

# Data Product Options

Here are all the options pages. More details on the options below.

- [Ensemble Averaging, Bin-mapping, Three-beam Solutions and Filtering Options For RDI ADCPs](#)
- [CODAR](#)
- [Data Gaps](#)
- [Echosounder Resampling and Calibration](#)
- [File / Plot Breaks](#)
- [Hydrophone Channel](#)
- [Hydrophone Data Acquisition and Diversion Mode](#)
- [Imagenex File Breakdown](#)
- [LISST Text File Format](#)
- [Mobile Plot Options](#)
- [Quality Control \(Data Files\)](#)
- [Quality Control \(Plots\)](#)
- [Resampling \(Data Files\)](#)
- [Resampling \(Plots\)](#)
- [Seismometer Filtering Option](#)
- [Seismometer Channel Option](#)
- [Sensors To Include](#)
- [Spectral Probability Density \(SPD\) Colour Axis Upper Limit](#)
- [Spectral Probability Density \(SPD\) PSD Range](#)
- [Spectrogram Source](#)
- [Spectrogram Collation](#)
- [Cast Scalar Profile Plot and Data](#)
- [Ice Buoy Options](#)
- [JSON Output Encoding](#)
- [Kaiser-Bessel Filtering Options](#)
- [Track Plot Options](#)
- [ADCP Plot Limits](#)
- [Ensemble Averaging, Bin-mapping and Plan Options for Nortek ADCPs](#)
- [Time Series Profile Plot and Gridded Data](#)

## Scalar Data Product Options

Applies to scalar data products, such as the time series scalar [data](#) and [plots](#) and the plot variants such as the [staircase plot](#) or [profile plot](#).

### Quality Control *For time series scalar data:*

**Data Product Options**

Quality Control:  Clean Data  Raw Data

Data Gaps:  Fill missing/bad data with NaNs (Not a Number)  Do not fill gaps

Resample:

(Type/Period)

#### Raw Data

When this option is selected, raw data will be supplied in the data products: no action is taken to modify the data. In general, all scalar data is associated with a [quality control flag](#). These flags are stored adjacent to the data values.

Oceans 2.0 API filter: `dpo_qualityControl=0`

#### Clean Data

Selecting this option will cause any data values with quality control failures ([QAQC flags 3, 4 and 6](#)) to be replaced with NaNs. If the [do not fill data gaps option](#) is selected, data values with quality control failures will be removed. For all data products, when resampling with the clean option, any data with quality control failures are removed prior to the resampling (this rule applies to all resampling types: average, min/max, etc).

*This is the default option for all data products.*

Oceans 2.0 API filter: `dpo_qualityControl=1`

#### File-name mode field

'clean' is added to the file-name when the quality option is set to clean data.

*For time series scalar plots:*

**Data Product Options**

Quality Control:  Clean Data  Raw Data

Resample: (Type/Period)

### Raw Data

When this option is selected, raw data will be supplied in the data products: no action is taken to modify the data. In general, all scalar data is associated with a [quality control flag](#). For plots, such as the [time series scalar plot](#), data that fail quality control are marked on the plot with coloured data points and flag markers for emphasis.

Oceans 2.0 API filter: `dpo_qualityControl=0`

### Clean Data

Selecting this option will cause any data values with quality control failures ([QAQC flags 3, 4 and 6](#)) to be replaced with NaNs. Because NaNs cannot be plotted, quality control failures will be excluded from any plots under the clean option. For all data products, when resampling with the clean option, any data with quality control failures are removed prior to the resampling (this rule applies to all resampling types: average, min/max, etc).

*This is the default option for all data products.*

Oceans 2.0 API filter: `dpo_qualityControl=1`

File-name mode field

'clean' is added to the file-name when the quality option is set to clean data.

### Data Gaps *For time series data only:*

**Data Product Options**

Quality Control:  Clean Data  Raw Data

Data Gaps:  Fill missing/bad data with NaNs (Not a Number)  Do not fill gaps

Resample: (Type/Period)

### Fill missing/bad data with NaNs (Not Number)

This option will, as it says, fill in data gaps with 'NaN' values in the data products. For CSV files, the text 'NaN' is inserted, while MAT files have a built-in type of the same name. Data gaps occur when the time difference between subsequent readings is greater than 1.9 times the sample period (otherwise known as the data rating). The NaNs are placed one sample period after the last reading before the data gaps.

This option will also keep any existing NaNs in the data. These are most often caused by the clean data option being selected, or by real NaNs being report, or when a sensor in a multi-sensor data product has no data. The metadata report accompanying the data product will elaborate on the QAQC test that was applied.

*This is the default option.*

Oceans 2.0 API filter: `dpo_dataGaps=1`

### Do not fill gaps

This option will not take action to fill in data gaps.

This option will cause action to be taken to *remove all NaNs in the data*. The main implication of this is if the clean option had been selected, data that failed quality control tests will be removed entirely. However, there is an exception to this: for multi-sensor time series scalar data, if one sensor at a given time stamp has valid data, the entire row/time stamp cannot be removed, so the remaining sensors will be left as NaNs. For clarification, see the following example, note that QAQC flags of 1s are good data, 4s are failures and 9s are missing data:

sample time	sensor 1	sensor 1 flag	sensor 2	sensor 2 flag	Comment
12:00:00	42	1	42	1	Good row.
12:00:01	NaN	4	NaN	9	Two bad values; one QAQC failure, one data gap. If the <b>do not fill gaps</b> is selected, this entire row will be removed.
12:00:02	NaN	4	44	1	One good value, can't remove row.

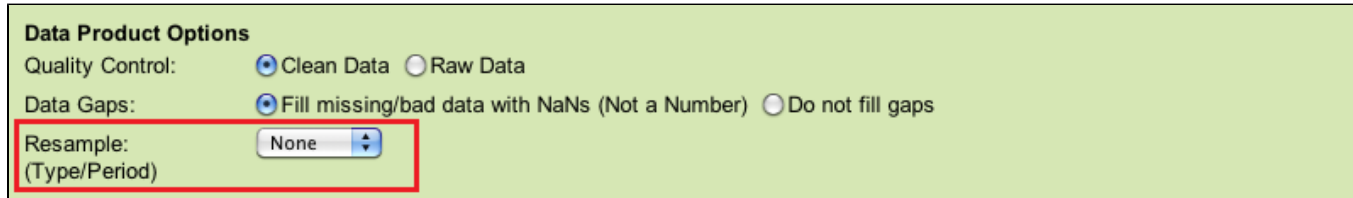
File-name mode field

'NaN' is added to the file name when the data gaps are filled with NaNs.

Oceans 2.0 API filter: `dpo_dataGaps=0`

## Resampling

For *time series scalar data*:



The screenshot shows a form titled "Data Product Options" with a light green background. It contains several controls: "Quality Control" with radio buttons for "Clean Data" (selected) and "Raw Data"; "Data Gaps" with radio buttons for "Fill missing/bad data with NaNs (Not a Number)" (selected) and "Do not fill gaps"; and "Resample: (Type/Period)" which is a dropdown menu currently showing "None". The dropdown menu is highlighted with a red rectangular box.

### Resample Type:

- None - no resampling. *This is the default option for time series scalar data.*

Oceans 2.0 API filter: `dpo_resample=none`

- Average - the mean value within resample period (fixed-window averaging without overlap). This is also known as a 'box-car' or ensemble average. It is subject to the 70% data completeness QAQC check (see below) with the exception of engineering data or data from irregular or scheduled sampling. *Only available with the [clean data product option](#).*

Oceans 2.0 API filter: `dpo_resample=average`

### Resample Period:

Visible when an actionable resample type is selected, immediately to the right of the resample type. Current periods offered:

- 1 Minute:

Oceans 2.0 API filter: `dpo_average=60`

- 10 Minute:

Oceans 2.0 API filter: `dpo_average=600`

- 15 Minute:

Oceans 2.0 API filter: `dpo_average=900`

- 1 Hour:

Oceans 2.0 API filter: `dpo_average=3600`

- 1 Day:

Oceans 2.0 API filter: `dpo_average=86400`

When resampling is selected:

- The timestamps in the data series correspond to the centre of each resampling interval. (Data downloaded prior to 13 Feb 2013: timestamps were at beginning of interval). The resample interval always begins and ends at an integer multiple of the resample period, so minutes on the minute, hours on the hour, days on the day, etc.
- If the date/time range on the search has limits that are within a resampling interval, the date/time endpoints are extended to include the entire resampling interval. For example, when daily resampling is selected from 03:00:00.000 on Monday to 20:00:00.000 on Thursday, the date range is extended to 00:00:00.000 on Monday to 23:59:59.999 on Thursday.
- **Note that tides are not filtered out in resampled products.**
- **No anti-alias filtering is done.** This is why only averaging and min/max are offered at this time. Box-car / ensemble averaging is an easily understood and ubiquitous process that is an effective low-pass anti-alias filter. For more information, see this page on [data reduction and time-averaging](#).
- **All resampled data products are subject to an additional QAQC check on data completeness** (except engineering data or data from irregular or scheduled sampling). If any resample period does not contain at least 70% of the expected data, the QAQC flag for this period will be a failure (6), unless overridden by a manual QAQC flag, see the [QAQC page](#). For live data, it is quite likely that the last resample period will not be complete and will be flagged; this is especially obvious for plots. Future improvements will allow users to modify the data completeness threshold.

More options will be available in the future as we work to improve the data products, an example is Min/Max resampling (only available for plots). Feedback is welcomed and encouraged. For custom resampling, users can develop their own matlab code in [CodeRunner](#) in the ONC computing environment (users can access all production data and code). See [CodeRunner Help](#) for more details.

File-name mode field

The resample type and period are added to the file-name when resampling is selected. Example: 'avg1hour'.

For *time series scalar plots*:

**Data Product Options**

Quality Control:  Raw Data  Clean Data

Resample:

(Type/Period)

### Resample Type:

- None - no resampling.

[Oceans 2.0 API filter](#): `dpo_resample=none`

- Average - the mean value within resample period (fixed-window averaging without overlap). This is also known as a 'box-car' or ensemble average. It is subject to the 70% data completeness QAQC check (see below) with the exception of engineering data or data from irregular or scheduled sampling. *Only available with the [clean data product option](#).*

[Oceans 2.0 API filter](#): `dpo_resample=average` and `dpo_average={0, 60, 600, 900, 3600, 86400}`

- Min/Max - the most extreme minimum and maximum values within resample period. It is subject to the 70% data completeness QAQC check (except for engineering data or data from irregular or scheduled sampling); QAQC flags are taken from the extreme data points.

[Oceans 2.0 API filter](#): `dpo_resample=minMax` and `dpo_minMax={0, 60, 600, 900, 3600, 86400}`

- Min/Max+Avg - the combination of the min/max and average as described above. The average is always calculated from clean data and will be NaN if there is less than 70% data available after cleaning. QAQC flags for min/max+avg with automatic resampling are the worst flag in the resample period, which includes the 70% check on data completeness (except for engineering data or data from irregular or scheduled sampling). *This is the default option for time series scalar plots, other plots, such as the BHT, AGO, profile or staircase plots will have different options and defaults.*

[Oceans 2.0 API filter](#): `dpo_resample=minMaxAvg` and `dpo_minMaxAvg={0, 60, 600, 900, 3600, 86400}`

### Resample Period:

Visible when an actionable resample type is selected, immediately to the right of the resample type. Current periods offered:

- 1 Minute
- 10 Minute
- 15 Minute
- 1 Hour
- 1 Day
- Automatic

[Oceans 2.0 API filter](#): as noted above, choose from the available resample periods (in seconds, 0 is automatic): 0, 60, 600, 900, 3600, 86400

When resampling is selected:

- The timestamps in the data series correspond to the centre of each resampling interval. (Data downloaded prior to 13 Feb 2013: timestamps were at beginning of interval). The resample interval always begins and ends at an integer multiple of the resample period, so minutes on the minute, hours on the hour, days on the day, etc.
- If the date/time range on the search has limits that are within a resampling interval, the date/time endpoints are extended to include the entire resampling interval. For example, when daily resampling is selected from 03:00:00.000 on Monday to 20:00:00.000 on Thursday, the date range is extended to 00:00:00.000 on Monday to 23:59:59.999 on Thursday.
- **Note that tides are not filtered out in resampled products.**
- **No anti-alias filtering is done.** This is why only averaging and min/max are offered at this time. Box-car / ensemble averaging is an easily understood and ubiquitous process that is effective as a low-pass anti-alias filter. For more information, see this page on [data reduction and time-averaging](#).
- **All resampled data products are subject to an additional QAQC check on data completeness** (except engineering data or data from irregular or scheduled sampling). If any resample period does not contain at least 70% of the expected data, the QAQC flag for this period will be a failure (6), unless overridden by a manual QAQC flag, see the [QAQC page](#). For live data, it is quite likely that the last resample period will not be complete and will be flagged; this is especially obvious for plots. Future improvements will allow users to modify the data completeness threshold.
- Automatic resampling chooses the most appropriate resample period for min/max or min/max+avg resampling, such that the amount of data returned is adequate for plotting. For short duration plots, it can result in no resampling.

More options will be available in the future as we work to improve the data products. Feedback is welcomed and encouraged. For custom resampling, users can develop their own matlab code in [CodeRunner](#) in the ONC computing environment (users can access all production data and code). See [CodeRunner Help](#) for more details.

File-name mode field

The resample type and period are added to the file-name when resampling is selected. Examples: 'avg1hour', 'MinMax10minute', 'MinMaxAvgAuto15minute', 'MinMaxAvgAuto' (automatic resampling chose no resampling).

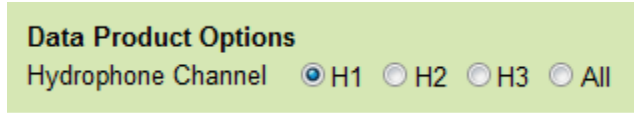
## Complex Data Product Options

For non-scalar data products, the options are more varied and are specific to the device and data formats provided.

Many options are not yet released. Planned options include, but are not limited to, ensemble averaging selections and plotting options for ADCP data.

## Hydrophone Channel

*For hydrophone data products only (audio and spectrogram data) on the hydrophone array devices only:*



### H1

This option will cause the search to return results for hydrophone channel H1 only. The hydrophone arrays consist of multiple hydrophones connected to a single data acquisition computer, which collects the data into single files that have multiple channels (nominally [raw hydrophone array](#) files, although other formats can handle multiple channels). Data products may be produced from these files on a per channel basis and returned as specified.

*This is the default option.*

[Oceans 2.0 API filter](#): `dpo_hydrophoneChannel=H1`

#### File-name mode field

'H1' is added to the file-name when the hydrophone channel option is set to H1, i.e. IOS3HYDARR02\_20111211T152404.000Z-spect-H1.pdf.

### H2

This option will cause the search to return results for hydrophone channel H2 only.

[Oceans 2.0 API filter](#): `dpo_hydrophoneChannel=H2`

#### File-name mode field

'H2' is added to the file-name when the hydrophone channel option is set to H2, i.e. IOS3HYDARR02\_20111211T152404.000Z-spect-H2.png.

### H3

This option will cause the search to return results for hydrophone channel H3 only.

[Oceans 2.0 API filter](#): `dpo_hydrophoneChannel=H3`

#### File-name mode field

'H3' is added to the file-name when the hydrophone channel option is set to H3, i.e. IOS3HYDARR02\_20120801T090939.000Z-H3.mp3.

### All

This option will cause the search to return results for all available hydrophone channels.

[Oceans 2.0 API filter](#): `dpo_hydrophoneChannel=All`

#### File-name mode field

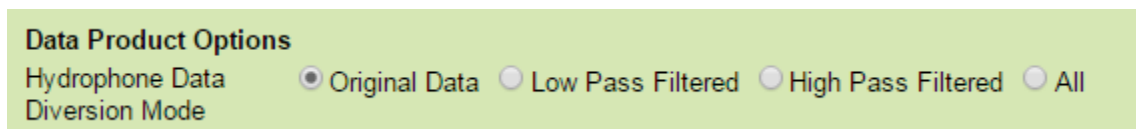
'H1', 'H2', 'H3', etc are added to the file-name.

## Hydrophone Data Diversion Mode

*For hydrophone data products only (audio and spectrogram data):*

Hydrophones that have both low and high frequency sensors will have the data acquisition mode option while the other hydrophones will have the data diversion mode option.

## Diversion Mode



For security reasons, the military occasionally diverts seismic and acoustic data. Over time how this diversion is performed has changed. Currently, when diverted the entire data set is removed. Diverted data is then reviewed by military authorities, if it does not contain sensitive recordings it is returned to the ONC archive.

Prior to August 2016, instead of diverting the entire frequency range of the data, the military diverted only a low frequency band of the data. When this filtering occurred, the file-name was appended with 'LPF' or 'HPF' for high-pass or low-pass filtering. Sometimes one-half of this diverted was available live, while the other component was withheld for review. Usually that withheld data was returned, after a delay of 3 days to 2 months. Once filtered, this data remained in the LPF/HPF frequency bands.

Data diversion is further explained in the [data diversion page](#).

## Original Data

This option will cause the search to return results for original data only. Files labelled with "-HPF" or "-LPF" are excluded as well as any files that overlap in time with "-HPF" or "-LPF" files. For spectral probability density plots and spectrograms, 'Data Diversion Mode: Original Data' will appear in the plot title.

*This is the default option.*

**Oceans 2.0 API filter:** `dpo_hydrophoneDataDiversionMode=OD`

## Low Pass Filtered

Applies to pre-August 2016 data only. This option will cause the search to return results for diverted data that has been low pass filtered only (only files with "-LPF" in the their file-names). For spectral probability density plots and spectrograms, 'Data Diversion Mode: Low Pass Filtered' will appear in the plot title.

**Oceans 2.0 API filter:** `dpo_hydrophoneDataDiversionMode=LPF`

## High Pass Filtered

Applies to pre-August 2016 data only. This option will cause the search to return results for diverted data that has been high pass filtered only (only files with "-HPF" in the their file-names). For spectral probability density plots and spectrograms, 'Data Diversion Mode: High Pass Filtered' will appear in the plot title.

**Oceans 2.0 API filter:** `dpo_hydrophoneDataDiversionMode=HPF`

## All

This option will cause the search to return results for all data. For spectral probability density plots and spectrograms, 'Data Diversion Mode: High Pass Filtered' will appear in the plot title. This is only way to see data that overlaps in time with files labelled "-LPF" or "-HPF".

**Oceans 2.0 API filter:** `dpo_hydrophoneDataDiversionMode=All`

## File-name mode field

"-LPF" or "-HPF" is added to the file-name when the quality option is set to high or low pass filtered data, i.e. ICLISTENHF1234\_20110101T000000Z-HPF. wav. For spectral probability density data products, 'All' may be added to the file-name, as these plots can join LPF, Original and HPF data together into one plot if the spectral frequency bins are the same (data with different frequency content will make addition plots with labels indicating the frequency range). For brevity, 'Original' does not get added to the file-name.

## Acquisition Mode



For hydrophones operating with a duty cycle that includes high and low frequency sample rates. The low sample frequency data will likely have a sample frequency of 16 kHz and the high sample frequency data will likely have a sample frequency greater or equal to then 128 kHz.

## Low Sample Frequency

This option will cause the search to return results for the low sample frequency data only (files with "-16KHZ" in their file-names). For spectral probability density plots and spectrograms, "Data Acquisition Mode: Low Frequency" will appear in the plot title.

**Oceans 2.0 API filter:** `dpo_hydrophoneAcquisitionMode=LF`

## High Sample Frequency

This option will cause the search to return results for the high sample frequency data only (files with "-128KHZ" or similar in their file-names). For spectral probability density plots and spectrograms, "Data Acquisition Mode: High Frequency" will appear in the plot title.

Oceans 2.0 API filter: `dpo_hydrophoneAcquisitionMode=HF`

All

This option will cause the search to return results for both the low and high sample frequency data or other mode data. For spectral probability density plots and MAT files, the low and high frequency data will be segregated regardless of option.

Oceans 2.0 API filter: `dpo_hydrophoneAcquisitionMode=All`

### File-name mode field

The sample frequency is added to the file-name for each data acquisition mode option, i.e. `ICLISTENHF1234_20110101T000000Z-16KHZ.wav`. There is a device attribute on devices with a duty cycle that links the low frequency (LF) and high frequency (HF) acquisition modes with the exact file-name mode modifier string - if this link is not correct, the data acquisition mode option will not properly filter the data products.

## Hydrophone Spectrogram Source

For hydrophone [spectrogram](#) (*PNG and PDF*) data products only, when *FFT* spectral data is available (*icListen HF hydrophones currently*):

Spectrogram Source:  Audio data preferred (FFT spectral data fills in gaps only)  Audio data only  FFT spectral data only (maybe available regardless of data diversion mode)

### Audio Data Preferred (FFT spectral data fills in gaps only)

In this *default option*, searches for spectrogram data products will return the best combination of spectrograms sourced from [.wav](#) or [.hyd](#) audio data files and sourced from [FFT spectral data files](#). Hydrophones produce audio data and spectrograms are best generated from the audio data. However, in some circumstances, such as low bandwidth data connections to remote hydrophones or [military diversion](#), audio data is not available and we only receive spectral *FFT* data files. Spectrograms produced from FFT data files fill in the gaps where with normal audio data sourced spectrograms are not available. This presents the user with the most complete coverage of data.

Oceans 2.0 API filter: `dpo_spectrogramSource=MIX`

### Audio data only

This option will cause the search to only return spectrograms sourced from audio data. This is useful if you just want the high resolution spectrograms.

Oceans 2.0 API filter: `dpo_spectrogramSource=WAV`

### .fft Spectral Data only (maybe available regardless of data diversion mode)

This option will cause the search to only return spectrograms sourced from *FFT* spectral data files. This is useful when audio data is present, but is limited in bandwidth due to military diversion. FFT sourced spectrograms have less resolution than audio sourced spectrograms but often have frequency ranges from 0 to well above 44 kHz (audio data is often limited to 44 kHz sampling)..

Oceans 2.0 API filter: `dpo_spectrogramSource=FFT`

### File-name mode field

Spectrograms produced from .fft spectral data files are appended with a '-FFT', and are also noted as such within the plots themselves.

## Hydrophone Spectral Probability Density Colour Axis Upper Limit

For hydrophone [spectral probability density plot](#) (*PNG and PDF*) data products only:

Spectral Probability Density Colour Axis Upper Limit ():  Automatic  0.05  0.01  0.012  0.25  0.5  1.0

### Automatic

In this *default option*, it sets the upper limit of the colour axis to a value that's the nearest 0.1 (unit-less) to the 98th percentile of the empirical probability density. The empirical probably density is generally the most relevant at values less than 0.25. Only in small data sets or extreme frequency / sound level bins does one see values approach the maximum value of 1.0. For this reason, the manual fixed limit options are clusters at the lower values. The spectral probability density plots from [Merchant et al. \(2013\)](#) all had fixed upper limit values of 0.05. The lower limit is always 0.0.

Oceans 2.0 API filter: `dpo_spectralProbabilityDensityColourAxisUpperLimit=0`

### Manual fixed limit settings (0.05, 0.01, 0.012, 0.25 0.5, 1.0)

This option will cause the spectral probability density plot to use a fixed value, as chosen, for the colour axis upper limit.

Oceans 2.0 API filter: `dpo_spectralProbabilityDensityColourAxisUpperLimit={0.05,0.01,0.012,0.25,0.5,1.0}`

#### File-name mode field

Spectral probability density plots generated with the manual limits will have a file mode modifier added to their file names of the format: `<-CLIMIT><option>` where `<option>` is the value as chosen, but without the '.'.

## Hydrophone Spectral Probability PSD Range

**For hydrophone spectral probability density plot (PNG and PDF) data products only:**

Spectral Probability Density PSD range:  Automatic  40 to 160 dB  20 to 140 dB  40 to 140 dB

#### Automatic

In this *default option*, it sets the Y-axis range for the Power Spectral Density to the min/max of the data extended to the next 10 dB interval.

Oceans 2.0 API filter: `dpo_spectralProbabilityDensityPSDRange=0`

#### Manual fixed limit settings

This option will cause the spectral probability density plot to use a fixed value, as chosen, for the y-axis range. Using a fixed range is useful for comparing multiple plots.

Oceans 2.0 API filter: `dpo_spectralProbabilityDensityPSDRange={40_160,20_140,40_140}`

#### File-name mode field

Spectral probability density plots generated with the manual limits will have a file mode modifier added to their file names of the format: `<-YLIM><option>` where `<option>` is the value as chosen, with ' to ' replaced by '\_'.

## File / Plot Breaks

*Currently for hydrophone spectral probability density plot (PNG, PDF and MAT) data products only:*

File / plot breaks:

This option will cause files or plots to break (the current file/plot is stopped and a new one created) as specified. Generally, weekly means the break occurs at midnight every Sunday. This is the default for [spectral probability density plots](#). Daily means the break will occur every day at midnight. Yearly and Monthly breaks occur on midnight of the respective year/month, meaning that some months may have more days than others. The "None (break on configuration changes only)" option, means just that: no file/plot break unless there's a configuration change, which can be sample rate or some other primary factor in the data acquisition that makes the data incompatible to be collated.

- Weekly  
Oceans 2.0 API filter: `dpo_filePlotBreaks=2`
- Daily  
Oceans 2.0 API filter: `dpo_filePlotBreaks=1`
- Hourly  
Oceans 2.0 API filter: `dpo_filePlotBreaks=3`
- Monthly  
Oceans 2.0 API filter: `dpo_filePlotBreaks=4`
- Yearly  
Oceans 2.0 API filter: `dpo_filePlotBreaks=5`
- None (break on configuration changes only)  
Oceans 2.0 API filter: `dpo_filePlotBreaks=0`

#### File-name mode field

Data products generated may have a file mode modifier added to their file names of the format. For [spectral probability density plots](#), they will be "-WEEKLY", "-DAILY", "-MONTHLY", "-YEARLY" and nothing added for the "None" option.

## Echosounder Resampling and Calibration

*For echosounder data products only. Currently used by the [ASL Acoustic Profiler Time Series](#) data products.*



## Data Product Options

Ensemble Period:  
(ping averaging)

Data not altered (none) ▾

Calibration:

Calibrated (if available)  Uncalibrated (raw data)

Sun Elevation:

Hide  Show

### Ensemble Period

This option will cause the search to perform the standard box-car average resampling on the data. 'Boxes' of time are defined based on the ensemble period, e.g. starting every 15 minutes on the 15s, with the time stamp given as the center of the 'box'. Acoustic pings that occur within that box are averaged range or bin-wise, and the summary statistics, such as 'Data.nPingsAcquired' are updated. This process is often called 'ping averaging'. The process uses log scale averaging, which involves backing out the dB scale to pressure, compute the weighted average, and then compute the dB scale again. Weighted averages are used when raw files bridge an ensemble period and when the data is already an ensemble or ping average.

New files are started when the maximum records per file is exceeded (files will not exceed 1 GB of memory when loaded), or when there is a configuration, device or site changes. In the case where there is data from either side of a configuration change within one ensemble period, two files will be produced with the same ensemble period, the same time stamps, but different data. Users may use the ensemble statistics on the number of pings or samples per ensemble to filter out ensembles that do not have enough data. (As an aside, we do this by default with clean averaged scalar data - each ensemble period needs to have at least 70% of it's expected data to be reported as good.)

The default value is no averaging, meaning the data is not altered. Some echosounders are configured to do ping averaging during acquisition, so the data you request with 'Data not altered (none)' could already be averaged. To determine if the echosounder is averaging data as it is acquiring it, check the device details page (e.g. <http://dmas.uvic.ca/DeviceListing?DeviceId=22608>, go to the additional attributes tab) or check the data products: see the comment field in the plots or the Config structure in mat files, look for Config.p Available ensemble periods are 1, 10, 15 and 60 minutes.

- Data not altered

[Oceans 2.0 API filter](#): dpo\_ensemblePeriod=0

- 1 Minute

[Oceans 2.0 API filter](#): dpo\_ensemblePeriod=60

- 10 Minute

[Oceans 2.0 API filter](#): dpo\_ensemblePeriod=600

- 15 Minute

[Oceans 2.0 API filter](#): dpo\_ensemblePeriod=900

- 1 Hour

[Oceans 2.0 API filter](#): dpo\_ensemblePeriod=3600

File-name mode field

Selecting an ensemble period will add 'Ensemble' followed by the ensemble period. For example '-Ensemble600s'.

### Calibration

This option will apply the calibration to the data, when the calibration coefficients are available. The calibration calculation and coefficients are supplied by the manufacturer. See the device details page (additional attributes tab) to see the coefficients, see the instrument documentation page, or [contact us](#) for more details. These values are also provided in the mat file Config / Cal structure - see the [ASL data product page](#) for more information.

The default value is to apply calibration when available. The alternative option will provide the raw data only. Raw data has units of raw counts, which are proportional to the received acoustic pressure.

- Calibrated (if available)

[Oceans 2.0 API filter](#): dpo\_calibration=1

- Uncalibrated (raw data)

[Oceans 2.0 API filter](#): dpo\_calibration=0

File-name mode field

'Calibrated' will be added if all the channels of the device were successfully calibrated.

### Sun Elevation

This option applies to echosounder plots only. If 'Show' is selected, it appends a graph of the Sun's elevation over time below the acoustic data, such a plot is useful to correlate the acoustic data with dial (daily) and tidal effects, such as zooplankton migrations.

The default will not add a plot of sun elevation.

- Hide

- [Oceans 2.0 API filter: dpo\\_sunElevation=0](#)
- Show

[Oceans 2.0 API filter: dpo\\_sunElevation=1](#)

File-name mode field

No affect on file-name.

## ADCP Ensemble Averaging and Bin-Mapping

Ensemble Period (ping averaging)

For *RDI ADCP data file products (MAT and netCDF formats)*

Ensemble Period:  (ping averaging)

Ensemble Period:

- Data not altered (none)  
[Oceans 2.0 API filter: dpo\\_ensemblePeriod=0](#)
- 1 Minute  
[Oceans 2.0 API filter: dpo\\_ensemblePeriod=60](#)
- 10 Minute  
[Oceans 2.0 API filter: dpo\\_ensemblePeriod=600](#)
- 15 Minute  
[Oceans 2.0 API filter: dpo\\_ensemblePeriod=900](#)
- 1 Hour  
[Oceans 2.0 API filter: dpo\\_ensemblePeriod=3600](#)

When selecting any of the ensemble periods, this option will cause the search to perform the standard box-car average resampling on the data. 'Boxes' of time are defined based on the ensemble period, e.g. starting every 15 minutes on the 15s, with the time stamp given as the center of the 'box'. Acoustic pings that occur within that box are averaged and the summary statistics are updated. This process is often called 'ping averaging'. The process uses log scale averaging on the intensity data, which involves backing out the logarithmic scale, compute the weighted average, and then compute the logarithmic scale again. Weighted averages are used when raw files bridge an ensemble period and when the data is already an ensemble or ping average.

New files are started when the maximum records per file is exceeded (usually set to make files that will use less than 1 GB of memory when loaded), or when there is a configuration, device or site changes. In the case where there is data from either side of a configuration change within the one ensemble period, two files will be produced with the same ensemble period, with the same time stamps, but different data. Users may use the ensemble statistics on the number of pings or samples per ensemble to filter out ensembles that do not have enough data. (As an aside, we do this by default with clean averaged scalar data - each ensemble period needs to have at least 70% of it's expected data to be reported as good.)

The default value is no averaging, meaning the data is not altered. This option is only available for **MAT** and **NETCDF** files.

File-name mode field

Selecting an ensemble period will add 'Ensemble' followed by the ensemble period. For example '-Ensemble600s'.

Velocity Bin-mapping (tilt compensation EX)

For all *RDI ADCP data products (PNG/PNG and MAT and netCDF formats)*

Velocity Bin-mapping:  Nearest vertical bin (matches winADCP)  As configured on the device (matches processing on device)  None  Linear interpolation (Ott method) (tilt compensation EX)

This option specifies the bin-mapping processing method to be applied. Bin-mapping is also known as 'depth cell mapping' or 'tilt compensation' or even 'map to vertical'. There are two methods, both correct for tilt effects on ADCP velocity data, while the none option leaves the velocity data as is. For details on the two methods, see the section on [correction and rotation of velocities](#) (included below). The 'None' option is the default for Nortek ADCPs since the free version of the manufacturer's software does not apply bin-mapping (a core goal of our data products is to replicate the functionality offered by the manufacturer's software). The 'Nearest vertical bin' is the default for RDI ADCPs as *winADCP* applies this method for Instrument or Beam co-ordinate data. The 'As configured on the device' option uses the configuration onboard to determine whether to apply bin-mapping, this matches processing on-board the device (for Earth-co-ordinate data, while for Instrument or Beam co-ordinate data winADCP ignores the device configuration and always uses 'Nearest vertical bin'). The best method has been shown to be the linear interpolation method ([Ott, 1992](#)).

- Nearest vertical bin  
[Oceans 2.0 API filter: dpo\\_velocityBinmapping=1](#)
- As configured on the device (matches processing on device)  
[Oceans 2.0 API filter: dpo\\_velocityBinmapping=-1](#)
- None  
[Oceans 2.0 API filter: dpo\\_velocityBinmapping=0](#)

- Linear interpolation (Ott method)  
Oceans 2.0 API filter: `dpo_velocityBinmapping=2`

File-name mode field

The velocity bin-mapping option will be appended to the filename. For example: '-binMapNone', 'binMapLinearInterp', 'binMapNearest'.

### Three-beam Solutions (EX)

For all *RDI* ADCP data products (PNG/PNG and MAT and netCDF formats)

Three-Beam Solutions  Off  As configured on the device (matches winADCP)  On (EX):

Three-beam solutions allow computation of velocity from three beams when the fourth beam has been masked or screened to NaN, as described in [ADCP Velocity Computation: Correction and Rotation to East-North-Up Co-ordinate System, Three-beam Solutions and Screening](#) (included below). This option allows the user to use the on-device configured value or override it and select whether or not to use three-beam solutions. The default value retains the previous behaviour of ONC data products: off. Only available on Instrument or Beam co-ordinate data.

- Off  
Oceans 2.0 API filter: `dpo_3beam=Off`
- As configured on the device (matches winADCP)  
Oceans 2.0 API filter: `dpo_3beam=config`
- On  
Oceans 2.0 API filter: `dpo_3beam=On`

File-name mode field

If a value other than the default is used, a '-3beam<value>' will be appended to the file-name, where <value> is the value of the option matching the API filter.

### Low Correlation Screen Threshold (WC)

For all *RDI* ADCP data products (PNG/PNG and MAT and netCDF formats)

Low Correlation Screen Threshold (WC):  64 counts (RDI default)  As configured on the device (matches winADCP)  0 counts (off)  16 counts  32 counts  64 counts  128 counts

This option allows the user to control the RDI correlation screening step. The default value retains the previous behaviour of ONC data products: a threshold of 64 counts. Beam-velocities that have associated correlation values lower than this threshold are masked / screened to NaN values. Only available on Instrument or Beam co-ordinate data. The WC command configures this value on-board the device which is then used for on-board processing (Earth co-ordinate data only). ONC data products can use the WC set value to match winADCP output or the user can override it.

- 64 counts (RDI default)  
Oceans 2.0 API filter: `dpo_corScreen=64`
- As configured on the device (matches winADCP)  
Oceans 2.0 API filter: `dpo_corScreen=-1`
- Off (0 counts)  
Oceans 2.0 API filter: `dpo_corScreen=0`
- Any value between 1 and 255  
Oceans 2.0 API filter: `dpo_corScreen=<1:255>`

File-name mode field

If a value other than the default is used, a '-corr<value>' will be appended to the file-name, where <value> is the value of the option matching the API filter.

### Error Velocity Screen Threshold (WE)

For all *RDI* ADCP data products (PNG/PNG and MAT and netCDF formats)

Error Velocity Screen Threshold (WE):  2 m/s (RDI default)  As configured on the device (matches winADCP)  0 m/s (off)  5 m/s  1 m/s  0.5 m/s  0.25 m/s  0.1 m/s

This option allows the user to control the RDI error velocity screening step. The default value retains the previous behaviour of ONC data products: a threshold of 2 m/s. Final East-North-Up co-ordinate velocities that have associated error velocity values higher than this threshold are masked / screened to NaN values (lower values are more stringent). Available on all data, except for velocities are the result of a three-beam solution, see [ADCP Velocity Computation: Correction and Rotation to East-North-Up Co-ordinate System, Three-beam Solutions and Screening](#) (included below) for more information on how three-beam solutions and the error velocities are related. The WE command configures this value on-board the device which is then used for on-board processing (Earth co-ordinate data only). ONC data products can use the WE set value to match winADCP output or the user can override it.

- 2 m/s  
Oceans 2.0 API filter: `dpo_errVelScreen=2`
- As configured on the device (matches winADCP)  
Oceans 2.0 API filter: `dpo_errVelScreen=-1`
- 0 m/s ( off )  
Oceans 2.0 API filter: `dpo_errVelScreen=0`

- 5 m/s  
Oceans 2.0 API filter: dpo\_errVelScreen=5
- 1 m/s  
Oceans 2.0 API filter: dpo\_errVelScreen=1
- 0.5 m/s  
Oceans 2.0 API filter: dpo\_errVelScreen=0.5
- 0.25 m/s  
Oceans 2.0 API filter: dpo\_errVelScreen=0.25
- 0.1 m/s  
Oceans 2.0 API filter: dpo\_errVelScreen=0.1

File-name mode field

If a value other than the default is used, a '-errVal'<value> will be appended to the file-name, where <value> is the value of the option matching the API filter.

## False Target Threshold Maximum (WA)

For all *RDI ADCP data products (PNG/PNG and MAT and netCDF formats)*

False Target Threshold Maximum (WA):  255 counts (off)  As configured on the device (matches winADCP)  192 counts  128 counts  64 counts  50 counts (RDI default)  32 counts  16 counts

This option controls the False Target Detection algorithm, which is also known as the Fish Rejection algorithm. See chapter 7 in the [adcp coordinate transformation\\_Jan10.pdf](#) documentation from RDI. Essentially, the algorithm looks at the echo levels from bins at the same depth/range and if there is a large difference in their levels, it rejects them in two steps: reject one bin (then the 3-beam solution may apply, so it is suggested to use Fish Rejection and Three-beam solutions together), and if that does not resolve the difference, reject all bins at that depth/range. Lower values of the threshold are more stringent. Available on Beam and Instrument co-ordinate data only, Earth co-ordinate data may have had this algorithm to it onboard the device, see the WA command and configuration value. ONC data products can use the WA configuration value to match winADCP output or the user can override it.

- 255 counts  
Oceans 2.0 API filter: dpo\_falseTarScreen=255
- As configured on the device (matches winADCP)  
Oceans 2.0 API filter: dpo\_falseTarScreen=-1
- 192 counts  
Oceans 2.0 API filter: dpo\_falseTarScreen=192
- 128 counts  
Oceans 2.0 API filter: dpo\_falseTarScreen=128
- 64 counts  
Oceans 2.0 API filter: dpo\_falseTarScreen=64
- 50 counts (RDI default)  
Oceans 2.0 API filter: dpo\_falseTarScreen=50
- 32 counts  
Oceans 2.0 API filter: dpo\_falseTarScreen=32
- 16 counts  
Oceans 2.0 API filter: dpo\_falseTarScreen=16

File-name mode field

If a value other than the default is used, a '-falseTar'<value> will be appended to the file-name, where <value> is the value of the option matching the API filter.

## CODAR Options

Currently used by *CODAR Data products*.

### RUV Data Product Options

Data Product Options  
Station

#### Station

This option indicates to the search which radial data files (.ruv) should be retrieved from the archive. The choice of stations include VCOL (Westshore Coal Terminal station), VION (Iona Wastewater Treatment Plant), VCWY (Iona Causeway) and All indicating all station radial files should be retrieved.

### PNG Data Product Options

**Data Product Options**  
Station/Totals

#### Station/Totals

This option indicates to the search which PNG files should be retrieved from the archive. The choices include VCOL (Westshore Coal Terminal station), VION (Iona Wastewater Treatment Plant), VCWY (Iona Causeway), TOTALS, PNGs for combined station data and All indicating all station PNGs and combined PNGs should be retrieved.

## Imagenex Options

#### Daily or Scan-Separated Files

**Data Product Options**  
Data file breakdown  Daily  Hourly

For .txt and .81a data, this option determines whether a specified time range of downloaded data will be split into files by day or by scan. An Imagenex rotary sonar will perform one scan every hour.

- Daily  
[Oceans 2.0 API filter: dpo\\_datafilebreakdown=0](#)
- Hourly  
[Oceans 2.0 API filter: dpo\\_datafilebreakdown=1](#)

#### File-name mode

'-daily' or '-hourly' will be appended to the file-name.