

# Ecological Risk Management and Decision Making at EPA

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# Conclusions from 1994 ORD/OPPE Study on Managing Eco Risks at EPA

- Acute mortality to fish and wildlife most frequent and widely used eco effect of concern in EPA Program decisions; chronic and subchronic effects also covered by several key programs (OPP, OW, OSWER)
- Data on LC50/LD50's and NOAELs from lab testing play a large role in defining eco risk levels
- Animals more focused on than plants
- No definitive bright lines have been set as to what magnitude of eco impacts are considered significant--- however, except for endangered species, we aren't protecting individual organisms

# Conclusions from 1994 ORD/OPPE Study on Managing Eco Risks at EPA (con)

- In general we are not considering dynamic parameters such as birth, death, migration in eco risk assessments
- In general we are not considering interactions among species (e.g., predator/prey relationships)
- In general we are not considering interactions among animal and plant communities

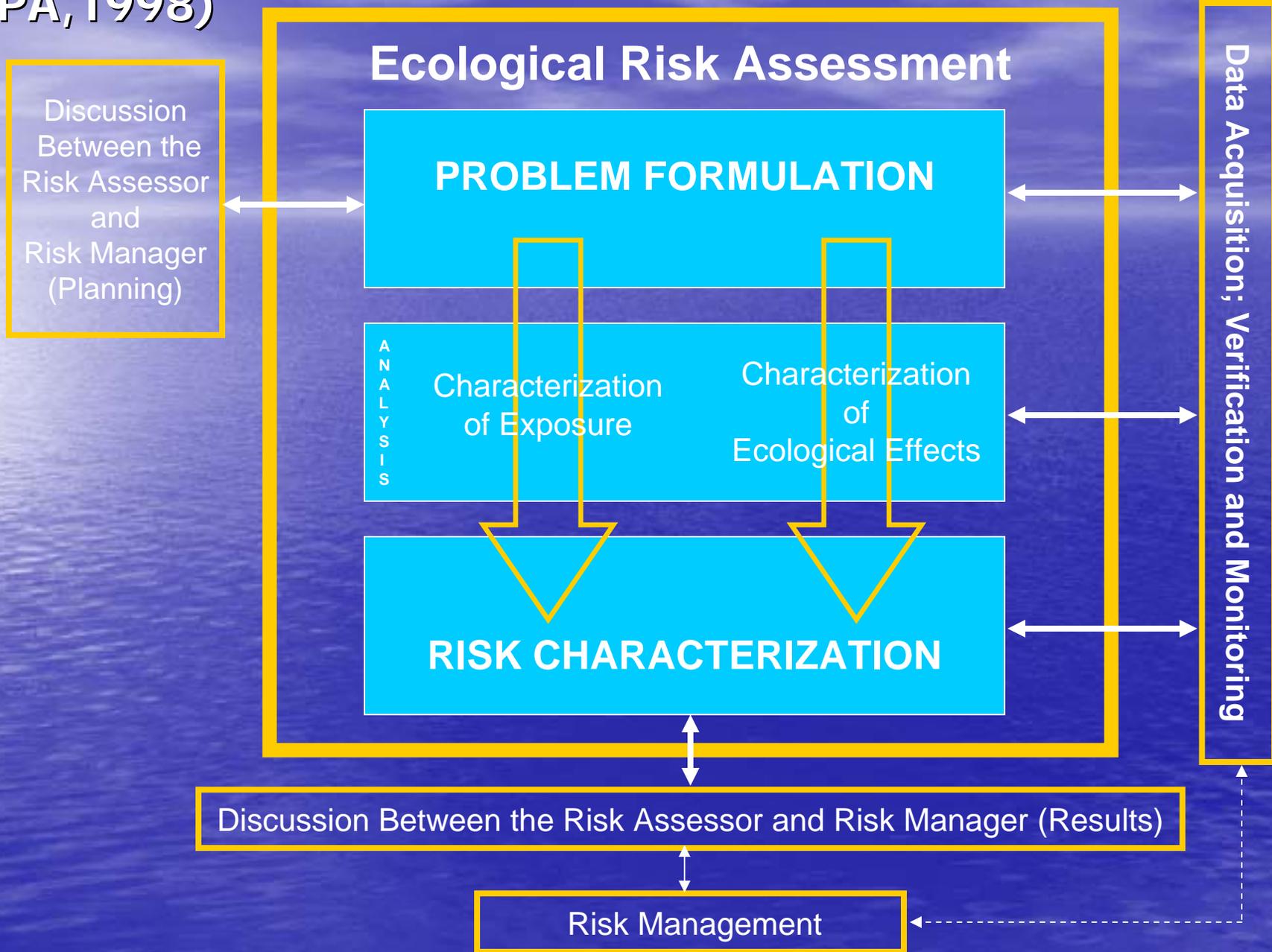
# Bottom-line?

- Most programs consider ecological/environmental impacts in their regulatory decisions in a fairly simplistic manner, but....
  - the risk assessment process does not provide a full and robust understanding to the individual risk manager or society of what's really going to happen in the environment as a consequence of action or lack of action.....
- As a consequence, it's difficult to make the case for actions based on ecological risk in cases where the economic impacts to society of actions are expected to be large

# What's changed since 1994?

- More uniform application of the Agency's ecological risk assessment guidelines across Programs
  - OW, OPP and OSWER all using this framework
  - This means more early engagement between risk assessors and risk managers in problem formulation, which in turn helps improve relevance between risk assessment results and risk management questions

# Guidelines for Ecological Risk Assessment (U.S. EPA, 1998)



# What's changed since 1994? (continued)

- Some Programs, like OPP, have invested significant resources and effort in the development of probabilistic techniques to estimate pesticide risks to aquatic life and wildlife to answer the “so what” question
  - These methods help in estimating the magnitude and extent of mortality rates, growth rates, fecundity and other effects associated with exposure to pesticides
- OPP actually used probabilistic risk assessment methods in decision not to register the insecticide Pirate/Chlorfenapyr because of risks posed to reproduction in birds

# What is the challenge before us still?

- Having ecological risk assessment methods that will be able to answer the real questions risk managers have.....
  - And, to produce these answers in a timely manner for a reasonable cost

# What are some of the “real questions”?

- What will happen, really, to a local population of fish if the predicted concentration of chemical X exceeds the LC50 for rainbow trout by a small amount for a short period of time? LC10? LC20? Etc.
- What are the “trip points” across frequency and magnitude of exceedance of a LC value for a sensitive species where the local population will not be able to recover and will therefore disappear?
- What will happen to a local stream community if there are no sensitive fish? Reduction in size? Reduction in number? Problems with diversity?
- What will happen to wildlife if there are no sensitive fish?
- How sure are you?

# What are some of the “real questions”? (continued)

- In short, we risk managers have a need to know enough biologically, temporally and spatially to be able to argue persuasively about the regulatory action that is needed when such action is really needed
  - And we need to know how confident scientists are in risk assessment conclusions (and how to increase confidence)
  - And we need to know what various risk management options will achieve in terms of ecological improvement---in as quantitative terms as possible

# Considerations for Enhancing Eco-Risk Decisions at EPA

- Need to continue to use the Agency's Ecological Risk Assessment Guidelines and continue to emphasize importance of early engagement in problem formulation with risk managers
- Need to continue to invest in improving risk assessment methodology that will allow us to better answer the "so what" question (probability and magnitude and implications spatially and temporally)
- Need to ensure resources are available to use methods that answer these questions (OPP makes thousands of decisions each year)
- Need to ensure continued investment in data collection needed to feed new methodology enhancements

# Considerations for Enhancing Eco Focus in Program Decisions

- Need to keep records of ecologically-based risk management decisions and encourage more sharing across EPA on an ongoing basis
  - Specify rationale and note precedents for ecological protection
- Need to invest in methods to better quantify benefits of ecological protection and eco risk mitigation
- Need to improve ecological risk communication with risk managers and the public
  - “If this pesticide is registered and used according to the proposed label to kill grubs in your lawn, it’s going to kill enough cardinals that in 5 years you won’t see them anymore as you sip your morning coffee and glance into your backyard at your bird feeder”

# Communication Example #2

- "If you continue to apply fertilizer to your lawn in the spring, summer and fall at the amounts suggested to you by the label and most of your neighbors do the same and most of the other communities in the counties surrounding the Chesapeake Bay do the same as you and your community, in another 5 years the waters of the Chesapeake Bay will be so green and lacking of oxygen that the only fish that you'll be able to catch will be bottom dwellers that feed on rotting and decaying plant matter."

# To sum up: Build it and they will come.....

- Providing better eco risk assessments that more fully answer the risk managers' "so what" questions is the foundation
- Better quantification of what is being lost ecologically and what can be done to mitigate loss is the "framing"
- Better communication with risk managers and the public about what the science is telling us is the "finishing work"
  - It's hard to overestimate how much non scientists don't understand about ecological risk