Southern Climate Impacts Planning Program

ANNUAL REPORT

2024 -2025

PLANNING FOR LONG TERM CHANGE IN A SHORT TERM WORLD

SCIPP
A NOAA CAP TEAM

NOAA Climate Adaptation Partnerships (CAP)

The work highlighted in this report covers the performance period of June 1, 2024 - May 31, 2025, and is supported by the National Oceanic and Atmospheric Administration's Climate Program Office through grant #NA21OAR4310306.

J.T. Nickel Preserve in northeast Oklahoma
Image Credit: GracedByTheLight

Report prepared by: Caylah Cruickshank

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ABOUT US

The Southern Climate Impacts Planning Program (SCIPP) is a NOAA-funded Climate Adaptation Partnerships (CAP) team, which conducts research to understand climate hazard trends and patterns that are useful to decision makers, convenes decision makers from local, state and national organizations to solve complex problems, and co-produces data tools and information that are useful to a variety of audiences. SCIPP is a partnership between the University of Oklahoma (OU), Louisiana State University (LSU), Louisiana State University Health Sciences Center (LSU HSC), Texas Sea Grant at Texas A&M University, and Adaptation International (AI). Our ultimate goal is to help the people and economies of the south central region thrive in the midst of highly variable and often extreme weather conditions.

This year, SCIPP expanded on research related to heat health, which contributed to the addition of a new subcontract on the grant. In an effort to strategically align personnel expertise and project goals, we added the LSU HSC (School of Public Health) in New Orleans as an official partner. This collaboration will provide further opportunities to explore climate-related health impacts, and better position us to build relationships in that area.

Figure 1. The SCIPP region, including partner logos.

MISSION: We help communities and organizations in the South Central U.S. assess and address their weather and climate risks and impacts.

Core Office & Investigators

- Rachel Riley, PI - OU (Director)
- Mark Shafer, PI - OU (Deputy Director)
- Vincent Brown, PI - LSU (Climate Research Director)
- Barry Keim, PI - LSU HSC (Investigator)
- Trey Bell* - OU (Engagement Associate)
- Darrian Bertrand, Co-PI - OU (Climate Assessment Specialist)
- Caylah Cruickshank, Co-PI - OU (Program Manager)
- Xochitl Hidalgo - OU (Student Climate Communications Assistant)
- Derek Thompson - LSU (Research Associate)

Co-Principal Investigators & Researchers

- Aimee Franklin, Co-PI - OU
- Cassandra Jean - Adaptation International (Climate Resilience Specialist)
- Lauren Mullenbach, Co-PI - OU
- Sascha Petersen, Co-PI - Adaptation International
- Laura Picariello*, Co-PI - Texas Sea Grant
- Celine Rendon - Adaptation International (Climate Resilience Specialist)

Senior Personnel

- Ioana Cionea - OU
- Renee Edwards - LSU
- Renee McPherson - OU
- Randy Peppler - OU

Advisory Committee

- Nelun Fernando - Texas Water Development Board
- Jordan Fischbach - Water Institute of the Gulf
- Michael Hayes - University of Nebraska-Lincoln
- Kim Jenson - Oklahoma City Emergency Management
- Julie Lively - Louisiana Sea Grant
- Tim Lovell - Disaster Resilience Network
- Michelle Meyer - Hazard Reduction and Recovery Center, Texas A&M University
- Leif Olson - City of Fayetteville, AR

Students

- Denis Cheruiyot, Graduate Student - OU
- Sadé Miller*, Graduate Student - LSU
- Sarah Seibold, Graduate Student - LSU
- Olivia Van Buskirk, Graduate Student - OU

***Denotes recent addition to the SCIPP team**

FEATURED ACCOMPLISHMENT

Advancing Knowledge of Hurricane and Tropical Cyclone Science

Our team conducted novel research on tropical cyclone (TCs) characteristics, which has advanced knowledge through three peer-reviewed publications, fostered stakeholder engagement that improved awareness of the scientific advancements, and positioned us to develop stakeholder-focused tools. This body of work builds on our previous efforts of developing SURGEDAT - the world's most comprehensive database of storm surges (Needham and Keim 2012; Needham et al. 2013; Needham et al. 2015), Live Surge Tracker which provides real-time surge observations during a hurricane, and evaluating heavy rainfalls induced by tropical systems like the 2016 flood in south central Louisiana (Brown et al. 2020). In the past year, we published research on three subtopics: **1) Lengthening Atlantic hurricane seasons, including its implications**, **2) Stalling North Atlantic tropical cyclones**, **3) Assessing the sizes of tropical cyclones at landfall, including whether there have been any changes over time**.

1

In our analysis of Atlantic hurricane season length (Keim et al. 2024), we found that storms are forming increasingly earlier AND later in the season, thereby increasing season length over the period from 1970–2022. In 1970, the date the first named storm (sustained winds ≥ 34 kts) formed was around July 27th; however, by 2022, the date shifted earlier to around May 31st, representing an approximate shift of 11 days per decade. Additionally, in 1970, the last named storm dissipated around October 24th, but in 2022, the last storm dissipated around November 18th. This represents a roughly 5-day per decade shift. While improvements in observational practices raised some concerns about data quality, our results suggest that the primary driver of season expansion is the earlier onset and prolonged persistence of favorable conditions for tropical cyclones, such as warm sea surface temperatures, elevated humidity, and reduced wind shear. As such, we recommend that the National Hurricane Center consider moving the start of hurricane season to May 15th to heighten awareness of these early season storms. **We have presented our work at academic conferences (e.g., American Meteorological Society Annual Meeting, with greater than 50 attendees in the session), at stakeholder workshops and meetings (e.g., Inland Marine Underwriters Association in-person and virtual events, click here for video), and to community partners to improve preparedness for an expanding temporal risk for the coastline.**

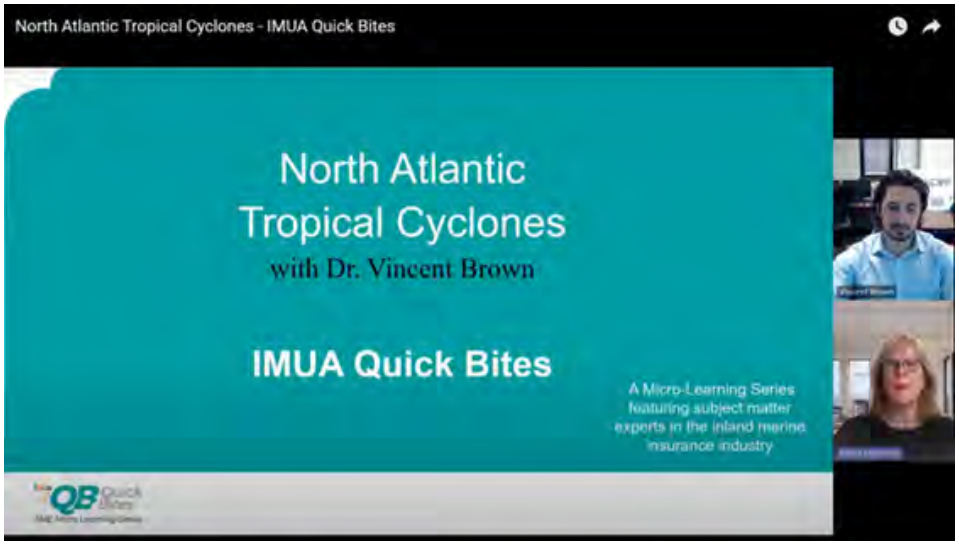


Figure 2. Dr. Vincent Brown presented virtually on North Atlantic Tropical Cyclones to the Inland Marine Underwriters Association.

2

The second project developed a definition and climatology of slow-moving (stalling) TCs in the North Atlantic from 1900–2020 (Trepanier et al. 2024). We defined a stall as a TC remaining within a 200 km radius for at least 72 hours and found that approximately 15% of storms stall at some point during their lifecycle. Preferred stalling locations include the western Caribbean, central Gulf Coast, Bay of Campeche, and areas near Florida and the Carolinas. Stalling occurs more frequently within 200 km of the coast.

Stalling TCs are of particular concern due to their potential to prolong exposure to hazardous conditions in coastal areas, thereby increasing flood risks to storm surge and extended periods of heavy rainfall.

Seasonally, stalling was most common in October (17.3% of storms) and least common in August (8.2%). Time series analysis showed a significant increase in annual stalling frequency during the satellite era (1966–2020) at 1.5% per year, along with an increase in the proportion of stalling storms relative to all storms. Stalling storms were also significantly more likely to reach major hurricane intensity. **These findings have been presented to stakeholders and academic audiences (e.g., 2025 American Meteorological Society and 2025 Association of American Geographers Annual Meetings) and can help emergency managers (e.g., Louisiana Hazard Mitigation Team) better prepare for future stalling events in vulnerable regions.**

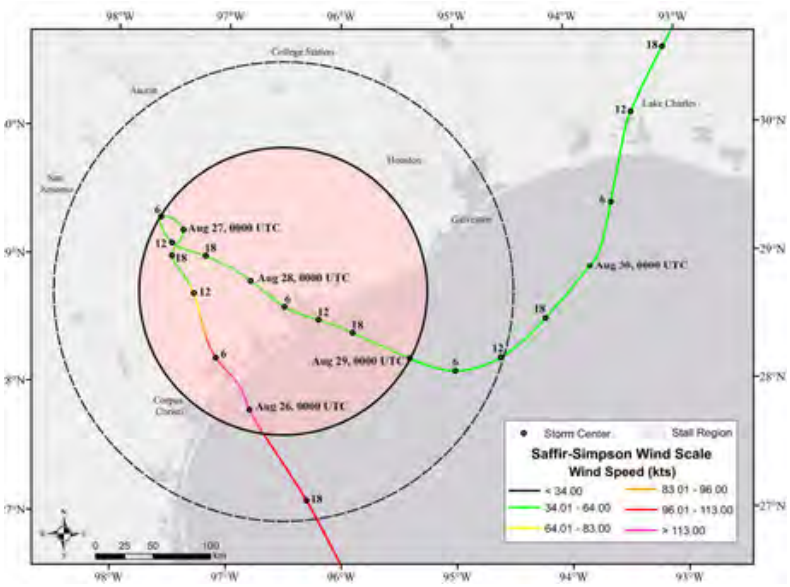


Figure 3. Hurricane Harvey's track and corral method. The pink buffer over Houston, Texas, is Harvey's observed minimum stall zone with a radius of 123 km. The larger dashed circle denotes the 200 km radius used as the corral size definition in this study (Trepanier et al. 2024).

3

The final project developed a database of tropical cyclone size at landfall (Thompson et al. 2024), a critical factor in determining the extent and severity of storm impacts for coastal communities. Accurate size data allows emergency managers, planners, and policymakers to better estimate potential exposure, improve evacuation planning, allocate resources, and design infrastructure that accounts for the full spatial footprint of storms. The database also supports enhanced risk assessments, insurance modeling, building codes, and long-term coastal planning. Our analysis found no statistically significant long-term change in TC size at landfall; however, certain parts of the season—particularly September through November—exhibited larger landfall sizes compared to other months. We also found that average landfall size was comparable between the Gulf of Mexico ($\bar{x}$ = 455 km) and the East Coast ($\bar{x}$ = 438 km), and that size did not differ significantly across Category 1–4 storms. **This work provides coastal communities with a valuable dataset to better quantify their exposure to landfalling storms and strengthen preparedness and resilience strategies.**

Collectively, this research highlights the critical need to better understand tropical cyclone characteristics that directly affect coastal population including season length, storm motion, and size at landfall. As coastal populations continue to grow, these findings provide a foundation for more accurate hazard assessments and improved decision-making. **Moving forward, this work will inform the development of stakeholder-driven tools that translate scientific findings into actionable guidance for emergency management, infrastructure planning, and long-term community resilience. This portfolio of work is what our team is most proud of and is a focal area we will continue to develop in an effort to protect lives and property in areas affected by TCs.**

NEW AREAS OF FOCUS/PARTNERSHIPS

Louisiana State University School of Public Health

This reporting period, SCIPP expanded on research elements of heat health and broader climate health impacts. To address these impacts to public health, SCIPP delved into key projects that examine historical wet bulb globe temperature trends throughout the region, the impacts of heat stress on emergency room visits, and heat monitoring and mitigation (these projects were discussed in the previous reporting cycle). In an effort to strategically align personnel expertise and project goals, we have added the LSU School of Public Health as an official SCIPP partner on the grant. This new partnership will provide further opportunities to explore climate-related health impacts and better position us to build relationships in that area.

Hazard Resilient Buildings Workshop

In Fall 2025, SCIPP will host a Hazard Resilient Buildings Workshop with representatives and speakers from the home building, insurance, and real estate industries in central Oklahoma. These sectors play a pivotal role in shaping the built environment and managing risk. They have also become increasingly relevant to hazard risk reduction efforts as property insurance premiums have increased significantly in recent years. The goals of the workshop are to raise awareness of the frequency and intensity of the weather and climate hazards that impact the geographic region and showcase best practices for strengthening homes and buildings. It also aims to identify resources the aforementioned industries need to make informed decisions that could reduce damages caused by weather hazards. SCIPP's mission centers around building and encouraging resilience across the south-central United States. By equipping industry professionals with tools and knowledge to construct more hazard resistant structures, the workshop ultimately benefits homeowners and communities across the region. If well received, the workshop could be expanded to other parts of the SCIPP region.

SCIPP Summer Internship Program

During Spring 2025, SCIPP designed, prepared for, recruited, and began a summer internship program for undergraduate students. The internships will be completed during the next reporting period. The purpose of the 10-week internship is to strengthen the capacity of local decision makers and community partners to address weather-related challenges, while also building the next generation workforce by providing undergraduate students with valuable professional experience. Seven undergraduate students, primarily from the University of Oklahoma's College of Atmospheric and Geographic Sciences, were matched with city or county government offices and other local organizations across the states of Arkansas, Louisiana, Oklahoma and Texas. Projects include tasks that build skills in data collection, outreach services, Geographic Information System mapping, policy, emergency management, and hazard planning.

SCIPP has previously partnered with a stakeholder organization (e.g., Disaster Resilience Network) to host an undergraduate intern on a limited basis. However, the scale of the current program is much larger. Even within the first few weeks, several city officials and organizational representatives have already noted meaningful benefits from SCIPP student intern involvement. A formal evaluation will be conducted to measure program impact and usefulness.

RESEARCH HIGHLIGHTS

In addition to the hurricane research advancements that were reported on page 2, progress on five other research projects was made during the reporting period.

Fiscal Decentralization and Implications on Disaster Risk Reduction – Shreveport, Louisiana, Case Study

SCIPP Investigator(s): Denis Cheruiyot, Dr. Aimee Franklin, Dr. Mark Shafer
Collaborator(s): City of Shreveport

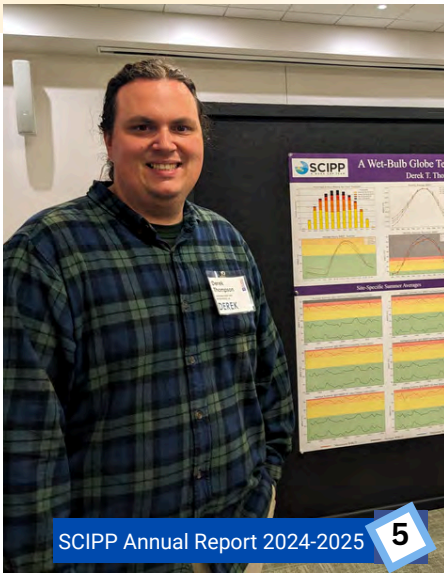
Over the past year, one of our research projects has focused on examining the implications of fiscal decentralization on local disaster risk reduction (DRR) outcomes in Shreveport, Louisiana. This study investigates how the distribution of fiscal responsibilities between federal, state, and local governments affects the city's capacity to anticipate, prepare for, and respond to disaster risks. Drawing on analysis of nine key documents (including the master plan, City's consolidated plans, emergency operations plan, capital improvement plans, Caddo Parish HMP, climate resilience and adaptation strategies, CAPER report, and flood hazard awareness brochures), seven key informant interviews, and budgetary data, the results found that **while Shreveport benefits from formal fiscal transfers and federal hazard mitigation funding, the rigidity of earmarked funds and limited discretionary budgeting capacity at the local level often constrains proactive DRR investments.**

Preliminary findings also indicate a misalignment between localized risk priorities and budgetary allocations, revealing systemic challenges in translating federal or state mandates into contextually grounded resilience strategies. Besides, the research highlights the importance of intergovernmental coordination and adaptive fiscal frameworks in fostering more effective disaster preparedness and climate adaptation at various localities. This work contributes directly to core research investigating the influence of fiscal governance structures on interlocal DRR capabilities. It also reinforces the sentiments of participants on flexibility drawbacks of project grants during the Shreveport-focused extreme weather and resilience workshop (see page 15), which brought together city officials, scholars, and practitioners to deliberate actionable reforms.

Assessing and Promoting Awareness of Heat Stress through Wet Bulb Globe Temperature

SCIPP Investigator(s): Derek Thompson
Collaborator(s): Louisiana Department of Health

Derek Thompson worked alongside the Louisiana Department of Health (LDH) to analyze twelve years (2010–2021) of heat-related emergency department (ED) visits, inpatient hospitalization, and fatality data across Louisiana. The goals of this project were to better understand how Louisiana's heat-related negative health outcomes vary by demographics and geography and to assess the statistical relationship between heat (temperature, heat index, and wet bulb globe temperature [WBGT]) and ED visits. All three heat variables were derived using ERA5-Land, an hourly, native 9-km gridded dataset, while the health data were provided by LDH's Multi-Source Heat-Related Illness Database. Finally, although WBGT is considered a more comprehensive heat stress metric than temperature or heat index, it did not exhibit a stronger association with heat-related ED visits than either of the other two measures. Progress is being made toward publishing the research results in an academic journal.



Assessing Adaptation Efforts in Fayetteville, Arkansas

SCIPP Investigator(s): Dr. Lauren Mullenbach & Olivia Van Buskirk

Collaborator(s): Suraya Yamada-Sapien (OU), Leif Olson (City of Fayetteville)

Image Credit: Denis Tangney Jr

This reporting period, Ph.D. student Olivia VanBuskirk, Suraya Yamada-Sapien (University of Oklahoma), and Dr. Lauren Mullenbach, advanced research efforts on climate adaptation strategies in Fayetteville, Arkansas. This work is part of a larger study investigating climate adaptation in three cities throughout the region: Tulsa, Oklahoma, Fayetteville, Arkansas, and Shreveport, Louisiana. The study aims to (1) assess climate adaptation activities, (2) analyze planning processes, and (3) evaluate vulnerability.

Located in northwest Arkansas, Fayetteville is a rapidly growing city due to its favorable climate, corporate presence, and the University of Arkansas. It faces increasing demand for development and affordable housing. However, the city is also interested in preserving existing undeveloped space, taking action to reduce emissions, and adapting to the challenges of warming temperatures. We conducted interviews and focus groups with eight city planners, two non-profit employees, seven members of the Fayetteville Environmental Action Committee (EAC), and three city staff from the sustainability department. Key issues of concern included flooding and changing precipitation patters, and extreme heat and urban heat islands.

Examining climate adaptation efforts in Fayetteville offers valuable insight into the complexities faced by local governments striving to implement environmental actions, particularly within the constraints of limited resources and variable state-level support. As a result, Fayetteville's approach could serve as a model for similar communities striving to address changing weather patterns, while managing growth. With continued action and effective governance, Fayetteville has the potential to become a more resilient and thriving community. In the coming reporting period, the researchers plan to complete a final case study in Shreveport and conduct a comparative analysis of the three inland cities.

Hazard Mitigation in Low-Capacity Jurisdictions

SCIPP Investigator(s): Rachel Riley & Darrian Bertrand

Collaborator(s): Ed Hecker, Annie Vest, & Yelena Martinez (National Hazard Mitigation Association), Shanene Thomas (FEMA Region 6)

The focus of this research is to determine how to make the hazard planning process more meaningful and effective for local officials, including resources that are needed. This will, in turn, help build capacity for hazard mitigation planning and implementation in jurisdictions that currently lack capacity to do so, and improve disaster risk reduction efforts. During this reporting cycle, a truncated virtual focus group that included the participants who were unable to attend their respective in-person 3rd round (n = 5) was held, along with the 4th and final round of focus groups which were conducted virtually (n = 17 participants). Thirty-one participants are involved in the study and they work in at least 160 jurisdictions across the four-state region. During the 4th round of focus groups, SCIPP researchers presented draft hazard mitigation training objectives that were identified as needs during prior focus group meetings. Participants provided feedback on the wording of each training objective and ranked them in order of importance. These training recommendations are one of several project deliverables and will inform the

National Hazard Mitigation Association's training curriculum development and other interested agencies such as FEMA. Other project deliverables are in progress and will be completed soon, including a white paper, peer-reviewed journal article, and recommendations for a revised regional hazard mitigation planning guide, hazard mitigation and messaging strategies, and a hazard mitigation action database design concept. The product recommendations are a direct result of the needs identified by the emergency manager and city and regional planner participants.

The County-Level Minimum Temperature Explorer Tool

SCIPP Investigator(s): Dr. Vincent Brown

In Fall 2024, SCIPP developed the County-Level Minimum Temperature Explorer (CminTex), which allows users to analyze several variables related to minimum temperature. The following variables are analyzed for the contiguous U.S. from 1951 to the near present:

- Freeze Days – number of days where the minimum temperature was less than or equal to 32°F
- Coldest Minimum Temperature – coldest county-wide minimum temperature annually
- Warmest Minimum Temperature – warmest county-wide minimum temperature annually
- Minimum Temperature Threshold – the number of days with greater than or equal to OR less than or equal to a user-defined temperature.

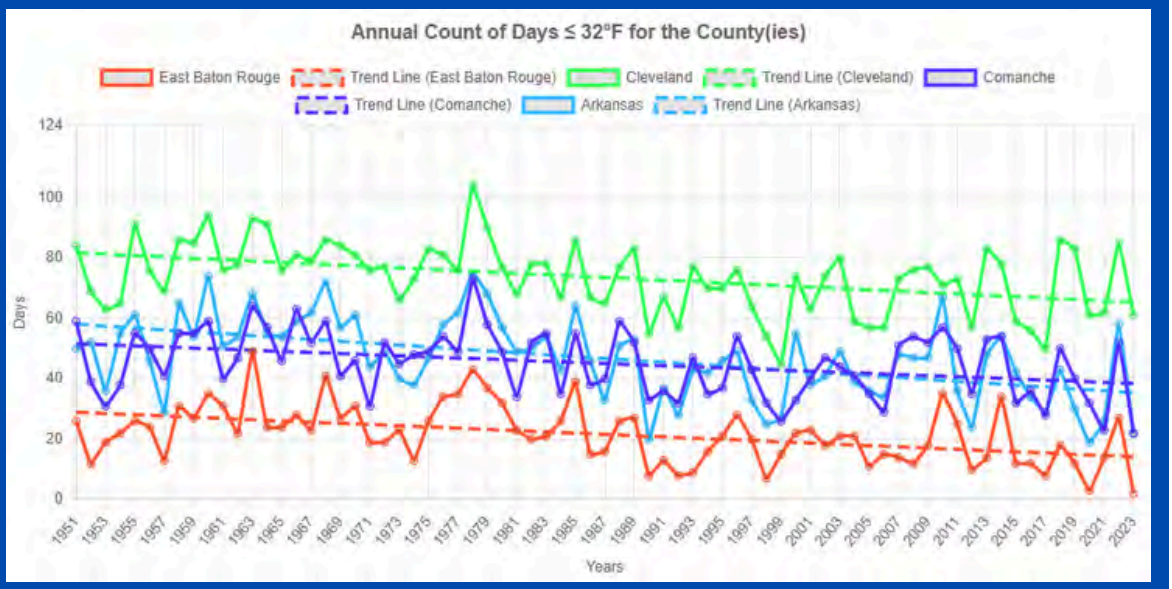


Figure 4. Freeze Days plot for four counties within the SCIPP region.

This tool can be used alongside SCIPP's Temperature Trends Dashboard which focuses on other indices. CminTex allows for up to five counties to be selected at a time so users can compare trends across counties. The analysis of minimum temperatures was conducted due to the impact of climate change on minimum temperatures (i.e., overnight lows, most of the time). The tool is linked on SCIPP's data tools page and can be viewed here. Users can learn about the methodology, datasets, and included variables in the documentation tab.


Image Credit: Darrian Bertrand

STATE AND LOCAL ENGAGEMENT

Simple Planning Tool Featured in Presentations Across the Region

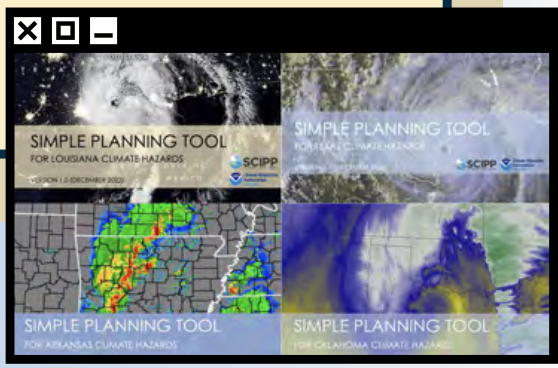
Darrian Bertrand engaged with several organizations across the region through presenting about the Simple Planning Tool for Climate Hazards v2.0 (SPT). The various presentations raised awareness of the decision support tool to new stakeholders and was a re-fresh for existing stakeholders. A detailed demonstration was provided. The events in which this engagement occurred included:

- Arkansas Emergency Management Conference (Hot Springs, Arkansas)
- Oklahoma Floodplain Managers Association Conference (Durant, Oklahoma)
- Texas Sea Grant Coastal Resilience and Adaptation Conference (Online)
- Oklahoma Climatological Survey training for the Oklahoma Department of Emergency Management (Oklahoma City, Oklahoma)
- South Central Climate Adaptation Science Center Tribal Vulnerability Assessment Workshop (Shawnee, Oklahoma)

This series of presentations helped increase stakeholder awareness of the new SPT platform. Earlier this year, the SPT underwent a redesign that converted it into an interactive tool on our website from individual PDFs. Learn more about the redesign here.

To access the SPT for Climate Hazards v2.0 CLICK HERE

Or visit https://www.southernclimate.org/resources/tools/simple-planning-tool/



Council of State and Territorial Epidemiologists' Occupational Surveillance Methods Workgroup Call

In April 2025, Derek Thompson presented results of his work on “Linking Wet-Bulb Globe Temperature (WBGT) to Heat-Health Data (ED, Hospitalization and Mortality Data)” to various health department officials, in collaboration with the Louisiana Department of Health (LDH). The focus of this project (discussed in the previous reporting cycle) was to create a climatology of derived WBGT from gridded data and investigate the relationship between WBGT and morbidity/mortality using hospitalization, emergency department visits, and fatality records from the LDH. Participating in this working group call helped strengthen network relationships and supported knowledge exchange.

Oklahoma City Extreme Heat Tabletop Exercise

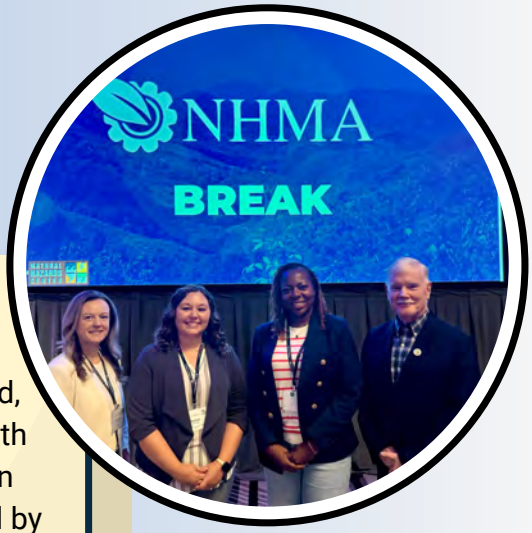
On August 13-14, SCIPP participated in the Oklahoma City Extreme Heat Tabletop Exercise led by NOAA, the National Integrated Heat Health Information System (NIHHIS), and the City of Oklahoma City. The exercise brought together several city, county, and state departments/entities, academia, local community organizations and non-profits, healthcare representatives, and utility companies with a stake/role in extreme heat events that impact Oklahoma City and surrounding areas. The objectives of the exercise were to better understand heat, heat risk, and the populations most at risk in the area; identify and strengthen pathways of communication across and within organization and community groups related to high heat to ensure effective communication to stakeholders; and to recommend solutions (action plan for intervention, remediation) for both short (1-2 years) and longer term (10-15 years) that can occur at various social levels (individual, community, municipality, etc.). As part of the climate information segment to set the stage, Darrian Bertrand presented impacts of extreme heat to health and infrastructure. Bertrand, Caylah Cruickshank, and Xochitl Hidalgo also participated in the exercise, which included breakout group discussions about key issues regarding response and preparedness for extreme heat.

Caption: Participants listen to a presentation at the Oklahoma City Extreme Heat Tabletop Exercise.

29th International Interdisciplinary Conference on the Environment

Heat is the deadliest hazard in the United States, causing an estimated 183 fatalities annually. In 2023, Louisiana recorded its hottest year, according to data beginning in 1930, resulting in 88 heat-related fatalities and 6,190 visits to the Emergency Department with heat-related illnesses. In October 2024, Dr. Vincent Brown presented his work, “Enhancing Public Awareness of Heat Risk Through Weather/Climate Data Integration,” at this virtual conference. In his session, which included 16 people, Dr. Brown described the synoptic setting(s) that often cause extreme heat in Louisiana, how heat watches/warnings are defined, and examples of how integrating weather and health data can create useful tools and visualizations to help citizens better understand heat risk.

Natural Hazards Research and Applications Workshop Practitioners Meeting



Caption: Presenter panel at the Practitioners Meeting in Broomfield, Colorado.

Darrian Bertrand served on a panel during a Practitioners Meeting hosted by the National Hazard Mitigation Association (NHMA) in July 2024 in Broomfield, Colorado. The Practitioners Meeting is a supplemental meeting associated with the annual Natural Hazards Workshop hosted by the Natural Hazards Center in Colorado. The panel focused on an ongoing research project being conducted by SCIPP investigators, Rachel Riley and Darrian Bertrand, and collaborators from the NHMA and FEMA Region VI entitled "Building Capacity for Hazard Mitigation Planning in Low-Capacity Communities." An estimated 50 people participated in broader discussion of the research. The audience included local and state hazard mitigation professionals (e.g., emergency managers, planners), private sector consultants, national and regional FEMA staff, and academic researchers. Through the workshop and subsequent Practitioners Meeting, SCIPP was able to share our research, learn from others in the natural hazards field, and develop a new connection that led to a collaboration with the LSU Stephenson Disaster Management Institute.

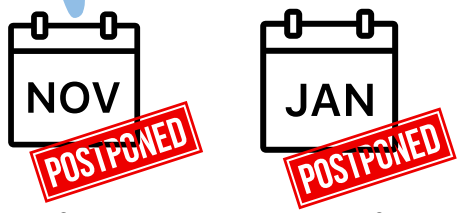
National Weather Center Colloquium

Caption: Riley presents at a National Weather Center Colloquium in Norman, Oklahoma.

Rachel Riley presented at a National Weather Center (NWC) Colloquium in January 2025 in Norman, Oklahoma. Her presentation, "Increasing the Utility of Meteorological and Climatological Information for Non-Academic Audiences," sought to inform listeners of the shortcomings that limit the impact of meteorological and climatological information and offer potential solutions. After providing a brief overview of the weather and climate hazards impacting the SCIPP region, Riley shared information from a variety of engagement activities, case studies, and research projects conducted at SCIPP within the past 15 years. Compared to most of the other research organizations that are housed within the National Weather Center, the research and stakeholder engagement that SCIPP undertakes is unique. Riley's presentation provided an opportunity to share results from SCIPP's past work with the 75 in-person and virtual attendees. The presentation provided insight on the thought processes and timelines decision makers adhere to, allowing for increased understanding of the decision-making process. Riley also discussed SCIPP's Simple Planning Tool for Climate Hazards, which has evolved over time to better meet stakeholder needs.

CHALLENGES

Navigating Extreme Weather Events



During this reporting period, extreme weather events, particularly ice storms and freezes, posed a significant challenge to workshop planning and execution efforts. For example, the Extreme Weather and Resilience Workshop that was organized in collaboration with the City of Shreveport, LA, was cancelled and rescheduled twice (in November 2024 and January 2025). Winter precipitation and freezes were key contributing factors. These disruptions to the workshop not only caused attrition in participation from city officials, but they also hindered productivity, as additional time was spent rectifying logistics. Extreme weather is a common reality in the South Central region, and this example showcases the need to be flexible and resourceful with our research and engagement planning efforts.

SOCIETAL IMPACTS

Elevating a Sense of Agency Among Arkansas Planners

Image Credit: Tara Ballard

SCIPP, in collaboration with the National Hazard Mitigation Association and FEMA Region 6, is working to build capacity for disaster risk reduction at local scales across the region, and especially in small and rural communities where existing capacity is very limited. As a result of SCIPP's engagement and service in Arkansas regarding hazard mitigation needs, a staff member of a regional economic development district in northwest Arkansas formed their own state-focused working group on hazard mitigation planning. Their group aims to expand on discussions from SCIPP's engagement to build capacity for hazard mitigation in Arkansas and collaborate on funding opportunities.

Boosting Scientific Learning Outcomes in Relation to State Legislation

Image Credit: Kameleon007

The Louisiana State Legislature considered a bill in Spring 2025 requesting that the collegiate athletics Southeastern Conference schedule LSU September football games after 6:00 pm to reduce the risk of heat-related illness among those in attendance. As of June 11, 2025, the bill was unanimously approved by the state House and the state Senate, and has been sent to the Secretary of State.

This development of the bill was prompted by a September 2024 football game between LSU and the University of California, Los Angeles, where over 80 EMS calls, the majority of which were heat-related, were reported (Tuttle 2024). In light of the discussions occurring within the state legislature, LSU's student-led media

organization, LSU Reveille, contacted SCIPP for an interview to better understand heat risks associated with LSU football games. Using hourly wet bulb globe temperature (WBGT) estimates, SCIPP demonstrated how, during August and September, WBGT reaches hazardous levels during late morning and early afternoon hours before cooling to safer levels around 6:00 pm. This finding supported the bill's suggested game start time. Although SCIPP was not directly responsible for the outcome of the bill, we boosted learning outcomes for the general public, resulting in a deeper understanding of the science that supports this legal action. Following the interview, a health-focused working group reached out to SCIPP to explore potential collaborations. The working group had previously helped craft legislation for a state outside of the SCIPP region that would utilize WBGT as a guide for outdoor activities at local schools, and they were interested in learning more about SCIPP's WBGT work.

Image Credit: Jamie Tuchman

EVALUATION

Our evaluation model employs a multi-faceted approach engaging stakeholders, SCIPP personnel, and advisory board members through questionnaires and interviews administered at multiple stages throughout the grant cycle. Relevant to this year's report is the mid-point evaluation.

During Summer 2024, Dr. Ioana Cionea, SCIPP's semi-external evaluator who attends monthly team meetings but can act as an unbiased third party, administered a 16-item survey to a core group of stakeholders – approximately 70-80 individuals who have collaborated with SCIPP in recent years. The survey was available from June to August 2024. Twenty-seven participants from Arkansas, Oklahoma, and Texas completed the survey, either fully or partially. Their responses reflected a high level of satisfaction with the services provided by SCIPP (see Figure 5 below).

"They are an amazing resource for our local governments who may not have the $$, staff, or political backing to hire a consultant to help with planning for climate resilience."
-Evaluation participant

Area assessed	*N*	Scale anchors	Min. score	Max. score	Mean	Standard deviation	Median
Ability to respond to information requests	20	0 - 100	80	100	96.95	5.84	100
Ability to listen to stakeholder needs	14	0 - 100	91	100	95.36	13.32	100
Expertise	14	0 - 100	90	100	95.86	10.78	100
Quality of analyses provided to stakeholders	13	0 - 100	40	100	93.08	16.49	100

Figure 5. Survey responses to satisfaction level with SCIPP's services.

Although the response rate was low, overall stakeholder satisfaction was very high, M = 95.93, Mdn = 100, SD = 8.65 (0 - 100 scale). These results are consistent with findings from the 2020 stakeholder survey, reinforcing that SCIPP consistently provides high-quality reliable services. Additional qualitative data from the survey revealed that SCIPP's work has broader community and public impacts as the information it provides in various forms to stakeholders extends to broader audiences. Stakeholders also highlighted SCIPP's regional nature and focus as well as its understanding of climate impacts as key strengths. The staff's helpfulness and responsiveness were praised across the board in multiple responses. These findings mirror the results of the evaluation conducted in the previous grant cycle in 2020. The primary limitation we continue to battle involves response rates and stakeholder engagement in evaluation efforts. To address this issue we have implemented several strategies to enhance our evaluation approaches. These include conducting mini evaluations throughout the grant activities, workshops, and presentations that assess specific initiatives such as the Summer Academy in 2022 or SCIPP's Summer 2025 internship program. One approach that has proven particularly effective involves administering initial broad-scale surveys followed by targeted interviews to elicit more in-depth feedback.

Image Credit: codyphotography

NEXT STEPS

Forced Retreat of Coastal Populations

Climate migration, or the forced movement of individuals from their home due to short and/or long-term changes in their environment (Brown 2008), is becoming more frequent in Louisiana and the Gulf. Although gradual sea level rise and land loss are in the backdrop of these changes, the real impetus for change seems to be devastating hurricanes and storm surge. SCIPP graduate student, Sadé Miller, recently began her research on climate migration receiving communities (RCs) in Louisiana. RCs are communities that are prepared for an influx of people relocating as a result of changing climate conditions and have a relatively lower risk of climatological hazards. This research seeks to identify and rank Louisiana's most suitable RCs based on location, hazard risk, and six socioeconomic characteristics: affordable housing availability, access to health services, economic opportunities, quality education, public transportation, and updated hazard mitigation plans. Miller gathered all the socioeconomic data and is currently documenting the methods. Next steps for this project include analyzing and creating maps for each of the other five socioeconomic characteristics as well as conducting a literature review to validate landward migration trends in Louisiana.

Simple Planning Tool Evaluation

A formal evaluation of the utility of SCIPP's Simple Planning Tool for Climate Hazards version 2.0 is planned during the next reporting period. An initial evaluation of the stakeholder decision support tool was conducted in 2019 and focused on Oklahoma and Arkansas only (see Riley 2021). The research was conducted less than two years after the original versions of the tool were produced. That research indicated high utility but a limited user base. Since then, the tool has been expanded to the other two SCIPP states, Texas and Louisiana, and transformed into an online version for all four SCIPP states rather than a PDF format (see https://www.southernclimate.org/resources/tools/simple-planning-tool/). The purpose of the upcoming evaluation will be to further understand the tool's utility (e.g., usefulness and impact) for decision makers across a larger geographic region. It will also investigate how the tool could be improved to become even more useful to local and state decision makers who use it to assess their jurisdiction's risk and impacts to weather and climate hazards.

2026 South Central Climate Resilience Forum

SCIPP, in collaboration with several organizations across the region (see Figure 6), successfully executed the inaugural South Central Climate Resilience Forum (SCCRF) that was held in April 2024 in Dallas, TX. This event brought together over 250 representatives from all levels of government, academia, the private sector, and non-profit organizations to share research, tools, knowledge, and lessons learned regarding all aspects of climate resilience. Participant feedback emphasized the Forum's value in fostering collaboration and sharing region-specific strategies for climate resilience, and many expressed the need for future events. Additionally, SCIPP was presented with a Texas Impact Enterprise Award on behalf of SCCRF, which recognized organizations that have a positive environmental and/or societal impact in Texas. We aim to build upon the success and momentum of the inaugural event by hosting the second SCCRF in April 2026 in San Antonio, TX. The planning committee, which includes previous and new members, have met regularly to plan logistics for this upcoming event, with SCIPP continuing to lead the efforts.

Figure 6. The 2024 Planning Committee included academic institutions, municipalities, federal agencies, and organizations.

NARRATIVE CASE STUDIES

Emerging Projects with the City of Shreveport, Louisiana

Louisiana is home to some of the most intense storms the nation faces each year. While the state receives a large amount of Federal assistance to recover from and mitigate impacts of such storms, not all parts of the state receive the benefits. Most funding is directed toward coastal communities that deal with landfalling hurricanes and coastal land loss, but storms affect all parts of the state (Gall & Friedland 2020). Shreveport, Louisiana (population 187,593 in 2020 Census), located in the northwest corner of the state, contends with heat and cold outbreaks, intense rainfall and flooding, and severe storms with their attendant wind, hail, and tornadoes. Yet, it receives little financial assistance.

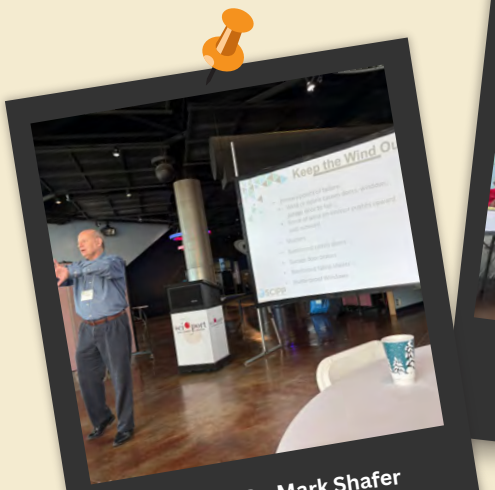
Image Credit: Sean Pavone

Recognizing the City's struggle to obtain funding to mitigate these weather hazards and as a location in which SCIPP had not previously engaged, a SCIPP team member contacted city officials to gauge their interest in tackling some of these issues. The City was eager to collaborate, and has led to a new, productive relationship. Working together, the SCIPP team identified weather-related issues that affect the city, including heavy rainfall, flooding, extreme temperatures (e.g., extreme heat, freezing and winter weather conditions), and high winds and storms (e.g., tornadoes). In addition to addressing weather hazards, the work on the topic will benefit public safety and, longer-term, economic development. In the central part of the country, businesses often ask about impacts from and resilience to storms when choosing where to locate their facilities. Accurate information about hazard risk profiles can be useful to dispelling mis-perceptions about risks. For example, prior experience from the Oklahoma Climatological Survey in working with their state's Chamber of Commerce found that businesses tend to overestimate the impacts from tornadoes, leading them to choose locations outside of "tornado alley".

The City of Shreveport had minimal hazard preparedness work prior to involvement with SCIPP. For example, their local Hazard Mitigation Plan is produced by an outside group covering Caddo Parish and includes minimal input from the City. To help resolve this issue, in March 2025, we hosted a workshop with representatives from city and parish government agencies and partners to discuss these challenges and begin exploring potential solutions. There were 25 participants from the City and Parish, representing 11 different departments, along with the city manager. Participants included City of Shreveport, Shreveport Police Department, Property Standards, Public Works, Risk Management, Water and Sewerage, Regional Arts Council, Sci-Port Discovery Center, Southern University, Caddo Parish Public Works, and Caddo Parish Finance/Grants. Trey Bell, Darrian Bertrand, Dr. Vincent Brown, Denis Cheruiyot, Dr. Mark Shafer, and Derek Thompson collaboratively led the workshop, and presented various topics of interest to the City. Each topic included a brief presentation about the frequency of severe weather impacts and potential means to address some of those challenges, followed by ample discussion time with the city and parish officials.

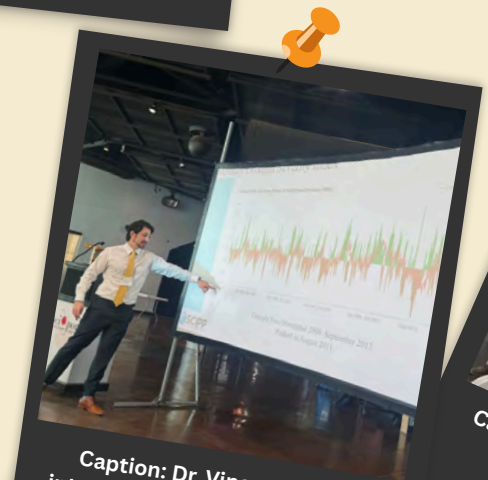
A workshop discussion summary is currently in development and will be shared with participants when it is complete. For each specific issue that arose, the SCIPP team is working to identify potential solutions, including costs and timelines for each. The report will identify potential actions that can help in the short-term as well as developing strategies to address longer-term needs. In addition, we are identifying areas where further information is needed, some of which can be supplied through SCIPP research and tools applied to the specific jurisdiction.

Although specific economic benefits have not yet emerged, it is anticipated that these efforts will produce value for the City. In addition to dispelling myths about storm-related vulnerabilities that can be useful for industry recruitment and improving public safety preparedness and response, other cost-saving opportunities have emerged. One area is the City's Community Rating System (CRS) for flood insurance. The City currently is rated as CRS Class 8 (of 10). Each class lower results in a 5% reduction on flood insurance rates for residents of the jurisdiction. In some cases, the City is already taking flood-risk reduction efforts, but those efforts are not reflected in the CRS rating. By examining the City's actions and comparing it to the CRS rating, it may be possible to improve the class rating without any additional actions or expenses.

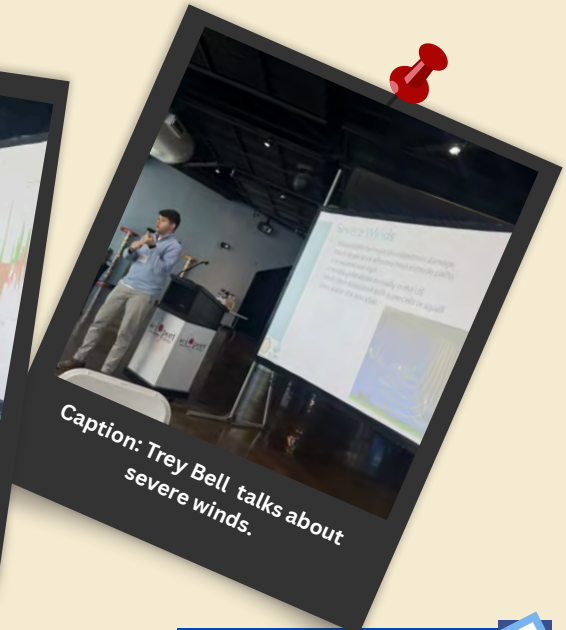


Caption: Dr. Mark Shafer discusses high winds and storms.

Caption: Several City/Parish participants listen to SCIPP presentations.



Caption: Dr. Vincent Brown introduces the Drought Severity Index.



Caption: Trey Bell talks about severe winds.

Extreme Weather & Resilience Workshop

March 17 & 18, 2025 in Shreveport, LA

NARRATIVE CASE STUDIES

Building Resilience Efforts in South Texas

Image Credit: Celine Rendon

One ongoing project is to advance weather and climate resilience efforts in South Texas, an area that is susceptible to flooding and extreme heat. Prioritizing a bottom-up approach to identify local needs, Dr. Cassandra Jean and Celine Rendon convened community organizations and local researchers for both a virtual (Fall 2024) and in-person (Winter 2025) workshop throughout the reporting cycle. The workshops hosted 18 participants respectively. Discussions centered on understanding community priorities, developing actionable project plans, and strengthening collaborative storytelling. Key themes included the need for governmental support, extreme heat mitigation (extreme heat resilience and data collection tools) and disaster preparedness. Participants emphasized that resilience efforts must be ongoing rather than reactive, with a focus on improving emergency response capacity, reducing energy burdens, and promoting infrastructure improvements in rural areas. At the February 2025 workshop, Dr. Vincent Brown, Derek Thompson, Caylah Cruickshank, and Darrian Bertrand provided an overview of various SCIPP tools and other pertinent resources for attendees.

After months of collaboration, several local project ideas were identified. Emerging project ideas include establishing community resilience hubs in the South Texas area, and increasing local data collection to inform policy and funding applications. The workshops reinforced the need for collaboration between various local groups and initiatives. Participants committed to identifying funding opportunities, aligning efforts across organizations, and working towards achieving buy-in and support from decision makers.

DISASTER PREPAREDNESS

EXTREME HEAT, ENERGY BURDENS

WATER SECURITY: DROUGHT, FLOODING

Figure 7. High-level community needs and concerns were identified throughout the workshops. Key themes included: disaster preparedness, extreme heat, energy burdens, access to clean energy, and water security.

As a result of these workshops, SCIPP and other stakeholders co-developed a participatory story mapping project focused on identifying unaddressed extreme heat and cold issues and flooding areas, local strengths and needs, and communication and outreach to encourage more data collection and knowledge sharing in the area. Efforts to complete the story map are ongoing. The broader implication of this work is an example of deep engagement with local organizations in South Texas, fostering a sense of agency by enhancing their expertise and capability to act. Progress is being made toward publishing a journal article about this work. Collaboratively, we contributed to the local community's flexibility in addressing weather and climate priority needs and supported their pursuit of new funding opportunities to build resilience.

"It was incredibly valuable hearing about other organizations who are potential collaborators for future climate resilience projects". - Workshop Participant

"We value how intentionally your group was listening to our voice and issues. We highly appreciate that". - Workshop Participant

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APPENDIX A: SCIPP BY THE NUMBERS

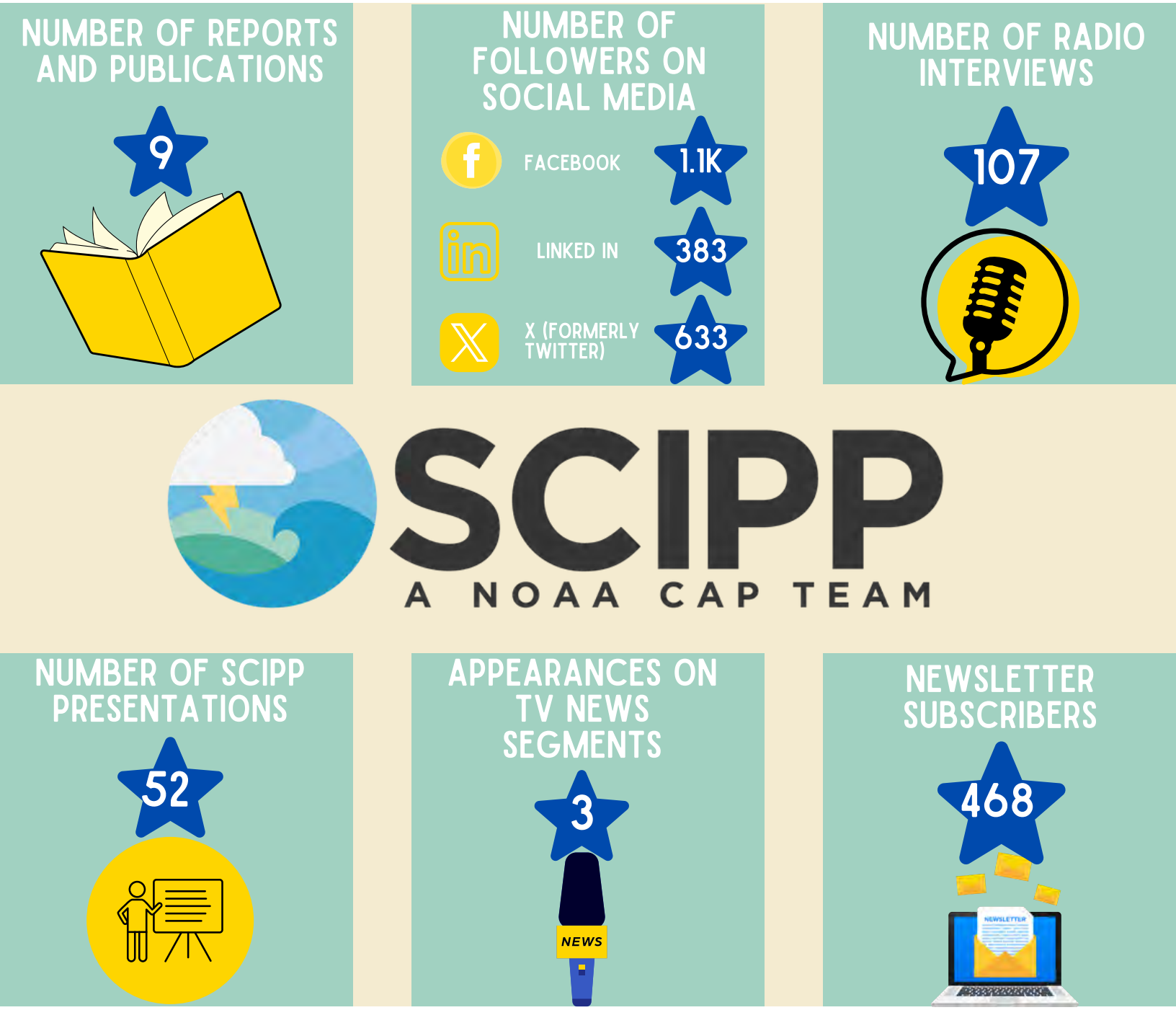

Figure 8. SCIPP summary statistics specific to the 2024-2025 reporting cycle.

APPENDIX A: SCIPP BY THE NUMBERS

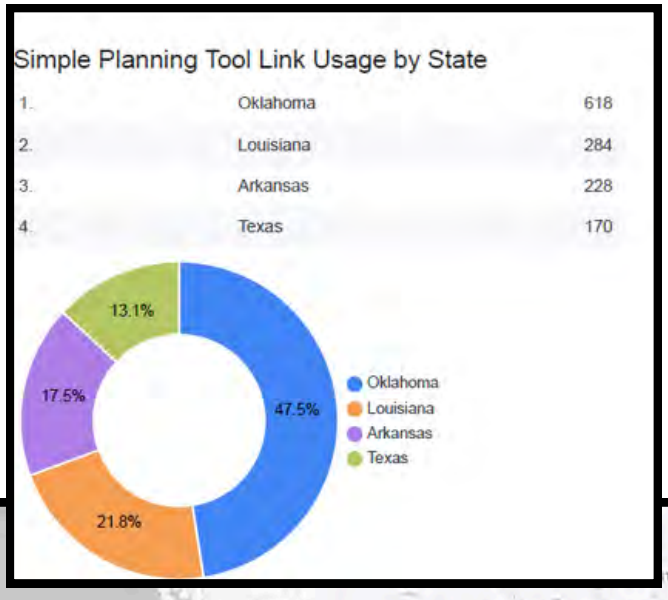

Figure 9. SCIPP's Simple Planning Tool (SPT) link usage for the four-state region. Link usage number represents the total unique number of clicks to each state SPT throughout the reporting period.

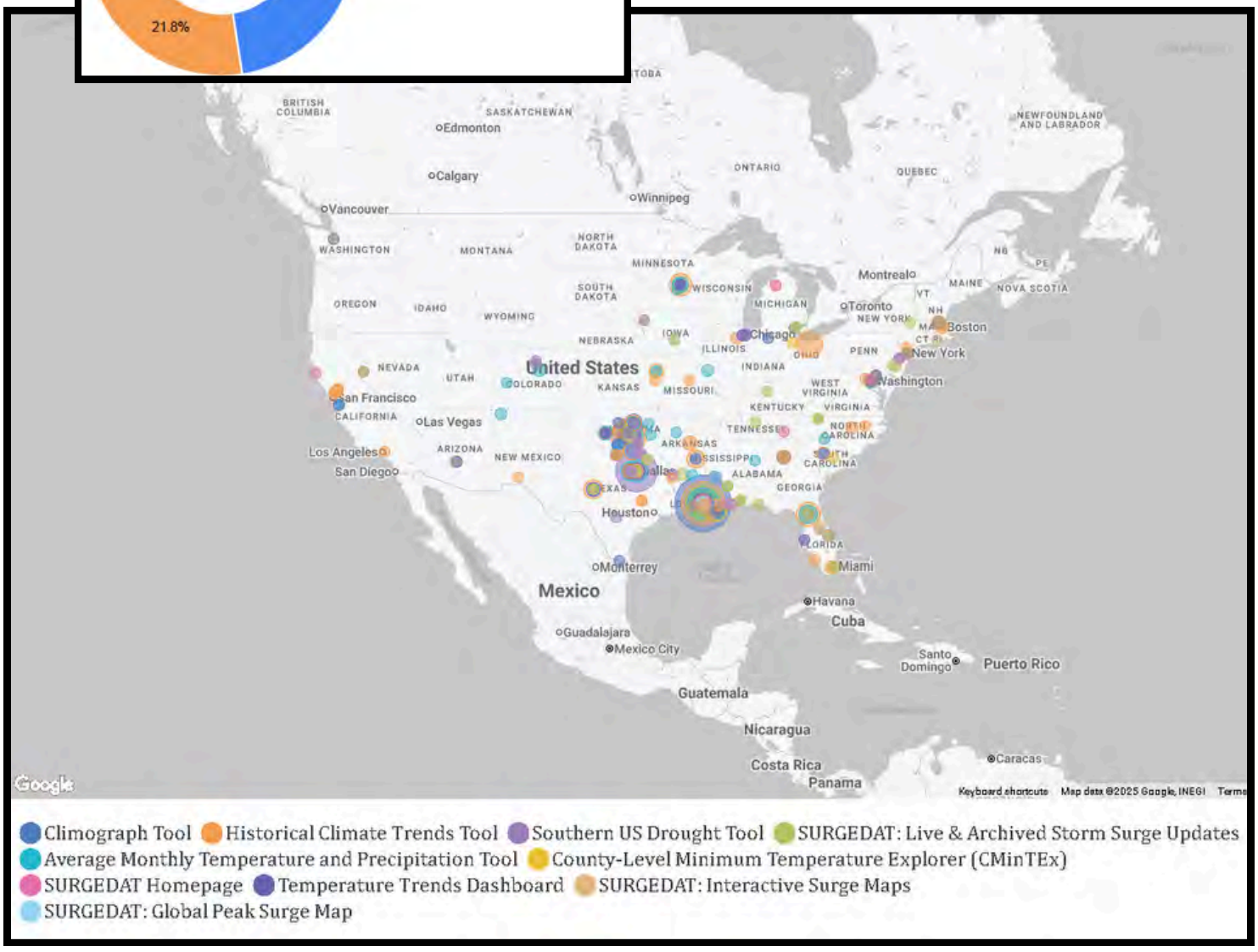

Figure 10. Public usage of all other SCIPP tools (excluding the Simple Planning Tool), on a national scale. Specific to the reporting period.

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Texas
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