

Aquatic Nutrient Monitoring on Process Time Scales

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Nutrient dynamics in aquatic systems are driven by a range of natural and anthropogenic forcing functions. Because nutrient dynamics broadly affect issues related to public health, ecosystem status and resource sustainability there are increasing needs to monitor nutrient loading and variability. Monitoring and modeling ecosystem dynamics and predicting changes in normal variability due to potentially adverse impacts requires sustained and accurate information on nutrient loads on the appropriate time scales. On site sampling is often resource limited which results in sparse data sets with low temporal and spatial density. For nutrient dynamics, sparse data sets will bias analyses because critical time scales for the relevant biogeochemical processes are often far shorter and spatially limited than sampling regimes. Recent technological developments have brought the ability to sample and remotely deliver data on the time scales that the forcing functions operate. These technological improvements, while still nascent, have delivered new understanding of process variability from the physiological to event to seasonal scales.