

# Water Quality and North Carolina Fisheries

## Survey Results of Commercial and Recreational Fishermen

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### **Supported by:**

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Water quality affects all North Carolinians. The issue, however, is particularly significant to those who catch and harvest fish. This includes both commercial and recreational fishermen.

To understand better the perceptions of commercial and recreational fishermen, Coastal Carolina Riverwatch with assistance from the East Carolina University (ECU) Center for Survey Research (CSR) completed a recent survey. The results from the survey, presented below, include 376 respondents. The survey was conducted online from March 4 through March 21.

### Summary of Key Findings

- ▶ Significant differences exist between recreational and commercial fishermen\* when asked if they are catching or harvesting as many fish or shellfish as they had in the past. (\* Note: The term “recreational fishermen” also includes recreational shellfish harvesters. The term “commercial fishermen” also includes commercial shellfish harvesters.)
  - > **70.4%** of recreational fishermen reported that they are not catching or harvesting as many fish or shellfish as they had in the past compared to **32.4%** of commercial fishermen ( $p \leq .001$ ).
  - > **21.6%** of commercial fishermen answered that they were catching more fish or shellfish than in the past compared to **4.6%** of recreational fishermen ( $p \leq .001$ ).
- ▶ Significant differences also exist between recreational and commercial fishermen when asked if they are catching the same types of fish as they used to catch five years ago.
  - > **41.5%** of recreational fishermen reported that they are not catching the same types of fish as they had in the past compared to **21.6%** of commercial fishermen ( $p \leq .02$ ).
- ▶ Among all fishermen who participated in the survey, **26.3%** reported that the general health of the fish or shellfish that they catch or harvest has deteriorated.
- ▶ There was a significant difference between recreational and commercial fishermen when asked to identify factors that affect water quality the most.
  - > **40.5%** of commercial fishermen identified *septic system issues* compared to **9.5%** of recreational fishermen ( $p \leq .001$ ).
- ▶ Among both commercial and recreational fishermen, the two most identified factors that affect water quality were: (1) agricultural runoff from fertilizer, pesticides, and sediment (identified by **65.8%** of recreational fishermen and **64.9%** of commercial

fishermen) and (2) stormwater runoff from roads, highways, and parking lots (identified by **50.0%** of recreational fishermen and **62.2%** of commercial fishermen).

- > The third most identified factor for recreational fishermen was low oxygen levels contributing to algae blooms and fish kills (**39.8%**).
- > The third most identified factor for commercial fishermen was septic system issues (**40.5%**).

## RESULTS

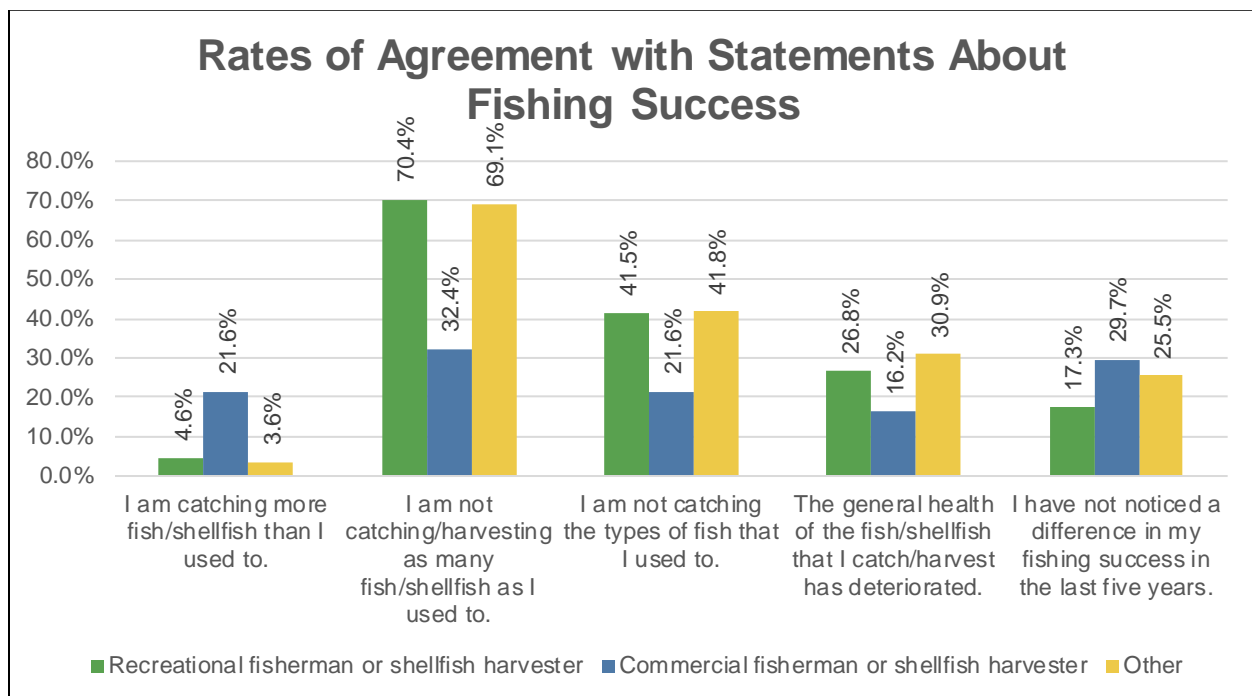
### I. Fishing and Shellfishing Success Compared to the Past

*How would you compare your success in fishing/shellfishing now with five years ago? (Please select all that apply.)*

- ▶ Among all respondents, the most frequently cited response was “I am not catching/harvesting as many fish/shellfish as I used to” (66.5%). See Table 1 below.

I am not catching/harvesting as many fish/shellfish as I used to.	66.5%
I am not catching the types of fish that I used to.	39.6%
The general health of the fish/shellfish that I catch/harvest has deteriorated.	26.3%
I have not noticed a difference in my fishing success in the last five years.	19.7%
I am catching more fish/shellfish than in the past.	6.1%
Number of respondents (N)	376

- > As Table 1 also shows, **26.3%** reported that the general health of the fish or shellfish that they catch or harvest has deteriorated.
- ▶ However, significant differences exist on this question when comparing recreational fishermen to commercial fishermen.



- > As shown in the chart above, **70.4%** of recreational fishermen reported that they are not catching or harvesting as many fish or shellfish as they had in the past compared to **32.4%** of commercial fishermen ( $p \leq .001$ ).
  - > **21.6%** of commercial fishermen answered that they were catching more fish or shellfish than in the past compared to **4.6%** of recreational fishermen ( $p \leq .001$ ).
- ▶ Significant differences also exist between recreational and commercial fishermen when asked if they are catching the same types of fish as they used to catch five years ago.
- > **41.5%** of recreational fishermen reported that they are not catching the same types of fish as they had in the past compared to **21.6%** of commercial fishermen ( $p \leq .02$ ).

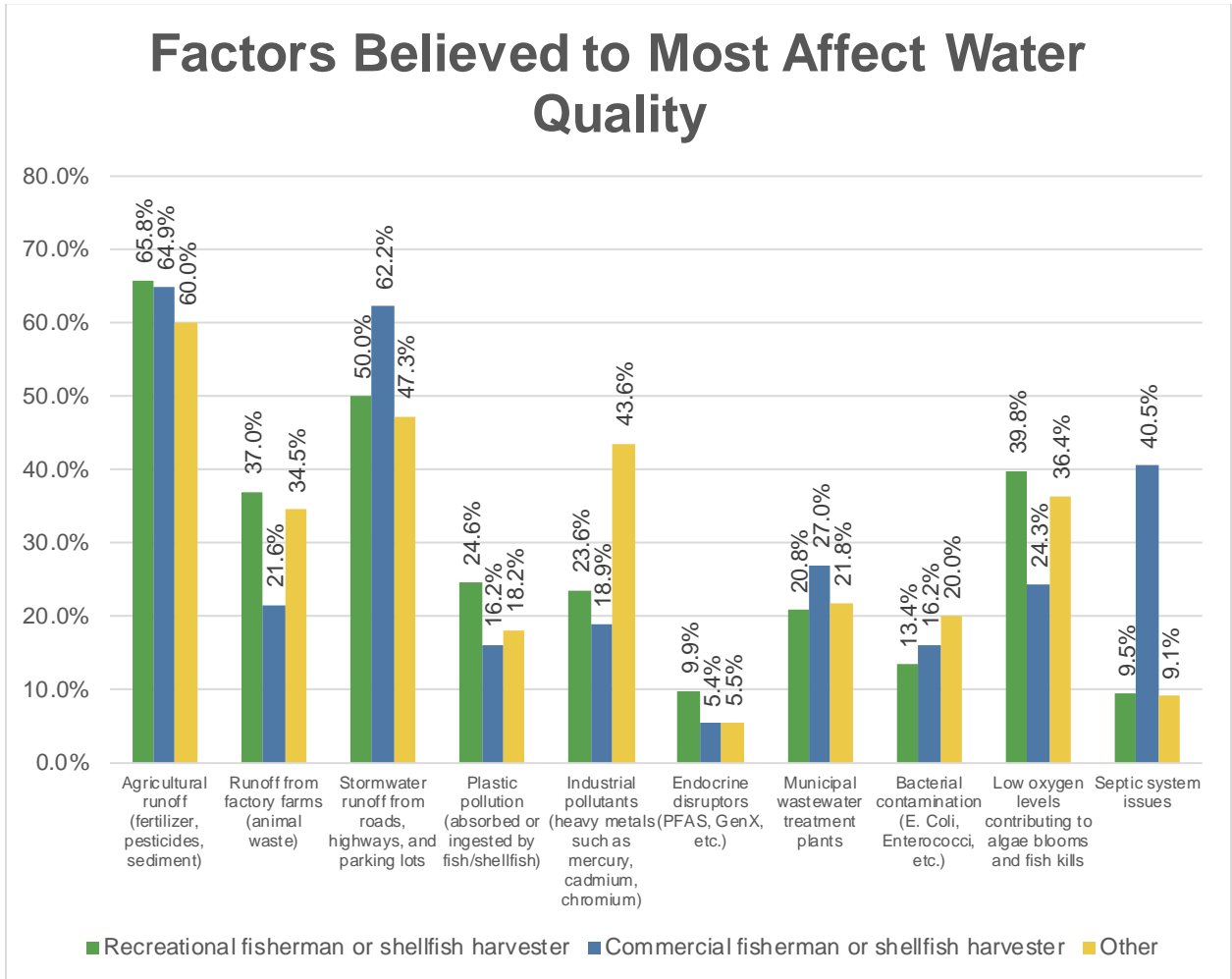
## II. Water Quality Issues

*The following is a list of possible water quality concerns. Please select the THREE that you believe affect water quality the most.*

- ▶ Among all respondents, the most frequently cited response was “agricultural runoff” (64.9%). See Table 2 below.

<b>Table 2.</b>	
Agricultural runoff (fertilizer, pesticides, sediment)	64.9%
Stormwater runoff from roads, highways, and parking lots	50.8%
Low oxygen levels contributing to algae blooms and fish kills	37.8%
Runoff from factory farms (animal waste)	35.1%
Industrial pollutants (heavy metals such as mercury, cadmium, chromium)	26.1%
Plastic pollution (absorbed or ingested by fish/shellfish)	22.9%
Municipal wastewater treatment plants	21.5%
Bacterial contamination (E. Coli, Enterococci, etc.)	14.6%
Septic system issues	12.5%
Endocrine disruptors (PFAS, GenX, etc.)	8.8%
I do not have any water quality concerns.	2.7%

- ▶ There was a significant difference between recreational and commercial fishermen when asked to identify factors that affect water quality the most.



- > As shown in the chart above, **40.5%** of commercial fishermen identified *septic system issues* compared to **9.5%** of recreational fishermen ( $p \leq .001$ ).
- ▶ Among both commercial and recreational fisherman, the two most identified factors that affect water quality were: (1) agricultural runoff from fertilizer, pesticides, and sediment (identified by **65.8%** of recreational fishermen and **64.9%** of commercial fishermen) and (2) stormwater runoff from roads, highways, and parking lots (identified by **50.0%** of recreational fishermen and **62.2%** of commercial fishermen).
  - > The third most identified factor for recreational fishermen was low oxygen levels contributing to algae blooms and fish kills (**39.8%**).

- > The third most identified factor for commercial fishermen was septic system issues (**40.5%**).

### III. Improving Water Quality

*What single action do you think would be most effective in improving water quality?*

- ▶ Below is a word cloud analysis (i.e., a visual representation of word frequency) based on open-ended responses to the question above.



- ▶ As shown above, the words “runoff” and “waste” appear most frequently. Below is a sample of comments that include these words.
  - > Herbicides seem to have the most negative effect on fish and shellfish. With the spraying of such chemicals that **runoff** into ditches, rivers and sounds. They kill the grass fields and vegetation on the bottom of the bodies of water that animal life need to strive. I’ve seen evidence of the complete eradication of grass fields in the albemarle sound that hosted plenty of fish and shellfish life that are now barren, with no grass field and little year round animal life. The fish and shellfish seem to move around more to find cover and food than they did ten years ago. I’ve seen Crop dusters spray fields that are along the rivers and sounds, and have had said spray fall onto myself and crew.

- > I feel actions must be made to prevent fresh water/**runoff** being ran to our rivers. It's killing our water. We call it dead water. Kills everything in its path. On a hard south/ southwest wind I strongly advise some research being done in our rivers. Pick new Bern or little Washington. Either Pamlico or neuse river. When you see hard crabs swimming on the surface you know right there is no oxygen in the water and the crabs/fish are trying to stay alive. Then go to the windward shorline and test. All fish will be pushed to the windward shallow shoreline because of the agitation in the water they have a fighting chance of living.
- > Stiff fines for **wastewater** spills. Every time it rains hard there is a spill into Slocum creek. Fishing was legendary until September when rains and warm water caused algae blos and killed massive amounts of baitfish. Kills we're very focused around Slocum and Northwest creek initially.
- > Controlling commercial and agricultural **runoff**
- > Improve the treatment of **waste** water from commercial animal farms.
- > Completely stop raw human and commercial animal **waste** from from being dumped into the rivers and creeks.
- > Do a study on how to stop factory farm **waste** and the chemicals contain in lagoons from getting into streams and ground water



## Appendix. Topline Results and Open-Ended Comments

### I. Topline Results

*How do you identify yourself with respect to fisheries and fishing activities? Please select all that apply.*

Recreational fisherman	94.1%
Recreational shellfish harvester	19.7%
Subsistence fisherman	14.6%
Commercial fisherman	9.0%
Commercial shellfish harvester	4.8%
For-hire inshore guide	2.9%
Offshore charter captain	2.7%
Other	1.6%

*Where do you primarily conduct your fishing activities?*

Sounds	33.8%
Rivers	21.5%
Ocean/offshore waters	13.8%
Creeks	13.0%
Surf/pier waters	10.6%
Other	7.2%

*Approximately how many years have you been engaged in these activities?*

10 years or less	17.3%
11 to 20 years	18.1%
21 to 30 years	13.3%
31 to 40 years	14.4%
41 to 50 years	14.6%
More than 50 years	22.3%

*How would you compare your success in fishing/shellfishing now with five years ago? Please select all that apply.*

I am not catching/harvesting as many fish/shellfish as I used to.	66.5%
I am not catching the types of fish that I used to.	39.6%
The general health of the fish/shellfish that I catch/harvest has deteriorated.	26.3%
I have not noticed a difference in my fishing success in the last five years.	19.7%
I am catching more fish/shellfish than in the past.	6.1%

The following is a list of possible water quality concerns. Please select the **THREE** that you believe affect water quality the most.

Agricultural runoff (fertilizer, pesticides, sediment)	64.9%
Stormwater runoff from roads, highways, and parking lots	50.8%
Low oxygen levels contributing to algae blooms and fish kills	37.8%
Runoff from factory farms (animal waste)	35.1%
Industrial pollutants (heavy metals such as mercury, cadmium, chromium)	26.1%
Plastic pollution (absorbed or ingested by fish/shellfish)	22.9%
Municipal wastewater treatment plants	21.5%
Bacterial contamination (E. Coli, Enterococci, etc.)	14.6%
Septic system issues	12.5%
Endocrine disruptors (PFAS, GenX, etc.)	8.8%
I do not have any water quality concerns	2.7%

Do you currently belong to any fishing organizations or clubs?

Yes	44.4%
No	55.6%

## II. Open-Ended Comments

What single action do you think would be most effective in improving water quality?

### Comments:

Prohibiting all bottom trawling in all of our sounds and nursery areas.

Controlling commercial and agricultural runoff

A strong shellfish habitat

Clean up municipal wastewater.

Storm water management. Builders and developers are not held accountable for poor or inept construction.

Increase riparian buffers for any human activity to include farms, homes, roads, and industry

Reducing the amount of agriculture runoff.

Stop bottom trawling inshore which stirs up all the sediment that settled from up river in our sounds

storm water treatment plants and restoring shellfish

stricter environmental regulations

There needs to be better management of river flow in the Roanoke River. The continuous high water levels are not only affecting water quality in the river, but in the entire Albemarle Sound Region

Eliminate point discharges for all commercial operations & stop direct farm/surface water discharges.

Reduction of runoff from farm land and industrial plants

Do Not allow over development near water ways

Shrimp trawls removed from inland waters. The fish they kill pollutes the waters

Better policing of industry dumping into the water supply.

Controlling erosion, runoff

More effective water treatment by farms and businesses.

Better education on causes

Large buffer areas between farm and streams, rivers and also developments close to such streams and rivers.

As a water quality professor at Duke University, I do not believe that WQ adversely affects surf fishing on Cape Fear beaches. Rather, I think that overfishing by commercial fish/shellfish boats has changed the recreational fish catch in this area. Inland towns need to be responsible for waste they put into the water ways. The Bogue Sound always looks polluted after the runoff from the rivers inland end up in the sound.

Improve the treatment of waste water from commercial animal farms.

Improvement effort of runoff

control or eliminate agricultural runoffs

figure way to flush Neuse River system - have had clients that do it in huge lakes

Storm water management to control runoff of both chemical and solid waste pollutants.

ceasing to allow industrial pollution

Adequate sediment and pollution control

More oysters. Less shrimp trawlers in the sounds

Making test kits available to recreational fisherman and publicizing results.

Stop the return of bycatch

Education of those in and around our rivers and sounds.

Appropriate oversight , e.g. effective warden visibility - I have only seen one warden in the last five years in the Wrightsville Beach area. A lot of folks catching but not releasing. Too many giggers and gill nets !

Better manage run off from developed areas , cities, residential areas, sewage releases

Chemical runoff

Eliminate shrimp trawling in Pamlico sound and commercial harvesting of Menhaden in ocean waters

Monitoring cities, towns and hog farms all along our river systems.

Active enforcement of existing laws.

Enforce current laws and regulations

Allowing marginal farmlands to return to meadows, wetlands and forests. "Marginal" means those soils which are too wet to farm part or most of the growing season.

Landowners would need to be compensated for lost crop income and/or lost lease payments.

more upstream runoff retention such as retention ponds.

improve municipal water treatment and collection of runoff

stronger regulation of runoff from point and non point sources

Limit waterfront land development and plan for it more comprehensively when it is done.

Herbicides seem to have the most negative effect on fish and shellfish. With the spraying of such chemicals that runoff into ditches, rivers and sounds. They kill the grass fields and vegetation on the bottom of the bodies of water that animal life need to thrive. I've seen evidence of the complete eradication of grass fields in the albemarle

sound that hosted plenty of fish and shellfish life that are now barren, with no grass field and little year round animal life. The fish and shellfish seem to move around more to find cover and food than they did ten years ago. I've seen Crop dusters spray fields that are along the rivers and sounds, and have had said spray fall onto myself and crew.

stronger regulations for development

Stop building so many houses near water

Stopping agriculture and yard fertilizer and pesticide runoff

Actually using an outside source to get your water samples correctly done instead of an in-state facility that would show bias

Stop polluting the water

keeping an eye on farm runoff

There is no easy answer--a lot of factors contribute to polluted runoff--development, industry, etc.

get rid of the waterfront developments

Mostly limit farming

Eliminating fecal waste contamination into our waterways from industrial farming

Focusing on the track of oysters. 1 single 3" oyster will filter up to 50 gallons of water a day. An oyster will not survive in heavy brackish/fresh water. Bad enough southwest winds pull the fresh water into these rivers from the western part of the state. None the less when the damms are opened in the western part of the state. All of that water runs into our rivers. The neuse river takes a heavy hit year after year. They state shut down the trawlers which weld to cultivation of our rivers bottom, never kept up on oysters which is nature's way of water filtration, and the strict laws enforced on these larger fish (striped bass, red drum) everyone needs to realize bigger fish eat smaller fish. There's a circle of life in these waters and with human error year after year we are destroying not only the fishery. We are destroying coastal waters. Please keep in mind our rivers have very little to zero tide. All driven off the wind. I feel actions must be made to prevent fresh water/runoff being ran to our rivers. It's killing our water. We call it dead water. Kills everything in its path. On a hard south/ southwest wind I strongly advise some research being done in our rivers. Pick new Bern or little Washington. Either Pamlico or neuse river. When you see hard crabs swimming on the surface you know right there is no oxygen in the water and the crabs/fish are trying to stay alive. Then go to the windward shoreline and test. All fish will be pushed to the windward shallow shoreline because of the agitation in the water they have a fighting chance of living.

Heavy regulations on pesticides in herbicides roadside spraying that goes directly in the canals in the dishes that run straight into the rivers there needs to be some kind of big filtering system that goes on these farms that filters out the pesticides and herbicides and stop the roadside spraying go back to the bush ax and mechanical ways of clearing underbrush instead of pesticides

To start, Hancock creek on neuse river has multiple septic tank spills in that creek leading to the neuse river killing millions of fish a year. Water quality coming from Raleigh is a disaster releasing the dams with runoff rain water polluting our rivers. No one has to pay big fines or is held accountable big businesses and farms pay off politicians to look the other way.

Open our inlets for better water flow.

Conserve the waterfront coastal communities by limiting development

Agriculture runoff in creeks

Stop developing the coastal areas

No sure

point source monitoring

Stop inshore shrimp trawling which tears up grass beds and stop harvesting wild oysters which clean our water.

Make more oyster reefs

Increasing natural shorelines and making property owners have a natural undisturbed buffer on the waters edge and stop building homes on the water.

Reduction in coastal development

monitoring water by testing and amending the culprit

Stricter storm water runoff retention requirements.

Removal of waste (especially plastics) from daily, single use

more public education regulation regarding the use of herbicides and pesticides, such as used on golf courses, and residents. Also more education, about plastics and littering.

Send the Yankees back home.

Stop dumping industrial water

KEEPING CONTAMINANTS OUT OF THE WATER SUPPLY

Enforcement of existing environmental regulations

enforcement of policies already law

Waste Water Treatment Facilities dumping raw sewage

More frequent inspections are needed.

Restrict development of watersheds.

Water stewards. On my lake people blow yard waste and soap from cleaning docks.

Storm water runoff management

Protect our estuaries by containing runoff and protecting wetlands

Elect a majority of the legislature that is willing to learn and act upon the problems we have in NC

Buffer areas adjacent to streams and rivers planted to permanent grasses to reduce runoff.

Mitigation of agricultural runoff

More enforcement powers for regulators. No grandfather clauses for impervious areas for redevelopment. Buffer rules on the Cape Fear and other basins

Require factory farm to collect their waste.

less people less water run off

Best management practices to reduce sediment loads.

I have not noticed a problem with water quality.

More effective monitoring/sampling of the Pamlico and Neuse rivers as well as the creeks that feed into them.

Try and stop pollution of all types.

Monitoring and following the results

Double the size & budget of regulatory bodies to enforce and strengthen protections for our coastal areas.

Run off from all Houses and Buildings on Shore areas, Ocean Beaches, near Rivers of all NC lands! Pollution comes from Rivers running to the Coastal areas. Example is the Red Tide years ago!

Use of vegetative buffers

I think it starts with accurate monitoring and transparent reporting.

Reducing municipal waste water spillage.

Dredging inlets.

Reduce the carbon footprint from water pollution

Reduce waste

Education

Improve operation of sewage plants.

Enforce the laws to the full extent against polluters

Contain runoff

Better enforcement of existing regulatory requirements. Hold municipalities accountable for fixing issues of raw sewage spills.

Tighter NPDES permits

Control factories pollution

enforce current regulations

Increased enforcement of existing rules through appropriate staffing of state environmental agencies.

more monitoring of waste water systems

Aggressively promote/mandate measures to control/minimize agricultural runoff

Eliminate inshore shrimp trawling that destroys native seagrass and other vegetation

Stronger storm water and polluter regulations



Land Management by all concerned.

waste management by industrial and commercial polluters

Reduce population living close to these waters.

Tighter controls on industries responsible for water pollution

riparian buffers around agriculture plots

Insure increasing development in Southeast North Carolina comes with adequate stormwater controls to prevent creeks from going entirely fresh during storm events  
more enforcement efforts

Runoff (silt) containment along with some cautious dredging of tidal creeks

Control hog waste and municipal sewage system overloads following significant rain.

Also improve buffers along rivers and streams to control agricultural runoff.

establish forested/ vegetation buffer zones around creeks, rivers, and streams

Create was to filter the water before it runs off in to the creeks and rivers through filter strips.

Not sure

Improve city/county public sewer systems.

Ban oyster/muscle harvesting and actively try to boost their populations. They're better at cleaning water than mankind will ever be.

Hog waste reduction

Prevention of runoff into the creeks and rivers

Prevent sewage overflow

Reduce storm water runoff from farms and roads.

Allowing no waste in the water

oyster replenishment

Improve waste water runoff

Develop buffer zones to protect marshes from ANY development.

Completely stop raw human and commercial animal waste from from being dumped into the rivers and creeks.

Do a study on how to stop factory farm waste and the chemicals contain in lagoons from getting into streams and ground water

Increasing treatment requirements on septic systems. Eliminating ATUs

Stopping all pollutants.

Runoff

Slow down coastal development. Stop granting variances to build more than allowed by existing zoning.

More oysters

Holding municipal waste water system accountable for their leaks

managing run off from agriculture and residential neighborhoods

if people pick up their trash

reducing stormwater runoff

Dredging of waterways again. The corps of Engineers use to actively dredge the channels and put sediments on spoil islands. This allowed the sediments to be removed continuously. Now we have layers of silt because the dredging is nonexistent.

Reducing plastic waste

Find out why Havelock dumps waste inti Neuse

Not necessarily water quality but netting by commercial fishermen of fish, shrimp and bait fish

Re-enact the water quality buffer rules that the republicans eliminated a few years ago, and recognize those that originally wrote them.

Stronger regulations on hog farming, penalties should be so stiff that they can't profitably afford to be fined.

Reduction in pollutants

Stricter regulations for commercial businesses along the river systems.

1. reduce bycatch throw back from commercial shrimp trawlers. 2. improve oyster colonies to help filter water

Manage the runoff and stop dumping contaminants in the upstream creeks and rivers

Strict enforcement of litter laws in sounds and rivers

Storm water runoff regulation.

The answer to pollution is dilution. Less pollution of chemicals and plastics. Find a solution to clean waters effectively.

Improved agricultural land buffers and replacement of individual septic systems

Address all runoff

Stiff fines for wastewater spills. Every time it rains hard there is a spill into Slocum creek. Fishing was legendary until September when rains and warm water caused algae blos and killed massive amounts of baitfish. Kills we're very focused around Slocum and Northwest creek initially.

Control application of pesticides/fertilizers on all properties adjoining rivers, creeks, and sounds.

Make the City of Havelock construct a new waste water treatment plant.

Soil conservation

Reduce runoff to the greatest extent possible

Upsteam pollutant mitigation

Reduce stormwater runoff

controlling runoff from farms

Closer monitoring of all things going into these waters

prevent industrial and commercial pollution into our waterways

Riparian buffers on upstream waters

Enforce already existing laws and shut loopholes

Stop letting municipal waste water spills be dismissed hold towns accountable for neglect

Get the trawlers out of inshore

No single action will have much of an effect.

Implementing a well rounded strategy that reduces nitrogen from septic tanks, ag and other sources

Land Development along Waterways.

Installing sewer systems in coastal areas would be a great start.

It may be difficult, but creating a series of large catch basins that can collect and filter contaminants from runoff would be interesting to consider.

Eliminate the dumping of millions of pounds of by catch by industrial shrimp trawlers.

Less lawn fertilizer. Trash awareness and education

Remove mifoil

educating and supporting commercial interests and educating the general public about how pollution effects the activities they enjoy.

Get the Gill nets out of the rivers and creeks

Better regulate certain agricultural practices like cotton defoliating that contributes to run-off

A comprehensive by NC not only education the serious nature of pollution, from city/storm drainage, municipal waste releases, plastic pollution, industrial pollution with enforcement and fines plus having the companies and local governments have to pay for remediation.

Enforcing existing laws

Ban inshore trawling

Control of algae bloom. Fertilizer runoff

Eliminate plastic packaging of all types

Eliminate the Duke Energy waste storage sites

Reducing run off from towns and agriculture.

Suing industrial polluters

Runoff surveys to pinpoint specific sources

Stricter laws on industrial pollution

Heavier fines on commercial farms

Impossible to pick one

EPA action

Significant regulations and punitive actions against violators

Stop runoffs

Less nitrogen and fertilizer run off from yards and golf courses located along coastal estuaries.

Eliminating plastics

Improving pervious pavement areas and allowing rainwater to infiltrate the ground as best as possible before flowing

Industrial and other man made materials that are intentionally or unintentionally introduced to the water

Adding required green buffer zones to all farms borders along streams, drainage ditches, rivers, lakes, and sounds.

Futch creek has not been dredged out to the Intercoastal waterway in over 15 years and the sediment has built up during the time. That has smothered a lot of the grasses the oyster beds that were in this area. It needs to be dredged as the creek is now less than 12" deep in a lot of areas at low tide where it used to be about 3' deep in most area and the shorelines are muddy now with less grass to protect the small fish and crabs. banning inshore trawling. Stop the silting and the dumping of millions of pounds of dead marine life

better regulation of run-off sources

Better regulation

Stricter run off control regulations and the incorporation of more natural barriers to waterways around residential development

Reduce over harvesting by commercial industries to allow ecosystem rejuvenation better control of hog farms and storm water run off

development restrictions to retain stormwater runoff

Reducing chemical waste entering the water

Reduce accidental spills of sewage treatment plants and farm operation runoff

Enforcing builders to use sediment barriers when building

In the New River stop the MCB from dumping treated drinking water in the river. Millions of gallons a year.

control farm runoff.

Seeing the live oyster beds that were there years ago.

Commercial and residential control of fertilizer leech into ICW

Get people interested in conservation by letting them access to all beaches and waterways so they can enjoy and appreciate the resources. Currently too many regulations, permit requirements, fees, etc.

stopping soil erosion

It has to be a comprehensive strategy

Removing humans. But that is not a good answer. Sorry. arg checks??

Control runoff from developed areas.

Tighter regs for surface water run off from all sources

Stronger enforcement of municipal discharge violations

Actually ENFORCE water quality rules and regulations.

Flood control of runoff.

Better controls on the runoffs of waste (all waste) that contaminate these waterways.

Remove development from low lying areas and replace with natural habitats (e.g. treatment wetlands, forests)

Less development around estuaries.

Addressing city and industrial (farm) issues with water treatment area due to flooding and overall capacity to prevent impact on waterways

Increased capacity of storm water run off drains/ ditches to accommodate storms making sure septic systems all work properly

Remove CCA

Enforce EPA regulations

Ag runoff

Oversite of cooperate farms, industries, and runoff from developed areas.

Effective treatment of industrial waste

Stop dredging our sounds!!!

This is hard to pick just one. Industrial waste dumping or plastic waste in our oceans. Implement farming practices that reduce sediment runoff/ increase riparian zones

Enforcement

Enforcement of Laws

Farming runoff

Maybe deviate polluted water to a place where it can be treated or have filters installed before water reverse into the sound or ocean. Hard to say. Penalties to animal farmers and Interdiction to the most dangerous pesticides.

Watershed development

LIMIITING CONTRUCTION ON THE COAST

Remove commercial nets

We have to hold developers accountable and really get strict when building near the waterways.

Industrial waste and careless discarding of trash and plastics

Rebuild our oyster population

Limiting the commercial industry from fishing nursery waters, sounds and ICW  
More buffer area around treated fields to absorb and filter runoff more effectively.

Rules and regulations on pollution-fertilizers, animal waste, chemicals with accountability  
Fixing outdated sewer systems in municipalities along the rivers. Large animal operations need to be operated under cleaner water standards. Violators need to be fined such that if it happens, it only happens once.

Stop net fishing!

Limit development adjacent to coastal waters

Get rid of the cormorants. They eat all of the young fish they can catch. Real bad for the trout!

public education

To monitor rivers and storm water at multiple locations to really find the sources

Stop the pollution, and dirty water that enters our rivers and oceans. Stop over harvesting.

Stop municipal waste spills into creeks and rivers. Then slow storm water runoff. single action... would be place higher cost on the producers of pollution making sure the sewer system does not leak and controlling the amount of development

Preventing storm water runoff w retention ponds and controlling upstream river flooding

Clean up the waters, limit commercial fishing/shrimping due to bycatch problems.

Control emerging contaminants such as PFOS, PFAS 1,4 dioxane

Reducing pollutant concentrations of multiple types

Figuring out how to eliminate algae blooms!

control chemicals that enter our waterways

Buffers

Strict regulations, enforcement, fines



For our area on the Neuse River Minnesott Beach, stop allowing municipal dumping of storm drain and waste from the Cherry Point side of the river. Our River front water has really deteriorated over the past few years

Maintaining "adequate" buffer/riparian zones

Less Development

Storm Drain Runoff

sewerage system upgrades

Contain/treat runoff into tributaries and primary bodies of water.

Establish a buffer area around drainage ditches to control agricultural run off

monitor water quality at source of possible pollution

not allowing waste water to be pumped into cape fear river

Filtering the runoff water from streets, parking lots and roofs before it runs into the streams and estuaries

Buffer ALL streams, rivers and sounds!!.

Restoration of oyster, marsh, and seagrass habitat at landscape scales

Agriculture practices have become increasingly low/minimum tillage, resulting in a significant increase in chemical use. Better management of such practices to minimize runoff is warranted. On a side note, the continued destruction of vegetation on our sound floor by industrial inshore shrimp trawling absolutely must be stopped.

Improving storm water drains and runoff collection.

Opening up of the inlets to improve water flow.

Controlling agricultural runoff

Reducing/treating runoff

Hold municipalities, like Havelock, New Bern, Raleigh and Cherry Point accountable for their spills. All they ever get is a slap on their hands and a small fine.

Limit agricultural/animal farm runoff

Eliminate wasteful items

Strictly enforcing laws governing pollution and littering, illegal dumping, etc...

strictly enforce laws dealing with any and all discharges, municipal and industrial; be more strict and prohibit the destruction of estuarine shorelines and water bottoms.

Shoreline development permits are easy to get. Once it is gone, there is no getting it back.

Figure out how to clean up PFA's

Study what they did for the Potomac river in Washington DC.

Awareness

providing more buffer zones between all development(ag and commercial) and the water

stop dumping water from lake jordan into the cape fear

Reduce runoff from agricultural practices

Monitor the health of the upper rivers. O2 levels and run off from farms

Reducing/eliminating urban runoff, including that coming from agricultural and golf locations

Better enforcement of Best Management Practices and ex. NPDES rules and regulations.

Control of housing development and much stricter adherence to runoff, set back and riparian guidelines

More control of waste water dumping into streams, rivers

Agriculture runoff

Stronger regulations on farm/factory waste management practices especially run off

Runoff controls

Limit new construction in Dare county near the sounds. Ensure septic systems meet code and have enough filtration.

limit development

Clean up upstream! It all runs downhill!

Looking at headwaters feeding the Sounds and monitoring polluters and industry upstream of collection areas like sounds before they reach the nearshore areas. municipal wastewater systems to replace septic systems.

Better waste collection for plastics, better filtration systems for other issues

Buffer between residential property and the sound. Less boat traffic.

Nature based rainwater control

Make companies that dump gen x into the water stop at once and pay to clean the water supply that we r drinking

Better filtration of waste water

controlling ag runoff

Protecting estuarine water quality from runoff

more oyster bed regeneration