

The .mat files that contain the Acoustic Doppler Current Profiler (ADCP) data have variables as described below:

An - Ancillary data begins with an “An” prefix

Ser - Series data begins with an “Ser” prefix

RDI - Variables beginning with “RDI” are generated from Instrument Settings

Because the time variable is split up it is usually beneficial to start by creating a new variable with each column being **[year/month/day/hour/min/sec/hundredth]** and then running a **datenum()** function on that to have an easy to work with time vector.

The depth is also calculated by each beam, so an averaged vector of depth needs to be created.

Latitude and Longitude are measured at the **beginning** and **end** of each ensemble so we have been calculating the average position for each ensemble as well.

The water velocity series data is the crucial data that is being examined and has been highlighted in green.

Unused Variables are red.

A complete description of each variable follows:

AnBatt - Ancillary battery charge measurement

AnBIT - Unused Variable N/A

AnBTDepthcmB1 - Bottom tracking depth measurement from Beam 1 (**cm**)

AnBTDepthcmB2 - Bottom tracking depth measurement from Beam 2 (**cm**)

AnBTDepthcmB3 - Bottom tracking depth measurement from Beam 3 (**cm**)

AnBTDepthcmB4 - Bottom tracking depth measurement from Beam 4 (**cm**)

AnBTDir10thDeg - Direction of boat velocity derived from bottom tracking in **10th** of a degree

AnBTEmmpersec - Boat velocity “U-component” (East component of velocity) (**mm/s**)

AnBTEmmpersec - Error of Magnitude of boat velocity (**mm/s**)

AnBTMagmmpersec - Magnitude of boat velocity (**mm/s**)

AnBTNmmpersec - Boat velocity “V-component” (North component of velocity) (**mm/s**)

AnBTVmmpersec - Boat velocity “W-component” (Vertical component of velocity) (**mm/s**)

AnDepthmm - Depth of ADCP (always 0 for the vessel mounted ADCP because its at the surface)

AnFLatDeg - First latitude measured for a particular data point

AnFlonDeg - First longitude measured for a particular data point

AnH100thDeg - Heading measured by GPS in **100^{ths} of a degree**

AnLLatDeg - Last latitude measured for a particular data point

AnLLonDeg - Last longitude measured for a particular data point

AnNVDir10thDeg - Navigation direction in 10^{ths} of a degree. Unused Variable N/A

AnNVEmmpersec - Navigation U (East) velocity. Unused Variable N/A

AnNVMagmmpersec - Navigation velocity magnitude. Unused Variable N/A

AnNVNmmperssec - Navigation V (North) velocity. Unused Variable N/A

AnOrienUP - either a 0 or 1. 0 = orientation upright. 1 = orientation not upright

AnP100thDeg - Pitch measured by an IMU in **100^{ths} of a degree**

AnR100thDeg - Roll measured by an IMU in **100^{ths} of a degree**

AnT100thDeg - Temperature measured by ADCP in **100^{ths} of a degree**

AnWMDir10thDeg - Water mass direction in 10^{ths} of a degree. Unused Variable N/A

AnWMEmmpersec - Water mass U (East) direction (mm/s). Unused Variable N/A

AnWMErmmperssec - Water mass velocity magnitude error (mm/s). Unused Variable N/A

AnWMMagmmpersec - Water mass velocity magnitude (mm/s). Unused Variable N/A

AnWMNmmperssec - Water mass V (North) direction (mm/s). Unused Variable N/A

AnWMVmmperssec - Water mass W (Vertical) direction (mm/s). Unused Variable N/A

RDIBin1Mid - Depth of the middle of the 1st bin (**meters**)

RDIBinSize - Size of the bins (**meters**)

RDIEnsDate - Start **date** of the data collection period

RDIEnsInterval - Average time between ensembles (**seconds**)

RDIEnsTime - Start **time** of the data collection period

RDIFileName - Original name and path of the saved data

RDIPingsPerEns - average number of pings per ensemble

RDISecPerPing - seconds per ping

RDISystem - Configuration and frequency of ADCP

SerBins - Number of Bins

SerC1cnt - Beam correlation for beam 1

SerC2cnt - Beam correlation for beam 1

SerC3cnt - Beam correlation for beam 1

SerC4cnt - Beam correlation for beam 1

SerCAcnt - Average beam correlation

SerDay - **Day #** at which ensemble occurred

SerDir10thDeg - Direction of water flow in each bin (**10^{ths} of a degree**)

SerEA1cnt - Echo amplitude of each bin for ADCP beam 1

SerEA2cnt - Echo amplitude of each bin for ADCP beam 2

SerEA3cnt - Echo amplitude of each bin for ADCP beam 3

SerEA4cnt - Echo amplitude of each bin for ADCP beam 4

SerEAAcnt - Average echo amplitude for all beams in each bin

SerEmmpersec - Water velocity “U-component” (East component of velocity) (mm/s)

SerEnsembles - Number of ensembles for the dataset

SerErmpersec - Error of Magnitude of water velocity (**mm/s**)

SerHour - **Hour #** at which ensemble occurred

SerHund - **100th of seconds #** at which ensemble occurred

SerMagmpersec - Magnitude of water velocity (mm/s)

SerMin - Minute # at which ensemble occurred

SerMon - Month # at which ensemble occurred

SerNmmperssec - Water velocity "V-component" (North component of velocity) (mm/s)

SerPG1 - Percent good 1st calculation (NOT 1st beam)

SerPG2 - Percent good 2nd calculation (NOT 2nd beam)

SerPG3 - Percent good 3rd calculation (NOT 3rd beam)

SerPG4 - Percent good 4th calculation (NOT 4th beam)

SerSec - Second # at which ensemble occurred

SerVmmperssec - Water velocity "W-component" (Vertical component of velocity) (mm/s)

SerYear - Year # at which ensemble occurred