

NLC Climate Change Work Group
Module 02: Climate Change Science
Workshop



January 16, 2025

NLC Climate Change Work Group



Workgroup

- History
- Mission

Resource Modules

- Module 1 - Coordinator Role
- Module 2 - Science
- Module 3 - Adaptation
- Module 4 - Advocacy
- Module 5 - Education

Next Steps

- Conduct training
- Continue recruiting coordinators



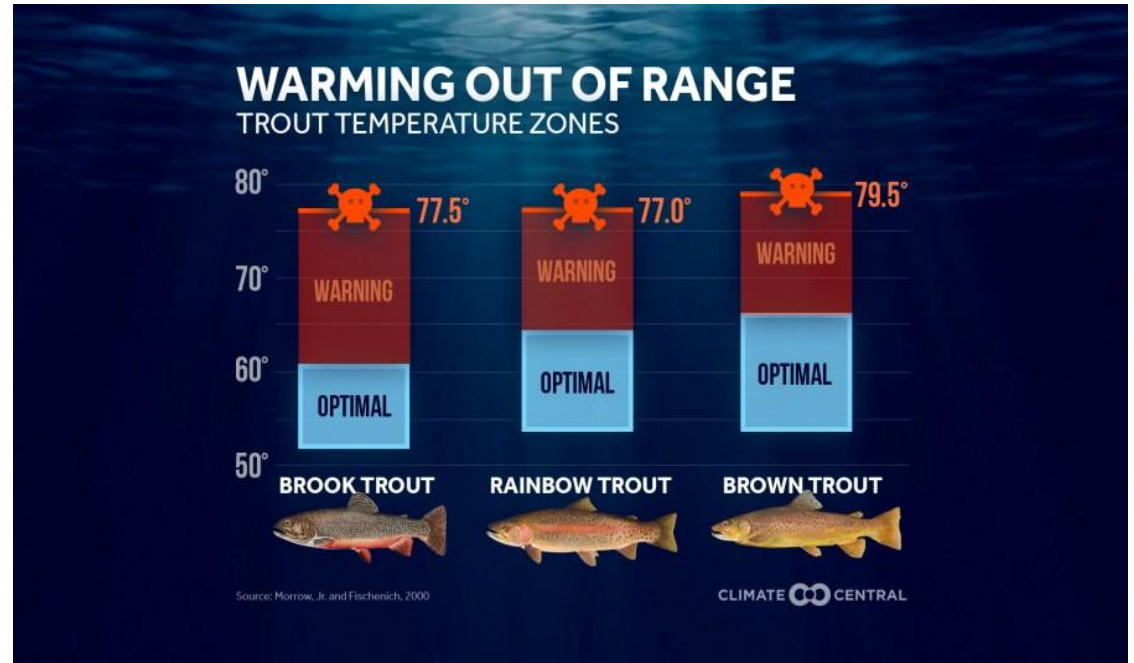
Ed Northern, Mackay Reservoir Idaho



Climate Change Work Group History



Founded in 2013
to raise awareness
of climate change.



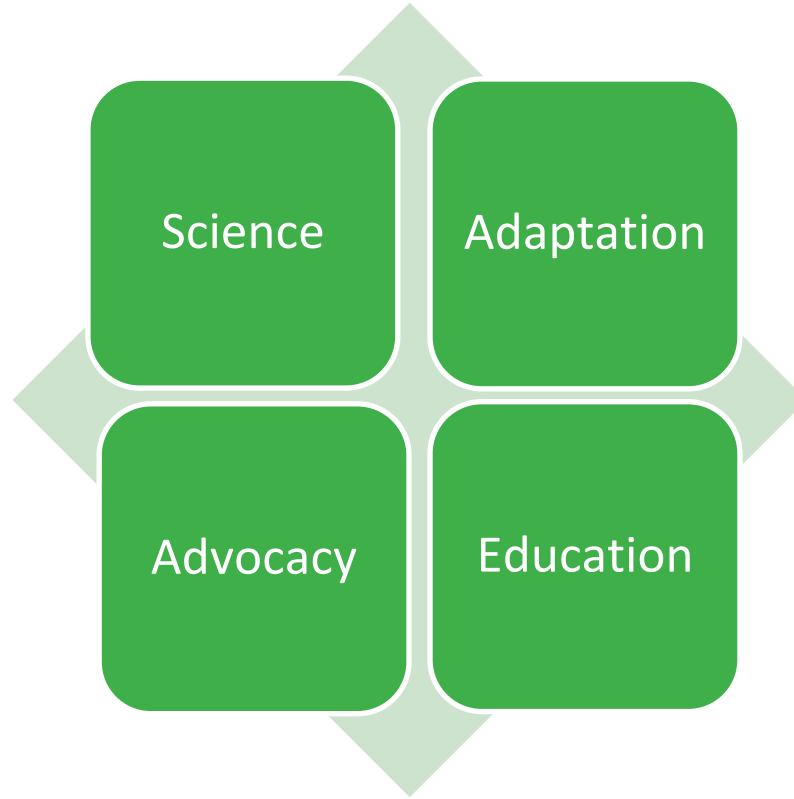
Climate Change Work Group Mission



Empower TU members to become **effective champions** for TU climate change policy and initiatives, in their communities, regionally and nationally, through science-based education, communication, and advocacy.



CCWG Resource Modules



CCWG Module Resources

- Tools
- Tips
- Facts
- References
- Links
- Contacts

Note that third party perspectives and opinions presented in the resources and examples may not be endorsed by TU.

Climate Change Coordinator Training - Trout Unlimited



[Home](#) > [Get Involved](#) > [Volunteer Tacklebox](#) > [Council Leader Resources](#) > [National Leadership Council](#) > [NLC Conservation Workgroups](#) > [Climate Change Workgroup](#) > [Clim](#)



Climate Change Coordinator Training - Trout Unlimited



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CCWG Module Resources



Our most effective messaging is peer-to-peer!



Use the **CCWG Module Resource** to:

- **Request a regular timeslot** (5–10 minutes) on Climate Change at your monthly chapter business meeting or quarterly council meeting.
- **Prepare a short, impactful presentation** for each opportunity using content provided by the CCWG module or your own research efforts.
- **Establish a dedicated section** of your chapter/council website and other social media where you provide dependably fresh messaging and links.
- **Regularly update** your chapter and council social media with Climate Change information.

CCWG Bit-sized Pieces



Take the lead on climate change adaptation projects in your area.

- **Concentrate on TU efforts** to reduce the effects of climate change to assure you are an effective spokesperson for TU.
- **Coordinate with your Conservation chair** and other NLC Workgroup representatives on their key initiatives.
- **Leverage additional outside resources** that reinforce or amplify the TU mission and messaging by partner with a local agency to cosponsor a program of climate change activities.
- **Invite a representative** to present at a monthly meeting and advertise it in your newsletter and on social media.

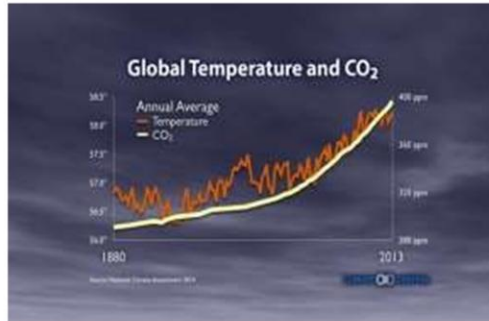
Reach out.

- Encourage chapter/council members to **join organizations** sharing TU's goal of reducing emissions.
- Encourage your chapter/council members to **ask their members of Congress** to support legislation that will lower emissions.

Module 02: Science

What causes this warming trend?

- Increased levels of Greenhouse Gases* are correlated with temperature increases



*CO₂, CH₄, NO_x and ozone



Purpose of Climate Change Module 02



This module is intended to help Climate Change Coordinators communicate a consistent **TU science-based message**; one that can and should be in your own voice and come from your observations and experiences.

- ✎ I'm a mom. I care about my daughters' future.
- ✎ I love nature and feel an ethical need to conserve it.
- ✎ I spend a ton of time outdoors and my experience is impacted frequently.
- ✎ I am not religious – but you may be, and that might be helpful.
- ✎ And yes, I'm a scientist, and the science of CC is clear.

Module 02: Science

RESOURCE 01: TU's Policy on Climate Change

RESOURCE 02: TU FAQs

Module 02: Science

RESOURCE 01

TU Climate Change

Table of contents

- Introduction
- What's Happening
- Risks & Impacts to Trout
- Climate Science & Adaptation Work
- Policy Positions
- Take Action



RESOURCE 01

TU Climate Change

A fundamental shift

We need to **reduce greenhouse gas emissions** from existing energy production and make a fundamental shift toward renewable technologies.

At the same time, we should **address the effects of climate change** facing us today, and that requires federal and state funding that matches the scope of the problem.

Climate change adaptation protects people and communities from flood, wildfire, and drought while making trout and salmon fisheries more resilient. It also provides high-paying jobs in rural communities across America.

RESOURCE 01

TU Climate Change Policies

1. **Conserve land and water** to increase the natural storage of carbon.
2. **Mitigate the effects** of a hotter, drier, more turbulent climate.
3. **Reduce the U.S. carbon footprint**, including greenhouse gas emissions, and encourage renewable energy.



RESOURCE 02: TU FAQs

How do scientists monitor climate change and what evidence is there that it is changing?

Air temperatures around the globe are monitored by NASA's Goddard Institute for Space Studies, NOAA and others. Global temperatures have increased steadily since the beginning of the industrial revolution. The longest continually running data set is maintained by NASA and dates back to 1880 as shown below. According to NASA data, which is consistent with NOAA and other records, 16 of the 17 warmest years in the 136-year record have occurred since 2001.

RESOURCE 02: TU FAQs

Do 97% of scientists really believe that climate changes is human caused?

A 2009 Earth and Space Science News study showed 97.5% of climate scientists actively studying climate change believe that it is human caused. Slightly less than 90% of climatologists not currently active in climate change research believe that humans are causing climate change. A 2021 Cornell study showed 99.9% of peer reviewed scientific papers agree climate change is primarily human caused.

Module 02: Science

RESOURCE 03: Climate Change & Trout:
Impacts, Opinions & Ways you can help - PowerPoint

RESOURCE 04: TU Podcast:
What Climate Changes Means for Trout and Salmon

RESOURCE 05: Trout and Climate Change - PowerPoint

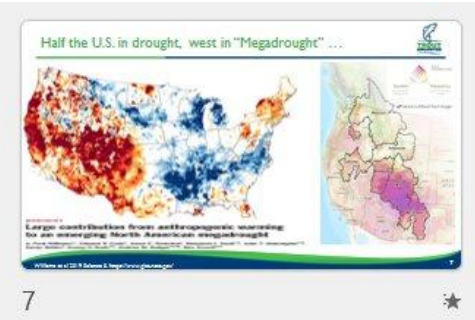
You can draw upon and adapt the CCWG resources to your own situation and outlets such as newsletters, websites and social media, in person presentations, articles, and more ...

Module 02: Science

RESOURCE 03: Climate Change & Trout: Impacts & Opinions

Helen Neville, TU senior scientist

Impacts of climate change:
a broad overview

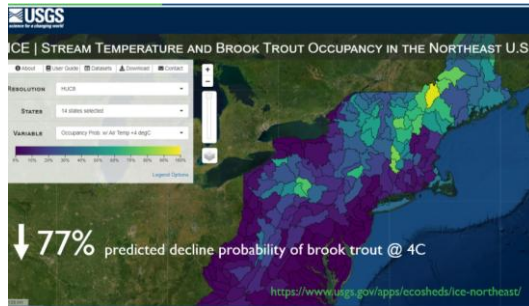


What scientists, the general public and TU members think.

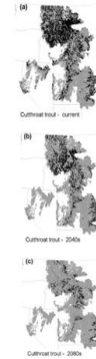
Module 02: Science

RESOURCE 03: Climate Change & Trout Impacts on fisheries

Trout declines anticipated east and west



50% decline in cutthroat trout habitat by 2080s



Module 02: Science

RESOURCE 03: Climate Change & Trout: What TU is Doing and How You Can Help

- TU helps with the 3 primary strategies for dealing with climate change (adaptation, sequestration, and mitigation).
- TU helps and can help more by pairing science with actions.
- You can take opportunities to reduce legacy impacts for fish and habitat and advocate for smart policy.

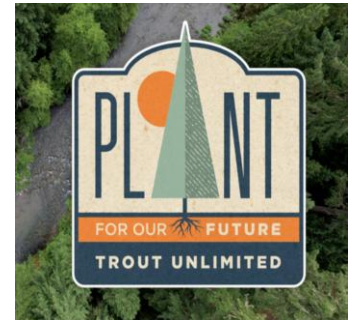


PRIMARY RESEARCH ARTICLE

WILEY [Global Change Biology](#)

Carbon sequestration in riparian forests: A global synthesis and meta-analysis

Kristen E. Dybala¹  | Virginia Matzek²  | Thomas Gardali¹  | Nathaniel E. Seavy¹ 



Module 02: Science

RESOURCE 04: TU Podcast: What Climate Changes Means for Trout and Salmon

TU senior scientist Helen Neville and Western Water Policy Advisor Sara Porterfield explain what's happening and what TU is doing about it.



RESOURCE 05: Trout and Climate Change

- **To define** climate change and its effect on trout.
- **To present** relevant graphs and data which illustrate the indicators of climate change.
- **To encourage** members and chapters towards efforts to increase stream resiliency to climate change.

By Larry Harris



RESOURCE 06: En-ROADS – A Global Climate Simulator

RESOURCE 07: Science & Information for a Climate-smart Nation

RESOURCE 08: NOAA-Climate Vulnerability Assessments

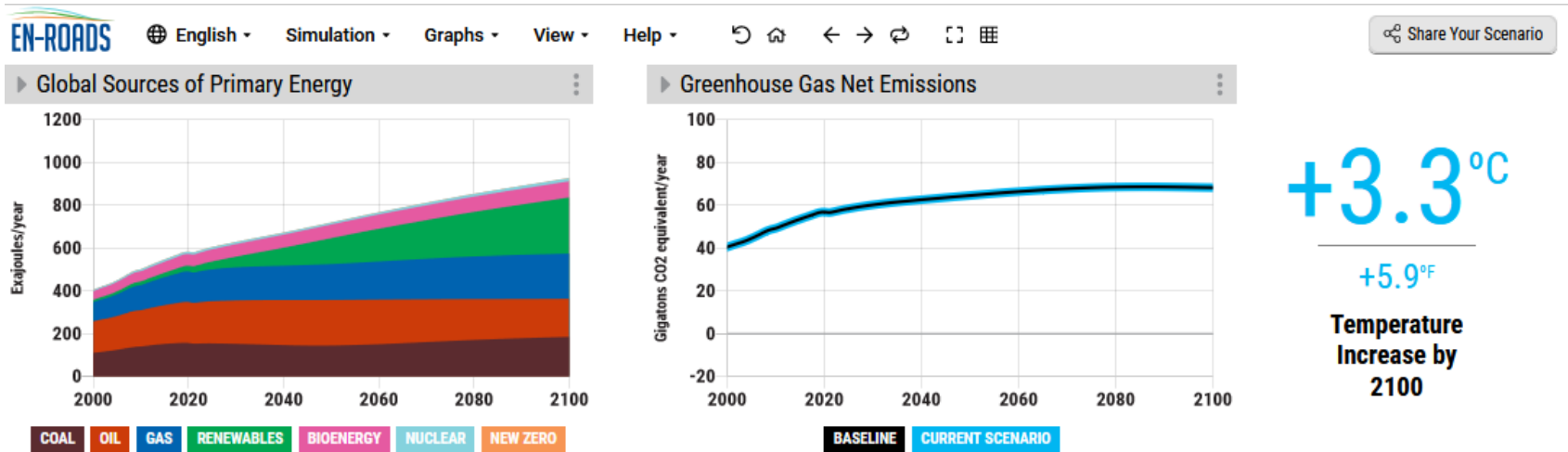
RESOURCE 09: Fish and Climate Change Database (FiCli, USGS)

RESOURCE 10: Sixth National Climate Assessment

RESOURCE 11: Climate Change Science Basics (citizens climate lobby)

Module 02: Science

RESOURCE 06: En-Roads – A Global Simulator



Module 02: Science

RESOURCE 07: Science & Information For a Climate-Smart Nation (climate.gov)

Global Climate Dashboard

Tracking climate change and natural variability over time

Sort by Indicator: Climate Change

Greenhouse Gases



The heating influence of all human-produced greenhouse gases was 49 percent higher in 2022 than it was in 1990.

[Learn more >](#)

Arctic Sea Ice



Since 1979, the extent of ice covering the Arctic Ocean at the end of summer has shrunk by more than 40 percent.

[Learn more >](#)

Carbon Dioxide



Atmospheric carbon dioxide has risen more than 50 percent since people began burning fossil fuels for energy.

[Learn more >](#)

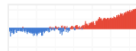
Mountain Glaciers



The glaciers in a key reference network lost an average thickness of 94 feet between 1970 and 2023 (preliminary data).

[Learn more >](#)

Ocean Heat



The ocean is storing 91% of the excess heat from global warming, causing sea level rise, ice shelf retreat, and stress on marine life.

[Learn more >](#)

Sea Level



Sea level has risen 8-9 inches since 1880, and the rate of increase has accelerated over the satellite era.

[Learn more >](#)

Spring Snow



Since the start of satellite observations in 1967, June snow cover has shrunk by 12.9 percent per decade.

[Learn more >](#)

Incoming Sunlight

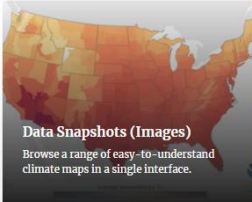


The sun's brightness does vary over time, but no changes have occurred that are big enough to cause observed global warming.


[Learn more >](#)

Maps & Data

Tools and Interactives >>



Data Snapshots (Images)
Browse a range of easy-to-understand climate maps in a single interface.




Climate Data Mapper (Interactive)
Visualize climate data via an interactive web map.

Climate Data Primer
Find out about measuring, modeling, and predicting climate and ways to find and use climate data.

[Learn more >](#)


Dataset Gallery & Advanced Tools

Event Tracker




Browse stories about the 'climate behind the weather' in this interactive map of current events found in our News and Features department.

Dreaming of a White Christmas?



Map of the historic probability of there being at least 1 inch of snow on the ground in the Lower 48 states on December 25 based on the latest U.S. Climate Normals from NOAA NCEI.

Historic date of first snow

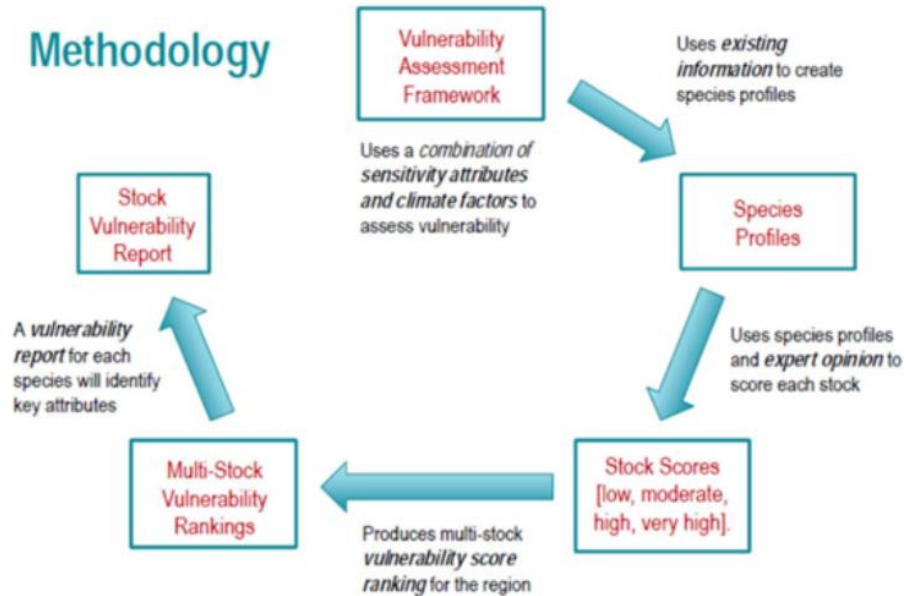


When does the climate record say you can expect the season's first snow? This map shows the historic date by which there's a 50% chance of at least 0.1" of snow on the ground, based on snowfall data from 1981-2010.

RESOURCE 08: NOAA – Climate Vulnerability Assessments

NOAA Fisheries is assessing the vulnerability of fish stocks...

Dense, but place-based scientific reports and resources for those interested.



Infographic illustrating the methodology scientists use for the Climate Vulnerability Assessment.

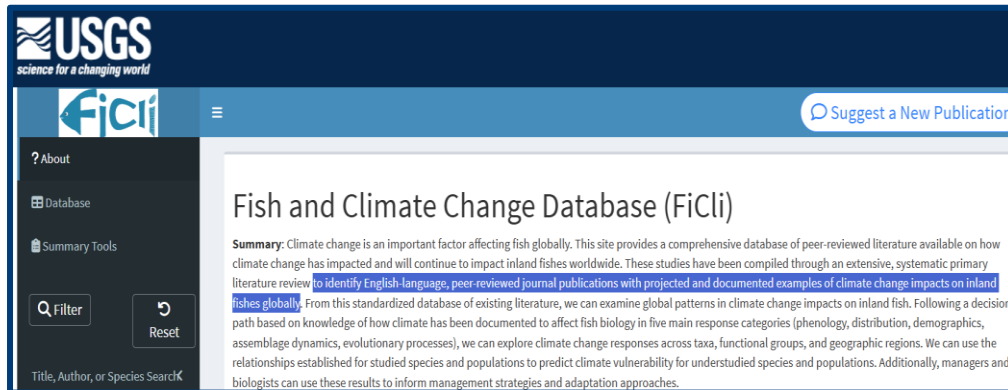
Module 02: Science

RESOURCE 09: Fish and Climate Change Database (FICLI, USGS)

A comprehensive database

...on how climate change has impacted and

...will impact inland fishes worldwide.



The screenshot shows the USGS FICLI website. The header includes the USGS logo and the tagline "science for a changing world". The FICLI logo is prominently displayed. A navigation menu on the left includes "About", "Database", and "Summary Tools". A search bar at the bottom left is labeled "Filter" and "Reset". The main content area features the title "Fish and Climate Change Database (FiCli)" and a summary paragraph. A "Suggest a New Publication" button is located in the top right corner of the content area.

USGS
science for a changing world

Ficli

Suggest a New Publication

? About

Database

Summary Tools

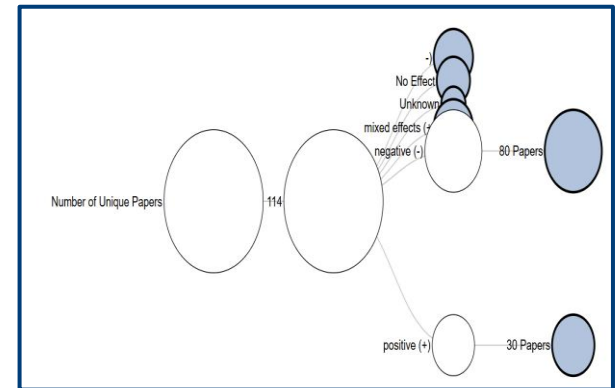
Filter

Reset

Title, Author, or Species Search

Fish and Climate Change Database (FiCli)

Summary: Climate change is an important factor affecting fish globally. This site provides a comprehensive database of peer-reviewed literature available on how climate change has impacted and will continue to impact inland fishes worldwide. These studies have been compiled through an extensive, systematic primary literature review to identify English-language, peer-reviewed journal publications with projected and documented examples of climate change impacts on inland fishes globally. From this standardized database of existing literature, we can examine global patterns in climate change impacts on inland fish. Following a decision path based on knowledge of how climate has been documented to affect fish biology in five main response categories (phenology, distribution, demographics, assemblage dynamics, evolutionary processes), we can explore climate change responses across taxa, functional groups, and geographic regions. We can use the relationships established for studied species and populations to predict climate vulnerability for understudied species and populations. Additionally, managers and biologists can use these results to inform management strategies and adaptation approaches.



Module 02: Science

RESOURCE 10: Sixth National Climate Assessment (March 2023)

10 Big Findings

1. Human-induced global warming of 1.1 degrees C has spurred changes to the Earth's climate that are unprecedented in recent human history.
2. Climate impacts on people and ecosystems are more widespread and severe than expected, and future risks will escalate rapidly with every fraction of a degree of warming.
3. Adaptation measures can effectively build resilience, but more finance is needed to scale solutions.
4. Some climate impacts are already so severe they cannot be adapted to, leading to losses and damage.
5. Global GHG emissions peak before 2025 in 1.5 degrees C-aligned pathways. (The 1.5 target represents: one to stave off the worst impacts of climate change. At 2 degrees, we anticipate tipping points and cascading and unavoidable severe impacts to ecosystems and humans.)
6. The world must rapidly shift away from burning fossil fuels — the number one cause of the climate crisis.
7. We also need urgent, systemwide transformations to secure a net-zero, climate-resilient future.
8. Carbon removal is now essential to limit global temperature rise to 1.5 degrees C.
9. Climate finance for both mitigation and adaptation must increase dramatically this decade.
10. Climate change — as well as our collective efforts to adapt to and mitigate it — will exacerbate inequity should we fail to ensure a just transition.

RESOURCE II: Climate Change Science Basics - Citizens Climate Lobby

Core Volunteer Training

INTRODUCTION

- ☰ Sources & Concentrations of Greenhouse Gases (6 min)
- ☰ The Role of Carbon Dioxide (12 min)

MAIN CONTENT

- ☰ How Humans Factor In (9 min)
- ☰ The Scientific Consensus (4 min)
- ☰ Commonly Asked Questions (8 min)
- ☰ The Ozone Hole: A Success Story (5 min)
- ☰ Communicating the Science (4 min)

RESOURCE 12: When I talk about Climate Change, I don't talk about science.

RESOURCE 13: Tips on how to conduct effective public engagement.

RESOURCE 12: When I talk about Climate Change, I Don't Talk about Science

- I talk about Fishing.
- I talk about Flooding.
- I talk about Farming.
- I talk about Faith.
- I talk about the Future.

By Andrew Thaler (Southern Fried Science)

RESOURCE 13: Tips on How to Conduct Effective Public Engagement

The six principles of effective public engagement

- Be a confident communicator.
- Talk about the real world, not abstract ideas.
- Connect with what matters most to your audience.
- Tell a human story.
- Lead with what you know.
- Use effective visuals in your communication.

American Fisheries Society

Climate Change Coordinator Training Plan



**CLIMATE CHANGE
WORKGROUP MODULE
ORIENTATION**

By TROUT UNLIMITED

Join the NLC Climate Change Workgroup to learn more about their resources and becoming a coordinator

Free

📅 Thu, Nov 14 at 8:00 PM (EST)

📶 After you purchase tickets you'll get instructions and a link to attend the event online.

January 16 – Science Workshop

February 13 – Adaptation Workshop

March 13 – Advocacy Workshop

April 10 – Education Workshop

NLC Climate Change Work Group



Please join us!

CCWG Module Development Team

Chair, Jeff Holzem - jeff2002h@yahoo.com

Co-chair, Peter Gray - bccpjgray@yahoo.com

Mark van Roojen, Peter Tovar, Neal Anderson, Paul McKay, Debbie McKay

URL for CCC Resources and Recordings

<https://www.tu.org/ClimateChangeCoordinator>

