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RESEARCH ARTICLE



At the intersection of environmental learning and special education: Hidden opportunities

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ABSTRACT

This mixed methods study explored accessibility and inclusion in field trip-based environmental learning programming among 80 staff members from 69 organizations across the United States. Quantitative survey results indicated that over 85% of organizations offered programs perceived as accessible to students with disabilities, though the degree of accessibility varied widely. Qualitative data revealed a spectrum of inclusive practices, ranging from minimal accommodations to fully integrated approaches. The findings underscore three key themes: 1) the persistence of ableist frameworks within environmental education, 2) the influence of federal education policies on improving accessibility practices, and 3) the importance of comprehensive organizational commitment to fostering sustainable, inclusive change within environmental learning organizations.

KEYWORDS

accessibility;
environmental learning;
field trip programming;
inclusive practices

Introduction

Research consistently demonstrates that pro-environmental ideologies are often fostered through personal connections and experiences, leading to natural knowledge development, including the significance and exigency of protecting nature and a more sustainable future (Aguilar et al., 2017). Nationwide, many students have opportunities to participate in experiential learning activities at unique outdoor locations—also known as environmental learning (EL; Hemby et al., 2024). However, these locations and activities have not always been designed with all learners in mind, specifically people with disabilities, who have been excluded from full participation due to physical, curricular, and social barriers (Brannan et al., 2002).

In this study, accessibility is examined across three dimensions: physical (e.g., terrain, infrastructure), attitudinal (e.g., staff training, cultural belonging), and curricular (e.g., instructional methods, materials). Inclusion is defined here as the meaningful participation of all participants, supported by necessary accommodations or modifications to ensure equitable engagement. For this study, the term EL is used as an umbrella term to include the various iterations of environmental-focused education programs pertaining to human relationships with the natural environment, such as environmental education (EE), outdoor education (OE), adventure education, and site-based nature learning experiences.

Background

Historically, students with disabilities have not been recognized in the development of EL programming or spaces, which resulted in programs entrenched in ableist ideologies. Presently, opportunities for youth to have personal and learning experiences in the natural world are steadily decreasing, which inhibits their opportunities to develop personal connections to nature (Louv, 2005; Umali & Gonzalez, 2020). The rise of EL in the United States during the 1970s was expected to impact the societal relationship with

nature and reshape the spreading belief that our growth, well-being, and future can be maintained separately from the natural world (Johnson & Činčera, 2023; Lubis, 2021). While the EL movement has grown, its reach and opportunity for access have not been equitably distributed (Groulx et al., 2021; Moustakas & Mania, 2021; Schmidt et al., 2021; Stern et al., 2022) and there is no current national policy regarding equitable access to learning opportunities in environmental education (Schmidt, 2023). To increase the impact of EL programming and foster pro-environmental competencies, opportunities for all youth to engage with EL must become more accessible for students of all cognitive, social, and physical abilities and backgrounds (Aguilar et al., 2017; Story et al., 2024).

Around the same time that EL programming began to rise in the United States, Congress passed the Education for All Handicapped Children Act (1975), later renamed the Individuals with Disabilities Education Act (IDEA) in 1990 (National Education Association, 2025). The IDEA outlines that students with disabilities have the right to a free appropriate public education in the least restrictive environment and should be supported by any necessary accommodations or modifications (National Education Association, 2025). IDEA specifically applies to K-12 public education institutions; therefore, all EL organizations owned or operated by a public school district *are* required to comply with IDEA. Community-owned or private-owned EL organizations are generally not bound by IDEA unless they receive public funding or are providing services as a part of a student's Individual Education Plan. The Americans with Disabilities Act (ADA), passed in 1990, prohibits discrimination against individuals with disabilities in all contexts, including those that do not receive federal funding (e.g., community- or private-owned EL organizations; Education Law Center, 2010). The ADA further requires organizations to provide reasonable modifications for students with disabilities to participate in their programs, unless doing so fundamentally alters said program or imposes excessive financial and administrative load (U.S. Department of Justice, 2025). Although IDEA and ADA offer EL leaders a framework for inclusion in out-of-school learning environments, a gap exists regarding guidance and enforcement of these practices. Recent scholarship confirms that intersectional frameworks are rarely applied in practice within EL settings (Schmidt, 2023). Still, as the prevalent national law pertaining to students with disability, this study used parts of the IDEA's definition of accessibility as a baseline to examine whether EL programming is intentionally inclusive of students with disabilities.

Exclusionary practices will continue to prevail within EL until foundational pro-inclusion ideologies become an engrained pillar in the field of EL. Participation in EL programming is a privileged experience heavily based on socioeconomic and ability (physical and cognitive), which has marginalized diverse learning groups (Aguilar et al., 2017; Story et al., 2024). As U.S. demographics continue to change, so should all forms of education. To grow and expand practices, attitudes, ideologies, and policies based upon the needs of those in the served community, inclusion must be a part of the foundational identity of education-based agencies, specifically those operating outside of traditional school systems. By working toward universally designed programs, EL organizations can take steps to acknowledging inherently exclusionary practices and identifying individual and collective starting points toward building equitable learning opportunities in nature (Bonta, 2019; Burns & Graefe, 2007; Nagakyrie, 2022). Implementing accessibility measures and considering the needs of marginalized groups ensures that the field of EL will become more physically, emotionally, and socially accessible to diverse learners.

A wealth of research exists on the positive impacts that intentional engagement with the natural world has on mental and physical well-being (Hurly & Walker, 2019; Kuo et al., 2022). This literature also includes the impact of specialized and separate/segregated EL programs for youth and adults with disabilities; yet, there is minimal literature directly addressing the inclusion of youth with disabilities in field trip-based EL programs (Bonta, 2019; Salvatore & Wolbring, 2022; Stern et al., 2022). This study explored the current state of inclusive practices in field trip-based opportunities to address the limitations in the knowledge of inclusivity in site-based EL.

Literature

The goal of this literature review was to understand the methods U.S.-based EL organizations have used to successfully integrate students with disabilities in field trip-based experiences. These experiences

include educational-based summer camps, residential/overnight programs, and day trips, all of which are novel experiences for immersive learning at locations away from school grounds. Since this study focused on a national survey of field trip-based EL programs, the following sections highlight key literature related to the inclusion of students with disabilities into these specific EL contexts.

Before proceeding with the analysis of the literature most relevant to this study's scope, it is important to note promising work in related fields regarding accessible field trip-based learning opportunities for youth with disabilities. For example, in the United States, therapeutic outdoor programs, such as adventure therapy and wilderness therapy, serve youth with disabilities or mental health challenges, but these are generally segregated experiences tailored exclusively for those populations (Dillenschneider, 2007; Johnson et al., 2020; Nocera et al., 2022; Wozencroft et al., 2019; Zwicker et al., 2015). In addition, camps and outdoor adventure designed solely for individuals with disabilities provide valuable opportunities for site-based EL immersive learning, but they do not include non-disabled peers and are not representative of inclusive programming (Caron et al., 2025; Lieberman et al., 2023). The field of geoscience is also leading U.S. research on practical and evidence-informed guidance on methods for developing accessible fieldwork opportunities in postsecondary education contexts for adults with disabilities (Carabajal & Atchison, 2020; Chiarella & Vurro, 2020; Feig et al., 2019; Hendricks et al., 2017; Stokes et al., 2019). This research provides important models for reference that can be adapted for inclusion of school-age youth. However, these areas of contemporary research do not focus on inclusion-based programs that bring together students with and without disabilities. This finding aligns with Brannan et al.'s (2002) observation that although programs for individuals with disabilities exist, research on inclusive practices in traditional EL settings is still emerging. Finally, a growing body of literature exists on Universal Design for Learning (UDL) applied to EL or nature-based learning (Kelly et al., 2022; Pikus et al., 2025), but this research often focuses on school-based classroom contexts rather than field trips, limiting their direct relevance to this study.

United States-based national survey studies

Two national survey studies stand out as foundational to understanding inclusive EL site-based programming. The American Camping Association (ACA) survey by Brannan et al. (1997) is among the most comprehensive studies on integrated youth programming at camps and outdoor education agencies. Of the 162 camps and EL agencies identified, 71 completed the ACA survey. Of those 71 survey responses, 31 camps had programs implemented with nondisabled students and that provided program sessions integrating disabled campers. In addition, 24 camps provided programming specifically designed for campers with disabilities and that provided "reverse mainstream" programming opportunities for non-disabled peers to join (Brannan et al., 1997, p. 32). Analysis focused on the 31 mainstream camps that reported inclusive programming and found that children with disabilities participated alongside their peers in 94% of program activities. This study underscored the following key factors for successful integration: intentional staff training, adaptive programming, accessible facilities, and proactive peer support.

The second foundational survey study was conducted by Liddicoat et al. (2006) on Residential Outdoor Environmental Education (ROEE) and identified 350 centers. A total of 137 surveys were returned; 96 were completed, while the other 41 reported they did not provide ROEE to school groups. Liddicoat et al. focused on the processes used by EL organizations to support inclusion of students with disabilities. Of the 96 ROEE agencies, 64% reported that school recruitment encourages the inclusion of students with disabilities. For staff preparation, 34% of ROEE agencies included a question about experience working with students with disabilities during their hiring process and 25% stated consistent employment of staff with knowledge on how to make accommodations. To strengthen staff preparation to support diverse learners, 50% reported providing training on adaptation of activities, instructional techniques to facilitate communication between all students, and site/location-specific accessibility. An important point addressed was the need for the ROEE staff to have prior notice of students with disabilities attending, and 70% of the ROEE agencies required schools to provide "medical or special needs information" for all students attending (p. 122). To address physical and facility accessibility, 45% reported the use of an accessibility survey of their overall site. A higher number (55%) also reported the adaptation of

program equipment for select activity sites. For curricular accessibility, 81% stated materials included pre-developed options for adapting activities. Liddicoat et al.'s findings were foundational to the survey developed for this study.

Brannan et al. (1997) and Liddicoat et al. (2006) confirmed that due to the lack of publicly accessible lists of organizations, collaboration with other national-level organizations was required to distribute the surveys to EL organizations across the United States. A more recent national survey on the availability of U.S.-based EE field trip programs corroborated the limited access to comprehensive state databases of EE providers (Hemby et al., 2024). Hemby et al. (2024) surveyed the spatial accessibility for single-day EE field trip programs for middle school students (5th–8th grade). Using public and private school locations and confirmed EE providers, they identified higher rates of spatial access in urban and suburban locations than in rural areas. The results indicate that access for BIPOC youth is limited due to “issues such a historic systemic racism, multi-generational poverty, and inequitable educational opportunities” (p. 230). Although access for students with disabilities was not explicitly discussed, the disability community faces similar challenges to EL access due to historic systemic ableism and inequitable educational opportunities.

United States field trip-based studies

Research on inclusive, field trip-based EL programs in the United States has explored the feasibility of integrating students with disabilities and the developmental outcomes for all participants. Early research by Schleien et al. (1994) examined whether the inclusion of students with severe intellectual disabilities in a one-day EL program affected the cognitive growth of general education students. Their findings showed no negative impact on the cognitive gains of students without disabilities. Staff attitudes were generally positive toward inclusion, although some expressed the need to maintain segregated programming. Similarly, Rynders et al. (1990) investigated the feasibility of integration/inclusion of students with severe disabilities (i.e., Autism and severe cognitive, physical, and sensory disabilities) during a 2-week camping trip. Data collection methods in this case study looked at the attitudes, social interactions, frequency of socially appropriate behavior, and the development of leisure and daily living skills. Results documented improvements in the students' independent living skills and socially appropriate behaviors. The positive social dynamics and staff perceptions throughout the program suggested inclusion benefits for students outweighed implementation challenges. EL staff perceptions from Schleien et al. (1994) and Rynders et al. (1990) were positive and supported the integration of the special education students, despite increased challenges associated with program implementation when compared to typical homogeneous groups. The majority of EL staff in both studies concluded integration practices were beneficial for all participants, especially general education students.

Building on these foundational studies, the National Inclusive Camp Practices project advanced understanding of effective practices at inclusive camps and outdoor schools. Using sites identified through the ACA survey (1997), Brannan et al. (2002) and Fullerton et al. (2002) performed qualitative and quantitative studies at the same sites and published the results in two companion pieces to identify effective practices and points of developmental growth. Brannan et al. surveyed the inclusive programs and determined successful inclusive programs prioritized intentional staff training, adaptive programming, accessible facilities, and proactive peer-support strategies. The identified practices were reported contributors to greater participation and social integration for youth with disabilities. The second publication by Fullerton et al. provided insights into qualitative data collected through a multi-case analysis from the same sites. Results indicated that inclusive camp programs fostered increased self-confidence, social competence, and a stronger sense of belonging among participants with disabilities. These results emphasize the impact intentions inclusive design has on environmental access and meaningful social engagement.

More recent work has explored group dynamics and technology's role in supporting inclusive outdoor setting. Sutherland and Stroot (2010) investigated the impact on group dynamics of a three-day rock climbing trip with the inclusion of one student with high functioning Autism through an ethnographic case study. Their observations highlighted how “challenge by choice” empowered the student to regulate his participation and helped the group bond socially, illustrating the importance of flexible,

participant-centered approaches to inclusion. Moore et al. (2016) incorporated the use of an iPad during three hikes over the course of three semesters to increase engagement and access to science content for two students with ADHD. Before and after each hike, students completed a pre- and post-multiple choice test on content knowledge as well as a Likert-style environmental awareness survey. Although limited by a small sample due to attrition, results suggested that technology can help students with disabilities achieve learning gains comparable to their peers in field-based environments.

At the organizational level, Columb et al. (2020) surveyed EE centers in Wisconsin to assess diversity, equity, and inclusion (DEI) efforts. Their findings showed strong commitments to DEI principles but also persistent challenges translating these into effective practices, particularly regarding staff training, inclusive program development, and community outreach. The authors called for additional resources, guidance, and collaboration to support meaningful inclusion of diverse audiences, including individuals with disabilities. A common practice in EL organizations reported by Columb et al. (2020) was using funding designated specifically for professional growth opportunities focused on DEI, physical modifications to the facilities to support increased physical accessibility, and local community collaboration and partnerships. These studies highlight the importance of training opportunities for EL staff to provide a foundation of knowledge from which DEI initiatives can stem. Leading changes made in pre-trip communication, collaboration with local community resources and organizations, maintenance of affordable cost of EL programs, and modifications or accommodations to program material proved to support independent participation and engagement.

Literature conclusion

Despite these valuable insights, a notable gap persists. Few studies have systematically examined how inclusive practices are conceptualized, implemented, and scaled across multiple EL sites providing school-organized field trips (Chasen et al., 2025; Salvatore & Wolbring, 2022). Most U.S.-based field trip literature focuses on general education students' learning outcomes (Bravo et al., 2022; Kiewra et al., 2023; Richmond et al., 2018), leaving little understanding of organizational-level efforts to increase equitable access for students with disabilities. This study aims to address this gap by surveying EL organizations nationwide to understand how they currently conceptualize and implement accessibility and inclusion for students with disabilities, to provide more equitable EL field trip experiences.

Methods

This research utilized a mixed methods survey design to capture current practices in the diverse field of EL at the national level. Specifically, it obtained baseline data on DEI initiatives of EL organizations that provide field trip-based programming (at a location other than the school) for school-aged children (prekindergarten–12th grade).

Overarching Research Question:

- What is currently being done in the field of Environmental Learning at out-of-school education-based program sites to increase accessibility and participation for diverse populations (inclusive practices), particularly students with disabilities?

Focused research sub-questions:

- Overall Access: Are EL Organizations offering inclusive/integrated programming for youth with disabilities? What inclusive practices are in place to establish a welcoming culture and atmosphere for all diverse learners?
- Physical Accessibility: What has/is currently being done to specifically address physical accessibility to the site/location where the Environmental Learning programming is being implemented?

- **Curricular Accessibility:** What has/is currently being done to specifically address accessibility to the curriculum (i.e., adaptations, modifications, and/or Environmental Learning programming (e.g., translation into other languages, differentiation of student completed work, or scaffold learning opportunities)?

Three inclusion criteria were established for study participants: aged 18 or older, in a paid position for a minimum of 6 months, and working at an EL organization that provides field trip-based programming to school-aged youth. The survey developed for this study, the DEI in EL Inventory, was informed by Liddicoat et al.'s (2006) survey study on inclusive practices at ROEE centers and the Special Education and Accessibility Self-Evaluation Tool first published by Oregon State University in 2021 (Oregon State University, 2025). Questionnaires were distributed *via* targeted outreach using social media pages and emails to EL organizations, and staff of EL organizations completed surveys *via* Qualtrics. Fifteen interviews were conducted using Zoom, an online meeting platform, through secure, password-protected links.

To support national representation, outreach efforts intentionally targeted EL organizations across all regions of the United States starting with national-level agencies, then state-level, and ending with direct contact to individual sites in each state over the course of five months in 2022. The study did not target a specific number of organization participants per geographic region; rather, it targeted recruitment at the national and state level to obtain as many responses as possible from individual EL organizations. Despite recruitment efforts, responses were not received from every state. Invitations to participate were shared *via* emails, phone calls, and social media posts on EL organizations' LinkedIn and Facebook pages. Although support from national- and state-level organizations increased the visibility of the survey, half of the completed surveys ($n=40$) were recruited through direct emails. Three websites helped to locate initial lists of state-level EL agencies: eco-usa.net, environmentalgroups.us, and causeiq.com/directory. A total of 17 participants were recruited through listserv emails, four through an organization's blog post, and nine from the recruitment email being forwarded by a colleague.

A total of 312 surveys were completed, 122 of which were identified as false submissions or robot/AI responses; 101 were at 65% completion or less, and nine responses were from EL staff in unpaid positions. A total of 80 survey responses met the inclusion criteria and were analyzed for this study. Multiple responses from staff at the same EL organization, representing 69 EL organizations, were accepted. Table 1 provides detailed demographic results of study participants.

The final dataset included 69 organizations across 32 states (see Appendices A and B). These organizations included nonprofits ($n=15$, 57.7%), public agencies ($n=7$, 26.9%), and university-affiliated programs ($n=4$, 15.4%). Most offered youth day trips ($n=66$, 95.7%), along with other programs, such

Table 1. Demographic data of participants.

Demographic	Survey ($N=80$)	
	n	%
Gender Identification		
Female	58	72.50
Male	18	22.50
Gender non-binary/other	4	5.00
Ethnicity		
Black/African American	1	1.25
Asian	1	1.25
Hispanic/Latinx	6	7.50
White	65	81.25
Native/Indigenous	2	2.50
Multiracial	2	2.50
Other/not provided	3	3.75
Age range		
18–29	18	22.50
30–39	28	35.00
40–49	16	20.00
50–59	12	15.00
60+	6	7.50

as summer camps ($n = 17$, 24.6%) and outreach or classroom visits ($n = 18$, 26.1%). Some also provided early childhood education ($n = 5$, 7.2%), adult learning opportunities ($n = 16$, 23.2%), and public programs ($n = 18$, 26.1%). The most commonly served age groups were elementary ($n = 60$, 87.0%) and middle school students ($n = 51$, 73.9%). While some organizations operated regionally or statewide, many were locally rooted.

Most EL organizations relied on a mix of funding sources to support their work. The most common source was grants ($n = 51$, 73.9%), followed by individual contributors ($n = 45$, 65.2%), government funding ($n = 44$, 63.8%), and program revenue, such as fees or sales ($n = 44$, 63.8%). Other sources included local fundraisers ($n = 34$, 49.3%), endowments ($n = 27$, 39.1%), corporate gifts ($n = 24$, 34.8%), state agency funds ($n = 20$, 29%), and charitable trusts ($n = 20$, 29%). A small number of respondents ($n = 2$, 2.9%) reported limited knowledge of their organization's funding sources. Organizations were allowed to select multiple sources of funding, which is reflected in the percentages exceeding 100%.

Results

More than 75% of the EL organizations ($n = 61$) in this study reported offering accessible programming. However, the number of EL organizations dropped ($n = 17$) when asked if the youth-based programming was designed to be accessible for students with disabilities as defined by IDEA. This indicates a significant gap in the interpretation of accessibility and compliance with the specific legal standards that define inclusion as per IDEA. A review of qualitative data identified major discrepancies in the individual- and organizational-based definitions and in the understanding of accessible and inclusive educational practices.

The culture and attitudes of organizations toward DEI are a precursor to providing accessible programming. Our analysis confirmed that 23 EL organizations had DEI mission statements accessible *via* the organization's website. These mission statements focused on increased access for individuals in the disability community.

Organizational barriers to inclusive initiatives and implementation of integrated programming for students with disabilities participating with their non-disabled peers at EL organizations also emerged within our findings, even without a direct question of this nature in the survey. These seven barriers are a mix of personal perceptions and limitations of an organization's capabilities. They include (a) Difficult Terrain, (b) Limited Staff Training, (c) Lack of Full Buy-In, (d) Limited Funding, (e) Targeting Specific Communities/Audiences, (f) No Need/No Interest, and (g) Engagement/Participation Requirements.

In addition to the described culture, attitudes, and barriers related to accessible programming, this analysis also identified five overall accessibility themes, five physical accessibility themes, and five curricular accessibility themes. Categories within those themes surfaced among EL organizations and their programs. [Table 2](#) define each theme within the three domains of overall accessibility, physical accessibility, and curricular accessibility. See [Appendices C, D, and E](#) for the thematic sub-categories for each domain of inquiry.

Accommodations and modifications for active student engagement between disabled and non-disabled peers are key elements of physical accessibility. Of the 69 EL organizations represented, 44 reported the completion of inclusive initiatives and integrated programming that targeted increased access to program materials, content, and curriculum. This study also asked participants to rate their perception of ADA compliance with their EL organization and for any insights they had on the rating. Across all participants ($N = 80$), the average rating for individual perception of ADA compliance was 6.08 on a scale from 0 to 10, with a standard deviation of 2.88.

Inclusive initiatives through curricular changes were the third and last domain of inquiry regarding accessibility. Over half of the EL organizations (60.87%) reported making targeted changes to program materials, program design, and instructional methods to increase access for learners with diverse support needs. Of the 27 EL organizations that reported no modifications to the program curriculum, 11 reported existing plans to address increasing the curricular accessibility of their youth programming.

Table 2. Definitions of themes in environmental learning organizations.

Overall accessibility themes	
Theme	Definition
Collaboration	Focuses on support with access to environmental learning programming (transpiration and/or financial), input on program design and development, as well as support for the development process and operation of programming.
Communication	Communication is important to ensure classroom teachers, parents, and students know what to expect and can adequately prepare.
Goal-oriented action/growth	Change toward operating from an inclusive lens takes time and is ongoing. This theme highlights the active and reiterative process involved in changing system operations.
Adapted programs and experiences	Entails field locations and facilities that are physically accessible and explores the utilization of different instructional strategies, adapted materials, as well as the use of support staff and personnel from the school.
Pre-designed programs and experiences	Programming and program adaptation options may be permanent fixtures within an organization's repertoire of offerings.
Physical accessibility themes	
Theme	Definition
Trails and pathways	Most of the reports of modified trails attributed the goal to increasing access for wheelchairs and motorized mobility aids, which are heavy and require compact ground for ease of navigation.
Accessible outdoor location	Two modified elements commonly reported included the addition of wheelchair-accessible picnic tables and the use of different routes or trails that are easier to navigate (e.g., locations other than the traditional program sites).
Accessibility of facilities	Covers all modifications to man-made structures and elements on Environmental Learning Organizations' land, mainly buildings.
Physical accommodations	Addresses reports on physical access initiatives that are geared toward meeting individual needs for activity engagement. Although physical accommodations can support the engagement of multiple students, in this theme, they are implemented in a 1:1 method.
Developmental goals	Accounts for all reports on plans and goals for increased access to facilities through construction, renovation, the purchasing of equipment, projects that are a collaboration with another agency, and staff training.
Curricular accessibility themes	
Theme	Definition
Accommodations	Covers the various supports that are implemented during traditional Environmental Learning programming with minimal disruption to a student's learning experience
Augmented experience	Includes a wide variety of approaches to supporting student engagement. The underlying anchor is that the learning experience is changed to a degree.
Developed materials	This encompasses all reports of materials for a specific program being created to increase accessibility and engagement in the learning process.
Organizational preparation	Addresses systematic approaches to increasing accessibility of programs by impacting procedures for all staff and internal processes.
Developmental goals	Accounts for any reports of projects that targeted improving ease of access to curricular content in the stages of development, design, and/or completion.

Discussion

EL organizations engaged with or starting the process of increasing the accessibility of their locations, facilities, and programming must address the fact that spaces developed for EL-based endeavors were historically built without accessibility in mind (Bailey et al., 2020; Bonta, 2019; Clark, 2013; Gough, 2021). Consequently, when faced with identified barriers to access, possible actions taken by EL organizations are ultimately defined by their funding, administrative decision-making, available resources and knowledge, and systemic bias. Spaces dedicated to providing generalized opportunities for the public to engage with nature have been weaved into the design of EL organizations, inherently and inadvertently creating obstacles to automatically implementing accessibility resources and programs. For instance, before many EL organizations could increase physical access to trails, construction-based work was required to integrate and retrofit access points to trails, spaces, and throughout the trails themselves.

Although not the majority, a few of the EL organizations mentioned how their organizations were integrating new approaches into the learning process. Representatives of these organizations gave accounts of utilizing a multimodality approach and implementing scaffolding activities and information to meet

learners where they are. These practices ensure programming is accessible to various ability levels and represent a change in action.

By focusing on the instructional methods used, the organizations that discussed their approach to the learning process within their descriptive responses addressed points beyond establishing a welcoming culture. No matter how welcoming an organization claims to be, if the focus has not been placed on establishing inclusive-based practices, that warm welcome can quickly fade as the reality of non-existent accommodations sets in. When accommodations do not exist or do not work, students with disabilities may feel they are only welcome to be in the backdrop of a program, are a burden to the staff, or even are unwanted despite the initial positive initiations of an organization. The necessity for intentional and well-planned accommodations for increased accessibility for all is imperative. Clearly identifying the capabilities of successful accommodations or modifications to EL programming on websites and in pre-communication paperwork allows visitors to make an informed decision about whether the program meets their accommodation needs (Columb et al., 2020; Dillenschneider, 2007; Nagakyrie, 2022).

Legal mandates and operational impact

For integrated EL programming to be a sustainable and viable option, an established base of inclusivity within the field of EL is needed through policy and legislation, ideally at the federal level. Education-based legislation focused on improving the quality of public education for students with disabilities began in 1958 with funding allocated toward training educators to work with students with cognitive differences, followed by the Elementary and Secondary Education Act of 1965, which directed funds to the students (Francisco et al., 2020; Yell et al., 1998). Section 504 of the Rehabilitation Act of 1973 established the prohibition of discriminatory practices against individuals with disabilities for organizations receiving federal funding (Francisco et al., 2020). In 1975, the passage of The Education for All Handicapped Children Act (Public Law 94–142) established the civil right of students with disabilities to access free, appropriate public education and therapeutic services in the least restrictive environment through federal funding. However, the coverage of protection established through these legal mandates ends once a student steps out of a public school's property line.

Regarding legal mandates for physical accessibility, federal legislation has focused on locations of commerce and public access, which establish societal norms of access for inclusion and engagement as a community member. Although the ADA was signed into law in 1990, 32 years after foundational legislation addressing equitable access to public education, it initiated major changes within U.S. societal infrastructure. Unfortunately, exemption measures within the ADA provide loopholes that maintain the continuation of discriminatory practices in places deemed public spaces. Still, this study found that inclusive initiatives and practices targeting physical access are reported at higher frequency levels compared to reported practices for increased curricular access by EL organizations. Participants referenced ADA compliance in their descriptive responses, indicating that legislation has been and will continue to be considered by EL organizations when renovating and building facilities. Although the ADA also defines invisible disabilities—such as chronic illnesses, mental health conditions, learning differences, and other physiological conditions or psychological disorders—participants reported its application at their EL organization through elements targeting physical access to the constructed facilities and some aspects of field locations and access points. Consideration for invisible disabilities and how they impact access to programming and learning opportunities were minimally addressed in participant reports on accessible curricular initiatives.

Due to EL organizations' unique structure and often remote locations, adhering to ADA compliance standards for buildings does not inherently guarantee a student will have access to all facilities or program locations. While the main limitation to accessing field locations was attributed to the land's natural terrain, a few participants made it a point to discuss the logistical issues that seem to have fallen through the gaps. For instance, if all access points to a building retrofitted for ADA compliance are covered in thick gravel, traversing through the gravel to get to the building becomes the barrier to access. The unique site characteristics of EL organizations mean the redesign for increased accessibility must be just as unique as the organization itself. The EL organizations that allocated funding to address remodeling and renovating of buildings before addressing the access to those buildings from the parking lot may

have valid reasons for their decisions. Depending on how long the entrance walkways are and the amount of gravel that would need to be removed, the available funding may not have been able to cover the cost of the gravel removal and walkway replacement. At the end of the day, building accessibility is only a small part of the accessibility barriers faced when real learning experiences happen outdoors.

Of the 32 EL organizations that reported modifications to trails and pathways, 17 specifically mentioned an in-camp accessible trail used as an alternative location for programming that is typically run further out in the field and away from facilities. Accessible trails further out in the field (accessible field trails) were mentioned by 13 EL organizations. The number of factors that impact whether an EL organization has the resources or the opportunity to develop a trail designed for use by those with various levels of physical ability could not be captured by this study. Limited funding was reported as a major barrier to the feasibility of construction-based projects to improve the ease of physical access to their site. The lack of available funding can also impact how the EL organization perceives DEI work. If a major construction-based project is in discussion (e.g., rebuilding ADA-compliant bathroom facilities), the big-picture project can dominate the dialogue around potential ways to increase program accessibility.

Many variables impact the minimal to non-existent representation of individuals with disabilities in EL programming. If another organization in the community has been providing accessible nature-based experiences for individuals/youth with disabilities, then why would those individuals take a chance and go somewhere that may not meet their accessibility needs? This may also reflect sentiment in the field of EL that individuals with disabilities are not represented in program attendance because they do not have an interest in engaging with nature or have a ‘typical outdoor lifestyle’; this belief has already been disproven by the limited literature centering voices from the disability community in conversations about wants and needs to have equitable access to nature and opportunities to develop a personal relationship with the outdoors (Lewis & James, 1995; Salvatore & Wolbring, 2022; Schmidt, 2023). It is worth noting that Organization 39 did report attempts to connect with special recreation groups but were unsuccessful; they did not get any response or engagement that indicated interest. Seeing a lack of responsiveness from outreach efforts to engage youth who require special accommodations may be the foundation for the belief held by Organization 39 that the “interest isn’t there.” Instead of reflecting on alternative options for establishing connections with diverse and minoritized groups within their community and the organizations that already work with them, organizations with this belief may conclude they do not need to put more effort in because of its low reward. It is possible that the lack of receptivity and commitment on the part of community organizations to participate in EL experiences may influence the willingness of EL organizations to engage in consistent outreach over time and perceive the value of their current and potential physical accessibility accommodations.

Organizational culture and attitudes: Value of full buy-in

As previously stated, the power of having full buy-in from all staff when working with DEI initiatives is the collective agreement on the value of equitable access to nature. Systematic changes to an organization’s infrastructure determined by those in leadership positions do not automatically change the perceptions and ideals of all staff. Obtaining full buy-in from staff for foundational changes that impact all aspects of an organization requires time, opportunities for individual voices to be heard, open forums for discussion, and professional growth opportunities. If the organization operates at a state level with multiple operational program sites, then it can be expected that each site will be at various stages in the change process. Mission statements create a foundation for an organization to build out action-based work and establish the organization’s values for non-leadership employee buy-in.

Of the 69 EL organizations represented in this study, 32 participants reported a developed statement, but five did not provide a link for verification and another four did not include ability status in their DEI statement. Thus, the actual percentage of EL organizations with developed DEI mission statements to address students with disabilities was 33.3% ($n=23$). Although the ROEE center study by Liddicoat et al. (2006) also included two questions regarding centralization of inclusion in their mission statement and level of prioritization on increased inclusion practices and access, it is a difficult comparison. A scale

from one (*unrelated*) to five (*very central*) for individual director views obtained data regarding the center's atmosphere and culture toward inclusion. For both questions, results were a positive mean of 3.6, indicating that, on average, most ROEE centers considered the inclusion of students with disabilities to be an active topic with some level of priority focus. Interestingly, this study showed that just over half of the EL organizations that reported engagement in increasing accessibility of programming lacked a developed DEI mission.

One question toward the end of the survey prompted participants to define and describe the conceptualization of inclusion in practice at their EL organization. The intention behind this question was to give participants the opportunity to describe the culture and attitudes of colleagues and the EL organization as a whole to gain insight into the development and level of action taken toward increased accessibility. Regarding a connection to having a DEI statement, the EL organizations that described actively engaging in the process of systematic change did not consistently report a developed DEI statement. EL organizations with a developed DEI statement did not consistently express statements indicative of full organizational buy-in toward increased accessibility initiatives. This qualitative trend, where EL organizations with a developed DEI statement do not always express full organizational buy-in for accessibility initiatives, appears to counter Liddicoat et al. (2006) results. Liddicoat et al. found higher ratings for centering inclusive initiatives within the mission of the ROEE centers and overall prioritization of inclusion of students with disabilities, as significant predictors for facility and program accessibility.

Categorization of inclusive initiatives

When asked to describe the conceptualization of inclusion in practice at their EL organization, 20 of the EL organizations reported minimal to no initiation of establishing inclusive practices. The remaining 49 EL organizations were sorted into three categories: Organizations in the Development Process, Organizations with Inclusive Initiatives in Place, and Organizations with Integrated Systemic Changes for DEI. These categories reflect a continuum of an EL organization's inclusive development, starting from early stages of awareness to deeply embedded structural change in their programs. To determine which categorization an organization fell into, the study triangulated the quantitative data from physical and curricular accessibility questions, verification of a DEI statement, and qualitative data from descriptive responses on the importance of inclusion at their organization.

Organizations in the development process

Organizations categorized as "within the development process" can be described as an initial engagement in the process of systematic change for increased access for diverse individuals ($n = 25$). This description is a key indicator regarding the need to learn more about accessibility. References to areas of needed growth did not specifically state that access initiatives were framed in terms of access for individuals with disabilities, but rather to the need for increased access across race, ethnicity, gender, and socioeconomic status along with ability status. This category highlights the limited establishment of inclusive practices within EL organizations that do not have full organizational buy-in on the importance of increased accessibility and established goals for future growth. A participant in this category stated the following, "We do all that we can with limited staffing and training." Lacking full organizational buy-in at the administrative/leadership level was not directly stated as a barrier but some mentioned it as a limitation to staff's ability to dedicate time to working on accessibility-based initiatives or developing integrated programming.

Organizations with inclusive initiatives in place

Organizations categorized as "having inclusive initiatives in place" were reported to have taken action to establish organizational practices and culture changes ($n = 15$). Although there is no clear line to determine the level of organizational buy-in, establishing lasting changes within an agency's internal and external operations indicates the existence of organizational buy-in to the process of change to some degree. Common statements in the descriptions from participants that fell into this category include a

focus on establishing an “open” and “welcoming” environment or atmosphere for all who attend programming. Essentially, they describe various stages of establishing an organizational culture of acceptance and access. They also discussed goals for future growth and change initiatives that were outlined in action-based steps for leadership staff and program staff. Maintaining a vision—and a path to reach that vision—to include accessibility in as many forms as is feasible for the organization requires input from all. A board member who has not been to a program site or seen a program in operation for an extended period of time may be making decisions based on outdated assumptions of what is required. Changes in working culture are interconnected to lasting systematic change. Two other commonly referenced practices within this category were providing access through individualized student support and collaboration with other agencies to increase programming accessibility. The three EL organizations that reported specifically providing specialized programs did so through collaboration with their community and local agencies.

Organizations with integrated systemic change for DEI

The nine organizations in this final category, addressing increased accessibility, were described as an integrated part of the organizational culture. Of these nine, two did not have a verified DEI mission statement targeting accessibility for students with disabilities. With full organizational buy-in and foundational commitment to change, inclusive initiatives resulted in lasting changes to administrative operations, policies, and instructional practices. The three main areas of focus for organizations in this category were targeting equity and equal opportunity in employment, workplace culture, and expansion and continued development of programming. According to the findings from the ROEE survey, addressing hiring practices to establish systemic changes to the work culture is an area of potential growth (Liddicoat et al., 2006). Only 34% of ROEE directors reported asking about previous work experience with students with disabilities during the hiring process, and 25% reported always employing a staff member trained in accommodations and modifications to serve as the accessibility resources coordinator (Liddicoat et al., 2006).

The data from this study shows how full buy-in strengthens the total program and EL organization's success by establishing systemic and systematic institutional changes for overall increased accessibility that can be sustained. Including viewpoints of all staff at various levels brings forth different perspectives on what needs to be discussed and thus leads to increased diversity in idea development.

Recommendations

Table 3 presents six key recommendations for EL organizations and staff, including actions they can take to increase their DEI and accessibility efforts. Table 4 presents four key recommendations for school staff to implement in their planning and coordination of field trips to EL organizations. Section 4.4.1. provides a current example of a program that blends EE lesson design and UDL to support EL staff in making their programs more accessible.

Example training for EL organization members

In 2022, Silvers Lining PLLC, the California Association for Environmental and Outdoor Education (AEOE), and the Environmental Educators of North Carolina (EENC) designed a professional learning course that blended EE lesson design and the principles of UDL with the intention of supporting EE practitioners with more access and inclusion materials. As of 2024, the course titled “Universal Design for Learning in Environmental Education” (since renamed “Accessible by Nature: Designing EE to Support All Learners” to broaden the scope of participants) had seen 211 participants nationwide who reported a 96.9% increase in knowledge of UDL principles and an average of 4.82 out of 5 in their confidence to take action using the materials (UDL Impact Report; Environmental Educators of North Carolina, 2024). Using the foundations of this course, the EENC and Silvers Lining designed a two-day collaborative learning opportunity for the leadership and programming staff of the Cooper Center for

Table 3. Recommendations for environmental learning organizations and staff.**Recommendations**

- Before starting DEI^a initiatives, Environmental Learning Organizations should keep in mind that it is not reasonable to accommodate the needs of all potential students. First, take into consideration the demographics of the school and community populations served. Identify who is not participating in programs and begin to determine “why.”
 - Separate long-term goals from short-term goals. Long-term goals can be considered as outcomes of inclusive initiatives. Achieving long-term goals requires a) full Organization buy-in, b) establishment of sustainable systematic changes, and c) time. Short-term goals can be identified as projects that target changes to program implementation. Achieving short-term goals also requires a) time and b) staff collaboration, but they can be achieved and put into action over the course of a few months.
 - Consideration of multiple ways of interacting with materials ensures students have options for directing their own learning experience.
- Clearly share points of accessibility to programs, including locations on websites and in program information packets.
 - Use relevant terminology that is known in the disability community to articulate access along with descriptive language to provide context. Present information as if it is being read by someone who has never seen a picture of the site.
 - If information is sent to classrooms prior to the field trip, include details about what to expect from time of arrival to time of departure. Consider creating a welcome video that provides a visualization and brief overview of the site giving students a pre-trip welcome.
- Establish systematic procedures for pre-communication with teachers and caregivers prior to field trip programs.
 - Include specific questions about student accessibility requirements and support needs. What is being assumed about students’ ability to fully participate in the program and what does staff need to know to prepare?
 - Ask about students who will NOT be attending and find out why. This is an opportunity to identify a potential barrier—perceived by the teacher or parent, or truly in existence—which will provide insight on how the community perceives accessibility at the site.
 - Encourage general education teachers to connect with special education teachers prior to scheduling field trips and contribute pre-trip information to Environmental Learning staff if applicable.
- Conduct an accessibility survey/evaluation in collaboration with an agency that specializes in accessible design to identify a) barriers to physical access and b) compliance with ADA^b regulations.
 - For renovations and construction of educational spaces and facilities, keep in mind the different height accommodations needed for adults versus children who use wheelchairs.
 - When addressing physical access with height placement of objects in bathrooms (e.g., sinks and hand dryers) for individuals who use wheelchairs, ensure the height difference required for children who use wheelchairs.
- Identify professional growth opportunities that all staff can participate in and are interested in that will help facilitate progress toward a short- or longer-term goal for increased accessibility.
- Engage with the community outside of local/public schools and school districts. Learn about the different and unique needs and interests of local community members. Opportunities for growth and development are not often cultivated in isolation.

^aDEI = Diversity, Equity, and Inclusion.^bADA = American Disabilities Act.**Table 4.** Recommendations for school staff.**Recommendations^a**

- Collaborate with colleagues: General education teachers who already work with Environmental Learning Organizations and take classes on field trips can collaborate with special education teachers from their schools.
 - If a teacher is already familiar with a program, they can support their colleague with determining if the Environmental Learning Organization and the site location can meet the accessibility needs of students with disabilities.
- Include parents in communications with the Environmental Learning Organization, especially if there are safety concerns for students with disabilities attending. Consider coordinating a pre-trip site visit to report back to other teachers and parents. If coordinating a field trip at a new location, establish an understanding of what navigation in the physical space will entail.
- Pre-assign peer buddies as a student’s go-to person for support during programming. This may support students’ engagement with peers and encourage collaborative peer problem solving instead of relying on adult support.
- Intentionally share personal behavior management strategies during pre-trip communication for the whole class as well as specific students as needed with Environmental Learning staff early in the planning phase. Ensure Environmental Learning staff and Organizations have the information they need to make adequate preparations.

^aRecommendations in this category are intended for school staff involved in planning and coordinating field trips as well as classroom teachers.

Environmental Learning (EENC, 2022). After the two-day in-person training, staff from EENC and Silvers Lining continued to meet with the Cooper Center team quarterly to review progress on their organizational short- and long-term goals around program design and materials, teaching locations, and staff professional growth. As stated previously, organizational mission and vision greatly impact the change initiatives. Through this work, the Cooper Center created an Inclusion Statement based on their organizational Mission Statement: “In accordance with our mission, The Cooper Center for Environmental Learning fosters the growth of individuals of all abilities. We will create a respectful

learning environment, accommodating all individuals' needs to expand their knowledge and connection to nature" (Cooper Center for Environmental Learning, 2025). This collaborative learning opportunity offers an example of organizational buy-in to accessibility and inclusion, including a long-term investment in making a change.

Future research

One area that requires further investigation and analysis is the impact of funding source(s) on an EL organization's ability to pursue accessibility initiatives. According to the limited funding data collected in this study, most EL organizations use multiple sources of funding to remain in operation. Obtaining data on whether EL organizations have applied, received, or even considered applying for funding support to purchase equipment, make renovations, and build new construction would better illustrate the balance between intent, opportunity, and success with accessibility initiatives.

This study obtained baseline data—as a starting point and on a broad scale—to identify what is currently being done for students with disabilities in EL field trip-based programming. The themes identified in this study should be used in future research to develop a shorter survey and to obtain more quantitative data that capture the unique capabilities of EL programs working with students with disabilities. Correlational studies would also be beneficial to identify how funding impacts EL organizations' abilities to increase accessibility.

Another potential area of future research is how access to environmental knowledge and activities has been facilitated within urban spaces and public school grounds through collaborations with EL agencies. Collaborations between city officials, school boards, and EL agencies to discuss the development of green spaces within urban communities (Wolch et al., 2014) and address the discrepancies in access to green spaces due to socioeconomics may be a genesis point for solutions in urban areas.

Investigating how EL organizations navigate federal compliance standards for policies such as IDEA and ADA will also help identify ways in which legislation falls short of direct impact to educational opportunities and access. As previously stated, IDEA targets public schools while ADA targets all public-facing organizations, but neither directly addresses the educational programming provided by field trip-based EL organizations.

Limitations

All parts of this study were conducted in a virtual setting. The PI did not visit each location in person. The PI also did not visit the website for each EL organization for follow-up verification of information provided in the survey and interview.

The survey was not adapted to meet participants' needs, and no question about whether English was the participants' primary language was asked. Participants would not have been able to complete the survey or interview if they did not speak English.

The use of questions with a Yes/No response forced participants to respond to false dichotomies, which was proven by the disagreements between staff from organizations with multiple responses. The forced dichotomies missed points of clarification within the collected data that would have provided more contextual insight into inclusive initiatives in place. The addition of descriptive responses for "Yes" responses provided qualitative data gathering opportunities. "No" responses did not trigger a required descriptive response, which was a missed data collection opportunity. In addition, the survey took participants over 30 min to complete due to the descriptive responses. The amount of time required to complete the survey had a potential impact on the number of surveys submitted.

The impact of the COVID-19 pandemic on recruitment and EL organization operations can be inferred. Recruitment for this study began in December of 2021. Due to the onset of quarantine and limited social interactions brought about by the pandemic in early 2020, many EL organizations closed their doors for the final time, as did many small businesses.

Use of social media for recruitment resulted in multiple submissions from bots that were unanticipated. The number of bot submissions negatively impacted the ability to determine a meaningful response rate. By using social media posts, the number of potential participants who viewed the post could not be accounted for.

Conclusion

Nature prescriptions are becoming more common as a medical approach to bridge our modern lives to the outdoors, away from the technology that now drives our daily routines and engagement with society (Kondo et al., 2020). To truly enhance and support the health and movement-based experiences of young people emerging into current social landscapes, more must be accomplished by EL organizations, schools, and their communities. Including all youth with disabilities or marginalized backgrounds in environmental learning opportunities will build connections to the natural world through novel learning experiences.

The intent among EL organizations is moving in the direction of overall, physical, and curricular inclusivity. However, a consistent and systematic process that successfully expands participation opportunities for students with disabilities across EL programming has not been achieved. Granted, this is a huge undertaking with a specific benefitting audience, but many EL organizations have accomplished smaller endeavors that can serve as examples to others, provided other challenges are met.

Full organizational buy-in and access to funds are significant factors for many EL programs. Increased access to sufficient funding resources, engagement of staff in inclusive program training, and collaboration with classroom teachers and local organizations that work directly with the disability community have key roles in improving accessibility. Work that continues to establish the fidelity of effective, innovative, and cost-efficient ways to increase engagement of diverse youth has the power to reduce exclusionary EL programming, encourage intentional program design, and promote a systemic shift toward prioritization of inclusive initiatives.

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Ethics statement

The IRB process was completed at the University of Arizona while the PI was a doctoral student.

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Appendices

Appendix A

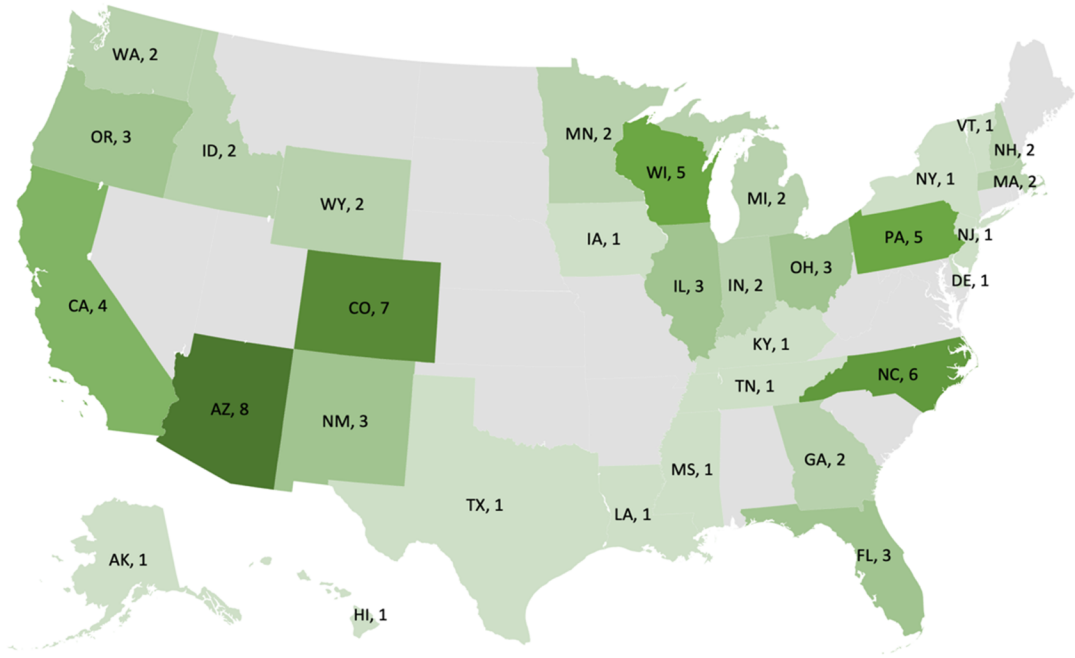


Figure A1. Number of survey responses per the U.S. state.

Appendix B

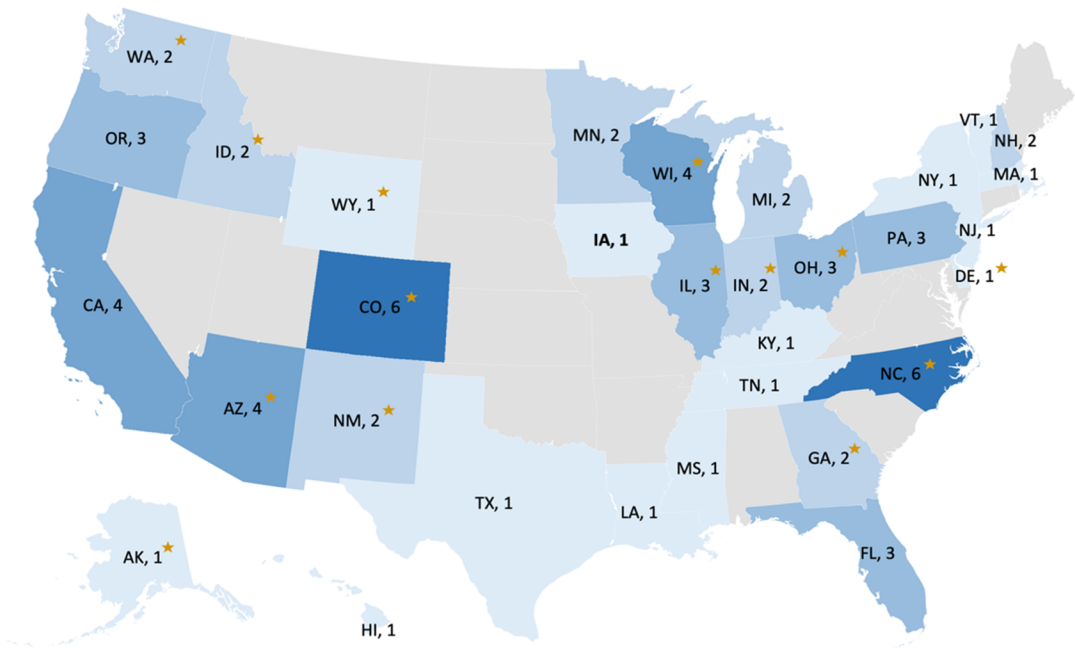


Figure A2. Number of EL organizations represented by the U.S. state. *Represents the states where interviewees were located.

Appendix C

Table A1. Classifications of overall accessibility themes in environmental learning organizations.

Theme	Thematic subcategory				
	Category 1	Category 2	Category 3	Category 4	Category 5
Collaboration	Family	School	Agency/Community	–	–
Communication	Recruitment/program information	Pre-program communication	–	–	–
Goal-oriented action/growth	Strategic plans for organizational growth	Staff preparation	Organization preparation	–	–
Adapted programs and experiences	Accessible/alternative locations	Program delivery	–	–	–
Pre-designed programs and experiences	Virtual programs	Specialized programs	Integrated programs	–	–

Appendix D

Table A2. Classifications of physical accessibility themes in environmental learning organizations.

Theme	Thematic subcategory				
	Category 1	Category 2	Category 3	Category 4	Category 5
Trails and pathways	Modified trails/pathways	In-camp and ADA trails	Accessible field-based trails	–	–
Accessible outdoor location	Retrofitted locations	Alternative locations	Designs with intention		--
Accessibility of facilities	Accessible entrances	Accessible buildings	Accessible bathrooms	Modified indoor spaces	ADA facilities
Physical accommodations	Mobility aids	Adapted recreation equipment	–	–	–
Developmental goals	Purchasing equipment	Building and/or renovating	Collaboration projects	Self-training	–

Appendix E

Table A3. Classifications of curricular accessibility themes in environmental learning organizations.

Theme	Thematic subcategory				
	Category 1	Category 2	Category 3	Category 4	Category 5
Accommodations	Assistive technology	Visual access and aids	Translation	–	–
Augmented experience	Adapted/modified existing materials	Instructional methods	Self-regulation	Supported learning	–
Developed materials	Virtual materials	Design with intention	Purchased materials	–	–
Organizational preparation	Staff professional growth	Collaboration	Feedback on program experiences	–	–
Developmental goals	Update program materials	Program design	–	–	–