# 2015 CHESAPEAKE BAY BLUE CRAB ADVISORY REPORT

Emilie Franke
ERT, CBSAC Coordinator
Management Board Meeting
July 9th, 2015

Chesapeake Bay Program
Science. Restoration. Partnership.

# Outline

- CBSAC and Annual Report Process
- Stock Status
- Management Advice and Data Needs
- Agreement Outcomes and Management Strategy

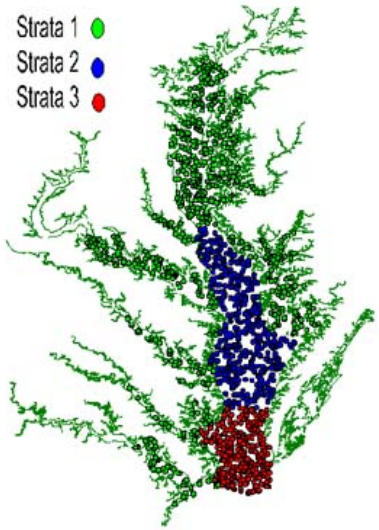
# Chesapeake Bay Stock Assessment Committee (CBSAC)

- Workgroup of the Sustainable Fisheries GIT
- Combines expertise of fisheries scientists/managers from the Chesapeake Bay region and federal fisheries scientists

# Annual Report Process

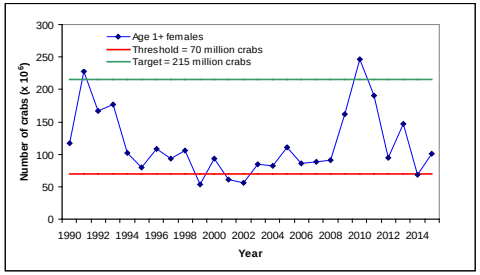
**December-March**

Annual Winter Dredge Survey and Abundance Estimates




**March-April**

Analysis of abundance and harvest estimate against the reference points (target/thresholds)




**May-June**

CBSAC develops the Blue Crab Advisory Report (stock status and science/ management recommendations)

**Ongoing**

Jurisdictions and CBSAC coordinate research on critical data gaps

# Stock Status Summary

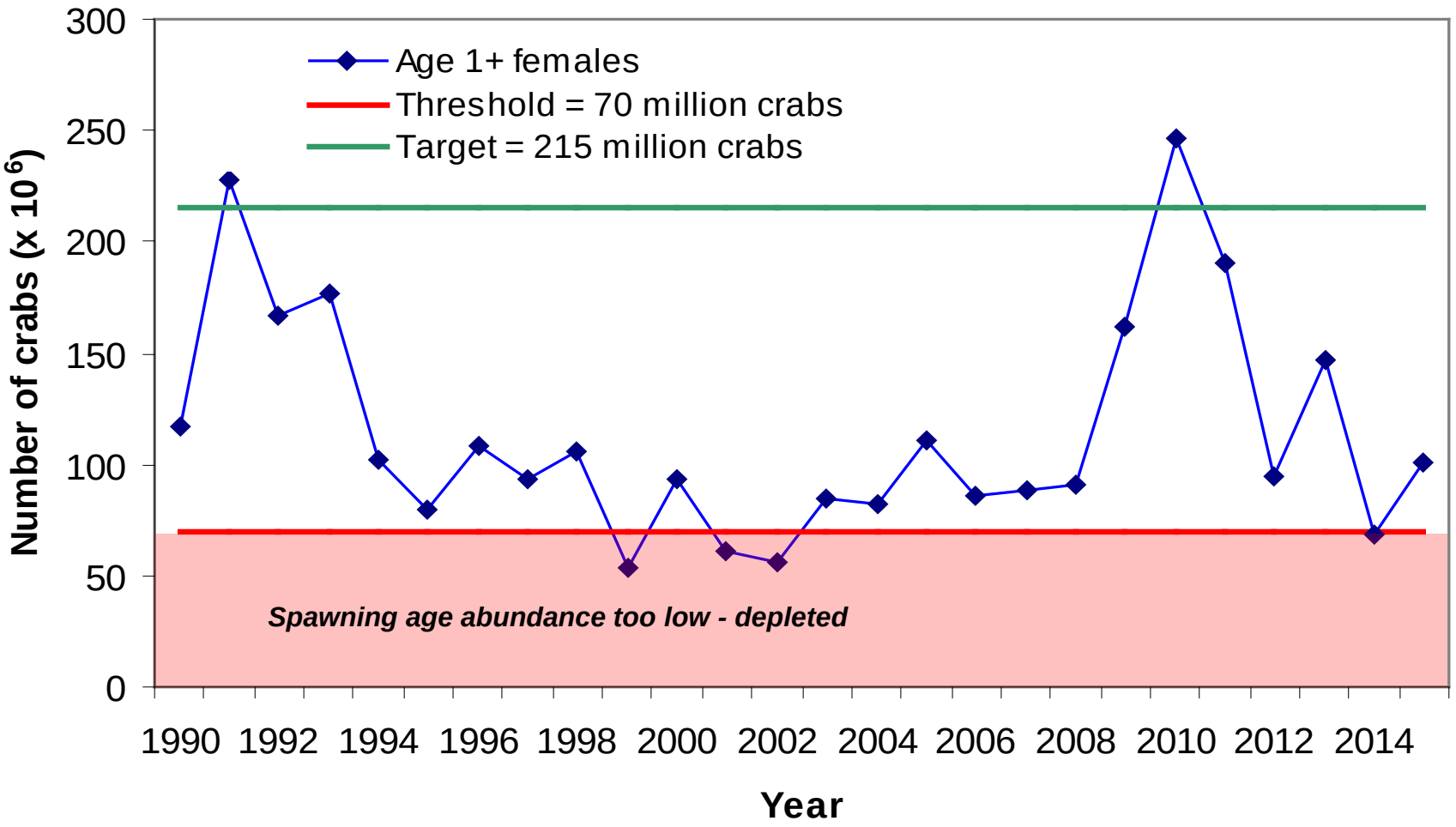
- The Chesapeake Bay blue crab stock is not depleted and overfishing is not occurring.
- Spawning-age female abundance increased from a depleted status of 68.5 million in 2014 to 101 million in 2015, but are still below the 215 million target.
- The female exploitation fraction was 17% in 2014, the seventh consecutive year below the 25.5% target.
- Abundance of all crabs increased from 297 million in 2014 to 411 million in 2015.
- Male abundance increased from 29 million in 2014 to 44 million 2015, but remains relatively low.
- Juvenile crabs increased from 198 million in 2014 to 269 million in 2015. Blue crab recruitment is highly variable and affected by a number of environmental factors, including winter temperatures, predation, coastal currents and weather patterns.
- Overwintering mortality of all crabs is estimated at 16% due to the cold temperatures during the 2014-15 winter.

The Chesapeake Bay blue crab stock **not depleted and overfishing is not occurring.**

| Control Rule | Reference Points | | | Stock Status | | | | |
|---|---|---|---|---|---|---|---|---|
| | Period | Target | Threshold | 2011 | 2012 | 2013 | 2014 | 2015 |
| **Exploitation Fraction** | Current, Female-specific | 25.5% | 34% (max) | 24% | 10% | 23% | 17% | TBD |
| **Abundance** (millions of crabs) | Current, Female-Specific | 215 | 70 (min) | 190 | 97 | 147 | 68.5 | 101 |

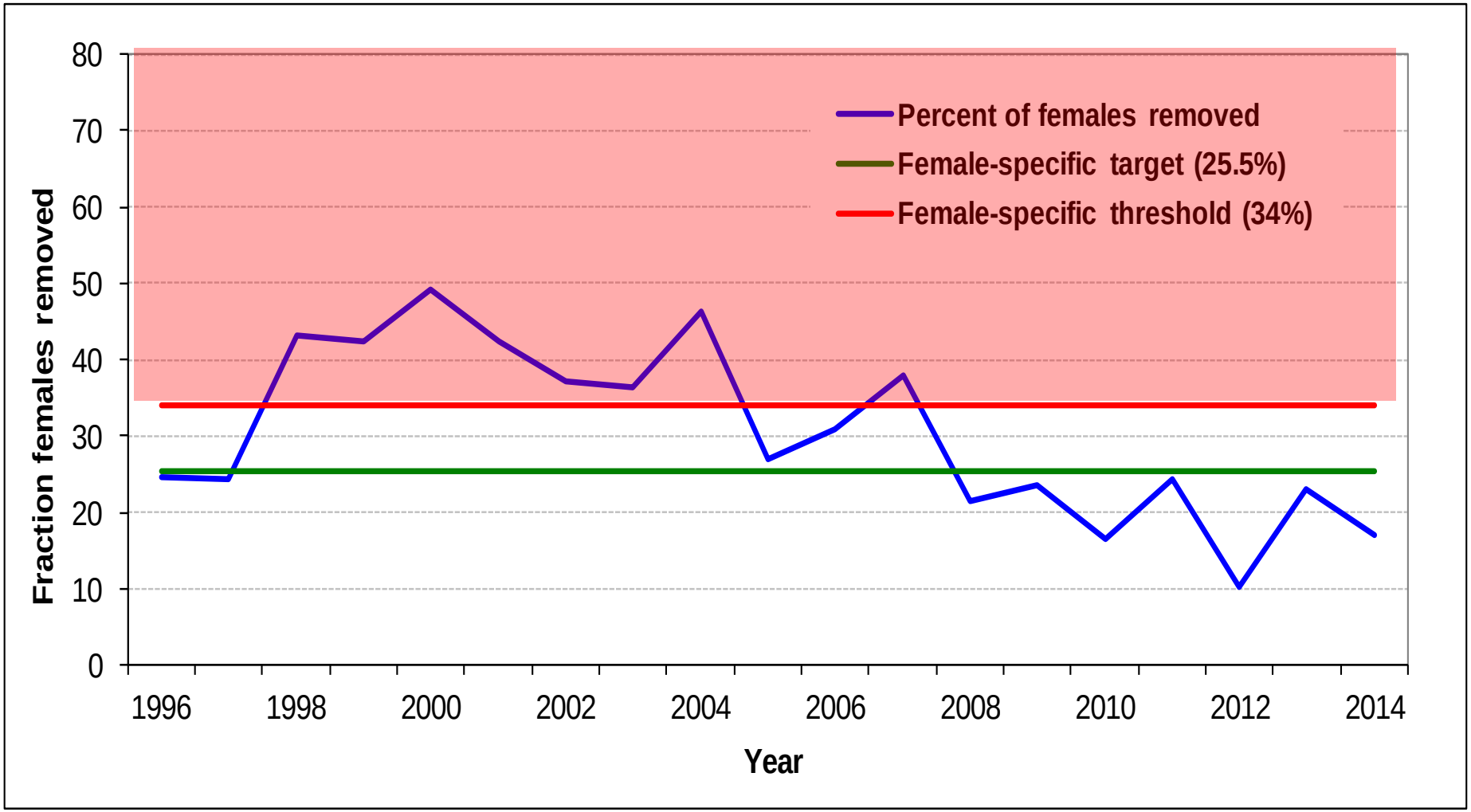
# Adult Female Abundance

Winter dredge survey estimate of **abundance of female blue crabs age one year and older (age 1+)** 1990-2015 with female-specific reference points. These are female crabs measuring greater than 60mm across the carapace and are considered the 'exploitable stock' that will spawn within the coming year.



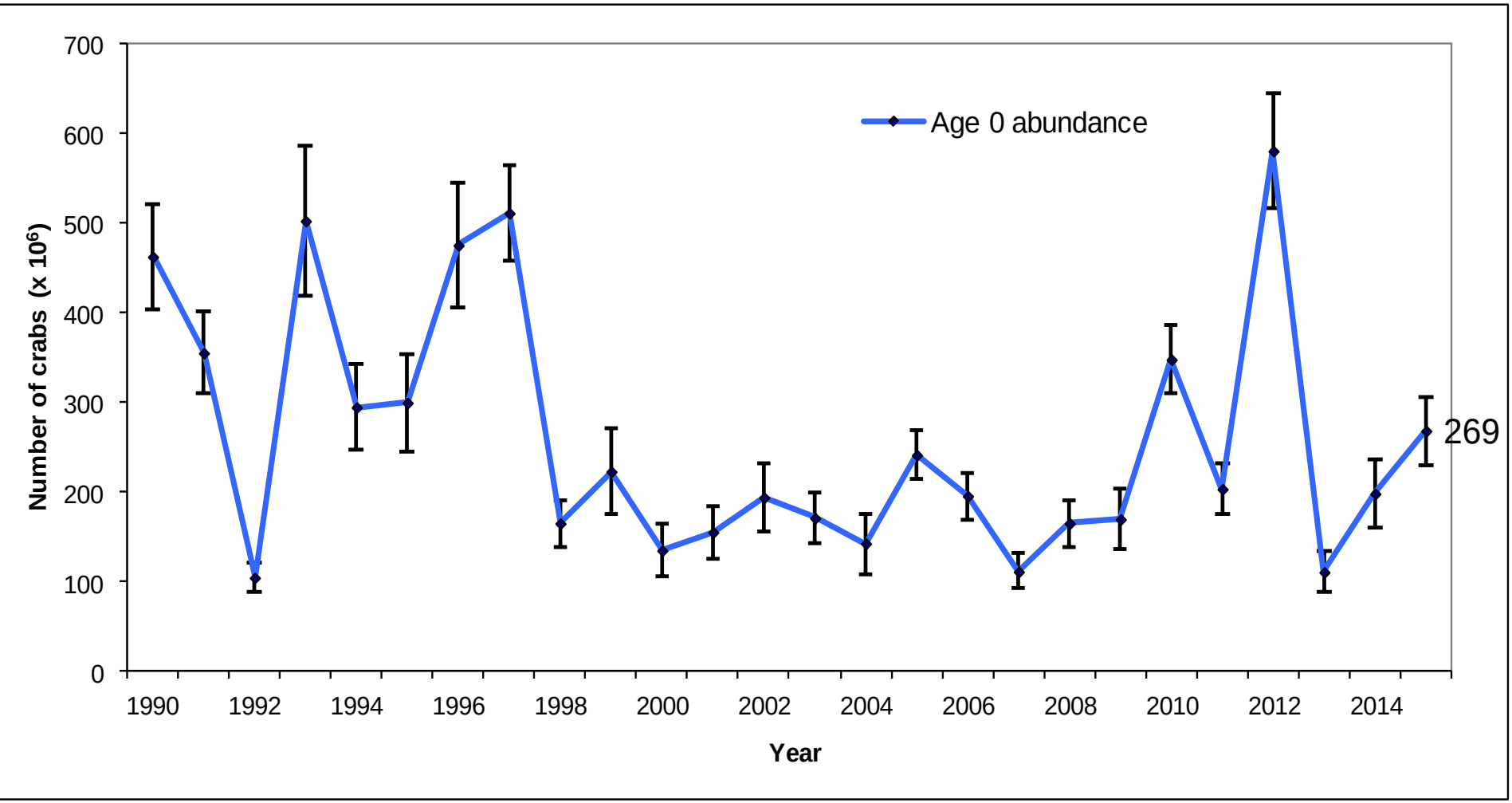
# Female Exploitation Fraction

The percentage of all female blue crabs removed from the population each year from 1990-2014 by fishing relative to the female-specific reference points. Exploitation rate (% removed) is the number of female crabs harvested within a year divided by the female population (age 0 and age 1+) estimated at the beginning of the year.



# Juvenile Abundance

Winter dredge survey estimate of **abundance of juvenile blue crabs (age 0)**, 1990-2015 calculated without the catchability adjustment for juveniles. These are male and female crabs measuring less than 60mm across the carapace. Error bars represent 95% confidence intervals.



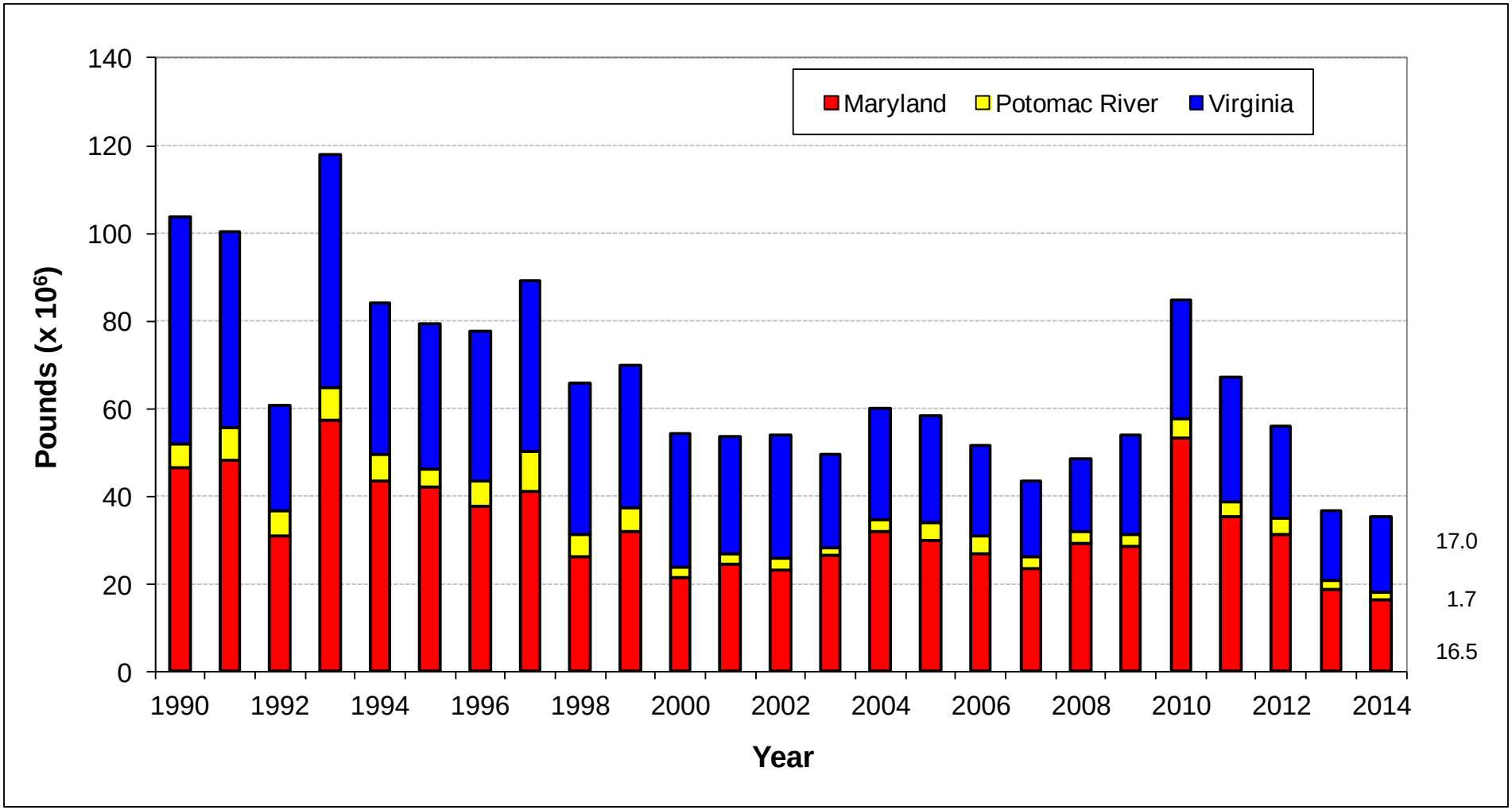
# Overwintering Mortality

Baywide abundance estimates for 2015 before and after overwintering mortality. Overwintering mortality decreased the abundance of all sectors of the blue crab population in 2014. 2014 estimates of overwintering mortality are some of the highest values in recent history.

| Baywide Age/sex group | Abundance estimate in millions before overwintering mortality (millions of crabs) | Final abundance estimate in millions after overwintering mortality (millions of crabs) | % Overwintering mortality |
|---|---|---|---|
| All crabs | 487 | 411 | 16% |
| Juveniles | 302 | 269 | 11% |
| Adult Females | 125 | 101 | 19% |
| Adult Males | 61 | 44 | 28% |

# Commercial Harvest

Total commercial blue crab landings (all market categories) in Chesapeake Bay, 1990-2014.



# Management Advice

Short Term

- Maintain a risk-averse management approach protecting 2015 recruits.
- Improve harvest accountability and quality of catch and effort data submitted by commercial and recreational crabbers.

Long Term

- As stated in the 2014 Watershed Agreement, evaluate the establishment of a Baywide allocation-based management framework.
- Consider a year-round sanctuary in Virginia and complementary management measures in Maryland and PRFC to protect mature females.

*See Advisory Report for full list

# Critical Data and Analysis Needs

- Increased accountability and improved harvest reporting for both commercial and recreational fisheries.
- Improve recruitment estimates through shallow water survey.
- Investigation of the potential for sperm limitation.
- Other sources of incidental mortality (specifically sponge crab discards, unreported losses after harvest from the peeler fishery, disease, and predation).

*See Advisory Report for full list

# Blue Crabs in the Agreement


***Blue Crab Abundance Outcome :*** Maintain a sustainable blue crab population based on the current 2012 target of 215 million adult females. Refine population targets through 2025 based on best available science.

***Blue Crab Management Outcome :*** Manage for a stable and productive crab fishery including working with the industry, recreational crabbers and other stakeholders to improve commercial and recreational harvest accountability. By 2018, evaluate the establishment of a Bay-wide, allocation-based management framework with annual levels set by the jurisdictions for the purpose of accounting for and adjusting harvest by each jurisdiction.

# Blue Crab Management Strategy


Blue crab abundance is influenced by various ecosystem factors that cannot be controlled by managers. Managers rely on the best available science and data to inform decisions.

CBSAC and the annual Blue Crab Advisory Report are an integral part of current management efforts and assessing progress.

The upcoming benchmark stock assessment* is a major component of the management approach to provide in-depth analysis of the blue crab population, fishery and management reference points.

*pending available funding

**CBSAC Members:**

| | |
|---|---|
| Joe Grist (Chair) | Virginia Marine Resource Commission |
| Ellen Cosby | Potomac River Fisheries Commission |
| Glenn Davis | Maryland Department of Natural Resources |
| Lynn Fegley | Maryland Department of Natural Resources |
| Daniel Hennen | NMFS, Northeast Fisheries Science Center |
| John Hoenig | Virginia Institute of Marine Science |
| Eric Johnson | University of North Florida |
| Rom Lipcius | Virginia Institute of Marine Science |
| John McConaugha | Old Dominion University |
| Tom Miller | UMCES, Chesapeake Biological Laboratory |
| Rob O'Reilly | Virginia Marine Resource Commission |
| Amy Schueller | NMFS, Southeast Fisheries Science Center |
| Mike Seebo | Virginia Institute of Marine Science |
| Alexei Sharov | Maryland Department of Natural Resources |
| Mike Wilberg | UMCES, Chesapeake Biological Laboratory |

# QUESTIONS?

Contact: emilie.franke@noaa.gov

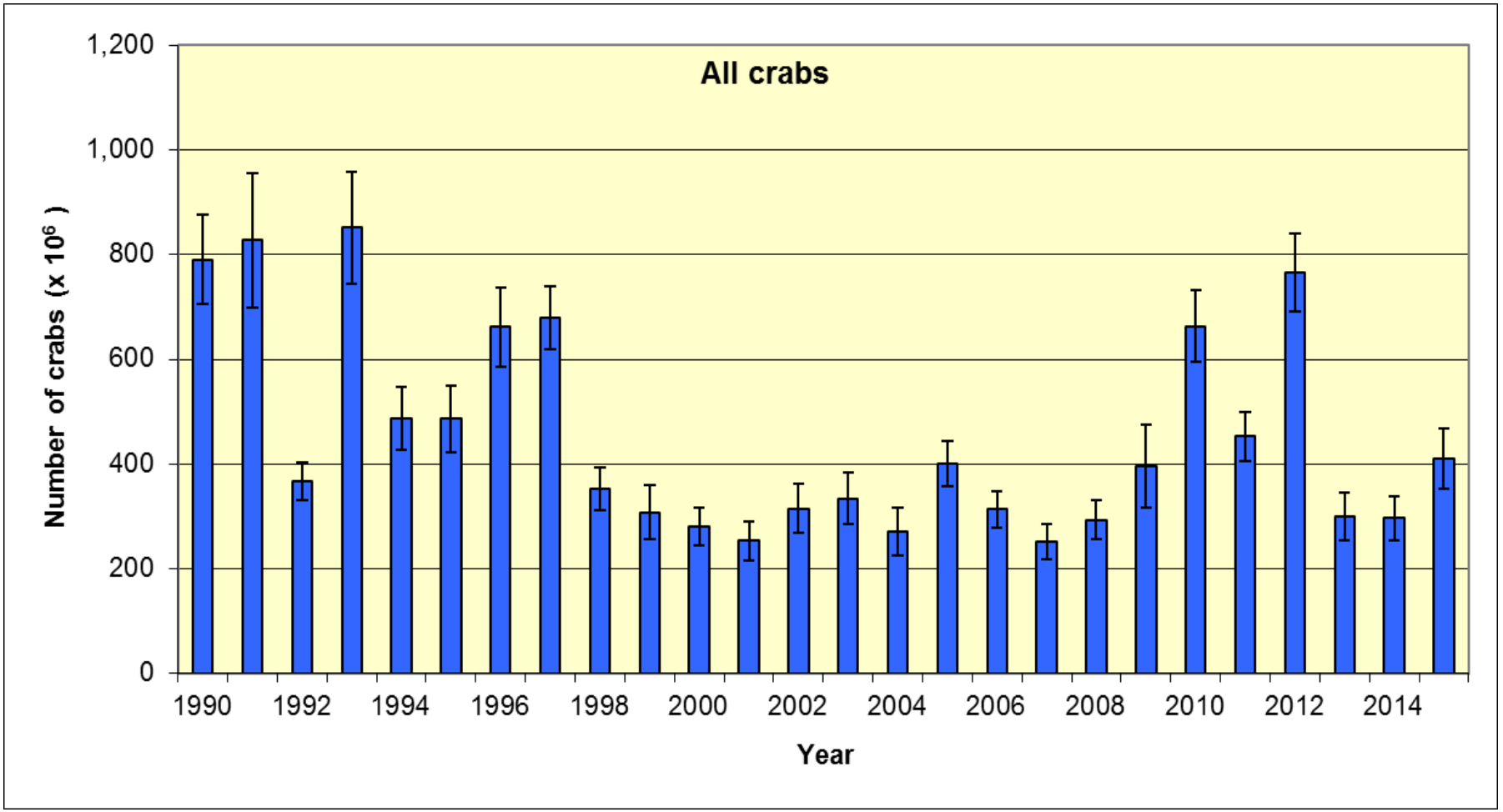
CBSAC Report
http://www.chesapeakebay.net/documents/CBSAC_2015_Advisory_Report_6-30_FINAL.pdf

CBP Press Release
http://www.chesapeakebay.net/presscenter/release/blue_crabs_doing_better_but_report_notes_theres_still_room_for_improvement

Blue Crab Management Strategy
http://www.chesapeakebay.net/documents/22029/1a_blue_crab_6-24-15_ff_formatted.pdf

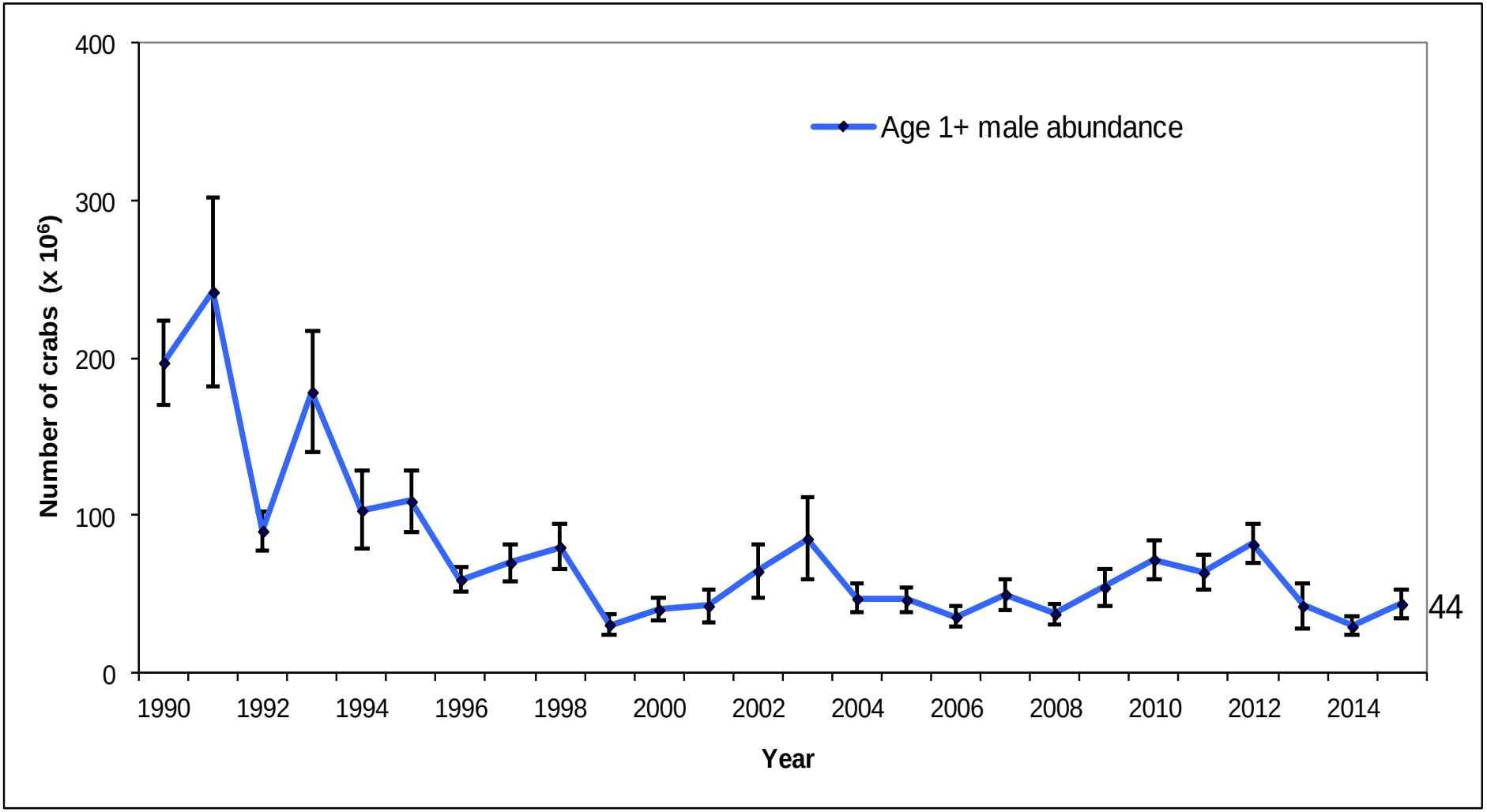
# Total Crab Abundance

Winter dredge survey estimate of abundance of all crabs (both sexes, all ages) in Chesapeake Bay, 1990 through 2015. Error bars represent 95% confidence intervals.



# Adult Male Abundance

Winter dredge survey estimate of **abundance of male blue crabs age one year and older (age 1+)** 1990-2015. These are male crabs measuring greater than 60mm across the carapace and are considered the 'exploitable stock' capable of mating within the coming year. Error bars represent 95% confidence intervals.



# Overwintering Mortality

Percent dead crabs found in late winter dredge samples each year from 2012-2015 and the average for 1996-2011[1]. 2014 estimates of overwintering mortality are some of the highest values in recent history.

| Bay wide Age/sex group | 2015 | 2014 | 2013 | 2012 | 96-11 avg |
|---|---|---|---|---|---|
| All crabs | 15.98% | 3.79% | 4.00% | 1.59% | 4.78% |
| Juveniles | 10.84% | 0.89% | 0.00% | 0.52% | 1.00% |
| Adult Females | 19.25% | 7.68% | 3.00% | 2.69% | 9.53% |
| Adult males | 28.11% | 13.58% | 13.88% | 4.90% | 9.11% |

[1] 1996 was the first year MDNR sampled specifically in mid to late March to assess the level of over-wintering mortality. 1996 – 2010 values are Maryland only. Mortality in random samples from Virginia's portion of the dredge survey were incorporated beginning in 2011 by applying the percent dead crabs according to sampling vessel.