

Additional Resources for Understanding Climate Change Impacts on Water Resources

Below are course-related resources, related training sources, and other web resources to provide additional details and information to supplement the course.

Course-Related Resources

Climate Change 101

<https://nca2023.globalchange.gov/>

The most recent National Climate Assessment can always be found at <https://www.globalchange.gov/>

The National Climate Assessment (NCA) is a quadrennial assessment conducted by the US Global Change Research Program which is comprised of 15 federal agencies. The NCA:

Integrate[s], evaluate[s], and interpret[s] the findings of the Program and discuss[es] the scientific uncertainties associated with such findings

Analyze[s] the effects of global change on the natural environment, agriculture, energy production and use, land and water resources, transportation, human health and welfare, human social systems, and biological diversity

Analyze[s] current trends in global change, both human-induced and natural, and project[s] major trends for the subsequent 25 to 100 years

Climate Change 101

<https://nca2023.globalchange.gov/>

What is causing climate change?

<https://nca2023.globalchange.gov/chapter/2/>

What is causing this rise in greenhouse gases?

<https://nca2023.globalchange.gov/chapter/2/>

Xi-Liu YUE, Qing-Xian GAO, Contributions of natural systems and human activity to greenhouse gas emissions, *Advances in Climate Change Research*, Volume 9, Issue 4, 2018, Pages 243-252, ISSN 1674-9278, <https://doi.org/10.1016/j.accre.2018.12.003>.

(<https://www.sciencedirect.com/science/article/pii/S1674927818300376>)

What are the indicators of climate change?

<https://nca2023.globalchange.gov/#overview-section-4>

<https://www.epa.gov/climate-indicators>

The Water Cycle

<https://nca2023.globalchange.gov/chapter/4/>

<http://water.usgs.gov/edu/watercycle.html>

What are the observed and projected changes in the U.S.?

<https://nca2023.globalchange.gov/#overview-section-2>

Vulnerabilities of Water Resources to Climate Change

Office of Water 2022-2026 Climate Adaptation Implementation Plan,

https://www.epa.gov/system/files/documents/2022-10/bh508-OW-12113_ClimateAdaptatImplementPlan_508final.pdf

Changes to Water Supplies and Quality

<https://nca2023.globalchange.gov/chapter/4/>

EPA National Water Program Highlight: Colorado River

<https://www.usbr.gov/ColoradoRiverBasin/index.html>

<https://www.whitehouse.gov/briefing-room/statements-releases/2023/04/06/fact-sheet-biden-harris-administration-announces-new-investments-to-protect-the-colorado-river-system/>

https://www.usbr.gov/watersmart/bsp/docs/finalreport/ColoradoRiver/CRBS_Executive_Summary_FINAL.pdf

EPA National Water Program Highlight: WaterSense

<http://www.epa.gov/watersense/>

Castine, ME Case Study

<https://epa.maps.arcgis.com/apps/MapSeries/index.html?appid=22ce8bf3bcd742b68101d679828a00d7>

Drought Response and Recovery; A Basic Guide for Water Utilities

(https://www.epa.gov/sites/default/files/2017-10/documents/drought_guide_final_508compliant_october2017.pdf)

Increased Water Pollution

<https://nca2023.globalchange.gov/chapter/4/>

<https://www.epa.gov/nutrientpollution/effects-environment>

Office of Water 2022-2026 Climate Adaptation Implementation Plan,

https://www.epa.gov/system/files/documents/2022-10/bh508-OW-12113_ClimateAdaptatImplementPlan_508final.pdf

EPA National Water Program Highlight: NPDES

<https://www.epa.gov/npdes/climate-and-extreme-weather-tools-npdes-program>

EPA National Water Program Highlight: Green Infrastructure

Green Infrastructure websites:

<https://www.epa.gov/green-infrastructure>

<https://www.epa.gov/nps/urban-runoff-low-impact-development>

https://www.epa.gov/system/files/images/2021-08/climate_res_infographic-1.jpg

Kansas City, MO Case Study

Stormwater Management Model-Climate Adjustment Tool; <http://www.epa.gov/water-research/stormwater-management-model-swmm>

National Stormwater Calculator-Climate Assessment Tool; <http://www.epa.gov/water-research/national-stormwater-calculator>

Risks to Infrastructure and Operations

<https://nca2018.globalchange.gov/>

<https://www.epa.gov/climate-adaptation>

<http://www.epa.gov/climate-change-water-sector/planning-and-management-programmatic-response-climate-change-and-water>

EPA National Water Program Highlight: Clean Water and Drinking Water State Revolving Funds

<https://www.epa.gov/cwsrf>

<https://www.epa.gov/dwsrf>

EPA National Water Program Highlight: FFRMS

<https://www.epa.gov/system/files/documents/2022-09/Federal%20Flood%20Risk%20Managment%20Standard%20.pdf>

EPA National Water Program Highlight: WIFIA

<https://www.epa.gov/wifia>

EPA National Water Program Highlight: CRWU

<http://www.epa.gov/crwu>

https://www.epa.gov/sites/default/files/2016-06/documents/rural_and_small_systems_guidebook_-_may_2016_508.pdf

South Monmouth, NJ Case Study

http://www.onewaterohio.org/docs/1300.EPAs_Climate_Resilience_Evaluation_and_Awareness.pdf

Video: <https://www.fema.gov/media-library/assets/videos/86134>

<https://femacontract.com/news/sewerage-authority-mitigation-plan-reduces-risk-of-environmental-disaster/>

Wailuku-Kahului, HI Case Study

Wailuku-Kahului; <http://files.hawaii.gov/dlnr/meeting/submittals/140411/K-2.pdf>

Watershed Degradation

<https://www.epa.gov/hwp/benefits-healthy-watersheds>

<https://nca2023.globalchange.gov/chapter/8/#fig-8-4>

EPA National Water Program Highlight: Healthy Watersheds Program

<https://www.epa.gov/hwp>

<http://www.epa.gov/rps/>

<http://gispub.epa.gov/wsio/>

Taunton River, MA Case Study

<https://www.manomet.org/publication/manomet-climate-change-adaptation-plan-guides-efforts-in-taunton-river-watershed>

<https://kresge.org/sites/default/files/Uploaded%20Docs/Manomet%20CCS.pdf>

Coastal Impacts

<https://nca2023.globalchange.gov/chapter/9/>

EPA National Water Program Highlight: Climate Ready Estuaries

<http://www.epa.gov/cre>

San Juan, PR Case Study

http://water.epa.gov/type/oceb/nep/programs_sjb.cfm

<http://www.estuario.org/>

<http://www.epa.gov/national-aquatic-resource-surveys/national-coastal-condition-assessment>

Ocean and Coastal Acidification: The *Other* CO₂ Problem

https://oceanacidification.noaa.gov/wp-content/uploads/2023/08/IWGOA_Vulnerability_Assessment_2023.pdf

<https://www.epa.gov/ocean-acidification>

<https://nca2023.globalchange.gov/>

EPA National Water Program Highlight: National Estuary Programs & Geographic Programs

<https://www.epa.gov/water-infrastructure/geographic-programs>

<https://www.epa.gov/nep>

<https://www.epa.gov/ms-htf/gulf-hypoxia-program>

Explore Your Climate Region

Supplemental Scientific Resource:

Thomas Johnson, Jonathan Butcher, Stephanie Santell, Sara Schwartz, Susan Julius, Stephen LeDuc; *A review of climate change effects on practices for mitigating water quality impacts*. Journal of Water and Climate Change 1 April 2022; 13 (4): 1684-1705. doi: <https://doi.org/10.2166/wcc.2022.363>

Regional Impacts of Climate Change: Northeast

<https://nca2023.globalchange.gov/chapter/21/>

Regional Impacts of Climate Change: Southeast and Caribbean

<https://nca2023.globalchange.gov/chapter/22/>

<https://nca2023.globalchange.gov/chapter/23/>

Regional Impacts of Climate Change: Midwest

<https://nca2023.globalchange.gov/chapter/24/>

Regional Impacts of Climate Change: Great Plains

<https://nca2023.globalchange.gov/chapter/25/>

<https://nca2023.globalchange.gov/chapter/26/>

Regional Impacts of Climate Change: Southwest

<https://nca2023.globalchange.gov/chapter/28/>

Regional Impacts of Climate Change: Northwest

<https://nca2023.globalchange.gov/chapter/27/>

Regional Impacts of Climate Change: Alaska and the Arctic

<https://nca2023.globalchange.gov/chapter/29/>

Regional Impacts of Climate Change: Hawai'i and the U.S. Affiliated Pacific Islands

<https://nca2023.globalchange.gov/chapter/30/>

You Have Completed This Course!

<https://www.epa.gov/arc-x>

Related Training

U.S. EPA:

- Local Government Climate Adaptation Training - <https://www.epa.gov/arc-x/local-government-climate-adaptation-training>
- U.S. EPA's YouTube Video Playlist for Climate Change - <https://www.youtube.com/playlist?list=PLBhfkujnoRB2-MJKSMN9SL0jZOjXz8Am>
- U.S. Climate Resilience Toolkit Training Course - <http://toolkit.climate.gov/training-courses>

National Oceanic and Atmospheric Administration:

- <http://climate.gov/teaching>
- <https://www.youtube.com/user/NOAAClimate/videos>

U.S. Global Change Research Program:

- <https://www.globalchange.gov/resources>

National Aeronautics and Space Administration:

- http://climate.nasa.gov/climate_resource_center/interactives/quizzes

U.S. Department of Agriculture Forest Service:

- <http://www.fs.usda.gov/ccrc/>

U.S. Department of Agriculture Natural Resources Conservation Service:

- <https://www.nrcs.usda.gov/conservation-basics/natural-resource-concerns/climate>

Additional Web Resources

To understand more about climate change impacts and adaptation, visit:

<https://nca2023.globalchange.gov/>

To learn more about climate change impacts on water resources, visit:

<https://www.epa.gov/climate-change-water-sector>

To find more about information about what EPA is doing to reduce greenhouse gases, visit:

<http://www.epa.gov/climatechange>

To read other federal adaptation and implementation resources, visit:

<https://www.globalchange.gov/our-work/interagency-groups/farg>

To view the President's Climate Action Plan, visit:

<https://obamawhitehouse.archives.gov/sites/default/files/image/president27sclimateactionplan.pdf>

To access the Climate Resilience Toolkit, visit:

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