
USGCRP Climate Indicators: An Interagency Collaboration

Northeast Monthly Climate Update

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U.S. Global Change
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Why Use Indicators?

An effective means for communicating the science.

- A powerful way to make complex science more ‘accessible’.
- Helps characterize change (i.e., patterns of change, rates of change, timing, frequency, and intensity of events).

Helps people understand the relevance of these changes.

- ‘Connects the dots’ between climate change and our lives and values (e.g., Why does this matter to me?).
- Provides a foundation for informing decisions and further investigation.



USGCRP Background

- The U.S. Global Change Research Program (USGCRP) was established by Presidential initiative in 1989 and mandated by Congress in the Global Change Research Act (GCRA) of 1990.
- Through the GCRA, USGCRP is mandated to produce a quadrennial assessment, which has become known as the National Climate Assessment (NCA), and an annual report to Congress known as *Our Changing Planet*, which addresses USGCRP's progress towards achieving its goals.

The Fourth NCA (NCA4) builds on the work of previous assessments (2000, 2009, 2014). It is being developed in two volumes:

- Volume I: Climate Science Special Report (CSSR), final released 11/3/17
- Volume II: released for public and expert reviews on 11/3/17.
 - Expected completion: December 2018



USGCRP Sustained Assessment Goals

How can USGCRP and Agencies meet program, public, and legislative needs?

- Recommendation: **Indicators Platform** to serve as a foundational element:
 - Highlight Agency research and data.
 - A cross-cutting resource of information across a broad range of scales/topics/sectors.
 - A means for providing readily accessible and vetted climate change science.
 - A way to provide “Interim assessment information” between the major National Climate Assessment reports.

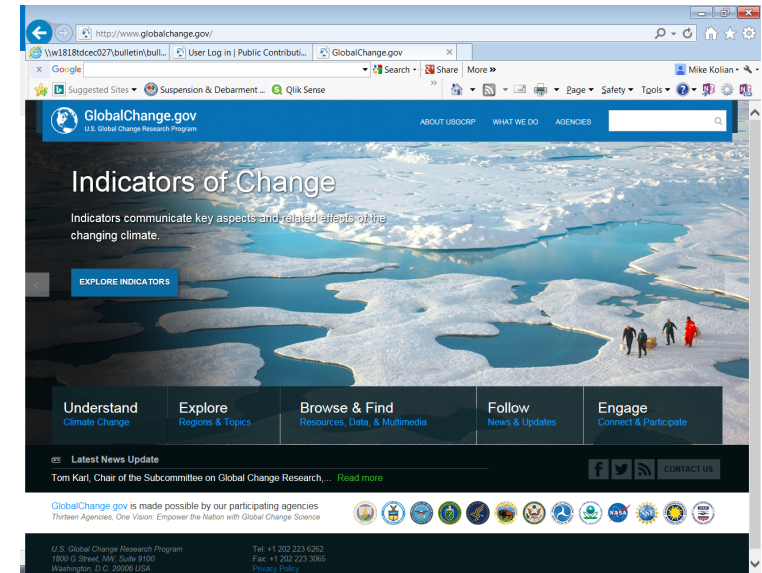
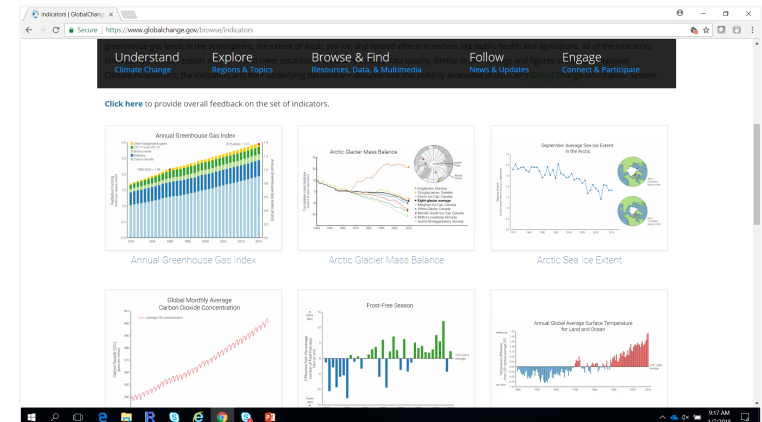
Sustained Assessment Ecosystem



USGCRP Indicators Website

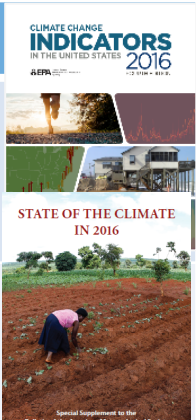
- Accessible website of indicators
- Documentation and data available through GCIS – consistent with NCA requirements
- Routine maintenance eventually to reside with NOAA's TSU for sustained management
- All the indicators are based on a set of criteria
- Plan to add new indicators, broaden scope over time, organize topically

<http://www.globalchange.gov/browse/indicators>

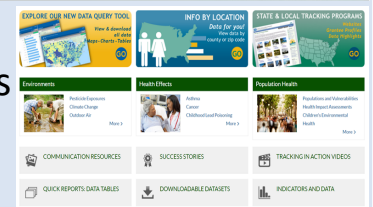
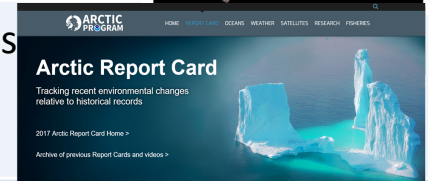
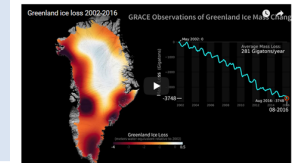


A Few Existing Indicator Efforts

Climate-Related Indicators	Website	Products/Features
EPA's Climate Change Indicators in the U.S.	epa.gov/climate-indicators	37 indicators Website, Print report Annual
NOAA's State of the Climate (aka BAMS report)	ncdc.noaa.gov/sotc	~100 indicators Print report Annual
NASA Indicators of a Warming World (Vital Signs)	climate.nasa.gov/vital-signs	6-8 indicators Website, dashboard Annual/Real-time
NOAA's Arctic Report Card	arctic.noaa.gov/Report-Card	~12 indicators Website Annual
CDC's Environmental Public Health Tracking Program	ephtracking.cdc.gov/	Environmental, Health indicators Website Annual



Video: Greenland ice loss 2002-2016





CLIMATE CHANGE INDICATORS IN THE UNITED STATES 2016

FOURTH EDITION



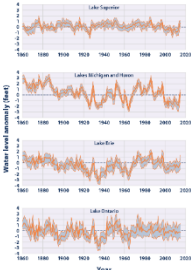
EPA's Climate Change Indicators in the United States

- Primary goal is to communicate the causes and effects of climate change
- Observations only (no projections)
- Features 37 climate indicators (100+ figures) in the areas of GHGs, weather and climate, oceans, snow and ice, health and society, and ecosystems
- EPA partners with over 40 agencies and organizations; fed and non-fed data sources
- Vetted, peer-reviewed report
- Routinely updated with new data

U.S. Environmental Protection Agency. 2016. Climate change indicators in the United States, 2016. Fourth Edition. EPA 430-R-16-004. www.epa.gov/climate-indicators.

EPA Indicators and NCA4 Regions

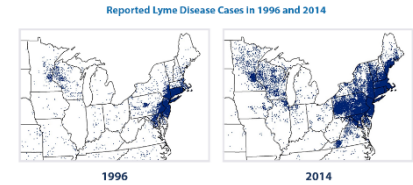
Great Lakes Water Levels, 1860-2015



Lake Ice, 1905-2015

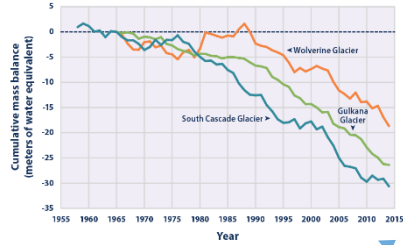


Lyme Disease

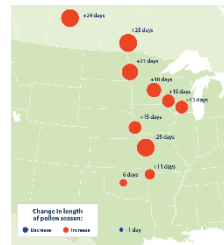


Data source: CDC, Centers for Disease Control and Prevention, 2015. Lyme disease data and statistics: www.cdc.gov/lyme/disease/index.html. Accessed December 2015.
For more information, visit U.S. EPA's "Climate Change Indicators in the United States" at www.epa.gov/climate-indicators.

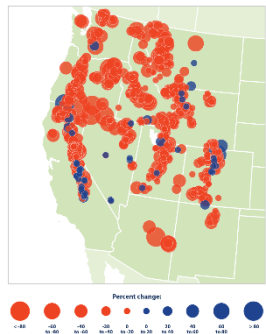
Glaciers, 1955-2015



Ragweed Pollen Season, 1995-2015

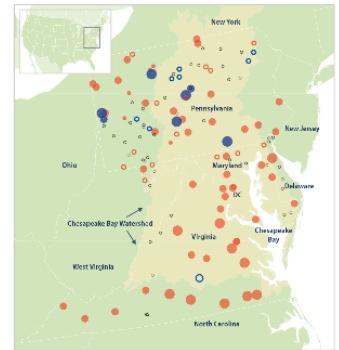


Snowpack, 1955-2016

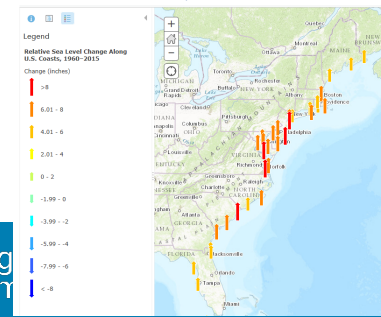


Stream Temperature, 1960-2014 Chesapeake Bay Region

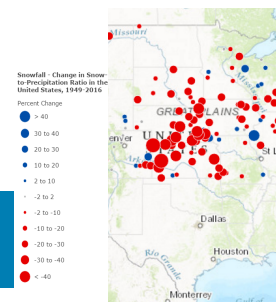
Changes in Stream Water Temperatures in the Chesapeake Bay Region, 1960-2014



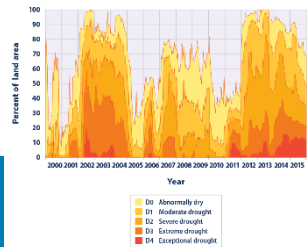
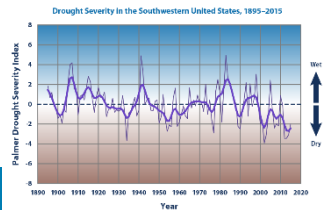
Sea Level, 1960-2015



Snowfall, 1949-2016



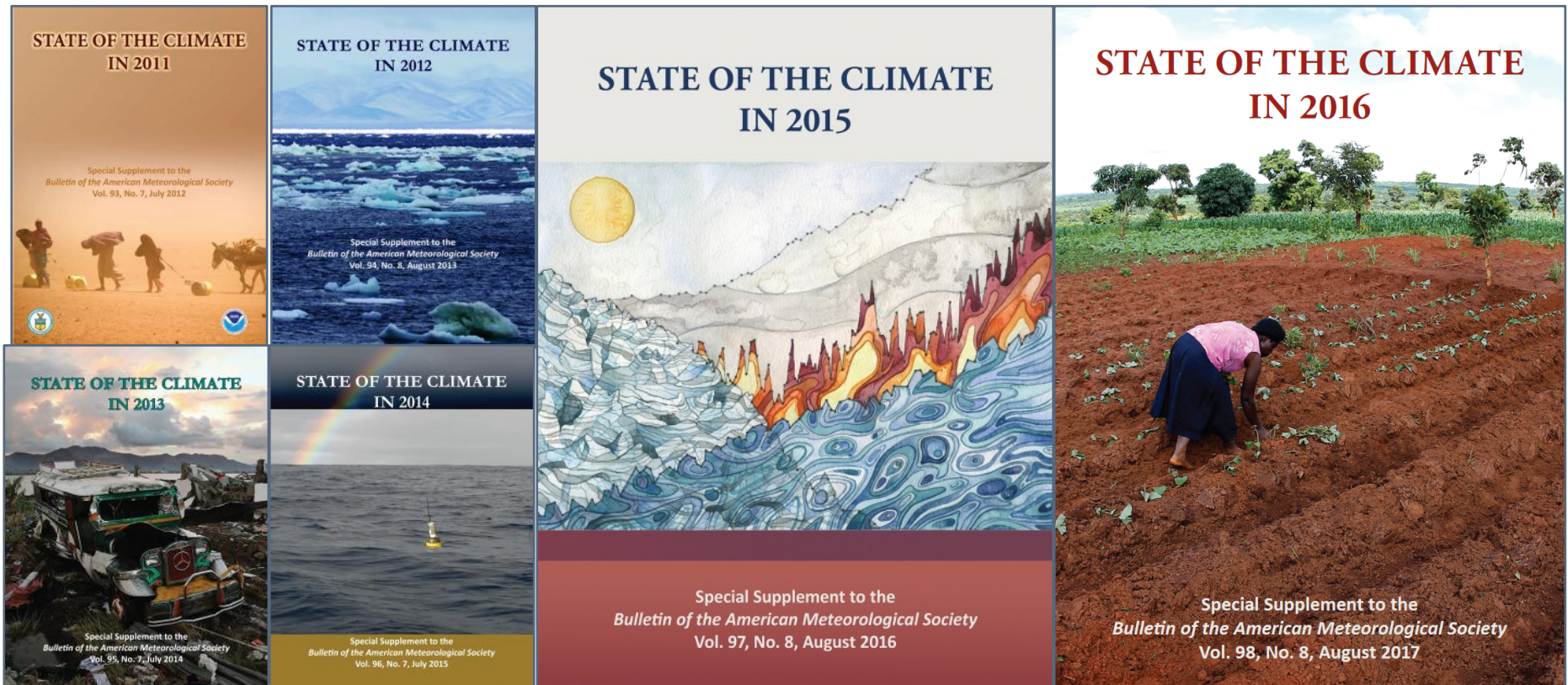
Drought in the Southwest



Climate Change Program

State of the Climate series

Bulletin of the American Meteorological Society



27th Year of Publication

- Many scientists from many disciplines from around the world fit the pieces of Earth's climate system and its changes together to connect the dots
 - Dozens of essential climate indicators, extreme weather and climate events, historical context
- This report does not pursue “attribution” or contain forecasts, scenarios, or projections



468 authors from 64 countries; 16 editors on 3 continents



Atmosphere



Land



Oceans



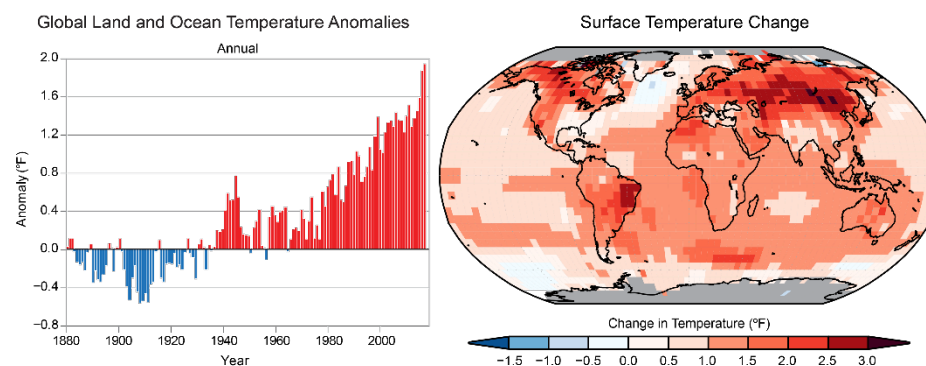
Snow and Ice



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Indicators and 'Assessment' Products

- Indicators as technical input for the 4th National Climate Assessment.
- Indicators drawn from Assessment products.
- Indicators developed for future reports.



Source: Climate Science Special Report (CSSR), 2017

Core reports

Climate Science Special Report (CSSR)

<https://science2017.globalchange.gov/>

State of the Carbon Cycle Report

<https://www.carboncyclescience.us/>

NOAA State Summaries

<https://statesummaries.ncics.org/>



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What makes a great Indicator?

- Indicators can indicate:
 - Climate change itself (“physical indicators”, straightforward and familiar)
 - Impacts of climate change (“extremes”, costs, etc.)
 - Measures of vulnerability or resilience (less robustly developed)
- Capturing two of these in a robust way is even better!
- Regionally relevant; nationally significant
- Data sets identified
- Science / methods documented
- Constituent data set(s) have robust stewardship
- Data updated at least occasionally (even better: routinely)
- Indicator has a compelling and graspable “story” on how it connects the climate system with our lives
- Indicator lends itself well to quick and accurate interpretation



What is the process?

- There's a process adapted from the National Climate Assessment itself
- The process is fairly straightforward – steps are documented and templates available
- The most important step is identifying a “champion” for an indicator
 - This person serves as Subject Matter Expert, primary content provider/reviewer, and go-to reviewer at critical steps



Outlook: 2018 and Beyond

- Updates to existing indicators; Adding 10-12 new ones (2018)
- Launch a revised website (May 2018) that incorporates broader “platform” concept – Leveraging USG efforts.
- Increase membership and contribution!
 - Distribute a “How-to” guide on new indicators (e.g., process, criteria).
 - Hold expert workshops to identify/develop indicators.
- Ramp up role as input to the National Climate Assessment process and future products.
- Maintain a manageable and efficient approach (not a growing expenditure or clearinghouse of information).



Questions?

Connect with us:



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