

# Hydroacoustic Laboratory and Field Measurements

---

Schedule	Topic	Instructor
<b>Wednesday</b>		
9:00-10:00	<b>Class Introductions and Review of Course</b>	<b>Oberg and others</b>
10:00-11:00	<b>Measuring flows using acoustics: Background (Lab Measurements)</b>	<b>Garcia</b>
11:00-11:30	<b>BREAK</b>	
11:30-12:00	<b>Laboratory experimentation: why, how and when?</b>	<b>Garcia</b>
12:00-1:00	<b>An introduction to ADV</b>	<b>Garcia</b>
1:00-2:00	<b>LUNCH</b>	
2:00-3:30	<b>Laboratory Session Introduction</b>	<b>Garcia/Szupiany</b>
3:30-4:00	<b>BREAK</b>	
4:00-6:00	<b>Laboratory Session</b>	<b>All</b>
<b>Thursday</b>		
9:00-10:30	<b>Introduction to ADCPs</b>	
	Intro. to ADCP Discharge/Velocity Measurements	<b>Jackson</b>
	Key Concepts / Water Modes & Bottom Modes	<b>Oberg</b>
	How ADCPs Compute Discharge	<b>Oberg</b>
10:30-11:00	<b>BREAK</b>	
11:00-12:30	<b>Introduction to WinRiver II</b>	
	Introduction to WinRiver II	<b>Jackson</b>
	WinRiver II Files and Configurations	<b>Oberg</b>
	Customizing WinRiver II Graphs and Displays	<b>Jackson</b>
	Configuring an TRDI ADCP using WinRiver II	<b>Oberg</b>
12:30-1:30	<b>LUNCH</b>	
1:30-2:30	<b>Field Data Collection Procedures</b>	
	Velocity survey planning	<b>Parsons/Jackson</b>
	Recommended Instrumentation and gear	Parsons/ <b>Jackson/Oberg</b>
	Measurement procedures	Parsons/ <b>Jackson/Oberg</b>
2:30-3:00	<b>BREAK</b>	
3:00-4:30	<b>Fieldwork Session Intro &amp; Planning</b>	
	Site Description	Parsons/ <b>Szupiany</b>
	Instrumentation	<b>Parsons/Szupiany</b>
	Review of Data collected earlier in the week	<b>Parsons/Szupiany</b>
	Discussion of field work/procedures for Friday	Parsons/ <b>Szupiany/Oberg/Jackson</b>
4:30-5:30	<b>Velocity Mapping Toolbox: Intro &amp; Example Data Set</b>	<b>Jackson</b>
	Overview of VMT (history, applications, etc.)	<b>Jackson</b>
	Examples of output	<b>Jackson</b>
	Group Exercise: Processing an example data set	<b>Jackson</b>

<b>Friday</b>		
9:00-6:00	<b>Fieldwork Session on the Parana</b> <b>FULL DAY</b>	
<b>Saturday</b>		
9:00-9:30	<b>Laboratory Data Processing and Analysis Introduction</b>	<b>Garcia</b>
9:30-10:30	<b>Laboratory Data Processing and Analysis</b>	<b>All</b>
10:30-11:00	<b>BREAK</b>	
11:00-11:45	<b>Field Data Processing and Analysis Introduction</b>	
	Processing ADCP data using WRII	<b>Oberg</b>
	Creating ASCII output files	<b>Oberg</b>
	Review of using VMT	<b>Jackson</b>
11:45-1:00	<b>Field Data Processing and Analysis I &amp; II</b>	
	Process Friday's data in WRII	<b>All</b>
	Output ASCII files	<b>All</b>
	Process transects in VMT	<b>All</b>
1:00-2:30	<b>LUNCH</b>	
	Explore cross sectional data in VMT	<b>All</b>
	Explore reachwise flow evolution in VMT	<b>All</b>
5:00-5:30	<b>Concluding Session</b>	<b>All</b>

Instructor notes:

ADCP lectures:

- 1) Intro to ADCPs
  - a. Intro to ADCPs (USGS lecture)
  - b. Key Concepts (very condensed USGS lecture)
  - c. Water and bottom modes (very condensed USGS lecture)
  - d. How ADCPs Compute Discharge (condensed)
- 2) Intro to WinRiver II (some of these may be combined)
  - a. Intro to WinRiver II (USGS lecture)
  - b. WinRiver II files and configurations (condensed)
  - c. WinRiver II Custom Graphs/Displays (condensed)
  - d. Configuring an TRDI ADCP using WinRiver II (condensed) – Could do this in the field if not enough time
- 3) Guide for Field Data Collection
  - a. Velocity survey planning
    - i. General Considerations (when, where, data storage, etc.)
    - ii. Single vs. multiple transects & spacing
    - iii. HYPACK or other navigation tool
  - b. Recommended Instrumentation and gear
    - i. ADCPs (600 vs 1200 vs S5 vs M9)
    - ii. Differential GPS
    - iii. Boats and mounts (condensed)
    - iv. Computer & Software
    - v. Misc
      1. Toolkit
      2. Rangefinder
      3. Thermometer
      4. Spares, cables, mounts

- c. Measurement Procedures
  - i. Predeployment
    - 1. ADCP test
    - 2. Compass Calibration
    - 3. Draft measurement
  - ii. Moving bed tests
  - iii. Data collection
    - 1. Edge measurement procedures
    - 2. Navigation during repeated transects
  - iv. Field Data Evaluation
  - v. Data Backup
- 4) Fieldwork Session Intro & Planning
  - a. Site Description
  - b. Data Expectations
  - c. Review of Data collected earlier in the week
  - d. Discussion of procedures for Thursday
- 5) Field work, Rio Parana
  - a. Repeated transects (say 6) downstream of island (Aguas Corrientes) at multiple cross sections (1 or 2 boats)
    - i. Single computer, alternate users
    - ii. Field instruction includes
      - 1. Configuration of new measurement
      - 2. Predeployment tests
      - 3. Data collection
      - 4. Data evaluation
  - b. Stationary Measurements (???)
    - i. Single computer, alternate users
    - ii. Collect stationary data above bedforms

iii. Single computer, alternate users

- 6) Field Data Processing and Analysis Introduction: WinRiverII
  - a. Processing ADCP data using WRII (USGS condensed version). Specially show how to screen out erroneous or suspect data.
  - b. Outputting data for further processing (ASCII out)
- 7) Velocity Mapping Toolbox: Introduction and Example Data Set
  - a. Overview of VMT (history, applications, etc.)
  - b. Examples of output
  - c. Group Exercise: Processing an example data set
- 8) Field Data Processing and Analysis I & II
  - a. Process Friday's data in WRII
  - b. Output ASCII files
  - c. Process transects in VMT
  - d. Explore cross sectional data in VMT
  - e. Explore reachwise flow evolution in VMT