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Event Name: 2018 Island Sustainability Conference

Location: Tumon, Guam

Event Dates: 03/26/18 - 03/30/18

Presentation Date: 03/27/18

URL: <http://www.guamcoralreefs.com/2018-island-sustainability-conference>

Sponsor: University of Guam Center for Island Sustainability (UOG CIS)

### NASA Fluid Lensing & MiDAR – Next-Generation Remote Sensing Technologies for Aquatic Remote Sensing

Piti's Tepungan Bay and Tumon Bay, two of five marine preserves in Guam, have not been mapped to a level of detail sufficient to support proposed management strategies. This project addresses this gap by providing high resolution maps to promote sustainable, responsible use of the area while protecting natural resources. Dr. Chirayath, a research scientist at the NASA Ames Laboratory, developed a theoretical model and algorithm called "Fluid Lensing." Fluid lensing removes optical distortions caused by moving water, improving the clarity of the images taken of the corals below the surface. We will also be using MiDAR, a next-generation remote sensing instrument that provides real-time multispectral video using an array of LED emitters coupled with NASA's FluidCam Imaging System, which may assist Guam's coral reef response team in understanding the severity and magnitude of coral bleaching events. This project will produce a 3D orthorectified model of the shallow water coral reef ecosystems in Tumon Bay and Piti marine preserves. These 3D models may be printed, creating a tactile diorama and increasing understanding of coral reefs among various audiences, including key decision makers. More importantly, the final data products can enable accurate and quantitative health assessment capabilities for coral reef ecosystems.

Key Words: Fluid, Lensing, Aquatic, Remote Sensing