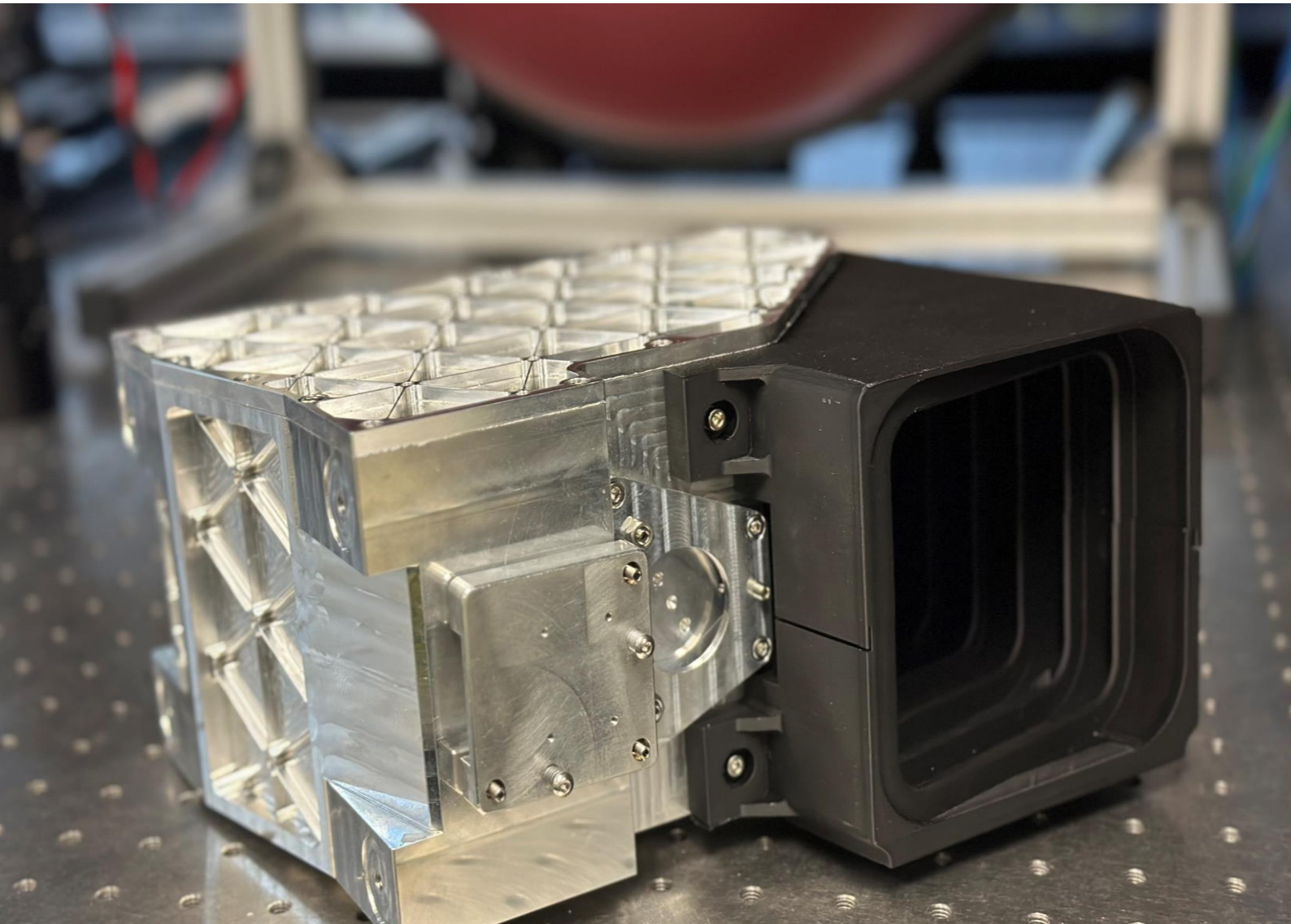
CSIRO

Australia's National
Science Agency

CyanoSense

Advancing water quality monitoring with Australian hyperspectral imaging technologies



Water quality is a global issue

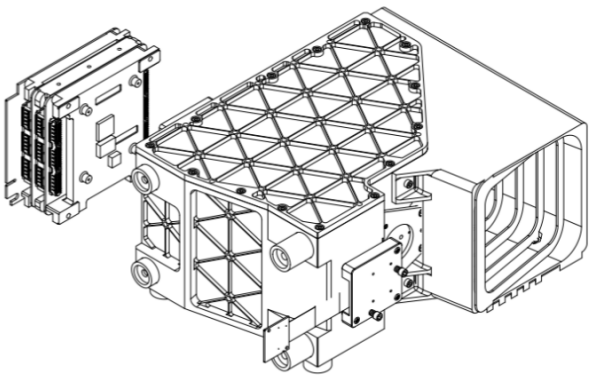
The United Nations (UN) estimates that over three billion people are at risk of illness from poor water quality due partly to a lack of monitoring. Freshwater systems, essential for drinking water, agriculture, and ecosystem health, face significant threats from pollution, harmful algal blooms (HABs), and sedimentation. Reliable, high-quality data is essential to manage these challenges and make informed water resource decisions. However, existing monitoring systems are often outdated, inconsistent, and limited in scope.

In response, CSIRO developed CyanoSense - a hyperspectral imaging solution to deliver accurate information on inland water quality, with a special focus on detecting harmful algal blooms to support CSIRO's AquaWatch Australia initiative.

Innovative approach to harmful algal bloom detection

CyanoSense is a state-of-the-art hyperspectral imaging payload designed specifically to monitor coastal and inland waterbodies, customised to detect the presence of potentially harmful algal blooms. This innovative tool integrates a custom optical system with a high powered compute module for data processing, supported by a low-power supervisor module. *CyanoSense* can interface with various spacecraft buses, making it a flexible and powerful resource for freshwater monitoring and management.

Key features and specifications



Mechanical design of the *CyanoSense* payload including back-end electronics sub-system.

CyanoSense instrument specifications

Size	300 x 150 x 150 mm
Weight	4 kg
Power	30 W Peak, <1 W Avg.
Interfaces	UART, Ethernet, CANBUS, USB RS422/485 all accepted
Storage & Processing	512 GB on-board storage with processing to Level-1A
Spectral Range	500 – 810 nm
Spectral Resolution	12 – 18 nm
Ground Sampling Distance	50 m
Across Track Swath	24 km
Signal-to-Noise Ratio*	160 @ 500 nm; 118 @ 600 nm; 65 @ 700 nm; 58 @ 800 nm

*specified for radiance expected from inland waters

Applications and benefits

CyanoSense can be used by environmental agencies, policymakers, and water management authorities, in support of their needs in:

Early Warning: *CyanoSense* can help identify and track algal blooms early, enabling proactive management to protect freshwater resources.

Data-Driven Decision Making: Delivers data on water quality, supporting initiatives aligned with sustainable development goals (SDGs).

Integrated Solution: As part of CSIRO's AquaWatch Australia initiative, *CyanoSense* contributes to a scalable solution for water quality monitoring, delivering updates across vast geographical areas.

Get involved

CSIRO is actively seeking partnerships to expand *CyanoSense*'s capabilities and reach. Contact us to start a conversation about the opportunities.

For further information

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