MARYLAND DEPARTMENT OF NATURAL RESOURCES

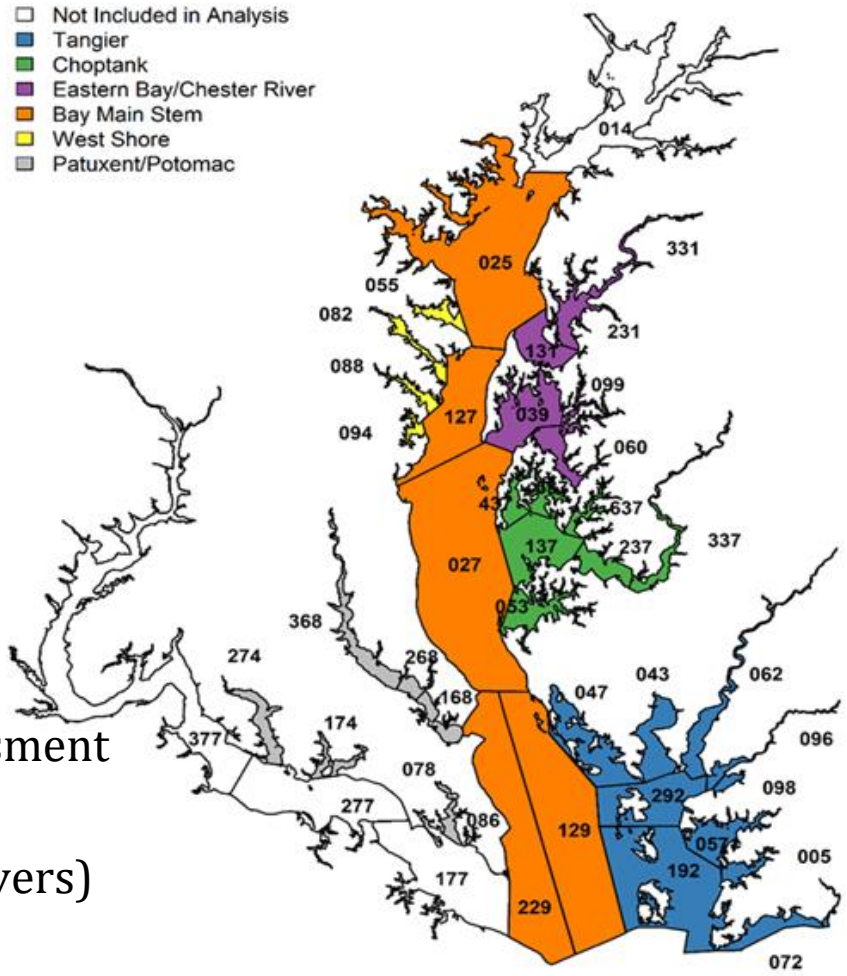
Maryland Oyster Stock Assessment Update 2021

June 8, 2021

Update of 2018 Assessment

- Same Methods were Used
  - Updated the stage-structured and reference point models
- Updated Data were Used
  - Harvest data (Buy ticket data)
  - Fall Dredge Survey
  - Seed and Shell data (some corrections)
- 2020-2021 season was used
  - Assessment timeframe is October 1999 through March 2021

Spatial Scale - NOAA Codes



Conducted individual analyses for 36 NOAA Codes organized into 6 Regions

Tangier Sound
Choptank River
Eastern Bay
Bay Mainstem
Patuxent and Potomac
Western Shore

Excluded from assessment due to lack of data:
094 (Rhode/West Rivers)
055 (Magothy River)
098 (Monie Bay)

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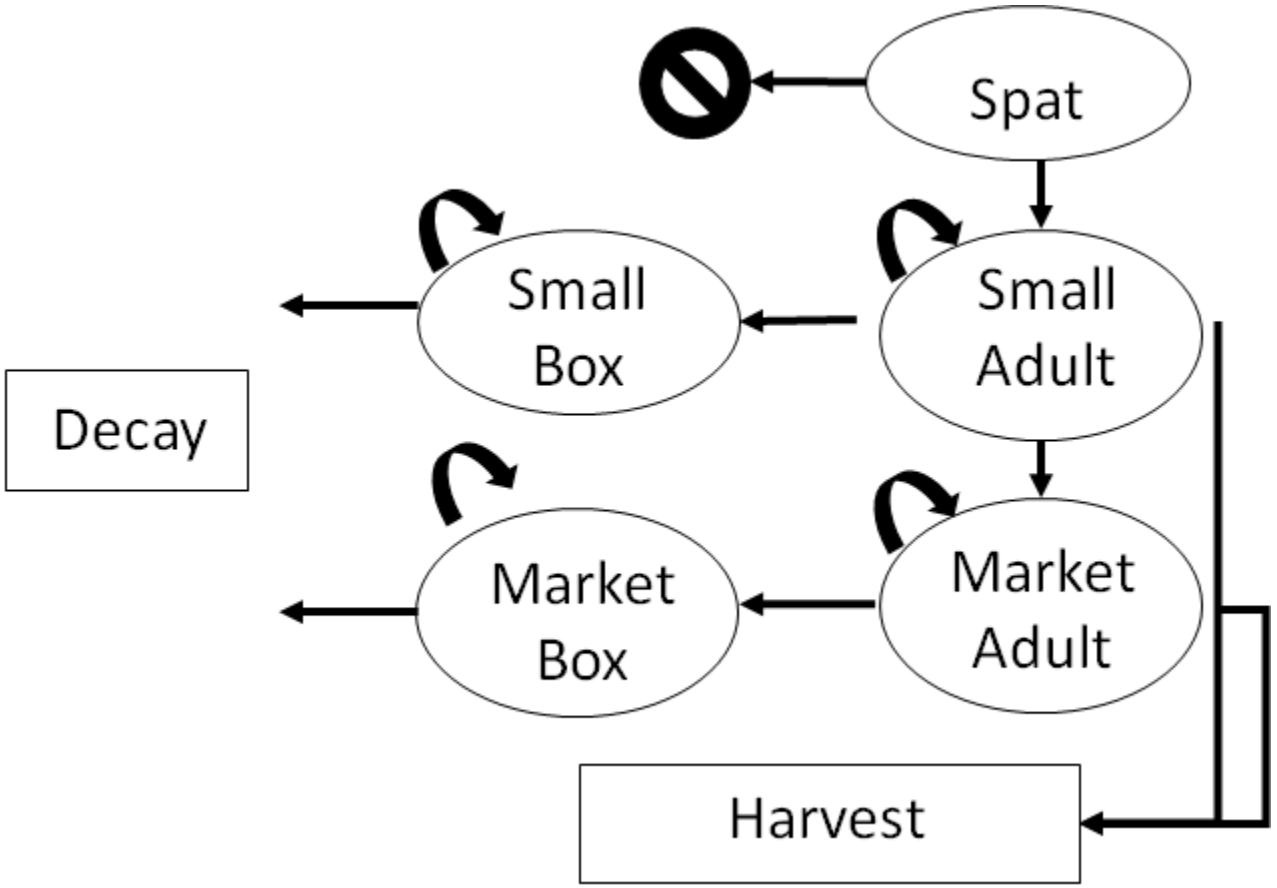
Stage-structured Model



Types of Results

Types of results estimated in model:

- Number of spat (<1 year old), small (>1 year old, < 3 inches), and market-sized oysters (>3 inches)
- Natural mortality rates (Fraction that die to causes other than harvest)
- Harvest fraction
- Habitat relative to 1980

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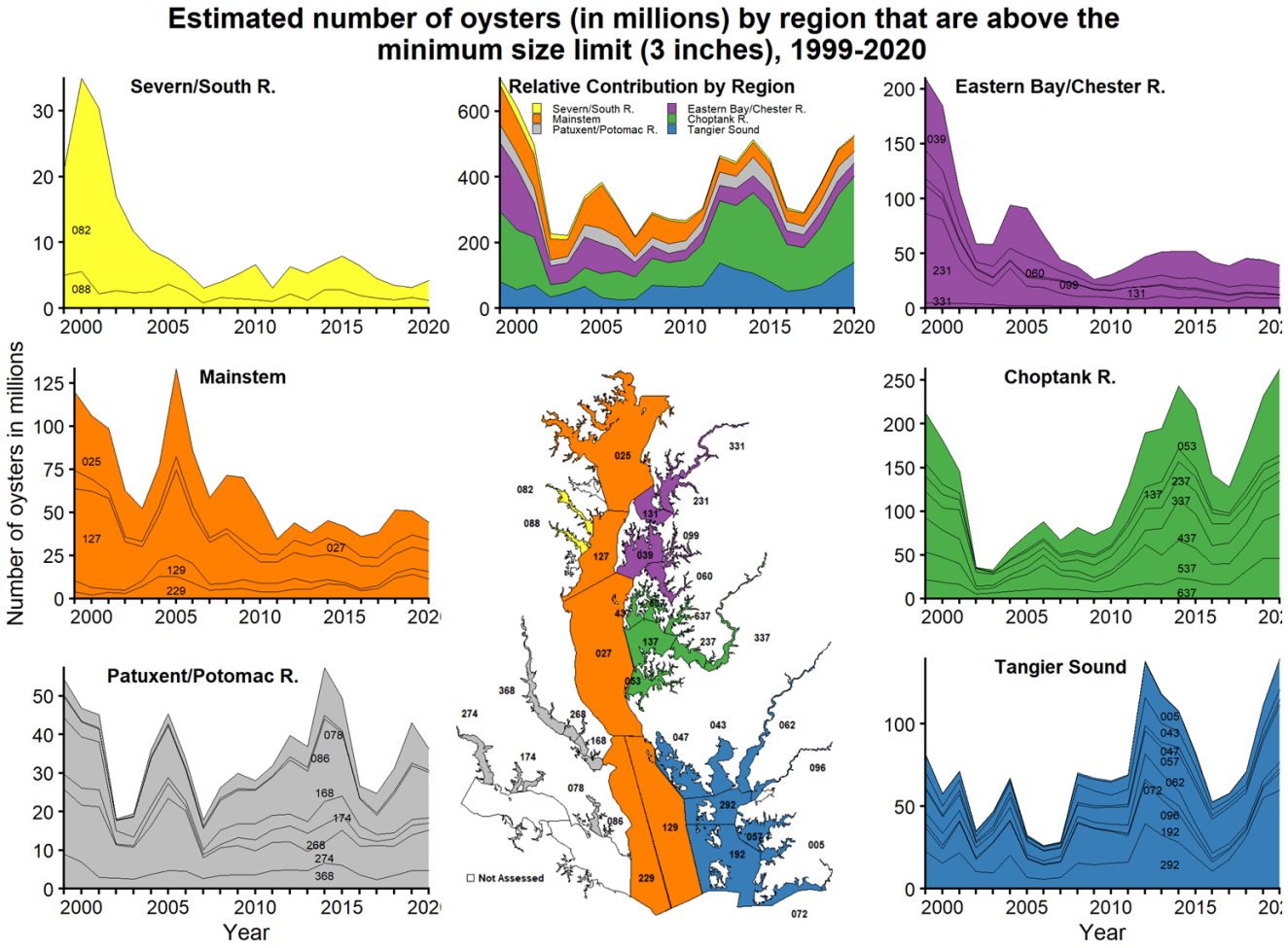
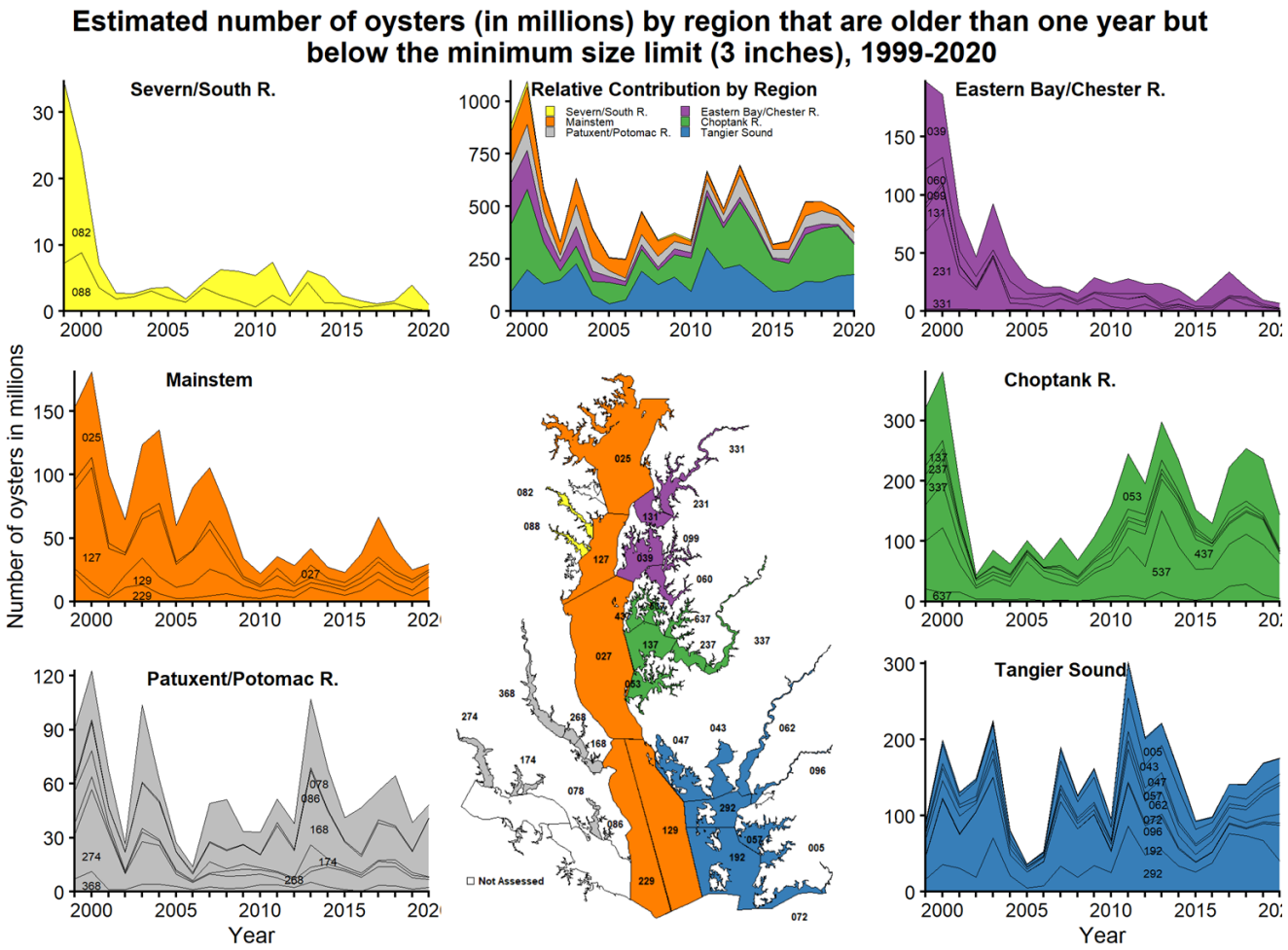
Market-Sized Oyster Results



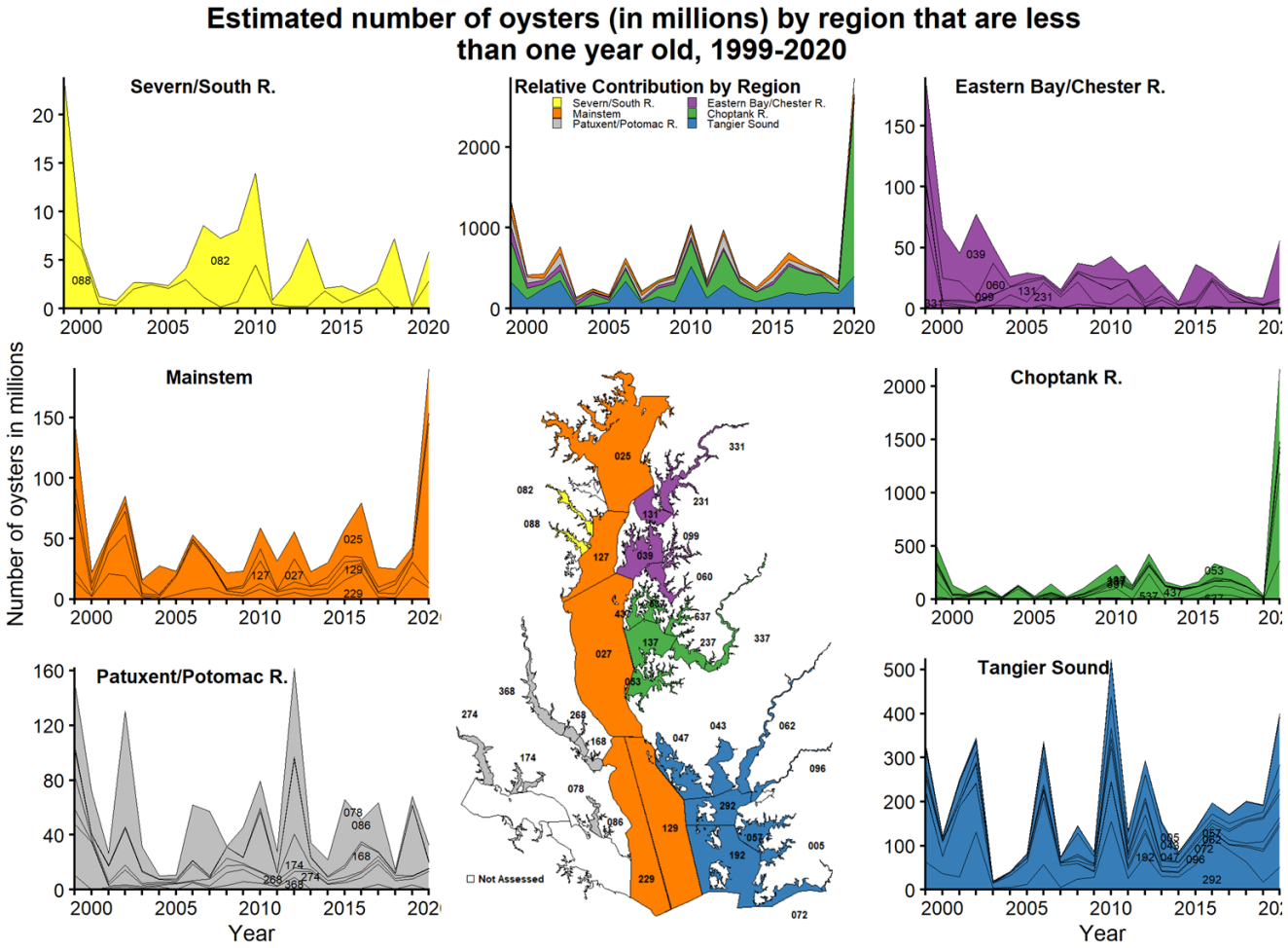
- Current year is 3rd highest since 1999
- Choptank and Tangier regions have increased to levels greater than 1999
- Some regions are still much lower than 1999 levels

Small-Sized Oyster Results



- Total abundance a little below 1999-2020 average
- Most regions similar to last year
- Tangier Sound region had increase from last year

Spat Results



- Current year is highest since 1999
- Choptank, Tangier, and Mainstem regions had the highest recruitment in 2020
- Average recruitment in other regions for 2020

Biological Reference Points

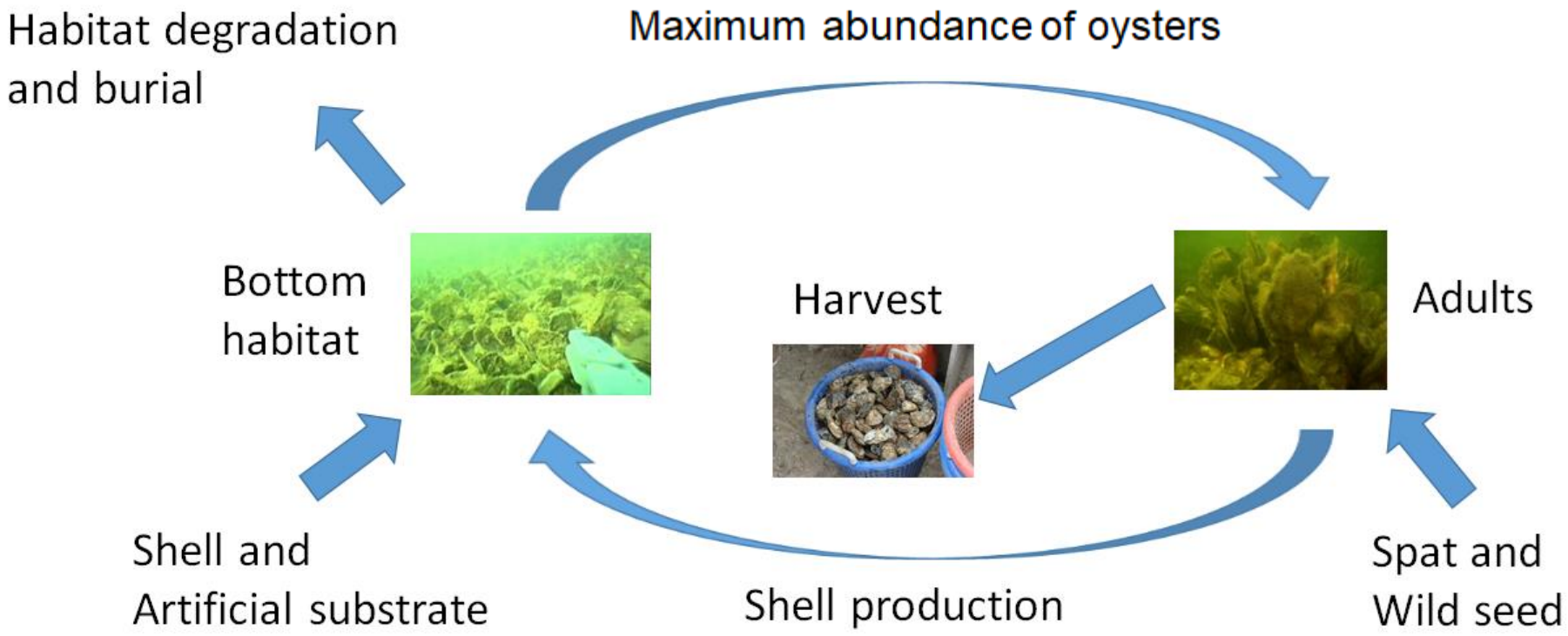
Harvest Rate (target and upper limit)

- Target rate is estimated as the fraction of market-sized oysters that maximizes long-term harvest while resulting in a stable or increasing oyster population
- Upper limit represents the absolute maximum harvest rate that can be sustainable, which will result in eventual disappearance the population if it is regularly exceeded
- Estimated using a model that includes oyster's reliance on shell for habitat and their production of shell
- Goal: Not allow the harvest rate to exceed the upper limit

Abundance (lower threshold only)

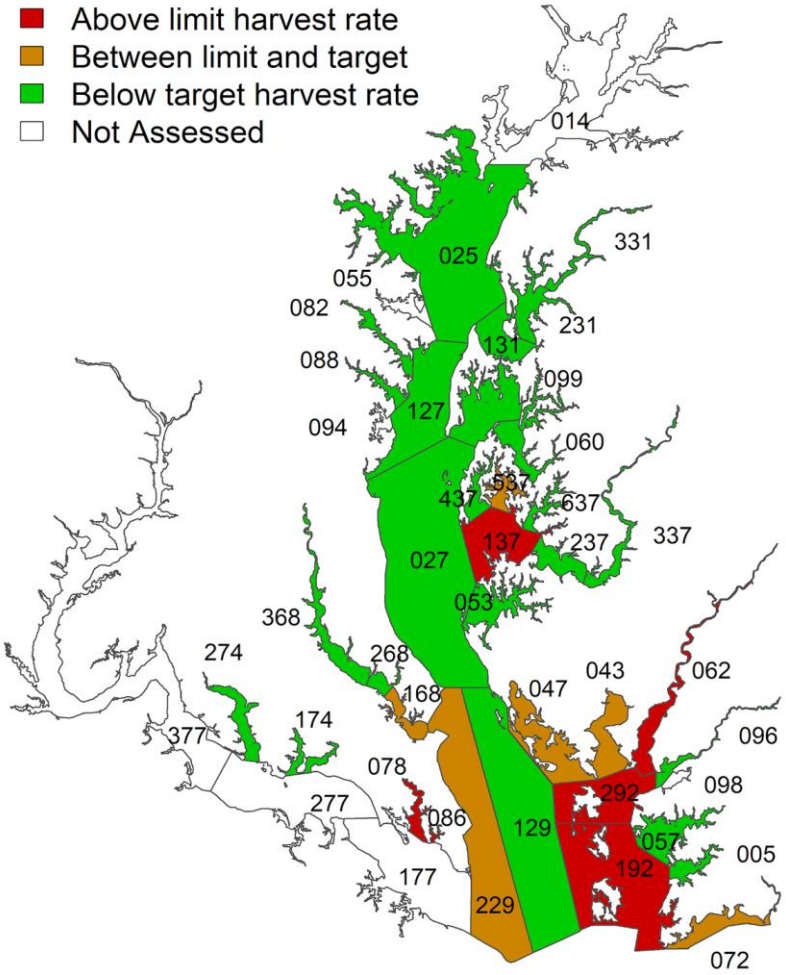
- Goal: Not allow abundance to decrease below the lowest levels observed
- Set to the minimum abundance estimated during 1999-2017

Reference Point Model



Harvest Rates 2020-21

Harvest rate (corrected for spat plantings) in the 2020-2021 season relative to target and upper limit harvest rates



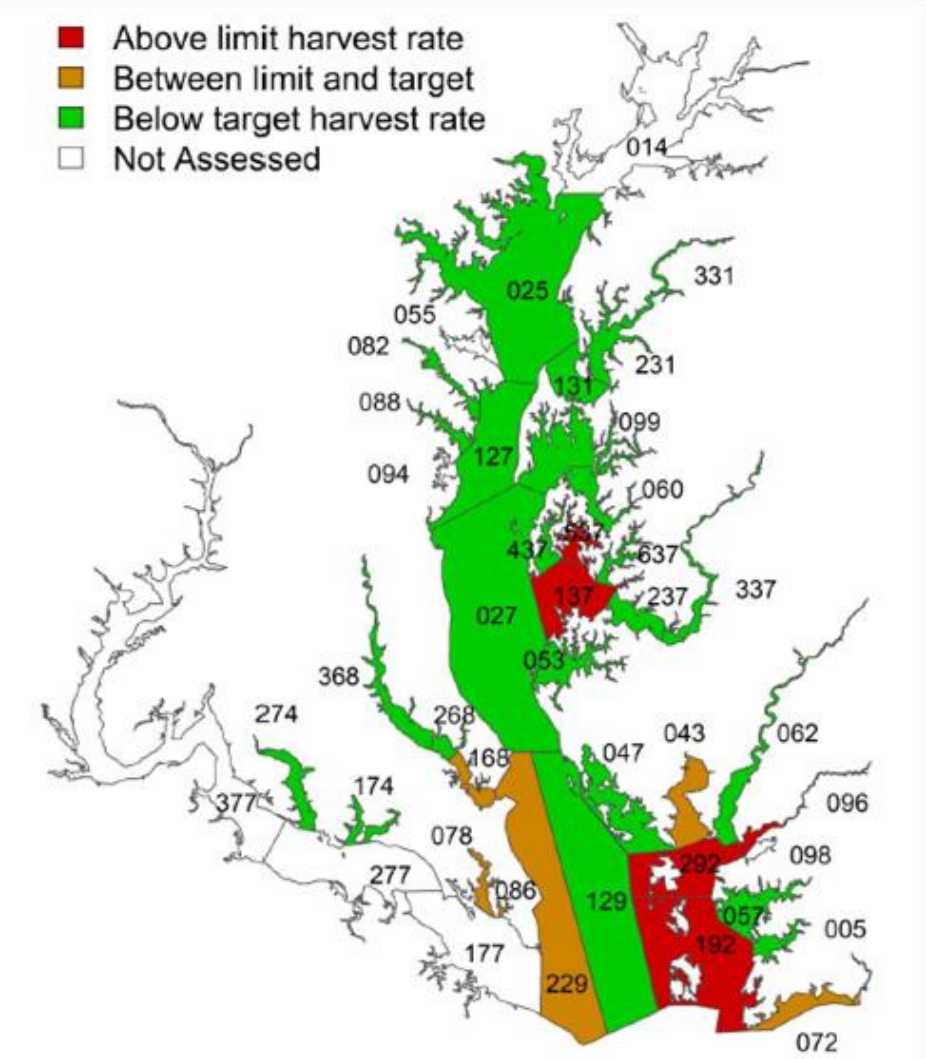
Green shaded boxes indicate fishing at or below the target rate.

Orange shaded boxes indicate fishing over the target rate and under the upper limit.

Red shaded boxes indicate fishing over the upper limit.

Harvest Rates 2019-20

As reported last year, harvest rate (corrected for spat plantings) in the 2019-2020 season relative to target and upper limit harvest rates



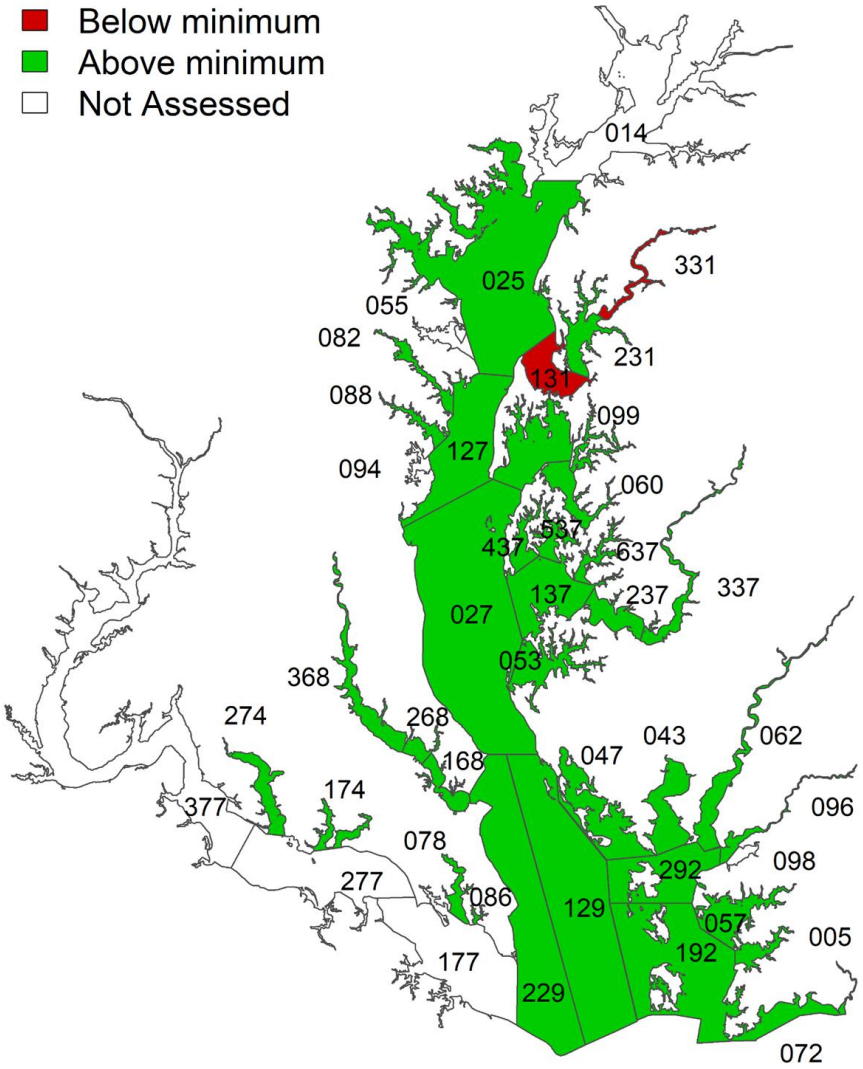
Green shaded boxes indicate fishing at or below the target rate.

Orange shaded boxes indicate fishing over the target rate and under the upper limit.

Red shaded boxes indicate fishing over the upper limit.

Market Abundance in 2020

Market abundance in 2020 relative to the lower threshold



Green shading indicates abundance above the lower threshold.

Red shading indicates abundance below the lower threshold.

Summary of Findings

Updated Results for Assessment and Biological Reference Points:

- Generally, the status of oysters in Maryland is similar to the 2020 assessment update.
  - Notable: Spat highest since 1999. Markets 3rd highest since 1999
- 30/36 NOAA Codes are estimated to be below the upper limit fishing rate in the most recent year (83%).
- 34/36 NOAA Codes were above the minimum abundance threshold in the most recent year (94%).
  - Improvement in Severn River.

…….Detailed written report will be available by July 1, 2021……