PERCEPTIONS OF WATER QUALITY & HARMFUL ALGAL BLOOMS IN FLORIDA:
CAUSES AND MANAGEMENT OPPORTUNITIES FROM AN ENGAGED COMMUNITY

Harmful Algal Bloom Task Force Meeting

December 10, 2019

UF UNIVERSITY of FLORIDA IFAS Extension

Sea Grant

Ocean Conservancy®

PURPOSE

- Understand perception and identify action and management priorities for water quality and harmful algal blooms in Florida (*K. brevis* and *M. aeruginosa*)
- Improve HAB communications and outreach efforts
- Facilitate local and regional response efforts


FWC Fish and Wildlife Research Institute


SFWMD

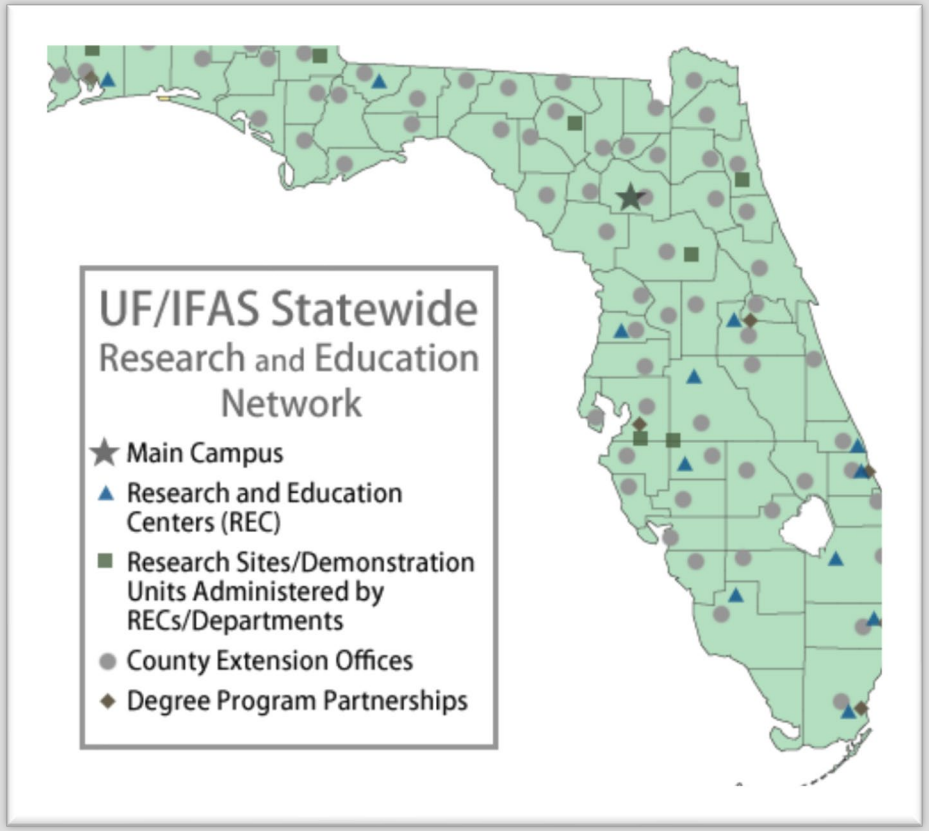
METHODS

HOW: Web-survey (IRB approved)

- Beliefs and opinions on water quality and HABs
- Perceptions of risk
- Behaviors, responsibilities & solutions
- Demographics

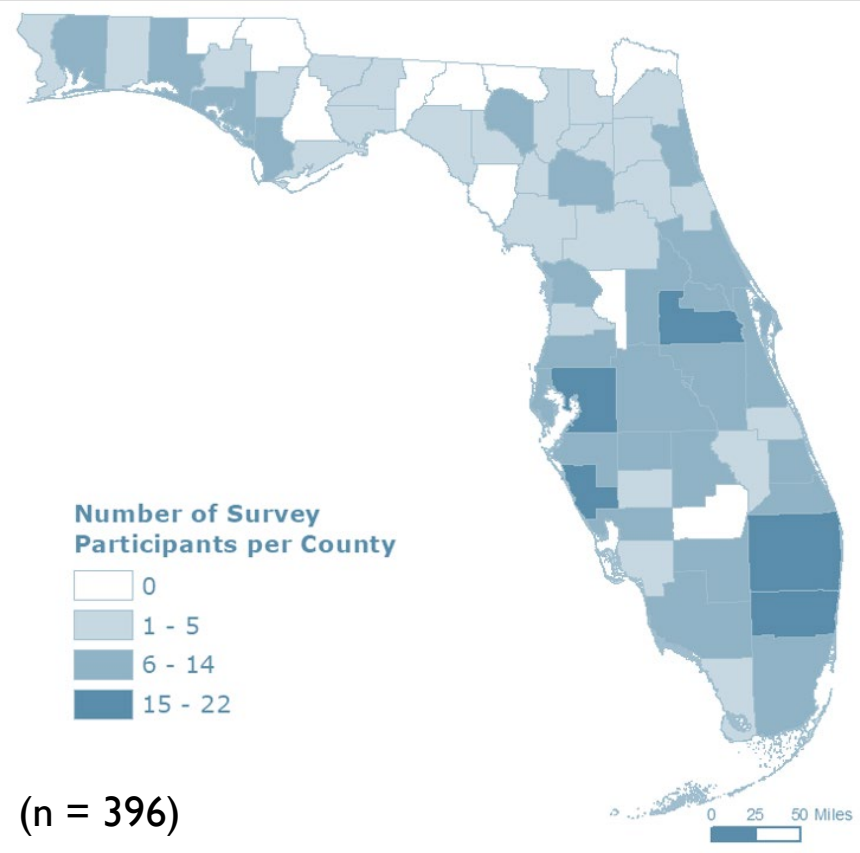
WHO: UF/IFAS Extension Advisory Committee Members

- 1,434 members, response 34%
- response 57 of 67 counties



Agriculture • Community Resource Development • Family & Consumer Sciences (Wealth Management, Health & Nutrition) • Horticulture (Florida Friendly Landscaping and Master Gardeners) • Natural Resources & Sustainability • Sea Grant (Marine & Coastal) • Youth 4-H • Other

DEMOGRAPHICS



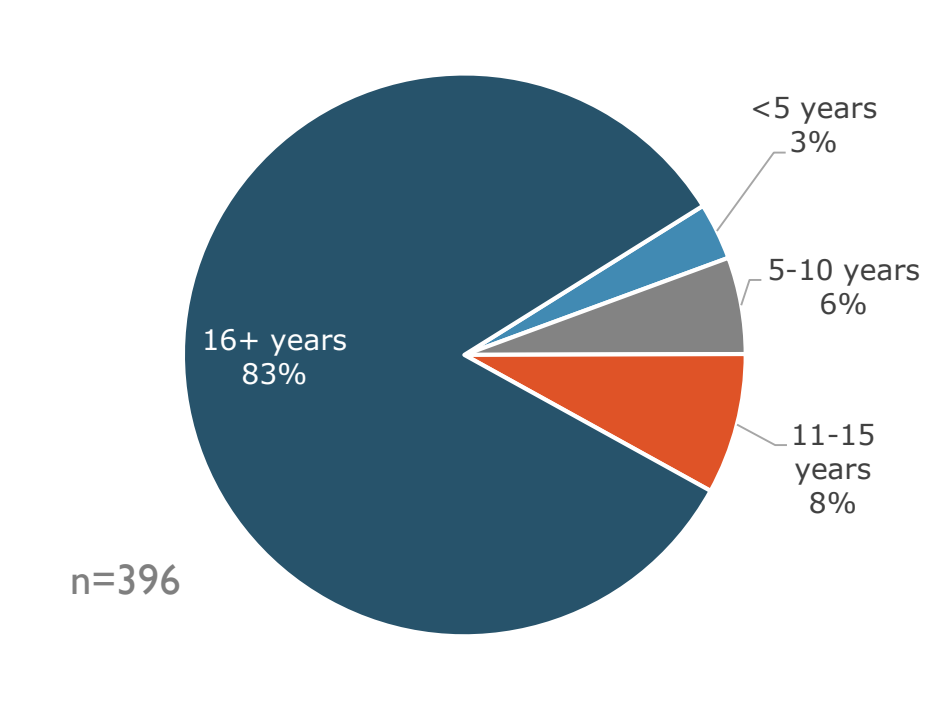
(n = 396)

Characteristic	Respondents %	Florida %*
Race (n = 409)		
Asian	2	2
Black or African American	5	15
Hispanic or Latino	5	23
White, non-Hispanic	79	58
Other	3	2
Prefer not to answer	6	NA

*Bureau of Economic and Business Research (2010)

DEMOGRAPHICS

Residence in Florida

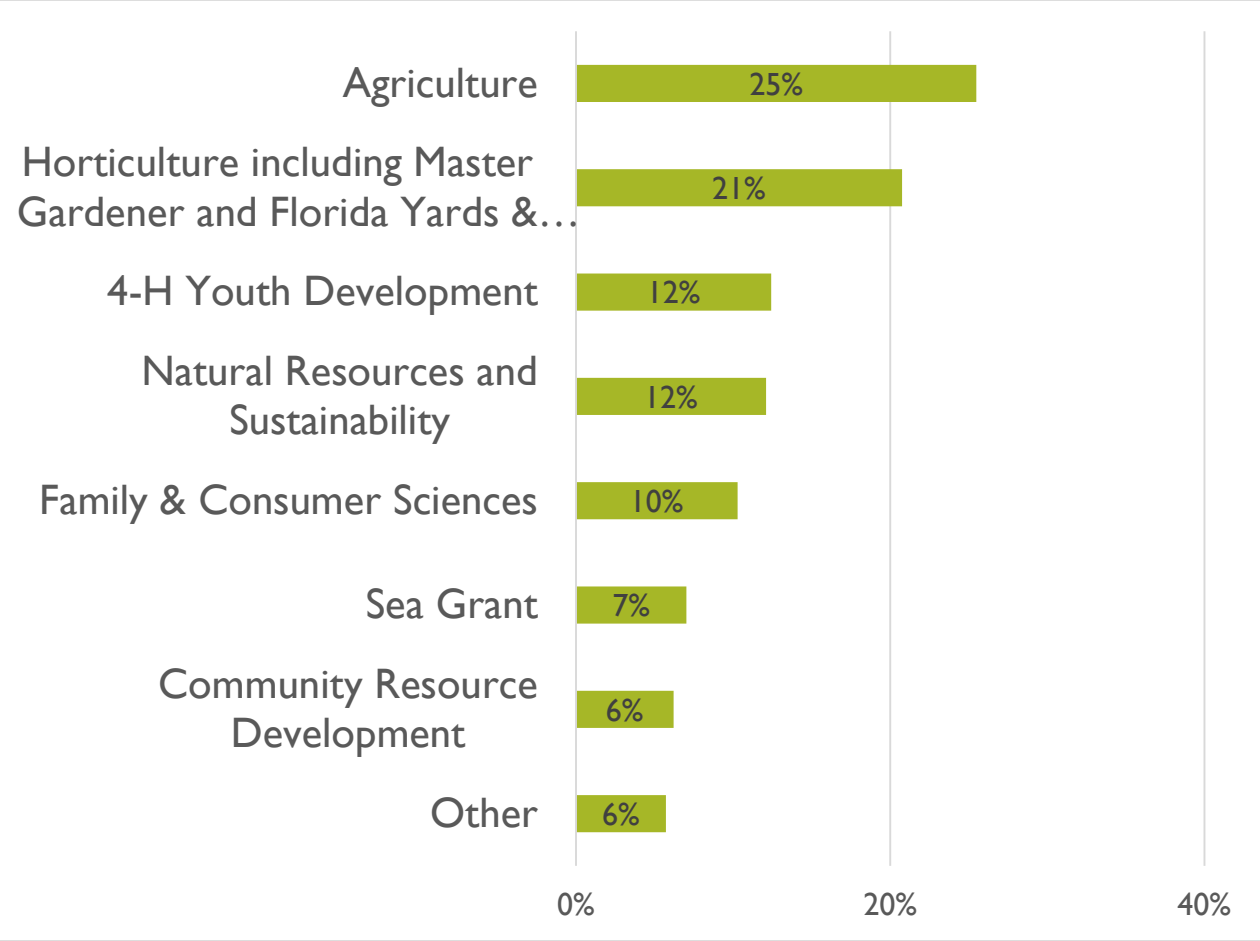


Characteristic	Respondents %	Florida %*
Gender (n = 396)		
Man (Male)	46	49
Woman (Female)	51.5	51
Prefer not to answer	2.5	NA
Age (n = 396)		
18-24 years	0.5	12
25-44 years	20	32
45-64 years	44	34
65+ years	32	22
Prefer not to answer	3.5	NA

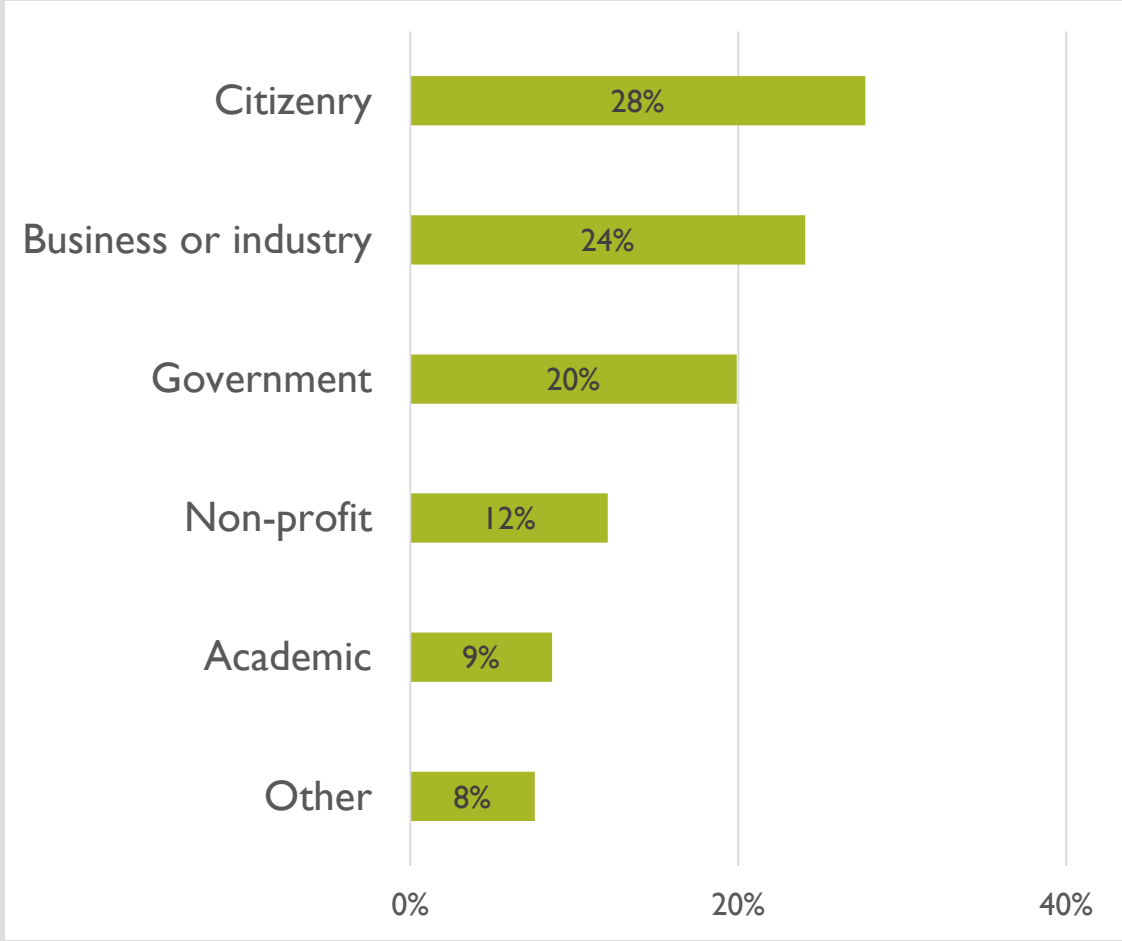
*Bureau of Economic and Business Research (2010), Office of Economic and Demographic Research (2010)

DEMOGRAPHICS

Extension Program Area



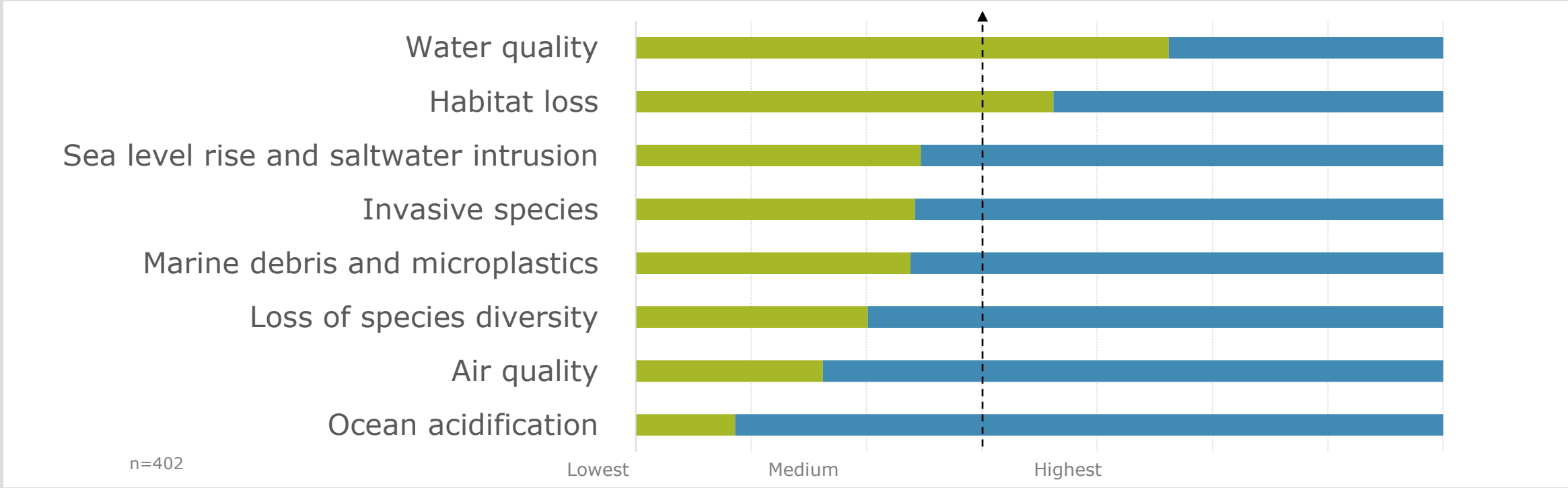
Sector Representing



REVIEW

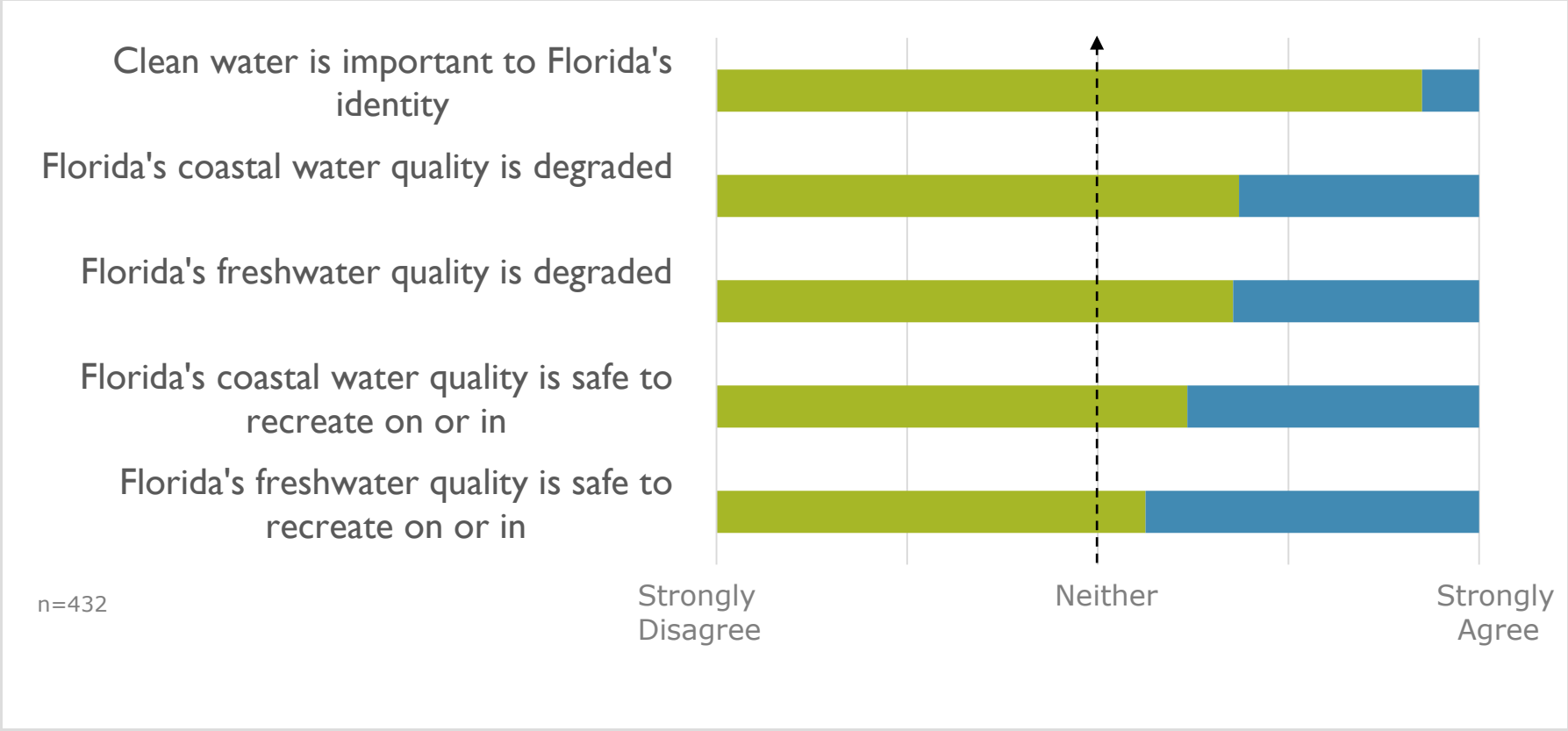
- Extension advisory committee are an engaged stakeholder group that **does not** necessarily represent the general public
- Provides statewide assessment of HAB perceptions
- Audience can be segmented by:
  - Program area
  - Geography
  - Demographics

Most important **environmental issue** in Florida today



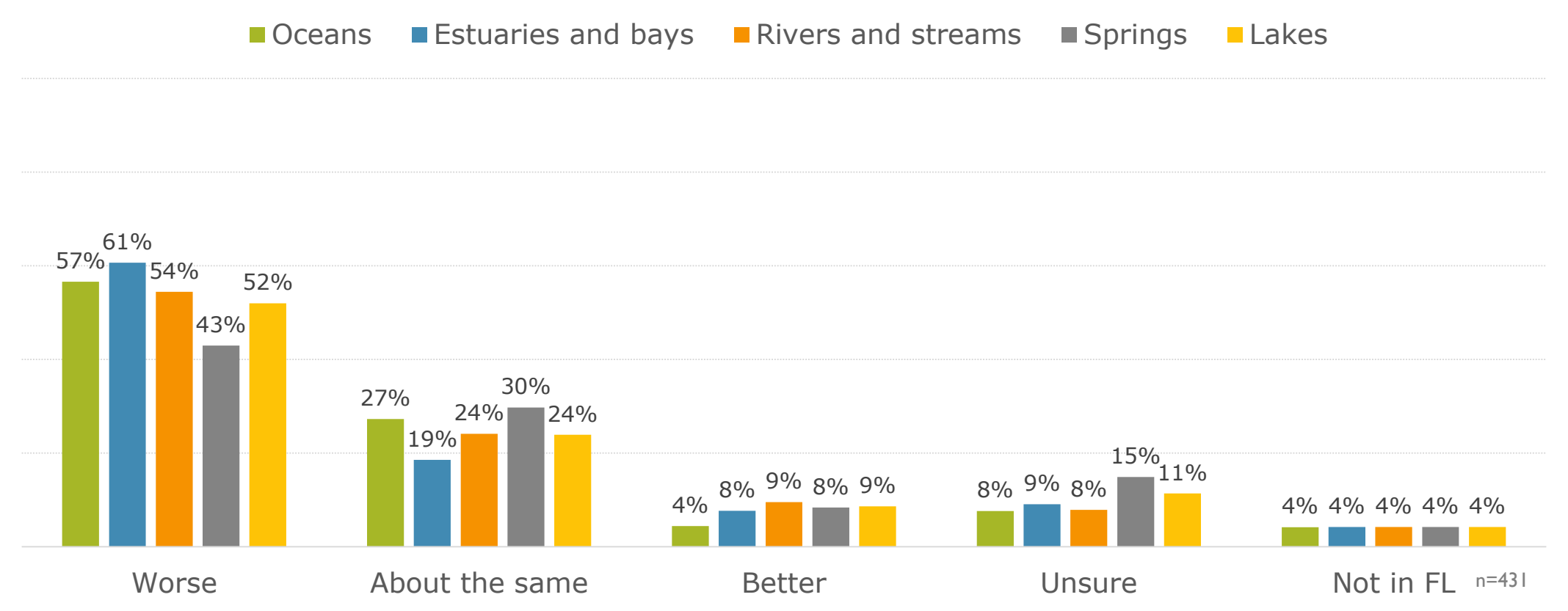
BELIEFS & OPINIONS ON WATER QUALITY

Level of agreement



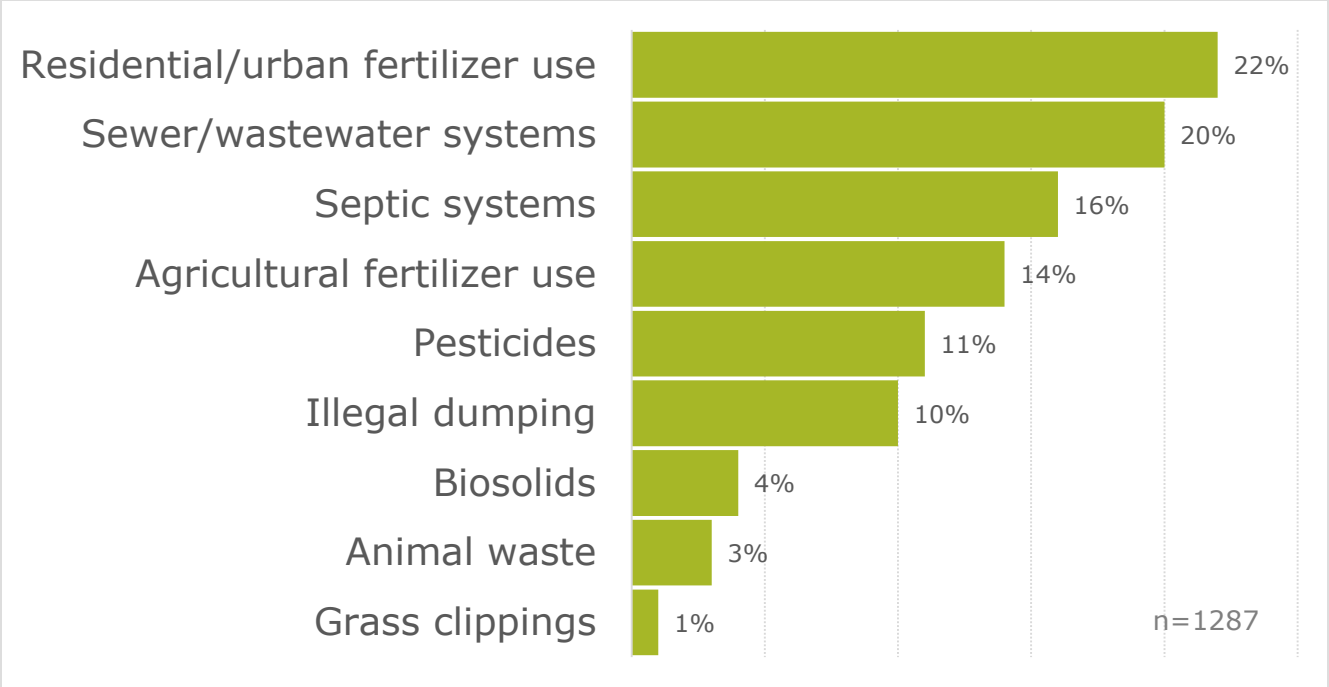
BELIEFS & OPINIONS ON WATER QUALITY

Florida's **water quality** today vs 10 years ago



BELIEFS & OPINIONS ON WATER QUALITY

Largest **contributors** of pollution in Florida's water bodies



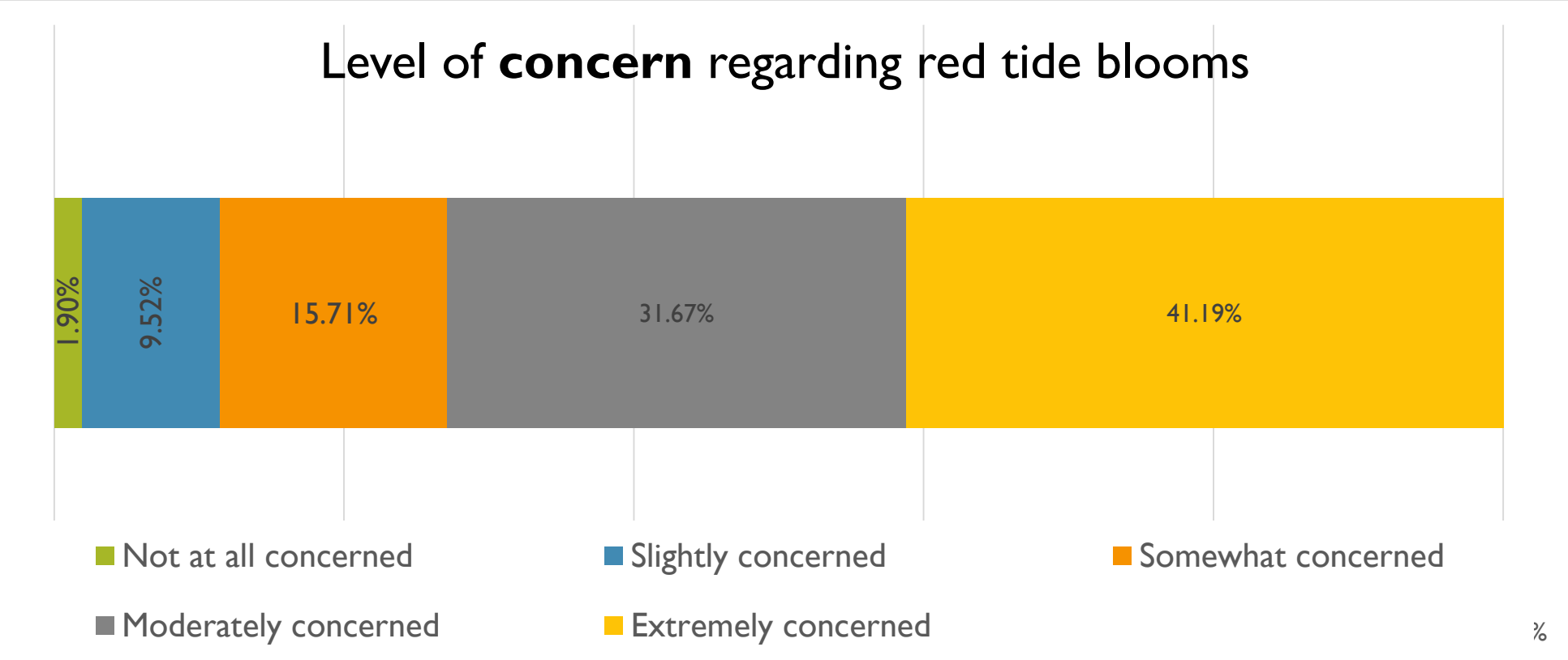
BELIEFS & OPINIONS ON WATER QUALITY

REVIEW

- Water quality is the top environmental concern in the state.
- Perception is that water quality in **all** state water bodies has declined over time.
- The state's identity and economy* are dependent on clean water.

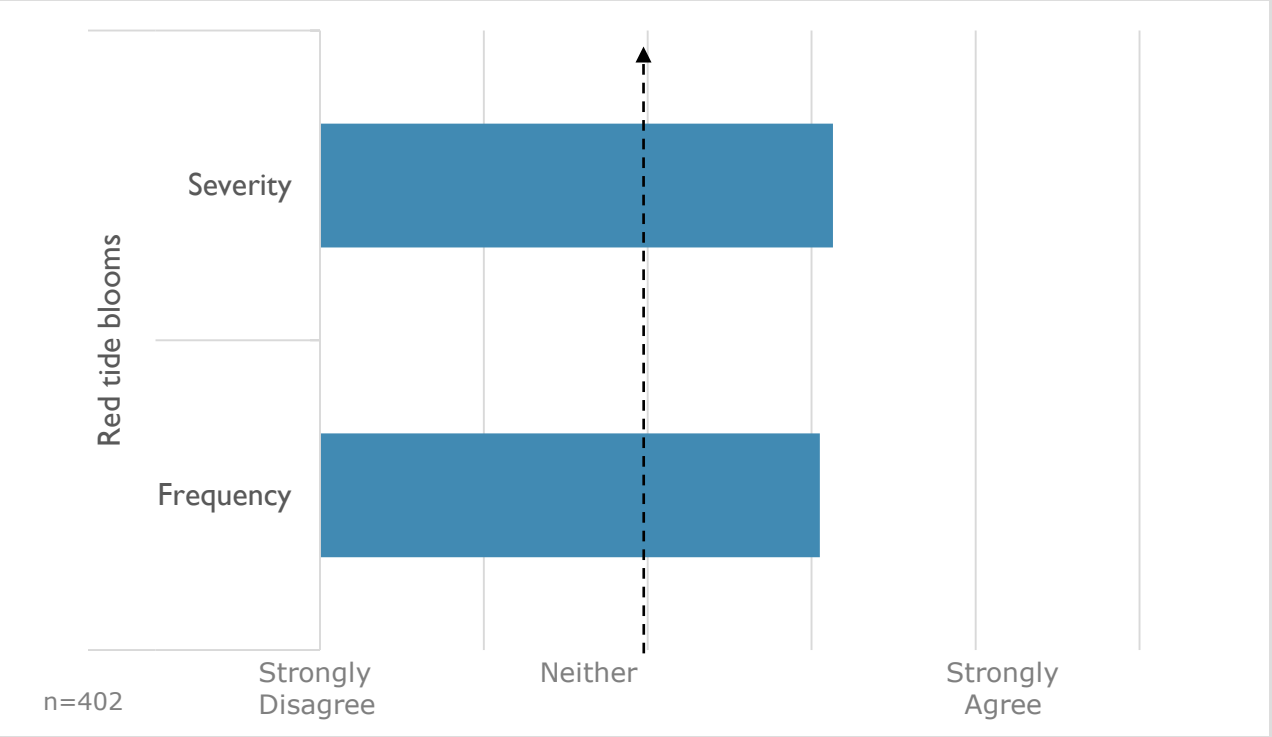
*(data not shown)

97% of respondents are aware of red tide blooms in Florida

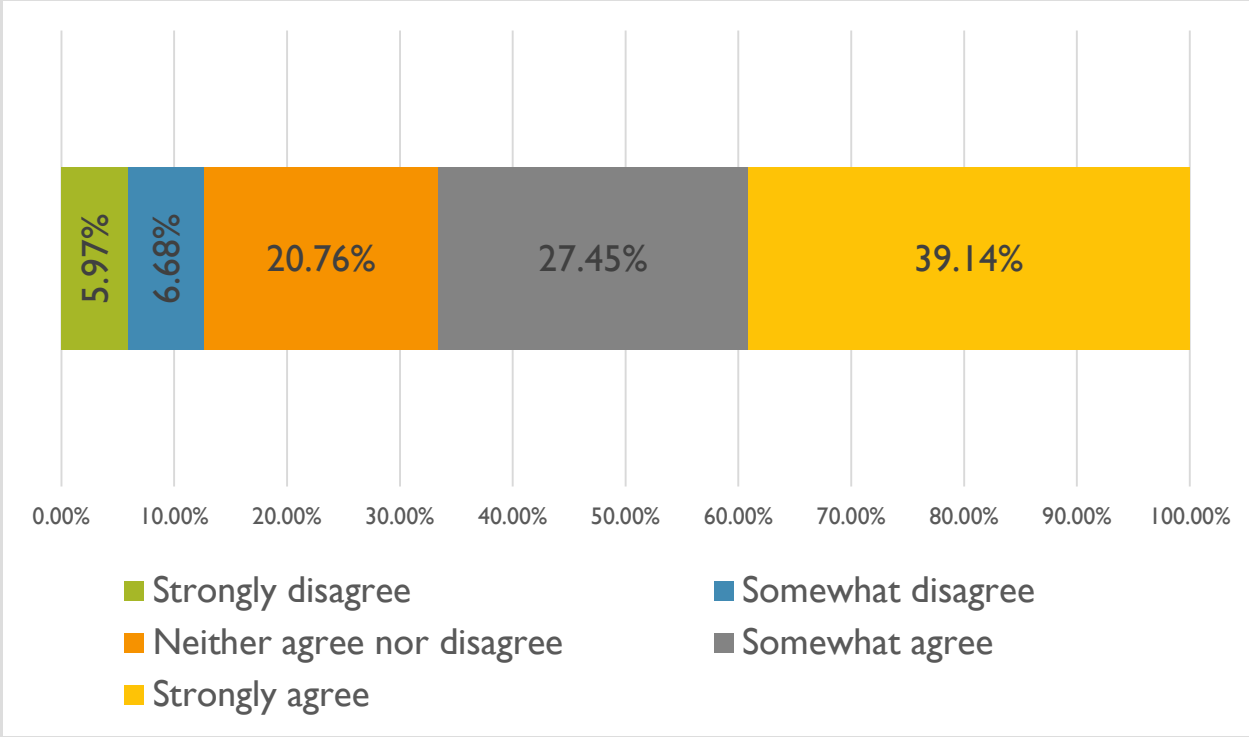


BELIEFS & OPINIONS ON HABS - RED TIDE

Compared to 10 years ago, the severity and frequency is **increasing**



Florida's red tide is made **worse** by human activities

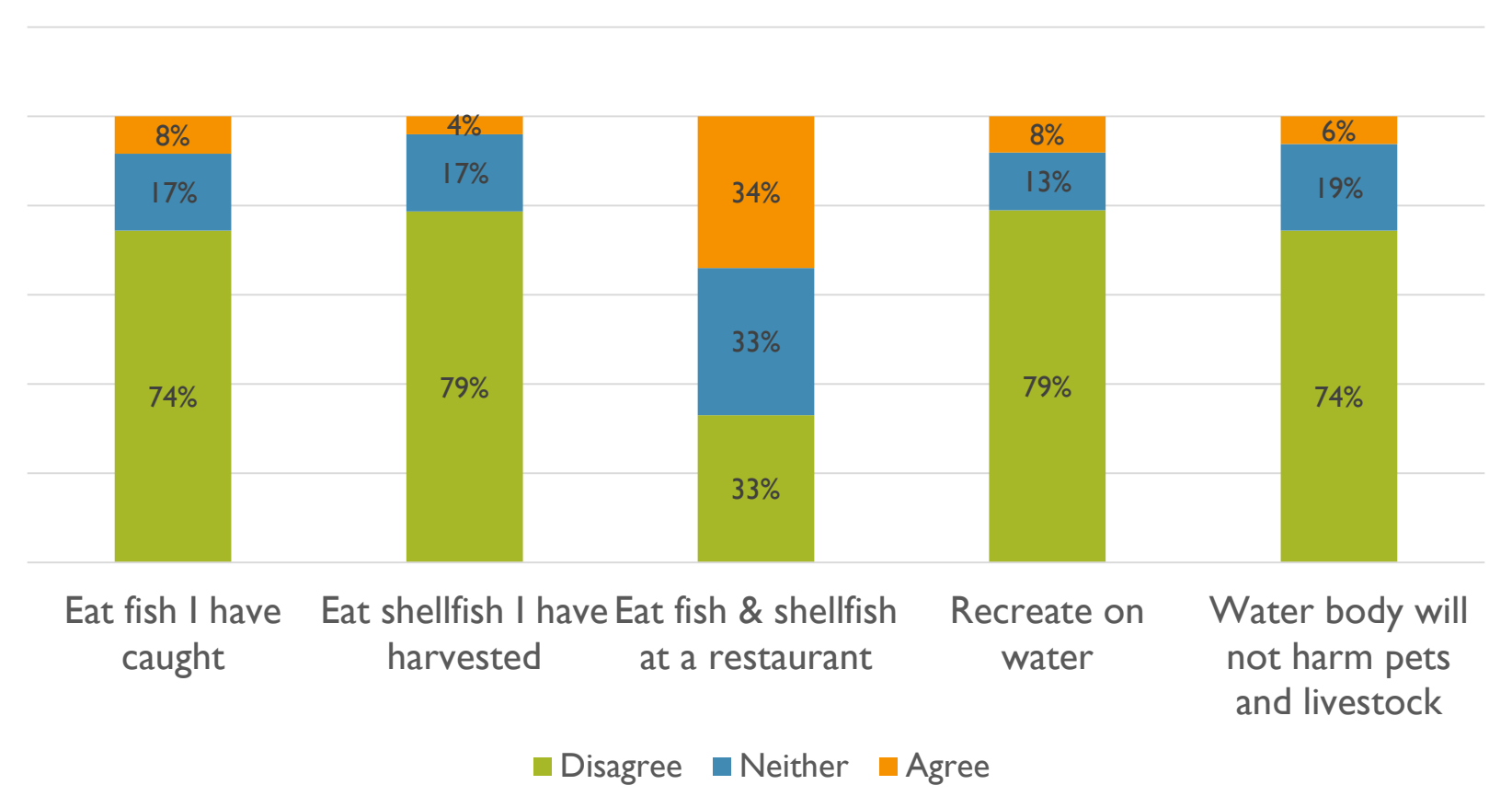


BELIEFS & OPINIONS ON HABS - RED TIDE

REVIEW

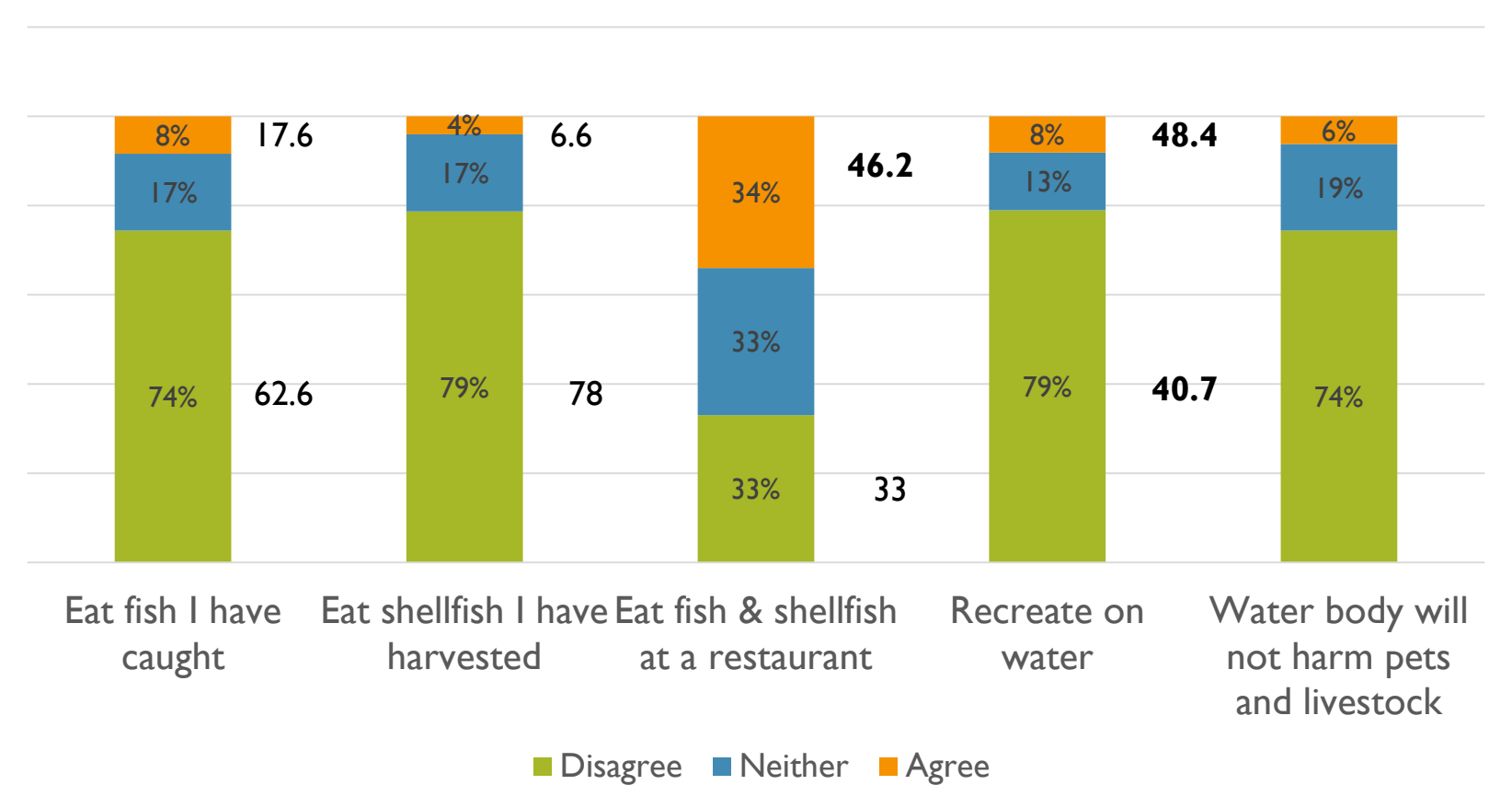
- Majority (97%) of respondents are familiar with red tides and >70% are concerned about these blooms.
- Perception that red tide is getting worse and that human activities contribute.

During a red tide it is **safe** to (for):



PERCEPTIONS OF RISK

During a red tide it is **safe** to (for):



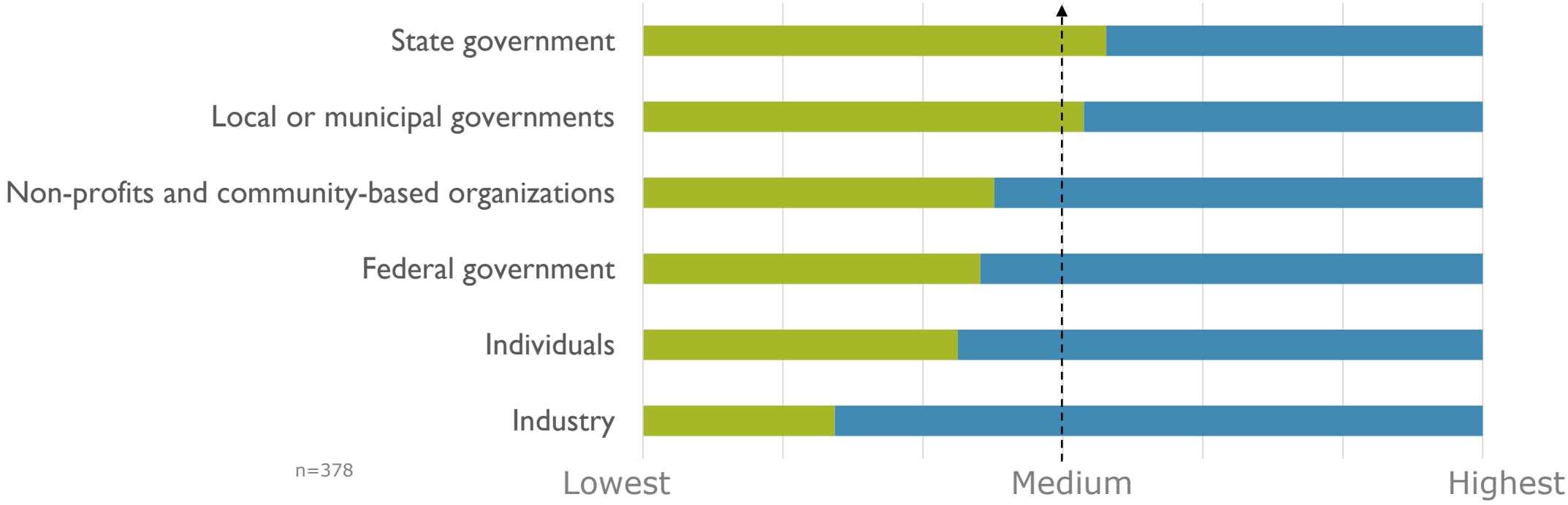
PERCEPTIONS OF RISK

Nierenberg et al 2010. (surveys 2005-6)

REVIEW

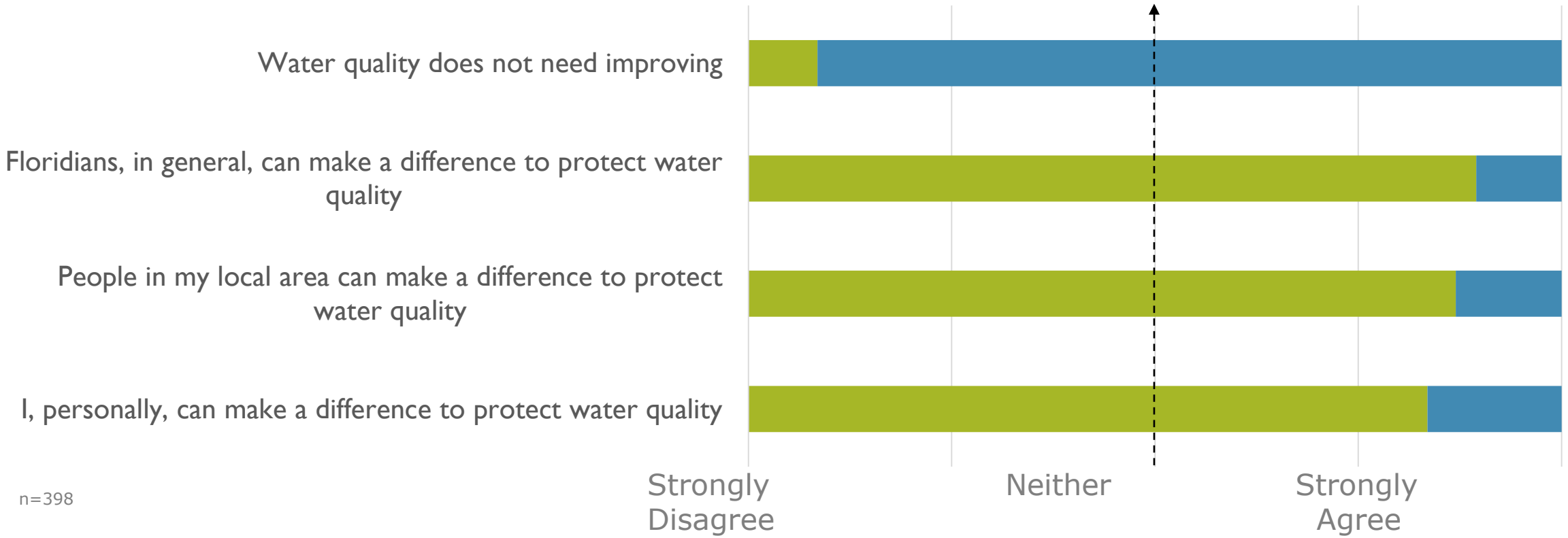
- Gaps in knowledge regarding human health risks

Performance in **protecting** Florida's water bodies



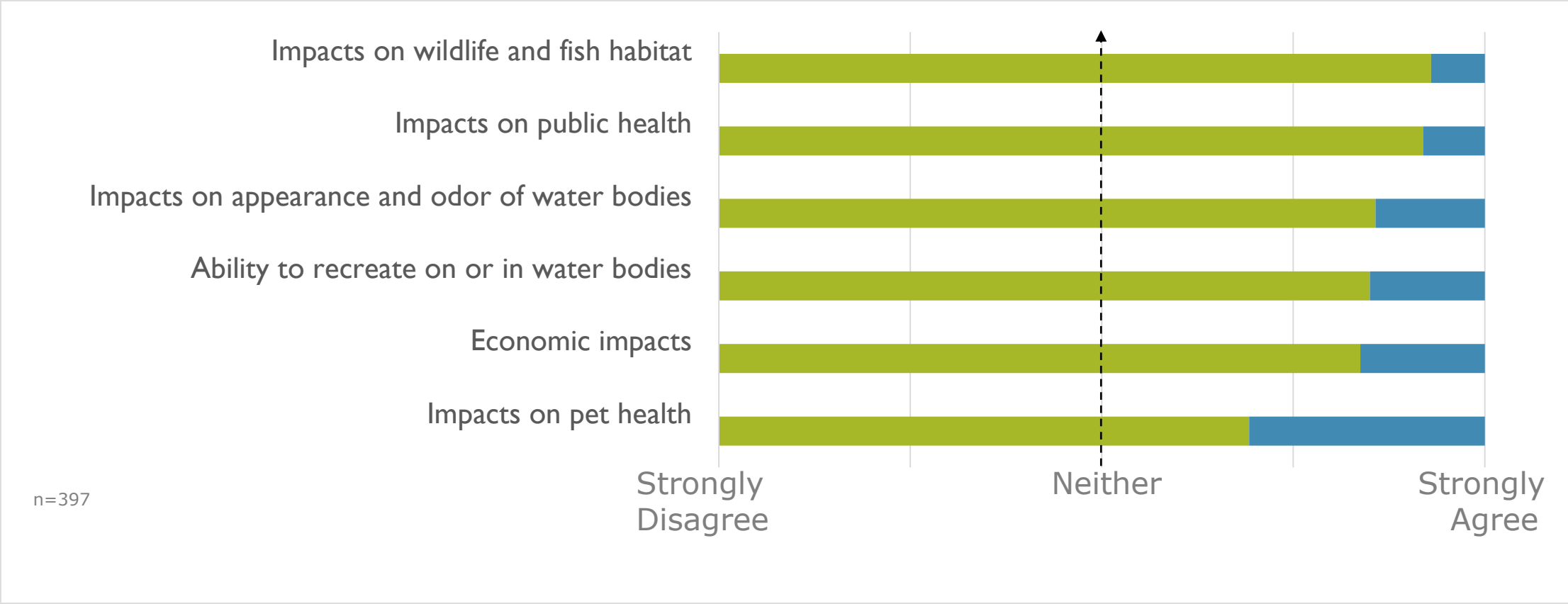
BEHAVIORS, RESPONSIBILITIES & SOLUTIONS

Level of **agreement**



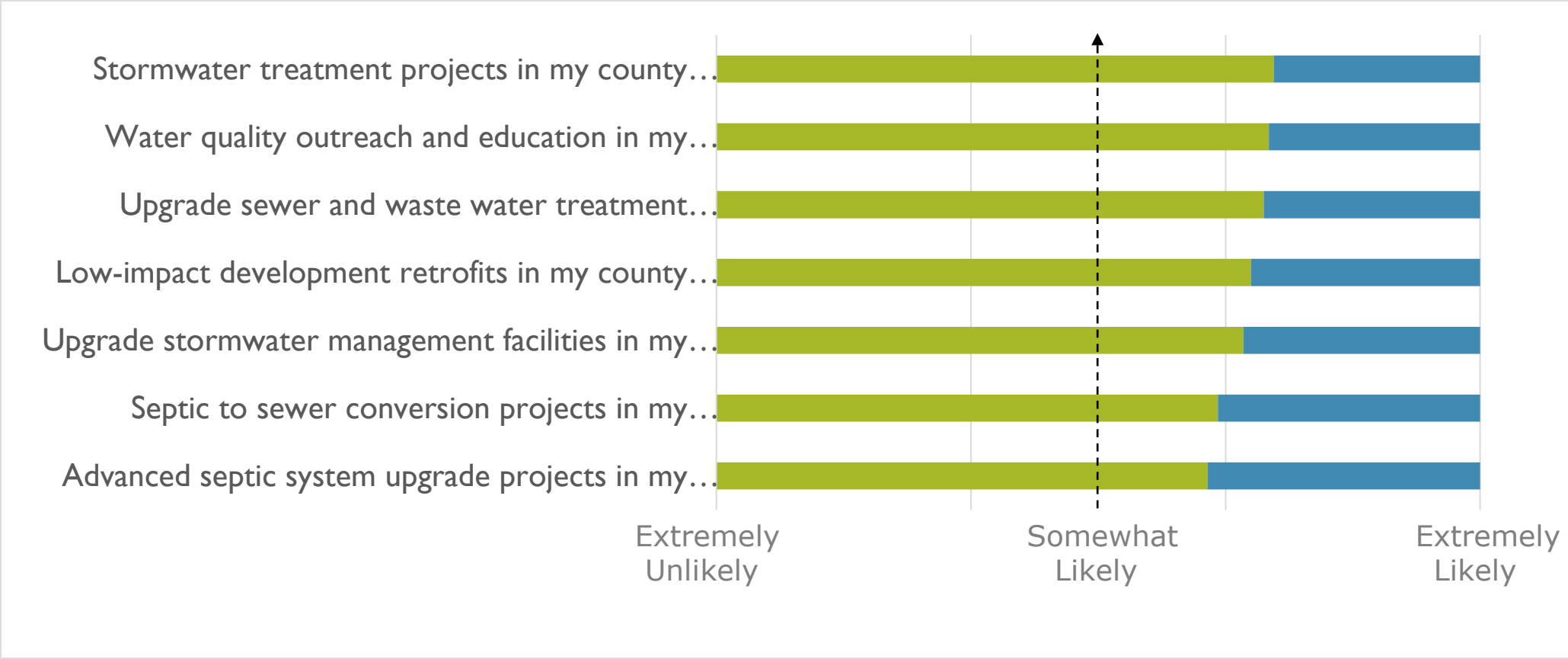
BEHAVIORS, RESPONSIBILITIES & SOLUTIONS

Motivating factors for protecting water quality



BEHAVIORS, RESPONSIBILITIES & SOLUTIONS

Willingness to pay a sales tax for **nutrient reduction** projects



BEHAVIORS, RESPONSIBILITIES & SOLUTIONS

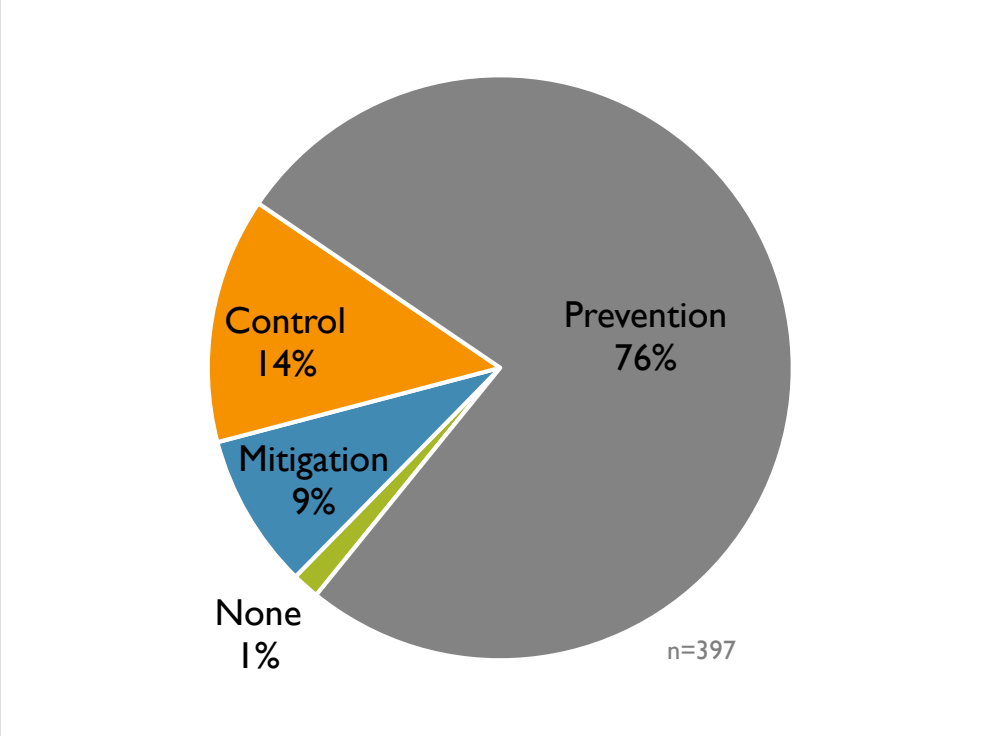
MANAGEMENT STRATEGIES

Prevention – Focus on actions that attempt to **address the problem of algal blooms before they occur**. They aim to reduce the frequency and the severity of future bloom events. Most programs focus on reducing human activity that increases the amount of **nutrients** in coastal waters. Benefits from these programs **are not immediate** and usually take a long time to realize. Prevention programs will help improve some aspects of water quality. Prevention programs **have not been definitively proven** to effectively prevent or reduce the frequency of HABs.

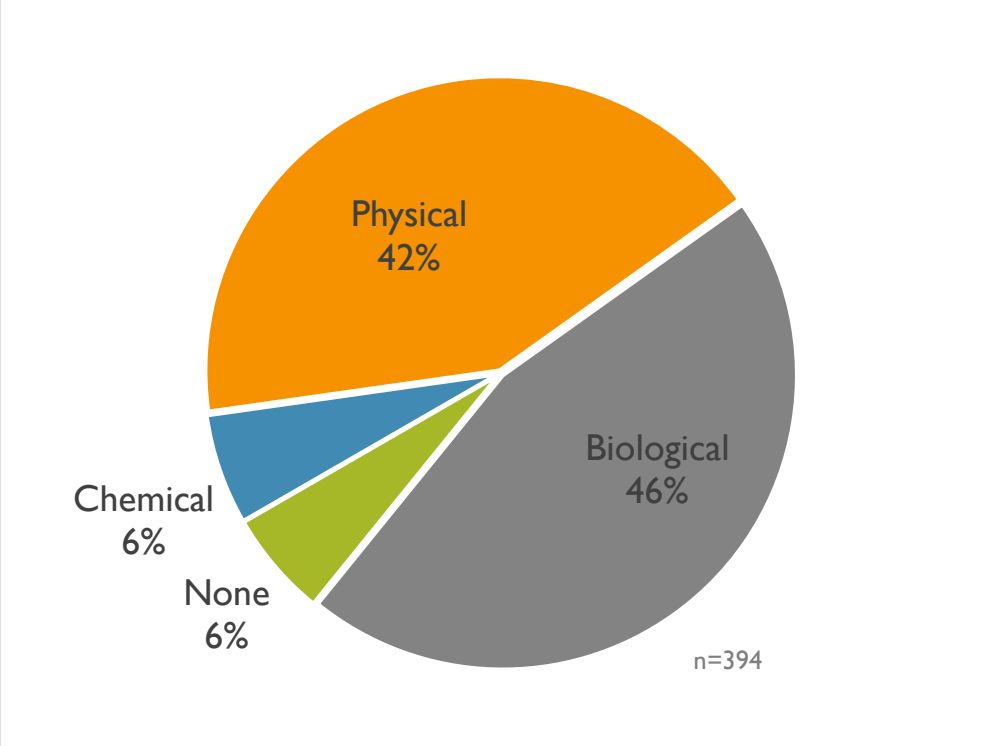
Mitigation – Focus on actions that can be taken to **minimize the effects** of a bloom on humans, the environment and the economy **after the bloom has already occurred**. Mitigation tools include informational campaigns such as the development and dissemination of outreach tools for HAB avoidance, forecasting tools to assist in clean-up of fish kills, physical barriers such as air curtains to keep HABs out of a specific location, and portable water treatment systems for localized areas. The benefits of mitigation programs are **site specific, localized, and short-term**.

Control – Focus on actions **to manage a bloom after the bloom has occurred** by reducing the duration and extent of the bloom. They **attempt to suppress or stop the bloom through biological, chemical, or physical controls**. Biological controls mainly include the introduction of non-native or the enhancement of native predators, parasites or pathogenic species. Chemical control include applying a chemical that can kill or suppress a target algae species without causing mortalities of other co-occurring organisms. Physical control include the application of non-chemical materials such as clays or flocculants to remove or suppress harmful algae. Control practices have been **demonstrated effective in the laboratory, small-scale field studies, or in other countries but have not been tried in a large-scale application in the United States**.

Preferred **management** strategy



Preferred **control** method



BEHAVIORS, RESPONSIBILITIES & SOLUTIONS

REVIEW

- Belief that **all** segments of the population can make water quality improvements.
- Respondents are willing to pay for local water quality outreach, education and nutrient management projects
- Prevention strategies are preferred

TAKE AWAYS

- Water quality is a primary concern for engaged residents
- Outreach and education regarding red tide and harmful algae blooms is still necessary – especially regarding areas of uncertainty
- Respondents have positive attitudes and perceived behavioral control in the ability to improve water quality
- Strategic messages and communication efforts should be considered for public buy-in and acceptance.

THANK YOU

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