



**NOAA Teacher at Sea**  
**Brenton Burnett**  
**Onboard NOAA Ship DAVID STARR JORDAN**  
**June 26 – July 6, 2006**

**NOAA Teacher at Sea: Brenton Burnett**  
NOAA Ship DAVID STARR JORDAN  
Mission: Shark Abundance Survey  
Day 4: Thursday, June 29, 2006

**Weather Data from Bridge**

Visibility: 10 nautical miles (nm)  
Wind direction: 306 degrees  
Wind speed: 15 kts  
Sea wave height: 1-2'  
Swell wave height: 2-3'  
Seawater temperature: 19.8 degrees C  
Sea level pressure: 1017 mb  
Cloud cover: Partly cloudy

**Science and Technology Log**

While today's catches were lighter than yesterday's, there were some very interesting new sights to see.

One blue shark that made it up on deck, threw up some of its stomach contents. Out came the remains of a pelagic (open water) crab and a number of squid beaks. The largest of these beaks was three centimeters (just over an inch) in diameter and the smallest less than a half a centimeter.



The beaks of a variety of squids and a fisheye lens found in a blue shark's stomach.

Blue sharks are perhaps the most widely distributed shark, living in all oceans except in the polar latitudes. As such, they are generalists and eat squid, fish, smaller sharks and even birds. Jacques Cousteau even filmed blues shepherding virtually invisible krill into balled clusters so they could swim through the ball to feast.

While setting the afternoon line, I saw a curved tip dorsal fin break the surface off the starboard bow. Then it disappeared under a wave. Moments later as we caught up to it, a large disc of a fish could be seen below the fin—a mola!! Molas are the largest bony fish though they are not the largest of all fishes. That honor belongs to the docile plankton-eating whale shark. Molas can reach a length over 4 m (13 feet), though the one we saw was closer to 2 m (6 feet). Whale sharks, however, can grow to over 20 m (70 feet) long.

Later, as we hauled the afternoon set, another mild surprise—a pelagic stingray was caught on our line! Once aboard, the highest priority was to disarm the poisonous spine projecting from the base of the stingray's tail. While Sean Suk, another Southwest Fisheries Science Center (SWFSC) researcher, held the ray down, Suzy Kohin was able to clip the spine disabling the ray, but not harming it.

Rays and skates evolved flattened bodies as an adaptation as benthic, or bottom feeders. Rays and skates, or batoids as they are called collectively, have a mouth positioned on the bottoms of their bodies so they can best feed along the bottom of the ocean.

Pelagic rays, as their name implies, live in the open ocean. So the pelagic ray has evolved a unique style of feeding. When approaching a school of fish, this ray will turn upside down and curl its wings above it forming a funnel. This funnel shape directs the fish right to its mouth.

In the evening, after our work was done for the day, a few of us were on the stern deck when a school of dolphins approached. Soon they surrounded the ship and a group of six or seven stayed with us porpoising at our bow for close to thirty minutes! “Porpoising” is the arched jumping above the water as dolphins swim. This behavior allows these mammals to breathe while maintaining their pace. Porpoising should not be confused with breaching which is a more vertical jump from the water. Breaching behavior has been observed in a number of whale species, but also in some sharks. The two shark species best known for breaching happen to be the two species we are most interested in on this cruise—makos and threshers. Scientists are not certain why whales breach, nor



Bottlenose dolphins porpoising in front of the bow of the DAVID STARR JORDAN.

are they entirely certain why sharks breach. At least a partial answer may be that they are making an attack on prey. Many sharks, not just blues, are known to eat sea birds, and makos, specifically, have been seen jumping from the water in attempts to attack floating sea birds. White sharks, the larger cousins of makos, are known to breach but in False Bay near Dyer Island off South Africa, this behavior could even be described as common. The unique seafloor topography there forces the southern fur seals to repeatedly swim from surface to seafloor as they make their way to the island (if they didn't they would be eaten by the sharks outright). Researchers have discovered that as the great whites pursue the seals from the depths their momentum takes them up and fully out of the water in spectacular breaches.

### **Personal Log**

Every day on board brings something new to this mountain man. On deck, when critters aren't appearing on board or in the sea, there are always science folks to answer questions. Of course, that is when they aren't watching World Cup soccer via the satellite TV. 'Til, tomorrow...

Brenton