Myrtle Beach advisory forecast model development:

Integrating data from monitoring programs, remote sensing, and observing systems

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Storyboard

1)Water quality issue: Bacterial contamination at beaches

2)User community: Beach program, public

3)Process: Objectives, data integration and model approach

4)Outcomes: Improved information, efficiency of effort

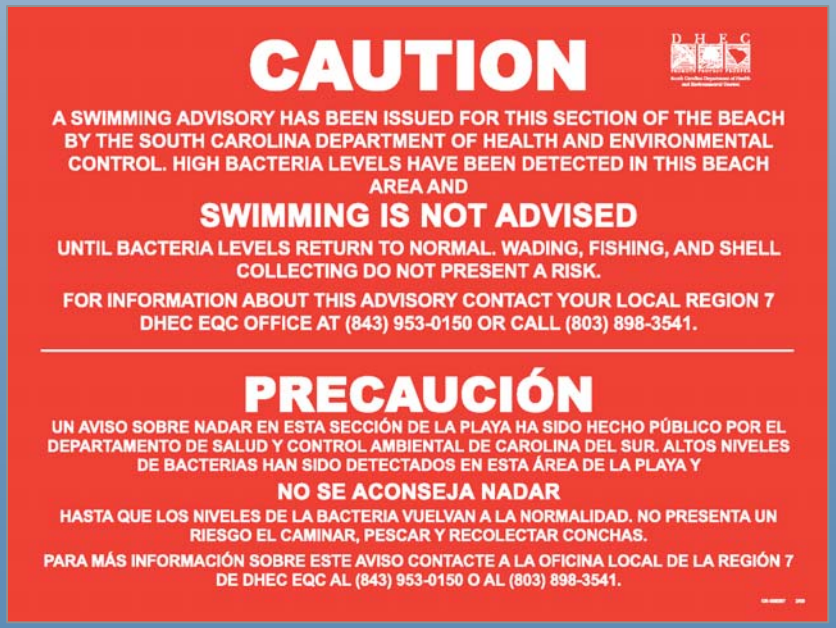
5)Performance metrics: Model validation, re-evaluation, intervention analysis

6)Value added from improved technologies: NEXRAD extraction, data management, telemetry

7)Needs: Asset coverage, beachgoer data, bacterial source tracking, research

1.) Water quality issue

- Bacteria contamination
- Advisory posting



CAUTION

A SWIMMING ADVISORY HAS BEEN ISSUED FOR THIS SECTION OF THE BEACH BY THE SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL. HIGH BACTERIA LEVELS HAVE BEEN DETECTED IN THIS BEACH AREA AND

SWIMMING IS NOT ADVISED

UNTIL BACTERIA LEVELS RETURN TO NORMAL. WADING, FISHING, AND SHELL COLLECTING DO NOT PRESENT A RISK.

FOR INFORMATION ABOUT THIS ADVISORY CONTACT YOUR LOCAL REGION 7 DHEC EQC OFFICE AT (843) 953-0150 OR CALL (803) 898-3541.

PRECAUCIÓN

UN AVISO SOBRE NADAR EN ESTA SECCIÓN DE LA PLAYA HA SIDO HECHO PÚBLICO POR EL DEPARTAMENTO DE SALUD Y CONTROL AMBIENTAL DE CAROLINA DEL SUR. ALTOS NIVELES DE BACTERIAS HAN SIDO DETECTADOS EN ESTA ÁREA DE LA PLAYA Y

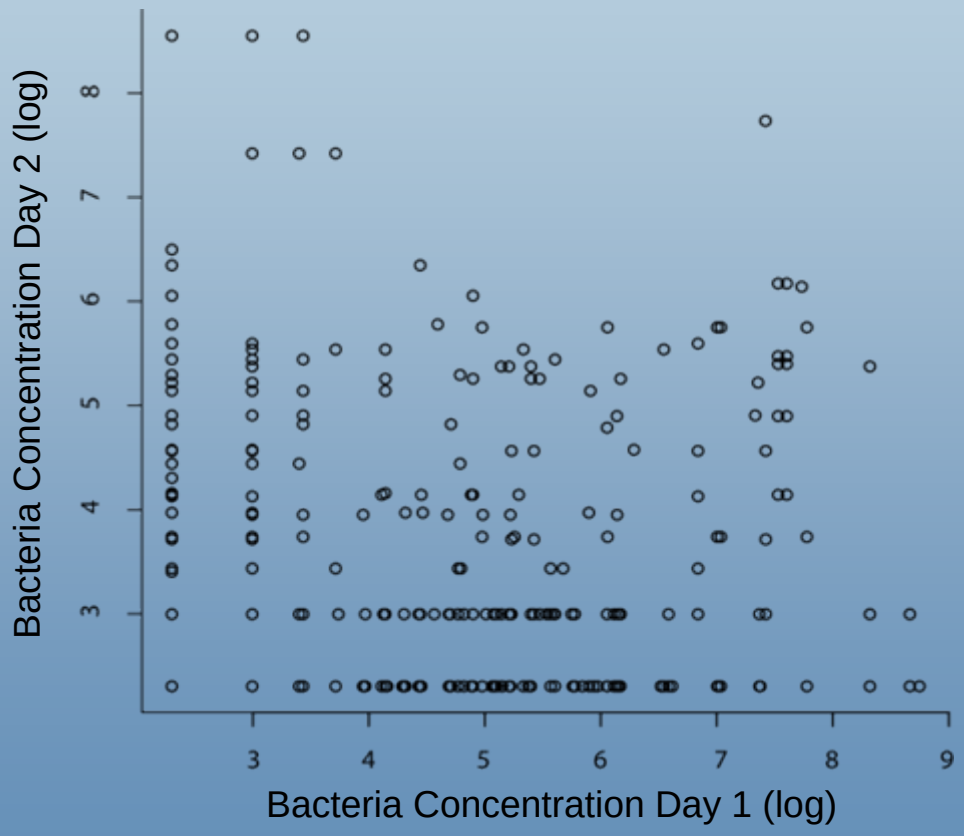
NO SE ACONSEJA NADAR

HASTA QUE LOS NIVELES DE LA BACTERIA VUELVAN A LA NORMALIDAD. NO PRESENTA UN RIESGO EL CAMINAR, PESCAR Y RECOLECTAR CONCHAS.

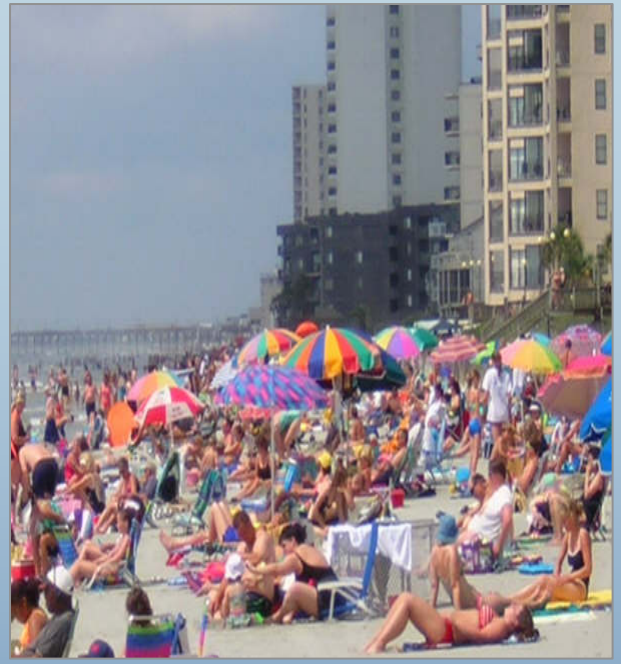
PARA MÁS INFORMACIÓN SOBRE ESTE AVISO CONTACTE A LA OFICINA LOCAL DE LA REGIÓN 7 DE DHEC EQC AL (843) 953-0150 O AL (803) 898-3541.

1.) Water quality issue

- Most beaches use yesterday's bacteria concentration to issue advisories
- Predictive modeling
  - Rainfall and rain gauges



2.) User community



Beachgoing public

- Better, more timely information

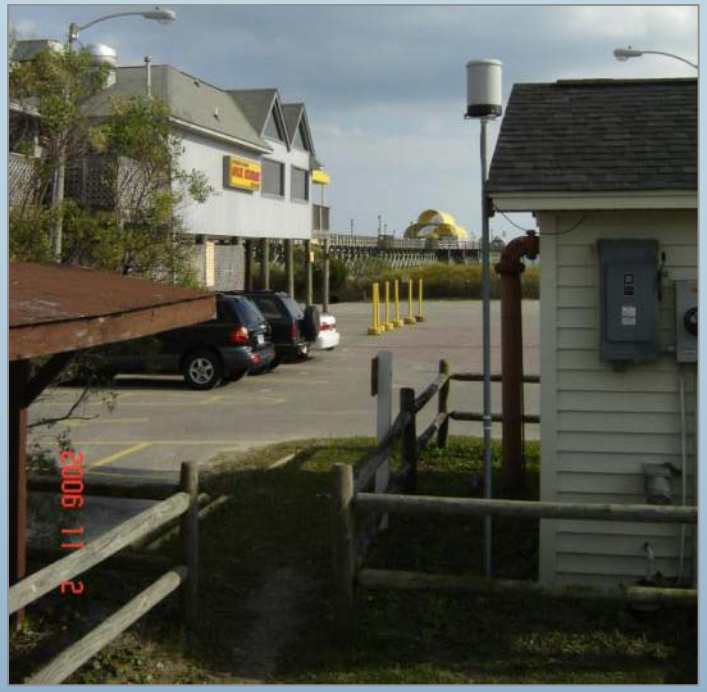
Beach program staff

- Reduced effort
- Improved results

Rayna King
Sean Torrens
Jennifer Canaright
David Cudd

4.) Outcomes

- Reduced sampling during rain events
- Public has better and more timely information



ADVISORY INFORMATION

SC DHEC routinely collects water samples at over 100 locations on South Carolina's beaches. If high numbers of bacteria are found, an advisory is issued for that portion of the beach. An advisory means that DHEC advises you to NOT swim in certain areas. This is especially true for young children and those with compromised immune systems. Advisories do not mean that the beach is closed. Wading, fishing, and shell collecting do not pose a risk. Advisories may be issued due to high bacteria counts or rainfall. Advisories are lifted when sample results fall below the limit of 104/100mL. Check the local newspaper and television news stations. Look for advisory signs when you go to the beach.

Know before you go!

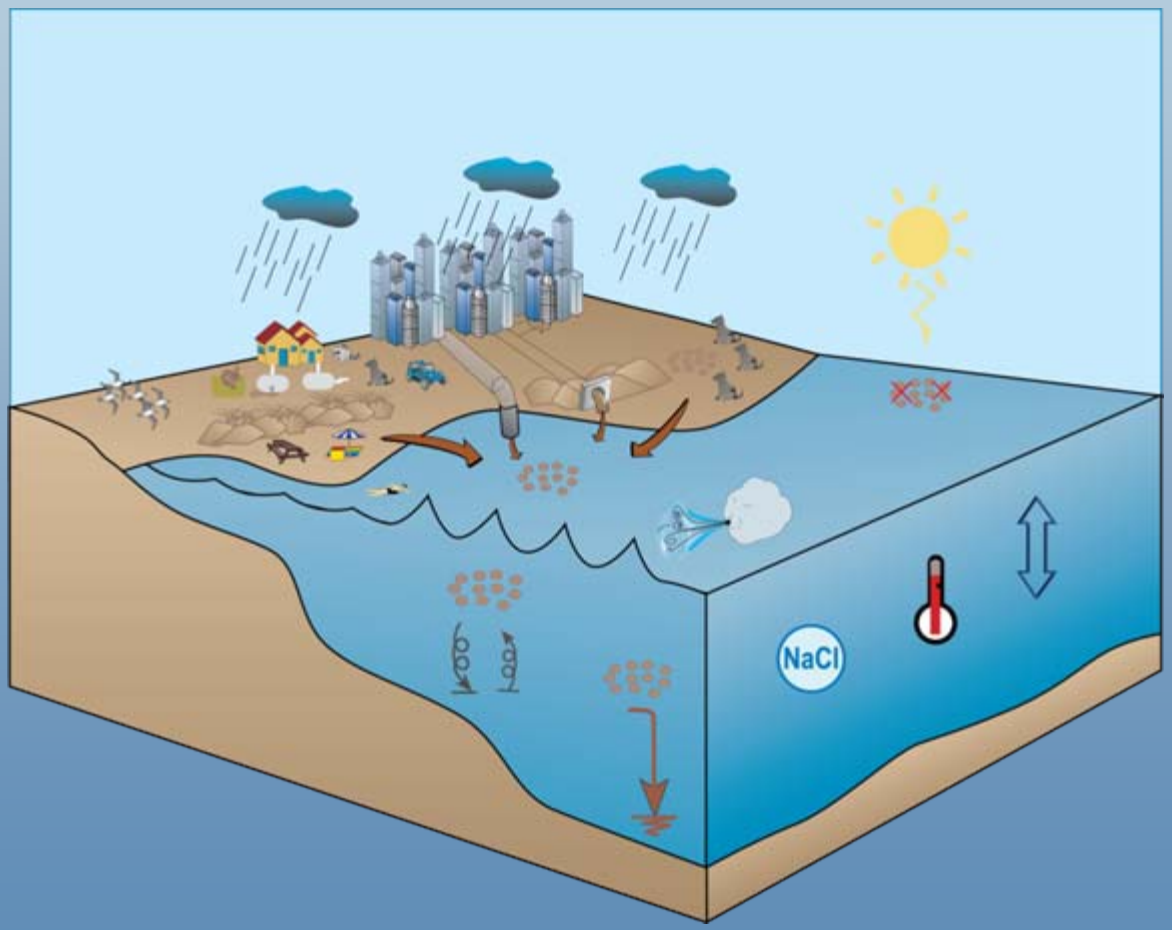
3.) Process

Objectives

1. Develop decision support tools for bacteria contamination at beaches
2. Increase utility Observing System and Remote Sensing data
3. Pilot "science to management" application through integration of data

3.) Process

- Factors affecting bacteria concentration



LOADING

- Precipitation
- Animal waste
- Urban runoff
- Bacterial input
- Failed septic systems

SURVIVABILITY

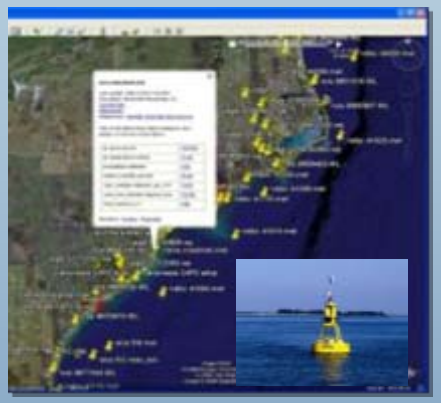
- Sedimentation
- Solar inactivation
- Temperature
- Tidal flushing
- Salinity
- Wind
- Deposition/ resuspension

3.) Process

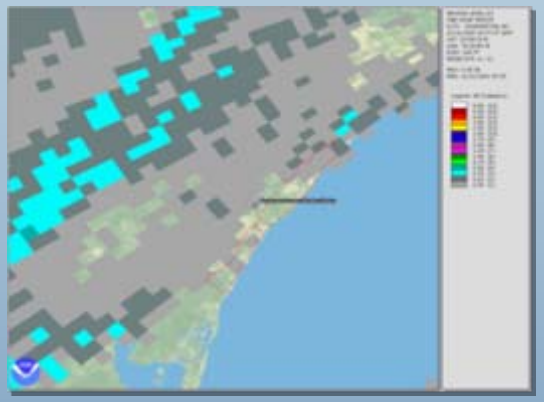
- Integrating data incorporates these factors

Monitoring programs

Observing systems



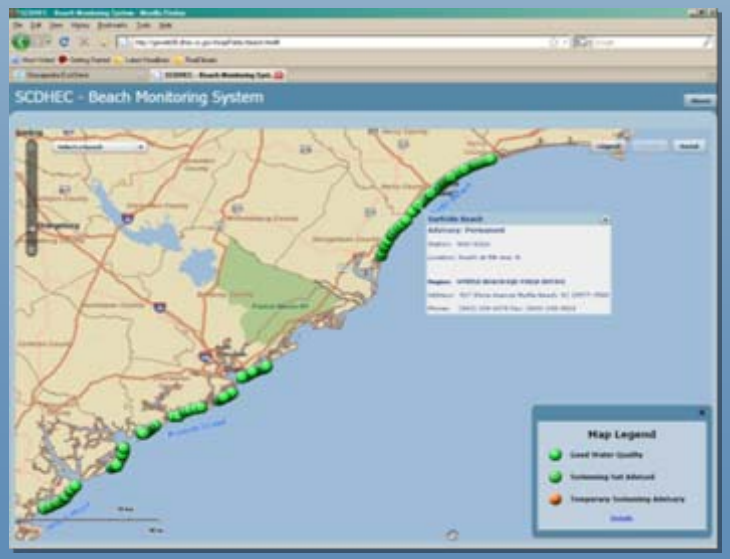
Remote sensing

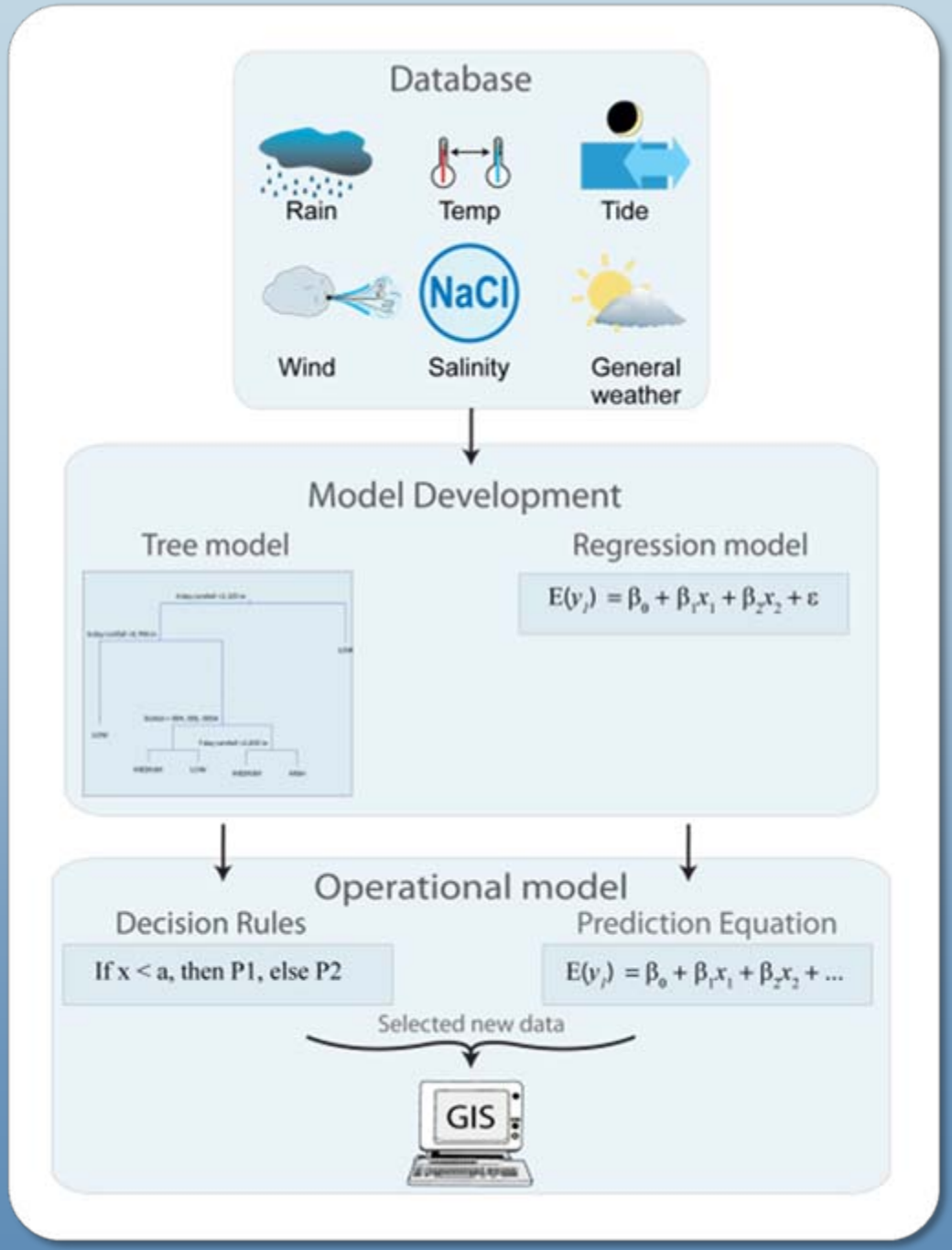


Parameter	***Source***
Bacteria density	Monitoring Programs
Air temperature	Monitoring Programs / Observing Systems/ Remote Sensing
Water temperature	Monitoring Programs / Observing Systems/ Remote Sensing
Salinity	Monitoring Programs / Observing Systems
Tide stage	NOAA
Weather conditions	Weather Service/ Observing Systems/ Remote Sensing
Wind direction	Weather Service/ Observing Systems/ Remote Sensing
Precipitation	Weather Service/ Observing Systems/ Remote Sensing
Solar radiation	Observing Systems/ Remote Sensing
River Flow	River Forecasting Centers / USGS
Soil Moisture	Remote Sensing

3.) Process

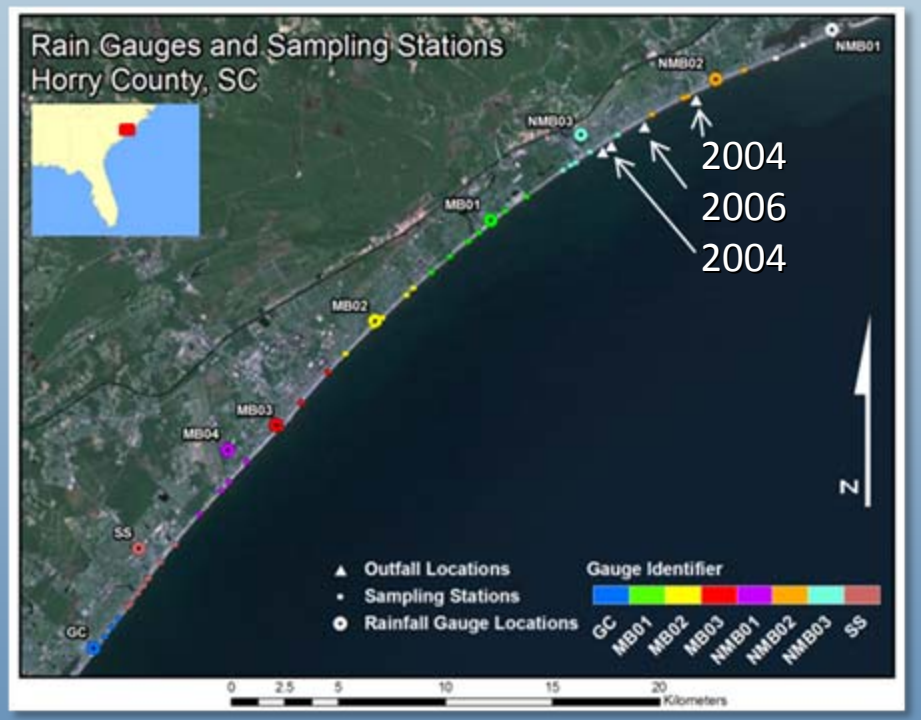
- Model approach
  - Ensemble model output
  - Regression
  - Classification and Regression Trees (CART)
  - Incorporate output to SCDHEC on line GIS



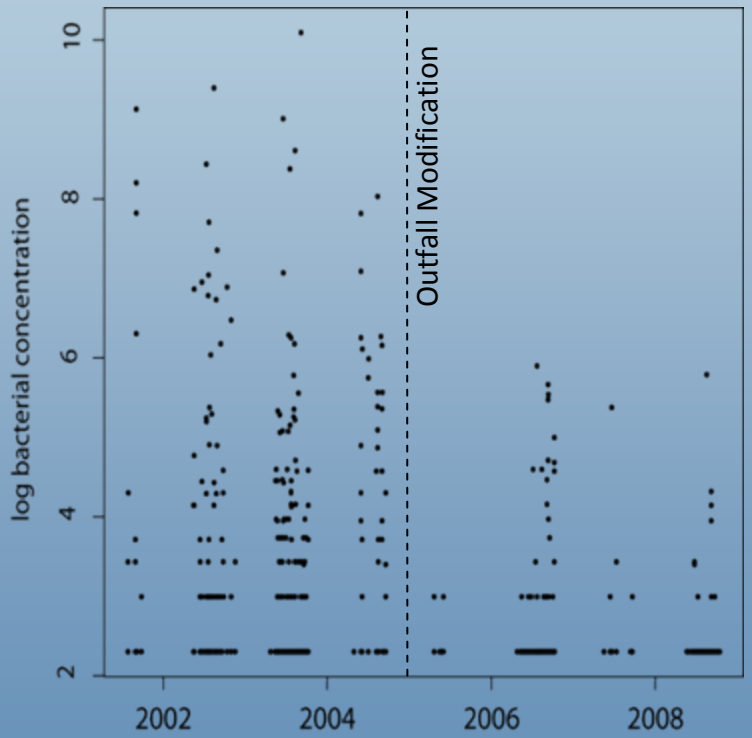


5.) Performance metrics

•Model validation, re-evaluation, intervention analysis



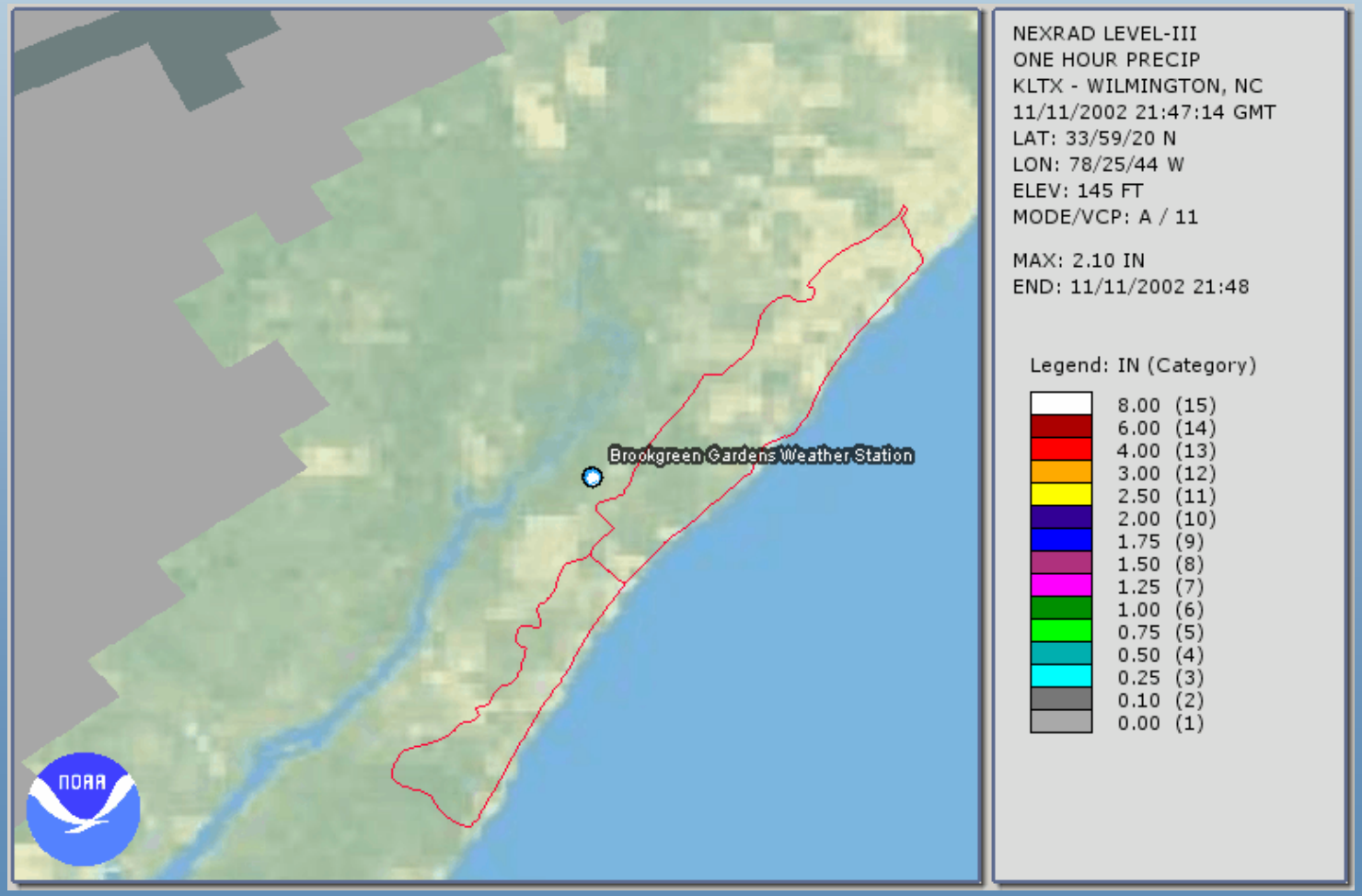
Stormwater modifications



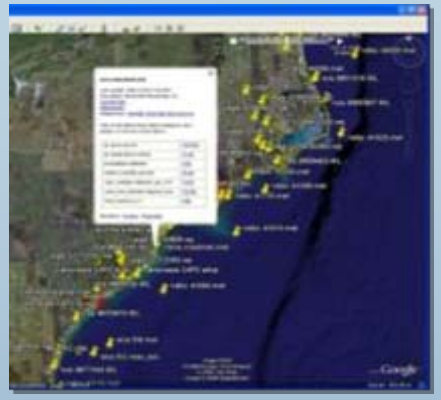
Reduced bacteria concentration

6.) Value added from improved technologies

- NEXRAD extraction, data management, telemetry



7.) Gaps and needs for improved outcomes



- Improved coverage for observation data

- Beach usage information
- Research:
  - Bacterial Source Tracking
  - Sediment resuspension
  - Tropical events