Day 75: September 29, 2010

Well, we continue to limp in. Thanks to hard work from Iain Kerr connecting us with the manufacturer in Holland, we have learned that the oil cooler has failed. Not a part one normally travels with and not a fix one can make at sea. Iain has arranged for a new one to be waiting for us on the dock with a mechanic to install it on Friday. He has done an awesome job taking care of us from Massachusetts and we love him for it. Thanks Iain! The weather looks awful starting Saturday thru Thursday so it may be serendipity that we are headed into port anyway.

Meanwhile on the boat, Captain Bob and our trusty crew have done an unbelievable job of getting us into port. We are now only 20 miles out, which is amazing, progress given our situation. Captain Bob has worked a pattern of run the engine until its hot (sometimes 5 minutes, sometimes one hour) to supplement the sailing. All three crew have sailed remarkably well. We are pleased and proud of their hard work. The rest of the team spent the day hard at work on land-based issues. We hope to be at dock tomorrow. Dr. Bob, Steve, Tania and Kait will all be leaving us. Monique has asked to stay longer and will.

Most of the news today came out of the land laboratory at USM. Amie has carefully inventoried all of our samples. Carolyne has weighed each piece and recorded the weights. Hong has assembled a team of James, Carolyne, Cathy and Jane who will now extract whale DNA from each piece of whale skin. Once the DNA is extracted, they will then perform a molecular biology test and determine the gender of each whale. A big thank you to all of them because that is a lot of work!

This test is relatively straightforward. We will target a gene that males whales have and female whales do not have. We will heat the double stranded DNA molecules so that they come apart into single strands. We will then add a short DNA sequence that brackets the whale gene we are targeting it is the only thing to get copied. Then we will add an enzyme that copies DNA and the ingredients needed to supply that enzyme. Then we will cool down the DNA to allow the copying to occur. Thus, we start with 1 set of the gene at the beginning. It will be copied in the first round so we end up with 2 sets. Then the second round will copy 2 sets into 4 sets and so on until after about 35 cycles we will have about a billion copies of that gene, which we then can run in a gel made of a gelatin like substance, stain it and visualize it with our eyes. We will simultaneously focus on a second gene that both male and female whales have. Thus, when we take a picture of our gel, males will have two bands of DNA and females one. I will show you a picture after they do the work and Hong sends me one.

After the gender is determined, we will then know how many male and female whales we sampled. Next, we will take a drop of DNA from each whale and put it in a special plate and send it to our collaborator at Oregon State. His team will then perform a related technique that will provide a DNA fingerprint for each whale. This information will identify each whale uniquely and show familial relationships. Then we may be able to separate our whales into families and see if we sampled any whales twice.

The DNA extractions started today so that work is in process. In addition, James continues his work on chemical dispersant toxicity in human cells, while Cathy ramps up her efforts of dispersants on whale cells. Meanwhile, Qin, Juli, Priya, Carolyne, Amie, James, Cathy, Jane, Ryan, Kellie, Shouping and Hong are all growing up the sperm whale cell lines and preparing them for analysis of their background chromosome damage and karyotypes among other things. See I told you lots of people doing lots of work and this work is all above and beyond their regular projects. We thank all of them too!
So even when the boat limps in the project moves forward.

Not a lot to say tonight. Hope to be at dock soon and back out to sea as soon as the weather clears.

John