CSIRO

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Science Agency

HydraSpectra

Low-cost, above-water surface water quality sensor measuring surface spectral reflectance

Technology to solve global challenges

Developed by CSIRO, HydraSpectra is an affordable, low-maintenance sensor, designed for water quality monitoring using spectral reflectance. It can determine key water quality constitutents, such as algal blooms, suspended sediment, and dissolved organic colour.

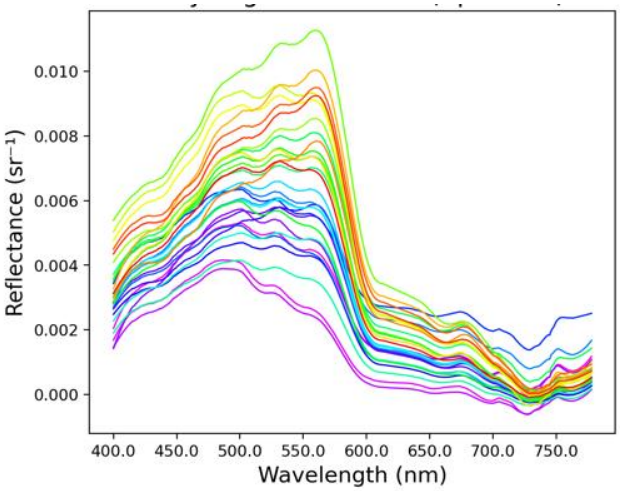
It combines measurements from multiple fields-of-view to accurately capture above-surface water reflectance at high spectral resolution. HydraSpectra, is deployed from both fixed and floating structures, complementing other in-water monitoring sensors and paired with satellite imaging technologies.

HydraSpectra above surface water quality sensor

Spectral reflectance is a measure of how much energy a water body reflects across specific wavelengths. Certain water quality parameters may optically influence the shape or intensity of that spectral reflectance. Notably, algal blooms are particularly distinctive as high concentrations of photosynthetic pigments influence the shape of the spectra observed. HydraSpectra can thus be used for the early warning of potential algal blooms across a variety of aquatic systems.

In addition to assessing individual water body dynamics, HydraSpectra can be integrated with satellite observations to form part of a region-wide monitoring program for algal bloom threats. This integration allows managers to develop strategies to manage exposure risk effectively.

Currently, HydraSpectra is deployed globally as part of several AquaWatch Australia (AquaWatch) pilot projects in both inland and coastal environments. It accurately estimates chlorophyll, cyanobacterial pigments, coloured dissolved organic matter, and suspended sediment concentrations. Its above-surface operation minimizes maintenance by avoiding biofouling issues common with in-situ systems.



Example of daily reflectances obtained from a coastal site over a month illustrating changes in spectral shape.

Get involved

If you are interested in learning more about AquaWatch, or building new partnerships, please reach out to find out how to be involved and to keep up to date with our progress.

As Australia's national science agency and innovation catalyst, CSIRO is solving the greatest challenges through innovative science and technology.

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For further information

AquaWatch Australia
Email: aquawatch@csiro.au
https://reserch.csiro.au/aquawatch/