

So why is coastal sewage disposal
not a hot issue in NC?

... geography!

CA population centers are on coast
NC population centers are inland

North Carolina – note hot cities in blue

- most sewage is treated tertiary
- outfalls in rivers and Pamlico Sound
- Outer Banks coast: storm drains, some septic tanks



California AB-411 Standards: Bacteria

Kind of Bacteria	Number Allowed	Chance of Sickness
Total Coliform	10,000 / 100 ml	1 in 60 (skin rash)
Enterococcus	104 / 100 ml	1 in 77 (stomach flu)

www.healthebay.org

North Carolina Beach Cleanliness Standards

Enterococcus only

Three kinds of beaches

- **Tier 1:** used daily, any public access beach
- **Tier II:** used 3 days / week on average
- **Tier III:** used 4 days/ month on average

The less the beach is used,
the more polluted it can be

Postings: Alert or Advisory, NOT Closure

Type of Beach	Definition	104 Entero/100 ml	276 Entero/100 ml	500 Entero/100ml
Tier I	daily use	Alert	Alert	Advisory
Tier II	used 3days/week	Nothing	Alert	Advisory
Tier III	used 4 days/month	Nothing	Nothing	Advisory if 2 days

Alert = tell the media, no sign posted
Advisory = sign "swimming not recommended"

NC Dept of Environment and Natural Resources
has no authority to **forbid** swimming

why such wimpy laws?
... too much shoreline!

- 300 miles of coast
- 3000 miles around Sound

Advisory => must test again
Not enough people

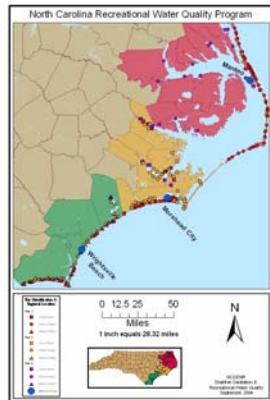


www.outerbanks.org

North Carolina Regional Water Quality

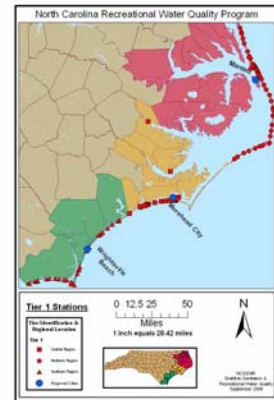
- mission:
"monitor and notify"
- started 1997
- EPA compliant: 2002
- 240 beaches
- 17 people
- \$0.5 million /year

JD Potts



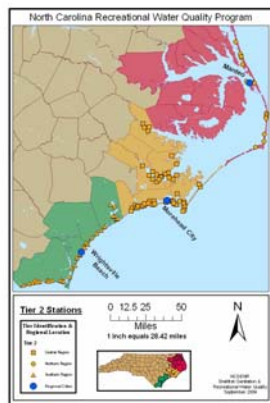
Tier I Sites

Daily Use,
Sampled 5 times/month



Tier II Sites

Used 3 Days / Week
Sampled Twice Monthly



Tier III Sites

Used 4 Days / Month
Sampled Twice Monthly.



What makes a good indicator?

- easy to detect
- only in polluted waters
- concentrations \leftrightarrow contamination.
- lives as long as pathogens
- EPA says: enterococci



Fecal Bacteria

From intestines of
Warm-blooded animals

JD Potts

Table 1. Numbers of Viable Bacteria Found Per Gram of Feces of Adult Animals¹
(Median values from 10 animals)

Animal	<i>E. coli</i>	<i>C. perfringens</i>	Enterococci	Bacteriodes	Lactobacilli
Cow	20,000	200	200,000	No Data	250
Horse	13,000	No Data	6,300,000	No Data	10,000,000
Pig	3,200,000	4,000	2,500,000	500,000	250,000,000
Sheep	3,200,000	20,000	1,300,000	No Data	7,900
Chicken	4,000,000	250	32,000,000	No Data	320,000,000
Dog	32,000,000	250,000,000	40,000,000	500,000,000	40,000
Cat	40,000,000	25,000,000	200,000,000	790,000,000	1,300,000,000
Human	5,000,000	1,600	160,000	5,000,000,000	630,000,000

Don't let your pets poop on the beach

JD Potts

Outer Banks: Central Sewage or Septic?



Why are Septic Tanks Best on Outer Banks? ... Lower Population Density!

- 1) with septic, must have large lots
- 2) fewer people make less sewage
- 3) less hard surface for runoff

Runoff



clean rain
runs over roof and driveway
dirty water into storm drains
not treated!

more houses => more runoff
fewer houses => rain seeps in

http://www.kytc.state.ky.us/EnvAnalysis/Stormwaterquality/Gen_info_edu.htm

What's wrong with this picture?

