

US EPA ARCHIVE DOCUMENT

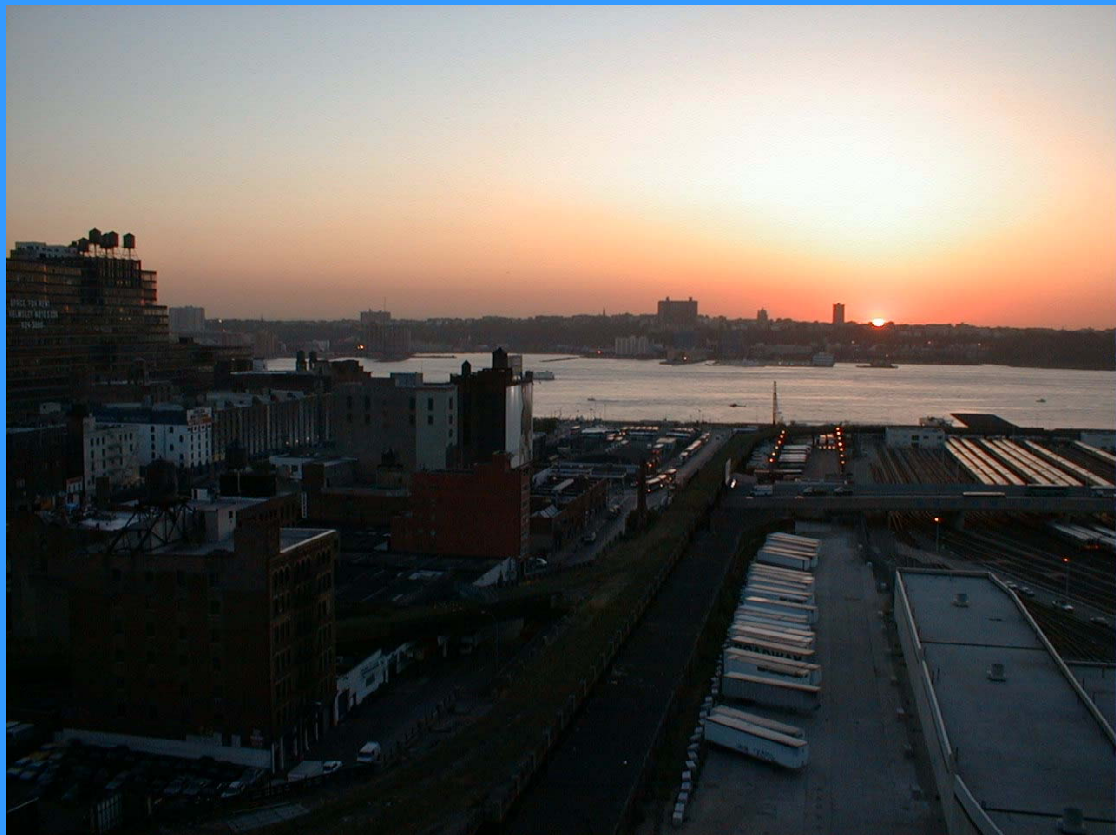
Who's Afraid of Ecological Risk Assessment?

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Ecological Risk Assessment is . . .

A process to evaluate the potential for adverse ecological effects occurring as a result of animal and plant exposure to stressors

Adverse Ecological Effects . . .

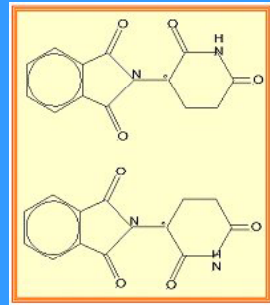
- Include sublethal effects on individual organisms to a loss of ecosystem function
- Effects on individual animals or plants are considered for threatened, endangered or rare species

Adverse Ecological Effects - Examples

- Loss of sensitive benthic species from surface waters
- Bioaccumulation of toxins in prey fish
- Loss of reproductive function in bird species

What are Stressors?

Physical, biological, or chemical elements that cause adverse ecological responses



RCRA Statutory Authority for Ecological Risk Assessment

RCRA Sections 3008a, 3008h, and 7003:
goals include protection of human health
and the **environment**

OSW regulations and permitting decisions
pursuant to RCRA must comply with other
federal statutes and regulations – such as the
Endangered Species Act

Why Must We Conduct Ecological Risk Assessments?

- Human health criteria used to screen site chemicals do not protect flora and fauna
- Only ecological risk assessment can identify harm to the environment, and the magnitude of that harm

Simplified Ecological Risk Assessment STEP 1

Identify any habitat on/near site with a
complete exposure pathway

HABITAT

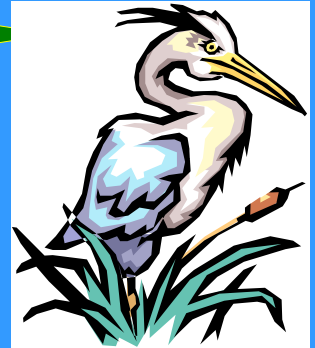
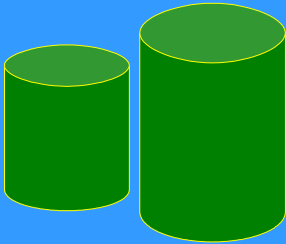
animals and plants



Habitat?



Complete Exposure Pathway

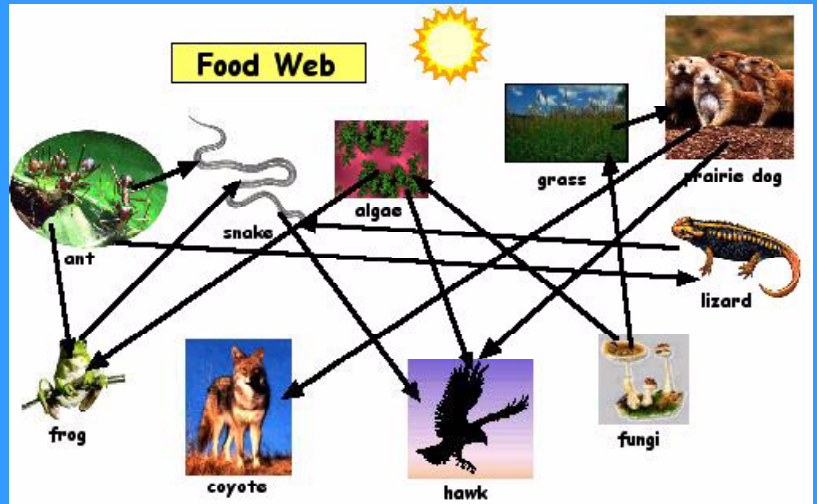


Simplified Ecological Risk Assessment STEP 2

- Analyze habitat media for COCs
- Screen media chemical concentrations against **ecological benchmarks**
- Estimate risk

Ecological Benchmarks?

COMPLICATED ...



Ecological Benchmarks

**Must account for most sensitive
receptor**

SURFACE WATER

Federal and State surface water quality
criteria are enforceable and protective

Ecological Benchmarks

SOIL AND AQUATIC SEDIMENT

- **Many different references are available**
- **Benchmarks must be interpreted**
- **Benchmarks are not “bright-line”**

Bottom Line: Call me for help!

Simplified Ecological Risk Assessment STEP 2

- Analyze habitat media for COCs
- Screen media chemical concentrations against ecological benchmarks
- **Estimate Risk**

Simplified Ecological Risk Assessment STEP 2

- Estimate risk by Hazard Quotient and any visual observation of natural resource damage
- Decision Point: no ecological risk or continue into Baseline Ecological Risk Assessment

STEP 3

Baseline Ecological Risk Assessment

- Not simple anymore!
- Includes food chain modeling and field sampling

**Now the only thing to
fear is fear . . .**

**NOT Ecological Risk
Assessment!!**

