

# Protecting the Great Barrier Reef with a scalable conservation model

Citizens of the Reef accelerate insights and conservation efforts with an AI-powered solution from Dell Technologies.



## Business needs

Citizens of the Reef is equipping volunteers, scientists, students and other groups with an AI-powered solution from Dell Technologies that enables the rapid collection and analysis of photographs to increase understanding of coral health and initiate effective, scalable conservation efforts.

## Innovations



Enabling scalable, data-informed conservation efforts.



Providing people of all ages, anywhere in the world, with a tangible way to help protect the Great Barrier Reef.

## Outcomes



85% faster reef image analysis, from minutes to seconds.



100,000 images mapped to date.



2x more reefs mapped in 1 year.



AI-supported analysis results are within 1% of what trained experts say.



**If you can find the right people, the right organisations and the right talent, you can actually move mountains."**

**Andy Ridley,**  
CEO and Founder,  
Citizens of the Reef

## Mapping the Great Barrier Reef

To help the Great Barrier Reef (GBR) thrive, scientists need up-to-date insights. However, continuously capturing and analysing images from the world's largest coral ecosystem – that's bigger than Italy and visible from space – requires more resources than what today's scientists have. The need for insights and resources sparked the creation of the organisation Citizens of the Reef (Citizens). Andy Ridley, CEO and founder of Citizens of the Reef, explains, "Previously, researchers have only been able to monitor around 5–10% of the 3,000 individual reefs [in the GBR], making informed conservation decisions difficult." He adds, "There's a really urgent need for broadscale reconnaissance imagery."

To create a visual map of the entire reef and accelerate image analysis, Citizens encourages global volunteers to help. Tourists, fishermen, commercial boats and sailors can capture and upload images as part of its annual Great Reef Census. To efficiently store, manage and analyse reef data, Citizens partners with Dell Technologies.

In the first census, 13,000 images were captured across 150 reefs. The next year, 42,000 images were captured across 315 reefs. Given the huge increase in data, Citizens realised that its current data analysis methods were not scalable.

## Employing AI for faster insights

To dramatically accelerate reef analysis and conservation, Citizens partnered with Dell Technologies on deep learning models for AI-powered analytics. Benjamin Vozzo, impact and communications director at Citizens of the Reef, says, "We don't have time to not use technology."

Running on a flexible Dell Technologies high-performance infrastructure, the AI-powered tools enable the categorisation of the coral in individual images in seconds rather than seven-plus minutes. For perspective, 13,000 images were analysed in just over a week. Without deep learning, this analysis took two-plus months. Dr. Chris Lawson, University Ph.D. at the University of Queensland Marine Spatial Ecology Lab, says, "AI is identifying

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different shapes and objects within the images. You end up with results that are pretty much within 1% of what trained experts are saying."

## Engaging the world to improve conservation efforts

Citizen scientists – who include global volunteers of all ages – provide richer insights by labelling the coral species identified by AI using an automated workflow. "Right now, across the world, we're at an average of 22 images being analysed per person," Vozzo explains. "The average in the first year was not even one per person." Nicole Senn, Engagement Manager at Citizens of the Reef, says, "Our solution makes conservation tangible. [Volunteers] can just pick up their phones, their laptops or tablets and do something that has an impact on the reef."

To date, Citizens has captured 100,000 images. Commenting on what the organisation has already accomplished with the help of its citizen scientists and Dell Technologies, Ridley says, "If you can find the right people, the right organisations and the right talent, you can actually move mountains."

To become a citizen scientist and help protect the reef, visit [citizensgbr.org](https://citizensgbr.org).

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