

# Welcome to the LIFE Webinar Series

We will begin the webinar momentarily



**Low-Income  
Forum on Energy**

# LIFE Webinar Series

Growing Green Cities - Forests and Green Infrastructure  
for Sustainability, Resilience, and Health

Simon Gruber

Institute for Sustainable Cities, Hunter College, City University of New York

January 28, 2020

1:30 p.m. – 2:30 p.m. ET



**Low-Income  
Forum on Energy**

# Mission Statement

## **Working to help low-income New Yorkers address energy issues.**

LIFE, the Low-Income Forum on Energy, is a unique statewide dialogue that brings together organizations and individuals committed to addressing the challenges and opportunities facing low-income New Yorkers as they seek safe, affordable and reliable energy.

Supported by the New York State Public Service Commission and the New York State Energy Research and Development Authority (NYSERDA), the LIFE dialogue encourages an interactive exchange of information and collaboration among the programs and resources that assist low-income energy consumers.

# Webinar Series, Newsletter, Social Media

## > Monthly webinars

- Wednesday, February 19, 2020  
*Energy Justice – Principles and Practice*
- Wednesday, March 25, 2020  
*Spotlight on New York's Energy Consumers – What We Can Learn from Current Research*
- Register at [nyscrda.ny.gov/LIFE-Webinar-Series](https://nyscrda.ny.gov/LIFE-Webinar-Series)

## > Monthly electronic newsletter

- Sign up at [nyscrda.ny.gov/LIFE](https://nyscrda.ny.gov/LIFE) – “Join the email list”

## > Social media

- Twitter: @LIFEenys
- LinkedIn: Low-Income Forum on Energy

# Connect

- > Find more information on the website
  - [nysesda.ny.gov/LIFE](https://nysesda.ny.gov/LIFE)
- > Join the mailing list for announcements and updates
  - Sign up at [nysesda.ny.gov/LIFE-mailing-list](https://nysesda.ny.gov/LIFE-mailing-list)
- > Contact LIFE
  - Phone: 866-697-3732 – Request “Low-Income Forum on Energy”
  - Email: [LIFE@nysesda.ny.gov](mailto:LIFE@nysesda.ny.gov)

# Upcoming Event

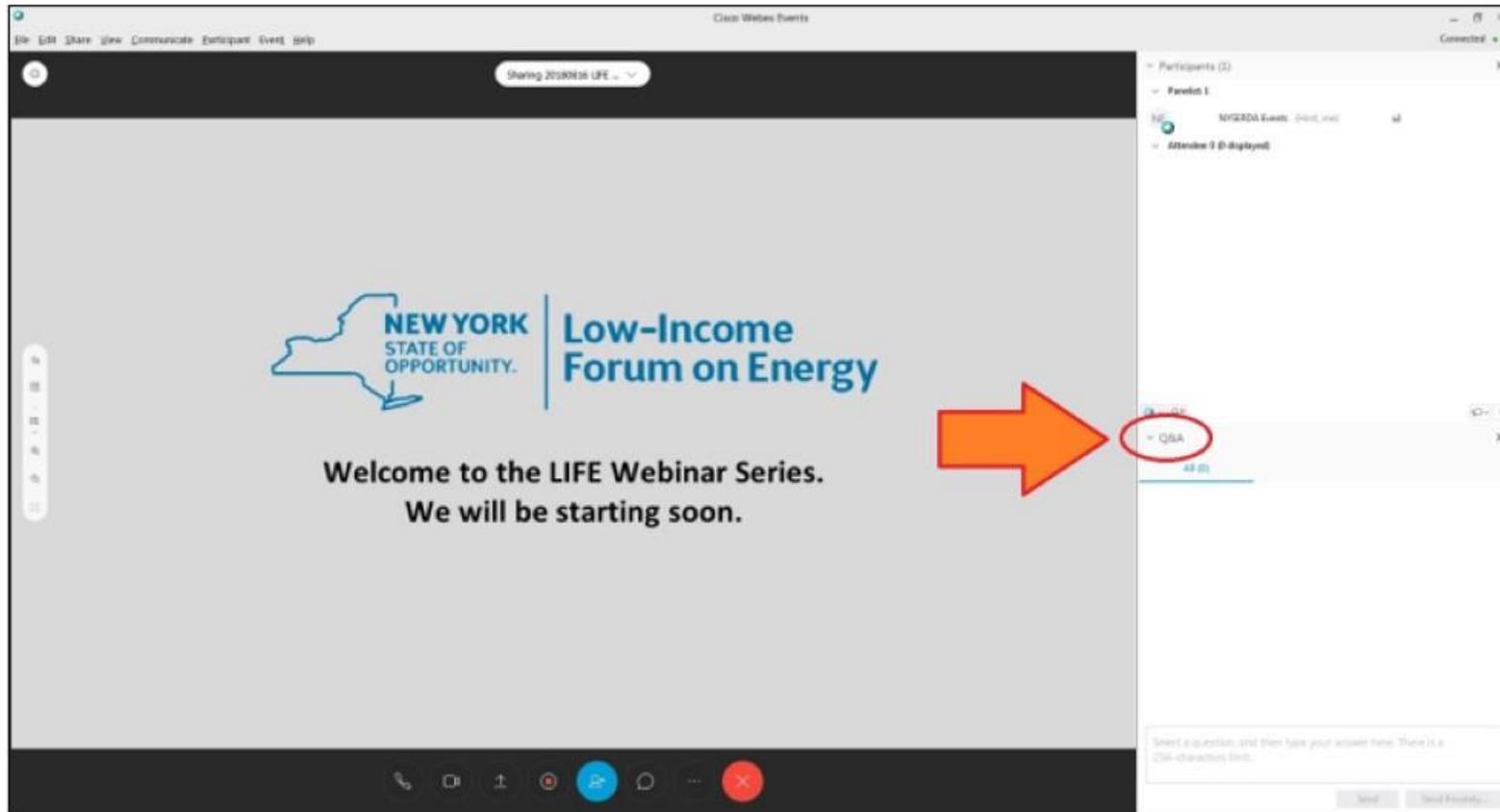
## **LIFE 2020 Statewide Conference**

May 19-20, 2020

Albany, NY

[nyscrda.ny.gov/LIFE-mailing-list](https://nyscrda.ny.gov/LIFE-mailing-list)

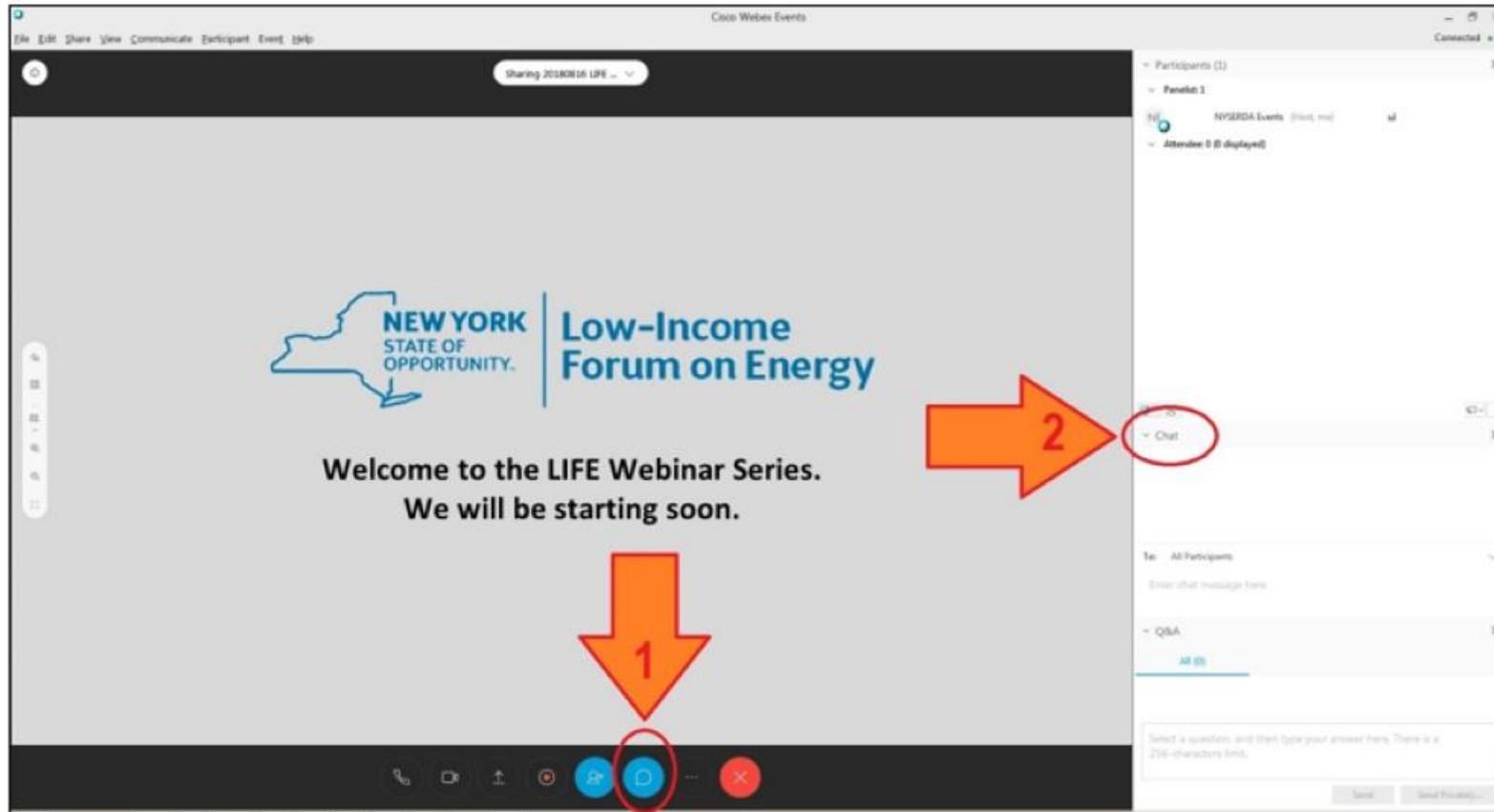
# Asking Questions During Today's Webinar



The screenshot shows a Zoom webinar interface. The main content area displays the "NEW YORK STATE OF OPPORTUNITY. Low-Income Forum on Energy" logo and the text "Welcome to the LIFE Webinar Series. We will be starting soon." An orange arrow points from this text to the "Q&A" tab in the right-hand sidebar. The sidebar also shows a "Participants" list with "Faviah S.", "NYGADA Event (Host)", and "Attendee 1 (Display)". Below the "Q&A" tab, there is a text input field with the placeholder "Send a question, and then type your answer here. There is a 256-character limit." and "Send" and "Send Private..." buttons.

- > Click on the small arrow to the left of Q&A to open the text field.
- > Type your question into the text field and click "send."

# Technical Difficulties or Contacting the Host



The screenshot shows a Zoom webinar interface. The main content area displays the "NEW YORK STATE OF OPPORTUNITY. Low-Income Forum on Energy" logo and the text "Welcome to the LIFE Webinar Series. We will be starting soon." At the bottom of the screen, there is a control bar with several icons. A red circle highlights the "Chat" icon, with a red arrow labeled "1" pointing to it. To the right, a sidebar is open, showing a list of participants and a "Chat" button. A red circle highlights the "Chat" button, with a red arrow labeled "2" pointing to it. Below the "Chat" button, there is a "Q&A" section with a "Send" button.

- > Click on the "Chat icon on the bottom menu to activate the chat function.
- > The chat function will appear in the middle right portion of your screen.



Growing Green Cities:  
Forests & Green Infrastructure for  
Sustainability, Resilience & Health

New York State  
Low-Income Forum on Energy  
January 28, 2020

Simon Gruber  
Institute for Sustainable Cities  
Hunter College, City University of New York



Growing Green Cities is a project of the Open Space Institute

# Key points:

- There are major benefits for people and communities when we have more trees and green space in our built environment – the places where we live, work, play and learn.
- These benefits include improved health and wellness; cooling in hot weather (heat island mitigation) with associated energy savings; more opportunities for social interaction and making connections with neighbors; reduced rates of certain kinds of crime; better management of stormwater runoff and protection of water quality; and air quality and noise reduction.
- This information is important for local and state planning and policies on energy, climate change, health care, education, and other sectors, yet the science, technical guidance and experience is not being applied by relevant agencies and organizations – there are key exceptions and newer trends.
- Resilience is a widely-used term in the context of climate change planning; it is also being used in the context of child and human development and mental and emotional health.
- Nature experience, and access to nature, for children and adults provide deep and important benefits for learning, stress reduction, physical and mental health, and resilience; the term biophilia describes an innate human affinity for nature (plants, trees, animals, landscapes, water, etc.).

# Origins of Growing Green Cities project

Perspectives, background knowledge and timeline:

- Solar energy systems and passive solar design perspective
- Building science and high-performance buildings and site design
- Watershed planning, water resources and infrastructure focus
- Green infrastructure (GI) for stormwater management
- Co-benefits of GI for energy, health, wildlife habitat, aesthetics

Common elements:

Water, energy, buildings, infrastructure, and living systems ...

People!

Conference Announcement

# Greening Our Buildings & Landscapes - Linking Economics, Ecology & Human Health

Thursday, March 18, 1999  
8:30 a.m. - 4:30 p.m.  
Mount Saint Mary College  
330 Powell Avenue  
Newburgh, NY 12550

*Conference in 1999 in Newburgh, NY about building & landscape designs supporting linking environmental, health and economic goals.*

## Ecological Engineering: An Integrated Approach to Resource Protection

By Simon L. Gruber

*Sierra Atlantic article in 1995 advocating integrated, multi-purpose landscapes for stormwater management, open space, habitat, etc. ... i.e., green infrastructure, (before this term was in use here).*



*Regional trainings, demonstration project planning, conferences & policy analysis on stormwater management, 2004-2011, then from 2009-2020 this work has focused mainly on green infrastructure strategies using rain gardens, green roofs, trees, porous paving, & related practices for capturing and treating stormwater runoff. Work during 2008-2017 was sponsored by the Hudson Valley Regional Council with NYS DEC funding.*

**Green infrastructure integrates stormwater management into site design and community planning. It describes systems that use trees, plants soils, porous paving or other permeable surfaces, green roofs, stormwater harvest and reuse, and other landscaping to capture stormwater runoff, cleanse and return it to the environment. Growing Green Cities is focused partly on linking this with sustainability, public health, energy efficiency, climate change adaptation and mitigation, community development, social cohesion, children's development and education, trauma prevention and response, and quality of life.**

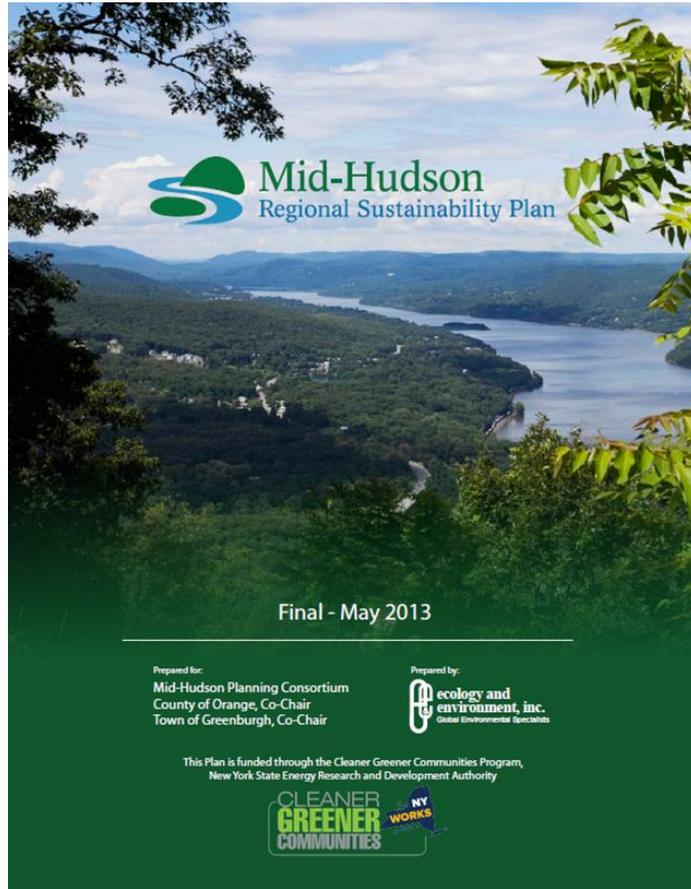
For an official definition of green infrastructure in Section 502 of the Clean Water Act, visit this link: <https://www.epa.gov/green-infrastructure/what-green-infrastructure>



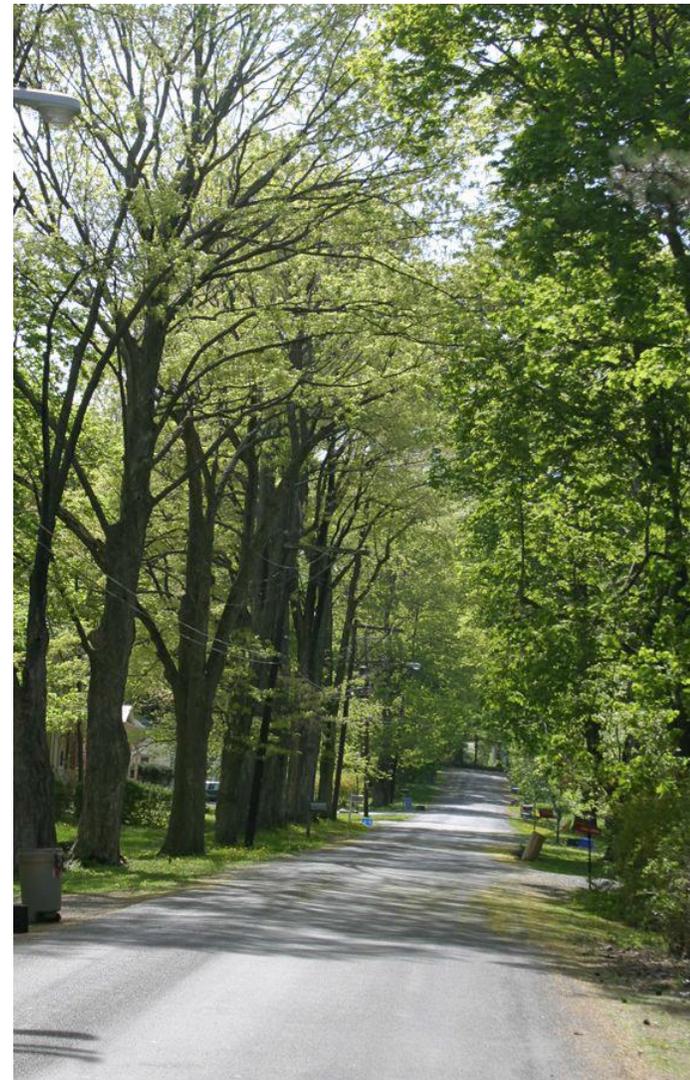
# Origins of Growing Green Cities project...

Perspectives, background knowledge and timeline, continued:

- Co-benefits of GI for energy, health, wildlife habitat, aesthetics
- c. 2010 – Conceptual focus on need for interdisciplinary approach, drawing in decision-makers in community development, public health, health care, energy and other sectors, to realize full potential of GI in cities
- 2012-2013 – Mid-Hudson Region sustainability planning process, funded by NYSERDA
  - Reduction in greenhouse gas emissions is the central metric
  - Adaptation's importance is recognized, but without any clear metric for measurement
- How can we understand the full value of green infrastructure for reducing greenhouse gas emissions? Where are the major benefits?
- Trees, forests and other green space are key infrastructure resources



*Mid-Hudson Regional Sustainability Plan*, completed in May 2013 as part of New York State's Cleaner Greener Communities program.



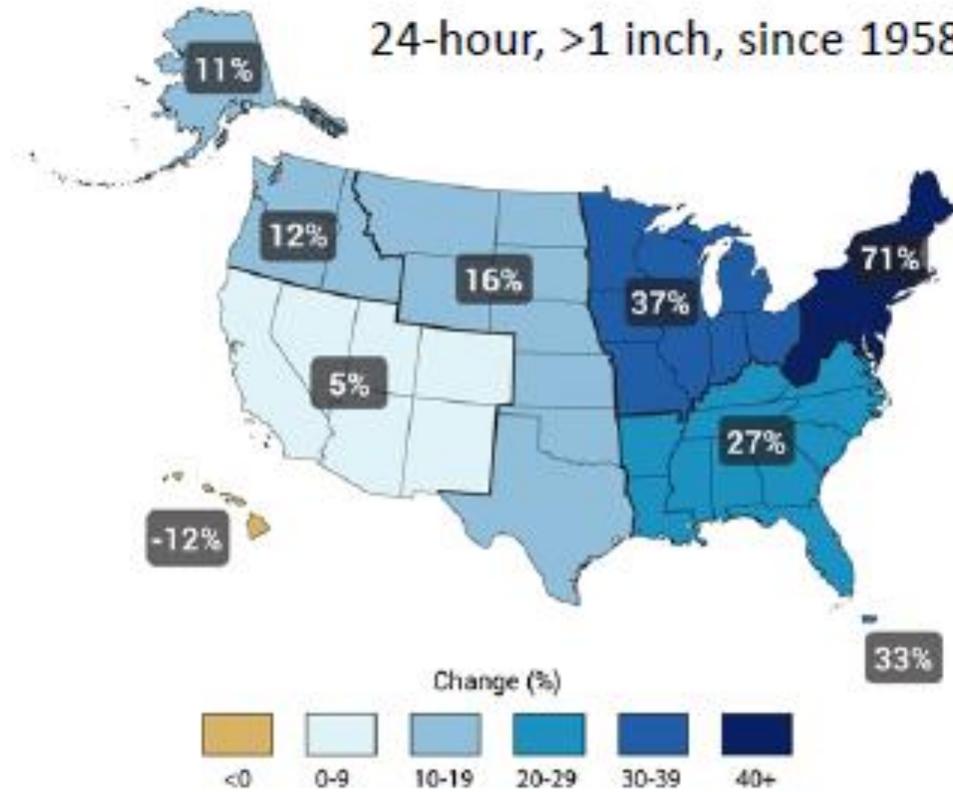
Challenge: How are best practices for managing water related to sustainability, climate adaptation, greenhouse gas reduction, and resilience?

Decision: Focus on trees.

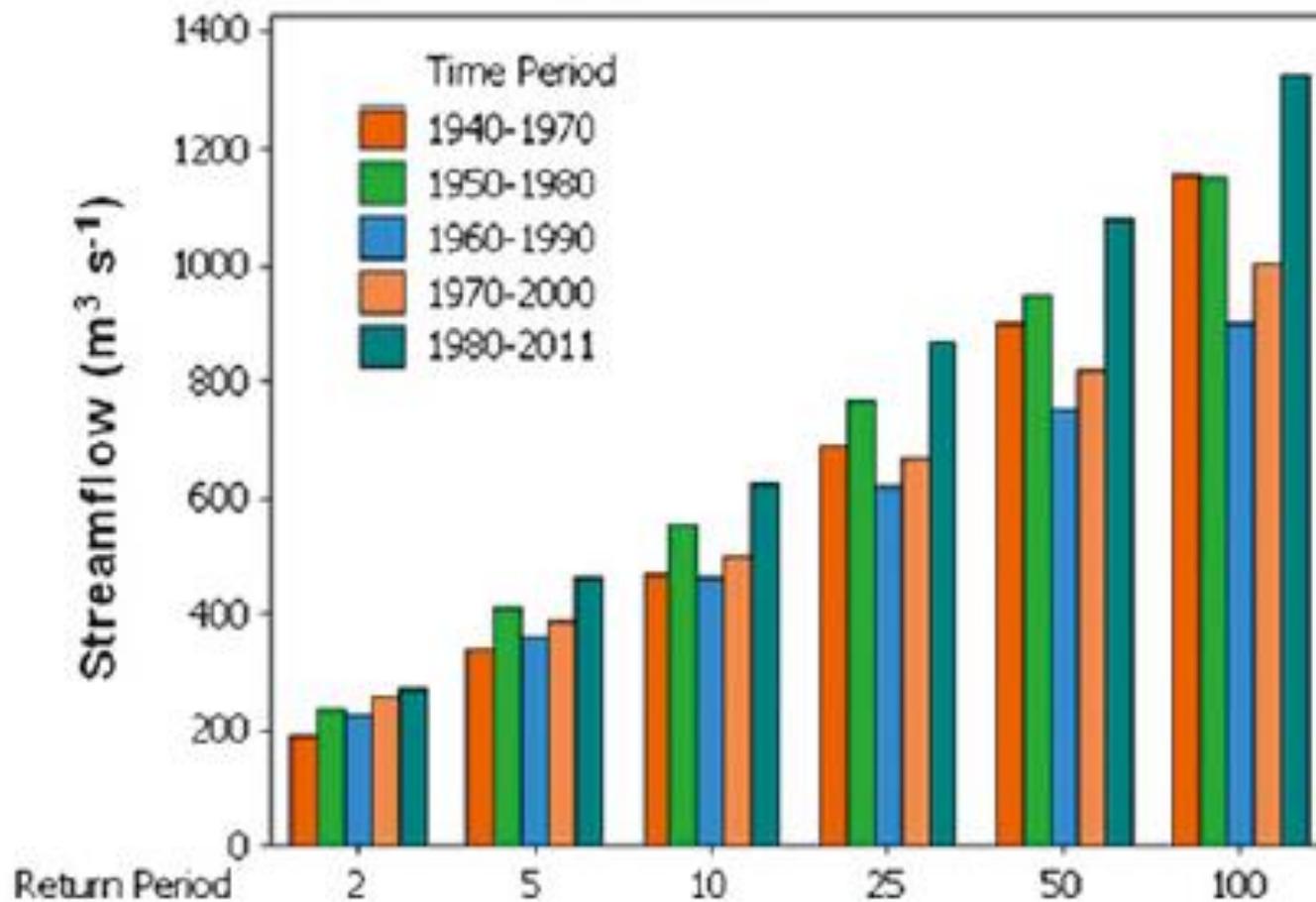
# Climate trends

Observed Change in Very Heavy Precipitation

24-hour, >1 inch, since 1958



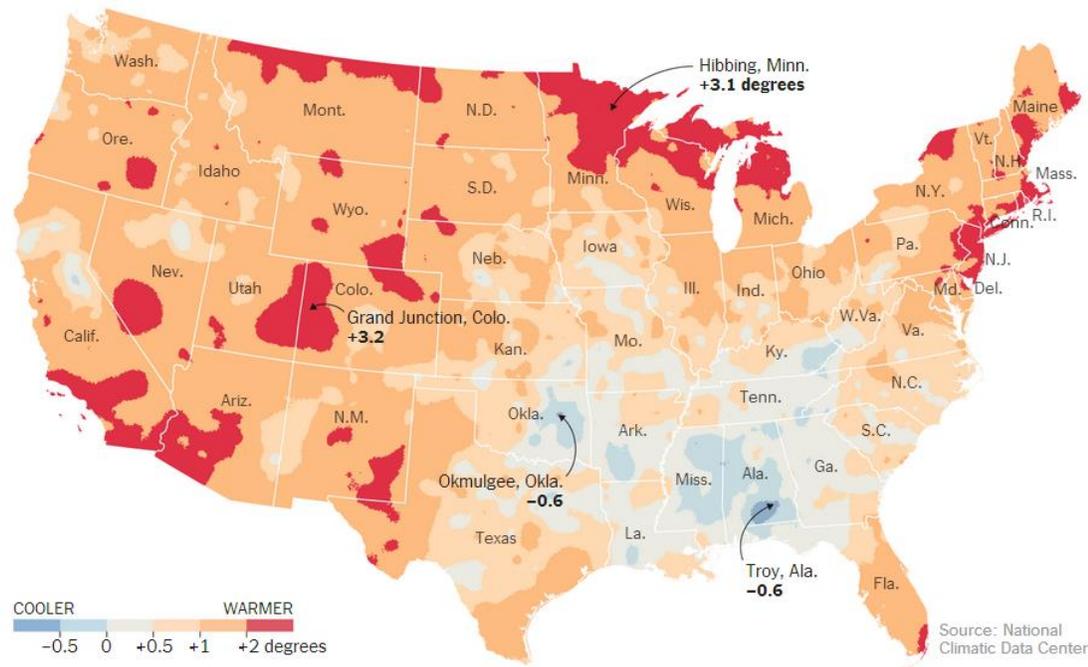
National Climate Assessment



In the Hudson Valley & Catskill Mountain region, the 10-year flood from the period 1960-1990 became the 5-year flood during 1980-2011, and the 25-year flood from 1960-1990 became the 10-year flood for 1980-2011.

Matonse, Adão H, Allan Frei, 2013: A Seasonal Shift in the Frequency of Extreme Hydrological Events in Southern New York State. *J. Climate*, 26, 9577–9593. Published in American Meteorological Association *Journal of Climate*, December, 2013.

# U.S. National Climate Assessment released on May 6, 2014



## Rising Temperatures

1991-2012 average temperature compared with 1901-1960 average



John Holdren, Director, White House Office of Science and Technology Policy, speaking about the new report in New York City on May 7, 2014.

Photo by Simon Gruber

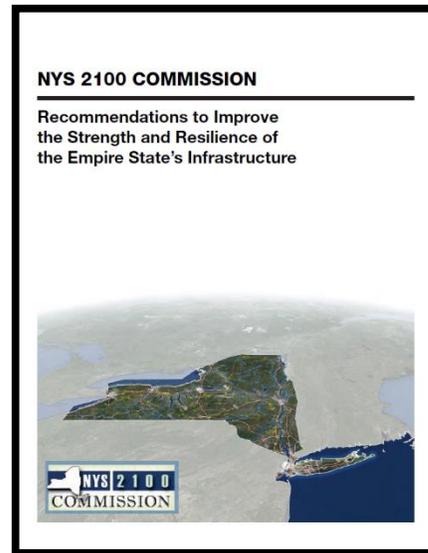
## ***U.S. Climate Has Already Changed, Study Finds, Citing Heat and Floods***

By JUSTIN GILLIS MAY 6, 2014

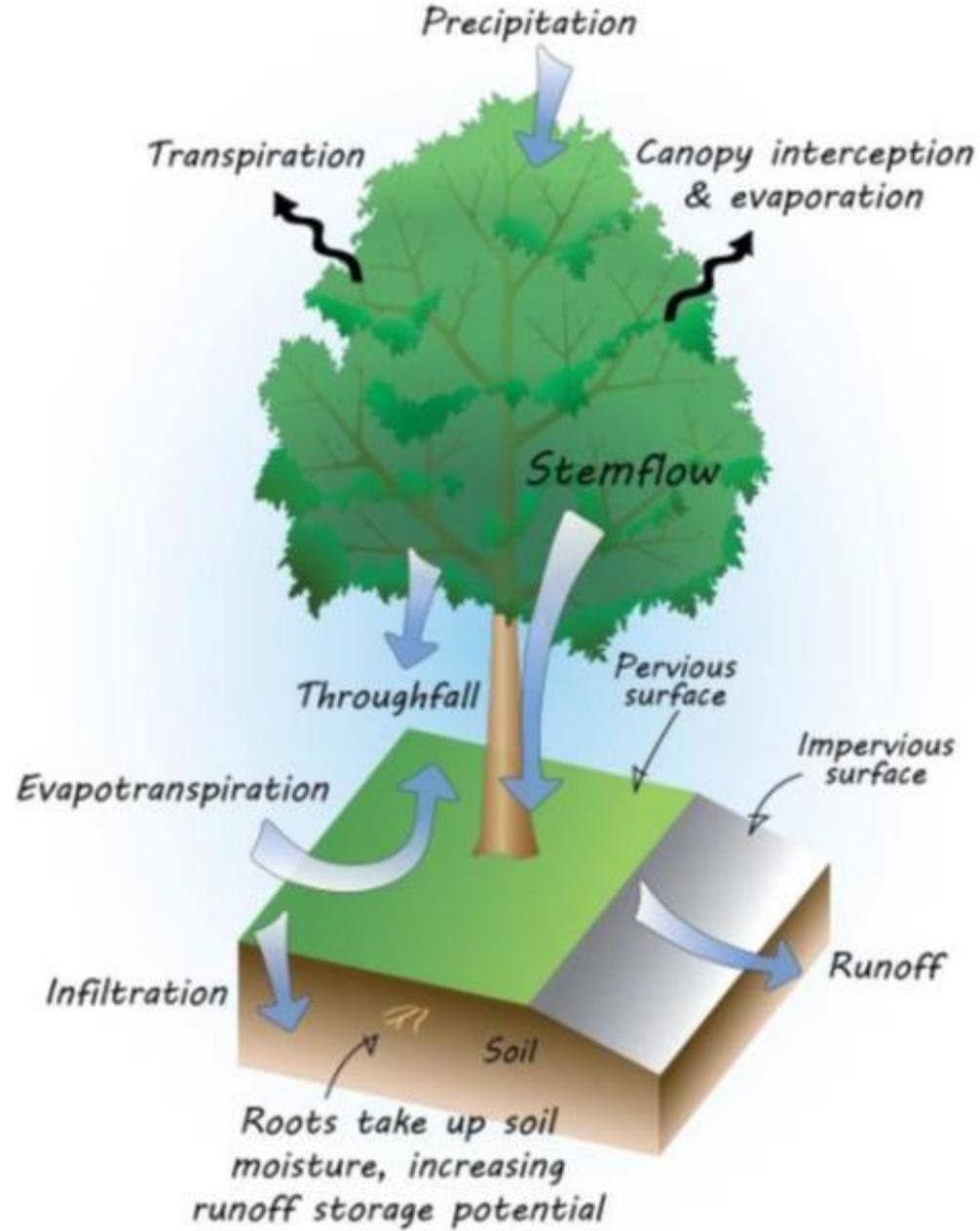
[http://www.nytimes.com/2014/05/07/science/earth/climate-change-report.html?\\_r=0](http://www.nytimes.com/2014/05/07/science/earth/climate-change-report.html?_r=0)

## Trends and challenges:

- Trees, open space and landscapes are not viewed as essential infrastructure, and should be
- Local and state resources for effective management are extremely limited
- Climate and policy trends, etc., often lead towards removing trees or planting smaller or invasive species
- Health, psychological, social, and long-term economic benefits often not factored into budgets, programs, policies and management decisions



NYS 2100 Moreland Commission report established after Superstorm Sandy in 2012:  
**“Promote and expand urban forests... to combat stormwater runoff and urban heat” (p. 131)**



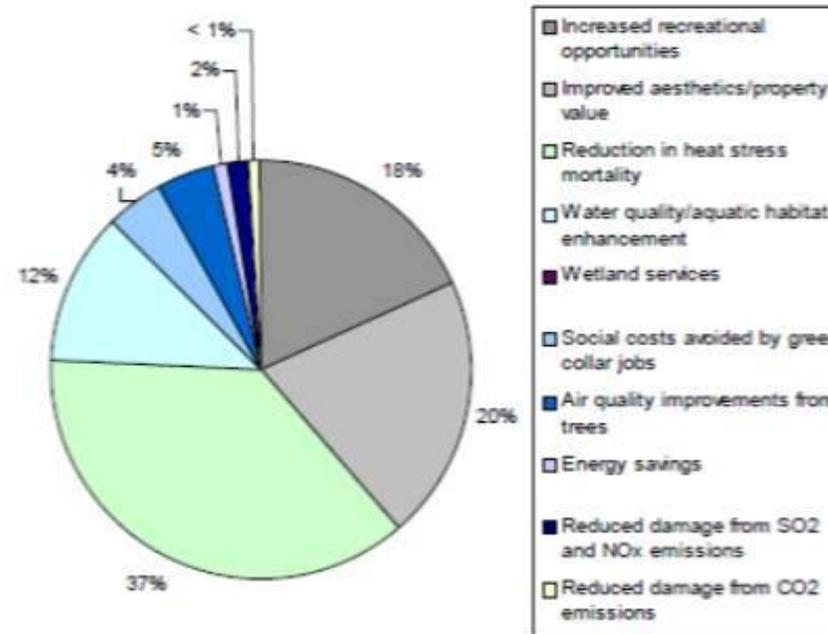
## Urban forest, green infrastructure & nature experience benefits:

- energy efficiency
- ecosystem services – air quality, water quality, energy benefits
- health and wellness; faster healing times in hospitals, etc.
- quality of life -- beauty, quiet, wildlife, social connections, safety
- providing healing environments that reduce stress and trauma
- productivity, lower absenteeism
- learning and cognition
- infrastructure resilience, performance and cost-effectiveness
- risk reduction and mitigation – e.g., insurance and finance sectors, lower health care costs, reduced crime risk
- climate adaptation and mitigation
- social benefits -- social cohesion, lower rates of certain crimes
- economic benefits for communities -- increased time shopping in downtowns, increased property values, resident and business retention and attraction

What's missing from this list?



Water is an essential ingredient



**Figure 5.2. Shares of City-wide present value benefits of key CSO options: Cumulative through 2049.**

An analysis in 2009 of estimated triple bottom line benefits of major investments in a city-wide green infrastructure plan for stormwater management in Philadelphia found that reduction in heat stress mortality, increased property values and more recreational opportunities accounted for c. 50% of total economic benefits.

# Related research, planning and outreach projects, funding, etc.

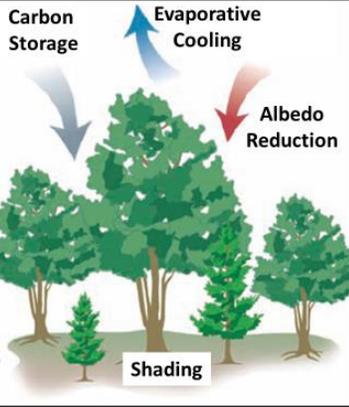
Westchester County Forest Inventory: Mapping and Ecosystem Services Assessment, funded with a grant from the NYS Dept. of Environmental Conservation Hudson River Estuary Program to CUNY, led by Dr. Andrew Reinmann and Simon Gruber is leading the community outreach and coordination, in close collaboration with Westchester County and other partners.

“Planting Westchester” is the working title for a county-wide public campaign focused on highlighting the benefits of trees and community gardens, an initiative planned by the Westchester County Climate Crisis Task Force for 2020 and beyond.

Governor Cuomo’s proposed budget for FY 2020-2021 includes a budget line for community forests.

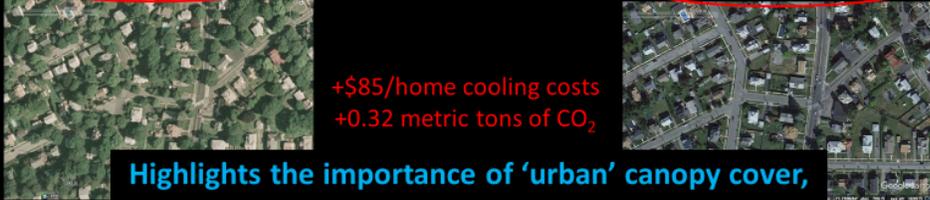
### Ecosystem Services of Trees and Forests

- Habitat/biodiversity
- Recreation and aesthetics
- Dampen noise pollution
- Maintain water and air quality
- Regulate water flow
- Climate regulation
  - Thermoregulation
  - Surface energy dynamics
  - Reduce energy demand
  - Carbon Sequestration



### Ecosystem Services of Trees and Forests: Thermoregulation Worcester, MA Case Study

2008 (Before)	2009 (After)
• 39.5% canopy cover	• 6% canopy cover
• 5.4 kWh per block	• 10.7 kWh per block



+\$85/home cooling costs  
+0.32 metric tons of CO<sub>2</sub>

Highlights the importance of ‘urban’ canopy cover, not traditionally thought of as ‘forest’

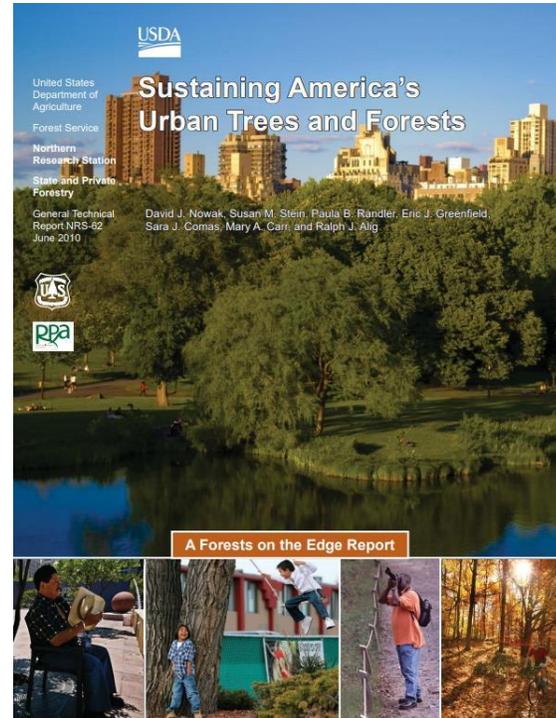
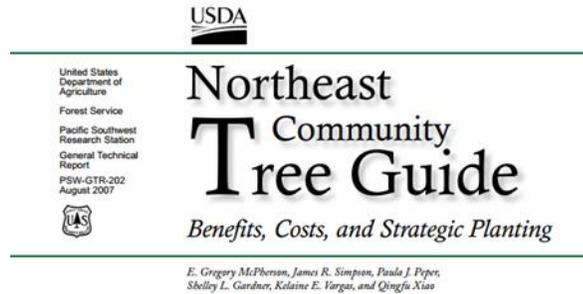
Morzuch et al. Umass Amherst

The graphics on this page are courtesy of Dr. Andrew Reinmann, from a presentation he gave at the annual statewide New York ReLeaf conference on urban forestry presented by the NYS Urban Forestry Council, the Region 3 ReLeaf Committee, and NYS DEC in 2019.

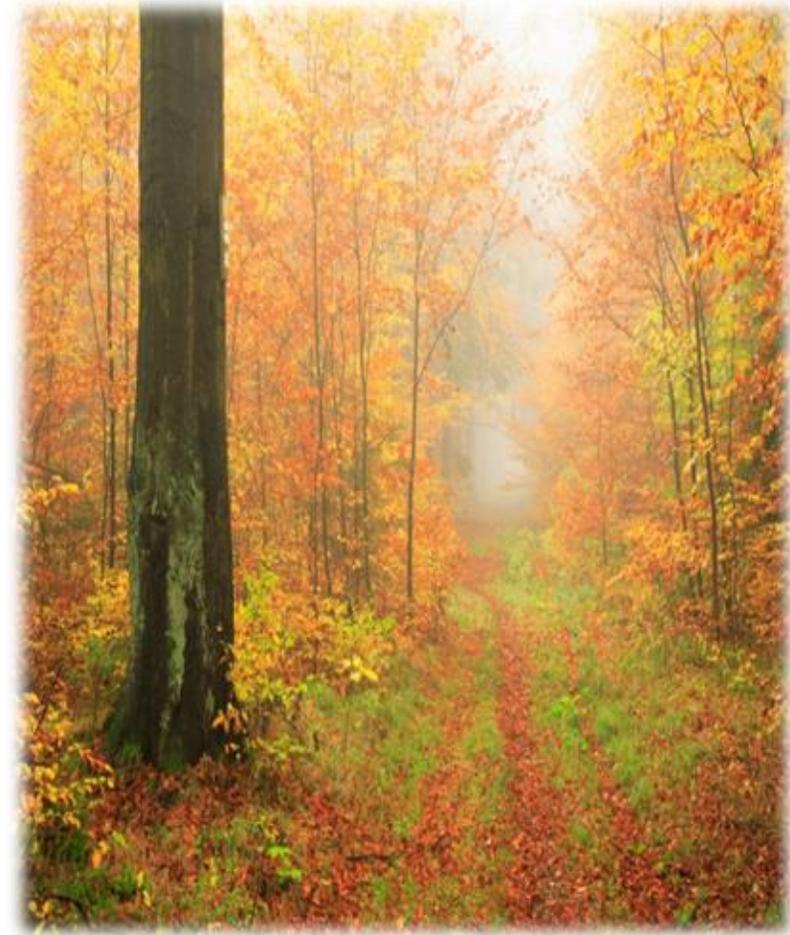


Case study: Safe Harbors Green in Newburgh, NY, is a public space adjacent to 128 units of affordable, supportive housing with green infrastructure designed into a mixed-use landscape and gathering and performance venue. (Photo above taken during construction.) Owner: Safe Harbors of the Hudson. Designer/Builder: OneNature LLC

# Resources



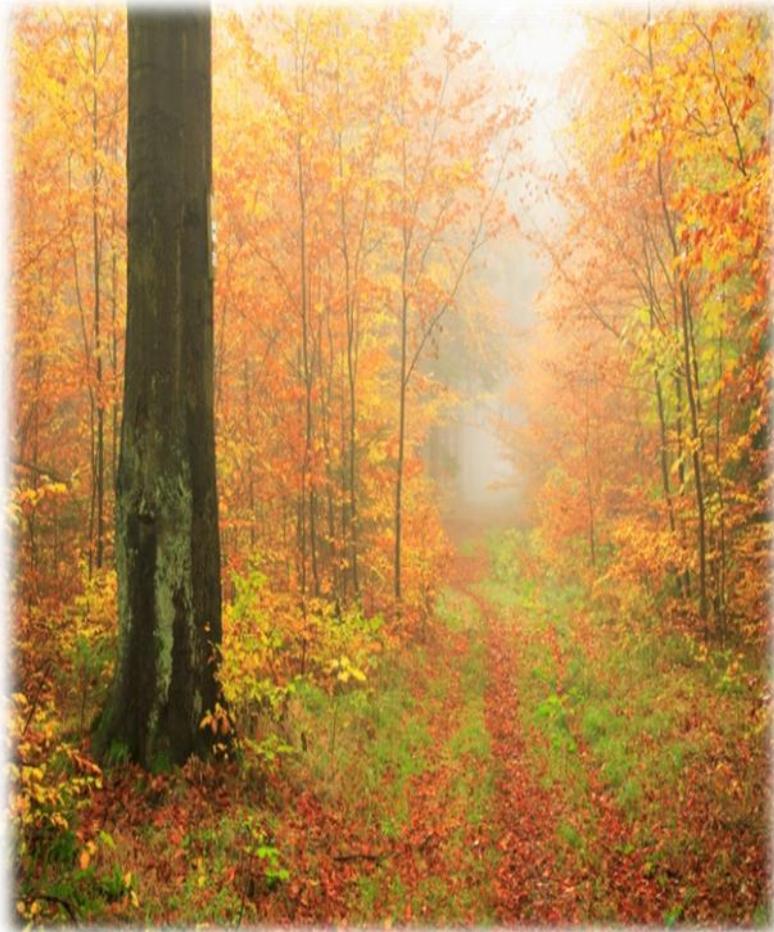
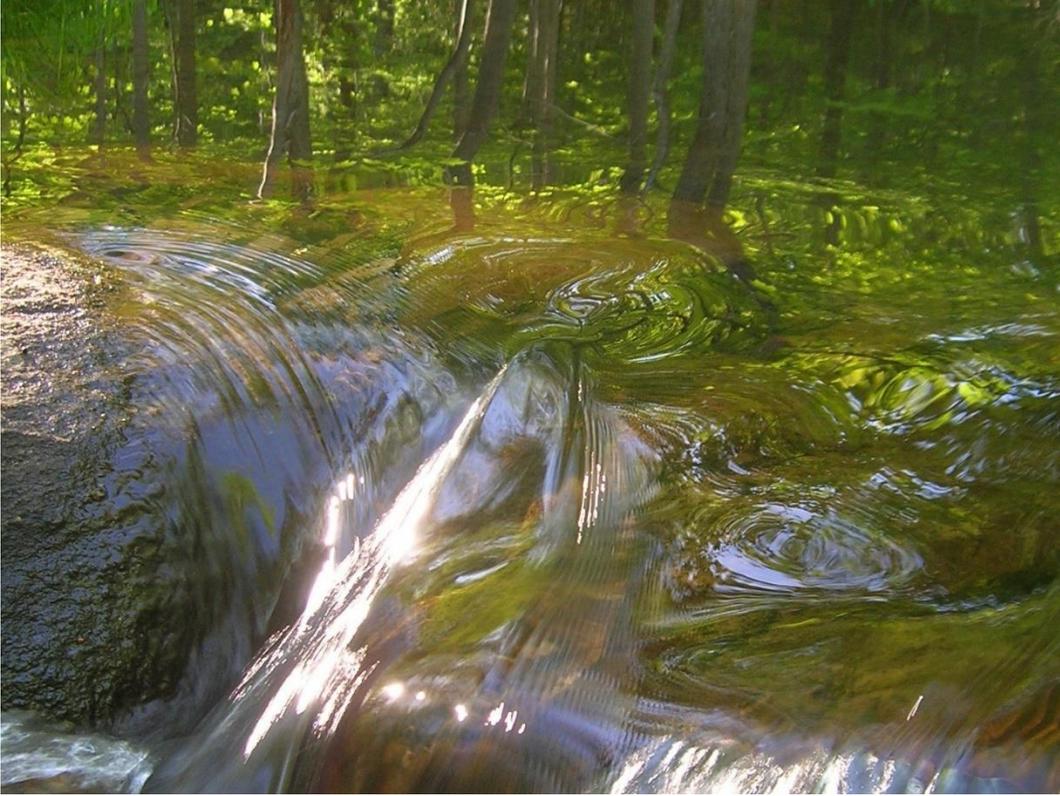
Key research, technical, training and educational resources on various elements of Growing Green Cities include materials from the USDA Forest Service on energy and social dimensions, the Cornell Urban Horticultural Institute, Kathleen Wolf's website at the University of Washington, the WELL Building Standard, BPI's Healthy Home Evaluator certification, Oxford Textbook on Nature and Public Health, and many others



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[www.instituteforsustainablecities.org/growing-green-cities](http://www.instituteforsustainablecities.org/growing-green-cities)

Photo courtesy of Marilyn Wyman, Cornell Cooperative Extension of Columbia and Greene Counties



# Join Us

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