

# From Modeling to Criteria: Integrated Approach to Criteria Development

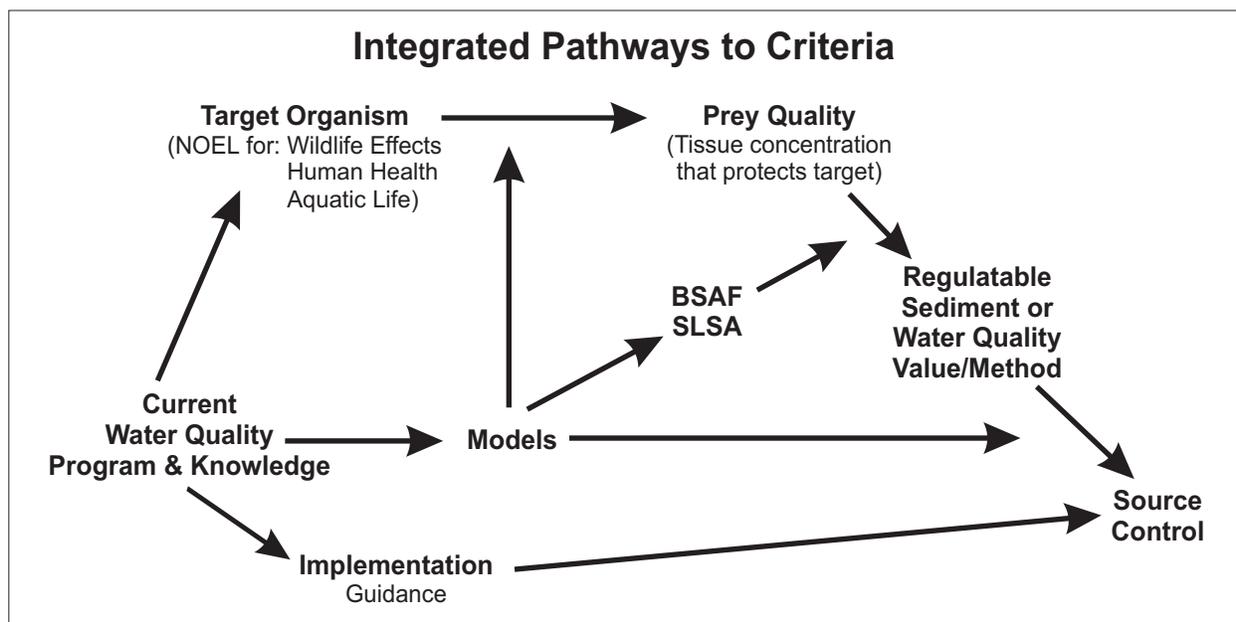
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The Office of Water's Water Quality Criteria Program (CWA Section 304(a)) is at a major crossroads in its evolution. The national program currently develops chemical criteria from the priority pollutant list (CWA Section 307(a)) based on toxicity testing with little or no consideration of mixtures, bioaccumulative potential, or exposure pathway. Individual criteria (aquatic life, human health, sediment, and wildlife) were developed for a host of chemicals, often with the result of several criteria types for a given chemical. The most stringent of these criteria was then used to derive the water quality goals of an aquatic system or a permit limit. To develop assessment methods and criteria that will align more closely with the stated objective of the Clean Water Act, "... to restore and maintain the chemical, physical, and biological integrity of the Nation's waters," the program would like to integrate criteria development using the risk assessment paradigm. The goal is to develop criteria and methods more efficiently and with more insight into the effects of chemicals on

aquatic systems (including those terrestrial organisms which are aquatic dependent, e.g., fish eaters).

The Office of Science and Technology (OST) proposes to develop water quality criteria by evaluating the different possible pathways of exposure and determining the pathway that is most critical for a particular chemical. To accomplish this task, OST will develop a strategy to merge the technical and programmatic aspects of water quality criteria programs (human health, drinking water, aquatic life, wildlife, sediments, biocriteria) to address ecosystem threats for a specific chemical (or class of chemicals). The product developed under this strategy will be a multi-pathway model(s) for establishing human health and ecological criteria, with particular attention paid to the most sensitive pathway. The program is working with the Society for Environmental Toxicology and Chemistry (SETAC) to design a Pellston Workshop that will address the state of the science and research needed to be able to construct integrated assessment tools. The figure below is a conceptual diagram of how this may be achieved.



# **From Modeling to Criteria:**

## **Integrated Approach to Criteria Development for Bioaccumulative Chemicals**

### **5 Types of Water Quality Criteria**

Aquatic Life  
Human Health  
Sediment Quality  
Wildlife  
Biocriteria

## **Integrating Criteria**

Chemicals  
Designated Use/Target Organism  
Fish Tissue  
Measurement Media  
Regulatory Implementation

## **Research and Implementation Issues**

Incorporate metabolism into the model(s).  
Change residue values into acceptable loadings.  
Account for multiple sources.  
What level of protection do we strive for?  
Package model(s) and guidance for practicality.

