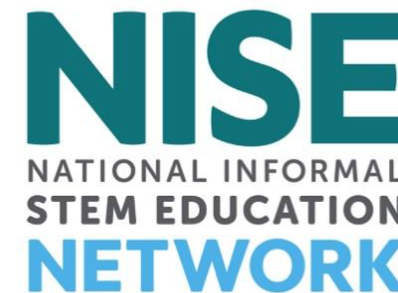


NISE Net Online Workshop

Learn about how to get involved with a new community science project around heat waves, sea level rise, extreme precipitation, and drought

Tuesday, December 1, 2020



Today's presenters:

David Sittenfeld, Museum of Science, Boston, MA

Sara Benson, Museum of Science, Boston, MA

Katie Baur, Museum of Science, Boston, MA

Max Cawley, Museum of Life and Science, Durham, NC

Caroline Nickerson, SciStarter

Owen Weitzman, Museum of Science, Boston, MA



Welcome!

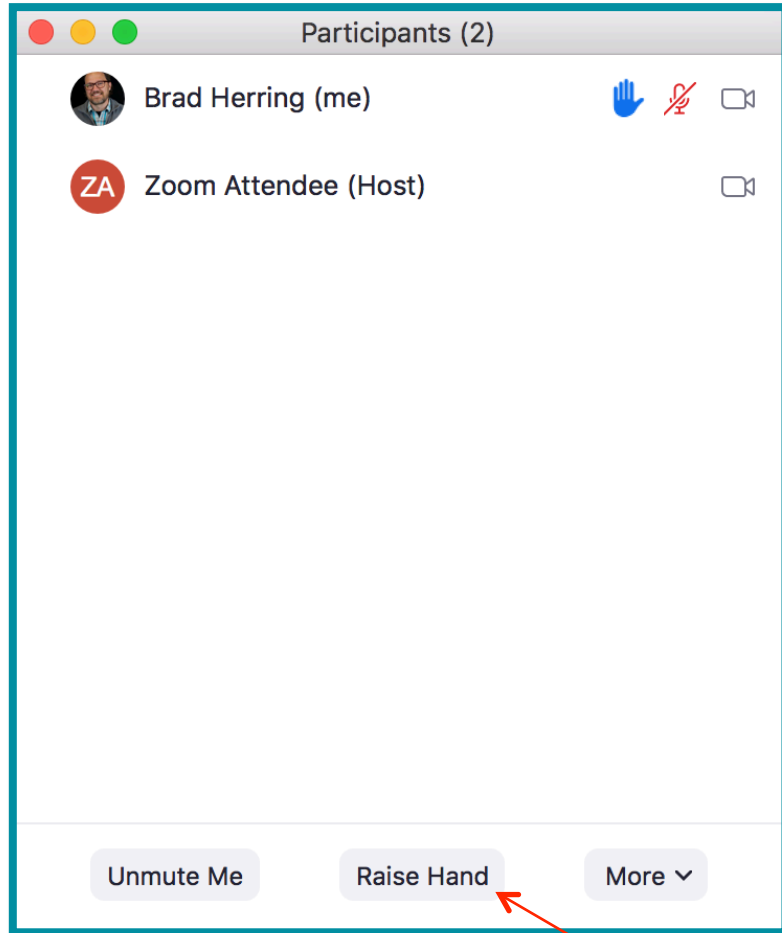
As we wait to get started with today's discussion, please:

Introduce yourself! Type your name, institution, and location into the Chat Box

Questions? Feel free to type your questions into the Chat Box at any time throughout the webinar or use the raise your hand function in the participants list and we'll unmute your microphone.

Today's discussion will be recorded and shared on nisenet.org at: nisenet.org/events/online-workshop

How to Participate in the Discussion



How to talk

- Raise your hand
- Keep yourself muted
- Keep the conversation constructive
- Reminder that today's session is being recorded

How to chat

- Enter your comments and questions into the chat box



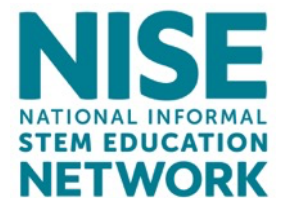


David Sittenfeld

Museum of Science

Boston, MA

Citizen Science, Civics, And Resilient Communities: A Project Opportunity For NISE Net Partners



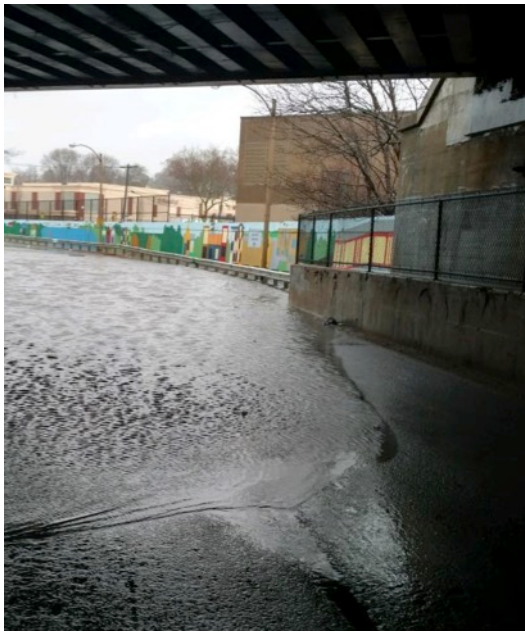


Photo credit: <https://www.mass.gov/service-details/morrissey-boulevard-redesign-for-reconstruction>

Climate hazard resilience is a fast-rising priority for communities across the US and around the world and communities are revisioning what their communities need to become to meet these concerns.

All stakeholders – including and particularly low-income, communities of color, and other vulnerable, historically under-represented groups with valuable local knowledge – **must be engaged in the design of equitable policies and solutions.**



Bey, G., C. McDougall, & S. Schoedinger. 2020. Report on the NOAA Office of Education Environmental Literacy Program Community Resilience Education Theory of Change. National Oceanic and Atmospheric Administration, Washington, DC. doi:10.25923/mh0g-5q69



Our Strategy: Science-to-Civics

In 2018, NOAA awarded the Museum of Science and its partners a 3-year grant to work with science centers across the U.S. **to engage diverse communities** in projects connecting community science and deliberation to **build community engagement** and **inform local resilience planning** regarding four hazards:

- Heat Waves
- Sea Level Rise
- Extreme Precipitation
- Drought

The Science-to-Civics Process:

Agenda Setting

Selection of Locally Relevant Citizen Science Project

Participant Recruitment for Citizen Science Activities

Introduce Hazard & Resilience Planning Context

Participant Training

Data Collection by Citizen Volunteers

Decision-Making

Convene Public Forum with Diverse Public Audience

Presentation/discussion of citizen-collected data

Public deliberation using hazard module

Policy-Forming

Discussion of locally focused resilience planning question

Formulate Action Plans and Recommendations

Call to Action/Sustained Engagement

Our Partners:



Northeastern University
Marine Science Center



Consortium for Science,
Policy & Outcomes
at Arizona State University

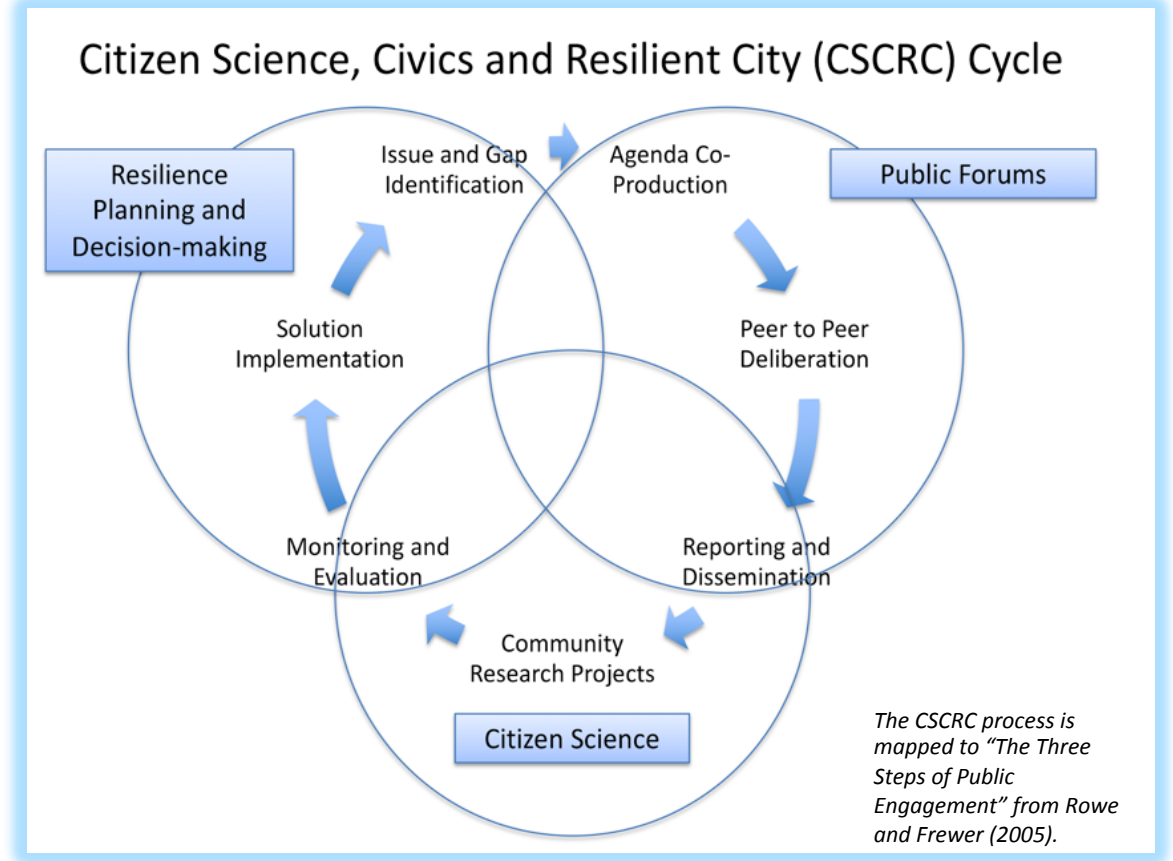




Our Objectives

For each project, participants will:

- **Collect and analyze data** around a specific hazard relevant to their community
- **Learn** about vulnerabilities through visualizations of geospatial data
- **Engage** in deliberative problem-solving
- **Design** community resilience plans accounting for diverse perspectives
- **Present recommendations** to resilience planners and the public



Component 1: Citizen/Community Science

Informal science center educators and **diverse members of the lay public** collect data relevant to local priorities.

Community science volunteers are recruited in partnership with **civic and community partners**, especially those serving vulnerable communities.

Trained volunteers **independently contribute observations** via [SciStarter](#), apps like [MyCoast](#) and [iSeeChange](#), or specialized sensors over a period of 1-2 months.



Component 2: Public Forums

Forums engage participants in **deliberative, inclusive conversations** about climate hazards.

Forums use **interactive games and expert-led discussion** to engage diverse community members, scientists, and policymakers and **help them share perspectives and learn from one another.**

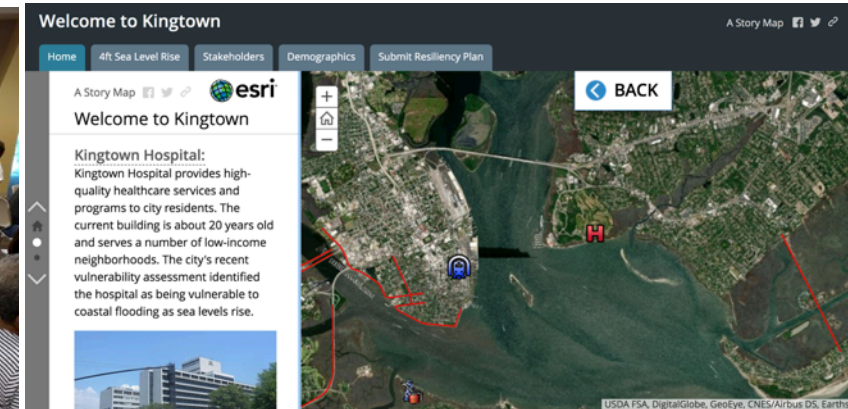


Science Center Public Forums (2017-2018)



Steps to Resilience:

- 1 Step 1: Explore Climate Threats
- 2 Step 2: Assess Vulnerability & Risks
- 3 Step 3: Investigate Options
- 4 Step 4: Prioritize Actions
- 5 Step 5: Take Action



Exploring Climate Threats

Welcome To Rivertown

A Story Map

Extreme Precipitation Rivertown Stakeholders 100 Year Flood Event Demographics Strategy: Inform the Public Strategy: Keep It Out Strategy: Soak It Up

A Story Map


Extreme Precipitation

Flash floods occur in small and steep watersheds and waterways and can be caused by short-duration intense precipitation, dam or levee failure, or collapse of debris and ice jams. Most flood-related deaths in the U.S. are associated with flash floods.

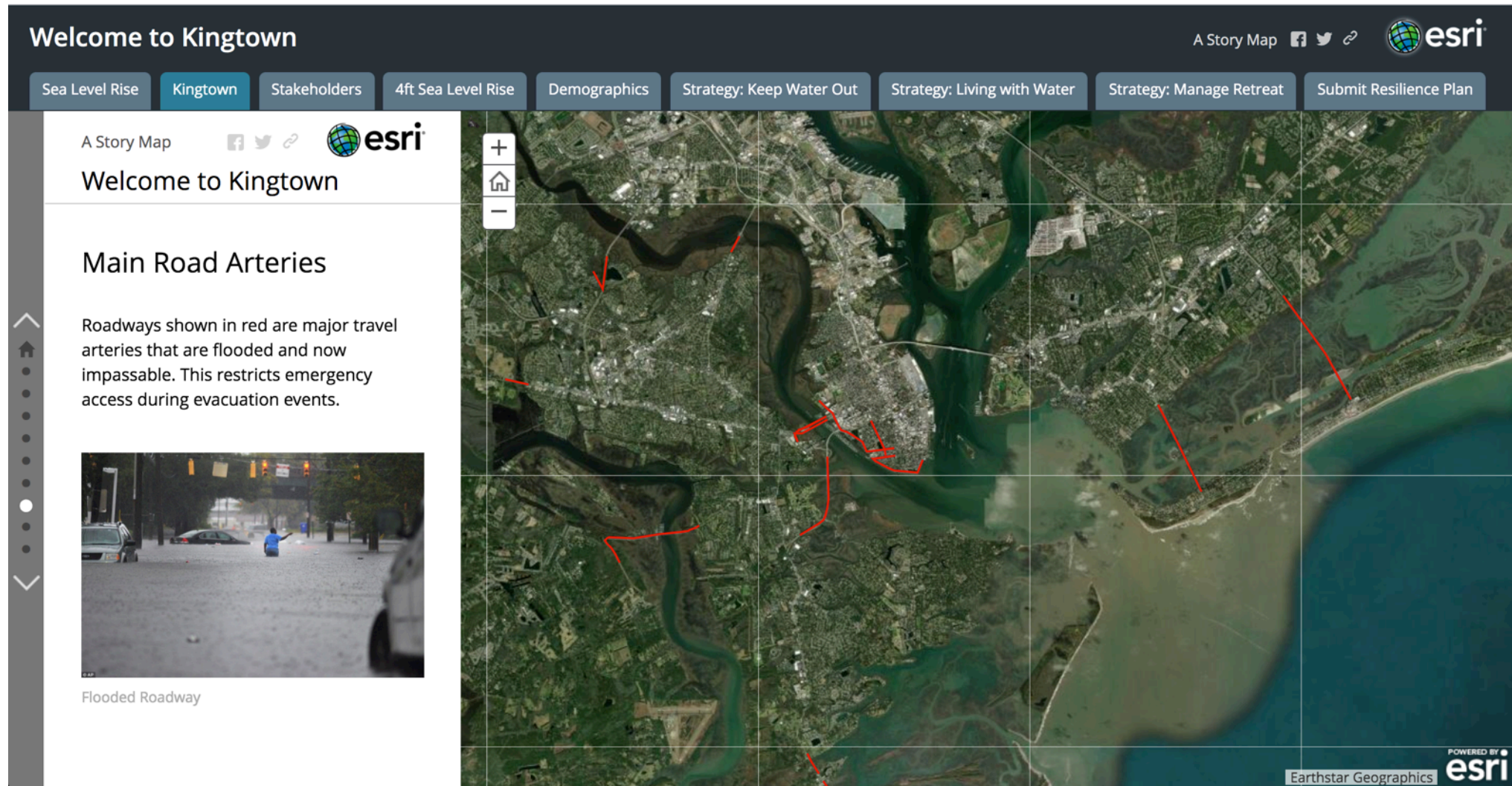
Urban flooding can be caused by short-duration very heavy precipitation. Urbanization creates large areas of impervious surfaces (such as roads, pavement, parking lots, and buildings) that increased immediate runoff, and heavy downpours can exceed the capacity of storm drains and cause urban flooding.

Flash floods and urban flooding are directly linked to heavy precipitation and are expected to increase as a result of increases in heavy precipitation events.

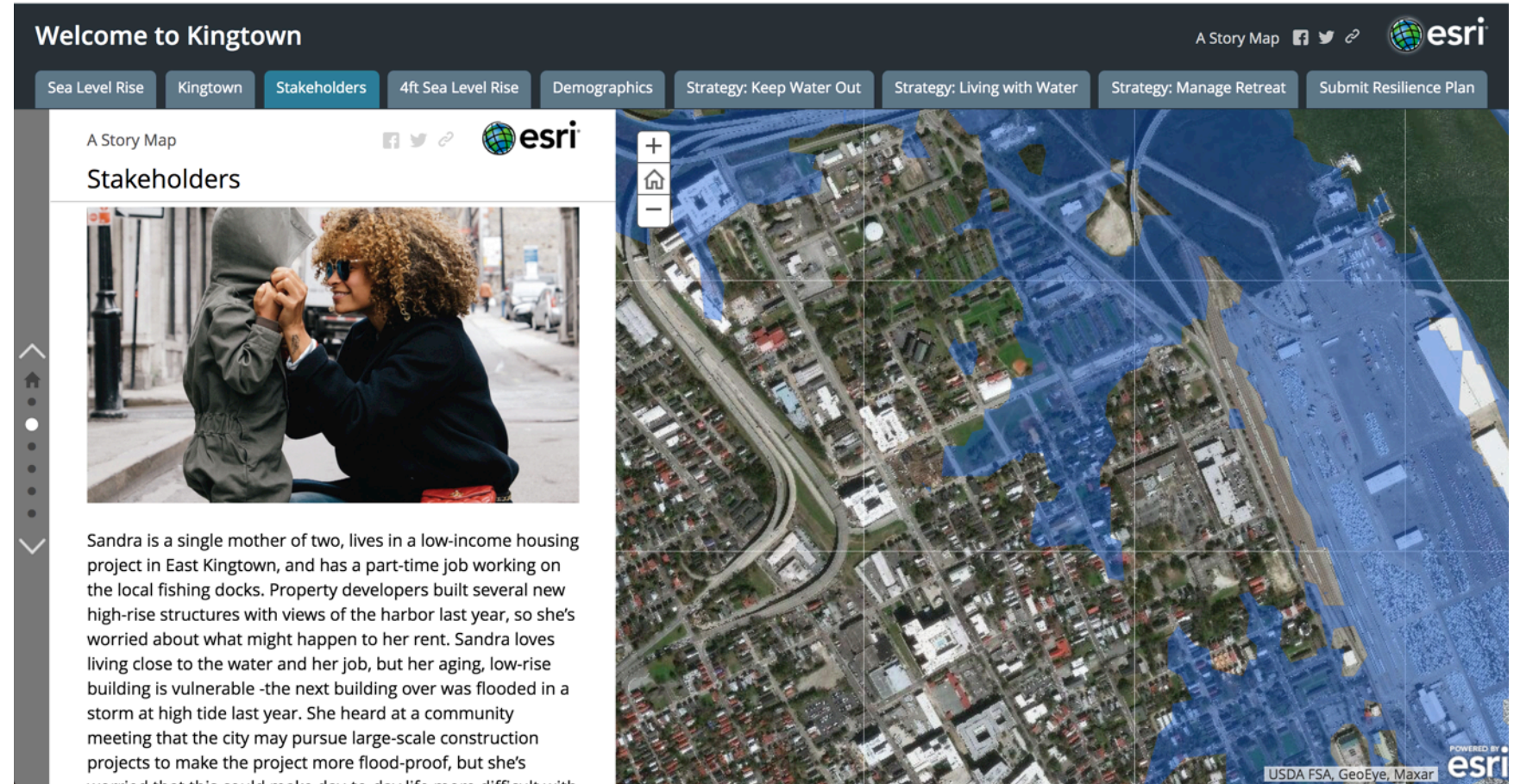
River flooding occurs when surface water drained from a watershed into a stream or a river exceeds channel capacity, overflows the banks, and inundates adjacent low lying areas. Riverine flooding depends on precipitation as well as many other factors, such as existing soil moisture conditions and snowmelt.



Assessing Vulnerabilities & Risks



CONSIDERING STAKEHOLDER PERSPECTIVES





KEEP WATER OUT

Keep Water Out involves building man-made barriers or using natural flood protection to prevent coastal flooding. This could mean installing a massive lock, erecting seawalls, or even restoring wetlands.

ECONOMIC ★★

Barriers are expensive to build and coastal armoring and artificial beaches require costly annual maintenance and regular monitoring. Vegetative methods, such as a living shoreline, are less costly. Massive locks are a possible tourist attraction, although the city will lose money in real estate since some of the extremely valuable coastline will no longer be available for redevelopment.

ENVIRONMENTAL ★★★

Barriers can cause environmental damage by restricting and altering the natural flushing of an estuary. Even small seawalls cut off water from its floodplains, which are often valuable breeding and feeding zones. Wetlands are valuable because they filter pollutants, sequester carbon, and create critical habitats for fish and wildlife.

SOCIAL ★★★★★

Barriers protect large vulnerable areas from flooding, saving lives and preventing property damage. Similarly, coastal armoring protects development along coastlines. In addition to their flood protection services, beaches and wetlands provide recreational space for communities.



LIVING WITH WATER

Living with Water accommodates rising sea levels by allowing water into city spaces. This means elevating roads and buildings above water levels, waterproofing electrical and transportation infrastructures, and building floating or floodable development.

ECONOMIC ★★★

Floodable development is untested and therefore a risky investment, while flood-proofing structures presents challenges to existing frameworks such as freshwater and electricity. Retrofitting buildings can be expensive but may be a cost effective strategy for new buildings.

ENVIRONMENTAL ★★★★★

Natural areas such as floodable waterfront parks create green space and habitat. Floating structures can provide a dynamic aquatic habitat in a similar way to a coral reef or sunken ship.

SOCIAL ★★

Floodable spaces can be used as recreational areas, although they can also be a public health hazard when filled with polluted stormwater. Floating buildings provide flood and hurricane safety for coastal residents. However, retrofitting and/or closing infrastructure can be an inconvenience.



MANAGED RETREAT

Drastic managed retreat involves completely relocating vulnerable structures and neighborhoods, while less-intensive measures include prohibiting development in vulnerable zones and offering incentives for residents and businesses to relocate on their own.

ECONOMIC ★★★

Relocating is costly in areas that are significantly developed, but usually less expensive than armoring strategies. The federal government would save money in the long run by reducing losses that they would have to pay for under the National Flood Insurance Program.

ENVIRONMENTAL ★★★★★

Managed retreat can be designed to allow the restoration of flood-buffering wetlands and natural shoreline habitat.


SOCIAL ★★

Important landmarks and attractions can be lost in the relocation process, which can disrupt personal roots to a place. There are also significant political complications involving tremendous legal and equity issues with land and property disputes. Despite this, retreat minimizes human suffering by relocating before a catastrophic flood.

PRIORITIZING STAKEHOLDER VALUES

KEEP IT OUT













Keep It Out involves improving water management systems through actions such as separating sewer systems, updating the local wastewater treatment plant, building stormwater basins, and protecting public transit systems.

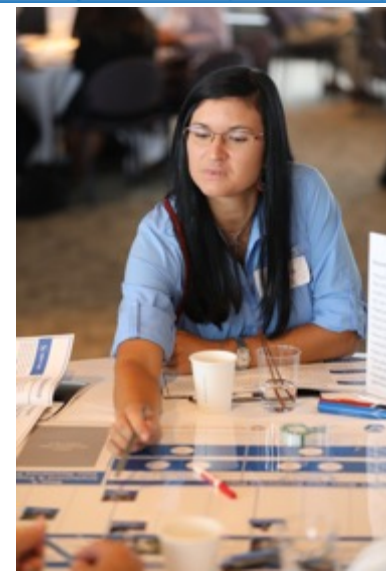


ECONOMIC ★★
Sewer separation is costly and extremely inconvenient for older cities, likely costing billions of dollars and causing widespread disruption. Replacing aging infrastructure and removing dams is also expensive. Retrofit projects, such as barriers to protect water from entering subway tunnels, are a cost-effective management option but are only a temporary solution.

ENVIRONMENTAL ★★★★★
Protecting wastewater treatment plants makes it less likely for plants to flood during storm events, preventing pollution from entering waterways. Stormwater management also helps prevent nutrient pollution, which leads to unwanted consequences such as algal blooms and fish kills.

SOCIAL ★★★★★
Even though construction of stormwater management systems is disruptive, separating sewer systems prevents wastewater from entering homes and buildings, protecting residents from pathogens and mold. If built strategically, recreation can be incorporated into stormwater management strategies, like allowing outdoor theaters to collect water during a flood.

KEEP IT OUT			SOAK IT UP			INFORM THE PUBLIC		
ECONOMIC ★★			ECONOMIC ★★★★★			ECONOMIC ★★★		
ENVIRONMENTAL ★★★★★			ENVIRONMENTAL ★★★★★			ENVIRONMENTAL ⓧ		
SOCIAL ★★★★★			SOCIAL ★★★★★			SOCIAL ★★★★★		
0	\$	\$\$	0	\$	\$\$	0	\$	\$\$
	 Director of Community Health	 Soybean Farmer		 Director of Community Health	 Floodplain Resident		 Floodplain Resident	 Director of Community Health
	 Floodplain Resident			 Soybean Farmer				 Soybean Farmer



MAKING YOUR RESILIENCE PLAN



KEEP IT OUT






Plan A

The city's aging combined sewer system is currently releasing nearly 3 billion gallons of untreated wastewater into nearby water ways due to combined sewer overflows during heavy rainfalls. To reduce this amount of overflow by 95%, the city will replace half of the combined sewer system pipes and update the wastewater treatment plant - investing \$5 billion in construction costs over the next 25 years. The city will also prepare for future flooding events by designing and installing emergency covers for public transportation station entrances. This billion-dollar project will allow for quick and complete coverage of each vulnerable station entrance, allowing the stations to remain dry and functional for use immediately after a storm.

Plan B

The city cannot currently afford to invest in high budget, long term projects, but needs to decrease the amount of stormwater from flooding the streets and running into the local river. The city has invested \$4.5 million in building a water plaza for the city. A water plaza can serve as a space to play sports, eat lunch, and relax when it's dry, but will catch stormwater and act as a water basin during an extreme rain event. These plazas can be a cost-effective way to beautify the city and take some stress off of the sewer system. To protect their public transportation tunnels, the city is planning a \$30 million project to raise the tunnel vents located in floodplains above ground level to prevent inundation, and seal off the vents that are not necessary.

Extreme Precipitation

Today you will act as the resilience planning team for the city of Rivertown. Your report card is an interactive tool that allows you to compare the three plans and the city. The report card is a visual tool that allows you to compare the three plans and the city. The report card is a visual tool that allows you to compare the three plans and the city.

Step 1. Consider Stakeholder Perspectives

Place Stakeholder Cards Here

Step 2. Prioritize Stakeholder Values

KEEP IT OUT

Stakeholder 1	Stakeholder 2	Stakeholder 3	Stakeholder 4	Stakeholder 5
0	0	0	0	0
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5

SOAK IT UP

Stakeholder 1	Stakeholder 2	Stakeholder 3	Stakeholder 4	Stakeholder 5
0	0	0	0	0
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5

INFORM THE PUBLIC

Stakeholder 1	Stakeholder 2	Stakeholder 3	Stakeholder 4	Stakeholder 5
0	0	0	0	0
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5

Step 3. Make Your Resilience Plan

KEEP IT OUT	SOAK IT UP	INFORM THE PUBLIC
Resilience Plan A	Resilience Plan A	Resilience Plan A
Resilience Plan B	Resilience Plan B	Resilience Plan B

Step 4. Implement & Explore Your Resilience Plan

EP_008



Welcome To Rivertown

A Story Map

[Extreme Precipitation](#)
[Rivertown](#)
[Stakeholders](#)
[100 Year Flood Event](#)
[Demographics](#)
[Strategy: Inform the Public](#)
[Strategy: Keep It Out](#)
[Strategy: Soak It Up](#)

Submit Resiliency Plan

KEEP IT OUT	SOAK IT UP	INFORM THE PUBLIC
Plan A	Plan A	Plan A
Plan B	Plan B	Plan B

EP_008

KEEP IT OUT	SOAK IT UP	INFORM THE PUBLIC
Plan A	Plan A	Plan A
Plan B	Plan B	Plan B

EP_008

EXPLORING YOUR RESILIENCE PLAN



KEEP WATER OUT	LIVING WITH WATER	MANAGED RETREAT
Plan A	Plan A	Plan A
Plan B	Plan B	Plan B

SLR_012

Our plan puts a small amount of money towards the Living with Water and strategy and a lot of money towards the Managed Retreat strategy. Once completed, many areas of the city will remain vulnerable to flooding damage, but the most vulnerable areas and residents are relocated. By investing in the Managed Retreat strategy, the city implements a plan to move crucial infrastructures such as the hospital and power plant further inland. Residents and businesses in the locations near the coast are provided with a "Rising Tide" incentive program to help move them further from dangerous flooding areas. The city will also install flood control areas such as plazas and underground reservoirs in downtown locations, as well as a system of pumps to help remove floodwater from vulnerable structures and areas. While these updates will help decrease the damage from flooding to certain neighborhoods and eliminates much of the risk at the coastal locations, coastal flooding on roadways at high tide will get worse as sea levels rise. For those who aren't in a retreat zone and don't need to relocate, flood insurance may become expensive since flooding is likely to increase and no structures are being erected to keep the water out.

Sea Level Rise 001

A Story Map

Introduction Flood Visual Plan: Keep It Out Visual Plan: Living With Water Stakeholder Impact

Stakeholders Headlines

[Click here to view location](#)

[Click article to read](#)

GUARDIAN NEWS

JANUARY 1, 2020

COASTAL FLOODING ACROSS TOWN

East Kingtown facing major flooding due to storm surge; residents of this coastal community upset they aren't protected by new ocean lock paid for with taxpayer dollars.

EAST KINGTOWN: The coastal community of East Kingtown was hit again by flooding after last week's storm. The surge from the storm was measured to be well over 6 feet during high tide periods.

East Kingtown, like other coastal island neighborhoods to the south of downtown, is not protected by the newly built massive ocean lock that was constructed to protect most of the city from storm surge and sea level rise at a cost of over \$4 billion. Residents say they are confused how the lock, paid by the taxpayers, doesn't protect their neighborhood.

Senior city planner George Smith explains that the lock is located in the most ideal location to protect as much of the population as possible. The coastal communities right on the ocean, however, were never meant to be included in the planning. "It would be impossible to span a lock that would cover the coastal areas," said Smith.

Residents of East Kingtown will continue this struggle, as more storms are expected to hit throughout this winter.

Beach Ave flooded due to storm surge from last week's winter storm

Component 3: Resilience Planning & Decision Making

Local climate resilience planners participate in Forums to hear diverse community perspectives.

Data is disseminated post-forum

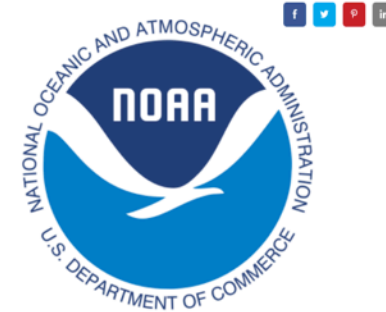
Community-generated data ultimately informs locally-focused resilience planning and iteratively connects to future community science campaigns.



Photo credit: Emily Norton, Charles River Watershed Association

With support from NOAA, and in partnership with SciStarter, Arizona State University, Northeastern University, and the National Informal Science Education Network, the Museum of Science (Boston) is leading a project to engage public participants in citizen science and resilience planning on four climate hazards: extreme heat, extreme precipitation, sea level rise, and drought.

Eight science centers are engaging the public in programs in 2020 before the project expands to [20 other science centers](#).



GET STARTED!

STEP 1: Create your SciStarter account

Username

What should we call you?

* Email

Email address

Zip Code

For finding projects in your area

* Password

Password

* Repeat password

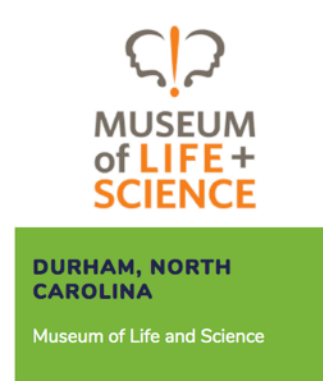
Repeat password

☒ Sign up for our newsletter

☒ Agree to our [Terms of Use](#)

A SciStarter account is not required, but it saves you time when submitting data, tracks your contributions, and connects

Welcome! Click on a Science Center to get started.



About

Projects

[Building with Biology](#)

[Changing Brains](#)

[ChemAttitudes](#)

[Let's Do Chemistry Train-the-Trainer Workshops](#)

[Citizen Science, Civics, and Resilient Communities \(CSCRC\)](#)

[Moon and Beyond project](#)

[Nanoscale Informal Science Education Network](#)

[Space and Earth Informal STEM Education \(SEISE\) project](#)

[Sustainability in Science Museums](#)

[Sustainability Fellow Participants](#)

[Sustainability Fellowship](#)

[Sustainable Futures](#)

[Frankenstein200](#)

[Project Funding Acknowledgements](#)

[FAQ](#)

Citizen Science, Civics, and Resilient Communities (CSCRC)

Citizen Science, Civics, and Resilient Communities (CSCRC) Project

Through forums and citizen science projects, museums engage the public in active learning and resilience planning around heat waves, sea level rise, extreme precipitation, and drought.



Opportunities for NISE Network partners

- Apply to be one of 20 sites that will be selected to receive a small stipend and support from the project team to organize and implement a science-to-civics campaign in your community
- **Dates and Deadlines:** See the project timeline and deadlines below
 - Fill out the [expression of interest form](#) to receive reminders about project info sessions, application updates and deadlines
 - Optional: Attend sea level rise virtual forum hosted by Museum of Science on **November 10, 2020** from 5-7pm ET - [Sign up via Eventbrite](#)
 - Optional: Attend an online workshop on **December 1, 2020** to learn more about the project and ask your questions: [Register here](#)



<https://www.nisenet.org/CSCRC>

Thank You!

Scistarter.org/noaa
nisenet.org/cscrc

This presentation was prepared by the Museum of Science, Boston under awards NA15SEC0080005 and NA18SEC0080008 from the Environmental Literacy Program of the National Oceanic and Atmospheric Administration (NOAA), U.S. Department of Commerce.. The statements, findings, conclusions, and recommendations are those of the author(s) and do not necessarily reflect the views of NOAA or the U.S. Department of Commerce.



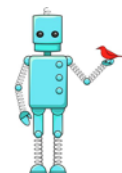
Northeastern University
Marine Science Center



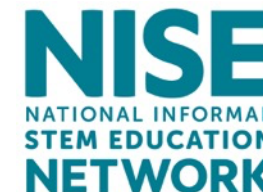
**Consortium for Science,
Policy & Outcomes**
at Arizona State University



Museum of Science.



scistarter
People-powered science.





Sara Benson

Museum of Science
Boston, MA

Wicked High Tides Sea Level Rise

WICKED HIGH TIDES

Museum of Science. 

What are wicked high tides?

Tides are rising higher than previously experienced due to **sea level rise, land subsidence, and coastal erosion**. Flooding during high tides, also known as sunny day flooding, is increasing in frequency in the US. Rising seas also create higher storm surges, causing further damage to coastal areas.

Why is understanding them so important?

With **40% of the American population living by the coast**, these flooding events cause major social, economic, and environmental impacts, including interruptions to businesses, damage to transportation, and loss of coastal barriers.

How can you help? Sign up for MyCoast...

You can document **storm damage and king tides** (extremely high tides in your communities). First, go to SciStarter.org/NOAA and create an account. Next, click the MyCoast icon to start. MyCoast allows citizen scientists to submit images and damage reports.

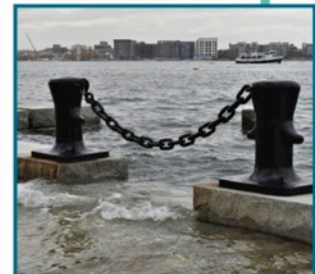
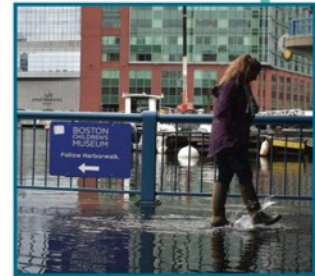
Our project is aimed at **connecting citizen science projects** to a community deliberation on sea level rise. By signing up and posting to MyCoast, you're helping us and state coastal resource managers make better-informed decision about what areas need protection for future flooding events.

...And come to the sea level rise forum!

Our **Wicked High Tides forum** is **March 3, 2020**. Explore the social, economic, and environmental impacts of sea level rise, work with others to recommend resilience strategies, and learn how you can help inform scientists. **Free with RSVP to wickedhightides.eventbrite.com required.** Email forumrsvp@mos.org with any questions (visit mos.org/public-events to stay up-to-date on this event and future forums).



This resource was prepared by support of award NA18SEC0080008 from the Environmental Literacy Program of the National Oceanic and Atmospheric Administration (NOAA), US Department of Commerce. The statements, findings, conclusions, and recommendations are those of the author(s) and do not necessarily reflect the views of NOAA or the US Department of Commerce.



Science-to-Civics

Agenda Setting

Selection of Locally Relevant Citizen Science Project

Participant Recruitment for Citizen Science Activities

Introduce Hazard & Resilience Planning Context

Participant Training

Data Collection by Citizen Volunteers

Decision-Making

Convene Public Forum with Diverse Public Audience

Presentation/discussion of citizen-collected data

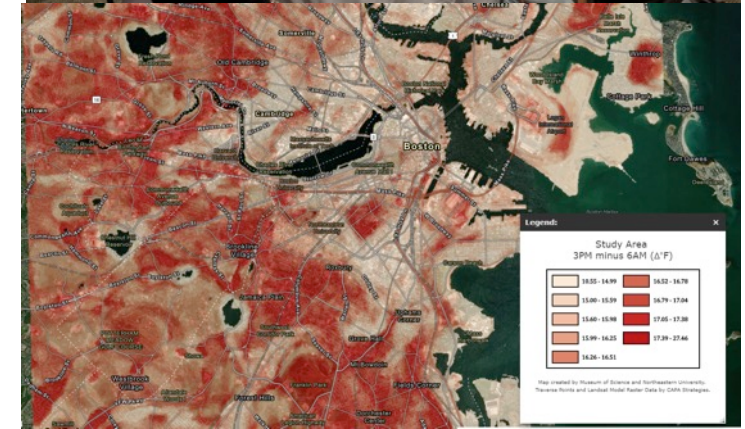
Public deliberation using hazard module

Policy-Forming

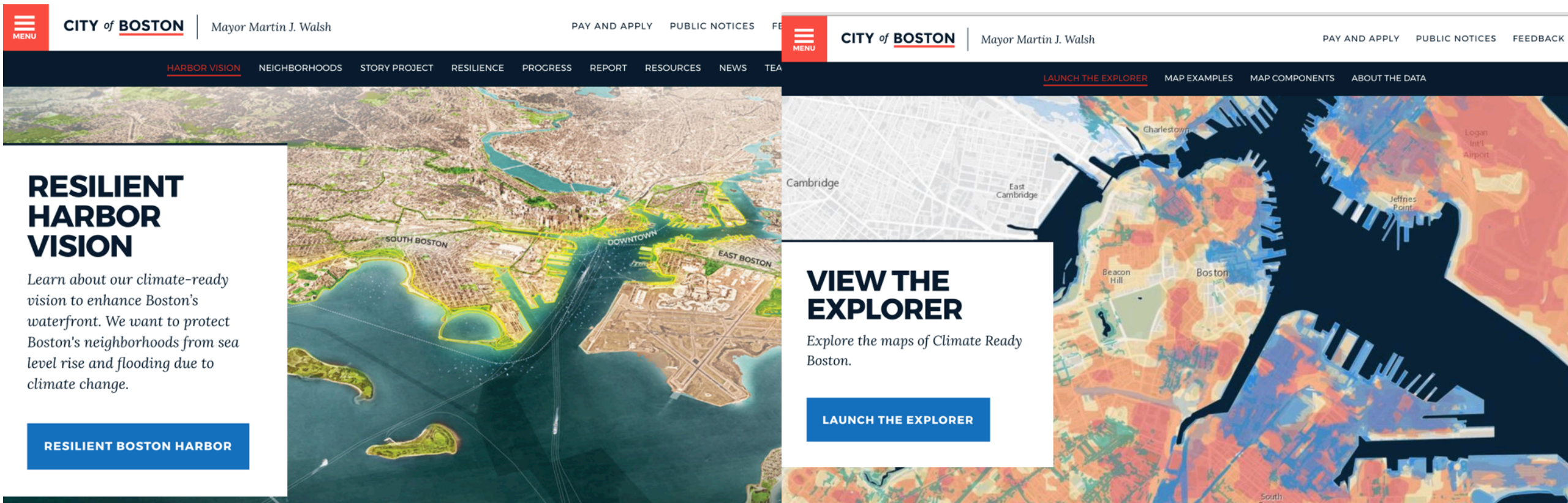
Discussion of locally focused resilience planning question

Formulate Action Plans and Recommendations

Call to Action/Sustained Engagement



Agenda Setting: Climate Hazard



<https://www.boston.gov/departments/environment/preparing-climate-change>

Agenda Setting: Citizen Science Project



MA MyCoast StormReporter King Tides Register Log in Support

MyCoast: Massachusetts

A project of the **Massachusetts Office of Coastal Zone Management**

MyCoast: Massachusetts is a portal for the Massachusetts Office of Coastal Zone Management to collect and analyze pictures and data relating to coastal events. Information collected through this site is used to visualize the impact of coastal hazards and to enhance awareness among decision-makers and stakeholders. Scroll down to view existing reports, or use the button below to submit a new report.



Massachusetts MyCoast has 3 Tools Activated



King Tides

Capturing Massachusetts's Highest Tides



StormReporter

Documenting Storm Damage in Massachusetts



Coastal Resilience

Monitoring Living Shorelines & Coastal Change

King Tide Report

"Boston Harbor"



03/10/2020 | 12:29 pm

(0 hours 0 minutes after high tide)



Weather Overview



Wind Speed: 6.5 MPH
Wind Direction: 168°
Temperature: 47°F
Rainfall (Calendar Day): 0.01"
Rainfall (Past 24 Hours): 0"

[\(Click here for full weather details\)](#)

Tidal Overview

Data from **BOSTON** (0.4 miles away)
Water Level: 12.4' (observed MLLW)
Predicted tide: 12:29 pm, 11.9'

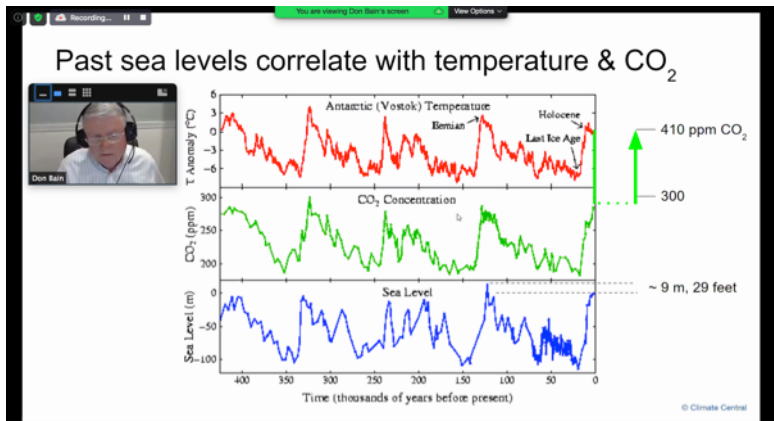


Decision Making: Wicked High Tides Forum

Community Organizations:

- Boston Harbor Now
- Charles River Watershed Association
- Communities Responding to Extreme Weather (CREW)
- Harborkeepers
- Massachusetts Office of Coastal Zone Management (CZM)
- Mystic River Watershed Association (MyRWA)
- Neighborhood of Affordable Housing (NOAH)
- New England Aquarium
- Northeastern University Marine Science Center





Virtual Forums

Welcome to Kingtown

A Story Map

Home 4ft Sea Level Rise Stakeholders Demographics Submit Resiliency Plan

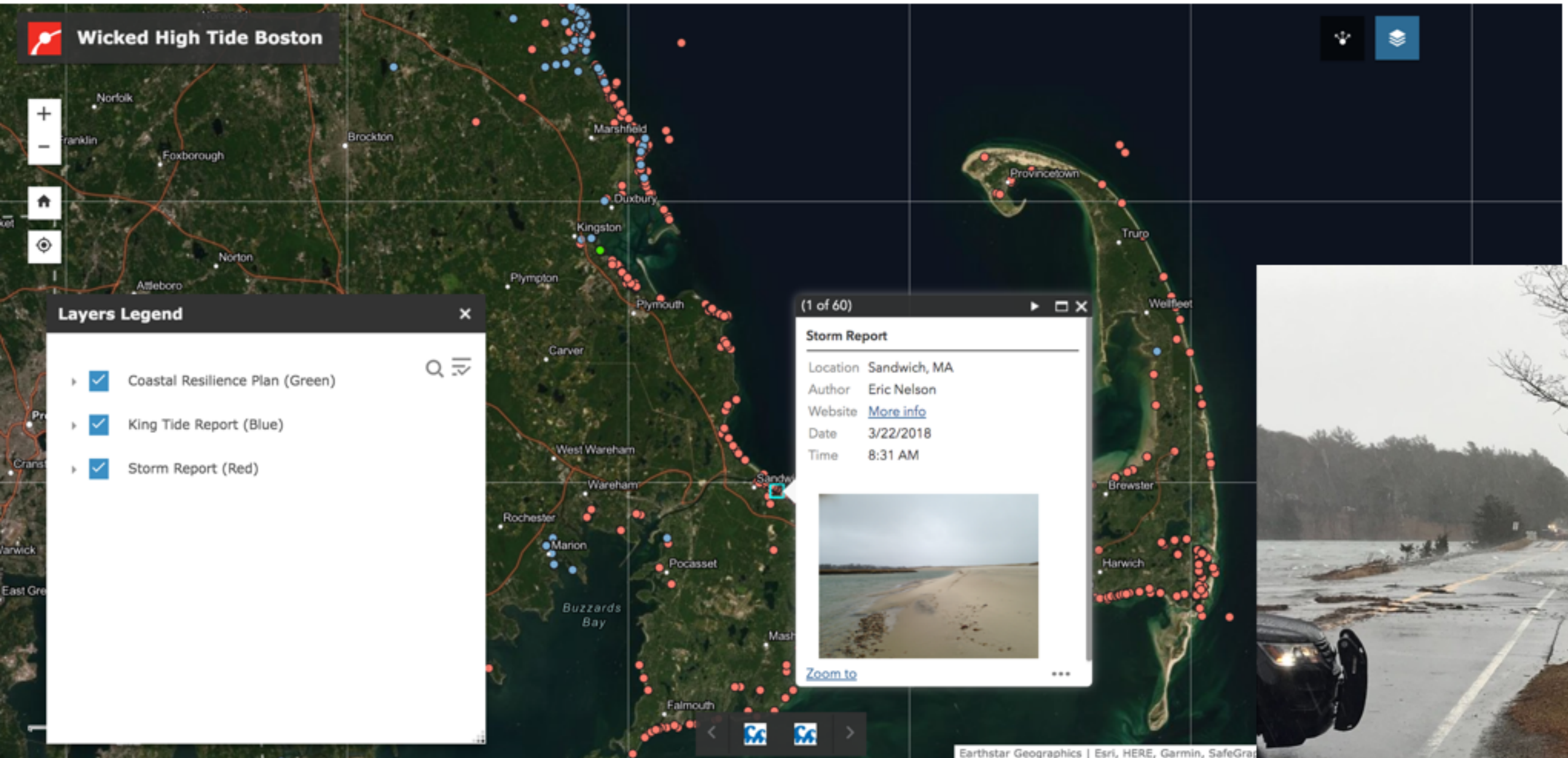
Kingtown Hospital:
Kingtown Hospital provides high-quality healthcare services and programs to city residents. The current building is about 20 years old and serves a number of low-income neighborhoods. The city's recent vulnerability assessment identified the hospital as being vulnerable to coastal flooding as sea levels rise.

USDA FSA, DigitalGlobe, GeoEye, CNES/Airbus DS, Earthstar Ge... esri

The image shows a screenshot of a web application titled "Welcome to Kingtown". It features a navigation bar with links to Home, 4ft Sea Level Rise, Stakeholders, Demographics, and Submit Resiliency Plan. The main content area displays a "Story Map" titled "Welcome to Kingtown" with a description of Kingtown Hospital and its vulnerability to coastal flooding. Below the text is a photograph of the hospital building. To the right of the text is a large aerial map of Kingtown, showing the hospital location and potential flooding areas. The map includes a "BACK" button and a "POWERED BY esri" logo. The map also shows various landmarks and infrastructure, including roads, buildings, and water bodies.

Wicked High Tides: Planning for Rising Seas

Policy Forming





Thank You!

Sara Benson

sbenson@mos.org



Max Cawley

Museum of Life and Science
Durham, NC

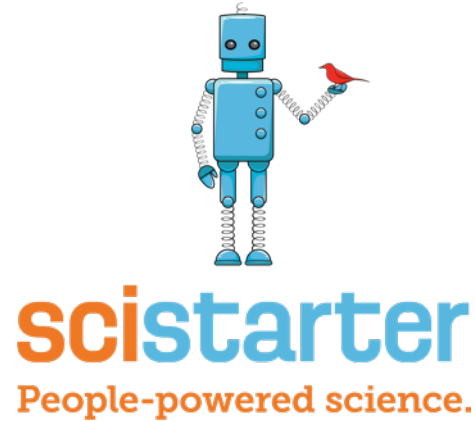


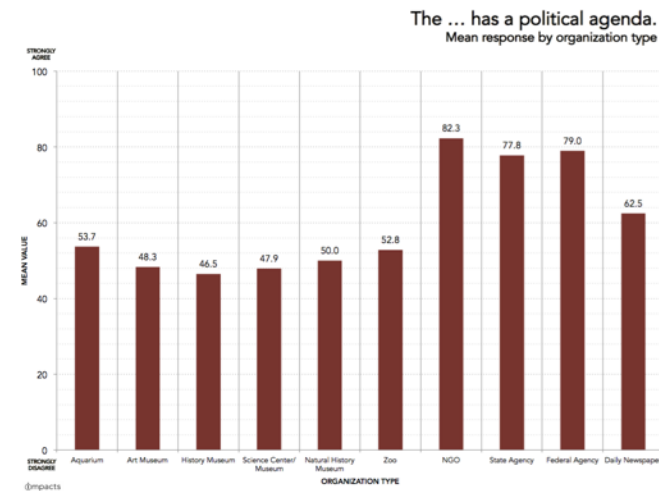
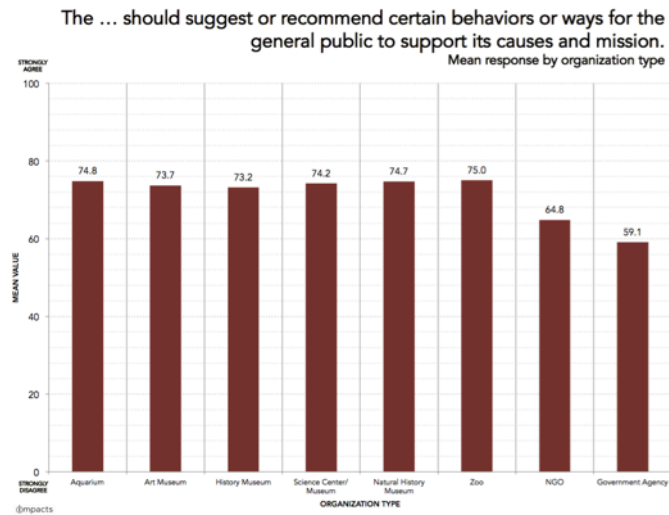
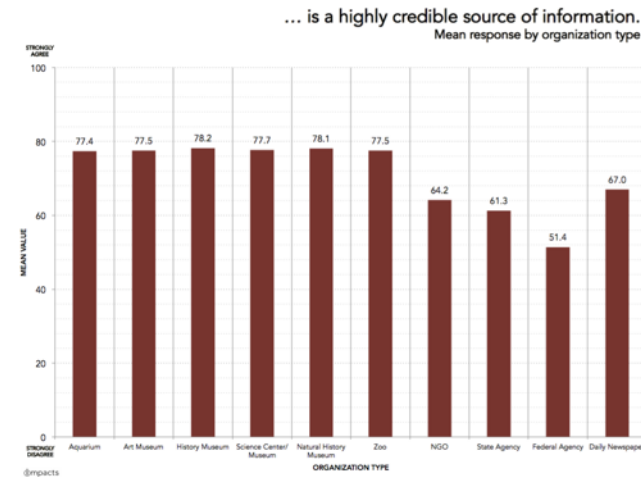
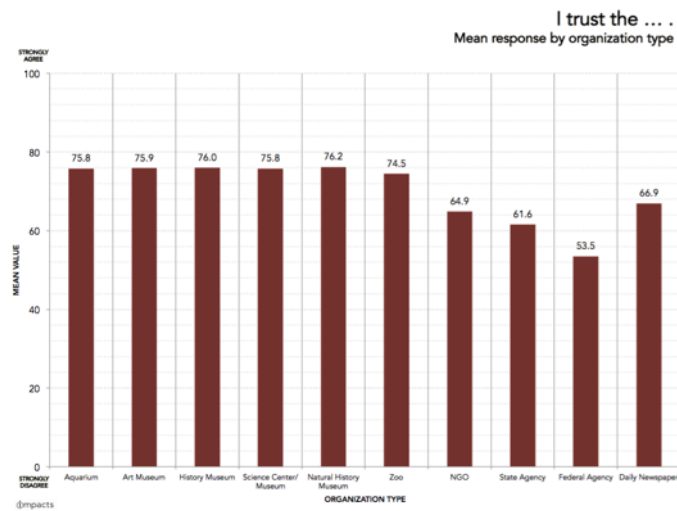
CHANGING CLIMATE:

BUILDING A CLIMATE-CONSCIOUS NC

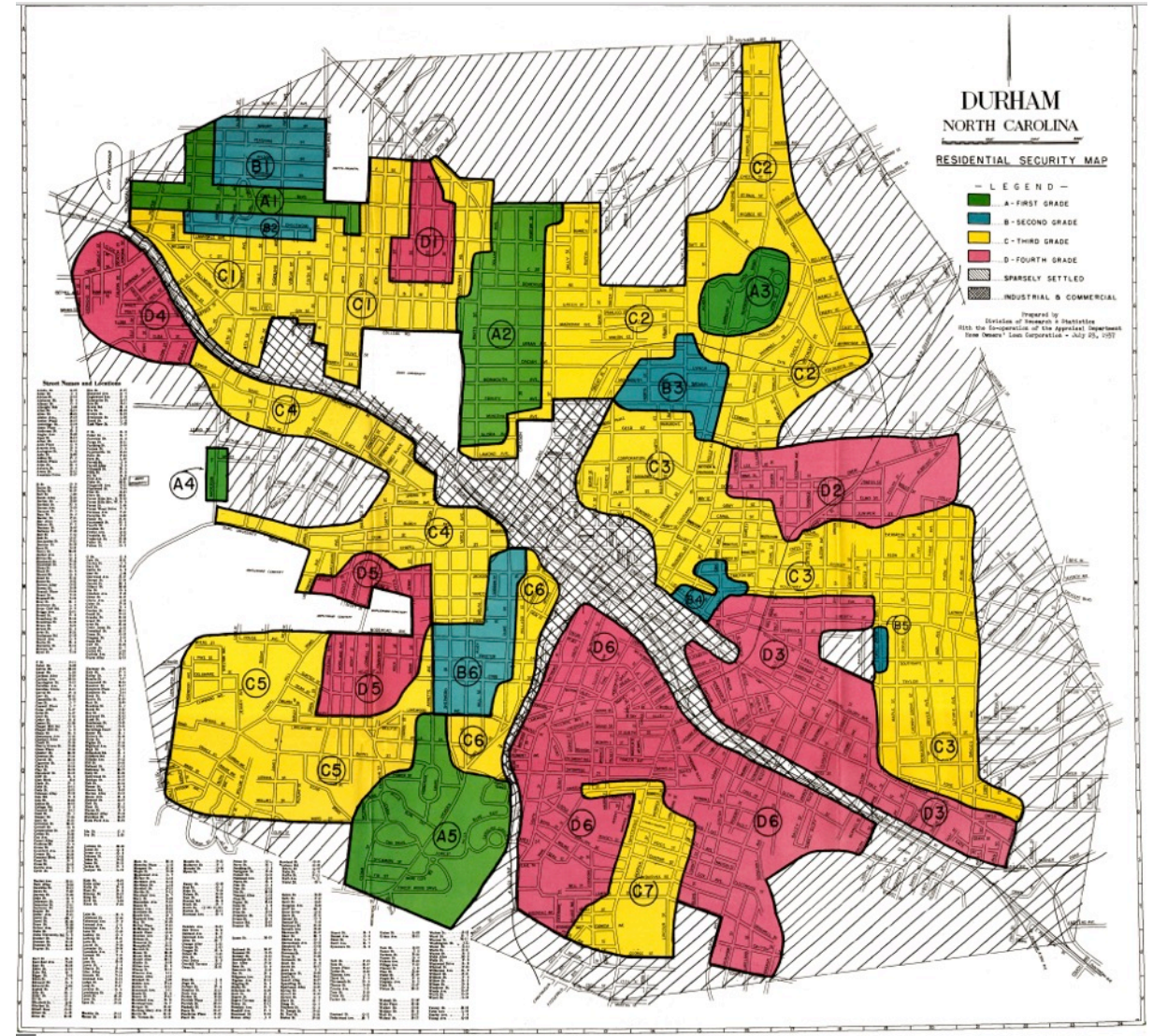
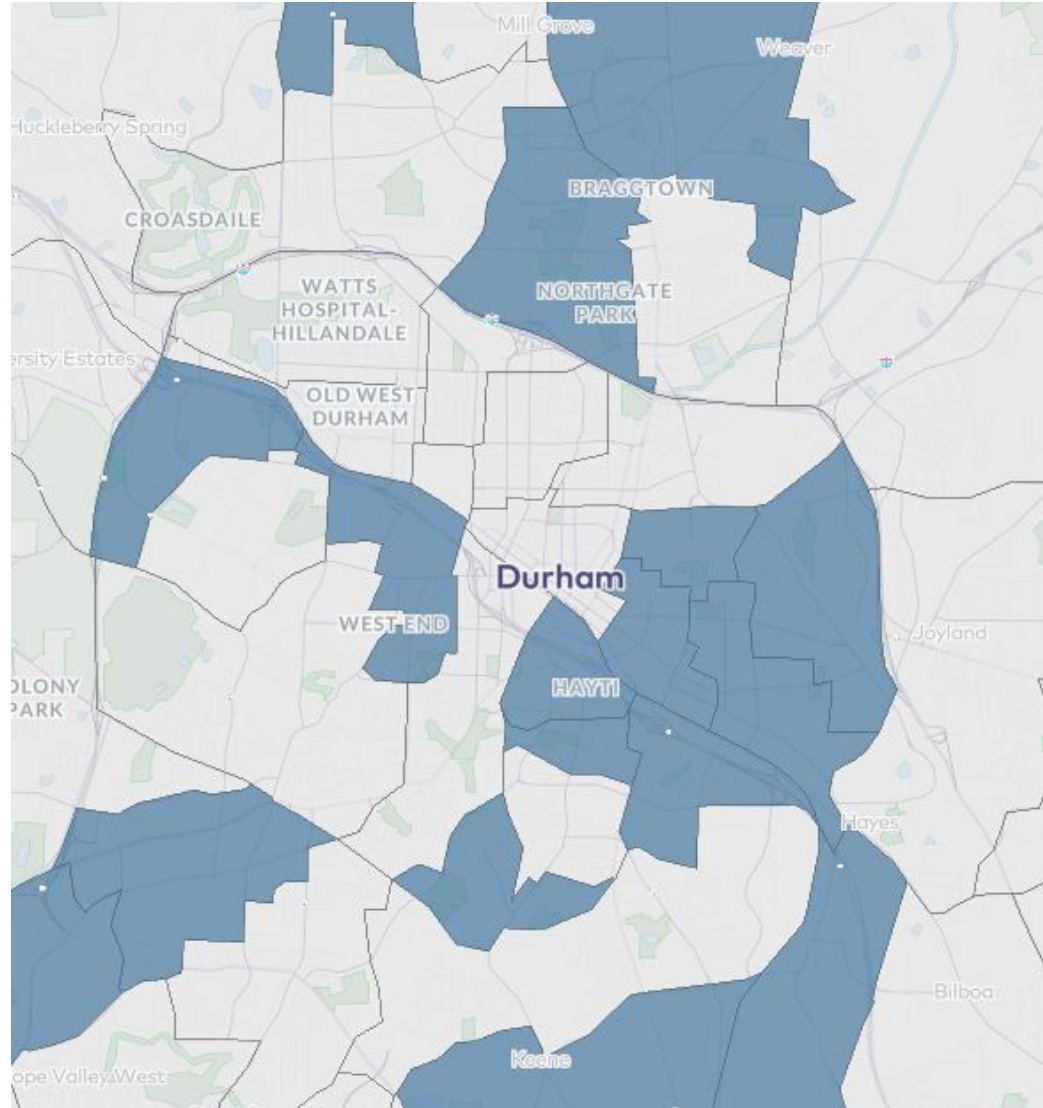


thanks to our partners:

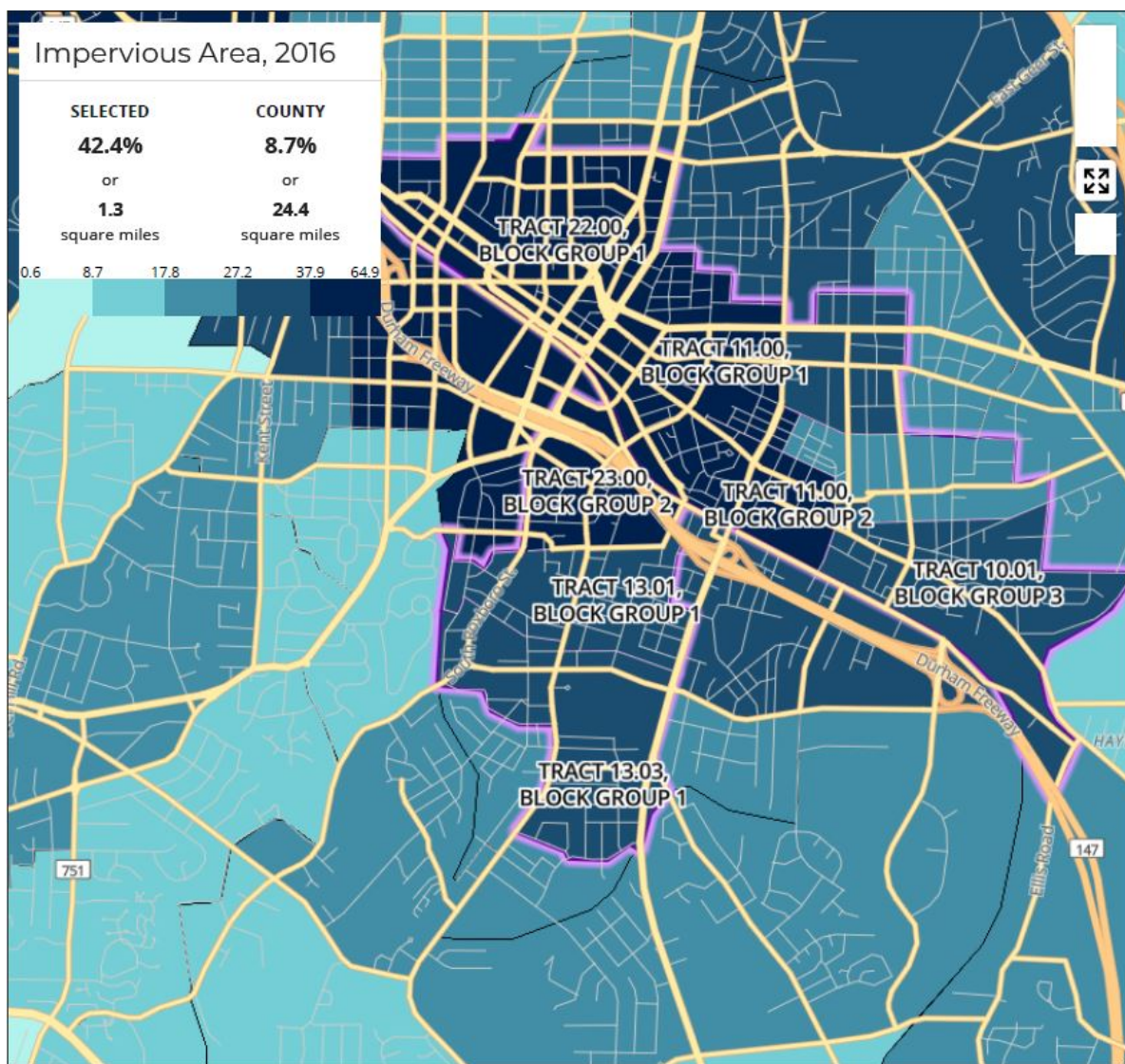




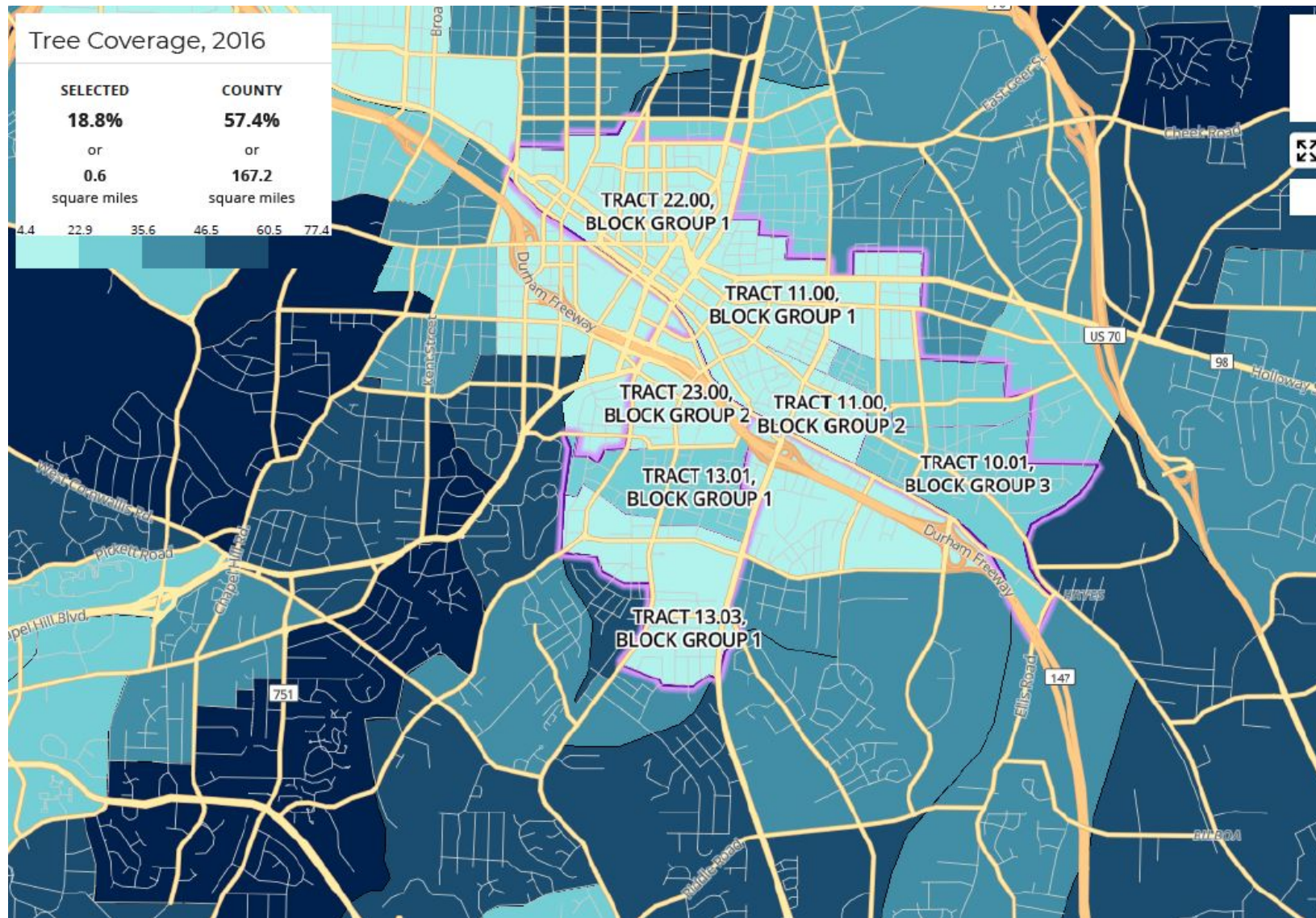
Source: Colleen Dilenschneider/NAAU, <https://www.colleendilen.com/2017/04/26/people-trust-museums-more-than-newspapers-here-is-why-that-matters-right-now-data/>



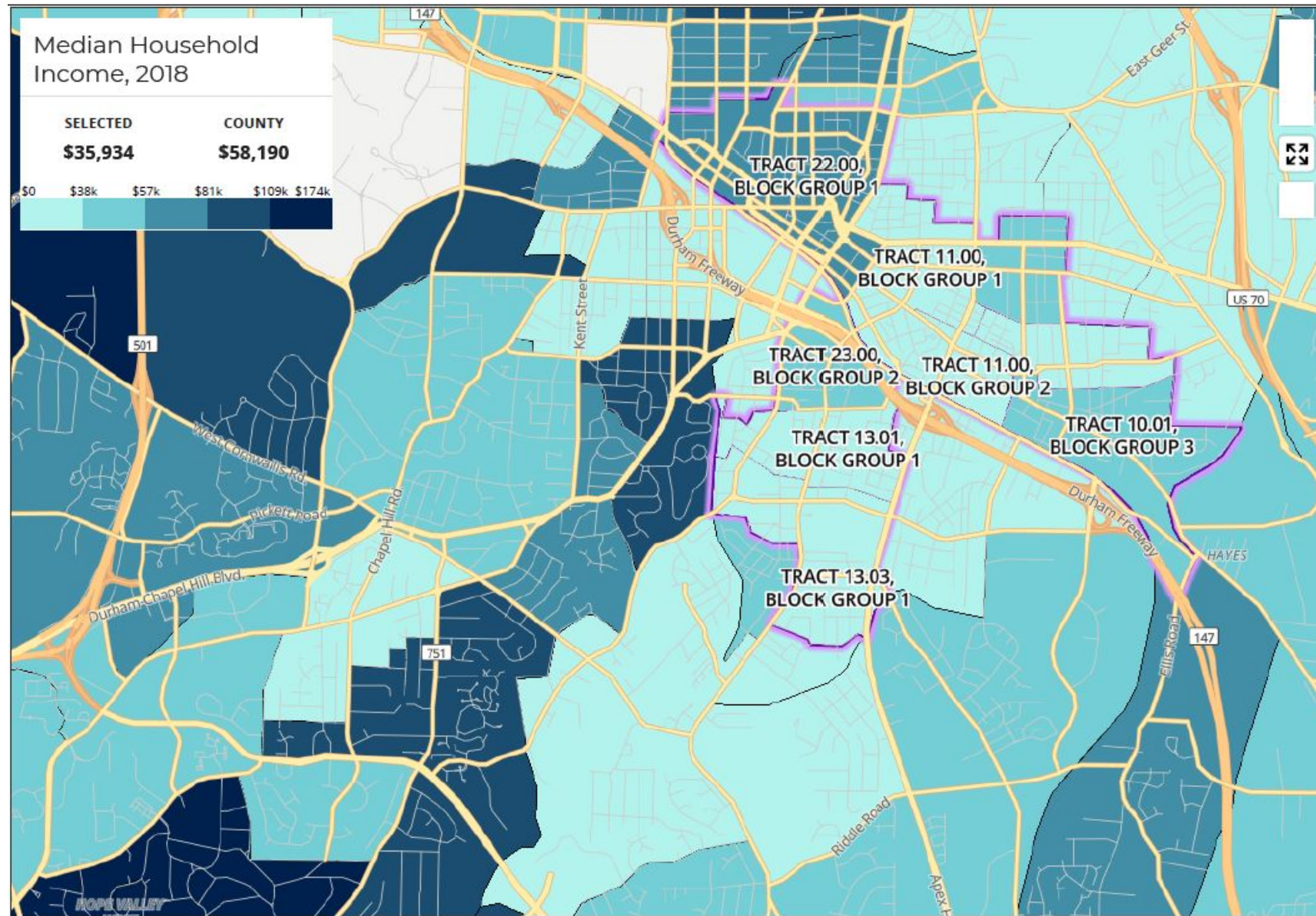
Source: Durham Neighborhood Compass - <https://compass.durhamnc.gov/en>



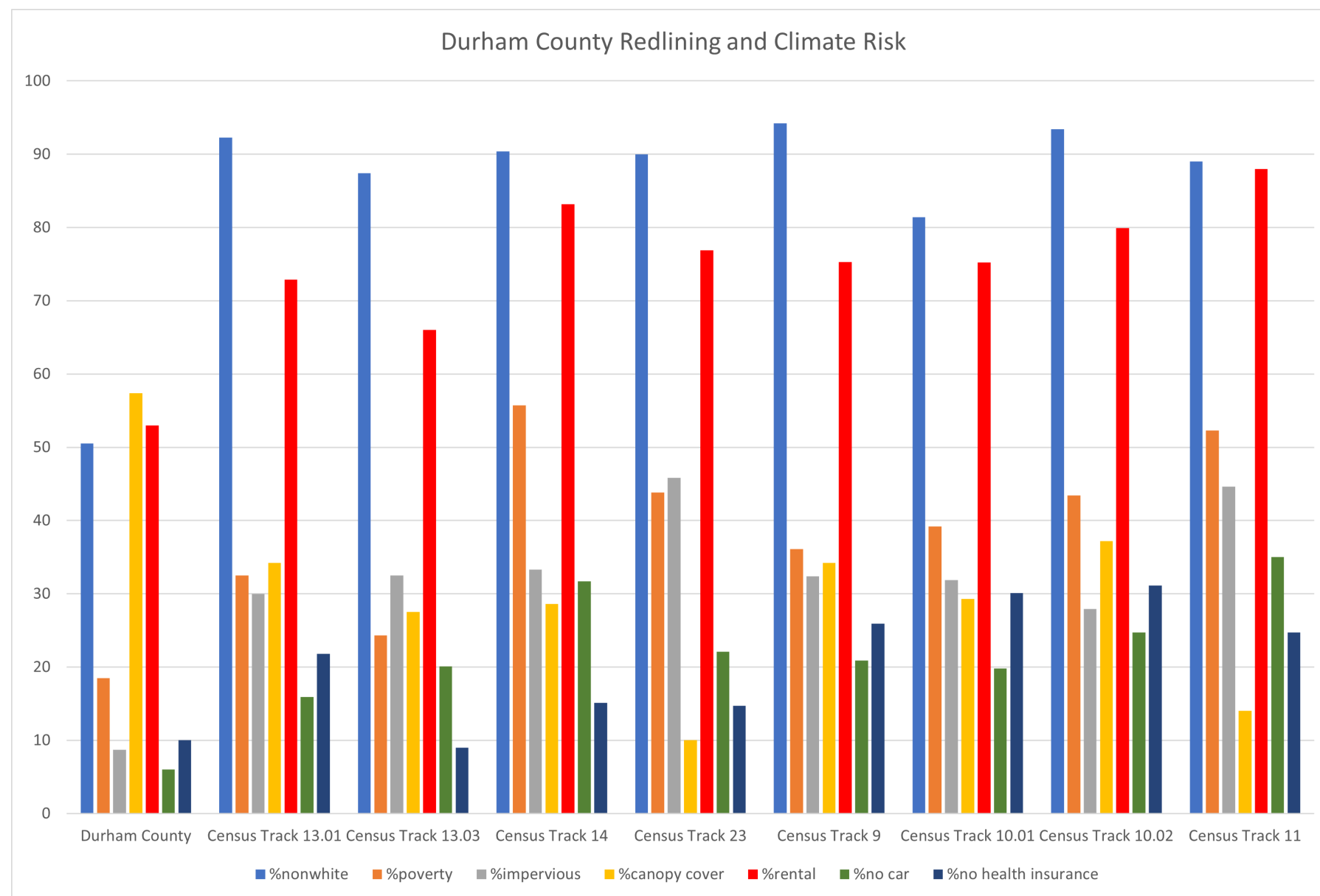
Source: Headwaters Economics Neighborhoods At Risk Tool: <https://headwaterseconomics.org/apps/neighborhoods-at-risk/>



Source: Headwaters Economics Neighborhoods At Risk Tool: <https://headwaterseconomics.org/apps/neighborhoods-at-risk/>



Source: Headwaters Economics Neighborhoods At Risk Tool: <https://headwaterseconomics.org/apps/neighborhoods-at-risk/>



Data Source: Durham Neighborhood Compass - <https://compass.durhamnc.gov/en>

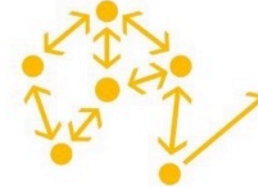
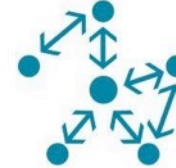
Community
Participation
Model

convey/consume

contribute

collaborate

co-create

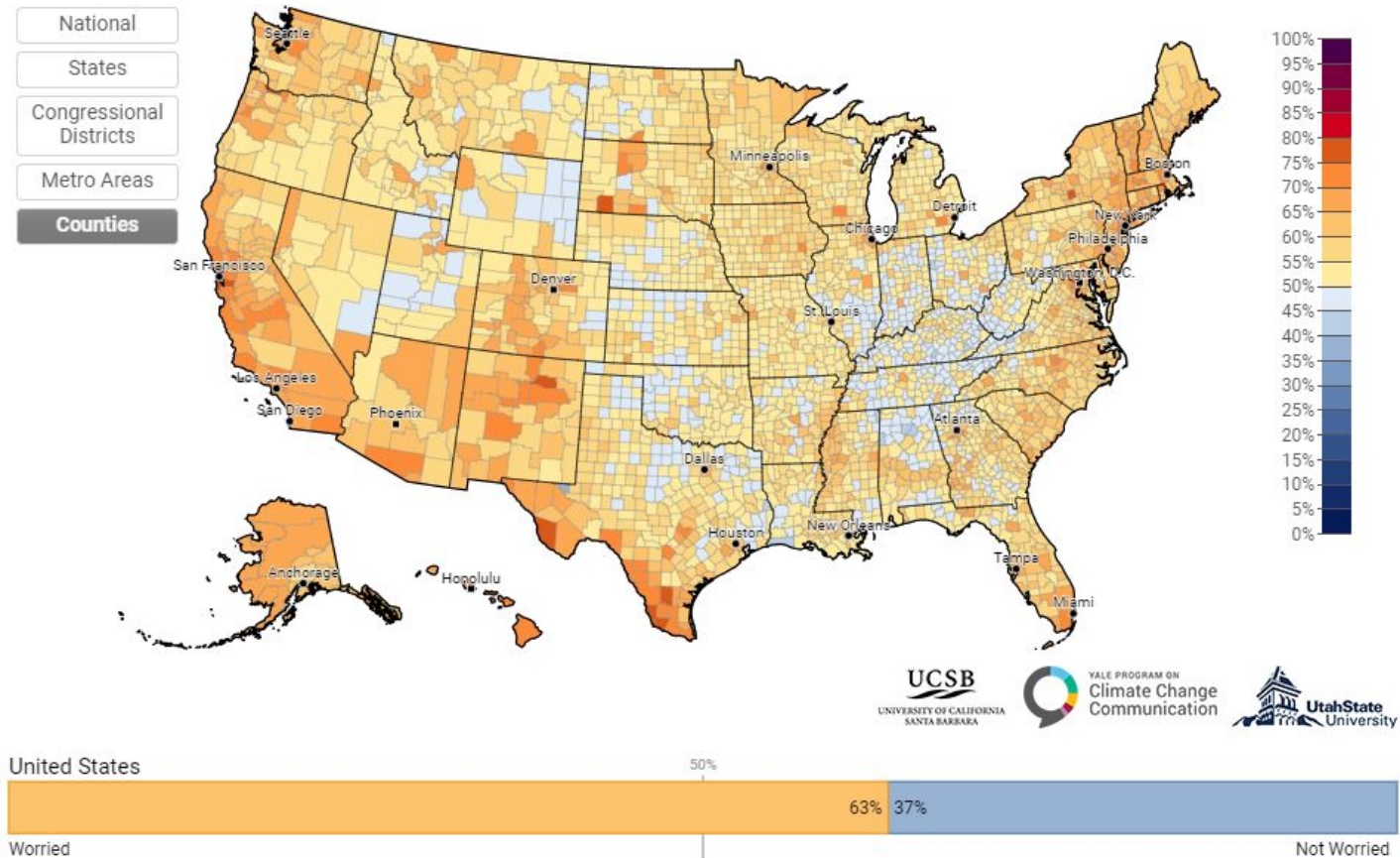


champion

INTERACTIONS	one-to-many	crowdsourced	cooperative	community-led
COMMUNITY MANAGEMENT GOAL	inform and inspire	obtain feedback, skills, or information	gather resources, including knowledge, to achieve a common goal	create something new together
COMMUNITY ACTIVITIES	read watch listen	comment vote / like tag	discussion knowledge exchange production	integration and synthesis multi-directional learning co-production
POWER BALANCE	organization as expert	organization as convenor	scaffolded cooperation	mutual sharing and learning; (near) equity
SLOGAN	here's something interesting	give us some feedback	how can we work together?	what shall we do next...?

Estimated % of adults who are worried about global warming (63%), 2020

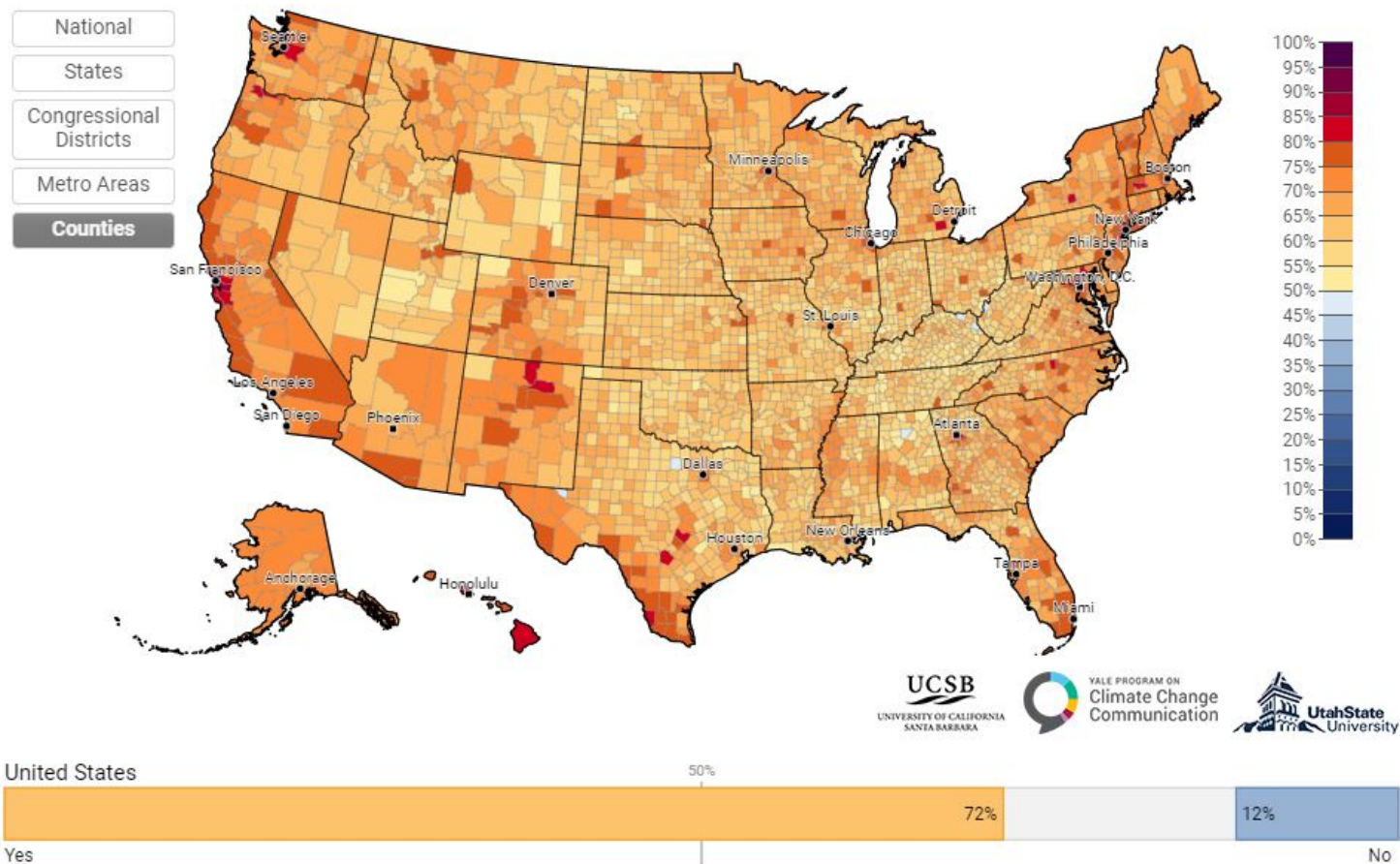
Select Question:
Click on map to select geography, or:



Estimated % of adults who think global warming is happening (72%), 2020

Select Question:

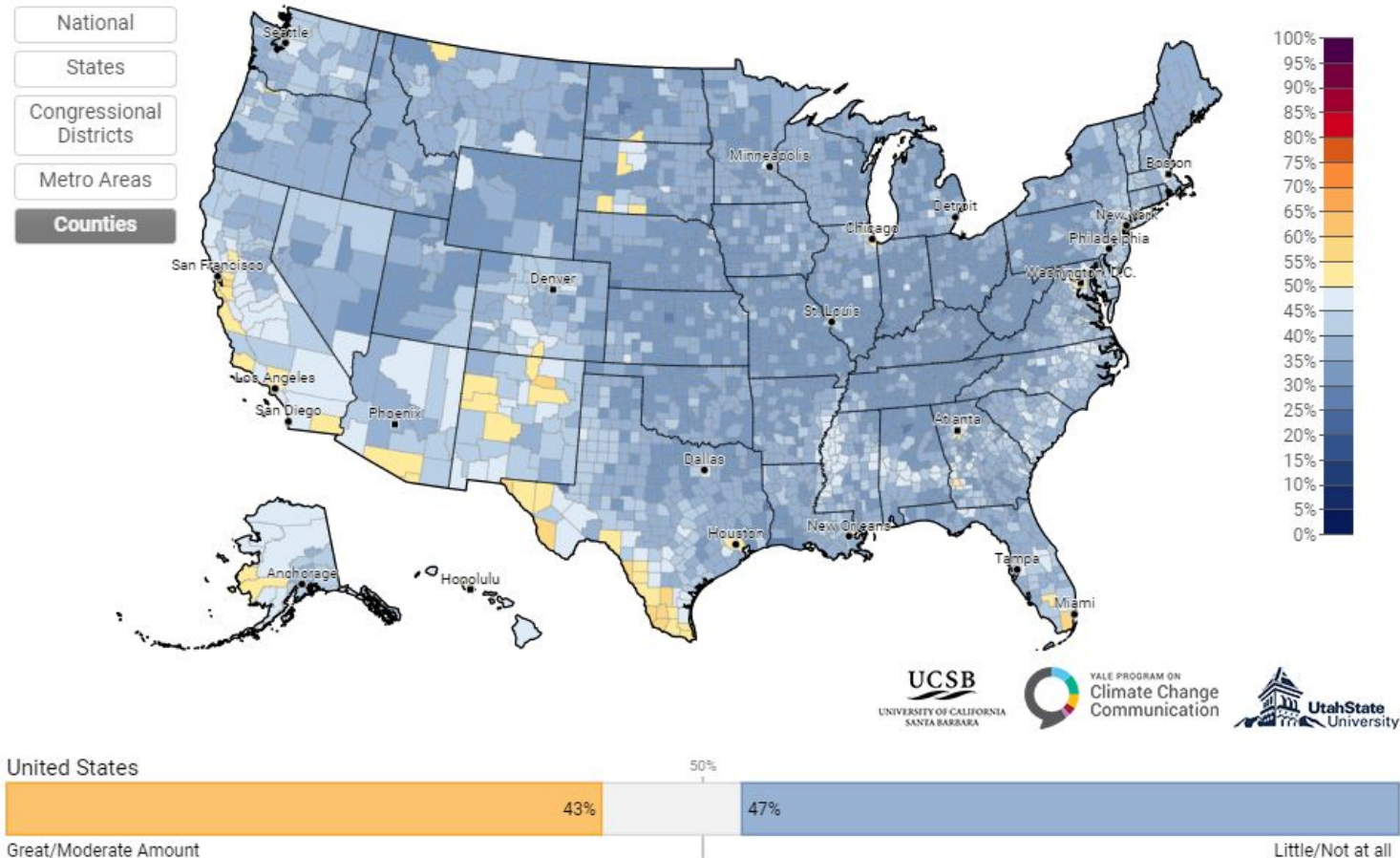
Click on map to select geography, or:



Estimated % of adults who think global warming will harm them personally (43%), 2020

Select Question: Absolute Value

Click on map to select geography, or:

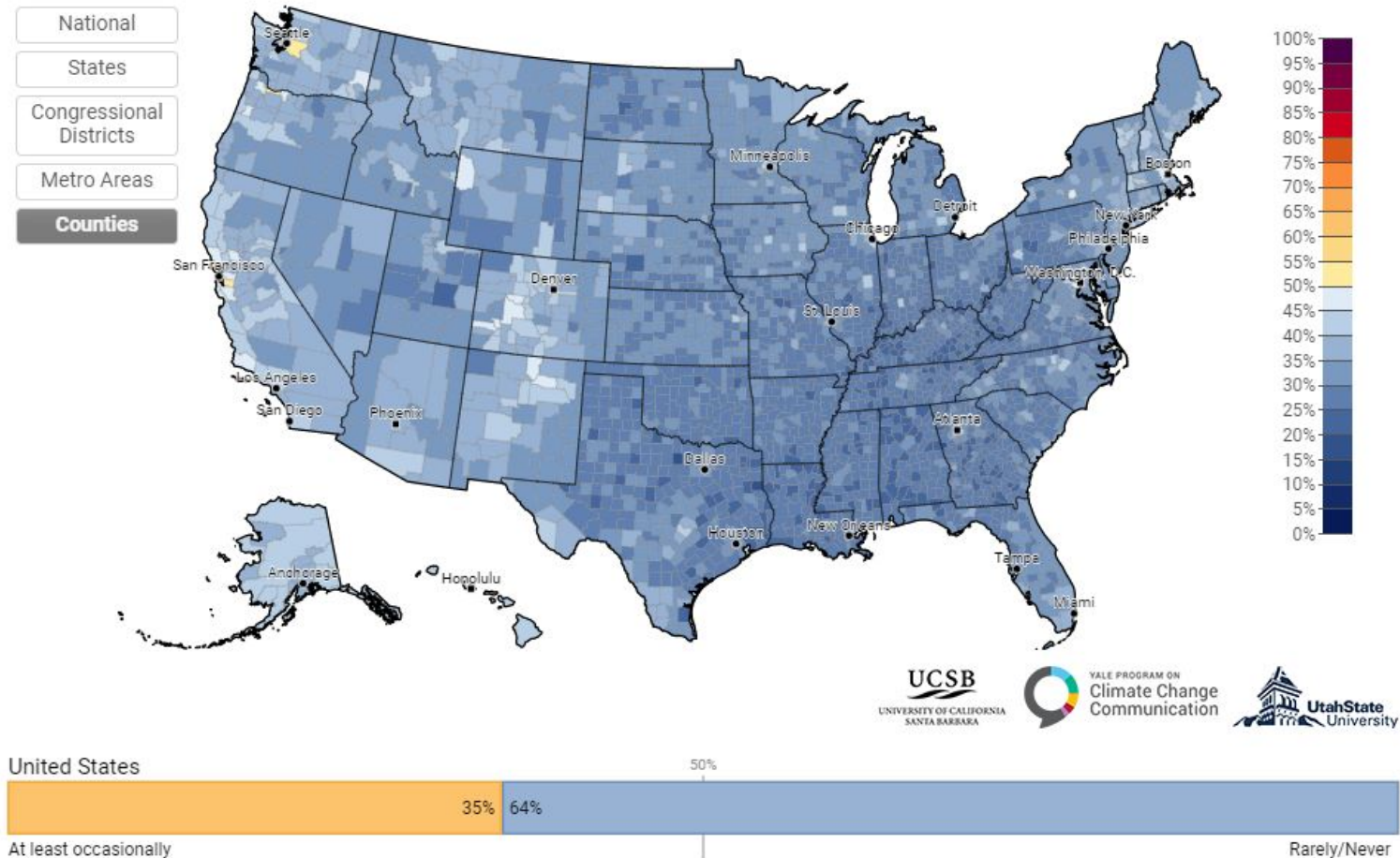


Source: Yale Program on Climate Change Communication - <https://climatecommunication.yale.edu/>

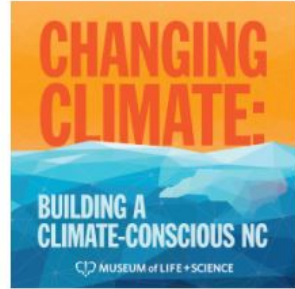
Estimated % of adults who discuss global warming at least occasionally (35%), 2020

Select Question:

Click on map to select geography, or:



Source: Yale Program on Climate Change Communication - <https://climatecommunication.yale.edu/>



Climate-Conscious NC

<https://tinyurl.com/climateconscious>

Join us for a series of free programs on how to become a Climate-Conscious member of the North Carolina community! People living in rural and urban areas in North Carolina will both experience hazards related to climate change. How people experience the risks and threats from these hazards, however, will vary based off of where they live, which in turn will help shape their values, perspectives, and priorities with regards to climate resilience and adaptation strategies.

How might a person living in a rural area experience extreme heat, sea level rise, drought, or extreme precipitation events differently than someone living in an urban area? How might these differing experiences impact their opinions on advocacy, policy, and adaptation?

Climate-Conscious NC will explore the science and the lived experiences of the people living in rural and urban areas in our State, and hopes to turn a lens towards participatory data collection, knowledge co-creation, and finding common ground on resilience strategies and solutions that works for people living in different situations.

We hope that you will consider joining us for the length of this project: we will start with four mini-seminars, followed by a public forum, and finally a workshop on how to begin collecting weather and climate data in your own backyards! *Participants who attend all events will receive a Certificate of Completion and an official CoCoRaHS Rain gauge.*

To sign up for all of our events, click [here](#) !

To join our Community Science efforts, click [here](#) !

Join us for all of our free programming:

Live Events **Past Events 6**

Live Events **Past Events 6**



Thu, Sep 24, 6:30 PM

Collecting Data, Advocating Change, Building Resilience in NC



Thu, Sep 10, 6:30 PM

Changing Climate: A Public Forum on Extreme Precipitation



Thu, Sep 3, 6:30 PM

Exploring Urban and Rural Perspectives on Extreme Precipitation



Thu, Aug 27, 6:30 PM

Exploring Rural and Urban Perspectives on Drought



Thu, Aug 20, 6:30 PM

Exploring Rural and Urban Perspectives on Extreme Heat



Thu, Aug 13, 6:30 PM

Exploring Urban and Rural Perspectives on Sea Level Rise



Follow

CHANGING CLIMATE: BUILDING A CLIMATE-CONSCIOUS NC

Climate-Conscious NC: Sign-Up!

Join us for a series of free programs - starting with four mini-seminars, followed by a public forum, followed by a workshop on collecting weather and climate data where you live to become a Climate-Conscious community member in NC!

People living in rural and urban areas in North Carolina will both experience hazards related to climate change. How people experience the risks and threats from these hazards, however, will vary based off of where they live, which in turn will help shape their values, perspectives, and priorities with regards to climate resilience and adaptation strategies.

Climate-Conscious NC will explore the science and the lived experiences of the people living in rural and urban areas in our State, and hopes to turn a lens towards participatory data collection, knowledge co-creation, and finding common ground on resilience strategies and solutions that works for people living in different situations.

We hope that you will consider joining us for the length of this project. Participants who attend all events will receive a Certificate of Completion and an official CoCoRaHS Rain gauge.

Join us for all of our free programming by signing up below (note: best suited for ages 14 + older):

Email Address:

Short answer text

NOAA » noaa-lifeandscience



The Museum of Life and Science is participating in **Citizen Science, Civics, and Resilient Communities** project with support from NOAA.

In 2020, we're running **Climate-Conscious Durham** – an attempt to promote dialogue, build resilience, and empower understanding and engagement on climate-related issues in North Carolina.

To join our free programming for Climate-Conscious NC, sign-up [here](#), and check out our calendar of events [here](#).



Find a project

Choose a project from this page or search through thousands more options with our Project Finder.

Find a Project

[Advanced search](#)

Choose any of the projects below to get started!



**EXTREME
PRECIPITATION:
COCORAHS**



**EXTREME HEAT:
ISEECHANGE**

Document change in weather and



DROUGHT: INATURALIST

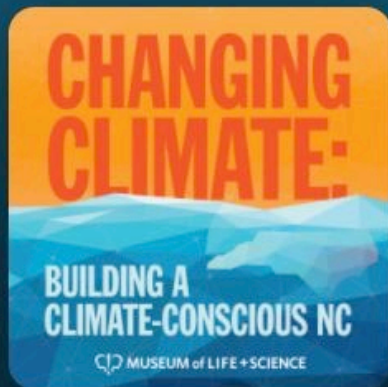
Document and identify plants and animals around you.



- Home
- Search
- Your Library

PLAYLISTS

- Create Playlist
- Liked Songs



PODCAST

Climate-Conscious NC

climateconsciousnc



FOLLOW



All Episodes

About



Exploring Urban and Rural Perspectives on Extreme Precipitation

How might a person living in an urban area experience extreme precipitation differently than a person living in a rural area? How might these experiences shape their values, perspectives, and priorities regarding climate, mitigation, and resilience policies and...



Sep 4 · 31 min



Exploring Rural and Urban Perspectives on Drought

How might a person living in a rural area of NC experience drought differently than a person living in an urban area? How might their shared, or differing experiences affect their values, perspectives, and priorities regarding climate, resilience, and adaptation policy...



Aug 31 · 33 min

People living in rural areas experience hazards related to climate change differently than people living in urban areas. This podcast explores how these experiences vary based off of where you live.

CHANGING CLIMATE: BUILDING A CLIMATE-CONSCIOUS NC

CERTIFICATE OF COMPLETION

This certificate acknowledges that

is an actively Climate-Conscious member of the North Carolina community, and bestows our appreciation and thanks for participating across different levels of engagement with our climate, resilience, and adaptation program. May you continue to create and spread knowledge about climate change in your community with our sincere thanks and appreciation.



Max Cawley
Program Manager for
Learning Philosophy & Evaluation



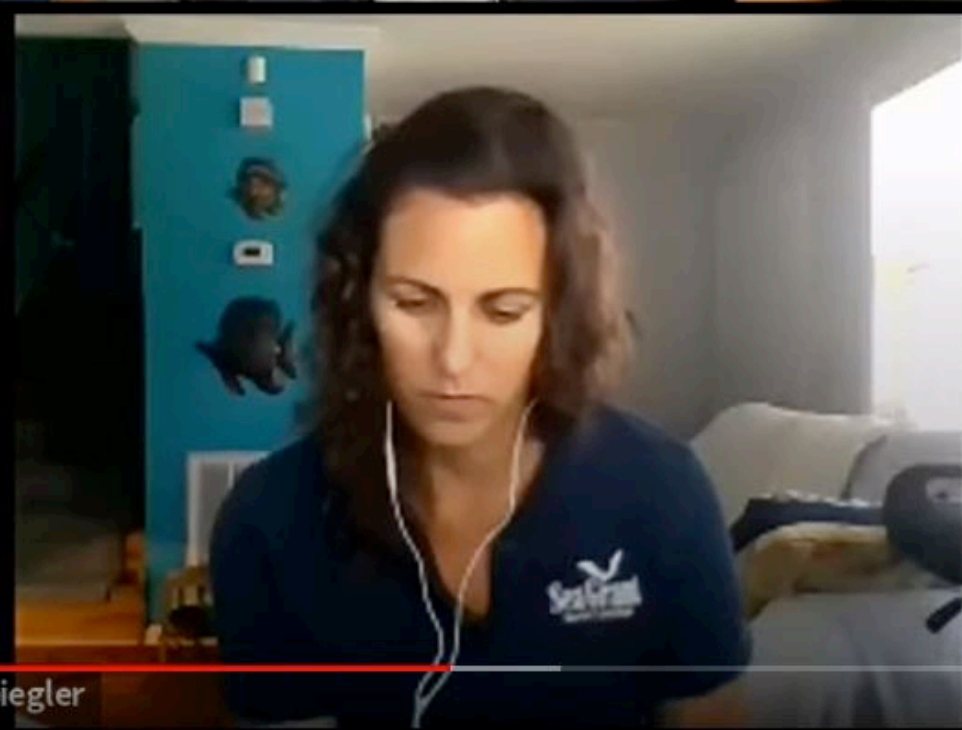
Kathie Dello
State Climatologist, North Carolina



Max Cawley (he/him/his)



Melody Hunter-Pillion



8 Sarah Spiegler



Holly White



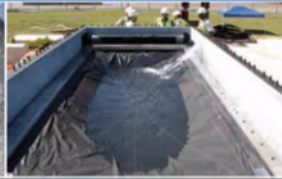
zoom







KEEP IT OUT



Plan A

The city's aging combined sewer system is currently releasing nearly 3 billion gallons of untreated wastewater into nearby water ways due to combined sewer overflows during heavy rainfalls. To reduce this amount of overflow by 95%, the city will replace half of the combined sewer system pipes and update the wastewater treatment plant - investing \$5 billion in construction costs over the next 25 years. The city will also prepare for future flooding events by designing and installing emergency covers for public transportation station entrances. This billion-dollar project will allow for quick and complete coverage of each vulnerable station entrance, allowing the stations to remain dry and functional for use immediately after a storm.

Plan B

The city cannot currently afford to invest in high budget, long term projects, but needs to decrease the amount of stormwater from flooding the streets and running into the local river. The city has invested \$4.5 million in building a water plaza for the city. A water plaza can serve as a space to play sports, eat lunch, and relax when it's dry, but will catch stormwater and act as a water basin during an extreme rain event. These plazas can be a cost-effective way to beautify the city and take some stress off of the sewer system. To protect their public transportation tunnels, the city is planning a \$30 million project to raise the tunnel vents located in floodplains above ground level to prevent inundation, and seal off the vents that are not necessary.





Max Cawley (he/him/his)



Keshi Satterwhite

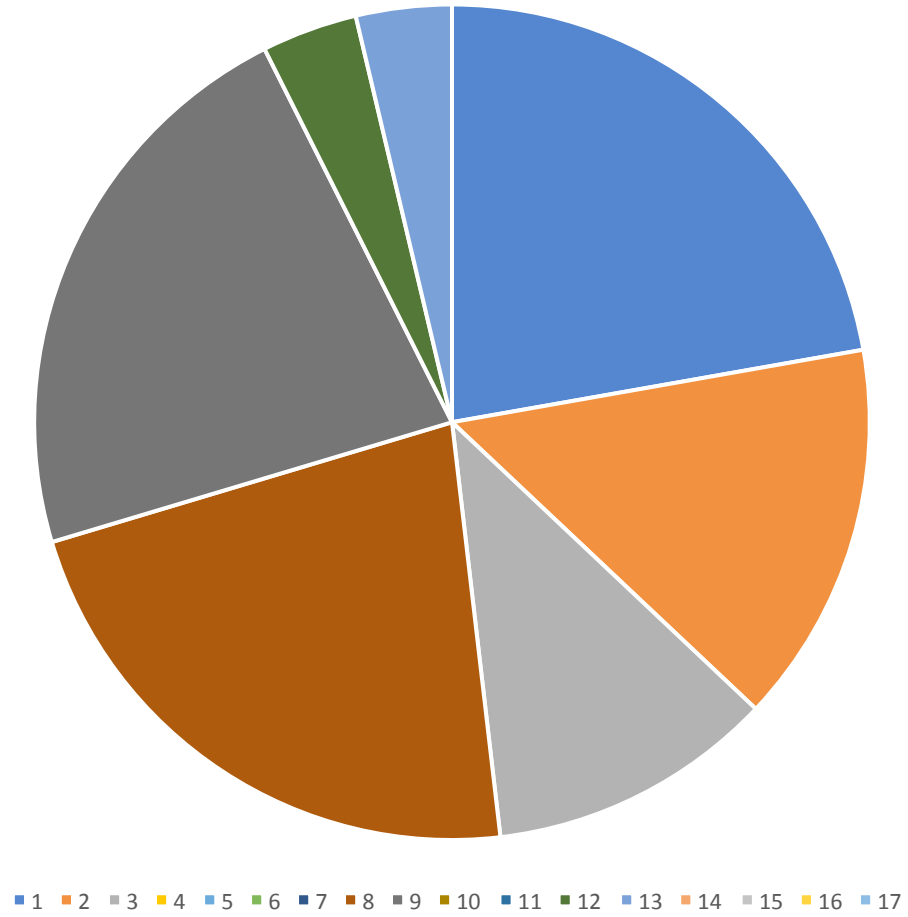


51 Noah Newman

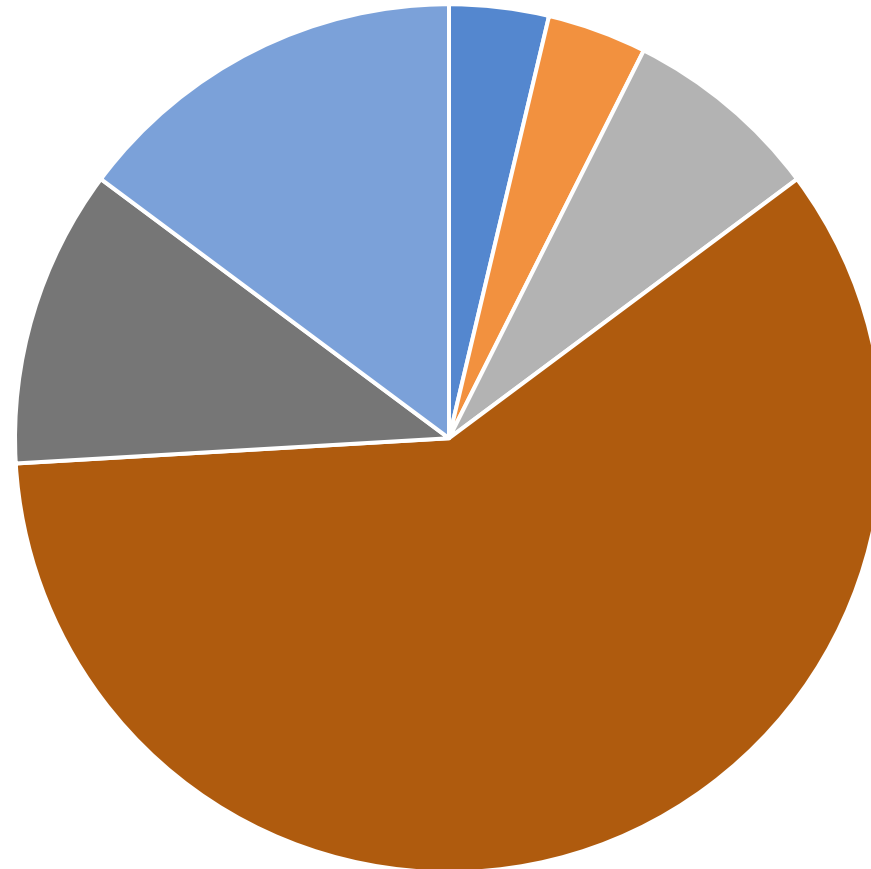


Tobin Freid

Individual Resilience Plans - NC

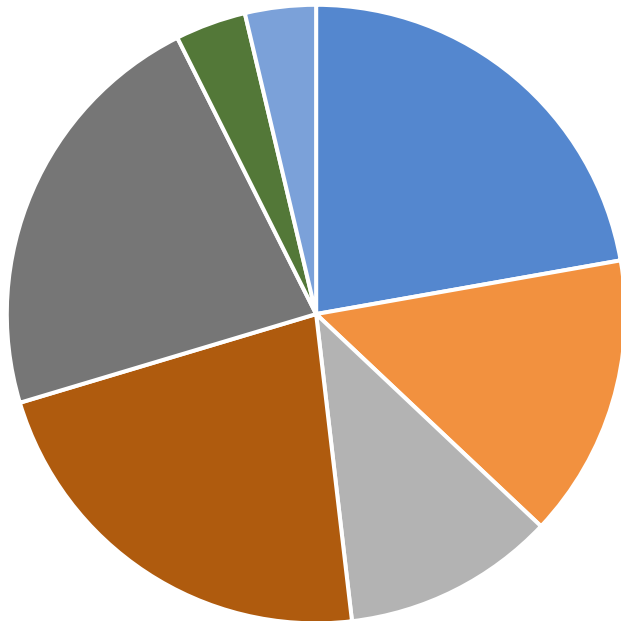


Group Resilience Plans - NC



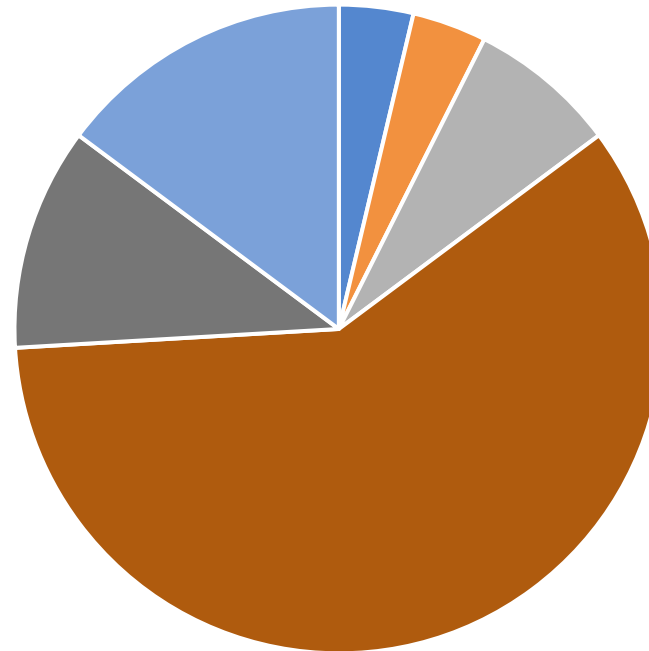
■ 1 ■ 2 ■ 3 ■ 4 ■ 5 ■ 6 ■ 7 ■ 8 ■ 9 ■ 10 ■ 11 ■ 12 ■ 13 ■ 14 ■ 15 ■ 16 ■ 17

Individual Resilience Plans - NC



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

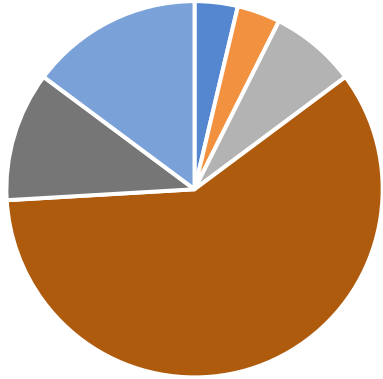
Group Resilience Plans - NC



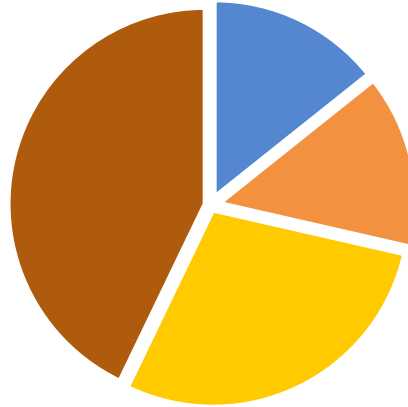
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

what about the rest of the country?

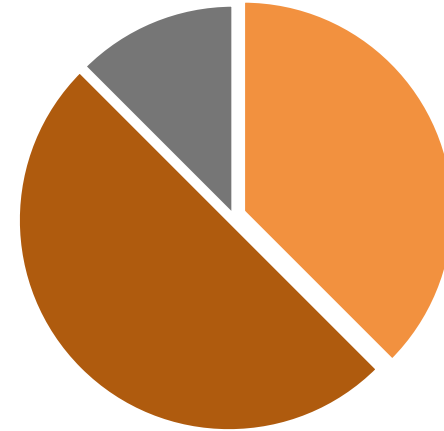
North Carolina



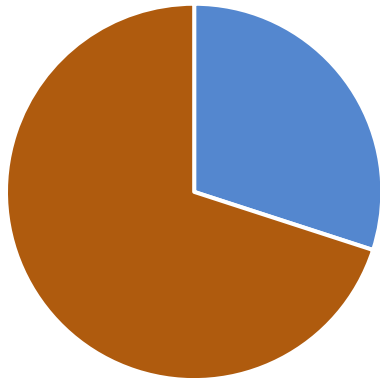
St Paul, MN



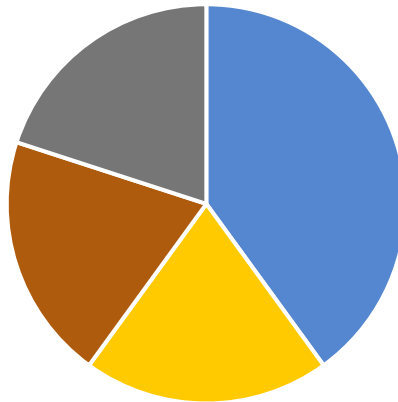
Portland, OR



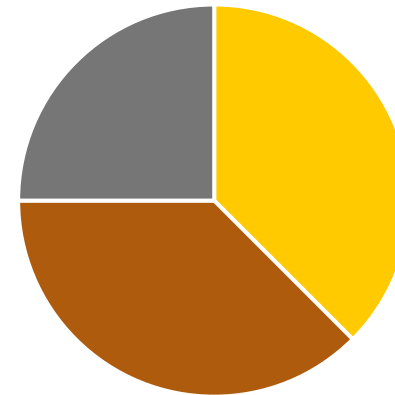
Boston, MA



Mobile, AL



Honolulu, HI



thanks!

Max Cawley

Max.cawley@lifeandscience.org



Caroline Nickerson
SciStarter

SciStarter connects citizen scientists to over 3,000 projects, events, and tools.

The screenshot shows the SciStarter website. At the top is a dark blue header with the SciStarter logo (text: "scistarter Science we can do together.") on the left, a search bar with a magnifying glass icon, and a "log out" link on the right. Below the search bar are navigation links: "My Account", "Project Finder", "CitSciDay", "Calendar", and "Blog". A green "Girl Scout?" button is also visible. The main content area features a large banner image of a person looking through a telescope against a starry night sky. Overlaid on the left side of the banner is a green box with the text "CITIZEN SCIENTISTS ARE" and a dark blue box with "DISCOVERING NEW WORLDS". On the right side of the banner is a "FIND A PROJECT" sidebar with a search bar labeled "Find a location" (placeholder: "enter a location"), a dropdown menu labeled "Select a topic" (placeholder: "select a topic..."), and a "find a project" button. Below the banner, there are two sections: "Featured Projects" and "Come and Participate". The "Featured Projects" section displays a project titled "Stream Selfie" with a star rating of 3 stars, a goal to "Map streams across the country and start testing the waters.", a task to "Simply snap a pic of your local stream and share it!", and a location of "Stream Selfie, United States of America". It includes a small photo of a person in a red jacket and a "credit:" label. The "Come and Participate" section features a video player with the title "Get Started in Citizen Science with ..." and a play button, with the text "It's birds & butterflies" below it. At the bottom of the "Featured Projects" section are five colored dots (green, yellow, orange, red, green) and a "search all projects" link.

“SciStarter is the Amazon.com of Citizen Science,” Carl Zimmer, Discover Magazine

Citizen Science

A **collaboration** between scientists and those of us who are curious, concerned, and **motivated to make a difference.**

Your MicroSite on SciStarter.

Showcase your entire program: events, featured projects, blog posts about outcomes.

[NOAA](#) » Museum of Science



The Museum of Science, Boston, is coordinating the **Citizen Science, Civics, and Resilient Communities** project with support from NOAA.

In 2019, we [studied the impacts](#) of **extreme heat** and the urban heat island effect through community-based participatory science, otherwise known as citizen science.

In 2020, we are focused on **sea level rise** and we need your help! Click on an image, below, to learn more.



Museum of Science®

Organize and Promote Related Events

Wicked High Tides: Webinar & Forum Recordings



WEBINAR RECORDING: SEA-LEVEL RISE & CITIZEN SCIENCE WITH THE MUSEUM OF SCIENCE, BOSTON

Watch this recording to learn how you can study sea-level rise with citizen science and how you can contribute to an upcoming forum.



FORUM RECORDING: WICKED HIGH TIDES

This forum consisted of two presentations and interactive discussion groups.

Curate Specific Citizen Science Projects



MYCOAST

Investigate sea level rise by chronicling our changing coast.



ISEECHANGE





Investigate how weather and climate change impact your life and community by sharing photos and stories.


On Demand Analytics



Museum of Science

(Download identified user data)

 6,328 Landing Page Views <small>all-time</small>	 1,337 View Project Clicks <small>all-time</small>	 567 Clicks to Participate <small>all-time</small>	 33,905 Contributions <small>all-time</small>
--	--	---	--

Your Projects	 Your Visitors	Your Traffic
---------------	---	--------------



Wicked High Tides Forum

Additional Outreach: Blogs, Social Media, Newsletters, Emails



LOGOUT

THE SCIENCES | MIND | TECHNOLOGY | HEALTH | ENVIRONMENT | PLANET EARTH

THE SCIENCES

Boston Could Become WICKED Hot. This is What They're Doing About it.

Over the past year, the people of Boston have banded together to address extreme temperat



Easily find and sign up for forums/events and projects

Welcome! Click on a Science Center to get started.



**BOSTON,
MASSACHUSETTS**

Museum of Science, Boston



**DURHAM, NORTH
CAROLINA**

Museum of Life and Science




RICHMOND, VIRGINIA

Science Museum of Virginia

For Participants

Join the SciStarter Community



GET STARTED!
Create your SciStarter account

Username

What should we call you?

* Email

Email address

Zip Code

For finding projects in your area

* Password

Password

* Repeat password

Repeat password

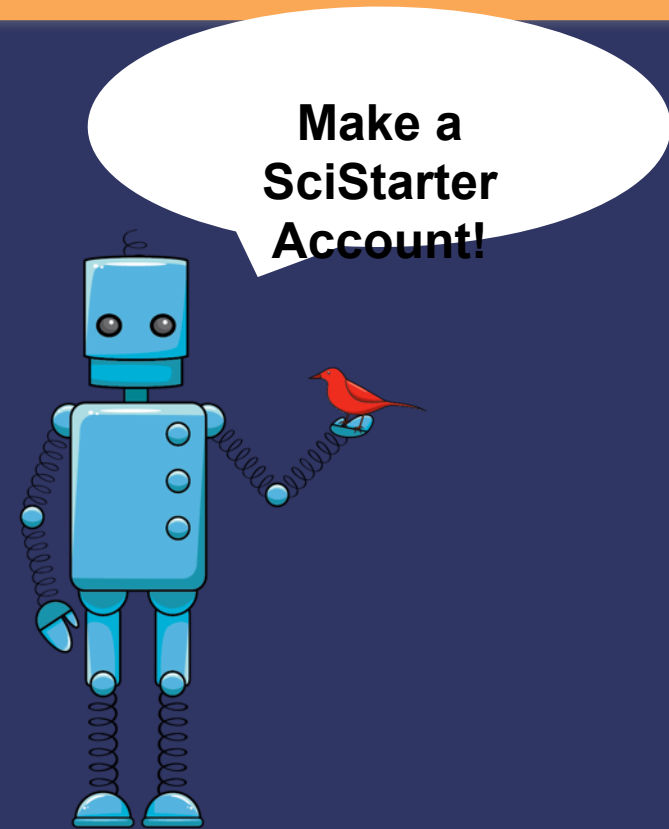
☒ Sign up for our newsletter

☒ Agree to our [Terms of Use](#)

A SciStarter account is not required, but it saves you time when submitting data, tracks your contributions, and connects you with relevant projects and the wider citizen science community.

Sign up

Log in



scistarter


People-powered science.

For Participants

Learn about Citizen Science via a self-guided, online tutorial from instructional designers at Arizona State University.



Engage in curated projects with step-by-step instructions and videos (from SciStarter) and customized messages from your museum/science



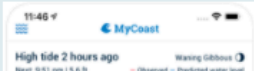
0:00 / 1:24

MYCOAST

Investigate sea level rise by chronicling our changing coast.

Use MyCoast to document tides, storm damage, beach cleanups, and more. Coastal decision makers, emergency managers, and others use your reports to make better decisions. To use this app, you will need to be near coastal waters.

In Boston and want to get involved with the Wicked High Tides project? Participate in MyCoast by following the instructions listed below and register for the Wicked High Tides forum [here](#).



11:46 AM MyCoast

High tide 2 hours ago
Next: 9:51 pm (5.6 ft)

Warning: Gibbous ☾

Observed - Predicted water level


Add to my lists

MATERIALS NEEDED

MyCoast App or Website

Internet Access

Smartphone, computer or tablet



STEP 1

Create a SciStarter account or sign in. After you've read through the instructions below, you'll be directed to a link to download the MyCoast app or use the MyCoast website via the "Participate" buttons. Create your MyCoast account using the same email you used to sign up for SciStarter. Your contributions to

Connect with community members, receive program updates, participate in evaluations.



Wicked Hot Boston

In 2019, the Museum of Science, Boston (MOS) team and local citizen scientists addressed the extreme heat climate hazard.

Learn more:

[Wicked Hot Boston blog series](#)

[Part One](#) | [Part Two](#) | [Part Three](#)

[Museum of Science, Boston project website](#)

Other SciStarter Microsites (see “Partner Gateways”) include...



All of Us
RESEARCH PROGRAM

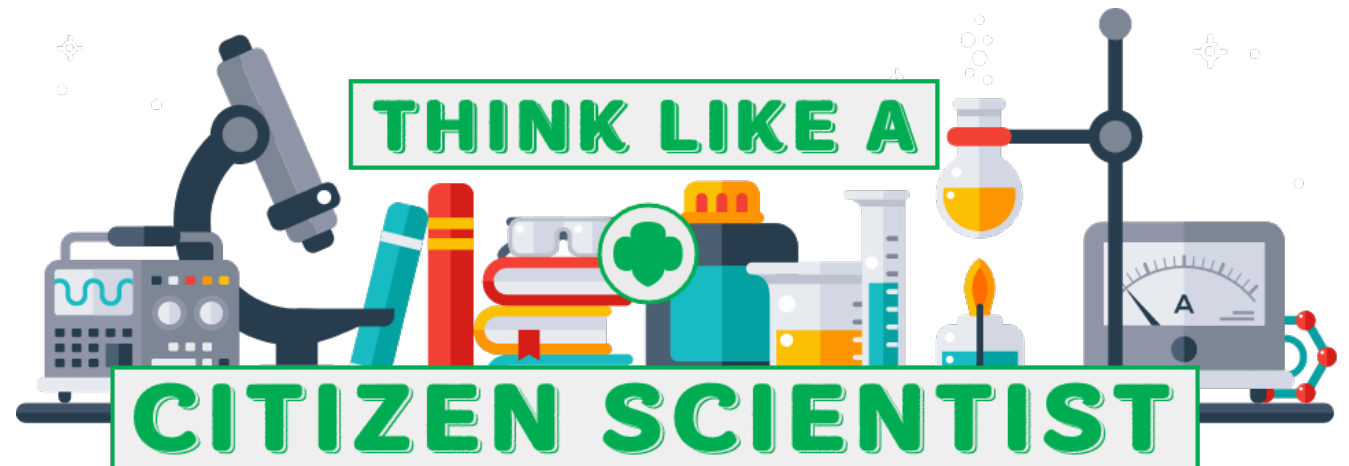
NC STATE UNIVERSITY

Citizen Science Campus



**Osher Lifelong
Learning Institute**

**Arizona State
University**



Free to all: make a list! bit.ly/SciStarterLists

List View

Stats View



(Download data)

Participant	Project / Event	Viewed this list	Contributions Since Viewing	Clicked to join	Contributions Since Joining
Amy	Green Watch: Sport, Recreation, and Active Transit	7/15/2020, 6:52:56 PM	(not an affiliate)	7/16/2020, 3:42:38 PM	(not an affiliate)
ted	Flu Near You *	7/15/2020, 5:22:16 PM	2	4/28/2020, 4:08:35 PM	2
ted	Globe at Night *	7/15/2020, 5:22:16 PM	0	2/24/2020, 9:06:04 PM	2

Example: SciStarter.org/list/183

Welcome to Lists, a new feature from SciStarter to help people find, organize, share and support progress in select citizen science projects! You've been invited to participate in the projects featured on this page. If you're new to "citizen science," we recommend that you click through the self-guided, "Introduction to Citizen Science" tutorial on this page.

Your participation in these projects will be shared with the creator of this list, so they can support your progress.

St. Charles Public Library Volunteers

Thank you for your interest in becoming a Citizen Scientist. Please review some featured projects below. You can also use the "Project Finder" tool above to search for other projects in your area or interests. There is no limit to the number of projects you join. You can help scientists and researchers understand our world and make it a better place. Please watch some videos about Citizen Science <https://scistarter.org/citizen-science>

Students may participate to receive volunteer credit. If you have any questions please contact me. Kimi Majors (630)584-0076 ext.228 kmajors@scpld.org

View our Zoom events about Citizen Science and some featured projects.

Eterna & Debris Tracker - https://www.youtube.com/watch?v=JZkFc6r_qqo

Stall Catchers & I See Change - https://www.youtube.com/watch?v=19RWB_IBOqA

iNaturalist



iNaturalist

iNaturalist *

Goal Share observations of biodiversity.

Task Take photos of biodiversity and upload to iNaturalist

Where Global, anywhere on the planet

Note LIBRARY VOLUNTEER NOTES: All Ages (under 13 must work with an adult), Need smart phone or camera/computer/internet to upload pictures. Easy Level.



ISEECHANGE

ISeeChange *

Goal Our climate is changing—and so are we.

Task Share your experiences and collect data to help our [more»](#)

Where Global, anywhere on the planet

Note LIBRARY VOLUNTEER NOTES: All Ages (under 13 must work with an adult), Need smart phone or camera/computer/internet to upload pictures. Easy Level.

Thank you!

CarolineN@SciStarter.org

scistarter

Science we can do together.



Katie Baur

Museum of Science
Boston, MA

Budget & Expenses

- \$2,000 Stipend
 - Staff Time
 - Staff Benefits
 - Guest Speakers
 - Participant Subsistence

Not Allowed

- Indirect Costs
- Alcohol
- Participant Stipends
- Prizes or entertainment

	Amount (in dollars)	Brief description of expense
Salary		
Benefits		
Other		
STIPEND TOTAL	2,000	—



Owen Weitzman

Museum of Science

Boston, MA



Museum of Science®

CSCRC Project Evaluation

Evaluation team

Liz Kollmann
ekollmann@mos.org



Sune Paneto
spaneto@mos.org



Katie Todd
ktodd@mos.org



Owen Weitzman
oweitzman@mos.org



Evaluation requirements for stipend recipients



Meet with evaluators
prior to your project
activities to develop a
schedule and plan.



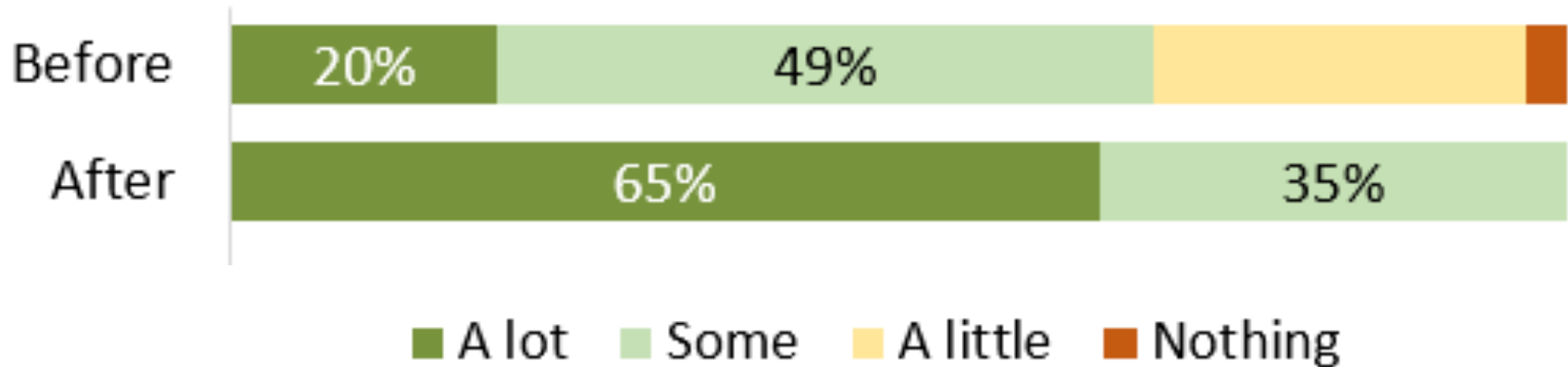
Gather participants' emails
and share them with the
evaluators (you may use
SciStarter to gather these
emails automatically).



Update the evaluators
if you make any changes
to your activities, schedule,
or approach for gathering
email addresses

The forums support strong learning outcomes.

How much did you know about how climate-related hazards could affect your local community BEFORE the forum, and how much do you know AFTER participating in the forum?
(n=356)*



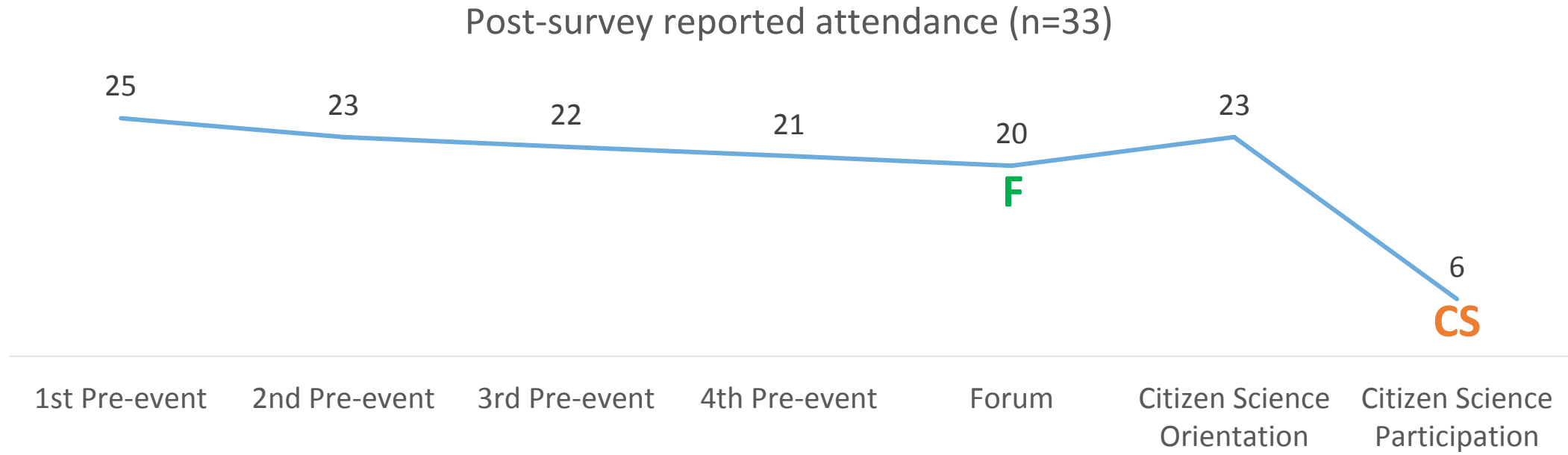
Participants value citizen science.

“Feeling **connected** with others in the state who are attentive to the importance of resiliency was the best feeling!”

“Enjoyed **learning** more about the scope of research projects, resources, and organizations involved. Gave me **confidence** in my ability to collect data and help.”

“This is an extremely **important** topic going forward. Scientists and elected officials have to figure out how to best communicate with and seek input from residents.”

It can be difficult to foster sustained engagement between the forum and citizen science.



Barriers for citizen science (n=15):

- Lack of time (n=7)
- Disinterest (n=4)
- Not feeling prepared (n=2)
- Insufficient equipment or space (n=2)

Questions?

Today's presenters:

- **David Sittenfeld**, Museum of Science, Boston, MA
- **Sara Benson**, Museum of Science, Boston, MA
- **Max Cawley**, Museum of Life and Science, Durham, NC
- **Caroline Nickerson**, SciStarter
- **Katie Baur**, Museum of Science, Boston, MA
- **Owen Weitzman**, Museum of Science, Boston, MA

Future Online Workshops

Sustainability in Science and Technology Museums

Part 1: Tuesday, January 12, 2021

Part 2: Tuesday, February 9, 2021

2pm-3pm Eastern / 11am-12pm Pacific

Preparing for NASA Perseverance's landing on Mars

Tuesday, January 26, 2021

2 - 3pm Eastern / 11am - 12pm Pacific

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