



BALLAST WATER TECHNOLOGY DEMONSTRATION PROGRAM

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
U.S. FISH AND WILDLIFE SERVICE
U.S. MARITIME ADMINISTRATION

Great Lakes Ballast Water Conference: *Targeting Technology*

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Sept 27, 2007





Ballast Water Technology Demonstration Program

- Mission: development, demonstration, and, ultimately, use of effective treatment technologies on ships
- Primary mechanism: annual grants competitions
- Currently running 2 competitions:
 - Treatment Technology Demonstration Project grants
 - Research, Development, Testing and Evaluation Facility grant
- NOAA-FWS-MARAD partnership
- Federal help from USCG, USGS, EPA, DOD (Navy)





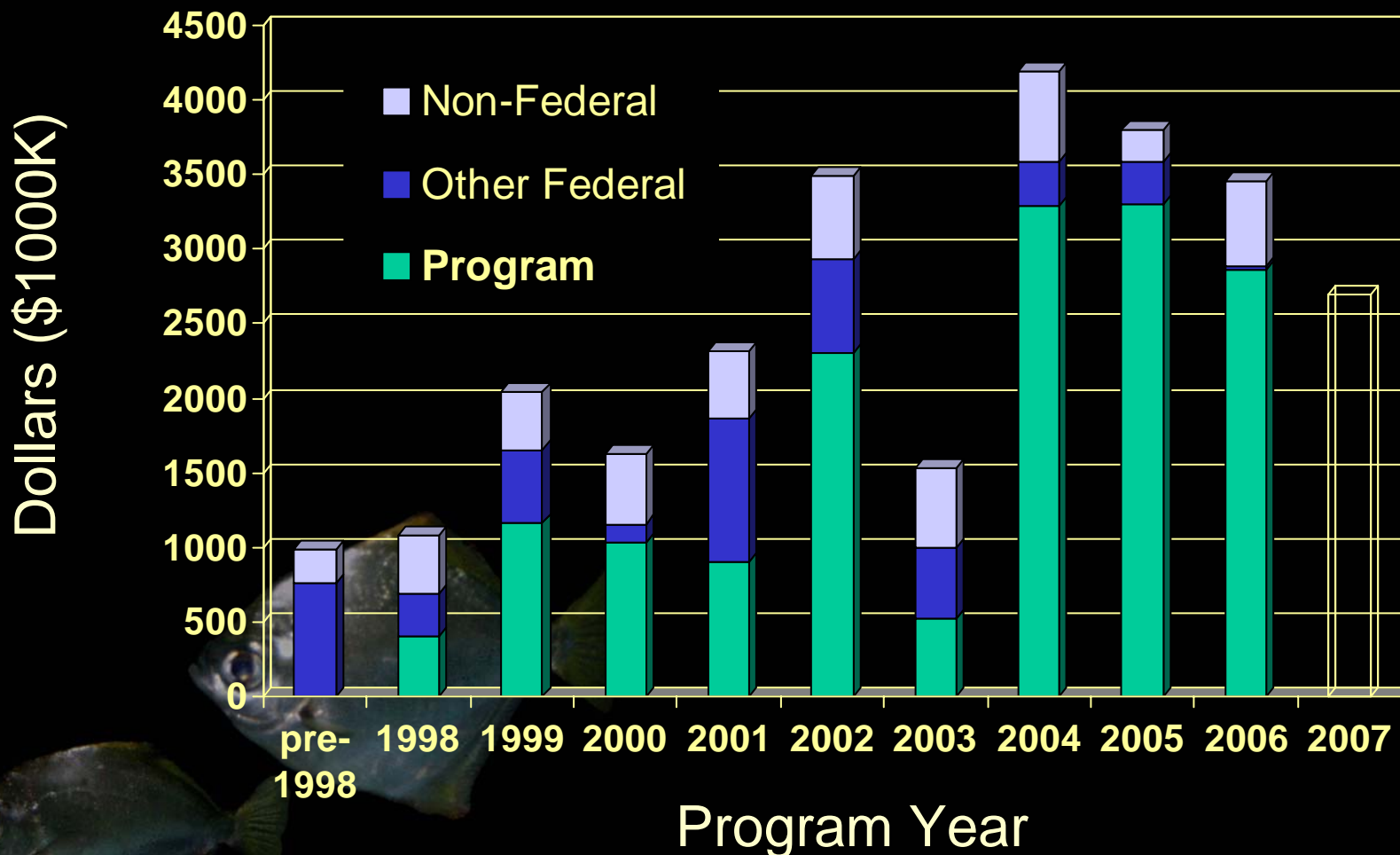
Ballast Water Technology Demonstration Program

- NOAA and FWS provide funding
- MARAD provides access to MARAD fleet and expertise
 - Applicants contact MARAD for use of a fleet vessel prior to submitting the proposal.
 - Project costs for engineering onboard a MARAD vessel count towards the funding limit.
 - Necessary funds for this engineering are transferred directly to MARAD for use towards the project.





Ballast Water Technology Demonstration Program Funding History





Ballast Water Technology Demonstration Program: Funded Technologies (# of projects*)

Chemical Biocides:

Carbon Dioxide (1)
Chlorine / Chlorine Dioxide (1)
Ferrate Ion (1)
Gluteraldehyde (2)
Halogens (1)
Hydrogen Peroxide (2)
Juglone (1)
Menadione (2)
Ozone (8)
Peracetic acid (2)
Sodium Hypochlorite (1)

Practices/Other:

Coagulation (1)
Depressurization (1)
Deoxygenation (5)
Exchange (7)
Onshore Treatment (3)
Design of Ships or Tanks (4)

Energy:

Acoustic (6)
Microwave (1)
Thermal (4)
Ultraviolet (6)

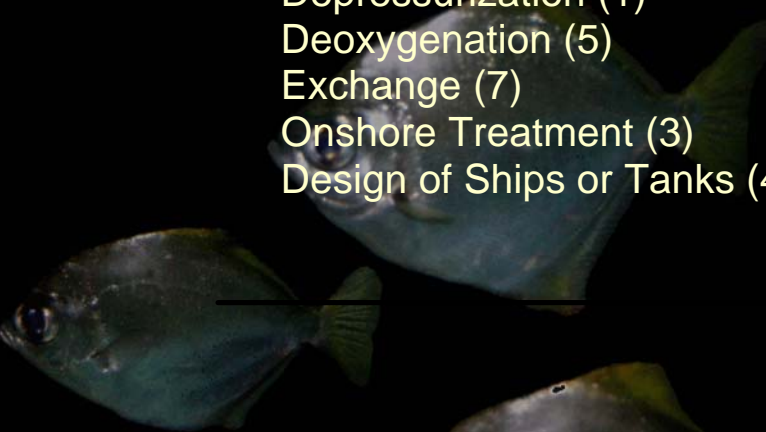
Separation:

Filtration (including Media & Screen) (10)
Vortex/Hydrocyclone (4)
Centrifugation (1)

Related Research:

Assessment (1)
Microorganisms (6)
Monitoring / Standards (5)
No-ballast-on-board (NOBOB) (2)
Outreach (2)
Toxicity Analysis (1)

* Some projects investigated more than one type of technology





Ballast Water Technology Demonstration Program

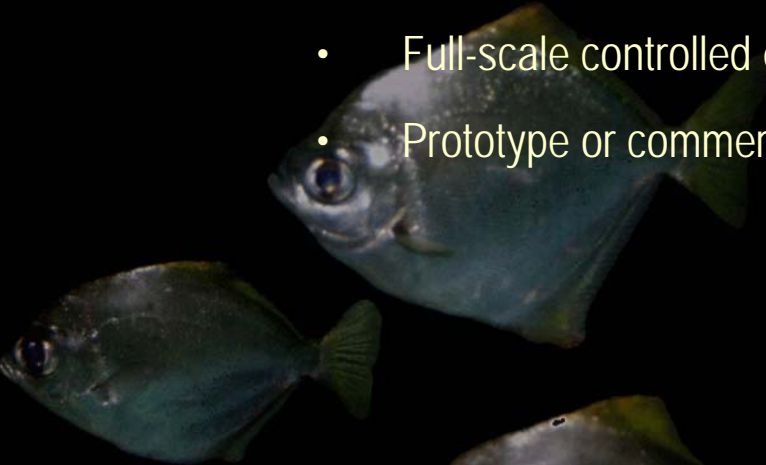
- Treatment Technology Programmatic Priorities:
 - Project Necessity and Chance for Success.
 - Geographical distribution
 - Commercialization potential
 - Regulatory approval





Ballast Water Technology Demonstration Program

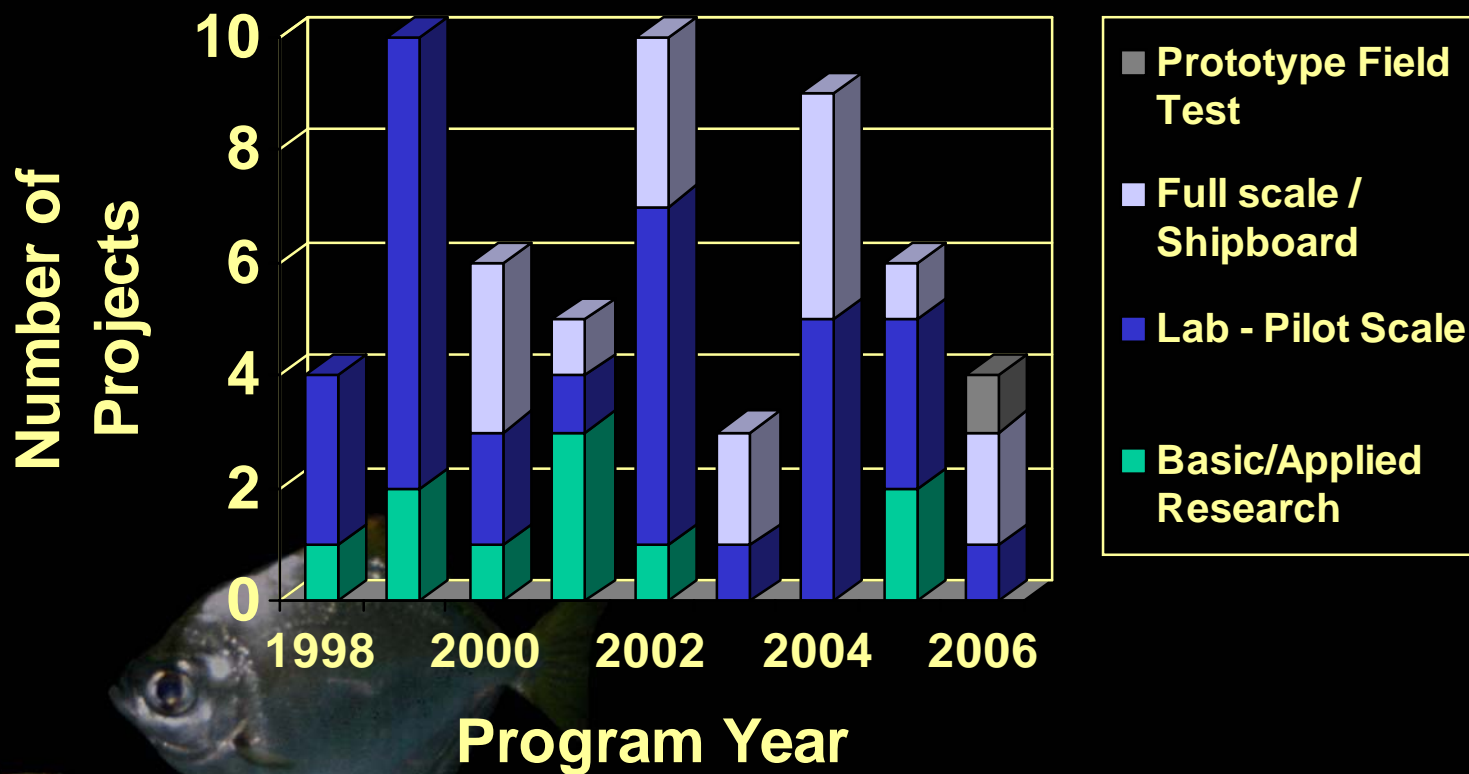
- Expect phased process of development.
- Funded projects generally cover only one phase.
- Categorize projects into four phases
 - Basic or applied research
 - Laboratory-scale to pilot-scale controlled experiments
 - Full-scale controlled experiments
 - Prototype or commercial ballast water field tests





Ballast Water Technology Demonstration Program

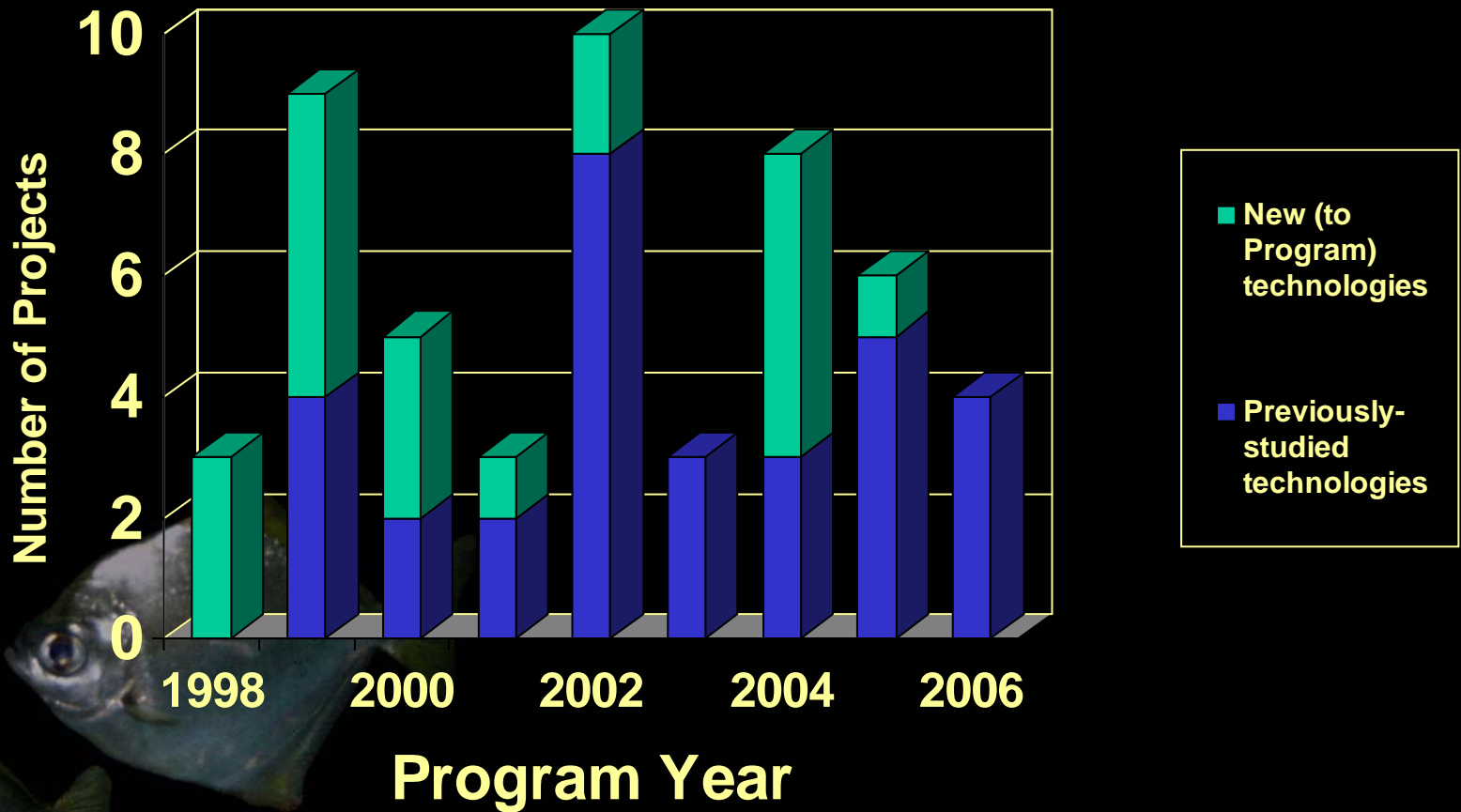
Treatment Technology Projects





Ballast Water Technology Demonstration Program

New vs Continuing Technologies





Ballast Water Technology Demonstration Program

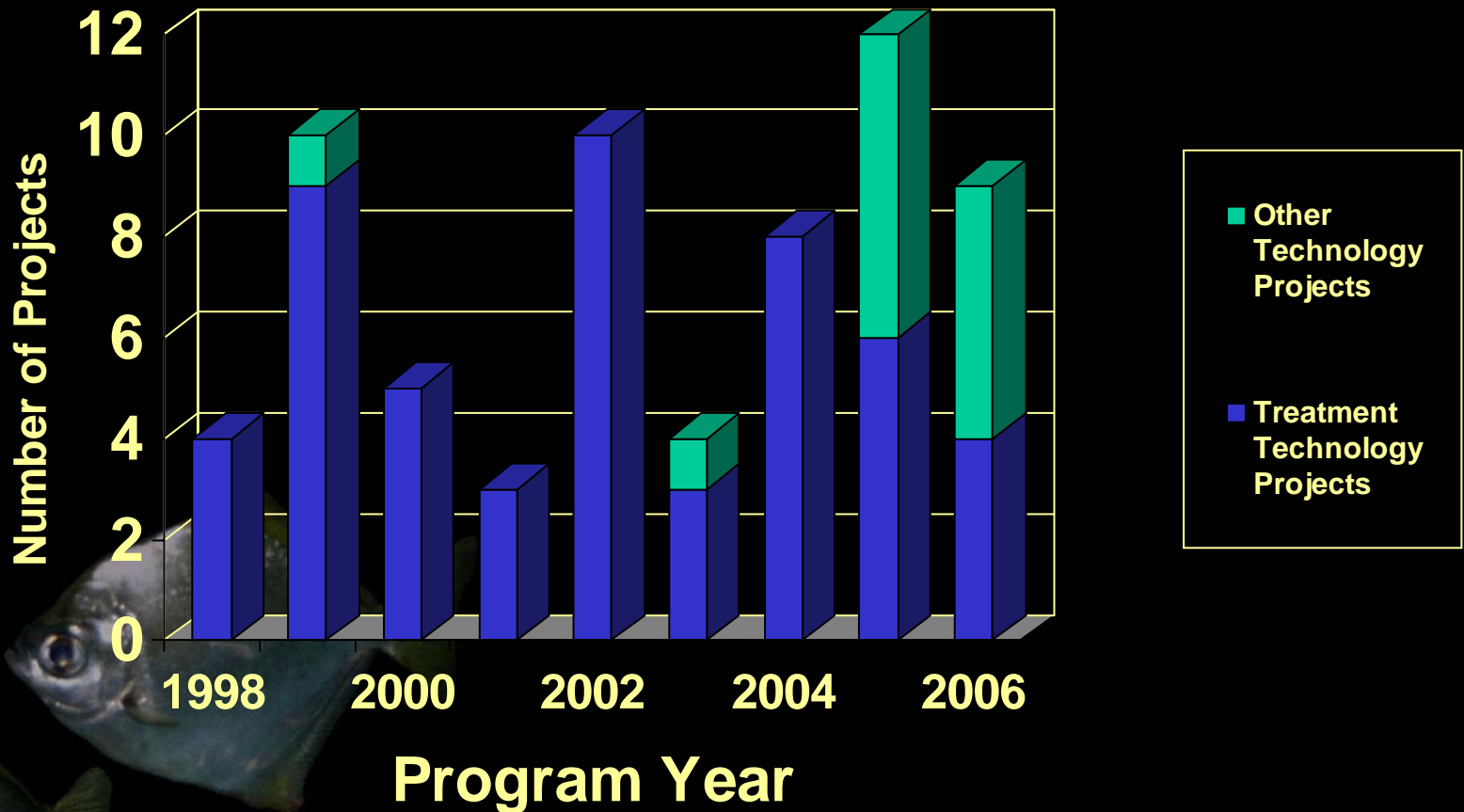
- The ultimate mission of the program is the implementation of effective ballast water treatment technologies.
- This process requires:
 - development of treatment technologies
 - the ability to test, evaluate, regulate and use these technologies.
- Appropriate projects for this funding opportunity can address any problem along this spectrum.





Ballast Water Technology Demonstration Program

"Other" Technology Projects





Ballast Water Technology Demonstration Program

Frequent Problems with Proposed Projects:

- Too expensive, with too little budget justification
- Proposal included multiple steps.
- Proposal skipped 'steps'.
- Too little experimental detail / too little scientific rigor
- Too little consideration of the ship environment.
- Too little 'homework'.
- Too little attention to standardized test methods





Ballast Water Technology Demonstration Program

RDTE facilities will support ballast water technology development efforts by increasing:

- Long-term continuity in projects.
- Standardization and quality control in experiments.
- Independence between treatment technology vendors and investigators.
- Greater engagement of ship and port interests locally and regionally.
- Ease access to necessary physical infrastructure otherwise unavailable.
- Coordinated regional participation in the development and use of consensus standard ballast water test methods and protocols.





Ballast Water Technology Demonstration Program

- RDTE Programmatic Priorities:
 - National integration.
 - Local involvement.
 - Geographical Considerations.
 - Freedom of apparent conflict of interest.





Ballast Water Technology Demonstration Program

- 2006
 - ONE AWARD for RDTE Facility (geographic priority: Great Lakes)
 - TWO STARTUP GRANTS for others to prepare for an application for an RDTE facility in the future
 - FIVE Treatment Technology Demonstration Grants
- 2007 (ongoing)
 - 30 Letters of intent to submit grant proposals
 - 4 RDTE Facility Preproposals
- The future
 - Goal is to have provided viable technologies by the time they are required
 - When goal is achieved, current program will end





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or visit:

<http://www.oarhq.noaa.gov/ballast/index.html>

For information on the Coast Guard Step Program:

<http://www.uscg.mil/hq/g-m/mso/step.htm>





extra slides





Ballast Water Technology Demonstration Program

- Technology development is insufficient to achieve implementation of ballast water treatment technologies.
- Need for standardized testing and evaluation of technologies.
- To address this need, the Program implemented a new competition in 2005: to award grants for Research, Development, Testing and Evaluation (RDTE) Facilities.





Ballast Water Technology Demonstration program

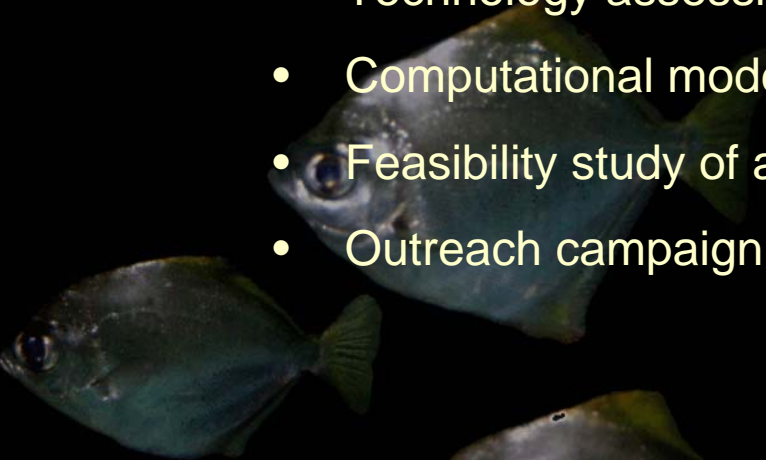
- Multi-agency program to support research, development, test and evaluation of BW treatment technologies
- NOAA funding is from Congressional earmarks, sometimes with strings attached.
- Through 2005, the BWTDP funded 54 proposals with \$11.8M in funds from NOAA (\$10.2M) and FWS (\$1.6M). MARAD has contributed use of its vessels.
- \$3.5M in matching funds.





2005 BWTDP projects

- Treatment Technology (7 Projects)
 - Deoxygenation
 - Energy (microwave)
 - Filtration
 - Filtration, ozonation, sonic energy
 - Monitoring / verification technology (3 projects)
- Chronic toxicity testing for ballast water biocides.
- Technology assessment methodology.
- Computational modeling of flow in ballast tanks.
- Feasibility study of a treatment technology development site.
- Outreach campaign for BW best management practices.





2006 BWTDP plans

PROGRAM IMPROVEMENT GOALS

- Better long-term continuity in projects
- More use of common test protocols to facilitate results comparison across projects
- More, and more standardized, quality control in experiments
- More independence between investigators and vendors
- More engagement of ship and port interests





2006 BWTDP plans

A NEW INITIATIVE FOR 2006

- Competitive multi-year cooperative agreement to set up and operate a regional RDT&E facility
- Initial target region: Great Lakes
- Competitive startup grants for groups in other regions, to build capacity to establish other regional sites in future years
- Individual project grants are planned to continue

