# Data Files

Data for all figures are summarized in Table 1.

Table : Table of data files related to each figure

|  |  |  |  |
| --- | --- | --- | --- |
| **Figure** | **Configuration** | **File Name** | **Comment** |
| Baseline performance (Fig. 2) | DAISY | MCRL\_DAISY\_4 | Duration: 110-200 s |
|  | Reference Hydrophone | MCRL\_DAISY\_16 | Duration: 110-200 s |
| Stationary comparison (Fig. 4) | DAISY | DAISY\_data | Subset of standard data structure |
|  | AMP | AMP\_data | Two sequences bracketing time of DAISY drift |
| Flow shield velocity comparison (Fig. 5) | Shielded ADV | MCRL\_DAISY\_153\_ADV |  |
|  | Unshielded ADV | MCRL\_DAISY\_152\_ADV |  |
| Tether length comparison (Fig. 6)(also Fig. 8) | DAISY – 5 m tether | Admiralty\_DAISY\_1 |  |
|  | DAISY – 10 m tether | Admiralty\_DAISY\_5 |  |
| (also Fig. 7) | DAISY – 15 m tether | Admiralty\_DAISY\_9 |  |
| (also Fig. 8) | Unshielded DAISY – 5 m tether | Admiralty\_DAISY\_2 |  |
|  | Unshielded DAISY – 10 m tether | Admiralty\_DAISY\_6 |  |
| (also Fig. 7) | Unshielded DAISY – 15 m tether | Admiralty\_DAISY\_10 |  |
| (also Fig. 8) | Reference Hydrophone – 5 m tether | Admiralty\_DAISY\_4 |  |
|  | Reference Hydrophone – 10 m tether | Admiralty\_DAISY\_8 |  |
| (also Fig. 7) | Reference Hydrophone – 15 m tether | Admiralty\_DAISY\_12 |  |
|  | ADV – 5 m tether | Admiralty\_DAISY\_3\_ADV |  |
|  | ADV – 10 m tether | Admiralty\_DAISY\_7\_ADV |  |
|  | ADV – 15 m tether | Admiralty\_DAISY\_11\_ADV |  |
| Suspension system comparison (Fig. 10 & Fig. 11) | Heave plate | WETS\_DAISY\_30 |  |
|  | Rubber only | WETS\_DAISY\_31 |  |
|  | Flow shield | WETS\_DAISY\_32 |  |
| Surface-hydrophone comparison (Fig. 12) | Heave plate | WETS\_DAISY\_41 | Duration: 0 – 300 s |
| Localization (Fig. 14 & Fig. 15) | Heave plate | WETS\_DAISY\_49 | Berth-bracketing |
|  | Heave plate | WETS\_DAISY\_50 | Berth-bracketing |
|  | Heave plate | WETS\_DAISY\_51 | Berth-bracketing |
|  | Heave plate | WETS\_DAISY\_52 | Berth-bracketing |
|  | Heave plate | WETS\_DAISY\_53 | Berth-bracketing |
|  | Heave plate | WETS\_DAISY\_54 | Buoy-bracketing |
|  | Heave plate | WETS\_DAISY\_55 | Buoy-bracketing |
|  | Heave plate | WETS\_DAISY\_56 | Buoy-bracketing |
|  | Heave plate | WETS\_DAISY\_57 | Buoy-bracketing |
|  | Heave plate | WETS\_DAISY\_58 | Buoy-bracketing |
|  | Heave plate | WETS\_DAISY\_64 | Buoy-bracketing |
|  | Heave plate | WETS\_DAISY\_65 | Buoy-bracketing |
|  | Heave plate | WETS\_DAISY\_66 | Buoy-bracketing |
|  | Heave plate + 5 m additional tether | WETS\_DAISY\_67 | Buoy-bracketing |
|  | Heave plate + 10 m additional tether | WETS\_DAISY\_68 | Buoy-bracketing |
| Tether type comparison (Fig. B.2) | Rubber Cord – 5 m tether | Admiralty\_DAISY\_19 |  |
|  | Rubber Cord – 10 m tether | Admiralty\_DAISY\_16 |  |
| (also Fig. B.3) | Rubber Cord – 15 m tether | Admiralty\_DAISY\_13 |  |
|  | Nylon – 5 m tether | Admiralty\_DAISY\_20 |  |
|  | Nylon – 10 m tether | Admiralty\_DAISY\_17 |  |
| (also Fig. B.3) | Nylon – 15 m tether | Admiralty\_DAISY\_14 |  |
|  | Faired Nylon – 5 m tether | Admiralty\_DAISY\_21 |  |
|  | Faired Nylon – 10 m tether | Admiralty\_DAISY\_18 |  |
| (also Fig. B.3) | Faired Nylon – 15 m tether | Admiralty\_DAISY\_15 |  |

* MCRL: quiescent bay and entrance channel in Sequim Bay adjacent to PNNL Marine and Coastal Research Laboratory
* Admiralty: energetic tidal channel Admiralty Inlet
* WETS: U.S. Navy Wave Energy Test Site in Kaneohe, HI

# Acoustic Data File Format

All [site]\_DAISY\_[Drift #].mat files follow the same data conventions. Variables are summarized here.

*acoustic\_proc*: acoustic processing parameters

* *V\_range*: Voltage range (+/- VDC) for the DAISY hydrophone
* *f\_range*: Minimum and maximum frequencies reported
* *cal\_path*: Path for sensitivity data [*will be deprecated*]
* *settings*: acoustic processing settings (2)
	+ *dt*: duration of each window for frequency-domain processing
	+ *win\_overlap*: fractional overlap of adjacent windows
	+ *taper*: tape applied to each window
	+ settings(1) contains processing for time-resolved spectrogram plots
	+ settings(2) contains processing for frequency-resolved periodogram plots
* *f\_trunc*: Maximum frequency to store during processing (blank indicates no limit)
* *Pref*: acoustic reference pressure squared (1e-12 uPa2)
* *resample\_rate*: sample rate for embedded audio for playback

*audio*: resampled audio for playback purposes

* *time*: datetime (Nx1)
* *v*: voltage (Nx1)
* *fs*: sample rate (equal to resample\_rate)

*boat*: position of survey vessel recorded by handheld GPS (if available)

* *time*: datetime (Nx1)
* *lat*: latitude (Nx1)
* *lon*: longitude (Nx1)
* *U*: vessel speed over ground (Nx1) [m/s]
* *cog*: vessel course over ground (Nx1) [degrees true]
* *PDOP*: GPS dilution of precision (Nx1) [not accurate]
* *HDOP*: GPS horizontal dilution of precision (Nx1) [not accurate]
* *x*: UTM easting (Nx1) [m]
* *y*: UTM northing (Nx1) [m]

*GPS*: DAISY position during drift – this is interpolated to acoustic time stamps

* *time*: datetime (Nx1)
* *lat*: latitude (Nx1)
* *lon*: longitude (Nx1)
* *U*: DAISY speed over ground (Nx1) [m/s]
* *cog*: vessel course over ground (Nx1) [degrees true]
* *U\_uncertain*: uncertainty in DAISY speed over ground (Nx1) [not accurate]
* *HDOP*: GPS horizontal dilution of precision (Nx1) [not accurate]
* *x*: UTM easting (Nx1) [m]
* *y*: UTM northing (Nx1) [m]

*lower\_imu*: inertial measurement unit co-located with hydrophone

* *time*: datetime (Nx1)
* *roll*: roll angle (Nx1) [degrees]
* *pitch*: pitch angle (Nx1) [degrees]
* *heading*: yaw angle (Nx1) [degrees]
* *acceleration* (Nx3) [m/s2]
* *magnetometer* (Nx3) [radians?]
* *gyroscope* (Nx3) [radians?]

*upper\_imu*: inertial measurement unit on surface expression

*met*: Airmar meteorological station on surface expression (if available)

* *time*: datetime (Nx1)
* *lat*: latitude (Nx1)
* *lon*: longitude (Nx1)
* *x*: UTM easting (Nx1) [m]
* *y*: UTM northing (Nx1) [m]
* *airpres*: air pressure (Nx1) [kPa]
* *airtemp*: air temperature (Nx1) [oC]
* *winddir*: wind direction (Nx1) [degrees true]
* *windspd*: wind speed (Nx1) [m/s]
* *roll*: roll angle (Nx1) [degrees]
* *pitch*: pitch angle (Nx1) [degrees]
* *sog*: speed over ground (Nx1) [m/s]
* *cog*: course over ground (Nx1) [m/s]

*pressure*: pressure logger co-located with hydrophone

* *time*: datetime (Nx1)
* *p*: pressure (Nx1) [kPa]
* *T*: temperature (Nx1) [oC]
* *z*: depth corrected for pressure sensor drift (Nx1) [m]
* *z\_rough*: uncorrected depth (Nx1) [m]

*spectra*: processed acoustic data – each element corresponds to the settings in acoustic\_proc.settings

* *time*: datetime (Nx1)
* *f*: frequency (Mx1) [Hz]
* *Ppp*: mean-square sound pressure spectral density (MxN) [µPa2/Hz]
	+ Pressure spectral density: 10log10(*Ppp*/*Pref*) [dB re 1 µPa2/Hz]
* *x*: georeferenced UTM easting (Nx1) [m]
* *y*: georeferenced UTM northing (Nx1) [m]
* *t\_end*: end of drift [datetime]

*t\_end:* end of drift [datetime]

*t\_start*: start of drift [datetime]

# Velocity Data File Format

All [site]\_DAISY\_[Drift #]\_ADV.mat files follow the same data conventions. All variables are packaged in the *ADV* structure.

* *time*: datetime (Nx1)
* *rvel*: relative velocity in ADV instrument coordinates (x,y,z) (Nx3) [m/s]
* *amp*: beam amplitude (Nx3) [counts]
* *snr*: beam signal-to-noise ratio (Nx3) [~]
* *corr*: beam correlation (Nx3) [counts]
* *p*: pressure (Nx1) [dBar]
* *accel*: acceleration (Nx3) [m/s2]
* *ang*: angular velocity (Nx3) [deg/s]
* *mag*: magnetomer (Nx3) [deg?]
* *orient\_XX*: orientation vector (Nx3) [quaternions?]
* *fs*: sample rate
* *magvel*: velocity magnitude (vector sum) (Nx1) [m/s]
* *spectra*: horizontal and vertical velocity spectra
* *mean*: mean relative velocity in ADV instrument coordinates (u,v,w) (1x3) [m/s]