

Measurements of lateral flow from the Mississippi River at Mardi Gras
Pass in the Bohemia Spillway using synoptic ADCP

A field report

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By

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Introduction

The Coastal Hydrodynamics and Sediment Transport Laboratory, at the Pontchartrain Institute for Environmental Sciences conducted synoptic ADCP surveys of Mardi Gras Pass connected to the Mississippi River at the Bohemia Spillway. The survey was conducted on August 06, 2014.

Objective

The objective of the survey was to measure the flow in the pass, named Mardi Gras Pass (MGP), to create a new stage-discharge data point toward developing rating curve for MGP (Figure 1).

Methods

To measure flow, we used a vessel-mounted Acoustic Doppler Current Profiler (ADCP), used in tandem with a differential global positioning system (DGPS, Trimble GS232). The surveys followed a pre-determined schedule of transects, targeted mainly to establish a flow balance within reach 4 of MGP.

Results

The flow in Mardi Gras Pass on August 06, 2014 was approximately $43.5 \text{ m}^3/\text{s}$, or 1535.1 cfs, which is the average of three transects conducted over a two-hour window. Using a standard deviation derived from the field measurements, the average flow at the time of measurement was $43.5 \pm 1.1 \text{ m}^3/\text{s}$, or 1535.1 ± 40.4 cfs. Figure 1 shows the updated rating curve for MG Pass using only ADCP flow data, and Table 1 provides a summary of all flows measured in MGP from each survey conducted throughout the monitoring period.

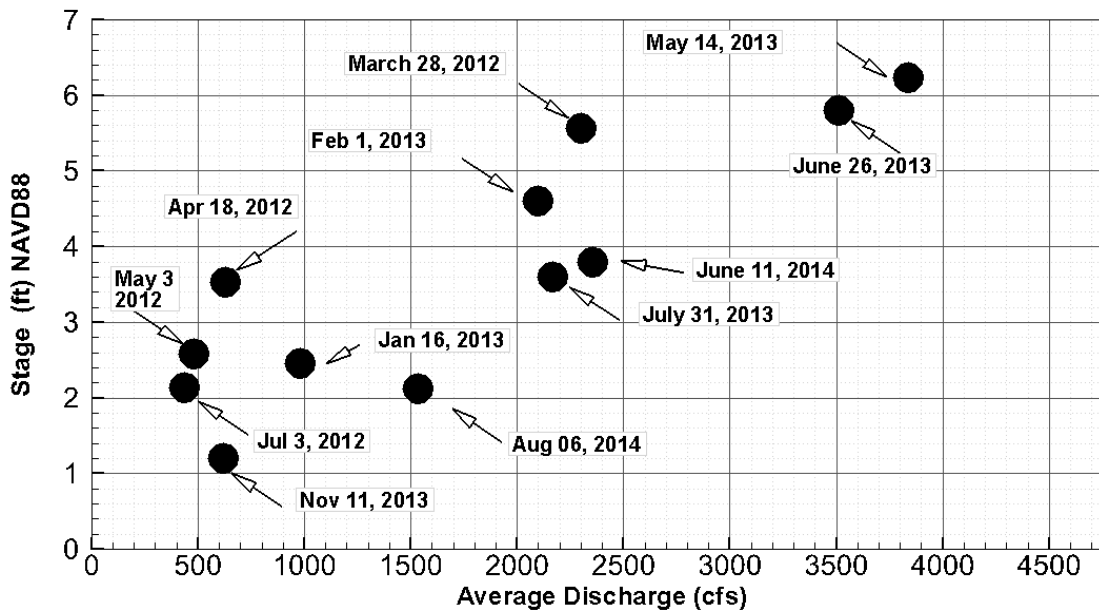


Figure 1. Stage Discharge curve for Margi Gras Pass showing all flow measurements.

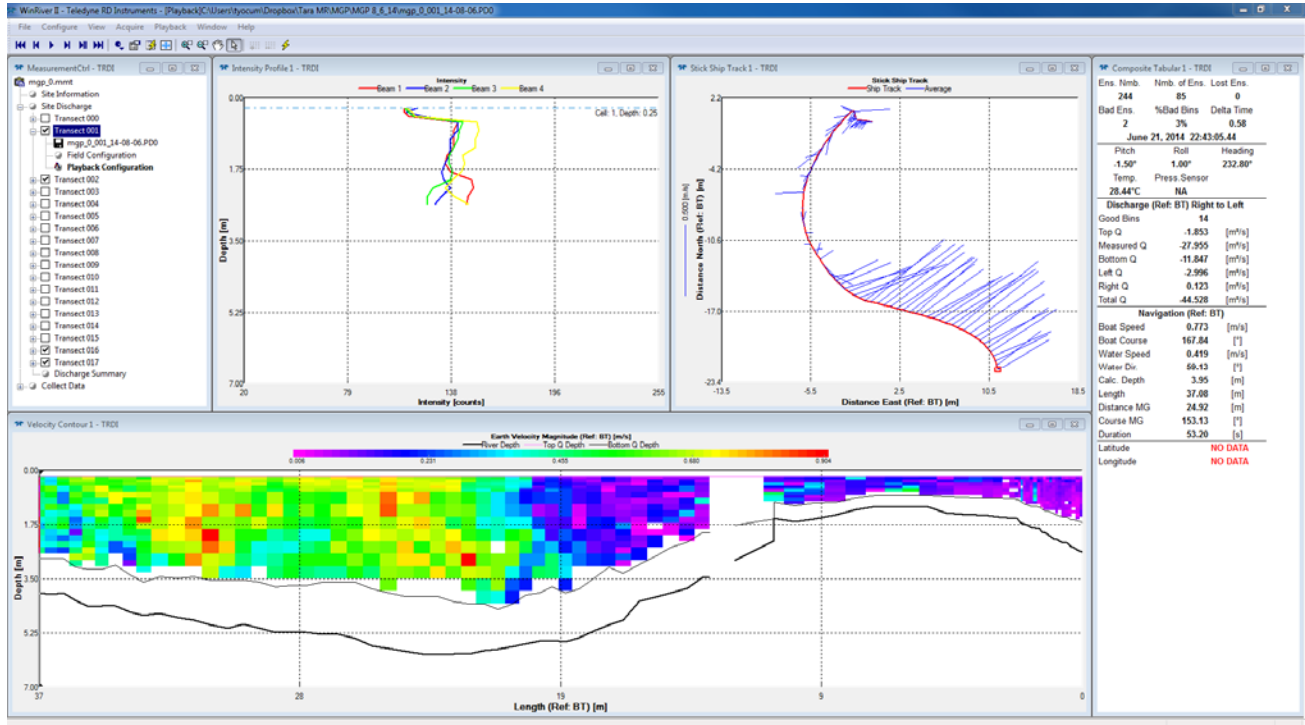
Table 1. Discharge details from each survey (1-10) with statistics and Stage (ft NAVD88) at West point a la Hache.

Survey number	Date	Average Discharge (cfs)	Standard Deviation (cfs)	Standard Error (cfs)	Average Discharge (cms)	Standard Deviation (cms)	Standard Error (cms)	Stage (ft) NAVD88
MGP01	3/28/2012	2303	59.4	24.3	65.2	1.7	0.7	5.57
MGP02	4/18/2012	630.3	10.8	5.4	17.8	0.3	0.2	3.53
MGP03	5/3/2012	479.9	23.3	10.4	13.6	0.7	0.3	2.58
MGP04	7/3/2012	436.1	13.5	6	12.3	0.4	0.2	2.14
MGP05	1/16/2013	981.9	24.7	12.4	27.8	0.7	0.3	2.45
MGP06	2/3/2013	2097.2	16.6	6.8	59.4	0.5	0.2	4.60
MGP07	5/14/2013	3840.5	194.2	97.1	108.8	5.5	2.8	6.23
MGP08	6/26/2013	3510.3	40	28.2	99.4	1.1	0.8	5.80
MGP09	7/31/2013	2167.2	31	17.8	61.4	0.9	0.5	3.60
MGP10	11/11/2013	621.5	37.2	21.5	17.2	1.1	0.61	1.20
MGP11	6/11/2014	2353.6	46.2	26.7	66.6	1.3	0.8	3.80
MGP12	8/06/2014	1535.1	40.4	20.2	43.5	1.1	0.6	2.12

Appendix A. Mardi Gras Pass Survey August 06, 2014

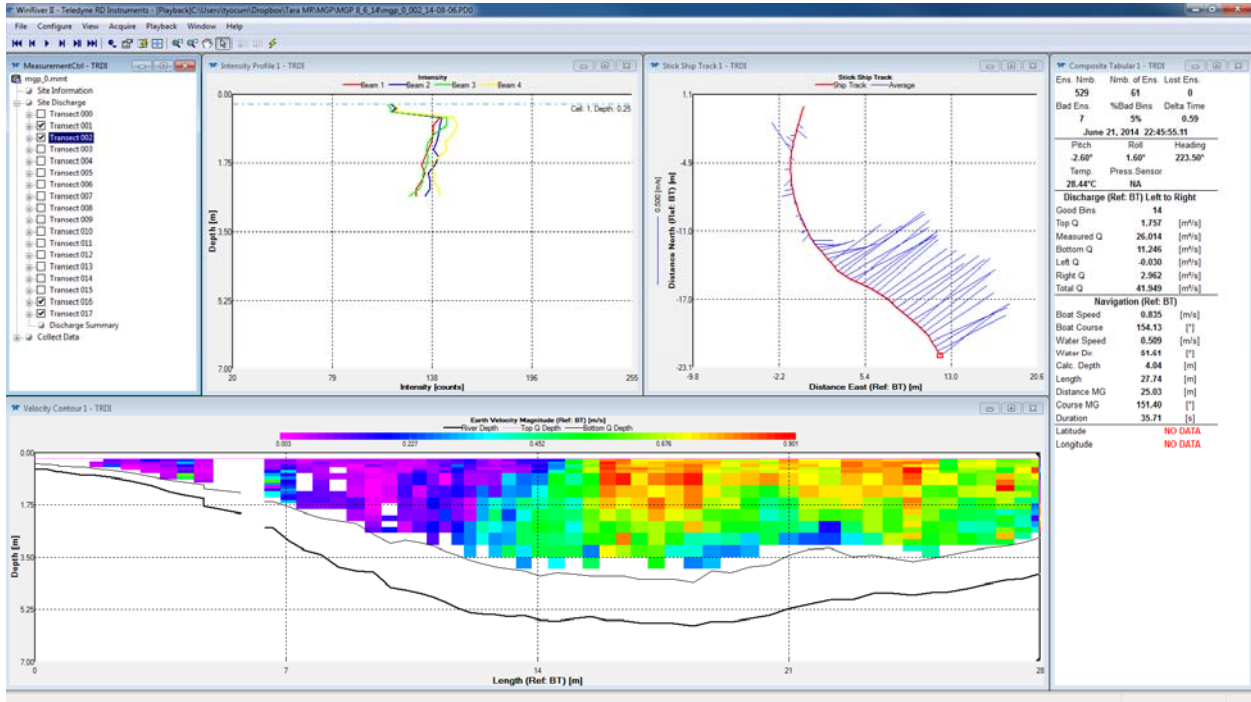
Transect 001

$Q \sim 45 \text{ m}^3/\text{s}$



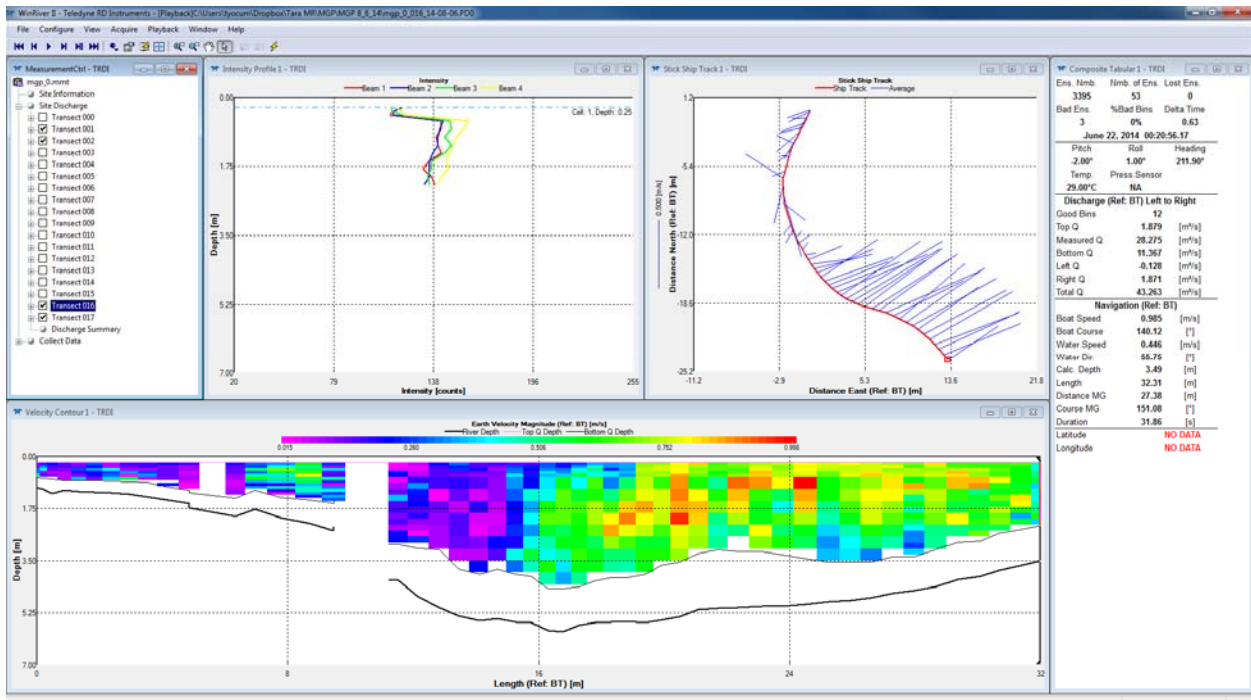
Transect 002

$Q \sim 42 \text{ m}^3/\text{s}$



Transect 016

$Q \sim 43 \text{ m}^3/\text{s}$



Transect 017

Q ~ 44 m³/s

