

**CSCAPE – Cooperative Survey of California Abundance in the Pelagic Ecosystem**  
**NOAA Ship *David Starr Jordan***  
**Leg 4 Weekly Science Report**

Eric Archer – Cruise Leader  
30 September 2005

**A Wind From... Elsewhere** by Elga Haymon White

The wind blows here... the wind blows there  
The wind seems to blow from... everywhere.  
But the wind I love... when it blows... blows fair...  
This wind... when it blows... blows from... ELSEWHERE!  
Can you see its graceful fingers... playing in your hair?  
Nay! You cannot see the wind... e'en though you know it's there.  
It's flitting... it's flirting... it's prancing everywhere  
This wind... when it blows... blows from... ELSEWHERE!  
It blows unexpectedly... with a gentle breeze... it blows...  
The Great Hand of Miracles... brings it... then it goes  
To greet the early morning sun... to dance to and fro  
From the highest, loftiest mountain heights... to valleys... far below.

'Who is He that sitteth upon the circle of the earth...  
Who gathereth the winds in his fists—Who maketh a wind to pass over...  
Thou hearest the sound thereof...  
But canst not tell whence it cometh... and wither it goeth.'

The wind blows here... the wind blows there...  
The wind seems to blow... from everywhere.  
But the wind I love... when it blows... blows fair—  
This wind... when it blows... blows from... ELSEWHERE!

**SCIENCE SUMMARY: 22 September – 30 September 2005**

Welcome to the final report from Leg 4 of CSCAPE. The major theme for the week (+ 2 days) was wind... and it blew EVERYWHERE! We started the week running south from a developing system off of central California, and it chased us all the way to the southern edge of the study area. We managed to miss the worst of it (30 – 40 knots reported at its core), but still had to contend with several 25 knot, Beaufort 6 days. In all, about four days total were lost to the weather. After “reworking” some of our tracklines (“You were like, every cruise leader for himself...”, Alex Von Saunder, CO *David Starr Jordan*), we managed to “liberate” some wind-free segments from Leg 7 and get some survey time in.

Early in the week, when we could work, we made up for it by covering a lot of trackline. Unfortunately for the observers, this was only because we were covering a lot of area with practically nothing but water to observe, to the point of being totally skunked for two days with a handful of sightings the rest of the time. Nevertheless, two of these sightings were notable. The first, on Thursday morning of the previous week, was of a pod of killer whales (*Orca orcinus*) in close proximity to some fin whales (*Balaenoptera physalus*). Because of worsening weather, the orcas proved difficult to track while we were attempting to positively ID the fin whales, and we

had to end our observations prematurely to continue our run south. A sighting on Sunday was of a group of short-finned pilot whales (*Globicephala macrorhynchus*), a first for this cruise. The whales seemed to be fairly nonplussed about the presence of the Jordan, so we tried to get some biopsies from the small boat. While they didn't expend much energy avoiding J-3, they made it perfectly clear that they weren't interested in making interspecies contact, and would quietly sink on approach only to pop up 10-15 minutes later half a mile away. Nevertheless, it was a good reason to exercise J-3's engines.

Things definitely picked up at the end of the leg on the way into San Diego. On Thursday, we passed by Cortez Bank, a popular fishing, diving, and surfing (yes, surfing) spot 100 miles west of San Diego. Most of the day we had scattered sightings of blue (*Balaenoptera musculus*) and fin whales. Sometimes individuals of each species seemed closely associated, other times they occurred as singles or a handful of animals of the same species. We also ran across a sizeable, very aerial school of short-beak common dolphins (*Delphinus delphis*) that stayed together rather tightly. While a few animals rode the bow, the school seemed rather ambivalent about our presence, unlike previous common dolphins we've encountered where the animals would rush over for a free ride. The big sighting of the day came at the end, when we were encountered a lone minke whale (*Balaenoptera acutorostrata*). Being somewhat difficult to catch and track, it took several surfacings to get good views of the sharp rostrum characteristic of this species. We dropped a sonobuoy as we left the area in the hopes of adding to the growing picture of the range of vocalizations of these animals.

Friday would prove to be our busiest day as we started in the Santa Barbara Channel between Santa Catalina and San Clemente Islands pointing straight for La Jolla. The observers earned their pay in the first few hours of that day as practically the entire channel was filled with common dolphins. While some would come to ride the bow, others seemed content to just take up space in the big eyes and let us cruise past. It wasn't until we left both islands well behind that they started to once again occur in discrete schools containing both short- and long-beak commons that would continue to pop up throughout the day (see Photo report for more). As we steamed on we had three other sightings of minke whales, the first, a group of three animals. We dropped both a sonobuoy and the small boat for biopsy attempts. While they got close enough to take a good shot, the bolt hit, but only captured a smidgen of whale-smelling slime, which was saved. Coastal fog quickly shut down operations in the early evening, leaving the ship free to head for home.

My deepest thanks go out to the officers and crew of the *David Starr Jordan* for providing us with a safe, clean, and happy platform and working environment throughout this cruise. I also want to thank the entire scientific party (both on the ship as well as the support from shore) for all of their hard work and patience. It was, by far, the best team I have ever sailed with and it was simply a joy to watch them do what they do best. I will miss their company.

**Sightings and Effort Summary for Marine Mammals**

| <b>Date</b> | <b>Start Stop</b> | <b>Position</b>      | <b>Total Distance</b> | <b>Avg. Beaufort</b> |
|-------------|-------------------|----------------------|-----------------------|----------------------|
| 092205      | 0716              | N36:31.02 W124:15.42 | 15.2 nmi              | 5.6                  |
|             | 1037              | N36:11.31 W124:20.25 |                       |                      |

|        |      |           |            |           |     |
|--------|------|-----------|------------|-----------|-----|
| 092305 |      |           |            | 0.0 nmi   | 6.0 |
| 092405 |      |           |            | 0.0 nmi   | 6.0 |
| 092505 | 0717 | N31:30.61 | W124:50.64 | 111.1 nmi | 4.3 |
|        | 1901 | N30:31.79 | W123:44.12 |           |     |
| 092605 | 0716 | N30:32.83 | W123:41.23 | 70.3 nmi  | 2.6 |
|        | 1836 | N30:51.58 | W122:49.26 |           |     |
| 092705 | 0720 | N31:28.30 | W124:16.98 | 112.9 nmi | 4.0 |
|        | 1856 | N30:58.88 | W122:12.90 |           |     |
| 092805 | 0708 | N30:58.27 | W122:11.36 | 2.3 nmi   | 5.9 |
|        | 0724 | N30:57.67 | W122:08.75 |           |     |
| 092905 | 0702 | N31:08.98 | W119:24.02 | 60.6 nmi  | 2.6 |
|        | 1723 | N32:10.73 | W119:03.63 |           |     |
| 093005 | 0651 | N33:11.49 | W118:43.86 | 48.2 nmi  | 1.4 |
|        | 1656 | N32:55.80 | W117:30.85 |           |     |

| <b>CODE</b> | <b>SPECIES</b>               | <b>Weekly<br/>Total</b> | <b>CSCAPE<br/>Total</b> |
|-------------|------------------------------|-------------------------|-------------------------|
| 5           | Unidentified common dolphin  | 6                       | 7                       |
| 13          | striped dolphin              |                         | 8                       |
| 16          | Long-beaked common dolphin   | 6                       | 6                       |
| 17          | Short-beaked common dolphin  | 10                      | 55                      |
| 18          | Bottlenose dolphin           | 1                       | 6                       |
| 21          | Risso's dolphin              | 1                       | 55                      |
| 22          | Pacific white-sided dolphin  |                         | 88                      |
| 27          | northern right whale dolphin |                         | 26                      |
| 36          | Short-fin pilot whale        | 1                       | 1                       |
| 37          | killer whale                 | 1                       | 10                      |
| 40          | harbor porpoise              |                         | 77                      |
| 44          | Dall's porpoise              |                         | 149                     |
| 46          | sperm whale                  |                         | 26                      |
| 49          | ziphiid whale                |                         | 3                       |
| 51          | Mesoplodon sp.               |                         | 4                       |
| 61          | Cuvier's beaked whale        |                         | 3                       |
| 63          | Baird's beaked whale         | 1                       | 5                       |
| 69          | gray whale                   |                         | 2                       |
| 70          | Balaenoptera sp.             | 1                       | 30                      |
| 71          | minke whale                  | 5                       | 12                      |
| 74          | fin whale                    | 4                       | 79                      |
| 75          | blue whale                   | 5                       | 50                      |
| 76          | humpback whale               |                         | 369                     |
| 77          | unid. dolphin                | 3                       | 44                      |
| 78          | unid. small whale            | 1                       | 4                       |
| 79          | unid. large whale            | 3                       | 45                      |
| 277         | unid. medium delphinid       |                         | 1                       |
| 377         | unid. large delphinid        | 1                       | 1                       |
|             | <b>TOTAL</b>                 | <b>50</b>               | <b>1166</b>             |

Note: Pinnipeds not included; mixed groups are counted once for each species

**Biopsies (Tim O'Toole, Gary Friedrichsen, Laura Morse)**

| <b>Species</b>               | <b>Weekly</b> | <b>CSCAPE Total</b> |
|------------------------------|---------------|---------------------|
| Minke whale                  | 1             | 1                   |
| Humpback whale               |               | 21                  |
| Blue whale                   |               | 7                   |
| Fin whale                    |               | 1                   |
| Sperm whale                  |               | 11                  |
| Baird's beaked whale         |               | 2                   |
| Short-beaked common dolphin  | 3             | 66                  |
| Pacific white-sided dolphin  |               | 21                  |
| Northern right whale dolphin |               | 6                   |
| Striped dolphin              |               | 2                   |
| Dall's porpoise              |               | 3                   |
| Killer whale                 |               | 5                   |
| Risso's dolphin              |               | 4                   |
| <b>Grand Total</b>           | <b>4</b>      | <b>149</b>          |

**Photo-Project (Annie Douglas, Cornelia Oedekoven, Holly Fearnbach,)**

The past seven days gained momentum as we neared the coast. Photographers had all about tossed in the towel after not taking a single marine mammal photo for three days, but the waves and winds abated and by September 26<sup>th</sup> we had sighted and photographed the first short-finned pilot whales of the cruise. Generally, an easy species to work around, we found that this group would not allow the small boat to get within 100 meters, so we had to content ourselves with some beautiful photos taken from the flying bridge crowd. Worldwide there is a wide range of pigmentation variation among pilot whales, these animals were markedly light in coloration, almost light gray flanks on some animals. They did not have well defined “saddles”, however, most animals had white shoulder stripes that ran up to their dorsal fins.



Short-beaked common dolphin

Photo by Cornelia Oedekoven



Long-beaked common dolphin Photo by Annie Douglas

As we closed in on Tanner and Cortes banks we began to see individual blue whales as well as a few fin whales. Blue and fin whales near the banks seem to be feeding, or at least they are not traveling far from a single area, and approaching them for photographs is a fairly simple task. Today, our last day of Leg 4, we are meandering our way back to San Diego by way of San Clemente Island. Along the east side of San Clemente we have come across huge schools of long-beaked and short beaked common dolphins. In an effort to look at coloration patterns among these animals we have tried to take many photos to help document variations in color patterns, and any hint as to the interactions between these species.



Red-billed tropic bird Photo by Laura Morse

Sep 22-Sep 30

| Species                                 | Summary of groups and individual whales |
|---|---|
| Blue whale                              | 3                                       |
| Fin whale                               | 1                                       |
| Minke whale                             | 4                                       |
| Pilot whale                             | 1                                       |
| Risso's dolphin                         | 1                                       |
| Short-beaked common dolphin             | 3                                       |
| Long-beaked/short-beaked common dolphin | 3                                       |
| <b>Grand Total</b>                      | <b>16</b>                               |

### **Bird Buzz (Dawn Breese and Thomas Staudt)**

Our last chapter left us at the Fall equinox, and with the days getting shorter, it's always good to head south, and that's just what we did. From 60 miles off Pt. Reyes, to 200+ miles off Baja California we attempted to outrun nasty weather, not rain, just high winds and big seas. We reached the southernmost boundary of our study area, and with that five new species for this Leg! We added Wedge-rumped (Galapagos) Storm-petrel, Black Storm-petrel, Red-billed Tropicbird, Brown Pelican, and Craveri's Murrelet to our list, which totaled 21 seabird species for the week. We also saw quite the array of landbirds, including Great-blue Heron, Mourning Dove, Say's Phoebe, Brown-headed Cowbird, Red-winged Blackbird and Western Meadowlark. Species diversity was high for the week, but total numbers were pretty darned low. We saw just over 200 individual birds in our 300-meter transect over nine days (between 12 and 37 per day), which very roughly comes to about two birds an hour. And what great birds they were! Like our sister survey down south of Hawaii, we too had a grand slam of Stercorariids! Pomarine, Parasitic and Long-tailed Jaegers and South Polar Skua—the whole team representing the North Pacific Division of the family Stercorariidae. As we got farther south, the Leach's Storm-petrels with white rumps were joined by their southern counterpart with dark rumps, and a few “intermediate” ones were mixed in just to keep us on our toes. It was a great week for tropicbirds. The Red-tailed's we'd been seeing this Leg were replaced by their larger southern cousins the Red-billed. They are fairly curious about the ship and will often fly in to have a look.

It's goodbye to Leg 4, a great ride that produced 41 bird species (30 seabirds and 11 non-seabirds), good times on the flying bridge, learning opportunities from a wonderful group of people, and excellent company. Thanks to all, especially Eric, our intrepid Cruise Leader who had the unenviable job of dealing with all that challenging weather! So long, and thanks for the fish!

## Oceanographic Operations (Candice Hall & Liz Zele)

Last night turned out to be a perfect ending to this the fourth leg of CSCAPE 2005. Our near shore CTD and Bongo (although still in 1440m of waters) brought forth many visitors, both off and on board. Visiting scientists rushed to shrink their final cups, following their cup's progress, on the computer screen, to 1010m. Dawn decided to play 'cannibal, cannibal' and shrink a head (see figure 1 below)!



Figure 1: Shrinking heads (Photo: Shawn Noren).

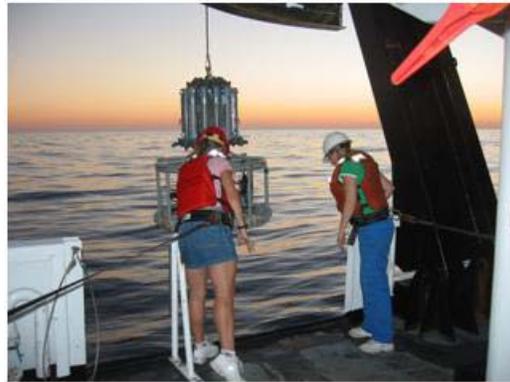


Figure 2: CTD deployment (Photo: Gaby Serra-Valente).

Others were drawn to the evening's festive hub of activity, including a large blue shark! During our retrieval of the CTD he just quietly floated nearby, watching this strange grey object that moved only vertically through the ocean (we had perfect weather so it was flat calm!). Even though we were attached by safety belts it was still a little unnerving to see him so close by. Our gleefully 'adrenalized' cries of 'shark, shark' (figure 2) brought many out onto the aft deck, including Chico with his squid pole!

Our track line this leg has certainly taken us through a huge (oceanographically speaking) range of temperatures, from our study area's northerly inshore waters with temperatures of 10 °C (50 °F) to southerly offshore water temperatures of 21.5 °C (71 °F). Even our salinity range has been large, from 31 to 34 psu (!), again indicative of the large currents and vibrant ecosystem in this area. Figure 3 shows the temperature and salinity profiles (known as T/S plots) of the 3 major oceans. As you can see, this leg we've covered them all! Lately the warm waters have given rise to cries of 'swim call', but sadly it was not to be.

| Date  | CTD's | XBT's | Bongo Tows | Comments                            |
|-------|-------|-------|------------|-------------------------------------|
| 09/22 | 0     | 5     | 1          | CTD repairs                         |
| 09/23 | 0     | 5     | 1          | CTD repairs                         |
| 09/24 | 0     | 5     | 0          | Very rough seas                     |
| 09/25 | 0     | 5     | 1          | CTD repairs                         |
| 09/26 | 2     | 4     | 1          | Morning CTD aborted – cable failure |
| 09/27 | 1     | 4     | 1          |                                     |
| 09/28 | 2     | 2     | 1          |                                     |
| 09/29 | 2     | 3     | 1          |                                     |

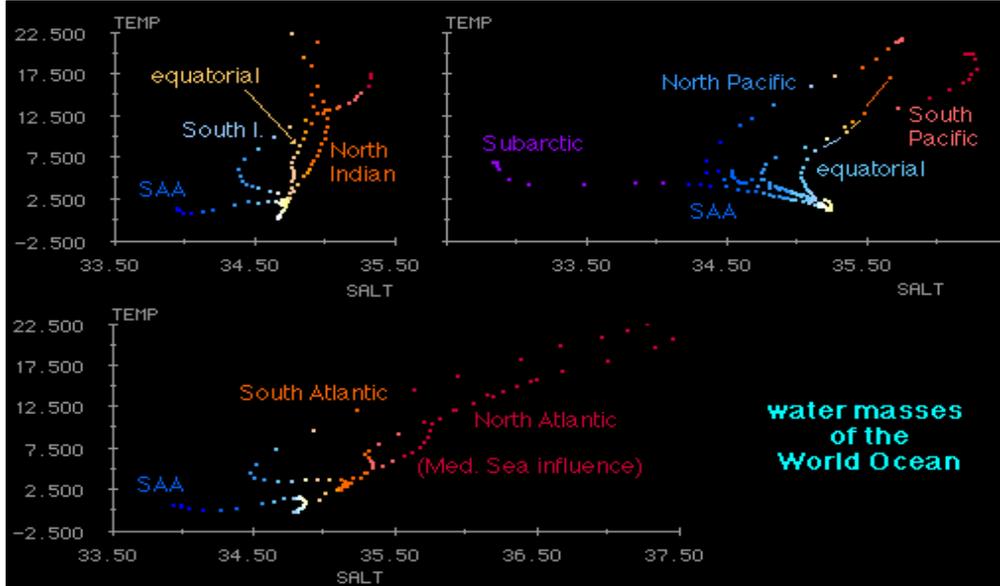


Figure 3: TS-diagrams of the Indian, Pacific and Atlantic Oceans showing the TS properties of the major water masses. Colour indicates salinity; the information is the same as given on the horizontal axis but helps to compare the three oceans. All TS-diagrams "fan out" from a point below 0°C and a salinity of about 35.6 (white). This is Antarctic Bottom Water, found in all oceans. At higher temperatures the shape of the TS-diagrams (i.e. the TS-properties of the ocean) depends on the ocean region. (Christo Whittle – Thermohaline Processes, 2005).

Our quote for the week: “There is one purpose in life and one only: to bear witness to and understand as much as possible of the complexity of the world – its beauty, its mysteries, its riddles. The more you understand, the more you look, the greater is your enjoyment of life and your sense of peace. That’s all there is to it. Everything else is fun and games. If an activity is not grounded in ‘to love’ or ‘to learn’, it does not have value.” (Anne Rice – *Servant of the Bone*, 1996)

### **Squeakly Report (Liz Zele)**

This week we have no squawks to report! Look forward to “hearing” from us at the beginning of Leg 5.