



# North Central Climate Adaptation Science Center

Volume 3 Issue 4

May/June 2022

## R-Shiny App to Project Daily Snowfall and Rainfall



The NC CASC Climate Science Support Platform has developed a new R-Shiny app to quantify daily snowfall and rainfall quantities from total daily precipitation data in both observations (gridMET) and future projections (MACAv2-METDATA). Often the observed and projected precipitation data do not distinguish between snowfall and rainfall. Based on our best current understanding, this new application uses the relationship between the phase of precipitation and the temperature and relative humidity metrics to quantify the proportion of daily precipitation falling as rainfall or snowfall. More information on the app can be found at: [https://nccasc.shinyapps.io/Rainfall\\_Snowfall/](https://nccasc.shinyapps.io/Rainfall_Snowfall/).

## Dr. Christy Miller-Hesed to Co-facilitate "Climate Change and Climate Adaptation Training for Grasslands Conservation Practitioners"

North American grasslands are a regional priority of the U.S. Fish and Wildlife Service (FWS). The South Central CASC, in partnership with the US FWS Science Applications Program, the Northwest CASC, and the North Central CASC, implemented a training series for grasslands conservation practitioners beginning in May 2022. Through the training series, practitioners are introduced to the science of climate change, explore the impacts, and discuss adaptation options available. For more information and to register for July and August sessions, go to: <https://southcentralclimate.org/resources/webinars-workshops/training-for-grasslands/>. A fall 2022 in-person Climate Adaptation Workshop will be held by invitation only.



## NC CASC Welcomes Ella Ho, Undergraduate Research Assistant



Ella Ho is an undergraduate in the Astronomy and Planetary Sciences department at CU Boulder with minors in Space and Atmospheric and Oceanic Science. Although her main focus is in space science, she firmly believes that Earth is the best planet. She will be working as a research assistant under [Professor William Travis](#) on creating future climate scenarios for ecological impact assessment and planning for the North Central Climate Adaptation Science Center (NCCASC). In her free time, she enjoys reading, journaling, and trying new restaurants. She also serves on the executive board for the Vietnamese Student Association at CU.

## NC CASC Partners Co-Author Paper: “Challenges to Forest Restoration in an Era of Unprecedented Climate and Wildfire Activity in Rocky Mountain Subalpine Forests”

NC CASC consortium partners, [Phil Higuera](#), University of Montana, and [Shelley Crausbay](#), Conservation Science Partners (CSP), are co-authors on a new paper, [“Challenges to forest restoration in an era of unprecedented climate and wildfire activity in Rocky Mountain subalpine forests”](#). Unprecedented conditions in Rocky Mountain subalpine forests challenge contemporary approaches to forest restoration, requiring deep thinking across the science–management spectrum. Paleoecology can contribute to this endeavor by contextualizing ongoing change and revealing how ecosystem transformations unfolded in the past. Read more [here](#).



## Rangwala Pens Essay, Gives Radio Interview on Western US Drought

In this recently published essay in *The Conversation*, NC CASC Climate Science Lead [Imtiaz Rangwala](#) explores the theory of a hotter and thirstier atmosphere caused by a rapidly warming climate as a primary cause of drought in the western U.S. Read the full essay: "[Grim 2022 drought outlook for Western US offers warnings for the future as climate change brings a hotter, thirstier atmosphere](#)".



The prolonged drought in the western U.S. has left Colorado River reservoirs seriously depleted. In a recent interview with CBC Radio-Canada, NC CASC Climate Science Lead Imtiaz Rangwala says one thing is clear: the states that rely on that water are about to start paying the price. [Listen to the full interview \(between 9:40 and 16:40\)](#).



## “Scenario Planning as a Climate Change Adaptation Tool” Webinar



NC CASC/USGS Research Ecologist [Brian Miller](#), Gregor Schuurman, NPS Climate Change Response Program and Amy Symstad, USGS co-presented “Scenario Planning as a Climate Change Adaptation Tool” as part of the National Park Service (NPS) Natural Resource Stewardship and Science Monthly Webinars on May 11. The [Natural Resource Stewardship and Science \(NRSS\) monthly webinar series](#) shares information about the work NRSS is doing, what’s happening in the field of science and natural resources, and how you can get involved.

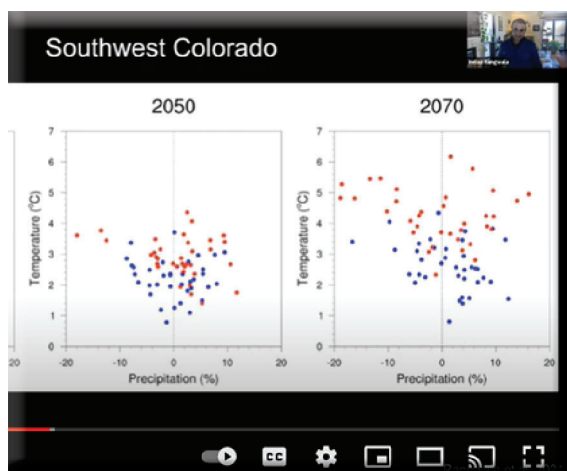
## Recent paper by Christy Miller-Hesed Explores Cultural Knowledge and Goals for Environmental Monitoring

NC CASC Research Associate [Christy Miller-Hesed](#) is co-author on a recent publication, [“Identifying and harmonizing the priorities of stakeholders in the Chesapeake Bay environmental monitoring community, in Current Research in Environmental Sustainability.”](#)

This paper explores cultural knowledge and goals for environmental monitoring and compares them across different stakeholders in the Chesapeake Bay environmental monitoring community. The paper concludes that building trust and working to understand stakeholders' changing priorities is important for the continued success of the partnership among scientists, managers, volunteers, coordinators, and service providers.



## Rangwala Presents to Climate Civilian Corps Fellows and USFWS Mentors



On June 8, NC CASC Climate Science Lead [Imtiaz Rangwala](#) presented and discussed "Climate Science Applications for Ecological Impact Assessment and Conservation" with six Civilian Climate Corps (CCC) Fellows working in different USFWS Wildlife Refuges and their FWS mentors. Fellows are primarily working on climate change vulnerability assessments and developing guidelines for better incorporation of climate considerations into planning and management efforts and were curious about which climate models to use in their regional assessments. Watch the recording, [Climate Science Applications for Ecological Impact Assessment and Conservation](#) on the [NC CASC YouTube channel](#).

## NC RISCC Network Shares First Management Challenge & Launches New Website

The [North Central Regional Invasive Species & Climate Change Network \(NC RISCC\)](#) has shared its first Management Challenge, "[Invasive Grass-Fire Cycle in the North Central US](#)". States in the North Central (NC) region have already been invaded by grass species capable of altering fire regimes and creating self-perpetuating "grass-fire cycles". Under climate change, these grasses may interact with drought and fire to burn more and exclude native species. Managers can plan for these interactions and create collaborative communities to address these complex challenges. The NC RISCC is a project affiliated with the NC CASC.



The NC RISCC is also excited to announce the launch of their new website containing published materials, videos, and other information about the NC RISCC. Check it out at [nc-riscc.org](http://nc-riscc.org).

## RISCC Management Network Announces Career Opportunity for Cross-RISCC Interaction

The Regional Invasive Species and Climate Change (RISCC) Management network, [risccnetwork.org](http://risccnetwork.org), aims to reduce the compounding effects of invasive species and climate change by synthesizing relevant science, communicating the needs of managers to researchers, building stronger scientist-manager communities, and conducting priority research. The RISCC Management network, in collaboration with the National Invasive Species Council, is seeking a Fellow to conduct research at the intersection of climate science and invasive species management to contribute to prioritizing management action in the face of global change across the U.S. As a member of the RISCC network, the Fellow will collaborate in stakeholder-driven research and engage in actionable science and science communication that serves the network. For more information about the position, including the application process, go to: [USGS Fellowship on Climate Change and Invasive Species Research Prioritization](#).

## WCS Co-authors Study on Climate Adaptation

NC CASC consortium partner, [Wildlife Conservation Society \(WCS\)](#), has co-authored a study on climate adaptation, "[Strengthening monitoring and evaluation of multiple benefits in conservation initiatives that aim to foster climate change adaptation](#)". The new study, co-authored by researchers at the Wildlife Conservation Society (WCS), the University of British Columbia's Faculty of Forestry, and the University of Massachusetts Amherst, reveals how practitioners are monitoring conservation adaptation projects and offers pathways to improve monitoring and evaluation (M&E) of climate-informed conservation. Read the [press release](#).



## Recent NC CASC Webinars & Newsletters

NC CASC Webinar Series: Identifying Potential Landscapes for Conservation Across the Central Grasslands of North America: Integrating Keystone Species, Land Use, and Climate Change

[NC CASC May 2022 Tribal Climate Newsletter](#)

[NC CASC June 2022 Tribal Climate Newsletter](#)

**The NC CASC Webinar Series is on hiatus through the summer.**

Watch [this page](#) for announcements about the next webinar planned for September.

## Recent NC CASC Publications

*Challenges to Forest Restoration in an Era of Unprecedented Climate and Wildfire Activity in Rocky Mountain Subalpine Forests* • PAGES • Higuera, Crausbay

*U.S. fires became larger, more frequent, and more widespread in the 2000s* • Science Advances • Travis, Balch

*Interannual variation in climate contributes to contingency in post-fire restoration outcomes in seeded sagebrush steppe* • Conservation Science and Practice • NC CASC funded

*Streamflow reconstructions from tree rings and variability in drought and surface water supply for the Milk and St. Mary River basins* • Quaternary Science Reviews • NC CASC funded

*Diurnal and Seasonal Dynamics of Solar-Induced Chlorophyll Fluorescence, Vegetation Indices, and Gross Primary Productivity in the Boreal Forest* • Journal of Geophysical Research: Biogeosciences • NC CASC funded

*Incorporating USGS Web Cameras into the Phenocam Network to Enhance Scientific Understanding of Phenological Trends and Variability* • Climate Adaptation Science Centers • NC CASC funded

*Landscape-scale forest restoration decreases vulnerability to drought mortality under climate change in southwest USA ponderosa forest* • Forest Ecology and Management • NC CASC funded

*Grassland easement evaluation and acquisition with uncertain conversion and conservation returns* • Canadian Journal of Agricultural Economics/Revue • NC CASC funded

*Harnessing NEON to evaluate ecological tipping points: Opportunities, challenges, and approaches* • ESA • NC CASC funded

*From flowering to foliage: Accelerometers track tree sway to provide high-resolution insights into tree phenology* • Agricultural and Forest Meteorology • NC CASC funded

*Eyes on the herd: Quantifying ungulate density from satellite, unmanned aerial systems, and GPS collar data* • ESA • NC CASC funded