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Summary for 'A Limnology Primer'
To be presented Feb 03, 2020, 13:30

Outdoor recreation and tourism are cited as important facets of Idaho's 'Key Industries' (Idaho Commerce), and water resources with high water quality are an integral component of this. Without a high-quality resource, the direct and indirect economic benefits will not be realized.

Idahoans expect their elected official to make sound decisions to ensure a strong economy and to safeguard the natural resources that are an integral to this.

The transport of excessive nutrients (nitrogen - N, and phosphorus - P) to aquatic ecosystems from human activities stimulates high aquatic plant growth that shortens the millennia-long natural eutrophication process to tens of years so that changes become visible during a human life time. This is termed 'cultural eutrophication'.

Of the two nutrients, typically P is in shortest supply, meaning that small additions greatly stimulate plant growth. Our activities on the landscape tend to liberate high amounts of P, resulting not only in elevated P in water, but also in an imbalance between N and P. This provides an advantage to cyanobacteria (blue-green algae) that can overcome N deficits by obtaining it from the atmosphere. Blooms of such algae are termed Harmful Algal Blooms (HABs) because they can produce some of the most potent toxins known to humans and consume oxygen from the water when they die.

Lakes and reservoirs generally retain 60-90% of sediment and nutrients that enter which can then cycle internally, each cycle potentially stimulating plant growth. Cycling of P occurs due to the lack of oxygen near the bottom, or from physical disturbances such as wind- or boat-generated waves/wakes in nearshore areas. The quantity of nutrients recycled physically depends on the bottom type and the amount of P in it. We currently have very poor data for Idaho waters, but it is clear that a blanket 'one size fits all' for no-wake zones to protect shorelines composed of vastly different materials is not appropriate.

The increasing prevalence of wake boats that generate 3' to 5' wakes for recreation presents a novel disturbance regime in terms of shoreline erosion and nutrient recycling when those waves come ashore because they are often beyond what our lakes have experienced in the past. Because the boats use internal water filled bladders/tanks to assist in making the wake, they also represent potential vectors for the transfer of invasive species among water bodies.

It is imperative to base decisions on sound science, thus we need to quantify the amount of P by type of lake bottom (silt, sand/gravel, rock etc.) and determine how much is recycled by different wave types to set realistic no-wake zones to protect high quality waters.