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Singapore successfully researched water quality sensor which can be used to sense oxygen and contaminants

This sensor only needs to withdraw 10-20ml of water and can detect algae and phytoplankton. And it can be used to detect oil compounds and detergents in water.

Singapore researchers spent 5 years to invent holistic sensor which uses optical principles to detect several substances. It can be used to detect if there is problem with water resources in the reservoir and marine environments. For example, if algae and phytoplankton exceeded dangerous levels. These organisms may affect oxygen level in the water causing marine life to suffocate and die. The sensor can also be used to detect oil compounds in the water to prevent oil spillage from affecting our fish farms. This group of researchers are from SMART CENSAM and NUS TMSI.

The researcher who leads this research, Dr Kelvin Ng, says, "Previously, when we need to sense water quality, the researcher must collect water samples, and sent these samples to the lab for analysis." Even using multiple types of sensing devices, each sensing device can detect one or two contaminants or biological compounds and its concentration. The usage is limited.

On the contrary, the new sensor brings lab to the water, the new sensor only needs to draw 10-20ml of water, and it can detect algae and phytoplankton concentrations, and it also can be used to detect oil compounds and detergents. The sensing device uses LED-induced fluorescence, and according to the matter in the water that can emit light (fluorescence), absorption of light and scattering – three optical principle. This device can classify and determine the concentration of these matters. These information can be communicated via 3G and 4G and sent directly to the monitoring station.

To prevent fish from dying of suffocation, for the past few weeks, 39 fish farms in Singapore have suffered loss of 160tonnes of fish, due to the lack of oxygen in the water and plankton blooming.

"The massive reproduction of plankton will compete for oxygen with the marine life. The death and decomposition of these plankton and bio-organisms will deplete oxygen in the water. These will cause the fish to suffocate and die. Using these sensors can prevent these from happening."

SMART has already licensed this technology to a company to produce the sensor. According to our understanding, the sensor is estimated to be \$25K. The consumer can choose to attach these sensors to their alarm system, for instance when the oxygen level in the water is insufficient, the system will automatically supply oxygen and send an SMS to fish farmers. The sensor can also be put on Autonomous Underwater Vehicle (AUV) and hence giving it mobility to sense water quality at different depths.