Public Attitudes and Perceptions about Water Issues in Texas

TEXAS A&M AGRILIFE EXTENSION

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Water Issues: *A Survey of Public Attitudes*

Research goals:

- Gauge the level of public knowledge and concerns about water issues

- Determine priorities for outreach/educational programs

- **Measure the impacts of outreach programs and changes in public attitudes at 5-year intervals**

Water Issues in Texas:

A Survey of Public Perceptions and Attitudes about Water

SOUTHERN

Regional Water Program

CSREES
USDA

A network that responds to water resource issues by advancing knowledge through research, education and extension projects.

The Land-Grant University System

Survey Design and Administration

- Instrument:
  - Based on the survey developed for US EPA Region 10 (2002)
  - 59 questions

- Distribution
  - Random sample of residential mailing addresses
  - August 2008 and April 2014
  - Four-stage mailing procedure following Dillman (2000)

Four-stage mailing procedure following Dillman (2000)

- Cover letter and survey with a self-addressed, stamped envelope mailed

- Reminder postcard mailed 20 days later to nonresponders

Dear Texas Water Survey Recipient,

This postcard is a friendly reminder to complete and return the *Water Issues in Texas* survey that you received 10 days ago. Your response is very important as you are one of 1,800 Texans representing our state of 26 million people.

Would you please return the questionnaire in its accompanying stamped business envelope supplied with the survey? The questionnaire will take only about 12 minutes to complete and your response will be completely confidential.

If you have any questions, we would be happy to answer them. Our email addresses are dboellstorff@tamu.edu and s-cummings@tamu.edu. Thank you very much for your assistance.

Diane Boellstorff and Scott Cummings, Texas A&M AgriLife Extension

- 20 days later, another cover letter, survey and business reply envelope mailed to nonresponders

- 20 days later, another reminder postcard was sent to nonresponders

Survey Instrument

- Importance of water resource issues

- Importance of management actions

- Drinking water issues

- Water quality and water availability

- Water resource information

- Demographics and residence

Survey Instrument

- Direct mail to 1,800 residents

- Removed:
  - Returned to Sender
  - Opting out
  - Deaths

- 1,655

- N = 475 responses

- Response rate of 29%

Research Focus Areas

Public Perceptions and Attitudes about Water Availability Following Exceptional Drought in Texas

Consumer Water Quality Evaluation of Private and Public Drinking Water Sources

Learning Preferences for Water Resource Information from Extension and Other Sources

Respondent Demographics: 2008 and 2014

	2008	2014
Response Rate	33% of 1275	29% of 1655
N	419	475
Average Age	57	59
Gender*	Male: 63% Female: 37%	Male: 49% Female: 51%
Years in Texas: All my life or more than 10 years	89%	92%

The difference in gender between survey years is statistically significant (Chi-squared test (p<.05))

Respondent Demographics Cont.

		2008	2014
Size of Residence Community	> 100,000	48%	54%
	25,000 – 100,000	21%	20%
	7,000 – 25,000	12%	11%
	3,500 – 7,000	9%	6%
	< 3,500	10%	10%
Residence Location	Inside City Limits	48%	54%
	Outside City Limits, not engaged in farming	21%	20%
	Outside City Limits, engaged in farming	12%	11%

Repeated Survey of Public Attitudes Following an Extended Period of Exceptional Drought
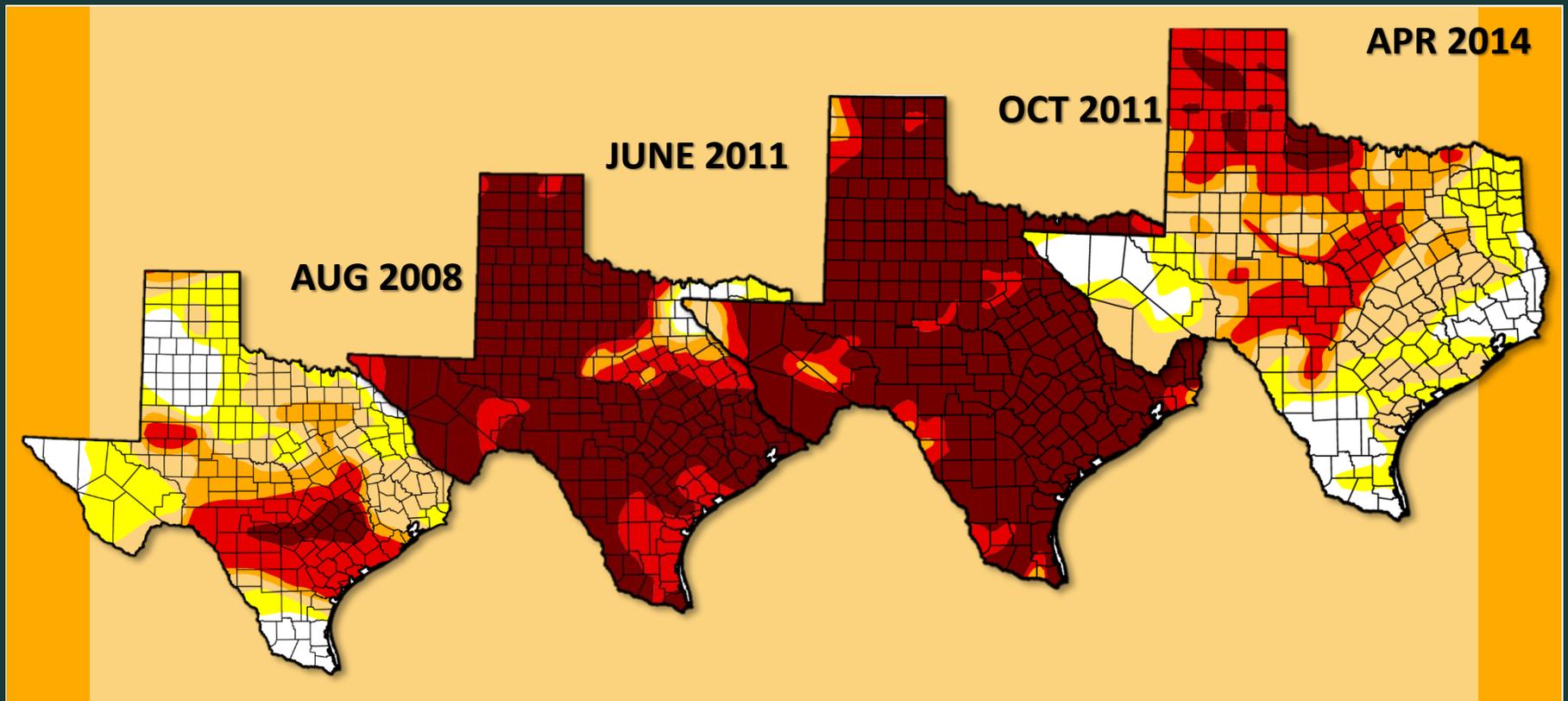
Is water quantity a problem in the area where you live?

Definitely	37.2 (dark red)	22.5 (blue)
Probably	24.4 (dark red)	25.4 (blue)
I don't know	10.3 (dark red)	7.9 (blue)
Probably not	21.4 (dark red)	29.1 (blue)
Definitely not	6.8 (dark red)	15.1 (blue)

0   10   20   30   40
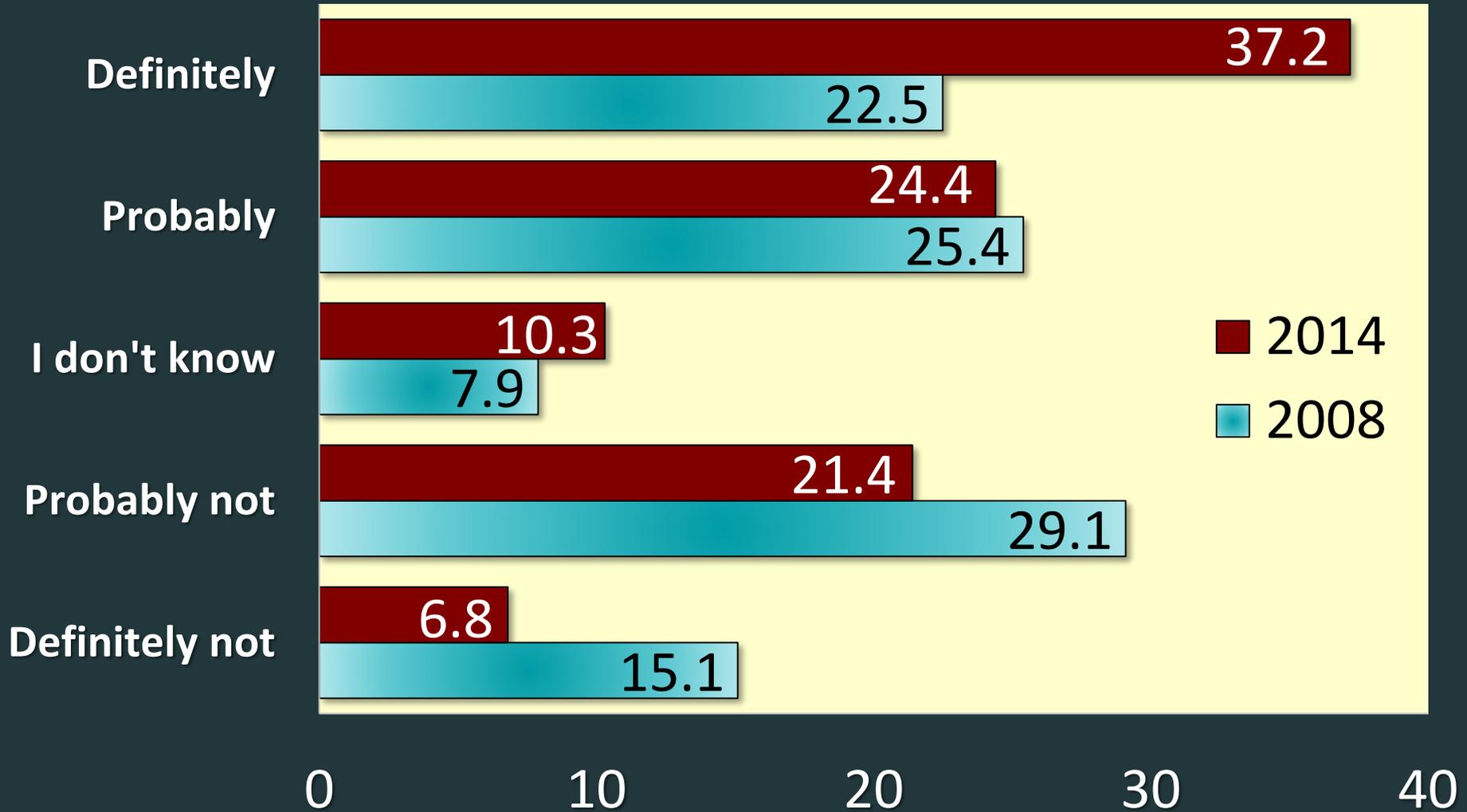
Water Quantity

- Chi-squared test: Significantly different (p<.00001) between years (2008 vs 2014)

- Multinomial logistic regression: No significance with socio-demographic variable (gender, community size, age, residence location, education)

The likelihood of your area suffering from a prolonged drought is:

Response	2008	2014	Change % Points
	% Respondents		
Increasing	51.6[a]	69.2[b]	17.6
Staying the same	37.9[a]	22.1[b]	-15.8
Decreasing	2.4[a]	2.1[a]	-0.3
No opinion	8.1[a]	6.6[a]	-1.5
Superscript indicates significance at the .05 level			

Likelihood of Prolonged Drought

- Chi-squared test: Significantly different (p<.00001) between years (2008 vs 2014)

- Multinomial logistic regression: No significance with socio-demographic variable (gender, community size, age, residence location, education)

The likelihood of your area having enough water resources to meet all of its needs 10 years from now is:
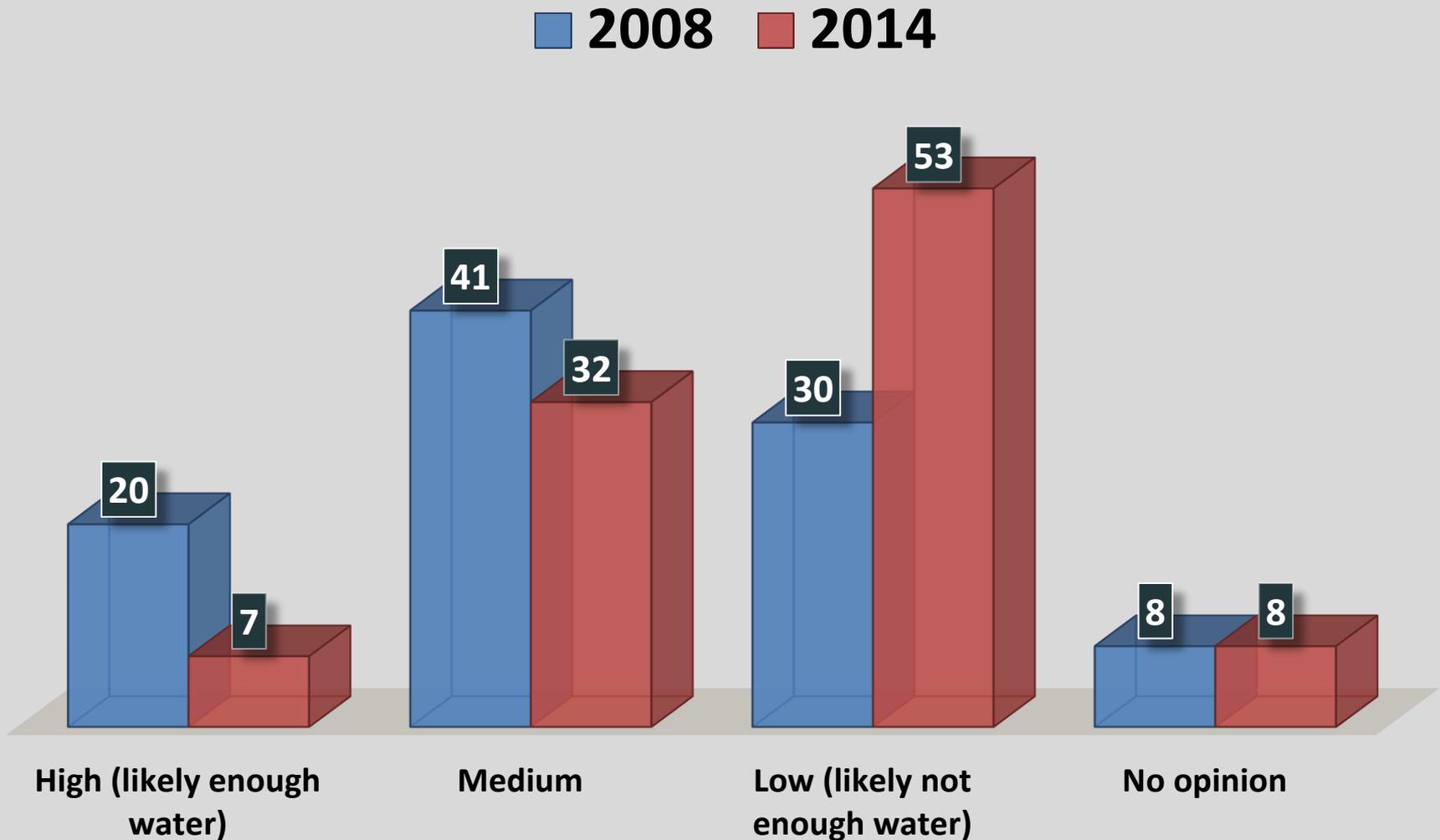

Legend: ■ 2008 ■ 2014

Category	2008	2014
High (likely enough water)	20	7
Medium	41	32
Low (likely not enough water)	30	53
No opinion	8	8

Enough Water in 10 Years
Multinomial Regression

- Education
  - (2014) Respondents with more education (p<.001) were more likely to believe there would not be enough water in 10 years
  - All other socio-demographic variables showed no differences

Rainfall Change as a Result of Global Warming

- Chi-squared test: Significantly different (p<.001) between years (2008 vs 2014)

- Multinomial logistic regression:
  - More education reduces the likelihood of responding that rainfall will increase (p<.001)

Have you or someone in your household done any of the following as part of an individual or community effort to conserve water or preserve water quality?

Changed the way your yard is landscaped: 2008 = 38.8[a], 2014 = 61.2[b]

Changed how often you watered your yard: 2008 = 46.0, 2014 = 54.2

Adopted new technologies: 2008 = 37.2[a], 2014 = 62.8[b]
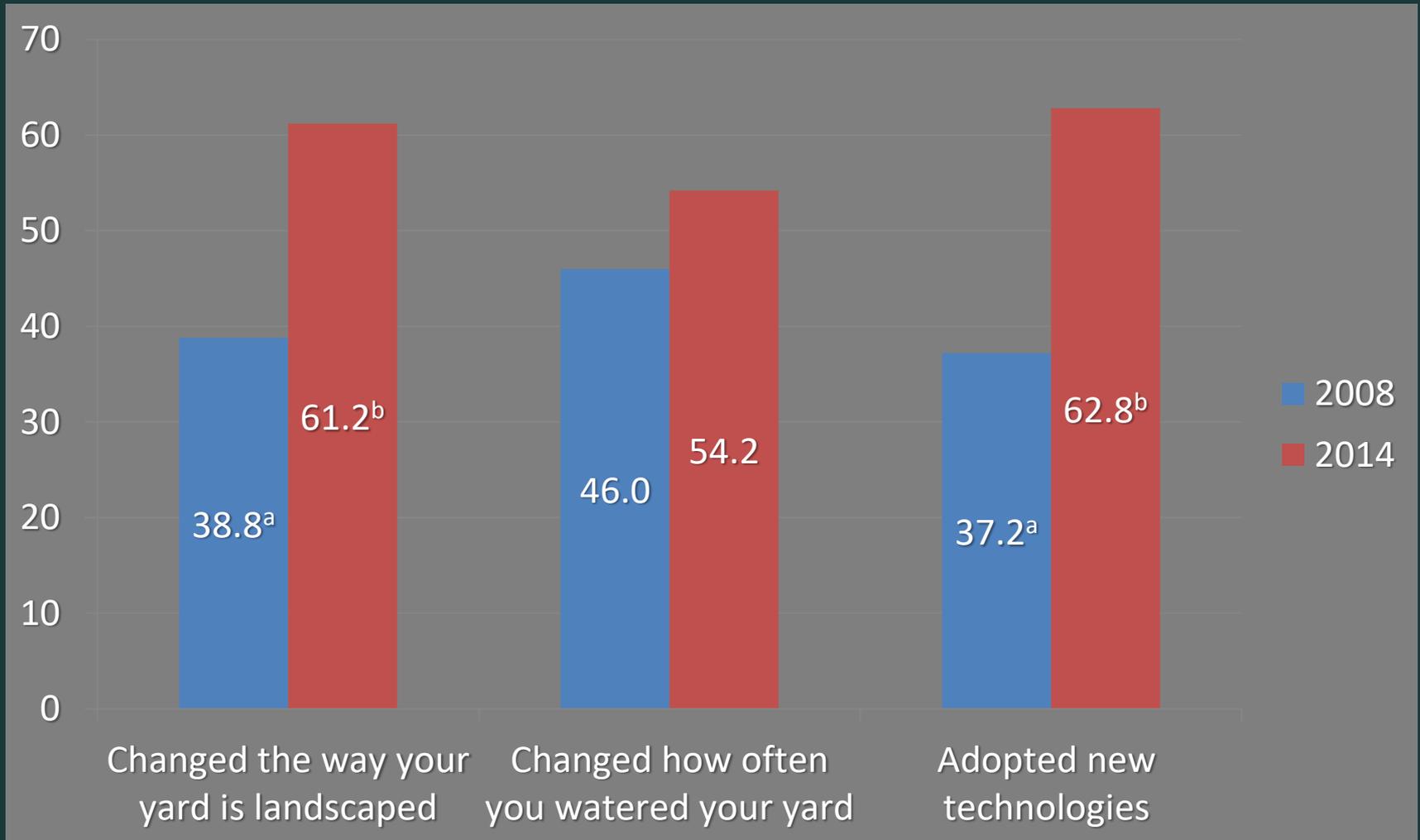
Superscript indicates statistically significant (Chi-squared test ($p<.05$))

Multinomial Regression

- Landscaping
  - Gender was a significant predictor (p<.05)
  - Females were more likely to change the way they landscaped
- Adopting New Technologies
  - Gender was a significant predictor (p=.006)

- Watering Yards
  - Gender (p<.05) and Years lived in Texas (p<.05) were significant predictors
  - The longer respondents lived in Texas and Females were more likely to have changed the way they watered their yard

Conclusions about Water Quantity

- From 2008 to 2014, the percentage of Texans replying that water quantity is an issue in their area increased from 47% to 61% ($p < 0.0001$).

- Texans believing that that their area will experience prolonged drought increased from 52% to 69% ($p < 0.0001$).

- Likelihood to not have enough water resources to meet needs 10 years from now increased from 30% to 53%.

- From 2008 to 2014, Texans have made changes to landscape and added new technology in efforts to conserve water.
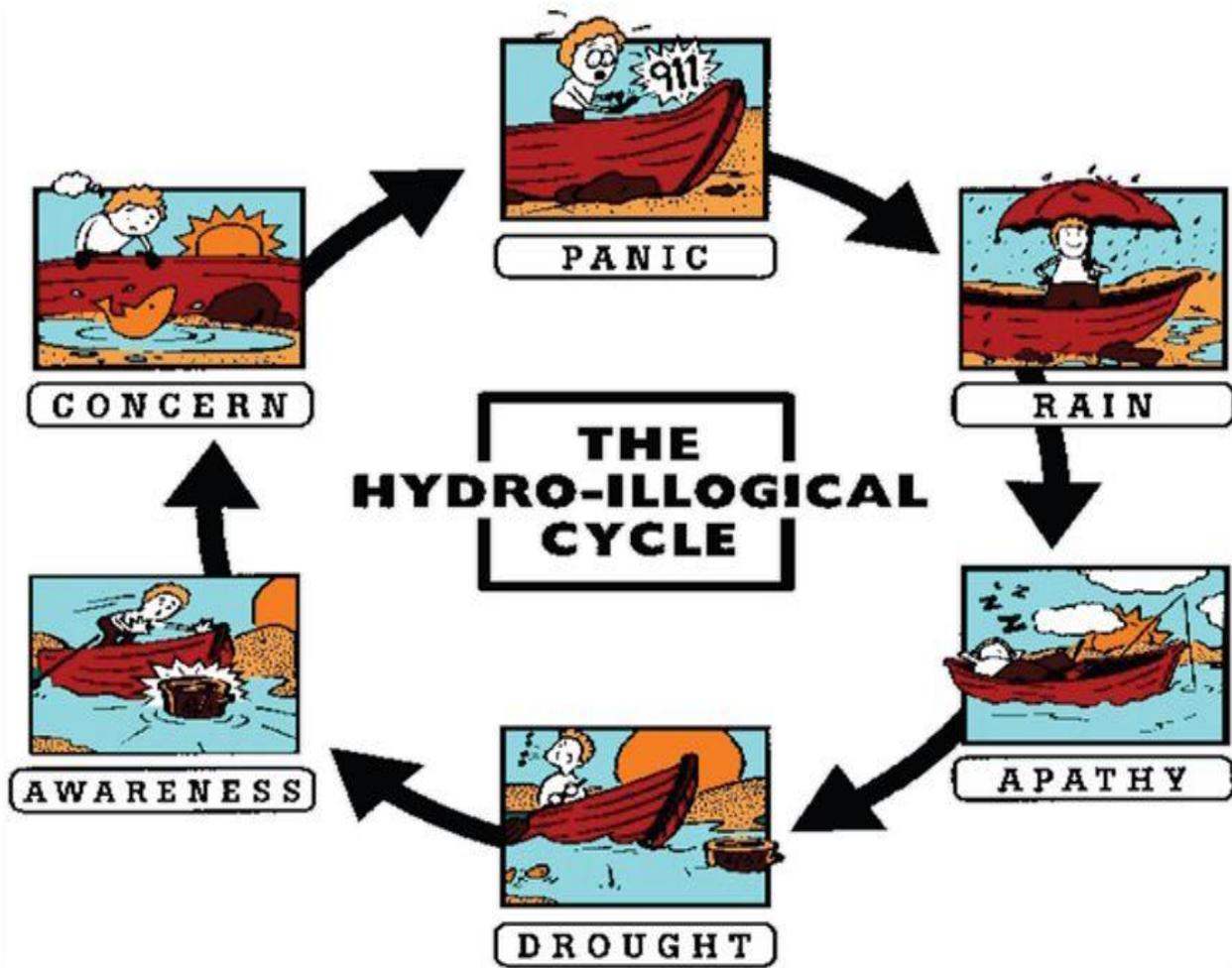
Learning Preferences for Water Resources Information

- How are you getting water resource information?

- What topics would you like to learn about?

- How would you like to receive water resource information?

Learning Preferences

Table 5. Water resource information sources and respondent residence location. †

Information sources	Overall % (n)	Inside city limits % (n)	Outside city limits, not engaged in farming % (n)	Outside city limits, currently engaged in farming % (n)
Extension	13.4 (52)	10.2 (29)	20.2 (17)	33.3 (6) ★
Television	56.9 (242)	61.1 (190) ★	46.8 (44)	40 (8)
Newspapers and magazines	63.9 (266)	65.6 (200)	58.7 (54)	63.2 (12)
City /Municipal water districts	68.2 (296)	73.9 (238) ★	57 (53)	26.3 (5)
Environmental groups	31.9 (126)	35.4 (103)	22.4 (19)	21.1 (4)
Environmental agencies	31.4 (126)	34 (100)	23.9 (21)	26.3 (5)
Universities	15.2 (60)	15.5 (45)	12.9 (11)	22.2 (4)

Would you like to learn more about any of the following water quality issue areas? (Mark all that interest you)

Issue Area	Percentage
Protecting public drinking water supplies	57.4
Water management in home and garden landscaping	55.8
Fish and wildlife water needs	32.1
Community actions concerning water issues	31.5
Restoring fish and aquatic habitat	28.6
Watershed management	27.2
Water policy and economics	25.6
Landscape buffers	25.6

Precentage
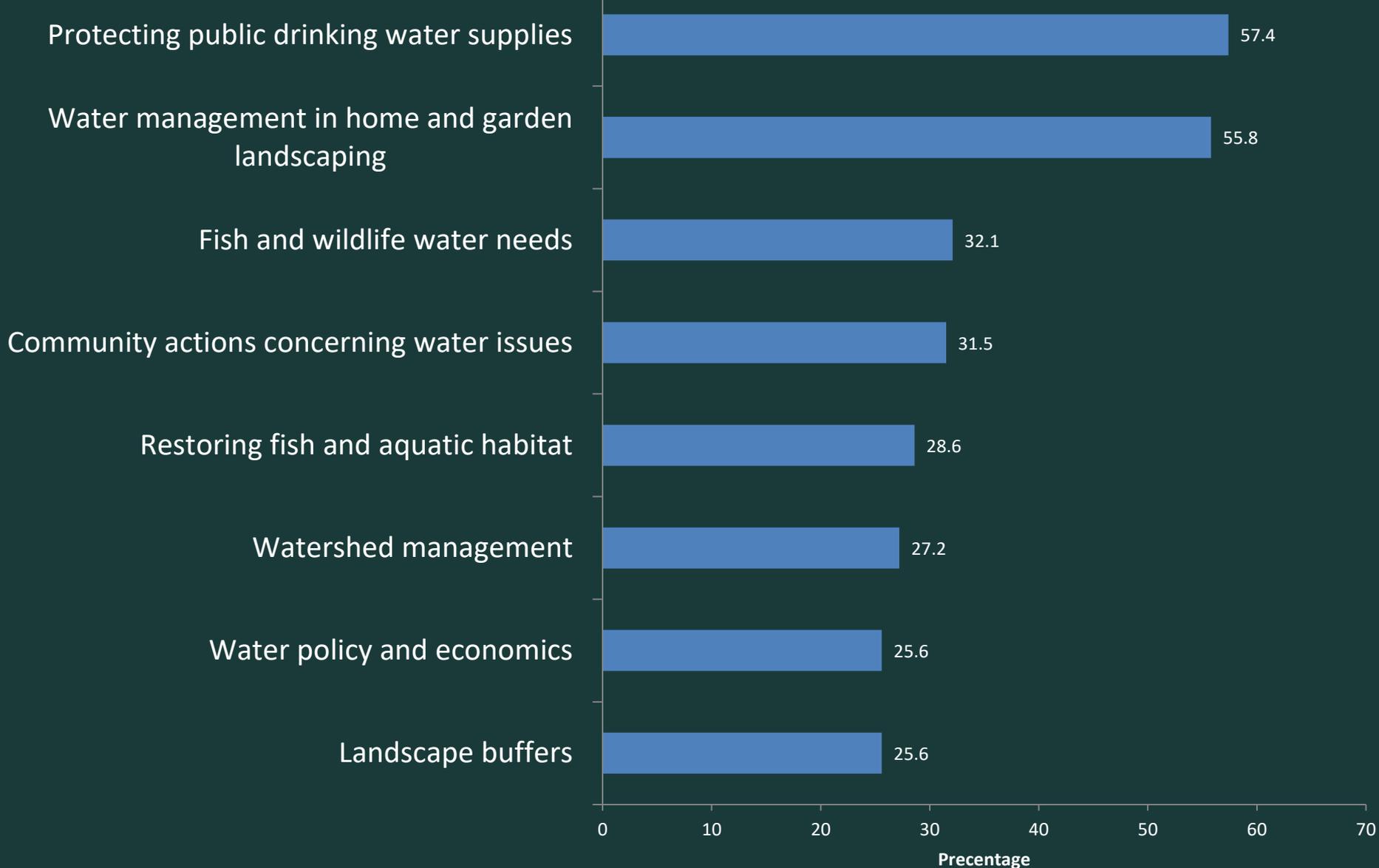
What Topics Would You Like to Learn About?
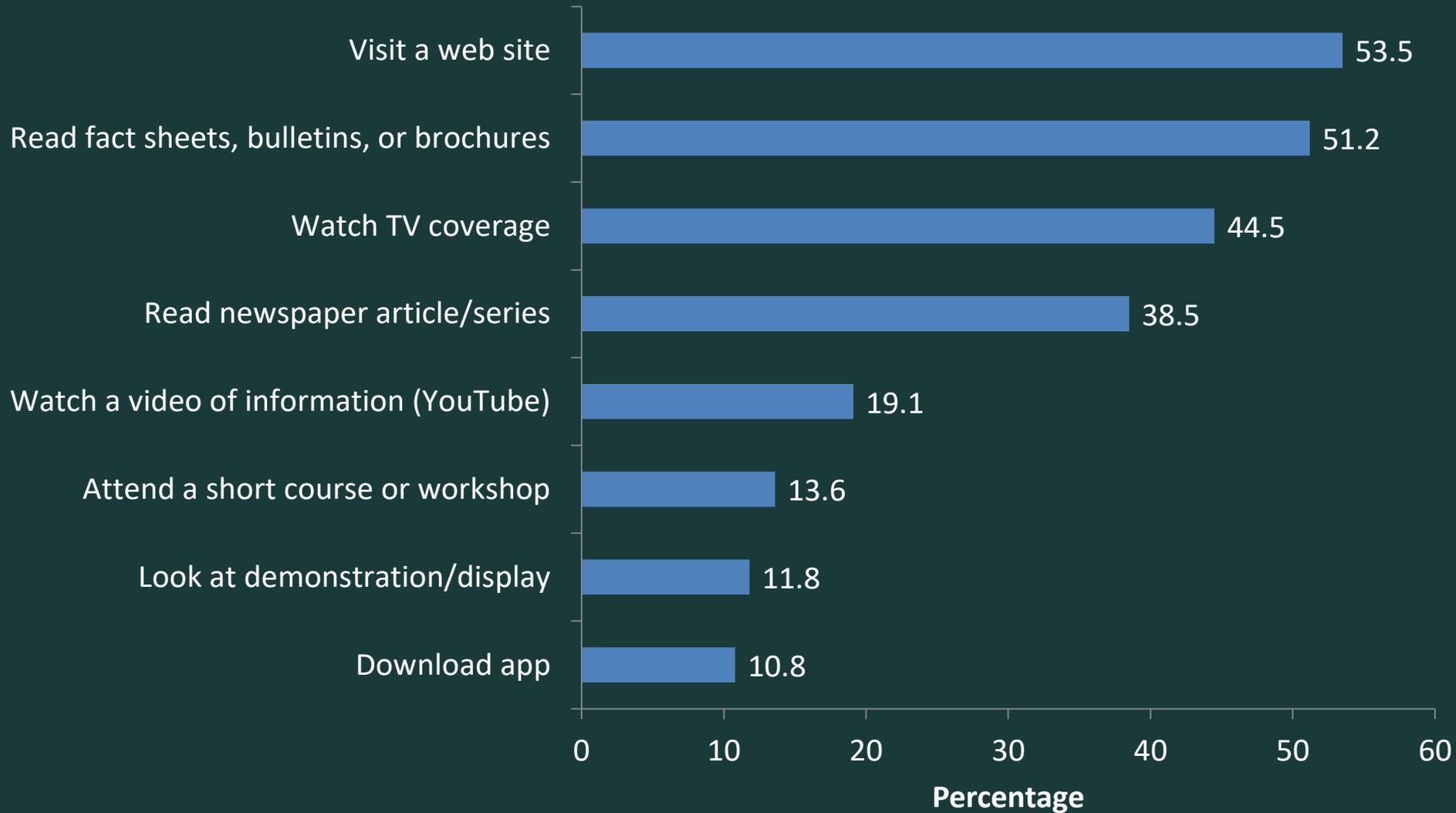
- 2008 vs. 2014 (Chi Square)
  - Increase in home and garden landscaping (34% to 56%; likelihood ratio p. <.003)
- Binary Logistic Regression
  - More likely to want to learn about home and garden landscaping
    - Females (p<.01)
    - Lived in Texas shorter amount of time (p<.012)
  - More likely to want to learn about protecting drinking water
    - Respondent in city limits (P<.005)

Water Resource Topic	Inside city limits	Outside city limits, not farming	Outside city limits, farming
	(n=266)	(n=79)	(n=18)
Protecting Public Drinking Water Supplies	63.2%	41.8%	
Septic System Management		39.2%	
Private Well Protection		35.4%	55.6%
Watershed Management			44.4%
Fish and Wildlife Water Needs			38.9%
Home and Garden Landscaping	59.4%	51.9%	
Watershed and Stream Restoration			44.4%

If you had the following kinds of opportunities to learn more about water issues which would you be most likely to take to take advantage of?

Opportunity	Percentage
Visit a web site	53.5
Read fact sheets, bulletins, or brochures	51.2
Watch TV coverage	44.5
Read newspaper article/series	38.5
Watch a video of information (YouTube)	19.1
Attend a short course or workshop	13.6
Look at demonstration/display	11.8
Download app	10.8

Opportunities by Age Group

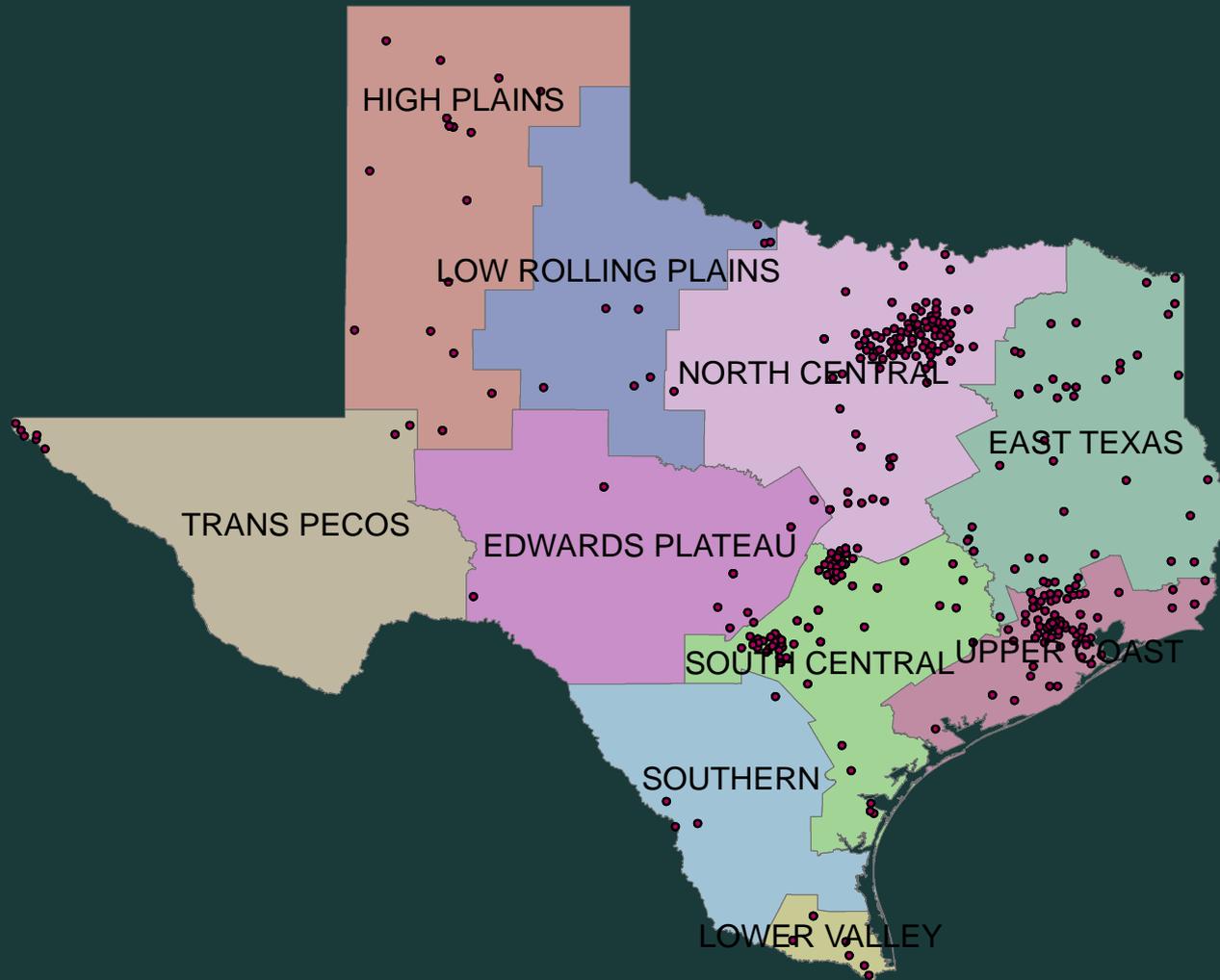| Table 7. Preferred learning opportunities and respondent age				
	Age Groups			
Learning Method	**18 - 34**	**35 - 49**	**50 - 64**	**65 and Older**
	(n=18)	**(n=72)**	**(n=155)**	**(n=135)**
Visit a website***	55.6%	56.9%	58.7%	36.3%
Read fact sheets, bulletins, or brochures*	33.3%	37.5%	45.2%	57.0%
Watch TV coverage	33.3%	30.6%	36.1%	48.1%
Read newspaper article/series*	27.8%	25.0%	32.9%	44.4%
Watch a video of information (YouTube)*	33.3%	19.4%	18.7%	10.4%

* Probability level of 0.05.

*** Probability level of 0.001.

Conclusions

- The most frequently identified source of information was city and municipal water districts for

  - 68.2% of all respondents, and

  - 73.9% of those living within city limits

- From 2008 to 2014, visiting a website went from fourth to the most popular learning method.

- Younger respondents were more likely to visit a website or watch a short video, while those older were more likely to prefer printed material.

Thank You

Locations of 2014 Respondents