IRB NUMBER: 11841 IRB APPROVAL DATE: 12/22/2020

You are invited to participate in research regarding socially sustainable solutions for water, carbon and infrastructure resilience in Oklahoma. This study will ask you about your perceptions and experiences with weather/climate in Oklahoma, and to characterize and evaluate problem areas and potential solutions to weather/climate challenges. This is an important long-term study and we are looking for research partners throughout the state who are willing to share their experiences and views. We are contacting you because you indicated an interest in participating. You must be at least 18 years of age and be willing to provide your contact information to participate.

If you agree to participate, you will respond to an Internet survey that should take about 30 minutes to complete.

There are no risks or benefits.

If you participate, you will receive a $10 gift card, either mailed or emailed to you after you complete the survey.

Your participation is voluntary, and your responses will be de-identified before they are shared for research purposes or published. After removing all identifiers, we might share your data with other researchers or use it in future research without obtaining additional consent from you.

Even if you choose to participate now you may stop participating at any time and for any reason.

Data are collected via an online survey system that has its own privacy and security policies for keeping your information confidential.

If you have questions about this research, please contact:
Dr. Hank Jenkins-Smith
Institute for Public Policy Research and Analysis
University of Oklahoma
(405) 325-1720 or ippra@ou.edu

You can also contact the University of Oklahoma – Norman Campus Institutional Review Board at 405-325-8110 or irb@ou.edu with questions, concerns or complaints about your rights as a research participant, or if you don't want to talk to the researcher.

*Please print this document for your records. By providing information to the researcher(s), I am agreeing to participate in this research.*

**consent_18:** Are you a U.S. citizen 18 years of age or older?
0 - No (If no – cannot participate)
1 - Yes

**contact_consent:** This project focuses on problems that are different across Oklahoma and it is important that we know where you live so that we can understand the problems in your area. Are you willing to provide us with your home address so that we can identify your area?
0 - No (If no – cannot participate)
1 - Yes

**consent:** Do you agree to participate in this study? [two buttons]
0 - No, I do not want to participate in this study
1 - Yes, I agree to participate in this study [IF **consent** = 0, skip to new page that says: "You have indicated that you do not want to participate in this study. If you have reached this page by accident and do wish to participate in this study, please contact our technical support staff at: (405) 325- 1720 or ippra@ou.edu."]

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Before we begin, we want to sincerely thank you for being part of this study!

**contact_consent:** This is one of the final surveys in our current project, but we hope to continue our research in the future. Would you be willing to participate in future surveys with our team?
0 - No
1 - Yes

Regardless of your answer, we truly appreciate your time and willingness to complete this survey. Thank you!

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**contact_consent:** Again, thank you for taking the time to complete this survey. It is different than most. We are not simply asking for opinions and preferences. We are asking for advice and guidance on how to tackle some of the biggest problems facing Oklahoma. While we will keep your identity strictly confidential, we are going to share the answers you provide with a team of scientists and policymakers across the state who are studying these problems and trying to develop creative solutions. Your responses will provide extremely valuable input into this process.

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First, we would like to get some background information about you.

**age:** How old are you? [verbatim; numeric]

**gend:** Are you male, female, or other?
0 - Female
1 - Male
2 - Other (please specify)
**gend_specify:** [verbatim]

**hispanic:** Do you consider yourself to be Hispanic, Latino, or Spanish or to have Hispanic, Latino, or Spanish origins?
0 - No
1 - Yes

**race:** Which of the following best describes your race?
1 - White
2 - Black or African American
3 - American Indian or Alaska Native
4 - Asian
5 - Native Hawaiian or Pacific Islander
6 - Two or more races
7 - Some other race (please specify)
**race_specify:** [verbatim]

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**current_zip:** What is the zip code at your current residence? [verbatim; numeric]

**current_lngth:** How many years have you lived at your current residence? [verbatim; numeric] years

**adults:** Including yourself, how many **adults age 18 and older** live in your current primary residence? [verbatim; numeric > 0]

**children:** How many **children age 17 and younger** live in your current primary residence? [verbatim; numeric]

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**marital:** What is your current marital status?
1 - Now married
2 - Widowed
3 - Divorced
4 - Separated
5 - Never married

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**ok_lngth:** How many years have you lived in Oklahoma? [verbatim; numeric] years

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**home_lot:** Which of the following best describes the property where you live?
1 - Urban
2 - Suburban
3 - Rural

**res_type:** Which of the following best describes the type of place you currently live in?
1 - An apartment (in a building with one or more other units)
2 - A single-family detached house
3 - A single-family attached house (such as a townhouse or rowhouse)
4 - A duplex, triplex, or other small multi-unit building
5 - A mobile home, trailer, or manufactured home
6 - A group living situation (such as a dormitory, nursing facility, or military barracks)
7 - Some other type of housing (please specify) [verbatim]

**res_own:** Do you or someone in your household own or rent your current home?
1 - Own (with or without a mortgage)
2 - Rent
3 - Stay without paying rent (e.g., living with friends or family)
4 - Other arrangement (please specify) [verbatim]

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Water, land, and infrastructure affect prosperity and quality of life in many parts of Oklahoma. Scientists and decisionmakers working on this project are evaluating each of these resources and we want to know if you have any concerns about them.

We are currently thinking about three aspects when evaluating *water resources* in Oklahoma:

- Water availability: the supplies of water for various purposes, such as drinking, farming/ranching, recreation, or industrial processes
- Water quality: the suitability (cleanliness) of water for various purposes, such as drinking, farming/ranching, or recreation
- Water cost: the cost of water for various purposes, such as such as drinking, farming/ranching, or industrial processes

**concern_water_availability:** Do you have any concerns about *water availability* in your region of Oklahoma?
1 - Definitely no
2 - Probably no
3 - Unsure
4 - Probably yes
5 - Definitely yes

**concern_water_quality:** Do you have any concerns about *water quality* in your region of Oklahoma?
1 - Definitely no
2 - Probably no
3 - Unsure
4 - Probably yes
5 - Definitely yes

**concern_water_cost:** Do you have any concerns about the *cost of water* in your region of Oklahoma?
1 - Definitely no
2 - Probably no
3 - Unsure
4 - Probably yes
5 - Definitely yes

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We are currently thinking about two aspects when evaluating *land resources* in Oklahoma:

- Wildlife habitat: ecosystems that support animals and birds that people enjoy watching and hunting, such as butterflies, deer, quail, and turkey
- Soil quality: the suitability of soil for sustaining plants, animals, and livelihoods, such as productive farming and ranching

**concern_land_wildlife:** Do you have any concerns about *wildlife habitat* in your region of Oklahoma?
1 - Definitely no
2 - Probably no
3 - Unsure
4 - Probably yes
5 - Definitely yes

**concern_land_soil:** Do you have any concerns about *soil quality* in your region of Oklahoma?
1 - Definitely no
2 - Probably no
3 - Unsure
4 - Probably yes
5 - Definitely yes

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If you were advising the scientists and policymakers who are working on this project, which of the following would you tell them require the most attention? Please rank the items from one (most attention) to seven (least attention). [table; randomize; rank]

**rank_water_availability:** Water availability
**rank_water_quality:** Water quality
**rank_water_cost:** Water cost
**rank_land_wildlife:** Wildlife habitat
**rank_land_soil:** Soil quality
**rank_infra_electricity:** Electricity infrastructure
**rank_infra_transportation:** Transportation infrastructure

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Researchers and policymakers are also studying the impact of weather and climate hazards on *water*, *land*, and *infrastructure* resources in Oklahoma. The team is focusing on forecasts/predictions at three different time scales:

- Short-range weather forecasts that focus on the next day to two weeks

- Medium-range (seasonal) weather forecasts that focus on the next two weeks to 90 days
- Long-range climate predictions that focus on the next season to decade or more

Weather hazards that occur during the short-range weather time frame include tornadoes, hail, high winds, lightning, flooding/flash flooding and snow/ice storms.

How do you rate the risk of these weather hazards to people in Oklahoma? [table; randomize]

**risk_tornado:** Tornadoes
1 - No risk
2 - Low risk
3 - Moderate risk
4 - High risk
5 - Extreme risk

**risk_hail:** Hail
1 - No risk
2 - Low risk
3 - Moderate risk
4 - High risk
5 - Extreme risk

**risk_wind:** High winds
1 - No risk
2 - Low risk
3 - Moderate risk
4 - High risk
5 - Extreme risk

**risk_lightning:** Lightning
1 - No risk
2 - Low risk
3 - Moderate risk
4 - High risk
5 - Extreme risk

**risk_flood:** Flooding/flash flooding
1 - No risk
2 - Low risk
3 - Moderate risk
4 - High risk
5 - Extreme risk

**risk_snow_ice:** Snow/ice storms
1 - No risk
2 - Low risk
3 - Moderate risk
4 - High risk
5 - Extreme risk

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Did you experience any of these weather hazards in the last 6 months? [table; randomize]

**experience_tornado:** Tornadoes
0 - No

1 - Yes

**experience_hail:** Hail
0 - No
1 - Yes

**experience_wind:** High winds
0 - No
1 - Yes

**experience_lightning:** Lightning
0 - No
1 - Yes

**experience_flood:** Flooding/flash flooding
0 - No
1 - Yes

**experience_snow_ice:** Snow/ice storms
0 - No
1 - Yes

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When you think about the next 25 years in Oklahoma, do you think the risk (frequency and severity) of these weather hazards will increase, decrease, or stay about the same? [table; randomize]

**future_tornado:** Tornadoes
1 - Significantly decrease
2 - Decrease
3 - Stay about the same
4 - Increase
5 - Significantly increase

**future_hail:** Hail
1 - Significantly decrease
2 - Decrease
3 - Stay about the same
4 - Increase
5 - Significantly increase

**future_wind:** High winds
1 - Significantly decrease
2 - Decrease
3 - Stay about the same
4 - Increase
5 - Significantly increase

**future_lightning:** Lightning
1 - Significantly decrease
2 - Decrease
3 - Stay about the same
4 - Increase
5 - Significantly increase

**future_flood:** Flooding/flash flooding

1 - Significantly decrease
2 - Decrease
3 - Stay about the same
4 - Increase
5 - Significantly increase

**future_snow_ice:** Snow/ice storms
1 - Significantly decrease
2 - Decrease
3 - Stay about the same
4 - Increase
5 - Significantly increase

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Hazards that occur during the medium-range (seasonal) weather time frame include:

- Flash drought: periods of intense drought that arise quickly and last for a few weeks
- Pluvials: periods of excessive precipitation/rain that last for a few weeks
- Heat waves: periods of excessively hot temperatures that last for a few weeks
- Cold spells: periods of excessively cold temperatures that last for a few weeks

How do you rate the risk of these seasonal hazards to people in Oklahoma? [table; randomize]

**risk_flash_drought:** Flash drought
1 - No risk
2 - Low risk
3 - Moderate risk
4 - High risk
5 - Extreme risk

**risk_pluvial:** Pluvials (periods of excessive precipitation/rain)
1 - No risk
2 - Low risk
3 - Moderate risk
4 - High risk
5 - Extreme risk

**risk_heat_wave:** Heat waves
1 - No risk
2 - Low risk
3 - Moderate risk
4 - High risk
5 - Extreme risk

**risk_cold_spell:** Cold spells
1 - No risk
2 - Low risk
3 - Moderate risk
4 - High risk
5 - Extreme risk

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Did you experience any of these seasonal hazards in the last 6 months? [table; randomize]

**experience_flash_drought:** Flash drought

0 - No
1 - Yes

**experience_pluvial:** Pluvials (periods of excessive precipitation/rain)
0 - No
1 - Yes

**experience_heat_wave:** Heat waves
0 - No
1 - Yes

**experience_cold_spell:** Cold spells
0 - No
1 - Yes

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When you think about the next 25 years in Oklahoma, do you think the risk (frequency and severity) of these seasonal hazards will increase, decrease, or stay about the same? [table; randomize]

**future_flash_drought:** Flash drought
1 - Significantly decrease
2 - Decrease
3 - Stay about the same
4 - Increase
5 - Significantly increase

**future_pluvial:** Pluvials (periods of excessive precipitation/rain)
1 - Significantly decrease
2 - Decrease
3 - Stay about the same
4 - Increase
5 - Significantly increase

**future_heat_wave:** Heat waves
1 - Significantly decrease
2 - Decrease
3 - Stay about the same
4 - Increase
5 - Significantly increase

**future_cold_spell:** Cold spells
1 - Significantly decrease
2 - Decrease
3 - Stay about the same
4 - Increase
5 - Significantly increase

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There are multiple hazards that occur during the long-range climate time frame, but one of the most common in Oklahoma is long-term drought, which can last for several months.

**risk_long_drought:** How do you rate the risk of long-term drought to people in Oklahoma?
1 - No risk
2 - Low risk

3 - Moderate risk
4 - High risk
5 - Extreme risk

**experience_long_drought:** Did you experience long-term drought in the last 6 months?
0 - No
1 - Yes

**future_long_drought:** When you think about the next 25 years in Oklahoma, do you think the risk (frequency and severity) of long-term drought will increase, decrease, or stay about the same?
1 - Significantly decrease
2 - Decrease
3 - Stay about the same
4 - Increase
5 - Significantly increase

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In addition to weather and climate hazards, Oklahoma also experiences other natural hazards, including wildfires and earthquakes.

How do you rate the risk of these hazards to people in Oklahoma? [table; randomize]

**risk_wildfire:** Wildfires
1 - No risk
2 - Low risk
3 - Moderate risk
4 - High risk
5 - Extreme risk

**risk_earthquake:** Earthquakes
1 - No risk
2 - Low risk
3 - Moderate risk
4 - High risk
5 - Extreme risk

Did you experience any of these hazards in the last 6 months? [table; randomize]

**experience_wildfire:** Wildfires
0 - No
1 - Yes

**experience_earthquake:** Earthquakes
0 - No
1 - Yes

When you think about the next 25 years in Oklahoma, do you think the risk (frequency and severity) of these hazards will increase, decrease, or stay about the same? [table; randomize]

**future_wildfire:** Wildfires
1 - Significantly decrease
2 - Decrease
3 - Stay about the same
4 - Increase
5 - Significantly increase

**future_earthquake:** Earthquakes
1 - Significantly decrease
2 - Decrease
3 - Stay about the same
4 - Increase
5 - Significantly increase

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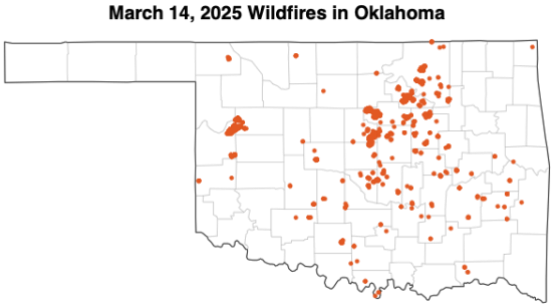
In mid-March 2025, wildfires fueled by high winds and dry conditions severely impacted Oklahoma, with over 130 fires reported across 44 counties. The fires burned more than 170,000 acres and destroyed over 300 homes. Rapid evacuation orders were issued in several areas across the state as the fires spread.




**fire_recall:** Do you recall the wildfires that occurred in mid-March 2025?
0 - No
1 - Yes
2 - Not sure

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[if **fire_recall** = 1]

**fire_aware:** Before the fires began (e.g., the morning of the event), were you aware that wildfires were a possibility that day?
0 - No
1 - Yes
2 - Not sure

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[if **fire_aware** = 1]

**fire_concern:** Before the fires began (e.g., the morning of the event), were you concerned that fires might affect your area?
1 - Not at all concerned
2 - Slightly concerned
3 - Somewhat concerned
4 - Very concerned
5 - Extremely concerned
6 - Not sure

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[if **fire_aware** = 1]

*How* did you receive information that wildfires were a possibility on the day of the event? Please select all that apply.
**fire_channel_tv_radio_online:** News media (e.g., TV, radio, online news)
**fire_channel_social:** Social media platform(s) (e.g., Facebook, X)
**fire_channel_app:** Mobile app(s) (e.g., weather app)
**fire_channel_alert:** Wireless emergency alert
**fire_channel_in_person:** Personal conversation (e.g., text message, phone call, conversation)
**fire_channel_other:** Other (please specify) [verbatim]
**fire_channel_dk:** I don't recall

*Who* provided the information that wildfires were a possibility on the day of the event? Please select all that apply.
**fire_source_nws:** National Weather Service (NWS)
**fire_source_local_gov:** Local official(s) (e.g., city or county emergency manager or fire department)
**fire_source_state_fed:** State official(s) (e.g., Oklahoma Forestry Services or Oklahoma Department of Emergency Management)
**fire_source_news_org:** News organization or journalist
**fire_source_friend_family:** Friend, family member, or neighbor
**fire_source_social_influencer:** Social media influencer or community group
**fire_source_other:** Other (please specify) [verbatim]
**fire_source_dk:** I don't recall

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[if **fire_recall** = 1]

**fire_impact_direct:** Was your area *directly* impacted by the wildfires that occurred in mid-March 2025? (e.g., evacuation orders, fire damage)?
0 - No
1 - Yes
2 - Not sure

**fire_impact_indirect:** Was your area *indirectly* impacted by the wildfires that occurred in mid-March 2025? (e.g., smoke)?
0 - No
1 - Yes
2 - Not sure

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[if **fire_impact_direct** = 1]

**fire_evac_iss:** Was an evacuation order issued for your area?
0 - No
1 - Yes
2 - Not sure

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[if **fire_evac_iss** = 1]

How did you receive information that there was an evacuation order issued for your area? Please select all that apply.
**evac_channel_tv_radio_online:** News media (e.g., TV, radio, online news)
**evac_channel_social:** Social media platform(s) (e.g., Facebook, X)

**evac_channel_app:** Mobile app(s) (e.g., weather app)
**evac_channel_alert:** Wireless emergency alert
**evac_channel_in_person:** Personal conversation (e.g., text message, phone call, conversation)
**evac_channel_other:** Other (please specify) [verbatim]
**evac_channel_dk:** I don't recall

Who provided the information that there was an evacuation order issued for your area? Please select all that apply.
**evac_source_nws:** National Weather Service (NWS)
**evac_source_local_gov:** Local official(s) (e.g., city or county emergency manager or fire department)
**evac_source_state_fed:** State official(s) (e.g., Oklahoma Forestry Services or Oklahoma Department of Emergency Management)
**evac_source_news_org:** News organization or journalist
**evac_source_friend_family:** Friend, family member, or neighbor
**evac_source_social_influencer:** Social media influencer or community group
**evac_source_other:** Other (please specify) [verbatim]
**evac_source_dk:** I don't recall

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[if **fire_evac_iss** = 1]

**fire_evac:** Did you evacuate?
0 - No
1 - Yes

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[if **fire_evac** = 0]

If you're comfortable sharing, can you briefly describe why you chose not to evacuate? For example, was it because you felt it wasn't necessary, or were there challenges like traffic, road closures, or other obstacles?
**fire_evac_no_reason_not_necessary:** I didn't think evacuation would be necessary
**fire_evac_no_reason_not_dangerous:** I didn't believe the fire was close or dangerous enough
**fire_evac_no_reason_home_defensible:** I believed I could protect or defend my home
**fire_evac_no_reason_pets:** I was worried about leaving pets or livestock behind
**fire_evac_no_reason_family:** I needed to stay to help a family member, friend, or neighbor
**fire_evac_no_reason_traffic:** I was worried about traffic or road closures
**fire_evac_no_reason_transport:** I didn't have reliable transportation
**fire_evac_no_reason_cost:** I was concerned about the cost of evacuation (e.g., gas, lodging, food)
**fire_evac_no_reason_shelter:** I didn't know where to go
**fire_evac_no_reason_trust:** I didn't trust the evacuation order
**fire_evac_no_reason_other:** Other (please specify) [verbatim]
**fire_evac_no_reason_dk:** I'm not sure

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[if **fire_evac** = 1]

If you're comfortable sharing, can you briefly describe your evacuation experience?

**fire_evac_from:** Where were you evacuating from? (e.g., my home in Norman, OK) [verbatim]
**fire_evac_to:** Where did you go when you evacuated? (e.g., my mom's house in Oklahoma City, OK) [verbatim]
**fire_evac_how:** How did you travel from where you were to where you went? (e.g., I drove my car, I took public transit, or my son drove me) [verbatim]
**fire_evac_challenges:** Did you experience any challenges or obstacles while evacuating? (e.g., there was a traffic jam on I-35 North) [verbatim]

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Now we want you to think about the future.

Imagine it's a hot, dry Saturday afternoon in late August. A wildfire has ignited near your community, and strong winds are causing it to spread rapidly. Local authorities have issued an evacuation order, urging residents to leave immediately.

**fire_scen_evac:** If you were in this situation, how likely would you be to evacuate your home?
1 - Not at all likely
2 - Not very likely
3 - Moderately likely
4 - Very likely
5 - Extremely likely

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[it **fire_scen_evac:** < 4]

It sounds like you might be unsure about evacuating your home in the situation described on the previous page. Can you tell us more about why? Please select all that apply.
**evac_reason_not_necessary:** I don't think evacuation would be necessary
**evac_reason_not_dangerous:** I wouldn't believe the fire was close or dangerous enough
**evac_reason_home_defensible:** I believe I could protect or defend my home
**evac_reason_pets:** I would be worried about leaving pets or livestock behind
**evac_reason_family:** I would need to stay to help a family member, friend, or neighbor
**evac_reason_traffic:** I would be worried about traffic or road closures
**evac_reason_transport:** I don't have reliable transportation
**evac_reason_cost:** I'd be concerned about the cost of evacuation (e.g., gas, lodging, food)
**evac_reason_shelter:** I wouldn't know where to go
**evac_reason_trust:** I wouldn't trust the evacuation order
**evac_reason_other:** Other (please specify)
**evac_reason_dk:** I'm not sure

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[it **fire_scen_evac:** >= 4]

It sounds like you are relatively confident that you would evacuate your home in the situation described on the previous page. Can you tell us what challenges you might worry about if you had to evacuate? Please select all that apply.
**evac_challenge_traffic:** Traffic or road closures
**evac_challenge_disabled:** Someone in my household has a disability or health condition that would make evacuation difficult
**evac_challenge_pets:** Evacuating with pets or livestock
**evac_challenge_family:** Helping a family member, friend, or neighbor
**evac_challenge_transport:** Not having reliable transportation
**evac_challenge_cost:** Costs related to evacuation (e.g., gas, lodging, food)
**evac_challenge_shelter:** Not knowing where I would go
**evac_challenge_trust:** Not fully trusting the evacuation order
**evac_challenge_property:** Leaving my home and property behind
**evac_challenge_other:** Other (please specify)
**evac_challenge_none:** I don't think I would face any major challenges

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**evac_to:** If you had to evacuate because of a fast-moving wildfire (moving from west to east toward your community), where would you most likely go? Please select the option that best describes your likely destination.
1 - A friend's or family member's home nearby (within the region)
2 - A friend's or family member's home outside the region
3 - A hotel or motel
4 - A public evacuation shelter
5 - I would stay in my car, RV, or another vehicle
6 - I would not leave / I would stay at home
7 - Other (please specify)
8 - I don't know where I would go

**evac_location:** What is the location of the place you would most likely go if you had to evacuate? (for example: Norman, OK)? [verbatim]

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**past_evac:** Have you ever had to evacuate your home due to an emergency—such as a wildfire, hurricane, flood, or other disaster—either in Oklahoma or elsewhere?
0 - No
1 - Yes

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[it **past_evac** = 1]
**past_evac_exp:** How would you describe your past evacuation experience overall?
1 - Very negative
2 - Somewhat negative
3 - Neutral
4 - Somewhat positive
5 - Very positive

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Now we have some more questions about *water resources* in Oklahoma.

Water is essential in Oklahoma—for drinking, farming, industry, and more. But it is also a limited resource, and at times, there is not enough to meet everyone's needs. That is why it is important to consider all potential sources of water in the state.

Several nontraditional water sources remain underutilized in Oklahoma. Exploring safe and sustainable ways to use these sources could help meet the state's growing water needs. Examples include **municipal wastewater**, **produced water**, and **stormwater**.

- **Municipal wastewater** is water that has been used in homes and businesses. It includes waste from sinks, showers, toilets, and washing machines.
- **Produced water** is water that comes up from underground during oil and gas production, either during drilling or as part of ongoing well operations. It often contains salt, oil, and other substances from deep underground.
- **Stormwater** is rain or snow that runs off streets, parking lots, rooftops, and other surfaces. As it flows, it can pick up dirt, oil, chemicals, and debris.

These three types of water can be collected and repurposed for various needs, but they must be treated before they are safe to use.

In the next section, the survey will ask for your feedback on different ways treated water from these nontraditional sources could be used.

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Assuming the water has been treated to meet standards approved by the Oklahoma Department of Environmental Quality (DEQ) for the protection of public health and the environment, how *comfortable* would you feel if your city or town used **treated municipal wastewater** for the following purposes: [randomize]

**mw_drnk:** As drinking water for people
1 - Very uncomfortable
2 - Uncomfortable
3 - Neutral
4 - Comfortable
5 - Very comfortable

**mw_irr_lnd:** To water landscaping like public parks, sports fields, medians, and golf courses
1 - Very uncomfortable
2 - Uncomfortable
3 - Neutral
4 - Comfortable
5 - Very comfortable

**mw_irr_edib:** To irrigate crops that people eat, such as wheat or corn
1 - Very uncomfortable
2 - Uncomfortable
3 - Neutral
4 - Comfortable
5 - Very comfortable

**mw_irr_feed:** To irrigate crops that animals eat but people don't, such as alfalfa or sorghum
1 - Very uncomfortable
2 - Uncomfortable
3 - Neutral
4 - Comfortable
5 - Very comfortable

**mw_irr_inedib:** To irrigate crops that are not used for food, such as cotton (for clothing) or switchgrass (for biofuel)
1 - Very uncomfortable
2 - Uncomfortable
3 - Neutral
4 - Comfortable
5 - Very comfortable

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Assuming the water has been treated to meet standards approved by the Oklahoma Department of Environmental Quality (DEQ) for the protection of public health and the environment, how *comfortable* would you feel if your city or town used **treated produced water** for the following purposes: [randomize]

**tw_drnk:** As drinking water for people
1 - Very uncomfortable
2 - Uncomfortable
3 - Neutral
4 - Comfortable

5 - Very comfortable

**tw_irr_lnd:** To water landscaping like public parks, sports fields, medians, and golf courses
1 - Very uncomfortable
2 - Uncomfortable
3 - Neutral
4 - Comfortable
5 - Very comfortable

**tw_irr_edib:** To irrigate crops that people eat, such as wheat or corn
1 - Very uncomfortable
2 - Uncomfortable
3 - Neutral
4 - Comfortable
5 - Very comfortable

**tw_irr_feed:** To irrigate crops that animals eat but people don't, such as alfalfa or sorghum
1 - Very uncomfortable
2 - Uncomfortable
3 - Neutral
4 - Comfortable
5 - Very comfortable

**tw_irr_inedib:** To irrigate crops that are not used for food, such as cotton (for clothing) or switchgrass (for biofuel)
1 - Very uncomfortable
2 - Uncomfortable
3 - Neutral
4 - Comfortable
5 - Very comfortable

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Assuming the water has been treated to meet standards approved by the Oklahoma Department of Environmental Quality (DEQ) for the protection of public health and the environment, how *comfortable* would you feel if your city or town used **treated stormwater** for the following purposes: [randomize]

**sw_drnk:** As drinking water for people
1 - Very uncomfortable
2 - Uncomfortable
3 - Neutral
4 - Comfortable
5 - Very comfortable

**sw_irr_lnd:** To water landscaping like public parks, sports fields, medians, and golf courses
1 - Very uncomfortable
2 - Uncomfortable
3 - Neutral
4 - Comfortable
5 - Very comfortable

**sw_irr_edib:** To irrigate crops that people eat, such as wheat or corn
1 - Very uncomfortable
2 - Uncomfortable
3 - Neutral
4 - Comfortable
5 - Very comfortable

**sw_irr_feed:** To irrigate crops that animals eat but people don't, such as alfalfa or sorghum
1 - Very uncomfortable
2 - Uncomfortable
3 - Neutral
4 - Comfortable
5 - Very comfortable

**sw_irr_inedib:** To irrigate crops that are not used for food, such as cotton (for clothing) or switchgrass (for biofuel)
1 - Very uncomfortable
2 - Uncomfortable
3 - Neutral
4 - Comfortable
5 - Very comfortable

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Many cities and towns in Oklahoma are facing chronic water shortages.

Imagine you live in one of these communities, and local leaders are seeking your input on the best ways to reduce water use and manage water supplies more sustainably.

Please rank the following options from most to least preferred, with the top being the option you favor the most and the bottom being the one you favor the least. [randomize]
**rnk_wtr_rate_com:** Raise water rates for *commercial* and *industrial* users to encourage conservation.
**rnk_wtr_rate_res:** Raise water rates for *residential* users to encourage conservation.
**rnk_wtr_rate_lim:** Place mandatory limits on certain types of outdoor water use, such as lawn watering.
**rnk_wtr_rate_inc:** Provide conservation incentives, such as a residential lawn replacement program.
**rnk_wtr_rate_pot:** Reuse water from nontraditional sources (treated municipal wastewater, treated produced water, or treated stormwater) for *potable* purposes (e.g., drinking water).
**rnk_wtr_rate_non_pot:** Reuse water from nontraditional sources (treated municipal wastewater, treated produced water, or treated stormwater) for *non-potable* purposes (e.g., irrigation for landscaping, non-edible crops).
**rnk_wtr_rate_pur:** Purchase water from a nearby city or water supplier to supplement local supplies.

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Now we have some more specific questions about **municipal wastewater**, which, as a reminder, is water that has already been used in homes and businesses—for example, water from sinks, showers, toilets, and washing machines.

Many cities and towns in Oklahoma have centralized wastewater treatment plants (sometimes called water reclamation facilities) that clean municipal wastewater before releasing it into nearby rivers or streams. Most of these plants use **active treatment** systems that rely on physical, biological, and chemical processes—like filters, microbes, and disinfectants—to remove harmful substances from the water and make it safe to release into the environment. Active systems are highly effective in meeting target water quality goals and are widely used, but they can be expensive to upgrade and operate, and they often require large amounts of energy.

To supplement these systems to meet new regulations and further clean the water, some cities are exploring **passive treatment** approaches that work alongside active infrastructure. Passive systems use natural processes—like plants, sunlight, and soil—to help further clean the water. For example, a city might build a constructed wetland where partially treated water flows through plants and soil, allowing natural microbes to remove remaining pollutants. These systems can help reduce operational and energy costs, while also offering environmental and recreational benefits—such as scenic walking trails or areas for bird watching.

While passive systems offer some advantages as a complement to traditional active systems, they are still relatively new in Oklahoma. They may also be less consistent in meeting target water quality goals, which can make

regulatory approval and permitting more complex. They also require significantly more space, which can be a challenge in some communities.

**trt_sys_sense:** Does this short explanation give you a basic understanding of the difference between **active** and **passive** treatment systems for municipal wastewater?
0 - No
1 - Yes
2 - Not sure

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Imagine that your city or town is planning to upgrade its municipal wastewater treatment plant. Local leaders are considering two different options, each with its own benefits, costs, and tradeoffs.

- **Option 1: Upgrade the existing active treatment system**. This option would improve the current system by installing newer equipment—such as energy-efficient pumps, filters, and chemical treatment units—to clean the water before it is released. It would be reliable, require relatively little space, and use familiar technologies that system operators already know. However, it could lead to higher long-term energy and maintenance costs and would offer fewer environmental or recreational benefits.

- **Option 2: Add a passive treatment system downstream of the existing active system.** This option would build a man-made wetland where water from the existing system flows through plants and soil, allowing natural processes to remove additional pollutants before the water is released or reused. It may reduce long-term energy and maintenance costs and provide environmental and recreational benefits—scenic walking trails or areas for bird watching. However, it may be less reliable, would require more land, and could take longer to complete due to a more complex permitting process.

**trt_sys_opt:** Based on what you've read, which option would you prefer your city or town choose?
1 - Option 1: Upgrade the existing active treatment system
2 - Option 2: Add a passive treatment system downstream of the existing active system
3 - Not sure

**trt_sys_exp:** Can you briefly explain why you chose this option? [verbatim]

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Earlier, we noted that passive treatment systems for municipal wastewater—such as constructed wetlands—can offer environmental and recreational benefits. These types of benefits may require additional investments or ongoing maintenance costs.

If your city or town were considering adding a passive treatment system alongside its existing active system, would any of the following potential benefits increase your support for the decision? Please select all that apply.

**pass_nat:** Native plants that support habitat for birds, pollinators, and other wildlife
**pass_wlk:** Walking trails around the wetland area
**pass_ons:** Platforms for observing birds and other wildlife
**pass_edu:** Educational signs or programming for schools and community members
**pass_grn:** Scenic green space or natural area for community use
**pass_none:** None of these would increase my support

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Now we have some more specific questions about **produced water**, which, as a reminder, is water that comes up from underground during oil and gas production, either during drilling or as part of ongoing well operations. It often contains salt, oil, and other materials.

Currently, oil and gas companies in Oklahoma manage most of the produced water they extract by injecting it deep underground into disposal wells. This approach is widely used and effectively keeps produced water out of rivers, lakes, and other surface water sources. At the same time, there are a few challenges associated with this practice. For example, it means that large volumes of water are not available for use. Additionally, there are limits on how much produced water can be injected in certain areas due to concerns about potential links to induced seismicity (earthquakes).

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In some cases—and typically on a limited scale—companies reuse produced water for hydraulic fracturing (fracking), which can help reduce the need for fresh water in oil and gas operations.

Recent research suggests there may be additional ways to reuse produced water beyond traditional oil and gas operations. One promising approach involves recovering valuable materials—such as lithium, bromine, and other rare earth elements—that are sometimes found in small amounts in produced water. These materials have important industrial and technological uses, including in batteries and electronics. Researchers are developing technologies to detect and extract these elements, but significant work remains to determine whether they can be implemented cost-effectively at full scale to generate economic value.

There are also new water treatment systems that could clean produced water to a level that makes it safe for reuse in multiple applications, such as irrigation, industrial use, or even aquifer recharge (injecting or allowing treated water to infiltrate the ground to replenish groundwater supplies, especially in areas with declining water tables).

While promising, these new approaches are still in early stages of research and development. Until they can be scaled up and proven safe, reliable, and cost-effective, produced water will continue to be managed primarily through deep well injection.

**pwr_sense:** Does this short explanation give you a basic understanding of what **produced water** is and how it might be reused beyond oil and gas production?
0 - No
1 - Yes
2 - Not sure

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Imagine that state officials in Oklahoma are considering a program that would provide financial assistance—such as infrastructure grants and low-interest loans—to oil and gas companies that invest in new ways to reuse produced water outside of oil and gas operations.

The program would be expensive, but supporters say it could increase water availability across the state, provide a source of rare earth minerals, and reduce the volume of produced water that oil and gas companies re-inject into the ground.

**pwr_vote:** Imagine that government officials were asking you to vote on this program. If it would not cost you anything directly (for example, if the funding came from existing state resources rather than new taxes) would you vote for a program that provides financial assistance to oil and gas companies that invest in new ways to reuse produced water outside of oil and gas operations?
1 - Definitely vote against the program
2 - Probably vote against the program
3 - Not sure
4 - Probably vote for the program
5 - Definitely vote for the program

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[ask if **pwr_vote** = 4 or 5]

**pwr_wtp**: Would you vote *for* the produced water reuse program if you had to pay a one-time fee of [**pwr_wtr_bid**: $1:500] to support water management in Oklahoma?
0 - No (vote *against* the program)
1 - Yes (vote *for* the program)
2 - Not sure

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[ask if **pwr_wtp** = 1]

**pwr_wtp_con_yes:** On a scale from zero to ten, where zero means not at all certain and ten means completely certain, how certain are you that you would vote *for* the program if you had to pay a one-time fee of [$**pwr_wtr_bid**]?
0 - Not at all certain
1
2
3
4
5
6
7
8
9
10 - Completely certain

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[ask if **pwr_wtp** = 0]

**pwr_wtp_con_no:** On a scale from zero to ten, where zero means not at all certain and ten means completely certain, how certain are you that you would vote *against* the program if you had to pay a one-time fee of [$**pwr_wtr_bid**]?
0 - Not at all certain
1
2
3
4
5
6
7
8
9
10 - Completely certain

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[ask if **pwr_wtp** = 1]

**pwr_comm_for:** Can you briefly explain why you would vote *for* the program? [verbatim]

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[ask if **pwr_vote** = 1 or 2 or **pwr_wtp** = 0]

**pwr_comm_agnst:** Can you briefly explain why you would vote *against* the program? [verbatim]

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[ask if **pwr_vote** = 3 or **pwr_wtp** = 2]

**pwr_comm_unsur:** Can you explain why you are *not sure* if you would vote for the program? [verbatim]

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As you may know, the U.S. Environmental Protection Agency (EPA) and the Oklahoma Department of Environmental Quality (DEQ) set rules and regulations to limit contaminants so that water is safe to use for various purposes. They also set water-testing schedules and methods to ensure that water systems follow these rules. Establishing and enforcing these rules and regulations requires *scientific expertise*, *technology*, and *public management*.

We rely on *scientists* to know the contaminants (and amounts) that may cause health issues.

**wtr_trust_sci:** How much trust do you have in the *scientists* who study water systems?
1 - No trust
2 - Low trust
3 - Moderate trust
4 - High trust
5 - Complete trust

We rely on *technology* (e.g., monitors, filters) to identify, limit, and/or remove potentially dangerous contaminants.

**wtr_trust_tech:** How much trust do you have in the *technology* we use in water systems?
1 - No trust
2 - Low trust
3 - Moderate trust
4 - High trust
5 - Complete trust

Finally, we rely on *public officials/employees* to routinely test for potentially dangerous contaminants and address/report possible issues.

**wtr_trust_gov:** How much trust do you have in the *public officials/employees* who manage water systems?
1 - No trust
2 - Low trust
3 - Moderate trust
4 - High trust
5 - Complete trust

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Solving problems as a group or community can be contentious and technically complex, so getting information you can trust is important. How much do you trust information from the following groups and organizations? [table; randomize]

**trust_university:** University scientists
1 - No trust
2 - Low trust
3 - Moderate trust
4 - High trust
5 - Complete trust

**trust_nonprofit:** Nonprofit research organizations
1 - No trust
2 - Low trust
3 - Moderate trust
4 - High trust
5 - Complete trust

**trust_policy:** State and local policymakers and elected officials
1 - No trust
2 - Low trust
3 - Moderate trust
4 - High trust
5 - Complete trust

**trust_agencies:** State and local agencies that regulate water, land, and infrastructure resources
1 - No trust
2 - Low trust
3 - Moderate trust
4 - High trust
5 - Complete trust

**trust_private:** Private companies whose operations use water, land, and infrastructure resources
1 - No trust
2 - Low trust
3 - Moderate trust
4 - High trust
5 - Complete trust

**trust_tribe:** Tribal leaders and governing bodies
1 - No trust
2 - Low trust
3 - Moderate trust
4 - High trust
5 - Complete trust

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As you may know, the issue of global climate change has been the subject of public discussion over the last few years.

**glbcc**: In your view, are greenhouse gases, such as those resulting from the combustion of coal, oil, natural gas, and other materials, causing average global temperatures to rise?
0 - No
1 - Yes

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**glbcc_cert:** On a scale from zero to ten, where zero means *not at all certain* and ten means *completely certain*, how certain are you that greenhouse gases are/are not [“are” if **glbcc** = 1; “are not” if **glbcc** = 0] causing average global temperatures to rise?
0 - Not at all certain
1
2
3
4

5
6
7
8
9
10 - Completely certain

**glbcc_risk:** On a scale from zero to ten, where zero means *no risk* and ten means *extreme risk*, how much risk do you think global warming poses for people and the environment?
0 - No risk
1
2
3
4
5
6
7
8
9
10 - Extreme risk

**glbwrm_ok:** In your view, is global warming causing the weather patterns in Oklahoma to change?
0 - No
1 - Yes
2 - Don't know

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**party:** Generally speaking, do you usually think of yourself as a Republican, a Democrat, an Independent, or what?
1 - Democratic party
2 - Republican party (or GOP)
3 - Independent
4 - Other party (Please specify)
**party_spec:** [verbatim]

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[If **party** = 1 or 2]

**iden:** Would you call yourself a strong [Democrat if **party** = 1; Republican if **party** = 2] or a not very strong [Democrat if **party** = 1; Republican if **party** = 2]?
2 - Strong
1 - Not very strong

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[If **party** = 3 or 4]

**lean:** Do you think of yourself as closer to the Republican or Democratic Party?
1 - Democratic Party
2 - Republican Party
3 - Neither

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**ideol:** On a scale of political ideology, individuals can be arranged from strongly liberal to strongly conservative. Which of the following categories best describes your views?
1 - Strongly liberal
2 - Liberal
3 - Slightly liberal
4 - Middle of the road
5 - Slightly conservative
6 - Conservative
7 - Strongly conservative

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**education:** What is the highest level of education you have COMPLETED?
1 - Less than High School
2 - High School / GED
3 - Vocational or Technical Training
4 - Some College — NO degree
5 - 2-year College / Associate's Degree
6 - Bachelor's Degree
7 - Master's degree
8 - PhD / JD (Law) / MD

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**inc**: Was the estimated annual income for your household in 2024:
1 - Less than $50,000 [skip to **inc50**]
2 - At least $50,000 but less than $100,000 [skip to **inc100**]
3 - At least $100,000 but less than $150,000 [skip to **inc150**]
4 - $150,000 or more [skip to **inc200**]

**income_people:** Including yourself, how many people contributed to the annual income for your household in 2024? [verbatim; require numeric > 0]

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**inc50**: Was the estimated annual income for your household in 2024:
1 - Less than $10,000
2 - $10,000 to less than $20,000
3 - $20,000 to less than $30,000
4 - $30,000 to less than $40,000
5 - $40,000 to less than $50,000

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**inc100**: Was the estimated annual income for your household in 2024:
6 - $50,000 to less than $60,000
7 - $60,000 to less than $70,000
8 - $70,000 to less than $80,000
9 - $80,000 to less than $90,000
10 - $90,000 to less than $100,000

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**inc150**: Was the estimated annual income for your household in 2024:
11 - $100,000 to less than $110,000
12 - $110,000 to less than $120,000

13 - $120,000 to less than $130,000
14 - $130,000 to less than $140,000
15 - $140,000 to less than $150,000

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**inc200**: Was the estimated annual income for your household in 2024:
16 - $150,000 to less than $160,000
17 - $160,000 to less than $170,000
18 - $170,000 to less than $180,000
19 - $180,000 to less than $190,000
20 - $190,000 to less than $200,000
21 - $200,000 or more

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Thank you very much for completing this survey. Your responses will help our team of scientists and policymakers identify and solve some of the biggest problems facing Oklahoma. As a token of our appreciation, you will be receiving a $20 gift card by mail or email in the next few weeks.

**giftcard_selection:** Please select the type of gift card you would most like to receive from the four options shown below. You will be able to change your selection each time you complete the survey. Please note, if you do not select from the choices below, we will select a $20 Walmart gift card for you.
1 - $20 Walmart gift card
4 - $20 Amazon **e-card (will be sent via email)**

Please verify that our records are correct: [verbatim; autofill with prior data if available; require response]
**confirm_fname**: First name: [verbatim]
**confirm_lname:** Last name: [verbatim]
**confirm_address:** Address: [verbatim]
**confirm_city:** City: [verbatim]
**state:** Oklahoma
**confirm_zip:** Zip: [verbatim; 5-digit numeric]
**confirm_county:** County: [drop down list of counties]
**confirm_phone:** Phone: [verbatim; numeric
**confirm_email:** Email: [verbatim]

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Thank you very much for your participation in the Oklahoma Weather, Society and Government Survey! We greatly appreciate your time and attention. As a token of our appreciation, you will be receiving a $20 gift card by mail or email within the next few weeks.