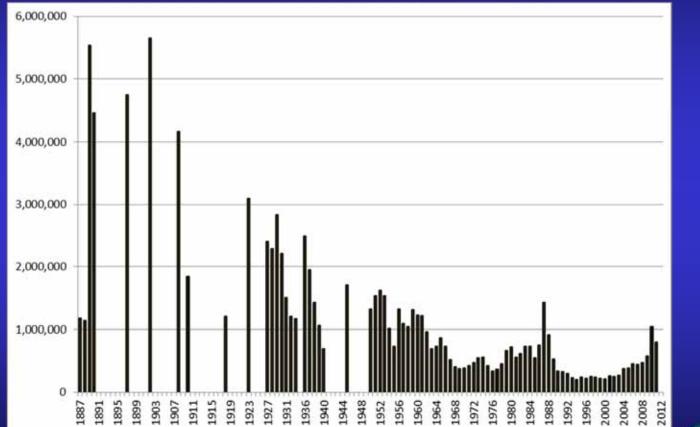
### Historical Landings





# N.C. OYSTER STOCK STATUS

- Manage by fishery management plans
- Assess overfishing and overfished status
- Stock Assessment



# OYSTER STOCK ASSESSMENT

- Classic stock assessments methods not available for oysters due to life history characteristics and problems with age determination
- New Mg/Ca ratio methods for ageing



# OTHER ASSESSMENT METHODS

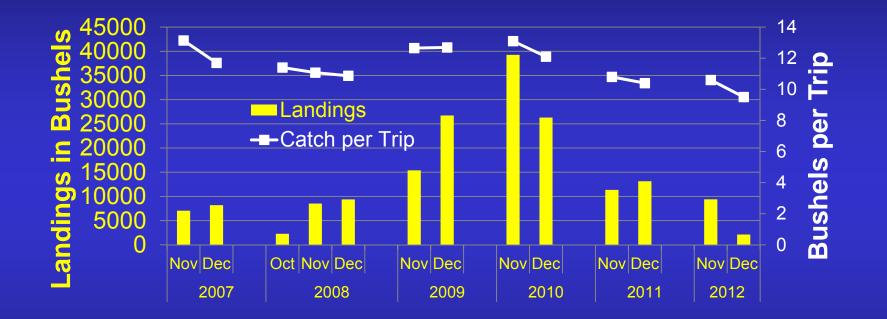


Use independent indices for stock status

Too few indices to assess oysters



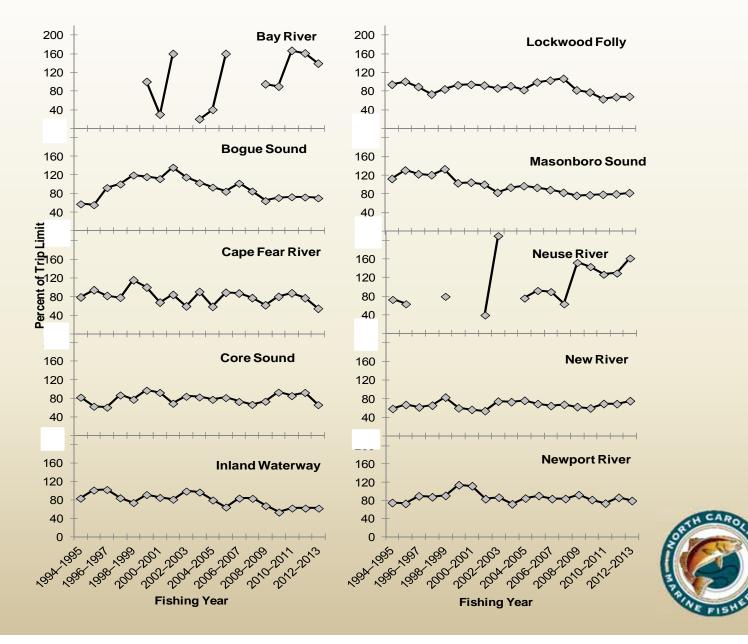
### LANDINGS?



Market, weather, pollution closures, rule changes, other fisheries



#### Percent of Trips Reaching the Trip Limit - Overfishing



### **OVERFISHED**?

- No quantitative assessment
- Use a qualitative assessment
- Oysters continue to be impacted by water quality and habitat loss and disease concerns
- Status = concern



### We are not alone

- Only three states have quantitative stock assessments: Maryland, Virginia and Delaware
- One of three states managing oysters using a fishery management planning system: Delaware, Texas and North Carolina



### What is the alternative?

- Oyster Bar (rock) surveys
- Maryland, Virginia, Delaware and Texas
- Requires information on the location, size and population parameters of the oyster habitat throughout the state



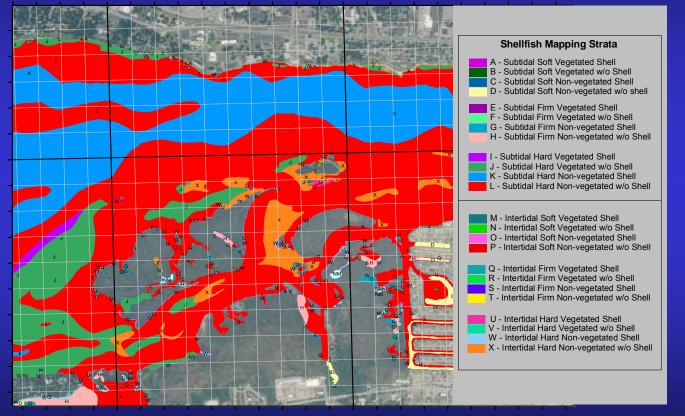
### Shellfish and Habitat Mapping

### Program objectives:

- Locate and map shellfish producing areas, and Submerged Aquatic Vegetation (SAV).
- 2. Delineate potentially productive bottom.
- 3. Determine shellfish concentrations and abundance within productive bottom types by a stratified random sampling scheme.
- 4. Quantify habitat types.



### Methodology



76°46'0"W

76°45'0"W



### Sampling Data

- Density and size class data for all oysters, clams and scallops
- Water temp, salinity, dissolved oxygen for both surface and bottom of sample
- Latitude and longitude for samples
- Substrate composition and characteristics
- Submerged aquatic vegetation species and density class



# Mapping Efforts



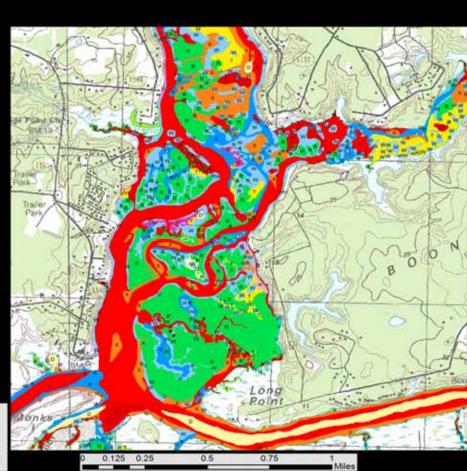


### Mapping Efforts

#### Legend

A - Subtidal Soft Vegetated Shell Subtidal Soft Vegetated w/o Shell Subtidal Soft Non-vegetated Shell D - Subtidal Soft Non-vegetated w/o shell E - Subtidal Firm Vegetated Shell F - Subtidal Firm Vegetated w/o Shell G - Subtidal Firm Non-vegetated Shell H - Subtidal Firm Non-vegetated w/o Shell I - Subtidal Hard Vegetated Shell - Subtidal Hard Vegetated w/o Shell - Subtidal Hard Non-vegetated Shell Subtidal Hard Non-vegetated w/o Shell M - Intertidal Soft Vegetated Shell N - Intertidal Soft Vegetated w/o Shell O - Intertidal Soft Non-vegetated Shell P - Intertidal Soft Non-vegetated w/o Shell Q - Intertidal Firm Vegetated Shell R - Intertidal Firm Vegetated w/o Shell - Intertidal Firm Non-vegetated Shell T - Intertidal Firm Non-vegetated w/o Shell U - Intertidal Hard Vegetated Shell V - Intertidal Hard Vegetated w/o Shell W - Intertidal Hard Non-vegetated Shell X - Intertidal Hard Non-vegetated w/o Shell Lease Not Mapped

DMF Mapping Program Shellfish Mapping Data Area: Lower Shallotte River, S008 Mapped/Sampled: June-Sept 2008



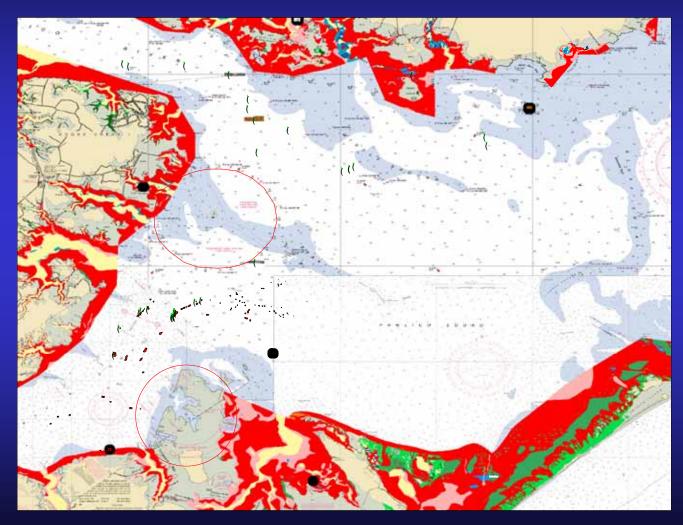


# Deepwater Mapping Effort



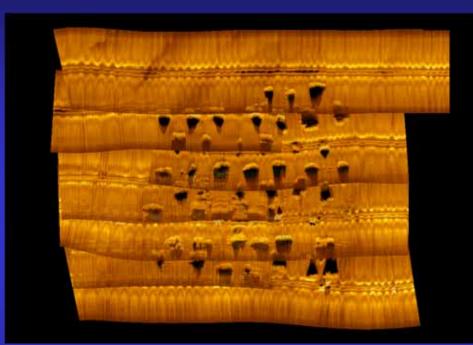


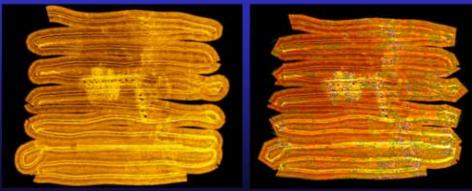
# Deepwater Mapping Effort





### Remote Sensing of Benthic Habitat





Use of side scan sonar and other remote sensing techniques to map, classify and quantify oyster habitat on:

- Oyster sanctuaries
- Selected cultch planting sites
- Selected natural deep water oyster rock locations

