

# Chesapeake Bay Oyster Brief

August 2003

NOAA Chesapeake Bay Office



## **Native Oyster - *Crassostrea virginica***

- Restoration Goal
- NOAA Funding
- Current Status

## **Limiting Factors**

- Shell supply
- Hatchery production
- Magnitude of task
- Disease

## **Asian Oyster - *Crassostrea ariakensis***

- Biology & Concerns
- History
- VSC Industry Trial
- NAS Study
- NOAA Funds Research
- Next Steps & Policy Decisions

# Native Oyster

## Eastern Oyster *Crassostrea virginica*

- Restoration Goal
- NOAA Funding
- Current Status



# Native Oyster C2K Agreement

*By 2010, achieve, at a minimum,  
a tenfold increase in native oysters  
in the Chesapeake Bay*

## Ecology:

water quality  
reef habitat

## Economy:

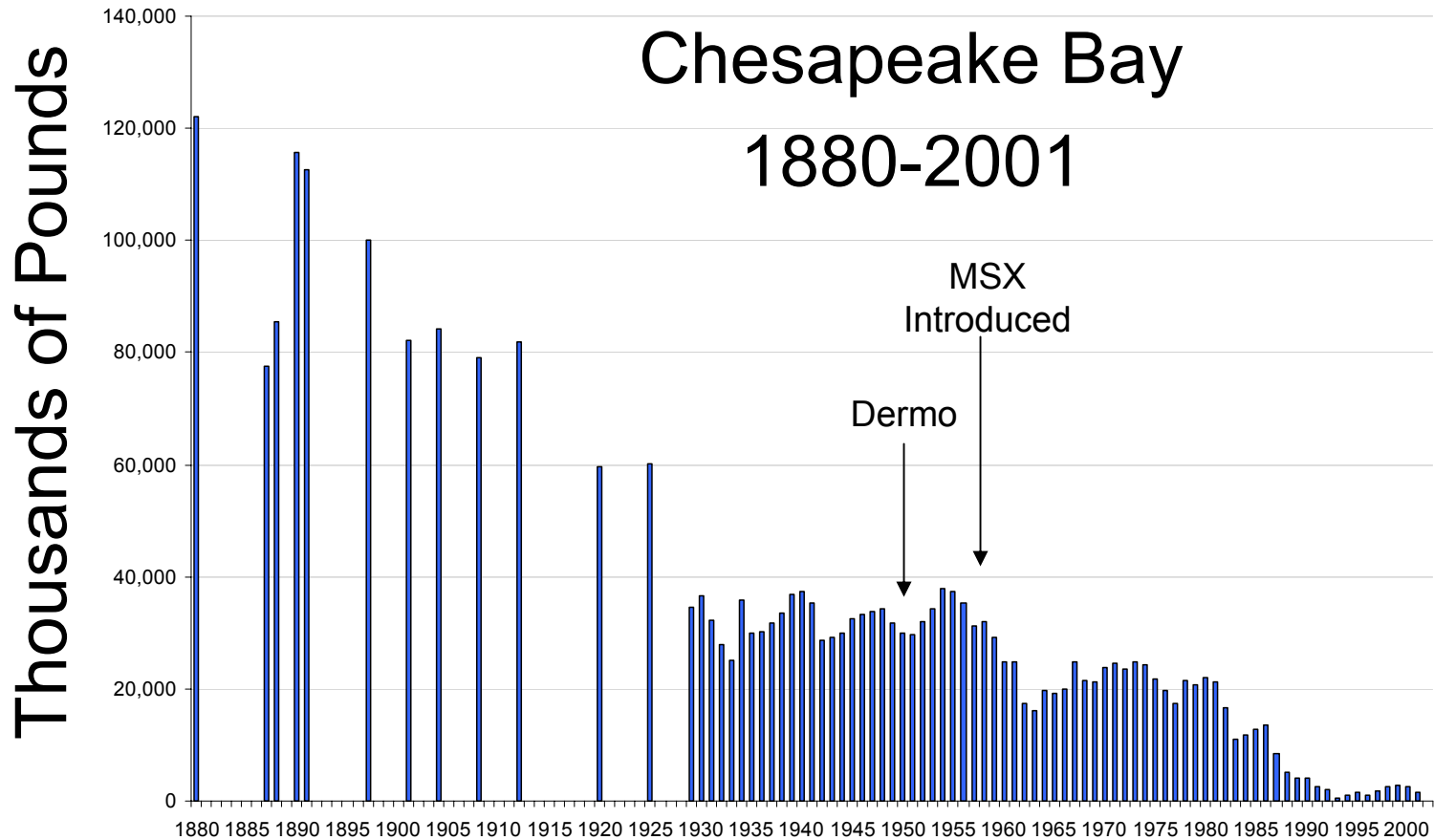
Billion \$ industry  
secondary revenue



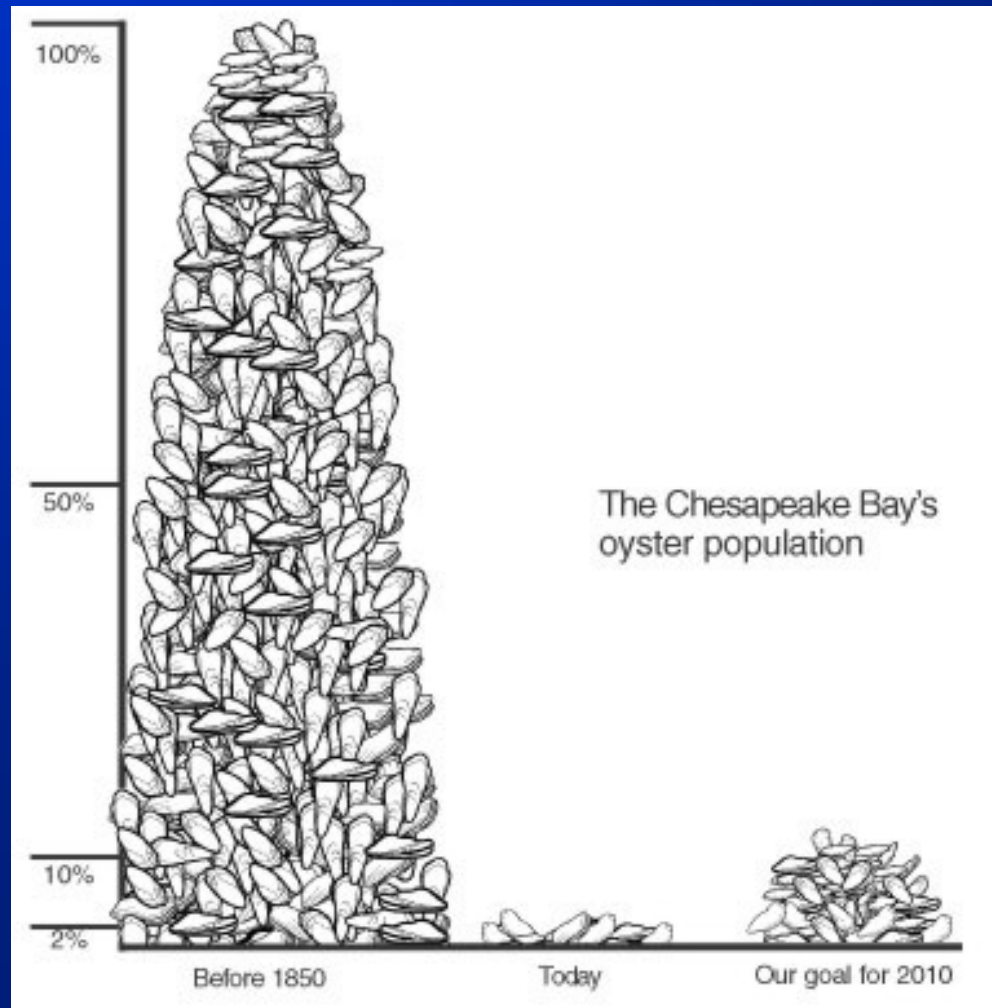
# Native Oyster NOAA Funding

	<u>Annual (Millions)</u>
➤ Large-scale restoration (MD and VA)	\$ 1.9
➤ Small watershed projects	\$ 0.2
➤ Oyster disease research (national program)	\$ 2.0
➤ Oyster fishery management	\$ 0.05
➤ NOAA divers - monitoring__	<u>Not Avail.</u>
<b>TOTAL: &gt; \$ 4 M/yr</b>	

# Native Oyster Harvest

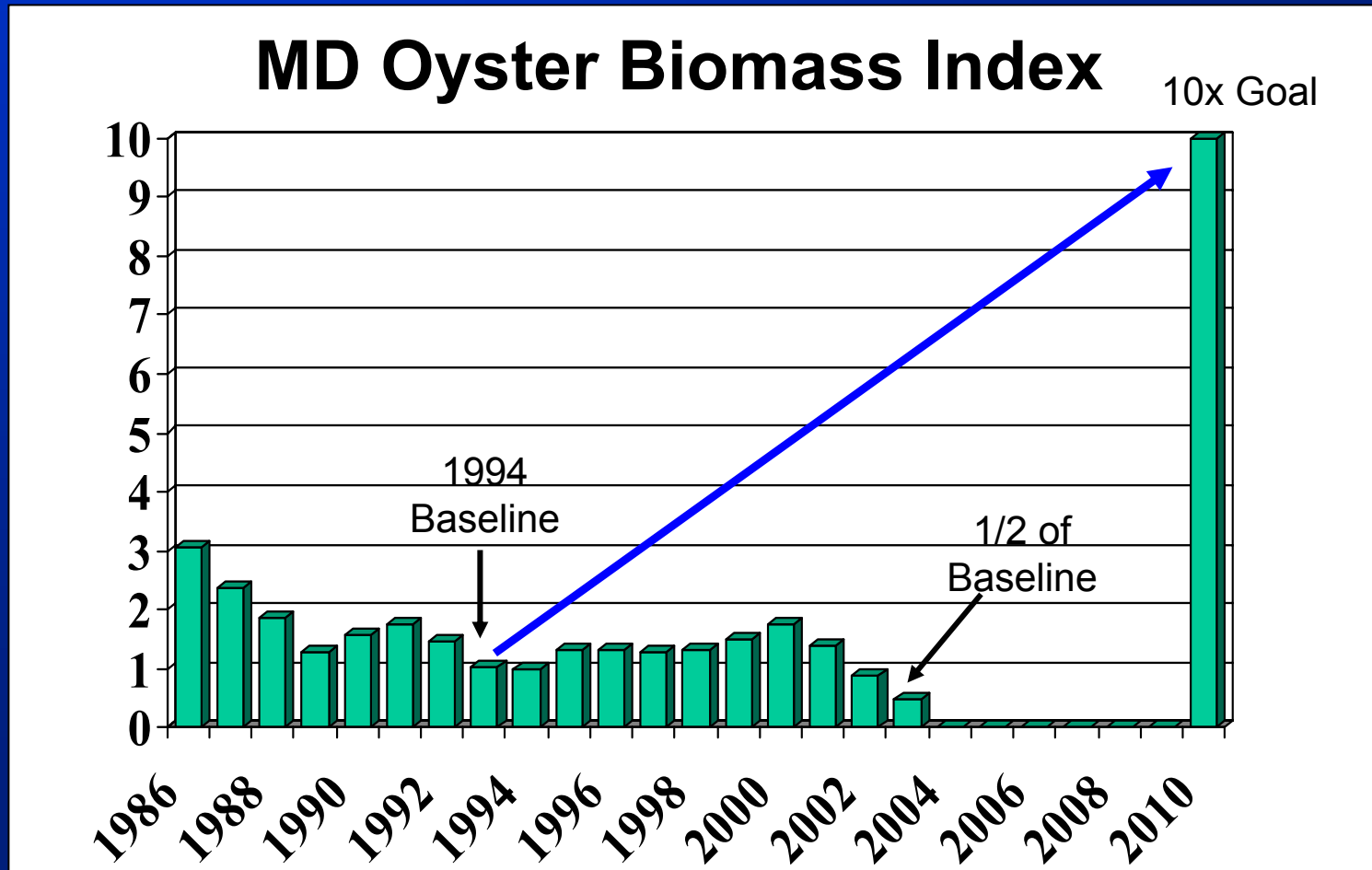


# Native Oyster Population





# Native Oyster Current Status





# Limiting Factors

**Things that will limit our ability to restore an abundant, ecologically & economically viable oyster population to Chesapeake Bay.**

- Shell supply
- Hatchery production
- Large spatial scale
- Disease



# Limiting Factors Shell Supply

## Oyster shell supplies are limited

- Decreased amounts from shucking houses
- Fossil shell - requires dredge permit
- Alternative substrates being investigated



# Limiting Factors Hatchery Production

## Maryland:

UMD Horn Point Lab

MDNR: Deal Island Hatchery

Piney Point Hatchery

No private hatcheries

## Virginia:

VIMS

Numerous private hatcheries



Skip Brown





## Horn Point Lab Spat Production

1994:	< 5 M
2003:	100 M
AREL:	200 - 500 M



# Limiting Factors Spatial Scale

Chesapeake Bay: 4.48 million acres

## Oyster Habitat:

charted oyster grounds: 458,000 acres

historically productive: 200,000 acres

currently productive: a fraction

Current restoration efforts: 10s-100s acres/year

# Limiting Factors Oyster Disease



## MSX (*Haplosporidium nelsoni*)

- 1956 Delaware Bay
- 1957 Chesapeake Bay



## Dermo (*Perkinsus marinus*)

- 1940s Gulf of Mexico
- 1949 Chesapeake Bay
- 1950s Delaware Bay
- 1990s CT, NY, MA, RI, ME





# Limiting Factors Oyster Disease

## SEA GRANT

### Oyster Disease Research Program (ODRP)

- Developing molecular tools for disease detection
- Determining processes of parasitic infection
- Understanding oyster immune system
- Producing disease-resistant oyster strains

**CROSBreed** highly resistant to MSX, not to Dermo

**DEBY** moderately resistant to both MSX and Dermo

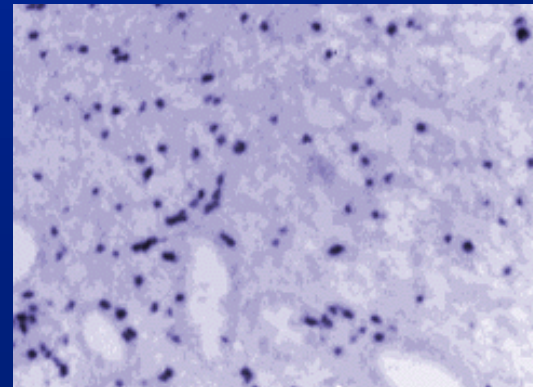


# Limiting Factors

---



All these major limitations apply regardless of oyster species, with the exception of DISEASE.



# Non-native Oyster

## Asian or Suminoe Oyster *Crassostrea ariakensis*

- Biology & Concerns
- History
- VSC Industry Trial
- NAS Study
- NOAA's position on *C. ariakensis*
- NOAA Funds Research
- Next Steps



# *C. ariakensis* Biology

## Different

## Similar

Appearance/Taste

X

X?

Larval Behavior/Dispersal

X?

Filtration

X?

Reef Building

X?

Response to Pathogens

X

Growth to Market Size



# *C. ariakensis* Concerns

Introduce new disease (virus)

Harbor & spread existing diseases

Become fouling/invasive

Hybridize with *C. virginica*

Act as a gamete sink

Outcompete and displace *C. virginica*

Cascading food web effects



# *C. ariakensis* History

- 1991 VA industry request for non-native oyster introduction
- 1995 VA House Joint Resolution No. 450
- 1996 VIMS 5-Year Plan to study *C. gigas*, *C. ariakensis*
- 1997 VIMS *C. gigas* study - failed marketability tests
- 1998 VIMS *C. ariakensis* study \*\*\*
- 2000 VSC Trial #1 - 6,000 oysters, 6 growers
- 2001 VSC Trial #2 - 60,000 oysters, 13 growers
- 2002 VA House Joint Resolution No. 164
- 2002 VSC Trial #3: 1,000,000 oysters, 39 growers -- Proposed
- 2002 NAS study commissioned



# *C. ariakensis* VSC Industry Trial

## Previous VSC Trials:

2000 6,000 oysters, 6 growers

2001 60,000 oysters, 13 growers

## Current VSC Proposal:

“Economic analysis and pilot-scale field trials of triploid *C. ariakensis* aquaculture”

2002 1,000,000 oysters, 39 growers



# *C. ariakensis* VSC Industry Trial

## Biosecurity Concerns

### Triploidy

- Reproductive sterility
- 100% triploids
- Triploid stability

### Handling

- Catastrophic loss
- Inventory control

## Regulatory Authorities

Sect. 10 Rivers & Harbors Act

Sect. 404 Clean Water Act



# *C. ariakensis* VSC Industry Trial

- Dec 2002 VSC resubmits modified proposal
- Mar 2003 Federal agency permit review elevation
- Mar 2003 15 project-specific permit conditions
- Apr 2003 ACOE prepared EA and Findings
- Apr 2003 ACOE permit issued with conditions
- Aug 2003 Deployment
- Aug 2003 **NAS study to be released**
- Sep 2003 Revisit VSC project permit





# *C. ariakensis* NAS Study

## National Academy of Sciences *Non-native Oysters in the Chesapeake Bay*

### Sponsors:

EPA

Maryland

MD Sea Grant

NOAA

Virginia

VA Sea Grant

USFWS

CT Sea Grant

### Purpose:

To examine the ecological and socio-economic risks and benefits of open water aquaculture or direct introduction of the non-native oyster, *Crassostrea ariakensis*, in the Chesapeake Bay.



# *C. ariakensis* NAS Study

## Will address potential effects on:

- ecology of Chesapeake Bay
- water quality
- habitat
- spread of human & oyster diseases
- native oyster recovery

## Will encompass:

- Chesapeake Bay & neighboring coastal areas
- Adequacy of existing regulatory and institutional frameworks to monitor and oversee activities



# *C. ariakensis* NAS Study

## Release of Report

**Aug 12** Embargoed copies to sponsors

**Aug 13** Fed/State agencies meet to discuss:

- preliminary reactions
- confirm core messages for press releases

**Aug 14** Public release date

- Sponsors briefing 10:00-11:30 am
- Public press conference 1:00-3:00 pm



# *C. ariakensis* NAS Study

## NOAA Communications Strategy

NAS will issue a press release

CBP will issue a statement from partner agencies

All inquiries/responses from NOAA directed to: { NOAA Public Affairs  
Linda Taylor, NCBO

Prepare talking points

Prepare future press conference



# *C. ariakensis* NOAA's Position

## What should be NOAA's position on *C. ariakensis*?

- Balancing economics and environment (DOC)
- Regulatory vs. voluntary/cooperative process
- Facilitating science and funding research

## Current position of NOAA CBO:

- Neutral
- Science-based
- Non-regulatory



# *C. ariakensis*

## NOAA Funds Research

- |  |                 |
|--|-----------------|
| ➤ Sponsor of NAS study (FY02)                        | \$ 50 K         |
| ➤ VIMS <i>ariakensis</i> pathogen studies (FY02)     | \$ 75 K         |
| ➤ VSC project biosecurity/monitoring (FY03)          | \$ 1 M          |
| ➤ ODRP: 3 <i>ariakensis</i> research projects (FY03) | \$277 K         |
| • Control of natural predators                       |                 |
| • Competition between <i>C.a.</i> and <i>C.v.</i>    |                 |
| • Reef building potential in MD and VA               |                 |
| <b>TOTAL</b>   | <b>\$ 1.4 M</b> |



# *C. ariakensis* Next Steps

- NAS Report Review
- Revisit VSC Permit
- Future press conference
- MD/VA proposal for diploid introduction
- EIS

