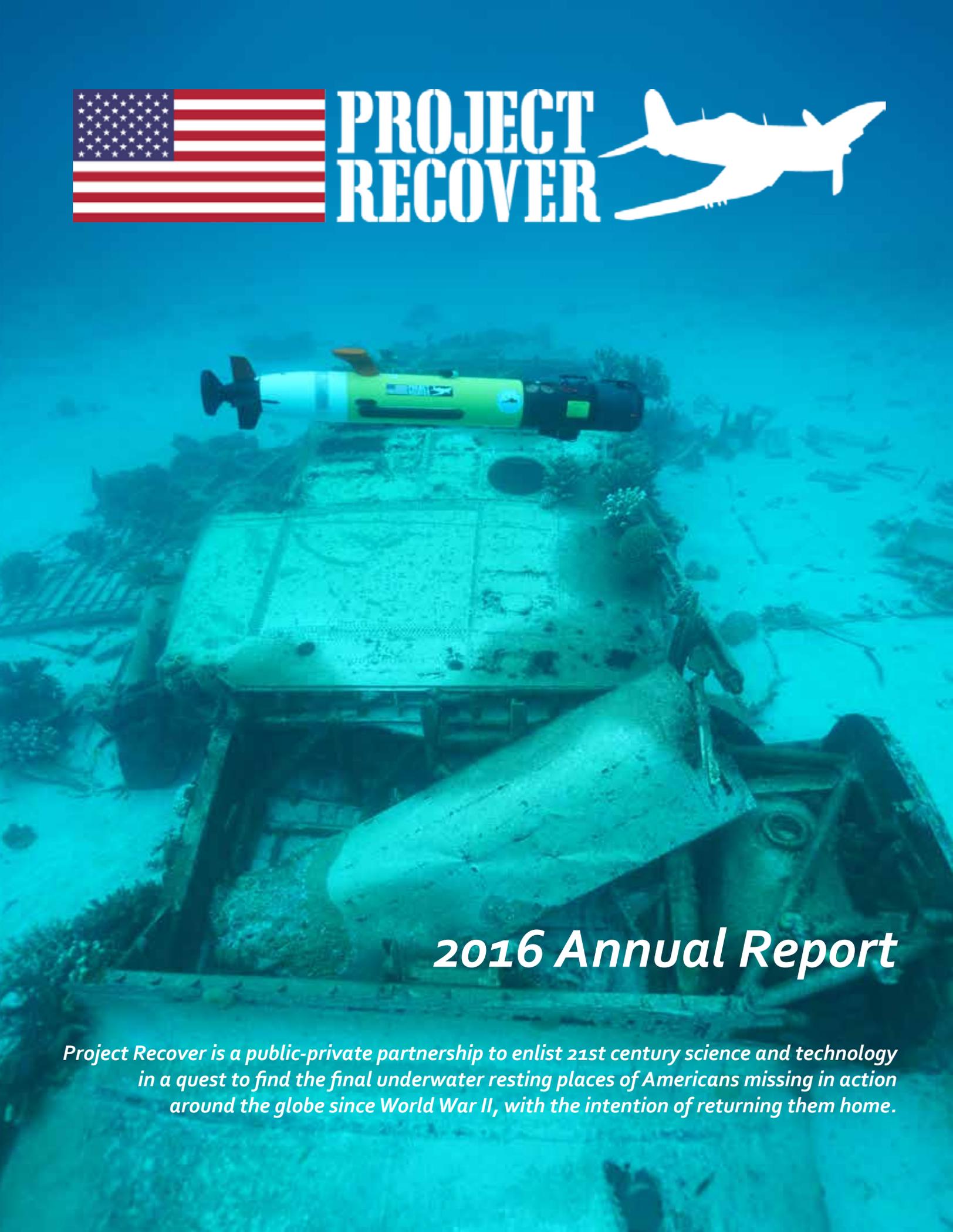




# PROJECT RECOVER



## *2016 Annual Report*

*Project Recover is a public-private partnership to enlist 21st century science and technology in a quest to find the final underwater resting places of Americans missing in action around the globe since World War II, with the intention of returning them home.*

## I. INTRODUCTION

While the U.S. has made, and continues to make, extensive efforts to recover and return home its war dead, more than 82,000 Americans remain missing in action (MIA) from World War II to the present, with large numbers from water losses. In addition to the sheer volume of individuals contained within, underwater sites often provide a greater degree of preservation in comparison to terrestrial losses. However, conventional water-based searches have historically been labor intensive, logistically cumbersome and technically difficult.

***Project Recover is a public-private partnership to enlist 21st century science and technology in a quest to find the final underwater resting places of Americans missing in action around the globe since World War II, with the intention of returning them home.***

Established in 2012, and formalized in 2016, Project Recover is a partnership between Scripps Institution of Oceanography at the University of California San Diego (SIO), University of Delaware College of Earth, Ocean, and Environment (UDEEL), and The BentProp Project (BPP).

This consortium of independent organizations has integrated operations that span historical research and discovery through target and forensic identification. Recovery of remains is handled separately in partnership with the Defense POW/MIA Accounting Agency (DPAA), with alternate funding. The Project Recover program office is responsible for overall coordination, communications and marketing, organizational structure, donor relations, and executive functions, allowing the three member entities to focus on mission related operations, case file development and technological advances.

The project combines historical and archival data with modern search technologies and approaches including flight trajectory analyses, Bayesian statistics, scanning sonars, high definition and thermal cameras, advanced diving, and unmanned aerial and underwater robotic technologies.

### *INTEGRATED OPERATIONS / INTEGRATED COMMUNICATIONS AND PUBLIC RELATIONS*

Historical  
Research  
and Lead  
Development

Prioritization  
(Logistics, Timing,  
Security)

Field Search

Physical  
Documentation

Forensic  
Documentation

Reporting /  
Coordinated Press  
Releases and  
Media Relations





*A Project Recover team member uses a Shark Marine Navigator with an attached imaging sonar system and magnetometer*

## II. CONCEPT TO OPERATIONS

In this first year of formal operations as Project Recover, the team expanded its operations, conducting missions in eight countries, in search of over 100 servicemen missing in action (bodies not recovered), spanning over 20 case files. In addition to mission operations, Project Recover's three principal investigators initiated tasks to support technology development, formalized standard operating procedures, engaged with partners, and transitioned to a more formalized entity, while still embracing each unique member entity's strengths. Several of the objectives of the three-year pilot partnership addressed the need for a small, but effective and diverse FTE-based team.

### LEADERSHIP TEAM

Ms. Katy O'Connell

Executive Director, Project Recover

Dr. Mark Moline

Director, School of Marine Science and Policy  
College of Earth, Ocean and Environment  
University of Delaware

Dr. Patrick Scannon

Team Leader and Founder, The BentProp Project

Dr. Eric Terrill

Director, Coastal Observing Research and Development Center  
Scripps Institution of Oceanography  
University of California San Diego

### ASSOCIATED STAFF

Colin Colbourn

Historian, The BentProp Project

Daniel O'Brien

Administrator, The BentProp Project

Dr. Andrew Pietruzka

Underwater Archaeologist  
Scripps Institution of Oceanography  
University of California San Diego

In addition to the leadership team and associated full-time staff, the academic institutions leverage the time of existing professional staff who support various activities of Project Recover, including but not limited to field operations, sensors, ROV operations, case file database development, and IT support: Hunter Brown, Engineer; Andy Nager, Development Engineer; Robert Hess, Development Engineer; Megan Cimino, Postdoctoral Researcher; Heidi Batchelor, IT Analyst; Travis Schramek, PhD Student; Eric Gallimore, PhD Student; and Brian Kim, IT analyst.

### III. 2016 & 2017 MISSION OVERVIEW

With the completion of Year One of the Project Recover partnership, we are confident that the partnership will continue to grow and develop potential pathways to sustainability. Through successful partnerships with private donors, government agencies, academic institutions and international entities, Project Recover is able to continue to address its three main goals:

- *To accelerate and enhance underwater discovery and recovery of Americans missing in action;*
- *To develop and test new underwater and land-based technologies; and*
- *To inspire, engage and educate a future workforce in fields directly related to advanced underwater technology.*

While the bulk of the collaborative work of the partners prior to 2016 focused in Palau, 2016 was an exercise in operations globally.

Status of 2016 Missions	Aircraft Type	MIA-Related	Location
Target located, site survey completed and submitted to DPAA	TBM-1C	Yes	Palau
	TBM-1C	No	Palau
	B-17	Yes	Guadalcanal, Solomon Islands
	SBD	Unknown	Guadalcanal, Solomon Islands
	B-17	Yes	Noumea, New Caledonia
New leads from completed missions	C-47	Yes (24)	Noumea, New Caledonia
	R4D-5	Yes (24)	Ouvea, New Caledonia
	P-38	Yes	Port Moresby, Papua New Guinea
Mission conducted, no target identified	B-24	Yes	Palau
	B-17	Yes	England
	F6F Hellcat (2)	Yes	Tinian



*During a mission in the South Pacific, a Project Recover team conducts a flag ceremony to honor servicemen still missing in action*



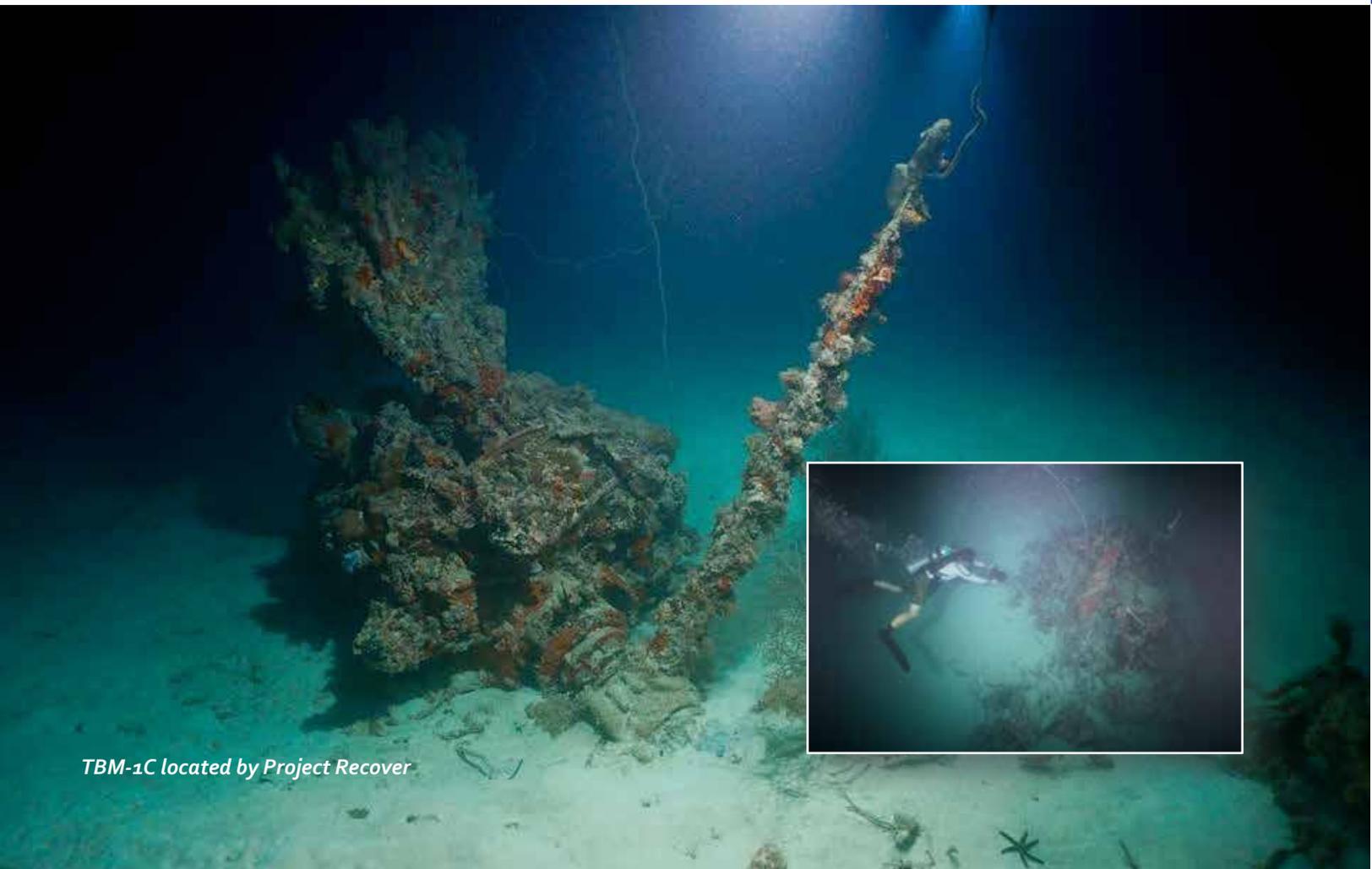
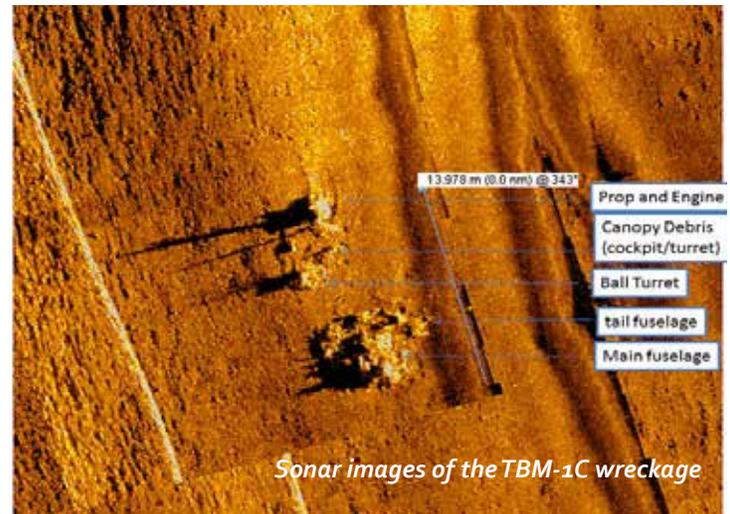
## IV. 2016 MISSION SUMMARIES

### A. Palau

It was a chance encounter in 2012 in the small island nation of Palau that first brought the three entities of Project Recover together. And thus, it was fitting that the first official mission of Project Recover, after its formal establishment, was to Palau in March and April 2016. The mission sought to locate and obtain surveys of wrecks associated with five downed aircraft.

A TBM-1C Avenger was located through leveraging years of historical document research and analyzing previous survey data. The target was found using an autonomous underwater vehicle equipped with sidescan sonar and subsequently surveyed by divers. The site findings were turned over to DPAA as the aircraft is associated with three bodies not recovered from WWII.

The announcement of the find resulted in significant media attention for the newly formalized Project Recover, with coverage in over two dozen regional and national media markets, including CNN, Fox News, the Christian Science Monitor and Huffington Post.





*A remotely operated vehicle is used to explore the wreckage (not MIA associated) of a TMB-1C Avenger*

Based on a personal interview from a former WWII Marine aviator, another TBM-1C Avenger (STEWART) was also located in Palau. The site was not MIA associated, so it had not been a priority target for searches in prior years. However, during a test of new equipment during this mission, the plane was located almost immediately, corroborated with a hand drawn map provided by the aviator. The site was remarkably intact in 43 meters of water.

In addition to the Avenger finds, the month-long mission resulted in several other found targets, most notably a B-24 wing. The wing is believed to be associated with one of two B-24 cases: a previously found B-24 wreck or a B-24 that has not yet been located, despite extensive historical, archival and field research.

In July 2016, a four-member Project Recover team led by archeologist Dr. Bill Belcher of the University of Hawaii, returned to Palau to conduct an archaeology wide area site survey of the Police Hill Prisoner of War (POW) execution area. Areas A and B were surveyed for possible burial areas beyond the one in Area B. The results indicate that Area A is consistent with the Japanese interviews that this was the primary execution area. Upon completion of formal analysis, recommendations will be made for additional fieldwork.



*Surveying Police Hill*

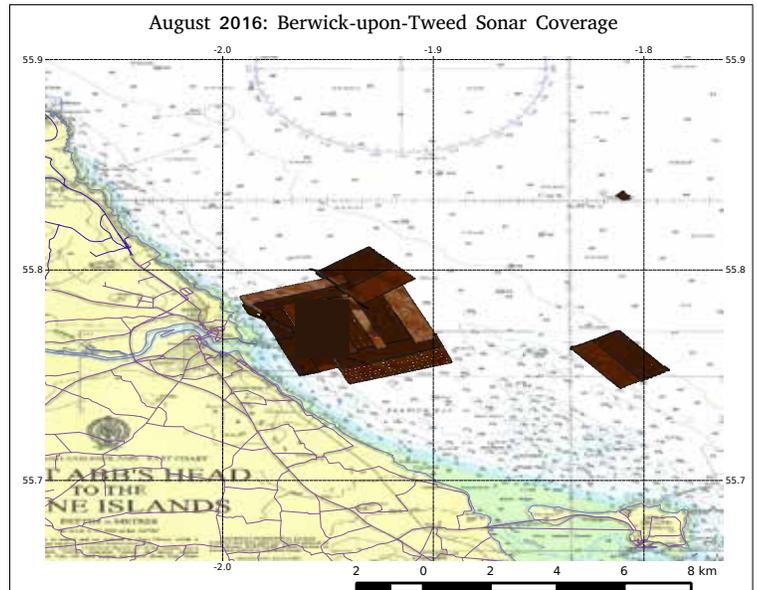
## B. United Kingdom

A four-member Project Recover team deployed to the United Kingdom from August 8–17 in search of missing in action associated with a B-17 off the coast of Berwick-Upon-Tweed, England. This was the first search mission of Project Recover beyond the waters of the Pacific. New operating conditions both on land and on sea created a learning environment for the team in more temperate waters.

Prior to the mission, a pre-deployment site survey was completed, and contacts with the Ministry of Defense determined that if found, the location was to be treated as a war grave. While the mission did not result in a located target, the search was extensive.

Thirty square kilometers were surveyed at approximately six-inch resolution. Side scan sonar showed significant bottom scouring from fisheries, which may have impacted the results. There will most likely not be a return mission specifically for this target, though additional areas may be searched during other future missions to the United Kingdom.

While conducting operations, side scan sonar did detect a sunken submarine. Upon determination of the country of origin, the appropriate authorities will be notified.



*AUV operations off the coast of England  
Sonar image of sunken submarine (Inset)*



Sonar coverage of Santa Monica Bay

### C. California, U.S.A.

In November, a U.S.-based mission was conducted in Santa Monica Bay in search of the only known WASP (Women Air Force Services Pilot) missing in action. Gertrude Tomkins was lost October 1944, flying a P-51, last seen taking off with two other aircraft from Mines Field (now Los Angeles International Airport—LAX), but only two planes were seen to pass over the field after taking off to the west and turning towards Palm Springs, their first stop in ferrying the aircraft to New Jersey.

With 24/7 operations from *R/V Sproul* from Scripps Institution of Oceanography, the survey consisted of exercising a long duration vehicle (28-hour mission) in conjunction with smaller vehicles typically used by Project Recover. Six and a half square miles were surveyed by sidescan sonar. Twenty viable targets were identified in the survey, and a target reacquisition mission was conducted on the last day of the mission using a vehicle mounted low light video camera with illumination provided by a green LED light bar. Low level passes with the sonar operating in high resolution mode were also part of this sortie. Using this data, the team was able to eliminate all but three targets as being non-aviation.

A remotely operated vehicle survey was conducted in late December on three targets at water depths of 150 feet. Two of the targets were found to be clearly aviation related and are presently being analyzed against P-51 airframe drawings.



Aviation related target



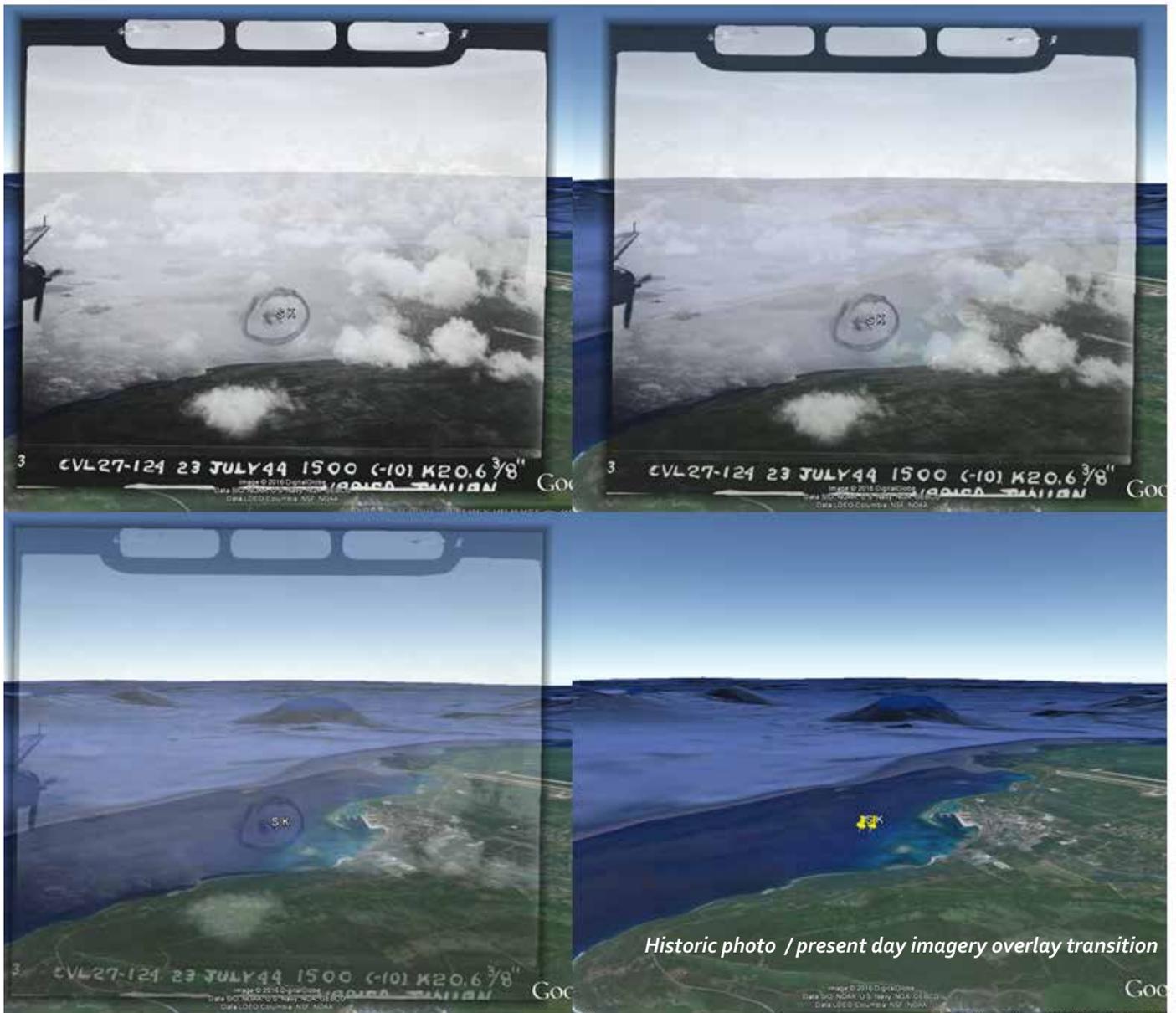
Deploying a long duration vehicle

## D. Saipan and Tinian

Five members of the Project Recover team deployed on a mission to Saipan and Tinian in late September to explore sites associated with three downed aircraft and 14 associated MIAs.

The first days of the mission focused on the waters along the southern coast of Saipan, associated with a B-29 loss. Historical records mention that the plane went down 300 meters off the northern runway. The team scanned one square kilometer on either side of both runways, and out to two kilometers offshore, where depths were almost 400 meters. This was conducted by a combination of near shore side scan sonar and deeper depths with multi-beam. The survey was comprehensive; even if the aircraft was in pieces, given the resolution and survey area, it would have been located had it been in the survey area.

The team then turned its attention toward a search in Tinian Harbor based on an MIA-associated mid-air collision of two F6F Hellcats. This search was based on photographic evidence discovered during archival and historical research, which was then overlaid with present-day imagery of the site.





*AUV operations in Tinian*

The search region extended from the shore out to the 165 foot depth contour, and covered nearly eight square kilometers at very high resolution. Hundreds of potential targets were identified through side scan sonar. For increased efficiency in identifying aviation related debris, for those targets return surveys were conducted using AUV-mounted video cameras.

Debris, sunken ships and ship anchors (including two historic anchors that were lost in the 1700s by *HMS Centurion* during a typhoon) were found, but no aviation debris associated with the crash was evident. Upon returning from the mission, subsequent archival research was conducted. A document was found that suggested that the Navy Seabees likely cleared the aircraft debris from the entrance to the harbor just after liberating the island.

In light of not locating targets, the team turned its attention to the Northeast side of the island to survey an area offshore of the runways associated with B-29 losses. They surveyed to depths of approximately 200 meters (depth beyond which recovery is improbable) with no evidence of aircraft wreckage.

Both countries are of interest for future missions because of reports received of underwater aircraft on the last day of the mission. Project Recover is currently reviewing actions in the area for consistency.



*Sonar coverage of Tinian Harbor*



*Sonar coverage offshore between Henderson Field and Alligator Point*

## E. Solomon Islands and Papua New Guinea

A five-member Project Recover team, including a midshipman from the U.S. Naval Academy, embarked to the Solomon Islands and Papua New Guinea for a short five-day mission to establish partnerships in country with relevant agencies and officials to set the stage for a more complete expedition in 2017; to conduct investigations on several known sites; and to conduct investigations on several unknown sites.

In the Solomon Islands, the team conducted a site survey on an underwater B-17 wreck associated with seven MIAs, and an SBD Dauntless, which appears to be in pristine condition. Over 20 miles of side scan sonar survey was conducted offshore.

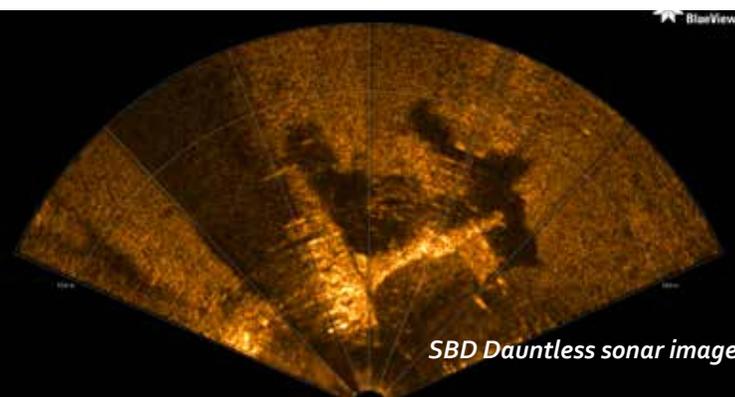


*SBD mosaic using photo stitching software*

The team met with the U.S. Consulate, National Museum, Ministry of Foreign Affairs and Trade, and filed appropriate permits with verbal approvals. An informal meeting was also held with an in-country DPAA team working on a terrestrial site. Connections were also made with a bomb disposal group in the Solomon Islands who already conduct scanning of the seafloor around the islands. They have agreed to contact Project Recover if they locate appropriate targets, and have offered the assistance of the National Police dive team to confirm if targets are aviation related.

Another take-away from this mission was the testing of a “fly-away kit” for Project Recover. No equipment was shipped prior to the mission; all cases were checked or carried on the aircraft with team members. Though it was convenient for the team to have the equipment at its immediate disposal before, during and after the mission, there was no significant cost savings.

Two team members traveled to Papua New Guinea accompanied by an in-country team from DPAA, in preparation for a mission in 2017. The team made multiple contacts at the U.S. Embassy and the National Museum. Permitting and security were discussed at both with a strong interest in cooperation as security is major concern due to violent crimes. There was also discussion of an additional known site for which Project Recover might conduct a site survey for DPAA. The mission confirmed Project Recover’s interest in returning to Papua New Guinea in 2017.



*SBD Dauntless sonar image*

## F. New Caledonia

Three MIA-associated wrecks were the focus of a two-week long Project Recover mission to New Caledonia in early December 2016. The team was accompanied by a representative from the in-country National Maritime Museum.

In Koumac on the northwest side of the island, the team conducted a site survey of a known B-17 underwater target associated with nine MIAs, which was originally discovered by a local spearfisherman in 2001. Project Recover divers also discovered additional portions of the aircraft, including a previously undiscovered engine, and completed full documentation of all targets. The site survey form was completed and will be submitted to DPAA for potential recovery operations.

In addition, the team investigated sites associated with two undocumented, underwater wrecks and associated MIAs. The two aircraft had a combined total of “bodies not recovered” or BNR of 48. The team reviewed video interviews of a now deceased eye witness to a C-47 crash and met with others, including a local underwater research organization, to collect intel for future planning. A possible search area is under review.

In reference to a documented R4D-5 (a USMC C-47) loss (main crash site not located), the team met the Paramount Chief of the Mouli, Ambois Dumai, who was very cooperative, bringing together two 85+ year old elders and several others for the team to interview about their WWII experiences and the R4D-5 crash. A local dive shop operator interviewed other elders (now deceased) some 15 years ago, and his evidence suggests that the aircraft may have crashed inside the lagoon, not outside where the elevator portion of the aircraft was previously discovered. Through the chief, the team located where the elevator structure was stored (found in 40 meters of water on the ocean side near Styx Passage by a dive shop operator in 2004 where locals said the aircraft crashed). The team measured and photographed the find, and confirmed that it is indeed consistent with R4D-5/C-47 elevator/trim structures.

Due to the ease of permitting and operations in French New Caledonia, Project Recover is evaluating the country for additional future missions to enlist 21st century science and technology to locate the C-47 and R4D-5 aircraft and the 48 MIAs.



*Meeting with local elders*

*Diving a wreck in New Caledonia*



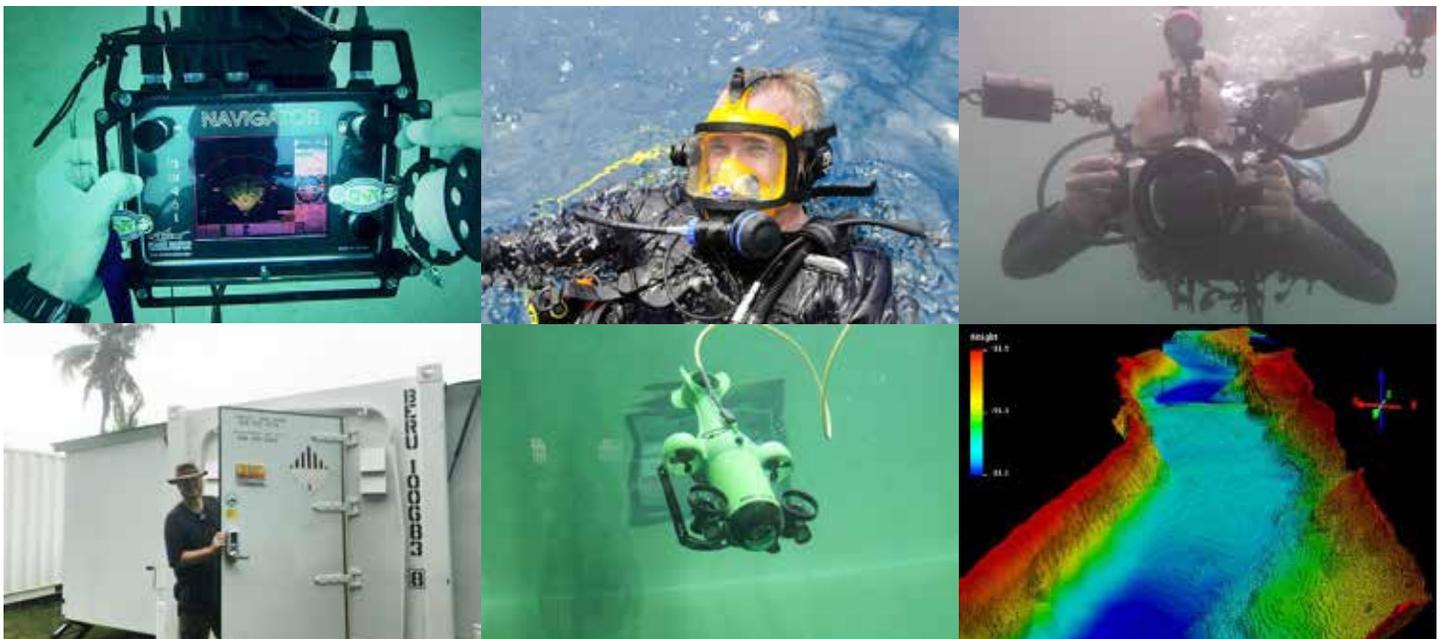
## V. SCIENCE AND TECHNOLOGY

Capital investments in the acquisition of new technology have enhanced underwater search activities and the documentation of Project Recover activities. In addition to working with manufacturers to procure new equipment, upgrades were made to underwater vehicles, including the addition of dual frequency sidescan sonar. Minor investments included the purchase of cold water dive gear for expanded global operations, seven full-face scuba masks with communications systems used primarily for forensic identification dives and a global internet communications system for better connectivity during field missions.

Major assets added to Project Recover's suite of technologies include:

- Two refurbished REMUS vehicles with advanced, built-in camera technology;
- Two dive navigators, each with a wide angle 900hz beam, allowing diver(s) to see using sonar up to 300 meters away in poor visibility;
- Advanced underwater and traditional camera systems for visual documentation;
- A 20 foot long ISO container that opens up to a portable 400 square foot mobile command center;
- An Aquabotix Endura fly-away mini ROV for external and internal wreck assessment;
- A multibeam sonar for operation from a small boat to allow for bathymetric and target mapping; and
- A 3-D laser scanner with high dynamic range (HDR) imager.

In addition to these assets, the university partners are able to leverage an estimated \$15 million of existing technologies to the project.



## VI. CASE FILE DEVELOPMENT AND MANAGEMENT

With greater than 73,000 missing in action from WWII alone, the Project Recover team has collectively invested a significant amount of time researching cases and down selecting them for mission consideration. Cases typically fall into one of two categories: 1) sites that are not yet located or surveyed and 2) sites that are known, but have not yet had the proper surveys or documentation needed for further investigation by the Defense POW/MIA Accounting Agency (DPAA).

Thousands of cases were searched and down selected to approximately 100 cases that fit metrics for consideration for field missions (depth of wreckage, accuracy of historical documentation, etc.). Project Recover team members individually ranked the cases, then conferred to prioritize missions for the upcoming year of activity. Project Recover has reached out to confer with DPAA on cases for any additional files on said cases, to prevent overlap in expeditions, and to assist with in-country relationships and meetings with associated officials.

A case file management system is in development to allow for storage of digital information associated with cases in development, and will include a searchable database to allow for rapid access of information. The Project Recover Storage System (PRESS) will allow for storage of both historical data, scanned documents, and modern GIS layers associated with each case. The system was designed expressly to allow for digital downloads associated with individual cases or groups of cases, so that the files can readily be taken by the expedition leaders into bandwidth limited areas of operation.

## VII. SUPPORTING ACTIVITIES

In addition to mission-related activities Project Recover has taken steps to formalize its overall operations through supporting activities including government relations, general operating procedures, communications and marketing. The team continues to explore partnerships with DPAA as well as foreign embassies, national museums and academic partners worldwide. Project Recover branded materials have been developed to aid in communicating our mission and operations to these audiences. A trademark application is being prepared to secure the project's wordmark and associated logo. Social media and web accounts have been secured.





**PROJECT  
RECOVER**



700 Pilottown Road, Lewes, DE 19958

[www.projectrecover.org](http://www.projectrecover.org)

(302) 645-4262