

Joint UNECE-UNCTAD Workshop:

Climate Change Impacts on International Transport Networks

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Impacts of Climate Change on Seaports: Results of a Global Survey

Presentation by

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Impacts of Climate Change on Seaports: Results of a Global Survey

Joint United Nations Economic Commission for Europe/
United Nations Conference on Trade and Development Workshop
Climate Change Impacts on International Transport Networks

Austin Becker, Stanford University


Prof. Pam Matson, *School of Earth Sciences*
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Prof. Satoshi Inoue, *Visiting Professor, National Graduate Institute for Policy Studies*





Why Ports?

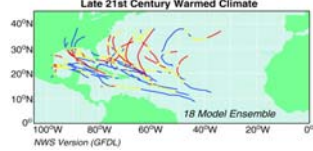
- Critical infrastructure in local and global economy
 - 80% of world freight moves by ship
- Highly dependent on specific locations
 - Deep water, protective harbors, multi-modal connections
- Difficult or impossible to relocate
- Highly vulnerable locations
 - Often estuaries or river deltas the provide ecosystem services
 - Prone to flooding, storm surge, and SLR



www.portofgeorgiaschristi.com


Climate Change Scenarios

Late 21st Century Warmed Climate



18 Model Ensemble
NWS Version (GFDL)

Control Climate



— Tropical Storm - Category 2
— Category 3
— Category 4 - Category 5

- Sea levels to rise .6 – 2 meters by 2100*
 - The world is not a bathtub!
- Doubling of Cat 4 and 5 storms*
- Ocean storm tracks shifting
- Inland flooding

* Americas Climate Choices, 2010 *Bender et al. Science 2010; 327(5964):454.



Impacts of Storms

IKE
\$2.4 Billion Damage to TX ports/waterways

Katrina
\$100 Million in Damage to 3 MS Ports

\$1.7 Billion in damage to Southern LA ports




Just eleven spills released approximately 7 million gallons of oil

Photos from Alabama State Port Authority

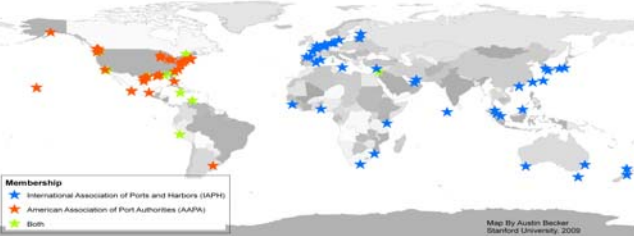
Global Ports Survey Objectives

- **Climate Change Impacts** –An issue for ports?
- **Climate Assumptions** – What impacts do ports foresee?
- **Adaptation Strategies** – What kinds of changes are ports considering with respect to climate change impacts?
- **Categories** - Are certain categories of ports or port directors considering these issues more than others?

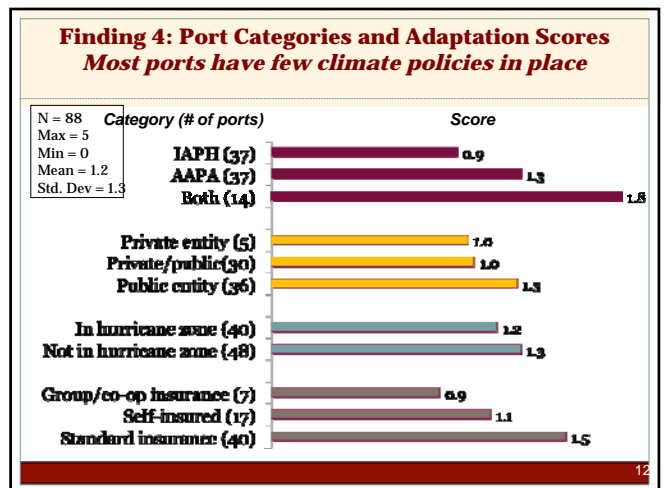
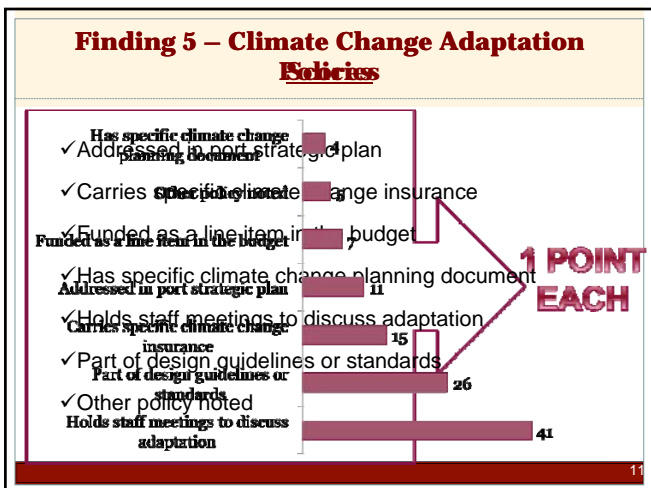
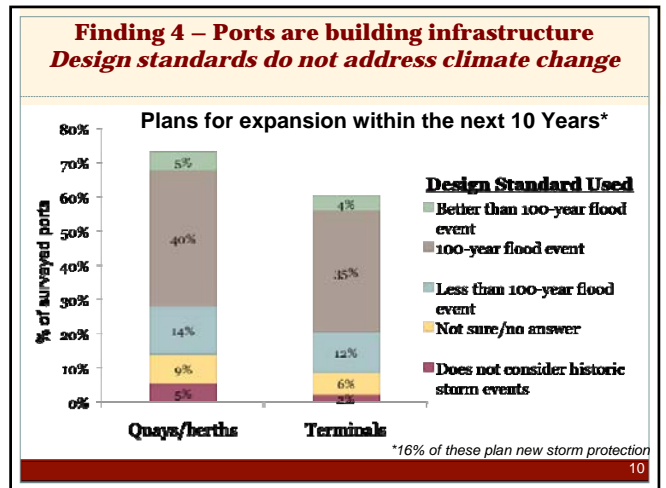
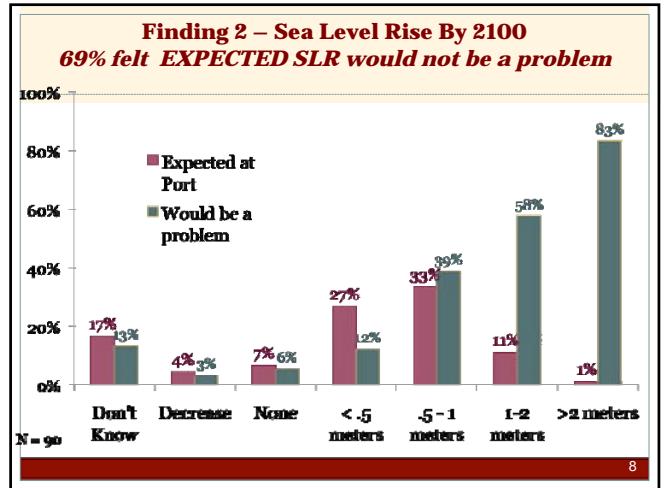
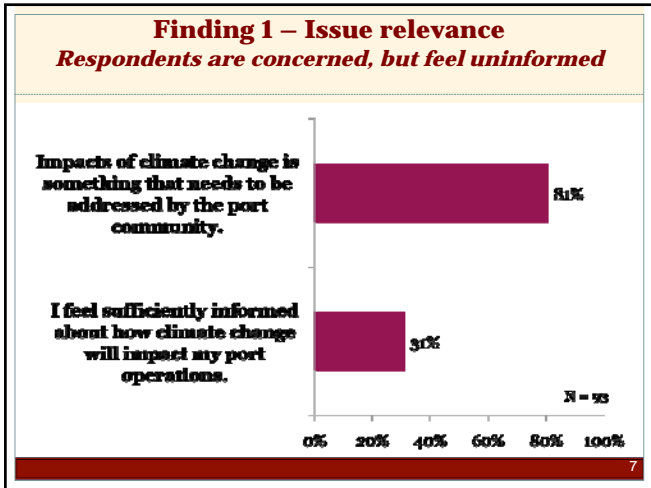
Climate Change Survey Respondents

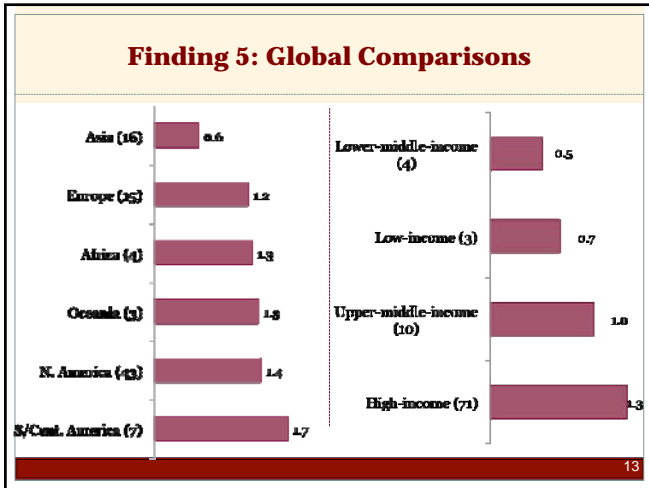
IAPH and AAPA



- Sampled IAPH/AAPA
- Survey Monkey
- Designed/Pretested with IAPH/AAPA

- 30 Questions
- Distributed Summer 2009
- 93 Usable Responses





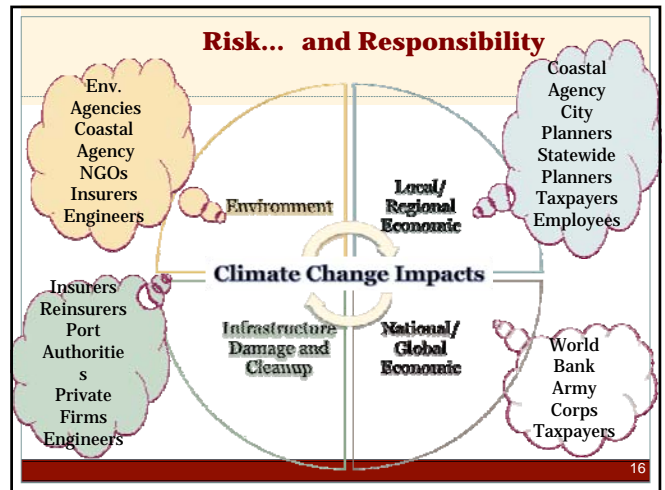
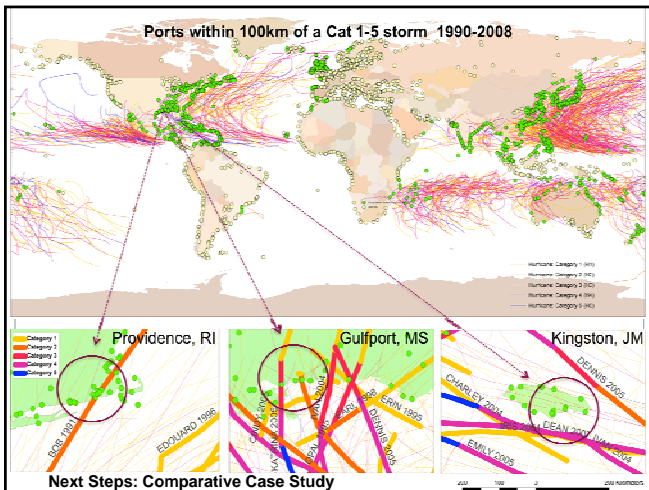
Questions

How do different stakeholders in a port system characterize impacts, objectives and alternatives with respect to storm-hazard mitigation?

What strategies for reducing vulnerabilities could be considered "optimal" by a port system?

Does the current system configuration allow storm impacts to be reasonably addressed?

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Acknowledgements

The Survey Respondents

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- Meredith Martino, *AAPA*
- CEE 129/229 Class

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