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CTD PROFILES

Tags Containing This Data Product
SCOUT-CTD

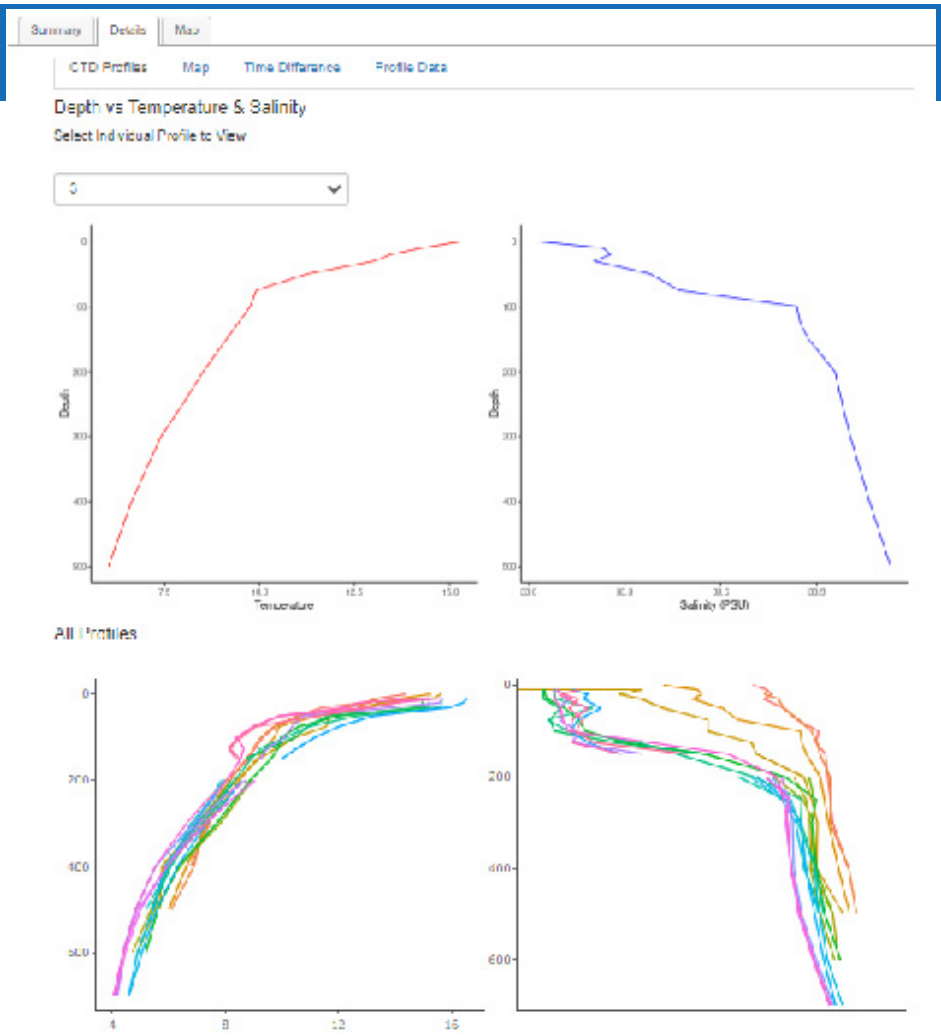
SCOUT-CTD is a prototype tag that collects oceanographic data including Conductivity, Temperature, and Depth (CTD). CTD data collected from animal-borne tags provide information about the environment of the tagged animal during the deployment period and are often used to supplement buoy- and ship-collected oceanographic data. The SCOUT-CTD tag generates salinity and temperature profiles with corresponding Fastloc® GPS locations. This tag uses a fully-calibrated electrode-based conductivity sensor coupled with a high-resolution temperature thermistor to collect oceanographic profiles using air-breathing marine mammals.

Data

A CTD profile is developed by measuring the external (environmental) temperature conductivity at pre-determined depths corresponding to either the World Ocean Database 2013 (WOD13) or World Ocean Atlas 1994 (WOA94) depth tables.

The tag is configured with a summary period (1-24hr) and a minimum dive depth and will store a "profile" from the deepest dive within the summary period. Temperature, conductivity, and depth will be sampled at 1 Hz on selected dive ascents. If a dive descends 10% deeper than any previous dive in the current summary period, then all previous data are cleared, and new CTD data are collected for the remainder of the current dive. The temperature and conductivity are saved if the depth of the reading corresponds to the selected depth table (WOD13 or WOA94). When a summarization period begins, the conductivity sensor is activated when the animal moves past the minimum dive depth and "triggers" the start of recording. Recording will stop when the tag reads "dry" and then a Fastloc® snapshot is taken and the "trigger" depth is increased by 10%. This cycle will continue until the end of the summary period.

When a summary period ends, the tag creates a profile message containing salinity and temperature pairs for each of the encountered depths from the selected depth table (WOD13 or WOA94).



The map pairs each GPS location to a profile based on the timestamps. The profile nearest in time to the time of the snapshopt is paired to that location.

Each CTD data message contains up to eight salinity + temperature pairs at consecutive depth levels. Depending on the max depth of the profile/dive, a profile may require multiple messages for transmission.

There are 26 standard depths for NODC (Levitus) World Ocean Atlas 1994 (WOA94, Table 1), and 67 World Ocean Database 2013 (WOD13, Table 2) standard depths for dives up to 2000 m. A dive to 125 m using WOA94 would be transmitted in one Argos data message. The same dive using WOD13 would require three messages for transmission.

CTD PROFILES – CONTINUED

WOA94 Standard Depths for 2000 Meters and Above									
Depth	**Level**	**Depth**	**Level**	**Depth**	**Level**	**Depth**	**Level**	**Depth**	**Level**
0	1	100	7	400	13	1000	19	1750	25
10	2	125	8	500	14	1100	20	2000	26
20	3	150	9	600	15	1200	21		
30	4	200	10	700	16	1300	22		
50	5	250	11	800	17	1400	23		
75	6	300	12	900	18	1500	24		

Table 1. WOA94 standard depths up to 2000 m.

WOD13 Standard Depths for 2000 Meters and Above									
Depth	**Level**	**Depth**	**Level**	**Depth**	**Level**	**Depth**	**Level**	**Depth**	**Level**
0	1	70	15	300	29	800	43	1500	57
5	2	75	16	325	30	850	44	1550	58
10	3	80	17	350	31	900	45	1600	59
15	4	85	18	375	32	950	46	1650	60
20	5	90	19	400	33	1000	47	1700	61
25	6	95	20	425	34	1050	48	1750	62
30	7	100	21	450	35	1100	49	1800	63
35	8	125	22	475	36	1150	50	1850	64
40	9	150	23	500	37	1200	51	1900	65
45	10	175	24	550	38	1250	52	1950	66
50	11	200	25	600	39	1300	53	2000	67
55	12	225	26	650	40	1350	54		
60	13	250	27	700	41	1400	55		
65	14	275	28	750	42	1450	56		

Table 2. WOD13 standard depths up to 2000 m.