Methane Gas Emissions at dams

Methane gas emissions at dams: why methane production isn't an issue at the lower Snake River dams.

Methane gas is produced naturally in bodies of water where there is no dissolved oxygen. These bodies of water are typically classified as "eutrophic," which means they are so rich in nutrients, and support such dense vegetation, that algae and other plants can grow excessively. When the plants decompose, the normal breakdown of organic matter reduces, or sometimes completely eliminates, the dissolved oxygen in the water, causing "anoxic" conditions, which produces methane gas.

Though unusual, some reservoirs can also release methane gas. This occurs when several factors are present. First, there is a higher rate of plant life deterioration than the oxygen available in the water to fuel the decay process. Second, the surface water temperature is drastically different than the water temperature on the floor of the reservoir, known as "stratification." These reservoirs are also deeper, so it is difficult for oxygen to reach all the way to the bottom. When the oxygen on the floor of the reservoir runs out, the decay process can produce methane. In addition, reservoirs with warmer water may have a faster rate of decay. Third, reservoirs with slower water flow, where the water pools for years, allow more time for bacteria in the decay process to use up available oxygen. This is seen in tropical reservoirs in South America or Africa, and those high in nutrients; however, not all reservoirs emit methane gas.

Generally, the lower Snake River projects do not release methane gas because oxygen levels are very high, the water does not stratify, and the reservoirs are shallower with water circulating regularly. Thus, measurable amounts of methane gas is not released by the decay process in the lower Snake River reservoirs.

Methane production in lakes and reservoirs

Lakes and reservoirs can sometimes be high in nutrients depending on what the land is used for surrounding it. For instance, Lacamas Lake, which is a natural lake in Vancouver, Washington, is very eutrophic due to its high nutrient content, along with elevated algae and plant growth fed by runoff from a stream that drains much of the nearby farmland. As the plants and algae decompose, oxygen on the bottom of the lake is depleted producing methane gas.

Lacamas Lake also tends to stagnate because of low water circulation. In May 1997, recreationalists observed a blue-green algae bloom in the lake. Water samples collected by the Washington Department of Ecology from the lake bottom emitted a heavy hydrogen sulfide odor, which is another by-product of anoxic conditions.

So, can dams play a role in methane gas production? Yes and no. Ultimately, it depends on the following factors: location, water temperature, water flow, depth, nutrient concentration, amount of plant growth, climate in the region, and the process that uses dissolved oxygen. For the relatively clean reservoirs of the Federal Columbia River Power System, which include the lower Snake River dams, conditions for low dissolved oxygen concentrations are not prevalent, thus methane gas is generally not an issue.

U.S. ARMY CORPS OF ENGINEERS – WALLA WALLA DISTRICT
201 North Third Avenue; Walla Walla, WA 99362
509-527-7020 cenww-pa@usace.army.mil
www.nww.usace.army.mil

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