PREVENTING AIS INTRODUCTIONS THROUGH VECTOR MANAGEMENT: LESSONS FROM THE MID-ATLANTIC REGIONAL PANEL

Joint Meeting Gulf and South Atlantic and Mississippi River Basin Panels
October 10 , 2012

Fredrika Moser
Maryland Sea Grant

Talk Outline

- Mid-Atlantic Panel
- Mid-Atlantic Panel activities
- Vector management workshop
- Live bait vector program
- Vector management next steps

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MAP Form

NASA/Goddard Space Flight Center
Scientific Visualization Studio

- Mid-Atlantic Panel on AIS (2003 – present)
- NJ, PA, DE, MD, VA, NC, WVA, DC
- Federal, state, local governments, and academic partners
- Mid-Atlantic Sea Grant programs

MAP Function

NASA/Goddard Space Flight Center
Scientific Visualization Studio

- Provide a forum for discussions across multiple audiences and jurisdictions
- Set priorities - ANSTF
- Support workshops and projects

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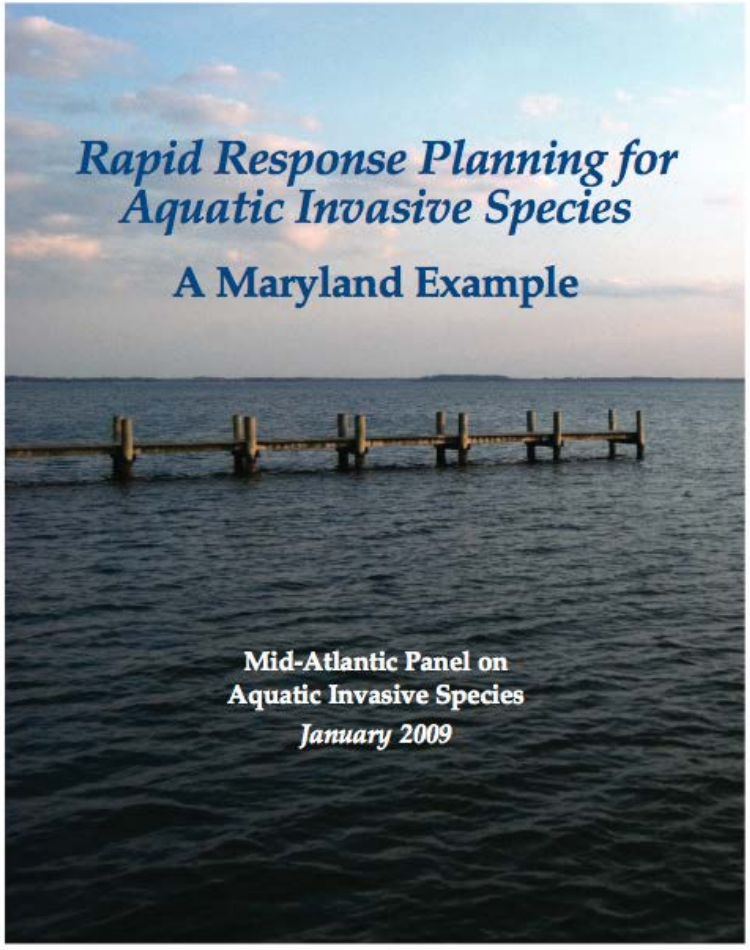
Managing Single Species

- Chesapeake Bay Program Office: Invasive Species Workshop 2002
  - mute swan (*Cygnus olor)*
  - Nutria *(Myocastor coypus)*
  - phragmites (*Phragmites australis)*
  - purple loosestrife *(Lythrum salicaria)*
  - zebra mussels *(Dreissena polymorpha)*
  - water chestnut *(Trapa natans)*

Mid-Atlantic Panel AIS on Aquatic Invasive Species

Responding To New Invasions



- National Sea Grant Office funded MAP: Rapid Response Plan for AIS

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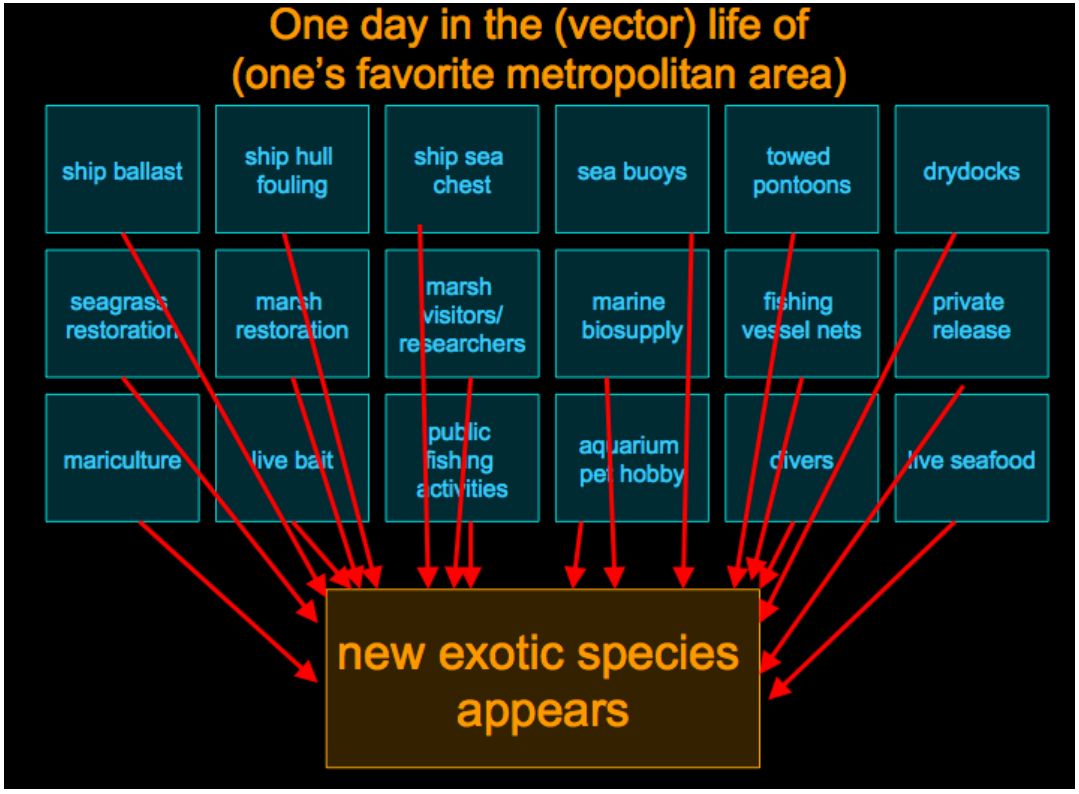
Preventing Invasions

- AIS Prevention Vector Management Workshop December 2009

Vector Management

Themes

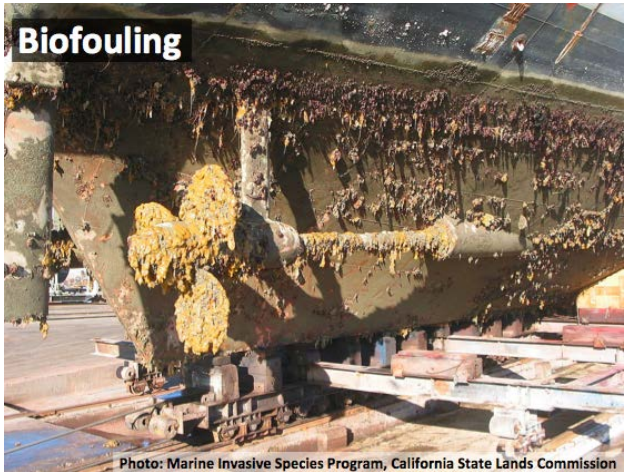
- Vector heterogeneity
- Integrated vector management
- Vector early warning system



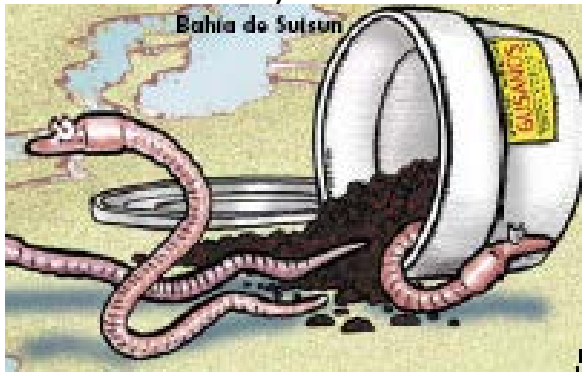
James T. Carlton, 2009

Vector Workshop Topics

- Maritime Shipping Vector:
  - Ballast water
    (W. Miller, SERC; R. Everett, USCG; M. Faulkner, CA
    R. Danesi, USEPA; M. Tamburri, UMCES - CBL)
  - Ship fouling
    (Ian Davidson, Portland State)



- Live Trade Vector:
  (E. Grosholz, UC Davis; Peter Jenkins, Center for Invasive Species Prevention)
  - Live bait
  - Aquarium trade
  - Aquaculture
  - Live seafood
  - Aquatic plants (horticulture)



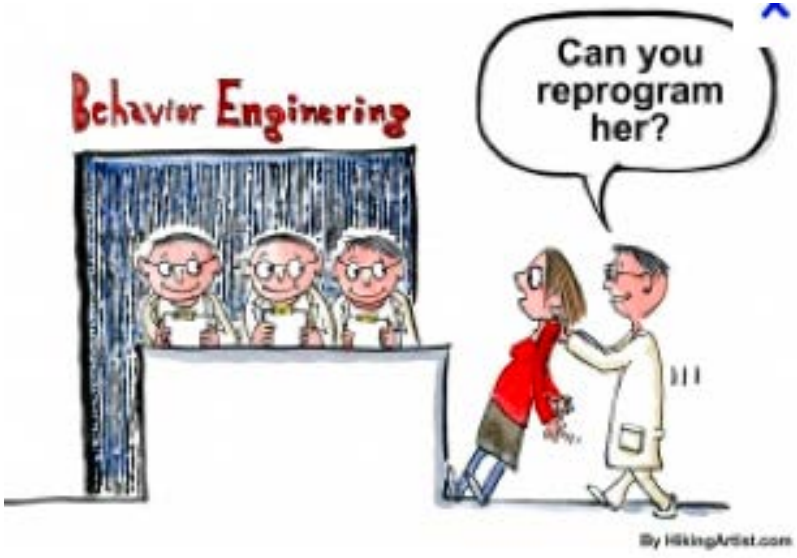
E. Grosholz 2009

Vector Management Knowledge Gaps

- Diversity of AIS species pool
- Species lists (screening, risk assessment)
- Priority actions to reduce spread
- Education and outreach intentional/unintentional
- Regulations and statues

Vector Management Approaches

Voluntary actions vs. regulatory action



"I wouldn't—there's an awful lot of scary-sounding legalese."

Biological and social science research

Vector Management
Outcome-based Priority Actions

- Maritime Shipping Vector
  - Research:
    - CA buy-in approach with shippers, understand propagule delivery, dry dock frequency, understand benefits of cleaning/timing, determine recreational vessel movement, inventory regulations
  - Management
    - Develop shared goals among all players, efficacy of fees for boat inspections
  - Education/Outreach
    - Foster boat cleaning ethic, evaluate outreach effectiveness

Vector Management
Outcome-based Priority Actions

- Live Trade Vector
  - Research:
    - Inventory and gap analysis state regulations, survey bait trade, socioeconomic effects bait trade, species problems, hitchhikers, packing material, social research bait use/disposal
  - Management
    - Bait white list, regulations on packaging, stakeholder buy-in, disease testing/standards, establish bait disposal practices
  - Education/Outreach
    - Identify audiences, outlets to reach, artificial bait, bait shipping

Vector Management
Outcome-based Priority Actions

- Aquaculture, Aquatic Horticulture, Aquaria
  - Research:
    - Inventory and gap analysis state regulations, understand import trade, determine diseases, economic value
  - Management
    - Establish BMPs, disposal protocols at point of sale
  - Education/Outreach
    - Identify target audiences, species of concern lists, outlets for intentional/unintentional releases

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Vector Management

- National Sea Grant Office – RFP for Regional AIS Research
- Our proposal
  - Biological and social science research and outreach to understand live bait vector
  - Objective: Understand ecological and social science to manage a live bait vector from supplier to user

Research Components

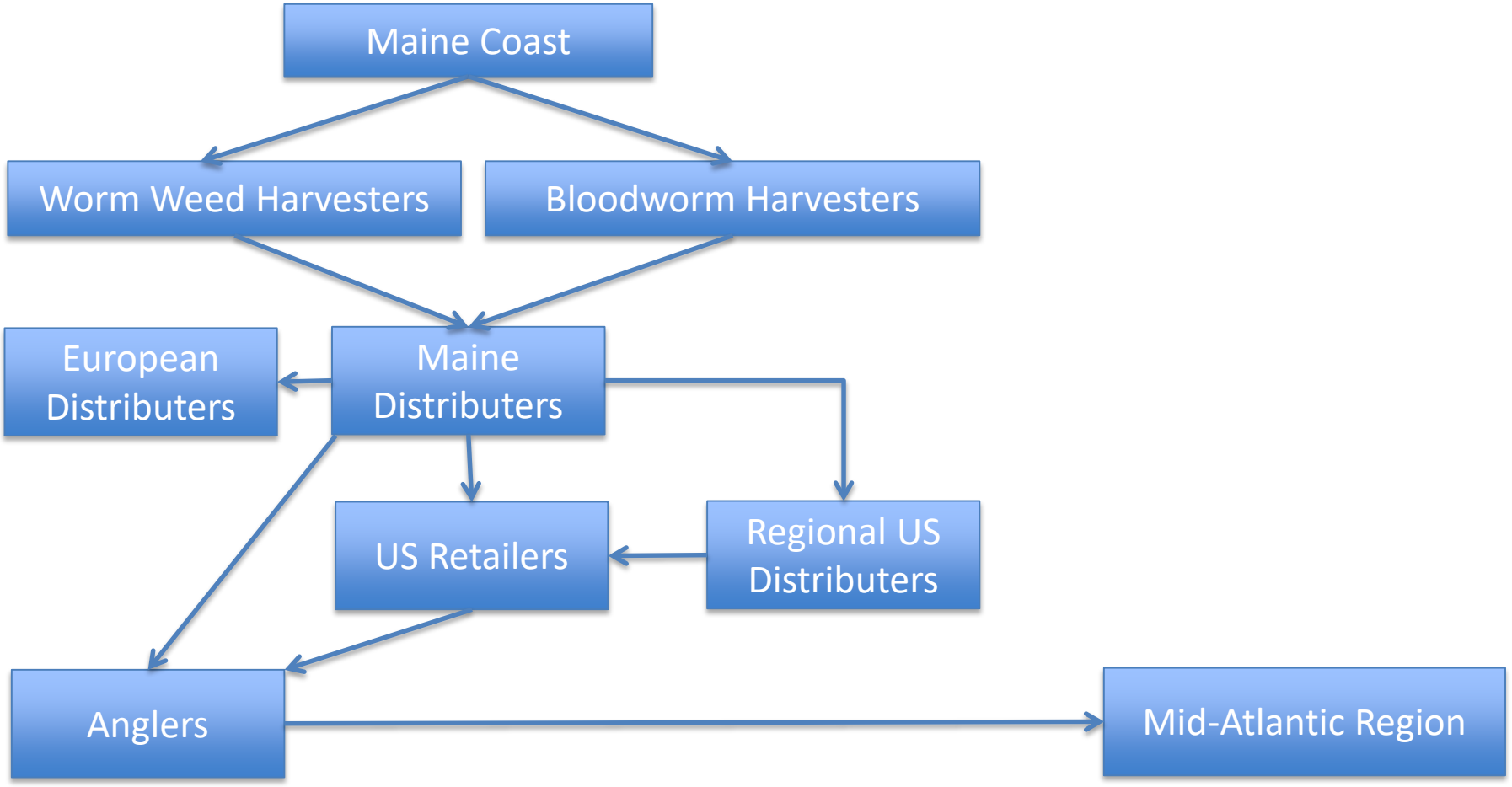
"Importation of Baitworms and their Live Algal Packing Materials to the Mid-Atlantic: Vector Characterization"

- Mid-Atlantic Sea Grant Outreach and Extension Component
  - *PI:* Fredrika Moser
  - *Co-PIs:* Mike Danko (NJ), John Ewart (DE), Sara Mirabillo (NC), Susan Park (VA), Amanda Rockler (MD), Sarah Whitney (PA)

- Biological Component
  - *PI:* Whitman Miller, Smithsonian Environmental Research Center
- Social Science Component
  - *PI*: Michael Paolisso, UM College Park
  - *Co-PI:* Ted Grozholz, UC Davis

(Photos: T. Getchis, CT Sea Grant; A. Fowler, SERC)

The Bloodworm Vector



Biological Component

- SERC uses the Maine baitworm trade as a model system to understand the quantitative flux of species and numbers of individuals (i.e. diversity) of hitchhiking species to characterize:
  - The richness and abundance of organisms associated with each step along the vector
  - The vector includes the source, packaging and transport, and recipients of baitworms
- Identify possible intervention strategies to
  - Reduce transfer and release of associated organisms at different points in the vector

Slide Credit: Amy Fowler, SERC

Social Science Component

- University of Maryland and Sea Grant Extension
  - Formal interviews with distributors, Maine Department of Marine Resources, and Sea Grant extension throughout Mid-Atlantic
  - Informal interviews with bloodworm harvesters, worm weed harvesters, and anglers in mid-Atlantic states, broad survey salt-water anglers m-A region
  - Seek to understand cultural knowledge that exists about AIS as well as how anglers choose to dispose of live marine bait through surveys, interviews with key players in baitworm industry, and on the ground observations
  - Intervention strategies and behavior change through education and outreach.

Photos: J. Trombley UMCP

Intervention Ideas

- Develop intervention strategies
  - At bait source
  - With Mid-Atlantic anglers, bait shops
  - Through voluntary behavior change
  - Regulatory required change

Live Bait!
This package contains live bloodworms (*Glycera dibranchiata*) that have been cleaned of any hitchhiking organisms associated with bait. Please reduce the spread of introduced species by discarding all unused bait and packaging material in the trash.

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How do we adopt vector management?

- Pilot project findings and recommendations
- Panel partnerships – policy guidelines?
- Cooperation across ANSTF Panels
- Federal funding to support these efforts
- Well defined vectors
- State support for better reporting by distributors of bait - species diversity/abundance

Thank you

Smithsonian Environmental Research Center

Mid-Atlantic Panel AIS on Aquatic Invasive Species

GSARP and MRBP Joint Meeting October 10, 2012

Sea Grant Maryland