SECONDARY SPREAD RISK MITIGATION PROJECT

INTRODUCTION

SEPTEMBER 27, 2011 ~ BALTIMORE

ACKNOWLEDGEMENTS

- **The CSA appreciates the leadership, commitment and generous offering of expertise and time of:**
  - Dr. Sarah Bailey, Coordinator of Expert Panel of ANS Scientists
  - Noel Bassett, Co-coordinator of the Technologies and Practices Panel
  - Project Panel participants (XX)
  - Craig Middlebrook, St. Lawrence Seaway Development Corp.
  - Dale Bergeron, Minnesota Sea Grant

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Expert Panel of ANS Scientists:

- Dr. Sarah Bailey
- Lindsay Chadderton
- Dr. David Reid
- Rochelle Sturtevant
- Dr. Lisa Drake
- Allegra Cangelosi
- Dr. Marvourneen Dolor
- Jennifer Sieracki
- Andrew Drake

Technologies and Practices Panel

- Noel Bassett
- Laurent Jean
- Kirk Jones
- Mira Hube
- Rob Houston
- Allegra Cangelosi
- Chris Wiley
- Daniel Cote
- Eric McKenzie
- Phyllis Green
- Caroline Denis
- Scott Porter
- Rick Harkins

BACKGROUND

- **Context of the Secondary Spread Risk Mitigation Project:**
  - Role of domestic vessels in secondary spread of aquatic invasive species
  - Significant limitations facing domestic vessels in the adoption of BWTS
  - Recognized benefits of risk-based approach

LIMITATIONS OF DOMESTICS

- Unique requirements:
  - Operating environment (fresh water, very cold water)
  - Operational realities (high ballast flow and volume, short trips)
- Supply constraint
- Retrofit not feasible
- Economic barriers

WHY RISK-BASED?

- Potential for enhanced risk-based approach
  - Existing regulatory framework is risk-based
  - Other jurisdictions (ie. Australia) employ a risk-based approach
  - EPA SAB recommend risk-based approach

OBJECTIVES

1. Improved understanding of the risk of secondary spread
2. Develop enhanced industry voluntary ballast water best management practices
3. Consider the role of additional measures and practices for addressing the risk

SCOPE AND PROCESS

- Major activities
  - Initiated the development of a risk assessment model
  - Initiated the review and assessment of existing and possible alternate risk mitigation measures
- Sought expert comment and input
  - Expert Panel of ANS Scientists
  - Technologies and Practices Panel

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UPDATE ON ACTIVITIES

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OUTLINE

- Ballast water movement inventory
- Risk assessment methodology and tool
- Assessment of BMPs and additional measures

BALLAST WATER INVENTORY

- Project team aggregated ballast water movement inventory for 2009, based on company submissions:
  - Algoma Central Corporation
  - American Steamship Company
  - Canada Steamship Lines
  - Great Lakes Fleet
  - Group Desgagnes

BALLAST WATER INVENTORY

- Summary of ballast water movement inventory:
  - 42,436,514 tonnes of ballast water transported in 2009
  - 2,645 individual vessel voyages
  - 86 vessels

BALLAST WATER INVENTORY

- Of these movements:
  - 35% between ports in the same body of water
    - 13% within the St. Lawrence River
    - 8% within Lake Erie
    - 5% within Lake Michigan
    - 4% within Lake Huron, Lake Ontario (respectively)
    - 2% within Lake Superior
  - 83% within the Great Lakes
  - 4% between ports from St. Lawrence River to Great Lakes
  - >0.25% between ports from Great Lakes to St. Lawrence River

BALLAST WATER INVENTORY

BW Donor BOW	BW Recipient BOW	# Trips	Ballast Water Volume (tonnes)	% of BW Moved in GLSLS Inventory	% of Voyages in GLSLS Inventory
St. Lawrence River	St. Lawrence River	438	5,504,848	13%	17%
Erie	Superior	151	3,598,891	8%	6%
Erie	Erie	243	3,587,425	8%	9%
Huron	Superior	140	3,562,064	8%	5%
Superior	Michigan	92	3,461,994	8%	3%
Michigan	Superior	108	2,855,258	7%	4%
Ontario	Erie	160	2,711,845	6%	6%
Erie	Huron	230	2,579,217	6%	9%
Superior	Erie	62	2,069,625	5%	2%
Michigan	Michigan	121	1,965,149	5%	5%
Huron	Huron	131	1,582,097	4%	5%
Ontario	Ontario	185	1,576,707	4%	7%
Ontario	Superior	65	1,132,125	3%	2%
Michigan	Huron	85	1,051,106	2%	3%
Superior	Superior	46	755,851	2%	2%
Ontario	Huron	52	713,763	2%	2%
Michigan	Erie	29	708,336	2%	1%
St. Lawrence River	Superior	31	537,664	1%	1%
St. Lawrence River	Erie	34	488,170	1%	1%
Erie	Michigan	28	403,072	1%	1%
Huron	Michigan	27	361,526	1%	1%
St. Lawrence River	Ontario	75	329,477	1%	3%
Huron	Erie	24	274,294	1%	1%
	Total	2645	42,436,514	100%	100%

BALLAST WATER INVENTORY

- Top donor ports

Donor Port	Ballast Water (tonnes)	No. Trips
Hamilton	3,944,144	235
Thunder Bay	3,129,361	84
Duluth	2,300,868	75
Toledo	2,131,028	131
Quebec	1,738,363	222
Indiana Harbor	1,704,461	82
Sorel	1,630,421	106
Burns Harbor	1,444,200	43
St. Clair	1,411,800	39
Milwaukee	1,274,233	93
% of Total	49%	42%

BALLAST WATER INVENTORY

- Top recipient ports

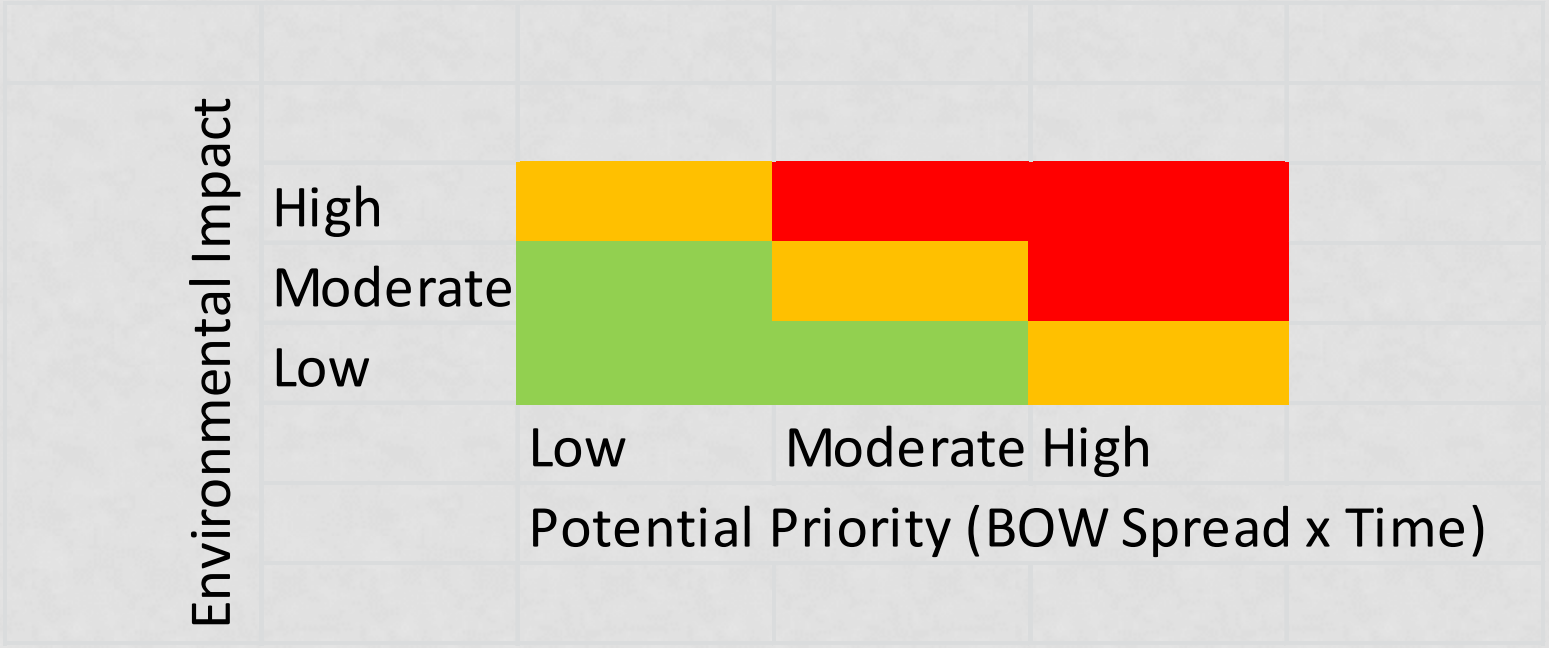
Recipient Port	Ballast Water (tonnes)	No. Trips
Superior	7,545,301	287
Gary	3,650,608	105
Duluth	3,538,167	197
Goderich	2,748,432	203
Ashtabula	2,275,302	135
Havre St. Pierre	2,240,346	132
Toledo	1,551,327	98
Meldrum Bay	1,540,689	123
Conneaut	1,527,984	50
Sept Iles	1,137,035	70
% of Total	65%	53%

RISK ASSESSMENT METHODOLOGY

- Secondary Spread Risk Assessment
  - Assigns a risk rating to ballast water movements where species present in donor but not recipient body of water
  - Incorporates environmental impact
  - Prioritizes species based on time since first report and number of bodies of water it is reported in

RISK ASSESSMENT METHODOLOGY

- Secondary Spread Risk Assessment rating



MODEL DEMO

ASSESSMENT PROCESS

- Technologies and Practices Panel
  - BMPs assessed based on feasibility and practicability criteria (technical, operational, economic)
  - Identified opportunities for improved practices and implementation
- Expert Panel of ANS Scientists
  - Expert opinion on the degree to which a measure or practice contributed to reducing the risk of secondary spread
  - Ranking potential for risk reduction as Low / Moderate / High for different organism sizes

INVENTORY OF MEASURES

- Sediment management
- Minimizing ballast water uptake
- Sea chest screens
- Secondary strainers
- Ballast water pumps
- Ballast water exchange (fresh, river, gulf)
- Filtration (50 micron)
- Biocide
- Vessel modifications
- Thermal treatment
- Biocide shock treatment
- Temporary vessel re-routing
- Temporary avoidance of ballast water uptake

INVENTORY OF MEASURES

- Group 1: Inventory of Practices within existing BMPs
  - Sediment management
  - Minimizing ballast water uptake
  - Sea chest screens
  - Secondary strainers
  - Ballast water pumps
  - Ballast water exchange (fresh, river, gulf)

INVENTORY OF MEASURES

- Group 2: Alternate measures
  - Filtration (50 micron)
  - Biocide
  - Vessel modifications

INVENTORY OF MEASURES

- Group 3: Emergency measures
  - Biocide shock treatment
  - Temporary vessel re-routing
  - Temporary avoidance of ballast water uptake

BENEFITS & ADVANTAGES

- Achievable approach
- Provides earlier action
- Accounts for vessel/trade-specific needs
- Adaptive approach that matches mitigation measure to risk
- Recognizes overall environmental benefits
- Potential to build on the existing regulatory framework
- Aligned with expert opinion expressed in SAB Report

THANK YOU