en640 flatfile notes

Date	Version	Notes	Who
7/16/2019	v1	Assembled workbook from binned *.btl files.	jpm
7/18/2019	v1	Add columns for FileName, Cruise, Station, StnEvent, BottleID. Clean up formatting for consistency	jpm
7/18/2019	v1	Export sheets to assemble flat file, then add flatfile to this workbook	jpm
2/13/2020	v2	Copy nutrients and add habitat parameters	hap
2/19/2020	v2	add sheet with surface (upper 10m) data	jpm
3/12/2021	v1	Created "en640-FlatFile-N-v1" to represent that this flatfile has N, nutrient, concentrations added	EKS
4/8/2021		Created "DATASET-EN640-Nutrients" to prepare data for BCO-DMO submission	
4/8/2021		Cleaned up workbook and input 'nd" to designate no data for these parameters	

en640 representative header file

* Sea-Bird SBE 9 Data File:
* FileName = D:\ctd\raw\EN640_002_01.hdr
* Software Version Seasave V 7.26.7.121
* Temperature SN = 4695
* Conductivity SN = 2822
* Number of Bytes Per Scan = 40
* Number of Voltage Words = 5
* Number of Scans Averaged by the Deck Unit = 1
* System UpLoad Time = Jun 15 2019 01:57:38
* NMEA Latitude = 11 17.29 N
* NMEA Longitude = 054 49.04 W
* NMEA UTC (Time) = Jun 15 2019 01:57:32

* Store Lat/Lon Data = Append to Every Scan
* SBE 11plus V 5.2
* number of scans to average = 1
* pressure baud rate = 9600
* NMEA baud rate = 4800
* surface PAR voltage added to scan
* A/D offset = 2
* Latitude/Longitude added to scan
* GPIB address = 1
* advance primary conductivity 0.073 seconds
* autorun on power up is disabled
* S>
** Ship: R/V Endeavor
** Cruise: EN640_Montoya
** Chief Scientist: Joseph Montoya
** Organization: GeorgiaTech
** Area of Operation: Amazon Plume
** Dates: 13 June - 08 July 2019
** Bridgetown, Barbados to Bridgetown, Barbados
** Station: 002
** Bottom Depth: 4667
** Operator: jpm
** Microstar deployment site
* System UTC = Jun 15 2019 01:57:38
# nquan = 45
# nvalues = 495
# units = specified
# name 0 = scan: Scan Count
# name 1 = timeJ: Julian Days
# name 2 = timeS: Time, Elapsed [seconds]

name 3 = prDM: Pressure, Digiquartz [db]
name 4 = depSM: Depth [salt water, m]
name 5 = t090C: Temperature [ITS-90, deg C]
name 6 = t190C: Temperature, 2 [ITS-90, deg C]
name 7 = T2-T190C: Temperature Difference, 2 - 1 [ITS-90, deg C]
name 8 = c0S/m: Conductivity [S/m]
name 9 = c1S/m: Conductivity, 2 [S/m]
name 10 = C2-C1S/m: Conductivity Difference, 2 - 1 [S/m]
name 11 = v0: Voltage 0
name 12 = CStarAt0: Beam Attenuation, WET Labs C-Star [1/m]
name 13 = CStarTr0: Beam Transmission, WET Labs C-Star [%]
name 14 = v1: Voltage 1
name 15 = flECO-AFL: Fluorescence, WET Labs ECO-AFL/FL [mg/m^3]
name 16 = v2: Voltage 2
name 17 = altM: Altimeter [m]
name 18 = v3: Voltage 3
name 19 = par: PAR/Irradiance, Biospherical/Licor [umol photons/m^2/sec]
name 20 = v4: Voltage 4
name 21 = sbeox0V: Oxygen raw, SBE 43 [V]
name 22 = v5: Voltage 5
name 23 = sbeox1V: Oxygen raw, SBE 43, 2 [V]
name 24 = v6: Voltage 6
name 25 = v7: Voltage 7
name 26 = spar: SPAR, Biospherical/Licor [umol photons/m^2/sec]
name 27 = pumps: Pump Status
name 28 = latitude: Latitude [deg]
name 29 = longitude: Longitude [deg]
name 30 = depSM: Depth [salt water, m], lat = 11.2882
name 31 = sal00: Salinity, Practical [PSU]
name 32 = sal11: Salinity, Practical, 2 [PSU]

name 33 = sigma-È00: Density [sigma-theta, kg/m^3]
name 34 = sigma-È11: Density, 2 [sigma-theta, kg/m^3]
name 35 = sbeox0Mm/L: Oxygen, SBE 43 [umol/l], WS = 2
name 36 = sbeox1Mm/L: Oxygen, SBE 43, 2 [umol/l], WS = 2
name 37 = potemp090C: Potential Temperature [ITS-90, deg C]
name 38 = potemp190C: Potential Temperature, 2 [ITS-90, deg C]
name 39 = svCM: Sound Velocity [Chen-Millero, m/s]
name 40 = svCM1: Sound Velocity, 2 [Chen-Millero, m/s]
name 41 = dz/dtM: Descent Rate [m/s], WS = 2
name 42 = gpa: Geopotential Anomaly [J/kg]
name 43 = nbin: number of scans per bin
name 44 = flag: flag
span 0 =   297,   17259
span 1 = 166.081833, 166.090013
span 2 =   12.326,   719.080
span 3 =   4.023,   501.459
span 4 =   4.000,   498.000
span 5 =   8.4490,   27.9989
span 6 =   8.4488,   27.9993
span 7 =   -0.0229,   0.1150
span 8 =   3.675294,   5.682390
span 9 =   3.674775,   5.682457
span 10 = -0.013726,   0.017389
span 11 =   4.3140,   4.4144
span 12 =   0.6501,   0.7434
span 13 =   83.0389,   84.9986
span 14 =   0.1111,   0.1580
span 15 =   -0.0062,   0.3223
span 16 =   -0.2102,   4.5487
span 17 =   -4.20,   90.97

span 18 =   0.0036,   1.3499
span 19 = -4.397e-04, 2.2583e+00
span 20 =   1.3167,   2.7128
span 21 =   1.3159,   2.7128
span 22 =   1.3419,   2.8160
span 23 =   1.3411,   2.8160
span 24 =   0.1734,   1.3816
span 25 =   0.0000,   0.0000
span 26 = 1.8968e+00, 1.8968e+00
span 27 =   1,   1
span 28 =   11.28825,   11.29007
span 29 = -54.81736, -54.81663
span 30 =   4.000,   498.000
span 31 =   27.5020,   37.0642
span 32 =   27.4977,   37.0611
span 33 =   16.7722,   27.1286
span 34 =   16.7689,   27.1244
span 35 =   111.359,   207.736
span 36 =   112.564,   209.631
span 37 =   8.3956,   27.9961
span 38 =   8.3954,   27.9965
span 39 =   1492.22,   1541.33
span 40 =   1492.22,   1541.33
span 41 =   -0.090,   1.539
span 42 =   0.134,   11.323
span 43 =   15,   485
span 44 = 0.0000e+00, 0.0000e+00
interval = meters: 1
start_time = Jun 15 2019 01:57:38 [System UTC, header]
bad_flag = -9.990e-29

```
# <Sensors count="15" >
#   <sensor Channel="1" >
#     <!-- Frequency 0, Temperature -->
#     <TemperatureSensor SensorID="55" >
#       <SerialNumber>4695</SerialNumber>
#       <CalibrationDate>01-Jan-19</CalibrationDate>
#       <UseG_J>1</UseG_J>
#       <A>0.00000000e+000</A>
#       <B>0.00000000e+000</B>
#       <C>0.00000000e+000</C>
#       <D>0.00000000e+000</D>
#       <F0_Old>0.000</F0_Old>
#       <G>4.39685694e-003</G>
#       <H>6.43712223e-004</H>
#       <I>2.15839307e-005</I>
#       <J>1.77633866e-006</J>
#       <F0>1000.000</F0>
#       <Slope>1.00000000</Slope>
#       <Offset>0.0000</Offset>
#     </TemperatureSensor>
#   </sensor>
#   <sensor Channel="2" >
#     <!-- Frequency 1, Conductivity -->
#     <ConductivitySensor SensorID="3" >
#       <SerialNumber>2822</SerialNumber>
#       <CalibrationDate>06-Apr-18</CalibrationDate>
#       <UseG_J>1</UseG_J>
#       <!-- Cell const and series R are applicable only for wide range sensors. -->
#       <SeriesR>0.0000</SeriesR>
#       <CellConst>2000.0000</CellConst>
```

```
#      <ConductivityType>0</ConductivityType>
#      <Coefficients equation="0" >
#        <A>0.00000000e+000</A>
#        <B>0.00000000e+000</B>
#        <C>0.00000000e+000</C>
#        <D>0.00000000e+000</D>
#        <M>0.0</M>
#        <CPcor>-9.57000000e-008</CPcor>
#      </Coefficients>
#      <Coefficients equation="1" >
#        <G>-1.01731965e+001</G>
#        <H>1.38552072e+000</H>
#        <I>-7.63638531e-004</I>
#        <J>1.20854147e-004</J>
#        <CPcor>-9.57000000e-008</CPcor>
#        <CTcor>3.2500e-006</CTcor>
#        <!-- WBOTC not applicable unless ConductivityType = 1. -->
#        <WBOTC>0.00000000e+000</WBOTC>
#      </Coefficients>
#      <Slope>1.00000000</Slope>
#      <Offset>0.00000</Offset>
#    </ConductivitySensor>
#  </sensor>
#  <sensor Channel="3" >
#    <!-- Frequency 2, Pressure, Digiquartz with TC -->
#    <PressureSensor SensorID="45" >
#      <SerialNumber>0712</SerialNumber>
#      <CalibrationDate>02-May-18</CalibrationDate>
#      <C1>-5.127137e+004</C1>
#      <C2>-6.250695e-001</C2>
```

```
#      <C3>1.463390e-002</C3>
#      <D1>3.819700e-002</D1>
#      <D2>0.000000e+000</D2>
#      <T1>2.998602e+001</T1>
#      <T2>-4.688386e-004</T2>
#      <T3>4.060280e-006</T3>
#      <T4>1.932470e-009</T4>
#      <Slope>1.00000574</Slope>
#      <Offset>-0.98745</Offset>
#      <T5>0.000000e+000</T5>
#      <AD590M>1.280800e-002</AD590M>
#      <AD590B>-9.760950e+000</AD590B>
#    </PressureSensor>
#  </sensor>
#  <sensor Channel="4" >
#    <!-- Frequency 3, Temperature, 2 -->
#    <TemperatureSensor SensorID="55" >
#      <SerialNumber>4333</SerialNumber>
#      <CalibrationDate>27-Dec-18</CalibrationDate>
#      <UseG_J>1</UseG_J>
#      <A>0.00000000e+000</A>
#      <B>0.00000000e+000</B>
#      <C>0.00000000e+000</C>
#      <D>0.00000000e+000</D>
#      <F0_Old>0.000</F0_Old>
#      <G>4.39861285e-003</G>
#      <H>6.47699445e-004</H>
#      <I>2.26254086e-005</I>
#      <J>1.80776199e-006</J>
#      <F0>1000.000</F0>
```

```
#      <Slope>1.00000000</Slope>
#      <Offset>0.0000</Offset>
#    </TemperatureSensor>
#  </sensor>
#  <sensor Channel="5" >
#    <!-- Frequency 4, Conductivity, 2 -->
#    <ConductivitySensor SensorID="3" >
#      <SerialNumber>1749</SerialNumber>
#      <CalibrationDate>12-Apr-18</CalibrationDate>
#      <UseG_J>1</UseG_J>
#      <!-- Cell const and series R are applicable only for wide range sensors. -->
#      <SeriesR>0.0000</SeriesR>
#      <CellConst>2000.0000</CellConst>
#      <ConductivityType>0</ConductivityType>
#      <Coefficients equation="0" >
#        <A>0.00000000e+000</A>
#        <B>0.00000000e+000</B>
#        <C>0.00000000e+000</C>
#        <D>0.00000000e+000</D>
#        <M>0.0</M>
#        <CPcor>-9.57000000e-008</CPcor>
#      </Coefficients>
#      <Coefficients equation="1" >
#        <G>-4.02069658e+000</G>
#        <H>5.07427251e-001</H>
#        <I>-5.95189790e-004</I>
#        <J>5.62956472e-005</J>
#        <CPcor>-9.57000000e-008</CPcor>
#        <CTcor>3.2500e-006</CTcor>
#        <!-- WBOTC not applicable unless ConductivityType = 1. -->
```

```
#         <WBOTC>0.00000000e+000</WBOTC>
#       </Coefficients>
#       <Slope>1.00000000</Slope>
#       <Offset>0.00000</Offset>
#     </ConductivitySensor>
#   </sensor>
#   <sensor Channel="6" >
#     <!-- A/D voltage 0, Transmissometer, WET Labs C-Star -->
#     <WET_LabsCStar SensorID="71" >
#       <SerialNumber>969DR</SerialNumber>
#       <CalibrationDate>29-Mar-18</CalibrationDate>
#       <M>19.5111</M>
#       <B>-1.1316</B>
#       <PathLength>0.250</PathLength>
#     </WET_LabsCStar>
#   </sensor>
#   <sensor Channel="7" >
#     <!-- A/D voltage 1, Fluorometer, WET Labs ECO-AFL/FL -->
#     <FluoroWetlabECO_AFL_FL_Sensor SensorID="20" >
#       <SerialNumber>231</SerialNumber>
#       <CalibrationDate>10-Jan-19</CalibrationDate>
#       <ScaleFactor>7.00000000e+000</ScaleFactor>
#       <!-- Dark output -->
#       <Vblank>0.1120</Vblank>
#     </FluoroWetlabECO_AFL_FL_Sensor>
#   </sensor>
#   <sensor Channel="8" >
#     <!-- A/D voltage 2, Altimeter -->
#     <AltimeterSensor SensorID="0" >
#       <SerialNumber>49899</SerialNumber>
```

```
#       <CalibrationDate>30-Mar-15</CalibrationDate>
#       <ScaleFactor>15.000</ScaleFactor>
#       <Offset>0.000</Offset>
#     </AltimeterSensor>
#   </sensor>
#   <sensor Channel="9" >
#     <!-- A/D voltage 3, PAR/Irradiance, Biospherical/Licor -->
#     <PAR_BiosphericalLicorChelseaSensor SensorID="42" >
#       <SerialNumber>70513</SerialNumber>
#       <CalibrationDate>02-Jan-2019</CalibrationDate>
#       <M>1.00000000</M>
#       <B>0.00000000</B>
#       <CalibrationConstant>9803921569.00000000</CalibrationConstant>
#       <ConversionUnits>1</ConversionUnits>
#       <Multiplier>1.00000000</Multiplier>
#       <Offset>-0.10346660</Offset>
#     </PAR_BiosphericalLicorChelseaSensor>
#   </sensor>
#   <sensor Channel="10" >
#     <!-- A/D voltage 4, Oxygen, SBE 43 -->
#     <OxygenSensor SensorID="38" >
#       <SerialNumber>1230</SerialNumber>
#       <CalibrationDate>21-Mar-19</CalibrationDate>
#       <Use2007Equation>1</Use2007Equation>
#       <CalibrationCoefficients equation="0" >
#         <!-- Coefficients for Owens-Millard equation. -->
#         <Boc>0.0000</Boc>
#         <Soc>0.0000e+000</Soc>
#         <offset>0.0000</offset>
#         <Pcor>0.00e+000</Pcor>
```

```
#       <Tcor>0.0000</Tcor>
#       <Tau>0.0</Tau>
#     </CalibrationCoefficients>
#     <CalibrationCoefficients equation="1" >
#       <!-- Coefficients for Sea-Bird equation - SBE calibration in 2007 and later. -->
#       <Soc>4.6282e-001</Soc>
#       <offset>-0.5101</offset>
#       <A>-4.5510e-003</A>
#       <B> 2.1257e-004</B>
#       <C>-3.1781e-006</C>
#       <D0> 2.5826e+000</D0>
#       <D1> 1.92634e-004</D1>
#       <D2>-4.64803e-002</D2>
#       <E> 3.6000e-002</E>
#       <Tau20> 1.1500</Tau20>
#       <H1>-3.3000e-002</H1>
#       <H2> 5.0000e+003</H2>
#       <H3> 1.4500e+003</H3>
#     </CalibrationCoefficients>
#   </OxygenSensor>
# </sensor>
# <sensor Channel="11" >
#   <!-- A/D voltage 5, Oxygen, SBE 43, 2 -->
#   <OxygenSensor SensorID="38" >
#     <SerialNumber>0348</SerialNumber>
#     <CalibrationDate>18-Aug-18</CalibrationDate>
#     <Use2007Equation>1</Use2007Equation>
#     <CalibrationCoefficients equation="0" >
#       <!-- Coefficients for Owens-Millard equation. -->
#       <Boc>0.0000</Boc>
```

```
#         <Soc>0.0000e+000</Soc>
#         <offset>0.0000</offset>
#         <Pcor>0.00e+000</Pcor>
#         <Tcor>0.0000</Tcor>
#         <Tau>0.0</Tau>
#       </CalibrationCoefficients>
#       <CalibrationCoefficients equation="1" >
#         <!-- Coefficients for Sea-Bird equation - SBE calibration in 2007 and later. -->
#         <Soc>4.2760e-001</Soc>
#         <offset>-0.4676</offset>
#         <A>-3.2801e-003</A>
#         <B> 1.7741e-004</B>
#         <C>-2.4529e-006</C>
#         <D0> 2.5826e+000</D0>
#         <D1> 1.92634e-004</D1>
#         <D2>-4.64803e-002</D2>
#         <E> 3.6000e-002</E>
#         <Tau20> 1.2200</Tau20>
#         <H1>-3.3000e-002</H1>
#         <H2> 5.0000e+003</H2>
#         <H3> 1.4500e+003</H3>
#       </CalibrationCoefficients>
#     </OxygenSensor>
#   </sensor>
#   <sensor Channel="12" >
#     <!-- A/D voltage 6, User Polynomial -->
#     <UserPolynomialSensor SensorID="61" >
#       <SerialNumber>783</SerialNumber>
#       <CalibrationDate>28-Jul-2016</CalibrationDate>
#       <SensorName>SUNA</SensorName>
```

```
#       <A0>-6.80600000</A0>
#       <A1>24.79800000</A1>
#       <A2>0.00000000</A2>
#       <A3>0.00000000</A3>
#     </UserPolynomialSensor>
#   </sensor>
#   <sensor Channel="13" >
#     <!-- A/D voltage 7, Free -->
#   </sensor>
#   <sensor Channel="14" >
#     <!-- SPAR voltage, Unavailable -->
#   </sensor>
#   <sensor Channel="15" >
#     <!-- SPAR voltage, SPAR, Biospherical/Licor -->
#     <SPAR_Sensor SensorID="51" >
#       <SerialNumber>20121</SerialNumber>
#       <CalibrationDate>02-Jan-2019</CalibrationDate>
#       <ConversionUnits>1</ConversionUnits>
#       <ConversionFactor>1.5535e+003</ConversionFactor>
#       <RatioMultiplier>1.00000000</RatioMultiplier>
#     </SPAR_Sensor>
#   </sensor>
# </Sensors>
# datcnv_date = Jul 04 2019 03:29:37, 7.26.7.129 [datcnv_vars = 30]
# datcnv_in = D:\CTD\raw\640_002_01.hex D:\CTD\raw\640_002_01.XMLCON
# datcnv_skipover = 0
# datcnv_ox_hysteresis_correction = yes
# filter_date = Jul 04 2019 03:29:50, 7.26.7.129
# filter_in = D:\CTD\proc\640_002_01.cnv
# filter_low_pass_tc_A = 0.030
```

filter_low_pass_tc_B = 0.150
filter_low_pass_A_vars =
filter_low_pass_B_vars = prDM depSM
alignctd_date = Jul 04 2019 03:29:53, 7.26.7.129
alignctd_in = D:\CTD\proc\640_002_01.cnv
alignctd_adv = c1S/m 0.073, v4 4.000, sbeox0V 4.000, v5 4.000, sbeox1V
4.000
celltm_date = Jul 04 2019 03:29:55, 7.26.7.129
celltm_in = D:\CTD\proc\640_002_01.cnv
celltm_alpha = 0.0300, 0.0300
celltm_tau = 7.0000, 7.0000
celltm_temp_sensor_use_for_cond = primary, secondary
Derive_date = Jul 04 2019 03:29:57, 7.26.7.129 [derive_vars = 13]
Derive_in = D:\CTD\proc\640_002_01.cnv D:\CTD\proc\640_002_01.XMLCON
derive_time_window_docdt = seconds: 2
derive_ox_tau_correction = yes
derive_time_window_dzdt = seconds: 2
binavg_date = Jul 04 2019 03:30:03, 7.26.7.129
binavg_in = D:\CTD\proc\640_002_01.cnv
binavg_bintype = meters
binavg_binsize = 1
binavg_excl_bad_scans = yes
binavg_skipover = 0
binavg_omit = 0
binavg_min_scans_bin = 1
binavg_max_scans_bin = 2147483647
binavg_surface_bin = yes, min = 0.000, max = 0.000, value = 0.000
file_type = binary
END