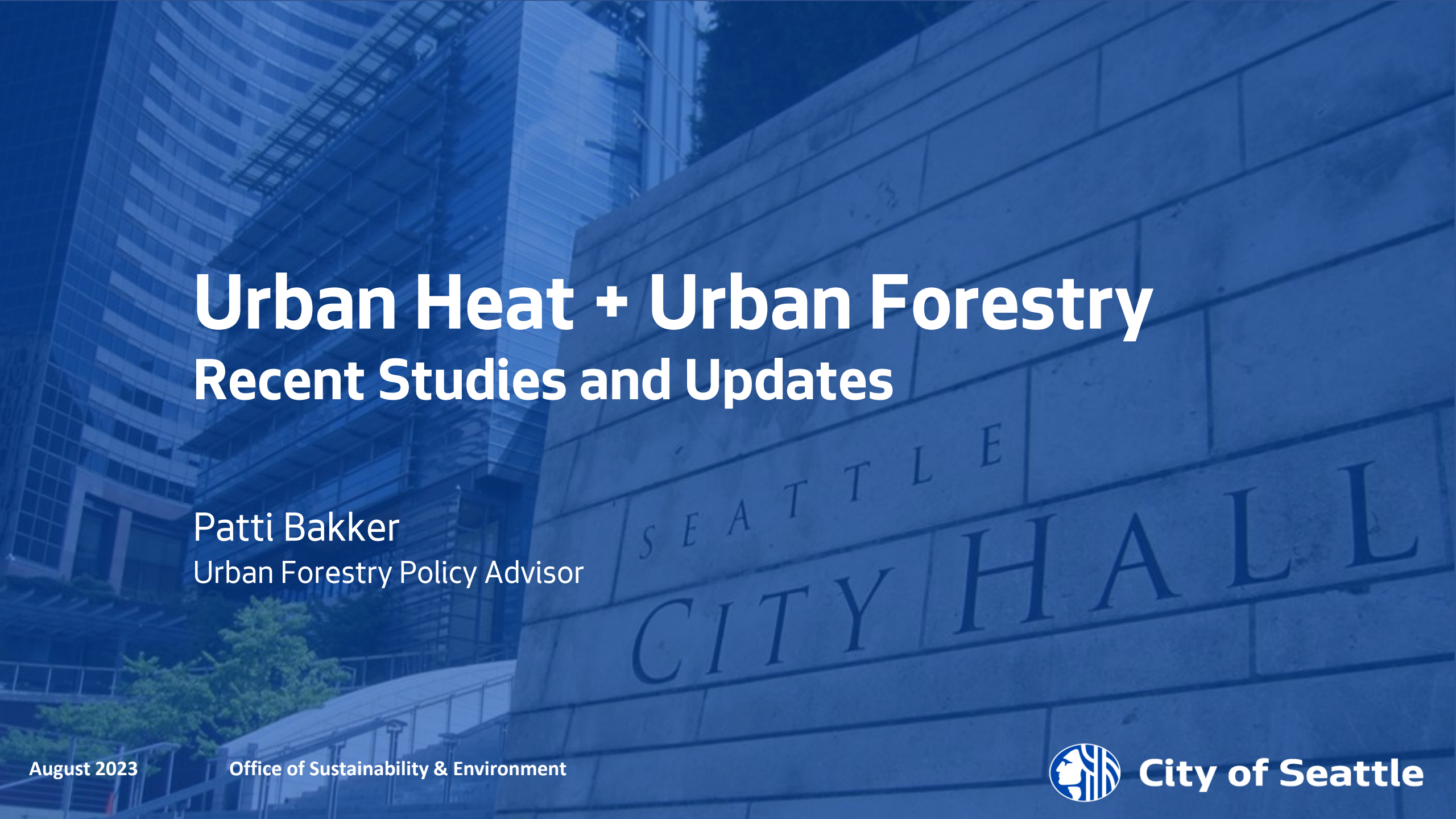

Urban Heat + Urban Forestry

Recent Studies and Updates

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August 2023

Office of Sustainability & Environment

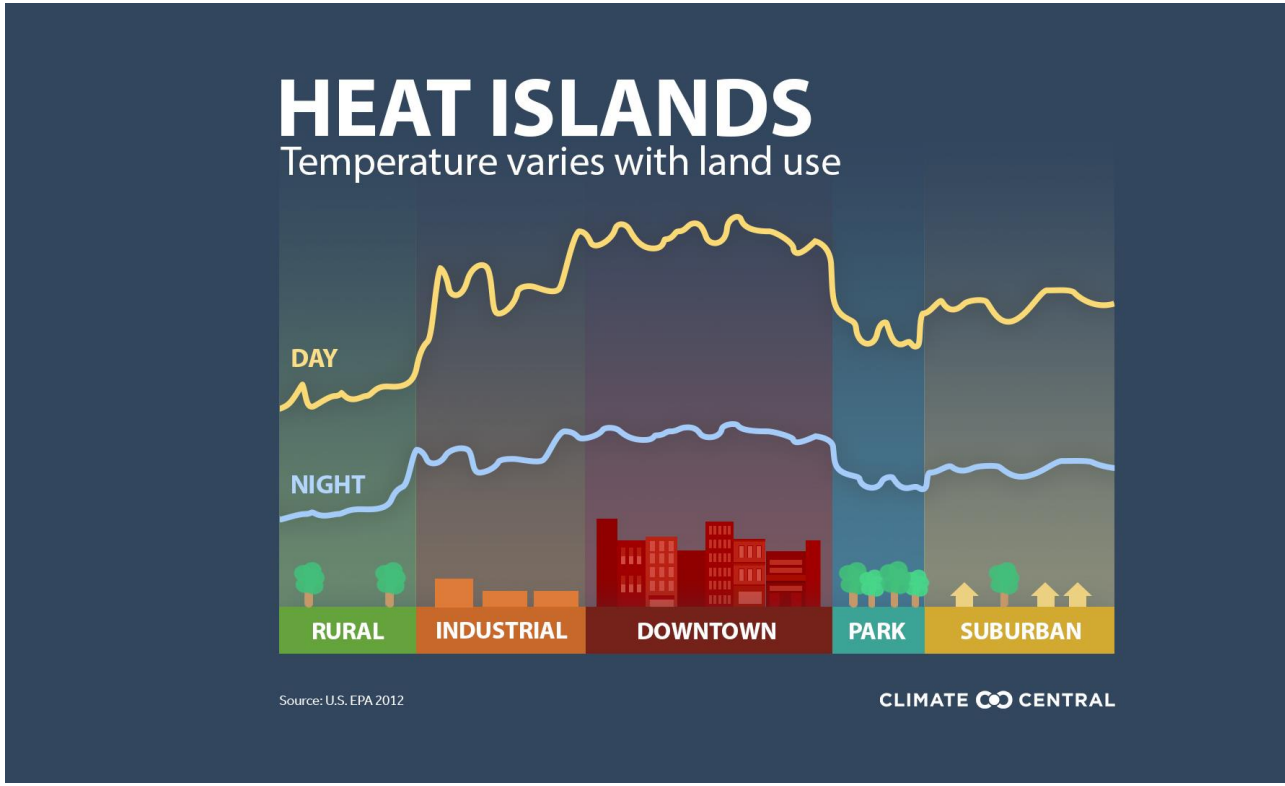
City of Seattle

CLIMATE CENTRAL URBAN HEAT STUDY

Climate Central Urban Heat Study Process

The study:

- Analyzed how urban heat island intensity varies within 44 major U.S. cities.
- Calculated the urban heat island (UHI) index for each census tract within the cities to estimate how much hotter these areas are due to the characteristics of the built environment.



Climate Central Urban Heat Study Results

A few highlights:

- The results of the analysis show Seattle with one of the higher UHI indeces, behind NY, SF, Chicago and Miami – New York (9.5°F), San Francisco (8.8°F), Chicago and Miami (8.3°F), and Seattle (8.2°F)
- Primary factors influencing UHI index estimates in this analysis are, in order of influence: albedo, percentage of green space, and population density. Albedo is the proportion of incoming sunlight reflected by a surface, and has the largest effect on UHI.
- Planting street trees and installing cool roofs and pavements are among the ways to reduce local heat islands.

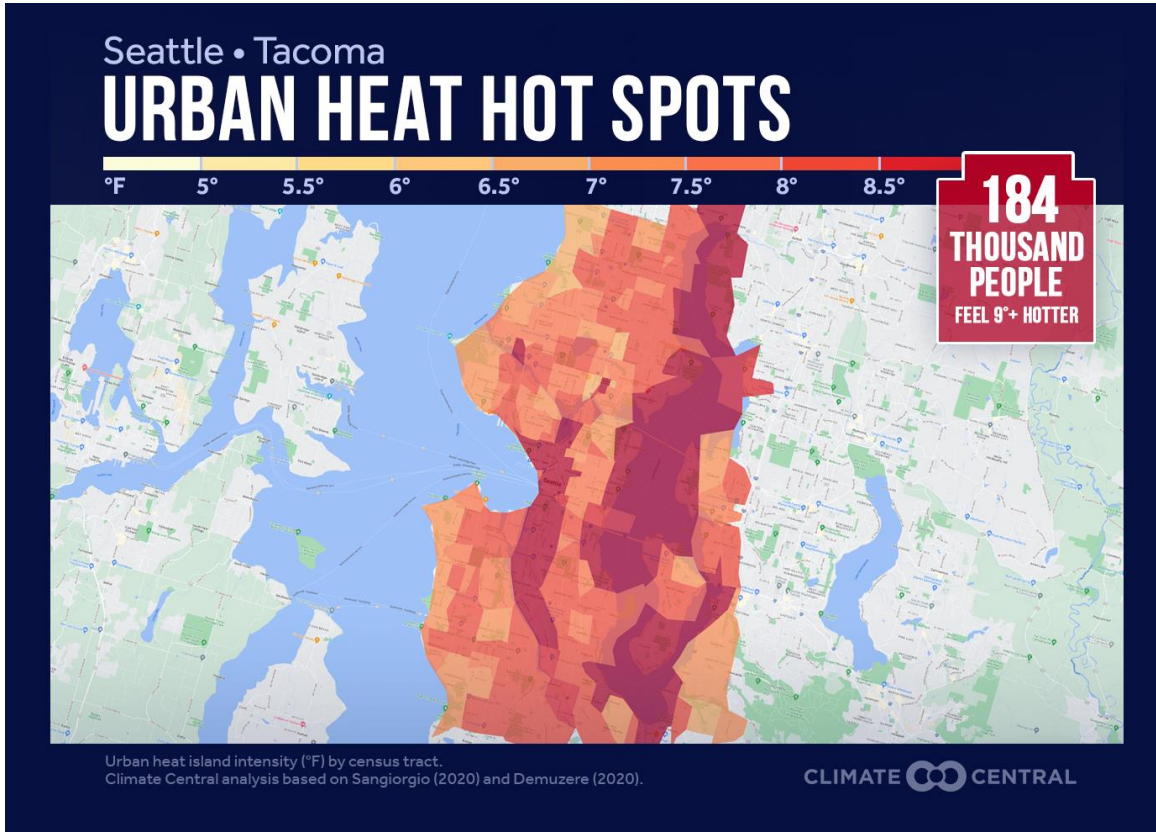
Climate Central Urban Heat Study Results

Data down to the census tract level and city maps are available for download:

Download data (.xlsx) to explore findings for census tracts, cities, and population exposure.

Download .kml versions of urban heat island intensity maps for each city.

Study: **Urban Heat Hot Spots | Climate Central**



NATURAL AREAS CONSERVANCY
COOLING CITIES REPORT

From the study:

“During summer 2022, the Natural Areas Conservancy (NAC) partnered with 12 cities from the Forests in Cities network to conduct a study focused on quantifying differences in air and surface temperature between types of urban greenspace, with a focus on natural areas.

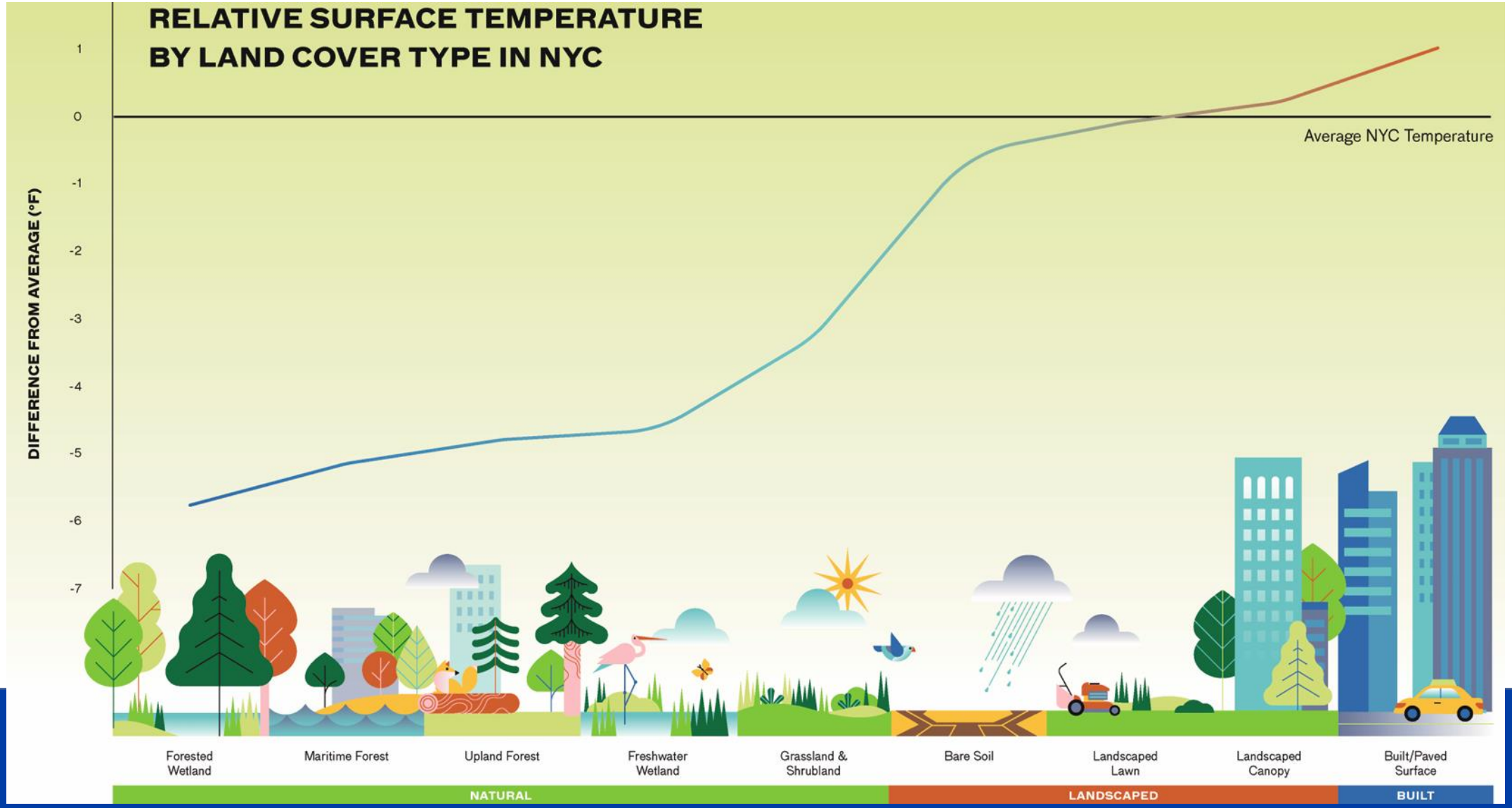
As a result of this study, we found that natural areas are the coolest types of greenspaces in cities. Natural areas were significantly cooler than non-natural and landscaped areas, and forested natural areas have lower air temperature than areas of landscaped trees by several degrees. In some cities on a hot summer day – it was over 10°F cooler in a forested natural area compared to under lanscaped trees just a few hundred feet away in a street scape. We also found that forests that were higher quality tended to be cooler than those that were more degraded during the warmest point of the day and had lower high temperature extremes”

The study assessed three questions:

1. Does land surface temperature vary across categories of natural and landscaped land cover?
2. Is the air temperature in forested natural areas cooler than under trees in landscaped areas?
3. Are higher quality forested natural areas cooler than lower quality?

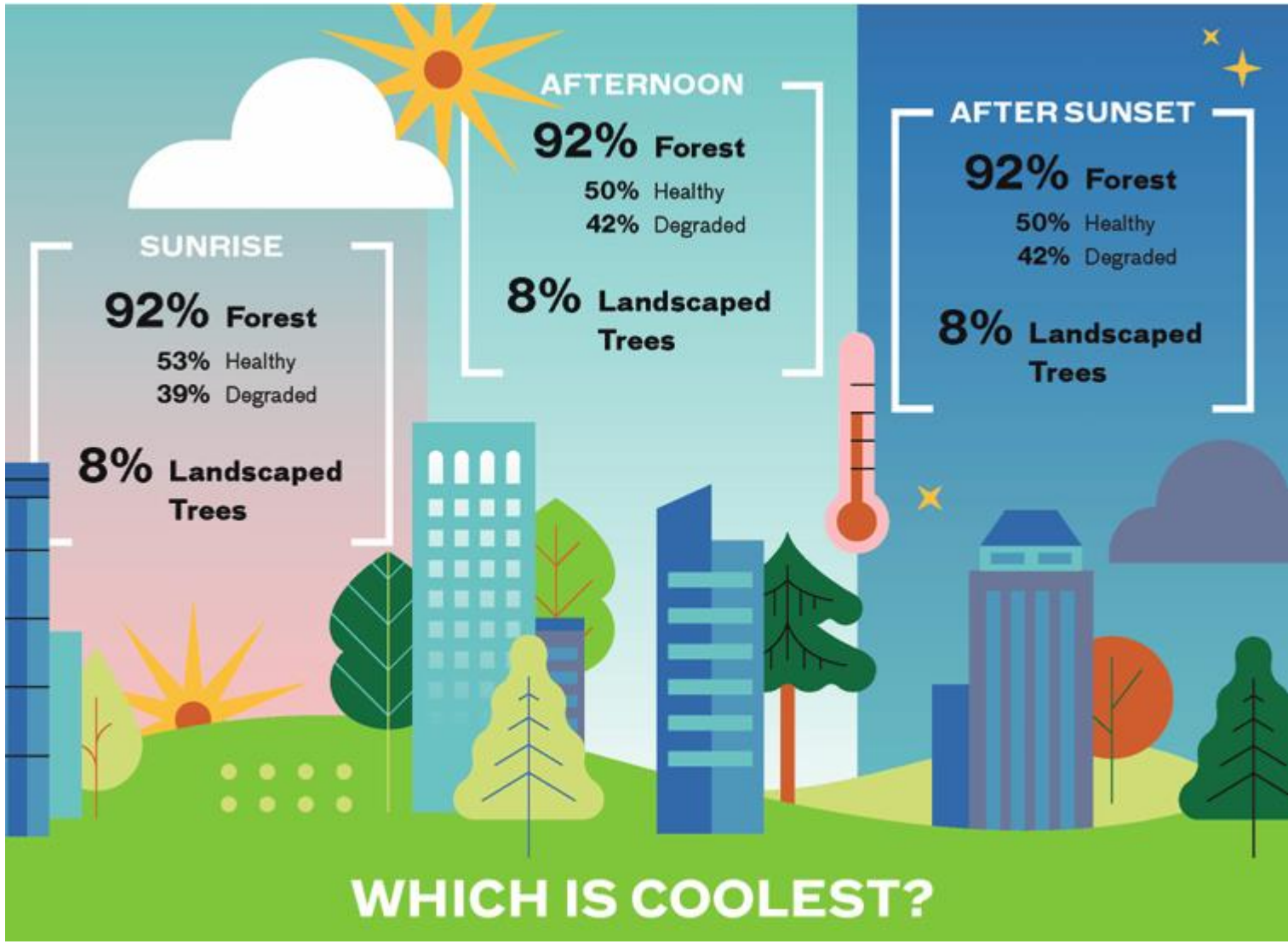
Findings:

1. Forested natural areas are the coolest land cover type



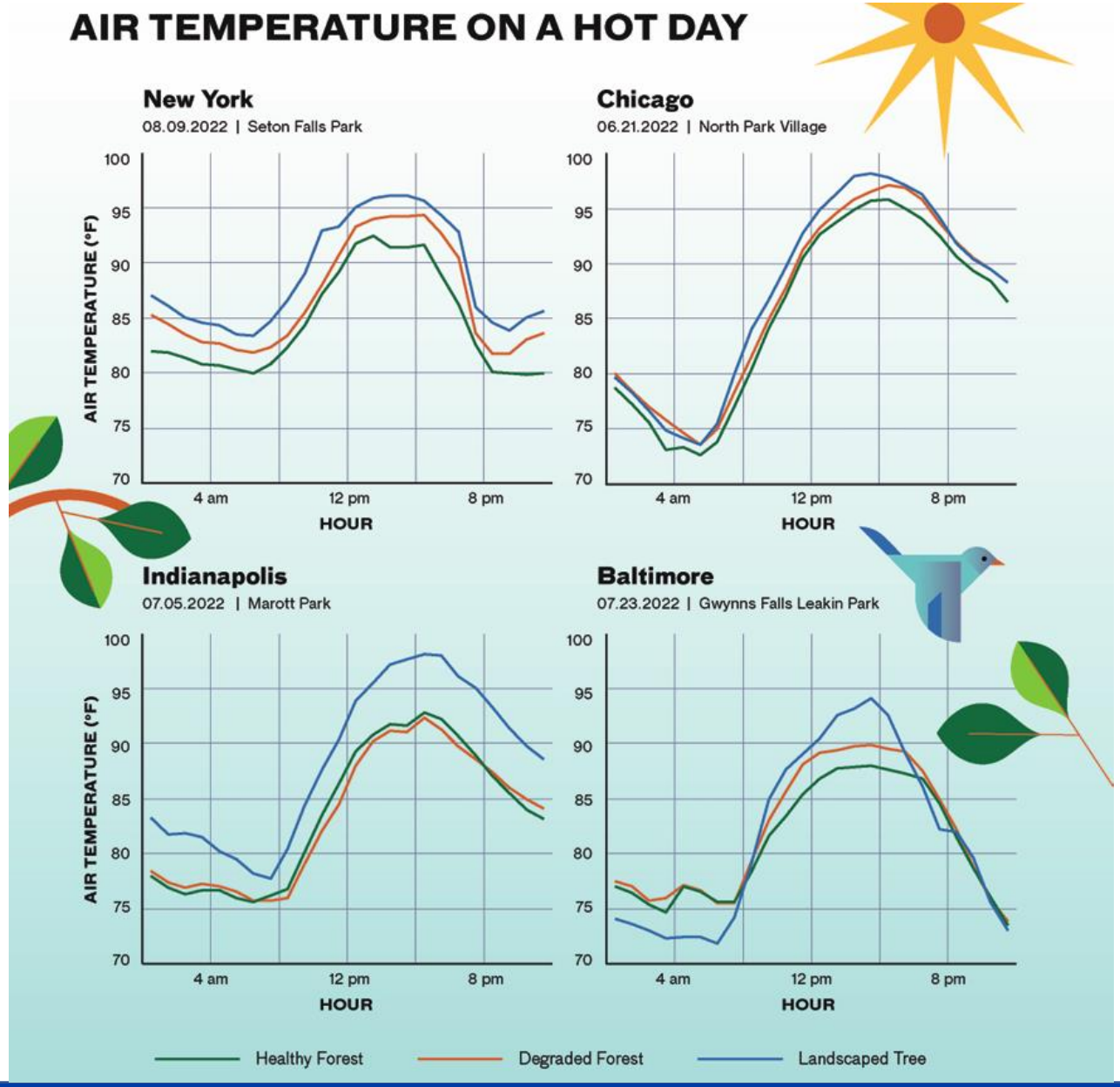
Findings:

2. Air temperature in forested natural areas was cooler than under landscaped tree areas, and healthy forests were the coolest



Findings:

3. Forests have a smaller daily air temperature range and fewer high temperature extremes



- Report on the study: nac-cooling-cities.pdf (naturalareasnyc.org)
- Read more on Green Seattle Partnership's blog post: *Caring and Cooling: Seattle's Forests in a Warming World*.
- Visit this slide deck for a descriptive summary of some high-level results, and links to data from Seattle.

URBAN HEAT + URBAN FORESTRY ACCELERATOR PROGRAM

CENTER FOR
REGENERATIVE
SOLUTIONS

Accelerating Nature-Based Climate Action

The 2023-24 Urban Nature-based Climate Solutions Accelerator is a sequence of three 5-month-long capacity-building intensives designed to rapidly grow community capacity to implement equity-centered, nature-based climate solutions to some of the most pressing climate change challenges facing communities.

1. Urban Heat + Urban Forestry

March – July 2023

2. Storm-Flood Risks + Green Infrastructure

March – June 2024

3. Carbon-Depleted Landscapes + Circular Urban Carbon Economies

September – December 2024

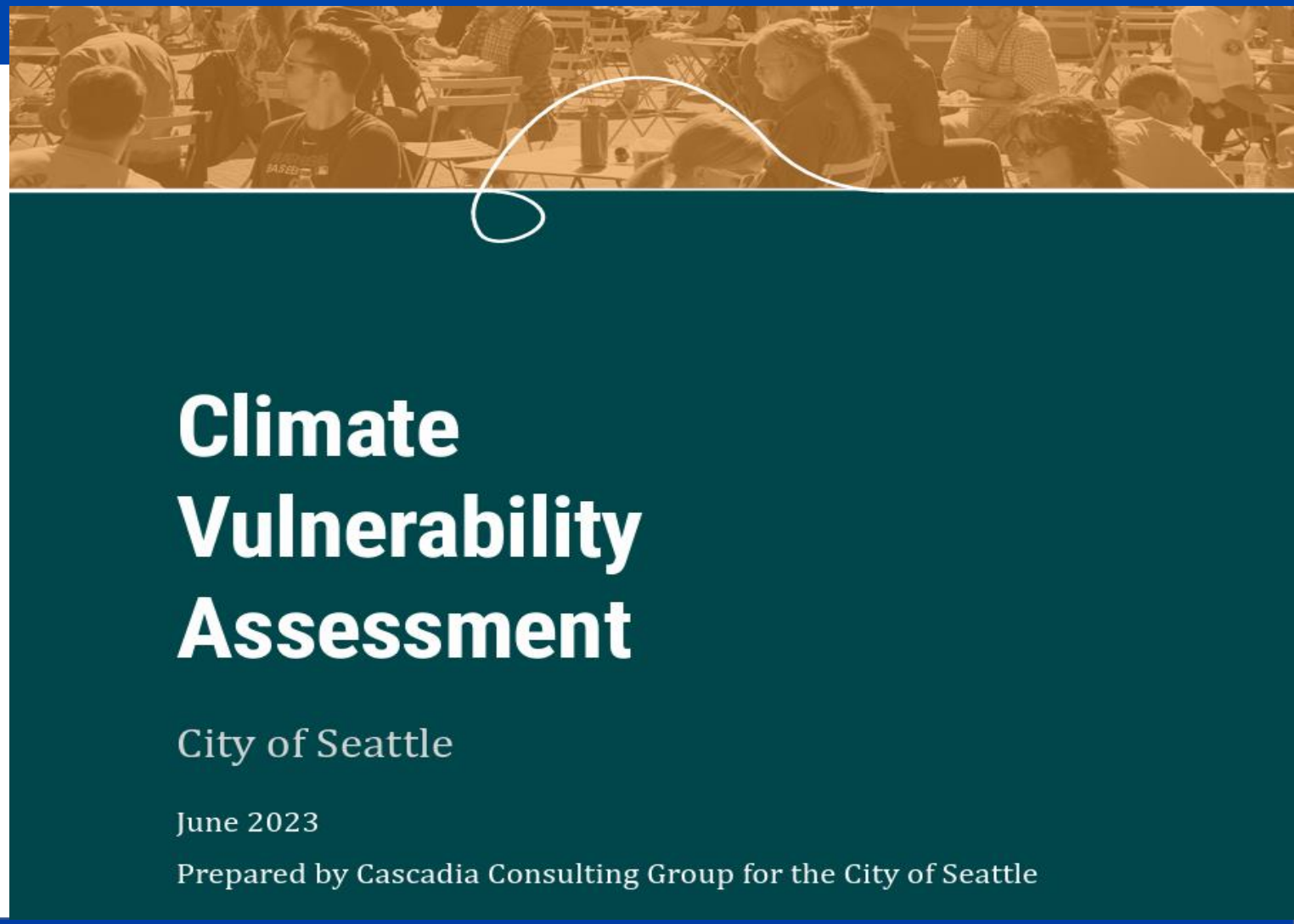
Vanguard Cities Community Tree Initiative

Overview

In 2020, a consortium of "vanguard" cities began collaborating around shared goals and knowledge about rapid implementation of high impact urban forestry efforts in historically under resourced communities and areas with high vulnerability to climate change impacts. Lead cities in this collaboration - Philadelphia, Cleveland, Chicago, Denver/Front Range, Portland, and Albuquerque -formalized their collaboration as the **Vanguard Cities Community Tree Initiative** and have since developed and refined large-scale urban forestry expansion strategies ready to utilize both federal and other leveraged resources. The Vanguard Cities are working with subject matter experts to develop "blueprints" for replicable, scalable urban forestry-based solutions that demonstrate equity-centered urban natural climate solutions as community development strategies. The technical and implementation expertise within these Vanguard Cities will outline how equity-centered, community-up natural climate solutions achieve desired outcomes, creating a model for other cities nationwide. With proven, existing community-based urban forestry initiatives underway, these Vanguard Cities are already modeling new, holistic and comprehensive best practices to showcase the range of climate, health and economic benefits of robust urban and community forestry programs.

https://naturebasedclimate.solutions/accelerator-resources

SEATTLE CLIMATE VULNERABILITY ASSESSMENT

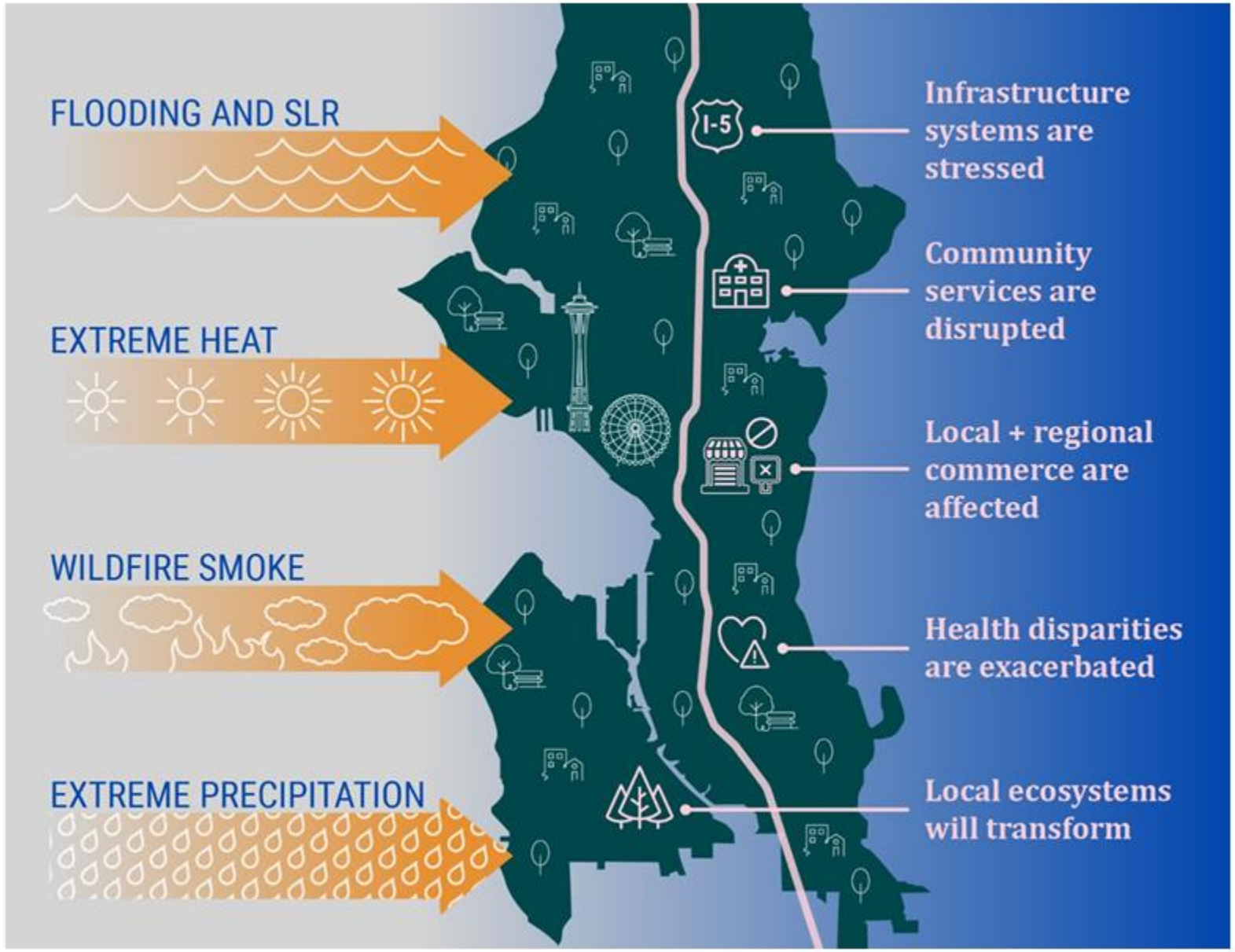


Climate change impacts and climate-related hazards

Areas within Seattle	Key Climate Risks and Impacts				
	Extreme Heat	Sea Level Rise & Coastal Flooding	Urban Flooding	Landslides	Smoke
Duwamish Valley (e.g., South Park, Georgetown)	▲▲▲	≈≈≈	☂☂☂	▲▲	☁☁
South Seattle (e.g., Rainier Beach, Columbia City, Beacon Hill)	▲▲▲	—	☂☂	▲	☁☁
West Seattle	▲▲	≈≈	☂	▲▲▲	☁☁
Downtown, Chinatown-International District, and South Lake Union	▲▲	≈≈	☂☂	▲	☁
Central Seattle (e.g., Capitol Hill, Central District, North Beacon Hill)	▲▲	—	☂	▲	☁
Northwest Seattle (e.g., Queen Anne, Ballard, Fremont, Greenwood)	▲▲	≈	☂	▲▲	☁
North Seattle (e.g., Northgate, Maple Leaf, Green Lake)	▲▲	≈	☂☂	▲	☁
Northeast Seattle (e.g., Lake City, Wedgewood)	▲	—	☂☂☂	▲	☁

▲▲▲ High risk in associated areas
▲▲ Medium risk in associated areas
▲ Low risk in associated areas
— Risk does not affect associated area

Transformative impacts



Purpose

The City of Seattle's Climate Vulnerability Assessment (CVA) is a detailed assessment of how climate change is already affecting and will continue to affect the community wellbeing, economy, health, infrastructure, and natural systems of the city. While this CVA illuminates how climate change impacts a variety of sectors, this CVA is not intended to be a comprehensive assessment of all risks and hazards to such systems. For example, this CVA is not meant to be used as a hazards risk assessment for emergency planners or an economic risk assessment for economic development professionals. Rather, this CVA is used to identify ways that climate change has already affected and will continue to affect various systems and complement other types of risk assessments.

This CVA was developed to inform the One Seattle Comprehensive Plan, or the City of Seattle's Comprehensive Plan update, which will guide City policies and decisions on housing and job development and how the City invests in transportation, utilities, parks, and other public assets. This CVA can support the development of specific climate-related policies in the One Seattle Comprehensive Plan to build resilience and reduce vulnerabilities from climate change across the city's communities, geography, and systems. Additionally, the CVA can support the implementation of One Seattle Comprehensive Plan's policies to ensure that investments are focused in areas that are more vulnerable to the current and future impacts of climate change.

Link to the assessment:

SeattleClimateVulnerabilityAssessmentJuly2023.pdf

Local Urban Heat + Urban Forest Activity

- Seattle actions to help community resiliency
  - Near term – connecting people to cooling
    - Public and community facilities
    - Enhanced communication
    - Ongoing collaboration – with KC and other community partnerships
  - Longer term -
    - Public and community facilities
    - Homes and private facilities
    - Urban forestry
      - Duwamish Valley planting
      - Canopy Equity and Resilience Plan

Local Urban Heat + Urban Forest Activity

King County Extreme Heat Strategy

- Being developed now; expected May 2024
- Urban forestry working group – developing UF related actions

Summary

Multiple King County departments are working with communities to develop the county's first-ever Extreme Heat Mitigation Strategy to prepare the region for prolonged heat events that are occurring more frequently as the result of climate change. The record-setting heat wave in 2021 killed over 30 people in King County, the deadliest climate-related event in the region's history.

https://kingcounty.gov/depts/dnrp/newsroom/newsreleases/2022/June/24-extreme-heat-mitigation-strategy.aspx

Questions?

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