WATER QUALITY AND NORTH CAROLINA FISHERIES

SURVEY RESULTS OF THE NORTH CAROLINA PUBLIC: BEFORE AND AFTER THE OUTREACH CAMPAIGN

COASTAL CAROLINA RIVERWATCH, WATER QUALITY FOR FISHERIES PROGRAM

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ECU CENTER FOR SURVEY RESEARCH

Water Quality and North Carolina Fisheries

Survey Results of the North Carolina Public: Before and After the Outreach Campaign

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This report assesses the impact of an outreach campaign designed to educate the North Carolina coastal population on water quality issues through of series of documentary films. In the pages that follow, this report provides a summary of findings that compare the results from two surveys: (1) a baseline, pre-outreach campaign survey of the North Carolina general population, with an oversample of those living in coastal counties, and (2) a second identical survey taken after the outreach campaign (For more information on the survey methodology, see the report's Appendix).

Key Findings

- There were significant effects for the outreach campaign among coastal residents who used social media for their information on water quality issues. Social media outreach was a major component of the outreach campaign, and those who reported using social media as a source of information on water quality issues were more likely to report increases in their knowledge of water quality issues, and were more likely to report increases in their perceptions of threats to water quality. Specifically, the results show:
    - A significant increase in self-reported knowledge of water quality issues after the outreach campaign among coastal residents who used social media for information on water quality issues.
    - A significant increase in perceptions of threats to water quality after the outreach campaign among coastal residents who used social media for information on water quality issues.
- As expected, non-coastal residents showed no significant changes in self-reported knowledge of water quality issues nor any changes in perceptions of threats to water quality from the pre-survey period to the post-survey period.

Detailed Findings

I. KNOWLEDGE OF WATER QUALITY ISSUES

► Among coastal residents, self-reported knowledge of various water quality issues was highest among those who used social media for information on water quality issues in the post-campaign period as compared to others (see Table 1 on the next page).

Table 1. How knowledgeable would you rate yourself on each of the following issues?

**** Percentages below reflect those who answered "Very knowledgeable"***

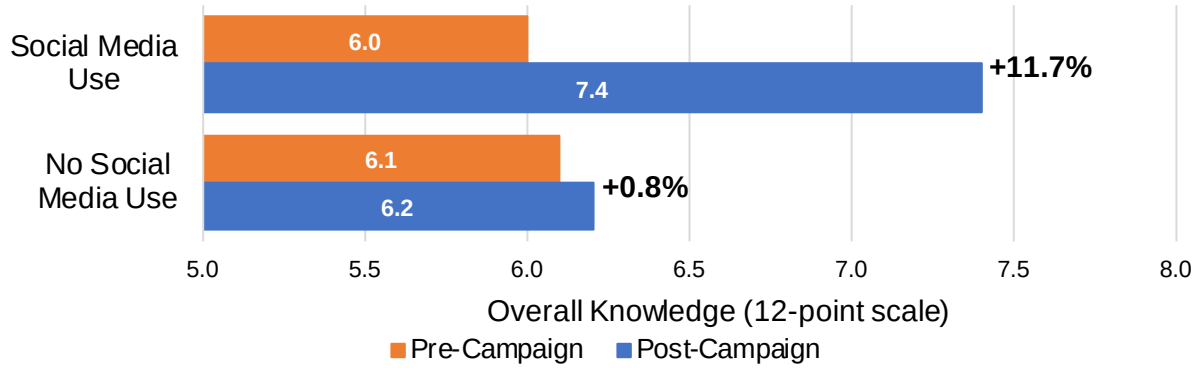
Coastal Residents	Pre-campaign, no social media use	Post-campaign, no social media use	Pre-campaign, social media use	**Post-campaign, social media use**
The effects of plastic pollution on the supply of fish and shellfish.	26%	24%	33%	**43%**
The effects of industrial pollutants on water quality.	22%	17%	29%	**41%**
The effects of wastewater treatment on water quality.	25%	18%	30%	**35%**
The effects of septic systems on water quality.	20%	20%	27%	**32%**
The effects of stormwater runoff from roads and highways on water quality.	20%	15%	19%	**32%**
The effects of agricultural runoff from fertilizers, pesticides, or animal waste on water quality.	18%	13%	21%	**27%**

► For additional and more in-depth statistical analysis, this report presents the results with control measures included to rule out other competing explanations that might also affect knowledge of water quality issues. This analysis, known formally as linear regression, estimates the effects of multiple variables simultaneously. Researchers throughout the social sciences make regular use of this statistical technique.

> The results from the analysis re-affirm the finding that *overall knowledge of water quality issues increased among coastal residents who used social media for their information of water quality issues in the post-campaign period*. (For the full results, see Table A-1 of the Appendix.)

> Specifically, among coastal residents, the results from the analysis estimate that overall knowledge of water quality issues *increased by almost 12%* (or 1.4 units on a 12-point scale) among those in the post-campaign period who used social media for their information of water quality issues as compared to those in the pre-campaign period who used social media, even when controlling for other factors (see Figure 1).

Figure 1. Campaign Influence on Overall Knowledge of Water Quality Issues Among Coastal Residents



> Our analysis also included a separate analysis among non-coastal residents. As expected, non-coastal residents, who did not live in an area where they were exposed to the campaign, showed no increase in knowledge of water quality issues from the pre-campaign period to the post-campaign period. (See Table A-2 of the Appendix.)

> The regression results further reveal that several of the control variables had a significant impact on overall knowledge of water quality issues. For both coastal and non-coastal residents, overall knowledge increased for those who reported using more sources (when selecting among local newspapers, local television, talk radio, friends and family, and other sources) for their information on water quality issues. In addition, for both coastal and non-coastal residents, overall knowledge of water quality issues was higher for those who were more active in participating in water activities. Finally, there were consistent results in both the coastal resident model and the non-coastal model on two of the demographic controls: gender and age. Men reported having higher knowledge scores on water quality issues than women (which is consistent with previous findings in the social science literature that report on the gender gap for self-reported knowledge of political and social issues; for a review, see Jerit and Barabas 2017). Those who were younger also reported having higher knowledge scores on water quality issues than those who were older. (For additional research on the generational divide on environmental issues, see Karol 2018).

II. THREATS TO WATER QUALITY

► Among coastal residents, there was a significant increase in perceptions of threats to water quality after the outreach campaign among those who used social media for information on water quality issues.

> As shown in Table 2, coastal residents who reported using social media for their information on water quality issues in the post-campaign period were more likely than others to respond that "very serious" threats were posed to water quality from all five of the "threat" items asked in the survey: (1) industrial pollutants, (2) agricultural runoff, (3) municipal wastewater, (4) stormwater runoff, and (5) septic systems.

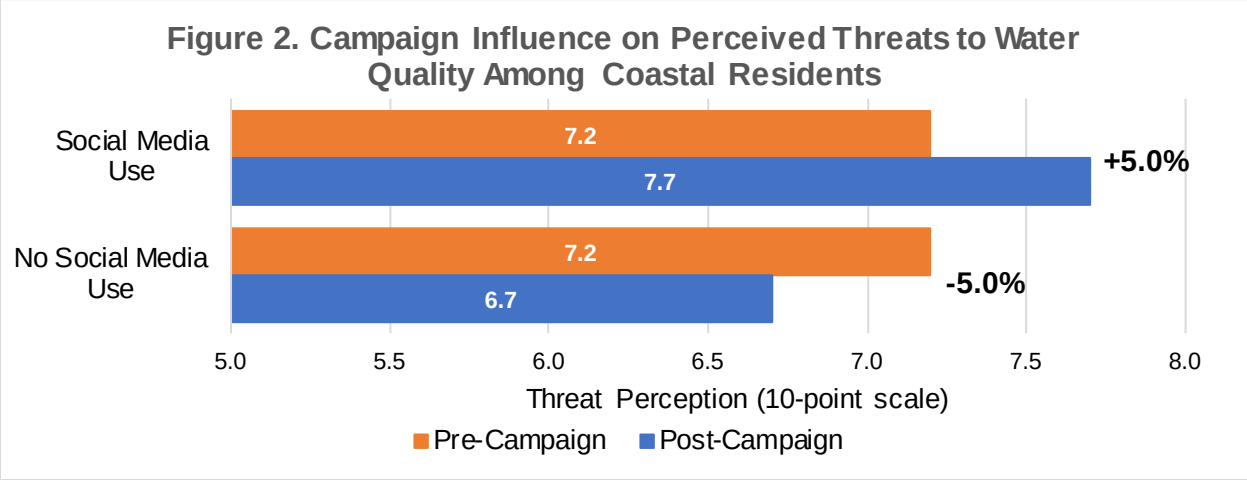
Table 2. Below is a list of possible threats to water quality. For each one, please answer how serious a problem the threat listed is to the cleanliness of the water from North Carolina's waterways and coasts.

**** Percentages below reflect those who answered "Very serious"***

Coastal Residents	Pre-campaign, no social media use	Post-campaign, no social media use	Pre-campaign, social media use	**Post-campaign, social media use**
Contamination from industrial pollutants.	56%	55%	68%	**75%**
Contamination from agricultural runoff from fertilizers, pesticides, or animal waste.	49%	49%	50%	**65%**
Contamination from municipal wastewater treatment plants.	41%	38%	50%	**61%**
Contamination from stormwater runoff from roads and highways.	42%	40%	41%	**50%**
Contamination from septic systems.	37%	26%	47%	**51%**

► As in the previous section, we extend the analysis to linear regression to control for other variables and to rule out competing explanations. The results reveal that *perceptions of threats to water quality increased among coastal residents who used social media for their information of water quality issues in the post-campaign period*. (For the full results, see Table A-3 of the Appendix.)

> Specifically, among coastal residents, the results show that perceptions of water quality threats overall *increased by 5%* (or 0.5 units on a 10-point scale) among those in the post-campaign period who used social media for their information of water quality issues as compared to those who used social media in the pre-campaign period, even after controlling for multiple factors (see Figure 2).



> Among non-coastal residents the results reveal no significant effects when interacting social media use for water quality information and the post-campaign period. (See Table A-4 of the Appendix.)

> The control variables in the regression model for coastal residents show that threat perceptions increased for those who reported using more sources for their information on water quality issues, whereas threat perceptions decreased for those who eat seafood more often and for men. In the regression model for non-coastal residents, threat perceptions decreased for those who are active in water activities; those who eat seafood more often; those who are college educated; and those who are younger.

III. ADDITIONAL ANALYSES

► Among coastal residents, those in the post-campaign period who used social media for their information on water quality issues were the most likely to answer "strongly agree" when asked about whether seafood and shellfish caught in North Carolina is safe to eat (see Table 3).

Table 3. Regardless of whether or not you eat seafood or shellfish caught in North Carolina, please indicate how strongly you agree or disagree with the following statement:

Seafood and shellfish caught in North Carolina is safe to eat.

Coastal Residents	Pre-campaign, no social media use	Post-campaign, no social media use	Pre-campaign, social media use	Post-campaign, social media use
Strongly agree	42%	36%	36%	**47%**
Somewhat agree	29%	39%	40%	30%
Neither agree nor disagree	14%	12%	15%	12%
Somewhat disagree	3%	1%	4%	6%
Strongly disagree	2%	3%	3%	2%
Not sure/don't know	9%	9%	2%	3%

- Among coastal residents, those in the post-campaign period who used social media for their information on water quality issues were the most likely to answer "strongly agree" when asked about whether plastic pollution absorbed or ingested by fish poses a serious risk to North Carolina's seafood industry (see Table 4 on the next page).

Table 4. Again, please indicate how strongly you agree or disagree with the following statement:

Plastic pollution absorbed or ingested by fish poses a serious risk to North Carolina's seafood industry.

Coastal Residents	Pre-campaign, no social media use	Post-campaign, no social media use	Pre-campaign, social media use	Post-campaign, social media use
Strongly agree	48%	48%	56%	**64%**
Somewhat agree	29%	26%	26%	24%
Neither agree nor disagree	9%	13%	10%	8%
Somewhat disagree	2%	2%	2%	--%
Strongly disagree	2%	5%	3%	1%
Not sure/don't know	10%	5%	3%	3%

Note: A "--" indicates less than one percent.

IV. CONCLUSIONS

The findings presented in this report examined the impact of an outreach campaign designed to educate the North Carolina coastal population on water quality issues through a series of documentary films. Those who were most likely to be exposed to the outreach campaign (i.e., coastal residents who used social media for their information on water quality issues) were more likely than others to report:

1. Higher levels of self-reported knowledge on specific water quality issues and water quality issues overall.

2. More concern (i.e., to answer "very serious") on a range of specific and overall threats to water quality.

3. Seafood and shellfish caught in North Carolina is safe to eat, but also that plastic pollution absorbed or ingested by fish poses a serious risk to North Carolina's seafood industry.

Indeed, even when controlling for other possible factors through linear regression analysis, the results remain statistically significant, suggesting that the outreach campaign had an effect on attitudes and opinions about water quality issues.

V. APPENDIX

Information About the Surveys

1. Pre-Campaign: Coastal Carolina Riverwatch, with assistance from East Carolina University's (ECU) Center for Survey Research (CSR), conducted a survey of North Carolina adults (i.e., 18 years of age or older). The results from the survey included 1,109 respondents from across the state. The survey included an oversample of coastal county residents (N=559) to allow for statistical comparisons between coastal and non-coastal residents (non-coastal N=550). Respondents completed the survey either online (N=497) through a panel provided by Lucid (see https://luc.id/), or by phone (N=612) through an Interactive Voice Response (IVR) system. The survey began on June 1 and ended on June 12, 2021. The CSR statistically weighted the data by age, education, race, and gender to ensure the results are representative of the North Carolina population.

2. Post-Campaign: Coastal Carolina Riverwatch, with assistance from East Carolina University's (ECU) Center for Survey Research (CSR), conducted a survey of North Carolina adults (i.e., 18 years of age or older). The results from the survey included 1,167 respondents from across the state. The survey included an oversample of coastal county residents (N=662) to allow for statistical comparisons between coastal and non-coastal residents (non-coastal N=505). Respondents completed the survey either online (N=504) through a panel provided by Lucid (see https://luc.id/), or by phone (N=663) through an Interactive Voice Response (IVR) system. The survey began on November 18 and ended on December 5, 2021. The CSR statistically weighted the data by age, education, race, and gender to ensure the results are representative of the North Carolina population.

APPENDIX TABLES

Table A-1. Linear Regression Results for Overall Knowledge of Water Quality Issues Among Coastal Residents

	Coefficient	Standard error	Significance
VARIABLES OF INTEREST			
Post-campaign	.160	.236	.498
Social media	-.084	.271	.758
***Post-campaign X social media**	**1.256**	**.417**	**.003**
CONTROL VARIABLES			
*Gets information from other sources	.614	.078	.001
*Participates in water activities	.287	.088	.001
Eats seafood often	.092	.110	.410
*College educated	.758	.218	.001
*Male	.475	.198	.016
*Age	-.454	.060	.001
*Constant	5.612	.359	.001
Adjusted R^2 = .219			

Note: * designates variables that are statistically significant (at the .05 level).

Table A-2. Linear Regression Results for Overall Knowledge of Water Quality Issues Among Non-Coastal Residents

	Coefficient	Standard error	Significance
VARIABLES OF INTEREST			
Post-campaign	.235	.267	.379
Social media	.390	.300	.195
Post-campaign X social media	.079	.501	.875
CONTROL VARIABLES			
*Gets information from other sources	.932	.080	.001
*Participates in water activities	.195	.100	.051
*Eats seafood often	.305	.121	.012
College educated	.186	.232	.424
*Male	.863	.221	.001
*Age	-.351	.072	.001
*Constant	10.130	.394	.001
Adjusted R^2 = .261			

Note: * designates variables that are statistically significant (at the .05 level).

Table A-3. Linear Regression Results for Perceived Threats to Water Quality Among Coastal Residents

	Coefficient	Standard error	Significance
VARIABLES OF INTEREST			
Post-campaign	-.456	.246	.064
Social media	.017	.274	.949
***Post-campaign X social media**	**.907**	**.413**	**.028**
CONTROL VARIABLES			
Gets information from other sources	.088	.078	.264
*Participates in water activities	-.242	.091	.008
*Eats seafood often	-.299	.110	.007
*College educated	-.573	.221	.010
Male	.206	.208	.322
*Age	-.194	.060	.001
*Constant	8.554	.357	.001
Adjusted R^2 = .063			

Note: * designates variables that are statistically significant (at the .05 level).

Table A-4. Linear Regression Results for Perceived Threats to Water Quality Among Non-Coastal Residents

	Coefficient	Standard error	Significance
VARIABLES OF INTEREST			
*Post-campaign	-.582	.286	.043
*Social media	.953	.304	.002
Post-campaign X social media	-.911	.506	.072
CONTROL VARIABLES			
*Gets information from other sources	.278	.082	.001
Participates in water activities	.009	.100	.927
*Eats seafood often	-.470	.124	.001
College educated	-.276	.241	.252
*Male	-.674	.232	.004
Age	.022	.075	.768
*Constant	7.228	.403	.001
Adjusted R^2 = .108			

Note: * designates variables that are statistically significant (at the .05 level).

Coding of the Variables in the Linear Regression Analyses

Dependent Variables

Knowledge index: Based on an additive index derived from the six survey items shown in Table 1. For each item, 0 equals "not knowledgeable at all," 1 equals "somewhat knowledgeable," and 2 equals "very knowledgeable." Taken together for the six items, the knowledge index ranged from a low score of 0 to a high score of 12. The Cronbach's Alpha (i.e., a commonly used measure of reliability) is .906. A score of .6 or more is considered a reliable measure.

Threat index: Based on an additive index derived from the five survey items shown in Table 2. For each item, 0 equals "not at all serious," 1 equals "somewhat serious," and 2 equals "very serious." Taken together for the five items, the threat index ranged from a low score of 0 to a high score of 10. The Cronbach's Alpha (i.e., a commonly used measure of reliability) is .828. A score of .6 or more is considered a reliable measure.

Independent Variables

Post-campaign: Coded 0 if in the pre-campaign period. Coded 1 if in the post-campaign period.

Social media: Coded 0 if the respondent does not use social media for information on water quality issues. Coded 1 if the respondent uses social media for information on water quality issues.

Post-campaign X social media: An interaction term that multiplies the variables "post-campaign" and "social media." Those coded 1 are respondents from the post-campaign period who also use social media for their information on water quality issues. Coded 0 for all others.

Gets information from other sources: Coded from 0 to 5 with 0 indicating the respondent reported using zero sources from the following – local newspapers, local television, talk radio, friends and family, and "other" unmentioned sources – for information on water quality issues. A "1" indicates using one of the five sources listed, a "2" indicates using two sources, and so forth.

Participates in water activities: Coded from 0 to 3 with 0 indicating the respondent reported participating in zero of the following three activities: swimming in the ocean or other coastal waters in North Carolina, fishing in the ocean or coastal waters in North Carolina, or boating on the North Carolina waters. A "1" indicates participation in one of those three activities, a "2" indicates participation in two of the three activities, and a "3" indicates participation in all three activities.

Eats seafood often: Coded 0 to 4 with 0 indicating that the respondent does not eat seafood or shellfish. A "1" indicates that the respondent eats seafood or shellfish less than once a week, a "2" indicates that the respondent eats seafood or shellfish once a week, a "3" indicates that the respondent eats seafood or shellfish two to three times per week, and a "4" indicates that the respondent eats seafood or shellfish more than three times per week.

College educated: Coded 0 if the respondent has not earned a 4-year college or university degree. Coded 1 if the respondent has earned a 4-year college or university degree.

Male: Coded 0 if the respondent is female. Coded 1 if the respondent is male.

Age: Coded 1 to 6 with 1 for those ages 18 to 24 years old, 2 for those ages 25 to 34 years old, 3 for those ages 35 to 44 years old, 4 for those ages 45 to 54 years old, 5 for those ages 55 to 64 years old, and 6 for those 65 years or older.

Topline Results and Open-Ended Comments for the Post-Campaign Survey

I. Topline Results for Coastal Residents

How would you rate the overall cleanliness of the water from North Carolina's waterways and coasts?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very good	134	20.3	20.3	20.3
	Good	214	32.3	32.3	52.5
	Fair	151	22.8	22.8	75.3
	Poor	67	10.1	10.1	85.5
	Very poor	58	8.8	8.8	94.3
	Not sure or don't know	38	5.7	5.7	100.0
	Total	662	100.0	100.0	

Compared to five years ago, have you noticed any changes to the overall cleanliness of the water from North Carolina's waterways and coasts?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	235	35.6	35.6	35.6
	No	270	40.8	40.8	76.4
	Not sure or don't know	156	23.6	23.6	100.0
	Total	662	100.0	100.0	

Compared to five years ago, would you say that the overall cleanliness of the water from North Carolina's waterways and coasts has gotten better or worse?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Better	107	16.2	45.5	45.5
	Worse	128	19.4	54.5	100.0
	Total	235	35.6	100.0	
Missing	System	427	64.4		
Total		662	100.0		

Compared to ten years ago, have you noticed any changes to the overall cleanliness of the water from North Carolina's waterways and coasts?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	237	35.8	35.8	35.8
	No	203	30.7	30.7	66.5
	Not sure or don't know	222	33.5	33.5	100.0
	Total	662	100.0	100.0	

Compared to ten years ago, would you say that the overall cleanliness of the water from North Carolina's waterways and coasts has gotten better or worse?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Better	111	16.8	47.0	47.0
	Worse	125	18.9	53.0	100.0
	Total	237	35.8	100.0	
Missing	System	425	64.2		
Total		662	100.0		

Below is a list of possible threats to water quality. For each one, please answer how serious a problem the threat listed is to the cleanliness of the water from North Carolina's waterways and coasts. - Contamination from agricultural runoff from fertilizers, pesticides, or animal waste

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very serious	359	54.3	54.3	54.3
	Somewhat serious	164	24.8	24.8	79.1
	Not at all serious	74	11.2	11.2	90.4
	Not sure / don't know	64	9.6	9.6	100.0
	Total	662	100.0	100.0	

Below is a list of possible threats to water quality. For each one, please answer how serious a problem the threat listed is to the cleanliness of the water from North Carolina's waterways and coasts. - Contamination from stormwater runoff from roads and highways

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very serious	282	42.5	42.6	42.6
	Somewhat serious	238	35.9	36.0	78.7
	Not at all serious	85	12.8	12.8	91.5
	Not sure / don't know	56	8.5	8.5	100.0
	Total	660	99.7	100.0	
Missing	System	2	.3		
Total		662	100.0		

Below is a list of possible threats to water quality. For each one, please answer how serious a problem the threat listed is to the cleanliness of the water from North Carolina's waterways and coasts. - Contamination from industrial pollutants

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very serious	405	61.2	61.3	61.3
	Somewhat serious	146	22.1	22.1	83.5
	Not at all serious	46	7.0	7.0	90.5
	Not sure / don't know	63	9.5	9.5	100.0
	Total	660	99.7	100.0	
Missing	System	2	.3		
Total		662	100.0		

Below is a list of possible threats to water quality. For each one, please answer how serious a problem the threat listed is to the cleanliness of the water from North Carolina's waterways and coasts. - Contamination from municipal wastewater treatment plants

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very serious	312	47.1	47.2	47.2
	Somewhat serious	190	28.6	28.7	75.9
	Not at all serious	67	10.2	10.2	86.1
	Not sure / don't know	92	13.9	13.9	100.0
	Total	660	99.7	100.0	
Missing	System	2	.3		
Total		662	100.0		

Below is a list of possible threats to water quality. For each one, please answer how serious a problem the threat listed is to the cleanliness of the water from North Carolina's waterways and coasts. - Contamination from septic systems

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very serious	255	38.5	38.5	38.5
	Somewhat serious	171	25.9	25.9	64.4
	Not at all serious	141	21.3	21.3	85.7
	Not sure / don't know	94	14.3	14.3	100.0
	Total	662	100.0	100.0	
Missing	System	0	.0		
Total		662	100.0		

Do you ever eat seafood or shellfish caught in North Carolina?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	486	73.4	73.4	73.4
	No	176	26.6	26.6	100.0
	Total	662	100.0	100.0	

How often do you eat seafood or shellfish caught in North Carolina?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than once a week	288	43.4	59.2	59.2
	Once a week	132	20.0	27.2	86.4
	Two to three times a week	53	8.1	11.0	97.4
	More than three times a week	13	1.9	2.6	100.0
	Total	486	73.4	100.0	
Missing	System	176	26.6		
Total		662	100.0		

Regardless of whether or not you eat seafood or shellfish caught in North Carolina, please indicate how strongly you agree or disagree with the following statement:

Seafood and shellfish caught in North Carolina is safe to eat.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	256	38.7	38.7	38.7
	Somewhat agree	235	35.5	35.5	74.2
	Neither agree nor disagree	86	13.0	13.0	87.2
	Somewhat disagree	21	3.1	3.1	90.3
	Strongly disagree	15	2.2	2.2	92.6
	Not sure or don't know	49	7.4	7.4	100.0
	Total	662	100.0	100.0	

Again, please indicate how strongly you agree or disagree with the following statement:

Plastic pollution absorbed or ingested by fish poses a serious risk to North Carolina's seafood industry.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	347	52.5	52.5	52.5
	Somewhat agree	172	26.0	26.0	78.4
	Neither agree nor disagree	76	11.5	11.5	90.0
	Somewhat disagree	10	1.5	1.5	91.4
	Strongly disagree	23	3.5	3.5	94.9
	Not sure or don't know	34	5.1	5.1	100.0
	Total	662	100.0	100.0	

Do you ever swim in the ocean or other coastal waters in North Carolina during the summertime?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	353	53.3	53.3	53.3
	No	309	46.7	46.7	100.0
	Total	662	100.0	100.0	

Do you ever fish in the ocean or other coastal waters in North Carolina?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	337	50.9	50.9	50.9
	No	325	49.1	49.1	100.0
	Total	662	100.0	100.0	
Missing	System	0	.0		
Total		662	100.0		

Do you ever go boating on the North Carolina waters?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	349	52.7	52.7	52.7
	No	313	47.3	47.3	100.0
	Total	662	100.0	100.0	

How knowledgeable would you rate yourself on each of the following issues? - The effects of agricultural runoff from fertilizers, pesticides, or animal waste on water quality.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very knowledgeable	124	18.7	18.7	18.7
	Somewhat knowledgeable	392	59.2	59.2	77.9
	Not at all knowledgeable	146	22.1	22.1	100.0
	Total	662	100.0	100.0	

How knowledgeable would you rate yourself on each of the following issues? - The effects of stormwater runoff from roads and highways on water quality.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very knowledgeable	143	21.7	21.7	21.7
	Somewhat knowledgeable	346	52.2	52.3	73.9
	Not at all knowledgeable	172	26.0	26.1	100.0
	Total	661	99.9	100.0	
Missing	System	1	.1		
Total		662	100.0		

How knowledgeable would you rate yourself on each of the following issues? - The effects of industrial pollutants on water quality.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very knowledgeable	166	25.0	25.0	25.0
	Somewhat knowledgeable	341	51.5	51.6	76.6
	Not at all knowledgeable	155	23.4	23.4	100.0
	Total	661	99.9	100.0	
Missing	System	1	.1		
Total		662	100.0		

How knowledgeable would you rate yourself on each of the following issues? - The effects of wastewater treatment on water quality.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very knowledgeable	160	24.1	24.1	24.1
	Somewhat knowledgeable	335	50.6	50.6	74.7
	Not at all knowledgeable	168	25.3	25.3	100.0
	Total	662	100.0	100.0	

How knowledgeable would you rate yourself on each of the following issues? - The effects of septic systems on water quality.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very knowledgeable	150	22.7	22.7	22.7
	Somewhat knowledgeable	336	50.7	50.8	73.5
	Not at all knowledgeable	175	26.4	26.5	100.0
	Total	661	99.8	100.0	
Missing	System	1	.2		
Total		662	100.0		

How knowledgeable would you rate yourself on each of the following issues? - The effects of plastic pollution on the supply of fish and shellfish.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very knowledgeable	202	30.5	30.6	30.6
	Somewhat knowledgeable	317	47.9	48.1	78.7
	Not at all knowledgeable	140	21.2	21.3	100.0
	Total	659	99.6	100.0	
Missing	System	3	.4		
Total		662	100.0		

Do you use the local newspaper to keep informed about coastal water quality issues?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	240	36.2	46.3	46.3
	No	278	42.0	53.7	100.0
	Total	518	78.2	100.0	
Missing	System	144	21.8		
Total		662	100.0		

Do you use the local television news to keep informed about coastal water quality issues?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	418	63.1	74.2	74.2
	No	145	21.9	25.8	100.0
	Total	563	85.0	100.0	
Missing	System	99	15.0		
Total		662	100.0		

Do you use talk radio programs to keep informed about coastal water quality issues?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	183	27.6	38.6	38.6
	No	291	43.9	61.4	100.0
	Total	474	71.5	100.0	
Missing	System	188	28.5		
Total		662	100.0		

Do you use social media sources such as Facebook or Twitter to keep informed about coastal water quality issues?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	225	34.0	41.7	41.7
	No	315	47.5	58.3	100.0
	Total	540	81.5	100.0	
Missing	System	122	18.5		
Total		662	100.0		

Do you speak with friends or family to keep informed about coastal water quality issues?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	357	54.0	66.8	66.8
	No	178	26.8	33.2	100.0
	Total	535	80.8	100.0	
Missing	System	127	19.2		
Total		662	100.0		

Do you use any additional sources not mentioned in the previous questions to keep informed about coastal water quality issues?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	173	26.1	38.8	38.8
	No	272	41.1	61.2	100.0
	Total	445	67.1	100.0	
Missing	System	217	32.9		
Total		662	100.0		

What sources do you use to keep informed about coastal water quality issues? (Please select all boxes that apply.) - Other sources. Please specify: - Text

Valid	
	Academic articles. Scientific and legal
	Books
	Coastal Carolina, Ocean Conservancy, Carolina Tides
	Google
	I google climate related events weekly, occasionally North Carolina specific
	I have friends that work at NC dept or marine fisheries.
	I live in Kitty Hawk, so I see it.
	Local educational resources and the library
	local rotary charters
	My own experience
	My own experiences for living in this area for over 30 years.
	NC Coastal Federation
	npr
	Online news
	Others
	Research articles.
	Soundrivers.org
	Spouse in industry
	Water board reports
	Total

For statistical purposes only, which category best describes you?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Hispanic or Latino of any race	43	6.5	6.7	6.7
	White or Caucasian	457	69.1	71.7	78.4
	Black or African American	109	16.5	17.1	95.5
	Asian or Asian American	8	1.2	1.2	96.8
	Some other race or ethnicity, or multiple races	21	3.1	3.2	100.0
	Total	638	96.4	100.0	
Missing	Prefer not to answer	24	3.6		
Total		662	100.0		

What is your age range?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18 to 24 years old	92	13.9	14.4	14.4
	25 to 34 years old	103	15.5	16.0	30.4
	35 to 44 years old	91	13.7	14.2	44.6
	45 to 54 years old	93	14.1	14.6	59.2
	55 to 64 years old	109	16.5	17.1	76.3
	65 years or older	152	22.9	23.7	100.0
	Total	639	96.6	100.0	
Missing	Prefer not to answer	23	3.4		
Total		662	100.0		

What is the highest level of school you have completed or the highest degree you have received?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	High school graduate, GED certificate, or did not finish high school	250	37.7	39.1	39.1
	Some college or a 2-year associate degree	229	34.6	35.9	75.0
	4-year college or university degree	106	16.0	16.6	91.6
	Postgraduate degree	54	8.1	8.4	100.0
	Total	638	96.4	100.0	
Missing	Prefer not to answer	24	3.6		
Total		662	100.0		

Are you male or female, or do you prefer another description?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	320	48.4	49.4	49.4
	Female	324	49.0	50.1	99.5
	Prefer another description	3	.5	.5	100.0
	Total	648	97.9	100.0	
Missing	Prefer not to answer	14	2.1		
Total		662	100.0		

II. Topline Results for Non-Coastal Residents

How would you rate the overall cleanliness of the water from North Carolina's waterways and coasts?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very good	117	23.2	23.2	23.2
	Good	155	30.7	30.7	54.0
	Fair	105	20.9	20.9	74.8
	Poor	36	7.1	7.1	81.9
	Very poor	26	5.1	5.1	87.0
	Not sure or don't know	66	13.0	13.0	100.0
	Total	505	100.0	100.0	

Compared to five years ago, have you noticed any changes to the overall cleanliness of the water from North Carolina's waterways and coasts?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	121	23.9	23.9	23.9
	No	214	42.3	42.3	66.2
	Not sure or don't know	171	33.8	33.8	100.0
	Total	505	100.0	100.0	

Compared to five years ago, would you say that the overall cleanliness of the water from North Carolina's waterways and coasts has gotten better or worse?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Better	53	10.4	43.8	43.8
	Worse	68	13.4	56.2	100.0
	Total	121	23.9	100.0	
Missing	System	384	76.1		
Total		505	100.0		

Compared to ten years ago, have you noticed any changes to the overall cleanliness of the water from North Carolina's waterways and coasts?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	150	29.8	29.8	29.8
	No	148	29.4	29.4	59.2
	Not sure or don't know	206	40.8	40.8	100.0
	Total	505	100.0	100.0	

Compared to ten years ago, would you say that the overall cleanliness of the water from North Carolina's waterways and coasts has gotten better or worse?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Better	75	14.8	49.7	49.7
	Worse	76	15.0	50.3	100.0
	Total	150	29.8	100.0	
Missing	System	355	70.2		
Total		505	100.0		

Below is a list of possible threats to water quality. For each one, please answer how serious a problem the threat listed is to the cleanliness of the water from North Carolina's waterways and coasts. - Contamination from agricultural runoff from fertilizers, pesticides, or animal waste

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very serious	225	44.5	44.5	44.5
	Somewhat serious	157	31.0	31.0	75.5
	Not at all serious	63	12.4	12.4	88.0
	Not sure / don't know	61	12.0	12.0	100.0
	Total	505	100.0	100.0	

Below is a list of possible threats to water quality. For each one, please answer how serious a problem the threat listed is to the cleanliness of the water from North Carolina's waterways and coasts. - Contamination from stormwater runoff from roads and highways

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very serious	178	35.2	35.2	35.2
	Somewhat serious	206	40.9	40.9	76.1
	Not at all serious	55	10.9	10.9	87.0
	Not sure / don't know	66	13.0	13.0	100.0
	Total	505	100.0	100.0	

Below is a list of possible threats to water quality. For each one, please answer how serious a problem the threat listed is to the cleanliness of the water from North Carolina's waterways and coasts. - Contamination from industrial pollutants

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very serious	256	50.8	50.8	50.8
	Somewhat serious	128	25.3	25.3	76.1
	Not at all serious	57	11.2	11.2	87.3
	Not sure / don't know	64	12.7	12.7	100.0
	Total	505	100.0	100.0	

Below is a list of possible threats to water quality. For each one, please answer how serious a problem the threat listed is to the cleanliness of the water from North Carolina's waterways and coasts. - Contamination from municipal wastewater treatment plants

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very serious	215	42.6	42.6	42.6
	Somewhat serious	154	30.6	30.6	73.1
	Not at all serious	61	12.2	12.2	85.3
	Not sure / don't know	74	14.7	14.7	100.0
	Total	505	100.0	100.0	

Below is a list of possible threats to water quality. For each one, please answer how serious a problem the threat listed is to the cleanliness of the water from North Carolina's waterways and coasts. - Contamination from septic systems

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very serious	196	38.7	38.7	38.7
	Somewhat serious	150	29.8	29.8	68.5
	Not at all serious	81	16.1	16.1	84.6
	Not sure / don't know	78	15.4	15.4	100.0
	Total	505	100.0	100.0	

Do you ever eat seafood or shellfish caught in North Carolina?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	309	61.2	61.2	61.2
	No	196	38.8	38.8	100.0
	Total	505	100.0	100.0	

How often do you eat seafood or shellfish caught in North Carolina?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than once a week	227	44.9	73.3	73.3
	Once a week	51	10.1	16.5	89.8
	Two to three times a week	21	4.2	6.8	96.6
	More than three times a week	10	2.1	3.4	100.0
	Total	309	61.2	100.0	
Missing	System	196	38.8		
Total		505	100.0		

Regardless of whether or not you eat seafood or shellfish caught in North Carolina, please indicate how strongly you agree or disagree with the following statement:

Seafood and shellfish caught in North Carolina is safe to eat.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	143	28.3	28.3	28.3
	Somewhat agree	188	37.2	37.2	65.5
	Neither agree nor disagree	83	16.4	16.4	81.8
	Somewhat disagree	18	3.6	3.6	85.5
	Strongly disagree	10	1.9	1.9	87.4
	Not sure or don't know	64	12.6	12.6	100.0
	Total	505	100.0	100.0	

Again, please indicate how strongly you agree or disagree with the following statement:

Plastic pollution absorbed or ingested by fish poses a serious risk to North Carolina's seafood industry.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	211	41.8	41.8	41.8
	Somewhat agree	161	31.8	31.8	73.6
	Neither agree nor disagree	48	9.5	9.5	83.1
	Somewhat disagree	16	3.2	3.2	86.3
	Strongly disagree	17	3.3	3.3	89.6
	Not sure or don't know	52	10.4	10.4	100.0
	Total	505	100.0	100.0	

Do you ever swim in the ocean or other coastal waters in North Carolina during the summertime?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	199	39.4	39.4	39.4
	No	306	60.6	60.6	100.0
	Total	505	100.0	100.0	

Do you ever fish in the ocean or other coastal waters in North Carolina?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	163	32.2	32.2	32.2
	No	342	67.8	67.8	100.0
	Total	505	100.0	100.0	

Do you ever go boating on the North Carolina waters?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	168	33.2	33.2	33.2
	No	337	66.8	66.8	100.0
	Total	505	100.0	100.0	

How knowledgeable would you rate yourself on each of the following issues? - The effects of agricultural runoff from fertilizers, pesticides, or animal waste on water quality.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very knowledgeable	97	19.2	19.2	19.2
	Somewhat knowledgeable	261	51.6	51.6	70.8
	Not at all knowledgeable	148	29.2	29.2	100.0
	Total	505	100.0	100.0	

How knowledgeable would you rate yourself on each of the following issues? - The effects of stormwater runoff from roads and highways on water quality.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very knowledgeable	96	19.1	19.1	19.1
	Somewhat knowledgeable	246	48.6	48.7	67.8
	Not at all knowledgeable	163	32.2	32.2	100.0
	Total	505	99.9	100.0	
Missing	System	0	.1		
Total		505	100.0		

How knowledgeable would you rate yourself on each of the following issues? - The effects of industrial pollutants on water quality.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very knowledgeable	117	23.1	23.2	23.2
	Somewhat knowledgeable	239	47.4	47.5	70.7
	Not at all knowledgeable	148	29.3	29.3	100.0
	Total	504	99.8	100.0	
Missing	System	1	.2		
Total		505	100.0		

How knowledgeable would you rate yourself on each of the following issues? - The effects of wastewater treatment on water quality.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very knowledgeable	105	20.7	20.7	20.7
	Somewhat knowledgeable	245	48.5	48.5	69.2
	Not at all knowledgeable	156	30.8	30.8	100.0
	Total	505	100.0	100.0	

How knowledgeable would you rate yourself on each of the following issues? - The effects of septic systems on water quality.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very knowledgeable	98	19.5	19.5	19.5
	Somewhat knowledgeable	212	42.0	42.0	61.5
	Not at all knowledgeable	195	38.5	38.5	100.0
	Total	505	100.0	100.0	

How knowledgeable would you rate yourself on each of the following issues? - The effects of plastic pollution on the supply of fish and shellfish.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very knowledgeable	105	20.8	20.8	20.8
	Somewhat knowledgeable	247	49.0	49.0	69.8
	Not at all knowledgeable	153	30.2	30.2	100.0
	Total	505	100.0	100.0	

Do you use the local newspaper to keep informed about coastal water quality issues?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	144	28.5	38.2	38.2
	No	233	46.2	61.8	100.0
	Total	377	74.7	100.0	
Missing	System	128	25.3		
Total		505	100.0		

Do you use the local television news to keep informed about coastal water quality issues?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	288	56.9	68.0	68.0
	No	136	26.9	32.0	100.0
	Total	423	83.8	100.0	
Missing	System	82	16.2		
Total		505	100.0		

Do you use talk radio programs to keep informed about coastal water quality issues?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	120	23.7	33.6	33.6
	No	236	46.7	66.4	100.0
	Total	356	70.4	100.0	
Missing	System	149	29.6		
Total		505	100.0		

Do you use social media sources such as Facebook or Twitter to keep informed about coastal water quality issues?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	158	31.2	38.8	38.8
	No	249	49.3	61.2	100.0
	Total	407	80.5	100.0	
Missing	System	98	19.5		
Total		505	100.0		

Do you speak with friends or family to keep informed about coastal water quality issues?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	192	38.0	48.9	48.9
	No	201	39.8	51.1	100.0
	Total	393	77.8	100.0	
Missing	System	112	22.2		
Total		505	100.0		

Do you use any additional sources not mentioned in the previous questions to keep informed about coastal water quality issues?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	103	20.3	30.3	30.3
	No	236	46.8	69.7	100.0
	Total	339	67.1	100.0	
Missing	System	166	32.9		
Total		505	100.0		

What sources do you use to keep informed about coastal water quality issues? (Please select all boxes that apply.) - Other sources. Please specify: - Text

Valid	
	AAA magazine, newsletters and emails, nonprofits
	Articles by conservations and other environmental organizations
	Google research
	I go the the rivers and lakes myself
	Internet
	NC AGRICULTURE SITE, NC FOREST SERVICE, NC DEPT OF ENVIROMENTAL QUALITY, DIVISION OF WATER RESOURCES
	NPR
	Occasionally ads on YouTube
	Online News centers
	Own research
	State Senator Jeff Jackson
	Water suppliers
	web
	WUNC Public Radio
	Youtube
	YouTube
	Total

For statistical purposes only, which category best describes you?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Hispanic or Latino of any race	45	8.9	9.7	9.7
	White or Caucasian	290	57.4	62.4	72.1
	Black or African American	100	19.9	21.6	93.7
	Asian or Asian American	14	2.8	3.0	96.7
	Some other race or ethnicity, or multiple races	15	3.0	3.3	100.0
	Total	465	92.0	100.0	
Missing	Prefer not to answer	40	8.0		
Total		505	100.0		

What is your age range?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18 to 24 years old	59	11.6	12.1	12.1
	25 to 34 years old	83	16.5	17.3	29.4
	35 to 44 years old	80	15.8	16.5	45.9
	45 to 54 years old	85	16.8	17.6	63.5
	55 to 64 years old	80	15.8	16.5	80.0
	65 years or older	96	19.1	20.0	100.0
	Total	483	95.6	100.0	
Missing	Prefer not to answer	22	4.4		
Total		505	100.0		

What is the highest level of school you have completed or the highest degree you have received?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	High school graduate, GED certificate, or did not finish high school	184	36.5	38.6	38.6
	Some college or a 2-year associate degree	154	30.5	32.3	70.9
	4-year college or university degree	91	18.0	19.0	89.9
	Postgraduate degree	48	9.5	10.1	100.0
	Total	477	94.5	100.0	
Missing	Prefer not to answer	28	5.5		
Total		505	100.0		

Are you male or female, or do you prefer another description?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	234	46.4	47.5	47.5
	Female	256	50.6	51.9	99.5
	Prefer another description	3	.5	.5	100.0
	Total	492	97.5	100.0	
Missing	Prefer not to answer	13	2.5		
Total		505	100.0		