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Aligned and Depth-Binned Profile Data (On-Demand)

Aligned and Depth Binned profile data that are collecting profile data are described here. This data product is generated on-demand / on-the-fly and with several improvements over Aligned and Depth-Binned Profile Data (Legacy). A profile is a series of measurements made throughout the water column grouped by each pass through the water, known as a 'cast', as opposed to continuous time series data. Profiles of the water column can be created by performing casts with instruments. Casts involve lowering an instrument down into the water and back up again while it is making measurements. Cast detection or delineation is performed automatically with manual oversight, contact us for further details. The measurements from the various sensors attached to and within the instrument are processed to filter, smooth, align, and average data into depth bins. Information about the data processing is included in the header of the data product. Specifically, the default processing steps are:

- The alignment of oxygen to account for instrument response lags. This is instrument dependent.
- Chlorophyll is filtered using a 25 median point filter.
- Temperature and conductivity data is smoothed using a 5 point running mean.
- Practical salinity, sound speed, and density are calculated using smoothed temperature, smoothed conductivity, and pressure.
- Data is averaged into 1 m bins centred at 1 m intervals. Data is only averaged into its corresponding bin if 70% of the data within the bounds of the bin has a QAQC flag of 1.

Generally, the descending portion of the cast is then extracted (this will be user configuration in the future, as well as cast detection, alignment, binning parameters). This data product is only used with aligned and depth binned data. To distinguish it from the Aligned and Depth-Binned Profile Data (Legacy) data product, these files are named *without* "-CORRECTED" added to the standard file-name. This data product includes data from connected sensors when applicable. If connected sensors have been included. this is denoted by having "-ALLCONNECTEDSENSORS" add to the standard file-name. This data product retrieves all aligned and depth binned casts within the search range and produces one output file with one or more casts within it. Each cast is prefaced by a header which contains additional information associated with the cast. An example of this header can be seen below. The columns of data are labelled with numbers counting from left to right. Each number is labelled with the type of data contained within it and the associated units. The columns of data are comma-delimited with one space on either side of the comma. This data product is very similar to Aligned and Depth-Binned Profile Data (Legacy), however, each cast and instrument in the search range is included in one file (up to file and memory size limits).

Please note that these files are created on-demand from aligned and depth-binned sensors (sensor and device-level) from devices operating as profilers. Currently, availability is limited to pre-processed cast delineations, which will be back-filled for all data.

Please consult individual instruments' documentation for more information.

Oceans 2.0 API filter: `dataProductCode=OTFCPD`

Example Cast Header

```
Deployment 1 of 1
Patrol name: Salish Sea Marine Survival Program Patrol 3
NumberOfCasts: 5 casts in epoch in search range requested
Cast: 1 of 5
ProcessingCom: Calculation of derived variables: Practical Salinity, Density and Sound Speed are calculated
using smoothed Conductivity and smoothed scan-shifted Temperature. Temp Scan shift ahead = 0; Smoothing: 5-
point running mean.; 25 median point filter applied to the Chlorophyll data.; Oxygen data shifted ahead by 54
scans.; All data binned into depth bins of: 1m.; Percent Good Acceptance Value: 70.;
Cast location: Community Fishers
Station name: IRS3
ProcessingDate: 2019-10-29 22:17:32.606 ; UTC
StartDateCast: 2018-05-10 15:54:04 ; UTC
EndDateCast: 2018-05-10 16:00:44 ; UTC
LongitudeCastStart: -124.1091867 ; deg E
LongitudeCastEnd: -124.1097939 ; deg E
LatitudeCastStart: 49.546836 ; deg N
LatitudeCastEnd: 49.5468715 ; deg N
DepthCastStart: 1 m
DepthCastEnd: 151.5 m
*** 4 devices in cast
RBRconcerto C.T.D.DO.Fllfast6 (S/N 65647)
Aanderaa Optode 4831F (S/N 300)
Turner Cyclops-7 Fluorometer (S/N 2103465)
Samsung Galaxy Tab S2 (SN R52HA2KMCMP)
*** end devices
Column 1: Time, Column 2: Absolute Pressure (aligned and depth-binned); (decibar), Column 3: Conductivity
(aligned and depth-binned); (S/m), Column 4: Density (aligned and depth-binned); (kg/m3), Column 5: Depth
(aligned and depth-binned) (mobile position/attitude sensor); (m), Column 6: Practical Salinity (aligned and
depth-binned); (psu), Column 7: Pressure (aligned and depth-binned); (decibar), Column 8: Sound Speed (aligned
and depth-binned); (m/s), Column 9: Temperature (aligned and depth-binned); (C), Column 10: Oxygen Saturation
(aligned and depth-binned); (%), Column 11: Chlorophyll (aligned and depth-binned); (ug/l), Column 12: Latitude
(aligned and depth-binned) (mobile position/attitude sensor); (deg), Column 13: Longitude (aligned and depth-
binned) (mobile position/attitude sensor); (deg)
------ BEGIN DATA ------
20180510T155405.333Z , 9.609099 , 2.787437 , 1016.257904 , 1.000000 , 22.154511 , 1.229099 , 1489.057186 ,
14.175684 , 106.587980 , 3.951083 , 49.546836 , -124.109188
```

Behaviour when no data is retrieved

If the requested search range does not contain any data a file is created with "Missing Data Detected" for each sensor column in the file. These "Missing Data Detected" files are generated for each deployment in the search range. An example of this type of missing data file can be seen below.

Example Cast When No Data Retrieved

```
Deployment 1 of 1
Patrol name:   CommunityFishers_Set003_2020-01
NumberOfCasts: No casts in epoch in search range requested
Cast: 0 of 0
ProcessingCom: Calculation of derived variables: Practical Salinity, Density and Sound Speed are calculated
using smoothed Conductivity and smoothed scan-shifted Temperature. Temp Scan shift ahead = 0; Smoothing: 5-
point running mean.; 25 median point filter applied to the Chlorophyll data.; Oxygen data shifted ahead by 54
scans.; All data binned into depth bins of: 1m.; Percent Good Acceptance Value: 70.;
Cast location: Community Fishers
Station name:
ProcessingDate: Not Available ; UTC
StartDateCast: 2020-02-11 00:00:00 ; UTC
EndDateCast:   2020-02-11 09:00:00 ; UTC
LongitudeCastStart: Not Available ; deg E
LongitudeCastEnd: Not Available ; deg E
LatitudeCastStart:Not Available ; deg N
LatitudeCastEnd: Not Available ; deg N
DepthCastStart: Not Available
DepthCastEnd: Not Available
*** 4 devices in cast
AML CTD Plus X 50222
Turner Cyclops-7 Fluorometer (S/N 900052)
Aanderaa Optode 4531F-IW (S/N 737)
XSlate D10 Tablet (S/N SY9560FS00338)
*** end devices
Column 1: Time, Column 2: Conductivity (aligned and depth-binned); (S/m), Column 3: Density (aligned and depth-
binned); (kg/m3), Column 4: Depth (aligned and depth-binned); (m), Column 5: Practical Salinity (aligned and
depth-binned); (psu), Column 6: Turbidity (aligned and depth-binned); (NTU), Column 7: Pressure (aligned and
depth-binned); (decibar), Column 8: Sound Speed (aligned and depth-binned); (m/s), Column 9: Temperature
(aligned and depth-binned); (C), Column 10: Oxygen Saturation (aligned and depth-binned); (%), Column 11:
Chlorophyll (aligned and depth-binned); (ug/l)
------ BEGIN DATA ------
Missing Data Detected, Missing Data Detected, Missing Data Detected, Missing Data Detected, Missing Data
Detected, Missing Data Detected, Missing Data Detected, Missing Data Detected, Missing Data Detected, Missing
Data Detected, Missing Data Detected
------ END DATA ------
```

Revision History

1. 20191107: Initial Release

Formats

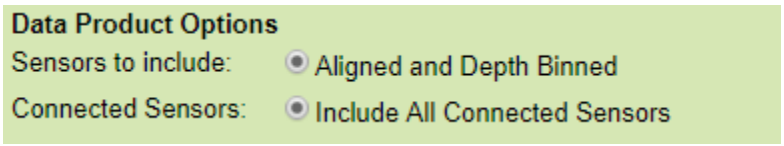
There is only one format for this data product which is a text file with a .cor extension. This type of file can be open in a wide variety of programs such as notepad, Wordpad, etc.

Oceans 2.0 API filter: `extension=cor`

Data Product Options

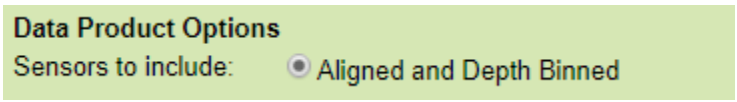
There are two data product option sets for this data product. These options are shown to represent the processing that is always applied to this data product and is therefore always selected. Devices with connected sensors, also known as 'piggyback' sensors will have two options as shown below, while devices without connected sensors will have one selected data product option.

Devices with connected / piggyback sensors (CTDs)



Oceans 2.0 API filter: `includePiggybackSensors=0,sensorstoinclude=1`

Devices without connected / piggyback sensors (CTDs)



Oceans 2.0 API filter: `sensorstoinclude=1`

Example Files

An example file for a device with connected sensors is available to download here: RBRCONCERTO65647_20180510T155405Z_20180510T215123Z-ALLCONNECTEDSENSORS.cor

An example file for a device without connected sensors is available to download here: AandOpt4831F300_20180510T155405Z_20180510T215123Z.cor