

June 5, 2017



Project Baseline

501 (c)(3)
15 South Main Street
High Springs, FL, 32643 USA

RE: Summary of the Project Baseline mission on the *m/y Ad-Vantage*, May 2017

Dear Captain Rowsell,

Please extend my sincere gratitude to your crew on the *Ad-Vantage* for their hard work, persistent positive attitudes, and engaged assistance with our recent Project Baseline mission in Fiji. Everyone on your team demonstrated a level of expertise and professionalism unsurpassed in my experience working at sea, and without which our mission could not have been successful. Despite the extremely short lead time with which to organize and prepare for this mission available to either of our groups, I could not be more pleased with the results; the locations we reached, data we collected, communities we engaged, and the overall positive and inspiring atmosphere I believe we created and shared.

Our Fiji mission ran for 14 days from Monday, May 14 to Saturday, May 27. Our two primary objectives were to 1) survey coral reef conditions at multiple depths leveraging SCUBA divers and *m/y Ad-Vantage's* 1,000 meter, 3-person submersible *Moby*, in collaboration with scientists from the University of the South Pacific (USP) based in Suva, Fiji, and Nova Southeastern University (Nova) based in Fort Lauderdale, Florida, USA; and 2) to engage with the public to describe our work and the importance of establishing baseline conditions for coral reef health to the local communities whom are culturally and economically dependent on the sustainability of the reefs and the fisheries they support.

In terms of location, our primary objective was to explore and document the Great Astrolabe Reef, which is one of the largest barrier reefs in the world, and is listed in the Register of Sites of National Significance to Fiji in Fiji's National Biodiversity Strategy and Action Plan. The reef encompasses Kadavu Island and the smaller islands that extend to the north ending with Dravuni. The reef is a breeding ground for many large billfish, sharks, tuna, giant trevally, mahi-mahi, and snapper. Our initial objective was to survey the reef on both the windward and leeward sides of the island chain at multiple depths and thereby expand on previous surveys conducted in shallow waters by the World Wildlife Foundation and the Planetary Coral Reef Foundation.

Weather conditions were certainly less than favorable leading up to and at the outset of the mission. On May 13, the day before our mission began, Tropical Cyclone Ella was located around 500 km to the north of Suva. The storm had sustained winds of 120 km/hr. Though the storm ultimately passed well to the north of our target area, the resulting winds and swell caused us to delay departure for Kadavu until Wednesday night, May 17. Largely at your recommendations, we were able to choose alternate locations in sufficiently protected waters near the island of Malolo, which ultimately yielded significant data that will allow our team and future investigators to contrast coral reef conditions between comparatively developed and undeveloped localities. We were also able to capitalize on that time to engage with local leaders beginning with a sevusevu in the village of Solevu on Malolo and ending with a tour of the *m/y Ad-Vantage* and a presentation on our mission for the Turaga Ni Koro and several other village representatives.

Once at Kadavu, weather conditions remained problematic and prevented us from operating on Tuesday May 23rd. Despite the persistently windy days, we were however able to conduct submersible and SCUBA operations on 7 days. We were able to conduct SCUBA dives on the windward side of the island chain on two days, once at northeastern end of the island chain near Dravuni and once at southwestern end of the island chain outside of Davigele Bay. We also conducted two submersible dives at the Davigele Bay site.

In terms of data, we set out to collect video transects of coral habitats and near-bottom fish populations at different depths and at different locations, and photo-documentation of representative locations and coral colonies at each site visited, as well as temperature, salinity, pH, and dissolved oxygen profiles across the water column over which our work took place. We focused on collecting these types of data because each one provides an independent and potentially quantitative record of coral reef conditions that will help establish baselines against which change over time can be measured. Collectively, the data will, to my knowledge, provide the broadest and most detailed record of coral reef conditions yet achieved in Fiji.

Our results surpassed my expectations in terms of the number of dives that returned all or the majority of these data streams. We visited 10 sites around Malolo and Kadavu. We were able to successfully leverage technical divers in conjunction with *Moby* on a nearly daily basis to explore and document conditions over a broad vertical range at each site. Our technical dive team performed daily 3+ hour dives during which they collected 55 50-meter long video transects across coral habitats, as well as 54 50-meter long stereo video near-bottom fish transects at water depths of 30, 20, and 10 meters while simultaneously documenting 36 representative stations precisely enough to enable future researchers to return to the same locations and evaluate change through time. Water chemistry parameters temperature, salinity, pH, and dissolved oxygen were collected across the water column by the divers on every dive through the use of a submersible multi-parameter data sonde.

In addition to the technical dives, we safely facilitated 16 dives for Dr. Ciro Rico of USP and Dr. Brian Walker of Nova accompanied by a professional photographer to conduct detailed documentation of specific coral colonies at depths between 12 and 30 meters.

In concert with the SCUBA dives, *Moby* conducted 12 dives at the same or nearly the same locations, 10 of which focused on scientifically documenting conditions at water depths between 50 and 362 meters. The primary mission was to collect vertical video transects of benthic conditions across the steepest portions of the slopes. *Moby* also carried a data sonde on every dive that collected temperature and salinity across the water column. In addition to the primary objective, which was carried out by the pilots, we carried Dr. Charles Messing of Nova on 8 dives during which he documented deep benthic lifeforms and that may prove to be unique to the established understanding of Fiji and perhaps even to the present-day science all together. During those dives, 29 physical samples were collected that were subsequently preserved and delivered to USP to be added to their South Pacific archives. We also carried Dr. Walker and Dr. Rico as well as two of Dr. Rico's colleagues from USP, Ronal Lal and Dr. Amadine Marie on submersible dives that enabled them to gain a unique and deeper perspective on underwater Fijian habitats. All of the video transects and station documentation that we collected will be freely available to the public via our YouTube channel (<http://tiny.cc/2a0oIy>) and our database (www.projectbaseline.org).

In terms of public outreach, we were able to engage with local communities on both Malolo and Kadavu. We met with the Turaga Ni Koro of the village of Solevu on Malolo and the villages of Tavuki and Dravuni in Kadavu, as well as several of the villagers from each including the Chief and 17 school children from Darvuni. All were invited aboard *m/y Ad-Vantage* and provided with tours of the ship and the sub, as well as an overview of our mission and its relevance to sustaining their historical and continued cultural relationship with the sea. We also

met with and described our mission to municipality leaders in Vunisea and representatives of Fiji's Department of Fisheries and Wildlife. We invited the Turaga Ni Koro from Solevu to join a submersible dive but he was unfortunately unable to participate due to conflicting obligations. Weather complications prevented us from extending similar invitations while operating from Kadavu. Our engagement with the public will continue on for some time through our social media outlets.

Though our focus was always directed on scientific documentation, we also successfully leveraged *Moby's* 3-person capacity to carry 9 other members of our collective team (6 from Project Baseline and 3 from the *Ad-Vantage* crew) along on the scientific dives. This exceptional opportunity engaged them directly in the exploration and documentation missions and provided them with, what is for most, the life-altering experience of deep underwater exploration in a submersible.

Finally, we were able to pair *m/y Ad-Vantage's* submersible pilot Barry McGowan, with Project Baseline's pilot Randy Holt on 3 submersible dives during which time, both pilots satisfactorily confirmed each other's skills and abilities, and Randy was able to successfully orient Barry to the specific survey and documentation methods our team has worked out over the past three years of operations. Barry then served as the primary pilot for the subsequent dives during which time, the scientists informed me that he demonstrated a high level of proficiency in performing the intricate maneuvers required for data collection and everyone reported that he made them feel safe and even provided some entertainment during the dives. We were also able to take two other members of your crew, Ben Brodie and Freya Marshall, down with us on one SCUBA dive during which we oriented them to Project Baseline's documentation objectives and had them independently record two stations. From my perspective, we therefore not only accomplished our primary objectives, but also advanced *m/y Ad-Vantage's* capacity to independently perform Project Baseline and related scientific missions in the future.

In summary, we accomplished every aspect of GUE's Project Baseline mission during our expedition in May 2017 onboard the *m/y Ad-Vantage* due to, of course the generous donation of time aboard the vessel and access to her resources, but also to the sincere cooperation and good will between our teams. Given the very short lead time for this expedition and the fact that this was our first opportunity to work together, I believe our mission exceeded all reasonable expectations. If future opportunities to work together manifest, I am confident that we'll continue a positive and productive relationship between *the m/y Ad-Vantage* and Global Underwater Explorers. The success of our efforts in Fiji has certainly helped to develop the team capacity necessary to replicate this mission in the future.

Thank you again for all of your help and hard work and please extend my gratitude to your crew as well.

Sincerely,



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CC: W. Foulis, J. Jablonski, M. Jeavons, B. Walker, C. Messing, C. Rico