

Ryan Chouest daily data transmission and report

Period covered: 1105hrs 06/20/2010-1145hrs 06/21/2010

187.076 - Nautical miles covered

Vessel science party:

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Cruise notes:

Since 1105 hrs 06/20/2010 we have sailed on the course as planned (Figure 1a). The cumulative cruise route taken on cruise 4 is shown in Figure 1b. The Fluorometers used onboard are the Chelsea (S1), Trios (S2), and the Contros (S3) sensors as described in the “Integrated Hydrocarbon Sensors for hydrocarbon exploration” slide pack prepared by Andy Ross. These instruments are designed to detect polycyclic aromatic hydrocarbons (PAH’s) and sensitive to the ppb-ppm range. Selected water/mousse samples are also examined onboard using a GCMS to calibrate and ground truth measurements.

Errata: The purple shaded regions on the maps in Figures 1 through 5 (and previous reports) should be labeled “potential oiling footprint” as noted on the ERMA website.

Science results and preliminary interpretation:

Fluorometry results

The Fluorometer sensors recorded low to medium inferred hydrocarbon concentrations. The Chelsea fluorometer gave the lowest values with the exception of slightly elevated values in the northern part of the transect, still in the low ppb range (Figure2). The Trios fluorometer recorded low to medium values (Figure 3). As noted in previous reports, the Contros sensor shows the highest values of the three sensors (Figure 4).

Planned versus actual route taken for cruise 4:

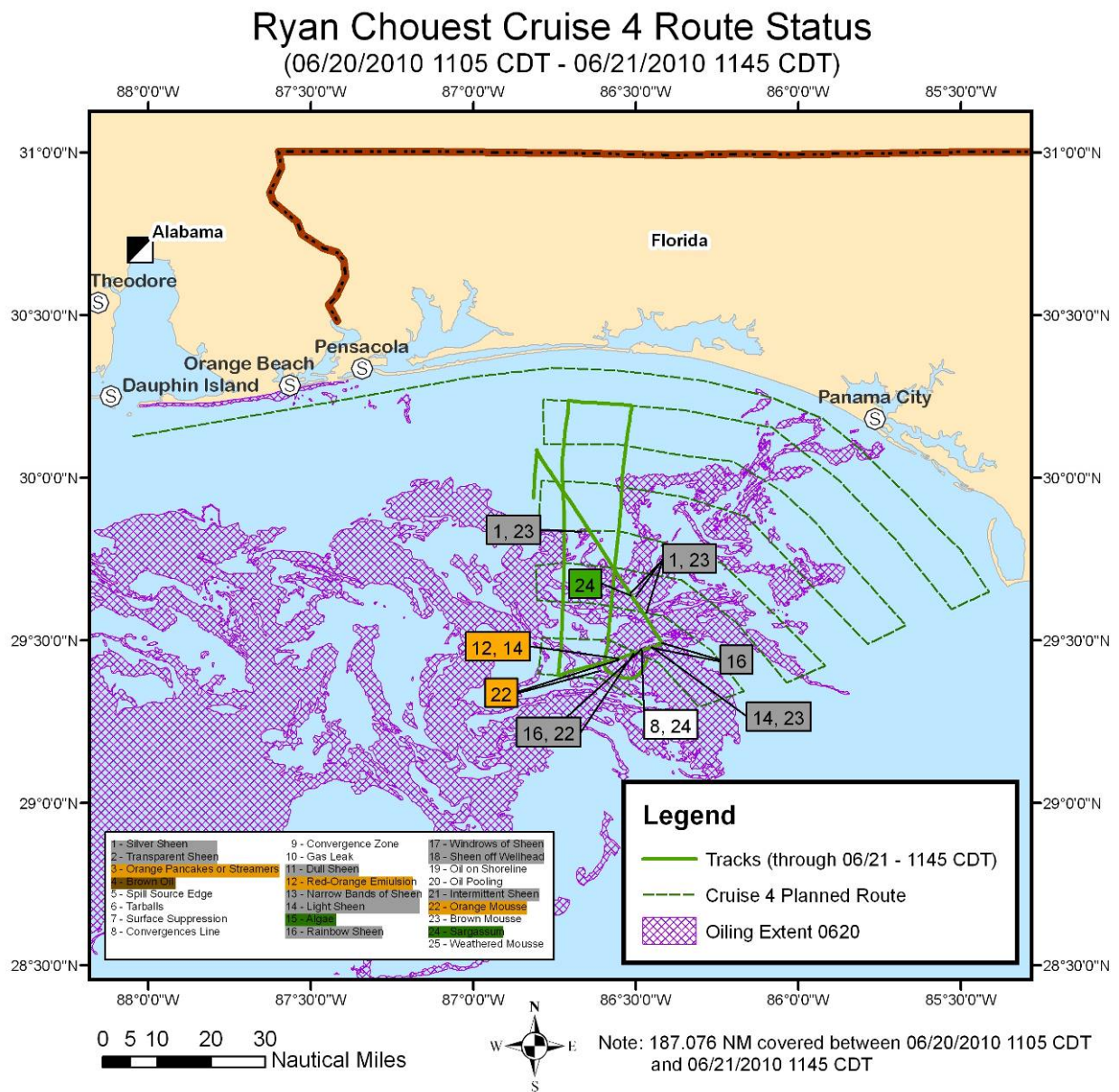


Figure 1a: Planned versus actual route course plotted between 06/20/2010 –06/21/2010. Purple shaded area represents outline extent of the slick from 06/20 ERMA composite.

Ryan Chouest Cruise 4 Route Status

(06/19/2010 0140 CDT - 06/21/2010 1145 CDT)

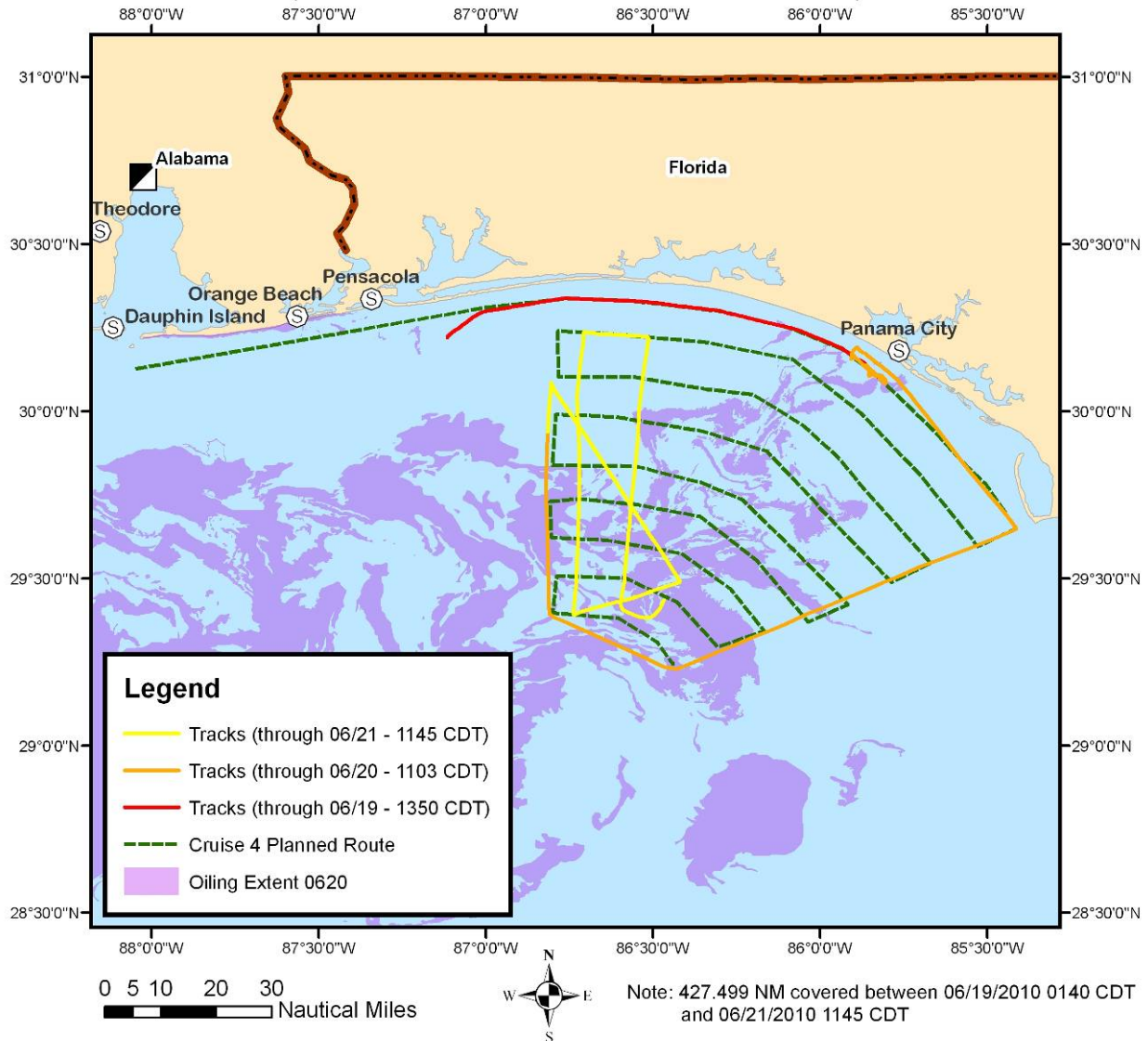


Figure 1b. Cumulative planned versus actual route course plotted between 06/19/2010 –06/21/2010. Purple shaded area represents outline extent of the slick from 06/20 ERMA composite.

During June 20th to 21st, there is only partial correlation between the visual observations at the sea surface and fluorometry measurements one to two meters below the surface. For example, we noted red-orange emulsions and rainbow sheen in the southern end of the transect, but the Trios fluorometer showed relatively lower inferred concentrations compared to more northern segments (Figure 3).

The use of the previous days potential oiling extents does necessarily not describe the actual oil extent during the period over which the sensor results are acquired or the visual observations that are made. To test the correlation between sensor results and potential oiling extent obtained from satellite data, the Trios fluorometry data was mapped as of report time for 06/20/2010 and potential oiling extent over the same time period (Figure 5a). Overall, there appears to be a limited correlation. Some regions correlate reasonably well as shown in Figures 5b and 5c whilst others do not. One explanation may be

that the amount of dissolved PAH's detected below the surface may depend on how weathered the oil slick is at the surface. Less weathered oil slicks on the surface will result in higher levels of dissolved PAH's immediately below the sea surface. A thorough examination of all data will need to be examined before we can draw any firm conclusions between potential oiling extent and fluorometry measurements.

Surface Observations

We observed many more seaweed clumps (Photographs 1-2), particularly in an area of convergence where they were concentrated (Figure 1, Photograph 4). In addition, we observed a wide diversity of different types of oil slicks. As reported yesterday, transparent and light surface sheens were by far the most common type of oil slicks observed. In reality, it is very difficult to discriminate between them. Rainbow sheens were also observed (Photograph 3) as well as a red-orange emulsion (Photograph 5). The rainbow sheens were noted near the denser region of red-orange emulsions (Figure 1), which were restricted to the southernmost part of the transect.

Vessel science operations:

We continued to log fluorometer measurements and observe/photo document sea-surface conditions.

Ryan Chouest Cruise 4 Data
 Chelsea- Fluorometer
 (06/20/2010 1105 CDT - 06/21/2010 1145 CDT)

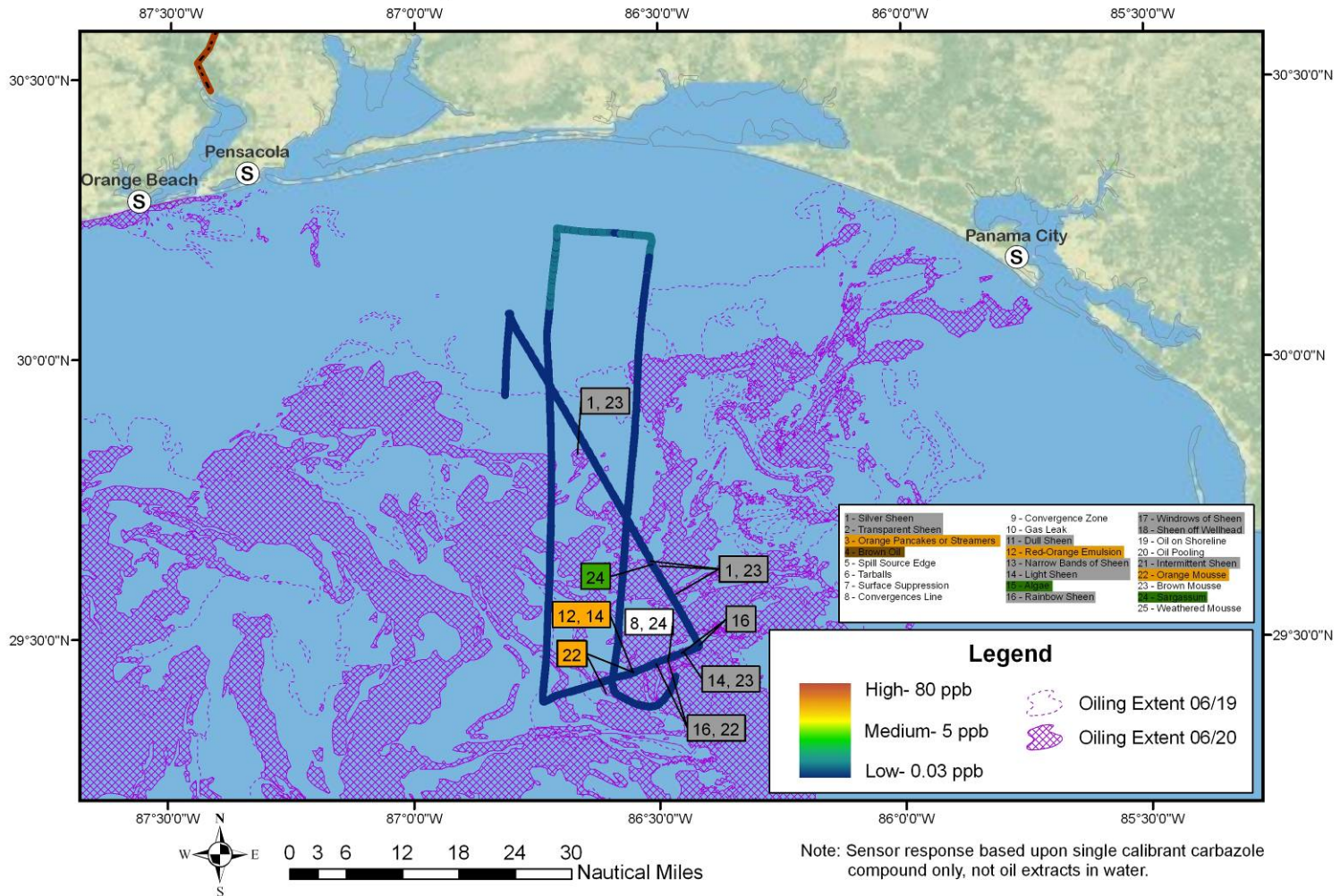


Figure 2. Chelsea fluorometer results plotted with location on cruise 4 track. Breaks in data occur when either data quality is poor or the systems were turned off due to pump problems.

Ryan Chouest Cruise 4 Data
 Trios- Fluorometer
 (06/20/2010 1105 CDT - 06/21/2010 1145 CDT)

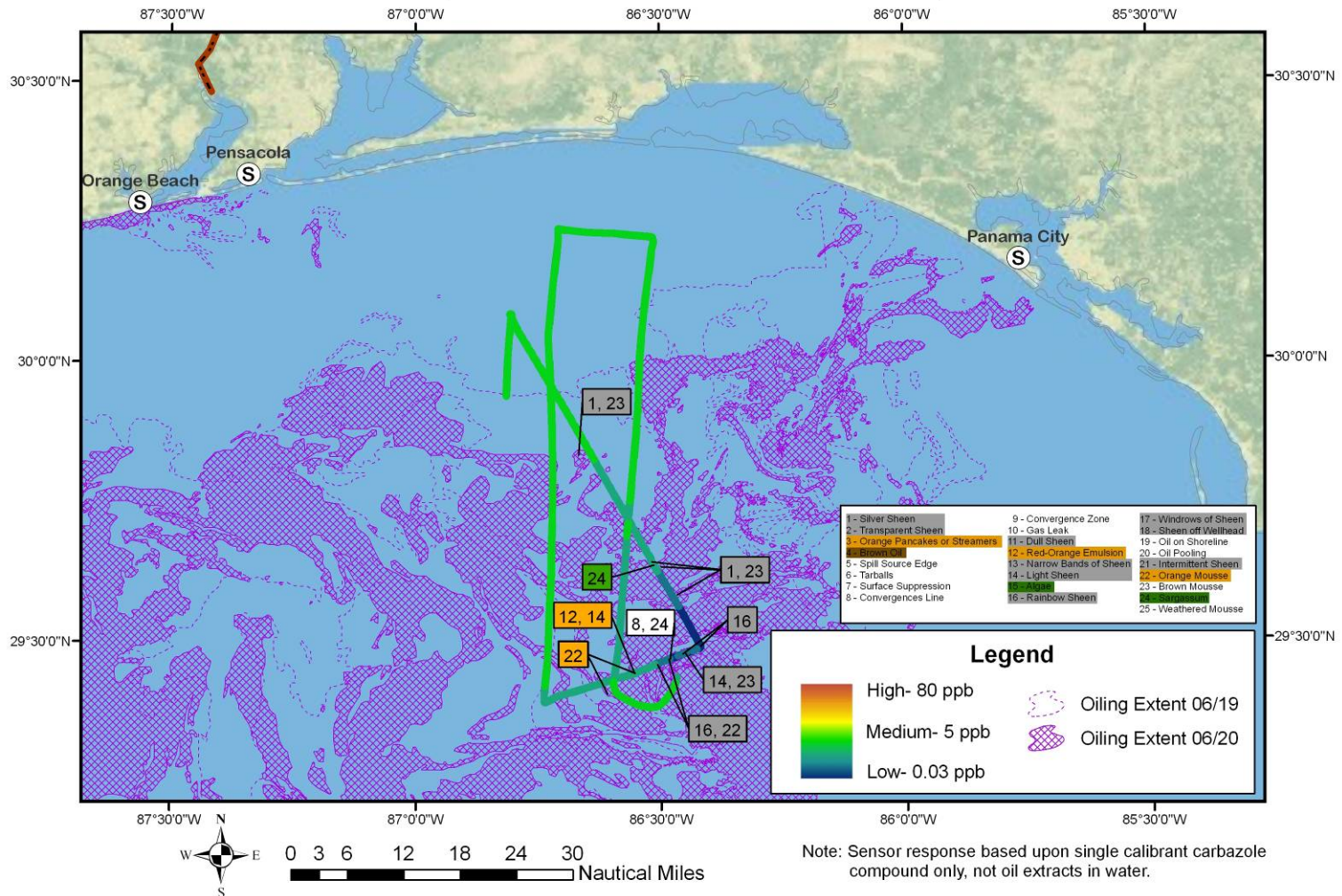


Figure 3. Trios fluorometer results plotted with location on cruise 4 track. Breaks in data occur when either data quality is poor or the systems were turned off due to pump problems.

Ryan Chouest Cruise 4 Data
 Contros- Fluorometer
 (06/20/2010 1105 CDT - 06/21/2010 1145 CDT)

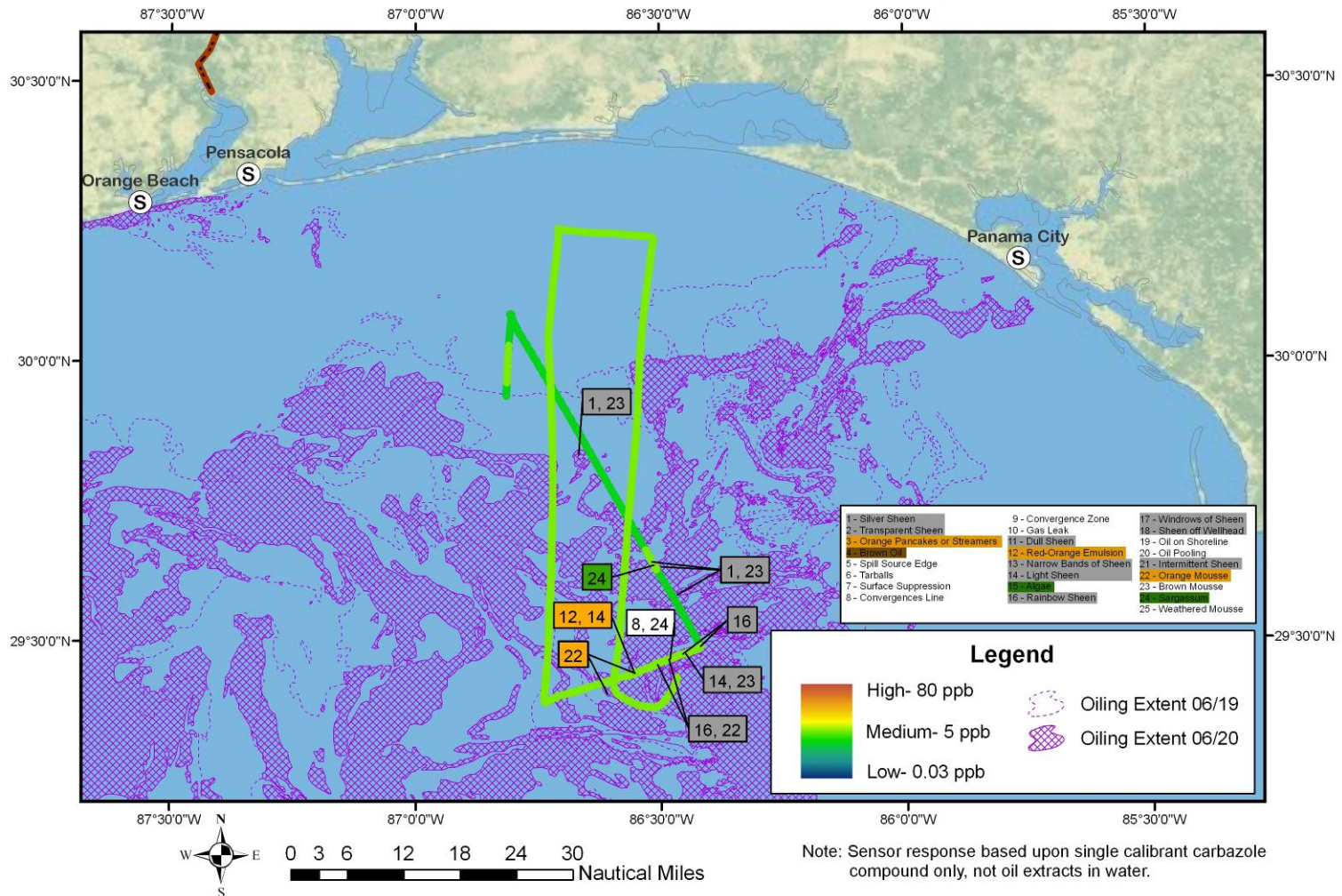


Figure 4. Contros fluorometer results plotted with location on cruise 4 track. Breaks in data occur when either data quality is poor or the systems were turned off due to pump problems.

Ryan Chouest Cruise 4 Data
 Trios- Fluorometer
 (06/19/2010 1350 CDT - 06/20/2010 1103 CDT)

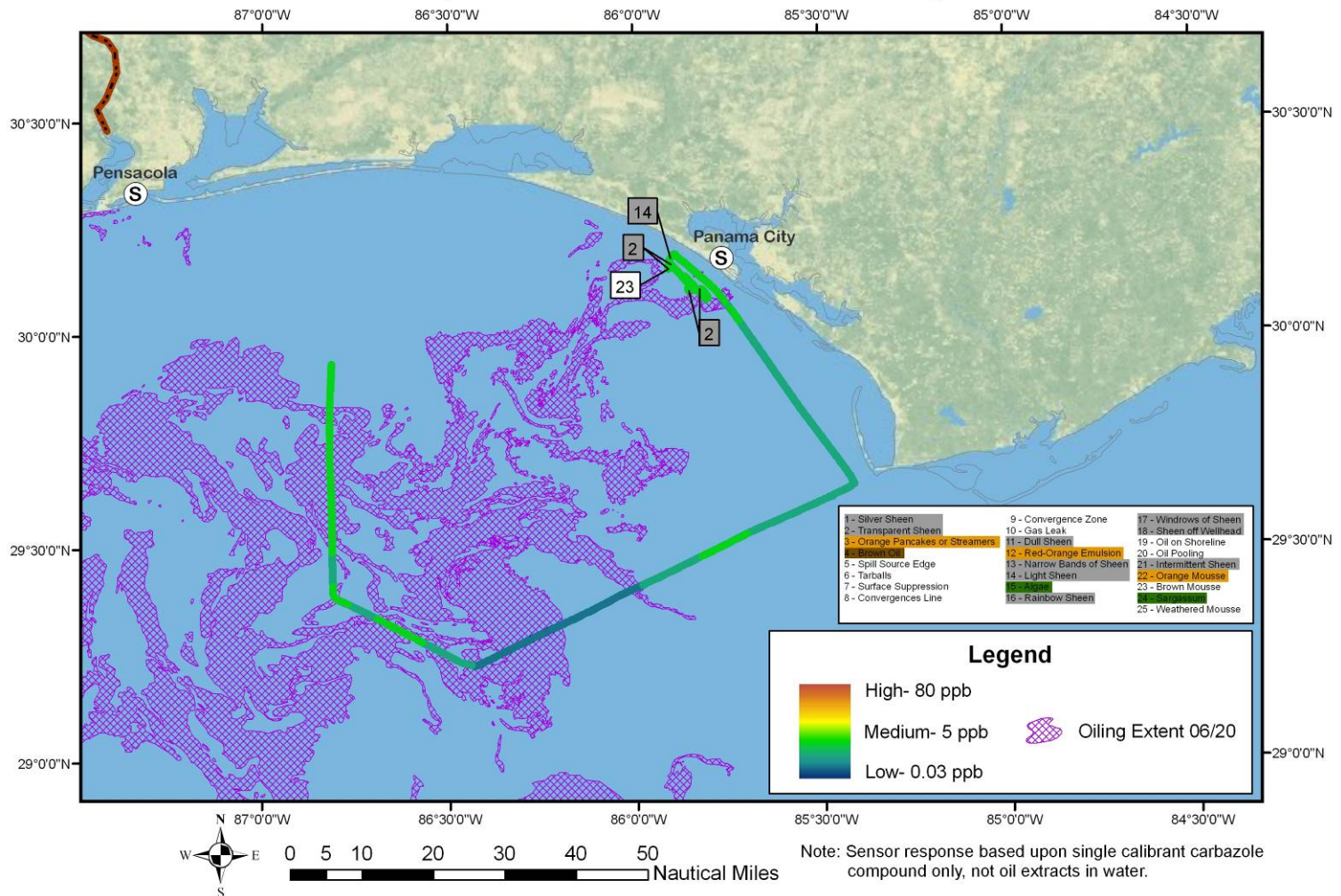


Figure 5a. Trios fluorometer results plotted as of 06/20/2010 with potential oiling extent for the same time frame. Breaks in data occur when either data quality is poor or the systems were turned off due to pump problems.

Ryan Chouest Cruise 4 Data
 Trios- Fluorometer
 (06/19/2010 1350 CDT - 06/20/2010 1103 CDT)

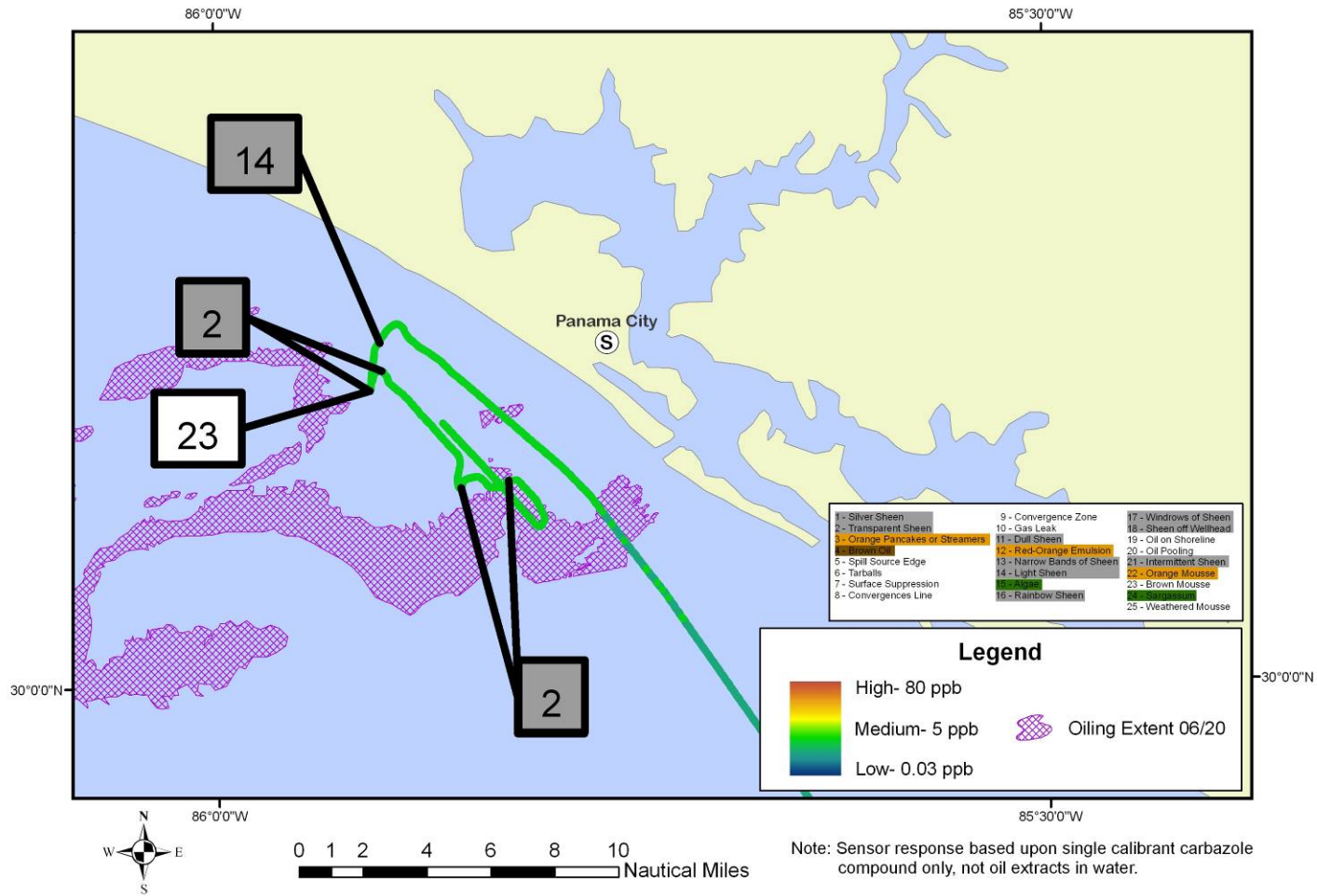


Figure 5b. Trios fluorometer results plotted as of 06/20/2010 with potential oiling extent for the same time frame. Breaks in data occur when either data quality is poor or the systems were turned off due to pump problems.

Ryan Chouest Cruise 4 Data
Trios- Fluorometer
(06/19/2010 1350 CDT - 06/20/2010 1103 CDT)

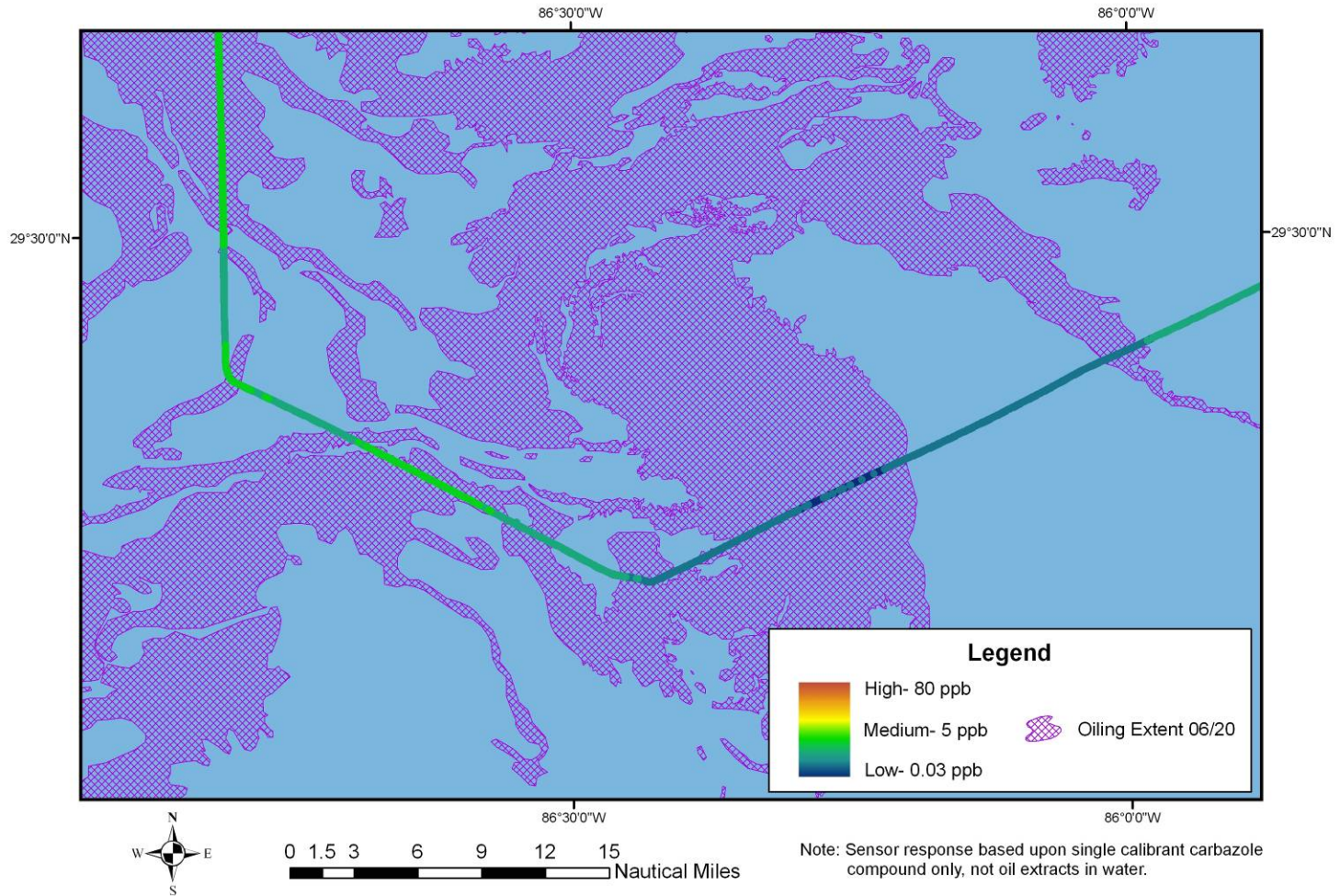


Figure 5c. Trios fluorometer results plotted as of 06/20/2010 with potential oiling extent for the same time frame. Breaks in data occur when either data quality is poor or the systems were turned off due to pump problems.

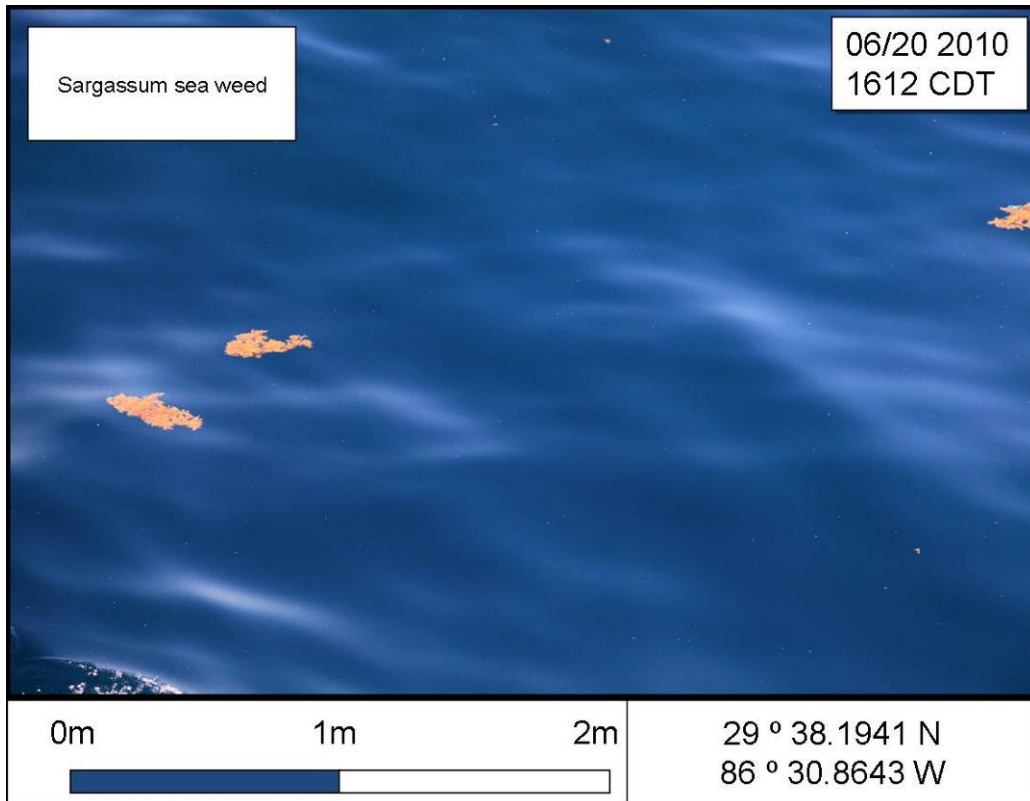


Photo 1. Sargassum seaweed floating on surface sheen. Although seaweed is brownish green up close, it may resemble orange mousse depending on observation distance and angle of solar illumination.

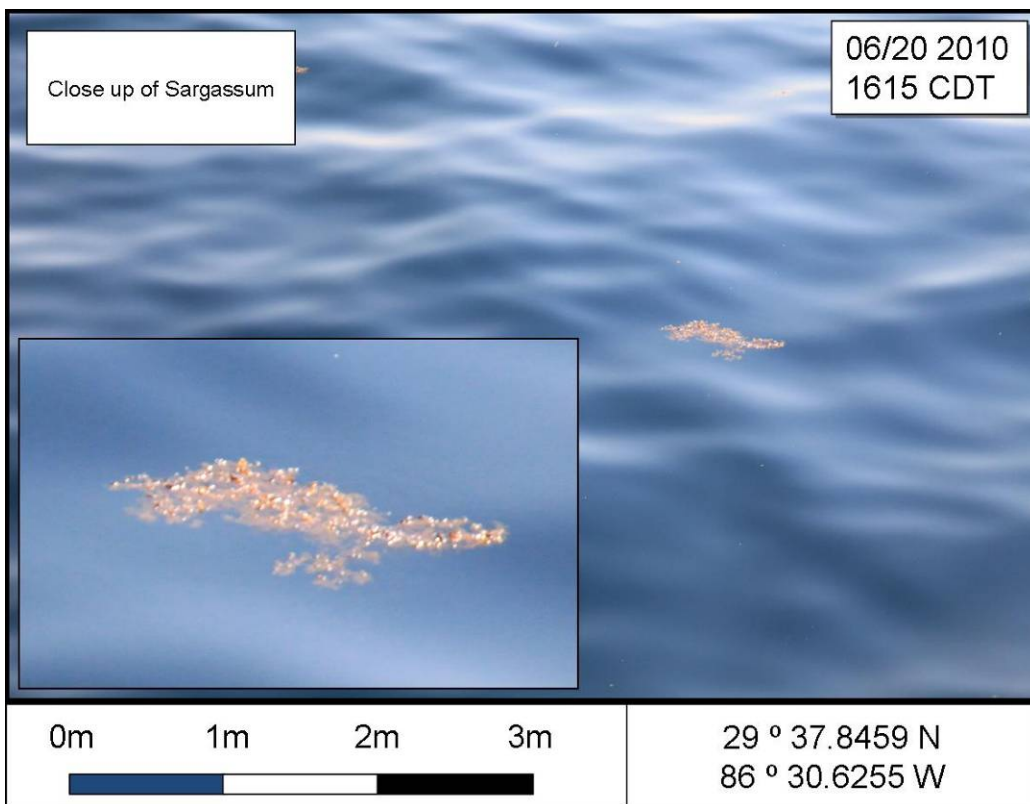


Photo 2. Zoomed image of seaweed showing grape-sized float bladders a little more clearly.

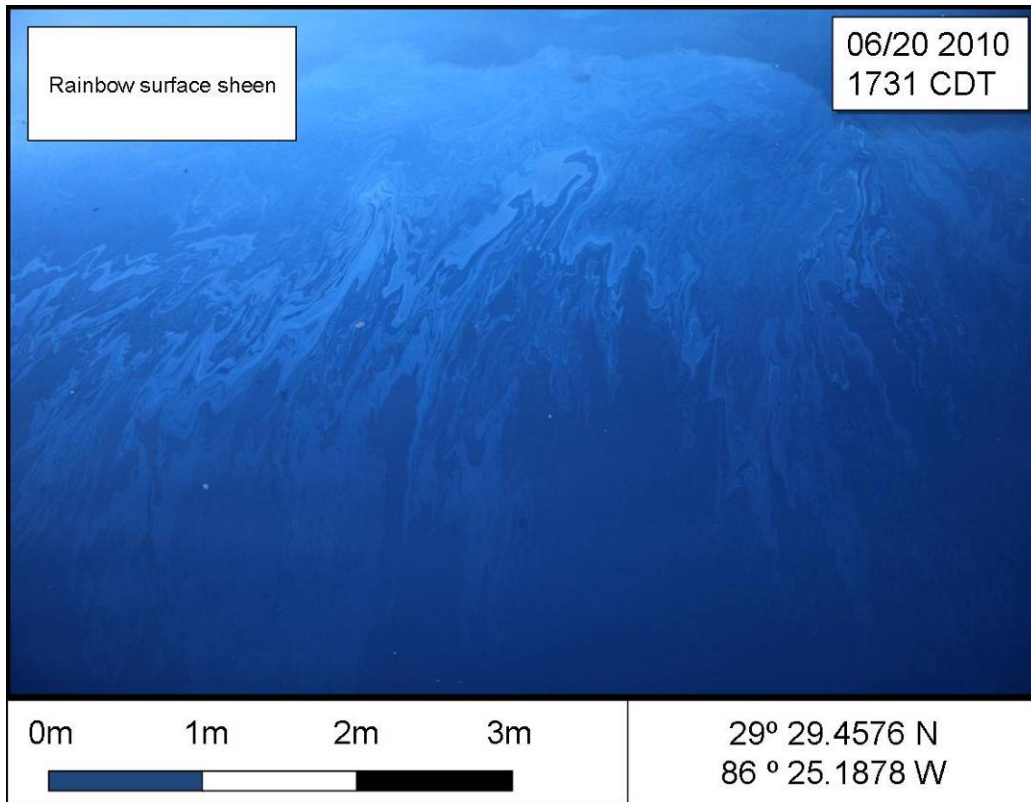


Photo 3. Rainbow surface sheen amongst transparent surface sheen.

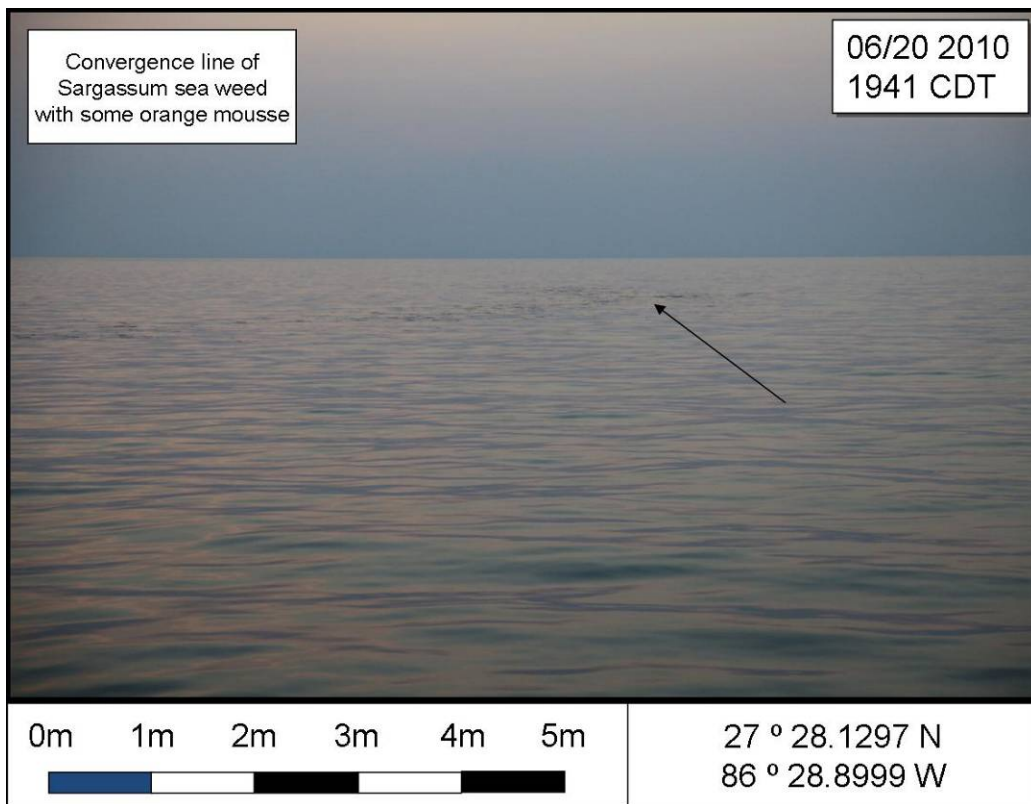


Photo 4. Convergence line of predominantly seaweed, some smaller pieces of orange mousse also present.

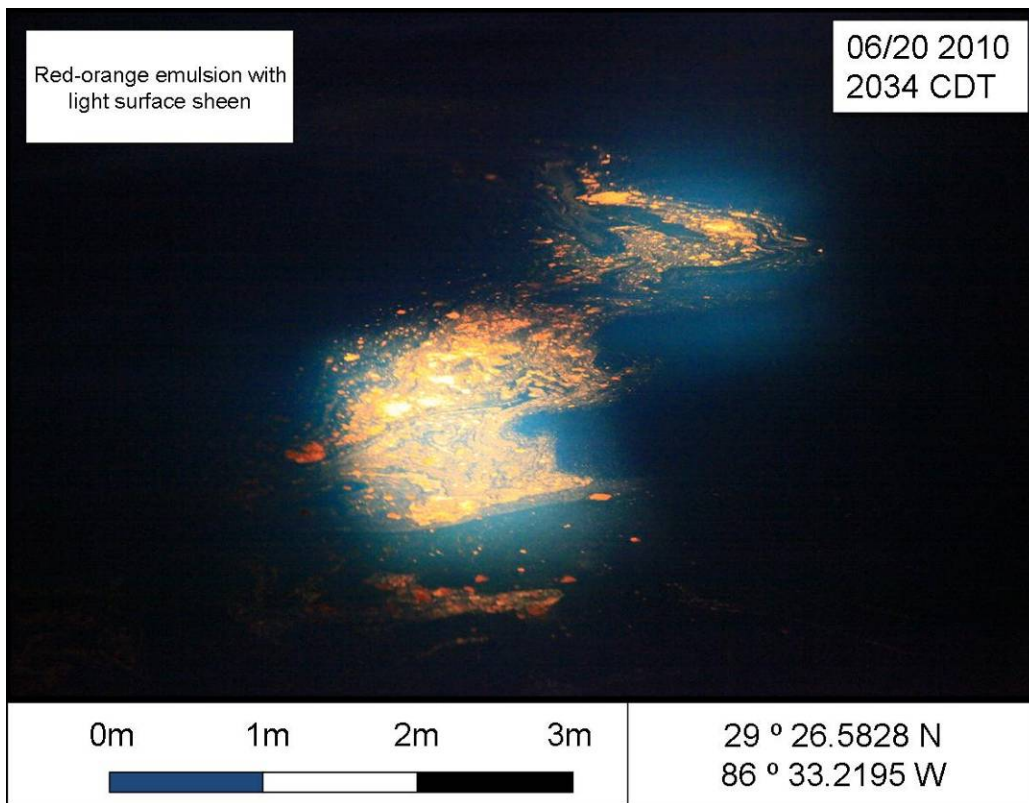


Photo 5. Red-orange emulsion surrounded by light surface sheen. A surface water sample and mousse sample was collected at this station.

Problems/operational issues:

(Includes items up to report submission time)

We are adjusting the vertical hose/pump system so that we use just one 50m length of power cable. Previous configurations in the casting system has involved several lengths of power cable connected by underwater connectors, these connectors and their splices with the original cable can become detached or shear during retrieval (Photograph 6). In this case we will only be able to take a 50m deep cast, but should provide ample length to sample any potentially submerged oil and to full test the casting system. The hose was unraveled this evening and modified for deployment during the day tomorrow.



Photo 6. Example of underwater electrical connectors that pull apart when under tension.

Planned activities for next 24 hours:

We will continue to make transects N to S and collect water/mousse samples at suitable locations unless otherwise advised to do so.