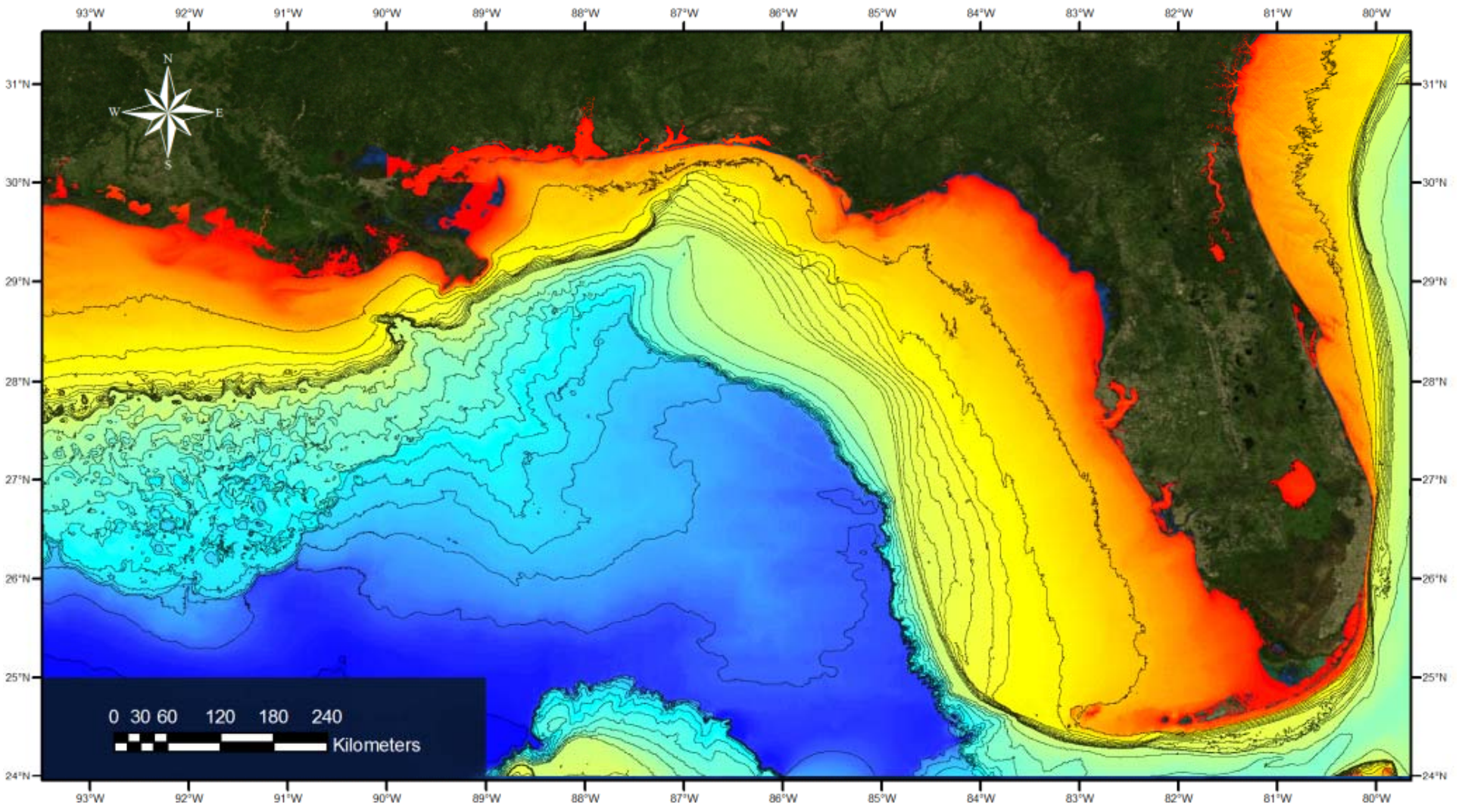
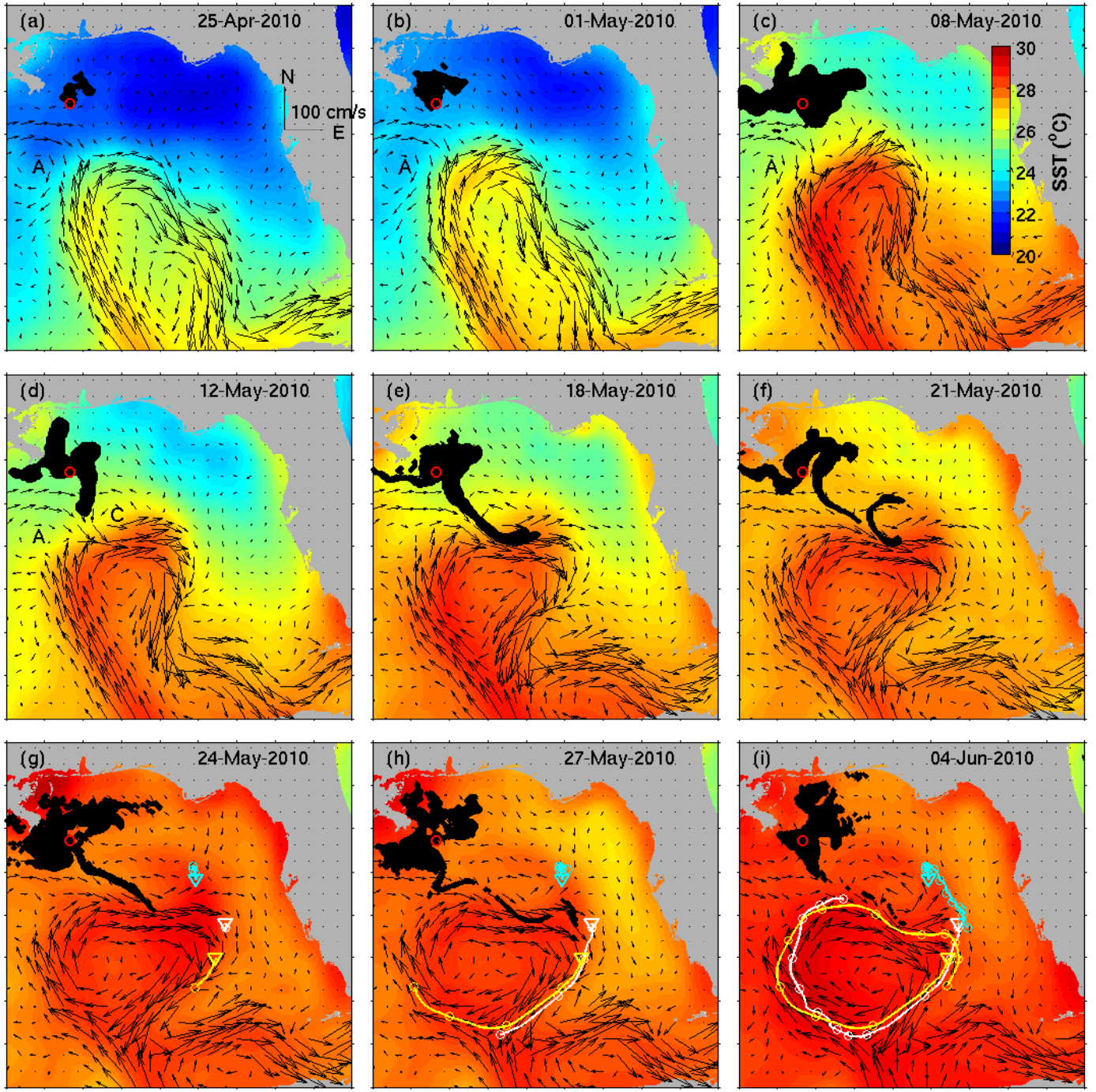
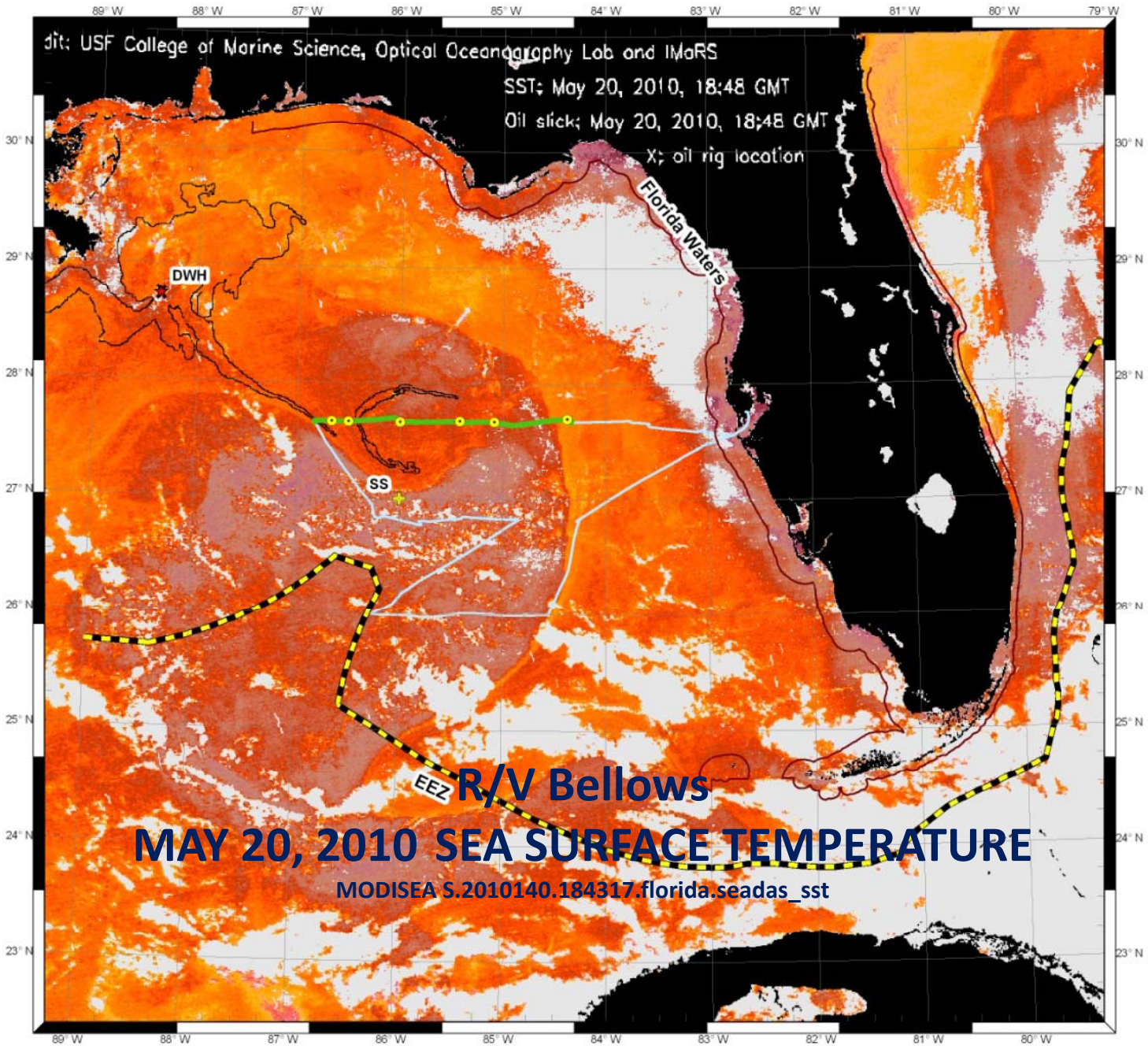
Surface tar distribution in Eastern Gulf of Mexico 2010-2011

Charles Kovach, FDEP

2010	
05-19 – 05-23	**R/V Bellows**
06-13 – 06-20	**M/V Richard L. Becker**
06-27 – 07-02	**M/V Ocean Star**
07-10 – 07-20	**R/V Weatherbird II**
08-06 – 08-11	**R/V Weatherbird II**
09-03 – 09-10	**R/V Weatherbird II**
12-10 – 12-20	**R/V Weatherbird II**
2011	
01-04 – 01-11	**R/V Weatherbird II**
02-17 – 02-23	**R/V Weatherbird II**
03-21 – 03-28	**R/V Weatherbird II**
05-03 – 05-09	**R/V Weatherbird II**
06-25 – 06-29	**R/V Weatherbird II**
08-08 – 08-15	**R/V Weatherbird II**
09-20 – 09-28	**R/V Weatherbird II**

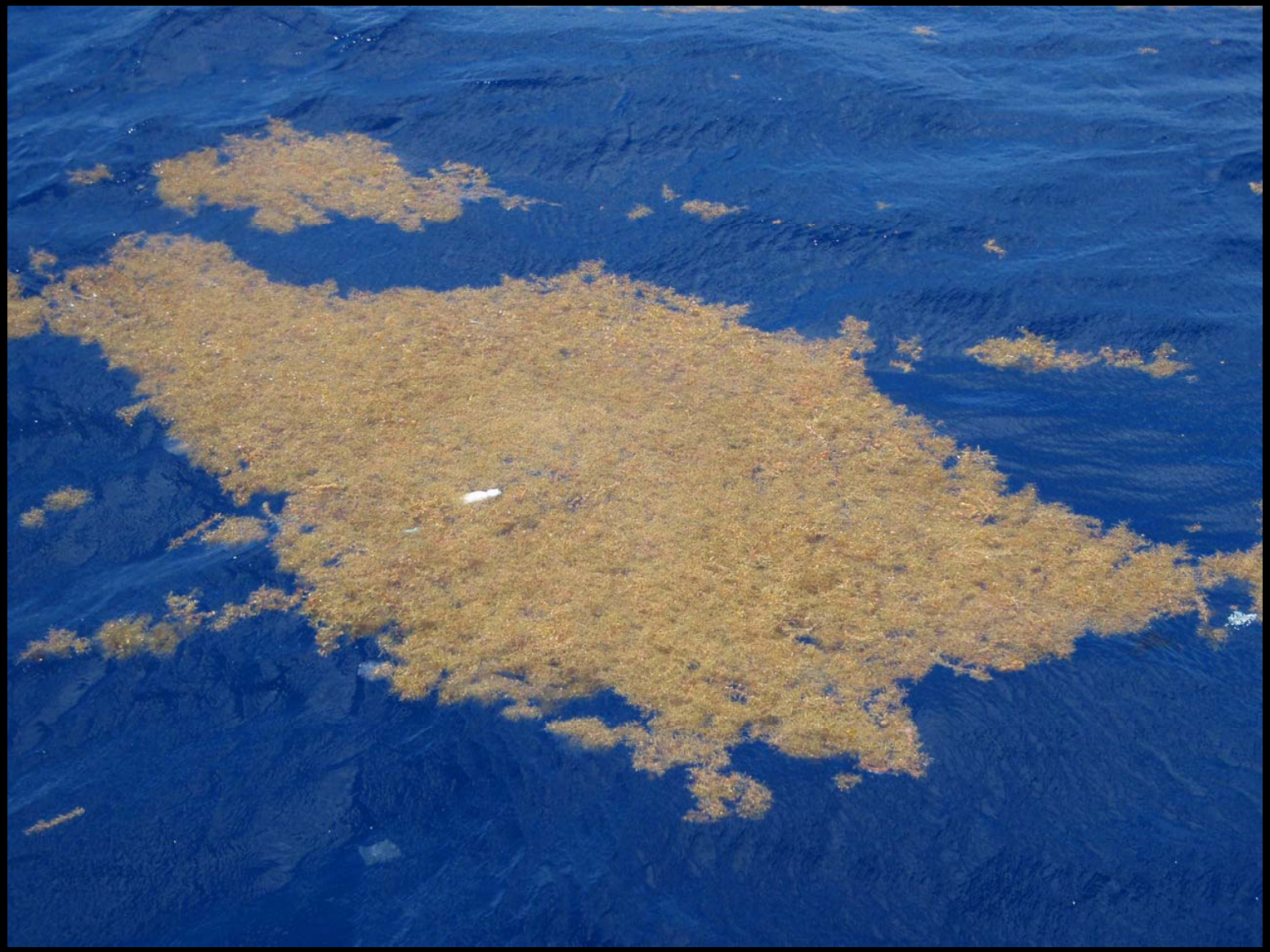

93°W
92°W
91°W
90°W
89°W
88°W
87°W
86°W
85°W
84°W
83°W
82°W
81°W
80°W
31°N
30°N
29°N
28°N
27°N
26°N
25°N
24°N
N
W
E
S
0 30 60 120 180 240
Kilometers


(a)
25-Apr-2010
N
100 cm/s
E
A
(b)
01-May-2010
A
(c)
08-May-2010
30
28
26
24
22
20
SST (°C)
A
(d)
12-May-2010
C
A
(e)
18-May-2010
(f)
21-May-2010
(g)
24-May-2010
(h)
27-May-2010
(i)
04-Jun-2010


dit: USF College of Marine Science, Optical Oceanography Lab and IMaRS
SST; May 20, 2010, 18:48 GMT
Oil slick; May 20, 2010, 18:48 GMT
X; oil rig location
Florida Waters
DWH
SS
EEZ
R/V Bellows
MAY 20, 2010 SEA SURFACE TEMPERATURE
MODISEA S.2010140.184317.florida.seadas_sst

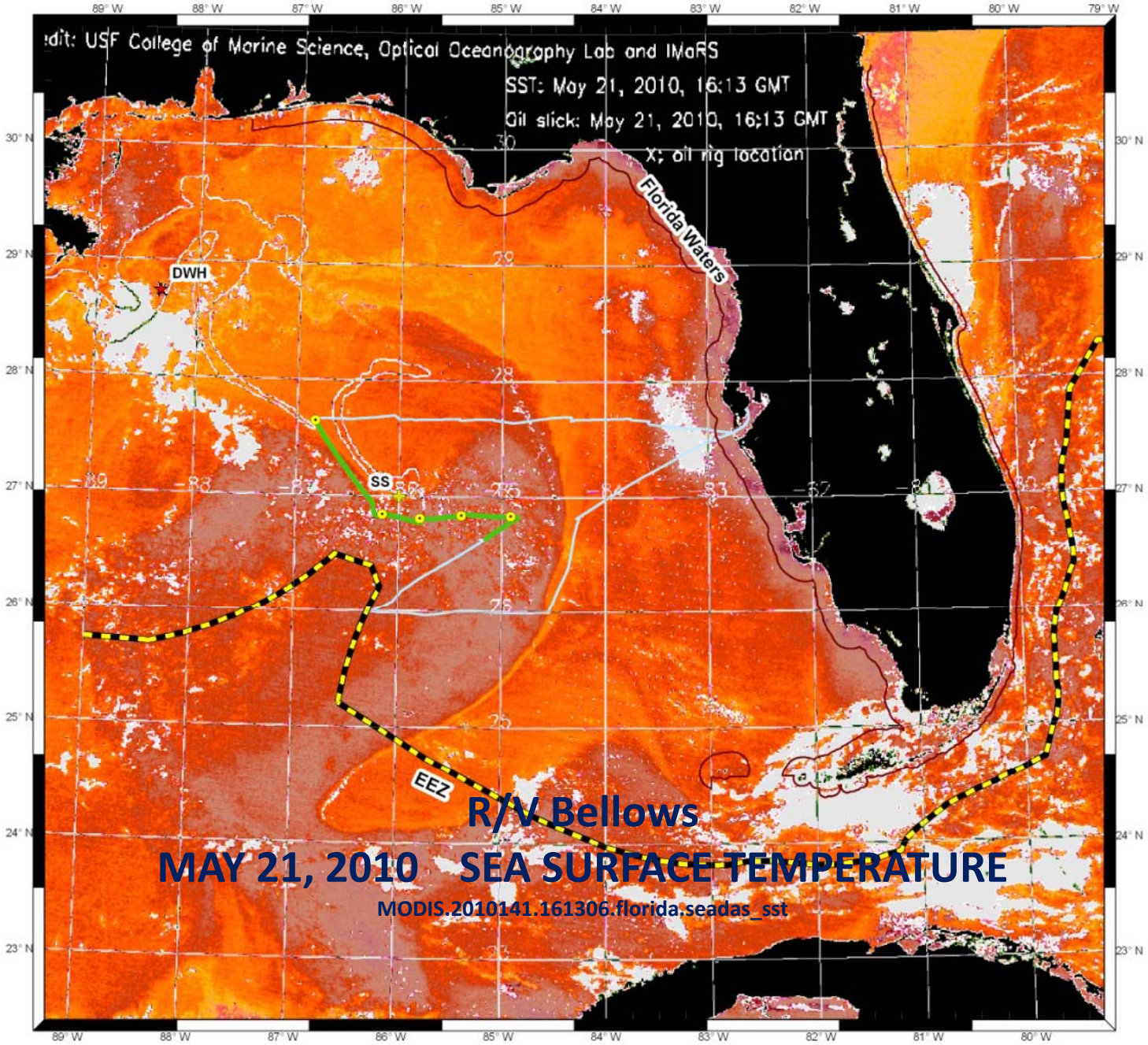
052110 1643.10

052110 1643.20

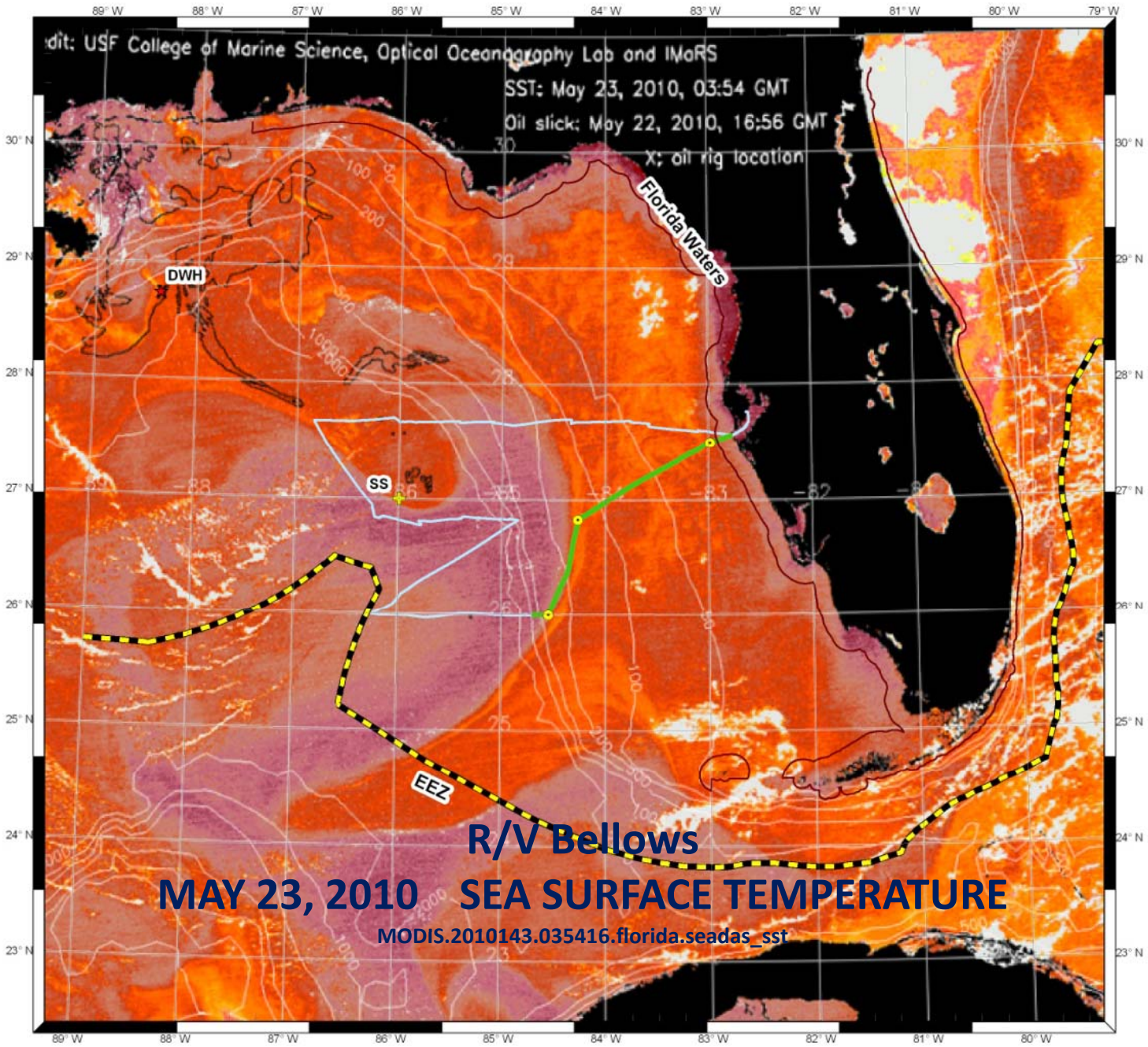


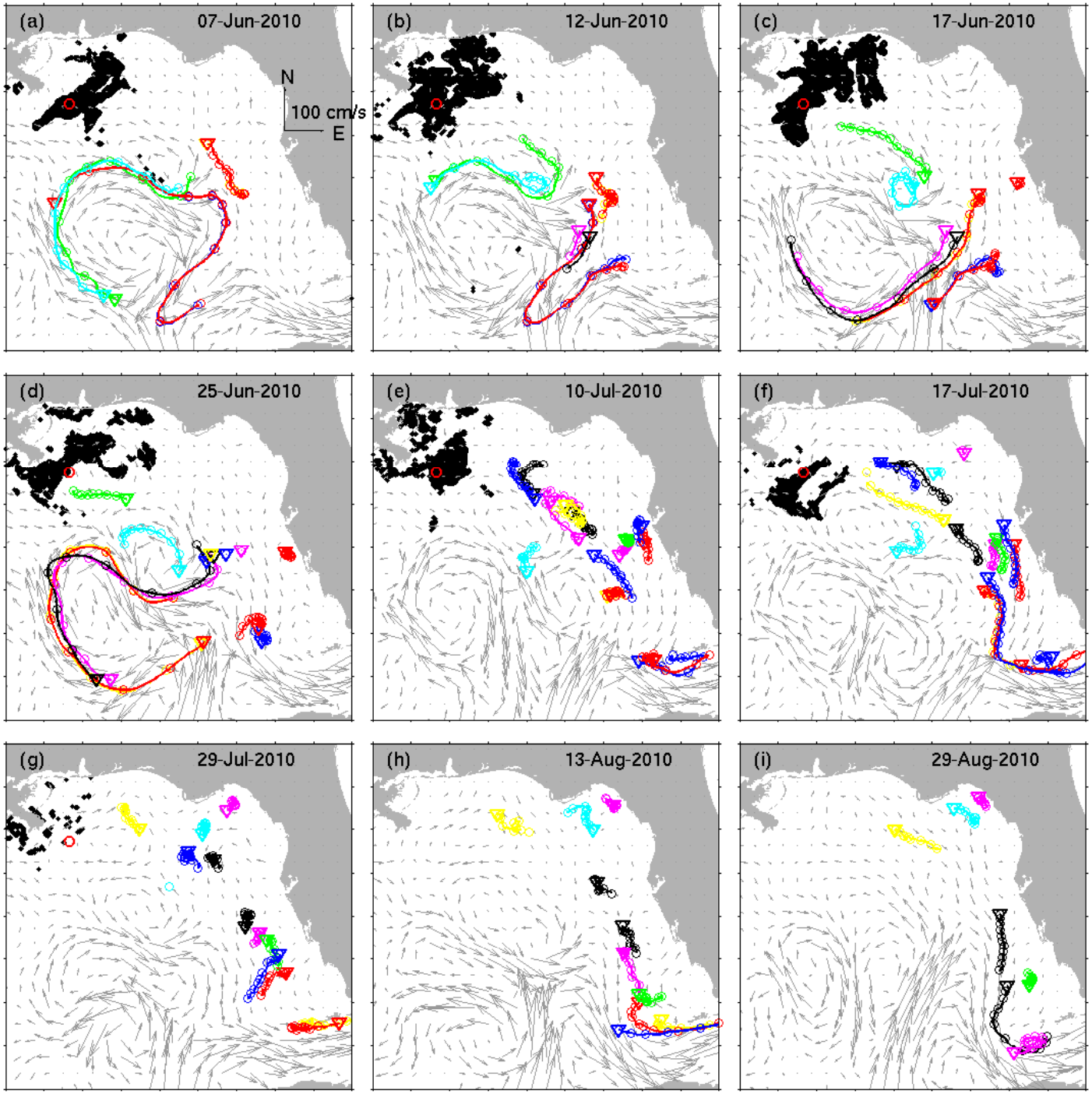
052110 1645.54

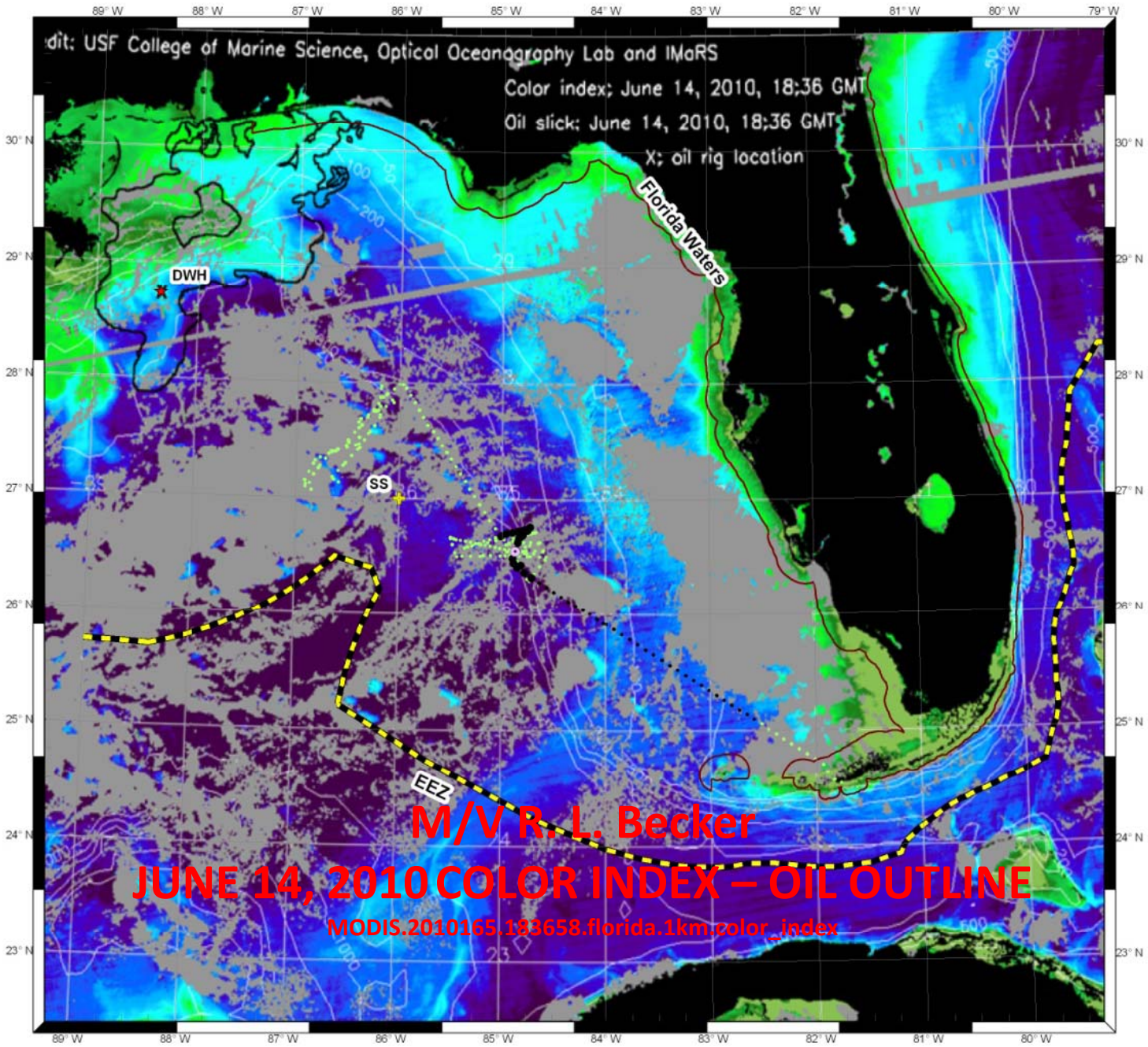
052110 1646.00


Credit: USF College of Marine Science, Optical Oceanography Lab and IMaRS
SST: May 21, 2010, 16:13 GMT
Oil slick: May 21, 2010, 16:13 GMT
X; oil rig location
Florida Waters
DWH
SS
EEZ
R/V Bellows
MAY 21, 2010 SEA SURFACE TEMPERATURE
MODIS.2010141.161306.florida.seadas_sst

052110 2118.00


dit: USF College of Marine Science, Optical Oceanography Lab and IMaRS
SST: May 23, 2010, 03:54 GMT
Oil slick: May 22, 2010, 16:56 GMT
X; oil rig location
Florida Waters
DWH
SS
EEZ
R/V Bellows
MAY 23, 2010 SEA SURFACE TEMPERATURE
MODIS.2010143.035416.florida.seadas_sst


(a)
07-Jun-2010
N
100 cm/s
E
(b)
12-Jun-2010
(c)
17-Jun-2010
(d)
25-Jun-2010
(e)
10-Jul-2010
(f)
17-Jul-2010
(g)
29-Jul-2010
(h)
13-Aug-2010
(i)
29-Aug-2010


dit: USF College of Marine Science, Optical Oceanography Lab and IMaRS
Color index; June 14, 2010, 18:36 GMT
Oil slick; June 14, 2010, 18:36 GMT
X; oil rig location
Florida Waters
DWH
SS
EEZ
M/V R. L. Becker
JUNE 14, 2010 COLOR INDEX – OIL OUTLINE
MODIS.2010165.183658.florida.1km.color_index


061410 1019.5

061410 1635

061410 1857

061410 1902.5

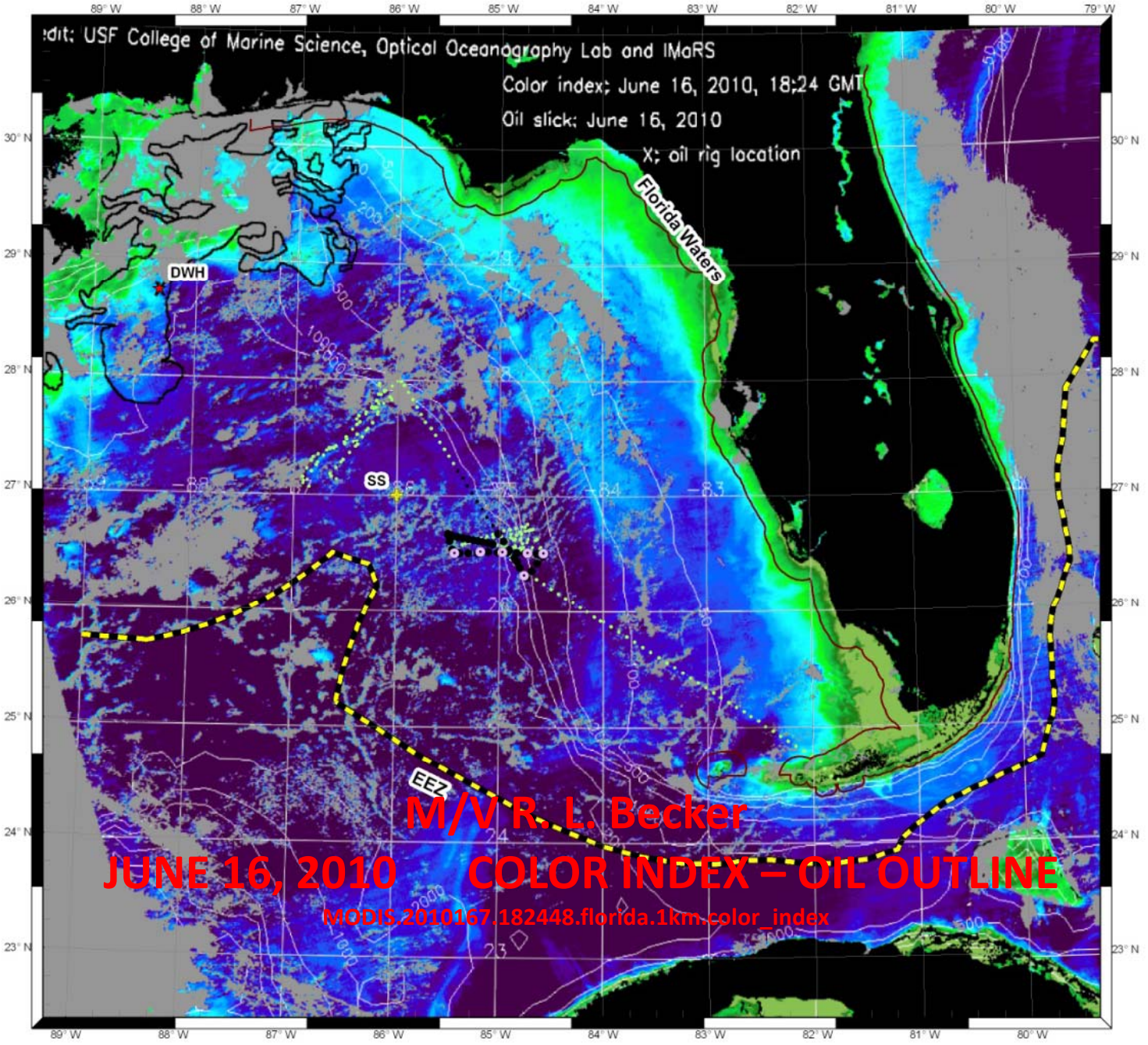
061410 1929.0

061410 2043.7

061410 2044.3

061510 0919.3

061510 0919.7


:dit: USF College of Marine Science, Optical Oceanography Lab and IMaRS
Color index; June 16, 2010, 18:24 GMT
Oil slick; June 16, 2010
X; oil rig location
Florida Waters
DWH
SS
EEZ
M/V R. L. Becker
JUNE 16, 2010 COLOR INDEX – OIL OUTLINE
MODIS.2010167.182448.florida.1km.color_index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Designer and Manufacturer of
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Valves and Regulators
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Applications for over 30 years
Useful Conversion Factors
1 atm = 406.8 in. of H2O
1 atm = 2126 lb/ft2
1 atm = 14.696 lb/in2
1 atm = 101325 N/m2
1 bar = 14.504 lb/in2
1 gal = 0.13368 ft3
1 kg = 2.2046 lb
1 kg/cm2 = 14.22 lb/in2
1 kg/m3= 6.243x10-2 lb/ft3
1 kg/m3 = 3.613x10-5 lb/in3
1L = 0.264 gal
1 m3/hr = 4.4 gal/min
1 m3 = 35.31 ft3
1 Nm3/hr = 0.589 scfm
1 Pa = 1.4504x10-4 lb/in
U.S. PARA PLATE
VALVES & REGULATORS
(888) 510-9690
www.usparaplate.com
cm

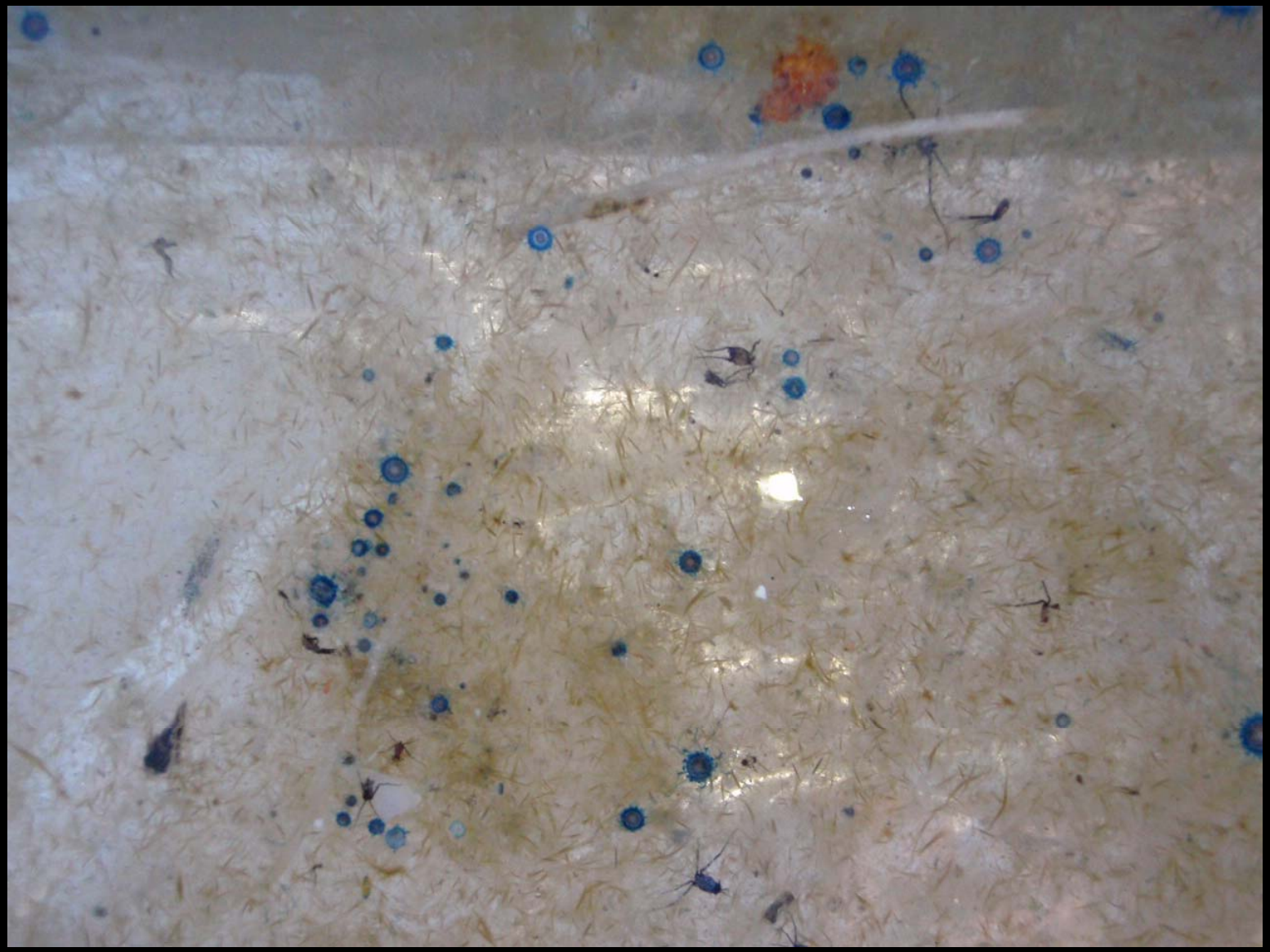
061610 1021

061610 1136

061610 1321

061610 1807

061710 0702.7



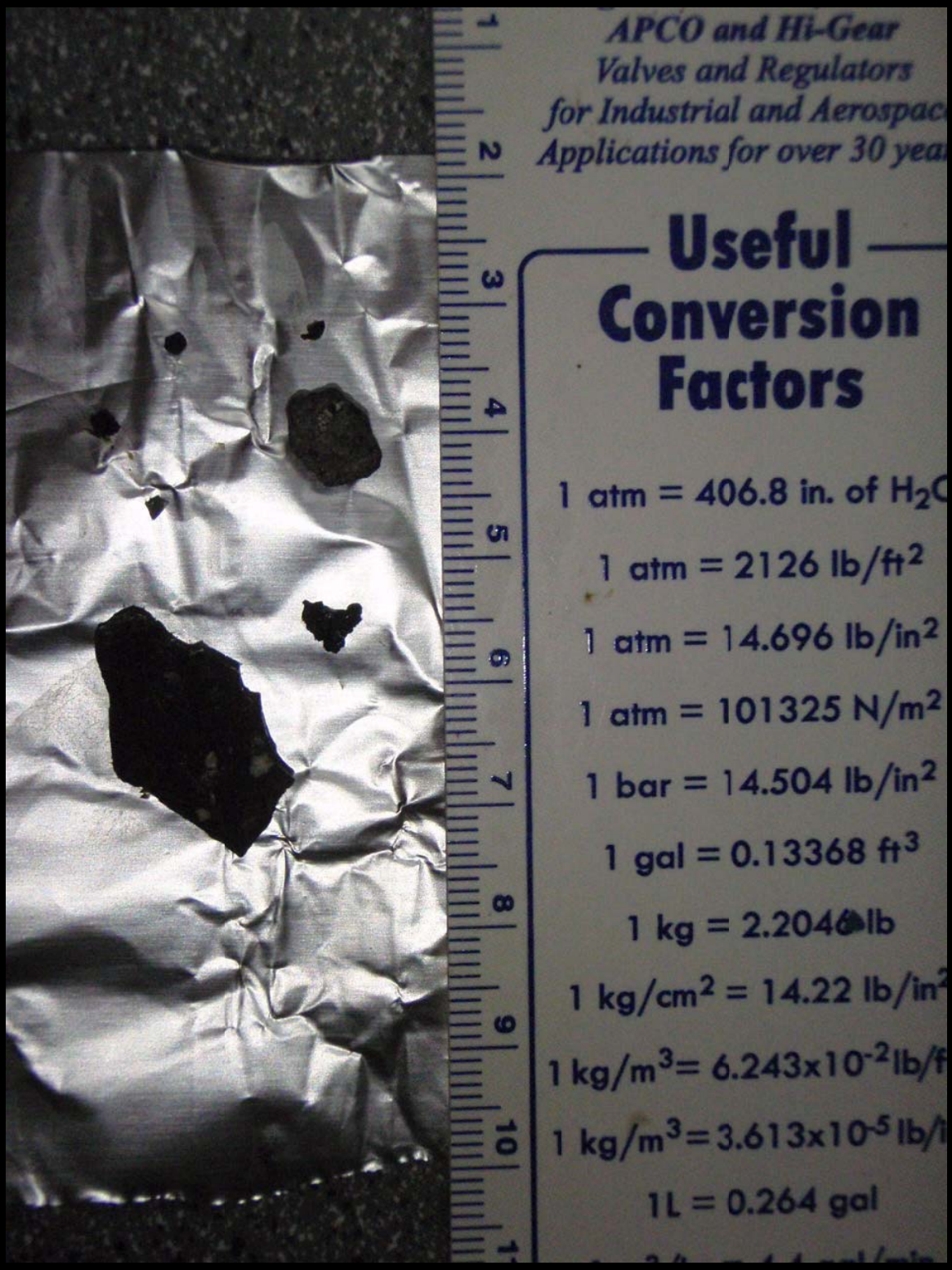
061710 0829.3

061710 1207

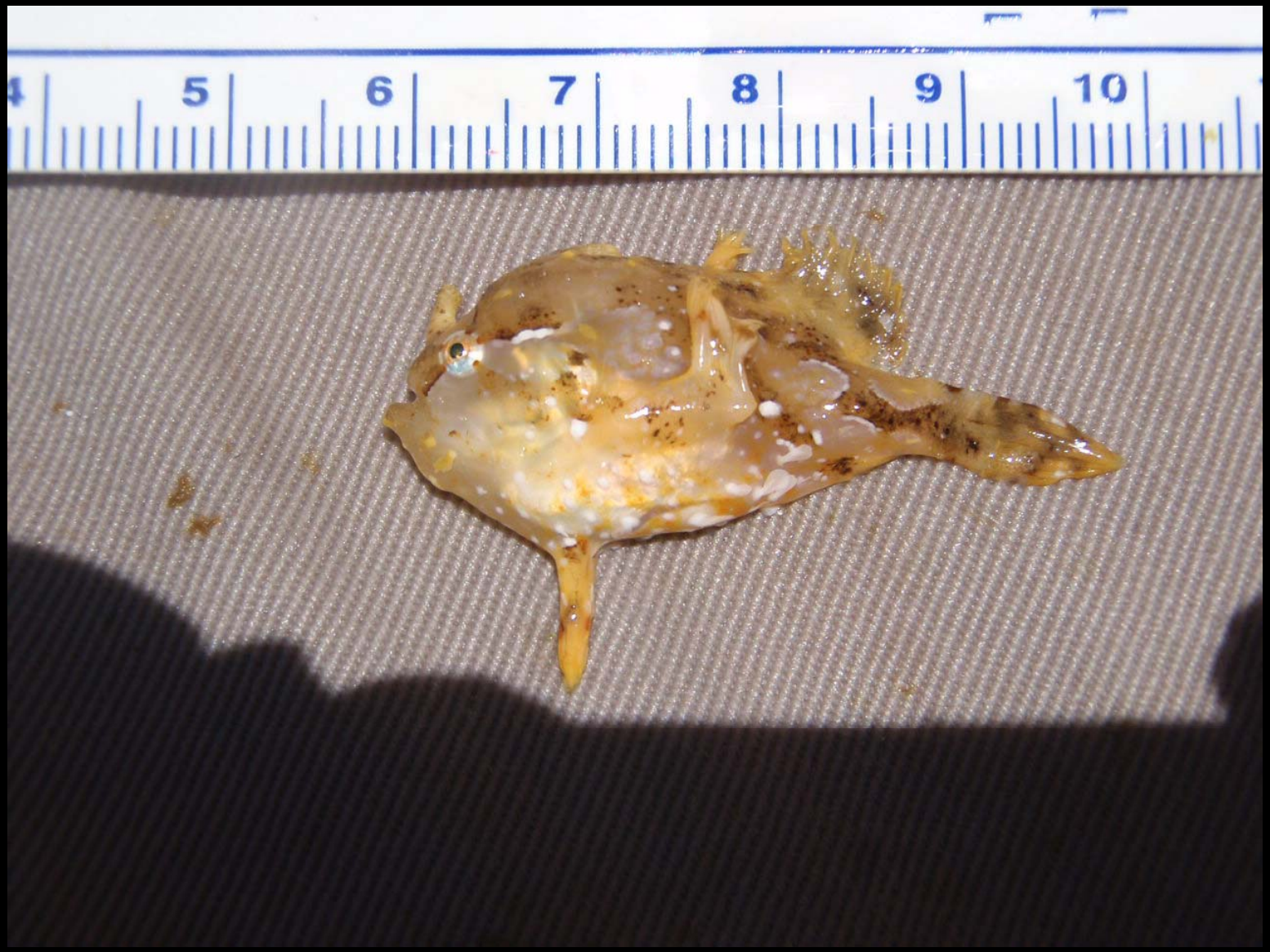
061710 1219.0

1 atm = 406.8 in.
1 atm = 2126 lb
1 atm = 14.696
1 atm = 101325
1 bar = 14.504
1 gal = 0.13368
1 kg = 2.2046
1 kg/cm2 = 14.22
1 kg/m3 = 6.243x10
1 kg/m3 = 3.613x10
1L = 0.264 gal
5
6
7
8
9
10

061710 1241

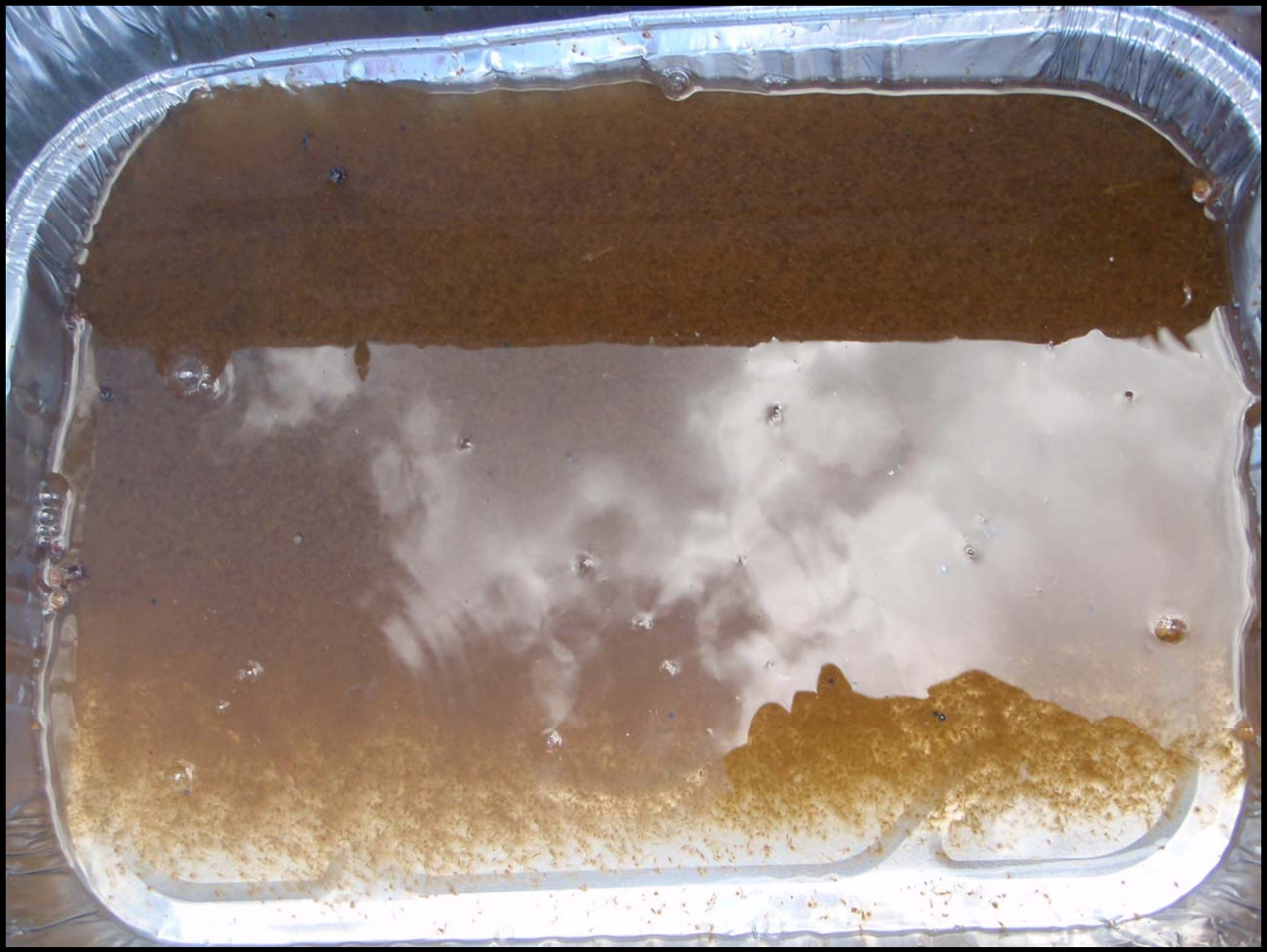

APCO and Hi-Gear
Valves and Regulators
for Industrial and Aerospac
Applications for over 30 yea
Useful
Conversion
Factors
1 atm = 406.8 in. of H2O
1 atm = 2126 lb/ft2
1 atm = 14.696 lb/in2
1 atm = 101325 N/m2
1 bar = 14.504 lb/in2
1 gal = 0.13368 ft3
1 kg = 2.2046 lb
1 kg/cm2 = 14.22 lb/in2
1 kg/m3 = 6.243x10-2 lb/f
1 kg/m3 = 3.613x10-5 lb/i
1L = 0.264 gal

061710 1338



061710 1343

061710 1511



061710 1513

061710 1552.4

061710 1952.9

061710 1952.0

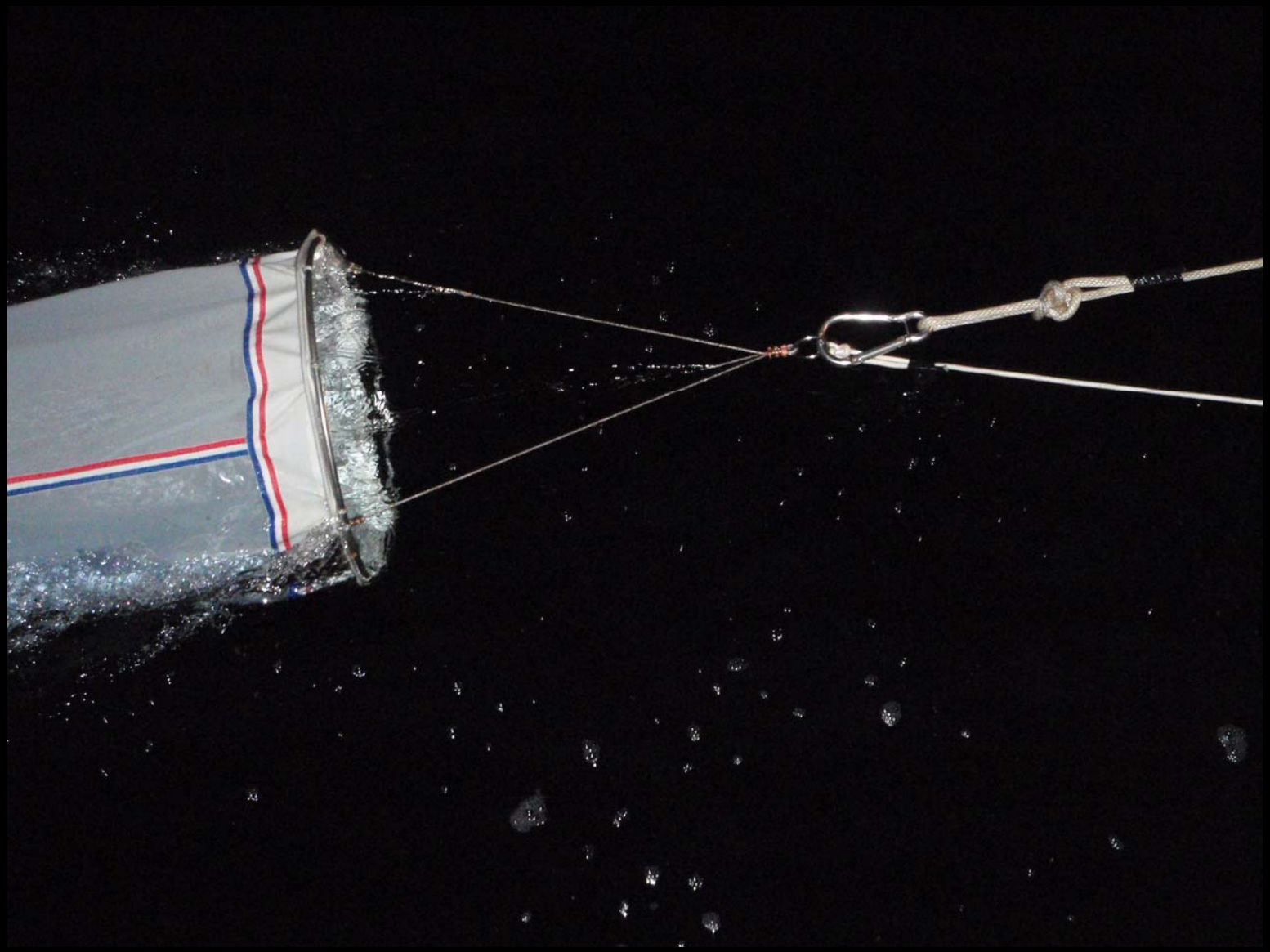
061710 2048.0

061710 2054

061710 2107


Recreational Vessels
EMERGENCY
CALL PROCEDURES
Rev. 9/00
1. MAKE SURE RADIO IS ON
2. SELECT CHANNEL 16
3. PRESS/HOLD THE TRANSMIT BUTTO
4. CLEARLY SAY: MAYDAY MAYDAY MAY
5. ALSO GIVE:
VESSEL NAME AND/OR DESCRIPTIO
POSITION AND/OR LOCATION
NATURE OF EMERGENCY
NUMBER OF PEOPLE ON BOARD
6. RELEASE TRANSMIT BUTTON
7. WAIT FOR 10 SECONDS – IF NO RESP
REPEAT "MAYDAY" CALL.
16
VHF-FM
HAVE ALL PERSONS PUT
U.S. Coast Guard
oline (600) 368-5647
PLEASE REPORT CHEMICAL AND PETK
STATE WARNING POINT (S
1-800-320-0519
FOR COASTAL AND WATERBORNE
NATIONAL RESPONSE CENTER (
1-800-424-8802
ENVIRONMENTAL CRIMES, ILLEGAL DUMP
*DEP (*337)
DEPARTMENT OF ENVIRONMENTAL PROTECTION
FLORIDA
THE BUREAU OF EMERGENCY RESPONSE
PROTECTION THROUGH APPROPRIATE RESPONSE

0617102230



061710 2346

061810 0017

061810 0831

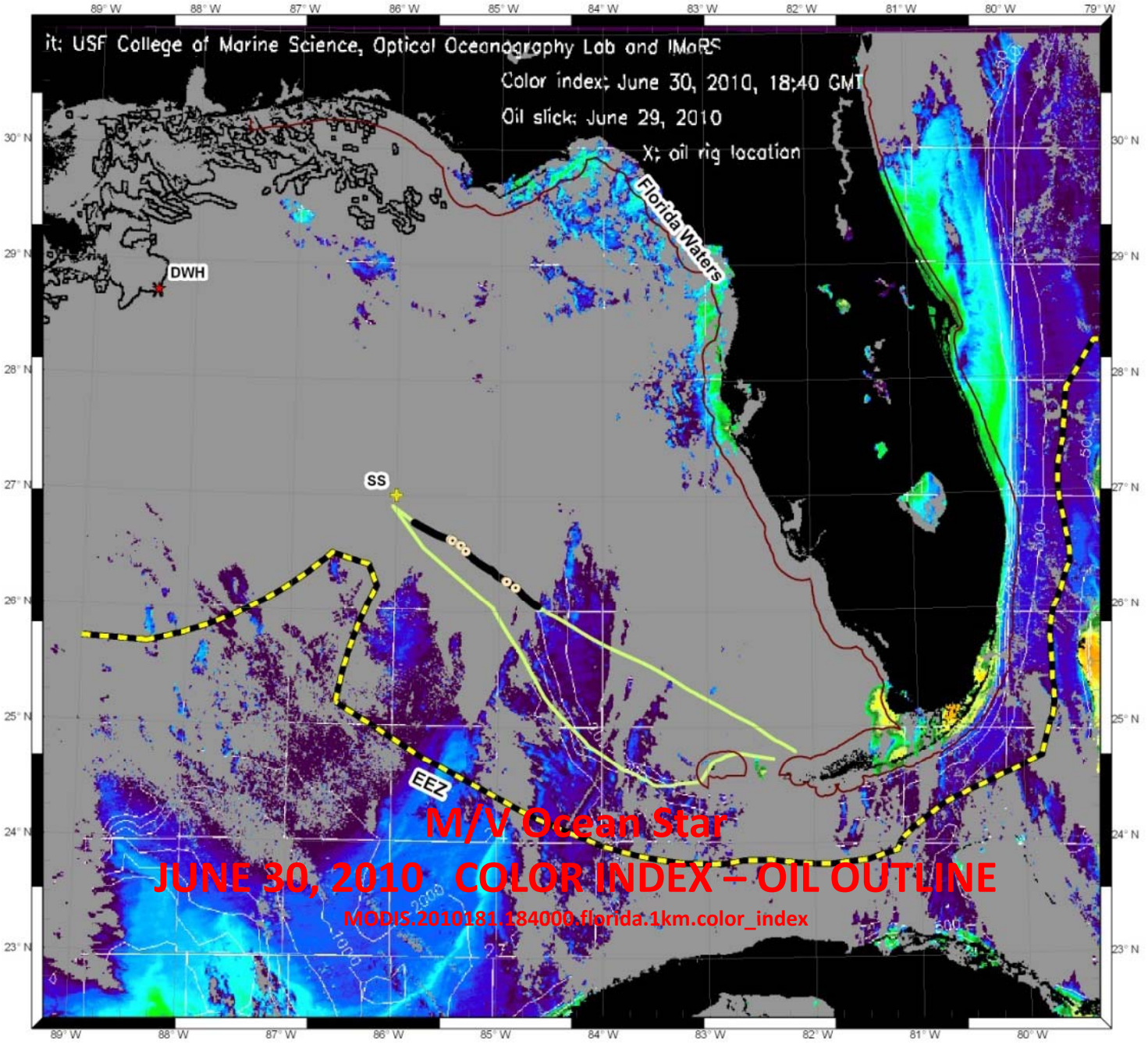
061810 1213

061810 1539

061810 1631

061910 1101.2

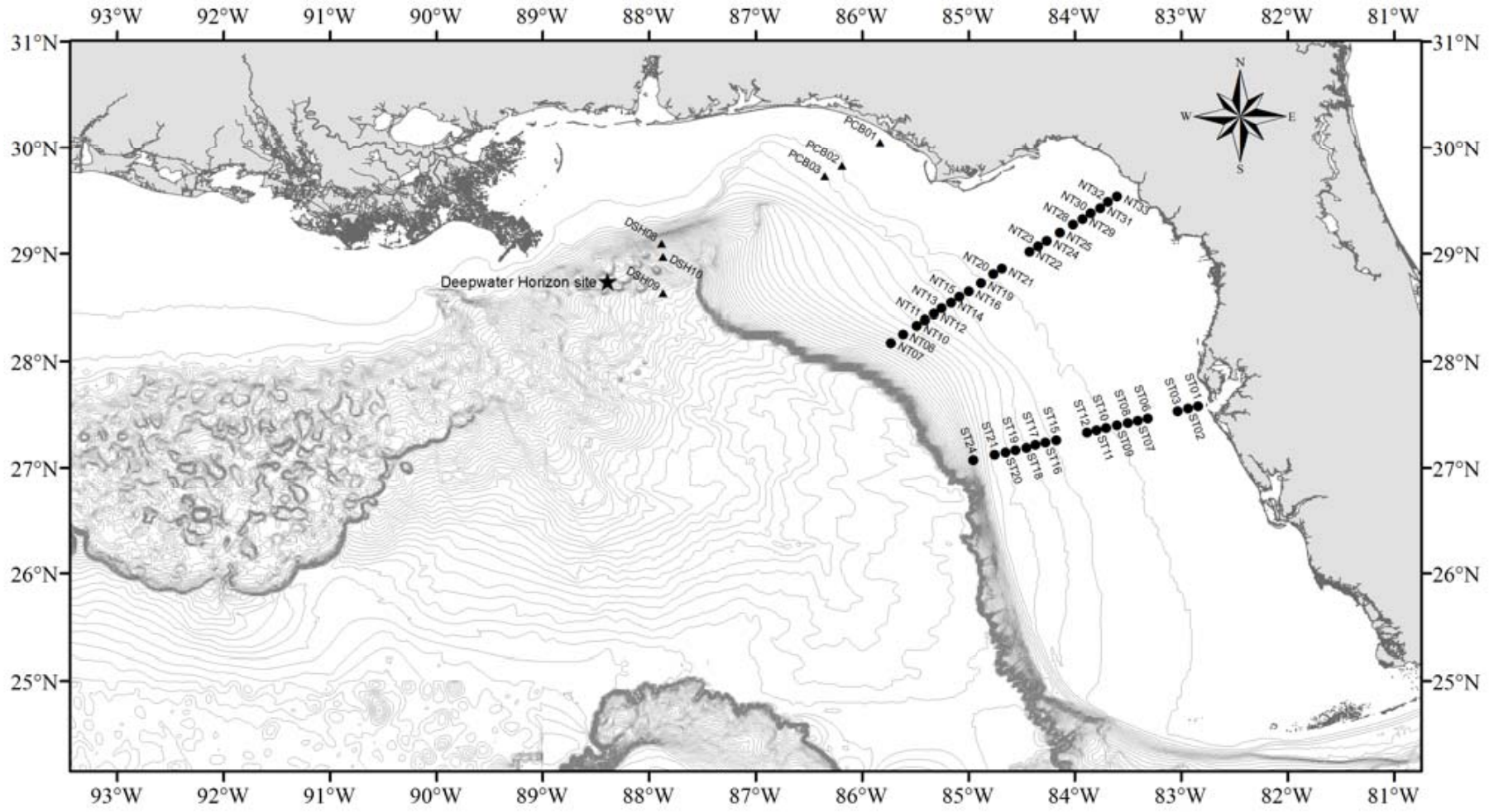
062910 0847.3

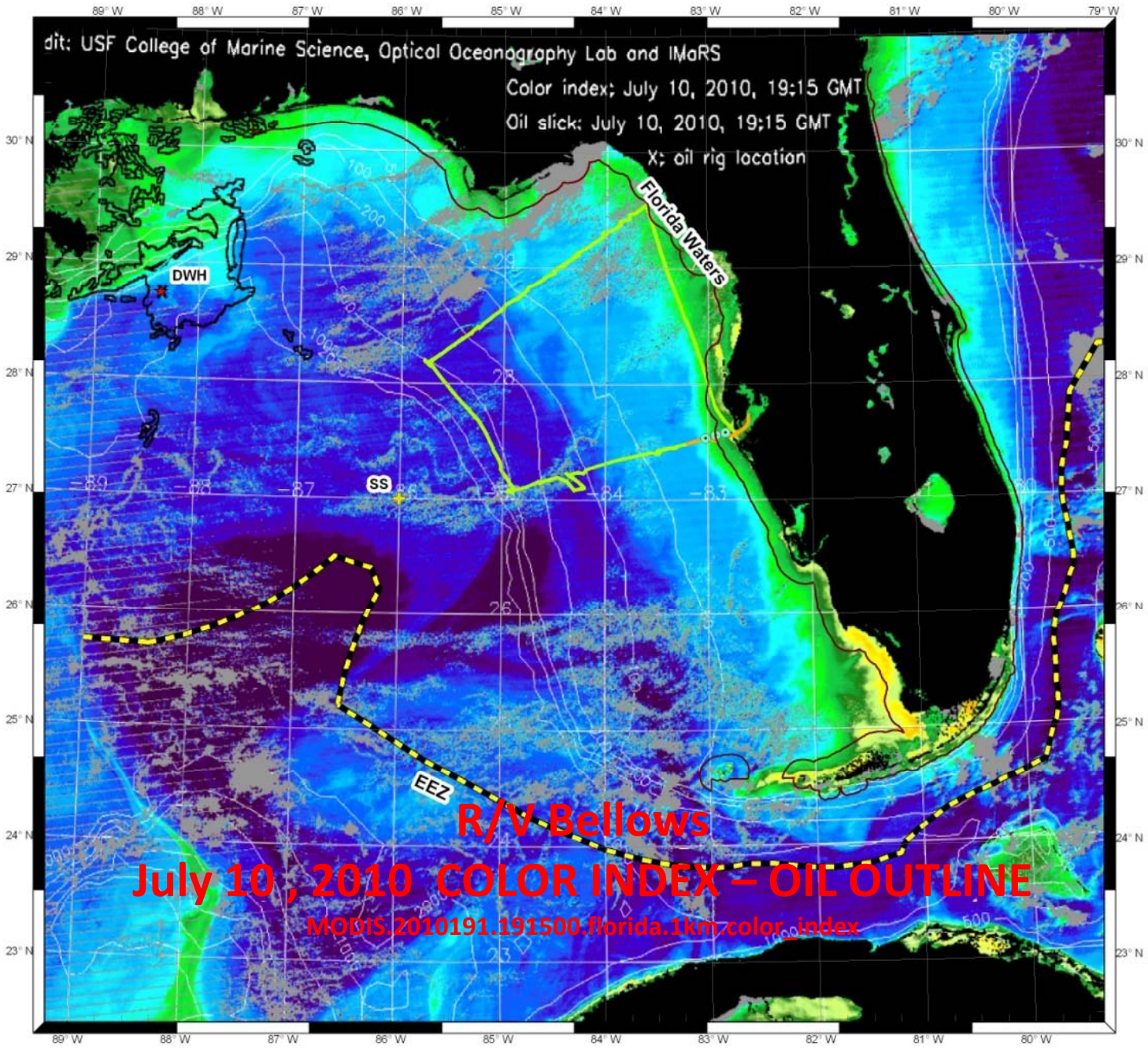

it; USF College of Marine Science, Optical Oceanography Lab and IMaRS
Color index; June 30, 2010, 18:40 GMT
Oil slick; June 29, 2010
X; oil rig location
Florida Waters
DWH
SS
EEZ
M/V Ocean Star
JUNE 30, 2010 COLOR INDEX – OIL OUTLINE
MODIS.2010181.184000.florida.1km.color_index

063010 1028.0

063010 1028.0

070110 0745.0


93°W
92°W
91°W
90°W
89°W
88°W
87°W
86°W
85°W
84°W
83°W
82°W
81°W
31°N
30°N
29°N
28°N
27°N
26°N
25°N
N
S
W
E
PCB01
PCB02
PCB03
DSH08
DSH10
DSH09
Deepwater Horizon site
NT32
NT33
NT30
NT31
NT28
NT29
NT25
NT27
NT24
NT23
NT22
NT20
NT21
NT19
NT15
NT18
NT16
NT13
NT14
NT11
NT12
NT10
NT08
NT07
ST03
ST01
ST02
ST06
ST08
ST07
ST10
ST09
ST12
ST11
ST15
ST16
ST17
ST18
ST19
ST20
ST21
ST24


dit: USF College of Marine Science, Optical Oceanography Lab and IMaRS
Color index; July 10, 2010, 19:15 GMT
Oil slick: July 10, 2010, 19:15 GMT
X; oil rig location
Florida Waters
DWH
SS
EEZ
R/V Bellows
July 10 , 2010 COLOR INDEX – OIL OUTLINE
MODIS.2010191.191500.florida.1km.color_index

071010

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Valves and Regulators
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Applications for over 30 years
INCHES
cm
Useful
Conversion
Factors
1 atm = 406.8 in. of H_2O
1 atm = 2126 lb/ft^2
1 atm = 14.696 lb/in^2
1 atm = 101325 N/m^2
1 bar = 14.504 lb/in^2
1 gal = 0.13368 ft^3
1 kg = 2.2046 lb
1 kg/cm^2 = 14.22 lb/in^2
1 kg/m^3= 6.243x10^{-2}lb/ft^3
1 kg/m^3=3.613x10^{-5} lb/in^3
1L = 0.264 gal
1 m^3/hr = 4.4 gal/min
1 m^3 = 35.31 ft^3
1 Nm^3/hr = 0.589 scfm
1 Pa = 1.4504x10^{-4} lb/in
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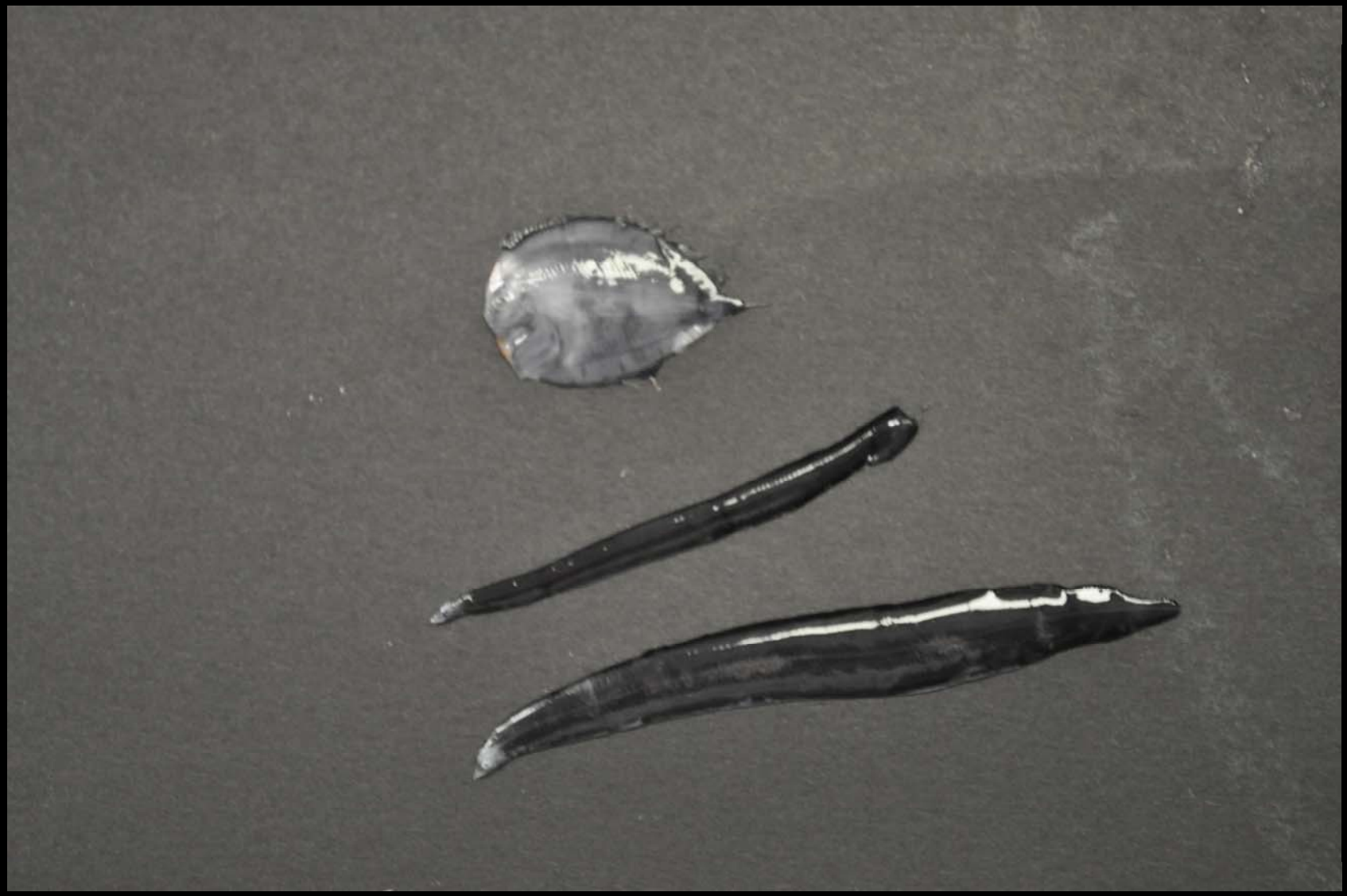
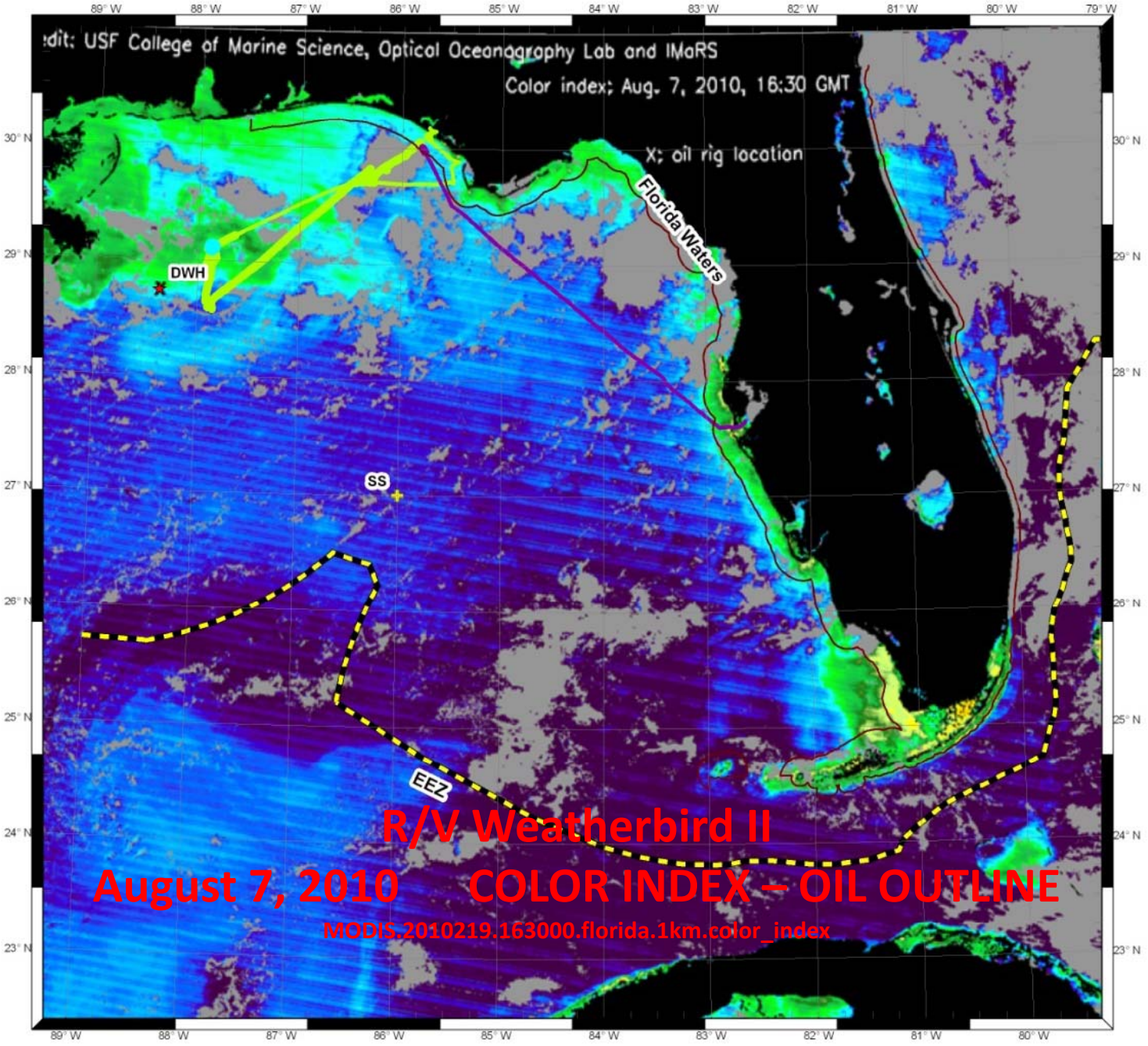
www.usparaplate.com

071010

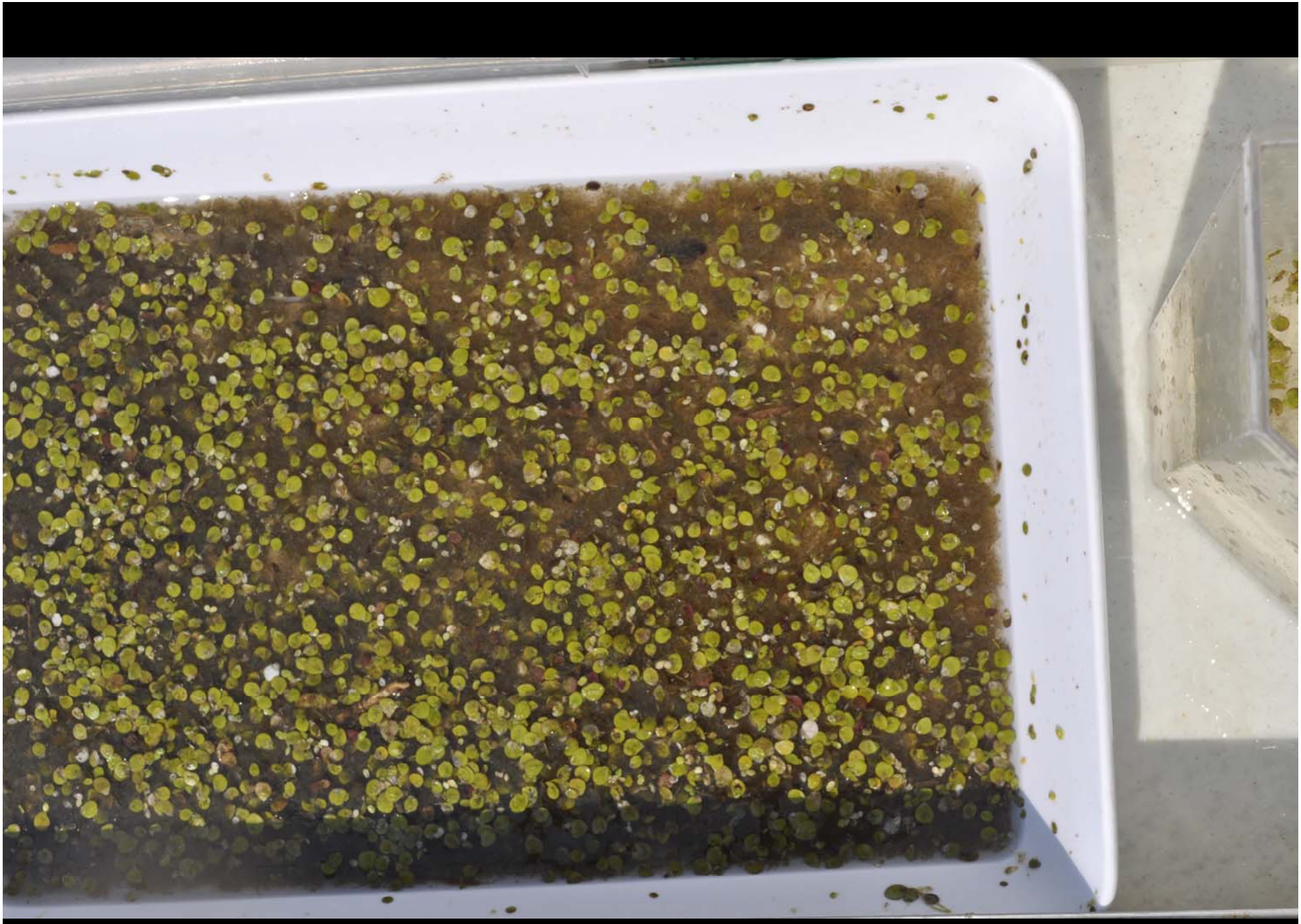
071510



071510

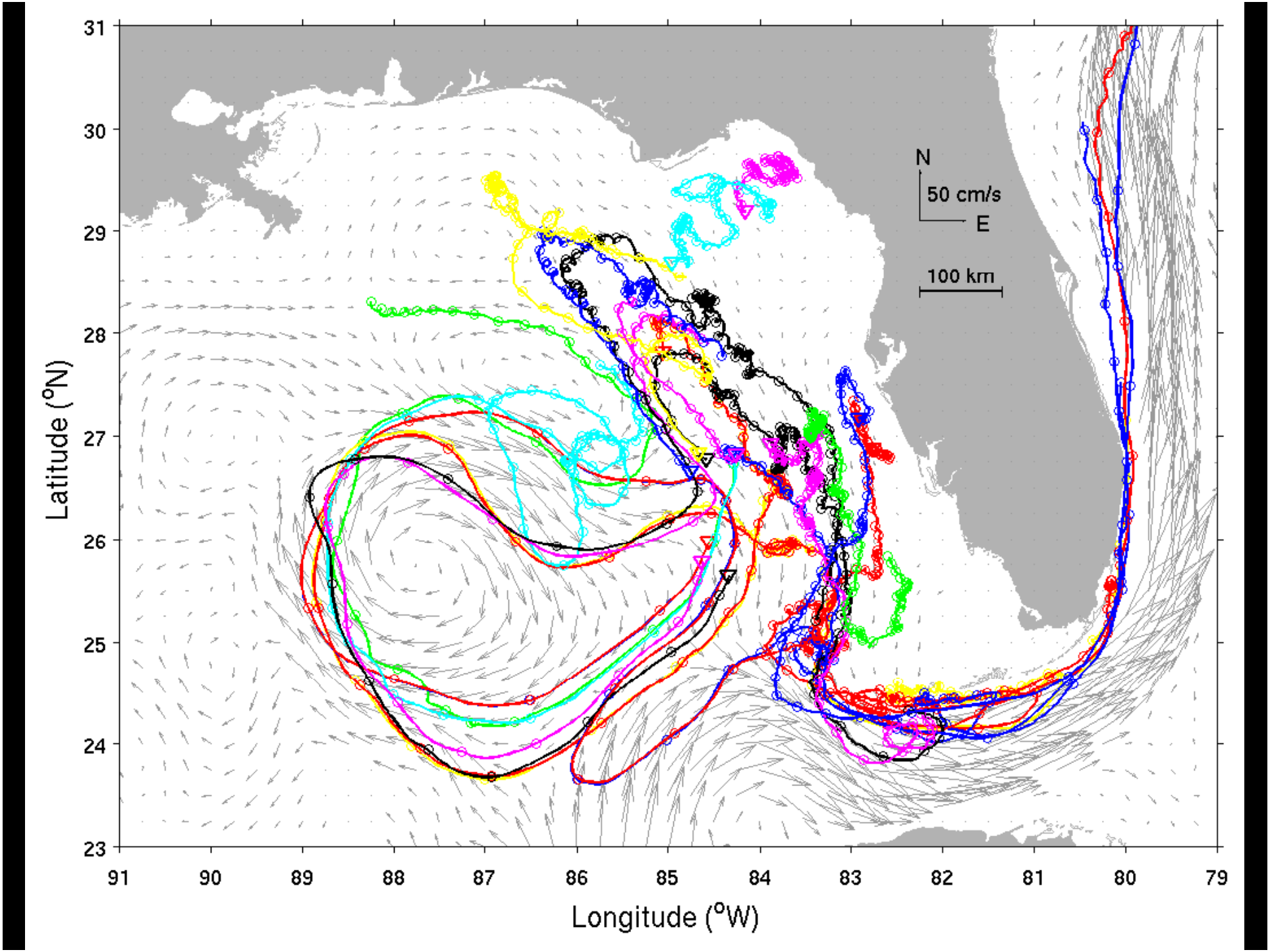

:dit: USF College of Marine Science, Optical Oceanography Lab and IMaRS
Color index; Aug. 7, 2010, 16:30 GMT
X; oil rig location
Florida Waters
DWH
SS
EEZ
R/V Weatherbird II
August 7, 2010 COLOR INDEX – OIL OUTLINE
MODIS.2010219.163000.florida.1km.color_index
89° W
88° W
87° W
86° W
85° W
84° W
83° W
82° W
81° W
80° W
79° W
30° N
29° N
28° N
27° N
26° N
25° N
24° N
23° N

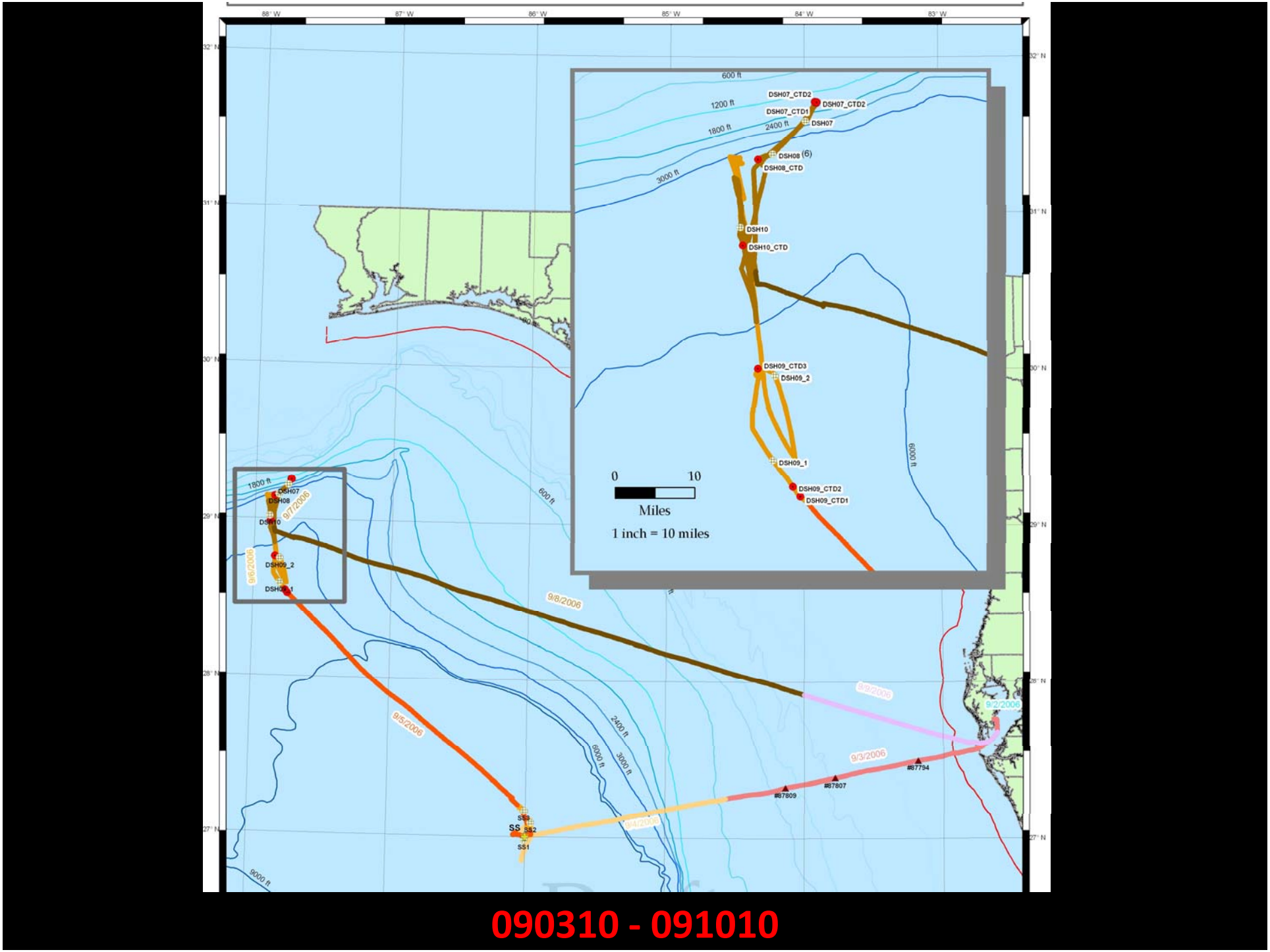

080910 1935.0



081010 1127.2

081010 1127.3


N
50 cm/s
E
100 km
Latitude (°N)
Longitude (°W)
31
30
29
28
27
26
25
24
23
91
90
89
88
87
86
85
84
83
82
81
80
79



090310 - 091010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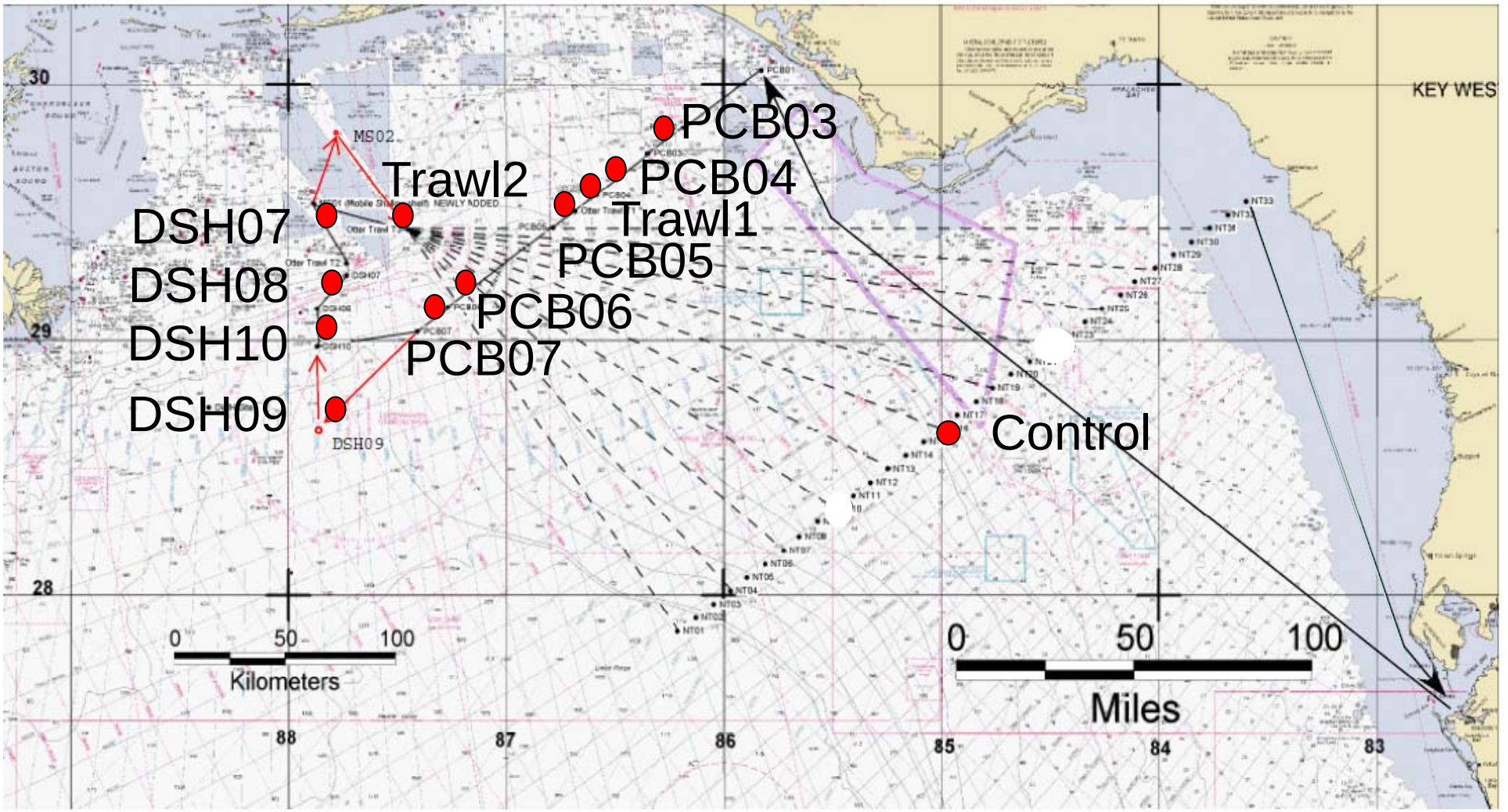
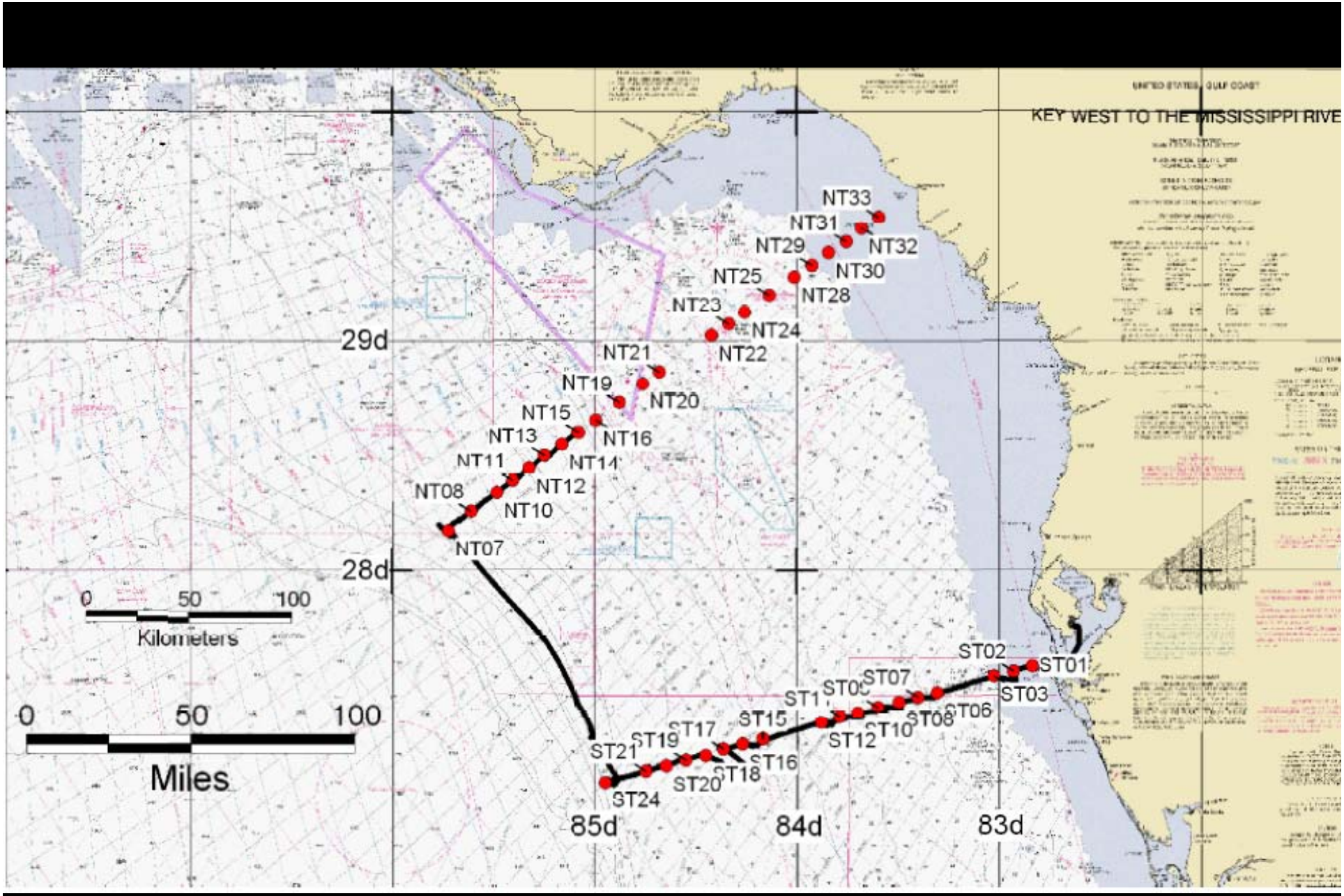
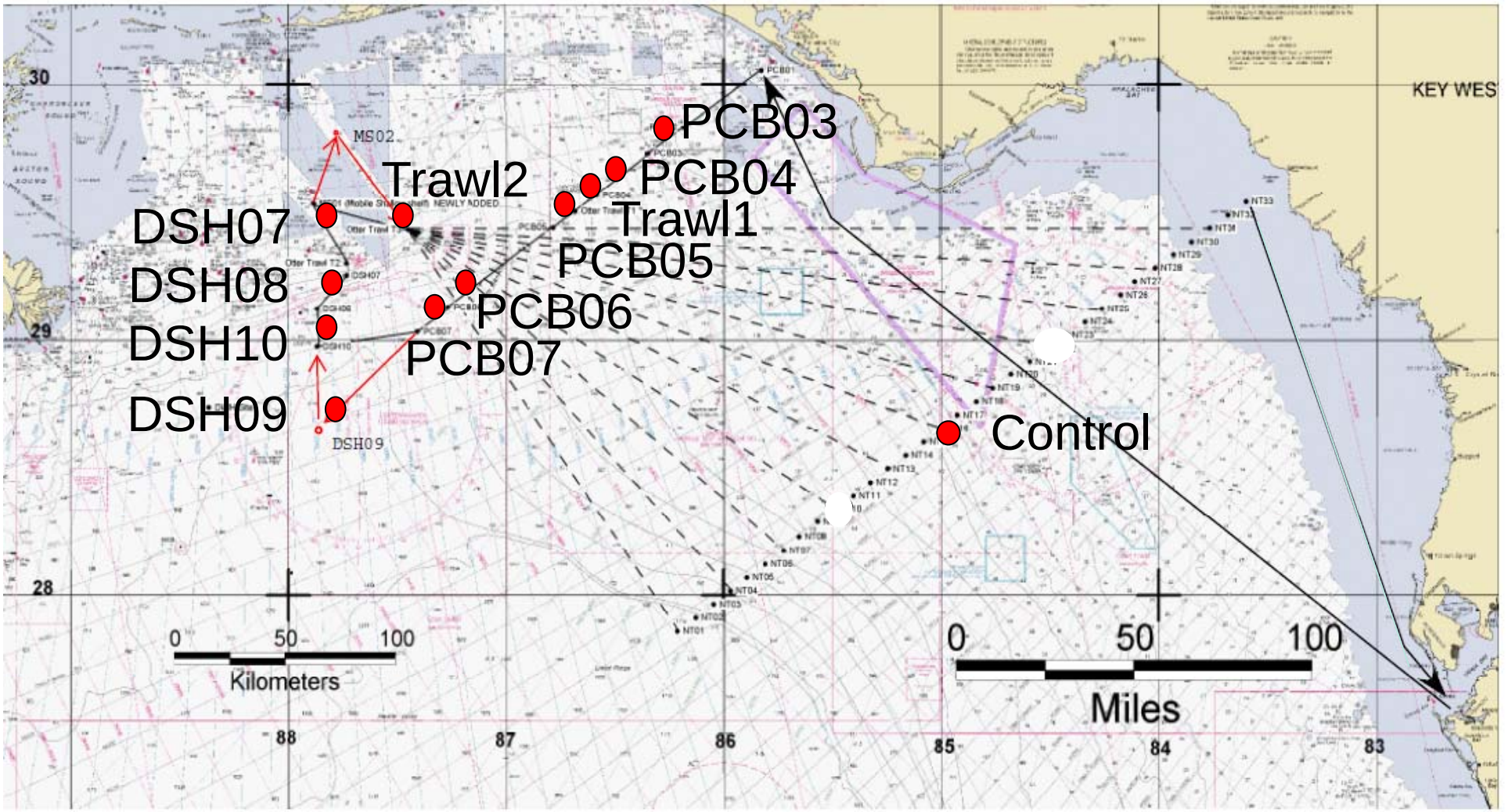


113010 - 120810

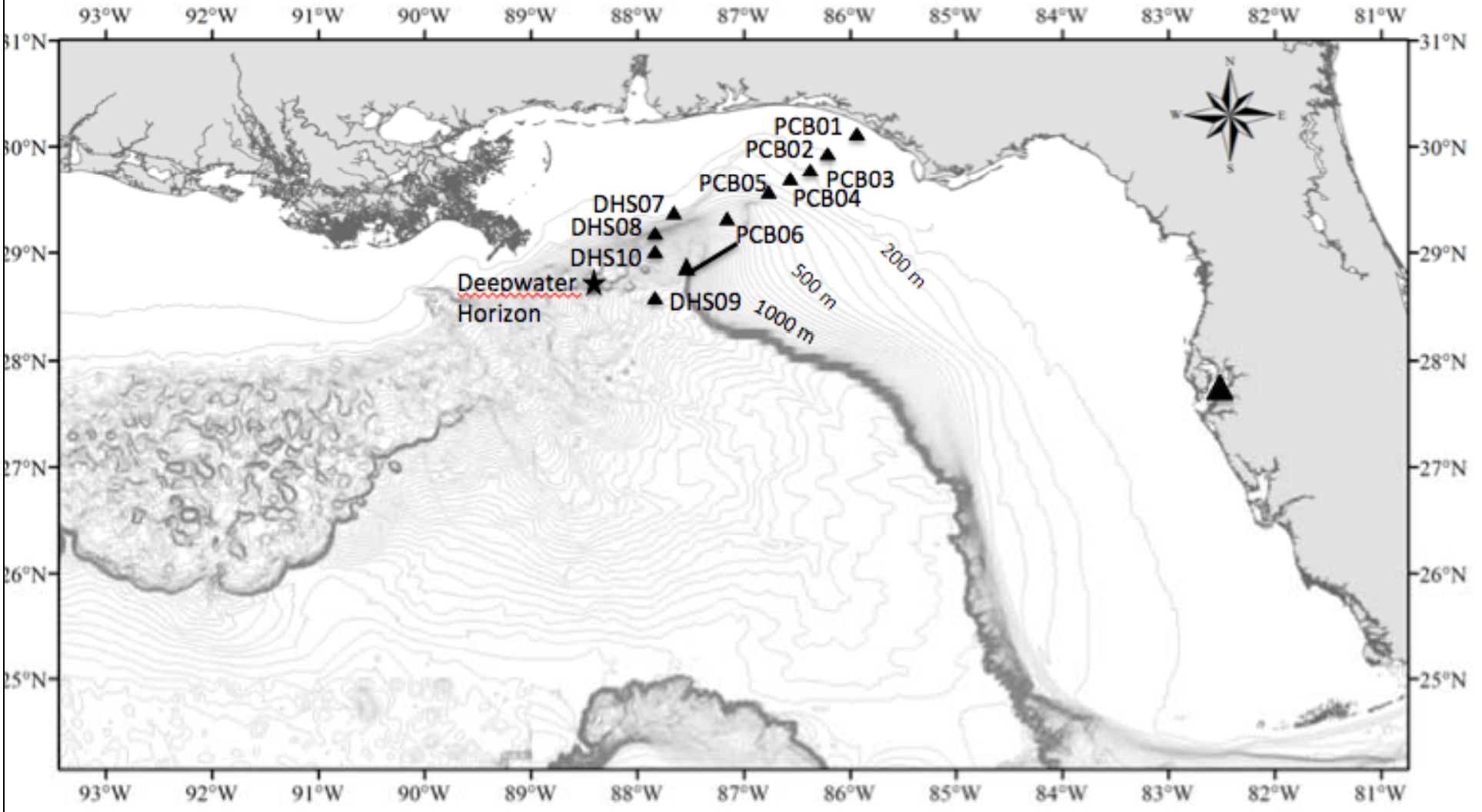


010411 - 011111

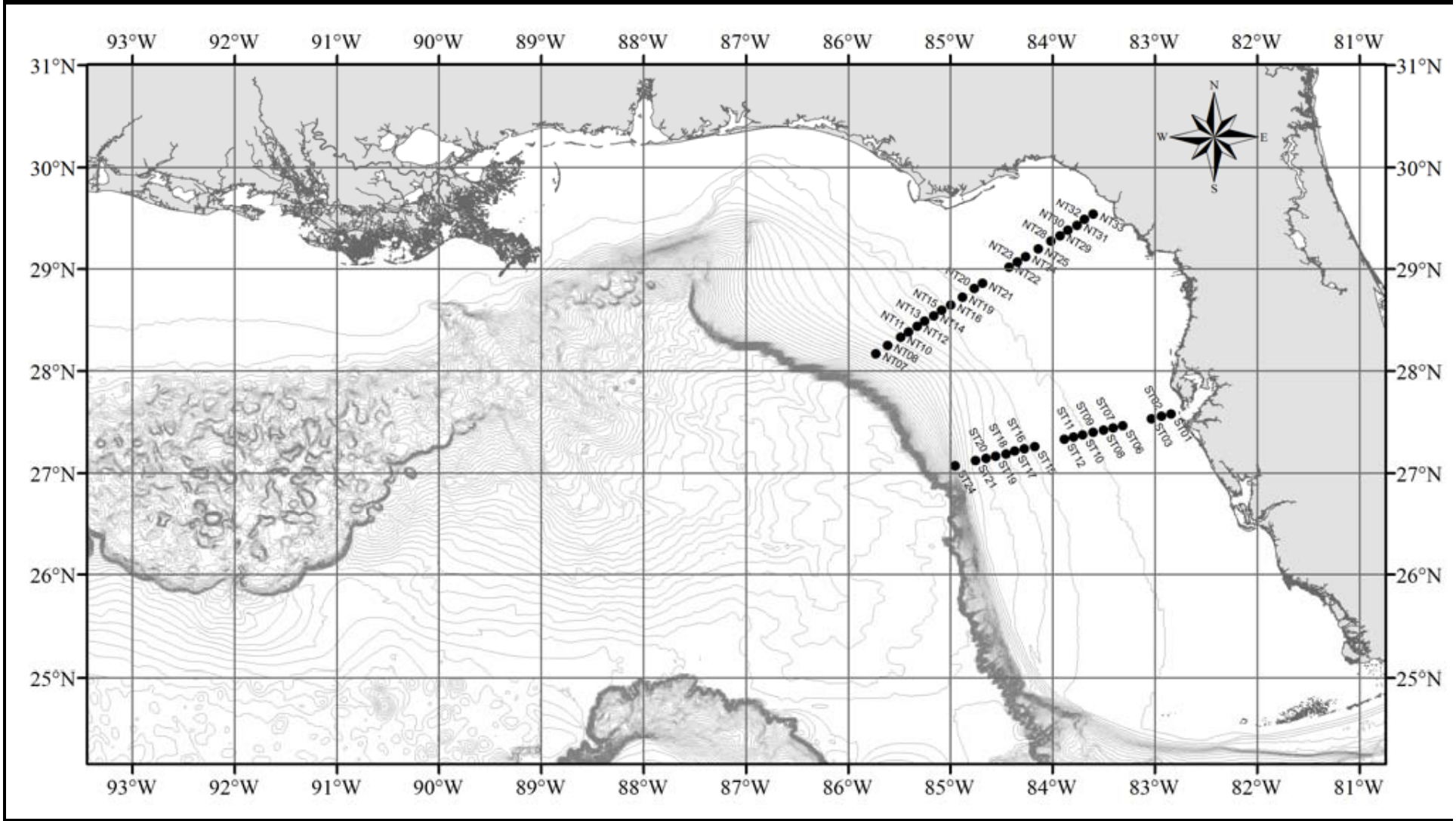


021711 - 022311

032111 - 032311

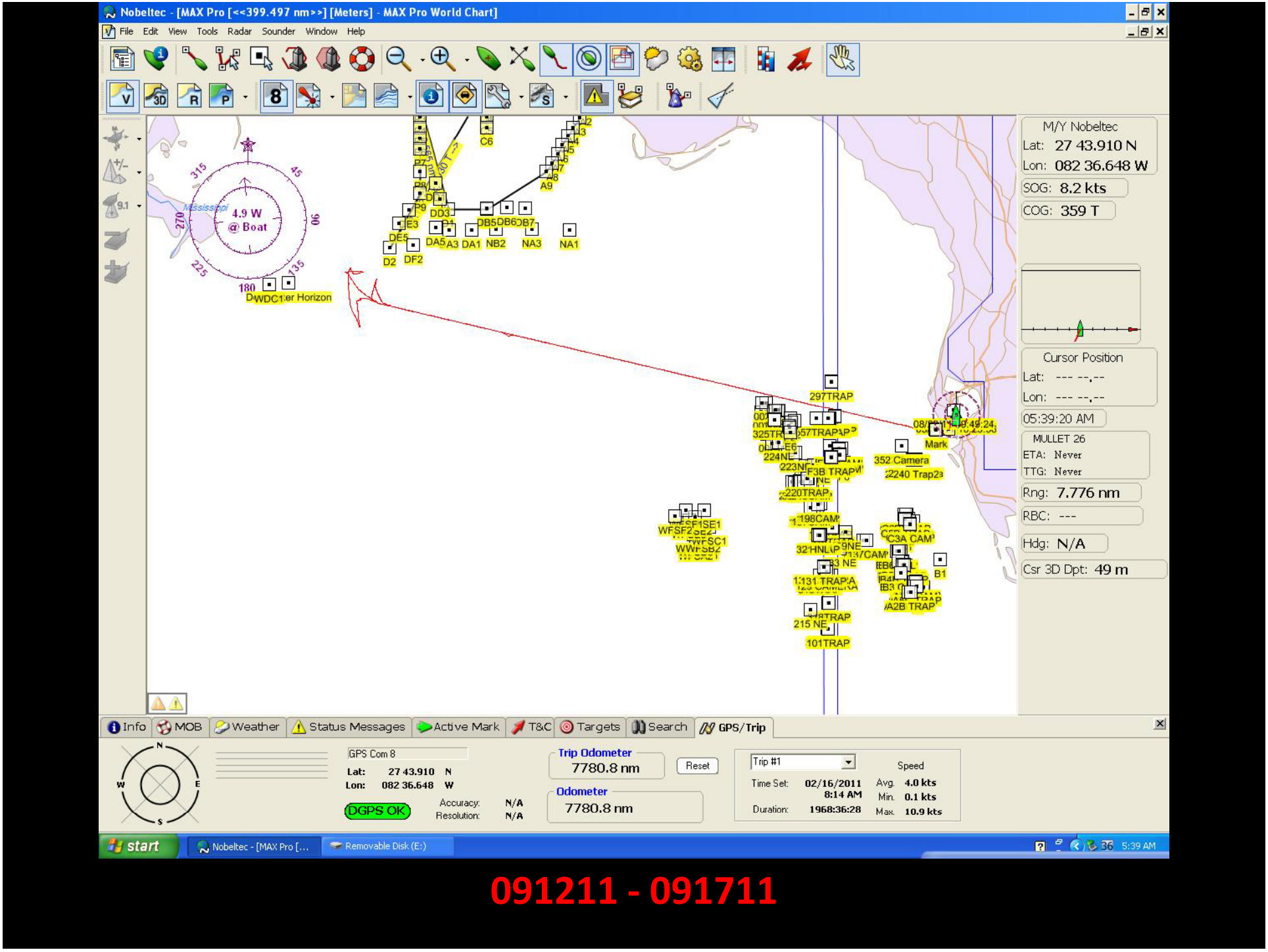


050311 - 050911

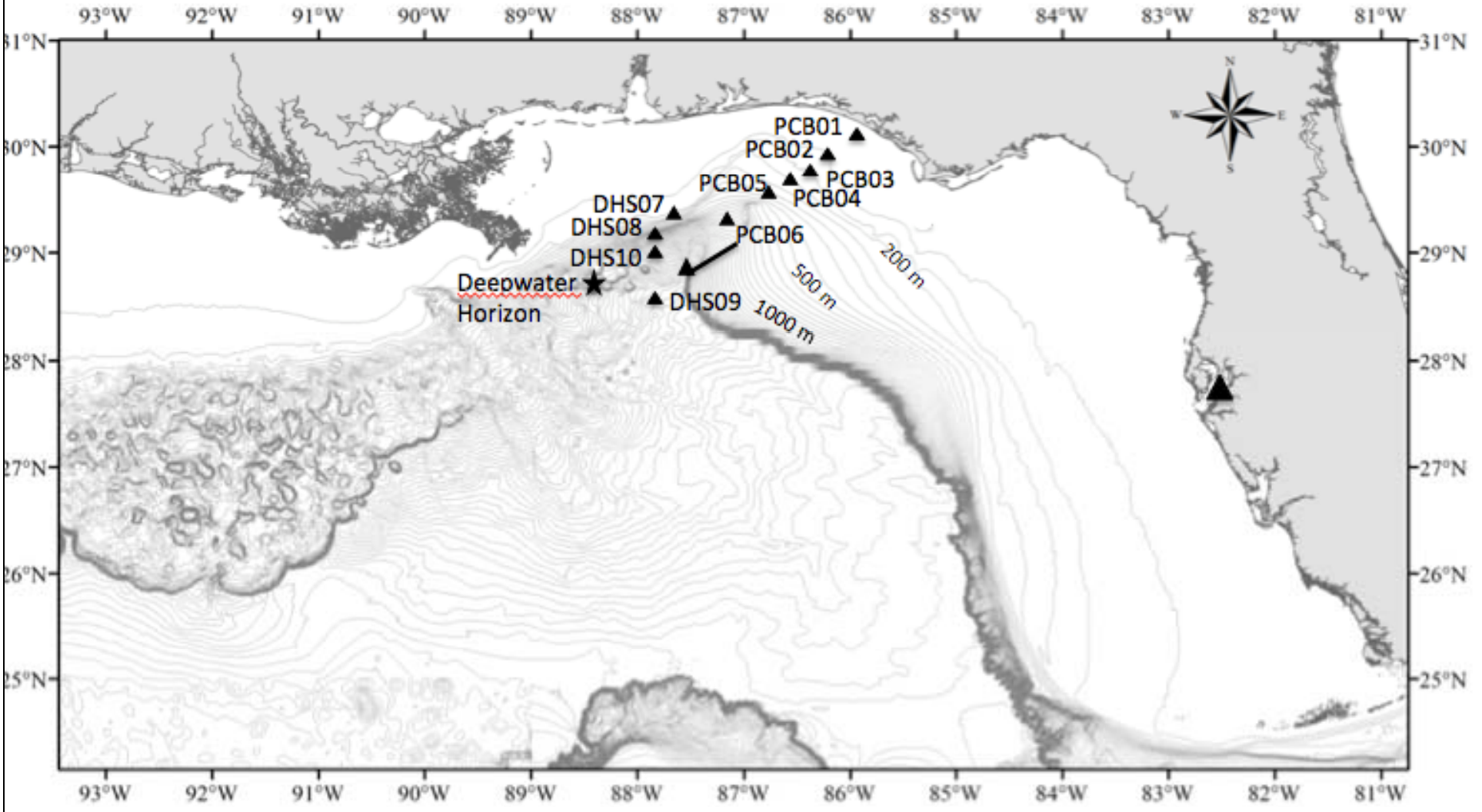


062511 - 062911

062911 1924

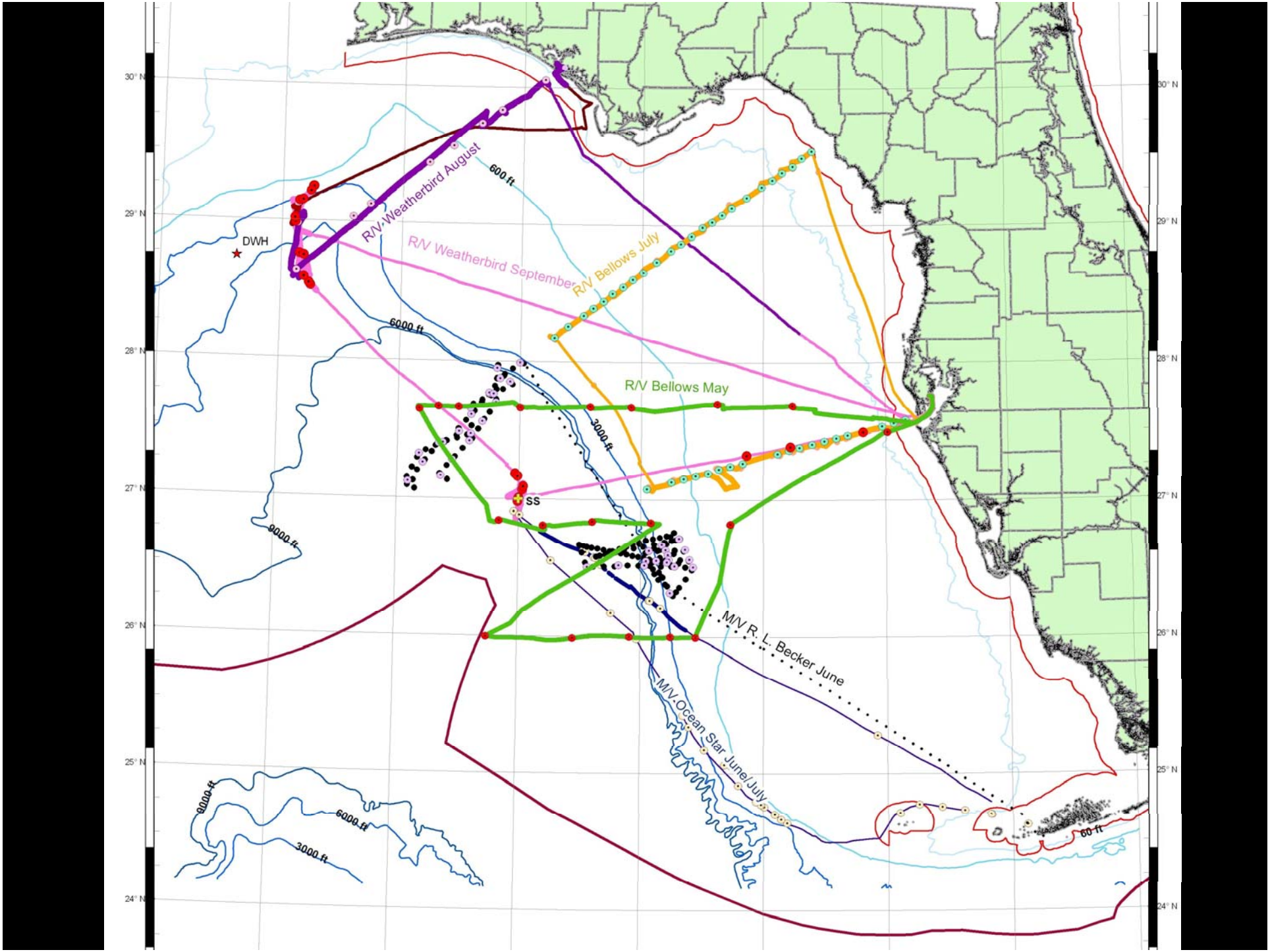


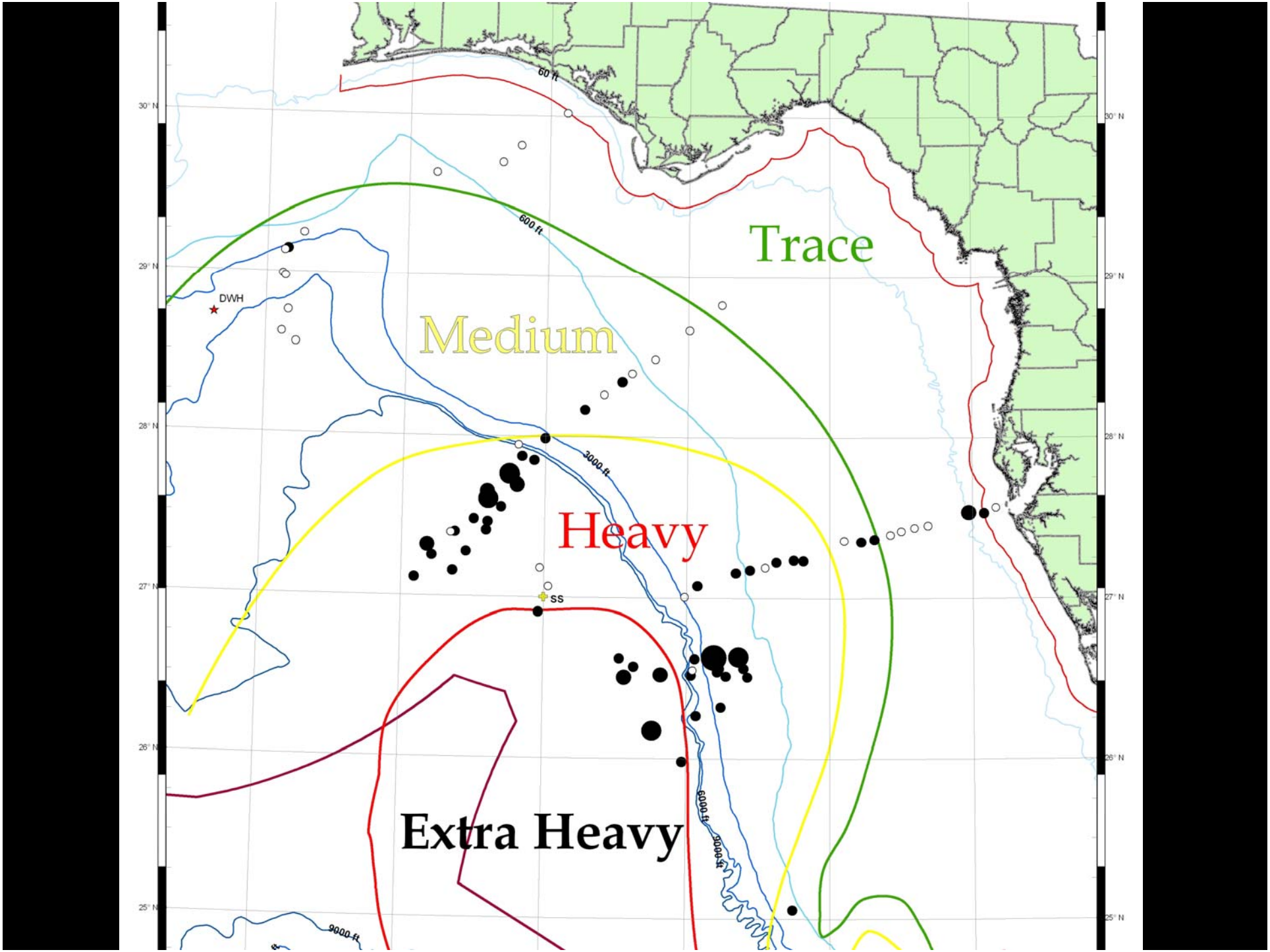
091211 - 091711

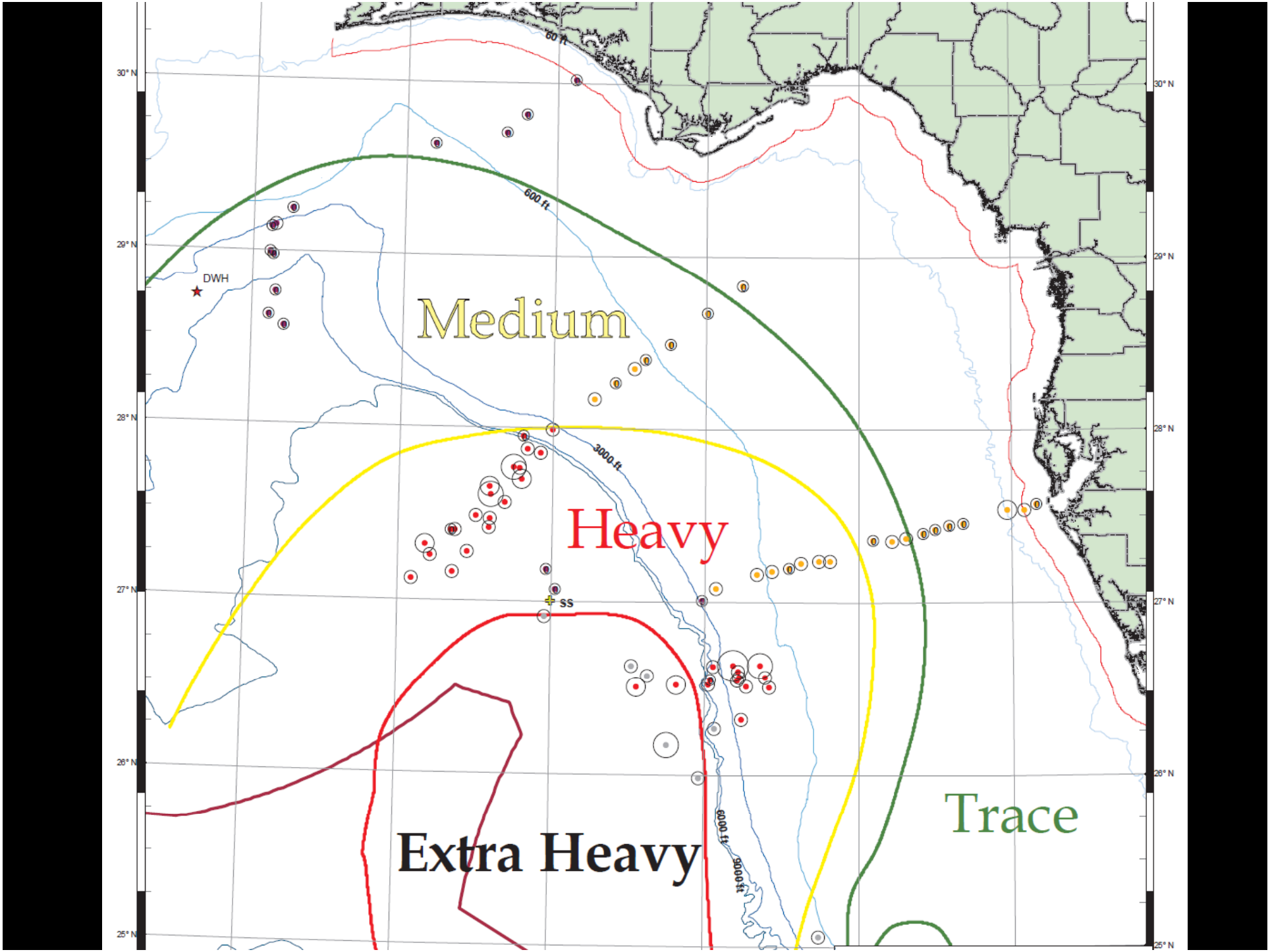


092011 - 092811

092711 1851

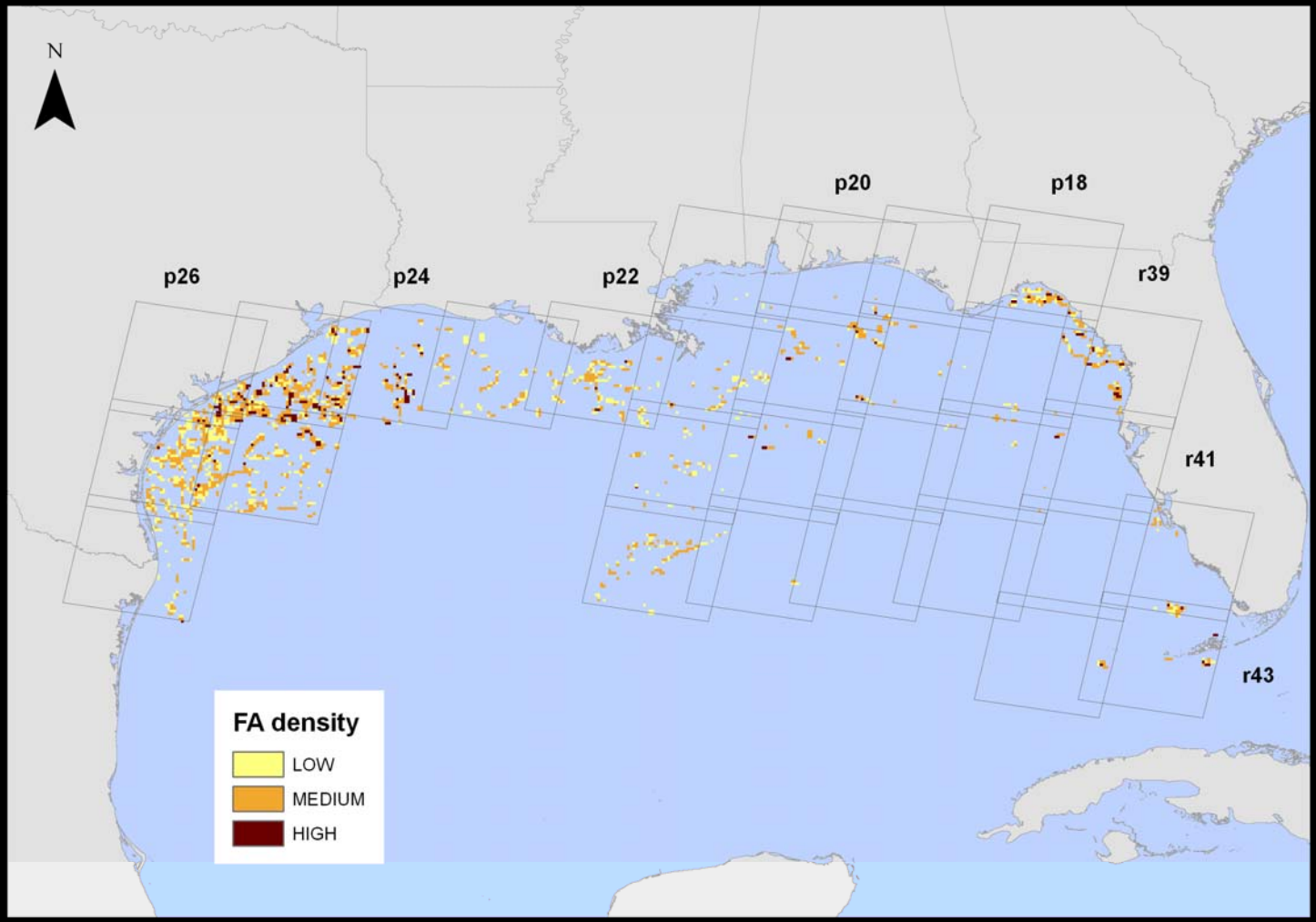

30° N
29° N
28° N
27° N
26° N
25° N
24° N
DWH
R/V Weatherbird August
600 ft
R/V Weatherbird September
R/V Bellows July
6000 ft
R/V Bellows May
3000 ft
SS
9000 ft
M/V R. L. Becker June
M/V Ocean Star June/July
9000 ft
6000 ft
3000 ft
60 ft


60 ft
600 ft
3000 ft
6000 ft
9000 ft
9000 ft
Trace
Medium
Heavy
Extra Heavy
DWH
SS
30° N
29° N
28° N
27° N
26° N
25° N


60 ft
600 ft
3000 ft
6000 ft
9000 ft
DWH
SS
Medium
Heavy
Extra Heavy
Trace
30° N
29° N
28° N
27° N
26° N
25° N

Sargassum Distribution for 2010

Robert Hardy, FWRI/USF



~ 500 images, 200 GB data, Visualization

Can We Distinguish Sargassum from oil?

They Appear Similar on Color Photos

Aircraft photo 86°52’35 27°15’20"); 05/20/2010

(Credit: Paul Carlson, Florida Fish and Wildlife Conservation Commission)

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VENT 16