WHERE'S THE SCIENCE IN THE PROPOSED 'WOTUS' RULE?

Dr. S. Mažeika Patricio Sullivan, Ph.D.

Associate Professor & Assist. Director, School of Environment & Natural Resources (SENR)

Director, Schiermeier Olentangy River Wetland Research Park

Email: sullivan.191@osu.edu

Twitter: @STRIVELab

OVERVIEW

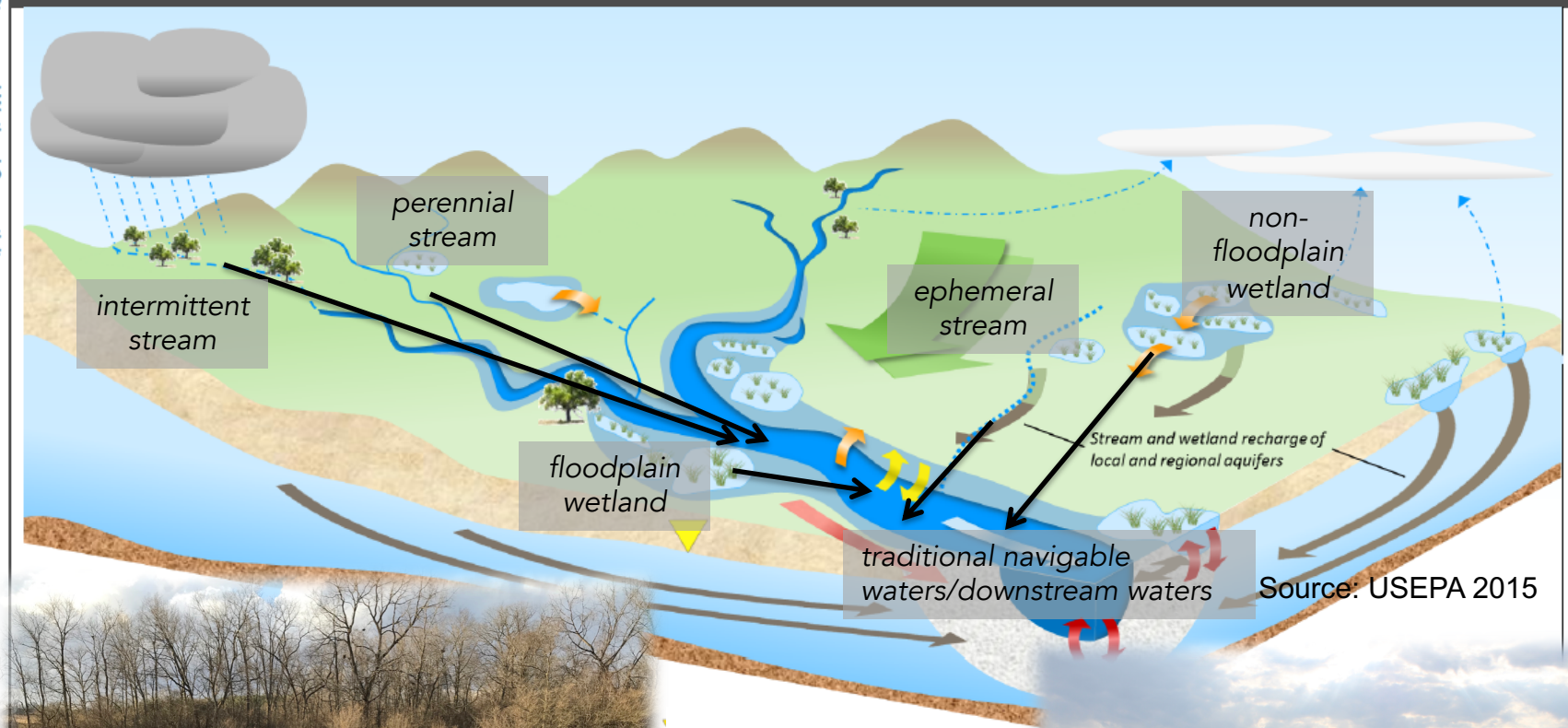
1. CONNECTIVITY OF WATERS

2. HOW THE NEW RULE IS INCONSISTENT WITH THE BEST AVAILABLE SCIENCE

3. IMPACTS OF THE NEW RULE

CONNECTIVITY OF WATERS

Figure 1-1A. Hydrologic flowpaths. Arrows are representative of surface-water and ground-water flows occurring throughout the watershed. Subsurface flows are shown within the cross section, and by faded arrows outside the cross section.



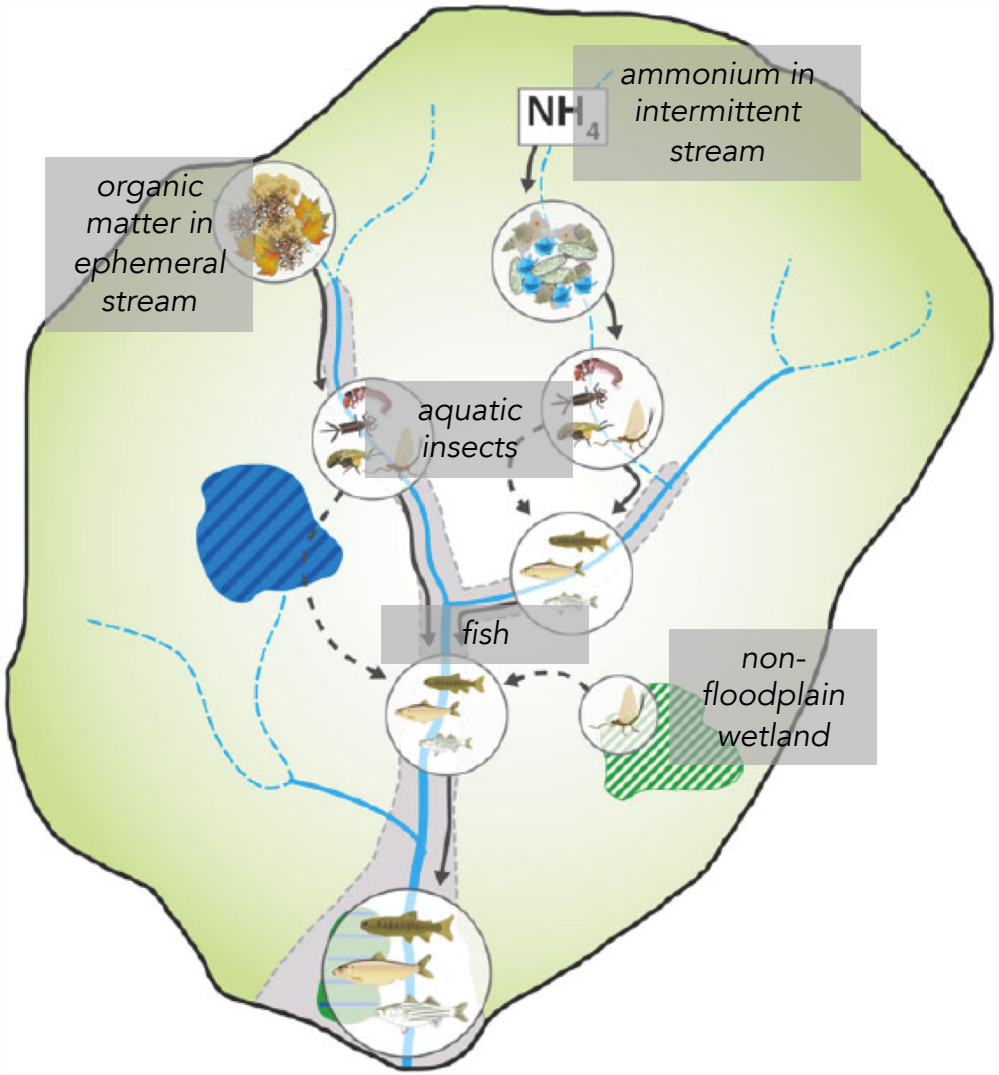
Source: USEPA 2015

←Non-floodplain wetland in Ohio prairie Source: S.M.P. Sullivan. Ephemeral stream in Colorado. Source: D.A. Allan. →

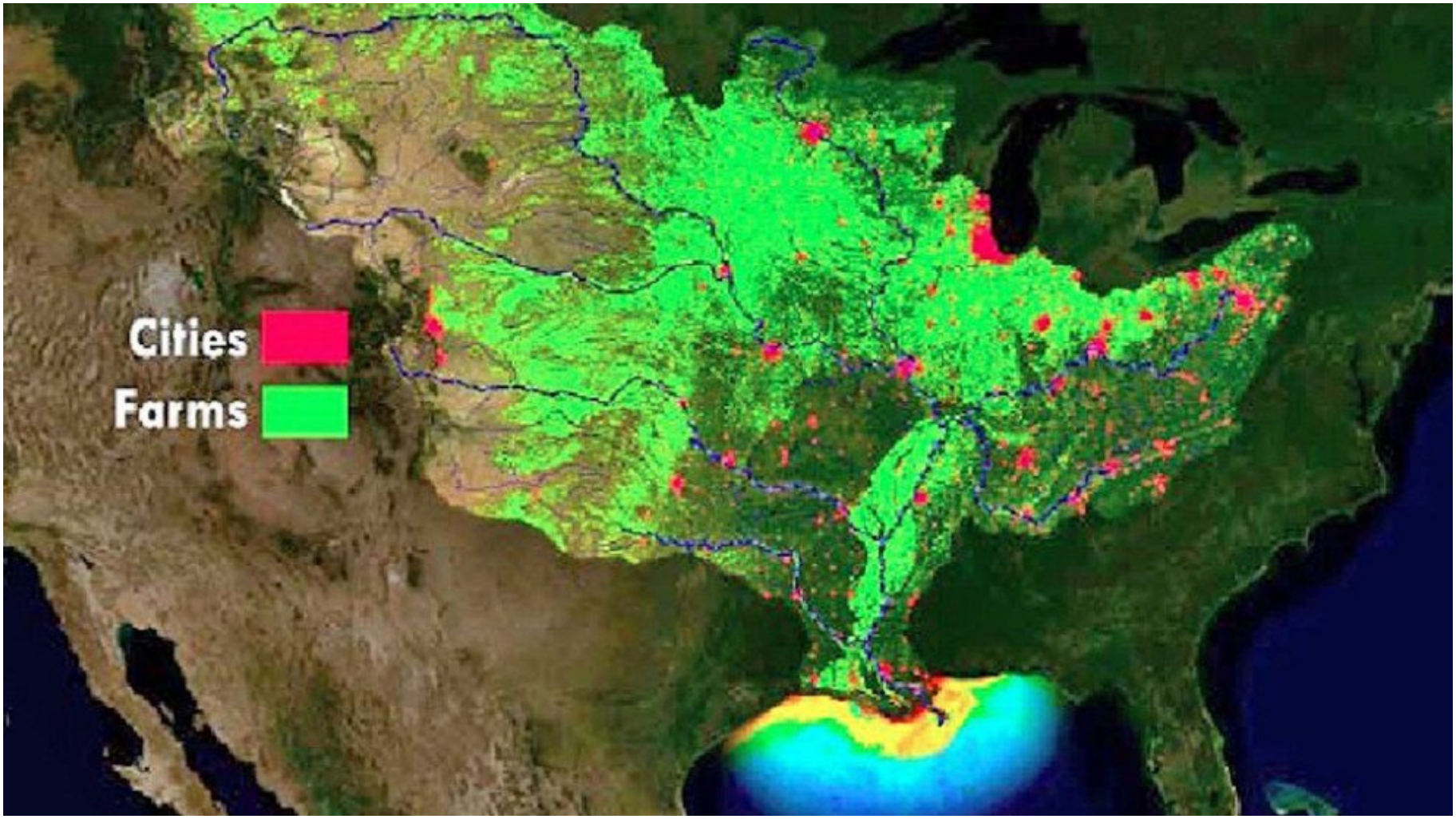
Stream and Wetland Connectivity: A Review and Synthesis

1-5

- Physical connections
  - Transport/exchange of non-living materials that do not chemically change en route from streams and wetlands to downstream waters
- Chemical connections
  - Transport/exchange of non-living materials that can chemically change en route to downstream waters
- Biological/ecological connections
  - Transport/exchange of living organisms (or their products) to downstream waters
- Connectivity not constant
  - Can vary over time



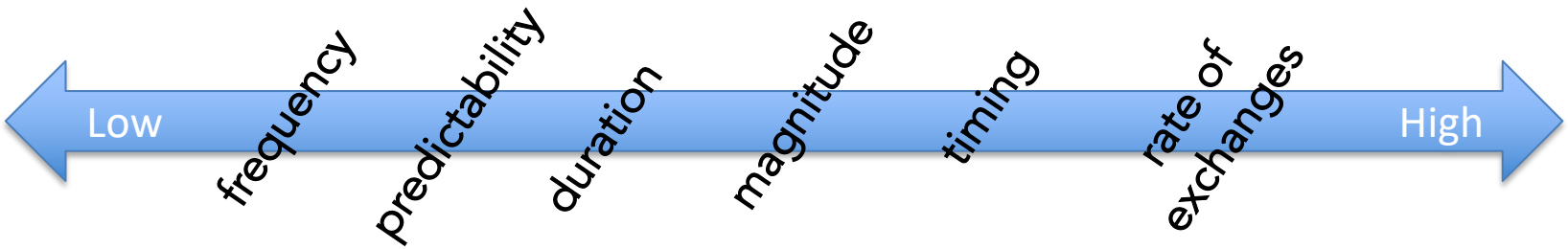
Source: USEPA 2015



Source: Institute for Global Environmental Strategies and MotherJones.com

WHY IS CONNECTIVITY CRITICAL?

- Key scientific concept at cornerstone of legislation and regulation
- Critical to water quality and ecosystem function
- All parts of a watershed are connected but not to the same degree
  - SAB recommended "Connectivity Gradient"



Degree and downstream effects of connections variable

PROPOSED RULE *NOT* SUPPORTED BY BEST AVAILABLE SCIENCE

Reliant on hydrological connectivity only, ignores other types of physical connectivity as well as biological, and chemical connectivity

Critical to consider *all three* given the intent of the CWA: "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters"

- Example 1: Definition of tributaries fails to include appropriate measures of physical connectivity.
  - Proposed rule relies on flow permanence, which is a flawed approach.
  - Multiple physical parameters indicate connectivity, such as bed, banks, and high-water marks, as in the current 2015 rule.
  - These features serve as indisputable indicators of the connectivity of all streams to downstream waters, ***including all intermittent and ephemeral streams.***

- Example 2: Biological and chemical connectivity are completely ignored.
  - SAB noted importance of biological connectivity and provided numerous scientific studies as support.
  - Ignoring chemical and biological integrity goes against intent of CWA.
  - ***Without biological connectivity, aquatic ecosystems would not function properly***.

Proposed rule misinterprets or ignores natural gradients and the importance of considering the cumulative effects of connectivity

- "This proposal is intended to establish categorical bright lines that provide clarity and predictability for regulators and the regulated community … " (84 Fed. Reg. 31).
- Goes against scientific evidence that connectivity and other landscape features occur along a gradient.
  - The SAB clearly articulated the importance of recognizing gradients of waterbody connectivity (vs. a binary property: connected, not connected).
  - *Even low, or infrequent levels of connectivity can be important to downstream waters.*
- The proposed rule *removes all non-floodplain wetlands and ephemeral streams from protection*, irrespective of their degree of connectivity and the consequences of alterations of that connectivity to downstream water quality.
  - Proposed rule removes case-by-case treatment of non-floodplain wetlands.

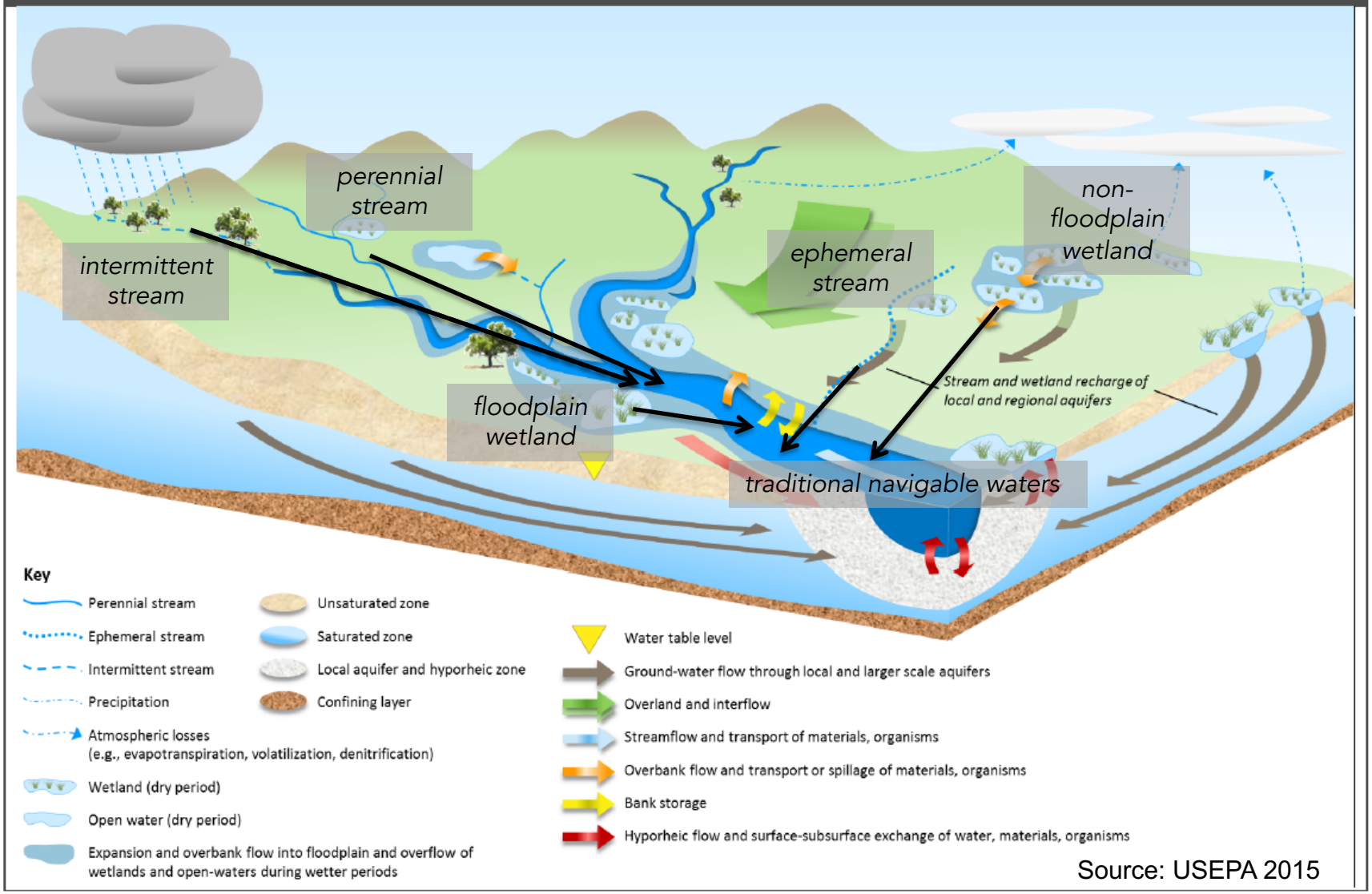
- Serious concerns with potential use of mapping "blue-line" streams
- Considering waterbodies in aggregate critical yet is not sufficiently addressed

Proposed rule does *not* appropriately recognize how watersheds function

- Trying to overly simplify a complex issue
- Proposed rule focuses on waterbody connections in isolation, and misses their functional importance
  - Key recommendation of the SAB was to view waterbodies as part of larger systems
- Rule overly reliant on using case law to delineate watersheds and landscape instead of basing the Rule on a solid scientific understanding of how they function
  - Leads to unsupported calls to remove critical components of watersheds, such as ephemeral streams, that can have important downstream effects

IMPACTS OF NEW RULE

Figure 1-1A. Hydrologic flowpaths. Arrows are representative of surface-water and ground-water flows occurring throughout the watershed. Subsurface flows are shown within the cross section, and by faded arrows outside the cross section.



Source: USEPA 2015

IN A NUTSHELL

- Proposed rule *inconsistent* with current science & the intent of the CWA -

- Loss of protection for some of our Nation's most vulnerable waters
  - Headwater streams comprise 79% of our nation's stream networks; wetlands outside of floodplains comprise 6.59 million hectares in the conterminous U.S.
- Loss or impairment of ecological functions not only within headwater regions, but also in downstream rivers, lakes, and coastal areas.
- Loss of biodiversity
  - Loss or degradation of habitat for many endemic and threatened fish species as well as species supporting economically important fisheries.
- Headwater streams and wetlands are culturally important for many segments of U.S. society, with particularly high significance for many Native peoples.
- The proposed rule could lead to future loss of protections.

Impairment or loss of chemical, physical, and biological integrity of our Nation's waters - and thus loss of water quality - is assured under the proposed WOTUS rule, and would have severe and long-lasting negative consequences for environmental conditions throughout the U.S.