MARYLAND DEPARTMENT OF NATURAL RESOURCES

US Army Corps of Engineers

VIRGINIA MARINE RESOURCES COMMISSION

DRAFT PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT FOR OYSTER RESTORATION IN CHESAPEAKE BAY INCLUDING THE USE OF A NATIVE AND/OR NONNATIVE OYSTER

Public Meeting Presentation
November 2008

Agencies Involved in Preparing PEIS

- Lead (Decision-making) Agencies

US Army Corps of Engineers

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- Cooperating Federal Agencies

NOAA

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

U.S. FISH & WILDLIFE SERVICE

- Other Project Partners
  - Potomac River Fisheries Commission
  - Atlantic States Marine Fisheries Commission

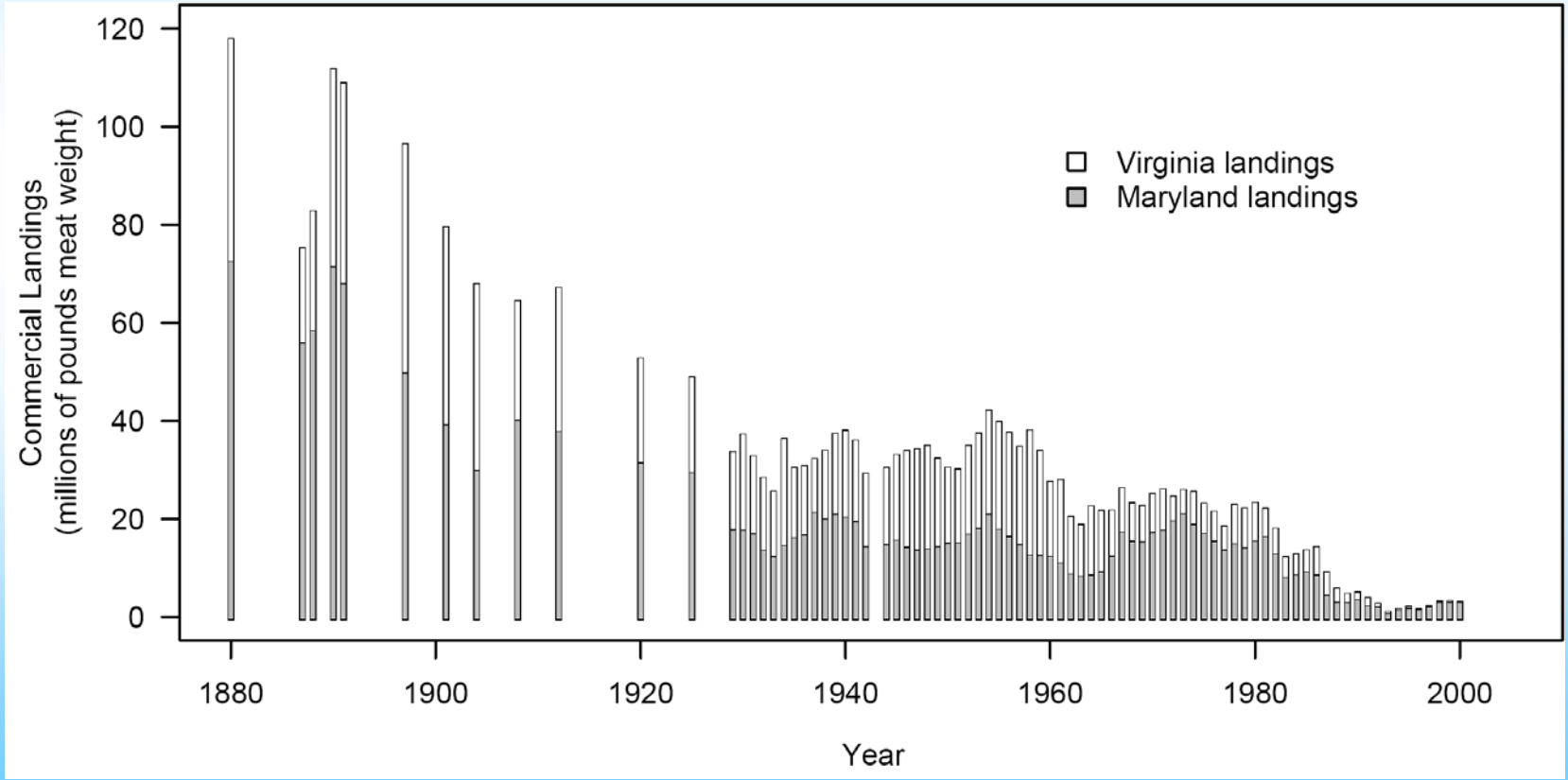
OVERVIEW

- **History and Causes of Decline of the Chesapeake Bay Oyster Stock**
- **Failure of Traditional Restoration Efforts**
- **Need for Programmatic Evaluation: PEIS**
  - **Research and Assessment**
  - **Quality Assurance**
- **Descriptions of Proposed Action and Alternatives**
- **Highlights of PEIS Findings for Combinations of Alternatives**

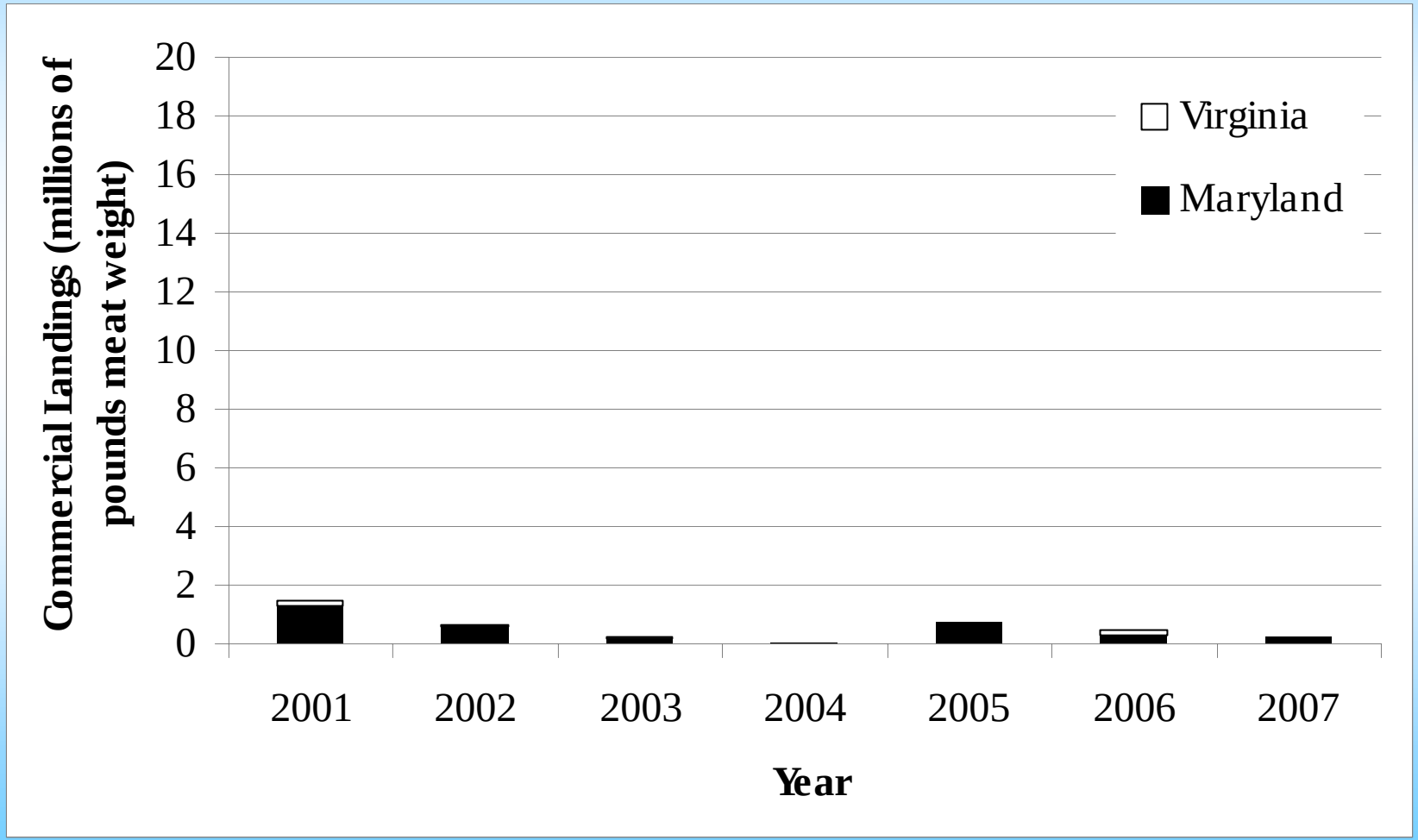
DECLINE OF THE CHESAPEAKE BAY OYSTER STOCK

- Oyster harvest declined by half from the late 1880s to about 1930
- Further steep decline began in the early 1980s
- Current population estimated to be 1% of that existing in the 1800s
- Loss of 80% of oyster habitat over the past 25 years

Commercial Landings of Oysters in Chesapeake Bay from 1880 to 2000



Commercial Landings of Oysters in Chesapeake Bay from 2001 to 2006



CAUSES OF THE DECLINE

Historically:

- Overfishing
- Mechanical destruction of habitat
- Siltation and degradation of necessary substrate
- Water quality degradation

In addition, more recently:

- Oyster diseases (MSX and Dermo)

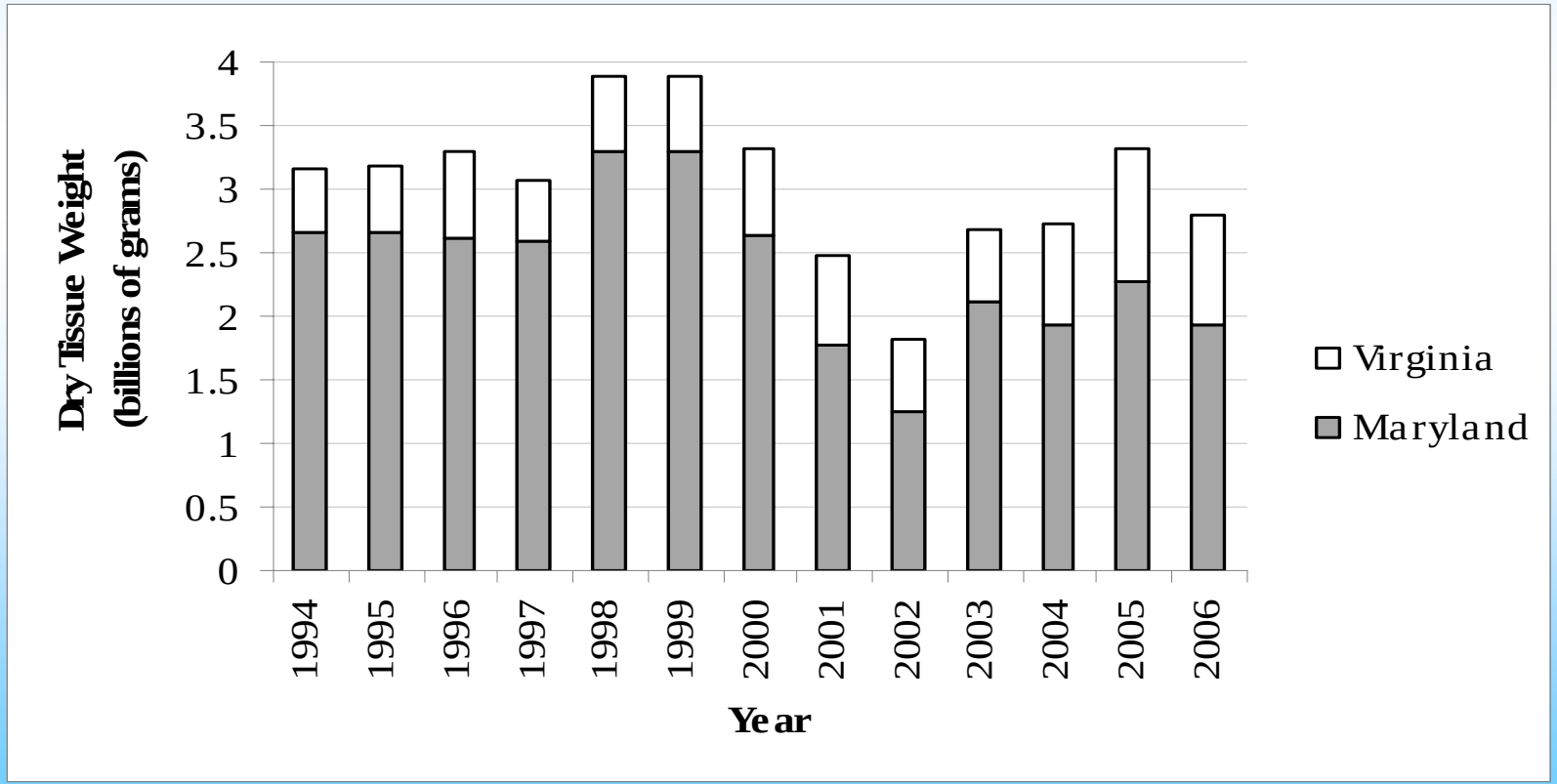
TRADITIONAL RESTORATION ACTIVITIES

- Placement of shell on selected bars to provide clean surfaces on which larval oysters can settle
- Transporting juvenile oysters (spat) from high salinity areas of high reproduction to low salinity areas of higher survival
- Planting of hatchery seed (spat) on selected bars
- Establishing sanctuary and harvest reserve bars
- Constructing 3-dimensional reefs, some using material other than oyster shell

LACK OF BAYWIDE RESTORATION SUCCESS

- Average annual oyster harvest from 1997 to 2006 – approximately 187 thousand bushels
- Average annual oyster harvest from 2002 to 2006 – approximately 57 thousand bushels
- Total oyster population has remained at historically low levels since 1994
- Habitat loss at 2,600 acres annually, and 1,200 acres on average being rehabilitated

Estimated Biomass of Oysters Present in the Chesapeake Bay from 1994 to 2006



NATIONAL RESEARCH COUNCIL (2004) IDENTIFIED THE RISKS OF CONTINUING STATUS QUO

- Further declines in Bay water quality
- Continued or accelerated losses of SAV and oyster reef habitats, with cascading effects on the structure and stability of the Bay's estuarine communities
- Continued decline of the oyster fishery and erosion of traditional economies and cultures of Bay watermen
- Erosion of confidence in governmental management of the living marine resources of the Bay

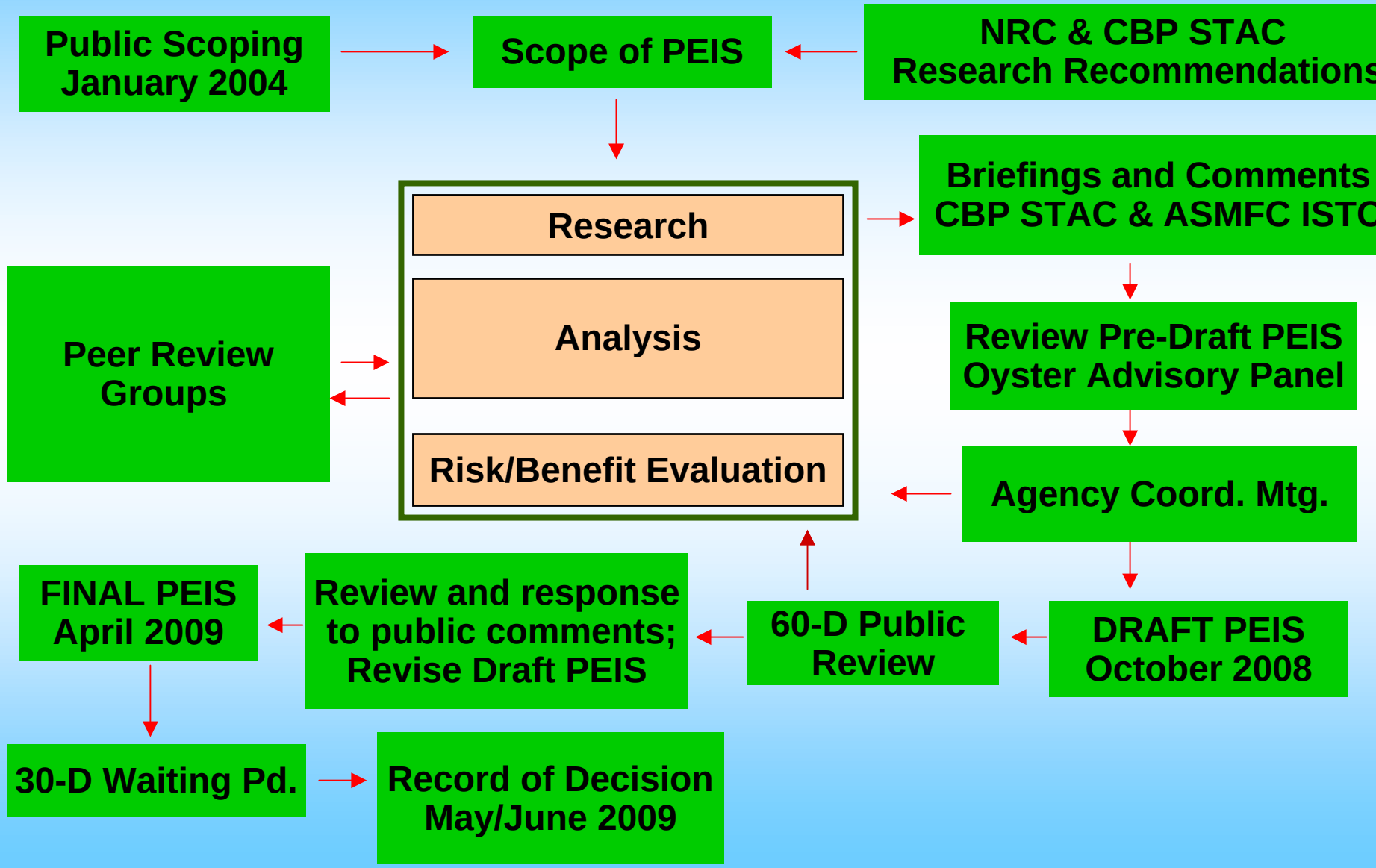
WHY A PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT (PEIS)?

- Oyster diseases are considered to be a major obstacle to restoration
- Introduction of a disease-resistant, nonnative oyster (Suminoe oyster) is considered a possible means of overcoming that obstacle
- Introducing a nonnative species is controversial and would be irreversible
- Lead agencies determined that high-level review is required and that alternative restoration approaches should be evaluated
- Congress authorized Norfolk District USACE to coordinate preparation of a PEIS in 2003

WHAT IS A PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT?

- A management, decision-making tool
- Valuable when considering actions that encompass a large geographic scale or that constitute complex programs
- Intended to address broad issues so that the large-scale analyses can be taken into account in subsequent site-specific assessments
- Used when subsequent NEPA analyses and documents will be prepared as more site-specific plans for implementing the proposed action or an alternative are defined
- If preferred alternative includes a nonnative species, additional analyses may be needed to meet permitting requirements

PEIS DEVELOPMENT PROCESS



RESEARCH & ASSESSMENT PROGRAM

- Begun at initiation of the PEIS process; findings from earlier studies funded by Virginia and in the National Research Council (NRC) review also used in the assessment
- 40 Suminoe oyster research projects completed by various research institutions
- Research followed NRC and CBP STAC Recommendations
- PEIS-specific analyses, including biological and economic modeling, socio-cultural surveys, literature reviews, etc.
- Funded by NOAA, MD DNR, VMRC, ACOE, PRFC and EPA

QUALITY ASSURANCE PROGRAM

- **Peer review groups**
  - Established to peer review research, modeling, and assessments by topic
  - Nationally renowned experts in their fields
- **Oyster Advisory Panel (OAP)**
  - Established to review modeling, assessments, and comprehensive PEIS document
  - Nationally and internationally renowned experts in their fields
- **NEPA public review period**
  - Standard of 45 days to review EIS - extended by 15 days

PEIS OVERVIEW

- **Need for Action** - to restore the ***ecological role of oysters*** in the Bay and the ***economic benefits of a commercial fishery*** through native oyster restoration and/or an ecologically compatible nonnative oyster species that would restore these lost functions

- **Purpose of Action** - to establish an oyster population that reaches a level of abundance in Chesapeake Bay that would support sustainable harvests comparable to harvest levels during the period 1920 to 1970

BENCHMARKS CONSISTENT WITH STATEMENT OF PURPOSE

- Average annual harvest for the 1920-1970 period, the goal, is estimated to be 5 million bushels of market-size oysters
- Wild population required to support that harvest is estimated to be 12 billion market-size oysters
- Size of a wild population of all ages and sizes necessary to sustain 12 billion market-size oysters cannot be estimated
- Aquaculture could substitute for harvest of wild stock in achieving the harvest goal
- The 2004 oyster population was estimated to be 809 million market-size oysters

PROPOSED ACTION

- Introduce the Suminoe oyster into the tidal waters of Maryland and Virginia for the purpose of establishing a naturalized, reproducing, and self-sustaining population

- Use existing third or later generations of the Oregon stock of the species, in accordance with ICES protocols

- Continue current Eastern oyster restoration activities

EIGHT ALTERNATIVES

- 1 – No Action – Continue current programs
- 2 – Enhanced Restoration – Increase level of restoration activities (spat planting and shell replenishment)
- 3 – Impose a temporary harvest moratorium and a compensation program for the oyster industries (alternative management measures possible)
- 4 – Expand Eastern Oyster Aquaculture

EIGHT ALTERNATIVES (Con't)

- 5 – Expand aquaculture with sterile nonnative species
- 6 – Introduce a nonnative species other than the Suminoe oyster or a different Suminoe oyster strain
- 7 – Introduce diploid Suminoe oysters and cease Eastern oyster restoration
- 8 – Combinations of alternatives

TWO ALTERNATIVES DISMISSED

- 6 – Introduce a nonnative species other than the Suminoe oyster or a different Suminoe oyster strain – Dismissed due to lack of information on a suitable alternative nonnative species or strain

- 7 – Introduce diploid Suminoe oysters and cease Eastern oyster restoration – Dismissed due to minimal economic and ecological differences from the proposed alternative and a policy decision that native oyster restoration would not be abandoned

DEVELOPMENT OF COMBINATIONS OF ALTERNATIVES

- No single alternative capable of achieving the desired outcome
- The Executive Committee defined three combinations under Alternative 8 that could increase the probability of success
- Combinations are intended to help focus stakeholder comments in the absence of a preferred alternative

HIGHLIGHTS OF PEIS FINDINGS

- Brief summaries of very complex findings follow
- Level of scientific uncertainty recognized and described for all findings in the PEIS
- Organized within the context of the combinations of alternatives
- Stakeholders are encouraged to review the PEIS Executive Summary for a more complete overview, and the PEIS and supporting documents for more details, at http://www.nao.usace.army.mil/OysterEIS/

INDIVIDUAL ALTERNATIVES INCLUDED IN COMBINATION 8A- EASTERN OYSTER ONLY

- 2 – Enhanced Restoration – Increase level of restoration activities (spat planting and shell replenishment)
- 3 – Impose a temporary harvest moratorium and a compensation program for the oyster industries (alternative management measures possible)
- 4 – Expand Eastern Oyster Aquaculture

POTENTIAL POSITIVE ATTRIBUTES OF COMBINATION 8A

- Substantial increases in oyster abundance likely in low salinity waters in Maryland due to planting seed oysters, but not self-sustaining
- Some local increases in ecological services and water quality possible
- Potential for development of disease resistance in native oyster; MSX resistance confirmed, Dermo resistance less certain; most likely to occur in higher salinity waters in Virginia
- Time needed to develop a Bay-wide population of resistant oysters is unknown
- Assuming private development only (no government expenditures), 10-year net present fishery value of an expanded aquaculture industry of approximately $8 M; use of disease-resistant strains and triploid native oysters might increase value

POTENTIAL NEGATIVE ATTRIBUTES OF COMBINATION 8A

- Continuing loss of hard bottom habitat throughout the Bay
- Increase in oyster abundance in higher salinity areas would be unlikely
- 10-year present value cost approximately $521 M
- Aesthetic concerns, interference with recreation, and State regulations could limit where aquaculture operations can be sited
- Maximum aquaculture industry not likely to be achieved within 10 years
- Will not restore stakeholders' shared cultural goals

INDIVIDUAL ALTERNATIVES INCLUDED IN COMBINATION 8B: EASTERN OYSTER AND TRIPLOID SUMINOE OYSTERS

- 2 – Enhanced Restoration – Increase level of restoration activities (spat planting and shell replenishment)
- 3 – Impose a temporary harvest moratorium and a compensation program for the oyster industries (alternative management measures possible)
- 4 – Expand Eastern Oyster Aquaculture
- 5 – Cultivate triploid Suminoe oysters

POTENTIAL POSITIVE ATTRIBUTES OF COMBINATION 8B

- Substantial increases in oyster abundance likely in low salinity waters in Maryland due to planting seed oysters, but not self-sustaining
- Some local increases in ecological services and water quality possible
- Potential for development of disease resistance in native oyster; MSX resistance confirmed, Dermo resistance less certain; most likely to occur in higher salinity waters in Virginia
- Time needed to develop a Bay-wide population of resistant oysters is unknown
- Assuming private development only (no government expenditures), 10-year net present fishery value of an expanded aquaculture industry of approximately $16 M using triploid Suminoe oysters or possibly disease resistant and/or triploid native oysters

POTENTIAL NEGATIVE ATTRIBUTES OF COMBINATION 8B

- Continuing loss of hard bottom habitat throughout the Bay
- Increase in oyster abundance in higher salinity areas would be unlikely
- 10-year present value cost approximately $521 M
- Aesthetic concerns, interference with recreation, and State regulations could limit where aquaculture operations can be sited
- Maximum aquaculture industry not likely to be achieved within 10 years
- Shorter shelf-life, higher cost for biosecure hatcheries and biosecure deployment for Suminoe oyster could decrease fishery benefits
- Likely to result in unintended and irreversible introduction of reproducing Suminoe oysters, but only over an extended period of time
- Will not restore stakeholders' shared cultural goals

INDIVIDUAL ALTERNATIVES INCLUDED IN COMBINATION 8C: EASTERN OYSTER AND BOTH DIPLOID AND TRIPLOID SUMINOE OYSTERS

- 2 – Enhanced Restoration – Increase level of restoration activities (spat planting and shell replenishment)
- 3 – Impose a temporary harvest moratorium and a compensation program for the oyster industries (alternative management measures possible)
- 4 – Expand Eastern Oyster Aquaculture
- 5 – Cultivate triploid Suminoe oysters
- Proposed action: Introduce diploid Suminoe oyster and continue native oyster restoration

POTENTIAL POSITIVE ATTRIBUTES OF COMBINATION 8C

- Introduction of new diseases is unlikely
- High growth and disease resistance of the Suminoe oyster creates potential for reaching the restoration goal
- Suminoe oysters likely to provide ecological services similar to native oyster
- Potential for increases in oyster abundance in low and high salinity waters
- Potential for localized WQ improvements
- Potential for restoring stakeholders' shared cultural goals
- Potential fishery benefits not quantifiable but likely greater than 8a and 8b

POTENTIAL NEGATIVE ATTRIBUTES OF COMBINATION 8C

- A number of factors (continuing Bay-wide habitat loss, predation, Bonamia disease, low dissolved oxygen, etc.) may preclude successful Suminoe oyster introduction
- Suminoe and native oysters likely to compete, but may co-exist; introduction would be irreversible
- 10-year estimated cost of $668 M
- Aesthetic concerns, interference with recreation, and State regulations could limit where aquaculture operations can be sited
- Commercial value of Suminoe oysters may be constrained by lower shelf life and vulnerability to Polydora
- Likely to result in introduction of Suminoe oysters to coastal waters in the mid-Atlantic region and further north

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