

WELCOME!



Creating
healthy
outdoor
learning
environments



Creating healthy outdoor learning environments

Robin Moore, MCP, Hon ASLA
Professor of Landscape Architecture,
NLI Director

Nilda Cosco, PhD
Research Associate Professor
NLI Director of Programs

Misty Pearson, MEd
Division of Nutrition, Physical Activity,
and Obesity Prevention
South Carolina Department of Health
& Environmental Control SCDHEC





Natural Learning Initiative, College of Design, NC State University

A photograph of a lush garden with a stone path. Two young girls in white dresses are running and playing on the path. A man is sitting on a concrete step to the right, looking towards the children. The garden is filled with various plants, including purple flowers and green foliage.

Nature play and learning every day!

www.naturalearning.org

Creating environments for healthy human development and a healthy biosphere for generations to come.

Natural Learning Initiative **Activity Areas**

Creating environments for healthy human development and a healthy biosphere for generations to come

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Design Assistance

Childcare/development centers, schools, museums, zoos, botanical gardens, nature centers, park & recreation systems, and residential neighborhoods—everyday places of children and families.



Information Dissemination

NLI website online resources and technical assistance, including the Green Desk, best practice demonstration sites, InfoSheets, publications, and Spanish versions.



Action Research

NLI research and evaluation tools applied in pre-post methodologies. Contributions to the scientific literature, best practice indicators, professional development programs, online resources, print publications, and media productions.



Comprehensive Projects

Multi-year projects, which include strategic planning and coordination, research, preliminary site visits, site analysis, community presentations, stakeholder meetings, design workshops, design reviews, training, and post-occupancy evaluation.



Professional Development

Annual events (Design Institute, Growing IN Place, Gatherings and Tours), regional symposia, interactive sessions, webinars, workshops, and certificate programs.

“99.999% of human evolutionary history has been spent in natural environments”

Juyoung Lee, et al, 2014



UNDERSTANDING

Planet Earth



Creating

Sustainable Culture

Through childhood engagement with nature



ONE HEALTH

“The health of humankind, animals, and the biosphere is interwoven in a single, interdependent system.”



Ecosystems and Human Well-being
World Health Organization (2005)

Environmental biodiversity = stronger immune system

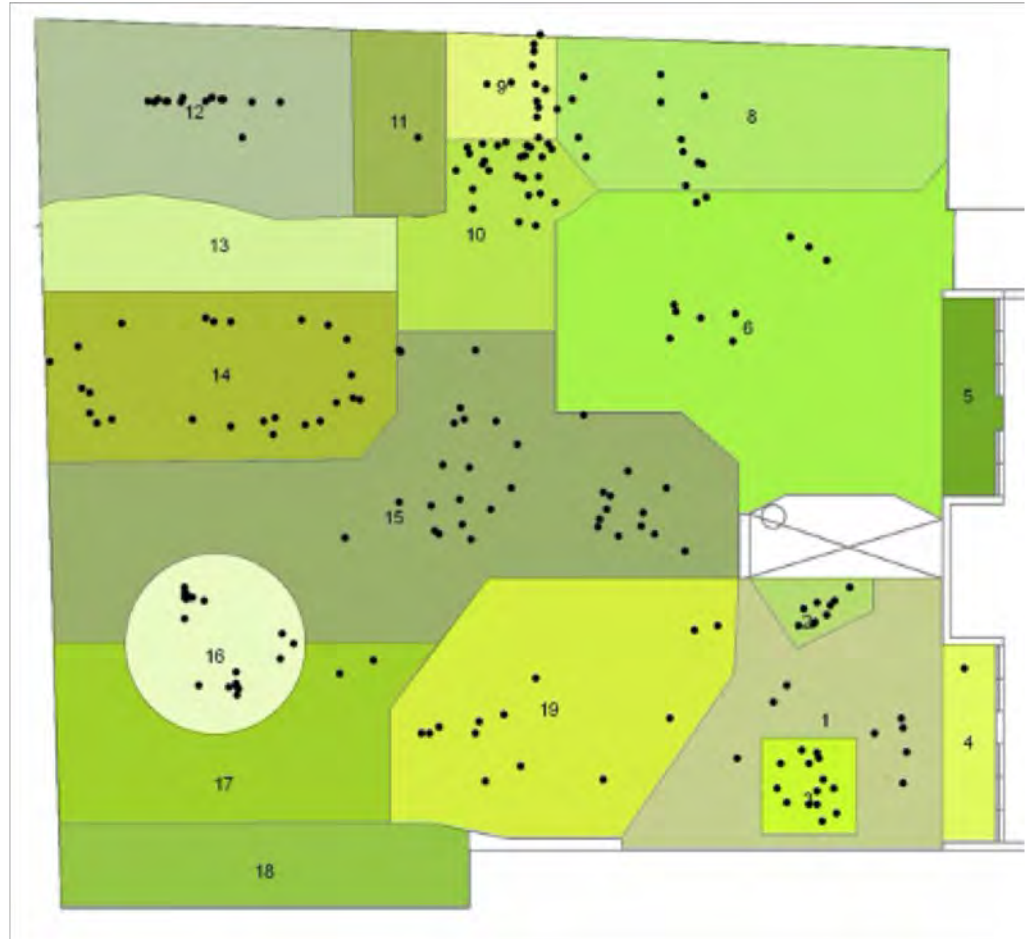


Microbiota exposure

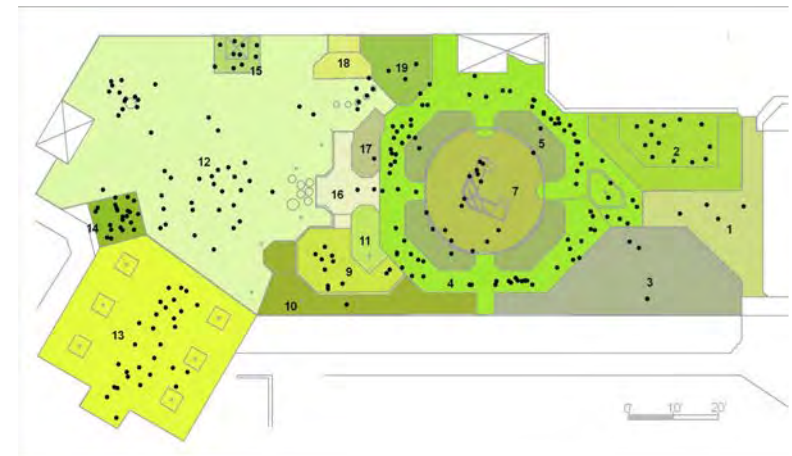
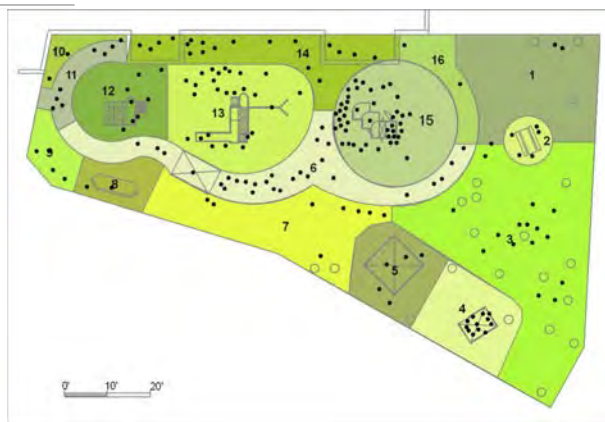
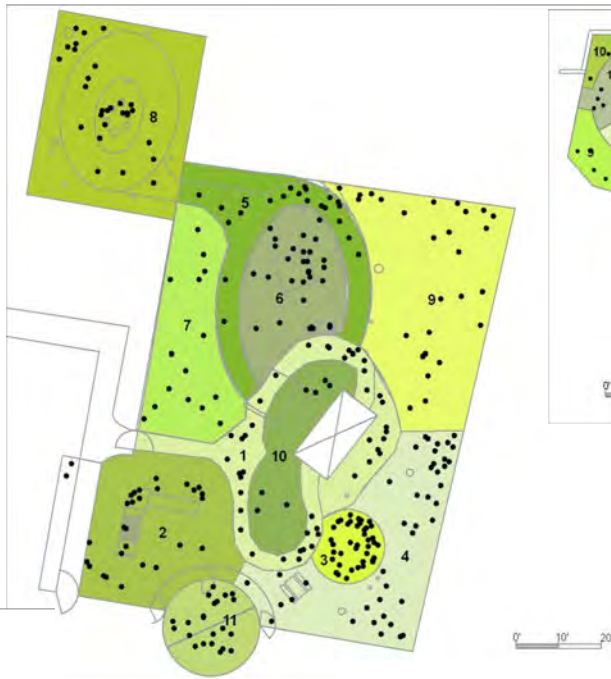


Gensollen, et al (2016). How colonization by microbiota in early life shapes the immune system.
Haahtela, et al (2013). The biodiversity hypothesis and allergic disease: World Allergy Organization position statement.
Ruokolainen, et al (2015). Green areas around homes reduce atopic sensitization in children.

Variable Outdoor Areas



Variable Outdoor Areas



Variable Outdoor Areas

Adjacency and centrality of play settings increase physical activity of young children.

Larger sites are associated with less activity.

Larger activity settings are associated with higher activity.

Content such as play equipment, balls, wheeled toys, pathways attract/increase activity.

IN OTHER WORDS: Type and distribution of activity are influenced by the form and content of outdoor space.

Environment & Behavior. September 2014

Article

Increasing Physical Activity in Childcare Outdoor Learning Environments: The Effect of Setting Adjacency Relative to Other Built Environment and Social Factors

William R. Smith¹, Robin Moore¹, Nilda Cosco¹, Jennifer Wesoloski¹, Tom Danninger¹, Dianne S. Ward², Stewart G. Trost³, and Nicole Ries¹

Abstract

The problem of childhood obesity can be addressed through study of how built environment characteristics can foster physical activity (PA) among preschool children. A sample of 355 behavior settings in 30 childcare center outdoor learning environments (OLEs) was studied using behavioral mapping techniques. Observers coded activity levels of preschool children across behavior settings. The level of PA observed in 6,083 behavioral displays of children aged 3 to 5 was modeled using multi-level statistical techniques. Both adjacency and centrality of play settings were found to be important factors in increasing the degree of PA, net the effect of numerous other variables. In addition, child-to-child interaction was found to foster

Environment and Behavior
1-29

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¹North Carolina State University, Raleigh, USA

²University of North Carolina at Chapel Hill, USA

³The University of Queensland, St. Lucia, Australia

Corresponding Author:

Variable Outdoor Areas

Diversity of Content Variables

- **Natural/Fixed**, e.g., trees, shrubs, vines, ground covers, flowering perennials
- **Natural/Loose**, e.g., plant parts, ground surfaces, animals ...
- **Manufactured/Fixed**, e.g., anchored play equipment, shade structures, decks/stages,
- **Manufactured/Loose/Moveable**, e.g., portable play equipment, e.g., wheeled toys, sand play toys; recycled/ repurposed items



Variable Outdoor Areas

Measures of Diversity

- **Number of Activity Settings**
 - Here, 7 in one preschool section
 - NLI repertoire of approx. 40
 - NLI Best Practice Indicator: 10 or more
- **Number of Stand-alone Components/Features**
 - More the merrier!
- **Moveable is your best friend!**



Variable Outdoor Areas

Measures of Diversity (before renovation)

- Number of Activity Settings: 4
- Number Components/Features?
- **COVID-19 strategy:** Increase moveable components and loose



Why focus on outdoor spaces in childcare?



Nilda Cosco, PhD

Research Associate Professor, Department
of Landscape Architecture and
Environmental Planning

Director of Programs, NLI



Why focus on outdoor spaces in childcare?



- Majority of young children with working parents attend childcare.
- Developmental window of opportunity.
- Outdoor environments stimulate active living, healthy eating, outdoor learning, positive social interactions.
- Outdoor environment interventions are cost-effective strategies.

Benefits of Being Outdoors



Supports physical activity



Boosts the immune system



Reduces allergies and asthma incidence



Alleviates stress



Supports attention functioning



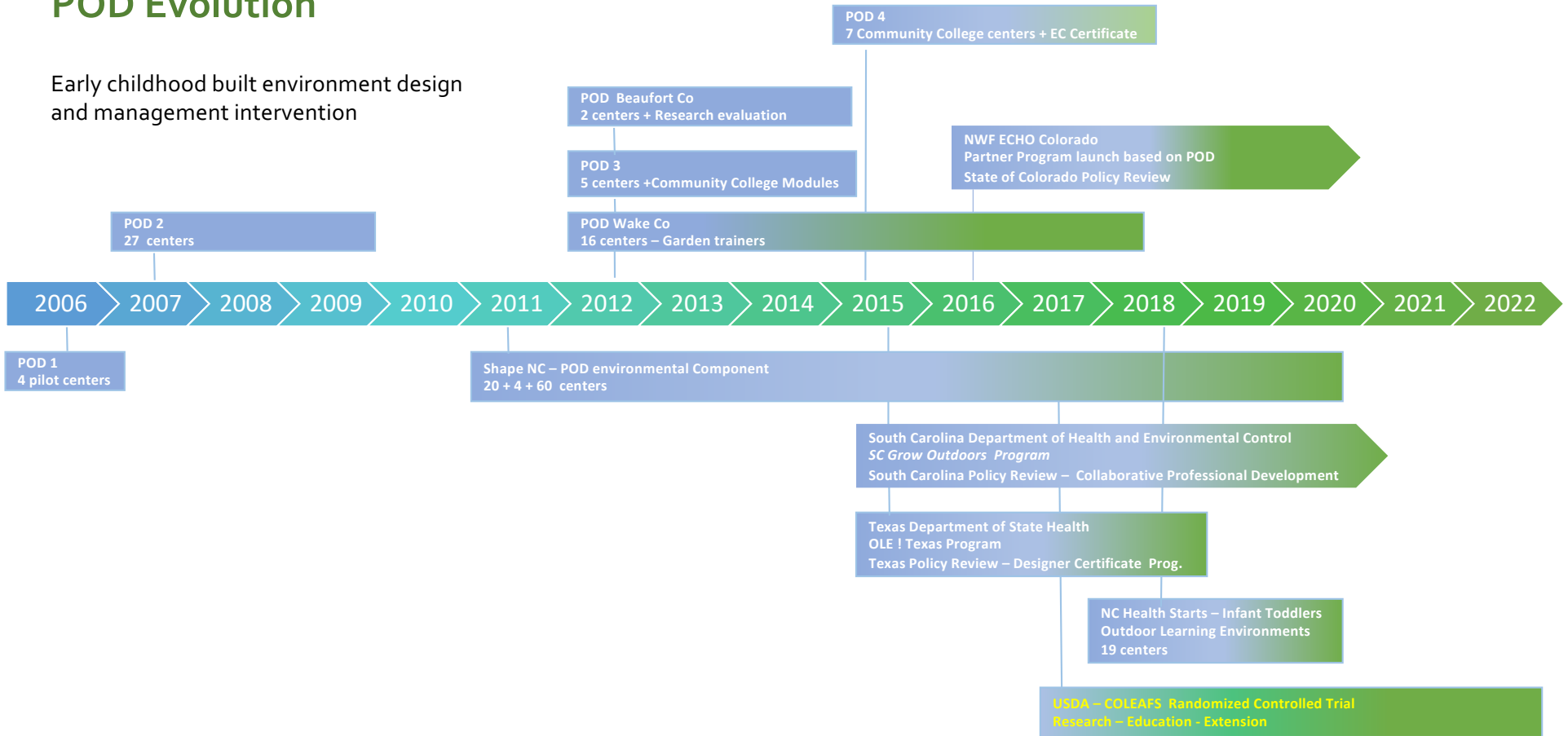
- Boldemann, C.; Sördeström, M;Mårtensson, F; Moore, R; Cosco, N; et al.. (2015). The Health-Promoting Potential of Preschool Outdoor Environments: Linking Research to Policy. In Lindsay, G and Morhayim, L. (Eds), *Revisiting "Social Factors": Advancing Research into People and Place*. Newcastle.
- Burdette, H., & Whitaker, R. (2005). Resurrecting free play in young children: looking beyond fitness and to attention, affiliation, and affect. *Archives of Pediatrics & Adolescent Medicine*, 159(1), 46-50.
- Faber Taylor, A. F., Kuo, F., Sullivan, W. (2001). Coping with ADD: The Surprising Connecting to Green Play Settings. *Environment and Behavior*, 33(1), 54.
- Haahtela, T., Holgate, S., Pawankar, R., Akdis, C. A., Benjaponpitak, S., Caraballo, L. (2013). The biodiversity hypothesis and allergic disease: world allergy organization position statement. *World Allergy Organization Journal*, 6(1).
- Kuo, M. (2010). *Parks and Other Green Environments: Essential Components of a Healthy Human Habitat*. Ashburn, VA: National Recreation and Park Association.
- Moore, R. and Cosco, N. (2014). Growing Up Green: Naturalization as Health Promotion Strategy in Early Childhood Outdoor Learning Environments. *Children, Youth & Environments*, 24(2): 168-191.
- Riedler J, Braun-Fahrländer C, Eder W, Schreuer M, Waser M, Maisch S et al. (2001) Exposure to Farming in Early Life and Development of Asthma and Allergy: A Cross-sectional Survey. *Lancet*, 358:1129-1133.

POD is...
an early childhood
built environment design and management intervention



Natural Learning Initiative POD Evolution

Early childhood built environment design
and management intervention



THE POD APPROACH

- Diverse outdoor activity settings
- Many choices for play and learning
- Across developmental phases



POD PROCESS

- Community engagement
- Best practice design + incremental quality improvement
- Demonstration / model sites



POD PROCESS

- Community engagement
- On-site and online professional development



Incremental Development



Incremental Development



**Why and how to implement high quality environments
during the pandemic?**

First, let's follow public health recommendations



Stay home when sick



Respect physical distancing



Hand wash often



Wear a mask to reduce transmission



Use individual tools and materials as much as possible

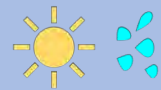


Clean and disinfect areas after use

Promising Research



☞ Sunlight disinfects non-porous surfaces



Sunlight deactivates airborne viral droplets



Solar Deactivation Calculator: <https://www.dhs.gov/science-and-technology/sars-airborne-calculator>



Gardening is a low risk activity



No evidence of COVID transmission via food



Low stability in water

- Shanna Ratnesar-Shumate, Gregory Williams, Brian Green, Melissa Krause, Paul Dabisch*, et al. June 2020. Simulated Sunlight Rapidly Inactivates SARS-oV-2 on Surfaces. *Journal of Infectious Diseases*. In Print.
- Michael Schuit, Shanna Ratnesar-Shumate, Jason Yolitz, Paul Dabisch*, et al. 2020. Airborne SARS-CoV-2 is Rapidly Inactivated by Simulated Sunlight. *Journal of Infectious Diseases*. Accepted manuscript. National Biodefense Analysis and Countermeasures Center, Operated by Battelle National Biodefense Institute for the US Department of Homeland Security, Frederick, Maryland, USA.
- Chu, Derek K et al. June 2020. Physical distancing, face masks, and eye protection to prevent person-to-person transmission of SARS-CoV-2 and COVID-19: a systematic review and meta-analysis. *The Lancet*.
- Centers for Disease Control and Prevention. Food Safety and Coronavirus Disease 2019 (COVID-19). <https://www.cdc.gov/coronavirus/2019-ncov/community/outdoor-garden.html> -
- La Rosa, G., Bonadonna, L., Lucentini, L., Kenmoe, S., & Suffredini, E. (2020). Coronavirus in water environments: Occurrence, persistence and concentration methods - A scoping review. *Water research*.

NLI COVID-19 ideas and resources

COVID Support we're all in this together!

EARLY CHILDHOOD OUTDOOR PLAY AND LEARNING RESOURCES

Outdoors with nature is the healthiest place to be, where exuberant play, motivated learning, and gardening fun awaits! In solidarity, NLI offers these resources to support families schooling at home, teachers and children in childcare centers, early childhood college educators, and all who influence the development of young children.

LET'S GET OUTSIDE!

This set of four resources, created in collaboration with the National Wildlife Federation ECHO program, offer outdoor, community-based, health-promoting ideas for child care providers, regulators, and others working with or on behalf of young children.



Practical, cost-effective suggestions for child care providers to manage outdoor spaces, in support of longer time outside, as a strategy for reducing COVID-19 transmission, while ensuring the health and safety of children and caregivers. *(Disponible en español)*

Providers



Considerations for regulatory agencies that may influence child care providers to increase time outside as a strategy for reducing COVID-19 transmission, while ensuring the health and safety of children and caregivers.

Regulators



Suggestions for those involved in the care of young children, to increase time outside as a strategy for reducing COVID-19 transmission, while ensuring the health and safety of children and caregivers. *(Disponible en español)*

Making the Case

Further Resources by NLI and Others → naturalearning.org/covid-support/

NLI COVID-19 ideas and resources

Healthy

Comfortable

Engaging



Reduce risk of disease and improve health during COVID-19—and beyond

Suggestions for child care providers!

LET'S GET OUTSIDE!

Risk of spreading COVID-19 may be reduced if children and teachers spend more time outside. The American Academy of Pediatrics (AAP) says that spending more time outdoors is one of the highest priority strategies for reducing transmission of the virus among preschoolers and elementary school children. Studies suggest that exposure to sunlight rapidly deactivates the virus in the air and on surfaces. Open-air spaces are less likely to concentrate the virus than confined indoor spaces and outdoor moving air disperses the virus, lowering the risk of transmission.

Decades of research also show that spending time outside in nature supports healthy child development by increasing physical activity, supporting healthy eating through hands-on gardening, reducing stress, and enhancing social-emotional development. For evidence supporting enhanced outdoor spaces at child care centers, see [Benefits of Engaging Children with Nature](#) and this [Research Brief](#).

While the immediate and long-term benefits of time outside in child care settings are clear, the large majority of child care facilities are not designed and managed to support long durations of outside time to engage young children and their providers. This resource offers suggestions to immediately enhance child care outdoor spaces, through low-cost improvements and programming, to make them **healthy, comfortable, and engaging**.

HEALTHY
The suggestions below promote health and aim to reduce the likelihood of COVID-19 transmission. Please adhere to best practices for hygiene, sanitation, and disinfection routines for adults and children based on the latest local or state rules, evidence-based standards, and the [latest CDC guidance for child care](#), while noting any rules or guidance for outdoor areas or materials.

Create groupings or "cohorts." Given the challenges of individual physical distancing and mask wearing for young children, establishing stable groups of children and adult(s), called cohorts. This approach aims to prevent mixing between groups while allowing for social interaction within groups. It can be combined with time outdoors adhering to local or state guidelines for personal protective equipment and sanitation (1).



1. Class cohort on personal mats under shade tree, gathered for story time with puppets sitting at table bench—ECHO

(This document is produced by the National Wildlife Research Center's (NWR) Children's Health Outdoors (ECHO) program and North Carolina State University's Natural Learning Initiative (NLI). It is a work of a licensed teaching child care providers and regulations respectively, addressing COVID-19 transmission reduction in child care facilities by increasing time outside. A third document presents the case for outside time as a direct strategy for

naturalearning.org/covid-support/

NLI COVID-19 ideas and resources



naturalearning.org/covid-support/



For Early Childhood Educators

Early Childhood Outdoor Learning Environments



For Designers

Designing Early Childhood Outdoor Environments



Audience

- Early childhood educators
- Public Health professionals
- Technical Assistance providers
- Cooperative Extension Agents
- Master Gardeners
- Park and Recreation Professionals
- Volunteers working with early childhood institutions
- Designers

Fully online | Self-paced | 24hs
in 12 weeks | 2.4 CEUs

“The two **certificate programs** are fully online, distance education courses presented by the Natural Learning Initiative, North Carolina State University. Both courses are worth 2.4 Continuing Education Units (CEUs) and are individually tailored respectively for early childhood educators and landscape designers. Each supports interested learners in gaining the skills and understanding required to create, manage, promote, organize, and administer high quality outdoor environments for young children and accompanying adults. The certificate programs were developed with the support of the Blue Cross and Blue Shield of North Carolina Foundation and the Texas Department of State Health Services.



South Carolina's Approach to Outdoor Learning Environments

**Misty Pearson,
MEd**



SYSTEM CHANGE STRATEGIES

The Natural Learning Initiative



South Carolina's Approach to Outdoor Learning Environments



Creation of 10 Demonstration Sites 2015-2016

Expansion - Online Design Assistance for 10 additional sites 2016-2018



South Carolina's Approach to Outdoor Learning Environments



Professional development to support outdoor learning environments

- Dedicated SC Certificate Program

Integration of outdoor learning environment indicators into ABC Quality (QRIS)

- Activity Settings
- Naturalization



South Carolina's Approach to Outdoor Learning Environments

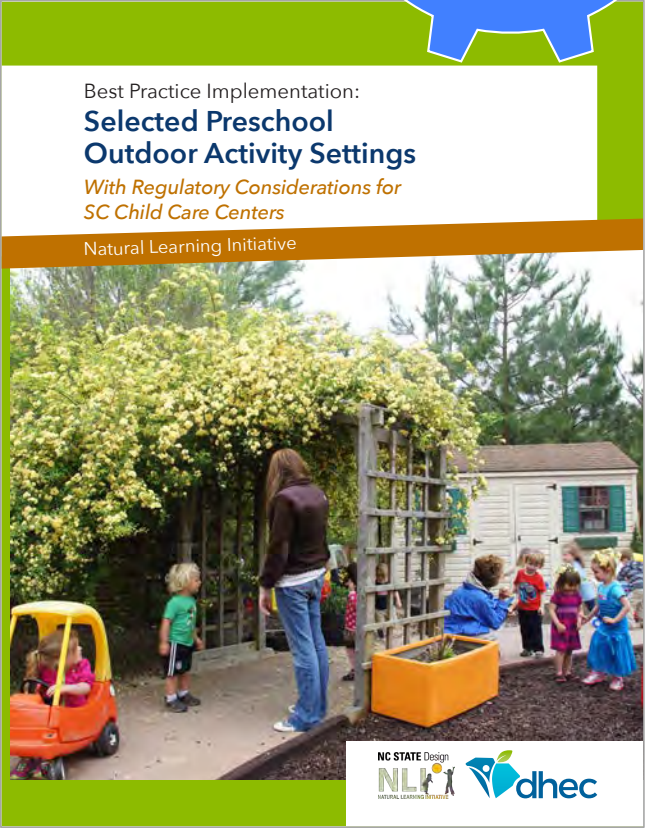
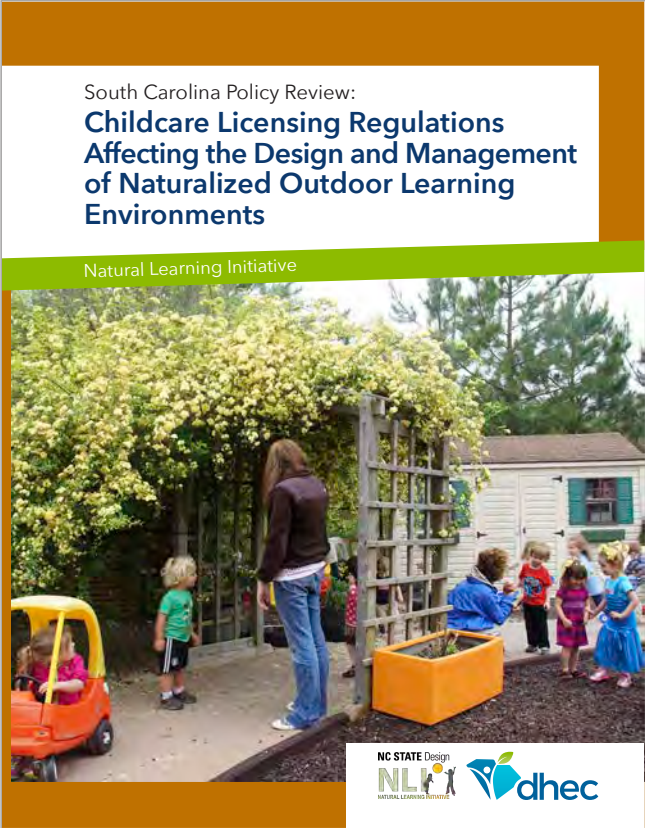


Facilitating internal dialog across SC Department of Social Services Division of Early Care and Education 2015-present

- SC Child Care Licensing
- Office of State Fire Marshal
- ABC Quality (QRIS)

Creating a supportive network

- Introduction to naturalized outdoor environments
- Documents internal review
- Other ECE partners



Individual Play and Learning Settings: Primary Pathways

DEFINITION

Primary pathways follow curvy, looping forms, on flat ground, without dead ends. They stimulate children's sense of exploration and discovery and motivate higher levels of physical activity. Pathways provide crucial circulation through the OLE, link major settings, and ensure effective use of the whole OLE by teachers and children.

BASIC REQUIREMENTS

- Poured concrete is best practice (highest cost / highest functionality) or asphalt (not as stable as concrete).
- Pathway channel needs to be excavated. Decide where to put excavated dirt beforehand.
- Install low railings to protect adjacent plantings or lawn from children "cutting across." The primary pathway contains traffic flow.
- Minimum width of 5 feet wide allows two trikes to pass each other.

CONSIDERATIONS

- Make sure any utility lines (water, surface drains, electrical, communications, etc.) are accommodated under the installation, including future installation through a PVC pipe.
- Concrete requires minimal maintenance, supports wheeled toy use, and stimulates high levels of health-promoting, sustained physical activity.
- Tinted concrete (ochre-rose hue) creates a more attractive finish for a small fraction of added cost. Work with contractor who knows this technique or test ahead of time.
- Inlay leaf forms of existing or planned OLE trees, using real leaves, in the wet surface as the pathway is poured. Carefully plan ahead of time.
- Alternative surfacing materials include decomposed granite, granite screenings or quarry tailings (moderate cost / moderate functionality); triple-shredded, hardwood mulch (moderate cost / low functionality); and woodchips (least cost / lowest functionality).
- Concrete should be 4" thick, 3000 PSI, a light broom finish, joints either saw cut or tooled. Score/control joints 3/4" deep, placed every 5' along length of the path. Expansion joints every 30', 1/2" wide and sealed with sealant. Reinforcement and expansion board are unnecessary. The latter tends to pull out with children riding over it; use sealant the full length instead.

APPROXIMATE FOOTPRINT

450-2000 square feet

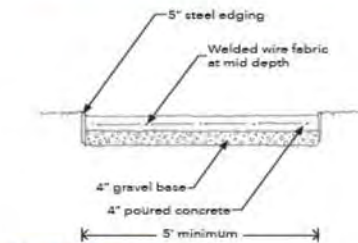
REGULATORY CONSIDERATIONS

Hard surfaced primary pathways should be designed to satisfy the ADA requirements for accessible routes in outdoor learning environments listed under accessibility in POTENTIALLY RELEVANT REGULATIONS.

As primary pathways would be considered walkways in South Carolina regulations, the following applies: "Outdoor walkways shall be free from debris, leaves, ice, snow, and obstruction" (114-507.B3).



Concrete primary pathway, five feet wide, allows two-way wheeled toy traffic.



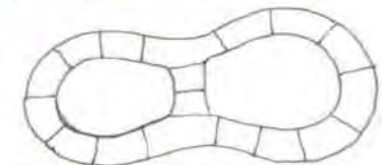
Concrete Pathway Construction



Perfor provides a touch of shade, adds visual interest, and an attractive second enclosure.



After constructed from lattice panels provides an inexpensive enhancement to the primary pathway experience.



Curvy Double Looped Pathway



Design for Johnson Pond preschool OLE. Center of drawing includes primary pathway in the form of 5' - providing many potential play activity options.

SYSTEM CHANGE STRATEGIES

The Natural Learning Initiative



Results

- New understanding: OLE importance and impact
- Professional development
- Adoption of best practices
- State policy supportive of local, independent initiatives



Mission: Increase young children's access to quality, naturalized outdoor environments that support play and learning across all domains of development.

- State-level process supporting providers to implement naturalized, outdoor learning environments
 - ① Introductory training
 - ② *NLI Early Childhood Outdoor Environments Online Certificate Course*
 - ③ Course Implementation (policy change, staff training)
 - ④ *Interactive Design Session*
 - ⑤ Incremental Design Implementation
 - ⑥ Training/Use of Outdoor Space
- Pilot GO SC process Spring 2021
- GO SC demonstration sites



Thanks!

www.naturalearning.org

NC STATE Design

NLI
NATURAL LEARNING INITIATIVE

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