Overview of the ERA Framework
Outline

- Spatiotemporal scales of ecological risk
- Ecological risk assessment framework
Spatiotemporal scales of hazardous events

Source: Suter (2007)
Spatiotemporal scales of ecological endpoints

Source: Suter (2007)
Natural ecosystems are nested

\[ E = \text{Ecosystem} \quad (\text{e.g., ocean, lake, desert, soil, etc.}) \]

- \( E_1 \)
- \( E_2 \)
- \( E_3 \)
- \( E_4 \)
- \( E_5 \)
- \( E_6 \)
- \( E_7 \)

\[ \text{HETEROGENEOUS} \]

\[ \text{GLOBAL ECOSYSTEM} \]

\[ \text{Species A, B, C, D…n} \]

\[ E = \text{Ecosystem} \]

(e.g., ocean, lake, desert, soil, etc.)
\[ P_{\text{Effect}} = P_{\text{Exposure}} \times P_{\text{Hazard}} \]
Ecological risk assessment framework

Planning & Scoping
(Risk assessor, risk manager, stakeholders, dialogue)

PROBLEM FORMULATION

ANALYSIS
Characterization of Exposure
Characterization of Ecological Effects

RISK CHARACTERIZATION

Communication of results to risk manager

As necessary, acquire data, iterate process, monitor results
Phase 1: Problem Formulation

Integrate available information

Assessment Endpoints

Conceptual Model

Analysis Plan
Phase 2: Analysis

Exposure Analysis

Profile

Stressor-Response Profile

Characterization of Exposure

Exposure Analysis

Exposed Profile

Ecological Response Analysis

Stressor-Response Profile

Characterization of Effects
Phase 3: Risk Characterization

Risk Estimation

Risk Description