NJIT | TAB Technical Assistance to Brownfield Communities

presents

Carrie Martin, AICP

Environmental Sustainability Planner, Center for Community Systems

Climate Change and Brownfields 101

Thursday, March 7, 2024

12:00pm - 1:00pm EST

Made possible with funding from the US EPA

Thank you for joining us today!

This webinar will be starting soon.

But first, some helpful information:

- Today's session will be recorded.
- The recording for this session will be available on our website: https://www.njit.edu/tab/
- Use the Q&A box to queue up questions. Use the chat to share your thoughts.
- Experiencing technical issues? Reach out to fm392@njit.edu
- We want to know your thoughts! Fill out our feedback survey after today's session.
- Continue the conversation on our LinkedIn page! https://bit.ly/3UYkHPR

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Climate Change and Brownfields 101

Carrie Martin, AICP
Environmental Sustainability Planner
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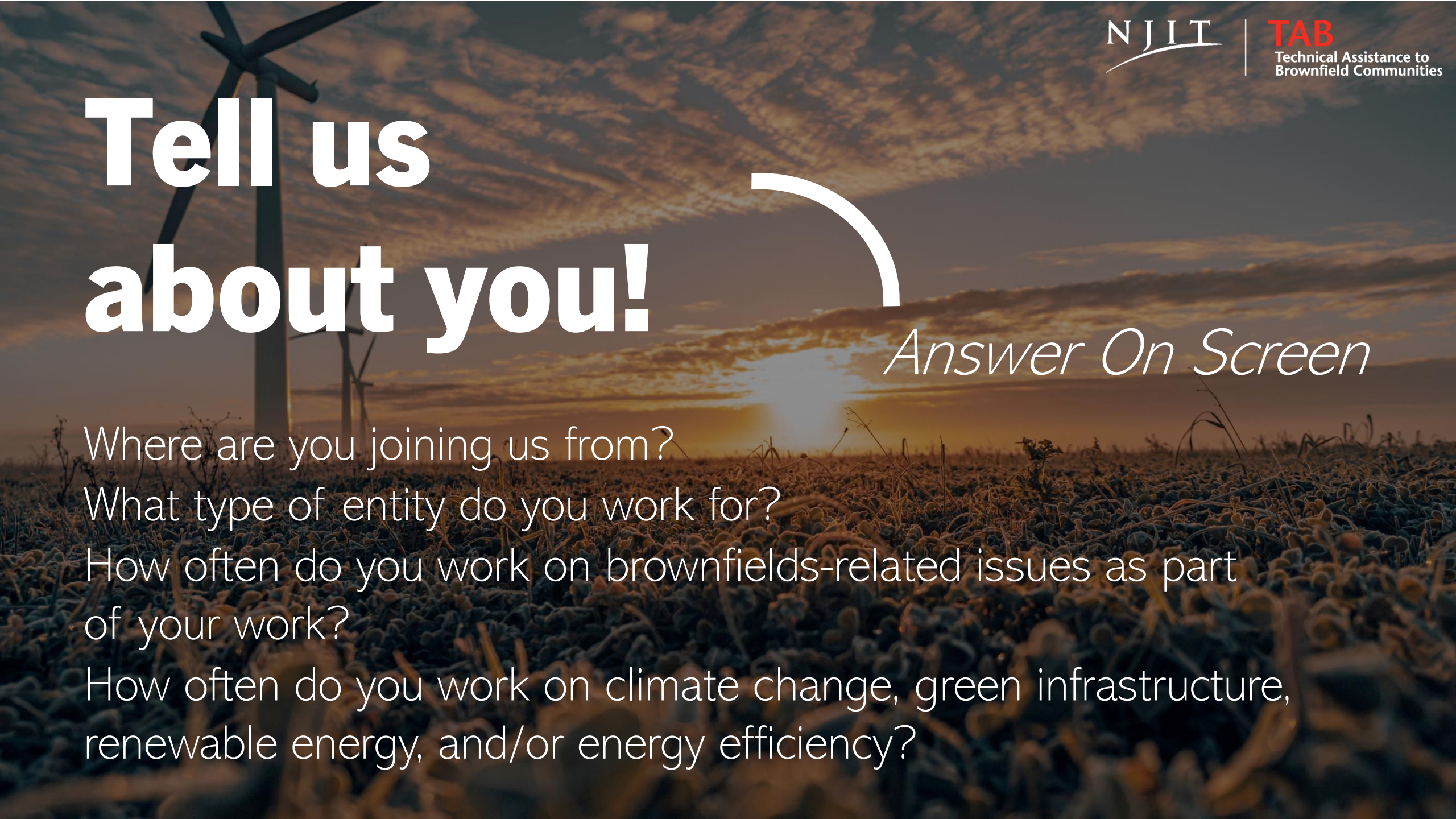
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TAB
Technical Assistance to Brownfield Communities
Tell us about you!
Answer On Screen
Where are you joining us from?
What type of entity do you work for?
How often do you work on brownfields-related issues as part of your work?
How often do you work on climate change, green infrastructure, renewable energy, and/or energy efficiency?

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Agenda

Climate Change, Resilience, and Brownfields

- What is climate change? What is climate resilience? And what does it have to do with brownfield communities and brownfield sites?

Climate Adaptation

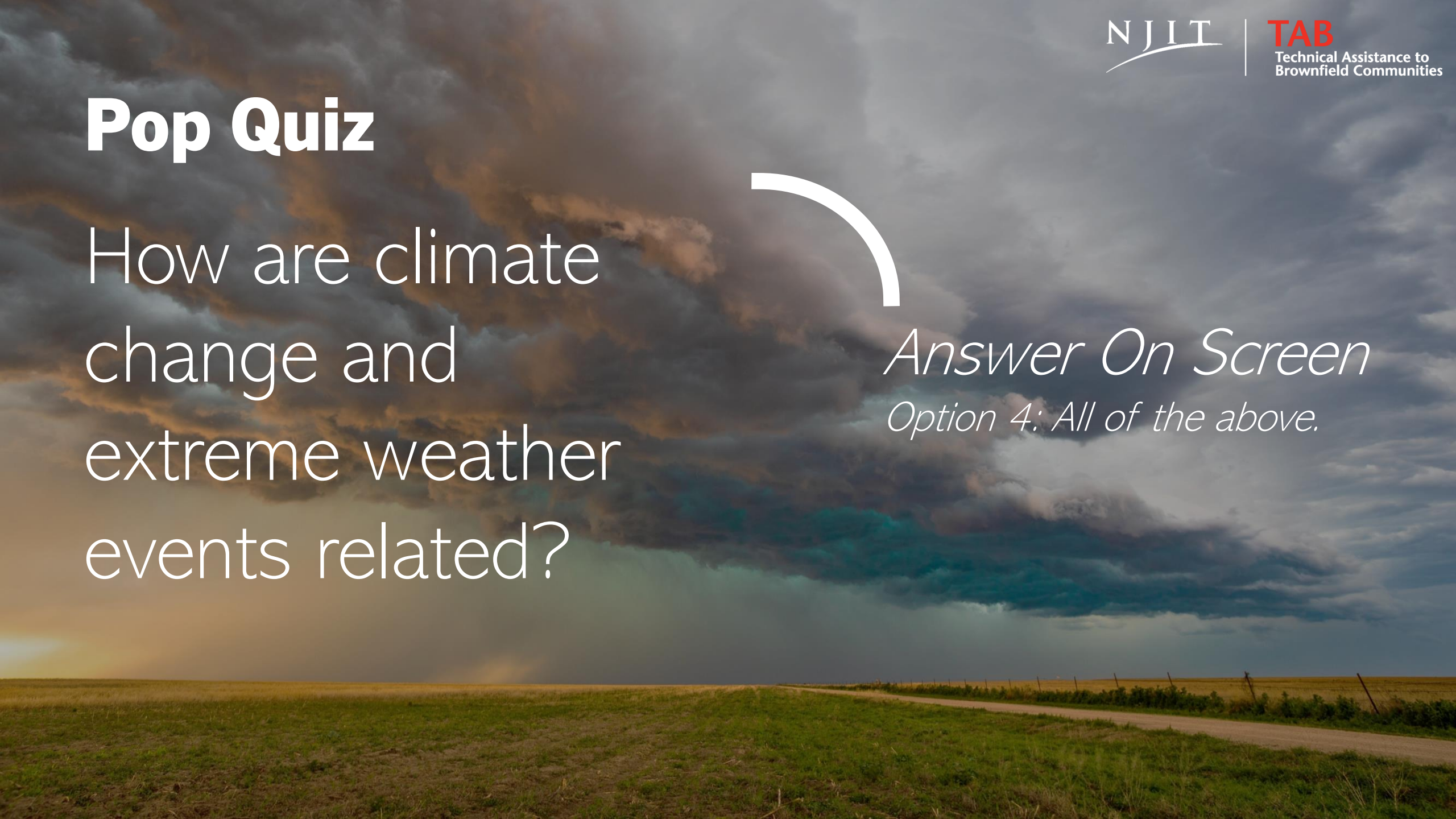
- How can you redevelop your site to better protect your community from climate threats?

Climate Mitigation

- How can your site reduce greenhouse gas emissions through renewable energy and energy efficiency?

Case Study: Perth Amboy, NJ

- How has the City of Perth Amboy built resilience into their brownfield redevelopment?



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Pop Quiz

How are climate change and extreme weather events related?

Answer On Screen

Option 4: All of the above.

Climate Change

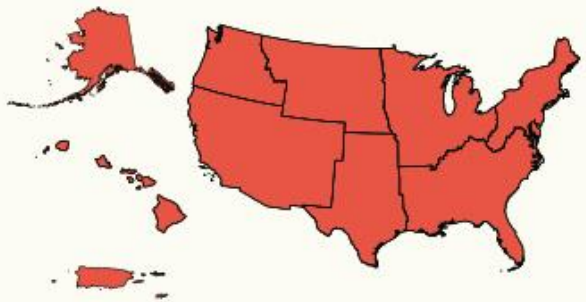
- Changes in average weather conditions that persist over multiple decades or longer

- Includes:
  - Increases and decreases in temperature
  - Shifts in precipitation
  - Changes in frequency and location of severe weather events
  - Changes to other features of the climate system

Source: Fifth National Climate Assessment

Climate change is happening now in all regions of the US

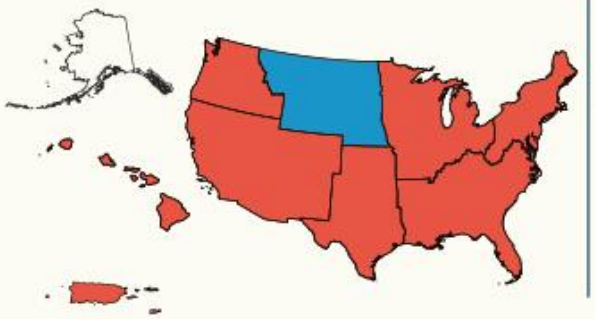
Annual Temperature



Annual Precipitation

Sea Level

Warm Nights



Heavy Precipitation

Direction of Change

Not applicable

Each additional increment of warming leads to greater risks

- Water supply
- Food security
- Infrastructure
- Health and well-being
- Ecosystems
- Economy
- Livelihoods and heritage

Source: Fifth National Climate Assessment

What Does This Have To Do with Brownfields?

"Real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant."

- EPA (CERCLA)

Vacant Land

Dry Cleaner

Factory

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Climate Impacts on Brownfields: Before Remediation

Underground Storage Tank

Hurricane Harvey in Houston, TX

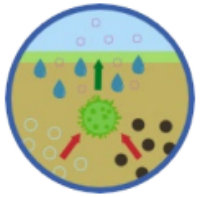
Unaddressed brownfield sites are susceptible to increased and repeated damage for extreme events that can spread contaminants from and compromise structures on brownfield sites.

Source: Resilient Brownfields Redevelopment: Understanding the Financial Risks of Our Changing Climate

Climate Impacts on Brownfields: Cleanup and Beyond

Drought Conditions

Capping. Creating or adding a barrier between the surface and contaminants by using a geotextile, a layer of clean soil or both. Capping protects areas of cleanup, reduces exposures and prevents the spread of contamination.



Bioremediation. Naturally-occuring or adapted microbes consume organic contaminants. Active management at bioremediation sites includes adding nutrients, oxygen or chemicals that release oxygen to increase microbial growth, allowing them to degrade the contaminants over time to water, gas or less harmful or toxic substances.

Phytoremediation. Plant root systems release substances which help plants neutralize, stabilize or increase microbial degradation of contaminants in contaminated soil or water near roots. Select plants can also take up contaminants through their roots, reducing soil and water contamination over time.

Climate impacts can minimize how protective cleanup and redevelopment are.

Sources: Resilient Brownfields Redevelopment: Understanding the Financial Risks of Our Changing Climate
Cleaning Up Brownfield Sites

The Costs of Climate Inaction on Brownfields

If brownfield site partners delay acting to address climate impacts onsite, the site may become more expensive.

Flooding Overwhelming a Structure

Source: Resilient Brownfields Redevelopment: Understanding the Financial Risks of Our Changing Climate

Climate Resilience

"A capability to anticipate, prepare for, respond to, and recover from significant multi-hazard threats with minimum damage to social well-being, the economy, and the environment"

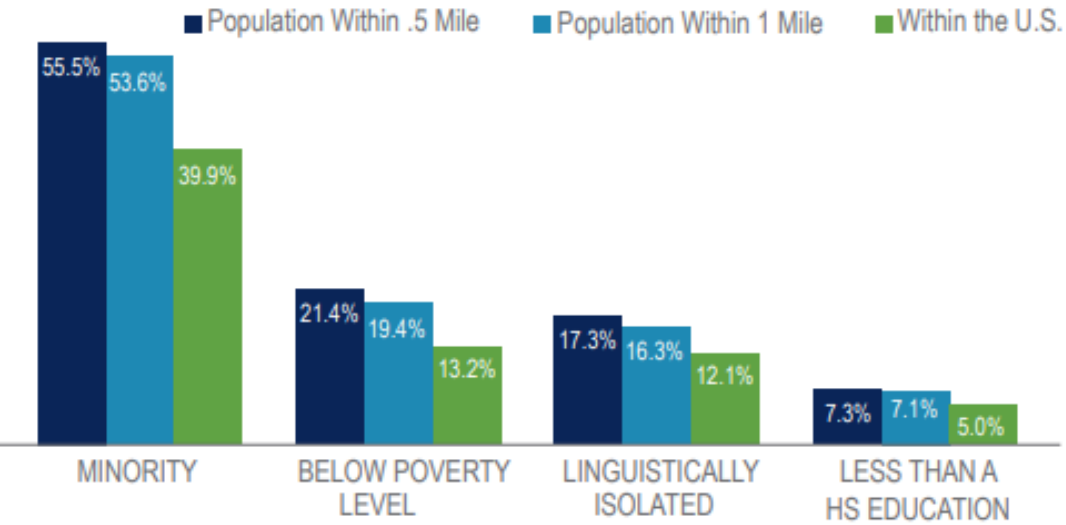
- EPA

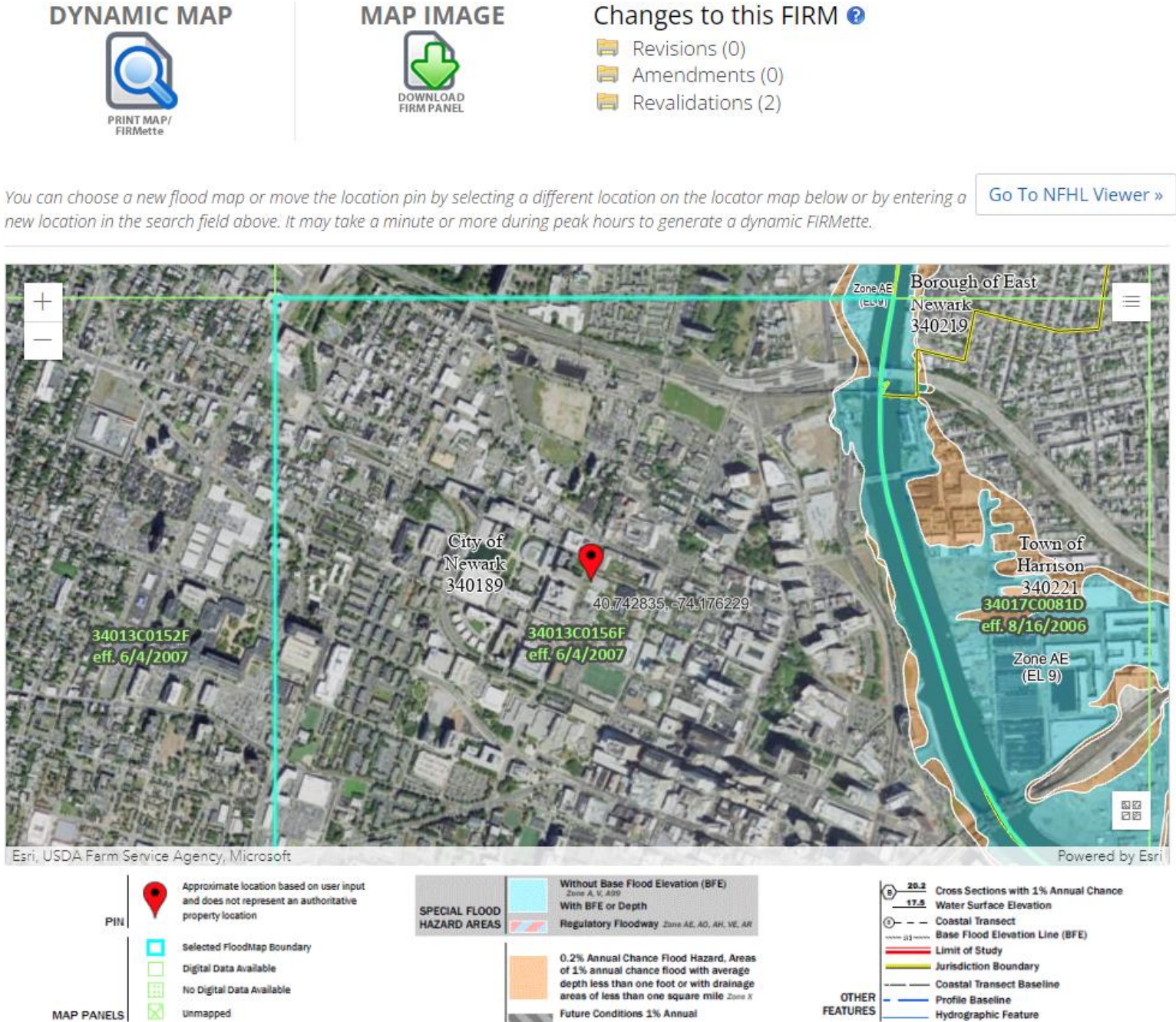
COMMUNITY CHARACTERISTICS NEAR BROWNFIELD SITES

Brownfield sites from Assessment, Cleanup and Redevelopment Exchange System (ACRES) as of FY20
Population Data from 2016-2019 American Community Survey

The population living within .5- and 1-mile of a Brownfield site is:

- more minority,
- more low income,
- more linguistically isolated, and
- less likely to have a high school education than the U.S. population as a whole.





FEMA Flood Map Service Center

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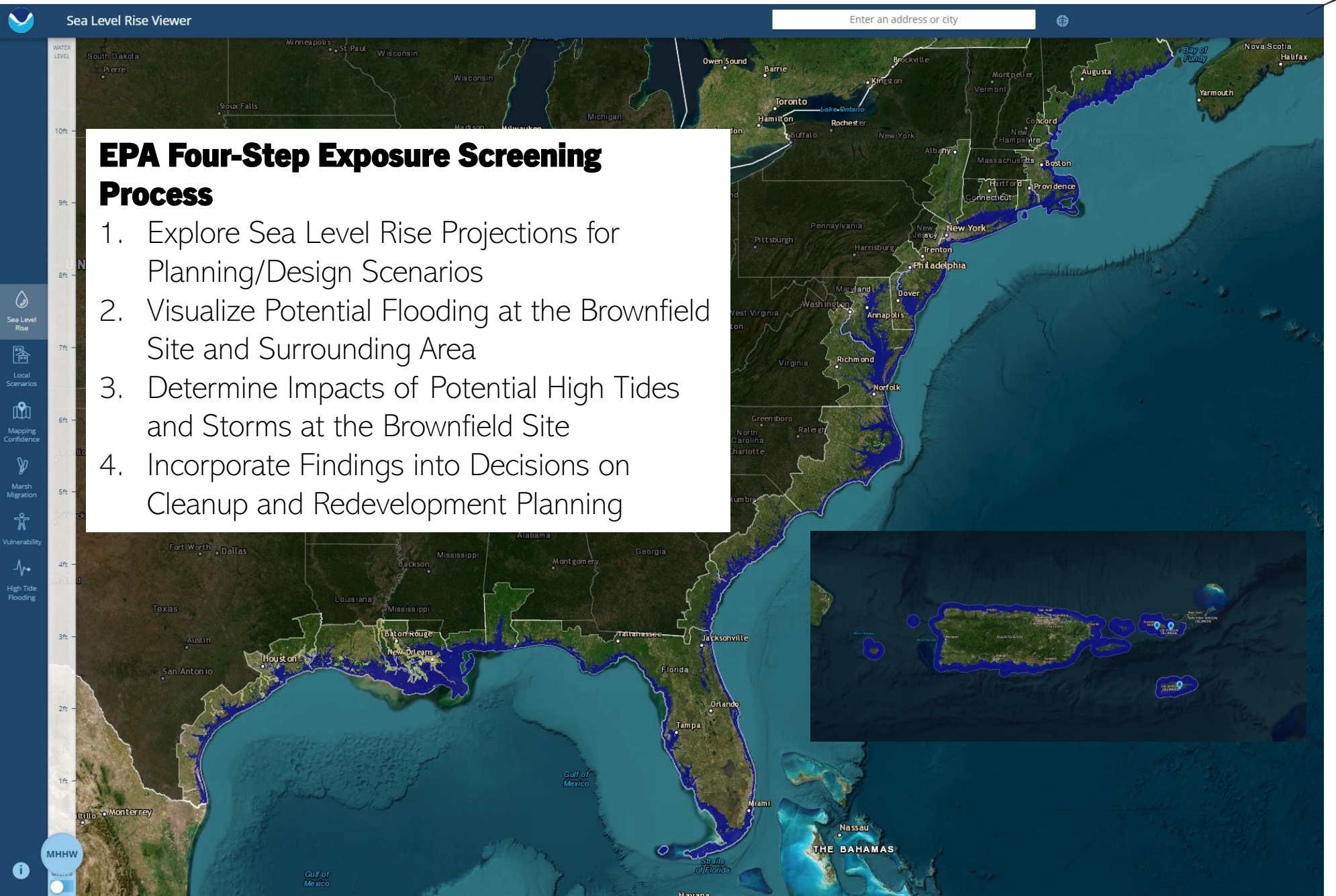
Extreme Heat

Future Climate Indicators

Indicator	Modeled History (1976 - 2005)	Early Century (2015 - 2044)		Mid Century (2035 - 2064)		Late Century (2070 - 2099)	
		Lower Emissions	Higher Emissions	Lower Emissions	Higher Emissions	Lower Emissions	Higher Emissions
	Min - Max	Min - Max	Min - Max	Min - Max	Min - Max	Min - Max	Min - Max
Temperature thresholds:							
Annual days with maximum temperature > 90°F	**12 days** 12 - 17	**29 days** 18 - 40	**31 days** 19 - 42	**37 days** 20 - 54	**45 days** 24 - 61	**46 days** 26 - 67	**75 days** 34 - 97
Annual days with maximum temperature > 95°F	**3 days** 2 - 4	**9 days** 4 - 15	**9 days** 4 - 13	**12 days** 6 - 22	**17 days** 7 - 27	**17 days** 7 - 34	**41 days** 10 - 66
Annual days with maximum temperature > 100°F	**0 days** 0 - 1	**2 days** 0 - 4	**2 days** 1 - 4	**3 days** 1 - 7	**5 days** 1 - 10	**5 days** 1 - 7	**16 days** 2 - 37
Annual days with maximum temperature > 105°F	**0 days** 0 - 0	**0 days** 0 - 1	**0 days** 0 - 1	**0 days** 0 - 2	**1 days** 0 - 3	**1 days** 0 - 4	**5 days** 0 - 18
Annual temperature:							
Annual single highest maximum temperature °F	**97 °F** 96 - 98	**100 °F** 98 - 103	**101 °F** 99 - 103	**102 °F** 99 - 106	**103 °F** 100 - 107	**103 °F** 100 - 108	**108 °F** 101 - 113
Annual highest maximum temperature averaged over a 5-day period °F	**92 °F** 91 - 92	**95 °F** 93 - 98	**95 °F** 93 - 97	**96 °F** 93 - 100	**97 °F** 95 - 101	**97 °F** 94 - 102	**102 °F** 95 - 108
Cooling degree days (CDD)	**898 degree-days** 843 - 962	**1,204 degree-days** 987 - 1,507	**1,235 degree-days** 1,027 - 1,454	**1,361 degree-days** 1,084 - 1,716	**1,508 degree-days** 1,155 - 1,822	**1,530 degree-days** 1,127 - 1,964	**2,123 degree-days** 1,426 - 2,725

N/A = Data Not Available for the selected area

[Climate Mapping for Resilience & Adaptation]



EPA Four-Step Exposure Screening Process

1. Explore Sea Level Rise Projections for Planning/Design Scenarios
2. Visualize Potential Flooding at the Brownfield Site and Surrounding Area
3. Determine Impacts of Potential High Tides and Storms at the Brownfield Site
4. Incorporate Findings into Decisions on Cleanup and Redevelopment Planning

[NOAA Sea Level Rise Viewer]

+

[EPA's Consider Sea-Level Rise During Brownfields Redevelopment]

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Climate Adaptation

"Adjustment in natural or human systems to a new or changing environment that exploits beneficial opportunities or moderates negative effects."

- EPA

Green roof on top of the Jacob Javits Convention Center in New York City

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Pop Quiz

How can green infrastructure help a community adapt to climate change?

Answer On Screen

Option 4: All of the above.

The newly planted Miyawaki forest at Danehy Park, Cambridge, MA, USA. Photo: Dino Kužnik for Sugi. (Rewilding)

Photo: from "The State of the Urban Forest in NYC" by The Nature Conservancy (Diane Cook and Len Jenshel)

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Green Infrastructure

- Uses landscape features to store, infiltrate and evaporate stormwater

- Considerations for brownfield sites:
  - The state regulatory entity will decide what is appropriate for a site
  - Refer to NJIT TAB's "Green Stormwater Infrastructure Decision Tree"

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Green Infrastructure at the Watershed Scale

- Land Conservation
- Stormwater Park
- Greenway
- Floodplain Restoration
- Wetland Restoration

ResilienCity Park, Hoboken, NJ (Source: NJ.com)

Proctor Creek Greenway, Atlanta, GA (Source: PATH Foundation)


Climate Adaptation
ATLANTA
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WESTSIDE RESERVOIR PARK
BANKHEAD MARTA STATION
PROCTOR CREEK GREENWAY
HISTORICAL / INTERPRETIVE WALK
INTERPRETIVE PAVILION
TO WHITTIER MILL PARK
ATLANTA INDUSTRIAL PARK
FORMER CHATTAHOOCHEE BRICK COMPANY
TO CHATTAHOOCHEE BEND STATE PARK
OVERLOOK
WETLAND WINDOW
KAYAK REST AREA
TO BUFORD DAM
OUTDOOR CLASSROOM
NEW BRIDGE
FULTON COUNTY
COBB COUNTY
RIVER OVERLOOK
CHATTAHOOCHEE RIVER
I-285
TO BUFORD DAM
TO CHATTAHOOCHEE BEND STATE PARK
Chattahoochee RiverLands

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Green Infrastructure at the Neighborhood Scale

- Green Roof
- Rain Garden
- Permeable pavement

Green Street in Seattle, WA (Source: Abby Hall, US EPA)

Green Parking Lots (Source: Naturally Resilient Communities)

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Green Infrastructure in Action: Lion Gate Park, Bloomfield, NJ

Permeable Pavement in Bloomfield, NJ

Wetland Restoration in Bloomfield, NJ (PrincetonHydro)

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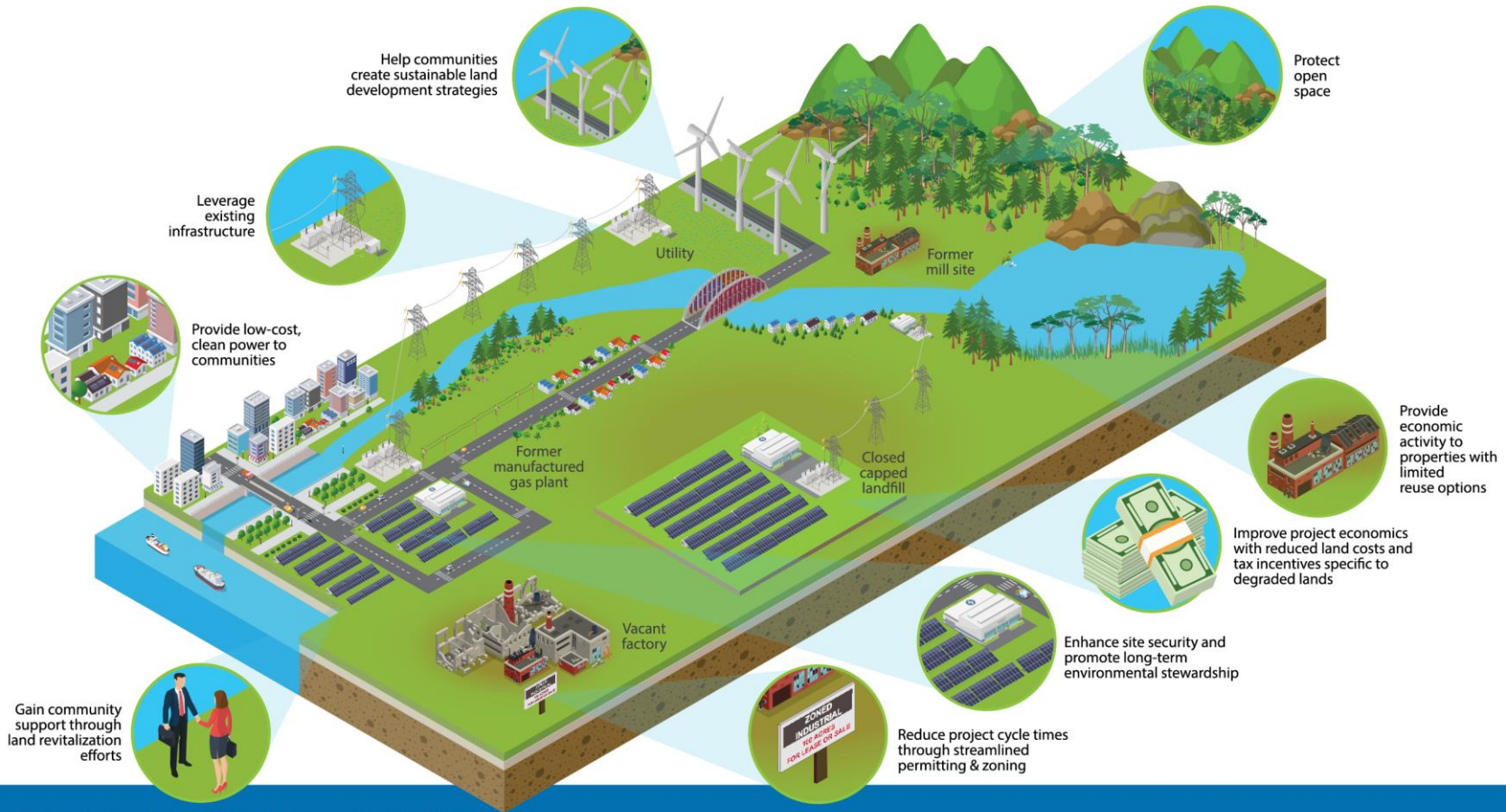
Climate Mitigation

"Measures to reduce the amount and speed of future climate change by reducing emissions of heat-trapping gases or removing carbon dioxide from the atmosphere" - EPA

EPA United States Environmental Protection Agency

RE-Powering America's Land

Potential Advantages of Reusing Potentially Contaminated Land for Renewable Energy



RE-POWERING AMERICA'S LAND INITIATIVE

Through the RE-Powering America's Land initiative, the U.S. Environmental Protection Agency promotes the reuse of potentially contaminated lands and landfills for renewable energy through a combination of tailored redevelopment tools for communities and developers, as well as site-specific technical support. The initiative aims to revitalize degraded land by promoting renewable energy as a productive end use, when aligned with the community vision for the site.

This strategy creates new markets for potentially contaminated lands, while providing a sustainable land development strategy for renewable energy. RE-Powering aims to turn liabilities into assets for surrounding communities by fostering collaborative networks between the energy and remediation sectors. This fact sheet provides an overview of the potential advantages of this development approach.

MADE FROM 100% RECYCLED LAND

Forms of Renewable Energy

Solar

Wind

Geothermal

Renewable Energy in Action

Solar array on a former landfill in Mt. Olive, NJ (CEP)

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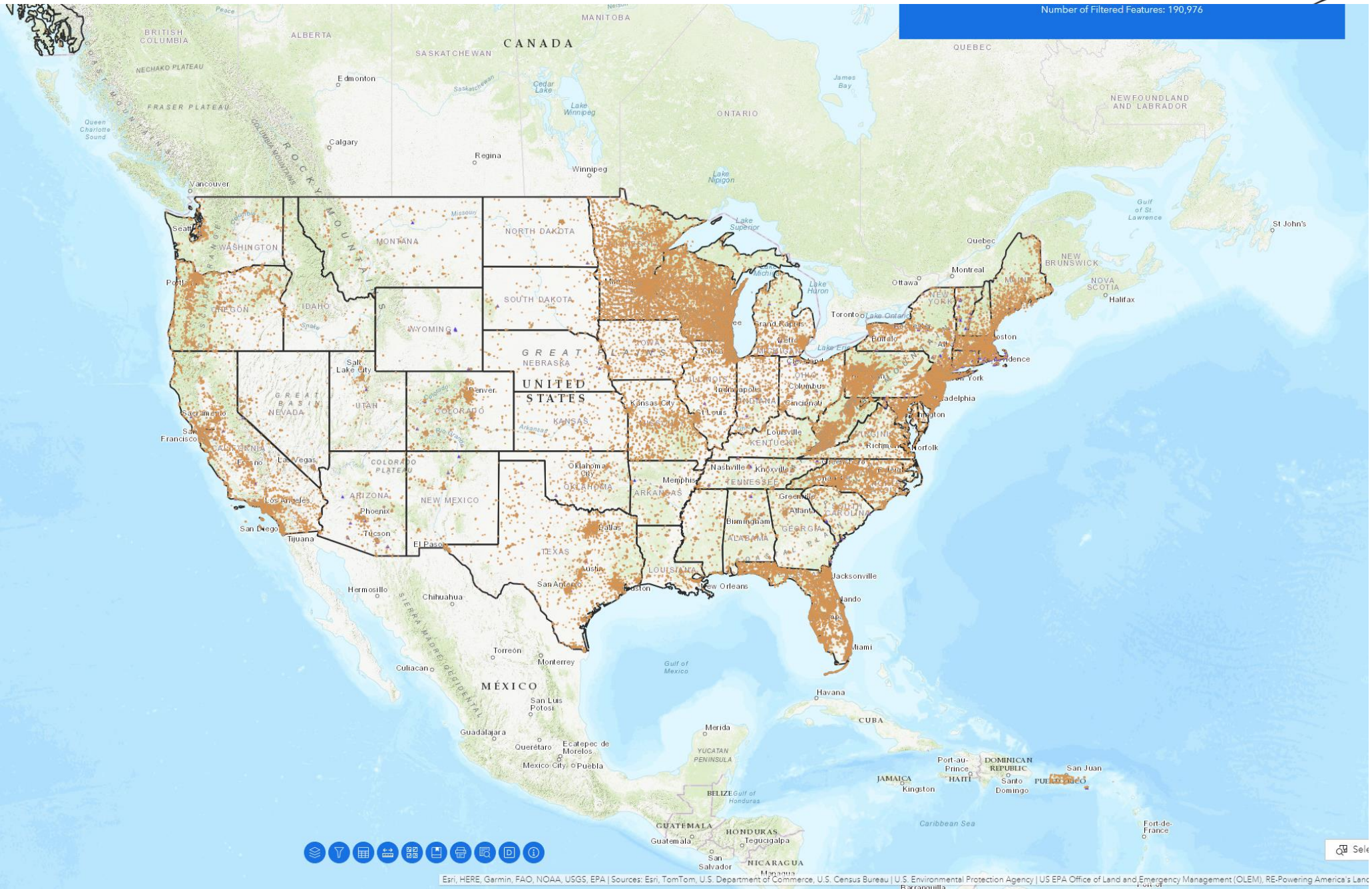

RE-Powering Mapper

Ironside, Newark, NJ Gold Certified LEED brownfield redevelopment

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Energy Efficiency

- Energy efficient technology can be integrated into new, renovated, and retrofitted buildings on site.

- Benefits of integrating energy efficient technology in the buildings on your brownfield site:
  - Lower energy costs for owners and tenants
  - Reduced energy consumption
  - Reduced operating expenses

Source: Are You Considering Renewable Energy or Energy-Efficient Approaches in Your Brownfields Redevelopment?

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Climate Change Criteria in EPA Grant Applications

OVERVIEW

AGENCY: ENVIRONMENTAL PROTECTION AGENCY (EPA)

TITLE: FY24 GUIDELINES FOR BROWNFIELD ASSESSMENT GRANTS (**COMMUNITY-WIDE ASSESSMENT GRANTS**)

ACTION: Request for Applications (RFA)

RFA NO.: EPA-OLEM-OBLR-23-12

Describe how the proposed project will improve local climate adaptation/mitigation capacity and resilience to protect residents and community investments. *(Climate adaptation/mitigation is defined in Section I.F.)*

If applicable, describe how the reuse of the priority site(s) will facilitate renewable energy from wind, solar, or geothermal energy; or will incorporate energy efficiency measures. *(For more information on energy efficiency measures, please refer to the FY24 FAQs and Renewable Energy or Energy-Efficient Approaches in Brownfields Redevelopment Fact Sheet.*[27]*)*

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Key Takeaways

- Use the FEMA Flood Map Service Center, Climate Mapping for Resilience and Adaptation, and NOAA Sea-Level Rise Viewer (if applicable) to determine climate threats to your site(s).

- Explore green infrastructure and other climate adaptation solutions applicable to your project scale that will address your climate threats.

- Use like RE-Powering Mapper to see if your site(s) have been pre-screened for renewable energy potential.

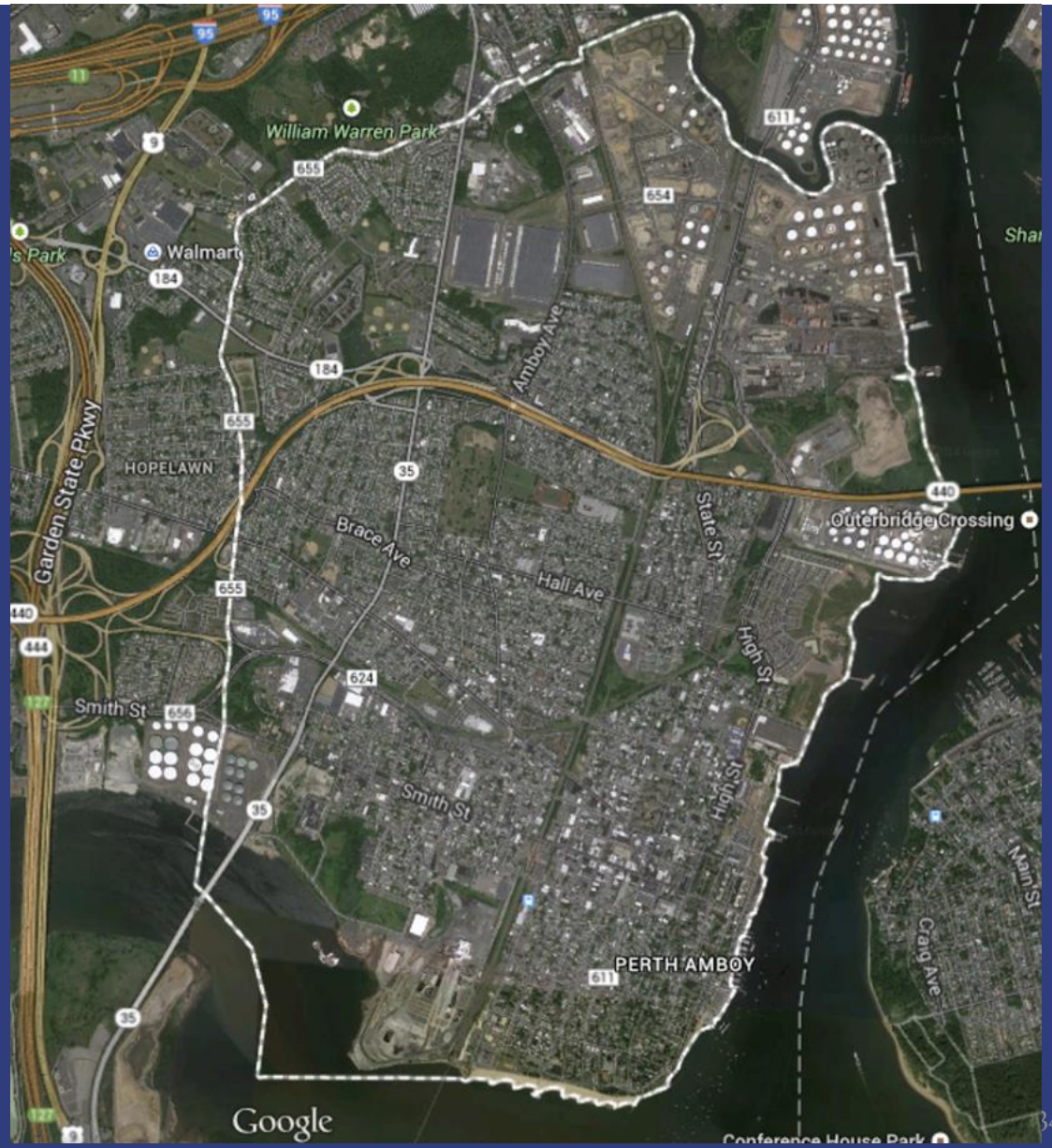
SUSTAINABILITY IN BROWNFIELD REDEVELOPMENT

Perth Amboy Case Studies

Climate Change and Brownfields 101
Presented by William Kurzenberger, AICP – Redevelopment Planner, Topology
March 7, 2024

TOPO LOGY

PERTH AMBOY AT A GLANCE



BROWNFIELDS + RESILIENCY CONTEXT

- Industrial Legacy
- Aging Infrastructure and Combined Sewer System

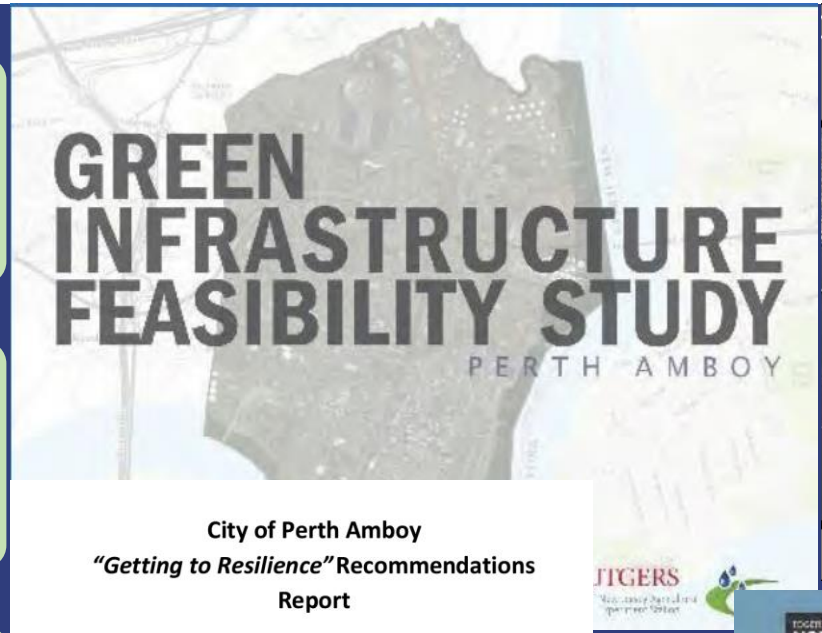
RARITAN COPPER WORKS.

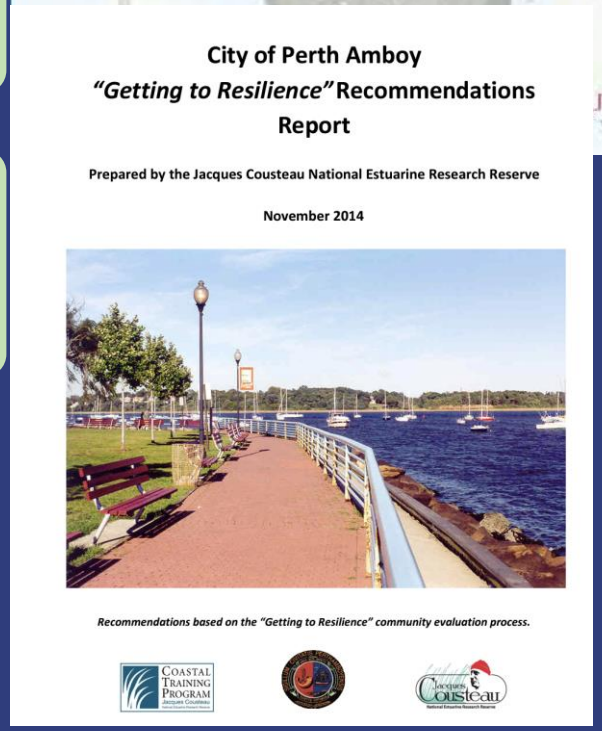
REDEVELOPMENT SUCCESS

- Over 300 acres of brownfields remediated or under remediation
- Community benefits inclusive of recreational improvements, employment opportunities, affordable housing, improved connectivity, and robust stormwater management

KEY SUSTAINABILITY PLANNING EFFORTS

- **Impervious Coverage and Green Infrastructure**
- **Flood Resiliency**
- **Strategic Redevelopment**

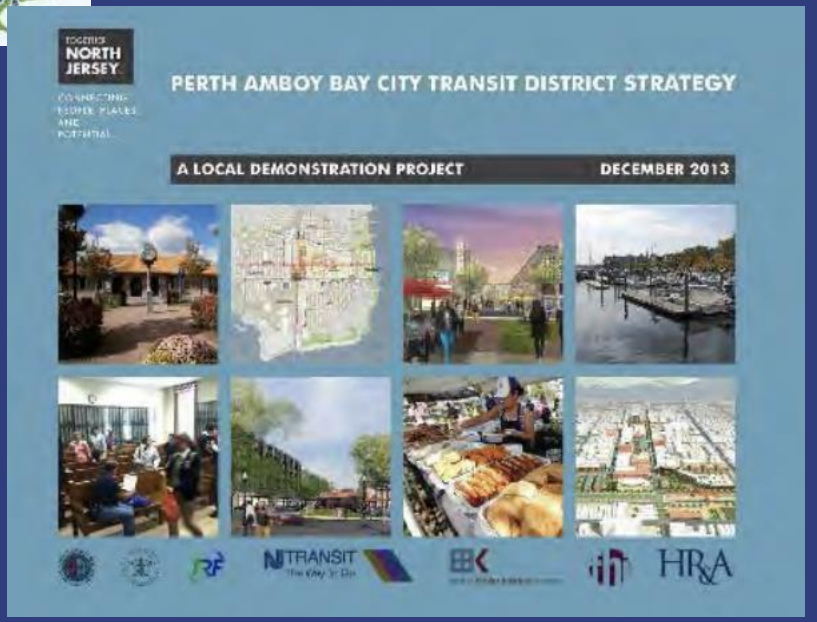



City of Perth Amboy
"Getting to Resilience" Recommendations Report

Prepared by the Jacques Cousteau National Estuarine Research Reserve

November 2014

Recommendations based on the "Getting to Resilience" community evaluation process.



GREEN INFRASTRUCTURE IN PERTH AMBOY

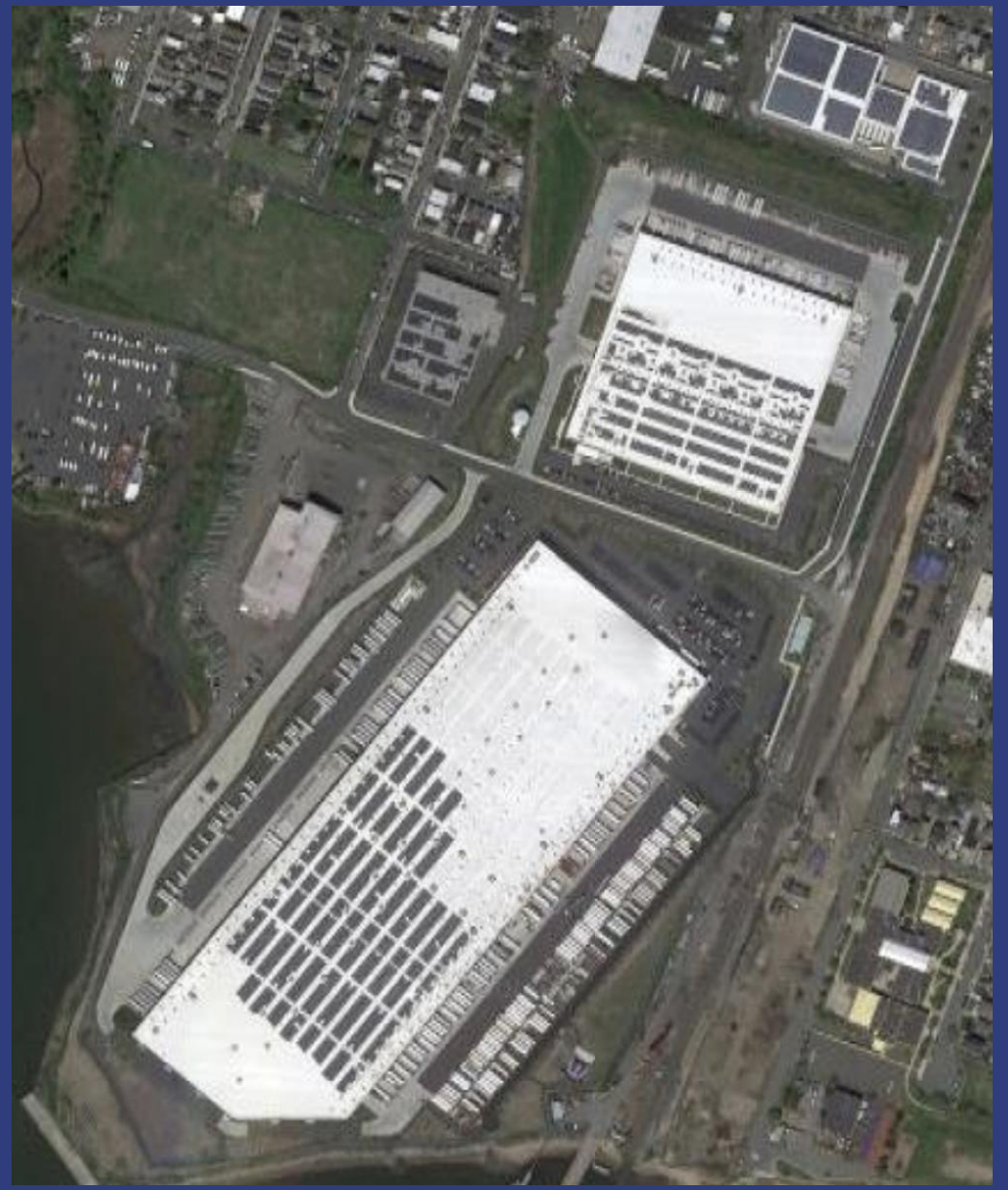
- Numerous public demonstration projects
- Ubiquitous component of redevelopment projects

SOLAR SUCCESSES IN PERTH AMBOY

- First Pilot program of the now permanent NJ Community Solar Program (1/28/2021)
  - Approx. 11.1 MW generated
- Approx. 2,215,000 SF at present

ELM STREET LOGISTICS CENTER

- 90 acres remediated
- 1 million SF distribution facility

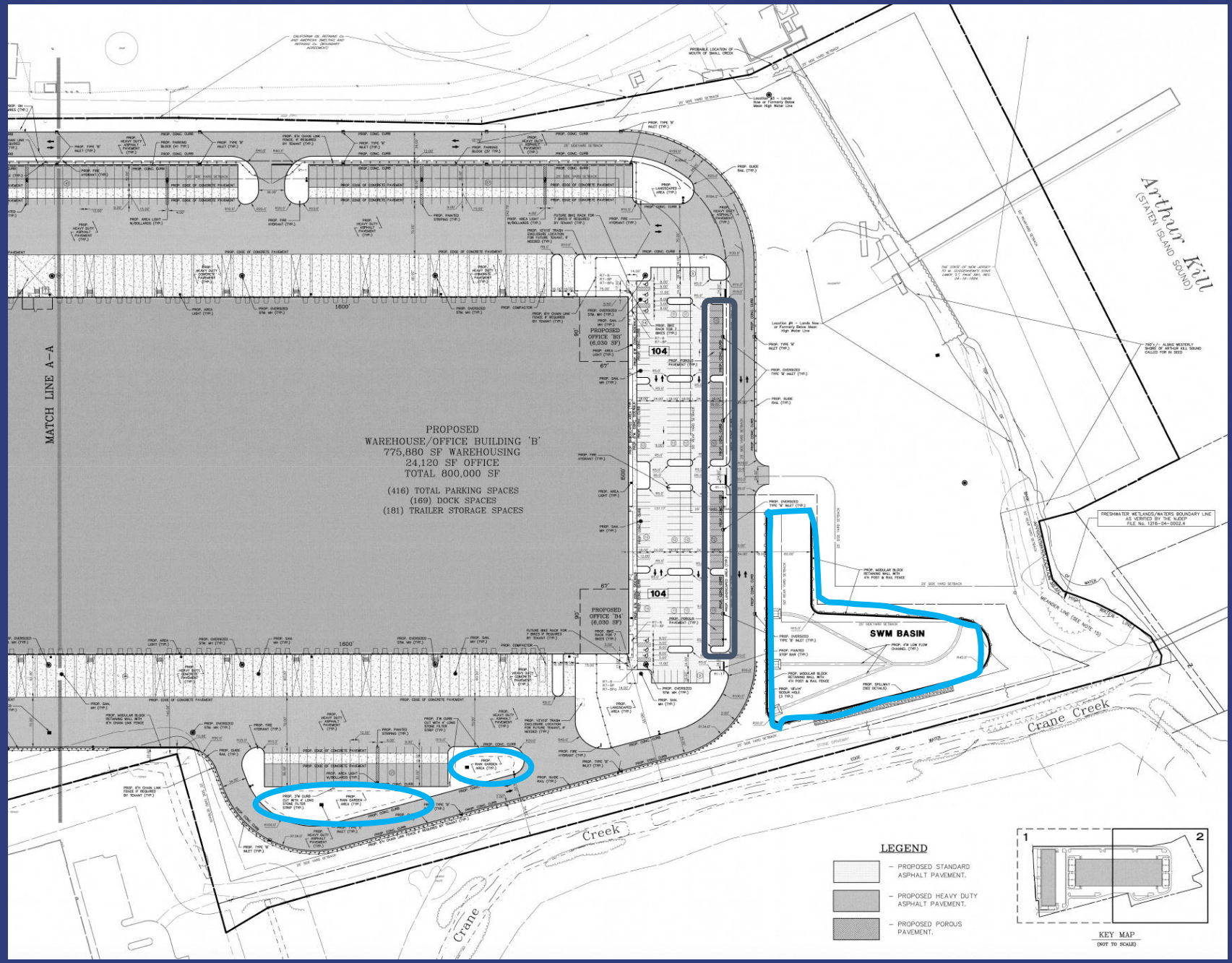


ELM STREET LOGISTICS CENTER

Eport I + II

- 150 acres remediated
- Over 2,256,000 SF distribution facilities

Eport I + II


MATCH LINE A-A
PROPOSED
WAREHOUSE/OFFICE BUILDING 'B'
775,880 SF WAREHOUSING
24,120 SF OFFICE
TOTAL 800,000 SF
(416) TOTAL PARKING SPACES
(169) DOCK SPACES
(181) TRAILER STORAGE SPACES
PROPOSED OFFICE 'BC' (6,030 SF)
PROPOSED OFFICE 'B4' (6,030 SF)
104
SWM BASIN
Arthur Kill
(STATEN ISLAND SOUND)
Crane Creek
Creek
Crane
LEGEND
– PROPOSED STANDARD ASPHALT PAVEMENT.
– PROPOSED HEAVY DUTY ASPHALT PAVEMENT.
– PROPOSED POROUS PAVEMENT.
KEY MAP
(NOT TO SCALE)

Resources

- Sustainable Jersey – Community Solar Guide
- Rutgers Cooperative Extension Water Resources Program – Green Infrastructure Feasibility Study
- Rutgers Cooperative Extension Water Resources Program – Impervious Coverage Assessment

THANK YOU!

William Kurzenberger, AICP
w.kurzenberger@topology.is
973.318.4173
topology.is

NJIT TAB EPA REGIONS 2 & 4

Free Technical Assistance to Brownfield Communities

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Technical Assistance to Brownfield Communities

What We Do

NJIT provides free technical assistance to state, regional, county, tribal, and local government entities and nonprofit organizations interested in learning about, identifying, assessing, cleaning up, and redeveloping brownfield sites in EPA Regions 2 & 4.

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NJIT TAB Assistance

NJIT has served as an EPA designated technical assistance provider since 2008.

Assistance is provided through…

- Brownfields Academy
- Brownfield Community Engagement and Educational Forums
- One-on-one Technical Assistance

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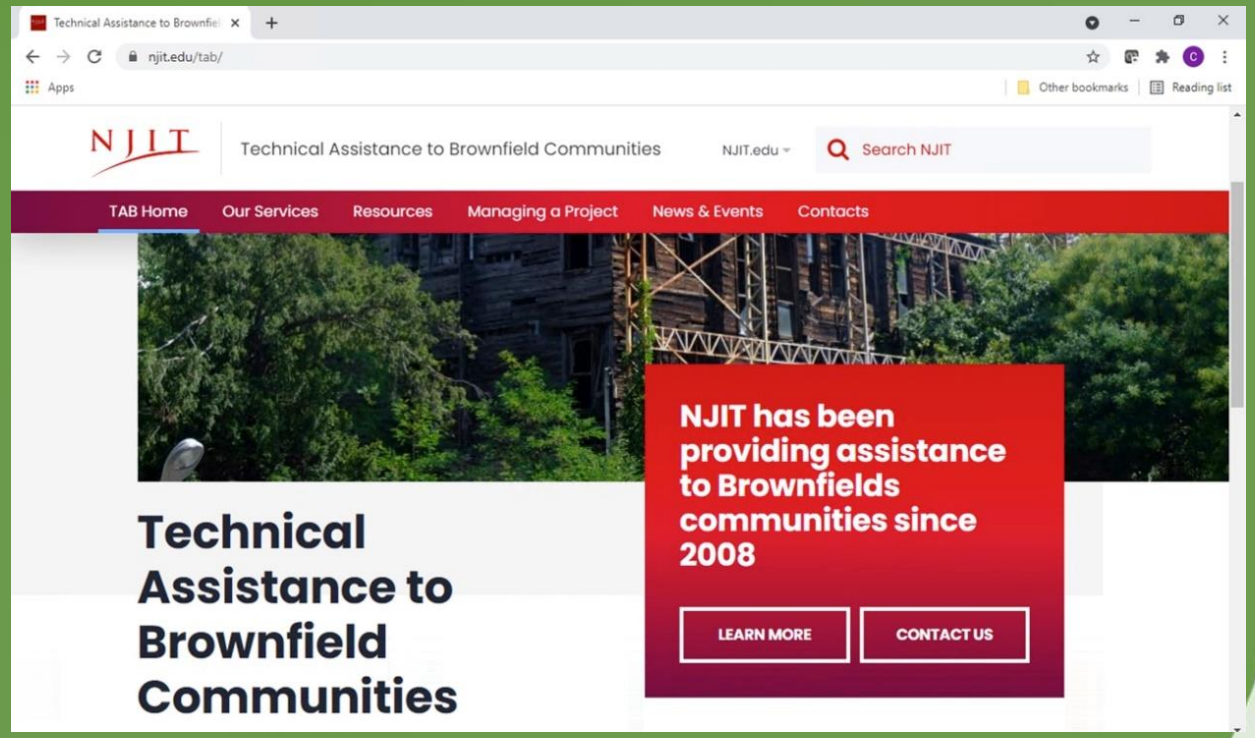
NJIT TAB Brownfields Academy

www.njit.edu/tab

- How-To Videos
- Infographics
- Success Stories
- News and Upcoming Events
- Federal and State Funding Sources
- EPA And State Contacts
- Previously Recorded Webinars
- Downloads of Workshop and Seminar Presentations
- Successful Grant Applications



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Community Engagement and Educational Forums

- **Breaking Brownfields:** an event where a government entity or nonprofit presents their specific brownfields redevelopment challenge to an audience of private sector representatives and obtains feedback on how to overcome those challenges.
- **Brownfield Basics Workshops:** brownfield redevelopment process.
- **Brownfield Summits**: Full day event that may include peer-to-peer sessions, success stories, and sessions on brownfield-related topics relevant to the specific locations, their needs, and their challenges.
- **Community Workshops:** on brownfield-specific topics.
- **Grant Writing Workshops:** getting started on your MAC grant applications; tips and tricks for preparing an EPA brownfields grant application.

One-on-One Technical Assistance

Tailored to your specific needs

- Identify funding sources
- Review draft grant applications
- Develop redevelopment strategy
- Participate in the consultant solicitation process
- Explain the regulatory programs
- Guidance on developing brownfield inventories
- Explain clean-up technologies
- Create project prioritization processes
- Develop strategies on marketing brownfields sites
- Develop Assets and Needs Studies
- Design and conduct community workshops

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What do you want to hear more about?
Answer On Screen

Contact Us

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If you have any questions about this presentation, please reach out.

Carrie Martin, AICP
carrie.martin@njit.edu
(973) 642-7044

Thank you for joining!

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Further Reading: Climate Adaptation Resources

- Brownfield Revitalization in Climate-Vulnerable Areas
- Green Infrastructure
- Stream Daylighting at Brownfield Sites
- Building Community Resilience With Nature-Based Solutions: A Guide for Local Communities
- Building Community Resilience With Nature-Based Solutions: Strategies for Success

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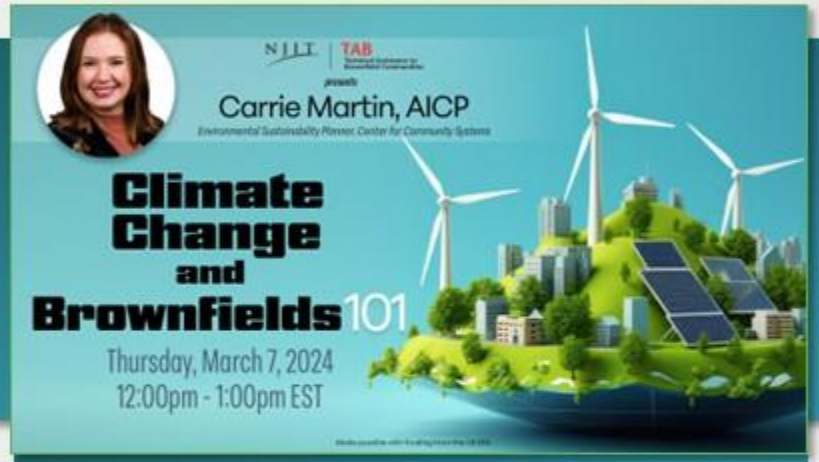
Further Reading: Climate Mitigation Resources

- RE-Powering America's Land
- RE-Powering Mapper 3.0
- Are You Considering Renewable Energy or Energy-Efficient Approaches in Your Brownfields Redevelopment?
- Charging Forward: Revitalizing Brownfield Sites into Electric Vehicle Charging Stations

Upcoming Events 2024

TAB In Your Area

If you'd like NJIT TAB to visit your area, feel free to contact us!



March 7, 2024

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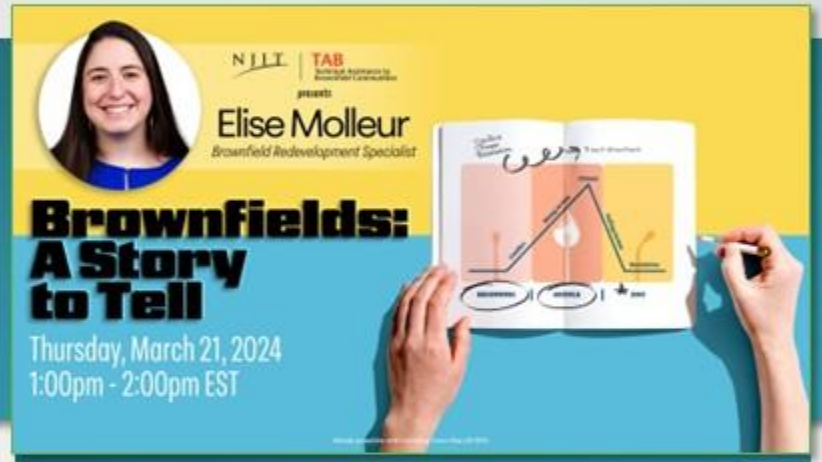

March 21, 2024

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MOHAWK VALLEY
BROWNFIELDS DEVELOPER SUMMIT
NETWORK. EXPLORE. INVEST.

Mohawk Valley Brownfield Basics
April 10, 2024

Mohawk Valley Brownfield Developers Summit
April 23 & 24, 2024

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In Case You Missed It

Pop-Up Progress: Unveiling the Magic of Temporary Brownfield Makeovers

Brownfield Contaminants and Human Health

Both these webinars with associated presentations and resource links can be found on our website!

www.njit.edu/tab/webinars

NJIT | TAB Technical Assistance to Brownfield Communities

What is NJIT | TAB Technical Assistance to Brownfield Communities ?

NJIT provides free technical assistance to state, regional, county, tribal, and local government entities and nonprofit organizations interested in learning about, identifying, assessing, cleaning up, and redeveloping brownfield sites in EPA Regions 2 & 4.

Contact Us

tab@njit.edu

(973) 642-4165

www.njit.edu/tab

https://www.linkedin.com/company/njit-tab/