



SOUTH CENTRAL

CLIMATE ADAPTATION SCIENCE CENTER



2021-2022 Annual Report

August 1, 2021 - July 31, 2022

The South Central Climate Adaptation Science Center (CASC) is one of eight regional Climate Adaptation Science Centers that are managed by the U.S. Geological Survey (USGS). The USGS Climate Science Adaptation Centers are working across regions of the United States to develop and bring critical science results to managers and stakeholders concerning impacts of climate variability, trends, and extremes with the goal of developing strategies to minimize economic, sociological, and ecological consequences. Priority science activities include measurement, modeling, and decision support that are related to the impacts of climate on natural and cultural resources.

**South Central Climate
Adaptation Science Center
Annual Report**



Administrative

Award Recipient:

University of Oklahoma
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Norman, OK 73019

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Photo taken in 2021

Project Title:

Hosting the Department of the Interior's South Central Climate Adaptation Science Center

Award Agreement Number:

G19AC00086

Report Date:

May 31, 2022

Reporting Period:

August 1, 2021 – July 31, 2022

Purpose and Objectives

The South Central Climate Adaptation Science Center (CASC) is a research collaboration between the USGS, University of Oklahoma (host institution), Texas Tech University, Chickasaw Nation, Choctaw Nation of Oklahoma, Louisiana State University, Oklahoma State University, and the University of New Mexico. Our team conducts science that helps fish, wildlife, ecosystems, and the communities they support adapt to climate change. The South Central CASC collaborates with a wide range of researchers and decision-makers in tribes, state and Federal agencies, universities, and non-governmental organizations. Our Center has existed since March 2012, but in this report we refer to Year 3 since it is the third year in our current Host Agreement.

This report provides a summary of the South Central CASC Consortium activities for Year 3 (August 1, 2021 – July 31, 2022). The Consortium accomplished the agreed-upon deliverables for this year outlined in our Term Sheet document, and these are discussed throughout this report. In Year 3, the South Central CASC:

- Hosted four online short courses for resource managers world-wide (two in Fall 2021; two in Spring 2022);
- Conducted stakeholder-driven science related to our six science priorities;
- Engaged with stakeholders and built capacity through virtual trainings and workshops (e.g., climate 101s, climate projection trainings, tribal resilience, etc.);
- Promoted cross-departmental and inter-collegial engagement at each institution and across the Consortium through new proposal efforts and our Communities of Practice;
- Continued growing our Affiliate Program with three new Affiliate members;
- Developed a plan focused on tribal engagement evaluation to be implemented in Year 4;
- Maintained our online presence through our website, social media, and webinars;
- Hosted a virtual Science Meeting in Fall 2021;
- Engaged in cross-network collaborations in research, DEI, and climate training efforts; and
- Submitted the required communications products to the National CASC.



Organization & Approach

Personnel Financially Supported on the Host Agreement

The table below highlights CASC employees at our consortium institutions supported on our host agreement.

Personnel	Affiliation	Role	FTE on Host Agreement
Renee McPherson	University of Oklahoma	Consortium PI & University Director	1 FTE for 1 month
Emma Kuster	University of Oklahoma	Consortium Co-PI & University Assistant Director	1 FTE for 8 months
Jenifer Henslee Peck	University of Oklahoma	Science Translator	1 FTE for 7 months
Yvette Wiley	University of Oklahoma	Tribal Liaison & Research Associate	0.5 FTE for 7 months
Sharon Hausam	University of Oklahoma	Climate Adaptation Planner & Research Scientist	0.5 FTE for 2 months
Ellen Robertson	Oklahoma State University	Postdoctoral Associate	1 FTE for 12 months
Emma Roberts	Texas Tech University	Postdoctoral Associate	1 FTE for 12 months
Radilyn Senz	Texas Tech University	Undergraduate Student	20 hours per week (Aug-Mar)
Kristine DeLong	Louisiana State University	Consortium Co-PI	1 FTE for 1 month
Victor Rivera-Monroy	Louisiana State University	Consortium Co-PI	1 FTE for 1 month
Kylie Palmer	Louisiana State University	Graduate Student	0.5 FTE for 12 months
Xioachen Zhao	Louisiana State University	Graduate Student	0.5 FTE for 5 months
Ivan A. Vargas-Lopez	Louisiana State University	Graduate Student	0.5 FTE for 12 months
Renia Ehrenfeucht	University of New Mexico	Consortium Co-PI	0.01 FTE for 9 months
Lani Tsinnajinnie	University of New Mexico	Consortium Co-PI	0.01 FTE for 4.5 months
John Fleck	University of New Mexico	Consortium Co-PI	0.01 FTE for 9 months
Annalise Porter	University of New Mexico	Graduate Student	0.5 FTE for 5 months
Maximiliano Trujillo	University of New Mexico	Graduate Student	0.5 FTE for 10 months
Brennan Davis	University of New Mexico	Graduate Student	0.25 FTE for 8 months
April Taylor	Chickasaw Nation	Consortium Co-PI & Tribal Liaison	1 FTE for 12 months

Personnel Who Contribute Time/Service to the Host Agreement

The table below highlights the CASC employees at our consortium institutions that are supported by other means but contribute time/service to the host agreement mission.

In addition, the CASC has over 95 Research Affiliates across the consortium and at partner institutions.

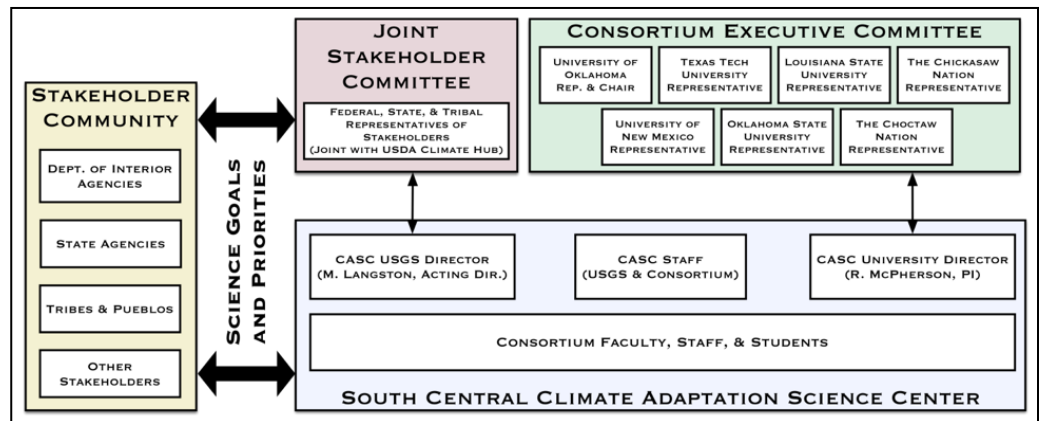
Affiliation	Personnel (Role at CASC)
University of Oklahoma	Elinor Martin (Consortium Co-PI); Mark Shafer (Consortium Co-PI); Berrien Moore (Consortium Co-PI); Cynthia Naha (NM Tribal Liaison - left Dec. 2021); Noetta Harjo (Financial Administrator); Derek Rosendahl (Research Scientist); Irene Lodangco (Research Scientist); Adrienne Wootten (Research Scientist); Caitlin Rottler (Postdoctoral Associate); Dolly Na Yemeh (Postdoctoral Associate); Laura Bray (Postdoctoral Associate); Paulina Cwik (Graduate Student); Olivia VanBurskirk (Graduate Student); Ebone Smith (Graduate Student); Taylor DeWinter (Graduate Student); Carrie Leslie (Graduate Student); Amelia Cook (Graduate Assistant); Luke Kerr (Student Office Assistant); Rachel Koch (Student Office Assistant); Nondumiso Mndzebele (Social Media Coordinator); Peyton Cavnar (Undergraduate Research Assistant); Matt Davies (Undergraduate Research Assistant); Tsali Smith (Undergraduate Research Assistant); Asa Samuels (Undergraduate Research Assistant); Patrick Painter (Undergraduate Research Assistant)
Oklahoma State University	Jim Ansley (Consortium Co-PI); Scott Loss (Postdoc Supervisor)
Texas Tech University	John Zak (Consortium Co-PI); Katharine Hayhoe (Consortium Co-PI); Venki Uddameri (Consortium Co-PI); Natasja van Gestel (Consortium Co-PI); Ian Scott-Fleming (Research Associate); Kerry Griffiths-Kyle (Faculty); Nick Smith (Faculty); Tirhas Hailu (Postdoctoral Associate); Amin Ferdous (Graduate Student); Garrett Huddleston (Graduate Student); Diana Vargas-Gutierrez (Graduate Student); Erin Stukenholtz (Graduate Student); Pablo Tovar (Graduate Student)
Louisiana State University	Chris D'Elia (Consortium Co-PI)
University of New Mexico	Dave Gutzler (Retired Faculty); Mollie Hantulla (Graduate Student)
Chickasaw Nation	Kara Berst (Consortium Co-PI); Krisopher Patton (Researcher); Newakis Webber (Researcher); Chaylum Hogue (Researcher); Matthew Armor (School to Work Intern); Taylor Broadbent (BIA Intern), CJ McLemore (BIA Intern); Clarissa Dixon (BIA Intern); Ian Stevens (BIA Intern); Lex Smith (Student Intern); Buster Beshires (Student Intern)
Choctaw Nation	Ethan Schuth (Consortium Co-PI); Tye Baker (Consortium Co-PI)



Organization & Approach

Organizational Structure & Communication

The University Director and University Assistant Director oversee the Consortium budget and provide guidance on science and planning activities conducted through the host agreement. The diagram shown overviews the relationship between USGS and Consortium leadership teams and stakeholders as of August 2019.



The Consortium Executive

Committee (EC) meets annually (typically in March or April) to discuss progress-to-date in a given year and begin planning for the following year. In Year 3, the EC met virtually on March 31st to discuss future research and capacity building opportunities, the 2022 Fall Science Meeting, and science communication efforts conducted through the host agreement.

To facilitate regular communication across the Consortium, we have scheduled bi-monthly Zoom calls to discuss general updates, critical issues, and the science being conducted by students and postdocs. In Year 3, we started dedicating one call per month for a research presentation and discussion.

Personnel Achievements

Dr. Elinor Martin earned the Edith Kinney Gaylord Presidential Professorship Award from The University of Oklahoma for her outstanding leadership and teaching efforts in the OU School of Meteorology.

Ms. April Taylor received an Honorable Mention for the 2021 Climate Adaptation Leadership Award in the Individual Achievement Category from the Association of Fish and Wildlife Agencies for her outstanding climate adaptation efforts with tribal communities in the South Central US.

Host Agreement Challenges

We continued to face a few challenges in Year 3 (primarily related to COVID-19), but were able to overcome and adjust accordingly:

Administrative: Due to delays with the congressional budget, FY22 projects have not yet received funding to begin their projects. Additionally, OU has experienced some internal delays with processing award paperwork, but this is being resolved.

Travel: Due to ongoing delays, cancellations, or transitions to virtual options for conferences and other events, our team has been unable to use much of the travel funding in the host agreement. We have requested to carry over remaining travel funds or reallocate those to salary and fringe for our research team.

Cross-Departmental Interaction Challenges: Due to the ongoing situation with COVID-19, it has been challenging to promote such interactions. However, our Communities of Practice that have been established over the past few years are helping to fill in this gap and are stimulating new collaborative efforts across departments and institutions.

Capacity Building Challenges: Our CASC had several workshops and listening sessions planned that were either postponed or transitioned to virtual during Year 3 due to the ongoing COVID-19 situation. This has impacted our ability to engage with some of our stakeholders and tribal partners, but has offered us a way forward in maintaining some engagement during these difficult times. Additionally, virtual options have provided more flexibility in reaching stakeholders that would normally have to travel longer distances to attend in-person events. Moving forward, we will likely have a virtual option available for most of our training and workshop events.



Results

Partnerships

Our goal is to respond to high priority natural and cultural resource management challenges and foster substantive, sustained engagement between scientists and managers. In Year 3, the South Central CASC focused on building new partnerships and strengthening existing partnerships.

South Central CASC staff at OU in partnership with the Southern Plains Drought Early Warning System (DEWS) team are planning a Drought Partners Meeting for August of 2022. We are excited to continue building our relationship with the Southern Plains DEWS team and USDA Southern Plains Climate Hub to bring our stakeholders the best drought information possible.

We have continued to strengthen our connection with U.S. Fish and Wildlife Refuge Managers across our region through regular engagement. In Year 3, we conducted brainstorming sessions to identify pilot projects with three wildlife refuges in our region. Additionally, our team has been working with the U.S. Fish and Wildlife Service to provide technical expertise on climate modeling for two Species Status Assessments.

The South Central CASC hosted a virtual Science Workshop in Fall 2021 that brought together over 60 scientists and resource managers from across our region to discuss research opportunities related to climate adaptation. Participants were invited to join one of our Communities of Practice (CoPs). The science being conducted by each group is further discussed in the *Science* section.

South Central CASC staff has been building new partnerships with the National Park Service, in particular with the Climate Change Response Program team and the Intermountain West Region climate coordination team. Ms. Emma Kuster will be working with these teams to update and streamline their climate change workshop process with the ultimate goal to increase the number of parks per year that they can assist in planning for a changing climate. We are starting with a pilot project this year to develop a new framework that can be implemented service-wide and strengthen NPS partnerships with the entire CASC network.

Capacity Building

Our goal is to build a community of researchers and managers and foster their leadership in science-based resource management. In Year 3, we focused building capacity through virtual workshops and training events, webinars, and our Managing for a Changing Climate short course series. The South Central CASC team hosted 15 training or workshop events for resource managers, including our tribal partners.

Our Managing for a Changing Climate short course series continued to be popular, and were spread out over four short courses, two in the Fall of 2021 and two in the Spring of 2022. Our *Introduction to the Climate System* course had over 100 people register with 20 tribal attendees representing 13 tribes. Our *Climate Modeling, Downscaling, and Assessments* course had over 175 people register including 27 tribal attendees representing 13 tribes. For our Spring 2022 courses, we had over 125 people register for the *Societal Impacts* course and over 100 people register for the *Physical Impacts* course.

South Central CASC staff also offered *How to Use Climate Projections* training opportunities for approximately 50 resource managers as part of the Native American Fish and Wildlife Society Annual conference.

Strategic Planning & Tribal Engagement Evaluation

Our team continues to work toward sharing knowledge and lessons learned about evaluating climate services, as well as learning best practices to do so. They are working on a case study with the NM Tribal Action Resilient Network to illustrate long term impacts of the program and will be conducting interviews in the summer of 2022 to assess tribal needs and challenges. Our Evaluation Committee includes representation from the US Dept. of Agriculture Climate Hubs, the Southern Plains Drought Early Warning System group (through NIDIS), the Climate Assessment for the Southwest group (a NOAA RISA), and the Southern Climate Impacts Planning Program (a NOAA RISA).



Results

Science

Our goal is to advance the understanding of the impacts of climate change and variability on fish, wildlife, water, land, and people to support sound resource management and adaptation. Below are research highlights from our Community of Practice (CoP) members and our South Central CASC host agreement efforts:

- *Sustainable & Usable Water Resources*: The Water Resources CoP completed two publications since they started, but now the group is starting to phase out as several members faced changes in their personal and professional lives. We hope to re-establish this group in another year as new needs surface from the management community. Additionally, graduate students at UNM continued to work on projects related to water usage and policy in the Middle Rio Grande. Initial results from their work suggests that increased water use poses risks of unsustainable increases in groundwater pumping, especially in light of climate change.
- *Enhancing the Resilience of Indigenous, Rural, & Vulnerable Communities*: The Building Resilient Communities CoP has reframed its purpose and are now focusing on climate change and adaptation on the ground. They are interested in how people in their everyday lives and everyday work lives are experiencing, interpreting, responding and adapting to, and living with environmental change. The team is focusing on the intersections among climate change, environmental change from development patterns and ways of living, and the social and economic changes that accompany environmental change or shape what actions are possible or desirable. They are developing a webinar series on the topic of resilient communities following the model of TTU's *Science by the Glass* series.
- *Mapping & Predicting Changes in Species and Ecosystems*: Team members in this CoP have been working on five focus areas: (1) conceptual paper to describe climate change effects on species distributions (currently under review in *Ecosphere*); (2) creating a white paper studying emerging urban ecosystems; (3) creating species-specific fact sheets for climate-smart guidance for New Mexico and Oklahoma; (4) evaluating the impacts of agricultural practices on biodiversity, species distributions, and landscape connectivity for species; and (5) studying the relationships between animal and human health in the context of a changing climate. In addition to the work done by this CoP, Dr. Ellen Robertson at OSU has continued her work with e-bird to understand how changes in spring green up are impacting the migration patterns of migratory birds in the Central Flyway.
- *Understanding Teleconnections that Influence Ecosystem Resilience*: CoP members are submitting an article titled *Impacts of Atmosphere-Ocean Teleconnections on the South-Central United States* to the journal *Frontiers in Earth Science*. Moving forward, this group will be continuing a literature review on the use of telecoupling to support progress in integrated climate science. They are also working to develop a first draft manuscript on the use of teleconnection concepts in human-environment systems research.
- *Understanding Uncertainty*: This team is working to identify useful resources about working with and describing uncertainty in climate change. They are developing a web site to house materials about communicating uncertainty effectively and understanding the types of uncertainty inherent in climate projections and scientific statements with plans to provide a demo at the 2022 Fall Science Meeting.
- *Resilient Coastal Systems*: A new CoP group, Resilient Coastal Ecosystems was established at the Fall 2021 Science meeting and they are in the process of setting goals and gaining new members.
- *NEW THEME: Extreme Weather and Climate Change*: This group was established at the Fall 2021 Science meeting and has established a central research theme *to address how changes in extreme weather impact our National and State Parks and National Wildlife Refuges*. Progress toward this mission is strong and the National Park Service is currently identifying a few specific parks which are experiencing significant and immediate issues with climate change and extreme weather for the team to begin pilot projects with over the next year.



Communications & Outreach Efforts

Our goal is to understand and respond to information needs and support the integration of climate adaptation in resource management through usable, useful products and tools. Below is a brief description of our outreach, products, and tools resulting from efforts directly funded by the host agreement.

Communications & Outreach

In Year 3, we submitted over 25 highlights to the National CASC that included publications from our researchers, virtual events, and presentations. We maintained and expanded our online presence through our website (<https://southcentralclimate.org/>), social media platforms (Facebook [960 followers], Twitter [701 followers], LinkedIn [395 followers], YouTube [1000 followers], and Instagram [145 followers]), monthly newsletters [652 subscribers], and webinars from partners and Affiliates. Since August 2021, we have had over 8,000 visitors, resulting in over 18,000 page-views on our website.

In a joint effort with the USDA Southern Plains Climate Hub and the Southern Plains Climate Impacts Planning Program, we continued to host our bi-monthly Southern Plains Climate Science Webinar to accommodate for virtual overload and as a result created a quarterly webinar series with varying style approaches for more active audience engagement. We are averaging around 45 registrants for each webinar. Webinars that are recorded are made available for viewing on our website (<https://southcentralclimate.org/resources/webinars-workshops/>).

The TTU-Climate Center continued to host virtual monthly Science by the Glass Events that facilitate climate related research presentations and discussions. Participants attended from around the U.S. and internationally. The events average from 100-250 views between live and recorded content. This format has also fostered more cross-consortium interaction, with Dr. Mike Langston and Dr. Kristine DeLong as invited speakers for the series.

Additionally, we continued to engage in outreach efforts with youth and educators to build up the next generation of scientists. Ms. Emma Kuster presented to over 100 state coordinators for Project WET, Project WILD, and Project Learning Tree. We also had a booth at the Oklahoma Indian Education Conference, which led to a new contact with the outreach coordinator at the First Americans Museum, and ultimately participation at a youth outreach event at the museum in March, in which several members of the Center participated.

Engagement with Regional & Local Decision-Makers

South Central CASC staff at LSU met with the Flower Garden Banks National Marine Sanctuary (FGBNMS) to discuss research progress and brainstorm new project ideas. LSU staff will work with them to set up a new water monitoring program as a result of these discussions. They also took part in multiple virtual workshops to address the status and trends of resources in the FGBNMS which will be used to draft a new condition report.

The South Central CASC staff at OU and CN were asked to create a flood history and climate projections report for the Coushatta Tribe in Louisiana.

Members at OSU had discussions with the Cornell Lab of Ornithology about climate change effects on bird migration using citizen-science data and are collaborating on a manuscript together.

Members at TTU started a new collaboration with CEMEX USA surveying biodiversity and wildlife health in the Tans-Pecos region of Texas as it relates to climate change.

Tools & Products

Several staff members are creating a four-page set of flyers for a Climate Adaptation Series on the topics of climate adaptation, seed banking, fire, and floods.

Over this past year, the South Central CASC team submitted over 45 publications and presented over 100 presentations at conferences, workshops, and webinars across our region. A list of selected publications and presentations are highlighted in the appendix. All publications are linked on our website.



Activities Planned for Year 4

In Year 4 of this host agreement, we plan to continue to develop new products and tools, offer trainings and workshops, and engage in actionable science that will assist our stakeholders in adapting to a changing climate. Moving forward, we plan to:

- Continue to grow existing Communities of Practice and establish additional CoPs to synthesize and identify gaps in stakeholder-driven science priorities;
- Implement our Tribal Engagement evaluation plan and use the results to strengthen our efforts;
- Revamp and host our online climate education short course series, and co-teach climate adaptation courses across our CASC institutions (including Managing for a Changing Climate);
- Develop a training approach rooted in adult education practice for providing climate adaptation training to resource managers across our region;
- Continue taking our new projections to DOI agencies and partner agencies to infuse climate information into adaptation and conservation plans (e.g., SSAs, Habitat Plans, and SWAPs, etc.);
- Engage stakeholders directly through listening sessions and workshops to understand priority science needs and provide scientific expertise as requested;
- Educate and support Tribal engagement across the region, including hosting Tribal workshops and pursuing funding opportunities in collaboration with Tribal partners;
- Develop an evaluation plan to evaluate other CASC activities;
- Further enhance partnerships with Tribes and Tribal organizations, National Wildlife Refuges, National Park Service, and other State and Federal agencies across our region; and,
- Strategically develop large-scale inter-institutional and inter-disciplinary regional proposals to establish a broader funding base.





South Central CASC Host Agreement Budget

Due to the ongoing COVID-19 pandemic, many of our institutions have faced difficulty in spending from their travel and supply lines. Since many workshops and conferences have been postponed, cancelled, or transitioned to virtual, we have submitted reallocation requests throughout the year to move travel and supply funds as needed. We will also be submitting a request to carryover remaining Year 3 funds into Year 4 for OU, CN, and UNM. Remaining carryover is primarily associated with unspent travel funds in Year 3.

Leveraged Funding

In 2014, there was an anonymous donation of \$330,000 provided to the South Central CASC, which has been set up as a Foundation Account at OU. Each year we use that funding to provide at least three study abroad scholarships and two academic scholarships. This year, we offered three study abroad scholarships and four Department of Geography and Environmental Sustainability academic scholarships.

In 2018, the South Central CASC became a consortium member of the Oklahoma NASA Space Grant Consortium. The funding we continue to receive through this partnership has been used to support several postdocs and students at the South Central CASC working on climate-related projects. This past year, we supported four native students on our NASA funding. Ms. Peyton Cavnar worked on a project related to climate adaptation and seed banking, Mr. Asa Samuels has been investigating tribal representation and participation in State Wildlife Action Plans, Mr. Tsali Smith completed the first 3D printed weather station, and Ms. Amelia Cook developed a K-12 curriculum around the weather station and its data.

Our NM Tribal Liaison receives funding through a separate grant from the Bureau of Indian Affairs. We have been able to secure funding for this position through grants since June 2017. The current cooperative agreement will end in Fall 2022 and we are currently working to establish a new Cooperative Agreement. We are looking to fill this vacant position in summer 2022.

Climate Science Center Support for Tribal Resilience Planning

Renee McPherson (OU), PI – ongoing, BIA, Start Date: 7/5/2017

South Central CASC Consortium researchers were successfully awarded 4 projects through the FY22 USGS awards competition. In addition, our team also was awarded 3 projects through directed funding.

The research team of the South Central CASC successfully submitted 5 additional proposals to other federal agencies, totaling in an additional \$15,306,256 of leveraged funds for CASC-related projects since August 1, 2021. We have additional proposals submitted and currently under review, so this dollar amount may continue to grow for Year 3. Many of these projects are awarded to our PIs because of the expertise built through the South Central CASC network.



Appendix: Additional Achievements & Efforts

NASA Earth to Sky Program

In October 2019, April Taylor and Emma Kuster participated in the NASA Earth to Sky Academy to become regional leaders for the Earth to Sky Program. In July of Year 3 we will hold our first in-person workshop for tribal educators, led by April Taylor. This workshop was originally scheduled for the summer of 2020 but was postponed due to COVID-19.

Diversity, Equity, & Inclusion Efforts

In partnership with the USGS CASC, and leveraging previous discussions learned by staff and students, there have been diversity, equity, inclusion, and accessibility (DEIA) discussions and resource building in Year 3. This includes a Padlet that allows the team to share media, tools, resources, and other information of interest that allow for personal and professional growth and group discussions. These discussions have allowed our team to get to know one another better as well as allow us to explore and foster changes that will be beneficial to the South Central CASC and our partners.

Supporting our Communities of Practice

Using some of our leveraged funding through our OU cost share, we were able to support two students at the University of Oklahoma to work on summer projects with our Teleconnections CoP and Species and Ecosystems CoP. These students will be helping the teams with their ongoing work described above in the *Science* section.

New CASC Employees

The South Central CASC added Jenifer Henslee Peck as the new Science Translator and Communications Specialist in January 2022. In Fall 2021, Yvette Wiley and Dr. Sharon Hausam were hired to build out our tribal engagement program. Yvette transitioned to full time as a Research Associate and Tribal Liaison in January 2022. Dr. Sharon Hausam was hired as the Climate Adaptation Planner and Research Scientist and has been working to identify climate adaptation planning efforts in which the Center could assist. In Spring 2022, Dr. Dolly Na-Yemeh started as a Climate Adaptation Specialist (started May 27th, 2022) and will be working with our resource managers on their climate adaptation related science needs. We will be hiring a New Mexico Tribal Liaison in Summer 2022.

Sabbatical CASC Employees

Dr. Renee McPherson, Dr. Renia Ehrenfeucht, and Dr. Kristine DeLong are on a sabbatical from their professorships at their respective universities for portions of Year 3. During their sabbaticals they have been working on research efforts that are benefiting the larger CASC network.

Fifth National Climate Assessment (NCA5)

The South Central CASC is represented in the NCA5 effort with Dr. Renee McPherson serving as the Southern Plains region chapter lead, and April Taylor and Taylor Broadbent as additional authors.

Climate Adaptation Scientists of Tomorrow

LSU was selected as one of the host sites for the Climate Adaptation Scientists of Tomorrow program funded by the National CASC. Students will start their multi-year experience in the summer of 2022 at LSU in partnership with Auburn University, Savannah State University, and Jackson State University. This program aims to 1) increase diversity, equity, and inclusion in STEM; 2) cultivate the next generation of climate scientists; and 3) foster climate science programs at Minority Serving Institutions.

Regional Early Career Researcher Workshop

In July 2022, we are hosting the Early Career Researcher Workshop for the first time since 2018 due to COVID-19 restrictions. The workshop brings together a diverse cohort of graduate students, post-docs, and early career environmental professionals from a wide variety of disciplines and provides them with the skills necessary to conduct and communicate stakeholder-based actionable science.



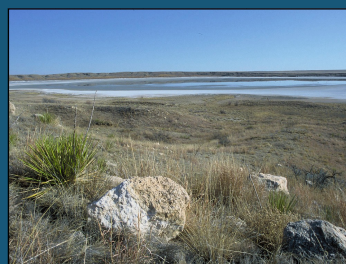
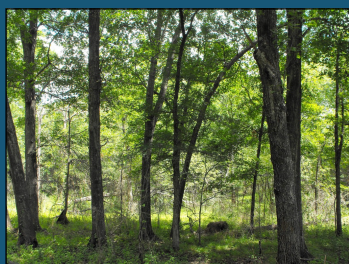
Appendix: Selected Publications

- Dong, N., Wright, I. J., Chen, J. M., Luo, X., Wang, H., Keenan, T. F., **Smith, N. G.**, & Prentice, I. C. (2022). Rising CO₂ and warming reduce global canopy demand for nitrogen. *New Phytologist*, [<https://doi.org/10.1111/nph.18076>]
- Moser, C. D., Chavarria, S. B., & **Wootten, A. M.** (2021). Streamflow response to potential changes in climate in the Upper Rio Grande Basin. Scientific Investigations Report. [<http://pubs.er.usgs.gov/publications/sir20215138>]
- Nelson, M., **Ehrenfeucht, R.**, Birch, T. & Brand, A. (2022) Getting By and Getting Out: How Residents of Louisiana's Frontline Communities Are Adapting to Environmental Change, Housing Policy Debate, 32:1, 84-101, DOI: [10.1080/10511482.2021.1925944](https://doi.org/10.1080/10511482.2021.1925944)
- Robertson, E. P.**, Tanner, E. P., Elmore, R. D., Fuhlendorf, S. D., Mays, J.D., Knutson, J., Weir, J. R., & Loss, S. R. (2022) Fire management alters the thermal landscape and provides multi-scale thermal options for a terrestrial turtle facing a changing climate. *Global Change Biology*, 28, 782-796. [<https://doi.org/10.1111/gcb.15977>]
- Stukenholtz, E. E., **Hailu, T. A.**, Childers, S., Leatherwood, C., Evans, L., Roulain, D., Townsley, D., Treider, M., Platt II, R. N., Fritts, S. R., Ray, D. A., **Zak, J. C.** & Stevens, R. D. (2022). A pigeon's eye view of a university campus. *The Southwestern Naturalist*, 66(1), 13-24. DOI: [10.1894/0038-4909-66.1.13](https://doi.org/10.1894/0038-4909-66.1.13)
- Tsinnajinnie, L.M.**, Frisbee, M.D., Wilson, J.L. (2021). Groundwater from perennial springs provide refuge from wildfire impacts in mountainous semiarid watershed. *Journal of Hydrology*, Volume 596. [<https://doi.org/10.1016/j.jhydrol.2020.125701>]
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Appendix: Selected Presentations and Other Media

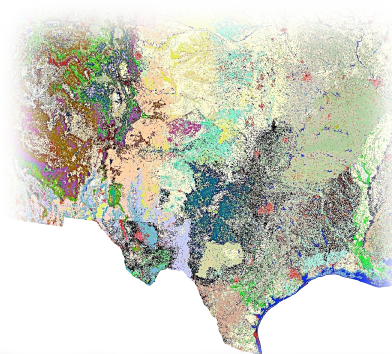
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- Canvar, P.**, May 2022: "The Power of Seeds: Climate Change and Indigenous Knowledge in the South Central Region" - South Central CASC office, Virtual
- DeLong, K.**, Wagner, A. J., Palmer, K., Weerabaddana, M. M., Slowey, N. C., Zinke, J., December 2021: "Geochemical proxies in a long live coral from Flower Garden Banks National Marine Sanctuary as a candidate for the Anthropocene Global Boundary Stratotype Section and Point (GSSP)" - American Geophysical Union Fall Meetings, New Orleans, LA
- Ehrenfeucht, R.**, October 2021: "Seeking Climate Justice: Interest and Outcomes in Louisiana's Climate Relocations" - Association of Collegiate Schools of Planning, Virtual.
- Fleck, J.**, March 2022: "Science and Governance: From Overallocation to Climate Change and Megadrought" - Colorado River Compact Centennial Symposium, Stegner Center, University of Utah.
- Martin, E., DeLong, K.**, Palmer, K., Bromley, G., May 2022: "Understanding Inter-American Seas Climate Variability Using Paleo-proxies and Climate Models", American Meteorological Society 35th Conference on Hurricanes and Tropical Meteorology Meeting, New Orleans, LA.
- Roberts, M.**, 2021: "Climate Impacts on Wildlife Health" - TTU Science by the Glass, Virtual
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- Schuth, E.**, March 2022: "Climate Narratives and Climate Justice" - OU's Teach-In on Solve Climate by 2030 Keynote presentation, Norman, OK.
- Taylor, A.**, January 2022: "Losing Culturally Significant Plants due to Climate Change" - University of Florida Plant Science Conference, Virtual
- VanBuskirk, O., McPherson, R.**, January 2022: "What Water Manager Want: Using Climate Information for Decision Making" - American Meteorological Society, 17th Symposium on Societal Applications, Virtual
- Wootten, A.**, September 2021: "Projecting Evapotranspiration and Evaporation Using Remotely Sensed Data" - Texas Water Development Board, Austin, TX.
- Zak, J.**, February 2022: "Seeing with New Eyes: Connecting Ecology, Stewardship, and Agriculture" - 4th Annual No-Till Texas Soil Health Symposium, Amarillo, TX.



Helping to solve real problems in a variable and changing climate

Our region

Water, energy, agriculture, native peoples, and rapidly growing metropolitan areas intersect with a highly variable and changing climate to frame many of the risks, challenges, and opportunities for natural and cultural resources in the south-central United States. National parks, scenic waterways, tribal and trust lands, and other protected areas are prevalent across the region. Spatial and temporal changes in the south-central's climate are linked to changes in biodiversity; key wildlife habitats; wetlands quality and extent; stream sedimentation and flow; range and density of heritage and invasive species; cultural and natural landscapes; water quality; pathogen outbreaks; and health of ecosystem services. Changes in the region also result from other stressors; hence, responses to climate change must be examined in combination with land cover/use change, habitat fragmentation, increasing population, pollution, invasive species, increasing demand for natural resources, and other stressors.



The south-central U.S. encompasses 20 ecoregions, resulting from a significant gradient in annual average precipitation, from 60 inches in coastal areas to 6 inches in the deserts.

Visit our website at southcentralclimate.org

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