CASE STUDY

Product solution for: NZ Coastal Mapping

DigitalGlobe™

DigitalGlobe imagery enables underwater reef mapping

Situated in the Auckland region and jutting north to the Pacific Ocean, the 4,000 square kilometer Hauraki Gulf is an important asset of the eastern coastline of New Zealand. From fisheries supporting the livelihood of indigenous peoples to the north to providing recreation opportunities for the urban population of Auckland, the Hauraki Gulf is central to the lives of a huge and varied population.

Determining the economic opportunity

Although a vibrant body of water, the Hauraki Gulf has seen its share of environmental damage due to industrialized fishing, dredging, and development pressure along its shoreline. The gulf is home to about 25 species of mammals, dozens of unique species of birds, and hundreds of kilometers of delicate rocky reefs—ecosystems that have not been previously surveyed due to the lack of time, funding and resources.

"We had no real idea of how much of a particular habitat we have underwater or how often it may undergo change," says Jarrod Walker, Senior Marine Scientist for the Auckland Council, the governing body responsible for the planning and management of New Zealand's largest city. "To protect these delicate environments, we need to have a baseline of where we are today to plan for the future."

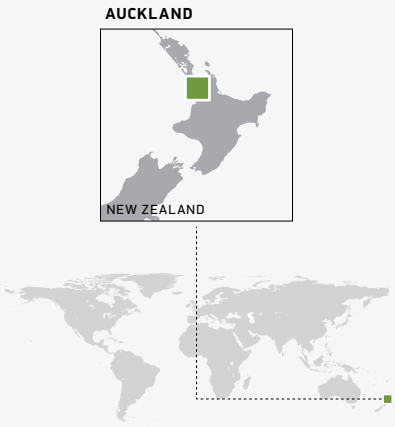
WorldView-2 imagery procured

Leveraging funding from the central government's Kiwi Image project, the Auckland Council procured WorldView-2 imagery for a 2,000 square kilometer area through DigitalGlobe information partner Sinclair Knight Merz (SKM).

"Our goal was to identify and classify the physical habitats of intertidal and subtidal reef, sand and mud, as well as biological habitats like kelp forest, urchin barrens and mixed and turfing algae," Walker explains. "With this data we can make informed planning and management decisions relating to these manmade and natural environments."

Company information

The Auckland Council, the governing body responsible for the planning and management of New Zealand's largest city, procured WorldView-2 imagery through DigitalGlobe information partner Sinclair Knight Merz (SKM), a Sydney, Australia-based leading projects firm with global capabilities in strategic consulting, engineering and project delivery.



Auckland Council
Te Kaunihera o Tāmaki Makaurau

www.aucklandcouncil.govt.nz

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Imagery helps identify and classify habitats

WorldView-2's 8-band multispectral imagery and GIS analysis provided by ecoGIS Limited was ideally suited to the task, enabling mapping of the reefs and associated habitats to a depth of 15 to 18 meters. These detailed maps provided new insight about the extent and change patterns of particular underwater habitats.

"The imagery and multispectral analysis allowed us to identify and classify both physical habitats like reefs, sand and mud, and biological habitats such as kelp forest and urchin barrens," Walker says. "WorldView-2's coastal band and yellow band helped us identify areas of intertidal reef, sandy beaches, subtidal sand areas and three subtidal reef habitats.

"Once the results of our analysis are confirmed we produce stylized maps of the habitats that we publish and distribute to regional councils," Walker continues. "The imagery and analysis has given us greater confidence in our ability to identify and differentiate the various habitats and how to best preserve them moving forward."

An Ongoing Monitoring Solution

Just over a year into the project, the Auckland Council has mapped the majority of the Hauraki Gulf, applying classification algorithms to the imagery to derive a defined set of biological and physical habitat types to generate a GIS database where further attribution and metadata is applied to create the final habitat map.

"WorldView-2 has been invaluable to the project," Walker says. "From a cost standpoint we were able to map the majority of the Gulf and produce highly accurate and detailed maps and analysis. And we now have the ability to calculate reef productivity which will help us understand the role of reefs in supporting the Gulf's ecosystem and enable greater planning and aid in tracking both large and small scale changes of marine habitats."

JARROD WALKER, SENIOR MARINE SCIENTIST FOR THE AUCKLAND COUNCIL

INDUSTRIES

- Utilities
- Environmental Services
- Government

USES

- Mapping
- Cadastral
- Elevation Data
- Water Mapping
- Water Pipeline Network Design

Challenge	Map the underwater rocky reef habitats of New Zealand's Hauraki Gulf, a 4000 square kilometer body of water that is home to more than one million people along its shores.
Solution	DigitalGlobe WorldView-2 8-band multispectral imagery, with its coastal band that allows for greater penetration into the water, and yellow band, crucial for vegetation identification and analysis.
Results	Measuring up to 18 meters, the Auckland Council's Research Unit has mapped the majority of the gulf, providing valuable data for better protection, usage and planning decisions.

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