



Montana Teacher at Sea



Richard Jones, Montana's Teacher at Sea

This Website has been created to give students and educators access to the "Montana Teacher at Sea". Richard Jones is a Physics teacher from Billings Senior High who spent two months last summer (June 2, 1998 - August 3, 1998) aboard the NOAA research ship KA'IMMONA. The overall mission of the cruise, classified as TOA/GOALS, was to improve understanding of the role of the tropical ocean in modifying the world's climate. The ship deployed, recovered, and serviced deep sea moorings in the TOA (Tropical Atmospheric and Ocean) array that measures ocean currents, ocean temperature, and atmospheric variables throughout the equatorial Pacific. These measurements were transmitted in "real time" to the NOAA Pacific Marine Environmental Laboratory in Seattle and are available to researchers around the world working on a wide variety of climate studies including El Nino research and weather prediction. In addition to the buoy operations, the ship measured upper ocean currents, sea surface temperature, salinity, carbon dioxide content (for Scrips), Carbon 14 and chloryphill (for MBARI), and upper air atmospheric soundings while underway. Other programs conducted during the cruise included an ongoing census of barnacles (for Bloomsburg University) and marine life that inhabit the recovered moorings. Richard uploaded daily journal entries, digital photos, and other data collected during this unique research opportunity designed to give K-12 teachers first hand experience "doing science".

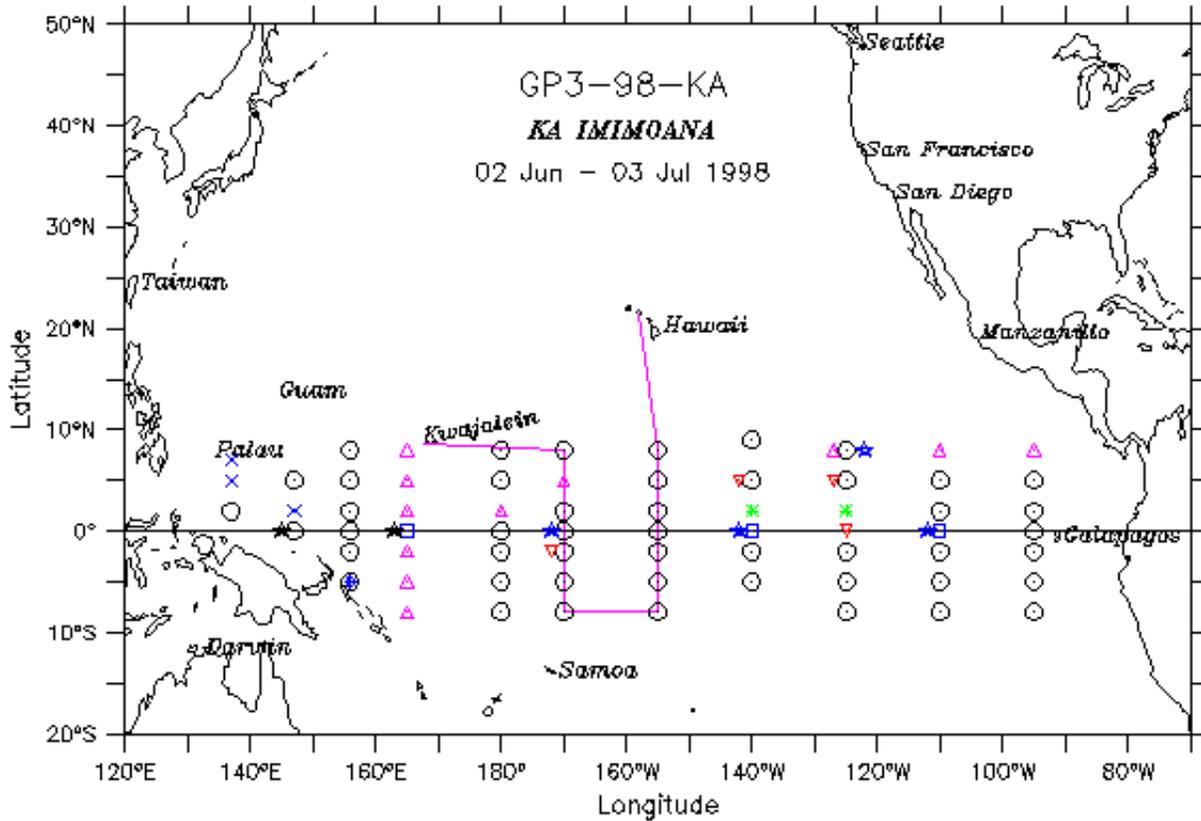


Daily Journal Entries and Related Links:

June 7 - 13	June 14 - 20	June 21 - 27
June 28 - July 4	July 5 - 11	July 12 - 18
July 19 - 25	July 26 - August 1	August 2 - 16
Planned Route	Related Links	OPI Homepage



Montana Teacher at Sea Planned Route



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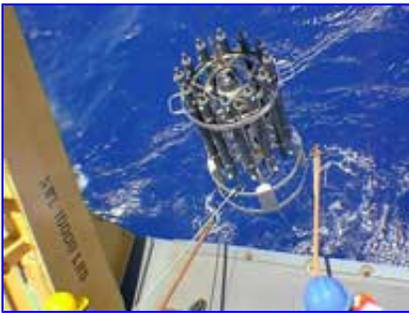
Montana Teacher at Sea Journal Entries June 7-13, 1998

June 7 - Deep CTC

2200GMT 6N 155W It is about 11:30am lcl and we are running our first deep CTD. Yesterday evening at about 7:30pm we ran our first CTD to 1000m shortly after our first buoy op. The buoy at 8N had a faulty anomometer and humidity sensor so those were replaced by the Chief Scientist (Linda Stratton) and head equipment specialist (Rick Miller). The seas were moderate with an 8 to 10 foot swell from 080 degrees. The CO brought the ship to with in a 1/4 mile up wind of the buoy so that we could drift toward the work crew on the buoy. It is amazing that you can find a buoy in the middle of the ocean...ain't technology grand! With out GPS and Radar there is no way we could do it so easily. At about 2:45am lcl I got up to work the computer for the second 1000m CTD. Basically once all the computers are set up and working all one has to do is to radio the winch opperator when and where to stop so that sample bottles can be filled. It takes about an hour or so for a 1000m cast. The current cast is to 4000m and that takes about an hour and a half to get to depth at 60m per minute. The first 50m is done at 30m per min the next 150 at 45m per min and then the rest is at 60m per min (mpm). On the way back up there are 12 samples taken. The most critical are 200, 150, 100, 60, 40, 25, 10, 0. The other samples are taken at depths that depend on the depth of the cast, but there is always on at the bottom. The computer sends a signal to the CTD to "fire" a switch that closes the appropriate sample tube. If everything works right then you have 12 good water samples that are isolated by depth. The data from these samples is being analysed by Pete Strutton (MBARI) and Kate Treese (Bloomsburg University). Pete is looking doing Carbon 14 work, Nutrient work and Productivity using Chlrophyll. Kate is doing side work for Scripps looking at CO2 and studing barnacles on the recovered buoys. We will do at least two more CTD casts today, one at every degree of latitude and do our first Buoy recovery tomorrow in the am.



June 8 - CTC at Dawn



This morning starts with a CTD at day light...except that it is raining and only a few streaks of light are coming through in the east. It is 0645 and we are going to 1000m for this cast at 3N. there was another cast at midnight at 4N. we will do another 1000m cast at about 1300 when we reach 2N. While at 2N we will also do a Buoy Recovery and instrument swap. We will spend most of the day at 2N and likely get underway at about 2000 or 2100 for our next CTD at 1N.

June 8 - Buoy Op

Today we a very busy one since we recovered the ATLAS/TAO Buoy at 5N 155W and deployed a new one. We are actually in the middle of the deployment as I write this message. I needed to take a break since we ave been at it consistantly since about 0800 this morning.

It is now 1630 lcl and I have about a half hour till we drop the anchor of the new one. The anchors are a stack of five or six old train wheels. I worked on one of the cable reels on the recovery and on the thremistor cable on the deployment. Now the crew is running out about 4000 meters of nylon line to secure the buoy to the bottom. On the recovery several of the crew used the time to fish for Yellow Fin Tuna (Ahi). They caught six 20+ lb fish...it looks like we will be having a BBQ soon.



June 9 - Approaching the Equator



Montana Teacher at Sea Journal Entries June 14-20, 1998

June 14 - On to 3S and beyond



We have finally finished the recovery/deployment for 2S; 155W. It is now 1830 lcl and we started at 0800 this morning. I was fortunate to actually go out to the buoy and help remove the anemometer so that it wouldn't be damaged during the recovery. We had to circle the buoy for about 15 minutes because the release had not worked and we were waiting for the hydrosonic release to signal the ship that the buoy was free of the anchor. Once the computer received the confirmation we came back in and started the recovery.

Something that I never expected to experience was standing on a buoy in the middle of the Pacific Ocean with 4900 meters of water below and 1000's of trigger fish schooling around the bridle of the buoy. No wonder that the fishing is so great around the buoys. This is actually a problem because several of the buoys in the array have had the anchor lines fouled by fishing line (not what we would use back in Montana, these guys use 100 lb test or greater) and hooks that are about the size of a nice Brook Trout! This stuff really makes the recovery more interesting for the people knocking off the "fistgrips" shackles with an air wrench and the person on the capstan winch who keeps tension on the line (this is one of the jobs that I did today) and cleans the sea slime off the line too.

Now that we are almost done with the second week of the cruise I am getting to experience more and more aspects of the whole operation. I also set up the shackles that mate the nylon lines. It is amazing how much has to happen to make something like a recovery/deployment work. If there was ever a great example of cooperative working it has to be on a ship! Cooperation is even evident during the crews recreational fishing. Everyone lends a hand when a fish is on, especially if it is a Tuna or Mahi. Today while we were running the line out for deployment one of the engineers, Wade the Oiler, caught a 5+ foot White Tip Shark and four people were right there to help. The Sharks had spent most of the day just cruising around the Ship, so it was pretty likely that one would get hooked. It is kind of spooky to realize that to them you are just a big fish that would really be easy to catch...if you just fell in.

We just finished a 200 meter CTD for Biological samples while the anchor settled. We are on to check to electronic signal from the buoy and then we are on to 3S for a 1000 meter CTD cast at about 0200 lcl and then on to 4S for the same around 0900 or so. Probably some time in the early afternoon we should reach 5S where we are going to have a buoy ride and CTD then it is possibly on to 8S; 170W.



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June 15 - 4S and 5S; 155W

Early this morning, about 0130 Pete Strutton did a 1000 meter CTD cast at 3S; 155W. This morning at 0830 I did my first complete 1000 meter CTD cast. Of course Dennis Sweeney the Senior Survey Tech was right behind me to make sure that I did everything according to the plan. It is amazing how many steps are involved in doing on of these casts.

The CTD itself has to have all the bottles cocked, the pressure transducers need to have the protective syringes removed, the winch had to be unpinned, the slack needs to be taken out of the cable, the safety gate needs to be taken down, safety lines need to be taken off the CTD (but you better have yours on), the tag line needs to be in place, the computer has to be in the right program and recording, the CTD power unit needs to be turned, the VCR needs to be in record, and the on deck readings have to be recorded. Now you are ready to lower the CTD to just below the surface to get the surface measurements, make sure that the power unit is reading 11 not 10.



Now tell the winch operator to lower at 30 meters per min for the first 50 meters, 5 MPM for the next 150 and then 60 MPM for the rest of the trip down. At the bottom make sure that you record all the data, including weather and sea conditions, and then start firing the bottles on the trip back up. Once the CTD is back on deck, take water samples from all the bottles for salinity experiments and hope that there is enough water for all the other experiments being done with these samples. Sometimes the samples from ten meters and the surface get depleted and someone just doesn't get data for that CTD.

The next scheduled CTD is at 1630 hrs today (in about an hour) and I am planning on doing this one too. It is best that I do them now so I will know how to do them on my own on at 0200 some morning very soon...this is not one of the favorite jobs, but one that every scientist on board must do.

Beautiful, but really warm today. Probably since there isn't much wind for a change. The seas are fairly calm, with only ground swells and small ripples. There is hardly any sensation that you are at sea until you look out the window and only see blue, dark and light with a few white clouds thrown in for fun.

June 15 - The Bitter End

Ask a question and you will get an answer! Being the curious type I asked Steve Foye our Deck Utilityman why there was a sign up on the forward bulkhead by the ships store that said "Bitter End". He then explained the whole concept of anchor chain measurement and the need for a weak link or the "bitter end" of the chain. The anchor chain is measured in "shots" which is fifteen fathoms. Since a fathom is six feet, a shot is 90 feet. Each shot is connected by a detachable link and on either side of this link are links painted to identify the shot.

The colors are Red, White, and Blue repeating until you get to the last shot which the whole length is yellow for "caution" and the last shot is painted red for "danger". The "bitter end" is a weak link that connects the anchor chain to the ship. If the chain were to get away from the deck crew this link would break before the ship was damaged by a runaway anchor. The port chain is 9 shots and the starboard chain is eight. When we were anchored off Kiritimati Atoll (Christmas Island) we were in the yellow so it was seven shots deep, or 630 feet deep about 2 miles from shore. So when someone says that they will stick with something to the "bitter end" you will know where the terminology came from. You will also know that to take something to the bitter end means it will break when you get there!

In the next few days while we are steaming to 170W I will try to shed some light on what a ship is really like. How do we have enough fresh water, how do we fight a fire with out using so much water we sink the ship, how do we generate enough electricity...there is no extension cord back to Honolulu! I will also try to find out the origins of some other the other terms used on the ship...

June 16 - Sea Legs? And the Ship's Store

In response to a message from Ken Miller: Strange term "sea legs"!

It is pretty interesting to think about walking through the ship's passageways leaning one way then the other. It really looks strange when someone is down the hall, either walking toward or away from you because it looks like they are going to fall over. This ship has a fairly flat bottom which generally makes for a rougher ride, but she is in fact pretty stable since she has stabilizing tanks of salt water in the hull that act as inertia dampers to the roll of the ship. Water has a lot of mass and likes to stay at rest...resisting the roll caused by the ocean. Boy it is scary I can find Physics almost anywhere!

We are also really fortunate to be close to the equator where "the smoothest seas in the world" reside. This seems to be a function of the geography and the upwelling that occurs here. The last three days have been really smooth, with very small wind ripples and 5 - 10 foot ground swells. When we first started the cruise the seas were a little more lively and walking was a contact sport...contact with the passageway wall and bulkheads. The ships center of gravity is about 17 feet above the waterline and aft of midship so the best ride is actually toward the stern, where all the heavy lifting cranes and capstans are located

. Another remarkable thing that I have noticed about sea legs is that while you are working on deck you hardly even notice the roll of the ship. It is really noticeable though when you come inside and head some where like the mess deck. Sleeping is another experience. If the seas aren't too rough, the rolling actually seems to "rock" me to sleep. On the other hand, we had fairly active seas just before we made our detour to Christmas Island and it was really a challenge to stay in my rack. It is a good thing that there are side rails on the bed or I am sure I would have ended up on the floor. One suggestion that several of the crew have regarding sleeping in rough seas is to get a spare pillow and put it under your mattress, to sort of wedge your self in bed between the bulkhead and the mattress.



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The second subject of this little note is The Ship's Store! I have never seen such a small, under supplied mini mart in my life...but with out it the crew would likely go bonkers. Every evening from 1945 to 2000 hrs Wade Crane the Oiler becomes Wade Crane master salesman! K-mart hasn't got deals as good as you can get when Wade runs the Ship's Store. Gee, I got 5 Tootsie Pops for \$.35 ! Such a deal. Actually the store has a pretty good selection of stuff. You can buy almost any type of pop by the case, probably twenty kinds of candy, four types of microwave popcorn, tee-shirts, coffee cups, toothbrushes, fishing tackle, but probably the best thing doesn't even have a price....it is the evening social center of the ship. Since it is adjacent to the crew recreation room, most of the crew frequent it between the evening movies. Yep, that's right movies. There must be 250 movies on board, everything from "A Fish Called Wanda" to "Star Trek: First Contact". We have at least two movies per night plus four other channels that can have TV programming or other movies. I might catch up on all the movies I haven't seen in the last four years since my son was born. That fact still doesn't make up for the time that I am missing with him.

June 17 - The KA in the News

Steve Meredith mentioned that he saw the KA on NBC news yesterday. This ship seems to be the one that gets most of the press since its mission is Tropical Atmosphere Ocean Array work. The TAO Array is instrumental in gathering data for El Nino research and since this is the US ship that is responsible for the tropical Pacific the Ka'Imimoana gets a lot of news coverage. On the last cruise the National Geographic Arranged for Photographs for an up coming issue, the cruise previous to that had a crew from the Nova series and the cruise before that was a BBC crew. The Nova special is scheduled to come out in November. The NBC folks were on a cruise about 6 months ago when the same PMEL staff were on board. It is very likely that if it was a woman working on the buoy, it was probably Linda Stratton our chief scientist. She makes two cruises per year, usually 6 months apart.

We are currently cruising toward 8S; 170W for a instrumentation swap. The transit between stations takes about three days + and it has gotten to the point where most of the science folks are trying to find things to do. It is amazing how much I longed for days like this during the school year...a day to just relax and do nothing but read or play "free cell" on the computer. Now that I have one of those days I have to find something to do...strange isn't it! Yesterday was about the same so I painted anti-fouling paint on the bottom half of the tolroids of the buoys. Hot work, I never really thought about having my hands sweating to the point where perspiration would actually drip out of the rubber gloves. No wonder people wear rubber suits to loose weight!



Today the other science folks beat me to the painting...said we have to spread the work so we all don't get bored silly.. The deck crew, never is at a loss for work on a ship! They have been grinding on the deck for the last two days, making it really noisy in the ship! Ear plugs are generally pretty helpful and most folks are wearing them just to lessen the roar. Painting and grinding are never done on a ship, it is a full time job to battle the effects of salt water on metal.

Current Conditions and Position 0315 GMT 6/18/98;1615 lcl 6/17/98 06:39.34S; 163:21.33W Vis 15-20 Km 3/10 cloud cover cumulus Humidity 67% Barometer 1009.4 mb wind 10 Kts @ 100 degrees Temp 32 degrees c Seas 1.5 - 3 meters @ 080 degrees Surface sea temp 30 degrees c

June 18 - Rainy Days!

We have had almost continuous rains today. Sometimes the rain has been falling so heavy that when the ship rolls the water on the upper decks runs off in sheets like a waterfall. You have to be really careful walking up the stairs, it is not so much that you will get wet it is the force of the torrent could knock you down. Believe me you wouldn't want to fall on the deck or the stairs since they are metal covered with anti-skid treatment and a layer of sand right in the paint.

We are experiencing a similar region that in the northern hemisphere is called the ITCZ for Inter Tropical Convergence Zone. This is a region around 6 degrees where the weather seems to be especially rainy. Between heavy showers, the air is almost thick enough to cut. We actually have 100% humidity and when it is not raining it seems almost misty. When walking outside your glasses fog up it is so humid. Kinda' the same thing that happens in Montana in the winter when you come in side after driving to work when it is 20 below! But in this case it is going from 70 inside the ship to 90 outside with 100% humidity so the moisture condenses on the cooler glasses. Just like an ice cold soda on a hot Montana summer day...which from what I understand there haven't been too many yet this summer...it must be El Nino!

I did actually get a chance to do some work on the buoy bridles after lunch. I removed the old zinc anodes and ground off the corrosion before placing

new zinc's on. Using a grinder is generally not a problem, but today with all the water on deck and the off-and-on rain I really had to pay attention. You really don't want to get hurt out in the middle of nowhere.



The ship is really and interesting dynamic. It has to provide all the services of home in a very hostile environment. The ship runs on diesel-electric motors. There are four diesel generators, three of which are generally in use, that produce AC current which is then converted to DC for use in the ships two 800 horsepower electric motors. This makes the ship relatively quiet. This is good since the original mission of the Navy ship Titian, now the NOAA ship Ka'imimoana, was Anti-Submarine-Warfare. So the ship needed to be quiet. The diesel generators also produce all the AC current needed for lights, computers, cooking, and water production. This ship doesn't have large fresh water tanks that are filled in port, this ship has two large evaporators that evaporate the water out of sea water. As long as the evaporators keep working we can use all the fresh water we want...which means after a long hot day you can really enjoy a nice long hot shower. The only real limitation on the ship is how much fuel she can hold and how much food can be stored. The general length of a cruise is 30 days. Some cruises are a little longer but in general they are kept at 30. When the Navy had this ship it wasn't uncommon for her to be at sea for 60 days at a time. I guess if you are at sea for 30 days at a time Ka'imimoana is a good name for the ship...it means "The Ocean Seeker" in Hawaiian.

June 19 - Almost Lost E-mail!

That is right. We woke up today to find that there had been a short in one of the electrical control panels that blew out most of our communication systems on the ship. All ships phones, the computer network, and some electronic monitoring devices for the winches were all pau (done in Hawaiian). Apparently one of the wires inside of one of the large electronic racks rubbed bare and grounded out. This caused some other wires and the power unit on one of the computers to fry. I guess this is not that unusual, that is why there is usually an electronics technician on board. Since we lost our ET we were really scrambling. One of the problems was that our Satellite Phone was part of the computer that got fried, so we had no way to call a shore base ET to tell us what to do to fix the problem. Again a great example of team work in action. The engineering department, the XO, and the CO worked through the problem and after about six hours had repaired the system to the point where we can at least talk to the outside world again. Even if they couldn't have fixed the problem we wouldn't have really been out of contact. The ship has a HF radio that can send and receive messages at about 1200 baud. It is to be used only for ship related communication so e-mail would have been out until Kwajalein. Living on land you never really appreciate how important all the infrastructure systems are. On ship everyone depends on that infrastructure, and will do everything possible to maintain it.



On the lighter side. I went out on the "tube swap" this morning. Just as we loaded into the Rib the sky opened up and the rain came down in sheets...at least it was warm rain! It was amazing to sit in a boat in the rain in the middle of the ocean getting soaked. I was going out to take pictures of the swap, with the hope that one would be good enough for the web page. I had to put my digital camera in a zip lock bag, and hope for the best. After about a half hour bouncing around the buoy in the rain, it started to break up and we were treated to one beautiful rainbow that framed the KA. I really wish that I had a wide angle lens! I got a decent picture but only half of the rainbow shows up. When I get back to Montana that will be a picture that I will put in the NOAA'S Ark folder.

I would send photos from the ship except that it costs about \$10.00 per photo and on a teacher's salary that can get rich really fast. I ended up taking about twenty images. I made copies of them for the PMEL Scientists and then loaded them on to the Survey Techs computer. He will pick and choose from those. If one of my pics gets selected I will let everyone in MT know. After our return to the ship, and a quick change into dry clothes it was time to finish painting the tolriods. We did a couple of CTD's today. The first was at 8S; 170W and the second was at 7S; 170W. We have another scheduled for around midnight at 6S and then tomorrow we will do a recovery-deployment at 5S; 170W and a CTD. It looks like we will spend the better part of a day at 5S.

June 20 - On The Front Lines!

Yes we are the "soldiers of science" on the front lines of research! Okay, you probably think I have been out in the sun too long. Today was one of those days where the team really clicked and everyone was just having a great time. We were doing a recovery-deployment at 5S; 170W, and actually were getting things done remarkable fast. You have to understand that when you are basically thrust into a closed environment with 24 strangers, humor is really a great way to reduce stress. The level of silly banter has continually increased since the start of the cruise, to a point where we all participate. Today, while we were running the t-cable and the neilspin cable back into the water, Linda Stratton said that we were the soldiers of science. Of course she had the air gun in one hand and nylon tie clipper in the other while she said it. Linda, Denise Kester (GVA - General Vessel Assistant) and I were standing on the fantail putting the fist grips and nylon ties on the cables, just BS'ing when Linda started on her discussion of how we were fighting the elements and risking life and limb for the cause of science. That's when she came up with her idea that we were the "Soldiers of Science". Considering some of the weather and other risk involved with ship board research she is probably not that far off. Not many teachers get the opportunity to be on the front lines of research and science. I feel very fortunate to be here. I would highly recommend this cruise to any teacher in Montana. I know that the KA can use a teacher at sea on all of her cruises. In October the in port will be Fiji! Keep it in mind. Start working on those administrators now!!

Today was like most at the equator, mid 80's mostly sunny. Another day in paradise. The fact that the humidity is about 85% would make it not so comfortable if it weren't for the 15 knot trade winds. With out the wind it would be really uncomfortable. We started the day with a 1000m CTD at 0530 lcl and then followed that with a recovery-deployment starting around 0800. We finished up the deployment at about 1730 lcl. While the anchor was settling we ran a shallow (200m) biological CTD, and then left station at about 1820. It is now about 1920 and I am witness to yet another beautiful sunset. I can sit at the computer and type my messages while watching the sun (deep orange) sink slowly below the horizon. It must be El Nino! No seriously, I never thought that the sunsets would be this fantastic out in the middle of the ocean. But with all the fires burning in Asia, and the salt air, the colors are amazing. I have probably taken a dozen sunset images already.



Current Conditions and Position 0625 GMT 6/21/98 1925 Lcl 6/20/98 04:48.39S; 169:59.45W winds 17.5 kts @ 104 degrees humidity 74% barometer 1007.3 mb air temp 29 degrees c 84.2f sea temp 29.8 degrees c 86f sea swell 6-12 @ 085 degrees 4/10th cloud culumus, cirrus

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Yesterday we completed the 2N Buoy recovery/deployment at 2330lcl and then did a 1000m CTD cast. I didn't stay up to do the 2N CTD since I had worked most of the day on the mooring op. I helped wind line and cable on the recovery and manned the T-cable on the deployment.

The deployment was a little more interesting this time because some unexpected events occurred. The first was the swell of the sea made it very difficult for the deck crew to bolt the T-cable to the anchor line. A tag line was needed to keep the finished line close to the ship. The second unusual thing was that as we were about to drop the anchor off the stern of the ship a large swell hit the ship causing the quick release shackle to release early...dropping the anchor and causing the securing line to fly toward the ship at about head level. The securing line went flying over the top of the A-frame and then we had a real mess to deal with. Lucky that no one was hurt. Several of the deck crew said this was the Buoy From Hell! Buoy ops are usually a much smoother operation. This morning we did another 1000m CTD cast at 1n at about 0700lcl and now we are doing another 1000m CTD at 30min N.

We should be at the Equator in about 3 hrs or 1400lcl. We are planning a Buoy ride to exchange some of the electronic monitoring equipment for MBARI but not a mooring op. From what I have over heard the crew has a little ceremony planned for the pollywogs on board...me included sometime around the time we transit the Equator.

June 9 - Crossing the Equator



I thought that since our Buoy Ops have been put on hold for a couple of days I would take the time, since I actually have some today, to say hi and bring everyone up to date. Yesterday at about 1400 hrs we had an abandon ship drill and then a short video on eye protection. Several of the Pollywogs aboard thought we were about to get our initiation...but we have a sly CO and he is keeping us in suspense!

We crossed the Equator at about 1500 lcl and did an equipment swap on a MBARI (Monterey Bay Aquarium Research Institute Buoy at 0 Lat. This buoy was a real challenge for the two guys that went out to work on it because it was partially submerged. The Tolroid "doughnut" was awash and most of the swells were coming about half way up the tower (about shoulder level on me). Both Peter Strutton from MBARI and Rick Miller from PMEL/NOAA looked like drowned rats when they finally got back to the KA at about 1830 lcl. I had really wanted to go out on this "Buoy Ride" but after watching them for an hour or two through binoculars I think that it was definitely not a fun place to be. While the ship was waiting for the return of the Rib and the buoy riders, several of the crew went Tuna fishing. Two of the guys from the engineering department Frank James (3rd Assistant Engineer) and Wade Crane (Oiler) spent about an hour fighting a couple of fair sized Yellow Fin. Both fish were over 60 lbs. A big fish in my book. But from what I have been told by our Navigation Officer Billy Campbell, these fish can get up to 300+ lbs. Wade donated his fish to the cook so we will have fresh Ahi tonight! After the equipment exchange we did a 1000m CTD cast at 0 and then headed to our next station at :30 min S to do another 1000m CTD cast around 2200 hrs lcl. Both these casts were routine and uneventful. The routine changed sometime after 2330 lcl.

June 9 - Medevac to Christmas Island

At about 2330 lcl last night the 9th of June the ship was turned around due to a medical emergency. We are presently enroute to Christmas Island which is about 15 hrs at max speed from our present position at 00:08.8N 155:50.5W. We have crossed back over the Equator and will re-cross again tomorrow to return to our planned cruise track. It seems that Christmas Island doesn't have any recreational facilities for the rest of the crew so this will be a "binocular leave" we will be able to see the Island but not actually go ashore. We are scheduled to get to the Island at about midnight and since the facilities are too small for the ship to berth we will need to send in the Rib. If the seas are rough we will wait till first light to send the Rib in. Once this little operation is complete we will return to the Buoy Ops. From what I have been told this is a pretty unusual occurrence...as one of the crew put it "it has to be a real emergency to stop Buoy Ops and loose \$20,000 a day till we are back on station.

June 10 - Christmas Island

We are currently anchored about 3 miles off Cook Inlet adjacent to London, Christmas Island. We sent the Rib in at about 0800 lcl to get the lay of the lagoon and pier. On the trip in the Rib ran aground "twice" and the prop was badly damaged so the operation of taking the Electronics Tech to the Island has taken on a new dimension. The Rib limped back to the KA at about 1/4 its normal speed and was used to ferry the evac person to the second Zodiac. He will be taken in on that smaller Zodiac and the Rib will be repaired on the fan tail of the ship. The prop will be replaced and the shroud will be pounded out.

It is very unlikely that any of the crew will actually get shore leave since things are getting a little more complicated. The initial hope was that we could have everything done by 1200 lcl. Since it is 1155 lcl that is really unlikely. Christmas Island is really an atoll, with the highest point the top of a rather large white church. I really can't tell how large the population is from the ship but I have seen several fishing boats. We have also had a half dozen or so small boats come out and check us out. It seems that large vessels are not allowed in to Christmas Island except in emergencies, so having the 224 foot KA off shore is probably a real event.



All the boats that have come by were no more than 20 feet long and usually had 5 or 6 people aboard who all waved and smiled at us as they circled around the KA. As always on the ship plans change and we are now scheduled to go back to the equator Buoy and replace it since the CO is concerned that it is going to sink in the next storm that passes over its mooring position. We are about 20 hours from that Buoy so it will be about a day to get there once we depart Christmas Island.

June 11 - MedEvac

We are just now getting underway from Christmas Island at 1430 lcl. As is the case with any operation where type A personalities are in a type d environment things just don't go as you want. The people on Christmas Island work on their own time schedule and nothing is done in any big hurry. Schedules and the like are not something that is a big deal. This is contrary to the nature of the folks who are running the ship...they like everything to go according to plan and within the proper time frame of their schedule. We had originally planned on running the Rib ashore at first light but that was postponed because the local folks don't really get going till after 8:30.

Once the Rib got to the pier after running aground twice and ruining the prop the ships doc, Xo and three crew waited around till the local doc could be found. After the two docs got to exchange notes the local doc wanted to talk with someone back in the US. Well needless to say just calling collect didn't work! It turned in to a real "class a" phone tag event. The US docs called the local doc but nobody picked up the phone, the local doc called the US docs but they were calling the Island, then the Island docs fax was tying up the line. Eventually the ships Co told our doc to tell the island doc to go to his house and wait till the US docs called at X time. Once all the communication stuff was cleared up it was time to make reservations for our Electronics Tech (ET) to get off the Island. It seems that there is a weekly flight off of Christmas for Honolulu which is in the next Wednesday so the CO, the local doc, the US docs, and the ships doc decided that it was soon enough to get the ET home and they wouldn't need to send in a C-130 from Hawaii...this is still a very real and very expensive possibility and the ET will be kept under observation until his flight out. If he stays stable there will be no need for the C-130. Until a cat scan etc. can be run on our ET, the problem that has been bothering him for the last week will remain unknown.

His symptoms are acute pain in the left shoulder that codeine hasn't been able to deaden. The ET found that if he placed his arm in a sling and secured it to his chest with the hand about neck level he could at least sleep. The ET said it felt like a case of Bursitis like he had in a knee a few years back...nothing that a couple of cortisone shots couldn't fix! The only problem cortisone is that after a week or so it will wear off....and in a week or so we will be about five days cruise from the closest land. I can say that I was disappointed to not be able to go ashore here but after I say what happened to the prop on the Rib I can understand why the CO doesn't want to make a bunch of trips back and forth.... News flash!! we are still close to Christmas Island, we pulled up the anchor at 1430 and now it is 1500 and we still haven't headed out! It seems that the local doc wants the ship to send in some drugs for the ET. For this day this is about par for the course. If anything big happens I will send an additional message. The longer we stay here the later we get back to 0 lat to fix the submerged MBARI Buoy. What time we lose on this Op will be made up by skipping several CTD's and possibly a mooring op.

June 12 - Buoy Recovery @ 0 N 155W

At about 1330 lcl we reached the partially submerged Buoy that we visited a few days ago. The folks at PMEL (Pacific Marine Environmental Lab) in Seattle decided that since this buoy is of particular importance due to its location at the equator and all the special MBARI equipment on board it would be best to change out the tolroid. There was some concern that under the "wrong" conditions this buoy could sink and everyone (tax payers) would be out about \$12,000 for the TAO Buoy and about \$50,000 for the MBARI research equipment. That is about twice the average Montana teachers salary tied up in one buoy!



It is now 1900 lcl and we have just about got the tower and bridle transferred from the old tolroid to the new one. It is likely that 4 glass balls (floats) will be added to this mooring to ensure positive buoyancy. We pretty much worked through dinner and came down to the mess hall two at a time so that there would be enough hands on deck to finish bringing up the nylon anchor line. At about 1730 the last of the anchor line and the hydrosonic anchor release (a nice little \$5000 unit) finally came on deck.

The crew continued to work on the buoy change while I went to help the Senior Survey Technician drop a deep (4000+ m) CTD cast. All I did was watch the gauges and monitor the computer until the CTD was in the water. This is an important CTD because it allows for calibration of all the equipment to a great depth. We are currently in 4330 meters of water so this is a great cast. It is an amazing thing to watch the computer display real time data for the cast. The bottom temp is about 1 degree c compared to the surface layer at 28. At several of our previous stations there has been a great (textbook) example of a thermocline at about 100 meters. But here at the equator where there is upwelling of bottom water due to the heating at the surface and we actually have cooler surface temps than at 4 N. This upwelling also breaks down the nice thermocline we had at 8N through 2N. We are going to suspend buoy operations for the night since it won't really gain us any time to our next site so we will deploy tomorrow in the morning. Then on to 1 S to do the CTD we missed due to the Medevac.

June 13 - Buoy Deployment @ 0; 155W

Today started at 0800 lcl with the deployment of the MBARI/TAO buoy. This was an unusual mooring because the old tower and bridle from the previous mooring were re used. The old one had only been in service for about 6 months but was having some problems with buoyancy. The deployment of the new mooring took a little longer than it normally would because this time an extra length of (orange and gray) slack line was added with 4 glass balls (floats). The floats were added at the end of the anchor line just before the hydrosonic release and 50 m nylon were attached. this last section of nylon and the 5 railroad wheels are disposable. The 5 wheels make the anchor about 4200 lbs of dead weight that holds the buoy and 4000 + meters of anchor line in place. Most buoys at sea are drifters and a deep mooring like is used on the TAO/MBARI/ATLAS is very unusual. It took until about 1300 lcl to get everything set and drop the anchor. At 1330 we did a PRR profile which measures downwelling and upwelling by examining light in the 380 to 780 nanometer wavelengths. The PRR looks like a big black rocket. It is about 5 feet long and about 5 inches in diameter and has four fins on the aft foot. There are sensors on both ends so that light measurements can be taken as it is lowered to about 100 meters.

After the PRR we started a shallow (200m) biological CTD to collect water samples for nutrients, salinity and chlorophyll. We are just finishing up the CTD at 1410 lcl and now we will run by and check the buoy to make sure everything is running. If all is well with this new mooring then we will head for 1S 155W to do a CTD and then head on to 2S 155W to do another CTD and buoy recovery/deployment.

Today the weather was about as good as it gets! Sun, sun, and more sun. There was a breeze from the east at about 10 knots and very light swells from the east as well. It is a good thing that I have SPF 45 or I would be toast working in the sun for 5 hours. The doc makes a five gallon cooler of gator aid or some equally useful liquid, that the crew drinks down during their time on deck. I must drink 8 12 oz mugs of the stuff during the recovery or deployment. Keeping hydrated is one of the main concerns for the crew. It is amazing that you can get so dry around so much water!

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Montana Teacher at Sea Journal Entries June 14-20, 1998

June 14 - On to 3S and beyond



We have finally finished the recovery/deployment for 2S; 155W. It is now 1830 lcl and we started at 0800 this morning. I was fortunate to actually go out to the buoy and help remove the anemometer so that it wouldn't be damaged during the recovery. We had to circle the buoy for about 15 minutes because the release had not worked and we were waiting for the hydrosonic release to signal the ship that the buoy was free of the anchor. Once the computer received the confirmation we came back in and started the recovery.

Something that I never expected to experience was standing on a buoy in the middle of the Pacific Ocean with 4900 meters of water below and 1000's of trigger fish schooling around the bridle of the buoy. No wonder that the fishing is so great around the buoys. This is actually a problem because several of the buoys in the array have had the anchor lines fouled by fishing line (not what we would use back in Montana, these guys use 100 lb test or greater) and hooks that are about the size of a nice Brook Trout! This stuff really makes the recovery more interesting for the people knocking off the "fistgrips" shackles with an air wrench and the person on the capstan winch who keeps tension on the line (this is one of the jobs that I did today) and cleans the sea slime off the line too.

Now that we are almost done with the second week of the cruise I am getting to experience more and more aspects of the whole operation. I also set up the shackles that mate the nylon lines. It is amazing how much has to happen to make something like a recovery/deployment work. If there was ever a great example of cooperative working it has to be on a ship! Cooperation is even evident during the crews recreational fishing. Everyone lends a hand when a fish is on, especially if it is a Tuna or Mahi. Today while we were running the line out for deployment one of the engineers, Wade the Oiler, caught a 5+ foot White Tip Shark and four people were right there to help. The Sharks had spent most of the day just cruising around the Ship, so it was pretty likely that one would get hooked. It is kind of spooky to realize that to them you are just a big fish that would really be easy to catch...if you just fell in.

We just finished a 200 meter CTD for Biological samples while the anchor settled. We are on to check to electronic signal from the buoy and then we are on to 3S for a 1000 meter CTD cast at about 0200 lcl and then on to 4S for the same around 0900 or so. Probably some time in the early afternoon we should reach 5S where we are going to have a buoy ride and CTD then it is possibly on to 8S; 170W.



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June 15 - 4S and 5S; 155W

Early this morning, about 0130 Pete Strutton did a 1000 meter CTD cast at 3S; 155W. This morning at 0830 I did my first complete 1000 meter CTD cast. Of course Dennis Sweeney the Senior Survey Tech was right behind me to make sure that I did everything according to the plan. It is amazing how many steps are involved in doing on of these casts.

The CTD itself has to have all the bottles cocked, the pressure transducers need to have the protective syringes removed, the winch had to be unpinned, the slack needs to be taken out of the cable, the safety gate needs to be taken down, safety lines need to be taken off the CTD (but you better have yours on), the tag line needs to be in place, the computer has to be in the right program and recording, the CTD power unit needs to be turned, the VCR needs to be in record, and the on deck readings have to be recorded. Now you are ready to lower the CTD to just below the surface to get the surface measurements, make sure that the power unit is reading 11 not 10.



Now tell the winch operator to lower at 30 meters per min for the first 50 meters, 5 MPM for the next 150 and then 60 MPM for the rest of the trip down. At the bottom make sure that you record all the data, including weather and sea conditions, and then start firing the bottles on the trip back up. Once the CTD is back on deck, take water samples from all the bottles for salinity experiments and hope that there is enough water for all the other experiments being done with these samples. Sometimes the samples from ten meters and the surface get depleted and someone just doesn't get data for that CTD.

The next scheduled CTD is at 1630 hrs today (in about an hour) and I am planning on doing this one too. It is best that I do them now so I will know how to do them on my own on at 0200 some morning very soon...this is not one of the favorite jobs, but one that every scientist on board must do.

Beautiful, but really warm today. Probably since there isn't much wind for a change. The seas are fairly calm, with only ground swells and small ripples. There is hardly any sensation that you are at sea until you look out the window and only see blue, dark and light with a few white clouds thrown in for fun.

June 15 - The Bitter End

Ask a question and you will get an answer! Being the curious type I asked Steve Foye our Deck Utilityman why there was a sign up on the forward bulkhead by the ships store that said "Bitter End". He then explained the whole concept of anchor chain measurement and the need for a weak link or the "bitter end" of the chain. The anchor chain is measured in "shots" which is fifteen fathoms. Since a fathom is six feet, a shot is 90 feet. Each shot is connected by a detachable link and on either side of this link are links painted to identify the shot.

The colors are Red, White, and Blue repeating until you get to the last shot which the whole length is yellow for "caution" and the last shot is painted red for "danger". The "bitter end" is a weak link that connects the anchor chain to the ship. If the chain were to get away from the deck crew this link would break before the ship was damaged by a runaway anchor. The port chain is 9 shots and the starboard chain is eight. When we were anchored off Kiritimati Atoll (Christmas Island) we were in the yellow so it was seven shots deep, or 630 feet deep about 2 miles from shore. So when someone says that they will stick with something to the "bitter end" you will know where the terminology came from. You will also know that to take something to the bitter end means it will break when you get there!

In the next few days while we are steaming to 170W I will try to shed some light on what a ship is really like. How do we have enough fresh water, how do we fight a fire with out using so much water we sink the ship, how do we generate enough electricity...there is no extension cord back to Honolulu! I will also try to find out the origins of some other the other terms used on the ship...

June 16 - Sea Legs? And the Ship's Store

In response to a message from Ken Miller: Strange term "sea legs"!

It is pretty interesting to think about walking through the ship's passageways leaning one way then the other. It really looks strange when someone is down the hall, either walking toward or away from you because it looks like they are going to fall over. This ship has a fairly flat bottom which generally makes for a rougher ride, but she is in fact pretty stable since she has stabilizing tanks of salt water in the hull that act as inertia dampers to the roll of the ship. Water has a lot of mass and likes to stay at rest...resisting the roll caused by the ocean. Boy it is scary I can find Physics almost anywhere!

We are also really fortunate to be close to the equator where "the smoothest seas in the world" reside. This seems to be a function of the geography and the upwelling that occurs here. The last three days have been really smooth, with very small wind ripples and 5 - 10 foot ground swells. When we first started the cruise the seas were a little more lively and walking was a contact sport...contact with the passageway wall and bulkheads. The ships center of gravity is about 17 feet above the waterline and aft of midship so the best ride is actually toward the stern, where all the heavy lifting cranes and capstans are located

. Another remarkable thing that I have noticed about sea legs is that while you are working on deck you hardly even notice the roll of the ship. It is really noticeable though when you come inside and head some where like the mess deck. Sleeping is another experience. If the seas aren't too rough, the rolling actually seems to "rock" me to sleep. On the other hand, we had fairly active seas just before we made our detour to Christmas Island and it was really a challenge to stay in my rack. It is a good thing that there are side rails on the bed or I am sure I would have ended up on the floor. One suggestion that several of the crew have regarding sleeping in rough seas is to get a spare pillow and put it under your mattress, to sort of wedge your self in bed between the bulkhead and the mattress.



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The second subject of this little note is The Ship's Store! I have never seen such a small, under supplied mini mart in my life...but with out it the crew would likely go bonkers. Every evening from 1945 to 2000 hrs Wade Crane the Oiler becomes Wade Crane master salesman! K-mart hasn't got deals as good as you can get when Wade runs the Ship's Store. Gee, I got 5 Tootsie Pops for \$.35 ! Such a deal. Actually the store has a pretty good selection of stuff. You can buy almost any type of pop by the case, probably twenty kinds of candy, four types of microwave popcorn, tee-shirts, coffee cups, toothbrushes, fishing tackle, but probably the best thing doesn't even have a price....it is the evening social center of the ship. Since it is adjacent to the crew recreation room, most of the crew frequent it between the evening movies. Yep, that's right movies. There must be 250 movies on board, everything from "A Fish Called Wanda" to "Star Trek: First Contact". We have at least two movies per night plus four other channels that can have TV programming or other movies. I might catch up on all the movies I haven't seen in the last four years since my son was born. That fact still doesn't make up for the time that I am missing with him.

June 17 - The KA in the News

Steve Meredith mentioned that he saw the KA on NBC news yesterday. This ship seems to be the one that gets most of the press since its mission is Tropical Atmosphere Ocean Array work. The TAO Array is instrumental in gathering data for El Nino research and since this is the US ship that is responsible for the tropical Pacific the Ka'Imimoana gets a lot of news coverage. On the last cruise the National Geographic Arranged for Photographs for an up coming issue, the cruise previous to that had a crew from the Nova series and the cruise before that was a BBC crew. The Nova special is scheduled to come out in November. The NBC folks were on a cruise about 6 months ago when the same PMEL staff were on board. It is very likely that if it was a woman working on the buoy, it was probably Linda Stratton our chief scientist. She makes two cruises per year, usually 6 months apart.

We are currently cruising toward 8S; 170W for a instrumentation swap. The transit between stations takes about three days + and it has gotten to the point where most of the science folks are trying to find things to do. It is amazing how much I longed for days like this during the school year...a day to just relax and do nothing but read or play "free cell" on the computer. Now that I have one of those days I have to find something to do...strange isn't it! Yesterday was about the same so I painted anti-fouling paint on the bottom half of the tolroids of the buoys. Hot work, I never really thought about having my hands sweating to the point where perspiration would actually drip out of the rubber gloves. No wonder people wear rubber suits to loose weight!



Today the other science folks beat me to the painting...said we have to spread the work so we all don't get bored silly.. The deck crew, never is at a loss for work on a ship! They have been grinding on the deck for the last two days, making it really noisy in the ship! Ear plugs are generally pretty helpful and most folks are wearing them just to lessen the roar. Painting and grinding are never done on a ship, it is a full time job to battle the effects of salt water on metal.

Current Conditions and Position 0315 GMT 6/18/98;1615 lcl 6/17/98 06:39.34S; 163:21.33W Vis 15-20 Km 3/10 cloud cover cumulus Humidity 67% Barometer 1009.4 mb wind 10 Kts @ 100 degrees Temp 32 degrees c Seas 1.5 - 3 meters @ 080 degrees Surface sea temp 30 degrees c

June 18 - Rainy Days!

We have had almost continuous rains today. Sometimes the rain has been falling so heavy that when the ship rolls the water on the upper decks runs off in sheets like a waterfall. You have to be really careful walking up the stairs, it is not so much that you will get wet it is the force of the torrent could knock you down. Believe me you wouldn't want to fall on the deck or the stairs since they are metal covered with anti-skid treatment and a layer of sand right in the paint.

We are experiencing a similar region that in the northern hemisphere is called the ITCZ for Inter Tropical Convergence Zone. This is a region around 6 degrees where the weather seems to be especially rainy. Between heavy showers, the air is almost thick enough to cut. We actually have 100% humidity and when it is not raining it seems almost misty. When walking outside your glasses fog up it is so humid. Kinda' the same thing that happens in Montana in the winter when you come in side after driving to work when it is 20 below! But in this case it is going from 70 inside the ship to 90 outside with 100% humidity so the moisture condenses on the cooler glasses. Just like an ice cold soda on a hot Montana summer day...which from what I understand there haven't been too many yet this summer...it must be El Nino!

I did actually get a chance to do some work on the buoy bridles after lunch. I removed the old zinc anodes and ground off the corrosion before placing

new zinc's on. Using a grinder is generally not a problem, but today with all the water on deck and the off-and-on rain I really had to pay attention. You really don't want to get hurt out in the middle of nowhere.



The ship is really and interesting dynamic. It has to provide all the services of home in a very hostile environment. The ship runs on diesel-electric motors. There are four diesel generators, three of which are generally in use, that produce AC current which is then converted to DC for use in the ships two 800 horsepower electric motors. This makes the ship relatively quiet. This is good since the original mission of the Navy ship Titian, now the NOAA ship Ka'imimoana, was Anti-Submarine-Warfare. So the ship needed to be quiet. The diesel generators also produce all the AC current needed for lights, computers, cooking, and water production. This ship doesn't have large fresh water tanks that are filled in port, this ship has two large evaporators that evaporate the water out of sea water. As long as the evaporators keep working we can use all the fresh water we want...which means after a long hot day you can really enjoy a nice long hot shower. The only real limitation on the ship is how much fuel she can hold and how much food can be stored. The general length of a cruise is 30 days. Some cruises are a little longer but in general they are kept at 30. When the Navy had this ship it wasn't uncommon for her to be at sea for 60 days at a time. I guess if you are at sea for 30 days at a time Ka'imimoana is a good name for the ship...it means "The Ocean Seeker" in Hawaiian.

June 19 - Almost Lost E-mail!

That is right. We woke up today to find that there had been a short in one of the electrical control panels that blew out most of our communication systems on the ship. All ships phones, the computer network, and some electronic monitoring devices for the winches were all pau (done in Hawaiian). Apparently one of the wires inside of one of the large electronic racks rubbed bare and grounded out. This caused some other wires and the power unit on one of the computers to fry. I guess this is not that unusual, that is why there is usually an electronics technician on board. Since we lost our ET we were really scrambling. One of the problems was that our Satellite Phone was part of the computer that got fried, so we had no way to call a shore base ET to tell us what to do to fix the problem. Again a great example of team work in action. The engineering department, the XO, and the CO worked through the problem and after about six hours had repaired the system to the point where we can at least talk to the outside world again. Even if they couldn't have fixed the problem we wouldn't have really been out of contact. The ship has a HF radio that can send and receive messages at about 1200 baud. It is to be used only for ship related communication so e-mail would have been out until Kwajalein. Living on land you never really appreciate how important all the infrastructure systems are. On ship everyone depends on that infrastructure, and will do everything possible to maintain it.



On the lighter side. I went out on the "tube swap" this morning. Just as we loaded into the Rib the sky opened up and the rain came down in sheets...at least it was warm rain! It was amazing to sit in a boat in the rain in the middle of the ocean getting soaked. I was going out to take pictures of the swap , with the hope that one would be good enough for the web page. I had to put my digital camera in a zip lock bag, and hope for the best. After about a half hour bouncing around the buoy in the rain, it started to break up and we were treated to one beautiful rainbow that framed the KA. I really wish that I had a wide angle lens! I got a decent picture but only half of the rainbow shows up. When I get back to Montana that will be a picture that I will put in the NOAA'S Ark folder.

I would send photos from the ship except that it costs about \$10.00 per photo and on a teacher's salary that can get rich really fast. I ended up taking about twenty images. I made copies of them for the PMEL Scientists and then loaded them on to the Survey Techs computer. He will pick and choose from those. If one of my pics gets selected I will let everyone in MT know. After our return to the ship, and a quick change into dry clothes it was time to finish painting the tolriods. We did a couple of CTD's today. The first was at 8S; 170W and the second was at 7S; 170W. We have another scheduled for around midnight at 6S and then tomorrow we will do a recovery-deployment at 5S; 170W and a CTD. It looks like we will spend the better part of a day at 5S.

June 20 - On The Front Lines!

Yes we are the "soldiers of science" on the front lines of research! Okay, you probably think I have been out in the sun too long. Today was one of those days where the team really clicked and everyone was just having a great time. We were doing a recovery-deployment at 5S; 170W, and actually were getting things done remarkable fast. You have to understand that when you are basically thrust into a closed environment with 24 strangers, humor is really a great way to reduce stress. The level of silly banter has continually increased since the start of the cruise, to a point where we all participate. Today, while we were running the t-cable and the neilspin cable back into the water, Linda Stratton said that we were the soldiers of science. Of course she had the air gun in one hand and nylon tie clipper in the other while she said it. Linda, Denise Kester (GVA - General Vessel Assistant) and I were standing on the fantail putting the fist grips and nylon ties on the cables, just BS'ing when Linda started on her discussion of how we were fighting the elements and risking life and limb for the cause of science. That's when she came up with her idea that we were the "Soldiers of Science". Considering some of the weather and other risk involved with ship board research she is probably not that far off. Not many teachers get the opportunity to be on the front lines of research and science. I feel very fortunate to be here. I would highly recommend this cruise to any teacher in Montana. I know that the KA can use a teacher at sea on all of her cruises. In October the in port will be Fiji! Keep it in mind. Start working on those administrators now!!

Today was like most at the equator, mid 80's mostly sunny. Another day in paradise. The fact that the humidity is about 85% would make it not so comfortable if it weren't for the 15 knot trade winds. With out the wind it would be really uncomfortable. We started the day with a 1000m CTD at 0530 lcl and then followed that with a recovery-deployment starting around 0800. We finished up the deployment at about 1730 lcl. While the anchor was settling we ran a shallow (200m) biological CTD, and then left station at about 1820. It is now about 1920 and I am witness to yet another beautiful sunset. I can sit at the computer and type my messages while watching the sun (deep orange) sink slowly below the horizon. It must be El Nino! No seriously, I never thought that the sunsets would be this fantastic out in the middle of the ocean. But with all the fires burning in Asia, and the salt air, the colors are amazing. I have probably taken a dozen sunset images already.



Current Conditions and Position 0625 GMT 6/21/98 1925 Lcl 6/20/98 04:48.39S; 169:59.45W winds 17.5 kts @ 104 degrees humidity 74% barometer 1007.3 mb air temp 29 degrees c 84.2f sea temp 29.8 degrees c 86f sea swell 6-12 @ 085 degrees 4/10th cloud culumus, cirrus

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Montana Teacher at Sea Journal Entries June 21-27, 1998

June 21 - Two Buoys, One Station

We arrived on station at 2S; 170W at about 1230 lcl. One of the more unusual aspects of this station is that there are two moorings located about four miles apart here. The first buoy that was worked on was the MBARI buoy. Pete Strutton went over to replace all of these special instrumentation. I was told that this package is worth around \$75,000. The buoy has its own specially designed elevator that raises and lowers instrumentation to a depth of about a meter and to a height of about a meter above sea level. There is also a package that measures light at about 20 meters that has a specially designed shutter that opens and closes on command from the on board communications system that is activated by satellite and transmits direct to satellite. Pete went over to the buoy at about 1330 lcl. He is on the buoy with Ed Long ABS and there are three others in the Rib to help him with equipment and to provide support. It is now 1615 lcl and he should be back by 1700. We will start our first ATLAS/TAO exchange as soon as the Rib is safely back aboard. There are roughly 500 ATLAS moorings and the next generation, the TAO Buoy will start being deployed on this cruise. TAO stands for Tropical Atmosphere Ocean. The only difference that I can see on the surface is that these buoys have TAO painted on them not ATLAS! Under the water they are similar too. One major difference is that this mooring doesn't have to have the anchor cut loose to be changed. This should cut about four hours off the turn around time. We probably won't be off station till about midnight, so it will be another long day. I was up at 0600 to do a 1000m CTD cast with Kate Treese (the Barney person from Bloomsburg university). The powers that be have decided that since Pete will be leaving the ship in Kwajalein, it is about time that WE learned how to do it on our own...so that we can do the early morning CTD's...like the ones at god awful hours like 0300! Hey that is what I signed up for. It is nice to have more responsibilities.



On another front I have been trying to learn how to tie some of the basic knots that are used on the ship. I asked Steve Foye the Deck Utilityman if he could show me a bowline and he said, "I have a book on knots that you might like to take a look at!" He went to his stateroom and came out with a The Ashley Book of Knots! 600 pages, with more than 3000 different knots. Sailors must be nuts about knots! He also gave me an encyclopedia of Nautical terms to "broaden" my horizon. During transit from 170W to Kwajalein I will take a look at this book and try to find some interesting stories. Oh well I have to go have supper and then hit the deck for the recovery. It looks like the Rib is along side and Pete is done.

June 22 - 18 Hour Days!

Yesterday turned into a marathon. Having started @ 0600 with a CTD, we didn't get the Next Generation Buoy in the water until 2350. We are looking at a long day today, but probably not that long. As I mentioned yesterday the Next Generation ATLAS Buoy, called TAO looks pretty much the same as the standard mooring...on the surface. Under the surface it differs by not having a T-cable (transducer cable). The pressure and temperature transducers are connected directly to the neilspin cable and use conductors within themselves and the cable to induce a current that will transmit data to the surface unit. This information is then transmitted to a satellite by the surface unit. I am not sure that I am convinced that these NextGen Buoys are any better than the Standard ATLAS. I think that since you don't have to drop the anchor and you don't have to fist grip two cables together it is the time savings and thus money savings that make these NextGen attractive to the folks back on the mainland.



Our project today at the equator, will be to recover an unusual mooring. This mooring looks like a big orange. this mooring is unusual because it is a subsurface mooring. It is suspended at 300 meters and it is designed to look at currents using Doppler Radar. Once we have recovered the old ADCP (Acoustic Doppler Current Profiler) mooring we will deploy another. Then we will wait for eight hours to make sure that it is at the proper depth. If it is then we will do a standard recovery-deployment. If it isn't right then we will re do the ADCP and try again. How we determine if the mooring is at proper



Montana Teacher at Sea Journal Entries June 28-July 4, 1998

June 28 - International Dateline

The day started early when I got a wake up call from the XO at 0445 to report to the Survey Department to run a deep (4000 meter) CTD cast while the deck department lubed the cable. The trip down for the CTD unit took over an hour and the trip up took until almost 0830. The lube device which uses air pressure to force lubrication into the cable failed at about 3870 meters so the crew had to come up with plan b. They did! They simply rolled the grease on with a paint roller. This is not as effective as the high pressure lubricator, but hey it worked. After we got the CTD back on board it was time to steam the 3 miles to the buoy at 8N; 180 that needed repair. At about 0915 the Rib was lowered over the side. On this trip there were six of us in the Rib. I went along to help pass instruments and to help hold the rib to the buoy when Linda Stratton and Rick Miller (both PMEL folks) transferred from the Rib to the buoy and back. The Seas were fairly rough and the winds were gusting to about thirty, which made for an interesting and wet ride. The anemometer and humidity sensors haven't been working since a hurricane passed over the buoy in November. When we approached the buoy, you could see why the anemometer wasn't working...the prop was missing! No wonder the satellite wasn't getting any wind speed data. Once the repairs were made to the buoy it was back to the KA to be picked up. Shortly after 1100 we crossed the International Dateline. No real fanfare. Someone played the "Star Spangled Banner" and the OOD made the announcement that if we fell overboard we would fall into yesterday since we are going into tomorrow. A bizarre concept?!



After lunch I painted anti-fouling paint on the next buoy that will be deployed. The deployment isn't until the second day of the next cruise, so I am not really pressed to do it but during transit there really isn't a whole lot to do. The anti-fouling paint is rally rank stuff and a real pain to get off.

I have included two images "karainb" shows the KA with half a rainbow to starboard, "handoff" shows a close up view of Rick Miller taking a new anemometers from the Rib. This image should give you an idea of what is like to work on the buoy.



June 29 - Steaming and Dreaming

Today was a pretty slow day in the tropics. We had rains off an on today so it was a challenge to get any painting done. When the sun was out it was really humid with the water evaporating off the decks. It was interesting to see the steam rising as the deck temp raced up. I didn't get a whole heck of a lot done. I did replace the zinc's on several bridles. It is fairly dirty and noisy work while you grind the zinc oxide off the stainless frame of the bridle. We are still on schedule to arrive at Kwajalein early on the 2nd. Kwajalein is a pretty small island. From what I have been told it only takes about twenty minutes to walk across the width and about an hour to walk the length. The runway is almost as long as the whole island. Kwajalein is actually one of 100's of small islands that make up the Kwajalein atoll. Kwajalein Lagoon is the worlds largest lagoon. I will take a look through the ships resources to see if I can find out any interesting trivia about Kwaj. Yesterday we had a BBQ "johnbbq" on the fantail so I thought that it would be a good idea to show the spread and our chief stewburner, John Gunther. The second image is the sunset from yesterday. Enjoy!



June 30 - "Pinging Ops"



As we approach Kwajalein the ship is being prepared for arrival. The rust is being acid washed and then power rinsed to make the ship all white and looking good for the good citizens of Kwajalein. Because the deck and hull are being acid washed there is limited access to the deck...makes sense to me. We are also going to prepare the ship for "pinging operations". The KMR (Kwajalein Missile Range) has asked the KA to provide a radar target for some type of calibration I would guess. We are going to use the ships sonar to ping the Kwaj hydrophones. There will also be a strobe light on the deck of the ship directly above the sonar unit to provide a better distance calibration from shore. We will steam in a designated pattern outside of the atoll over night on the first of July to help them mark the position of the hydrophones. Kwajalein is the target area for ICBM's that are launched from Vandenberg AFB in California. It takes thirty minutes for the missile to go from CA to Kwaj. Kind of spooky to think that it only takes 30 minutes to go one third the circumference of the earth!

The history of Kwaj and the Marshall Islands is a long one with people inhabiting the islands for over 3000 years. Before W.W.I this area was a German territory. After W.W.I the Japanese gained control of the Marshall's from the League of Nations. Once under the control of the Japanese, who understood the strategic value of this area, Kwajalein was developed into a military base. During W.W.II this location was seen as a prime position to help shorten the war for the US. Kwajalein was also the first chunk of Japanese territory to be captured by the US that had been Japanese before W.W.II. The Japanese knew that the Americans were going to try to take the Island and they prepared man traps all along the ocean side of the island by blasting a trench in the reef that would swallow up the heavily loaded marines as they walked ashore. What the Japanese didn't figure on was that the Americans would come in on the Lagoon side of the island. This essentially caught them off guard. The outcome was that the Marines won and the Japanese lost very badly. A 10 to 1 casualty ratio meant that it was not a good day for the Japanese, or the 100's of US soldiers who died. After the war the Kwajalein became a testing center for the Nike rocket and eventually the KMR was developed. Now this Army base is primarily run by independent contractors and very few Army personnel are actually stationed here. A truly American enclave in the Pacific, has all the important comforts of home...with the exception that there are no private cars. Bus, bike or walk. There is a grocery, a convenience store, a department store, a couple of bars and restaurants, pools, beaches, and of course a golf course. It is also supposed to have some of the best diving in the world. I hope that I get the chance.

July 1 - Placing the pinger!



We are now about 5 miles off the east coast of the Kwajalein Atoll. We had been slowly steaming north until about 1230 lcl when we stopped to do a deep 3600 meter CTD for the Army. The data will be used to make a sound velocity curve for calibration of the KMR's hydrophone Array. After we complete the CTD we will steam into position to start the pinging ops as soon as the sun sets. We could have been in harbor early but that wouldn't have been a good use of sea days. It is also important for all the uniform services to cooperate. Nothing like a little inter service cooperation to help with the PR. NOAA does a favor for the Army here, the Army probably won't kill us as bad when we play against them at softball on the 4th.

Another fairly slow day for most of the crew. Other than using the basket to put the pinger on the A-frame. Most of the activity on the ship has centered around painting over rust and other misc. marks. I have painted on the buoys off and on since about 0930, working for about an hour then taking about an equal length break. There is almost no wind and with the ship moving slowly or stopped for the CTD is really hot on deck. It is amazing how much you have to drink to keep hydrated. I must drink ten or twelve mugs of ice water on days like today. Although it is supposed to be beastly hot on the island I am looking forward to getting ashore for a few days, a chance to walk in a line for more than 100 feet!

I have included an image of Denise and Ed putting up the pinger.

July 2 - Kwajalein, RMI

Little America! Amazing how much of the old USA is right here only 8000 miles from Montana. Everybody is gearing up for the long weekend. The 4th is tomorrow for these folks, Int. Dateline and all. I went for the grand tour of the island. This only took an hour at 15mph, and that was around the island with stops. I will have more time to write a full account and send some pictures tomorrow. Now I have to run ashore to have a nice cold adult beverage at the sea side recreation area.

July 3 - Tropical Sun...Part 2



2200 lcl July 4 Kwajalein, RMI or 0400 July 4 Montana Time! Well SPF 45 is pretty darn good stuff in most places. But here after about eight hours in the sun (four of which were spent floating face down in the water) even SPF 45 wasn't enough to protect from the tropical sun. It is a darn good thing that we have a gross of Aloe on this tub! I am a little sore on my back but not the worst that I have seen for the crew. Some have blisters on the tops of there feet, ouch! He fourth here was a great experience. The fireworks were great and made even more colorful by defraction gradient glasses that were given to everyone at the beach. The fireworks were launched from a barge about 1000 meters off the beach, an unobstructed view of the display for everyone on the beach. I have included two images that I have collected over the last several days that might be interesting. "pilotsb" is a shot of the pilots boat approaching the KA ""worthy" this is an image of the worthy... One of the KA's original US Navy sister ships. It is now run by the Army as part of the Missile range. It is pretty obvious the superstructure differences.



July 4 - Baked, Boiled, Fried!

July 4th It is hot, hot, hot in old Kwaj this Fourth of July!! I think that this is the first US Soil to celebrate the fourth! We have had a very relaxed day on the beach. Snorkeling and swimming are the major activities for the ship's crew. The locals are having a big party for the fourth with a Bike Parade for the Kids and a big Fireworks Show for everyone tonight. We are planning on a 0730 trip out to do some diving tomorrow. I will keep everyone posted as to what we see.

July 4 - Prinz Eugen



The Prinz Eugen was a German Heavy Cruiser launched in the summer of 1938. In 1941, while on her first war patrol, the Prinz Eugen opened fire on the HMS Hood. The Eugen was heavily damaged in the battle and departed from her sister ship "Bismarck" after the Hood was sunk. During her career she was damaged by RAF bombs and a torpedo from the submarine HMS Trident. In May of 1945 she was surrendered to the Allied forces. In Jan of 1946 she was headed to the US where she was refitted in preparation for the Nuclear Tests at Bikini Atoll. At Bikini, she survived two nuclear blasts in July of 1946. Now designated as the USS IX-300 she was towed to Kwajalein for decontamination and study. On Dec 21 she was observed to be listing and down in the stern so it was decided to beach her. The attempt failed and she ran aground, turning over and sinking on Dec. 22, 1946. Now she is a great wreck to dive on, still fully armed for combat...kind of spooky seeing live torpedoes still in the tubes. You can see what is above the surface in the attached image.

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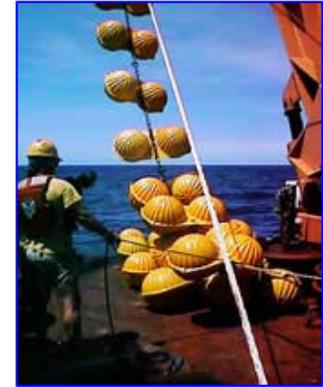
depth is by having a temporary pressure transducer attached at the ADCP's depth. After eight hours it will be triggered and it will float to the surface, recovered and the depth will be checked. It is very important that the ADCP be placed in the correct pressure window or a \$75,000 unit will be useless.

Well they are getting the Rib ready for the recovery. The OOD just announced that the ADCP will take about twenty minutes to surface.

June 23 - Day Two At The Equator

It is our second day on station at 0; 170W. The weather couldn't be better here at the equator. We have had high 80's and 15 mph trades so it is even bearable on the fantail in direct sun. It is a good thing that I brought SPF 45 in bulk! I pretty much have to coat myself with the stuff to keep from turning in to a cinder. During mooring ops we spend hours in the sun. Today started with a standard ATLAS Buoy recovery at about 0800 and finished up about 1200. Now we are in transit back to the ADCP mooring to see if it is positioned at the correct depth. I thought that this was only a \$75,000 buoy but I didn't hear the 2 in front of the 75,000. These big orange balls cost about 275,000 dollars! The special Kevlar cable cost \$5000.00 alone. Now I know where all my Tax Money goes. Once we get back to the ADCP position the Chief Scientist will trigger a hydrosonic release and a temporary pressure transducer will be released. If this transducer has a pressure reading between 275 and 325 meters we will be set to go back to the TAO deployment site where we will deploy a new buoy. I did all the painting on this buoy so I am interested in seeing it in the water. This will be the second TAO Buoy put into the array along 170W. Yesterday was another long one. We finished up with the ADCP deployment at about 2300. It is really feast or famine on these cruises. Some days you beg for work and other days you beg for a break. When we finish with the moorings along the 170W and start our transit to Kwajalein I know I will be looking for things to do.

When we got to the ADCP mooring location I was called to Rib duty. I went out with Ed Long, Tammy McAnally, Denise Kester, and Steve Foye. I went along to supply some extra strength to bring the "Glass Ball" floats and hydrosonic release into the Rib. You would think that something designed to float would be easy to lift a couple of feet into a boat! It took three of us using all of our strength to wrestle those dumb things into the Rib. They are a really an awkward shape and have virtually no good hand holds. Once they were in the Rib we headed back to the ship to turn over the temporary pressure transducer to the Chief Scientist. She then plugged the unit into the computer...The ADCP was right on the money! At 320 meters it is in the "window", so we are in transit back to the TAO deployment site. When we get there in about an hour we will deploy our last standard mooring of this cruise. The moorings north of the equator on the 170W line that we will be working with are all NexGen and have only the single, slack line. That means no more T-cable duty after tonight. We are to arrive back on station at 1630 and we should finish up about 2200. A short day by comparison to the last couple.



June 24 - On to 5 North

Today was a little more relaxed than the last three. We didn't have any mooring operations scheduled today! At about 100 lcl the Rib made a trip to the buoy at 2N to replace a couple of weather instruments. The humidity sensor that they took over turned out to be faulty so they had to make another trip out to take another new one to the buoy. They knew their first one was faulty because they have a satellite receiver in the lab that reads all the data from the buoy just to make sure everything is running before the ship heads on. We did a bit of deck work, moving tolroids around to make a new NexGen for deployment at 5N; 170W. It is looking like 5N will be our last station on the 170W line. We will likely turn toward Kwajalein after the recovery-deployment and a CTD tomorrow. From what I understand it will take about a week to transit to Kwaj. I am really looking forward to seeing land now that I we have been out of sight of land for a couple of weeks. I am not tired of the ship experience, in fact I really like everything that I have done so far. I guess I really miss not moving! It will be strange to walk on something that isn't constantly rolling.

June 25 - NexGen at 5N; 170W



At about 0800 lcl I got the call to report to the Rib for the ride over to secure the buoy for recovery. Denise Kester, Ed Long, Linda "Super Chief" Stratton and I headed out in moderate seas to remove the anemometer from the buoy and to make fast the tow line. Once I got the shackle of the tow line attached to one of the shackles on the buoy it was back to the KA to pick up the tow line. After Ed and I got the tow line attached, the KA reeled in the buoy. The Rib then followed the buoy in till it was about 30 feet from the ship and then the Rib was hoisted aboard. After the Rib is aboard we get down to the fantail as quickly as possible to begin hauling the buoy on to the ship. My general duties has been running the 20,000 pound A Frame, positioning the block where ever the Chief Boatswain Remus Gladden tells me to. After the buoy is on deck then I usually take one of the tag lines to keep tension on the buoy as it is moved to the cradle on the buoy deck. After the buoy is secured then it is time to reel in the cable and nylon line, all 5000 meters of it. I have been doing a variety of duties during this portion of the recovery. Everything from turning the spools to pulling the line taught over the capstan. It takes about 15 minutes per 500 meter length of nylon and about an hour for the first 500 meter length of cable since this is where the "pods" are located. On the standard buoy the T-cable is attached to the neilspin cable and has to be removed, on the NexGen there is no T-cable so this is somewhat faster and less labor intensive. It takes two people to just handle the T-cable on a standard buoy, so it is no wonder the folks back in Seattle are looking at this as a future option on all moorings.

The deployment essentially works in reverse of the recovery. The exception is that the Buoy is still the first thing that is dealt with. Once the ship is in position for deployment, the buoy is hoisted over the port side of the ship by on of the two fantail cranes. Once the buoy is in the water it is released and the allowed to drift aft. Once it is astern of the ship the cable is let out and after the cable the reels of nylon line. It only takes about 6 minutes to unwind

a spool so deployment is usually faster. Today the deployment to 5450 meters took 2 and a half hours. This is our last deployment of this leg. We are doing a shallow CTD for biological samples as the anchor settles. Once the CTD is done we will do a pass by the buoy to make sure all the instruments are working and then it is off to 8N; 180 for an instrument repair. The International Dateline awaits. It has been decided to skip the rest of 170W due to our Medevac to Christmas Island early in the cruise. Since 8N; 180 is on the course to Kwajalein it won't cost the ship any time. It will also make it less critical for the next cruise from Kwajalein to Honolulu to visit this station if delays occur. Which is a very real possibility at sea.

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Montana Teacher at Sea Journal Entries July 5-11, 1998

July 6 - Fueled Up!

The KA is all fueled up and ready for departure...well not quite ready. The fuel barge was brought along side at about 0830 this morning and it took until about 1300 to fuel the ship. The capacity of the KA is about 115,000 gallons of Diesel, and we took on 56,000 gallons. It is amazing that the ship could have gone back to Honolulu with out refueling but we (crew) couldn't. The Chief Steward and Second Cook have been making continual runs to the local supermarket "Surfway" to get all the foodstuffs for the next 30 day leg.



It will be hard to leave the beach after such a nice change of pace. The first Buoy Op station is going to come too soon, only 18 hours after we depart Kwajalein. I am not all that disappointed since I have just about seen all there is to see on Kwajalein. Yesterday was a hard core diving day for me. I did four total dives, by 1800 lcl when I was back on the dock from the fourth one I was beat. The sun and water really drain your energy. It is hard to believe that I hit the hay at 2100! Getting back into the work schedule will make the next 30 days go by fast. We are changing several of our crew at kwajalein so there will be new names to remember. We have even picked up a Cadet from one of the merchant marine academies. I have included a couple more images that you might enjoy. "Fistgri" shows Linda Stratton and Denise Kester putting on the fistgrips as a buoy is deployed. "Motleyc" shows Linda Stratton with most of the deck crew: Ed Long, Denise Kester, Remus Gladden.



July 6 - Departing Kwajalein @ 1500

Our visit to Kwajalein is just about over. The CO has announced that all ship's personnel are to be aboard at 1400 for a 1500 sailing. I am not that unhappy to be leaving the island since that means that I will see my family sooner. The local folks are not happy to see us leave since we have boosted the economy and "brought rain". Kwajalein has been under a water shortage for the last six months due to unusually low precipitation. The monthly average is about 8 inches in a normal year. This year the total for six months has only been about 8 inches, so they are about 40 inches behind normal...at least until the KA came into port. We have had a couple of inches of rain in the last two days! At this rate Kwajalein could be back to normal in a month. The locals said that our ship was a good omen since we are the El Nino research ship and it has been El Nino that has caused their drought.



The KA real time page should have an image of the crew, with some new faces. We had to take the picture in the after mess since it was simply pouring on the pier. It will be good to get back to work tomorrow. We will be heading to our first buoy op station at 8N; 165E. Since Kwajalein is at 8:44N; 167:44E we should arrive on station rather early in the morning. We will do a CTD first and then a NexGen recovery-deployment. The whole 165E line is NexGen so it should be interesting to see how much faster the line goes in comparison to a line of Standard Buoys.

I just found out that Kate Treese and I will be getting up about 0100 to do a 1000 meter CTD. Talk about a change in pace! It looks like we will be up for a long time tomorrow.

July 7th - On the 165E line

1225 lcl We didn't arrive on station until about 0800 this morning so we didn't have a 0100 CTD! This fact alone makes this a great day. I don't mind doing the CTD's, actually I like the whole activity, it is just really a bummer to get up at 0100 when you have a buoy op the next day. Some how the messages got confused from the bridge to the buoy lab and this confusion didn't get straightened out until about 1900 yesterday. The recovery has been really smooth and the buoy and all the cable and nylon line are now on board. The only low point of the op so far is that it has been pouring most of the morning. It doesn't just rain here it drenches! Even with a raincoat, the water just hammers so hard that it leaks in around your neck and face. The rain has been so heavy that I finally had to take of my glasses so I could see. Another strange thing about the rain, which is warm, is that even though it is 85 degrees on deck you still get chilled. With a raincoat on you at least stay warm, if not dry. We are currently steaming to the deployment point and we should be ready to put the buoy over the side in about 1 1/2 or 2 hours. It seems that as we approach the new deployment sight the weather is improving. I hope that this storm passes so that we can at least dry out. Once we finish up with the deployment we will do a CTD while the anchor settles, then we will be off for our next recovery-deployment station at 5N; 165E, which we should hit at about 1430 tomorrow if we don't run into any snags this afternoon. We will likely do CTD's at 7N and 6N late tonight and early tomorrow while we transit to station.

July 8 - Sunny Day!

After a whole day of rain it was a real pleasure to see the sun rise on a clear day. Clear relative to yesterday! It is more like 5/10 clouds but that also means 5/10 sun. The sea is almost flat with only a slight swell and almost none existent winds...it is going to be a hot one on the fantail. We will start our next buoy recovery at about 1330, so it will likely be a late night. I did my first true solo CTD this morning at 0600 lcl. A 1000 meter cast at 6N; 165E. The thing that amazes me is that I only forgot one of the twenty-five or so steps...waking up Kate Treese so she could take her samples. She had wanted to get up when the cast was at depth!



I woke her when it reached the surface. Not a problem, actually it gave her a chance to have a couple of cups of NOAA Coffee! This stuff is even thicker than the stuff in the Senior High Lounge! I found a couple of images that I thought that you might like. One is of the Prinz Eugen in 1941 in full battle dress "eugen19". The other is a typical sight on Kwaj. "nopark". Since there are no private cars on Kwaj everyone has a bike and no one pays attention to the signs...just like home!



July 9 - Headed to 2N; 165E

After an early evening deployment, finishing up at 2000 lcl yesterday and a second early morning CTD, (very early) at 0330. I am relaxing before our next station at 5N. It is a good feeling to have a second successful CTD under my belt! This morning it was a 1000 meter cast at 4N. After catching another couple of hours of rack time after the CTD I started to record the species and length of the barnacles recovered from the 5N buoy. There were a bunch of Barnies on this buoy, it took about five hours for Kate Treese to scrape them off. Since there isn't much happening till we get to our next station at 2N I thought that I would help Kate out. When one person measures and the other records, this little task is reduced by about 30% of the time needed for one person to do it. There are two common species of barnacle that are generally recovered. *L. anatifera* and *L. anserifera*. There were around 2500 anatifera on this buoy, with typically about a 100:1 ratio of anatifera to anserifera. It takes about a half hour to record 600 barnies with two of us doing it, so you can imagine how long it would take for one person.

If you check out the KA's real-time page today or tomorrow there should be a web picture of Kate and I counting Barnies.

We have also completed another CTD at 3N and will be doing a "tube swap" (electronics package change out) and CTD at 2N around 1800 lcl. There is a good chance that I will be going on the Rib to help with the "tube swap". There is something about being on a little boat that is rally fun and I try to go on the Rib when ever I get the chance.

July 9 - Wild Rib Adventure!



My wife has kept telling me that this is a "Once-in-a-lifetime" experience. After the Rib ride I just had I think that she is definitely right. Everything went really great for the "tube swap" We left for the buoy at about 1745 and headed about 2 miles south of where the KA was holding station to do a CTD. In general the CTD isn't done while there are people on the buoy because if there is a problem with the little boat or the folks on the buoy, we are basically stuck. The swap went as planned, changing the instrument tube and the photometer that measures light intensity. The chief scientist Ben Moore was back in the buoy lab watching the signals from the new tube and decided that another instrument, the air temp and humidity sensor was on the fritz so he requested that the Rib come back to the KA to get a new sensor. The trip back was a blast, bouncing over 5 - 7 foot swells like they weren't even there. When we got back to our "stand off" position about 100 yards off the port stern the boat was put into neutral until we received permission to come along side to pick up the new sensor. When permission was granted, not even five minutes later, the Rib wouldn't go into forward, only reverse. The clutch linkage had broken or slipped and we didn't have the tools on board to fix it.

We then headed toward the KA in reverse and had to break out the oars to give the boat some stability, with out the oars in the water the Rib simply went in circles. Once we were along side the KA, one of the engineers (Frank James) came aboard the Rib to see if the problem was fixable in the water. All the while the rest of the folks on the Rib are trying to keep it from banging into the KA. It is amazing how big the side of the KA is when it is pitching up and down only inches from your nose! The folks on deck were trying to hold the two lines on the Rib so we wouldn't drift off with out holding them so taught that we would slam into the KA. It was determined that the fix was more than could be done on a pitching little boat so we worked our way to the Rib Cradle. But first the Rib had to be turned around which meant that the stern line had to be run behind the bow line so the stern would swing around and we would be oriented in the right direction to be brought aboard. After another five minutes of pushing the Rib away from the KA as we were dragged forward to the Cradle we were finally in position to be hoisted out of the water. With in ten minutes the engineers had the clutch linkage repaired...it is much easier when the boat isn't tossing you around! A call to the buoy lab confirmed that the air temp and humidity sensor really did need replaced so it was back into the Rib for another trip out to the buoy. Just like getting thrown from a horse we had to get back in the saddle and do it again. This time we took an engineer with us just in case the clutch linkage pooped out again. The second trip was uneventful and we made the sensor swap just as the sun was setting. It is little things like a broken clutch linkage that make me appreciate how isolated we are out here in the middle of the vast Pacific, and how important it is for the crew to work as a team. Alone you couldn't survive, no one person has all the skills required to keep everything fixed and running.

July 11 - Images from yesterday

Here are some images from the current meter recovery-deployment as I promised. "glassba" shows the train of glassballs being recovered, "curmeter" shows the actual current meter modules that are placed at fifty meter increments on the cable, "fairings" shows Steve Smith (PMEL) and me putting the old fairings back on the cable, "releases" shows the two hydrosonic releases that are placed just above the anchors to ensure that the instruments are recoverable.

An interesting occurrence this morning. At about 0915 lcl I was looking out my stateroom window contemplating the smooth as glass surface of the equatorial Pacific and I noticed smoke on the horizon. A ship!! Out here!! Nobody is out here except us and a few fishing boats...which this apparently was. Likely Korean or Chinese, using the buoy as a easy fishing area. We haven't actually seen any fishing on or around the buoys as of yet, only evidence that fishing has gone on there. After talking to the CO about the ship 4 miles off our port beam, I found out that it had been stopped just off the buoy at 2S; 165E. As soon as that ship saw the KA on radar it fired up its engines and pulled away to see what we were up to. I imagine that it could be pretty intimidating to see a ship coming at you in a bee line from over twenty miles away. They didn't know who we were, only that we were heading directly for where they were!

We are about to start our next recovery-deployment in about 15 minutes. Four in five days is a really busy schedule. We are doing one more recovery-deployment on this leg at 8S and another "tube swap" at 5S.



July 11 - Current Meter at 0; 165E

2100 lcl Back on the equator for the fourth time since leaving Honolulu in June. Only one more crossing...and that will be at the "Golden Point". The 0; 180 is considered to be a special place for sailors. Those that are shelbacks become "Golden Shelbacks" Even though I have now crossed the equator on a ship I haven't gone through the "ceremony" so I am still a "Pollywog" or better a "lowly wog" to those who have gone through the "ceremony". I am hopeful that a ceremony is a foot for the wogs on the ship. There are five of us and it would definitely be another "Once-in-a-lifetime" experience to add to the list for this adventure. I strongly recommend that any teacher, elementary or secondary apply for this program. I have had experiences that most people never even imagine...a whole new perspective to bring to my teaching.

Today was our first, and thankfully last, current meter recovery-deployment. We got started at about 0830 on the recovery of an "old style" current meter (actually 4 current meters connected about 50 meters apart). These five foot long tube have impellers for speed and a fairing to give direction of the currents down to 200 meters. This technology is old, from the 1940's and does about the same thing that the ADCP does for about 100,000 dollars as opposed to 250,000. Frankly, even though it is my tax money (and yours) that pays for these things, after putting one of the "old style" in the water and one of the ADCP in the water, I would rather pay for the ADCP. I probably feel this way because I got the honor of being one of the people to put on the "fairings" that help the ocean current flow in a laminar pattern around the cable. I smell like Barney squirt! This has got to be one of the yuckiest jobs that I have done since I have been on this ship. The reason it was so slimy is because we simply replaced the old fairing from the old cable. They were covered in algae and barnacles. I can barely move my fingers after literally smacking these plastic, wing shaped sleeves onto the neilspin cable. We did 250 meters of the fairings, each one is a foot long so we had 750 of the dumb things to put on the cable. I did about half of them so it is no wonder that my hands are sore. Actually I asked to be on the fantail in the middle of the action so I could get the "full experience" so I have only myself to blame for a day of hard, physically demanding work. The crew and scientists are all to happy to give me the opportunity to get the "full experience"

We actually had the whole mooring aboard shortly after 1200 and then started the deployment at around 1330. At about 1730 we were just about ready to drop the anchors. This is really an unusual mooring because it has 2 anchors unlike the rest of the moorings that have only one. because the current meters are very heavy and very expensive, 32 "glassball" floats are attached to the anchor line just above the actual anchors so that when the hydrosonic release fires the meters will come up to the surface. Even if the cable breaks and the buoy is lost it is still possible to recover the current meters since the floats will bring them to the surface. Heck, there is even a second hydrosonic release on this mooring "just in cases" something goes wrong. We had a short delay of an hour while we towed the whole mooring ,sans anchors, to the proper drop point. It is really critical that we drop the anchor in the right place (where the depth is really close to the length of the anchor line) or we will have a real problem. If the bottom is 25 meters too deep the Buoy sinks, if it is too shallow the buoy runs slack and can drag the anchor. So we finally got the whole thing in the water and away from the KA at about 1845. Another long day in the Pacific come to a close. Tomorrow we have a NexGen recovery-deployment at around 1000 hrs. It looks like another long day in paradise. I took some digital images of the current meter and I will get them posted as soon as I have the time. I will probably send them tomorrow.

Daily Journal Entries and Related Links:



Montana Teacher at Sea Journal Entries July 12-18, 1998

July 12 - On to 5 South

1125 lcl After four recovery-deployments and a tube swap in the last five days it is nice to have a days break before the next recovery-deployment and the 12 plus hour day that usually goes with it. We are scheduled to do a tube swap this evening at about 1900 lcl when we reach 5S; 165E. We would have normally arrived on station at about 1600 but we have been facing heavy seas since last night and have had to slow down so the prop shafts don't overheat. When the ship pounds through heavy seas at 10.5 knots the bow digs in and the stern actually comes out of the water allowing the screws to come out of the water. Not a good thing so we have had to slow to about 8 knots to reduce the amount of pitch that the ship experiences.



Not only does going into the heavy swell slow us but in order to prevent damage to the ship we have to slow further, thus making our time to the next station longer than the usual 6 hours per degree. The ocean is a far cry from its placid state yesterday morning. We have 10 to 15 foot swells and a very choppy surface. We have also had almost continually rains since yesterday around 1200. However, the clouds seem to be breaking up over the last half hour or so. I am hopeful that we are coming out of this "tropical depression". After the tube swap it will be on to 8S, our last station on the 165E line.

July 13 - Tube Swap in the dark

0945 lcl Yesterday went pretty slow with the rough seas and the rain. Our original ETA for 5S had been about 1600, with the seas and weather we actually got on station at about 1930. It was really dark when we put the Rib in the water and with out the ships powerful searchlight there would be no was for the Rib crew to see the buoy. The KA came to about a quarter mile from the buoy, put the light on it and the Rib headed over. Once the Rib got to the buoy the light was turned away from it so the two crew members working on the buoy would be able to see. That probably sounds strange but the spotlight is so bright that with is shining on you, you actually can't see. So small head lamps and a couple of "snake" lights are all that are needed to see when actually on the buoy. Each of the Rib crew also wear a small chemical light as a personal position marker. It was really strange to see five green glowing spots out in the vast black of the sea when the spot was moved off. All that you could see from the ship was these small chemical lights a quarter mile off bobbing, then there were two that seemed to drift away from the group. That was the only way to tell that someone was on the buoy, until they turned on their head lamps. It would have been really interesting to have been on that buoy ride, a little isolated in that big black void, but interesting. Unfortunately, or maybe fortunately, NOAA doesn't let non crew/PMEL folks out on the night buoy rides since the liability and the risk are too great.



Today started with an early 0300 wake-up call to do a 1000 meter CTD at 6S. This was my third solo. Well not actually solo, I am now training our "Cadet" Anya Wilhelm. Anya is on the ship till the end of September and is eager to be trained to do the CTD's since she will likely have that duty when Kate Treese and I depart at the end of this cruise in early August. We are steaming toward our last station, 8S, on this leg for a NexGen recovery-deployment starting at about 1730. By starting at 1730 it is very likely that we won't get done till 2300 or so. A very long, but productive day.

July 14 - Done with the 165

0910 lcl This is a really efficient crew! I can hardly believe it, we started the recovery of the mooring at 8S; 165E at about 1715 yesterday and actually got the anchor in the water at 2210. Just under five hours for the complete mooring op. This was the fastest that I have seen since leaving Honolulu in early June. The fact that we only had 5 full spools of nylon and a 269 meter cut piece probably helped. This was our shallowest mooring at 4009 meters. Since this mooring was so shallow the CO and the chief scientist decided to do the whole thing last night and get started on our transit to the 180 line a half a day early. Being almost a full day ahead of schedule really gives a nice buffer to the rest of the cruise should any difficulties arise on the 180. I think that the CO wants to get back to Honolulu almost as much as the rest of us. I know that I won't be too upset if I get to see my family a day earlier! Since the 180 leg has much deeper moorings and the bottom is not as flat as the 165E leg I imagine that a rapid recovery-deployment is not going to be the standard. The 180 only has one NexGen mooring op which is another change from the 165E which were all NexGen. Our first Recovery-deployment will be at 5S; 180, a nine plus a cut piece standard ATLAS buoy. Standard means we will be back to running T-cable and "fist grips" for the first 500 meters. This means that the first 500 meters takes about four times as long as the first 500 meters of a NexGen. One nice thing about the 180 leg is that we have only three recovery-deployments instead of five like we had on the 165E. It should go pretty fast.

July 15 - In Transit, Day two

1530 lcl A ship in transit is a noisy ship! It is a good thing that we haven't been pulling 12+ hour days during transit...it is too noisy to catch a nap even if you wanted to. From about 0800 this morning the deck crew has been grinding the boat deck. This deck happens to be directly above most of the crew quarters and over the computer lab so the whole ship has been ringing with the sounds of thousands of angry bees. Well that is what it sounds like, or at least what I imagine it would sound like if you stuck your head into a bee hive. I have included an image 'growler' of Remus using the Deck Growler to grind the rust, paint, and non-skid surface off the boat deck. In order to fight back the noise it is sometimes better to make your own, like Steve is doing in the image "grinding". He is grinding one of the small ratchet winches that we use when we move the tolroids from the boat deck to the buoy deck. I guess the old adage is true...if you can't beat'em join'em! At least when it comes to making noise on the KA. If you aren't making noise you are still wearing ear protection, otherwise you would have a splitting headache. Tomorrow is a painting day, since there is too much grit in the air today. I will see what I can find for images.

The seas have been anything but calm the last couple of days. The whole ship shudders when the stern comes out of the water due to the over spinning of the screws which produces cavitation. We also have a more subtle shake when the ship pounds into a big swell. The seas have been running at 10 to 15 feet today with a moderate chop. We have really been weaving down the passage ways today!



July 17 - Transit Day 3

The day at least started out sunny. Not to long after we got started with the painting projects the sky opened up and the water came forth! Heavy rain and heavier seas than we have had at any time since June. Seas like this make me remember days like we had after leaving Kwajalein "smooth" when the sea was almost as smooth as silk. We have been heading into a tropical depression and from what some of the "plank owners" the guys that have been on the KA since she joined NOAA, these are the roughest seas that they have seen on this ship. I will say that walking up and down the ladder ways is almost as much fun as a carnival ride. You are almost weightless one step and then seem to weigh three time your body weight the next step. This will build the old muscles in the calves. Walking down a passage way is like being the ball in a pinball, you sort of bounce your way off the bulkheads from side to side and you walk. I am not uncomfortable, or even close to feeling seasick! It is actually kind of fun! Before the rain came I actually got the black waterline stripe painted on the next buoy to go out "blkstrp". This buoy will be deployed at 5S;180 in about three days. I am looking forward to getting back to the work routine of buoy ops...it is hectic and exhausting and never boring like the transits tend to get. I have been keeping busy by taking underway chlorophyll and nutrient samples for the MBARI folks. Underways are taken every 4 to 6 hours during transit periods or when CTD are not regularly scheduled.



July 17 - Sunshine!

1430 lcl After a couple of days of rain, and this mornings down pours, it is great to see the sun again. Since about 1130 lcl the clouds have been breaking and the sun has been showing it's self more and more. It is looking like we might have pretty decent weather for our 180 leg. Since the seas have been rougher than usual we are now expected to get to our first station sometime early tomorrow morning, not this evening as was scheduled. It is amazing how much difference a couple of knots will make when you are covering large distances, two knots slower has added to about a half day in transit time between lines. We will be doing an instrument tube swap at 8s; 180 and a CTD then CTD's at 7S and 6S followed by a standard Atlas recovery-deployment and CTD at 5S. This schedule is busy, but not as busy as the 165E line that we just finished. I am looking forward to getting back to the swing of things.

July 18 - On the 180 line

1435 lcl We started our first 1000 meter CTD at about 0645 this morning at 8S; 180. We are at the extreme western edge of the Hawaii time zone so it didn't get light till about 0820 lcl. This means that we didn't get started with the instrument repair and data download until about 0900. The chief scientist, Ben Moore decided that we weren't going to do a tube swap since the seas were pretty rough, the winds were at about 35 knots, and probably most of all since he had lost one of the laptop computers to water damage last week. He couldn't afford to lose another computer. Well as things go at sea, the conditions quickly changed from the rotten conditions at 0700 to almost perfect conditions at 0900. The rain and wind simply disappeared just after sunrise, and the seas eased to about 5 feet from the 10 to 15 they had been only an hour or so earlier. A tube swap was still not done, but Ben did call the ship and request that the Rib comeback to pick up a laptop so that the last six months of stored data in the tube could be downloaded. The downloading, in hexadecimal code, took almost an hour which put the actual time at the buoy at almost two hours...a long time to be bouncing around in the Pacific, just inches above the fishes. With the better surface conditions we are making about 10 knots, so we should be at 7S at about 1700 to do our next CTD. It will be on to 6N for a CTD at about midnight, which will put us on a schedule for arrival at the 5S buoy about 0700 tomorrow. We are scheduled to do our first recovery-deployment at this station, I expect a long day since it is a standard Atlas and not a NexGen.

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July 19 - 25	July 26 - August 1	August 2 - 16
Planned Route	Related Links	OPI Homepage



Montana Teacher at Sea Journal Entries July 19-25, 1998

July 19 - 5S; 180

1300 lcl We have just completed the first part of our buoy op here at 5S. Our day on station started with a 100 meter CTD at 0600. When the sun finally came up around 0830 I went for a Rib ride to secure the buoy for recovery. A funny thing happened when we brought the Rib along side the KA to pick up the recovery line. Somehow the line wasn't attached to the throwing line so once we caught the throwing line and hauled it to the rib...nothing was on the end! We made a second pass by the KA and the end of the towing line was simply handed to one of the boat crew. After looking at the throwing line it was noticed that the line had actually parted, so nobody got chewed out for messing up! Once we were back on the KA I ended up running the neilspin winch and controlling the line itself. Controlling the line involves running rags, clenched in your fists as you pull in the cable. The cable is really slippery, generally covered with slime and algae...sometimes a barny or two. This is a dirty and wet job that is usually done by Eric Moberley, one of the deck crew. But Eric cut his finger on the Rib yesterday and couldn't bend that finger or get a bunch of sea snot in the wound so I got the dirty job! After the cable was in and all the fist grips removed, I traded bringing in spools of nylon with Ed Long. This is a really deep, 6000+ meter mooring so there were 9 reels of nylon plus a 92 meter cut piece. About 2.5 hours just to bring the line aboard.

We are on a two hour transit to our new deployment position. The chief scientists has found a new position for deployment that is somewhat flatter and about 500 meters shallower. If it is an acceptable position the deployment will be cut by about a half hour. We are still looking at about 3 hours for the deployment.

July 20 -Images from yesterday

0815 lcl We had a really fast deployment yesterday afternoon. We got started at about 1400 and were done at 1800! For such a deep standard ATLAS to be completely turned around in eight hours is remarkable. After departing 5S we steamed to 4S to do a 1000 meter CTD at about 0100 this morning. We are currently at 3S; 180 doing yet another 1000 meter CTD. After this CTD is back on board, in about an hour, we will be off to 2S to do a RAM dump. A RAM dump involves taking a laptop out to the buoy and hooking it up to the instrumentation tube so that the RAM can be downloaded. The process takes about an hour to download six months worth of data. I am hopeful that I will be able to go out on this buoy ride so I can get some good images. The ride yesterday was just after dawn and the light for my digital camera was pretty low. I did get a couple of images that I think you will find interesting so I have attached those: "dawn@5s" shows the KA in the early light, "ribsrise" is a high contrast image looking directly into the sun from the bow of the Rib toward its stern.



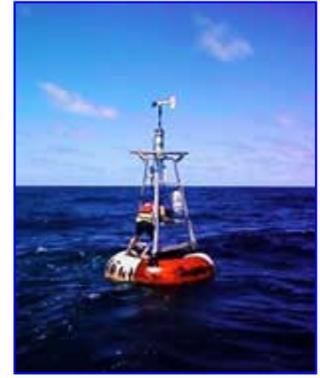
Some may wonder why we do so many CTD's? The CTD is used to develop a subsurface profile of the water temperature, salinity and density. Based on these data, three dimensional profiles can be generated that can help to show the depth and breadth of events like El Nino. It is the CTD data that tells us if the El Nino event is lessening or strengthening. The KA's primary mission is El Nino research and most of the data that is found on the Web or seen on the news has come from this ship's CTD's, and the ATLAS/NexGen Buoy Array. If you visit the PMEL Homepage, the KA's real-time page, or do a search for El Nino on the internet you will likely find some of these profiles and other data that we generate.



July 20 - Data Dump!



1800 lcl After doing some painting on the next buoy that is going out, I got called to the Rib for a trip over to the buoy at 2S; 180 to help with the equipment needed for a "Data Dump". We spent about 2 hours in the Rib while the instrument tube downloaded the past six months worth of data to a laptop computer. See the attached image "newoff" to see how the computer is just left on the buoy while we sit in the Rib. The reason that we just leave the computer unattended is because the buoy is still attached to the anchor and rides really rough. The chief scientist made a run over to the buoy about every 15 minutes to check the progress of the data transfer. See the image "datadump". In other developments we are now doing 1/2 degree CTD's from the 2S to the 2N latitude to give much better data for the profiles, and also because we are a day ahead of schedule.



July 21 - Golden Point!

1515 lcl We made it! At 0600 this morning we stopped at the "Golden Point". The "Golden Point" is the point where the 180 longitude line crosses the equator, the 0 latitude line. At this point you are in all four hemispheres of the earth at the same time. An added bonus for me was a Rib ride out to the buoy to help Steve Smith (PMEL) do a tube swap. It was really amazing to be out bobbing on that little buoy at such a geographically significant point. I have attached an image of the action at 0; 180 the "Golden Point". Steve Smith and myself doing the final attachment of the "Bird Cage" and securing the electrical cables with nylon panduits. The whole trip out to the buoy and back to the KA only took an hour. Once we got back to the ship it was time to get the next buoy ready for deployment. This essentially meant that I had to finish painting the white and orange sections of the toloid and paint the waterline black stripe and the letters TAO on the side. This buoy is going to have several MBARI instruments on board besides the typical instrument tube. The equator moorings are very important to Pete Strutton's research. He will come out in six month's and retrieve the instruments and replace the power supply as well. It is looking like we will get to our next recovery-deployment station 2N; 180 sometime around midnight since we have added 1/2 degree CTD's in the last day. If we hadn't started doing the half degree CTD's we probably would have reached station about 1900 lcl this evening and taken care of the whole turn around. It is likely that we could have done it in five hours since this next mooring is a NexGen.

July 22 - Only 1 more to go!

1615 lcl We just finished the deployment of the second to last buoy that we will be doing on this cruise. We started at about 0800 this morning with a two mile Rib ride. It was a great ride out, small swells that the Rib could just glide over at 30 knots. At three times the speed of the KA we can really cover some distance in no time. Once we had secured the instruments and prepared the buoy for recovery we sat and waited for the KA to steam over to us, about fifteen minutes. It is really something to see the ship come up on you...you can really appreciate how big 224 feet really is. The KA made a direct approach to the buoy which would have been the perfect thing to do whif eight knot winds...but as usually happens at sea the winds changed to eighteen knots very quickly and literally pushed the buoy into the KA about thirty feet aft of the bow on the port side. The buoy slid along the side of the KA and then shot on aft of the fantail. It is something to see the inertial of 22,000 tons. Even with the KA "backing down" (running in reverse) the ship still over shot the buoy by about a half mile. Once the Rib got out to the Rib again, we attached the mooring line and let the KA start to reel it in. As is typical of the NexGen moorings the recovery only took three hours once the KA started to pull. The deployment only took one hour and forty-five minutes...a record for a eight + spool mooring.



We are now on our way to 5N; 180 for the last recovery-deployment of the cruise. We have CTD's on the schedule for 3N and 4N for tonight and early tomorrow. It is hard to believe that the working portion of this experience is coming to a close. It will take me some time to really put this whole experience in perspective...I am glad that I will have the week transit back to Honolulu.

July 23 - Half way there!

1825 lcl We have just finished the recovery of our last buoy! The first 500 meters took over 2.5 hours. This was even long for a typical standard ATLAS mooring with "fist grips" every 5 meters. The real problem with this buoy was the miles and miles of tangled fishing line wrapped around the tope 300 meters of the t-cable. At each "fist grip" shackle there was usually a big ball of line that really looked like a rats nest. (I will transfer an image from my camera tomorrow so you will have some idea of how big a mess it was.) Now I am on an hour break while we steam to the anchor point and I thought that I would at least try to get a short message off to good old Montana.

It was looking like we were going to be done with the 180 leg a day or so ahead of schedule and then head toward Honolulu for an early in-port. That was at least until about 1000 today when we were informed that we are going to do some more CTD's on the 180 line since we were a head of schedule. No ship is going to waste sea days! We will be extending the CTD's to 12N on the 180 line which will add about a half day to the schedule. We also will be doing a deep (4000 meter) CTD sometime in the next couple of days to both calibrate the CTD unit and to lubricate the cable. That whole process will use up another half day, putting us back on schedule.

We are looking at about a three hour deployment starting in about a half hour, so it is looking like about 2200 lcl when we will have this "Last Buoy" in the water and the anchor dropped...that is of course if we don't have to tow it for an hour!

July 24 - On to 12N and then??

1530 lcl My prediction of completing the deployment of our last buoy were only off by 1.5 hours...on the short side. We didn't get the anchor dropped until 2330, a far cry from the one hour forty-five minute deployment on the 22nd. I am definitely sold on the NexGen design for ease of deployment and time savings after yesterday's marathon.

Today has been a catch-up day for me. I did some reading this morning, then helped Kate Treese, our Barny Girl, record species and length of the barnacles recovered off yesterday's buoy. It looks like the crew that put this buoy out a year ago didn't apply the anti-fouling paint to the tolroid. The section below the waterline on the tolroid had 1075 L. anatifera alone. The bridle and weight pocket we equally covered, making this a 4000 + barny buoy, the most for this cruise. After a couple of hours recording barnies it was lunch time and then to escape from the mind numbing sound of the deck grinder, I put in my ear plugs and started to read, only to pass out in the chair for a two hour nap. I think the pace of the last few days had finally caught up with me. I don't know how the deck crew can consistently work sixteen hour days!

We have passed 7N, doing CTD's every degree along the way. We are scheduled to do our next CTD at 8N at about 2000. After 8N we will have 4 more CTD's to do, one will be a 4000 meter cast. Then it is the long cruise to Honolulu, a week or so at 10 knots.

July 24 - Knot Fun!



I actually had the time to transfer the images from my camera so I thought that I would ship them out before it gets busy again and I forget! In this image you can see Denise Kester, Ed Long and Remus Gladden trying to untangle the rats nest of "long line" around one of the "Fist Grip" shackles. One of the really big problems was the three inch long hooks that were in this mess. This is one of the reasons that NOAA doesn't look too kindly on folks who fish their buoys.

July 25 - Two more CTD's to go!

1610 lcl Only two more CTD's to go for GP498 (our current cruise #). We should be changing our heading for Oahu at about 0100 tomorrow morning, shortly after we bring the 12N; 180 CTD aboard. Once we make the course change we have about 145 hours of steaming ahead of us.

The CO just informed the Chief Survey tech that we can't enter Pearl before the 3rd. due to some military operation that is going to use "all the Berthing" space. So now it looks like we will simply steam off the coast for a day or two. I wonder what the logic was for us to leave Kwajalein a day early...oh the mysteries of the US Government. As our Chief Survey tech says "We are never ahead of Schedule" in NOAA. I am sort of bummed to find out this bit of information so early. I really wish we didn't know until the first, so I wouldn't have a week to think of all the fun I will be missing as we steam off the coast for a day or two. Oh well such is life!

Looking for things to keep busy is going to be a challenge now that we will have even more transit days. In fact I already helped paint two of the three buoys that needed to be painted today since I was under the impression that we only had six days to port!

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Montana Teacher at Sea Journal Entries July 26-Aug.1, 1998

July 26 - Hawaii Bound



1530 lcl At about 0200 last night we changed course from the 180 line toward Oahu. With the change in course came a change in the sea conditions. Now that we are heading directly into the NE Trades and the ocean swell the ship is taking a good pounding. At about 0530 the high temperature alarms on the prop shafts started going off and the KA was slowed from 10.5 to about 8.5 knots to reduce the strain on the shafts and also reduce vibration due to cavitation. As we have continued on this same course through the day the seas have increased and we have had to further reduce headway to 6 knots. At this speed we will not be steaming off Oahu for a day as was a possibility yesterday. Now we will be lucky to make it into port on the 4th as was originally planned. It is amazing how dependent on conditions we are! I have attached an image of the seas that shows the waves breaking beside the ship. Usually our wake is a mere ripple, not today! You can even make out the white caps of waves breaking in the distance. The seas are about 15 to 20 feet, some of the biggest since we left Oahu in June.

July 27 - Better Weather!

1730 lcl The winds eased off at about 2200 last night, followed by the seas about an hour later. For most of the day yesterday, and the night before we had been hammered by 30 knot winds and 15 foot seas. This "poor" weather had slowed our speed to 5 knots at times. Today we have been able to make about 9 knots most of the day and thus have put many more miles behind us than we did yesterday. An added bonus to the milder conditions is the crew can actually walk in a more normal manner, and sleeping is much easier. Several of the crew that sleep in forward staterooms moved to more central or aft staterooms, that were vacant, for a couple of nights in order to get at least some rest. The ride in the forward portions of the ship is similar to that of a roller coaster, even with brief periods of weightlessness. Not the most pleasant way to sleep!

July 28 - Last Buoy Painted!

1400 lcl As I wait for the weekly abandon ship drill and fire drill, I thought that I would send a quick message. The transit is generally pretty dull. We had our Command Inspection at 1000 today. Command Inspection is when the CO, XO, and Chief Bos'n check all the staterooms, and other spaces of the ship to make sure that everything is up to standard. If anything is damaged or unclean it is recorded and the problem is dealt with before we make our next port. Since Command Inspection was today most of the crew spent part of yesterday cleaning fittings and making their staterooms spic and span. For an image of my stateroom see the attached image "stateroom". Hard to believe it but I have actually made my bed everyday...boy would my Mom be shocked, not to mention my wife! Once the Command Inspection was complete at about 1300 I went out to paint the Orange and white on the last buoy that is to be made ready for the next cruise. Two coats of each and an hour later I have just about done everything that needs to be done until we arrive in Honolulu. The black waterline and lettering will be my big project tomorrow! Our schedule, which has changed about as often as summer weather in the Beartooths, is now arrive on the morning of the second off the Island of Lanai. This will be a day of R and R while we wait for a berth to open at Pearl. We will steam overnight from Lanai for a morning mooring at Pearl on the 3rd. I will believe it when it actually happens.



July 29 - The Crane Operator?

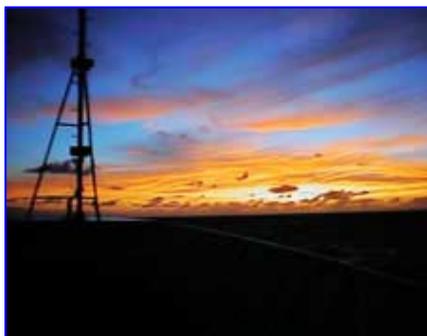
1510 lcl Another reason that I am a teacher and not an AB. I had my first intensive (one hour) crane driving lesson this morning. Unlike the capstan, brailing winch, and A-frame which are either on or off and move at a glacial pace, the crane has a sensitive hydraulic drive. The first time that I went to swing the boom, I simply pulled the lever expecting it to slowly swing around. Wrong answer! This thing moved like lightning compared to the other equipment that I have operated. After a brief moment of panic, when the spool hook flew off the main hook on the crane, crashing to the deck about three feet from Steve Foye, I figured out that this was an entirely different animal. Steve gave me a dagger look and said in his most refined saliorese, try it with a little less authority this time. After an hour of manipulating a dozen nylon spools with only the crane, and a constant barrage of commands from

Steve, I actually felt like I had a pretty good idea of how to operate the crane. Inner boom up, outer boom down, swing CCW, winch down and wow, the spool was only a half foot from where Steve wanted it. Give me another twenty years and I might actually be able to do it by myself!

July 31 - 18N; 165W

Steaming and dreaming for yet another day in the Equatorial Pacific. Things around here are really starting to slow down. Even the deck grinding has finally died off. Now the deck crew is in the process of putting the deck coat down. This is an interesting system of primer, a coat of deck gray, then another coat of deck gray which is covered by a layer of sand. After the paint, with imbedded sand, dries the excess sand will be vacuumed up. The deck is covered with a very durable, inexpensive nonskid surface that will protect it from the corrosive effects of the marine environment for about a year. A year is a fairly long time considering that the "professional", store bought deck coat with nonskid last six months at best. Another sure sign that we are soon to approach port is "acid washing" is soon to commence. Starting tomorrow the starboard side of the KA will have a stem to stern acid bath and high pressure freshwater bath to erase any rust, temporarily, from her hull. We need to have the KA look bright and beautiful for her return to Pearl. NOAA likes to show those dull gray NAVY ships up!

August 1 - Tropical Sunrise!



With only about 450 miles to go till we reach Hawaiian waters, I thought that I should get up and take a picture of one of the fantastic sunrises that we have been having the last few days. With a tropical storm to the east that has been breaking up the clouds have made for wonderful color. As you can see from the attached image we are heading into the rising sun. This heading is about 065 degrees. Since the sun is coming up about 20 degrees north of the equator this time of year that isn't too far off from directly into the sun. It looks like another day of transit after today at our current speed of 9 knots. At this speed we should make Lanai about 0630 on the 2nd of Aug.

August 1 - Into the Hot Zone

1610 lcl At about 1400 hrs we passes into the "Kapu" Hot Zone of the "Hula Girl" MidPac Naval exercise area. We had to get permission from a navy ship that was stationed on the edge of this "live fire" zone to pass through. The Navy ship and it's two helicopters are the first sign of humanity since we passes the fishing ship back a couple of weeks ago. It was actually exciting to see a big gray mass on the horizon, get bigger as we approached. The first indication I had that we were no longer alone was the sound of a helicopter passing over our bow at about 200 feet. We should clear the Hot Zone at about 2000 lcl and make for Lanai, for a 0700 anchor drop. We are scheduled to stay about 1/10 of a mile off Lanai until about 2200 tomorrow then make way for Pearl Harbor for a 0800 arrival on the 3rd. I have had a great experience as the Montana Teacher at Sea. I have experienced many things that I had never even dreamed of. I know that this experience will add many new dimensions to my teaching. I hope that other teachers will be inspired to become a Teacher at Sea. I know that it is an experience that they, their community, their school, and most of all their students will benefit from.

Daily Journal Entries and Related Links:

June 7 - 13	June 14 - 20	June 21 - 27
June 28 - July 4	July 5 - 11	July 12 - 18
July 19 - 25	MT Teacher at Sea Homepage	August 2 - 16
Planned Route	Related Links	OPI Homepage



Montana Teacher at Sea Journal Entries August 2 - 16, 1998

August 2 - One more night at sea!

1935 lcl Today was spent on the island of Lanai. This is the "pineapple" Island that was/is owned mostly by the Dole company. Most of Lanai hasn't been developed...yet! There are two large resorts that are in the early stages of development. Lots of "lots" for sale if anyone is interested. The crew enjoyed the time ashore and the short R and R break has helped to break up the cruise. After only one day on the beach most of the crew is ready for another cruise. Well maybe not most of the crew! I know that I am ready to get off in Honolulu tomorrow. I have had a great time and am glad that I had the chance to experience a couple of months at sea. With El Nino having been a hot topic in the news over the last six months it has been especially rewarding to be on "The Ship" that does the El Nino research for the USA. I have a much better appreciation for the El Nino event and the amount of data that has been collected and is collected to help predict it. I would encourage any teacher to apply for a Teacher at Sea cruise...you will have the experience of a lifetime!



A special thanks to all who have helped to make this project a reality: Steve Meredith and the Metnet folks, the NOAA Teacher at Sea Program, all the people who have been following this adventure, and most of all my wife MaryAnn and my son Casey for giving up their summer time with me. Thanks, Rick

August 3 - Last Message From The KA

0830 lcl We are sitting just off of the entrance to Pearl Harbor. We have been given orders to hold at the outer buoy until around 0900 then we are cleared to enter the harbor. It has been interesting to watch the ships coming in and out of the harbor. After so many days at sea, only seeing an occasional ship, this is like a major rush hour on an LA Freeway!



This is very likely my last communication from the KA as I will be departing from the ship as soon as we clear customs and Ag. inspection. I will be flying off to the Island of Maui for about a week of R and R with my family. The week in Maui is how I convinced my wife to let me go on this adventure. We are also planning on visiting some of our old friends on the island of Kauai for about five days before heading back to the wide open spaces of Montana. I taught in Kauai before moving to Billings, so it will be great to see some old friends.

Again, thanks to all who have made this project possible. I am planning to develop a multimedia presentation on the Teacher at Sea program and my experiences doing El Nino research on the Ka'Imimoana that will be presented at the MEA/MFT convention in October. I hope to see you there! Rick

August 16 - Back In Montana!

Thanks to all who made this project a success. I am now back in Montana after a very short 10 days on Maui and Kauai. I was great to see old friends and visit my old classroom at Kauai High and Inter. School, to see the changes that have come about since Iniki in 1992. The house that I lived in actually had blown away during the storm! The economy is very depressed on Kauai and it is doubtful if recovery will ever be complete. But on the bright side, you might actually be able to afford a 3 bdrm 2 bath condo now. I was shocked to see formerly \$150,000 condos going for \$59,000, heck that is almost affordable on a teacher's salary!

Over the next few weeks I will be gathering up more images and some additional comments to bring closure to this project. Rick

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<u>July 19 - 25</u>	<u>July 26 - August 1</u>	<u>MT Teacher at Sea Homepage</u>
<u>Planned Route</u>	<u>Related Links</u>	<u>OPI Homepage</u>