

The “psychology” of Bay restoration efforts (with emphasis on climate change & sea level rise issues)



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Climate Change Effects on the Bay

- **Sea level rise** – accelerating rise; compounded by land subsidence issues; loss of tidal marshes faster than species can migrate upland; urban flooding
- **Increases in temperatures** – warmed by 2 deg F since 1960s; projected to increase another 5 to 9 degrees by end of century; warmer water temperatures; worsens sea level rise problem
- **Fewer underwater bay grasses** – eelgrass – stressed at water temperature above 86 deg F or higher; affect other species - post-larval blue crabs nest in eelgrass, waterfowl feed on eelgrass, etc.
- **More precipitation** – more sediments flow into Bay; diminish water quality; more algae blooms; urban flooding
- **Larger “dead zones”**
- **Fewer wintering waterfowl**
- **Influx of new species**

The Issue of Interest

- Climate change (anthropogenic) -> rise in global sea levels (IPCC, 2007)
- Most Americans do not feel a personal connection to the issue – despite being ‘aware’ of climate change/sea level rise (CC/SLR) (Leiserowitz, 2007, Pew Center, 2009)
- Since 2009, sig. decline in Americans’ beliefs, risk perceptions, trust in messengers of CC (Leiserowitz et al, 2010)
 - Norfolk - second only to New Orleans – most vulnerable in the US to SLR (land subsidence + SLR) (Karl, et al, 2009, Boone et al, 2010)
 - HRPDC + ODU -> addressing hazards associated with CC/SLR
 - QoL survey (SSRC, ODU, 2011) -> 23.5% residents believe that CC is not a serious concern; 11.5% see it as a “hoax”



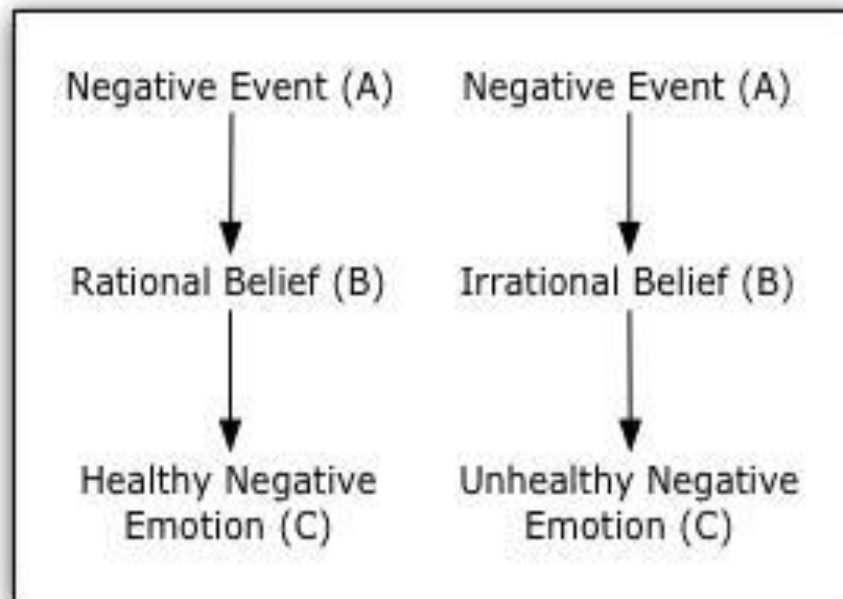
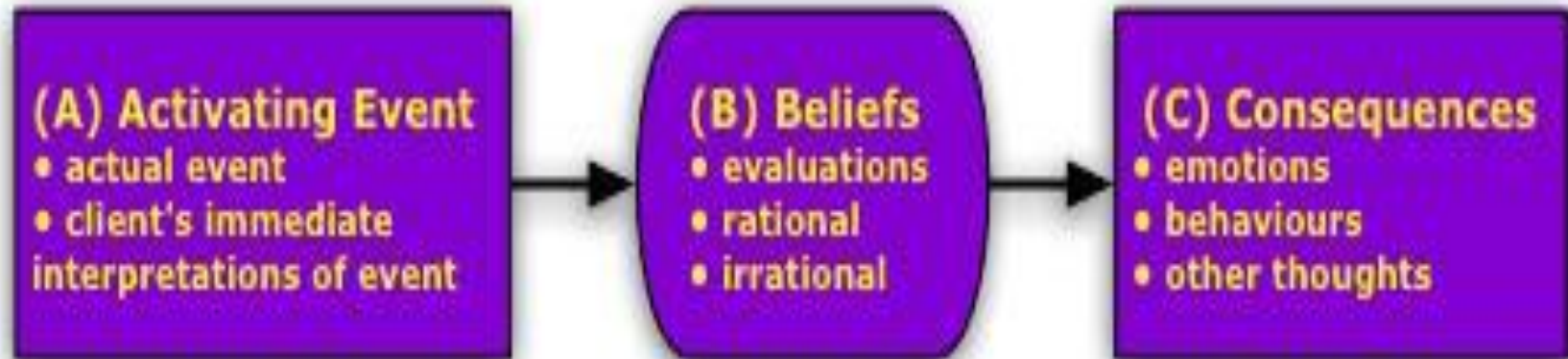
Tidewater Region, Virginia



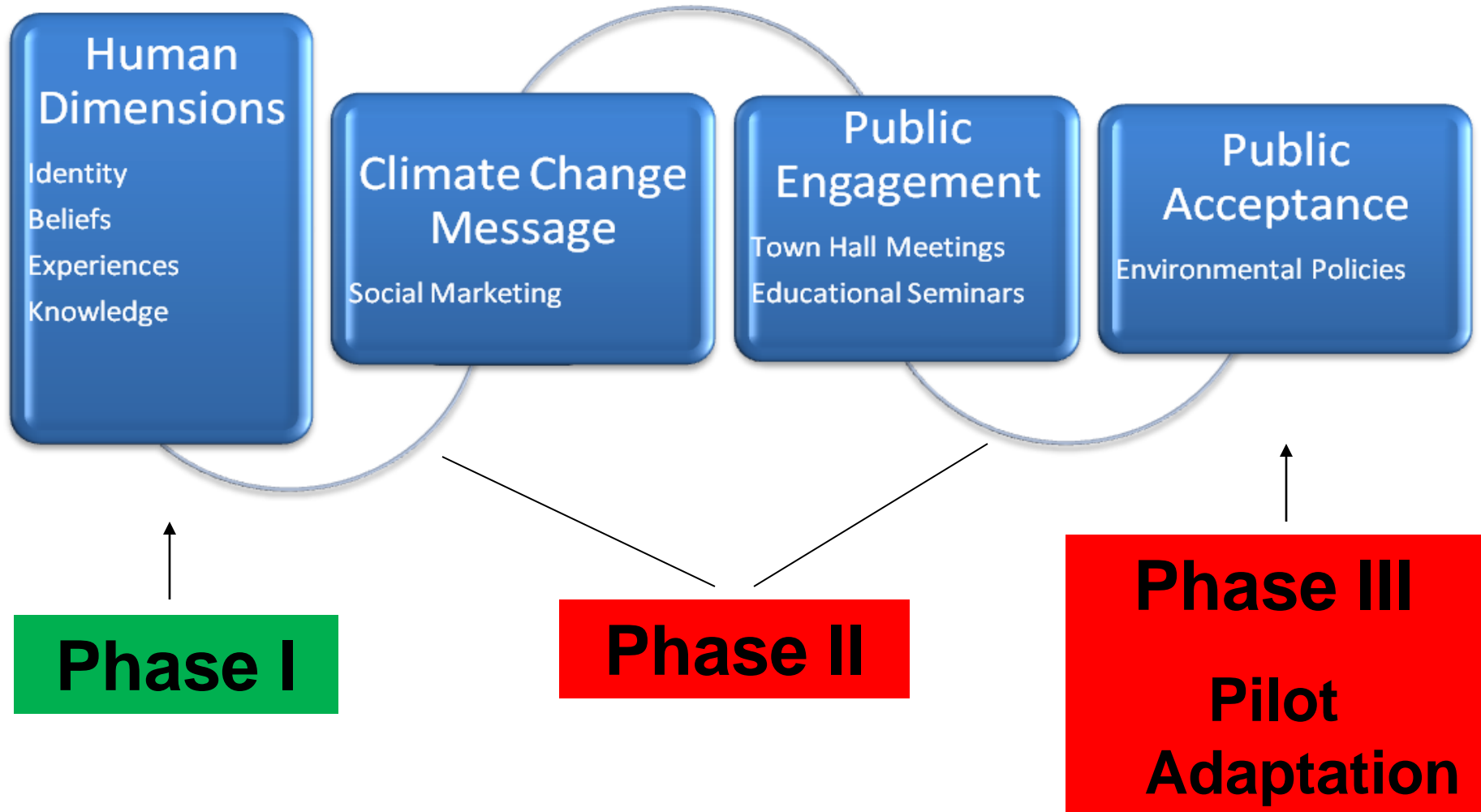
Case Study: Norfolk, Virginia

- What explains this **public (lack of) reaction**?
- Is there a perceived sense of urgency?
- How do people understand & process information, make (purchase, lifestyle) decisions?
- Construct & test a social science driven process model of communicating CC/SLR -> **excite public engagement in & support for policies** -> **environmental resiliency**

ABC model of Behavior



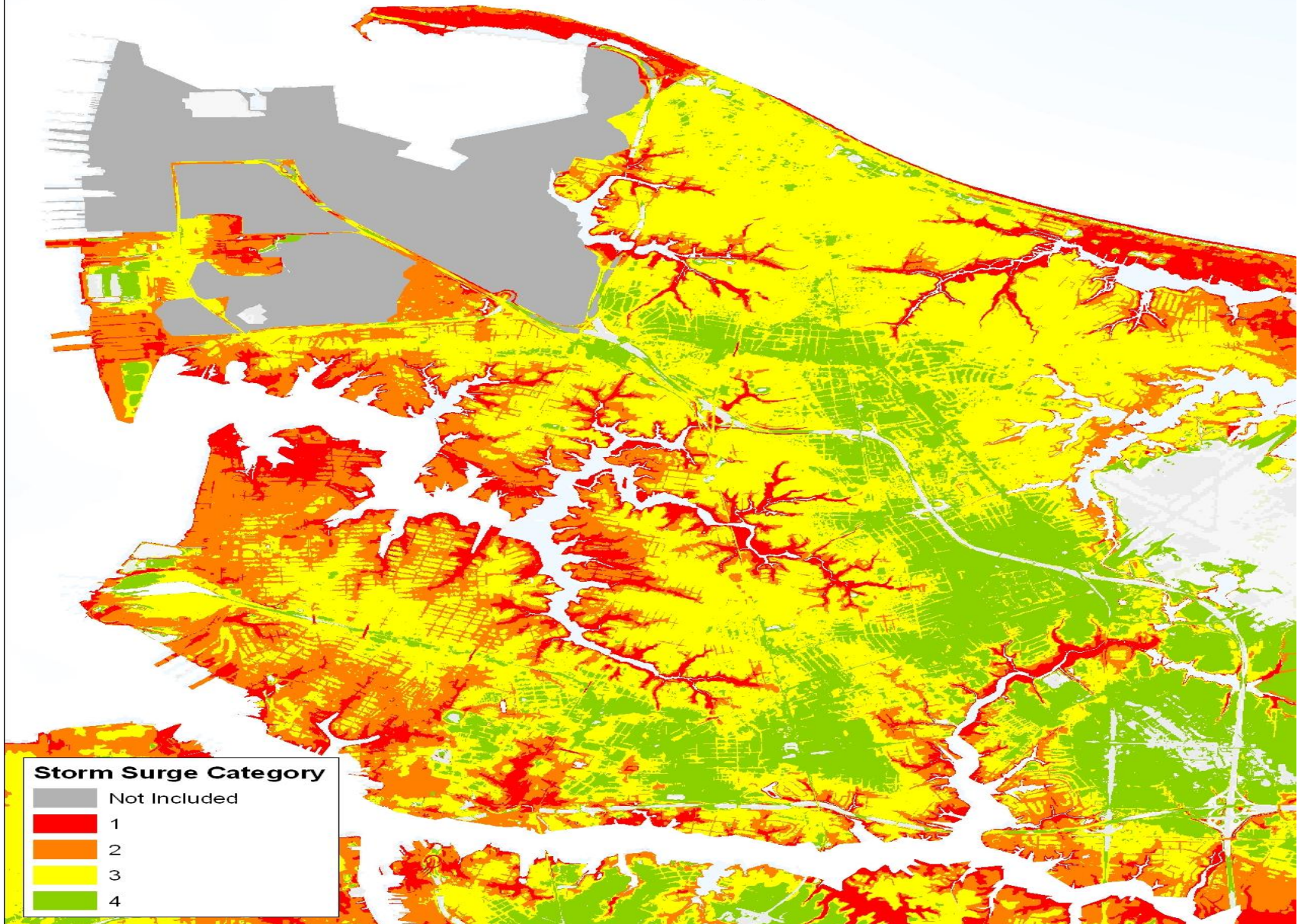
Social Science Model of Resilience Building



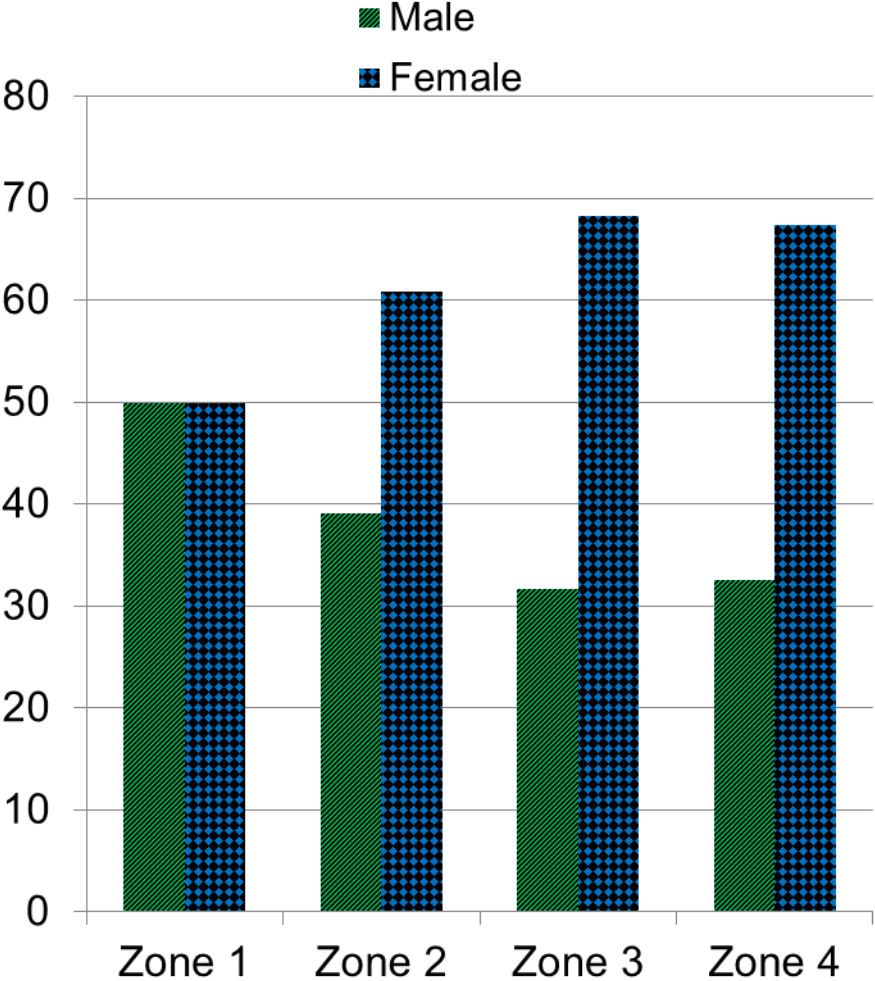
Phase I – The Current Project

- Internally funded by ODU
- **Telephone survey** of a representative sample – conducted by SSRC - listed land lines purchased from Marketing Systems Group
- 614 completed interviews; demographic distribution fairly representative of population
- 15-20 min surveys, 60 questions
- **Four urban storm surge zones** defined by VA DEQ (1 = risk of flooding from category 1 storm; 4 = risk of flooding from category 4 storm)

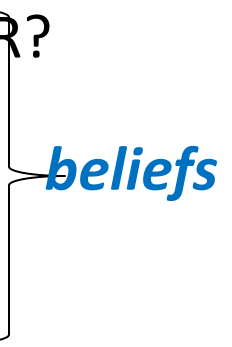
Norfolk Storm Surge Zones



Gender Distribution in Survey Sample

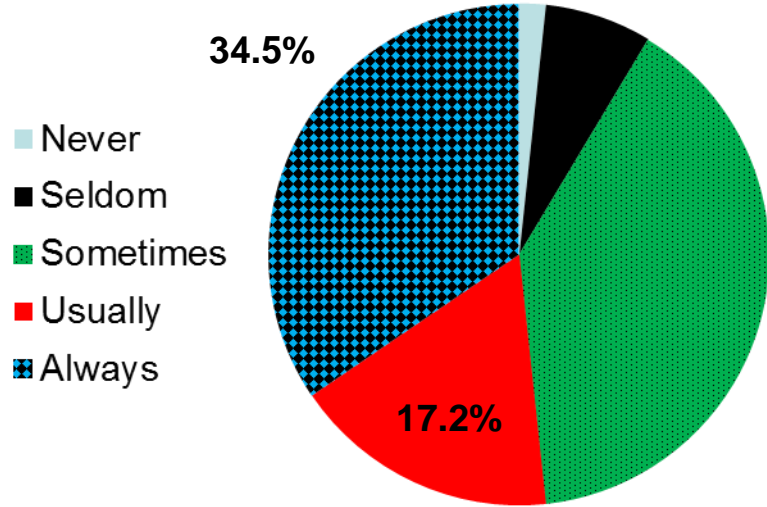


Research Questions

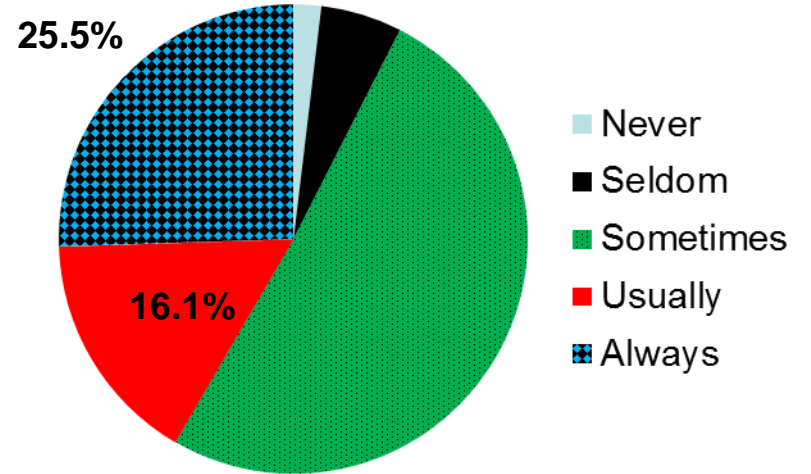
1. What are the *activating events* related to CC/SLR?
 2. How do people *perceive the risks* associated with CC/SLR?
 3. What are the *psychosocial impacts* of CC/SLR?
 4. How do people *adapt to & cope with* perceived threat & unfolding impacts of CC/SLR? - *consequences*
 5. How can *social science assist* in adapting to CC/SLR?
- 
- beliefs*

A = Activating Events
(or, antecedents)

Zone 1

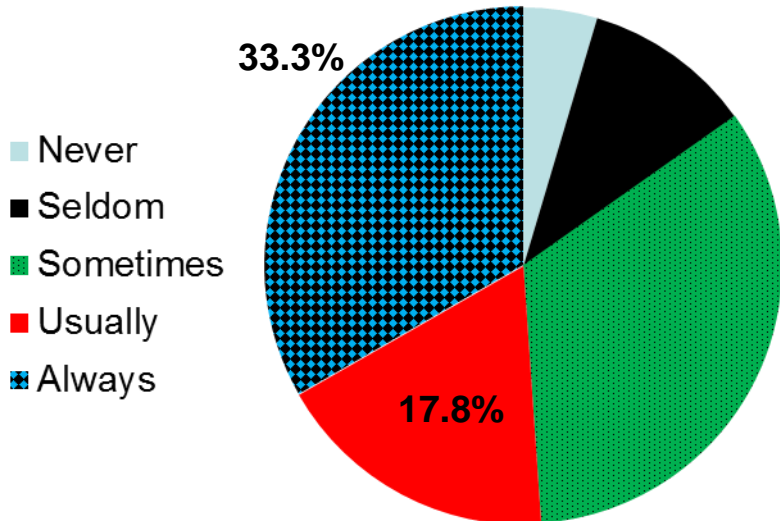


Zone 2

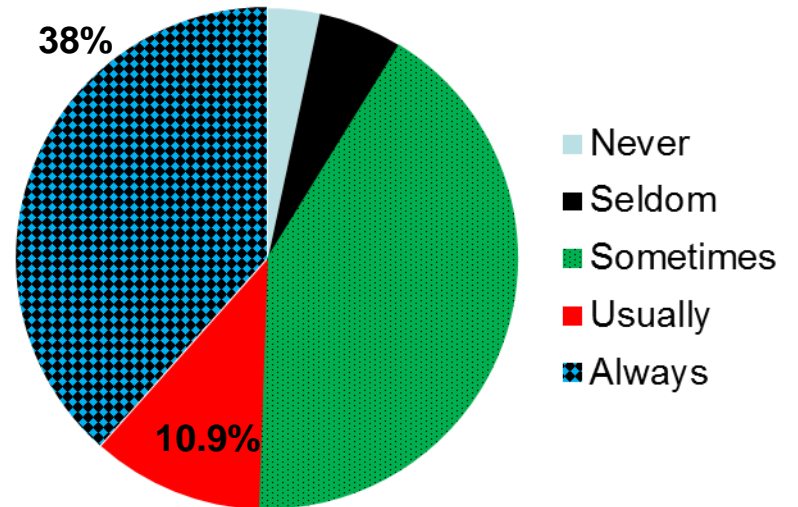


“Driven through flooded roadways”

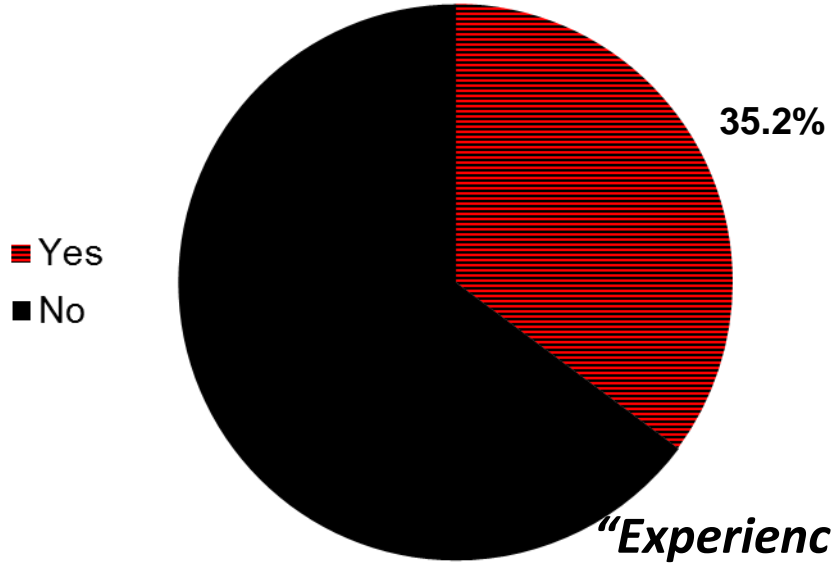
Zone 3



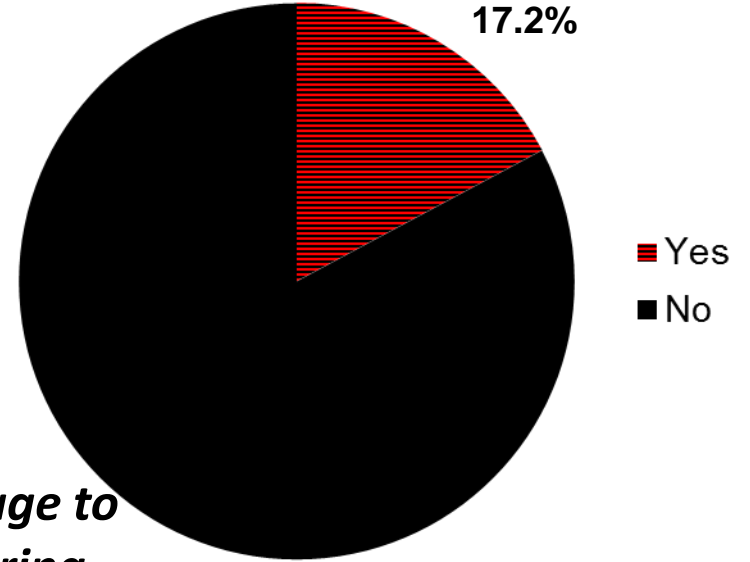
Zone 4



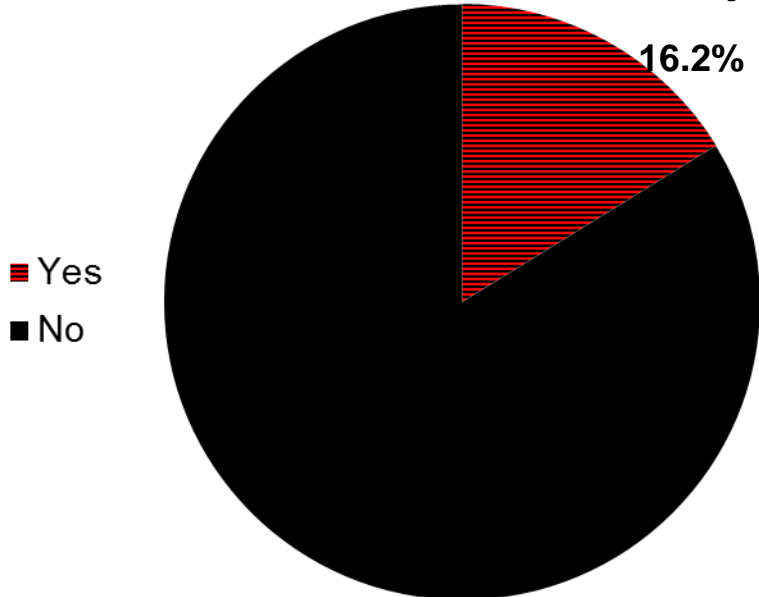
Zone 1



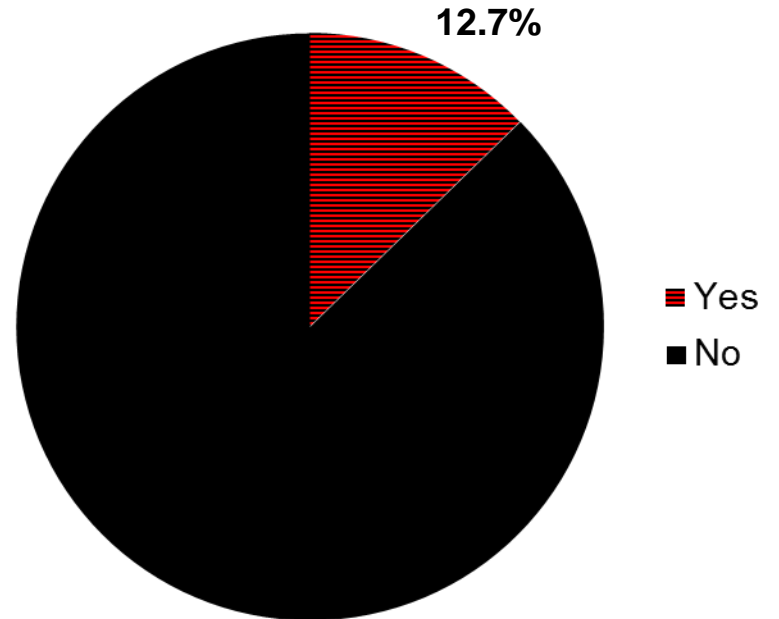
Zone 2



Zone 3



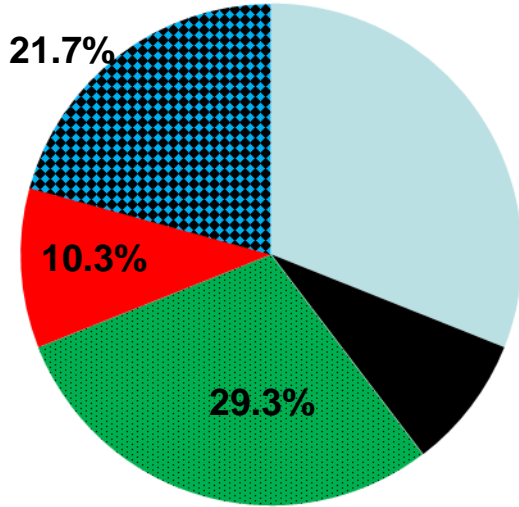
Zone 4



“Experienced damage to parked vehicle during flood events”

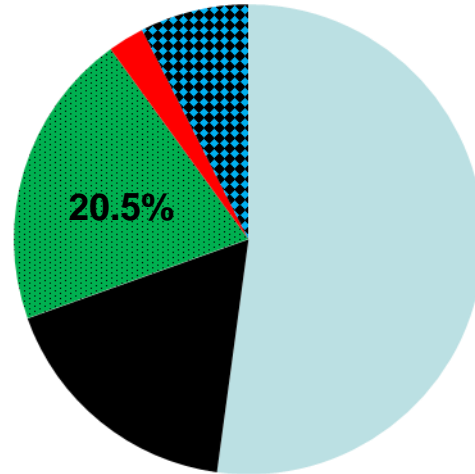
Zone 1

- Never
- Seldom
- Sometimes
- Usually
- Always



Zone 2

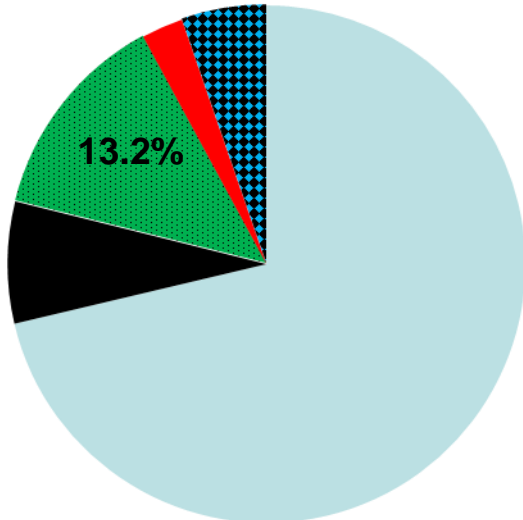
- Never
- Seldom
- Sometimes
- Usually
- Always



“Been forced to move valuables to prevent flood damage”

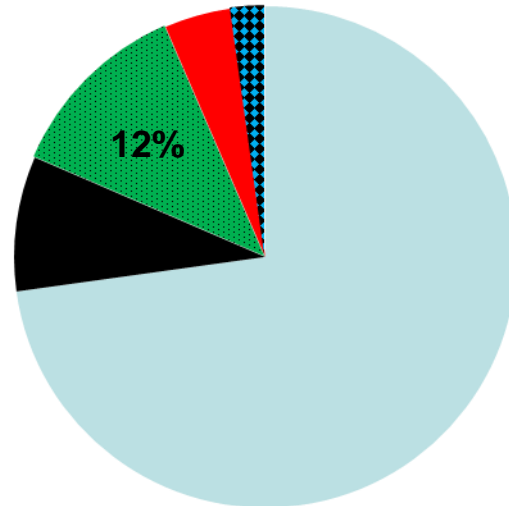
Zone 3

- Never
- Seldom
- Sometimes
- Usually
- Always



Zone 4

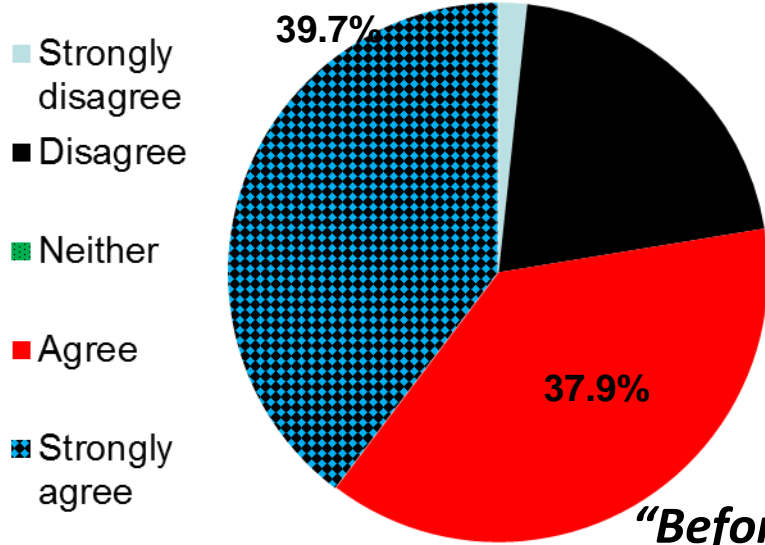
- Never
- Seldom
- Sometimes
- Usually
- Always



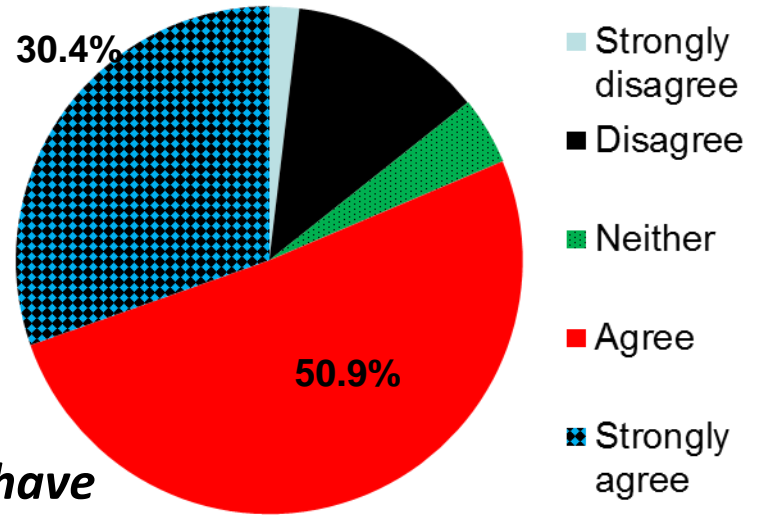
B = Beliefs

i. How do people **perceive the risks of**
SLR?

Zone 1

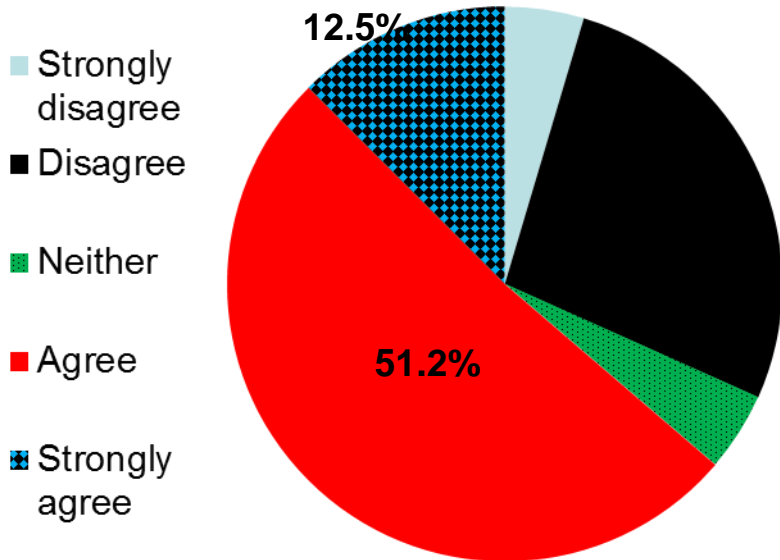


Zone 2

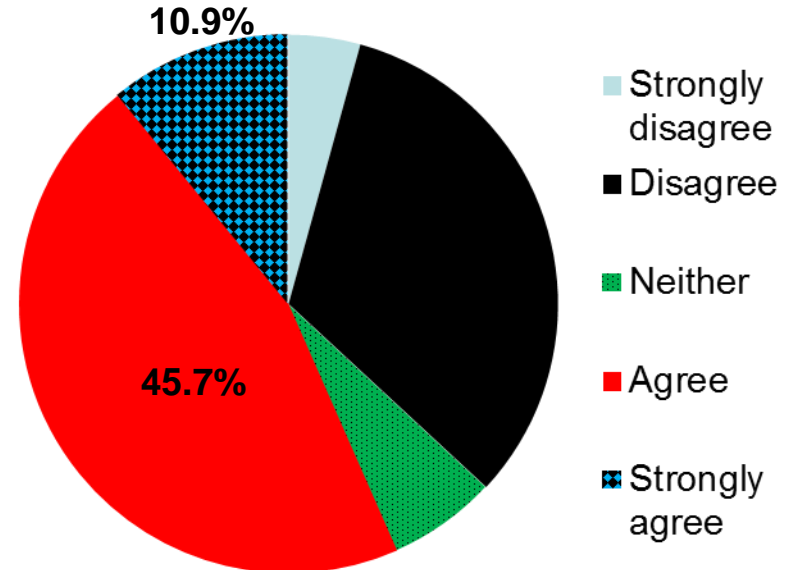


“Before today, I have been concerned about SLR”

Zone 3

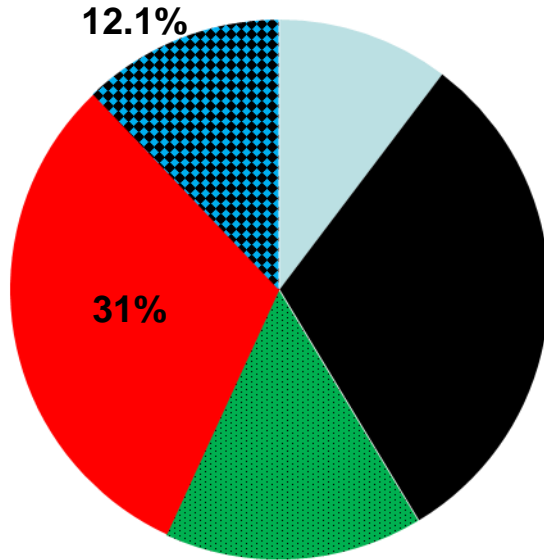


Zone 4



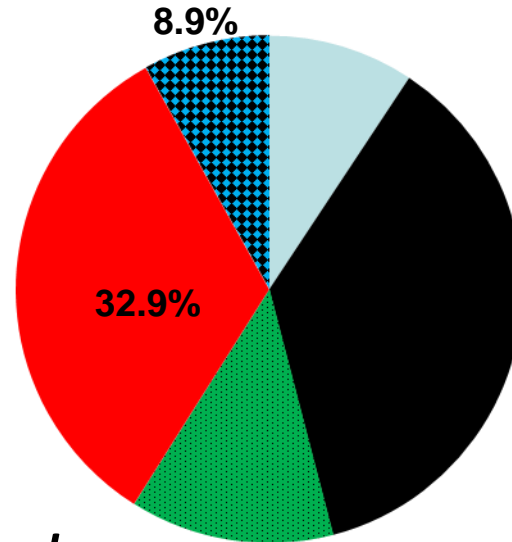
Zone 1

- Strongly disagree
- Disagree
- Neither
- Agree
- Strongly agree



Zone 2

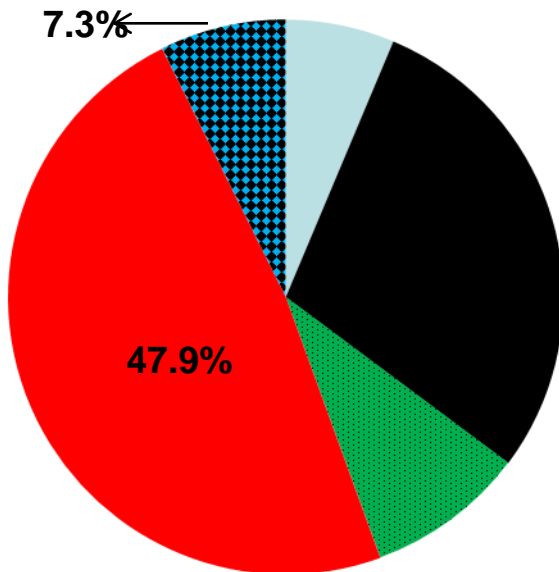
- Strongly disagree
- Disagree
- Neither
- Agree
- Strongly agree



"I feel helpless to do anything about SLR"

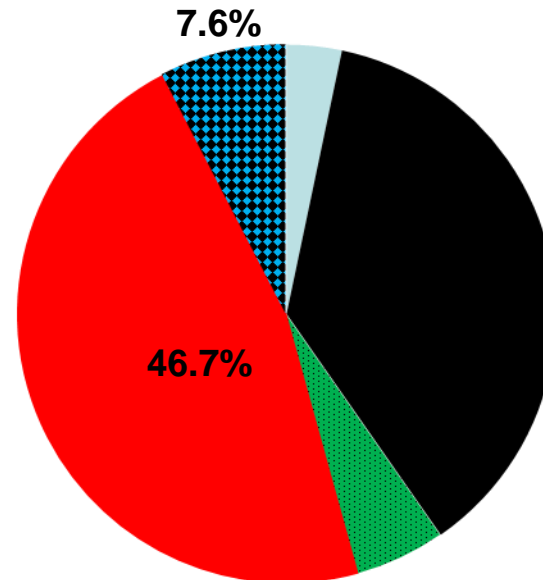
Zone 3

- Strongly disagree
- Disagree
- Neither
- Agree
- Strongly agree

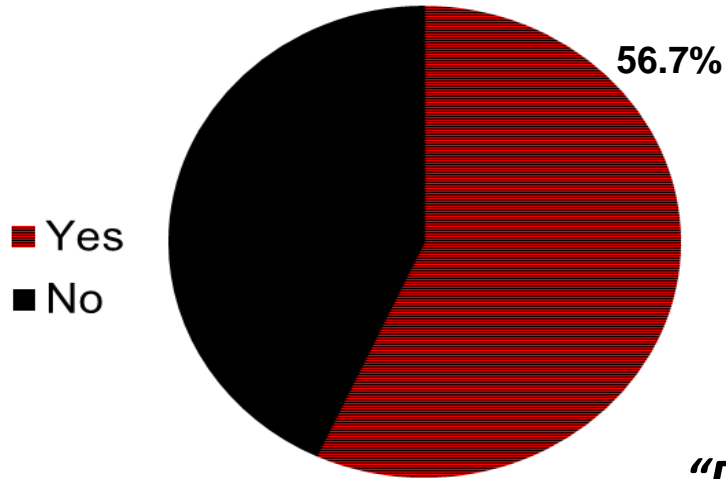


Zone 4

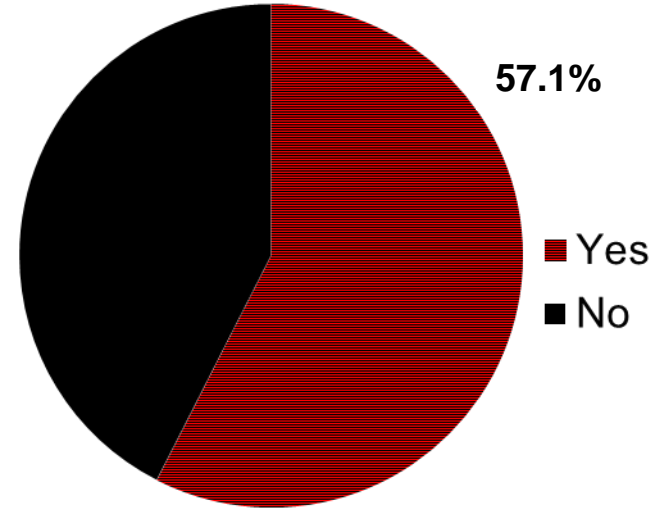
- Strongly disagree
- Disagree
- Neither
- Agree
- Strongly agree



Zone 1

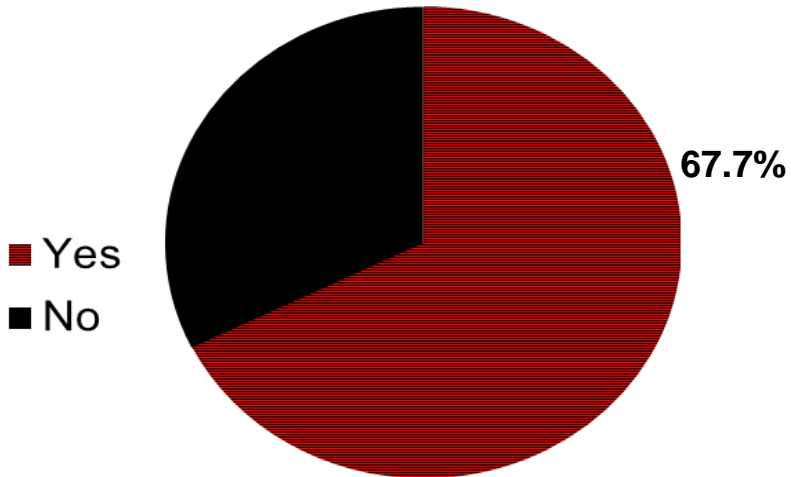


Zone 2

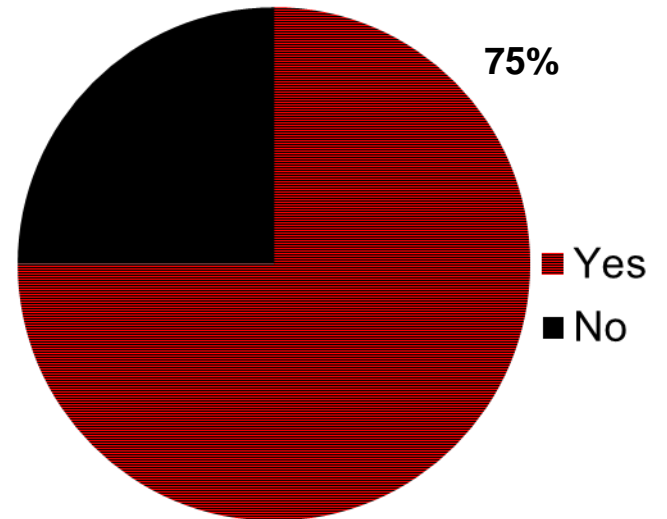


"Do you consider yourself a native of Hampton Roads?"

Zone 3



Zone 4

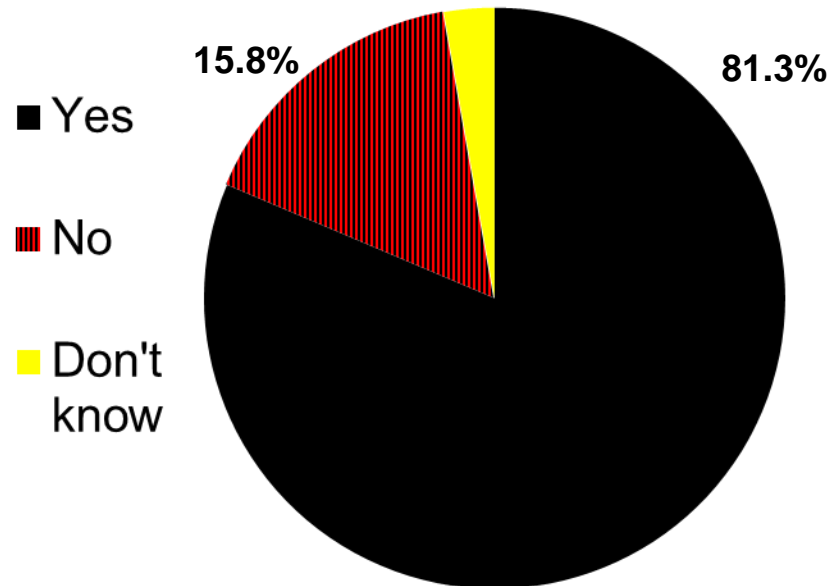


Understanding risks of CC/SLR

- **Affect (or, emotions)**
 1. **“Finite pool of worry” effect** – existence of **other classes of “risks”** – economic recession doesn’t help! – flood zone effect (3&4)
 2. **“Spread of affect” effect** – **translation** of one risk to another – flood zone effect (1&2)
- **Experiences** – moderate affective reactions
 - **Social identity/identification** with sub-cultural groups – resident of “Hampton Roads” vs. “resident of particular neighborhood” – flood zone effect
 - shifting population problem
 - **Familiarity** – inversely proportionate to perceived riskiness!

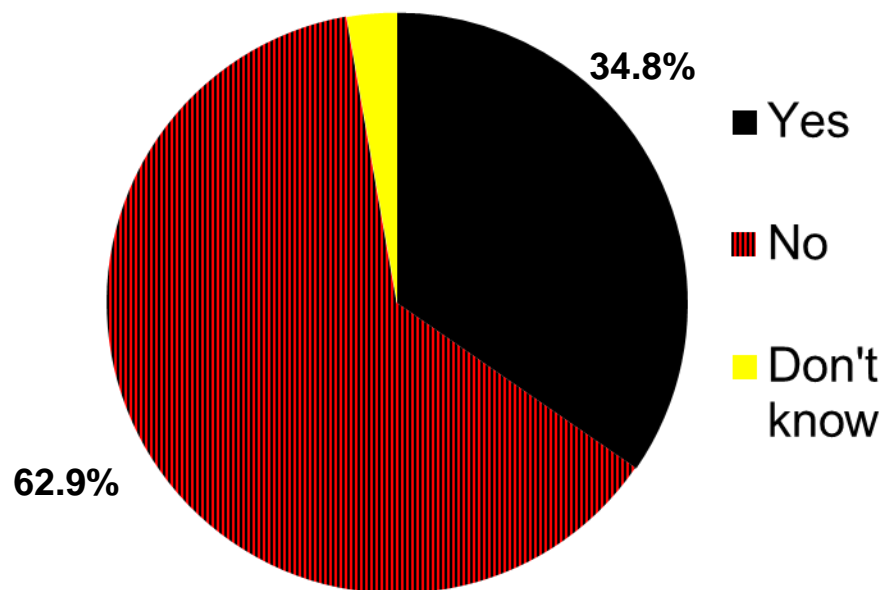
ii. What are the **psychosocial impacts** of SLR?

“Increased flooding will have a strong negative impact on human health conditions”

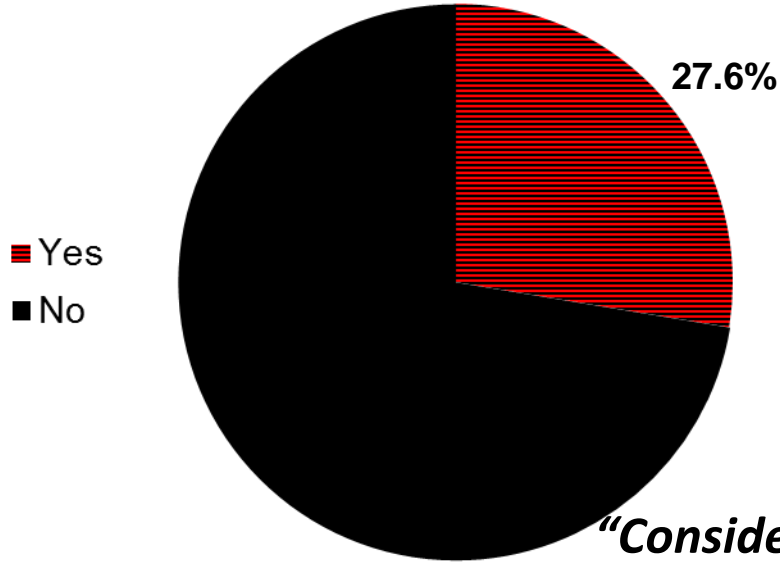


***Tangible and Intangible Impacts
(no zone variability)***

“I feel guilty when thinking about SLR”

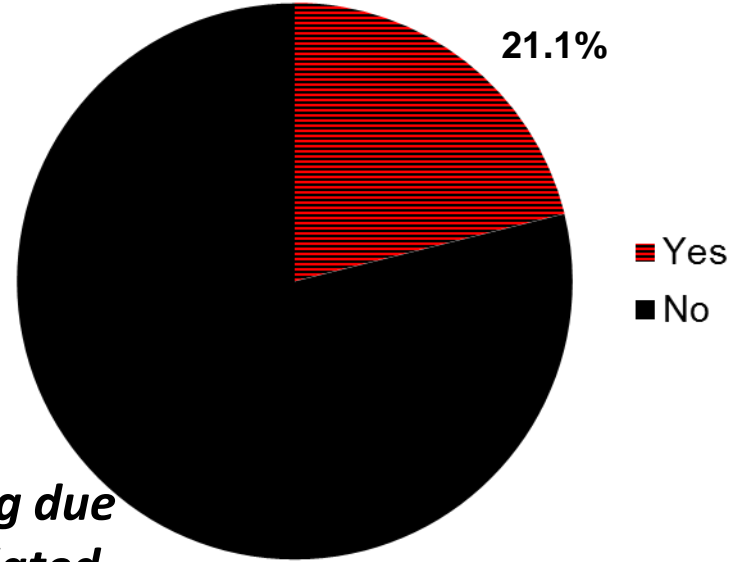


Zone 1



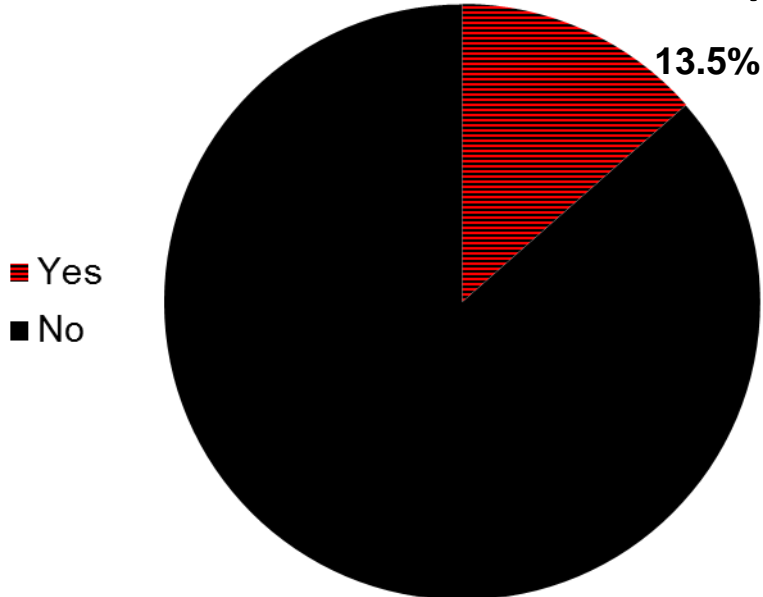
■ Yes
■ No

Zone 2



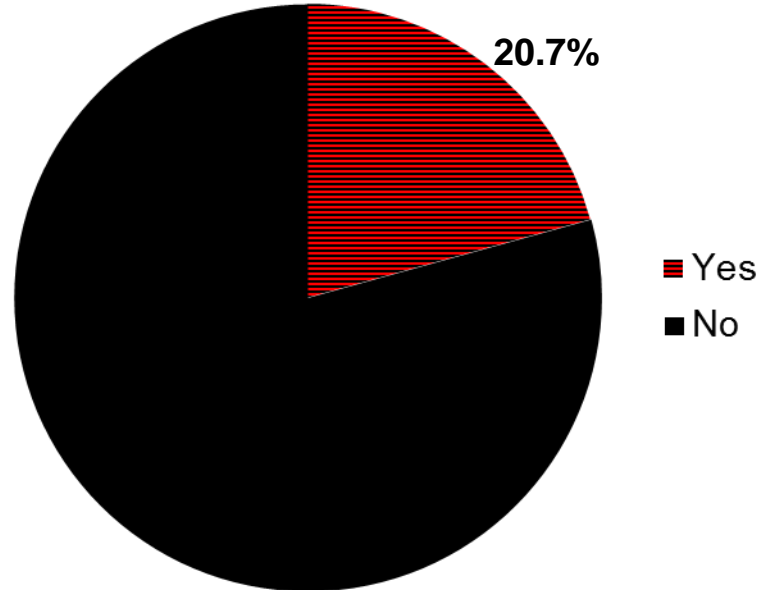
■ Yes
■ No

Zone 3



■ Yes
■ No

Zone 4



■ Yes
■ No

“Considered moving due to flooding and related problems?”

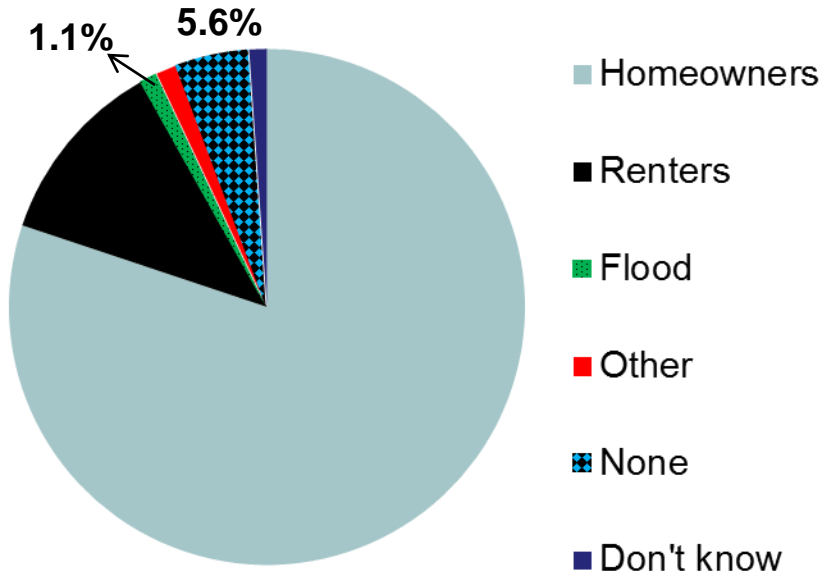
Psychosocial Impacts

- **Mental health issues** – loss, PTSD, depression, anxiety, drug & alcohol abuse, elevated risk of child abuse – greater vulnerability for preexisting mental health conditions – Hurricane Katrina effect
- **Stress & emotional issues** – phases – disbelief, shock, denial, outrage – altruistic feelings -> disillusionment, anger & disappointment (can last years) – flood zone effect (1&2)
 - – disruption of social support networks lasting decades – mediated by socioeconomic conditions
- **Uncertainty & despair**
 - Barriers from expressing emotions/environmental loss – fear of being seen a morbid, unpatriotic, **ignorant, defeatist**
- **Numbness, apathy, guilt**
 - “eco guilt” – messages aimed at inducing guilt (“guilt appeals”) – environmentalist effect

C = Consequences

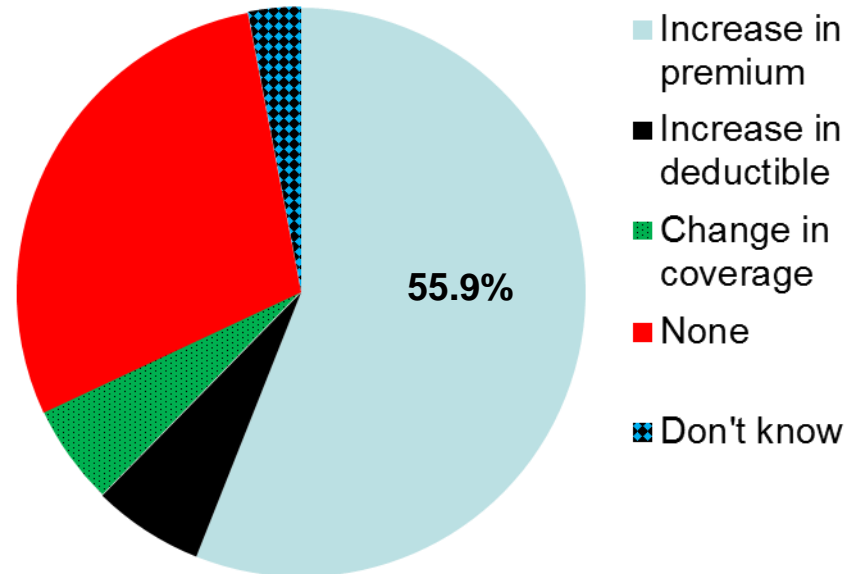
***Awareness, Perceived Urgency
and Willingness to Support
Action***

“Which of the following types of insurance do you have?”

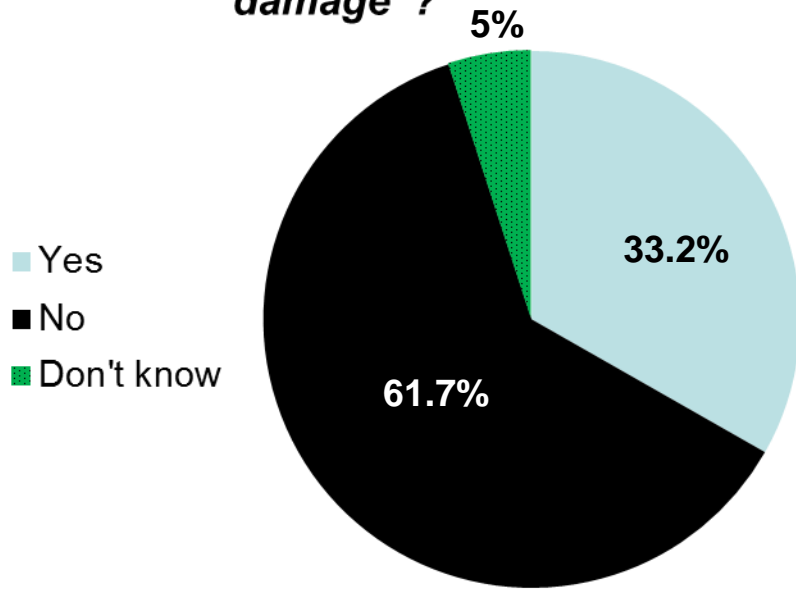


***Insurance Purchasing Habits
(no zone variability)***

“Have you noticed the following w.r.t your insurance?”

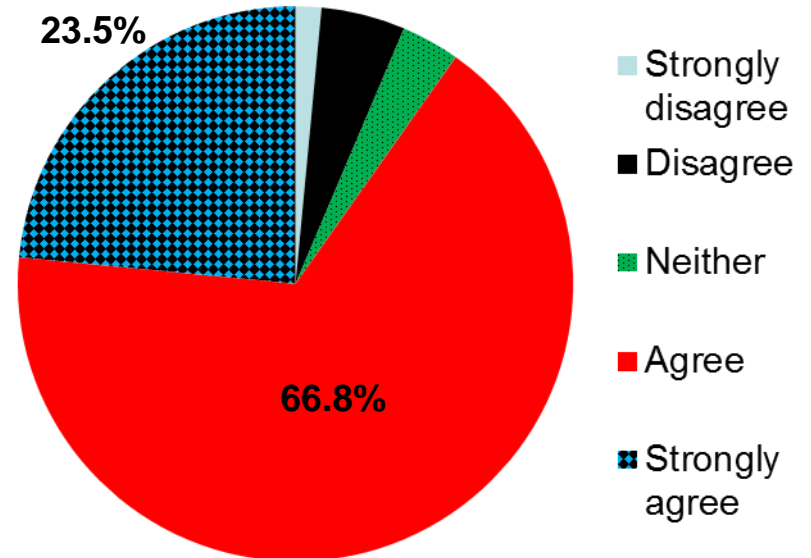


“ Has the City of Norfolk elevated streets & rewired utilities to prevent flood damage”?

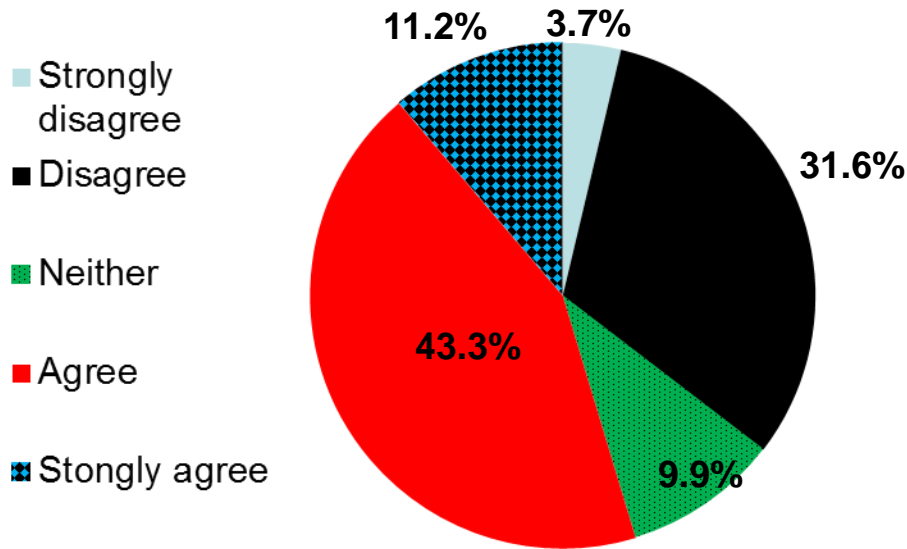


***Awareness of Government Action
(no zone variability)***

“Local govt. should provide more public information on flooding issues”



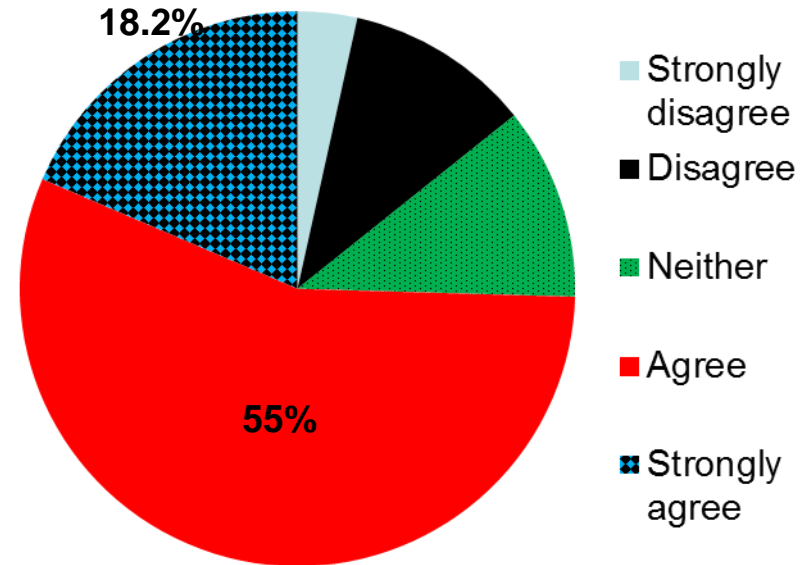
***“Would you get involved in local
govt. planning & land use
decisions”?***



Willingness to Act

(no zone variability)

***“Vote for a candidate with a
clear plan to address flooding
issues”?***



Adaptation & Coping

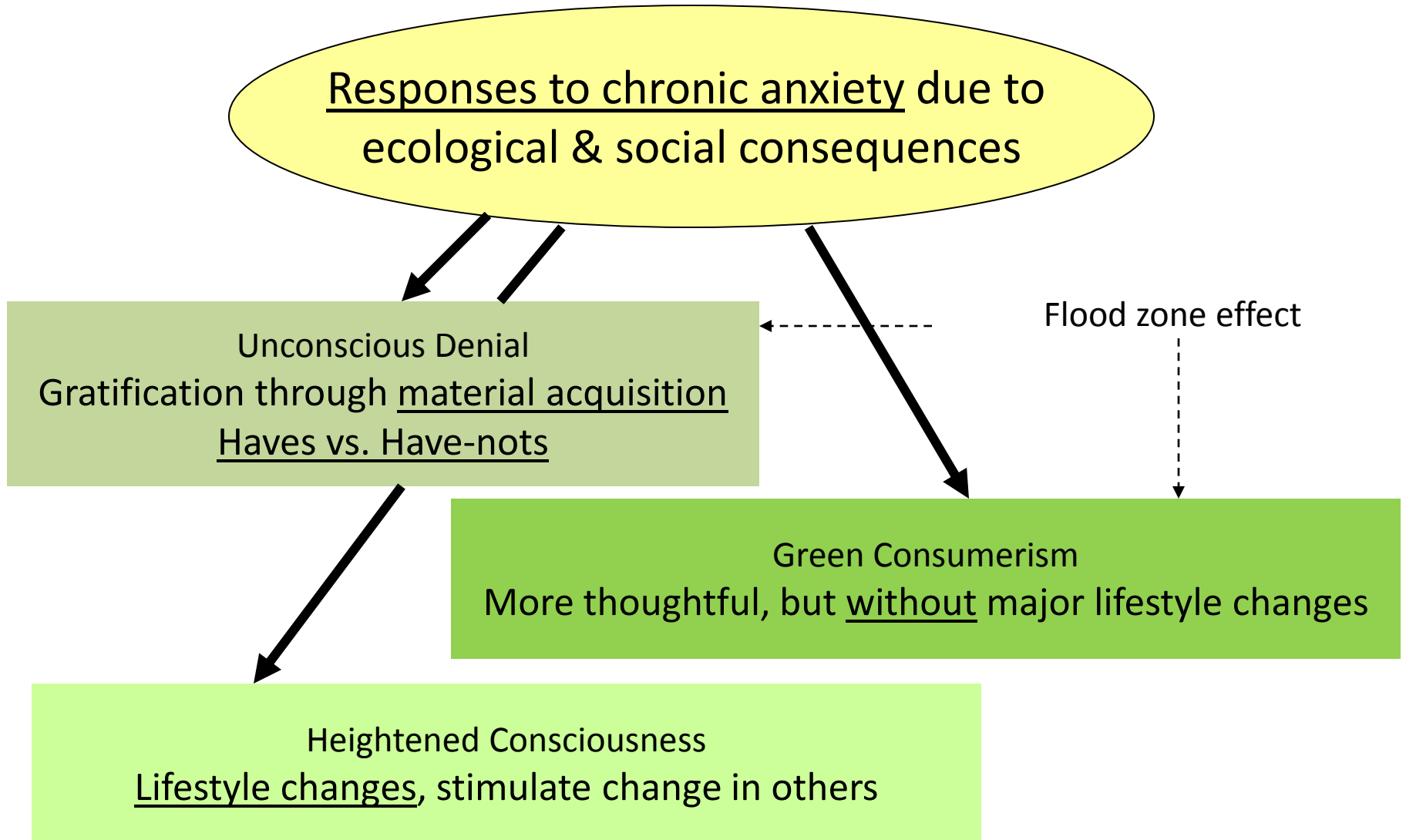
Responses to chronic anxiety due to ecological & social consequences

Unconscious Denial
Gratification through material acquisition
Haves vs. Have-nots

Green Consumerism
More thoughtful, but without major lifestyle changes

Heightened Consciousness
Lifestyle changes, stimulate change in others

Flood zone effect



How can social science **assist in adapting** to CC/SLR?



Next Steps -> Community Outreach

Consumer/customer orientation 😊

Behavioral goals – actionable steps phased over time



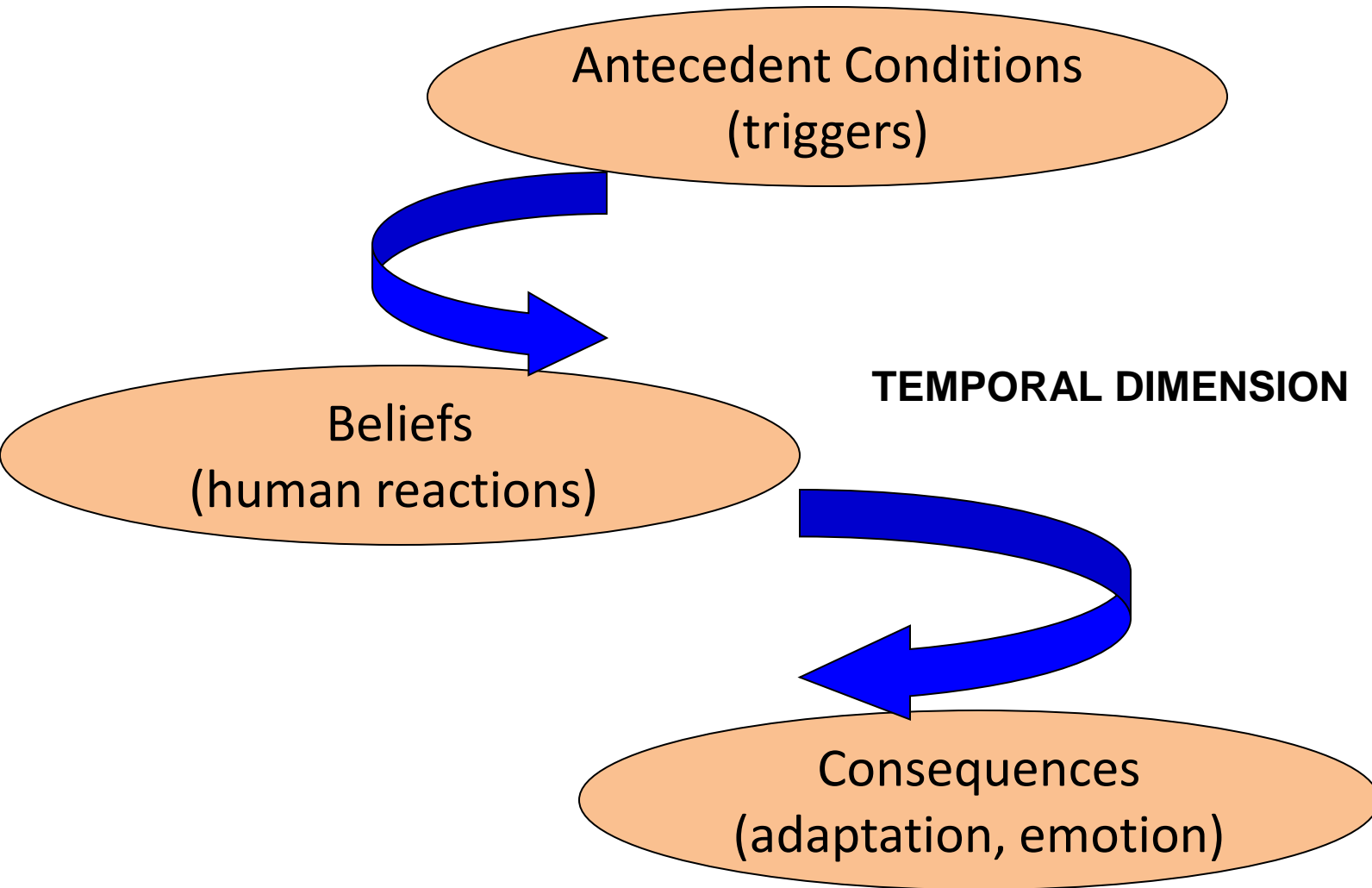
Intervention & marketing “mix” – (i) seminars, (ii) listening sessions, (iii) recreational education techniques, (iv) mock adaptation exercises



Audience segmentation – varying techniques according to special needs – e.g., storm surge zone

- **Insight** – details about consumer experiences
- **Exchange** – what is the “real cost”? – **PRIVATE SECTOR**
- **Competition** – balance factors that might compete – e.g., economic concerns vs. recreation

Human Dimensions of SLR



THANK YOU

