Gathering, Using and Sharing Large Uncertainty

Colorado River Water Users Association
71St Annual Conference
December 14, 2016

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Uncertainty – Drought - is a Wicked Problem

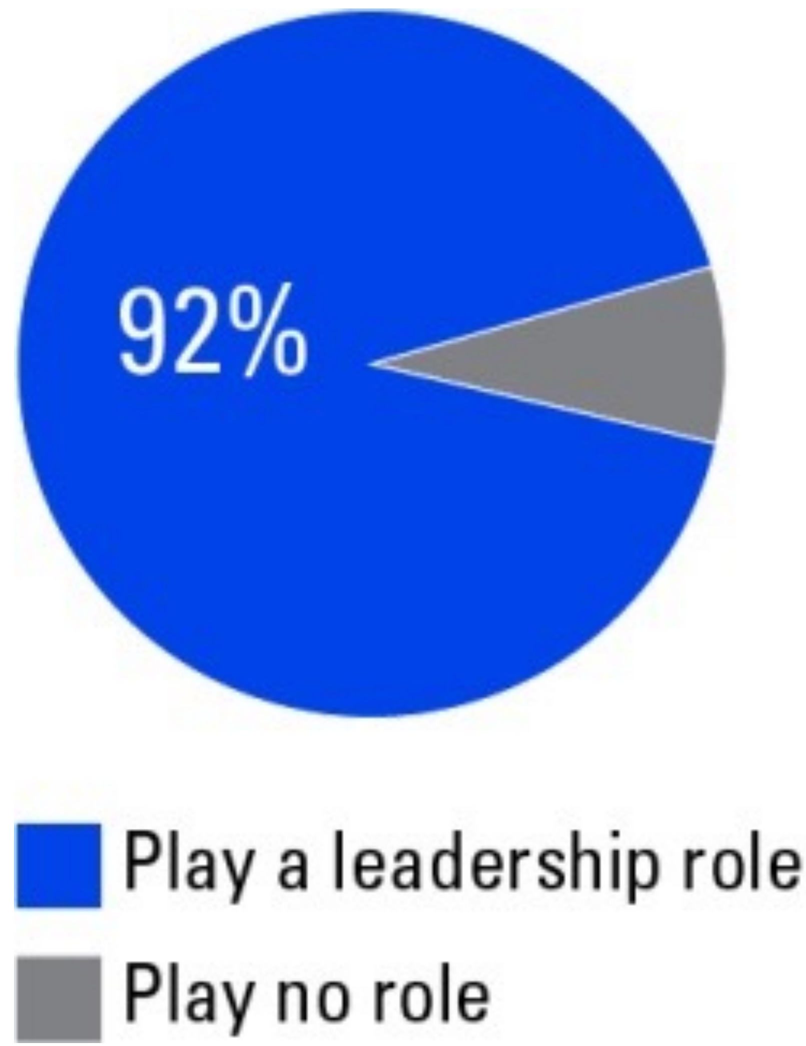
- Difficult to define – mean something different to different sub-groups
- Both the problem and the solution can have different goals for different groups
- Complex scientific components
- No easy solution
- No yes/no solution
- Can't learn from trial and error
- Require behavior change

We Make Safe Decisions Quickly…

Effective Climate Change Communication for Water Stakeholders

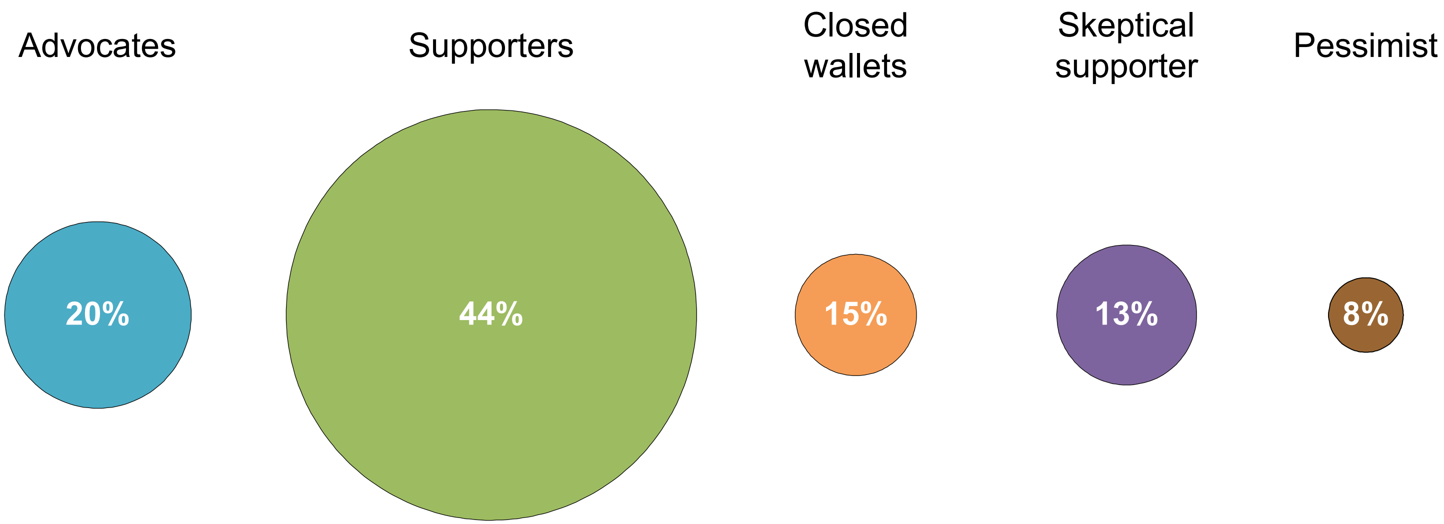
WRF Project 4381
(2103-2105)

92% of Americans want their community water provider to be a leader in prespring their community for climate change



Community water providers are a trusted source for community climate water information

5 Americas for Community Water and Climate Change



Message Testing

- Water cycle
- Extreme events
- Separation

Uncertainty Survey
WRF Project 4678

Great Response from CRWUA

Thank you!!!

Trusted source

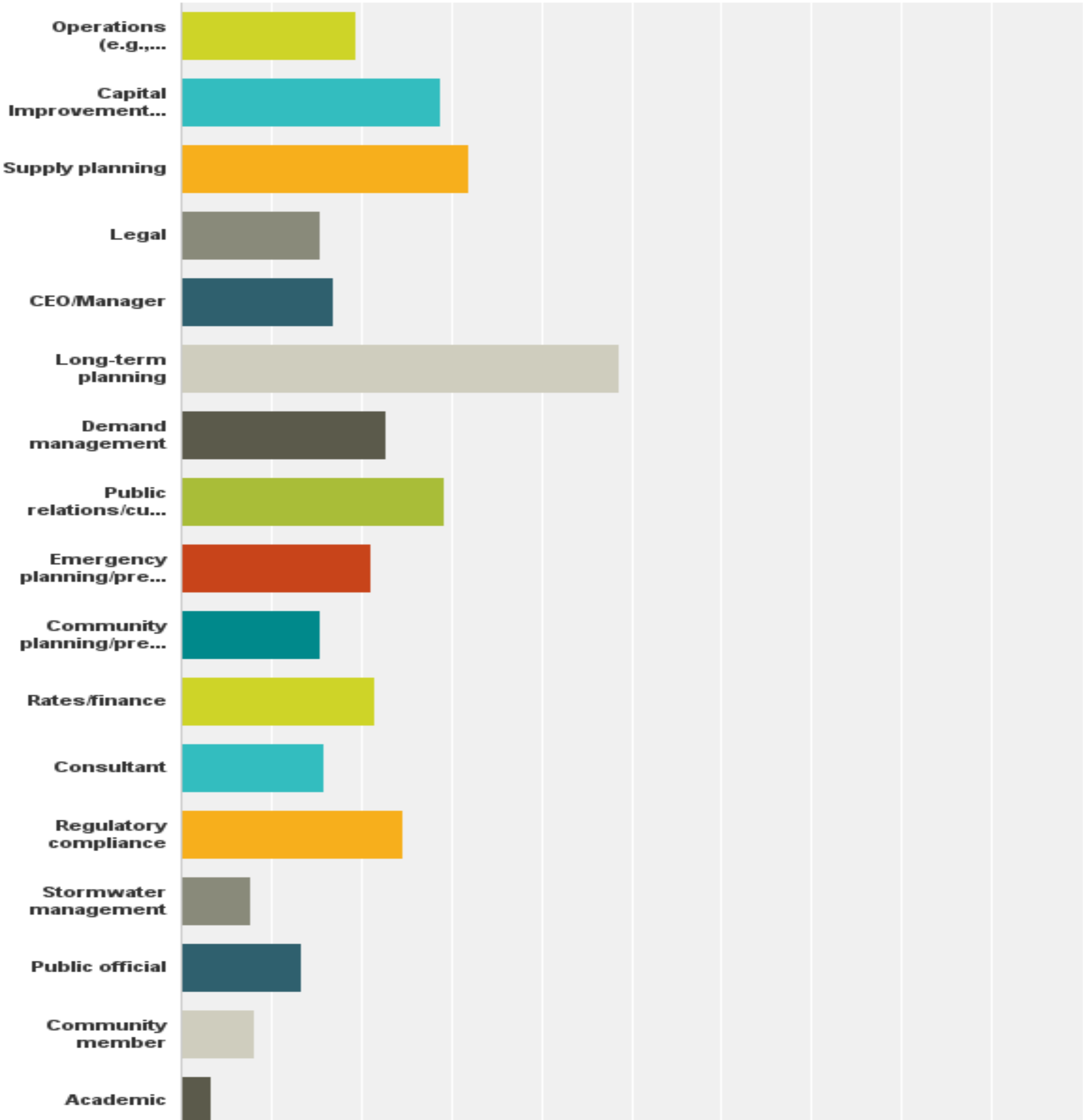
Have my back

Are water professionals qualified to do this?

What do water professional think about this?

Representation:

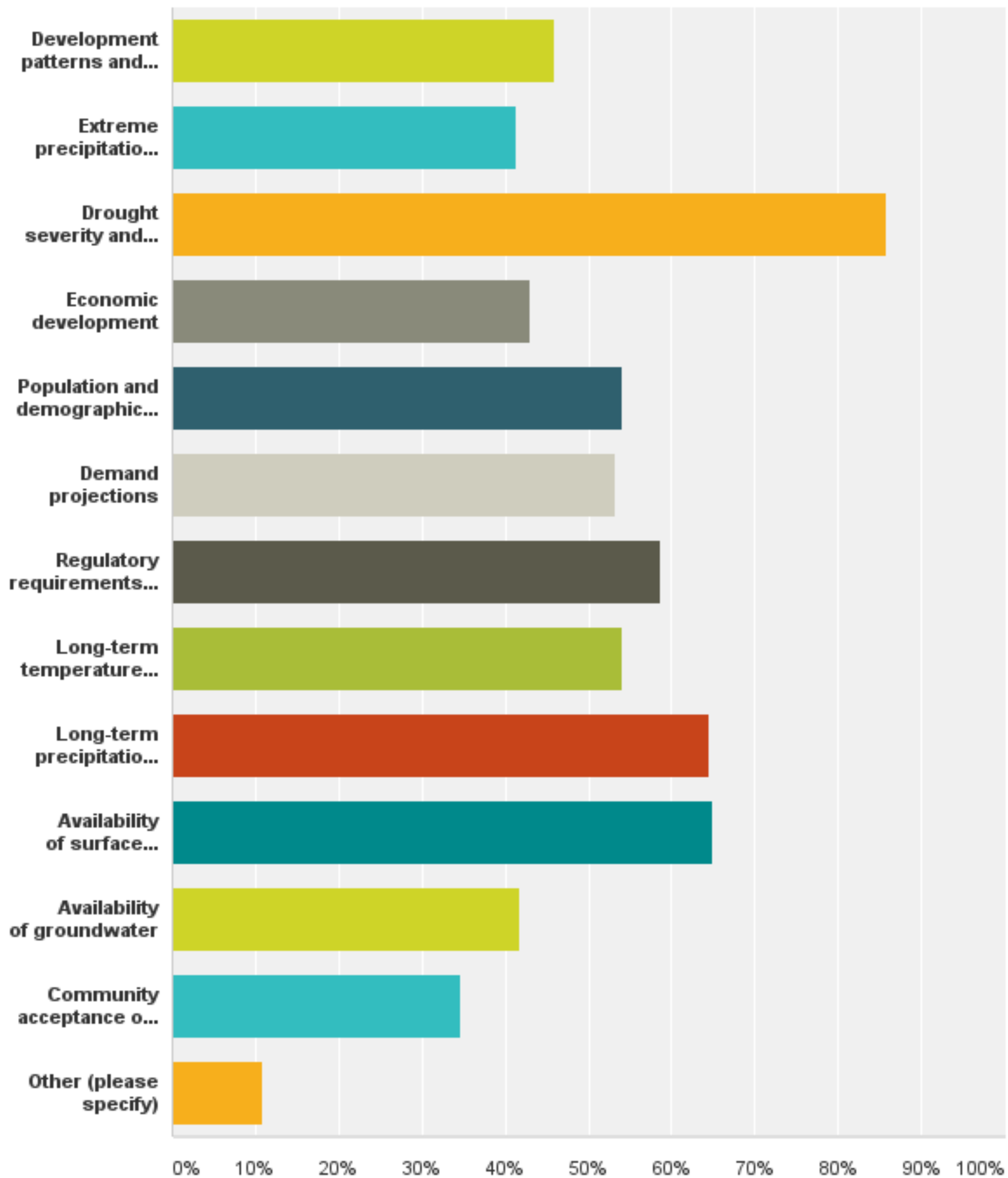
- Across the US
- Across job responsibilities
- Across ages
- Mostly large drinking water or combination Clean Water & Drinking Water Agencies

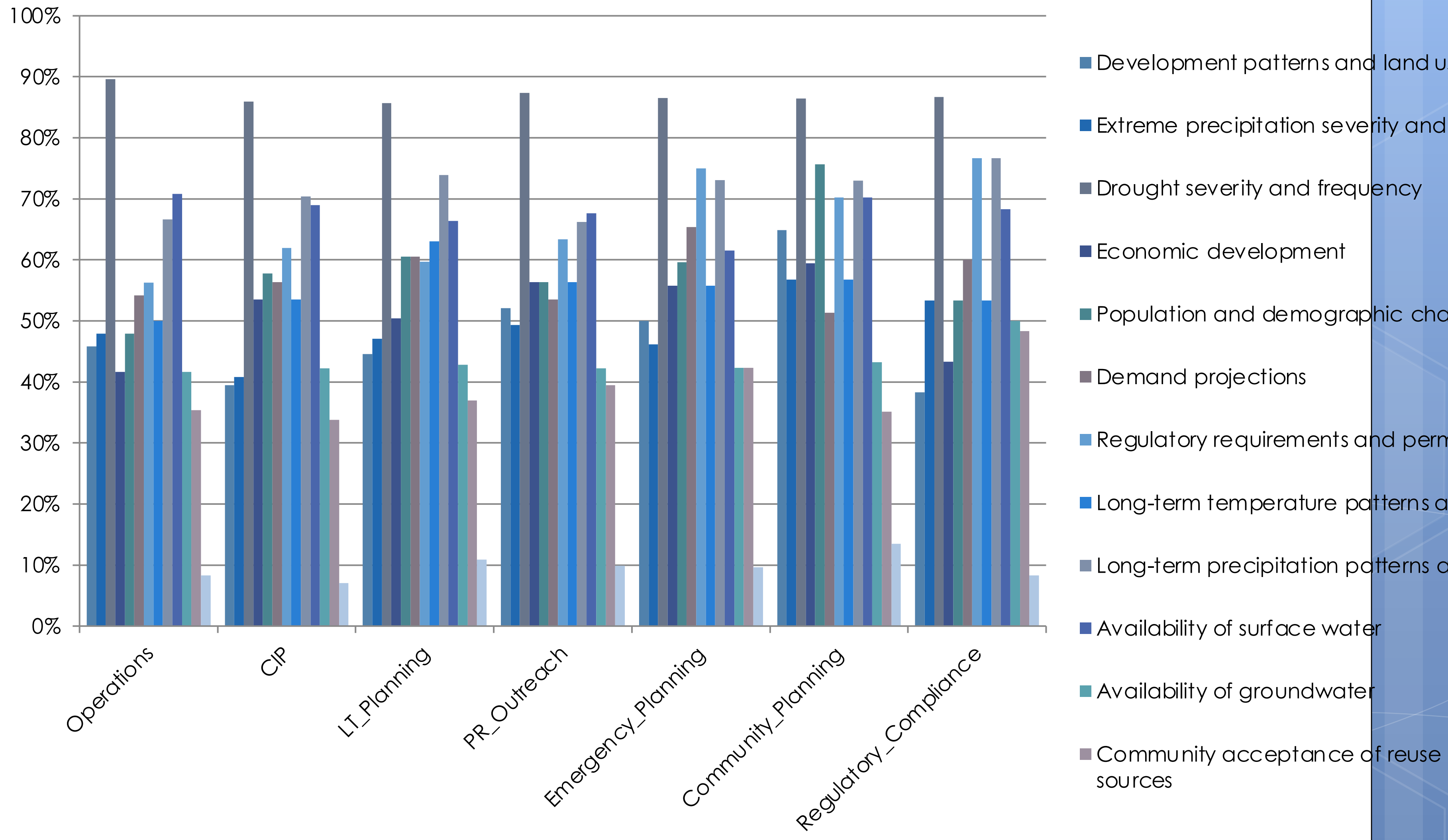


Operations (e.g.,...
Capital Improvement...
Supply planning
Legal
CEO/Manager
Long-term planning
Demand management
Public relations/cu...
Emergency planning/pre...
Community planning/pre...
Rates/finance
Consultant
Regulatory compliance
Stormwater management
Public official
Community member
Academic

water professionals in your region? Mark all that apply.

Answered: 240 Skipped: 8




100%
90%
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60%
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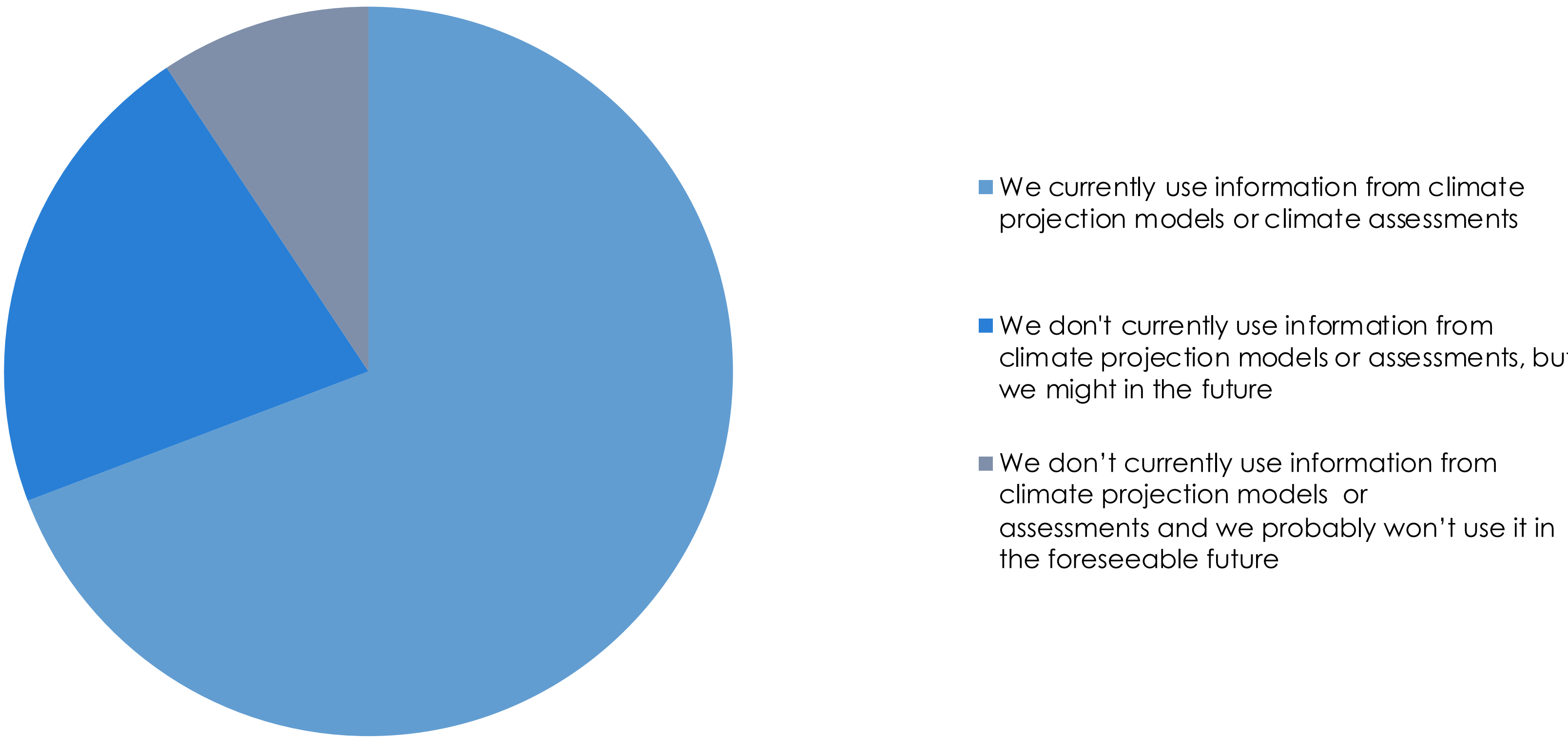
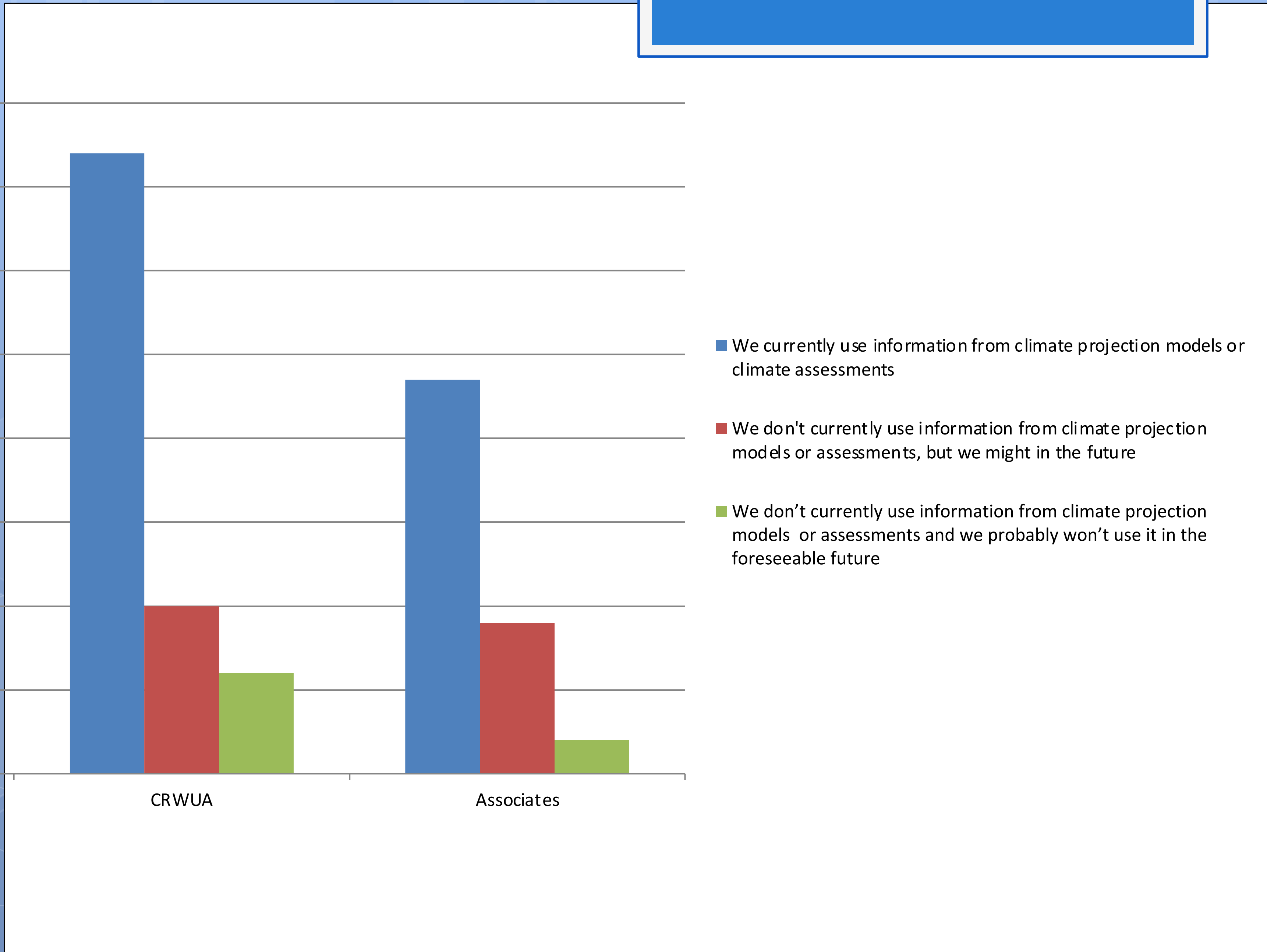
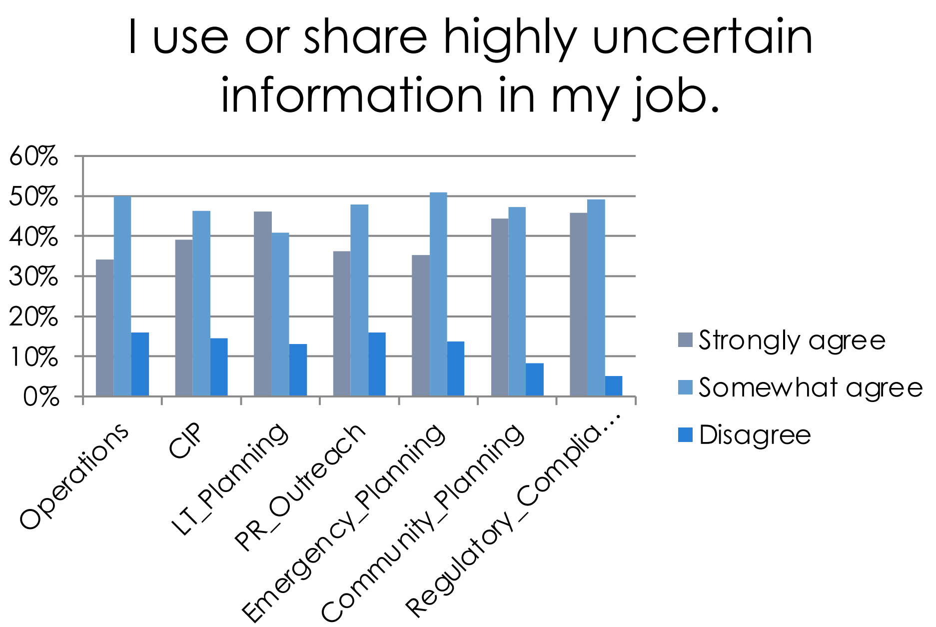
10%
0%
Operations
CIP
LT_Planning
PR_Outreach
Emergency_Planning
Community_Planning
Regulatory_Compliance
Development patterns and land u
Extreme precipitation severity and
Drought severity and frequency
Economic development
Population and demographic cha
Demand projections
Regulatory requirements and perm
Long-term temperature patterns a
Long-term precipitation patterns o
Availability of surface water
Availability of groundwater
Community acceptance of reuse
sources



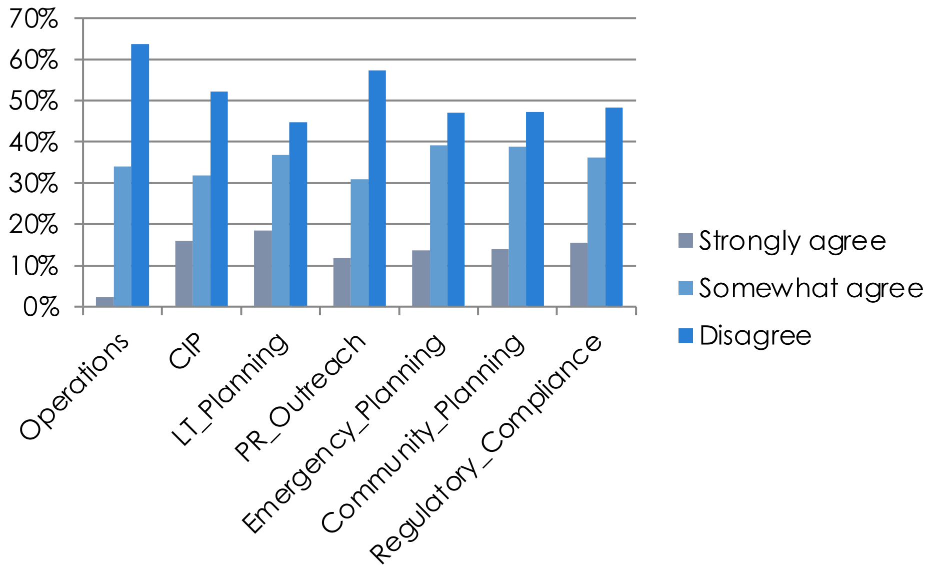
We currently use information from climate projection models or climate assessments
We don't currently use information from climate projection models or assessments, but we might in the future
We don’t currently use information from climate projection models or assessments and we probably won’t use it in the foreseeable future



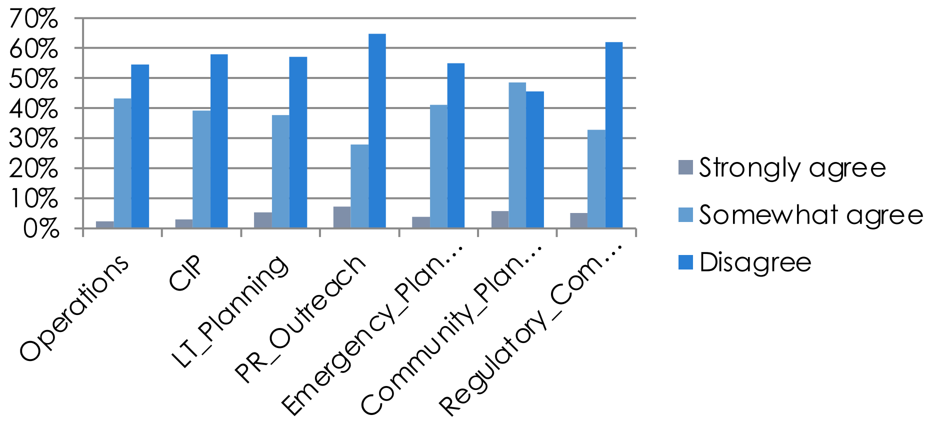
CRWUA
Associates
We currently use information from climate projection models or climate assessments
We don't currently use information from climate projection models or assessments, but we might in the future
We don't currently use information from climate projection models or assessments and we probably won't use it in the foreseeable future

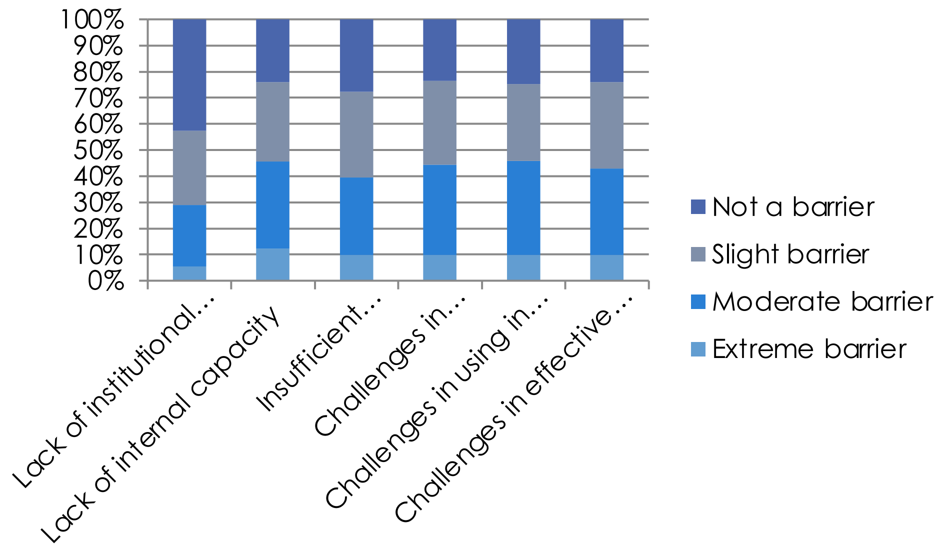

I use or share highly uncertain information in my job.
60%
50%
40%
30%
20%
10%
0%
Operations
CIP
LT_Planning
PR_Outreach
Emergency_Planning
Community_Planning
Regulatory_Complia...
Strongly agree
Somewhat agree
Disagree

I received training on how to use highly uncertain information as part of my college education.



I received training on how to use highly uncertain information as part of ongoing or certification training.

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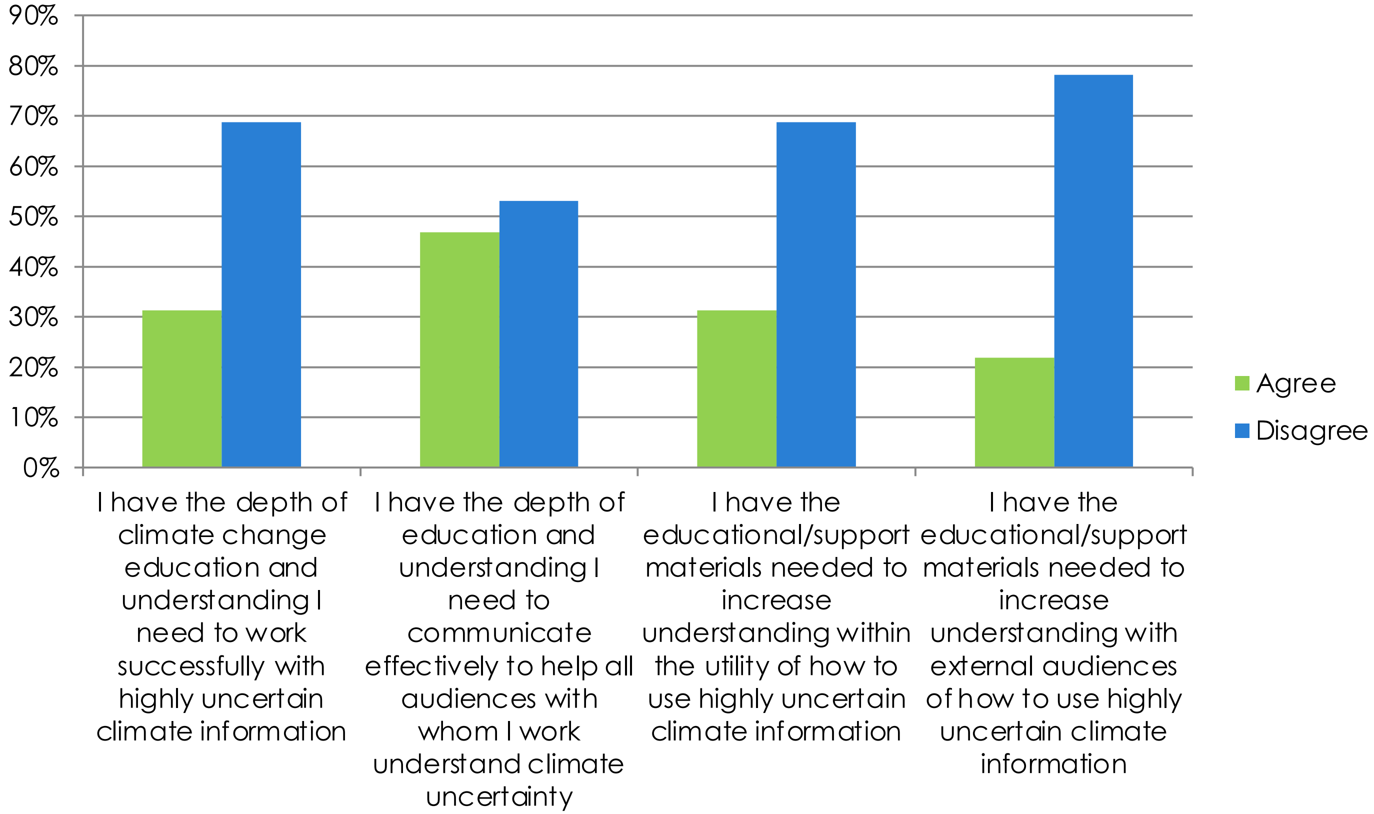
70%
60%
50%
40%
30%
20%
10%
0%
Lack of institutional…
Lack of internal capacity
Insufficient…
Challenges in…
Challenges in using in…
Challenges in effective…
Not a barrier
Slight barrier
Moderate barrier
Extreme barrier


90%
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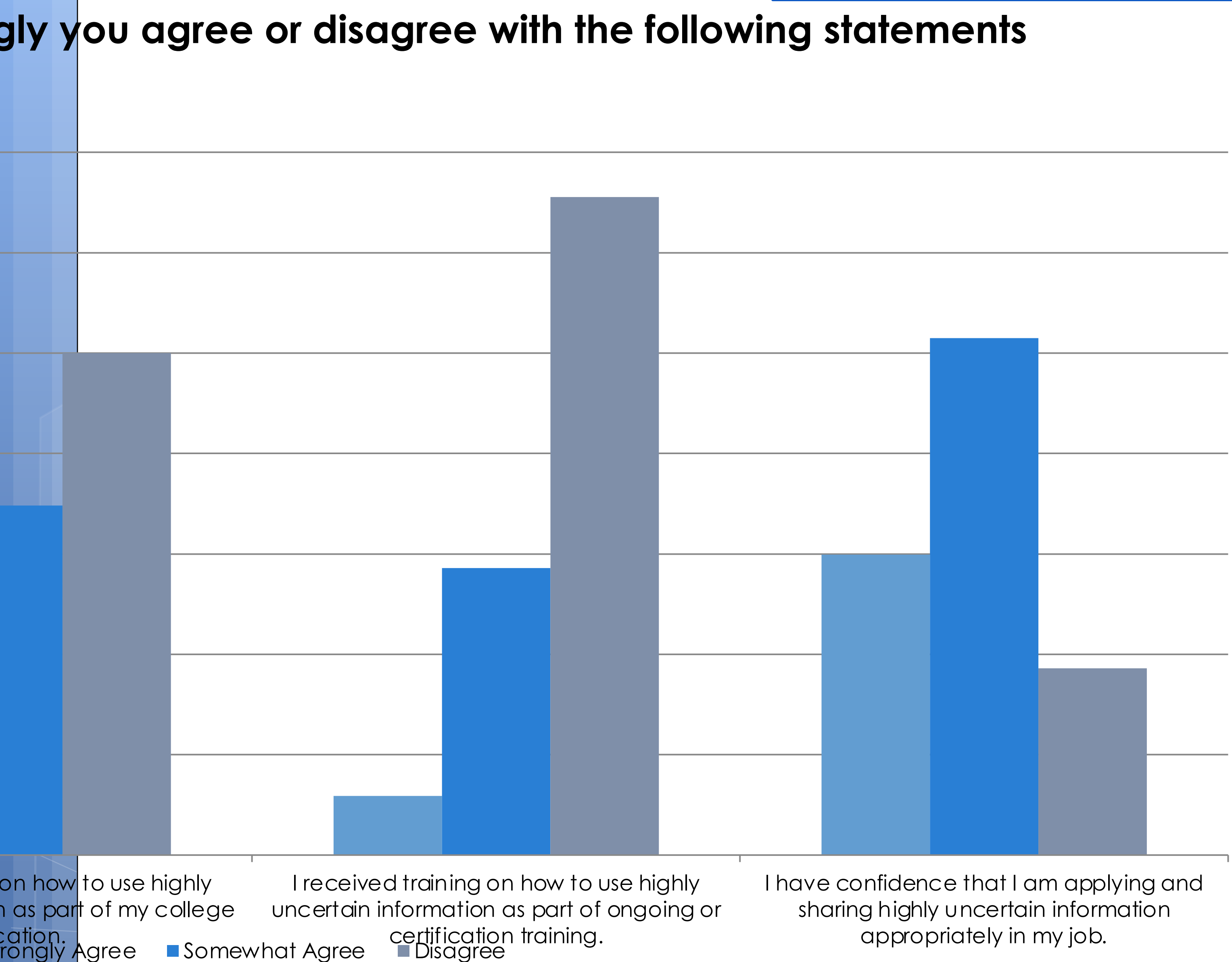
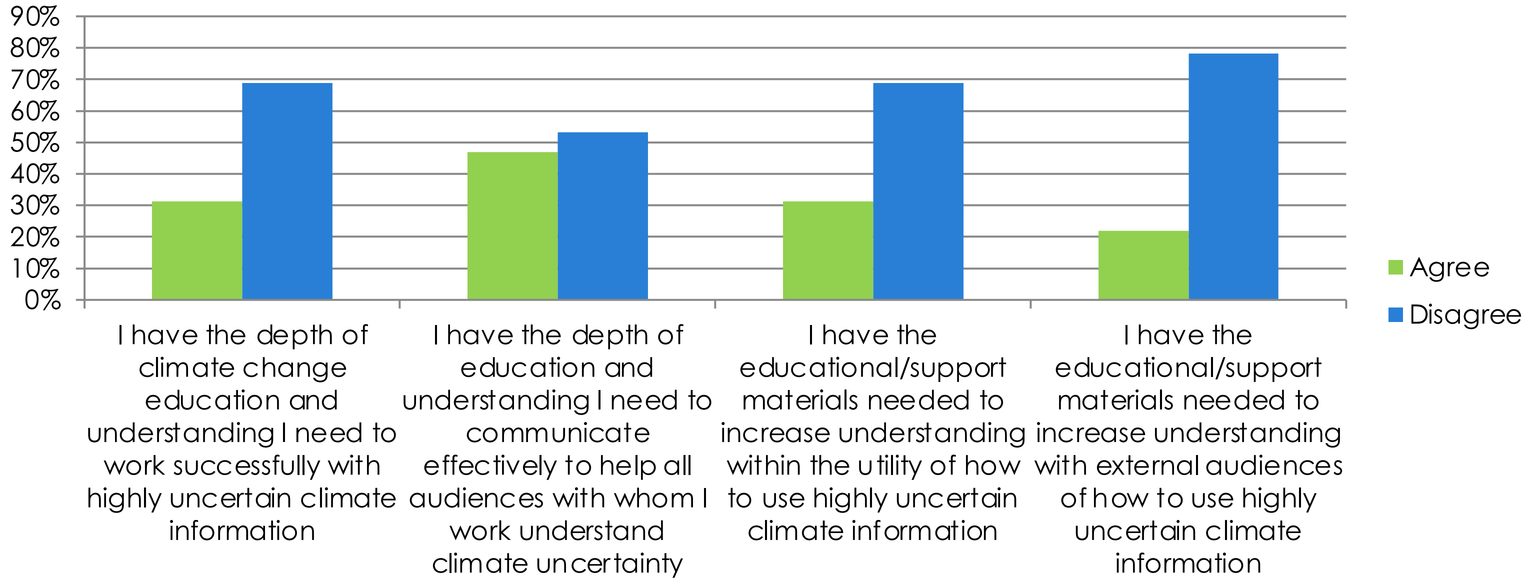
60%
50%
40%
30%
20%
10%
0%
I have the depth of climate change education and understanding I need to work successfully with highly uncertain climate information
I have the depth of education and understanding I need to communicate effectively to help all audiences with whom I work understand climate uncertainty
I have the educational/support materials needed to increase understanding within the utility of how to use highly uncertain climate information
I have the educational/support materials needed to increase understanding with external audiences of how to use highly uncertain climate information
Agree
Disagree


gly you agree or disagree with the following statements
on how to use highly
n as part of my college
cation.
I received training on how to use highly uncertain information as part of ongoing or certification training.
I have confidence that I am applying and sharing highly uncertain information appropriately in my job.
rongly Agree
Somewhat Agree
Disagree


90%
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20%
10%
0%
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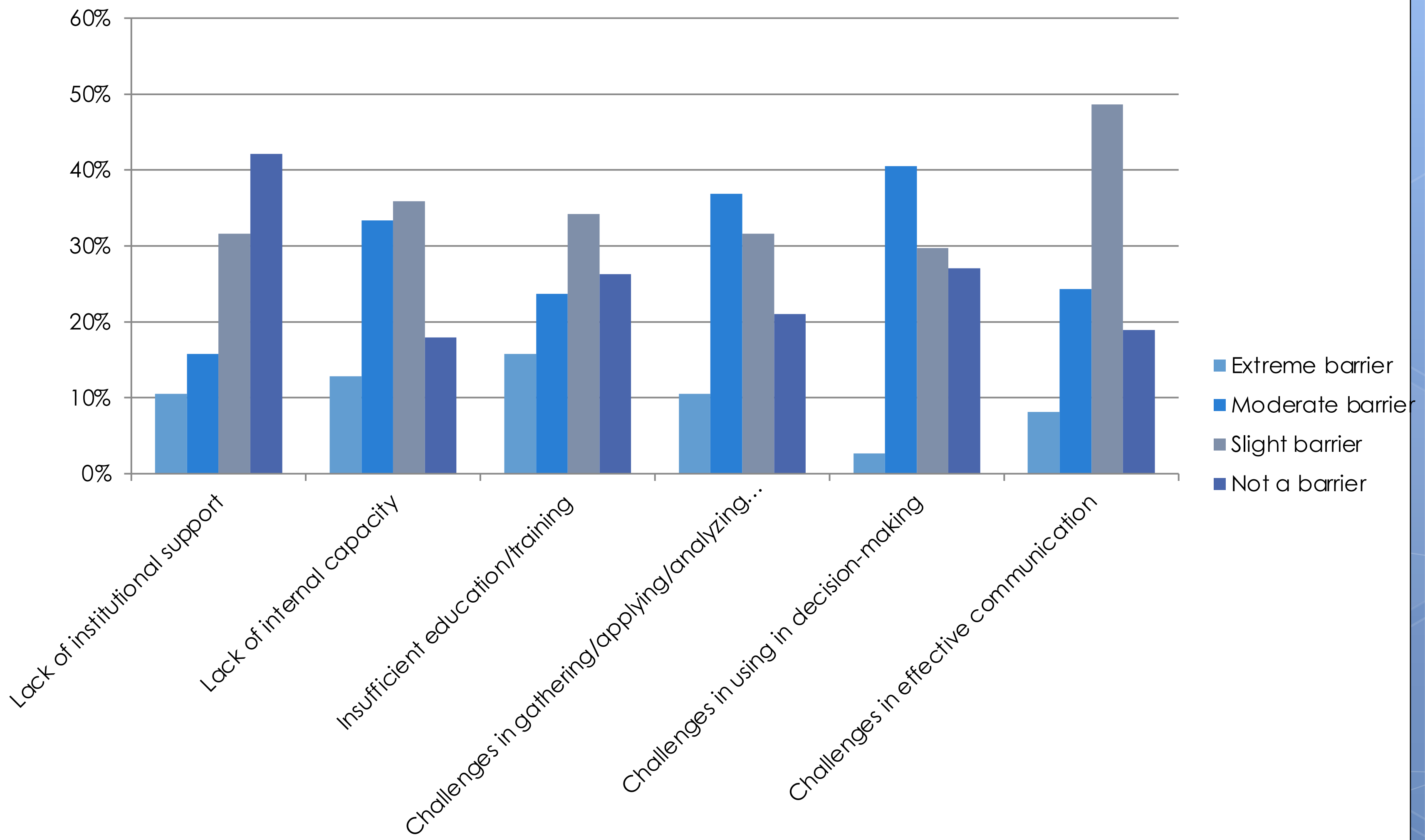
I have the depth of education and understanding I need to communicate effectively to help all audiences with whom I work understand climate uncertainty
I have the educational/support materials needed to increase understanding within the utility of how to use highly uncertain climate information
I have the educational/support materials needed to increase understanding with external audiences of how to use highly uncertain climate information
Agree
Disagree


60%
50%
40%
30%
20%
10%
0%
Lack of institutional support
Lack of internal capacity
Insufficient education/training
Challenges in gathering/applying/analyzing…
Challenges in using in decision-making
Challenges in effective communication
Extreme barrier
Moderate barrier
Slight barrier
Not a barrier

A nationally representative survey, conducted in 2014 for WRF as part of Project #4381, found that:

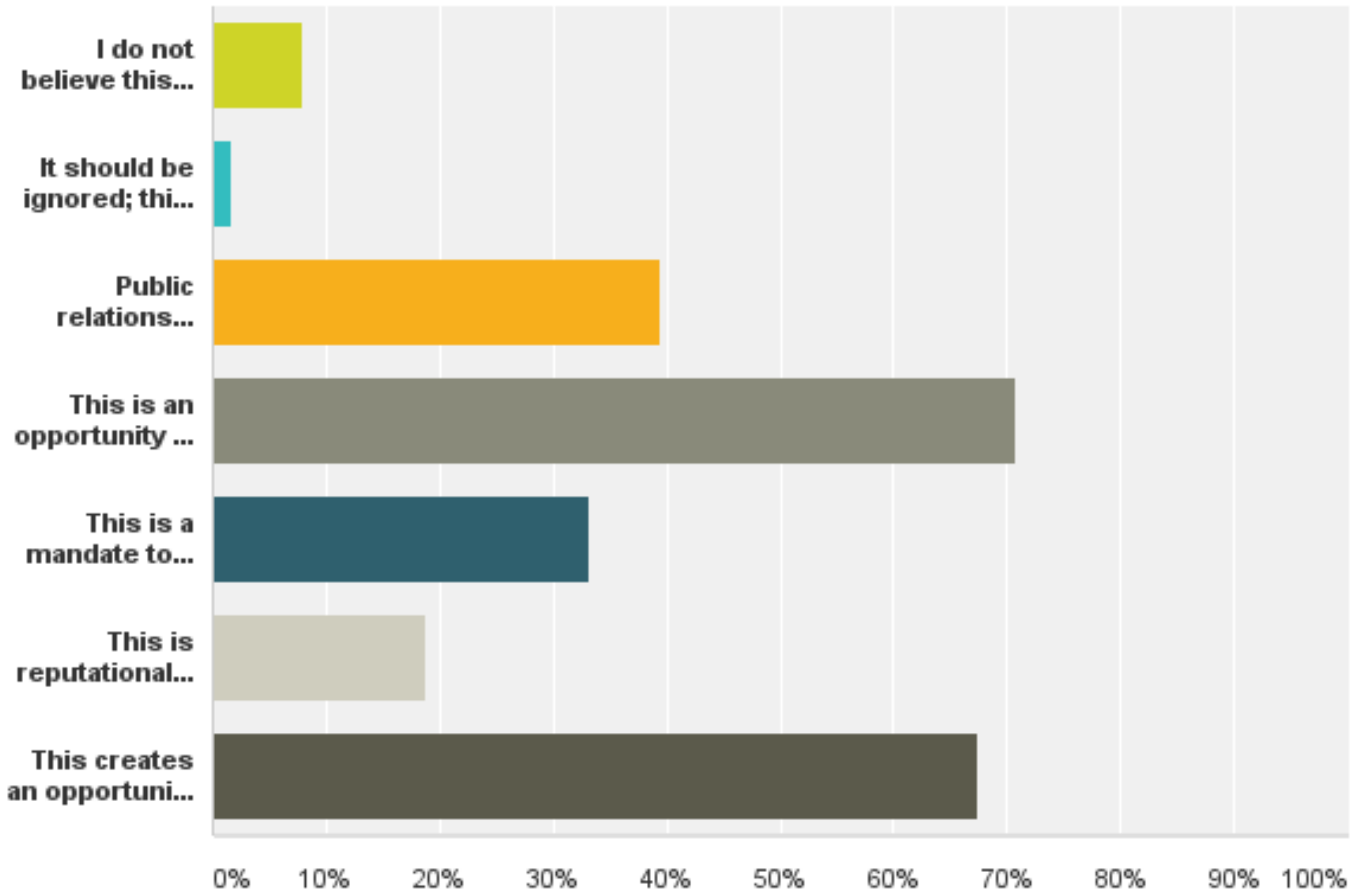
92% of Americans want their community water provider to be a leader in preparing their community for climate change.

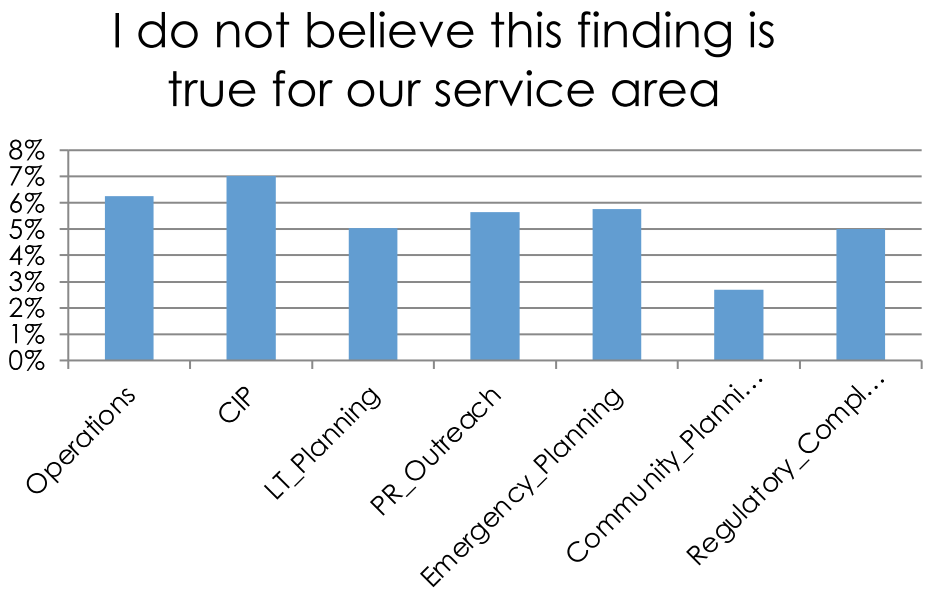
And that,

Community water providers are a trusted source for climate information.

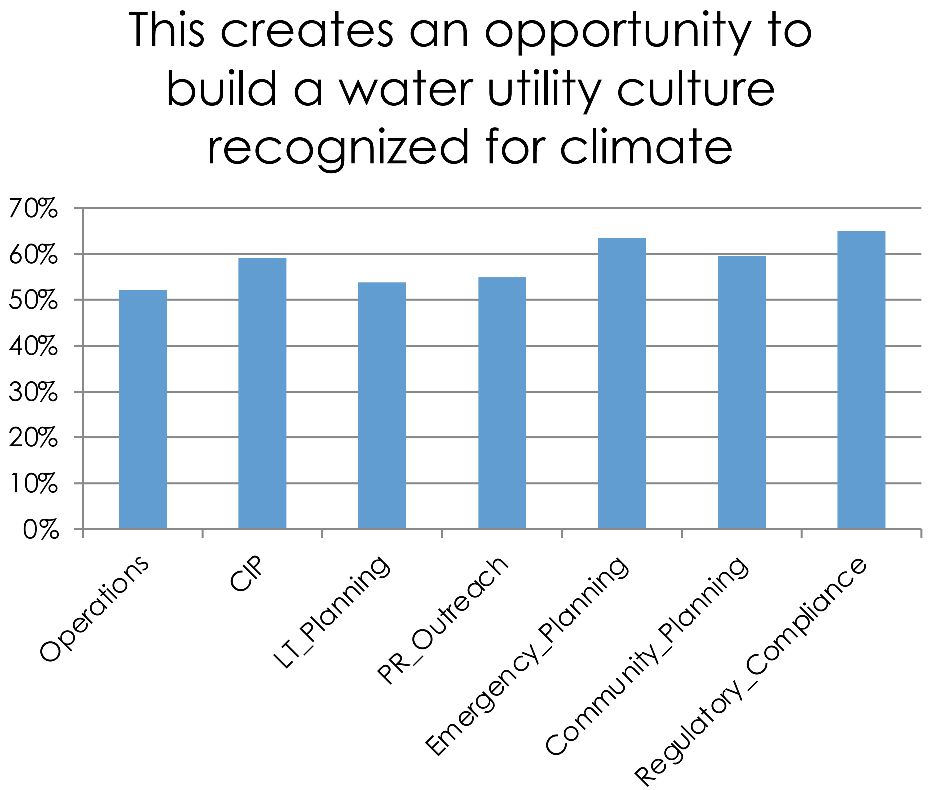
Q18 Please indicate how you personally think water utilities should use these data-based public opinion insights? Mark all that apply.

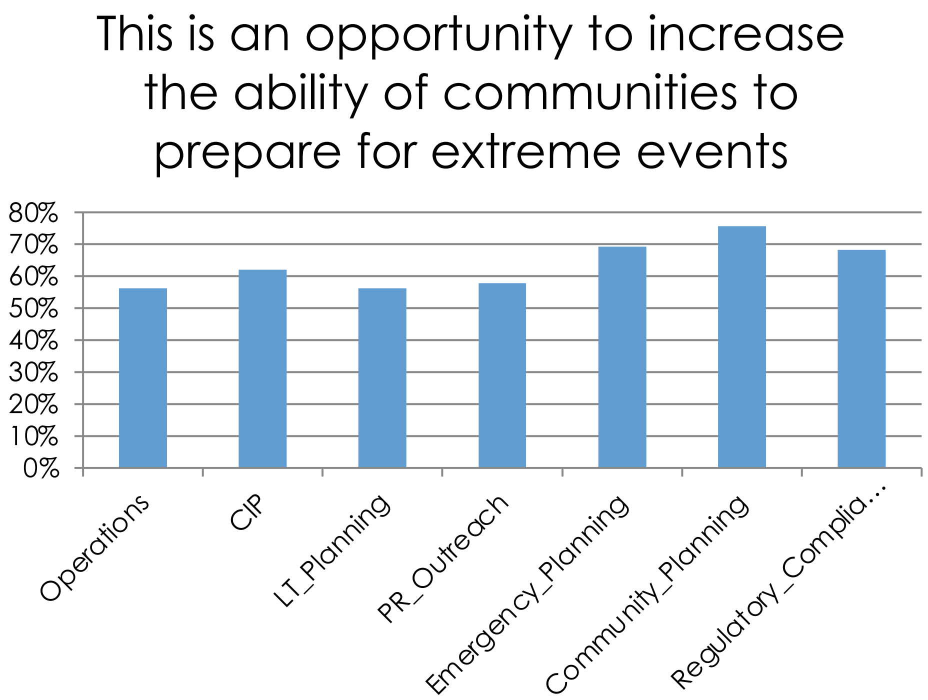
Answered: 175 Skipped: 73

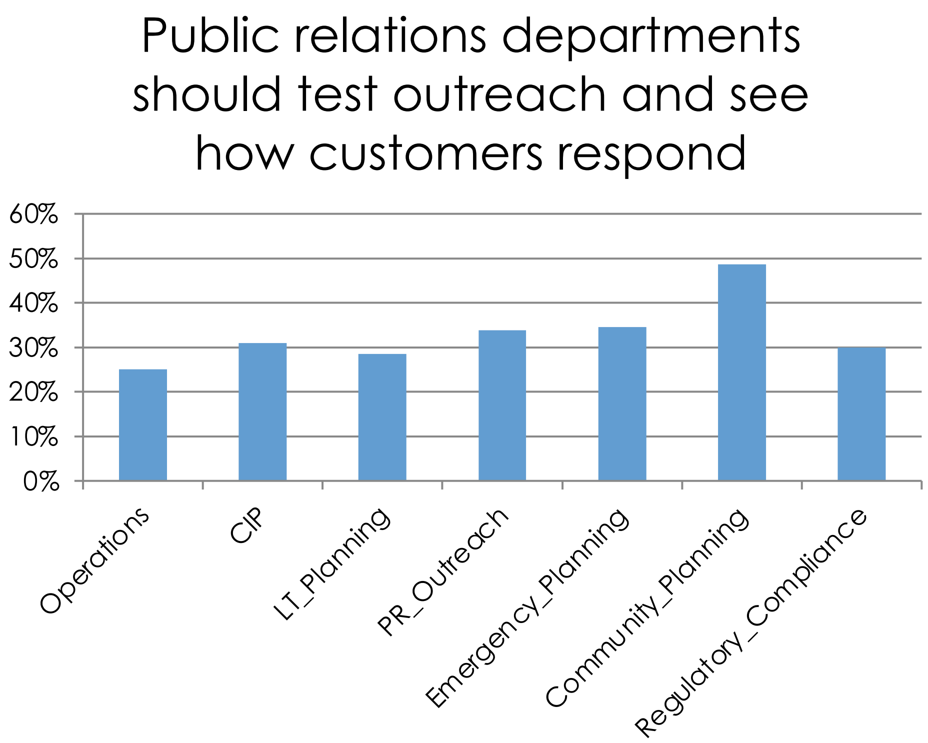




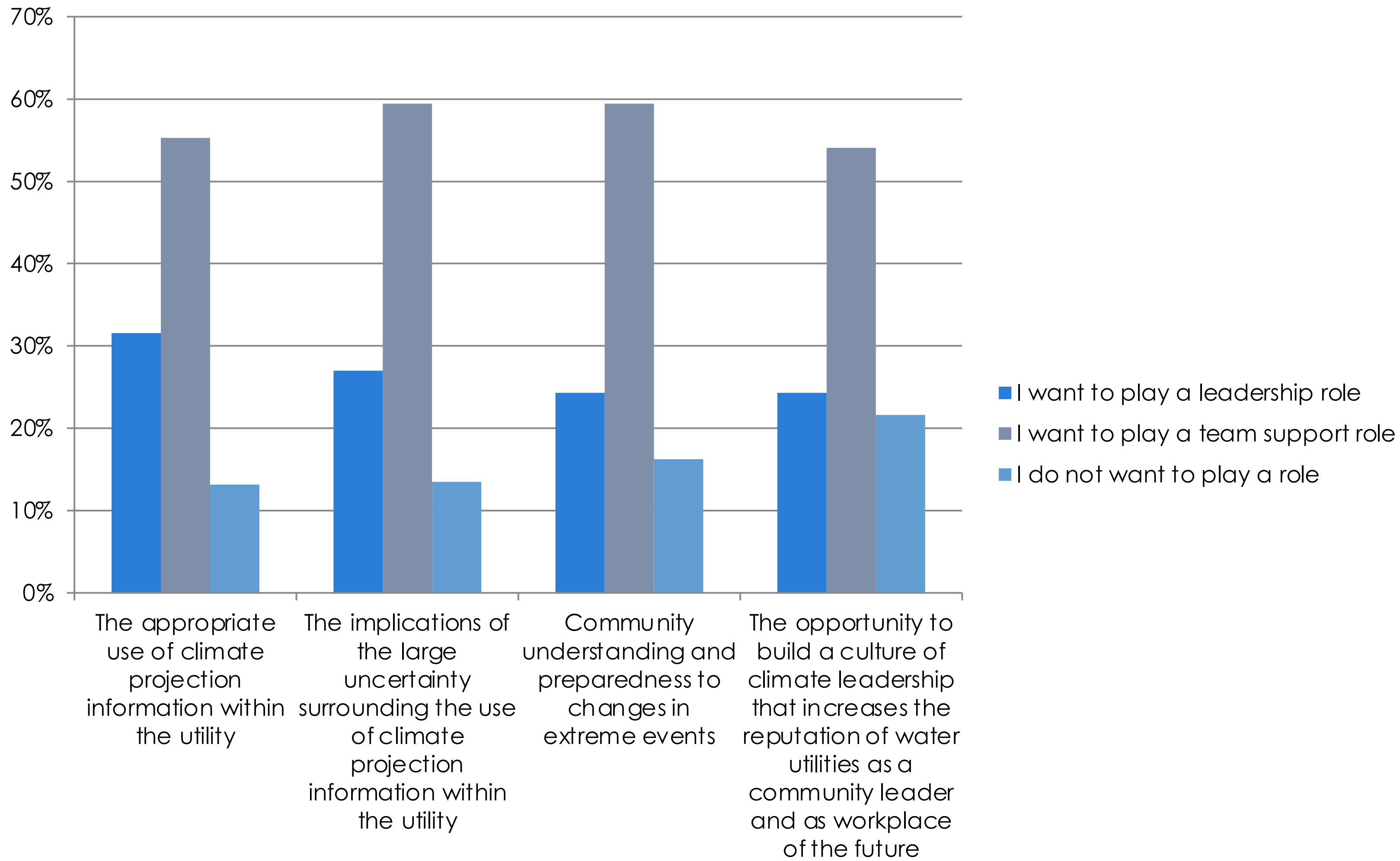
I do not believe this finding is true for our service area
8%
7%
6%
5%
4%
3%
2%
1%
0%
Operations
CIP
LT_Planning
PR_Outreach
Emergency_Planning
Community_Planni...
Regulatory_Compl...


This creates an opportunity to
build a water utility culture
recognized for climate
70%
60%
50%
40%
30%
20%
10%
0%
Operations
CIP
LT_Planning
PR_Outreach
Emergency_Planning
Community_Planning
Regulatory_Compliance


This is an opportunity to increase the ability of communities to prepare for extreme events
80%
70%
60%
50%
40%
30%
20%
10%
0%
Operations
CIP
LT_Planning
PR_Outreach
Emergency_Planning
Community_Planning
Regulatory_Complia...



Public relations departments should test outreach and see how customers respond
60%
50%
40%
30%
20%
10%
0%
Operations
CIP
LT_Planning
PR_Outreach
Emergency_Planning
Community_Planning
Regulatory_Compliance


70%
60%
50%
40%
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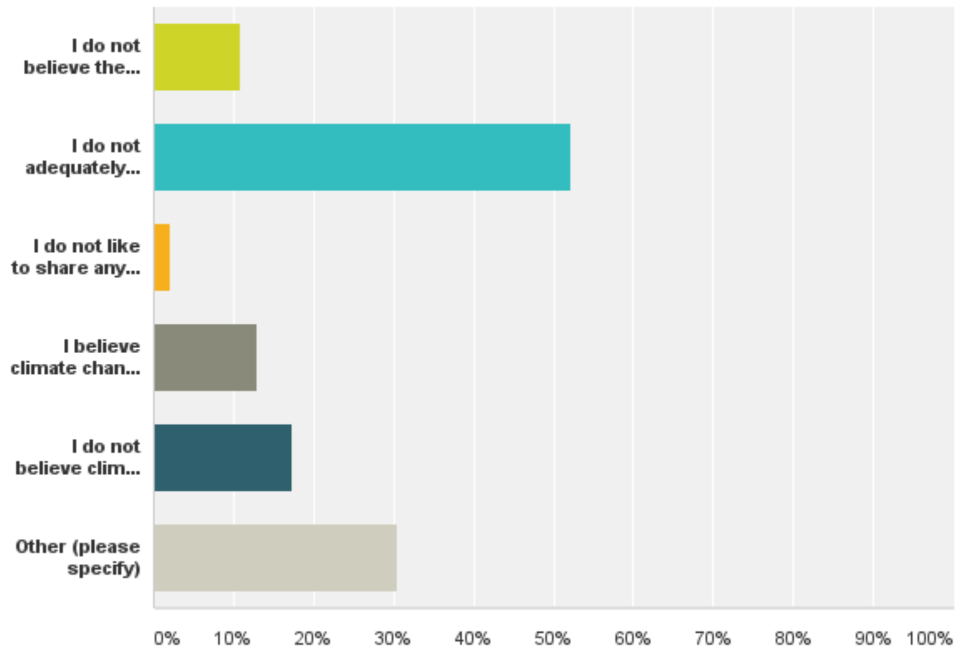
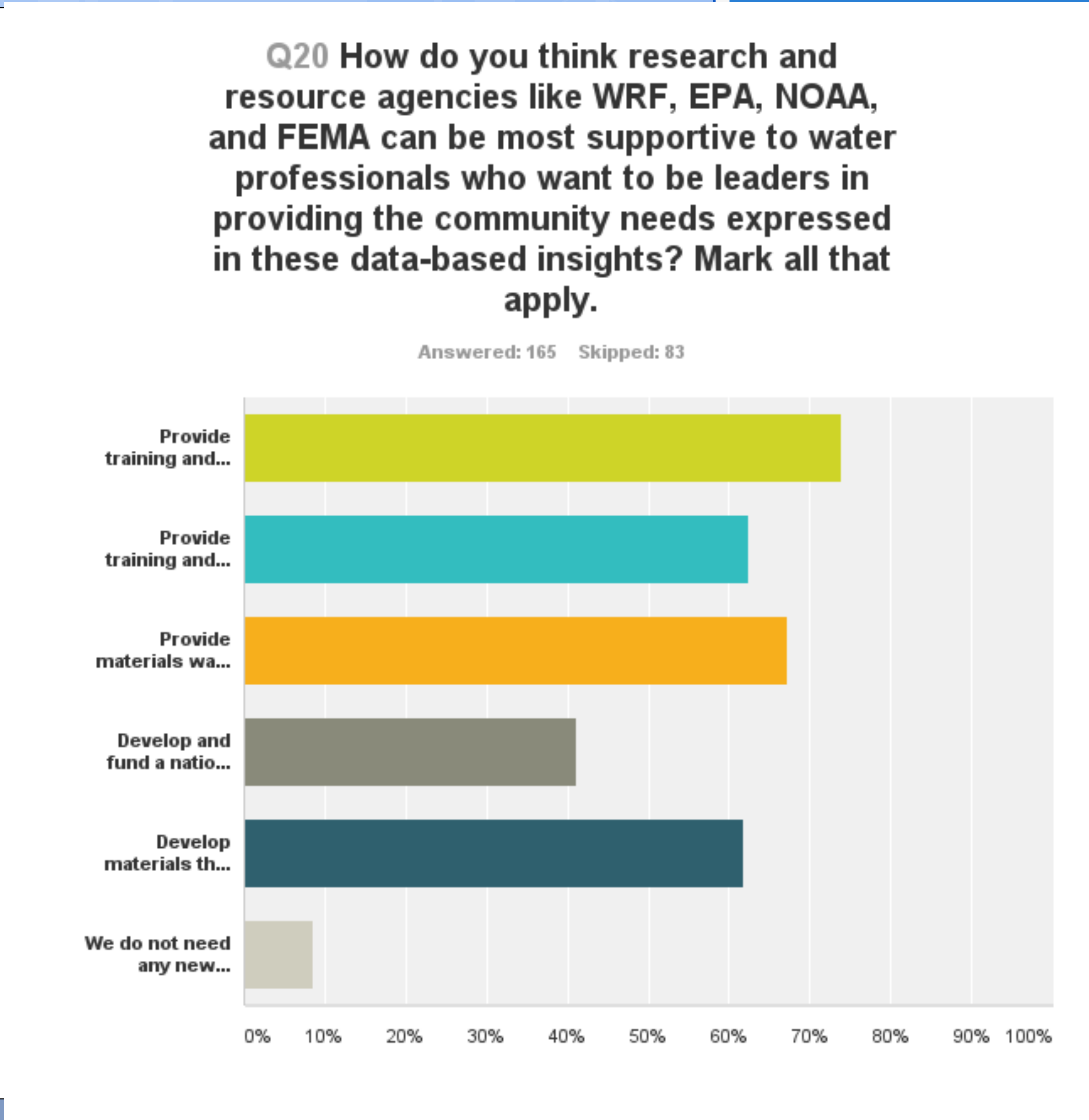
20%
10%
0%
The appropriate use of climate projection information within the utility
The implications of the large uncertainty surrounding the use of climate projection information within the utility
Community understanding and preparedness to changes in extreme events
The opportunity to build a culture of climate leadership that increases the reputation of water utilities as a community leader and as workplace of the future
I want to play a leadership role
I want to play a team support role
I do not want to play a role

Q23 If you indicated you do not want to play a role in sharing climate information and creating an understanding in any of the situations, please answer this question. If not, skip it.I do not want to share climate-water information because... (Mark all that apply)

Answered: 46 Skipped: 202

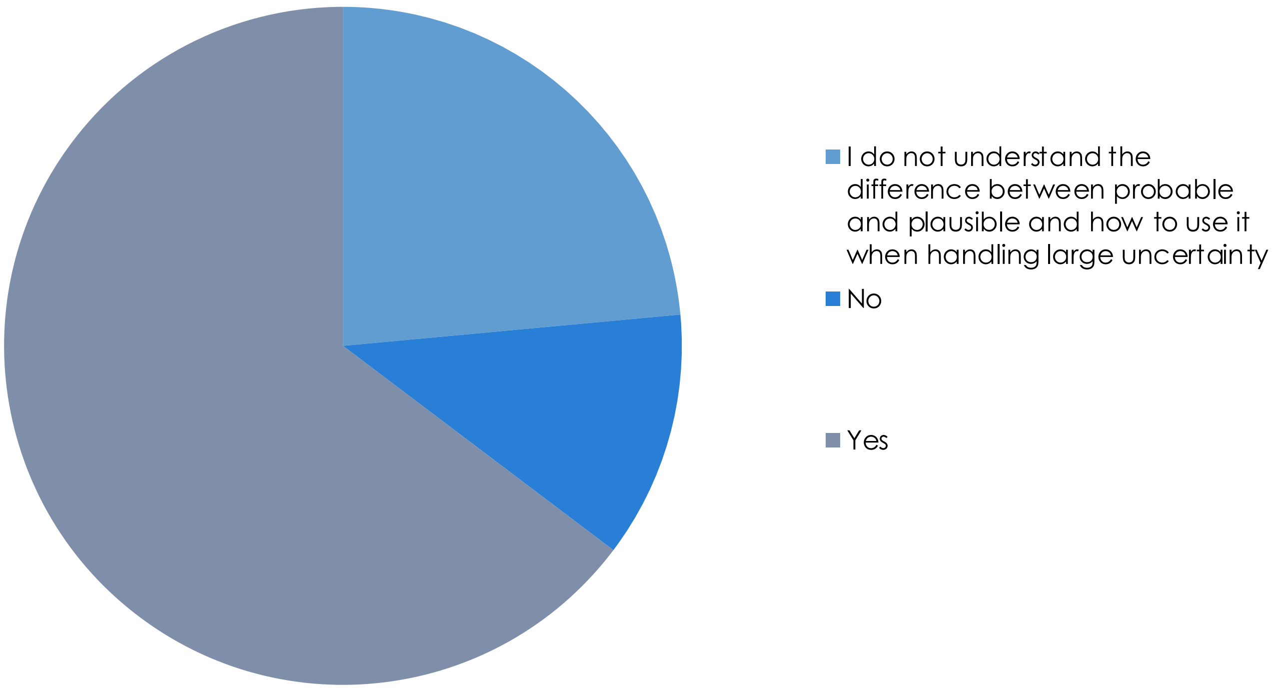


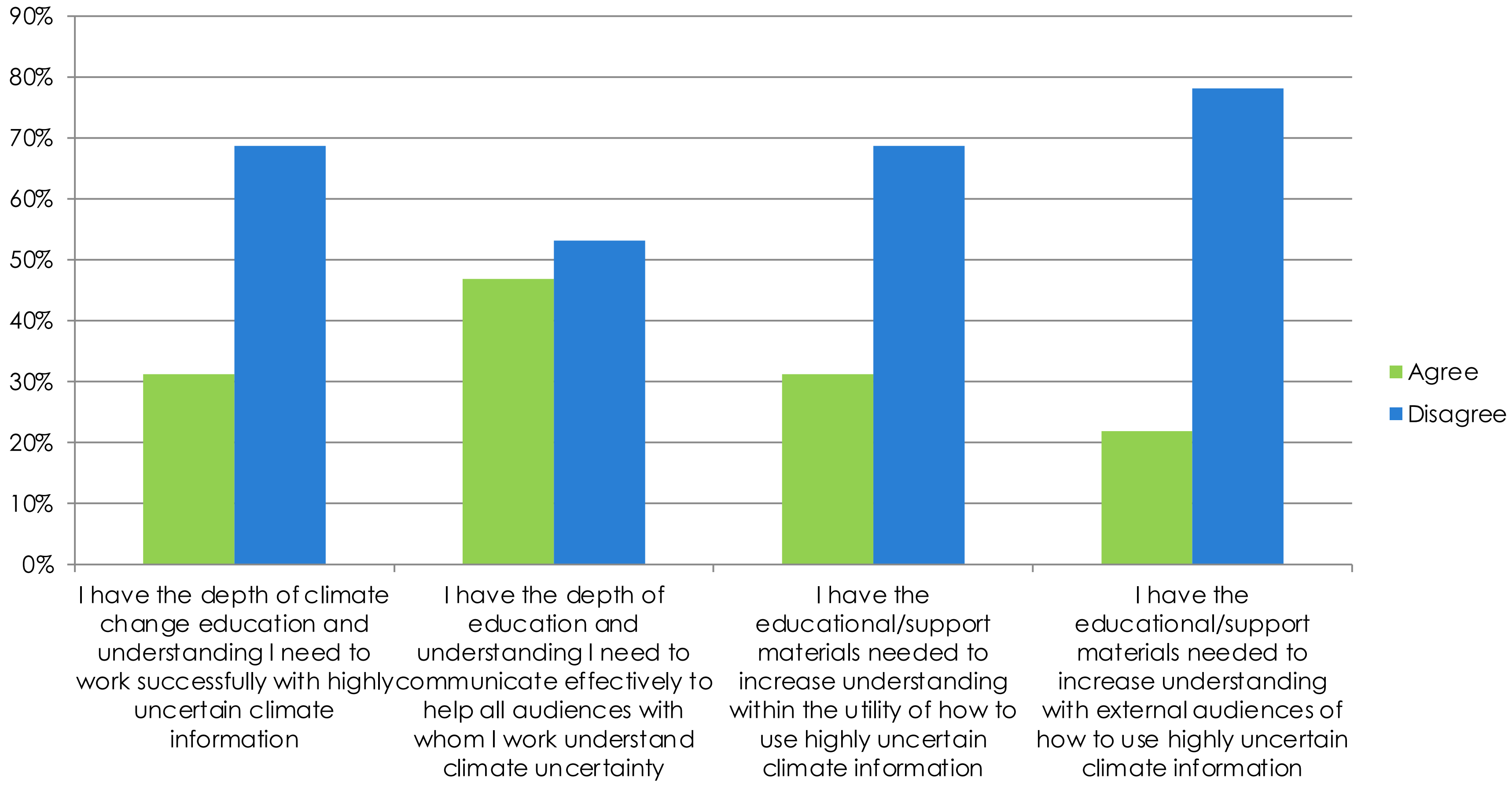

Q20 How do you think research and resource agencies like WRF, EPA, NOAA, and FEMA can be most supportive to water professionals who want to be leaders in providing the community needs expressed in these data-based insights? Mark all that apply.
Answered: 165 Skipped: 83
Provide training and...
Provide training and...
Provide materials wa...
Develop and fund a natio...
Develop materials th...
We do not need any new...
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%

What trainings educational products do you want?

What are the missing pieces?

Plausibility?


I do not understand the difference between probable and plausible and how to use it when handling large uncertainty
No
Yes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0%
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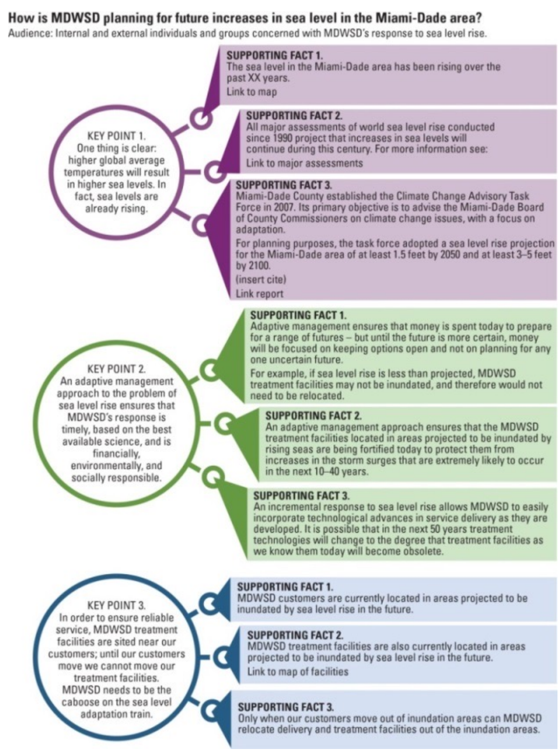
I have the educational/support materials needed to increase understanding within the utility of how to use highly uncertain climate information
I have the educational/support materials needed to increase understanding with external audiences of how to use highly uncertain climate information
Agree
Disagree

Primers

- *What is your objective – What is the change you want to create?*
- *What are your audiences questions of critical concern?* ***Listen!***
- *What is the emotional connector?*
- *What is your 27/9/3 banner statement?*
- *How will you evaluate and modify?*

Sample Message Map



Large Future Uncertainty

Thank you!!!

And the winner is…..
rbillingsley@cap-az.com

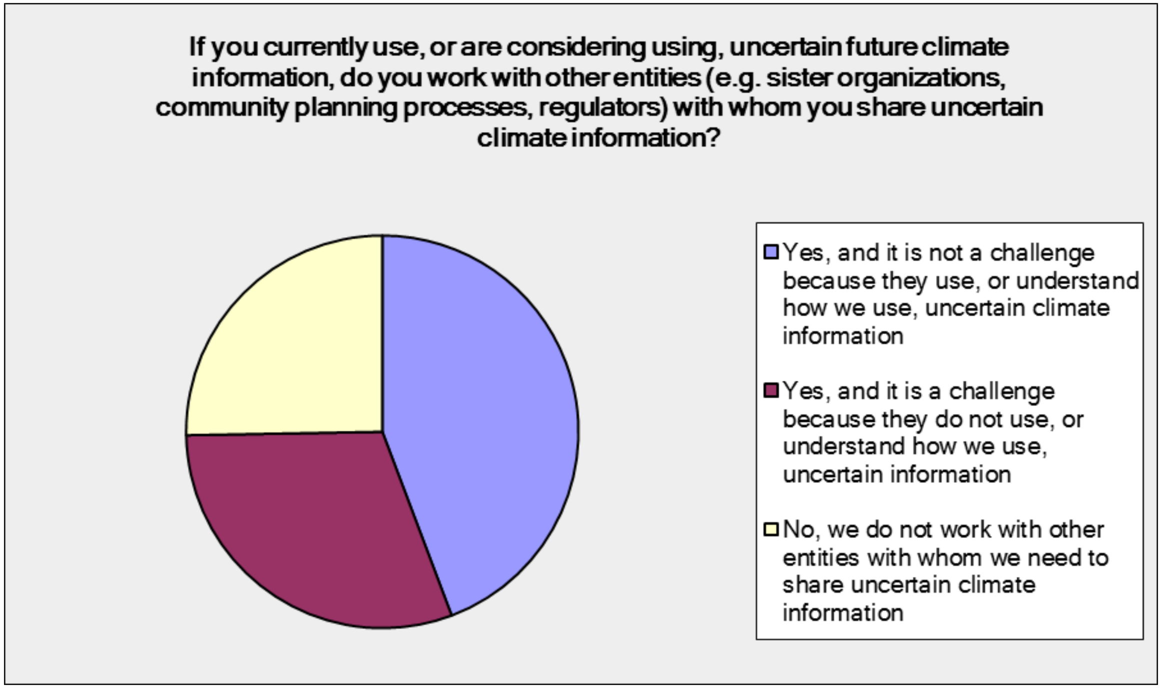
Karen Raucher
kraucher@coronaenviro.com
303.579.2864

Q13 If you checked "Unlikely to use" for any of the action areas in the previous question, please answer this question. If not, please skip it. I do not believe our utility needs to use this type of climate projection information because (Mark all that apply)

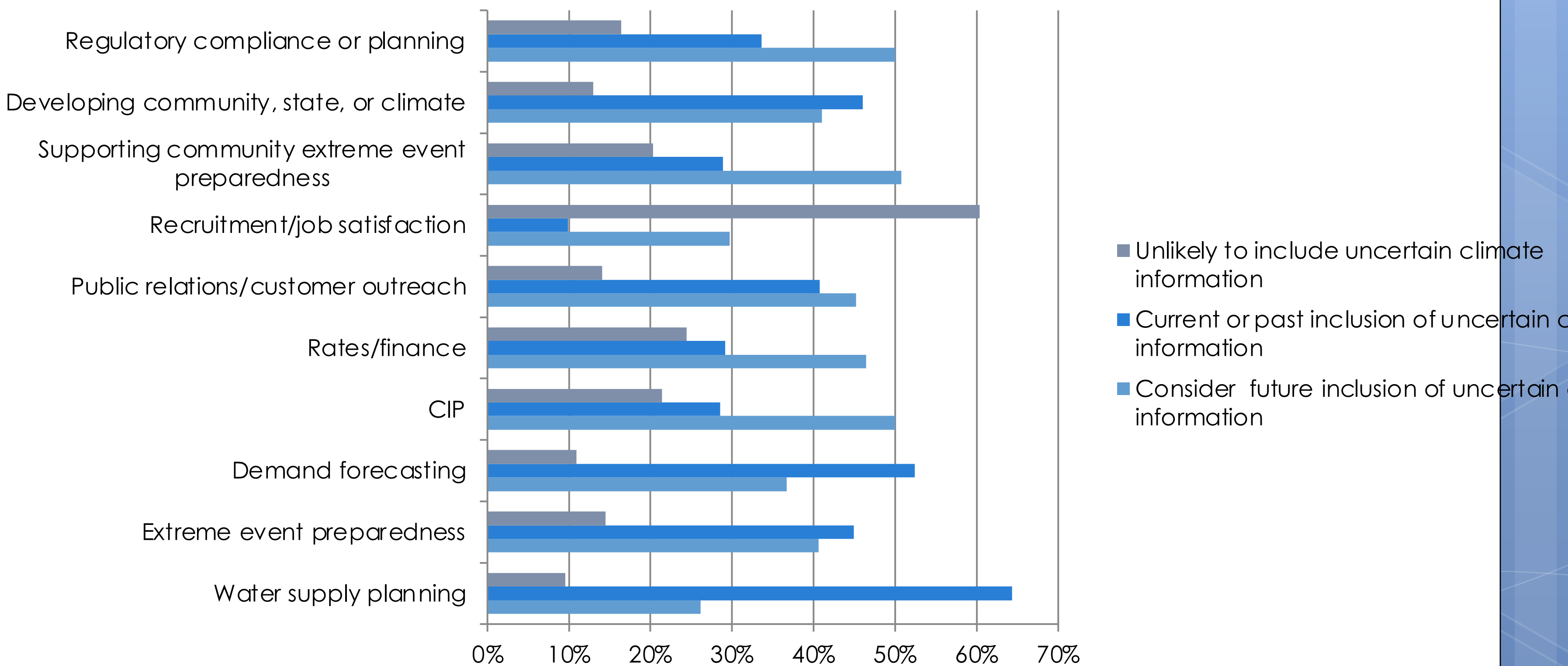
Answered: 88 Skipped: 160

Q6 Please list the entities with whom you share uncertain climate information.

Answered: 78 Skipped: 170


If you currently use, or are considering using, uncertain future climate information, do you work with other entities (e.g. sister organizations, community planning processes, regulators) with whom you share uncertain climate information?
Yes, and it is not a challenge because they use, or understand how we use, uncertain climate information
Yes, and it is a challenge because they do not use, or understand how we use, uncertain information
No, we do not work with other entities with whom we need to share uncertain climate information

Q12. In which of the following action areas does your agency currently apply, or might consider applying in the future, uncertain climate projection or assessment information?



Q14 To the best of your knowledge, does your agency currently use, or might consider using in the future, any of the analytical approaches/methods/models/tools listed below designed to increase understanding of potential climate impacts, implications, and adaptation needs? Mark all that apply.

Answered: 154 Skipped: 94