

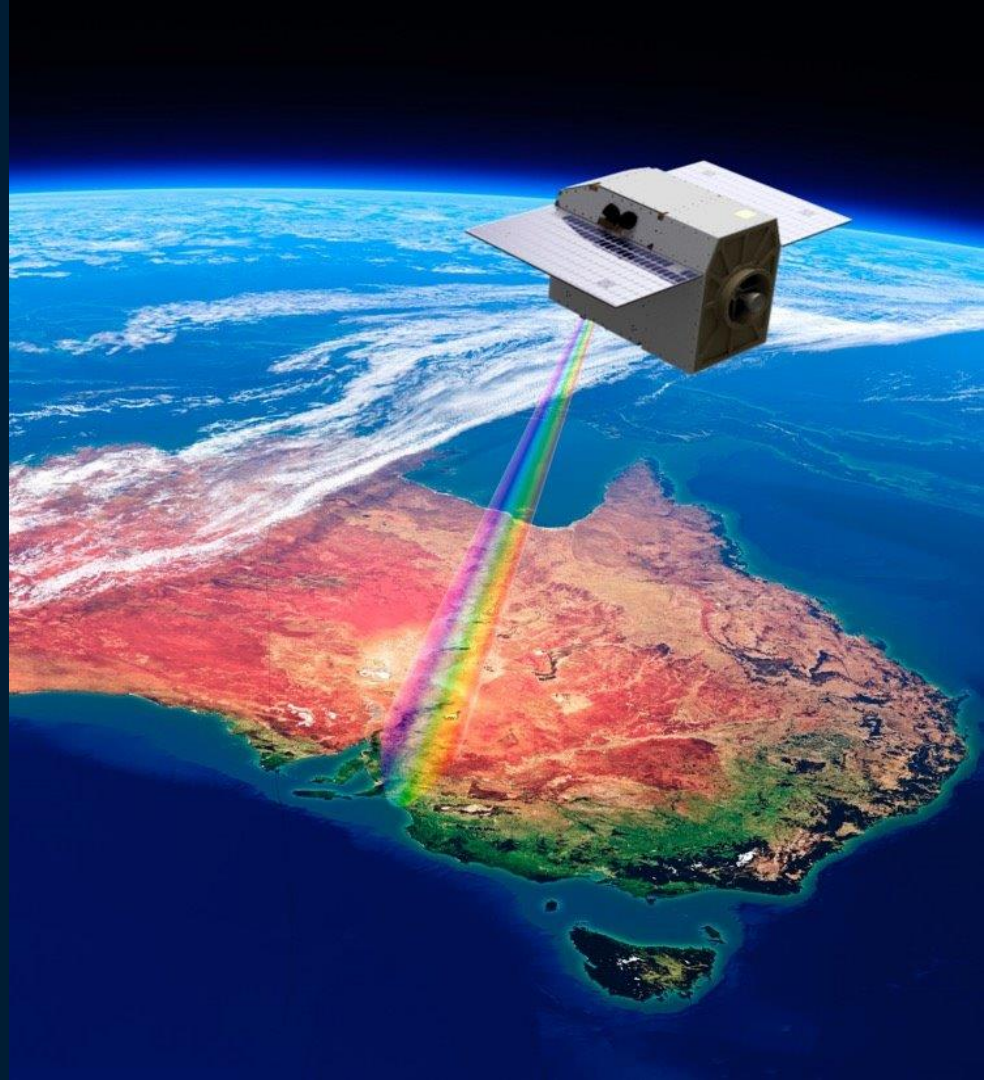


Harnessing AquaWatch Technology and Citizen Science for Water Quality

Janet Anstee, Leo Lymburner, Timon
Sotiropoulos, Alex Held, Zandria Farrell

AquaWatch Australia
CSIRO Space and Astronomy

Next Water 2025
Melbourne 21-22 October 2025



CSIRO

We acknowledge the Traditional Owners of the lands and waters on which this conference is held — the peoples of the Kulin Nation. We pay our respects to their Elders past and present, and acknowledge their enduring connection to Country, including the rivers, wetlands, and waterways that sustain life and culture.



'Eternal Wisdom, Infinite Innovation'
artwork by Rachael Sarra, working with Gilimbaa.



AquaWatch: a 'weather service' for water quality

Our AquaWatch Australia Mission is establishing an integrated ground-to-space national water quality monitoring system to support water management with accurate data and predictive forecasting.



<https://research.csiro.au/aquawatch/>



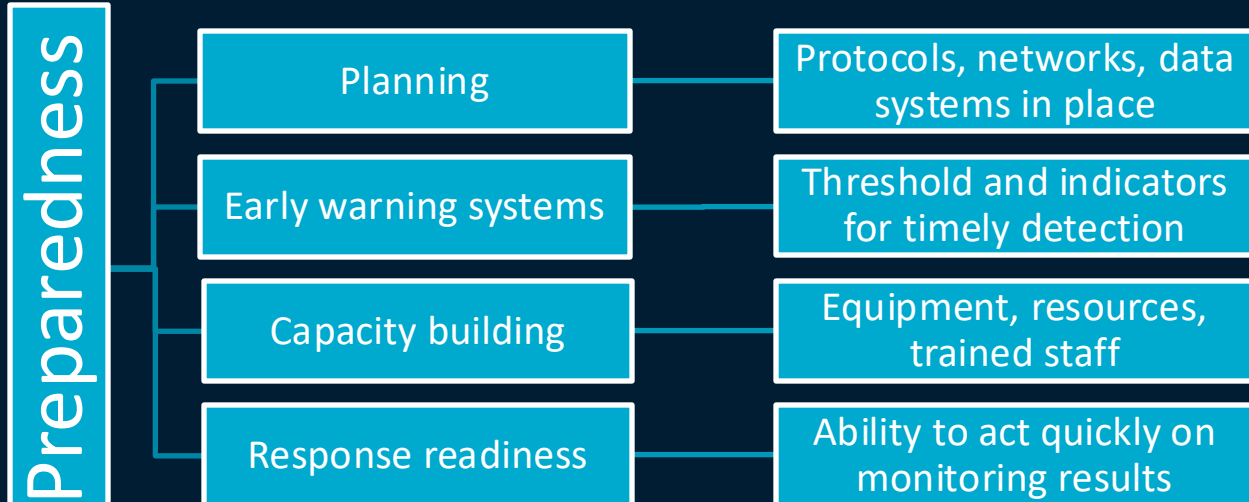
AquaWatch Australia concept

- Virtual Satellite Constellation
- In-situ sensing
- Ground to space integration
- Calibration/Validation
- Modelling and AI
- Community Collaboration
- Building a comprehensive system



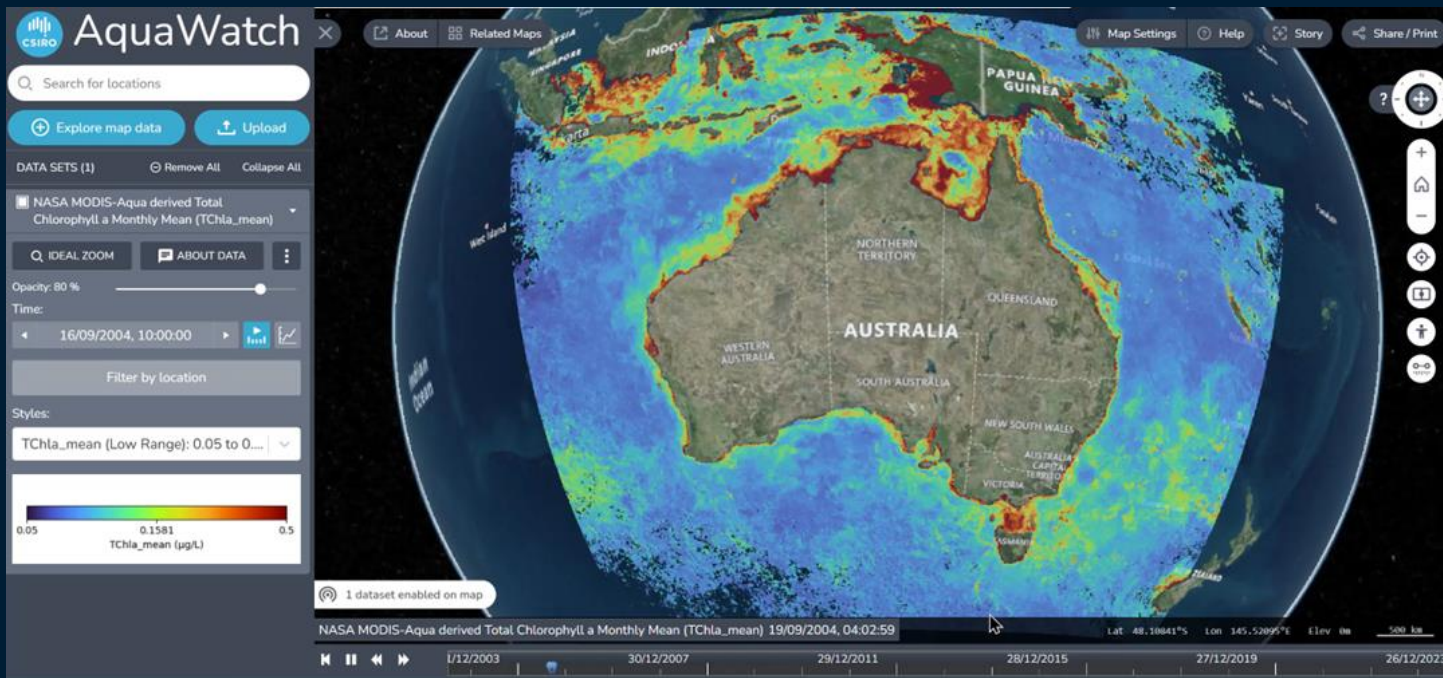


Actionable information before and during environmental events



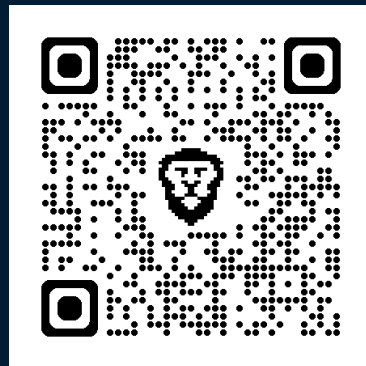


EO Continental scale water quality products



20 years of NASA MODIS WQ maps (2002 – 2023) At 1km are available.

NOAA VIIRS 2012 – 2025 NRT data products under development.



Mapping Total Suspended Solids (TSS) and Dissolved Organic Carbon (DOC) in Complex Coastal Waters Using Deep Learning Enhanced Remote Sensing. Ecological Informatics (2025). <https://doi.org/10.1016/j.ecoinf.2025.103276>

Nagur.Cherukuru@csiro.au

AquaWatch Data Portal

<https://map.adias.aquawatchaus.space/>

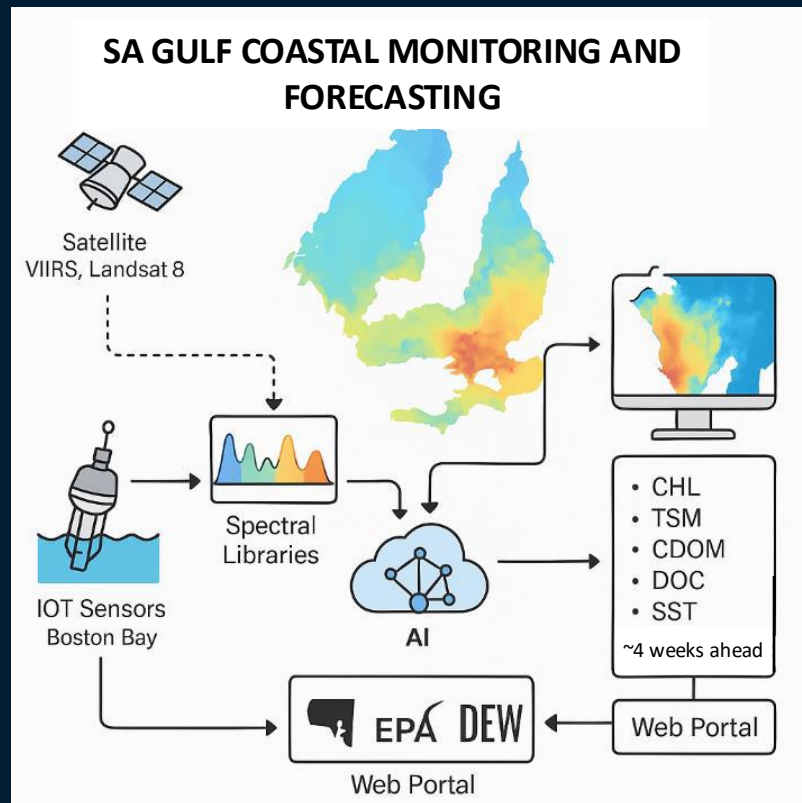


How will AquaWatch be used?

Integrated system architecture for SA Gulf coastal monitoring, combining:

- satellite data,
- in-situ sensors,
- AI-driven forecasting.

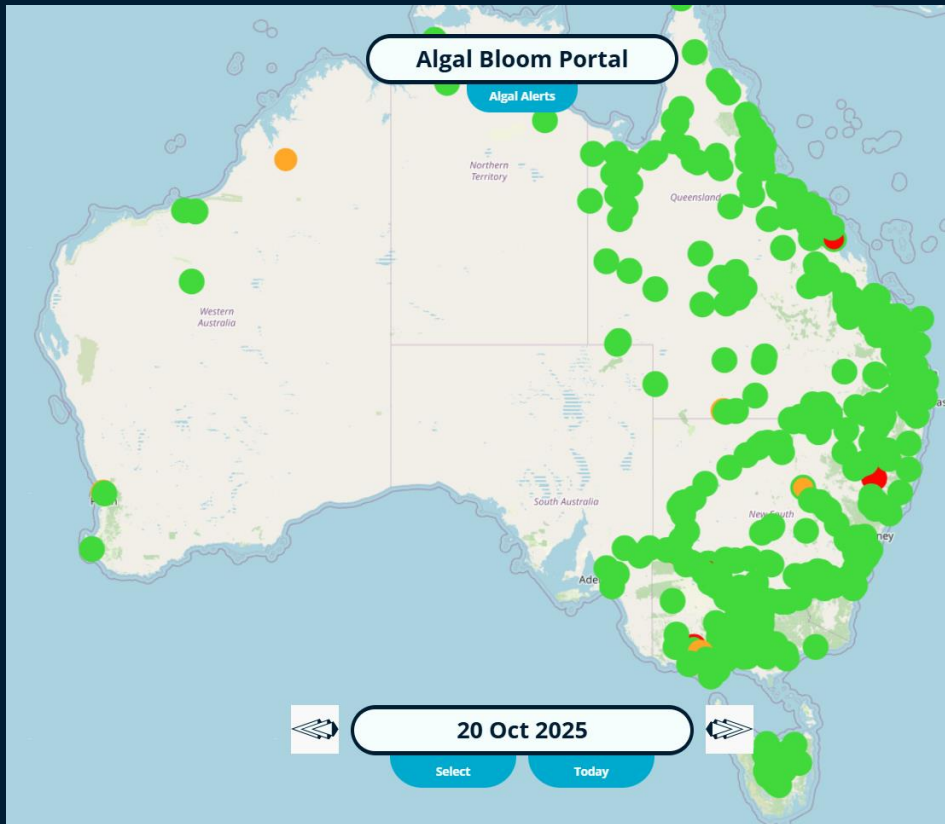
Outputs include real-time and 4-week forecasts of key water quality parameters accessible via user portal



Nagur.Cherukuru@csiro.au



AquaWatch Inland Water Quality Portal



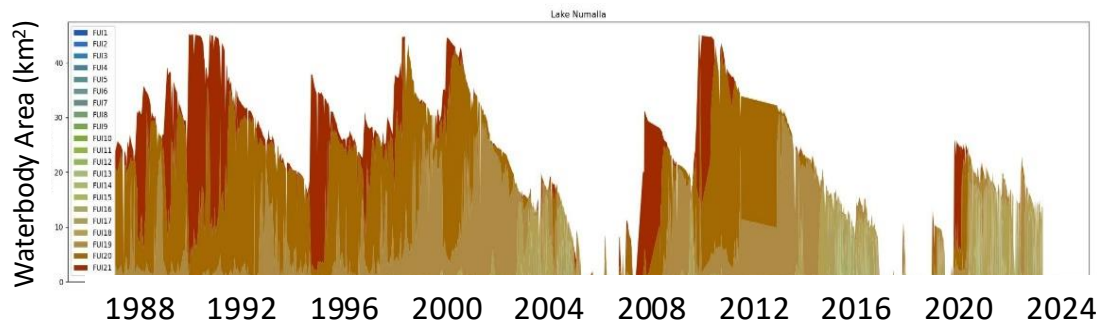
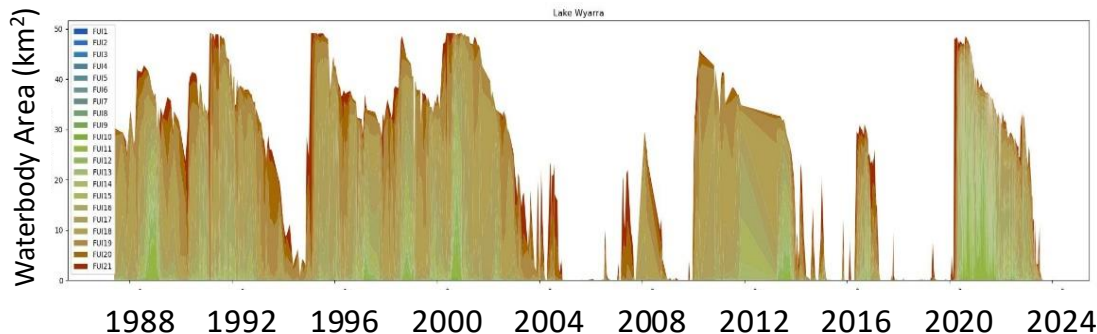
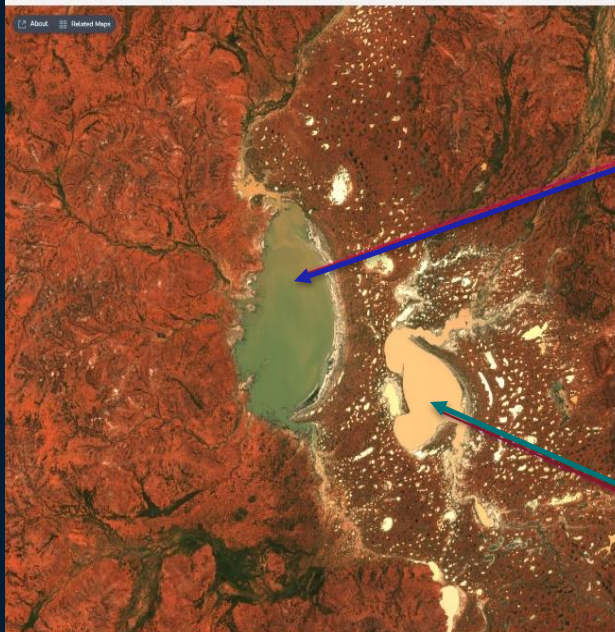
Includes an Algal Alert since 2017, maps the Severity vs Extent of algae using a traffic light system.

Specified water bodies Updated weekly.

What's it like this week?
Mid Spring
Lower water temperatures
Not much activity



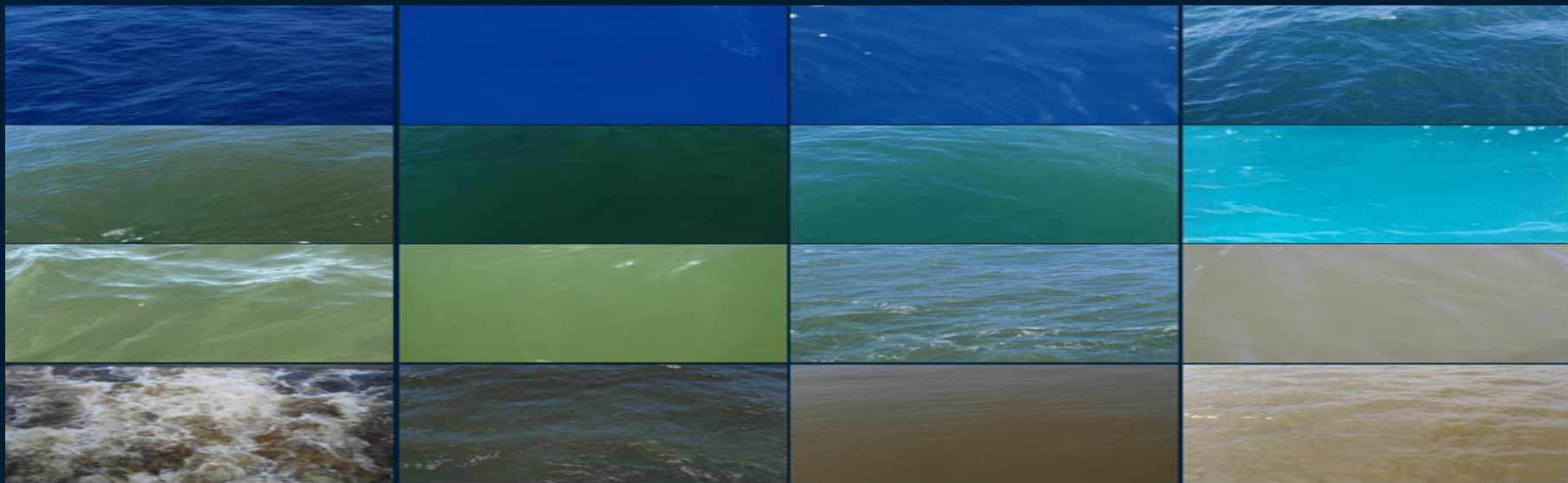
Using colour to quantify change over time



Lake Wyara (left) and Lake Numalla (right), Budjiti Country



Water colour scale



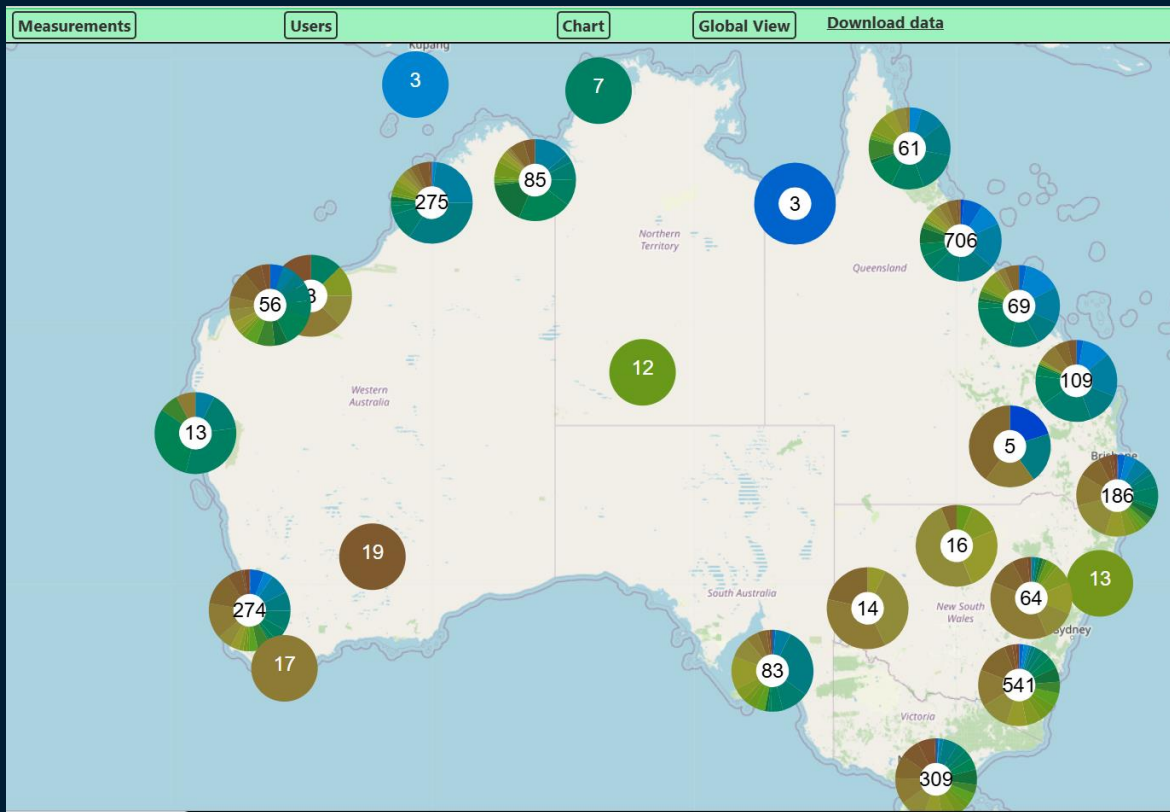
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21

The Forel-Ule colour scale was developed in the late 19th century.

This scale is composed of 21 colours, going from indigo blue to 'cola' brown, through blue-green, green, and yellow colours.



Citizen Science – Eye on Water Australia



<https://research.csiro.au/eyeonwater/>

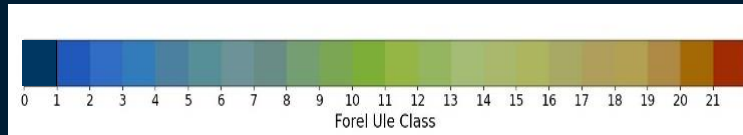


Monitoring water quality for AquaWatch

AquaWatch buoys with instruments



Eye on Water (EoW)
Citizen Science



Other indicators

Bioindicators

Cultural
Indicators

Temperature

pH

Conductivity

Dissolved
Oxygen

Nutrients




Turbidity

How the Eye on Water observations are used with satellite pictures




17 Aug 1986
Landsat 5



Measurement

Secchi Depth	0.11m	
Date and time	2020-08-01 02:09:42	
Latitude	-32.2550020104599	
Longitude	142.434400325216	
FU Value (User)	18	
FU Value (Calculated)	17	
Device platform	iOS	
Device model	iPhone12,3	
Viewing angle	6	
Rain	no	
Bottom visible	no	

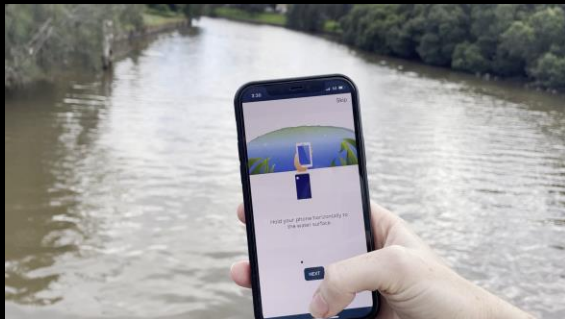
Measurement

Secchi Depth	0.2m	
Date and time	2024-05-04 03:42:55	
Latitude	-32.3552899	
Longitude	142.4044289	
FU Value (User)	15	
FU Value (Calculated)	14	
Device platform	Android	
Device model	SM-A326B	
Viewing angle	2	
Rain	no	
Bottom visible	no	



Harnessing AquaWatch Technology and Citizen Science for Water Quality

- **AquaWatch Australia** is developing a comprehensive water quality monitoring system through its integrated satellite and in-situ sensor network.
- **Citizen science** via *Eye on Water – Australia* enriches data quality, community engagement, and environmental stewardship.
- **Algal Alert product** empowers participants to compare observations, enhancing public awareness and scientific validation.
- **Inclusive monitoring:** Combining traditional and non-traditional data sources strengthens national-scale water quality insights.
- Together, we are building a **collaborative, data-driven future** to address Australia's critical water challenges.



Thank You

Janet.Anstee@csiro.au

AquaWatch Australia

Next Water '25 | AquaWatch Australia

