New technology makes wastewater from the oilsands industry safer for fish

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Research Summary:

- Research focused on massive tailing ponds that are filled with toxic water near Fort McMurray.
- The purpose of ponds is to store and reuse water from mining to reduce the amount of new water taken from the nearby Athabasca River.
- The reuse of water causes ponds to accumulate extremely high concentrations of harmful contaminants that are lethal to birds, frogs, fish, and plants. There is enough sludge like water in these ponds to fill half a million Olympic sized swimming pools.
- This is especially problematic given new policies allowing the controlled release of water from tailings ponds into the environment. (The Alberta government is allowing the oil sands to release 1.3 trillion litres of wastewater into the Athabasca River.) This could cause massive potential harm to people and wildlife living downstream.
- Dr. Dianne Orihel and her team tested how new technology (titanium dioxide microparticles) which are cost-effective, sustainable, and efficient can be used to clean up the water.
- Titanium dioxide is a common ingredient found in many household products such as toothpaste and sunscreen. When it is placed on microparticles (tiny objects made of glass) it can help break down the organic chemicals known as naphenic acids in oil sands wastewater.
- This technology is also recyclable as the glass particles float to the surface so can be skimmed off the surface of the water and reused.
- Experiment designed to see if the technology left the treated water safe for plants and animals.
- Discovered that when naphenic acids were treated by titanium dioxide its immediate lethal effects were eliminated (animals and plants were no longer dying).
- However, research showed that when the naphenic acid was broken down by only 80% the remaining chemicals produced sublethal impacts such as misshapen hearts in fish etc. This indicates that wastewater treated with this technology must be thoroughly treated to reduce the risk of causing unintended harm to wildlife.
- Study showed how the improper treatment of oilsands wastewater prior to its release into the environment may lead to unintended ecological consequences.

