

## **Cabled-12\_TN393\_Discrete\_Summary Information:**

### **File Mapping:**

Hex files were renamed from the original ship-provided files for consistency and ease of processing. Original file names are listed below on the left, with corresponding new file names on the right. Original Hex files are accessible for each cruise in the Cruise Data folder under the "Ship Data" sub-directory. Bottle files used to populate the discrete summary can be found in the Water Sampling sub-directory under "Shipboard Data".

TN-393\_CTD\_01 = TN393\_CTD-001  
TN-393\_CTD\_02 = TN393\_CTD-002  
TN-393\_CTD\_03 = TN393\_CTD-003  
20210804\_0600 = TN393\_J2-1341\_20210804\_0600  
TN-393\_CTD\_04 = TN393\_CTD-004  
TN-393\_CTD\_05 = TN393\_CTD-005  
20210806\_1800 = TN393\_J2-1347\_20210806\_1800  
20210823\_0400 = TN393\_J2-1369\_20210823\_combined  
20210823\_0500 = TN393\_J2-1369\_20210823\_combined  
TN-393\_CTD\_06 = TN393\_CTD-006  
TN-393\_CTD\_07 = TN393\_CTD-007

### **Summary Notes:**

- TN393, CTD-001, Niskin 5: DiscreteSampleFlag: Salinity bottle cracked
- TN393, CTD-001, Niskin 6: DiscreteSampleFlag: Oxygen stopper placed in bottle upside down
- TN393, CTD-001, Niskin 21: DiscreteSampleFlag: salt present on salinity bottle neck
- TN393, CTD-003, Niskin 13: Niskin Flag: White caps needed to be taken off to get sample
- TN393, CTD-003, Niskin 17: Niskin Flag: White caps needed to be taken off to get sample
- TN393, CTD-006, Niskin 5: DiscreteSampleFlag: Oxygen sample over-titrated
- TN393, CTD-006, Niskin 18: Niskin Flag: Noted that Niskin was leaking after DIC collection
- TN393, CTD-007, Niskin 1: DiscreteSampleFlag: salt present on salinity bottle neck
- TN393, CTD-007, Niskin 2: DiscreteSampleFlag: Chlorophyll Stored in refrigerator after filtering
- TN393, CTD-007, Niskin 18: DiscreteSampleFlag: Chlorophyll Stored in refrigerator after filtration

- TN393, CTD-007, Niskin 21: DiscreteSampleFlag: Oxygen Sample not clear another 1 mL of H2SO4 added
- TN393, CTD-007, Niskin 22: DiscreteSampleFlag: Chlorophyll Stored in refrigerator after filtration
- TN393, CTD-007, Niskin 23: DiscreteSampleFlag: salt present on salinity bottle neck
- TN393, CTD-002, Cast Flag: "bottles triggered but did not close due to improper rigging"
- TN393, CTD-004, Cast Flag: "CTD hit the seafloor", CTD File Flag: "HPIES water collected, no verification samples"
- TN393, J2-1369, CTD File Flag: "Combined ROV CTD files 20210823\_0400.CT2 and 20210823\_0500.CT2 to cover timestamps of both Niskin triggers"

#### **General File Notes:**

- Fill value = -9999999
- Carbon analysis was provided by Burke Hales lab at Oregon State University. Calculated carbon parameters were provided by Hales using custom software routines using published values for the various carbon chemistry constants. Hales' lab provides the following references regarding constants used in the calculations. For further information, please contact Burke Hales (bhales@coas.oregonstate.edu).
  - Carbonic acid dissociation constants: Millero (2010), with full resolution constants provided by Millero via private conversation, equal to Lueker's constants at  $S > 25$ ).
  - $K_w$ : Millero (1995)
  - $K_b$ : Dickson (1990)
  - $K_{sp}$  for calcite and aragonite: Mucci (1980)
  - $K_h$ : Weiss (1973)
  - Alkalinity is modeled as:  $HCO_3^- + 2CO_3^{2-} + B(OH)_4^- + OH^- - H^+$

## Data Flag bit maps:

Bit Position	Cast Flags	CTD File Flags	CTD Parameter Flags	Niskin Flags	Discrete Sample Flags	Discrete Replicate Flags
0	Notes/Other	Notes/Other	Notes/Other	Notes/Other	Notes/Other	Notes/Other
1	Delayed start to data collection	Data cast only, no Niskins triggered	Not calibrated	Bottle information unavailable	Sample for this measurement was drawn from water bottle but analysis not received.	Duplicate analysis on same sample
2	Acceptable; normal cast according to SOP	Acceptable; file processed according to SOP	Acceptable measurement	No problems noted	Acceptable; sample processed according to SOP	Single sample
3	Non-standard winch speed	File processed using modified parameters	Questionable measurement	Leaking	Questionable measurement	Duplicate analysis from same Niskin
4	Non-standard surface soak time	File processed using alternate XMLCON	Bad measurement	Ran out of water during sampling	Bad measurement	Triplicate analysis from same Niskin
5	Non-standard bottle soak time before Niskin trip	Missing scans as indicated by modulo error counts	Not reported	Vent open	Not reported	Unassigned
6	Sensor issues but cast completed and data collected	Missing metadata	Calibration coefficients > 1 year old	Misfire at wrong depth	Sample collected out of order	Unassigned
7	Cable issues but cast completed and data collected	Unassigned	Corresponding discrete sample	Unknown problem	Sample processed using alternative method; see notes	Unassigned
8	Winch issues but cast completed and data collected	Unassigned	Unassigned	Unassigned	Unassigned	Unassigned
9	Premature cast end with data and/or data loss	Unassigned	Unassigned	Sample not drawn for this measurement from this bottle	Unassigned	Unassigned
10	Significant ship heave	Unassigned	Unassigned	Unassigned	Unassigned	Unassigned
11	Station position not adequately maintained during cast	Unassigned	Unassigned	Unassigned		Unassigned
12	Tow-yo, Yo-yo cast	Unassigned	Unassigned	Unassigned	Unassigned	Unassigned
13	ROV bottle sample	Unassigned	Unassigned	Unassigned	Unassigned	Unassigned
14	Unassigned	Unassigned	Unassigned	Unassigned	Unassigned	Unassigned
15	Unassigned	Unassigned	Unassigned	Unassigned	Unassigned	Unassigned