

# **Shellfish Sanitation and Recreational Water Quality Section**

**N.C. Division of Marine Fisheries  
Dept. of Environment and Natural  
Resources**

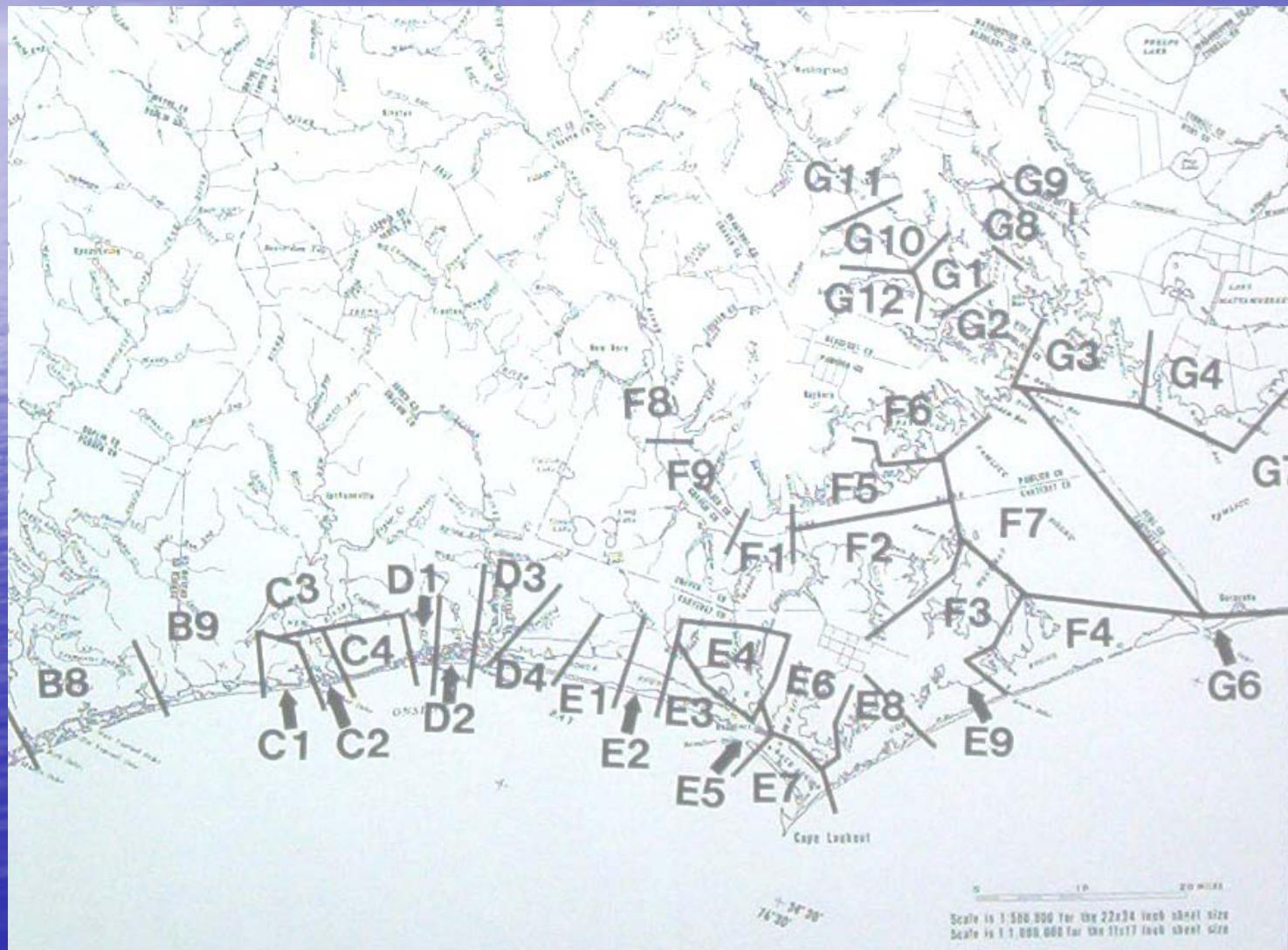
# Shellfish Sanitation Program

- Started in 1925 following outbreaks of typhoid fever in Chicago, New York, Washington and several other cities linked to tainted shellfish.
- Is responsible, (along with county health departments), for the way shellfish are produced, stored, transported , processed, sold, and served.
- *NSSP (National Shellfish Sanitation Program) consists of FDA, State Shellfish Authorities, and Industry.*

# Recreational Water Quality Program

- Started in 1997 in response to public concern regarding coastal swimming waters.
- Program became mandated by the E.P.A. in October 2000.
- Monitors coastal recreational waters including ocean beaches, sounds, bays and estuarine rivers.

# Growing Areas



# Section Operations

- Main Office in Morehead City
- Regional Offices in Nags Head and Wrightsville Beach
- Home Based Inspector in Reidsville who covers western N.C.
- Staff of 29

# Section Facilities

- Operate 9 outboard boats to 24 ft.
- Three FDA and State Certified Laboratories
- Mapping Grade DGPS equipment
- Hydrographic monitoring equipment

# The Sanitary Survey

- Shoreline Survey
- Bacteriological Sampling
- Hydrographic Studies
- Rainfall Monitoring
- Three year cycle
- Triennial Reports to FDA
- Annual Updates to FDA

# Shoreline Survey Program

- Looks for failing septic systems.
- Evaluates municipal wastewater treatment plant discharges and package treatment plants.
- Evaluate storm water discharges, farming practices, silviculture, wildlife.
- Marinas.
- Potential sources of toxins.

# Failing Septic Systems/Straight Pipes



# Wastewater treatment plants



# Storm water and Runoff



# Marinas and Docks



# Other Sources



2.8.2001

# Bacteriological Sampling

- Approx. 1,300 stations coast wide sampled a minimum of six times per year.
- All samples are planted, cultured and analyzed by Section laboratories.
- Sampling is used to classify shellfish growing areas and to open and close areas
- *Fecal coliform bacteria is used as indicator of pathogens*

# Sampling

- Water
- Meats



10. 19. 2000



9. 21. 2000

# Planting Samples



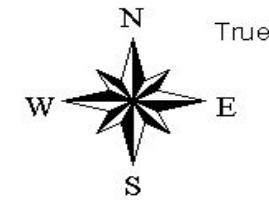
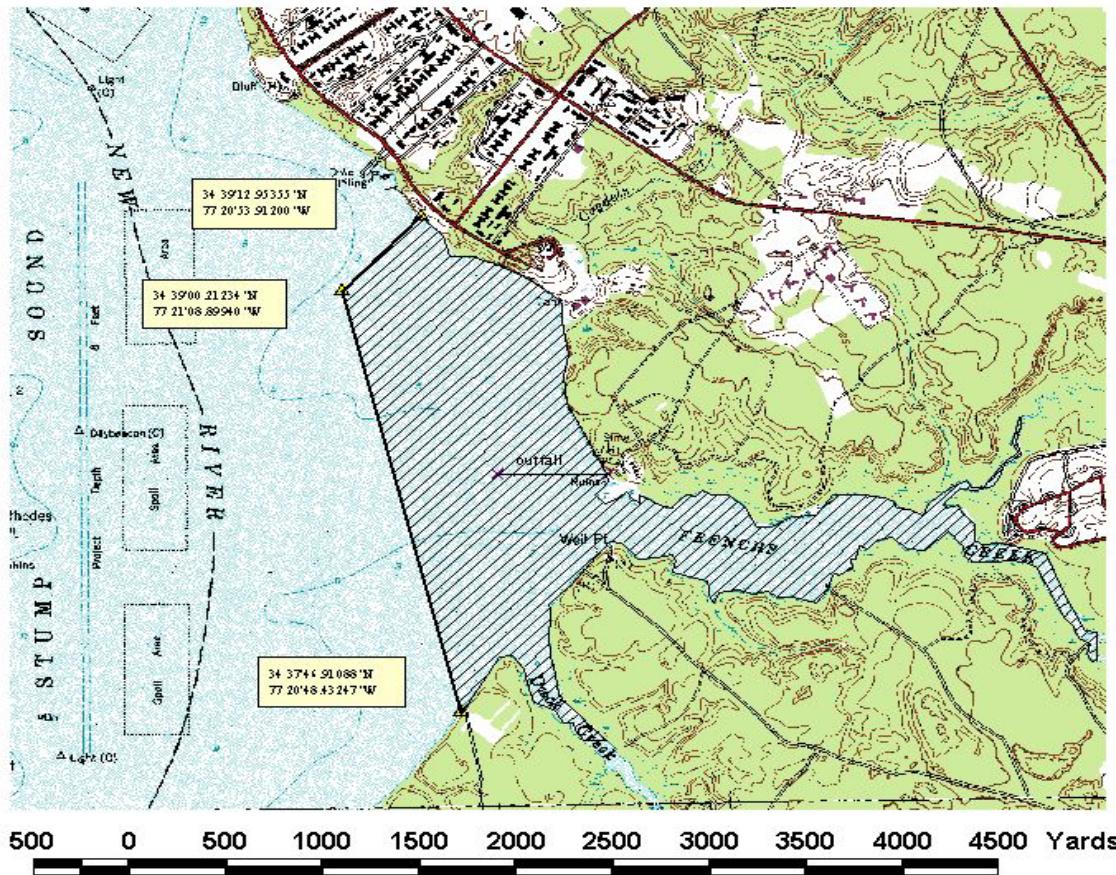
# Five Tube Dilution Method

- *Takes 24 hours to complete growing water sample test*



# Hydrographic Studies

## Shellfish Closure Line Frenchs Creek WWTP New River



4/25/02  
NC DENR  
Division of Environmental Health  
Shellfish Sanitation Section

Coordinates shown in d/m/s  
NAD 83

newline.shp  
Outfall.shp

# Rainfall Monitoring

- Approximately 30 stations coast wide
- Conditional growing area closures are usually linked to rainfall



# Growing Area Classifications

- *Approved – (shall not exceed geo mean MPN of 14 f.c./100 ml and a 90<sup>th</sup> percentile MPN of 43/100ml)*
- Conditionally Approved – (Open, Closed)
- Restricted – (shellfish relaying)
- Prohibited – (WWTP discharge, areas not surveyed)

# Shellfish Plant Inspections

- Interstate
- Intrastate
- Shucker-Packer, Shellstock Shipper, Repacker and Reshipper



# Refrigeration and Tagging

- Mechanically Refrigerated 45° F or below.
- Keep Tag 90 days at last point of sale.
- Stored off Floor and away from other products

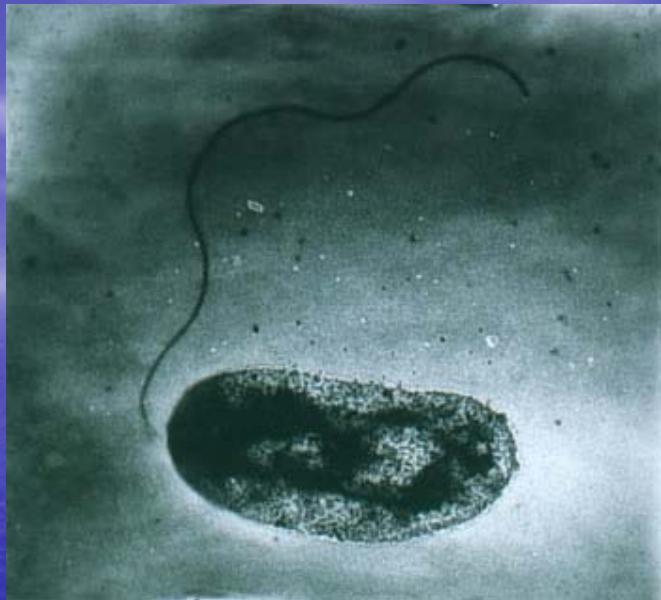


# Crustacea Plants

- Crabs, Shrimp, Crayfish, etc.



# *Vibrio vulnificus*



## CONSUMER ADVISORY

*Eating raw oysters, clams or mussels may cause severe illness. People with the following conditions are at especially high risk: liver disease, alcoholism, diabetes, cancer, stomach or blood disorder, or weakened immune system. Ask your doctor if you are unsure of your risk. If you eat shellfish and become sick, see a doctor immediately.*

N. C. Department of Environment and Natural Resources  
Division of Environmental Health

DENR 4004  
Environmental Health Services Section

# Recreational Water Quality Program

- 240 sampling stations coast wide
- Post swimming advisories when required to protect the public health
- Uses Enterococci as a indicator of waterborne pathogens
- Program is jointly funded by State and U.S. EPA

# Lab Criteria

- Geo Mean under 35 per 100 ml
- Single sample max below 104



# Tier Based Monitoring

- Tier I: High Use
- Tier II: Medium Use
- Tier III: Occasional Use



# Pollution Sources

- Storm water
- Waterfowl
- Wildlife, Pets
- Other Bathers (Mom, Katie's diaper leaked again!)



**ATTENTION**

NO SWIMMING  
BETWEEN SIGNS



WATERS MAY BE  
CONTAMINATED BY  
STORM DRAIN  
DISCHARGE.

OFFICE OF THE STATE HEALTH DIRECTOR



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**ATTENTION**

SWIMMING IN THIS AREA  
IS NOT RECOMMENDED.

BACTERIA TESTING  
INDICATES LEVELS OF  
CONTAMINATION THAT  
MAY BE HAZARDOUS TO  
YOUR HEALTH. THIS  
ADVISORY AFFECTS  
WATERS WITHIN 200'  
OF THIS SIGN.

OFFICE OF THE STATE HEALTH DIRECTOR

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<http://portal.ncdenr.org/web/mf/shellfish-sanitation-and-recreational-water-quality>

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10.4.2000