

**Science Advisory Board (SAB) Draft Report (09/17/14) to Assist  
Meeting Deliberations -- Do Not Cite or Quote –**

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EPA-SAB-14-00X

The Honorable Gina McCarthy  
Administrator  
U.S. Environmental Protection Agency  
1200 Pennsylvania Avenue, N.W.  
Washington, D.C. 20460

Subject: Science Advisory Board (SAB) Consideration of the Adequacy of the Scientific and Technical Basis of the EPA’s proposed rule titled Definition of Waters of the United States Under the Clean Water Act.

Dear Administrator McCarthy:

As part of its statutory duties, the Science Advisory Board (SAB) may provide advice and comment to you on the adequacy of the scientific and technical basis of certain planned actions. The Environmental Research, Development, and Demonstration Authorization Act of 1978 (ERDDAA) requires the EPA to make available to the SAB proposed criteria documents, standards, limitations, or regulations provided to any other Federal agency for formal review and comment, together with relevant scientific and technical information on which the proposed action is based. The SAB may then provide advice and comments on the adequacy of the scientific and technical basis of the proposed action.

This letter documents the SAB’s activities related to the proposed rule “Definition of ‘Waters of the United States’ Under the Clean Water Act” released on March 25, 2014, and provides advice and comments related to that proposal. Briefly, the SAB finds that the available science provides an adequate scientific basis for the key components of the proposed rule. Although waterbodies differ in degree of connectivity that affects the extent of influence they exert on downstream waters (i.e., they exist on a “connectivity gradient”), the available science supports the conclusion that the types of water bodies identified as waters of the United States in the proposed rule exert strong influence on the physical, biological, and chemical integrity of downstream waters. Additional comments regarding the Board’s major findings and recommendations to strengthen the science supporting the rule may be found below.

**Background**

In SAB deliberations leading to the letter sent to you on July 26, 2013, *Science Advisory Board (SAB) Discussions about EPA Planned Actions in the Fall 2012 Unified (Regulatory) Agenda and their Supporting Science* (EPA-SAB-14-003), the chartered SAB discussed the agency’s plan to propose the rule. The Board also discussed the EPA’s plan to use the EPA’s September 2013 draft report, *Connectivity of Streams and Wetlands to Downstream Waters: A Review and Synthesis of the Scientific Evidence* (connectivity synthesis document) to inform determinations in the rule. In those discussions,

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1 the chartered SAB highlighted the importance of the rulemaking and the need for SAB advice and  
2 comment on the adequacy of the science to support the rule.

3  
4 An *ad hoc* panel of the SAB has completed a peer review of the EPA’s draft connectivity synthesis  
5 report. [INSERT IF APPROPRIATE AFTER THE CHARTERED SAB’S 09/26/14 QUALITY  
6 REVIEW TELECONFERENCE: “The peer review report was approved and is being finalized to send to  
7 you shortly”]. For that peer review, the agency did not ask the SAB to consider the adequacy of the  
8 science to support the proposed rule. Because this question was not considered during the peer review, I  
9 requested the panel members to comment on the scientific and technical basis of the EPA proposed rule.  
10 In response to my request, the SAB panel held public teleconferences on August 20 and 21, 2014, (79  
11 FR 40100-40101) to discuss this topic.

12  
13 A Work Group of chartered SAB members considered comments provided by panel members, agency  
14 representatives, and the public on the adequacy of the science informing the proposed rule. This Work  
15 Group, chaired by Board member Dr. James Mihelcic, then took the lead in SAB deliberations on this  
16 topic at a public teleconference held on September 29, 2014, where the chartered Board discussed the  
17 advice and comments in this letter.

18  
19 **SAB Advice and comment on the science informing the proposed rule**

20  
21 The SAB finds that the available science provides an adequate scientific basis for key components of the  
22 proposed rule. The following comments summarize major points regarding the adequacy of the scientific  
23 and technical basis of the proposed action. The SAB also provides recommendations for strengthening  
24 the science informing the rule.

25  
26 Tributaries

27  
28 There is strong scientific evidence to support the EPA’s proposal to include all tributaries within the  
29 jurisdiction of the Clean Water Act. Tributaries, as a group, exert strong influence on the physical,  
30 chemical, and biological integrity of downstream waters, even though the degree of connectivity is a  
31 function of variation in the frequency, duration, magnitude, predictability, and consequences of physical,  
32 chemical and biological processes.

33  
34 The Board advises the EPA to reconsider the definition of tributaries because not all tributaries have  
35 ordinary high water marks. An ordinary high water mark may be absent in ephemeral streams within  
36 arid and semi-arid environments or low gradient landscapes where the flow of water is unlikely to cause  
37 an ordinary high water mark. The Board advises the agency to consider changing the wording in the  
38 definition to “bed, bank, and other evidence of flow.” In addition, tributaries are not typically defined to  
39 include lentic systems (e.g., lakes, ponds, wetlands). Thus, the EPA may want to consider whether flow-  
40 through lentic systems should be included as adjacent waters and wetlands, rather than as tributaries.

41  
42 Adjacent Waters and Wetlands

43  
44 The available science supports the EPA’s proposal to include adjacent waters and wetlands as waters of  
45 the United States. This is because adjacent waters and wetlands have a strong influence on the physical,  
46 chemical, and biological integrity of navigable waters. Importantly, the available science supports

1 defining adjacency or determination of adjacency on the basis of functional relationships, not on how  
2 close an adjacent water is to a navigable water. The Board also notes that local shallow subsurface water  
3 sources and regional groundwater sources can strongly affect connectivity. Thus, the Board advises the  
4 EPA that adjacent waters and wetlands should not be defined solely on the basis of geographical  
5 proximity or distance to jurisdictional waters. The science also supports consideration of the temporal  
6 dimension of connectivity to define adjacent waters and wetlands. This is particularly important in arid  
7 systems with intermittent and ephemeral waters.

#### 8 9 Other Waters

10  
11 The scientific literature has established that “other waters” can influence downstream waters,  
12 particularly when considered in aggregate. Thus, it is appropriate to define “other waters” as waters of  
13 the United States on a case-by-case basis, either alone or in combination with similarly-situated waters  
14 in the same region. As mentioned previously for adjacent waters, distance should not be the primary  
15 indicator used to evaluate the connection of “other waters” to jurisdictional waters.

16  
17 There is also adequate scientific evidence to support a determination that certain subcategories and types  
18 of “other waters” in particular regions of the United States (e.g., Carolina and Delmarva Bays, Texas  
19 coastal prairie wetlands, prairie potholes, pocosins, western vernal pools) are similarly situated (i.e., they  
20 have a similar influence on the physical, biological, and chemical integrity of downstream waters and  
21 are similarly situated on the landscape) and thus are waters of the United States. Furthermore, as the  
22 science continues to develop, other sets of wetlands may be identified as “similarly situated.” The Board  
23 notes, however, that the science does not support excluding groups of “other waters” (or subcategories  
24 of them, e.g., Great Plains playa lakes) that may influence the physical, chemical and biological integrity  
25 of downstream waters.

26  
27 Some of the exclusions listed in the proposed rule do not have strong scientific justification and the SAB  
28 recommends that several should be reconsidered. For example, the proposed rule excludes groundwater,  
29 (including groundwater drained through subsurface drainage systems). The available science, however,  
30 shows that groundwater connections, particularly via shallow flow paths in unconfined aquifers, are  
31 critical in supporting the hydrology and biogeochemical functions of wetlands and other waters.  
32 Groundwater also connects waters and wetlands that have no visible surface connections. Furthermore,  
33 there is a lack of scientific knowledge to help discriminate between ditches that should be excluded or  
34 included. For example, many ditches in the Midwest would be excluded under the proposed rule because  
35 they were excavated wholly in uplands, drain only uplands, and have less than perennial flow. However,  
36 these ditches may drain areas that would be identified as wetlands under the Cowardin classification  
37 system and may provide certain ecosystem services.

38  
39 Although gullies, rills, and non-wetland swales are excluded by the rule, the proposed rule’s preamble  
40 notes that these features are important conduits for moving water between jurisdictional waters, making  
41 them important with respect to hydrological and other forms of connectivity. Also, although excluded  
42 from jurisdiction under the proposed rule, artificial lakes or ponds, or reflection pools, created by  
43 excavation, diking, or construction may be directly connected to jurisdictional waters by groundwater,  
44 which may be shallow as well as deep groundwater in unconfined aquifers. It is also not clear in the  
45 proposed rule how engineered structures would be treated, especially given changes occurring in  
46 technology, urbanization, or economic sectors. Some examples of such changes in engineered structures  
47 include: (1) design of stormwater management systems that more closely mimic natural systems (i.e.,  
48 low impact development technology); (2) demand for lower quality water sources that results in

1 construction of desalination brine storage basins; (3) the impact of urbanization that has led to  
2 construction of artificial lakes and ponds that may have connections to downstream waters; (4)  
3 agricultural sectors that utilize aquaculture and rice paddies; and (5) expanding domestic energy  
4 production that results in construction of oil and gas tank basins.  
5

6 Finally, the SAB has a specific recommendation for strengthening the presentation of the science  
7 informing this regulatory action. The SAB finds that the term “significant nexus” was not well defined  
8 in the proposed rule and recommends that the EPA clarify in its general communications and in the  
9 preamble to the final rule that “significant nexus” is a legal term, not a scientific term.

10  
11 **Recommendations for next steps**

12  
13 In conclusion the SAB has determined that the available science, as summarized in the preamble to the  
14 proposed rule and the EPA technical document peer reviewed by the SAB, provides an adequate  
15 scientific and technical basis for the proposed rule. The Board has made several recommendations to  
16 strengthen definitions and reconsider exclusions in the proposal. For a more detailed summary of many  
17 of the points in this letter, please see the enclosure, which contains a memorandum from the panel Chair  
18 transmitting panel members’ comments and the summary of the panel teleconference discussions on  
19 August 21 and 22, 2014 provided by the Chair of the SAB Panel for the Review of the EPA Water Body  
20 Connectivity Report,  
21

22 The SAB does not expect to provide further advice and comment on the scientific and technical basis for  
23 this proposed action at this time. The SAB requests that the agency provide an update describing how  
24 scientific input provided by the SAB and public comment concerning the underlying science influenced  
25 the final rule.  
26

27 On behalf of the SAB, I thank you for the opportunity to support EPA through consideration of the  
28 science supporting this important proposed regulatory action.  
29

30 Sincerely,  
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34 Dr. David T. Allen, Chair  
35 Science Advisory Board  
36

37  
38 Enclosures

39  
40 Roster of SAB Members

41  
42 Memorandum (September 2, 2014) from the Chair of the SAB Connectivity Panel transmitting comments  
43 on the adequacy of the scientific and technical basis of the proposed rule titled "Definition of 'Waters of  
44 the United States' under the Clean Water Act"  
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**NOTICE**

This report has been written as part of the activities of the EPA Science Advisory Board (SAB), a public advisory group providing extramural scientific information and advice to the Administrator and other officials of the Environmental Protection Agency. The SAB is structured to provide balanced, expert assessment of scientific matters related to problems facing the agency. This report has not been reviewed for approval by the agency and, hence, the contents of this report do not necessarily represent the views and policies of the Environmental Protection Agency, nor of other agencies in the Executive Branch of the Federal government, nor does mention of trade names of commercial products constitute a recommendation for use. Reports of the SAB are posted on the EPA website at <http://www.epa.gov/sab>.

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**U.S. Environmental Protection Agency  
Science Advisory Board**

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