

Use, needs, and views on climate information of water managers in Southeastern U.S.

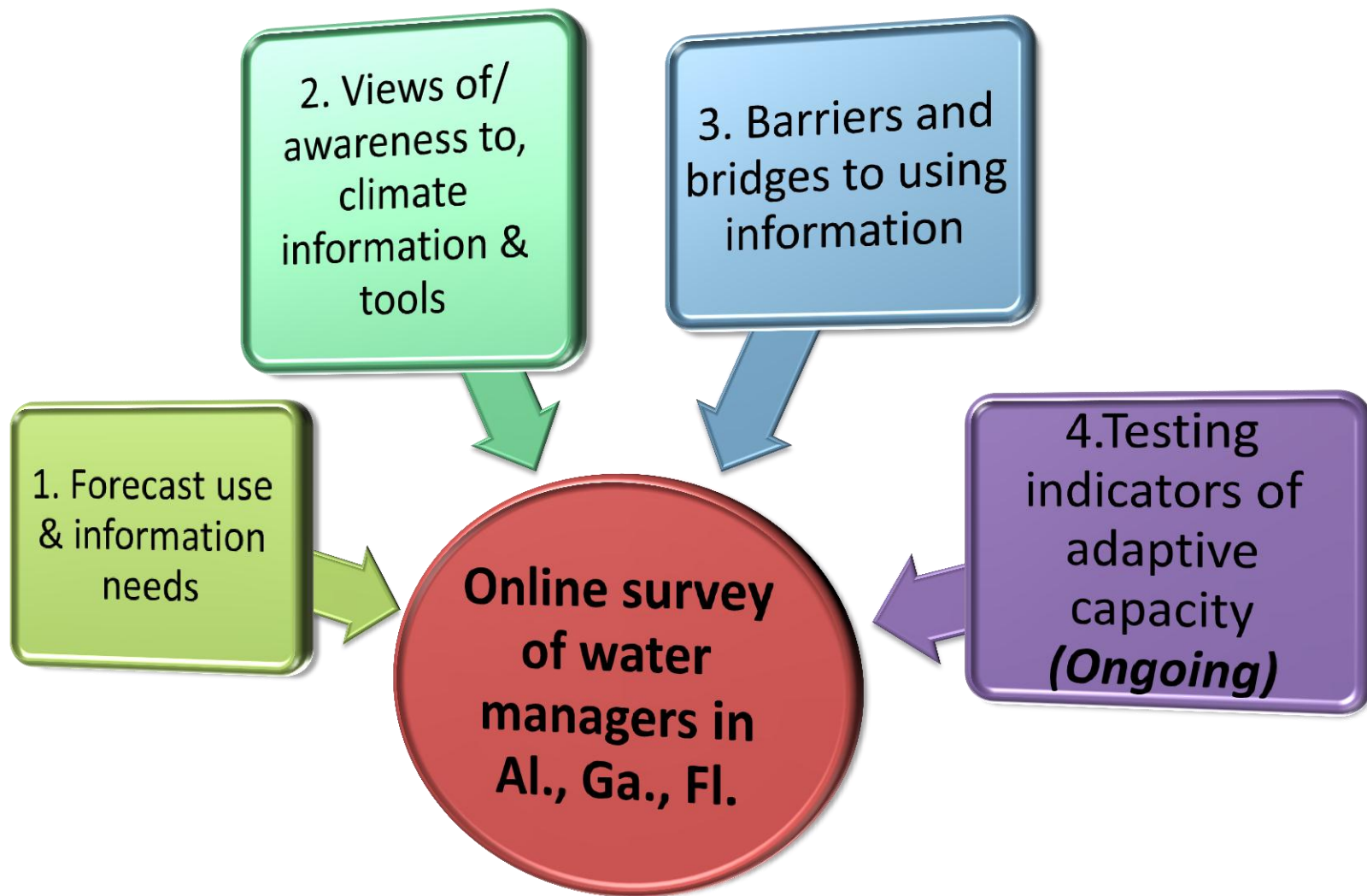
Jessica Bolson and Chris Martinez
University of Florida

Project Description

- 2 SARP Assessment Projects
 - Martinez et al.
 - Mid to large size water managers throughout Florida, Alabama, and Georgia
 - Srivastava et al.
 - Small water managers in ACF Basin
- Other SECC Collaborators:
 - Norman Breuer, Pam Knox, Tatiana Borisova



-Objectives of assessment



Motivation for research

Recent droughts cause for increased concern

Rainfall in SE is moderated by ENSO

U.S. Drought Monitor Southeast

October 30, 2007
Valid 7 a.m. EST

Drought Conditions (Percent Area)						
	None	D0-D4	D1-D4	D5-D6	D7-D8	D9
Current	18.8	85.2	66.7	46.3	31.3	18.5
Last Week (10/23/07 map)	13.6	86.4	73.6	64.3	50.0	31.4
5 Months Ago (6/01/07 map)	2.4	97.6	78.1	42.9	26.4	14.1
Start of Calendar Year (1/01/07 map)	52.2	47.8	10.2	1.5	0.0	0.0
Start of Water Year (10/01/06 map)	95.1	89.9	77.9	63.8	45.2	24.0
One Year Ago (10/31/06 map)	48.1	51.9	21.8	0.0	0.0	0.0



Conflicts for water, trans-boundary issues, and water resource scarcity are increasing

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New to Being Dry, the South Struggles to Adapt



ATLANTA, Oct. 22 — For more than five months, the lake that provides drinking water to almost five million people here has been draining away in a withering drought. Sandy beaches have expanded into flats of orange mud. Tree stumps not seen in half a century have resurfaced. Scientists have warned of impending disaster.

Enlarge This Image



John Bazemore/Associated Press
Low levels this month at Lake Lanier, which supplies water to Atlanta. The Southeast has been slow to respond to its drought.

And life, for the most part, has gone on just as before.

The response to the worst drought on record in the Southeast has unfolded in ultra-slow motion. All summer, more than a year after the drought began, fountains sprayed and football fields were watered, prisoners got two showers a day and Coca-Cola's bottling plants chugged along at full strength. On an 81-degree day this month, an outdoor theme park began to manufacture what was intended to be a 1.2-million-gallon mountain of snow.

By September, with the lake forecast to dip into the dregs of its storage capacity in less than four months, the state imposed a ban on outdoor water use.

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WORLD U.S. N.Y. / REGION BUSINESS TECHNOLOGY SCIENCE HEALTH SPORTS OPINION

POLITICS EDUCATION BAY AREA CHICAGO TEXAS

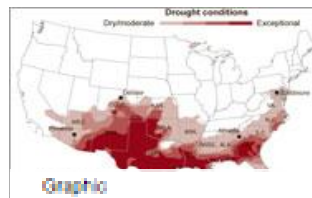
Drought Spreads Pain From Florida to Arizona



Grant Blankenship for The New York Times

Buster Haddock, an agricultural scientist at the University of Georgia, in a field where cotton never had the chance to grow.
[More Photos »](#)

By KIM SEVERSON and KIRK JOHNSON
Published: July 11, 2011



Dangerously Dry



Motivation for research

WEATHER FORECASTS ARE FOR WIMPS*: WHY WATER RESOURCE MANAGERS DO NOT USE CLIMATE FORECASTS

STEVE RAYNER¹, DENISE LACH² and HELEN INGRAM³

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Rayner et al., 2005

JOURNAL OF THE AMERICAN WATER RESOURCES ASSOCIATION
VOL. 35, NO. 6 AMERICAN WATER RESOURCES ASSOCIATION DECEMBER 1999

WEATHER AND CLIMATE EXTREMES, CLIMATE CHANGE, AND PLANNING Views of Community Water System Managers in Pennsylvania's Susquehanna River Basin¹

*Robert E. O'Connor, Brent Yarnal, Rob Neff, Richard Bord, Nancy Wiefek,
Christopher Reenock, Robin Shudah, Christine L. Jocoy, Peter Pascale, and C. Gregory Knight²*

O'Connor et al., 1999



JOURNAL OF THE AMERICAN WATER RESOURCES ASSOCIATION

AMERICAN WATER RESOURCES ASSOCIATION

December 2008

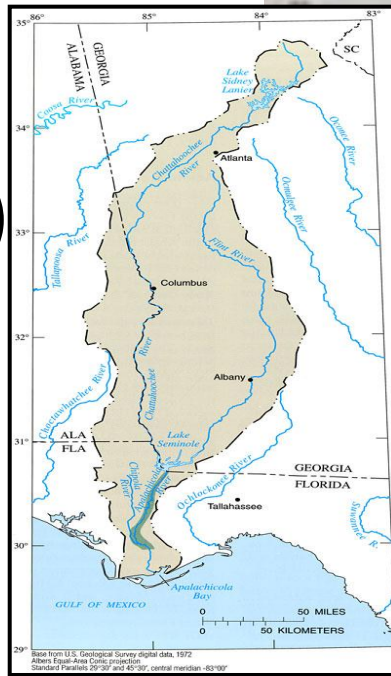
WHAT INFLUENCES INNOVATION ADOPTION BY WATER MANAGERS? CLIMATE INFORMATION USE IN BRAZIL AND THE UNITED STATES¹

Maria Carmen Lemos²

Lemos, 2008

More recently there has been more focus on bridges that enable the integration of Seasonal climate information into decision making.

Region (Al., Ga., Fl., & the ACF Basin)



Context

Diverse systems

-Management structures and institutions

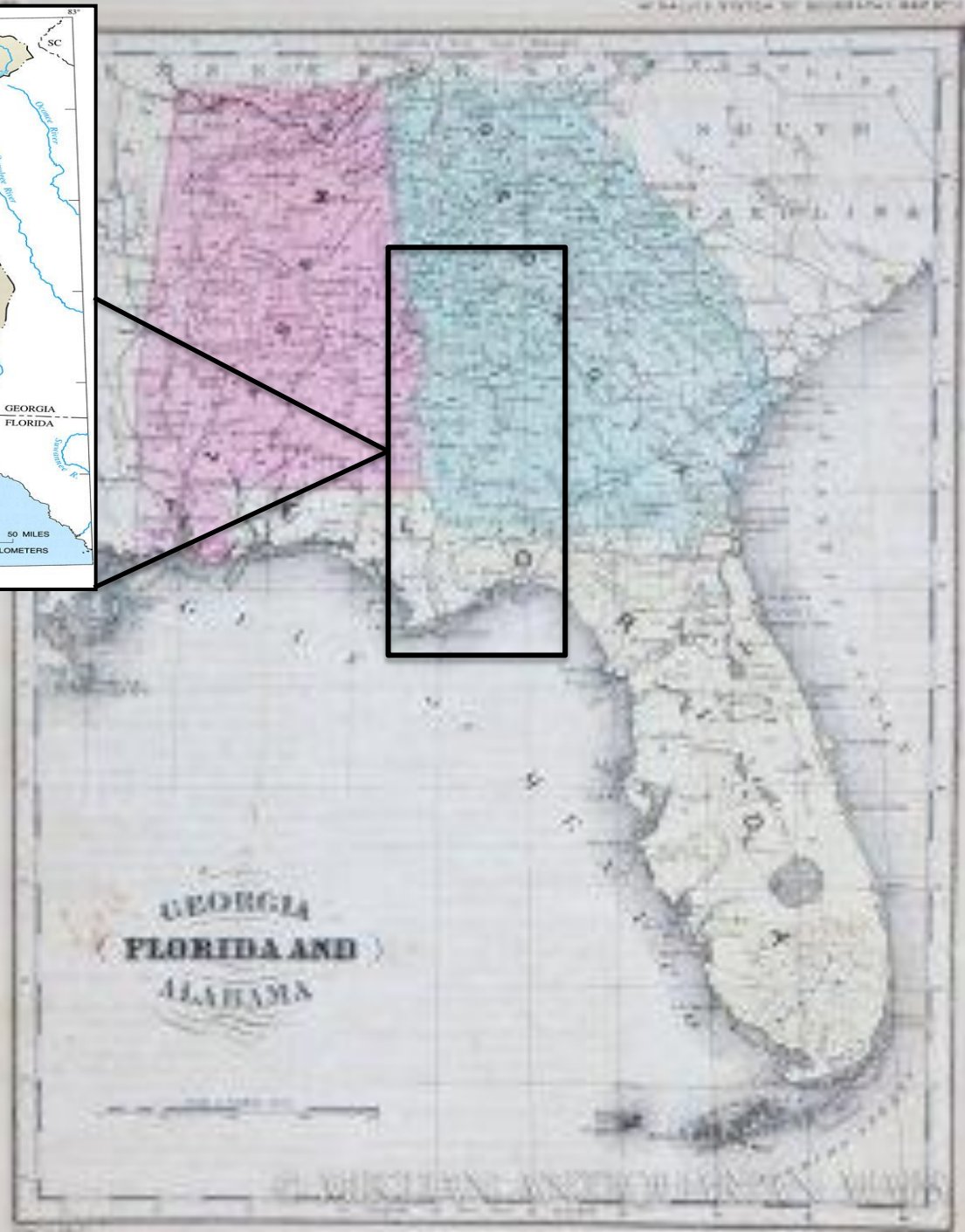
-Geographical contexts

-Water sources

-Stakeholders

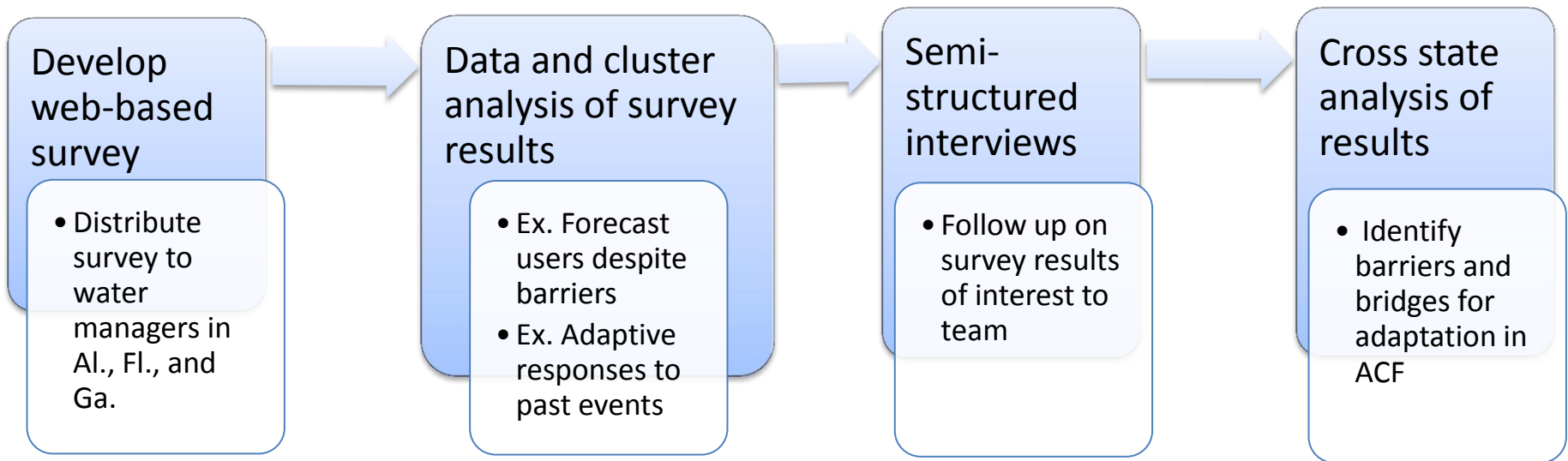
-Resources/Capacity

5/10/12



Research Approach

Region- and sector-specific assessment of stakeholders is essential to providing useful and relevant forecasts and decision support



Ongoing iterative feedback using tools/forecasts currently under development

Online survey

Assessing Southeast Water Man... x Qualtrics Survey Software x Southeastern U.S. Water Manage... x +

qualtrics.com https://uffred.qualtrics.com/SE/?SID=SV_8eHX5ueL1nn6U3W

how to take a screen snapshot

qualtrics.com

1b. If one of your responsibilities is providing municipal water supply, what is the population you serve?

☐ 500 people or fewer

☐ 501-3,300 people

☐ 3,301-50,000 people

☐ 50,001-100,000 people

☐ 100,001-200,000 people

☐ 200,001-500,000 people

☐ more than 500,000 people

☐ Do not know

☐ Not applicable

0% 100%

<< >>

Survey Powered By Qualtrics®

Findings

- Survey respondents
- Use of climate information
- Need for climate information
- Barriers to using climate information
- Opportunities to improve the integration of climate information
- Future directions

Water managers surveyed

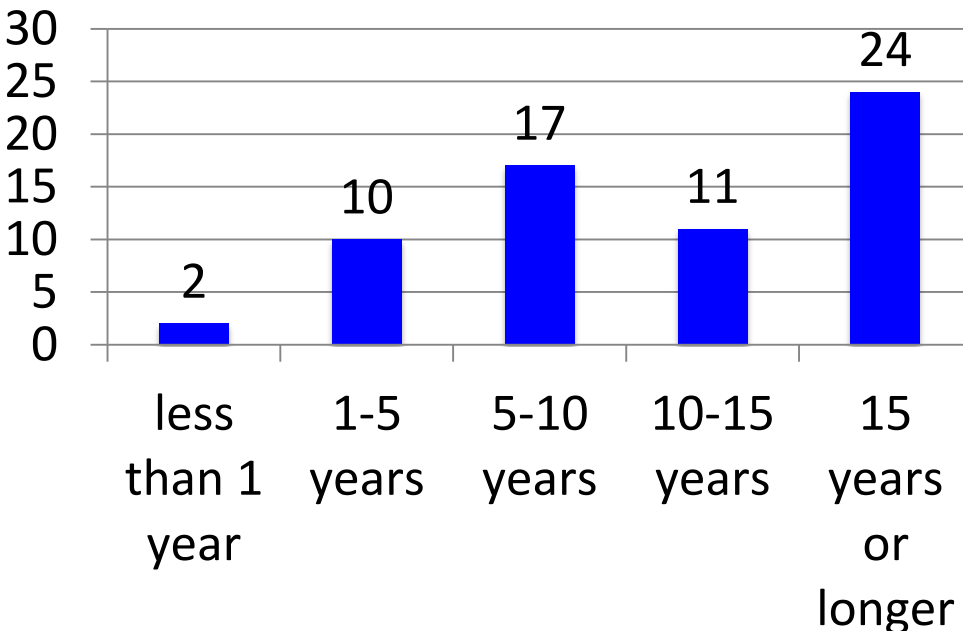
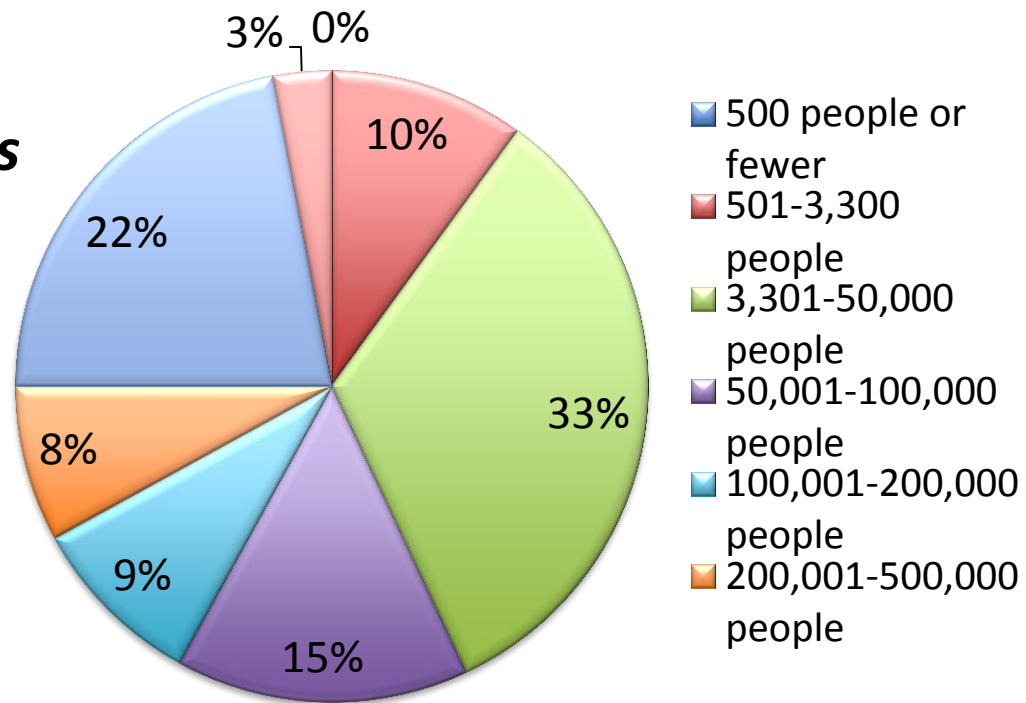
Who responded to the survey?

Surveys successfully emailed	Surveys completed	Response rate
850	141	16.6%

	Georgia	Alabama	Florida	Total
Water managers surveyed	42	68	31	141

Water managers surveyed

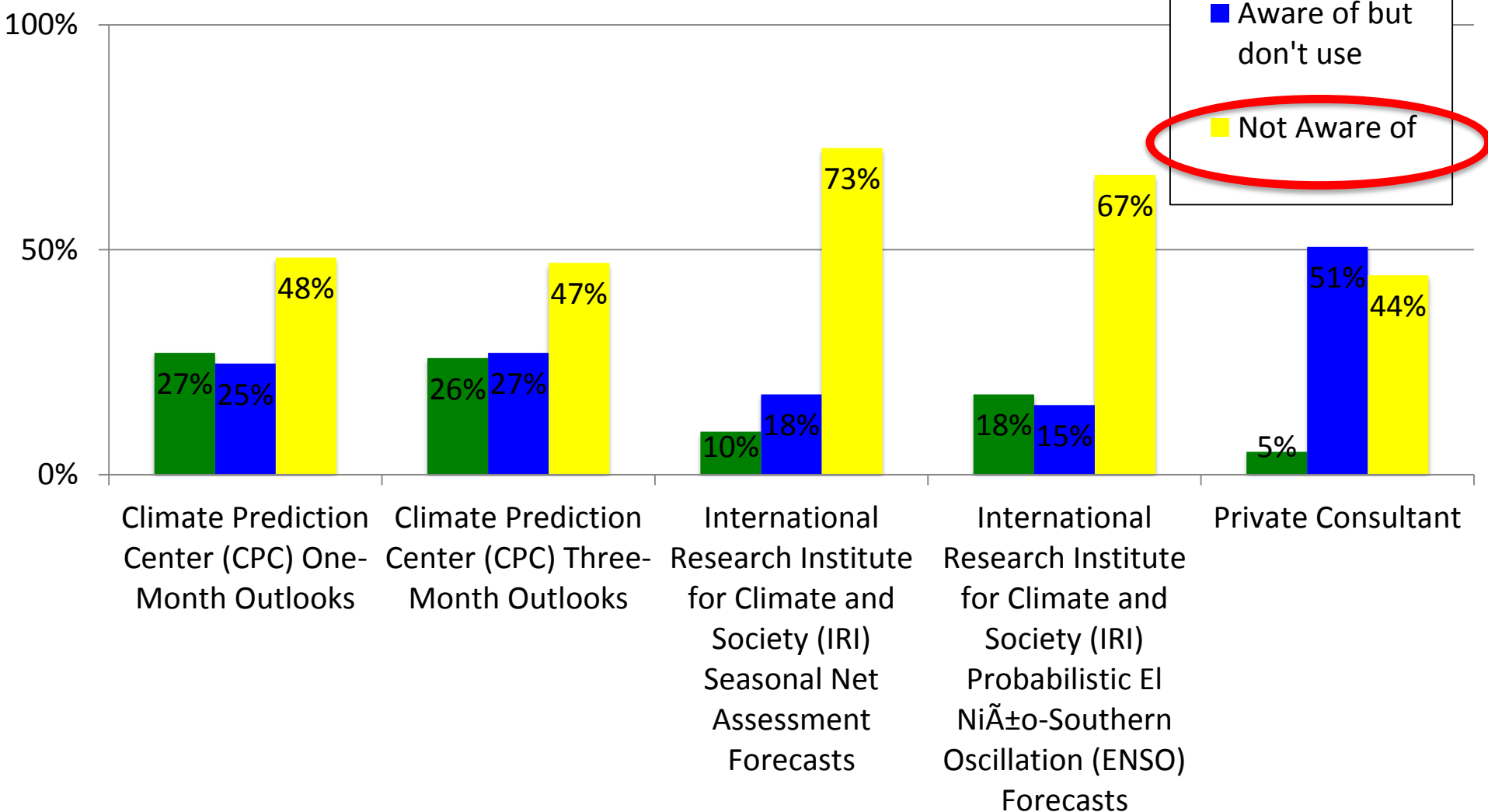
“If one of your responsibilities is providing municipal water supply, what is the population you serve?”



“Years working in current water management agency”

Use

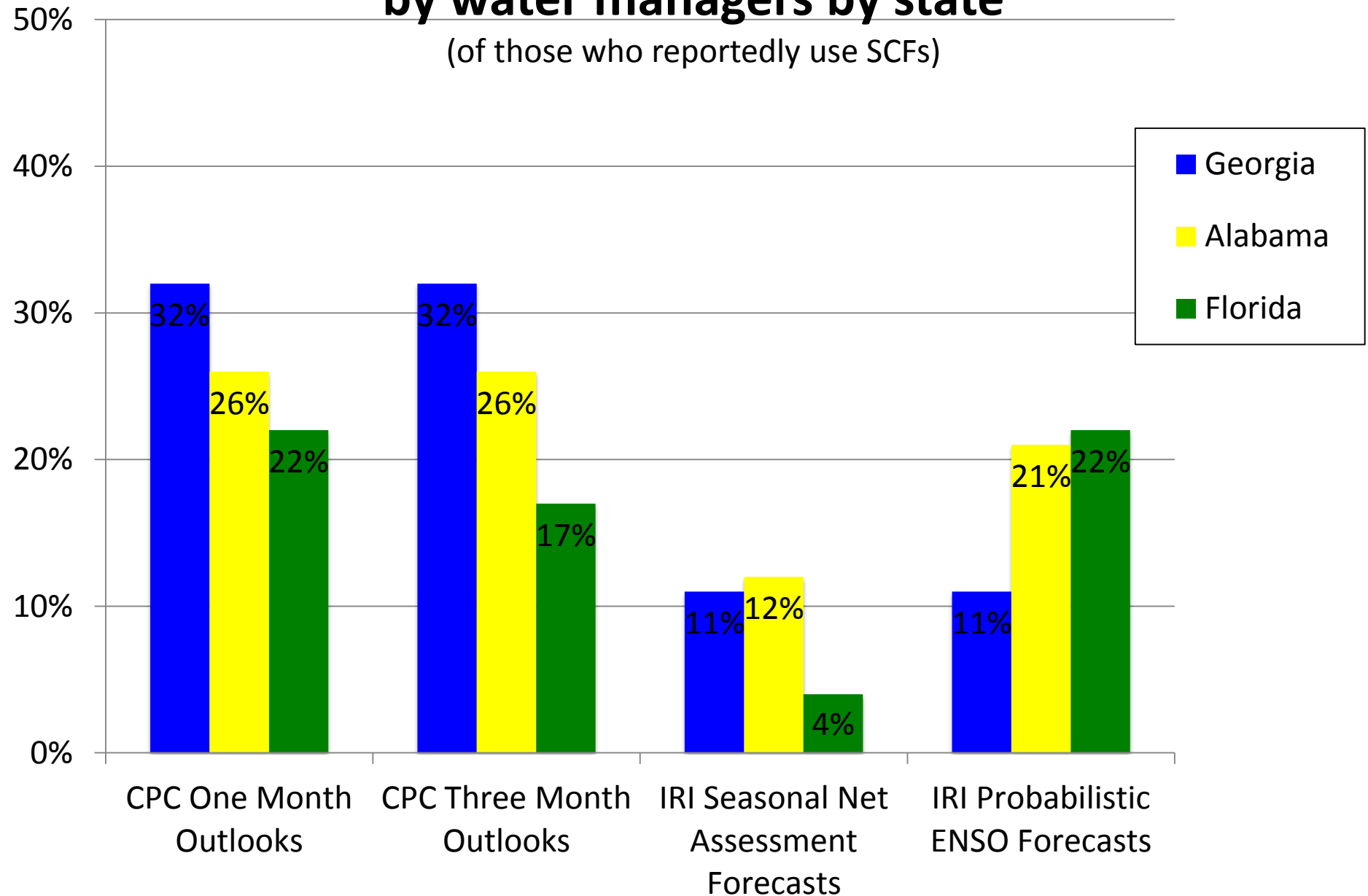
Use of seasonal climate forecasts (n=85)



Use of seasonal climate forecasts by water managers by state

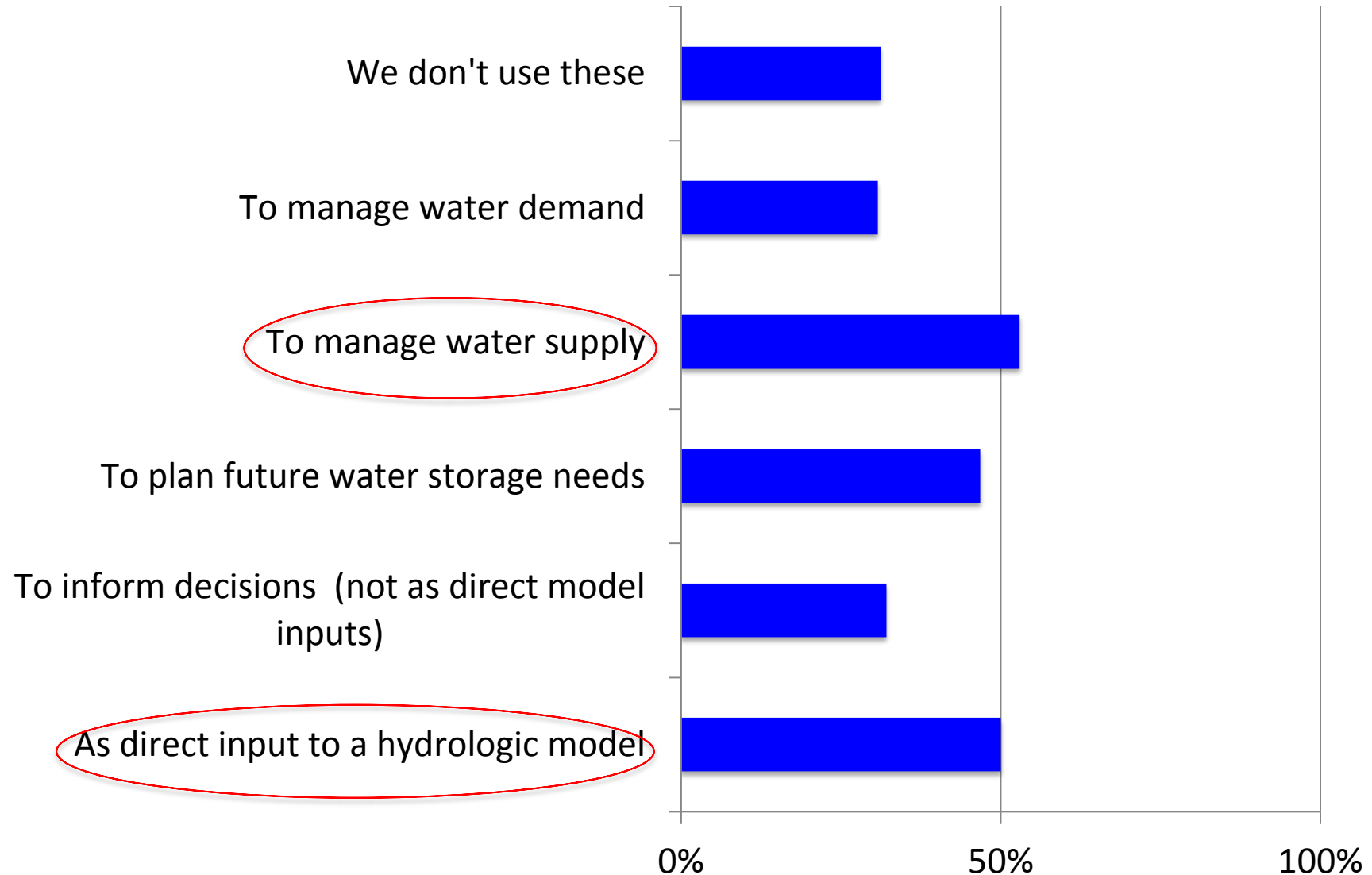
Use

(of those who reportedly use SCFs)



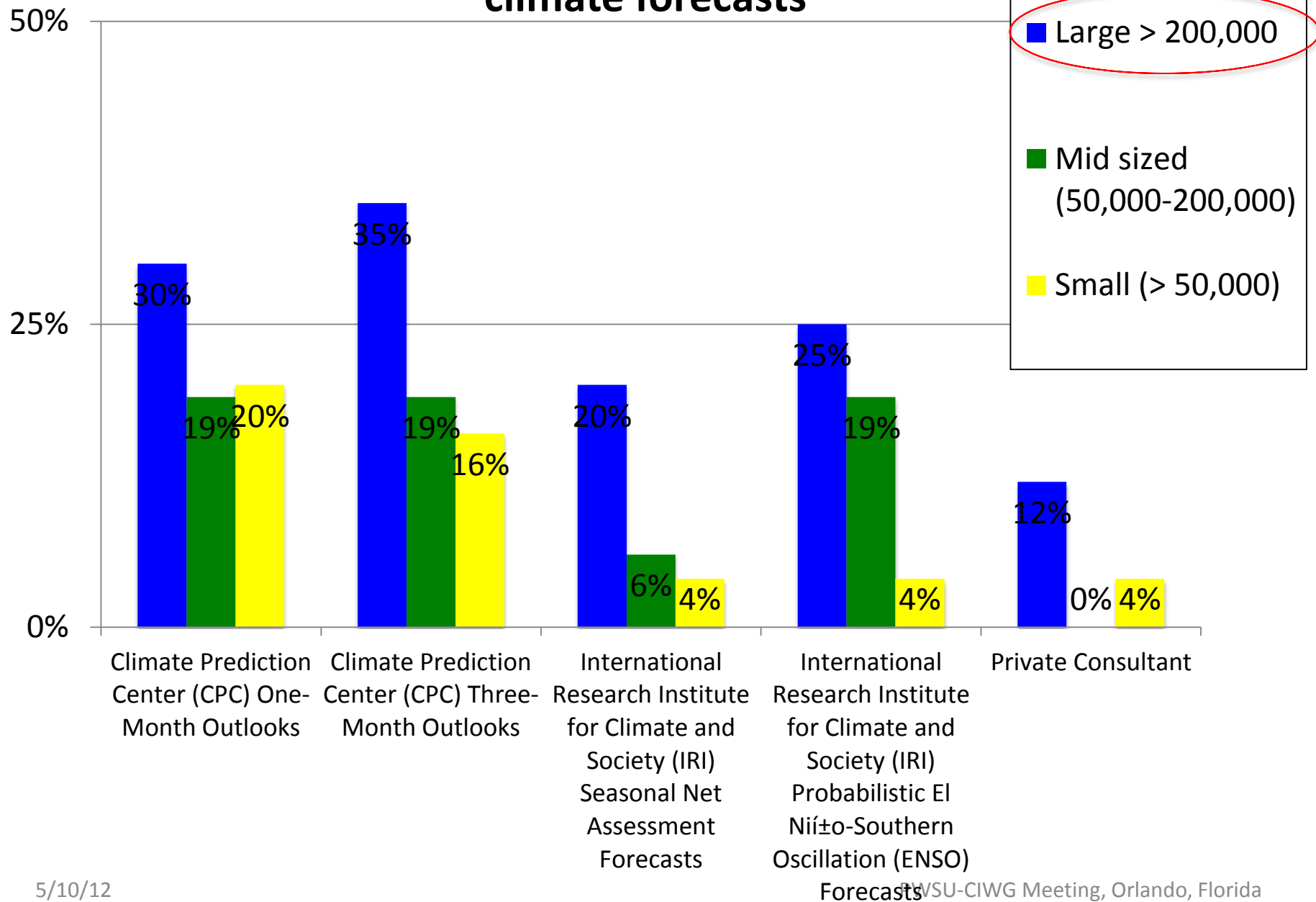
Use

How do water managers use seasonal climate forecasts? n=72



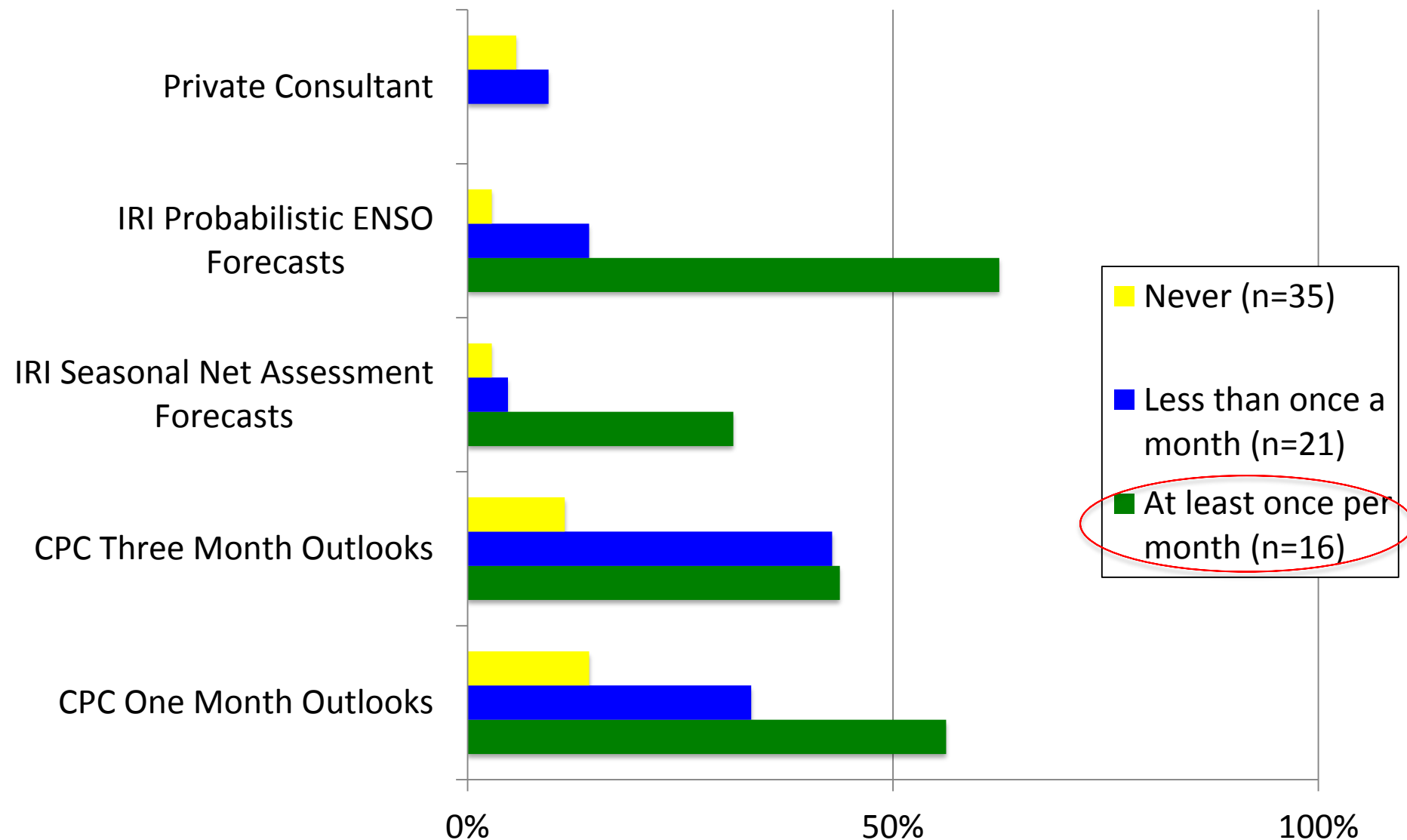
Use

Size of agency and use of seasonal climate forecasts



Use

Use of SCFs and interactions with climate scientists

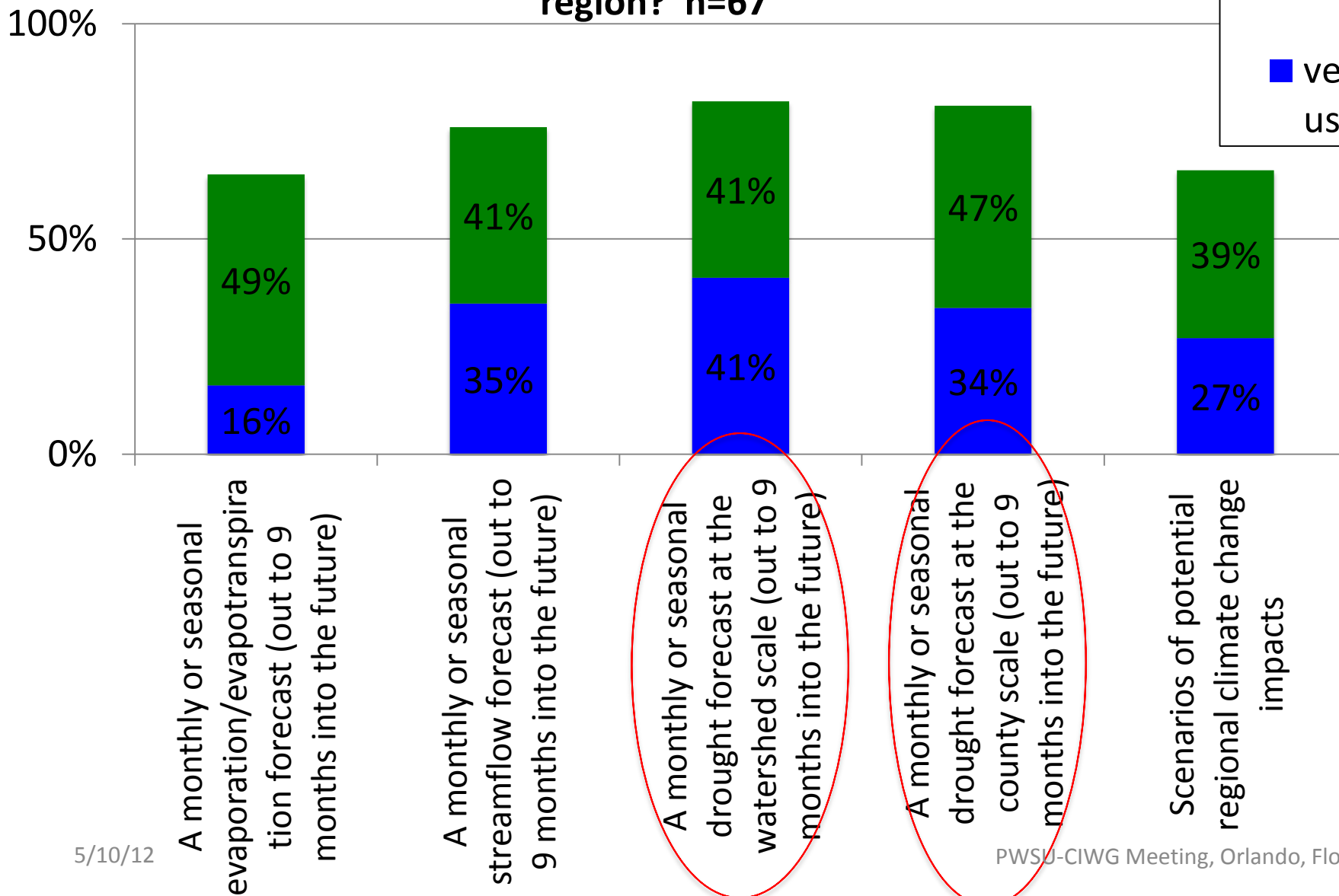


Need

Climate information desired by survey respondents

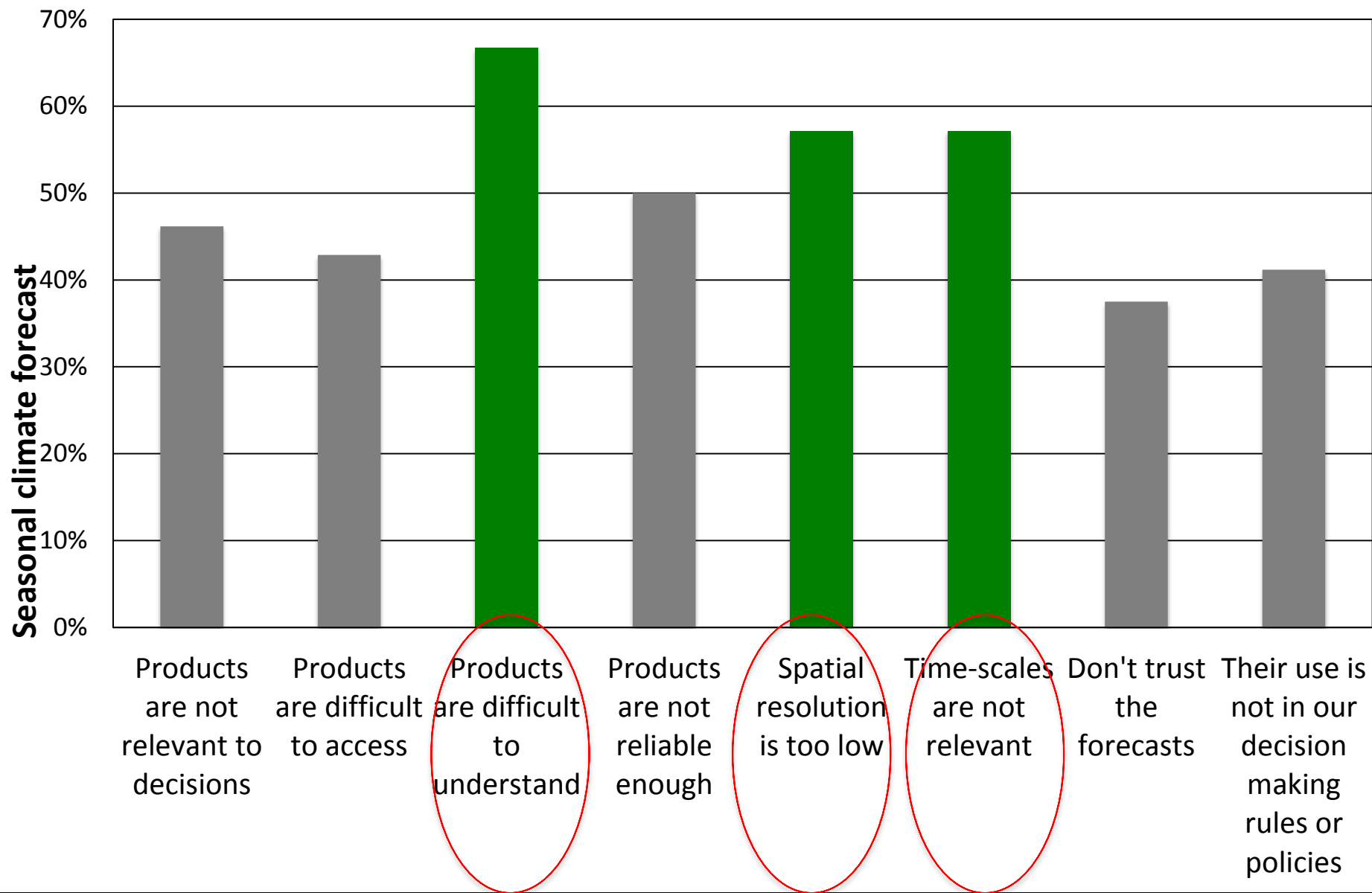
What types of information would you ideally like to have for your region? n=67

■ useful
■ very useful



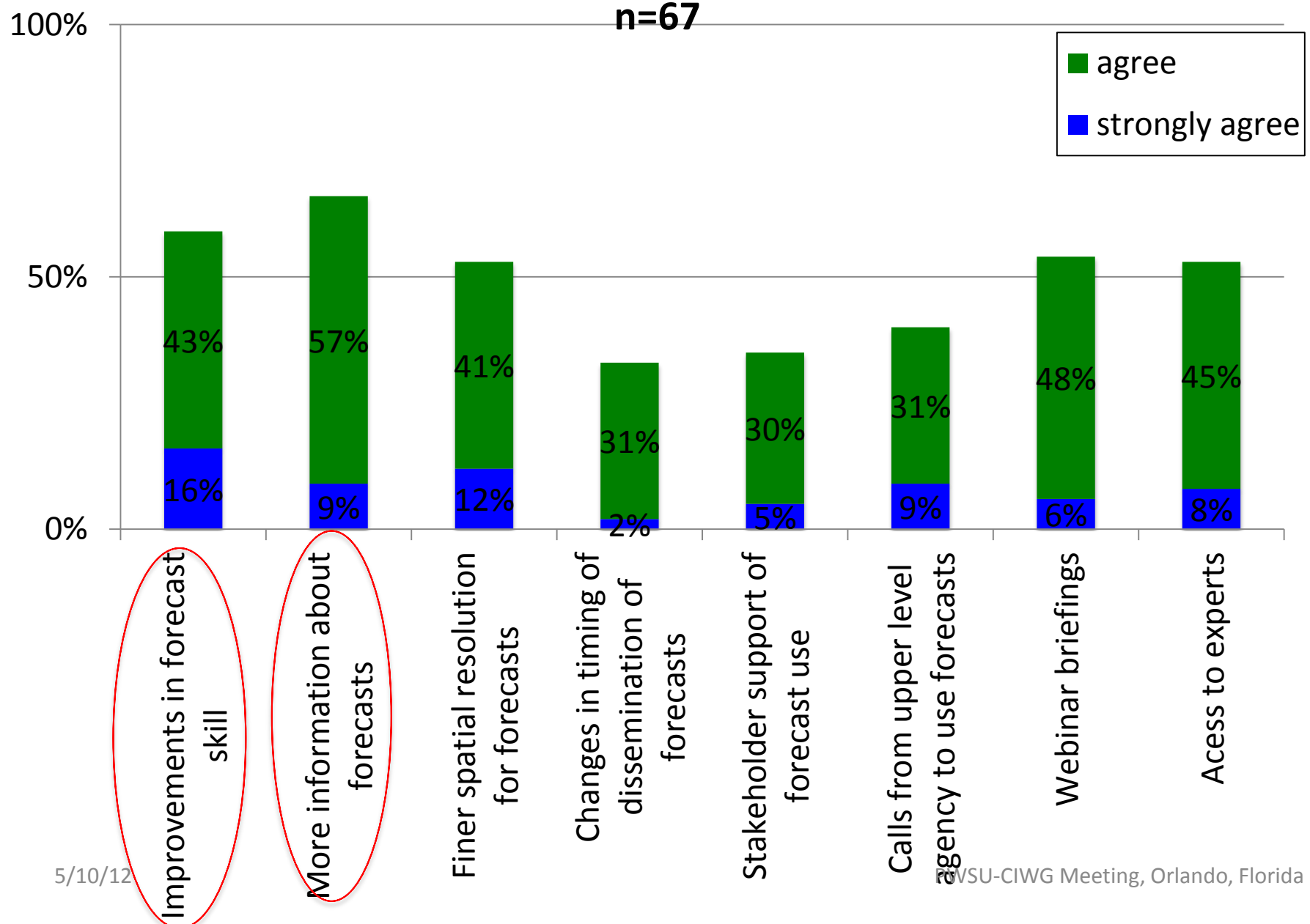
Barriers

Why don't you use seasonal climate forecasts?



Barriers

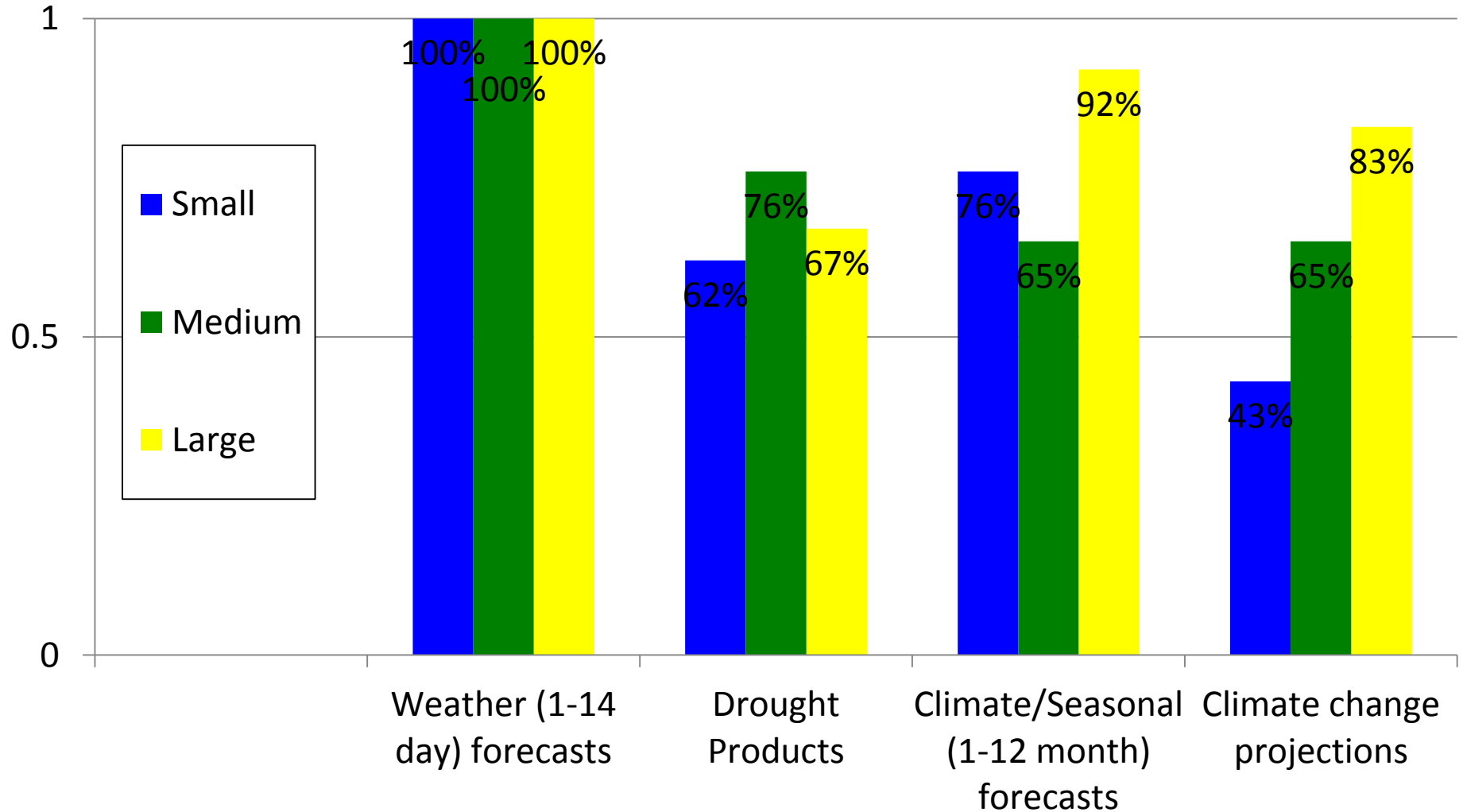
What types of changes might enable you to use seasonal climate forecasts in decision making?



Barriers

Familiarity with information across agency size.

“How would you rate your awareness of sources of information on weather and climate?”



Barriers

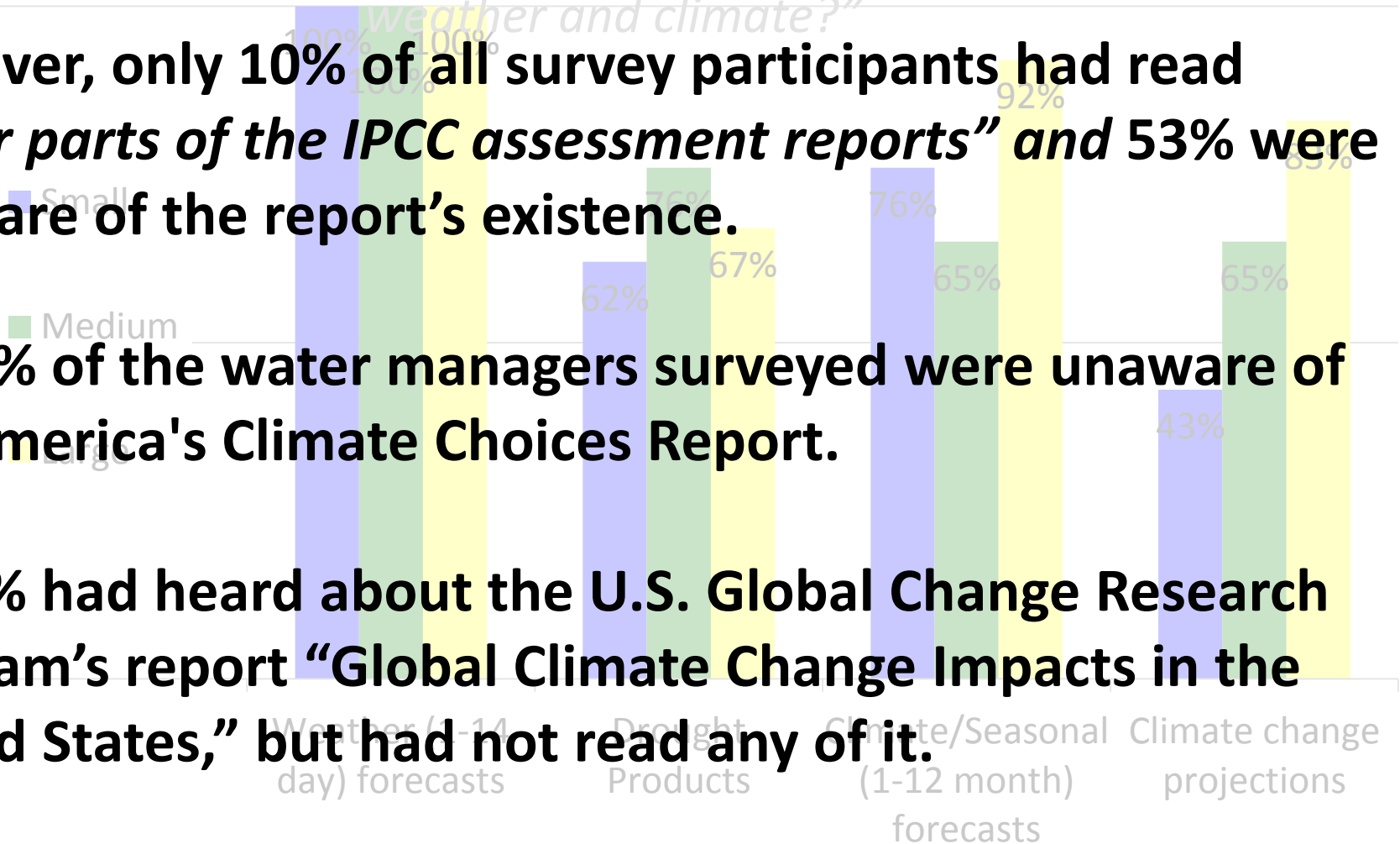
Familiarity with information across agency size.

"How would you rate your awareness of sources of information on weather and climate?"

However, only 10% of all survey participants had read *"all or parts of the IPCC assessment reports"* and 53% were unaware of the report's existence.

Sixty % of the water managers surveyed were unaware of the America's Climate Choices Report.

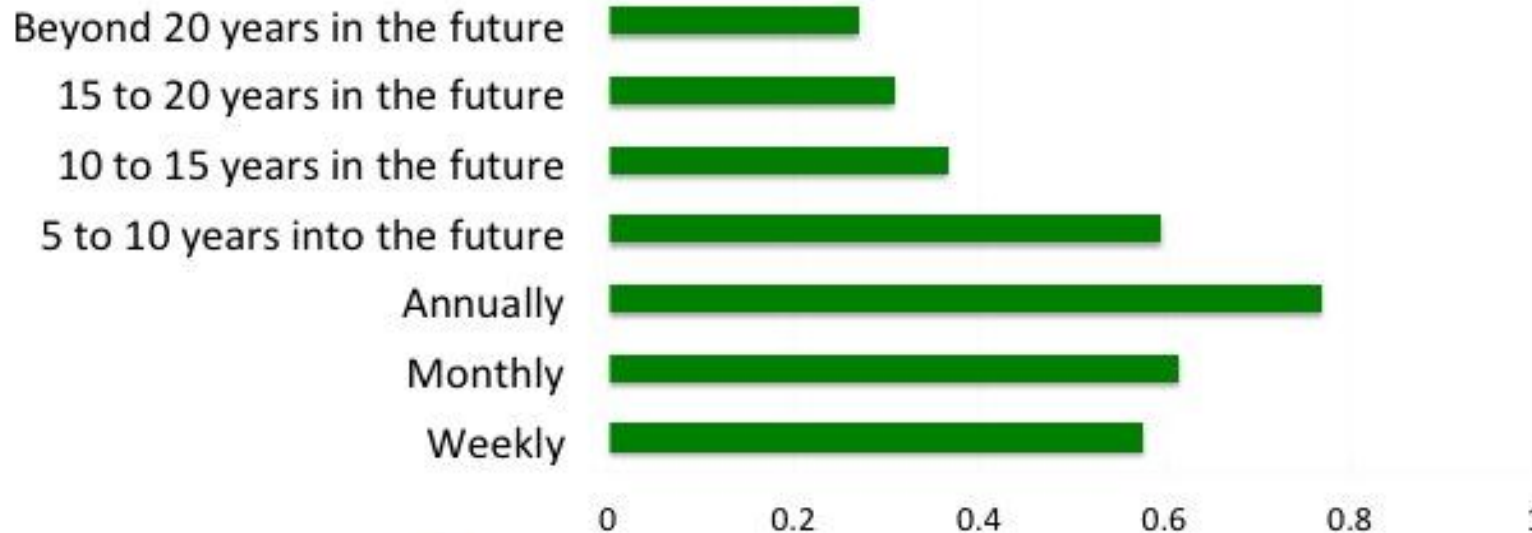
Fifty % had heard about the U.S. Global Change Research Program's report *"Global Climate Change Impacts in the United States,"* but had not read any of it.



Opportunities

Opportunities to improve integration

What decisions are being made? At what time scales?



Time Scale	Decisions
Weekly	operations, water quality, monitoring, storage, withdrawals
Monthly	treatment, drought management, updates & outlooks, forecasts, allocations, treatment
Annually	financial, capital improvements
5 to 10 years into the future	strategic planning, land-use planning, budgetary, demand forecasts, capital improvements
10 to 15 years in the future	growth and capital improvements, long range planning
15 to 20 years in the future	infrastructure planning, master planning, growth management
Beyond 20 years in the future	Land acquisition, master planning

Opportunities

Coded responses to open ended question *“If you knew that an upcoming season would be very dry, would you have the ability to modify your operations to lessen potential impacts?”*

Categories of open ended responses	Number of mentions
Reductions to releases	3
Increased storage	11
Buy additional water	1
Produce more water	2
Build additional wells	2
Implement restrictions	18
Rate adjustments	1
Increase public awareness of conservation	8
Implement water conservation measures	10
Alternative sources within system	5
Follow Water Ordinance/ Plan	3

Future directions

- Adaptive capacity and use of information
 - What have water managers learned from past events?
 - What determines the ability to change and respond to weather and climate events?

Conclusions

- Use of SCFs is limited across states
- Awareness of products (SCFs and CC) is **VERY** limited across states
- Most wanted list includes:
 - Seasonal variability products at watershed scale
 - Drought forecasts at watershed scale
- The most common reason for limited forecast use: difficulty with understanding
- Opportunities to improve integration
 - Match info with decisions being made, timing, and responses
 - Interactions (translation) with decision makers

Or... we can continue
to rely on past
approaches...

SUMMONING THE RAINS TO GEORGIA

Published: June 10, 2008

PHOTO: A vigil for rain was held on Monday on the steps of the Georgia State Capitol in Atlanta. A man who introduced himself as Six Bears joined other American Indians in the ceremony. Last year, Gov. Sonny Perdue held a prayer vigil in the same spot seeking relief from drought. (PHOTOGRAPH BY JOHN BAZEMORE/ASSOCIATED PRESS)



Thank you



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