

Port Security Challenges (US)

Todd S. Bridges, Ph.D.

Senior Scientist for Environmental Sciences

U.S. Army Engineer Research and Development
Center

Vicksburg, MS

Todd.S.Bridges@erdc.usace.army.mil



- *Port Security Management*, A systematic process for managing risks to sustain port operations and functions
 - Systems approach emphasizes the connections among diverse components of a system, i.e., a port
 - “Managing risks” is an acknowledgement that risks will always exist
 - Sustainability introduces concepts of strategic planning and growth into the decision process

Port Risk Management Challenges

- Environmental
 - Invasive species: ballast water, cargo
 - Contaminants: dredged material, spills, wastewater, stormwater
 - Habitat: fish, wetlands, dredging windows, other valued resources
 - Natural events: storms, earthquakes
- Human safety and property
 - Accidents: navigation, land-side
 - Criminal activity: terrorism, illegal immigration, smuggling, theft, vandalism
- Business
 - Competitive position based on efficiency of operations: navigation infrastructure, inter-modal infrastructure, land development potential

Risk-Based Decision-Making

- *Risk assessment*: A process for developing a quantitative understanding of the processes shaping the scope and nature of risks and uncertainties that is sufficient to support decision making
 - Why and how are the risks occurring?
 - How do the management alternatives differ in terms of risk reduction performance?
 - What are the quantified uncertainties associated with management alternative performance?

Risk-Based Decision-Making

- *Risk management*: Actions taken to reduce risks to acceptable levels and manage uncertainties in a manner that is informed by facts about the risks.
 - How do I balance the trade-offs inherent to decision making?
 - How do I apply the rules of decision-making in a consistent and transparent way?
 - How do I develop an understanding of the influence of values in my decision?

Uncertainty Defined

- Uncertainty due to incertitude
 - Can collect more data/information
- Uncertainty due to variability
 - Known population heterogeneity
 - Cannot be reduced only better understood
- The distinction is important

Sources of Uncertainty

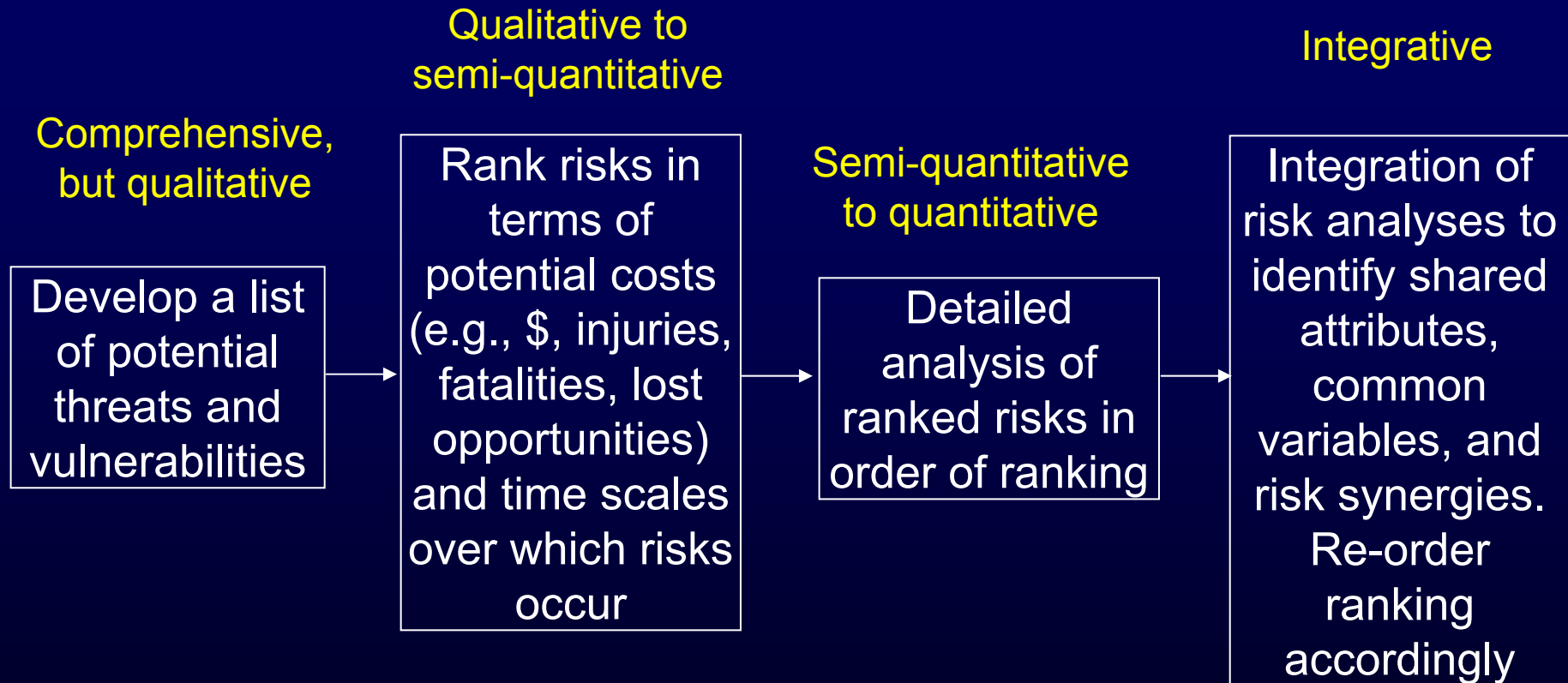
- Scenario
 - Missing components in the CSM
 - e.g., failure to consider specific threat scenarios
- Model
 - Structure and assumptions differ among models
 - e.g., choices about use of specific models (air dispersion, groundwater transport, hydrodynamics)
- Parameter
 - Specification of model parameters
 - e.g., bottom roughness

Managing Uncertainty

- Uncertainty must be managed throughout assessment and management
- Can the uncertainties be reduced? How?
- Use of adaptive management principles to optimize management actions through time and to manage uncertainties



Assessment and Ranking of Risks



Evaluating and Selecting Risk Management Alternatives

Identify feasible/available management alternatives



Evaluate and compare risk-reduction performance of alternatives



Evaluate and compare costs of the alternatives



Develop management strategy that maximizes global risk reduction



Develop monitoring plan



Execute monitoring of management alternative performance



Provide feedback for ensuring performance of management alternatives and the assessment/management process