Protecting US river health by maintaining the legal status of their temporary waterways

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Protecting the ecological health of rivers relies on maintaining intact flows from source areas to downstream navigable waters. Yet, the United States Environmental Protection Agency (USEPA) intends to rescind legal protection of tributary rivers, streams and wetlands that do not have year-round flows (temporary waterways), and whose surface waters contribute flow to permanent 'navigable waters' (*1*). As scientists who study and manage rivers globally, it is our opinion that this decision would severely damage the condition and uses of many US waters, both temporary and navigable.

Why this opinion? Temporary waterways are globally widespread and abundant. In the USA they form 59% of river miles overall and over 90% in some large regions (*2*). Recent research in the USA

and worldwide has revealed the many ecosystem services to humans provided by temporary waterways, including water purification and water provisioning, thus contributing substantially to securing water quantity and quality (*3, 4, 5*). Of all waterways providing drinking water on the continental USA, 58% are temporary or headwater streams, and these contribute to the supply and quality of potable water for over one third of the total U.S. population (*6*). In addition, temporary waterways harbor important biodiversity (*7, 8*) and play key roles in global carbon and nutrient cycles (*9*). Even when dry, temporary watercourses provide pivotal ecosystem services such as the mediation of toxicants and future floods and the provision of habitat for unique biodiversity (*10, 11*).

The recognition, by a comprehensive scientific review (*12*), of these many important services provided by temporary waterways led to the decision in 2015 to recodify the definition of Waters of the United States (WOTUS) to include temporary waters hydrologically connected to navigable waters. This provided protection to many temporary waterways under the US Clean Water Act directive for the USEPA to protect WOTUS, and was hailed as a well informed decision (*3*). However, the recodification is yet to be implemented because the legal process is incomplete, and now reversal of the decision is expected (*1*).

We urge the USEPA to uphold their 2015 decision and to ratify the legal status and protection of temporary waterways. This would provide a similar level of protection in the USA to that afforded temporary waterways in some other countries such as Australia (*5*). Failure to do so not only sets a global precedent, but importantly also risks costly (*13*) and potentially irreversible harm to the ecosystem services and uses supported by temporary waterways in the USA, including the provision of water supply and good water quality.

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