

Hilo Bay Watershed Advisor Group
Public Opinion Survey
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Prepared by:

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Purpose

In August, 2007, we (Drs. Juvik, de Pillis and Belt) were contacted by Susan O'Neill and Steve Godzsak, Spokespersons for the Hilo Bay Watershed Advisory Group. Mr. Godzsak requested both verbally and in writing a survey to determine the "community's knowledge of and perceptions about the Hilo Bay Watershed, its rivers, streams, ponds aquifers, and Hilo Bay specifically...determine if the community perceives that a problem or problems exist and what the problem(s) are so that corrective actions can be enacted." What follows is the result of a pilot study to gauge general trends in public opinion and to test the feasibility of a more comprehensive study in the future.

Method

Mr. Godzsak provided us with a list of potential questions to include in our survey. The most pertinent questions were extracted and were combined with a similar survey questionnaire being fielded by students in Dr. Belt's Methods of Research class in the Fall of 2007. The combined questionnaire was distributed among classes taught by Drs. Juvik and de Pillis for suggestions and markup. The final survey instrument was fielded during the last two weeks of October, 2007 by UH Hilo students Molly Egan, Lee Gibbons, Ryan Kanaka'ole, Villazon Saimon and Muliufi Tuimalealiifano. The surveys were implemented through a self-response, pen-and-paper method. Sampling was done on a convenience basis at a number of public areas (including the Farmer's Market, Prince Kuhio Plaza, and several parks).

Data

As the survey questionnaire included a number of questions relevant only to students' individual research projects and not to this study, students shared the task of data entry with Dr. Belt (who received assistance from Department of Political Science Research Assistant S. Colin Morrison). A student (not named here) involved in the original data collection process was found to have fabricated survey responses. This student's surveys were removed from the data set and the rest of the surveys were thoroughly vetted to insure validity.

Results

A total of 185 surveys were completed (surveys less than half complete were rejected), corresponding to a margin of error of ± 7 percent at the 95% confidence level. Respondents ranged in age from 16 to 75 years old (mean = 31.1, standard dev. = 14.0, median = 25.5). Respondents were roughly evenly divided between men and women:

Respondents' Sex

| | Frequency | Percent |
|--------|-----------|---------|
| Male | 90 | 48.6 |
| Female | 95 | 51.4 |
| Total | 185 | 100.0 |

Other demographic indicators, such as ethnicity, income and education were collected. The results are as follows:

Respondents' Ethnicity

| | Frequency | Percent |
|------------------------|-----------|---------|
| Asian/Hawaiian/Pac.Is. | 116 | 62.7 |
| White | 42 | 22.7 |
| Hispanic/Latino | 9 | 4.9 |
| Black/Afr.-American | 6 | 3.2 |
| Am. Indian/Alaskan | 1 | .5 |
| Other | 11 | 5.9 |
| Total | 185 | 100.0 |

Respondents' Income

| | Frequency | Percent |
|---------------------|-----------|---------|
| \$0 - \$9,999 | 79 | 42.7 |
| \$10,000 - \$14,999 | 20 | 10.8 |
| \$15,000 - \$24,999 | 24 | 13.0 |
| \$25,000 - \$35,999 | 15 | 8.1 |
| \$36,000 - \$49,999 | 21 | 11.4 |
| \$50,000 + | 26 | 14.1 |
| Total | 185 | 100.0 |

Respondents' Education

| | Frequency | Percent |
|------------------|-----------|---------|
| Less than HS | 10 | 5.4 |
| HS Grad or GED | 30 | 16.2 |
| Some College | 59 | 31.9 |
| AA Degree | 34 | 18.4 |
| BA, BS or higher | 52 | 28.1 |
| Total | 185 | 100.0 |

Our first variable of interest in this study is the public's perception of the water quality in Hilo Bay. Of the 156 respondents who offered an opinion (29 people, 15.7 percent, of total said they didn't know), nearly three-quarters (73.8 percent) said that Hilo Bay was either somewhat or very polluted. The full distribution of responses is as follows:

Perceived Cleanliness of Hilo Bay

| | Frequency | Percent |
|-------------------|-----------|---------|
| Clean | 11 | 7.1 |
| Somewhat Clean | 30 | 19.2 |
| Somewhat Polluted | 72 | 46.2 |
| Very Polluted | 43 | 27.6 |
| Total | 156 | 100.0 |

Another measure of water quality is whether respondents think it is safe to eat the fish caught in Hilo Bay. A large plurality, 40.5 percent said that they didn't know if it was safe to eat the fish. Of the remainder of respondents who volunteered an answer, roughly two-thirds said that the fish were not safe to eat, and a third said the fish were safe (64.5 percent and 35.5 percent respectively).

Safe to Eat Fish Caught in Hilo Bay

| | Frequency | Percent |
|-------|-----------|---------|
| Yes | 39 | 35.5 |
| No | 71 | 64.5 |
| Total | 110 | 100.0 |

Our next question measured perceived responsibility for the quality of Hilo Bay. A little less than half (45.4 percent) felt that industry was most responsible. Residents were listed as a close second (38.4 percent) in terms of responsibility, while farms ranked last with 16.2 percent:

Responsibility for Water Quality of Hilo Bay

| | Frequency | Percent |
|-----------|-----------|---------|
| Industry | 84 | 45.4 |
| Residents | 71 | 38.4 |
| Farms | 30 | 16.2 |
| Total | 185 | 100.0 |

Our next set of questions attempted to identify what, specifically, respondents felt were the primary water quality problems in Hilo Bay. Respondents were presented with a list of problems and were allowed to check all of the problems that they could identify. A majority of respondents identified four problems in the bay: algae, oil slicks, low fish population and fuel spills. Roughly a third of respondents listed runoff and litter as problems affecting the water quality in Hilo Bay:

Perceived Water Quality Problems (“Yes” responses)

| | Frequency | Percent |
|---------------------|-----------|---------|
| Algae | 147 | 79.5 |
| Oil Slicks | 137 | 74.1 |
| Low Fish Population | 125 | 67.6 |
| Fuel Spills | 122 | 65.9 |
| Runoff | 70 | 37.8 |
| Litter | 59 | 31.9 |

We also offered respondents another set of questions attempting to ascertain what the public thought were the sources problems affecting the cleanliness of Hilo Bay. Cruise ships and runoff from farms were cited as the primary sources of problems, although a significant percentage said they did not know whether each potential source of pollution was a problem. The results are as follows:

Sources of Hilo Bay Water Quality Problems

| | Percent Yes | Percent No | Percent Don't Know |
|--------------|-------------|------------|--------------------|
| Cruise Ships | 65.4 | 7.6 | 43.2 |
| Farm Runoff | 59.5 | 9.7 | 30.8 |
| Cesspools | 58.1 | 8.6 | 43.2 |
| Pet Waste | 40.5 | 14.6 | 44.9 |

Next, we attempted to identify types of behaviors that the public might engage in that could contribute to a degradation in the water quality of Hilo Bay. The first set of questions measured the use of lawn/yard care products. Again, respondents could indicate multiple responses, meaning that they had used more than one product. The results indicate that respondents were just as likely to use chemical fertilizer and pesticide products as they were to use organic products (roughly 15 percent on all measures). A greater number of respondents (37.3 percent) said that they used compost.

Usage of Lawn/Yard Care Products (“Yes” responses)

| | Frequency | Percent |
|---------------------|-----------|---------|
| Chemical Fertilizer | 29 | 15.7 |
| Organic Fertilizer | 32 | 17.3 |
| Chemical Pesticide | 28 | 15.1 |
| Organic Pesticide | 25 | 13.5 |
| Compost | 69 | 37.3 |

Our next query was the frequency of washing one’s automobile. Roughly half (49.7 percent) said that they washed their car about once per month or more frequently. The distribution is as follows:

Frequency of Automobile Washing

| | Frequency | Percent |
|----------------------|-----------|---------|
| More than once/month | 52 | 28.1 |
| About once/month | 40 | 21.6 |
| Every few months | 33 | 17.8 |
| 2-3 times/year | 21 | 11.4 |
| Once a year or less | 39 | 21.1 |
| Total | 185 | 100.0 |

Lastly, we attempted to identify what leisure activities the public engages in around Hilo Bay. Respondents were allowed to check each of the following activities, and they are reported in the order of most popular:

Leisure Activities in and around Hilo Bay (“Yes” responses)

| | Frequency | Percent |
|---------------------|-----------|---------|
| Walking | 76 | 41.1 |
| Running | 56 | 30.3 |
| Swimming | 45 | 24.3 |
| Canoeing / Kayaking | 36 | 19.5 |
| Fishing | 34 | 18.4 |
| Bicycling | 29 | 15.7 |
| Surfing | 26 | 14.1 |
| Boating | 10 | 5.4 |

Conclusion

There seems to be some confusion as to the cleanliness of Hilo Bay. Many people are not sure whether the bay is clean and whether or not it is safe to eat fish that come from the bay. Many people are unclear as to the sources of pollution, as well. This small, pilot survey points to the need for greater education about the water quality of Hilo Bay and the watershed.

Appendix: Survey Questionnaire Items

What is your age? _____

What is your sex? Male Female

Which of the following best describes your ethnicity?

- Black / African American
- American Indian / Alaskan Native
- Asian / Hawaiian / Pacific Islander
- Hispanic / Latino
- White (non-Hispanic)
- Other, please specify: _____

Which of the following best describes your annual income?

- \$0-\$9,999
- \$10,000-\$14,999
- \$15,000-\$24,999
- \$25,000-\$35,999
- \$36,000-\$49,999
- \$50,000+

What is the highest level of education that you have completed?

- Less than High School
- High School or GED
- Some College
- AA Degree
- BS, BS degree or higher

When thinking about the water quality in Hilo Bay, would you say it is?

- Clean
- Somewhat Clean
- Somewhat Polluted
- Very Polluted
- Don't know

Which of the following is most responsible for the water quality on Hilo Bay? (check only one)

- Industry
- Farms
- Residents

In your opinion, what water quality problems exist in Hilo Bay? (check all that apply)

- Algae Blooms
- Oil Slicks
- Fuel Spills
- Litter / Trash
- Low fish population
- Runoff or leaching of waste from other areas

Which of the following do you use on your property? (check all that apply)

- Chemical fertilizer
- Organic fertilizer
- Chemical pesticide
- Organic pesticide
- Compost

Appendix: Survey Questionnaire Items (Cont'd)

Which of the following best estimates how often you wash your car(s)?

- More than once a month
- About once a month
- Every few months
- 2-3 times per year
- Once a year or less often

Do you agree or disagree with the following statements:

It is safe to eat fish caught in Hilo Bay.

- Agree Disagree Don't Know

Pet waste poses a problem for Hilo Bay water quality.

- Agree Disagree Don't Know

Runoff from farms poses a problem for Hilo Bay water quality.

- Agree Disagree Don't Know

Cesspools pose a problem for Hilo Bay water quality.

- Agree Disagree Don't Know

Cruise ships pollute Hilo Bay.

- Agree Disagree Don't Know

Do you participate in any of the following activities in or around Hilo Bay? (check all that apply)

- Walking or Beachcombing
- Running/Jogging
- Bicycling
- Swimming
- Fishing
- Surfing or Paddleboarding
- Canoe Paddling or Kayaking
- Sail or Powerboating