

Attitudes toward water in the High Plains-Ogallala Region

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United States
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National Institute
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OgallalaWater.org

OPTIMIZING WATER USE TO SUSTAIN FOOD SYSTEMS

Overview

- Motivation
- Some key findings
- Descriptive
 - Overall response patterns
 - By state where meaningful
- **View as group**
 - Do not breakdown by type of operation (i.e., irrigated/irrigator vs...)
- Lots of charts: a story
 - self and community
 - present and future





An alternative title and a takeaway point...

“A case for talking about ***what*** we value and ***why***”

“Why we need to have ***conversations*** about ***conservation***...

...and why the conversations should focus on

what we are conserving
and not just how to conserve
[although that is important]”

An idea worth pursuing?

From technical infrastructure to ***social infrastructure***:

Networks, cultures, capacities for conservation

Motivation?



- Time is running out for the HPA
 - and it's been a long time...
- Need to know more about
 - how people view water
 - how/why they value it (or not)
- Where are shared values? tensions?
- Then, build capacity... *if* a goal...

Motivation #1?



- *Is* there a problem?
- Whether people subject to this 'problem' ***actually believe there is a problem***
- Conservation efforts lack legitimacy
- ...if people that must face consequences of depletion do not believe there is a problem

Motivation #2?



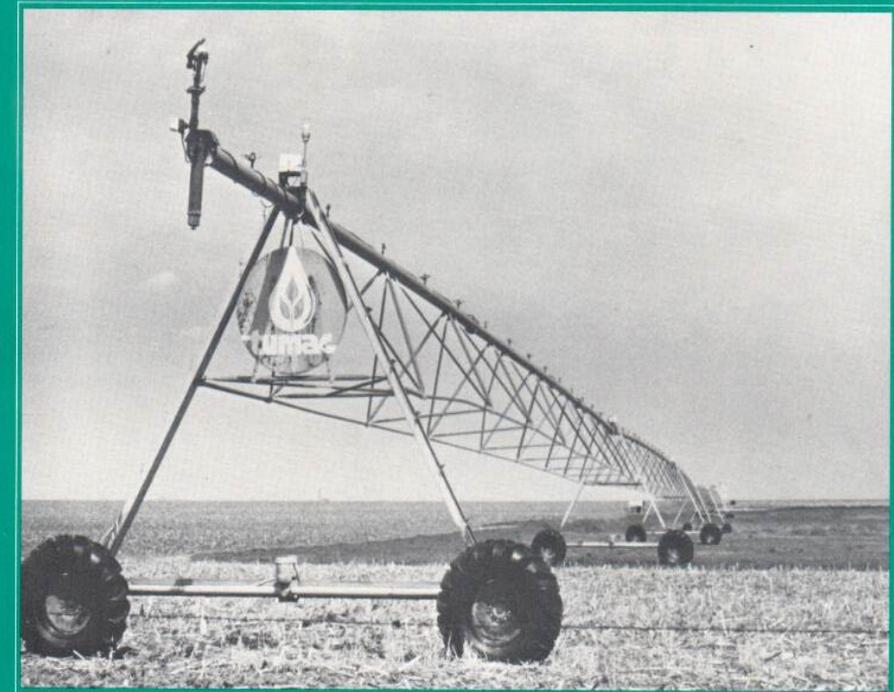
- We know ***very little*** about attitudes, perceptions in this region
 - Limited questions about technology adoption, preferences, etc.
 - Limited scale/scope
- Help ‘see’ context
 - Overcome individualized/isolated
- The last such study...

The last/only regional survey

- David E. Kromm and Stephen E. White @ KSU
- January – July 1984
- Farmers and Public Residents
- 405 farmers-useable responses (551 public)
- *Because owners/operators/producers shape water use directly through decision-making, we asked...*
- **Broader** set of questions/issues among a...
- **A narrower** constituency
[producers/operators/owners]

Conserving the Ogallala: What Next?

by David E. Kromm and Stephen E. White



Data

- Defined region according to hydrological boundaries
 - 227 counties in 6 states
- Eligible with any planted acres and/or livestock
- Mail survey:
 - Owner, operator, owner-operator, irrigation practices, attitudes in water conservation groups, beliefs, attitudes about groundwater use and conservation, participation, norms, basic demographics
- January – July, 2018
- 1,226 responses = 18.9% response rate
 - Met target
 - Close to K&W
 - Sufficient n for analysis
- Proportional sample
- Oklahoma counties, n=51: Cimarron, Texas, Beaver, Harper, Ellis



Profile

- Generally represents target population [USDA Ag Census, 2017]
- Good variation
- Age: Mean/Median = 64; Range = 26 – 96 years
- Male: 88%
- Education: H.S. diploma (30%), Associate (23%), Bachelor (24%)

52% irrigate [n = 637]

- **“Total irrigated acres in 2017?”**
- Median = 0 acres
- Mean = 296 acres
- Range = 0 - 7,500 acres

48% did not irrigate [n = 589]

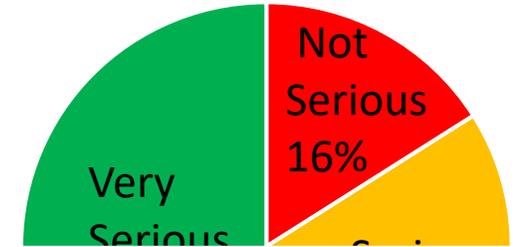
- **“Total dryland acres in 2017?”**
- Median = 240 acres
- Mean = 722 acres
- Range = 0 - 43,264 acres



Have views changed over 34+ years?

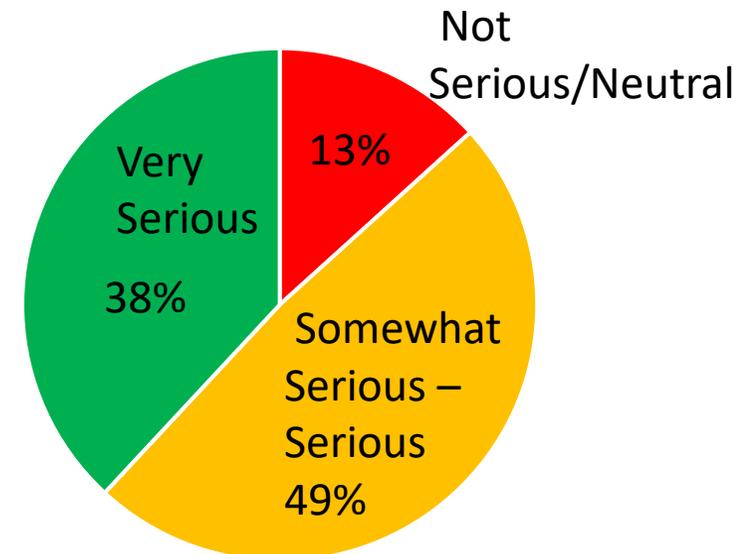
How serious is the problem?

- Kromm and White: “How serious of a problem is groundwater depletion in your area?”
- 5 point scale with 3 measures:

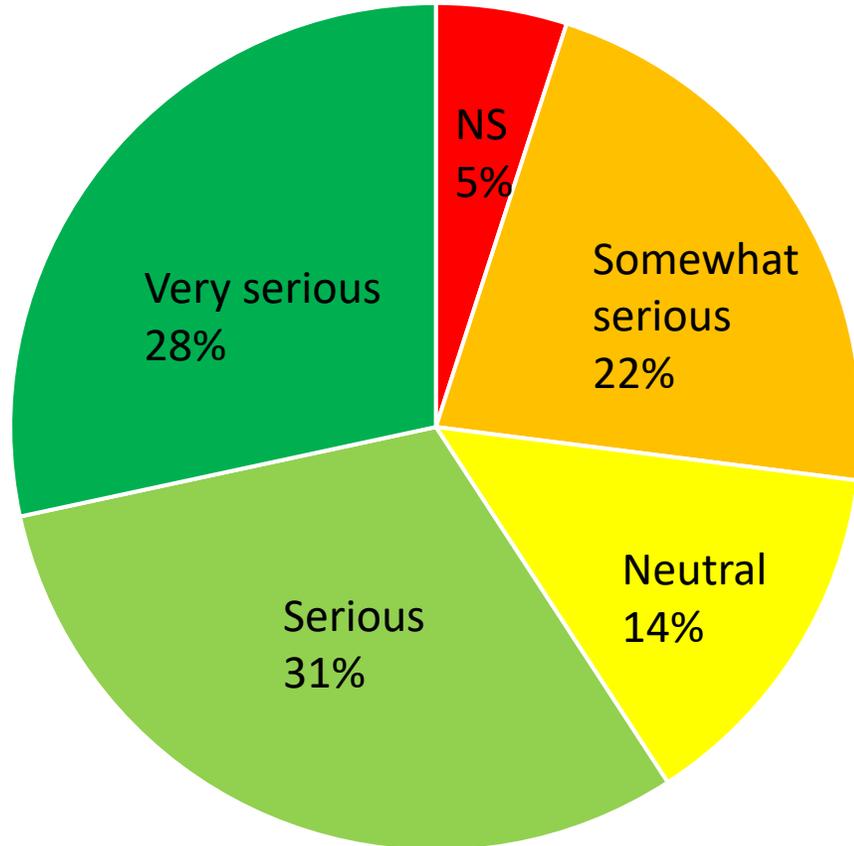


We can go further...

- **84%: Serious problem**
- Our study: Same question
- Percentage viewing as at least a serious problem unchanged: **87%**



A broader look



- More inclusive of all counties
- Focus: producers only
- More categories to see full spectrum of responses

- ***Like 34 years ago, majority see a problem...***

- Overall Mean = **3.56** [n=1,166]: **Serious**

- **81%: at least somewhat serious**

- **~60%: serious or very serious**

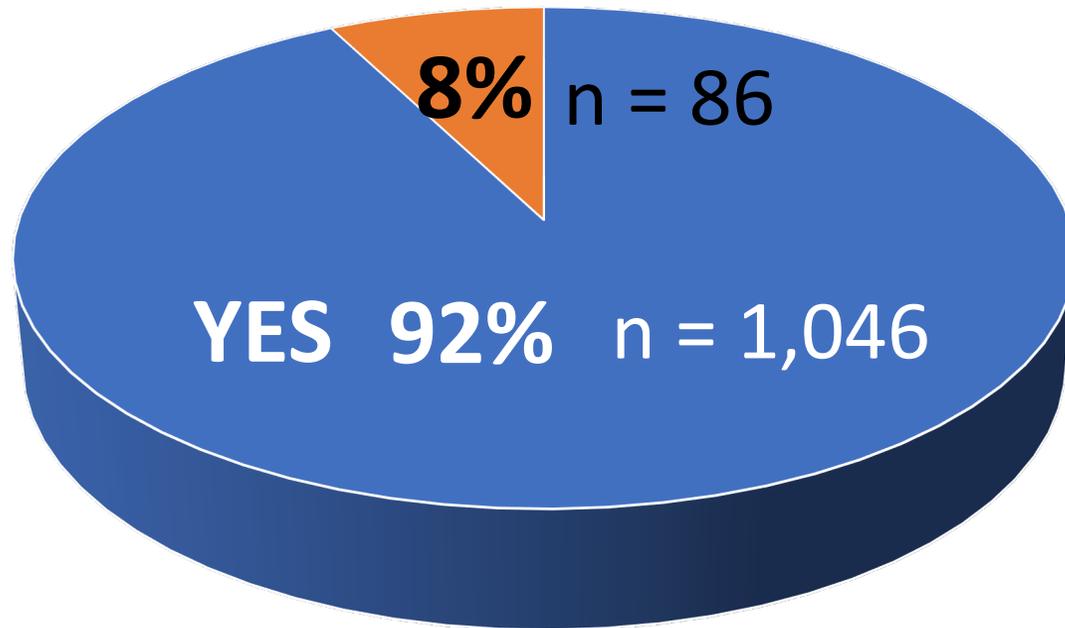
How does perception of problem vary across region?...

Does view of problem severity vary by state?

- **Clear difference between Nebraska and all other states [North to South]**
- Nebraska = 42% [27% Serious + 15% Very Serious]
 - In 5/6 states: ***“super-majority” (2/3) “serious or very serious”***
 - In TX and NM: ***nearly ½ “very serious”***
 - Colorado = 67% [27% Serious + 40% Very Serious]
 - Kansas = 74% [37% Serious + 37% Very Serious]
 - **Oklahoma = 80% [45% Serious + 35% Very Serious]**
 - Texas = 83% [33% Serious + 50% Very Serious]
 - New Mexico = 85% [38% Serious + 47% Very Serious]

Let's back up; limit bias from framing as “problem”...

Should groundwater be saved or conserved?



- Yes or No
 - 94 no-response [7.7%]
- **Overall ~ 9/10 say “yes”**
 - 85% with non-responses
- By state, no fewer than 8/10 say “yes” [with non-responses]
- CO = 81%
- NE = 83%
- TX = 84%
- KS = 90%
- **OK = 92%**
- NM = 94%
- As a robustness check...

“Groundwater should be used.
Groundwater does no good in the ground.”

- “Use ethic/value”

- 1 = strongly disagree; 5 = strongly agree

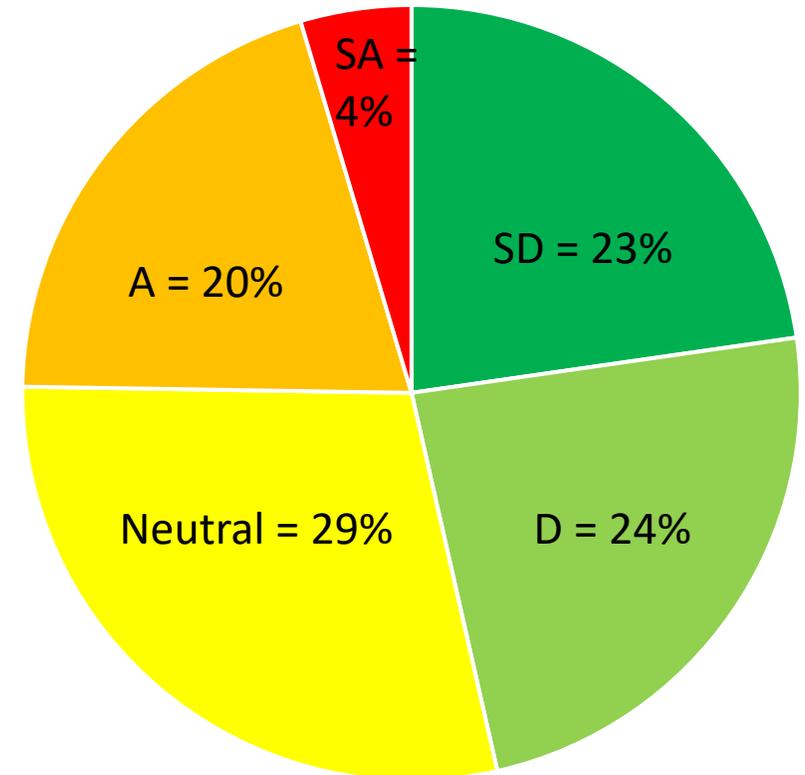
- Only ~1/4 **agree** to some extent (24%)

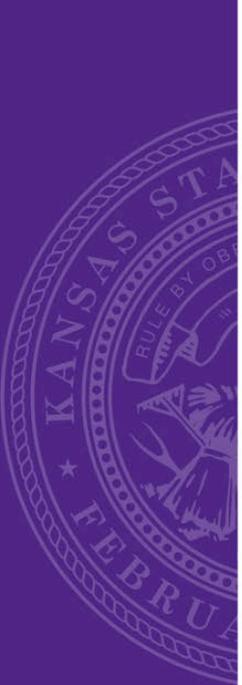
- Of note:

- ~ 1/3 are neutral [29%]

- ~ 1/2 disagree to some extent [47%]

- Some difference across states...





“Groundwater should be used.
Groundwater does no good in the ground.”

- **Overall, 24% agree**
- By state, no more than 1/3 agree or strongly agree:
 - CO = 33%
 - TX = 29%
 - NE = 27%
 - NM = 24%
 - **OK = 19%**
 - KS = 14%



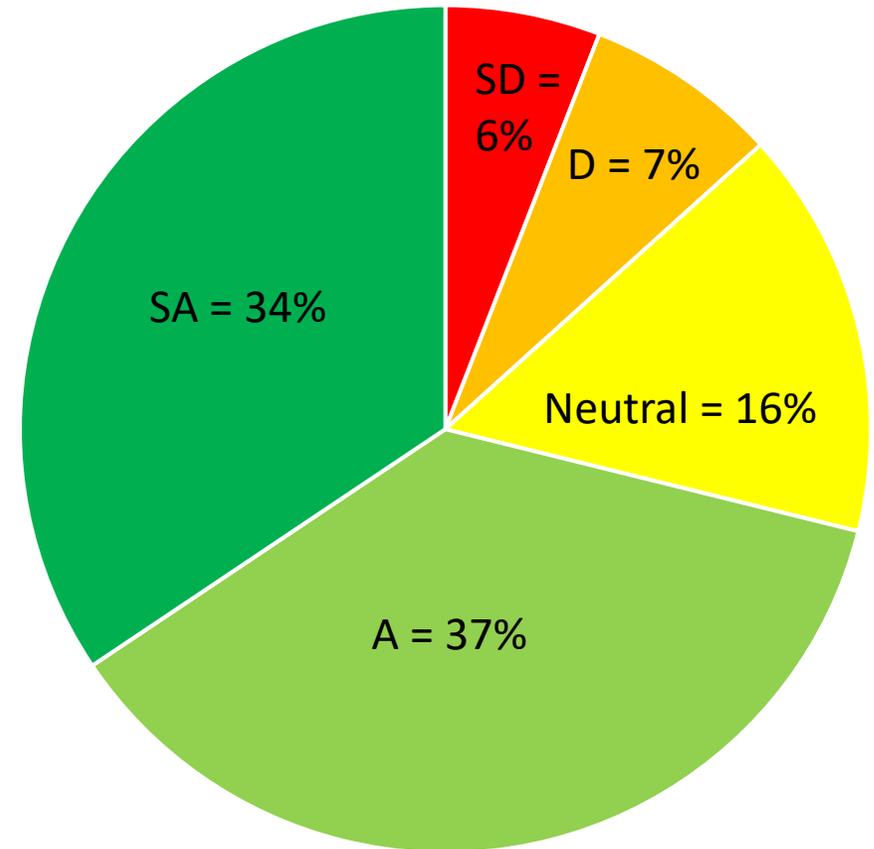
Summary thus far...

- Yes, GW depletion is a legitimate problem
- Yes, GW should be conserved/saved, and...
- Serious or very serious problem among clear majority in every state except NE
- Some division in 'use ethic/value', but pluralities in all states against stronger use value

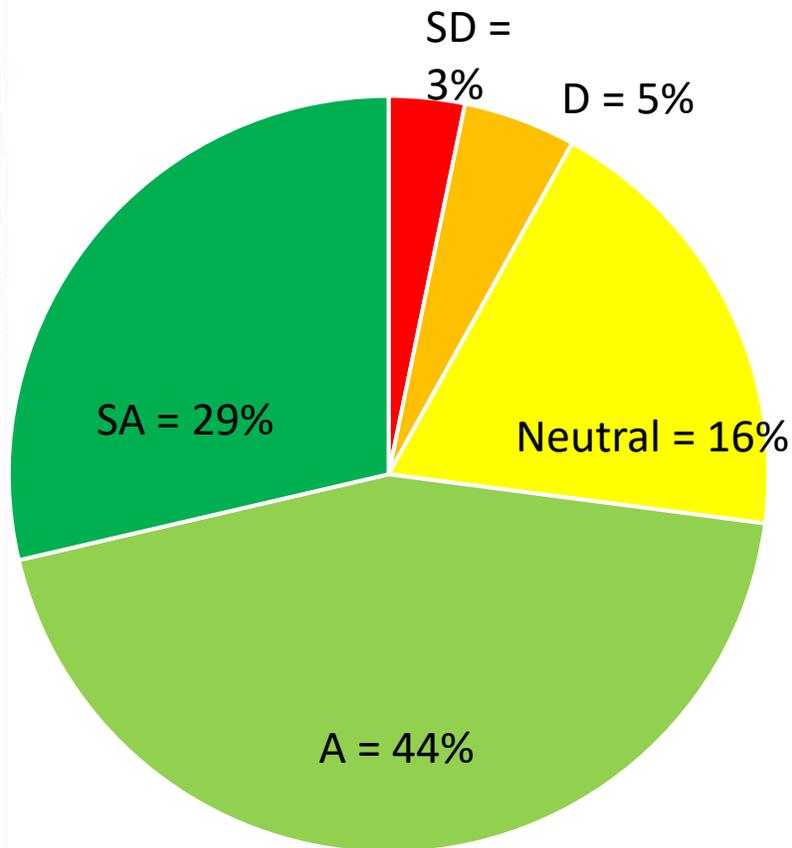
So, ***for whom/what*** is depletion a problem?...

How dependent on groundwater?

- **Self**
- “Groundwater is important for the profitability of my agricultural production business.”
 - 1 = strongly disagree; 5 = strongly agree
- **Clear personal interests at stake here**
- 71% agree, and ~1/3 strongly agree
- ***How about for community?...***

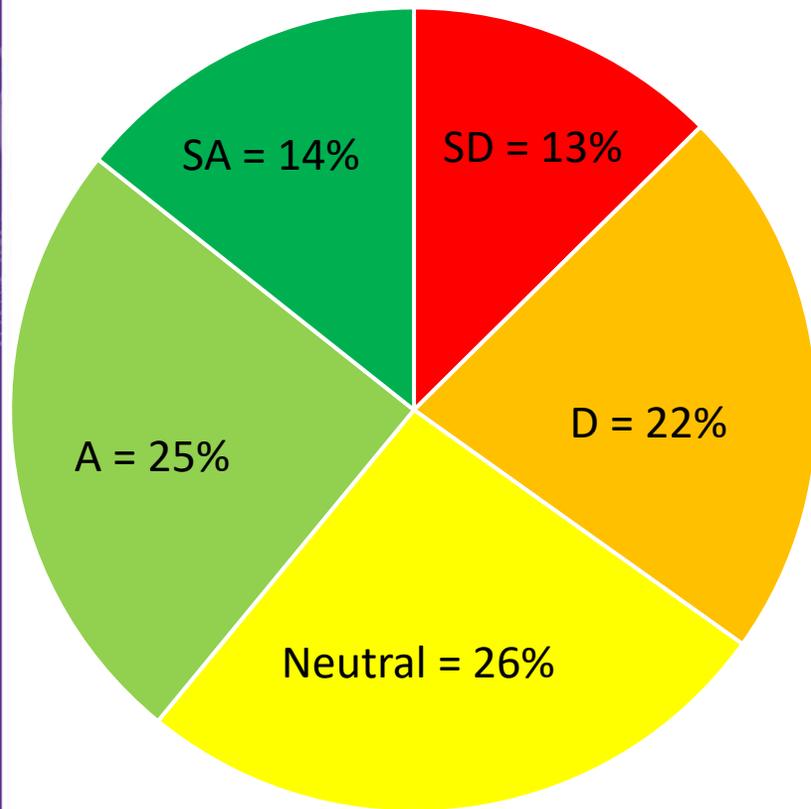


How dependent on groundwater?



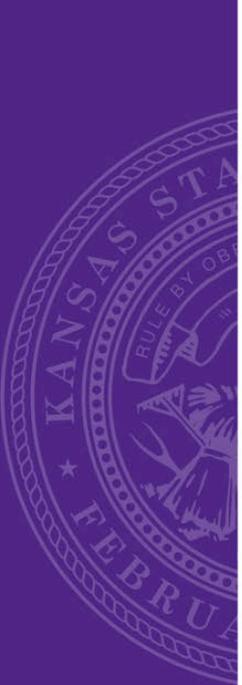
- **Community**
- “Groundwater is important because it provides jobs and business opportunities in my community.”
 - 1 = strongly disagree; 5 = strongly agree
- **Even more alignment on perception of community dependence**
- ~3/4 agree (73%)
- ~1/3 strongly agree (29%)
- Only 8% disagree to some extent
- Not much difference across states on dependence questions
- ***From dependence to vulnerability/exposure...***

For whom/what is depletion a problem?



- **Personal vulnerability/exposure**
- “Groundwater levels are a problem for my farm/family/household”
 - 1 = strongly disagree; 5 = strongly agree
- ***Strong variation/split in vulnerability***
- 39% Agree or strongly agree
- 35% Disagree or strongly disagree
- 26% Neutral
- An interpretation: many see dependence but variation in exposure to risk from GW depletion

Differences across states...



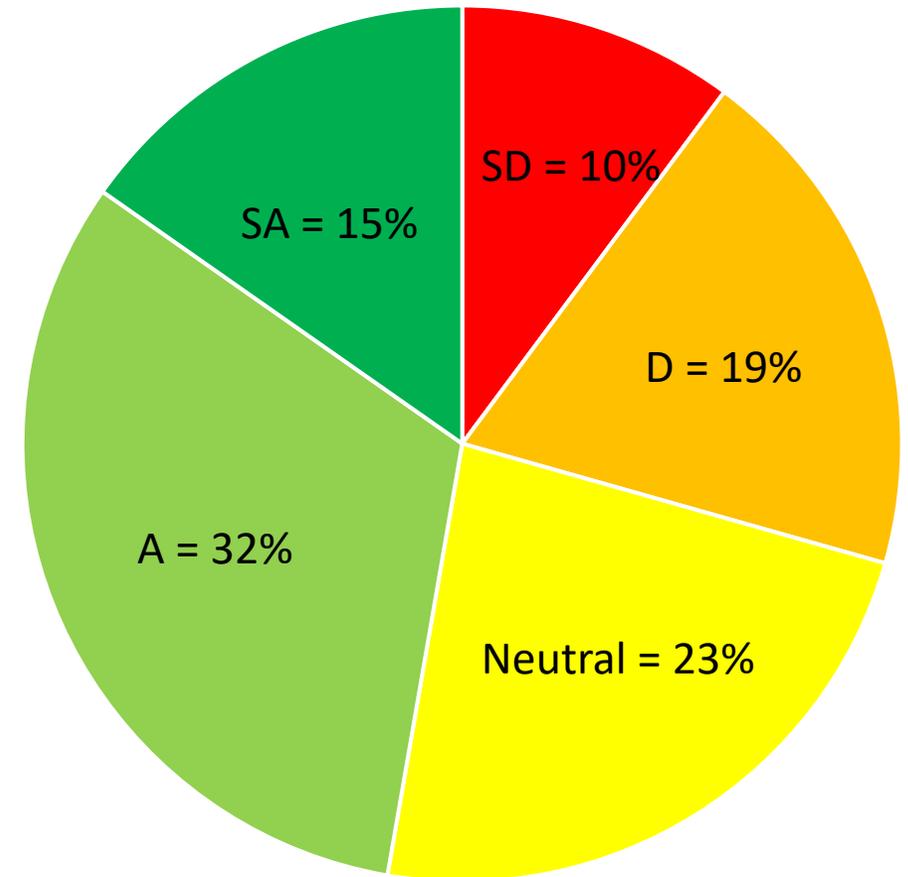
“Groundwater levels are a problem for my farm/family/household”

- Overall, 39% agree
- **Moderate** personal vulnerability/exposure in **KS: 37%**
- **Lower** proportion of a personal problem in **NE: 23%**
- **Much more prevalent** perceived exposure:[above mean]
- TX = 73%
- NM = 61%
- CO = 56%
- **OK = 47%**

What about perceived community vulnerability?...

For whom/what is depletion a problem?

- **Community vulnerability/exposure**
- “Groundwater levels are a problem for my community”
 - 1 = strongly disagree; 5 = strongly agree
- **More agreement here**
 - Higher % perceive community exposure
- Nearly ~ ½ **agree** or strongly agree (47%)
- ***By state...***





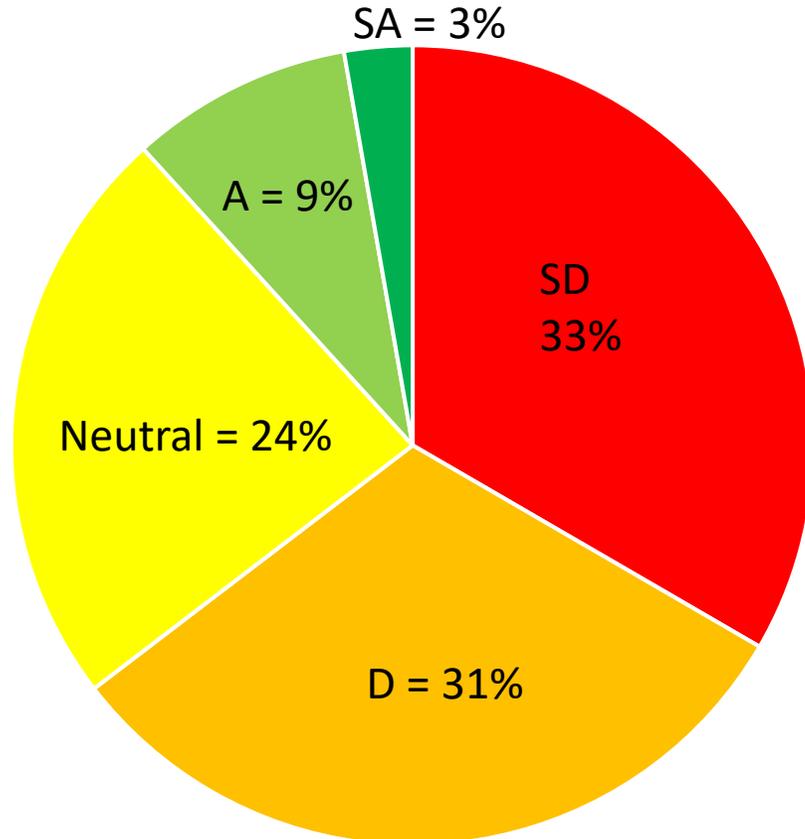
“Groundwater levels are problem for my community”

- **Overall, 47% agree**
- Strong perception of community exposure across the region
 - Only in NE do <55% agree; in NE [only 29% agree]
- In *all* states, perception of community problem is > perception of personal problem
- In *Kansas*, the gap in perception (personal/community problem) *is largest*

- TX: 80% [73% perceive it as a personal problem]
- NM: 76% [61%]
- CO: 67% [56%]
- KS: 61% [37%]
- **OK: 55% [47%]**
- NE: 29% [23%]

If problem, how willing? Capacity?...

Responsible for groundwater depletion?



- “I feel personally responsible for groundwater depletion in my area.”
 - 1 = strongly disagree; 5 strongly agree
- **Majority do not feel responsible for depletion**
- ~ 2/3 disagree or strongly disagree (64%)
- ~1/10 agree or strongly agree (12%)
- Not likely related to GW use [weak correlation]
- Not much variation across states
- ***Not much difference between non-irrigators and irrigators***

Willingness to conserve? Capacity to conserve more?...

Conservation: *Willingness? Capacity?*

- **Willingness**

- "I should reduce or minimize my groundwater use."

- **Split/mixed**

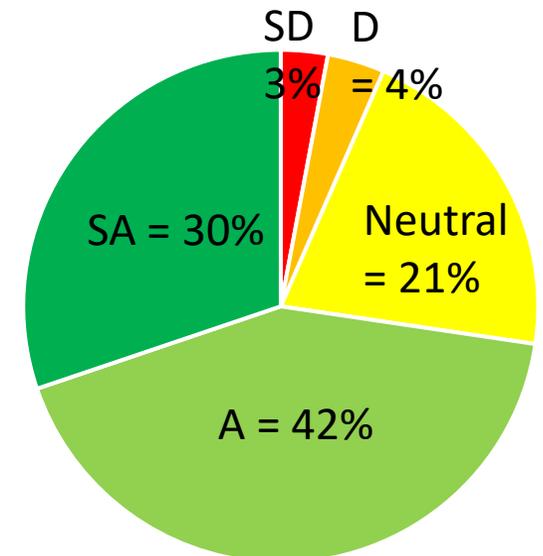
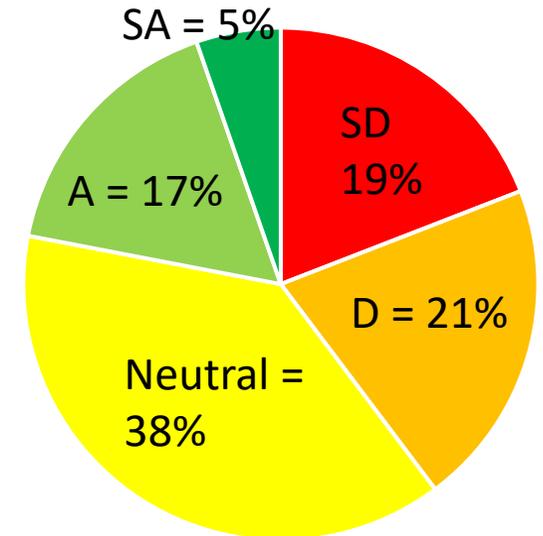
- 40% disagree or strongly disagree
- ~1/5 agree (22%)
- Large neutral group ~ 4/10 (38%)

- **Capacity**

- "I already limit my groundwater use as much as possible."

- **Strong agreement: limited conservation capacity**

- ~ ¾ agree or strongly agree (72%)
- Only 7% perceive additional capacity
- Not much variation across states on these questions



Perceived barriers?...

Barriers to conservation? % Agree/Strongly Agree

- ***“Most people do not save more groundwater because...”***

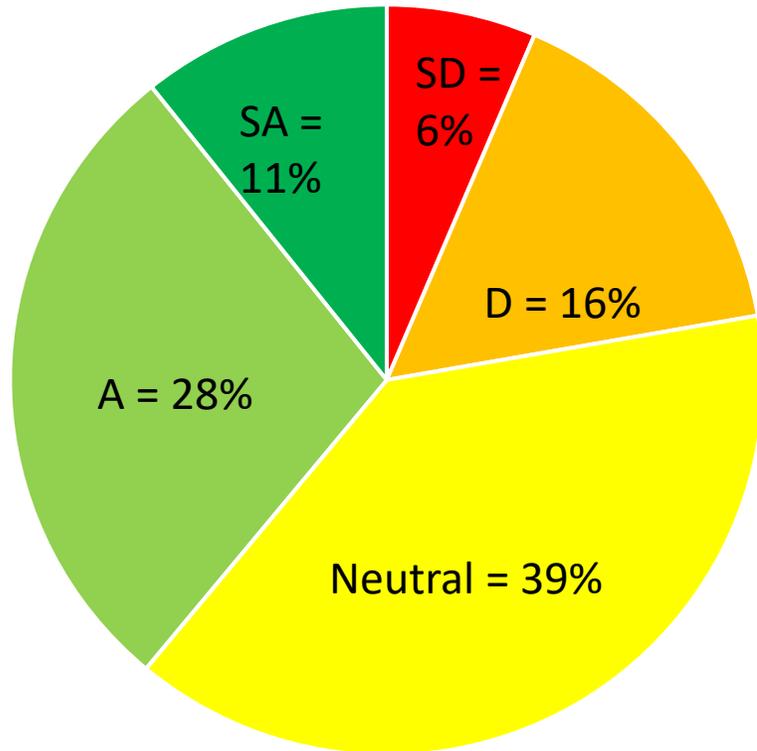
• it takes too much effort to conserve groundwater.	21%	Less common
• environmental regulations are too strict.	27%	
• they do not know what options exist to save groundwater.	38%	
• water use regulations are not strict enough.	46%	More common
• if they do not pump the water, someone else will.	49%	
• they are self-interested/greedy.	53%	
• it would require more expensive technology.	54%	
• they do not want to change their irrigation practices.	65%	Very common
• it would decrease their production.	76%	

If it should be conserved, why? For whom/what should we save it?

Groundwater should be conserved today so that...

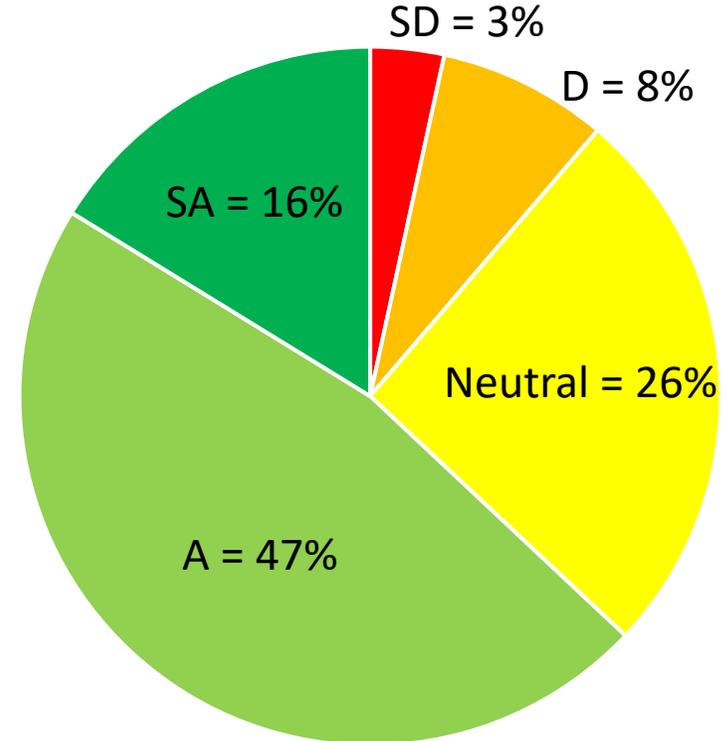
- ...it is available to producers if commodity prices are higher in the future.

- **39% Agree**



- ...it is available to producers if drought becomes more frequent in the future.

- **73% Agree**

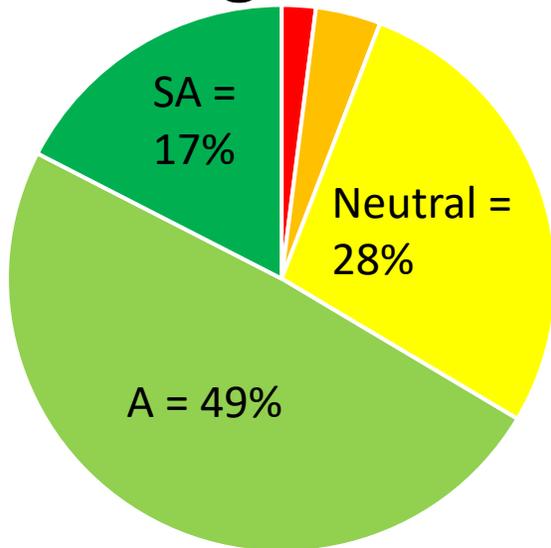


Strongest agreement on altruistic measures...

Groundwater should be conserved today so that...

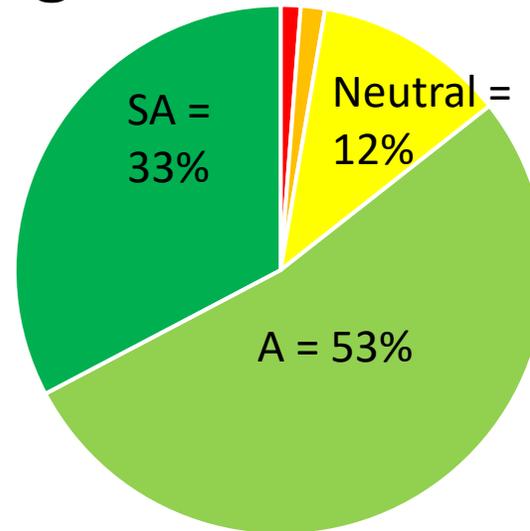
"...**jobs and business** opportunities continue to be available in my **community** in the future."

66% Agree



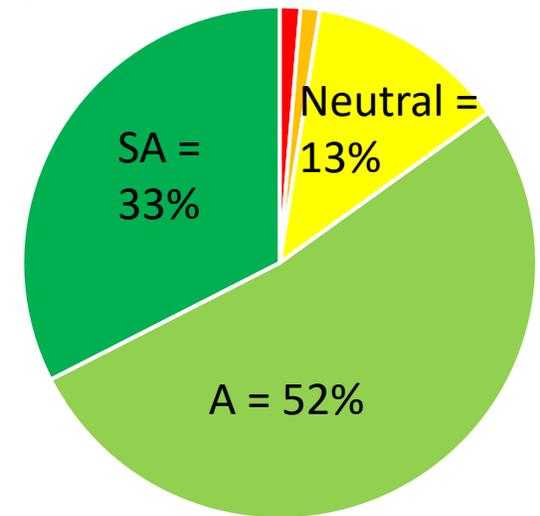
"....**future generations in my area** can enjoy the benefits I have experienced."

86% Agree



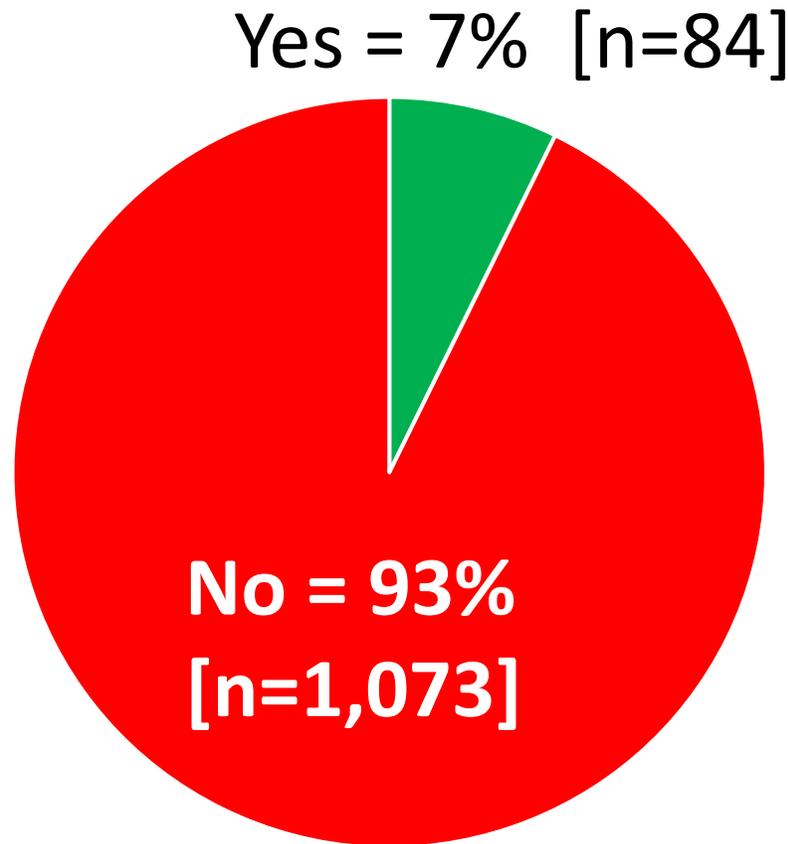
"...**my children and grandchildren** can enjoy the benefits I have experienced."

85% Agree



Voluntary participation?...

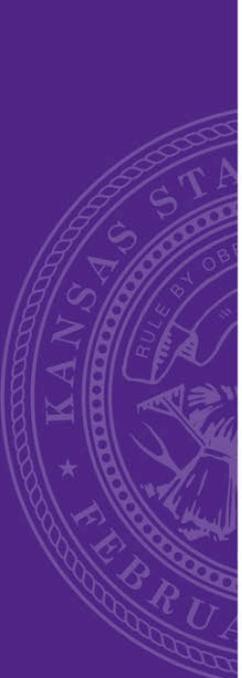
Participation in voluntary conservation?



- Are you involved with leading, organizing, or advocating for any voluntary group efforts to conserve water?
- For example:
 - GMDs, LEMAs, or WCAs in Kansas
 - NRDs in Nebraska
 - or Groundwater Conservation Districts in Texas
- N = 1,151

If yes, average years of participation = 19

Barriers?...



Summary & Implications

1. Nebraska is different
 2. Yes, there is a legitimate problem, and it is perceived to be ***about as severe as it was in 1984***
 3. **Drought** is a major personal reason to conserve
 - Considerable perceived dependence with variation in personal exposure/vulnerability
 4. A key aspect of challenge seems to be social
 - Pushing tech adoption further can still play role; many doing what they can
 - Will be more about ***extending*** technologies, broadening uptake
 - May be more limited, but could be means of building networks, capacities, culture of conservation
- A basis of concern...



Summary

5. Despite variation in personal exposure/vulnerability, perception of **community dependence is stronger and less variable**
 - Likely even higher among public
6. **Challenge:** participation in voluntary conservation is scarce
7. Seems to be sufficient **motivation to conserve**
 - Strong majorities see a future for others in the region as most important reason to conserve
 - E.g., jobs, businesses, future generations, my kids and grandkids



Where to from here?

“A case for talking about what we value and why”

Conversations about ***conservation***...

...and the conversations should include ***what we are conserving***
[and not just how to conserve, although that is important]

An idea worth pursuing?

From technical infrastructure to ***social infrastructure***:
Networks, cultures, capacities for conservation

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OPTIMIZING WATER USE TO SUSTAIN FOOD SYSTEMS

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What is groundwater worth? Today

Economic (\$) value: Now?

- “In your farming operation, what is the current value of groundwater in dollars per acre-feet?”
 - N=267 [**~1,000 did not answer**]
 - No answer – Do not irrigate: 503
 - No answer – **Do not know: 456**
- Maximum = \$900
- Minimum = \$0
 - N= 87, **33% of respondents with an answer**
- **Median = \$99**
 - Mean = \$239.46

By state: [Median/Mean]

- Kansas: **\$125** / \$281 [n=63]
- Texas.: **\$110** / \$207 [n=26]
- Colorado: **\$100** / \$377 [n=30]
- New Mex.: **\$56** / \$262 [n=8]
- Nebraska: **\$50** / \$204 [n=131]
- Oklahoma: **\$0** / \$83 [n=9]

What about the future?...

What is groundwater worth? Future

- “Think ahead 50 years. Assuming you have the same quantity of groundwater in 50 years, what do you think the value of groundwater will be, in dollars per acre-feet, for your farming operation?”
 - N=242 [*~ 1,000 did not answer*]
 - No answer – Do not irrigate: 501
 - No answer – ***Do not know: 483***
- Maximum = \$900
- Minimum = \$0
 - N= 85, *35% of respondents with an answer*
- **Median = \$125 [+25% over today]**
 - Mean = \$327.40 [+37% over today]

***Much variation
across states...***

Future value? [Median / Mean]

- Colorado: **\$700 / \$530** [n=30] **+ 600%**
- Kansas: **\$325 / \$385** [n=62] **+160%**
- New Mex.: **\$300 / \$373** [n=8] **+ 430%**
- Texas: **\$150 / \$343** [n=26] **+ 36%**
- Nebraska: **\$100 / \$264** [n=131] **+100%**
- Oklahoma: **\$0 / \$133** [n=9] **Unchanged**

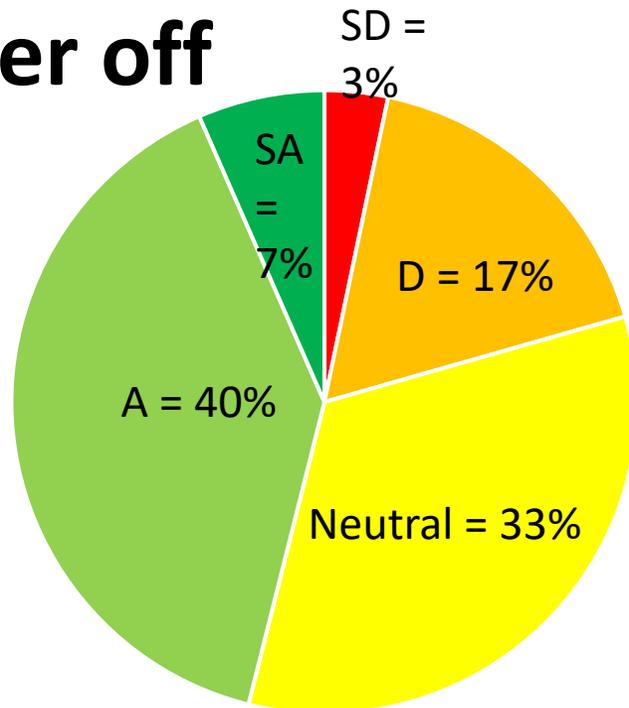
How do we feel today, compared to 5 years ago...

Better off than 5 years ago? In 5 years?

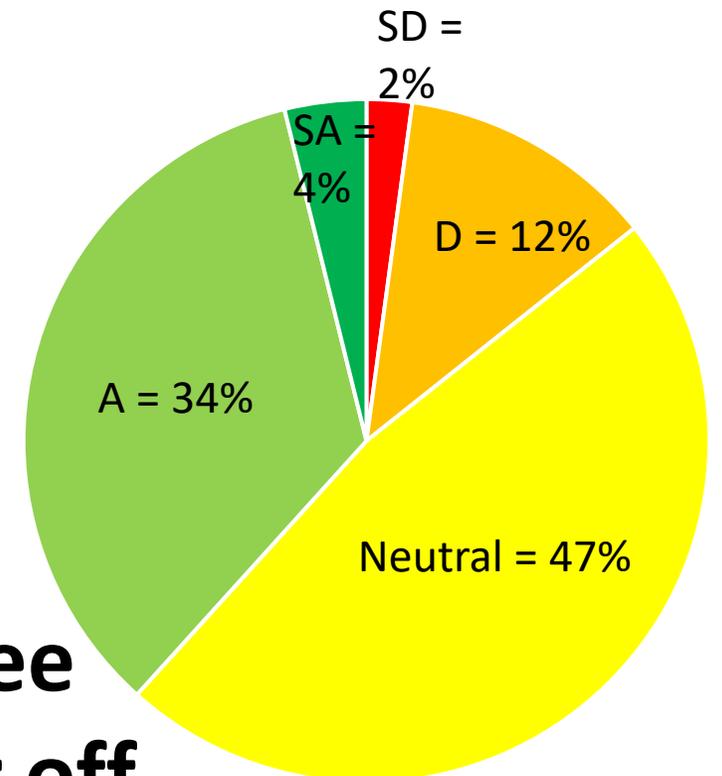
- “All things considered, do you think you are better or worse off than you were 5 years ago?”

- All things considered, do you think you will be better or worse off in 5 years?

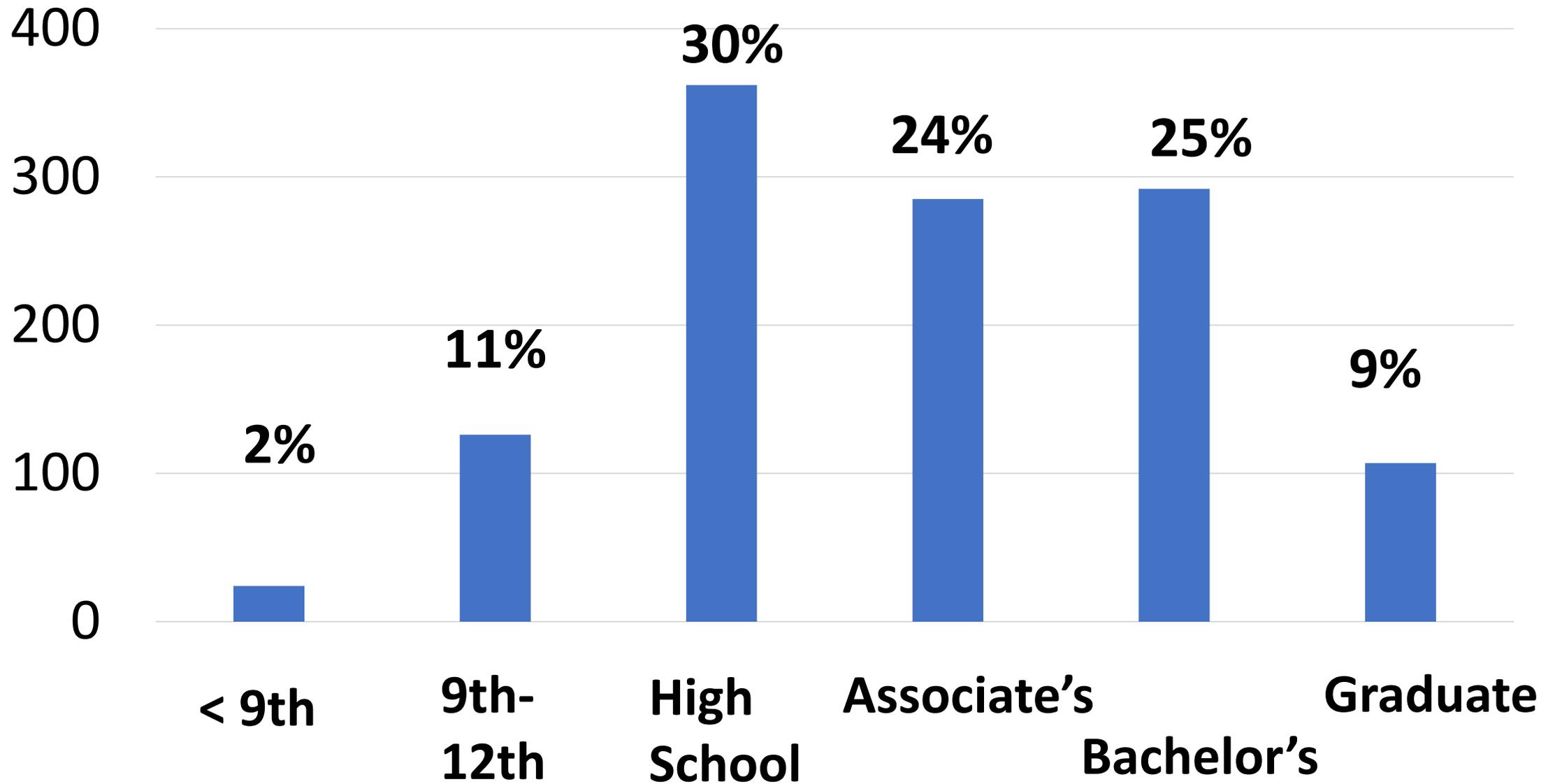
Stable: Most are same or better off



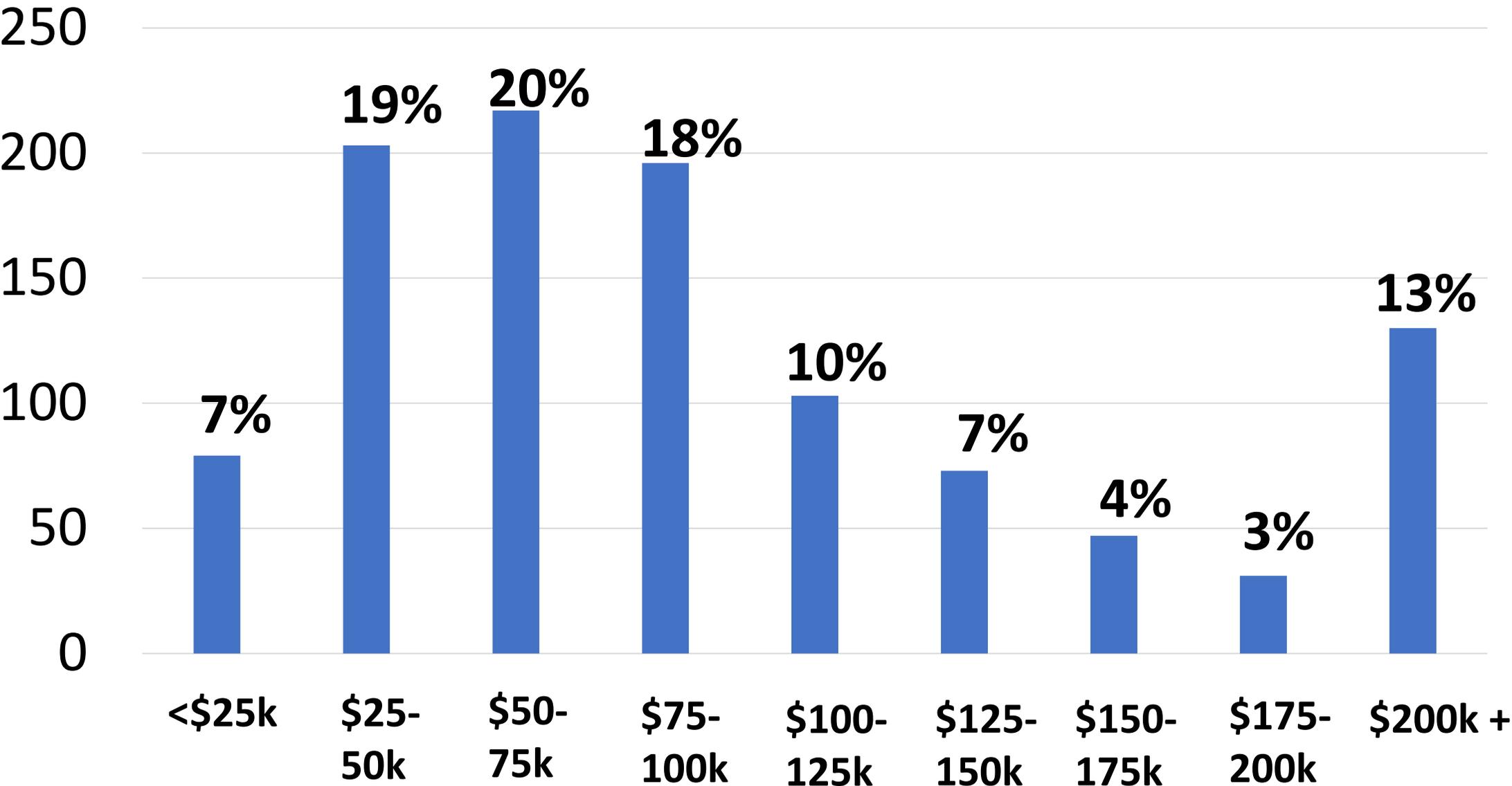
Stable: Most see same or better off



Education



Income



Political Orientation

