



Age-friendly Green Infrastructure Planning

Green Infrastructure Webinar Series

April 9th, 2024

Housekeeping

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- All participants are muted to minimize background noise.
- Technical issues or questions?
 - Contact us via the Q&A Box.



Your host



Clark Wilson
U.S. EPA
Green Infrastructure Team



Equity and Equitable Development

- “Equity” means recognizing that we do not all start from the same place and that actions must be taken to address the imbalances.
- “Equitable development” is “equity-in-action” in the built environment.
- Green infrastructure can help to reduce the disproportionate impacts of stormwater and flooding on overburdened communities provide additional benefits to communities.

Upcoming Webinars with an Equity and Equitable Development Focus

Creating Age-Friendly Communities with Green Infrastructure: How Addressing Needs of Children and Older Adults Benefits All

Planting for the Future: Native Plants, Green Jobs, and Equitable Climate Resilience – May/June 2024

Conserving Rural Landscapes: Green Infrastructure in the Rural and Tribal Context – Fall 2024

Igniting Community Imagination: Advancing Green Infrastructure Implementation Through Arts and Culture – Winter 2024



Resources: Community Change Equitable Resilience Technical Assistance

Intended for disaster-prone and disadvantaged communities

Design assistance, community engagement, and partnership development that result in climate resilience projects with an emphasis on green infrastructure eligible for [Community Change Grant](#) funding.

Up to 50 projects completed by fall 2024 with application on rolling basis

Community Change Equitable Resilience: <https://www.epa.gov/inflation-reduction-act/community-change-grants-technical-assistance>

Email: EquitableResilience@epa.gov



Today's Panelists



Danielle Arigoni

Managing Director for Policy
and Solutions, National
Housing Trust



Juan Mireles

Director, School Facilities and
Transportation Services Division,
California Department of
Education



Sharon Danks

Founder and CEO of Green
Schoolyards America



Poll Questions



How familiar are you with green infrastructure practices?

- I am unfamiliar with green infrastructure practices.
- I have heard of green infrastructure practices but don't know much about them.
- I am familiar with green infrastructure practices but not their implementation in my community.
- I am aware and involved in implementing green infrastructure practices in my community.

How familiar are you with climate vulnerabilities for specific population segments within your neighborhood?

- I do not know what climate vulnerabilities are
- I know about climate vulnerabilities but not specific to my neighborhood.
- I know about climate vulnerabilities but not specific to my neighborhood.
- I am involved in developing or implementing solutions to climate vulnerabilities.



Which populations do you work with?

- Children and adolescents (under 18 years old)
- The working-age population (19–64 years)
- Older adults (65 years and older)
- All populations within the community

CLIMATE
RESILIENCE
FOR AN
AGING
NATION

**COMMUNITY
RESILIENCE AND
AGING: WHY
CLIMATE MATTERS**

Danielle Arigoni

EPA Soak Up the Rain | April 9, 2024





Learn more at
nationalhousingtrust.org

Nonprofit with nearly 40 years working on affordable housing preservation and sustainability

National leader in climate-resilient solutions through:

- Multifamily housing retrofits and development
- Solar deployment
- Financing
- Policy advocacy
- Resident services

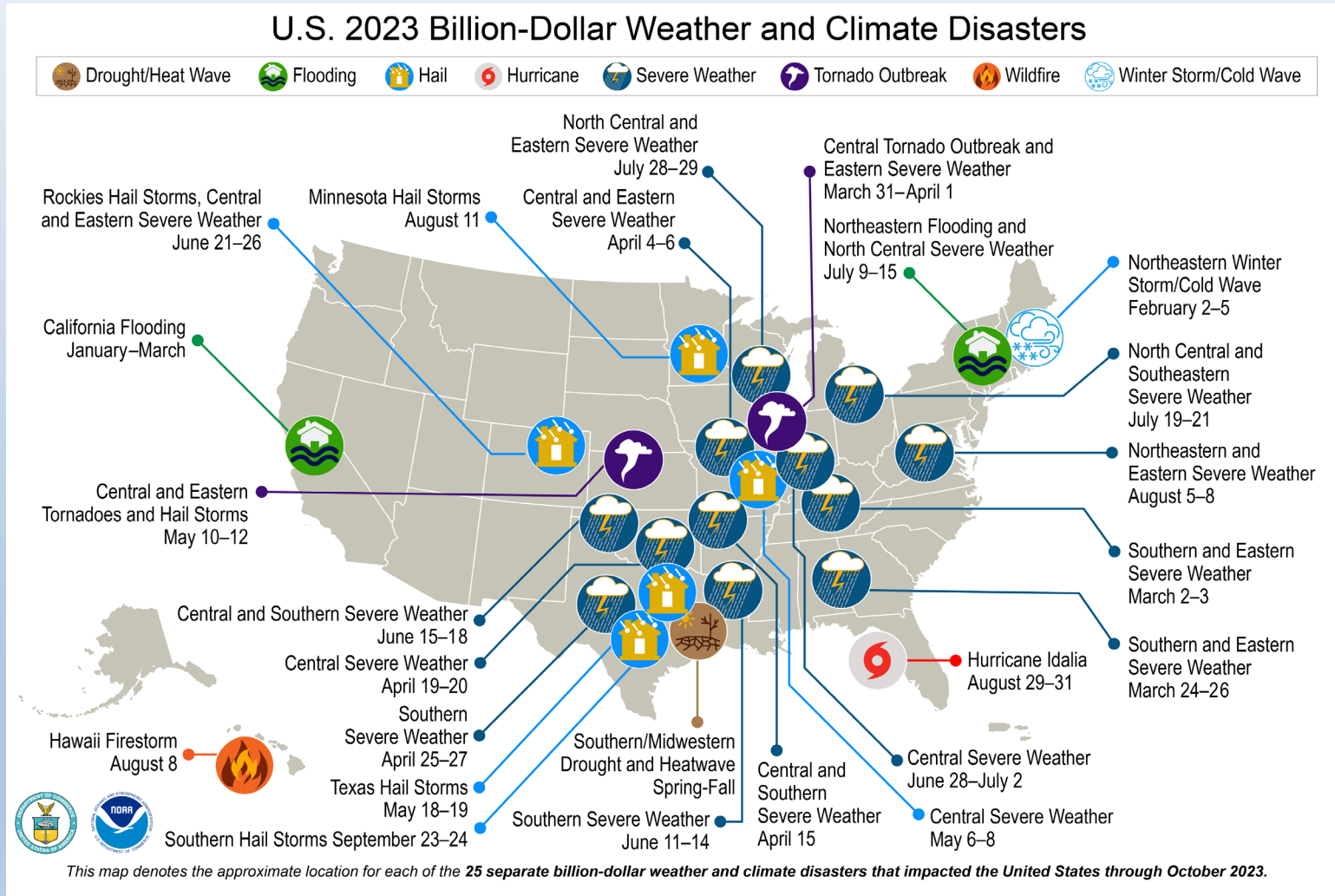


**Growing
Climate
Risks**



**Growing
Share of
Older
Adults**

GROWING CLIMATE RISKS



More billion-dollar disasters every year

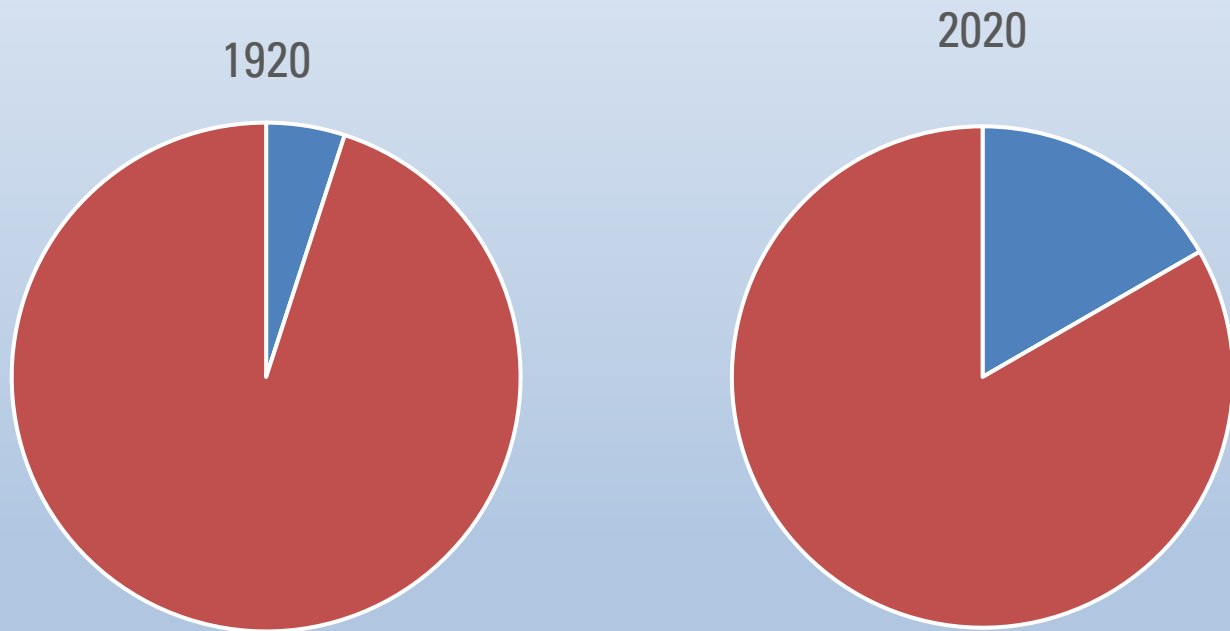
- 2023: 28 events*
- 2022: 18 events
- Since 1980: average of 8 events per year

Source: NOAA, <https://www.ncei.noaa.gov/access/billions/>

*Record high

GROWING SHARE OF OLDER ADULTS

% of total population, 1920-2020



By 2034, more people
>65 than <18
-- and increasingly
diverse

Source: US Census

POOR UNDERSTANDING OF OLDER ADULTS



1 in 6 live in poverty

98% live independently

30% live alone

20% don't drive

1 in 9 live with Alzheimer's disease

20% need help with ADL

40% have ambulatory limitations

80% have 2+ chronic med issues

Sources: ACL 2021 Profile of Older Adults; JCHS; NCOA

Engineers
Data analysts
Emergency
managers
CROs

**Growing
Climate
Risks**

**Growing
Share of
Older
Adults**

Gerontologists
Demographers
Health care
Aging advocates



OLDER ADULTS BEAR THE BRUNT

Louisiana: Hurricane Katrina (2005), **70% of people who died** were over 65

California: Camp Fire (2018) **85%** were over 60

North Carolina: Hurricane Florence (2018) **2/3** were over 60

Oregon (2021): heat waves **median age** of people who died was 67

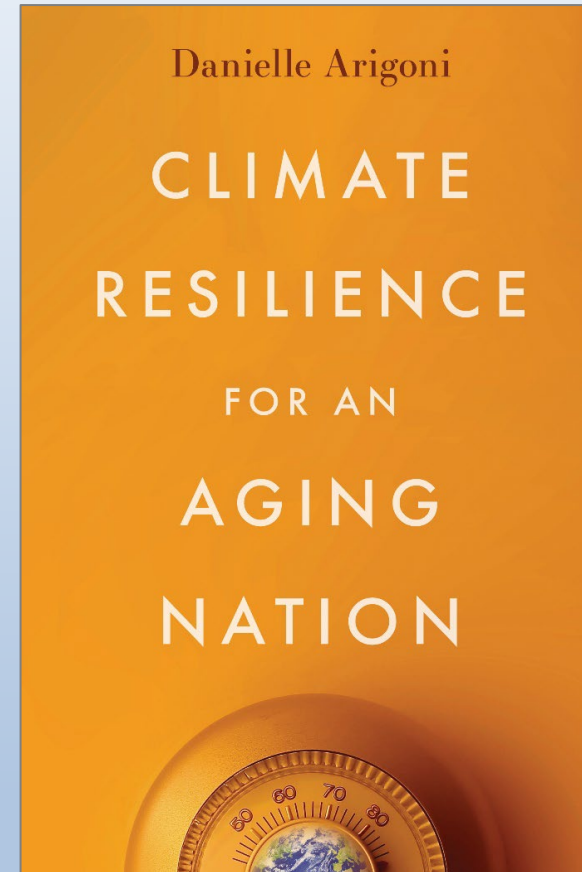
Buffalo, NY: Winter storms (2022) **63%** were over 60

Florida: Hurricane Ian (2022) **2/3** were over 60

Hawai'i: Lahaina wildfires (2023) **73%** were over 60

**Over 20 years:
no change**

WHAT CAN WE DO ABOUT IT?





FOR OLDER ADULTS,
DISASTERS MEAN:

- **Financial impacts** from loss or damage to property
- **Health impacts** from interrupted care, persistent damage to homes, and/or evacuation

**2.5 million
Americans**

displaced by climate change in
2023

Source: US Census as reported by NY Times, 2/22/24

FOR OLDER ADULTS, OUR 'NEW NORMAL' MEANS:

- **Health impacts** more intense for those with pre-existing health conditions

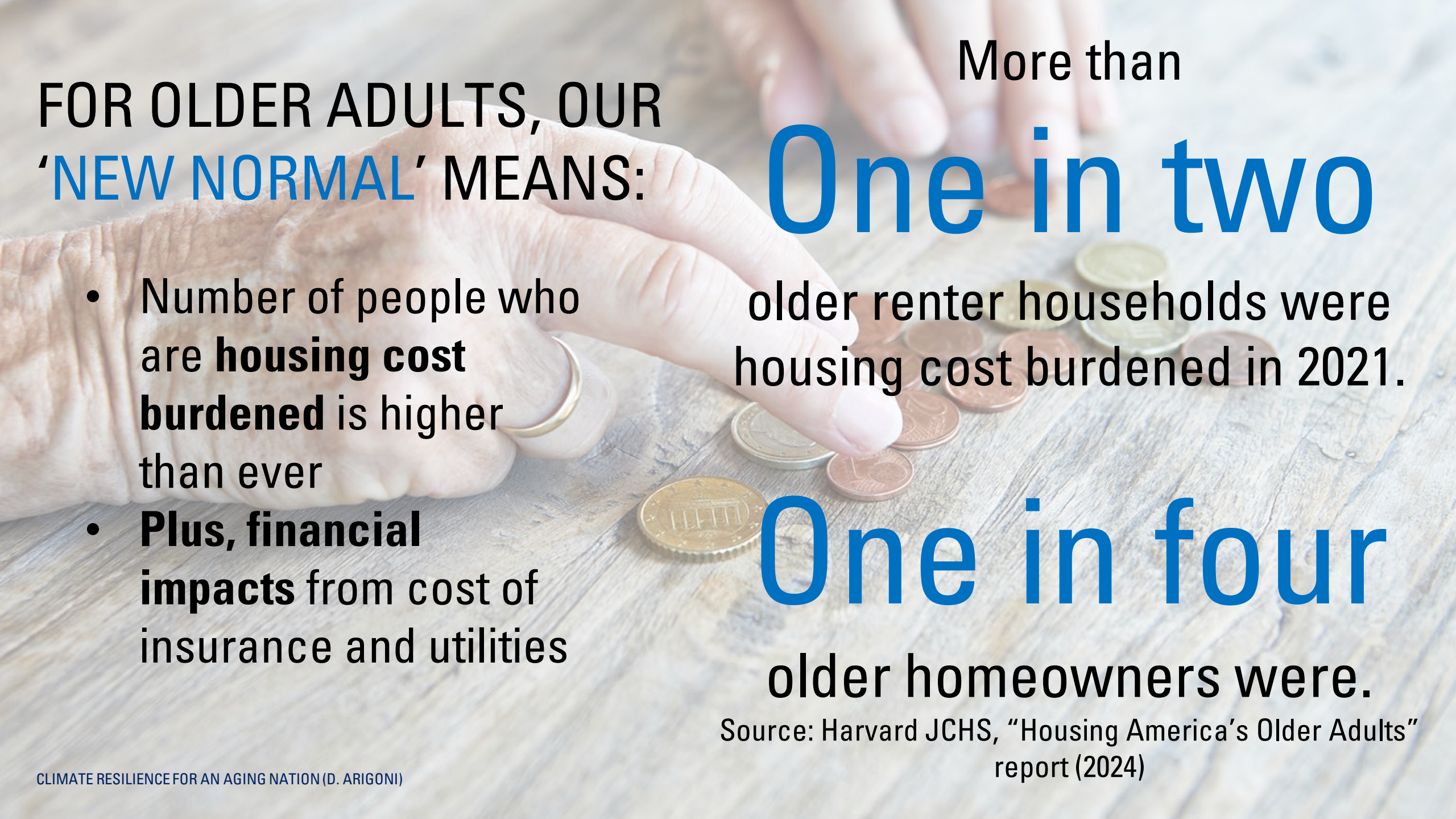
12,000

deaths caused by heat-related illness each year

80%

of are people over 60

Source: Climate Central, "Seniors at Risk"



FOR OLDER ADULTS, OUR
'NEW NORMAL' MEANS:

- Number of people who are **housing cost burdened** is higher than ever
- **Plus, financial impacts** from cost of insurance and utilities

More than

One in two

older renter households were housing cost burdened in 2021.

One in four

older homeowners were.

Source: Harvard JCHS, "Housing America's Older Adults" report (2024)



10 million

Households headed by person >60 are energy insecure, and

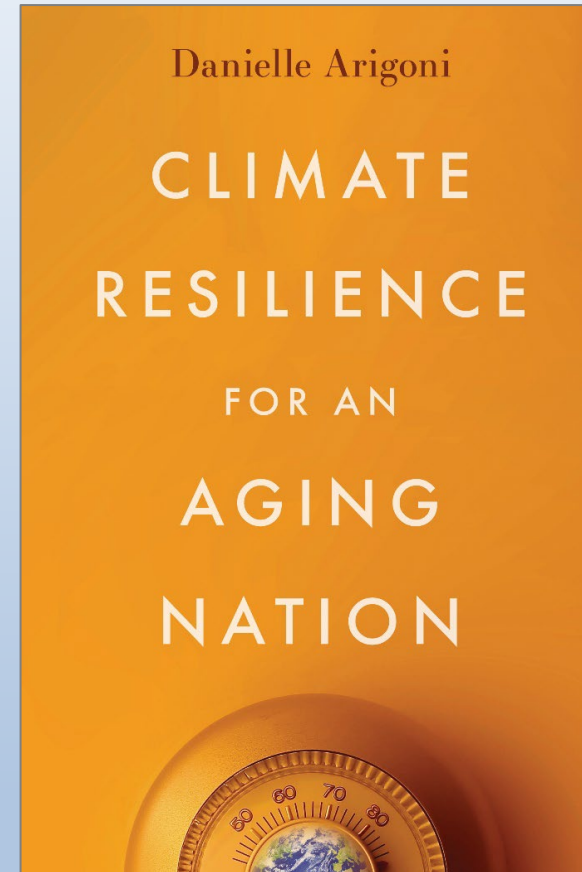
7 million

had to forego food or medical necessities to pay for utilities

\$842/yr to \$5431

is the expected annual flood insurance premium in Louisiana
following Risk Rating 2.0

WHAT CAN YOU DO ABOUT IT?



THREE MAJOR TAKEAWAYS

1. Acknowledge that **climate change impacts older adults differently** – and not just during disasters
2. Recognize that **individual and institutional preparedness is not enough**
3. Lean into solutions that **build community resilience** for all ages.



REDEFINING CLIMATE RESILIENCE (pt 1)

Climate-responsive infrastructure investments

- Grey and green infrastructure solutions
- (Accessible) open space and more trees
- More resilient and renewable energy

SAVANNAH PROPERTIES, WASHINGTON, DC



REDEFINING CLIMATE RESILIENCE (pt 2)

More affordable, accessible, green **housing** options

Multiple **transportation** alternatives

Improved **communication** during disasters



PARTNERS NEEDED TO ACHIEVE IT

Improved policies and practices by **utilities**
Explicit consideration of climate in **healthcare**
Aging is considered by **emergency managers**
Climate seen as the work of **aging advocates**
Aging + climate intersection in **infrastructure**

TOOLS AVAILABLE TO ASSIST

INFLATION REDUCTION ACT RESOURCES



COMMUNITY CHANGE GRANTS

GREENHOUSE GAS REDUCTION: NCIA AND CCIA

SOLAR FOR ALL PROGRAMS (STATES)

GRRP FOR HUD-ASSISTED HOUSING

TREASURY TAX CREDITS FOR SOLAR



U.S. DEPARTMENT OF
ENERGY

DOE REBATES

OTHER RESOURCES



COMMUNITY CHALLENGE GRANTS

AARP LIVABLE COMMUNITIES PUBLICATIONS AND TOOLS

GUIDE TO EXPANDING MITIGATION FOR OLDER ADULTS

BRIC GRANTS

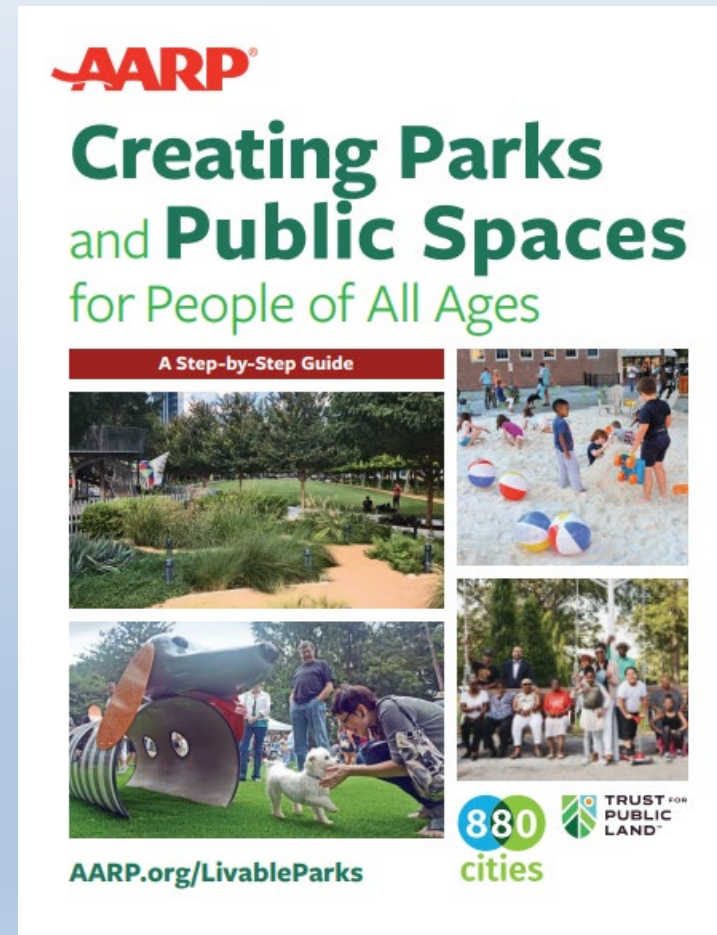


EXAMPLES IN PRACTICE



Photo Credit: AARP Livable Communities

Oklahoma City used AARP Community Challenge grant to create bioswales for capturing, slowing down and filtering stormwater runoff from a nearby parking lot.



STEP 1: Use the **AARP Livability Index** (page 22) to gain a deeper understanding of the community and identify its strengths and weaknesses.

STEP 2: Use the **ParkServe** tool (page 23) from Trust for Public Land to learn how many residents live near a park or green space.

STEP 3: Visit the actual or potential project location and conduct a **Public Space Audit** (page 28).

STEP 4: Use the **AARP Walk Audit Tool Kit** (page 24) to assess the area's walkability.

STEP 5: Use the **Public Space Field Study** (page 32) to understand who visits the park or public location and what they do there.

STEP 6: Recruit volunteers and have them help conduct an **Intercept Survey** (page 25) so the project team can understand how visitors feel about a park or green space location.

STEP 7: Collect and organize data from the **Public Space Audit**, the **Public Space Field Study** and the **Intercept Survey** to identify key themes and commonalities.

STEP 8: Complete the **Community Asset Map** (page 38) to identify key stakeholders and partners who might support the community's parks and public space efforts.

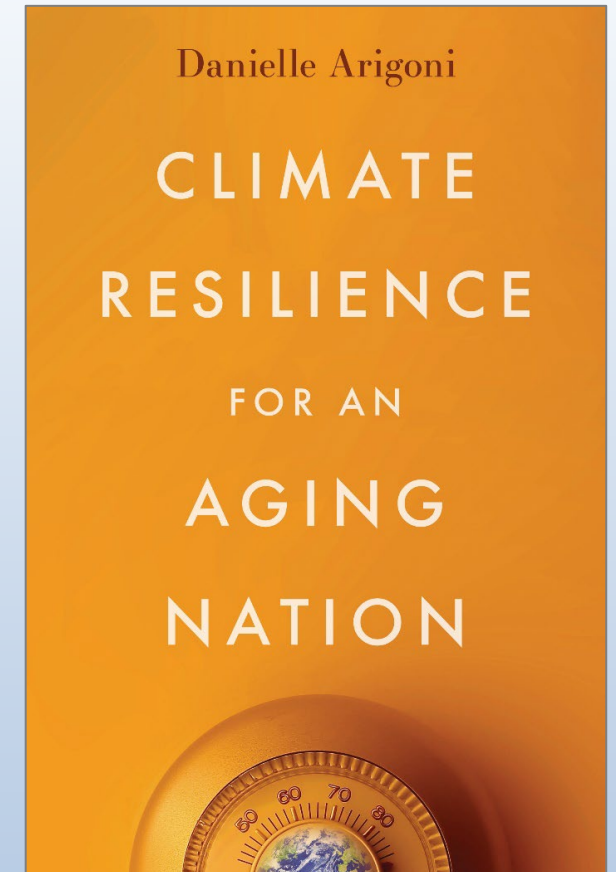
STEP 9: Complete the **Programming Calendar** (page 36) to understand what types of activities or events already happen in the location and identify new ideas that could make the space more inclusive and accessible.

STEP 10: Use the **AARP Pop-Up Placemaking Tool Kit** (page 39) to test potential solutions or livability features.

THANK YOU

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resilienceforanagingnation.com



Use ARIGONI for 20% discount when
ordering through Island Press





Creating Age-Friendly Communities with Green Infrastructure

How Addressing Needs of Children and Older Adults Benefits All

CALIFORNIA DEPARTMENT OF EDUCATION

Tony Thurmond, State Superintendent of Public Instruction

Our Role

- California *Education Code (EC)* Section 17251
 - Develop and establish standards
 - Provide guidance and resources requested by school districts
- *EC* Section 17070.55
 - Assist school districts in the evaluation and utilization of existing school facilities and the justification of the need for schoolsites, new facilities, and the rehabilitation or replacement of existing facilities

My Role in Supporting Sustainable Schools

- Help our schools adapt to climate change and be more sustainable.
- Protecting our youngest learners from environmental hazards.
- Educate our future leaders to become responsible stewards of the planet.



California's Climate Goals

Carbon neutrality by 2045

“What this means for California is an ambitious and aggressive approach to squeezing the carbon out of every sector of the economy.”

(AB 32 Climate Change Scoping Plan, 2022 Draft Update)

More than 11,000 public schools sit on nearly 8,500 properties, totaling 124,616 acres and containing 730 million square feet of buildings.

(Geospatial research by the Center for Cities + Schools, UC Berkeley)

Climate Impacts and Children's Needs

- Climate impacts disproportionately burden children
- “Almost every child on earth is exposed to at least one climate and environmental hazard...”

(United Nations Children's Fund (UNICEF), August 2021)



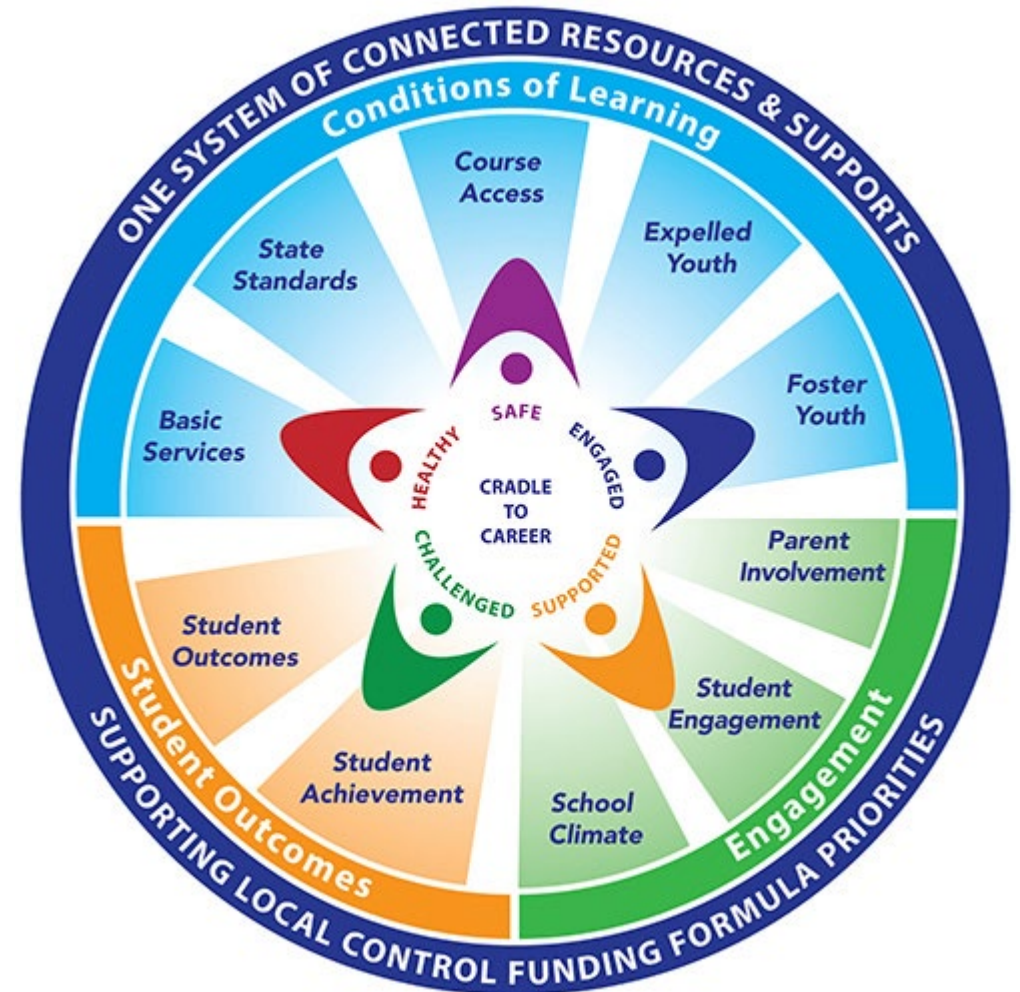
Inequities in School Building Design

- Aging buildings
- Older buildings lack modern sustainability.
- Limited local capacity for debt issuance.



Conditions of Learning

- Local Control Funding Formula (LCFF) State Priority 1 - Basic Services
 - School facilities in good repair [EC Section 17002(d)(1)]
- Facility master planning and educational specifications
 - Buildings and grounds



Green Schools Advance Equity

- Health equity
- Racial equity
- Closing the opportunity gap
- Environmental justice
- “Triple bottom line”
 - Financial, social, and environmental outcomes



U.S. Department of Education Green Ribbon Schools (2011)

- Pillar I: Reduced environmental impact and costs
- Pillar II: Improved health and wellness
- Pillar III: Effective environmental and sustainability education



California Green Ribbon Schools (2014)

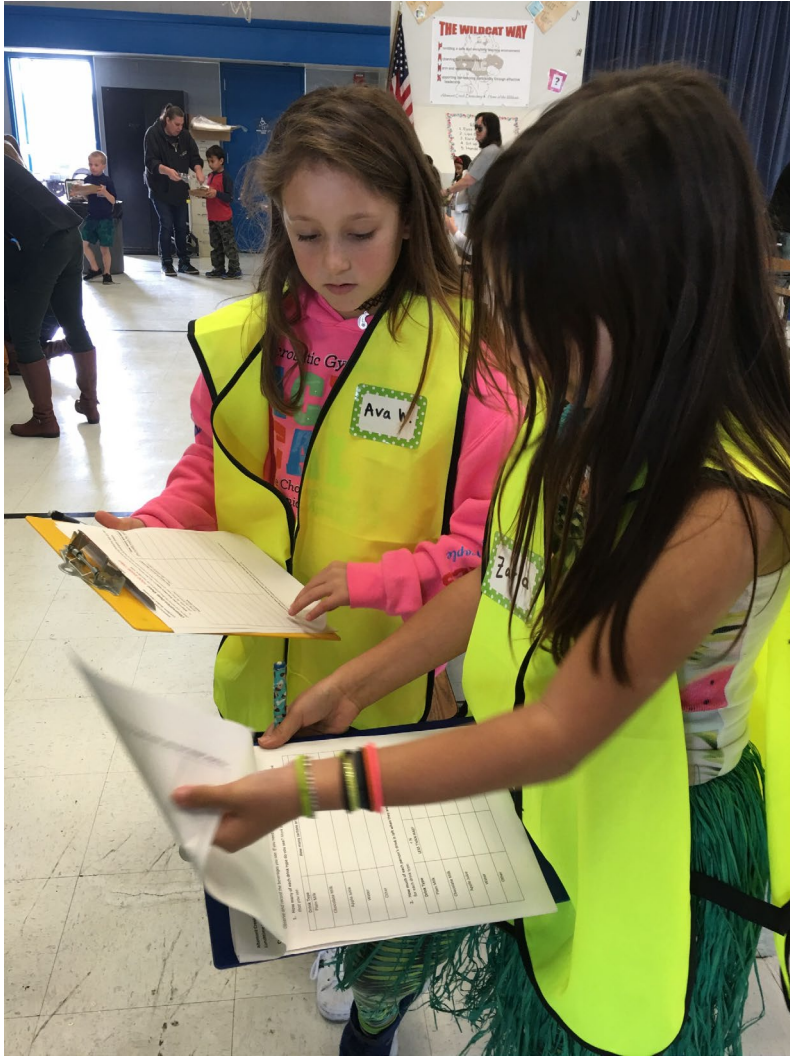
- Excellence in whole-school sustainability
- Awards beginning at 55% achievement
- An inspiring self-assessment tool and roadmap



Green Schools Best Practices

- Efficient buildings
- Student-led audits
- Waste diversion
- Active transportation
- School gardens and forests
- Infrastructure is a learning and teaching tool
- Indoor environmental quality
- Healthy cleaning practices
- Integrated pest management
- Outdoor learning
- STEM skills
- Green career pathways

Illustrated Best Practices



Interagency Collaboration

- California Energy Commission
 - California Clean Energy Jobs Act [Proposition 39 (2012)]
 - California Schools Healthy Air, Plumbing, and Efficiency Program [CalSHAPE, authorized by AB 841(2020)]
- State Water Resources Control Board
 - Drought Response Outreach Program for Schools [DROPS (2014)]
- California Health in All Policies Task Force
 - Land Use, Schools, and Health
 - Farm to School

Air Quality

- Indoor
 - Infiltration, mechanical and natural ventilation
 - Illness prevention
 - IAQ Tools for Schools Action Kit (US EPA)
- Outdoor
 - Land use and vehicle emissions
 - Wildfire smoke
 - Air Quality Flag Program (AirNow.gov)



Indoor Environmental Quality (IEQ)

- Indoor Air Quality (IAQ)
- Lighting
- Thermal Comfort
- Acoustic Comfort



Best Practices, Resources, and Research



SUSTAINABLE COMMUNITIES AND SCHOOL PLANNING

Although safety and educational appropriateness are the highest priorities for school facilities, the California Department of Education (CDE) also supports school district advancement of community sustainability via local engagement and collaborative planning.

What Sustainable Communities Are

Sustainability reflects an understanding that the needs of the present must be met without compromising the ability of meeting future needs.¹

Generally defined in the California Public Resources Code,² "sustainable communities" are those that promote equity, strengthen the economy, protect the environment, and promote public health and safety. They often utilize planning concepts such as smart growth, complete streets, mixed use, infill, brownfields, and transit-oriented development—all intended to encourage more walking and biking, efficient use of land, infrastructure, and multimodal transit, and a better jobs-housing balance.

Statewide, Regional, and City/County Sustainable Communities Planning

California's Strategic Growth Council brings together numerous state agencies with the Governor's Office of Planning and Research to coordinate activities that support sustainable communities consistent with the State's Planning Priorities.³ Also with a goal of more sustainable communities, recent legislation⁴ supports the State's climate action efforts through coordinated transportation and land use planning. For example, the Air Resources Board is required to set regional targets for each of the 18 metropolitan planning organizations (MPOs) for reduction of greenhouse gas emissions from cars. Each MPO must prepare a "sustainable communities strategy" (SCS) as part of its regional transportation plan. Within the SCS, land use, housing, and transportation plans are primarily aimed at reducing vehicle miles traveled by making more efficient use of land and infrastructure. Through their own general and specific plans, cities and counties are encouraged to implement the SCS. Local governments and developers are offered incentives, such as relief from certain environmental review requirements, for projects that are consistent with the SCS.



Schools' Role in Sustainable Communities

The location, accessibility, quality, maintenance, safety, and use of a school can have a significant impact on the health and well-being of a community. A school district can help advance its community's sustainability goals by including:

- **Partnerships, Co-location, and Joint Use/Development:** Sharing resources and facilities are excellent ways to leverage public and private funding, reduce costs, and increase the amount and quality of community and education assets provided. A common example is joint use with parks, where schools can be built on smaller sites and have access to adjacent parkland and facilities for physical activity. It also can include opening up use of facilities on school sites during both school and nonschool hours for a variety of uses and services: pools, theaters, libraries, fitness centers, parking, health clinics, senior centers, and career-technical educational partnerships. Strategically co-located and offering a variety of uses, a school can become the center of a community and help reduce the number and length of vehicle trips otherwise required.
- **Promoting Active Transportation:** Safe routes to school promote active forms of transportation (e.g., walking and biking) with associated health benefits and reduced pollution and traffic near schools. Creating safe routes by removing existing barriers or mitigating safety issues is much more difficult and expensive to accomplish after construction than if the school is originally sited



Sustainable Schools Improve Learning and the Environment

The recent National Action Plan for Greening America's Schools concludes that a sustainable school creates a healthy environment that is conducive to learning and saves energy, resources, and money. Additional benefits of sustainable schools include improved student health, attendance, and academic achievement.¹

Here are a few more reasons to consider sustainable features:

- A 2006 study showed that sustainable schools use 33 percent less energy and 32 percent less water than conventionally constructed schools, significantly reducing utility costs over the average 42-year life cycle of a school.²
- Additional studies show the continuing high cost of energy and utilities. According to national data from 2008, the median annual cost for energy and utilities per student in kindergarten through grade twelve was \$295.13.³
- Improving a school's health and safety standards can lead to a 36-point increase in California Academic Performance Index scores.⁴
- Because green schools emphasize a healthy indoor environment, a district that builds green schools will benefit from reduced exposure to liability for students' and staff's health-related problems, fewer lawsuits, and less risk of damage to its reputation.⁵
- A school site that uses effective construction techniques can reduce, reuse, and recycle between 50 percent and 75 percent of building materials (e.g., brick, asphalt, wood, plastic, glass, gypsum



board, and carpet), thereby reducing environmental impacts.⁶

- Attention to school siting practices can improve solar access; take advantage of natural air flows, maximize daylighting, and increase easy and safe pedestrian, bicycle, and mass transit options.^{7,8}
- Substandard physical environments are strongly associated with truancy and other behavior problems in students. Lower student attendance led to lower scores on standardized tests in English-language arts and math and to less reading.^{9,10}
- Studies indicate that student performance is improved by an even distribution of daylight, an expansive view, and limited glare and thermal heat gain. One study found 20 percent faster student progress on math and 26 percent faster progress in reading compared with students in classrooms with less exposure to daylight.^{11,12}

Notes

1. Brooks Rainwater and Jason Hartke, *A National Action Plan for Greening America's Schools: Local Leaders in Sustainability, Special Report from Sustainable* (Washington, DC: U.S. Green Building Council, 2010).
2. Gregory Katz, *Greening America's Schools: Costs and Benefits* (in p. CapitalE, 2006).
3. Joe Agnon, "18th Annual Maintenance & Operations Cost Study," *American School & University* #1, no. 9 (2009): 20-23.
4. Jack Barkley, Mark Schwenden, and Yi Shang, *Los Angeles Unified School District School Facilities and Academic Performance* (Washington, DC: National Clearinghouse for Educational Facilities, 2006).
5. *Collaboration for High-Performance Schools, Best Practices Manual*, Volume 1: Planning (San Francisco, 2006).
6. U.S. Environmental Protection Agency, *Travel and Environmental Implications of School Siting* (Washington, DC, 2003).
7. See note 5.
8. See note 6.
9. Valeria Orsola-Russell, "School Building Conditions, School Attendance, and Academic Achievement in New York City Public Schools: A Meta-Analysis," *Journal of Environmental Psychology*, no. 3 (2006): 278-86.
10. Jennifer Kerner, Patrick M. O'Malley, and Lloyd D. Johnston, "Association Between Physical Environment of Secondary Schools and Student Problem Behavior," *Environment and Behavior* #0, no. 4 (2006): 453-86.
11. Peter Boyce, *Review of Technical Reports on Daylight and Productivity* (Troy, NY: Rensselaer Polytechnic Institute, 2004).
12. *Harvard Mahone Groves, Daylighting in Schools: An Investigation into the Relationship Between Daylighting and Human Performance* (Fair Oaks, CA, 1999).

For more information, contact the California Department of Education, School Facilities Services Division, at 916-322-2470.

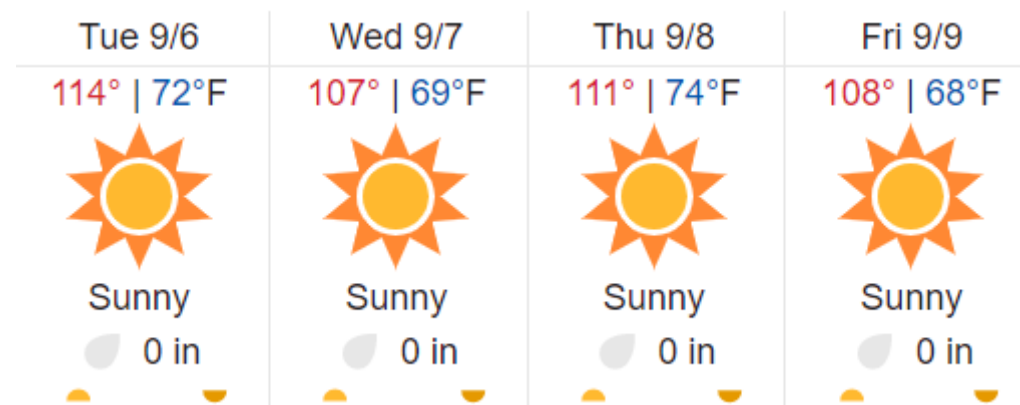
1-2010

- [CDE Sustainable Communities and School Planning Fact Sheet](#)
- [CDE Sustainable Schools Improve Learning and the Environment Research Summary](#)
- [CDE School Facilities Best Practices and Resources Fact Sheets](#)

Extreme Heat

“California’s best climate science projects that every corner of the state will be impacted in years and decades to come by higher average temperatures and more frequent and severe heat waves. These changes will pose a risk to every region and sector across natural, built, and social systems.”

California’s Extreme Heat Action Plan (April 2022)





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CALIFORNIA DEPARTMENT OF EDUCATION

Tony Thurmond, State Superintendent of Public Instruction

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**Green
Schoolyards
America**

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greenschoolyards.org



Living Schoolyards

Creating Climate-resilient Environments Children

Green Schoolyards America partners with public agencies and school districts across the U.S. to establish large-scale living schoolyard programs that transform school grounds into ecologically-rich, park-like green spaces. Our goal is to improve children's health, learning, and happiness while contributing to communities' ecological and climate resilience.



**Green
Schoolyards
America**



We are working to change the paradigm for school ground design, use, and management so all children will have access to the natural world in the places they visit every day.

Children are Vulnerable to Climate Impacts

Kids are vulnerable

to the same climate-related problems as adults—AND they are also more sensitive to extreme heat and pollutants due to their smaller size and developing bodies.

They have more limited mobility

than adults and spend a large portion of their time at school.



Extreme Temperatures

- High Heat
- Cold and Wind

Extreme Precipitation

- Flooding
- Droughts

Air Quality Problems

Wildfires

Sea Level Rise

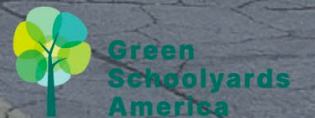
Biodiversity and Habitat Loss

Children need protection from the impacts of climate change in the places they spend their time—**at school.**



Across the United States, nearly 50 million K-12 students attend school every day on thousands of square miles of public land.

Many school grounds are highly paved and unshaded, and offer very little to improve the well-being of students, their communities, or their environment.





**Green
Schoolyards
America**

Resource Highlight

Stormwater Schoolyard Training Materials

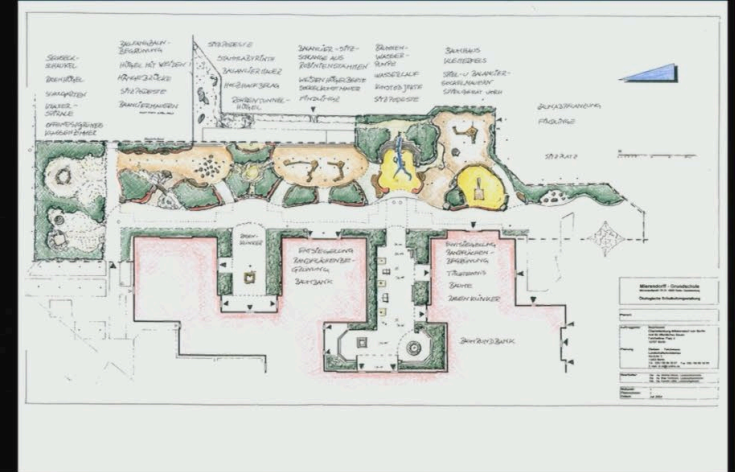
Video and written content about schoolyard stormwater management in the United States and abroad

Developed by Green Schoolyards America in collaboration with the San Francisco Public Utilities Commission, San Francisco Unified School District, and Birgit Teichmann



RENOWNED LANDSCAPE ARCHITECT, BIRGIT TEICHMANN, SHARES HER EXPERTISE IN STORMWATER SCHOOLYARD DESIGN WITH PARTICIPANTS IN THE STORMWATER SCHOOLYARD TECHNICAL TRAINING SEMINAR THAT GREEN SCHOOLYARDS AMERICA CREATED IN COLLABORATION WITH THE SAN FRANCISCO PUBLIC UTILITIES COMMISSION AND SAN FRANCISCO UNIFIED SCHOOL DISTRICT.

CASE STUDY - Mierendorff Grundschule - Plan



Living Schoolyards as Stormwater Infrastructure: Presentation 1

Unlisted



SF Water Power Sewer

1.23K subscribers

sfpuc.org/programs/san-franciscos-urban-watersheds/stormwater-schoolyards



**Green
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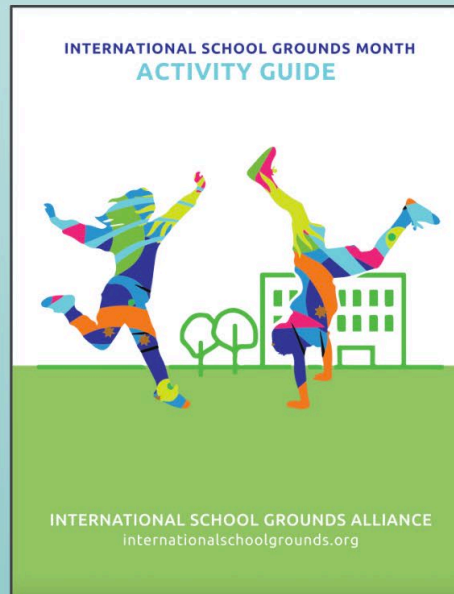
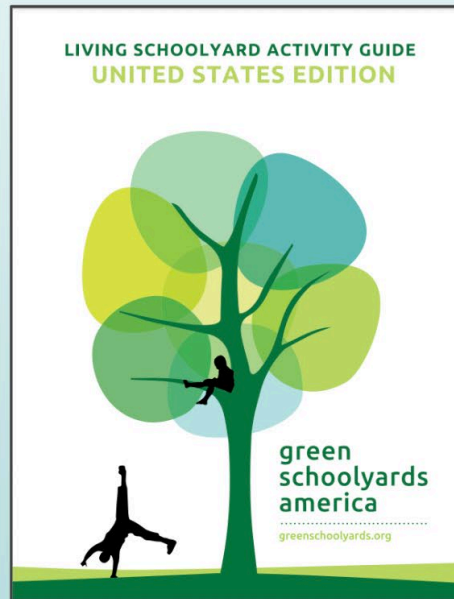
Resource Highlight

Stormwater Schoolyard Activities

Watershed stewardship and stormwater educational activities

*Living Schoolyard Activity Guide
U.S. Edition*
(pages 157-169)

*International School Grounds
Month Activity Guide*
(pages 125-133)



Watershed Stewardship

Clean, fresh water is a precious resource. It comes to our schools and communities in the form of rainfall and through municipal plumbing systems and natural waterways. It leaves school grounds through man-made storm drains and sewer networks, and by flowing over the landscape, percolating into the soil, and running through local creeks. In most cases, water from these sources is relatively clean when it arrives on school grounds and dirtier when it leaves. School communities have the power to improve their local water systems and to use them as educational resources at the same time by incorporating stormwater planning into the design and use of school grounds.¹

Stormwater Management. Schoolyards designed to manage stormwater can be beautiful and educational while holding and utilizing rainwater, and purifying runoff. Small scale stormwater management projects like rain gardens, vegetated swales, rain barrels, and cisterns can often be developed by the school community with some assistance from local experts. Larger stormwater management projects usually require substantial assistance from landscape architects and engineers, but they can have important beneficial impacts for their school and community.

Some schools around the world are removing large amounts of asphalt, concrete, and other impermeable surfaces and developing “green infrastructure” on their grounds that makes them feel more like parks. Converting school grounds to multi-use spaces with topography, ground cover plants, and trees can make it possible to absorb *all* of the runoff from the whole school site—helping to recharge the water table and prevent flooding of the school and surrounding neighborhood.

Water Conservation. Living schoolyards can conserve water by finding and fixing leaks, incorporating drought tolerant plant species, building gardens with efficient irrigation systems, and deeply mulching planted areas.

Water Quality Monitoring. Well-designed green schoolyards can improve the purity of local water bodies by removing particulates, nutrients, and pollutants from stormwater flows by catching them in planted areas before they can reach nearby rivers and lakes. Students can conduct citizen science studies to check the water quality of surface water on their school grounds and in their community.

Greywater Reuse. Schools can capture lightly used water from the building, purify it, and then use it to water trees, reducing the amount of fresh water they need from the municipal system. Each country and municipality has different rules that govern the use of greywater, so it is important to do some local research before implementing your own greywater reuse system.

INTERNATIONAL SCHOOL GROUNDS ALLIANCE
International School Grounds Month – Activity Guide
internationalschoolgrounds.org



125

greenschoolyards.org/guides



Closing Thoughts

Models exist — This is not a technical problem. Creating high quality green infrastructure for children on school grounds has been happening for decades in some places in the United States and abroad.

This is a consensus problem. — We need to make children's health and happiness a priority and ensure that they get their fair share of funding for nature-rich green infrastructure at school.

A growing number of school districts, counties, and states are making large scale plans to green their grounds. — Your school and district can, too!



Closing Thoughts

Land matters — Public land devoted to children is scarce and precious. We need to use it wisely.

Kids need shade — It is essential to directly protect children from extreme heat and other effects of climate change.

Now is the time to act — Green schoolyards and schoolyard forests provide opportunities to address pressing cross-sector problems at scale.

**We hope you will join us
in this important work.**



Thank you!



**green
schoolyards
america**

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Asphalt to Ecosystems

Design Ideas for Schoolyard Transformation

Sharon Gamson Danks



Links related to the presentation:

- Green Schoolyards America's website: greenschoolyards.org
- National Schoolyard Forest SystemSM: greenschoolyards.org/schoolyard-forest-system
- Schoolyard Forest SystemSM Resource Library: greenschoolyards.org/forest-resource-library
- Schoolyard Forest Design Guidance: greenschoolyards.org/design-implementation-maintenance
- Climate Adapted Tree List for California: greenschoolyards.org/cal-tree-palette
- Spacings App – Free tool for visualizing tree planting designs: greenschoolyards.org/forest-spacings
- Free online lecture series about schoolyard greening and schoolyard forests (one series about schoolyard design and another one that is a community of practice for school districts): <https://www.greenschoolyards.org/schoolyard-forest-design-lecture-series>
- Schoolyard stormwater resources for schools:
 - Design overview: <https://www.greenschoolyards.org/regional-initiatives> (bottom of page) and sfpu.org/programs/san-francisco-urban-watersheds/stormwater-schoolyards
 - Curriculum materials: greenschoolyards.org/guides
- US EPA: Best Practices for Reducing Near-Road Pollution Exposure at Schools: https://19january2017snapshot.epa.gov/sites/production/files/2015-10/documents/ochp_2015_near_road_pollution_booklet_v16_508.pdf



Q/A

