Invasive Species and Climate Change: Risk & Responses

Hosted by:

Environmental Law Institute (ELI)

Curtis and Edith Munson Foundation

May 27, 2008

12:00 EST

Participants

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Global Invasive Species Initiative
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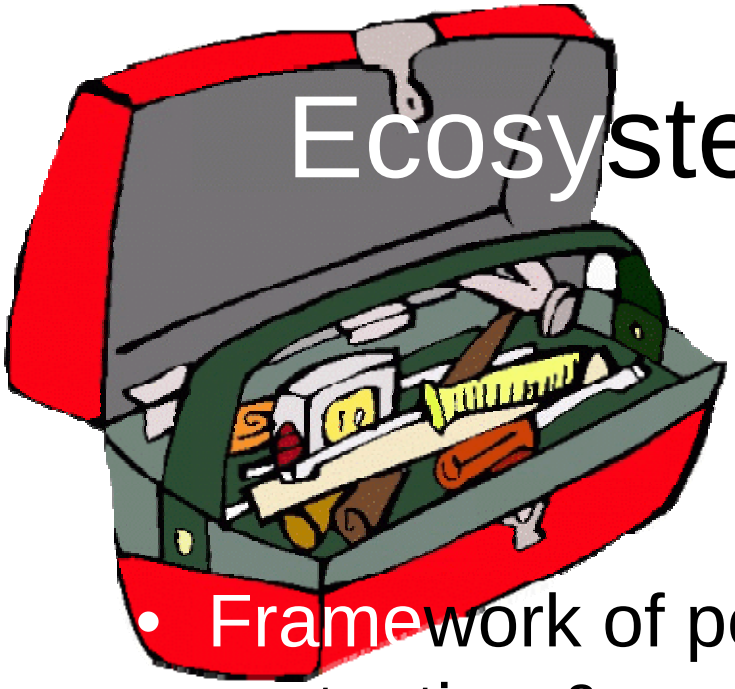
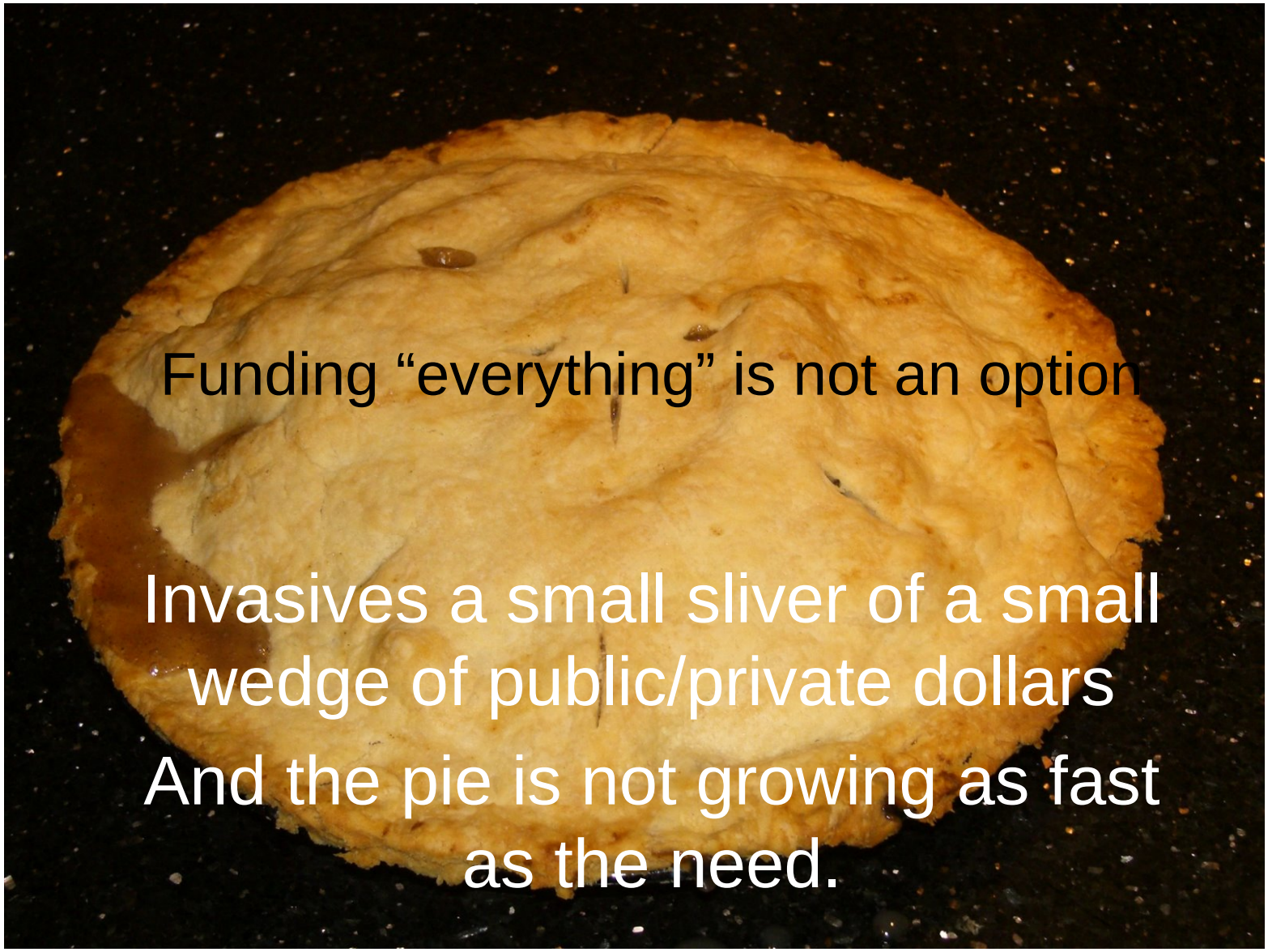
Funders Briefing
May 27, 2008
Angel Braestrup
The Curtis & Edith Munson Foundation



Ecosystem Management Tools

- Framework of policy/law to encourage protection & prevention of harm
- Big Picture Protections (air, water, etc.)
- Site-specific protection (parks, refuges)
- Management within sites (limited access, limited activities, invasives removal)


Funding “everything” is not an option
Invasives a small sliver of a small wedge of public/private dollars
And the pie is not growing as fast as the need.

Funder’s Dilemma

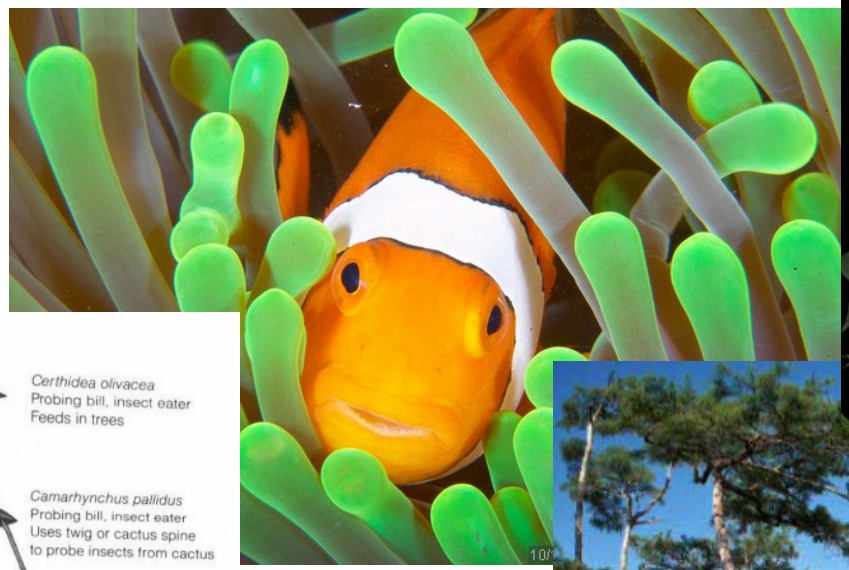
- Lots of threats and challenges
- Lots of great requests to try to address those challenges
- Evaluating priority and urgency
- Evaluating return on investment
- Deciding whether a problem is really a problem, or is even solveable in a cost-effective way

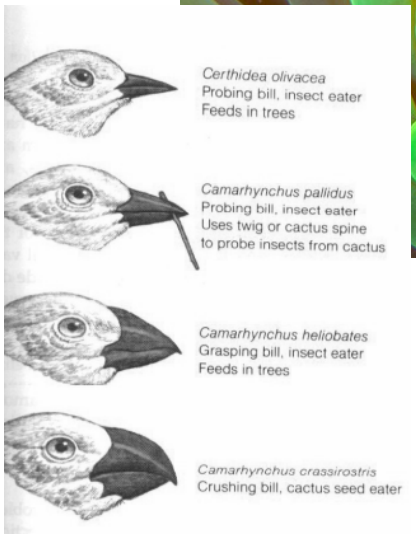
From a blank canvas

To a rich ecoystem created by successful invasion

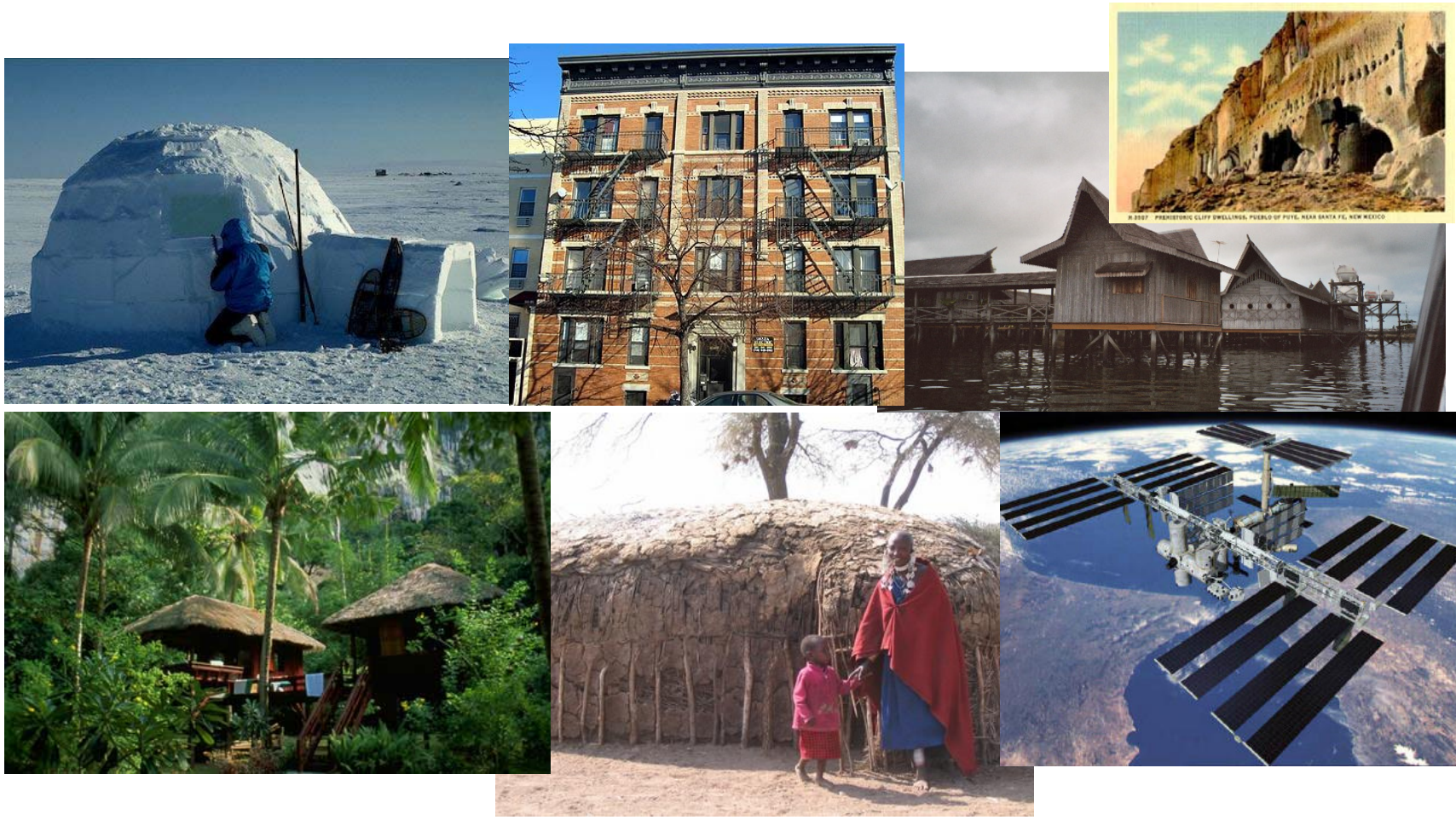
Adaptation & Evolution

We Only See the Winners who have carved out their niche





And as humans manage near-universal adaptation



And some species adapt to us

Or we find some invasives useful despite the disruption they cause in native ecosystems.

We get new winners-- like them or not!

Challenge of Investing in Managing Invasive Species

- The problem is huge
- Where it is most annoying or damaging to human habitation, often at least partly underwritten with government & corporate dollars
- Eradication/limitation challenge seems overwhelming in both cost and constancy
- Prevention challenge only slightly less so
- And, as with all issues in the U.S.,

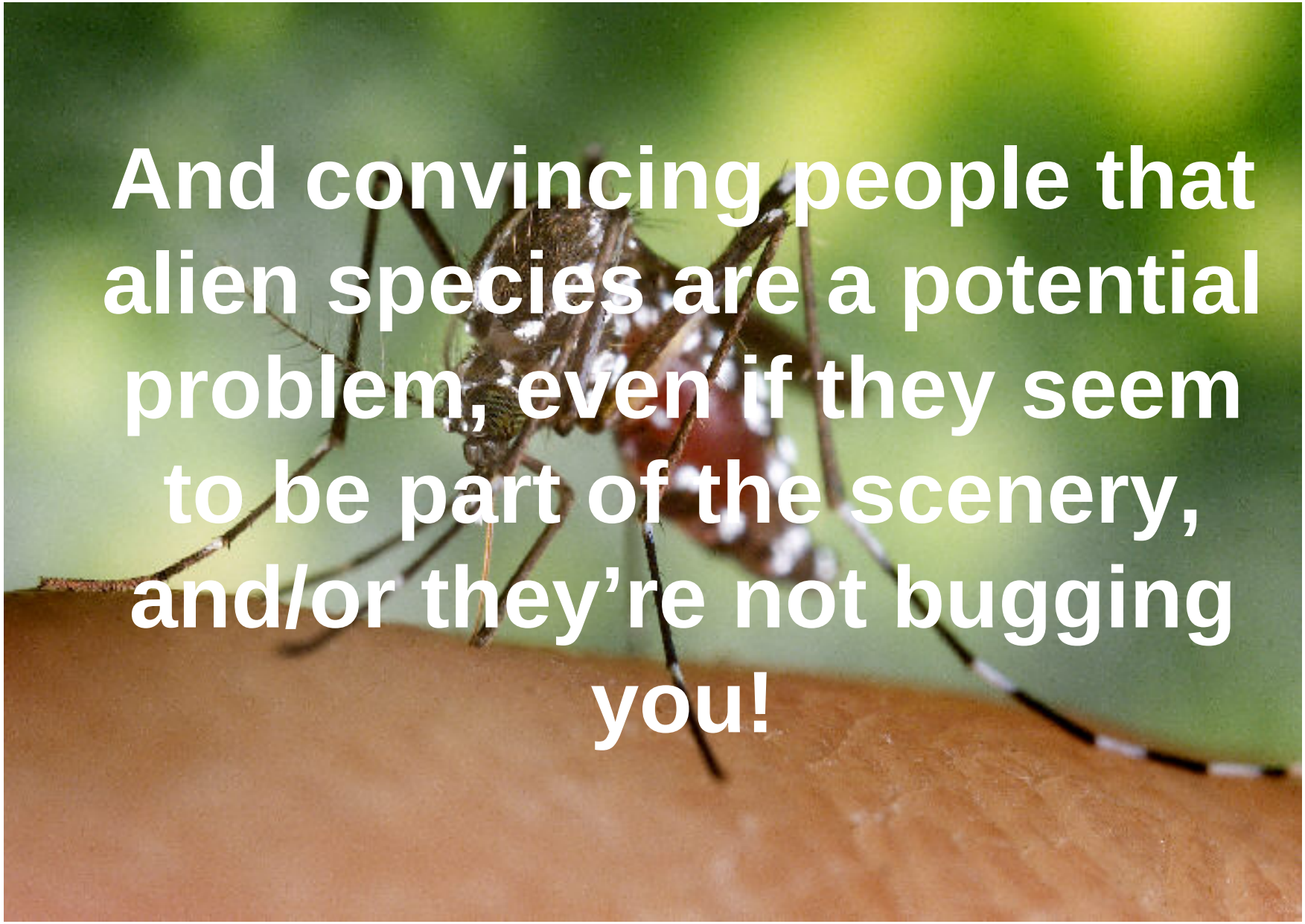
The overarching problem is the unseen constituency that shares

A FUNDAMENTAL BELIEF THAT ANY LIMITATION ON ABSOLUTE FREEDOM OF CHOICE IS ANTITHETICAL TO BEING AMERICAN,

and an economy that is dependent on providing as many choices as possible.

Managing Invasives means Limiting Choice:

- Limitation on imports;
- Limitation on unfettered shipping/ballast practices
- Limitation on pet ownership;
- Limitation on garden plants;
- Limitation on introducing species to solve life-style/human impact problems (e.g. kudzu for erosion, Australian pine for drainage, etc.)


And convincing people that alien species are a potential problem, even if they seem to be part of the scenery, and/or they’re not bugging you!

Munson Foundation Grantmaking

Areas of incredible biodiversity

Wide range of endemic species

Greatly affected by human “solutions” and activity

Fundamental Belief that Multiple Strategies are Needed To Achieve Conservation Goals

- Training & Education
- Site restoration (including eradication of harmful invasives)
- Prevention of harm and conservation through policy/regulatory frameworks
- Research into effective strategies, potential consequences, and on-site solutions
- Design of better international framework to limit mobility of harmful species through human transportation systems

Why Munson Funds Work on Invasives

- Primary funding programs are in areas of significant biodiversity and significant human threat
- Diversion of scarce resources (human & financial) from protection/ conservation to invasives seems wasteful
- Sheer magnitude of problem means government & ngo efforts are more targeted, strategic, and tend to be cost-effective-- and can be made more so through training and research.
- Because of other policy, education, and conservation priorities, invasive/alien management not a consistently significant portion of the grantmaking program.

Invasives, Funders, & Climate Change

- Already seeing climate change effects in key US regions of biodiversity significance
- Problem is getting worse but there are solutions
- Opportunity to invest in preventive & proactive measures is significant and timely--
- And can help ensure that every dollar you've already spent on ecosystem health

Doesn’t disappear!

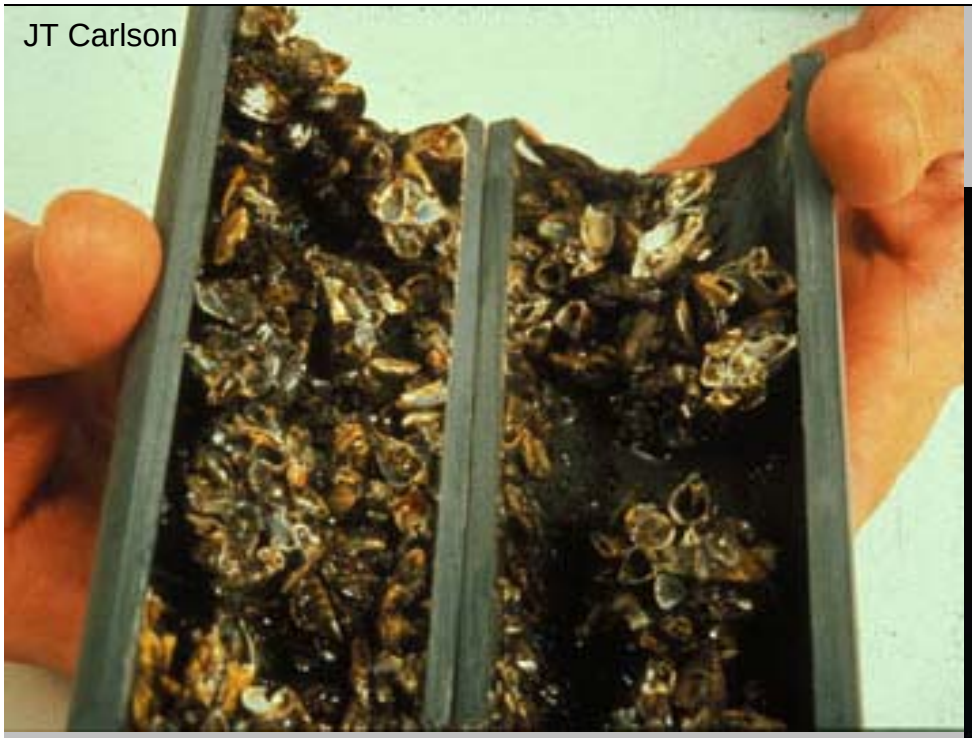
Aquatic Invasive Species

Read D. Porter
Environmental Law Institute

Cholera

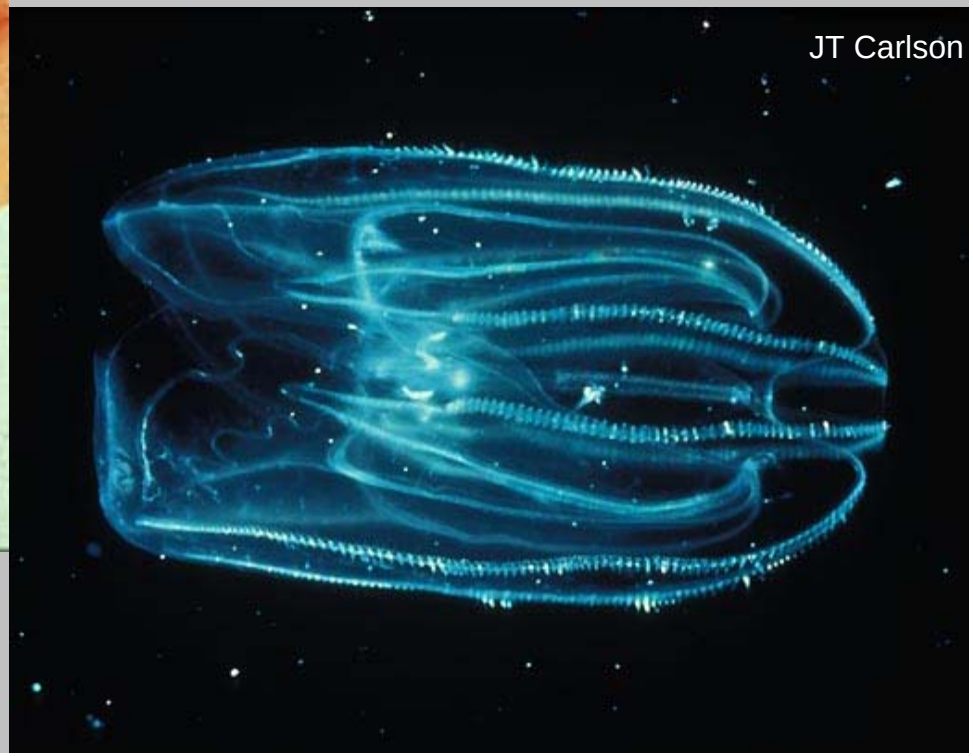
Threats from Aquatic Invaders

- Invasive species cost $137 Billion/year in the United States
- Environmental damage may affect entire ecosystems
- Severe public health impacts



Zebra mussell, *Dreissena polymorpha*

Comb jelly, *Mnemiopsis leidyi*



Ballast Water is a primary vector for the introduction of non-native aquatic species into new environments

- Oceangoing vessels require ballast water for stability as cargo is loaded and unloaded

Plugging the Ballast Water Pathway

- Known harm
- Known mechanism
- Known solutions

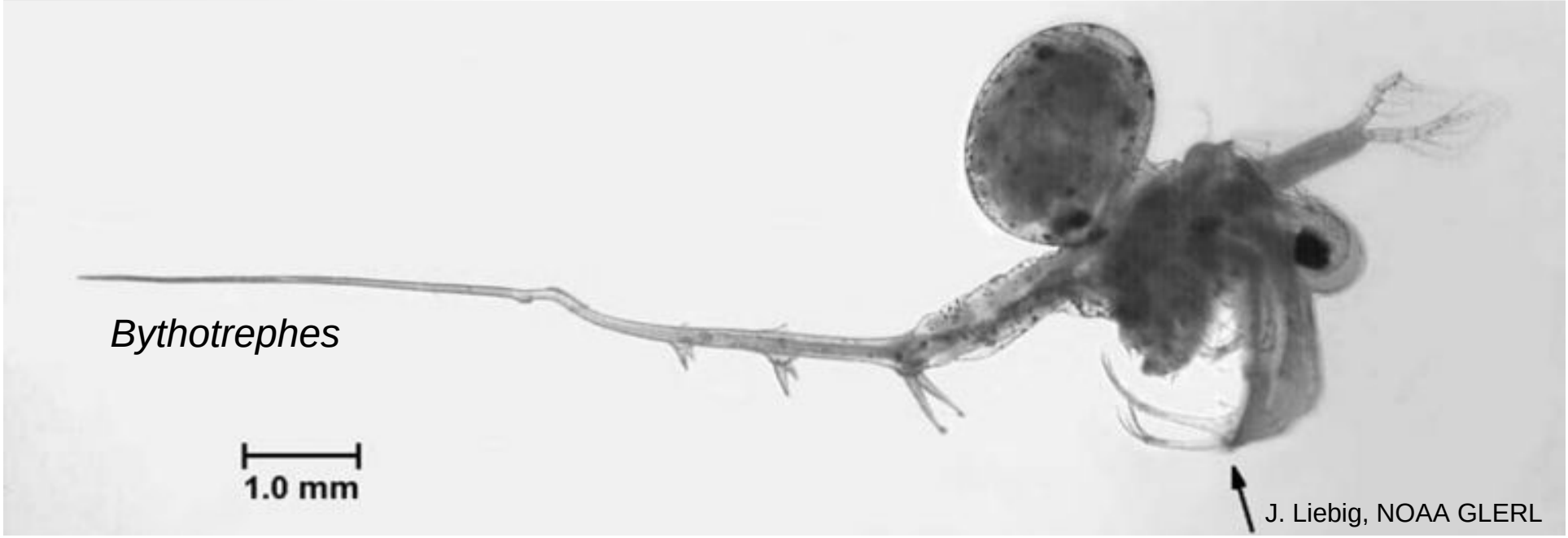
- Policy change needed to implement improved technologies

A Success Story: Policy in Action

- Prior international convention, state laws
- Ballast Water Treatment Act, H.R. 2830
  - PASSED by the House of Representatives!

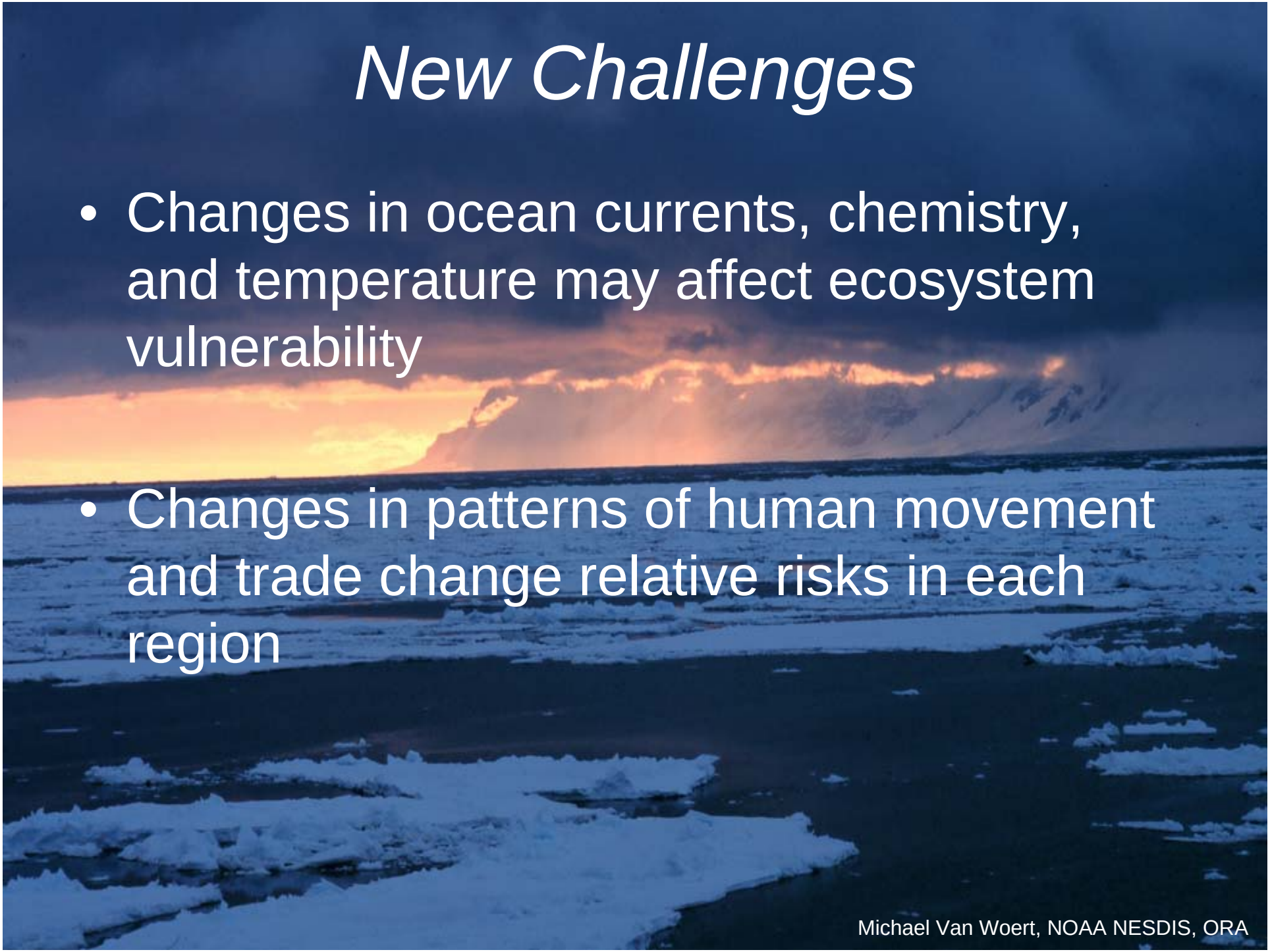
Next steps: *Implementation*

- Interaction of Clean Water Act and Ballast Water Treatment Act
- Monitoring, Compliance and Enforcement
- Recreational Vessels



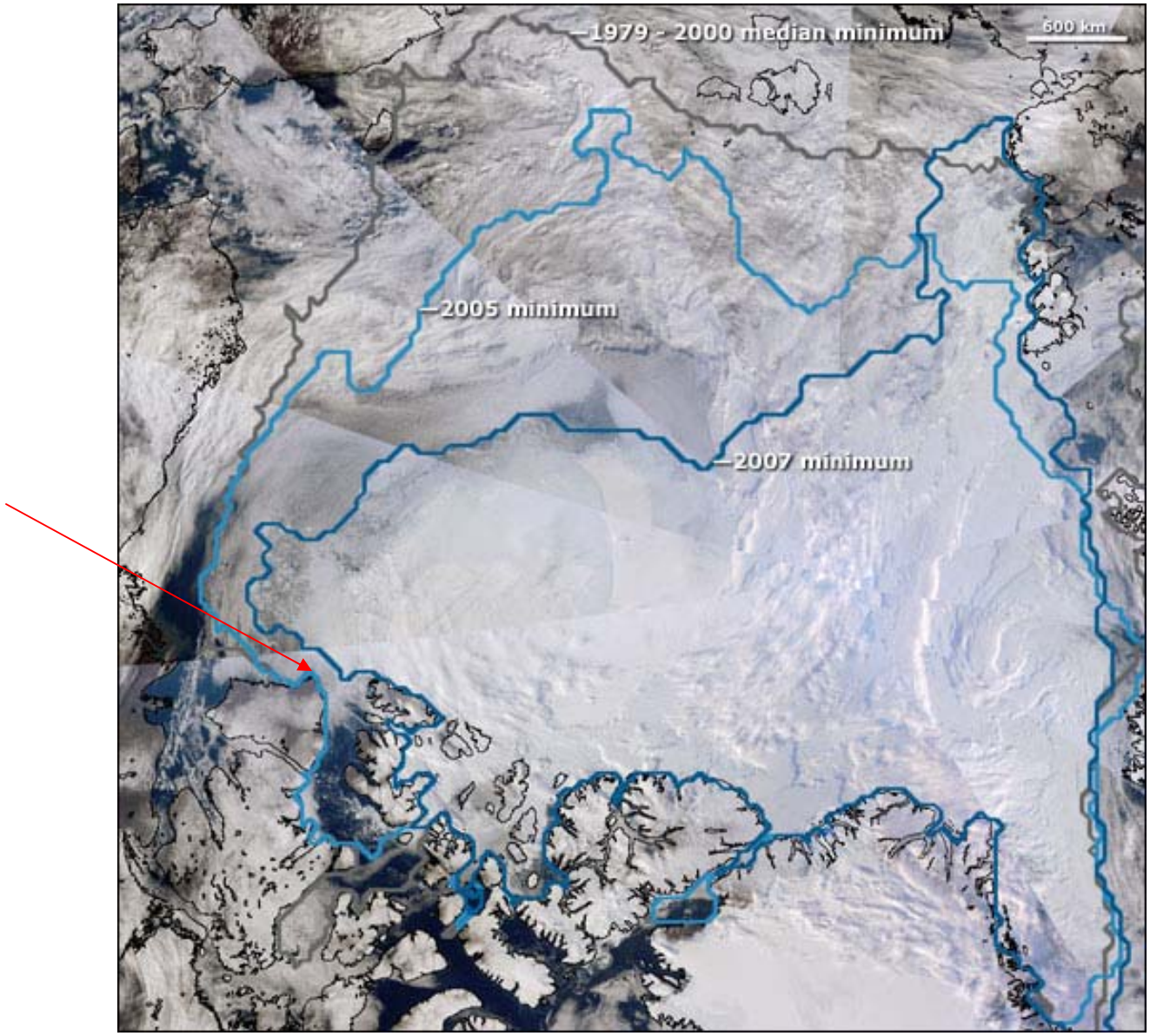
New Challenges

- Changes in ocean currents, chemistry, and temperature may affect ecosystem vulnerability
- Changes in patterns of human movement and trade change relative risks in each region



Michael Van Woert, NOAA NESDIS, ORA

Sea Ice and the Northwest Passage



Terry Haran, National Snow and Ice Data Center, University of Colorado, Boulder, using NASA MODIS data

Invasive Species Affect Climate

- Pine beetles: BC forests are a carbon source – not a sink!
- Cheatgrass/Malaleuca: wildfire severity
- Implications for RGGI, carbon trading?

Planning for the Future

- **Developing scientific information will drive future policy needs: *Adaptive management***

- **State management plans are not adaptive**

Michael Van Woert, NOAA NESDIS, ORA

Invasive Species and Climate Change:

Good-Gosh-All-Fish-Hooks!

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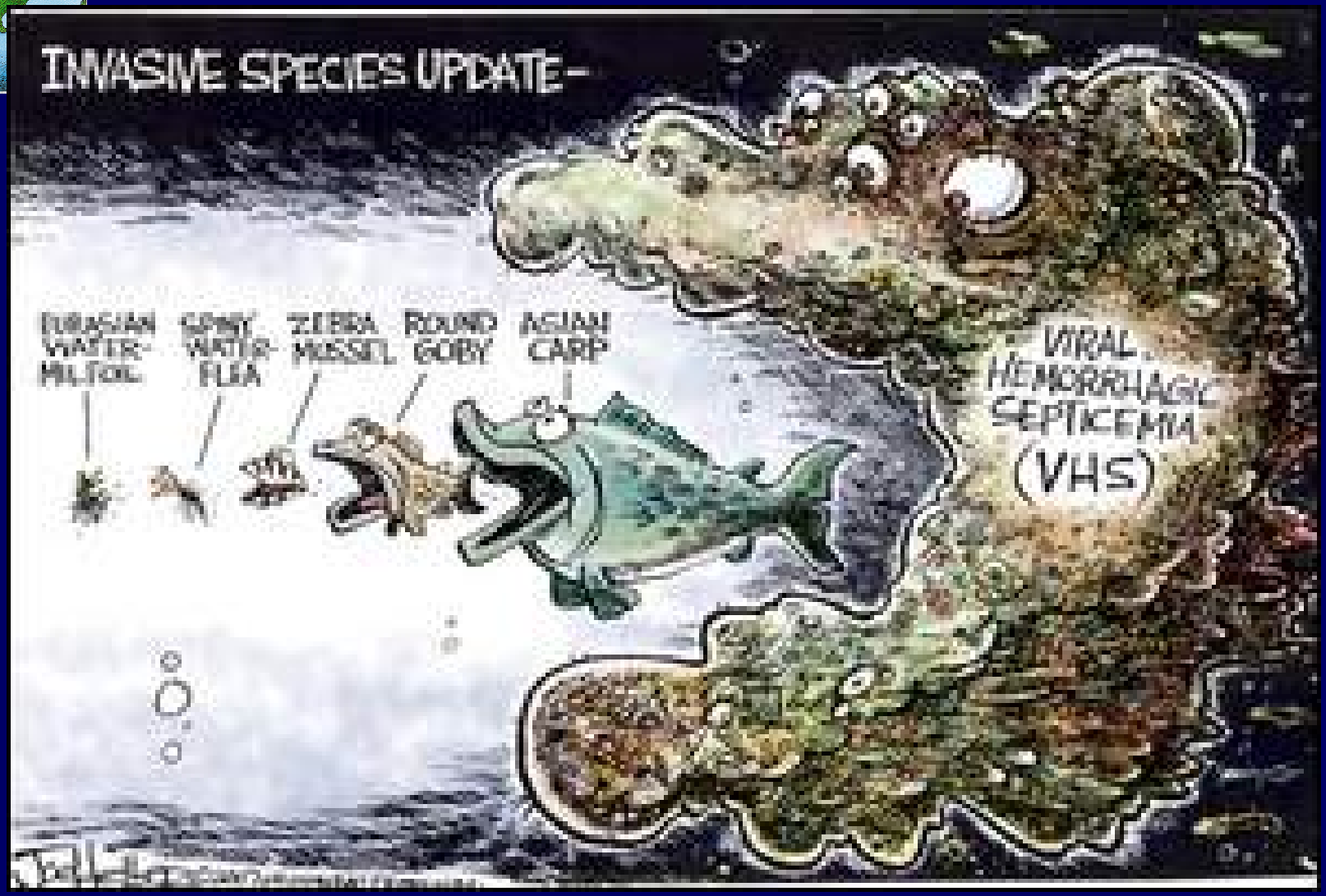
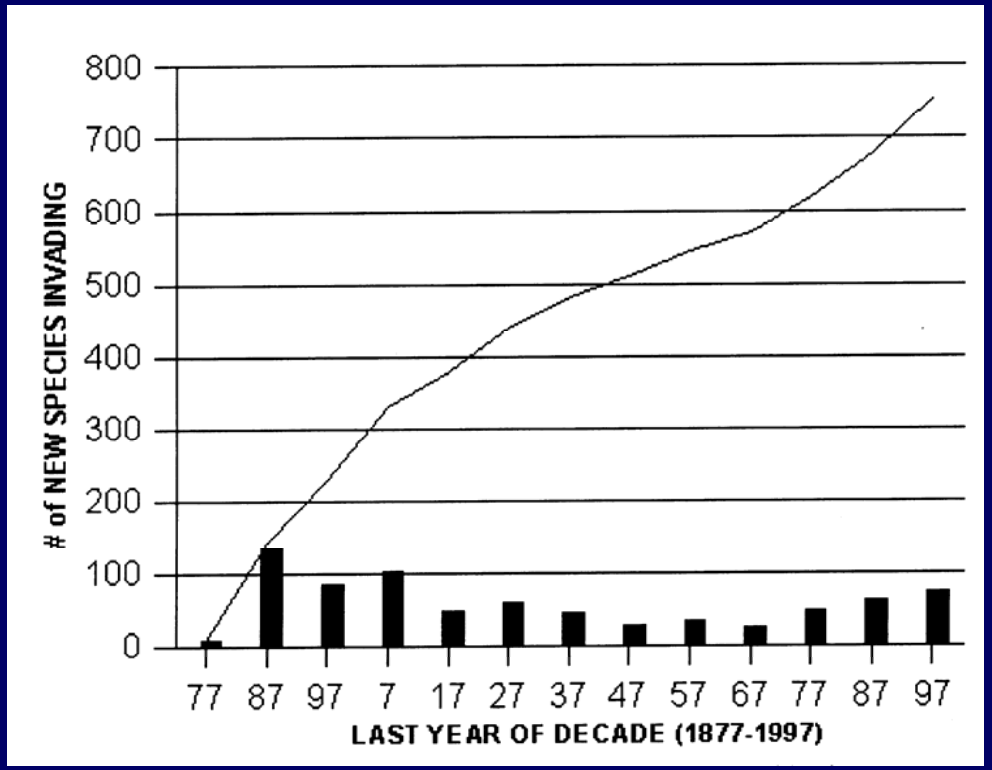
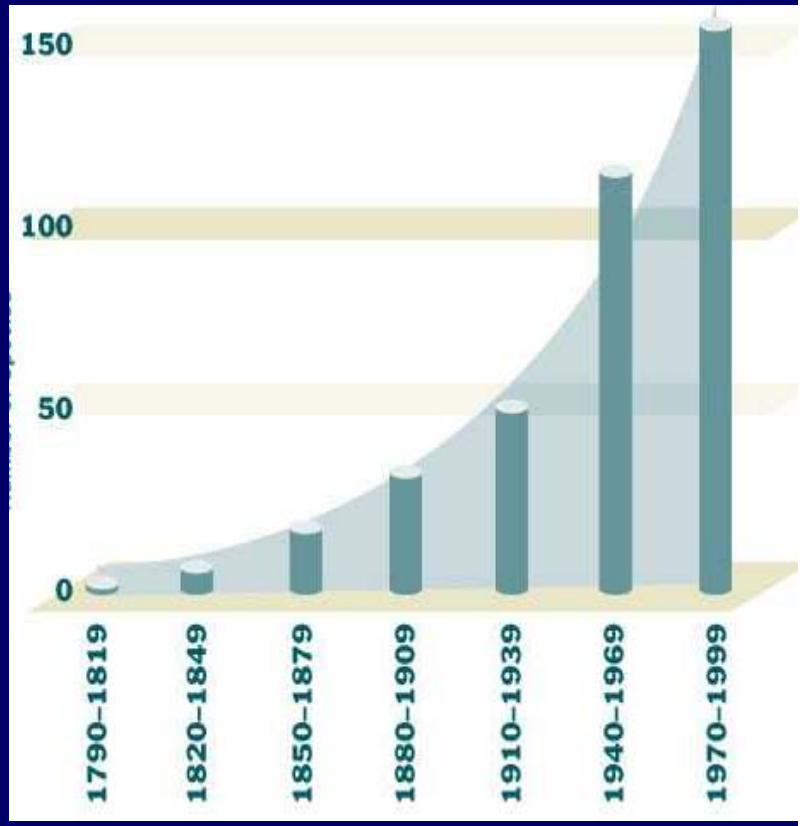


Tom Heller, *Green Bay Press Gazette*, June 2007

Invasive Species:
A problem that tracks international trade



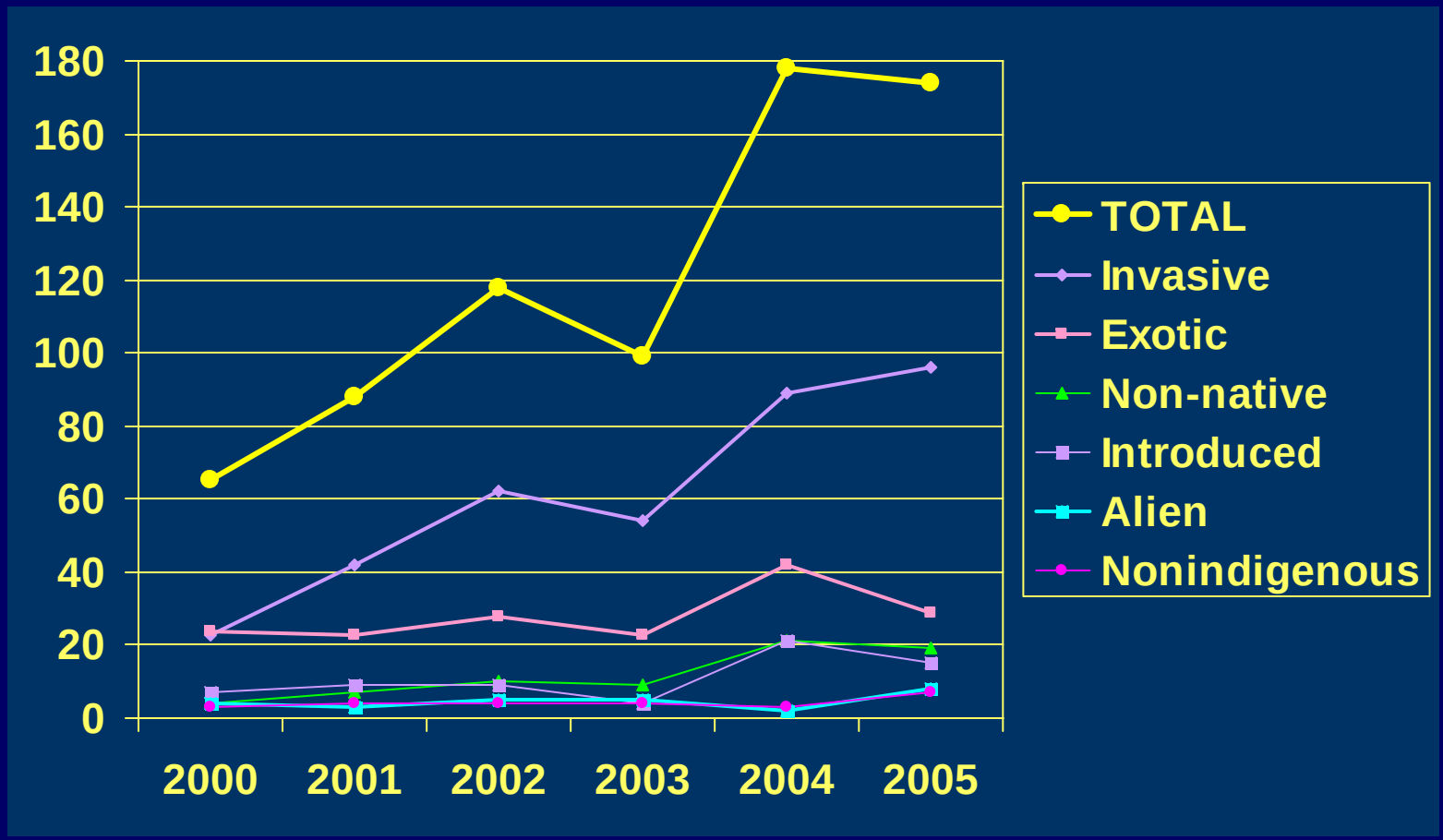
Plants in five northwestern states



Marine invertebrates and seaweeds

Invasive Species: A growing Science

Number of Papers at Ecological Society of America Annual Meetings



Invasive Species:
Exciting Science for New Solutions

Screening Out Invaders Before Import

- Biology: new, accurate, models to predict potential invaders
- Economics: evidence that screening pays for itself
- Technology: ships' ballast water could be invasives-free within about 15 years

Invasive Species Policy: Good-Gosh-All-Fish-Hooks!

Federal "Noxious Weeds"	1984	2004
Number of genera, species, or strains listed	93	96

melaleuca

Caulerpa taxifolia
Mediterranean strain

tropical soda apple

Invasive Species Policy:
Non-Native Animal Imports, 2000-2004

Group	Non-Native Species Imported	Proportion of Non-native Species	Proportion Not Identified to Species
Total Vertebrates	1,825	85%	10-98%
Total Invertebrates	416	72%	1-36%
All Groups	2,241	82%	94%

Summarized from: Jenkins, P., et al. 2007. *Broken Screens: the Regulation of Live Animal Imports in the United States. Defenders of Wildlife, Washington, DC.*


MAYBE IT'S TIME WE ADDRESS INVASIVE SPECIES.
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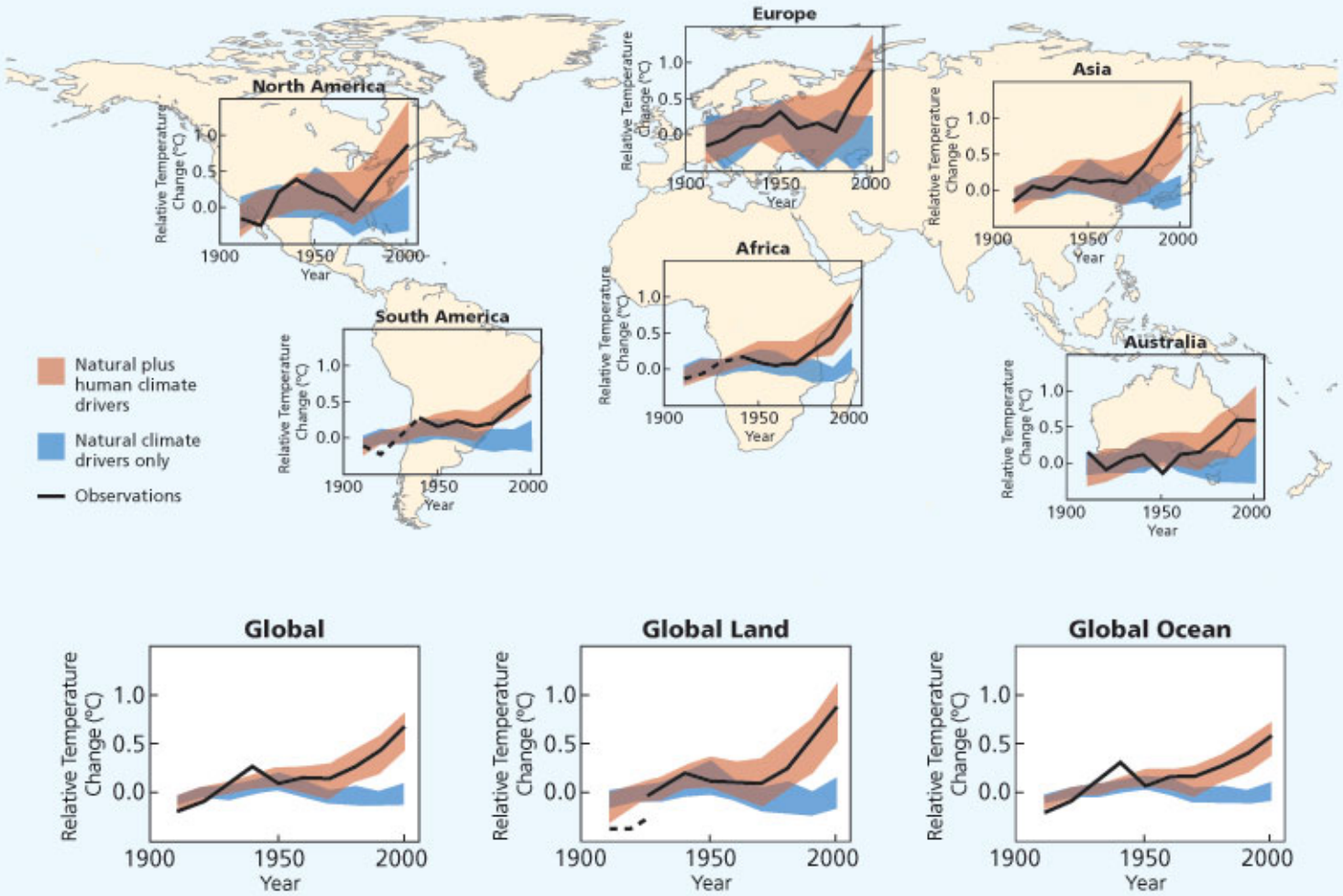
www.jklossner.com

Climate Change:
26,000 Data Points Can't Be Wrong



Source: IPCC. Climate Change 2007: The Physical Science Basis – Summary for Policymakers

Invasive Species AND Climate Change?

Google Scholar finds:

- 754,000 articles on “climate change”
- 34,500 articles on “invasive species”
- 8,650 articles on “invasive species” AND “climate change”

Source: UCS 5/21/08 search

Climate and Invasive Species:
Which Plants Does Higher CO_2 Favor ?

Habitat or Crop	Invasive Plant or Weed	THE WINNER!
Desert	Foxtail brome	**Invasive plant**
Prairie	Honey mesquite	**Invasive plant**
Woods	Wild cherry (or plum)	**Invasive plant**
Soybean	Pigweed	**Crop**
Sorghum	Pigweed	**Weed**
Soybean	Common lambsquarters	**Weed**
Alfalfa (lucerne)	Dandelion	**Weed**
Sorghum	Velvetleaf	**Weed**
Grasses	Dandelion and Plantain	**Weed**

Source: Ziska, L.H. 2008 “Climate change and invasive weeds.” USDA.
See this and related papers at http://www.climateandfarming.org/clr-cc.php

Invasive Species in Ohio

UCS forthcoming

Group or Topic	Legal Authority	Implementation	Funding and staffing	Enforcement
Invasive plants and "noxious weeds"	ELI. 2004a ELI. 2002	OIPC. 2006 ELI. 2004a	ELI. 2004a	ELI. 2004a
Aquatic species	ELI. 2002 ELI. 2008	ODNR. 1997 ELI. 2008	ODNR. 1997	
Live fish	Alexander. 2003 2004			
Ballast water: preemption of state laws	ELI. 2006			
Wildlife and other animals	ELI. 2002 OTA. 1993	OTA. 1993	OTA. 1993	OTA. 1993
Climate change and aquatic invasive species		EPA. 2008 UCS. 2003	UCS. 2003	UCS. 2003
Early detection and rapid response	ELI. 2007			

“But man [sic] cannot live on gloom alone.”

Charles Elton. 1958. *The Ecology of Invasions by Animals and Plants.*

“Ours is to be faithful, not necessarily successful.”

Calvin DeWitt . 2007. “Discovering Where We Live: Reimagining Environmentalism,” National Public Radio, January 1.