Shaughnessy, A. R., Sloan, J. J., Corcoran, M. J., & Hasenmueller, E. A. (2019). Sediments in Agricultural Reservoirs Act as Sinks and Sources for Nutrients over Various Timescales. *Water Resources Research*, 2018WR024004. https://doi.org/10.1029/2018WR024004

* Large reservoir acts as sink for nitrogen and source for phosphorus
  + 50% of NO3 retained
    - Denitrification?
  + Also source of NH3, but NH3 is small amount of the total nitrogen in the system
  + Was a sink for P until 1980s when it became a source; potential cap to how much P a reservoir can store?
* Significant variation in nutrient levels at sediment-water interface seasonally
  + Higher during warmer weather
  + Varied by N species seasonally
  + Phosphorus did not change significantly over the season

Harrison, J. A., Maranger, Æ. R. J., Alexander, Æ. R. B., Giblin, A. E., Emilio, Æ. P. J. Æ., Seitzinger, S. P., … Wollheim, Æ. W. M. (2009). The regional and global significance of nitrogen removal in lakes and reservoirs, 143–157. https://doi.org/10.1007/s10533-008-9272-x

* Global modelling study looking at nitrogen removal in lakes and reservoirs in the 1990s
* Lentic systems are sinks for N
* Estimated to remove 19.7 Tg N/year
* Small lakes disproportionately important (retaining almost half of global total)
* Reservoirs retain 33% of global N sink because of their higher watershed area, high settling velocities, and higher loading rates (in general)
* Land use is more important to changes in N retention than changes in climate globally
* Citations for other studies which say that n removal is positively correlated with n loading rates and residence time and negatively correlated with mean lake depth

Seitzinger et al 2002 saying that reservoirs do very little n removal in northeastern US—look up this paper

Scott, J Thad, Stanley, J. K., Doyle, R. D., Forbes, Æ. M. G., & Brooks, B. W. (2009). River – reservoir transition zones are nitrogen fixation hot spots regardless of ecosystem trophic state, 61–68. https://doi.org/10.1007/s10750-008-9696-2

* Analyzed nitrogen fixation in three reservoirs in Texas along the longitudinal gradient of the reservoir
* N fixation lowest in riverine, highest in transition, and low in lacustrine for all three reservoirs in TWO oligotrophic and ONE eutrophic reservoir (pattern consistent between trophic states)
* Magnitude of n fixation higher in eutrophic reservoir (makes sense because there are more inputs)
* Chla highest in riverine zone and decreased along reservoir continuum
* (NOTE TO SELF: nitrogen fixation is the production of NH3 from N2 by n-fixing bacteria)
* Scott et all 2008a: n fixation initiated seasonally by depletion of nitrate, ie n fixation is a response to depleted nitrate concentrations
* QUESTION: can we use NH3 concentration as a proxy for n-fixation? What are other sources of NH3?
* Nitrate highest in late winter/early spring and lowest in July-august (TEXAS)
* Why does nitrate increase in September/October? Decreased uptake by phytos?