**Phosphorus in the Bay Watershed, 2017 – Emerging Concerns and Lingering Issues**

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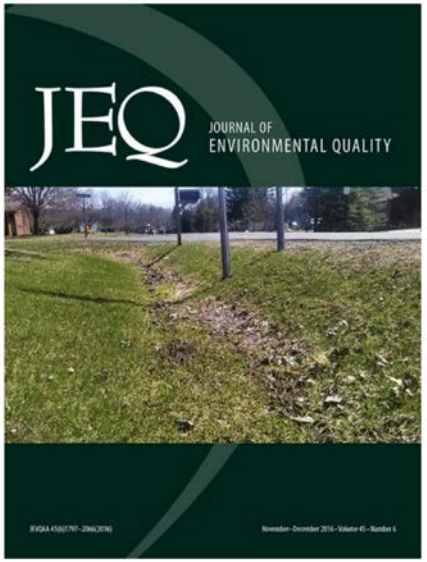
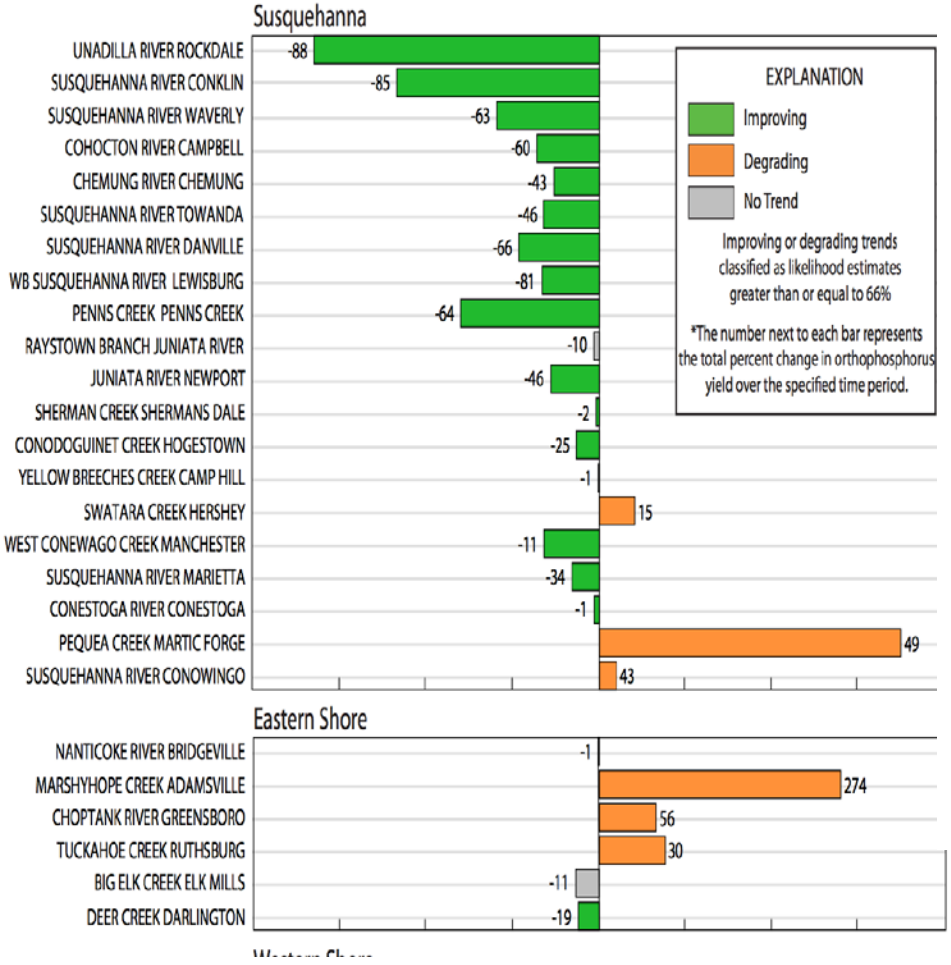
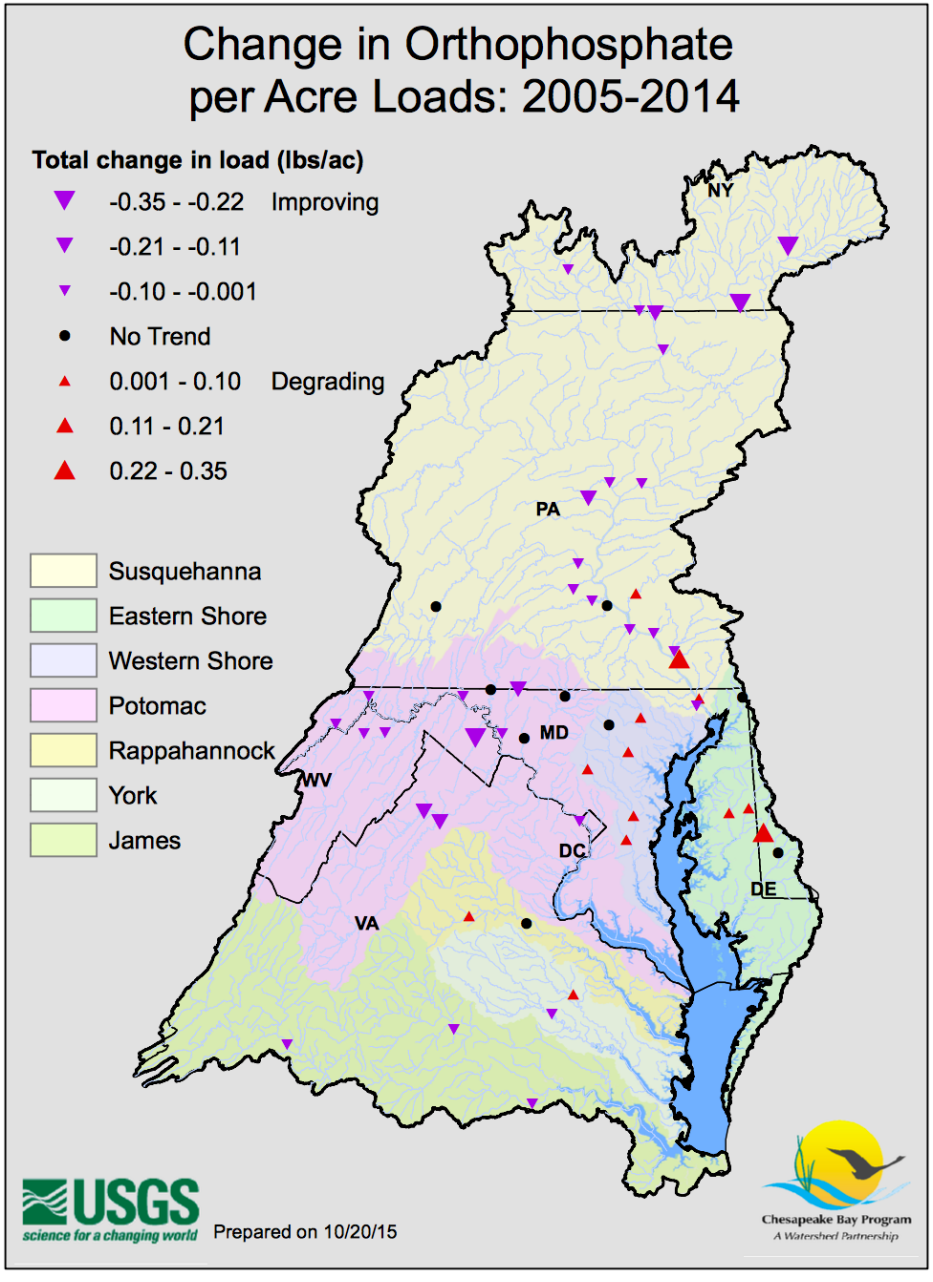
As 2017, the midpoint of the Chesapeake Bay TMDL, arrives, watershed managers are taking stock of successes, challenges and trade-offs in water quality improvement strategies. Phosphorus, one of the three pollutants of principal concern to the Bay, has seen significant reductions in many of the Bay's tributaries, as documented through USGS monitoring and as forecast by the Bay Model. However, recent analyses of tributary monitoring data point to some areas where anticipated improvements have not occurred and, in some cases, P loadings have actually increased (Hirsch, 2016). This STAC review highlights priority phosphorus concerns for the Chesapeake Bay watershed.

ENVIRONMENTAL ISSUES PAPER



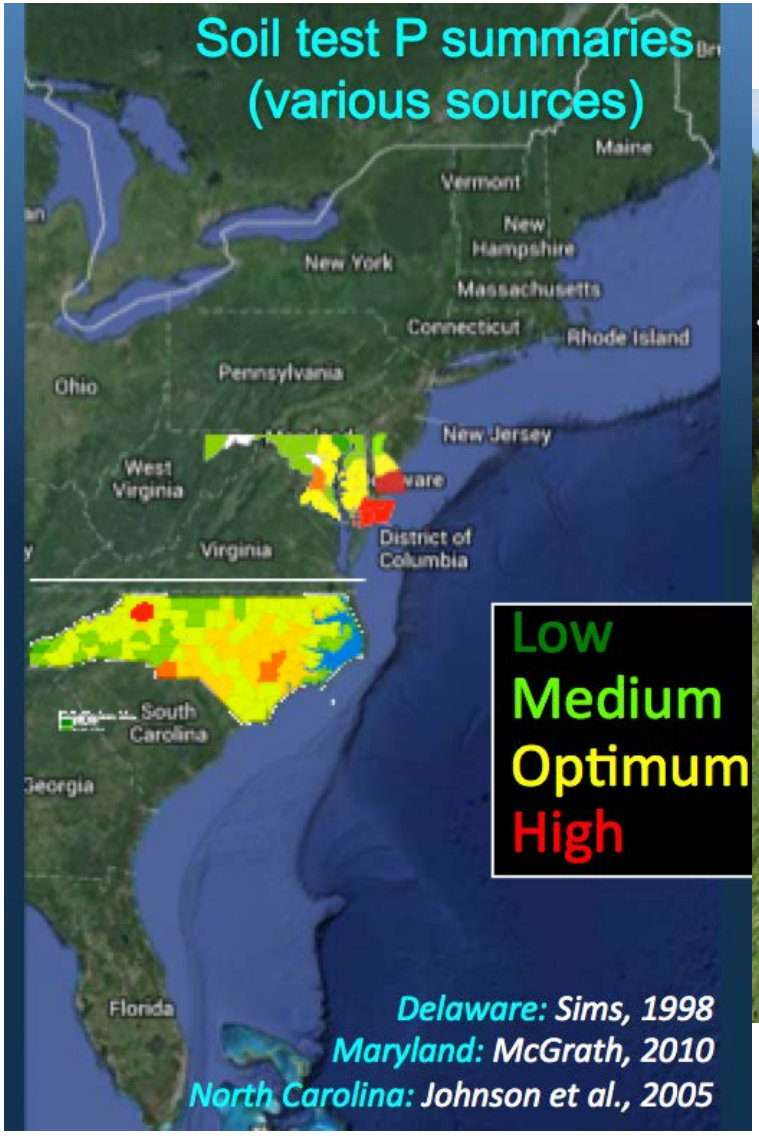
# Good news with a wet blanket:
# Notable exceptions to the great gains the Chesapeake Bay P loadings

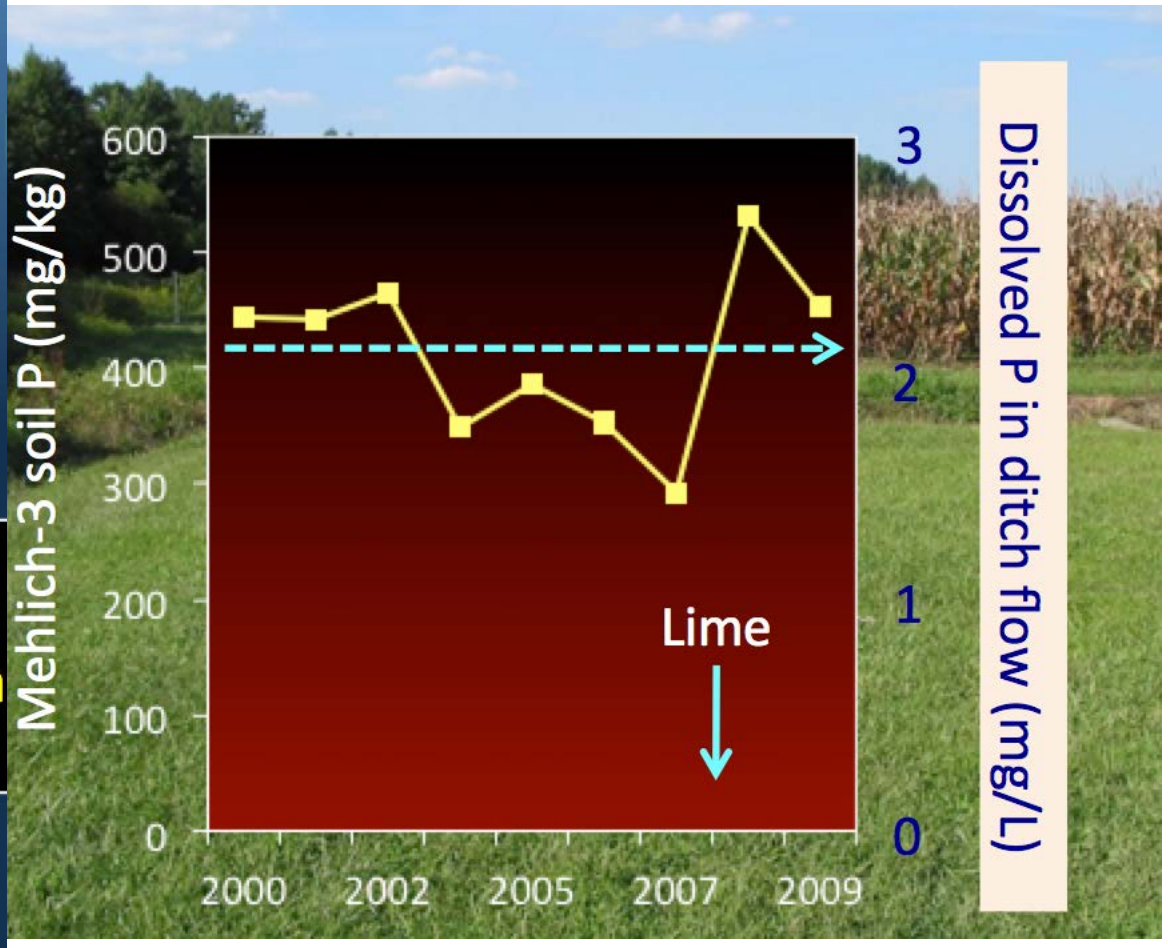



Hirsch and company (2016)

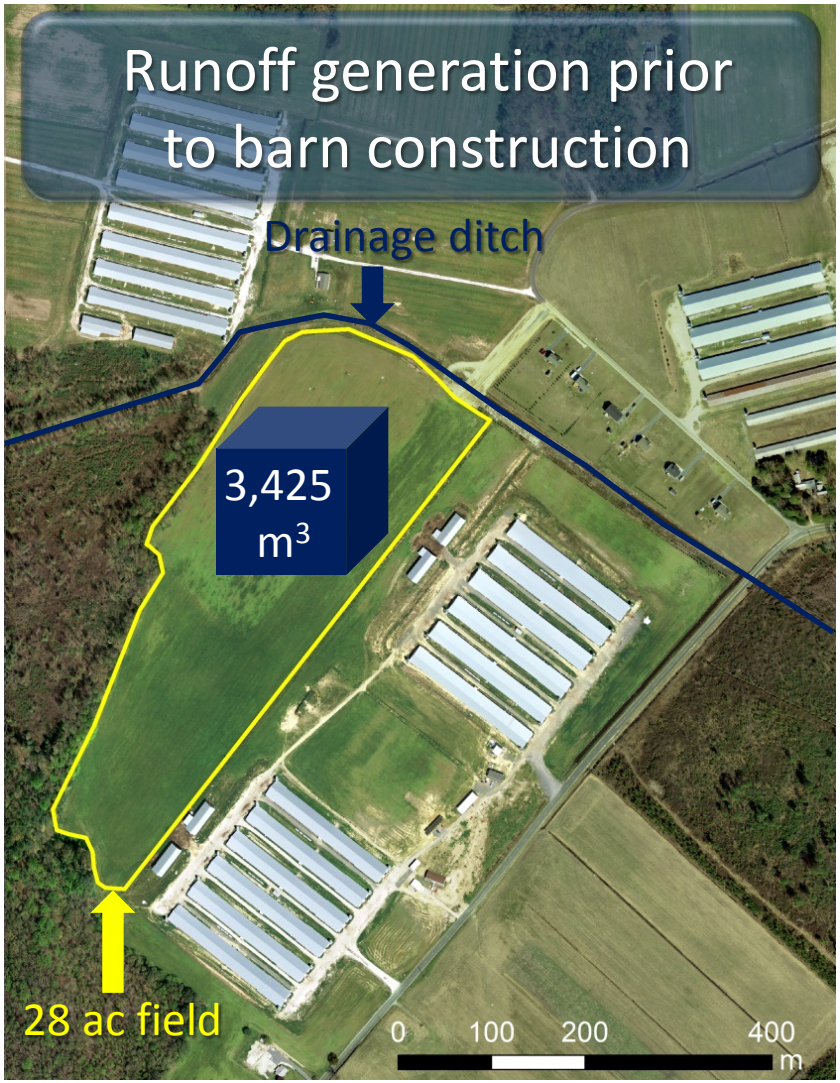
# The Delmarva: Legacy P and Artificial Drainage

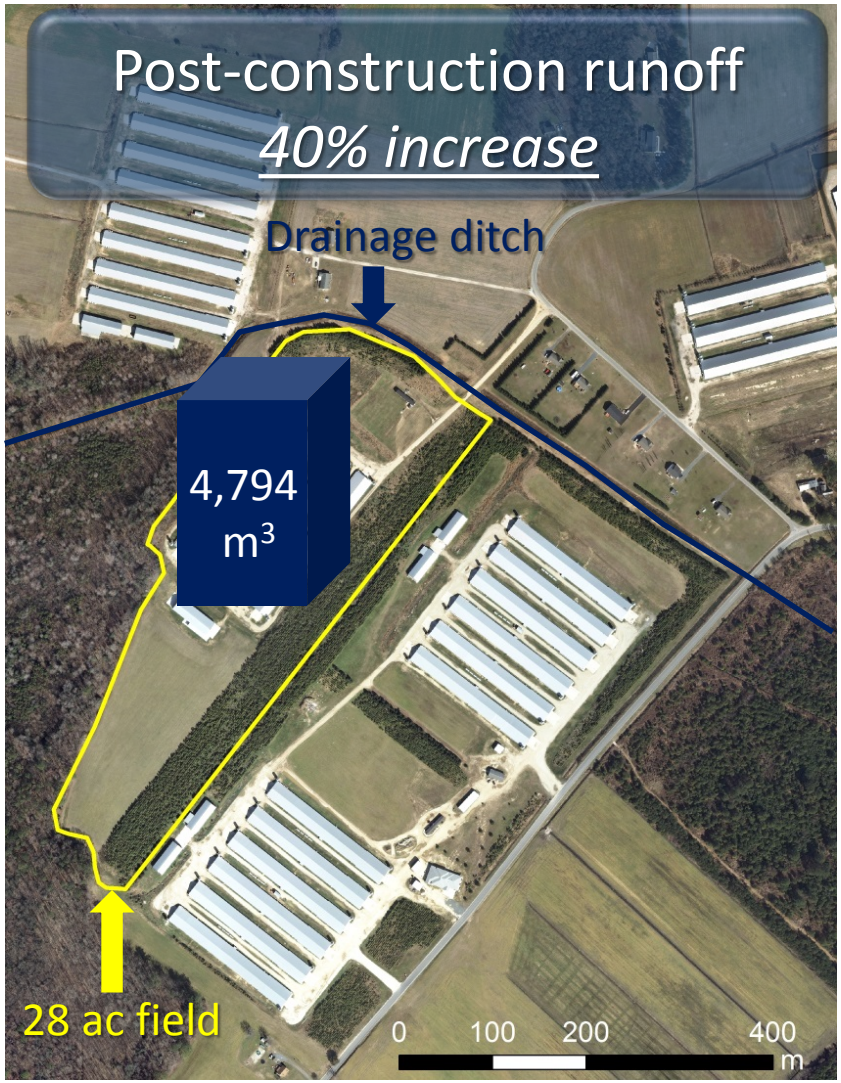


# The “zero acre” farm

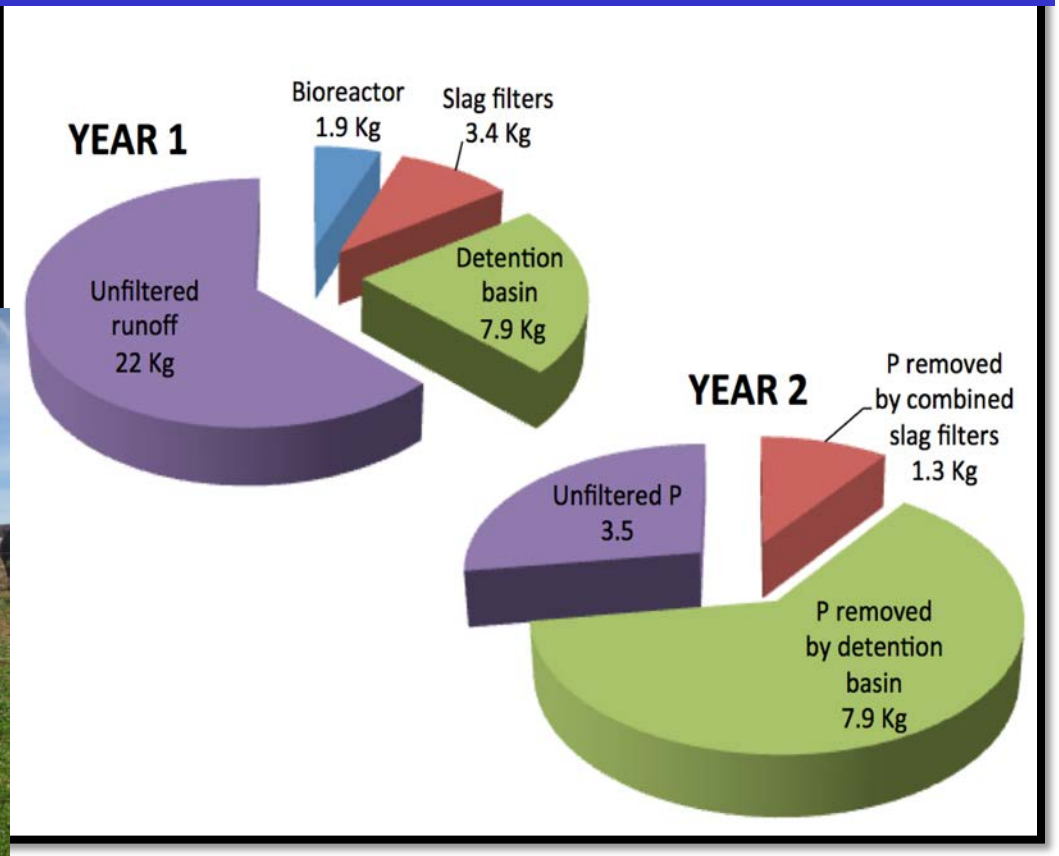
*No land application of litter but new storm water activates legacy P sources*



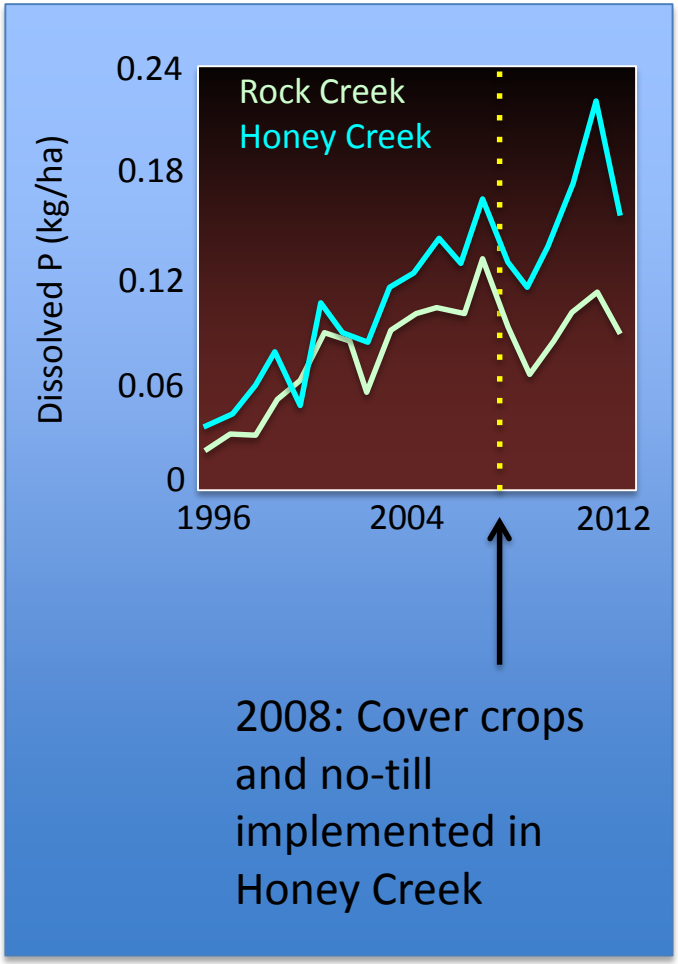



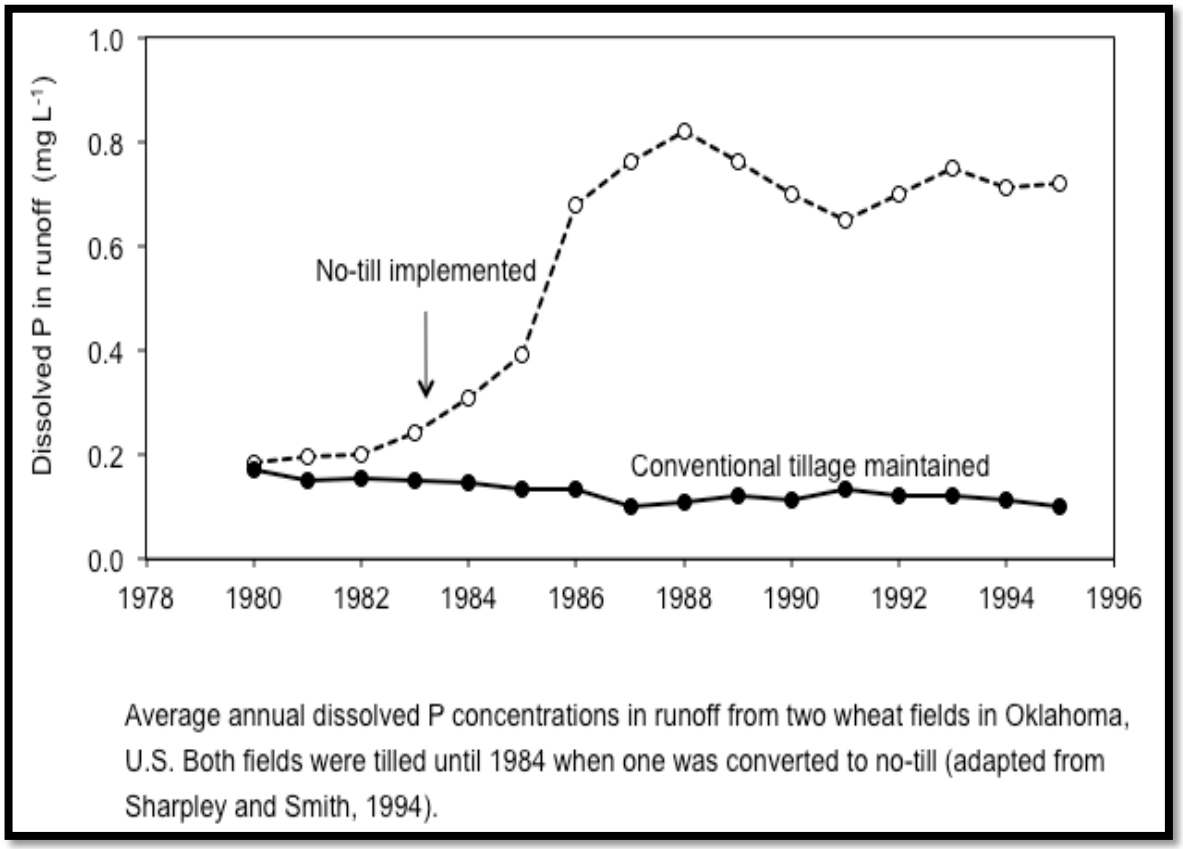
# Barnyards and loafing areas (Animal Heavy Use Areas)

Lancaster County study
28-78 lbs of P in runoff per year



# Dissolved P and the unintended consequence of conservation programs – leaving P on the surface




Average annual dissolved P concentrations in runoff from two wheat fields in Oklahoma, U.S. Both fields were tilled until 1984 when one was converted to no-till (adapted from Sharpley and Smith, 1994).

# The Conowingo Dam – from BMP to liability

*The single greatest source of legacy P?*

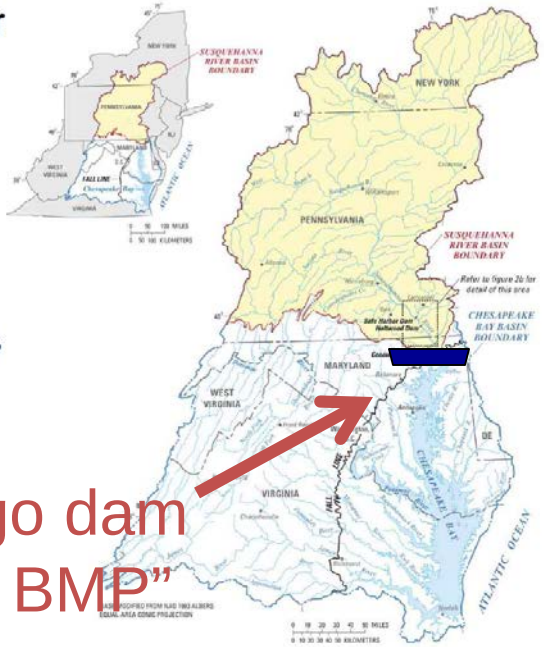
**Susquehanna River As a % of Chesapeake Bay inputs**

**47% of freshwater**

**41% of nitrogen**

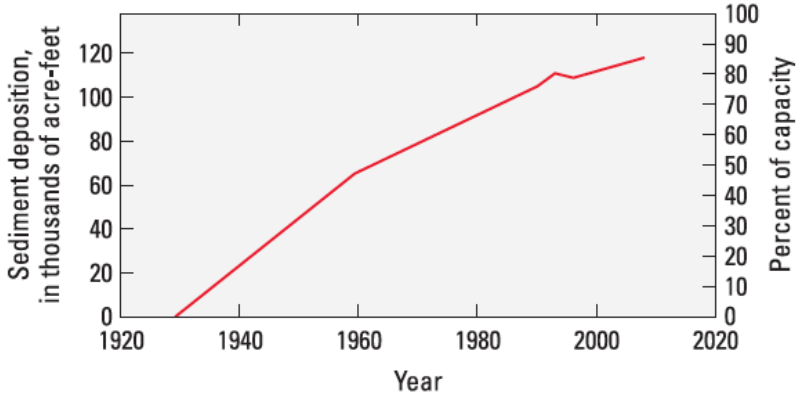
**25% of phosphorus**

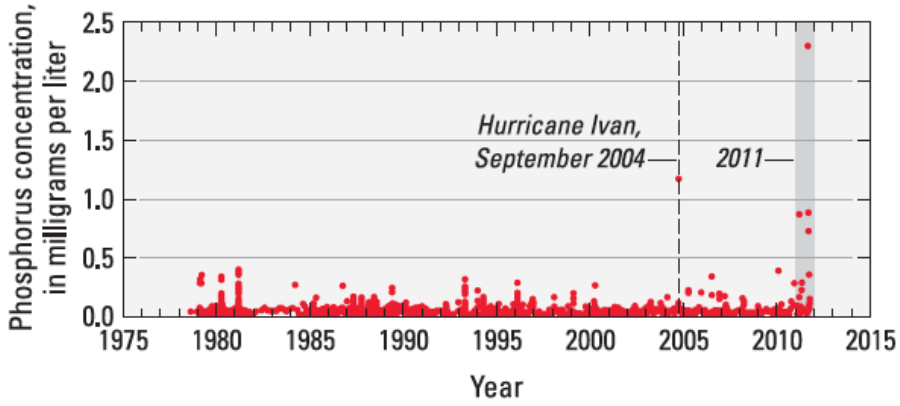
**27% of sediment**




Conowingo dam "greatest BMP"

Tropical storm Lee




Hirsch (2012); USGS (2012)