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Climate Change and Adaptation of Ports and Transport Logistics: The Kaleidoscope

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Acknowledgements

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Define “Climate Change and Adaptation”

Identify the Major Challenges, Problems and Obstacles

Identify Areas or Regions which are the Most Prone to the Impacts posted by Climate Change

Prioritize Possible Actions

A First Step to establish the International “Best Practices”



- Need for more **awareness-raising** about the complex implications climate change may have on ports and related transport infrastructure and networks. **Ports and transport operators do not seem to be sufficiently prepared, especially among secondary (or “regional”) ports.**
- Still many unknowns, in particular at the local and regional level. **Data and information about climate change factors and impacts at the local and regional levels** are required for the design of relevant and appropriate response measures.
- **THE IMPACTS OF CLIMATE CHANGE AND TRANSPORT NETWORKS (INCLUDING PORTS):**
 - At Gulf of Mexico, US: Rising Sea Level and Port Infrastructure and Efficiency (like Gulfport)
 - In Northern China: Extreme Climate (Frozen Bohai around Tianjin Port)
 - In Siberia, Russia: Melting Ice and Possible Shipping Routes along the Arctic (the possible rise of new ports)
 - In Tasmania, Australia: The changing quantity and quality of agricultural and sea products, thus affecting the survival (or even existence) of local/regional ports (and the well-being of surrounding communities)



The Kaleidoscope





The Kaleidoscope



Source: China Meteorological
Administration (2011)





- A lot of discussions (including this conference) have been put on “rising sea levels” and “increasing frequency of hurricanes” (which is not surprising given the tsunami and natural disasters in the past years, as well as the situation of a number of island states). Moreover, it currently largely focuses on container ports along the “trunklines” of international trade or the “hotspots”.
- However, this issue is clearly more than that...
- Coastal Management
- (Marine) Biodiversity
- Resource Sustainability, Port and Well-Being of Local Communities
- Logistics and Supply Chain (of which “port” and “transport” is only one component)
- Environment and Sustainable Development
- Port-Region (both land- and seaside) Relationship
- **INDIRECT (OR RELATIVELY IMPLICIT) IMPACTS ON PORTS AND TRANSPORT LOGISTICS**
- **CAN PERIPHERAL REGIONS, USUALLY WITH LESS FINANCIAL POWER AND SIMPLER PORT AND TRANSPORT FACILITIES, ABLE TO ADAPT TO THESE CHALLENGES (EVEN IF THEY KNOW ABOUT IT)?**



The Kaleidoscope

- Willingness to Adapt

- What to Adapt

“What are the risks and vulnerabilities?”

“Which matters most?”

“What are my options?”

“What happens first?”

- Capacity to Adapt



The Kaleidoscope



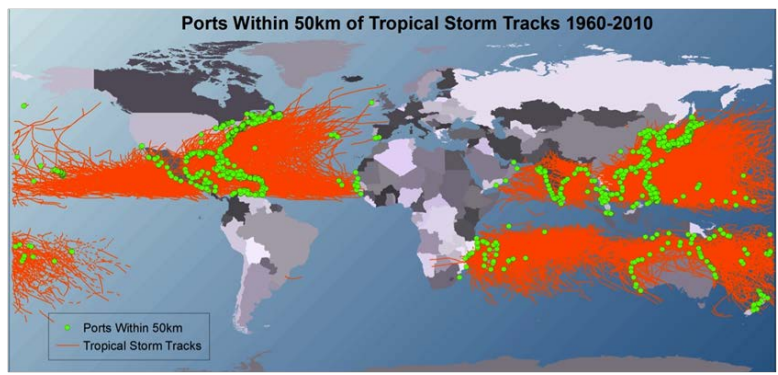
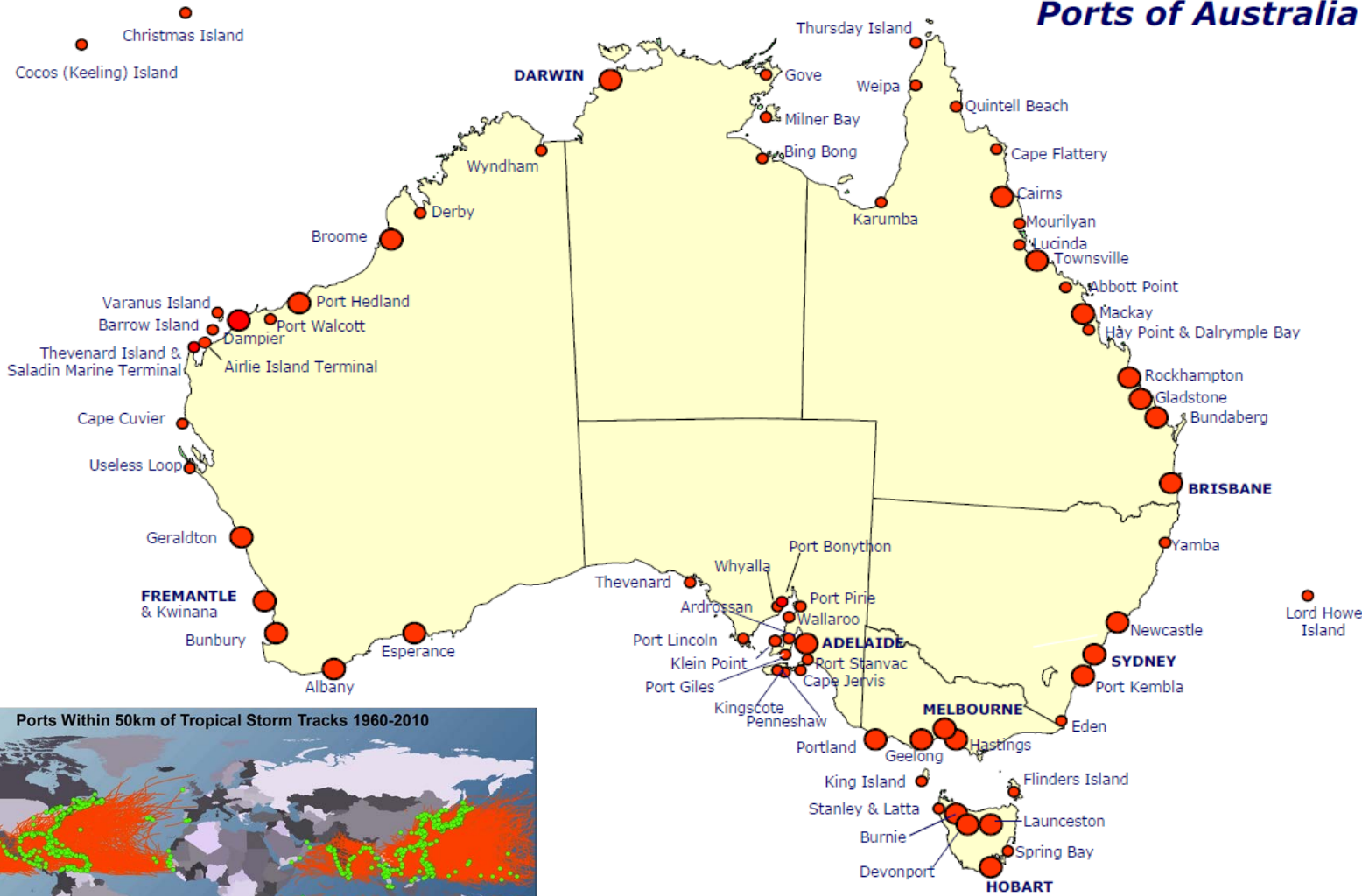
Damaged Harbour Facilities in Lanzhou, Ganxu Province in 2010

Source: <http://www.gscn.com.cn>





Ports of Australia



Acknowledgement to Austin Becker

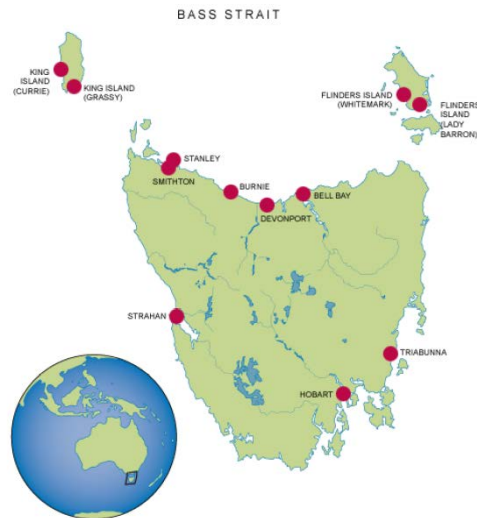
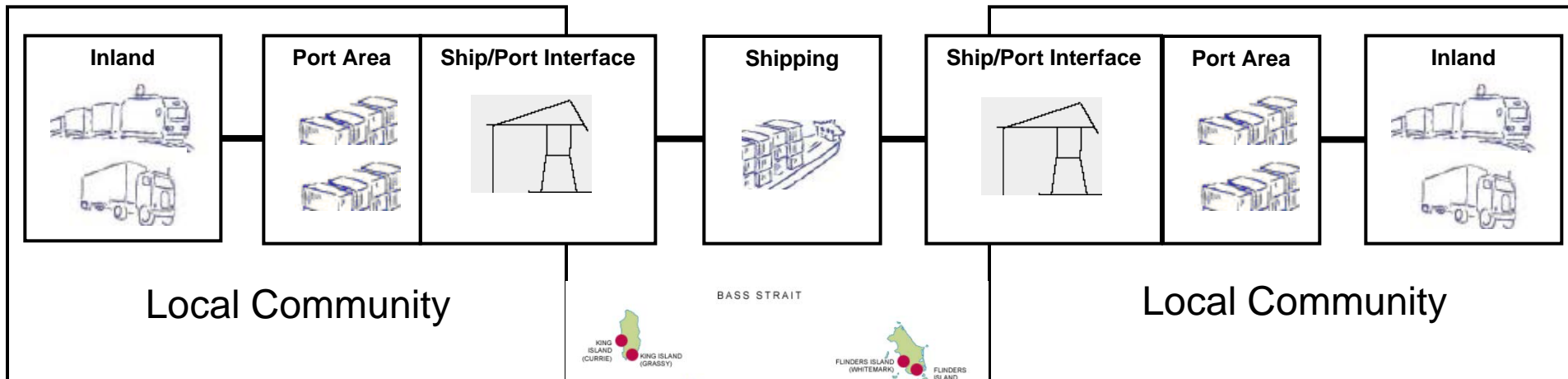


The Kaleidoscope

- Willingness to Adapt
- What to Adapt
- Capacity to Adapt
- Who (and How) should Adapt



The Kaleidoscope





Supply Chain and Regional Impacts: How does it affect port safety and operational efficiency? What are the impacts on the regional economy?

Policies and Port-City Relationship: How to share costs to facilitate port adaptation to climate change? What are the roles of Federal, State and Local Authorities?

Data Collection: What type of data is relevant? How to collect them? How to use them to raise awareness? Who should undertake data collection?

Increased Tourism: Warmer, drier summers would mean increased opportunities for coastal activities and business development. More information to the public to raise awareness of how they can avoid damaging coastal habitats and help preserve them.

Managed Realignment: Sea is allowed to reclaim certain areas to form mudflat or salt marsh. This will help to ease pressure on more criticality nearby flood defences and can replace habitats lost to a sea level rise.

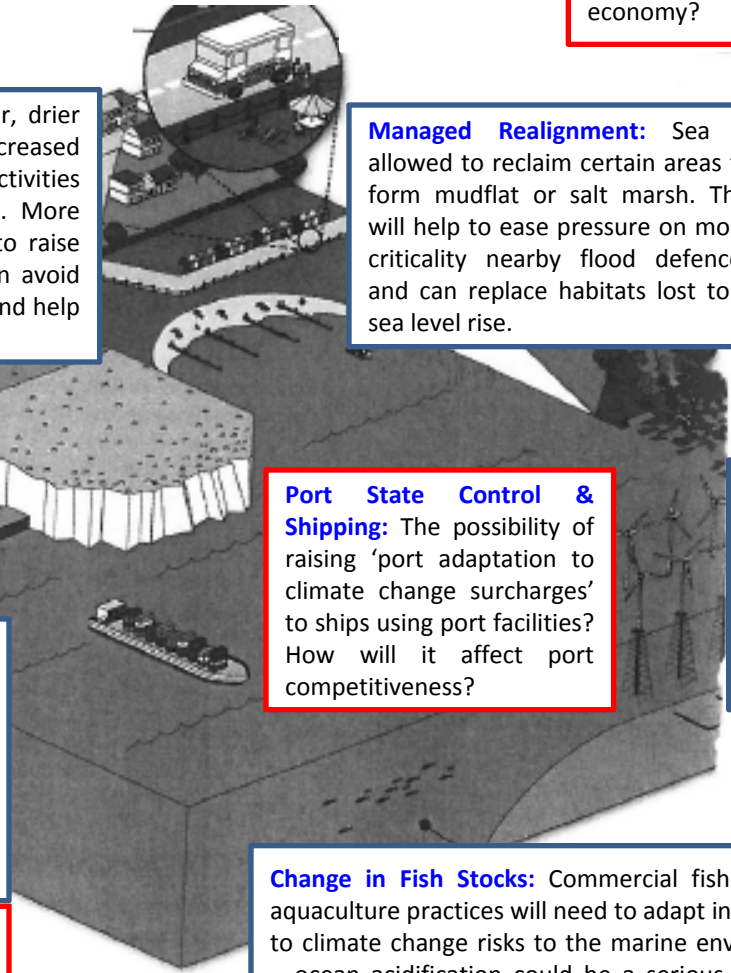
Port Facilities: The harbour wall is protected against sea level rise and new tide gates ensure extreme tidal surges can be kept at bay. Dockside cranes and adapted to be able to work in hotter temperatures. Sediments deposited from longshore currents and wave energy as well as new sediment generated from rivers and streams and coastal erosion, reduce depths and restrict the size of vessels that can utilize a port (thus more intensive dredging)

Port State Control & Shipping: The possibility of raising 'port adaptation to climate change surcharges' to ships using port facilities? How will it affect port competitiveness?

Windfarms: Offshore renewable energy schemes, including onshore substations, are built with potential sea level rise and extreme weather events in mind.

Port Management and Insurance: How ports are operated and identify some key classes of ports and the various types of insurance schemes that these private, public/private, or public organizations utilize to manage risk. What are the conventions for classifying ports? Does the insurance plan correlate with the category of port? Do insurers offer any incentives for going "above and beyond code" in protecting the port from storm impacts?

Change in Fish Stocks: Commercial fisheries and aquaculture practices will need to adapt in response to climate change risks to the marine environment – ocean acidification could be a serious threat to many marine organisms, including commercial shellfish, and changes to sea surface temperature could lead to changes in fish distribution.





The Kaleidoscope

- In areas outside the “hotspots”, it is often more than about local communities than just “ports” and “transport” networks
- “Shared responsibilities” throughout the networks (many adaptive efforts so far are still restricted within the jurisdiction of particular sectors). A challenge is how to ensure that different sub-sectors are sharing the same vision and standards, and imposing complementary solutions for the well-being of the whole logistical supply chain?



Conclusion

- Geographical diversification
- Willingness, What, Capacity, Who (and How)
- Not necessarily just a “port” problem, but “port system” problem
- The need for collaboration and communication between stakeholders so as to establish the so-called ‘best practices’



Conclusion

- The substance of the National Adaptation Programs of Actions (NAPAs)
- Should there be some kinds of “Network Manager” (maybe ports?) within the transport networks who is responsible to coordinate and liaise with other stakeholders to coordinate the impacts and challenges posed by climate change?



Thank You Very Much!