

New satellite system would enhance water quality management in Australia

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Analysis conducted at UNSW Canberra has demonstrated that a new space-based Earth observation system would be a valuable piece of infrastructure for monitoring and managing Australia's inland and coastal waterbodies.

The scoping study was one of the first steps in the AquaWatch Australia [water quality](#) management mission being developed as a joint initiative between CSIRO, Australia's national science agency and the SmartSat Cooperative Research Center (CRC). It was conducted at Australia's premier [space](#) mission development center, the Australian National Concurrent Design Facility (ANCDF) at UNSW Canberra.

ANCDF Manager and Space Systems Engineer Denis Naughton said the infrastructure could include a constellation of satellites and a network of ground-based sensors and that the study provided an understanding of the project's challenges and potential solutions.

"We were able to identify a system design that addresses those requirements and is feasible to

construct, commission and operate," Mr Naughton said.

"The consolidated technical solution for the operational AquaWatch satellites would require further detailed engineering analyses of the mission."

CSIRO's AquaWatch Australia mission leader Dr. Alex Held commented: "This preliminary system design report will underpin our approach to establishing the integrated space and ground infrastructure, and inform our analysis of domestic technical capability to build such purpose-designed Earth observation satellites. This will help drive the development of local advanced manufacturing, support the growth in Earth observation data analysis, modeling and applications."

Data gathered from space provides critical insights about [water](#) quality and natural events including toxic algal blooms, the contamination of drinking water and excess runoff from irrigation.

Earth observation satellites currently only provide 60–70 percent coverage for major Australian water bodies, and while the quality of some inland waterways is monitored directly by testing, this data is not routinely combined with satellite data.

AquaWatch aims to complement existing systems and build a comprehensive national monitoring system to deliver real-time updates, predictive analytics and forecast warnings to water managers.

SmartSat CRC's Chief Executive Officer, Prof Andy Koronios said: "The Concurrent Design Facility is an extremely important space infrastructure for the whole nation. Our partner, UNSW-Canberra should be congratulated for establishing such an important facility and for completing this study on behalf of SmartSat and CSIRO.

AquaWatch is a partnership between CSIRO and

SmartSat which aims to use space technologies to provide continuous monitoring of the quality of Australia's fresh and coastal water bodies; a critical national resource.

"The outcomes could lead to a step-change in Australia's national water quality information delivery, supporting decision makers in water agencies, local communities, water utilities and commercial water users to provide safe drinking water, regulate contamination events, and monitor water quality across primary industry and assist with management of aquaculture farms, reef structures and our coastal environs."

The study brought together experts from a range of institutions, with the ANCDF enabling each member of the group to contribute their part to the project simultaneously, significantly speeding up the design process.

The Preliminary Concept Study for the Satellite Segment of AquaWatch Australia report was published today by UNSW Canberra and will inform the upcoming Australian Space Agency's Earth Observations from Space Technology Roadmap.

More information: Preliminary Concept Study for the Satellite Segment of AquaWatch Australia.

www.unsw.adfa.edu.au/sites/default/files/2021-08/Report_Final_0.pdf

Provided by University of New South Wales

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