

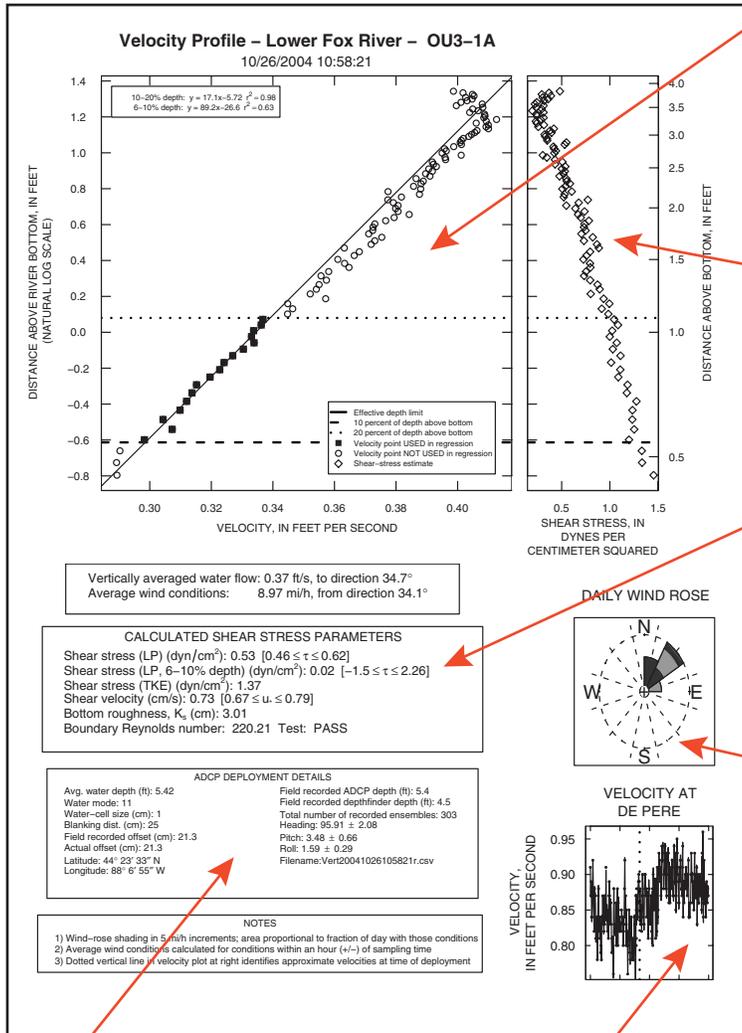
## Appendix: Velocity-Profile Plots for OU-3 and OU-4

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### Notes on construction of the velocity-profile plots

This section describes the specific techniques and data used to construct the velocity-profile plots included in this appendix. The plots were created using custom scripts written for the R statistical package (R Development Core Team, 2006).

Figure A1. Example velocity plot.



**Main velocity plot.** Regression includes velocity points between 10 percent and 20 percent of the total water depth from the sediment-water interface. Secondary regression (not shown) is calculated for data between the effective depth and 10 percent of total depth.

“Effective depth” is the closest depth to the sediment-water interface that can be resolved by the ADCP.

**Shear-stress plot.** This plot shows the calculated shear stress within the water column as estimated with the turbulent-kinetic-energy (TKE) method.

**Calculated shear-stress parameters.** This text box summarizes the key shear-stress parameters as estimated by the various methods described in the report.

Shear velocity and bottom roughness were calculated from the regression coefficients associated with the 10–20 percent of depth velocity points.

**Wind rose.** The wind-rose plot shows the distribution of wind direction and speed over the day when the ADCP was deployed. The data were recorded roughly hourly, at the Austin Straubel International Airport. The gray bars on the plot correspond to 5 miles per hour wind-speed increments. The direction represents the direction that the wind was coming from.

**ADCP deployment details.**

This text box lists details about the ADCP deployment that may be useful in interpreting the associated plots.

**Velocity plot.** This plot shows the instantaneous water-velocity time series for the day of ADCP deployment (6-hour increments, from midnight to midnight). The dotted vertical line shows the approximate time period for the deployment.

Data sources:

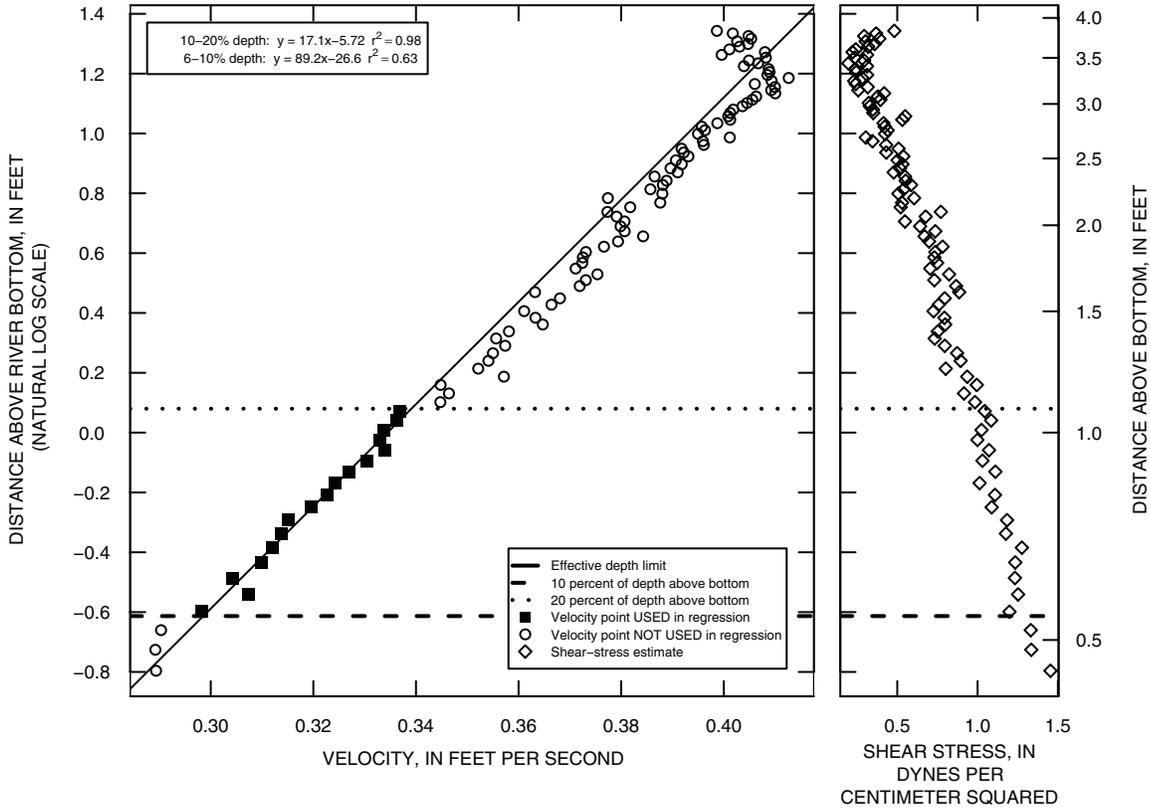
- 1) OU-3. Velocity record is 15-minute data obtained from a side-looking Doppler current meter. The location is shown on map 2 as “PT-2”.
- 2) OU-4. Velocity record is splined 60-minute data obtained from the side-looking Doppler current meter at the Oil Tank Depot (USGS ID 040851385).

## October 2004 Velocity Profiles (OU-3)

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### Velocity Profile – Lower Fox River – OU3-1A

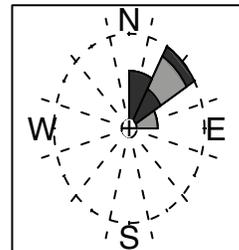
10/26/2004 10:58:21



Vertically averaged water flow: 0.37 ft/s, to direction 34.7°  
 Average wind conditions: 8.97 mi/h, from direction 34.1°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) ( $\text{dyn/cm}^2$ ): 0.53 [ $0.46 \leq \tau \leq 0.62$ ]  
 Shear stress (LP, 6-10% depth) ( $\text{dyn/cm}^2$ ): 0.02 [ $-1.5 \leq \tau \leq 2.26$ ]  
 Shear stress (TKE) ( $\text{dyn/cm}^2$ ): 1.37  
 Shear velocity (cm/s): 0.73 [ $0.67 \leq u_* \leq 0.79$ ]  
 Bottom roughness,  $K_s$  (cm): 3.01  
 Boundary Reynolds number: 220.21 Test: PASS

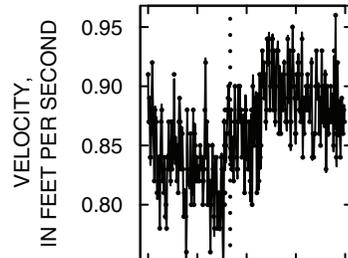
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 5.42	Field recorded ADCP depth (ft): 5.4
Water mode: 11	Field recorded depthfinder depth (ft): 4.5
Water-cell size (cm): 1	Total number of recorded ensembles: 303
Blanking dist. (cm): 25	Heading: $95.91 \pm 2.08$
Field recorded offset (cm): 21.3	Pitch: $3.48 \pm 0.66$
Actual offset (cm): 21.3	Roll: $1.59 \pm 0.29$
Latitude: $44^\circ 23' 33''$ N	Filename: Vert20041026105821r.csv
Longitude: $88^\circ 6' 55''$ W	

VELOCITY AT DE PERE

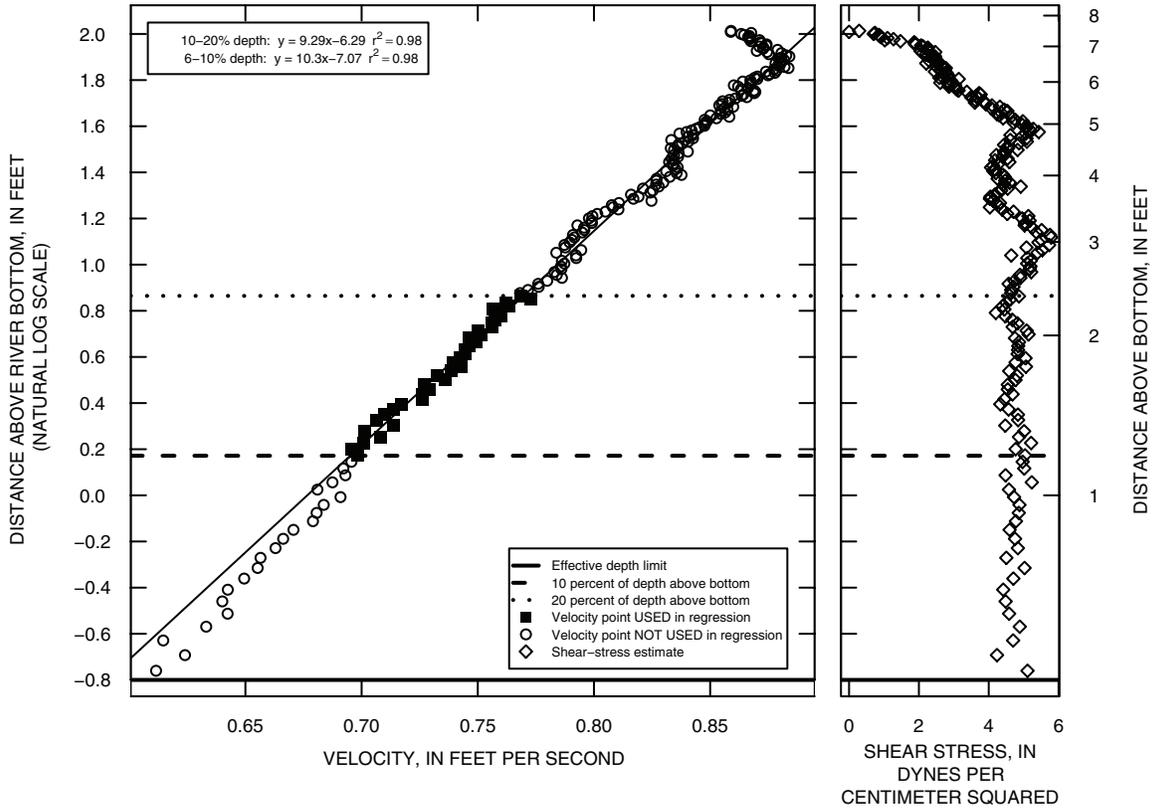


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

### Velocity Profile – Lower Fox River – OU3-1B1

10/26/2004 11:15:48



Vertically averaged water flow: 0.8 ft/s, to direction 36.5°  
 Average wind conditions: 8.1 mi/h, from direction 30°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 1.81 [1.63 ≤ τ ≤ 2]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 1.46 [1.26 ≤ τ ≤ 1.69]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 4.74  
 Shear velocity (cm/s): 1.35 [1.27 ≤ u\_\* ≤ 1.42]  
 Bottom roughness, K<sub>s</sub> (cm): 1.7  
 Boundary Reynolds number: 229.31 Test: PASS

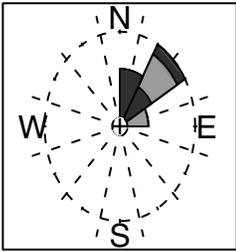
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 11.87	Field recorded ADCP depth (ft): 13.4
Water mode: 11	Field recorded depthfinder depth (ft): 11.2
Water-cell size (cm): 1	Total number of recorded ensembles: 187
Blanking dist. (cm): 25	Heading: 75.53 ± 7.09
Field recorded offset (cm): 107	Pitch: 4.46 ± 0.97
Actual offset (cm): 107	Roll: -0.67 ± 1.13
Latitude: 44° 23' 27.7" N	Filename: Vert20041026111548r.csv
Longitude: 88° 6' 50.4" W	

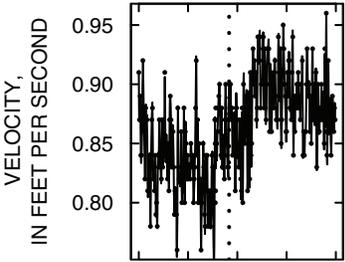
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

DAILY WIND ROSE

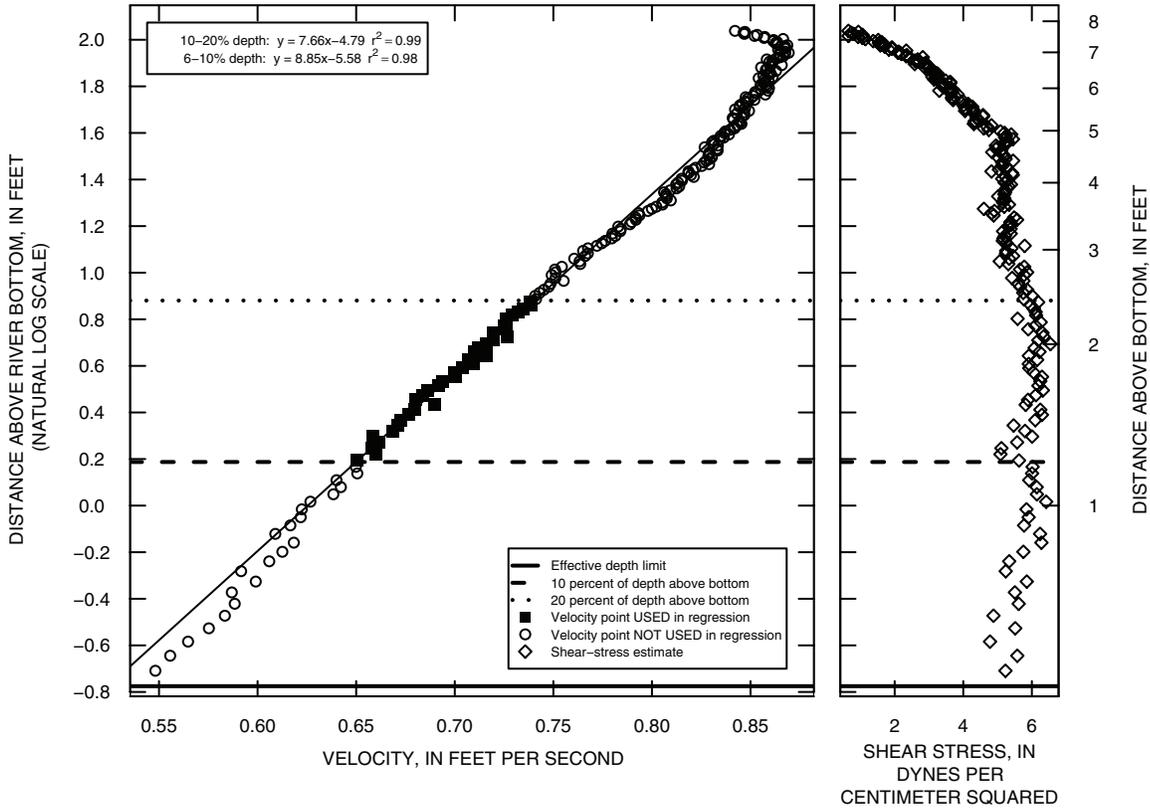


VELOCITY AT DE PERE



### Velocity Profile – Lower Fox River – OU3-1B2

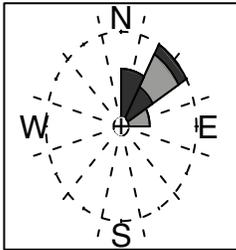
10/26/2004 11:22:19



Vertically averaged water flow: 0.78 ft/s, to direction 36.6°  
 Average wind conditions: 8.1 mi/h, from direction 30°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 2.66 [2.45 ≤ τ ≤ 2.88]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 2 [1.72 ≤ τ ≤ 2.29]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 5.73  
 Shear velocity (cm/s): 1.63 [1.57 ≤ u\_\* ≤ 1.7]  
 Bottom roughness, K<sub>s</sub> (cm): 7.6  
 Boundary Reynolds number: 1239.84 Test: PASS

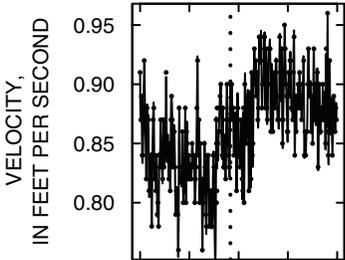
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 12.06	Field recorded ADCP depth (ft): 13.4
Water mode: 11	Field recorded depthfinder depth (ft): 11.2
Water-cell size (cm): 1	Total number of recorded ensembles: 301
Blanking dist. (cm): 25	Heading: 80.27 ± 12.45
Field recorded offset (cm): 107	Pitch: 2.72 ± 1.64
Actual offset (cm): 107	Roll: 2.24 ± 2.26
Latitude: 44° 23' 27.7" N	Filename: Vert20041026112219r.csv
Longitude: 88° 6' 50.4" W	

VELOCITY AT DE PERE

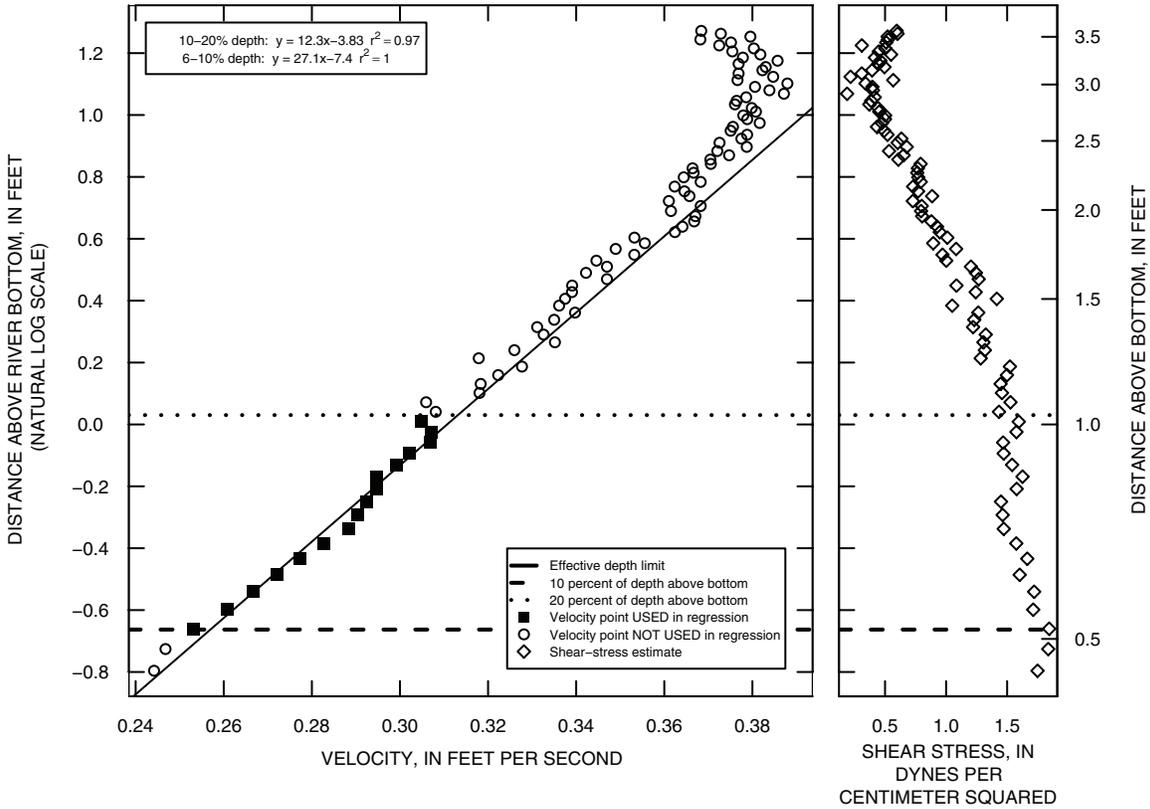


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**Velocity Profile – Lower Fox River – OU3-1C**

10/26/2004 11:40:58



Vertically averaged water flow: 0.35 ft/s, to direction 58.8°  
 Average wind conditions: 8.1 mi/h, from direction 30°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 1.03 [0.83 ≤ τ ≤ 1.24]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 0.21 [NaN ≤ τ ≤ NaN]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 1.79  
 Shear velocity (cm/s): 1.01 [0.91 ≤ u\_\* ≤ 1.11]  
 Bottom roughness, K<sub>s</sub> (cm): 19.79  
 Boundary Reynolds number: 2004.11 Test: PASS

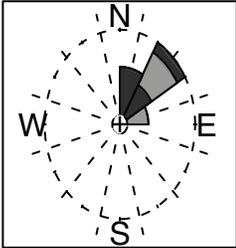
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 5.15	Field recorded ADCP depth (ft): 5
Water mode: 11	Field recorded depthfinder depth (ft): 4.4
Water-cell size (cm): 1	Total number of recorded ensembles: 300
Blanking dist. (cm): 25	Heading: 68.64 ± 3.62
Field recorded offset (cm): 21.3	Pitch: 3.52 ± 0.35
Actual offset (cm): 21.3	Roll: -1.56 ± 0.77
Latitude: 44° 23' 23.6" N	Filename: Vert20041026114058r.csv
Longitude: 88° 6' 47" W	

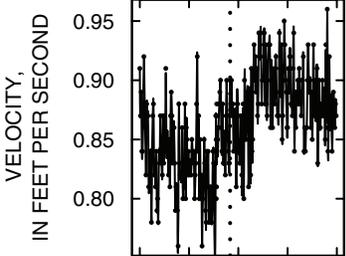
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

DAILY WIND ROSE

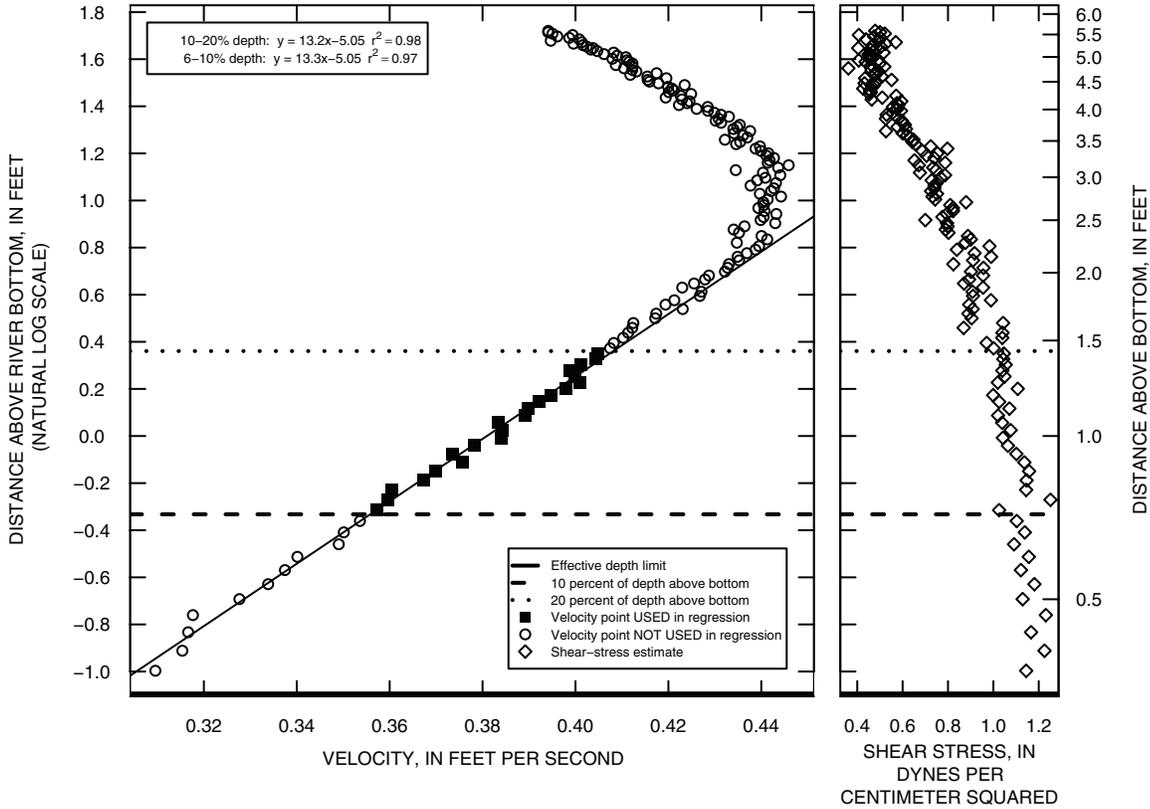


VELOCITY AT DE PERE



### Velocity Profile – Lower Fox River – OU3–1L1

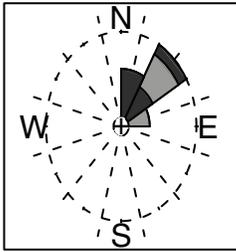
10/26/2004 10:33:43



Vertically averaged water flow: 0.41 ft/s, to direction 36.3°  
 Average wind conditions: 8.97 mi/h, from direction 34.1°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 0.89 [0.78 ≤ τ ≤ 1]  
 Shear stress (LP, 6–10% depth) (dyn/cm<sup>2</sup>): 0.89 [0.67 ≤ τ ≤ 1.14]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 1.15  
 Shear velocity (cm/s): 0.94 [0.89 ≤ u\_\* ≤ 1]  
 Bottom roughness, K<sub>s</sub> (cm): 5.88  
 Boundary Reynolds number: 554.66 Test: PASS

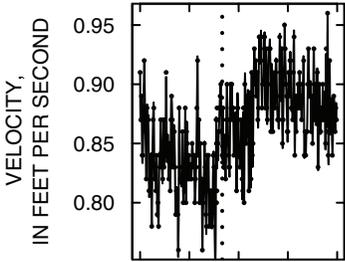
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 7.17	Field recorded ADCP depth (ft): 7.3
Water mode: 11	Field recorded depthfinder depth (ft): 6.5
Water-cell size (cm): 1	Total number of recorded ensembles: 301
Blanking dist. (cm): 25	Heading: 134.47 ± 3.78
Field recorded offset (cm): 21.3	Pitch: 2.83 ± 0.59
Actual offset (cm): 21.3	Roll: -1.29 ± 1.75
Latitude: 44° 23' 35.63" N	Filename: Vert20041026103343r.csv
Longitude: 88° 6' 58.18" W	

VELOCITY AT DE PERE

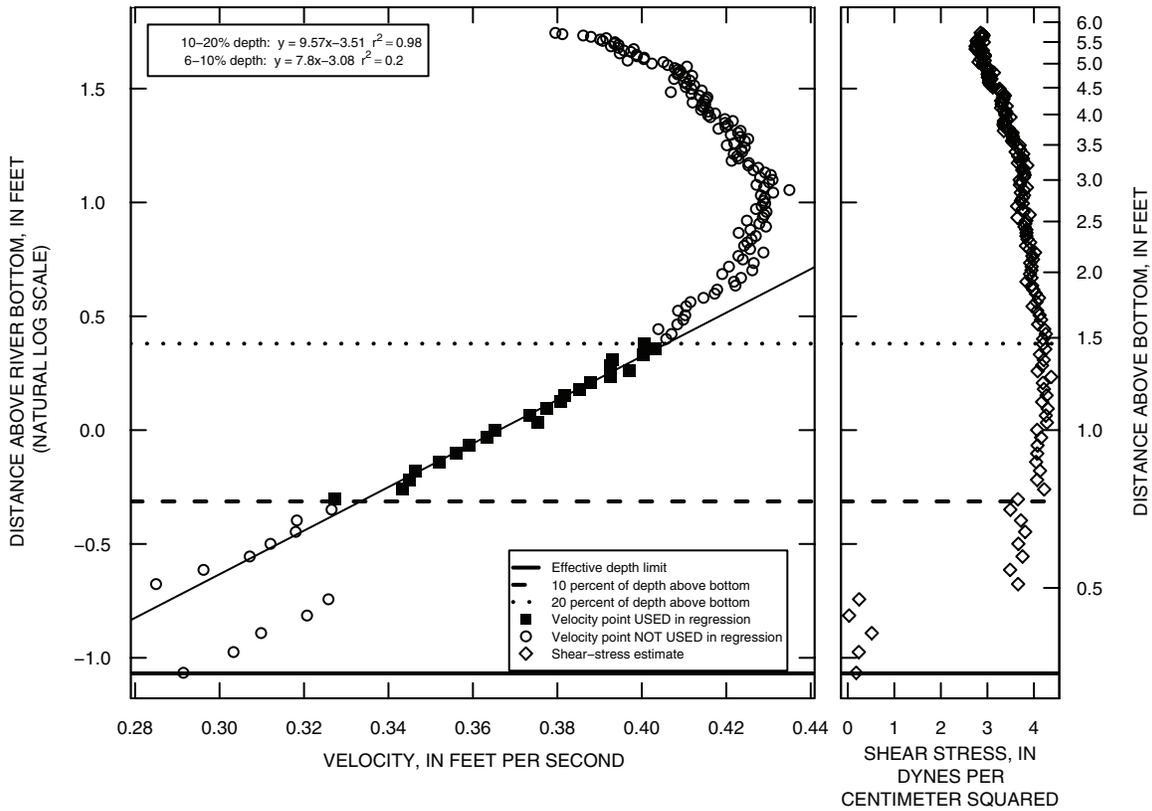


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

### Velocity Profile – Lower Fox River – OU3-1L2

10/26/2004 10:44:16



Vertically averaged water flow: 0.4 ft/s, to direction 37.3°  
 Average wind conditions: 8.97 mi/h, from direction 34.1°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 1.7 [1.5 ≤ τ ≤ 1.92]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 2.57 [-0.41 ≤ τ ≤ 14.77]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 2.23  
 Shear velocity (cm/s): 1.31 [1.22 ≤ u\_\* ≤ 1.39]  
 Bottom roughness, K<sub>s</sub> (cm): 27.47  
 Boundary Reynolds number: 3585.78 Test: PASS

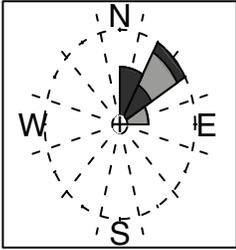
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 7.31	Field recorded ADCP depth (ft): 7.3
Water mode: 11	Field recorded depthfinder depth (ft): 6.5
Water-cell size (cm): 1	Total number of recorded ensembles: 312
Blanking dist. (cm): 25	Heading: 115.96 ± 13.48
Field recorded offset (cm): 21.3	Pitch: 3.67 ± 1.01
Actual offset (cm): 21.3	Roll: -2.27 ± 6.91
Latitude: 44° 23' 35.63" N	Filename: Vert20041026104416r.csv
Longitude: 88° 6' 58.18" W	

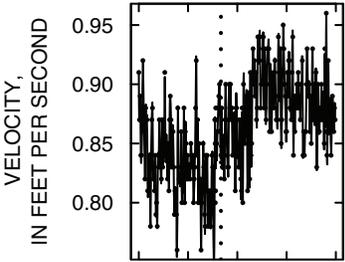
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

DAILY WIND ROSE

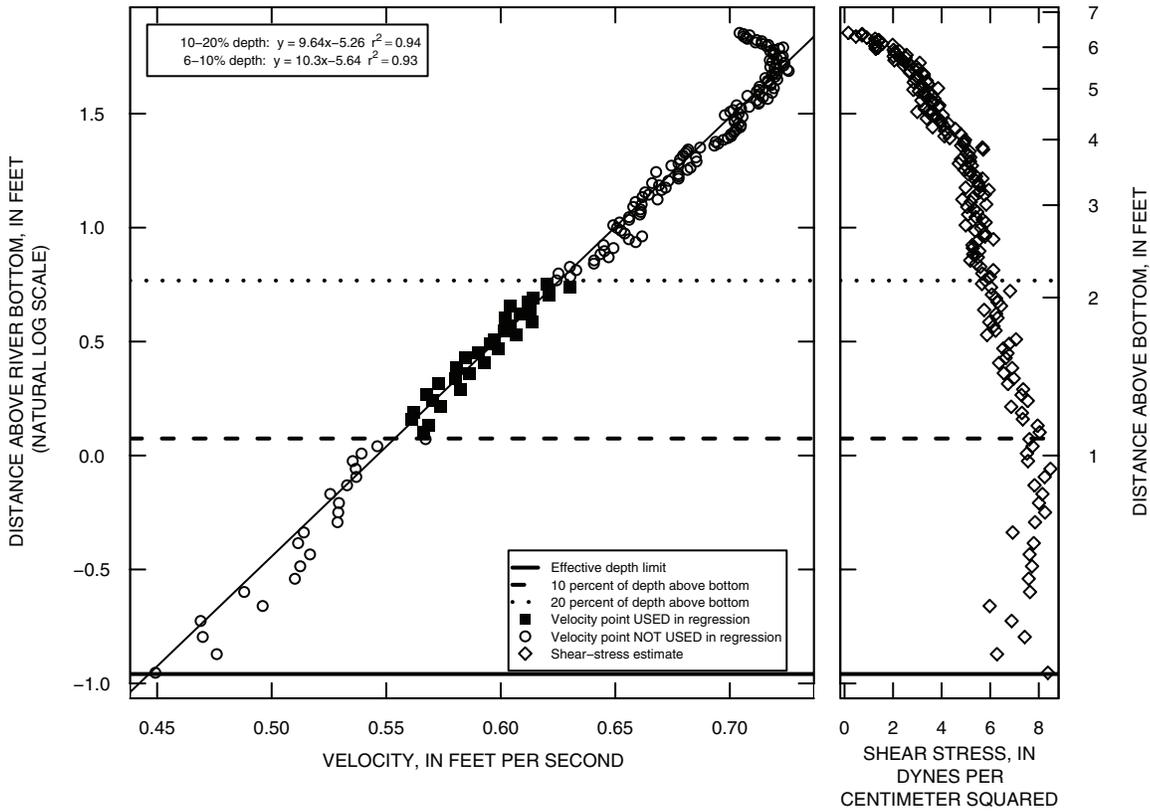


VELOCITY AT DE PERE



### Velocity Profile – Lower Fox River – OU3-2A1

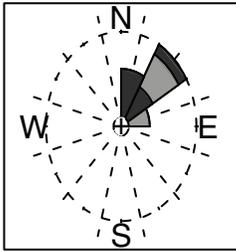
10/26/2004 12:45:59



Vertically averaged water flow: 0.65 ft/s, to direction 49°  
 Average wind conditions: 8.07 mi/h, from direction 33.3°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 1.68 [1.37 ≤ τ ≤ 2.02]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 1.48 [1.12 ≤ τ ≤ 1.9]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 7.61  
 Shear velocity (cm/s): 1.3 [1.17 ≤ u\_\* ≤ 1.42]  
 Bottom roughness, K<sub>s</sub> (cm): 4.74  
 Boundary Reynolds number: 615.23 Test: PASS

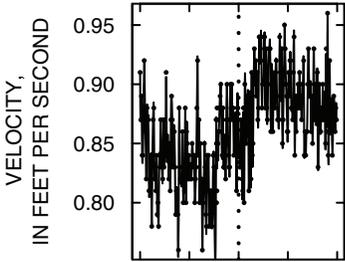
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 10.78	Field recorded ADCP depth (ft): 10.8
Water mode: 11	Field recorded depthfinder depth (ft): --
Water-cell size (cm): 1	Total number of recorded ensembles: 110
Blanking dist. (cm): 25	Heading: 85 ± 7.05
Field recorded offset (cm): 107	Pitch: 2.56 ± 1.53
Actual offset (cm): 107	Roll: -0.82 ± 0.68
Latitude: 44° 24' 0.9" N	Filename: Vert20041026124559r.csv
Longitude: 88° 6' 13.9" W	

VELOCITY AT DE PERE

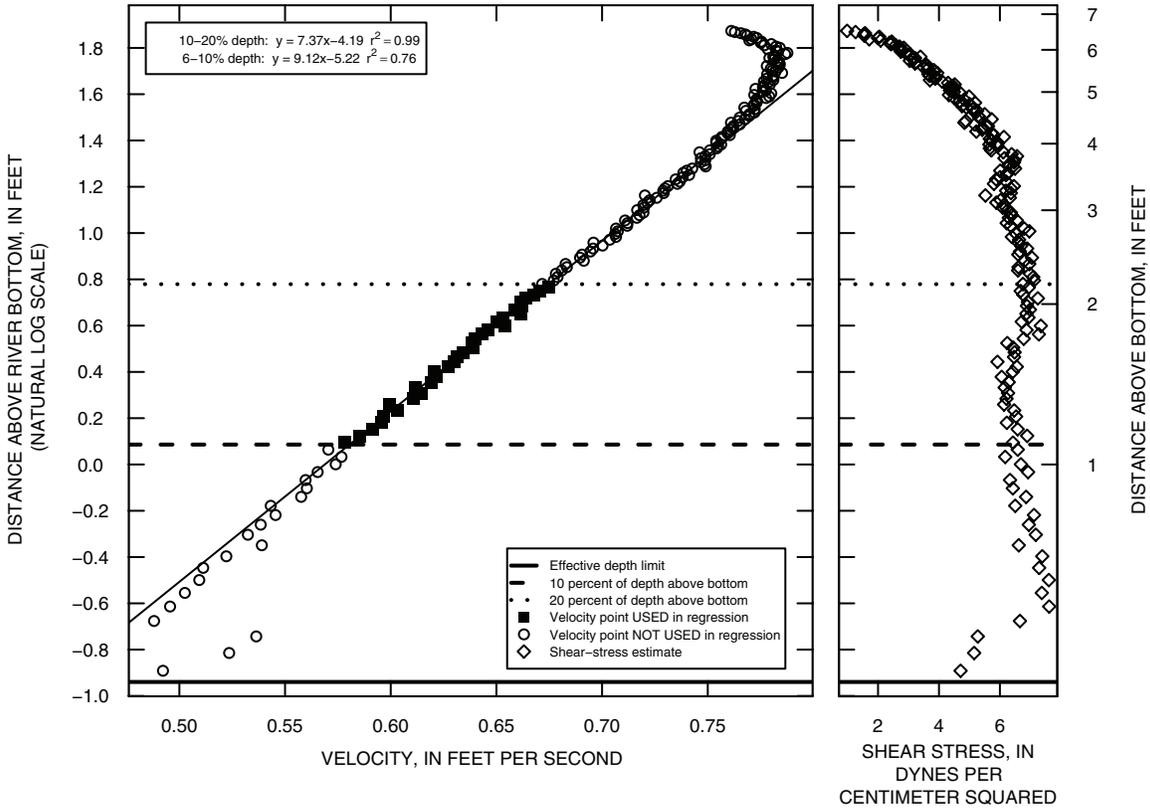


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**Velocity Profile – Lower Fox River – OU3-2A2**

10/26/2004 12:50:09



Vertically averaged water flow: 0.71 ft/s, to direction 52.9°  
 Average wind conditions: 8.07 mi/h, from direction 33.3°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 2.87 [2.7 ≤ τ ≤ 3.06]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 1.88 [1.01 ≤ τ ≤ 3.02]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 6.64  
 Shear velocity (cm/s): 1.7 [1.64 ≤ u\_\* ≤ 1.75]  
 Bottom roughness, K<sub>s</sub> (cm): 13.81  
 Boundary Reynolds number: 2341.51 Test: PASS

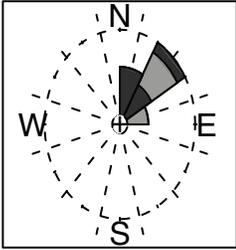
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 10.9	Field recorded ADCP depth (ft): 10.8
Water mode: 11	Field recorded depthfinder depth (ft): ---
Water-cell size (cm): 1	Total number of recorded ensembles: 300
Blanking dist. (cm): 25	Heading: 81.84 ± 7.8
Field recorded offset (cm): 107	Pitch: 2.61 ± 1.42
Actual offset (cm): 107	Roll: -0.95 ± 0.99
Latitude: 44° 24' 0.9" N	Filename: Vert20041026125009r.csv
Longitude: 88° 6' 13.9" W	

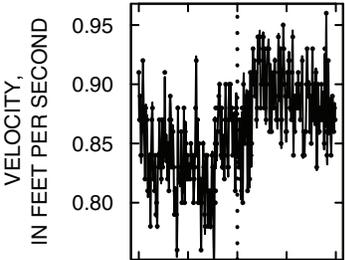
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**DAILY WIND ROSE**

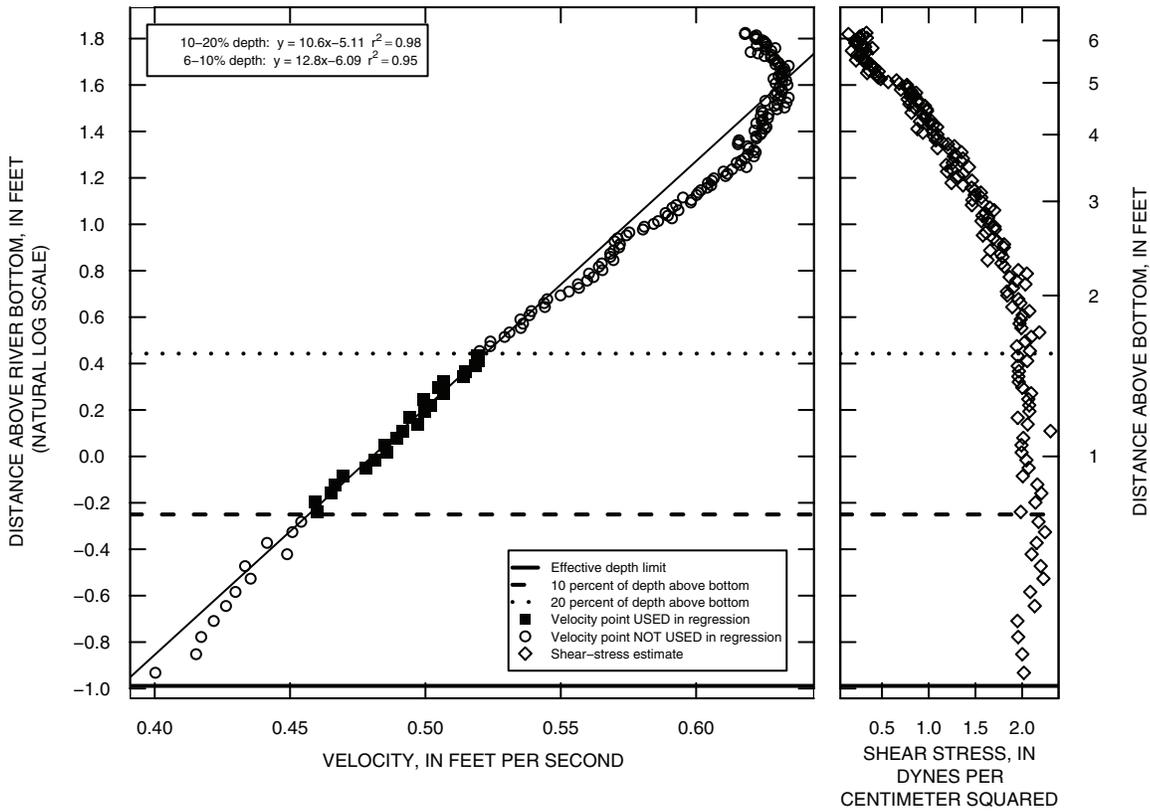


**VELOCITY AT DE PERE**



### Velocity Profile – Lower Fox River – OU3-2B

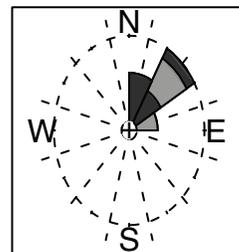
10/26/2004 12:26:44



Vertically averaged water flow: 0.58 ft/s, to direction 49°  
 Average wind conditions: 8.07 mi/h, from direction 33.3°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 1.38 [1.23 ≤ τ ≤ 1.54]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 0.96 [0.68 ≤ τ ≤ 1.28]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 2.1  
 Shear velocity (cm/s): 1.18 [1.11 ≤ u\_\* ≤ 1.24]  
 Bottom roughness, K<sub>s</sub> (cm): 5.53  
 Boundary Reynolds number: 649.29 Test: PASS

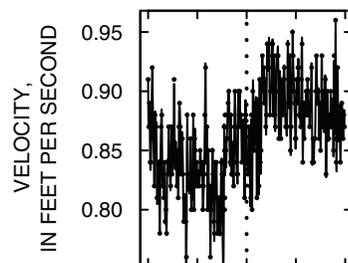
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 7.79	Field recorded ADCP depth (ft): 7.8
Water mode: 11	Field recorded depthfinder depth (ft): 7.3
Water-cell size (cm): 1	Total number of recorded ensembles: 301
Blanking dist. (cm): 25	Heading: 97.17 ± 5.54
Field recorded offset (cm): 21.3	Pitch: 3.15 ± 0.32
Actual offset (cm): 21.3	Roll: -1.43 ± 0.32
Latitude: 44° 23' 56.7" N	Filename: Vert20041026122644r.csv
Longitude: 88° 6' 11" W	

VELOCITY AT DE PERE

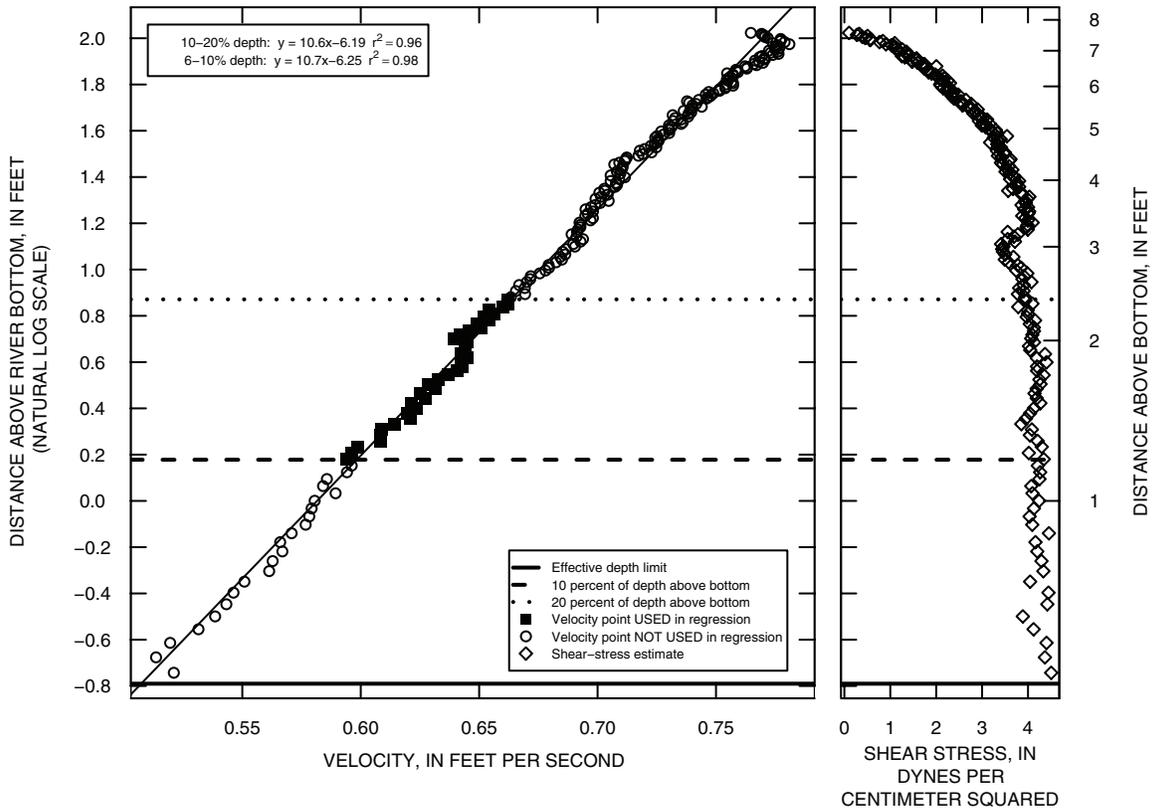


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**Velocity Profile – Lower Fox River – OU3-3A**

10/26/2004 13:52:52



Vertically averaged water flow: 0.7 ft/s, to direction 24.8°  
 Average wind conditions: 8.38 mi/h, from direction 40.4°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 1.38 [1.19 ≤ τ ≤ 1.58]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 1.36 [1.17 ≤ τ ≤ 1.56]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 4.23  
 Shear velocity (cm/s): 1.17 [1.09 ≤ u\_\* ≤ 1.26]  
 Bottom roughness, K<sub>s</sub> (cm): 1.88  
 Boundary Reynolds number: 220.79 Test: PASS

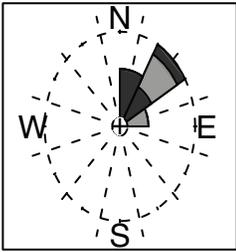
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 11.95	Field recorded ADCP depth (ft): 12
Water mode: 11	Field recorded depthfinder depth (ft): 11.2
Water-cell size (cm): 1	Total number of recorded ensembles: 303
Blanking dist. (cm): 25	Heading: 4.42 ± 4.86
Field recorded offset (cm): 107	Pitch: 3.31 ± 0.9
Actual offset (cm): 107	Roll: -0.48 ± 0.81
Latitude: 44° 24' 45" N	Filename: Vert20041026135252r.csv
Longitude: 88° 5' 34.3" W	

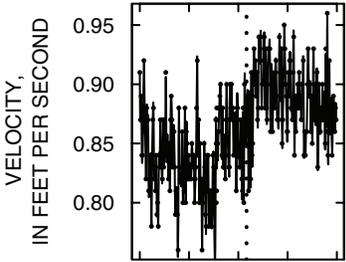
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

DAILY WIND ROSE

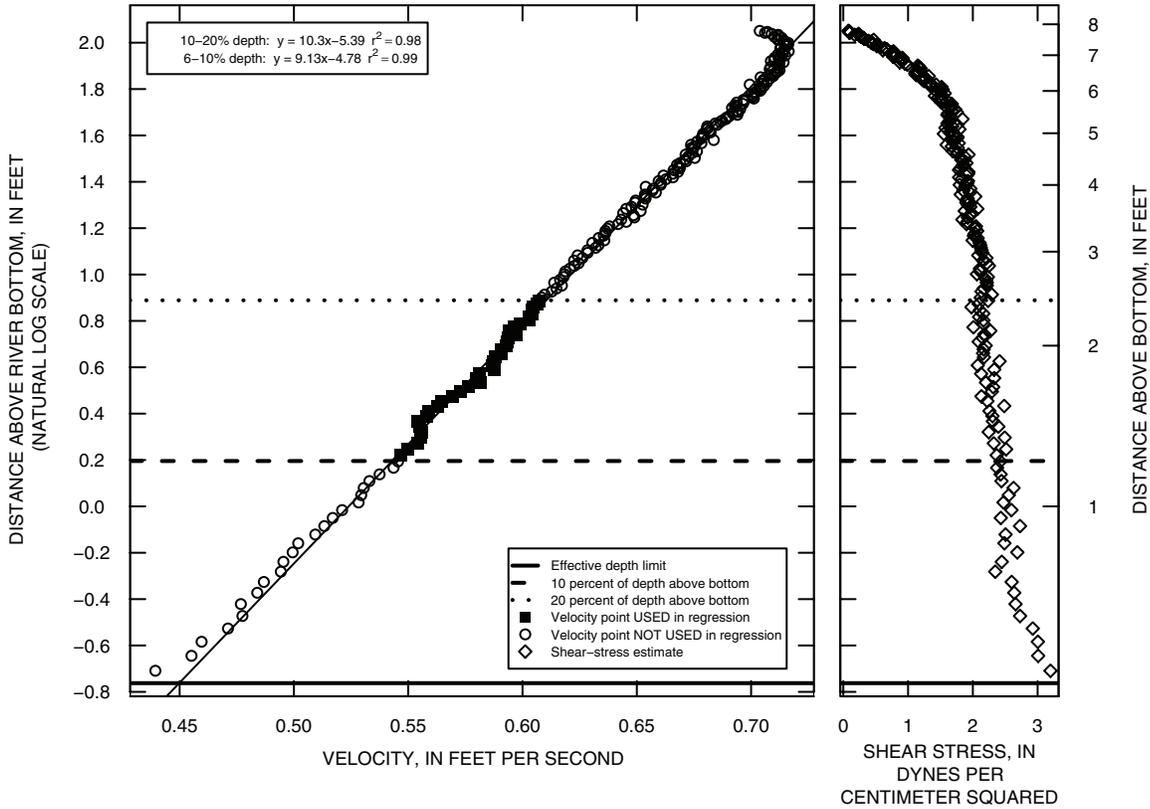


VELOCITY AT DE PERE



### Velocity Profile – Lower Fox River – OU3-3B

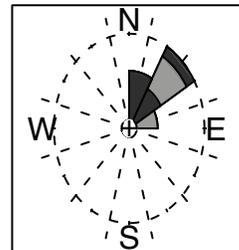
10/26/2004 14:07:02



Vertically averaged water flow: 0.64 ft/s, to direction 12.2°  
 Average wind conditions: 12.3 mi/h, from direction 57.5°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 1.48 [1.33 ≤ τ ≤ 1.63]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 1.87 [1.72 ≤ τ ≤ 2.03]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 2.62  
 Shear velocity (cm/s): 1.22 [1.15 ≤ u\_\* ≤ 1.28]  
 Bottom roughness, K<sub>s</sub> (cm): 4.18  
 Boundary Reynolds number: 507.79 Test: PASS

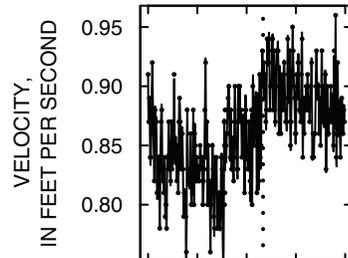
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 12.16	Field recorded ADCP depth (ft): 12
Water mode: 11	Field recorded depthfinder depth (ft): 11.5
Water-cell size (cm): 1	Total number of recorded ensembles: 299
Blanking dist. (cm): 25	Heading: 6.17 ± 3.71
Field recorded offset (cm): 107	Pitch: 2.95 ± 0.81
Actual offset (cm): 107	Roll: 1.94 ± 0.42
Latitude: 44° 24' 43.3" N	Filename: Vert20041026140702r.csv
Longitude: 88° 5' 28" W	

VELOCITY AT DE PERE

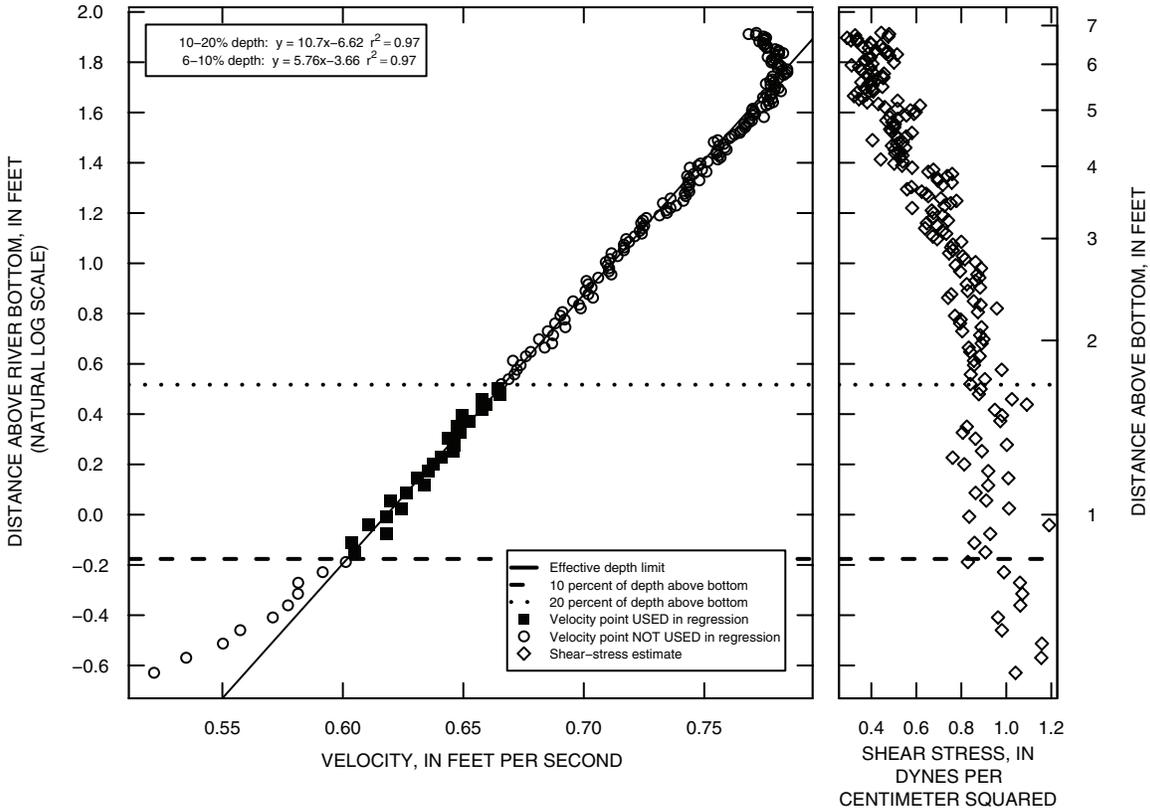


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**Velocity Profile – Lower Fox River – OU3-3R**

10/26/2004 14:21:43



Vertically averaged water flow: 0.72 ft/s, to direction 11.5°  
 Average wind conditions: 12.3 mi/h, from direction 57.5°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 1.36 [1.17 ≤ τ ≤ 1.56]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 4.71 [3.48 ≤ τ ≤ 6.13]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 1.03  
 Shear velocity (cm/s): 1.17 [1.08 ≤ u\_\* ≤ 1.25]  
 Bottom roughness, K<sub>s</sub> (cm): 1.22  
 Boundary Reynolds number: 142.35 Test: PASS

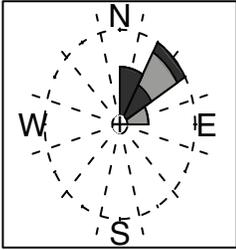
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 8.39	Field recorded ADCP depth (ft): 8.2
Water mode: 11	Field recorded depthfinder depth (ft): 6.9
Water-cell size (cm): 1	Total number of recorded ensembles: 300
Blanking dist. (cm): 25	Heading: 198.23 ± 2.54
Field recorded offset (cm): 21.3	Pitch: 3.79 ± 0.42
Actual offset (cm): 21.3	Roll: 0.27 ± 5.28
Latitude: 44° 24' 42.2" N	Filename: Vert20041026142143r.csv
Longitude: 88° 5' 25.4" W	

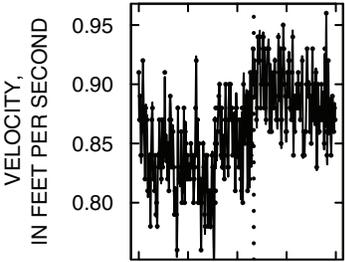
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**DAILY WIND ROSE**

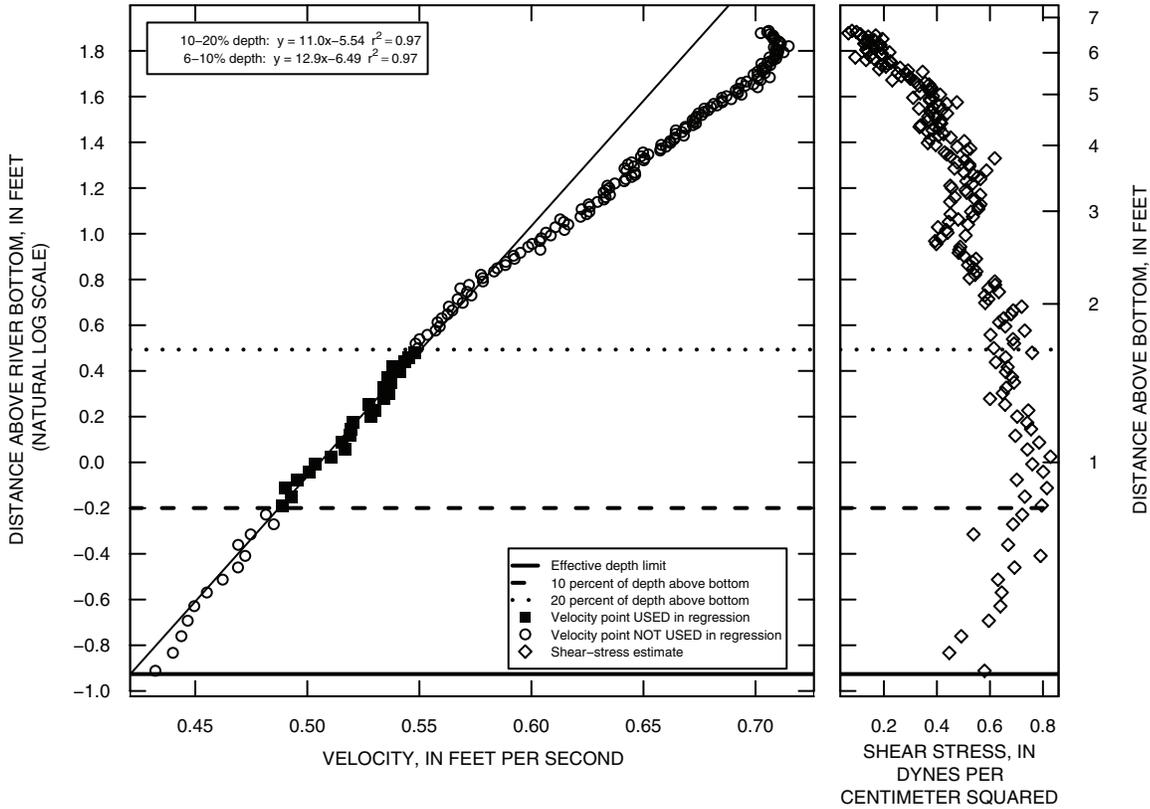


**VELOCITY AT DE PERE**



### Velocity Profile – Lower Fox River – OU3-4A

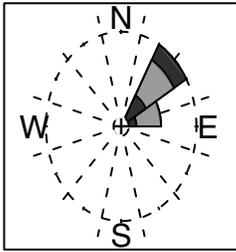
10/27/2004 12:59:10



Vertically averaged water flow: 0.62 ft/s, to direction 32.1°  
 Average wind conditions: 14.1 mi/h, from direction 50°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 1.3 [1.12 ≤ τ ≤ 1.49]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 0.93 [0.74 ≤ τ ≤ 1.15]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 0.63  
 Shear velocity (cm/s): 1.14 [1.06 ≤ u\_\* ≤ 1.22]  
 Bottom roughness, K<sub>s</sub> (cm): 3.6  
 Boundary Reynolds number: 410.83 Test: PASS

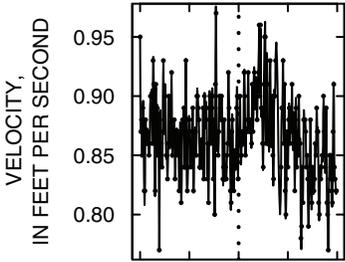
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 8.19	Field recorded ADCP depth (ft): 8.2
Water mode: 11	Field recorded depthfinder depth (ft): 8.3
Water-cell size (cm): 1	Total number of recorded ensembles: 301
Blanking dist. (cm): 25	Heading: 202.08 ± 1.37
Field recorded offset (cm): 21.3	Pitch: 2.74 ± 0.3
Actual offset (cm): 21.3	Roll: -1.14 ± 0.38
Latitude: 44° 25' 42.1" N	Filename: Vert20041027125910r.csv
Longitude: 88° 4' 34.9" W	

VELOCITY AT DE PERE

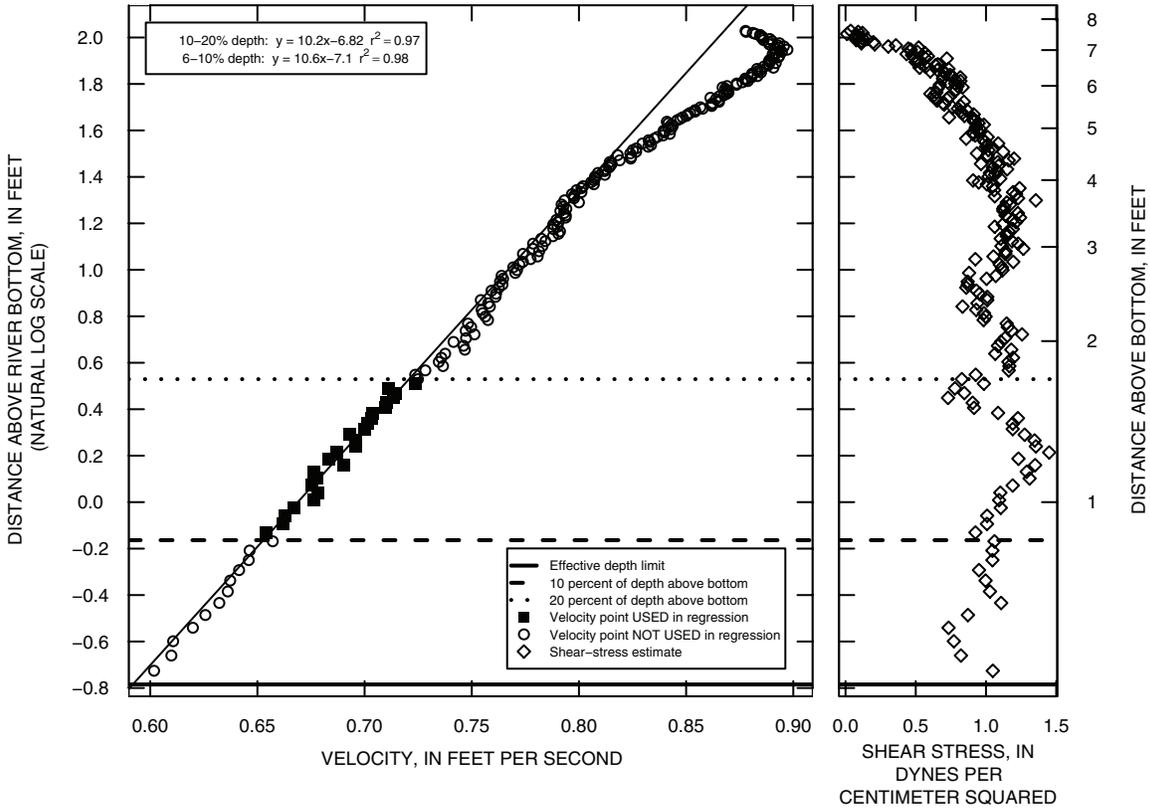


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**Velocity Profile – Lower Fox River – OU3-4B**

10/27/2004 12:45:51



Vertically averaged water flow: 0.8 ft/s, to direction 25.9°  
 Average wind conditions: 14.1 mi/h, from direction 50°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 1.5 [1.28 ≤ τ ≤ 1.74]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 1.39 [1.14 ≤ τ ≤ 1.67]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 0.96  
 Shear velocity (cm/s): 1.23 [1.13 ≤ u\_\* ≤ 1.32]  
 Bottom roughness, K<sub>s</sub> (cm): 1  
 Boundary Reynolds number: 122.4 Test: PASS

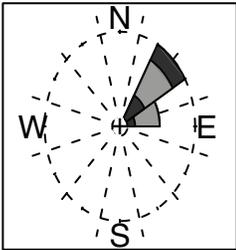
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 8.49	Field recorded ADCP depth (ft): 19
Water mode: 11	Field recorded depthfinder depth (ft): 19.5
Water-cell size (cm): 1	Total number of recorded ensembles: 303
Blanking dist. (cm): 25	Heading: 209.26 ± 4.66
Field recorded offset (cm): 320	Pitch: 0.24 ± 0.48
Actual offset (cm): 0	Roll: -3.01 ± 0.79
Latitude: 44° 25' 40" N	Filename: Vert20041027124551r.csv
Longitude: 88° 4' 30.3" W	

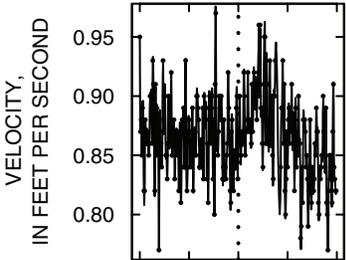
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

DAILY WIND ROSE

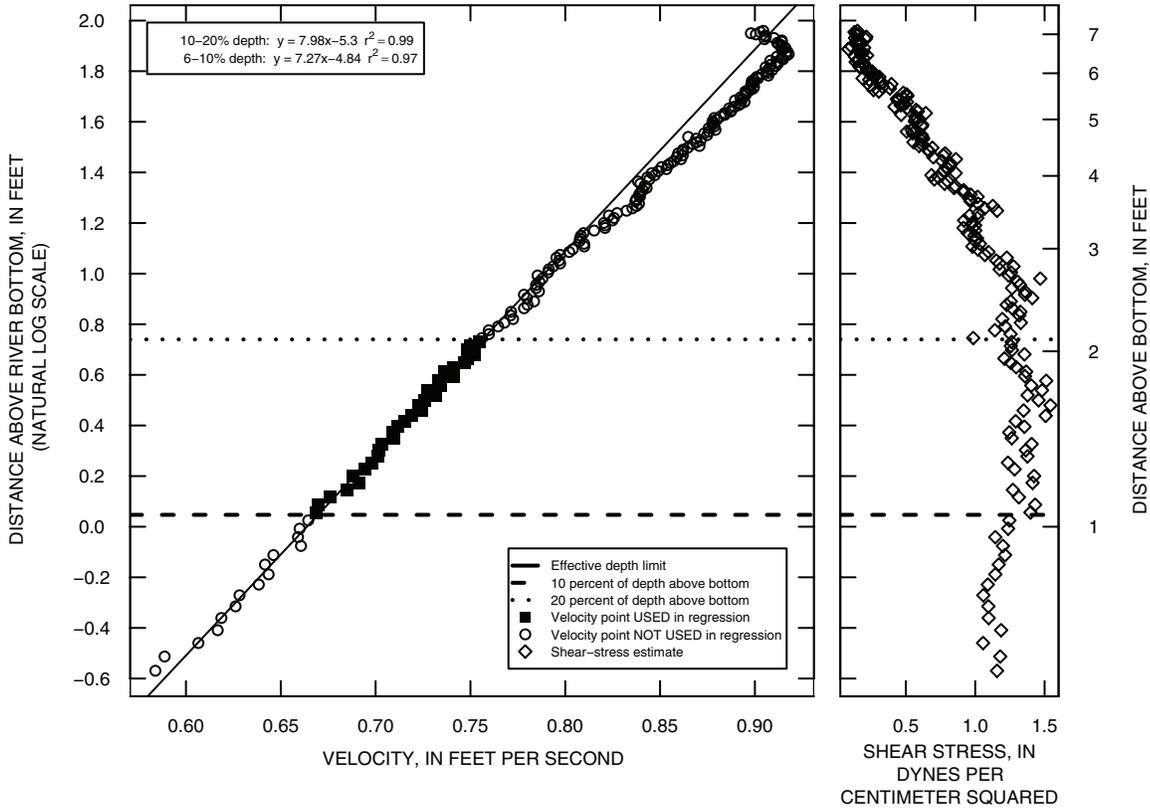


VELOCITY AT DE PERE



### Velocity Profile – Lower Fox River – OU3-4C

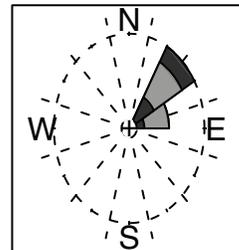
10/27/2004 12:31:12



Vertically averaged water flow: 0.82 ft/s, to direction 26.4°  
 Average wind conditions: 14.1 mi/h, from direction 50°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 2.45 [2.27 ≤ τ ≤ 2.64]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 2.96 [2.37 ≤ τ ≤ 3.61]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 1.15  
 Shear velocity (cm/s): 1.57 [1.51 ≤ u\_\* ≤ 1.62]  
 Bottom roughness, K<sub>s</sub> (cm): 4.57  
 Boundary Reynolds number: 715.13 Test: PASS

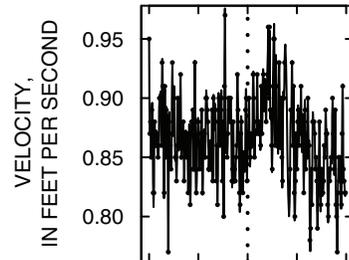
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 10.48	Field recorded ADCP depth (ft): 10.5
Water mode: 11	Field recorded depthfinder depth (ft): 9.2
Water-cell size (cm): 1	Total number of recorded ensembles: 305
Blanking dist. (cm): 25	Heading: 226.32 ± 1.96
Field recorded offset (cm): 76.2	Pitch: 1.68 ± 0.16
Actual offset (cm): 76.2	Roll: -0.46 ± 0.58
Latitude: 44° 25' 39.2" N	Filename: Vert20041027123112r.csv
Longitude: 88° 4' 28.6" W	

VELOCITY AT DE PERE

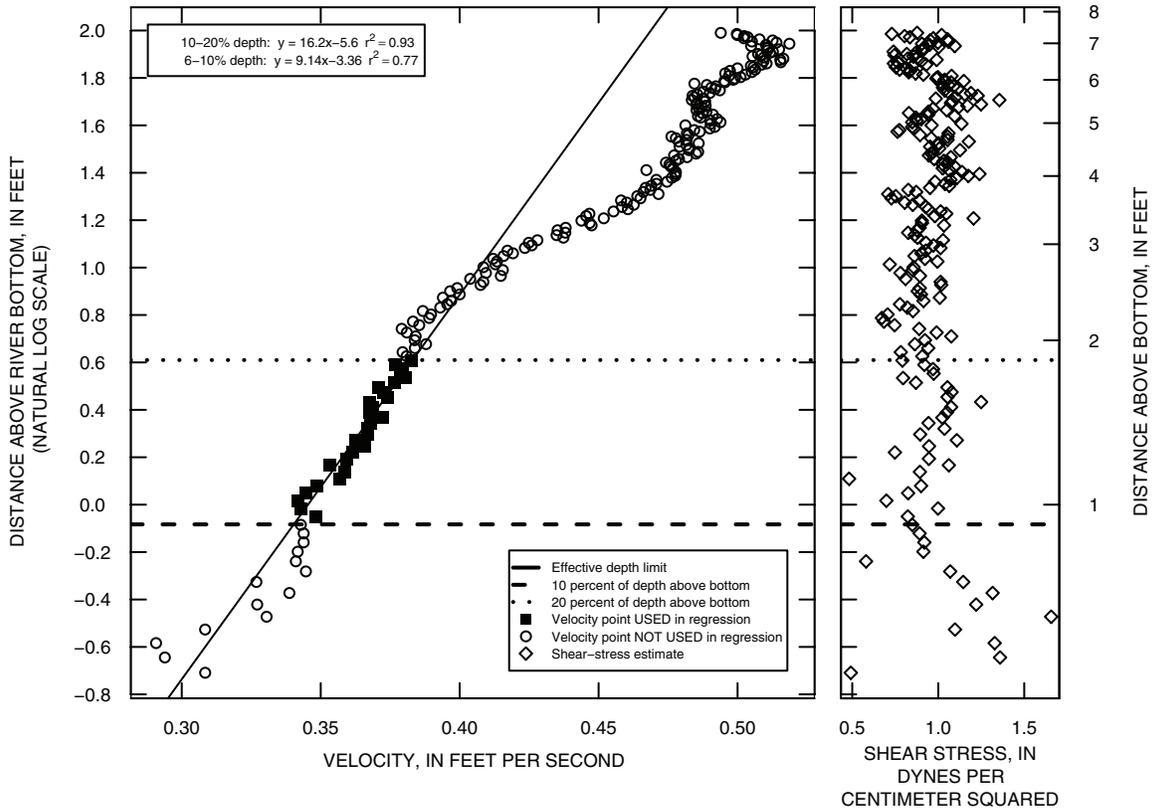


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

### Velocity Profile – Lower Fox River – OU3-5A1

10/27/2004 11:46:20



Vertically averaged water flow: 0.44 ft/s, to direction 37.5°  
 Average wind conditions: 15 mi/h, from direction 50°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 0.59 [0.47 ≤ τ ≤ 0.73]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 1.87 [0.81 ≤ τ ≤ 3.35]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 1.06  
 Shear velocity (cm/s): 0.77 [0.69 ≤ u\_\* ≤ 0.86]  
 Bottom roughness, K<sub>s</sub> (cm): 3.38  
 Boundary Reynolds number: 260.62 Test: PASS

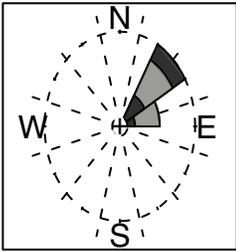
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 9.2	Field recorded ADCP depth (ft): 8.6
Water mode: 11	Field recorded depthfinder depth (ft): 7.9
Water-cell size (cm): 1	Total number of recorded ensembles: 81
Blanking dist. (cm): 25	Heading: 21.62 ± 10.62
Field recorded offset (cm): 30.5	Pitch: 2.62 ± 2.09
Actual offset (cm): 30.5	Roll: -1.94 ± 4.56
Latitude: 44° 25' 56.1" N	Filename: Vert20041027114620r.csv
Longitude: 88° 4' 23" W	

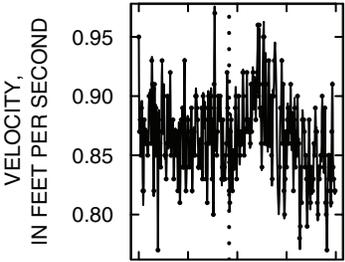
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

DAILY WIND ROSE

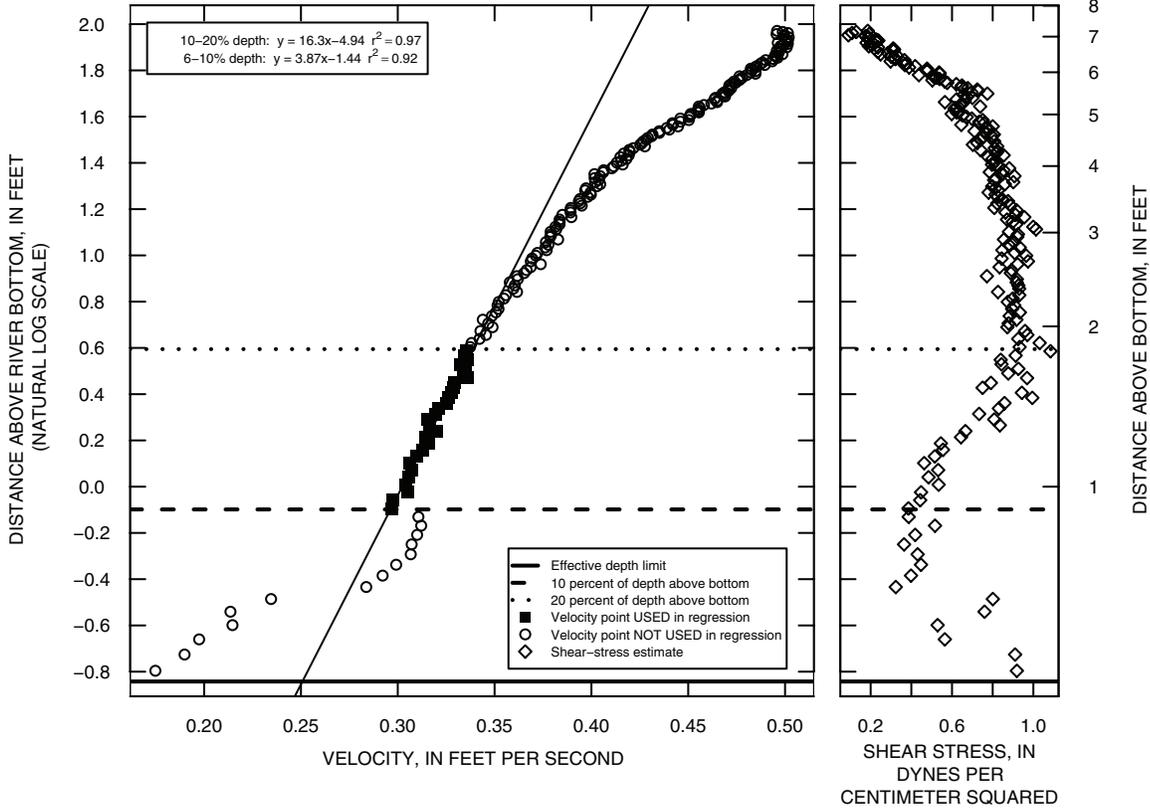


VELOCITY AT DE PERE



### Velocity Profile – Lower Fox River – OU3-5A2

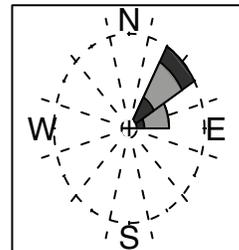
10/27/2004 11:48:23



Vertically averaged water flow: 0.4 ft/s, to direction 38.4°  
 Average wind conditions: 15 mi/h, from direction 50°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 0.58 [0.51 ≤ τ ≤ 0.67]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 10.43 [7.01 ≤ τ ≤ 14.52]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 0.56  
 Shear velocity (cm/s): 0.76 [0.71 ≤ u\_\* ≤ 0.82]  
 Bottom roughness, K<sub>s</sub> (cm): 6.54  
 Boundary Reynolds number: 499.97 Test: PASS

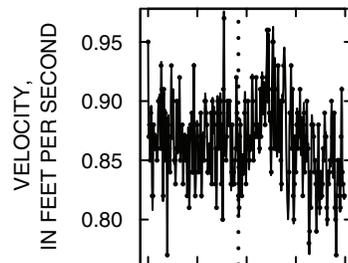
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 9.06	Field recorded ADCP depth (ft): 8.6
Water mode: 11	Field recorded depthfinder depth (ft): 7.9
Water-cell size (cm): 1	Total number of recorded ensembles: 302
Blanking dist. (cm): 25	Heading: 29.14 ± 6.43
Field recorded offset (cm): 30.5	Pitch: 2.74 ± 0.24
Actual offset (cm): 30.5	Roll: -1.68 ± 0.4
Latitude: 44° 25' 56.1" N	Filename: Vert20041027114823r.csv
Longitude: 88° 4' 23" W	

VELOCITY AT DE PERE

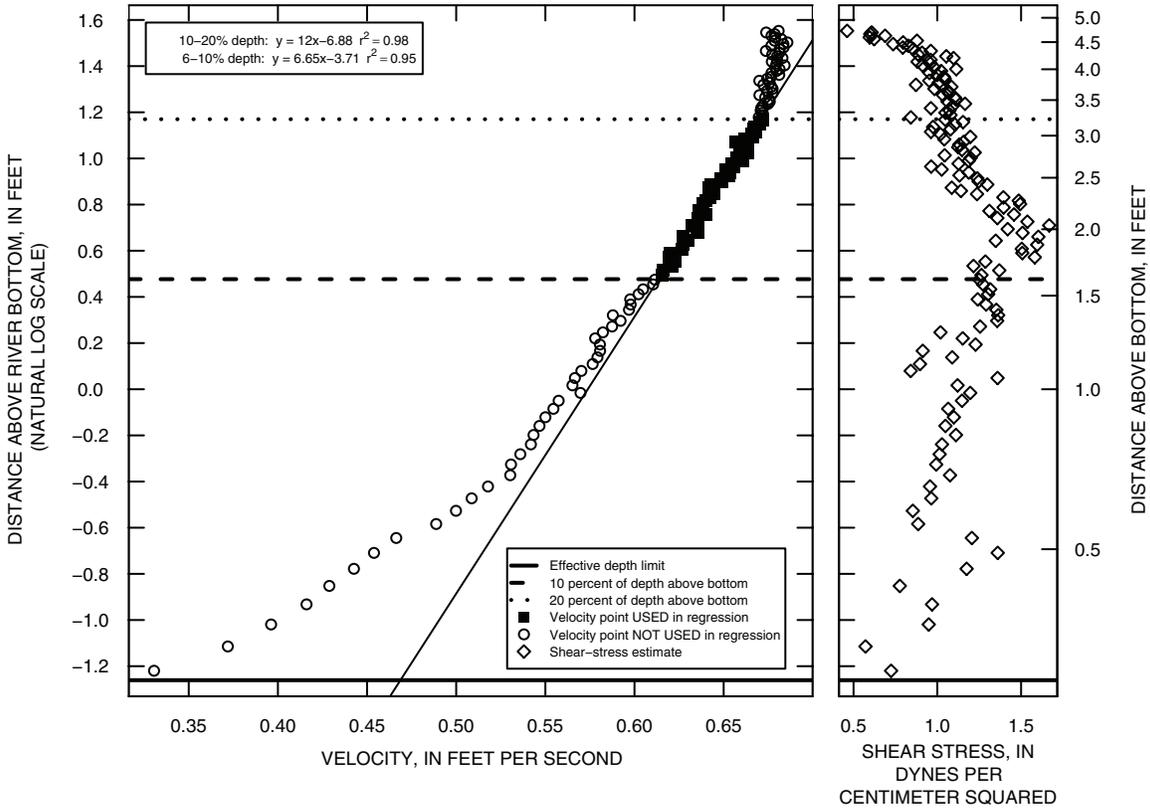


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**Velocity Profile – Lower Fox River – OU3-5B1**

10/27/2004 10:45:22



Vertically averaged water flow: 0.62 ft/s, to direction 35.9°  
 Average wind conditions: 15.51 mi/h, from direction 52.4°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 1.08 [0.99 ≤ τ ≤ 1.18]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 3.53 [3.03 ≤ τ ≤ 4.07]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 1.09  
 Shear velocity (cm/s): 1.04 [1 ≤ u\_\* ≤ 1.09]  
 Bottom roughness, K<sub>s</sub> (cm): 0.94  
 Boundary Reynolds number: 97.5 Test: PASS

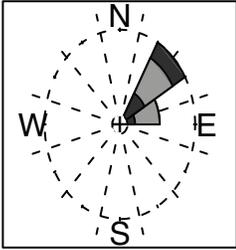
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 16.11	Field recorded ADCP depth (ft): 16.1
Water mode: 11	Field recorded depthfinder depth (ft): 16.1
Water-cell size (cm): 1	Total number of recorded ensembles: 302
Blanking dist. (cm): 25	Heading: 332.38 ± 4.98
Field recorded offset (cm): 320	Pitch: 1.3 ± 1.01
Actual offset (cm): 320	Roll: -0.35 ± 0.61
Latitude: 44° 25' 52.8" N	Filename: Vert20041027104522r.csv
Longitude: 88° 4' 17.5" W	

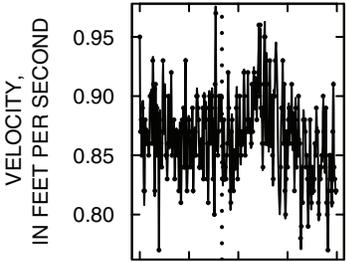
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**DAILY WIND ROSE**

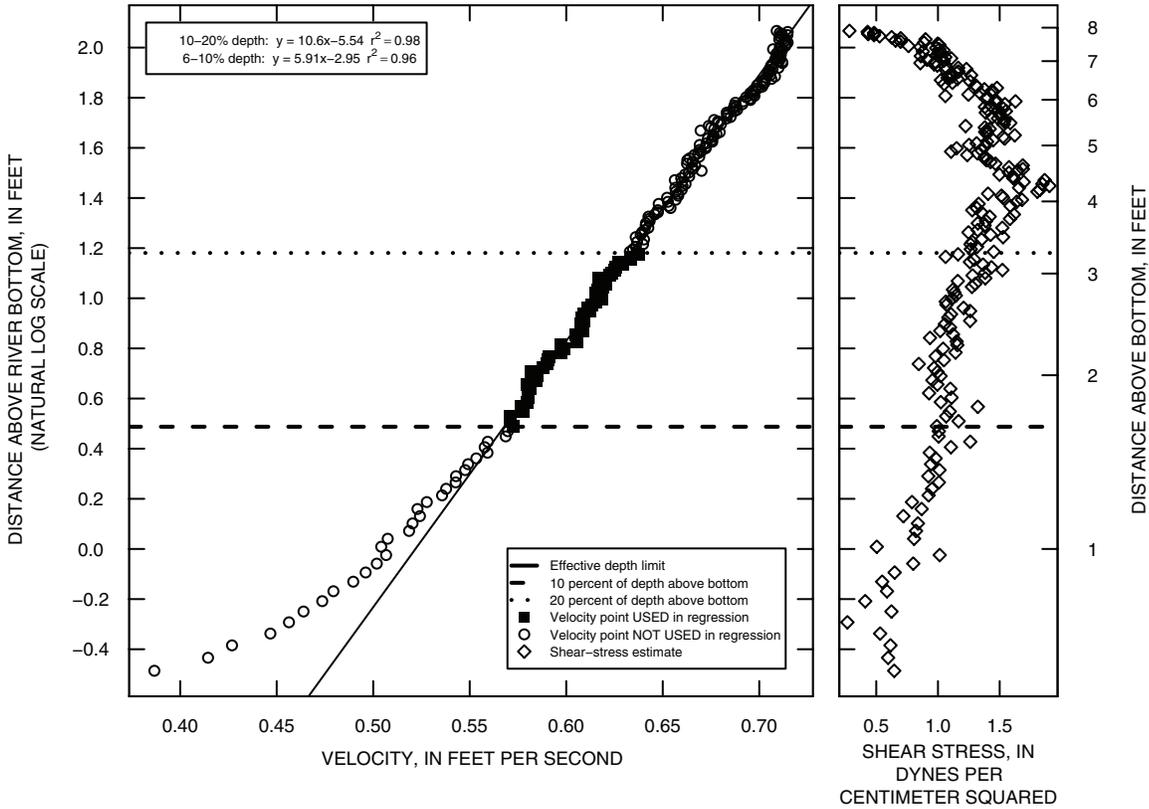


**VELOCITY AT DE PERE**



### Velocity Profile – Lower Fox River – OU3-5B2

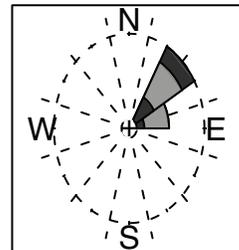
10/27/2004 10:55:09



Vertically averaged water flow: 0.64 ft/s, to direction 38.4°  
 Average wind conditions: 15.51 mi/h, from direction 52.4°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 1.39 [1.27 ≤ τ ≤ 1.51]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 4.47 [3.82 ≤ τ ≤ 5.17]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 0.8  
 Shear velocity (cm/s): 1.18 [1.13 ≤ u\_\* ≤ 1.23]  
 Bottom roughness, K<sub>s</sub> (cm): 3.59  
 Boundary Reynolds number: 423.08 Test: PASS

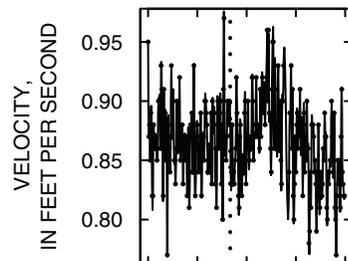
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 16.28	Field recorded ADCP depth (ft): 16.1
Water mode: 11	Field recorded depthfinder depth (ft): 16.1
Water-cell size (cm): 1	Total number of recorded ensembles: 311
Blanking dist. (cm): 25	Heading: 1.29 ± 8.04
Field recorded offset (cm): 229	Pitch: -0.12 ± 1.66
Actual offset (cm): 229	Roll: 2.09 ± 0.97
Latitude: 44° 25' 52.8" N	Filename: Vert20041027105509r.csv
Longitude: 88° 4' 17.5" W	

VELOCITY AT DE PERE

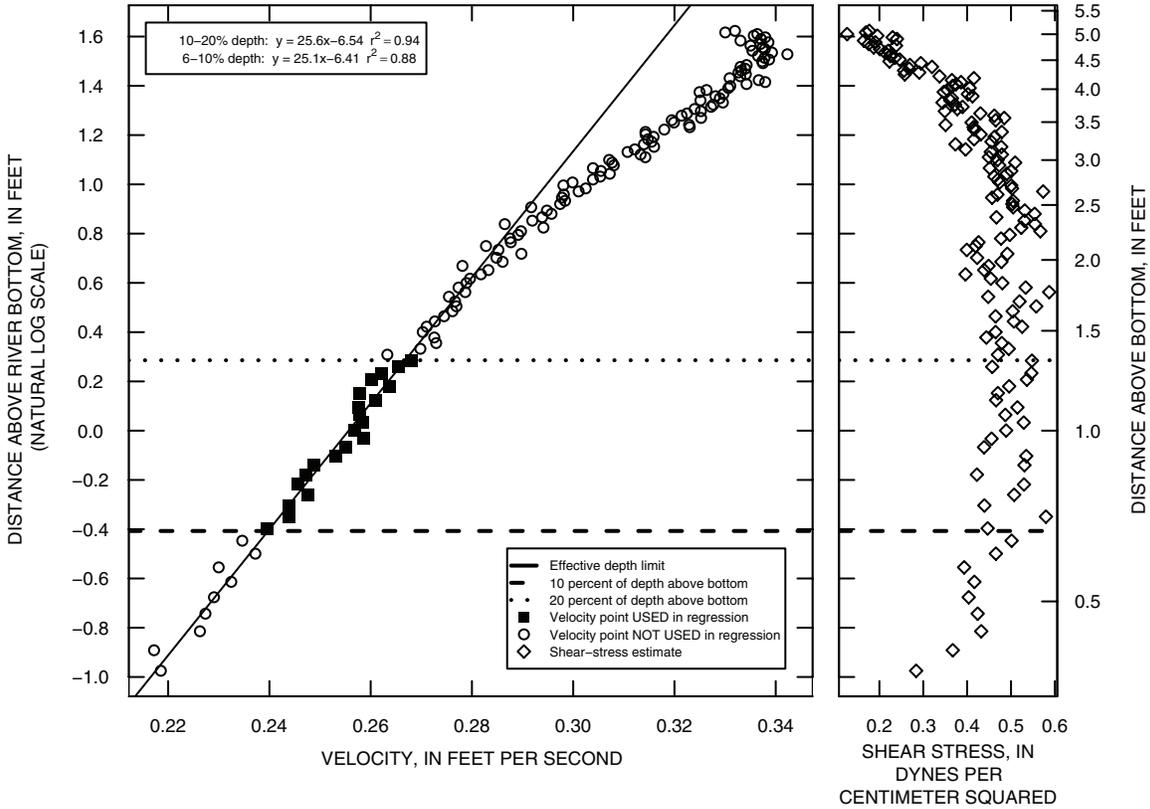


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**Velocity Profile – Lower Fox River – OU3-5C**

10/27/2004 11:17:36



Vertically averaged water flow: 0.3 ft/s, to direction 69.2°  
 Average wind conditions: 15 mi/h, from direction 50°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 0.24 [0.18 ≤ τ ≤ 0.3]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 0.25 [0.11 ≤ τ ≤ 0.44]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 0.41  
 Shear velocity (cm/s): 0.49 [0.43 ≤ u\_\* ≤ 0.55]  
 Bottom roughness, K<sub>s</sub> (cm): 1.32  
 Boundary Reynolds number: 64.59 Test: MAYBE

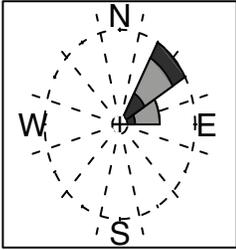
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 6.65	Field recorded ADCP depth (ft): 6.6
Water mode: 11	Field recorded depthfinder depth (ft): 6.4
Water-cell size (cm): 1	Total number of recorded ensembles: 312
Blanking dist. (cm): 25	Heading: 195.63 ± 2.99
Field recorded offset (cm): 21.3	Pitch: 2.58 ± 0.34
Actual offset (cm): 21.3	Roll: -1.78 ± 0.27
Latitude: 44° 25' 51.7" N	Filename: Vert20041027111736r.csv
Longitude: 88° 4' 16.6" W	

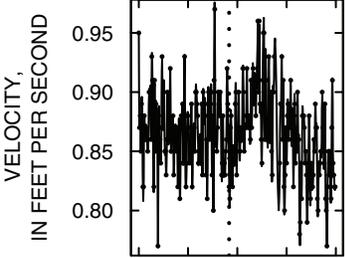
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

DAILY WIND ROSE

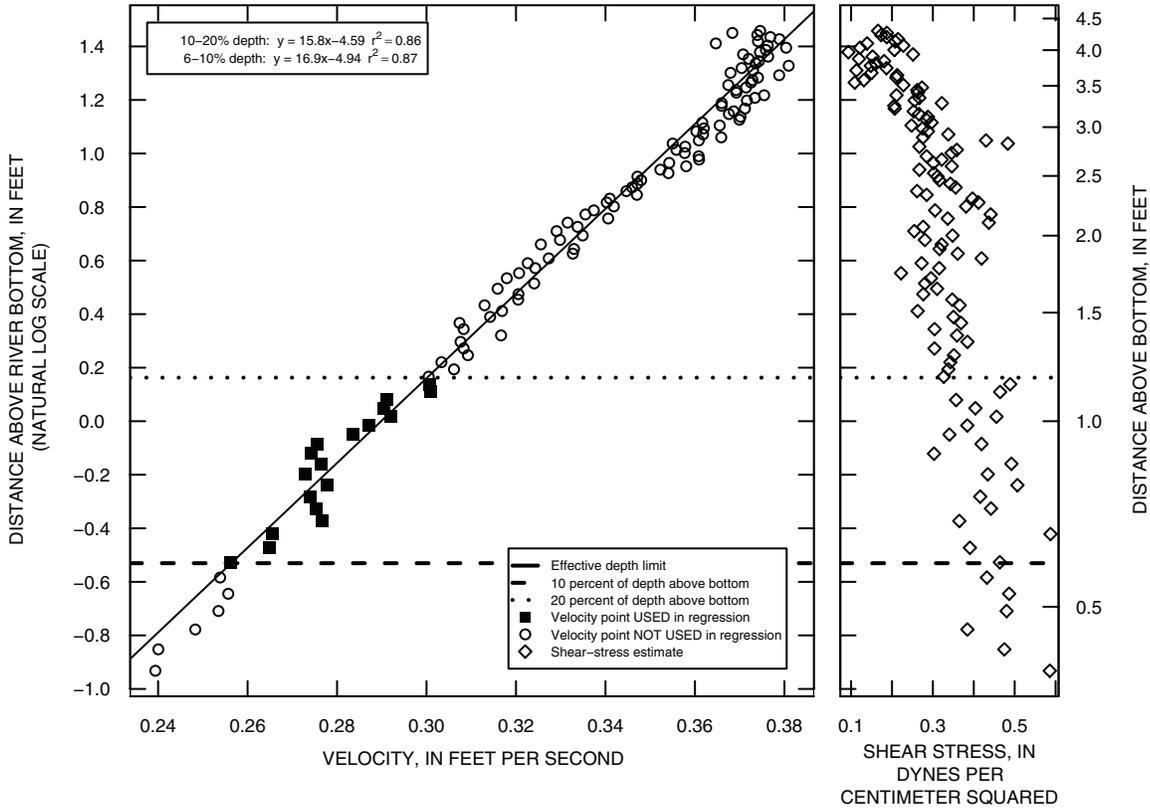


VELOCITY AT DE PERE



**Velocity Profile – Lower Fox River – OU3-6A1**

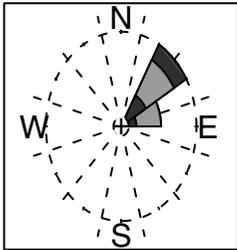
10/27/2004 10:08:15



Vertically averaged water flow: 0.33 ft/s, to direction 29.4°  
 Average wind conditions: 15.51 mi/h, from direction 52.4°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 0.62 [0.38 ≤ τ ≤ 0.92]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 0.55 [0.12 ≤ τ ≤ 1.29]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 0.47  
 Shear velocity (cm/s): 0.79 [0.62 ≤ u\_\* ≤ 0.96]  
 Bottom roughness, K<sub>s</sub> (cm): 9.3  
 Boundary Reynolds number: 734.48 Test: PASS

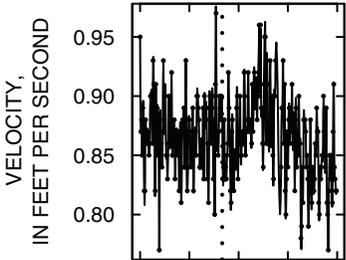
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 5.88	Field recorded ADCP depth (ft): 5.9
Water mode: 11	Field recorded depthfinder depth (ft): 5.9
Water-cell size (cm): 1	Total number of recorded ensembles: 181
Blanking dist. (cm): 25	Heading: 23.17 ± 1.58
Field recorded offset (cm): 21.3	Pitch: 3.21 ± 0.1
Actual offset (cm): 21.3	Roll: -0.72 ± 0.18
Latitude: 44° 26' 15.3" N	Filename: Vert20041027100815r.csv
Longitude: 88° 4' 12.7" W	

VELOCITY AT DE PERE

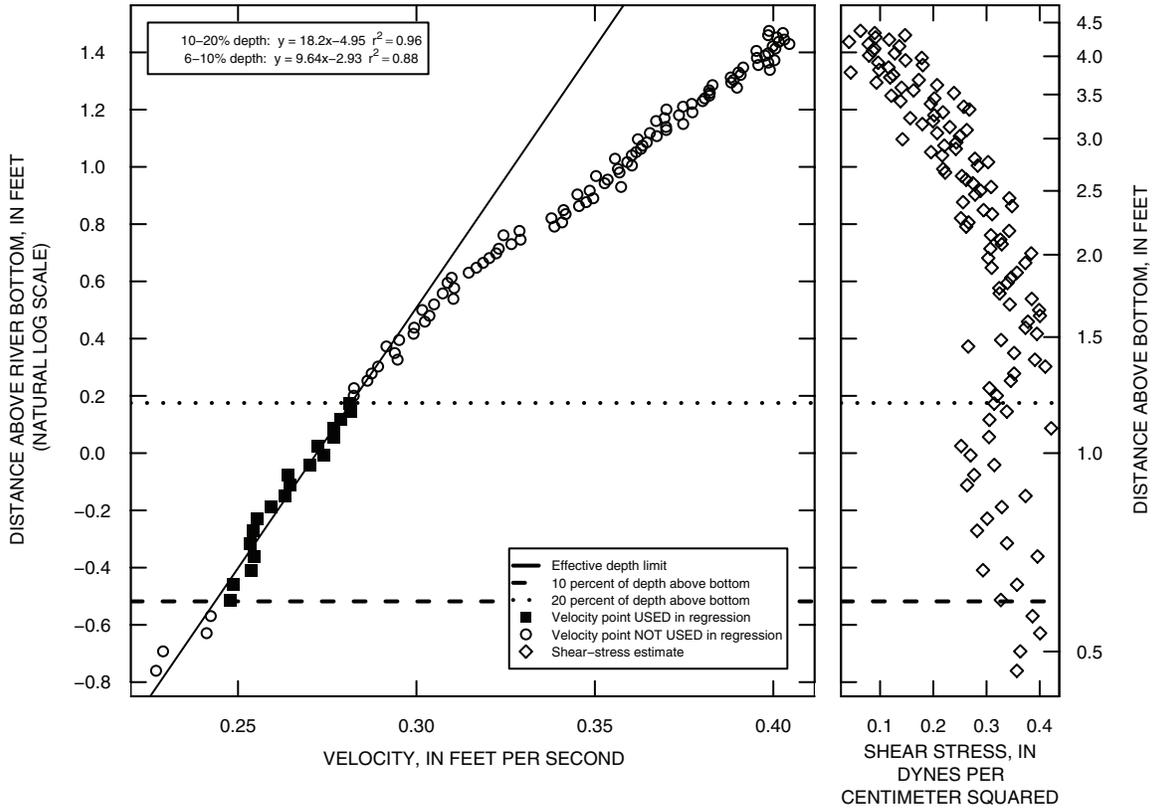


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

### Velocity Profile – Lower Fox River – OU3-6A2

10/27/2004 10:13:21



Vertically averaged water flow: 0.33 ft/s, to direction 29.6°  
 Average wind conditions: 15.51 mi/h, from direction 52.4°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 0.47 [0.38 ≤ τ ≤ 0.58]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 1.68 [-0.02 ≤ τ ≤ 7.51]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 0.38  
 Shear velocity (cm/s): 0.69 [0.61 ≤ u\_\* ≤ 0.76]  
 Bottom roughness, K<sub>s</sub> (cm): 6.47  
 Boundary Reynolds number: 443.9 Test: PASS

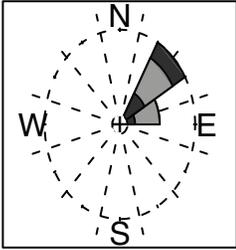
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 5.96	Field recorded ADCP depth (ft): 5.9
Water mode: 11	Field recorded depthfinder depth (ft): 5.9
Water-cell size (cm): 1	Total number of recorded ensembles: 302
Blanking dist. (cm): 25	Heading: 24.45 ± 1.34
Field recorded offset (cm): 21.3	Pitch: 3.21 ± 0.09
Actual offset (cm): 21.3	Roll: -0.66 ± 0.16
Latitude: 44° 26' 15.3" N	Filename: Vert20041027101321r.csv
Longitude: 88° 4' 12.7" W	

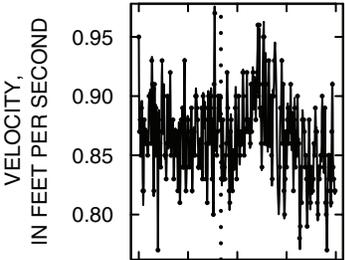
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

DAILY WIND ROSE

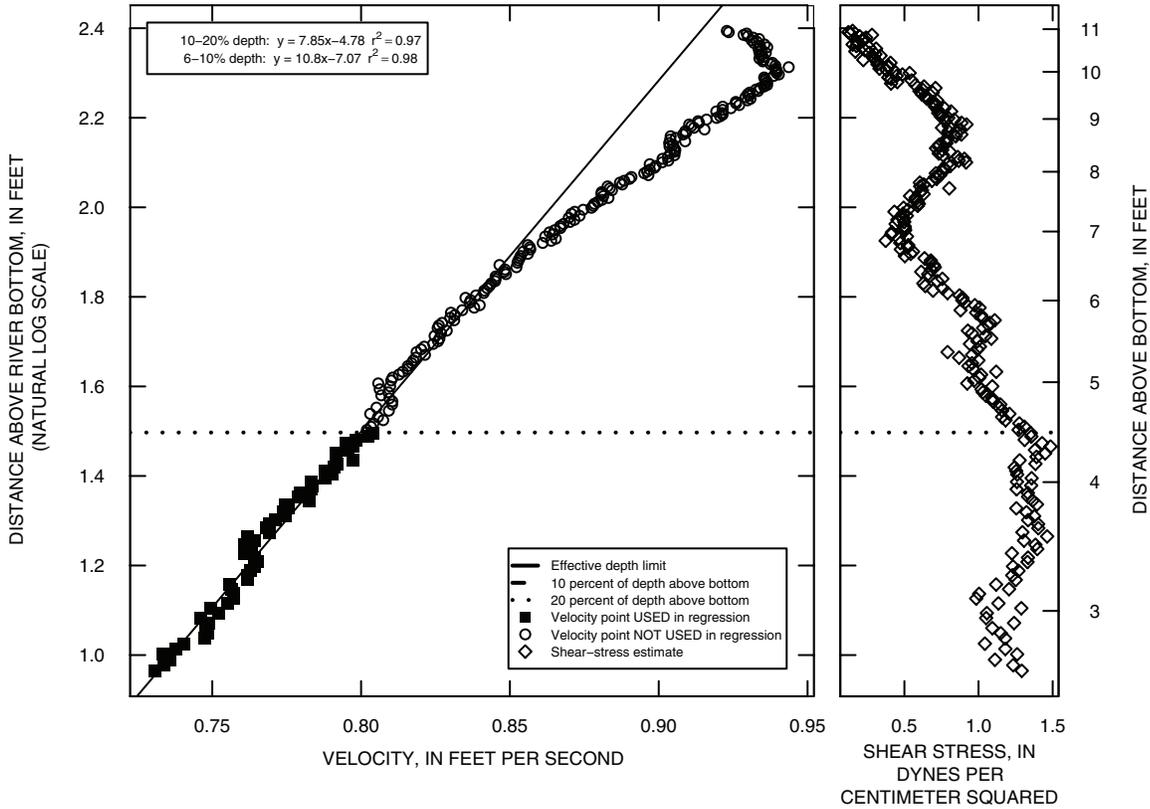


VELOCITY AT DE PERE



### Velocity Profile – Lower Fox River – OU3-6B1

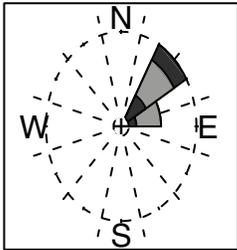
10/27/2004 9:42:55



Vertically averaged water flow: 0.86 ft/s, to direction 20.3°  
 Average wind conditions: 15.51 mi/h, from direction 52.4°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 2.54 [2.31 ≤ τ ≤ 2.77]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 1.35 [NaN ≤ τ ≤ NaN]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 0  
 Shear velocity (cm/s): 1.59 [1.52 ≤ u\_\* ≤ 1.67]  
 Bottom roughness, K<sub>s</sub> (cm): 7.7  
 Boundary Reynolds number: 1226.28 Test: PASS

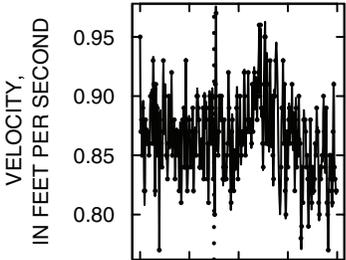
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 22.34	Field recorded ADCP depth (ft): 22.3
Water mode: 11	Field recorded depthfinder depth (ft): 22.4
Water-cell size (cm): 1	Total number of recorded ensembles: 300
Blanking dist. (cm): 25	Heading: 207.84 ± 3.04
Field recorded offset (cm): 320	Pitch: -0.35 ± 0.45
Actual offset (cm): 320	Roll: -2.65 ± 0.7
Latitude: 44° 26' 14.7" N	Filename: Vert20041027094255r.csv
Longitude: 88° 4' 7.3" W	

VELOCITY AT DE PERE

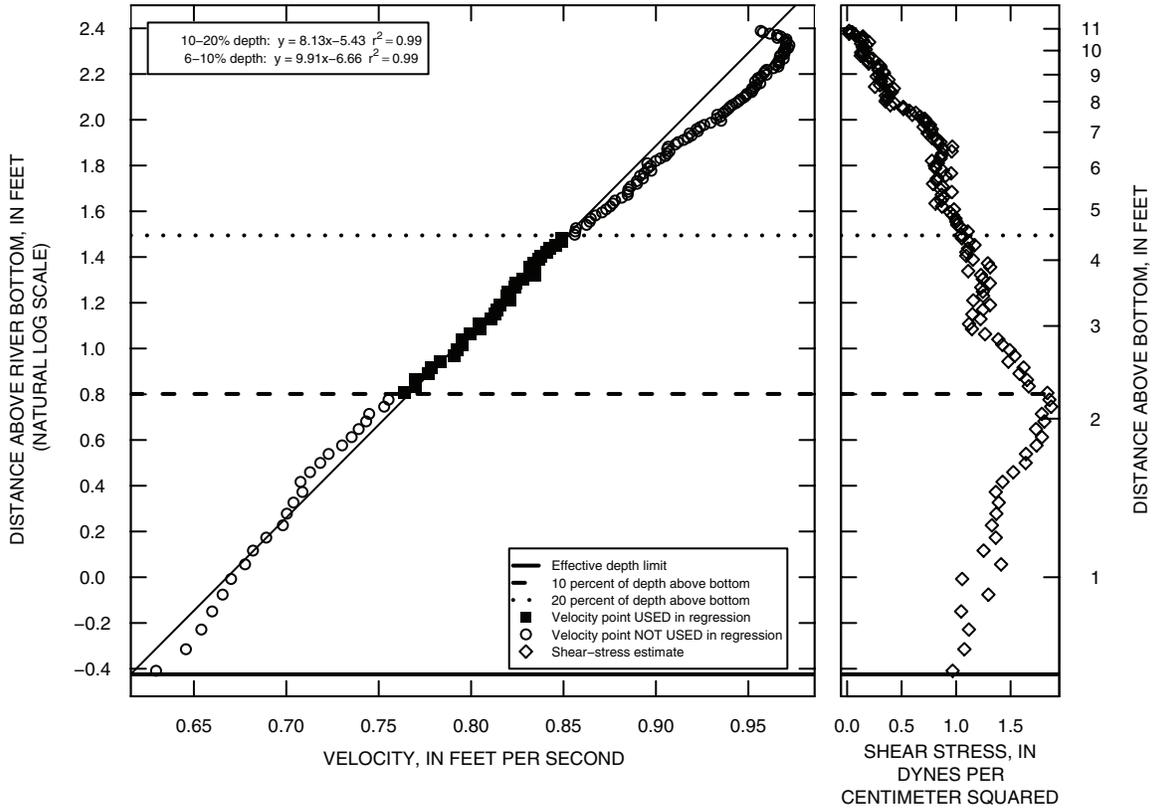


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

### Velocity Profile – Lower Fox River – OU3-6B2

10/27/2004 9:51:23



Vertically averaged water flow: 0.87 ft/s, to direction 22.8°  
 Average wind conditions: 15.51 mi/h, from direction 52.4°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 2.36 [2.2 ≤ τ ≤ 2.53]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 1.59 [1.46 ≤ τ ≤ 1.72]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 1.45  
 Shear velocity (cm/s): 1.54 [1.48 ≤ u\_\* ≤ 1.59]  
 Bottom roughness, K<sub>s</sub> (cm): 4  
 Boundary Reynolds number: 615.41 Test: PASS

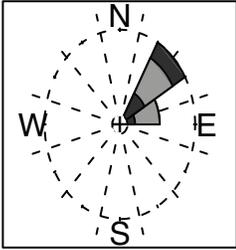
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 22.29	Field recorded ADCP depth (ft): 22.3
Water mode: 11	Field recorded depthfinder depth (ft): 22.4
Water-cell size (cm): 2	Total number of recorded ensembles: 300
Blanking dist. (cm): 25	Heading: 206.02 ± 3.41
Field recorded offset (cm): 320	Pitch: 0.02 ± 0.63
Actual offset (cm): 320	Roll: -2.55 ± 0.64
Latitude: 44° 26' 14.7" N	Filename: Vert20041027095123r.csv
Longitude: 88° 4' 7.3" W	

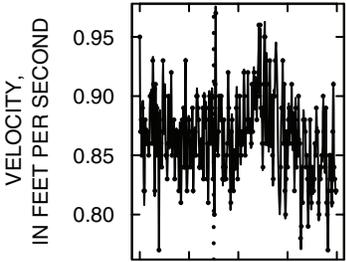
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

DAILY WIND ROSE

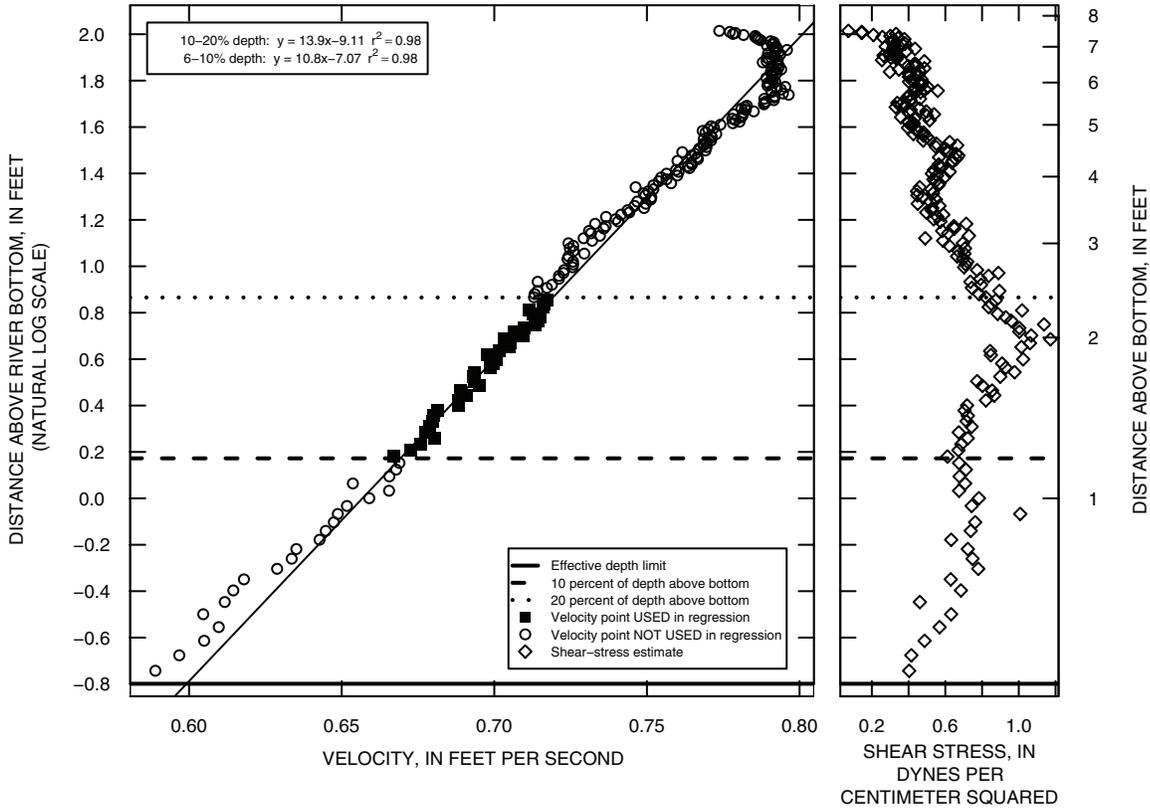


VELOCITY AT DE PERE



### Velocity Profile – Lower Fox River – OU3-6C

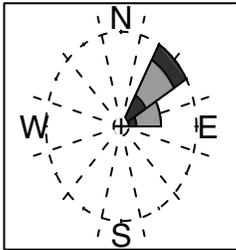
10/27/2004 9:28:40



Vertically averaged water flow: 0.74 ft/s, to direction 19.2°  
 Average wind conditions: 15.51 mi/h, from direction 52.4°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 0.81 [0.73 ≤ τ ≤ 0.9]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 1.35 [1.16 ≤ τ ≤ 1.54]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 0.67  
 Shear velocity (cm/s): 0.9 [0.86 ≤ u\_\* ≤ 0.95]  
 Bottom roughness, K<sub>s</sub> (cm): 0.1  
 Boundary Reynolds number: 9.1 Test: MAYBE

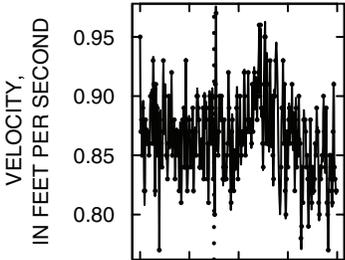
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 11.88	Field recorded ADCP depth (ft): 11.9
Water mode: 11	Field recorded depthfinder depth (ft): 11.8
Water-cell size (cm): 1	Total number of recorded ensembles: 304
Blanking dist. (cm): 25	Heading: 199.1 ± 1.64
Field recorded offset (cm): NA	Pitch: 2.58 ± 0.14
Actual offset (cm): 107	Roll: -1.29 ± 0.54
Latitude: 44° 26' 13.1" N	Filename: Vert20041027092840r.csv
Longitude: 88° 4' 4.7" W	

VELOCITY AT DE PERE

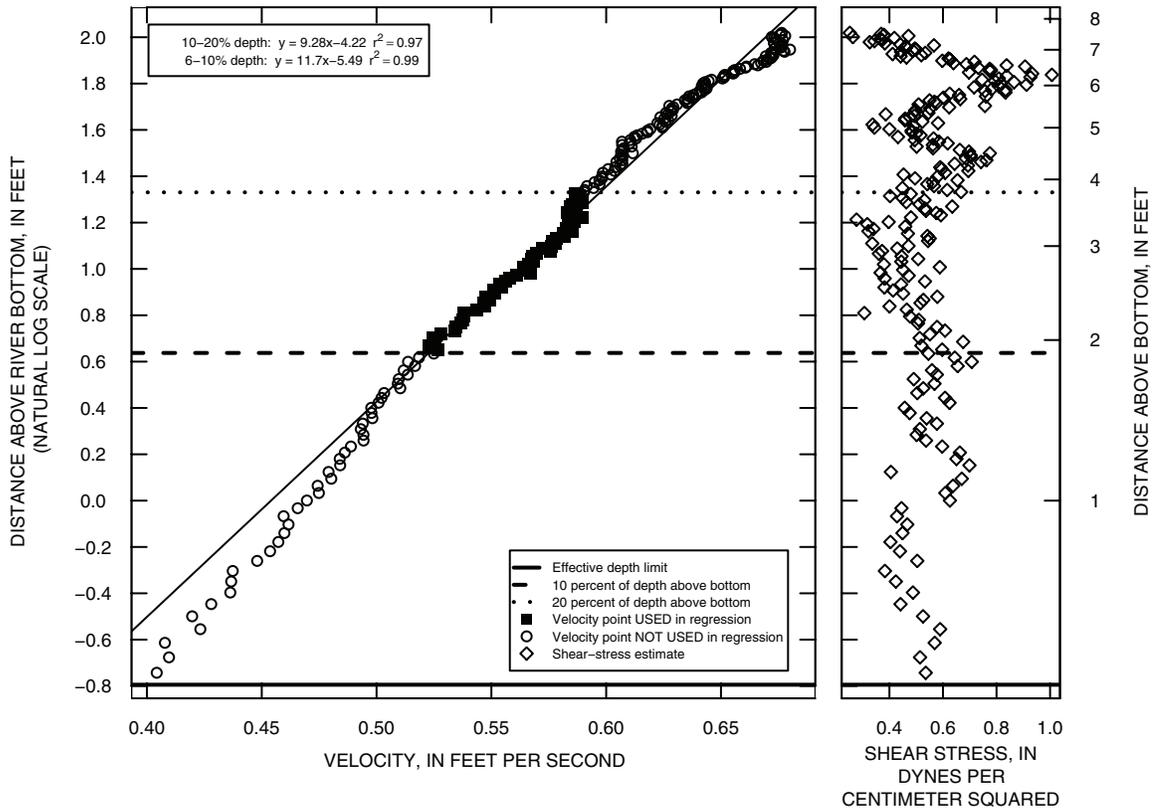


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

### Velocity Profile – Lower Fox River – OU3-7A

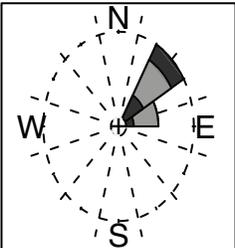
10/27/2004 8:44:24



Vertically averaged water flow: 0.59 ft/s, to direction 39.3°  
 Average wind conditions: 15.73 mi/h, from direction 50°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 1.81 [1.65 ≤ τ ≤ 1.99]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 1.13 [1.07 ≤ τ ≤ 1.2]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 0.54  
 Shear velocity (cm/s): 1.35 [1.28 ≤ u\_\* ≤ 1.41]  
 Bottom roughness, K<sub>s</sub> (cm): 13.5  
 Boundary Reynolds number: 1816.6 Test: PASS

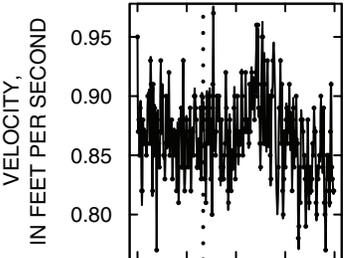
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 18.91	Field recorded ADCP depth (ft): 18.9
Water mode: 11	Field recorded depthfinder depth (ft): 18.9
Water-cell size (cm): 1	Total number of recorded ensembles: 303
Blanking dist. (cm): 25	Heading: 42 ± 3.29
Field recorded offset (cm): 320	Pitch: 3.19 ± 1
Actual offset (cm): 320	Roll: 1.45 ± 1.18
Latitude: 44° 26' 28.4" N	Filename: Vert20041027084424r.csv
Longitude: 88° 3' 59.2" W	

VELOCITY AT DE PERE

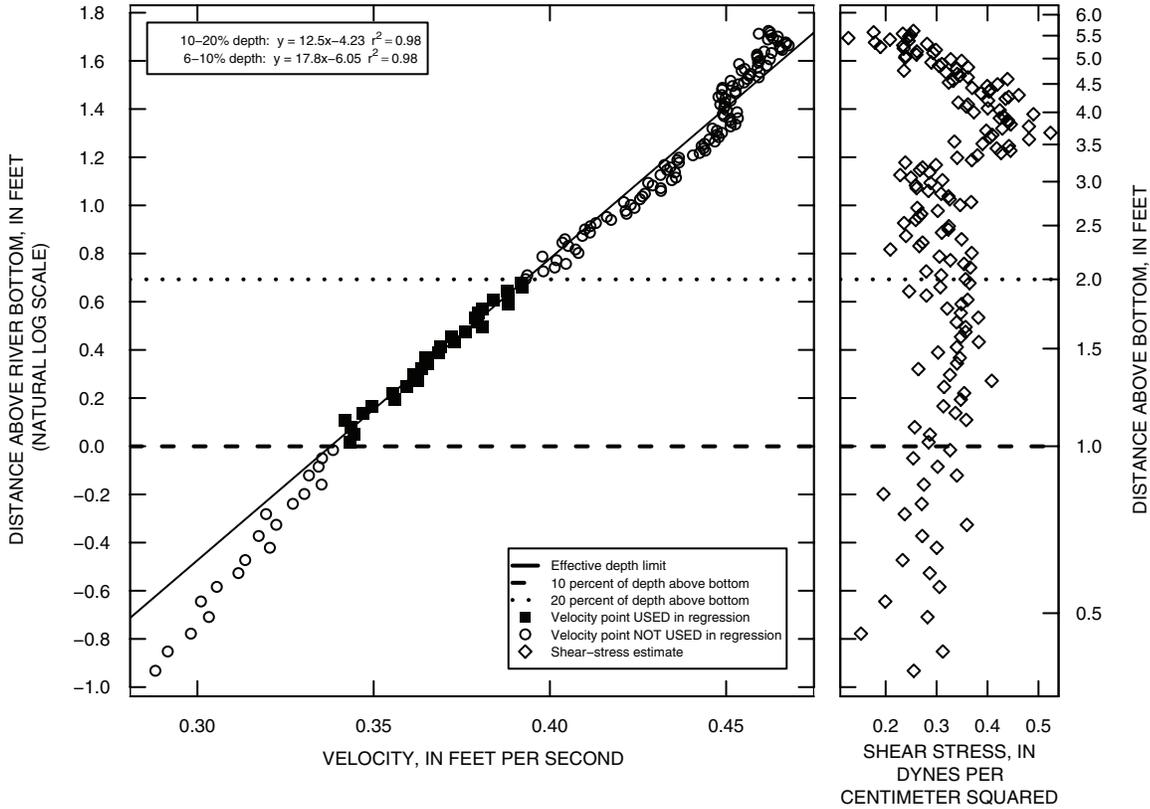


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

### Velocity Profile – Lower Fox River – OU3-7B

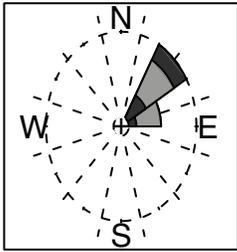
10/27/2004 8:59:11



Vertically averaged water flow: 0.41 ft/s, to direction 24°  
 Average wind conditions: 15.73 mi/h, from direction 50°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 1 [0.89 ≤ τ ≤ 1.1]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 0.49 [0.42 ≤ τ ≤ 0.57]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 0.27  
 Shear velocity (cm/s): 1 [0.94 ≤ u\_\* ≤ 1.05]  
 Bottom roughness, K<sub>s</sub> (cm): 13.28  
 Boundary Reynolds number: 1325.26 Test: PASS

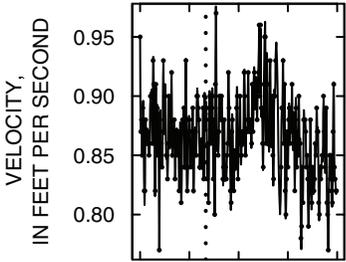
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 10	Field recorded ADCP depth (ft): 10
Water mode: 11	Field recorded depthfinder depth (ft): 9.8
Water-cell size (cm): 1	Total number of recorded ensembles: 302
Blanking dist. (cm): 25	Heading: 3.92 ± 0.97
Field recorded offset (cm): 107	Pitch: 1.68 ± 0.13
Actual offset (cm): 107	Roll: -1.03 ± 0.19
Latitude: 44° 26' 25.8" N	Filename: Vert20041027085911r.csv
Longitude: 88° 3' 54.4" W	

VELOCITY AT DE PERE

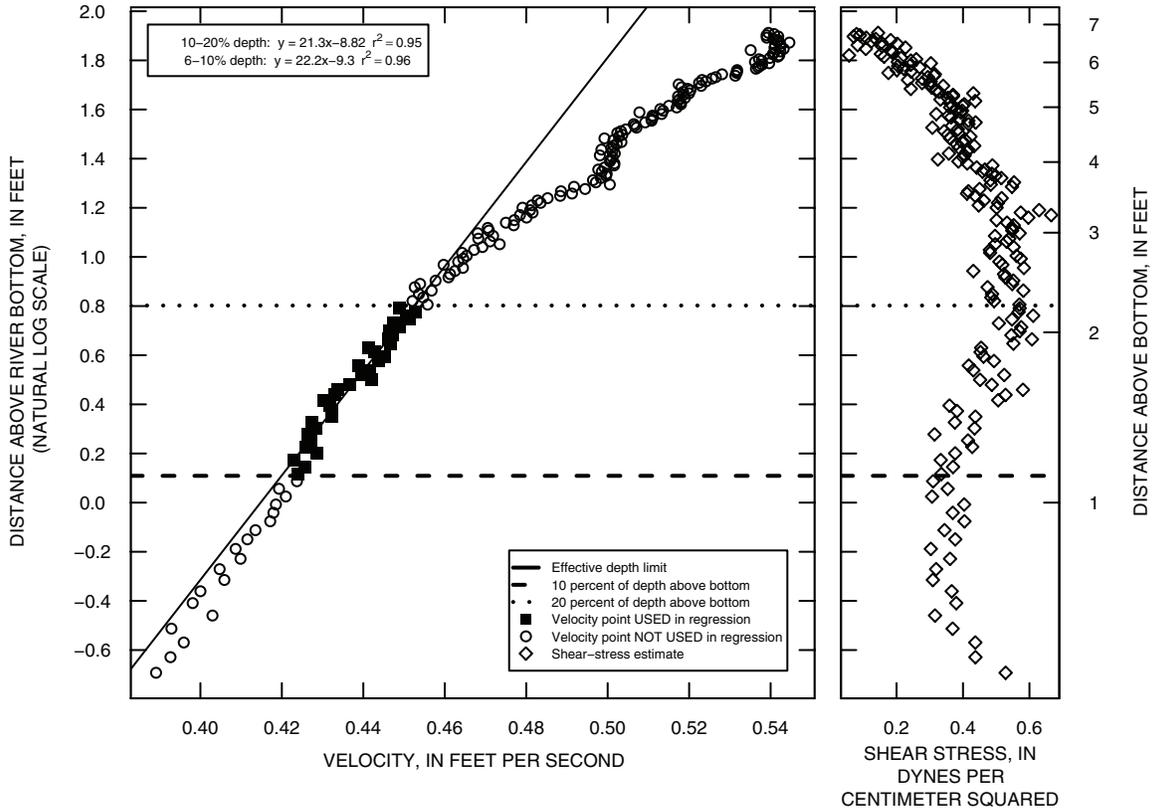


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

### Velocity Profile – Lower Fox River – OU3-7L

10/27/2004 8:29:51



Vertically averaged water flow: 0.48 ft/s, to direction 41.2°  
 Average wind conditions: 15.73 mi/h, from direction 50°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 0.35 [0.29 ≤ τ ≤ 0.41]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 0.32 [0.26 ≤ τ ≤ 0.38]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 0.37  
 Shear velocity (cm/s): 0.59 [0.54 ≤ u\_\* ≤ 0.64]  
 Bottom roughness, K<sub>s</sub> (cm): 0.14  
 Boundary Reynolds number: 7.95 Test: MAYBE

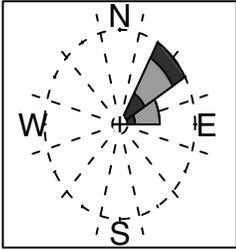
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 11.15	Field recorded ADCP depth (ft): 11.3
Water mode: 11	Field recorded depthfinder depth (ft): 10.4
Water-cell size (cm): 1	Total number of recorded ensembles: 307
Blanking dist. (cm): 25	Heading: 44.84 ± 5.52
Field recorded offset (cm): 107	Pitch: 2.99 ± 0.19
Actual offset (cm): 107	Roll: -2.69 ± 0.23
Latitude: 44° 26' 29" N	Filename: Vert20041027082951r.csv
Longitude: 88° 4' 0.8" W	

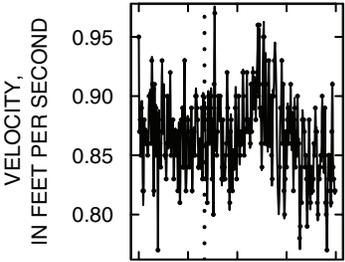
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

DAILY WIND ROSE

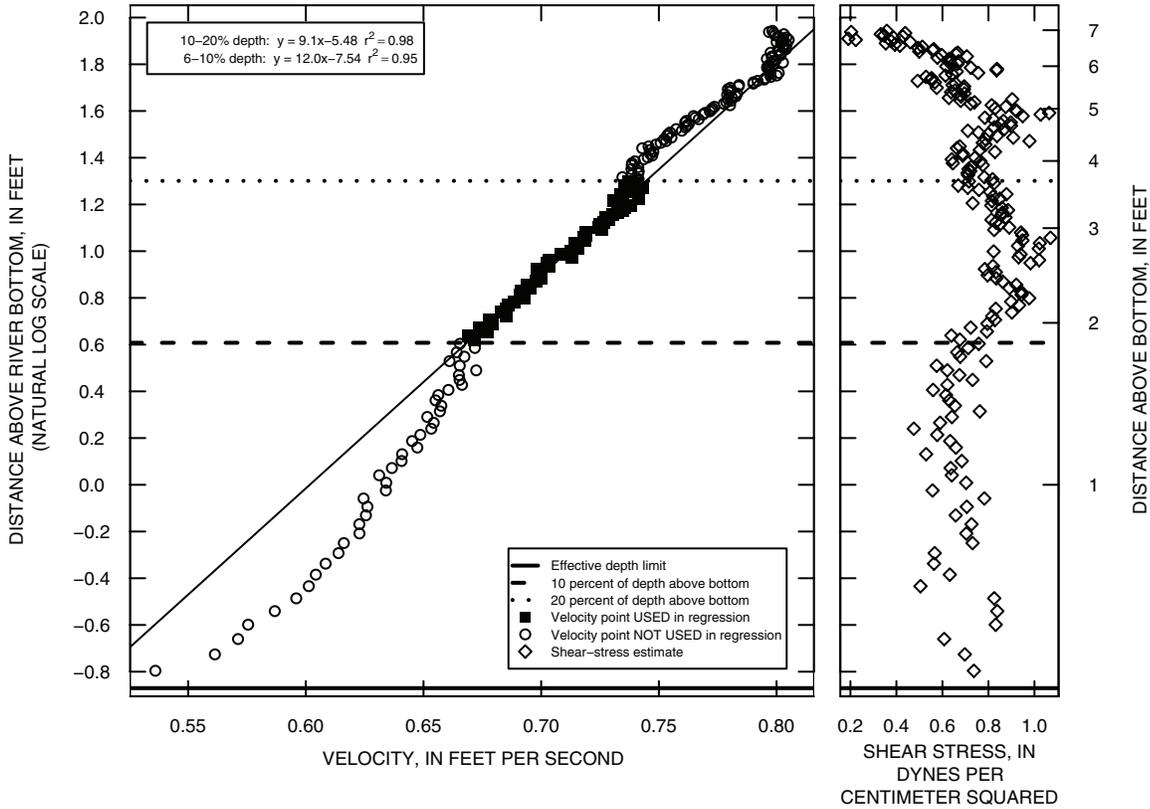


VELOCITY AT DE PERE



### Velocity Profile – Lower Fox River – OU3-8A

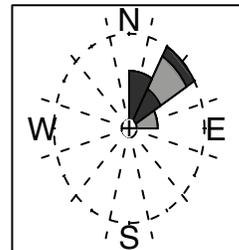
10/26/2004 16:58:51



Vertically averaged water flow: 0.73 ft/s, to direction 29.2°  
 Average wind conditions: 13.76 mi/h, from direction 70°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) ( $\text{dyn/cm}^2$ ): 1.89 [ $1.75 \leq \tau \leq 2.03$ ]  
 Shear stress (LP, 6-10% depth) ( $\text{dyn/cm}^2$ ): 1.09 [ $0.94 \leq \tau \leq 1.25$ ]  
 Shear stress (TKE) ( $\text{dyn/cm}^2$ ): 0.66  
 Shear velocity (cm/s): 1.37 [ $1.32 \leq u_* \leq 1.42$ ]  
 Bottom roughness,  $K_s$  (cm): 3.83  
 Boundary Reynolds number: 525.49 Test: PASS

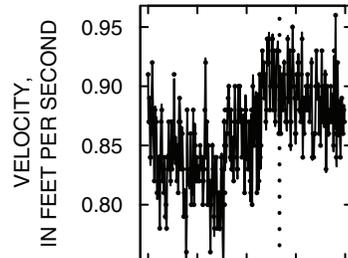
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 18.37	Field recorded ADCP depth (ft): 18.4
Water mode: 11	Field recorded depthfinder depth (ft): 18.2
Water-cell size (cm): 1	Total number of recorded ensembles: 301
Blanking dist. (cm): 25	Heading: $343.82 \pm 6.76$
Field recorded offset (cm): 320	Pitch: $3.8 \pm 0.49$
Actual offset (cm): 320	Roll: $-3.68 \pm 1.68$
Latitude: $44^\circ 26' 35.8''$ N	Filename: Vert20041026165851r.csv
Longitude: $88^\circ 3' 52.3''$ W	

VELOCITY AT DE PERE

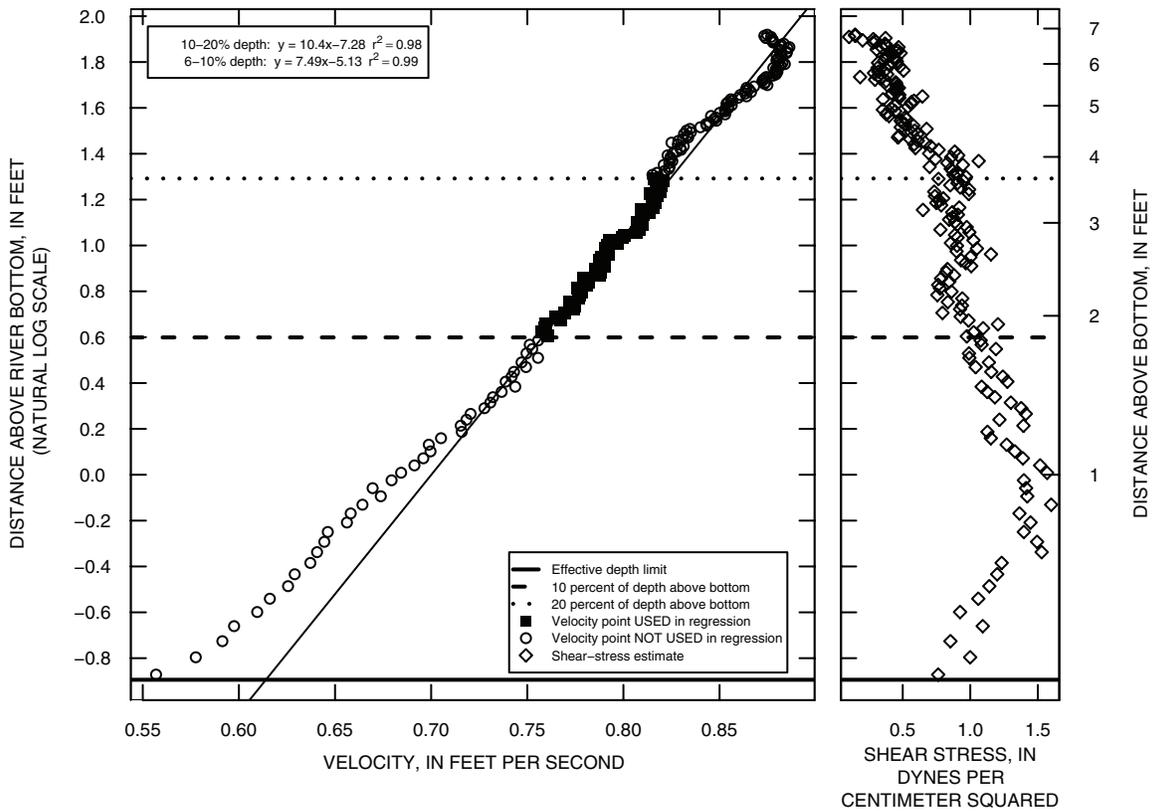


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

### Velocity Profile – Lower Fox River – OU3-8B

10/26/2004 16:43:36



Vertically averaged water flow: 0.8 ft/s, to direction 27.8°  
 Average wind conditions: 13.76 mi/h, from direction 70°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 1.45 [1.33 ≤ τ ≤ 1.57]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 2.78 [2.65 ≤ τ ≤ 2.92]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 1.23  
 Shear velocity (cm/s): 1.2 [1.15 ≤ u\_\* ≤ 1.25]  
 Bottom roughness, K<sub>s</sub> (cm): 0.63  
 Boundary Reynolds number: 76.09 Test: PASS

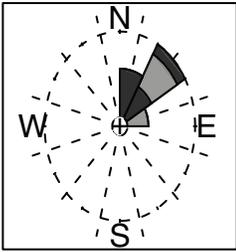
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 18.2	Field recorded ADCP depth (ft): 18.2
Water mode: 11	Field recorded depthfinder depth (ft): 18
Water-cell size (cm): 1	Total number of recorded ensembles: 301
Blanking dist. (cm): 25	Heading: 0.68 ± 3.65
Field recorded offset (cm): 320	Pitch: 2.3 ± 0.62
Actual offset (cm): 320	Roll: -1.13 ± 1.12
Latitude: 44° 26' 34.7" N	Filename: Vert20041026164336r.csv
Longitude: 88° 3' 50.4" W	

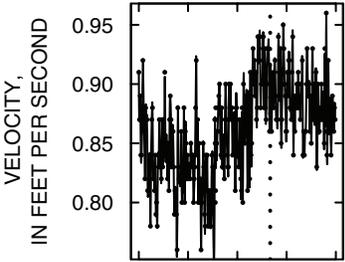
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

DAILY WIND ROSE

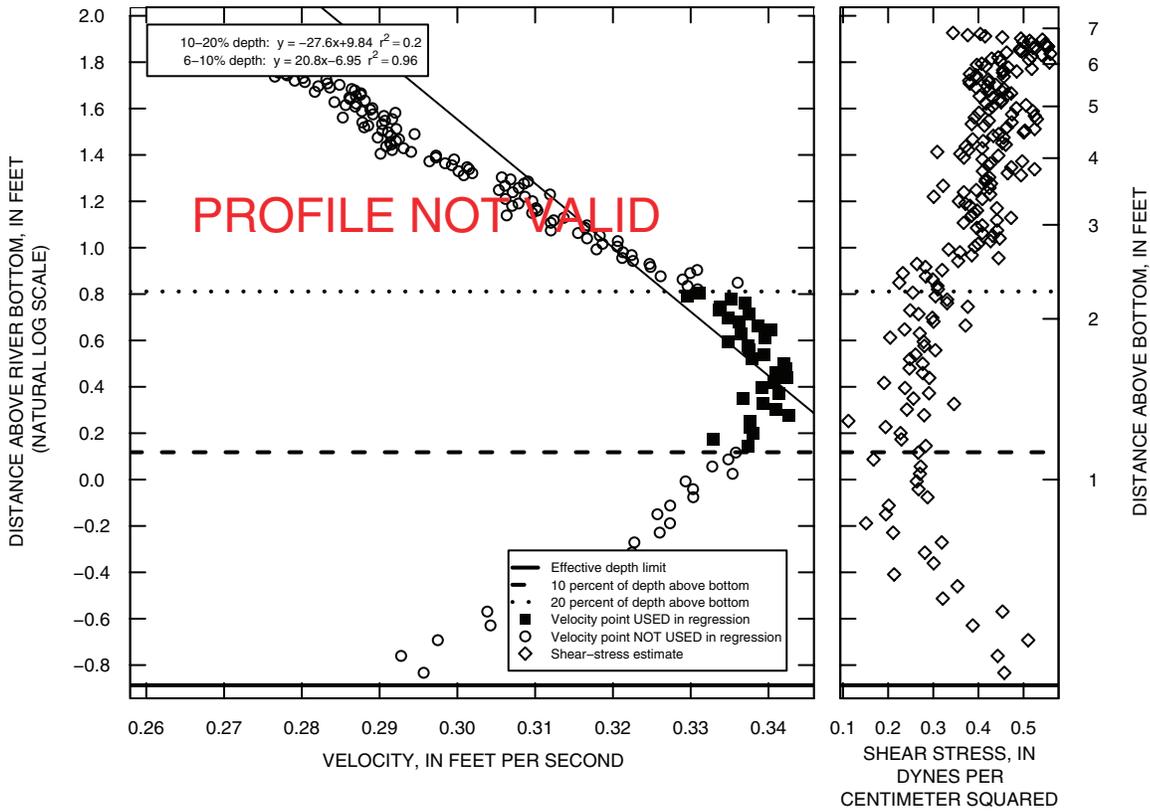


VELOCITY AT DE PERE



**Velocity Profile – Lower Fox River – OU3-8R**

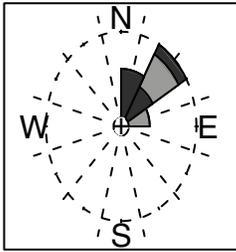
10/26/2004 16:28:52



Vertically averaged water flow: 0.3 ft/s, to direction 16.4°  
 Average wind conditions: 13.76 mi/h, from direction 70°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 0.2 [0.02 ≤ τ ≤ 0.6]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 0.36 [0.3 ≤ τ ≤ 0.43]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 0.3  
 Shear velocity (cm/s): -0.45 [-0.13 ≤ u<sub>\*</sub> ≤ -0.78]  
 Bottom roughness, K<sub>s</sub> (cm): 17207398  
 Boundary Reynolds number: -778210958.19 Test: FAIL

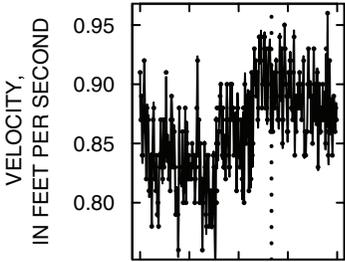
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 11.25	Field recorded ADCP depth (ft): 11.3
Water mode: 11	Field recorded depthfinder depth (ft): 11.4
Water-cell size (cm): 1	Total number of recorded ensembles: 300
Blanking dist. (cm): 25	Heading: 36.76 ± 3.35
Field recorded offset (cm): 107	Pitch: 1.66 ± 0.3
Actual offset (cm): 107	Roll: -1.42 ± 0.62
Latitude: 44° 26' 33.3" N	Filename: Vert20041026162852r.csv
Longitude: 88° 3' 47" W	

VELOCITY AT DE PERE

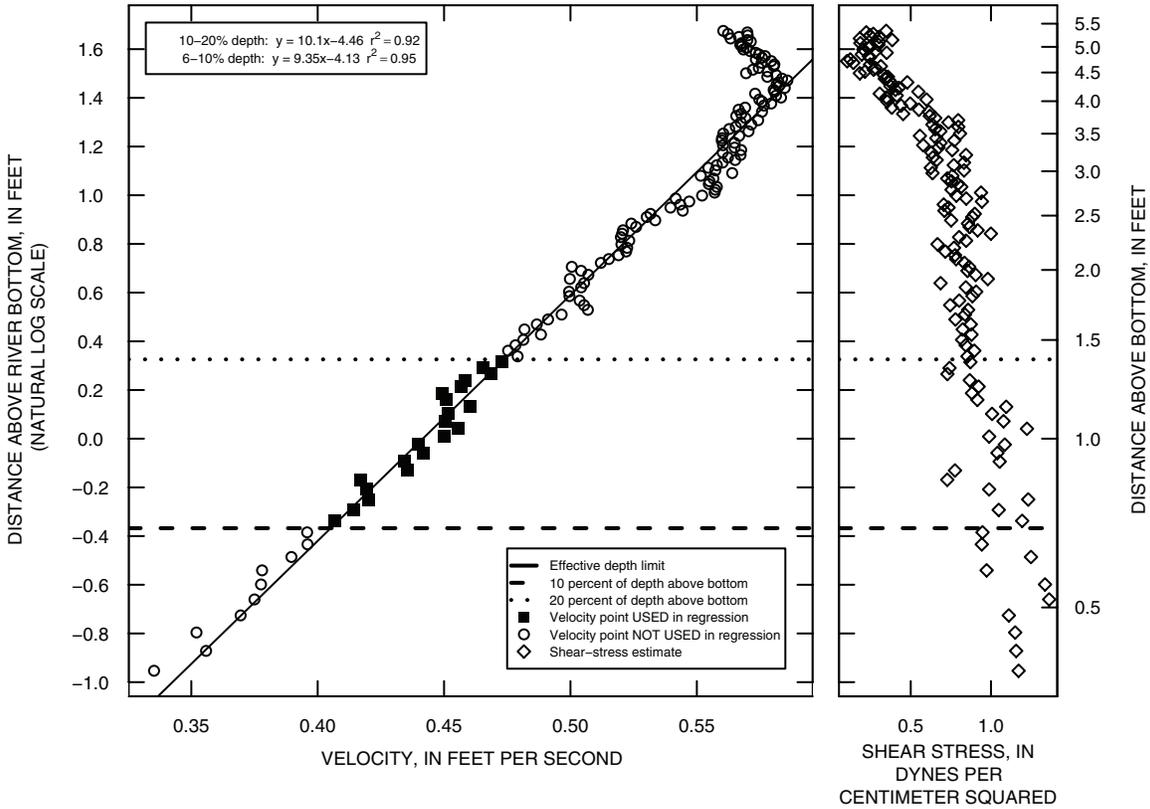


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**Velocity Profile – Lower Fox River – OU3-SUPP1**

10/27/2004 14:22:47



Vertically averaged water flow: 0.52 ft/s, to direction 42.9°  
 Average wind conditions: 13.82 mi/h, from direction 67.2°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 1.53 [1.13 ≤ τ ≤ 2]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 1.79 [1.17 ≤ τ ≤ 2.54]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 1.14  
 Shear velocity (cm/s): 1.24 [1.06 ≤ u\_\* ≤ 1.41]  
 Bottom roughness, K<sub>s</sub> (cm): 10.58  
 Boundary Reynolds number: 1308.58 Test: PASS

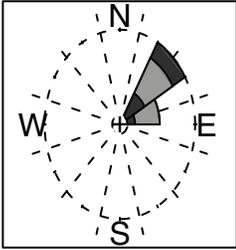
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 6.93	Field recorded ADCP depth (ft): 6.9
Water mode: 11	Field recorded depthfinder depth (ft): 6.5
Water-cell size (cm): 1	Total number of recorded ensembles: 97
Blanking dist. (cm): 25	Heading: 186.89 ± 2.34
Field recorded offset (cm): 21.3	Pitch: 2.97 ± 0.35
Actual offset (cm): 21.3	Roll: -1.9 ± 0.22
Latitude: 44° 24' 20.7" N	Filename: Vert20041027142247r.csv
Longitude: 88° 5' 48.2" W	

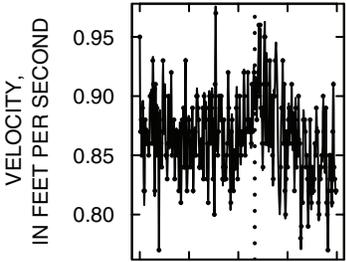
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**DAILY WIND ROSE**

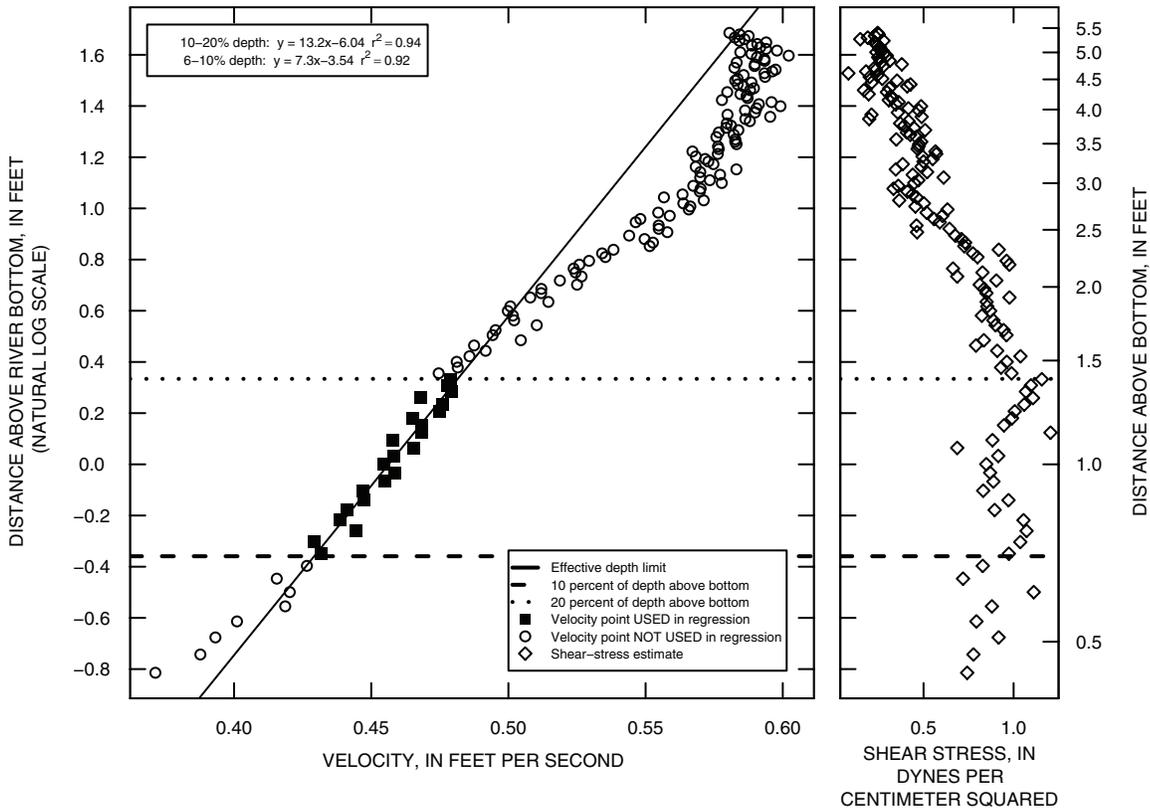


**VELOCITY AT DE PERE**



### Velocity Profile – Lower Fox River – OU3-SUPP2

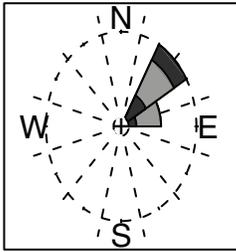
10/27/2004 14:25:42



Vertically averaged water flow: 0.54 ft/s, to direction 41.3°  
 Average wind conditions: 13.82 mi/h, from direction 67.2°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) ( $\text{dyn/cm}^2$ ): 0.89 [ $0.7 \leq \tau \leq 1.11$ ]  
 Shear stress (LP, 6-10% depth) ( $\text{dyn/cm}^2$ ): 2.93 [ $1.48 \leq \tau \leq 4.86$ ]  
 Shear stress (TKE) ( $\text{dyn/cm}^2$ ): 0.85  
 Shear velocity (cm/s): 0.94 [ $0.84 \leq u_* \leq 1.05$ ]  
 Bottom roughness,  $K_s$  (cm): 2.18  
 Boundary Reynolds number: 205.37 Test: PASS

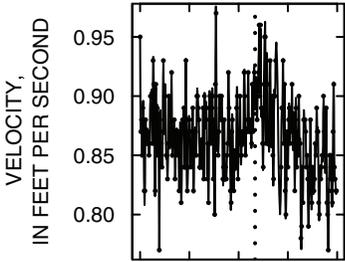
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 6.98	Field recorded ADCP depth (ft): 6.9
Water mode: 11	Field recorded depthfinder depth (ft): 6.5
Water-cell size (cm): 1	Total number of recorded ensembles: 62
Blanking dist. (cm): 25	Heading: $185.47 \pm 3.27$
Field recorded offset (cm): 21.3	Pitch: $3.41 \pm 0.49$
Actual offset (cm): 21.3	Roll: $-1.61 \pm 0.41$
Latitude: $44^\circ 24' 20.7''$ N	Filename: Vert20041027142542r.csv
Longitude: $88^\circ 5' 48.2''$ W	

VELOCITY AT DE PERE



**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

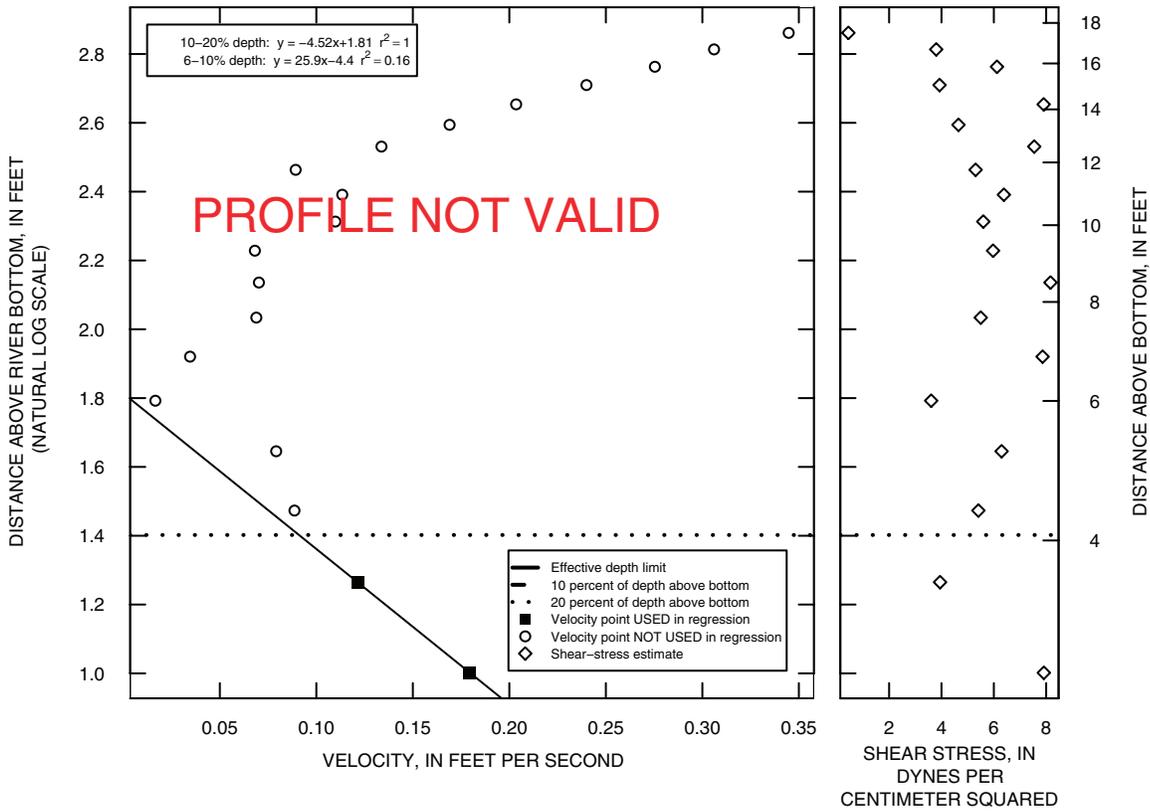
## June 2003 Velocity Profiles (OU-4)

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Results from the June, 2003, shakedown cruise were often given only a transect label without being assigned a site ID letter (A, B, C, etc.) In cases where the site ID is missing or unclear, the recorded coordinate data should be used to verify the actual position of the ADCP deployment.

**Velocity Profile – Lower Fox River – OU4-2**

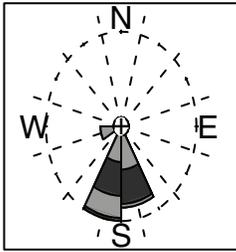
6/23/2003 18:23:47



Vertically averaged water flow: 0.09 ft/s, to direction 38.4°  
 Average wind conditions: 7.62 mi/h, from direction 200°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 7.64 [NaN ≤ τ ≤ NaN]  
 Shear stress (LP, 6–10% depth) (dyn/cm<sup>2</sup>): 0.23 [NaN ≤ τ ≤ NaN]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 0  
 Shear velocity (cm/s): -2.76 [NaN ≤ u<sub>\*</sub> ≤ NaN]  
 Bottom roughness, K<sub>s</sub> (cm): 5607.83  
 Boundary Reynolds number: -1549996.27 Test: FAIL

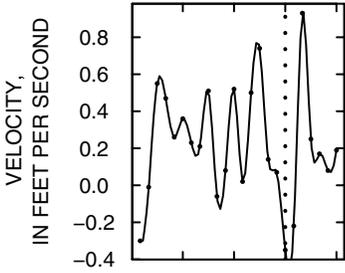
**DAILY WIND ROSE**



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 20.32	Field recorded ADCP depth (ft): --
Water mode: 1	Field recorded depthfinder depth (ft): --
Water-cell size (cm): 25	Total number of recorded ensembles: 1021
Blanking dist. (cm): 25	Heading: 124.25 ± 1.45
Field recorded offset (cm): NA	Pitch: 6.87 ± 0.75
Actual offset (cm): 21.3	Roll: 0.83 ± 0.31
Latitude: 44° 27' 46.72" N	Filename: FoxHydro20030623182347r.csv
Longitude: 88° 3' 24.9" W	

**VELOCITY AT OIL TANK DEPOT**

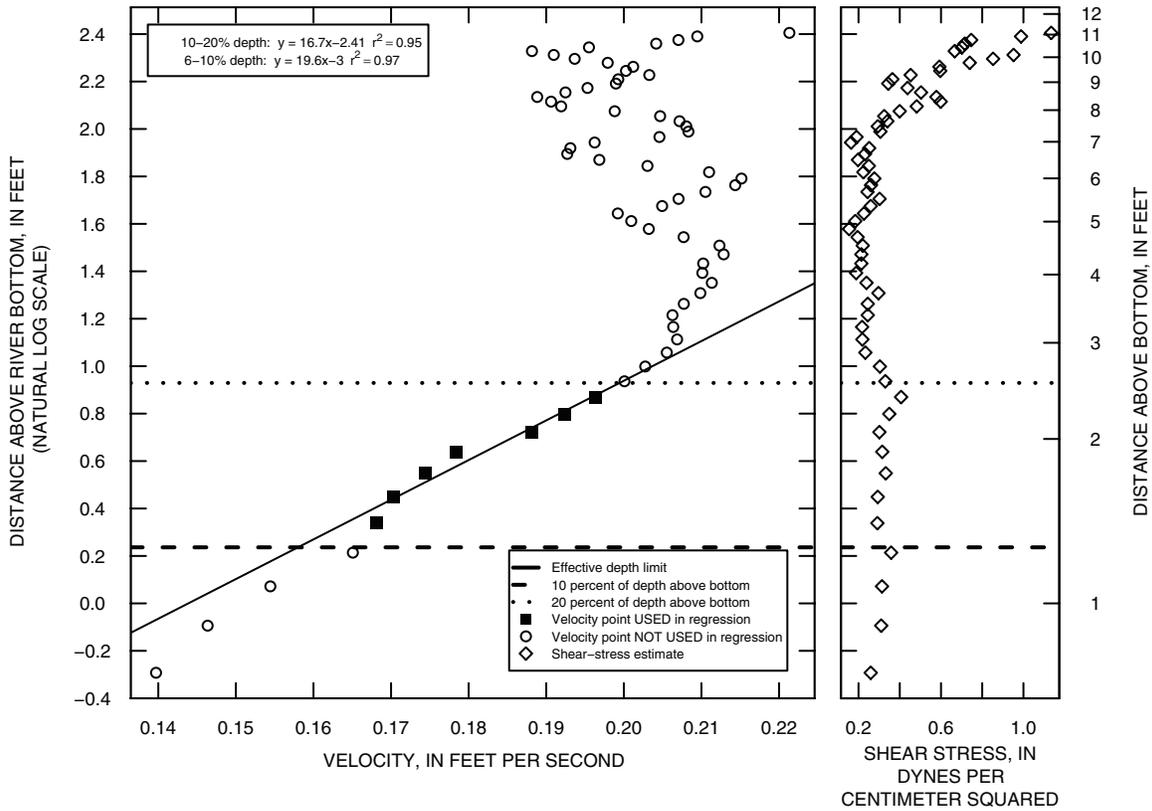


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

### Velocity Profile – Lower Fox River – OU4-2

6/24/2003 17:42:23



Vertically averaged water flow: 0.16 ft/s, to direction 4.3°  
 Average wind conditions: 15.15 mi/h, from direction 203°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 0.56 [0.31 ≤ τ ≤ 0.88]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 0.41 [0.08 ≤ τ ≤ 0.98]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 0.31  
 Shear velocity (cm/s): 0.75 [0.56 ≤ u\_\* ≤ 0.94]  
 Bottom roughness, K<sub>s</sub> (cm): 82.5  
 Boundary Reynolds number: 6166.04 Test: PASS

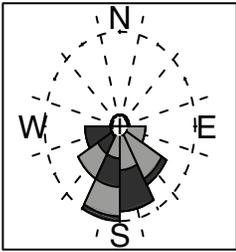
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 12.67	Field recorded ADCP depth (ft): --
Water mode: 5	Field recorded depthfinder depth (ft): --
Water-cell size (cm): 5	Total number of recorded ensembles: 79
Blanking dist. (cm): 25	Heading: 214.18 ± 4.51
Field recorded offset (cm): NA	Pitch: -1.82 ± 0.61
Actual offset (cm): 18.3	Roll: -1.87 ± 0.48
Latitude: 44° 27' 41.7" N	Filename: FoxHydro20030624174223r.csv
Longitude: 88° 3' 26.2" W	

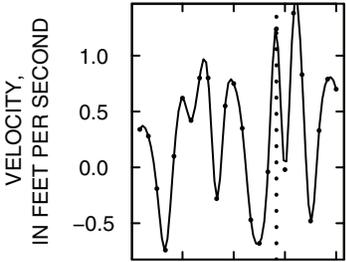
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

DAILY WIND ROSE

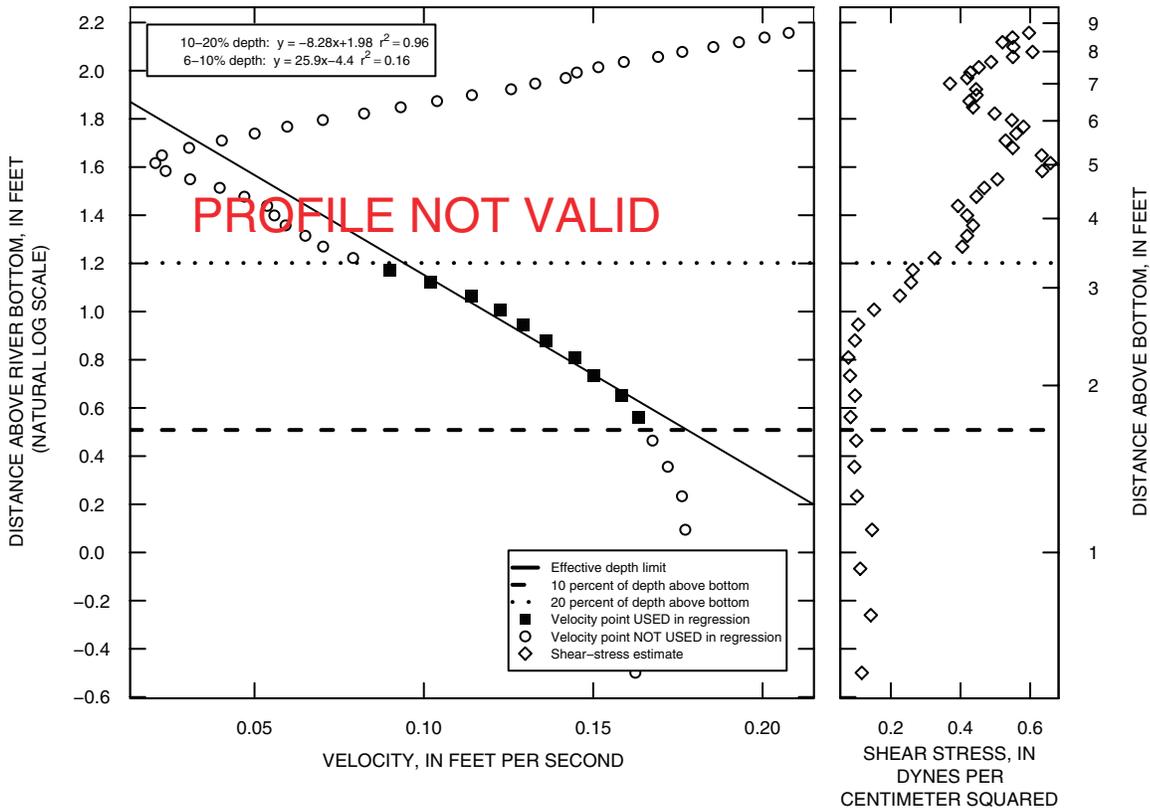


VELOCITY AT OIL TANK DEPOT



### Velocity Profile – Lower Fox River – OU4-3

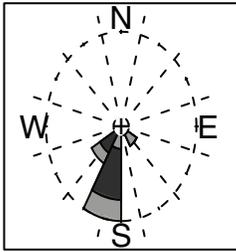
6/25/2003 13:50:49



Vertically averaged water flow: 0.01 ft/s, to direction 269.8°  
 Average wind conditions: 8.8 mi/h, from direction 196.1°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) ( $\text{dyn/cm}^2$ ): 2.28 [ $1.6 \leq \tau \leq 3.07$ ]  
 Shear stress (LP, 6–10% depth) ( $\text{dyn/cm}^2$ ): 0.23 [ $-0.63 \leq \tau \leq 3.09$ ]  
 Shear stress (TKE) ( $\text{dyn/cm}^2$ ): 0.12  
 Shear velocity (cm/s): -1.51 [ $-1.26 \leq u_* \leq -1.75$ ]  
 Bottom roughness,  $K_s$  (cm): 6627.97  
 Boundary Reynolds number: -1000030.54 Test: FAIL

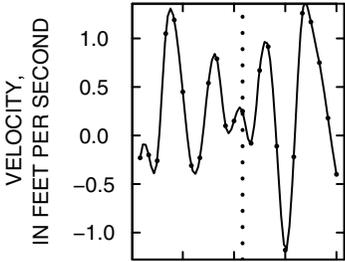
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 16.63	Field recorded ADCP depth (ft): 16.6
Water mode: 5	Field recorded depthfinder depth (ft): 16.4
Water-cell size (cm): 5	Total number of recorded ensembles: 595
Blanking dist. (cm): 25	Heading: $207.06 \pm 5.43$
Field recorded offset (cm): 213	Pitch: $-6.29 \pm 6.12$
Actual offset (cm): 213	Roll: $-1.35 \pm 1.22$
Latitude: $44^\circ 28' 16.9''$ N	Filename: Transect320030625135049r.csv
Longitude: $88^\circ 3' 2.1''$ W	

VELOCITY AT OIL TANK DEPOT

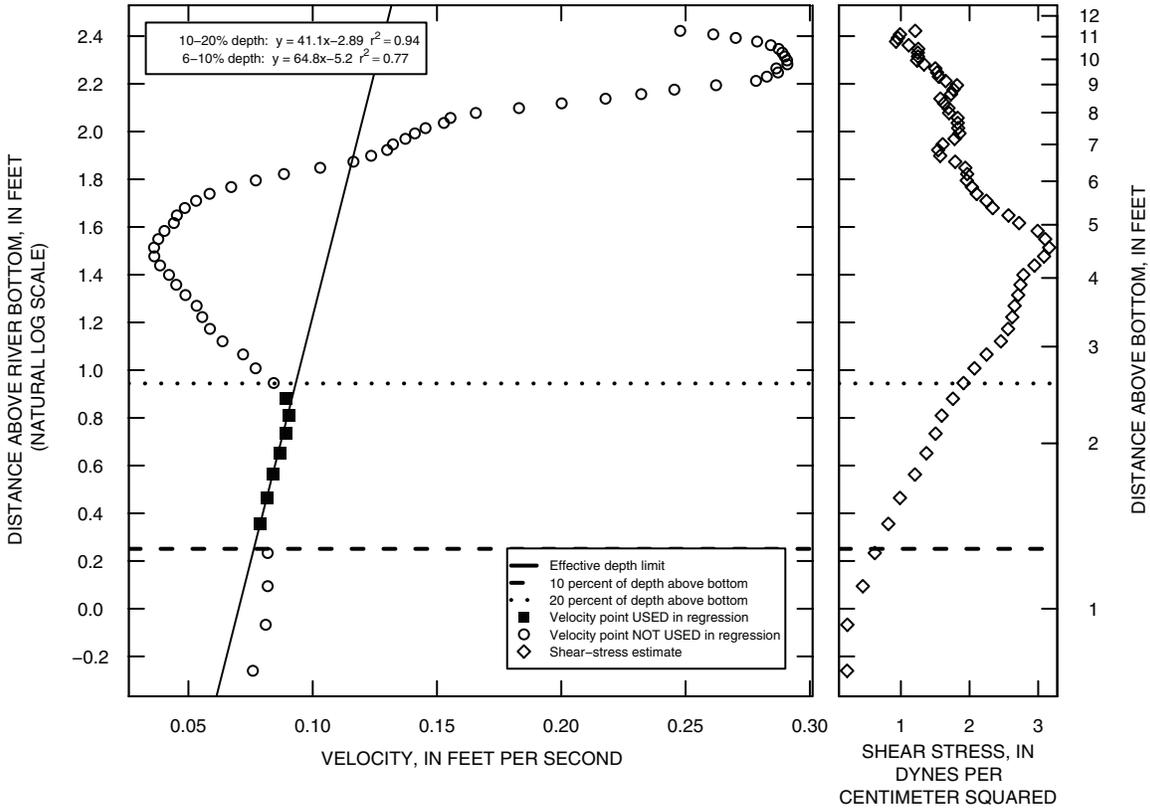


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**Velocity Profile – Lower Fox River – OU4-4**

6/24/2003 17:45:21



Vertically averaged water flow: 0.09 ft/s, to direction 237.2°  
 Average wind conditions: 15.15 mi/h, from direction 203°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 0.09 [0.05 ≤ τ ≤ 0.15]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 0.04 [-0.02 ≤ τ ≤ 0.27]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 0.38  
 Shear velocity (cm/s): 0.3 [0.22 ≤ u\_\* ≤ 0.39]  
 Bottom roughness, K<sub>s</sub> (cm): 50.9  
 Boundary Reynolds number: 1546.38 Test: PASS

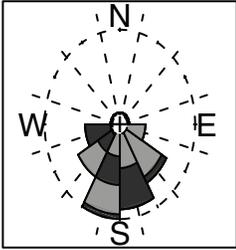
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 12.85	Field recorded ADCP depth (ft): --
Water mode: 5	Field recorded depthfinder depth (ft): --
Water-cell size (cm): 5	Total number of recorded ensembles: 563
Blanking dist. (cm): 25	Heading: 211.46 ± 5.31
Field recorded offset (cm): NA	Pitch: -0.01 ± 1.36
Actual offset (cm): 18.3	Roll: -2.74 ± 0.95
Latitude: 44° 27' 41.7" N	Filename: FoxHydro20030624174521r.csv
Longitude: 88° 3' 26.2" W	

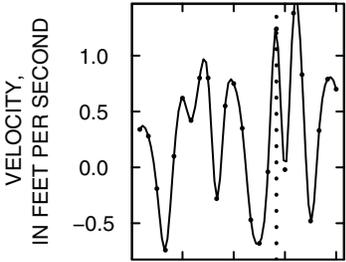
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**DAILY WIND ROSE**

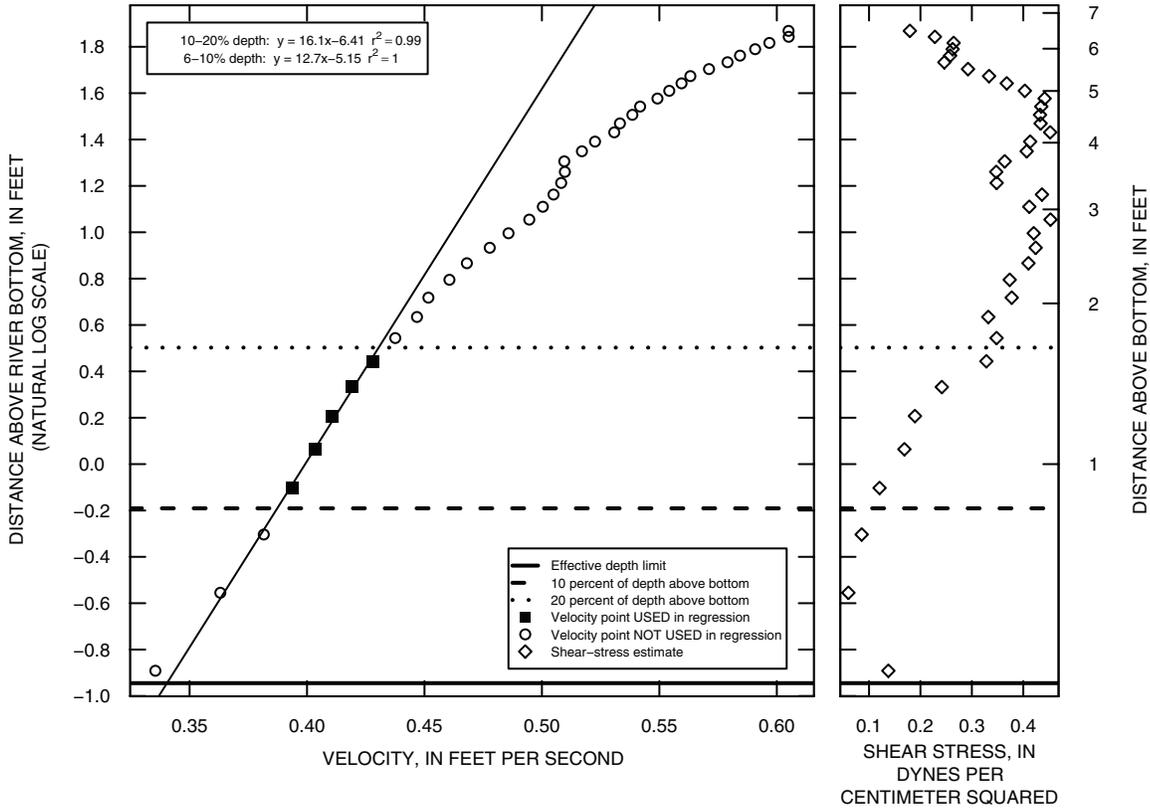


**VELOCITY AT OIL TANK DEPOT**



### Velocity Profile – Lower Fox River – OU4-4

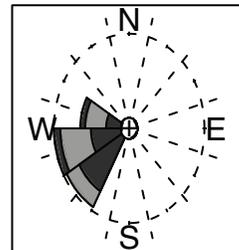
6/27/2003 11:16:10



Vertically averaged water flow: 0.5 ft/s, to direction 32.5°  
 Average wind conditions: 8.72 mi/h, from direction 243.9°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 0.61 [0.44 ≤ τ ≤ 0.8]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 0.97 [0.36 ≤ τ ≤ 1.87]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 0.09  
 Shear velocity (cm/s): 0.78 [0.66 ≤ u\_\* ≤ 0.89]  
 Bottom roughness, K<sub>s</sub> (cm): 1.5  
 Boundary Reynolds number: 116.95 Test: PASS

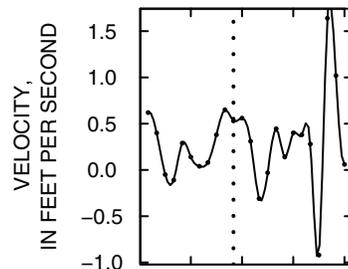
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 8.26	Field recorded ADCP depth (ft): 8.35
Water mode: 5	Field recorded depthfinder depth (ft): ---
Water-cell size (cm): 5	Total number of recorded ensembles: 551
Blanking dist. (cm): 25	Heading: 244.29 ± 3.93
Field recorded offset (cm): NA	Pitch: 1.53 ± 0.49
Actual offset (cm): 24.4	Roll: 0.06 ± 0.76
Latitude: 44° 28' 40.8" N	Filename: Transect420030627111610r.csv
Longitude: 88° 2' 39" W	

VELOCITY AT OIL TANK DEPOT

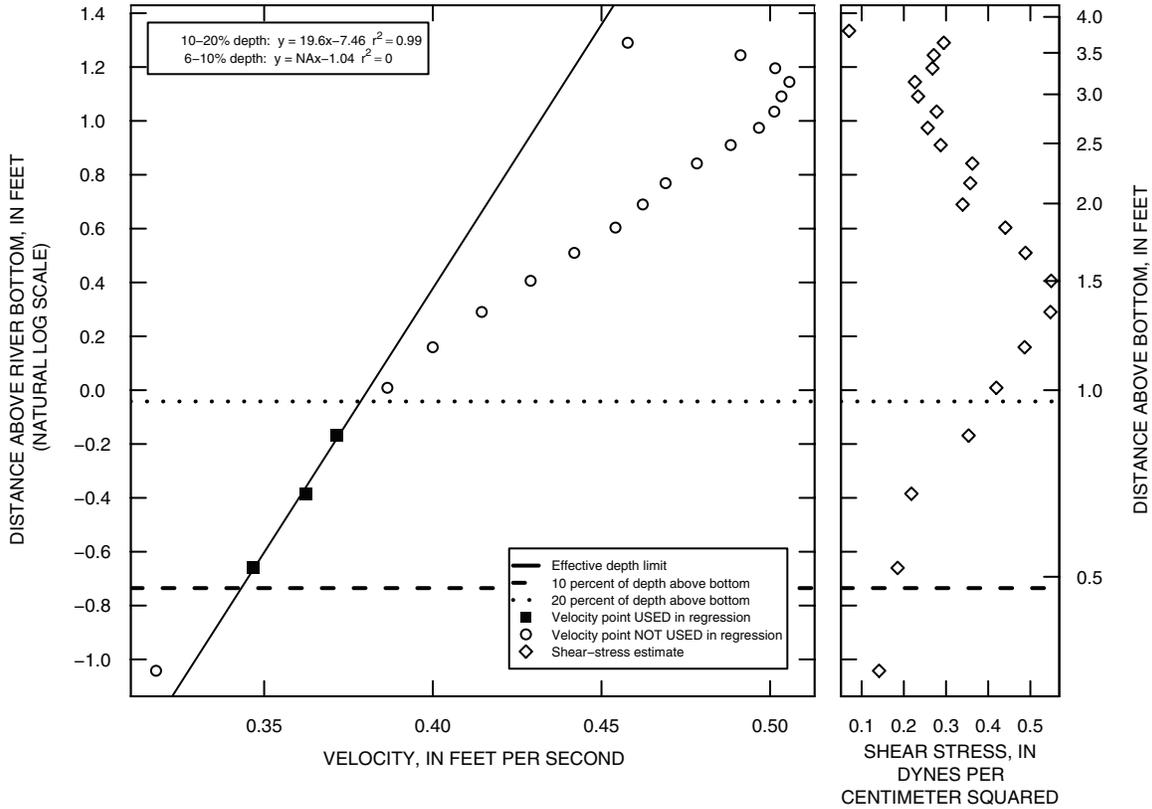


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**Velocity Profile – Lower Fox River – OU4-4R**

6/27/2003 11:37:05



Vertically averaged water flow: 0.44 ft/s, to direction 28.2°  
 Average wind conditions: 8.72 mi/h, from direction 243.9°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 0.41 [0 ≤ τ ≤ 1.72]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): NA [NA ≤ τ ≤ NA]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 0.14  
 Shear velocity (cm/s): 0.64 [-0.04 ≤ u<sub>\*</sub> ≤ 1.31]  
 Bottom roughness, K<sub>s</sub> (cm): 0.52  
 Boundary Reynolds number: 33.43 Test: MAYBE

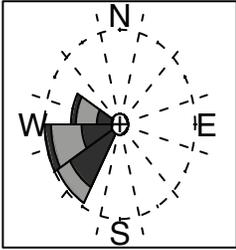
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 4.79	Field recorded ADCP depth (ft): --
Water mode: 11	Field recorded depthfinder depth (ft): --
Water-cell size (cm): 5	Total number of recorded ensembles: 541
Blanking dist. (cm): 1	Heading: 245.27 ± 1.8
Field recorded offset (cm): NA	Pitch: 0.94 ± 0.6
Actual offset (cm): 24.4	Roll: 0.61 ± 1.04
Latitude: 0° 0' 0" N	Filename: Transect420030627113705r.csv
Longitude: 0° 0' 0" W	

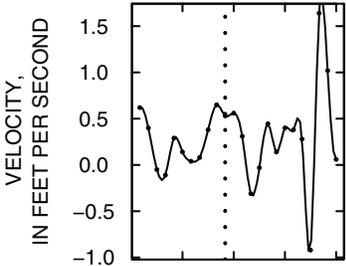
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**DAILY WIND ROSE**

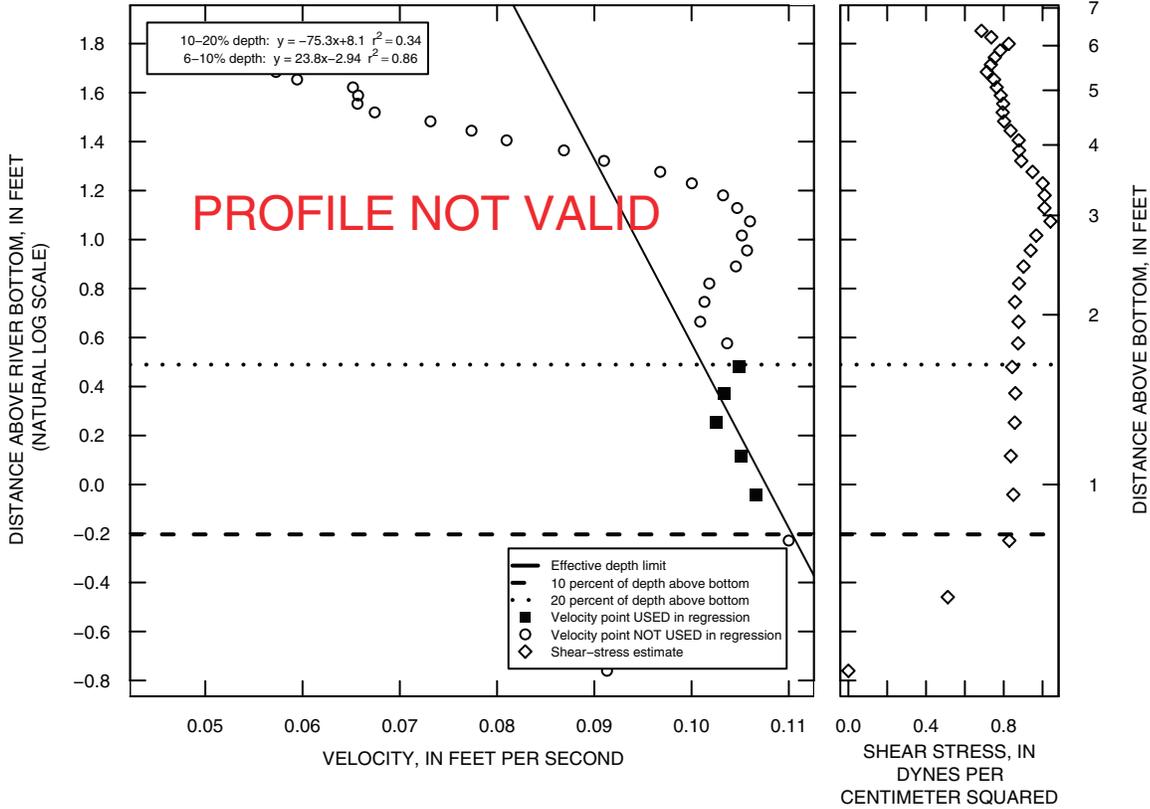


**VELOCITY AT OIL TANK DEPOT**



### Velocity Profile – Lower Fox River – OU4-5L1

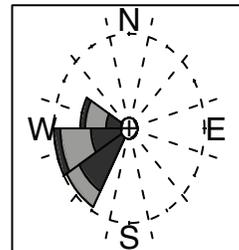
6/27/2003 13:46:05



Vertically averaged water flow: 0.08 ft/s, to direction 214.9°  
 Average wind conditions: 10.73 mi/h, from direction 254.3°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 0.03 [-0.07 ≤ τ ≤ 0.35]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 0.28 [-4.58 ≤ τ ≤ 10.18]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 0.45  
 Shear velocity (cm/s): -0.17 [0.26 ≤ u\_\* ≤ -0.59]  
 Bottom roughness, K<sub>s</sub> (cm): 3035465  
 Boundary Reynolds number: -50364250.59 Test: FAIL

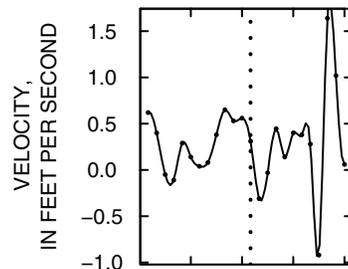
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 8.16	Field recorded ADCP depth (ft): --
Water mode: 5	Field recorded depthfinder depth (ft): 8
Water-cell size (cm): 5	Total number of recorded ensembles: 585
Blanking dist. (cm): 25	Heading: 231.47 ± 3.02
Field recorded offset (cm): NA	Pitch: 1.67 ± 0.48
Actual offset (cm): 24.4	Roll: 0.05 ± 1.6
Latitude: 0° 0' 0" N	Filename: Transect520030627134605r.csv
Longitude: 0° 0' 0" W	

VELOCITY AT OIL TANK DEPOT

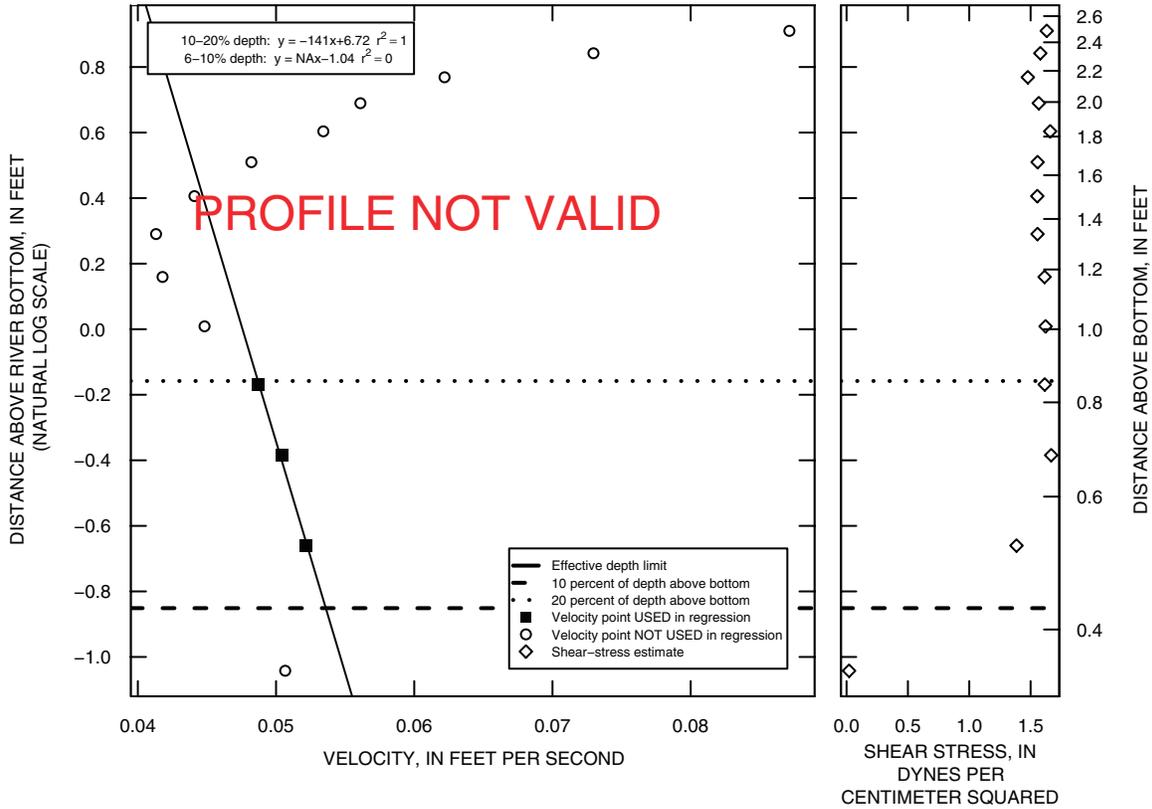


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**Velocity Profile – Lower Fox River – OU4-5R**

6/27/2003 14:09:45



Vertically averaged water flow: 0.05 ft/s, to direction 222.7°  
 Average wind conditions: 15.55 mi/h, from direction 260°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 0.01 [ $0 \leq \tau \leq 0.03$ ]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): NA [ $NA \leq \tau \leq NA$ ]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 0.02  
 Shear velocity (cm/s): -0.09 [ $-0.01 \leq u_* \leq -0.17$ ]  
 Bottom roughness,  $K_s$  (cm): 756712.9  
 Boundary Reynolds number: -6696194.51 Test: FAIL

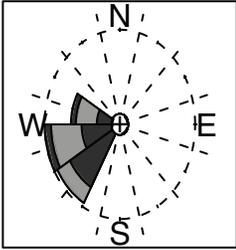
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 4.27	Field recorded ADCP depth (ft): ---
Water mode: 5	Field recorded depthfinder depth (ft): 4.2
Water-cell size (cm): 5	Total number of recorded ensembles: 936
Blanking dist. (cm): 25	Heading: 261.04 ± 3.21
Field recorded offset (cm): NA	Pitch: 2.01 ± 0.5
Actual offset (cm): 24.4	Roll: -1.67 ± 1.08
Latitude: 0° 0' 0" N	Filename: Transect520030627140945r.csv
Longitude: 0° 0' 0" W	

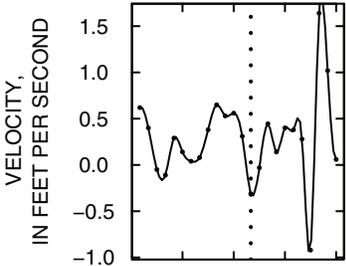
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

DAILY WIND ROSE

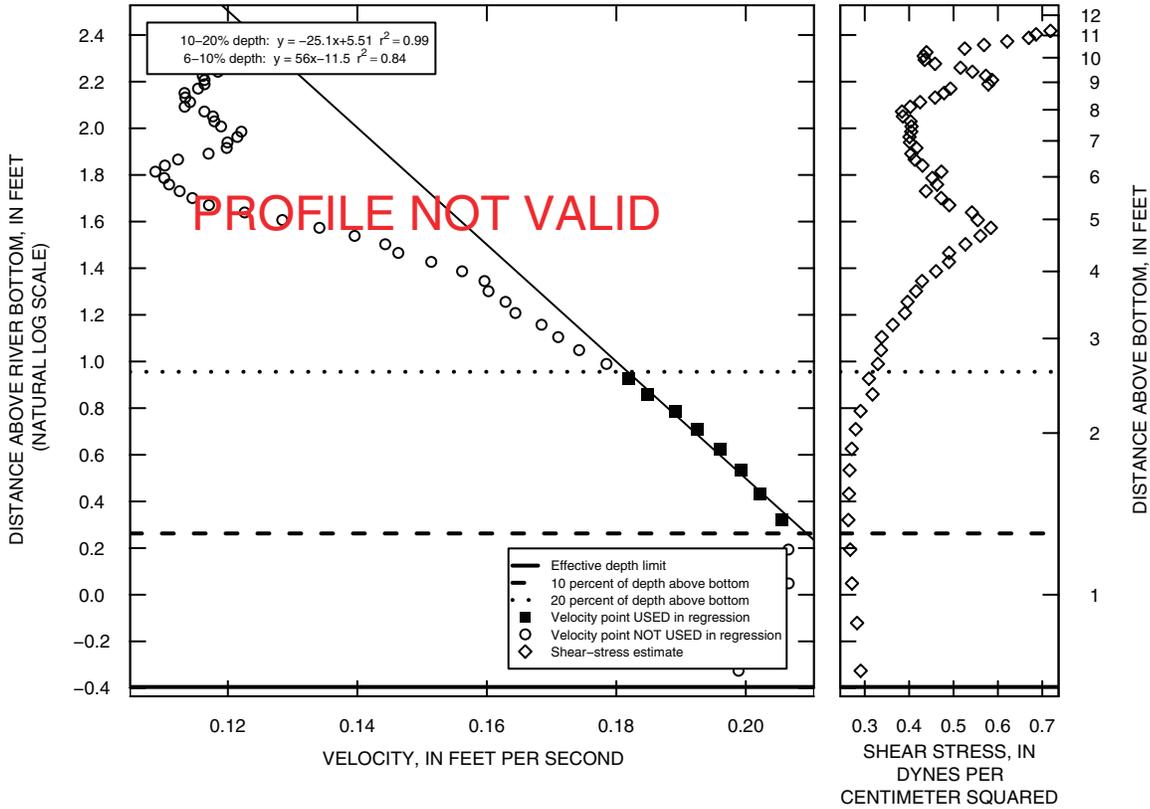


VELOCITY AT OIL TANK DEPOT



**Velocity Profile – Lower Fox River – OU4-6**

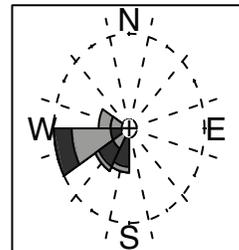
6/26/2003 9:40:30



Vertically averaged water flow: 0.11 ft/s, to direction 228°  
 Average wind conditions: 12.51 mi/h, from direction 232.7°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 0.25 [0.19 ≤ τ ≤ 0.31]  
 Shear stress (LP, 6–10% depth) (dyn/cm<sup>2</sup>): 0.05 [−0.01 ≤ τ ≤ 0.27]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 0.28  
 Shear velocity (cm/s): −0.5 [−0.44 ≤ u<sub>\*</sub> ≤ −0.56]  
 Bottom roughness, K<sub>s</sub> (cm): 226437.7  
 Boundary Reynolds number: −11288385.12 Test: FAIL

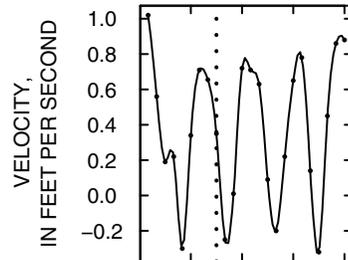
**DAILY WIND ROSE**



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 13	Field recorded ADCP depth (ft): --
Water mode: 5	Field recorded depthfinder depth (ft): --
Water-cell size (cm): 5	Total number of recorded ensembles: 494
Blanking dist. (cm): 25	Heading: 240.62 ± 4.9
Field recorded offset (cm): NA	Pitch: 1.35 ± 0.54
Actual offset (cm): 24.4	Roll: 0.97 ± 0.53
Latitude: 44° 29' 19.6" N	Filename: Transect620030626094030r.csv
Longitude: 88° 1' 50.4" W	

**VELOCITY AT OIL TANK DEPOT**

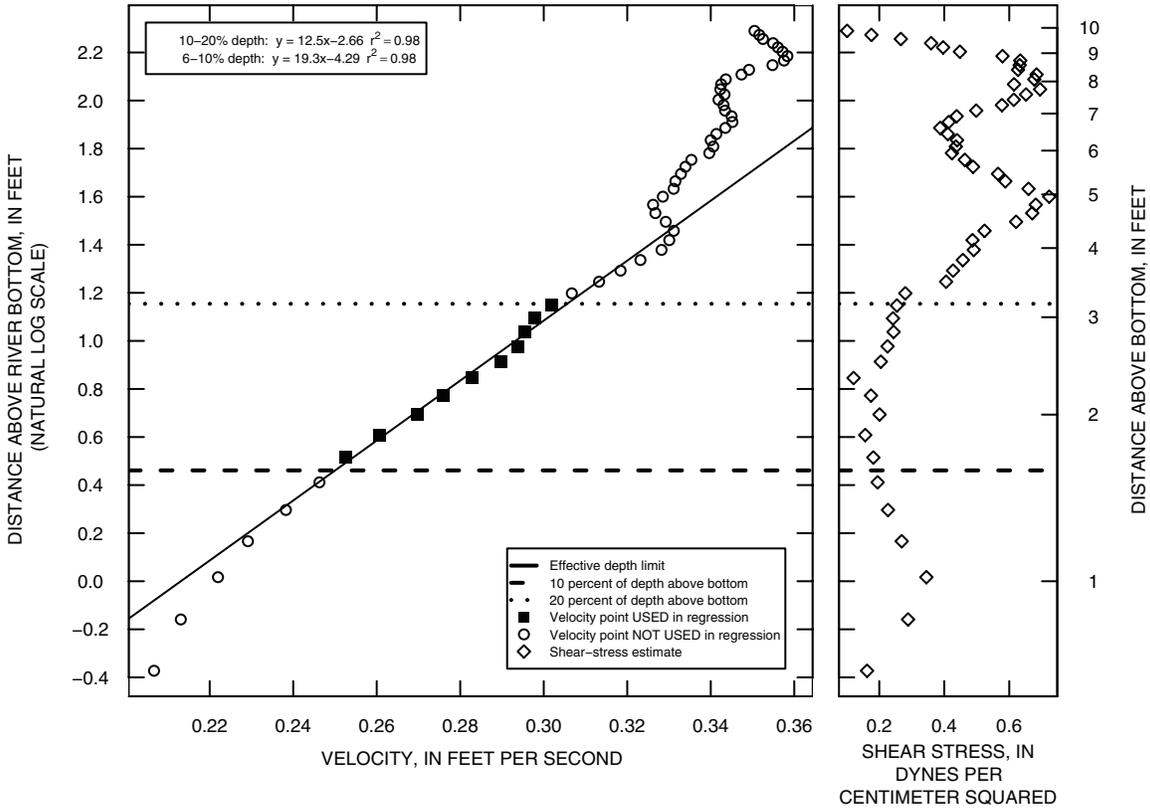


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**Velocity Profile – Lower Fox River – OU4-7**

6/26/2003 13:14:23



Vertically averaged water flow: 0.32 ft/s, to direction 10.9°  
 Average wind conditions: 15.68 mi/h, from direction 263.2°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 1 [0.8 ≤ τ ≤ 1.23]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 0.42 [0.26 ≤ τ ≤ 0.61]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 0.25  
 Shear velocity (cm/s): 1 [0.89 ≤ u\_\* ≤ 1.11]  
 Bottom roughness, K<sub>s</sub> (cm): 64.06  
 Boundary Reynolds number: 6417.22 Test: PASS

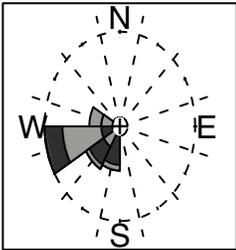
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 15.86	Field recorded ADCP depth (ft): --
Water mode: 5	Field recorded depthfinder depth (ft): --
Water-cell size (cm): 5	Total number of recorded ensembles: 532
Blanking dist. (cm): 25	Heading: 182.35 ± 3.17
Field recorded offset (cm): 152	Pitch: 0.2 ± 0.91
Actual offset (cm): 152	Roll: 0.54 ± 1.71
Latitude: 44° 30' 59.76" N	Filename: Transect720030626131423r.csv
Longitude: 88° 0' 57.13" W	

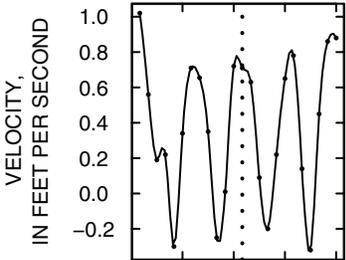
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**DAILY WIND ROSE**



**VELOCITY AT OIL TANK DEPOT**

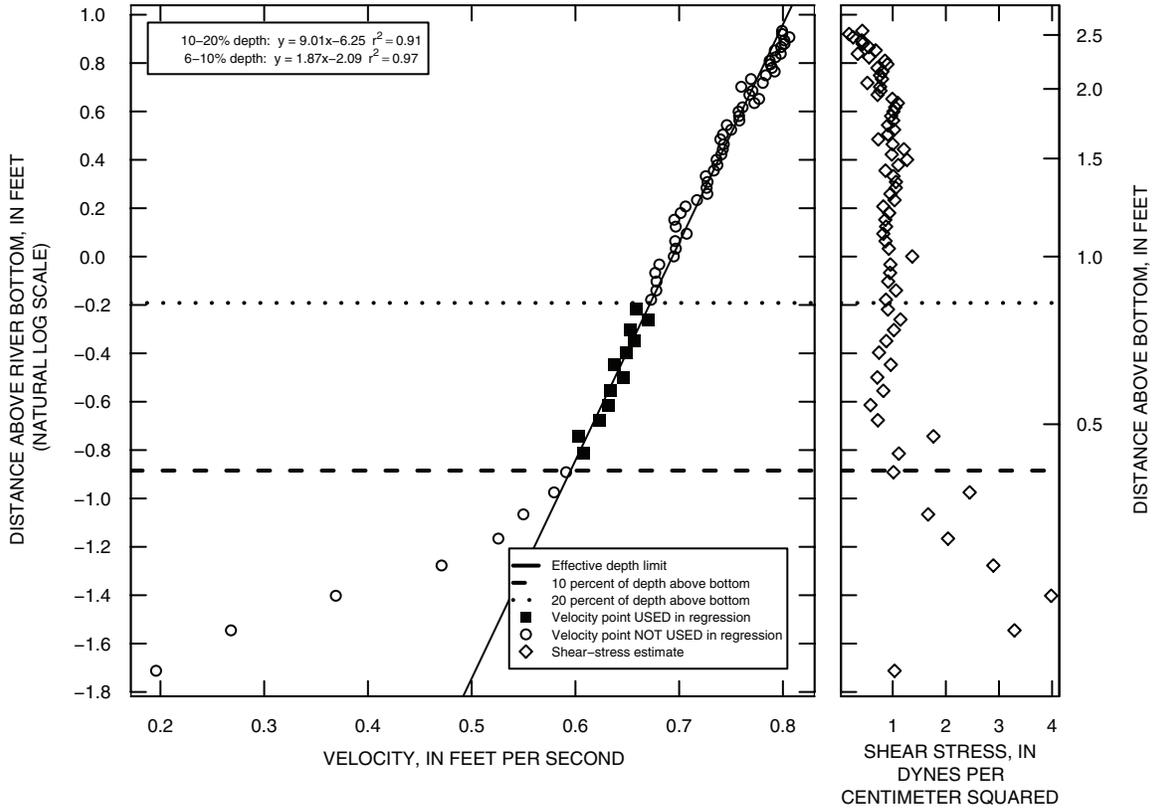


## November 2003 Velocity Profiles (OU-4)

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**Velocity Profile – Lower Fox River – OU4-1A**

11/5/2003 11:01:02



Vertically averaged water flow: 0.7 ft/s, to direction 31.7°  
 Average wind conditions: 9.17 mi/h, from direction 283.1°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 1.92 [1.16 ≤ τ ≤ 2.88]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 44.47 [29.3 ≤ τ ≤ 62.8]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 2.3  
 Shear velocity (cm/s): 1.39 [1.08 ≤ u\_\* ≤ 1.7]  
 Bottom roughness, K<sub>s</sub> (cm): 1.77  
 Boundary Reynolds number: 244.86 Test: PASS

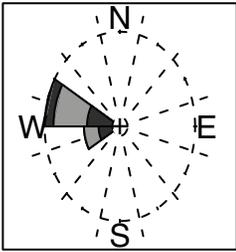
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 4.13	Field recorded ADCP depth (ft): ---
Water mode: 11	Field recorded depthfinder depth (ft): 4.1
Water-cell size (cm): 1	Total number of recorded ensembles: 293
Blanking dist. (cm): 25	Heading: 253.73 ± 1.7
Field recorded offset (cm): 21.3	Pitch: 2.69 ± 0.6
Actual offset (cm): 21.3	Roll: -1.45 ± 0.57
Latitude: 44° 27' 21.8" N	Filename: Vert20031105110102r.csv
Longitude: 88° 4' 4.3" W	

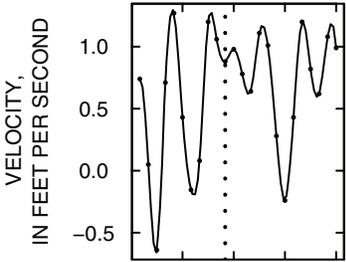
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**DAILY WIND ROSE**

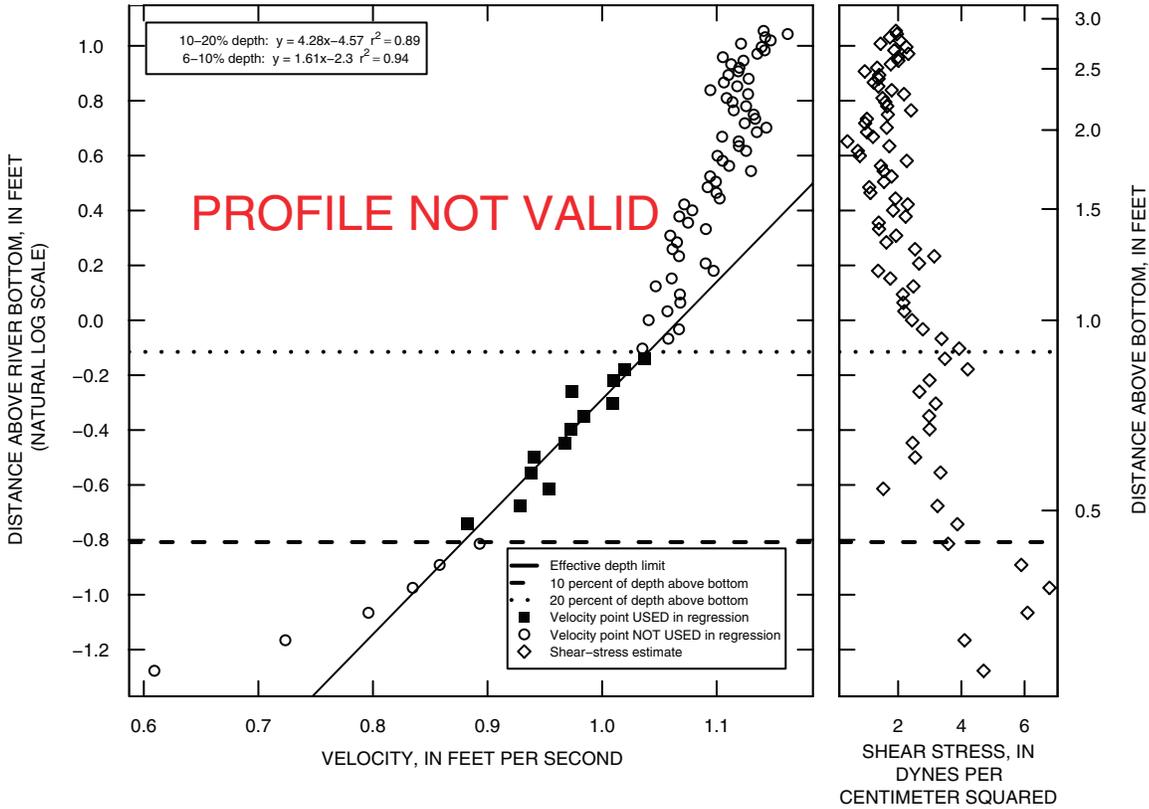


**VELOCITY AT OIL TANK DEPOT**



**Velocity Profile – Lower Fox River – OU4-1B1**

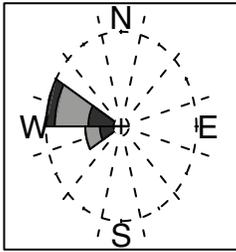
11/5/2003 11:15:05



Vertically averaged water flow: 1.06 ft/s, to direction 38.9°  
 Average wind conditions: 9.17 mi/h, from direction 283.1°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) ( $\text{dyn/cm}^2$ ): 8.52 [ $4.94 \leq \tau \leq 13.09$ ]  
 Shear stress (LP, 6-10% depth) ( $\text{dyn/cm}^2$ ): 60.06 [ $26.53 \leq \tau \leq 107.09$ ]  
 Shear stress (TKE) ( $\text{dyn/cm}^2$ ): 5.19  
 Shear velocity (cm/s): 2.92 [ $2.22 \leq u_* \leq 3.62$ ]  
 Bottom roughness,  $K_s$  (cm): 9.49  
 Boundary Reynolds number: 2770.17 Test: PASS

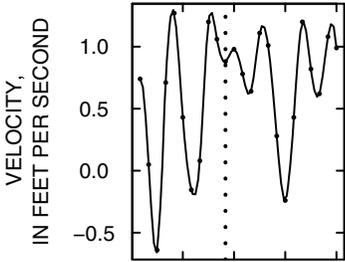
**DAILY WIND ROSE**



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 4.46	Field recorded ADCP depth (ft): ---
Water mode: 11	Field recorded depthfinder depth (ft): 4.4
Water-cell size (cm): 1	Total number of recorded ensembles: 35
Blanking dist. (cm): 25	Heading: 235.26 ± 5.51
Field recorded offset (cm): 21.3	Pitch: 2.52 ± 0.2
Actual offset (cm): 21.3	Roll: -2.41 ± 0.46
Latitude: 44° 27' 18.2" N	Filename: Vert20031105111505r.csv
Longitude: 88° 4' 1.2" W	

**VELOCITY AT OIL TANK DEPOT**

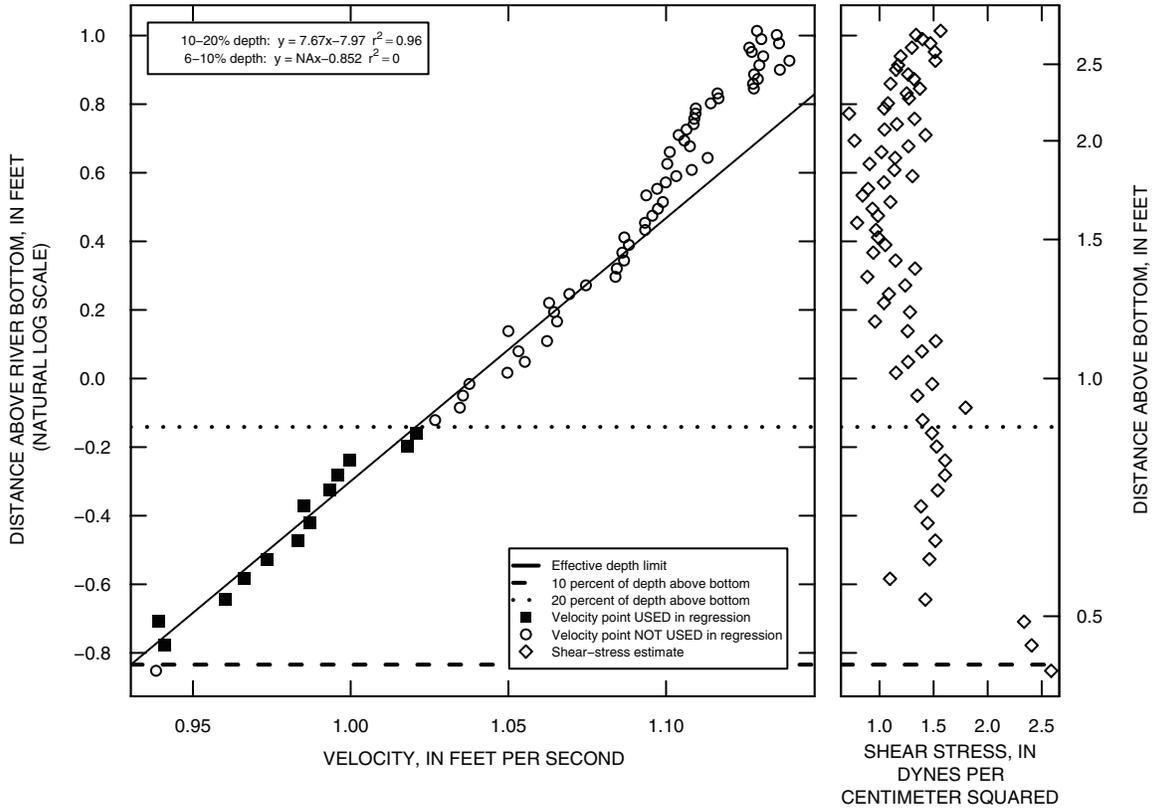


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**Velocity Profile – Lower Fox River – OU4-1B2**

11/5/2003 11:16:42



Vertically averaged water flow: 1.07 ft/s, to direction 36.3°  
 Average wind conditions: 9.17 mi/h, from direction 283.1°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 2.65 [1.97 ≤ τ ≤ 3.43]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): NA [NA ≤ τ ≤ NA]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 2.59  
 Shear velocity (cm/s): 1.63 [1.41 ≤ u\_\* ≤ 1.85]  
 Bottom roughness, K<sub>s</sub> (cm): 0.31  
 Boundary Reynolds number: 51.25 Test: MAYBE

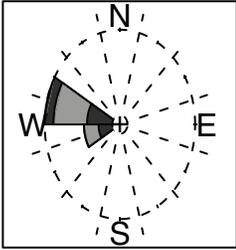
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 4.34	Field recorded ADCP depth (ft): --
Water mode: 11	Field recorded depthfinder depth (ft): 4.4
Water-cell size (cm): 1	Total number of recorded ensembles: 274
Blanking dist. (cm): 25	Heading: 233.09 ± 1.95
Field recorded offset (cm): 21.3	Pitch: 2.43 ± 0.4
Actual offset (cm): 21.3	Roll: -1.21 ± 0.89
Latitude: 44° 27' 18.2" N	Filename: Vert20031105111642r.csv
Longitude: 88° 4' 1.2" W	

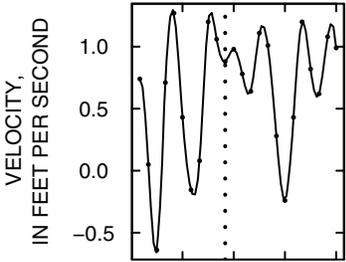
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**DAILY WIND ROSE**

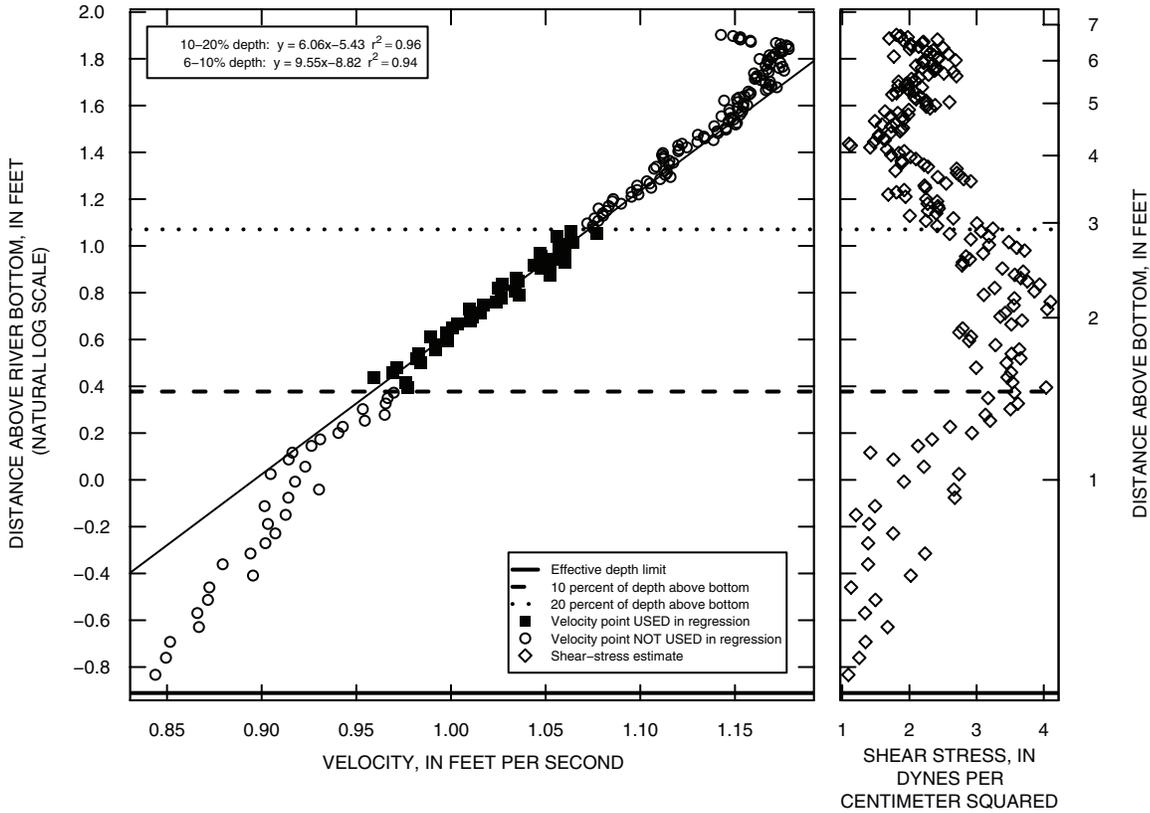


**VELOCITY AT OIL TANK DEPOT**



### Velocity Profile – Lower Fox River – OU4-1C1

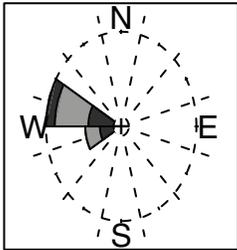
11/5/2003 11:33:20



Vertically averaged water flow: 1.07 ft/s, to direction 45.9°  
 Average wind conditions: 9.17 mi/h, from direction 283.1°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 4.26 [3.75 ≤ τ ≤ 4.79]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 1.71 [1.4 ≤ τ ≤ 2.06]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 2.12  
 Shear velocity (cm/s): 2.06 [1.94 ≤ u\_\* ≤ 2.19]  
 Bottom roughness, K<sub>s</sub> (cm): 4.01  
 Boundary Reynolds number: 827.93 Test: PASS

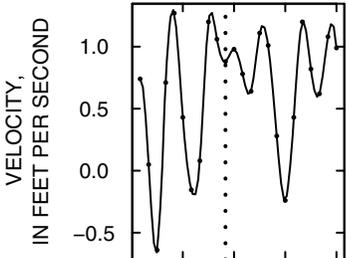
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 14.59	Field recorded ADCP depth (ft): --
Water mode: 11	Field recorded depthfinder depth (ft): 14.6
Water-cell size (cm): 1	Total number of recorded ensembles: 143
Blanking dist. (cm): 25	Heading: 243.83 ± 8.3
Field recorded offset (cm): 213	Pitch: -3.09 ± 2.4
Actual offset (cm): 213	Roll: -3.71 ± 2.73
Latitude: 44° 27' 15.5" N	Filename: Vert20031105113320r.csv
Longitude: 88° 3' 59" W	

VELOCITY AT OIL TANK DEPOT

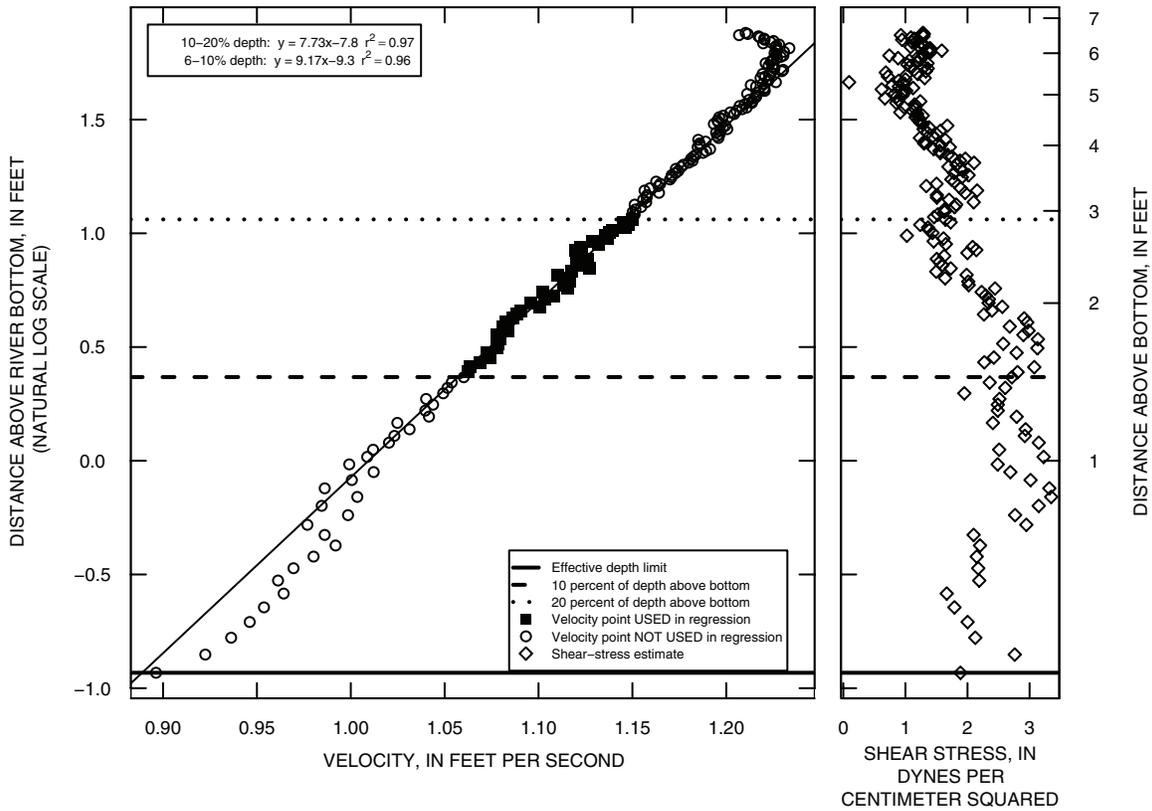


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

### Velocity Profile – Lower Fox River – OU4-1C2

11/5/2003 11:37:49



Vertically averaged water flow: 1.14 ft/s, to direction 43.1°  
 Average wind conditions: 9.17 mi/h, from direction 283.1°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 2.61 [2.35 ≤ τ ≤ 2.89]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 1.86 [1.59 ≤ τ ≤ 2.15]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 2.54  
 Shear velocity (cm/s): 1.62 [1.53 ≤ u\_\* ≤ 1.7]  
 Bottom roughness, K<sub>s</sub> (cm): 0.37  
 Boundary Reynolds number: 60.39 Test: MAYBE

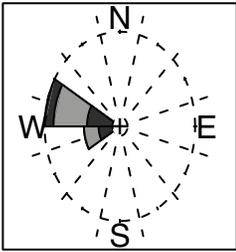
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 14.45	Field recorded ADCP depth (ft): --
Water mode: 11	Field recorded depthfinder depth (ft): 14.6
Water-cell size (cm): 1	Total number of recorded ensembles: 236
Blanking dist. (cm): 25	Heading: 256.26 ± 6.22
Field recorded offset (cm): 213	Pitch: -2.12 ± 1.51
Actual offset (cm): 213	Roll: -4.77 ± 1.97
Latitude: 44° 27' 15.5" N	Filename: Vert20031105113749r.csv
Longitude: 88° 3' 59" W	

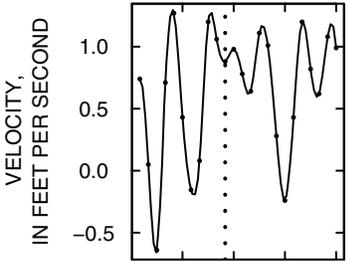
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

DAILY WIND ROSE

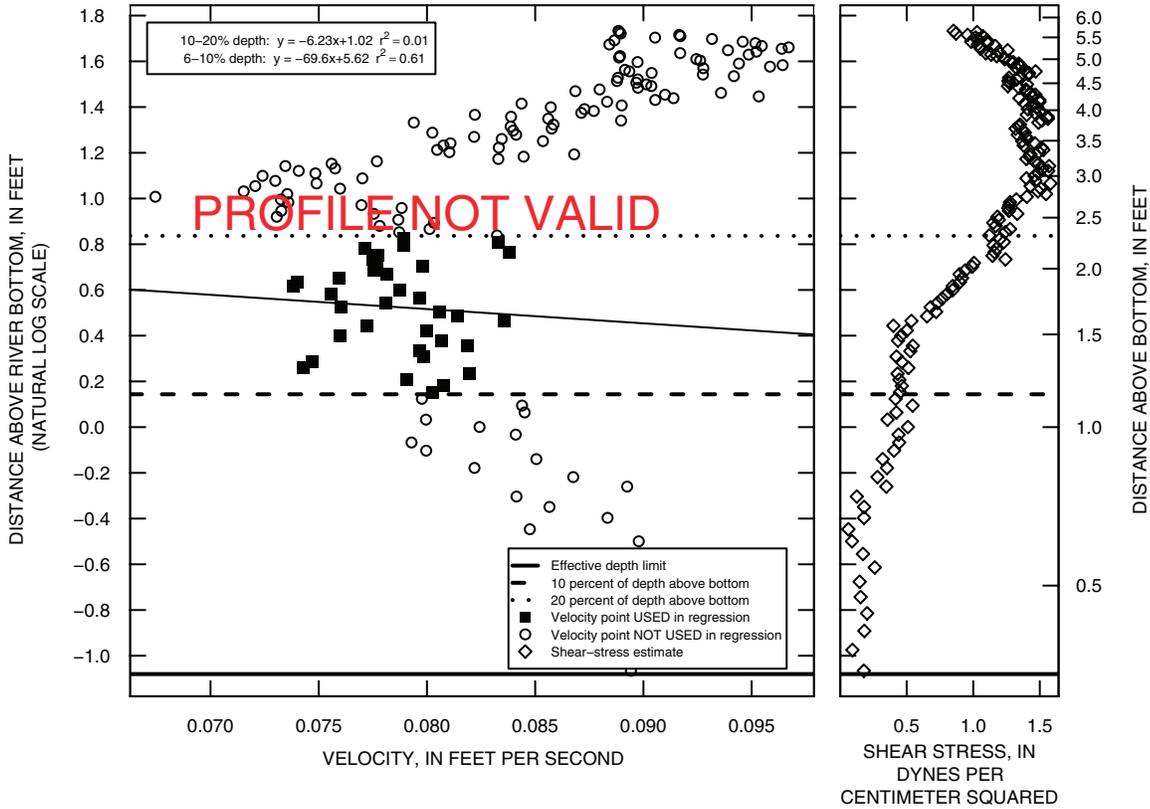


VELOCITY AT OIL TANK DEPOT



### Velocity Profile – Lower Fox River – OU4-1D

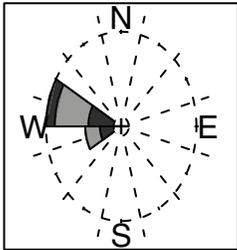
11/5/2003 11:55:52



Vertically averaged water flow: 0.08 ft/s, to direction 175.2°  
 Average wind conditions: 9.17 mi/h, from direction 283.1°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) ( $\text{dyn/cm}^2$ ): 4.02 [ $-42.33 \leq \tau \leq 110.58$ ]  
 Shear stress (LP, 6-10% depth) ( $\text{dyn/cm}^2$ ): 0.03 [ $0.01 \leq \tau \leq 0.06$ ]  
 Shear stress (TKE) ( $\text{dyn/cm}^2$ ): 0.27  
 Shear velocity (cm/s): -2 [ $6.51 \leq u_* \leq -10.52$ ]  
 Bottom roughness,  $K_s$  (cm): 2523.59  
 Boundary Reynolds number: -505875.8 Test: FAIL

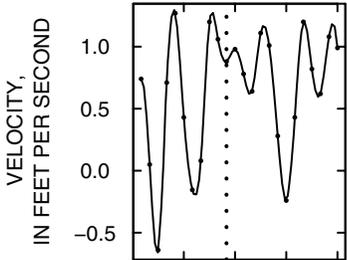
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 11.55	Field recorded ADCP depth (ft): --
Water mode: 11	Field recorded depthfinder depth (ft): 11.8
Water-cell size (cm): 1	Total number of recorded ensembles: 262
Blanking dist. (cm): 25	Heading: $276.49 \pm 2.78$
Field recorded offset (cm): 152	Pitch: $1.49 \pm 0.69$
Actual offset (cm): 152	Roll: $-0.18 \pm 3.59$
Latitude: $44^\circ 27' 10.8''$ N	Filename: Vert20031105115552r.csv
Longitude: $88^\circ 3' 54.6''$ W	

VELOCITY AT OIL TANK DEPOT

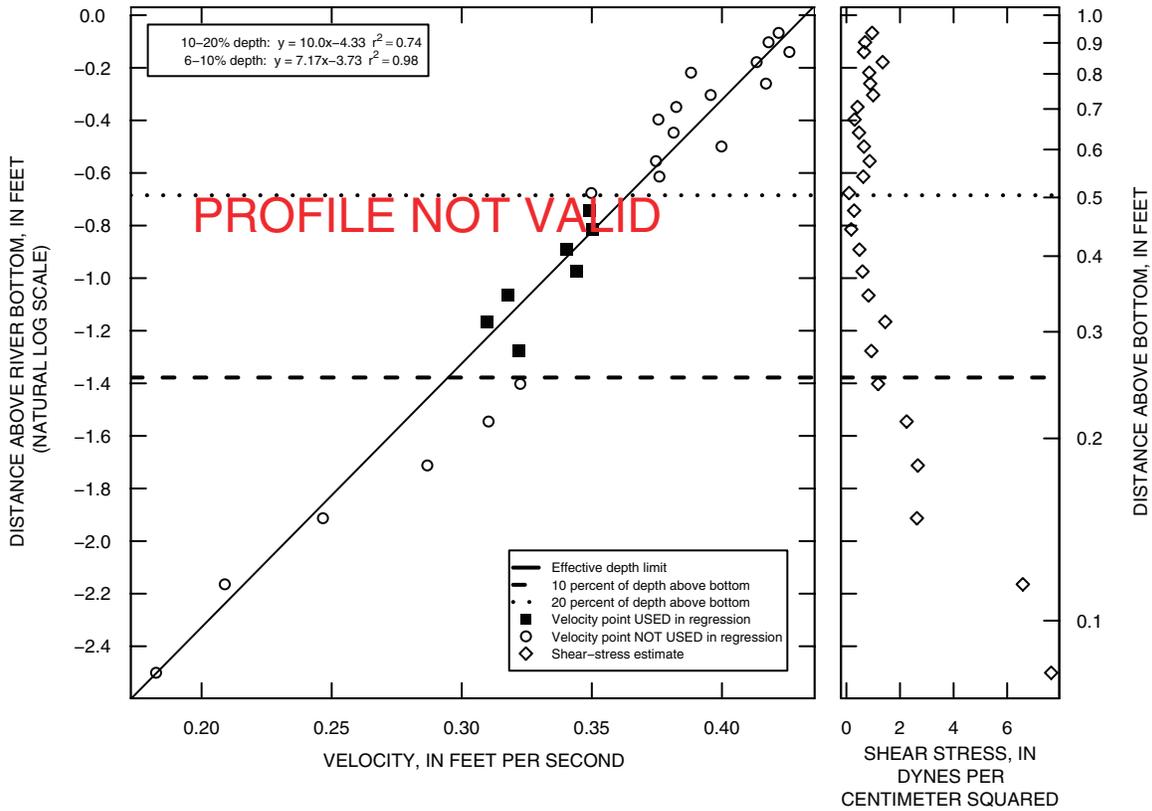


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**Velocity Profile – Lower Fox River – OU4-1L**

11/5/2003 10:48:03



Vertically averaged water flow: 0.35 ft/s, to direction 45°  
 Average wind conditions: 11.02 mi/h, from direction 291.1°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 1.55 [0.16 ≤ τ ≤ 4.35]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 3.04 [1.96 ≤ τ ≤ 4.35]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 3.83  
 Shear velocity (cm/s): 1.25 [0.41 ≤ u\_\* ≤ 2.09]  
 Bottom roughness, K<sub>s</sub> (cm): 11.99  
 Boundary Reynolds number: 1493.97 Test: PASS

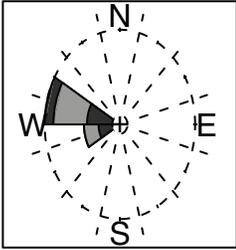
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 2.52	Field recorded ADCP depth (ft): --
Water mode: 11	Field recorded depthfinder depth (ft): 2.4
Water-cell size (cm): 1	Total number of recorded ensembles: 187
Blanking dist. (cm): 25	Heading: 273.2 ± 3.39
Field recorded offset (cm): 21.3	Pitch: 2.1 ± 0.18
Actual offset (cm): 21.3	Roll: -1.54 ± 0.53
Latitude: 0° 0' 0" N	Filename: Vert20031105104803r.csv
Longitude: 0° 0' 0" W	

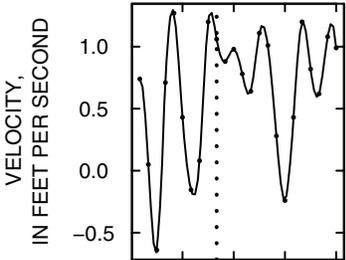
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**DAILY WIND ROSE**

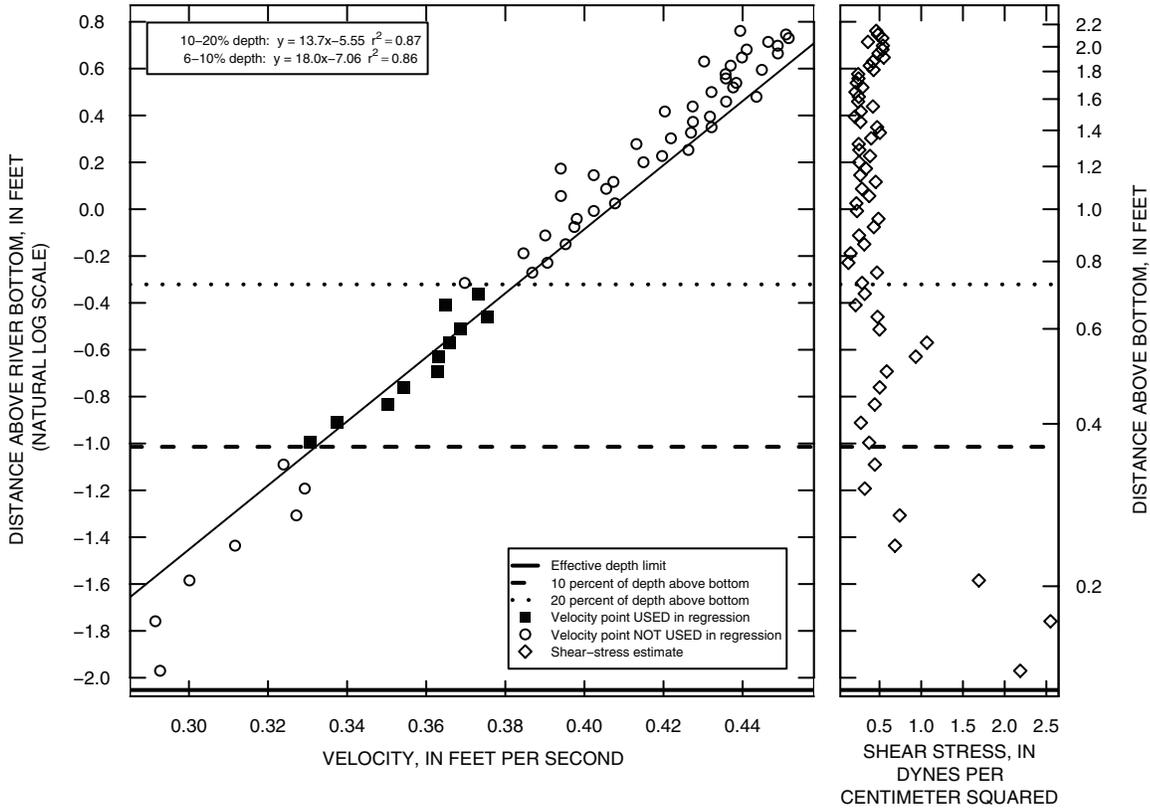


**VELOCITY AT OIL TANK DEPOT**



**Velocity Profile – Lower Fox River – OU4-2A**

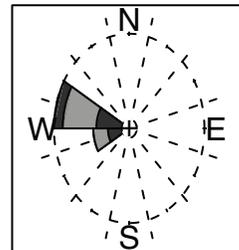
11/5/2003 13:47:43



Vertically averaged water flow: 0.4 ft/s, to direction 37.6°  
 Average wind conditions: 9.49 mi/h, from direction 288°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 0.84 [0.42 ≤ τ ≤ 1.39]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 0.48 [0.14 ≤ τ ≤ 1.02]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 1.23  
 Shear velocity (cm/s): 0.91 [0.65 ≤ u\_\* ≤ 1.18]  
 Bottom roughness, K<sub>s</sub> (cm): 3.54  
 Boundary Reynolds number: 323.63 Test: PASS

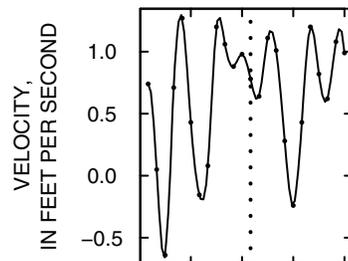
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 3.63	Field recorded ADCP depth (ft): --
Water mode: 11	Field recorded depthfinder depth (ft): 3.2
Water-cell size (cm): 1	Total number of recorded ensembles: 257
Blanking dist. (cm): 25	Heading: 212.51 ± 1.78
Field recorded offset (cm): 18.3	Pitch: 0.71 ± 0.71
Actual offset (cm): 18.3	Roll: -0.25 ± 4.59
Latitude: 44° 27' 43.4" N	Filename: Vert20031105134743r.csv
Longitude: 88° 3' 32.5" W	

VELOCITY AT OIL TANK DEPOT

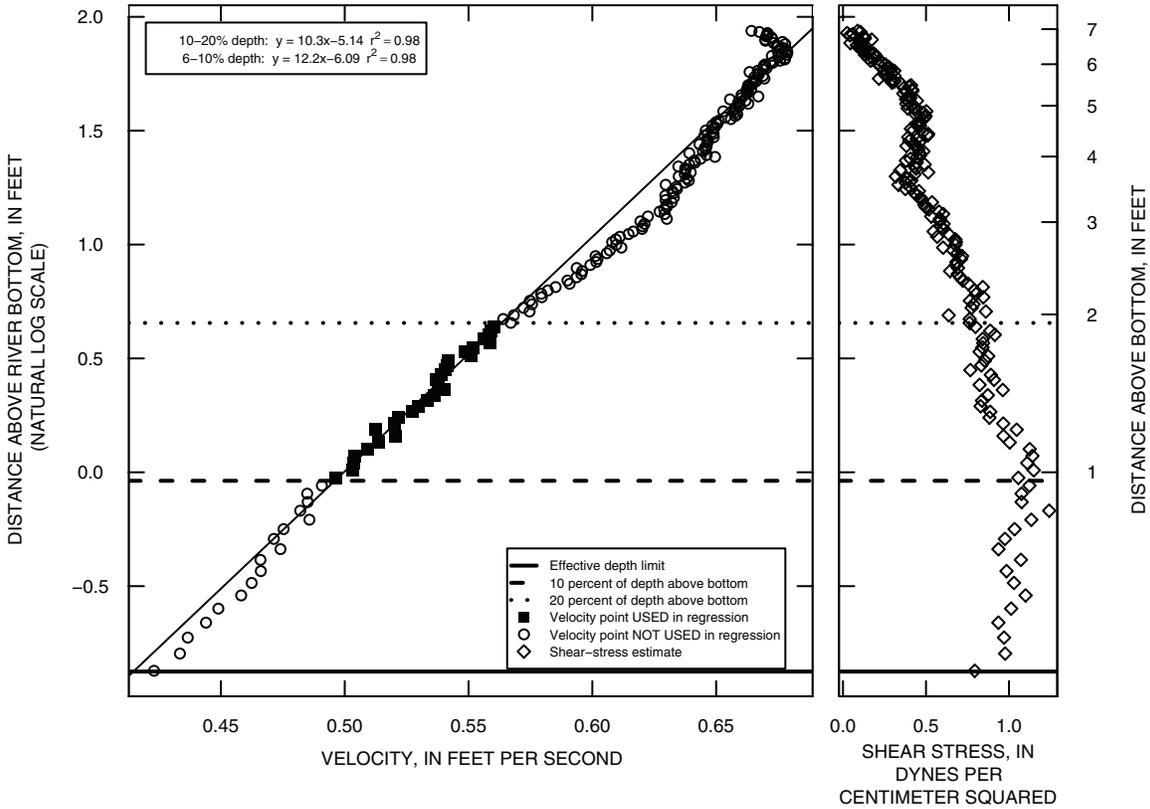


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**Velocity Profile – Lower Fox River – OU4-2B**

11/5/2003 13:36:17



Vertically averaged water flow: 0.61 ft/s, to direction 41.4°  
 Average wind conditions: 9.49 mi/h, from direction 288°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 1.47 [1.31 ≤ τ ≤ 1.65]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 1.04 [0.87 ≤ τ ≤ 1.23]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 1.03  
 Shear velocity (cm/s): 1.21 [1.14 ≤ u\_\* ≤ 1.28]  
 Bottom roughness, K<sub>s</sub> (cm): 5.33  
 Boundary Reynolds number: 647.01 Test: PASS

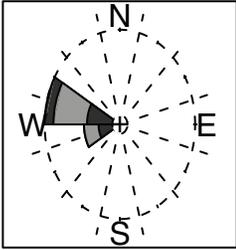
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 9.63	Field recorded ADCP depth (ft): --
Water mode: 11	Field recorded depthfinder depth (ft): 9.5
Water-cell size (cm): 1	Total number of recorded ensembles: 260
Blanking dist. (cm): 25	Heading: 228.41 ± 1.48
Field recorded offset (cm): 54.9	Pitch: 0.93 ± 0.19
Actual offset (cm): 54.9	Roll: -1.84 ± 1.95
Latitude: 44° 27' 43" N	Filename: Vert20031105133617r.csv
Longitude: 88° 3' 31.4" W	

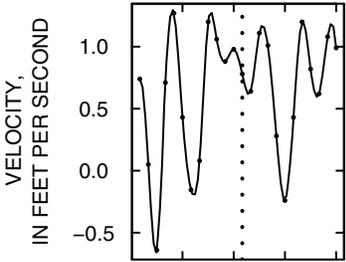
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**DAILY WIND ROSE**

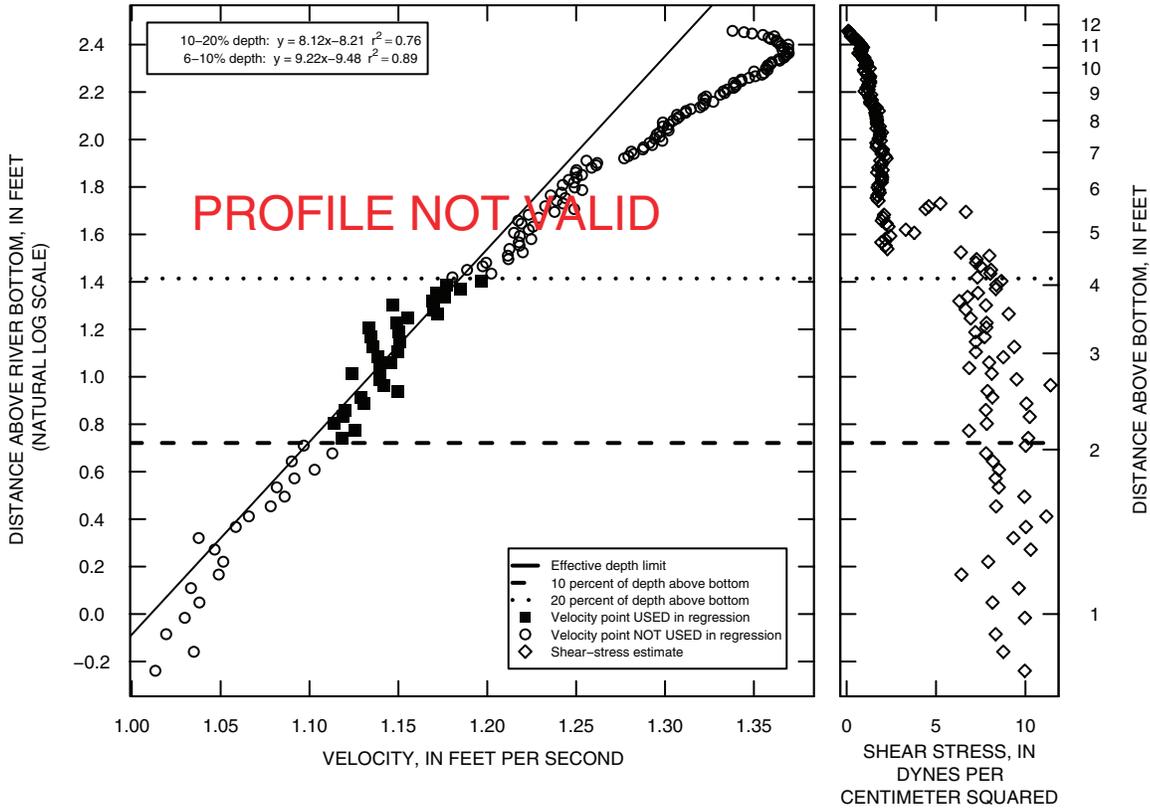


**VELOCITY AT OIL TANK DEPOT**



### Velocity Profile – Lower Fox River – OU4-2C

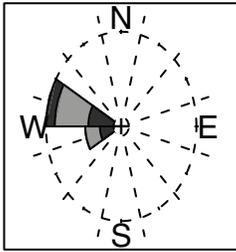
11/5/2003 13:17:27



Vertically averaged water flow: 1.24 ft/s, to direction 35.1°  
 Average wind conditions: 9.49 mi/h, from direction 288°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 2.37 [1.47 ≤ τ ≤ 3.47]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 1.84 [1.26 ≤ τ ≤ 2.53]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 8.98  
 Shear velocity (cm/s): 1.54 [1.21 ≤ u\_\* ≤ 1.86]  
 Bottom roughness, K<sub>s</sub> (cm): 0.25  
 Boundary Reynolds number: 38.22 Test: MAYBE

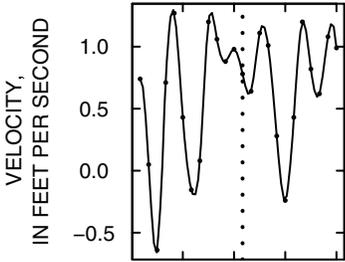
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 20.57	Field recorded ADCP depth (ft): --
Water mode: 11	Field recorded depthfinder depth (ft): 20.5
Water-cell size (cm): 2	Total number of recorded ensembles: 255
Blanking dist. (cm): 25	Heading: 230.47 ± 2.44
Field recorded offset (cm): 244	Pitch: -2.12 ± 0.65
Actual offset (cm): 244	Roll: -3.1 ± 3.16
Latitude: 44° 27' 43.3" N	Filename: Vert20031105131727r.csv
Longitude: 88° 3' 27.8" W	

VELOCITY AT OIL TANK DEPOT

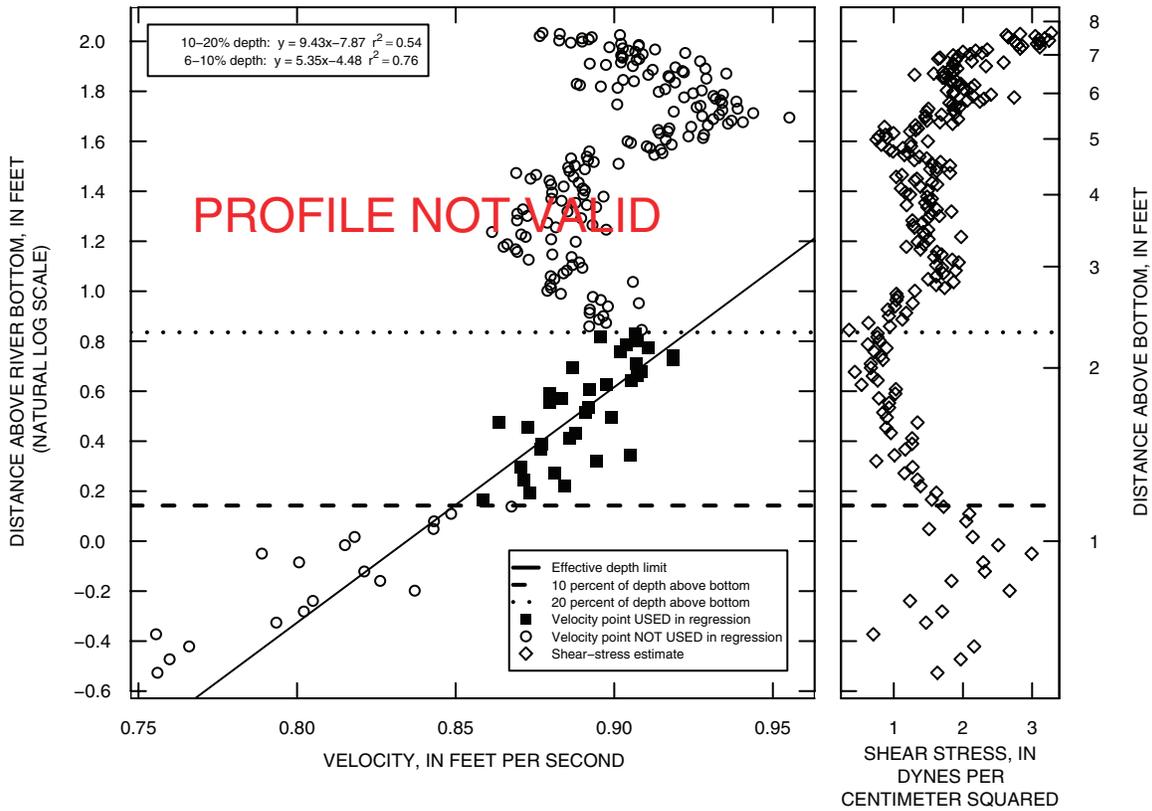


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**Velocity Profile – Lower Fox River – OU4-2D1**

11/5/2003 12:47:00



Vertically averaged water flow: 0.89 ft/s, to direction 26.5°  
Average wind conditions: 8.47 mi/h, from direction 280°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 1.76 [0.8 ≤ τ ≤ 3.08]  
 Shear stress (LP, 6–10% depth) (dyn/cm<sup>2</sup>): 5.46 [2.69 ≤ τ ≤ 9.2]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 1.94  
 Shear velocity (cm/s): 1.33 [0.9 ≤ u\_\* ≤ 1.76]  
 Bottom roughness, K<sub>s</sub> (cm): 0.35  
 Boundary Reynolds number: 46.43 Test: MAYBE

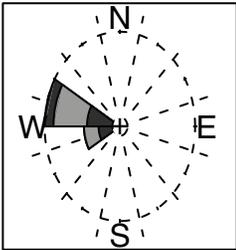
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 11.53	Field recorded ADCP depth (ft): ---
Water mode: 11	Field recorded depthfinder depth (ft): 10.6
Water-cell size (cm): 1	Total number of recorded ensembles: 15
Blanking dist. (cm): 25	Heading: 234.68 ± 13.49
Field recorded offset (cm): 91.4	Pitch: 1.1 ± 0.28
Actual offset (cm): 91.4	Roll: -4.15 ± 0.91
Latitude: 44° 27' 41.6" N	Filename: Vert20031105124700r.csv
Longitude: 88° 3' 26.2" W	

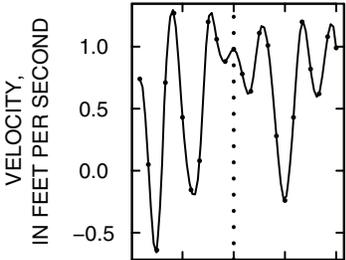
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**DAILY WIND ROSE**

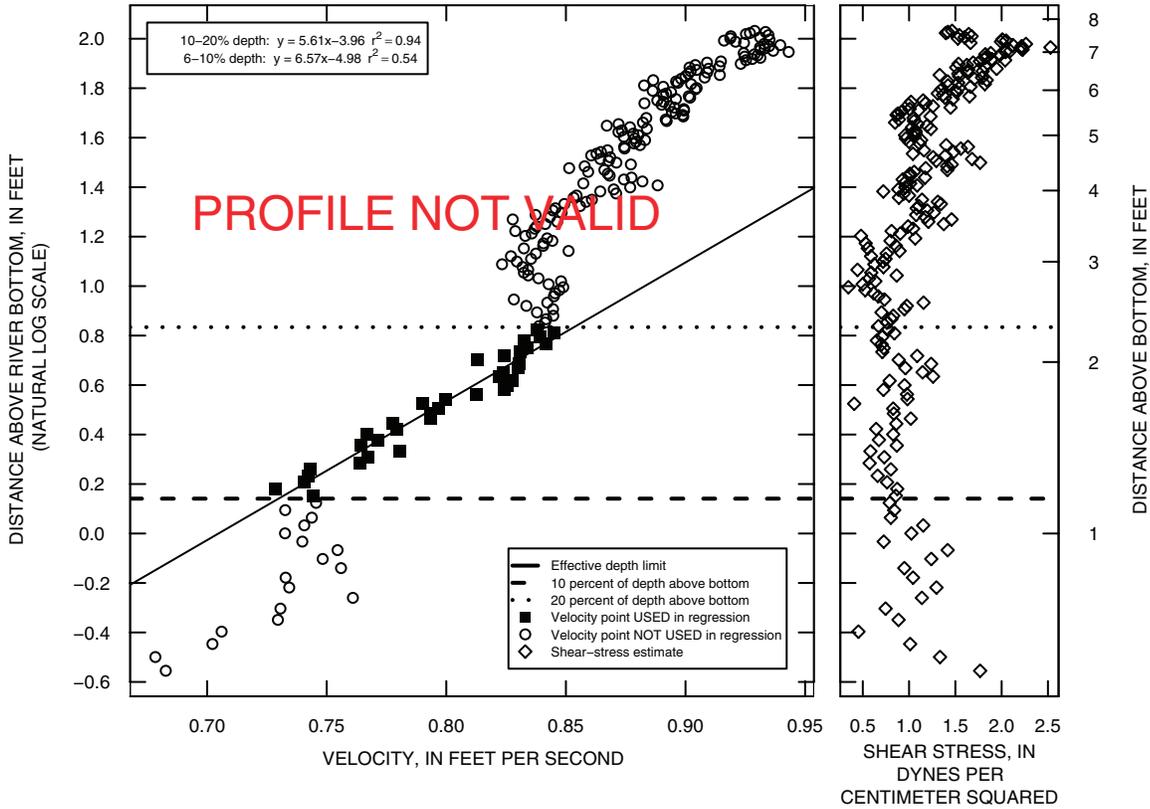


**VELOCITY AT OIL TANK DEPOT**



**Velocity Profile – Lower Fox River – OU4-2D2**

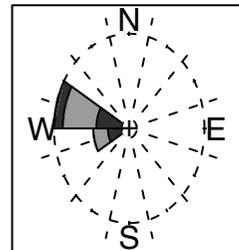
11/5/2003 12:48:55



Vertically averaged water flow: 0.85 ft/s, to direction 23.3°  
 Average wind conditions: 8.47 mi/h, from direction 280°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 4.96 [4.13 ≤ τ ≤ 5.86]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 3.62 [0.94 ≤ τ ≤ 8.03]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 1.03  
 Shear velocity (cm/s): 2.23 [2.03 ≤ u\_\* ≤ 2.42]  
 Bottom roughness, K<sub>s</sub> (cm): 17.51  
 Boundary Reynolds number: 3899.49 Test: PASS

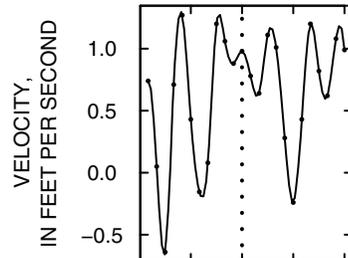
**DAILY WIND ROSE**



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 11.51	Field recorded ADCP depth (ft): --
Water mode: 11	Field recorded depthfinder depth (ft): 10.6
Water-cell size (cm): 1	Total number of recorded ensembles: 32
Blanking dist. (cm): 25	Heading: 233.82 ± 6.77
Field recorded offset (cm): 91.4	Pitch: 0.99 ± 0.14
Actual offset (cm): 91.4	Roll: -4.1 ± 0.31
Latitude: 44° 27' 41.6" N	Filename: Vert20031105124855r.csv
Longitude: 88° 3' 26.2" W	

**VELOCITY AT OIL TANK DEPOT**

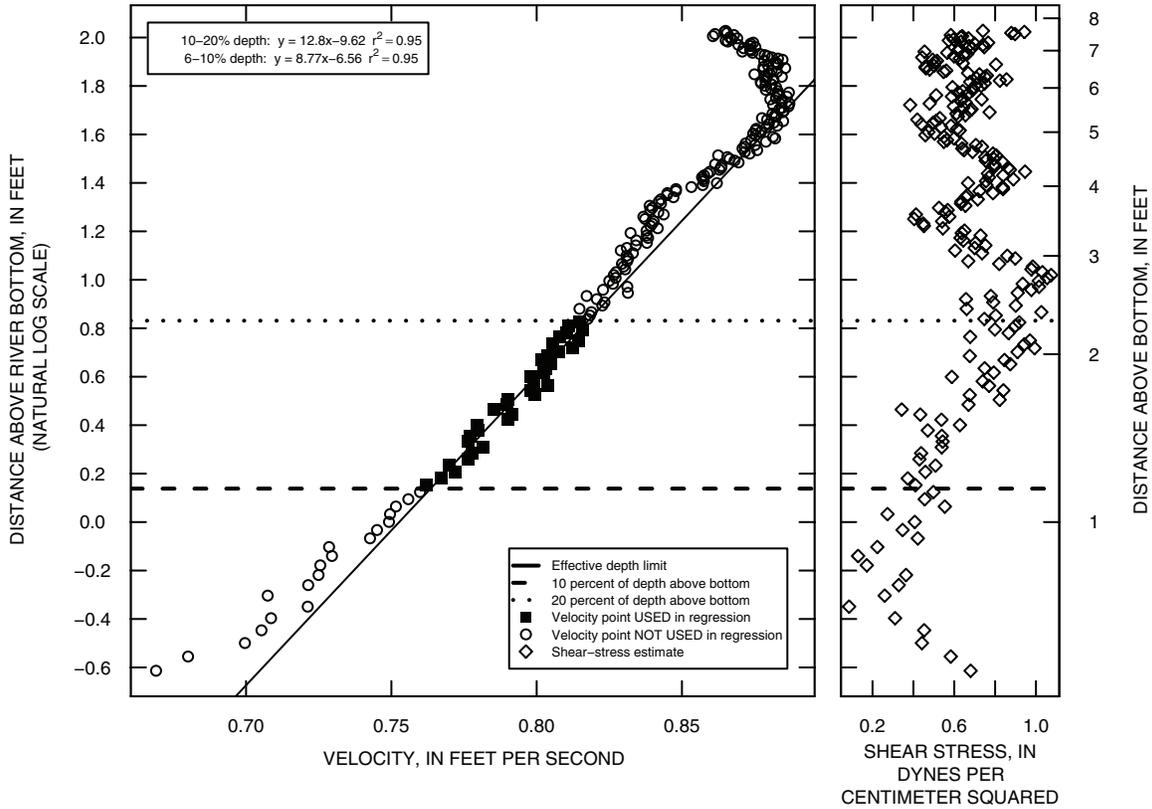


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

### Velocity Profile – Lower Fox River – OU4-2D3

11/5/2003 12:53:08



Vertically averaged water flow: 0.84 ft/s, to direction 24.8°  
 Average wind conditions: 8.47 mi/h, from direction 280°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 0.96 [0.81 ≤ τ ≤ 1.11]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 2.03 [1.59 ≤ τ ≤ 2.53]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 0.37  
 Shear velocity (cm/s): 0.98 [0.9 ≤ u\_\* ≤ 1.05]  
 Bottom roughness, K<sub>s</sub> (cm): 0.06  
 Boundary Reynolds number: 5.93 Test: MAYBE

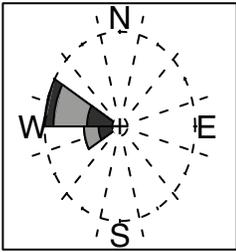
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 11.48	Field recorded ADCP depth (ft): ---
Water mode: 11	Field recorded depthfinder depth (ft): 10.6
Water-cell size (cm): 1	Total number of recorded ensembles: 230
Blanking dist. (cm): 25	Heading: 228.86 ± 3.15
Field recorded offset (cm): 91.4	Pitch: 0.78 ± 0.18
Actual offset (cm): 91.4	Roll: -2.99 ± 1.3
Latitude: 44° 27' 41.6" N	Filename: Vert20031105125308r.csv
Longitude: 88° 3' 26.2" W	

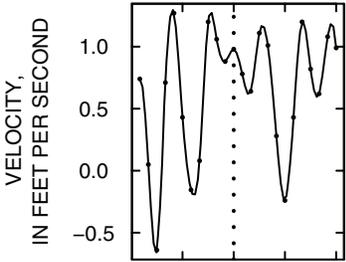
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

DAILY WIND ROSE

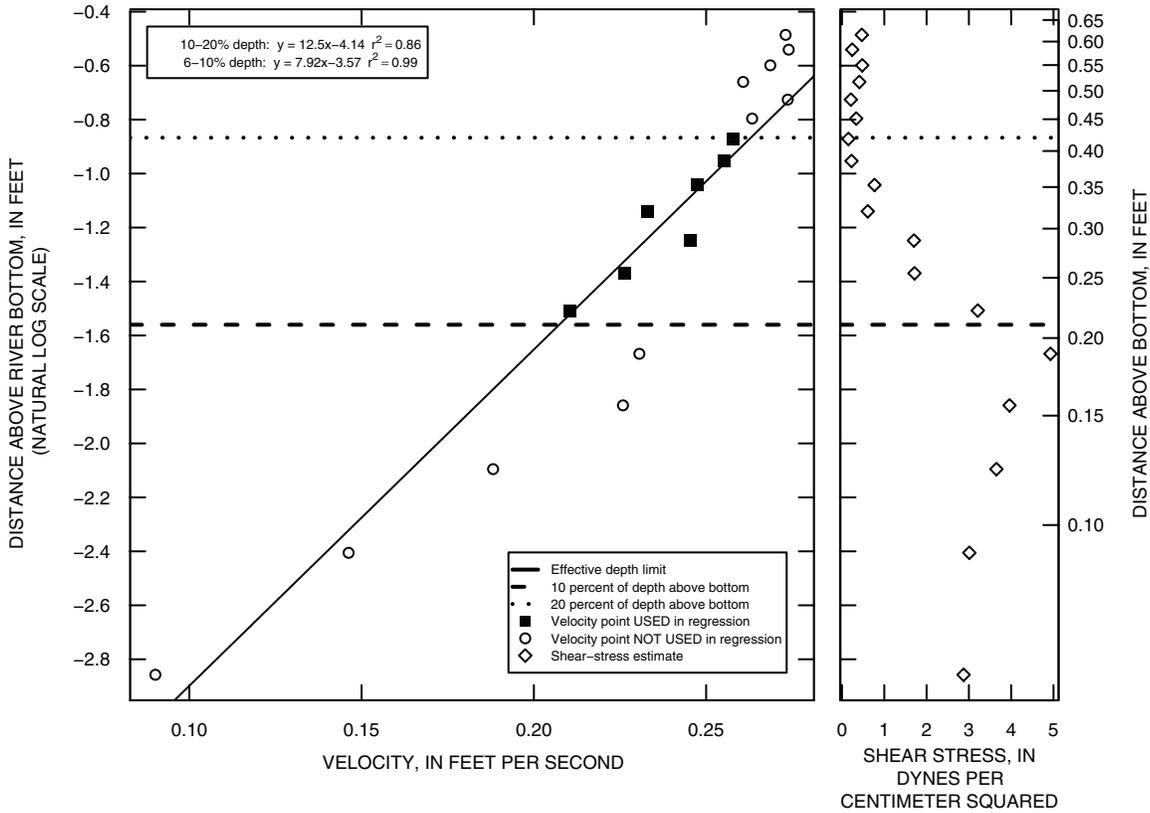


VELOCITY AT OIL TANK DEPOT



### Velocity Profile – Lower Fox River – OU4-3A

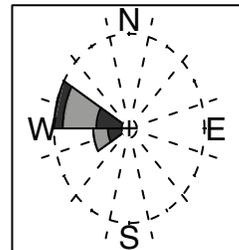
11/5/2003 14:45:13



Vertically averaged water flow: 0.23 ft/s, to direction 18.1°  
 Average wind conditions: 10.95 mi/h, from direction 300°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 1.01 [0.3 ≤ τ ≤ 2.13]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 2.49 [1.53 ≤ τ ≤ 3.68]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 3.69  
 Shear velocity (cm/s): 1 [0.55 ≤ u\_\* ≤ 1.46]  
 Bottom roughness, K<sub>s</sub> (cm): 14.49  
 Boundary Reynolds number: 1452.67 Test: PASS

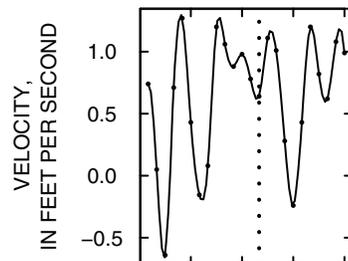
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 2.1	Field recorded ADCP depth (ft): --
Water mode: 11	Field recorded depthfinder depth (ft): --
Water-cell size (cm): 1	Total number of recorded ensembles: 303
Blanking dist. (cm): 25	Heading: 244.96 ± 1.83
Field recorded offset (cm): 18.3	Pitch: 1.69 ± 0.67
Actual offset (cm): 18.3	Roll: -0.7 ± 3.93
Latitude: 44° 28' 18.7" N	Filename: Vert20031105144513r.csv
Longitude: 88° 3' 10.1" W	

VELOCITY AT OIL TANK DEPOT

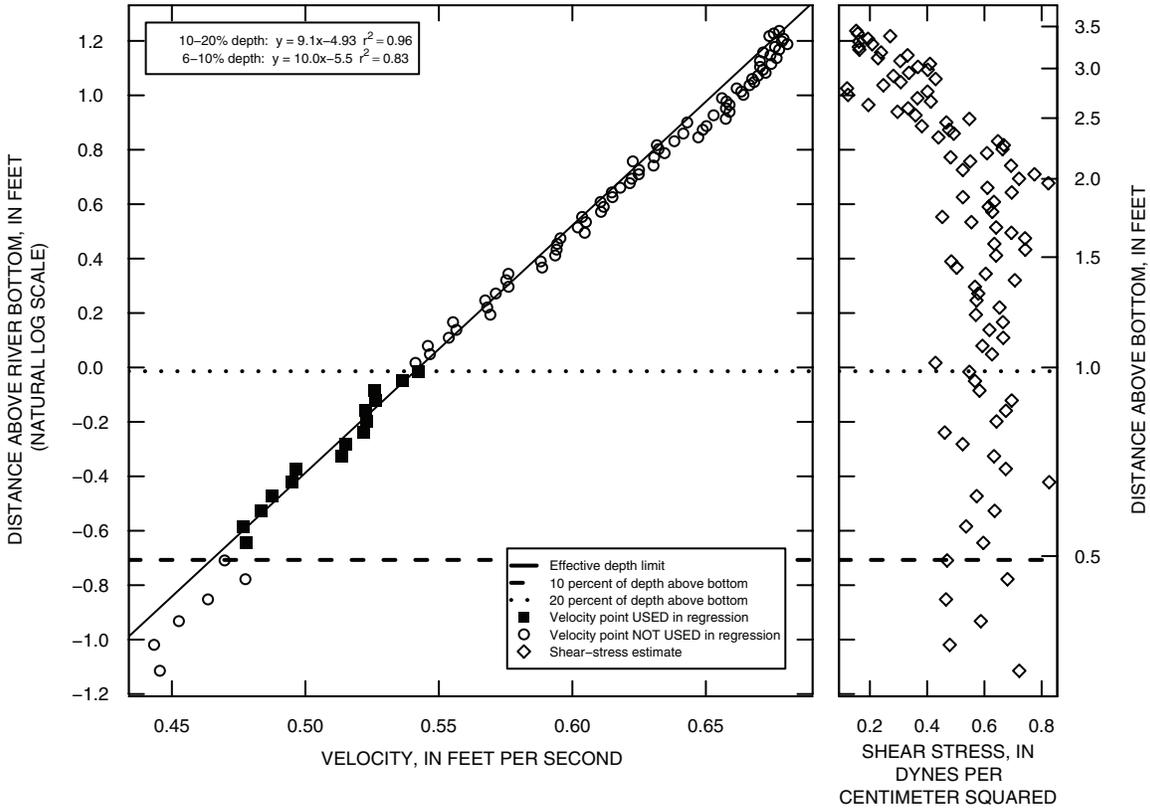


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**Velocity Profile – Lower Fox River – OU4-3B**

11/5/2003 14:57:48



Vertically averaged water flow: 0.6 ft/s, to direction 27.4°  
 Average wind conditions: 10.95 mi/h, from direction 300°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 1.89 [1.47 ≤ τ ≤ 2.36]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 1.56 [0.21 ≤ τ ≤ 4.14]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 0.57  
 Shear velocity (cm/s): 1.37 [1.21 ≤ u<sub>\*</sub> ≤ 1.53]  
 Bottom roughness, K<sub>s</sub> (cm): 6.58  
 Boundary Reynolds number: 904.97 Test: PASS

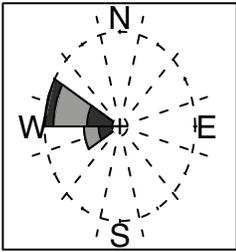
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 4.93	Field recorded ADCP depth (ft): ---
Water mode: 11	Field recorded depthfinder depth (ft): 4.5
Water-cell size (cm): 1	Total number of recorded ensembles: 267
Blanking dist. (cm): 25	Heading: 237.84 ± 1.44
Field recorded offset (cm): 18.3	Pitch: 1.5 ± 0.41
Actual offset (cm): 18.3	Roll: -0.72 ± 4.56
Latitude: 44° 28' 17.4" N	Filename: Vert20031105145748r.csv
Longitude: 88° 3' 5.6" W	

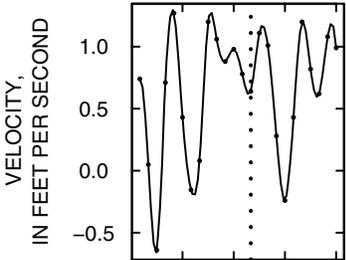
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**DAILY WIND ROSE**

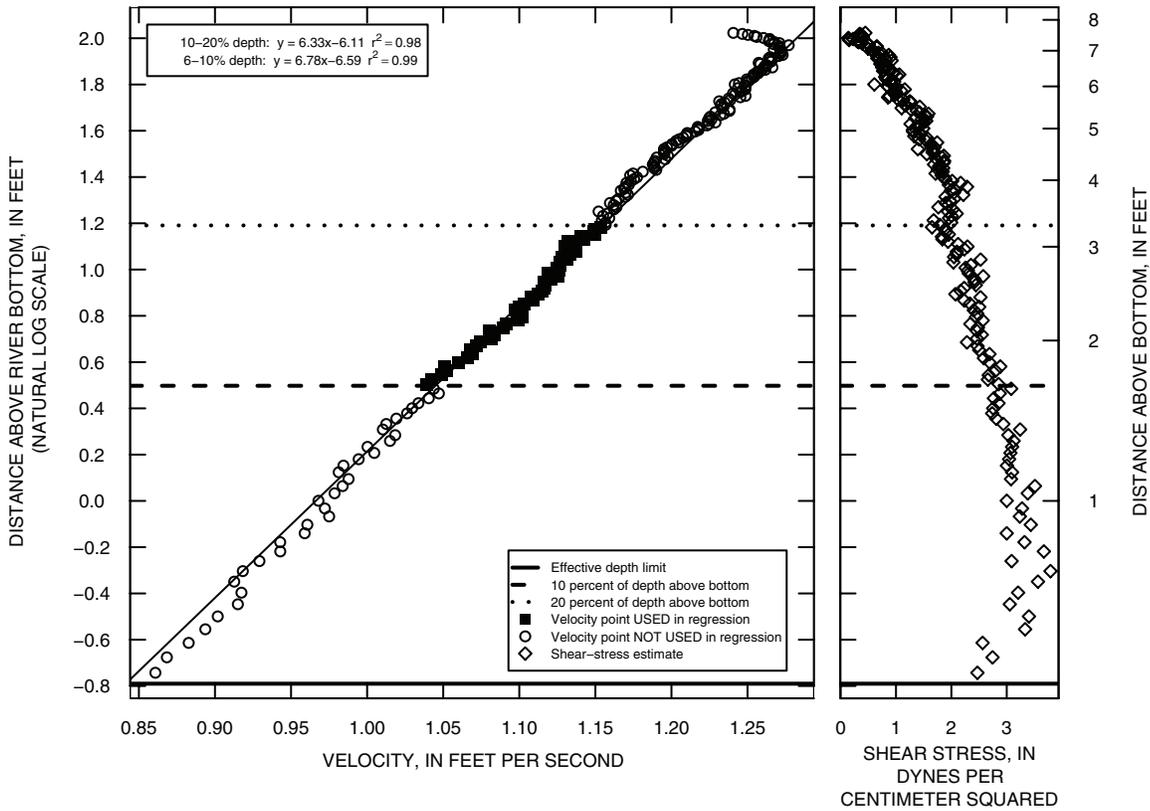


**VELOCITY AT OIL TANK DEPOT**



### Velocity Profile – Lower Fox River – OU4-3C

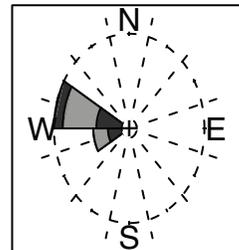
11/5/2003 15:12:47



Vertically averaged water flow: 1.15 ft/s, to direction 27.9°  
 Average wind conditions: 13.55 mi/h, from direction 287.5°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 3.9 [3.57 ≤ τ ≤ 4.25]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 3.4 [3.15 ≤ τ ≤ 3.66]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 3.1  
 Shear velocity (cm/s): 1.97 [1.89 ≤ u\_\* ≤ 2.06]  
 Bottom roughness, K<sub>s</sub> (cm): 2.02  
 Boundary Reynolds number: 399.12 Test: PASS

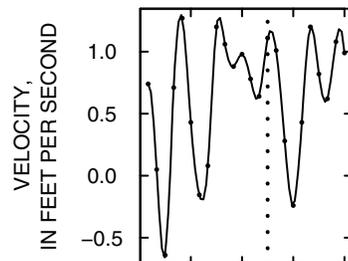
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 16.45	Field recorded ADCP depth (ft): --
Water mode: 11	Field recorded depthfinder depth (ft): 15.9
Water-cell size (cm): 1	Total number of recorded ensembles: 240
Blanking dist. (cm): 25	Heading: 214.98 ± 3.35
Field recorded offset (cm): 244	Pitch: -1.99 ± 0.73
Actual offset (cm): 244	Roll: -3.43 ± 1.59
Latitude: 44° 28' 17.2" N	Filename: Vert20031105151247r.csv
Longitude: 88° 3' 2.5" W	

VELOCITY AT OIL TANK DEPOT

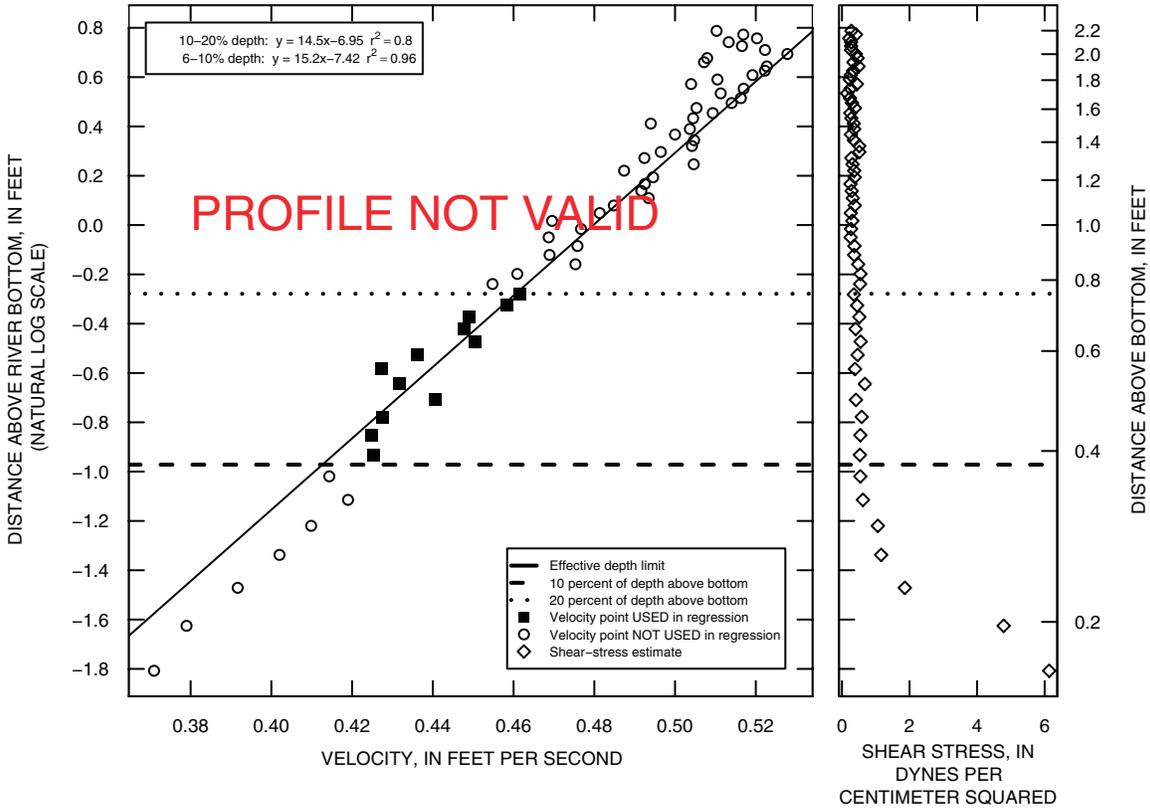


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**Velocity Profile – Lower Fox River – OU4-3D**

11/5/2003 15:28:41



Vertically averaged water flow: 0.48 ft/s, to direction 15.4°  
 Average wind conditions: 13.55 mi/h, from direction 287.5°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 0.75 [0.31 ≤ τ ≤ 1.36]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 0.68 [0.4 ≤ τ ≤ 1.02]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 2.31  
 Shear velocity (cm/s): 0.86 [0.56 ≤ u\_\* ≤ 1.17]  
 Bottom roughness, K<sub>s</sub> (cm): 0.88  
 Boundary Reynolds number: 76.02 Test: PASS

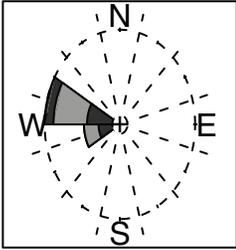
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 3.78	Field recorded ADCP depth (ft): ---
Water mode: 11	Field recorded depthfinder depth (ft): ---
Water-cell size (cm): 1	Total number of recorded ensembles: 334
Blanking dist. (cm): 25	Heading: 204.95 ± 1.24
Field recorded offset (cm): NA	Pitch: 1.94 ± 0.22
Actual offset (cm): 21.3	Roll: -1.49 ± 0.37
Latitude: 44° 28' 15.4" N	Filename: Vert20031105152841r.csv
Longitude: 88° 2' 57.6" W	

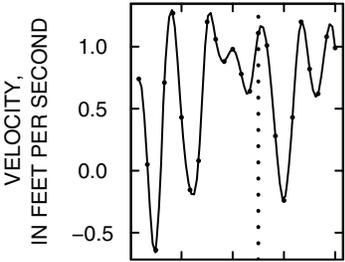
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**DAILY WIND ROSE**

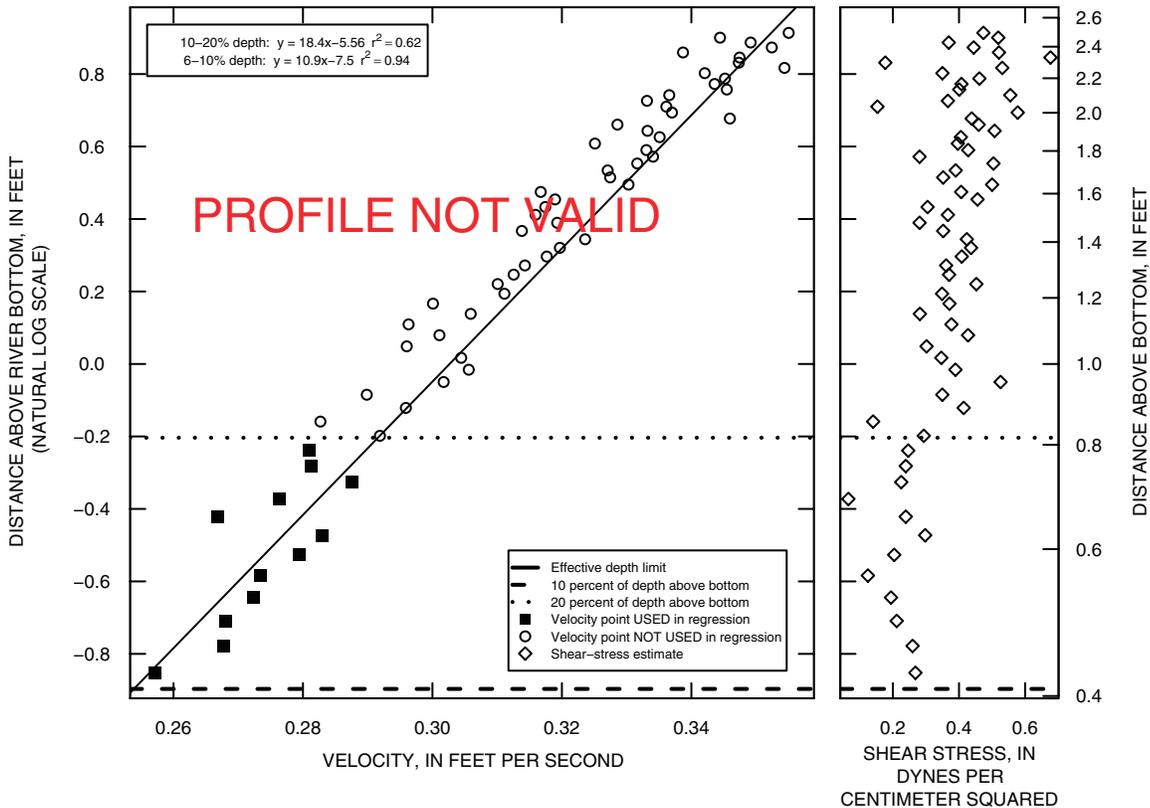


**VELOCITY AT OIL TANK DEPOT**



**Velocity Profile – Lower Fox River – OU4-4A**

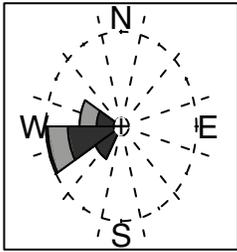
11/6/2003 9:00:24



Vertically averaged water flow: 0.31 ft/s, to direction 24.3°  
 Average wind conditions: 8.6 mi/h, from direction 270°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) ( $\text{dyn/cm}^2$ ): 0.46 [ $0.09 \leq \tau \leq 1.11$ ]  
 Shear stress (LP, 6-10% depth) ( $\text{dyn/cm}^2$ ): 1.3 [ $\text{NaN} \leq \tau \leq \text{NaN}$ ]  
 Shear stress (TKE) ( $\text{dyn/cm}^2$ ): 0  
 Shear velocity (cm/s): 0.68 [ $0.31 \leq u_* \leq 1.05$ ]  
 Bottom roughness,  $K_s$  (cm): 3.5  
 Boundary Reynolds number: 238.16 Test: PASS

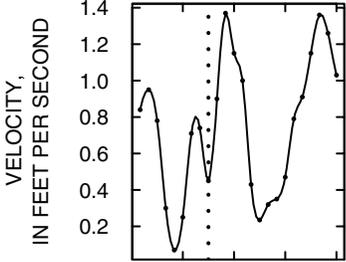
**DAILY WIND ROSE**



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 4.08	Field recorded ADCP depth (ft): ---
Water mode: 11	Field recorded depthfinder depth (ft): 3.4
Water-cell size (cm): 1	Total number of recorded ensembles: 298
Blanking dist. (cm): 25	Heading: $241.62 \pm 1.22$
Field recorded offset (cm): 21.3	Pitch: $2.29 \pm 0.18$
Actual offset (cm): 21.3	Roll: $2.12 \pm 0.27$
Latitude: $44^\circ 28' 42.1''$ N	Filename: Vert20031106090024r.csv
Longitude: $88^\circ 2' 45.9''$ W	

**VELOCITY AT OIL TANK DEPOT**

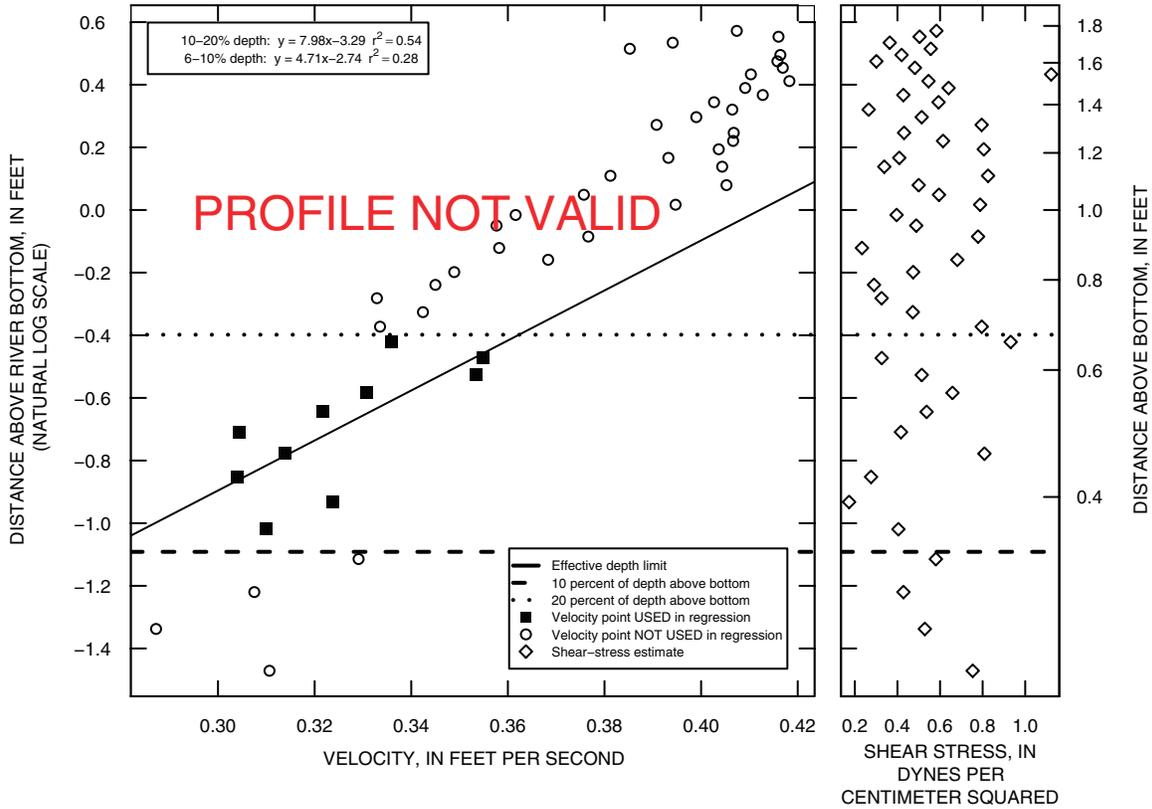


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**Velocity Profile – Lower Fox River – OU4-4A1**

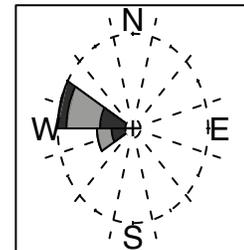
11/5/2003 16:42:32



Vertically averaged water flow: 0.37 ft/s, to direction 27.5°  
 Average wind conditions: 16.65 mi/h, from direction 280°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 2.45 [0.16 ≤ τ ≤ 7.48]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 7.03 [-107.33 ≤ τ ≤ 245.34]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 0.57  
 Shear velocity (cm/s): 1.57 [0.4 ≤ u\_\* ≤ 2.73]  
 Bottom roughness, K<sub>s</sub> (cm): 34.03  
 Boundary Reynolds number: 5325.74 Test: PASS

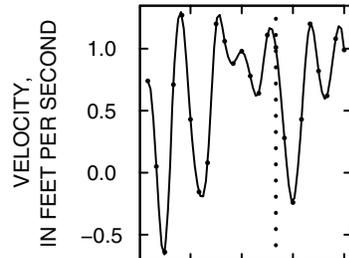
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 3.36	Field recorded ADCP depth (ft): ---
Water mode: 11	Field recorded depthfinder depth (ft): 3.8
Water-cell size (cm): 1	Total number of recorded ensembles: 84
Blanking dist. (cm): 25	Heading: 225.44 ± 2.32
Field recorded offset (cm): 21.3	Pitch: 1.83 ± 0.19
Actual offset (cm): 21.3	Roll: -0.65 ± 0.46
Latitude: 44° 28' 42.1" N	Filename: Vert20031105164232r.csv
Longitude: 88° 2' 45.8" W	

VELOCITY AT OIL TANK DEPOT

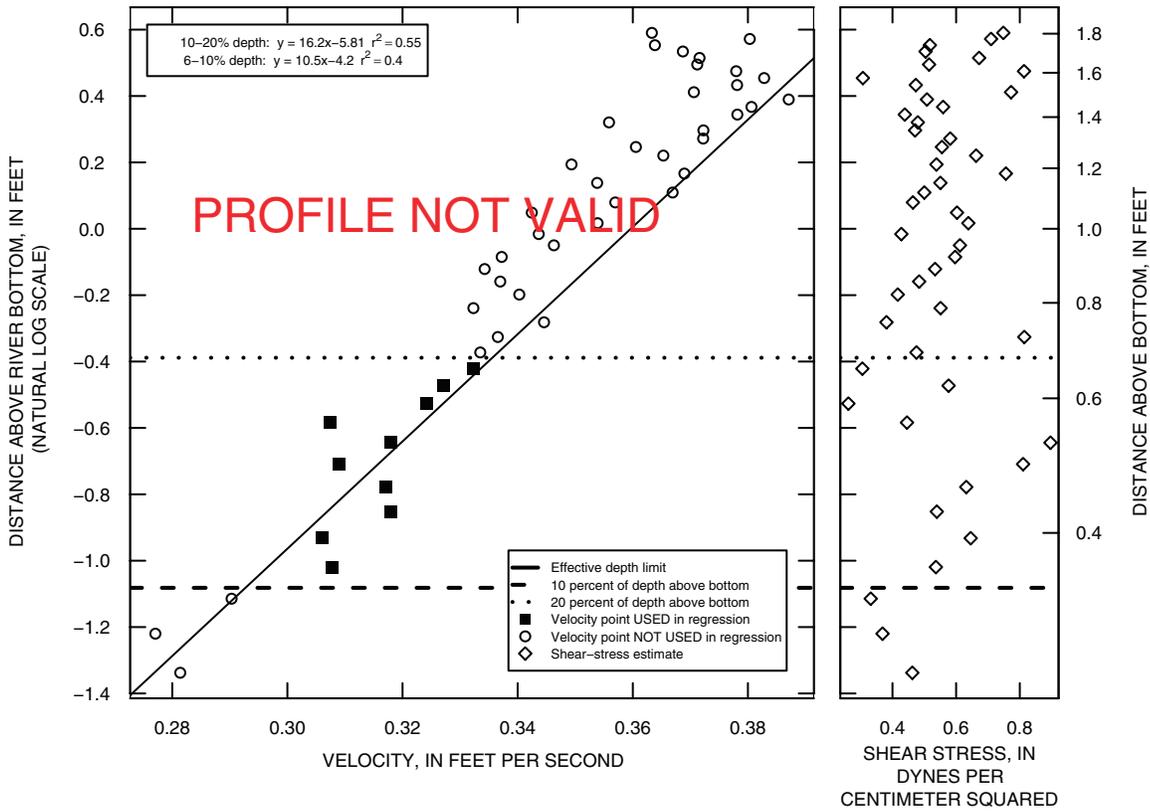


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**Velocity Profile – Lower Fox River – OU4-4A2**

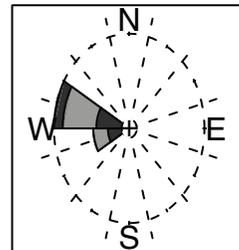
11/5/2003 16:45:28



Vertically averaged water flow: 0.35 ft/s, to direction 26.9°  
 Average wind conditions: 16.65 mi/h, from direction 280°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 0.6 [0.04 ≤ τ ≤ 1.81]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 1.41 [-293.68 ≤ τ ≤ 380.79]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 0.39  
 Shear velocity (cm/s): 0.77 [0.2 ≤ u\_\* ≤ 1.35]  
 Bottom roughness, K<sub>s</sub> (cm): 2.74  
 Boundary Reynolds number: 211.54 Test: PASS

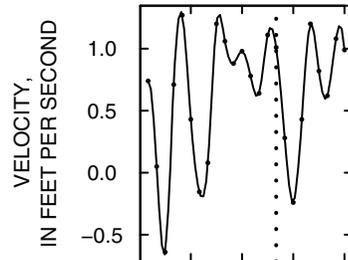
**DAILY WIND ROSE**



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 3.39	Field recorded ADCP depth (ft): ---
Water mode: 11	Field recorded depthfinder depth (ft): 3.8
Water-cell size (cm): 1	Total number of recorded ensembles: 142
Blanking dist. (cm): 25	Heading: 227.27 ± 1.38
Field recorded offset (cm): 21.3	Pitch: 1.8 ± 0.23
Actual offset (cm): 21.3	Roll: -0.72 ± 0.52
Latitude: 44° 28' 42.1" N	Filename: Vert20031105164528r.csv
Longitude: 88° 2' 45.8" W	

**VELOCITY AT OIL TANK DEPOT**

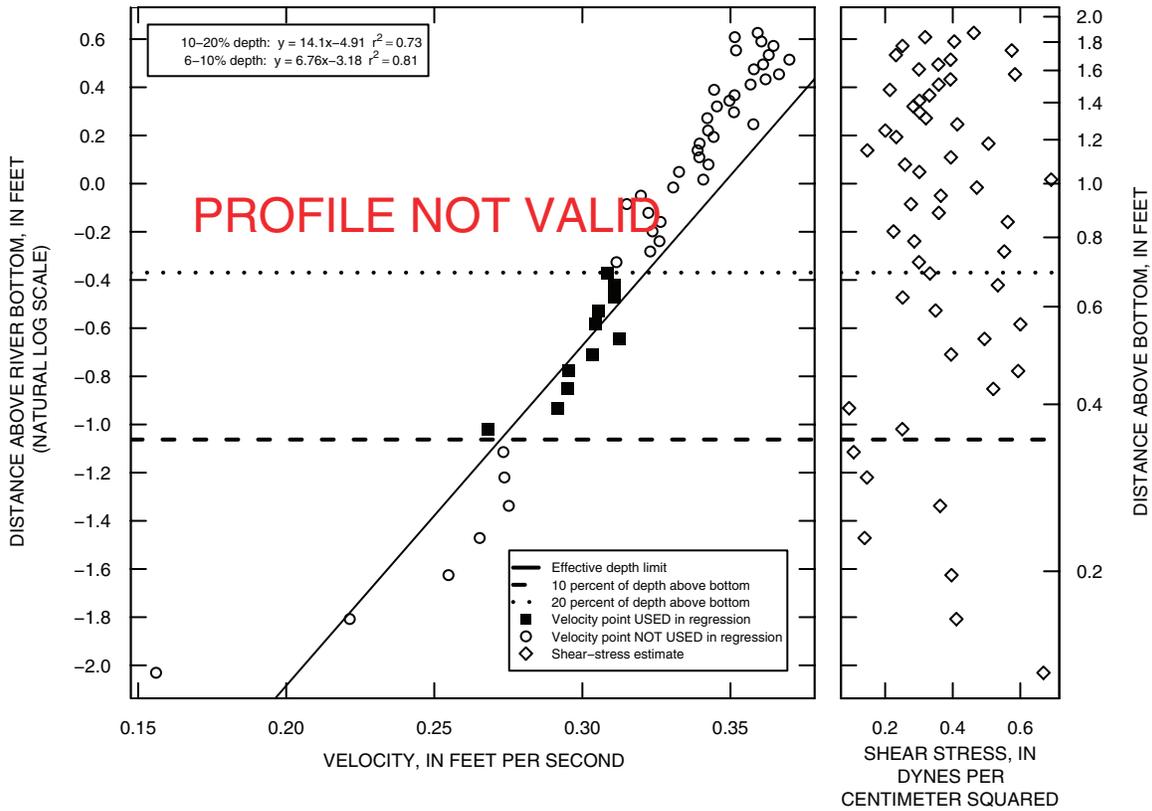


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

### Velocity Profile – Lower Fox River – OU4-4A3

11/5/2003 16:50:01



Vertically averaged water flow: 0.32 ft/s, to direction 27.7°  
 Average wind conditions: 16.65 mi/h, from direction 280°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 0.78 [0.23 ≤ τ ≤ 1.67]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 3.42 [0.7 ≤ τ ≤ 8.2]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 0.32  
 Shear velocity (cm/s): 0.88 [0.48 ≤ u\_\* ≤ 1.29]  
 Bottom roughness, K<sub>s</sub> (cm): 6.75  
 Boundary Reynolds number: 597.04 Test: PASS

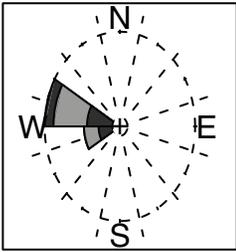
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 3.46	Field recorded ADCP depth (ft): ---
Water mode: 11	Field recorded depthfinder depth (ft): 3.8
Water-cell size (cm): 1	Total number of recorded ensembles: 209
Blanking dist. (cm): 25	Heading: 227.64 ± 1.17
Field recorded offset (cm): 21.3	Pitch: 2.32 ± 0.36
Actual offset (cm): 21.3	Roll: 0.04 ± 0.28
Latitude: 44° 28' 42.1" N	Filename: Vert20031105165001r.csv
Longitude: 88° 2' 45.8" W	

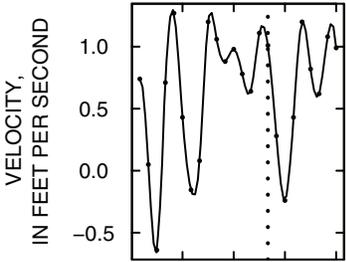
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

DAILY WIND ROSE

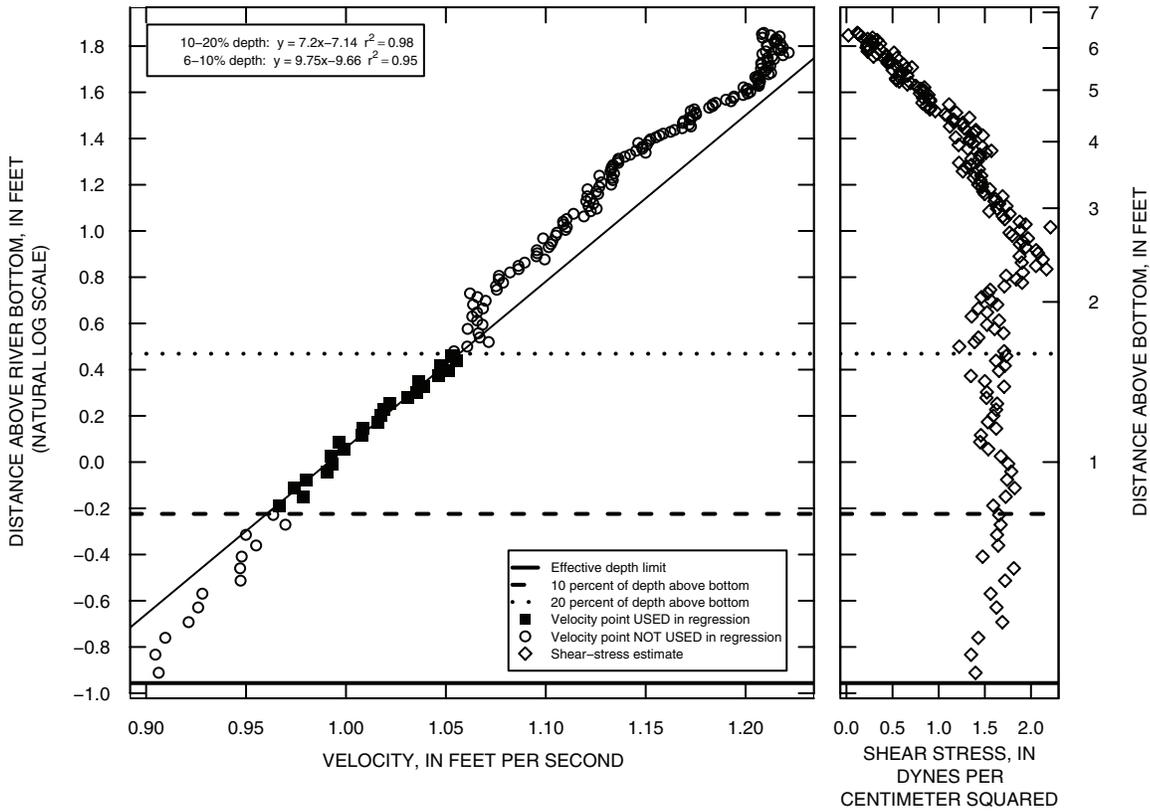


VELOCITY AT OIL TANK DEPOT



### Velocity Profile – Lower Fox River – OU4-4B

11/5/2003 16:30:48



Vertically averaged water flow: 1.12 ft/s, to direction 37.2°  
 Average wind conditions: 16.65 mi/h, from direction 280°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 3.01 [2.69 ≤ τ ≤ 3.36]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 1.64 [1.16 ≤ τ ≤ 2.21]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 1.59  
 Shear velocity (cm/s): 1.74 [1.64 ≤ u\_\* ≤ 1.83]  
 Bottom roughness, K<sub>s</sub> (cm): 0.73  
 Boundary Reynolds number: 126.26 Test: PASS

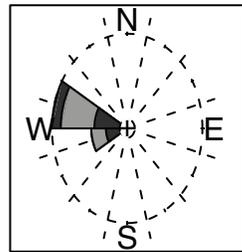
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 7.99	Field recorded ADCP depth (ft): ---
Water mode: 11	Field recorded depthfinder depth (ft): 7.6
Water-cell size (cm): 1	Total number of recorded ensembles: 222
Blanking dist. (cm): 25	Heading: 223.51 ± 1.96
Field recorded offset (cm): 21.3	Pitch: 1.71 ± 0.22
Actual offset (cm): 21.3	Roll: -0.65 ± 0.94
Latitude: 44° 28' 40.9" N	Filename: Vert20031105163048r.csv
Longitude: 88° 2' 38.8" W	

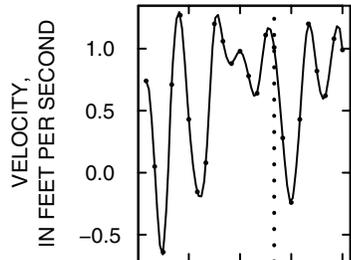
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

DAILY WIND ROSE

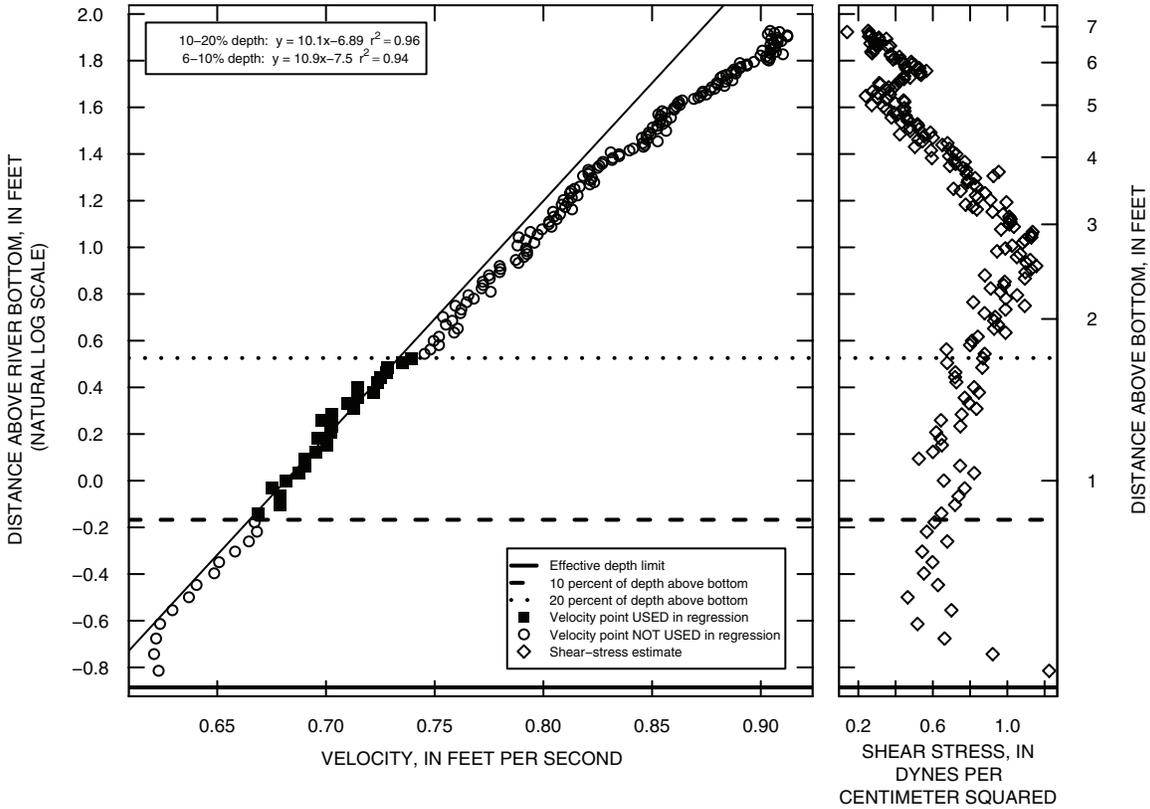


VELOCITY AT OIL TANK DEPOT



**Velocity Profile – Lower Fox River – OU4-4B**

11/6/2003 8:46:00



Vertically averaged water flow: 0.81 ft/s, to direction 35.8°  
 Average wind conditions: 9.75 mi/h, from direction 270°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 1.53 [1.28 ≤ τ ≤ 1.8]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 1.3 [0.89 ≤ τ ≤ 1.8]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 0.67  
 Shear velocity (cm/s): 1.24 [1.13 ≤ u\_\* ≤ 1.34]  
 Bottom roughness, K<sub>s</sub> (cm): 0.93  
 Boundary Reynolds number: 115.13 Test: PASS

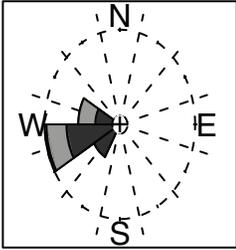
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 8.46	Field recorded ADCP depth (ft): ---
Water mode: 11	Field recorded depthfinder depth (ft): 8.1
Water-cell size (cm): 1	Total number of recorded ensembles: 241
Blanking dist. (cm): 25	Heading: 234.54 ± 1.51
Field recorded offset (cm): 21.3	Pitch: 1.95 ± 0.32
Actual offset (cm): 21.3	Roll: 1.26 ± 0.43
Latitude: 44° 28' 41" N	Filename: Vert20031106084600r.csv
Longitude: 88° 2' 39.1" W	

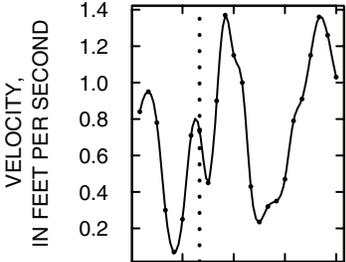
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**DAILY WIND ROSE**

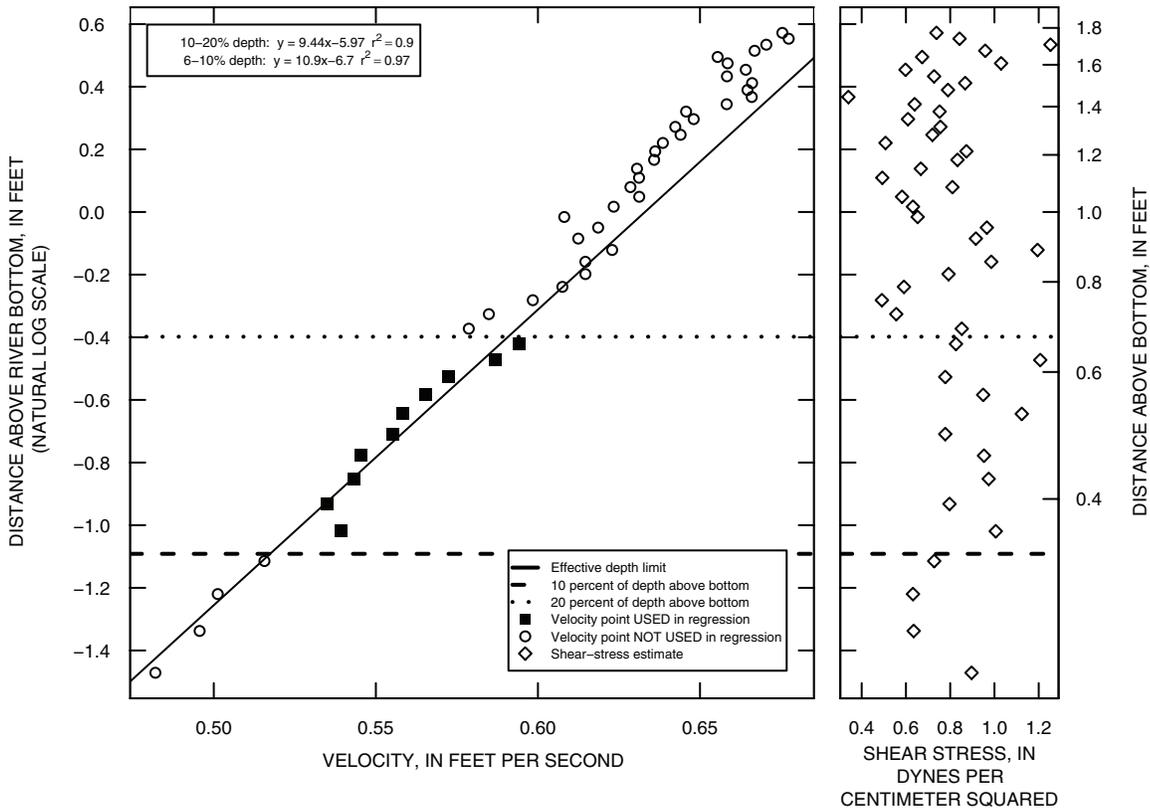


**VELOCITY AT OIL TANK DEPOT**



**Velocity Profile – Lower Fox River – OU4-4C**

11/5/2003 16:15:16



Vertically averaged water flow: 0.61 ft/s, to direction 26.7°  
 Average wind conditions: 16.65 mi/h, from direction 280°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 1.75 [0.94 ≤ τ ≤ 2.82]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 1.32 [0.31 ≤ τ ≤ 3.05]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 0.72  
 Shear velocity (cm/s): 1.32 [0.97 ≤ u\_\* ≤ 1.68]  
 Bottom roughness, K<sub>s</sub> (cm): 2.32  
 Boundary Reynolds number: 307.84 Test: PASS

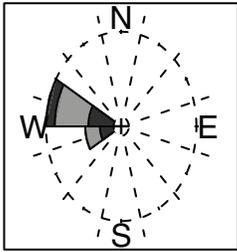
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 3.36	Field recorded ADCP depth (ft): --
Water mode: 11	Field recorded depthfinder depth (ft): 3
Water-cell size (cm): 1	Total number of recorded ensembles: 293
Blanking dist. (cm): 25	Heading: 232.46 ± 1.51
Field recorded offset (cm): 21.3	Pitch: 2.55 ± 0.48
Actual offset (cm): 21.3	Roll: 0.14 ± 0.83
Latitude: 44° 28' 37.3" N	Filename: Vert20031105161516r.csv
Longitude: 88° 2' 22.9" W	

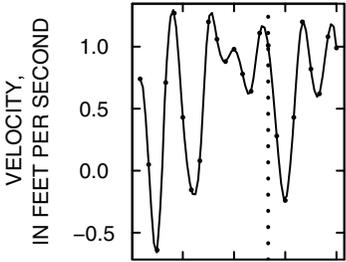
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**DAILY WIND ROSE**

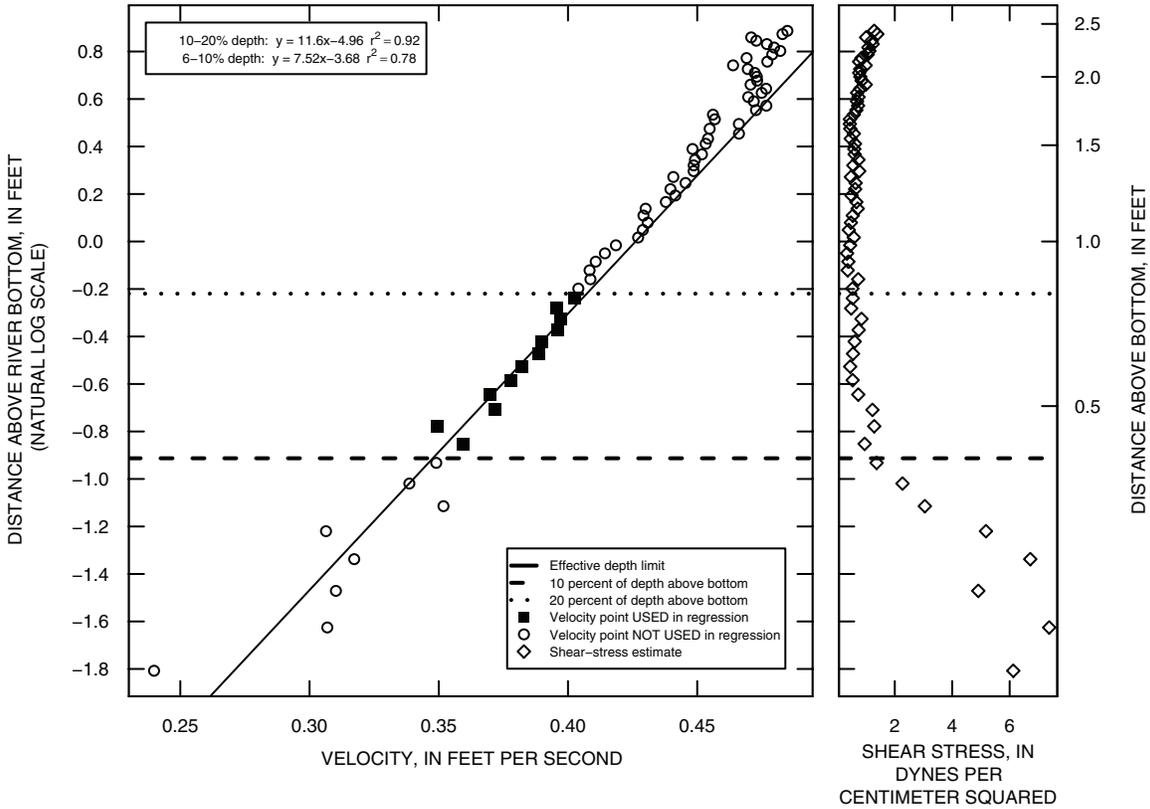


**VELOCITY AT OIL TANK DEPOT**



**Velocity Profile – Lower Fox River – OU4-4C**

11/6/2003 8:27:48



Vertically averaged water flow: 0.43 ft/s, to direction 28.5°  
 Average wind conditions: 9.75 mi/h, from direction 270°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 1.15 [0.73 ≤ τ ≤ 1.67]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 2.76 [0.59 ≤ τ ≤ 6.52]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 4.62  
 Shear velocity (cm/s): 1.07 [0.86 ≤ u\_\* ≤ 1.29]  
 Bottom roughness, K<sub>s</sub> (cm): 6.42  
 Boundary Reynolds number: 689.35 Test: PASS

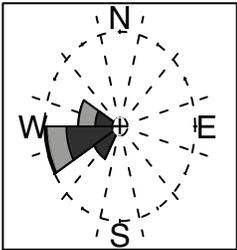
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 4.01	Field recorded ADCP depth (ft): ---
Water mode: 11	Field recorded depthfinder depth (ft): 3.1
Water-cell size (cm): 1	Total number of recorded ensembles: 287
Blanking dist. (cm): 25	Heading: 212.28 ± 2.01
Field recorded offset (cm): 21.3	Pitch: 2.5 ± 0.3
Actual offset (cm): 21.3	Roll: 1.02 ± 2.5
Latitude: 44° 28' 37.4" N	Filename: Vert20031106082748r.csv
Longitude: 88° 2' 22.8" W	

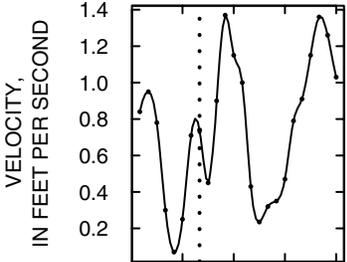
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

DAILY WIND ROSE

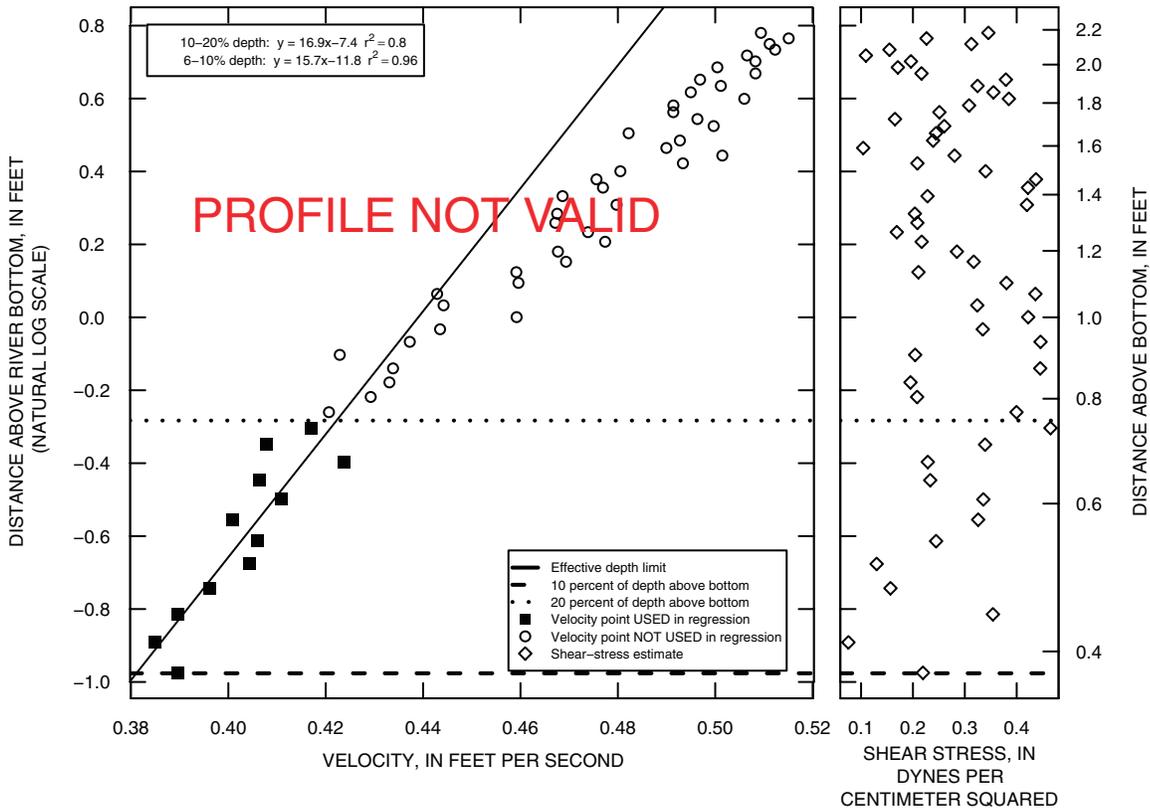


VELOCITY AT OIL TANK DEPOT



**Velocity Profile – Lower Fox River – OU4-5A**

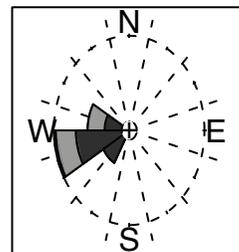
11/6/2003 10:26:15



Vertically averaged water flow: 0.46 ft/s, to direction 67.3°  
 Average wind conditions: 8.02 mi/h, from direction 275.7°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) ( $\text{dyn/cm}^2$ ): 0.55 [ $0.23 \leq \tau \leq 1.01$ ]  
 Shear stress (LP, 6-10% depth) ( $\text{dyn/cm}^2$ ): 0.63 [ $\text{NaN} \leq \tau \leq \text{NaN}$ ]  
 Shear stress (TKE) ( $\text{dyn/cm}^2$ ): 0  
 Shear velocity (cm/s): 0.74 [ $0.48 \leq u_* \leq 1$ ]  
 Bottom roughness,  $K_s$  (cm): 0.56  
 Boundary Reynolds number: 41.35 Test: MAYBE

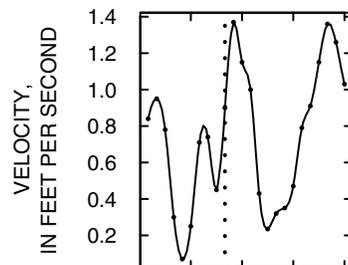
**DAILY WIND ROSE**



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 3.77	Field recorded ADCP depth (ft): --
Water mode: 11	Field recorded depthfinder depth (ft): 3.2
Water-cell size (cm): 1	Total number of recorded ensembles: 297
Blanking dist. (cm): 25	Heading: $268.95 \pm 1.62$
Field recorded offset (cm): 21.3	Pitch: $2.61 \pm 0.34$
Actual offset (cm): 21.3	Roll: $2.73 \pm 0.57$
Latitude: $44^\circ 29' 8''$ N	Filename: Vert20031106102615r.csv
Longitude: $88^\circ 2' 24.1''$ W	

**VELOCITY AT OIL TANK DEPOT**

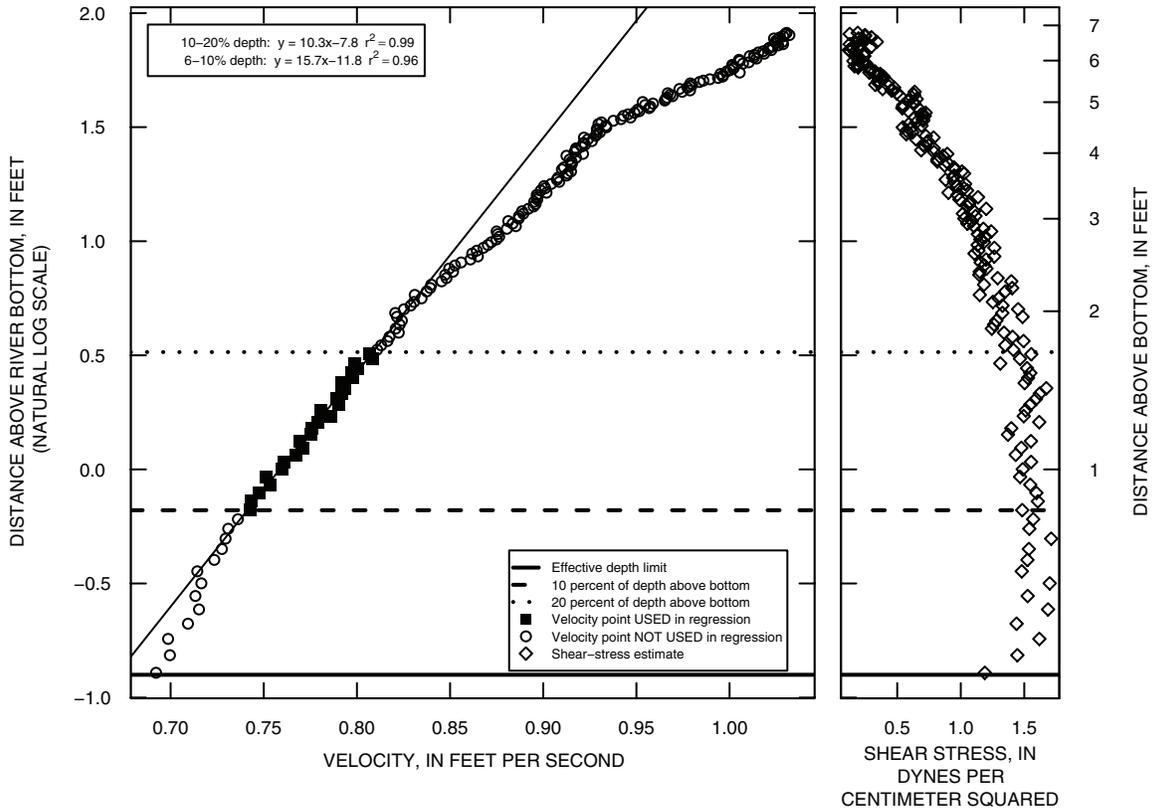


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

### Velocity Profile – Lower Fox River – OU4-5B

11/6/2003 10:11:24



Vertically averaged water flow: 0.9 ft/s, to direction 54.8°  
 Average wind conditions: 8.02 mi/h, from direction 275.7°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 1.48 [1.33 ≤ τ ≤ 1.64]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 0.63 [0.47 ≤ τ ≤ 0.82]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 1.54  
 Shear velocity (cm/s): 1.22 [1.15 ≤ u\_\* ≤ 1.28]  
 Bottom roughness, K<sub>s</sub> (cm): 0.38  
 Boundary Reynolds number: 45.89 Test: MAYBE

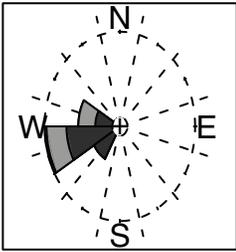
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 8.36	Field recorded ADCP depth (ft): --
Water mode: 11	Field recorded depthfinder depth (ft): 8
Water-cell size (cm): 1	Total number of recorded ensembles: 245
Blanking dist. (cm): 25	Heading: 287.93 ± 2.33
Field recorded offset (cm): 21.3	Pitch: 2.5 ± 0.27
Actual offset (cm): 21.3	Roll: 2.22 ± 0.53
Latitude: 44° 29' 4.2" N	Filename: Vert20031106101124r.csv
Longitude: 88° 2' 16.2" W	

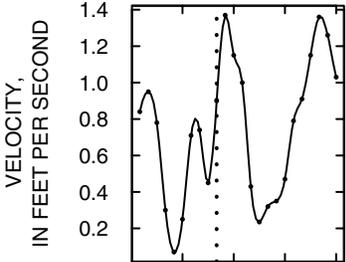
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

DAILY WIND ROSE

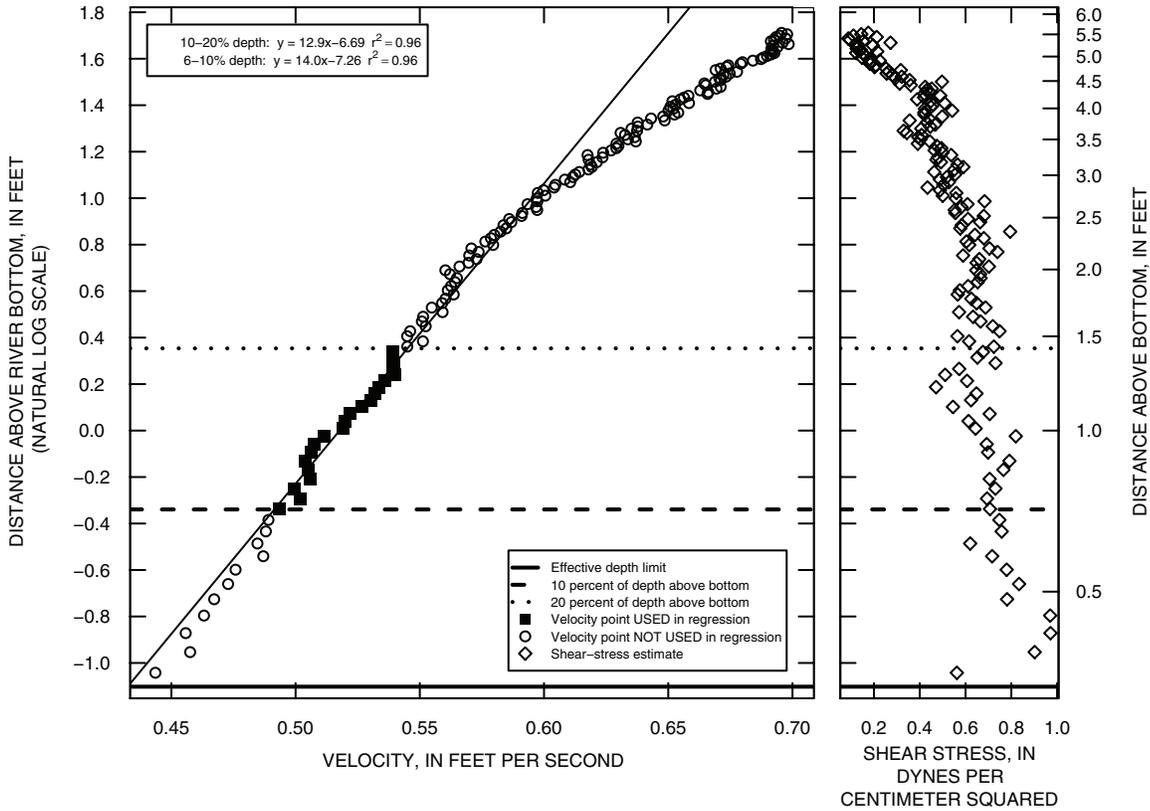


VELOCITY AT OIL TANK DEPOT



### Velocity Profile – Lower Fox River – OU4-5C

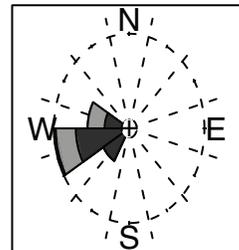
11/6/2003 9:54:55



Vertically averaged water flow: 0.6 ft/s, to direction 29°  
 Average wind conditions: 8.6 mi/h, from direction 270°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 0.94 [0.76 ≤ τ ≤ 1.12]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 0.8 [0.58 ≤ τ ≤ 1.05]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 0.79  
 Shear velocity (cm/s): 0.97 [0.87 ≤ u\_\* ≤ 1.06]  
 Bottom roughness, K<sub>s</sub> (cm): 1.14  
 Boundary Reynolds number: 110.05 Test: PASS

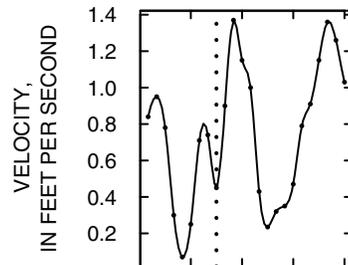
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 7.12	Field recorded ADCP depth (ft): ---
Water mode: 11	Field recorded depthfinder depth (ft): 6.2
Water-cell size (cm): 1	Total number of recorded ensembles: 262
Blanking dist. (cm): 25	Heading: 256.08 ± 2.18
Field recorded offset (cm): 21.3	Pitch: 2.3 ± 0.4
Actual offset (cm): 21.3	Roll: 1.26 ± 0.55
Latitude: 44° 28' 57.5" N	Filename: Vert20031106095455r.csv
Longitude: 88° 2' 2.3" W	

VELOCITY AT OIL TANK DEPOT

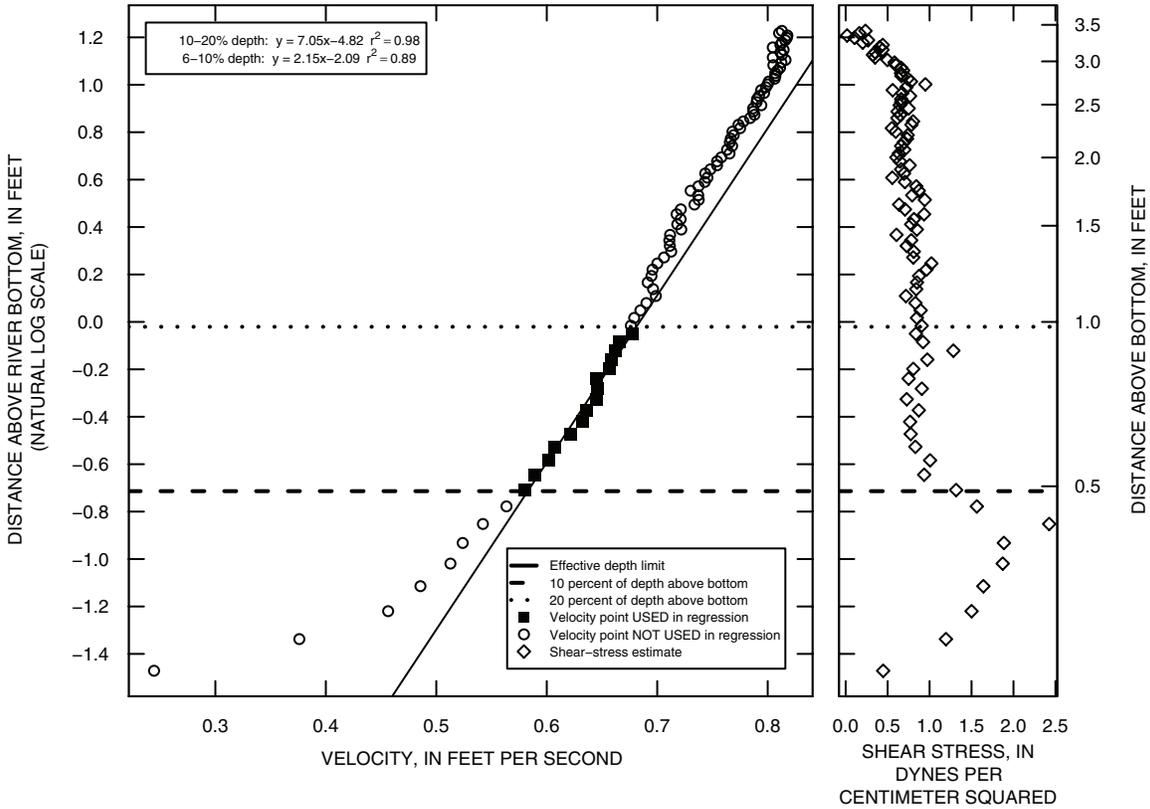


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**Velocity Profile – Lower Fox River – OU4-6A**

11/6/2003 11:51:00



Vertically averaged water flow: 0.72 ft/s, to direction 45.7°  
 Average wind conditions: 9.9 mi/h, from direction 286.9°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 3.15 [2.6 ≤ τ ≤ 3.75]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 33.85 [14.02 ≤ τ ≤ 62.27]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 1.57  
 Shear velocity (cm/s): 1.77 [1.61 ≤ u\_\* ≤ 1.94]  
 Bottom roughness, K<sub>s</sub> (cm): 7.37  
 Boundary Reynolds number: 1307.44 Test: PASS

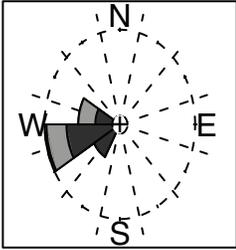
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 4.9	Field recorded ADCP depth (ft): ---
Water mode: 11	Field recorded depthfinder depth (ft): 4.3
Water-cell size (cm): 1	Total number of recorded ensembles: 266
Blanking dist. (cm): 25	Heading: 215.31 ± 1.25
Field recorded offset (cm): 18.3	Pitch: 2.64 ± 0.15
Actual offset (cm): 18.3	Roll: -0.44 ± 0.31
Latitude: 44° 29' 22.5" N	Filename: Vert20031106115100r.csv
Longitude: 88° 1' 55.8" W	

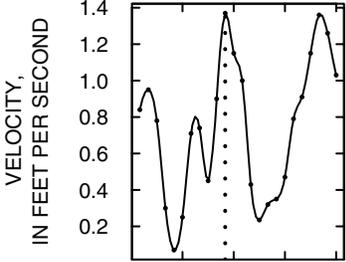
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**DAILY WIND ROSE**

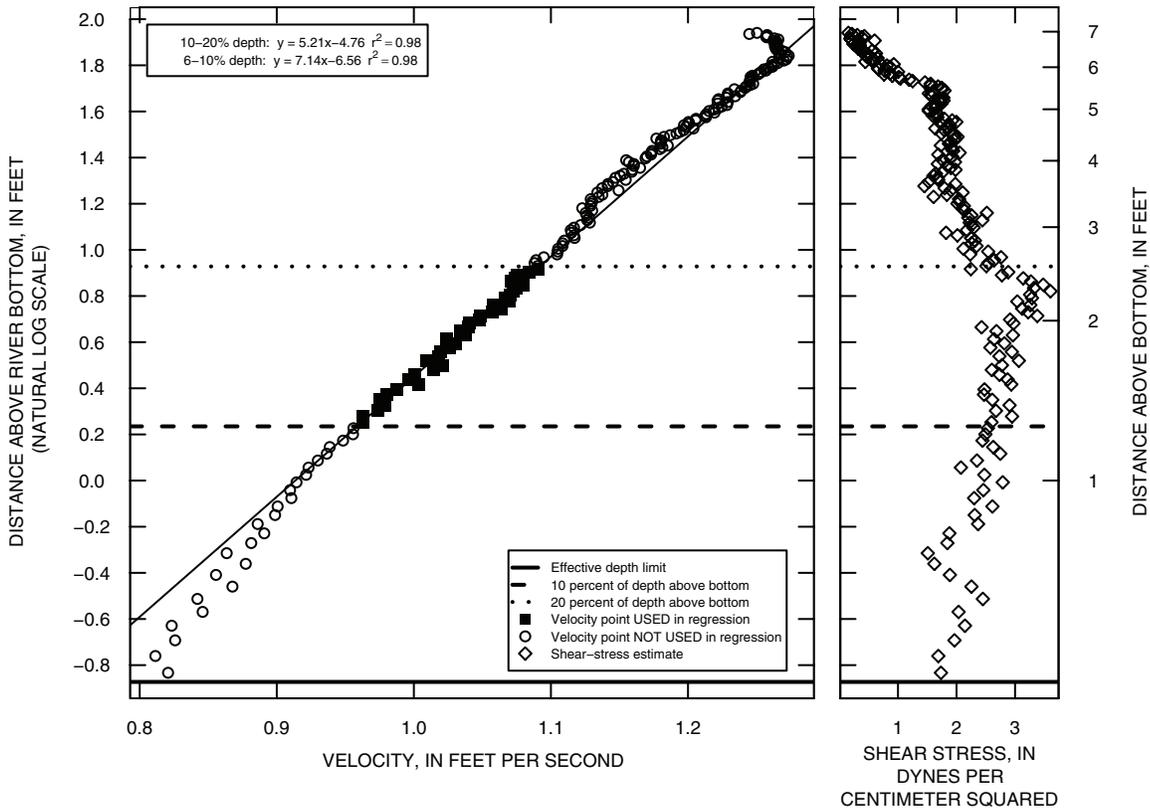


**VELOCITY AT OIL TANK DEPOT**



### Velocity Profile – Lower Fox River – OU4-6B

11/6/2003 11:32:05



Vertically averaged water flow: 1.13 ft/s, to direction 47°  
 Average wind conditions: 9.9 mi/h, from direction 286.9°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 5.76 [5.27 ≤ τ ≤ 6.28]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 3.07 [2.69 ≤ τ ≤ 3.47]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 2.22  
 Shear velocity (cm/s): 2.4 [2.3 ≤ u<sub>\*</sub> ≤ 2.51]  
 Bottom roughness, K<sub>s</sub> (cm): 7.87  
 Boundary Reynolds number: 1887.97 Test: PASS

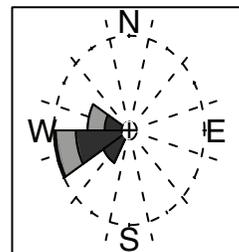
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 12.65	Field recorded ADCP depth (ft): --
Water mode: 11	Field recorded depthfinder depth (ft): 12.6
Water-cell size (cm): 1	Total number of recorded ensembles: 245
Blanking dist. (cm): 25	Heading: 254.46 ± 2.24
Field recorded offset (cm): 146	Pitch: 1.07 ± 0.61
Actual offset (cm): 146	Roll: -1.72 ± 0.44
Latitude: 44° 29' 20.1" N	Filename: Vert20031106113205r.csv
Longitude: 88° 1' 50.1" W	

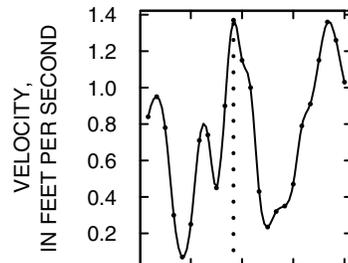
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

DAILY WIND ROSE

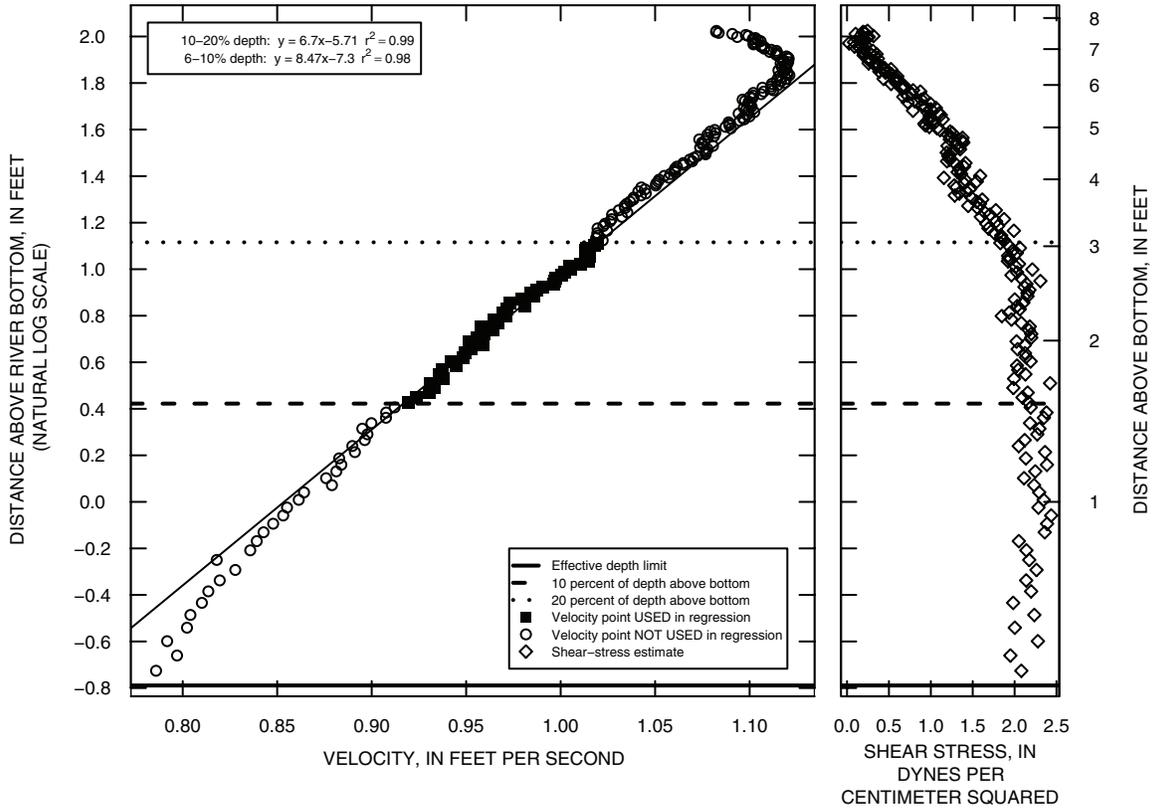


VELOCITY AT OIL TANK DEPOT



### Velocity Profile – Lower Fox River – OU4-6C

11/6/2003 11:16:17



Vertically averaged water flow: 1.03 ft/s, to direction 49.7°  
 Average wind conditions: 9.9 mi/h, from direction 286.9°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 3.49 [3.23 ≤ τ ≤ 3.75]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 2.18 [1.98 ≤ τ ≤ 2.38]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 2.22  
 Shear velocity (cm/s): 1.87 [1.8 ≤ u\_\* ≤ 1.94]  
 Bottom roughness, K<sub>s</sub> (cm): 3.02  
 Boundary Reynolds number: 563.41 Test: PASS

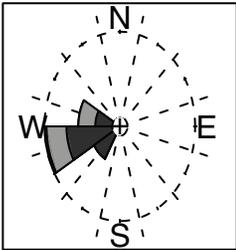
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 15.26	Field recorded ADCP depth (ft): --
Water mode: 11	Field recorded depthfinder depth (ft): 15
Water-cell size (cm): 1	Total number of recorded ensembles: 238
Blanking dist. (cm): 25	Heading: 226.64 ± 3.35
Field recorded offset (cm): 207	Pitch: 0.76 ± 0.45
Actual offset (cm): 207	Roll: -2.52 ± 0.52
Latitude: 44° 29' 18.6" N	Filename: Vert20031106111617r.csv
Longitude: 88° 1' 46.7" W	

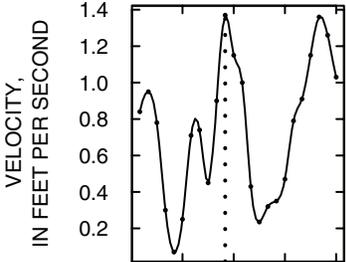
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

DAILY WIND ROSE

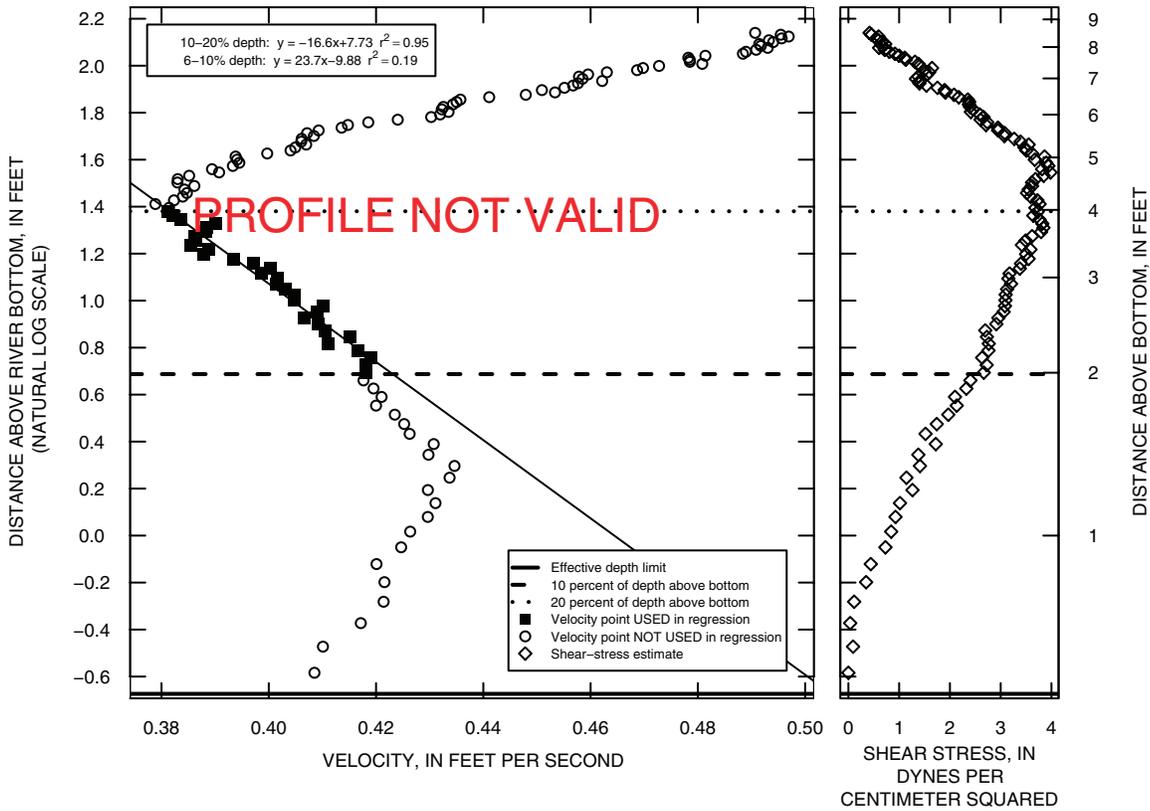


VELOCITY AT OIL TANK DEPOT



**Velocity Profile – Lower Fox River – OU4-7A**

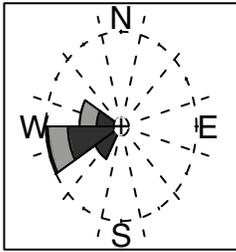
11/6/2003 13:35:09



Vertically averaged water flow: 0.42 ft/s, to direction 36.5°  
 Average wind conditions: 11.1 mi/h, from direction 283.1°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 0.56 [0.47 ≤ τ ≤ 0.66]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 0.28 [0 ≤ τ ≤ 1.07]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 1.17  
 Shear velocity (cm/s): -0.75 [-0.69 ≤ u<sub>\*</sub> ≤ -0.81]  
 Bottom roughness, K<sub>s</sub> (cm): 2079398  
 Boundary Reynolds number: -156134147.36 Test: FAIL

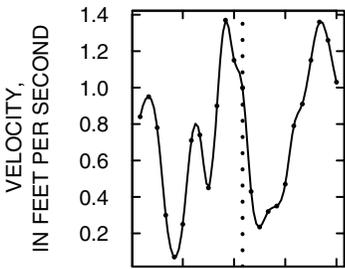
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 19.88	Field recorded ADCP depth (ft): ---
Water mode: 11	Field recorded depthfinder depth (ft): 18.8
Water-cell size (cm): 2	Total number of recorded ensembles: 250
Blanking dist. (cm): 25	Heading: 217.98 ± 3.43
Field recorded offset (cm): 320	Pitch: 1.44 ± 0.35
Actual offset (cm): 320	Roll: -2.24 ± 0.53
Latitude: 44° 31' 2.2" N	Filename: Vert20031106133509r.csv
Longitude: 88° 1' 3.5" W	

VELOCITY AT OIL TANK DEPOT

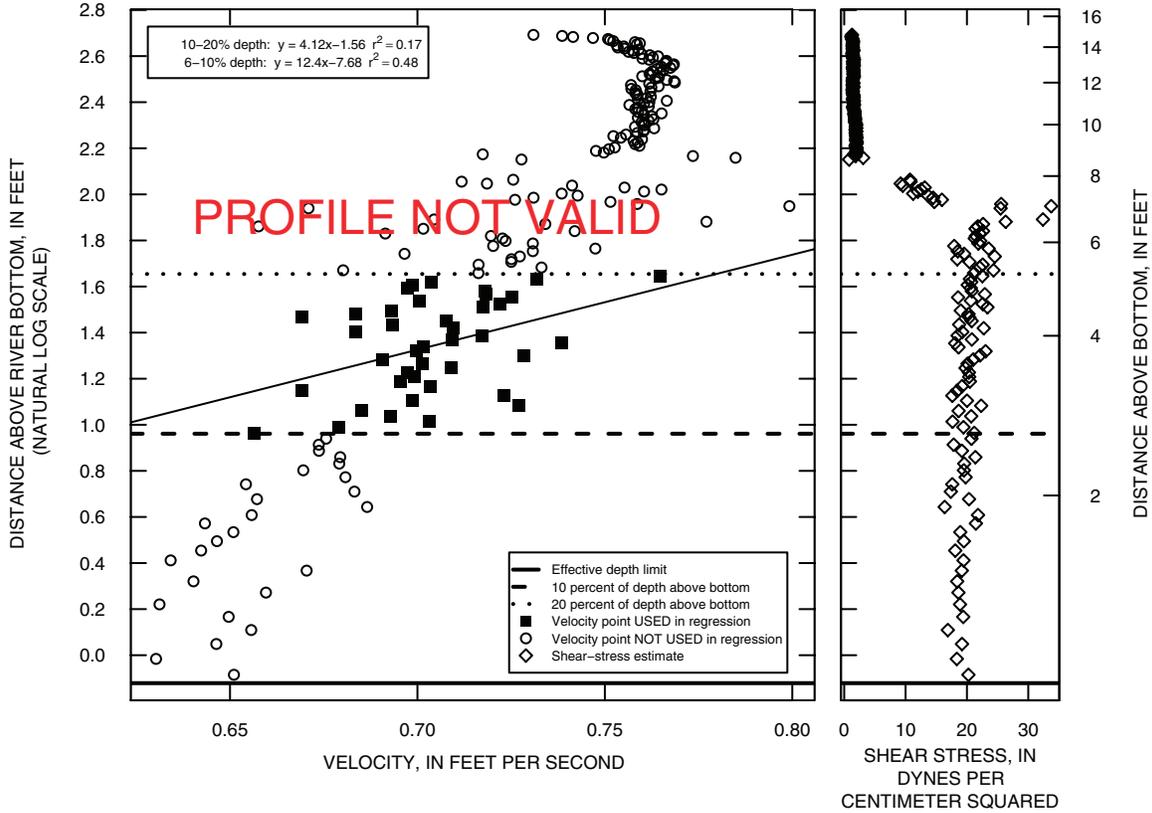


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**Velocity Profile – Lower Fox River – OU4-7B**

11/6/2003 13:17:32



Vertically averaged water flow: 0.73 ft/s, to direction 30.3°  
 Average wind conditions: 11.1 mi/h, from direction 283.1°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 9.19 [0.72 ≤ τ ≤ 27.2]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 1.01 [0.32 ≤ τ ≤ 2.1]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 19.16  
 Shear velocity (cm/s): 3.03 [0.85 ≤ u\_\* ≤ 5.22]  
 Bottom roughness, K<sub>s</sub> (cm): 192.14  
 Boundary Reynolds number: 58244.68 Test: PASS

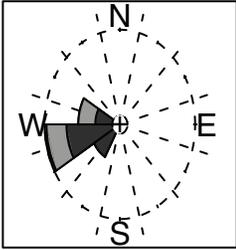
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 26.15	Field recorded ADCP depth (ft): --
Water mode: 11	Field recorded depthfinder depth (ft): 26.5
Water-cell size (cm): 2	Total number of recorded ensembles: 270
Blanking dist. (cm): 25	Heading: 199.34 ± 2.2
Field recorded offset (cm): 320	Pitch: 0.32 ± 0.42
Actual offset (cm): 320	Roll: -2.09 ± 0.97
Latitude: 44° 31' 1.7" N	Filename: Vert20031106131732r.csv
Longitude: 88° 0' 59" W	

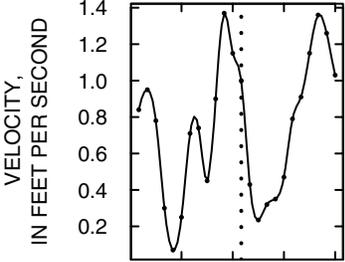
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**DAILY WIND ROSE**

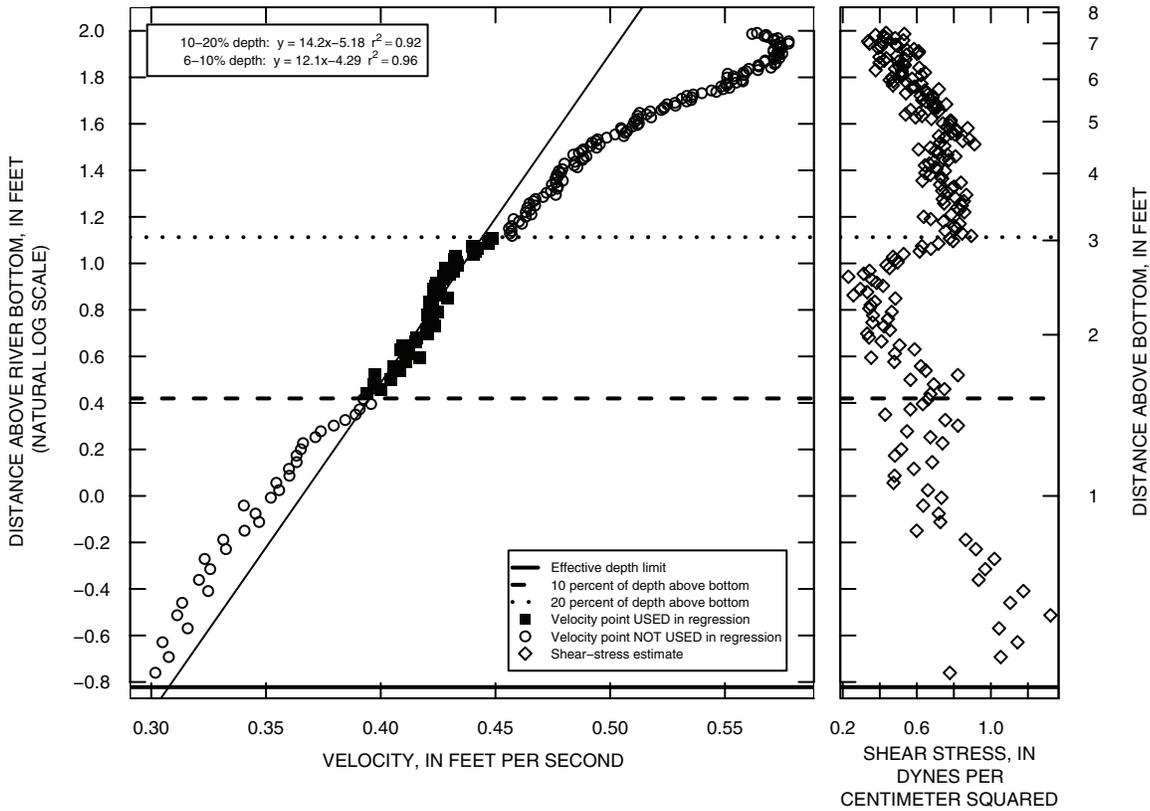


**VELOCITY AT OIL TANK DEPOT**



### Velocity Profile – Lower Fox River – OU4-7C

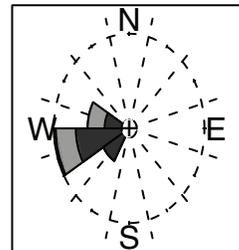
11/6/2003 12:57:00



Vertically averaged water flow: 0.47 ft/s, to direction 20.6°  
 Average wind conditions: 10.27 mi/h, from direction 286.7°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 0.78 [0.65 ≤ τ ≤ 0.92]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 1.06 [0.92 ≤ τ ≤ 1.22]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 0.77  
 Shear velocity (cm/s): 0.88 [0.8 ≤ u\_\* ≤ 0.96]  
 Bottom roughness, K<sub>s</sub> (cm): 5.16  
 Boundary Reynolds number: 455.48 Test: PASS

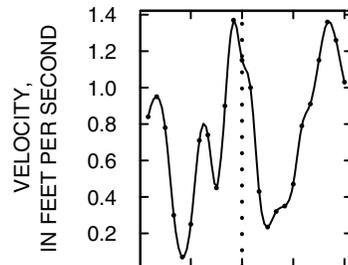
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 15.21	Field recorded ADCP depth (ft): ---
Water mode: 11	Field recorded depthfinder depth (ft): 13.8
Water-cell size (cm): 1	Total number of recorded ensembles: 242
Blanking dist. (cm): 25	Heading: 178.54 ± 2.81
Field recorded offset (cm): 213	Pitch: 1.83 ± 0.37
Actual offset (cm): 213	Roll: -0.04 ± 0.74
Latitude: 44° 31' 0.3" N	Filename: Vert20031106125700r.csv
Longitude: 88° 0' 56.9" W	

VELOCITY AT OIL TANK DEPOT



**NOTES**

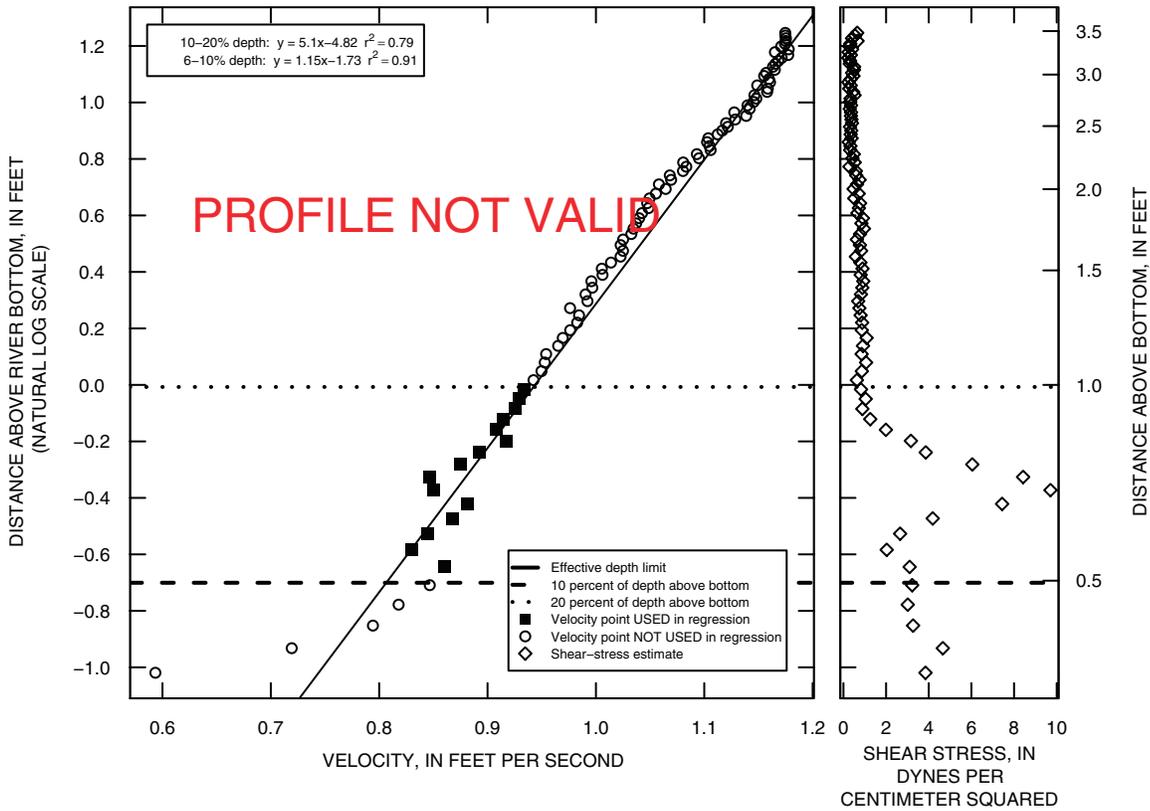
- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

## March 2004 Velocity Profiles (OU-4)

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**Velocity Profile – Lower Fox River – OU4-1A**

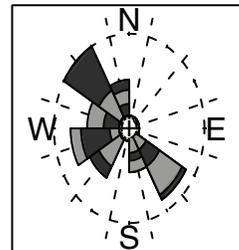
3/7/2004 10:32:20



Vertically averaged water flow: 1.04 ft/s, to direction 30.6°  
 Average wind conditions: 17.11 mi/h, from direction 253.8°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 6 [2.85 ≤ τ ≤ 10.3]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 117.39 [22.23 ≤ τ ≤ 287.45]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 3.6  
 Shear velocity (cm/s): 2.45 [1.69 ≤ u\_\* ≤ 3.21]  
 Bottom roughness, K<sub>s</sub> (cm): 7.4  
 Boundary Reynolds number: 1811.8 Test: PASS

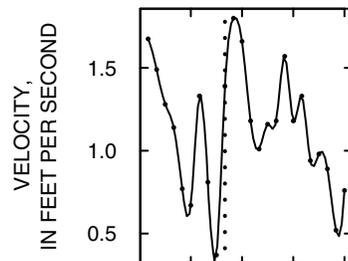
**DAILY WIND ROSE**



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 4.96	Field recorded ADCP depth (ft): --
Water mode: 11	Field recorded depthfinder depth (ft): 4
Water-cell size (cm): 1	Total number of recorded ensembles: 235
Blanking dist. (cm): 25	Heading: 281.85 ± 1.77
Field recorded offset (cm): 18.3	Pitch: 2.64 ± 0.38
Actual offset (cm): 18.3	Roll: -2.16 ± 0.44
Latitude: 44° 27' 22" N	Filename: Vert20040307103220r.csv
Longitude: 88° 4' 4.1" W	

**VELOCITY AT OIL TANK DEPOT**

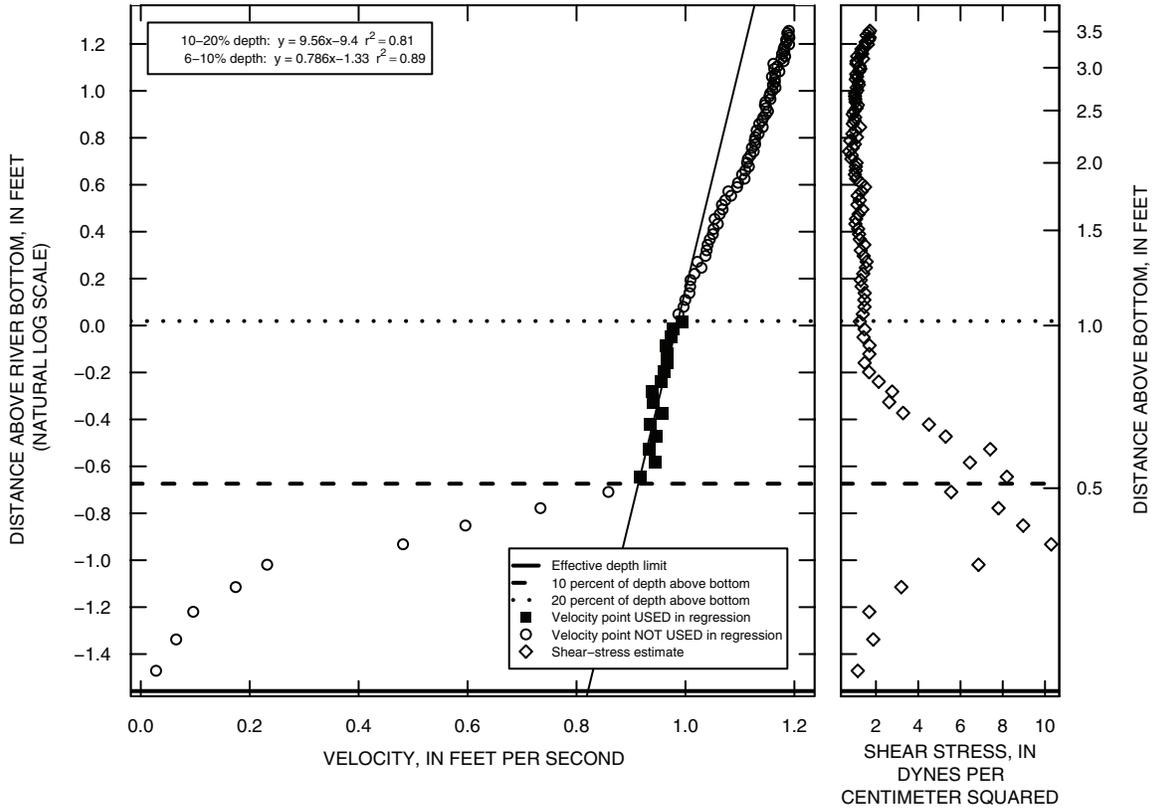


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**Velocity Profile – Lower Fox River – OU4-1B**

3/7/2004 10:15:30



Vertically averaged water flow: 1.02 ft/s, to direction 32°  
 Average wind conditions: 17.11 mi/h, from direction 253.8°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 1.71 [0.88 ≤ τ ≤ 2.81]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 252.83 [120.25 ≤ τ ≤ 434.12]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 5.26  
 Shear velocity (cm/s): 1.31 [0.94 ≤ u\_\* ≤ 1.68]  
 Bottom roughness, K<sub>s</sub> (cm): 0.08  
 Boundary Reynolds number: 9.82 Test: MAYBE

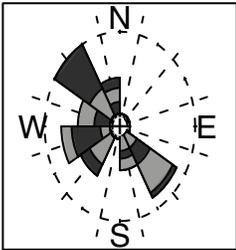
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 5.1	Field recorded ADCP depth (ft): ---
Water mode: 11	Field recorded depthfinder depth (ft): 4.1
Water-cell size (cm): 1	Total number of recorded ensembles: 264
Blanking dist. (cm): 25	Heading: 259.6 ± 3.85
Field recorded offset (cm): 21.3	Pitch: 3.31 ± 0.23
Actual offset (cm): 21.3	Roll: -1.24 ± 1.5
Latitude: 44° 27' 18.2" N	Filename: Vert20040307101530r.csv
Longitude: 88° 4' 1.5" W	

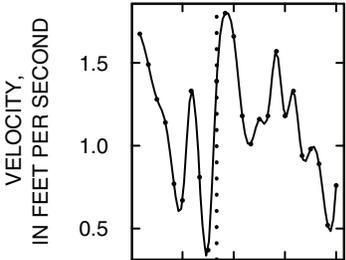
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

DAILY WIND ROSE

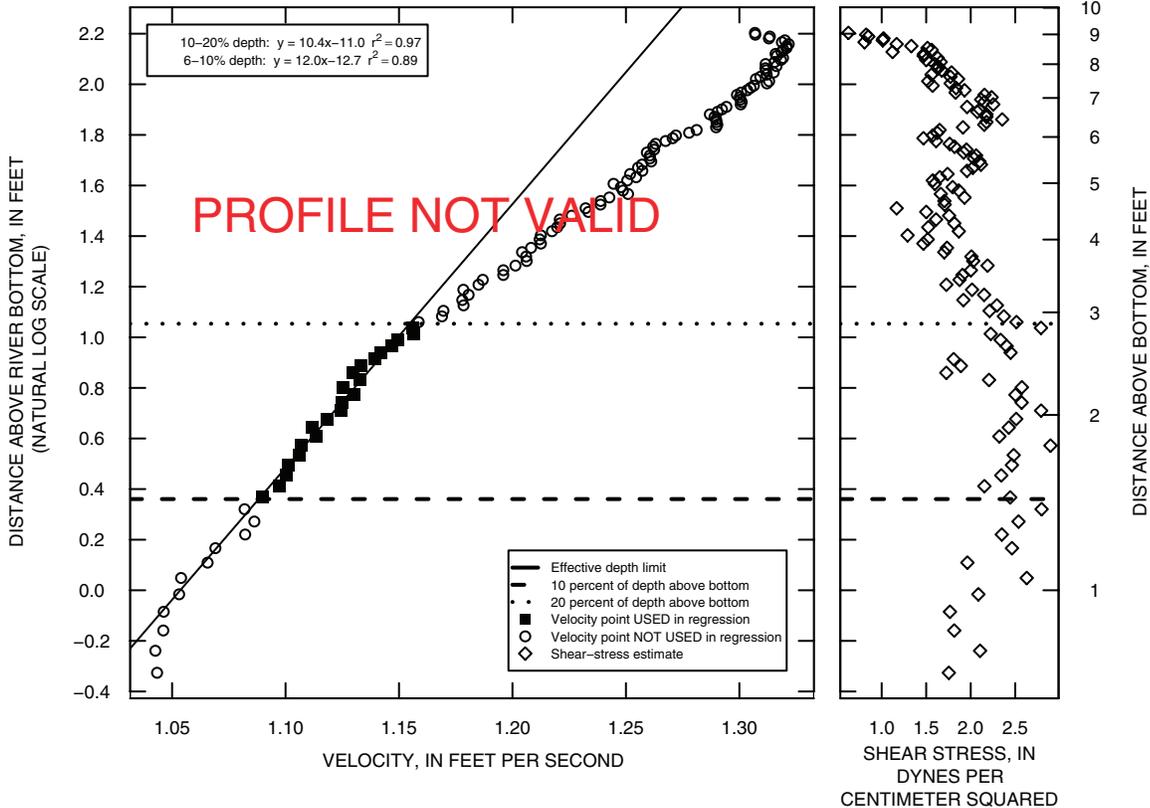


VELOCITY AT OIL TANK DEPOT



**Velocity Profile – Lower Fox River – OU4-1C**

3/7/2004 9:57:09



Vertically averaged water flow: 1.22 ft/s, to direction 36.9°  
 Average wind conditions: 16.86 mi/h, from direction 253.4°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 1.44 [1.23 ≤ τ ≤ 1.66]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 1.09 [0.58 ≤ τ ≤ 1.76]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 2.21  
 Shear velocity (cm/s): 1.2 [1.11 ≤ u\_\* ≤ 1.29]  
 Bottom roughness, K<sub>s</sub> (cm): 0.02  
 Boundary Reynolds number: 1.86 Test: FAIL

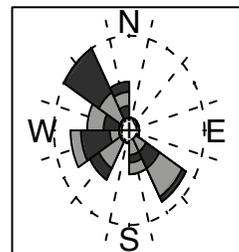
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 14.34	Field recorded ADCP depth (ft): --
Water mode: 11	Field recorded depthfinder depth (ft): --
Water-cell size (cm): 2	Total number of recorded ensembles: 252
Blanking dist. (cm): 25	Heading: 262.72 ± 8.29
Field recorded offset (cm): -3018	Pitch: 2.23 ± 1.77
Actual offset (cm): 134	Roll: -3.78 ± 1.79
Latitude: 44° 27' 15.6" N	Filename: Vert20040307095709r.csv
Longitude: 88° 3' 58.9" W	

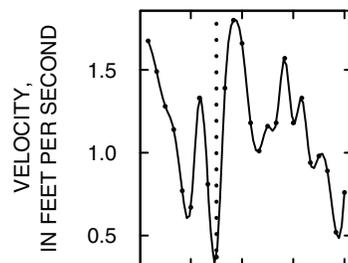
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**DAILY WIND ROSE**

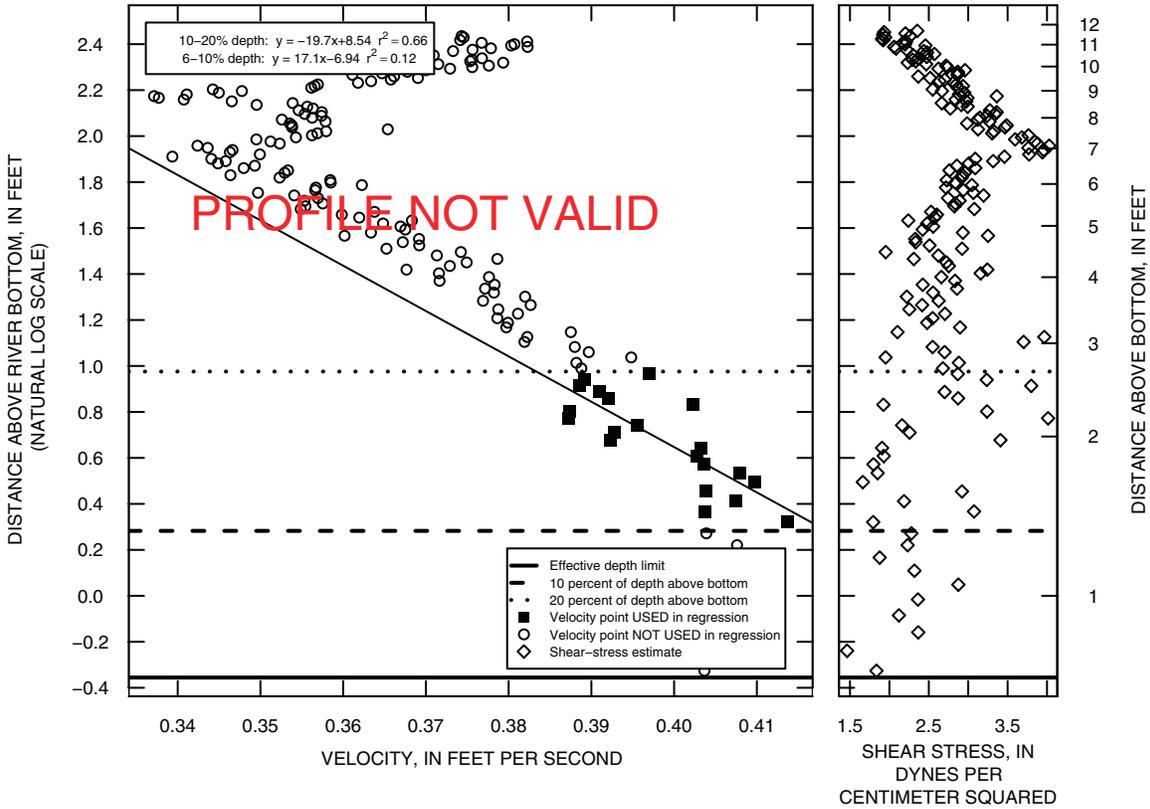


**VELOCITY AT OIL TANK DEPOT**



**Velocity Profile – Lower Fox River – OU4-1D**

3/7/2004 9:04:50



Vertically averaged water flow: 0.35 ft/s, to direction 191°  
 Average wind conditions: 16.86 mi/h, from direction 253.4°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 0.4 [0.17 ≤ τ ≤ 0.74]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 0.54 [-0.72 ≤ τ ≤ 5.36]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 2.17  
 Shear velocity (cm/s): -0.63 [-0.41 ≤ u<sub>\*</sub> ≤ -0.86]  
 Bottom roughness, K<sub>s</sub> (cm): 4670367  
 Boundary Reynolds number: -295839713.87 Test: FAIL

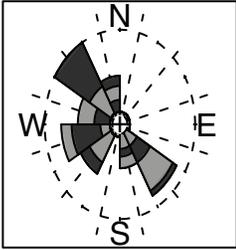
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 13.27	Field recorded ADCP depth (ft): 13.2
Water mode: 11	Field recorded depthfinder depth (ft): 13.9
Water-cell size (cm): 2	Total number of recorded ensembles: 253
Blanking dist. (cm): 25	Heading: 274.13 ± 9.12
Field recorded offset (cm): 21.3	Pitch: 2.96 ± 1.23
Actual offset (cm): 21.3	Roll: -2.41 ± 0.66
Latitude: 44° 27' 10.7" N	Filename: Vert20040307090450r.csv
Longitude: 88° 3' 54.5" W	

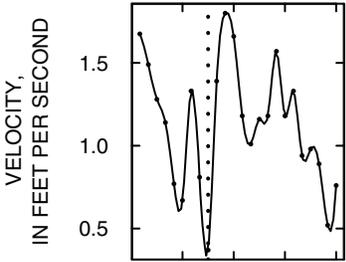
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**DAILY WIND ROSE**

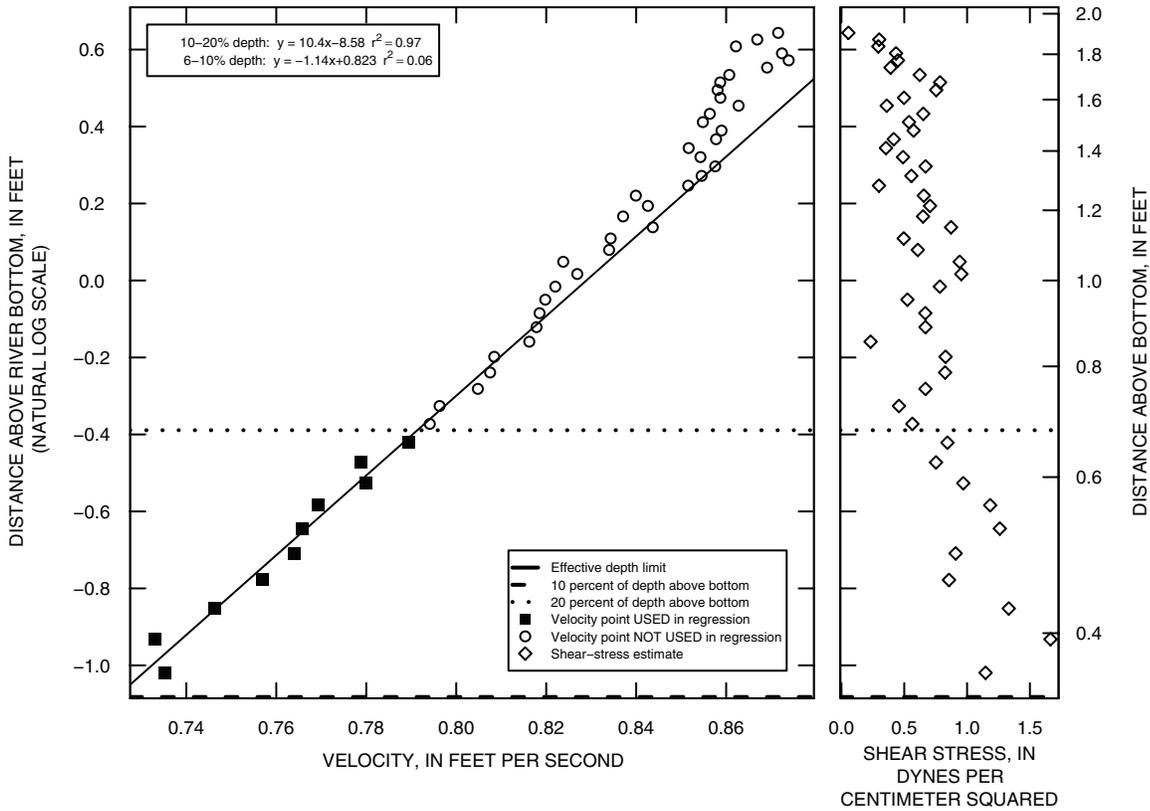


**VELOCITY AT OIL TANK DEPOT**



### Velocity Profile – Lower Fox River – OU4-2A

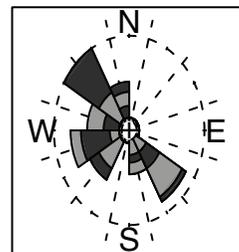
3/7/2004 12:40:19



Vertically averaged water flow: 0.83 ft/s, to direction 35.7°  
 Average wind conditions: 15.73 mi/h, from direction 243.1°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 1.46 [1.05 ≤ τ ≤ 1.94]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 120.41 [NaN ≤ τ ≤ NaN]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 0  
 Shear velocity (cm/s): 1.21 [1.02 ≤ u\_\* ≤ 1.39]  
 Bottom roughness, K<sub>s</sub> (cm): 0.17  
 Boundary Reynolds number: 20.66 Test: MAYBE

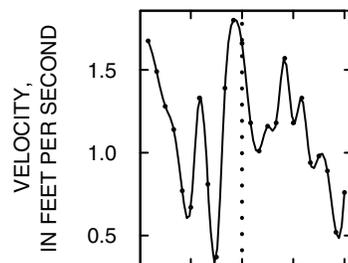
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 3.39	Field recorded ADCP depth (ft): --
Water mode: 11	Field recorded depthfinder depth (ft): 2.6
Water-cell size (cm): 1	Total number of recorded ensembles: 260
Blanking dist. (cm): 25	Heading: 223.99 ± 2.46
Field recorded offset (cm): 18.3	Pitch: 2.7 ± 0.49
Actual offset (cm): 18.3	Roll: -1.49 ± 3.5
Latitude: 44° 27' 43.6" N	Filename: Vert20040307124019r.csv
Longitude: 88° 3' 32.5" W	

VELOCITY AT OIL TANK DEPOT

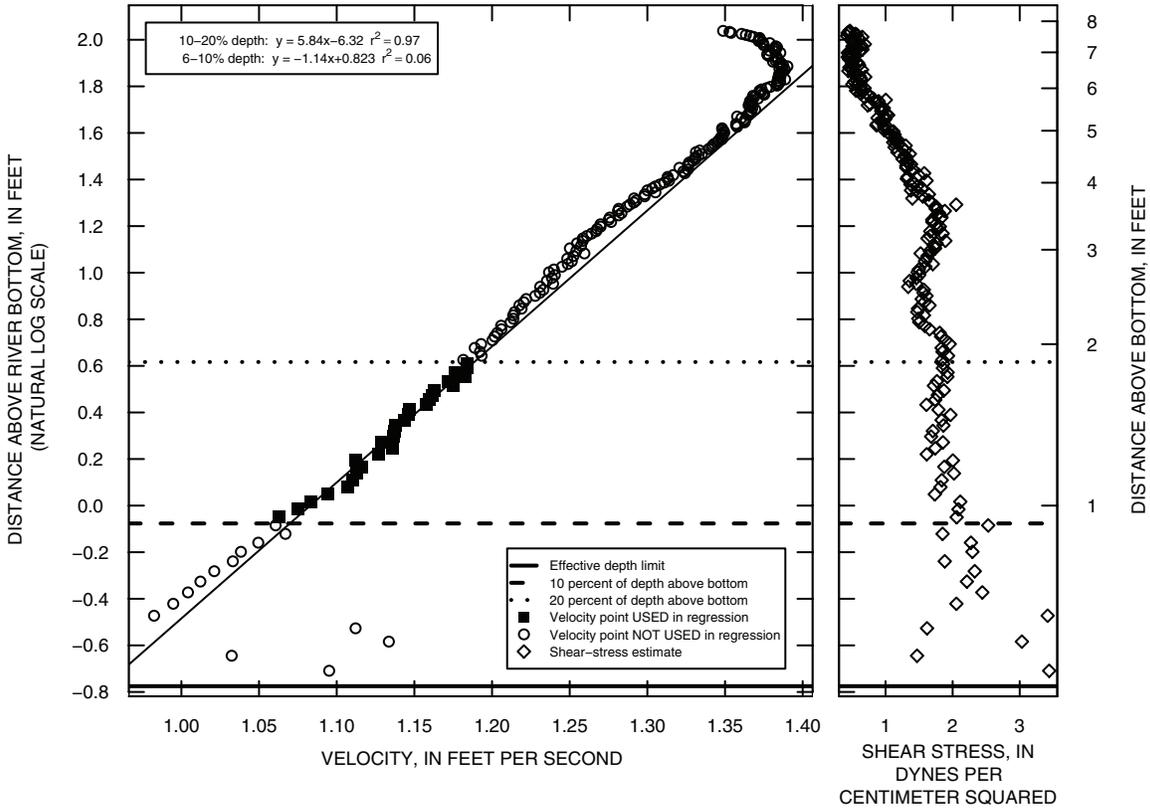


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**Velocity Profile – Lower Fox River – OU4-2B**

3/7/2004 12:27:33



Vertically averaged water flow: 1.28 ft/s, to direction 40.5°  
 Average wind conditions: 15.73 mi/h, from direction 243.1°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 4.58 [ $4 \leq \tau \leq 5.2$ ]  
 Shear stress (LP, 6–10% depth) (dyn/cm<sup>2</sup>): 120.41 [ $-235.14 \leq \tau \leq 1389.83$ ]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 2.35  
 Shear velocity (cm/s): 2.14 [ $2 \leq u_* \leq 2.28$ ]  
 Bottom roughness,  $K_s$  (cm): 1.64  
 Boundary Reynolds number: 350.68 Test: PASS

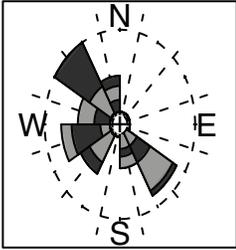
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 9.26	Field recorded ADCP depth (ft): --
Water mode: 11	Field recorded depthfinder depth (ft): 9
Water-cell size (cm): 1	Total number of recorded ensembles: 219
Blanking dist. (cm): 25	Heading: 211.16 ± 2.02
Field recorded offset (cm): 21.3	Pitch: 1.68 ± 0.85
Actual offset (cm): 21.3	Roll: -3.66 ± 1.83
Latitude: 44° 27' 43.3" N	Filename: Vert20040307122733r.csv
Longitude: 88° 3' 31.3" W	

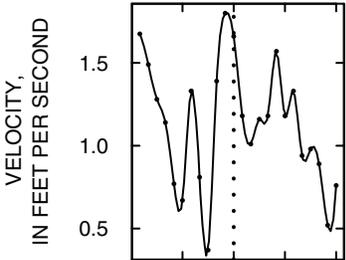
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**DAILY WIND ROSE**

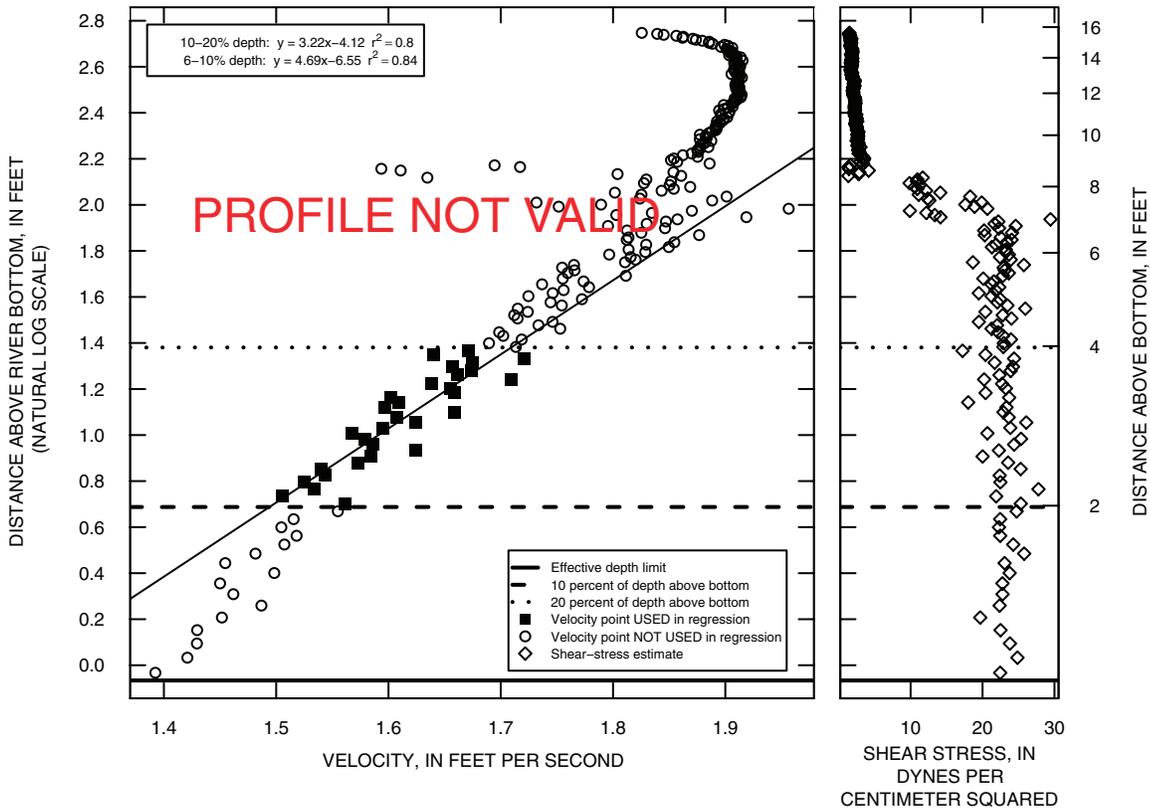


**VELOCITY AT OIL TANK DEPOT**



### Velocity Profile – Lower Fox River – OU4-2C

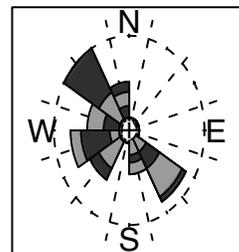
3/7/2004 12:06:59



Vertically averaged water flow: 1.79 ft/s, to direction 35.7°  
 Average wind conditions: 15.73 mi/h, from direction 243.1°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) ( $\text{dyn/cm}^2$ ): 15.07 [ $9.78 \leq \tau \leq 21.51$ ]  
 Shear stress (LP, 6-10% depth) ( $\text{dyn/cm}^2$ ): 7.1 [ $4.04 \leq \tau \leq 11.02$ ]  
 Shear stress (TKE) ( $\text{dyn/cm}^2$ ): 23.13  
 Shear velocity (cm/s): 3.88 [ $3.13 \leq u_* \leq 4.64$ ]  
 Bottom roughness,  $K_s$  (cm): 14.83  
 Boundary Reynolds number: 5759.45 Test: PASS

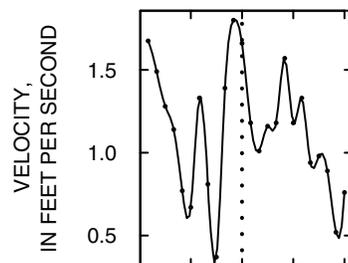
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 19.89	Field recorded ADCP depth (ft): --
Water mode: 11	Field recorded depthfinder depth (ft): --
Water-cell size (cm): 2	Total number of recorded ensembles: 221
Blanking dist. (cm): 25	Heading: $247.76 \pm 2.59$
Field recorded offset (cm): 104	Pitch: $2.82 \pm 0.24$
Actual offset (cm): 104	Roll: $-1.87 \pm 3.97$
Latitude: $44^\circ 27' 42.8''$ N	Filename: Vert20040307120659r.csv
Longitude: $88^\circ 3' 28.6''$ W	

VELOCITY AT OIL TANK DEPOT

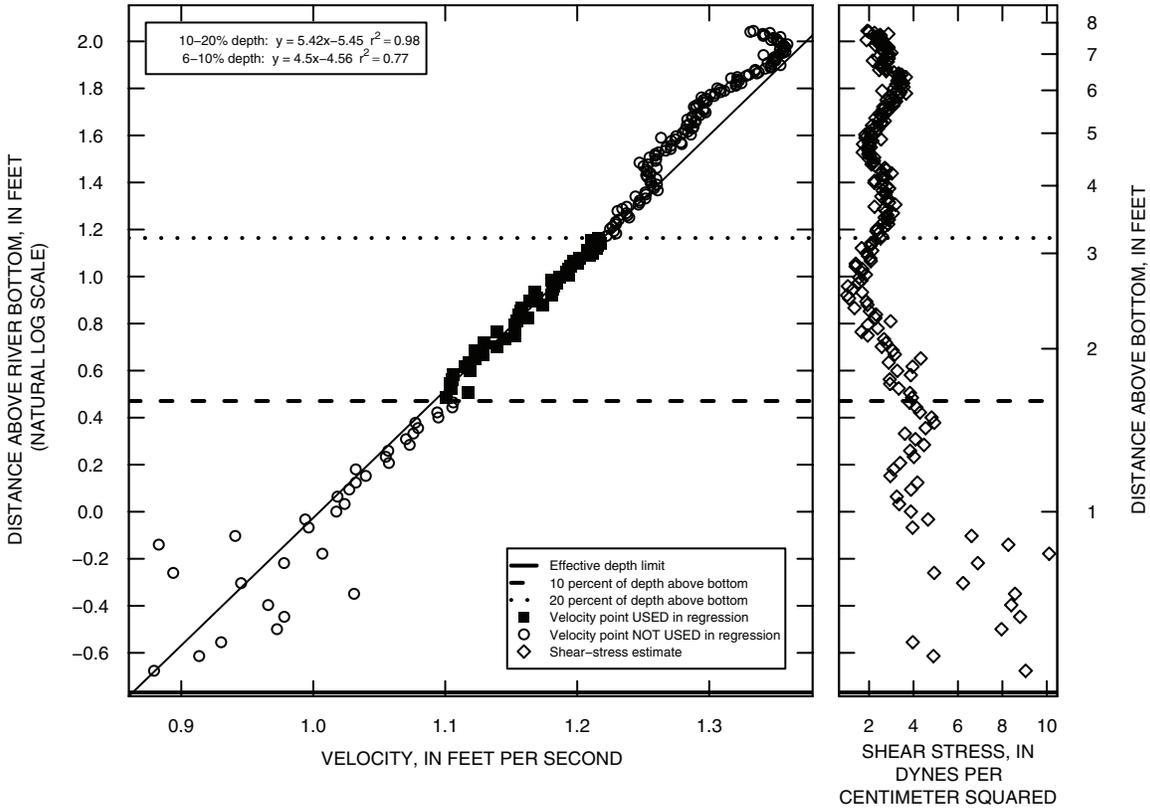


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**Velocity Profile – Lower Fox River – OU4-2D**

3/7/2004 11:45:56



Vertically averaged water flow: 1.22 ft/s, to direction 28.1°  
 Average wind conditions: 15.31 mi/h, from direction 245.4°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 5.31 [4.86 ≤ τ ≤ 5.78]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 7.71 [4.95 ≤ τ ≤ 11.09]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 5.23  
 Shear velocity (cm/s): 2.3 [2.2 ≤ u<sub>\*</sub> ≤ 2.4]  
 Bottom roughness, K<sub>s</sub> (cm): 3.93  
 Boundary Reynolds number: 904.4 Test: PASS

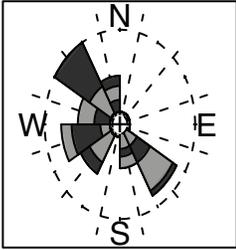
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 16.01	Field recorded ADCP depth (ft): ---
Water mode: 11	Field recorded depthfinder depth (ft): 14.5
Water-cell size (cm): 1	Total number of recorded ensembles: 217
Blanking dist. (cm): 25	Heading: 245.9 ± 4.76
Field recorded offset (cm): 226	Pitch: -1.27 ± 1.07
Actual offset (cm): 226	Roll: -6.11 ± 3.01
Latitude: 44° 27' 41.9" N	Filename: Vert20040307114556r.csv
Longitude: 88° 3' 26.5" W	

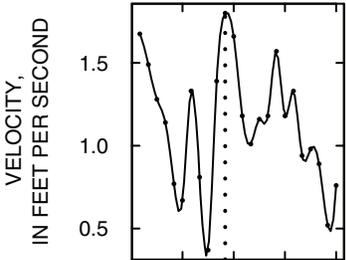
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**DAILY WIND ROSE**

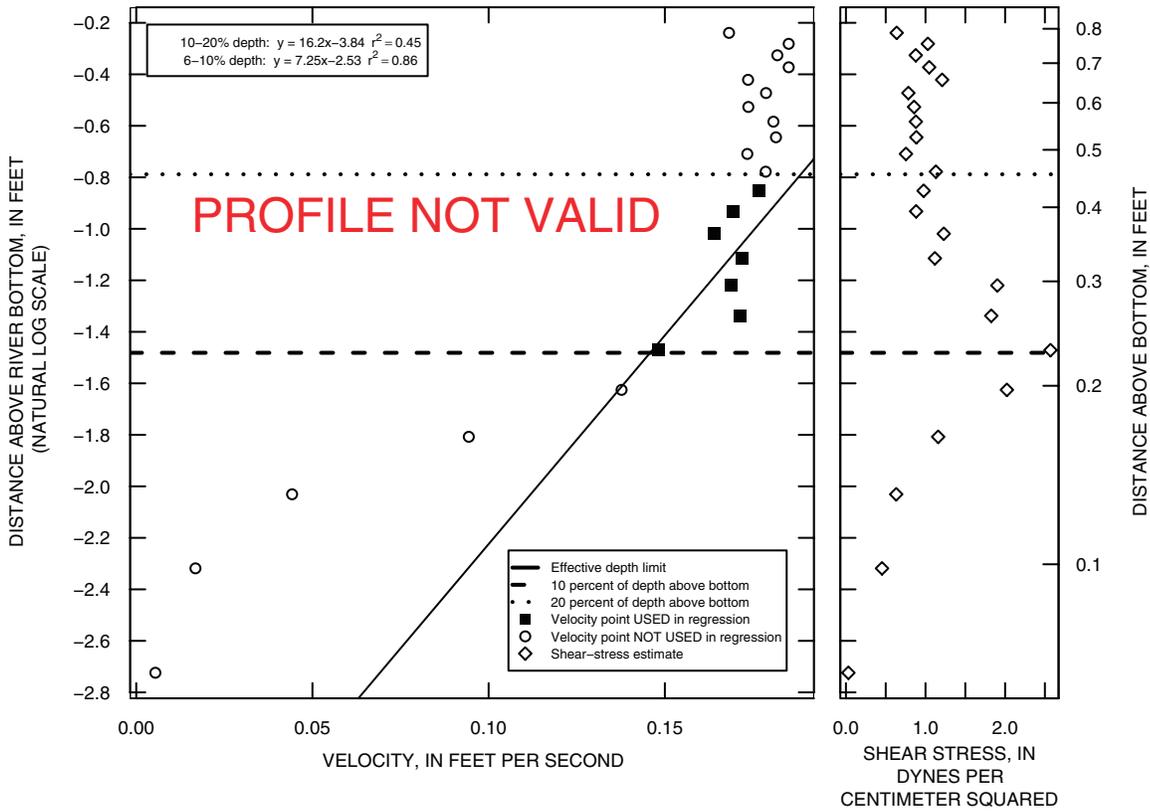


**VELOCITY AT OIL TANK DEPOT**



### Velocity Profile – Lower Fox River – OU4-3A

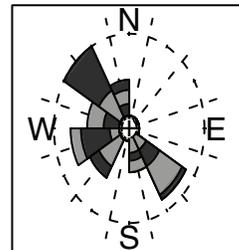
3/7/2004 15:03:51



Vertically averaged water flow: 0.15 ft/s, to direction 348.7°  
 Average wind conditions: 19.46 mi/h, from direction 285°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 0.59 [-0.04 ≤ τ ≤ 3.06]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 2.97 [0.2 ≤ τ ≤ 8.96]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 0.86  
 Shear velocity (cm/s): 0.77 [-0.21 ≤ u\_\* ≤ 1.75]  
 Bottom roughness, K<sub>s</sub> (cm): 19.56  
 Boundary Reynolds number: 1508.31 Test: PASS

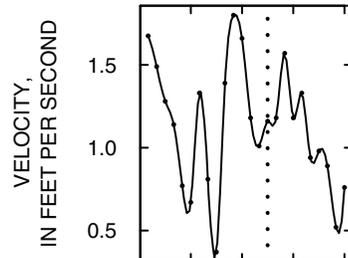
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 2.27	Field recorded ADCP depth (ft): --
Water mode: 11	Field recorded depthfinder depth (ft): 1.5
Water-cell size (cm): 1	Total number of recorded ensembles: 268
Blanking dist. (cm): 25	Heading: 227.46 ± 1.65
Field recorded offset (cm): 18.3	Pitch: 3.87 ± 0.29
Actual offset (cm): 18.3	Roll: 0.6 ± 1.46
Latitude: 44° 28' 18.8" N	Filename: Vert20040307150351r.csv
Longitude: 88° 3' 9.9" W	

VELOCITY AT OIL TANK DEPOT

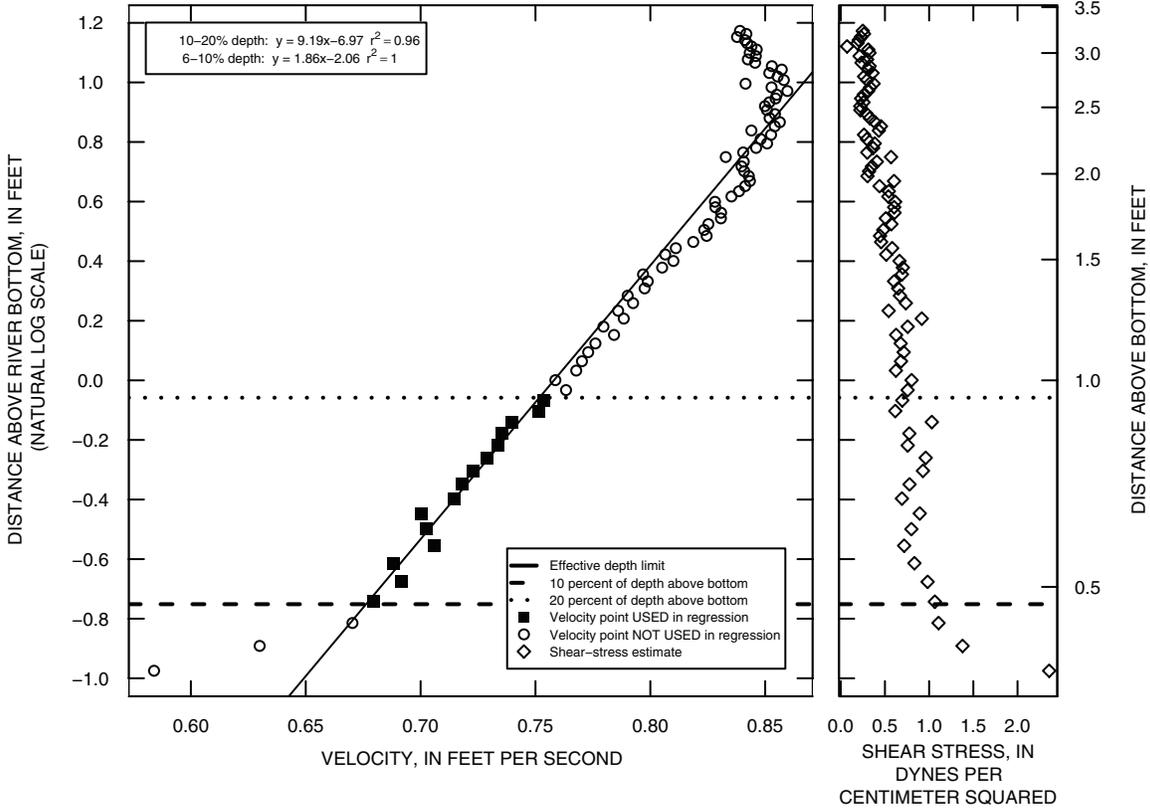


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**Velocity Profile – Lower Fox River – OU4-3B**

3/7/2004 14:51:16



Vertically averaged water flow: 0.8 ft/s, to direction 23.9°  
 Average wind conditions: 19.07 mi/h, from direction 267.8°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 1.85 [1.44 ≤ τ ≤ 2.31]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 45.35 [30.47 ≤ τ ≤ 63.18]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 1.61  
 Shear velocity (cm/s): 1.36 [1.2 ≤ u\_\* ≤ 1.52]  
 Bottom roughness, K<sub>s</sub> (cm): 0.86  
 Boundary Reynolds number: 117.33 Test: PASS

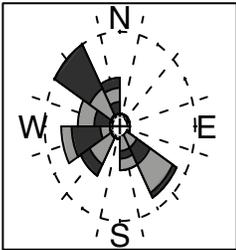
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 4.72	Field recorded ADCP depth (ft): ---
Water mode: 11	Field recorded depthfinder depth (ft): 4
Water-cell size (cm): 1	Total number of recorded ensembles: 234
Blanking dist. (cm): 25	Heading: 227.8 ± 2.51
Field recorded offset (cm): 18.3	Pitch: 3.78 ± 0.37
Actual offset (cm): 18.3	Roll: -0.3 ± 2.2
Latitude: 44° 28' 17.3" N	Filename: Vert20040307145116r.csv
Longitude: 88° 3' 5.9" W	

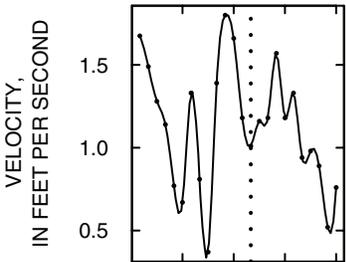
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

DAILY WIND ROSE

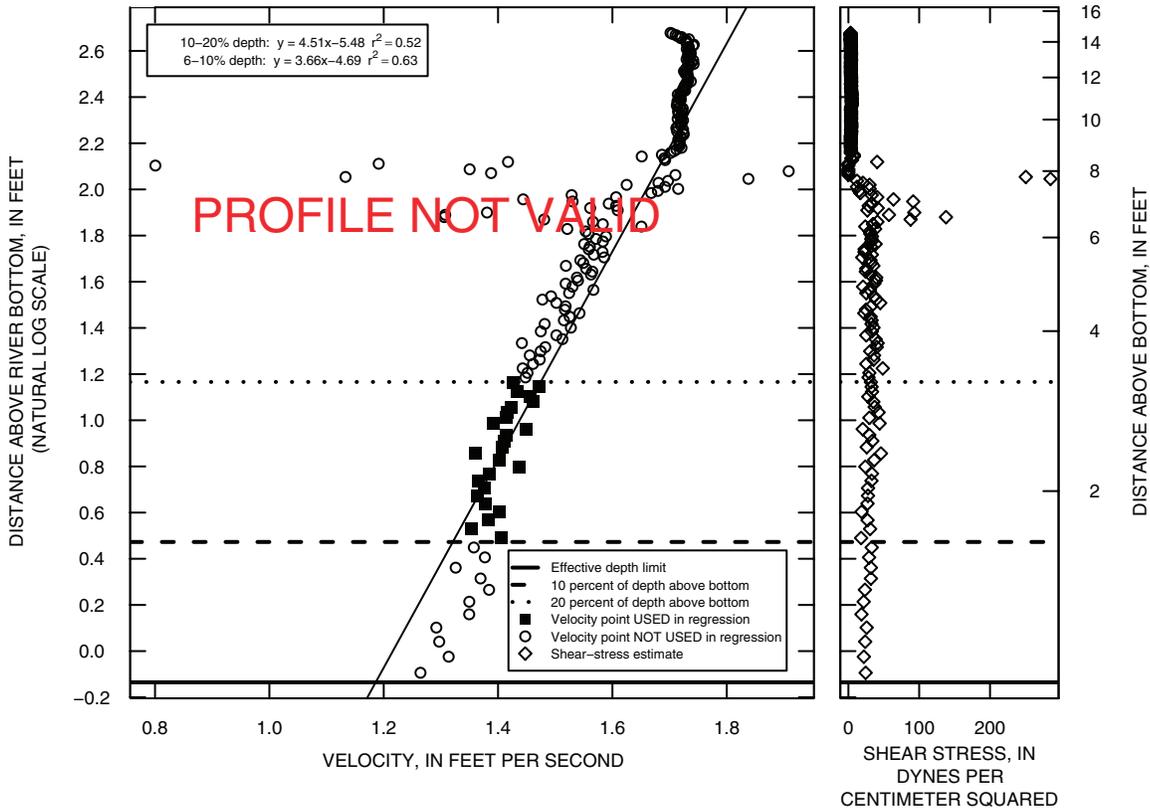


VELOCITY AT OIL TANK DEPOT



**Velocity Profile – Lower Fox River – OU4-3C**

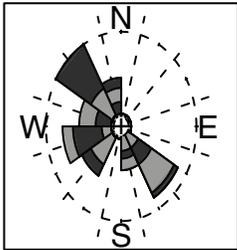
3/7/2004 14:35:16



Vertically averaged water flow: 1.54 ft/s, to direction 26°  
 Average wind conditions: 19.07 mi/h, from direction 267.8°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 7.69 [2.62 ≤ τ ≤ 15.42]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 11.65 [2.09 ≤ τ ≤ 28.93]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 25.89  
 Shear velocity (cm/s): 2.77 [1.62 ≤ u\_\* ≤ 3.93]  
 Bottom roughness, K<sub>s</sub> (cm): 3.81  
 Boundary Reynolds number: 1055.57 Test: PASS

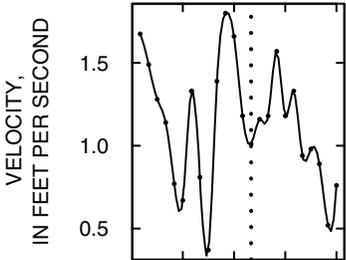
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 16.04	Field recorded ADCP depth (ft): --
Water mode: 11	Field recorded depthfinder depth (ft): --
Water-cell size (cm): 2	Total number of recorded ensembles: 241
Blanking dist. (cm): 25	Heading: 242.72 ± 3.79
Field recorded offset (cm): 18.3	Pitch: 3.3 ± 0.21
Actual offset (cm): 18.3	Roll: -1.48 ± 3.03
Latitude: 44° 28' 17.3" N	Filename: Vert20040307143516r.csv
Longitude: 88° 3' 2.3" W	

VELOCITY AT OIL TANK DEPOT

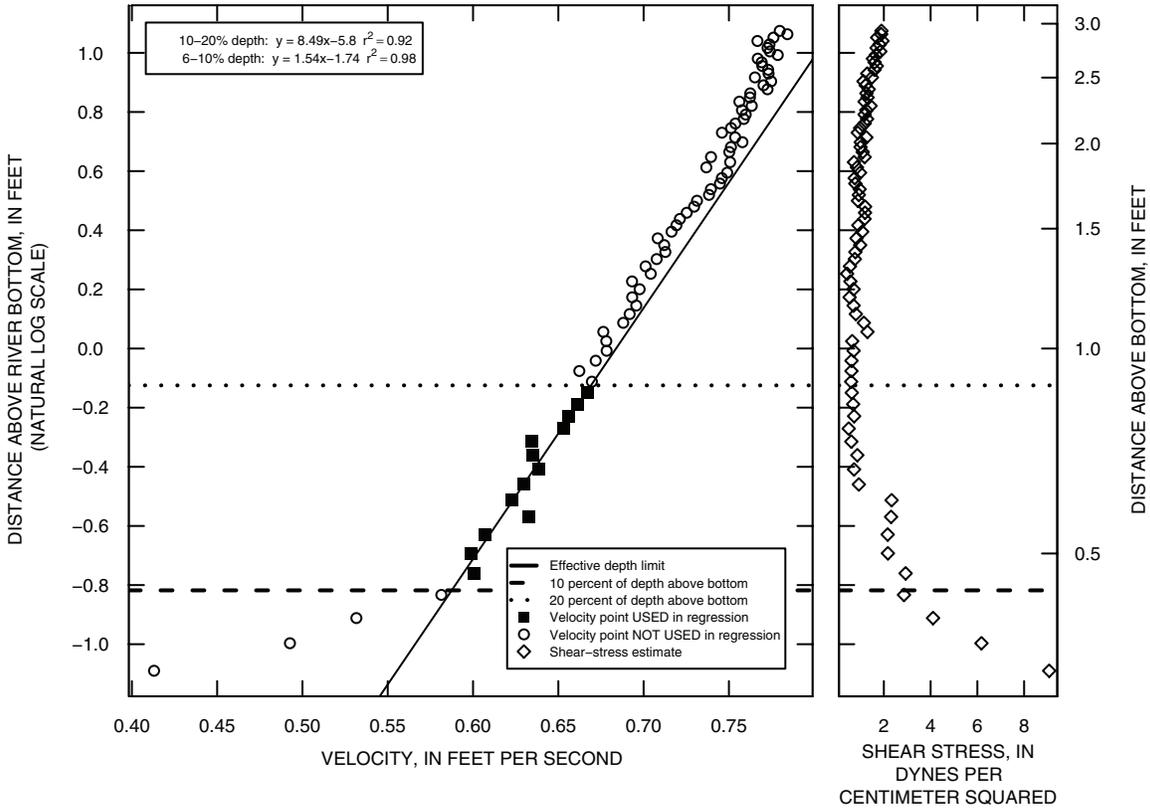


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**Velocity Profile – Lower Fox River – OU4-3D**

3/7/2004 14:20:27



Vertically averaged water flow: 0.71 ft/s, to direction 15.9°  
 Average wind conditions: 19.07 mi/h, from direction 267.8°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 2.17 [1.4 ≤ τ ≤ 3.11]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 65.65 [25.15 ≤ τ ≤ 125.24]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 5.55  
 Shear velocity (cm/s): 1.47 [1.18 ≤ u\_\* ≤ 1.76]  
 Bottom roughness, K<sub>s</sub> (cm): 2.76  
 Boundary Reynolds number: 405.64 Test: PASS

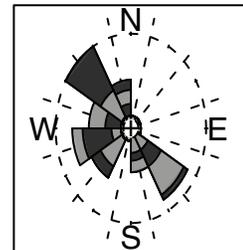
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 4.41	Field recorded ADCP depth (ft): ---
Water mode: 11	Field recorded depthfinder depth (ft): ---
Water-cell size (cm): 1	Total number of recorded ensembles: 237
Blanking dist. (cm): 25	Heading: 240.96 ± 2.65
Field recorded offset (cm): -3018	Pitch: 3.74 ± 0.42
Actual offset (cm): 18.3	Roll: 0.33 ± 3.07
Latitude: 44° 28' 15.3" N	Filename: Vert20040307142027r.csv
Longitude: 88° 2' 57.7" W	

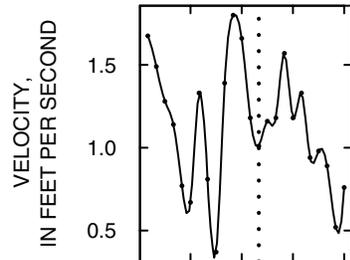
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

DAILY WIND ROSE

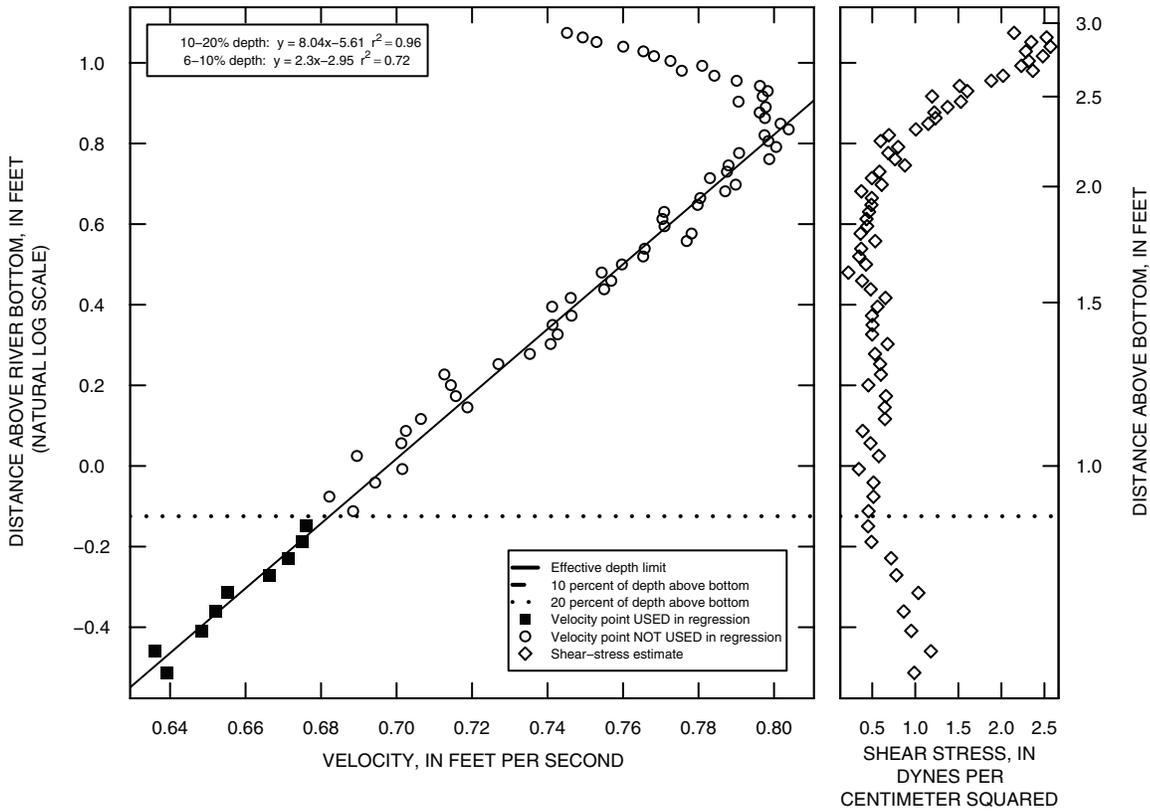


VELOCITY AT OIL TANK DEPOT



### Velocity Profile – Lower Fox River – OU4-4A

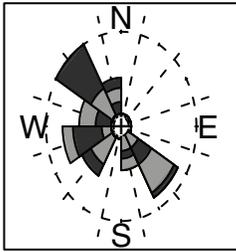
3/7/2004 16:28:31



Vertically averaged water flow: 0.75 ft/s, to direction 30.9°  
 Average wind conditions: 17.63 mi/h, from direction 308.8°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 2.42 [1.6 ≤ τ ≤ 3.41]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 29.47 [NaN ≤ τ ≤ NaN]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 0  
 Shear velocity (cm/s): 1.55 [1.26 ≤ u\_\* ≤ 1.85]  
 Bottom roughness, K<sub>s</sub> (cm): 3.35  
 Boundary Reynolds number: 521.62 Test: PASS

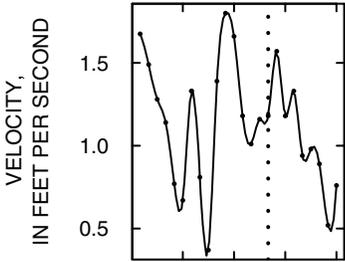
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 4.41	Field recorded ADCP depth (ft): 4.4
Water mode: 11	Field recorded depthfinder depth (ft): 3.4
Water-cell size (cm): 1	Total number of recorded ensembles: 243
Blanking dist. (cm): 25	Heading: 37.29 ± 2.63
Field recorded offset (cm): 18.3	Pitch: 4.91 ± 0.29
Actual offset (cm): 18.3	Roll: 0.52 ± 0.31
Latitude: 44° 28' 42.2" N	Filename: Vert20040307162831r.csv
Longitude: 88° 2' 45.6" W	

VELOCITY AT OIL TANK DEPOT

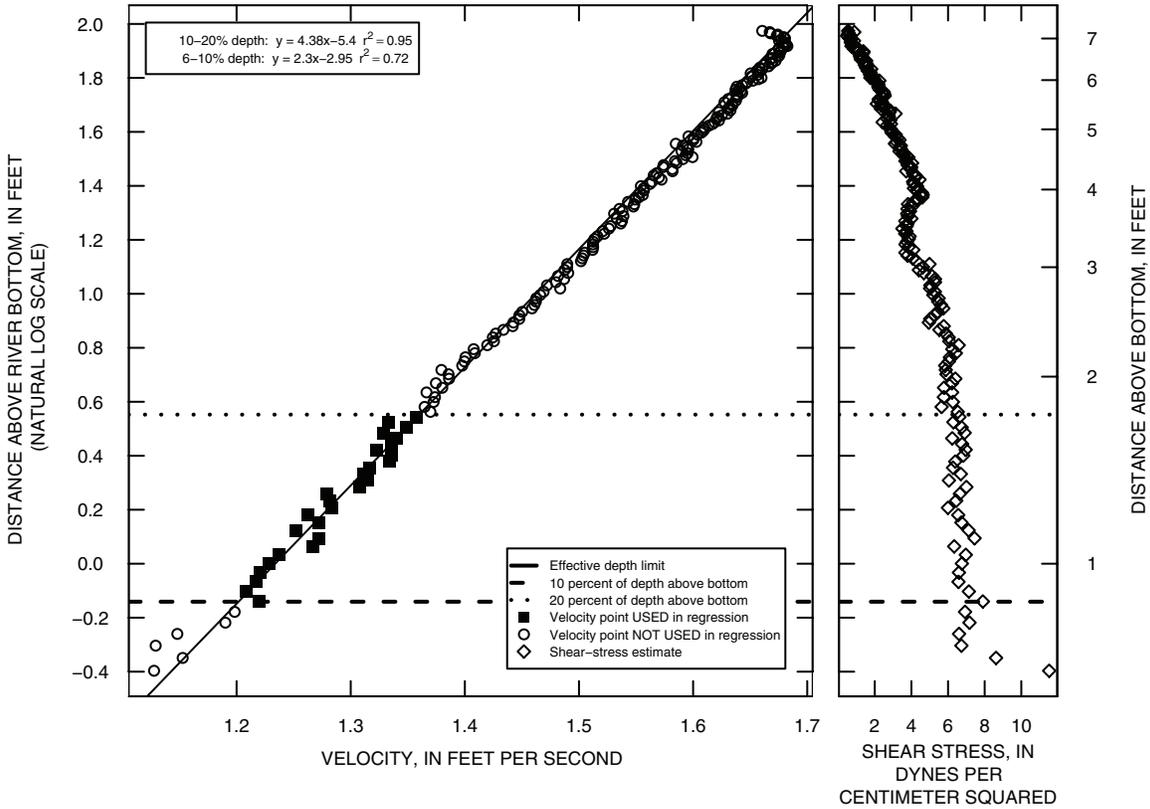


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**Velocity Profile – Lower Fox River – OU4-4B**

3/7/2004 16:14:26



Vertically averaged water flow: 1.52 ft/s, to direction 39.7°  
 Average wind conditions: 17.63 mi/h, from direction 308.8°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 8.14 [6.72 ≤ τ ≤ 9.7]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 29.47 [0.56 ≤ τ ≤ 102.16]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 7.93  
 Shear velocity (cm/s): 2.85 [2.59 ≤ u\_\* ≤ 3.12]  
 Bottom roughness, K<sub>s</sub> (cm): 4.11  
 Boundary Reynolds number: 1174.18 Test: PASS

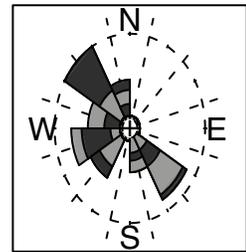
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 8.69	Field recorded ADCP depth (ft): 8.6
Water mode: 11	Field recorded depthfinder depth (ft): 8.2
Water-cell size (cm): 1	Total number of recorded ensembles: 221
Blanking dist. (cm): 25	Heading: 69.21 ± 3.44
Field recorded offset (cm): 18.3	Pitch: 4.91 ± 0.31
Actual offset (cm): 18.3	Roll: -0.85 ± 0.25
Latitude: 44° 28' 41" N	Filename: Vert20040307161426r.csv
Longitude: 88° 2' 38.9" W	

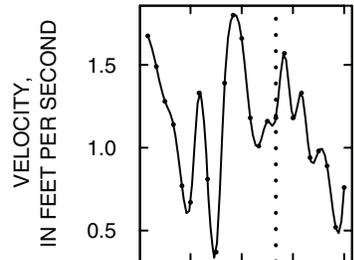
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**DAILY WIND ROSE**

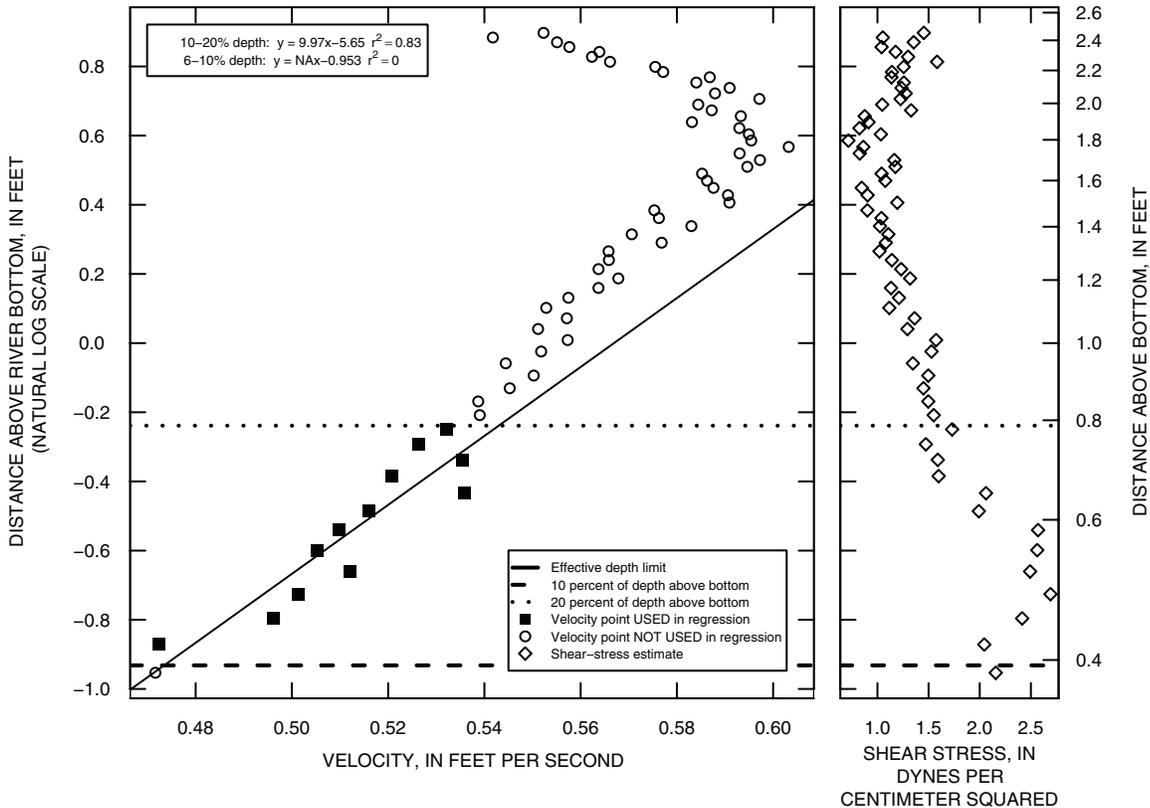


**VELOCITY AT OIL TANK DEPOT**



### Velocity Profile – Lower Fox River – OU4-4C

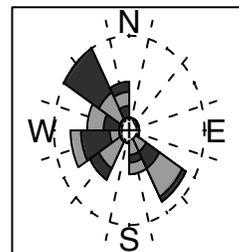
3/7/2004 15:52:57



Vertically averaged water flow: 0.56 ft/s, to direction 24.6°  
 Average wind conditions: 19.46 mi/h, from direction 285°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 1.57 [0.73 ≤ τ ≤ 2.73]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): NA [NA ≤ τ ≤ NA]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 2.16  
 Shear velocity (cm/s): 1.25 [0.85 ≤ u\_\* ≤ 1.65]  
 Bottom roughness, K<sub>s</sub> (cm): 3.21  
 Boundary Reynolds number: 402.86 Test: PASS

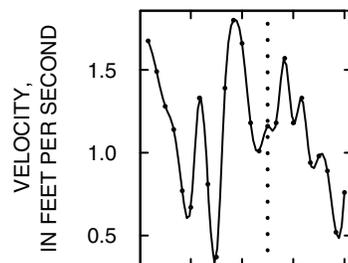
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 3.94	Field recorded ADCP depth (ft): ---
Water mode: 11	Field recorded depthfinder depth (ft): 3.2
Water-cell size (cm): 1	Total number of recorded ensembles: 260
Blanking dist. (cm): 25	Heading: 356.87 ± 2.31
Field recorded offset (cm): 18.3	Pitch: 3.46 ± 0.37
Actual offset (cm): 18.3	Roll: -0.89 ± 0.36
Latitude: 44° 28' 37.3" N	Filename: Vert20040307155257r.csv
Longitude: 88° 2' 22.9" W	

VELOCITY AT OIL TANK DEPOT

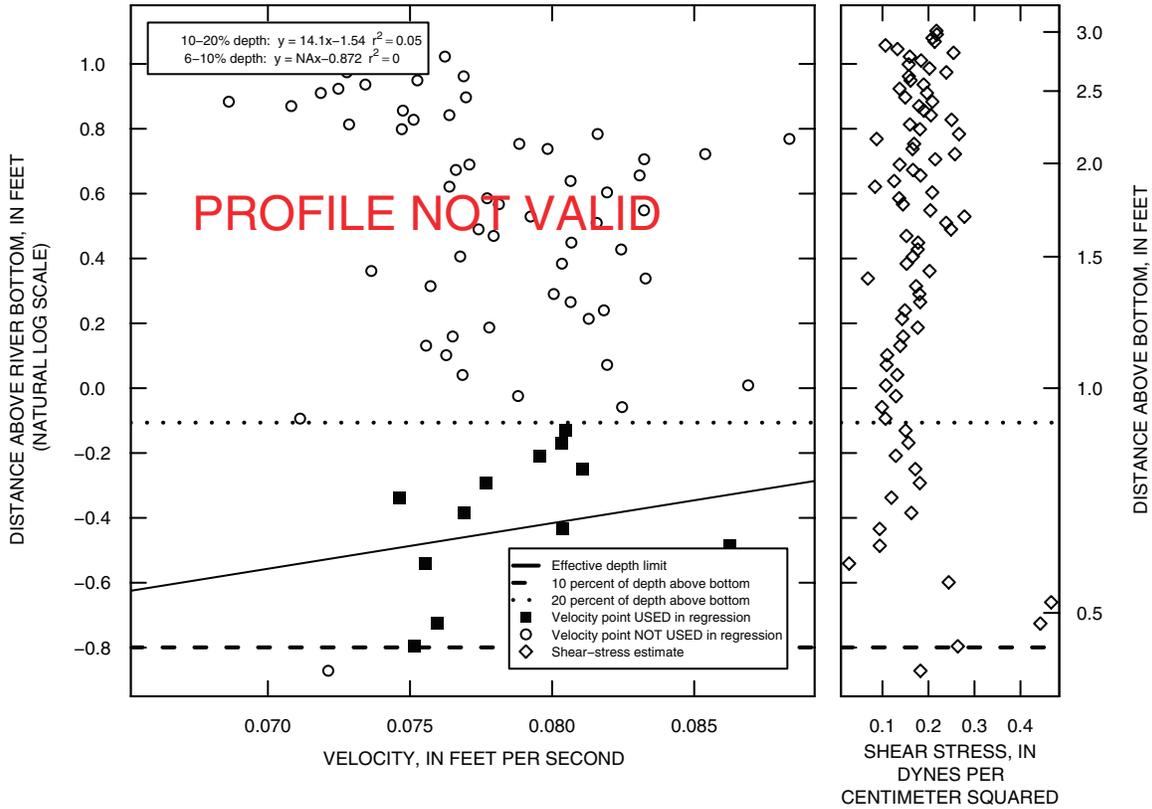


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**Velocity Profile – Lower Fox River – OU4-5A1**

3/8/2004 9:28:44



Vertically averaged water flow: 0.08 ft/s, to direction 348.4°  
 Average wind conditions: 15.55 mi/h, from direction 310°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm²): 0.79 [-2.75 ≤ τ ≤ 11.81]  
 Shear stress (LP, 6-10% depth) (dyn/cm²): NA [NA ≤ τ ≤ NA]  
 Shear stress (TKE) (dyn/cm²): 0.18  
 Shear velocity (cm/s): 0.89 [-1.66 ≤ u\_\* ≤ 3.44]  
 Bottom roughness, K<sub>s</sub> (cm): 195.69  
 Boundary Reynolds number: 17381.96 Test: PASS

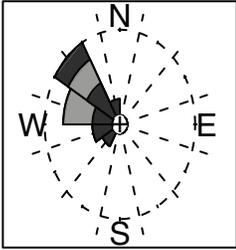
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 4.5	Field recorded ADCP depth (ft): 4.4
Water mode: 11	Field recorded depthfinder depth (ft): 3.6
Water-cell size (cm): 1	Total number of recorded ensembles: 237
Blanking dist. (cm): 25	Heading: 278.91 ± 1.03
Field recorded offset (cm): 18.3	Pitch: 2.41 ± 0.13
Actual offset (cm): 18.3	Roll: 0.18 ± 0.85
Latitude: 44° 29' 8.3" N	Filename: Vert20040308092844r.csv
Longitude: 88° 2' 24.6" W	

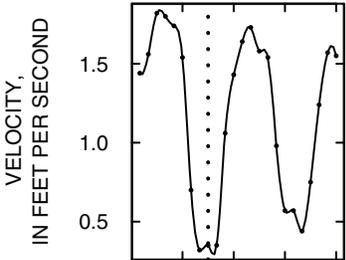
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**DAILY WIND ROSE**

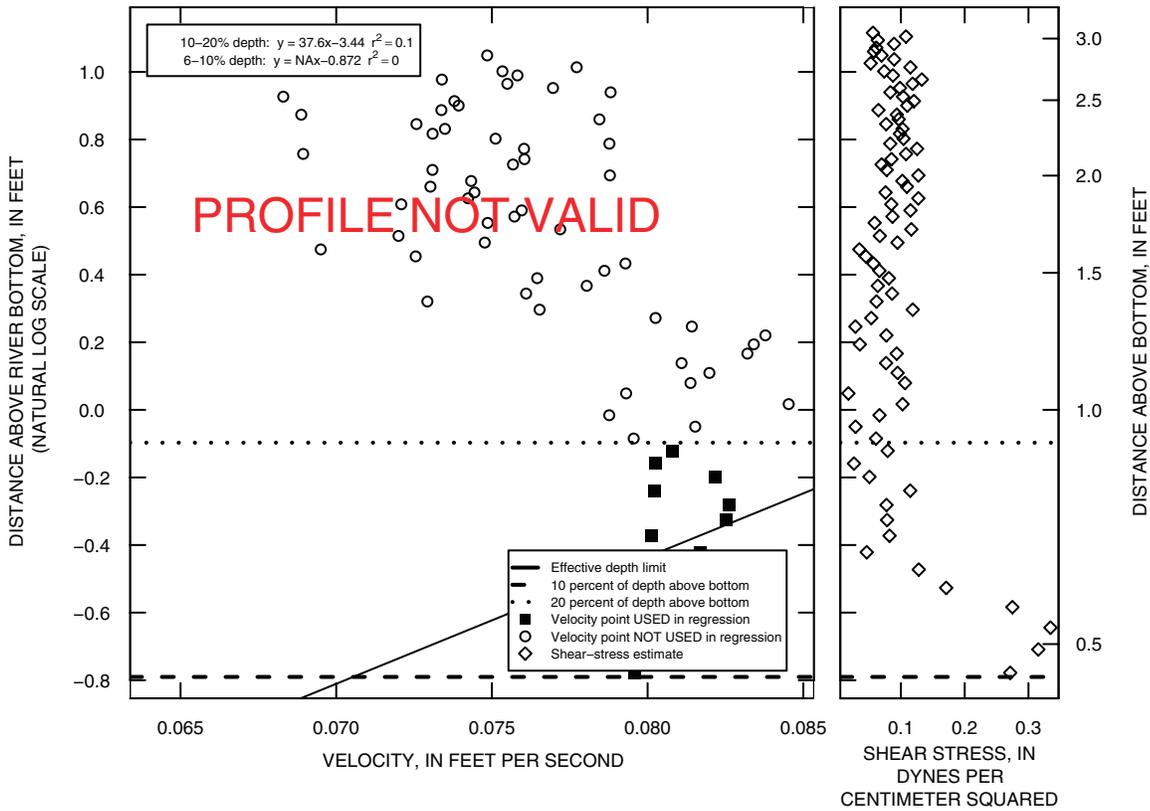


**VELOCITY AT OIL TANK DEPOT**



### Velocity Profile – Lower Fox River – OU4-5A2

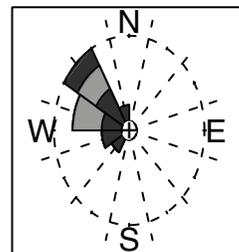
3/8/2004 9:36:00



Vertically averaged water flow: 0.08 ft/s, to direction 5.9°  
 Average wind conditions: 15.55 mi/h, from direction 310°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 0.11 [-0.08 ≤ τ ≤ 0.89]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): NA [NA ≤ τ ≤ NA]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 0  
 Shear velocity (cm/s): 0.33 [-0.28 ≤ u\_\* ≤ 0.94]  
 Bottom roughness, K<sub>s</sub> (cm): 29.31  
 Boundary Reynolds number: 975.15 Test: PASS

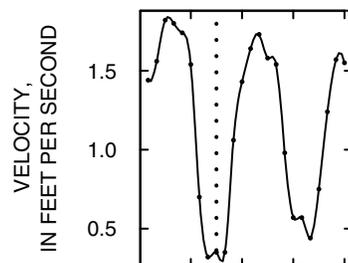
#### DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 4.54	Field recorded ADCP depth (ft): 4.4
Water mode: 11	Field recorded depthfinder depth (ft): 3.6
Water-cell size (cm): 1	Total number of recorded ensembles: 238
Blanking dist. (cm): 25	Heading: 278.74 ± 0.9
Field recorded offset (cm): 18.3	Pitch: 2.58 ± 0.11
Actual offset (cm): 18.3	Roll: 1.31 ± 0.32
Latitude: 44° 29' 8.3" N	Filename: Vert20040308093600r.csv
Longitude: 88° 2' 24.6" W	

#### VELOCITY AT OIL TANK DEPOT

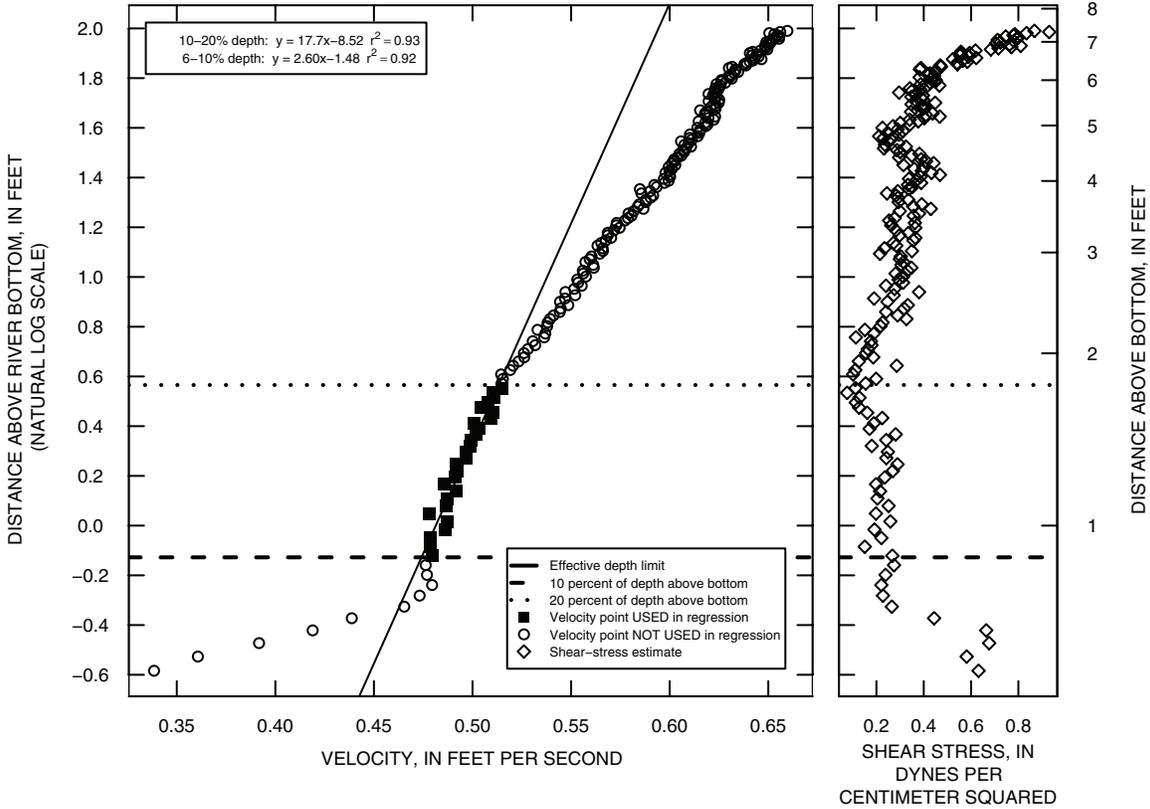


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**Velocity Profile – Lower Fox River – OU4-5B**

3/8/2004 9:10:57



Vertically averaged water flow: 0.58 ft/s, to direction 44.7°  
 Average wind conditions: 15.55 mi/h, from direction 310°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 0.5 [0.39 ≤ τ ≤ 0.62]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 23.03 [13.04 ≤ τ ≤ 35.83]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 0.42  
 Shear velocity (cm/s): 0.71 [0.63 ≤ u\_\* ≤ 0.79]  
 Bottom roughness, K<sub>s</sub> (cm): 0.18  
 Boundary Reynolds number: 12.88 Test: MAYBE

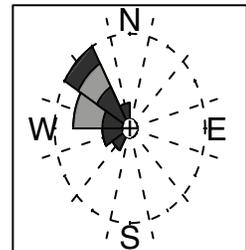
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 8.8	Field recorded ADCP depth (ft): 8.7
Water mode: 11	Field recorded depthfinder depth (ft): 8.4
Water-cell size (cm): 1	Total number of recorded ensembles: 219
Blanking dist. (cm): 25	Heading: 314.31 ± 1.49
Field recorded offset (cm): 18.3	Pitch: 1.29 ± 0.28
Actual offset (cm): 18.3	Roll: -1.4 ± 1.09
Latitude: 44° 29' 4" N	Filename: Vert20040308091057r.csv
Longitude: 88° 2' 16.1" W	

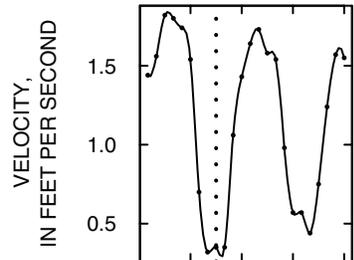
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

DAILY WIND ROSE

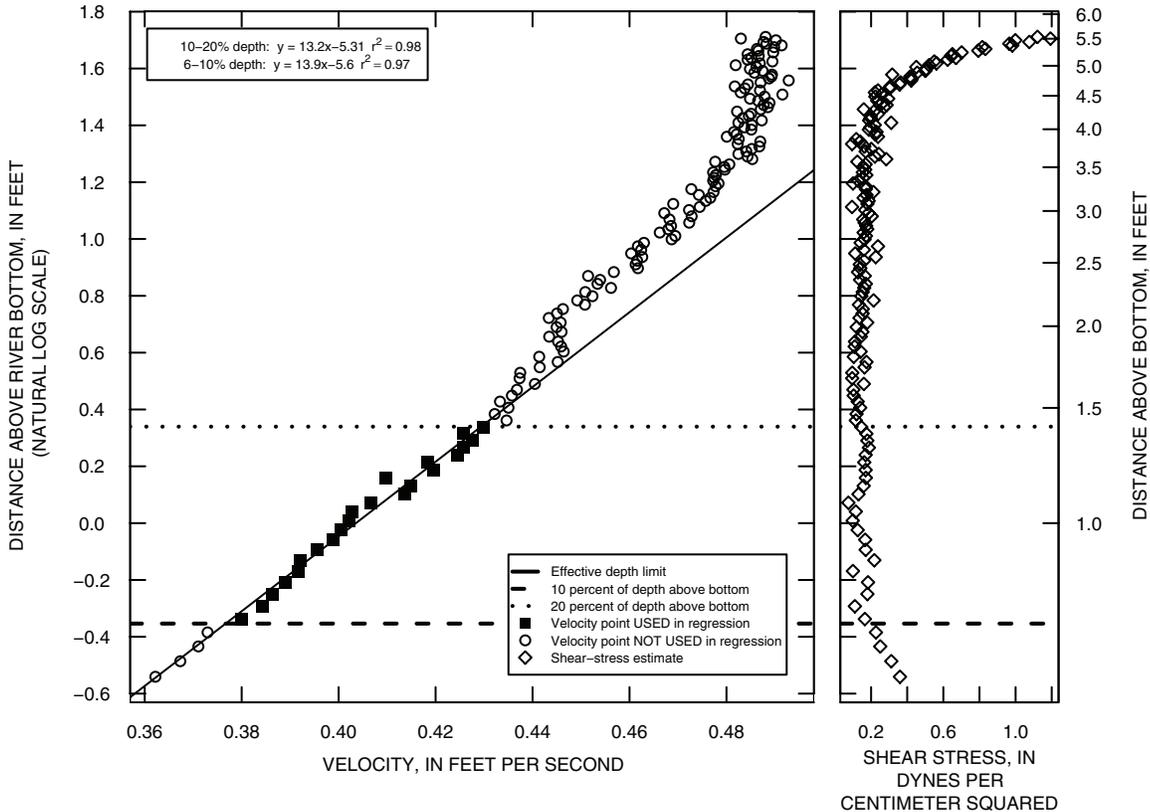


VELOCITY AT OIL TANK DEPOT



### Velocity Profile – Lower Fox River – OU4-5C

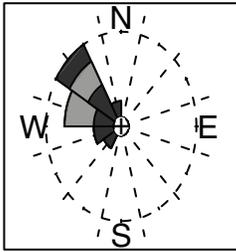
3/8/2004 8:53:18



Vertically averaged water flow: 0.46 ft/s, to direction 30.5°  
 Average wind conditions: 16.1 mi/h, from direction 310°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 0.9 [0.78 ≤ τ ≤ 1.03]  
 Shear stress (LP, 6–10% depth) (dyn/cm<sup>2</sup>): 0.8 [0.17 ≤ τ ≤ 1.91]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 0.29  
 Shear velocity (cm/s): 0.95 [0.88 ≤ u<sub>\*</sub> ≤ 1.02]  
 Bottom roughness, K<sub>s</sub> (cm): 4.53  
 Boundary Reynolds number: 429.93 Test: PASS

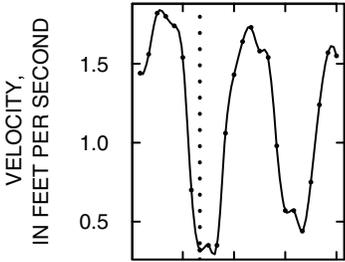
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 7.02	Field recorded ADCP depth (ft): 7
Water mode: 11	Field recorded depthfinder depth (ft): 6.2
Water-cell size (cm): 1	Total number of recorded ensembles: 232
Blanking dist. (cm): 25	Heading: 277.69 ± 1.18
Field recorded offset (cm): 18.3	Pitch: 2.68 ± 0.18
Actual offset (cm): 18.3	Roll: 2.73 ± 0.77
Latitude: 44° 28' 57.3" N	Filename: Vert20040308085318r.csv
Longitude: 88° 2' 2.3" W	

VELOCITY AT OIL TANK DEPOT

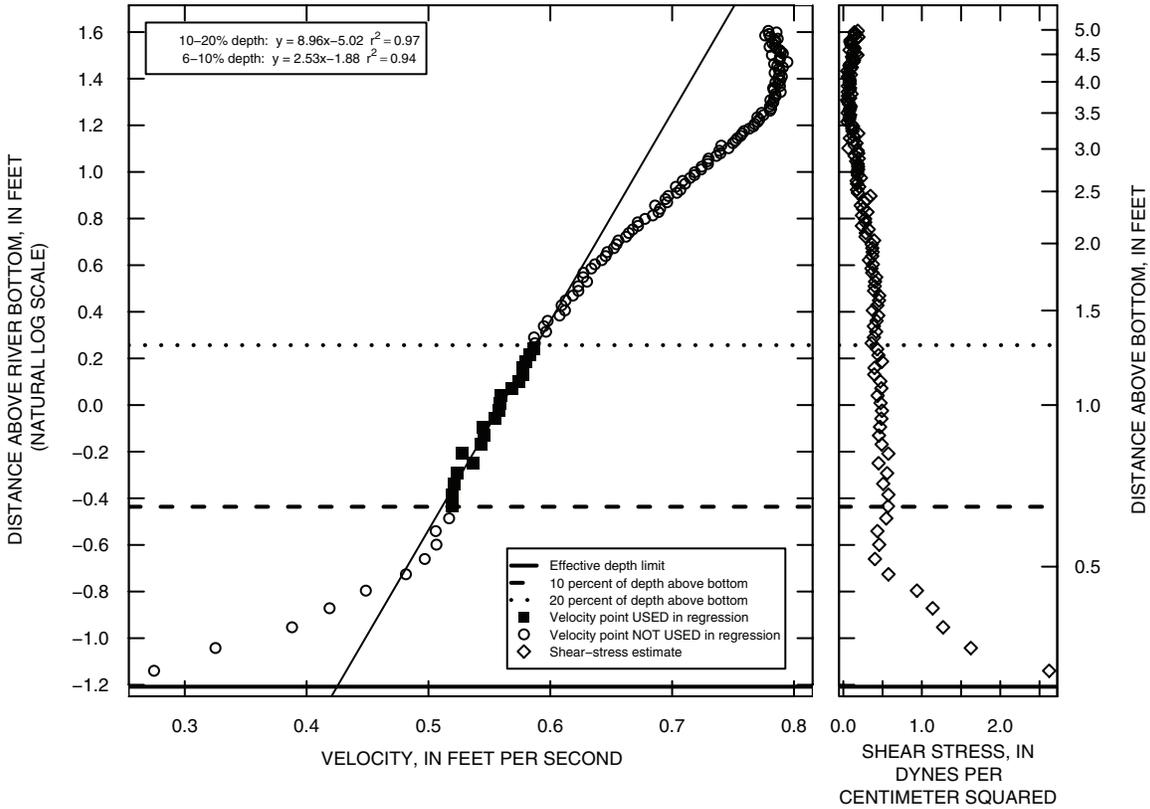


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**Velocity Profile – Lower Fox River – OU4-6A**

3/8/2004 10:28:23



Vertically averaged water flow: 0.68 ft/s, to direction 40.6°  
 Average wind conditions: 14.4 mi/h, from direction 305.6°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 1.94 [1.64 ≤ τ ≤ 2.27]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 24.44 [15.28 ≤ τ ≤ 35.74]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 1  
 Shear velocity (cm/s): 1.39 [1.28 ≤ u\_\* ≤ 1.51]  
 Bottom roughness, K<sub>s</sub> (cm): 6.06  
 Boundary Reynolds number: 845.24 Test: PASS

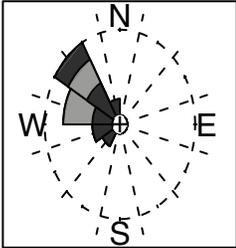
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 6.46	Field recorded ADCP depth (ft): 6.4
Water mode: 11	Field recorded depthfinder depth (ft): 6.4
Water-cell size (cm): 1	Total number of recorded ensembles: 233
Blanking dist. (cm): 25	Heading: 265.09 ± 2.08
Field recorded offset (cm): 18.3	Pitch: 2.92 ± 0.14
Actual offset (cm): 18.3	Roll: -0.79 ± 0.76
Latitude: 44° 29' 22.5" N	Filename: Vert20040308102823r.csv
Longitude: 88° 1' 55.7" W	

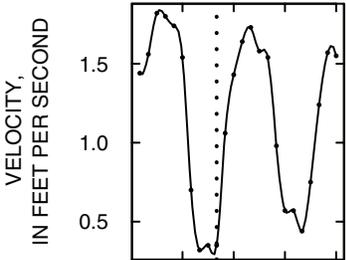
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

DAILY WIND ROSE

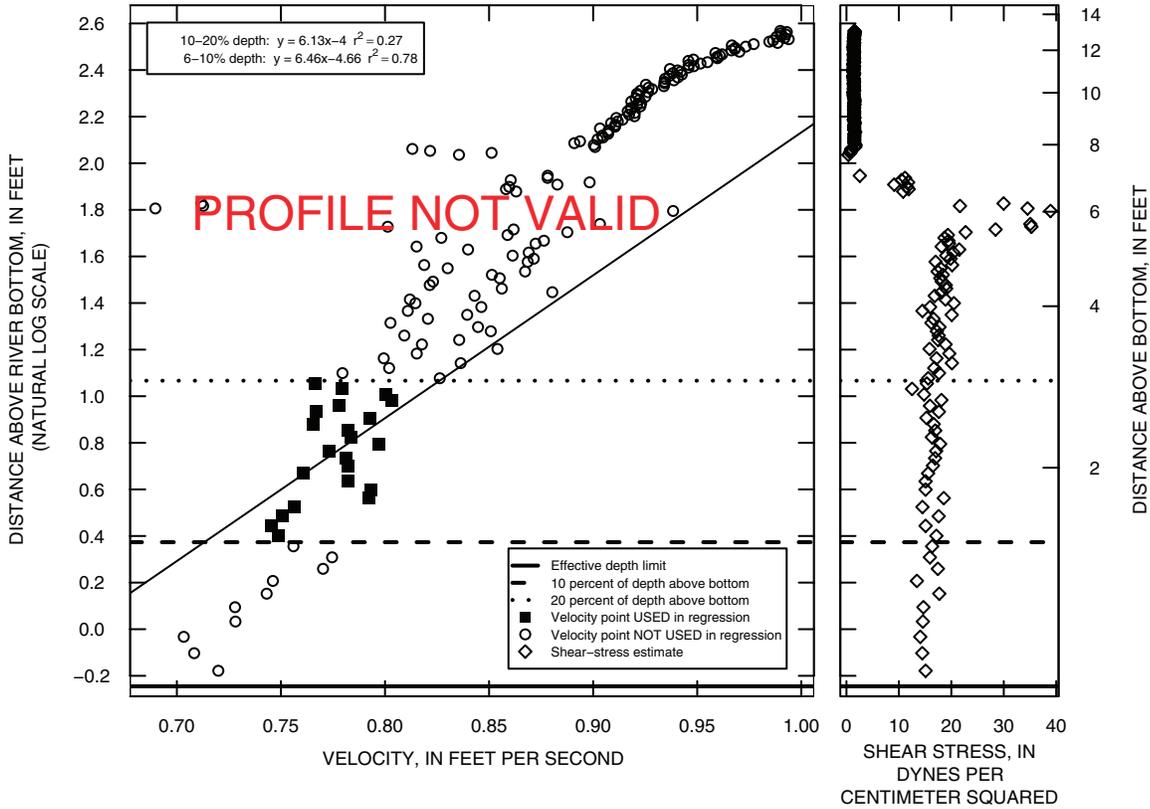


VELOCITY AT OIL TANK DEPOT



**Velocity Profile – Lower Fox River – OU4-6B1**

3/8/2004 10:42:55



Vertically averaged water flow: 0.87 ft/s, to direction 41.9°  
 Average wind conditions: 14.4 mi/h, from direction 305.6°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 4.15 [0.22 ≤ τ ≤ 12.97]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 3.74 [1.21 ≤ τ ≤ 7.65]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 15.37  
 Shear velocity (cm/s): 2.04 [0.47 ≤ u\_\* ≤ 3.6]  
 Bottom roughness, K<sub>s</sub> (cm): 16.74  
 Boundary Reynolds number: 3411.77 Test: PASS

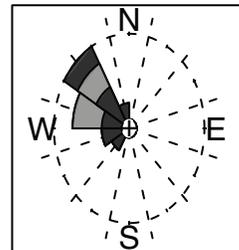
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 14.53	Field recorded ADCP depth (ft): 14.5
Water mode: 11	Field recorded depthfinder depth (ft): 14.7
Water-cell size (cm): 2	Total number of recorded ensembles: 241
Blanking dist. (cm): 25	Heading: 280.94 ± 1.48
Field recorded offset (cm): 18.3	Pitch: 2.82 ± 0.11
Actual offset (cm): 18.3	Roll: 0.74 ± 1.11
Latitude: 44° 29' 20" N	Filename: Vert20040308104255r.csv
Longitude: 88° 1' 49.8" W	

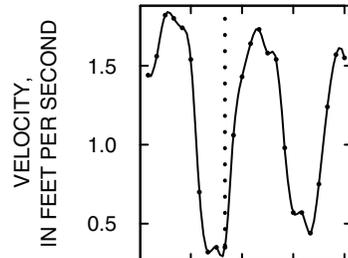
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**DAILY WIND ROSE**

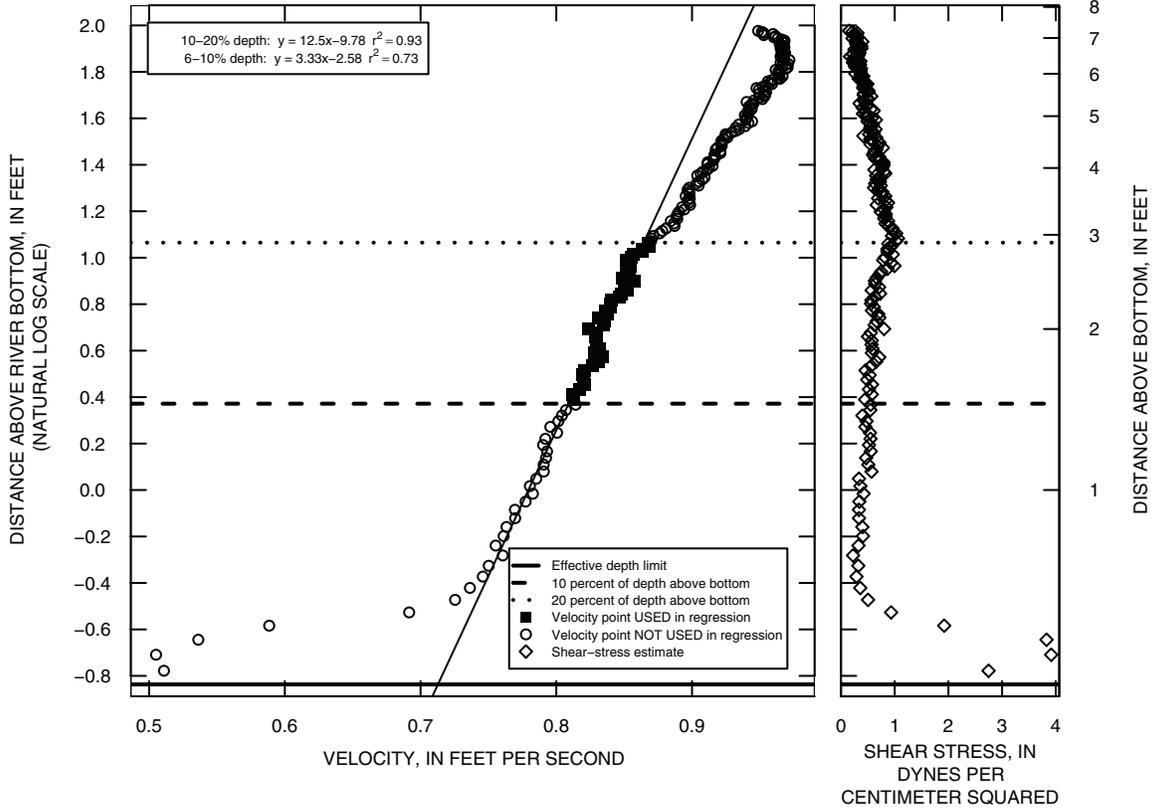


**VELOCITY AT OIL TANK DEPOT**



### Velocity Profile – Lower Fox River – OU4-6B2

3/8/2004 10:56:23



Vertically averaged water flow: 0.89 ft/s, to direction 44.1°  
 Average wind conditions: 14.4 mi/h, from direction 305.6°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 0.99 [0.83 ≤ τ ≤ 1.17]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 14.12 [8.32 ≤ τ ≤ 21.45]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 0.79  
 Shear velocity (cm/s): 1 [0.91 ≤ u\_\* ≤ 1.08]  
 Bottom roughness, K<sub>s</sub> (cm): 0.05  
 Boundary Reynolds number: 5.15 Test: MAYBE

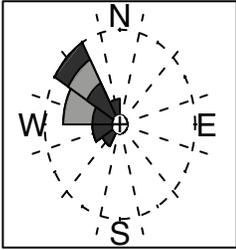
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 14.5	Field recorded ADCP depth (ft): 14.5
Water mode: 11	Field recorded depthfinder depth (ft): 14.7
Water-cell size (cm): 1	Total number of recorded ensembles: 219
Blanking dist. (cm): 25	Heading: 270.34 ± 2.45
Field recorded offset (cm): 195	Pitch: 0.6 ± 0.59
Actual offset (cm): 195	Roll: -2.16 ± 0.67
Latitude: 44° 29' 20" N	Filename: Vert20040308105623r.csv
Longitude: 88° 1' 49.8" W	

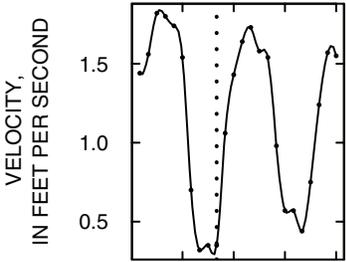
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

DAILY WIND ROSE

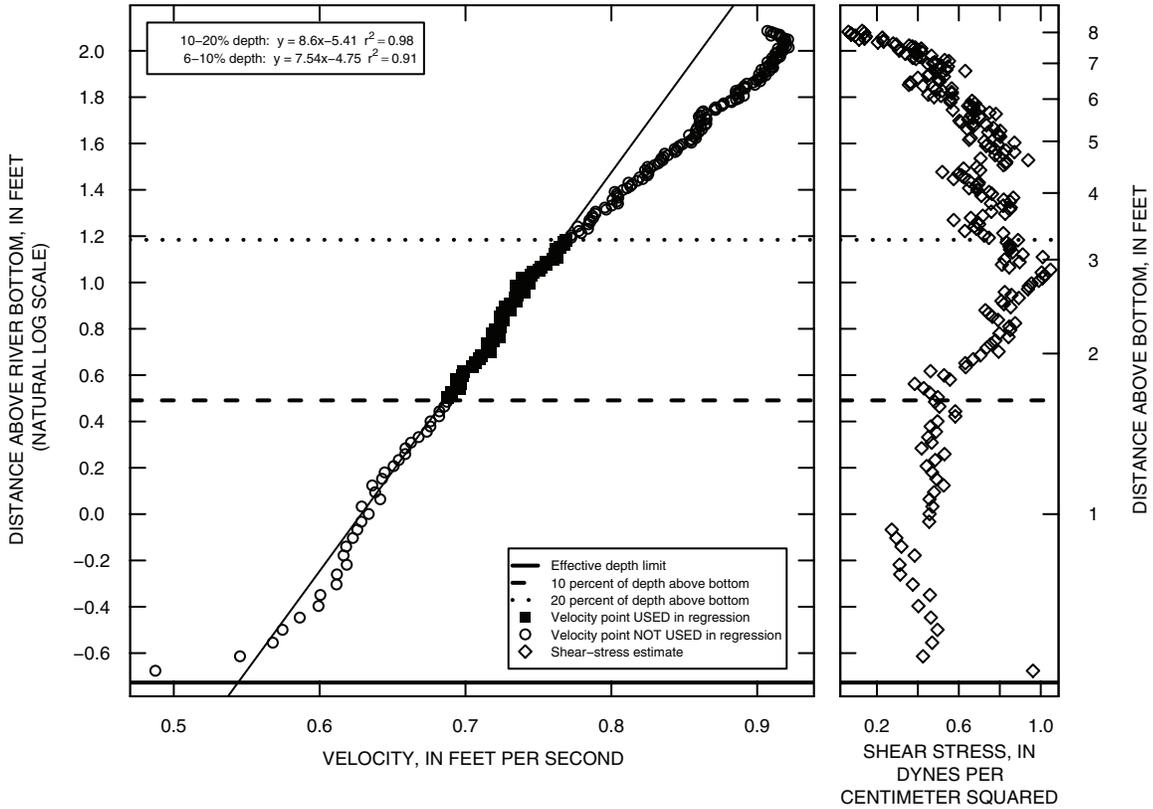


VELOCITY AT OIL TANK DEPOT



### Velocity Profile – Lower Fox River – OU4-6C

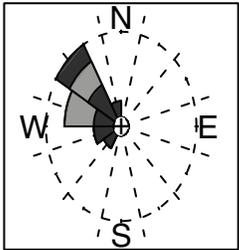
3/8/2004 11:11:53



Vertically averaged water flow: 0.8 ft/s, to direction 47.8°  
 Average wind conditions: 10.36 mi/h, from direction 305.9°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 2.11 [1.93 ≤ τ ≤ 2.3]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 2.75 [2.17 ≤ τ ≤ 3.39]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 0.46  
 Shear velocity (cm/s): 1.45 [1.39 ≤ u\_\* ≤ 1.52]  
 Bottom roughness, K<sub>s</sub> (cm): 4.1  
 Boundary Reynolds number: 594.73 Test: PASS

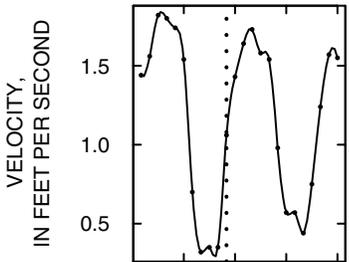
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 16.34	Field recorded ADCP depth (ft): --
Water mode: 11	Field recorded depthfinder depth (ft): 15.7
Water-cell size (cm): 1	Total number of recorded ensembles: 215
Blanking dist. (cm): 25	Heading: 267.98 ± 1.4
Field recorded offset (cm): 226	Pitch: 2.19 ± 0.28
Actual offset (cm): 226	Roll: -1.48 ± 0.31
Latitude: 44° 29' 16.6" N	Filename: Vert20040308111153r.csv
Longitude: 88° 1' 46.5" W	

VELOCITY AT OIL TANK DEPOT

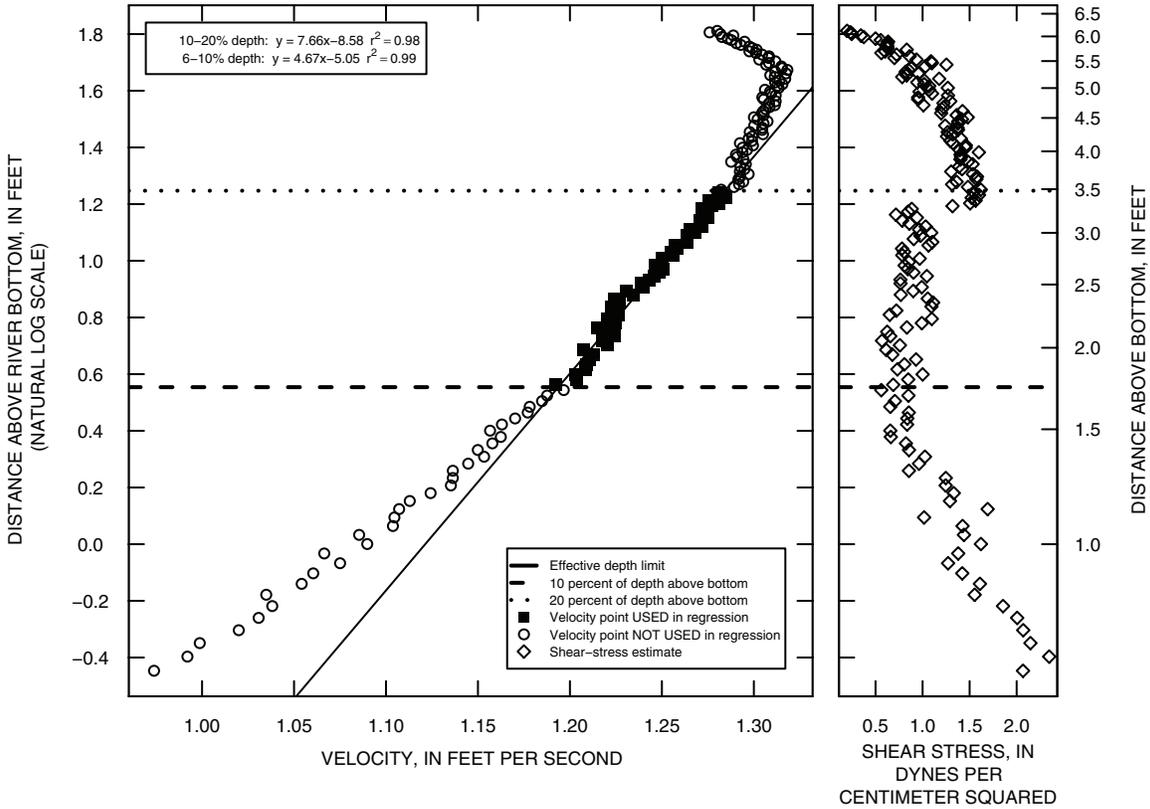


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**Velocity Profile – Lower Fox River – OU4-7A**

3/8/2004 12:57:08



Vertically averaged water flow: 1.24 ft/s, to direction 39.6°  
 Average wind conditions: 8.33 mi/h, from direction 304.6°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 2.66 [2.44 ≤ τ ≤ 2.9]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 7.16 [6.68 ≤ τ ≤ 7.65]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 1.27  
 Shear velocity (cm/s): 1.63 [1.56 ≤ u\_\* ≤ 1.7]  
 Bottom roughness, K<sub>s</sub> (cm): 0.17  
 Boundary Reynolds number: 27.92 Test: MAYBE

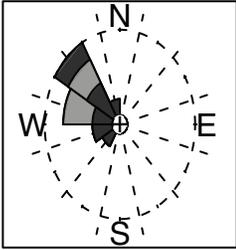
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 17.4	Field recorded ADCP depth (ft): --
Water mode: 11	Field recorded depthfinder depth (ft): 18.8
Water-cell size (cm): 1	Total number of recorded ensembles: 191
Blanking dist. (cm): 25	Heading: 213.61 ± 2.53
Field recorded offset (cm): 317	Pitch: -2.43 ± 0.39
Actual offset (cm): 317	Roll: -1.7 ± 0.87
Latitude: 44° 31' 2.9" N	Filename: Vert20040308125708r.csv
Longitude: 88° 1' 3" W	

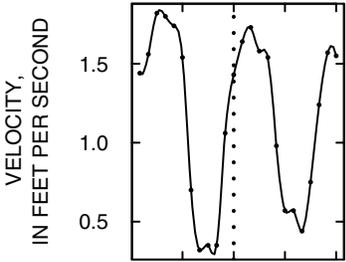
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

DAILY WIND ROSE

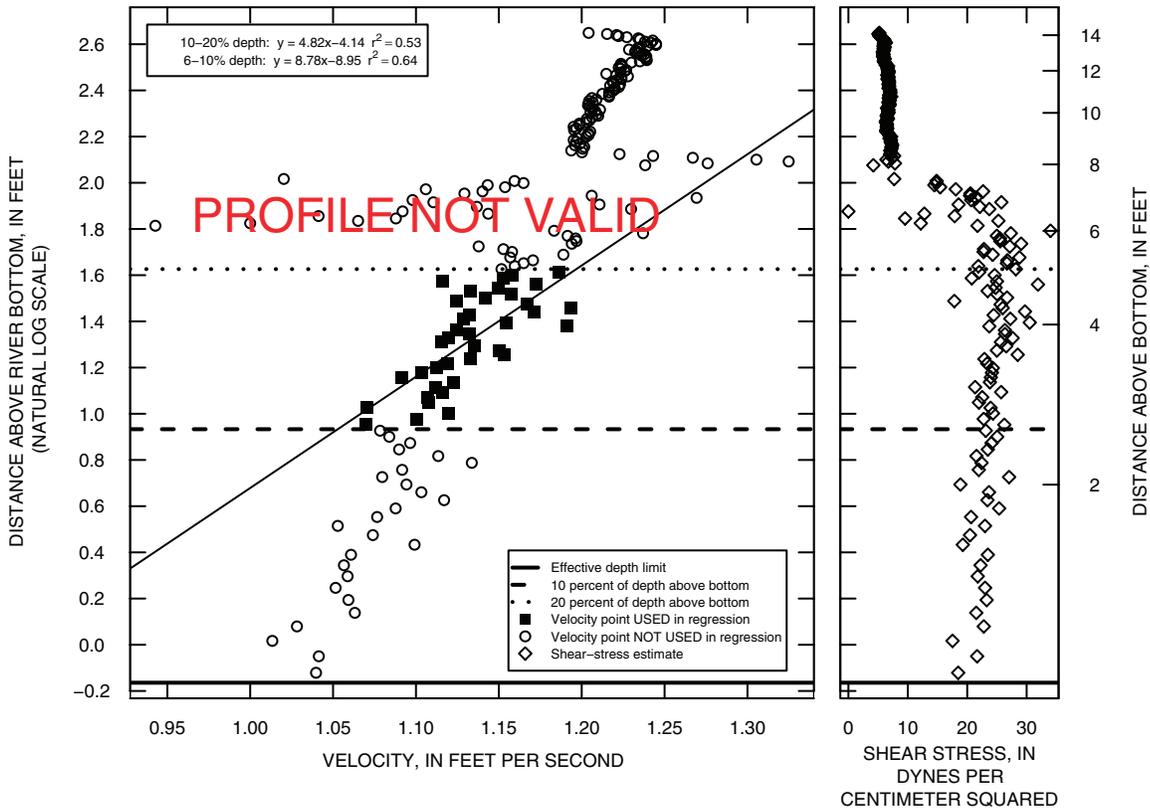


VELOCITY AT OIL TANK DEPOT



**Velocity Profile – Lower Fox River – OU4-7B1**

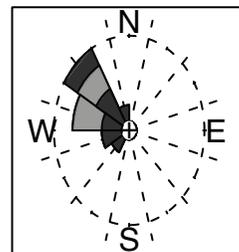
3/8/2004 12:32:51



Vertically averaged water flow: 1.17 ft/s, to direction 31°  
 Average wind conditions: 8.33 mi/h, from direction 304.6°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) ( $\text{dyn/cm}^2$ ): 6.73 [ $3.13 \leq \tau \leq 11.69$ ]  
 Shear stress (LP, 6-10% depth) ( $\text{dyn/cm}^2$ ): 2.03 [ $0.94 \leq \tau \leq 3.52$ ]  
 Shear stress (TKE) ( $\text{dyn/cm}^2$ ): 22.28  
 Shear velocity (cm/s): 2.59 [ $1.77 \leq u_* \leq 3.42$ ]  
 Bottom roughness,  $K_s$  (cm): 14.59  
 Boundary Reynolds number: 3786.17 Test: PASS

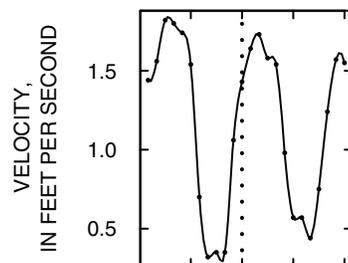
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 25.43	Field recorded ADCP depth (ft): 25.4
Water mode: 11	Field recorded depthfinder depth (ft): 27.4
Water-cell size (cm): 2	Total number of recorded ensembles: 241
Blanking dist. (cm): 25	Heading: $239.45 \pm 4.49$
Field recorded offset (cm): 317	Pitch: $-3.05 \pm 0.85$
Actual offset (cm): 317	Roll: $-5.27 \pm 0.94$
Latitude: $44^\circ 31' 2.1''$ N	Filename: Vert20040308123251r.csv
Longitude: $88^\circ 0' 59.6''$ W	

VELOCITY AT OIL TANK DEPOT

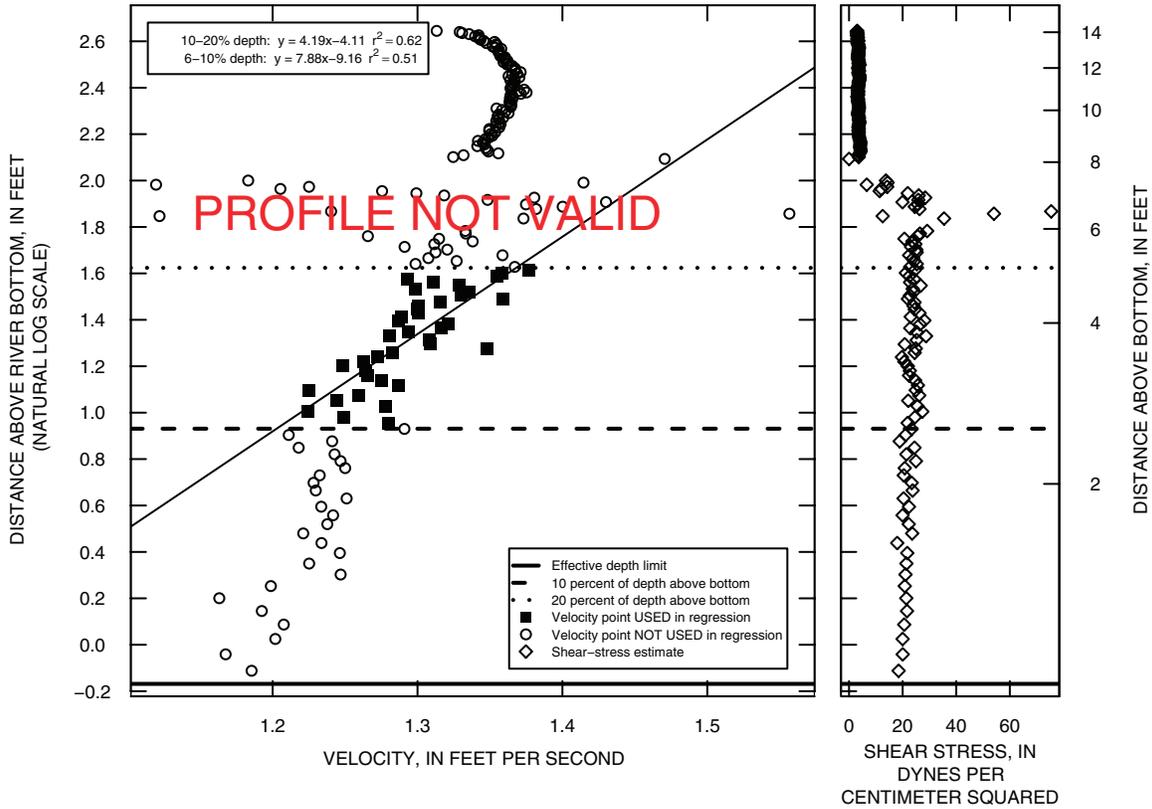


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**Velocity Profile – Lower Fox River – OU4-7B2**

3/8/2004 12:38:00



Vertically averaged water flow: 1.32 ft/s, to direction 37.3°  
 Average wind conditions: 8.33 mi/h, from direction 304.6°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) ( $\text{dyn/cm}^2$ ): 8.89 [ $4.81 \leq \tau \leq 14.21$ ]  
 Shear stress (LP, 6-10% depth) ( $\text{dyn/cm}^2$ ): 2.51 [ $0.86 \leq \tau \leq 5.04$ ]  
 Shear stress (TKE) ( $\text{dyn/cm}^2$ ): 21.38  
 Shear velocity (cm/s): 2.98 [ $2.19 \leq u_* \leq 3.77$ ]  
 Bottom roughness,  $K_s$  (cm): 14.99  
 Boundary Reynolds number: 4468.4 Test: PASS

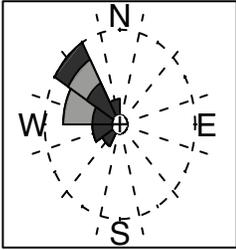
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 25.37	Field recorded ADCP depth (ft): 25.4
Water mode: 11	Field recorded depthfinder depth (ft): 27.4
Water-cell size (cm): 2	Total number of recorded ensembles: 240
Blanking dist. (cm): 25	Heading: $241.83 \pm 1.77$
Field recorded offset (cm): 317	Pitch: $-2.82 \pm 0.36$
Actual offset (cm): 317	Roll: $-5.88 \pm 0.67$
Latitude: $44^\circ 31' 2.1''$ N	Filename: Vert20040308123800r.csv
Longitude: $88^\circ 0' 59.6''$ W	

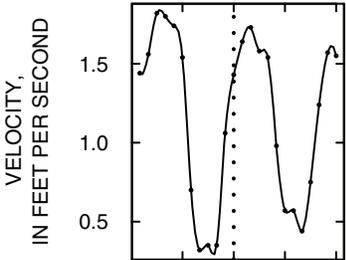
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**DAILY WIND ROSE**

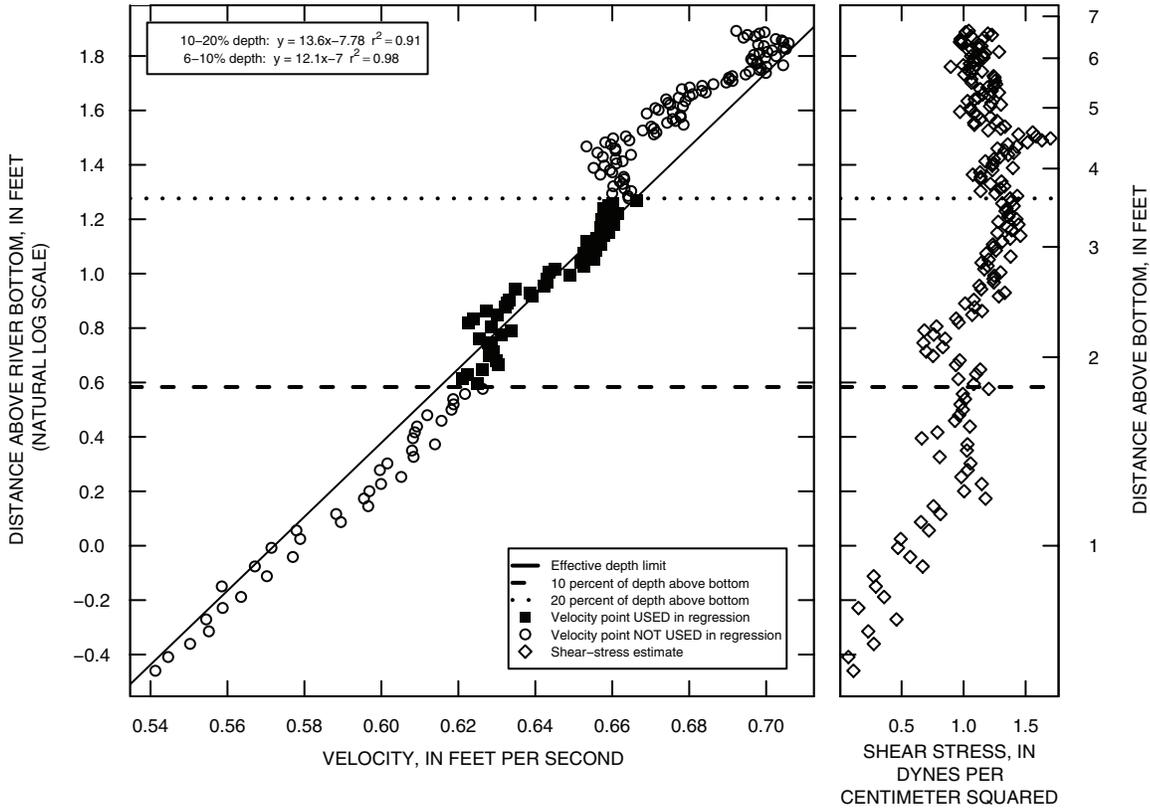


**VELOCITY AT OIL TANK DEPOT**



### Velocity Profile – Lower Fox River – OU4-7C

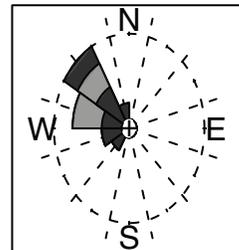
3/8/2004 12:13:57



Vertically averaged water flow: 0.65 ft/s, to direction 27.8°  
 Average wind conditions: 8.33 mi/h, from direction 304.6°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 0.84 [0.7 ≤ τ ≤ 1]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 1.06 [0.96 ≤ τ ≤ 1.17]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 0.73  
 Shear velocity (cm/s): 0.92 [0.84 ≤ u\_\* ≤ 1]  
 Bottom roughness, K<sub>s</sub> (cm): 0.38  
 Boundary Reynolds number: 35.13 Test: MAYBE

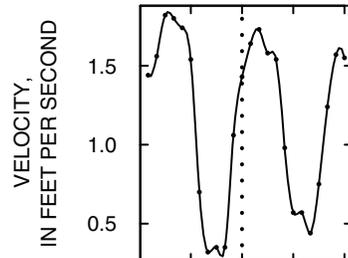
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 17.92	Field recorded ADCP depth (ft): --
Water mode: 11	Field recorded depthfinder depth (ft): 18
Water-cell size (cm): 1	Total number of recorded ensembles: 220
Blanking dist. (cm): 25	Heading: 223.39 ± 1.67
Field recorded offset (cm): 317	Pitch: 0.86 ± 0.71
Actual offset (cm): 317	Roll: -1.63 ± 0.95
Latitude: 44° 31' 0.5" N	Filename: Vert20040308121357r.csv
Longitude: 88° 0' 56.5" W	

VELOCITY AT OIL TANK DEPOT



**NOTES**

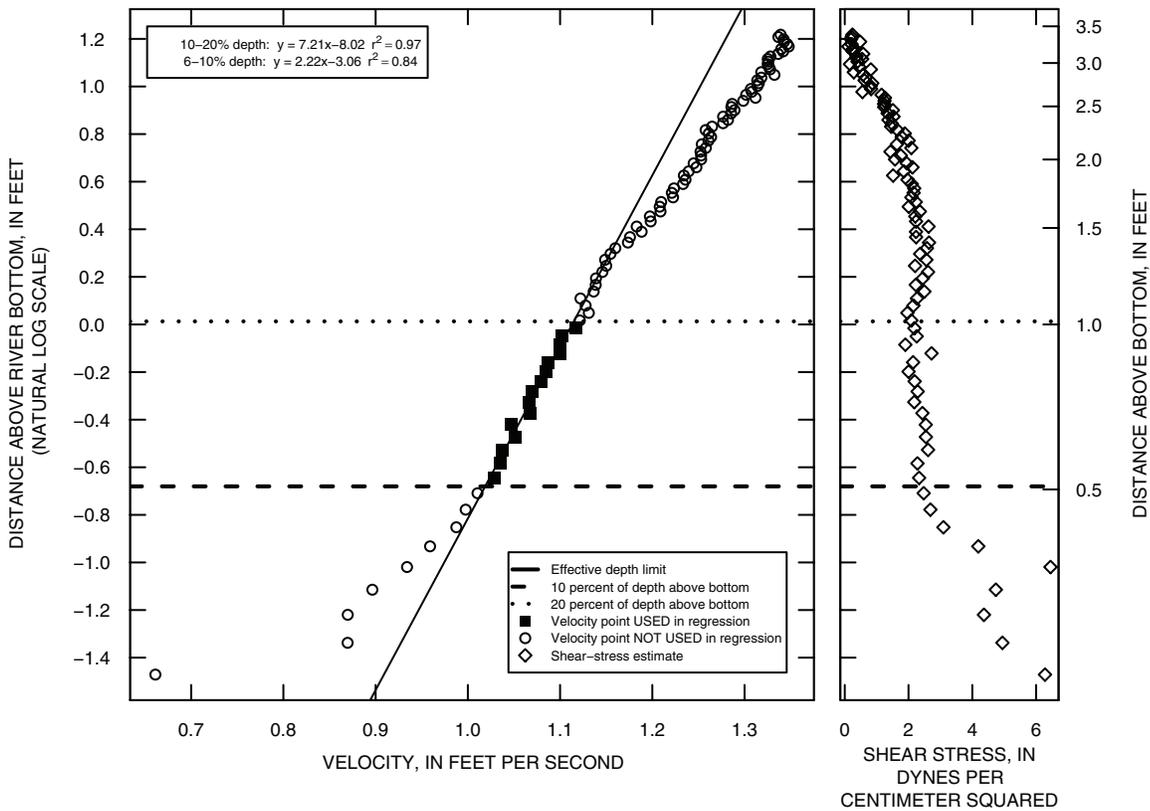
- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

## May 2004 Velocity Profiles (OU-4)

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### Velocity Profile – Lower Fox River – OU4-1A1

5/25/2004 18:23:43



Vertically averaged water flow: 1.19 ft/s, to direction 36.2°  
 Average wind conditions: 9.52 mi/h, from direction 235.2°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) ( $\text{dyn/cm}^2$ ): 3 [ $2.45 \leq \tau \leq 3.61$ ]  
 Shear stress (LP, 6-10% depth) ( $\text{dyn/cm}^2$ ): 31.81 [ $11.92 \leq \tau \leq 61.28$ ]  
 Shear stress (TKE) ( $\text{dyn/cm}^2$ ): 4.36  
 Shear velocity (cm/s): 1.73 [ $1.57 \leq u_* \leq 1.9$ ]  
 Bottom roughness,  $K_s$  (cm): 0.3  
 Boundary Reynolds number: 51.89 Test: MAYBE

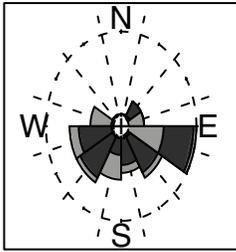
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 5.07	Field recorded ADCP depth (ft): 5.1
Water mode: 11	Field recorded depthfinder depth (ft): 4.3
Water-cell size (cm): 1	Total number of recorded ensembles: 191
Blanking dist. (cm): 25	Heading: 309.21 ± 1.15
Field recorded offset (cm): 24.4	Pitch: 1.38 ± 0.27
Actual offset (cm): 24.4	Roll: 1.32 ± 0.92
Latitude: 44° 27' 22" N	Filename: Vert20040525182343r.csv
Longitude: 88° 4' 4.3" W	

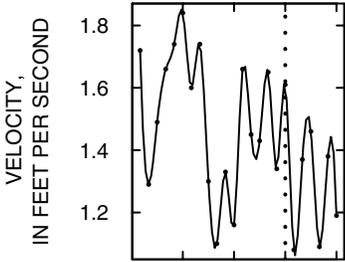
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

#### DAILY WIND ROSE

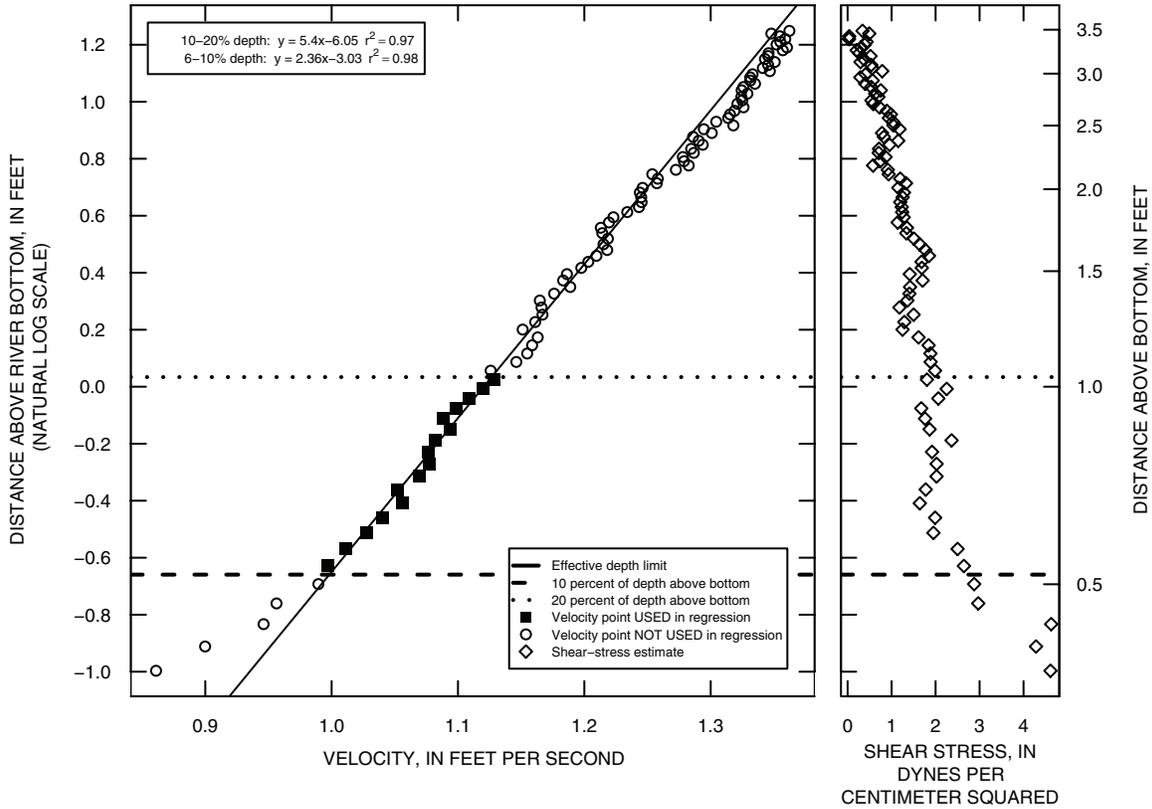


#### VELOCITY AT OIL TANK DEPOT



### Velocity Profile – Lower Fox River – OU4-1A2

5/25/2004 18:29:00



Vertically averaged water flow: 1.22 ft/s, to direction 35.6°  
 Average wind conditions: 9.52 mi/h, from direction 235.2°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 5.36 [4.41 ≤ τ ≤ 6.4]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 28.1 [14.36 ≤ τ ≤ 46.4]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 3.87  
 Shear velocity (cm/s): 2.31 [2.1 ≤ u\_\* ≤ 2.53]  
 Bottom roughness, K<sub>s</sub> (cm): 2.16  
 Boundary Reynolds number: 499.81 Test: PASS

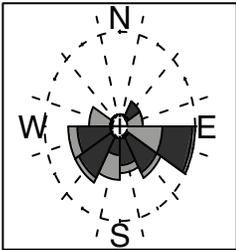
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 5.17	Field recorded ADCP depth (ft): 5.1
Water mode: 11	Field recorded depthfinder depth (ft): 4.3
Water-cell size (cm): 1	Total number of recorded ensembles: 233
Blanking dist. (cm): 25	Heading: 310.25 ± 1.04
Field recorded offset (cm): 24.4	Pitch: 1.64 ± 0.19
Actual offset (cm): 24.4	Roll: 0.69 ± 0.59
Latitude: 44° 27' 22" N	Filename: Vert20040525182900r.csv
Longitude: 88° 4' 4.3" W	

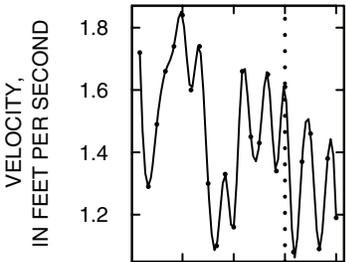
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

DAILY WIND ROSE

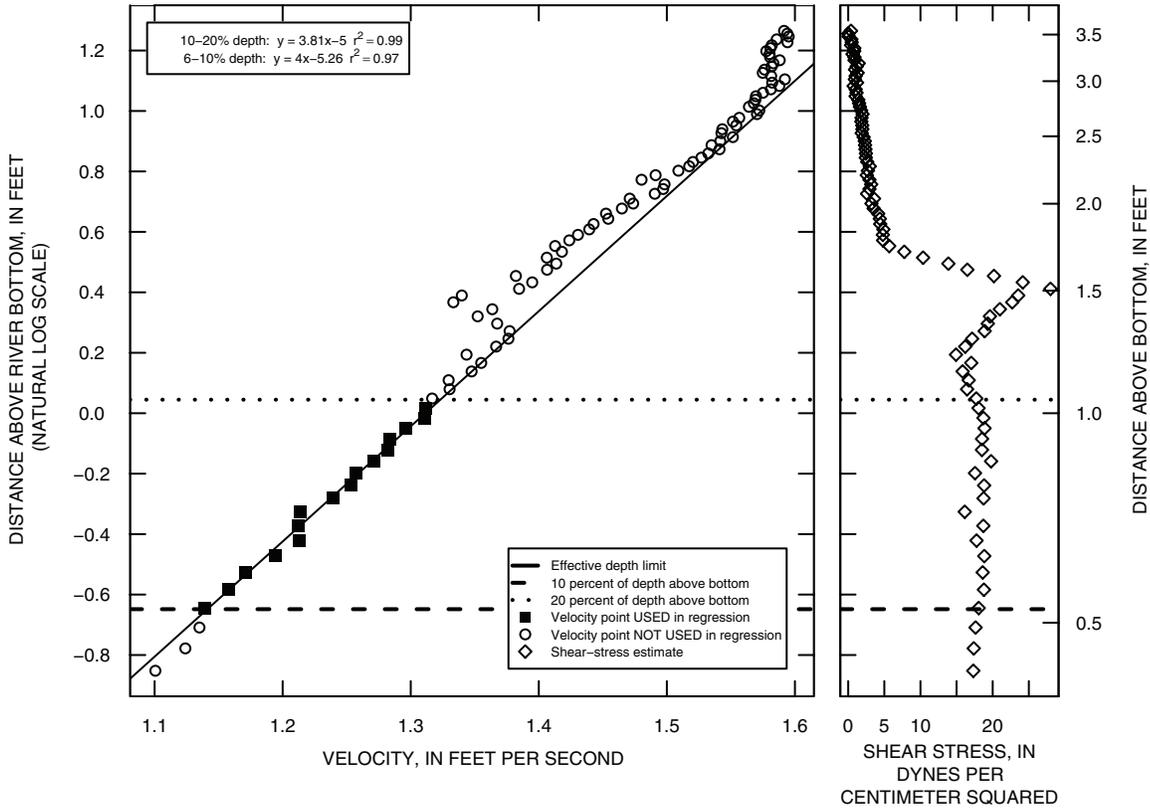


VELOCITY AT OIL TANK DEPOT



### Velocity Profile – Lower Fox River – OU4-1B

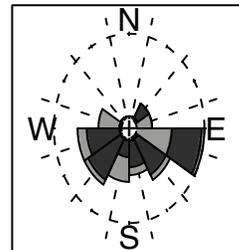
5/25/2004 18:10:53



Vertically averaged water flow: 1.44 ft/s, to direction 36.2°  
 Average wind conditions: 9.52 mi/h, from direction 235.2°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 10.76 [9.55 ≤ τ ≤ 12.03]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 9.75 [-18.19 ≤ τ ≤ 110.47]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 17.44  
 Shear velocity (cm/s): 3.28 [3.09 ≤ u\_\* ≤ 3.47]  
 Bottom roughness, K<sub>s</sub> (cm): 6.18  
 Boundary Reynolds number: 2026.52 Test: PASS

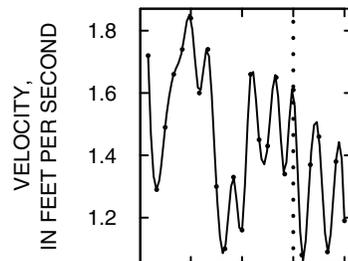
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 5.23	Field recorded ADCP depth (ft): 5.3
Water mode: 11	Field recorded depthfinder depth (ft): 4.5
Water-cell size (cm): 1	Total number of recorded ensembles: 235
Blanking dist. (cm): 25	Heading: 264.57 ± 0.87
Field recorded offset (cm): 24.4	Pitch: 1.27 ± 0.21
Actual offset (cm): 24.4	Roll: 0.94 ± 0.47
Latitude: 44° 27' 18.3" N	Filename: Vert20040525181053r.csv
Longitude: 88° 4' 1.5" W	

VELOCITY AT OIL TANK DEPOT

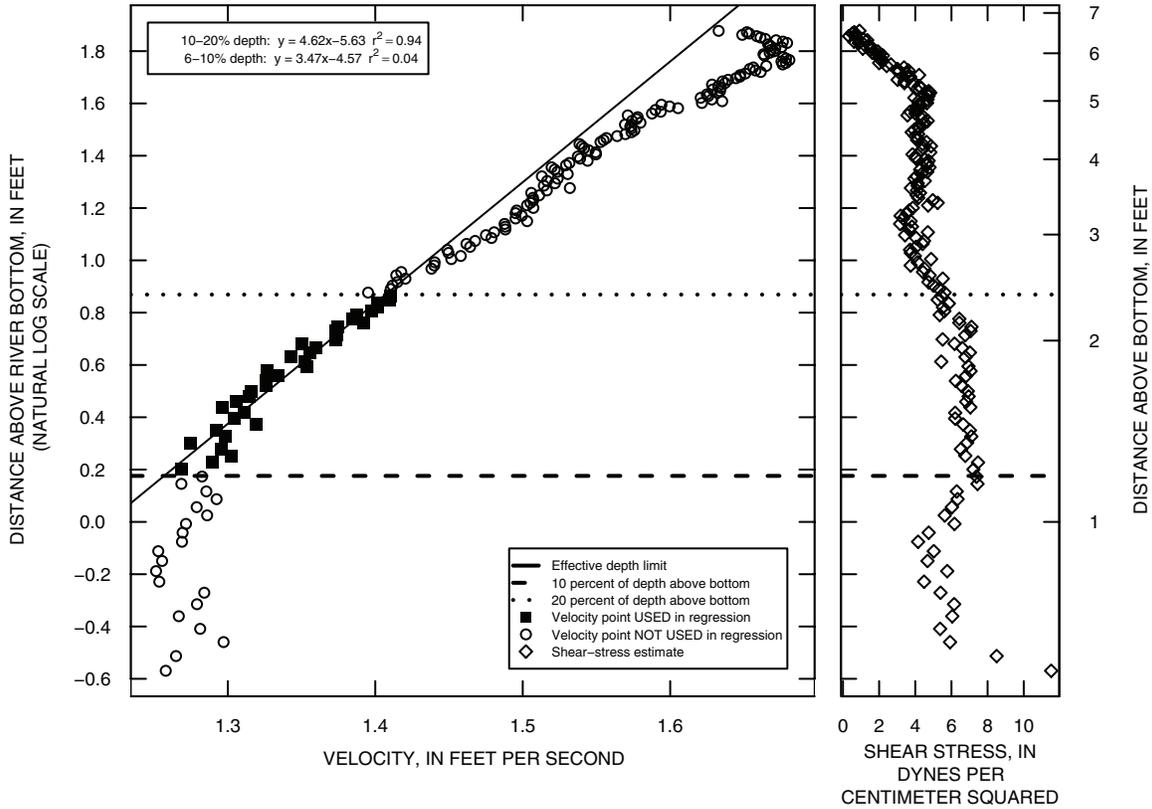


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

### Velocity Profile – Lower Fox River – OU4-1C

5/25/2004 17:58:31



Vertically averaged water flow: 1.49 ft/s, to direction 44°  
 Average wind conditions: 8.47 mi/h, from direction 218.5°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 7.33 [6.06 ≤ τ ≤ 8.71]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 12.94 [-22.77 ≤ τ ≤ 143.2]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 6.15  
 Shear velocity (cm/s): 2.71 [2.46 ≤ u\_\* ≤ 2.95]  
 Bottom roughness, K<sub>s</sub> (cm): 3.29  
 Boundary Reynolds number: 891.36 Test: PASS

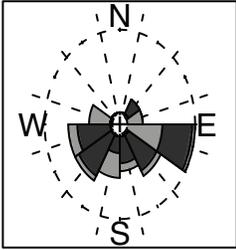
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 11.92	Field recorded ADCP depth (ft): ---
Water mode: 11	Field recorded depthfinder depth (ft): 13
Water-cell size (cm): 1	Total number of recorded ensembles: 224
Blanking dist. (cm): 25	Heading: 247.6 ± 1.92
Field recorded offset (cm): 137	Pitch: -0.68 ± 1.02
Actual offset (cm): 137	Roll: -2.54 ± 1
Latitude: 44° 27' 15.6" N	Filename: Vert20040525175831r.csv
Longitude: 88° 3' 59.1" W	

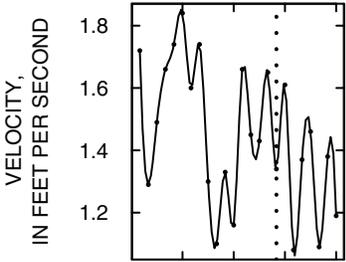
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

DAILY WIND ROSE

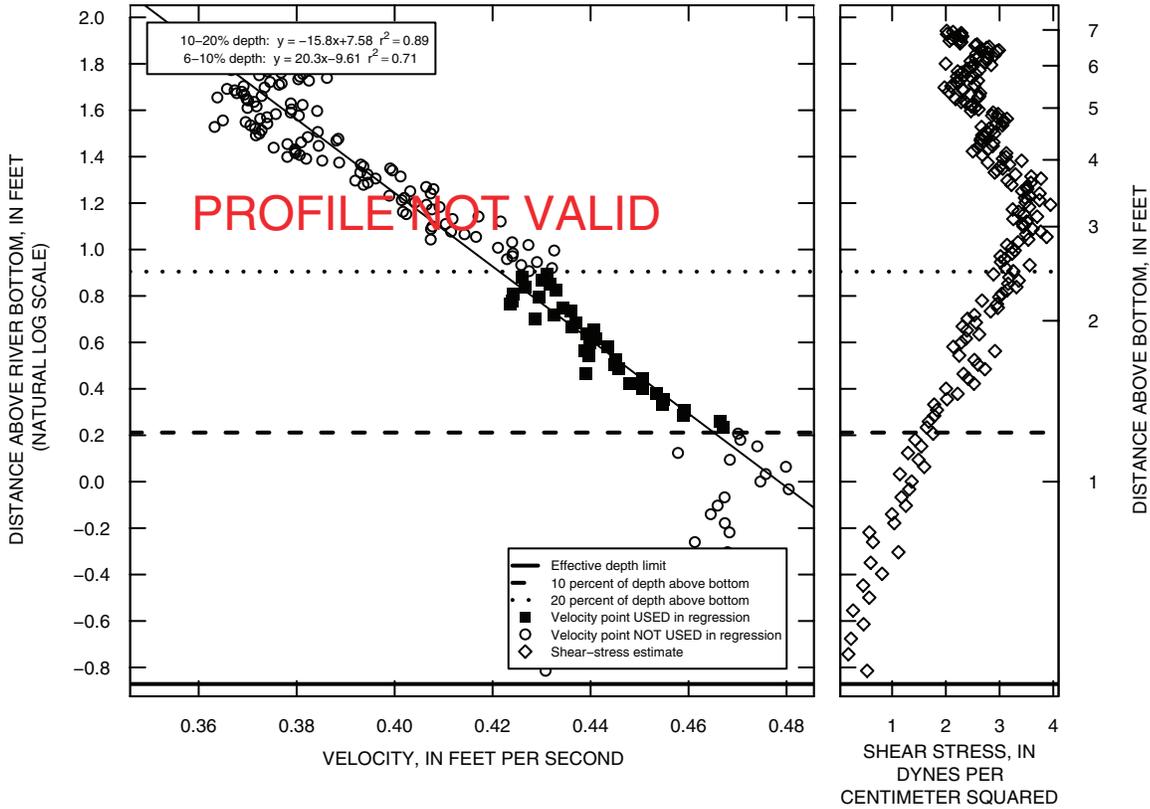


VELOCITY AT OIL TANK DEPOT



### Velocity Profile – Lower Fox River – OU4-1D1

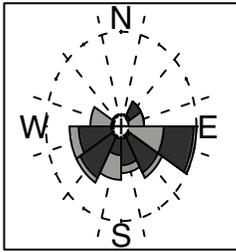
5/25/2004 17:00:00



Vertically averaged water flow: 0.38 ft/s, to direction 194.2°  
 Average wind conditions: 8.47 mi/h, from direction 218.5°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 0.62 [0.48 ≤ τ ≤ 0.78]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 0.38 [0.2 ≤ τ ≤ 0.62]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 0.96  
 Shear velocity (cm/s): -0.79 [-0.7 ≤ u<sub>\*</sub> ≤ -0.88]  
 Bottom roughness, K<sub>s</sub> (cm): 1792617  
 Boundary Reynolds number: -141400287.77 Test: FAIL

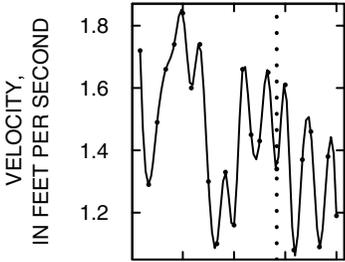
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 12.36	Field recorded ADCP depth (ft): 12.4
Water mode: 11	Field recorded depthfinder depth (ft): 13
Water-cell size (cm): 1	Total number of recorded ensembles: 112
Blanking dist. (cm): 25	Heading: 276.72 ± 3
Field recorded offset (cm): 137	Pitch: 2.14 ± 0.54
Actual offset (cm): 137	Roll: -0.43 ± 1.1
Latitude: 44° 27' 10.7" N	Filename: Vert2004052510r.csv
Longitude: 88° 3' 54.5" W	

VELOCITY AT OIL TANK DEPOT

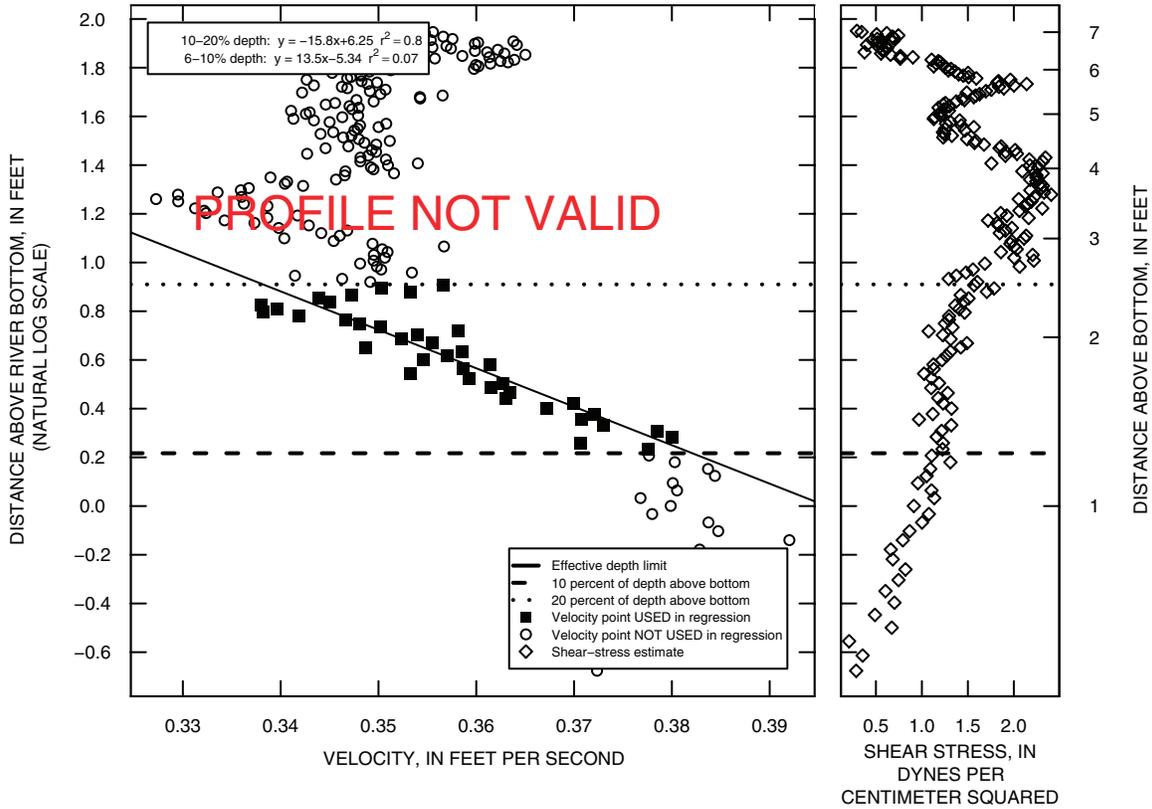


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

Velocity Profile – Lower Fox River – OU4-1D2

5/25/2004 17:40:40



Vertically averaged water flow: 0.33 ft/s, to direction 184.2°  
 Average wind conditions: 8.47 mi/h, from direction 218.5°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 0.63 [0.43 ≤ τ ≤ 0.86]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 0.85 [-0.39 ≤ τ ≤ 6.1]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 0.81  
 Shear velocity (cm/s): -0.79 [-0.66 ≤ u<sub>\*</sub> ≤ -0.92]  
 Bottom roughness, K<sub>s</sub> (cm): 473994.4  
 Boundary Reynolds number: -37510443.94 Test: FAIL

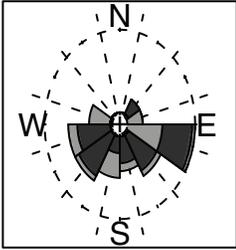
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 12.42	Field recorded ADCP depth (ft): 12.4
Water mode: 11	Field recorded depthfinder depth (ft): 13
Water-cell size (cm): 1	Total number of recorded ensembles: 221
Blanking dist. (cm): 25	Heading: 275.74 ± 2.63
Field recorded offset (cm): 137	Pitch: 2.68 ± 0.5
Actual offset (cm): 137	Roll: 0.74 ± 0.8
Latitude: 44° 27' 10.7" N	Filename: Vert20040525174040r.csv
Longitude: 88° 3' 54.5" W	

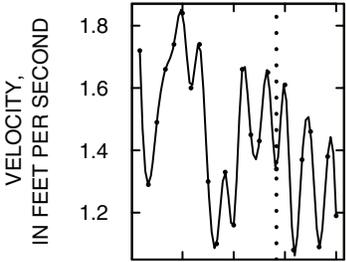
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

DAILY WIND ROSE

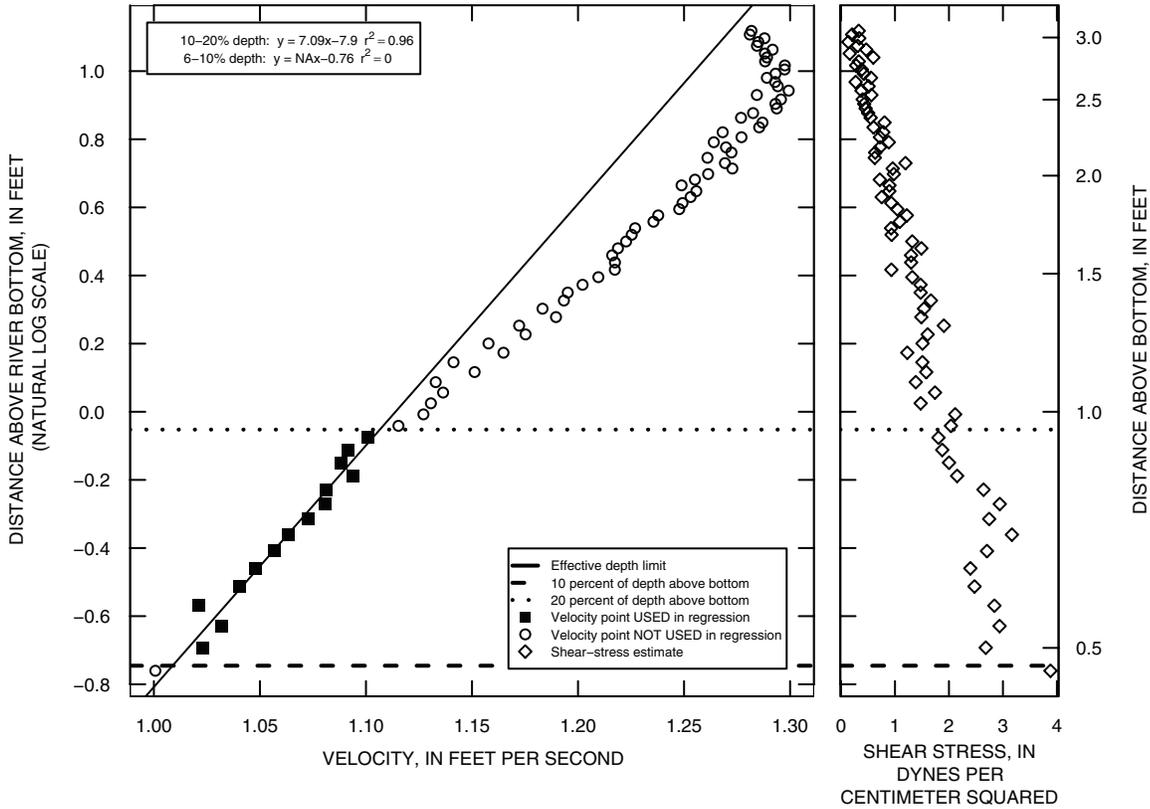


VELOCITY AT OIL TANK DEPOT



### Velocity Profile – Lower Fox River – OU4-2A

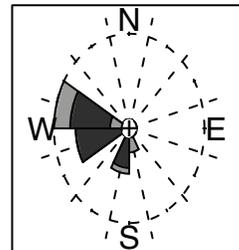
5/26/2004 18:33:25



Vertically averaged water flow: 1.21 ft/s, to direction 36.5°  
 Average wind conditions: 9.17 mi/h, from direction 256.7°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 3.11 [2.37 ≤ τ ≤ 3.94]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): NA [NA ≤ τ ≤ NA]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 3.88  
 Shear velocity (cm/s): 1.76 [1.54 ≤ u\_\* ≤ 1.98]  
 Bottom roughness, K<sub>s</sub> (cm): 0.34  
 Boundary Reynolds number: 59.74 Test: MAYBE

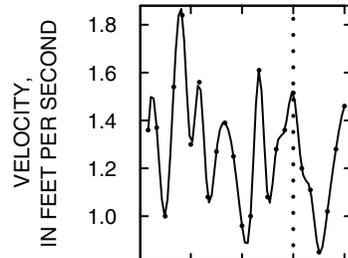
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 4.75	Field recorded ADCP depth (ft): 4.8
Water mode: 11	Field recorded depthfinder depth (ft): 3.7
Water-cell size (cm): 1	Total number of recorded ensembles: 181
Blanking dist. (cm): 25	Heading: 216.43 ± 2.38
Field recorded offset (cm): 24.4	Pitch: 2.53 ± 0.75
Actual offset (cm): 24.4	Roll: -3.84 ± 3.77
Latitude: 44° 27' 43.5" N	Filename: Vert20040526183325r.csv
Longitude: 88° 3' 32.5" W	

VELOCITY AT OIL TANK DEPOT

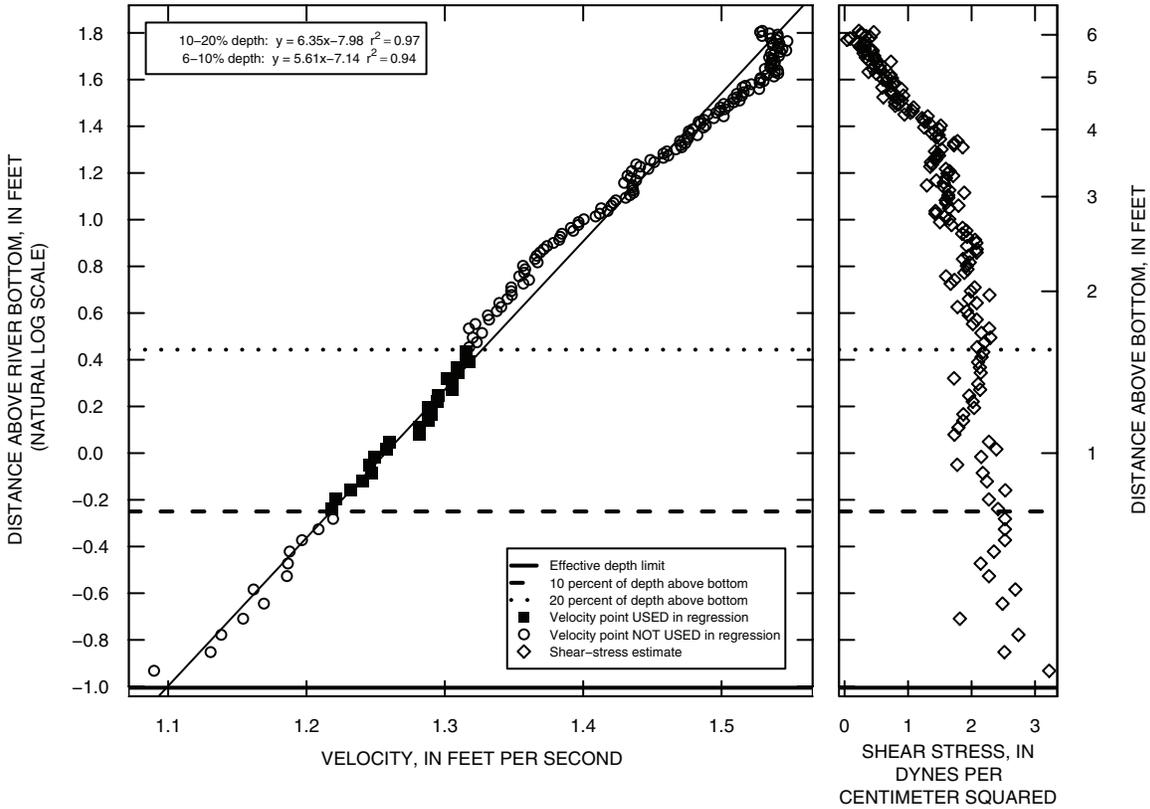


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**Velocity Profile – Lower Fox River – OU4-2B**

5/26/2004 18:16:25



Vertically averaged water flow: 1.41 ft/s, to direction 40.2°  
 Average wind conditions: 9.17 mi/h, from direction 256.7°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 3.87 [3.31 ≤ τ ≤ 4.49]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 4.95 [3.38 ≤ τ ≤ 6.83]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 2.48  
 Shear velocity (cm/s): 1.97 [1.82 ≤ u\_\* ≤ 2.12]  
 Bottom roughness, K<sub>s</sub> (cm): 0.31  
 Boundary Reynolds number: 61.55 Test: MAYBE

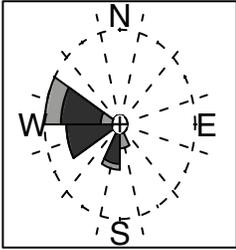
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 7.79	Field recorded ADCP depth (ft): 7.8
Water mode: 11	Field recorded depthfinder depth (ft): 7.6
Water-cell size (cm): 1	Total number of recorded ensembles: 215
Blanking dist. (cm): 25	Heading: 219.06 ± 1.53
Field recorded offset (cm): 24.4	Pitch: 2.97 ± 0.23
Actual offset (cm): 24.4	Roll: -0.9 ± 0.51
Latitude: 44° 27' 43.2" N	Filename: Vert20040526181625r.csv
Longitude: 88° 3' 31.8" W	

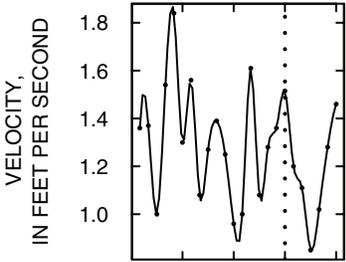
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**DAILY WIND ROSE**

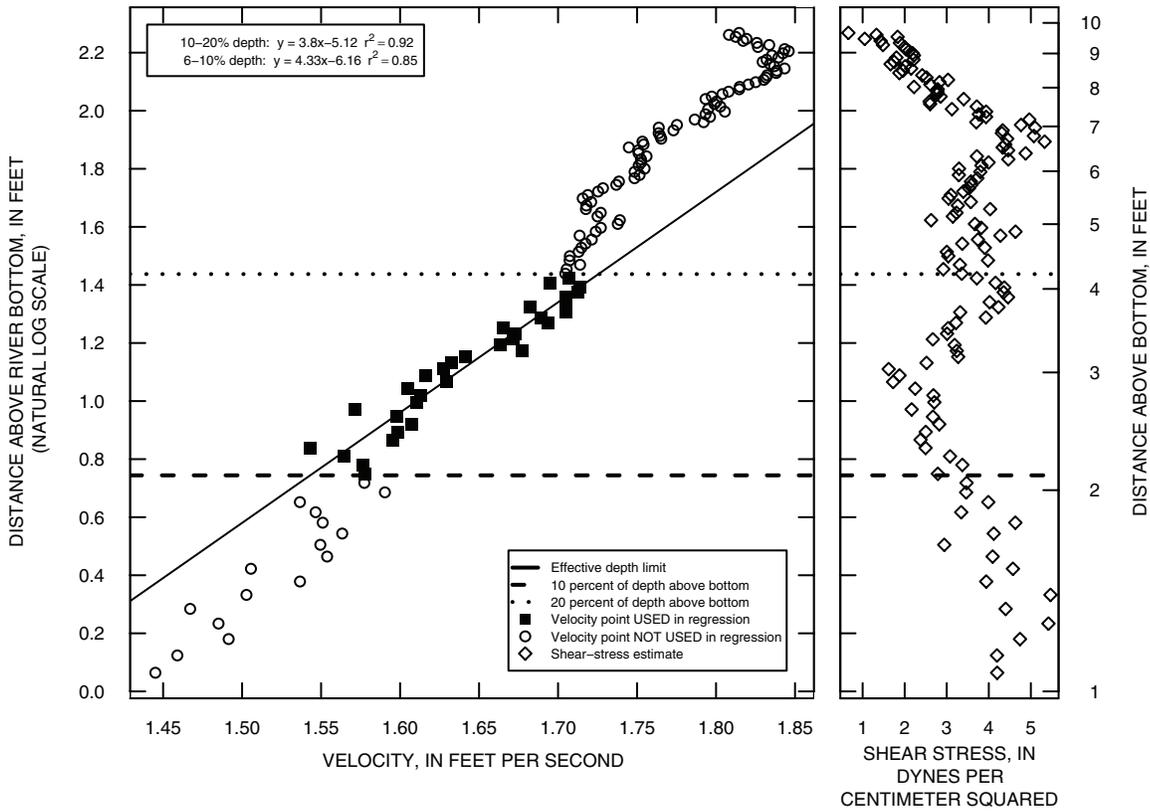


**VELOCITY AT OIL TANK DEPOT**



### Velocity Profile – Lower Fox River – OU4-2C

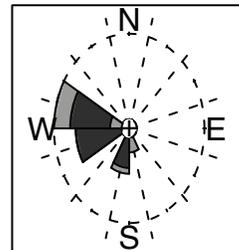
5/26/2004 17:54:38



Vertically averaged water flow: 1.71 ft/s, to direction 37.1°  
 Average wind conditions: 10.06 mi/h, from direction 272.2°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 10.82 [8.53 ≤ τ ≤ 13.37]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 8.35 [4.81 ≤ τ ≤ 12.85]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 4.19  
 Shear velocity (cm/s): 3.29 [2.92 ≤ u\_\* ≤ 3.66]  
 Bottom roughness, K<sub>s</sub> (cm): 5.47  
 Boundary Reynolds number: 1799.13 Test: PASS

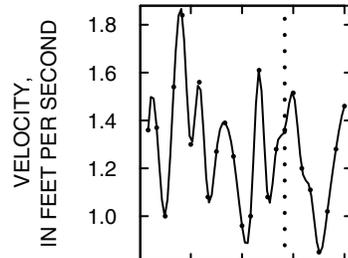
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 21.05	Field recorded ADCP depth (ft): 21.3
Water mode: 11	Field recorded depthfinder depth (ft): 20.7
Water-cell size (cm): 2	Total number of recorded ensembles: 226
Blanking dist. (cm): 25	Heading: 208.4 ± 3.59
Field recorded offset (cm): 320	Pitch: -3.31 ± 1.17
Actual offset (cm): 320	Roll: 2.75 ± 1.55
Latitude: 44° 27' 43" N	Filename: Vert20040526175438r.csv
Longitude: 88° 3' 28.5" W	

VELOCITY AT OIL TANK DEPOT

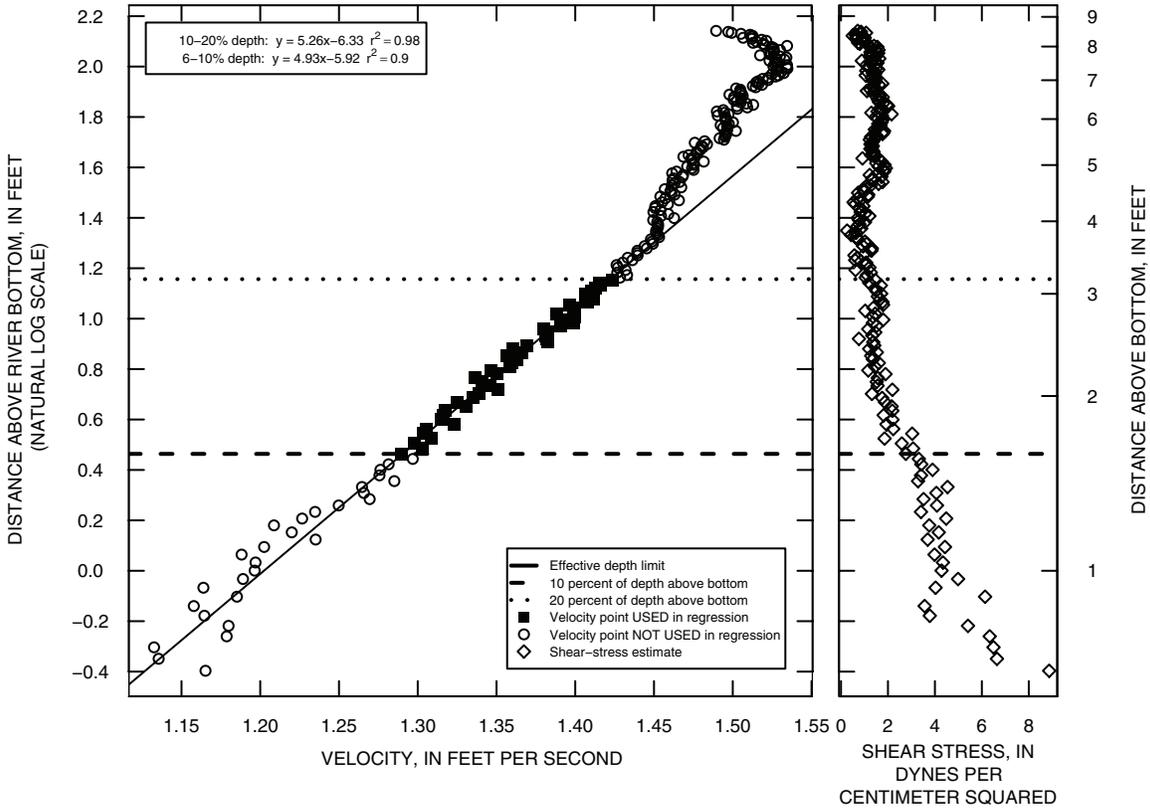


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**Velocity Profile – Lower Fox River – OU4-2D**

5/26/2004 17:13:11



Vertically averaged water flow: 1.43 ft/s, to direction 29.3°  
 Average wind conditions: 10.06 mi/h, from direction 272.2°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) ( $\text{dyn/cm}^2$ ): 5.64 [ $5.2 \leq \tau \leq 6.1$ ]  
 Shear stress (LP, 6-10% depth) ( $\text{dyn/cm}^2$ ): 6.42 [ $4.78 \leq \tau \leq 8.29$ ]  
 Shear stress (TKE) ( $\text{dyn/cm}^2$ ): 4.51  
 Shear velocity (cm/s): 2.37 [ $2.28 \leq u_* \leq 2.47$ ]  
 Bottom roughness,  $K_s$  (cm): 1.63  
 Boundary Reynolds number: 387.95 Test: PASS

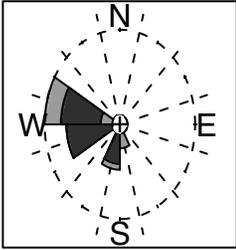
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 15.9	Field recorded ADCP depth (ft): 15.5
Water mode: 11	Field recorded depthfinder depth (ft): 14.6
Water-cell size (cm): 1	Total number of recorded ensembles: 191
Blanking dist. (cm): 25	Heading: $207.96 \pm 4.91$
Field recorded offset (cm): 198	Pitch: $-0.22 \pm 0.95$
Actual offset (cm): 198	Roll: $-2.12 \pm 0.94$
Latitude: $44^\circ 27' 42''$ N	Filename: Vert20040526171311r.csv
Longitude: $88^\circ 3' 26.2''$ W	

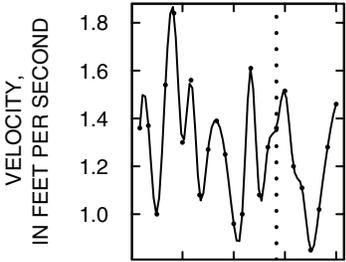
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**DAILY WIND ROSE**

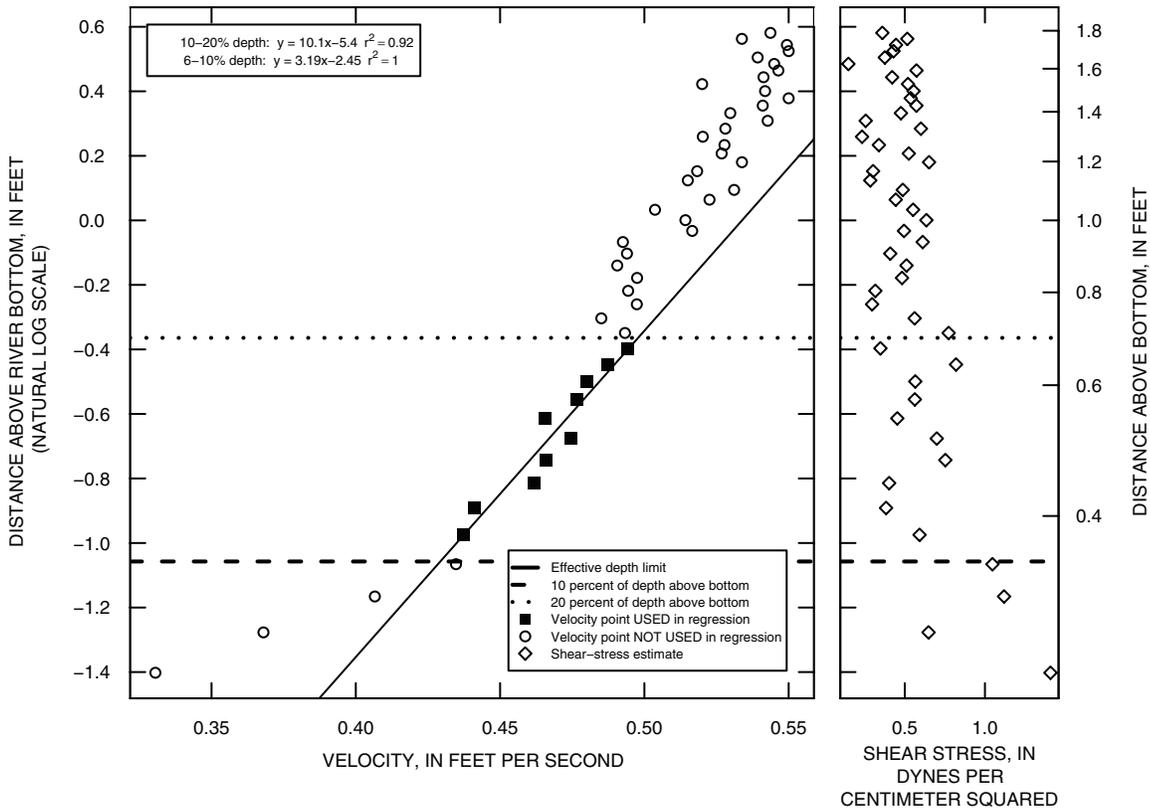


**VELOCITY AT OIL TANK DEPOT**



### Velocity Profile – Lower Fox River – OU4-3A

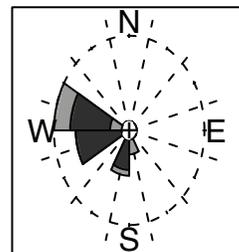
5/26/2004 9:37:59



Vertically averaged water flow: 0.5 ft/s, to direction 27.2°  
 Average wind conditions: 6.81 mi/h, from direction 286.6°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 1.53 [0.88 ≤ τ ≤ 2.35]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 15.39 [12.13 ≤ τ ≤ 19.03]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 1.06  
 Shear velocity (cm/s): 1.24 [0.94 ≤ u\_\* ≤ 1.53]  
 Bottom roughness, K<sub>s</sub> (cm): 4.14  
 Boundary Reynolds number: 511.35 Test: PASS

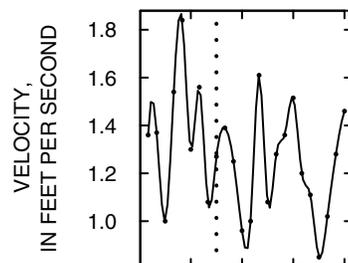
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 3.47	Field recorded ADCP depth (ft): 3.3
Water mode: 11	Field recorded depthfinder depth (ft): 2.7
Water-cell size (cm): 1	Total number of recorded ensembles: 200
Blanking dist. (cm): 25	Heading: 217.51 ± 1.71
Field recorded offset (cm): 24.4	Pitch: 3.69 ± 0.13
Actual offset (cm): 24.4	Roll: -0.3 ± 1.79
Latitude: 44° 28' 18.7" N	Filename: Vert20040526093759r.csv
Longitude: 88° 3' 9.7" W	

VELOCITY AT OIL TANK DEPOT

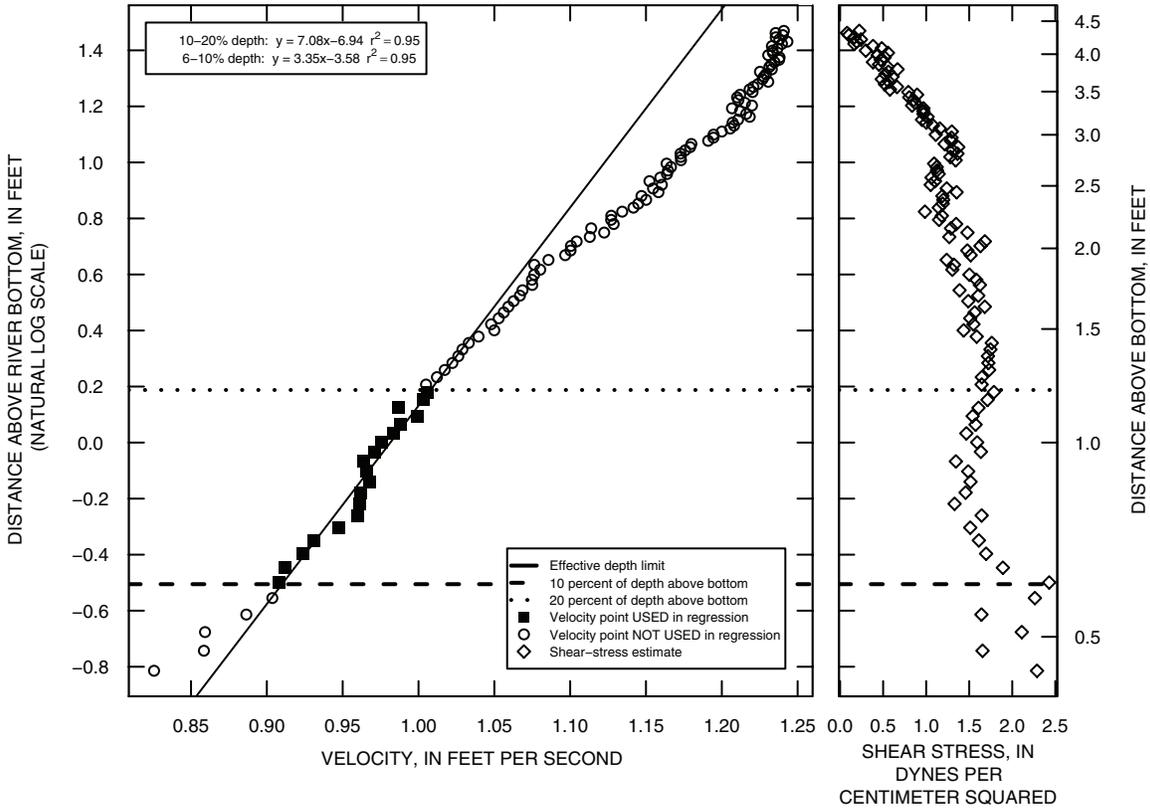


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**Velocity Profile – Lower Fox River – OU4-3B**

5/26/2004 9:55:52



Vertically averaged water flow: 1.12 ft/s, to direction 29.7°  
 Average wind conditions: 6.81 mi/h, from direction 286.6°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 3.12 [2.4 ≤ τ ≤ 3.93]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 13.92 [4.67 ≤ τ ≤ 28.09]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 1.99  
 Shear velocity (cm/s): 1.77 [1.55 ≤ u<sub>\*</sub> ≤ 1.98]  
 Bottom roughness, K<sub>s</sub> (cm): 0.88  
 Boundary Reynolds number: 155.67 Test: PASS

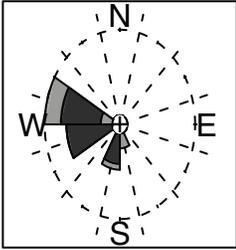
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 6.03	Field recorded ADCP depth (ft): 5.9
Water mode: 11	Field recorded depthfinder depth (ft): 4.9
Water-cell size (cm): 1	Total number of recorded ensembles: 206
Blanking dist. (cm): 25	Heading: 232.37 ± 4.53
Field recorded offset (cm): 24.4	Pitch: 3.88 ± 0.19
Actual offset (cm): 24.4	Roll: 0.76 ± 0.36
Latitude: 44° 28' 17.6" N	Filename: Vert20040526095552r.csv
Longitude: 88° 3' 5.7" W	

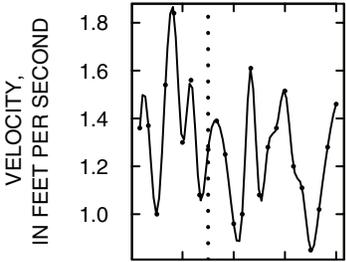
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**DAILY WIND ROSE**

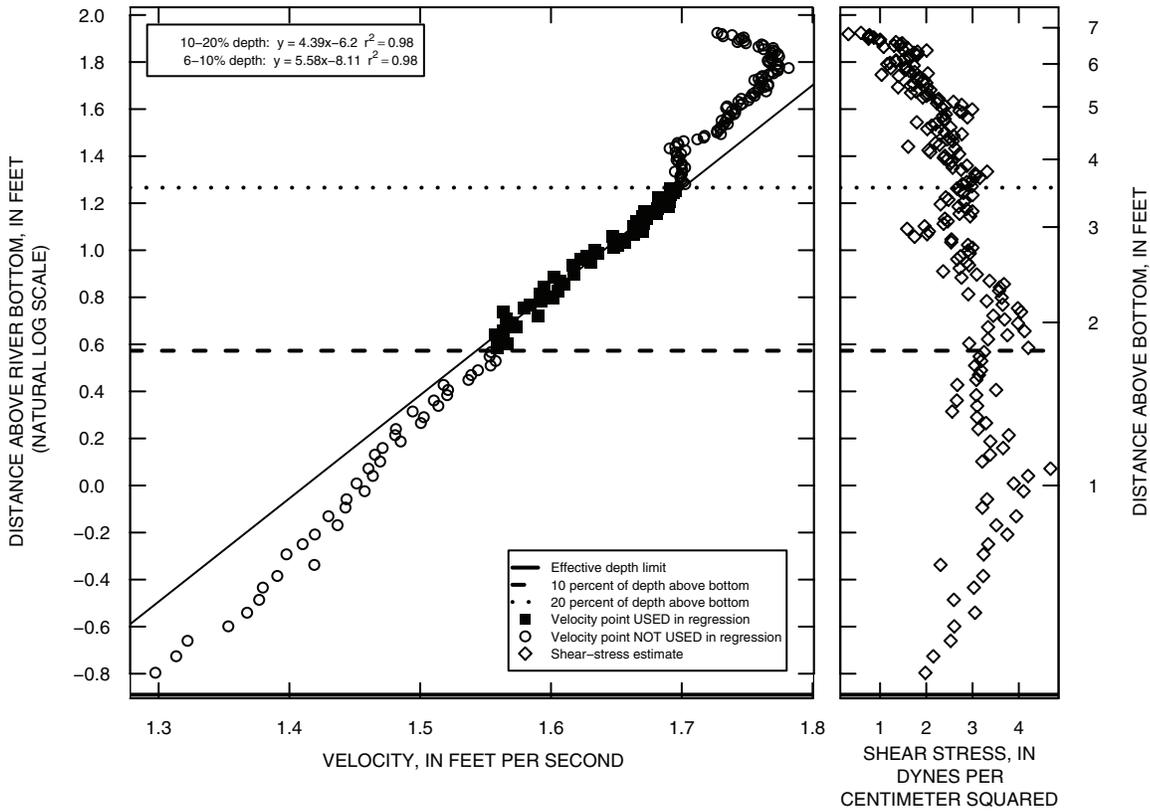


**VELOCITY AT OIL TANK DEPOT**



### Velocity Profile – Lower Fox River – OU4-3C

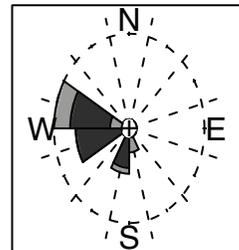
5/26/2004 10:20:40



Vertically averaged water flow: 1.65 ft/s, to direction 32°  
 Average wind conditions: 6.08 mi/h, from direction 287.4°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 8.1 [7.43 ≤ τ ≤ 8.81]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 5.01 [4.61 ≤ τ ≤ 5.43]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 3.2  
 Shear velocity (cm/s): 2.85 [2.73 ≤ u\_\* ≤ 2.97]  
 Bottom roughness, K<sub>s</sub> (cm): 1.85  
 Boundary Reynolds number: 527.46 Test: PASS

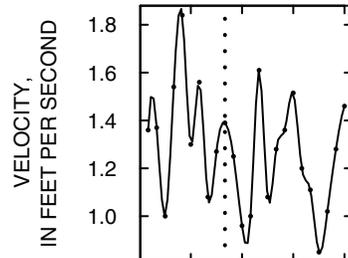
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 17.73	Field recorded ADCP depth (ft): 17.9
Water mode: 11	Field recorded depthfinder depth (ft): 17.8
Water-cell size (cm): 1	Total number of recorded ensembles: 211
Blanking dist. (cm): 25	Heading: 203.98 ± 4.65
Field recorded offset (cm): 305	Pitch: -2.57 ± 0.45
Actual offset (cm): 305	Roll: 1.52 ± 1.26
Latitude: 44° 28' 17.5" N	Filename: Vert20040526102040r.csv
Longitude: 88° 3' 1.9" W	

VELOCITY AT OIL TANK DEPOT

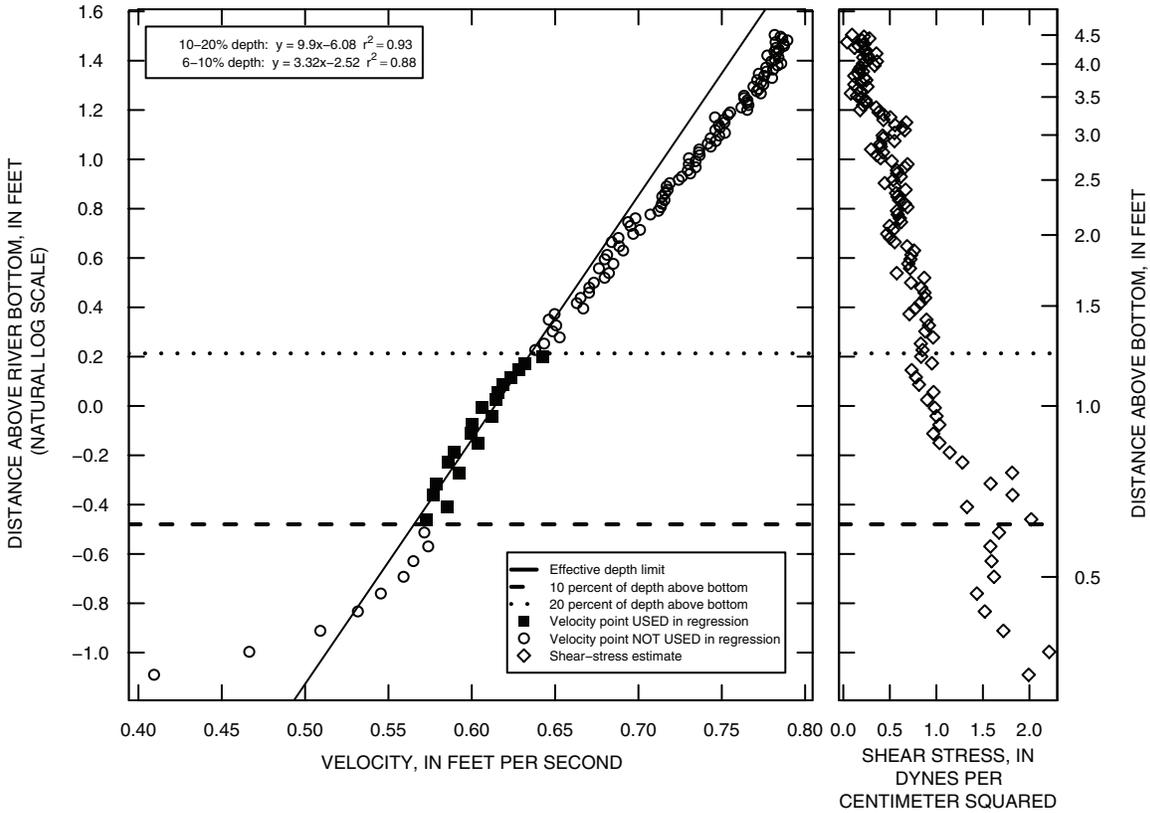


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**Velocity Profile – Lower Fox River – OU4-3D**

5/26/2004 10:38:52



Vertically averaged water flow: 0.7 ft/s, to direction 22.7°  
 Average wind conditions: 6.08 mi/h, from direction 287.4°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) ( $\text{dyn/cm}^2$ ): 1.59 [ $1.18 \leq \tau \leq 2.07$ ]  
 Shear stress (LP, 6-10% depth) ( $\text{dyn/cm}^2$ ): 14.17 [ $6.45 \leq \tau \leq 24.89$ ]  
 Shear stress (TKE) ( $\text{dyn/cm}^2$ ): 1.71  
 Shear velocity (cm/s): 1.26 [ $1.09 \leq u_* \leq 1.44$ ]  
 Bottom roughness,  $K_s$  (cm): 2.09  
 Boundary Reynolds number: 264.01 Test: PASS

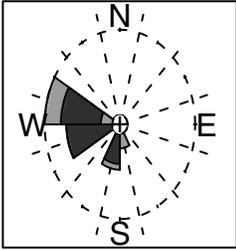
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 6.19	Field recorded ADCP depth (ft): 6.1
Water mode: 11	Field recorded depthfinder depth (ft): 4.9
Water-cell size (cm): 1	Total number of recorded ensembles: 223
Blanking dist. (cm): 25	Heading: $241.56 \pm 1.54$
Field recorded offset (cm): 24.4	Pitch: $2.74 \pm 0.12$
Actual offset (cm): 24.4	Roll: $1 \pm 0.59$
Latitude: $44^\circ 28' 15.4''$ N	Filename: Vert20040526103852r.csv
Longitude: $88^\circ 2' 57.9''$ W	

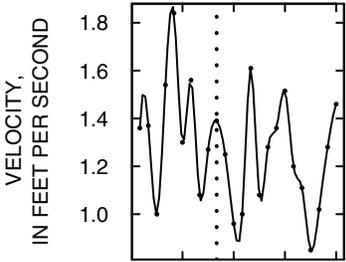
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

DAILY WIND ROSE

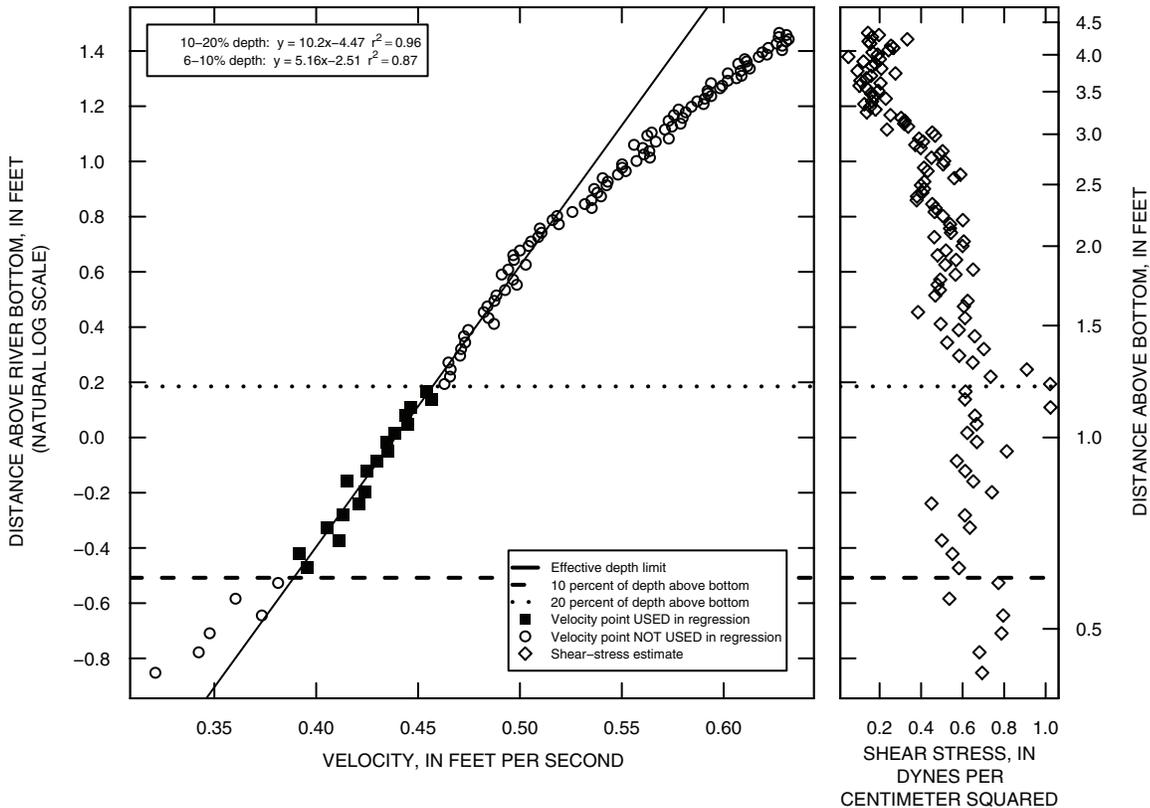


VELOCITY AT OIL TANK DEPOT



### Velocity Profile – Lower Fox River – OU4-4A

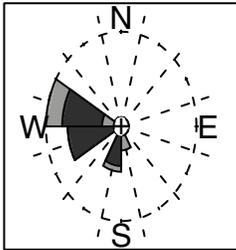
5/26/2004 12:28:05



Vertically averaged water flow: 0.52 ft/s, to direction 24.8°  
 Average wind conditions: 7.99 mi/h, from direction 293.4°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 1.51 [1.18 ≤ τ ≤ 1.87]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 5.86 [1.27 ≤ τ ≤ 13.82]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 0.71  
 Shear velocity (cm/s): 1.23 [1.09 ≤ u\_\* ≤ 1.37]  
 Bottom roughness, K<sub>s</sub> (cm): 10.51  
 Boundary Reynolds number: 1290.39 Test: PASS

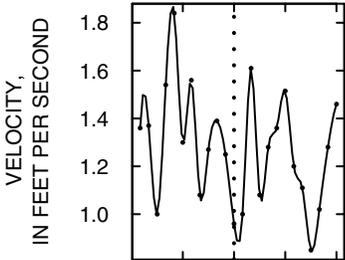
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 6.02	Field recorded ADCP depth (ft): 5.9
Water mode: 11	Field recorded depthfinder depth (ft): 5.1
Water-cell size (cm): 1	Total number of recorded ensembles: 213
Blanking dist. (cm): 25	Heading: 241.32 ± 3.85
Field recorded offset (cm): 24.4	Pitch: 2.82 ± 0.15
Actual offset (cm): 24.4	Roll: -0.13 ± 0.46
Latitude: 44° 28' 42.1" N	Filename: Vert20040526122805r.csv
Longitude: 88° 2' 45.6" W	

VELOCITY AT OIL TANK DEPOT

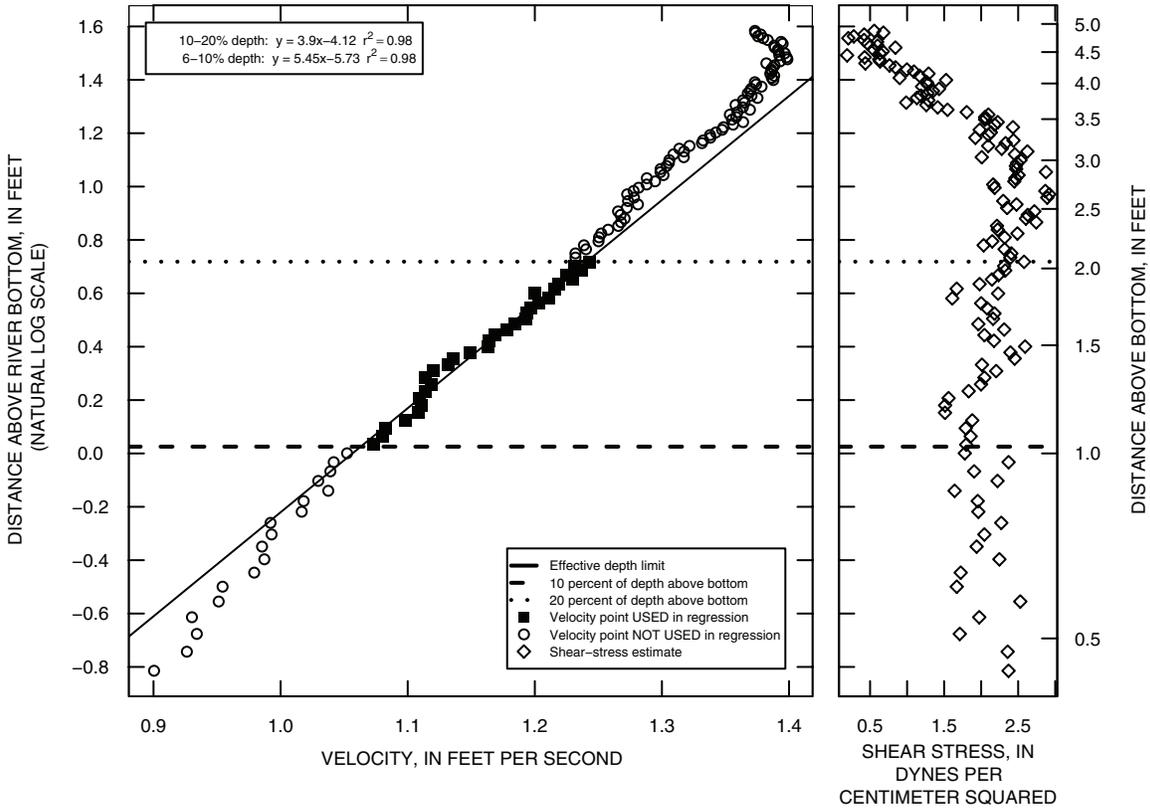


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

### Velocity Profile – Lower Fox River – OU4-4B

5/26/2004 12:00:11



Vertically averaged water flow: 1.25 ft/s, to direction 37.1°  
 Average wind conditions: 7.99 mi/h, from direction 293.4°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 10.27 [9.26 ≤ τ ≤ 11.34]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 5.26 [4.48 ≤ τ ≤ 6.11]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 2.04  
 Shear velocity (cm/s): 3.2 [3.04 ≤ u\_\* ≤ 3.37]  
 Bottom roughness, K<sub>s</sub> (cm): 14.85  
 Boundary Reynolds number: 4759.54 Test: PASS

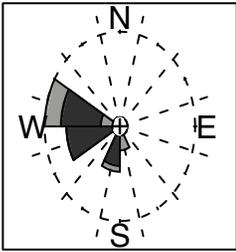
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 10.26	Field recorded ADCP depth (ft): 10.1
Water mode: 11	Field recorded depthfinder depth (ft): 9.4
Water-cell size (cm): 1	Total number of recorded ensembles: 216
Blanking dist. (cm): 25	Heading: 243.69 ± 3.16
Field recorded offset (cm): 137	Pitch: 2.61 ± 0.33
Actual offset (cm): 137	Roll: -0.65 ± 1.06
Latitude: 44° 28' 41" N	Filename: Vert20040526120011r.csv
Longitude: 88° 2' 38.8" W	

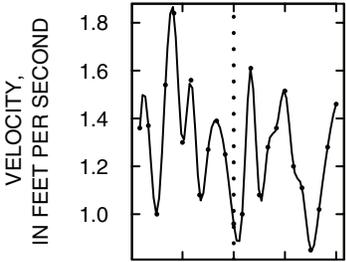
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

DAILY WIND ROSE

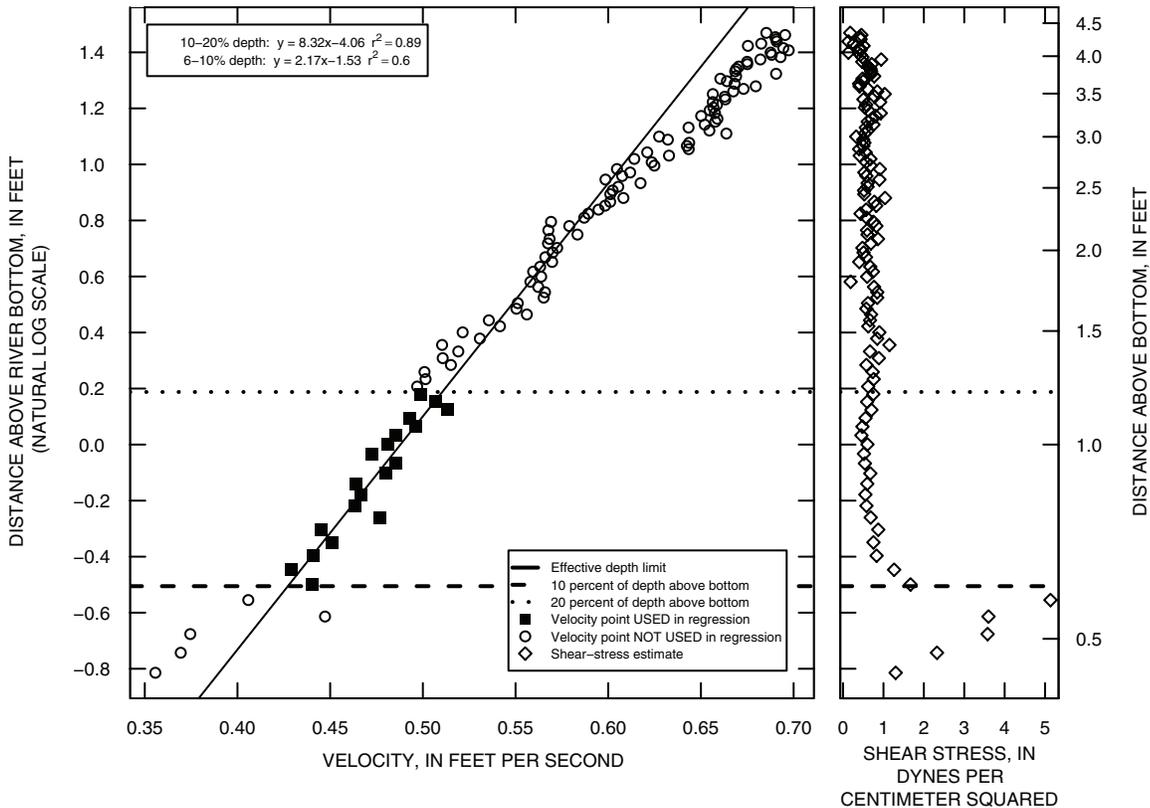


VELOCITY AT OIL TANK DEPOT



### Velocity Profile – Lower Fox River – OU4-4C1

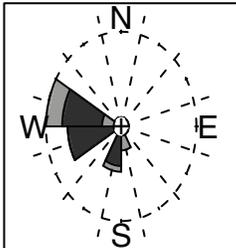
5/26/2004 11:31:13



Vertically averaged water flow: 0.58 ft/s, to direction 31.6°  
 Average wind conditions: 6.89 mi/h, from direction 295.5°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 2.26 [1.52 ≤ τ ≤ 3.13]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 33.27 [-8.49 ≤ τ ≤ 208.81]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 3.19  
 Shear velocity (cm/s): 1.5 [1.23 ≤ u\_\* ≤ 1.77]  
 Bottom roughness, K<sub>s</sub> (cm): 15.77  
 Boundary Reynolds number: 2368.97 Test: PASS

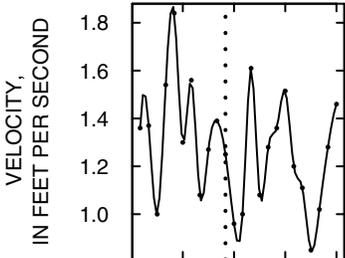
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 6.03	Field recorded ADCP depth (ft): 6
Water mode: 11	Field recorded depthfinder depth (ft): 4.9
Water-cell size (cm): 1	Total number of recorded ensembles: 54
Blanking dist. (cm): 25	Heading: 244.83 ± 3.64
Field recorded offset (cm): 24.4	Pitch: 4.51 ± 0.67
Actual offset (cm): 24.4	Roll: 0.29 ± 1.89
Latitude: 44° 28' 37.4" N	Filename: Vert20040526113113r.csv
Longitude: 88° 2' 23.1" W	

VELOCITY AT OIL TANK DEPOT

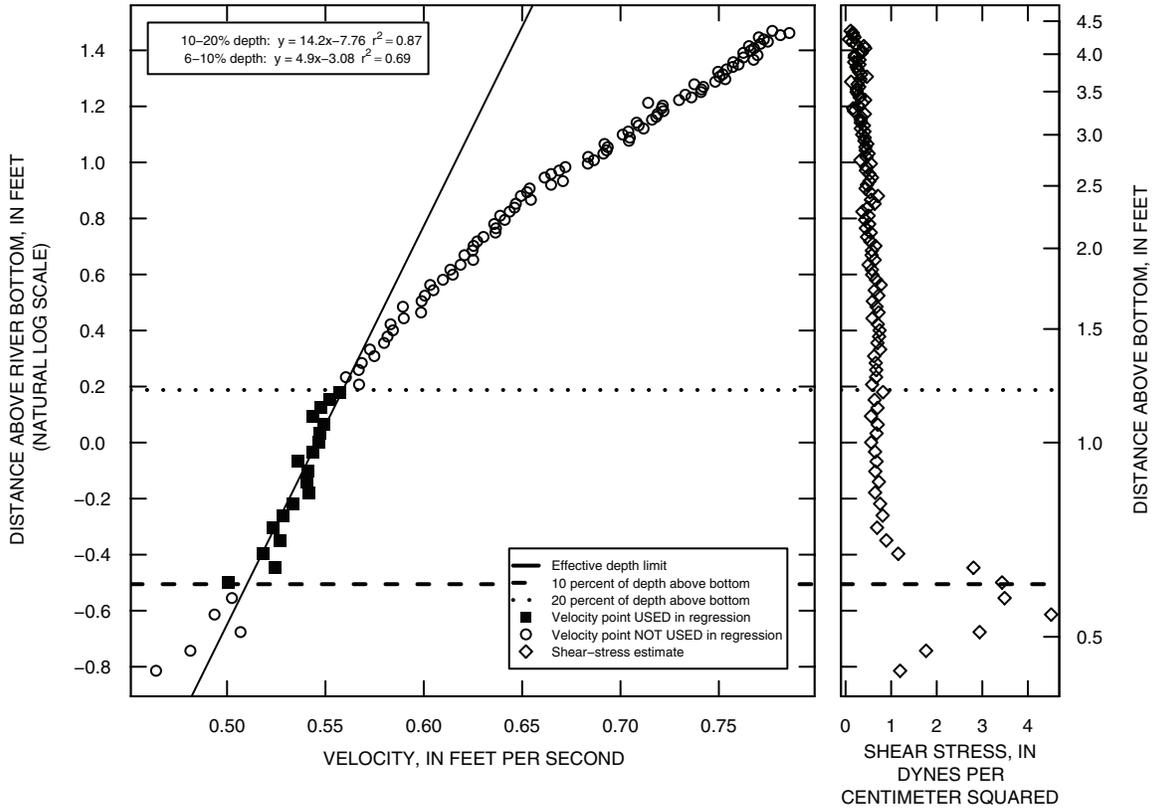


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**Velocity Profile – Lower Fox River – OU4-4C3**

5/26/2004 11:35:43



Vertically averaged water flow: 0.65 ft/s, to direction 29.8°  
 Average wind conditions: 6.89 mi/h, from direction 295.5°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 0.77 [0.5 ≤ τ ≤ 1.11]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 6.51 [-0.36 ≤ τ ≤ 32.55]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 2.78  
 Shear velocity (cm/s): 0.88 [0.71 ≤ u\_\* ≤ 1.05]  
 Bottom roughness, K<sub>s</sub> (cm): 0.39  
 Boundary Reynolds number: 34.25 Test: MAYBE

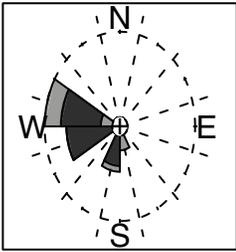
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 6.03	Field recorded ADCP depth (ft): 6
Water mode: 11	Field recorded depthfinder depth (ft): 4.9
Water-cell size (cm): 1	Total number of recorded ensembles: 208
Blanking dist. (cm): 25	Heading: 242.43 ± 1.94
Field recorded offset (cm): 24.4	Pitch: 4.06 ± 0.27
Actual offset (cm): 24.4	Roll: 0.5 ± 0.6
Latitude: 44° 28' 37.4" N	Filename: Vert20040526113543r.csv
Longitude: 88° 2' 23.1" W	

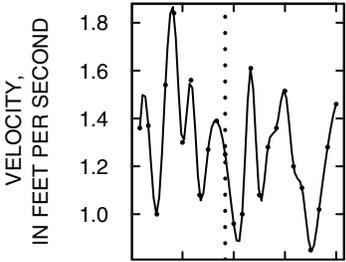
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**DAILY WIND ROSE**

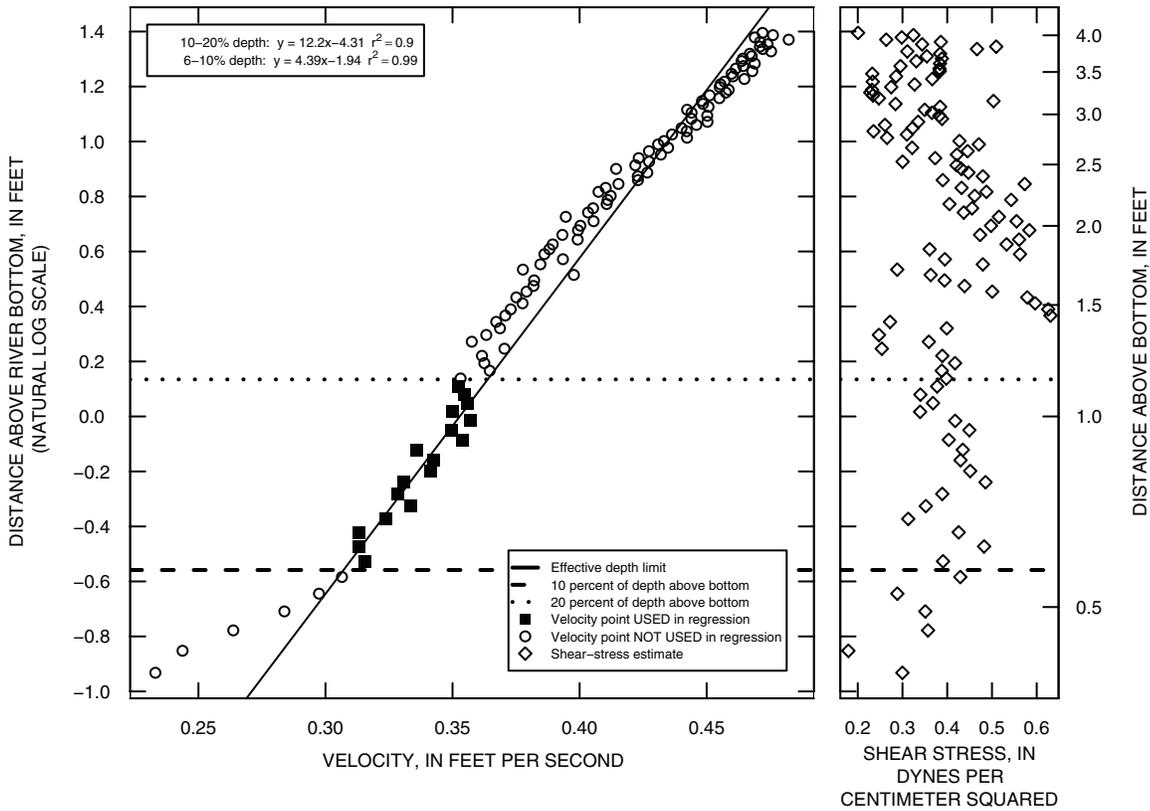


**VELOCITY AT OIL TANK DEPOT**



### Velocity Profile – Lower Fox River – OU4-5A

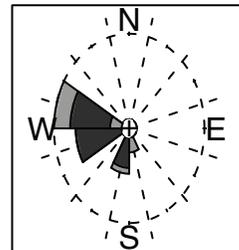
5/26/2004 13:28:01



Vertically averaged water flow: 0.4 ft/s, to direction 70°  
 Average wind conditions: 8.75 mi/h, from direction 290°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 1.05 [0.7 ≤ τ ≤ 1.47]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 8.12 [5.84 ≤ τ ≤ 10.77]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 0.32  
 Shear velocity (cm/s): 1.02 [0.83 ≤ u\_\* ≤ 1.21]  
 Bottom roughness, K<sub>s</sub> (cm): 12.28  
 Boundary Reynolds number: 1255.53 Test: PASS

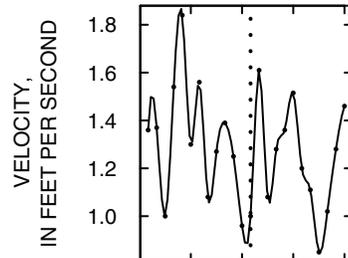
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 5.72	Field recorded ADCP depth (ft): 5.7
Water mode: 11	Field recorded depthfinder depth (ft): 5.1
Water-cell size (cm): 1	Total number of recorded ensembles: 201
Blanking dist. (cm): 25	Heading: 254.93 ± 1.88
Field recorded offset (cm): 24.4	Pitch: 3.12 ± 0.36
Actual offset (cm): 24.4	Roll: -0.78 ± 0.57
Latitude: 44° 29' 8" N	Filename: Vert20040526132801r.csv
Longitude: 88° 2' 23.8" W	

VELOCITY AT OIL TANK DEPOT

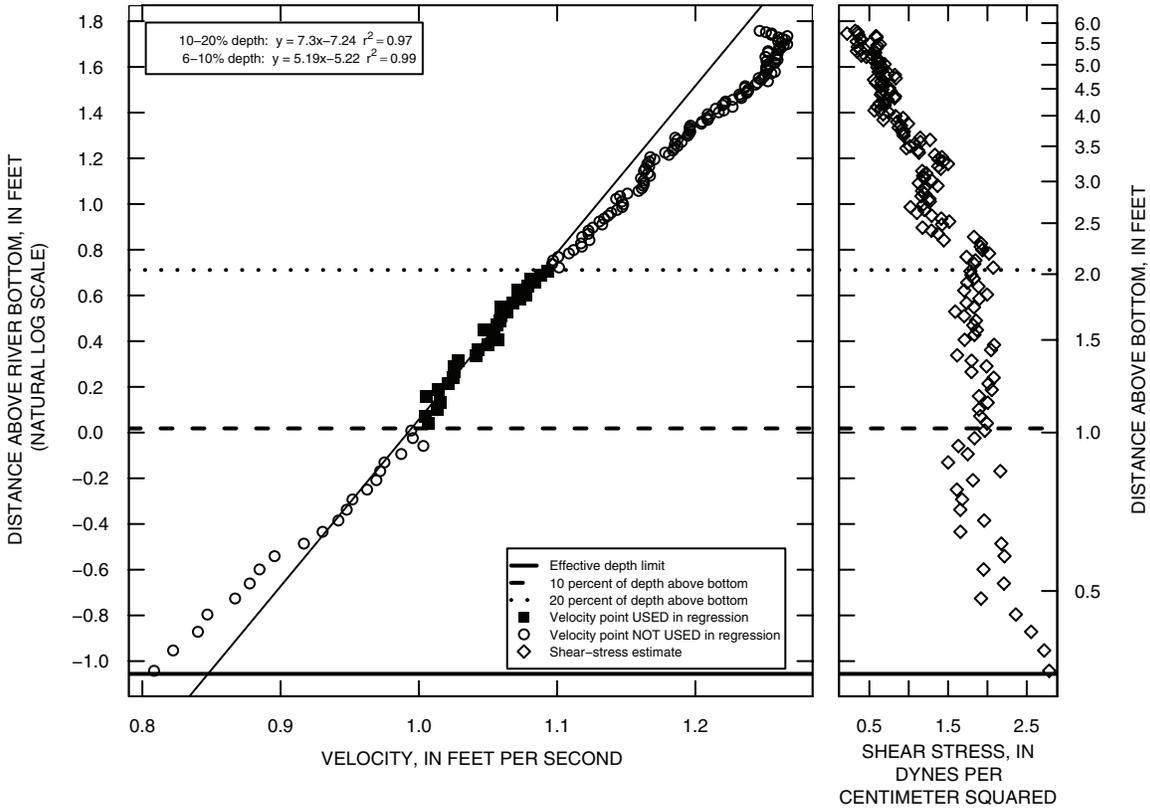


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**Velocity Profile – Lower Fox River – OU4-5B**

5/26/2004 13:49:19



Vertically averaged water flow: 1.14 ft/s, to direction 53°  
 Average wind conditions: 8.75 mi/h, from direction 290°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 2.93 [2.55 ≤ τ ≤ 3.34]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 5.8 [5.27 ≤ τ ≤ 6.35]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 2.01  
 Shear velocity (cm/s): 1.71 [1.6 ≤ u\_\* ≤ 1.83]  
 Bottom roughness, K<sub>s</sub> (cm): 0.65  
 Boundary Reynolds number: 112.15 Test: PASS

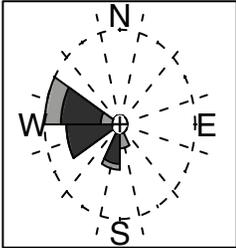
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 10.18	Field recorded ADCP depth (ft): 10.2
Water mode: 11	Field recorded depthfinder depth (ft): 9.4
Water-cell size (cm): 1	Total number of recorded ensembles: 204
Blanking dist. (cm): 25	Heading: 247.55 ± 1.95
Field recorded offset (cm): 107	Pitch: 3.37 ± 0.31
Actual offset (cm): 107	Roll: -2.02 ± 0.89
Latitude: 44° 29' 4" N	Filename: Vert20040526134919r.csv
Longitude: 88° 2' 16" W	

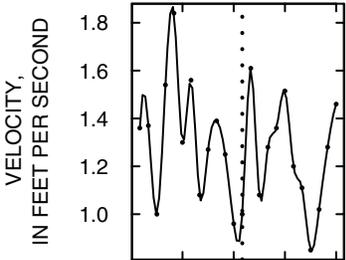
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**DAILY WIND ROSE**

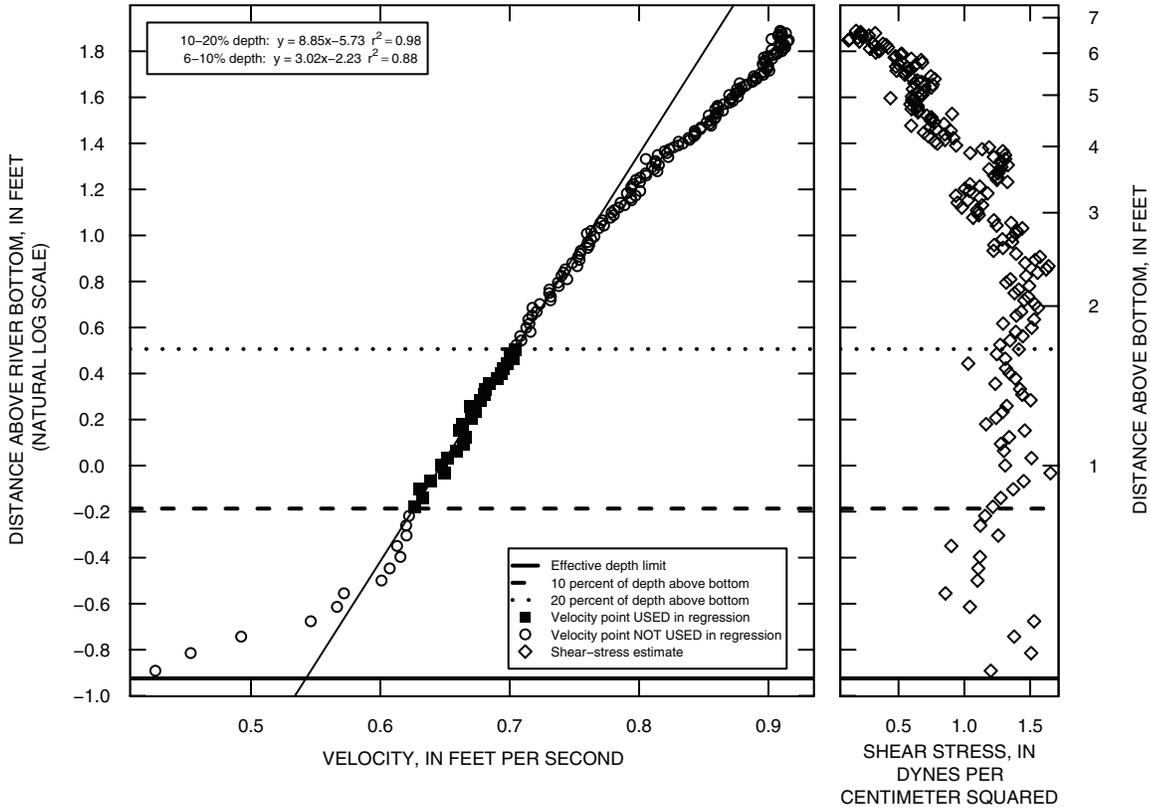


**VELOCITY AT OIL TANK DEPOT**



### Velocity Profile – Lower Fox River – OU4-5C

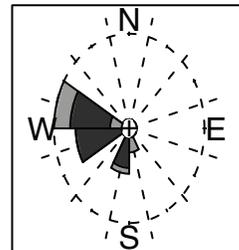
5/26/2004 14:10:52



Vertically averaged water flow: 0.79 ft/s, to direction 31.6°  
 Average wind conditions: 8.8 mi/h, from direction 283.9°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 1.99 [1.76 ≤ τ ≤ 2.24]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 17.16 [9.83 ≤ τ ≤ 26.52]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 1.18  
 Shear velocity (cm/s): 1.41 [1.33 ≤ u\_\* ≤ 1.5]  
 Bottom roughness, K<sub>s</sub> (cm): 2.98  
 Boundary Reynolds number: 421.34 Test: PASS

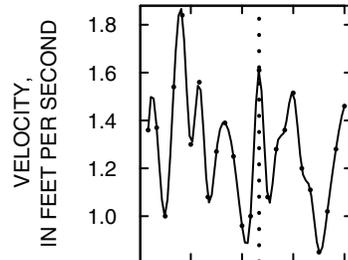
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 8.3	Field recorded ADCP depth (ft): 8.2
Water mode: 11	Field recorded depthfinder depth (ft): 7.4
Water-cell size (cm): 1	Total number of recorded ensembles: 204
Blanking dist. (cm): 25	Heading: 240.35 ± 1.7
Field recorded offset (cm): 24.4	Pitch: 3.32 ± 0.36
Actual offset (cm): 24.4	Roll: -2.88 ± 1.4
Latitude: 44° 28' 57.3" N	Filename: Vert20040526141052r.csv
Longitude: 88° 2' 2.3" W	

VELOCITY AT OIL TANK DEPOT

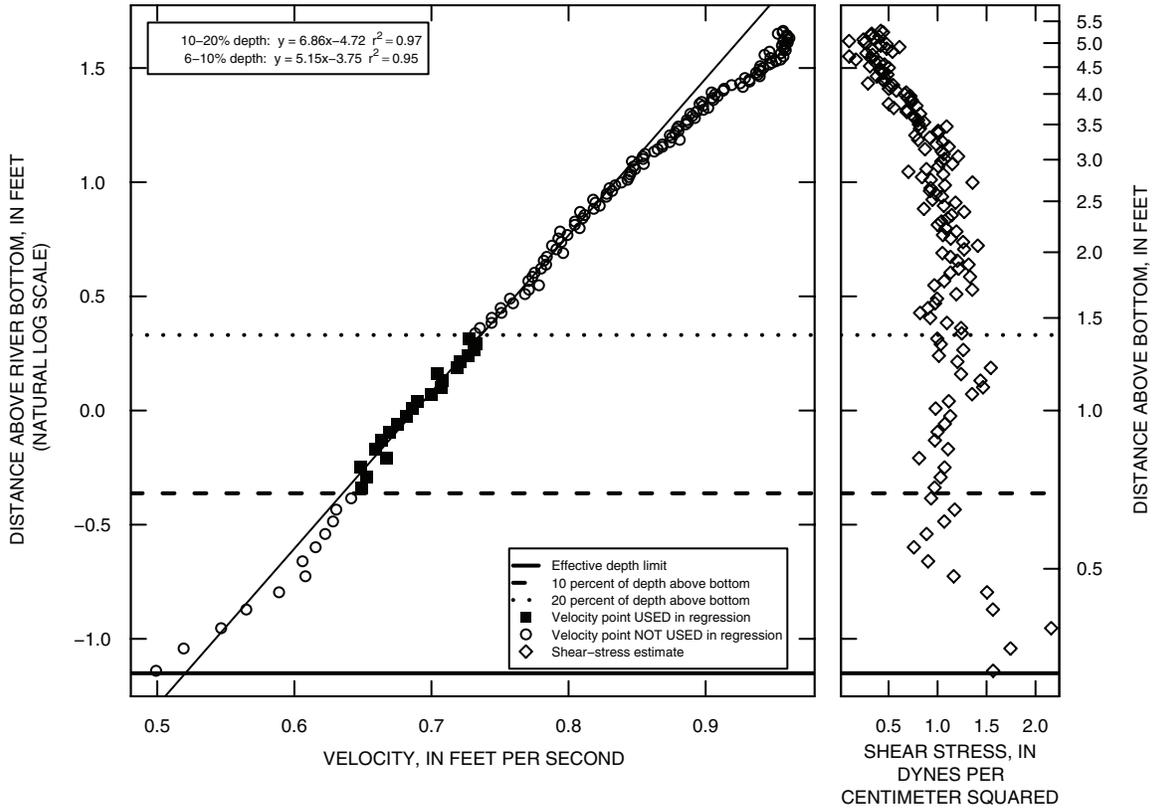


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**Velocity Profile – Lower Fox River – OU4-6A**

5/26/2004 15:53:42



Vertically averaged water flow: 0.82 ft/s, to direction 47°  
 Average wind conditions: 8.07 mi/h, from direction 276.7°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 3.32 [2.76 ≤ τ ≤ 3.92]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 5.9 [4.17 ≤ τ ≤ 7.93]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 1.29  
 Shear velocity (cm/s): 1.82 [1.66 ≤ u\_\* ≤ 1.98]  
 Bottom roughness, K<sub>s</sub> (cm): 8.14  
 Boundary Reynolds number: 1481.76 Test: PASS

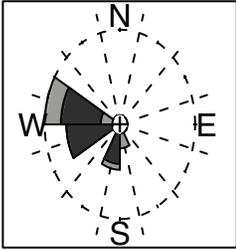
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 6.96	Field recorded ADCP depth (ft): 7
Water mode: 11	Field recorded depthfinder depth (ft): ---
Water-cell size (cm): 1	Total number of recorded ensembles: 210
Blanking dist. (cm): 25	Heading: 204.05 ± 1.94
Field recorded offset (cm): 24.4	Pitch: 2.57 ± 0.61
Actual offset (cm): 24.4	Roll: 1.67 ± 1.39
Latitude: 44° 29' 22.8" N	Filename: Vert20040526155342r.csv
Longitude: 88° 1' 55.5" W	

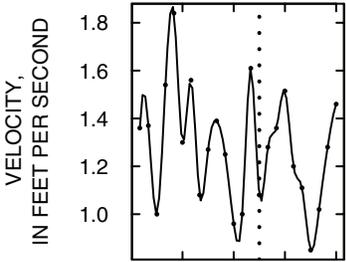
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

DAILY WIND ROSE

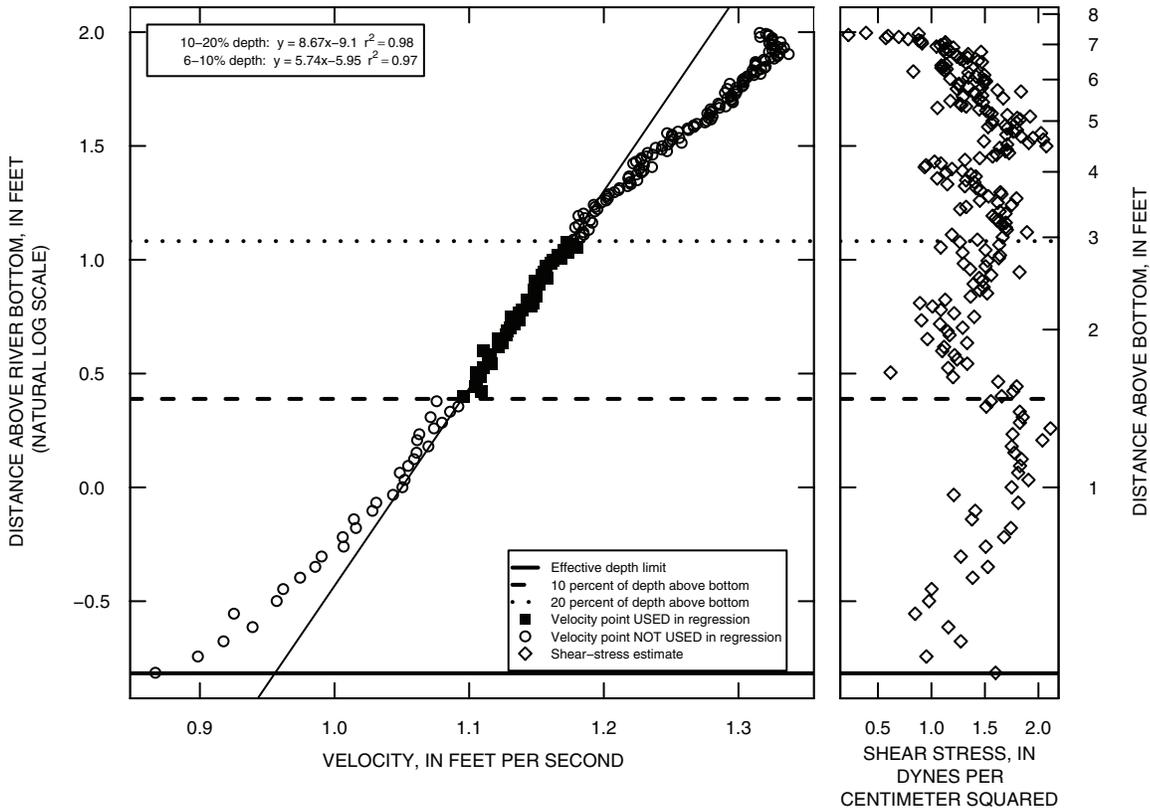


VELOCITY AT OIL TANK DEPOT



**Velocity Profile – Lower Fox River – OU4-6B**

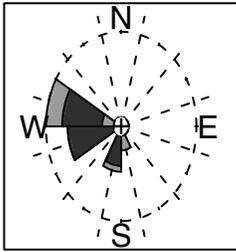
5/26/2004 15:34:57



Vertically averaged water flow: 1.2 ft/s, to direction 45°  
 Average wind conditions: 8.07 mi/h, from direction 276.7°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 2.08 [1.88 ≤ τ ≤ 2.28]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 4.74 [4.09 ≤ τ ≤ 5.43]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 1.56  
 Shear velocity (cm/s): 1.44 [1.37 ≤ u\_\* ≤ 1.51]  
 Bottom roughness, K<sub>s</sub> (cm): 0.1  
 Boundary Reynolds number: 14.68 Test: MAYBE

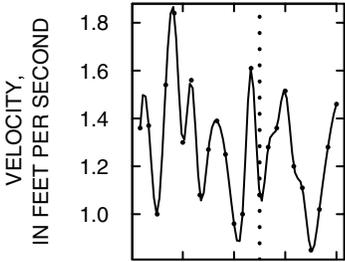
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 14.75	Field recorded ADCP depth (ft): 14.6
Water mode: 11	Field recorded depthfinder depth (ft): 14
Water-cell size (cm): 1	Total number of recorded ensembles: 218
Blanking dist. (cm): 25	Heading: 222.55 ± 4.63
Field recorded offset (cm): 198	Pitch: 1.07 ± 0.91
Actual offset (cm): 198	Roll: -0.75 ± 0.98
Latitude: 44° 29' 20.2" N	Filename: Vert20040526153457r.csv
Longitude: 88° 1' 49.9" W	

VELOCITY AT OIL TANK DEPOT

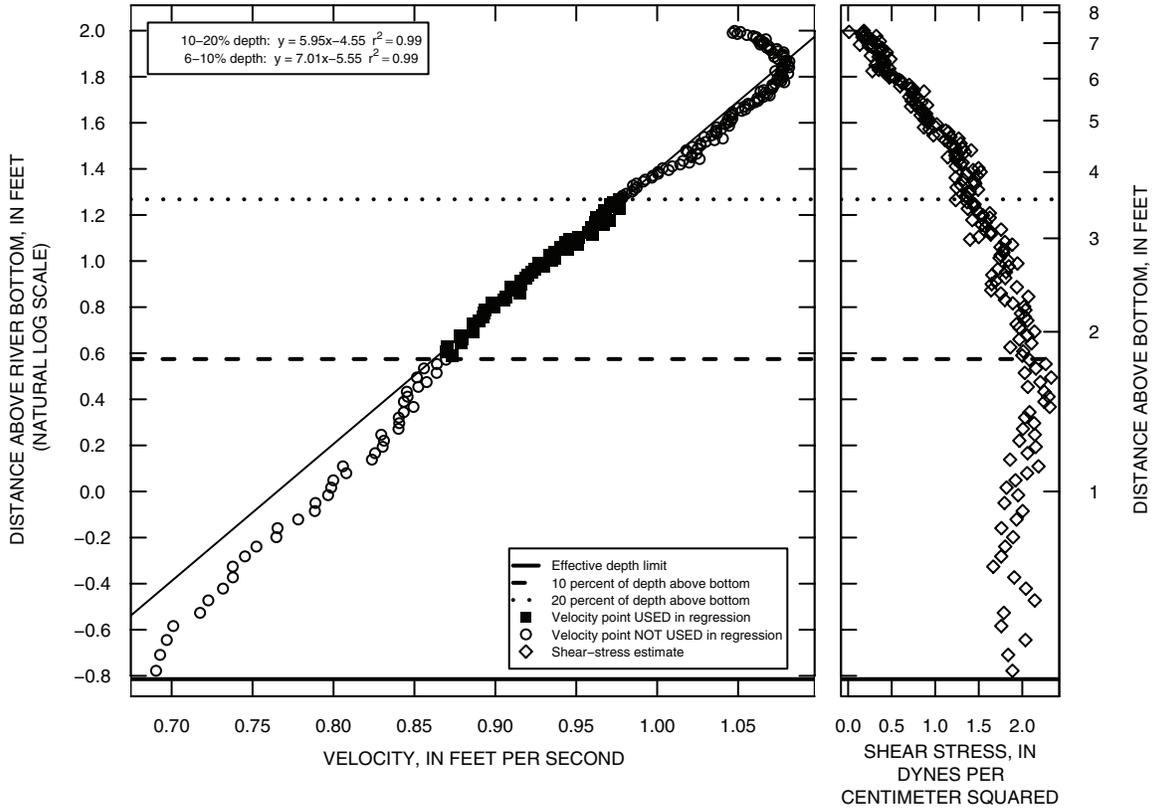


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**Velocity Profile – Lower Fox River – OU4-6C**

5/26/2004 15:10:45



Vertically averaged water flow: 0.97 ft/s, to direction 51.3°  
 Average wind conditions: 8.07 mi/h, from direction 276.7°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 4.42 [4.16 ≤ τ ≤ 4.68]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 3.18 [2.95 ≤ τ ≤ 3.42]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 2.02  
 Shear velocity (cm/s): 2.1 [2.04 ≤ u\_\* ≤ 2.16]  
 Bottom roughness, K<sub>s</sub> (cm): 9.66  
 Boundary Reynolds number: 2029.7 Test: PASS

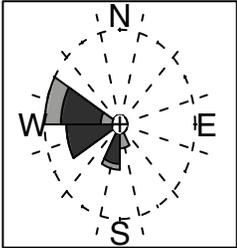
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 17.77	Field recorded ADCP depth (ft): 17.7
Water mode: 11	Field recorded depthfinder depth (ft): 17
Water-cell size (cm): 1	Total number of recorded ensembles: 215
Blanking dist. (cm): 25	Heading: 237.51 ± 1.94
Field recorded offset (cm): 290	Pitch: -0.31 ± 0.6
Actual offset (cm): 290	Roll: -0.47 ± 1.06
Latitude: 44° 29' 18.7" N	Filename: Vert20040526151045r.csv
Longitude: 88° 1' 46.8" W	

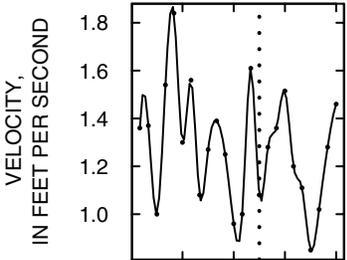
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

DAILY WIND ROSE

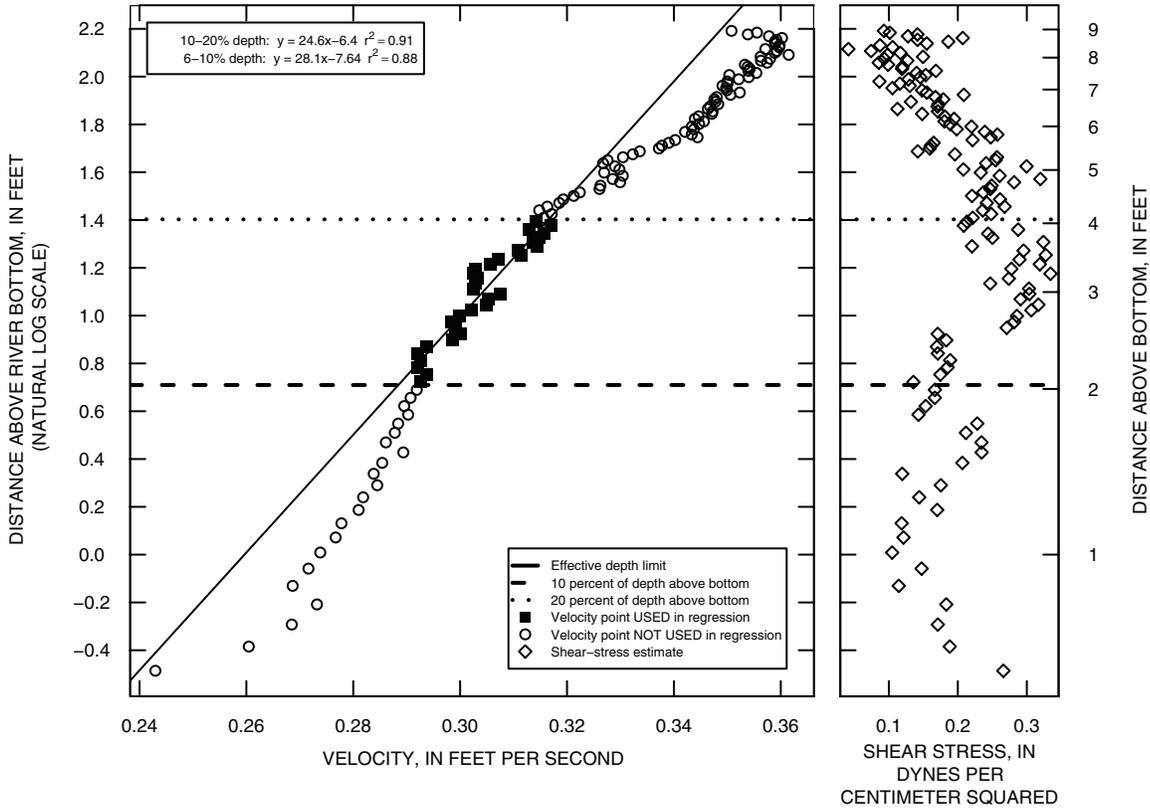


VELOCITY AT OIL TANK DEPOT



**Velocity Profile – Lower Fox River – OU4-7A**

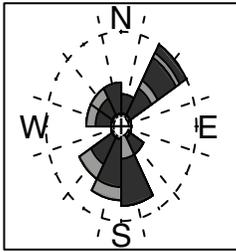
5/27/2004 12:34:40



Vertically averaged water flow: 0.32 ft/s, to direction 29.2°  
 Average wind conditions: 7.5 mi/h, from direction 190°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 0.26 [0.2 ≤ τ ≤ 0.32]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 0.2 [0.14 ≤ τ ≤ 0.27]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 0.17  
 Shear velocity (cm/s): 0.51 [0.45 ≤ u\_\* ≤ 0.57]  
 Bottom roughness, K<sub>s</sub> (cm): 1.52  
 Boundary Reynolds number: 77.17 Test: PASS

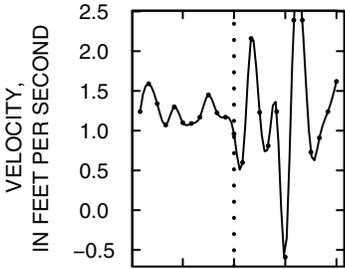
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 20.33	Field recorded ADCP depth (ft): 20.5
Water mode: 11	Field recorded depthfinder depth (ft): 20.2
Water-cell size (cm): 2	Total number of recorded ensembles: 201
Blanking dist. (cm): 25	Heading: 190.96 ± 5.78
Field recorded offset (cm): 320	Pitch: 2.22 ± 0.38
Actual offset (cm): 320	Roll: 1.37 ± 0.28
Latitude: 44° 31' 2.2" N	Filename: Vert20040527123440r.csv
Longitude: 88° 1' 3.6" W	

VELOCITY AT OIL TANK DEPOT

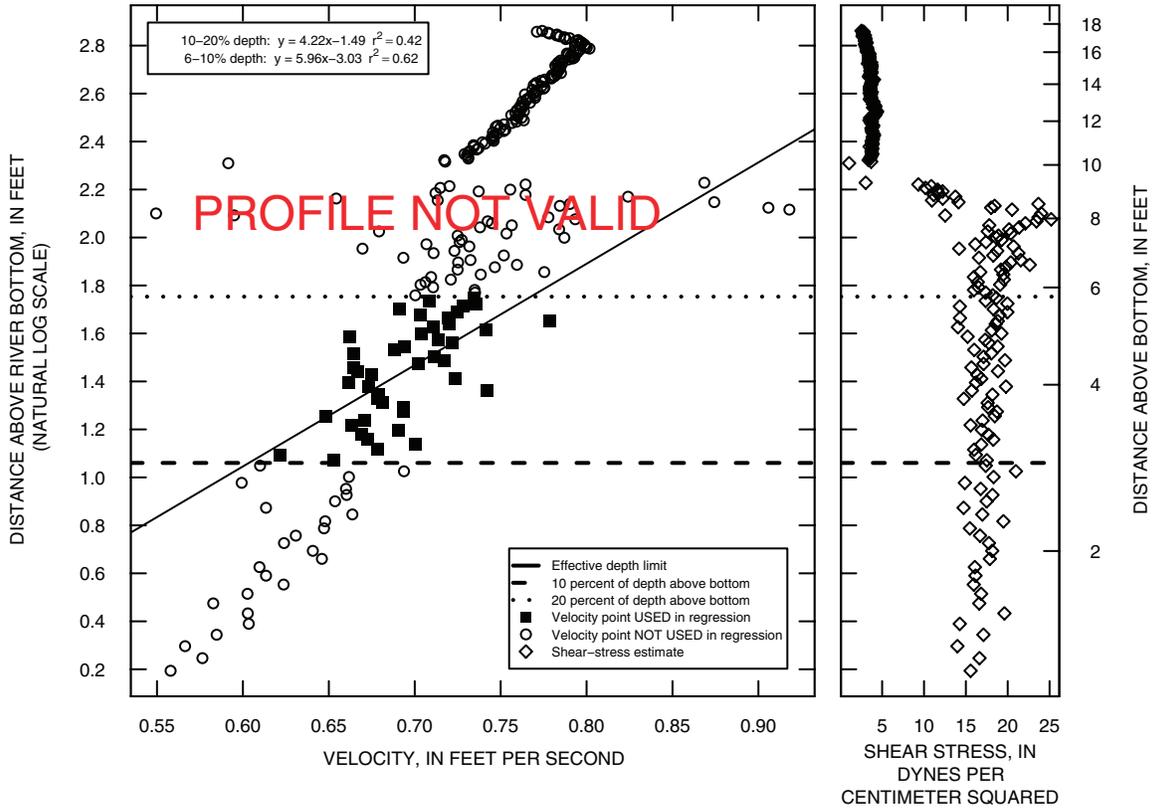


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**Velocity Profile – Lower Fox River – OU4-7B**

5/27/2004 12:10:56



Vertically averaged water flow: 0.73 ft/s, to direction 33.2°  
 Average wind conditions: 7.5 mi/h, from direction 190°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) ( $\text{dyn/cm}^2$ ): 8.75 [ $3.48 \leq \tau \leq 16.4$ ]  
 Shear stress (LP, 6-10% depth) ( $\text{dyn/cm}^2$ ): 4.39 [ $1.97 \leq \tau \leq 7.77$ ]  
 Shear stress (TKE) ( $\text{dyn/cm}^2$ ): 16.92  
 Shear velocity (cm/s): 2.96 [ $1.87 \leq u_* \leq 4.05$ ]  
 Bottom roughness,  $K_s$  (cm): 206.27  
 Boundary Reynolds number: 61017.35 Test: PASS

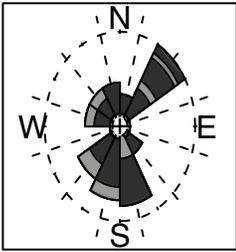
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 28.87	Field recorded ADCP depth (ft): 29
Water mode: 11	Field recorded depthfinder depth (ft): 28.7
Water-cell size (cm): 2	Total number of recorded ensembles: 209
Blanking dist. (cm): 25	Heading: $236.4 \pm 6.04$
Field recorded offset (cm): 320	Pitch: $0.39 \pm 0.42$
Actual offset (cm): 320	Roll: $-1.68 \pm 0.73$
Latitude: $44^\circ 31' 1.3''$ N	Filename: Vert20040527121056r.csv
Longitude: $88^\circ 0' 59.4''$ W	

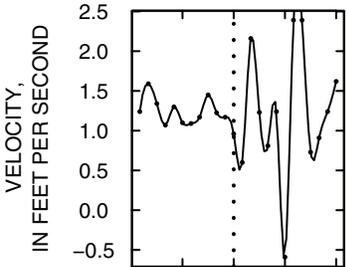
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**DAILY WIND ROSE**

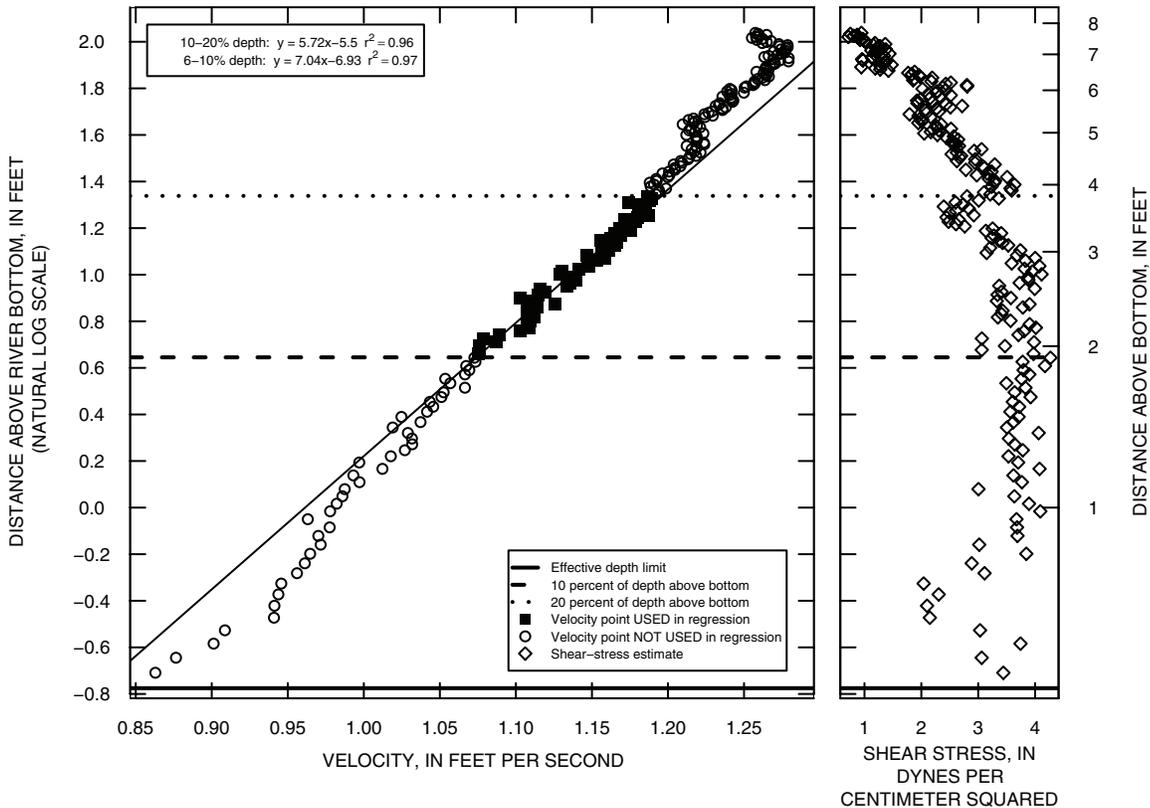


**VELOCITY AT OIL TANK DEPOT**



### Velocity Profile – Lower Fox River – OU4-7C

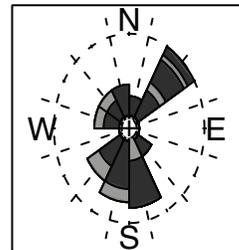
5/27/2004 14:13:16



Vertically averaged water flow: 1.17 ft/s, to direction 30.5°  
 Average wind conditions: 10.06 mi/h, from direction 207.8°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 4.77 [4.29 ≤ τ ≤ 5.27]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 3.15 [2.82 ≤ τ ≤ 3.5]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 3.51  
 Shear velocity (cm/s): 2.18 [2.07 ≤ u\_\* ≤ 2.3]  
 Bottom roughness, K<sub>s</sub> (cm): 3.73  
 Boundary Reynolds number: 815.09 Test: PASS

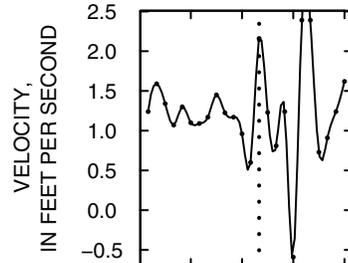
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 19.06	Field recorded ADCP depth (ft): 19
Water mode: 11	Field recorded depthfinder depth (ft): 17.8
Water-cell size (cm): 1	Total number of recorded ensembles: 216
Blanking dist. (cm): 25	Heading: 218.4 ± 2.45
Field recorded offset (cm): 320	Pitch: -2.22 ± 0.68
Actual offset (cm): 320	Roll: -3.1 ± 1.87
Latitude: 44° 31' 0.3" N	Filename: Vert20040527141316r.csv
Longitude: 88° 0' 57.1" W	

VELOCITY AT OIL TANK DEPOT

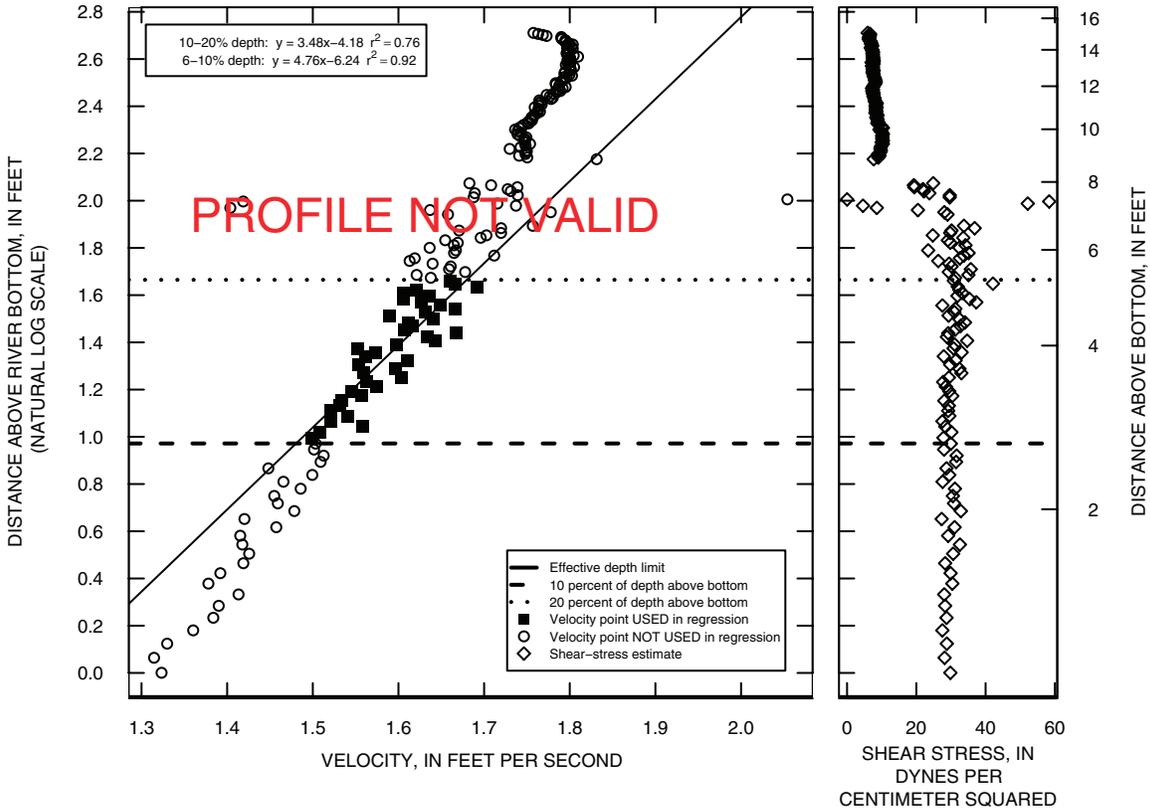


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**Velocity Profile – Lower Fox River – OU4-8A**

5/27/2004 8:54:47



Vertically averaged water flow: 1.68 ft/s, to direction 6.6°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 12.92 [8.56 ≤ τ ≤ 18.18]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 6.9 [5.25 ≤ τ ≤ 8.78]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 29.66  
 Shear velocity (cm/s): 3.59 [2.93 ≤ u\_\* ≤ 4.26]  
 Bottom roughness, K<sub>s</sub> (cm): 14.06  
 Boundary Reynolds number: 5052.76 Test: PASS

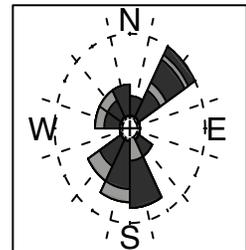
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 26.43	Field recorded ADCP depth (ft): 26.5
Water mode: 11	Field recorded depthfinder depth (ft): 26.4
Water-cell size (cm): 2	Total number of recorded ensembles: 212
Blanking dist. (cm): 25	Heading: 192.63 ± 2.56
Field recorded offset (cm): NA	Pitch: -4.33 ± 0.65
Actual offset (cm): 320	Roll: -2.3 ± 0.92
Latitude: 44° 31' 45.5" N	Filename: Vert20040527085447r.csv
Longitude: 88° 0' 33.1" W	

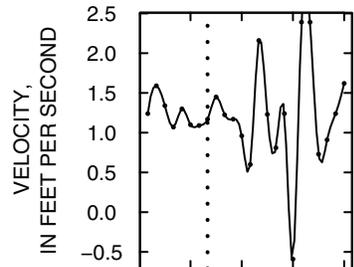
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**DAILY WIND ROSE**

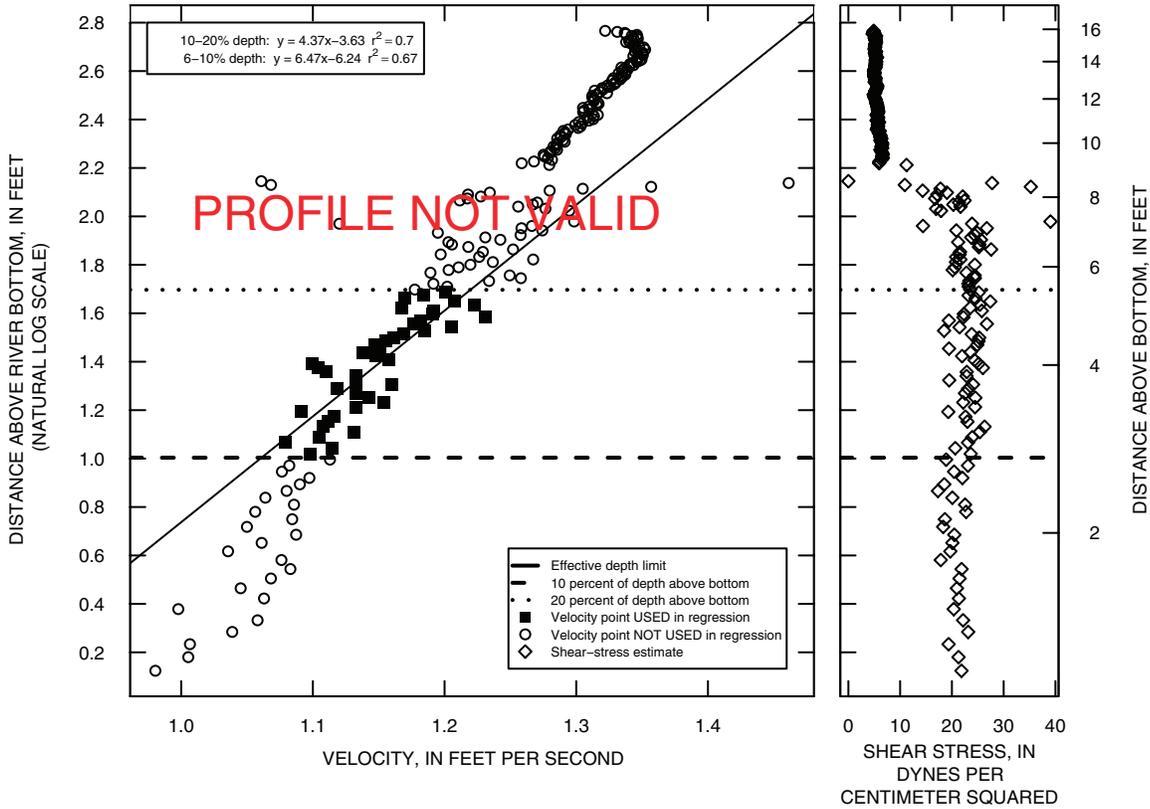


**VELOCITY AT OIL TANK DEPOT**



**Velocity Profile – Lower Fox River – OU4-8B1**

5/27/2004 8:16:23



Vertically averaged water flow: 1.24 ft/s, to direction 2.9°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) ( $\text{dyn/cm}^2$ ): 8.18 [ $5.1 \leq \tau \leq 12$ ]  
 Shear stress (LP, 6-10% depth) ( $\text{dyn/cm}^2$ ): 3.73 [ $1.81 \leq \tau \leq 6.33$ ]  
 Shear stress (TKE) ( $\text{dyn/cm}^2$ ): 20.58  
 Shear velocity (cm/s): 2.86 [ $2.26 \leq u_* \leq 3.46$ ]  
 Bottom roughness,  $K_s$  (cm): 24.22  
 Boundary Reynolds number: 6928.26 Test: PASS

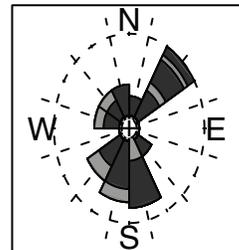
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 27.28	Field recorded ADCP depth (ft): 27.3
Water mode: 11	Field recorded depthfinder depth (ft): 27
Water-cell size (cm): 2	Total number of recorded ensembles: 214
Blanking dist. (cm): 25	Heading: $215.26 \pm 2.13$
Field recorded offset (cm): 320	Pitch: $-1.62 \pm 0.77$
Actual offset (cm): 320	Roll: $-4.32 \pm 1.49$
Latitude: $44^\circ 31' 45.4''$ N	Filename: Vert20040527081623r.csv
Longitude: $88^\circ 0' 31.1''$ W	

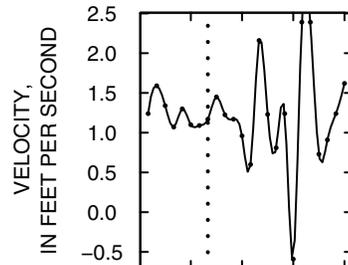
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**DAILY WIND ROSE**

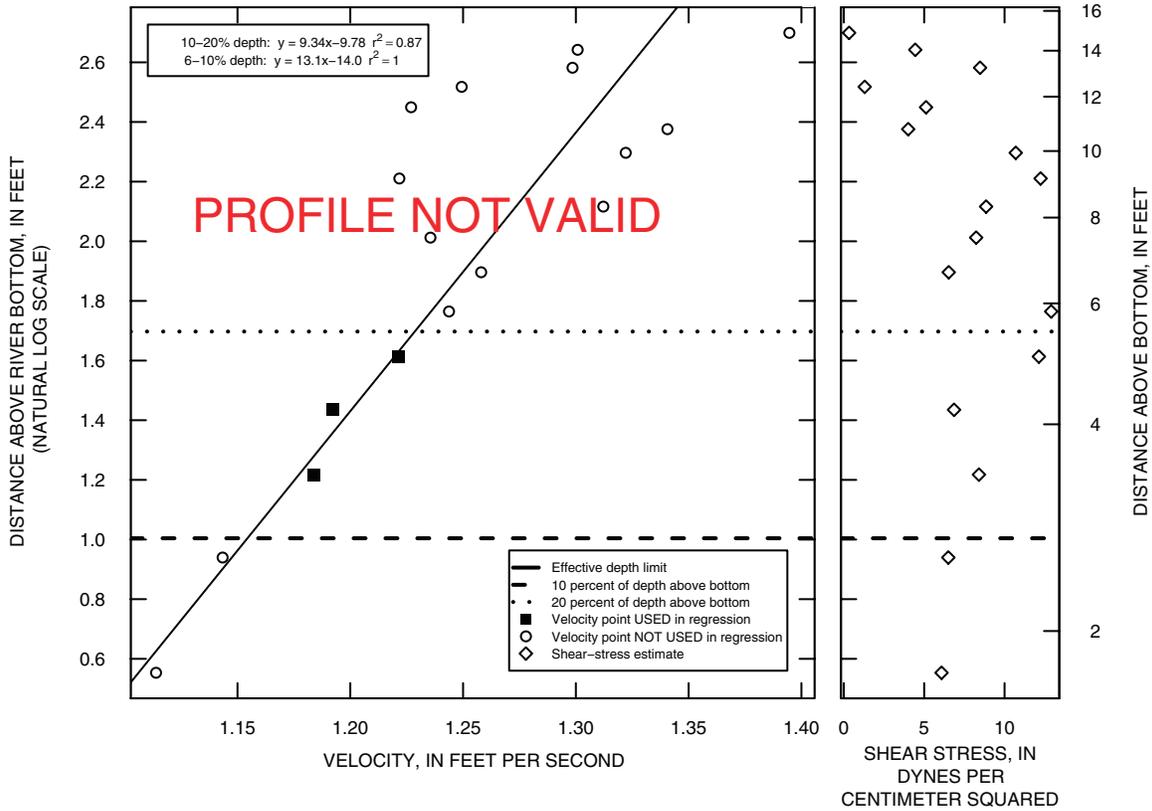


**VELOCITY AT OIL TANK DEPOT**



### Velocity Profile – Lower Fox River – OU4-8B2

5/27/2004 8:30:55



Vertically averaged water flow: 1.25 ft/s, to direction 357.6°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 1.79 [-27.36 ≤ τ ≤ 62.51]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 0.91 [NaN ≤ τ ≤ NaN]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 6.29  
 Shear velocity (cm/s): 1.34 [-5.23 ≤ u\_\* ≤ 7.91]  
 Bottom roughness, K<sub>s</sub> (cm): 0.05  
 Boundary Reynolds number: 6.91 Test: MAYBE

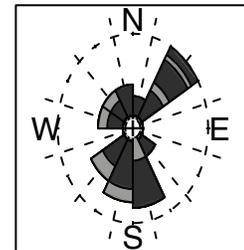
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 27.3	Field recorded ADCP depth (ft): 27.3
Water mode: 1	Field recorded depthfinder depth (ft): 27
Water-cell size (cm): 25	Total number of recorded ensembles: 283
Blanking dist. (cm): 25	Heading: 210.61 ± 1.79
Field recorded offset (cm): 320	Pitch: -2.06 ± 0.49
Actual offset (cm): 320	Roll: 0.79 ± 1.02
Latitude: 44° 31' 45.4" N	Filename: Vert20040527083055r.csv
Longitude: 88° 0' 31.1" W	

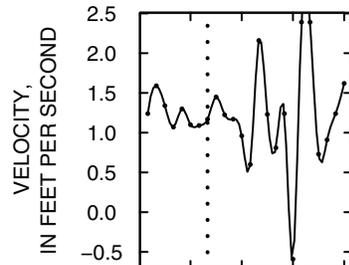
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

DAILY WIND ROSE

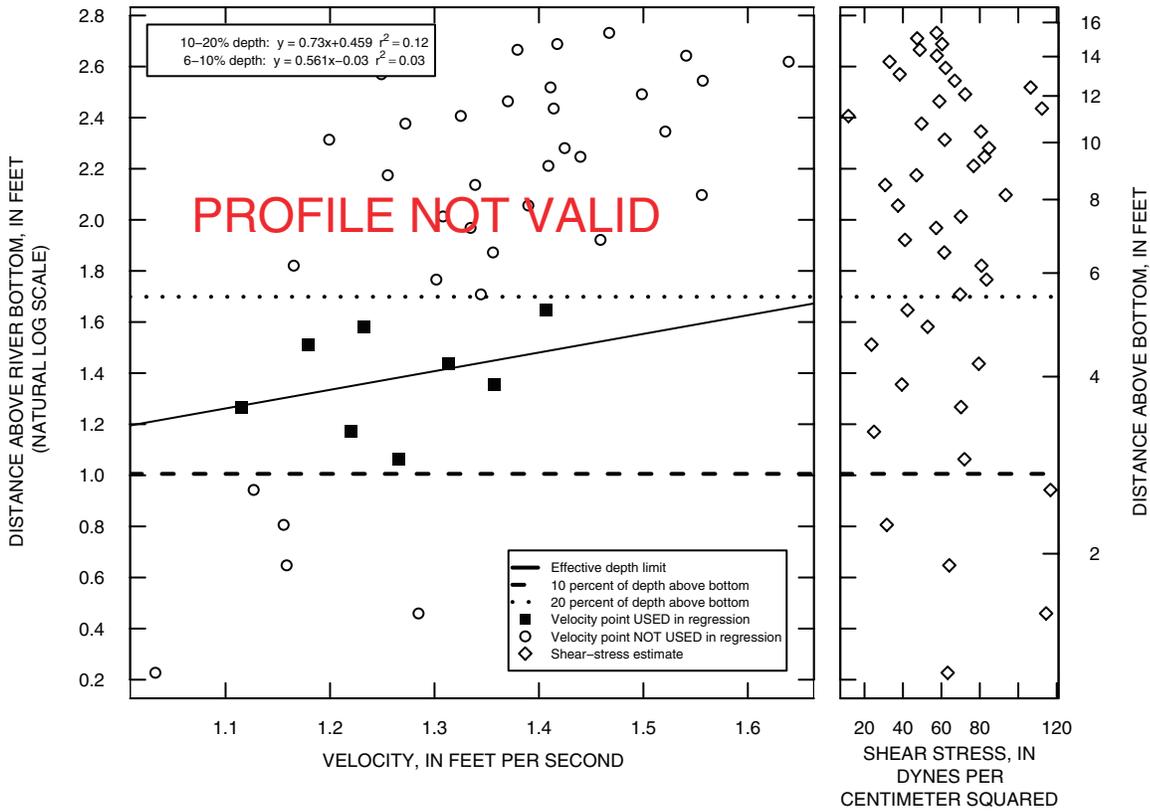


VELOCITY AT OIL TANK DEPOT



**Velocity Profile – Lower Fox River – OU4-8B3**

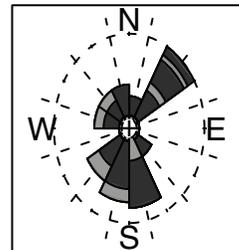
5/27/2004 8:35:50



Vertically averaged water flow: 1.32 ft/s, to direction 3°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) ( $\text{dyn/cm}^2$ ): 293.36  $[-891.46 \leq \tau \leq 4110.45]$   
 Shear stress (LP, 6–10% depth) ( $\text{dyn/cm}^2$ ): 495.44  $[-41004.68 \leq \tau \leq 61015.3]$   
 Shear stress (TKE) ( $\text{dyn/cm}^2$ ): 78.04  
 Shear velocity (cm/s): 17.13  $[-29.86 \leq u_* \leq 64.11]$   
 Bottom roughness,  $K_s$  (cm): 1447.28  
 Boundary Reynolds number: 2478869.85 Test: PASS

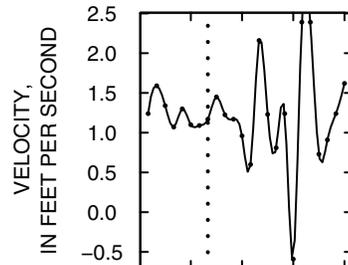
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 27.34	Field recorded ADCP depth (ft): 27.3
Water mode: 1	Field recorded depthfinder depth (ft): 27
Water-cell size (cm): 10	Total number of recorded ensembles: 104
Blanking dist. (cm): 25	Heading: $214.03 \pm 2.51$
Field recorded offset (cm): 320	Pitch: $-2.3 \pm 0.44$
Actual offset (cm): 320	Roll: $0.84 \pm 1.03$
Latitude: $44^\circ 31' 45.4''$ N	Filename: Vert20040527083550r.csv
Longitude: $88^\circ 0' 31.1''$ W	

VELOCITY AT OIL TANK DEPOT

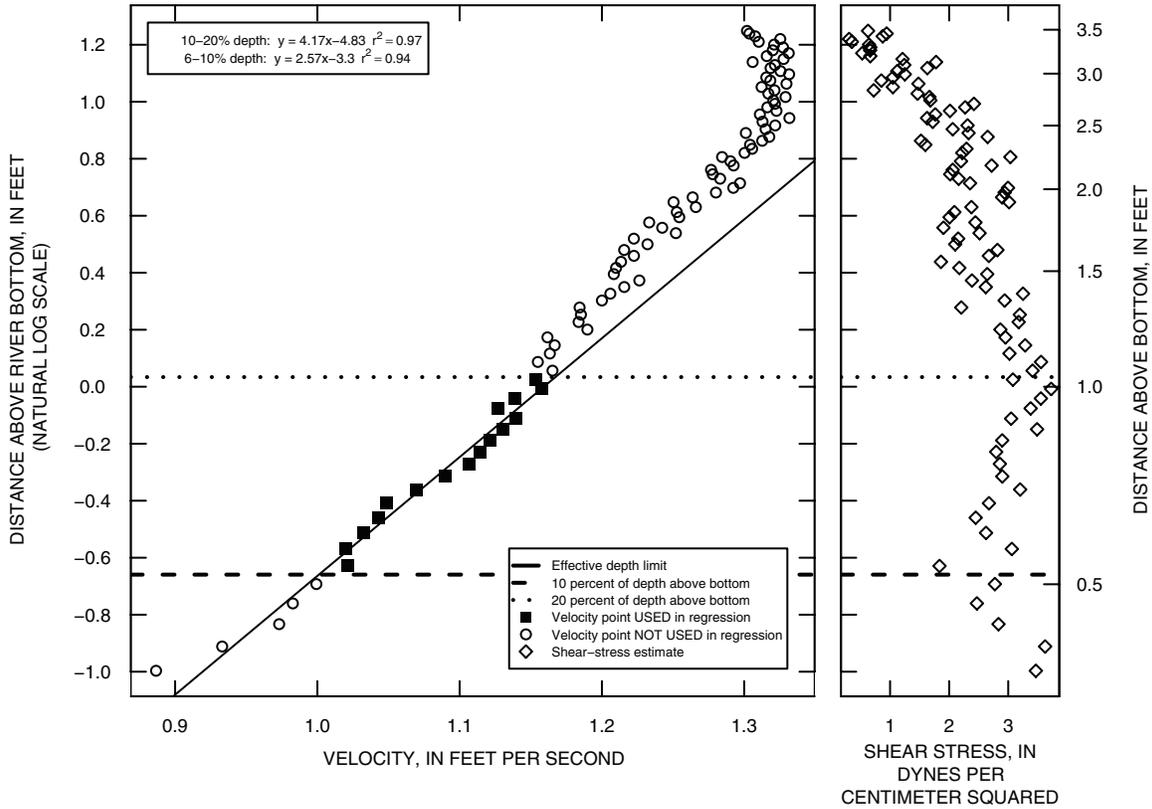


**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

**Velocity Profile – Lower Fox River – OU4-SUPP1**

5/25/2004 19:12:21



Vertically averaged water flow: 1.23 ft/s, to direction 344°  
 Average wind conditions: 9.9 mi/h, from direction 245.2°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) ( $\text{dyn/cm}^2$ ): 8.98 [ $7.14 \leq \tau \leq 11.04$ ]  
 Shear stress (LP, 6-10% depth) ( $\text{dyn/cm}^2$ ): 23.58 [ $6.96 \leq \tau \leq 50.03$ ]  
 Shear stress (TKE) ( $\text{dyn/cm}^2$ ): 3.03  
 Shear velocity (cm/s): 3 [ $2.67 \leq u_* \leq 3.32$ ]  
 Bottom roughness,  $K_s$  (cm): 7.28  
 Boundary Reynolds number: 2182.63 Test: PASS

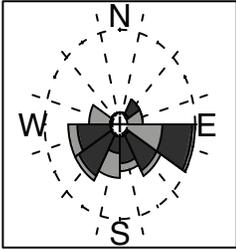
**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 5.17	Field recorded ADCP depth (ft): 5.1
Water mode: 11	Field recorded depthfinder depth (ft): 5.2
Water-cell size (cm): 1	Total number of recorded ensembles: 77
Blanking dist. (cm): 25	Heading: $176.48 \pm 3.81$
Field recorded offset (cm): 24.4	Pitch: $2.65 \pm 0.18$
Actual offset (cm): 24.4	Roll: $0.22 \pm 0.53$
Latitude: $44^\circ 27' 4.6''$ N	Filename: Vert20040525191221r.csv
Longitude: $88^\circ 4' 7.4''$ W	

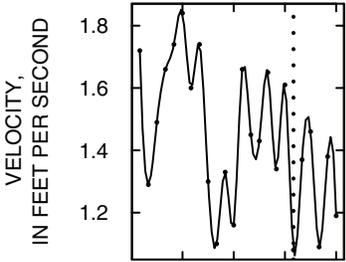
**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment

DAILY WIND ROSE

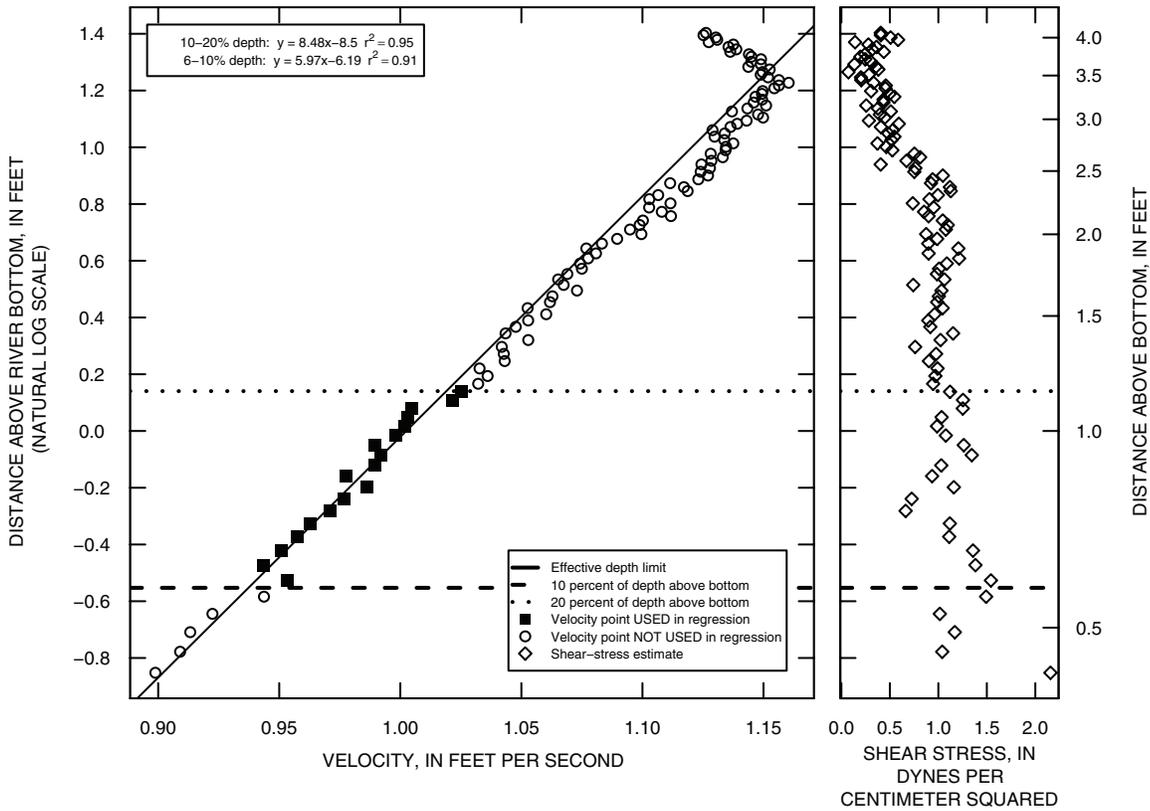


VELOCITY AT OIL TANK DEPOT



### Velocity Profile – Lower Fox River – OU4-SUPP2

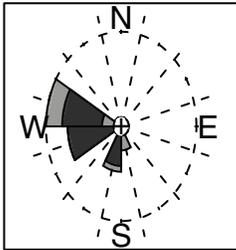
5/26/2004 16:32:10



Vertically averaged water flow: 1.08 ft/s, to direction 43°  
 Average wind conditions: 9.56 mi/h, from direction 281.6°

**CALCULATED SHEAR STRESS PARAMETERS**  
 Shear stress (LP) (dyn/cm<sup>2</sup>): 2.17 [1.68 ≤ τ ≤ 2.72]  
 Shear stress (LP, 6-10% depth) (dyn/cm<sup>2</sup>): 4.39 [0.76 ≤ τ ≤ 11.01]  
 Shear stress (TKE) (dyn/cm<sup>2</sup>): 1.37  
 Shear velocity (cm/s): 1.47 [1.3 ≤ u\_\* ≤ 1.65]  
 Bottom roughness, K<sub>s</sub> (cm): 0.19  
 Boundary Reynolds number: 27.36 Test: MAYBE

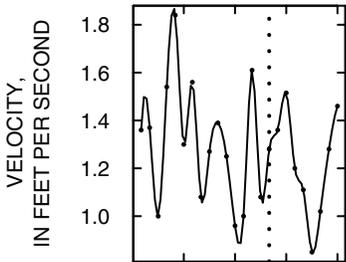
DAILY WIND ROSE



**ADCP DEPLOYMENT DETAILS**

Avg. water depth (ft): 5.75	Field recorded ADCP depth (ft): 5.7
Water mode: 11	Field recorded depthfinder depth (ft): 4.9
Water-cell size (cm): 1	Total number of recorded ensembles: 210
Blanking dist. (cm): 25	Heading: 224.23 ± 1.31
Field recorded offset (cm): 24.4	Pitch: 2.62 ± 0.09
Actual offset (cm): 24.4	Roll: -0.99 ± 0.46
Latitude: 44° 28' 44.7" N	Filename: Vert20040526163210r.csv
Longitude: 88° 2' 29.6" W	

VELOCITY AT OIL TANK DEPOT



**NOTES**

- 1) Wind-rose shading in 5 mi/h increments; area proportional to fraction of day with those conditions
- 2) Average wind conditions calculated for conditions within an hour (+/-) of sampling time
- 3) Dotted vertical line in velocity plot at right identifies approximate velocities at time of deployment



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