NORA INSTRATION U.S. DEBARTMENT OF COMMERCE

National Centers for Environmental Information

Hello from NCEI

NESDIS NCEI's Role in Building a
Climate Ready Nation, Past
Successes In Climate Services, and
Future Directions

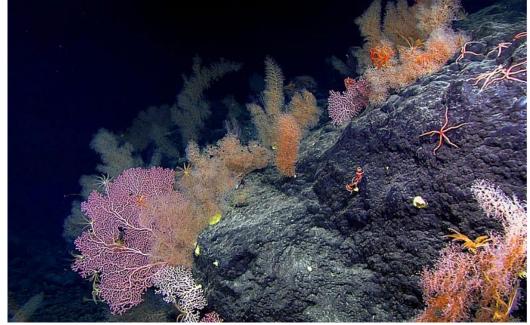
Deke Arndt, NCEI Director

Responsible for hosting and sharing one of the most significant archives on Earth

comprehensive oceanic, atmospheric, and geophysical data, and the people who build it

- From the depths of the ocean to the surface of the sun and from million-year-old sediment records to near real-time satellite images
- NCEI is the Nation's leading authority for environmental information

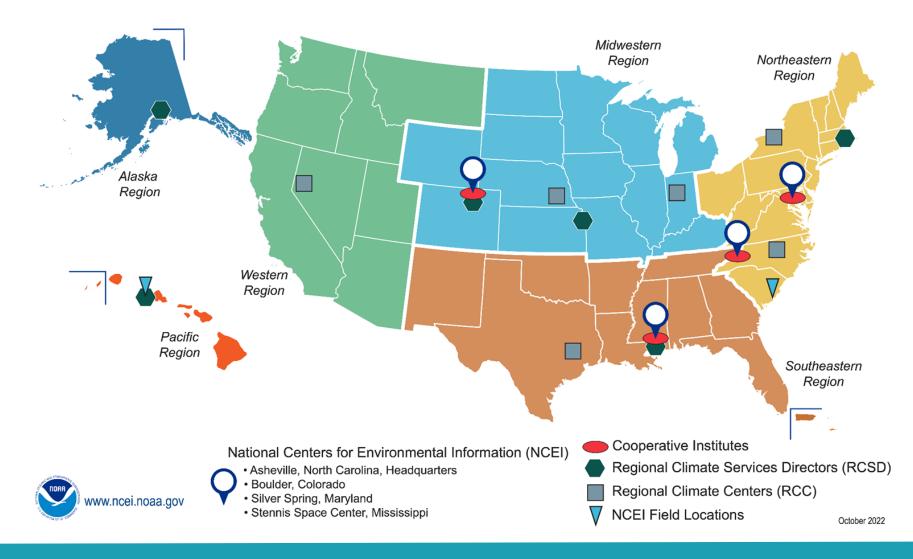






NCEI's Nationwide Presence

National Centers for Environmental Information (NCEI)





NOAA Data: High Impact, Global Reach

NOAA Observing Systems



















Scientific Data Stewardship

Research-quality products for decision making

Climate & Weather

- Climate Assessments
- Climate Normals
- Billion \$ Disasters
- Drought Monitoring

Oceans & Coasts

- Tsunami Warning
- Coastal Digital Elevation
 Models
- Extended Continental Shelf
- World Ocean Database

Geophysics

- Space Weather
- World Magnetic Model



Providing Climate Information to Inform the Future



Monthly U.S. & Global Climate Reports



U.S. Billion-Dollar Weather & Climate Disasters Report



U.S. Drought Monitor



Regional Snowfall Index



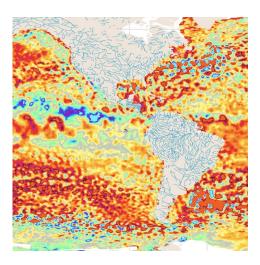
Tornado Climatology



Hourly Precipitation Data



Climate Extremes Index



Blended Sea Winds



Coast, Oceans, and Geophysics

Providing data and information from the Sun to Earth's seafloor



Ocean Exploration
Digital Atlas



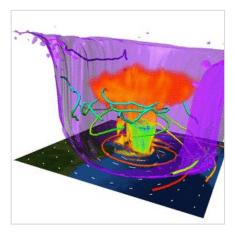
Enhanced Magnetic Model



Passive Acoustics



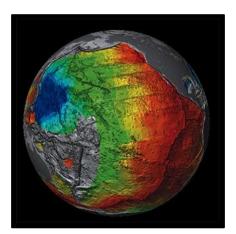
Gulf of Mexico Data Atlas



Model Reanalysis



Deep Sea Corals Data Portal



Bathymetry and Global Relief



World Ocean Database



Authoritative Climate Information and Services

"In the context of authoritative products and services, the notion of "authoritative" means...

... conferred by users

- Community /Partner
 Use and impact
- Proof is in their use
- Reliable, valuable

"service"

NCEI: — Aim here

"science"

... credibly represent earth system

- Accuracy, rigor
- Scientific credibility

... carefully sourced and transparent

- Discoverability
- Provenance
- Preservation

"stewardship"



NCEI User Engagement

- Reaching end-users for 70 years
- Value added climate information and data
- Years of systematically documenting user engagements, uses, and needs
- We serve retrospective information users (mostly)
- Our job and products pick up where the realtime missions ends





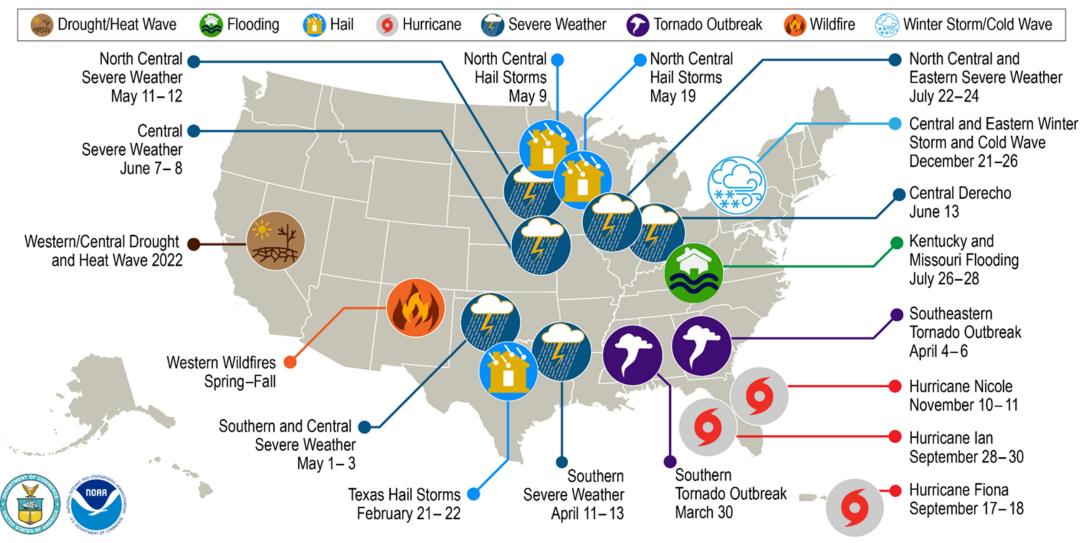






Our Relationship with the Earth System

U.S. 2022 Billion-Dollar Weather and Climate Disasters





This map denotes the approximate location for each of the 18 separate billion-dollar weather and climate disasters that impacted the United States in 2022.

Global Hazard Reporting

Selected Significant Climate Anomalies and Events in 2022



GLOBAL AVERAGE TEMPERATURE

The Jan-Dec 2022 average global surface temperature was the sixth highest since global records began in 1880.

The 2022 Arctic maximum and minimum extents were

ARCTIC SEA ICE EXTENT



both the 10th-smallest on record.

SEASON

8 hurricanes.

ATLANTIC HURRICANE

HURRICANE FIONA

In Sep, Fiona affected the Caribbean.

strongest and costliest post-tropical

AFRICA

year on record.

SOUTH AFRICA

South Africa during

GLOBAL CYCLONE ACTIVITY

88 storms, including 40 hurricanes/

mid-Apr.

cyclones/typhoons.

Record-breaking rain fell

across parts of eastern

2022 was Africa's 10th-warmest

cyclone on record for Canada.

Near-average activity:

14 storms, including

NORTH AMERICA

2022 tied with 2011 and 2019 as North America's 15th-warmest year on record.

CONTIGUOUS U.S.

Dry and warm conditions contributed to damaging wildfires across the West during Northern Hemisphere spring through fall.

HURRICANE AGATHA

Hurricane Agatha was the strongest May hurricane on record to hit-Mexico's Pacific coast.

EASTERN NORTH PACIFIC HURRICANE **SEASON**

Near-average activity: 19 storms, including 10 hurricanes.

HURRICANE IAN

After knocking out Cuba's power grid, lan made landfall in southwestern Florida just shy of Category 5 strength causing record heavy rain and catastrophic storm surges across parts of Florida.

SOUTH AMERICA

South America had its 12th-warmest year on record.

SOUTHERN SOUTH ÁMERICA

An intense heat wave affected parts of the region in Jan, resulting in multiple temperature records.

ANTARCTIC SEA ICE EXTENT

The Antarctic had its fourth-smallest annual maximum and its smallest minimum annual extents on record.

Europe had its second-highest yearly temperature on record. Warm and dry conditions during summer exacerbated drought conditions and fueled severe wildfires.

2022 was Asia's second-warmest year on record.

NORTH INDIAN OCEAN

7 storms, including 1 cyclone.

SOUTH INDIAN OCEAN

CYCLONE SEASON

Near-average activity:

9 storms, including 5

CYCLONE SEASON

Below-average activity:

cyclones.

Major cyclones Batsirai and Emnati, as

landfall in Madagascar in Feb – the first

made landfall in Madagascar in a single

well as Tropical Storm Dumako made

time since Jan 1988 that three storms

Heavy rain caused severe

flooding in parts of southern China in Jun. Some locations Record-breaking rain fell during Jul and Aug, causing were hit by the heaviest rain in 60 years. devastating floods that affected over 30 million

It made landfall in Nova Scotia as the people

MADAGASCAR

month.

JAPAN

A heat wave scorched Japan in Jun, marking the worst documented streak of hot weather in that month since

WESTERN NORTH PACIFIC TYPHOON **SEASON**

Below-average activity: 22 storms, including 12 typhoons.

WESTERN PACIFIC TYPHOONS

Typhoon Hinnamnor, which hit South Korea, and Typhoon Noru, which moved across the northern Philippines and into Vietnam and Laos, brought heavy rainfall, destructive flooding and strong gusts to the region in Sep.

OCEANIA

Oceania had a top-20 warm year.

AUSTRALIA

Extreme rain and flooding affected parts of eastern Australia from late Feb through early Mar.

SOUTHWEST PACIFIC CYCLONE SEASON

Below-average activity: 6 storms, including 2 cyclones.



Please note: Material provided in this map was compiled from NOAA's State of the Climate Reports. For more information please visit: https://www.ncei.noaa.gov/access/monitoring/monthly-report/global/

State Summaries: https://statesummaries.ncics.org/

Partners: CISESS-NC, NCEI, RCCs, State Climate Offices

51 concise summaries:

- historical perspectives on important features of each state's observed climate.
- Also show projected change in key climate metrics for two scenarios of future GHG emissions.

Available as web pages and 4-6 page PDFs.

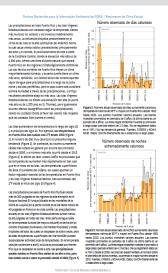


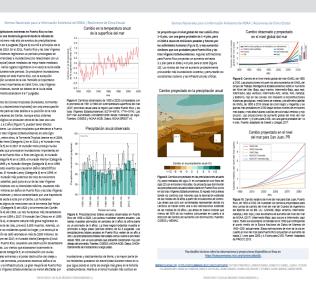
Centros Nacionales para la Información Ambiental de NOAA | Resúmenes de Clima Estatal 2022 150-PR

Mensajes clave

Las temperaturas en Puerto Rico y las Islas Vírgenes Estadounidenses han aumentado casi 2°F desde 1950. En un escenario de mayor emisiones, se proyecta un calentamiento históricamente sin precedentes durante este siglo, incluyendo un aumento en los eventos de calor extremo.





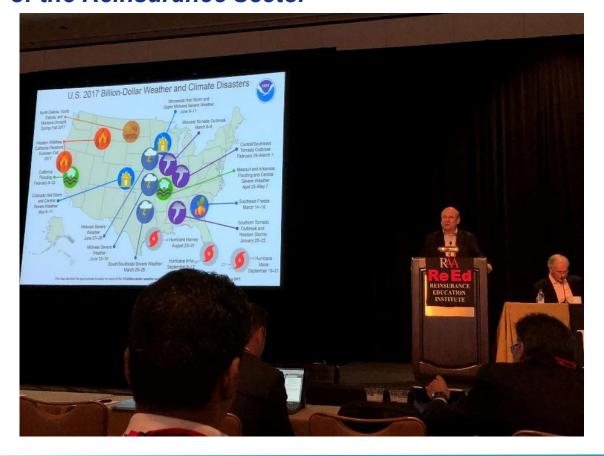


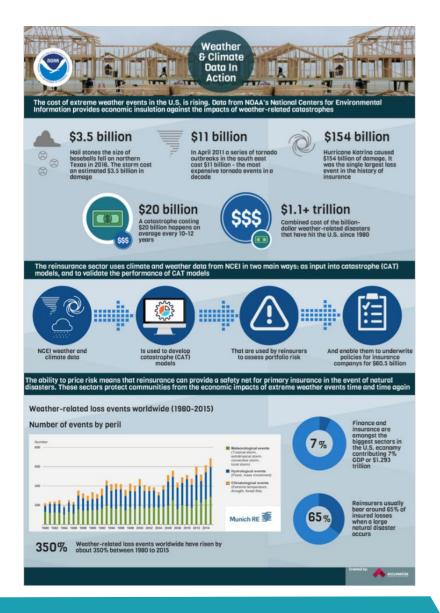


Long-Term Engagement Success

What Success Looks Like

Decades of Continuous Engagement Meeting the Needs of the Reinsurance Sector







Partnering with NWS HQ

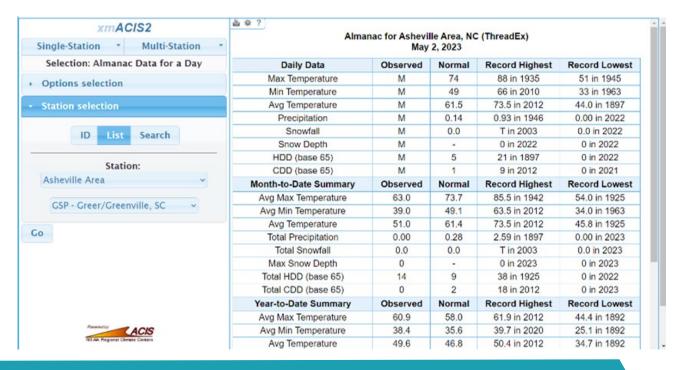
- Partnership for climate services
 - Key Example: This meeting jointly hosted by NWS and NCEI
 - Complementary activities at international, national, regional, state, and local levels
- A key part of the NCEI-NWS partnership revolves around stewardship
 & delivery of the climate records collected by NWS
 - o COOP
 - o ASOS
 - Upper Air
 - o SRRS





Partnering with NWS Regions and Field

- NCEI Regional Climate Services Directors coordinate with NWS Regional Climate Services Program Managers (matching regions)
- NCEI supports Regional Climate Centers to strengthen regional data, products, and delivery (complementary regions)
 - Wxcoder operations
 - o Datzilla
 - o xmACIS
 - o Threadex
 - o NOWData

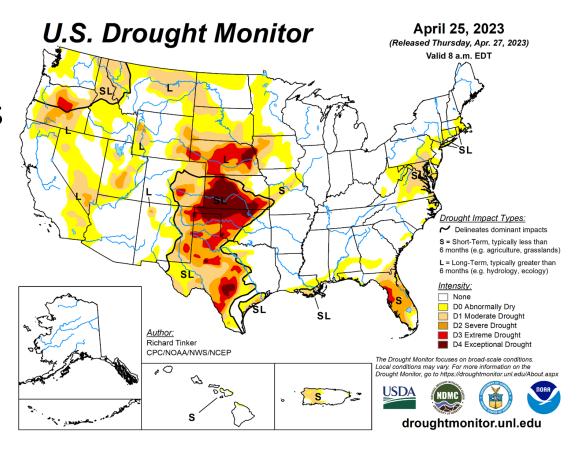




Partnering with NWS Climate Prediction Center

- Products
 - O US and North AmericanDrought Monitor co-authors
- Monitoring
 - Shared duties to monitor the climate of the planet
- Messaging
 - Shared webinars / telecons;
 support CPC's ENSO
 leadership

National Centers for Environmental Information - NCEI

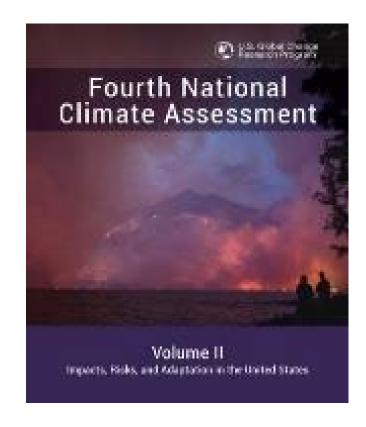




Partnering with OAR Climate Program Office

- National Climate Assessment
- Climate Indicators
- National Integrated Drought Information System
- Climate Change Attribution

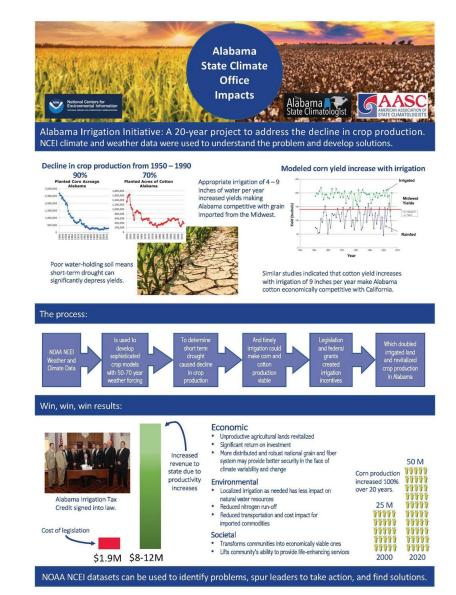






Partnering with States and AASC

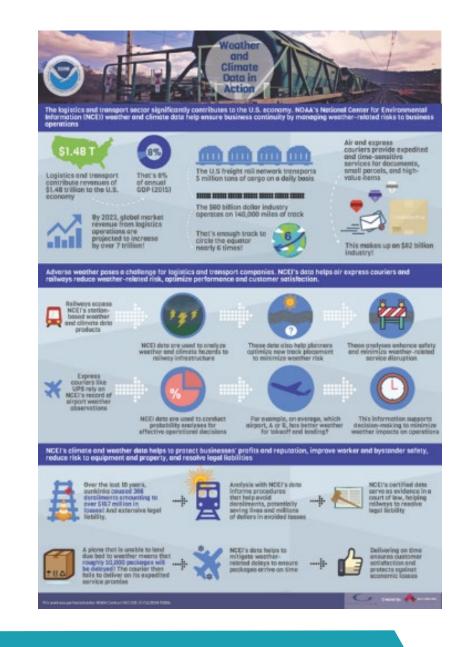
- NCEI leverages partnerships to reach into the state and local levels
 - o AASC
 - For delivery
 - o Inclusion in state activities (ex. drought or water management plans)
 - For understanding of reach and value





NCEI's Value To The Nation

- From NCEI: International Station Meteorological Climate Summary
- Uses: FedEx, UPS, and major railways land planes, set speed limits, and determine where to hub
- *Impact:* \$1.48T in revenues, brand image



NCEI's Value To The Nation

https://www.ncei.noaa.gov/about/our-impact

In-depth understanding of uses by

- Agriculture
- Coral Reef Management
- Aviation
- Finance/Reinsurance
- Retail & Manufacturing
- Drought & Livestock
- Logistics & Transportation
- Weather Service Providers
- Fisheries





NCEI's role in an increasingly climate-ready nation?

Perhaps New:

- Manage, serve and design tools built for forward-looking and direction-agnostic data
- "Climate and ..." data and analyses
- Extreme events and indirectly observed phenomena: data development and pertinent services
- Al-Ready formats; Al-informed work

Won't Change:

- Support partners and understand users
- Work "between the 20 yard lines"
- Relentlessly pursue "authoritative"
- Inform a nation that is more prosperous, more resilient, and more just



A Story

that has little to do with climate change, little to do with today, little to do with Asheville, and also, everything to do with all three

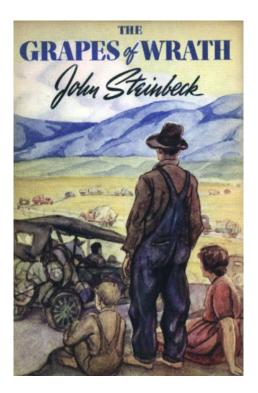


I'm from Oklahoma ...

... you may know part of our climate history

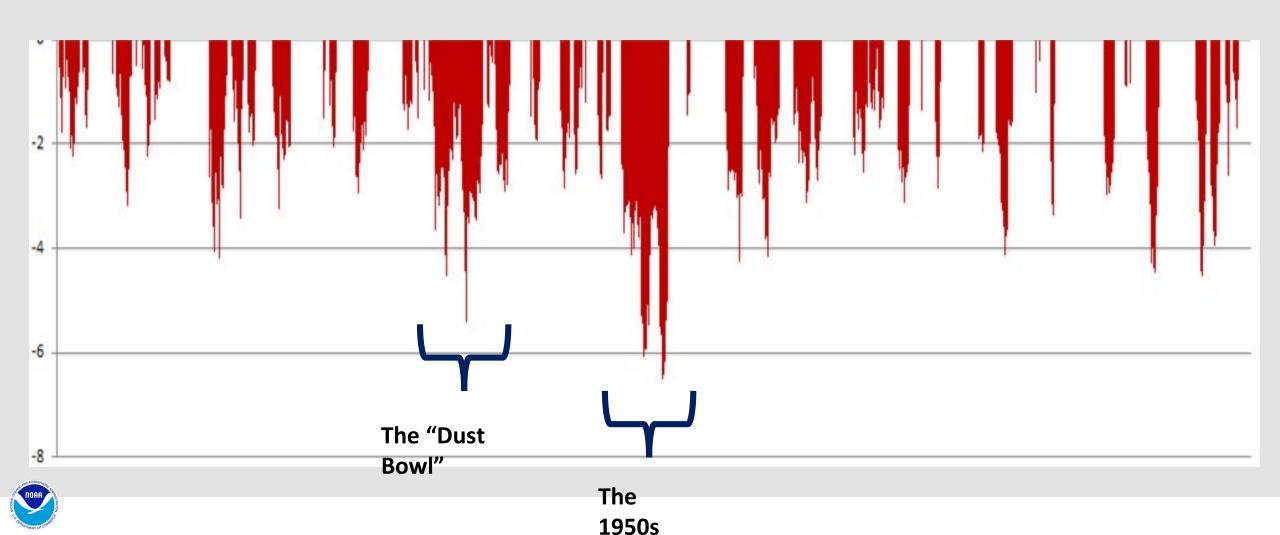




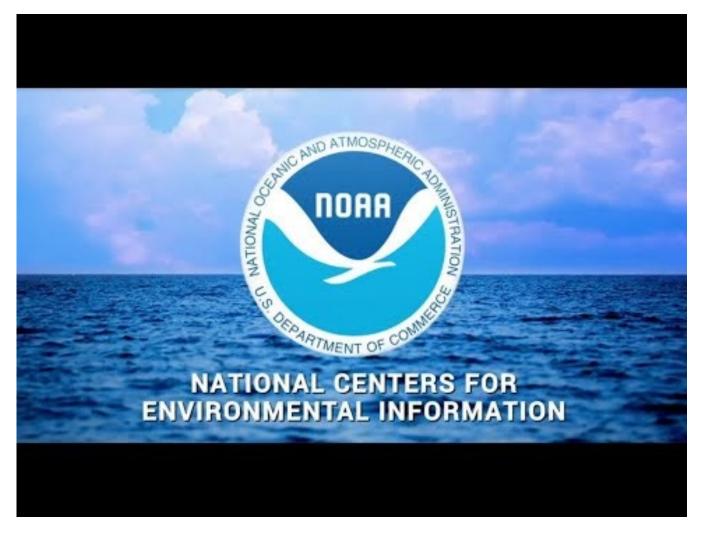




The Drought Decade Palmer Hydrologic Drought Index: OKCD2



Learn More About NCEI



www.ncei.noaa.gov



Archived slides



Climate Ready Nation: A Spectrum of Expertise

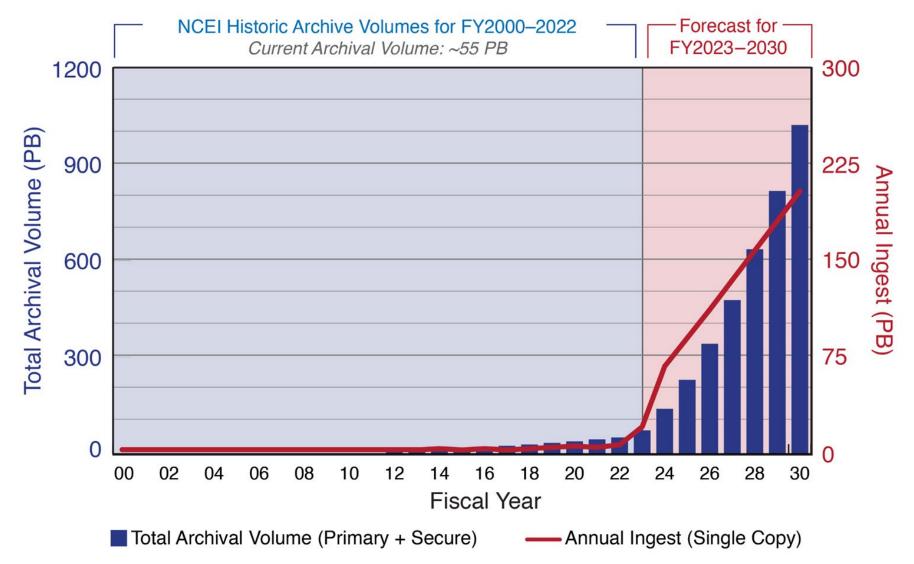
Climate Data and Products Climate Decision Support **Enabling Capacities** Analysis / **Product Enabling Capacities** Transmission / **Application** Application / Input Lines / Input Translation oEnd-user engagement Observations via oResearch / ○Baselines Knowledge transfer Expertise Place-based application partnership with of climate science to satellites, weather Development Assess, update, and oTraining climatologies governments*, the improve tools/services radars, buoys, ships, oAcademia, science support decision Extremes and **Climate reports/** private sector, federal aircraft, water level making (long-term and centers, modeling to maximize assessments with trends agencies, and the public. stations, etc. centers, industry short-term) usefulness and ○Outlooks Funding Opportunities future predictions and **Outilized by stakeholders** Data archives/ partners usability Convening Capacity oProjections projections Federal scientists, **Evaluation of user** curation (private sector, Research (Natural and Social ○Viewers/ Mapping oIT Infrastructure regional labs governments*, general need to better inform science) Geospatial Capacity public, etc.) data collection Communication, Outreach. Education Initial Risk and Focus Areas: Fire, Drought, Flood, Heat, Coastal, Marine Scales: Resources, and Mitigation. Temporal: Subseasonal to seasonal, annual, decadal, century Initial Partner Groups: DOC, Federal agencies, State and local leaders, Tribes, Spatial: National, Regional, Local Partnership Scope: Federal vs. Place-based Private sector, and the Public.



Bold - NCEI data, products, and expertise

NCEI Archival Volume History and Forecast

Increasing Data Volumes from Station, Model, Radar, UxS, Acoustics, 'Omics, and Satellite Sources



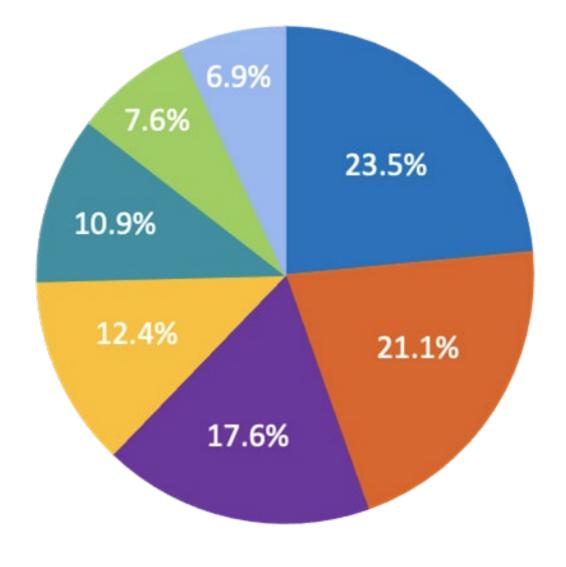


NCEI's Value to the Nation

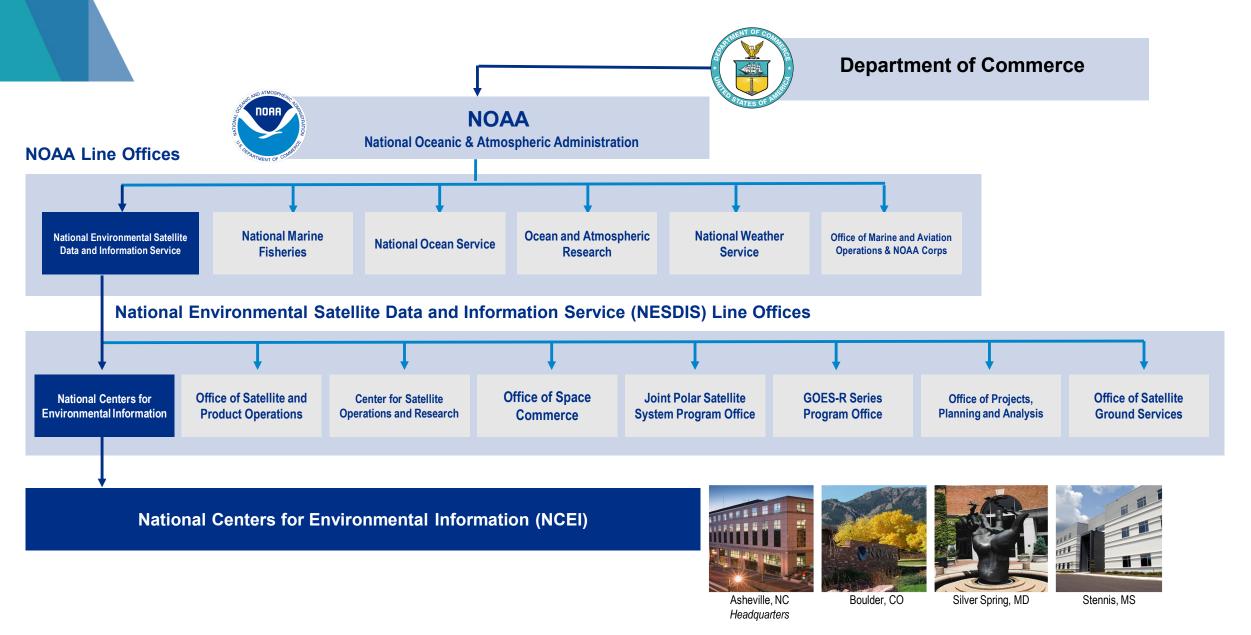
NCEI Stakeholders by Sector



- Ecosystems (Agriculture/Aquaculture)
- Transportation and Infrastructure
- Energy
- Insurance, Finance, and Legal
- Health and Emergency Management
- Higher Education









Continue our Productive Relationship with CISESS

Lean-ahead science:

e.g., Precipitation IDF curves, NCA model for transparency, integrate satellite information into climate products & services

Do-it-right science:

e.g., rapid response attribution, NCA Technical Support Unit

Service delivery & relationships:

e.g., listening sessions, SCONC/CAP relationship, climate monitoring improvements

Technical / Architectural acumen:

e.g., cloud and AI/ML leadership, invaluable to NCEI

Joint workforce development:

e.g., training, recruitment



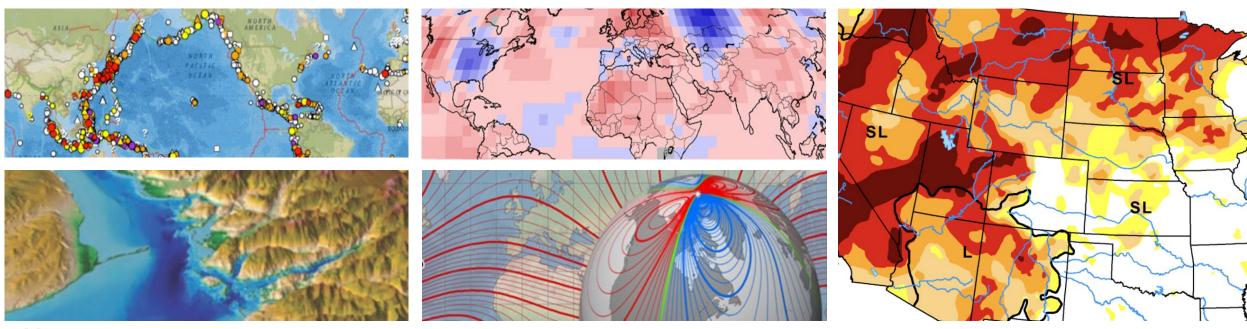
NCEI's Value to the Nation

Range of Products

- Time scale: Hourly to Decadal
- Geographic scale: Local to Global

Technical Expertise

- Aerosols to Coastal Inundation
- Drought Monitoring to Ocean Surface Winds
- Paleoclimatology to US/Global Climate Monitoring





Responsible for hosting and providing access to one of the most significant archives on Earth

with comprehensive oceanic, atmospheric, and geophysical data

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