Daily Report: Tracking the Plume of Dispersed Oil using Particle Size Distribution Measurements and Fluorescence Intensity Ratios

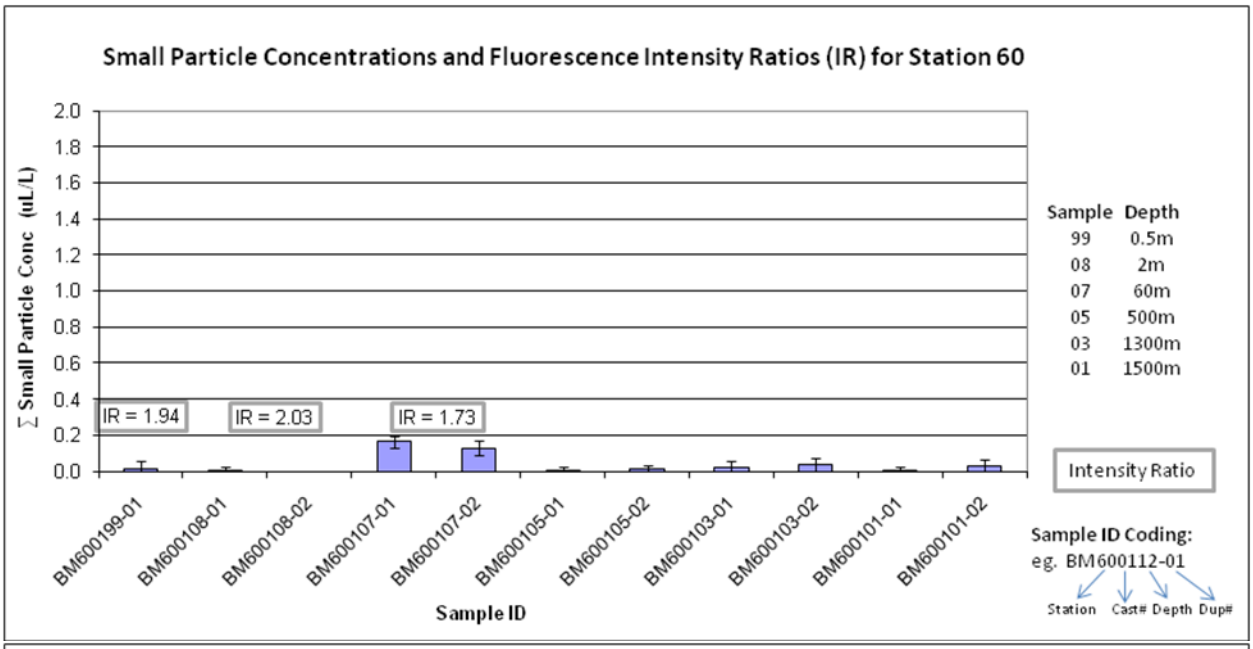
June 1, 2010

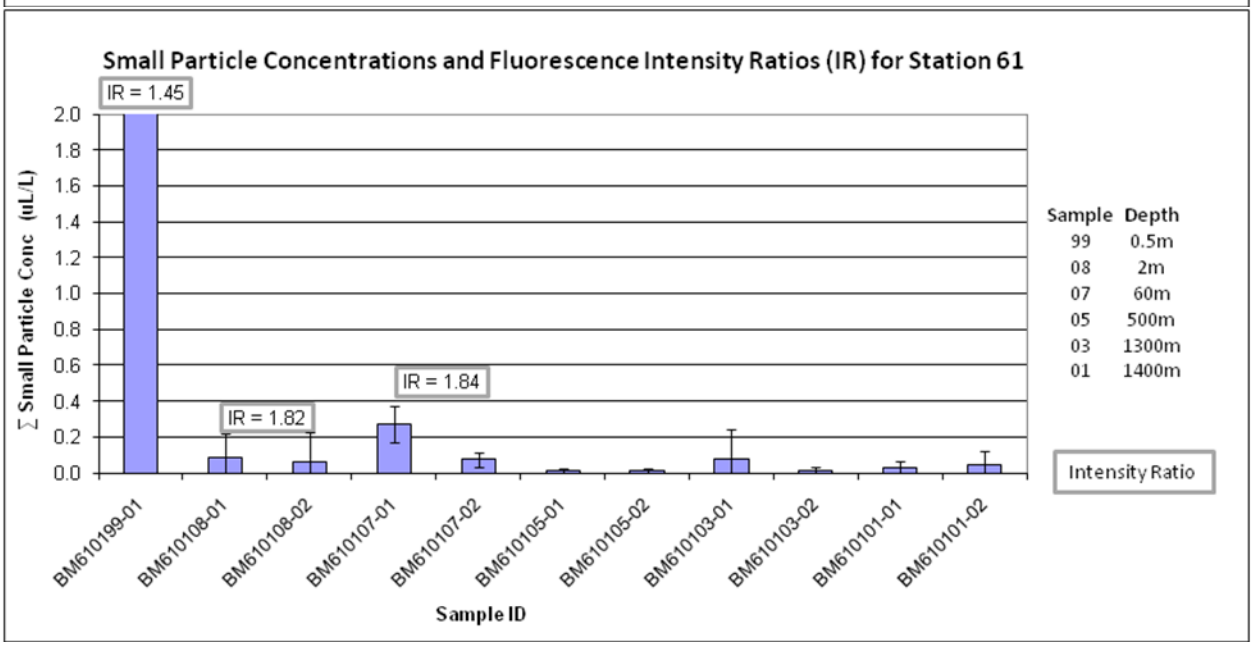
Water samples were collected at five stations for particle size distribution measurements using the LISST-100X particle counter. A total of 63 LISST samples were analyzed, including duplicates. Selected samples from depths of elevated fluorescence from the CTD trace were also collected for fluorescence intensity ratio measurements and analyzed using a Quantech Life Sciences fixed wavelength fluorometer.

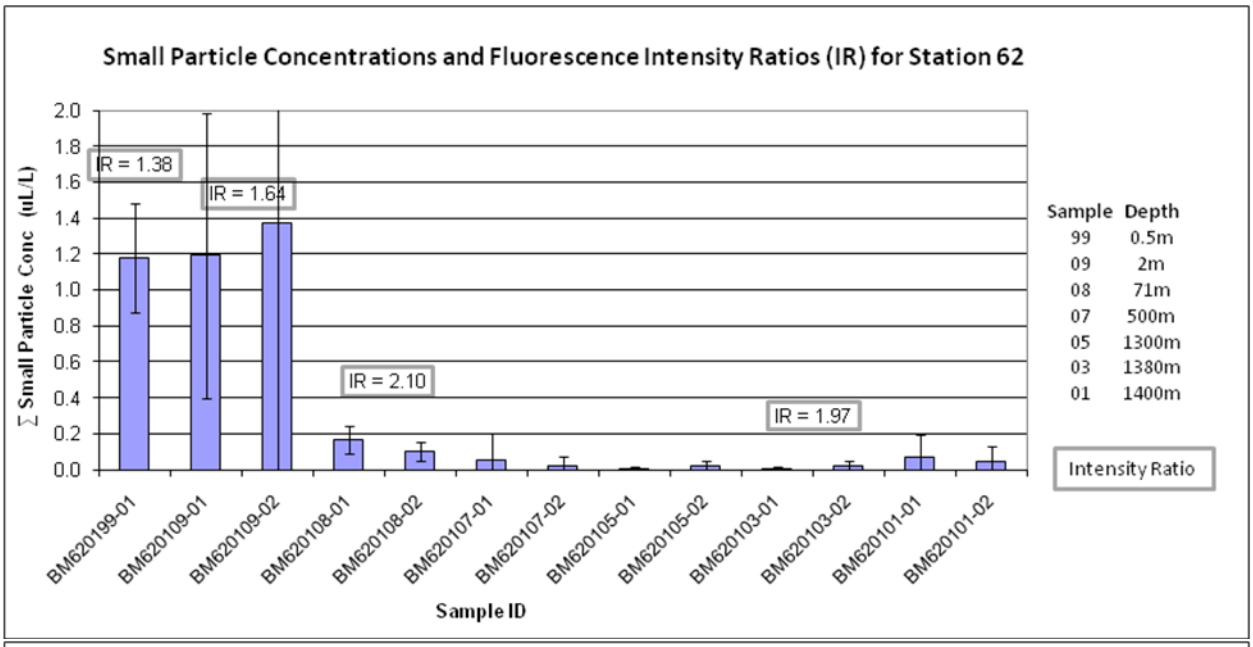
Figure 1 presents the small droplet ($\sum$ 2.5 - 60μm) particle size data and fluorescence intensity ratios for stations BM60 through BM64. Stations BM60 to BM62 were south southwest of the wellhead at distances of 1.5, 5 and 10km, respectively. Stations BM63 and BM64 were 10km from the wellhead southwest and west southwest of the wellhead, respectively.

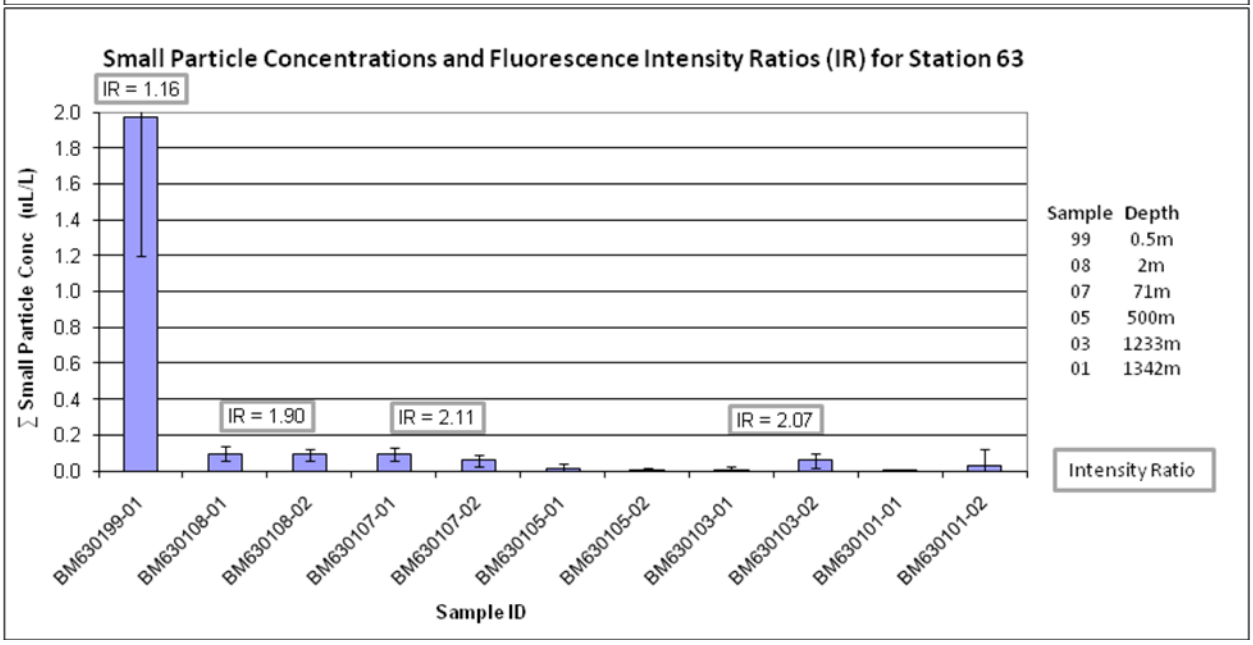
Slightly elevated concentrations of small particles were detected in the deepwater plume (approx. 1200m) at Stations BM63 and BM64. The increase in small particle concentrations at these depths also corresponds to data from the *in situ* CTD fluorometer. Stations BM61 through BM64 also had high concentrations of small particles in the surface water samples. The deepwater plume was not evident at Stations BM60 through BM62 in either the CTD fluorescence trace or LISST particle size measurements.

The results of fluorescence intensity ratios showed lower ratios in the near surface waters (2m or less) than in samples taken from the deepwater oil plume, though lower ratios extended deeper into the water column than seen on previous days.


Small Particle Concentrations and Fluorescence Intensity Ratios (IR) for Station 60
∑ Small Particle Conc (uL/L)
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
IR = 1.94
IR = 2.03
IR = 1.73
BM600199-01
BM600108-01
BM600108-02
BM600107-01
BM600107-02
BM600105-01
BM600105-02
BM600103-01
BM600103-02
BM600101-01
BM600101-02
Sample ID
Sample Depth
99 0.5m
08 2m
07 60m
05 500m
03 1300m
01 1500m
Intensity Ratio
Sample ID Coding:
eg. BM600112-01
Station Cast# Depth Dup#


Small Particle Concentrations and Fluorescence Intensity Ratios (IR) for Station 61
∑ Small Particle Conc (uL/L)
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
IR = 1.45
IR = 1.82
IR = 1.84
BM610199-01
BM610108-01
BM610108-02
BM610107-01
BM610107-02
BM610105-01
BM610105-02
BM610103-01
BM610103-02
BM610101-01
BM610101-02
Sample ID
Sample Depth
99 0.5m
08 2m
07 60m
05 500m
03 1300m
01 1400m
Intensity Ratio


Small Particle Concentrations and Fluorescence Intensity Ratios (IR) for Station 62
∑ Small Particle Conc (uL/L)
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
IR = 1.38
IR = 1.64
IR = 2.10
IR = 1.97
BM620199-01
BM620109-01
BM620109-02
BM620108-01
BM620108-02
BM620107-01
BM620107-02
BM620105-01
BM620105-02
BM620103-01
BM620103-02
BM620101-01
BM620101-02
Sample ID
Sample Depth
99 0.5m
09 2m
08 71m
07 500m
05 1300m
03 1380m
01 1400m
Intensity Ratio


Small Particle Concentrations and Fluorescence Intensity Ratios (IR) for Station 63
∑ Small Particle Conc (uL/L)
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
IR = 1.16
IR = 1.90
IR = 2.11
IR = 2.07
BM630199-01
BM630108-01
BM630108-02
BM630107-01
BM630107-02
BM630105-01
BM630105-02
BM630103-01
BM630103-02
BM630101-01
BM630101-02
Sample ID
Sample Depth
99 0.5m
08 2m
07 71m
05 500m
03 1233m
01 1342m
Intensity Ratio

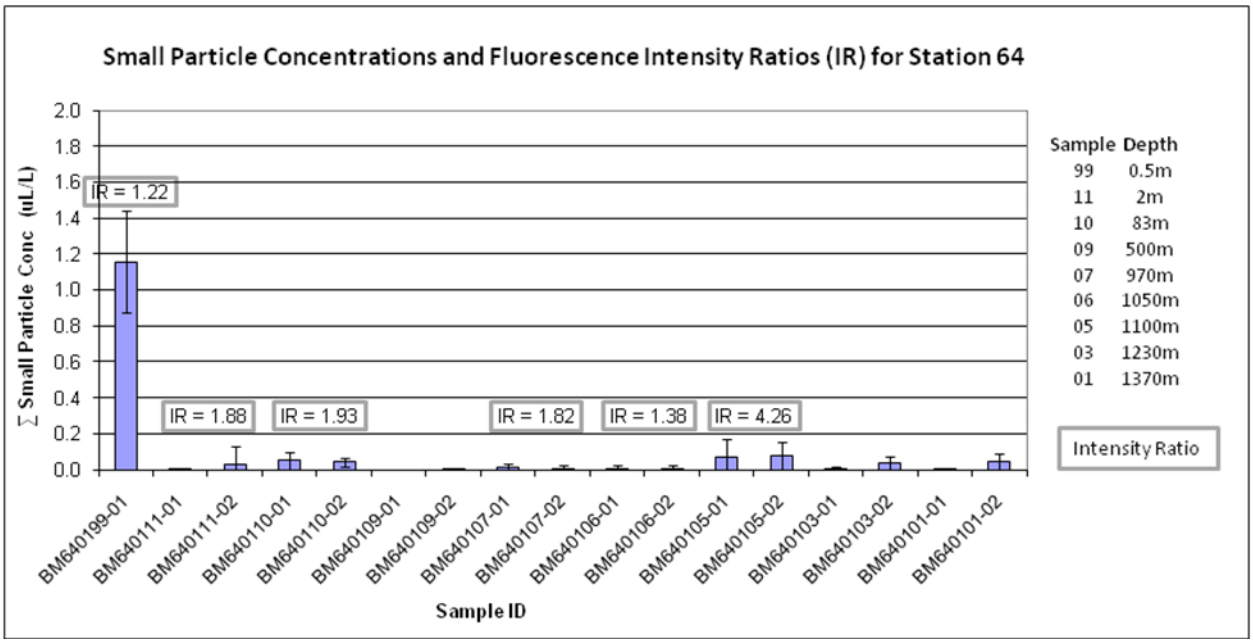


Figure 1: Average small particle concentrations and fluorescence intensity ratios as a function of depth for stations BM60 to BM64.