



Superfund Human Health Risk Assessment

EPA Region 2

May 8, 2013



What is Risk?

$$\text{Risk} = \text{Exposure} \times \text{Toxicity}$$

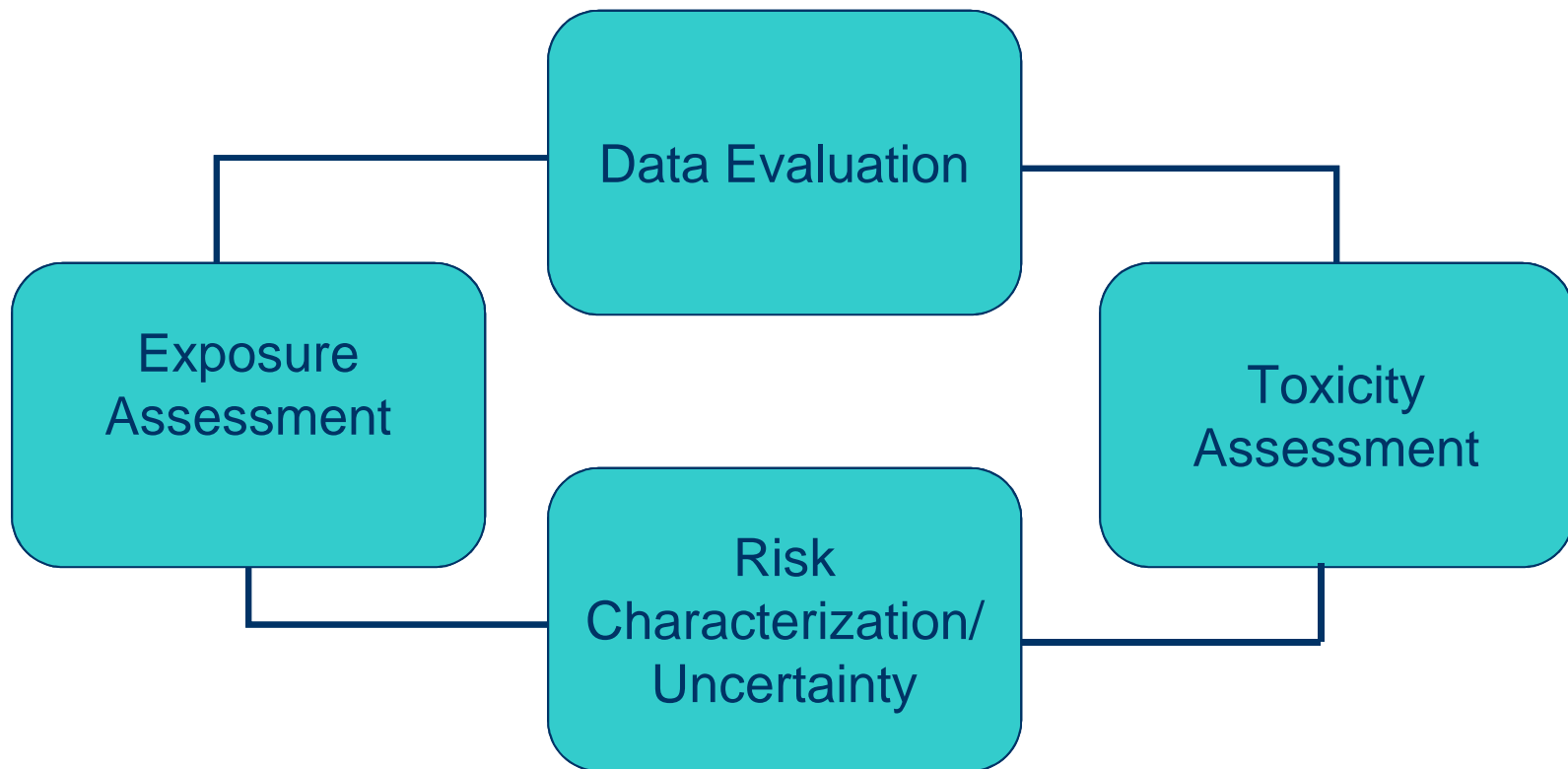
Exposure: How and how much people are exposed to a chemical

Toxicity: The ability of the chemical to cause adverse health effects

Types of Risk

- Cancer Risk
 - Expressed as a probability: one additional cancer incidence in a population of one million people exposed under similar conditions
- Noncancer Hazard
 - Presented as a ratio of the exposure dose at the site relative to the “safe” dose

Risk Assessment Process



Risk Assessment Process

- Data Evaluation: What chemicals are present and where are they?
- Exposure Assessment: Who is likely to be exposed under both current and future uses?
- Toxicity Assessment: What adverse effects are associated with these chemicals?
- Risk Characterization/Uncertainty: What are the risks/hazards at the site? What are the uncertainties and how do they influence the estimated risk?

Exposure Scenarios: Newtown Creek

- Exposure pathways
 - Dermal contact with surface water
 - Dermal contact with sediment
 - Volatilization from surface water
 - Ingestion of fish/shellfish

Exposure Scenarios: Newtown Creek

- Work-related activities along the shoreline or over the water (e.g., loading barges)
- Residential activities associated with people living on boats on the creek
- Recreational activities along the shoreline/in the water
 - Wading in the water and walking along the shoreline
 - Swimming and scuba diving*
 - Boating, including kayaking, canoeing and sail boating*
 - Fishing and crabbing*

*Current NYS water classification restricts these types of activities