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Testimony before
The Unites States House of Representatives
Committee on Resources

Hearing on
The Status of the Eastern Oyster (*Crassostrea virginica*) and the Petition to List the Eastern Oyster as Endangered or Threatened under the Endangered Species Act

July 19, 2005

Mr. Chairman and Members of the Committee, thank you for inviting me to testify on this issue of importance to the Eastern oyster and implementation of the Endangered Species Act (ESA). Clarity about the oyster's status and risk of extinction are critical. The public and key decision makers need to be well informed to appropriately declare a species threatened or endangered. The establishment of the Status Review Team by the National Marine Fisheries Service (NMFS) is a needed step in bringing clarity and accuracy to this issue.

Oysters are a critical component of a healthy Chesapeake Bay ecosystem, with an unparalleled ability to filter water and remove nutrient pollution. The State of Maryland and the Department of Natural Resources (DNR) are committed to restoring a viable oyster population in the Chesapeake Bay.

DNR does **NOT** support the petition to list the Eastern oyster as threatened or endangered under the ESA. This oyster is neither at risk of extinction nor threatened such that it may become at risk of extinction, and thus does not qualify for ESA listing. Data clearly demonstrates this. My testimony is limited to Maryland's situation, however an abundance of supporting data from other Eastern and Gulf Coast areas exists.

There are two components central to our position:

1. The status of the oyster: A review of the oyster's status will demonstrate that it is not at risk as a species. The oyster reproduces, broodstock are intact, the oyster is widely distributed throughout its historic range, and habitat exists throughout its historic range.

2. The status of the petition: It is anticipated that a review of the petition will reveal possible factual errors in the case for listing the Eastern oyster. We urge the Status Review Team to closely examine the petition.

I will now expand upon the status of the Eastern oyster in Maryland.

Low Population Abundance

Oysters are essential to the Bay's ecology and an abundant population is needed to improve water quality.

The oyster population is at very low abundance. (DNR testified as such in October 2003 before the Subcommittee on Fisheries Conservation, Wildlife and Oceans.)

The population is clearly in need of recovery. By age four, up to 90 percent of the oyster population die from disease. Many historically productive oyster bars are no longer commercially productive. Attachment 1 documents oyster harvests since the 1870s; Attachment 2 indicates more recent harvest trends.

Harvest data have a serious limitation. They reveal the trend for market oyster populations (oysters equal to or greater than 3 inches) but do not accurately reflect the status of younger and

smaller oysters, or of broodstock (reproducing oysters) and the potential of a species to repopulate itself.

The collapse of the fishery and the market population does not signal a collapse in oyster broodstock or the ability to produce progeny. Diseases kill larger, older oysters but many younger, smaller oysters survive. Because oysters reproduce before they reach market size, the majority of brood oysters are small (submarket) and still in the Bay.

Areas with low to no harvest are not devoid of oysters. Since all oysters are not harvested, both market oysters and small oysters remain present on oyster bars. If conditions support spat sets (young oysters that have attached to oyster shells), then spat are present as well. DNR surveys hundreds of oyster bars each year. The results confirm that broodstock populations remain intact and reproducing. Survey results can be made available for study by the Status Review Team.

Therefore, concluding that an organism is unable to sustain itself as a species based upon harvest data and market collapse is an inaccurate analysis.

While neither an abundant population nor widespread recovery is at hand, neither is extinction or near-extinction. The definition of endangered under ESA is that a species is in danger of extinction. Threatened means a species is likely to become endangered in the foreseeable future. As stated earlier, the Eastern oyster does not fit the criteria for either category because of successful reproduction, intact broodstock and wide distribution of habitat and population throughout its historic range.

Reproduction

The oyster population can be divided into three broad size categories: spat, smalls and market oysters.

- Spat are new oysters less than 1 year old. They typically do not spawn.
- Smalls are oysters about 1 to 3 inches in size, which tend to be about 1 to 3 years old.
- Market oysters are oysters 3 inches or greater, and tend to be about 3 to 4 years old in Maryland.

Oysters become sexually mature adults and begin spawning at about 1 year old, when they are young smalls. Since it is the market size category that has mostly been lost due to disease and smalls are not harvested, the majority of broodstock in the Bay are small oysters. As they grow, they typically spawn at least twice before being harvested or lost to disease. The oyster population contains broodstock and these oysters reproduce and yield spat. The species is functional and replenishes itself. The population is at low abundance due to disease mortality of older, larger oysters.

Attachment 3 shows the historical record of spat set, measuring reproductive success. Survey results indicate stocks exist in sufficient numbers and are reproducing dominant year classes under suitable environmental conditions. Significant spat sets are observed since the mid 1980s, even though diseases were killing many oysters and populations fell to record low levels.

During the 1970s oysters were much more abundant than today and market oysters were also abundant. In spite of this, spat sets were low.

The conclusion is that reproduction in Maryland is highly variable and not closely linked to the abundance of oysters. Attachments 3 and 4 illustrate spat setting patterns, which indicate reproduction is driven more by salinity patterns due to rainfall than by population abundance.

The 1970s were wet as were other times of low sets such as 1984, ’88, ’89, 1993, ‘94, ’96, ’98, and 2003 and 2004. Periods of drought and higher salinity typically, though not always, yield higher sets, as in 1980, ’81 and ’85, 1991 and ’97, and 1999 to 2002. Low salinity is more of an impediment to reproductive success than the low oyster population.

Low sets in any given year or geographic region (Attachments 3 and 4) do not mean the oyster is at risk of being lost. Sets were low in the 1970s, but rebounded during the ‘80s and ‘90s. Set was poor in 1988 (a wet year) but a record in 1991. After the low set of 1996, there was a record high set in 1997. The low sets of 2003 and 2004 are not a sign of crisis. Both years were very wet and reproduction can be expected to improve.

Therefore, while the oyster’s ability to rebuild its once abundant, older age classes has been negatively affected by high mortality due to disease, the survival of the species is not impaired.

Current Population Levels and Biomass

Based on calculations from a recent Chesapeake Bay Program project, the most recent population estimate for Maryland is in the hundreds of millions of oysters. This includes markets and smalls. This number does not include spat, or the tens of millions of seed oysters resulting from various restoration efforts.

Maryland’s oyster population is now surviving better than during the drought of 1999-2002 due to the rains of 2003 and 2004 that lowered salinity and decreased disease mortality. The result is that these oysters are growing and increasing their biomass (weight). Biomass is another measure of the oyster population that is not linked to skewed harvest records.

The population levels and biomass are doing best in areas that have experienced both a spat set and a reduction in disease mortality. This combination of factors provides new oyster stocks as well as encourages their survival and growth. Examples of such areas are Tangier Sound and St. Mary’s county.

Maryland oyster biomass began declining in 2001, due to the drought that started in 1999 and increased disease and mortality levels (Attachment 6). Harvest declined as well. Biomass reached a low point in 2003, but has increased slightly due to better survival during the rains of 2003-04. The biomass index measured by DNR is now .88 compared to the low point of .5 in 2003 (Attachment 5). The baseline standard is 1994, which had an index value of 1.

It is important to note, on the issue of “extinction” or “near extension” that the biomass index has recently increased, indicating the populations’ response to spat sets that survived and grew. A threatened or endangered population would not likely experience spat set followed by enhanced survival and biomass growth.

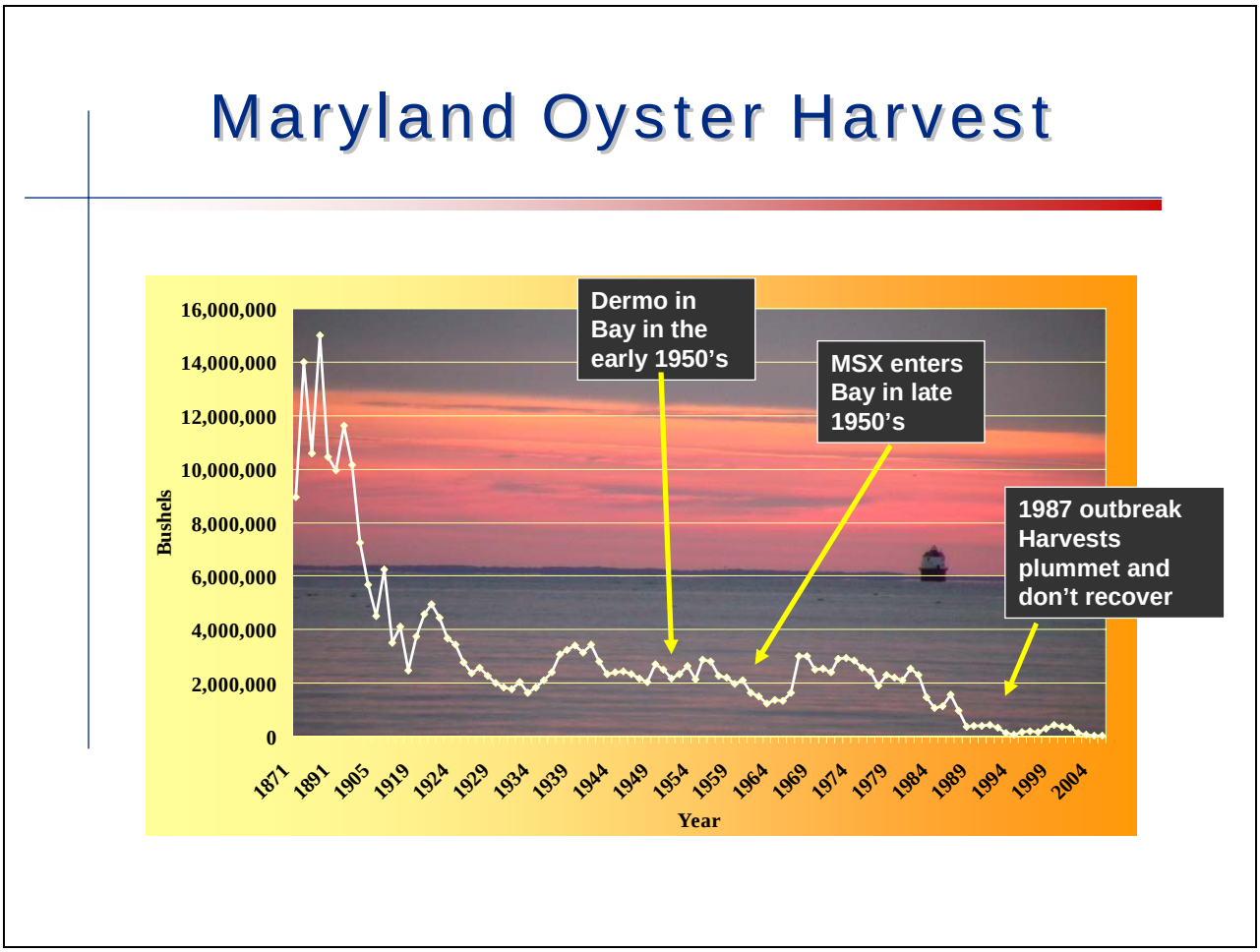
Are these signs that the oyster is coming back to its historic abundance? No. Diseases are entrenched and a chronic problem that suppresses broad recovery. But this data shows that as a species the oyster is functional and successfully replenishing itself and inhabiting oyster bar habitat.

Summary

Oyster stock abundance is low. This low abundance is due primarily to disease mortality. It does not appear that low abundance is impacting reproductive success, though it is negatively affecting the number of large adults in the population.

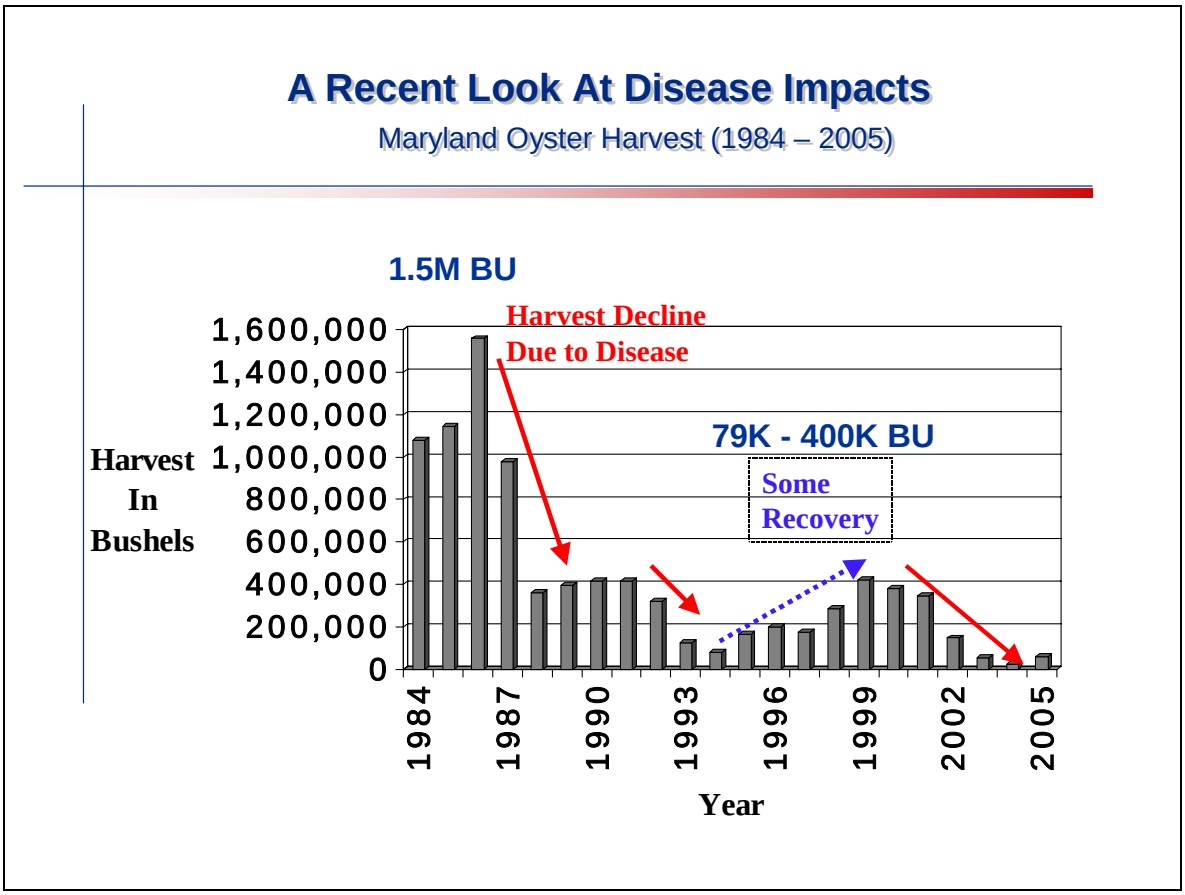
The Department does not support the petition to list the Eastern oyster as threatened or endangered.

Attachment 1: Maryland's Historical Oyster Harvest



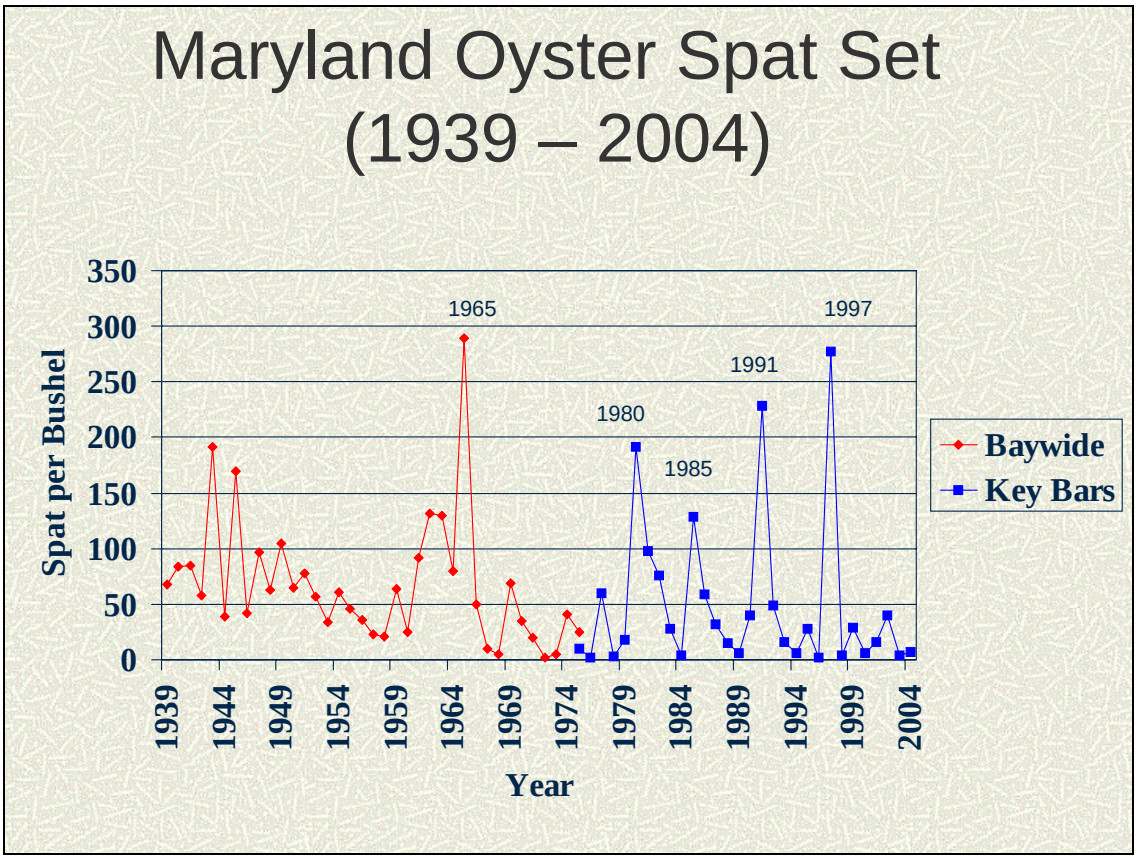
- Declining harvests in the early 1900s was due to over-harvesting.
- Restrictive laws and regulations controlled harvest and a period of relative stability resulted from about 1920 to the early 1980s.
- Diseases became an increasing problem in the early 1980s and especially in the mid 1980s. Diseases continue to be a chronic and widespread problem today.
- Harvests fell as market oysters were mostly killed by diseases.

Attachment 2: Recent Oyster Harvest



- The decline from the mid 1980s is highlighted in this graph.
- The slight rebound during the late 1990s (dotted line) was due to rainfall that lowered disease mortality and improved survival.

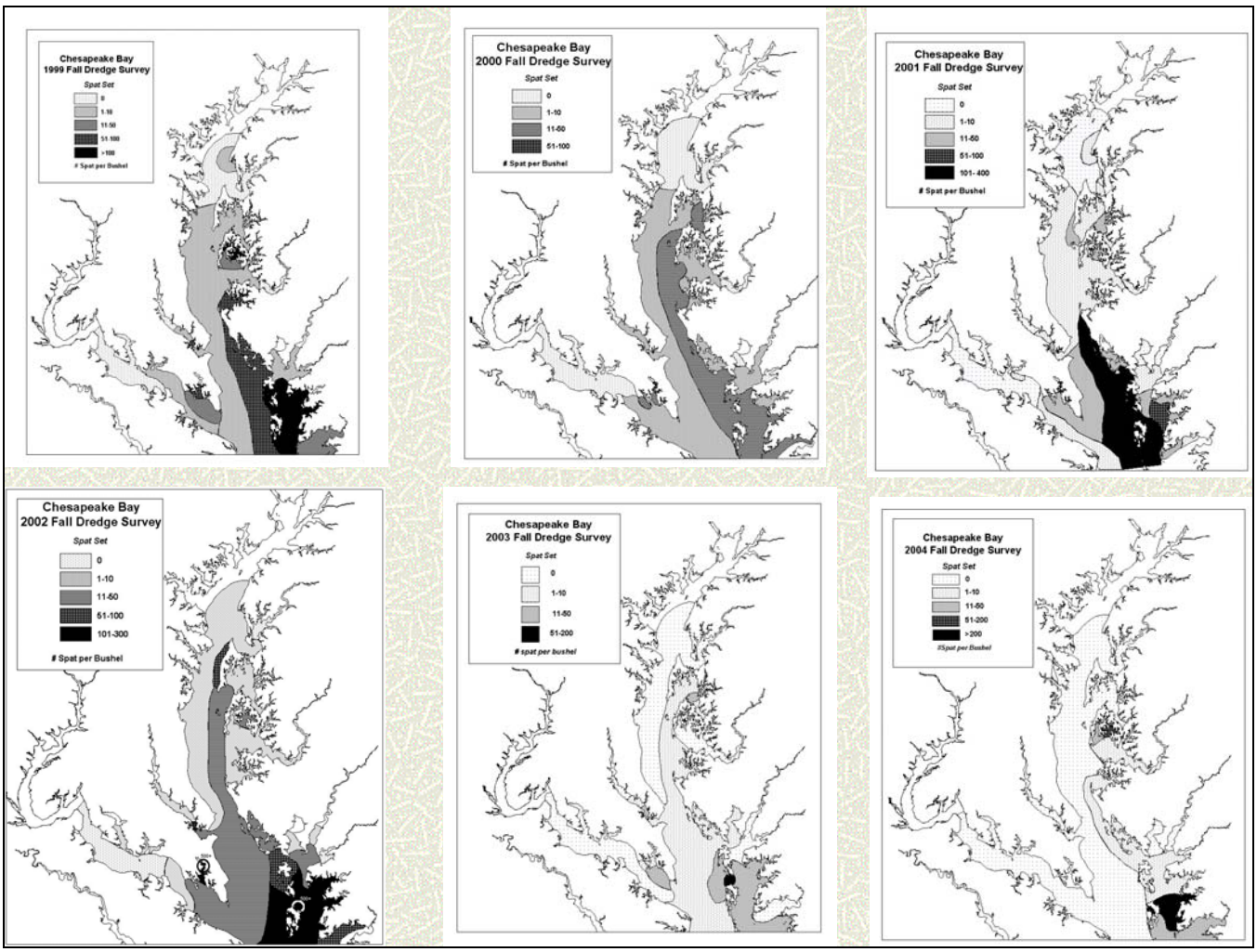
Attachment 3: History of Maryland Spat Set



- Years of high stock abundance can have low sets (1970s for example)
- Years of high stock abundance can have high sets (mid 1960s for example)
- Years of low stock abundance can have high sets (1980s for example)
- Years of low stock abundance can have low sets (some years in the 1980s and 1990s for example)
- Overall, stock abundance is not a significant factor for spat sets. Salinity as determined by rainfall is the main influence on set.
    - Fresher years correlate strongly with low sets.
    - Drier years correlate strongly with higher sets.
- Set is highly variable and mostly determine by rainfall.

Attachment 4: Geographic and Yearly Variability in Spat Set

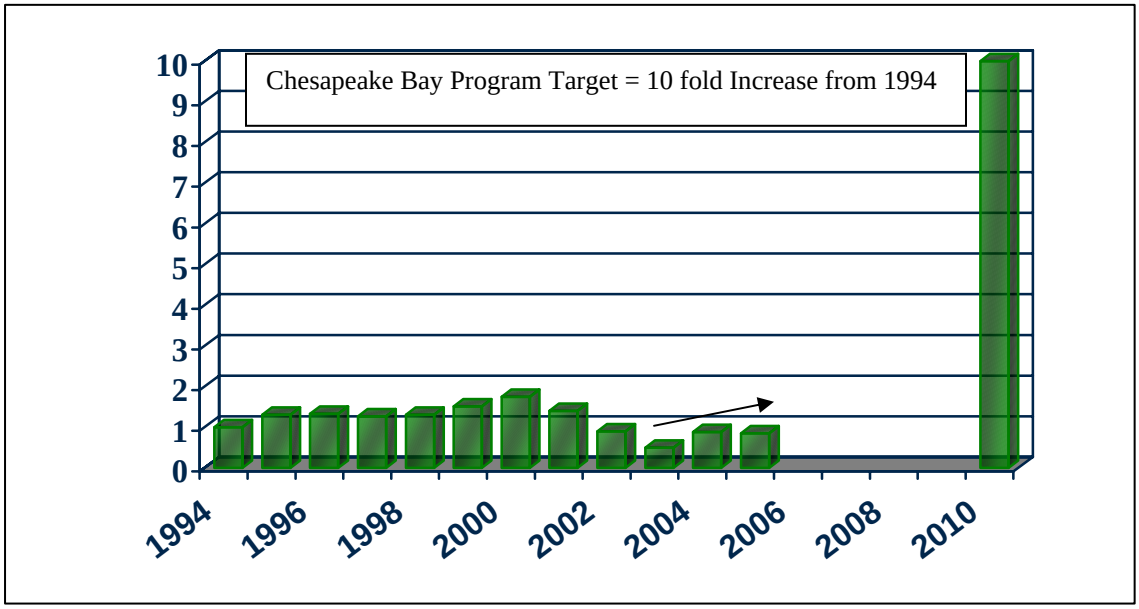
Maryland Spat Set: data expressed as the number of spat per bushel.



- These maps show variability in spat set by year and geographically throughout Maryland.
- Some areas typically receive low sets, while others typically receive moderate to high sets.
- The current low setting pattern is largely due to the high rainfall of 2003-04 that lowered salinity and impaired spat sets.
- During the 4-year drought of 1999-2002, sets were higher than they are currently.
- After periods of low sets due to rainfall, spat sets typically increase. See the annual data in Attachment 3.

Attachment 5: Maryland Biomass Index

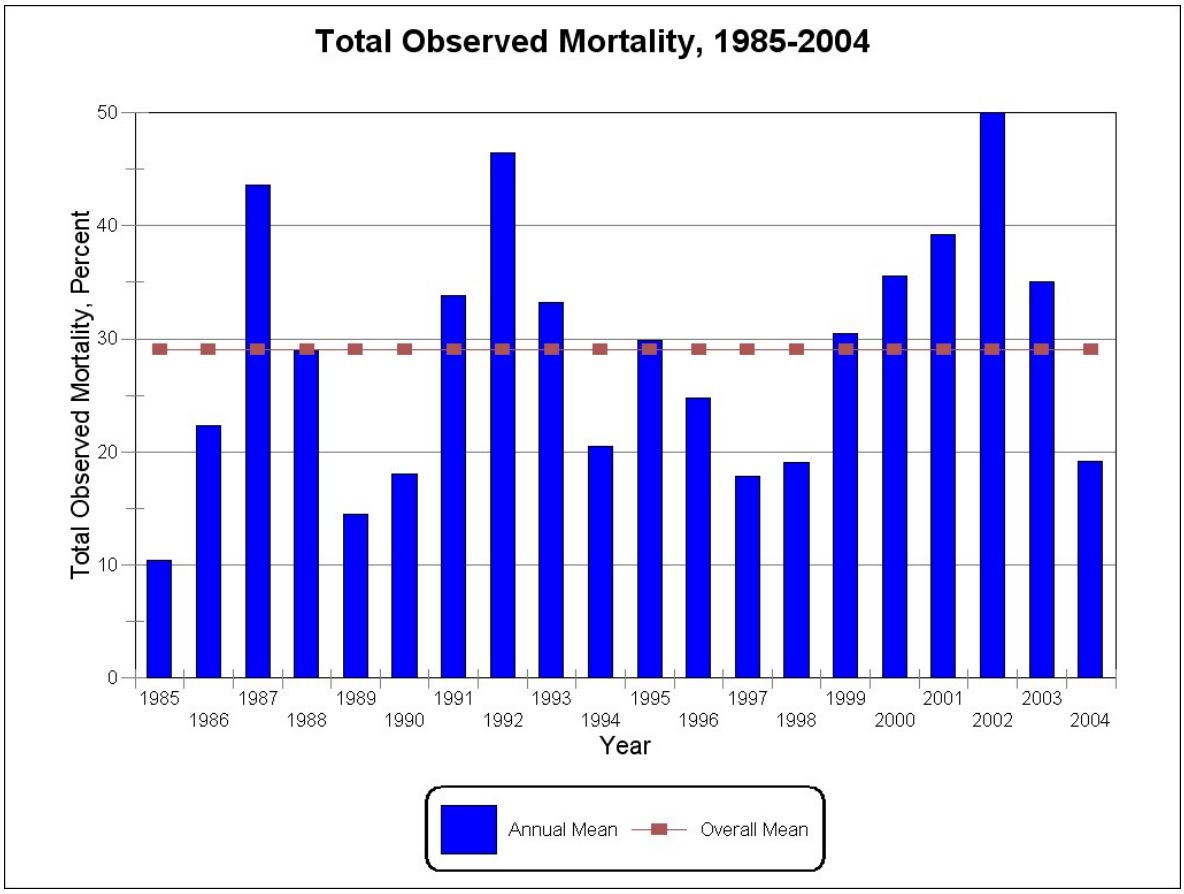
1994 Baseline = 1
2005 = .85
2003 lowpoint = .5



- The Chesapeake Bay program committed to a 10-fold increase in oyster biomass by 2010, based on 1994 as a baseline, under the Chesapeake Bay Agreement of 2000.

- The goal is designed to improve the oyster population, spat set, water filtration and ecological diversity.

Attachment 6: Oyster Mortality Due to Disease



- Historical baseline oyster mortality has been about 10% annually, as seen in 1985 (the last year such levels existed).
- In 1986 and especially 1987, diseases spread and became a significant problem and mortality escalated.
- Mortality rates peak during drought years and decline during wet years, but the historical mortality rate of 10% (a favorable rate for oysters) has never been achieved again.
- Mortality rates of approximately 30% or greater do not allow the oyster population to regain its historic level of abundance.
- The loss of oysters is directly and significantly linked to disease mortality and not the fishery, which has declined in the number of harvesters and bushels harvested, and become a minimal factor affecting oyster population trends.