



The Anchor



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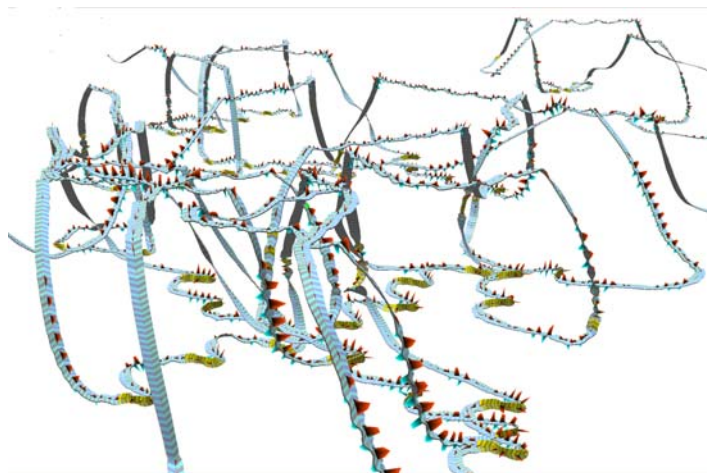
Visualizing the Underwater Behavior of Whales

Colin Ware, Roland Arsenault and Matt Plumlee have been working as part of the Whale Tracks Project, a collaboration between visualization experts engineers and marine biologists, spearheaded by Dr. David Wiley of the Stellwagen Bank National Marine Sanctuary. Scientists at Woods Hole Oceanographic Institution developed a small non-invasive tag that can be attached to a humpback whale with four suction cups, using a 45 foot pole mounted on the bow of a rigid hull inflatable boat.

In July, the CCOM group was invited to join Dr. Wiley and his colleagues aboard the NOAA ship Nancy Foster as they witnessed the placing of the tags. The tag can record data for up to 24 hours and will release on its own shortly thereafter. The "DTAG" records the whales' depth, sound, speed and dive angle. With the information collected from the tags, features were added to CCOM's GeoZuiD software that allow a user to follow a whale, and watch it's motions while listening to the various sounds that were picked up by the DTAG. To analyze the data, the CCOM team used both their existing GeoZuiD software and created a new application called TrackPlot, which uses a custom-designed ribbon to represent the track. The ribbon provides a visual recording of the whales' movements, including twists, direction, ascent and descent, and even individual fluke strokes.

By simultaneously tracking the path of ships in the vicinity, scientists can observe the possible effects of shipping on whale behavior. Understanding whale behavior is important for a number of reasons. Whales are dying due to ship collisions and entanglements with fishing gear in ever increasing numbers. The information gathered from the Whale Tracks Project may lead to changes in shipping regulations and changes in fishing apparatus. In December, Roland and Colin will join Dr. Wiley in

San Diego at the Conference on the Biology of Marine Mammals, to present the results of the team's work.



TrackPlot showing several hours of whale foraging behavior

The Lost City Expedition Comes to CCOM

It wasn't the latest blockbuster movie being viewed in the video classroom at the end of July...but it was just as exciting; CCOM was invited to be part of the Lost City Expedition, led by Dr. Robert Ballard of the University of Rhode Island (and famous for finding the Titanic in 1987), and Dr. Deborah Kelley of the University of Washington. The purpose of the expedition was to study the Lost City hydrothermal vent field, located in the middle of the Atlantic ocean, and discovered by Dr. Kelley in 2000. But CCOM researchers didn't need to travel any further than down the hall to view the vents on the ocean floor. Thanks to two remotely operated vehicles (ROVs), together with fiber-optic cables, satellite feeds and a special, high-speed Internet connection, images were transmitted by the ROVs on the ocean floor to our own video classroom. Researchers at the University of Rhode Island and the University of Washington also viewed the essentially live (within 1.5 seconds) images. The

expedition's leaders, who were stationed at the University of Washington, told the engineer's aboard the NOAA ship *Ronald H. Brown* where to send the ROV's. CCOM downloaded data from the ship, processed it into 3D visualizations, and sent the data back to the ship, where researchers used the visualizations to help guide the vehicles. CCOM held an open house and invited all marine faculty and staff to view the footage during a three-day period at the height of the action. The entire expedition was shown live at 24 museums, science centers and aquariums. According to Larry Mayer, "We should be proud to have played a role in this exciting experiment that not only brought the excitement of deep sea exploration and scientific discovery to large audiences, but also set a precedent for a number of new ways of doing ocean exploration and even hydrography." Special thanks go out to our many staffers who made CCOM's part of the cruise successful, including Brian Calder, Nathan Paquin, Will Fessenden, Andy McLeod, Matt Packard, Jim Case, Barbara Kraft, Randy Cutter, Ben Smith, Colin Ware, Glenn McGillicuddy and Mike Leo.



Roland Arsenault and Briana Sullivan watch as the first *Lost City Expedition* images stream into the video classroom.

Shallow Survey Conference 2005

The Shallow Survey 2005 4th International Conference was held in Plymouth, UK from September 12th to September 15th. Larry Mayer, Andy Armstrong, Brian Calder, and Lloyd Huff were in attendance. They joined Shep Smith, Rick Brennan and John Hall, who also attended. Larry has the DVDs of Brian's presentation *Field Verification of MBES Error Models*, as well as Lloyd's presentation (co-authored with Mashkoor Malik) *Extended Applications of CUBE*, and Shep Smith's presentation *Empirical Object Detection Performance of Lidar and Multibeam in Long Island Sound*, if anyone would like to view these.

The conference was established in Australia in 1999 and held at CCOM/JHC in 2001. In 2008 CCOM/JHC will again be hosting the conference for as many as 300 delegates from around the world.

Law of the Sea Kilo Moana Cruise

On June 24th, Jim Gardner, Srinivas Karlapati, Clive Angwenyi, and Hugo Montoro left Honolulu, HI aboard the M/V Kilo Moana to begin the first leg of the third U.S. Law of the Sea mapping cruise, a detailed multibeam echosounder survey of the U.S. Gulf of Alaska Continental Margin. Larry Mayer, Brian Calder, Mashkoor Malik, Abubakar Mustapha, Taisei Morishita and Tony Withers joined the group for the second leg of the cruise, which left Kodiak, AK on August 2nd and returned to Honolulu on September 2nd. The Law of the Sea Mapping program is designed to collect modern multibeam sonar data in regions where there may be a potential for the U.S. to extend its legal continental shelf under United Nations Law of the Sea Convention Article 76. The Law of the Sea treaty provides an international legal framework for exercising the rights and duties of countries related to their use of ocean space and resources.

CCOM/JHC Kicks Off New Academic Year at Odiorne Point State Park

On September 8th, CCOM/JHC students, staff and their families gathered at Odiorne Point State Park in Rye for a clambake. The weather cooperated and we had a beautiful day for the event.

We welcomed our new GEBCO students: Muhammad Bashir, Djoko Hartoyo, Jorge Luis Heredia, Apolonia Lagonsin and Tsuyoshi Yoshida.



Odiorne Point State Park, Rye

We also welcomed our new grad. students: Fan Gu, Gretchen Imahori, Luis Soares Rosa, Val Schmidt and Ed Sweeney.



Jorge, Pol, Djoko, Tsuyoshi and Tianhang enjoying themselves at the clambake.

In addition to all of our new students, Larry welcomed several new staff members: Research Scientist **Brian Locke** joined the CCOM/JHC staff in early September. He will be working on the processing and visualization of data from multibeam sonars for midwater mapping, and helping with software for other projects. He most recently worked at Enterasys Networks as a software engineer. His wife, Monica Chiu is an Associate Professor in the English Dept. at UNH. They live in Durham with their two children, Roland (2) and Ellie (5). Brian reports that before he had children, he enjoyed cycling and Frisbee golf, but his children now dictate the hobbies he has time for, including playing “horsey” and “monster”.

Kurt Schwehr came on board in August in the position of Research Scientist. He will be working with Colin, Briana, Roland and Matt on the Chart of the Future project and some additional upcoming projects. He and his wife, Sarah, recently moved to New Hampshire from California. Kurt will be receiving his Ph.D. in Geology/Geophysics from Scripps Institution of Oceanography where he studied Paleomagnetism and Stratigraphy. As for hobbies, Kurt hopes to have time for some once he finishes grad. school.

Shachak Pe’eri will be starting at CCOM/JHC as a PostDoctoral Research Associate doing geodetic research. He received his Ph.D. in Geophysics from Tel-Aviv University in Israel.

Tony Withers is a visiting scholar joining us from Australia, where he is a Naval Officer with the Australian Hydrographic Office. He will be here until December.

Jason Greenlaw is a new part-timer who will be working with Nathan and Will to keep our IT needs met. He previously worked at the Computer Store.

It’s a Boy!!

Andy and Pam McLeod welcomed their 2nd son, Lander, on September 23rd.

The newest McLeod weighed 8lbs. 8 oz. and was 21 inches long. He joins 2 year old brother, Perrin.



Perrin McLeod at Odiorne Pt., enjoying his last carefree days as an only child.

Wedding Bells!

Lee and Elaine Alexander’s daughter, Amy, was married on September 17th in Framingham, MA.

Administrative Notes

Reminder: For PAT staff, monthly leave records are due on the 1st of each month. You can leave them in Linda Prescott’s mailbox (now located inside the administrative office #214)

Friday, November 11th is Veteran’s day, and is a university paid holiday for full-time faculty, staff and students.

The University will also be closed on Thursday, **November 24th and Friday, the 25th** for the Thanksgiving holiday.

Reminder: The University will be closed for the week between Christmas and New Year’s Day (Monday, December 26 to Friday, December 30th). Three out of the five days are paid holidays. You must use 2 of your own personal days if you want to get paid for the entire week.



Kurt Schwehr and his wife, Sarah join Brian Calder, Chris DeMoustier, Val Schmidt and his wife, Alice at Odiorne Pt.

More pictures!



Lisa Czekanski tries lobster for the first time.



Catherine Gardner and Colin Ware eagerly waiting for the lobster.



Megan Case enjoying her veggies.



Larry with Brian Locke and his wife, Monica Chiu



Jen Dijkstra holds a sleepy Sydney



The Smith's and the Locke's get ready to dig in.