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| Process | N | P |
| Fixation | N can be fixed from N2 gas by some bacteria. N is not as often limiting phytoplankton growth in estuaries. | P is not gaseous. There is a very small proportion of phosphine (PH3, a volatile P compound). Therefore, P has no atmospheric deposition contribution. |
| Oxygen consumption | N metabolisms normally use oxygen such as nitrification | P metabolisms do not use oxygen. |
| Denitrification | N can be removed from aquatic systems by denitrification, which converts NO3- to N2O and N2. | No P exists in the gaseous form, so there is no real process of P removal from water |
| Settling and burial | N can adsorb to suspended sediments, but this process is not strong. Absorbed N easily returns to the water column before the suspended sediment settles to the bottom. | P has a strong ability to adsorb to suspended sediment and settle to the riverbed. This process (burial) can remove P from the water column. |
| Toxicity | NH3 with high concentration can be toxic for fishes | P is nontoxic in an aquatic system |