

Report by
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2022

RESULT REPORT

Climate Conversations
with the Oklahoma
Association of
Conservation Districts
Area Meeting Attendees



OVERVIEW

Oklahoma has seen an increased incidence of extreme climate-related events in the first 20 years of the 21st Century as compared to the last 20 years of the previous century. This includes drought, flooding events, extreme cold, and severe storms. Climate projections for the US indicate a likelihood that this trend will continue without intervention through greenhouse gas mitigation efforts, including efforts originating in agriculture. The “Climate Conversations” program has successfully been implemented in other states including Utah and North Dakota. In 2022, a slightly reimagined Climate Conversations program was implemented in Oklahoma. The program included a survey of the perspectives and challenges of climate change as identified by farmers and ranchers, state and federal conservation agency employees, and Oklahoma conservation districts employees in November of 2022. The Oklahoma Climate Conversations program focused on the needs and concerns of those on the front lines of conservation in the state.



KEY RESEARCH QUESTIONS

Our goal was to answer the following questions:

1. What is the base knowledge conservation district and NRCS employees have about climate change and extreme weather?
2. Do participants see problems associated with climate change in agriculture in the state today?
3. Do they perceive conservation programs as being an effective approach to adapting to climate change?
4. Where do they see gaps in their own knowledge, tools, or resources available now to address adaptation to climate change?

CLIMATE CONVERSATIONS

- 1 **Pre-Survey**
"Tell us what your initial thoughts are."
- 2 **Presentation**
Focus on climate information.
- 3 **Post-Survey**
"What are your ideas and concerns?"
- 4 **Analysis**
- 5 **Snowball Response**
"Ideas to address these challenges."

The full list of pre-survey and post-survey questions are provided at the end of this report.



MEETING LOCATIONS AND DATES

November 2nd,
Hugo

November 4th,
Stillwater

November 9th,
Enid

November 16th,
Fort Cobb

November 18th,
Bartlesville

OACC Annual Meeting
February 27th
Oklahoma City

"A conversation is a dialog,
not a monologue."
--Truman Capote

AREA MEETING SURVEY RESULTS



Summary

Attendees of the OACD area meetings generously supported this program with a high rate of "conversation" participation. Overall, there was a strong belief that climate change is impacting Oklahoma. Grassroots conservation was highly valued, and key challenges were identified in water management and grazing issues were apparent. The best ways to reach audiences varied slightly, but a combination of in person and remote appears best for this audience. Future conversations with producers may validate those findings.

**252 responses
(about 60% of attendees)**

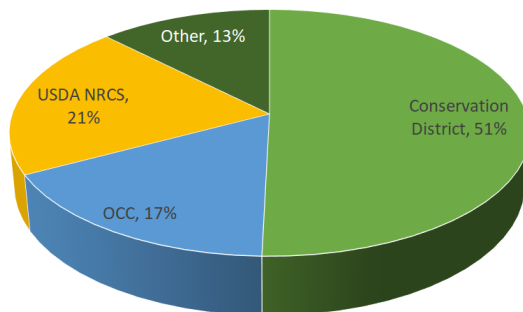
**216 matched pre/post
(87% of participants did
both surveys)**

This is a targeted sample of participants, focused on those who work with conservation programs regularly. As such, this is not representative of the 'average' population in Oklahoma. All results and conclusions should be read with this in mind.

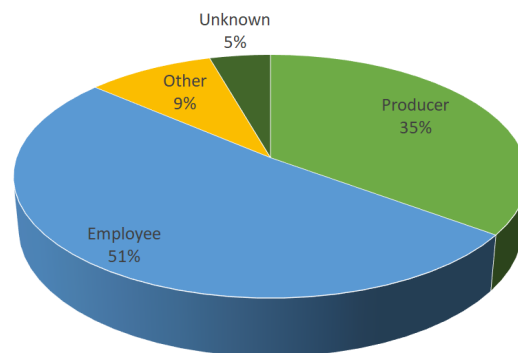
PARTICIPANT CHARACTERISTICS

The typical participant in this Climate Conversations series was an employee of the conservation district between 40 and 60 years of age with a Bachelor's degree.

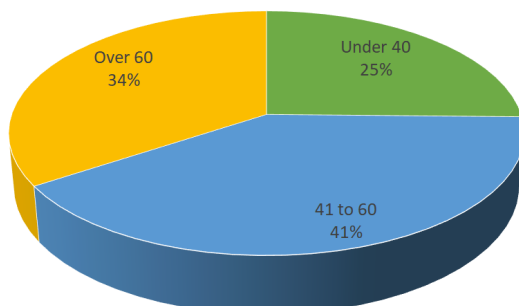
Agency Affiliation



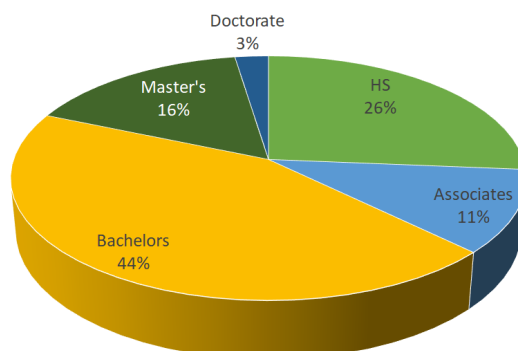
Role with the Agency



Age Clusters

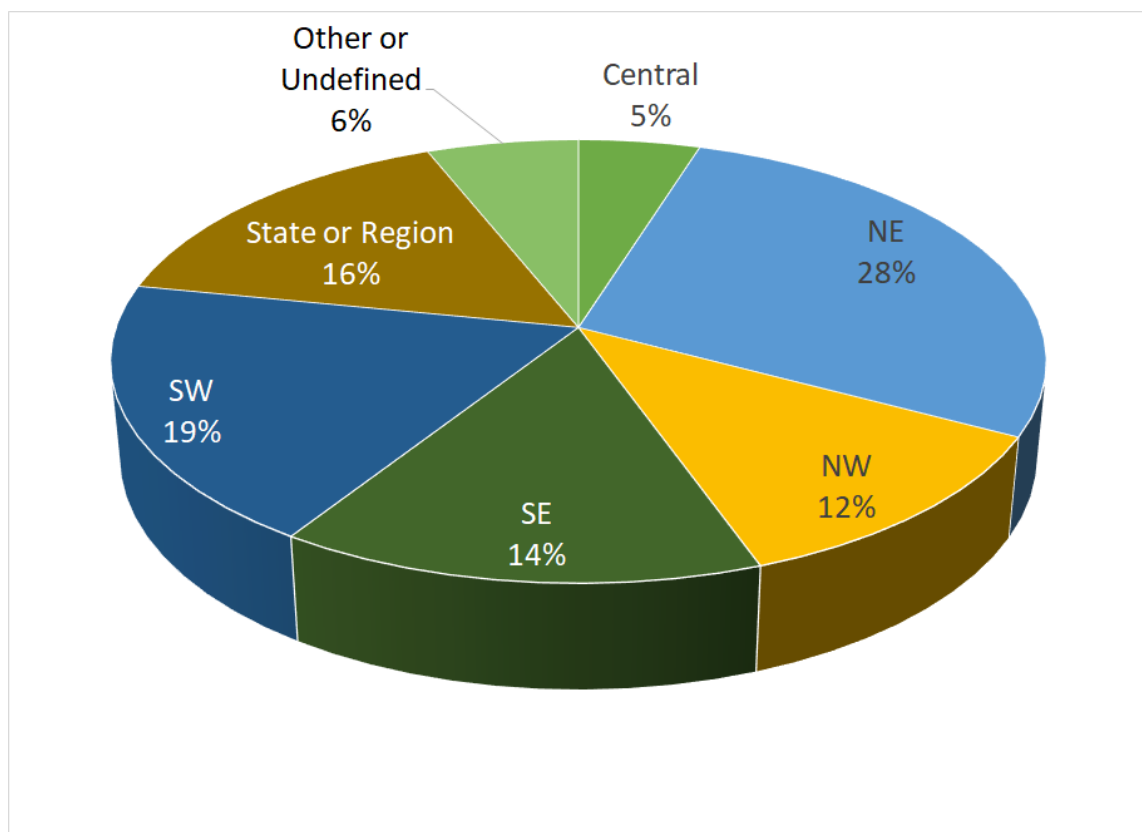


Highest Degree Awarded



PARTICIPANT CHARACTERISTICS

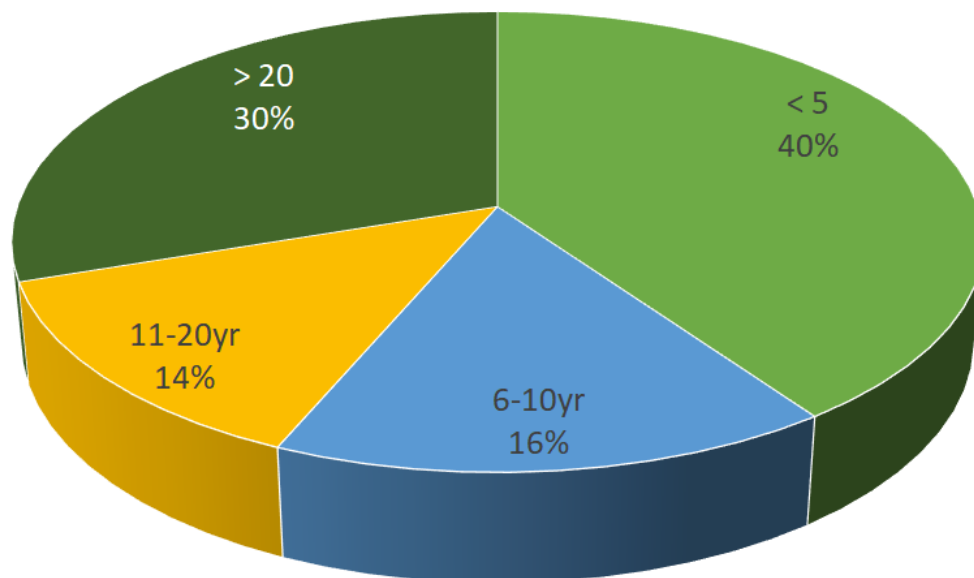
Geographic Area Served



Participants were asked to fill in the county or counties they currently worked in. The meetings were distributed around the state, which created a relatively even distribution of geographic areas served. The Northeast had the most participants. Districts were created based on the I-35 and I-40 corridors, with "Central" including any county that sits right on those crossing points. Some individuals were state representatives or covered large regions. Others represented tribal nations or were from other states.

PARTICIPANT CHARACTERISTICS

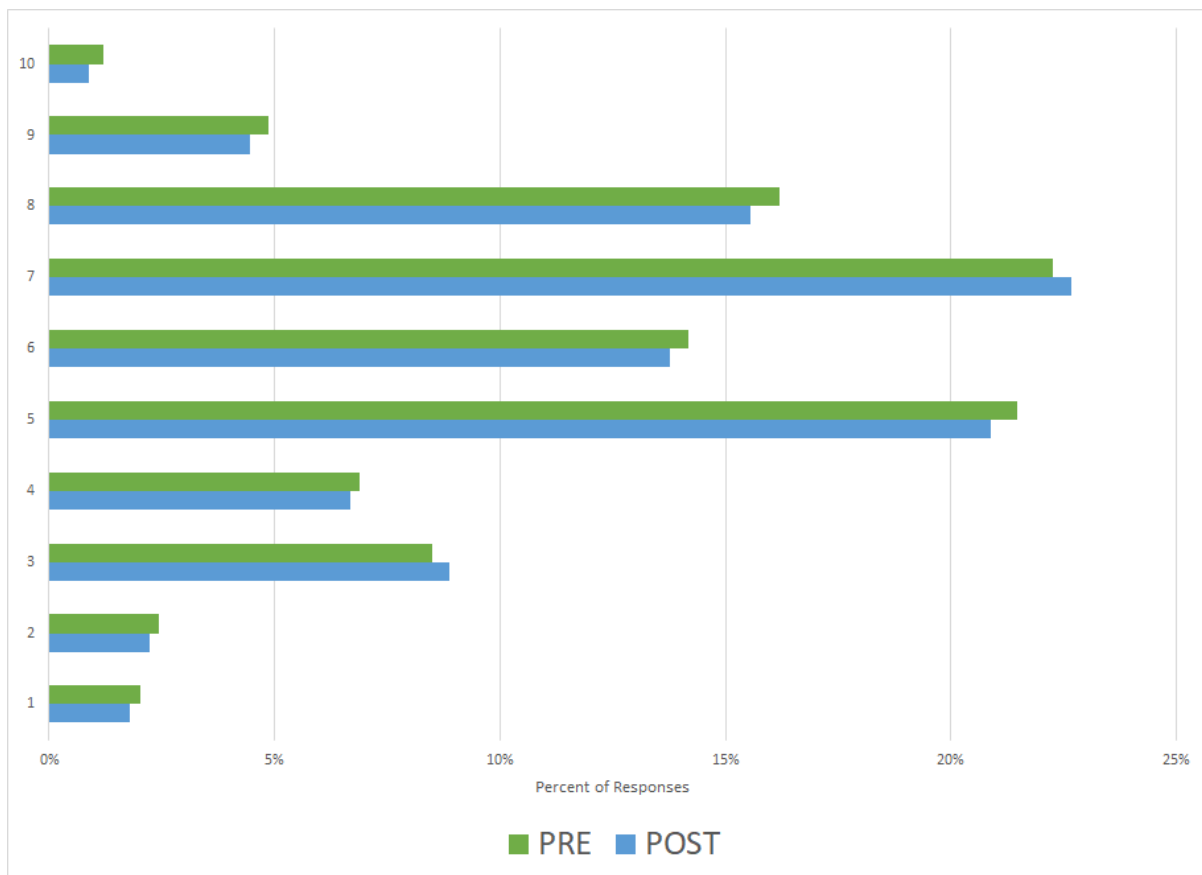
Years of Experience



Participants were asked to select the years of experience they had in their current position. Note, means their total years of professional experience could have been higher than their answer to this question; however, we wanted to understand how experienced they were with conservation practice prioritization and program implementation. The largest segment of participants had less than 5 years experience (40%) and the second highest had over 20 years experience (30%). This "bookend" career effect will be explored further in subsequent questions.

CLIMATE KNOWLEDGE

Participants were asked to rate their climate knowledge prior to and after the presentation. Interestingly, we saw a movement to the middle. We hope this indicates that all participants were exposed to new information, and now have additional questions related to the content.

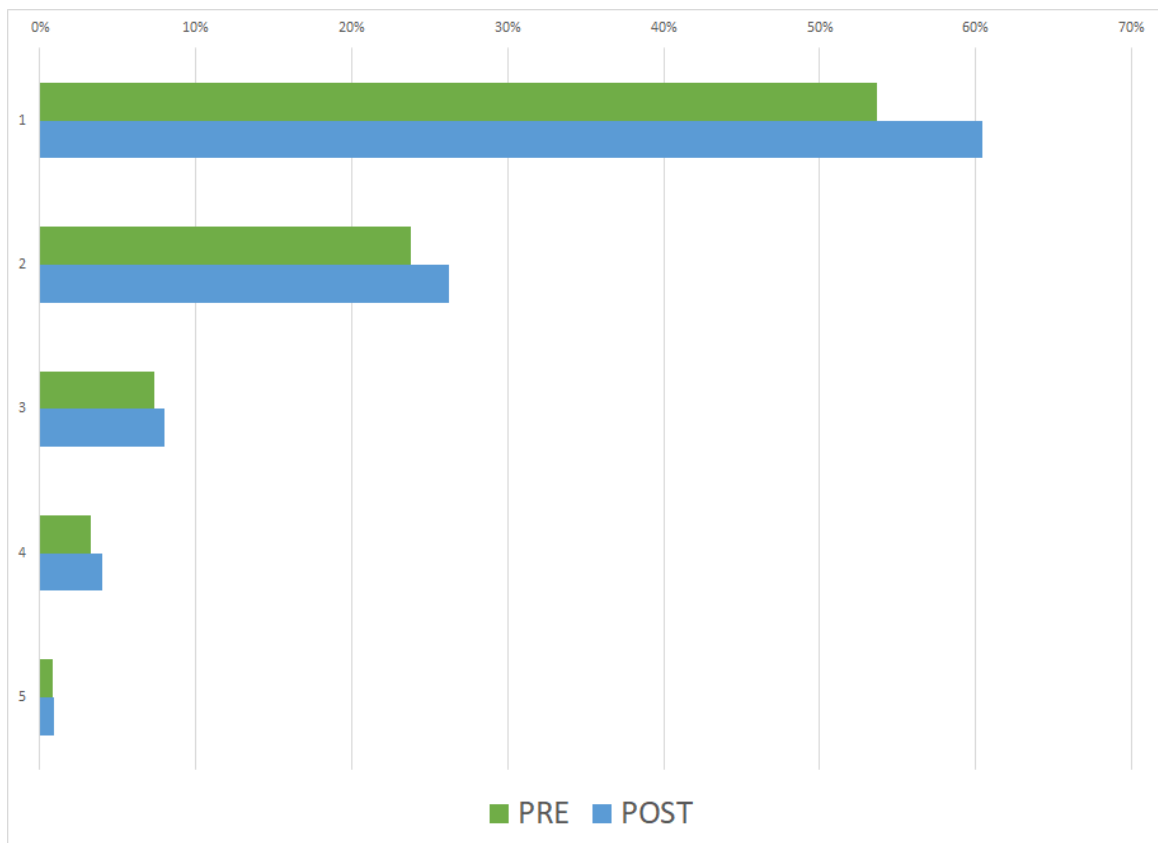
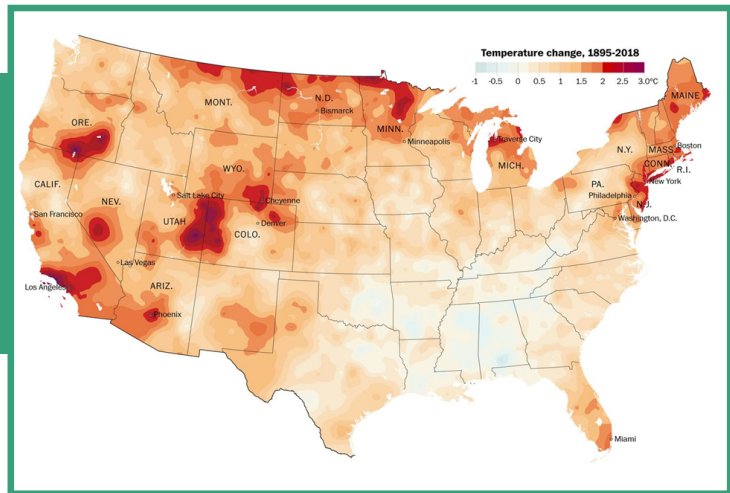


Please Rate Your Climate Knowledge on a Scale of 1 (No Knowledge) to 10 (Extremely Knowledgeable).

IS THE CLIMATE CHANGING?

The vast majority of participants did believe the climate is changing, and felt even more strongly that it was

changing after seeing the information presented. Keep in mind, we didn't ask them why or if they were concerned about the changes in this question.

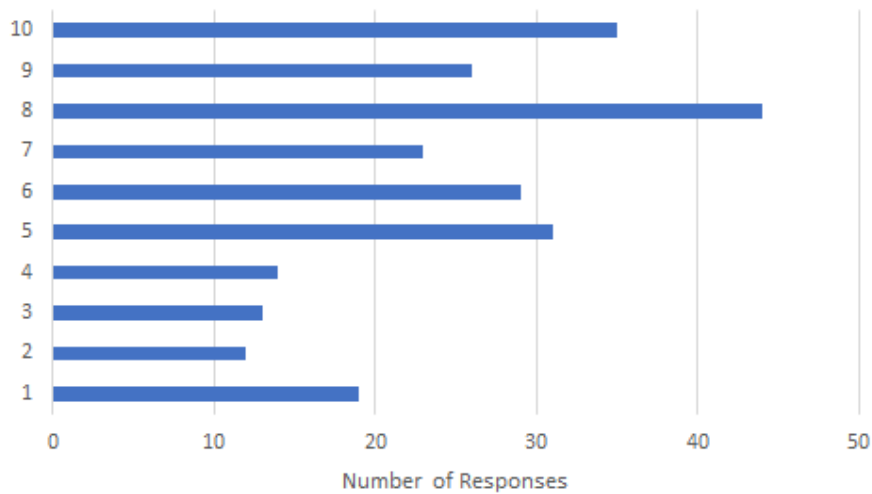


How likely is it that the climate is changing?
(1=Very Likely, 3=Undecided, and 5=No At All Likely)

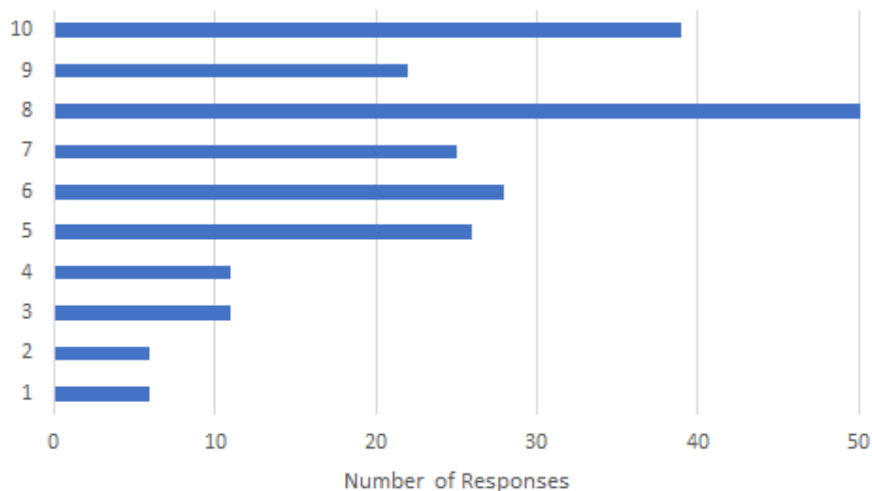
IS THE CLIMATE CHANGING?

TOTAL SAMPLE

We observed a slightly higher level of concern for Oklahomans potentially impacted by climate change after the presentation, but this may well be impacted by the region of Oklahoma.



BEFORE the presentation we asked, "How concerned are you for Oklahoma regarding Climate Change?" (10=Very Concerned, 1=Not Concerned)



Change by Rating

11%

-15%

13%

9%

-3%

-16%

-21%

-15%

-50%

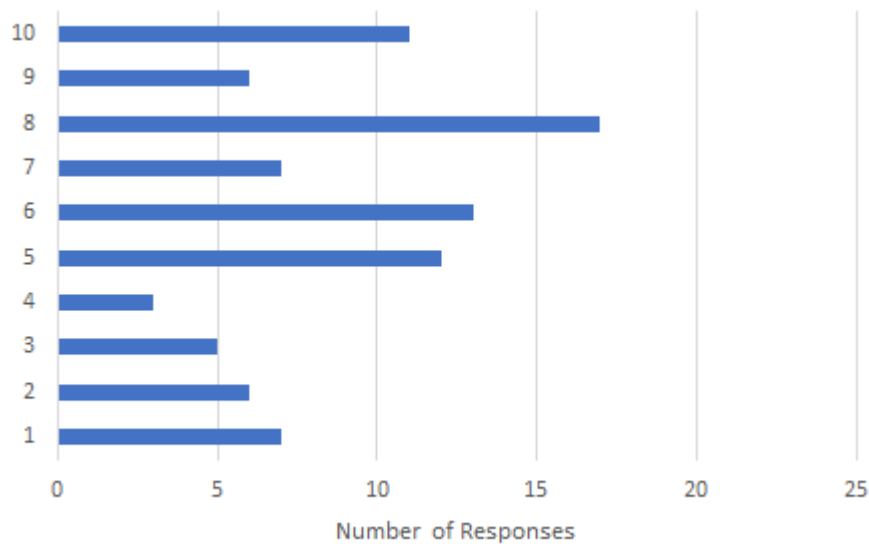
-68%

AFTER the presentation we asked, "How concerned are you for Oklahoma regarding Climate Change?" (10=Very Concerned, 1=Not Concerned)

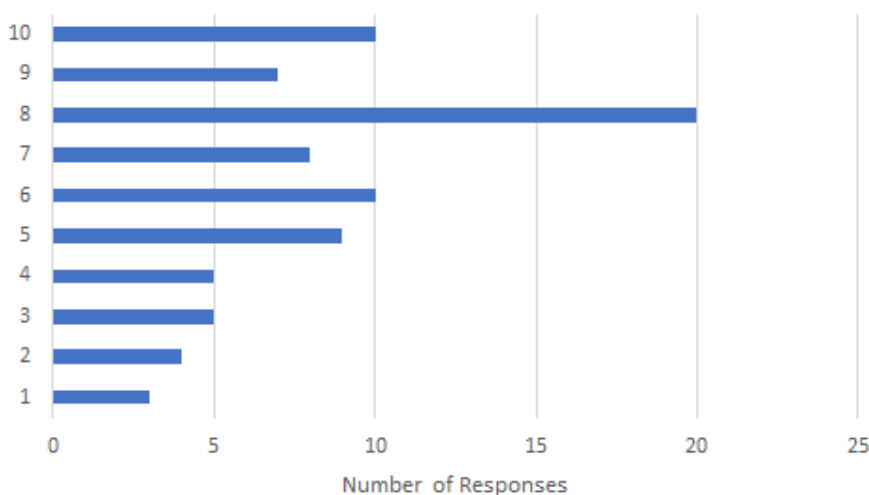
IS THE CLIMATE CHANGING?

PRODUCER SUB-SAMPLE

While our producer participants are expected to have a higher than average knowledge of conservation issues, they did have a larger increase in concern for Oklahoma regarding climate change than the total sample.



BEFORE the presentation we asked, "How concerned are you for Oklahoma regarding Climate Change?" (10=Very Concerned, 1=Not Concerned)



Change by Rating

-9%

17%

18%

14%

-23%

-25%

67%

0%

-33%

-57%

AFTER the presentation we asked, "How concerned are you for Oklahoma regarding Climate Change?" (10=Very Concerned, 1=Not Concerned)

IS THE CLIMATE CHANGING?

Concern rose for each region after seeing the presentation, with the greatest increase among participants serving Southeast counties and lowest among participants serving counties in the Southwest.

Region	PRE Survey	POST Survey	% of Responses
Central	6.94	7.13	5%
Northeast	5.93	6.64	28%
Northwest	5.38	6.08	12%
Southeast	6.42	7.37	15%
Southwest	6.33	6.94	19%
State or Region	6.88	7.77	16%
Other or Undefined	6.85	7.53	6%

Average Regional Rating for "How concerned are you for Oklahoma regarding Climate Change?" (10=Very Concerned, 1=Not Concerned)

CONCERN FOR CLIMATE CHANGE IMPACTS LOCALLY



For the potential climate change impacts listed below, please indicate how much each one concerns you.

Very Concerned=1, Not Concerned=5

Every one of these concerns had an average across participants between 1 and 3.

PRE All Respondents	POST All Respondents	PRE Producers/ Members	POST Producers/ Members	PRE Employees	POST Employees
Change in average rainfall	Impacts of climate change on agriculture	Impacts of climate change on agriculture	Impacts of climate change on agriculture	Change in average rainfall	Impacts of climate change on agriculture
Impacts of climate change on agriculture	Change in average rainfall	Change in average rainfall	Change in average rainfall	Impacts of climate change on agriculture	Change in average rainfall
Extreme weather incident frequency	Extreme weather incident frequency	Extreme weather incident frequency	Extreme weather incident frequency	Extreme weather incident frequency	Extreme weather incident frequency
Impacts of climate change on communities	Impacts of climate change on communities	Impacts of climate change on communities	Impacts of climate change on communities	Impacts of climate change on communities	Impacts of climate change on communities
Change in average temperature	Change in average temperature	Change in average temperature	Change in average temperature	Change in average temperature	Change in average temperature

In the midst of a serious drought, it is not surprising that rainfall topped the list of concerns in the pre-survey among all participant groups. Post-presentation, the highest concern changed from average rainfall to the impacts of climate change more generally on agriculture. Change in temperature was still rated as a strong concern, but not the strongest.

Narrowing focus in on those who identified as producers or board members, the greatest concern was on the overall impacts of climate change on agriculture. Extreme weather incidence was consistently placed in the middle among the extreme events that were ranked

Among the survey participants that were employees of NRCS, Conservation Districts or the Oklahoma Conservation Commission, the rankings aligned well with the overall participant group on the left.

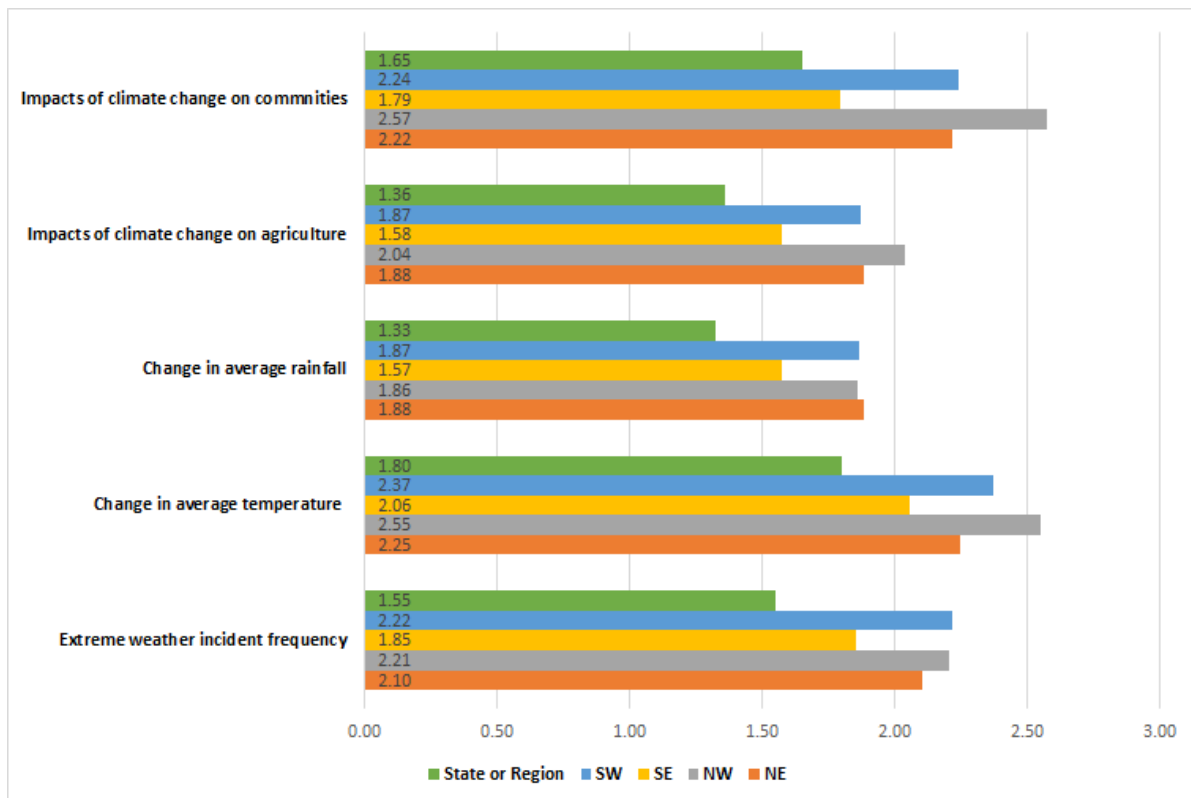
CONCERN FOR CLIMATE CHANGE IMPACTS LOCALLY

PRE Survey

For each of the topics below related to conservation issues, please indicate how critical they are in the counties you serve.

1=Very Critical

5=Not at all Critical



This was a question asked in the pre-survey and post-survey. Regional differences can be seen for those regions with enough observations to include in the breakdown of responses.

- In general the participants in western counties of Oklahoma felt each challenge was less critical than counterparts in eastern counties.
- Those serving in statewide or regional positions felt conservation efforts were broadly more critical than those in local positions.
- Change in average rainfall was consistently most critical across participants.
- Although the top 2 issues remained constant, differences were found between regions in other issues. For example participants in southeastern counties felt impact on local communities was a more critical issue than change in average temperature or extreme weather. However, participants in northwestern counties felt temperature was relatively more critical than extreme weather or community impacts.

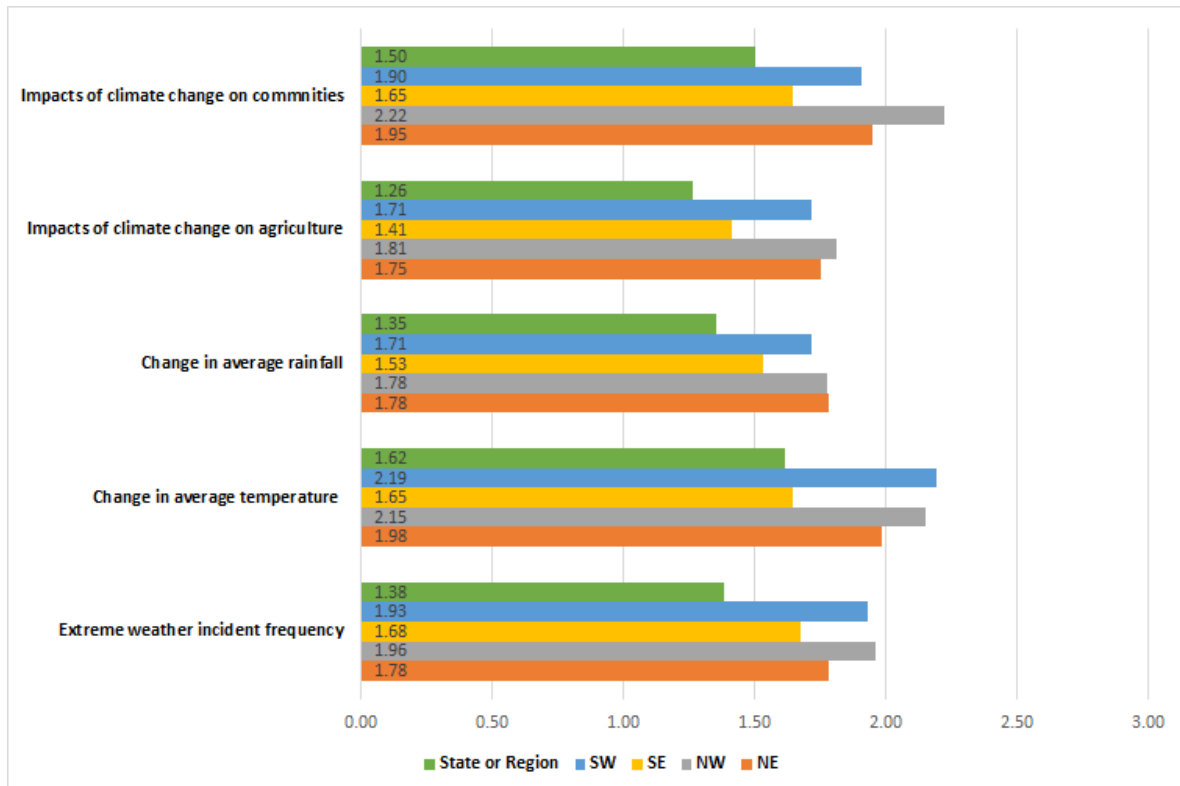
CONCERN FOR CLIMATE CHANGE IMPACTS LOCALLY

POST Survey

For each of the topics below related to conservation issues, please indicate how critical they are in the counties you serve.

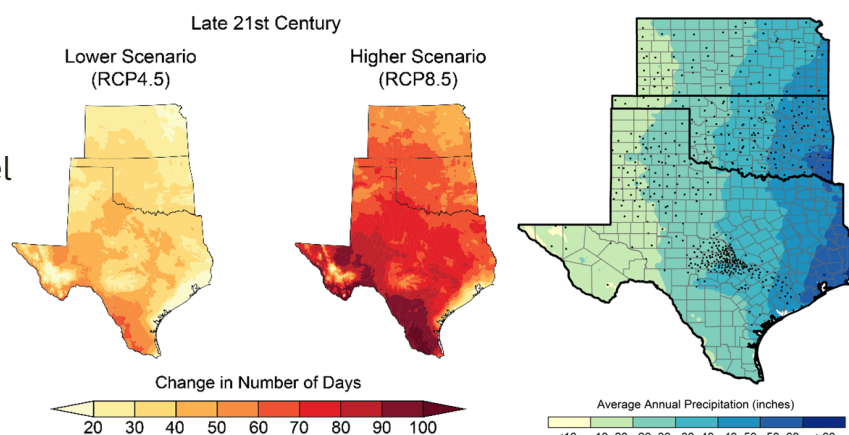
1=Very Critical

5=Not at all Critical



Across every region and category, the issues were rated more critical in the post survey. However the degree by which certain issues changed, varied by region. The northeastern region had the largest change in "rainfall", likely based on projections of heavy sheeting rains. While the northwest participants had the greatest change related to temperature.

Examples of the model projections from the 4th National Climate Assessment shared with participants are shown to the right.



WHAT HAVE YOU OBSERVED?

Many respondents felt that some change in patterns over time is expected, "after all we haven't had the capacity to measure change for a long time relative to the history of the Earth."

Most Common Answer: Fluctuations have increased.

"From one extreme to another in a short period of time"

Impact Depends on Your Perspective!

"Tornados have shifted east."

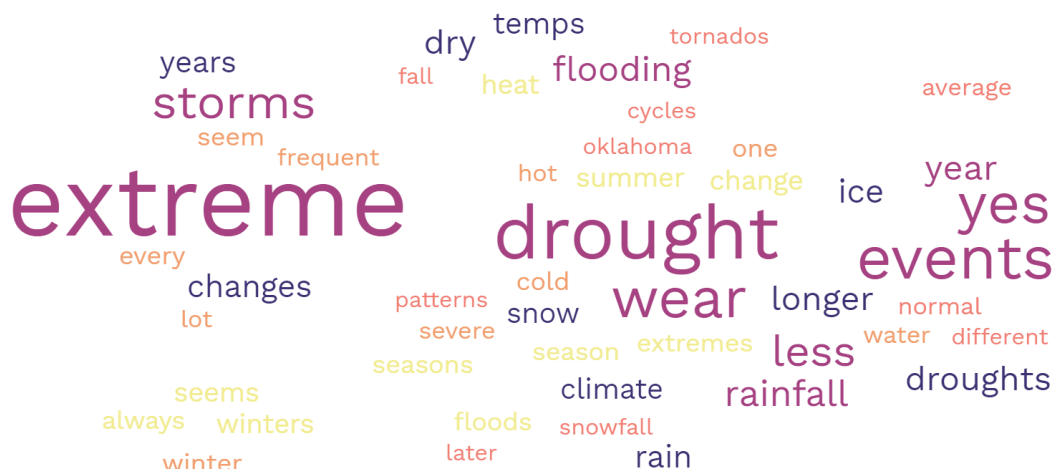
- Eastern Participant

"Very glad we are experiencing fewer tornadoes."

- Western Participant

A few other comments (paraphrased) from multiple respondents...

- Looking at 20 years of data is not enough to know if climate is changing.
- Weather is moving rapidly from one extreme to another. This causes many types of stress and damages for agricultural producers. Seasons are more defined / less defined depending on where you are in Oklahoma.
- Dust storm on our ranch makes it hard to work outside and can get weaning calves sick.
- Does it matter if climate is changing? We have always adapted in Oklahoma and will continue to do so.



The word cloud highlights some of the most common words found in responses like "extreme" and "drought". Looking through responses, a fair number of individuals felt that a changing climate was to be expected, and that the changes weren't concerning to them generally. That was explored further in subsequent questions.

HOW CRITICAL ARE THE CHALLENGES OF CLIMATE CHANGE?

For each of the challenges below, please indicate how critical they are.
Very Critical=1, Not at all Critical=5

Every one of these concerns had an average across participants between 1 and 3.

PRE All Respondents	POST All Respondents	PRE Producers/ Members	POST Producers/ Members	PRE Employees	POST Employees
Mitigation by corporations	Mitigation by corporations	Mitigation by corporations	Mitigation by corporations	Mitigation by agriculture	Mitigation by corporations
Mitigation by agriculture	Mitigation by agriculture	Adaptation in Oklahoma	Adaptation nationally or globally	Mitigation by corporations	Mitigation by agriculture
Adaptation in Oklahoma	Adaptation nationally or globally	Adaptation nationally or globally	Mitigation globally or nationally	Adaptation in Oklahoma	Adaptation nationally or globally
Adaptation nationally or globally	Mitigation globally or nationally	Mitigation by agriculture	Mitigation by agriculture	Adaptation nationally or globally	Mitigation globally or nationally
Mitigation in Oklahoma	Adaptation in Oklahoma	Mitigation in Oklahoma	Adaptation in Oklahoma	Mitigation in Oklahoma	Adaptation in Oklahoma
Mitigation globally or nationally	Mitigation in Oklahoma	Mitigation globally or nationally	Mitigation in Oklahoma	Mitigation globally or nationally	Mitigation in Oklahoma
Mitigation by households	Mitigation by households	Mitigation by households	Mitigation by households	Mitigation by households	Mitigation by households

WHO

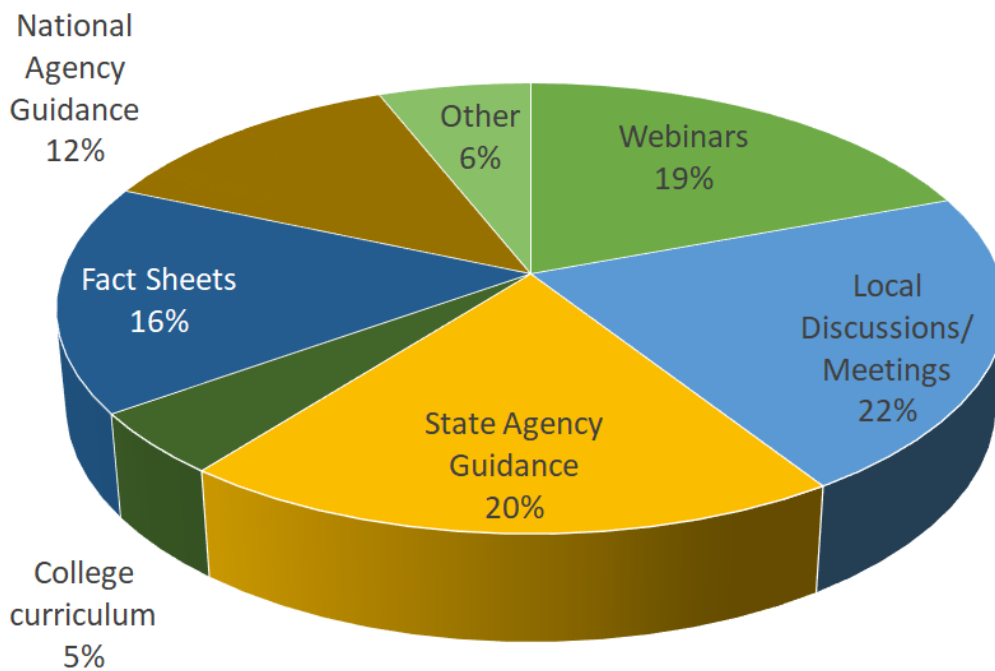
Across all respondents, the most critical challenge was felt to lie with corporations to mitigate climate change, followed by mitigation by agriculture. This was rated as a more critical challenge than either adaptation or geographic specific mitigation.

Everyone's Responsibility

Among producers and board members, the post-survey resulted in a 4-way tie among the most critical challenges. Those challenges included both mitigation and adaptation on a larger scale than Oklahoma. Interestingly, producers rated adaptation in the pre-survey higher than either the overall responses or the employee response group.

INFORMATION SOURCES

Across all participants, local connections are still highly valued with 22% getting their information from local discussions for their primary source of information for climate smart practices.



Sources listed under “Other”

- Mesonet
- RFDTV
- Newsletters
- Scientific publications
- Extension
- YouTube videos
- Clay Pope

INFORMATION SOURCES

BREAKDOWN BY DEMOGRAPHICS

Each person could select multiple information sources, so the numbers below will not add up to 100%.

Producers



Local Discussions & Meetings 48%

- State Agency Guidance 38%
- Webinars 31%
- Fact Sheets 30%
- National Agency Guidance 23%
- Other 11%
- College Curriculum 7%

Employees



Webinars 41%

- Local Discussions & Meetings 39%
- State Agency Guidance 39%
- Fact Sheets 34%
- National Agency Guidance 27%
- Other 10%
- College Curriculum 10%

Less Than 5 Years Experience



State Agency Guidance 44%

- Local Discussions & Meetings 39%
- Webinars 38%
- National Agency Guidance 29%
- Fact Sheets 27%
- Other 13%
- College Curriculum 12%

More Than 20 Years Experience



Local Discussions & Meetings 47%

- State Agency Guidance 35%
- Webinars 32%
- Fact Sheets 32%
- National Agency Guidance 26%
- Other 11%
- College Curriculum 7%

INFORMATION SOURCES

BREAKDOWN BY DEMOGRAPHICS

Each person could select as multiple information sources, so the numbers below will not add up to 100%.

High School or Associates



Local Discussions & Meetings 46%

- State Agency Guidance 39%
- Fact Sheets 34%
- Webinars 32%
- National Agency Guidance 20%
- Other 7%
- College Curriculum 3%

Bachelors or Masters



Tied: Webinars and Local Discussions & Meetings 41%

- State Agency Guidance 39%
- Fact Sheets 31%
- National Agency Guidance 28%
- Other 13%
- College Curriculum 11%

USDA NRCS Employee



Webinars 64%

- Fact Sheets 55%
- National Agency Guidance 52%
- Local Discussions & Meetings 50%
- State Agency Guidance 48%
- College Curriculum 12%
- Other 10%

Conservation District Employee



Local Discussions & Meetings 47%

- State Agency Guidance 42%
- Webinars 33%
- Fact Sheets 31%
- National Agency Guidance 19%
- Other 8%
- College Curriculum 3%

CONSERVATION ISSUES

For each of the topics below related to conservation issues, please indicate how critical they are in the counties you serve.

1=Very Critical 5=Not at all Critical

All Respondents	Producers/ Members	Employees
Well drilling for livestock water	Well drilling for livestock water	Well drilling for livestock water
Prescribed Fire	Rural water connections for livestock	Prescribed Fire
Cover Crops	No-Till	Cover Crops
Rural water connections for livestock	Cover Crops	Rural water connections for livestock
No-Till	Minimum Till	No-Till
Pond Construction	Pond Construction	Pond Construction
Minimum Till	Prescribed Fire	Minimum Till

Tied for
Second

This was a question asked in the pre-survey only. The left hand column is all participants, the middle column was just those participants that were conservation district members or board members, and the right column were employees of districts or NRCS. Producers did have a slightly different ranking on how critical certain challenges were as compared to employees, with emphasis on water. This may be heavily influenced by the intense drought most of the state was experiencing in the Fall of 2022.

CONSERVATION ISSUES

Note, most of the average ratings were "very critical"=1 to "critical"=2, and all were at least "somewhat critical" = 3. The discussion below is splitting hairs between practices that most felt were uniformly critical.

Question: For each of the topics below related to conservation issues, please indicate how critical they are in the counties you serve.

1=Very critical 5=Not at all Critical

	NE	NW	SE	SW	State or Region
No-Till	2.18	2.32	2.50	2.06	1.89
Cover Crops	2.30	2.25	2.25	2.04	1.79
Minimum Till	2.36	2.33	2.56	2.19	2.18
Prescribed Fire	2.03	2.19	1.94	2.57	2.00
Pond construction	2.19	2.70	1.81	2.61	2.47
Well drilling for livestock water	2.26	1.61	2.03	1.89	2.03
rural water connections for livestock water	2.30	2.07	2.47	1.89	2.15

This was a question asked in the pre-survey only. Results had more regional variation than some of the other questions did. Since higher numbers are relatively less critical, the heat map shows them in red while those rated relatively more critical are highlighted in green.

- Rural water connections for livestock and water well drilling for livestock were most critical among participants in western counties, yet pond construction was considered less critical.
- However, for participants in southeastern counties, pond construction was the most critical issue at the time of the program.
- Across participants serving eastern counties, prescribed fire was relatively more critical as compared to the other half of the state.
- Cover crops was considered most critical by those in state or regional positions, but did not rate as critical among those serving locally.

PRACTICE EFFECTIVENESS

One of the questions we had going into this program is whether participants **"perceive conservation programs as being an effective approach to adapting to climate change?"**

Question: For each of the practices below, please indicate how effective they are at addressing conservation challenges in the counties you serve.

1="Very Effective" to 5="Not at All Effective"

For this question, the rankings of conservation practices between producers/members and employees were notably differentiated by the value of conservation planning. Another comparison of interest might be the

Producers/ Members	Employees
Conservation Planning	Grass planting on highly erodible land
Grass planting on highly erodible land	Grazing plans/improved pasture management
Grazing plans/improved pasture management	Conservation Planning
Invasive Species Control	Invasive Species Control
Nutrient Management (other than CC and no-till)	Nutrient Management (other than CC and no-till)
Conservation Crop rotation	Conservation Crop rotation
Riparian Restoration	Riparian Restoration
Irrigation Improvements	Irrigation Improvements

difference in rankings between NRCS and Conservation Districts, but the ordering is virtually the same between the two with only slight differences.

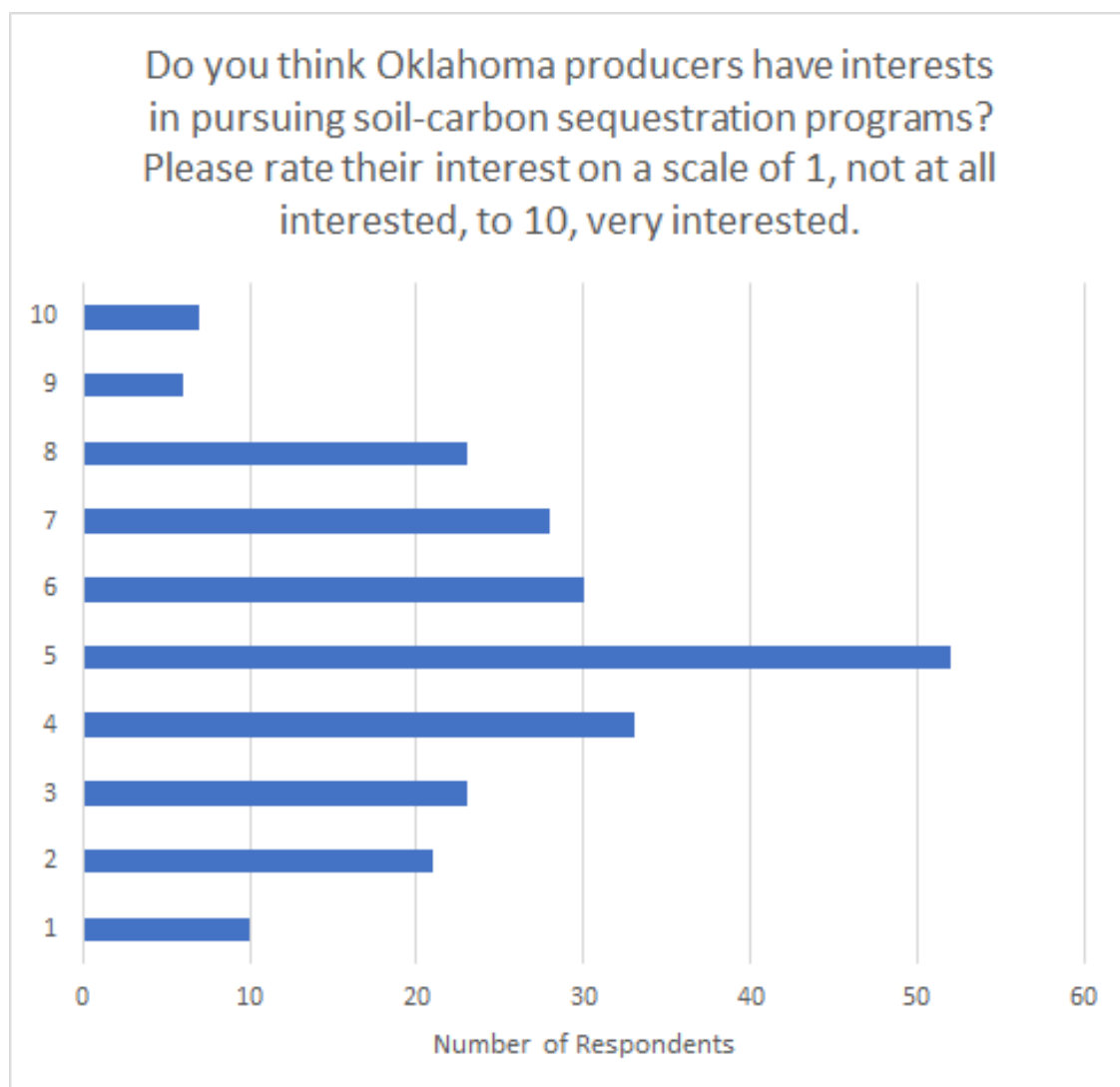
When results are broken down by region (below), regional differences among participants are apparent. Grass planting on highly erodible land was considered most effective in the western part of the state. Conservation planning and invasive species control were considered most effective in the eastern side of the state.

	NE	NW	SE	SW	State or Region
Grazing plans/improved pasture management	1.80	1.96	1.83	1.80	1.74
Grass planting on highly erodible land	1.82	1.57	1.89	1.72	1.95
Irrigation Improvements	2.77	2.31	2.69	2.28	2.27
Riparian Restoration	2.20	2.36	2.30	2.50	2.15
Conservation Planning	1.79	2.07	1.66	1.85	2.13
Conservation Crop rotation	2.12	2.35	2.19	1.96	2.03
Invasive Species Control	1.86	2.11	1.97	2.09	2.11
Nutrient Management (other than CC and no-till)	2.00	2.38	2.15	2.05	1.97

INTEREST IN CARBON MARKETS

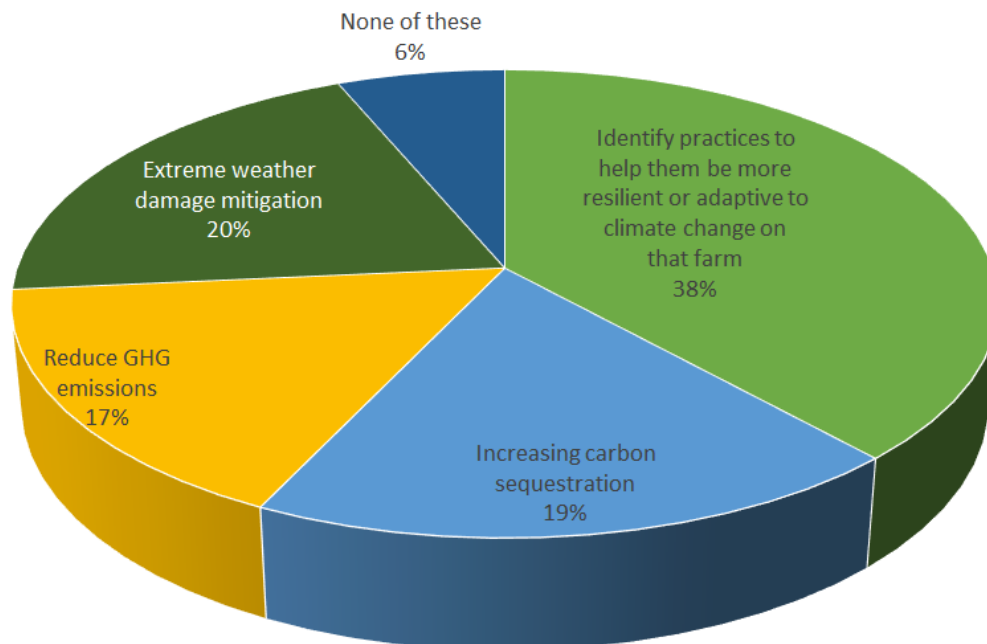
Too Soon to Tell?

The large number of responses at a "5" which is directly in the middle of the options may indicate that participants just weren't sure of the answer yet. Perhaps they needed more information on carbon sequestration programs. Or perhaps they felt there was too much uncertainty in the measurements. There was really no way to know for certain.



WORKFORCE CONFIDENCE ON CLIMATE SMART INQUIRIES

Question: If a producer came in and asked you to help develop a conservation plan that was "climate smart" check all the boxes that you feel confident you could help them with?



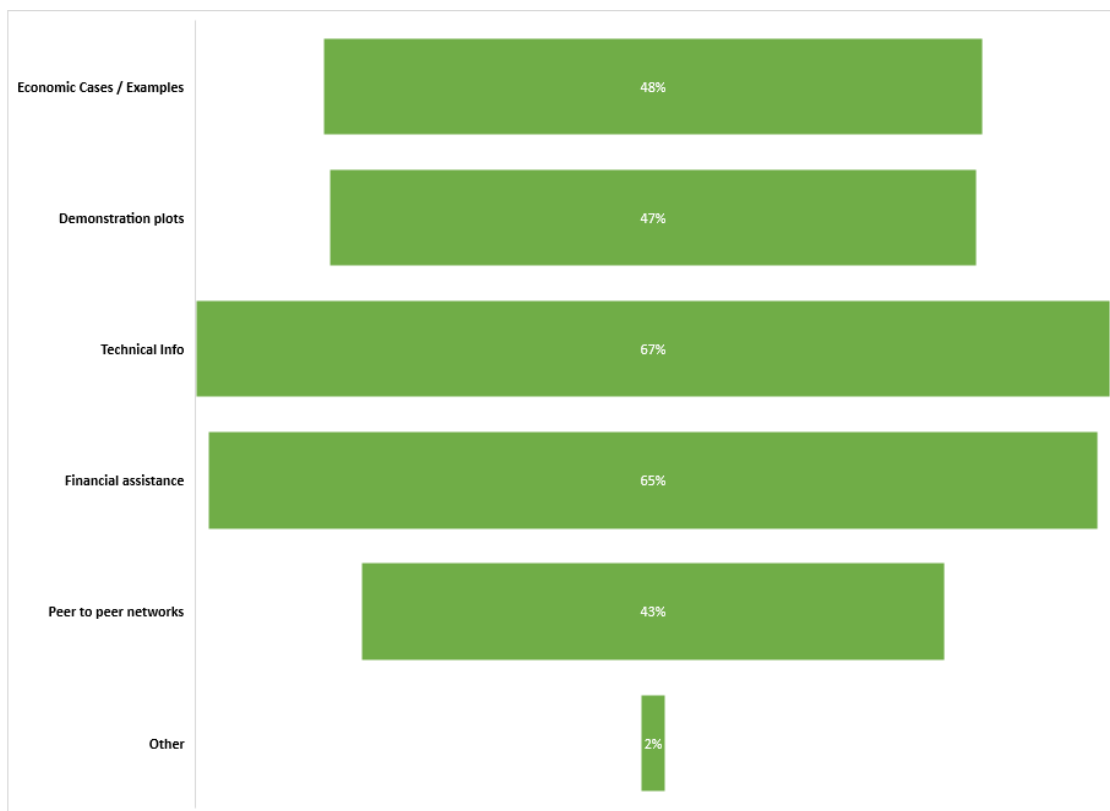
These results are limited to only those participants that were employees of NRCS, the Oklahoma Conservation Commission, or the Oklahoma Association of Conservation Districts. The largest proportion of respondents were confident they could help with the kinds of activities they have helped with in the past: identifying practices. This was followed by extreme weather damage mitigation.

Those who responded with "none" had roles that did not put them in a position to offer advice to producers, for example an administrative assistant or an information technology staff member.

WHAT ADDITIONAL RESOURCES DO YOU NEED?

EMPLOYEE responses only

Question: What do you need to help producers transition to more sustainable practices?



Participants could select as many answers as they wanted to. Over 2/3 of participants felt they could benefit from additional technical information and from added financial assistance. Almost half felt economic case studies and examples, demonstration plots, and added access to peer-to-peer networks would be beneficial. Overwhelmingly participants requested additional resources in two or more areas.

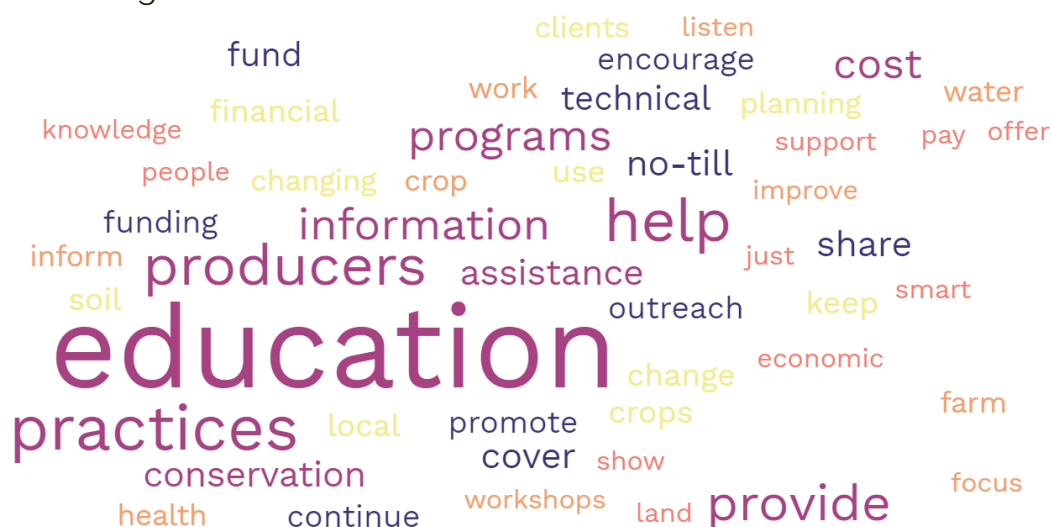
WHERE CAN WE GO FROM HERE?

"Continue to educate, lead, and offer up to date practices. It seems to work best if we can find local leaders to set examples."

"Get back to useable conservation planning; quit planning to the practice and plan for where the producer is and where they want to go."

Offer ways for them to implement practices and be more easy on standards and specifications. Also try to convince farmers of new ways to farm."

What can the Oklahoma conservation agencies do to help our clients adapt to climate change?



WHAT ADDITIONAL ISSUES DO YOU SEE THAT WERE NOT ADDRESSED ELSEWHERE?

At the OACD Annual Meeting in February, 2023, results were presented to attendees and they were asked to do a 'snowball consensus' activity at the end. A snowball begins with person reflections, and then audience members discuss those reflections with larger and larger groups until 2 different recommendations were made.

1. We need more K-12 education on climate change.

1. Additional research studies are needed to provide evidence of climate change and climate change impacts in the state.

The most common answer (paraphrased) was, "Who do we believe about climate change?" This motivated a broader recommendation to have trusted, local expertise and additional data on climate change. Also, how did it affect agriculture at a local level. Audience members wanted someone they could trust to provide unbiased information.

At the same time, participants felt there was a need for lay audience information, and that additional education for K-12 audiences would be valuable.



FINAL THOUGHTS

The results outlined in this report emphasize the value Oklahoma conservation front line workers place on grassroots efforts and trusted peer networks. It also emphasizes the need for additional, research driven information to aid in decision making and priorities going forward. Future partnerships may be needed to dig more deeply into concerns and challenges for specific groups of people (e.g. row crop producers versus livestock producers) or to compare results across a wider geographic space.

We would like to express our appreciation to the Oklahoma Association of Conservation Districts for supporting this study and to every participant that contributed.



Climate Conversations with the Oklahoma Association of Conservation Districts Area Meeting Attendees



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