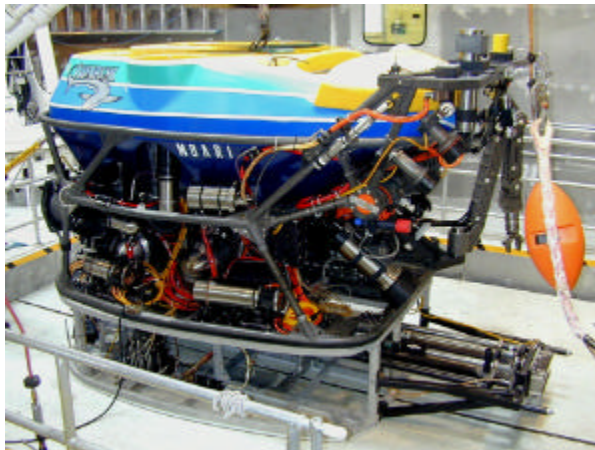


## MBARI Activity Report to DESSC, MAY 2001

MBARI marine science operations utilizing the *Western Flyer/Tiburon* and the *Pt. Lobos/Ventana* ROV systems have been running at full schedule since the last summer DESSC meeting.

In the year 2000 a major *Western Flyer/Tiburon* expedition was completed to the Juan De Fuca area, collecting samples on the Cleft Segment and the Mendocino Ridge areas. A major technical advance was the adaptation of the Stakes/Holloway core drill to a



The Stakes/Holloway core drillsled mounted beneath Tiburon

*Tiburon* style quick-change Toolsled package. 11 cores were successfully retrieved, mainly basalts, at depths reaching 3000 meters. Drilling rates were similar to those achieved with the system installed on *Ventana*, about 45cm per hour, but required less than a third of the power formerly used. The drillsled is the fourth Toolsled designed for *Tiburon*.

Overall during year 2000 the *Western Flyer/Tiburon* system was scheduled for 150 operational dive days and had an overall dive success of 98%, using the measurement of dive days achieved/dive days scheduled.

The major *Western Flyer/Tiburon* expedition of 2001 has been a transit and series of dives in Hawaiian waters to depths of 2900 meters. During the course of the research cruise 67 dives have been conducted, some midwater dives during the transit over, but most of the dives took place near the Hawaiian islands and were investigating submarine volcanic processes.

Over a thousand rock samples were collected, 136 push cores and 32 heat flow measurements were made using the WHOI/Alvin heat flow probe. On the biological front, several new species of midwater animals were found and numerous live collections were made. 38 specimens were frozen for subsequent DNA analysis. Weather had a significant impact with sustained winds reaching 30 knots causing revision of intended dive targets on several occasions. Overall the expedition was a success and only one dive day was lost. The general feeling was that the sample

collection capabilities of *Tiburon* and the 18 hour a day dive schedule quickly saturated the eleven person science staff's capability for processing samples at sea. In addition to MBARI researchers, a total of eleven outside collaborators participated in the various legs of the expedition. The *Western Flyer* is presently in transit back to California.

In the year 2001 the *Western Flyer/Tiburon* dive schedule includes 148 days of which 5 days are funded through NURP. Looking ahead, our next major expedition scheduled is a trip to the Guaymas Basin in the Sea of Cortez in February, March and April 2002.

MBARI's other vessel and ROV, The *Pt. Lobos/Ventana* system, continues to operate as a day boat and in year 2000 achieved a 90% dive success record out of 153 days of scheduled ROV operations and ten days of CTD transect data collection. Most of the lost dive days were due to weather, which was more severe in 2000 than past years.

New instrumentation for the *Pt. Lobos/Ventana* system includes the "Vibra-Core" which is able to take two meter cores of sediment from the ROV and the Vibra-Peeper which takes multiple one meter cores using barrels that are interchangeable in-situ. HDTV as the main ROV camera continues to be very useful for supporting the scientific mission and is invaluable for imaging targets ranging from small gas bubbles in dissolution to macroscopic biological specimens. The ability to frame-grab high quality images for publication from the standard dive video record continues to be an often used resource. A new tool sled currently under construction for *Ventana* is a benthic cable laying system for placing small diameter electro/optical cable between instrument nodes placed on the seafloor. This is part of MBARI's increasing efforts toward supporting in-situ long-term ocean observatories. MBARI has also partnered with the University of Washington, WHOI, JPL, and the Institute for Pacific Ocean Science (Canada) on the proposed NEPTUNE project.

During the year 2001 the *Pt. Lobos/Ventana* system is scheduled for 162 days of ROV operation and 18 days of CTD transect work. 14 of the scheduled dive days for 2001 are funded through NURP.

MBARI's latest vessel is a former San Francisco Bar Pilot boat now renamed the *Zephyr*. This vessel is 85 feet long, displaces 135 Tons and has sleeping accommodations for 8. It will be the main tender for the Dorado class of AUV's, as well as perform CTD transects and other miscellaneous work. It will not be operational for several more months as it goes through a shipyard refit to adapt it to its new mission in oceanography.

Lastly, our AUV and mooring programs continue to push ahead with several important milestones this year in each program, including an AUV expedition on the ice-breaker *Healy* to the Arctic this fall.

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MBARI 5/29/01