Environmental Initiatives at Seaports Worldwide
A snapshot of best practices
Sustainable Port Development: Summary of Environmental Initiatives

Noeleen Tillman
International Institute for Sustainable Seaports

Richard Vincent
Port of Portland
Presentation Overview

• Introduction
• International Institute for Sustainable Seaports
• Objective of Research
• Research Parameters
• Research Highlights
• Summary
• Questions
The I2S2 is the Institute for Sustainable Seaports:

- Non-profit **Center of Excellence**

- Designed to support port authorities, tenants and members of the maritime community implement sustainable practices
Research Objective

- To provide stakeholders (internal and external) with a greater awareness and understanding of how seaports are managing natural resources, adopting new operating methods and planning for sustainability

- To provide readers with a better understanding of the geographic, community, financial and regulatory context that led to the implementation decisions
Research Parameters

• Snapshot (Summer/Fall 2009)
• I2S2 and Port of Portland Staff
  – I2S2: International Ports
  – Port of Portland: North American Ports
• Interviews
• Literature search
Research Parameters

• Tools:
  – Questionnaire
    • Air quality; climate change; water quality; waste minimization; dredging; energy conservation; natural resources; sustainability; environmental management systems.

• Data Pool
  – International Association of Harbors and Ports
    • Environmental committee
  – American Association of Port Authorities
    • Harbors Navigation and Environment Committee
Research Highlights

- Air Quality
- Water Resources
- Recycling
- Energy Conservation and Renewable Energy
- Natural Resources Management
- Sustainability
- Dredging
- Climate Change
Air Quality

- Replace equipment with cleaner more efficient models
- Repower equipment
- Retrofit current equipment with emission control devices
- Refuel equipment with cleaner burning fuels
- Reduce emissions through operational changes
Air Quality

Shore Power

• Where it works
  – Cruise industry
  – Harbor craft
  – Same vessel repeat port calls

• Challenges
  – Standard for connections
  – Varying power demands for different types of ships
  – Expensive infrastructure
Shore Power

Shore Power for Harbor Vessels

• Partnership between Port of Portland and Shaver Transportation Company
Water Resources

- Stormwater discharge limits getting stricter
- Ports using infiltration to address stricter discharge limits
- EPA regulations attempt to standardize the approach for regulating stormwater runoff; however, state, regional and municipal regulations lead to additional requirements that must be fulfilled.
- Water conservation efforts focused on landscaping irrigation and use of water restriction devices in buildings
Water Resources

Storm water management:
- Bioswales, infiltration basins
- Low impact development
- Pervious pavement

Conservation
- Landscape irrigation
- Water use restrictions
- Building fixture replacement with more efficient devices
- Best Management Practices
  - Port of Brisbane (efficient fittings, education, usage of non-potable water)
Porous Pavement
Recycling

- Ports using both in-house and local community programs
- Municipal ordinances often drive port programs to achieve various levels of recovery of recycled material
- Construction project related recycling is widespread
- Several ports include reduce-recycle-reuse policies as part of their Environmental Management Systems (EMS) and sustainability programs
Recycling

Common materials being recycled

- Construction debris (metal, wood, concrete)
- Glass, plastic, paper
- Compostable materials
- Government Support:
  - Japan
Energy Conservation & Renewable Energy

- Reliance on the ability to purchase “green power” or renewable energy credits from local energy providers
- Cruise terminals appear to be a popular choice for the installation of solar equipment
- Partnerships with local power providers and tenants
Solar and Wind Power

• Installation of renewable energy sources such as solar or wind power generation equipment on port facilities is beginning to be implemented
  – Wind - Japan, Amsterdam
  – Solar – San Diego, New York/New Jersey
  – Feasibility studies for installations being conducted
Natural Resource Management

• “One size fits all” solution to management port natural resource issues does not work

• Two common approaches
  – Formal wetland mitigation and shoreline protection programs
  – Case by case or project by project approach.

• Teaming on mitigation projects with local municipalities, state agencies and community groups

• Establishing mitigation banks

• Financial support for projects at off-site locations by other entities in order to obtain mitigation credits to offset wetland impacts on port facilities.
Natural Resource Management

• Partnering
  – Port of Longview, Washington
  – Port Autonome du Havre – Camargue Horses
  – Associated British Ports – Royal Society for the Protection of Birds

• Establishing mitigation banks
  – Port of Portland

• Community investment projects
  – Port of Sydney
Sustainability

- Sustainability policy development.
  - The definition of what sustainability means to each port as well as the focus of the policy varied significantly from port to port.

- Heavy reliance on the Leadership in Energy and Environmental Design (LEED) Green Building Rating within the US.

- Many ports have policies in place that dictate new construction meet a specific LEED certification level or similar system.

- Creation of development standards and guidance manuals for design and construction of new and redeveloped facilities.
Environmental Management Systems (EMS)

• The majority of US ports that utilize an EMS limit the systems to specific properties, operations or programs. This approach is commonly referred to as a “fence line EMS”.

• While the EMSs are becoming more common at ports in the US, full ISO 14001 certification of these programs is often viewed as a time consuming and costly endeavor that only a few ports have completed.

• AAPA Program Port EMS Assistance Project led by AAPA, USEPA and the Global Environment and Technology Foundation (GETF)
Environmental Management Systems (EMS)

- EMSs widely used internationally
  - ISO 14001 (e.g. Port of Genoa)
  - Port Environmental Review System (PERS) Certificate supported by ECOPORTS
  - Eco-Management and Audit Scheme (EMAS) supported by the EU
Dredging Activities

• Water quality and endangered species issues impact projects

• Biological testing involving sediments is becoming a common requirement.

• Placement options for dredge material vary widely

• Fill material for habitat creation

• Upland disposal and confined disposal sites are often used for contaminated dredge material
Dredging

• Placement of facilities in locations with hydrologic conditions that scour berth areas decrease or eliminate the need to dredge

• Unique solutions and technology being evaluated
  - Singapore (MPA) partnership with New Earth Pte Ltd
  - Port of Charleston Sediment Suspension System
Climate Change

- International Agreements/partnerships
  - Green leases, carbon measurement tools
  - World Ports Climate Initiative (WPCI) includes US ports
- Green House Gas (GHG) inventories
- Sea Level Rise – Port of Brisbane
- Building Guidelines – Port of Sydney
- Sustainable Port Development – Port of Cape Town
Summary

Air emissions, climate change and how these issues effect business and the bottom line are the predominant topics on most ports’ current environmental agendas.
Summary

• Grant funding, pilot projects are essential sources for completion of (US) projects
Summary

• Exploiting opportunities during new development or redevelopment projects
  – Can upgrade equipment and practices to current standards: can yield increased efficiencies that produce financial and environmental benefits
Summary

- Partnerships

  Teaming with tenants, community groups, environmental groups, municipalities, state, provincial and federal agencies, associations, NGO’s, trade associations and regional consortiums is very common
Summary

• This survey is a snapshot of current environmental initiatives in use at ports around the world.

• The global economic downtown has made ports acutely aware of the bottom line.

• Each port has a unique set of circumstances that affect the way it approaches environmental matters:
  – Types of operations (auto, cruise, container, breakbulk, bulk, etc.)
  – How the ports manage their facilities (e.g. landlord port, facility operator or a combination).
Summary

– Suite of businesses lines that are managed by each port
  • marine terminals,
  • airports,
  • real estate and industrial developments, bridges, bridges, tunnels and ferries, etc.

– Location often determines what environmental conditions are encountered and how they are handled
  • freshwater river system, estuary, saltwater harbor

– Regulations