

ARTICLE

Unmanned Aerial Systems and an Archaeology of Accessibility

Gabriella Armstrong 

Department of Anthropology, Stanford University, Stanford, CA, USA
Email: garmstr@stanford.edu

(Received 1 December 2025; revised 24 April 2026; accepted 27 April 2026)

Abstract

Archaeology is in the midst of a technological revolution, particularly for data collection, first championed by light detection and ranging (lidar) in the early 2000s and now with widespread applications of unmanned aerial systems (UAS)-deployed remote sensing. While the importance of remote sensing for data collection and heritage conservation is known, less work has acknowledged the implications of remote sensing for field safety, particularly for disabled researchers. UAS offer a unique opportunity to explore circumstances that may affect mobility in the field and how advances in archaeological science can transform fieldwork by improving accessibility for disabled archaeologists. I argue that UAS can—and should—be improved to promote accessibility in archaeological fieldwork, due to their promotion of field safety, increased planning of daily tasks, and broader applications to community-engaged research. These interventions should be applied to the larger field of archaeology to improve labor management for researchers in all sectors of practice.

Resumen

La arqueología se encuentra en medio de una revolución tecnológica, especialmente en el ámbito de la recolección de datos, impulsada inicialmente por “light detection and ranging” (lidar) a comienzos de la década de 2000 y, más recientemente, por la expansión de los sistemas aéreos no tripulados para la teledetección. Si bien se reconoce la importancia de la teledetección para la recopilación de datos y la conservación del patrimonio, se ha prestado menor atención a sus implicaciones para la seguridad en el trabajo de campo, especialmente en el caso de investigadores con discapacidad. Los sistemas aéreos no tripulados (UAS) ofrecen una oportunidad única para analizar los factores que pueden afectar la movilidad en el campo, así como la forma en que los avances en la ciencia arqueológica pueden transformar el trabajo de campo al mejorar la accesibilidad para arqueólogos con discapacidad. Sostengo que los UAS pueden y deben mejorarse para promover la accesibilidad en el trabajo de campo arqueológico, dada su contribución a la seguridad en campo, a una mejor planificación adelantada de las tareas diarias y a sus aplicaciones más amplias en la investigación con participación comunitaria. Estas intervenciones deberían extenderse al conjunto de la práctica arqueológica con el fin de favorecer la gestión laboral de los investigadores en todos sus ámbitos.

Keywords: accessibility; fieldwork safety; labor management; unmanned aerial systems

Palabras clave: accesibilidad; seguridad en el trabajo de campo; gestión laboral; sistemas aéreos no tripulados

Archaeology has long drawn on remote sensing techniques and technologies to expand our understanding of past land use (Bauer 2013, 2018; Casana 2017; Casana and Cothren 2013; Casana et al. 2012; Challis et al. 2004; Fontana 2022; Gallagher and Josephs 2008; Hammer and Lauricella 2017; Hammer et al. 2022; Kennedy 1998; Lasaponara and Masini 2011; Masini and Lasaponara 2006; Masini et al. 2018; Moore et al. 2006; Opitz and Cowley 2013; Opitz et al. 2015; Romano and Tolba 1996).

The relatively recent adoption of unmanned aerial systems (UAS), unmanned aerial vehicles (UAV), and drones by archaeologists poses a unique opportunity not only in their application to remote sensing (Campana 2017; Carmona et al. 2020; Casana et al. 2014, 2017, 2021, 2023; Chiabrando et al. 2018; Eiselt et al. 2017; Hill et al. 2020; Paulsen et al. 2026; Waagen and van Hilst 2025) but especially for improving accessibility within archaeological fieldwork, an historically ableist field. While remote sensing and digital archaeology, like the use of aerial images, satellite data, and geographic information systems (GIS), have been accessible ways to engage with the archaeological record through laboratory settings, UAS have the ability to improve accessibility in fieldwork environments as well.

Although ableism in archaeological fieldwork has been challenged (Heath-Stout 2023; Heath-Stout et al. 2022) and demonstrated through such studies as Sneed and Shrader's (2024) "Digging While Impaired: Promoting the Accessibility of Archaeology Discipline," cultivating fully accessible fieldwork environments is not an archaeological norm. This is especially true with respect to people with disabilities or accommodations that prevent them from accessing traditional archaeological field projects and field schools. For example, to apply for many field schools, one must demonstrate an ability to participate in physically demanding labor tasks while spending an extended period away from life-stabilizing resources at home. Despite many efforts to improve accessibility in archaeology, strategies often target existing field methods, thus battling the long history of archaeology as a field of and for able-bodied, privileged researchers. The recent emergence of UAS in archaeology poses a unique opportunity to create accessible research avenues through the adoption of workflows that prioritize safety and accessibility. By promoting accessible workflows, the widespread adoption of UAS in archaeology can emerge as an inclusive and safe practice.

This article evaluates the extent to which UAS in archaeology is an accessible fieldwork methodology through three lenses: logistics, safety, and community-engaged accessibility. Additionally, I demonstrate the ways in which UAS remote sensing can be improved to promote inclusive field experiences, particularly for archaeologists with disabilities (both temporary and permanent) that affect mobility in the field. This article is informed by three main research questions: (1) how and in what ways do UAS enable a wider range of researchers to participate in fieldwork and data collection, (2) what are the ways in which other technologies might improve fieldwork for people with accommodations not typically addressed in field settings, and (3) how can we prioritize accessibility and safety as part of planning daily UAS routes?

To gauge the feasibility of UAS surveys as accessible data collection methods in archaeological fieldwork, I conducted 30–60-minute semi-structured interviews with archaeologists working in academia, cultural resource management (CRM), and the government sector. To prioritize seamless, unrestricted conversation, these interviews were not recorded. Instead, contemporaneous notes were taken to document quotes. To ensure anonymity, pseudonyms have been assigned to interviewees, and I refrain from referencing specific universities, projects, companies, or institutions. In this article, I focus on the responses of two interviewees: Grace, who holds a master's degree in archaeology and has worked as a project archaeologist in CRM for two years; and John, a remote-sensing specialist who owns a CRM company in the United States and collaborates with academic projects. While Grace commented directly on the ableist working conditions in archaeology and targeted solutions that UAS could propose based on her experience working in CRM, John focused on the logistics of UAS, improvements for safety, and its effectiveness in minimizing strenuous labor. The following accommodations and accessibility needs are used with the interviewees' consent, as are their experiences (see Data Availability Statement). Grace has a physical disability and dyslexia, and John has a chronic injury that affects mobility from years of archaeological survey and handheld remote sensing.

I synthesized these firsthand accounts, including my own experiences, with extant research on UAS surveys in archaeology in order to understand areas through which this technology could both become more accessible and also identify tasks that could be accessible alternatives for field researchers with disabilities or accommodations that limit mobility in the field. In reflecting on these findings, I outline how this technology can be improved to promote inclusive field experiences. This input was combined to create a checklist of supplies and equipment that can be used as a template to improve planning, organization, and safety (see Supplementary Material 1). While the original list

was created based on equipment mentioned in the cited UAS-related articles, significant feedback was provided by numerous archaeologists and interviewees. This was a collaborative effort intended to be useful for all sectors of archaeological practice. Ultimately, I argue that UAS workflows can and should be streamlined to improve accessibility for archaeologists, owing to their promotion of field safety, increased planning of daily tasks, and broader applications in accessible community-engaged research.

Disability in Archaeology

The discipline of archaeology has been shaped by the perception of “archaeologists as able-bodied adventurers.” This narrative is reinforced through fieldwork practices that emphasize physical labor as a key determinant of career advancement. For example, when I first applied to field schools, the applications required me to demonstrate that I would be physically able to perform tasks like excavation and pedestrian survey. While these tasks do require specific forms of physical labor, there are many other complementary ways to collect meaningful archaeological data in the field. Furthermore, and more importantly, there are many young scholars who would be unable to pursue a career in archaeology because they would be unable to demonstrate these abilities in their field-school applications. These practices are detrimental to the field for many reasons, including (1) it limits the pool of scholars who can participate in archaeological fieldwork, (2) it constrains diversity within knowledge production, (3) it perpetuates the exclusive, harmful history of archaeology as a discipline, and (4) it creates an unsafe field and working environment for all participants.

Interventions in disability studies in archaeology have noted the negative impact of able-bodied field environments on knowledge production, safety, and accessibility (Fitzpatrick et al. 2025; Fraser 2007; Heath-Stout et al. 2022; Klehm et al. 2021; Sneed and Shrader 2024), yet an ableist-oriented archaeological practice remains the norm. Sneed and Shrader (2024) demonstrate that the exclusion of disabled researchers from archaeological fieldwork is a result of a disciplinary adherence to the medical model of disability, which suggests that a disabled body fails to conform to the “normative” standards of behavior and physicality (Sneed and Shrader 2024:53). For example, many public school systems privilege certain types of learning behaviors over others, regardless of capability: an elementary student is expected to sit for up to six hours a day to be deemed “productive” or “smart.” This contrasts with a social model of disability, where society produces an environment in which a person is disabled (Sneed and Shrader 2024:57–58). Fieldwork, argue Sneed and Shrader (2024), has become privileged in archaeological practice and perpetuated this exclusive, inaccessible space. Heath-Stout (2023) has shown that this attitude “privileges some bodies and minds over others,” particularly those without disabilities or with invisible disabilities who pass as nondisabled (Heath-Stout 2023:17). Thus, archaeological fieldwork, especially, creates a paradox where fieldwork is required for entry into the profession and yet only certain scholars are allowed to participate in this necessary practice.

Despite the “compulsory able-bodiedness” (Heath-Stout 2023:21–22) of archaeological practice, there are still many archaeologists with disabilities. For instance, Grace has battled ableist academic and CRM environments almost every step of the way. During her undergraduate degree she spent up to 40 hours a week fighting active discrimination: “I was fighting for my [testing/extra time] accommodations, that the university had signed off on every year, to just be enforced! I was fighting for my ability to be in school and equity to access materials I was legally required to have.” Nonetheless, her passion for archaeology led her to pursue a master’s degree in archaeology, which, she noted, was “much better, all my accommodations were provided for me as they were already provided to all students, regardless. This is how it should be.” Following her graduate degree, she worked in CRM as a project archaeologist in the US Midwest, where work conditions were repeatedly inaccessible and discriminatory and often unsafe. Companies and bosses assumed she was “weak or feeble” after disclosing her disability, and often she was automatically assumed to be unable to complete tasks. This ableist work environment made Grace hesitant to report job-related injuries: two days into a three-week CRM project, she broke her foot. In fear that she would lose her job, she masked her pain, choosing instead to finish the project. This is representative of the “hero” mentality still present in archaeological fieldwork across sectors, which forces

archaeologists to mask medical symptoms and expose themselves to unsafe circumstances out of fear of workplace retaliation. During our conversation Grace noted that the barriers for disabled archaeologists are “insurmountable and it just shouldn’t be this way. We have all the accessibility at our fingertips, but there is no drive to implement these workflows because of personal choices made by higher-ups, even when at the direct peril of team members.”

Strategies for improving accessibility and safety in archaeological fieldwork have been proposed (Fitzpatrick et al. 2025; Heath-Stout et al. 2022; Klehm et al. 2021; Sneed and Shrader 2024; White 2021), as well as in ethnographic fieldwork (Procter and Spector 2024) and the natural sciences more broadly (Carabajal and Atchison 2020; Chasen et al. 2025) where archaeological field- and lab work overlap. Across the literature, three key areas of intervention regarding the improvement of archaeological practice are (1) increased planning and prior disclosure of fieldwork tasks to participants and applicants, (2) flexible workflows and field tasks, and (3) the inclusion of disabled people in conversations about inclusion and accessibility and the organization of fieldwork itself. The first two interventions are inherent in UAS archaeological surveys, and thus are core to this study. The third area is a necessary intervention that impacts archaeological fieldwork more broadly.

Accessibility is a spectrum, and there is no single solution to creating accessible spaces and methods. Following the principles of Universal Design, an accessible environment means it can be used by everyone regardless of ability or disability (National Disability Authority 2026). The principles of Universal Design were developed to produce environments usable for all and can—and should—be applied to data collection methods and fieldwork. Fraser (2007) has demonstrated how applying the principles of Universal Design to archaeological practice can increase access to all aspects of the field. Nonetheless, archaeological fieldwork is often still conducted as an able-bodied practice, which produces fieldwork sites and data collection methods inaccessible to many researchers. Disability, like accessibility, comes in many shapes and forms. Therefore, prior disclosure of fieldwork tasks to all participants, so that they can gauge their needs and ability, is required. Most accessibility improvements proposed in this article are geared toward researchers with disabilities and circumstances that may affect mobility in the field, including (but not limited to) physical disabilities, both temporary and permanent, due to logistics inherent in UAS use. Mobility-related circumstances are specifically addressed owing to a long history of archaeological fieldwork that emphasizes data collection in which physical labor, however intense, is the norm. Nonetheless, the increased planning necessary to UAS fieldwork, combined with the adoption of flexible workflows, can increase accessibility to a diversity of researchers (Fitzpatrick et al. 2025; Sneed and Shrader 2024).

UAS in Archaeology

Within the past decade, UAS emerged as an efficient and cost-effective way to collect aerial imagery and remotely sensed data, yielding a range of archaeological footprints that speak to larger anthropological, ecological, and environmental questions about land-use practices (Campana 2017). Each year, commercially available UAS become less expensive, and UAS data collection and processing software become increasingly user-friendly. Although other emerging sensors such as shortwave infrared (SWIR), near-infrared (NIR), multispectral cameras, magnetometers, and ground-penetrating radar (GPR) are also being deployed, this article introduces photogrammetry, thermal imaging, and light detection and ranging (lidar), as there is a significant literature on these three techniques in archaeological practice, and they show a breadth of UAS use.

Photogrammetry is a blanket term that comprises multiple techniques that allow the researcher to take measurements of landscapes, features, and objects using images (Campana 2017). From UAS-derived visible light imagery, archaeologists can build high-resolution 3D models, orthophotos, and digital elevation models (DEMs) of sites and features, which enable efficient and precise feature documentation and spatial analyses. The benefits of photogrammetry to archaeology are numerous, but the key highlight is the ability to document, visualize, measure, and analyze 3D representations of inherently 3D landscapes, features, and artifacts that originally would have been documented in 2D (Campana 2017). For example, in Figure 1, a UAS pilot collects aerial imagery to create photogrammetric models



Figure 1. Dr. Hemanth Kadambi using a nano-class drone to conduct photogrammetric mapping of excavation deposits. Photograph courtesy of Andrew Bauer.

throughout the excavation process. This use of UAS in fieldwork directly situates the UAS pilot(s) with the rest of the fieldwork team, actively contributing to data collection and analysis during excavation. This is important for accessibility in fieldwork, since the UAS pilot is actively contributing to the excavation process through mapping. As long as the researcher has the appropriate licensing and permits (acquired prior to field departure), they can take breaks from physically strenuous activities to conduct the mapping, or, if they cannot participate in the other physical requirements of excavation, they could lead or participate in the UAS mapping team.

Thermography, or thermal imaging, is the detection of temperature differences in the near-to-longwave infrared range using a thermal camera/sensor. Thus, thermal imaging has the potential to detect terrestrial and subterranean features by exploiting the different temperature signatures of materials from surrounding areas (Carmona et al. 2020; Casana et al. 2017; Hill et al. 2020). UAS are an efficient way to collect thermal imaging data and are being used more regularly to detect terrestrial and subterranean landscape features in archaeological practice (Carmona et al. 2020; Casana et al. 2014, 2017; Hill et al. 2020; Paulsen et al. 2026). Data processing is also straightforward, as degrees in Celsius are represented as pixels, with no complex software needed for visualization. Casana and colleagues (2017),

in an article titled “Archaeological Aerial Thermography in Theory and Practice,” note how important planning ahead is for conducting aerial thermal surveys, owing to the many factors that play into the effectiveness of thermal detection. As highlighted in archaeology-oriented disability studies literature (Sneed and Shrader 2024) and guides (Fitzpatrick et al. 2025), prior planning, combined with the disclosure of tasks in advance, promotes accessible practice.

Lidar is an active sensing technique that involves emitting regular pulses of light on the NIR spectrum at regular intervals, in which returned pulses are converted to a factor of elevation. Depending on the number of returns, lidar can penetrate tree canopies and ground vegetation, thus hitting the earth’s surface and detecting solid features. An article published by Gallagher and Josephs (2008) deemed lidar more effective at detecting archaeological and landscape features than traditional survey techniques. Similar results were also found in Hawai’i, Colorado, New Hampshire, and New Mexico, in addition to outside of the United States in Belize, China, Finland, Italy, and Romania (Braşoveanu et al. 2023; Casana et al. 2021, 2023; Chase et al. 2011; Fontana 2022; Masini et al. 2018; Risbøl and Gustavsen 2018; Roiha et al. 2021). Thus, lidar can be used to remotely access areas with surface features otherwise inaccessible on foot. Many of these case studies deployed lidar from UAS, all multi-propeller, with great success (Casana et al. 2021, 2023; Risbøl and Gustavsen 2018; Roiha et al. 2021).

Archaeological literature has discussed the benefits of UAS remote sensing, advances in UAS technologies, and lowering price points of UAS with increased commercial availability, yet none have focused on the broader implications of these technologies for improving accessibility and safety for archaeological labor practice. My experience with using UAS in the field, particularly the efficiency and vast safety improvement of employing this type of technology, demonstrated its potential for becoming an accessible data collection method. I work in the greater Mediterranean, which can reach high temperatures unsafe for fieldwork during the summer months. In summer 2024, there were heatwaves across the region, with numerous public-safety announcements advising people to limit sun exposure and to stay in air-conditioned areas. Unfortunately, academic archaeological fieldwork is restricted by academic calendars and permitting which require researchers to be in the field during specific periods of time, with little scheduling leeway. My concern was whether my asthma, which can be exacerbated in extreme weather conditions and arid environments, would impact my ability to conduct preliminary surveys during this season. Fortunately, most of the surveys this season were UAS-deployed, which enabled us to not only access land otherwise inaccessible due to ground cover but also minimized walking and sun exposure time. Furthermore, we were always near our vehicle and required a sun cover (tent or overhang), as periodically the UAS would overheat in these extreme conditions. By helping us avoid strenuous activity in these sunny, cloudless conditions, the UAS made me consider how this technology could be improved to not only promote safety but also increase accessibility to this version of fieldwork.

Fieldwork Logistics

Like all archaeological methods, the setup, collection, and processing of UAS data take training and expertise. Hence, the basic logistics of UAS surveys must be understood to produce accessible workflows. Presented here is a summary of the experiences shared through interviews. Conducting UAS surveys with lidar or a magnetometer involves heavy payloads that require a large UAS, such as the DJI Matrice RTK 300 and 350. This setup can fly for just under one hour at a time, but this is significantly shortened when carrying a large sensor such as lidar. As a result, an overlooked labor-intensive aspect of UAS workflows is the transportation of equipment. In addition to the UAS and the sensors, one needs to bring multiple batteries and/or a way to charge batteries to increase the efficiency of data collection over a multiple-hour field day. This is easily, and most often, solved by using a portable, robust generator, which does, however, add an additional item to transport, ultimately making UAS survey teams more reliant on transport vehicles than traditional pedestrian surveys (Figure 2).

A four-wheel-drive truck or SUV with quality tires, significant storage space, a full tank of gas, and extra gasoline (for both the truck and generator) are often essential to UAS survey. While a less heavy-duty vehicle could transport these items, an all-wheel-drive truck can allow teams to access more remote field and survey areas. This is also important for safety, as many archaeological landscapes are in remote areas or locations with difficult terrain, so a reliable 4×4 vehicle can reduce the risk of getting “stuck” in



Figure 2. A UAS home-base setup demonstrating the proximity of the transport vehicle, sun cover, and access to a robust generator. Photograph courtesy of Tamas Polanyi.

the field. Additionally, a truck bed cover is recommended, as it protects the equipment from the elements. Field archaeologists are often required to carry upwards of, or even more than, 20 kg of equipment at a time, so easing this burden through increased vehicle access could improve safety for all participants. Likewise, this means that researchers with disabilities that affect mobility or the ability to access remote sites on foot can rely on vehicle transportation to and from the site, while also having direct access to a vehicle and generator. Preplanning routes to survey areas with feedback from local collaborators and community members could reduce the labor and time burdens associated with travel and accessing survey sites. For researchers with medications that require refrigeration or have specific temperature needs, they can be stored in the vehicle in a cooler and easily accessed throughout the workday.

A standard UAS survey day, like excavation and other forms of fieldwork, starts by ensuring all the technology and associated equipment are charged and packed. To ensure these tasks are accomplished, the CRM archaeologists interviewed stressed the importance of a checklist, which should be referenced the night before the survey, and on the morning of it, to ensure the batteries are charged and the necessary maps downloaded onto the field computer. John also emphasized the importance of being prepared, and not just with checklists but also by practicing setting up and taking down the UAS and sensors prior to field departure. Furthermore, he noted the importance of organization and labeling. This makes packing more efficient and prevents the loss of items that can be difficult to acquire in remote regions, such as specific UAS rotors and cables. Here, organization, planning, and preparedness are necessary to eliminate error and inefficiency.

Grace noted that she always wrote a health and safety checklist and distributed it to her team prior to field departure. This included emergency contacts and environmental scenarios that might be a risk to the crew, including contaminated soils, rocky impasses, and the weather. She also

included routes to the nearest hospitals from the potentially hazardous areas. This not only prioritized the health and safety of the crew but also made data collection more efficient. She stressed that workday injuries can greatly impact data collection, but health and safety plans decrease time spent dealing with injuries, thus promoting more effective and efficient data collection. As demonstrated by Grace, preparedness and planning, so necessary to UAS surveys, can be easily altered to include health and safety measures, ultimately improving accessibility, safety, and efficiency for all team members.

Planning ahead is also necessary for understanding restrictions surrounding UAS use. For example, a UAS pilot's license (commercial remote pilot's license in the United States), is required to conduct UAS surveys, and place-based regulations dictate what types of UAS can be deployed, what airspaces can be flown in, and who can fly the UAS. Not unlike archaeological permitting, there are many regulations and procedures that impact UAS surveys, making planning a necessity; all contracts, permits, and licenses must be acquired prior to use and followed diligently.

Once in the field, it is important to park as close as possible to the field or area that one will survey. The equipment is heavy, and long-distance transport by hand increases the risk of breaking the equipment and can be a safety hazard for those carrying it. Thus, getting to areas accessible by car and setting up a home base are important for both the archaeologists and the UAS. Sometimes UAS requires a global navigation satellite system (GNSS) receiver for real-time kinematic flight path accuracy to increase the UAS's spatial awareness. It is also important to set up the computer, tablet, or phone with the flight paths and be in an area where the UAS, while flying, is always visible. Many surveys require archaeologists to set the UAS flight paths in advance, which functions as an "autopilot" where the UAS flies along preplanned transects that are monitored by the remote pilot. UAS surveys include downtime or periods of minimal work as one monitors the UAS fly over preset areas. John says it is good to have a seat and sun cover, so you do not have to stand while waiting to switch out the UAS batteries after it lands (Figure 2). Supplying seating at excavations is advised by the Enabled Archaeology Foundation to improve field accessibility, as is including ramps and steps (Fitzpatrick et al. 2025:16). A ramp, like the seats recommended by John, can easily be packed into a vehicle on UAS surveys to ease movement at sites.

Home bases, as depicted in Figure 2, can and should be modified to reflect the needs of the team present. UAS surveys are team-based, with people performing different tasks to increase the efficiency and success of data collection. Due to the necessary proximity of the vehicle, transporting the equipment is easy but should include at least one individual who is physically able to lift the equipment out of the vehicle. Multiple tasks are required during UAS survey setup, including setting up the computer and flight paths. This means a diverse set of researchers with varying levels of physical ability can participate in both the setup and piloting of UAS surveys. Operating the UAS requires the pilot to have the ability to fully control the remote control (a handheld device with buttons, control sticks, and a central screen). Even if the UAS is following a preplanned path, the remote pilot must be ready to intervene if the need arises, especially during takeoff and landing. Piloting the UAS can be accomplished sitting or standing up, as long as the remote pilot can maintain a visual line of sight with the UAS. Additional observers are also recommended to maintain sightline with the UAS at all times. The visibility necessary when piloting UAS may pose a challenge for researchers who are blind or low-visibility, or who are otherwise unable to maintain line of sight. Color blindness (most often associated with reduced ability to distinguish between green and red light bands) can also prove difficult when piloting UAS and processing remotely sensed data, as many technologies rely on green and red bands to demonstrate data differences. Additionally, many UAS use green and red navigation lights to help pilots and observers identify the UAS's position (especially at night). Here, prior disclosure of tasks and adjustments to workflow could help mitigate concerns related to visibility.

Discussed above are only a few examples of some of the tasks associated with flying the UAS in the field, which are often varied and contingent upon project needs. The exact needs of each UAS survey should be communicated prior to field departure to best prepare for the data collection and needs of the research team.

Accessibility and Safety

John was first introduced to UAS-deployed remote sensing technologies when he worked with the National Guard. The incentive of this form of data collection was desirable because it allowed for safety and increased access to survey areas on military land. For example, many survey areas could not be accessed on foot for safety reasons, such as toxic chemicals, explosives, and shrapnel. UAS offered a unique solution to limiting exposure to hazardous and inaccessible areas while still being able to map them. As a CRM field researcher who also worked in the US Southwest, John noted that environmental and archaeological surveys are particularly dangerous in this region (a hot, arid landscape), and there are strict rules about how much water needed to be brought to the field, the number of water breaks, and how many miles and hours teams could traverse in a day. This, he noted, is almost entirely transformed by UAS surveys.

The benefit of UAS for field safety is key to its potential for accessibility. Years of handheld magnetometry had left John with a chronic injury impacting his mobility and causing him pain, particularly in field settings. Seeking treatment for this injury is complicated by childcare duties and fieldwork requirements as part of his CRM work, making it impossible to find time to receive the necessary surgery without impacting his career or the care of his child. When asked about how UAS has improved his fieldwork, he highlighted UAS-deployed magnetometry as a comfortable alternative to the handheld version. Regarding UAS more generally, he states: “They make surveys accessible, since you need a flatbed truck, sun protection to keep the drone from overheating, cooler boxes, extra gasoline, cables, water, food, music, and comfort items. Someone with a physical disability or limited mobility can control the drones, monitor the computer work, and set up the flight plans—the bulk of the work.” Grace thinks the implementation of UAS in CRM, even just for mapping proposed survey areas in advance, could greatly improve accessibility and limit work-related injuries:

As a disabled woman, if the opportunity had been granted to use a drone to identify surveyable areas—instead of just trudging out there and enduring injuries and pain that that alone causes—this would have greatly limited my personal injuries and those of the team. If I could view an up-to-date high-resolution project area, it would make analysis and planning much easier, instead of using semi-blurry images from three or more years ago where the landcover has, often, changed greatly. Most times a client can’t tell you the land conditions, so knowing beforehand would help people with accessibility needs, since they could make plans and see if they could accept a project they’d otherwise assume inaccessible.

In their 2025 guide, the Enabled Archaeology Foundation highlights flexibility as essential to developing accessible archaeological fieldwork (Fitzpatrick et al. 2025:5), something that is also necessary for UAS surveys. For example, some sensors are more effective than others in certain conditions, and each requires different care. Furthermore, team members can switch tasks, having someone monitor the UAS, someone set up flight routes, and other personnel be available to walk in case the UAS crashes in a field far away. In my experience, the person performing survey roles switched duties based on day-to-day needs and comfort. When with the UAS, sometimes I was monitoring the flight, sometimes I was talking to local community members about their land, and other times I was collecting ground control points (coordinates that can be input into processing software to improve data accuracy). Flexible workflows are not only key to field success but necessary for UAS surveys.

As discussed above, planning and checklists are key to UAS fieldwork success, which overlaps with improving accessibility. Sneed and Shrader (2024:61) note:

The first and perhaps biggest obstacle for a disabled person considering whether to apply to work on a project is predicting if and what additional accommodations may be required. As is the case for anyone participating in a field school for the first time or working on a new project, there is a gap between expectation and reality. Fortunately, however, there are ways that everyone, including disabled people, can anticipate where they may need accommodation. In advertisements and

orientations for the project, the director and other experienced team members can present the realities of fieldwork on the site.

UAS surveys must be planned well in advance not only to determine viable survey tracts but also to acquire necessary permitting and licenses. This is the same for all archaeological fieldwork, yet many plans are not effectively disclosed to field participants prior to departure and/or on a day-to-day basis. In UAS work, however, planning, checking, and double-checking that all permits, licensing, field tracks, flight plans, and equipment are secured and prepared is the norm. Therefore, checking in with field participants and including safety and accommodation measures within this planning can become streamlined.

As is the case with most technologies or gear that pose high price points, anxiety levels can elevate. This is especially true in archaeological field settings where researchers are often separated from their homes, families, pets, and other daily comforts, working in laborious conditions. Reducing anxiety-triggers by being flexible and understanding that technologies, especially with multiple moving parts, require adjustments in workflows is important to improving field safety. It is also necessary to limit outside pressures while both acknowledging and accepting that trial and error are nothing out of the ordinary. When asked how he safely mitigates stress, John stated, “Pay attention and plan ahead. When aware of the dangers, it’s a highly predictable survey situation.” This statement further highlights the necessity of prior planning. Nonetheless, anxiety is a real safety concern in the field, and it is necessary to understand potential triggers before entering these settings. Taking the time to not only plan ahead but to take breaks, take one’s time, and even change plans is key to reducing anxiety and promoting safety in potentially high-stress situations.

Community-Engaged Research

Improving accessibility in fieldwork is in line with the priorities of community-engaged archaeology, which is not limited to public archaeology (often bound to the communication of archaeological results to broader publics), but rather spans the entire archaeological process, from research design to fieldwork, to the dissemination of results (Atalay 2012). By enabling a more accessible community-engaged archaeology, UAS surveys can promote larger archaeological labor management goals, particularly as they relate to the use of low-impact methodologies (see Gonzalez 2016) that limit destruction of the archaeological record while promoting community-defined heritage goals. For example, a professor shared their experience working with an Indigenous community in the United States, where their team mapped a large portion of the community’s reservation lands using UAS-deployed sensors. Before they flew the UAS, they worked with the Tribal council to define the targeted survey area, establish a Tribal monitoring procedure, and determine how results would be shared. This collaboration proved effective in mapping the archaeological landscape while minimizing risk and destruction to cultural heritage.

In addition to enabling a nondestructive approach to archaeological fieldwork, UAS technologies, virtual reality, and high-resolution 3D features and artifact scanning can help community members engage with their cultural heritage when they cannot physically visit these sites. For example, multiple archaeologists I spoke with expressed the opinion that UAS aerial scanning and documentation could be easier for community elders to access than physically visiting sites. Furthermore, archaeologists from the government sector noted that they are actively educating their communities, archaeological and otherwise, on the benefits of UAS for heritage preservation and land management. These same archaeologists are especially excited about its potential community-engaged use for monitoring coastal and high-impact climate areas susceptible to heavy erosion, and which are unsafe to access on foot. Here, archaeologists have identified an area of concern where UAS could improve both site protection and surveyors’ safety. Overall, what these community-engaged sentiments have in common is that UAS surveys can improve accessibility to cultural heritage through the digital documentation of archaeological sites that are difficult to access or are inaccessible on foot. Furthermore, their minimally invasive nature limits the destruction of heritage sites altogether.

While these digital technologies can improve accessibility for communities and researchers with mobility limitations, these technologies can also introduce new barriers around the sharing and use of the data produced. Digital data and the creation of large digital datasets have the potential to limit access as a result of disparities in digital literacy and access to the necessary technology needed to view high-resolution images and datasets (Faniel et al. 2018). This is something to be aware of when creating digital datasets: accessible data collection, analysis, and dissemination might not all look the same and, thus, require flexibility, planning, and consultation to confirm that the research design is accessible and effective. Ultimately, accessible archaeological fieldwork and productive, safe labor management are multifaceted; they should include a diversity of researchers, prioritize community engagement, and utilize a suite of archaeological methods to promote maximal knowledge production and distribution of results, with minimal impact on all communities and laborers participating or sharing in the research.

Conclusion and Future Directions

Throughout this article I have outlined three main benefits of UAS fieldwork for improving the accessibility of archaeological fieldwork: (1) planning and disclosure of tasks ahead of field departure, (2) flexibility in workflows to accommodate the varying needs of both the field team and form(s) of data collection, and (3) increased reliance on vehicles and minimized physical labor. Preplanning and the disclosure of tasks related to UAS surveys enable archaeologists to determine what accommodations they may need to participate in this type of fieldwork. The disclosure of tasks should be communicated prior to field departure and during fieldwork itself. To support ease of planning, a checklist is included here as Supplementary Material 1, which can be modified by archaeologists to best support their research project and accessibility needs. Similarly, flexibility in workflows allows archaeologists to switch tasks and change plans to best suit the safety and abilities of the research team. Finally, increased reliance on vehicles and minimized physical labor associated with UAS use can enable a wider range of archaeologists to participate in data collection in archaeological fieldwork environments, not just able-bodied researchers. Furthermore, the reliance on vehicles improves safety, as it reduces the risk of physical-labor-related injuries. I would like to further emphasize that planning/disclosure of tasks and flexible workflows are two key areas of improvement proposed by disability studies in archaeology literature, and they promote accessible fieldwork practices at large (Fitzpatrick et al. 2025; Sneed and Shrader 2024). Likewise, including disabled archaeologists in the creation of fieldwork plans would best support the accessibility of research projects (Fitzpatrick et al. 2025; Heath-Stout et al. 2022; Sneed and Shrader 2024).

Although place-based UAS regulations impact how research is completed, the three key takeaways regarding accessible UAS surveys listed above are not specific to North America. The experiences discussed in this article were those of archaeologists based in North America, yet their research and field sites are globally situated. Furthermore, the UAS research articles analyzed here present the effectiveness of UAS-deployed remote sensing worldwide, including the Netherlands, Oman, Romania, Spain, Turkey, and multiple US states. Nonetheless, to further account for differences in applications of UAS technologies, a more globalized perspective could gauge specific strategies, needs, or limitations present at different sites and institutions worldwide.

Accessible UAS workflows that emphasize planning, safety, and flexibility can be used to make data collection and archaeological fieldwork more inclusive of disabled researchers, as well as safer for everyone. To improve the application of UAS in promoting archaeological practice, one that “involves the active recruitment and inclusion of disabled people in archaeological fieldwork,” we must prioritize feedback and input from a diversity of disabled researchers (Sneed and Shrader 2024:51). It is important to highlight that UAS may not be the accessible alternative for everyone, as there is no one-size-fits-all solution, hence the importance of promoting accessibility in fieldwork across methods and sectors. Here, the methods and labor management practices learned from the accessibility of UAS can, and should, be applied to archaeological practice at all scales: UAS fieldwork should not be the sole accessible alternative with other aspects of fieldwork remaining ableist. In line with the principles of Universal Design, by prioritizing disability accessibility we improve labor management and safety in the field for everyone.

Acknowledgments. First and foremost, I would like to thank everyone (unnamed for anonymity) who shared their experiences and participated in these interviews. Your commitment to safety and accessibility in fieldwork is inspiring. Thank you, also, for contributing to the sample safety checklist and for your feedback on versions of this draft; this was a collaborative effort that could not have been done without your support. Thank you very much to all the anonymous reviewers for their constructive and detailed feedback. Thank you to Andrew Bauer and Tamas Polanyi for your feedback, in addition to providing the figures demonstrating versions of UAS fieldwork in archaeology. Thank you to Debby Sneed and Zach Silvia for also providing generous feedback on versions of this manuscript. Finally, I would like to extend a special thank you to Laura Heath-Stout; this research and article are possible thanks to your encouragement.

Funding Statement. The author received no financial support for the research, authorship, or publication of this article.

Data Availability Statement. Original interview data used in this study are IRB Exempt (Protocol #IRB-82737) and were collected through voluntary, informed conversations. All relevant statements/data are included in this document, and no other data will be shared, to maintain the anonymity of those who participated. The UAS references used in this research are publicly available and are included in the References Cited section of this article.

Competing Interests. The author declares no competing interests.

Supplementary Material. The supplementary material for this article can be found at <https://doi.org/10.1017/aap.2026.10160>.
Supplementary Material 1. Sample Field Checklist Form (text).

References Cited

- Atalay, Sonya. 2012. *Community-Based Archaeology: Research with, by, and for Indigenous and Local Communities*. University of California Press, Berkeley.
- Bauer, Andrew M. 2013. Impacts of Mid- to Late-Holocene Land Use on Residual Hill Geomorphology: A Remote Sensing and Archaeological Evaluation of Human-Related Soil Erosion in Central Karnataka, South India. *Holocene* 24(1):3–14. <https://doi.org/10.1177/0959683613512165>.
- Bauer, Andrew M. 2018. Remote Sensing Soils and Social Geographies of Difference: The Landscape Archaeology of Regur from Iron Age through Medieval Period Northern Karnataka, Southern India. *Journal of Field Archaeology* 43(1):31–43. <https://doi.org/10.1080/00934690.2017.1418611>.
- Braşoveanu, Casandra, Alin Mişu-Pintilie, and Radu-Alexandru Brunchi. 2023. Inside Late Bronze Age Settlements in NE Romania: GIS-Based Surface Characterization of Ashmound Structures Using Airborne Laser Scanning and Aerial Photography Techniques. *Remote Sensing* 15(17):4124. <https://doi.org/10.3390/rs15174124>.
- Campana, Stefano. 2017. Drones in Archaeology: State-of-the-Art and Future Perspectives. *Archaeological Prospection* 24(4):275–296. <https://doi.org/10.1002/arp.1569>.
- Carabajal, Ivan G., and Christopher L. Atchison. 2020. An Investigation of Accessible and Inclusive Instructional Field Practices in US Geoscience Departments. *Advances in Geosciences* 53:53–63. <https://doi.org/10.5194/adgeo-53-53-2020>.
- Carmona, José Ángel Salgado, Elia Quirós, Victorino Mayoral, and Cristina Charro. 2020. Assessing the Potential of Multispectral and Thermal UAV Imagery from Archaeological Sites: A Case Study from the Iron Age Hillfort of Villavieja del Tamuja (Cáceres, Spain). *Journal of Archaeological Science: Reports* 31:102312. <https://doi.org/10.1016/j.jasrep.2020.102312>.
- Casana, Jesse. 2017. Regional-Scale Archaeological Remote Sensing in the Age of Big Data: Automated Site Discovery vs. Brute Force Methods. *Advances in Archaeological Practice* 2(3):222–233. <https://doi.org/10.7183/2326-3768.2.3.222>.
- Casana, Jesse, and Jackson Cothren. 2013. The CORONA Atlas Project: Orthorectification of CORONA Satellite Imagery and Regional-Scale Archaeological Exploration in the Near East. In *Mapping Archaeological Landscapes from Space*, edited by Douglas C. Comer and Michael J. Harrower, pp. 33–43. SpringerBriefs in Archaeology Vol. 5. Springer, New York.
- Casana, Jesse, Jackson Cothren, and Tuna Kalayci. 2012. Swords into Ploughshares: Archaeological Applications of CORONA Satellite Imagery in the Near East. *Internet Archaeology* 32(2). <https://doi.org/10.1114/ia.32.2>.
- Casana, Jesse, Severin Fowles, Lindsay M. Montgomery, Richard Mermejo, Carolin Ferwerda, Austin Chad Hill, and Michael Adler. 2023. Multi-Sensor Drone Survey of Ancestral Agricultural Landscapes at Picuris Pueblo, New Mexico. *Journal of Archaeological Science* 157:105837. <https://doi.org/10.1016/j.jas.2023.105837>.
- Casana, Jesse, John Kantner, Adam Wiewel, and Jackson Cothren. 2014. Archaeological Aerial Thermography: A Case Study at the Chaco-Era Blue J Community, New Mexico. *Journal of Archaeological Science* 45:207–219. <https://doi.org/10.1016/j.jas.2014.02.015>.
- Casana, Jesse, Elise J. Laugier, Austin Chad Hill, Kelsey M. Reese, Carolin Ferwerda, Mark D. McCoy, and Thegn Ladefoged. 2021. Exploring Archaeological Landscapes Using Drone-Acquired LiDAR: Case Studies from Hawai'i, Colorado, and New Hampshire, USA. *Journal of Archaeological Science: Reports* 39:103133. <https://doi.org/10.1016/j.jasrep.2021.103133>.
- Casana, Jesse, Adam Wiewel, Autumn Cool, Austin Chad Hill, Kevin D. Fisher, and Elise J. Laugier. 2017. Archaeological Aerial Thermography in Theory and Practice. *Advances in Archaeological Practice* 5(4):310–327. <https://doi.org/10.1017/aap.2017.23>.

- Challis, Keith, Gary Priestnall, Adam Gardner, Julian Henderson, and Sarah O'Hara. 2004. Corona Remotely-Sensed Imagery in Dryland Archaeology: The Islamic City of al-Raqqa, Syria. *Journal of Field Archaeology* 29(1–2):139–153. <https://doi.org/10.1179/jfa.2004.29.1-2.139>.
- Chase, Arlen F., Diane Z. Chase, John F. Weishampel, Jason B. Drake, Ramesh L. Shrestha, K. Clint Slatton, Jaime J. Awe, and William E. Carter. 2011. Airborne LiDAR, Archaeology, and the Ancient Maya Landscape at Caracol, Belize. *Journal of Archaeological Science* 38(2):387–398. <https://doi.org/10.1016/j.jas.2010.09.018>.
- Chasen, Ariel, Hannah Chapman Tripp, and Maura Borrego. 2025. Disability and Postsecondary Fieldwork Experiences in the Natural Sciences: A Systematic Review. *Journal of Research in Science Teaching* 62(4):1006–1039. <https://doi.org/10.1002/tea.21989>.
- Chiabrando, Filiberto, Francesco D'Andria, Giulia Sammartano, and Antonia Spano. 2018. UAV Photogrammetry for Archaeological Site Survey: 3D Models at the Hierapolis in Phrygia (Turkey). *Virtual Archaeology Review* 9(18):28–43.
- Eiselt, B. Sunday, J. Andrew Darling, Samuel Duwe, Mark Willis, Chester Walker, William Hudspeth, and Leslie Reeder-Meyers. 2017. A Bird's-Eye View of Proto-Tewa Subsistence Agriculture: Making the Case for Floodplain Farming in the Ohkay Owingeh Homeland, New Mexico. *American Antiquity* 82(2):397–413. <https://doi.org/10.1017/aaq.2017.3>.
- Faniel, Ixchel M., Anne Austin, Eric Kansa, Sarah Whitcher Kansa, Phoebe France, Jennifer Jacobs, Ran Boytner, and Elizabeth Yael. 2018. Beyond the Archive: Bridging Data Creation and Reuse in Archaeology. *Advances in Archaeological Practice* 6(2):105–116. <https://doi.org/10.1017/aap.2018.2>.
- Fitzpatrick, Alex, Sarahjayne Clements, Abigail Hunt, Kymberly Jones, Freya O'Dea, and David Connolly. 2025. A Guide to Disability Inclusion in Archaeology. Electronic document, <https://www.bajr.org/wp-content/uploads/2025/06/BAJRGuideEAF.pdf>, accessed February 18, 2026.
- Fontana, Giacomo. 2022. Italy's Hidden Hillforts: A Large-Scale LiDAR-Based Mapping of Samnium. *Journal of Field Archaeology* 47(4):245–261. <https://doi.org/10.1080/00934690.2022.2031465>.
- Fraser, Meredith A. 2007. Dis/Abling Exclusion, En/Abling Access: Identifying and Removing Barriers in Archaeological Practice for Persons with (Dis/)abilities. PhD dissertation, Department of Anthropology, American University, Washington, DC.
- Gallagher, Julie, and Richard Josephs. 2008. Using LiDAR to Detect Cultural Resources in a Forested Environment: An Example from Isle Royale National Park, Michigan, USA. *Archaeological Prospection* 15(3):187–206.
- Gonzalez, Sara L. 2016. Indigenous Values and Methods in Archaeological Practice: Low-Impact Archaeology through the Kashaya Pomo Interpretive Trail Project. *American Antiquity* 81(3):533–549. <https://doi.org/10.7183/0002-7316.81.3.533>.
- Hammer, Emily, Mackinley FitzPatrick, and Jason Ur. 2022. Succeeding CORONA: Declassified HEXAGON Intelligence Imagery for Archaeological and Historical Research. *Antiquity* 96(387):679–695.
- Hammer, Emily, and Anthony Lauricella. 2017. Historical Imagery of Desert Kites in Eastern Jordan. *Near Eastern Archaeology* 80(2):74–83.
- Heath-Stout, Laura E. 2023. The Invisibly Disabled Archaeologist. *International Journal of Historical Archaeology* 27(1):17–32. <https://doi.org/10.1007/s10761-022-00653-8>.
- Heath-Stout, Laura, Katherine Kinkopf, and Laurie Wilkie. 2022. Confronting Ableism in Archaeology with Disability Expertise. *SAA Archaeological Record* 22(4):13–17.
- Hill, Austin Chad, Elise Jakoby Laugier, and Jesse Casana. 2020. Archaeological Remote Sensing Using Multi-Temporal, Drone-Acquired Thermal and Near Infrared (NIR) Imagery: A Case Study at the Enfield Shaker Village, New Hampshire. *Remote Sensing* 12(4):690. <https://doi.org/10.3390/rs12040690>.
- Kennedy, David. 1998. Declassified Satellite Photographs and Archaeology in the Middle East: Case Studies from Turkey. *Antiquity* 72(277):553–561.
- Klehm, Carla, Elisabeth Hildebrand, and Maureen S. Meyers. 2021. Mitigating Chronic Diseases during Archaeological Fieldwork: Lessons from Managing Asthma, Diabetes, and Depression. *Advances in Archaeological Practice* 9(1):41–48.
- Lasaponara, Rosa, and Nicola Masini. 2011. Satellite Remote Sensing in Archaeology: Past, Present and Future Perspectives. *Journal of Archaeological Science* 38:1995–2002.
- Masini, Nicola, Fabrizio Terenzio Gizzi, Marilisa Biscione, Vincenzo Fundone, Michele Sedile, Maria Sileo, Antonio Pecci, Biagio Lacovara, and Rosa Lasaponara. 2018. Medieval Archaeology under the Canopy with LiDAR: The (Re)Discovery of a Medieval Fortified Settlement in Southern Italy. *Remote Sensing* 10(10):1598. <https://doi.org/10.3390/rs10101598>.
- Masini, Nicola, and Rosa Lasaponara. 2006. Satellite-Based Recognition of Landscape Archaeological Features Related to Ancient Human Transformation. *Journal of Geophysics and Engineering* 3(3):230–235.
- Moore, Elizabeth, Tony Freeman, and Scott Hensley. 2006. Spaceborne and Airborne Radar at Angkor: Introducing New Technology to the Ancient Site. In *Remote Sensing in Archaeology: Interdisciplinary Contributions to Archaeology*, edited by James Wiseman and Farouk El-Baz, pp. 185–216. Springer, New York.
- National Disability Authority. 2026. *Definition and Overview of Universal Design (UD)*. Centre for Excellence in Universal Design, Dublin, Ireland. <https://universaldesign.ie/about-universal-design/definition-and-overview>, accessed February 18, 2026.
- Opitz, Rachel, and David Cowley (editors). 2013. *Interpreting Archaeological Topography: Lasers, 3D Data, Observation, Visualisation and Applications*. Oxbow, Oxford.
- Opitz, Rachel S., Krysta Ryzewski, John F. Cherry, and Brenna Moloney. 2015. Using Airborne LiDAR Survey to Explore Historic-Era Archaeological Landscapes of Montserrat in the Eastern Caribbean. *Journal of Field Archaeology* 40(5):523–541. <https://doi.org/10.1179/2042458215Y.0000000016>.

- Paulsen, Paige, Carolin Ferwerda, Joseph W. Lehner, Michael J. Harrower, Amir Zaribaf, Petra Creamer, and Jesse Casana. 2026. Drone-Based Thermal Imaging of Subsurface Architecture: Methodological Insights and Discoveries at Iron Age Raki (Oman). *Journal of Archaeological Science: Reports* 69:105569.
- Procter, Caitlin, and Branwen Spector (editors). 2024. *Inclusive Ethnography: Making Fieldwork Safer, Healthier and More Ethical*. Sage Publications, London.
- Risbøl, Ole, and Lars Gustavsen. 2018. LiDAR from Drones Employed for Mapping Archaeology: Potential, Benefits and Challenges. *Archaeological Prospection* 25(1):329–338.
- Roiha, Johanna, Heinari, Einari, and Markus Holopainen. 2021. The Hidden Cairns—A Case Study of Drone-Based ALS as an Archaeological Site Survey Method. *Remote Sensing* 13(10):2010.
- Romano, David Gilman, and Osama Tolba. 1996. Remote Sensing and GIS in the Study of Roman Centuriation in the Corinthia, Greece. In *Interfacing the Past: Computer Applications and Quantitative Methods in Archaeology CAA95: Analecta Praehistorica Leidensia* 28, Vol. 2, edited by Hans Kamermans and Kelly Fennema, pp. 461–468. Institute of Prehistory, University of Leiden, Leiden, Netherlands.
- Sneed, Debby, and Mason Shrader. 2024. Digging While Impaired: Promoting the Accessibility of Archaeology Discipline. *Ethics in Archaeological Practice: The Annual of the American Society of Overseas Research* 78:51–70.
- Waagen, Jitte, and Anne van Hilst. 2025. Drones over Excavations: Enhancing the Archaeologist's Eyes: An Empirical Case Study into the Deployment of UAS Remote Sensing as a Research Tool for Archaeological Excavation in Veldhoven, the Netherlands. *Journal of Archaeological Science: Reports* 62:105043.
- White, William A., III. 2021. Applying Risk Management Concepts from CRM and the Outdoor Recreation Industry to Academic Archaeology Projects. *Advances in Archaeological Practice* 9(1):61–65.