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

June 26, 2010

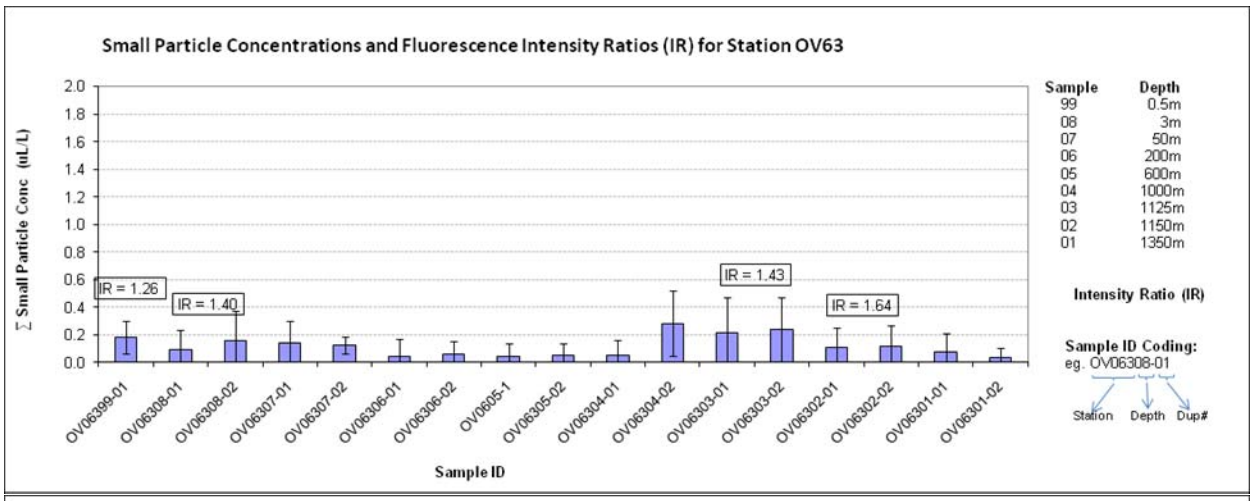
Water samples were collected at five stations for particle size distribution measurements using the LISST-100X particle counter. A total of 85 LISST samples were analyzed, including duplicates. Samples at depths of elevated fluorescence were selected from the CTD trace for fluorescence intensity ratio measurements and analyzed using a Quantech Life Sciences fixed wavelength fluorometer.

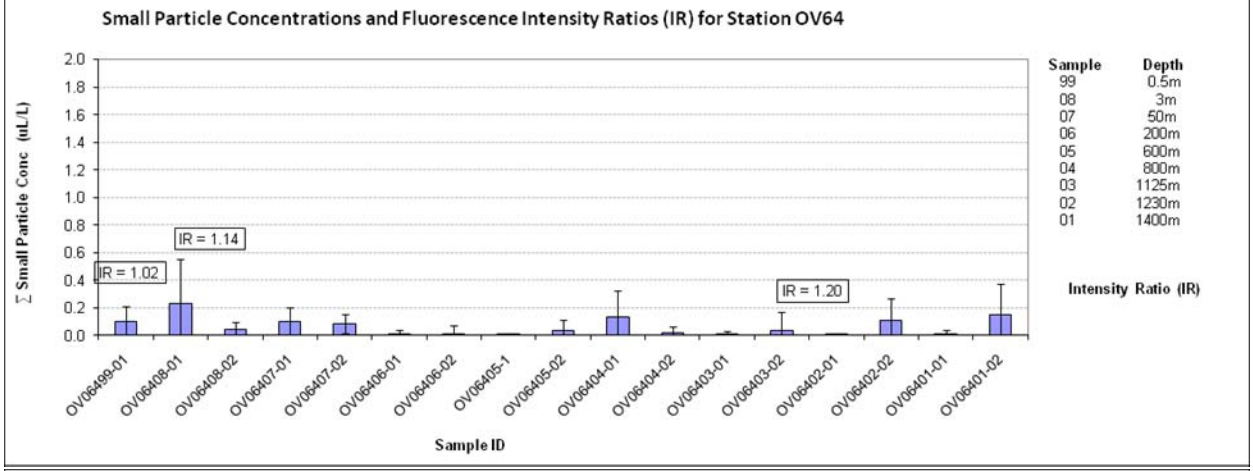
Figure 1 presents the small droplet ($\sum$ 2.5 - 60µm) particle size data and fluorescence intensity ratios for stations OV63 through OV67. The station locations were:

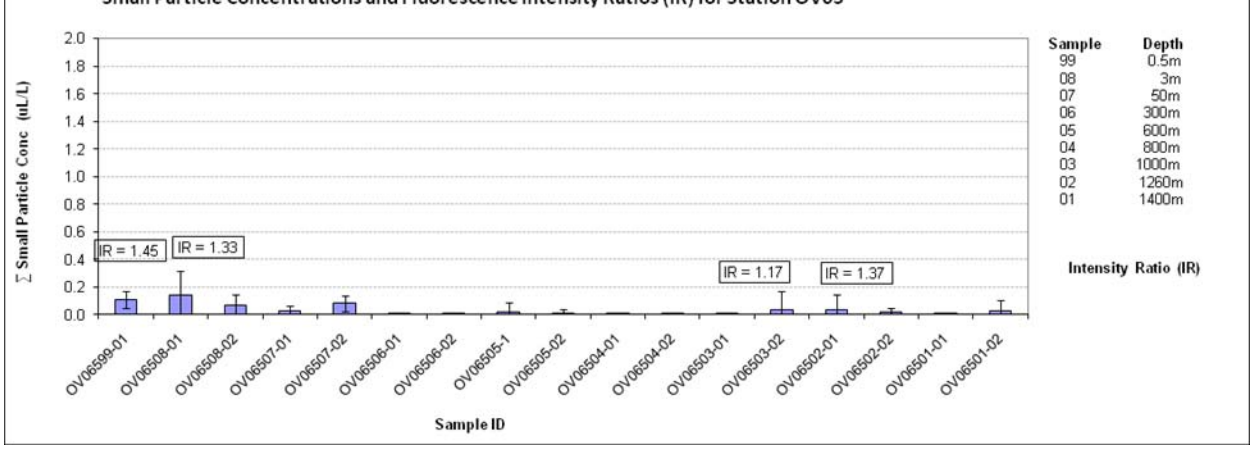
OV63: Lat= 28.726027 Long= -88.380862
OV64: Lat= 28.720631 Long= -88.380658
OV65: Lat= 28.738276 Long= -88.386492
OV66: Lat= 28.707779 Long= -88.403271
OV67: Lat= 28.695697 Long= -88.419291

Slightly elevated concentrations of small particles were detected in the deepwater plume (approx. 1150m) at Station OV63. The increase in small particle concentrations also corresponds to data from the *in situ* CTD fluorometer. The deepwater plume was not evident at Stations OV64 or OV65 in either the CTD fluorescence trace or LISST particle size measurements. Although the CTD fluorometer trace increased slightly at approximately 1100m for stations OV66 and OV67, there was no discernable increase in small particles concentrations.

The results of fluorescence intensity ratios showed that low ratios were observed in both the near surface waters (3m or less) and in the deeper water samples.


Small Particle Concentrations and Fluorescence Intensity Ratios (IR) for Station OV63
Σ 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 = 1.26
IR = 1.40
IR = 1.43
IR = 1.64
OV06399-01
OV06308-01
OV06308-02
OV06307-01
OV06307-02
OV06306-01
OV06306-02
OV0605-1
OV06305-02
OV06304-01
OV06304-02
OV06303-01
OV06303-02
OV06302-01
OV06302-02
OV06301-01
OV06301-02
Sample ID
Sample Depth
99 0.5m
08 3m
07 50m
06 200m
05 600m
04 1000m
03 1125m
02 1150m
01 1350m
Intensity Ratio (IR)
Sample ID Coding:
eg. OV06308-01
Station
Depth
Dup#


Small Particle Concentrations and Fluorescence Intensity Ratios (IR) for Station OV64
Σ 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 = 1.02
IR = 1.14
IR = 1.20
OV06499-01
OV06408-01
OV06408-02
OV06407-01
OV06407-02
OV06406-01
OV06406-02
OV06405-1
OV06405-02
OV06404-01
OV06404-02
OV06403-01
OV06403-02
OV06402-01
OV06402-02
OV06401-01
OV06401-02
Sample ID
Sample Depth
99 0.5m
08 3m
07 50m
06 200m
05 600m
04 800m
03 1125m
02 1230m
01 1400m
Intensity Ratio (IR)


Small Particle Concentrations and Fluorescence Intensity Ratios (IR) for Station OV65
Σ 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 = 1.33
IR = 1.17
IR = 1.37
OV06599-01
OV06508-01
OV06508-02
OV06507-01
OV06507-02
OV06506-01
OV06506-02
OV06505-1
OV06505-02
OV06504-01
OV06504-02
OV06503-01
OV06503-02
OV06502-01
OV06502-02
OV06501-01
OV06501-02
Sample ID
Sample Depth
99 0.5m
08 3m
07 50m
06 300m
05 600m
04 800m
03 1000m
02 1260m
01 1400m
Intensity Ratio (IR)

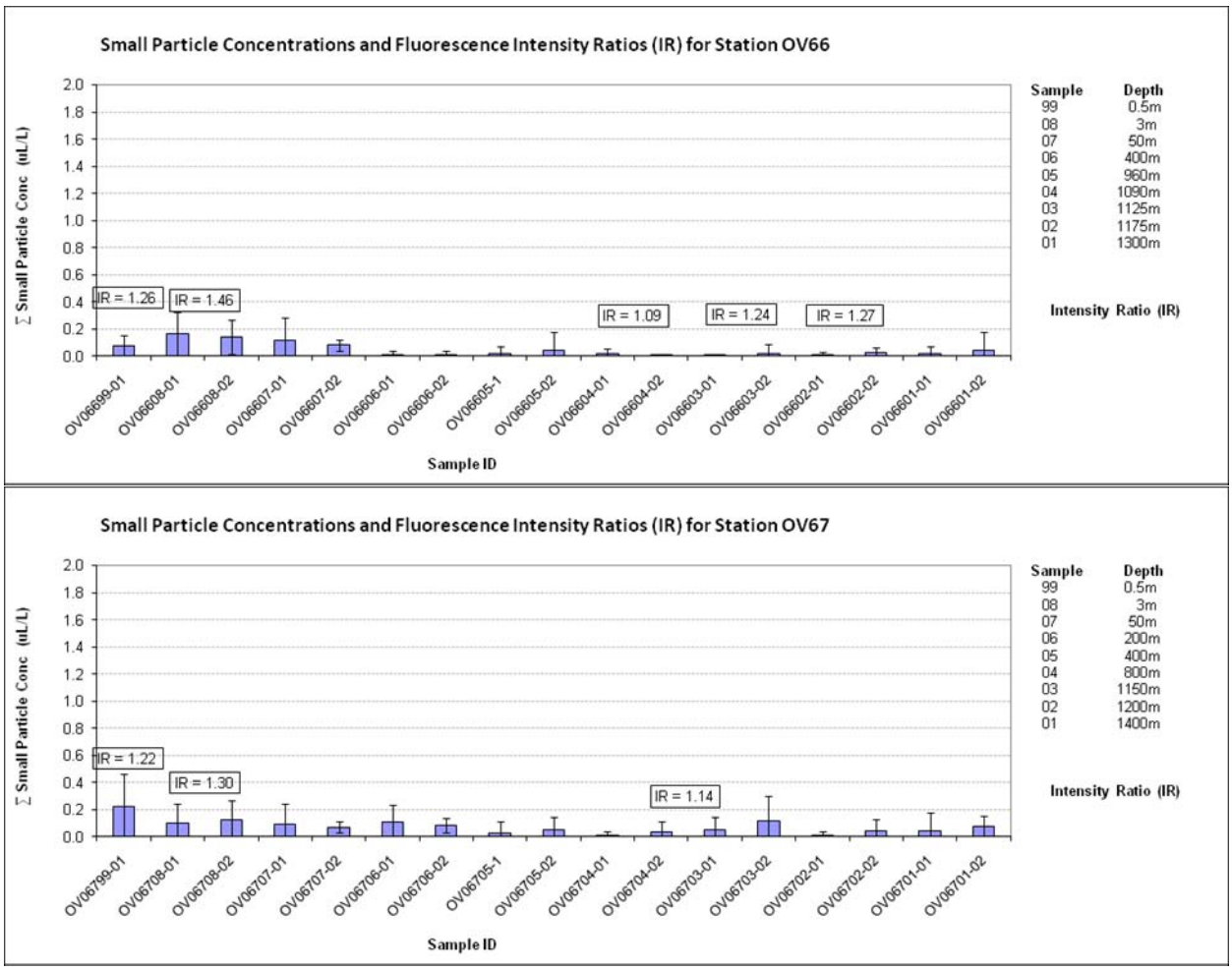


Figure 1: Average small particle concentrations and fluorescence intensity ratios as a function of depth for stations OV63 to OV67.