



## NEW RESEARCH PROJECT TO MAP CORAL REEFS TO ACCELERATE EFFECTIVE MANAGEMENT IN HAWAI'I

Hawai'i's coral reefs support a vibrant array of animals and plants, providing cultural, economic, and recreational opportunities to residents and visitors. However, pollution, overfishing, and ocean warming threaten Hawai'i's coral reefs. In 2016, Hawai'i Governor David Ige announced the Hawai'i Marine 30-by-30 Initiative, under which the State commits to effectively manage 30% of Hawai'i's reefs by 2030. To target areas for potential management measures, Hawai'i natural resource managers need to better understand reef location and condition across its coastline. The Lenfest Ocean Program is funding a project led by Dr. Greg Asner, Director of Arizona State University's Center for Global Discovery and Conservation Science, to use cutting edge mapping technologies to generate high-resolution maps of nearshore coral reef habitat across the eight main Hawai'ian Islands.

### THE NEED TO UNDERSTAND CORAL REEF LOCATION AND CONDITION

In less than fifty years, Hawai'i's coral reefs have undergone alarming losses in coral extent and health driven by destructive fishing, pollution, and unsustainable tourism co-occurring against a backdrop of ocean warming. In response, Hawai'i developed the Marine 30-by-30 Initiative to reduce local stressors and to enhance resilience of nearshore coral reefs. The Hawai'i Division of Aquatic Resources, National Oceanic and Atmospheric Administration (NOAA) and other supporting organizations are now working to identify which of Hawai'i's reef habitats will be selected for management. Then, over the coming years state managers and partners will work with local communities to develop and implement effective management measures. Examples include reducing sediment and nutrient runoff from land, addressing invasive species, and limiting illegal and unsustainable fishing.

|| **SUSTAINING HAWAI'I'S CORAL REEFS REQUIRES MANAGERS WORKING TOGETHER WITH COMMUNITIES UNDERPINNED BY HIGH-IMPACT SCIENCE AND TECHNOLOGY."**

- Greg Asner

To support this effort, Hawai'i is requesting region-wide data and information about the extent of living and dead coral reefs. To date, large-scale reef mapping has not been done because of limitations in traditional approaches. For example, dive surveys allow assessment of reef condition, but are too time intensive and expensive to conduct across all eight islands. Satellite-based approaches may provide maps across large spatial scales but miss the details of reef condition.

## PRODUCING HIGH-RESOLUTION MAPS ACROSS EITHER MAIN HAWAI'IAN ISLANDS

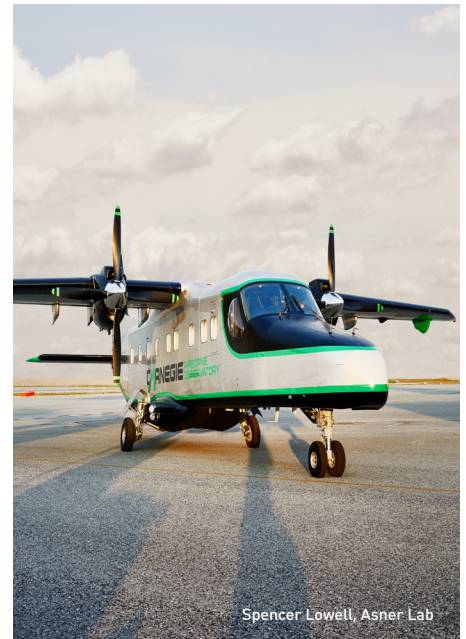
In this project, Dr. Asner and his team will produce high-resolution maps of coral reefs in waters up to 15 m depth across the eight main Hawai'ian Islands. The research team will use the Global Airborne Observatory (GAO), which is Dr. Asner's aircraft-based laboratory that is fitted with an advanced three-instrument remote sensing package known as the Airborne Taxonomic Mapping System (AToMS). Now in its third generation, the GAO uses one of the most advanced mapping technologies in the civil sector today.

While flying over nearshore areas, the cameras and spectrometers measure optical and spectral signatures of both the water column and seafloor, which are then analyzed to:

- visually remove, or "peel back" the overlying seawater to view the coral reefs below; and
- differentiate between various habitat components, such as live and dead coral, sand and macroalgae

Dr. Asner and his team have already collected raw data from previous low-altitude flight surveys taken from over 750 miles of Hawai'ian coastlines. With these data, they will develop and disseminate maps of these ecosystems to help state managers evaluate reef habitats. The maps can also be used by managers to engage local communities over the next several years as the Marine 30-by-30 Initiative transitions from planning to development and implementation of management measures.

The project started in March 2019 and will span one year.



Spencer Lowell, Asner Lab

The Global Airborne Observatory plane used to capture images of the Hawai'ian coast.



## Contact

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