Online Resource 5a and 6a). By contrast, Mesoamerican project areas are often hundreds or even thousands of square kilometers, though smaller projects on the order of 20 or 50 km^2 exist as well (Balkansky 2006). While some projects may cover very large areas—in the Mediterranean and elsewhere—they do so at the expense of detail and often ignore off-site data. This is a methodological trade-off, of course. Whatever choices people make about project area, methods, and coverage, they should be explicitly discussed and justified in publication, so that other researchers know exactly how data were collected. This methodological transparency is necessary for detailed comparison and interpretation of survey datasets.

One of the main criticisms of Mediterranean survey projects is that they are too small to examine truly regional settlement patterns. If, however, the Mediterranean comprises mosaicked microecologies (e.g., Horden and Purcell 2000), and a broader regional archaeological record exists for most areas through a combination of topographic studies, gazetteers, and site inventories of heritage managers, it seems that microregional or "landscape-level" data collection is indeed an appropriate scale of analysis for most new fieldwork.

Chronological and Behavioral Bias in the Interpretation of Surface Assemblages

The interpretation of the surface artifact record has been a key issue for Mediterranean survey archaeology from the earliest systematic, quantitative surveys. Artifact scatters from small sites have illuminated the "busy countryside" of many parts of the Mediterranean world (Pettegrew 2007). Survey has been less effective at tackling the wider distribution and significance of "busy" versus "empty" regions. Since the days of the POPULUS project (Barker and Mattingly

1999–2000), site formation processes and landscape taphonomy have been important considerations for how ground cover, slope, soil composition, and soil loss affect the density and representation of surface assemblages (e.g., Bevan and Conolly 2009; Tetford et al. 2018). The combination of geomorphological study and spatial modeling deployed in the Mediterranean contexts holds much promise elsewhere as well, especially for the interpretation of artifact-rich landscapes. Even for projects that take the identification of sites for granted, much more detailed and significant information can be extracted from surface assemblages by giving due consideration to site formation processes.

Fine-grained urban survey has revealed the tremendous amount of information that can be gained from surface investigations alone, even at long-known sites (e.g., Alcock 1991; Bintliff et al. 2017; Vermeulen et al. 2012). Many projects have noted the "haloes" of higher artifact densities that surround many sites, around which entire bibliographies have formed to explain them variously as manuring, rubbish disposal, small-scale occupation, and natural and anthropogenic landscape taphonomy (e.g., Alcock et al. 1994; Attema et al. 2020, pp. 13–19; Forbes 2013; Mayoral-Herrera et al. 2018; Pettegrew 2001; Wilkinson 1989).

The intensive methods of Mediterranean survey often result in large artifact collections, both from sites and across the landscape. These artifact collections typically have a high degree of spatial resolution, which has allowed patterns to be tracked across a landscape or a site for a variety of periods. Many surveys have noted significant variability in artifact quantities across space and time, which has invited a series of questions concerning the human, material, and environmental factors that influence this observed variation; this was particularly highlighted in the "chronotype" systems of artifact analysis developed in Greece and Cyprus in the 1990s and 2000s (Pettegrew 2010; Winther-Jacobsen 2010). This system provides a flexible set of

chronological and typological designations for ceramic artifacts, acknowledging also uncertainty inherent in pottery identification (i.e., some sherds will be identifiable only in general terms [Roman transport vessel], while others can be identified very specifically [Late Roman Amphora 2]) (Caraher et al. 2020b; Cloke et al., in press). The well-developed ceramic chronologies and approaches to artifact study in the Mediterranean raises other questions. For example, does the abundance of sherds (and sites) from the Late Roman period signal population growth, a boom in a particular type of material consumption (Late Roman amphorae), or the capacity of archaeologists to better recognize (and therefore record) the highly distinctive wares associated with this period? Other sets of questions concern potentially underrepresented categories of material culture, "missing" periods, or "hidden" landscapes, in which some periods are not as well represented on the surface as others, for a variety of reasons: material culture production and consumption (not using materials that preserve well); artifact preservation (poorly fired ceramics may be eroded and less diagnostic); or that material from deeper strata is simply less likely to percolate to the surface (Barker et al. 2000; Bintliff et al. 1999; Davis 2004; Rutter 1983). Periods that have received less scholarly attention in general are also underrepresented in survey publications. For example, the seventh to eleventh centuries—ironically, both BC and AD— present specific challenges in Greece and the eastern Mediterranean, due to poor understanding of overlap, start dates, and end dates in stylistic chronologies (Athanassopoulos 2020; Stissi 2011).

In deeper prehistory, Pleistocene landscape change is particularly significant for Mediterranean archaeology, owing to the vast amount of coastline, climatic instability, and geographic fragmentation. In the Aegean, for example, recent surveys have revealed new evidence of Pleistocene occupation in the islands (e.g., Carter et al. 2019; Strasser et al. 2010).

These discoveries must be contextualized by acknowledgment that the length of sea crossings to reach these islands would have been either severely reduced or nonexistent for much of the Pleistocene (Cherry and Leppard 2018; Lykousis 2009). The larger issue, relevant throughout the Mediterranean, is that huge parts of the Pleistocene world are simply lost to archaeological research, and that these coasts, plains, and corridors—now under water—would have been particularly favorable landscapes for Paleolithic (and Mesolithic) occupation and use. This accessibility bias certainly obtains in other parts of the world as well, especially in coastal areas known to be significant for Pleistocene and early Holocene human migrations (e.g., in the initial peopling of the Americas).

The vast majority of material derived from Mediterranean surveys is from the Holocene, even among diachronic projects. As discussed above, this has to do especially with the long-standing interest in plow-zone archaeology and the protohistoric and historical agricultural societies that tend to be best represented in it. Communities and groups not practicing sedentary, agricultural lifeways are much less likely to leave widespread or easily detectable surface signatures. Archaeologies of pastoralism represent a particular growth area (Arbuckle and Hammer 2019), as do surveys of marginal landscapes that are not explicitly focused on habitation (Knodell et al. 2020).

Landscape Archaeology as Long-Term History

Human Ecology, Demography, and Economy

Mediterranean survey archaeologists have a long history of collaboration with geomorphologists and other environmental scientists (e.g., Ghilardi 2016; Jameson et al. 1994; Weninger et al. 2009). The Mediterranean offers an interesting case where the environmental response to global

climatic events is likely to be highly variable and localized (e.g., McCormick et al. 2012); nevertheless, periods of climatic instability decidedly impacted human societies, even if in locally specific fashions. The microscale of much Mediterranean survey has the potential to document these parallel processes in some detail, but it requires more even (and comparative) application of paleoenvironmental research alongside finds-based study. Multisite studies, such as a recent dating project for terrace/earthworks across the Mediterranean (Turner et al. 2021), or classification of environments using multisource remote sensing data, offer alternative means of understanding economic development and human environmental impacts in rural contexts where surface finds may be few.

Equally relevant are processes involving sociotechnological or population change that have resulted in reconstituted relationships between human societies and their environments. In such cases issues of sustainability come to the fore, especially with respect to dynamic coastal environments that have been subject to sudden influxes of population, for example, in cases of island colonization and abandonment, the adoption of agricultural regimes (both agrarian and transhumant pastoralism), and large-scale, sometimes pan-Mediterranean, demic flows (e.g., Bevan and Conolly 2013; Leppard et al. 2020; Plekhov et al. 2021). Microregional studies of Mediterranean landscapes are well suited to contribute to these themes by highlighting areas that do not fit top-down models.

This leads us to the wider issue of settlement pattern studies and their relationship to demography and economy. Accepting that demographic and economic patterning is linked at very large scales (e.g., Shennan and Sear 2020), this patterning is likely to be integral to modeling trajectories of social change—in particular, the transition from small-scale to large-scale societies. As we have seen, Mediterranean survey archaeology excels at revealing the ebb

and flow of settlement at very high spatial and chronological resolution and, as a result, is a powerful tool for addressing demographic and economic change. For example, survey in the Knossos Valley has shown that the rapid growth in the size of the central site during the Middle Bronze Age was accompanied by the disappearance of smaller satellite sites (Manning 2018; Whitelaw 2012). This type of nucleation—driving urbanization and synchronous with state emergence—has global parallels (Fletcher 1986), but so far the potential for pan-Mediterranean testing of such patterns has been underrealized.

There are also demographic concerns of broader historical and anthropological interest. Absolute population size is related to economic integration and social stratification (Bintliff 2020; Chamberlain 2006). Yet we should resist the urge simply to equate growing numbers of sites with growing populations and to attach discrete values to certain types of "site"—that is, we should be skeptical of approaches to complex data that move directly from site numbers or sizes to population when the data were collected in different ways by different projects employing different definitions of a site (e.g., Bresson 2016, p. 59). Issues of coverage, sampling, and different modes of measurement make such models speculative at best, an issue further complicated in cross-project comparisons or studies seeking to integrate datasets (Osborne 2004). This does not mean that demographic modeling should not be undertaken, but it does mean that critical approaches to models, their underlying data, and the means by which the data were collected are all the more necessary.

One recent approach considers long-term population trends in the context of a single region, in relation to carrying capacity (Whitelaw 2019). The integration of settlement data derived from archaeological surveys with other proxies for settlement—summed probability densities of archaeological radiocarbon dates and cluster-based analysis of published pollen core

assemblages—represents another way forward, as seen in a recent special issue of *Holocene*, which presented large-scale analyses of proxies for land cover, demography, and environmental change in Morocco, Iberia, southern France, Italy, Greece, Anatolia, and the Levant (Bevan et al. 2019). Two other recently published papers (Palmisano et al. 2021; Parkinson et al. 2021) use aggregated radiocarbon dates to show marked variation in regional responses to climatic shifts across the central Mediterranean from the beginning of the Holocene to the Early Iron Age, after a widespread period of growth at the advent of the Neolithic.

Large-Scale Processes in Regional Contexts

Much Mediterranean scholarship orbits around a series of large-scale, basin-wide transformations: neolithization (the transition to agropastoral economies); urbanization (settlement nucleation and attendant processes, including state formation); colonialism (most notably during the Iron Age integration of Mediterranean economic structures); and imperialism (the emergence of large Iron Age and subsequent polities). Rome, classical city-states, Hellenistic kingdoms, Carthage, and Byzantium stand out especially (Bowman and Wilson 2011). These diverse processes were nonetheless all accompanied by changes in behavior and consequently material culture to which systematic intensive survey should be highly sensitive. Unsurprisingly, survey archaeologists have been concerned with many of these processes. Urbanization and the emergence of state-type forms of social organization have been of major interest (especially the expansion of the Roman polity). This has resulted in compelling local and regional syntheses, which provide a generally strong grasp of localized state formation in, for example, the Bronze Age Peloponnese and Minoan Crete (Cherry and Davis 2001; Wright

2004), as well as larger-scale processes of how the expansion of the Roman state transformed Mediterranean settlement (de Ligt and Bintliff 2020).

However, the Mediterranean basin challenges simple or unidimensional models of state formation. Substantial attention has been paid to the eastern Mediterranean, and specifically the Aegean, where settlements in the multi-tens of hectares with evidence for formalized governance, heterogenous institutions, and a degree of economic coordination, all reflected in scripts, are evident from c. 2000 BC (Parkinson and Galaty 2007). Intensive pedestrian survey in the hinterlands of these sites has revealed diverse pathways to superficially comparable outcomes. On Crete, the centralization of population at Knossos (c. 2000 BC) appears to have involved a regional demographic implosion (Whitelaw 2012, 2019), a fusion process that recalls urban dynamics in other parts of the world (Fletcher 1986). This is not evident in, for example, Messenia at around 1300 BC, where state formation may have involved integration of established, preexisting settlement hierarchies with degrees of economic decentralization (Cosmopoulos 2019; Parkinson and Cherry 2010). The situations in the contemporary Corinthia or Argolid, to the extent that survey data can be generated at the chronological resolution necessary to delineate fine-grained political processes, differ again (Cherry and Davis 2001; Pullen and Tartaron 2007). In this relatively small region of the Mediterranean, projects with broadly comparable methodologies have collated data that suggest multiple routes to "statehood"—thereby hinting that categorization of this type may more broadly obscure meaningful variation. Elsewhere in the Mediterranean (Iberia, for example), debates about statehood are less closely tied to plow-zone archaeology (e.g., Lull and Risch 1995), and in other parts of the basin and other survey traditions the topic is conspicuous by its absence.

The emergence of states is sometimes associated with nascent urbanization (e.g., Yoffee 2005). In much of the Mediterranean beyond the Aegean and the Levantine coast, however, these issues are not conflated, in part because the data themselves suggest a separation between urbanizing processes and apparent state formation. This is not necessarily true on the Tyrrhenian coast of the Italian peninsula, where—setting aside an implanted Greek urban tradition in the south—the appearance of indigenous polities with arguably state-like characteristics is accompanied by the emergence of densely populated urban cores associated with the exercise of political power through institutions, a process that can be reliably traced through survey (e.g., Barker and Rasmussen 1988; Patterson et al. 2020). Elsewhere in the western Mediterranean, including in the Iberian interior and the Apennines, local Iron Age traditions of nucleated settlement (the *oppida* phenomenon, also traceable through fieldwalking) elude categorization in both state/nonstate and urban/nonurban frameworks—pre-Roman Samnium, for example. Frequently in these contexts the focus is less on trajectories toward increased social complexity and/or settlement nucleation, and more on how external traditions of urbanism (Greek, Phoenician, Punic, Roman) intersect with local patterns. In part as a result, the operation or internal dynamics of established urban systems is often the focus of survey, rather than the emergence of settlement nucleation and settlement hierarchies themselves (e.g., Johnson and Millett 2013).

This consideration of urban traditions leads to a further question with substantial traction in global archaeologies: the establishment and operation of empire, although in the Mediterranean one instance bestrides the narrow world like a colossus. Diachronic survey projects are unavoidably concerned in part with the material evidence for the expansion, operation, and decay of the Roman Empire. This is to some degree because of the size of this

polity; all the surveys catalogued here, with at most three exceptions, fall within the boundaries of the empire at its maximum extent.

The type and scale of craft production in integrated imperial economies drove a material output that obscures the record of pedestrian survey two millennia later. Put simply, hard-fired, often visually conspicuous Roman fabrics (e.g., *terra sigillata*, African red slip, combed wares), or bulky Roman transport vessels, all produced and moved in unprecedented quantities (Murphy and Poblome 2017; Vernhet 1981), are hard to avoid in Mediterranean survey. This need not be because prehistoric or pre-state material is "hidden" (see Davis 2004), but because of the higher rate of discovery of wares of this type in the plow zone, and the increased survivability of diagnostics. This discrepancy in diagnosticity creates both problems and opportunities, in that much of the most significant, explicitly comparative work in Mediterranean survey is often structured around the organization of Roman rural landscapes (Alcock 1993; de Haas and Tol 2017), in a manner that would be unimaginable for addressing, for example, Mediterranean-wide patterns in fourth, or even second, millennium BC settlement ecology.

The Mediterranean basin has witnessed highly divergent patterns of social and economic change (especially during the third and second millennia BC), as well as lengthy periods of sustained social and economic integration, most obviously under Roman, Byzantine, Arab, and Ottoman megapolities. However, the comparative paucity of synthesis of these processes at a basin-wide scale based on survey data is striking. For example, elite institutions and ideologies become more archaeologically visible between 2000 and 1000 BC in the southern Aegean, northern Italy, parts of the circum-Tyrrhenian, and southern Iberia, yet in ways that seem very different (Broodbank 2013). How can we account for this difference in terms of varying

processes of urbanization versus ruralization, hinterland demographics, and the emergence or absence of specialization in rural settlement?

Survey archaeology has long been concerned with the emergence of urban and/or "complex" societies, especially in southwest Asia, central America, and south Asia (Kowalewski 2008, 2020). As such, the relative absence of interest on the part of some Mediterranean survey archaeologists in approaches to these processes elsewhere in the world is unfortunate, especially considering the cross-cultural capacity to enrich comparative studies with large datasets that also involve documentary records. This observation is hardly novel (Renfrew 1980). Rather than offering up our datasets to the rest of the world, we suggest that Mediterranean archaeologists should themselves engage in comparative projects and writing also for anthropological audiences (e.g., Englehardt and Nagle 2011; Knodell 2021; Parkinson and Galaty 2007).

Multi-temporality, Symbiosis, and Public Archaeology

A final point of concern for the long-term interests of Mediterranean survey is the complex set of temporal and symbiotic interactions that have been the subject of much innovative interpretative work in Mediterranean landscape archaeology. Recent work by Given (2013, 2017) draws on survey data from Cyprus, accumulated over the course of 13 years, to examine a series of people-nature-thing co-constitutive interactions as the basis of a tripartite theory of commotion (movement), collaboration (co-creation), and conviviality (engagement with the liveliness of the world).

Another vein of work emphasizes the multitemporality, rather than the diachronicity, of landscape. Palimpsest has long been a metaphor for archaeological landscapes, which are written, erased, and rewritten by a variety of natural, human, and hybrid interventions and

processes (Bailey 2007). Multitemporal perspectives point to surface assemblages as messy concatenations of materials from multiple periods, which together comprise a particular time of archaeological encounter with place (Witmore 2020). Such an approach might dovetail with cultural heritage paradigms, such as historic landscape characterization (Crow and Turner 2009).

We also highlight the need for contemporary perspectives. Building inroads between academic archaeology and cultural heritage management is an obvious starting point, as seen in recent work in North Africa and the Middle East (e.g., Leone et al. 2020). Recent work has also emphasized the effects of industrial pasts on present landscapes, for example, at Wadi Faynan, Jordan, or Rio Tinto, Spain (Barker et al. 2007; Pardo Abad 2017). At the same time, archaeologists must consider the real-world impacts of their work—both positive and negative—on local populations, especially in areas that have been overwhelmingly valued for their archaeological remains (Mickel and Knodell 2015). While US federal funding agencies have long made articulating "broader impacts" a necessary part of funding requests, levels of engagement with local communities vary widely, from very little, to consultation about archaeological remains and local history, to archaeologically interested ethnography, to ethnography for its own sake (Hamilakis 2011). While formal ethnography was employed in only about a quarter of projects responding to our SoMS (Online Resource 4b), we suggest that explicit engagement with the contemporary landscape and communities living within it is an important way forward for survey projects, both in the Mediterranean and elsewhere.

New Directions

We are currently in a phase of regional studies defined by the proliferation of spatial, remote sensing, and database technologies, whose increasing resolution, availability, and accessibility

have fundamentally changed the way regional-scale research is done (Knodell and Leppard 2018, p. 6; see also Gillings et al. 2020; McCoy and Ladefoged 2009). We wonder, however, if the sophistication of regional-scale research questions has kept pace with such technological developments (Leppard and Knodell 2018, pp. 330–331).

Remote Sensing and Spatial Analysis

The last two decades have seen remarkable growth in archaeological applications of remote sensing (Agapiou and Lysandrou 2015; Opitz and Cowley 2013; Opitz and Herrmann 2018; Casana 2021). Mediterranean applications have been especially effective in the satellite-based detection of looting at archaeological sites in Egypt, Libya, Syria, and Cyprus (Agapiou and Lysandrou 2016; Casana 2021; Parcak et al. 2016; Rayne et al. 2020). Methods of multispectral imagery classification and aerial photography interpretation have been used more in the Middle East, North Africa, and Asia than in Mediterranean Europe (Hritz 2014; Lawrence et al. 2020; though see Agapiou and Lysandrou 2015 and examples below). This probably represents a lost opportunity, and applications of predictive modeling and automated site detection have utility not only for identifying previously unknown remains but also for pedestrian survey design (e.g., Casana 2014; Plekhov et al. 2020). Vegetation classification in multispectral imagery has not been widely used in site detection, despite its success elsewhere (e.g., McKinnon and Haley 2017). At the same time, both commercial and publicly available satellite imagery and aerial photography have become standard tools for basic prospection and identifying areas of interest.

Recent experiments with crowd sourcing imagery analysis from an interested public are promising and growing ever more sophisticated, most notably with the GlobalXplorer^{o} project (Parcak 2019). Such projects face a number of practical and conceptual challenges, ranging from

false positive identifications by nonexperts to ethical questions about remote interventions in local landscapes, and they have yet to demonstrate significant contributions to wider regional and macroregional research questions (Casana 2021; VanValkenburgh and Dufton 2020, pp. S3–4). Nevertheless, regional archaeologists and heritage managers should take note.

Unmanned aerial vehicles (drones) have become ubiquitous in archaeological fieldwork. While drones are an obvious boon for producing aerial images of sites in their landscape context, the true innovations of drone use in archaeology lie in a variety of more sophisticated applications, especially machine learning and 3D photogrammetric recording of monuments, sites, and landscapes, with some study areas ranging up to 10 km^2 (Campana 2017; Orengo and Knappett 2018). In addition to creating models that can be viewed from multiple angles, drone photography can be used to construct high-definition digital elevation models, which can then be used in a variety of spatial analyses. Plummeting equipment costs and increasing software capabilities have made drones more economical, efficient, and accurate (Hill 2019). In addition to basic photography and photogrammetric applications, higher-end drones can now be outfitted with multispectral, near-infrared, thermal, or lidar sensors (e.g., Hill et al. 2020; Ronchi et al. 2020).

Aerial laser scanning using lidar (light detection and ranging) is underexploited in Mediterranean research. Examples of site-level lidar mapping using both planes and drones have been illuminating, but a regional scope has much greater potential. While whole previously unknown cities are unlikely to be revealed, as in the jungle environments of the Maya Lowlands (Canuto et al. 2018), systems of settlement and agriculture that are obscured by vegetation and other landcover are still quite likely to be apparent, as seen in recent work on feature detection in maquis or otherwise thickly vegetated landscapes in Lebanon (Rom et al. 2020), at Kolophon in

Turkey (Grammer et al. 2017), in Spain (Belarte et al. 2019), and in southern Italy (Masini et al. 2018). Mediterranean applications thus far have shown, at a minimum, significant "added value" in detecting microrelief signatures of paleofeatures, even in currently active field systems (Grau Mira 2017; Poirier et al. 2013). What is more, lidar provides an efficient and spatially accurate method of recording at the level of the site, although for site-level recording in less heavily vegetated areas, aerial photogrammetry provides a more cost-effective solution (Vilbig et al. 2020). As lidar becomes more widely available, and in some cases publicly accessible (e.g., García Sánchez 2018), we expect its use to become more widespread and automated forms of machine-learning analysis to continue to develop beyond the level of basic image interpretation (still the most common form of lidar analysis).

Machine learning and artificial intelligence have an increasing role to play in processing datasets derived from various digital sensors. Significant examples concern deep-learning algorithms, which have been used in Thessaly to extract archaeological features from historical satellite imagery and maps (Orengo et al. 2015, 2020). A recent experiment using high-resolution drone imagery to detect and quantify surface ceramics holds promise, and ongoing work is addressing issues of dating such assemblages, scalability, and computing time (Orengo et al. 2021).

A final frontier of regional research is maritime contexts. Interests in harbor archaeology, maritime networks, and underwater survey have grown exponentially, and archaeological survey can no longer be seen as exclusively terrestrial or pedestrian (O'Shea 2021). Remote underwater vehicles are opening new vistas, especially in the anoxic environments of the Black Sea (Drap et al. 2015; Pacheco-Ruiz et al. 2019). As more research is synthesized and more systematic work

is being done, it is clear that this represents a major development for regional studies in the Mediterranean, one of the world's most dynamic maritime theaters (e.g., Leidwanger 2020).

Data and Publication in the Digital Age

There is theoretically far more data available to archaeologists than anyone yet knows what to do with (Bevan 2015; VanValkenburgh and Dufton 2020). With respect to Mediterranean survey, however, the early optimism for digital publication (e.g., Alcock and Cherry 2004) has faded; few projects have published their entire datasets in a truly open form, and raw data remain difficult to access (Strupler and Wilkinson 2017). Besides accessibility, this is also partly due to the idiosyncrasy of complex Mediterranean survey datasets, since database integration requires common parameters that are often absent or differ in crucial dimensions. Even if certain standard methods of recording and data organization were uniformly adopted today, this does not solve the problem of divergent legacy datasets. Combining large and diverse datasets, collected from a variety of sources and types of fieldwork, is far from straightforward, and most successful examples involve something closer to the creation of an entirely new dataset (and data structures) than a clean merge. Several Mediterranean examples are highlighted above, but we would also point to good examples of integrating datasets to address macroregional processes of migration, demographic upheaval, and sociopolitical change in the southwestern and southeastern United States (Hally and Chamblee 2019; Mills et al. 2015) and from Mesoamerica (e.g., Blanton et al. 1999).

Ambitions to publish online are high among surveyors (Online Resource 8c). Recent calls for FAIR standards (to produce data that is findable, accessible, interoperable, and reusable) in documentation and good practices in survey design are an important consideration in this regard

(Attema et al. 2020; Banning et al. 2017; de Haas and van Leusen 2020). There are also other simple solutions, for example, making database and recording templates easily available and accessible to new projects or publishing detailed descriptions of recording strategies. Fortunately, moves toward linked open data and reflexive methodology are gaining momentum, though they remain entirely dependent on the initiatives of individual projects, most of which were "born digital" (Online Resource 8c; see also, e.g., Caraher et al. 2020a).

Regarding more traditional forms of publication, there is a pervasive lag between fieldwork and dissemination. In our SoMS, while 59% of the submitted projects said that they had completed their fieldwork, only 27% had completed study and publication. Many "first generation" or "new wave" survey projects that began in the 1980s are only now reaching full publication, with many volumes still expected (e.g., Athanassopoulos 2016; Bintliff et al. 2007, 2017). While these projects are well represented by dozens of interim publications, this begs the question of what is "full" or "final" publication and what is the best way to do it? If Mediterranean survey datasets are so complex that they require decades to bring to publication, it may be useful to reexamine fieldwork goals, publication priorities, and what happens in between.

Conclusions

The Mediterranean littoral covers only a fraction of the surface of the planet. Yet through a combination of factors—longevity of agricultural societies, early urbanization, population size—the surface material signature of Mediterranean settlement is prodigious. Intensive agricultural activity over the last century and the relatively sparse ground cover provided by Mediterranean flora render this enormous body of material culture relatively accessible to pedestrian observation. Further factors, including the tight chronological grasp that Mediterranean

archaeologists have on different material types and the relative cost-effectiveness of plow-zone observation, have driven the expansion of survey archaeology in the Mediterranean since the 1960s. This research, undertaken with a great deal of methodological variety, has produced enormous quantities of data, much of it now published.

Mediterranean survey archaeology is extremely diverse. Different scholars, working in different countries and traditions and possessed of different goals, have not necessarily oriented their research around common problems. For example, the issue of the mechanisms that drive the development of social complexity and/or states, a major scholarly preoccupation in Americanist archaeology (e.g., Sabloff and Sabloff 2018), has not exercised the same hold over much of Mediterranean survey archaeology, except that part of it connected to Americanist and more generally Anglophone traditions. With that said, we recognize that much survey archaeology globally has been concerned with problems of this type—delineating trajectories in political evolution at regional scales and attempting to understand demographic and economic transformations that both drive and reflect this evolution.

So what have we learned from the hundreds of thousands (perhaps millions) of person hours dedicated to Mediterranean survey archaeology, in terms of the major animating questions of anthropological archaeology? For one thing, the dense and chronologically refined record of the Mediterranean plow zone allows us to trace processes of political and economic coagulation at very tight resolution, but this reveals startling variation in—notably but not only—primary and secondary state formation. Indeed, a conceptual shift away from elite architectures and rigid categories of settlement hierarchies—and toward the long-term dynamics that can be observed in the hinterlands of developing polities—underscores this variation. Furthermore, an increased holistic understanding of polities, to which survey has contributed substantially, has complicated

the notion of the Mediterranean city, in terms of definitions but also in terms of scale. For example, Antigori, a Late Bronze Age Sardinian center and agglomeration of political power clearly plugged into broader trade routes, falls outside definitions of urbanism (and also statehood); whereas tiny classical Karthaia, controlling slightly less than one quarter of the small island of Kea, can be considered both "urban" and a "state." If we are interested in relative degrees of social and economic power, then this sort of categorization cannot be considered along strictly linear scales. In one sense, then, a major lesson of Mediterranean survey archaeology is that some otherwise compelling questions require contextual nuancing as they are translated across regions and between research traditions.

As regional datasets become more detailed, we see increasing opportunities for comparative studies of regional processes of colonialism, imperialism, human ecology, demography, urbanism, and more, both within the Mediterranean and beyond. Survey has the additional advantage that it is comparatively unobtrusive (unlike excavation), and increasingly automated technologies have only enhanced capacities while lowering impacts and costs. Systematic pedestrian survey remains a (perhaps the) key method for investigating past Mediterranean landscapes, both for its groundedness and for its ability to integrate innovations into its methodological toolkit.

At the same time, there are clearly things that archaeological surveys in the Mediterranean could be doing better. While we do not advocate for methodological prescriptivism, we do believe that *methodological transparency* is paramount to good practice in fieldwork and publication. Clarity of both research goals and research methods are important and not always evident in the published literature (this is equally true of other regional traditions). Our review has shown that there remain disciplinary islands and practical variations in research

approaches that could benefit considerably from cross-disciplinary dialogue: surveyors working in all parts of the Mediterranean would do well to free themselves from strict methodological dogma, where it exists, and attempt to learn from both the methods and questions of regional studies and landscape archaeology as practiced elsewhere.

In this review, we also have shown a clear bias toward particular historical periods of the Holocene in Mediterranean survey datasets. This should not come as a surprise to specialists. While we cannot control preservation bias and diagnosticity, there is certainly more work to be done in recovering and interpreting information about underrepresented periods, mostly prehistoric. For example, various surveys in Greece, Albania, and Spain have shown that targeted approaches to Pleistocene landscapes have been highly effective at recovering material evidence from this broadest period of human history (Burke et al. 2021; Olszewski et al. 2005; Runnels 1988; Runnels et al. 2004; Strasser 2010; Thompson et al. 2018). At the same time, both intensive fieldwalking or site-based surveys may miss this evidence, based on their tendency to target plow zones and other landscapes of interest to primarily agricultural societies. Nevertheless, areas of overlap for intensive Pleistocene and Holocene activity have been documented, for example, in the hinterland of Petra, Jordan, or in the Western Desert of Egypt (Kleindienst 2020; Knodell et al. 2017a; Rowland and Tassie 2014). Recognition of paleolithic evidence is a potential problem, however, since the identification of lithic artifacts, especially of certain materials and periods, cannot be assumed among nonspecialist field walkers (or even many trained archaeologists of historical periods) (Holcomb et al. 2020). While obsidian blades are clear enough, how many surveyors are trained to recognize quartzite Mesolithic microliths as artifacts? Mediterranean archaeologists need to continue to develop (and apply more widely) specific sets of methods for investigating prehistoric landscapes and account for the fact that

surviving remains must also be interpreted differently than more recent assemblages. And we would all benefit from resources to aid both novice and professional surveyors in the basic identification of difficult-to-recognize types of material culture. Along with broad methodological transparency, the digital publication of field lab manuals represents a promising way forward (e.g., Caraher et al. 2020a).

Finally, while the raw labor invested in archaeological regional studies in the Mediterranean is considerable, transforming this mass of studies into something greater than their constituent projects requires new forms of data and research integration. This requires the hard work of transforming existing datasets to address questions of broader significance, leveraging new analytical capabilities, and a good deal of interpretative effort. With new forms of collaboration, openness, and interaction—from open data to new fora for discussion—Mediterranean surveyors are well poised to contribute more consistently to discourses in regional archaeology across the globe.

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Figure Captions

Figure 1. Map of the Mediterranean, showing modern countries and regions mentioned in the text, points showing survey projects, overlain onto major bioclimatic zones (TNC 2009); red=Mediterranean biome.

Figure 2. Trends in survey maximal footprint area (on a logarithmic scale) since the 1950s by country groupings (see also Online Resource 5); the base-10 logarithmic scale means that the major ticks on the y-axis indicate metric values of 1 ha (0.01 km^2), 10 ha, 100 ha, 1000 ha, 100 km^2, 1000 km^2, 10 thousand km^2, 100 thousand km^2, 1 million km^2.

Figure 3. Spatial and chronological coverage; **a**: claimed completed coverage as % of survey areas, compared to total survey footprint area (on base-10 logarithmic scale), by country groupings* (see also Online Resource 6); **b** and **c**: stated approach to spatial and chronological coverage*, graphed as (upper) total number of projects and (lower) trends in proportion of projects with stated aims according to 5-year start year blocks (black line indicates relative number of projects starting per year).

Figure 4. Pan-Mediterranean survey intensity; **a**: numbers of projects by country recorded in online databases of Mediterranean surveys; **b**: estimated density of survey projects per thousand km^2 by country; **c**: number of survey projects starting per year (of which submitted to SoMS in dark red).

Figure 5. Contexts of research; **a**: project sponsorship by country*; **b**: gender of survey project (co-)leaders (total numbers per country groups)* (see also Online Resource 11); **c**: pan-Mediterranean trends in gender of project (co-)leaders according to start year*.

*=indicates that numbers shown are based purely on responses submitted to the Survey of Mediterranean Surveys (September 2020–January 2021)

Supplementary Online Resource Captions

Online Resource 1. List of aggregations of archaeological survey and site information (*=no longer active/kept up to date).

Online Resource 2. Responses to key questions in the Survey of Mediterranean Survey (CSV format).

Online Resource 3. Consolidated list of survey projects across Mediterranean (CSV format).

Online Resource 4. Methodology reported via SoMS; **a**: general methodological scope of projects, graphed by start year of project*; **b**: total number of projects employing particular methods, by country*.

Online Resource 5. Extent and landscape features of projects; **a**: trends in survey maximal footprint area (in km^2) since 1950s by country; **b**: landscape features within survey areas for all projects, by country*.

Online Resource 6. Spatial and chronological coverage reported via SoMS: claimed completed coverage as % of survey areas compared to total survey footprint area and median size of projects indicated by vertical dotted line and label, by country*.

Online Resource 7. List of digital data repositories for individual survey projects.

Online Resource 8. Publication status reported via SoMS; **a**: state of fieldwork*; **b**: state of publication*; **c**: online data availability*.

Online Resource 9. Pan-Mediterranean survey intensity; **a**: map showing location of Mediterranean survey projects from consolidated list; **b**: total number of projects in consolidated database vs. submitted to SoMS; **c**: percentage of projects per country submitted to SoMS vs. those listed in consolidated database.

Online Resource 10. List of regional and national journals for Mediterranean countries.

Online Resource 11. Contexts of research. **a**: gender of survey project (co-)leaders (total numbers per country)*; **c**: pan-Mediterranean trends in gender of project (co-)leaders according to start year, by country groups*.

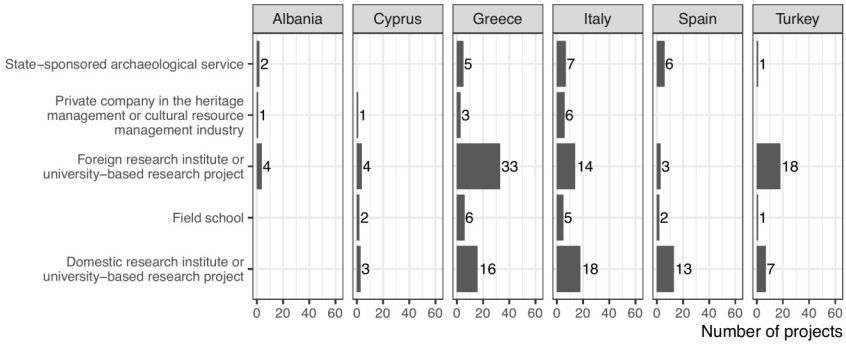
Online Resource 12. Trends and examples of approaches to sampling, coverage, and survey data visualization*. **a**: artifact densities across continuous area (Knodell et al. 2017b, p. 147); **b**: artifact densities within a sample of the project area as a whole (Kiriatzi and Broodbank 2011, fig. 1); **c**: selected zones that were surveyed within an overall project area (Davis et al. 1997, p. 393); **d**: distribution of archaeological sites as dots on a map (Wright et al. 1990, p. 598).

*=indicates that numbers shown are based purely on responses submitted to the Survey of Mediterranean Surveys (September 2020–January 2021)

a

Institutional sponsorship or context of project

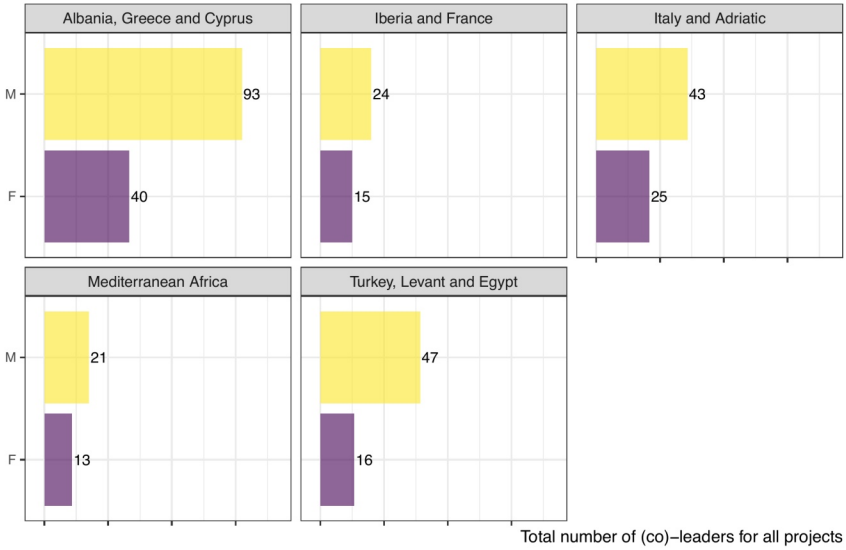
1 responses (only showing countries with >4 projects submitted to SoMS)



b

Gender of survey project leaders

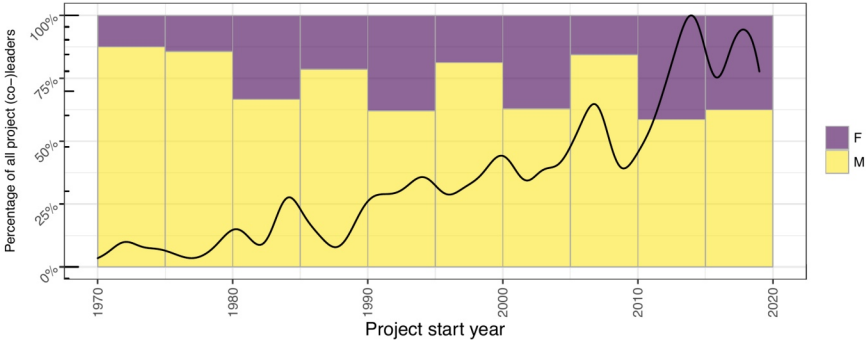
Binary gender assigned according to external presentation by name or image (i.e. not self−defined)



c

Trends in gender of survey leadership across all projects

Black line indicates relative total number of projects starting per year



Supplement to Survey Archaeology in the Mediterranean World: Regional Traditions and Contributions to Long-Term History, *Journal of Archaeological Research*, Alex R. Knodell*, Toby C. Wilkinson, Thomas P. Leppard, and Hector A. Orengo. *Corresponding author: Department of Classics, Carleton College, email: aknodell@carleton.edu

Online Resources 1–12

*=indicates that the numbers shown are based purely on responses submitted to the Survey of Mediterranean Surveys (September 2020–January 2021)

Online Resource 1. Aggregations of archaeological survey and site information

Name	*Description*	*URL*
MAGIS	Inventory of 382 survey projects in the Mediterranean region, with .kmz download available.	http://cgma.depauw.edu/MAGIS/
Fasti Survey	Online database including 448 survey projects in the Mediterranean world, with historical focus on Italy.	http://www.fastionline.org/survey/
Fieldwalker.org	Database of survey projects and collection of articles about survey in the Mediterranean region.	https://www.fieldwalker.org/
Prehistoric Stones of Greece	Inventory of 163 survey projects and 853 prehistoric sites in Greece, up to 2013.	https://archaeologydataservice.ac.uk/archives/view/stones_ahrb_2013/index.cfm
Israel Antiquities Authority Survey Website	Map showing the location and state of publication for each 10x10 km survey square for all of Israel.	http://survey.antiquities.org.il/index_Eng.html#/

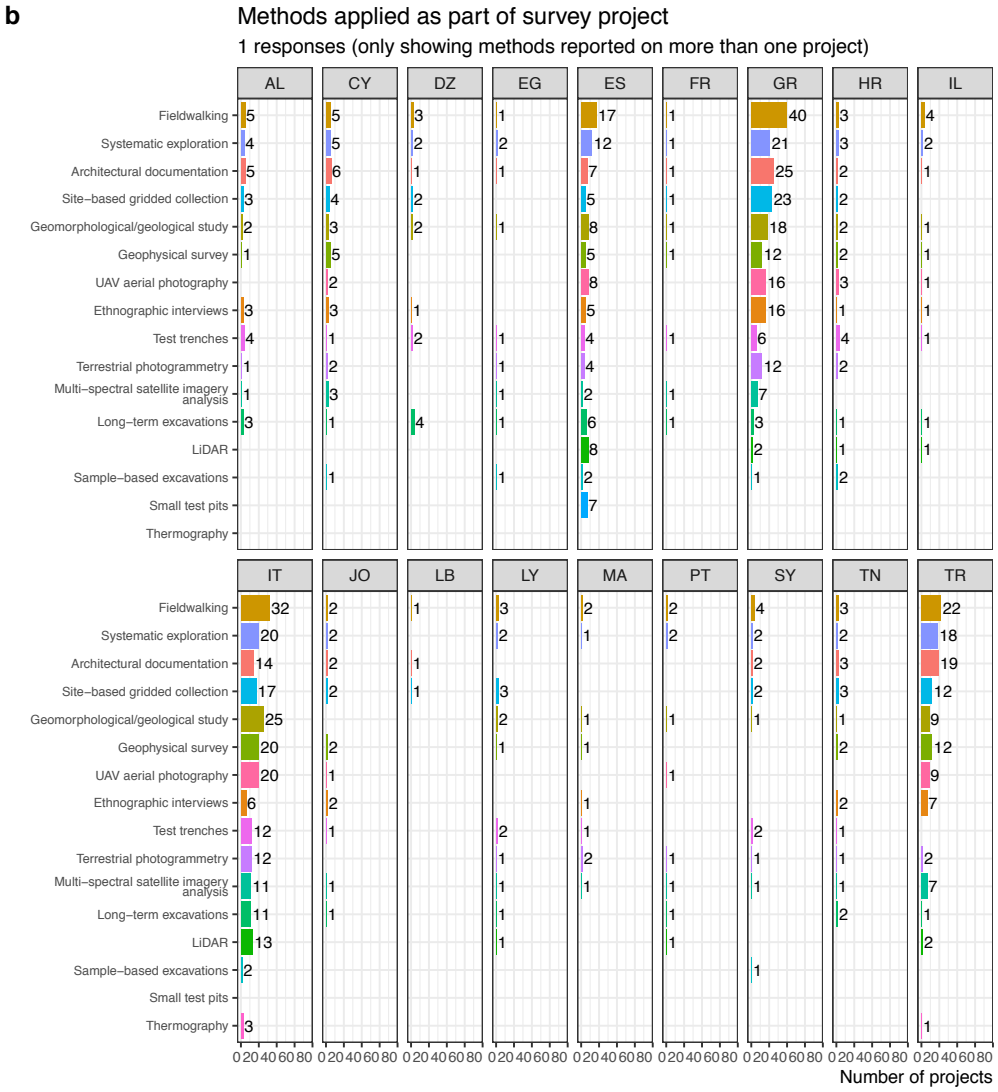
Digital Archaeological Atlas of the Holy Land	Digital atlas and collection of projects and site locations from the Middle East, focusing on spatial data.	https://daahl.ucsd.edu/DAAHL/Home.php
ESS Delta Survey Web Site	Database of sites in Nile Delta region	https://www.ees.ac.uk/delta-survey
Mycenaean Atlas Project	Database of Bronze Age archaeological sites in Greece and other places related to Mycenaean civilization.	http://www.helladic.info/
Pleiades	Collection of information about and references for places and spaces in the Mediterranean region.	http://pleiades.stoa.org/
Türkiye Arkeolojik Yerleşmeler (TAY)	Online synthetic database and webGIS with archaeological sites from across Turkey in English and Turkish, including multi-lingual glossaries	https://www.tayproject.org/
Topostext	Database of Greek texts and maps of and information about Greek places from the Neolithic to 2nd c. AD.	https://topostext.org/
Aristeia	Database of projects in Greece from the Early Iron Age to Early Archaic Period.	http://aristeia.ha.uth.gr/index.php
MedAfriCarbon	Spatially linked database of C14 evidence from Mediterranean Africa from 12000 to 600 cal. BC.	https://www.medafrica-cam.org/medafricarbon

Tabula Imperii Romani - Forma Orbis Romani (TIR-FOR)	Catalogue of Roman sites with good coverage for Catalonia, northwestern Italy and Romania.	https://tir-for.iec.cat/tirfor/showMapPage.action?request_locale=en
Geoportal del Patrimoni Cultural de la Generalitat de Catalunya	Catalogues of archaeological and paleontological sites and listed monuments of Catalonia.	https://sig.gencat.cat/portalsigcultura.html
GeoPortal, Portal do Arqueólogo, DGPC	Database of archaeological sites of Portugal	http://patrimoniodgpc.maps.arcgis.com/apps/webappviewer/index.html?id=5cb4735d7d7743a39a16d7269a753a4a
Atlas des patrimoines	Map service with heritage information including archaeological sites and heritage protection areas for several French regions.	http://atlas.patrimoines.culture.fr/atlas/trunk/
INRAP. Nos découvertes: Sites archéologiques	Catalogue of sites investigated by INRAP, in France	https://www.inrap.fr/chroniques-de-site/recherche

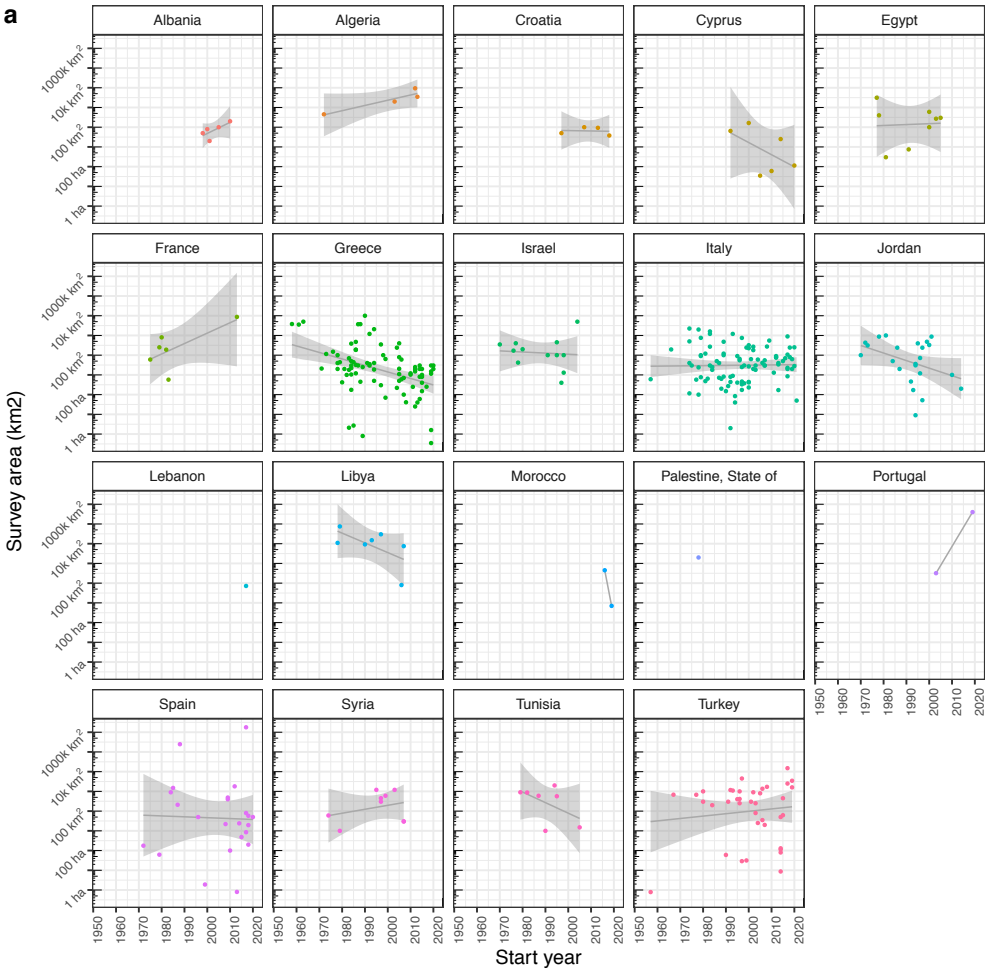
Online Resource 2. Responses to key questions in the Survey of Mediterranean Surveys (see separate file in CSV format: ADD URL TO ONLINE REPOSITORY PRIOR TO PUBLICATION).

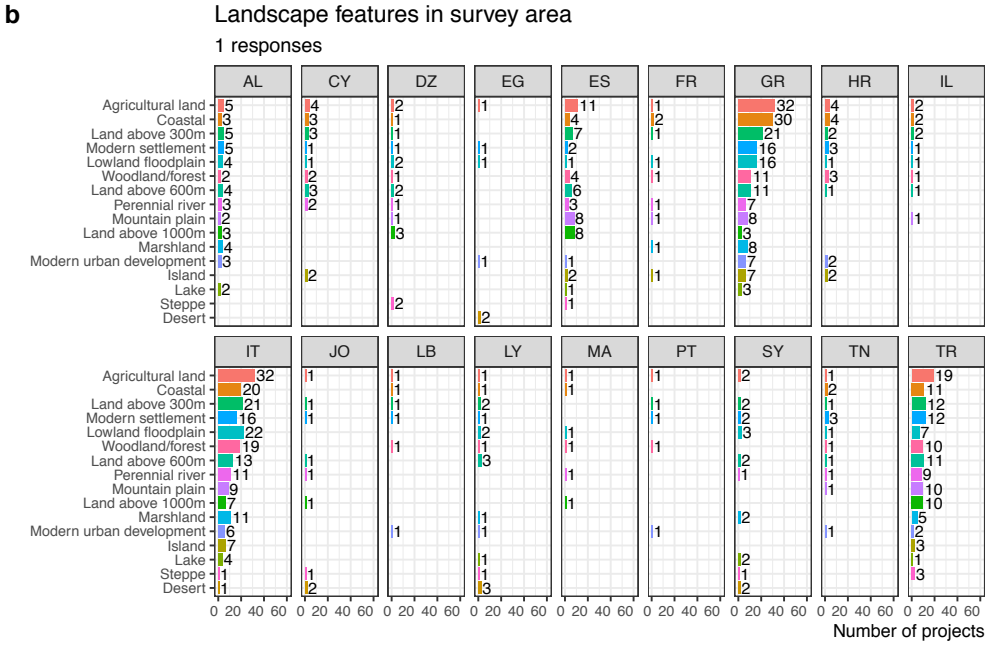
Online Resource 3. Consolidated list of survey projects across Mediterranean (see separate file in CSV format: ADD URL TO ONLINE REPOSITORY PRIOR TO PUBLICATION).

Online Resource 4. Methodology reported via SoMS; **a**: general methodological scope of projects, graphed by start year of project*; **b**: total number of projects employing particular methods, by country*.

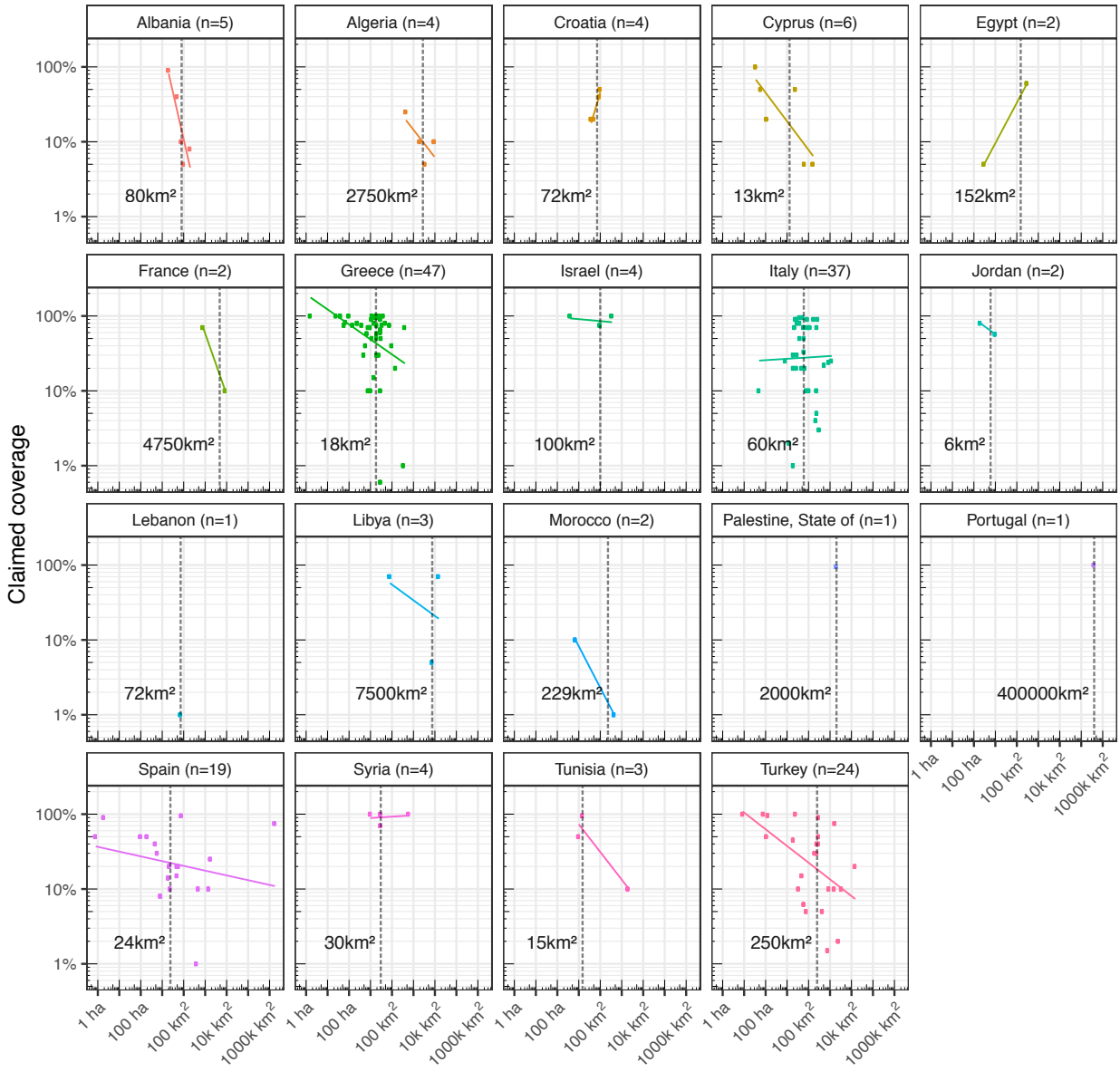


Online Resource 5. Extent and landscape features of projects; **a**: trends in survey maximal footprint area (in km^2) since 1950s by country; **b**: landscape features within survey areas for all projects, by country*.





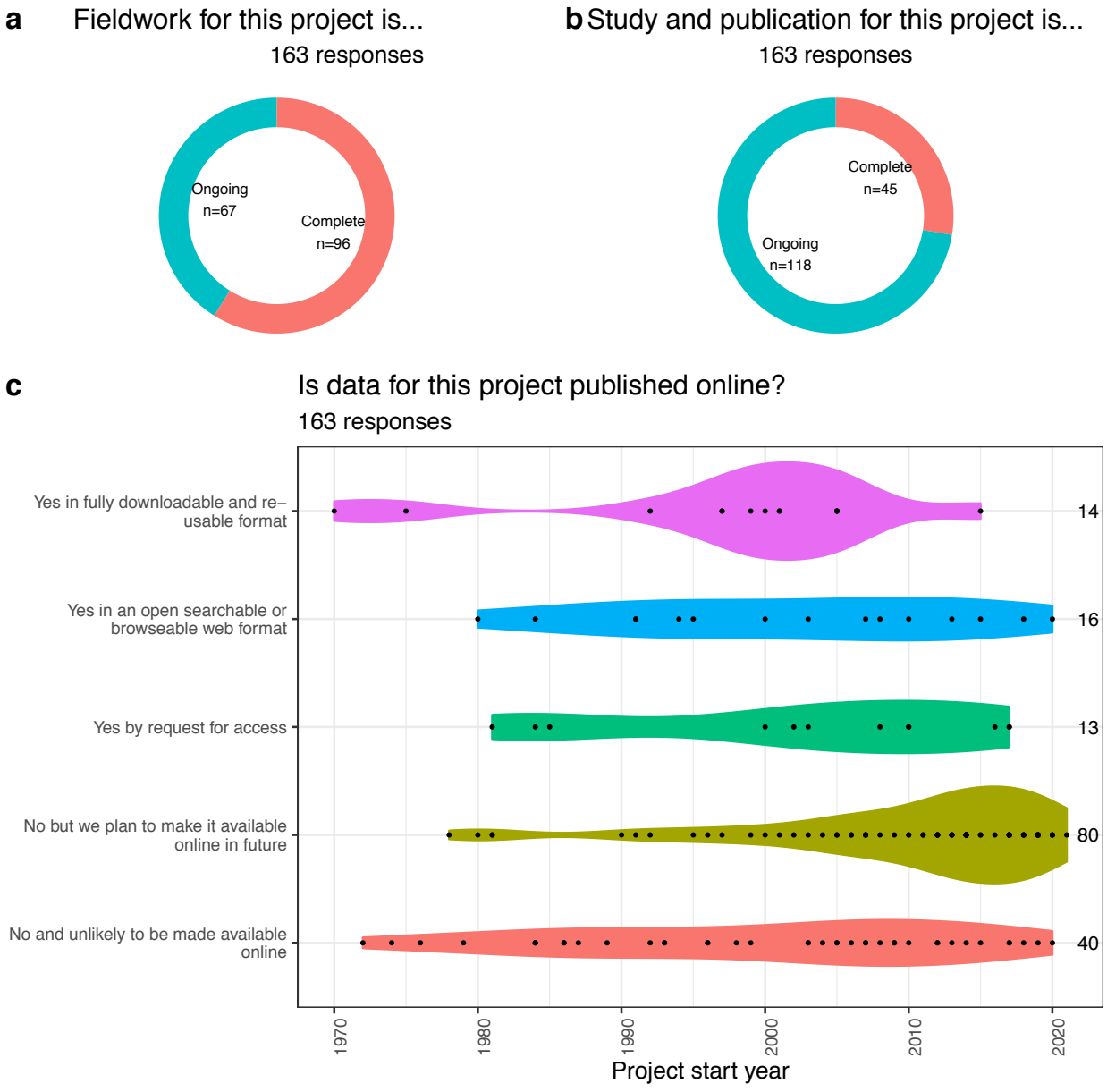
Online Resource 6. Spatial and chronological coverage reported via SoMS: claimed completed coverage as % of survey areas compared to total survey footprint area and median size of projects indicated by vertical dotted line and label, by country*.



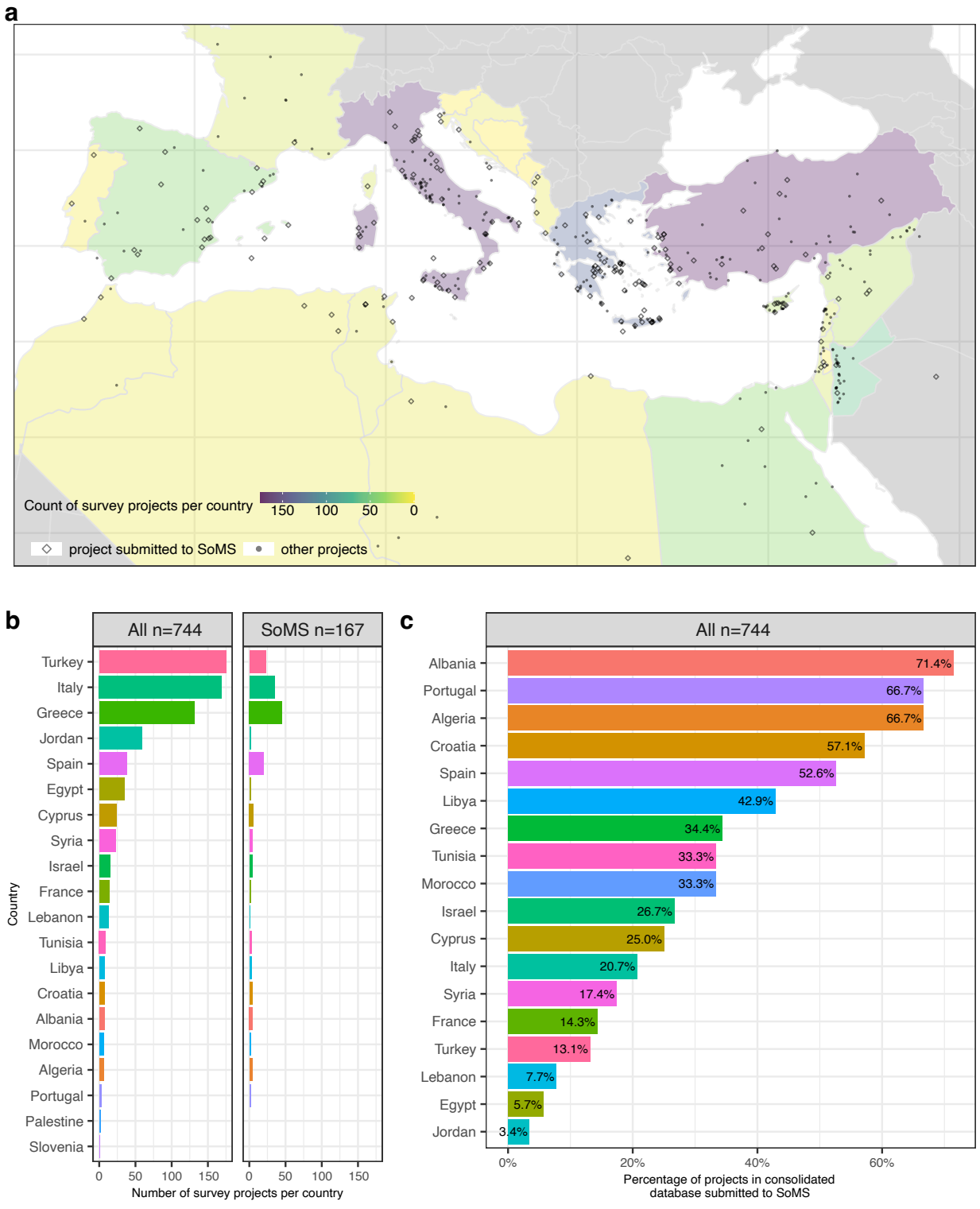
Online Resource 7. List of digital data repositories for individual survey projects.

Name	*Description*	*URL*
tDAR	Collection of digitized documents, images, and data from individual survey projects.	https://core.tdar.org/
Open Context	Database of primary data records and project media and documents recording data from prehistory to present.	https://opencontext.org/
Archaeology Data Service	Digital repository for data from projects in the UK.	https://archaeologydataservice.ac.uk/
Journal of Open Archaeology Data	Collection of short descriptions of datasets from projects housed in other open license repositories.	https://openarchaeologydata.metajnl.com/
Dutch national archaeological data repository, DANS-Easy	Digital repository for data from projects at Dutch universities.	https://easy.dans.knaw.nl/ui/home

Online Resource 8. Publication status reported via SoMS; **a**: state of fieldwork*; **b**: state of publication*; **c**: online data availability*.



Online Resource 9. Pan-Mediterranean survey intensity; **a**: map showing location of Mediterranean survey projects from consolidated list; **b**: total number of projects in consolidated database vs. submitted to SoMS; **c**: percentage of projects per country submitted to SoMS vs. those listed in consolidated database.

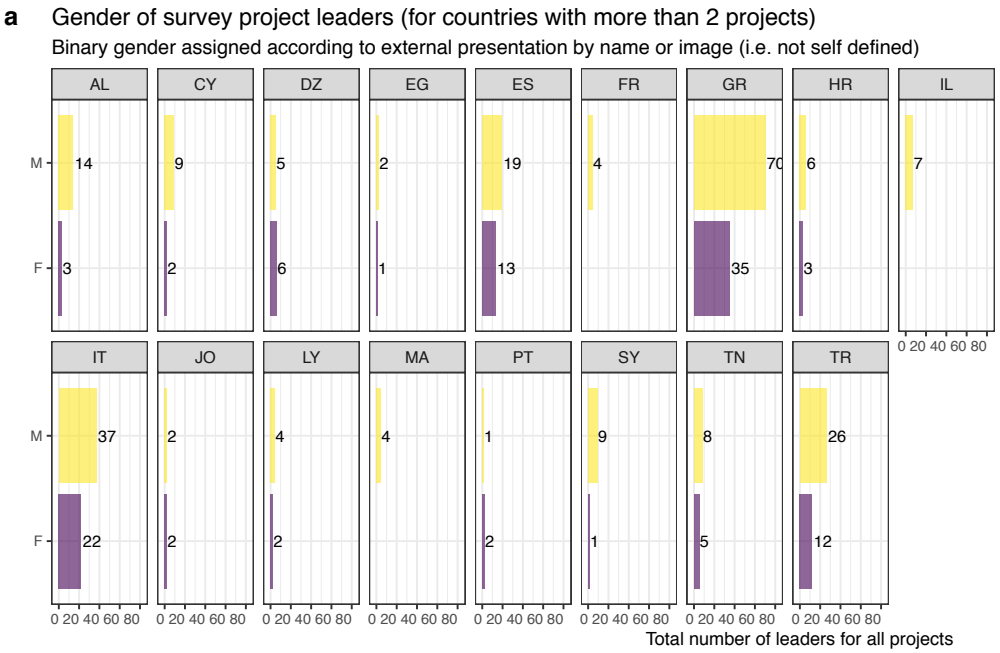


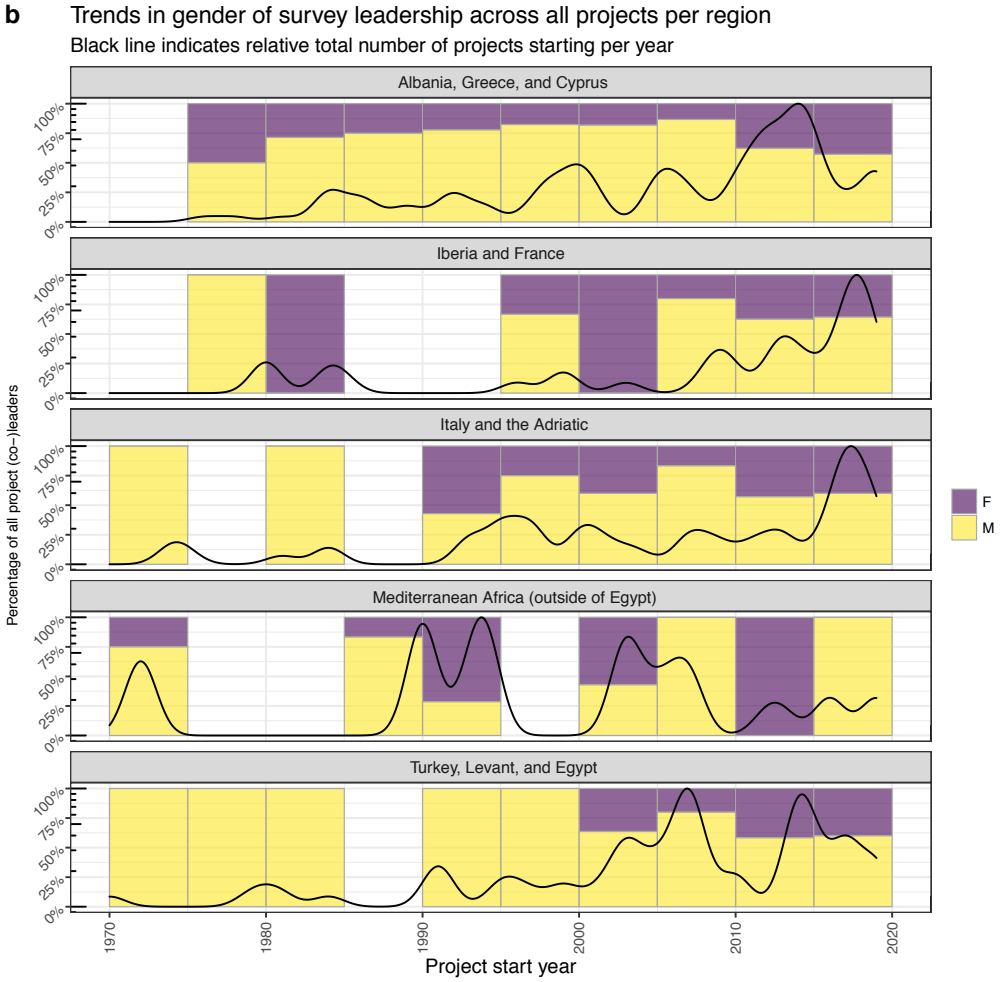
Online Resource 10. List of regional and national journals for Mediterranean countries (further examples can be found in the list of journal abbreviations for the *American Journal of Archaeology*).

Region	*National Journals/Repositories*
Italy and the Adriatic	Italy: *Papers of the British School at Rome*; *Etruscan and Italic Studies*; *Archeologia Medievale*; *Archeologia e Calcolatori*; *Rivista di Studi Fenici*; *IpoTESI di Preistoria*; *Fasti Online*; *Bolletino di Archeologia*; *Studi Romani*; *Papers of the Royal Netherlands Institute in Rome*; various regional *Quaderni, Atti* etc. Croatia: *Annales Instituti Archaeologici*; *Opuscula Archaeologica*; *Archaeologica Adriatica*
Greece, Cyprus, Albania	Greece: *Archaeologikon Deltion*; *Praktika*; *Ergon of the Archaeological Society at Athens*; *Hesperia*; *Annual of the British School at Athens*; *Bulletin de Correspondance Hellenique*; *Journal of Greek Archaeology*; *Aegean Archaeology*; *Athens University Review of Archaeology; Athens Annals of Archaeology* Cyprus: *Report of the Department of Antiquities, Cyprus* Albania: *Iliria*
Anatolia and the Levant	General: *Levant*; *Near Eastern Archaeology*; *Journal of Near Eastern Studies* Palestine: *Palestine Exploration Quarterly*; *Quarterly of the Department of Antiquities in Palestine* Jordan: *Annual of the Department of Antiquities of Jordan* Israel: *Bulletin of the Israel Exploration Society*; *Israel Exploration Journal*; Website of the Israel Antiquity Authority Syria: *Publications of an American Archaeological Expedition to Syria*; *Annales archéologiques arabes syriennes* Lebanon: *Bulletin d'Archéologie et d'Architecture Libanaise (BAAL)* Turkey: *Adalya*; *Anadolu*; *Anadolu Araştırmaları*; *Anatolia Antiqua; Anatolian Studies; Arkeoloji Dergisi; Araştırmalar Sonuçları Toplantısı; Belleten; Colloquium Anatolicum; Olba; Türkiye Bilimler Akademisi Arkeoloji Dergisi (TÜBA-AR); Türk Arkeoloji ve*

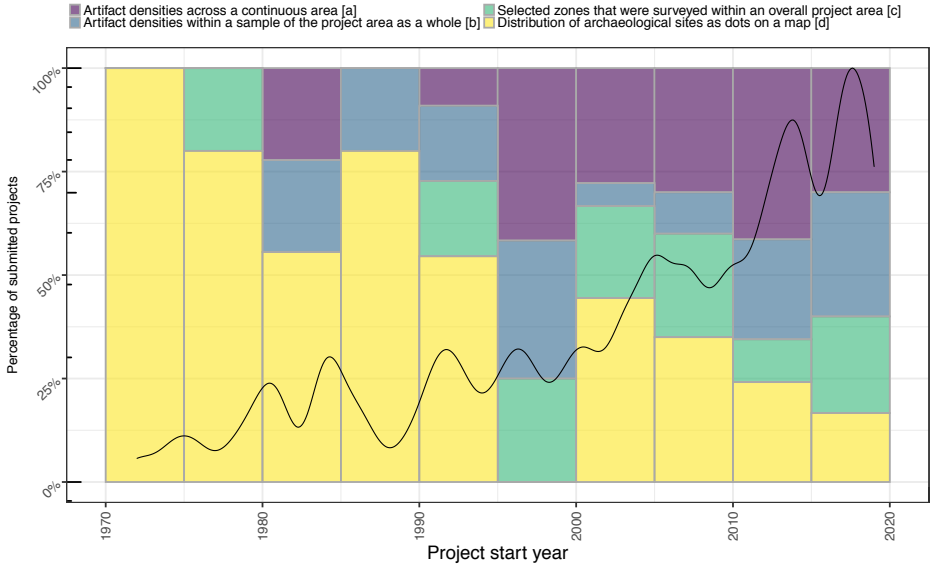
	Etnografya Dergisi; Turkish Series Bibliographic Database of the British Institute at Ankara
Egypt	Egypt: *Journal of Egyptian Archaeology*; *Bulletin de l'Institut Francais d'Archeologie Orientale du Caire*; *Archaeological Survey of Egypt* (in 36 volumes); Egyptian Exploration Society (see webpage)
North Africa	Libya: *Libyan Studies*; *Libya Antiqua* Tunisia: *Revue Tunisienne d'Archéologie*; *Atlas Archéologique de la Tunisie* (1982–1913; 1914–1932); *Cartes Nationales des Sites Archéologiques et des Monuments Historiques* Algeria: *Atlas Archéologique de l'Algérie* (1902–1911) Morocco: *Carte archéologique du Maroc*.
Iberian Peninsula	Spain: *Archivo Español de Arqueología*; *Trabajos de Prehistoria*; *Cuadernos de Prehistoria y Arqueología de la Universidad Autónoma de Madrid*; *Complutum*; *Munibe Antropologia-Arkeologia*; *Zephyrus*; *Pyrenae*; *Lucentum*; *Sagvntvm*; *SPAL*; *Anales de Arqueología Cordobesa.* Portugal: *Revista portuguesa de arqueologia*; *Portugalia*; *Estudos do Quaternário*
France	*Carte Archéologique de la Gaule* (1931-present); *Antiquité Tardive*; *Melanges de l'Ecole Française de Rome: Antiquité; Revue Archéologique; Revue Archéologique de Picardie*; *Revue Archéologique de Narbonnaise*; *Revue Archéologique de l'Est*; *Bulletin de la Societe Prehistorique Francaise*; *Histoire Médiévale et Archéologie*.

Online Resource 11. Contexts of research. **a**: gender of survey project (co-)leaders (total numbers per country)*; **c**: pan-Mediterranean trends in gender of project (co-)leaders according to start year, by country groups*.

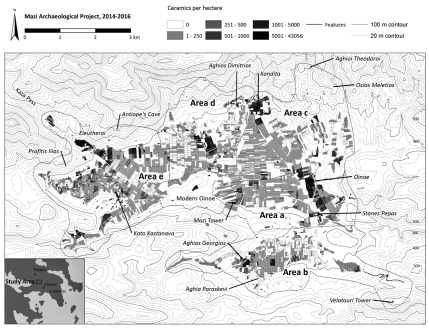




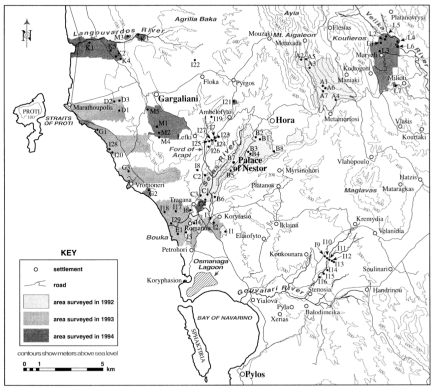
Online Resource 12. Trends and examples of approaches to sampling, coverage, and survey data visualization*. **a**: artifact densities across continuous area (Knodell et al. 2017b, p. 147); **b**: artifact densities within a sample of the project area as a whole (Kiriatzi and Broodbank 2011, fig. 1); **c**: selected zones that were surveyed within an overall project area (Davis et al. 1997, p. 393); **d**: distribution of archaeological sites as dots on a map (Wright et al. 1990, p. 598).



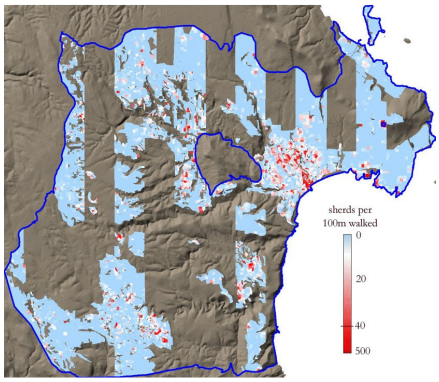
a



c



b



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