

Introduction

King County has witnessed an increasingly racially and ethnically diverse population where 35.2% of the population are minorities (as of 2010) compared to 21.1% in 2000¹. It is essential for the county to be able to effectively communicate with a wide range of residents regarding its values, programs, and implements. It is King County's goal to conserve fish and wildlife resources in the county and to maintain countywide biodiversity. The County hosts multiple events annually to celebrate the conservation effort and educate its residents about the importance of biodiversity. The Swimming Beach Monitoring program tracks water quality and measures bacteria and algal toxin levels at swimming beaches. Collected data would influence management decisions as exposure to such pathogens and toxins can potentially have serious impacts on human health. By evaluating the effectiveness of the beach closure and how different communities value biodiversity, we hope to improve existing and future programs related to these topics.

Biodiversity Conservation

People are the keepers of the Earth. Coastal environments are among the most biodiverse places on earth, but also susceptible to disturbance due to close proximity to human development². Most people are very familiar with beaches, where they enjoy the intersection of terrestrial and marine/freshwater environments as well as a wide range of outdoor activities it offers. This provides



Figure 1. Picture of **Hicklin Lake**, an example of a well-maintained beach with low degree of biodiversity

the County the opportunity to inform its residents about the native plants and animals that reside within the area, their roles within the ecosystem, and ways to support the ecosystem. Having a better understanding of the local biology, the residents can appreciate the ecological biodiversity and be part of the efforts to conserve it.

Surveys of beach users were conducted from 4 sites: Green Lake, Juanita Beach, Gene Coulon Beach, and Newcastle Beach.

Selected beaches were selected based on two criteria

1. Number of times and length closure due to fecal coliform and toxic algae based on the data from the Swimming Beach Monitoring Program in the past 5 years (2012-2016)
2. Racially diverse (as defined with relatively high portion of racial minority population with reference to population demographics of King County) using GIS census track data

Results

Warning Signage

On the survey, we asked survey participant whether they have experienced beach closure. If he/she responded *yes*, we then followed up with two sub-questions to access his/her opinion on the warning signs.

Question	Yes	No	Non-response	Total
Did the respondent experience beach closure?	25	57	2	84
Sub 1: Did the respondent swim or go into the water?	4	19	2	25
Sub 2: Did the warning signs affect respondent's decision to swim or go into the water?	21	2	4	25

Table 1. Number of respondents reported to have experience beach closure and whether signs impacted their decision to enter the water at surveyed beaches

Did the warning signs affect the respondent's decision NOT to go into the water?

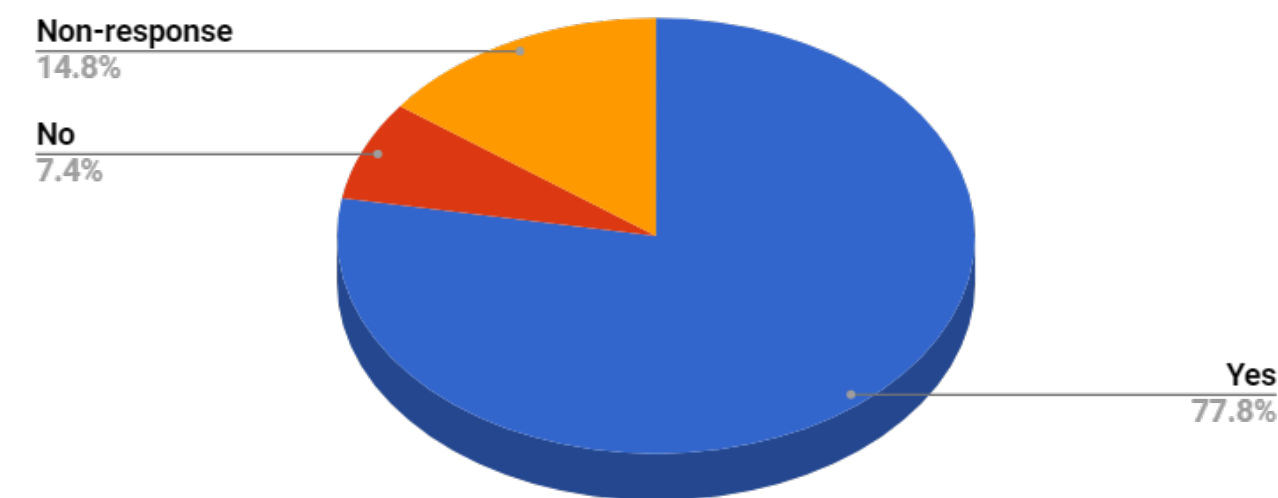


Figure 2. Percentage of respondents reported warning signs affected their decision to enter the water at surveyed beaches

Biodiversity

Respondent's Perception on Shoreline Biodiversity By Race

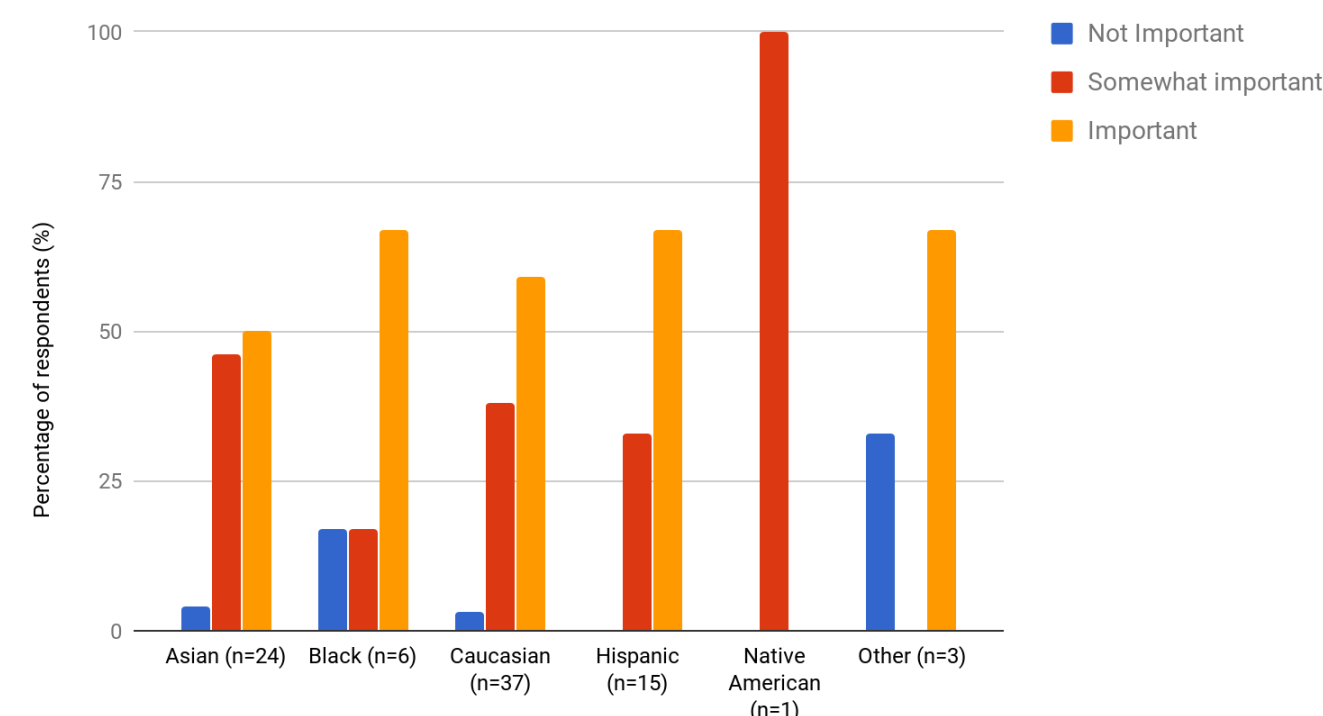


Figure 3. Percentage of respondents reported on the importance of having diverse shoreline

Results (cont.)

Warning Signage

- 78 percent of respondents experienced beach closure reported the warning signed affected their decision not going into contact with the water at the swimming beaches/lakes.
- 2 out of 25 individuals or 7 percent of respondents that reported the warning signs did *not affect* their decisions. This sample size is considered too small to be further analyzed for statistical significance.

Biodiversity

- Of 84 survey participants who answered the question, 93 percent reported having biodiverse shorelines is either *important* or *somewhat important*.
- Across races/ethnicity, *Important* was the most selected answer with the exception of Native American where there was only one participant.
- Based on the reported data, income also had little impact on respondent's opinion on biodiversity.



Figure 4. A resident participated in the survey at Newcastle Beach

Discussion and Conclusion

King County residents are very interested in the water quality at the swimming beaches/lakes in their neighborhood.

Warning signs are reported to be very effective in communicating exposure risks across the demographics. Further studies with a larger sample size might reveal what barriers might exist in communicating such risks.

The vast majority of the residents also believe that having biodiverse shorelines is important, as long as it does not interfere with the water quality at the beaches/lakes.

Reference

1. King County 2010 Census Race and Age Breakdown
2. Mario Brauns et al. *Human lakeshore development alters the structure and trophic basis of littoral food webs*. Journal of Applied Ecology. 18 May 2011.

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