Post-Tsunami Survey:
American Samoa
By: Devin Witt & Prof. Yin Lu (Julie) Young
Department of Naval Architecture and Marine Engineering
University of Michigan
Background on American Samoa

- Population: 60,000
- Island Area: 77 mi²
Quick Tsunami Facts

- Date: September 29th, 2009
- Earthquake Magnitude: 8.3
- Time: 6:48 am (Samoan Time)
- Epicenter: 120 mi south of Island
- 3 waves, highest reaching approximately 36 ft (Poloa, AS)
- ~150 deaths reported
Objectives for the Trip

- Survey Tsunami Damage to Coastal Structures and Shorelines
- Survey Post-Tsunami Coastal Impact and Damage to Coral Reefs with a Remote Operated Vehicle (ROV)
- Take Sediment Samples From Sea Floor and Shore
Pago Pago, AS - A boat crashed into a building approximately 200 yards from the harbors edge. Support beams are bent and entire wall is destroyed.
Tula, AS – When the Tsunami hit, the water created an extensive horizontal load causing the front and rear walls to fail under the pressure.
Vertical Fluid Pressure Damage

Poloa, AS – When the Tsunami hit, the water rose to 36 ft (middle of the beam), causing an air pocket to form under the roof. The uplift force was high enough to tear the beams apart, lifting the roof which then allowed the adjacent aluminum roof to slide underneath by wave action before the roof settled.
Scour Damage to Abutment

Amanave, AS – The tsunami caused the soil surrounding the left support to wash out leading to the complete failure of the bridge.
ROV Survey of The Sea Floor

Tutuila Island, American Samoa
Derived and Multibeam Bathymetry: Product DBM/B

Bathymetry Maps of American Samoa
ROV Preparations
ROV Operation

The control unit (above) consist of a power converter, image display, and control box.

Retrieving the ROV with sand sample.
Operating Condition

These are the types of waves we had to deal with in addition to a 5 ft swell. (Notice the damaged house in the background – Poloa, AS)
Snapshots of our ROV in action

ROV in action

Debris on the sea floor

Broken corals

Courtesy of NOAA Ocean Media Center.
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Contact Information

• Devin Witt
  Naval Architect and Marine Engineer ’12
  devinw@umich.edu

• Prof. Yin Lu (Julie) Young
  Associate Professor
  Dept. Naval Architecture and Marine Engineering
  ylyoung@umich.edu