Water Reuse Action Plan
Action 7.2: Develop a Coordinated National Research Strategy on Water Reuse

https://www.epa.gov/waterreuse/national-water-reuse-action-plan-online-platform?action=7.2

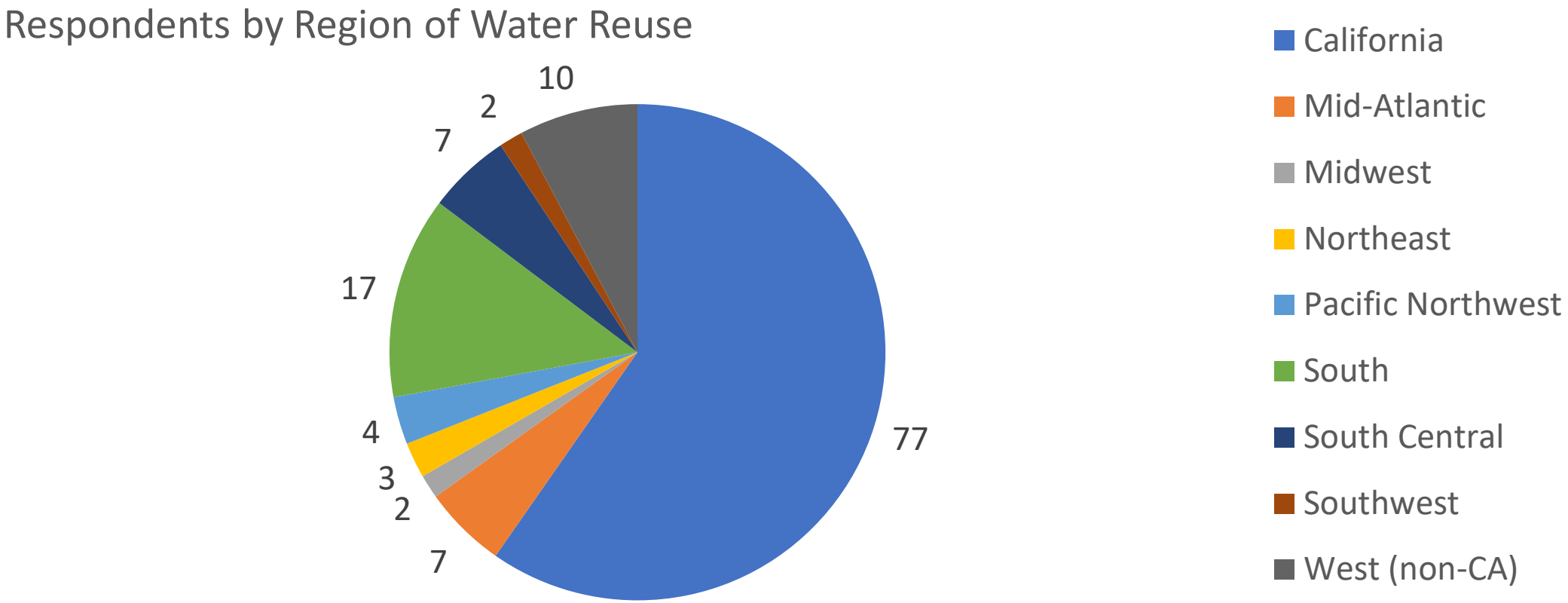
National Water Reuse Survey Results

Survey released September 2020;
compiled October 2020

Respondents

128 people completed all or most of the survey

Respondent Demographics



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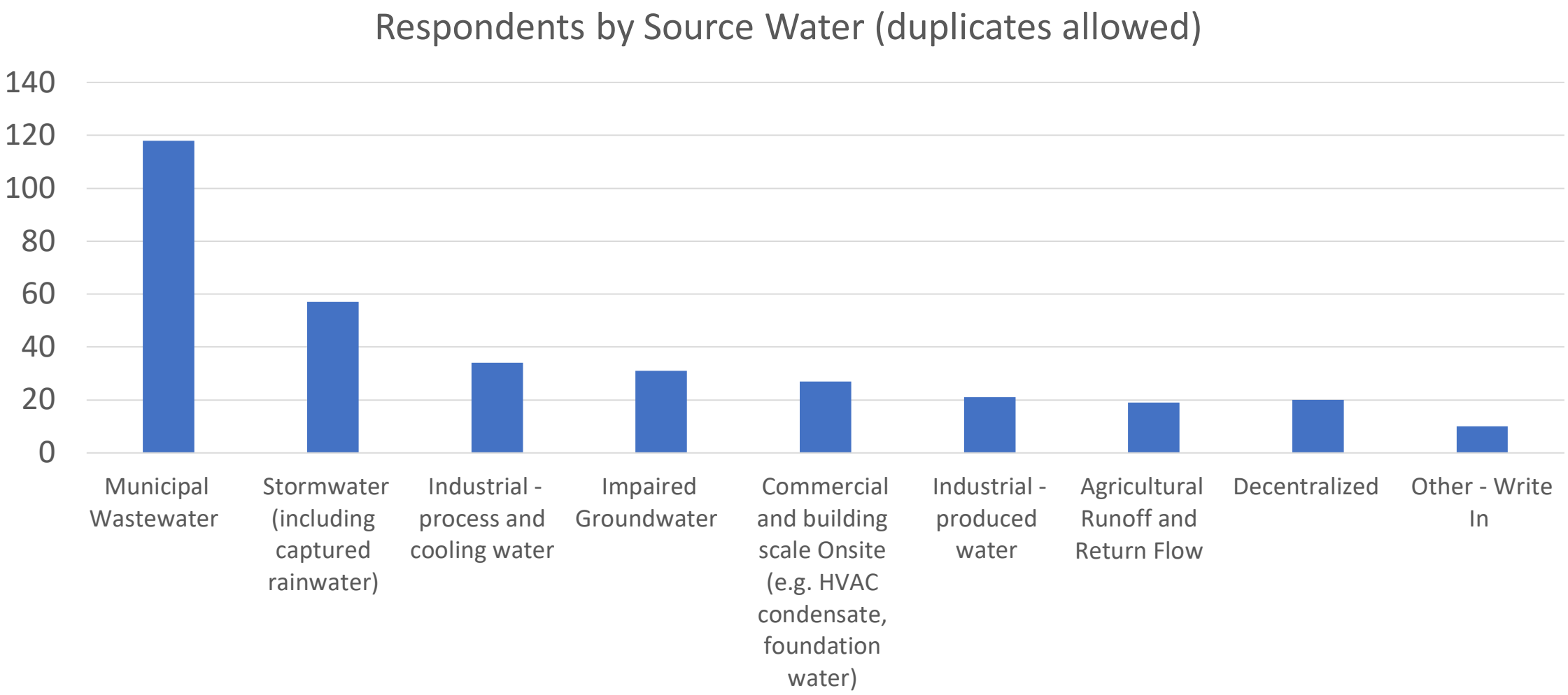

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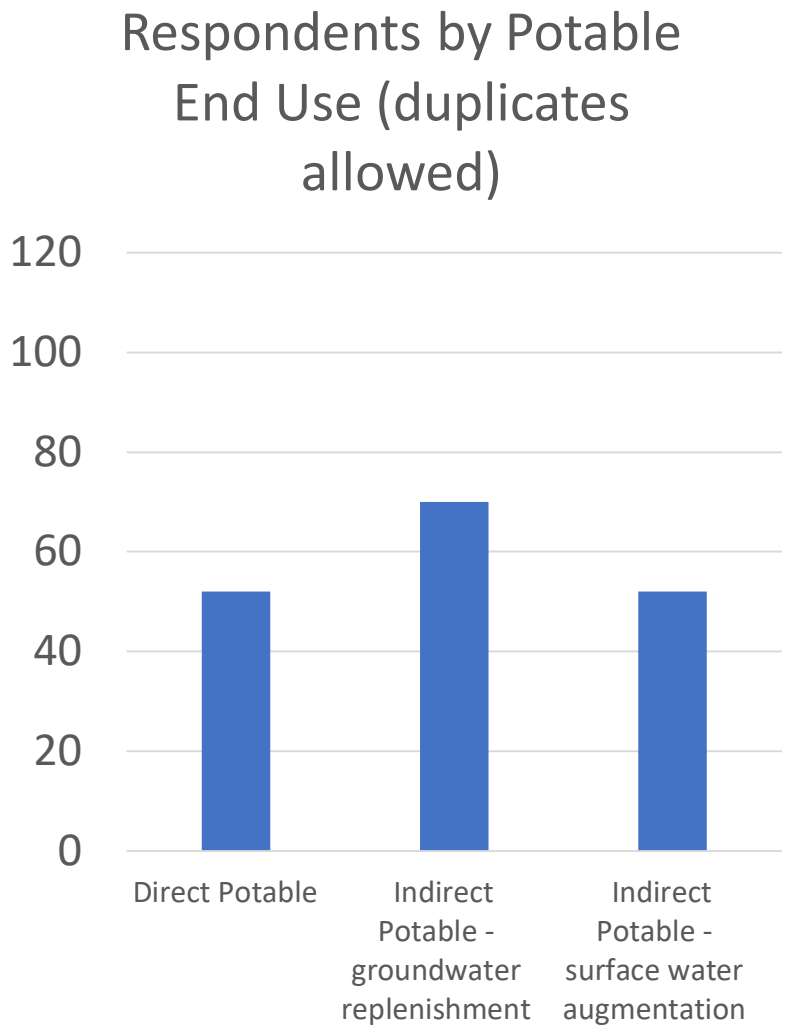
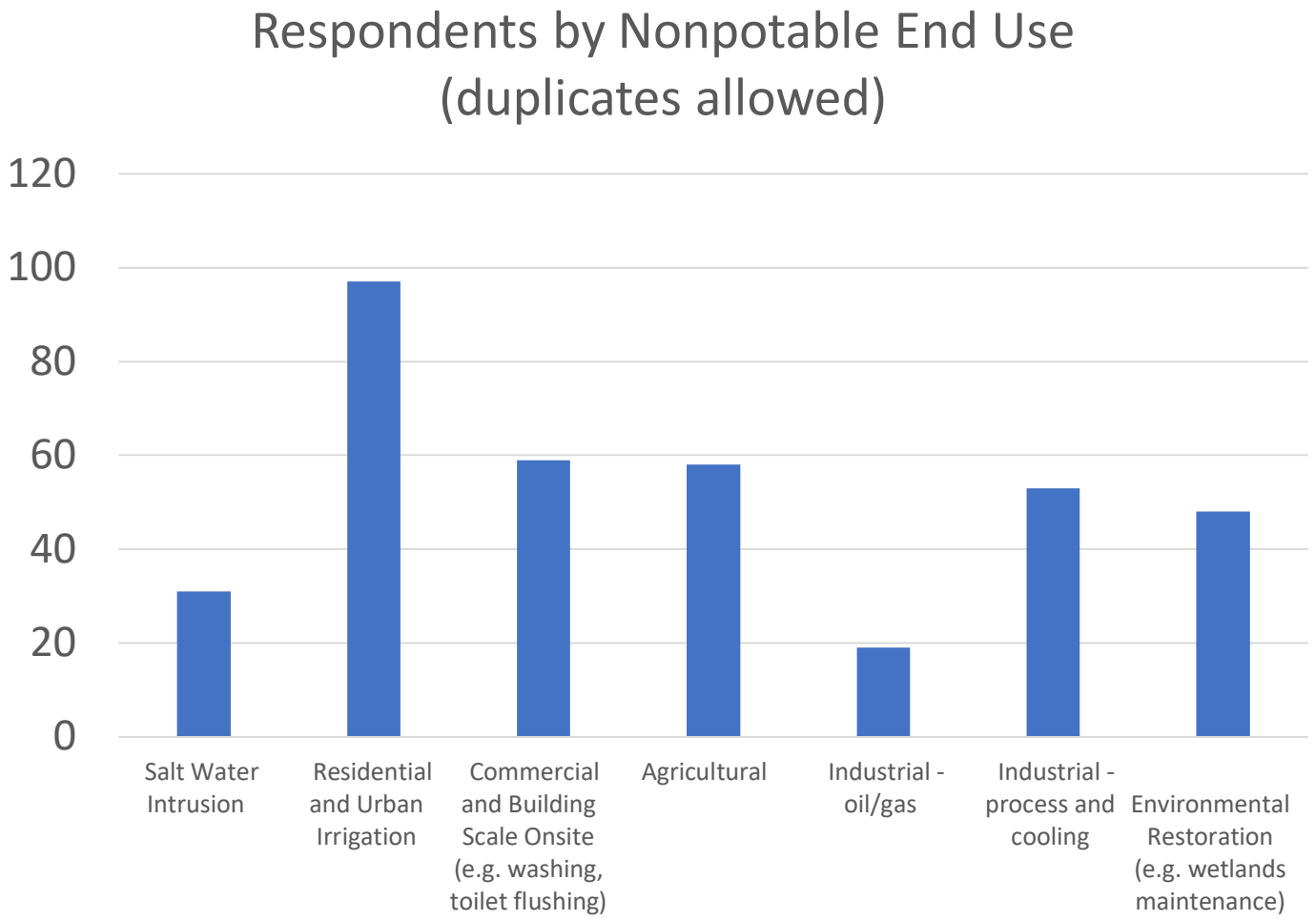




Respondent Demographics

Source Water Write-ins

- Rainwater, greywater, in-building desalination, onsite wastewater recycling
- urban runoff
- drinking water treatment backwash
- We advocate for it all
- Animal farm manure
- Graywater
- Considering IPR Only for Now
- Potable for storage
- Water Resource Management

End Use Write-ins

- Golf course irrigation
- Construction uses, dust control
- compaction, dust control
- Wildfire protection/suppression
- Equipment & Vehicle Washing, Fabric Dying
- Car wash
- Hauled Water Fill Stations
- public turf irrigation
- Buildings
- fit for purpose- reuse for frac

Respondent Demographics

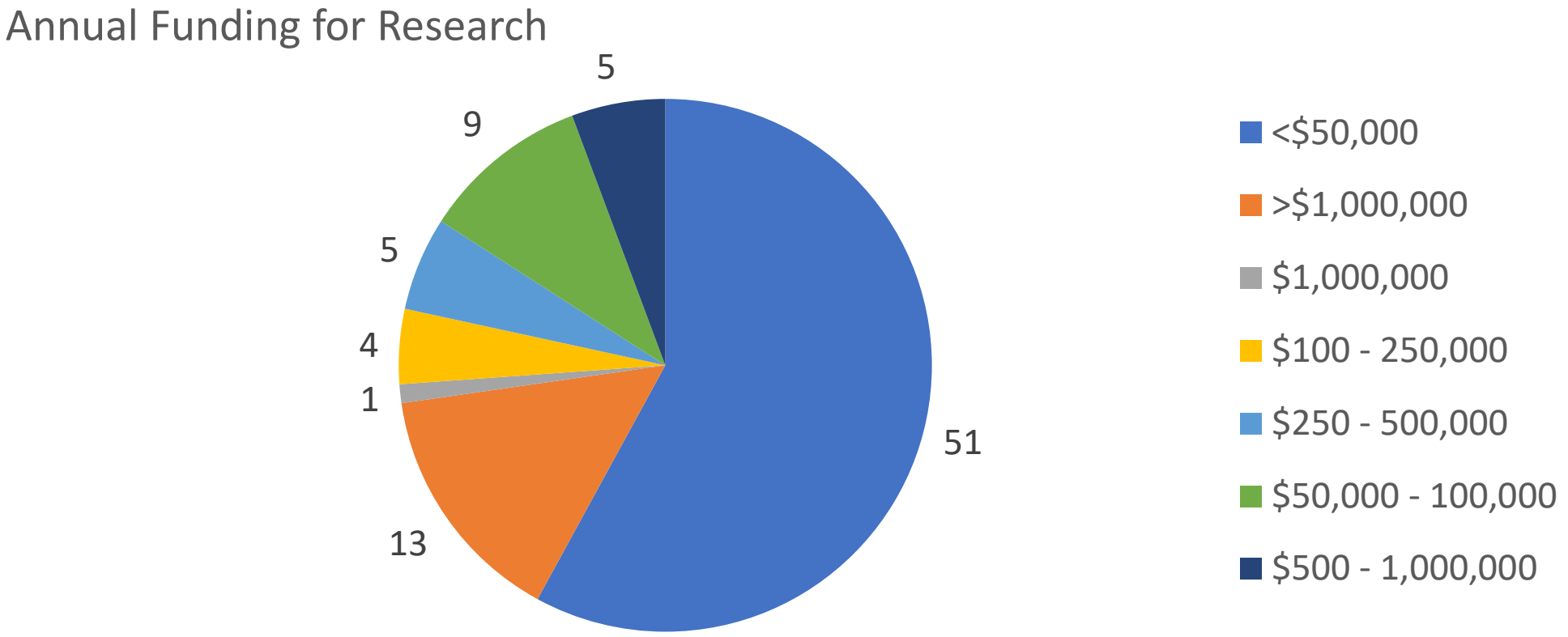
Primary Drivers of Water Reuse	
Address water scarcity and meet future demands	121
Increase water supply reliability through supply diversification	109
Reduce Discharge to Environment	69
Addressing Groundwater Overdraft	54
Reduce cost of water supply	44
Other - Write In	18
Provide CSO Relief	4
Sustainability	0
Diversified Water Supply	0
Water Scarcity	0

Respondent Demographics

Primary Drivers of Water Reuse – Write-in

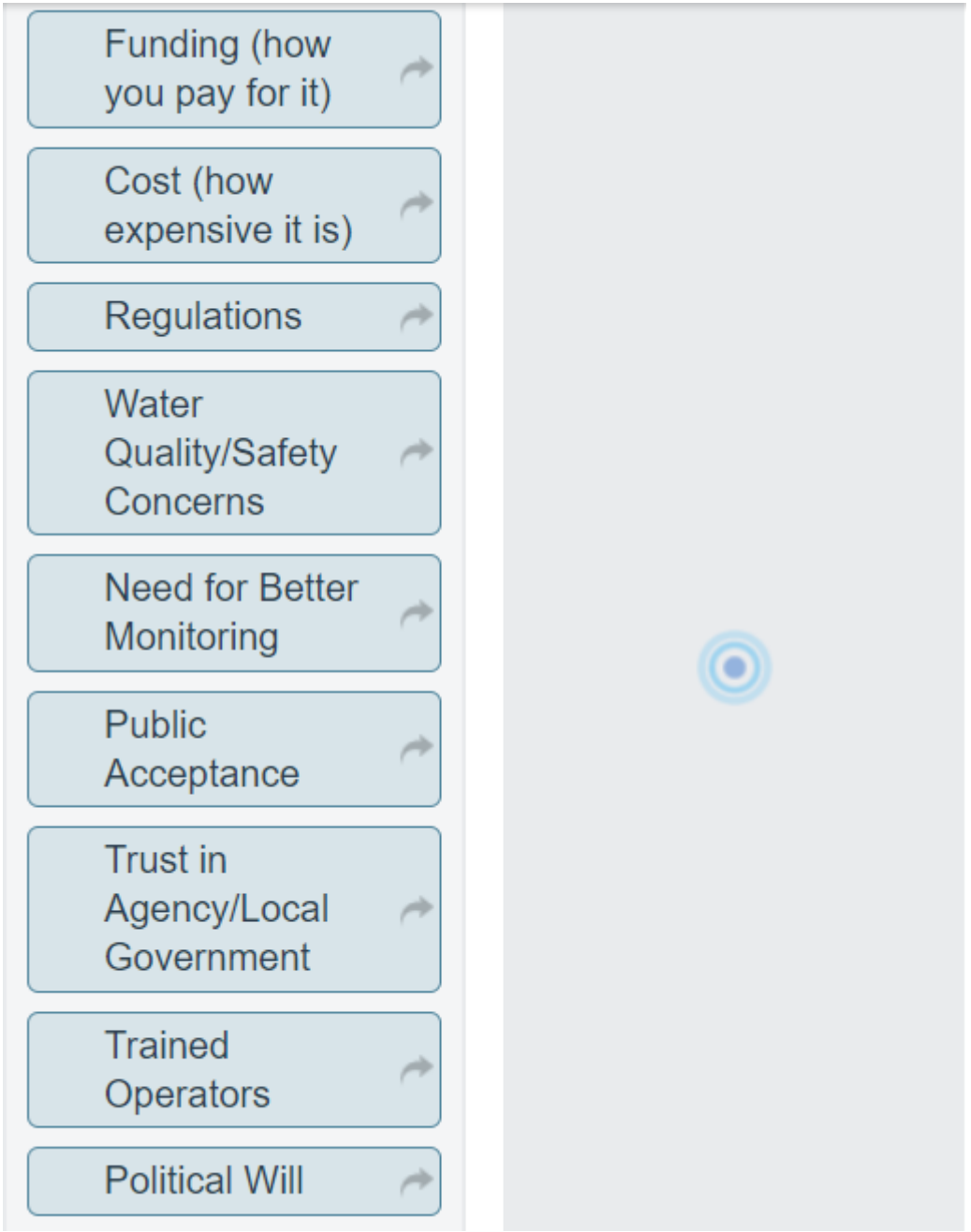
- Reduce Cost of WW service
- allow private property owners to participate in providing water resiliency, share the load, share the responsibility, share the empowerment for this vital task, allow the public to learn for themselves how much water they use and save with these changes to share with other people.
- Wildfire prevention
- increase climate resiliency and decrease GHG emissions
- reduce imported water deliveries
- Climate Change Resiliency
- reduce seawater intrusion
- Create organic fertilizer from manure
- increase resilience through development of constructed wetlands, natural systems
- Political commitments to maximize use of local water supplies.
- Reuse commitments for importation
- FDEP CUP limits
- De facto due to geography
- Guard against land subsidence, saltwater intrusion, TMDL
- Most cost-effective combination of next available water supply AND effluent disposal solution.
- Meet nutrient WLA in Chesapeake Bay
- Increased sustainability

Respondent Demographics

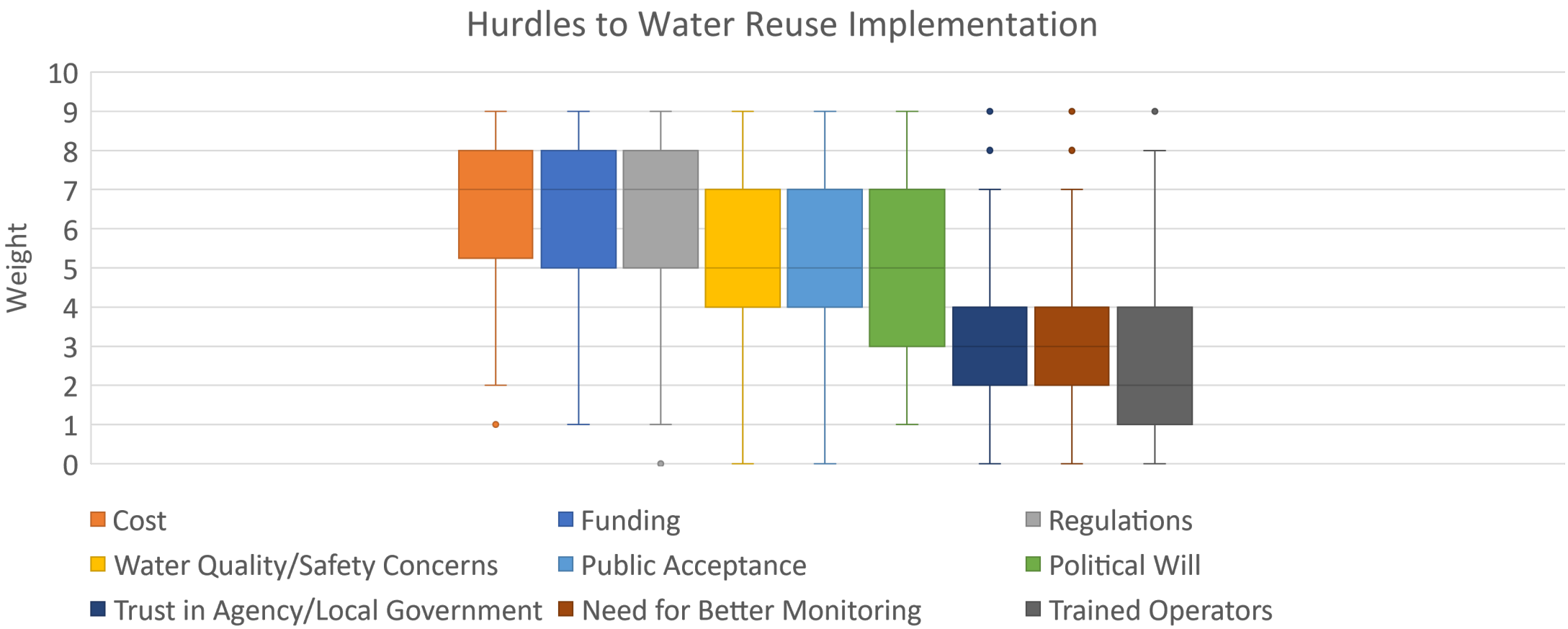


Forced Rank question on hurdles to water reuse

Ranked 9 hurdles to water reuse, from most to least



Results of Forced Rank question



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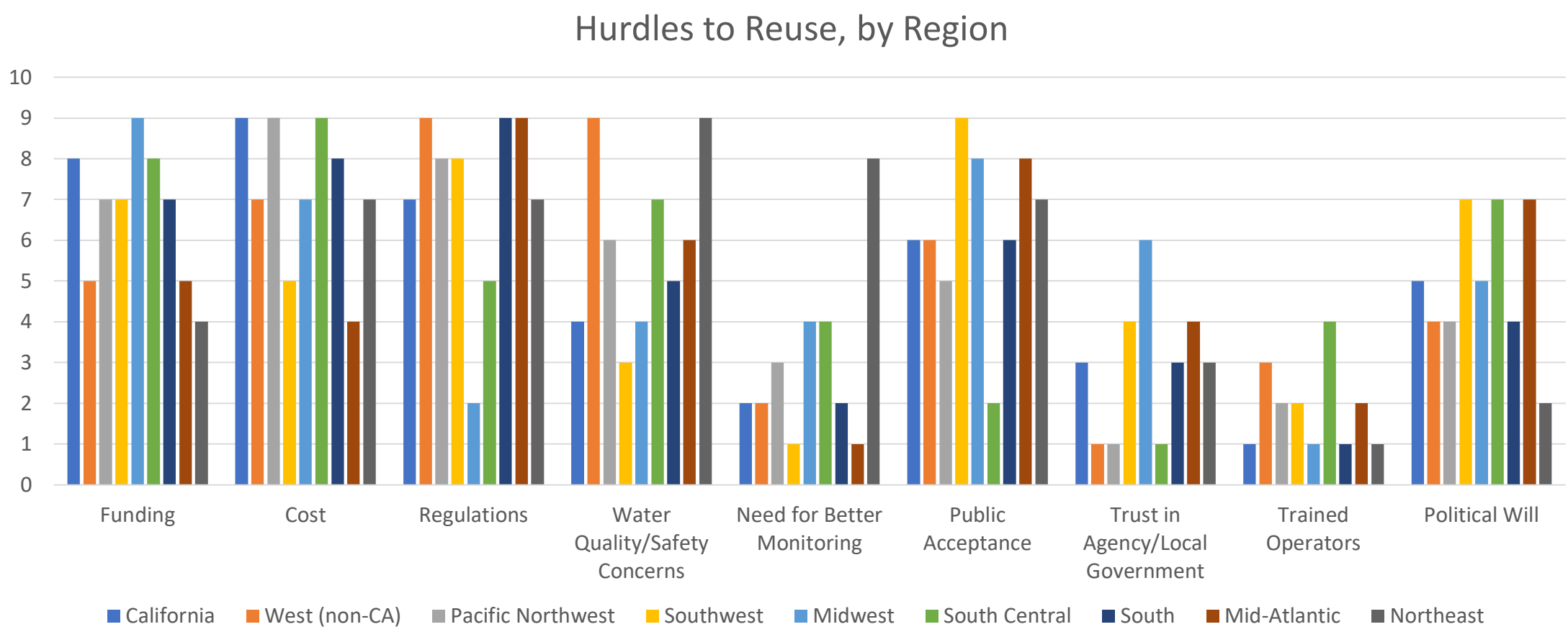


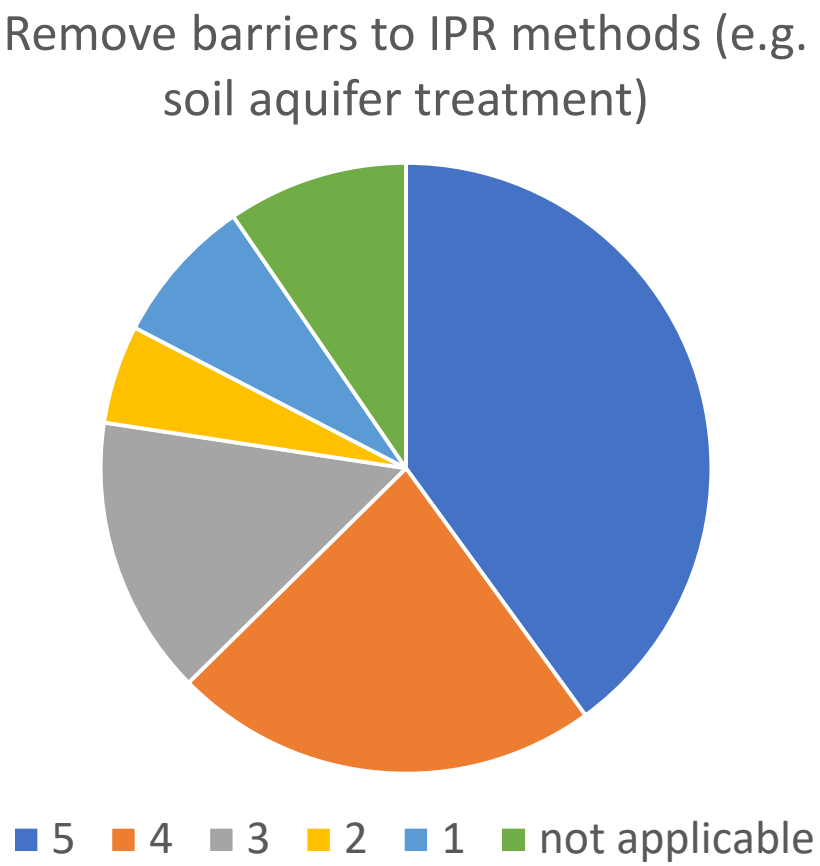
Questions on relevance of specific research statements

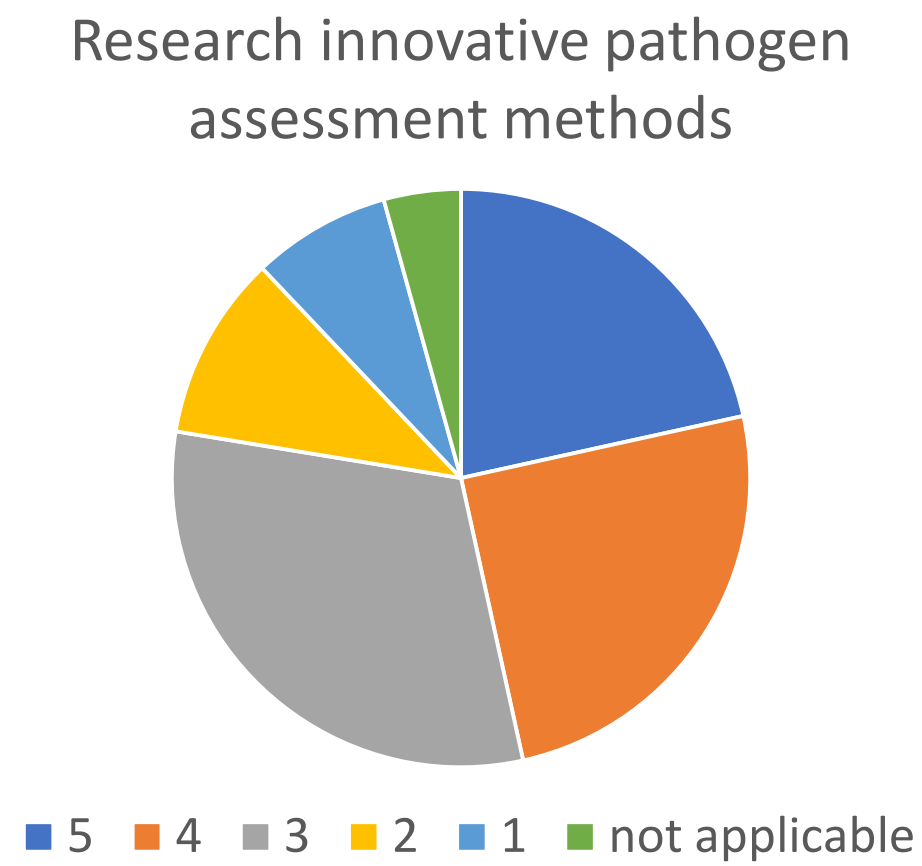
Each statement ranked on a scale of 1-5, including N/A

Health, Social and Environmental Issues

	California	West (non-CA)	South Central	South
Address gaps in information on health impacts for chemicals in reclaimed water	3.9	4.1	4.1	3.9
Research innovative exposure assessment methods, such as bioassays, for assessing human health effects of chemicals mixtures and unknowns	3.6	3.3	3.7	3.5
Develop non-targeted analytical methods to characterize unknown chemicals	3.5	2.8	3.1	3.5
Research innovative pathogen assessment methods, such as next-gen sequencing and culture methods.	3.3	3.2	4.0	3.4
Characterize potential impacts to the environment associated with more concentrated waste streams , such as concentrate and brine from membrane processes.	3.9	2.9	4.0	3.1
Quantify non-monetized benefits of potable and non-potable reuse	3.9	2.6	3.9	3.3
Assess environmental use of reclaimed water (including sensitive ecological areas)	3.6	3.1	3.6	3.8

Health, Social and Environmental Issues



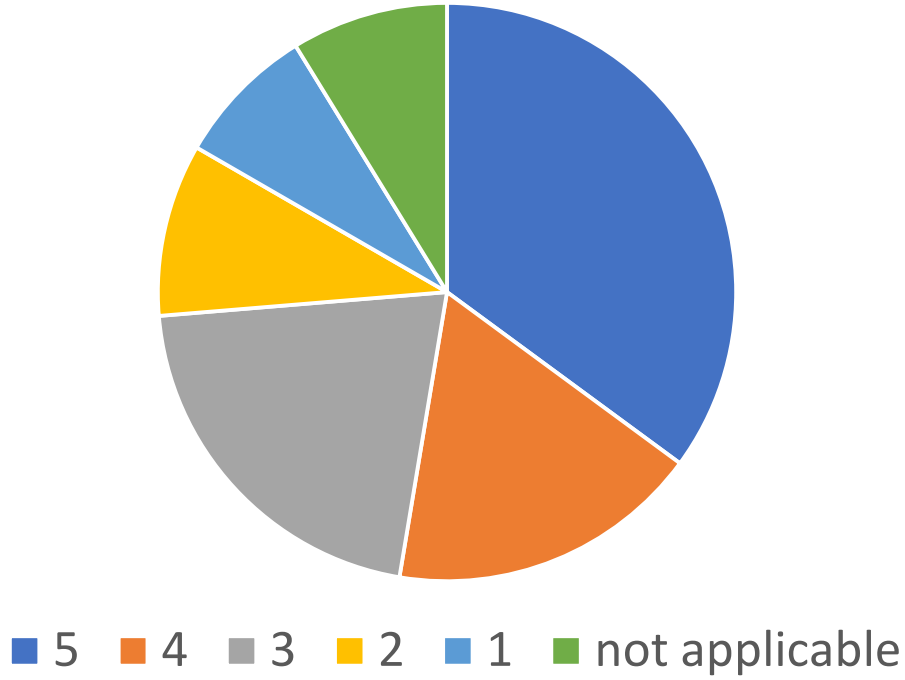


Treatment Efficiency and Quality Assurance

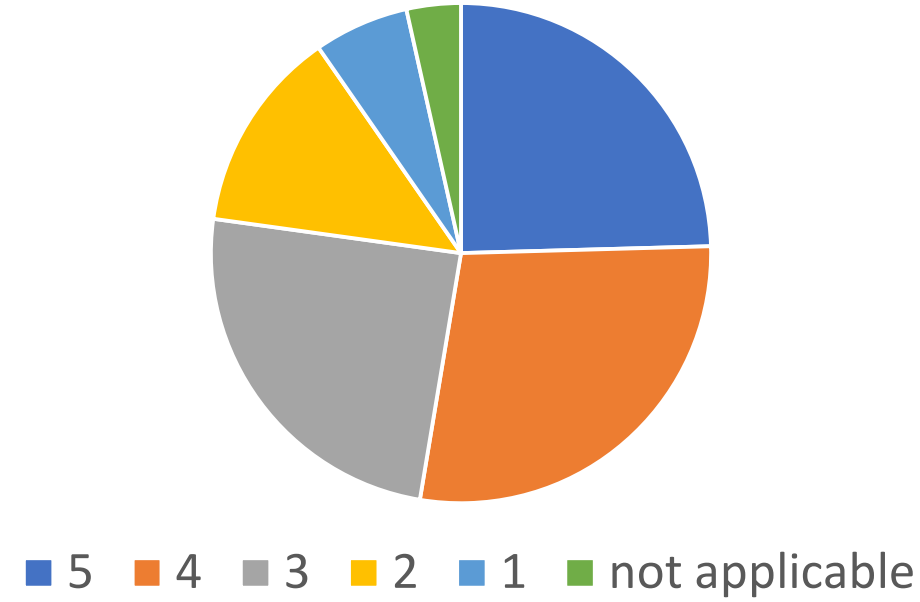
	California	West (non-CA)	South Central	South
Remove barriers to IPR methods (e.g. soil aquifer treatment) by developing better understanding of 1) contaminant attenuation (pathogens and chemicals) in environment and 2) aquifer assessment for reuse compatibility	4.0	3.2	4.1	3.6
Identify better indicators and surrogates for monitoring process performance	3.8	3.6	4.6	3.7
Characterize source water quality to understand treatability and public health	3.6	3.3	4.0	3.7
Develop better online sensors/ monitors for treatment performance and water quality characterization	3.6	3.2	4.0	3.4
Develop a better understanding of pathogen removal efficiencies and variability of performance in various unit processes	3.8	3.4	3.1	3.5
Optimize of existing technologies for improved efficiency and efficacy	3.9	2.3	3.7	3.6
Analyze future needs of water management and how they may be addressed by novel approaches to reuse or new technologies	3.7	2.9	3.3	4.3
Develop new concentrate management alternatives	3.9	3.1	4.3	3.3
Investigate use of data-driven decision making to drive increased water reuse (data management, predictive analytics/source control, increased automation/algorithm development	3.5	3.5	3.4	3.9

Treatment Efficiency and Quality Assurance

Develop new concentrate management alternatives



Investigate use of data-driven decision making to drive increased water reuse

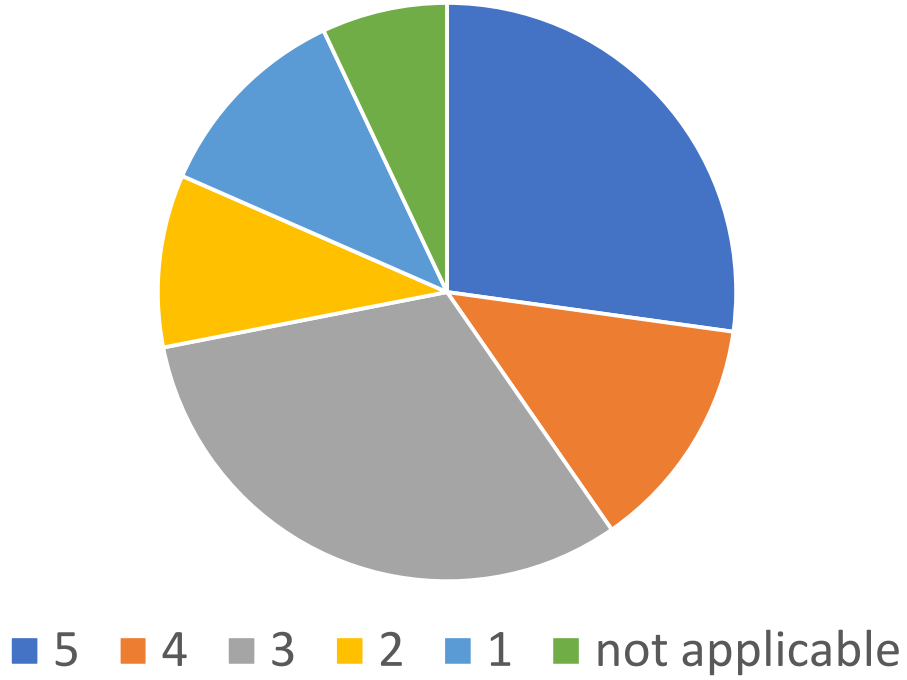


Regulatory, Institutional, Cost, and Other Barriers

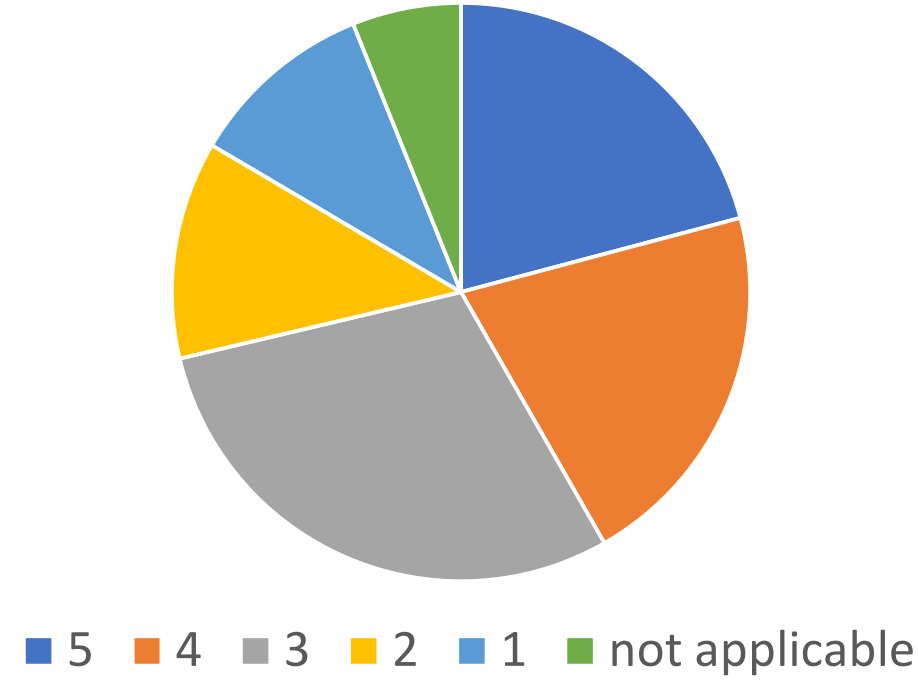
	California	West (non-CA)	South Central	South
Conceptualizing funding pathways and/or models to enable reuse	3.9	2.5	3.7	3.9
Conceptualizing partnership models (public-private, P3 options, industry-specific) to enable reuse	3.3	3.0	3.0	3.6
Develop guidance and/or regulations	4.0	3.3	3.7	4.1
Improve communications: Develop and share information across cities and with regulators. Is there a need for a national campaign?	3.7	3.4	3.4	4.0
Identify solutions to legal barriers: Ordinances restrict stormwater in collection systems	3.5	2.4	3.0	3.4
Identify solution to legal barriers: Water rights	3.5	2.6	3.0	3.6
Identify solution to legal barriers: opportunities for streamlined permitting and assess permitting options for blended source waters	3.9	2.9	3.6	4.1
Develop methods for public engagement to increase user acceptance and other benefits	3.7	3.1	3.3	3.9
Understand business models for distributed and on-site reuse	3.4	2.4	3.5	3.6
Understand business models for innovative reuse applications	3.5	2.4	3.8	3.8
Evaluate source waters considering their potential volumetric contribution, risks, and cost by region	3.3	3.0	3.7	4.0

Regulatory, Institutional, Cost, and Other Barriers

Understand business models for distributed and on-site reuse

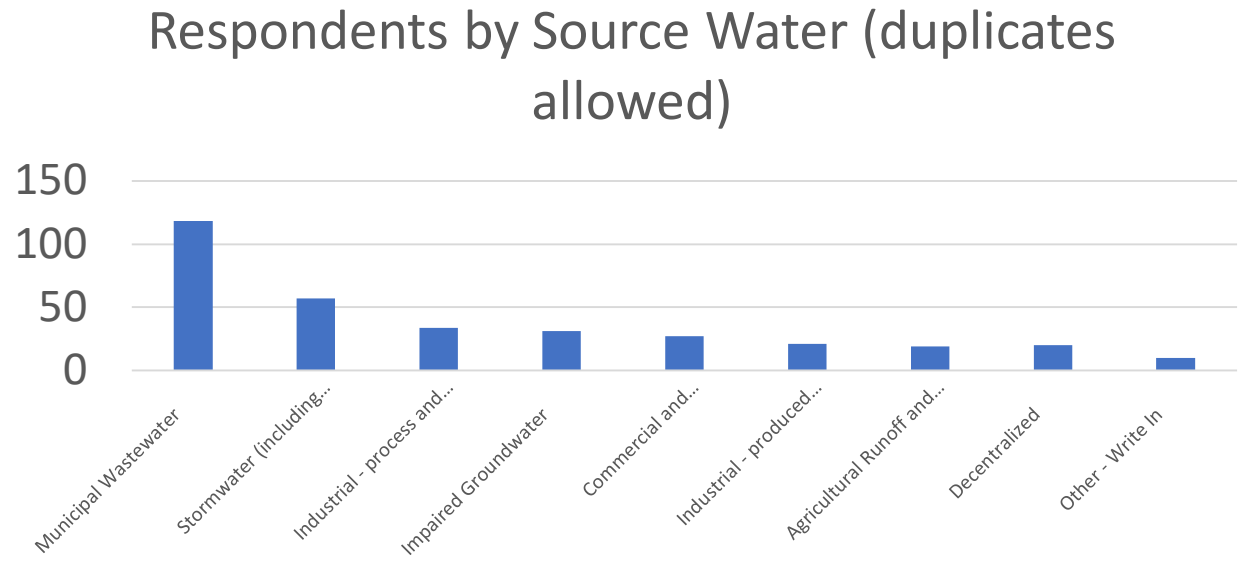


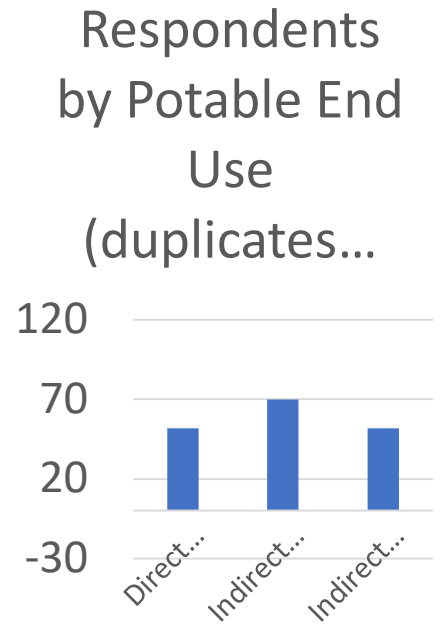
Conceptualizing partnership models to enable reuse

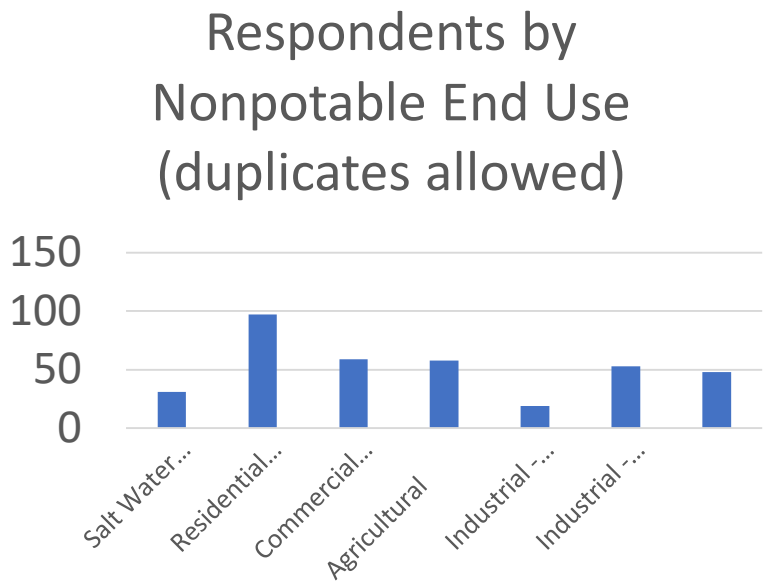


Scope discussion

- Phased approach ?
- Consider source water, end use application, barrier type (health, treatment, institutional)
- Phase 1 …
- Phase 2 …
- Phase 3 …

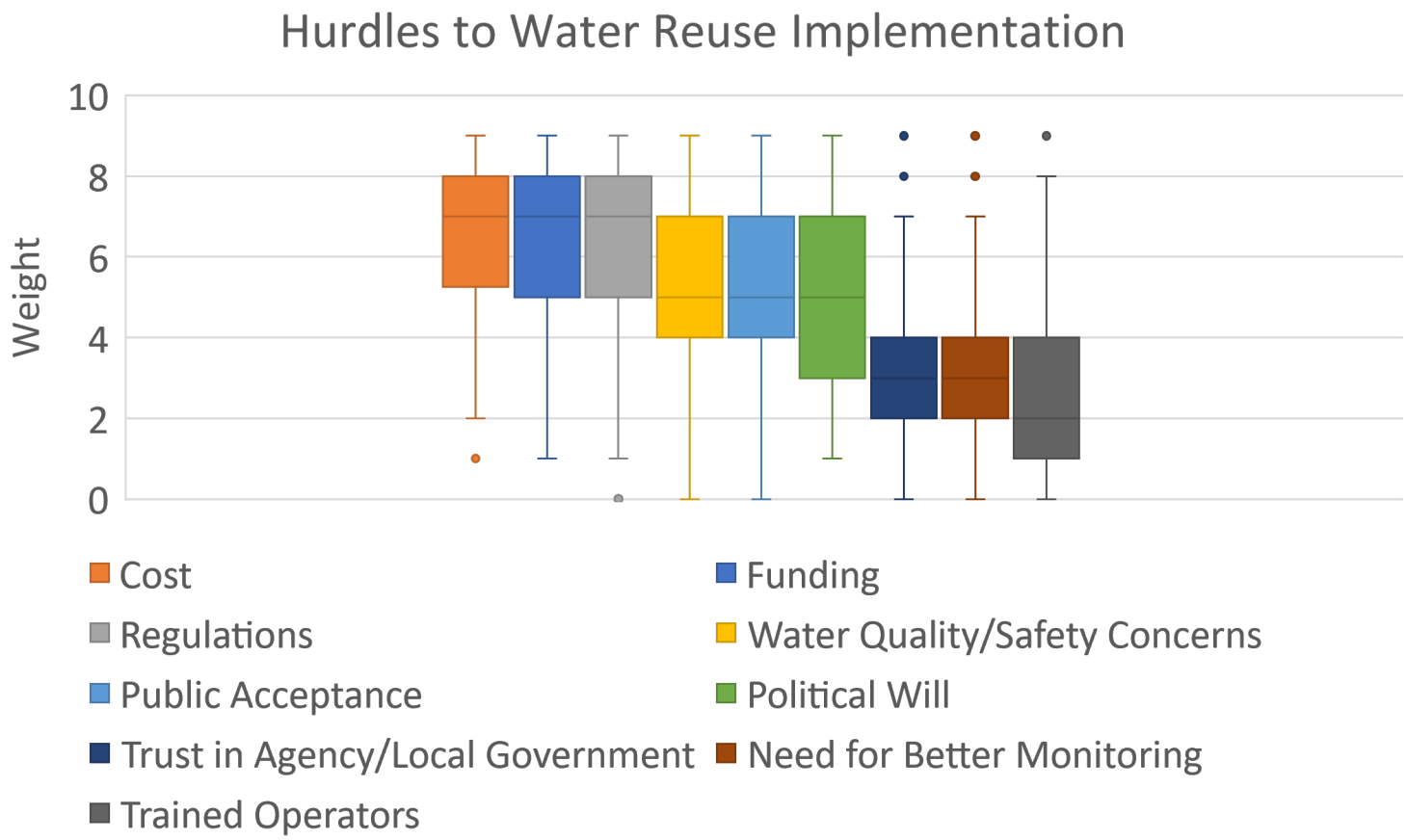






Scope discussion

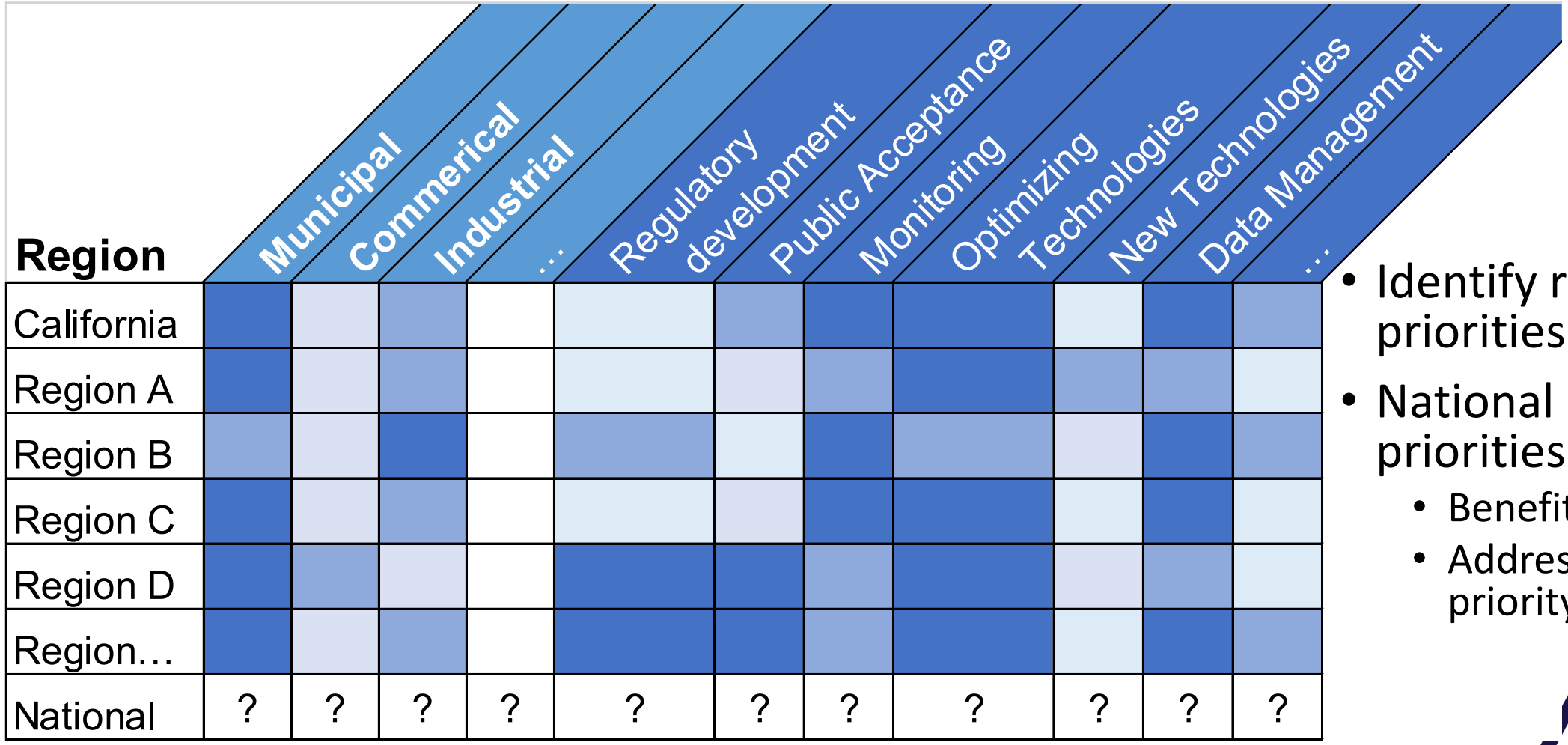
- Which of the hurdles can this Research Strategy take on?



Scope - Objectives

- Address the scientific questions that will underpin the important policy decisions being made by regulatory agencies and utilities.
- Understand and identify key research gaps that exist in the various applications of recycled water and provide a research roadmap to bridge these gaps.
- Leverage the important research that has been conducted by federal agencies (e.g., EPA, the Bureau of Reclamation, and Department of Energy, including current NAWI hub) and non-federal agencies (e.g., Water Research Foundation, National Water Research Institute, ReNUWIt, universities and utilities).
- More specific objectives dependent on phase

Looking Ahead: National Research Priorities



- Identify regional priorities
- National research priorities should:
  - Benefit most regions
  - Address the highest priority for each region