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**SOS Explorer™ Mobile App Now!**

Scan the QR code  
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in the Apple App Store  
or Google Play Store



# Keeping it local: how to access the climate data of your own backyard

Science On a Sphere, NOAA View, Climate  
Explorer, and more!



# Who am I?

TOM DI LIBERTO - (he/him) Washington, DC (Anacostans)

Climate Scientist and Science Communicator for NOAA's Climate.gov in NOAA's Climate Program Office

Tom.DiLiberto@noaa.gov



# What is NOAA and what does it do?

Under the Department of Commerce...

to observe and monitor weather and climate on the Earth.

Data from the **ATMOSPHERE** & the **OCEAN** is collected by people and remote sensing tools...

to support real-time observations, short-term and long-range forecasts, and predictions.

Data becomes products, applications and tools, for...

fisheries  
forecasts  
resilience data sustainability  
education mitigation  
production products tools  
applications  
natural disaster food  
navigation weather  
transportation  
defense research

& Science On a Sphere®



The exciting phenomena of ocean with the natural world  
are not reserved for scientists but are available to anyone  
who will spare himself under the influence of earth, sea and sky

learn

What Would You Explore?

The human race has never stopped seeking  
to know what lies over the far horizon  
whether it is on land or beneath the sea.

explore





Category All

Loaded datasets



Hot Air: Atmosphere and Climate Change (movie)



Human Impacts on Marine Ecosystems



Human Transportation



Hurricane Sandy - 2012



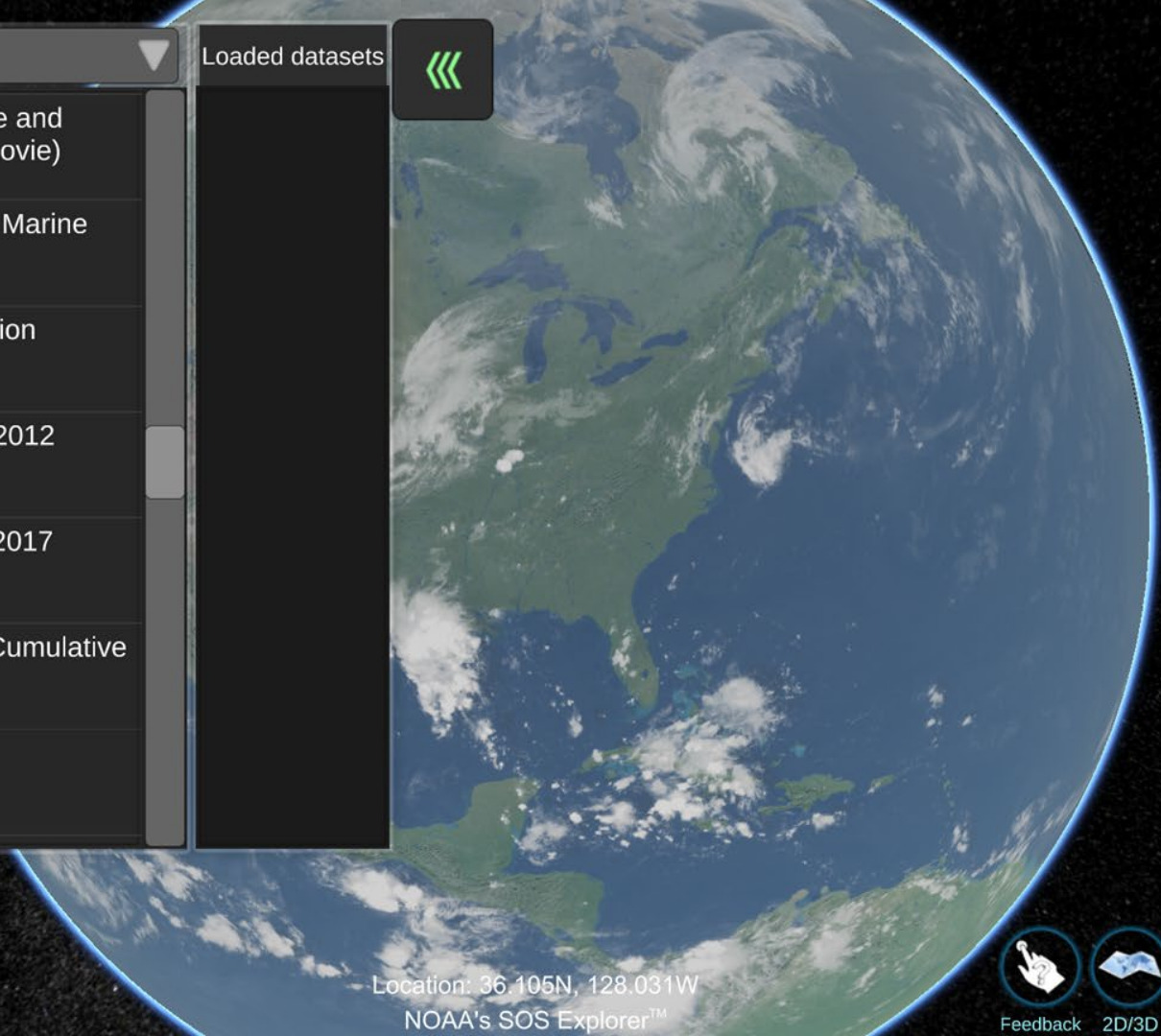
Hurricane Season 2017



Hurricane Tracks: Cumulative - 1950 - 2005



Io: Jupiter's Moon



Location: 36.105N, 128.031W  
NOAA's SOS Explorer™



Feedback 2D/3D Overlays Tools Quit



Barometric pressure Coastal hazards & navigation

Atmospheric moisture

Land surface temperature Atmospheric temperature

Ocean temperature & heat content Magnetic anomaly

Atmospheric temperature & heat content

Aquatic nutrients & chemistry

Aerosol optical thickness Rain accumulation Convective energy

Bathymetry Nighttime lights Space weather

Soil moisture & drought True color imagery

Wind speed & direction Weather models & forecasts

Infrared clouds Anthropogenic pollution Sea surface height


Climate models & forecast Coral bleaching

Fisheries statistics Accumulated precipitation

Sea level rise Precipitation Snow & ice cover

Ozone concentration Coastal & marine habitat locations

Sea ice concentration & extent



# How educators benefit from NOAA data

Knowledge of a completely free data

Plethora of data (global to local)

Specialized educational pages

NOAA content experts and outreach  
specialists who are just an email away

[www.noaa.gov/education](http://www.noaa.gov/education)

[www.climate.gov](http://www.climate.gov)

[outreach@noaa.gov](mailto:outreach@noaa.gov)





# How do you use NOAA data?

If you use NOAA data, how do you use it?

How do you wish to use NOAA data?

# How to connect NOAA data and products to content

**Goal: to build comfort with using NOAA products**

Case study: *Temperature*

**Goal: to make non-science connection with NOAA data**

Case study: *Sea Level Rise*

**Goal: Build familiarity with global vs local data**

Global: entry level data

*Science On a Sphere*

*NOAAView*

Local: Intermediate to experienced data

*climate.gov's Climate Explorer*

*NCEI - Climate at a Glance*

*xmACIS2 - EXPERT level*

# Where can entry data be found?




The screenshot shows the Science On a Sphere website. At the top, there are navigation tabs: "What is SOS?", "Getting SOS", "Education", "SOS Explorer", "Datasets", and "Support". The main header features the "Science On a Sphere" logo and the NOAA logo. Below this is a search bar for datasets and a "Submit" button. A large banner advertises the "Free SOSx Mobile App" with a "Try It" button. Below the banner is the "Climate.gov" logo and a search bar. The main content area features a map of the United States with a color-coded overlay representing temperature and precipitation data. The text next to the map reads: "June 2020 landed in the warmest and driest thirds of the U.S. historical record". Below this is a "Recent Topics" section with three items: "The Essential Principles of Climate Literacy", "A conversation with Danielle Clair: NOAA Postdoc, marine scientist, diver", and "Toolbox for Teaching Climate & Energy".



The screenshot shows the NOAAView Data Exploration Tool website. The header includes the NOAA logo and the text "NATIONAL CENTERS FOR ENVIRONMENTAL INFORMATION". Below the header is a navigation bar with links: "Home", "Climate Information", "Data Access", "Customer Support", "Contact", and "About". A search bar is located on the right side of the navigation bar. The main content area is titled "Temperature, Precipitation, and Drought" and features a sidebar with a list of categories: "Climate Monitoring", "State of the Climate", "Temp, Precip, and Drought", "Climate at a Glance", "Extremes", "Societal Impacts", "Snow and Ice", "Teleconnections", and "Monitoring References". The main content area is divided into "National" and "Global" sections. The "National" section includes "ASOS Temperature Departure & Degree Day Maps" and "Climatological Rankings". The "Global" section includes "Global Temp & Precip Maps" and "Climate at a Glance: Global Time Series Plots".

# Making that global to local connection with NOAA data...

An aerial photograph of a rural landscape. The foreground and middle ground are dominated by large, circular green fields, likely used for agriculture or as part of a conservation program. A winding river or stream flows through the landscape, cutting through the fields and creating a meandering path. The background shows more fields and some distant structures. The overall scene is a mix of natural and human-made elements.

# Case study: Temperature change

## Connections:

**How rare is what just happened?**

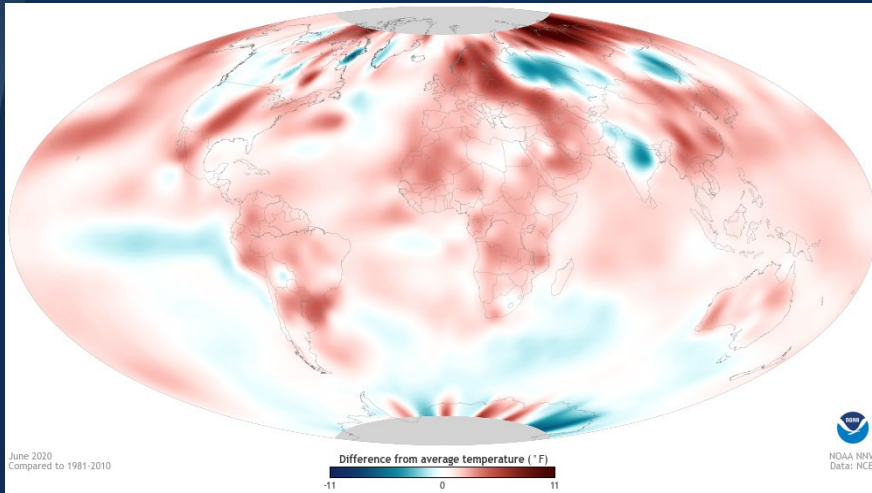
Who is vulnerable to changes in local temperatures?

What do forecasts for the future mean for communities?

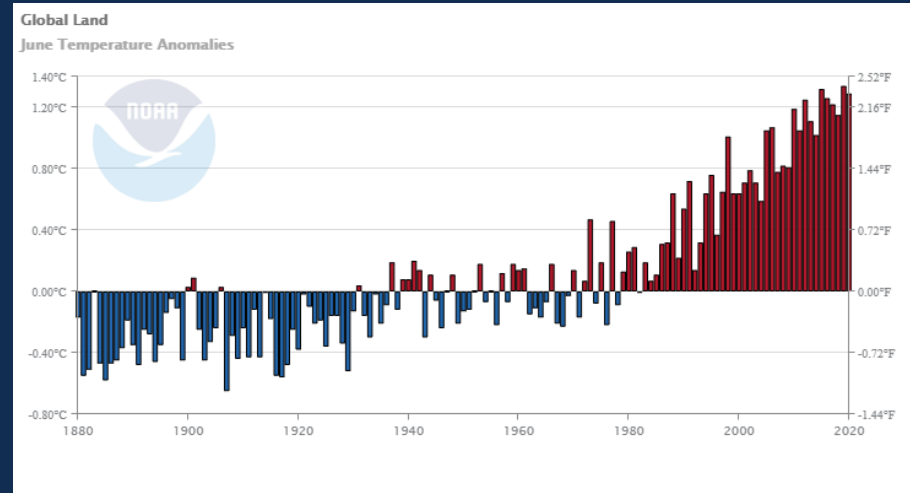
What can communities do to prepare/adapt?

# Global Temperature Change

Temperature anomaly (*climate.gov*)



Global land temperature anomaly (*climate.gov*)



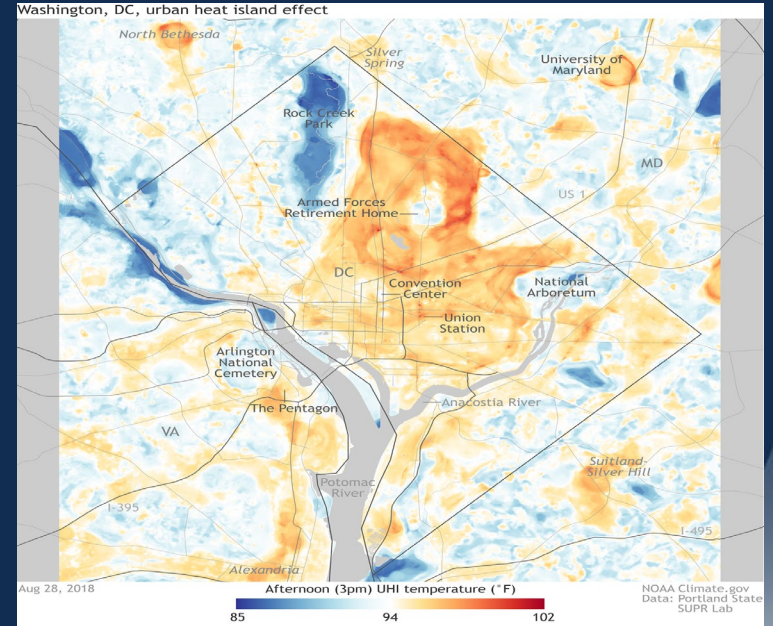
<https://climate.gov/news-features/understanding-climate/climate-change-global-temperature>

# Local Temperature Change

## Days above 90° (Climate Explorer)



## Detailed maps of urban heat islands (Climate.gov)



# Local Temperature History

xmACIS2 - <http://xmacis.rcc-acis.org/>

Consecutive days above 115°F record

Number of days above 100°F in Phoenix, AZ

**xmACIS2**

Single-Station Multi-Station

Selection: Consecutive Days

Options selection

Output:  HTML  CSV

Year range: por - 2020

Criteria: Max temp >= 115

Report content:  Top 10 longest runs  All runs >= days

More options

Station selection

Go Restore map

**Number of Consecutive Days Max Temperature >= 115 for PHOENIX AIRPORT, AZ**

Click column heading to sort ascending, click again to sort descending.

Rank	Run Length	Ending Date
1	4	2020-08-19
-	4	2020-07-31
-	4	1995-07-29
-	4	1990-06-28
-	4	1979-06-28
-	4	1968-06-22
7	3	2018-07-25
-	3	2017-06-21
-	3	2013-06-30
-	3	2003-07-16

Last value also occurred in one or more previous years.  
Period of record: 1933-06-01 to 2020-11-29

**xmACIS2**

Single-Station Multi-Station

Selection: Monthly Summarized Data

Options selection

Output: Table

Variable: Max temp Summary: Number of days

Threshold: >= 110

Year range: por - 2020

More options

Station selection

Go

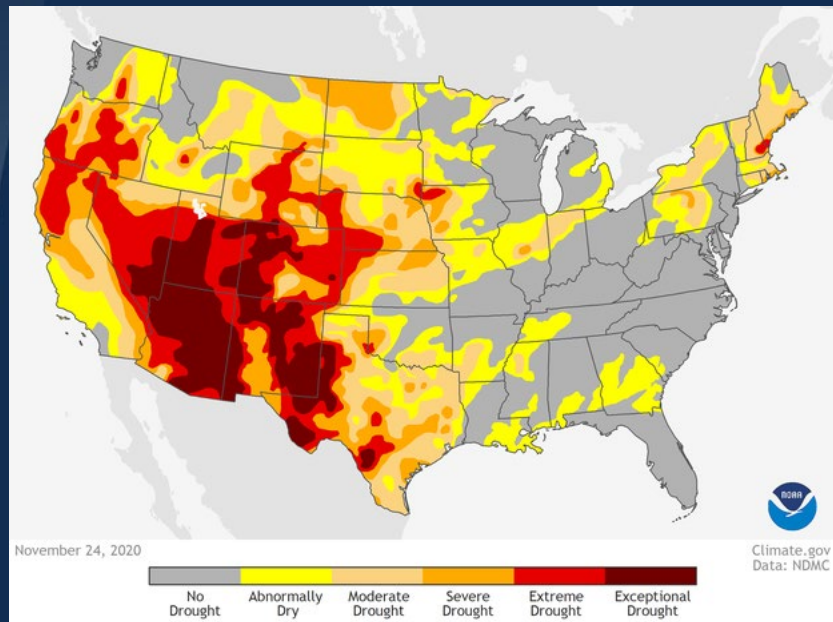
1998	0	0	0	0	0	0	2	11	4	0	0	0	0	0	17
1999	0	0	0	0	0	0	1	2	1	0	0	0	0	0	4
2000	0	0	0	0	0	2	0	8	3	2	0	0	0	0	15
2001	0	0	0	0	0	0	4	5	5	2	0	0	0	0	16
2002	0	0	0	0	0	0	12	9	6	1	0	0	0	0	28
2003	0	0	0	0	0	1	2	15	6	2	0	0	0	0	26
2004	0	0	0	0	0	0	2	6	4	0	0	0	0	0	12
2005	0	0	0	0	0	0	4	15	5	0	0	0	0	0	24
2006	0	0	0	0	0	0	6	13	0	0	0	0	0	0	19
2007	0	0	0	0	0	0	10	12	9	1	0	0	0	0	32
2008	0	0	0	0	0	1	14	6	1	0	0	0	0	0	22
2009	0	0	0	0	0	0	1	15	11	0	0	0	0	0	27
2010	0	0	0	0	0	0	5	10	6	2	0	0	0	0	23
2011	0	0	0	0	0	0	9	9	13	2	0	0	0	0	33
2012	0	0	0	0	0	0	7	4	10	0	0	0	0	0	21
2013	0	0	0	0	0	0	8	7	7	3	0	0	0	0	25
2014	0	0	0	0	0	0	2	7	1	0	0	0	0	0	10
2015	0	0	0	0	0	0	11	1	8	0	0	0	0	0	20
2016	0	0	0	0	0	0	12	15	3	0	0	0	0	0	30
2017	0	0	0	0	0	0	11	8	4	2	0	0	0	0	25
2018	0	0	0	0	0	0	5	10	7	0	0	0	0	0	22
2019	0	0	0	0	0	0	4	11	12	2	0	0	0	0	29
2020	0	0	0	0	0	2	7	19	22	3	0	0	M	53	
Mean	0	0	0	0	0	0	5	7	4	1	0	0	0	0	16
Max	0	0	0	0	0	2	18	19	22	4	0	0	0	0	53
Min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2020	2020	2020	2020	2020	1974	2020	2020	1982	2020	2020	2019	2020		
	2020	2020	2020	2020	2019	2000	1955	2006	2018	2020	2020	2019	1947		

Presented by **ACIS**  
WJAT Regional Climate Centers



# Temperature Connection

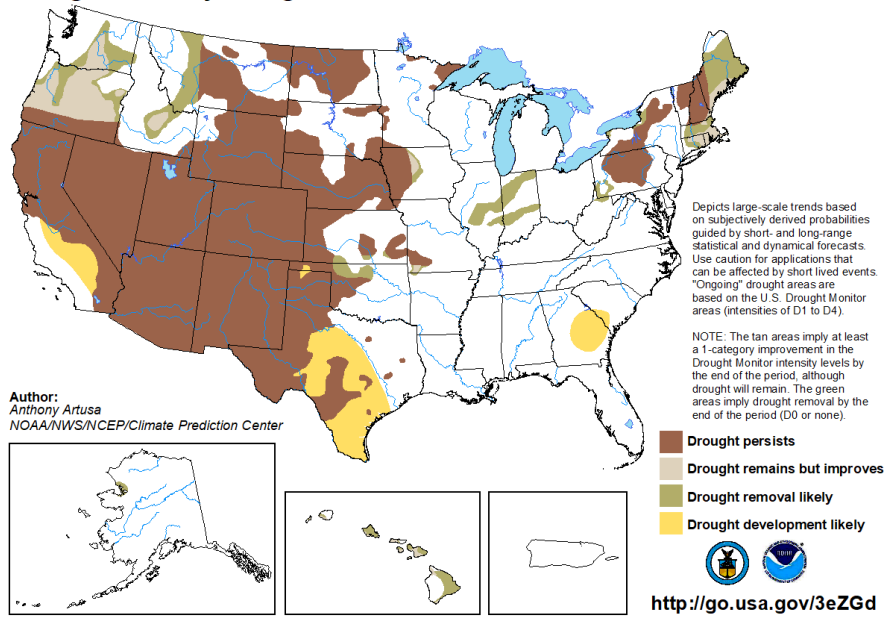
## Drought Monitor/Outlook – Climate.gov




## Climate Prediction Center

### U.S. Monthly Drought Outlook Drought Tendency During the Valid Period

Valid for November 2020  
Released October 31, 2020





# Case study: Sea Level Rise

## Connections:

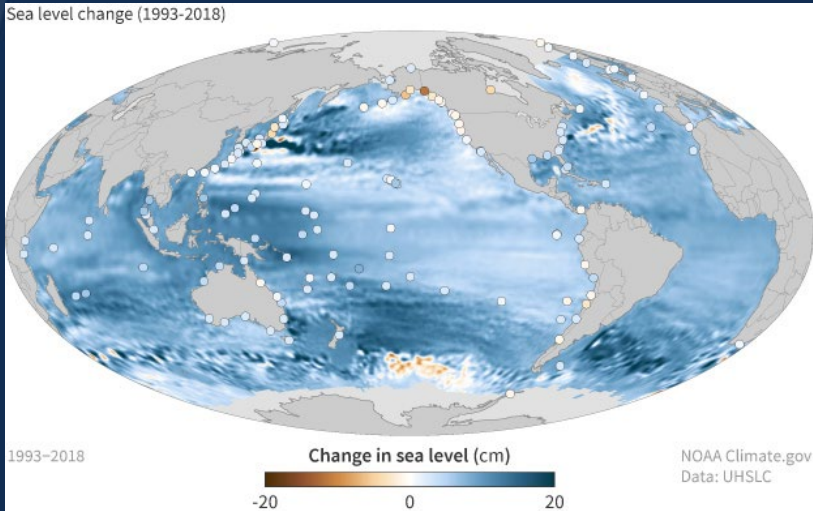
Who lives in the most vulnerable areas to sea level rise?

What do forecasts for the future mean for coastal communities?

What can communities do to prepare/adapt?

# Global Sea Level Rise

Understanding Climate Change (*climate.gov*)



Investigating Sea Level Rise  
(*dataintheclassroom.noaa.gov*)

Investigating Sea Level Using Real Data

NOAA Data in the Classroom

Introduction Level 1 Level 2 Level 3 Level 4 Level 5 Get Data Teacher's Guide

### Global vs Local Sea Level

Watch later Share

#### Introduction

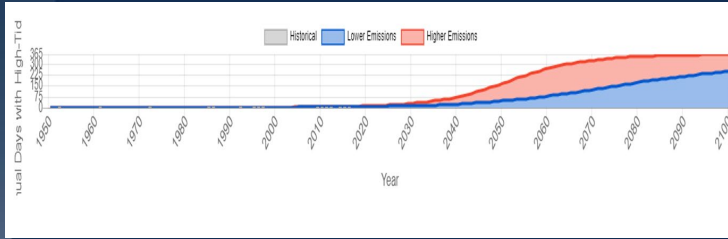
Globally, research has found that sea levels are rising. But how are water levels monitored and measured?

This activity uses a series of interactive web maps, apps, and high resolution images to help you learn about sea level using real data from NOAA.

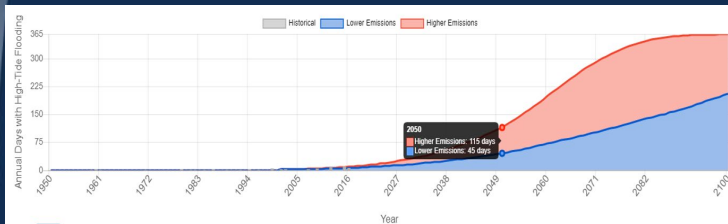
Work through Levels 1-5 to explore the data on [your own coast](#) using the NOAA data tools.

# Local Sea Level Rise

Climate Explorer tools ([climate.gov](https://climate.gov))

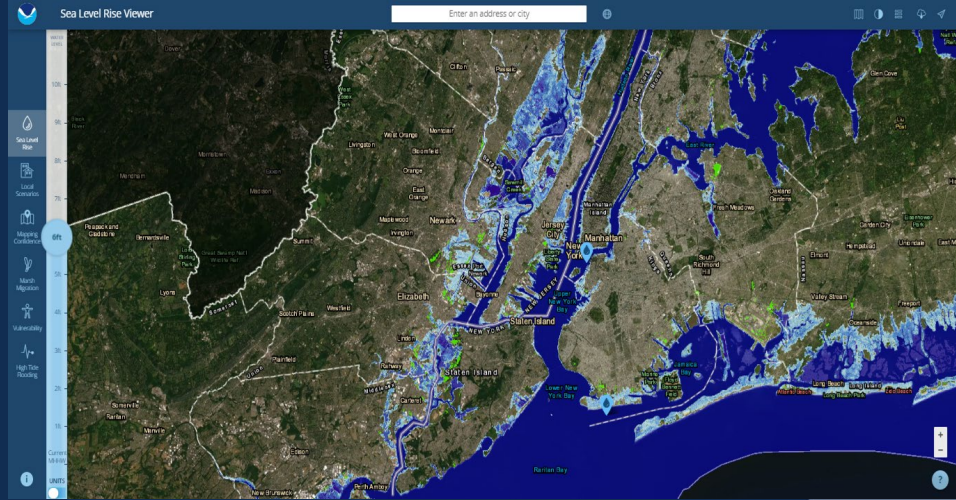


Washington, DC



Charleston, SC

Sea Level Rise Viewer ([coast.noaa.gov/slr](https://coast.noaa.gov/slr))



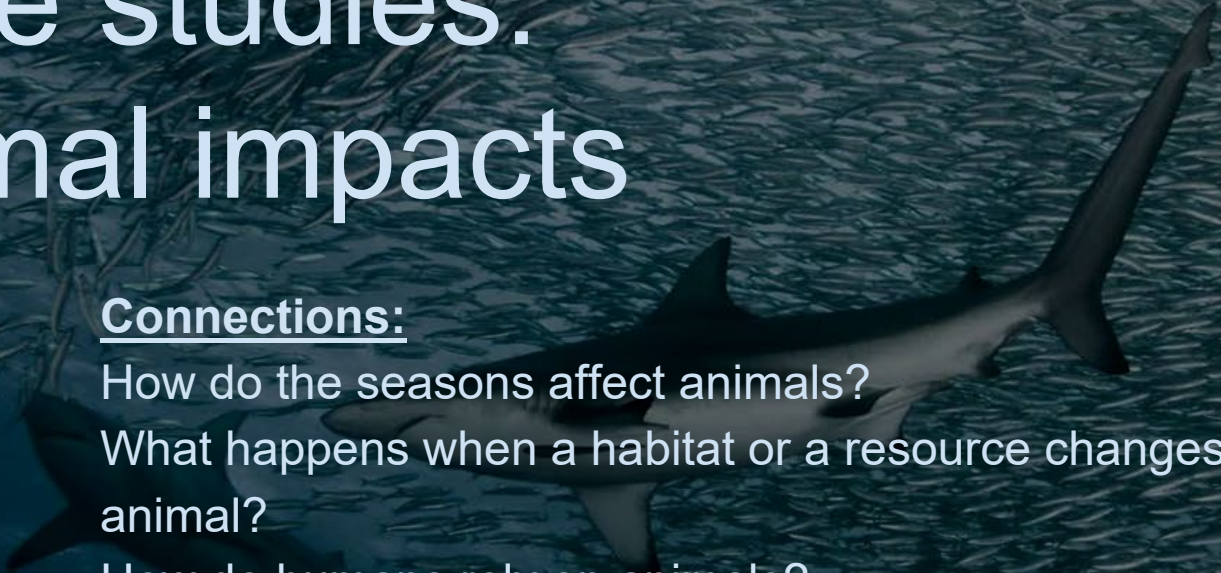
# Case studies: Animal impacts

## Connections:

How do the seasons affect animals?

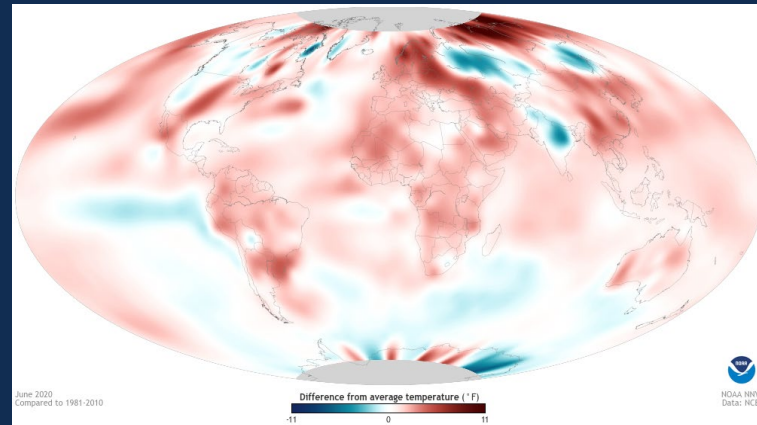
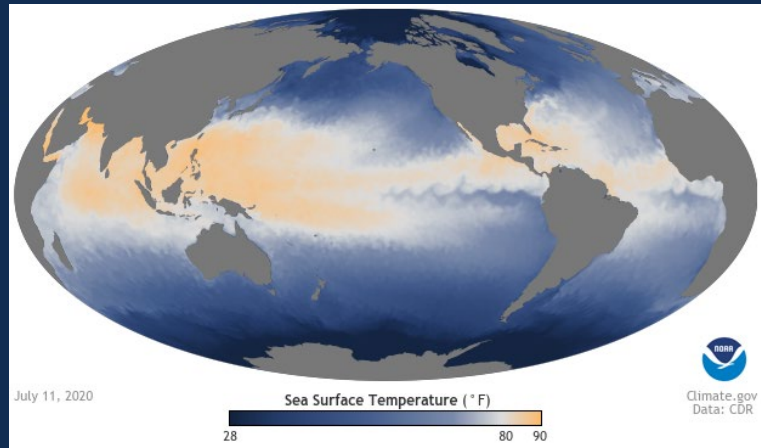
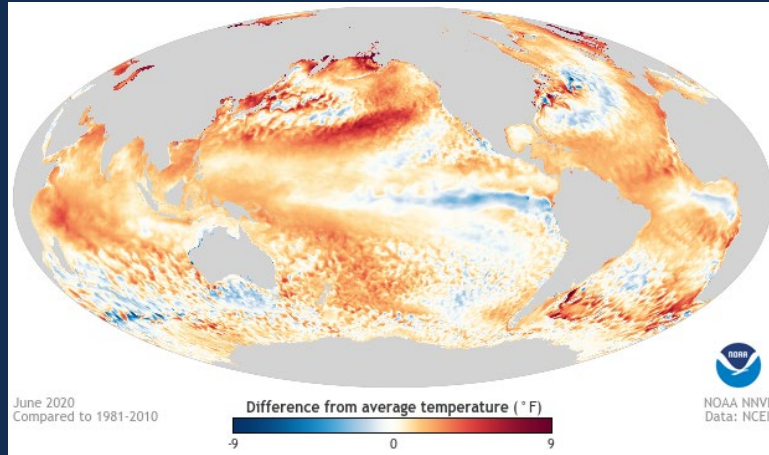
What happens when a habitat or a resource changes for an animal?

How do humans rely on animals?



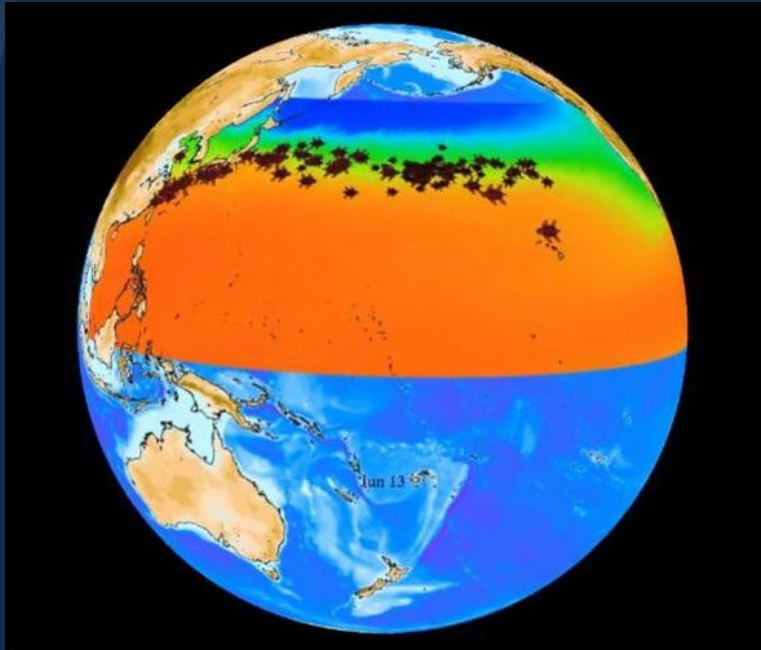
# Global Animal Impacts

Various ocean and atmospheric temperature anomaly data (*climate.gov*)

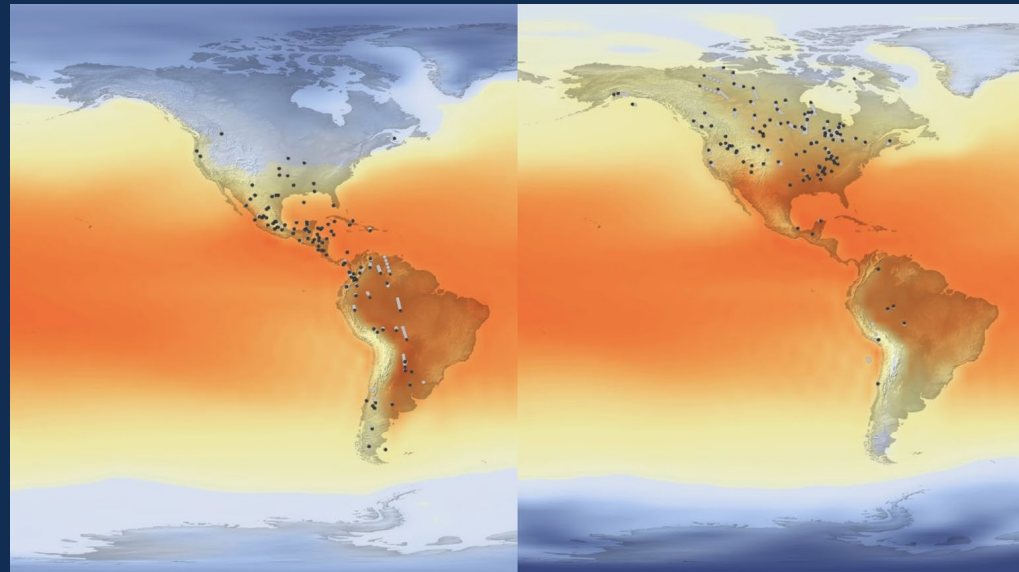


# Local Animal Impacts

Sea turtle migration (*Science On a Sphere*)



Seasonal bird migration (*Science On a Sphere*)



# Global/Country Climate review

## Connections:

How does the last year's temperature/precipitation rank?

How much rain fell in my state last month?

What are the warmest years on record? Warmest months?

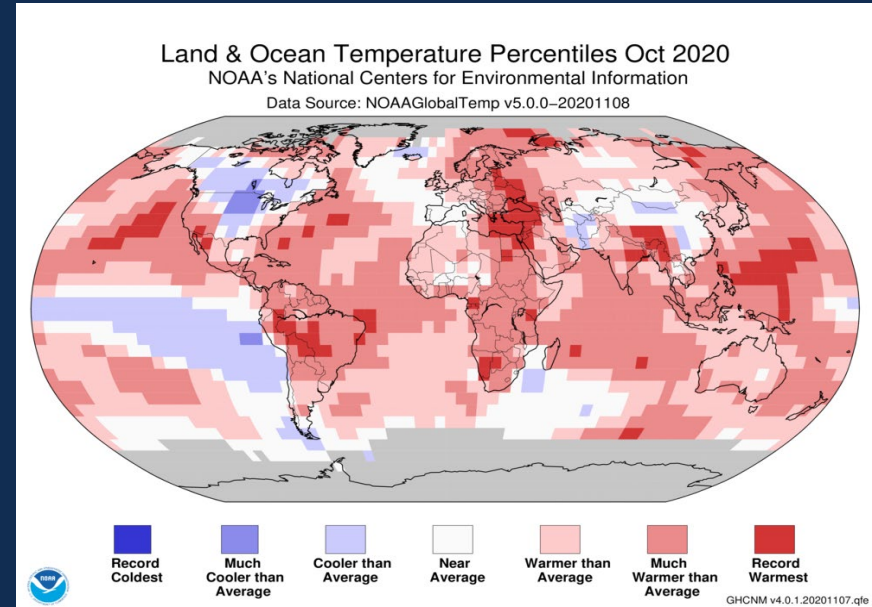
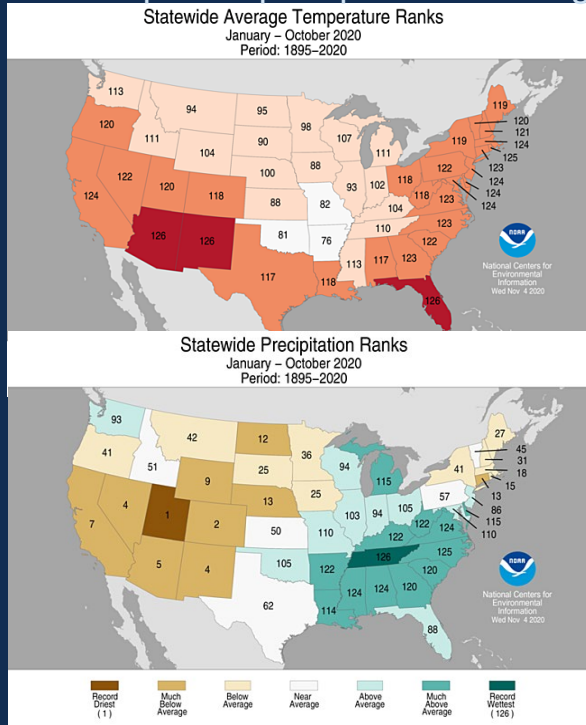


# Global Climate Rankings

National Centers for Environmental Information  
State temperate/precipitation rankings

<https://www.ncdc.noaa.gov/temp-and-precip/>

Global land temperature anomaly (*climate.gov*)



# Data resources for educators

NOAA Education ([noaa.gov/education/resource-collections](https://noaa.gov/education/resource-collections))

*Note: How-To Use NOAA Data video helpful with where to start*

Science On a Sphere ([sos.noaa.gov](https://sos.noaa.gov))

NOAA View ([nnvl.noaa.gov/view/globaldata.html](https://nnvl.noaa.gov/view/globaldata.html))

Data In the Classroom ([dataintheclassroom.noaa.gov](https://dataintheclassroom.noaa.gov))

## OTHER

xmACIS2 - <http://xmacis.rcc-acis.org/>

NCEI - <https://www.ncdc.noaa.gov/temp-and-precip/Temperature/Precipitation Ranks, Climate at a Glance>

Climate Program Office Resources

([Climate.gov](https://climate.gov))

*Data Snapshots; Teaching Climate; News and Features*

National Integrated Heat Health Information System (NIHHIS) (<https://nihhis.cpo.noaa.gov/>)

US. Climate Resilience Toolkit

(<https://toolkit.climate.gov/>)

Climate Explorer (<https://toolkit.climate.gov/#climate-explorer>)

***Can't find data or don't know where to go? Email me!***

***tom.diliberto@noaa.gov***

Department of Commerce | National Oceanic and Atmospheric Administration



# Questions?