August 1st | 2010

Ryan Chouest daily data transmission and report

Period covered: *1145hrs* 07/31/2010 - *1135hrs* 08/1/2010

115.835 - Nautical miles covered

Vessel science party:

Andrew Ross (Andrew.Ross@csiro.au), David Fuentes(David.Fuentes@csiro.au), Emma Crooke (Emma.Crooke@csiro.au), Asrar Talukder (Asrar.Talukder@csiro.au), Tosin Majekodunmi (Tosin.Majekodunmi@bp.com), Curtis Walker (cwalker@entrix.com), Quinn Guidrey (quinn.guidrey@cctechnol.com), Jen Carlson (jen.carlson@cctechnol.com), Kelly Bates (kelly.bates@cctechnol.com), Jay Ridgeway (Jay.Ridgeway@cctechnol.com), Mathew Baham (Mathew.Baham@cctechnol.com), Joseph Watson (Joseph.Watson@cctechnol.com)

Contact details:

+ 1 337 761 9830 – Sat phone
+ 1 337-761-9830 – Broadband phone ship office 1
+ 1 337-761-9827 – Broadband phone ship office 2
+ 1 337-761-9826 - Broadband phone ship bridge

Cruise notes:

The *Ryan Chouest* vessel continued survey at a higher spatial frequency within the 8 x 8 nautical mile survey area of 07/31/2010 with a vertical cast taken at within proximity of a seep location of interest (Figure 1). The cruise continued to the northeast quadrant of the 8 x 8 nautical mile survey area that showed relatively elevated sensor results from 07/31/2010 report, to correlate elevated levels with into possible seeps by combining results from the echo sounder and hydrocarbon sensor array. No vertical casts were taken in this area. The vessel then began a transit to the planned costal transect route.

Science results and preliminary interpretation:

Fluorometry results

Fluorometry measurements from the Chelsea and Trios sensors indicate low to minimal inferred hydrocarbon concentration for the track travelled in figure 2 & 4 respectively. The relative rescaling (using their corresponding highest and lowest sensor voltage values within the survey area) shows relative increases in sensor response over the areas of possible seepage especially to the north eastern section of the survey area shown in Figures 3 & 5. The Contros sensor indicates low to mid levels of inferred hydrocarbon concentration (Figure 6) while the relative scale (Figure 7) also shows relative increases in sensor response in the track segments shown by the Chelsea and Trios sensors.

Surface Observations

There was patchy sagassum at intervals during the track line however no significant surface observation noted during this period.

EK-60 Echosounder results

Several echosounder contacts were made during the period. Those contacts assigned as possible seeps are shown in figures 10-20. Many of these features were clustered within one portion the high resolution survey area shown in figures 3, 5 and 7. This area appears to be prolifically leaking and many of the possible seeps are associated with rugose terrain, scarps and depressions at the sea floor. Further studies of this area would be warranted to establish the nature of these features.

Vertical cast

A vertical cast was performed over a large possible seep (Figure 9) within the cluster of seeps identified in the high resolution survey area within the 8 x 8 nautical mile greater survey area. The results are shown in Figure 8. The results show limited or no response to the plume intersected for many of the parameters measured. The only sensor that showed an enhanced response within the plume was the Trios fluorometer. This is unusual as fluorometers usually attain their highest response at the top of the water column (not unlike the Chelsea fluorometer result). Whilst this result is interesting it should however be interpreted with caution. Neither of the other fluorometers responded in a similar manner, which would be expected. Therefore results of GCMS analysis on the samples taken at the 80, 60, 40, 20, 0 meter depths are required to corroborate these results.

Science Operations:

Fluorometer measurements were logged for the majority of the period and observations of sea-surface conditions were made throughout. The EK-60 echo sounder is continuously collecting data to evaluate the seabed and water column for possible seeps. In addition one vertical cast was performed.

Problems/operational issues:

Previous problems with the GCMS have been solved. The methane sensors used on the cast system and on the underway system have not returned values other than baseline. Testing has shown that the CSIRO methane sensor is operating however it is unclear if the positioning of the instrument is inhibiting its optimum operation. Further tests are being performed to establish if this is the case.

Planned route for cruise 11:

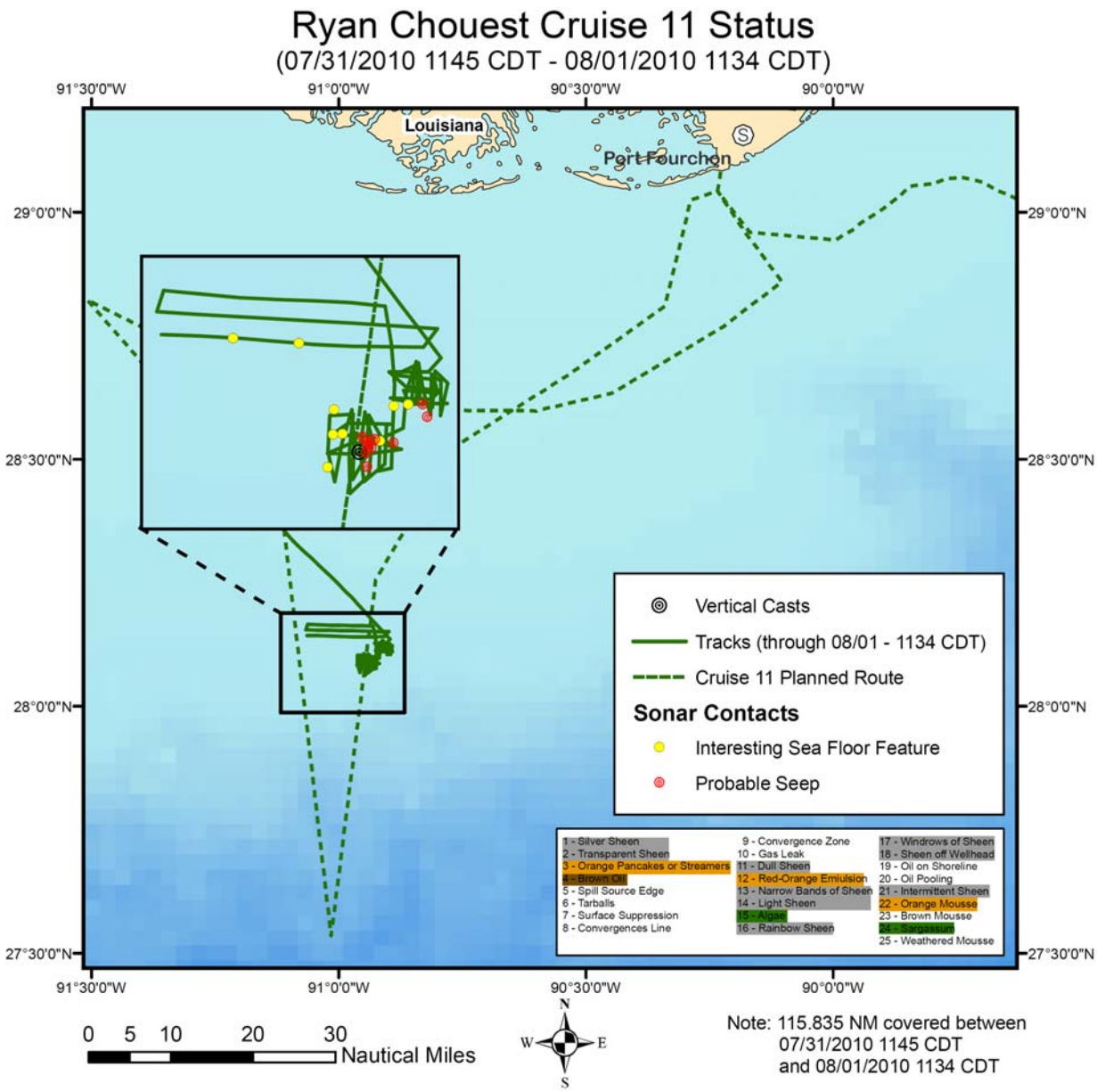

Figure 1: Planned route for cruise 11 versus the actual route plotted between 07/31/2010 – 08/01/2010.

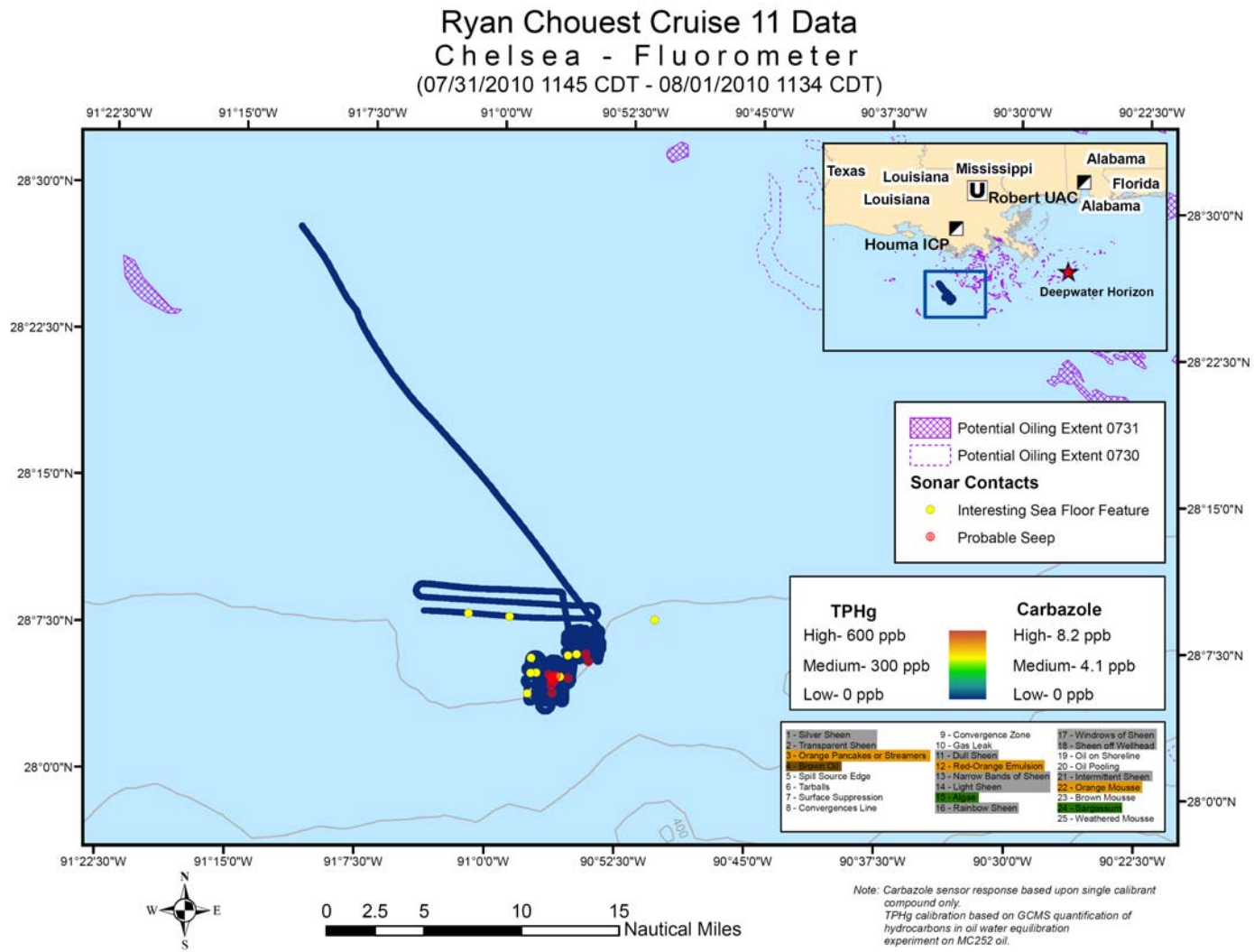

Figure 2. Chelsea fluorometer results plotted with location on cruise track 11. Breaks in data occur when either data quality is poor or the systems were turned off due to pump problems. Purple lines represent depth contours of 100 m intervals.

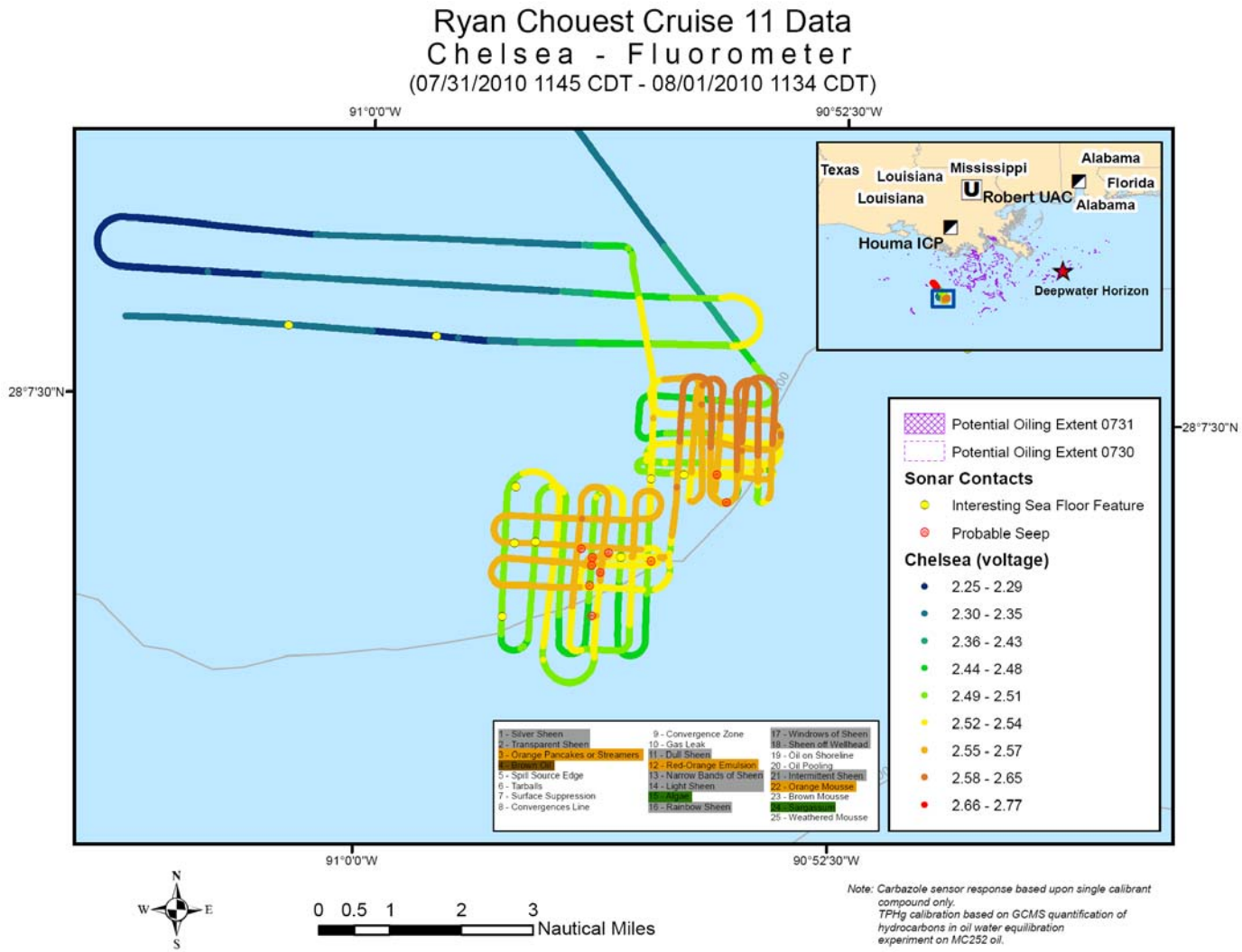

Figure 3. Chelsea fluorometer results, within 8 x 8 mile grid survey, plotted with location on cruise track 11. The figure scaling is relative based on the highest and lowest fluorometer responses made during the period. Breaks in data occur when either data quality is poor or the systems were turned off due to pump problems. Purple lines represent depth contours of 100 m intervals.

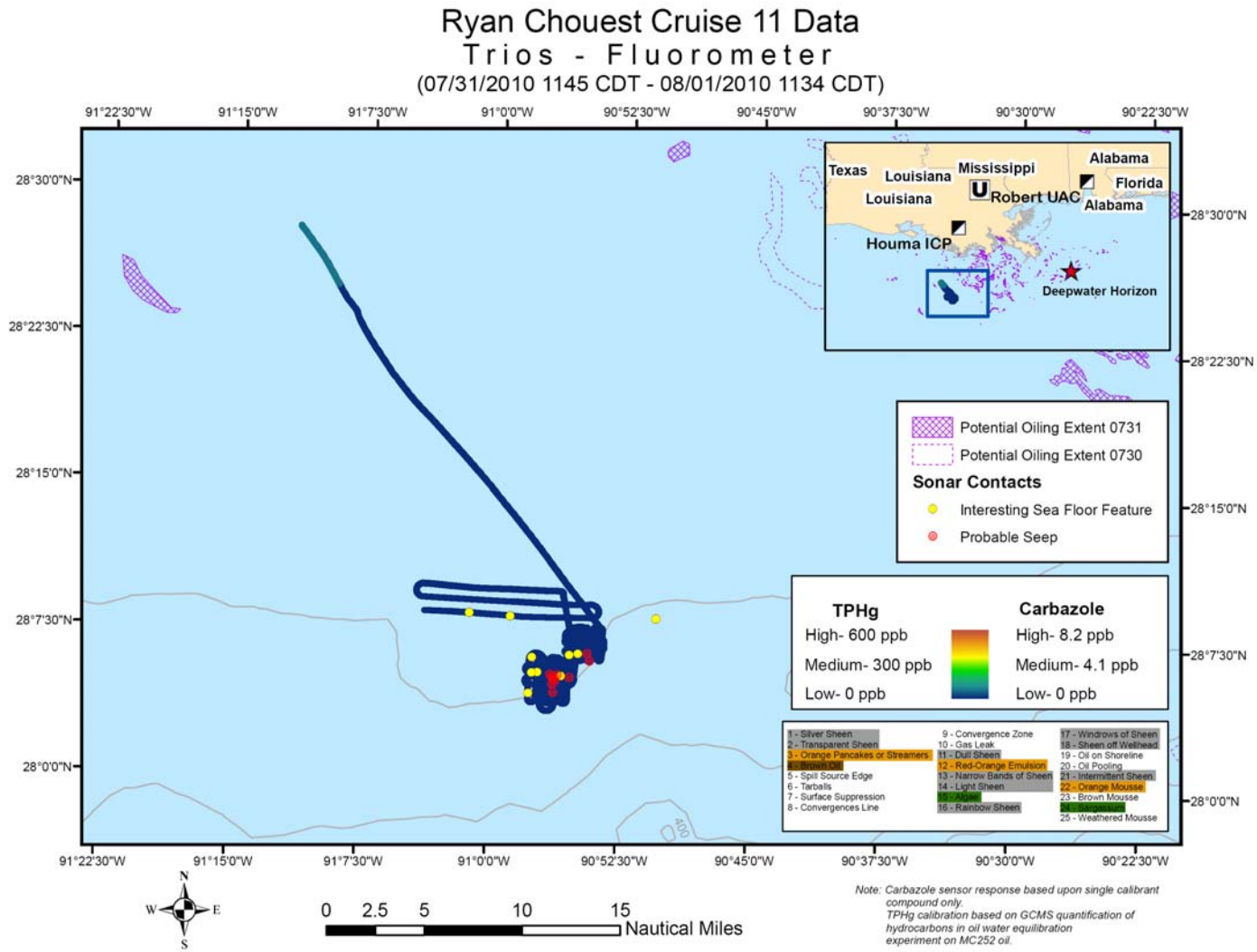

Figure 4. Trios fluorometer results plotted with location on cruise track 11. Breaks in data occur when either data quality is poor or the systems were turned off due to pump problems. Purple lines represent depth contours of 100 m intervals.

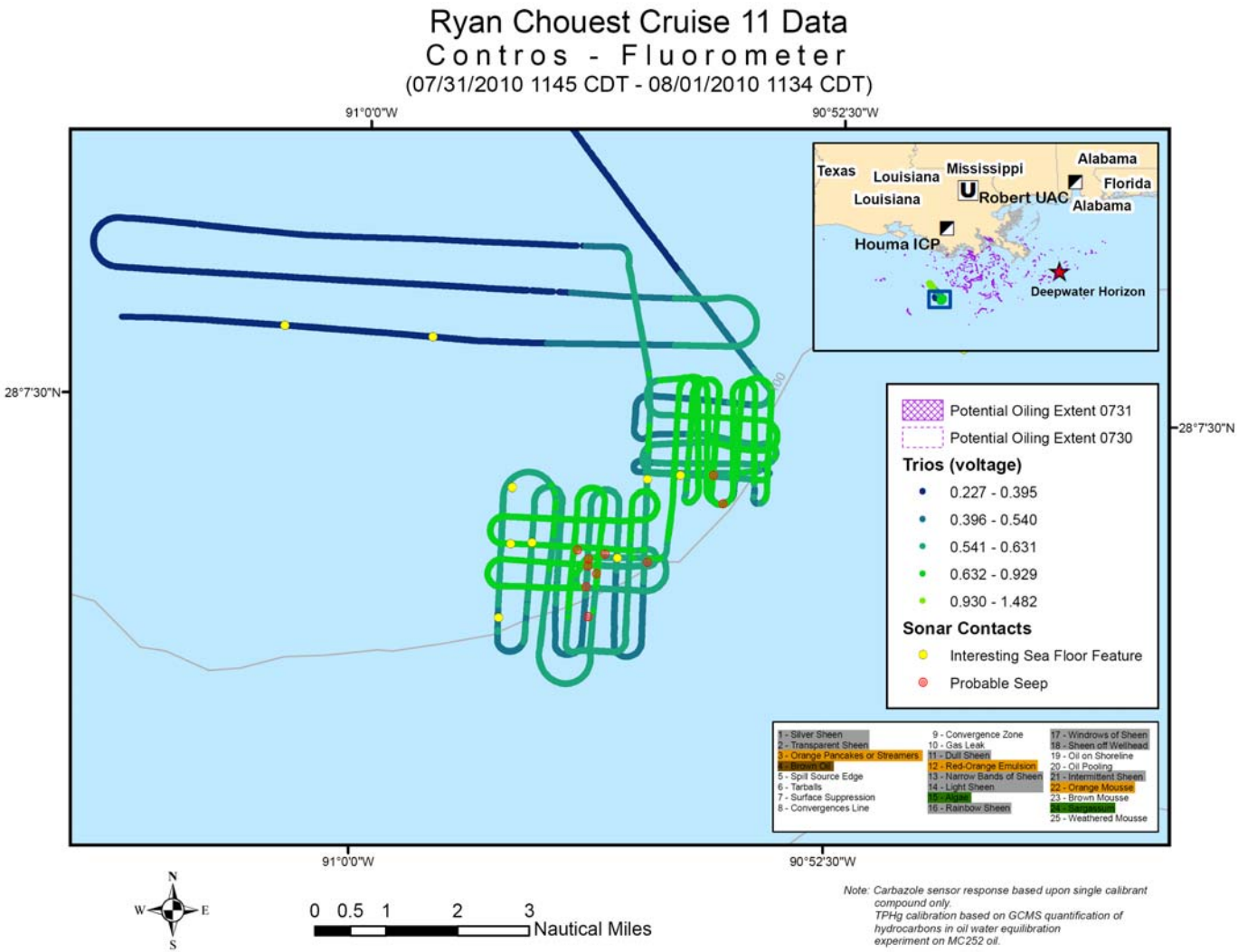

Figure 5. Trios fluorometer results, within 8 x 8 mile grid survey, plotted with location on cruise track 11. The figure scaling is relative based on the highest and lowest fluorometer responses made during the period. Breaks in data occur when either data quality is poor or the systems were turned off due to pump problems. Purple lines represent depth contours of 100 m intervals.

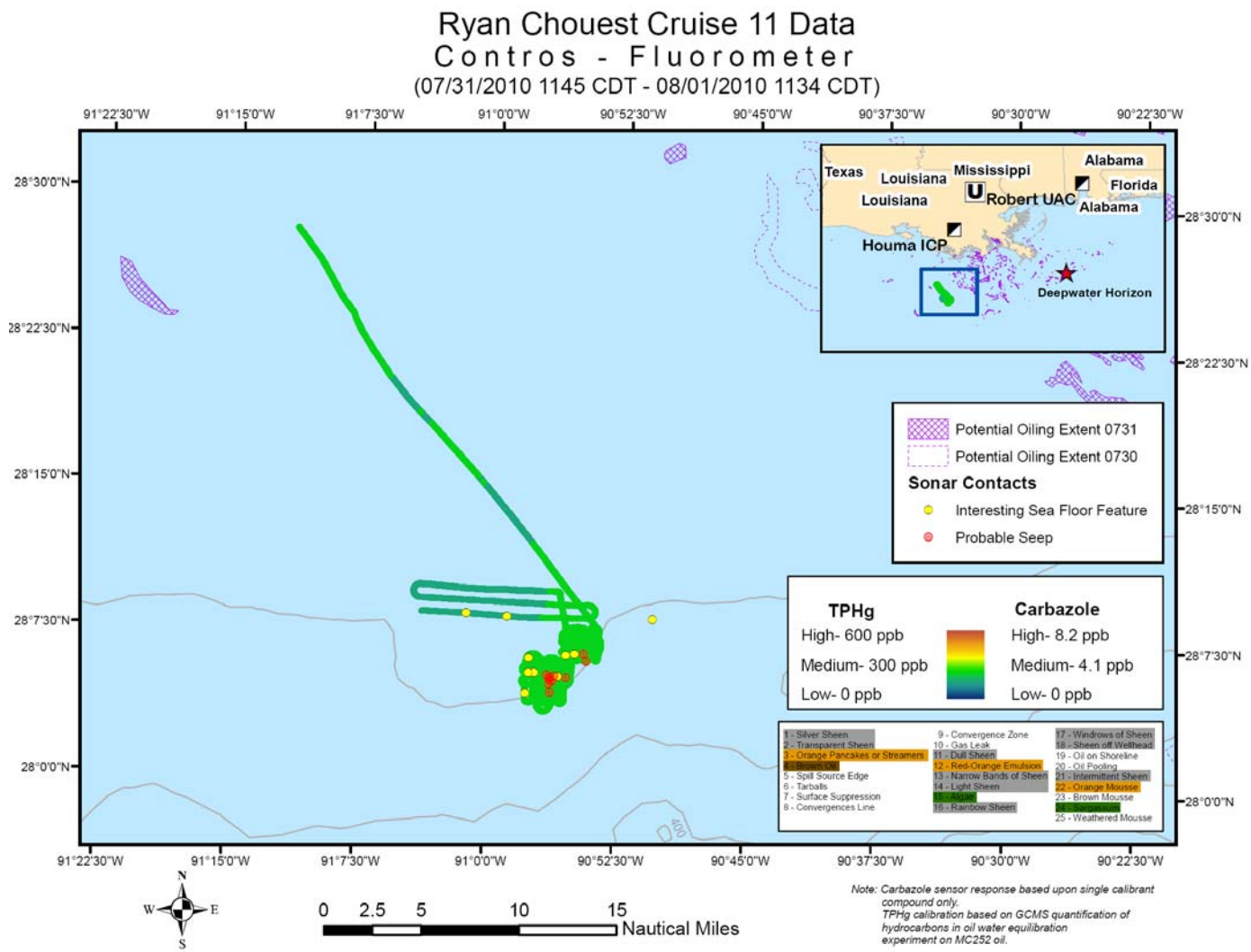

Figure 6. Contros fluorometer results plotted with location on cruise track 11. Breaks in data occur when either data quality is poor or the systems were turned off due to pump problems. Purple lines represent depth contours of 100 m intervals.

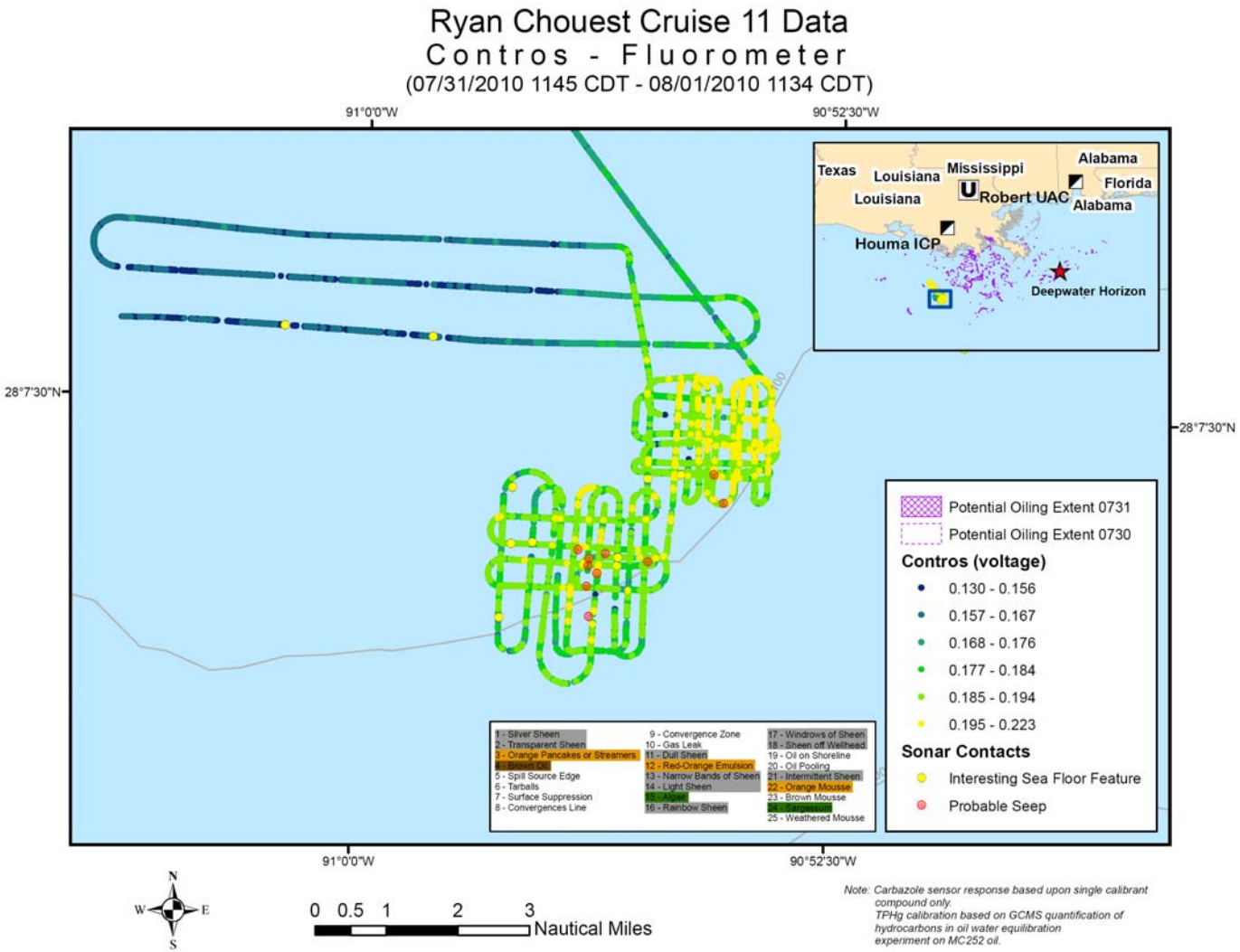

Figure 7. Contros fluorometer results, within 8 x 8 mile grid survey, plotted with location on cruise track 11. The figure scaling is relative based on the highest and lowest fluorometer responses made during the period. Breaks in data occur when either data quality is poor or the systems were turned off due to pump problems. Purple lines represent depth contours of 100 m intervals.

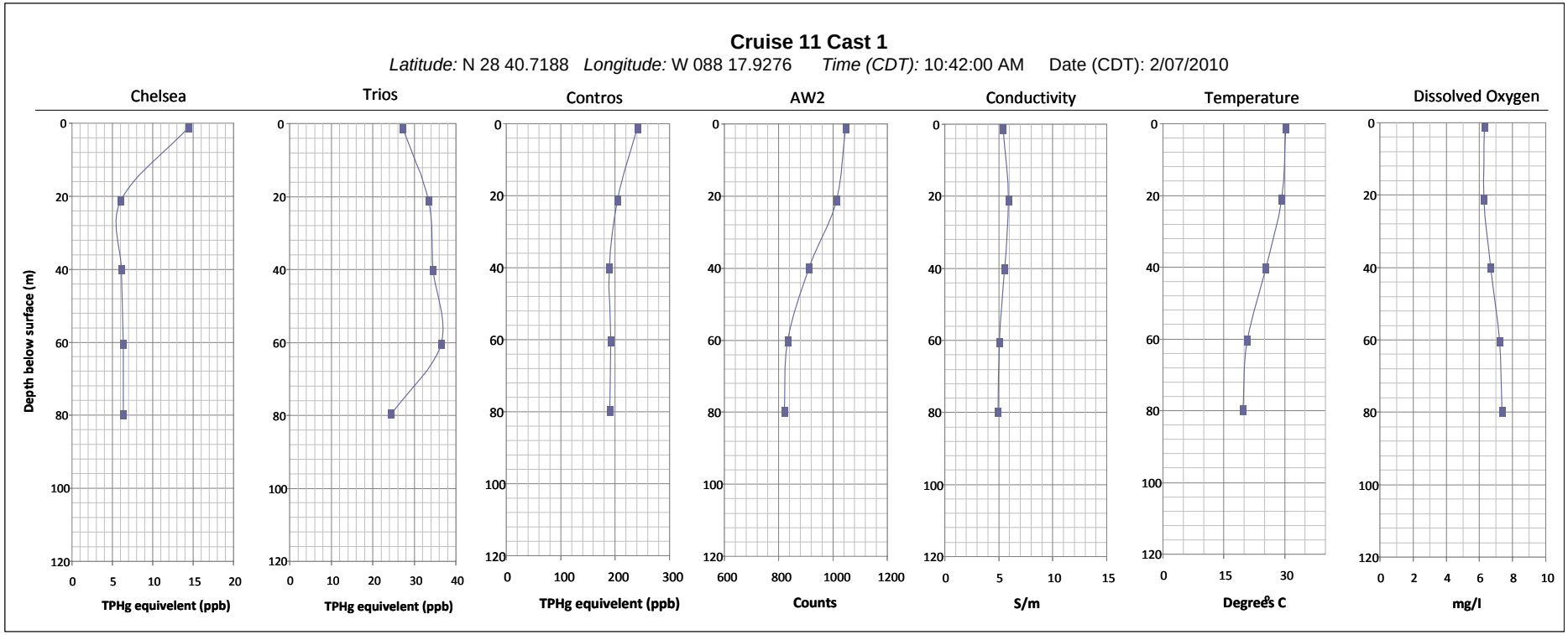

Figure 8. The results obtained for Cruise 11 vertical cast 1 down to 80 m. This cast location taken over the Contact_0729010_132310 site previously identified on the 29th July. The sensor fluorometry results for the Chelsea, Trios and Contros sensors were obtained from waters pumped to the surface. Conductivity, temperature, depth and dissolved oxygen measurements were obtained from a SBE 19+ system and oxygen sensor attached to the submersible pump used to draw the water into the sensor tank on the surface.

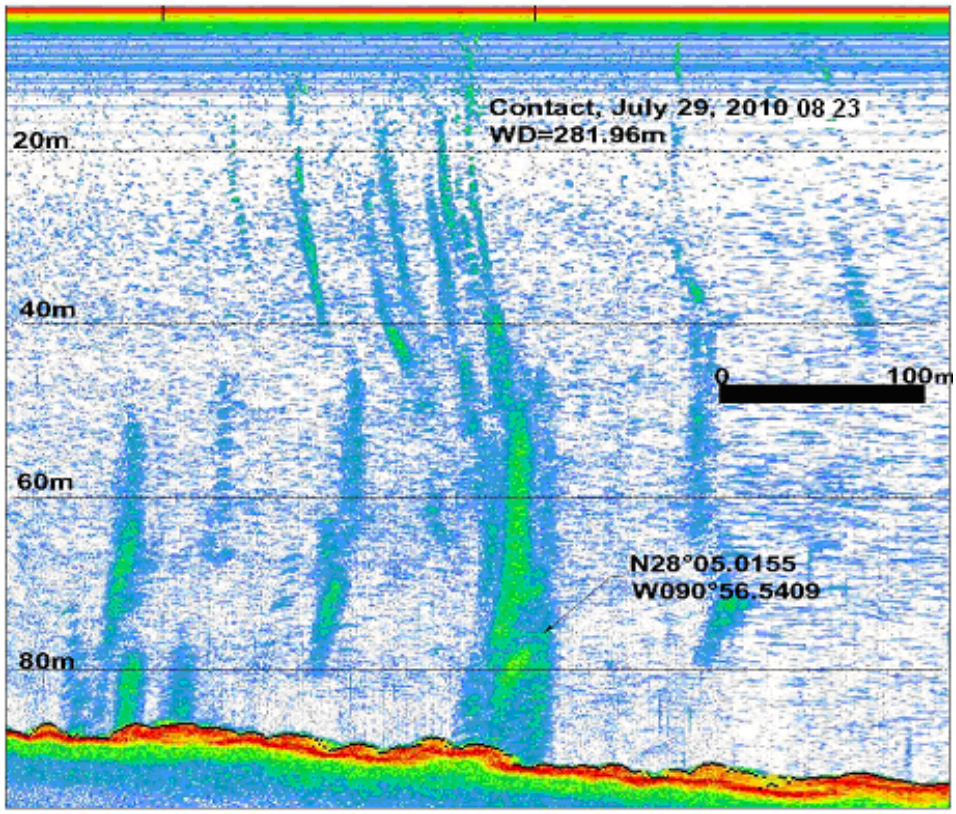

Figure 9. Contact_0729010_132310 identified on the 29th July the location of cruise 11 cast 1.

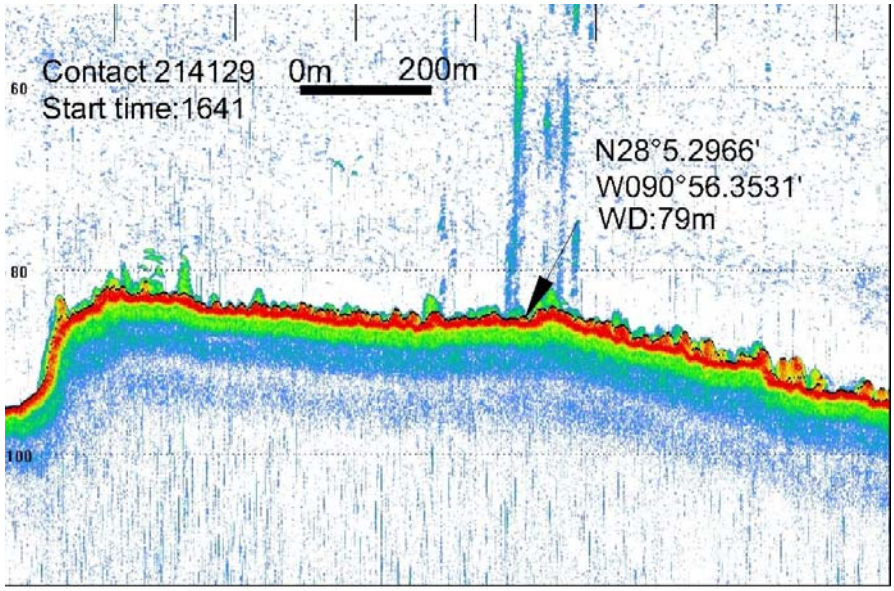

Figure 10. Contact_07312010_214129. Description: Possible seep. Time (CDT): 07/31/2010 1641hrs Location: 28° 05.2966N; 90° 56.3531W. Depth displayed: 22.60m to 80.67m.

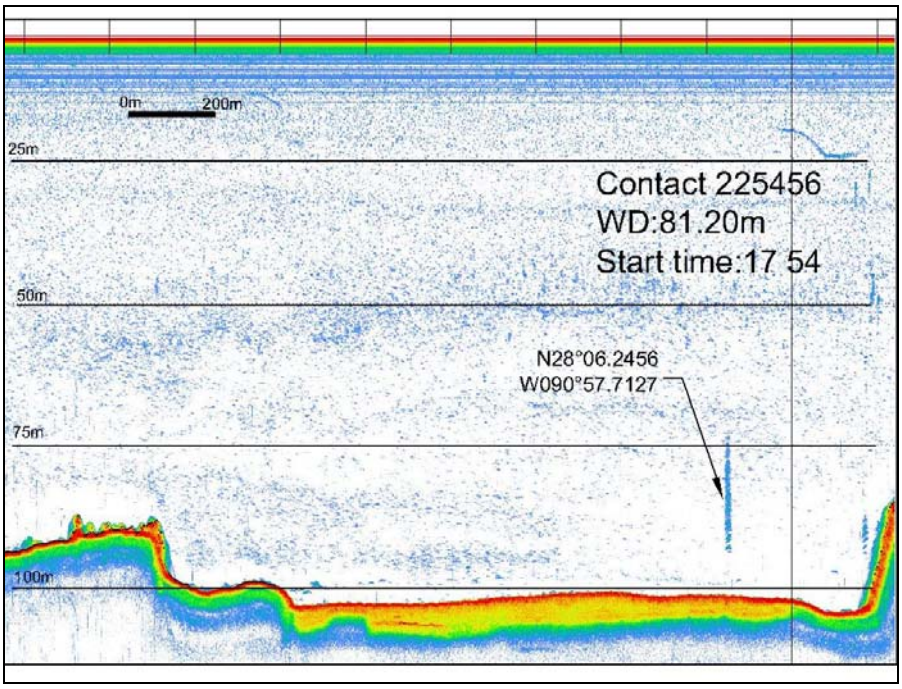

Figure 11. Contact_07312010_225456. Description: Mid water contact. Time (CDT): 07/31/2010 1754hrs Location: 28° 06.2456N; 90° 57.7127W. Depth displayed: 68.36m to 89.93m.

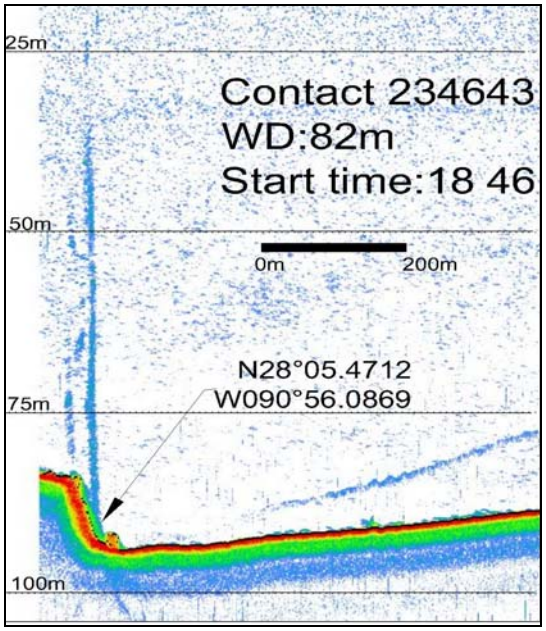

Figure 12. Contact_07312010_234643. Description: Possible seep. Time (CDT): 07/31/2010 1846hrs Location: 28° 05.4712N; 90° 56.0869W. Depth displayed: 20.24m to 92.71m.

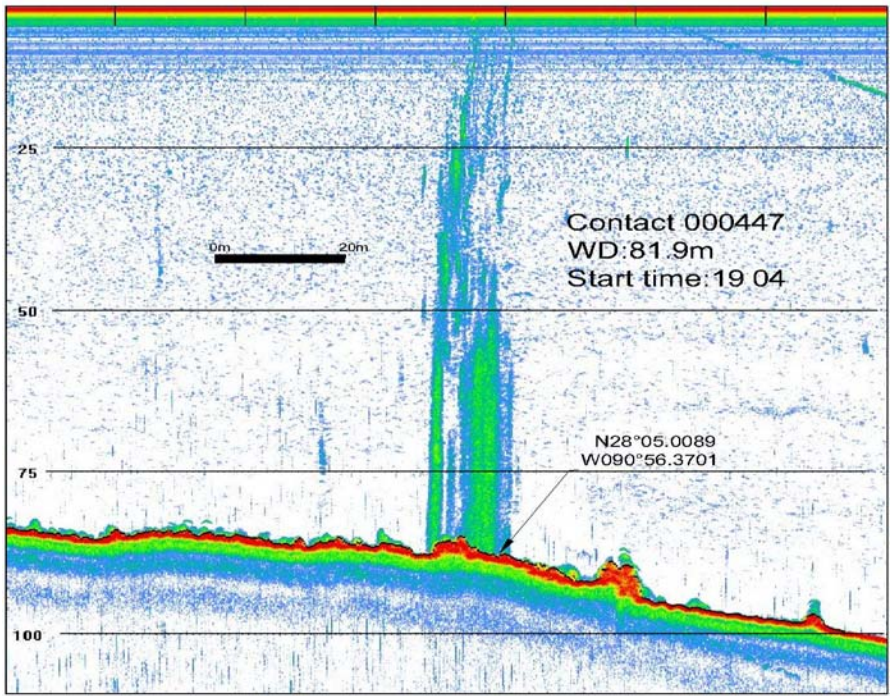

Figure 13. Contact_07312010_000447. Description: Possible seep. Time (CDT): 07/31/2010 1904hrs Location: 28° 06.0089N; 90° 56.3701W. Depth displayed: 2.82m to **8**3.29m.

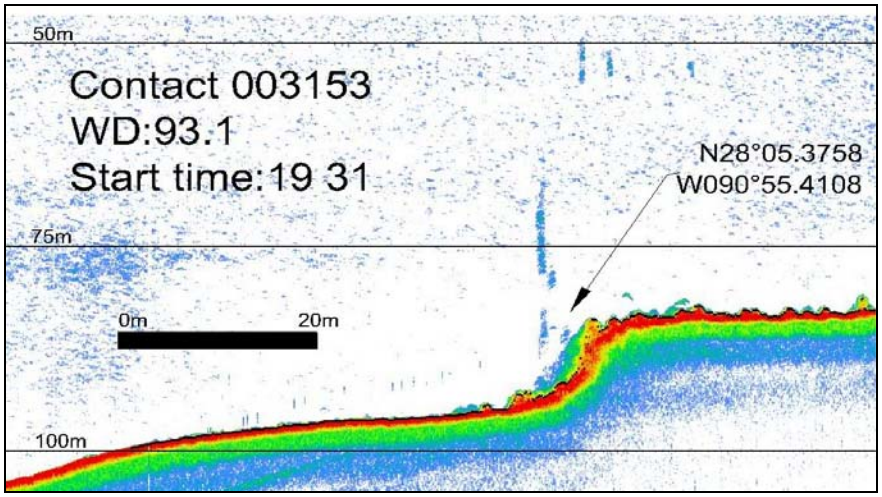

Figure 14. Contact_07312010_003153. Description: Possible seep. Time (CDT): 07/31/2010 1931hrs Location: 28° 05.3758N; 90° 55.4108W. Depth displayed: 44.71m to 88.47m.

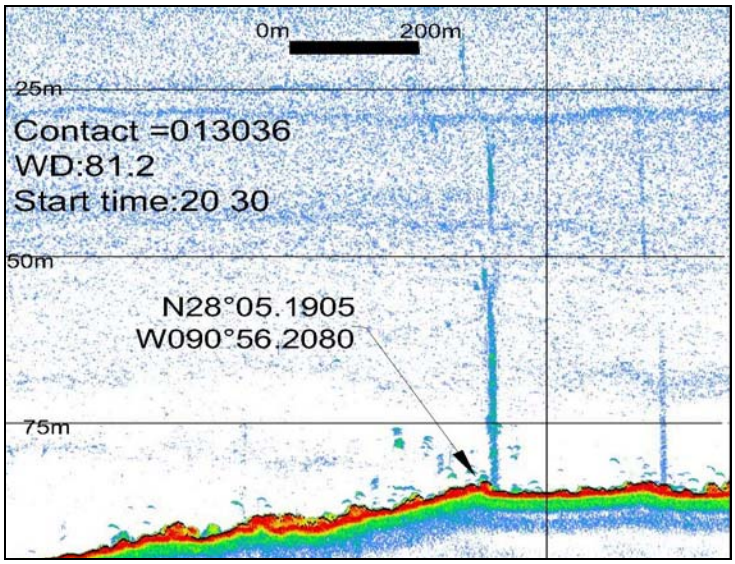

Figure 15. Contact_07312010_013036. Description: Possible seep**.** Time (CDT): 07/31/2010 2030hrs Location: 28**°** 05.1905N; 90° 56.2080W. Depth displayed: 24.55m to 83.15**m**.

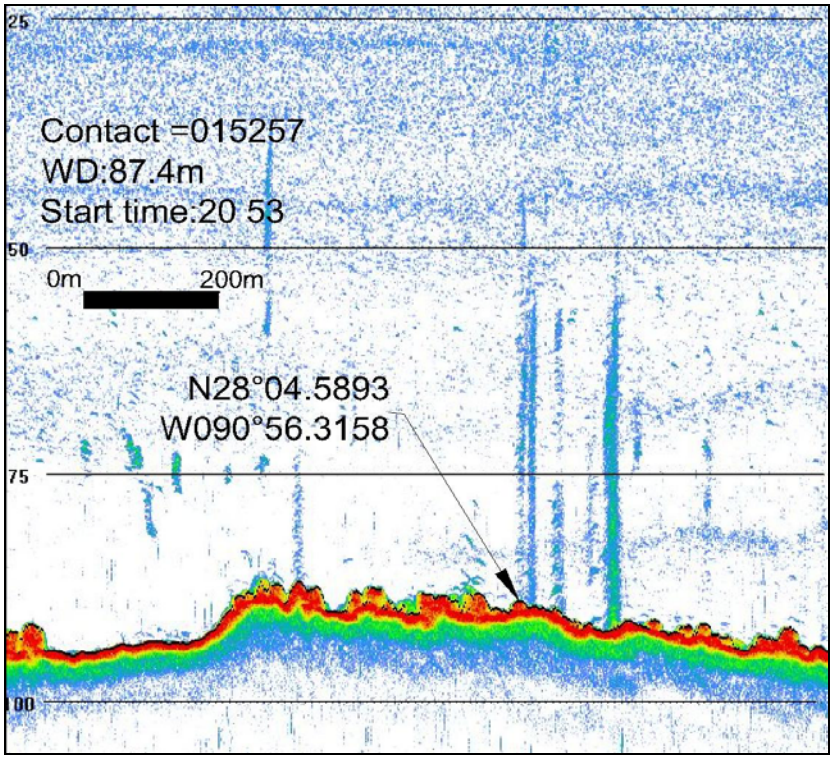

Figure 16. Contact_07312010_015257. Description: Possible seep**.** Time (CDT): 07/31/2010 2053hrs Location: 28**°** 04.5893N; 90° 56.3158W. Depth displayed: 28.80m to 91.47**m**.

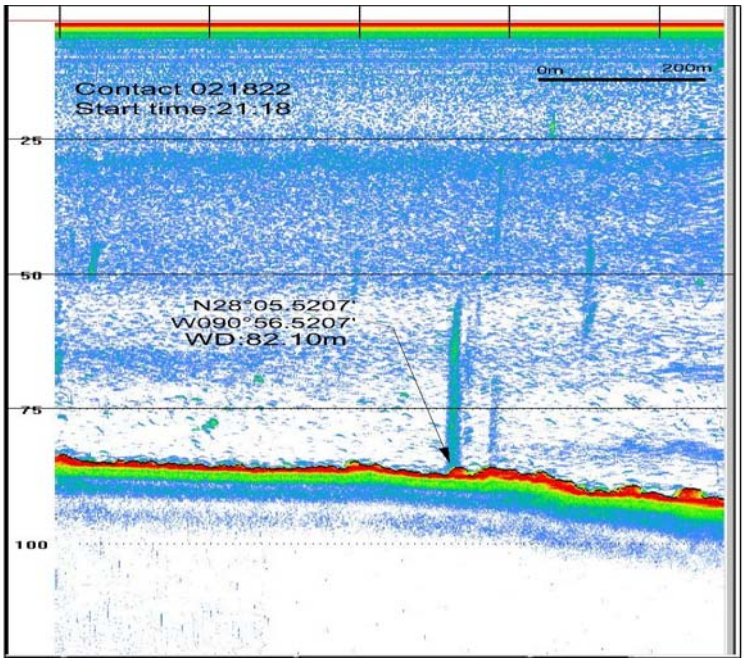

Figure 17. Contact_07312010_021822. Description: Possible seep**.** Time (CDT): 07/31/2010 2118hrs Location: 28**°** 05.5207N; 90° 56.5207W. Depth displayed: 51.77m to 82.58**m**.

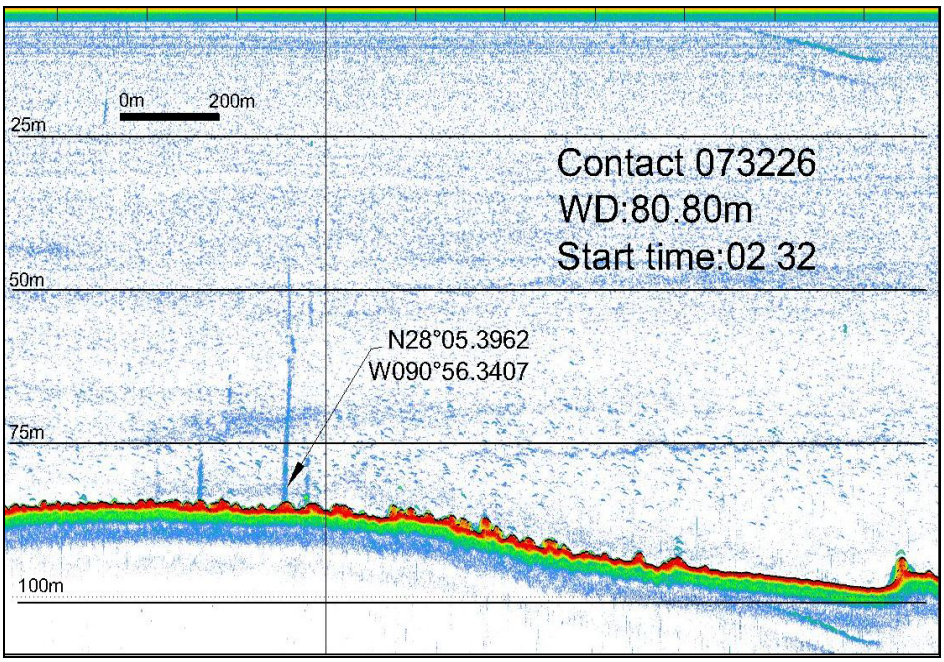

Figure 18. Contact_08012010_073226. Description: Possible seep**.** Time (CDT): 08/01/2010 0232hrs Location: 28**°** 05.3962N; 90° 56.3407W. Depth displayed: 40.38m to 80.29**m**.

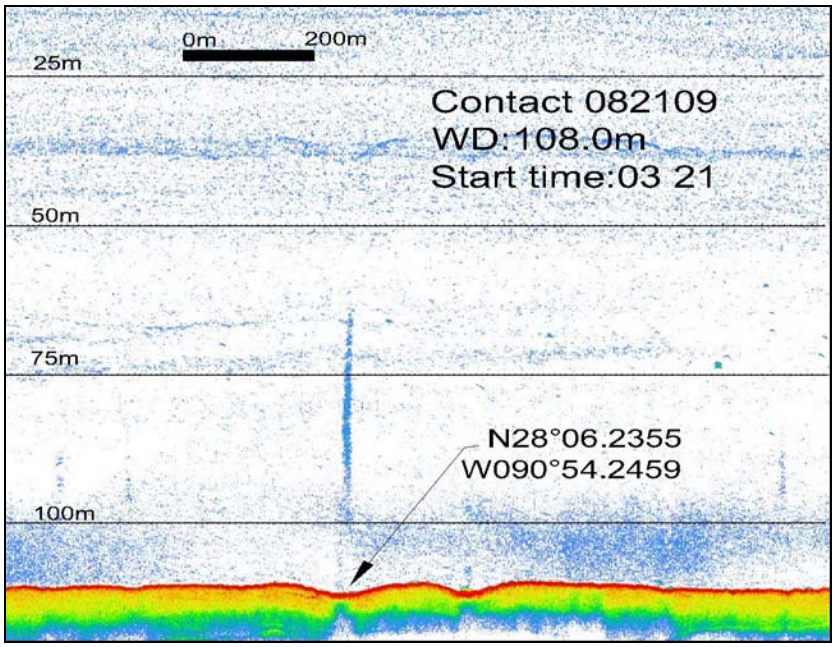

Figure 19. Contact_08012010_082109. Description: Possible seep**.** Time (CDT): 08/01/2010 0321hrs Location: 28**°** 06.2355N; 90° 54.2459W. Depth displayed: 82.50m to 110.16m.

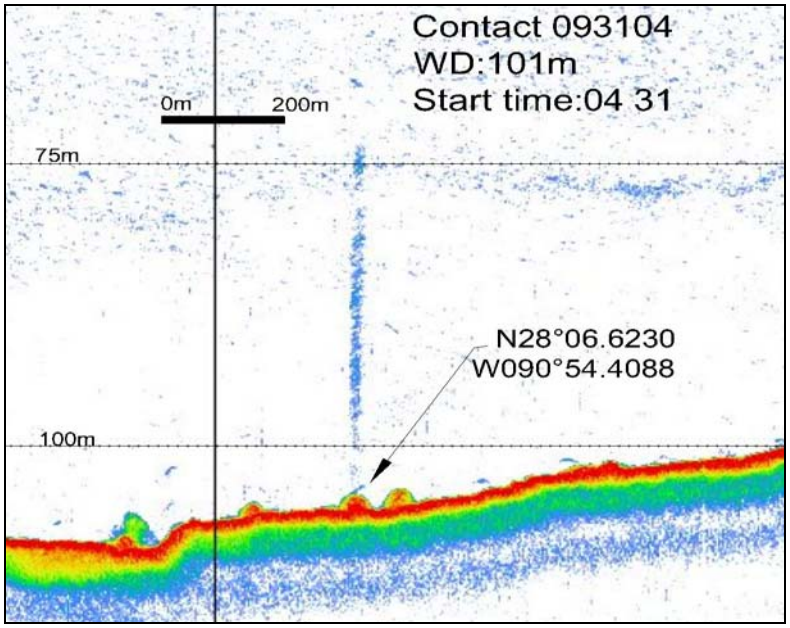

Figure 20. Contact_08012010_082109. Description: Possible seep**.** Time (CDT): 08/01/2010 0431hrs Location: 28**°** 06.6230N; 90° 54.4088W. Depth displayed: 60.82m to 102.67m.

Planned activities for next 24 hours:

The *Ryan Chouest* will head northeast on a coastal transect performing a number of vertical casts along the 30m bathymetric contour at approximately 20 nautical mile spacing. The vessel will then make a brief stop at Port Fourchon to pick up laboratory items and a new sampling hose before heading east along the gulf coastlines of Louisiana, Mississippi, Alabama and west Florida (Figure 1).

Selected Photos:

No photographs were taken over the cruise period.

Full Crew List:

William A. Smith	MASTER	Brian Corley	Mate
Craig Lyons	ENG	Patrick Cousin	A/B
Mark Harmon	A/B	Arthur Triggs	O/S
Elijah Benjamin	O/S	Patric Anderson	QMED
Kile Blunt	OS/Cook	Roderick Baker	OS/Cook
Tosin Majekodunmi	BP	Curtis Walker	Entrix
Andrew Ross	CSIRO	David Fuentes	CSIRO
Emma Crooke	CSIRO	Asrar Talukder	CSIRO
Quinn Guidrey	C&C	Kelly Bates	C&C
Jen Carlson	C&C	Mathew Baham	C&C
Joseph Watson	C&C	Jay Ridgeway	C&C
Josh Chauffe	C-Port	Larry Luke	C-Port