



2016 Stock Status Report and Sampling Overview

DEPARTMENT OF ENVIRONMENTAL QUALITY

Marine Fisheries

Marine Fisheries Commission | Lee Paramore | Aug. 18, 2016



2016 North Carolina Stock Status Report

- Annual report serves as barometer for the overall health of the state's fishery resources
- Information and classifications are based on biological and statistical data from prior year
- Species included are managed by:
 - North Carolina Division of Marine Fisheries
 - North Carolina Wildlife Resources Commission
 - Atlantic States Marine Fisheries Commission
 - South Atlantic Fishery Management Council
 - Mid-Atlantic Fishery Management Council
- Management entities noted in 2016 report

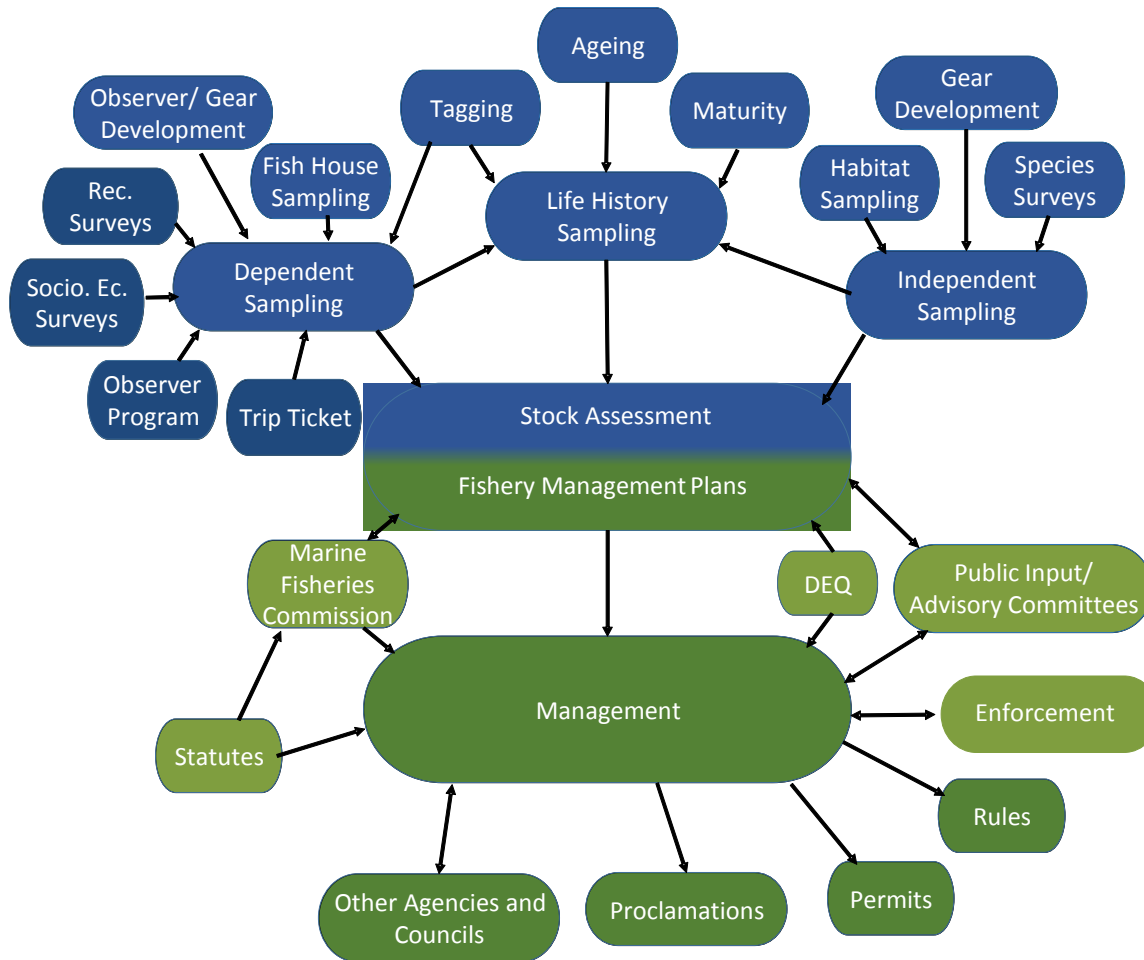
2016 North Carolina Stock Status Report

- Stock status determined for 37 important marine finfish, shellfish, shrimp and crabs

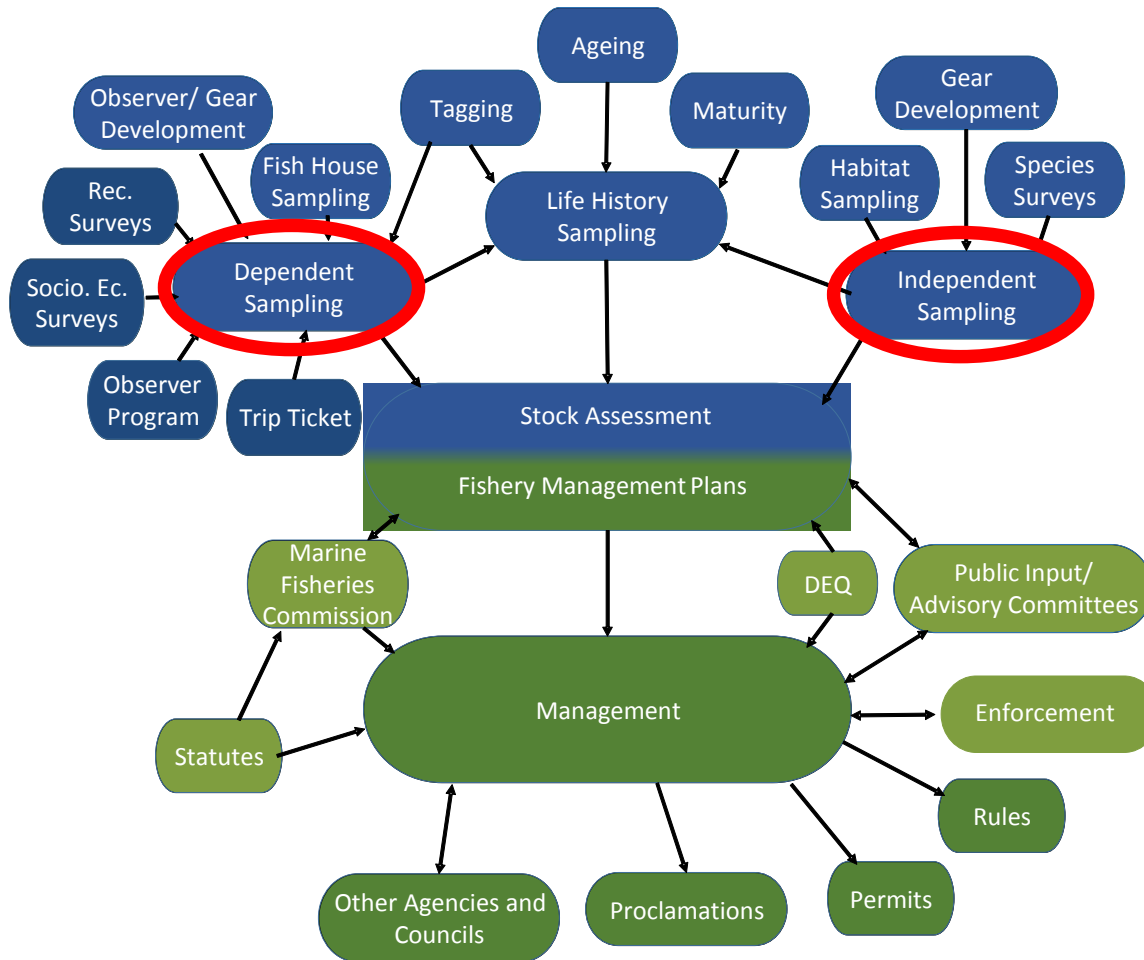
VIABLE	RECOVERING	CONCERN	DEPLETED	UNKNOWN
14	2	13	4	4

- One change from 2015 to 2016 stock status report
summer flounder – “VIABLE” to “CONCERN”
 - 2015 stock assessment indicated overfishing
 - Mid-Atlantic Fisheries Management Council lowered quota (29 percent)

North Carolina Marine Fisheries Tools and Products of Management



North Carolina Marine Fisheries Tools and Products of Management



Fishery Dependent Biological Sampling

- The collection of data from commercial and recreational fisheries for use in management of fish stocks
- Used to monitor removals (i.e., landings & discards), characterize the catch (size and age), gear used, effort, etc.

Sources of Dependent Data

Recreational

Marine Recreational Information Program – recreational harvest by number and size; releases by number

Carcass collection program – size/age data for harvest

Commercial

Trip Ticket – commercial harvest by gear and area

Fish House – size/age of commercial harvest by gear and area

Observer Program – quantity and size/age of discards

Fishery Dependent Biological Sampling

Dependent data are critical to determining stock status

- Needed to monitor removals (landings and discards), characterize the catch (size and age), monitor effort, gear specifications, etc.
- Not preferred for monitoring trends in the population, because interpreting results is difficult due to confounding factors.

Some of the confounding factors:

- Skill and techniques vary by individual
- Market conditions (price, size of fish, etc.)
- Regulatory changes
- Gear changes, vessel changes, technology changes
- No standardized effort
- Willingness of fishermen to provide accurate data
- Any other practices that change catchability



Fishery Independent Biological Sampling

- Information collected by biologists that does not involve the commercial or recreational harvest of fish
- Survey data to monitor trends in relative abundance
- Characterize habitat use

Why needed?

Biases of dependent data are minimized by the sample design employed in fishery independent surveys



Fishery Independent Biological Sampling

Sample design is paramount to success

- Typically either stratified random or fixed station
- Standardized gear construction and sampling techniques
- Designed to encompass occurrence of target species by season and area
- Study purposely not dependent on skill of sampler but is designed to be replicated following a set protocol
- Value of survey increases with time



Fishery Independent Biological Sampling

Fixed Station

- Used to monitor changes over time (indices)
- Sample same way and in same location
- Favorable for logistical and economical reasons



Stratified Random

- Samples are randomly taken based on some unifying characteristic (i.e., strata)
- Strata can be depth, habitat type, area or some other characteristic
- Sampling by strata increases precision
- Random collections allow for a survey that over time will provide an index that is representative of the population

Fishery Independent Biological Sampling

Examples of division surveys

Juvenile Surveys

Purpose

- Produce annual recruitment indexes
- Identify nursery areas for fish and shellfish

Methods

- Seasonal (correspond with spawning and recruitment)
- Both fixed stations and stratified random
- Trawls and large bag seines



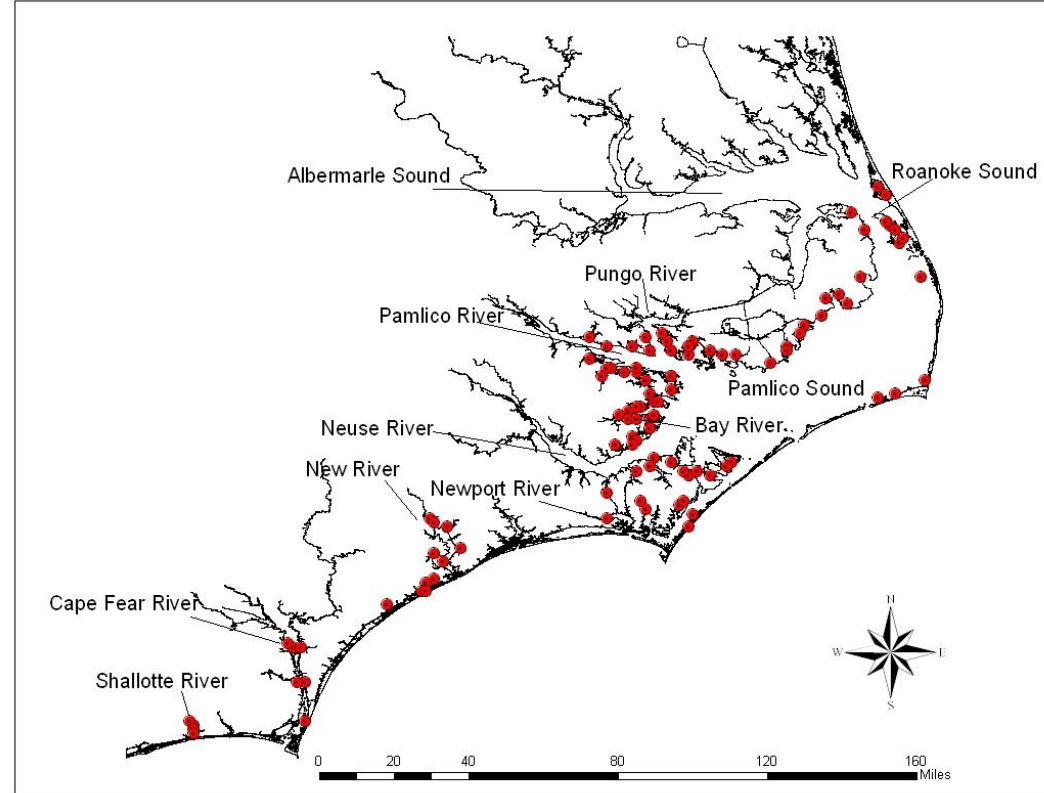
Fishery Independent Biological Sampling

Fixed Station Survey

Estuarine Trawl Survey

Methods and Products

- Long time series (1978)
- Shallow water trawl
- Critical habitat determination
- Impact of habitat alteration
- Index of abundance



Fishery Independent Biological Sampling

Stratified Random Survey

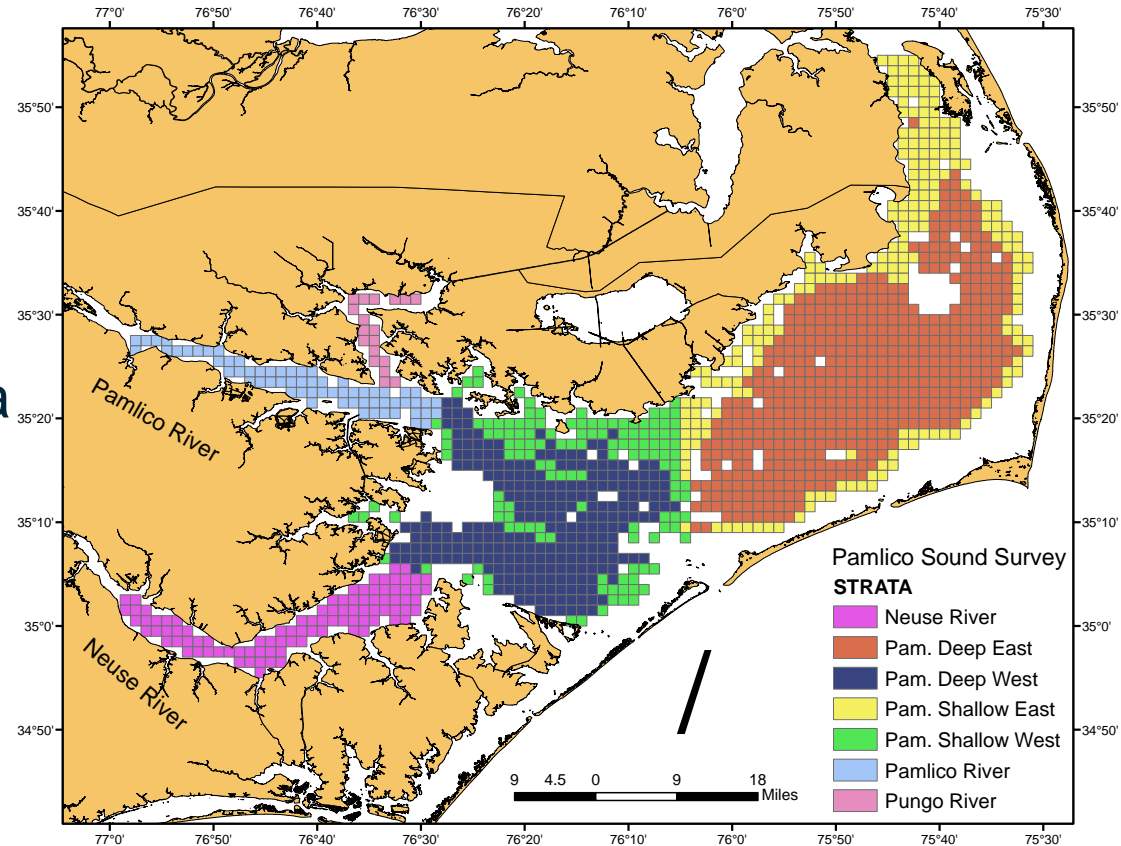
Pamlico Sound Trawl Survey

Methods

- Long time series (1987)
- Strata are depth and area
- 30 foot trawl
- 20 minute tow time

Products

- Identify ecological functions in support of Strategic Habitat Areas
- Index of abundance



Fishery Independent Biological Sampling

Stratified Random Survey

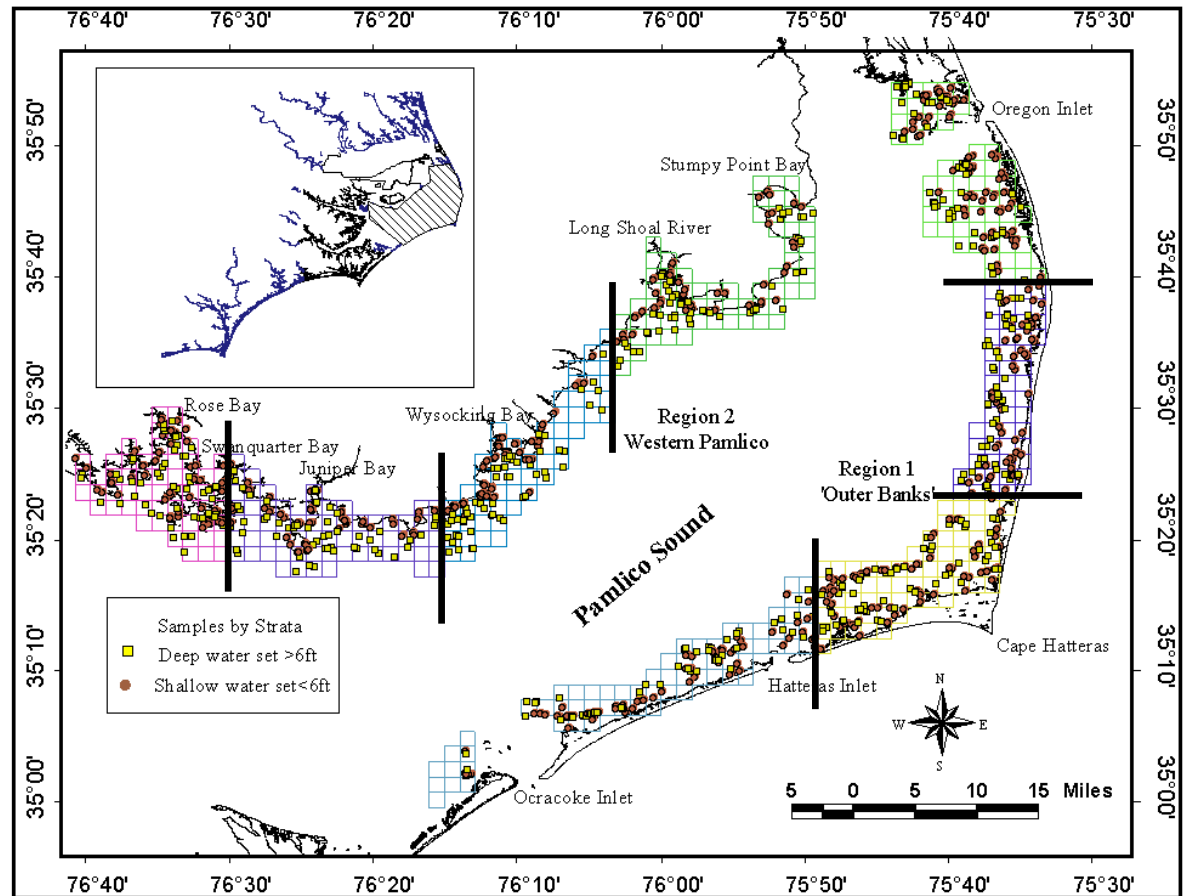
Pamlico Sound
Independent Gill Net Survey (example of an adult survey)

Methods

- Strata are depth and area
- Standardized gear and soak time

Products

- Index of abundance
- Habitat use
- Life history information



Fishery Independent Biological Sampling

WHY DO WE NEED BOTH DEPENDENT AND INDEPENDENT SAMPLING?

- Dependent sampling accounts for removals from fish stocks by size and age. Requires public interaction/participation
- Independent surveys track trends in relative abundance and also address other critical data needs such as evaluating critical habitat
- Independent surveys are scientifically designed and sampling methods are standardized to minimize sampling bias.
- Combined, both sources of data give managers a more complete picture to understand stock conditions and also to evaluate the likely causes leading to changes in stock status

Questions?



Department of Environmental Quality

