



Royalty-free image of Puget Sound from Pixabay

# PUGET SOUND PERCEPTIONS OF ENVIRONMENTAL CHANGE SUMMARY REPORT

A Report Prepared for Puget Sound Partnership

Krista Harrington

Dr. Kelly Biedenweg



# ACKNOWLEDGEMENTS

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# EXECUTIVE SUMMARY

This report covers perceptions of environmental and climate change results from the third Human Wellbeing Vital Sign Survey iteration, administered in December, 2022. This research was funded by the Puget Sound Partnership and led by members in Oregon State University's Human Dimensions Lab.

Survey Response Rate: 20.8%.

**Environmental impacts were felt by about 25% of residents**, with flooded or eroded roadways being the most common (25%), followed by natural disasters (19%).



Image taken by Krista Harrington

**Roughly, 80% of respondents reported some level of concern for environmental impacts affecting Puget Sound.** The highest level of concern was reported for more frequent/severe wildfires and smoke followed by worsening air quality.

**The most consistently accessible climate adaptation resource, meaning survey participants reported “always” having access to it, is health insurance (87%),** followed by an operable motor vehicle (87%). The least consistently accessed resources were wildfire and flood insurance yet those options also had the highest responses for those resources being unnecessary in their daily life.

**Belief in climate change was 85%, higher than the national average (72%) and Washington State’s average (75%).** Of those that believe in climate change, the majority attribute it to “mostly human activity and some natural changes in the environment.”

**Nearly 32% of participants identify as being “somewhat empowered” or “empowered” in their individual ability to adapt to climate change.**

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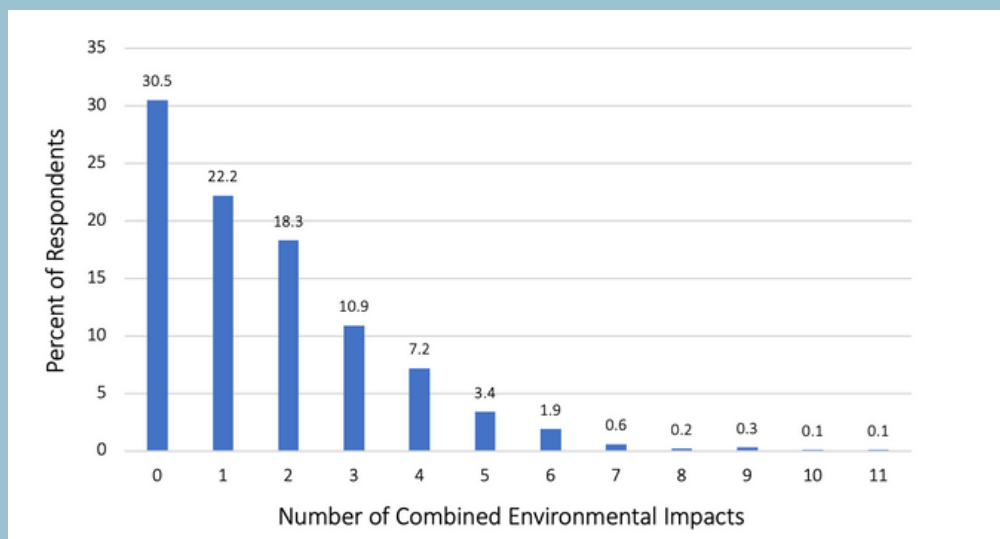
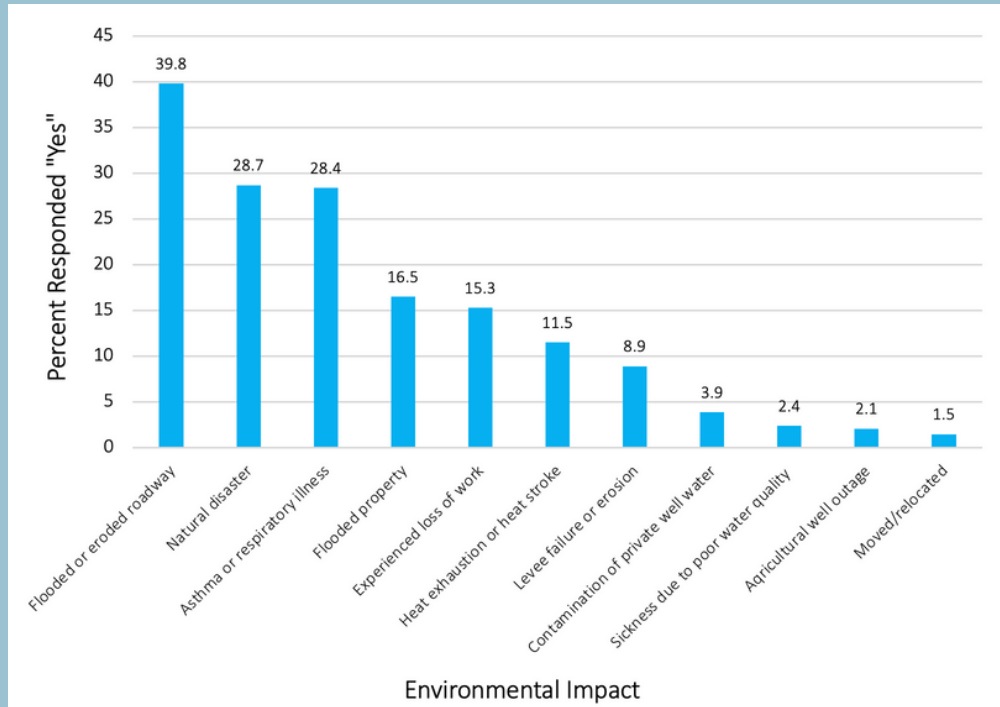
# INTRODUCTION

The latest general population Human Wellbeing (HWB) Vital Sign Survey, administered by Oregon State University in 2022, included questions related to environmental and climate change. The 2022 HWB VS survey was implemented in December 2022 to a random sample of 9,000 Puget Sound residents. Due to 804 undeliverable addresses, 38 removals by phone, and 34 returned blank surveys, the total sample reached was 8,144. The response rate was 20.8% for a total of 1,701 individual responses.

Questions on the 2022 HWB questionnaire were developed in collaboration with staff at the Puget Sound Partnership and informed by the San Joaquin-San Francisco Bay Delta Residents Survey (Rudnick et al. 2013).

Demographic information, such as age, gender identity, education, income, race, community area (rural, urban, suburban) and political leaning were also collected to determine the representativeness of our sample and determine whether they could clarify trends in environmental and climate responses. All variables were tested for significant differences across these demographics. The appendices include detailed methodology, and a copy of the survey instrument.

# EXPERIENCE WITH ENVIRONMENTAL IMPACTS



Flooded or eroded roadways was the most experienced environmental impact (39.8% of respondents answered “yes”) followed by natural disasters (29.7%) and asthma or respiratory illness due to poor air quality (28.4%). The bottom graph depicts the number of combined environmental impacts (e.g. the percent of respondents that answered “yes” to an impact on 0-11 occasions). From this, roughly one third of the population (30.5) has not experienced an environmental impact, but the majority has experienced 1 or more impacts over their time living in Puget Sound.

## WHAT

Environmental impacts are changes to the natural or built environment that can have adverse effects on human wellbeing. Environmental impacts specific to Puget Sound include those shown on the left.

## WHY

To monitor what impacts are being felt by participants on a personal level. By asking this, we can also ask where they are felt, and by whom. Research in other contexts shows that personal experience with climate extremes or impacts have significant influence on climate beliefs, concern and preparedness for future events. Experience may also be associated with aspects of human wellbeing.

## HOW

We measured experience by asking participants “have you ever personally experienced any of the following impacts since living in the Puget Sound?” on a dichotomous yes/no scale (See Appendix B for survey instrument).

# LEVELS OF CONCERN FOR ENVIRONMENTAL IMPACTS AFFECTING PUGET SOUND

*Today or at some point in the next 25 years*

## WHAT

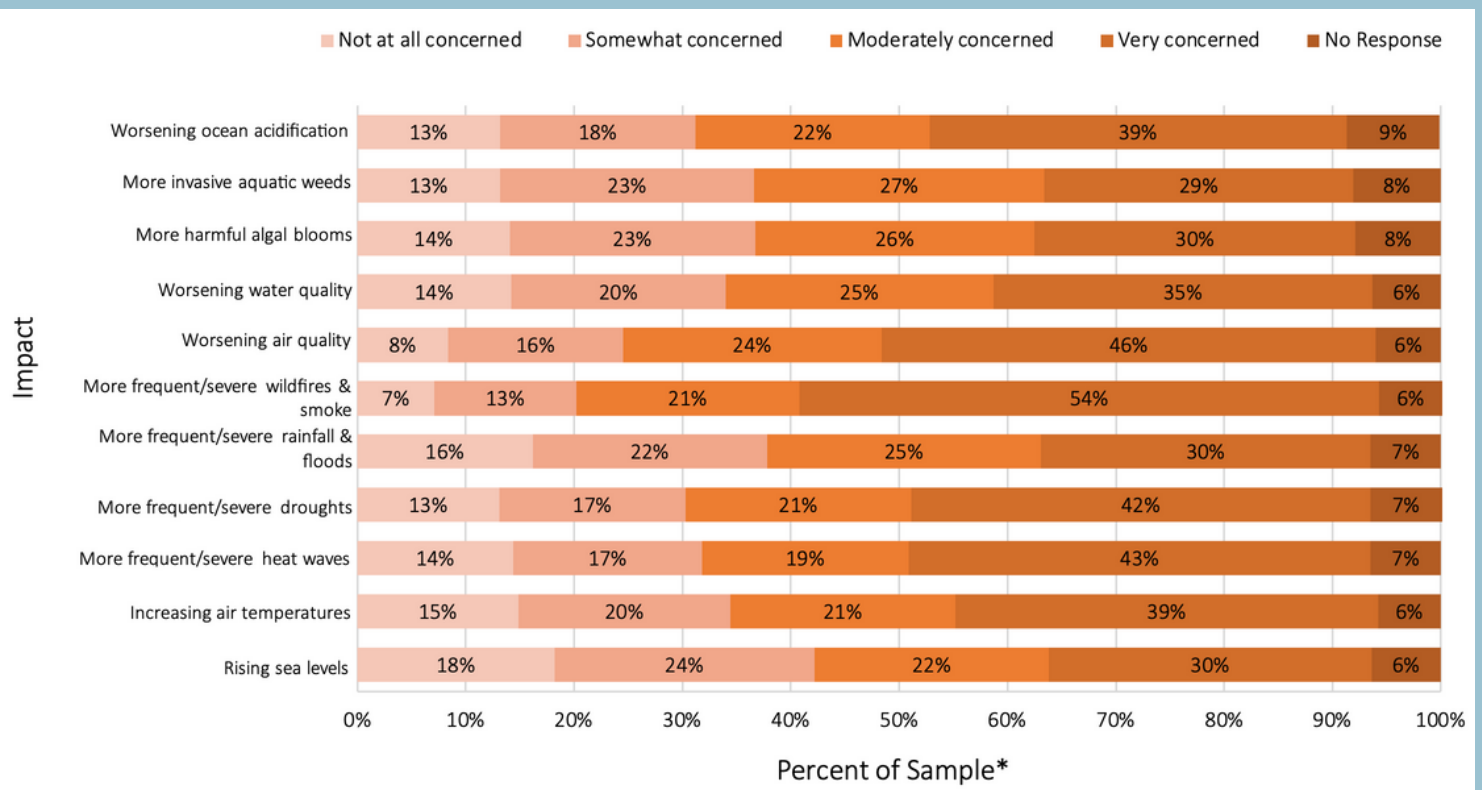
Level of concern for environmental impacts is an attitude that is associated with perceived risk and feelings of anxiety.

## WHY

To monitor participant levels concern for environmental impacts now or at some point in the near future. As a result of experiencing concern, residents may alter how they interact with their environment (e.g. outdoor activity) or prepare for future impacts (e.g. purchasing insurance).

## HOW

We measured concern by asking participants to rate their level of concern for impacts “affecting Puget Sound today or at some point over the next 25 years” on a 4-point scale (See Appendix B for survey instrument).



\*Percentages are rounded to the nearest whole number

Overall, between 29-54% participants reported being “very concerned” for environmental impacts affecting Puget Sound, with **the most concern for more frequent/severe wildfires and smoke followed by worsening air quality**. In each case over 80% of respondents reported some level of concern for every environmental impact. Further, there is high correlation among concerns for all these impacts; people who are concerned about one impact are likely to be concerned about all of the impacts.

*In their own words...*

## NEGATIVE IMPACTS AS A RESULT OF ENVIRONMENTAL CHANGE

An open ended question asked “for the environmental changes you are concerned about, what direct negative impacts will you or your family experience today or at some point over the next 25 years as a result?” Major response themes are identified in color with excerpts shown in callouts.

### PERSONAL WELLBEING

CHANGING  
SENSE OF  
PLACE &  
COMFORT

IMPACT TO  
OUTDOOR  
RECREATION

INCREASED HEALTH RISK

IMPACT TO  
OUTDOOR  
WORK

EMOTIONAL  
DISTRESS

PROPERTY DAMAGE

INCREASED FOOD, WATER,  
ENERGY COSTS

### FAMILY'S WELLBEING

CHILDREN WITH ASTHMA

ELDERLY WELLBEING

“Ability to get outside and exercise due to air quality or extreme weather and/or temperature.”

“We love the Puget Sound for outdoor activity and being so linked with nature and we have concerns about its future.”

“Excessive summer heat will impact my ability to function at basic activities; commuting to [my] job, fulfilling chores, errands, and paying AC bills from increased need.”

“I live near community forest land and fear wildfires. I think of it often and worry.”

“I expect negative health impacts like increased asthma and worry for my kids who already struggle with that.”

“Most of my family have genetic asthma and allergies. The decreased health [of the] environment has and will affect our work and be particularly hard on middle-aged to elderly family members.”



*In their own words...*

## IMPACTS TO SUMMER OUTDOOR ACTIVITY

We also asked “has environmental change affected your ability to participate in any outdoor activities in Puget Sound this past summer (about June -September)?” For those that responded yes, there was space to write which activities and why? Major response themes are identified in color with excerpts shown in callouts.

### AIR QUALITY

#### WILDFIRE SMOKE

##### THE MAJORITY OF ACTIVITIES:

WALKING  
 RUNNING  
 HIKING  
 CANOEING  
 CAMPING  
 BOATING  
 GOLFING  
 GARDENING  
 YARD WORK  
 GATHERINGS/FESTIVALS

“Outdoor athletic activities (soccer, baseball, for both kids and adults) cancelled due to smoke and low air quality. Inability to enjoy the outdoors in general due to smoke and poor air quality.”

“Smoke kept me inside for approximately 3 weeks.”

“Drought limited fishing opportunities.”

### DROUGHT

FISHING  
 GARDENING  
 KAYAKING

### WATER QUALITY

#### ALGAL BLOOMS/RED TIDES OCEAN ACIDIFICATION SEWAGE POLLUTION

SWIMMING  
 FISHING  
 SHELLFISH HARVESTING

“Algae shuts down clamming, algae blooms shut down lakes, and acidification impacts crabs [and] oysters.”

“I am a sailor and gardener and I have experienced environmental changes in the weather and seasons to the effect that pollination did not occur with most of our fruit trees this year. The wonky weather - too much rain or heat at the wrong time affected blooming and pollination. We also had a messed up Brussels sprouts year. First time ever that the Brussels failed.”

### SPATIAL & TEMPORAL SHIFTS IN SPECIES

FISHING  
 GARDENING & FARMING  
 FORAGING  
 BIRD WATCHING  
 SHELLFISH HARVESTING

**THESE IMPACTS LED TO**  
 ADJUSTING ACTIVITY TIMING AND DURATION OR CANCELING PLANS ALTOGETHER

*In their own words...*

## IMPACTS TO WINTER OUTDOOR ACTIVITY

We also asked “has environmental change affected your ability to participate in any outdoor activities in Puget Sound this past winter (about November -February)?” For those that responded yes, there was space to write which activities and why? Major response themes are identified in color with excerpts shown in callouts.

### AIR QUALITY

#### WILDFIRE SMOKE

##### THE MAJORITY OF ACTIVITIES:

WALKING  
RUNNING  
HIKING  
CANOEING  
CAMPING  
BOATING  
GOLFING  
GARDENING  
YARD WORK  
GATHERINGS/FESTIVALS

“Carry over from fall respiratory issues, limiting winter excursions and farming work.”

“Shortened foraging seasons, especially fall mushrooms”

### SPATIAL & TEMPORAL SHIFTS IN SPECIES

FISHING  
FORAGING  
SHELLFISH HARVESTING  
BIRD WATCHING

“Crabbing - long term decline of native crab populations eliminated the opportunity to harvest crabs.”

“Dryness made hunting extra hard [and] low water caused fishing closures.”

“Hiking, travel to ski, road closures from washouts.”

### PROLONGED DROUGHT

FISHING  
FORAGING  
HUNTING

“Flooded pasture and winter storms with ice made things challenging.”

### EXTREME PRECIPITATION & ICE EVENTS

#### HIGH RIVER FLOWS HIGH TIDES FLOODING EROSION

HIKING  
TRAVEL  
MOUNTAIN BIKING  
WALKING  
YARD WORK  
SKIING  
BICYCLING

Participants also noted increased fishing restrictions, trail/road closures, heavy winds, and avalanches following forest fires as impacts affecting their winter activity. Please note that many of these impacts, for both the summer and winter months, are occurring in tandem and are not as separate as these visuals portray.

# RESOURCE ACCESS

## WHAT

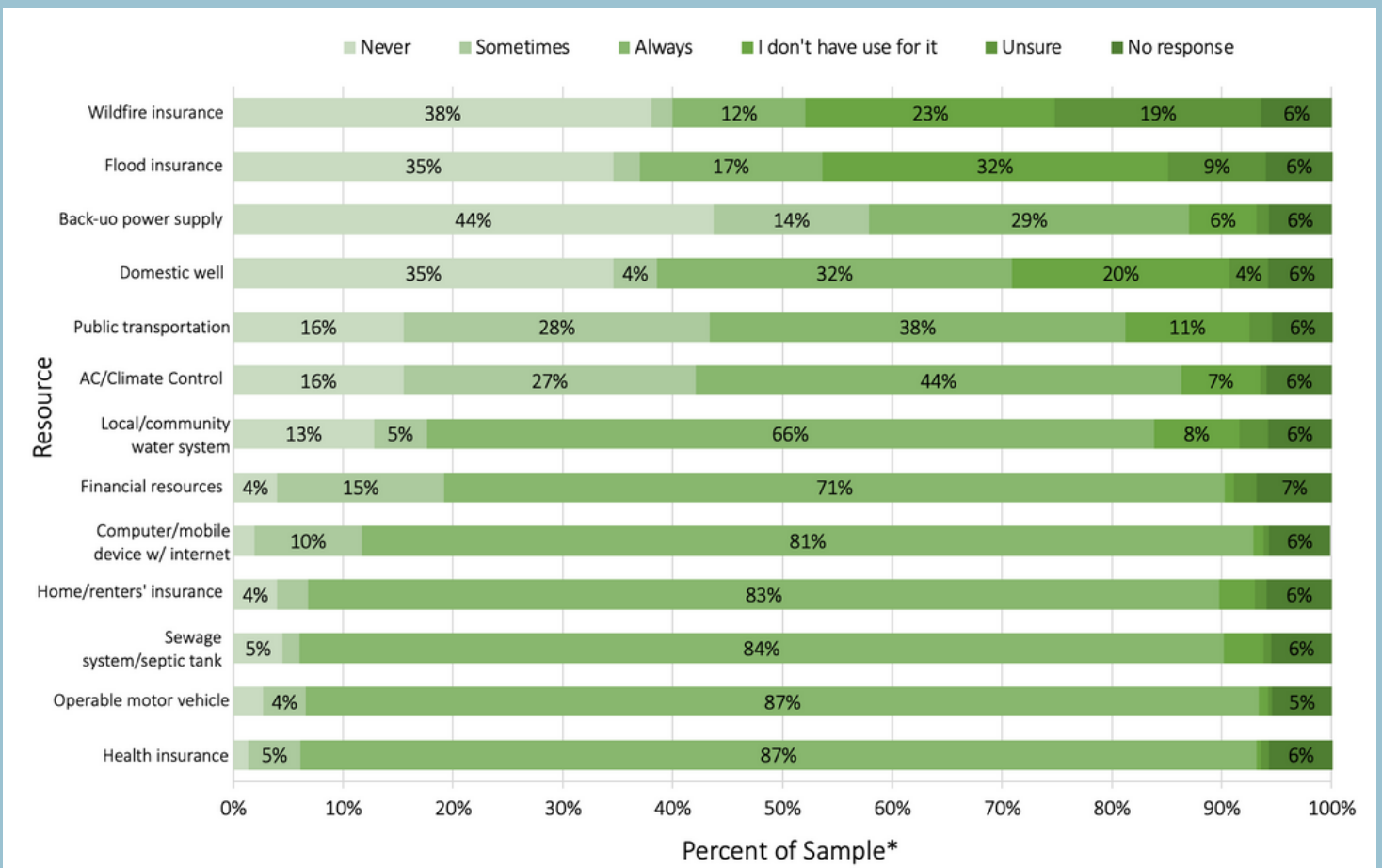
Resource access is the ability to access resources in the occurrence of an extreme climate event or impact.

## WHY

We asked this of our participants as a proxy for personal adaptive capacity and resilience during instances of environmental change. Higher resource access is associated with higher resilience, and thus less vulnerability to environmental change.

## HOW

We measured resource access on a 3-point scale of having access, “always, sometimes, or never,” but also included “I don’t have use for it” and “unsure” as additional options. (See Appendix B for survey instrument).

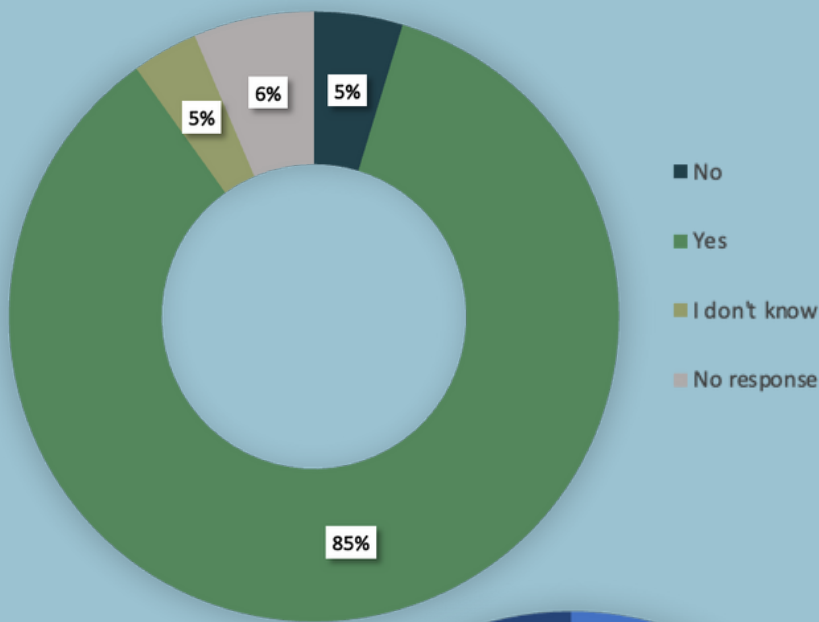


\*Percentages are rounded to the nearest whole number. Percentages less than 4% are not labeled.

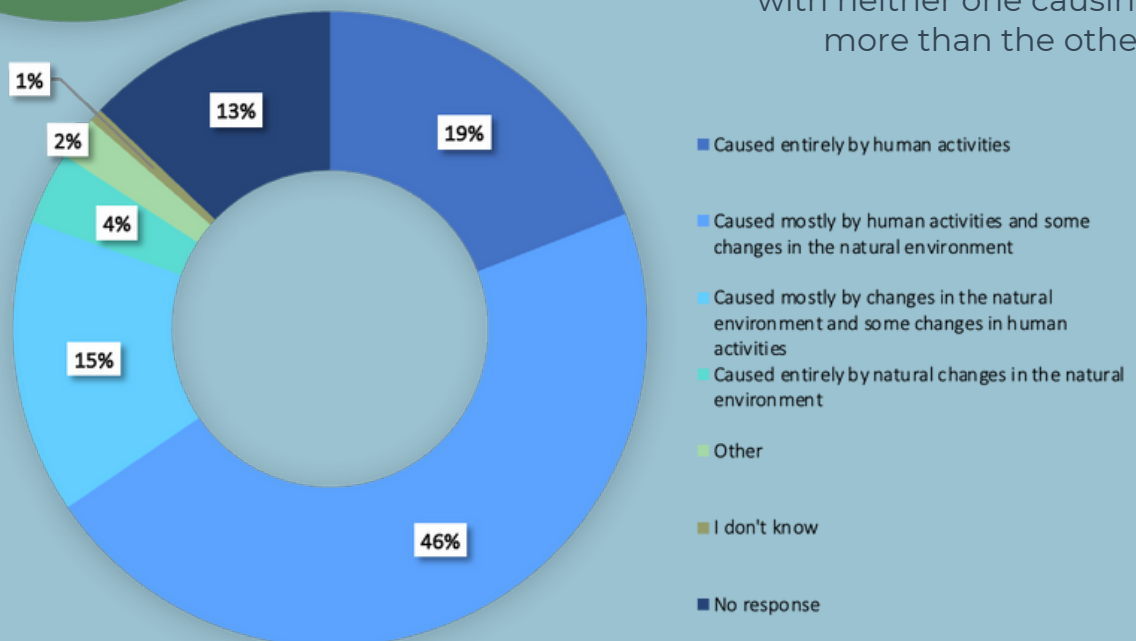
The most consistently accessible resource reported by survey participants is health insurance (87% answered “always”), followed by an operable motor vehicle (87% reported “always”), and an operable sewage system (84% reported “always”). The least consistently accessed resources were wildfire and flood insurance (38% and 35% responded “never,” respectively) yet those options also had the highest responses for those resources being unnecessary in their daily life.

# CLIMATE BELIEFS

Participants were asked about their climate change belief and attribution. The first question asked, “do you think climate change is happening?” If respondents answered “yes,” they were prompted to explain it’s cause. According to the 2021 Yale Climate Change Communication Study, 72% of U.S. adults believe global warming is happening and 75% of adults in Washington State believe it is happening (Marlon et al.). Based on the results below, participants scored higher in their belief that climate change is happening (85%) than both Washington’s average and the national average (85%).



Of the participants who answered that climate change *is* happening, the majority attributed the cause to “mostly human activities and some changes in the natural environment” (46%). Survey participants could also write-in a climate change attribution that differed from the available responses. The most common “other” response was that human activity and changes in the environment were equal, with neither one causing more than the other.



Percentages are rounded to the nearest whole number.

# ADAPTATION EMPOWERMENT

## WHAT

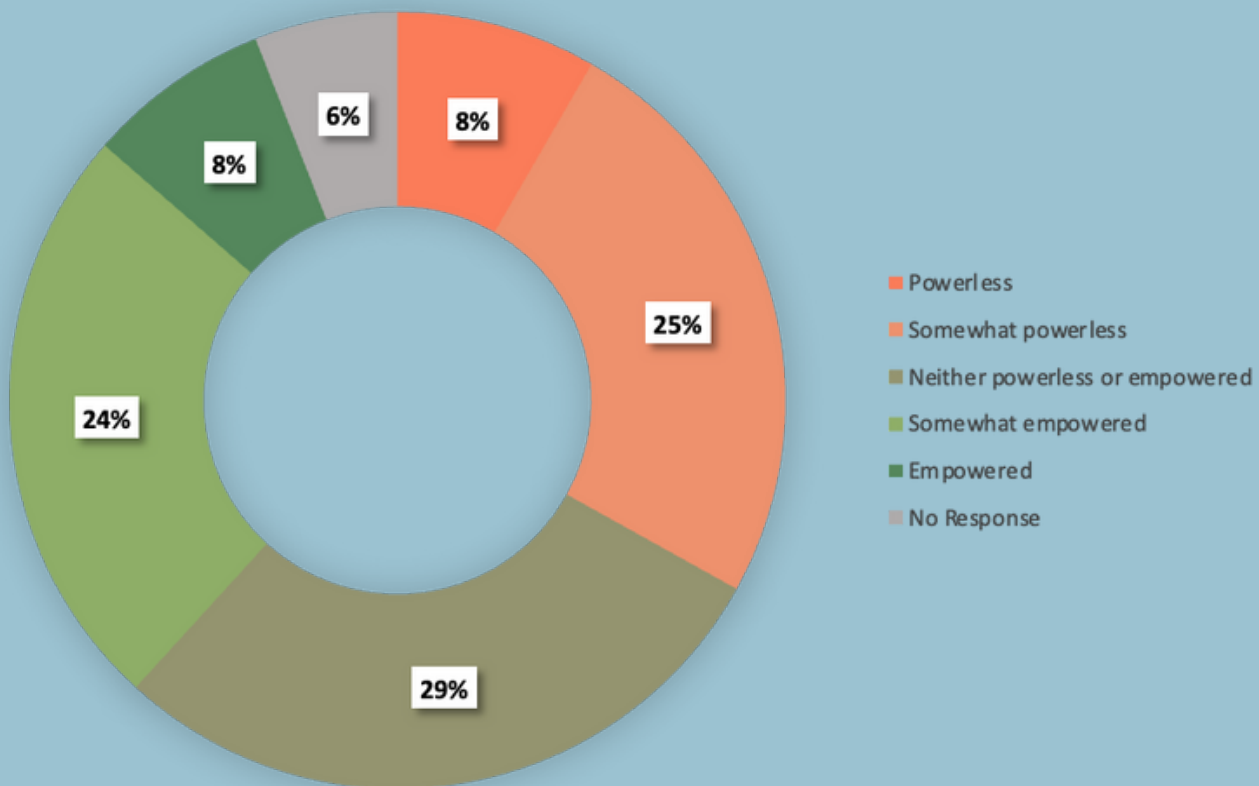
Empowerment is a degree of autonomy. In a climate change context, this looks like having a sense of control over adapting to climate changes one may experience.

## WHY

Empowerment is related to resilience and adaptive capacity as it may lead an individual to gain knowledge, resources, or capital to change their circumstance. At a community level, empowerment may lead to social change.

## HOW

We measured empowerment by asking participants, “in general, how empowered or powerless do you feel in your ability to adapt to possible climate change?” on a five-point scale where (See Appendix B for survey instrument).

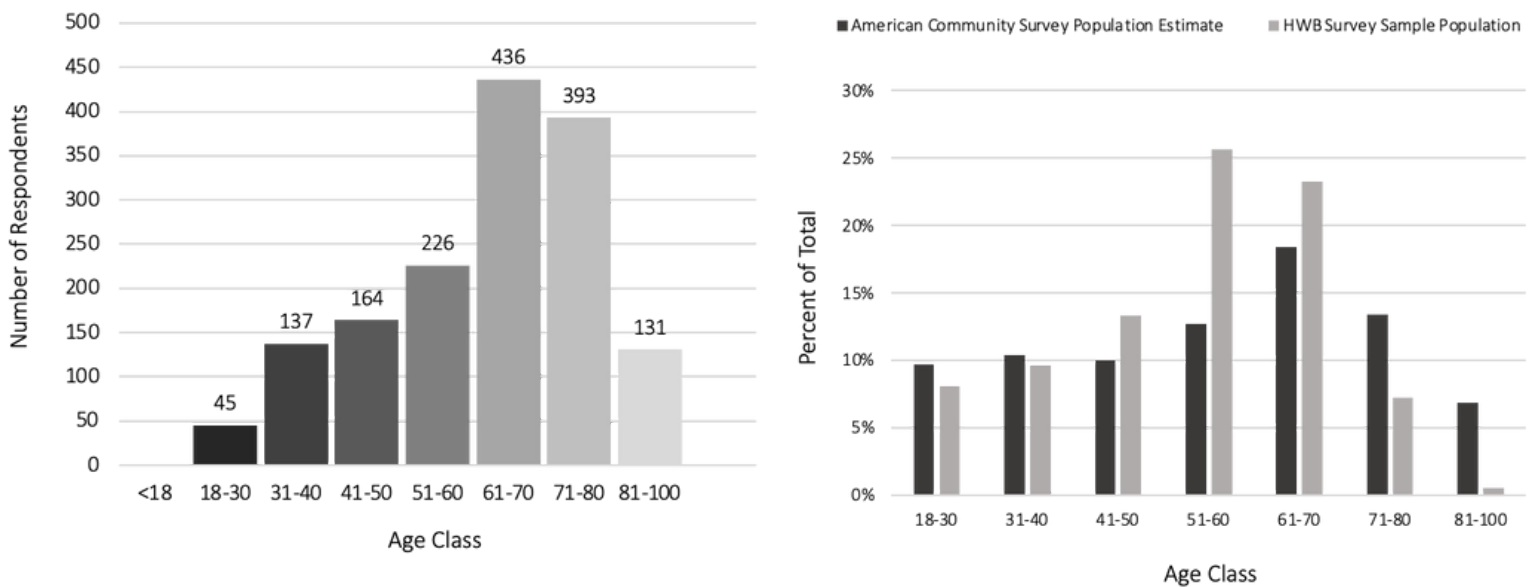


The majority of respondents (29%) felt “neither powerless nor empowered” yet responses on either side of this response (somewhat powerless/empowered) were relatively equal 24-25%. What’s noteworthy here is that a small, and equal, percentage (16%) felt strongly in both directions of empowerment.

## DEMOGRAPHICS

The HWB Survey asks about eight demographic characteristics; age, the number of years lived in Puget Sound, gender identity, are lived in (e.g. urban/rural), income, racial identity, education, and political ideology. The results on these demographics are on following pages, ending with map that shows the spatial distribution of survey participants by Puget Sound county.

### AGE: The individual's age

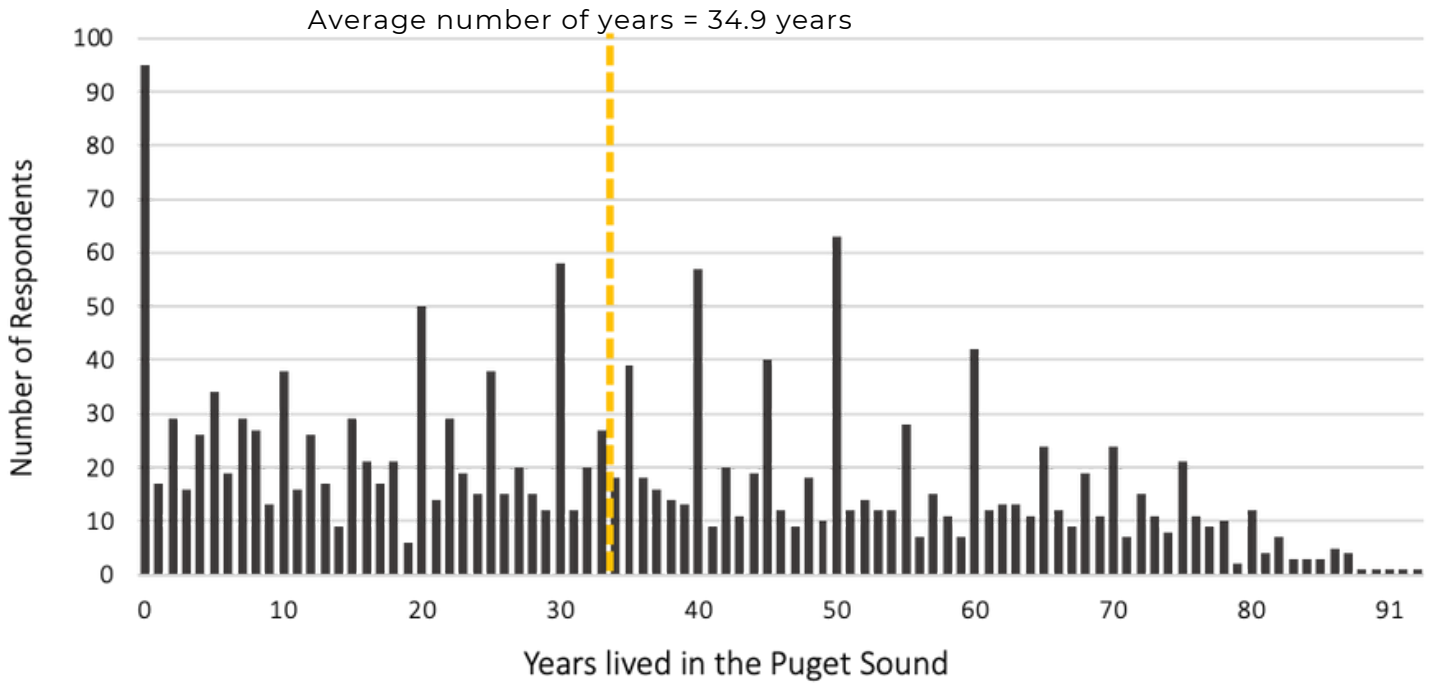


The majority of survey respondents were in the '61-70 years' age class. Respondents under the age of 18 were not included in survey data analyses.

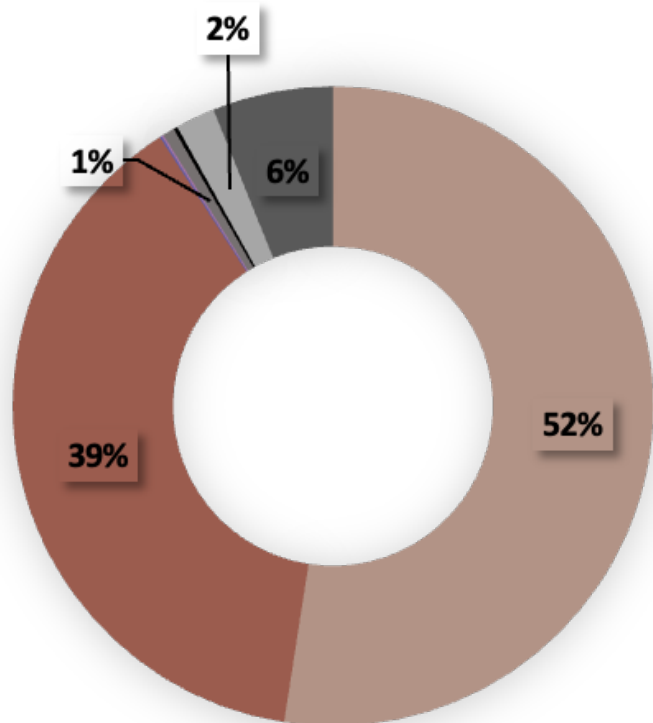
The American Community Survey (ACS) is an annual demographics survey program conducted by the U.S. Census Bureau. The graph on the right shows the comparison of the Puget Sound population distribution alongside the 2022 Human Wellbeing (HWB) Vital Sign survey age distribution on the left.

There is no significant difference between our survey age distribution and the ACS age distribution ( $p=0.55$ ). This means that the HWB Vital Sign survey is an accurate representation of the Puget Sound Population by age.

# Number of years lived in Puget Sound



## Gender: Gender identity



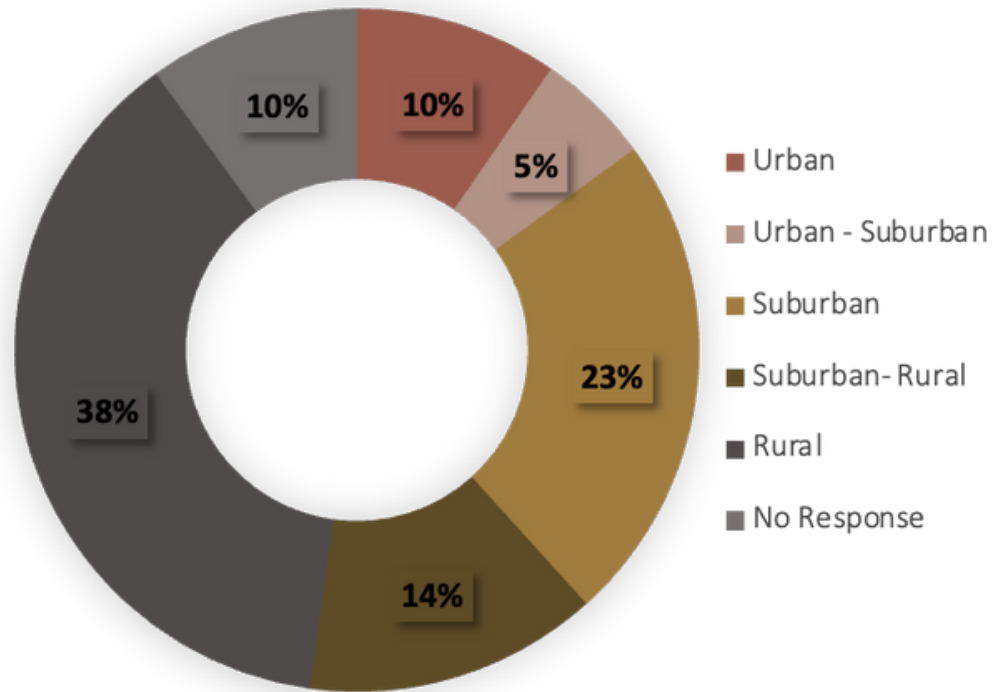
Gender Identity	Percent of Sample
Man	52.5%
Woman	38.5%
Transgender Man	0.1%
Transgender Woman	0.1%
Trans/Non-Binary	0.6%
Some other gender/not listed	0.2%
Prefer not to answer	2.0%
No Response	6.1%

The table is included to show representation of minority gender identities. In the 2020 survey, this demographic category was, 'sex' with only, 'man', 'woman', 'other', and 'prefer not to answer' as options.

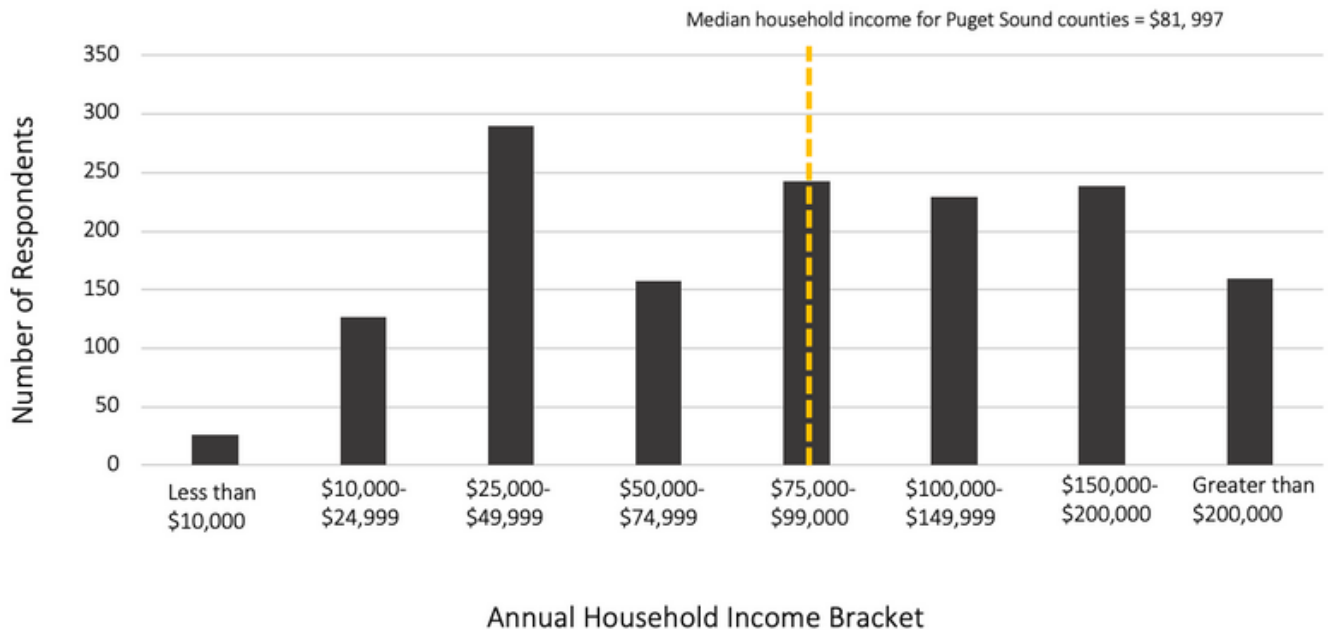
- Man
- Woman
- Transgender Man
- Transgender Woman
- Trans/Non-Binary
- Some other gender/not listed
- Prefer not to answer
- No Response

## Area Live In: Urban, suburban, or rural area

The majority of survey respondents live in rural places which was also the case in 2020. However, there is a ~3% increase in respondents living in urban environments and suburban environments compared to 2020 (Harrington et al. 2023).



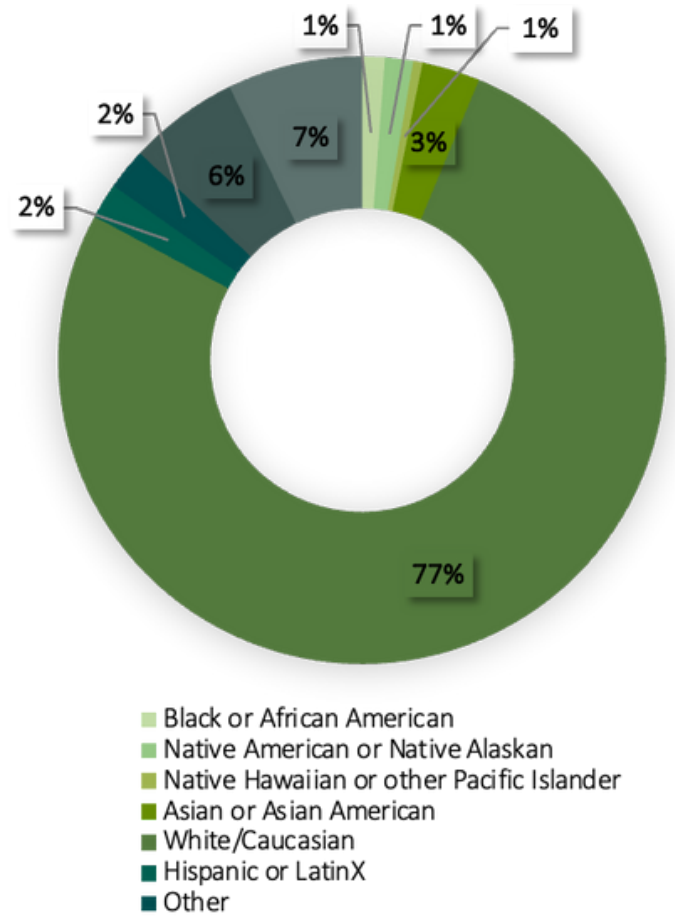
## Income: Annual household income



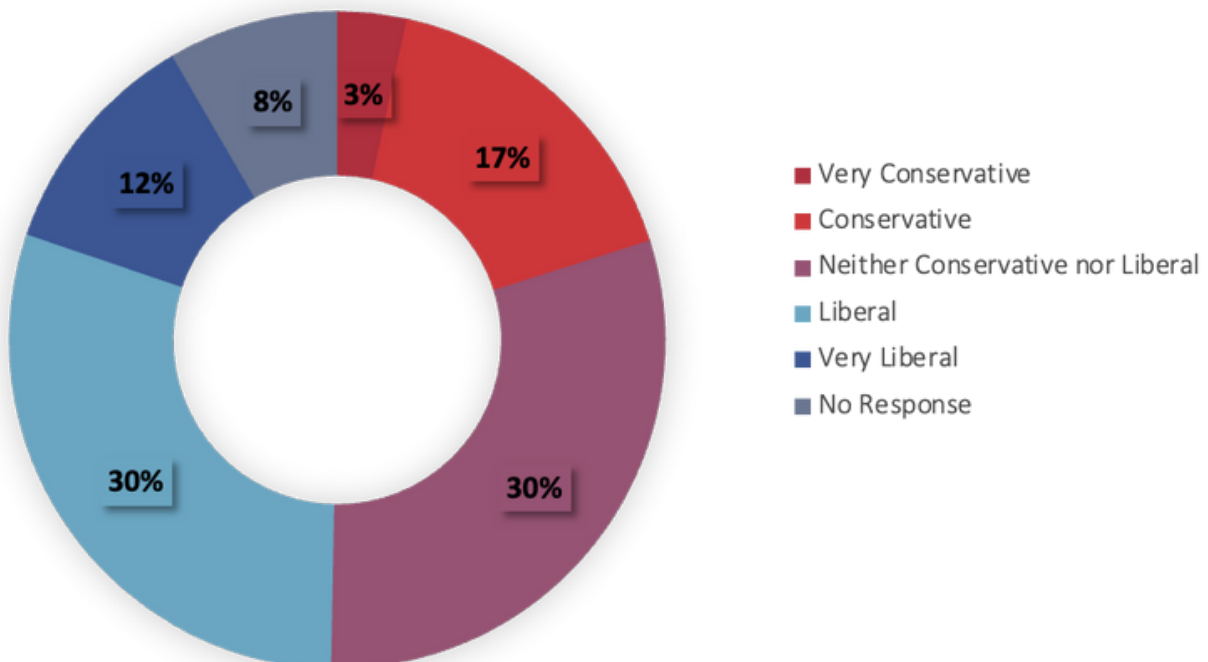


## Race: Racial identity

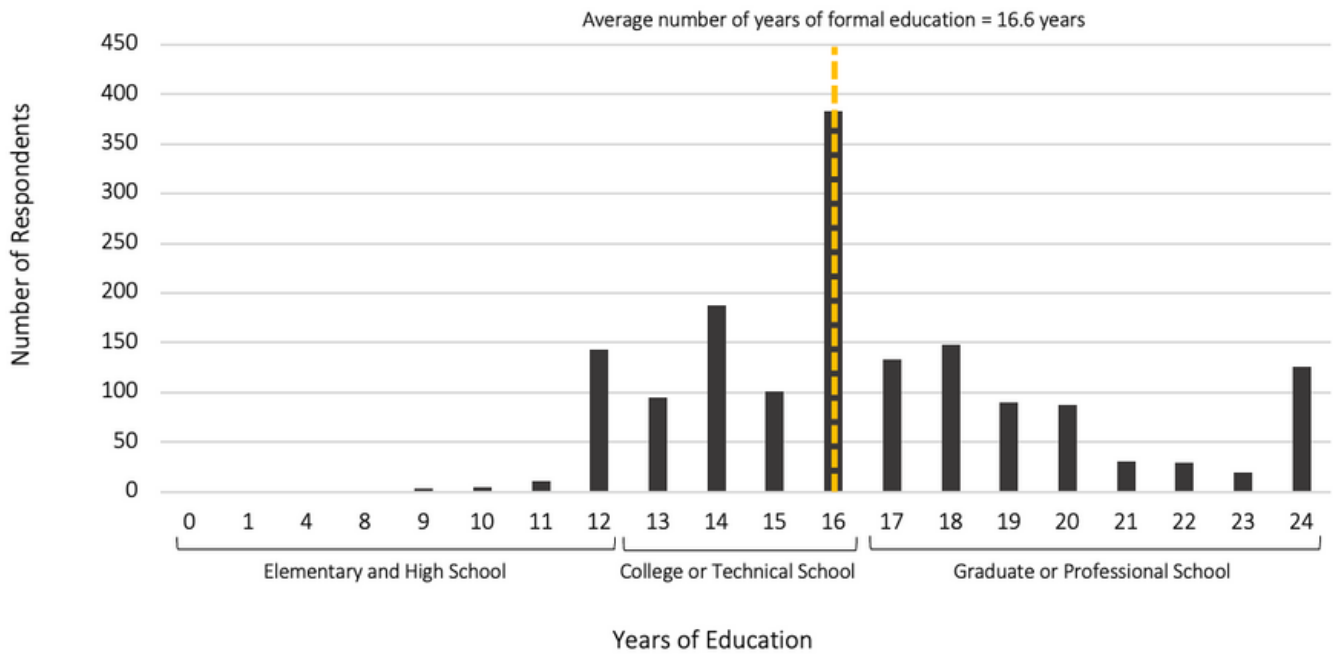
Race	Percent of Sample
Black or African American	1.2%
Native American or Native Alaskan	1.5%
Native Hawaiian or other Pacific Islander	0.5%
Asian or Asian American	3.1%
White/Caucasian	76.7%
Hispanic or Latinx	1.9%
Other	2.2%
Prefer not to answer	5.9%
No Response	7.2%



## Political Ideology: The degree to which the respondent identifies as either conservative or liberal

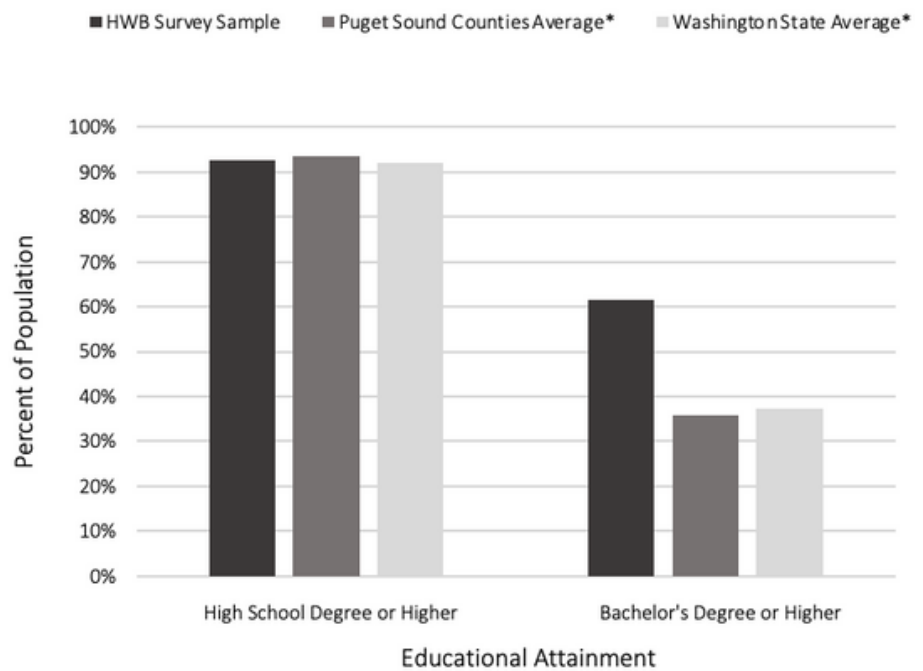


# Education: The number of years of formal education



On average, survey participants had 16.6 years of formal education, equating to a four-year college degree (top graph).

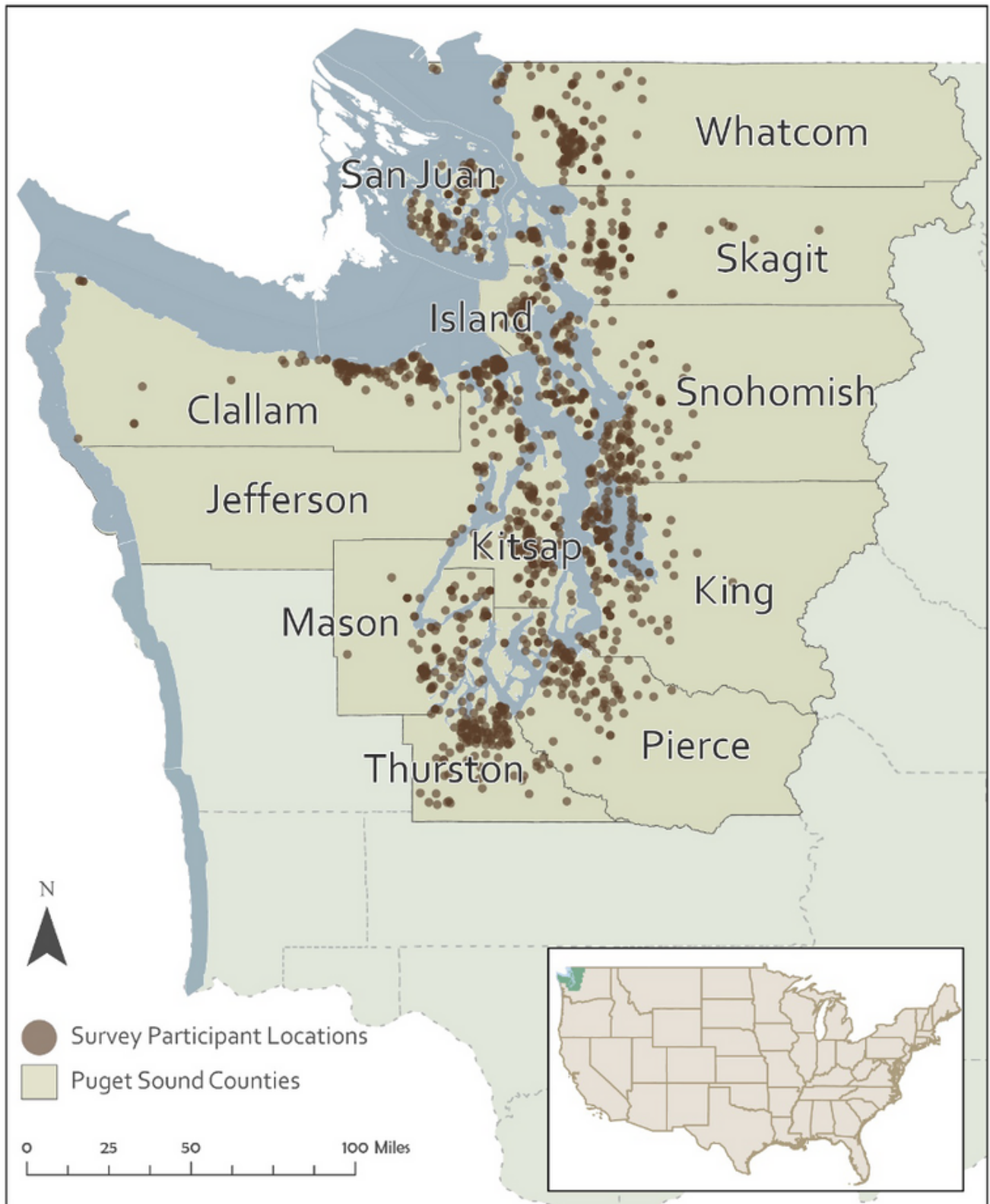
Data from census.gov (bottom graph) shows that 91.9% of Washington state residents have a high school degree or higher, and 37.3% of residents have a bachelor's degree or higher. 93.5% of residents in the Puget Sound have, on average, a high school degree or higher and 35.8% have a bachelor's degree or higher.



\*Values represent % of persons age 25 years+, 2017-2021 (data from census.gov)

HWB Survey respondents were found to be more educated than the Puget Sound and Washington state residents, having a higher percent of persons having a bachelor's degree or higher. However, direct comparisons should be made with caution as data from census.gov calculates education percentages for persons over 25 years of age. The HWB data represented above, includes percentages for persons over 18 years of age.

### 2022 Human Wellbeing Survey Participant Locations



Map created by Krista Harrington  
Data Source: Washington Geospatial Open Data Portal  
Map Projection: WGS 1984

# REFERENCES

Cranston, K. and K. Biedenweg. 2016. 2015 Google Insights & General Public Opinion Survey Reports. Report to Puget Sound Partnership.

Harrington, K., B. Leach, Z. Antenucci, and K. Biedenweg. 2023. Human Wellbeing Vital Signs Survey 2022 Summary: A report on subjective human wellbeing indicators prepared for the Puget Sound Partnership.

Marlon, J., L. Neyens, M. Jeffereson, P. Howe, M. Mildenberger, and A. Leiserowitz. Yale Climate Opinon Maps 2021. 23 November 2022.

Rudnick, J., Tomari, K., Dobbin, K., Lubell, M., and K. Biedenweg. 2023 Delta Residents Survey Summary Report. Report developed for the Delta Stewardship Council, Delta Science Program. Sacramento, CA.

# APPENDIX A: DETAILED METHODOLOGY

### Survey Design:

The survey questions discussed in this report were added to the third iteration of the Human Wellbeing Vital Sign survey (*for more details see Harrington et al. 2013*).

### Survey Distribution:

#### *Paper Survey Instrument*

A sample of addresses was obtained from The Marketing Systems Group in order to distribute the survey. The Marketing Systems group uses a United States Postal System Database for their surveys. A total of 9,000 addresses were purchased for a clustered random sample using Premier Matching to include phone numbers for participants. There were 750 records purchased per county using four counties classified as urban (King, Kitsap, Pierce, and Snohomish) and eight counties classified as rural (Clallam, Island, Jefferson, Mason, San Juan, Skagit, Thurston, and Whatcom).

When addresses were purchased, the following types of addresses were excluded:

1. Drops - A drop is a single delivery point or receptacle that services multiple residences. Examples: Boarding Houses, Fraternities, a single door slot shared by two or more residences. In standard orders, if a client includes Drops, there are two options. Have the Drop Unit in the sample once, or, if a Drop Point is randomly selected, we can expand the Drop Point to list out the addresses each time for each address. Therefore, if drops are selected the address can be included once or get all the residents of that Drop (which will include duplicate addresses).
2. Seasonal - An address given mail only during a specific season (i.e., summer only residence).
3. Vacant - Delivery points that have been unoccupied for 90 days or longer.

The paper survey instrument was printed and distributed by BMS Technologies using a modified Tailored Design Method [1]. For this method, a postcard was

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[1] Tailored Design Method (2) - Don Dillman, Jolene Smith, and Leah Christian, Internet, Phone, Mail, and Mixed-Mode Surveys- The Tailored Design Method, Fourth (John Wiley & Sons, Inc., 2014)

## APPENDICES

delivered to all usable addresses notifying the recipient that they would be receiving a survey packet. After the initial postcard, 38 individuals called in to opt out of the survey voluntarily. Additionally, 804 of the addresses were determined to be 'undeliverable' and subsequently not included to determine total response rate.

Packets were distributed to the remaining sample after two weeks with an introduction letter that had a URL and a QR code included if participants would like to complete the survey online, as well as the paper survey, a pre-paid return envelope, and a \$2 incentive enclosed. Two weeks later, a second reminder postcard was sent that included the URL and QR code to the online survey hosted by Qualtrics.

### **Data Analysis:**

#### *Response Rate*

Analysis used all surveys that were returned excluding surveys that were returned blank. Our sample included 1,701 possible respondents. 1,271 paper surveys were completed, and 430 surveys were completed online. Using the initial sample size of 9,000, this would bring the response rate to 18.9% while incorporating undeliverable addresses brings the response rate to 20.8%.

Number of responses by county are as follows:

Clallam	144	Pierce	115
Island	136	San Juan	125
Jefferson	166	Skagit	136
King	191	Snohomish	99
Kitsap	119	Thurston	128
Mason	112	Whatcom	126
		Other/ Unknown*	104

\*Unknown/other county respondents were documented from Qualtrics where location data could either not be found or indicated locations outside of the Puget Sound as location services collected from Qualtrics could differ from their physical location. For example, respondents could have taken the survey on vacation over the holidays or location services on a device may have been disabled. The authors decided to include these respondents in the data analyses because these respondents had access to the QR code from a post card physically received in the Puget Sound.

## APPENDICES

From the Qualtrics responses, we were able to acquire a latitude/longitude point for each respondent which was used to determine county. From paper surveys, we were able to acquire counties based off of the address data.

Statistical frequencies were calculated in statistical computing software, SPSS. All graphics were made in Microsoft Excel.

### **Limitations:**

A notable limitation of this year's survey design was that the impact of survey deployment timing may have limited responses. The paper instrument was sent out on December 1st of 2022, due to this timing, many respondents were likely handling them over the holiday season which may have led to skewed response rates.

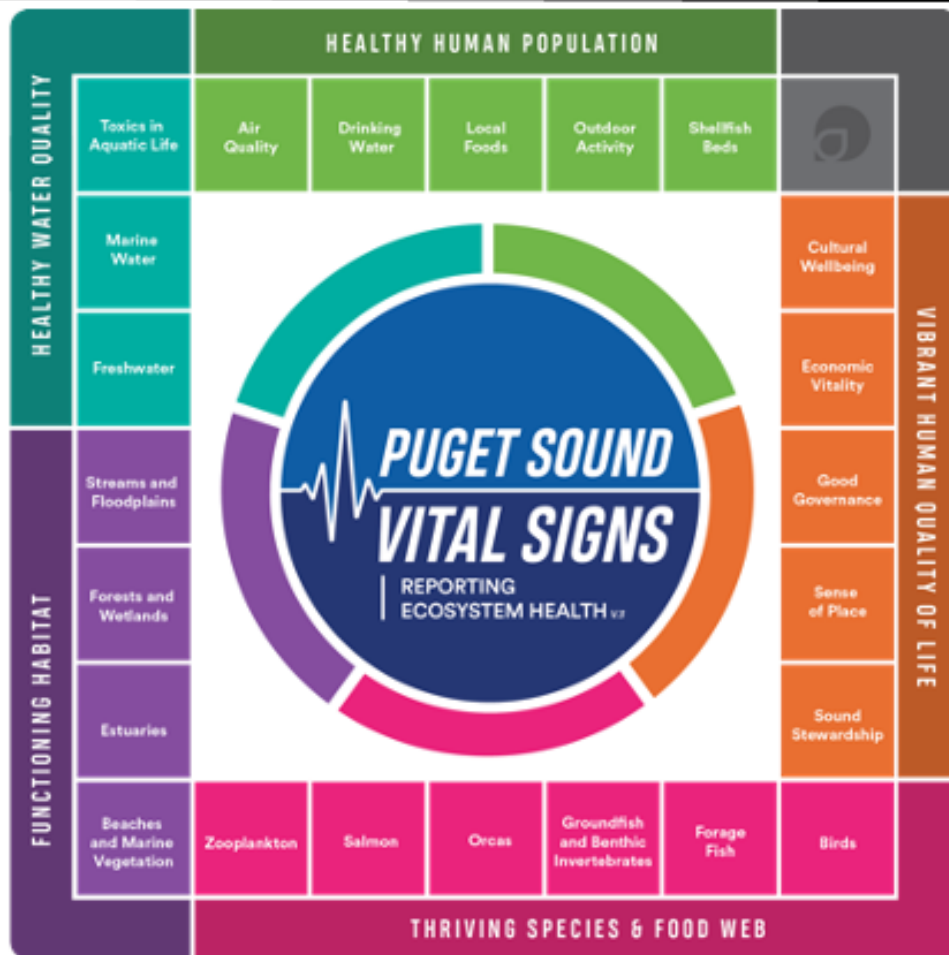
All surveys are subject to limitation due to error. An error refers to the difference between the sample and the true population. While the researchers did their best to limit errors, all of which have been addressed to the extent possible through the methods described.

# APPENDIX B: SURVEY INSTRUMENT

## PUGET SOUND HUMAN WELLBEING SURVEY

IMPORTANT QUESTIONS TO UNDERSTAND YOUR EXPERIENCES

A STUDY COMPLETED COOPERATIVELY BY:



Thank you for participating in this survey of human wellbeing in the Puget Sound, funded by the Puget Sound Partnership. It should take less than 15 minutes of your time. Please complete the brief survey and return it to the researcher using the pre-paid envelope. Participation is voluntary, and your responses are completely confidential.

If you have any questions about the survey, please contact Project Lead, Krista Harrington by e-mail at [krista.harrington@oregonstate.edu](mailto:krista.harrington@oregonstate.edu).

The results of this survey will be reported in the Puget Sound Partnership's *Puget Sound Info* dashboard. Please visit the following website for more details: <https://vitalsigns.pugetsoundinfo.wa.gov>



1. How much do you agree or disagree with the following statements related to the Puget Sound Region?

Please circle one number for each question:

Statement	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree	Don't Know
I have plenty of opportunities to influence natural resource decisions in the Puget Sound region if I want to	1	2	3	4	5	6	7	<input type="checkbox"/>
I feel well represented by the leaders of Puget Sound natural resource management processes	1	2	3	4	5	6	7	<input type="checkbox"/>
I trust regional policymakers to protect Puget Sound's natural resources	1	2	3	4	5	6	7	<input type="checkbox"/>
I have access to enough information regarding the social and economic consequences of how natural resources are managed in the Puget Sound	1	2	3	4	5	6	7	<input type="checkbox"/>
I have access to enough information regarding the environmental consequences of how natural resources are managed in the Puget Sound	1	2	3	4	5	6	7	<input type="checkbox"/>
I have access to enough information regarding the regulatory aspects of how natural resources are managed in the Puget Sound	1	2	3	4	5	6	7	<input type="checkbox"/>

2. Do you own property in the Puget Sound region?

No  Yes

→ **If Yes:** I have the freedom to make personal decisions about how natural resources are managed on my property

Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree	Don't Know
1	2	3	4	5	6	7	<input type="checkbox"/>

3. In the past year, about how often did you hunt, harvest, gather, or forage for the following food in the Puget Sound Region? Please circle one number for each item:

Local Food	Never	Rarely (1-2 times a season)	Occasionally (3-5 times a season)	Regularly (6-9 times a season)	Frequently (More than 10 times a season)	Don't Know
Fish	1	2	3	4	5	<input type="checkbox"/>
Crab or Shrimp	1	2	3	4	5	<input type="checkbox"/>
Oysters, Mussels, clams, (not razor clams)	1	2	3	4	5	<input type="checkbox"/>
Squid	1	2	3	4	5	<input type="checkbox"/>
Deer or Elk	1	2	3	4	5	<input type="checkbox"/>
Waterfowl	1	2	3	4	5	<input type="checkbox"/>
Plants, Berries, or Mushrooms	1	2	3	4	5	<input type="checkbox"/>

4. In the past year, about how often did you engage in the following types of behaviors/activities? Please circle one number for each question:

Behavior/Activity	Never	Rarely (1-4 times a year)	Occasionally (Once a month)	Regularly (Once a week)	Frequently (Almost every day)	Don't Know
Behaviors that you believe effectively benefitted the environment	1	2	3	4	5	<input type="checkbox"/>
Environmental behaviors that were personally meaningful to you	1	2	3	4	5	<input type="checkbox"/>
Environmental behaviors that you believe are needed by the community	1	2	3	4	5	<input type="checkbox"/>

5. Does your work involve spending time in natural environments (e.g. commercial or charter fishing, farming, forestry, habitat restoration, or outdoor-recreation jobs)?

- No  Yes → **If Yes:** About how many hours a week do you perform work that involves spending time in natural environments?  Less than 5 hours/week  5-10 hours/week  11-20 hours/week.  
 21-30 hours/week  More than 30 hours/week

6. In the past year, about how often have you felt *inspiration* when spending time in the outdoors of the Puget Sound region? Please circle one number:

Never	Rarely (1-4 times a year)	Occasionally (Once a month)	Regularly (Once a week)	Frequently (Almost every day)	Don't Know
1	2	3	4	5	<input type="checkbox"/>

7. In the past year, about how often has spending time in the outdoors of the Puget Sound region helped you reduce *stress*? Please circle one number:

Never	Rarely (1-4 times a year)	Occasionally (Once a month)	Regularly (Once a week)	Frequently (Almost every day)	Don't Know
1	2	3	4	5	<input type="checkbox"/>

8. In the past year, how satisfied were you with your level of participation in any of the following cultural activities or traditions *related to the environment*? Please circle one number for each question:

Environmental Cultural Activity or Tradition	Dissatisfied	Somewhat Dissatisfied	Neither Satisfied nor Dissatisfied	Somewhat Satisfied	Satisfied	I do not engage in this activity or tradition	Don't Know
<u>Native</u> practices or activities (canoe journey, Tribal center events, potlach, etc.)	1	2	3	4	5	<input type="checkbox"/>	<input type="checkbox"/>
<u>Spiritual</u> or <u>religious</u> practices related to the environment (meditation, prayer, solstice observance etc.)	1	2	3	4	5	<input type="checkbox"/>	<input type="checkbox"/>
Environmental practices or activities important to your <u>heritage</u> (formal or informal family or community events, etc.)	1	2	3	4	5	<input type="checkbox"/>	<input type="checkbox"/>
Environmentally oriented <u>social</u> activities (environmental clubs, festivals, outdoor events, etc.)	1	2	3	4	5	<input type="checkbox"/>	<input type="checkbox"/>

9. About how many days per month on average did you participate in the following recreation activities in the Puget Sound region this past **summer (about June - September)**. Please circle one number for each question:

Outdoor Activity	I do not engage in this activity	Less than 1 day per month	1-4 days per month	5-10 days per month	11-20 days per month	More than 20 days per month	Don't Know
Motorized Trail Use (e.g. ATV or OHV Riding)	1	2	3	4	5	6	<input type="checkbox"/>
Using Paved Paths or Trails for Walking, Running, Biking	1	2	3	4	5	6	<input type="checkbox"/>
Using Unpaved Trails for Walking, Running, Biking, Horseback, Hiking, Backpacking	1	2	3	4	5	6	<input type="checkbox"/>
Camping (Car or Back Country)	1	2	3	4	5	6	<input type="checkbox"/>
Fishing	1	2	3	4	5	6	<input type="checkbox"/>
Hunting	1	2	3	4	5	6	<input type="checkbox"/>
Picnic or BBQ	1	2	3	4	5	6	<input type="checkbox"/>
Motorized Boating	1	2	3	4	5	6	<input type="checkbox"/>
Non-Motorized Water Sports (e.g. Kayak, Surf, Sailing, Swimming, Scuba)	1	2	3	4	5	6	<input type="checkbox"/>
Gardening or Yard Work	1	2	3	4	5	6	<input type="checkbox"/>
Wildlife Viewing/Birding	1	2	3	4	5	6	<input type="checkbox"/>

10. About how many days per month on average did you participate in the following recreation activities in the Puget Sound region this past **winter (about November - February)**. Please check one box for each question:

Outdoor Activity	I do not engage in this activity	Less than 1 day per month	1-4 days per month	5-10 days per month	11-20 days per month	More than 20 days per month	Don't Know
Motorized Trail Use (e.g. ATV or OHV Riding)	1	2	3	4	5	6	<input type="checkbox"/>
Using Paved Paths or Trails for Walking, Running, Biking	1	2	3	4	5	6	<input type="checkbox"/>
Using Unpaved Trails for Walking, Running, Biking, Horseback, Hiking, Backpacking	1	2	3	4	5	6	<input type="checkbox"/>
Camping (Car or Back Country)	1	2	3	4	5	6	<input type="checkbox"/>
Fishing	1	2	3	4	5	6	<input type="checkbox"/>
Hunting	1	2	3	4	5	6	<input type="checkbox"/>
Picnic or BBQ	1	2	3	4	5	6	<input type="checkbox"/>
Motorized Boating	1	2	3	4	5	6	<input type="checkbox"/>
Non-Motorized Water Sports (e.g. Kayak, Surf, Sailing, Swimming, Scuba)	1	2	3	4	5	6	<input type="checkbox"/>
Skiing/Snow Boarding or Snowshoeing	1	2	3	4	5	6	<input type="checkbox"/>
Gardening or Yard Work	1	2	3	4	5	6	<input type="checkbox"/>
Wildlife Viewing/Birding	1	2	3	4	5	6	<input type="checkbox"/>

11. Has environmental change affected your ability to participate in any outdoor activities in the Puget Sound this past **summer** (about June - September)?

No  Yes → **If Yes**, which activity/activities and how so? \_\_\_\_\_

12. Has environmental change affected your ability to participate in any outdoor activities in the Puget Sound this past **winter** (about November - February)?

No  Yes → **If Yes**, which activity/activities and how so? \_\_\_\_\_

13. How much do you agree or disagree with the following statements related to the Puget Sound Region?  
Please circle one number for each question:

Statement	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree	Don't know
I am very attached to the natural environment in the Puget Sound region	1	2	3	4	5	6	7	<input type="checkbox"/>
I am proud to live in the Puget Sound region	1	2	3	4	5	6	7	<input type="checkbox"/>
I feel responsible for taking care of Puget Sound's natural environment	1	2	3	4	5	6	7	<input type="checkbox"/>
Living in the Puget Sound region says a lot about who I am	1	2	3	4	5	6	7	<input type="checkbox"/>
Being able to engage in outdoor activities or cultural practices is important to my connection to the Puget Sound	1	2	3	4	5	6	7	<input type="checkbox"/>
I am mostly attached to parts of Puget Sound that are nearest to me	1	2	3	4	5	6	7	<input type="checkbox"/>
I could be satisfied living in other places outside the Puget Sound	1	2	3	4	5	6	7	<input type="checkbox"/>

14. Have you ever **personally** experienced any of the following impacts since living in the Puget Sound?

Environmental Impact	No	Yes	If yes, do you think it is due to climate change? (circle only one answer)		
Natural disaster (e.g. flood, wildfire)	<input type="checkbox"/>	<input type="checkbox"/>	Yes	No	I don't know
Flooded property (e.g. home or farm)	<input type="checkbox"/>	<input type="checkbox"/>	Yes	No	I don't know
Flooded or eroded roadway	<input type="checkbox"/>	<input type="checkbox"/>	Yes	No	I don't know
Levee failure or erosion	<input type="checkbox"/>	<input type="checkbox"/>	Yes	No	I don't know
Contamination of private well water	<input type="checkbox"/>	<input type="checkbox"/>	Yes	No	I don't know
Agricultural well outage	<input type="checkbox"/>	<input type="checkbox"/>	Yes	No	I don't know
Moved/relocated due to disaster	<input type="checkbox"/>	<input type="checkbox"/>	Yes	No	I don't know
Experienced loss of work (hours/days, opportunities)	<input type="checkbox"/>	<input type="checkbox"/>	Yes	No	I don't know
Heat exhaustion or heat stroke	<input type="checkbox"/>	<input type="checkbox"/>	Yes	No	I don't know
Asthma or respiratory illness due to poor air quality (wildfire smoke)	<input type="checkbox"/>	<input type="checkbox"/>	Yes	No	I don't know
Sickness due to poor water quality	<input type="checkbox"/>	<input type="checkbox"/>	Yes	No	I don't know
Other (fill in) _____			Yes	No	I don't know

15. Please rate your level of concern for each of the following affecting the Puget Sound today or at some point over the next 25 years (approximately one generation from now)?

Statement	Not At All Concerned	Somewhat Concerned	Moderately Concerned	Very Concerned
Rising sea levels	1	2	3	4
Increasing air temperatures	1	2	3	4
More frequent/severe heat waves	1	2	3	4
More frequent/severe droughts	1	2	3	4
More frequent/severe rainfall events & floods	1	2	3	4
More frequent/severe wildfires & smoke	1	2	3	4
Worsening air quality	1	2	3	4
Worsening water quality	1	2	3	4
More harmful algal blooms	1	2	3	4
More invasive aquatic weeds	1	2	3	4
Worsening ocean acidification	1	2	3	4
Other (fill in) _____	1	2	3	4

16. If you are concerned about any of the environmental changes above, what negative impacts do you expect to happen to you or your family experience today or at some point over the next 25 years as a result?

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17. Do you have access to the following resources?

Resource	Always	Sometimes	Never	I don't have use for it	Unsure
Air conditioning/climate-controlled environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Back-up power supply/generator	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Operable motorized vehicle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Public transportation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Domestic well for clean drinking water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Local/community water system for clean drinking water (i.e. not your own well system)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sewage system or septic tank	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Financial resources (e.g. savings, stocks/bonds, credit, loans)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Home or renters' insurance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flood insurance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Health insurance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wildfire insurance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Computer/mobile device with reliable internet connection at home	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

18. Do you believe climate change is happening?  Yes  No  I don't know

→ If Yes: Do you think climate change is...?

- Caused entirely by human activities
  - Caused mostly by human activities and some changes in the natural environment
  - Caused mostly by changes in the natural environment and some changes in human activities
  - Caused entirely by natural changes in the natural environment
  - Other (fill in): \_\_\_\_\_
- I don't know

19. In general, how empowered, or powerless do you feel about your ability to adapt to climate change? Please circle one number:

Powerless	Somewhat Powerless	Neither Powerless nor Empowered	Somewhat Empowered	Empowered
1	2	3	4	5

20. In general, how satisfied, or dissatisfied are you with your life overall? Please circle one number:

Dissatisfied	Somewhat Dissatisfied	Neither Satisfied nor Dissatisfied	Somewhat Satisfied	Satisfied
1	2	3	4	5

21. How many years have you lived in the Puget Sound? \_\_\_\_\_

22. What is your gender identity?

- Man  Woman  Transgender Man  Transgender Woman  Trans/Non-Binary
- Some Other Gender/Not Listed  Prefer not to answer

23. Which of the following best describes the area you live in? Please circle one number:

Urban	Suburban	Rural
1	2	3

24. What is the highest level of education you have completed? Please circle one number:

Elementary and High School												College or Technical School				Graduate or Professional School							
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24+

25. What is your annual household income?

- Less than \$10,000  \$10,000-\$24,999  \$25,000-\$49,999  \$50,000-\$74,999
- \$75,000-\$99,999  \$100,000-\$149,999  \$150,000-\$200,000  Greater than \$200,000

26. Which of the following best describes your race? Mark all that apply.

- Black or African American  Native American or Native Alaskan  Native Hawaiian or Other Pacific Islander
- Asian or Asian American  White/Caucasian  Hispanic or LatinX  Other: \_\_\_\_\_
- Prefer not to respond

27. What is your age? \_\_\_\_\_

28. Which of the following do you consider yourself? Please circle one number:

Very Conservative	Conservative	Neither Conservative nor Liberal	Liberal	Very Liberal
1	2	3	4	5

If you would be willing to participate in a follow-up interview to discuss questions related to this survey, please provide your phone number or email here: \_\_\_\_\_

Thank you for completing this survey. If you have any additional thoughts on human wellbeing in your area, please write them here, as needed: