

The Waters of the US Proposed Rule – the Science Advisory Board

Western Coalitions of Arid States –Fall Meeting

October 29-31, 2014

Holiday Inn & Suites Phoenix Airport North

Dr. Mark Murphy, Principal Scientist

Hassayampa Associates

How did we arrive here?

- **1969, Clean Water Act passed** - Authority to regulate based upon the Commerce Clause
- **1985, Bayview Homes** – EPA/Corp policy confirmed by court to include adjacent wetlands, tributaries
- **2001, SWANCC** - “It was the **significant nexus** between the wetlands and ‘navigable waters’ that informed our reading of the CWA . . .”
- **2006, Rapanos** - “The required **nexus** must be assessed in terms of the statute’s goals and purposes. Congress enacted the law to ‘restore and maintain the **chemical, physical, and biological integrity** of the Nation’s waters.’” - Kennedy

What just happened?

- **March 2013.** EPA Office of Research & Development calls for an Science Advisory Board, Ad-Hoc Subcommittee to review, *Connectivity of Streams and Wetlands to Downstream Waters: A Review and Synthesis of the Scientific Evidence*

March to June – 128 nominees including lists from both industry, municipal and environmental activist group.

27 selected, only two non-academics, no active state regulators

- **September to December 2013.** Report released and reviewed by panel.

Comments received by EPA and forwarded to panel.

A consensus document.

The consensus of the panel

- General approval of the depth of research of the work
- Uncertainty about the relationship between the report and the draft rule.
- Dispute about the meaning of significance in the report.
- Serious reservations about assuming a dichotomous, or digital, definition of connection (i.e is connected/is not connected)

The consensus of the panel

- Lack of a clear conceptual model.
- Lack of any temporal and spatial scaling (all connections are equal)
- Confusion about unidirectional vs. ‘other-dimensional’ flow.
- Regional differences ignored (arid West, permafrost, tropical near-shore wetlands).
- Serious reservations about the definition of ‘geographic isolation.’ If all systems are connected . . . where do WOTUS end?

Conceptual model.

- Cause and effect
- Connectivity to what?
- Need to define ‘flowpaths’ not ‘connections.’
- Need to define actions and consequences.
- The risk exposure paradigm

Hayampa
Associates

“the science of clean water”

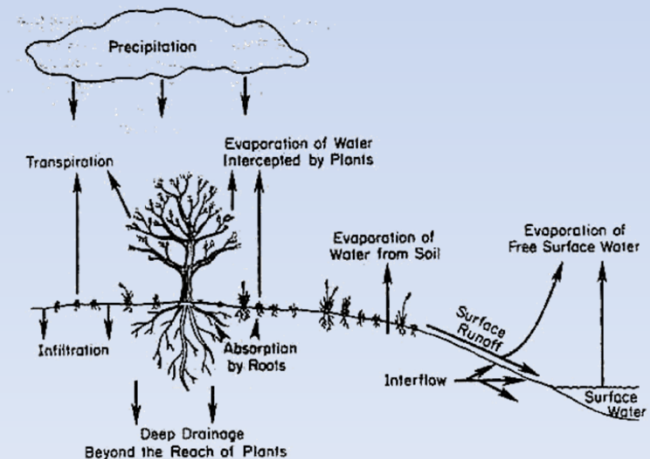


Figure 6.1. The water cycle showing major processes and pathways of water movement through a watershed. Water inflow = water outflow \pm storage.

The risk exposure paradigm

- A source - transport – exposure, physics-based process.
- Defines a clear, but possibly complex, flowpath
- Defines a testable cause and effect couple.
- End member exposure – directly extracted from toxicological science, for example, water quality criteria
- Connections become gradational, no longer dichotomous and depend on significance.

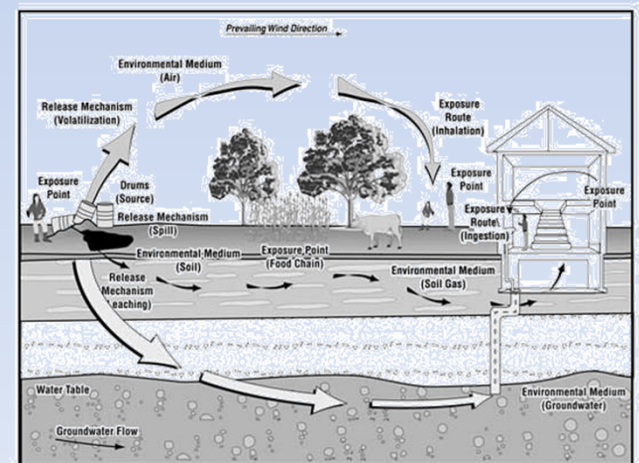


Figure 6-2. Site Conceptual Model—Exposure Pathway Schematic

The SAB told that ‘significant nexus’ was a policy term, not scientific.

- Justice Kennedy defined it relative to “the chemical, physical, and biological integrity of the Nation’s waters.”
- The Corps has always used a scientific basis for jurisdictional determination under the significant nexus test.
- The EPA Report uses ‘significant’ or ‘significantly’ 56 times, 43% citing statistically based conclusions from the scientific literature.





Significant nexus

“Waters have the requisite significant nexus if they . . . significantly affect the chemical, physical, or biological integrity of traditional navigable waters or interstate waters.”

Draft Guidance on Identifying Waters Protected by the Clean Water Act, US EPA, Office of Water, Office of Wetlands, Oceans, and Watershed, 4/26/2011

And what about the draft rule?

- Does not address the SAB review. How could it!
- No understanding of disturbance ecology or transport-based science.
- No science-based definition of either floodplains or isolated waters.
- Still based upon ‘ordinary high water mark’ which is not a science-based criteria.

“Other differences in identifying the jurisdictional limits of rivers and streams stemmed from the diverse environmental factors present in various districts. For example, districts in the arid West developed a method for identifying the jurisdictional boundaries of dry channels that flood occasionally, expanding several times their normal size.”

- Government Accounting Office, 2004, *Report to Congress , Corps of Engineers Needs to Evaluate Its District Office Practices in Determining Jurisdiction*

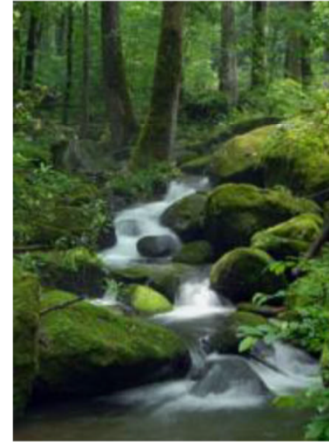
And what about the draft rule?

- Panel was split but the two members from WestCAS states did not support the scientific basis of the draft rule.
- The draft rule does NOT reflect the SAB review comments.
- Regulated community needs to provide a science-based alternative to the draft rule.
- Should use :
 - Gradational connectivity,
 - Physics-based transport processes,
 - Disturbance ecology and toxicological data to produce
 - Quantifiable down-gradient ecological consequences.

Draft ORD Findings Regarding Streams

Strong evidence for downstream connectivity and effects of streams of all sizes and flow classes

- Streams are “hydraulic highways” transporting materials, chemicals, organisms.
- Streams are the dominant source of water in most rivers.
- Ephemeral/intermittent streams shape river channels by gradually or episodically releasing sediment.
- Material transformations (e.g., nutrient processing) in small streams have large effects on downstream water quality.



14

“Little if any sediment entrained upstream of Marana (immediately north of Tucson) makes it through the Santa Cruz Flats to the Gila River, except during rare, large floods. Indeed, most maps do not show a channel crossing this nearly featureless plain. Most of the time, the lower Santa Cruz valley functions as a closed basin, with all the water and sediment from the Tucson Basin trapped on the alluvial plain downstream of Marana.”

- RH Webb et al, 2014, *Requiem for the Santa Cruz*, Univ of Arizona Press 279p.

Questions?

Hayampa
Associates

"the science of clean water"