



Sea Level Rise Risk Perceptions & Policy Preferences among Hawai'i's Civil Servants

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Sea Level Rise (SLR)- What is it?

Causes

- ▶ **Global Mean Sea Level Rise (GMSL):** the average height of the entire ocean surface.
- ▶ **Primary Causes:** Anthropogenic global warming
 - ▶ Melting glaciers & ice sheets
 - ▶ Thermal expansion of oceans

Predicted Global Impacts

- **3.2' SLR** predicted by the end of the century (IPCC Fifth Assessment Report of 2017)
- More recently, scientists are making intermediate-high scenario of **4'-6.6' SLR by 2100** (NOAA, 2022)
- SLR could cost the global community **\$14 trillion a year by 2100** (U.K. National Oceanographic Centre) due to vulnerable infrastructure, critical public utilities, coastal roads and buildings.
- World Economic Forum estimates **800 million people globally will be negatively impacted by SLR by 2050**



Why Study Risk Perceptions & Policy Preferences about SLR?

- Perceptions, values & belief matter– they impact policymaking
- SLR Adaptation policy is moving slowly in the USA and abroad
- Not much survey work on adaptation to date
 - *Yale Climate Change Communication Program, PEW- Climate Change Focus*
 - *Surveys in coastal states include Cone et al, 2008; Linderman et al. 2015; Hamin, Gurrán, and Emlinger, 2014; Frazier, Wood, and Yarnal 2010; Moser et al 2018*

Why study civil servants?

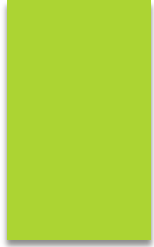
- Civil servants operate at the **nexus of policy-making, implementation, and public service**, placing them in a unique position to understand the challenges and opportunities in responding to climate change.
- In recent years, surveys of public servants have become increasingly common worldwide, including large-scale international efforts like the Global Survey of Public Servants (Ayesha and Schuster 2023; Meyer-Sahling et al. 2021)
- By surveying them, we sought to capture their perceptions, concerns, and readiness to address the complexities of SLR.

Hawaii as a “best case” case study for SLR perceptions & response

- Most remote island community on earth– vulnerable
- Experiencing SLR faster than other places
 - In Hawaii and other Pacific locations, SLR is expected to be 16-20% higher than the global average (Sweet et al, 2020).
 - Hawaii is planning for 4-6 feet SLR by end of century (intermediate-high prediction, SLR-XA)
- Citizens & policymakers have a close relationship with beaches and coastlines
- Deep blue state

Sea Level Rise Impacts in Hawaii

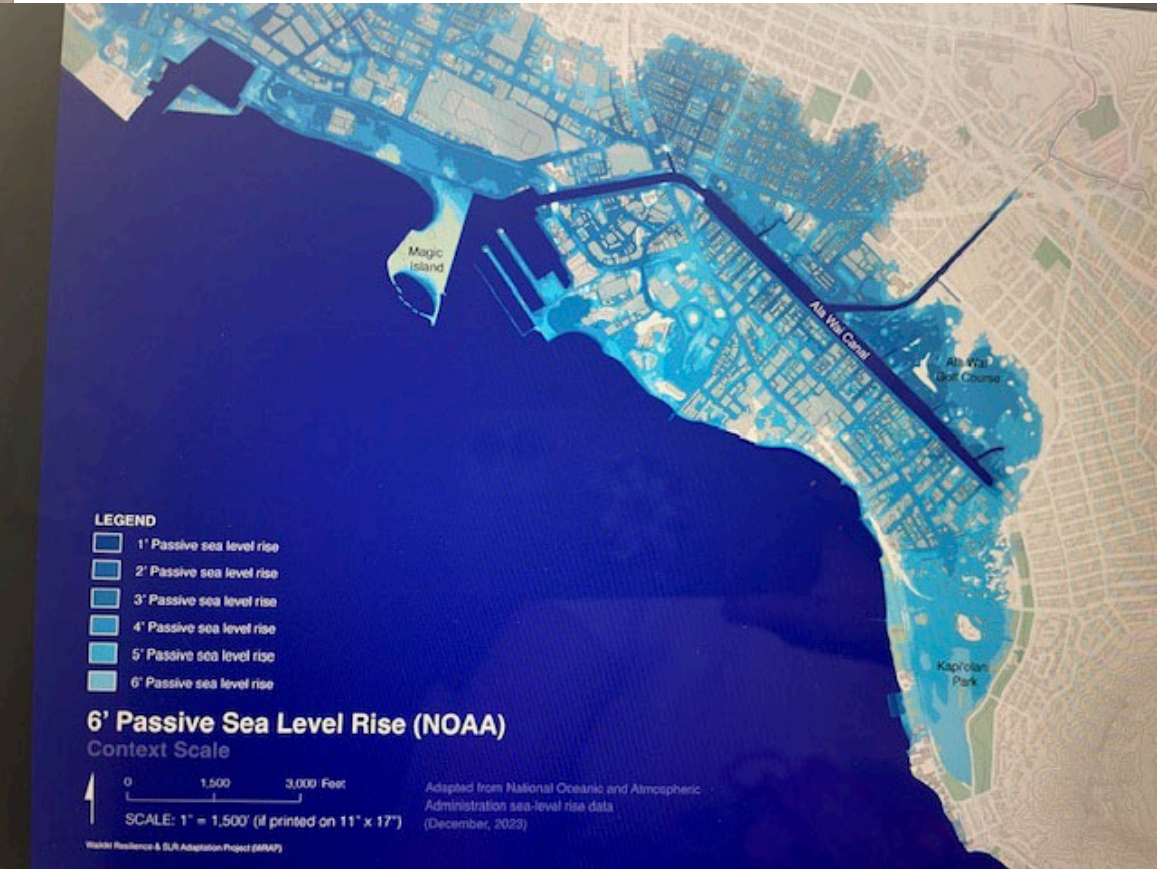
- ▶ **70% of beaches** on Maui, Kauai, and Oahu are eroding at a rate of -0.4ft/year
- ▶ **9% of beach length lost** to erosion in the last century (Fletcher et al, 2012)
- ▶ **Coastal highways** are experiencing erosion and flooding from high tides and storm surge; SLR is expected to more than double the historical erosion rate by the end of the century (Anderson et al. 2015)
- ▶ **Saltwater is already inundating groundwater**, raising the salinity in wetlands and estuaries and threatening coastal ecosystems and agriculture.
- ▶ **Half** of Hawaii's shorelines will be at risk of beach loss with only 2.4' of SLR (Tavares, Fletcher, Anderson, 2020)
- ▶ At 3.2' SLR, Oahu alone would experience flooding of some **3,880 structures and 17.7 miles of critical coastal roads— est. \$12.9B USD**



Predicted SLR Impacts in Waikiki by end of Century



Source: Waikiki WRAP Project.



Survey Methodology

Unit of Analysis: Civil Servants, Hawai'i State & 4 Counties

Delivery System: Survey Monkey via email

Period of Deployment: June-August, 2024

Questions: 35, multiple choice and open-ended

Average Time to Complete: 20 min

Survey Questions: Content

*Responses **Anonymous** except for questions to assess level of gov't (state or county); agency; profession; and location*

Inquired about the following:

- Beliefs (is SLR happening)
- Knowledge (causes of SLR)
- Risk perceptions- timing, consequences, seriousness, preparedness
- Sources of information and data
- Policy preferences
- Perceived Obstacles to policy & implementation
- Funding Sources

Survey Response

Total	State	Counties
N=129	N=27	N=102
		Hawaii Co. N= 9
		Honolulu Co. N=57
		Kauai Co. N= 47
		Maui Co. N= 16

NOTE: This Presentation looks at Total Responses

Agencies/ Departments Represented	
	Planning Departments N=24
Natural Resources N=8	Budget & Finance N=2
Board Water Supply N=14	Fire Department N=5
Public Works N=8	Law Enforcement N=4
Climate Change Office N=6	Mayor's Offices N=8
Neighborhood Commission N=5	Legal Services N=2
Housing N=5	Department Hawaiian Homelands N=1
Economic Planning N=6	Civil Defense Agency N=3
Transportation N=2	Department of Health N=2
Mayors/MD Office N=8	Parks & Rec N=2

Beliefs

Global sea level rise refers to the average increase in the water level of the Earth's oceans. Do you think sea level rise is happening?

All Respondents

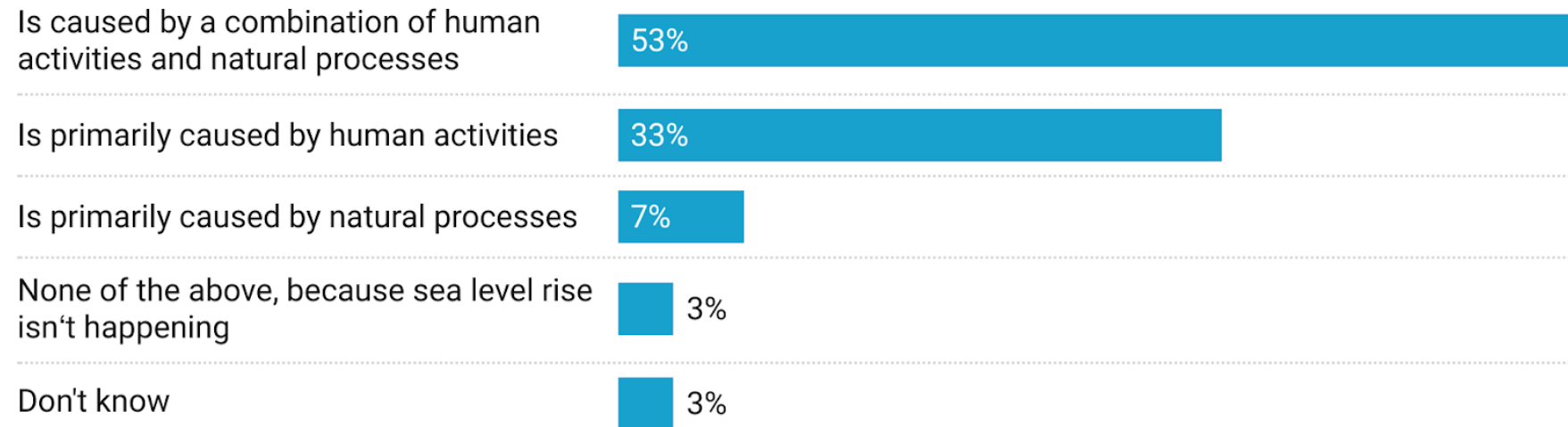


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Beliefs

What is the cause of sea level rise?

All Respondents

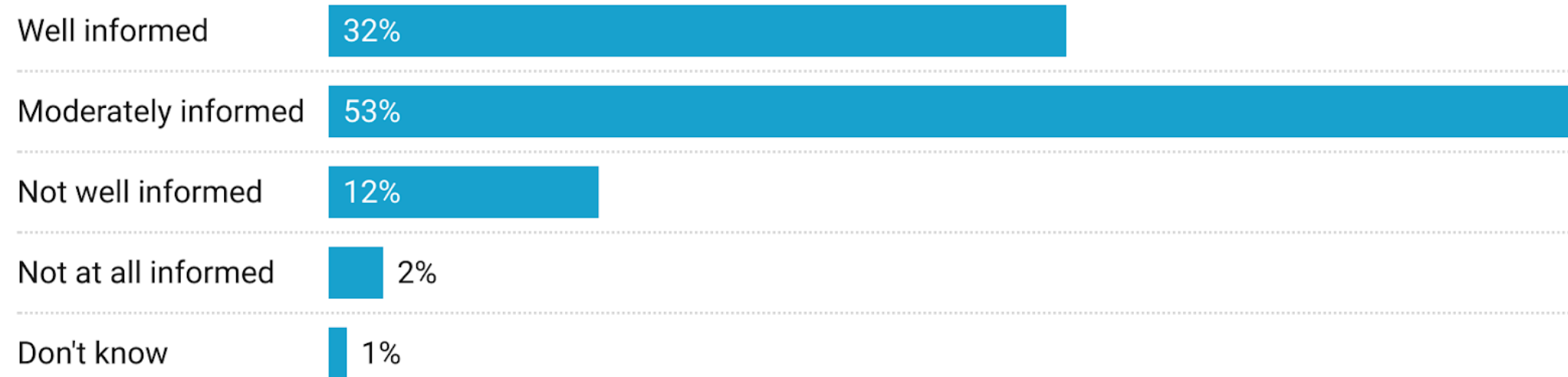


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Self-assessment of knowledge

How well informed do you feel you are about sea level rise?

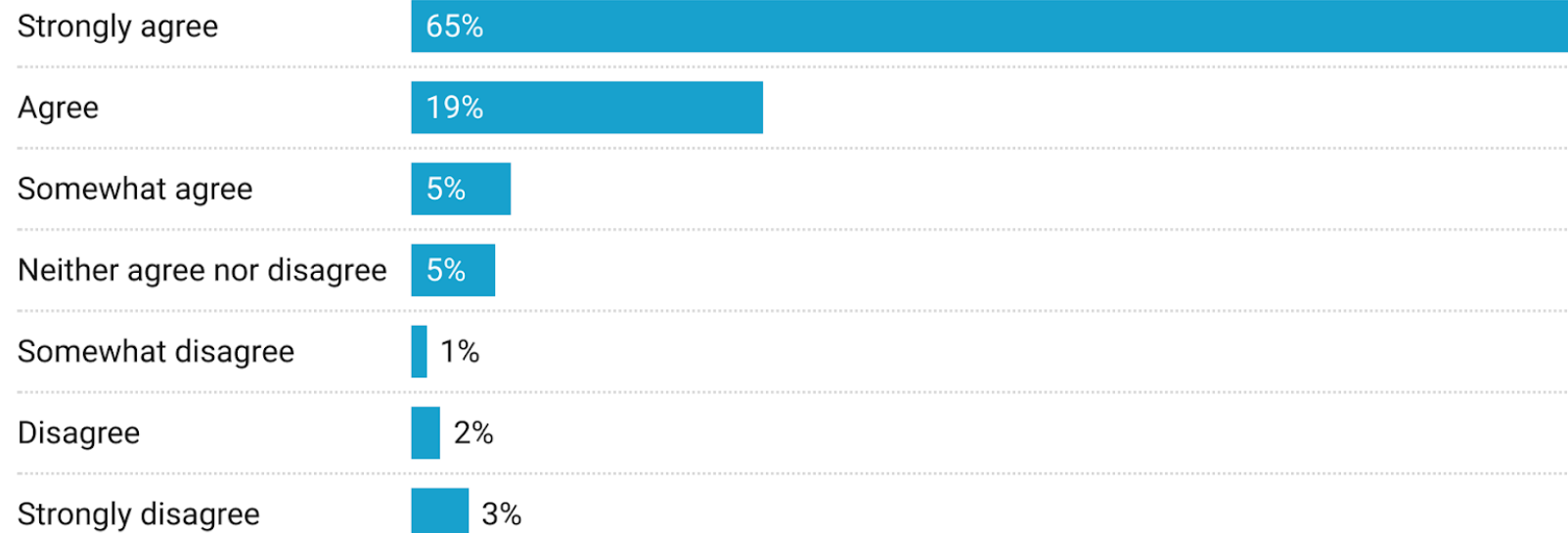
All Respondents



Perceived Timing

**"Sea level rise is already impacting coastlines in Hawai'i."
How strongly do you agree or disagree with this statement?**

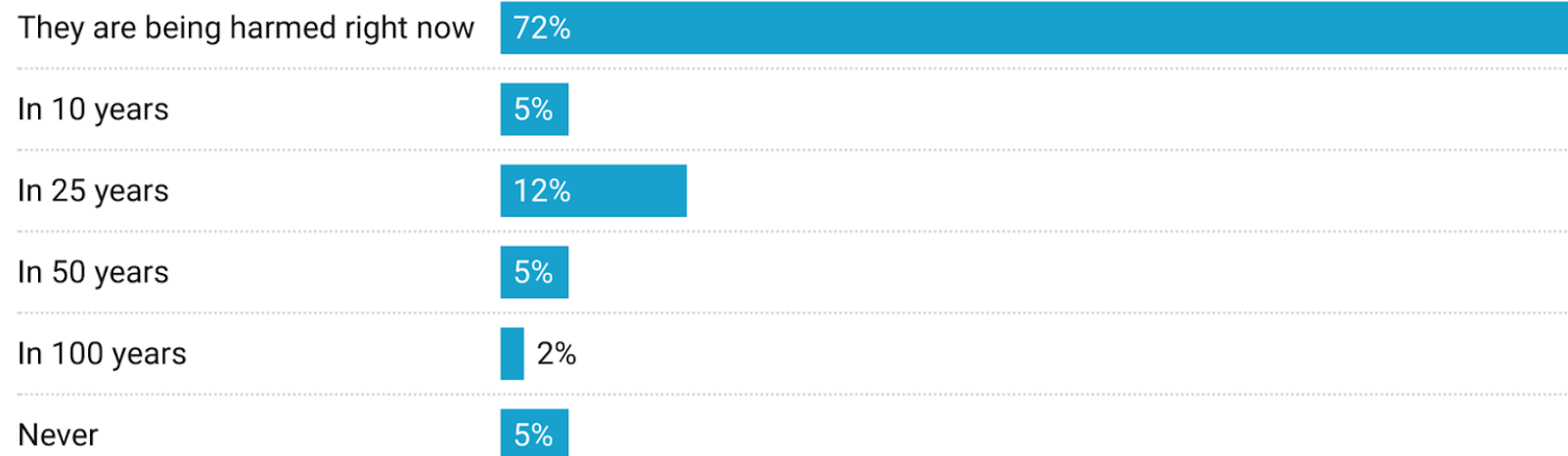
All Respondents



Perceived Timing

When do you think sea level rise will start to harm people in Hawai'i?

All Respondents

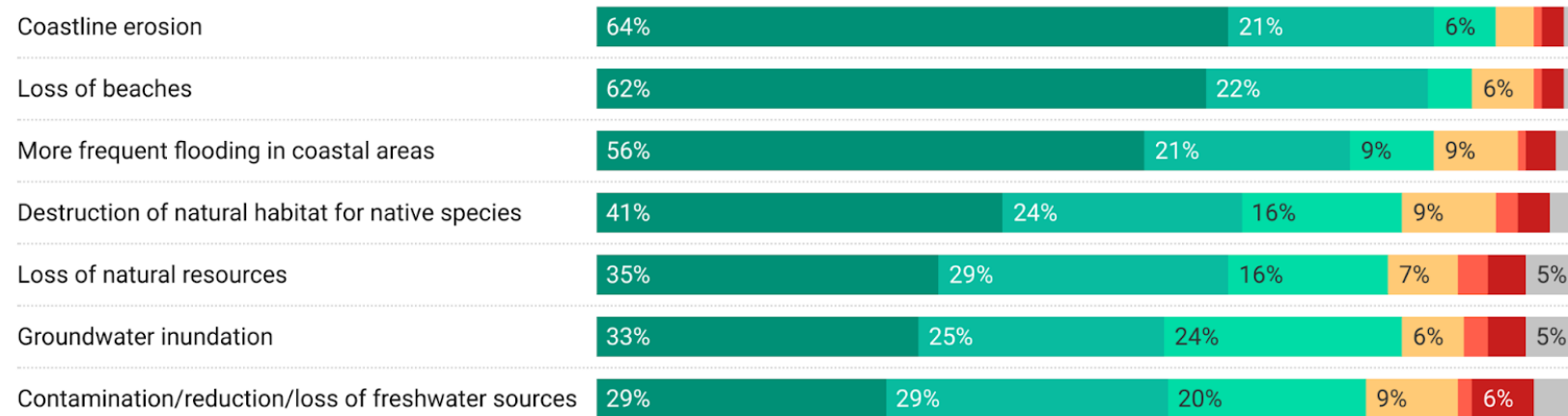


Expected Consequences

The following is a list of possible consequences of sea level rise. Please indicate how likely you think each is to occur in Hawai'i in the next 50 years if no action is taken to mitigate sea level rise.

All Respondents

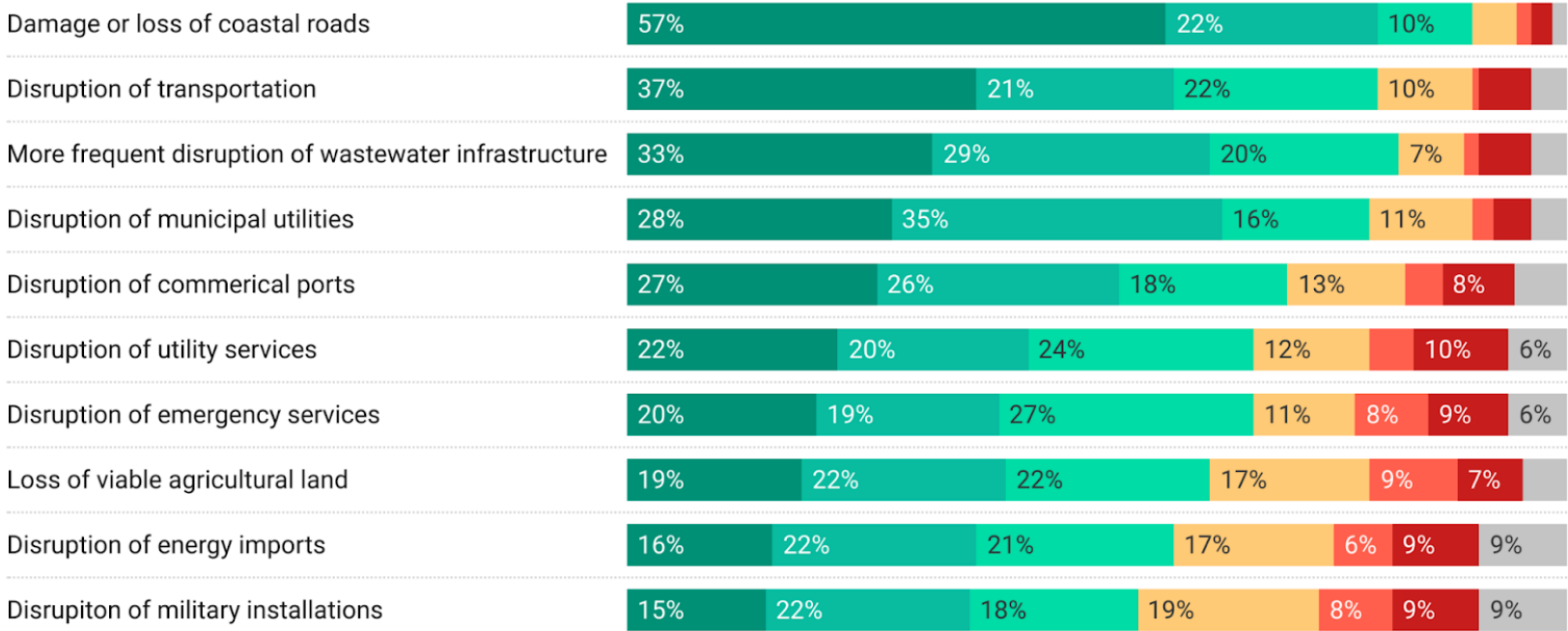
Legend: Virtually certain (Dark Green), Very likely (Medium Green), Likely (Light Green), 50/50 Likelihood (Yellow), Unlikely (Orange), Very unlikely (Red), Don't know (Grey)



The following is a list of possible consequences sea level rise will have for infrastructure. Please indicate how likely each is to occur in Hawai'i in the next 50 years if no action is taken to mitigate sea level rise.

All Respondents

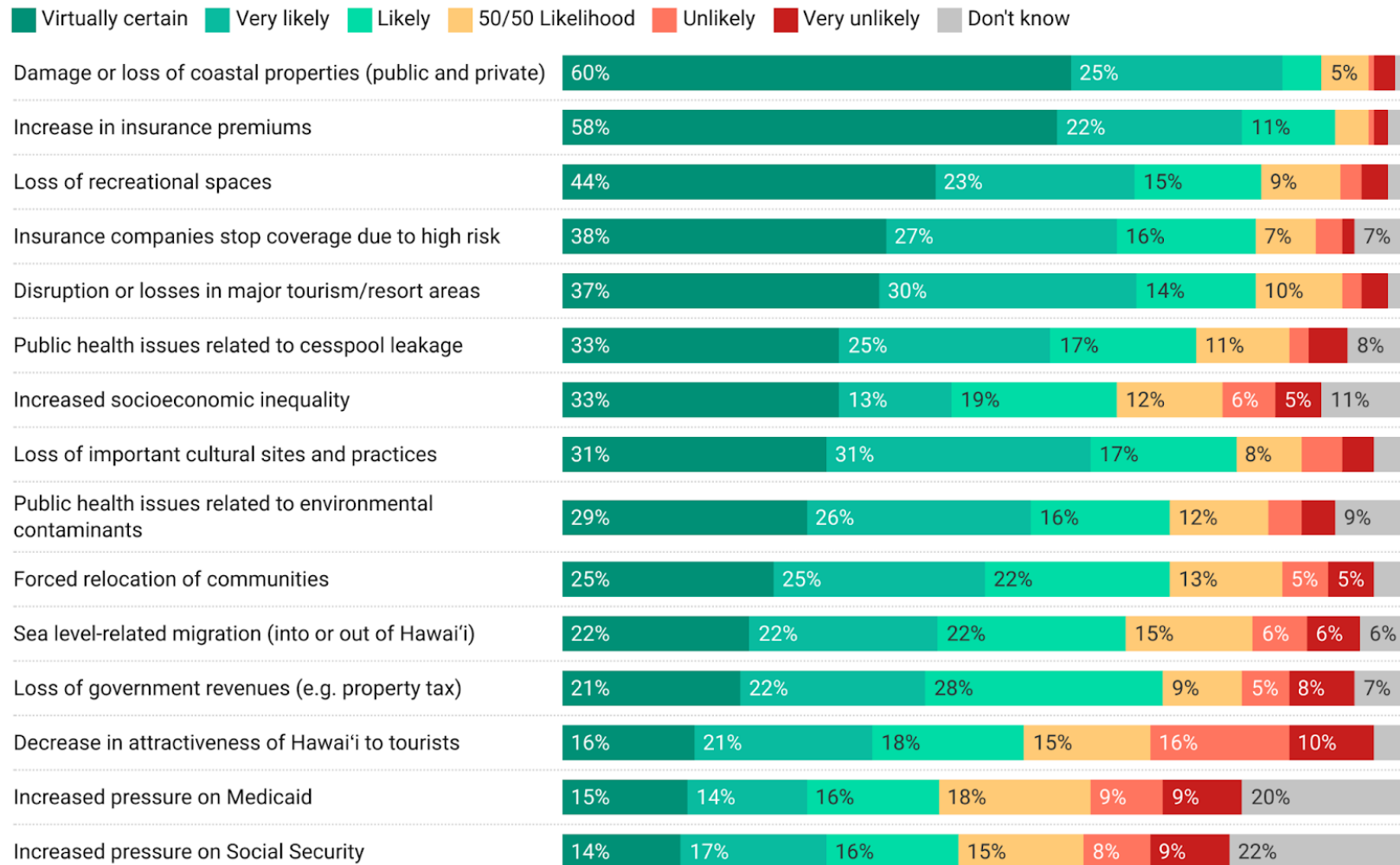
■ Virtually certain
 ■ Very likely
 ■ Likely
 ■ 50/50 Likelihood
 ■ Unlikely
 ■ Very unlikely
 ■ Don't know



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The following is a list of possible socioeconomic consequences of sea level rise. Please indicate how likely each is to occur in Hawai'i in the next 50 years if no action is taken to mitigate sea level rise.

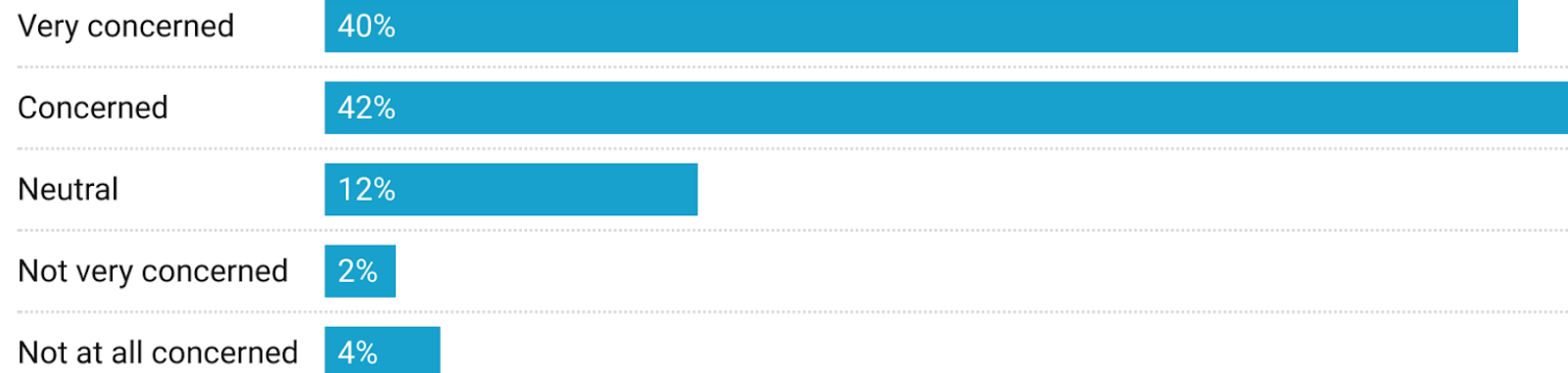
All Respondents



Level of Concern- Self

What is your personal level of concern about sea level rise?

All Respondents

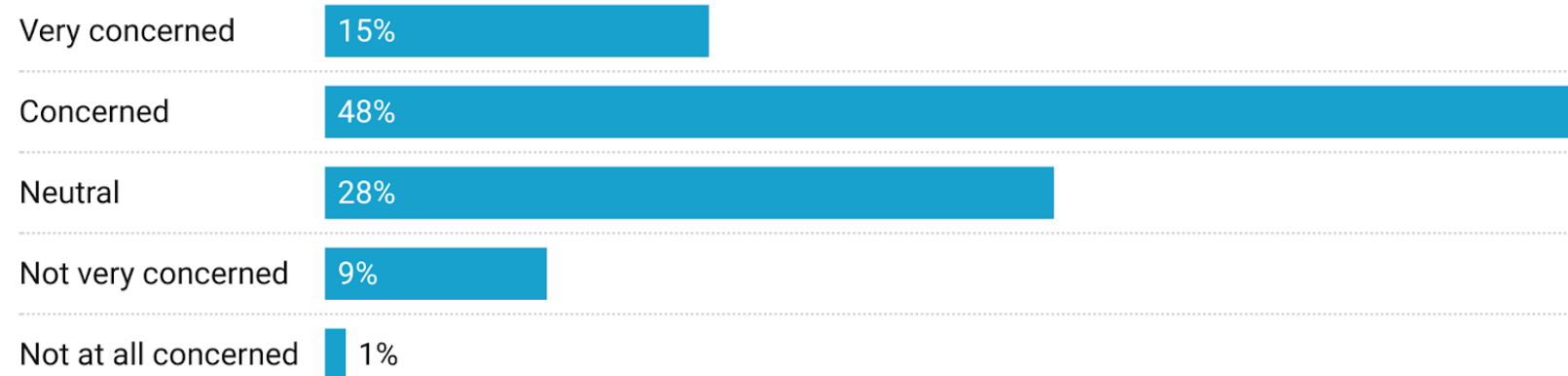


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Level of Concern-Colleagues

How concerned do you think your colleagues in Hawai'i state or local governments are about sea level rise?

All Respondents

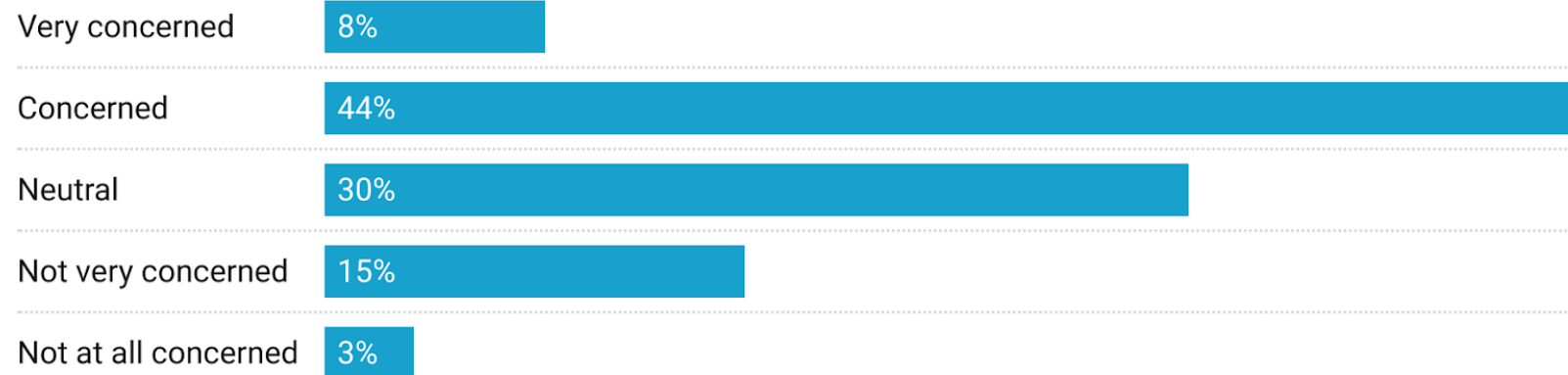


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Level of Concern-Electeds

How concerned do you think elected officials in Hawai'i are about sea level rise?

All Respondents

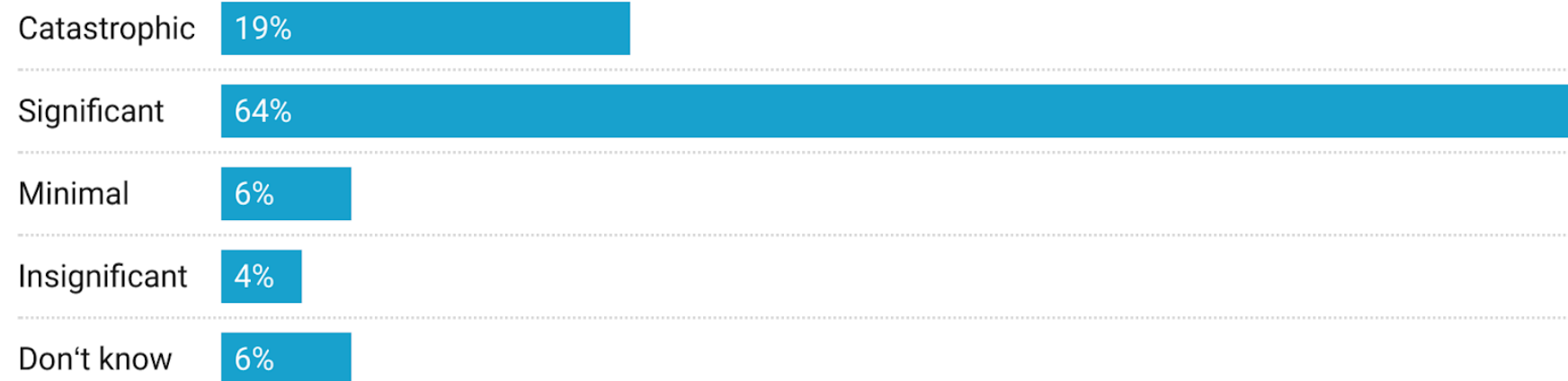


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Perceived Seriousness

Over the next 50 years, how serious do you think the impacts of sea level rise will be on Hawai'i's residents?

All Respondents

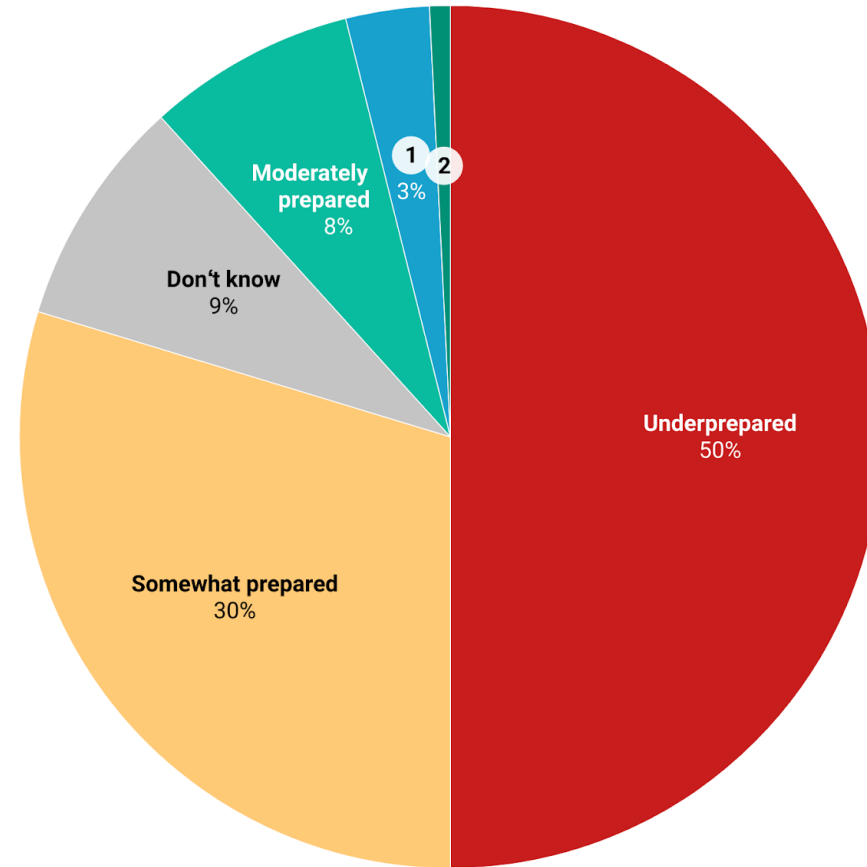


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Preparedness- State

Overall, how well do you think the State of Hawai'i is prepared for the impacts of sea level rise?

All Respondents



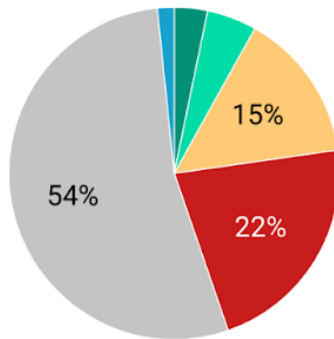
1 N/A- Sea level rise is not happening 2 Well prepared

Preparedness- Counties

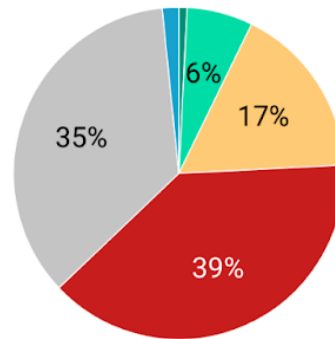
Overall, how well do you think the counties are prepared for the impact of sea level rise?

All Respondents

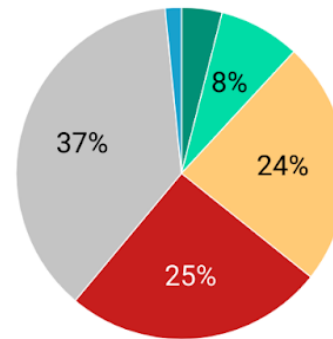
Well prepared Moderately prepared Somewhat prepared Underprepared Don't know
N/A- Sea level rise is not happening



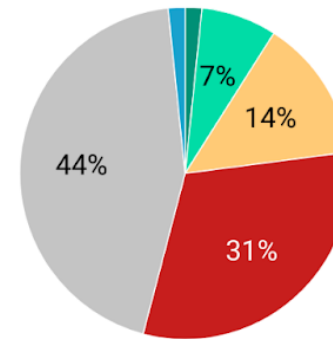
Hawai'i County



Honolulu County



Kauai County



Maui County

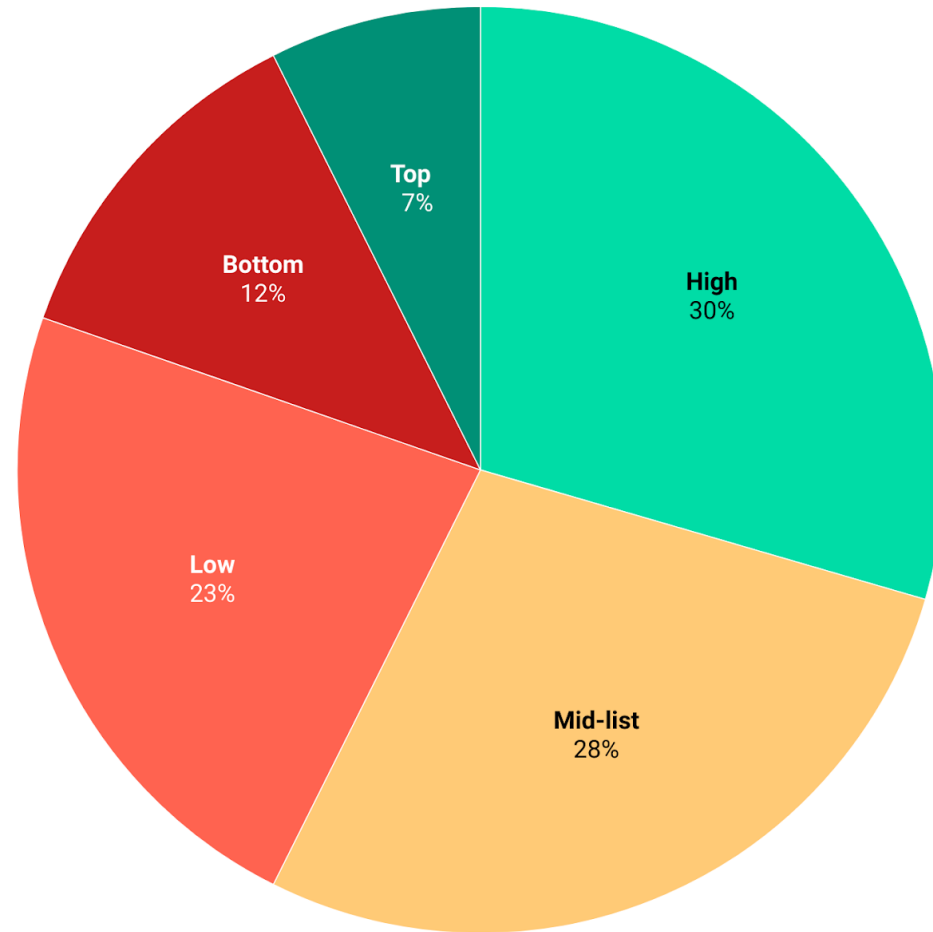
Summary thus far...

- ▶ High level of personal concern over what will happen in next 50 years; 83% of respondents think the impacts will be serious to catastrophic.
- ▶ Predict a wide variety of consequences for natural and human environment
- ▶ Majority of respondents believe the state is underprepared
- ▶ Majority of respondents think the counties are underprepared- or otherwise lack information about the counties' preparedness

Prioritization

Thinking about your agency/office/department as a whole, where does sea level rise fall on its list of priorities?

All Respondents



*What obstacles do you face in planning or designing sea level rise-related policy?
Please indicate the top 5 obstacles.*

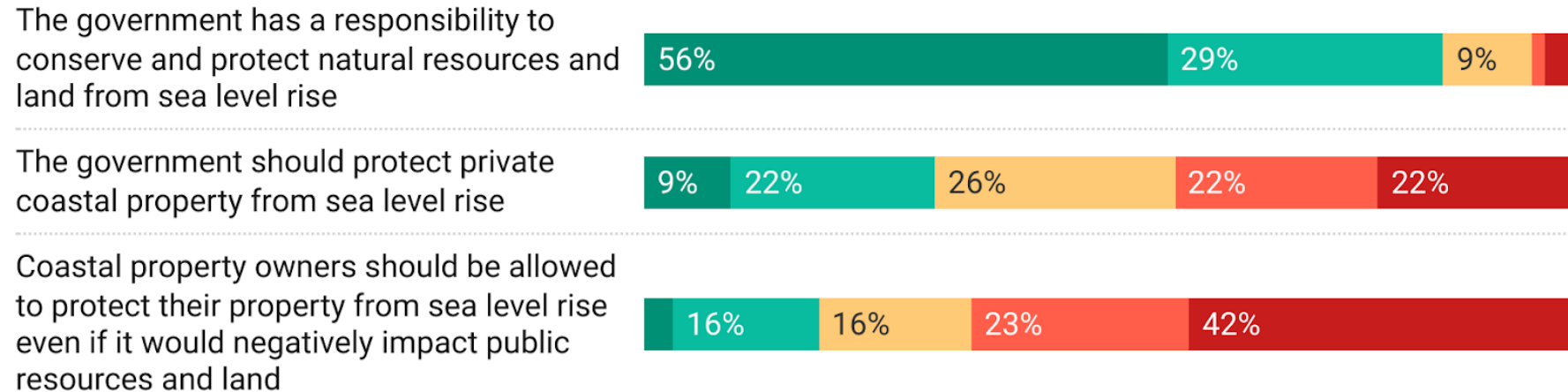
State	Counties
Insufficient staff resources to analyze/assess information (63%)	Lack of funding to implement a plan (43%)
Lack of political will/ not a political priority (59%)	Lack of coordination among government agencies (42%)
Lack of Funding to implement a plan (48%)	Insufficient staff resources to analyze/assess information (41%)
Opposition from stakeholder groups (44%)	Lack of coordination among agencies and other stakeholders (35%)
Lack of funding to prepare a plan (33%)	Lack of political will/not a political priority (34%)

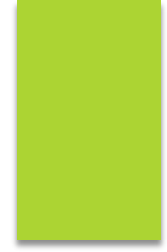
Policy Preferences

Do you personally agree or disagree with the following statements?

All Respondents

Strongly agree Somewhat agree Neutral Somewhat disagree Strongly disagree

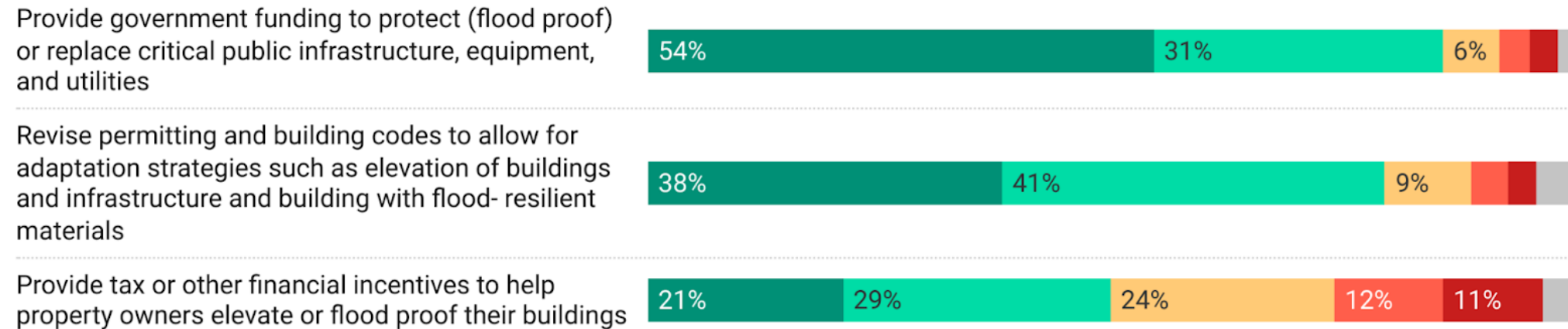




To what degree do you support or oppose the following "adapt/accommodate"- type policy approaches?

All Respondents

Strongly support Somewhat support Neutral Somewhat oppose Strongly oppose Don't know



To what degree do you support or oppose the following "protect"-type policy responses

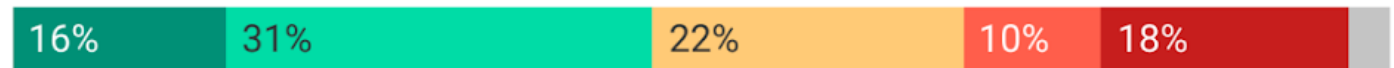
All Respondents

Strongly support Somewhat support Neutral Somewhat oppose Strongly oppose Don't know

Restore and promote living shorelines that buffer against sea level rise impacts (e.g. coral reefs, wetlands, seaside vegetation, sand dunes)



Use of government spending to build walls and other structural barriers along the shore to hold back flood waters from public buildings/infrastructure

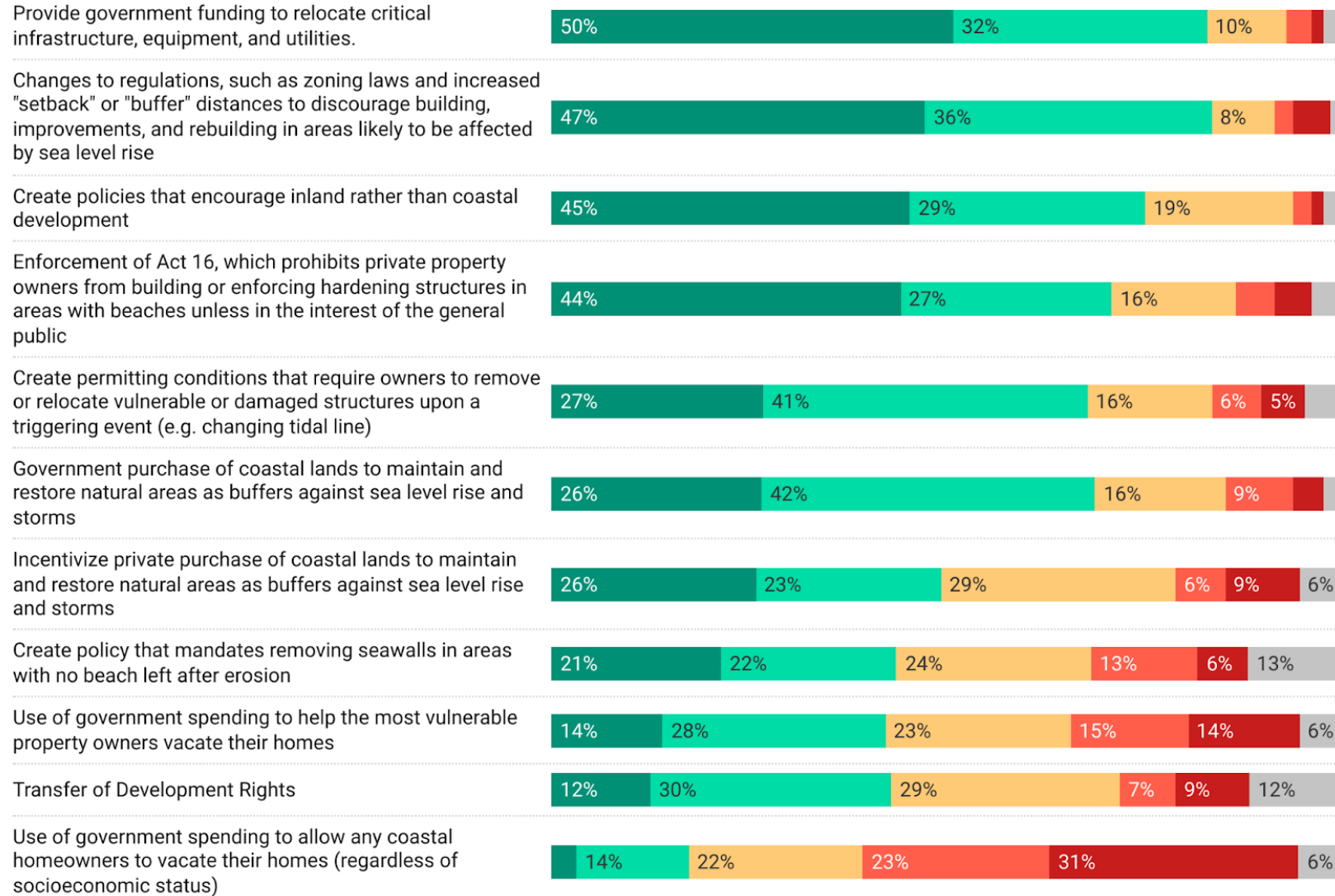


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To what degree do you support or oppose the following "managed retreat" -type policy responses?

All Respondents

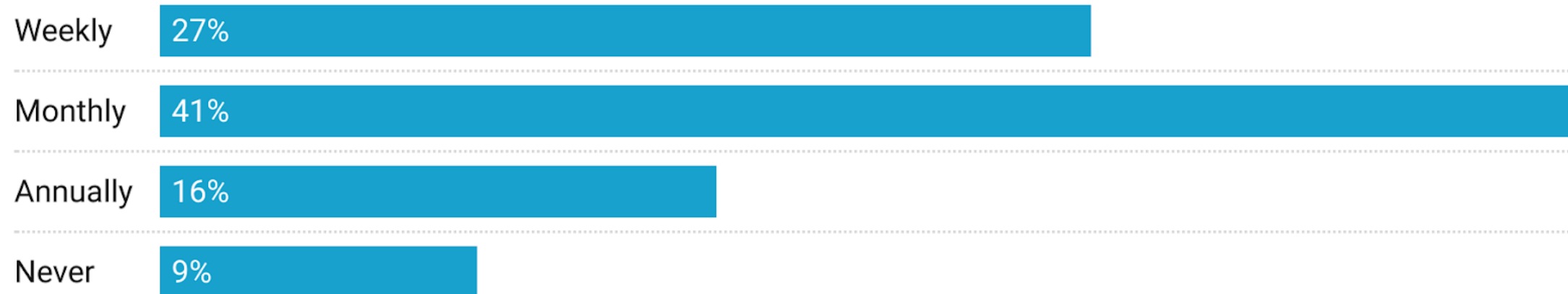
■ Strongly support
 ■ Somewhat support
 ■ Neutral
 ■ Somewhat oppose
 ■ Strongly oppose
 ■ Don't know



Media Exposure

How often do you hear about sea level rise in the media?

All Respondents

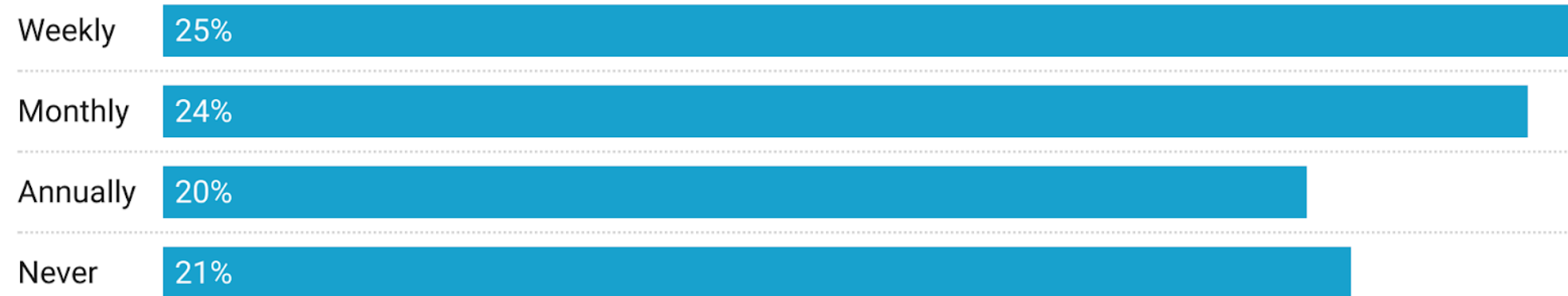


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Discussions with Colleagues

How often does the topic of sea level rise or coastal flooding and erosion come up in discussions with your colleagues?

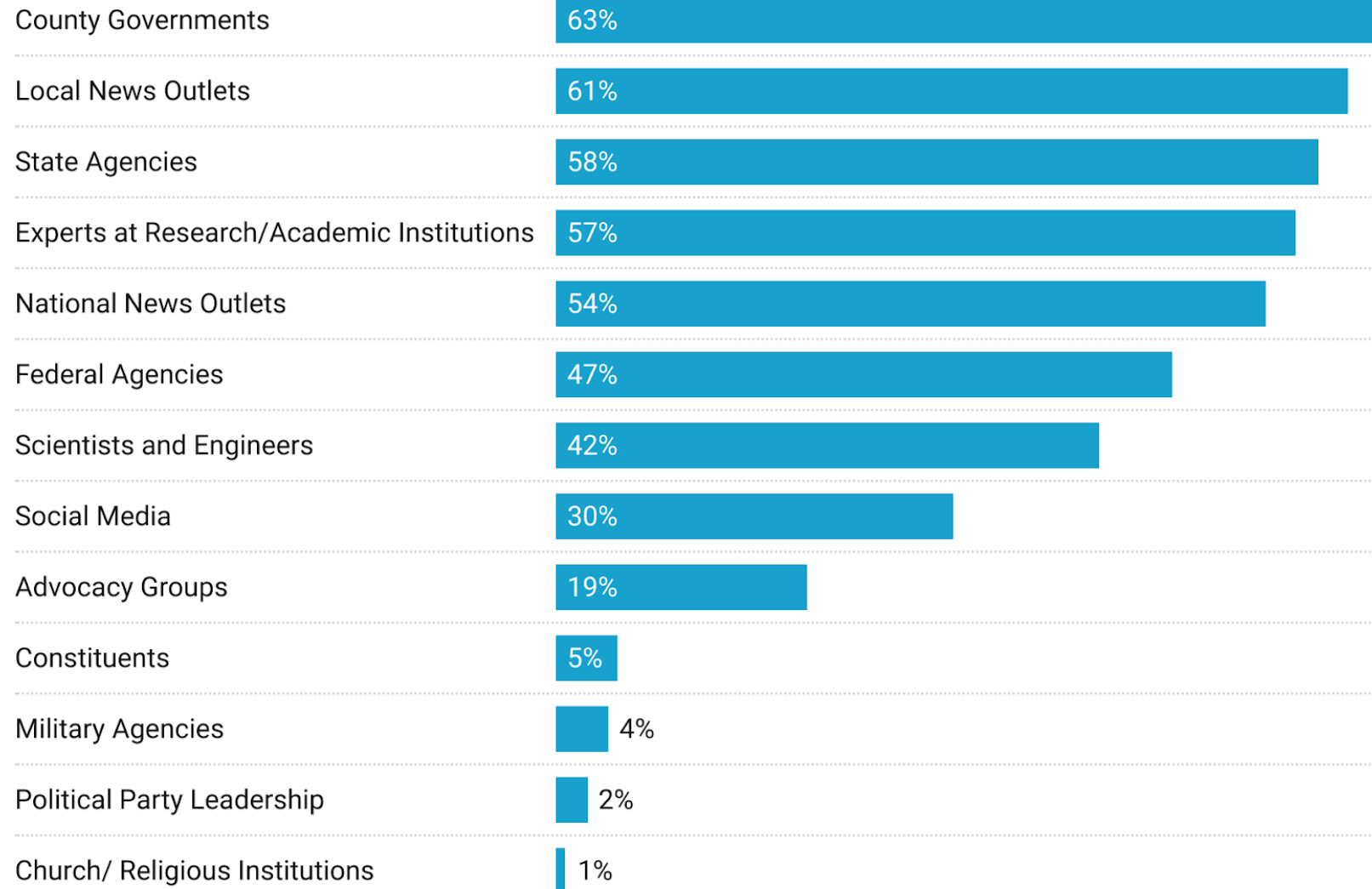
All Respondents



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Where do you get your information on sea level rise? (mark all that apply)

All Respondents



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Mahalo!