



NOAA Teacher at Sea
Dave Grant
Onboard NOAA Ship *Ronald H. Brown*
November 6 – December 3, 2008

NOAA Teacher at Sea: Dave Grant

NOAA Ship *Ronald H. Brown*

Mission: VOCALS, an international field experiment designed to better understand the physical and chemical processes of the Southeast Pacific climate system.

Date: November 8-10, 2008

Science and Technology Log

“Ships and sailors rot at port.”

Captain Horatio Nelson

Today is a bit frustrating for the science staff since we are delayed in our departure; although the crew doesn't object to another day of restaurant meals and visits to town to make final purchases.

“Science Sunday #1”

Part One: This gave the science and navigation team time to get up to speed on the cruise track, and view satellite images of what is happening offshore, and to determine the first waypoint of the ship – Point “Alpha.” Alpha is at -20° S, 075 W (That will put us 130-miles southwest of Arica, 1200-miles south of the Equator, and in 4,000-meters of water.)

We will be at the same Longitude as Philadelphia, PA.

Surface and subsurface sampling of the sea and air is to be done at the same time air samples are captured by several aircraft passing overhead at different altitudes.

Low passes by a slow-flying US Navy *Twin Otter* will take samples at the “boundary layer” where particles of salt spray and other particles are cast into the air by wave action; while higher passes are made by a much larger *C-130* operated by the National Center for Atmospheric Research.



The Brown's Meeting Room

Simultaneously, meteorologists on the ship will be launching SONDES (Weather Sounding Balloons) that collect data on the air temperature, humidity and air pressure up to about 25,000 meters; and oceanographers will be

taking water samples with a CTD meter (Conductivity, Temperature, Density) at the surface and down to 3,000-meters.

Rules and Regulations!

“You’ll never get in trouble following orders.”

Commander Tom Kramer - US Navy

Part Two of our meeting involved the running of the ship, our responsibilities, and of course, safety.

Safety

“One hand for the ship and one hand for yourself.” Onboard, the 3-Point Rule is in effect. Even at dock the ship can move, so you should always have three points of contact. (Two feet and at least one hand on a railing.)

“Only YOU can prevent...!” Fire, not drowning, is the biggest hazard on a ship. Smoking is only permitted in the designated area outside the ship and at the stern.

“If it’s too hot, stay out of the kitchen!” This is an open ship, but for obvious safety reasons and to avoid interfering with operations, certain places like the engine room, machine shop and galley are generally off-limits. Inform the bridge of your activities and always wear your safety vest and helmet while on the fantail.

Health

“Wash your hands!” Living in close quarters requires good hygiene. Wash frequently since you are constantly touching doors and railings. Immediately report any injuries to the health officer “Doc.” Know the signs of seasickness and immediately seek attention if you feel dizzy, nauseous or groggy. Stay hydrated.

Courtesy

“Can you hear me now?” We were reminded that we will be working where people live (the crew), and to observe others’ privacy whenever possible. Earplugs were on our list of *Items to bring* and one quickly learns that there is always inherent mechanical noise on a ship in addition to any work sounds. Since the ship is metal, any vibrations from the constant scraping, grinding and chipping of rust by the maintenance crew can often be heard reverberating through several decks to the sleeping quarters; sounding like your worst nightmare about visits to the dentist. (And they start work early, and work late!)

Meals

“Eat it and beat it!” To paraphrase that old Army saying, a ship *sails on its stomach* too, and the first order of the day was food, meal times and consideration of the galley staff. Meals are closely spaced and on a tight schedule because of rotating schedules (Someone on the ship has to be maintaining power, scientific equipment and our course every minute.). Also, the kitchen is in a constant state of *clean-up and prep* for the next meal, which means the small staff must start at “0-Dark-Thirty” hours (Well before dawn) and is not finished until evening. Mealtime is not the time for chit-chat. Eat and make room for others who are coming off duty.



Many WWII veterans admit that their motivation for joining the Navy was to be assured of warm chow. (And a dry bunk instead of a foxhole!) Regardless of your culinary tastes and dietary needs, they are met at every meal on this ship.

The cuisine...in a word? Excellent!

For those who are tardy, sleep late, like to spread out their meals, or are delayed because of a sampling conflict or problem in the lab; the cooks are always considerate enough to leave out fruit, soup, leftovers, world-class dessert (On the rare event that any is left) and predictably, the old standby – peanut butter and jelly.

The Galley staff serves dessert - sweet potato pie!

A typical daily menu on the Brown:

Breakfast 0700-0800	Lunch 1100-1200	Dinner 1630-1730
Eggs to Order	Fish Chowder	Fresh Salad Bar
Crisp Turkey Bacon	Fresh Salad Bar	Grilled Pork Chops
Beef Steak	Steamed Shrimp	Sweet & Sour Duck
Cheese Omelets	Grilled Hamburgers	Corn Pudding
Hot Cakes/Syrup	Cheese Burgers	Stewed Cabbage
Hot Oatmeal	Steak Fries	Steamed Rice
Home Fries	Stir-Fry Veggies	Steamed Vegetables
Hot Biscuits	Hot Bread	Hot Dinner Rolls
English Muffins	Ice Tea/Fruit Drinks	Ice Tea/Fruit Drinks
Assorted Fruit Juices	Baked Cookies	Peach Shortcake
Assorted Milk	Ice Cream	Ice Cream

Emergencies

“This is a Drill!” The earsplitting ship’s bell keeps everyone aware of any serious problems. There are three signals you must respond to without hesitation:

Fire	Ten (10) second continuous ringing of the general alarm bell and ship’s whistle.	Assemble at your muster station with your life jacket for roll call.
Man overboard	Three (3) prolonged blasts on the ship’s whistle and alarm bell.	Maintain watch if on deck or assemble at muster station for roll call.
Abandon ship	Seven (7) or more short	Assemble at the assigned

	blasts followed by one (1) long blast on the ship's whistle and alarm bell.	lifeboat muster station with your survival suit.
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“HEL-LO Gumby” Everyone has seen or used a life jacket, but the Brown’s bright orange ones are specially designed equipment with the ship’s name on the back, reflector tape, an oversized whistle, and a strobe-light that is activated automatically when it comes in contact with the water. Since they are fairly thick, they also make good windbreakers when you are on deck; so there is little excuse not to wear them.

Survival suits are oversized orange neoprene “dry” suits like the ones divers wear. Putting them on during our weekly drills is quite an adventure for the first time, but this is serious business and we are all checked out by the Safety Officer. And yes, you do look like the cartoon character, especially when you are walking in your “Jumbo Immersion Suit.”



Abandon ship drill - Fitting survival suits

“The two-man rule” Any doctor will tell you that nothing is better for allergies than an ocean cruise, and the air here between the desert and sea is very refreshing. However, in the confines of the ship we must be aware of gases like Nitrogen and Helium that the scientists need to operate analytical equipment, and since the ship has large and powerful engines, Carbon Monoxide is always a consideration.

When working with these gases and in tight quarters, we were reminded to have a partner, while the Safety Officer trained us on the 10-minute rescue breathers in our cabins.



Emergency breathing device - Demonstration by safety Officer

Interesting observation: One sign that odorless, suffocating gases are present is that someone passes out while you are talking to them. (Certainly THAT is every teacher’s worst nightmare!). We are also issued an EEBD (Emergency Evacuation Breathing Device) which would give us 10 minutes of air to escape such a situation.

Feeling informed, safe and secure, we were given one very important final tip from the maintenance crew: “Please don’t flush anything down the head besides toilet paper and whatever your last meal was!” We are ready to go to sea.

Personal Log

There may be miles of cordage on a ship: *Line* (Thin rope), *Rope* (Thick rope more than 1-3/4 inches in circumference) and *hawser* (Really thick rope at least 5-inches in circumference). Hawsers are used to secure and tow the largest ships. As many as ten bow, stern, breast and spring lines, ropes and hawsers secure a vessel to the wharf.

Returning to the Brown after a long day hiking around and hoping to see some unusual wildlife during our last hours of “shore leave” I noticed the gang plank was moving back-and-forth appreciably, even though the harbor was flat calm. At the beach I enjoyed watching thunderous “overhead” surf breaking on the point and speculated about what sea conditions would be like at our rescheduled Midnight departure. Back in the harbor, the circular, movement of the ship was confirmation that there was a good long period swell refracting around the breakwater and setting the port’s water in motion.

Watching the ship’s lines tighten and slacken at regular intervals of about a minute, I imagined the Brown was telling us she was biting at the bit to sail!

Checking the lines I realized the hawsers had become a perfect roost for Inca terns; a bird I had searched for in vain at the shore - hoping to spot at least one before the end of my trip. The Inca tern (*Larosterna inca*) is the most distinctive of this gregarious group of seabirds. Rare elsewhere, it is fairly common along the coasts of Chile and Ecuador...and becoming increasingly abundant on the Brown! At night they outnumber every other bird in the port.



Brown at dock with birds gathering on lines

Birds of a feather flock together and this is certainly the case with terns. They roost, breed and fish in groups, often made up of different, but similar-looking, mostly grey and white species. Identifying them can be a challenge; except in the case of the dark grey Inca tern. Its red bill and especially its whiskered facial plumes separate it from its cousins, and all seabirds.

Terns are my favorite group of birds and they have a cat-like aloofness when it comes to tolerating people. Sailing home from fishing trips in New Jersey waters, I usually have plenty of bait left over (Testimony to my questionable fish-finding ability.) and I soon learned that our common and least terns in Sandy Hook Bay are happy to dive down and perform fantastic mid-air catches of the bait I toss off the stern. These sharp-eyed hunters never seem to miss, and for me this is often the best part of the trip.

I thoroughly enjoyed my night with the whiskered terns, photographing them and watching their



Terns on the hawser

behavior. The birds were most crowded on the thick hawsers at the bow and stern. (Unlike perching birds like robins, most seabirds are flat-footed and can't grip a perch.) There are two lines at each end of the ship (An inner and outer) and they behave differently - the outer lines stretching more but less gracefully, and occasionally shuttering. Also, the inner lines were better lit by the harbor lights than the outer lines.

What follows is some of my *data-driven research* on the topic of Inca terns: It appears that some subtle differences encourage a definite hierarchy in the arrangement of the birds on the lines. Between 70-75% of the group were adults (with their fancy plumes and dark coloration), however they were not distributed randomly. Almost all of the birds on the inner lines were always adults, and the juveniles (brown, "clean-shaven" and with less colorful bills) were banished to the outer lines.

I monitored them for many hours and the whole group regularly would take off, even if only a few were disturbed (A typical tern behavior sometimes called "panic flights."). They would circle out over the harbor, squawk a bit, and then return to sort

themselves out at the lines. Adults would always jockey for space and replace any younger birds settled in the prime locations by hovering over them and making a few squawks and stabs with their bill. I never saw juveniles dislodge adults.

I also noticed some courtship behavior with the terns. This involves catching a small fish and offering it to your prospective bride; and since it only occurred between adults, I assume that like the gulls at the beach, they were approaching their breeding season too. At one point before it was too dark, a large gull wandered across the parking lot and was immediately dive-bombed and chased away (More typical tern



Balancing flat-footed Inca tern

behavior near colonies). There may even have been birds on eggs inside the few select hollow openings in the wharf's walls, since individual birds stationed themselves at the dark entrances, defending them from others that tried to land there.

Hmmm...Are Inca terns cavity nesters...cliff nesters...beach nesters?

There is so much to learn about Inca terns....So many birds, so little time!

Words to learn today:

Nautical term	Meaning	Origins
Alpha		
Bridge		
Bow		
Fantail		
Galley		
Head		
Port		
Starboard		
Stern		

(Answers: In the next log #3)