

NOAA's Eastern Region Climate Services Webinar Series
January 31, 2023
LuAnn Dahlman - NOAA Climate Program Office

The Federal Government is Building a Climate-Ready Nation

The Biden-Harris Administration is making climate action a priority

**EO 14008
Tackling the
Climate Crisis
at Home
and Abroad**

- increase resilience to the impacts of climate change
- ensure that federal infrastructure investments reduce climate pollution
- deliver environmental justice

The Federal Government is Building a Climate-Ready Nation

The country is making historic investments in infrastructure

Bipartisan Infrastructure Law

\$1.2 trillion

- Transportation
- Water
- Energy
- Broadband

Inflation Reduction Act

\$740 billion

- Energy tax credits
- Clean energy loan guarantees
- Advanced vehicle technology



CMRA

Introduction

Current Hazards

Assessment Tool

Hazard Information

Federal Policies

Open Data



A screening tool to help community leaders and grant officers recognize local exposure to current and future climate hazards

<https://resilience.climate.gov>



U.S. Climate
Resilience
Toolkit

toolkit.climate.gov

Steps to Resilience framework

1 Understand Exposure

2 Assess Vulnerability & Risk

3 Investigate Options

4 Prioritize & Plan

5 Take Action



Climate-related hazards in real-time

Climate-related hazards are affecting U.S. communities every day. View real-time statistics and maps documenting where people, property, and infrastructure may be exposed to hazards. Click any hazard below to display its associated map. Click areas of interest on any map for more information.

Screenshot from Jan 5, 2023

Wildfire

Active fires 56

Source: National Interagency Fire Center

Drought

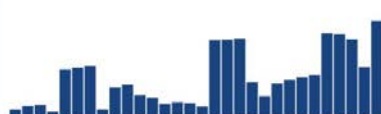
People experiencing drought 104,046,622

Source: NOAA/NIDIS Drought.gov

Inland Flooding

People under flood alerts 50,139,372

Last 30 days



Source: NOAA National Weather Service

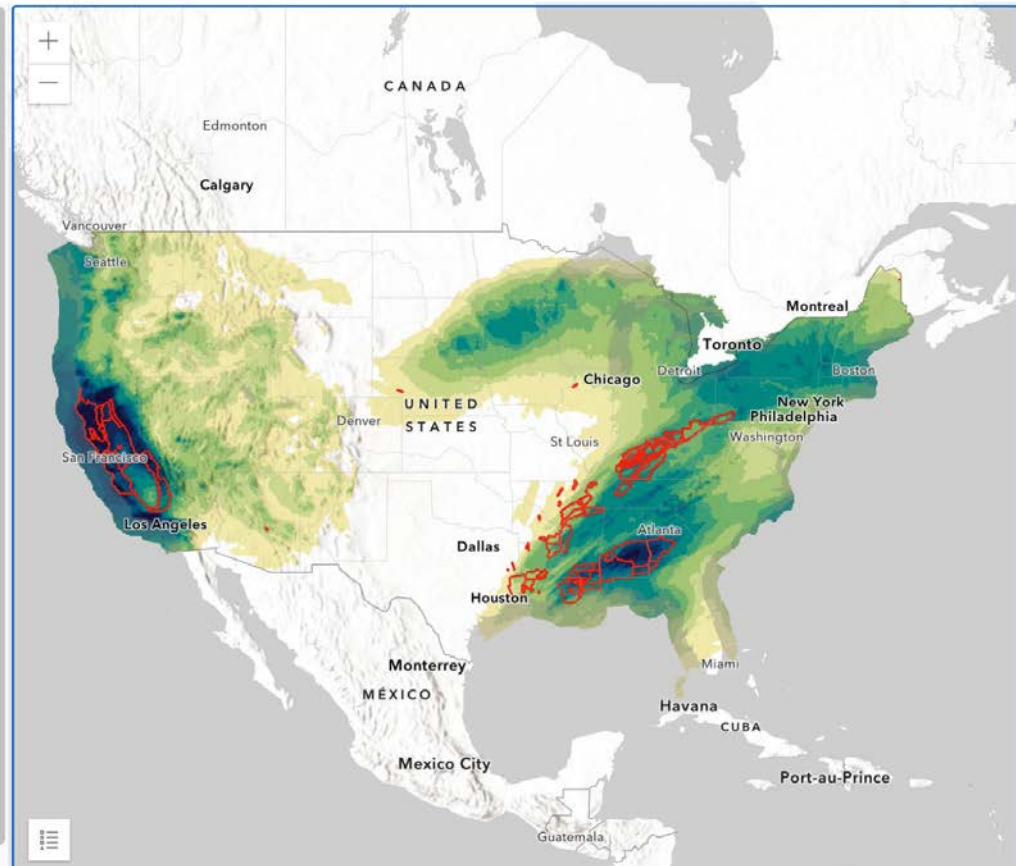
Coastal Flooding

People under flood alerts 0

Source: NOAA National Weather Service

Extreme Heat

People under heat alerts 0



Map showing climate-related hazards across the United States and parts of Canada and Mexico. The map uses a color scale from green (low hazard) to red (high hazard). Major cities labeled include Vancouver, Calgary, Edmonton, Seattle, San Francisco, Los Angeles, Denver, Chicago, St. Louis, Dallas, Houston, Monterrey, Mexico City, Guatemala, Miami, Havana, Port-au-Prince, New York, Philadelphia, Washington, Toronto, Detroit, Boston, Montreal, and Atlanta. The map also shows the borders of CANADA, UNITED STATES, and MÉXICO.

Source: Esri, Garmin, FAO, NOAA, USGS, EPA | Esri, USGS | Source: National Weather Service | NOAA, National Weather Service, Esri | Powered by Esri



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Flood Watch

Flood Watch is effective from 1/4/2023, 5:00 AM through 1/5/2023, 5:00 PM

Areas Affected: Carquinez Strait and Delta; Central Sacramento Valley; Motherlode; Northern San Joaquin Valley; Southern Sacramento Valley

Summary: ...FLOOD WATCH NOW IN EFFECT FROM EARLY WEDNESDAY THROUGH FRIDAY MORNING... * WHAT...Flooding caused by excessive

Zoom to 1 of 5

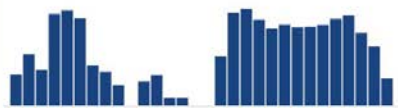
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Extreme Heat

People under heat alerts **18,659,370**

Last 30 days



Source: NOAA National Weather Service

Drought

People experiencing drought **114,119,787**

Source: NOAA/NIDIS Drought.gov

Wildfire

Active fires **392**

Source: National Interagency Fire Center

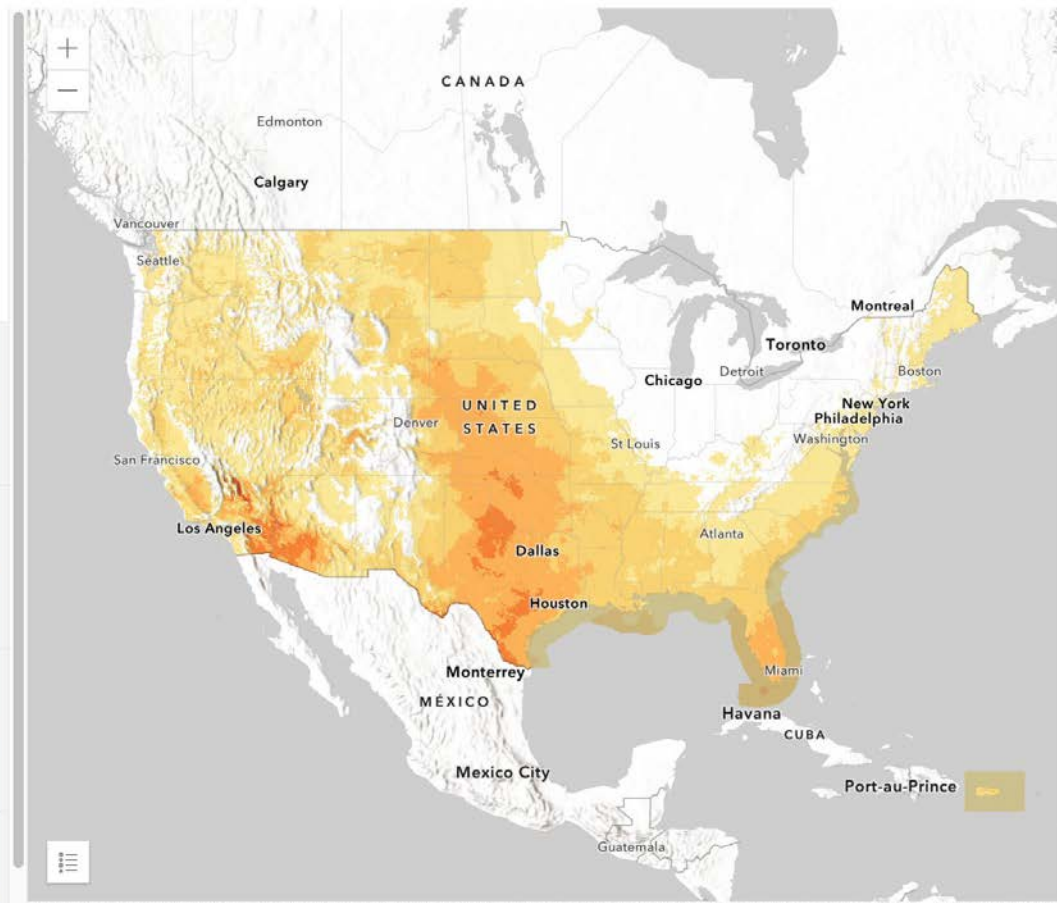
Inland Flooding

People under flood alerts **46,648,745**

Source: NOAA National Weather Service

Coastal Flooding

People under flood alerts **31,393,272**



Screenshot from
September 2022

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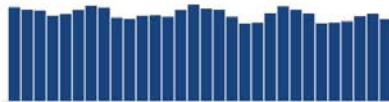
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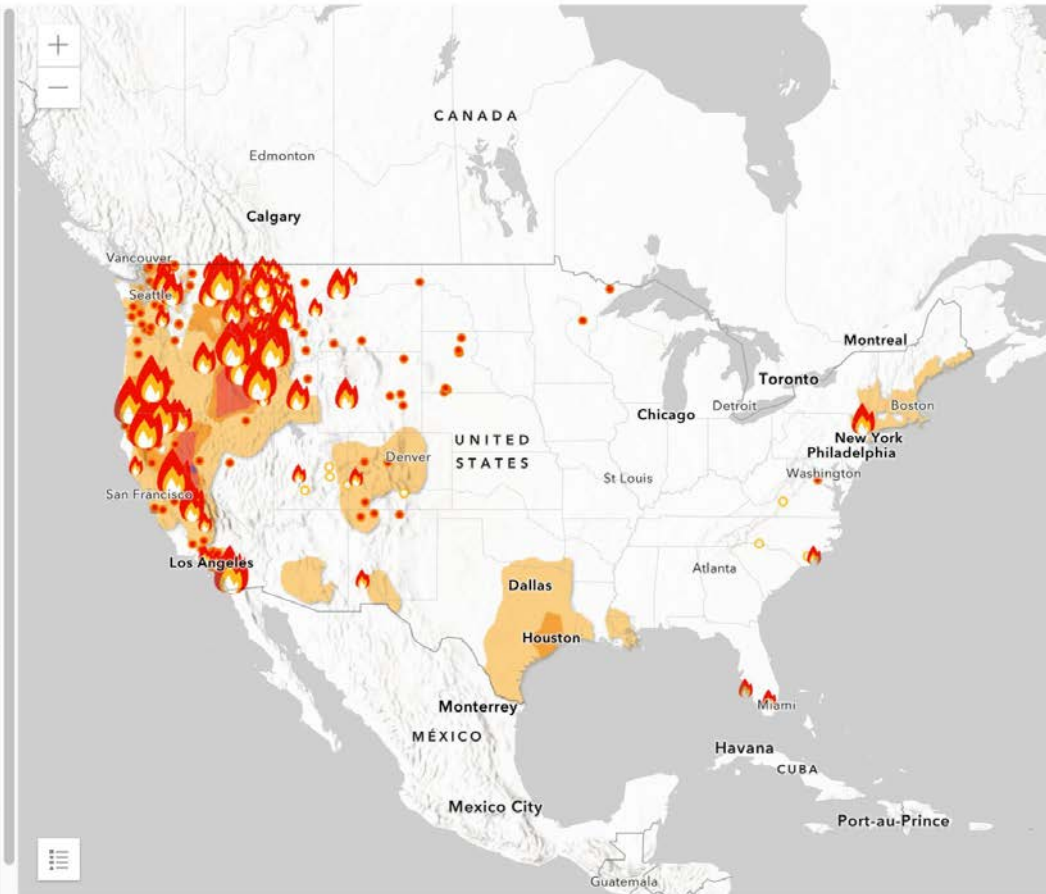
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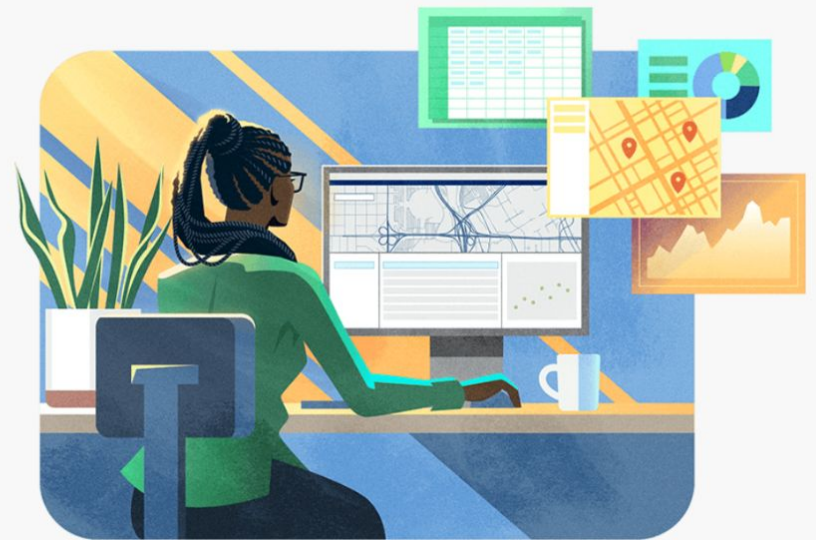


Screenshot from September 2022

Does your community face any of these hazards, now or in the future?

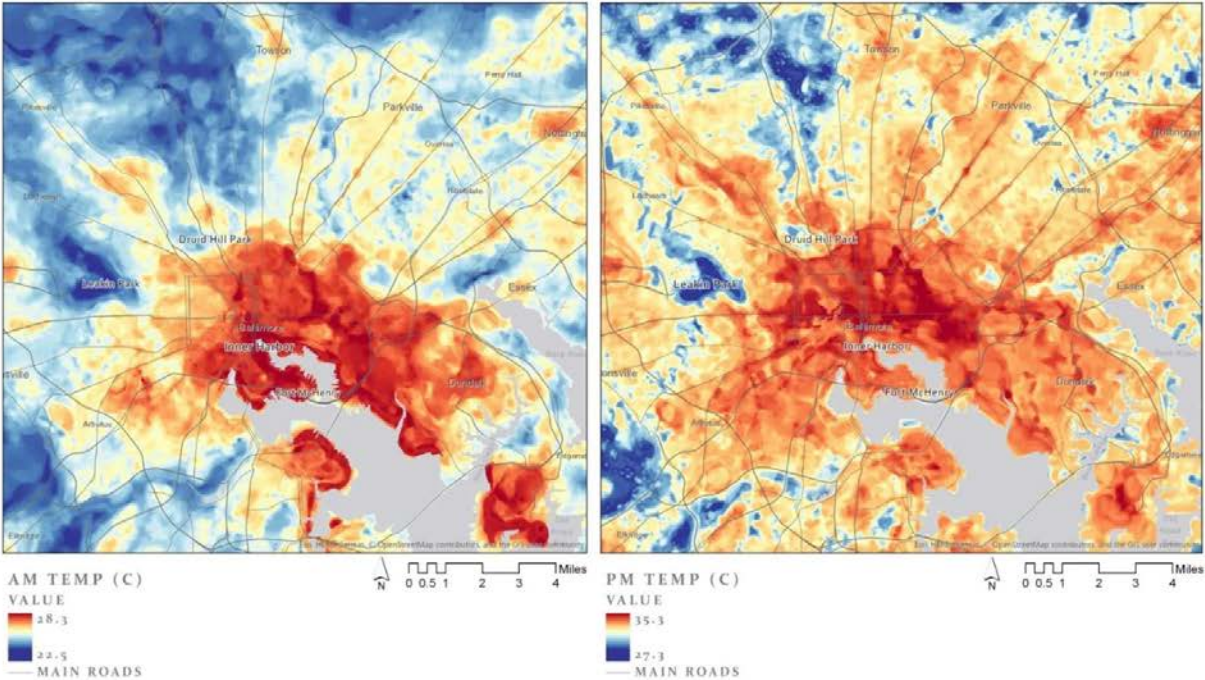
The impacts of climate-related hazards are already occurring, and they are projected to worsen in many regions.

Launch the CMRA Assessment tool below and enter your location to see how climate conditions are projected to change through this century.



Let's consider a potential infrastructure project in Anne Arundel County, Maryland

BALTIMORE



Citizen scientists in Baltimore mapped Urban Heat across the city in 2018



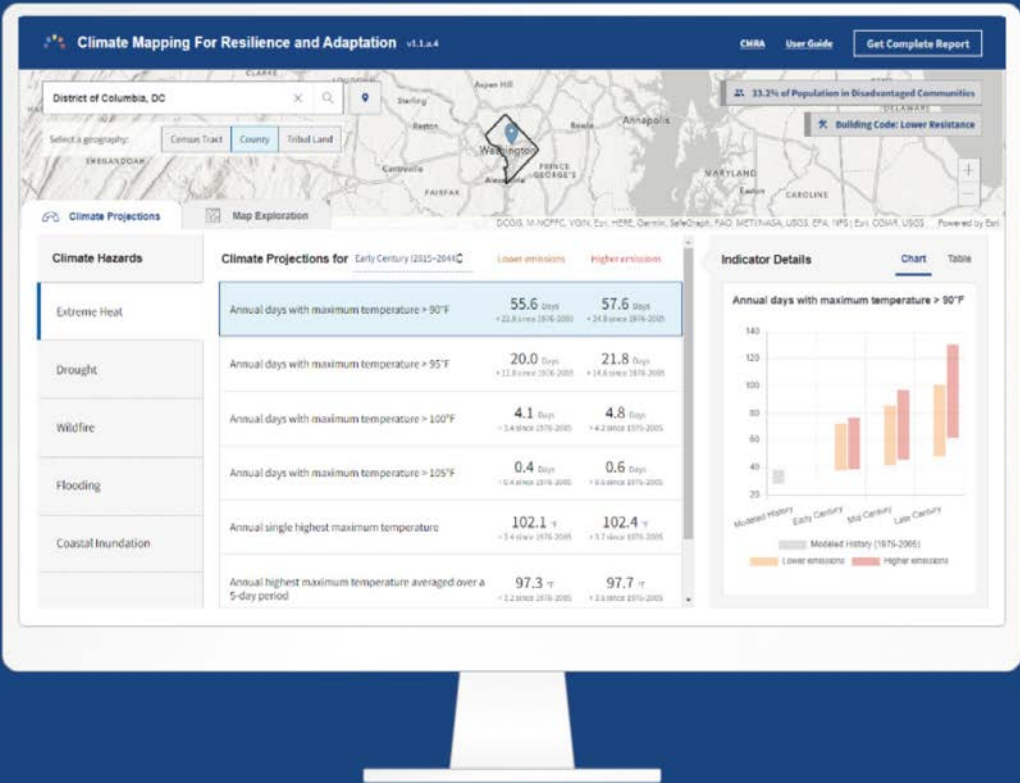
Concern:

People who wait at outdoor bus and train stations will need protection from extreme heat

CMRA Assessment Tool

Check how climate conditions in your location are projected to change over the next several decades. Explore the results to recognize if the things your community values—assets such as people, property, and infrastructure—could be exposed to climate-related hazards.

[Launch the CMRA Assessment Tool](#)
[Explore the User Guide](#)





Climate Mapping For Resilience and Adaptation



Or



Data and maps available in this tool are downscaled results from global climate models. Results for selected geographies indicate how local exposure to five common climate-related hazards is projected to change through this century. Assessing climate vulnerability and risk to your local assets will require additional information that is not available in this tool.

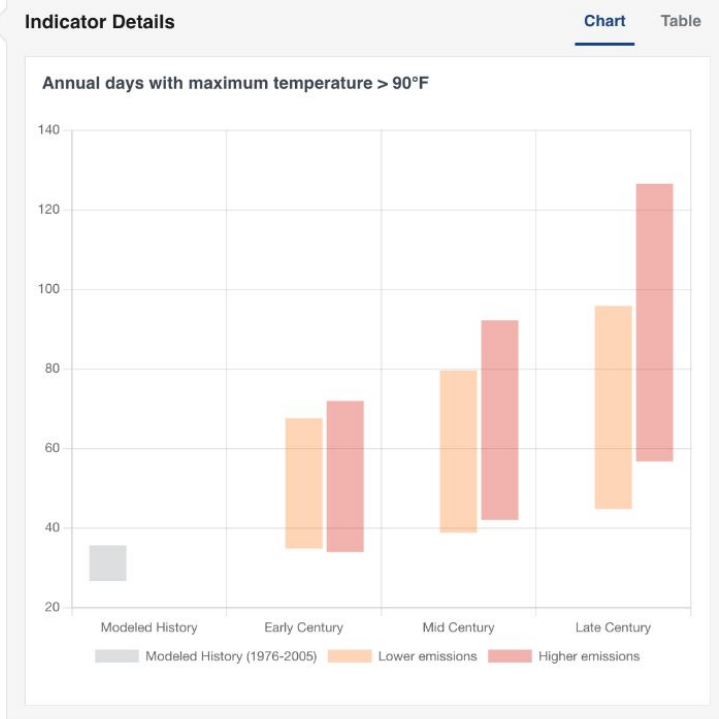
[See the U.S. Climate Resilience Toolkit's Steps to Resilience framework for more information.](#)



- Climate Hazards
- Extreme Heat
- Drought
- Wildfire
- Flooding
- Coastal Inundation

Climate Projections for **Early Century (2015-2044)** ↕

	Lower emissions	Higher emissions
Annual days with maximum temperature > 90°F	52.2 Days <small>+ 20.9 since 1976-2005</small>	54.1 Days <small>+ 22.9 since 1976-2005</small>
Annual days with maximum temperature > 95°F	20.1 Days <small>+ 12.0 since 1976-2005</small>	21.7 Days <small>+ 13.6 since 1976-2005</small>
Annual days with maximum temperature > 100°F	4.9 Days <small>+ 3.9 since 1976-2005</small>	5.6 Days <small>+ 4.7 since 1976-2005</small>
Annual days with maximum temperature > 105°F	0.6 Days <small>+ 0.6 since 1976-2005</small>	0.7 Days <small>+ 0.7 since 1976-2005</small>
Annual single highest maximum temperature	102.6 °F <small>+ 3.4 since 1976-2005</small>	102.9 °F <small>+ 3.7 since 1976-2005</small>
Annual highest maximum temperature averaged over a 5-day period	97.5 °F <small>+ 3.3 since 1976-2005</small>	97.9 °F <small>+ 3.7 since 1976-2005</small>
Cooling-degree days (CDD)	1,857.5 Degree Days <small>+ 404.8 since 1976-2005</small>	1,899.8 Degree Days <small>+ 447.1 since 1976-2005</small>



Baltimore city, MD

Select a geography:



Climate Projections

Map Exploration

Climate Hazards

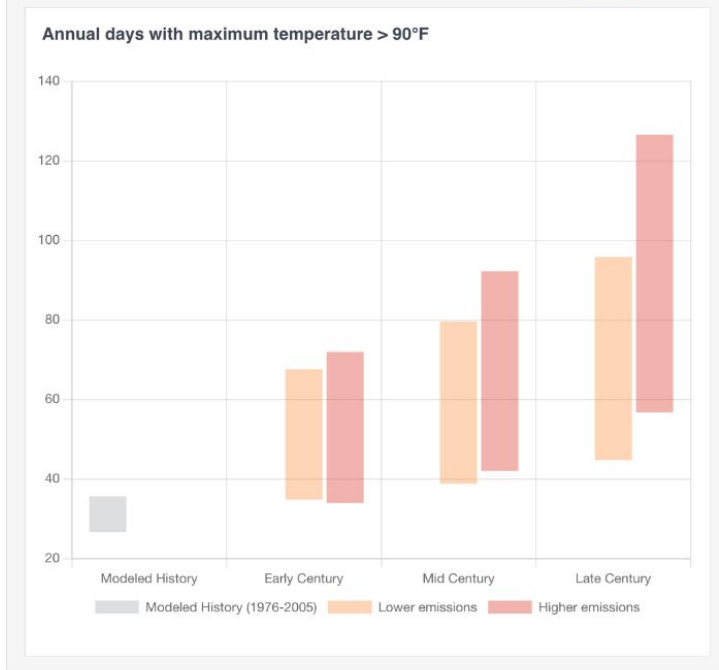
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Indicator Details Chart Table





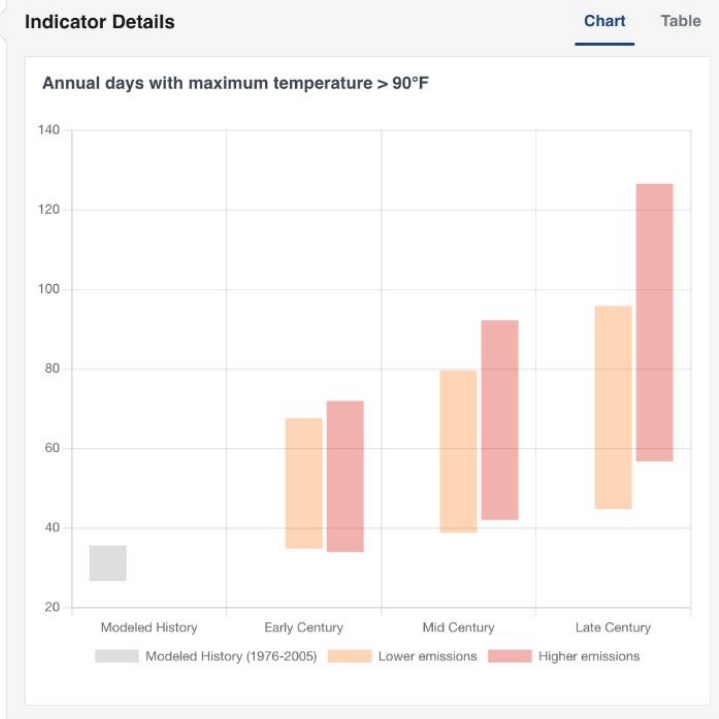
Climate Projections

Map Exploration

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Baltimore city, MD

Select a geography: Census Tract County Tribal Land

55.4% of Population in Disadvantaged Communities

Building Code: Resistant

Climate Projections

Map Exploration

- Climate Hazards
- Extreme Heat
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Climate Projections for **Early Century (2015–2044)**

	Lower emissions	Higher emissions
Annual days with maximum temperature > 90°F	2 Days + 22.9 since 1976-2005	54.1 Days + 22.9 since 1976-2005
Annual days with maximum temperature > 95°F	2.1 Days + 12.0 since 1976-2005	21.7 Days + 13.6 since 1976-2005
Annual days with maximum temperature > 100°F	4.9 Days + 3.9 since 1976-2005	5.6 Days + 4.7 since 1976-2005
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Climate Projections

Map Exploration

- Climate Hazards
- Extreme Heat
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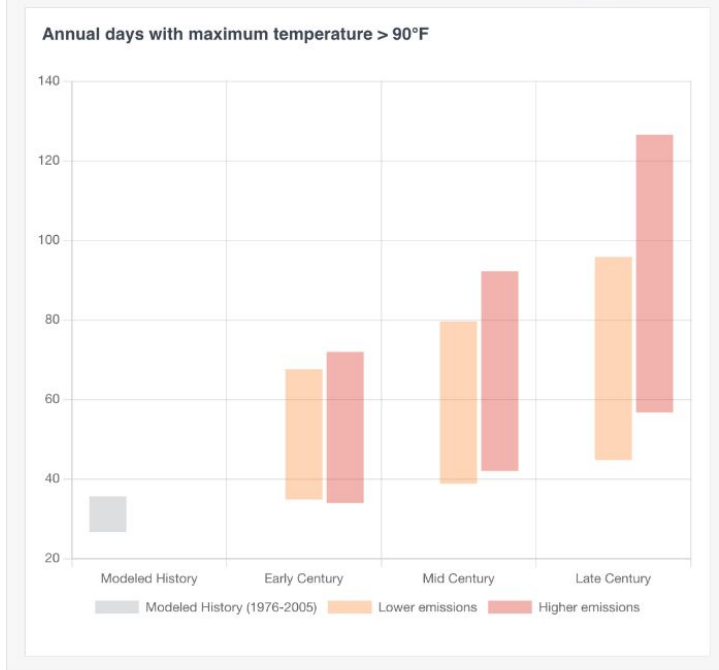
Climate Projections for Early Century (2015-2044)

Lower emissions Higher emissions

Annual days with maximum temperature > 90°F	Days 1976-2005	Days 1976-2005
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The Lower Emissions Scenario is a possible future in which humans drastically reduce their use of fossil fuels, reducing global emissions of heat-trapping gases to zero by 2040. This scenario is known as RCP 4.5.

Indicator Details





Climate Projections

Map Exploration

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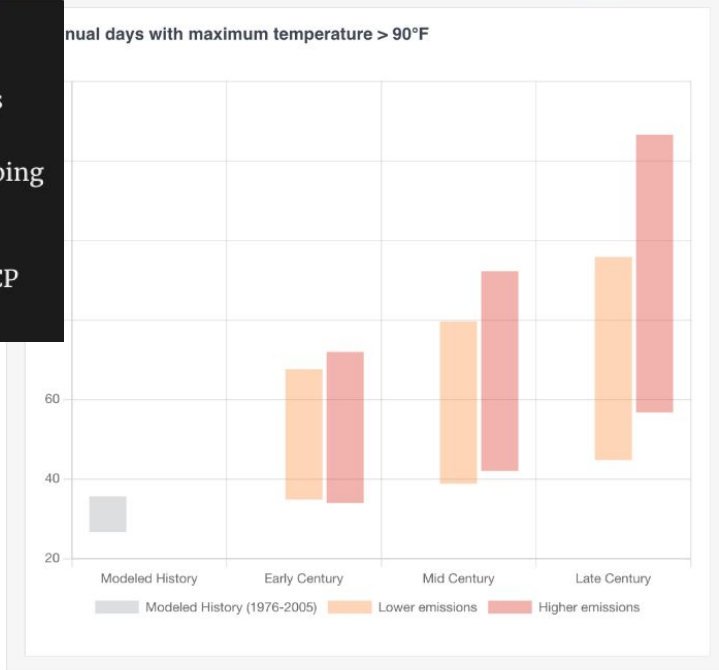
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Lower emissions Higher emissions

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The Higher Emissions Scenario is a possible future in which humans continue increasing emissions of heat-trapping gases from fossil fuels through 2100. This scenario is known as RCP 8.5.

Indicator Details





Climate Projections

Map Exploration

- Climate Hazards
- Extreme Heat
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Climate Projections for Early Century (2015-2044) ↕

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Baltimore city, MD

Select a geography: **Census Tract** County Tribal Land

55.4% of Population in Disadvantaged Communities

Building Code: Resistant

Climate Projections

Map Exploration

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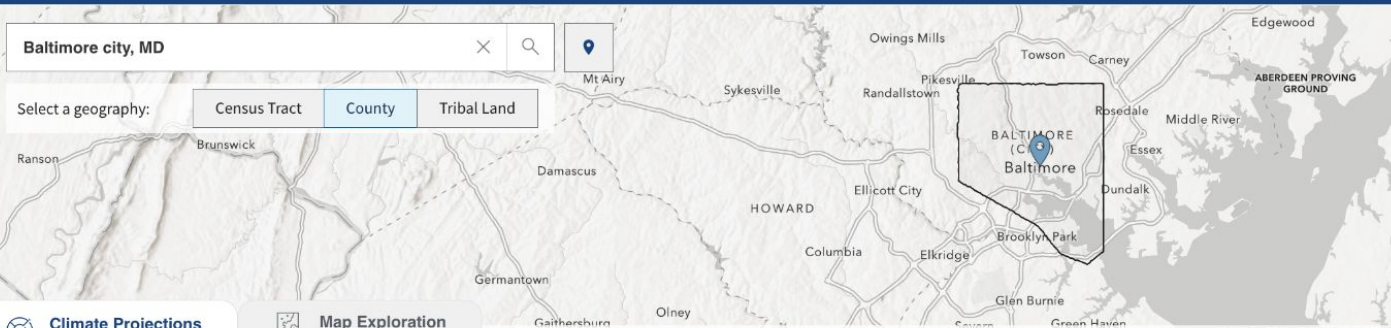
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Indicator Details Chart Table

Annual days with maximum temperature > 90°F

	Minimum Projection	Mean (Days)	Maximum Projection
Lower emissions			
Modeled History (1976-2005)	26.6	31.2	35.6
Early Century (2015-2044)	34.8	52.2	67.6
Mid Century (2035-2064)	38.8	61.9	79.6
Late Century (2070-2099)	44.7	70.9	95.8
Higher emissions			
Modeled History (1976-2005)	26.6	31.2	35.6
Early Century (2015-2044)	33.9	54.1	71.9
Mid Century (2035-2064)	42.0	70.0	92.2



55.4% of Population in Disadvantaged Communities

Building Code: Resistant

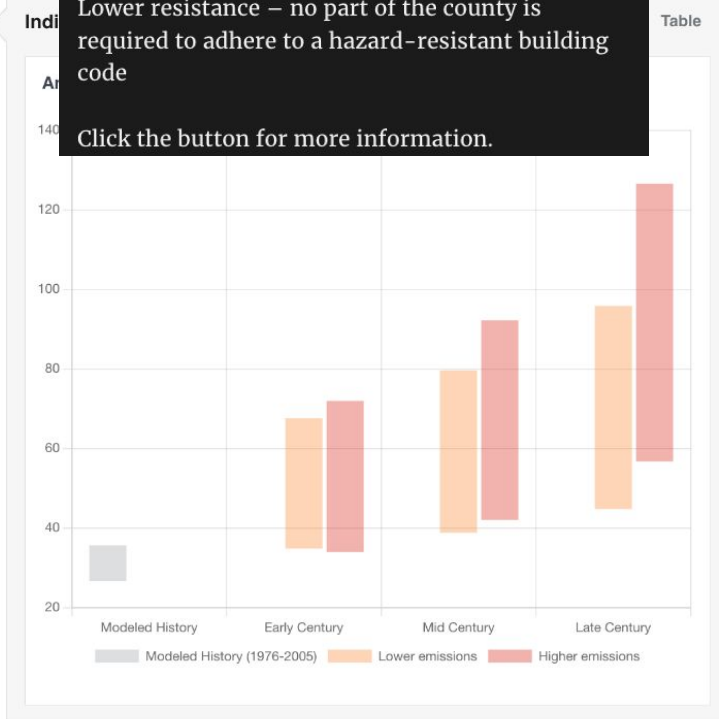
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Map Exploration

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Resistant — 100% of the county is required to adhere to a hazard-resistant building code

Partially Resistant – portions of the county are required to adhere to a hazard-resistant building code

Lower resistance – no part of the county is required to adhere to a hazard-resistant building code

Baltimore city, MD

Select a geography:

According to the Climate and Economic Justice Screening Tool (CEJST), communities are considered to be disadvantaged if they are in census tracts that meet the thresholds for at least one of the tool's categories of burden, or if they are on land within the boundaries of Federally Recognized Tribes, including Alaska Native Villages.

Federal agencies will use CEJST to help identify communities that can benefit from investments in climate, clean energy, and related areas.

Click the button to learn more about CEJST.

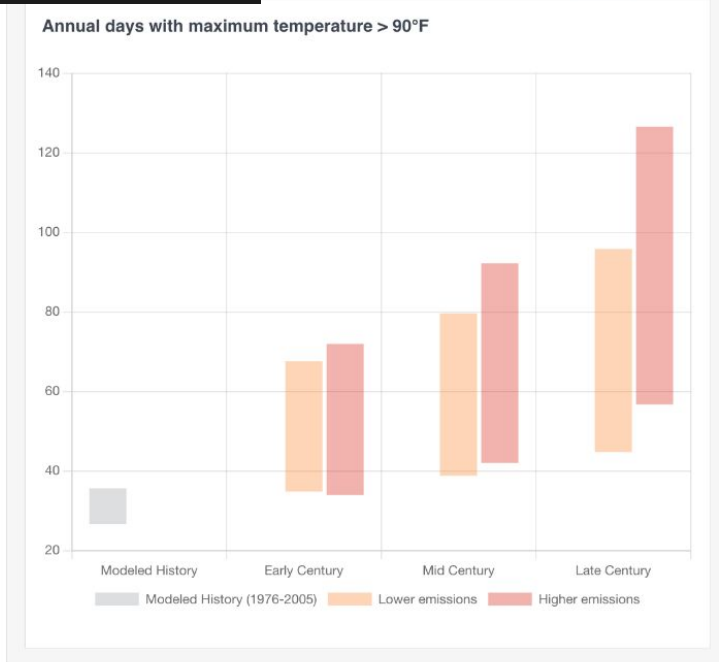
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Building Code: Resistant

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Climate Projections for Early Century (2015-2044) Lower emissions

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Baltimore city, MD

Select a geography: Census Tract County Tribal Land

55.4% of Population in Disadvantaged Communities

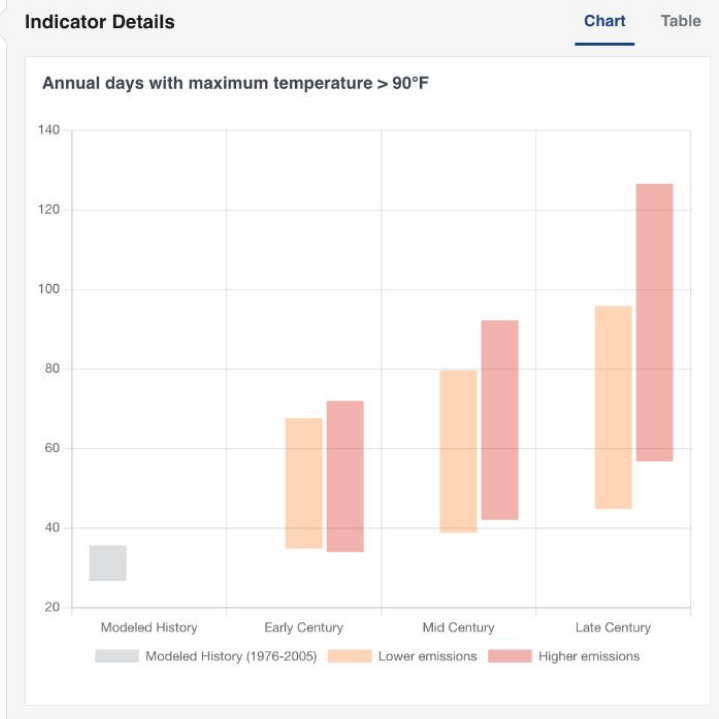
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Baltimore city, MD

Select a geography: Hager Census Tract County Tribal Land

55.4% of Population in Disadvantaged Communities

Building Code: Resistant

Baltimore city, MD

52.2 Days

Annual days with maximum temperature > 90°F

Zoom to

Click on the map to get information for the selected indicator

Climate Projections

Map Exploration

Hazards
Extreme Heat



Indicators

Annual days with maximum temperature > 90°F

52.2 Days

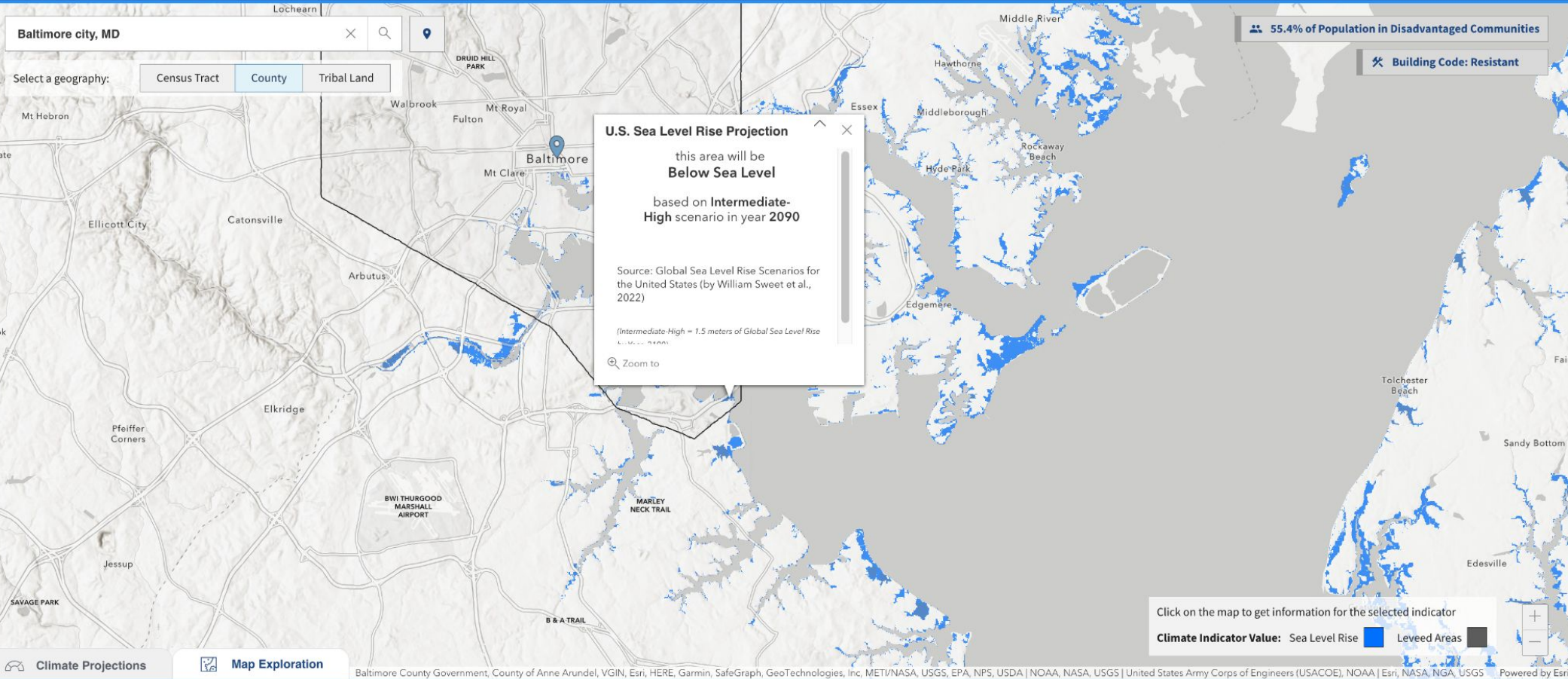
Annual number of days with a maximum temperature greater than 90°F

Timeframe

Early Century (2015-2044)

Prediction Model

Lower emissions Higher emissions



Hazards
Coastal Inundation

Indicators

Percent of selected county impacted by global sea level rise

0.5 %

Percent of selected area impacted by global sea level rise

Timeframe
Late Century (2070-2099)

Prediction Model
 Lower emissions Higher emissions

Baltimore city, MD

Select a geography: Census Tract County Tribal Land

55.4% of Population in Disadvantaged Communities

Building Code: Resistant

U.S. Sea Level Rise Projection

this area will be **Below Sea Level**

based on **Intermediate-High** scenario in year **2090**

Source: Global Sea Level Rise Scenarios for the United States (by William Sweet et al., 2022)

(Intermediate-High = 1.5 meters of Global Sea Level Rise by the year 2100)

Zoom to

Click on the map to get information for the selected indicator

Climate Indicator Value: Sea Level Rise Leveed Areas

Climate Projections

Map Exploration

Baltimore County Government, County of Anne Arundel, VGIN, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc. METI/NASA, USGS, EPA, NPS, USDA | NOAA, NASA, USGS | United States Army Corps of Engineers (USACOE), NOAA | Esri, NASA, NGA, USGS | Powered by Esri

Hazards
Coastal Inundation



Indicators
Percent of selected county impacted by global sea level rise

0.5% Percent of selected area impacted by global sea level rise

Timeframe
Late Century (2070-2099)

Prediction Model
Lower emissions Higher emissions

5-page reports are .html files. Unique URLs can be bookmarked, shared, printed, or incorporated into other reports.

cmra-reports.s3.amazonaws.com/county/24510.html

Fit page Page 1 Update

Hazard Report

Extreme Heat

Baltimore city, Maryland

- Total Population: 609,032
- Non-Hispanic White Population (%): 73%
- Income Below Poverty in Last 12 Mo (%): 21%
- Building Codes Hazard Resistance: Resistant
- % Population Disadvantaged: 55.38%

[Explore additional data](#)

U.S. Climate Resilience Toolkit
Source: Census Bureau, CEQ, Epi, FEMA, MRLC, NOAA, UCSD

National Risk Index Rating: Relatively High

Extreme Heat Annualized Frequency: 1.24

Expected Annual Loss Rating: Relatively High

Expected Annual Loss Total (\$): \$3,258,896.49

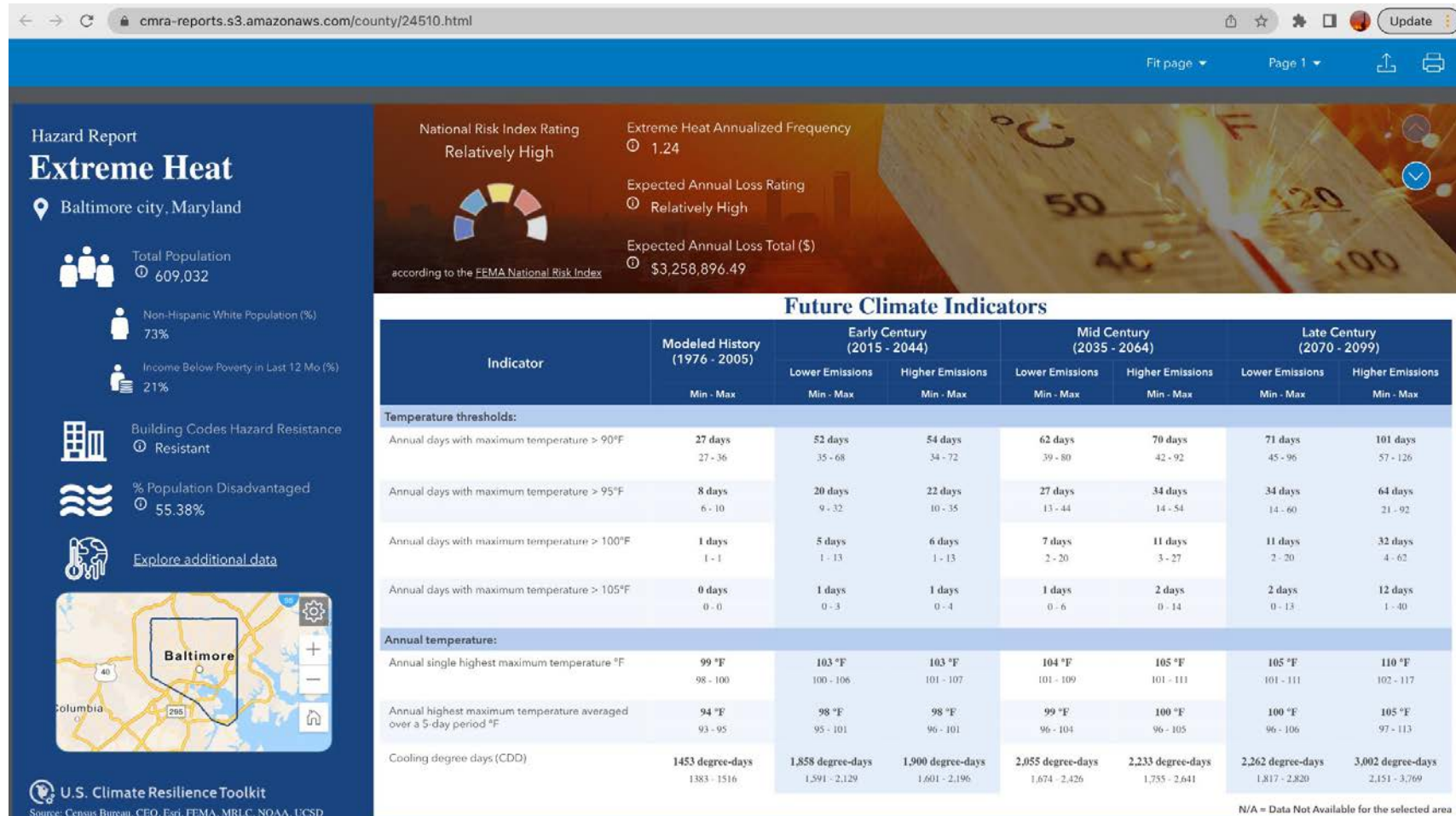
according to the FEMA National Risk Index

Future Climate Indicators

Indicator	Modeled History (1976 - 2005) Min - Max	Early Century (2015 - 2044)		Mid Century (2035 - 2064)		Late Century (2070 - 2099)	
		Lower Emissions Min - Max	Higher Emissions Min - Max	Lower Emissions Min - Max	Higher Emissions Min - Max	Lower Emissions Min - Max	Higher Emissions Min - Max
Temperature thresholds:							
Annual days with maximum temperature > 90°F	27 days 27 - 36	52 days 35 - 68	54 days 34 - 72	62 days 39 - 80	70 days 42 - 92	71 days 45 - 96	101 days 57 - 126
Annual days with maximum temperature > 95°F	8 days 6 - 10	20 days 9 - 32	22 days 10 - 35	27 days 13 - 44	34 days 14 - 54	34 days 14 - 60	64 days 21 - 92
Annual days with maximum temperature > 100°F	1 days 1 - 1	5 days 1 - 13	6 days 1 - 13	7 days 2 - 20	11 days 3 - 27	11 days 2 - 20	32 days 4 - 62
Annual days with maximum temperature > 105°F	0 days 0 - 0	1 days 0 - 3	1 days 0 - 4	1 days 0 - 6	2 days 0 - 14	2 days 0 - 13	12 days 1 - 40
Annual temperature:							
Annual single highest maximum temperature °F	99 °F 98 - 100	103 °F 100 - 106	103 °F 101 - 107	104 °F 101 - 109	105 °F 101 - 111	105 °F 101 - 111	110 °F 102 - 117
Annual highest maximum temperature averaged over a 5-day period °F	94 °F 93 - 95	98 °F 95 - 101	98 °F 96 - 101	99 °F 96 - 104	100 °F 96 - 105	100 °F 96 - 106	105 °F 97 - 113
Cooling degree days (CDD)	1453 degree-days 1383 - 1516	1,858 degree-days 1,591 - 2,129	1,900 degree-days 1,601 - 2,196	2,055 degree-days 1,674 - 2,426	2,233 degree-days 1,755 - 2,641	2,262 degree-days 1,817 - 2,820	3,002 degree-days 2,151 - 3,769

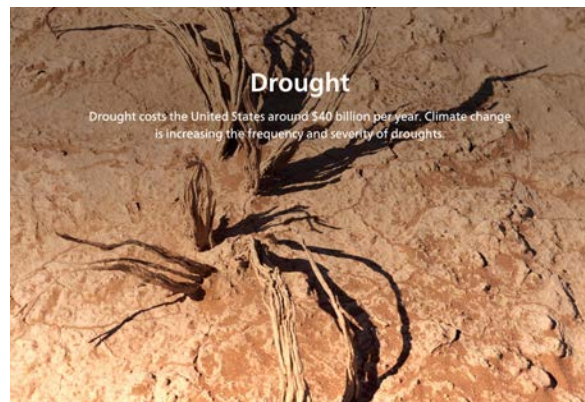
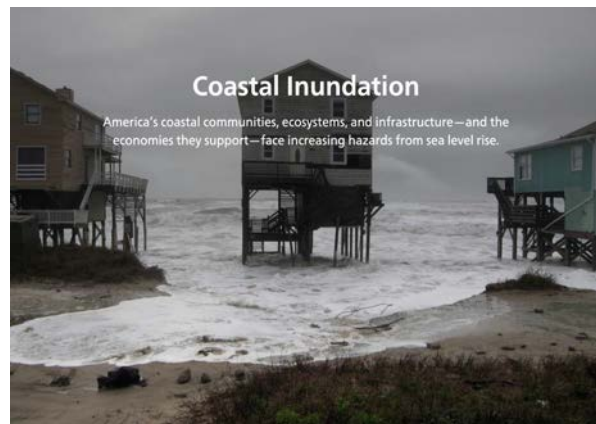
N/A = Data Not Available for the selected area

Includes demographic information and links to FEMA's National Risk Index





StoryMaps provide context on hazards and federal funding opportunities





Implementing climate resilience policy

The Federal government is taking action to protect people, property, and infrastructure from the impacts of changing climate conditions across the country. Federal agencies are providing access to improved datasets, new tools, and guidance to help people address their climate-related challenges.



E.O. 14008 - Tackling the Climate Crisis



Federal Support for Nature-Based Solutions



Federal Flood Risk Management Standard



National Initiative to Advance Building Codes



Federal Climate Adaptation Plans



Decision-relevant climate data

Select a climate-related hazard icon to explore relevant curated data and tools. These collections offer both Federal and non-federal resources.



Extreme Heat



Drought



Wildfire



Flooding



Coastal Inundation

Explore additional data: [Climate Models](#), [Demographics](#), [Infrastructure](#), [Environment](#), [Hazards](#)

About the data

Thank you!

If you have feedback, questions, or other requests for the CMRA team, please email

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