

# Research Vessel *Parke Snavelly*

**T**he Pacific Coastal and Marine Science Center (PCMSC) of the U.S. Geological Survey (USGS) acquired Research Vessel *Parke Snavelly* in November, 2007. R/V *Snavelly* is a seafloor mapping boat, used for sonar mapping, LIDAR mapping, and seafloor photography/videography or “ground-truthing”.

## About Our Boat

R/V *Snavelly* is named after Parke D. Snavelly, Jr. (1919 - 2003), a pioneer of marine geology research at USGS. R/V *Snavelly* is a 36-foot aluminum catamaran with a 10'6" beam and 3'9" draft. She was custom-built to fit onto a trailer, allowing access to inland and coastal waters all along the west coast.

## *Snavelly* Scientific Instruments

**Submetrix SwathPlus Interferometric Sonar.**—SwathPlus is a combination swath bathymetry and side-scan system that creates a 3-D image of the seafloor topography and a backscatter “picture”. The swath width is 3 to 5 times the water depth, and works in relatively shallow water (10 to 300 feet water depth). For example, in an area with a water depth of



*Parke D. Snavelly, Jr. (1919 – 2003)*



*R/V Parke Snavelly*

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65 feet, the swath could be 650 feet wide. By collecting a series of closely spaced parallel lines, we build up a 3-D picture of the seafloor.

**Reson Multibeam Sonar.**—The Reson is a “multibeam” echosounder that operates much like the SwathPlus in deeper water (up to 2,300 feet water depth).

**EdgeTech Chirp Sub-bottom Cross-section Sonar.**—The Chirp sub-bottom profiler creates a two-dimensional image of the material beneath the seafloor like a cross-section under the ship trackline, to a sub-bottom depth of about a few hundred feet.

**Minisparker Sub-bottom Cross-section Sonar.**—Minisparker sub-bottom profiler produces similar results to the Chirp, but produces a much deeper cross-section, up to about 2,000 feet beneath the seafloor. Minisparker can penetrate deeper in softer material such as silt and mud; penetration is less in hard rock.



*SwathPlus on its boom off starboard side of *Snavelly**

**Acoustic Doppler Current Profiler (ADCP).**—The ADCP transducer assembly, composed of 4 transducers, transmits acoustic pulses along two pairs of orthogonal beams. Pulses reflected from scatterers in the water column are received by the ADCP and converted into eastward, northward, and vertical components of water flow using the Doppler Effect and basic trigonometry.

**Camera Sled with Still-photo and Video Cameras.**—The camera sled is a steel frame equipped with underwater still-photo (color and black & white) and video cameras, towed behind the boat just above the seafloor. The camera sled takes pictures of the seafloor and the plants and animals living there. The pictures and videos are used for “ground-truthing” the seafloor, or relating image data from systems like the multibeam sonar to real features and materials on the seafloor.

**Riegl Laser Scanner: 3-D Modeling of Coast and Land.**—PCMSC can mount a Riegl laser scanner atop *Snavely* to create 3D LIDAR maps of coastal land from the boat.

### **Snavely Specifications**

#### **Heavy-duty A-Frame**

- Safe working load (SWL): 1 ton
- Height: 11 feet
- 5-foot transom clearance for deployment

#### **Removable Davit**

- SWL: 800 lbs.
- Height: 6 feet

#### **Deck-mounted Capstan**

- SWL: 1,500 lbs.

#### **Hydraulics**

- All stainless deck fittings
- Two Vickers VTM 42 electric clutches (port main and generator)
- 15-gallon hydraulic reservoir
- Hydraulic cross-over manifold to allow use of either pump online
- Hydraulic quick disconnect deck fittings
- Anchor winch with 300-foot 1/2” Amsteel line and 50-foot chain with Bruce anchor
- 4” hydraulic cathead

#### **Power and Fuel**

- Twin Volvo 310 HP electronic diesel engines
- Volvo Penta out-drives
- Two 120-gallon welded aluminum fuel tanks

#### **Electrical Systems and Generator**

- 12kW marine diesel generator
- 30 amp 120v AC power supply
- 50 amp 240v AC power supply
- 5000 W inverter and battery charger
- Uninterruptible power supply (UPS)

#### **Electronics and Navigation Aids**

- Autopilot
- Radar: 2.2 kW radar and chart plotter
- Depth sounder: thru-hull transducer with NMEA output
- VHF Radios: 2 VHF radios with direct select calling

#### **Helm and Operation Station**

- Aft deck auxiliary helm steering station
- Garmin GPS and chart plotter
- Weather station with wind, temperature, and barometric pressure



*R/V Snavely working in San Francisco Bay*

#### **Cabin Interior Layout and Equipment**

- 72”-long, starboard-side science data acquisition station:
  - Four 27” flat screen monitor work stations
  - 60” suspension-mounted computer rack for mounting of electronics
  - Three computers (navigation, data collection, and data processing) with Internet local area network (LAN) and UPS
  - 8” electronics deck cable pass-through to aft deck in starboard aft bulkhead
  - POS MV 320 GPS-aided inertial navigation system providing 6 degrees of freedom position and orientation
  - RAID array data storage server
  - Network Time Server for time-synchronized data collection
  - Wireless Internet link to shore (within mobile phone coverage)
  - YONAV navigation planning/logging software with direct data feed to helm station for navigation information transfer
- Microwave oven
- Refrigerator
- Port-side dinette table for science/observers with Internet LAN

#### **Pilot House with Low Profile Forward Berth**

- 12’ L x 8’ W welded aluminum pilot house cabin with 6’3” headroom

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#### **Cabin Heat**

- 18,000 BTU electric air conditioner/heating
- Kerosene cabin heater

#### **Plumbing (Potable)**

- 35-gallon freshwater tank
- Hot water to galley, head, and rinse deck

#### **Head (Bathroom)**

- Stand-up toilet compartment with wash basin
- Freshwater deck shower

#### **Other Pumps**

- Four 2000 gph bilge pumps
- One high capacity sea water deck wash down pump



*Pat Hart, Larry Kooker (ret.), Jackson Currie, and Jamie Grover in Snavely's pilot house*

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<http://walrus.wr.usgs.gov/mapping/Snavely.html>