



CHESAPEAKE BAY FOUNDATION
Saving a National Treasure

**Anglers for
Clean Water**

LAG TIMES: WHY IS THE BAY CLEANUP SO SLOW?

By Dr. Beth McGee, CBF Senior Water Quality Scientist

One of the most common questions we get about Bay restoration from the public and elected officials goes like this: "For years, we have been implementing measures to reduce nitrogen, phosphorus, and sediment pollution to our streams, rivers and Chesapeake Bay. So, why are we not seeing more improvement in water quality?"

One of the reasons is "lag times." That is, there will be a time lag between when a practice is put on the ground and when we will see the pollution reduction benefits of that practice. For example, think about a streamside forested buffer. These buffers filter polluted runoff before it reaches our waterways. However, the full benefits of that pollution filtering will not be achieved until the trees grow and become mature. Another example is winter cover crops. Planted in the fall and harvested in the early spring, these plants (usually wheat, rye or barley) scavenge nitrogen, reducing the amount that leaches from farmland into groundwater. Roughly 50% of the flow in our streams originates from groundwater, but it can take years for shallow groundwater to migrate to streams, resulting in a substantial lag time between cover crop planting and a reduction of nitrogen pollution in surface water.

In general, best management practices designed to control "nonpoint" or diffuse sources of pollution, like polluted runoff from farmland and urban/suburban areas, will have longer lag times than that associated with controls on "point" sources, like wastewater treatment plants. Those plants discharge directly to surface waters, so pollution reduction benefits occur as soon as the plant is upgraded. There is also, however, a time lag between decreased levels of pollution in waterways and the ecosystem response, i.e., improved levels of dissolved oxygen and water clarity and then, what we really care about, living resources like fish and crabs.

So, in a society that hungers for instant gratification, dealing with the reality of ecosystem lag times is a challenge. Restoration progress may seem to be slow, but there's increasing scientific evidence that what we're doing IS working. Here's a good example, the Chesapeake Bay program's 2014-15 *Bay Barometer*:

http://www.chesapeakebay.net/documents/2014-2015_Bay_Barometer_FINAL_02.02.2016.pdf

In addition, the Chesapeake Clean Water Blueprint has infused new life into the Bay cleanup. We are seeing accelerated implementation of practices that scientists agree will lead to improved water quality and ultimately a healing of the Bay and the streams and rivers that feed it. We need to be patient. Now is not the time to give up. This is "The Moment in Time" to stay the course that ultimately will lead to a restored Chesapeake Bay ecosystem.

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