HAWAI'I UNDERSEA RESEARCH LABORATORY

QUICK LOOK REPORT
DIVE: P5-651

MISSION STATUS

Location: Rose Atoll, American Samoa

Latitude: ° 14 32.643S **Longitude:** ° 168 10.663W

Mission Date: 13 July 2005 **Duration:** 6 hours 38 mins

Maximum Depth (m): 946m

Project Title: Investigation of the submerged remains of the Taiwanese fishing vessel *Jin Shiang Fa*, which ran aground at Rose Atoll in October 1993

Principal Investigator: Michael W. Graves, Ph.D. [with Suzanne Finney, ABD]

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Observer 1:	Suzanne S. Finney	**Observer 2:** Jim Maragos
Address:	Department of Anthropology University of Hawaii at Manoa Saunders 346, 2424 Maile Way Honolulu, HI 96822	Pacific Remote Islands NWRC U.S. Fish and Wildlife Service 300 Ala Moana Blvd, Rm 5231, Box 50167 Honolulu, HI 96850
Pilot 1:	Terry Kerby	**Pilot 2:** n/a

Scientific Data Acquired: Prepare an abstract outlining your objectives, techniques, findings, etc.

Objectives:

1. To determine the extent and condition of the debris field to the depths allowable using the Pisces IV or Pisces V submersible.
2. To photograph the remains to provide a visual record of the remains as a primary step in identifying and assessing potential hazards to the reef.
3. To provide documentation that will be useful to the ongoing monitoring of the effects of this shipwreck on the reef at Rose Atoll.
4. To develop a map showing the location of the debris field based on information collected during the dive.

Observations, findings, etc: Based on information provided by Jim Maragos of the US Fish and Wildlife Service (FWS), we know that the insurance company conducted an incomplete salvage of the wreckage in 1993. The large bow section was pulled off the reef by a salvage tug from Singapore and dropped into deeper waters "to a depth of at least 600 ft." Subsequently, the FWS began removing the rest of the wreck, beginning in 1999. The FWS intends to complete the clean up of the accessible debris in July 2005. Our goal was to determine what might be left at deeper depths that the recovery operation could not remove, and assess the damages, if any, of salvage and disposal of debris and wreckage near the SW ocean reef slope.

Of major concern was the ultimate location of the bow section. If the section is resting above the thermocline at 100-300m, the dissolution of iron from metallic debris will continue to negatively impact the reef. Based on the negative findings during the dive, it appears the bow section is not above a depth of 300m and is likely at much greater depth. The reef slopes sharply downward from the surface at an average angle of 60º to a depth of about 300m and then plummets as a sheer wall for hundreds of meters. The dive began at 941 meters and continued upslope to 141 meters without finding evidence of the bow.

The observers documented a minor amount of disassociated cultural material:

1. One piece of rebar [not measured but about one meter long] at 348 meters
2. Several pieces of yellow buoys or fishing floats at various depths
3. A black boot with hard sole [not measured] at 690 meters
4. Small pieces and coils of long-line fishing rope at several depths, and
5. One plastic fowl weather hood (blue) in a blue pouch collected during dive P5-652 at a depth of 800 meters NW of the wreck site during the following day.

Observed Species list:

The most common reef organisms observed during the dive were fish, soft corals, anemones, and echinoderms. Most of the time during the dive was spent on searching for shipwreck debris, and only limited time was directed at stopping to take photos and videos of marine life. Below is a partial list of the species photographed during the dive. Additional species were also captured on videotapes that will be examined later by Observer #2, a marine biologist.

Flabellum sp. - non reef-building stony coral (Order Scleractinia)
unidentified anemone, possibly *Liponema* sp.
Callogorgia sp.- gorgonian sea fan
Cypraea sp. - mole cowry, dead shell
Tridacna sp. – giant clam, dead shell
Corallimorphus sp. – anemone-like corallimorph.
Asteroschema sp.- brittle sea star living in gorgonian sea fan
Glossandon sp.- blue-green small fish
Ventrifossa sp.- common rat tail macrourid fish
Uroconger sp.- deep water conger eel
Etelis carbunculus- deep water pink snapper (ehu)
Pristipomoides zonatus- deep water snapper (gendai)
Grammatonotus sp.- small deep-water bottom fish

MISSION EVALUATION:

Limitations, failures, or operational problems noted:

Available Information provided to FWS and others before the dive concerning the probable location of the bow did not take into account the unusual underwater terrain, where the steep slope of the SW ocean reef below 140 meters is near the top of a sheer wall that plummets hundreds of meters, to depths in excess of 900 meters but well below the thermocline. Before the submersible dive, it was not possible for SCUBA divers to characterize the depth and bathymetry of the drop off and reef slope below a depth of 70 meters and search for the bow and other debris below this depth. Submersible dives helped to fill this void and provide data on the bathymetry of the southwestern ocean reef slope between 140 to 950 meters.

Although we found no evidence of the bow section, there is no indication that the remaining material from the *Jin Shiang Fa* seriously impacts the coral reef. The only metal object we located was the piece of rebar at a depth of 348 meters. There is rust visible at either end seeping over the sand from the rebar, but the small level of dissolved iron emanating from the stake will have no impact on reef life at depths less than 100m. Any dissolved material below a depth of 300 meters will not likely ascend to the shallow depths of the reef because the thermocline would act as an impenetrable barrier for the movement of deeper waters into shallow waters.

Dive P5-651 successfully completed the mission based on the parameters of the objectives. The concerns of the U.S. Fish and Wildlife Service have been addressed that the bow section of the ship is highly unlikely to be found above the depth of the thermocline and continue to provide dissolved iron to the shallow reef where it has fueled the outbreaks of invasive cyanobacteria. This portion of the reef slope is a near vertical wall with no chance of the bow become lodged in the reef after falling and tumbling hundreds of meters or more from the surface in 1993. The momentum and tumbling of the bow would likely have carried the bow into deep water, likely below the depth limit of the submersible *Pisces V*.

For the related, and more ideal purpose of determining the fate of the bow, a magnetometer and bathymetric survey followed by a second submersible dive with greater depth limits would be a likely next step. After examining the data from the first dive with emphasis on bathymetric analysis, the second submersible survey would attempt to locate the bow. The earlier magnetometer survey of the area would locate magnetic anomalies that would help identify targets to narrow down the most likely location of the bow.

Recommendations for corrective action or improvement:

n/a

In your opinion, did the mission essentially achieve its purpose? Compare actual work accomplished with the work that was expected to be accomplished.

Based on the four objectives outlined in the U.S. Fish and Wildlife Research/ Management Study Proposal approved prior to this cruise, this mission did achieve desired goals. The dearth of man-made materials does not mean there is no useful information to be collected from the dive. On the contrary, the lack of man-made materials indicates the atoll is still in a relatively pristine state. This information will support the current efforts by FWS to nominate

Rose Atoll to the World Heritage Sites list, allowing for additional financial support in the future to maintain the great biodiversity that is currently being catalogued at the atoll. Both P5-651 and P5-652 [Maragos and Mundy] covered large areas that can now be excluded from any future attempt to locate the bow. The lack of debris also means the clean-up operation that has been working for the past six years has been very successful in removing the majority of the remaining material, all of which would be detrimental to the well-being of the reef if allowed to deteriorate in shallow water.

List specimens or samples collected on the mission. NONE

No specimens or samples were collected on this mission as per the Research/Management Study Proposal approved by the U.S. Fish and Wildlife Service.

DATA RELEASE

Data may be retained by the project leader for up to 2 years after the mission date with the following exception. NOAA may request to use photos for publication or publicity purposes at any time.

Fill in the appropriate statement below and sign this form.

I hereby release the data archived by HURL for public consumption following mission **[P5-651]: Investigation of the submerged remains of the Taiwanese fishing vessel *Jin Shiang Fa*, which ran aground at Rose Atoll in October 1993**

held on in the following way:

a. CTD data by 31 December 2006
b. video and images by 31 December 2006
c. other n/a

d. I will give my written consent to individuals wishing to use these data prior to the above dates depending on the nature of the request(s).

Principal Investigator