



North Central Climate Adaptation Science Center

Volume 1 Issue 4

March/April 2020



Drought Index Portal (DrIP)

Imtiaz Rangwala, Climate Science Lead

NC CASC and Earth Lab have recently released the ***Drought Index Portal (DrIP)*** through the University of Colorado, Boulder. DrIP is a web analytic resource to display, compare, and extract time series for various indicators of drought in the contiguous United States.

Droughts take several forms (e.g., meteorological, hydrological, agricultural/ecological) driven by the interactions of different components of the physical climate system at shorter (weeks to months) and/or longer (months to years) timescales. No single index is generally able to capture all of these dimensions of drought. Thus a multi-index approach is recommended to understand the presence and evolution of drought. Limited online resources are available to quickly compare different drought indices and the spatial and temporal patterns of drought. DrIP has been developed to meet this need by providing a singular portal on which to perform quick visual comparisons of drought indices across time and space, and extract regional time series data. Several other analytical

features are also made available in DrIP including the ability to quantify and visualize any index's time series as the Drought Severity Coverage Index, a metric developed by the US Drought Monitor to assess severity of drought and its extent.

Travis Williams and William Travis at Earth Lab developed the initial versions of this tool to support a Western Water Assessment/ NIDIS project on decision analysis based on a consideration of different drought indices. Subsequently, NC CASC scientists engaged with Williams to further develop the tool, which is hosted on the Cooperative Institute for Research in Environmental Science (CIRES) web platform to be available for broader research support. DrIP data is updated at the end of every month. All data is interpolated to a common 0.25 degree spatial grid before other functions occur. Future improvement plans include increasing this resolution to 0.125 degree and adding more indices.

<https://droughtindexportal.colorado.edu>



New Project: Synthesis of Climate Impacts and Adaptation on Grassland Ecosystems in the Northern Great Plains

Heather Yocum, Stakeholder Engagement & Communications Lead

The NC CASC has funded and launched a new project on climate impacts to grassland ecosystems in the Northern Great Plains and adaptation actions that might be available to resource managers. The project team consists of PI Heather Yocum, co-PI's Imtiaz Rangwala, Jennifer Balch, Bill Travis, James Rattling Leaf, Molly Cross, and Shelley Crausbay, plus two working groups that will include USGS staff, other consortium partners, members from tribal nations, managers, and other researchers and stakeholders from the NC CASC region. The team will synthesize how climate change and variability will impact grassland ecosystems in the 21st century and identify key areas of focus for future research. The project will continue through 2022 and is in coordination with the USDA Northern Plains Climate Hub which is currently conducting a vulnerability assessment of US Forest Service and privately-owned grasslands in the region. This coordination, as well as the complementary but different study approaches, will help to generate a more complete picture of how private and public grasslands may be impacted by climate change in the future and how the two centers can best support managers working to adapt to those changes.

The Grasslands Synthesis Project is currently recruiting members for the two working groups that will synthesize existing information--one on known manager priorities and climate information needs, and one on the climate change impacts on grassland ecosystems. We are also looking for members for an advisory committee that can help guide the working groups to ensure that we are covering a broad range of stakeholder groups and existing climate impact information. If you would like more information about the project, or if you would be interested in learning more about the working groups or advisory committee, please contact Heather at heather.yocum@colorado.edu.



Conservation Science Partners Wins National Geographic “AI for Earth Innovation” Grant & Explorer Award *Shelley Crausbay, Conservation Science Partners*

Led by Tony Chang, CSP and colleagues from the USGS have won a substantial award from National Geographic and Microsoft to support the creation and deployment of an innovative deep learning model for estimating streamflow. CSP will develop this model using an extensive crowd-sourced training dataset of tens of thousands of stream images, matched to USGS stream gauge stations. The goal of this unique modeling effort is to provide a cost-efficient monitoring system for ephemeral and intermittent streams in the northeastern US, prototyping the potential for national applications. More information on the “AI for Earth Innovation” program can be found on the **National Geographic website**.

Recent Publications

Advances in Remote Sensors for Earth Observation and Modeling of Earth Processes • March 2020 • Gabriel Senay
Monitoring and Predicting Drought on Our Grasslands • March 2020 • Imtiaz Rangwala



Climate Change Workshop with Wyoming Game and Fish Department Molly Cross, Wildlife Conservation Society, NC CASC Principal Investigator

On April 28-30, Molly Cross (WCS) and the Wyoming Game and Fish Department (WGFD) held a climate change workshop that brought together agency staff with outside climate experts to discuss the consequences of a changing climate for river, riparian, and wetland ecosystems across the state. The workshop was designed to help the agency incorporate climate change into the upcoming revision of the WY Statewide Habitat Plan, which identifies protection and restoration priorities for both aquatic and terrestrial habitats. The goals of the workshop were to:

- - Learn about the best-available climate change projections and research on impacts to river/riparian/wetland habitats.
- - Discuss the consequences of climate change for Statewide Habitat Plan (SHP) priorities – including the identification of priority areas for protection and restoration, and recommended actions within those areas.
- - Identify specific climate-informed habitat protection and restoration actions that could be taken in Wildlife Habitat Management Areas or in specific watersheds across the state.
- -Develop a list of data/information/analyses would be useful for making climate-informed decisions in the near- and longer-term.

Workshop participants included WGFD staff, along with climate researchers from the North Central CASC, Western Water Assessment, USGS, University of Wyoming, University of Colorado, and Conservation Science Partners. In total, 45-70 people attended portions of the workshop, which was converted to a virtual format due to COVID 19 restrictions.

The workshop was also part of a larger research project led by Molly Cross and colleagues to evaluate methods for co-producing and co-applying climate science in natural resource management decisions. Results from the workshop will be shared via a workshop summary report, and Molly will continue to work with colleagues at WGFD to incorporate workshop discussions into the Statewide Habitat Plan, and identify high priority, decision-relevant research needs. Once the project is completed, lessons learned on methods for co-production will be captured in a publication and presentation that will be shared with the North Central CASC community and beyond. Molly is also available to discuss virtual workshop facilitation tips that she learned during this effort.