

Date: 16 July 2015

Location: Transiting North

Primary Activities: SPAWAR Wave Glider Tests; ROV Operations; Aerostat and Puma Digital Data Link

Conditions: Fog early then clearing with overcast skies; zero to 6/10's ice coverage

Temperatures: Air temperature range 40 - 45 F; water temperature 30 - 38 F

One of the most exciting turn of events today was a polar bear sighting. It was a nice moral boost as we approach the final phase of Arctic Technology Evaluation 2015.

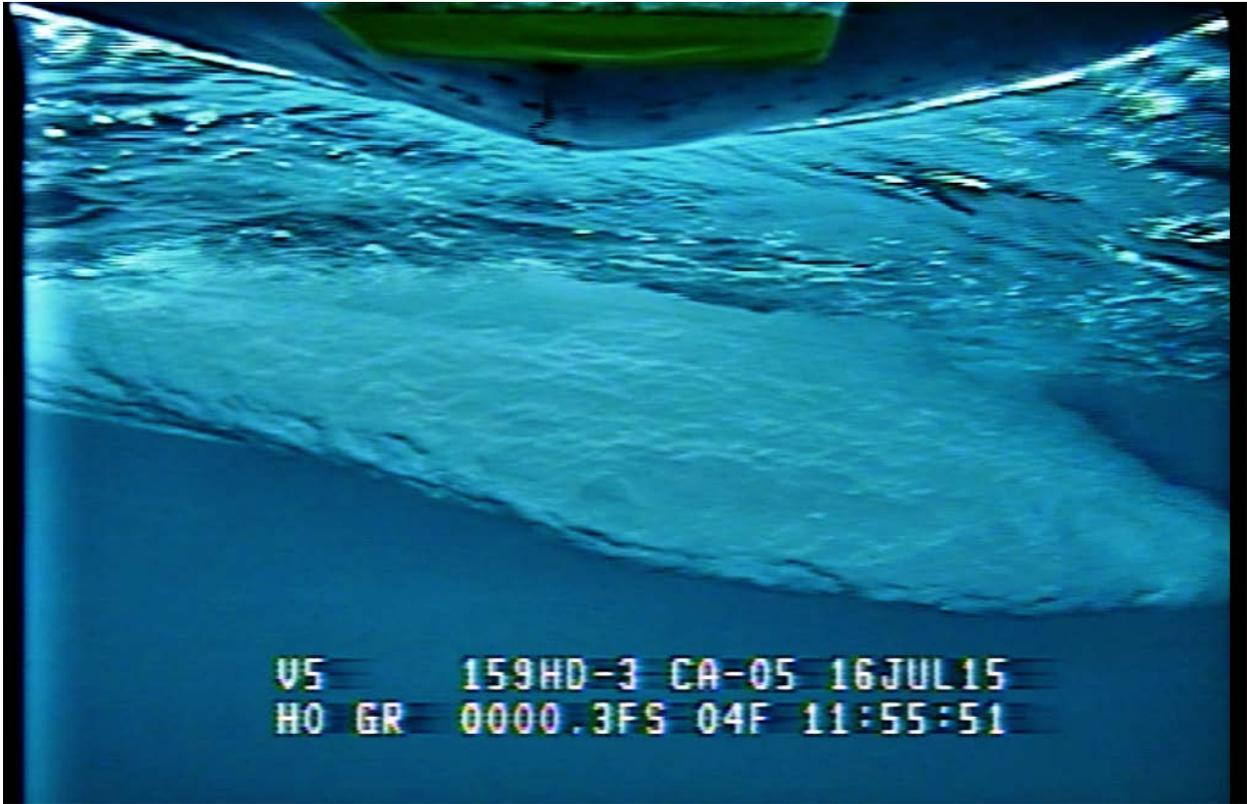
Today, we experienced a wide range of environmental conditions, from open water and fog at the start of the day to 6/10's ice coverage by the evening. Our goal was to make best possible speed this morning to meet our schedule for transiting as far North as possible for communications testing. As illustrated in the pictures, the science teams, crew, and Alaska Native Representative (Mayor Denise Michels) continue to interact, exchange insights, and sometimes collaborate in unexpected ways to achieve evaluation objectives.

The Space and Naval Warfare Systems Command (SPAWAR) SHARC Wave Glider team conducted another series of tests of their image processing algorithm to autonomously direct a glider around objects in its path. Although we had clear water and ice floes, we once again lacked waves to propel the glider. To overcome this obstacle, SPAWAR, the Coast Research & Development Center (RDC), and the Coast Guard Dive team (DV2 Sean Eversole and DV2 Adam Harris) modified the Wave Glider by connecting an ROV to provide propulsion.



(Photo courtesy USCG R&D Center Team) Wave Glider with connected ROV to provide propulsion. Note that this picture shows the combined efforts of three teams – SPAWAR, RDC, and the 3D Printing team (cone mounted to the camera).

This shared ingenuity enabled SPAWAR to analyze the ice-avoidance capability under controlled conditions. Additionally, SPAWAR and the ROV teams partnered to collect both surface and subsurface imagery to better exemplify ice conditions and characteristics. Today's results will aid SPAWAR in improving the responsiveness and accuracy of Wave Glider commands in relation to the ice imagery.



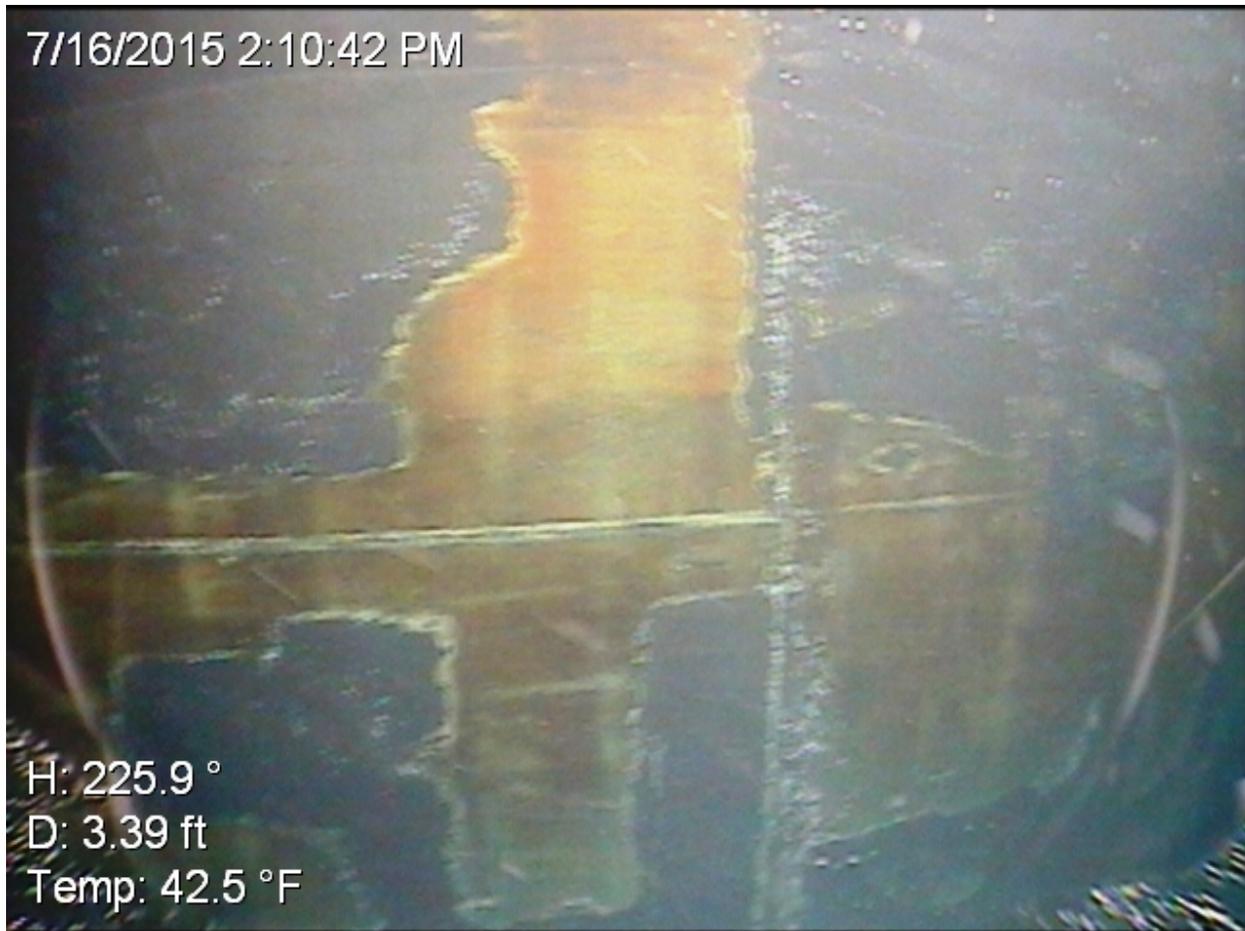
Subsurface view of ice (Photo courtesy USCG Dive Team)

The Dive team also provided underwater imagery of CGC HEALY's hull and running gear to the ship's crew.

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H: 164.7 °  
D: 20.92 ft  
Temp: 40.1 °F





(Photos courtesy USCG Dive Team) This latter photo shows the effects of ice on the hull - slight paint deterioration. Under the Dive Team's instruction, some of the crew and science team members experienced hands-on operations of the ROVs. During these evolutions, the RDC interns received on-the-job training on proper tending techniques.



Nome Mayor Denise Michels, DV2 Eversole, and RDC intern Nick Haliscak (Photo by DJ Hastings, RDC)



DV2 Eversole and District 17's Tribal Liaison, Sudie Hargis (Photo by DJ Hastings, RDC)



R&D Center Team members Jason Story and DJ Hastings competing ROVs (Photos courtesy USCG R&D Center Team)

Today, the Aerostat and Puma teams conducted a series of Digital Data Link (DDL) connectivity tests. Prior to launch, both teams verified linkage connectivity, and the Puma team set up Ground Control Stations (GCS) on both the flight deck and on the bow deck. Once the Aerostat launched, they established linkage with the flight-deck GCS. After launching the Puma, they established connectivity between it and the Aerostat. The teams were then able to control the Puma with the flight-deck GCS through the Aerostat. This has the effect of extending the Puma's operational range, both vertically and horizontally. Next, the teams verified the link with the secondary GCS on the bow deck, which simulated beyond line-of-sight operations due to the obstructed view between GCSs from HEALY's superstructure. The teams were able to hand off Puma control from one GCS to the other via the link through the Aerostat and then to pass direct control of the Puma to the bow-deck GCS. In addition to validating beyond-line-of-sight operations, the application is, for example, the ability to launch the Puma from one ship and land on another. Aerostat and Puma sorties will continue, weather permitting, as we continue to transit North conducting Comms testing.

Tomorrow and weather permitting, we will discuss a technology evaluation to predict atmospheric icing conditions in the Arctic.

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For description of ATE 2015 plans see newsletter at:

[http://www.uscg.mil/acquisition/rdc/pdf/ATE15%20Pub\\_FINAL.pdf](http://www.uscg.mil/acquisition/rdc/pdf/ATE15%20Pub_FINAL.pdf)

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