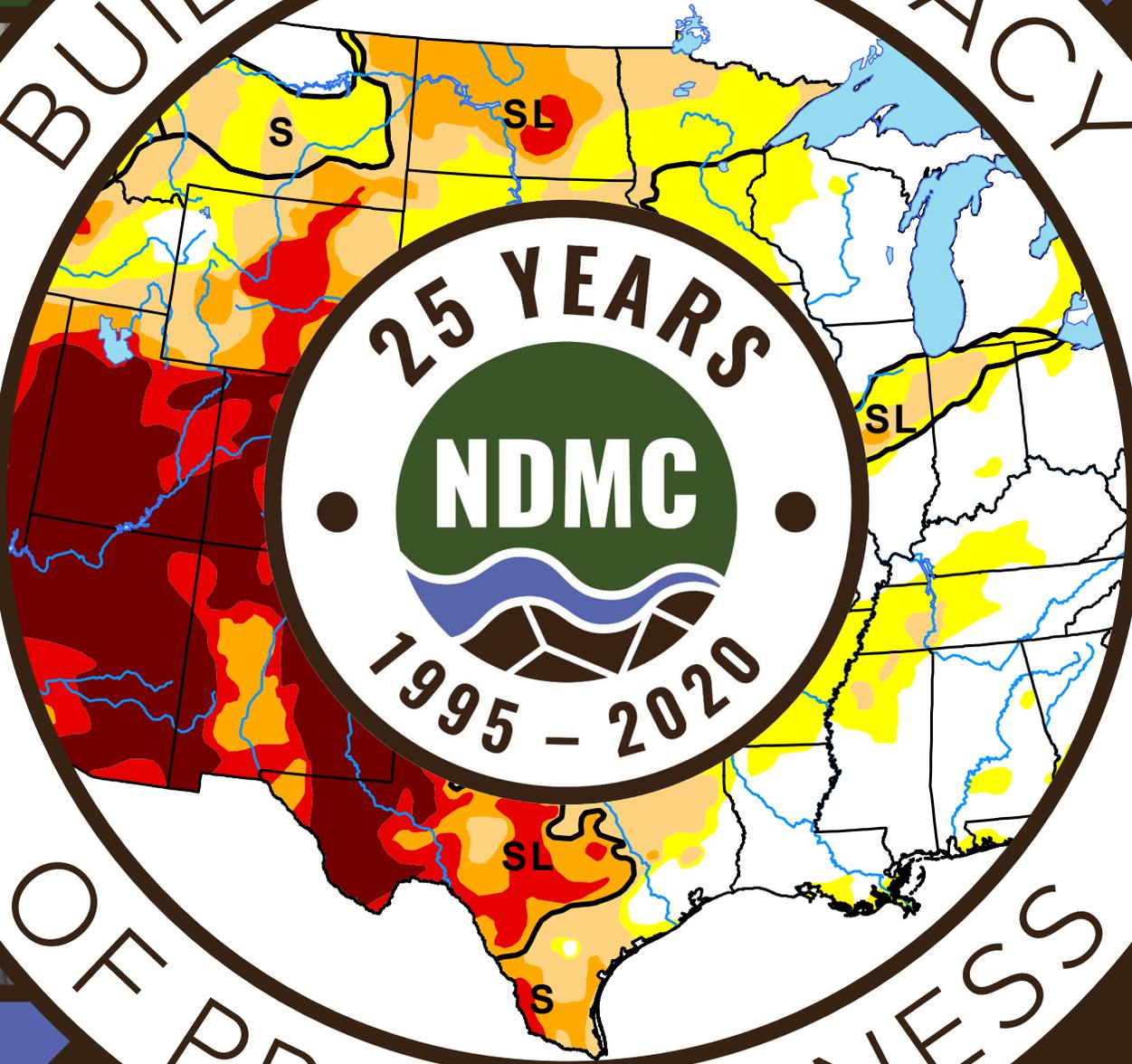


BUILDING A LEGACY



25 YEARS

NDMC

1995 - 2020

OF PREPAREDNESS

ANNUAL REPORT • 2020

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About the cover

In 2020, NDMC designer Brendon Orr updated the Drought Center logo to commemorate its 25th anniversary. It appears on the 2020 Annual Report atop a December 2020 U.S. Drought Monitor map.



National Drought Mitigation Center

2020 Annual Report
Building a Legacy of Preparedness
Lincoln, Nebraska

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NDMC Zoom screenshot

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This publication also is available in electronic PDF format from the center's website: drought.unl.edu

FROM THE DIRECTOR

The National Drought Mitigation Center's 25th year began in what I would consider to be typical fashion. We worked with partners across the country and the globe on a variety of projects designed to improve drought resilience. Four NDMC team members went to New Mexico and worked with the USDA Southwest Climate Hub team and drought management leaders from around the region to build a Drought Learning Network. Several of us traveled to Eswatini to continue work on a World Bank-backed project that will bolster drought monitoring there and in Tanzania, Botswana and Zimbabwe — countries in one of the world's most drought-prone areas. And several NDMCers ventured all the way from the University of Nebraska-Lincoln's East Campus, where the NDMC is located, to an upper-level graphic design classroom 3 miles away on UNL's City Campus. There, they hosted a round of the Ready for Drought scenario game to serve as an ice-breaker for a semester-long collaboration between the design class and the NDMC.



Then, of course, everything changed in early March. The effort to socially distance and slow the spread of the coronavirus abruptly altered our plans to attend and lead workshops and conferences and, most importantly, halted our ability to get out in the field and work with our partners on the ground. COVID-19 also indefinitely postponed our 25th-anniversary celebration. While the pandemic changed the way we worked, it has not changed the importance of our work or what we do.

In the 2020 Annual Report, you will find examples of projects and research we worked on with ranchers, ecologists, climatologists, remote sensing specialists, governing bodies, partner agencies like the USAID, International Water Management Institute, USDA, NOAA, NASA, and the World Bank, natural resource managers, aspiring designers and many more. Together, we are building a legacy of preparedness — the theme of this year's report.

While we were not able to celebrate the NDMC's 25th in person during 2020, the Drought Center's previous directors — Michael Hayes and founder Donald Wilhite — and I looked back and discussed the lead-up to the center's founding in 1995, and why the NDMC's mission remains crucial going forward (Page 2).

Preparedness takes many forms, and this year's Annual Report shows the breadth and scope of what we do and who we work with to improve responses to droughts as they develop both here and abroad. In our recent research efforts (Page 12), we worked with world-renowned drought experts to better define flash drought, surveyed ranchers to ascertain what having drought plans did and didn't change about their responses to drought and analyzed a trove of tweets to see if social media could provide early warning of future droughts. While we didn't meet face-to-face with our international partners as much as we normally would, we nonetheless collaborated with far-flung partners (Page 6). And even though that first in-person meeting with the design students turned out to be the only in-person meeting, they produced compelling work under challenging circumstances. Their work conveys the message that we can't simply hope that the next storm solves problems uncovered by a current drought. I'm proud of how our staff and partners navigated 2020 together and look forward to meeting in-person again. Let's hope that happens in 2021! □



A handwritten signature in blue ink that reads "Mark Svoboda". The signature is fluid and cursive.

Mark Svoboda, Ph.D., Director

NDMC's directors look back to center's founding 25 years ago

In 1995, the National Drought Mitigation Center opened its doors in Chase Hall on the University of Nebraska-Lincoln East Campus. Its founding director, Donald Wilhite, had to tell two of the center's first staff members he hired that funding was only in place to keep the doors open for a year.

"But," he told Michael Hayes and Mark Svoboda, "I'm pretty damn confident that we can turn this first year of funding into long-term support for the Drought Center."

Hayes and Svoboda went on to become Wilhite's successors as directors of the NDMC, which celebrated its silver anniversary in 2020.

"It really addressed a need that the nation had," Hayes said. "Don had done a great job in scoping out what a drought center would look like. He held a national conference in Portland in 1994, where the recommendations for a national drought center were put forward. He really did his homework in setting up the NDMC."

Said Svoboda, the current NDMC director: "The NDMC was at the forefront in bringing attention to the drought problem, and developing and sharing resources that better address this hazard proactively. The 25th anniversary of the NDMC is a great time to reflect on all that we've done to better detect, prepare and plan for droughts before it's too late, and to celebrate the continued, growing support for our work. We still have a lot to do, but we've come a long way."

Svoboda said that the NDMC's stance since its inception — that proactive, mitigation-based approaches to drought risk management lessen the effects of drought compared to in-the-moment crisis management — created a sound foundation for the NDMC that the center's growing staff has built upon with partners from local, state, national and international levels.

"I'd also be remiss if I didn't mention another watershed moment in the NDMC putting down solid roots early on and that was the creation of the U.S. Drought Monitor," Svoboda said. "The USDM has become the gold star for drought monitoring and early warning in the U.S. and has become a model for dozens of states and countries around the world in how they track drought. You can't pick up a paper or turn on the Weather Channel without seeing the USDM. It also helped solidify our partnerships with the USDA and NOAA."



From left to right: former NDMC director and founder Donald Wilhite, former NDMC director Michael Hayes and current NDMC director Mark Svoboda at the Center's 20-year anniversary in 2015.

Hayes attributes the success and longevity of the NDMC to three Ts — teamwork, trust and tools.

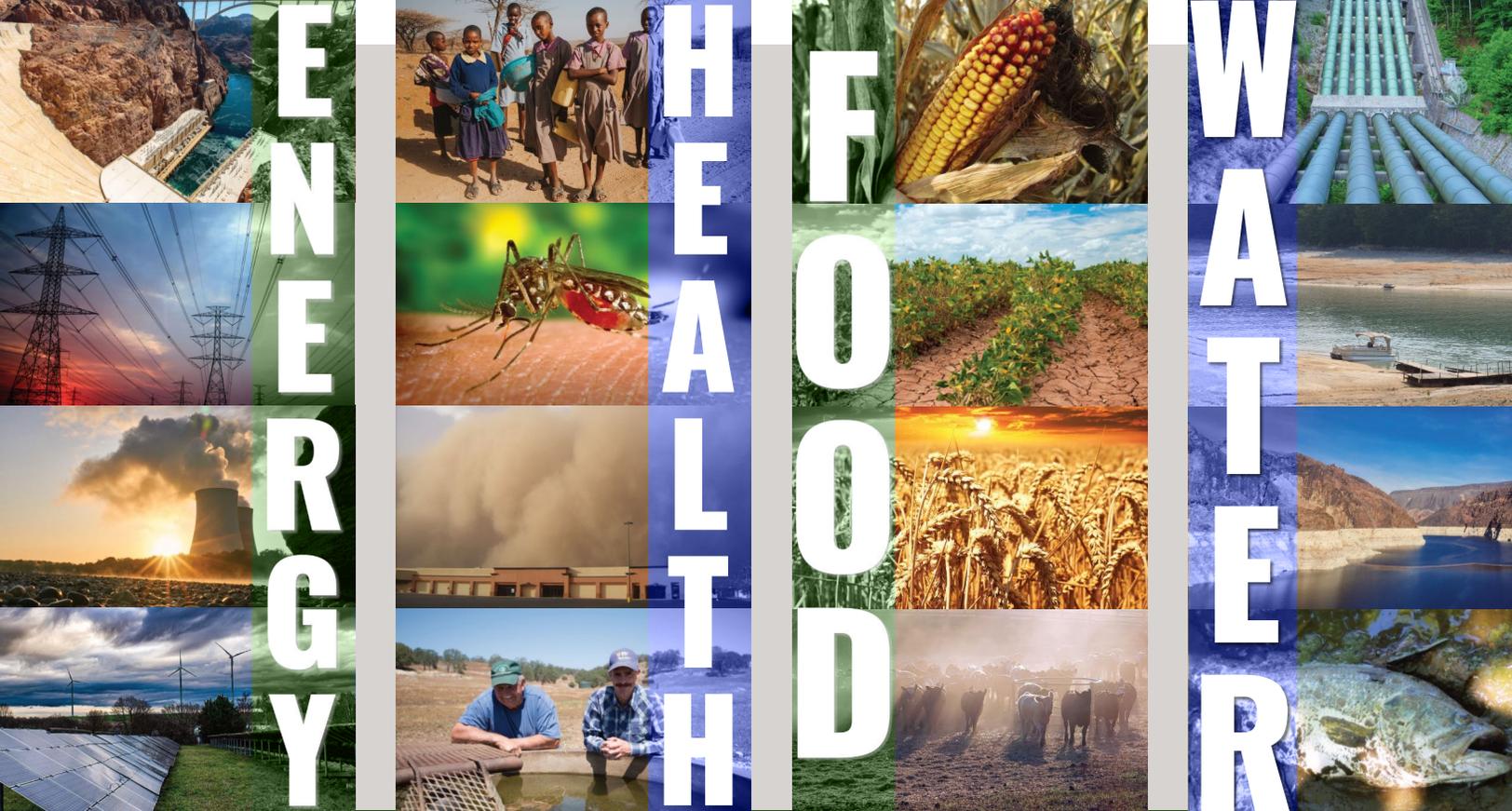
"Don always emphasized the value of a great team," Hayes said. "In those early days, we were six. And there are still four of us (Svoboda, Deb Wood, Kelly Helm Smith and Hayes) that are involved with the NDMC."

"The success of the NDMC has centered around the team of individuals that make up the NDMC. That's definitely true during the nine-plus years I was director at the NDMC."

And the NDMC's efforts to develop or collaborate on the development of tools like the U.S. Drought Monitor, Vegetation Drought Response Index and Visual Drought Atlas has helped build a level of trust with current and potential partners, Hayes said.

"When you ask us to do something, we do it," Hayes said. "From 1995 to 2020, we have been that trusted source of drought-related information that people can go to."

"Those three Ts are going to be as important in 25 years as they are today. Droughts are still going to be



The National Drought Mitigation Center planned to celebrate its 25th anniversary at a summer gathering that would highlight the center's work in reducing drought impacts on essential resources. The event was postponed due to the coronavirus.

“It's been a great investment for the federal government and the state of Nebraska. It's brought so much visibility to the state and the university to be ‘drought central,’ globally, on this issue.”

– Donald Wilhite, former NDMC director and founder

here. They may actually play more of a role in American society depending on how climate variability and climate change proceed going forward.”

Wilhite looks forward to celebrating the center's 25th anniversary once the NDMC team and its supporters can safely convene.

“What the Drought Center has done has been unbelievable not only nationally, but internationally,” Wilhite said. “It's been a great investment for the federal government and the state of Nebraska. It's brought so much visibility to the state and the university to be

‘drought central,’ globally, on this issue. When I started working with drought in the early 1980s, there were three states in the country that had drought plans. Now there are 47 states. That was a message that I was up on my soapbox, just continuously pushing not only in the U.S. but internationally — you've got to find a way to prepare for future drought events since they are a normal part of climate.” □

Making drought personal

National Drought Mitigation Center partners with University of Nebraska-Lincoln graphic design students to visualize drought's impacts

Graphic design students from the University of Nebraska-Lincoln experimented in 2020 with new ways to get the word out on reducing how drought affects people.

Their efforts were the result of collaboration between Stacy Asher, assistant professor of Art, Art History and Design, and the National Drought Mitigation Center. Three students went on to become interns at the center who created static and animated designs that conveyed drought's myriad impacts.

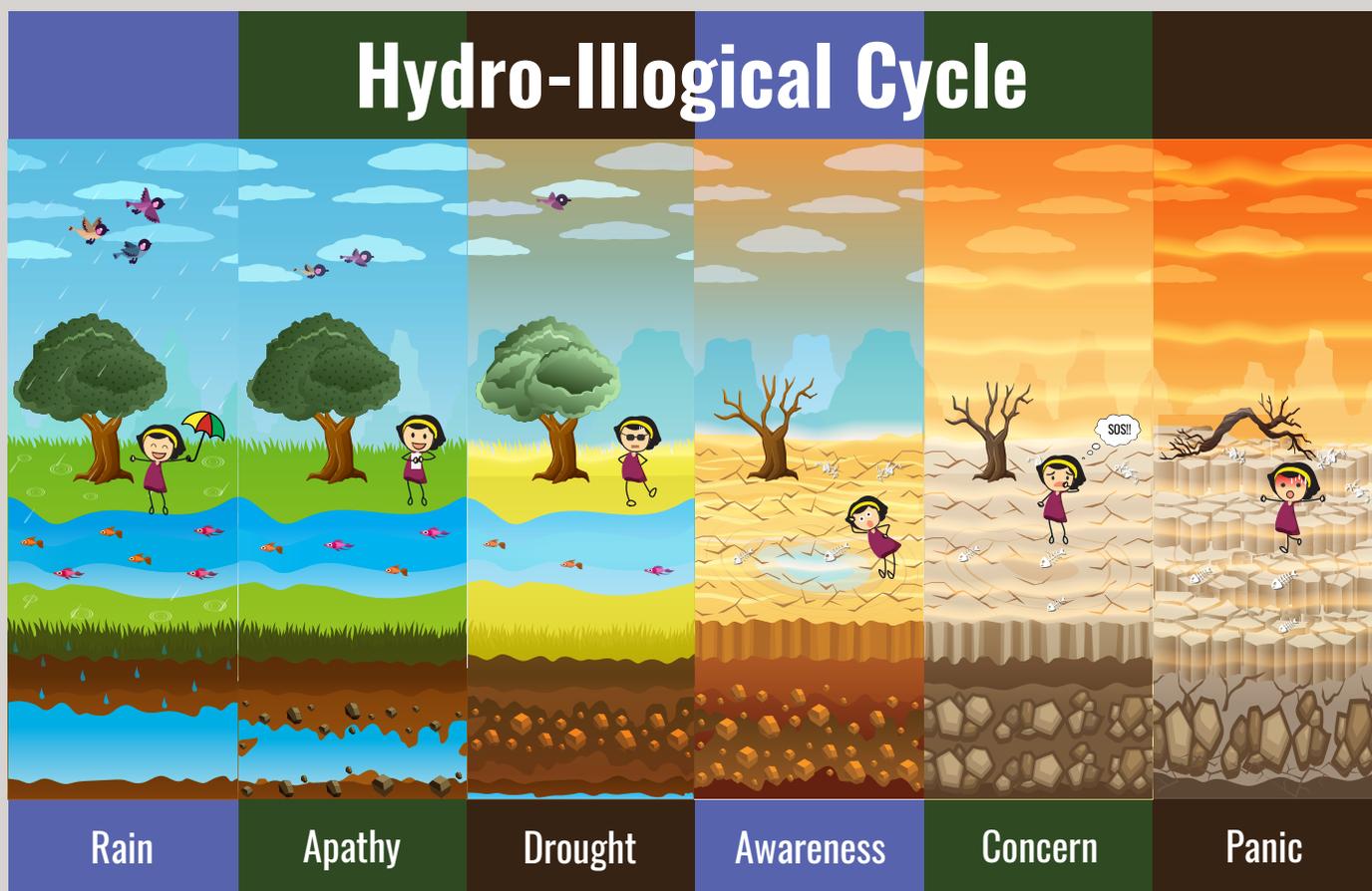
Asher, who was part of a group envisioning a transdisciplinary Environmental Futures Program, said she proposed the collaboration between GRPH 421 students and the NDMC team because it was an ideal case study to show how STEM and the arts could converge in a classroom setting.

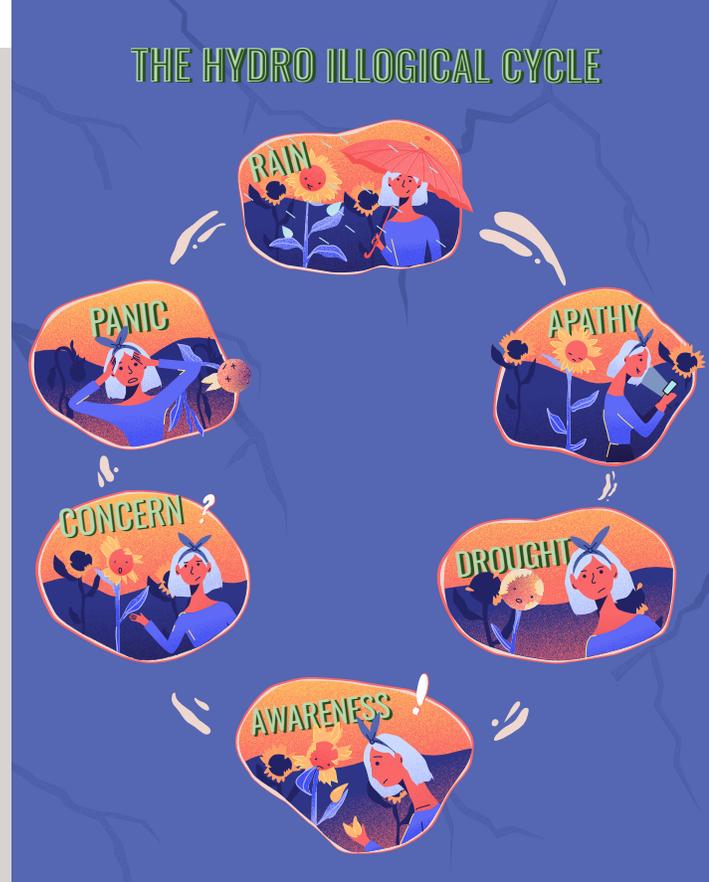
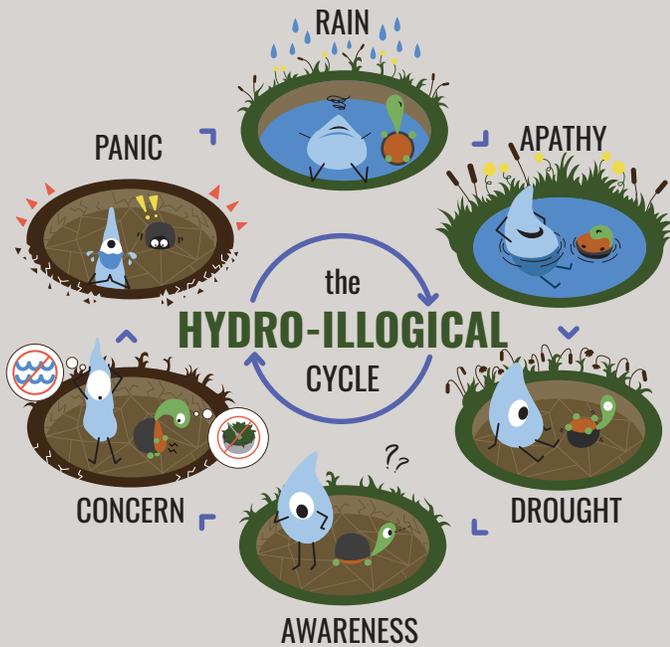
"Why did I reach out?" Asher said. "I think it's because I have a sincere interest in the topic, but also,

it's here. The National Drought Mitigation Center is here and it's part of our university community and they're doing global work. What a neat opportunity for students to collaborate and be part of a bigger project.

"Having an organization on campus that has a worldwide scope makes a big difference compared to me saying to my students: 'Water is important. Let's design something!' There were these clear objectives and certain messaging that needed to be communicated that the NDMC has researched and decided are key parts of the story. Now, how do we tell it visually?"

The NDMC team presented the design students with two projects. One was a re-imagining of the original Hydro-Illogical Cycle illustration, which shows that people tend to lapse back into apathy after a drought ends. The NDMC's mission, to mitigate drought, means that rather than lapsing into apathy, communities, states and countries should prepare for the inevitable





Three University of Nebraska-Lincoln advanced graphic design students interned with the National Drought Mitigation Center this summer. During the internship, they completed further work on two projects they began in class, including a reimagining of the Hydro-Illogical Cycle. From left to right, the designs were created by Muskan Yadav, Hannah Birdwell and Lindsey Musil.

emergence of the next drought. Though the stages remained the same, the center asked students to develop characters who could convey that this cycle was one that needed to be broken. The other project was titled Faces of Drought, and was based on an idea developed by NDMC director Mark Svoboda. The concept, Svoboda said, was to personify the effects that drought has across the U.S. and the world.

“Drought affects everyone, and everyone can benefit from better preparing for drought,” said Deborah Bathke, NDMC education coordinator. “Our interns, and the entire graphic design class, did a great job in their project work of illustrating how drought’s impact is a global concern, and how falling into the cycle of struggling through a drought and relaxing once it rains doesn’t improve responses for future droughts.”

The plan when the project began in February 2020 included the presentation of student work at the center’s scheduled 25th anniversary event. Within weeks, though, UNL went to a remote learning format to help control the spreading coronavirus pandemic. The collaboration continued, with NDMC staff and design students meeting virtually for presentations and critiques. Students presented the effects of drought in collages, graphs, animations and comic panels.

“It’s a credit to Stacy, the students and NDMC staff for how seamless the switch was,” says Brendon Orr, NDMC web graphics designer. “Even though we were limited to a virtual format, it was still very rewarding to see the creativity and talent in many of the students come through in their designs and to offer feedback to help the students improve their work and grow as potential design professionals.”

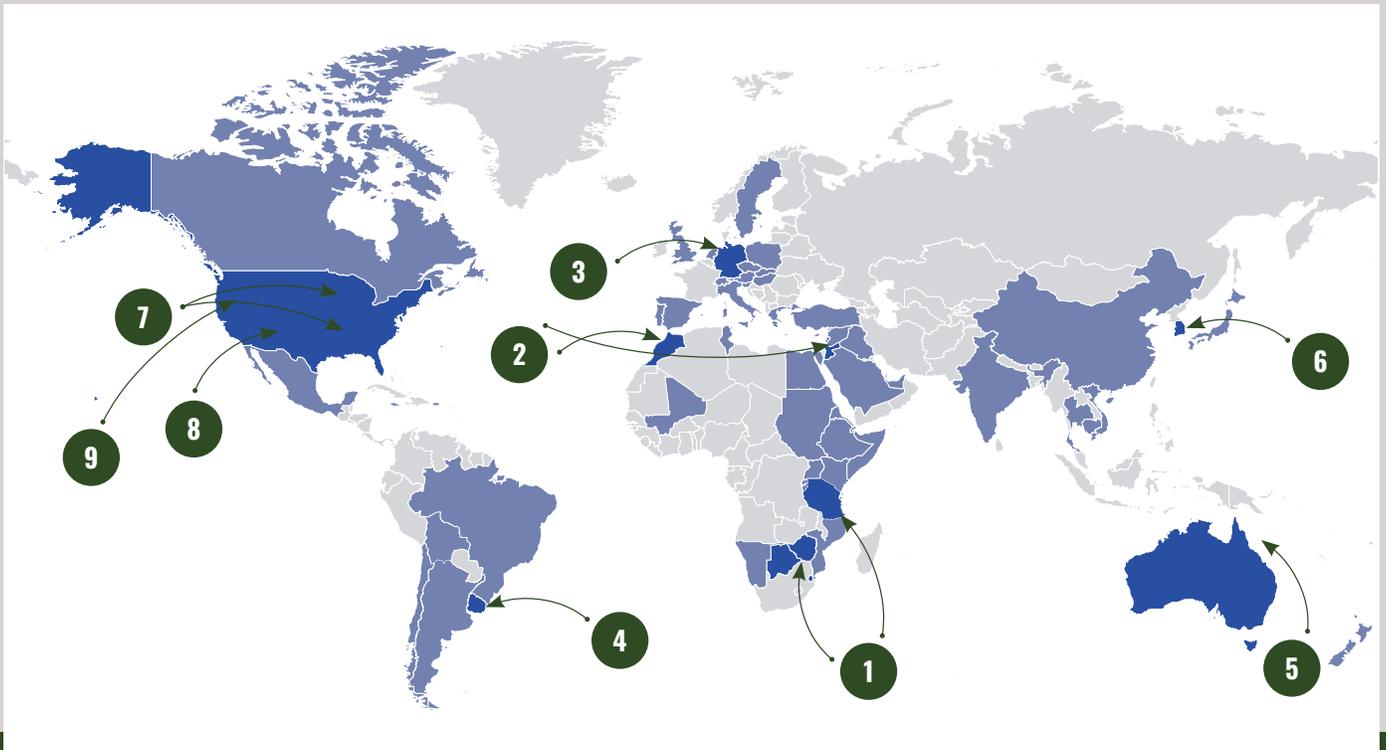
Though the coronavirus reshaped how the collaboration unfolded, Asher said that redesigning the Hydro-illogical Cycle aligned with the stated class objectives. And it was a challenge that three GRPH 421 students continued exploring during summer internships with the NDMC. Hannah Birdwell, Lindsey Musil and Muskan Yadav were hired to continue developing their Hydro-illogical Cycle and Faces of Drought work for the NDMC. Their work could be used in future NDMC presentations and on the NDMC website.

“All three interns did a solid job of interpreting NDMC’s provided specifications into visually interesting artwork that could potentially be used in a variety of media,” Orr said. “They also displayed the ability to make iterative progress on their designs and be open to cultivating the valuable skill of taking constructive feedback and incorporating it.” □

Where we work

In normal years, members of the National Drought Mitigation Center team travel across the country and the globe to share and further develop best practices in better preparing populations for future droughts. The coronavirus changed how the NDMC staff worked with our collaborators and partner agencies, but it did not change what we do. The past year put a stop to most in-person meetings and led to far more teleconferences than normal, but the NDMC continued to work in partnership on improving drought monitoring and readiness around the world. Here are some of the most recent projects that are moving forward or were recently completed in 2020.

■ 2020 countries ■ Previous countries



1 Global Combined Drought Index (CDI) development, Tanzania, Zimbabwe, Botswana and Eswatini

Before the spread of the coronavirus shut down travel, members of the NDMC team traveled to Eswatini in early 2020 to continue work with the World Bank and our in-country partners on enhancing drought preparedness strategies and creating drought monitoring resources that, like the U.S. Drought Monitor, can provide regular snapshots of drought and help direct aid and assistance to places and people where it is most needed.

2 Completed development of drought monitoring tools in the Middle East and North Africa (MENA)

In partnership with the International Water Management Institute, NASA's Goddard Space Flight Center, Johns

Hopkins University and others, NDMC team members completed work to adapt a drought monitoring system to the local environmental conditions of partners in the MENA region — Jordan, Morocco and Lebanon — so that the system can be operated locally. The multifaceted MENA drought project, funded by USAID, brought experts in drought monitoring, forecasting and management together to strengthen resilience in one of the most water-stressed regions of the world.

3 U.N. Convention to Combat Desertification (UNCCD) Intergovernmental Working Group, Germany

NDMC director Mark Svoboda is one of 15 independent experts invited by the United Nations to take part in the UNCCD Drought Initiative. It was created in part to provide drought planning expertise for officials who are cre-

ating plans in their home countries. The UNCCD mandate states that the Intergovernmental Working Group that Svoboda will serve on “supports over 70 countries in designing comprehensive national plans of action ready to be activated well before the drought strikes.”

4 Drought risk management for southern South America workshop in Montevideo, Uruguay

In May, the NDMC teamed with the Drought Information System for southern South America (or SISSA, for its Spanish acronym), to help create plans to increase drought resilience. Initially scheduled to be an in-person workshop, the online event included representatives from six SISSA member countries (Argentina, Bolivia, Brazil, Chile, Paraguay and Uruguay) as well as other countries of South and Central America. Workshop participants and leaders assessed current capabilities of each country represented at the meeting in regards to the three pillars of drought policy — monitoring and early warning, vulnerability and impact assessment, and mitigation and response — with the goal of developing proactive national policies and preparedness plans aimed at reducing societal vulnerability and increasing resilience to drought.

5 Creating an Australian Combined Drought Indicator, Southern Queensland, Australia

Australia is the world’s driest inhabited continent, and farmers and others there have endured some of the warmest years on record since 2005, including a historic drought in 2019. Programmers with the University of Southern Queensland’s Centre for Applied Climate Sciences have worked with NDMC programmers to develop an Australian combined drought indicator CDI. A CDI incorporates multiple data sets, including rainfall, soil moisture, evapotranspiration, and vegetation stress, to examine current drought conditions.

6 K-Water partnership, Korea

In 2019, NDMC director Mark Svoboda and Jae-Young Park of Korea Water Resources Corporation (K-Water) signed a memorandum of understanding between the National Drought Mitigation Center and K-water following Svoboda’s keynote talk at the International Asian Drought Forum, held during the grand opening of the Korean National Drought Information and Analysis Center. In 2020, the two sides continued to work toward goals outlined in the memorandum, including the development of improved drought early warning and risk management systems.

7 Midwest specialty crop decision calendars, Iowa, Wisconsin and Missouri

Growers of Midwestern specialty crops face high risks due to climate extremes such as drought, but are sometimes ignored in drought management outreach. Now, producers have new resources to turn to help them make decisions during drought years, available on the National Drought Mitigation Center website. The NDMC has released a set of fact sheets and decision calendars that provide month-by-month and seasonal advice on how growers manage production of Midwestern apple, grape, cranberry and irrigated potato crops during drought years. To create the resources, the project team met with specialty crop growers in three Midwestern states and conducted focus groups to learn what they considered to be the most important decisions they made, when they made them and how those decisions led to better vegetable and fruit production outcomes during drought.

8 Envisioning a Regional Drought Learning Network, Las Cruces, New Mexico

Staff from the NDMC worked in conjunction with the USDA’s Southwest Climate Hub to bring together drought management leaders from the Southwest and Southern Plains to establish a Drought Learning Network (DLN) where communities learn from communities. The meeting’s goals included documenting stakeholder experiences during drought, leveraging service provider resources and options to better meet needs via a DLN and establishing a collective approach and timeline for the development of a regional DLN. Six teams were developed as part of the DLN, each one focusing on specific issues related to drought in the region.

9 USDA Northwest Climate Hub Drought Workshop

Held in July, the virtual workshop highlighted drought issues prevalent in the region. The workshop included a discussion about the making of the U.S. Drought Monitor, and how local climate experts contribute to the weekly process, as well how some USDA programs are affected by U.S. Drought Monitor designations. Sessions focused on peer-to-peer learning for the East side of the region, as well as the West. During both sessions participants were engaged in discussion and information exchange about drought adaptation strategies and information needs. □

2020

By the Numbers

\$7.3
BILLION

Total Livestock Forage Disaster Program
payments triggered by the USDM
October 2011– September 2020

17
PROJECTS

23
PEER-REVIEWED
PUBLICATIONS



614
NDMC REFERENCES*

6,570
USDM REFERENCES*



*Media statistics from Meltwater

23

FACULTY & STAFF



4

STUDENTS



2020

By the Numbers

\$4.6

MILLION

Ad Value Equivalence of
NDMC + USDM
mentions in the media*

\$225

MILLION

Ad Value Equivalence of
USDM mentions in the media*

\$12

MILLION

Ad Value Equivalence of NDMC
mentions in the media*

\$4

MILLION

In total active grants in 2020

*AVE calculations according to Meltwater



5.9M

PAGEVIEWS

of all NDMC websites
(includes 5.2 million USDM views)



1.7M

USERS

of all NDMC websites
(includes 1.4 million USDM users)



48.1%

MOBILE + TABLET
TRAFFIC

on the U.S. Drought Monitor



164.2K

FILE DOWNLOADS

across all websites



7,841

FOLLOWERS



715
SINCE 2019



2,458

FOLLOWERS



196
SINCE 2019

New products cater to local, global audiences

The National Drought Mitigation Center team features staff members with expertise in climatology, remote sensing and information technology, community and regional planning, sociology, geography, policy analysis and communications. That knowledge is reflected in the variety of drought resilience and monitoring products developed, released or enhanced in 2020. Here are some of the latest examples.

Now hosted on NDMC website, Grass-Cast helps ranchers make more informed decisions.

Every spring, ranchers must try to figure out how much grass will be available for livestock to graze during the summer. A tool that can help Great Plains-based producers make the best guess possible is now available on the National Drought Mitigation Center website.

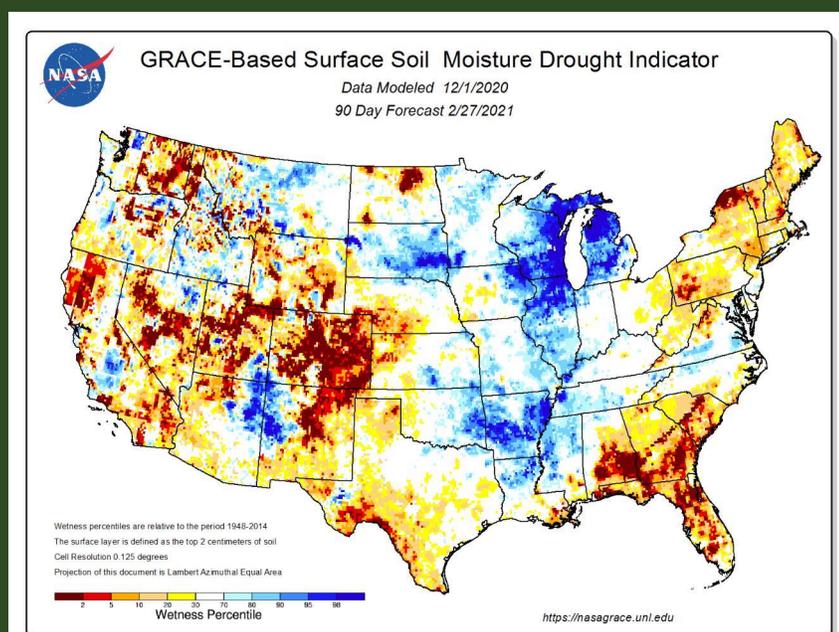
Grass-Cast uses nearly 40 years of historical data on weather and vegetation growth, coupled with seasonal precipitation forecasts, to provide estimates of how productive rangelands will be in individual grid cells (about 6 miles by 6 miles), depending on whether precipitation over the growing season is above normal, near normal or below normal. Take a look at grasscast.unl.edu.

NDMC helps launch latest drought monitoring and forecast products utilizing NASA satellite observations. Information from NASA's GRACE-FO satellites has resulted in first-of-its-kind maps of topsoil,

root zone soil and groundwater moisture around the world, as well as 30-, 60- and 90-day forecasts of wet and dry conditions across the continental United States. The National Drought Mitigation Center and UNL's Center for Advanced Land Management Information Technologies (CALMIT) partner to publish the maps. To view the forecasts and global outlooks, visit nasagrace.unl.edu.

"It is going to (help) a broad scope of people," NDMC climatologist Brian Fuchs said. "You're going to see anyone from individual producers from the ag sector using it, as well as water supply managers, policy makers and different decision makers at different levels of government who would have the opportunity to look at that."

Midwest specialty crop decision calendars and fact sheets help fill information gaps. Growers of Midwestern specialty crops face high risks due to climate extremes such as drought. New resources help them make decisions during drought years. The NDMC has released a set of fact sheets and decision calendars that provide month-by-month and seasonal advice on how growers manage production of Midwestern apple, grape, cranberry and irrigated potato crops during drought years. To view the project, funded by the National Integrated Drought Information System, visit go.unl.edu/calendars. □



Information from NASA GRACE-FO satellites is being used to produce and share first-of-its-kind maps 30-, 60- and 90-day forecasts of wet and dry conditions across the continental United States (pictured), as well as global maps of topsoil, root zone soil and groundwater moisture. The maps were developed in collaboration with the Center for Advanced Land Management Information Technologies and National Drought Mitigation Center.
Source, nasagrace.unl.edu

Drought Center develops social media resources to help encourage drought monitoring

Ready-to-post content in a National Drought Mitigation Center social media library can help you recruit more eyes on the ground to help build photo archives showing what dry, normal and wet conditions look like in different places.

In 2020, the NDMC developed the social media library to help the National Weather Service, Extension, state climatologists and others across the country publicize opportunities for the public to submit photos. Landscape photos from the public help the drought center and its federal, state and regional partners assess drought conditions in different locations.

The drought center is currently promoting two different ways to collect photos: The Visual Drought Atlas (VDA) and Condition Monitoring Observer Reports (CMOR, pronounced “see more”).

Find social media content to promote VDA and CMOR submissions at go.unl.edu/drought_social.

Asking the public to submit photos can produce more spatially dense information, which benefits U.S. Drought Monitor authors, policy makers and researchers looking for visual confirmation of conditions at a specific place and time, said Kelly Helm Smith, who is spearheading the NDMC’s photo collection efforts. It’s also a chance for farmers, ranchers and others to show what they are seeing and experiencing.

The social media resources overlay examples of questions from the user-friendly VDA and CMOR with images that show drought and additional conditions that might spur people to submit photos or reports. A goal of the campaign, Smith said, is to help people understand that drought varies significantly across regions. Just because a yard doesn’t have cracked earth doesn’t mean it can’t help tell the story of drought conditions across the U.S.

Several of the promotional images feature photos submitted to the Visual Drought Atlas. Along with the downloadable images, there are also suggested texts to post on social media. It’s all under 280 characters and ready to be tweeted.

Smith said that images can be submitted to the Visual Drought Atlas all year round, but NDMC staff promotes seasonal submissions that fall on four long weekends across the seasons — President’s Day, Memorial Day, Fourth of July and Labor Day. CMOR reports help the NDMC team understand how dry, wet and normal conditions affect different activities across the country. Anyone can submit a CMOR report at any time of the year.

The Social Media Resources page will be updated over time. When tweeting the images, don’t forget to tag @DroughtCenter too. □

The National Drought Mitigation Center has created a social media library section on its website with a collection of ready-to-post content that can help you recruit more eyes on the ground to help build photo archives showing what dry, normal and wet conditions look like in different places.



NDMC publication highlights

The Ranchers' Use of Drought Contingency Plans in Protective Action Decision Making

To manage not only ranching operations but also the stress of running them when water is lacking, many ranchers are developing drought plans in advance. Tonya Haigh, a rural sociologist with the National Drought Mitigation Center, led a team that surveyed a collection of Northern Plains ranchers who endured a 2016 flash drought that significantly altered forage production in the area.

Having a drought plan in place, and monitoring for conditions that would lead them to utilize if-then strategies, led many ranchers with drought plans to destock early enough to take advantage of better market prices or secure more forage for their core herds.

"As ranchers in the region contemplate current dry conditions and wonder what 2021 will bring, this study shows that it would be worthwhile to spend time putting together or updating their plan for drought," Haigh said.

Read the study at: doi.org/10.1016/j.rama.2020.09.007.

Monitoring #drought in the Twittersphere

Millions use Twitter to share their rapid-fire opinions, observations and connections to real-time events. And natural disasters are often major conversation starters. With that in mind, National Drought Mitigation Center assistant director Kelly Helm Smith wanted to see what tweets said about the impacts of drought, and whether tweets could contribute to a drought early warning system.

Smith developed a method to monitor the rate of tweets about drought over time, state by state, allowing her to detect when #drought tweets unexpectedly surge. Tweets, as a measure of fluctuating attention, could contribute to a drought early warning system, she said.

"A lot of hazard researchers are trying to figure out what we can learn from social media," Smith said. "Social media has a real role to play in both assessing the extent and impacts of disasters and in warning people about disasters."

Though the study is published, the work is ongoing, and will include exploration of larger Twitter searches. Meanwhile, on Mondays, Smith emails a map of the past week's #drought tweets to a listserv of drought experts and state climatologists.

On the web at: doi.org/10.1175/BAMS-D-19-0342.1.

Flash droughts present a new challenge for subseasonal-to-seasonal prediction

Mark Svoboda, director of the National Drought Mitigation Center, is credited with coining the term "flash drought" in the early 2000s.

"I wanted to find a term that would resonate for this quicker developing drought, and flash drought just popped in my head, as I thought people could relate it to their knowledge of flash floods," he said. "And that took off like wildfire."

In 2020, he was part of a team of 22 authors led by Angeline Pendergrass who wrote a wide-ranging study on flash droughts that was published in *Nature Climate Change*. The paper was the end product of a 2018 Aspen Global Change Institute workshop that brought together drought experts from around the world to address S2S prediction and flash drought.

Svoboda said that the *Nature* paper helps to more clearly define what a flash drought is (and isn't), sets guidelines on when to detect that one has occurred and explores ways to improve monitoring and predictions.

On the web: www.nature.com/articles/s41558-020-0709-0?proof=t. □



The journal *Rangeland and Ecological Management* published an article detailing the results of a survey of western South Dakota ranchers who endured a 2016 flash drought that significantly altered forage production in the area. USDA NRCS South Dakota

Our team

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Assistant director &
Communication coordinator

Dr. Deborah Bathke
Education coordinator

Brian Fuchs
Monitoring coordinator

Dr. Cody L. Knutson
Planning coordinator

Dr. Tsegaye Tadesse
Geospatial coordinator

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Graduate research assistant

Jenna McCoy
Undergraduate intern

Andrew Mwape
Graduate research assistant

Beichen Zhang
Graduate research assistant

STAFF

Yared Bayissa
Visiting Scientist

Tonya Bernadt
Education and outreach specialist

Denise Gutzmer
Drought impact specialist

Dr. Tonya Haigh
Project manager rural sociologist

Dr. Tingting Liu
Drought policy & impact analyst

Cory Matteson
Communications specialist

Mary Noel
Research assistant

Jeff Nothwehr
GIS and web specialist

Brendon Orr
Web graphics designer

Chris Poulsen
GIS manager

Dr. Renata Rimsaite
Water markets analyst

Curtis Riganti
Climatologist

Crystal Stiles
Climatologist

John Swigart
Geospatial analyst

Jeff Wisner
Concentric consultant

Deborah Wood
Publication specialist

Nicky Wood
Administrative assistant



Partnerships

International

- Global Water Partnership
- International Center for Biosaline Agriculture
- International Water Management Institute
- U.S. Agency for International Development
- Korea Water Resources Corporation
- Queensland Drought Mitigation Centre: University of Southern Queensland
- United Nations
 - Convention to Combat Desertification
 - Environment Program
 - Food and Agriculture Organization
 - World Meteorological Organization
- World Bank
- Caribbean Institute of Meteorology and Hydrology



Federal

- NASA
 - Jet Propulsion Lab
 - Goddard and Marshall Space Flight Centers
- National Science Foundation
- U.S. Department of Agriculture
 - Agricultural Research Service
 - Office of the Chief Economist
 - World Agriculture Outlook Board (USDA Chief Meteorologist)
 - Foreign Agriculture Service, Borlaug Fellowship Program
 - Climate Hubs
 - Natural Resources Conservation Service
 - Forest Service
 - Risk Management Agency
- U.S. Department of the Interior
 - Bureau of Indian Affairs
 - U.S. Fish & Wildlife Service
 - U.S. Bureau of Reclamation
 - U.S. Geological Survey
 - Earth Resources Observation and Science (EROS) System
- U.S. Department of Commerce
 - National Integrated Drought Information System
- National Centers for Environmental Information
- National Weather Service
 - River Forecast Centers
- NOAA Office of Atmospheric Research
- NOAA Climate Program Office
 - Sectoral Applications Research Program
 - Modeling, Analysis, Predictions and Projections
 - National Water Center
- Federal Emergency Management Agency
- U.S. Environmental Protection Agency
 - Office of Research and Development
- U.S. Army Corps of Engineers

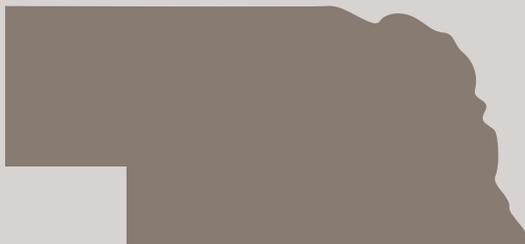


Academic

- Nebraska University
 - University of Nebraska Medical Center
 - Daugherty Water for Food Global Institute
 - Extension
 - Public Policy Center
 - High Plains Regional Climate Center
 - Hixson-Lied College of Fine and Performing Arts
 - State Climate Office
 - School of Natural Resources
 - Agricultural Economics
- Colorado State University
- Southern Climate Impacts Planning Program
- Carolinas Integrated Sciences and Assessment
- Desert Research Institute, University of Nevada, Reno
- University of Wisconsin Cooperative Institute for Meteorological Satellite Studies
- North Central Climate Collaborative (NC3)
- North Dakota State University
- Iowa State University Extension
- University of Maryland Earth System Science Interdisciplinary Center



- Oklahoma State University
- Kansas State University and Extension
- Extension Disaster Education Network
- New Mexico State University
- University of Colorado
- University of the Virgin Islands



State of Nebraska

- Governor's Climate Assessment and Response Committee, Water Availability and Outlook Committee
- Health & Human Services, vector-borne disease surveillance
- Natural Resources Districts
- Department of Natural Resources

Other Organizations

- Banner Associates, Inc.
- Community Collaborative Rain, Hail and Snow Network
- Great Plains Tribal Water Alliance
- American Planning Association
- Iowa Wine Growers Association
- Iowa Hops Growers
- Wisconsin Potato and Vegetable Growers Association



- Wisconsin Cranberries Growers
- North Central Regional Center for Rural Development
- Iowa Department of Natural Resources
- North Central Region Water Network
- South Carolina State Climate Office



The National Drought Mitigation Center, as many other workforces did, pivoted to remote meetings in 2020. Most of the staff was able to gather for a recent, socially distant, group photo.



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