

POINT LOMA OCEAN OUTFALL MONTHLY RECEIVING WATERS MONITORING REPORT

POINT LOMA WASTEWATER TREATMENT PLANT

NPDES Permit No. CA0107409
SDRWQCB Order No. R9-2017-0007

SEPTEMBER 2021

Environmental Monitoring and Technical Services
2392 Kincaid Road • Mail Station 45A • San Diego, CA 92101
Tel (619) 758-2300 Fax (619) 758-2309



October 31, 2021

Mr. David W. Gibson, Executive Officer
California Regional Water Quality Control Board
San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108

Attention: POTW Compliance Unit

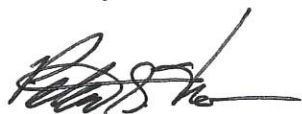
Dear Mr. Gibson:

Enclosed is the September 2021 Monthly Receiving Waters Monitoring Report for the Point Loma Ocean Outfall, Point Loma Wastewater Treatment Plant as required per Order No. R9-2017-0007, NPDES Permit No. CA0107409.

This report includes raw ocean monitoring data and summaries of water quality parameters and ocean conditions measured during the month for the Point Loma outfall region. Also included are summaries of compliance with the bacterial water-contact standards specified in the California Ocean Plan.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Sincerely,



Peter S. Vroom, Ph.D.
Deputy Public Utilities Director

PV/rk

cc: U.S. Environmental Protection Agency, Region 9

INTRODUCTION

Monthly reports of water quality and ocean conditions for the San Diego coastal region surrounding the Point Loma Ocean Outfall are submitted to the San Diego Regional Water Quality Control Board and U.S. EPA Region 9 in accordance with Order No. R9-2017-0007, NPDES Permit No. CA0107409 for the Point Loma Wastewater Treatment Plant (PLWTP), Point Loma Ocean Outfall (PLOO). This report includes receiving waters monitoring data collected from all shore, kelp and offshore stations specified in the above order. Data for influent and effluent monitoring activities for the PLWTP are presented in separate reports.

MATERIALS AND METHODS

Shore Stations

Water quality conditions are required to be monitored at eight shoreline stations, including D4, D5, D7, D8, D9, D10, D11 and D12, which range from the tip of the Point Loma Peninsula to west of Mission Bay (see station locations map). Over the past several years, due to increasing instability in several cliffside areas of Point Loma, City staff have been unable to safely access and sample several stations at various times. This has resulted in the following modifications:

- Station D8 was replaced by alternate station D8-A during July 2016, which was subsequently replaced by station D8-B in March 2018, after which sampling at station D8-A resumed in December 2020. Due to recent access issues at D8-A, sampling resumed at D8-B during February 2021.

Seawater samples are collected from the surf zone at each station on a weekly basis. These samples are subsequently transported to the City's Marine Microbiology Laboratory and analyzed for the presence of several types of fecal indicator bacteria (FIB), including total coliforms, fecal coliforms, and *Enterococcus*. Visual observations of water color and clarity, surf height, human or animal activity, and weather conditions are also recorded at the time of sample collection. Wind speed and direction are measured using a hand-held anemometer with a compass.

Kelp Bed Stations

The eight kelp stations are sampled weekly according to permit specifications to monitor water quality conditions within the Point Loma kelp forest. These stations include three sites located along the inshore edge of the kelp bed paralleling the 9-m depth contour (i.e., stations C4, C5 and C6), and five sites located near the offshore edge of the kelp bed along the 18-m depth contour (i.e., stations A1, A6, A7, C7 and C8).

Routine weekly monitoring at each of the kelp bed sites consists primarily of collecting seawater samples at discrete depths to determine concentrations of fecal indicator bacteria (i.e., total coliforms, fecal coliforms, and *Enterococcus*). Water column profiles of various physical/chemical parameters are also generated during each sampling event, and visual observations of weather and water conditions are recorded at each station.

Seawater samples at the kelp bed stations are collected using a CTD-integrated rosette sampler with Niskin bottles. Aliquots for bacteriological analyses are drawn from these bottles into sterile sample bottles for processing at the City's Marine Microbiology Laboratory. Water column

profiles of temperature, transmissivity, dissolved oxygen, pH, salinity, density, chlorophyll *a* are generated using a Sea-Bird conductivity, temperature and depth instrument (CTD), which collects these data at a rate of ≥ 4 scans per second. These scans are then internally averaged to create water column profiles with data readings at a rate of one per meter. Additionally, CTD profile data for each water sample depth are presented with the bacteriological data.

Offshore Stations

Offshore water quality sampling is conducted quarterly typically during the months of February, May, August and November. A total of 36 offshore stations (F01–F36) are sampled during each survey usually over a 3-day period. Three of the stations (F01–F03) are located along the 18 m depth contour, while 11 stations are located along each of the following contours: 60 m (stations F04–F14), 80 m (stations F15–F25), and 98 m (stations F26–F36). Of these 36 stations, 15 (F01–F03, F06–F14, F18–F20) are located within State jurisdictional waters (i.e., within 3 nautical miles of shore) and are subject to the California Ocean Plan’s compliance standards. Monitoring at all offshore sites includes measurements of *Enterococcus* bacteria, water temperature, salinity, density, dissolved oxygen, pH, chlorophyll *a*, transmissivity, chromomorphpic dissolved organic matter (CDOM), and visual observations of weather and water conditions.

Seawater samples for bacteriological analyses at the offshore stations are collected using a CTD-integrated rosette sampler with Niskin bottles. Profiles of the various physical/chemical parameters (listed above) are taken using a Sea-Bird CTD. Additionally, data for depths closest to those at which bacteriological samples were collected are extracted from the CTD profiles and presented with the bacteriological data.

Bacteriological Reporting and Quality Assurance

Estimated values for bacteriological analyses are denoted by greater than (>), less than (<), or estimated (e) qualifiers and result from plates with colony counts above or below the permissible counting limits established in Bordner et al. (1978)¹. This document defines membrane filtration limits of 20–80 colonies per plate for total coliforms and 20–60 colonies per plate for fecal coliforms and *Enterococcus*. No Data (ND) is reported if plate counts from all dilutions have a total colony count of >200 per plate.

Results of the bacteriological analysis of seawater samples collected from each of the shore, kelp bed, and offshore stations located within State waters are assessed relative to the geometric mean and single sample maximum water-contact standards specified in the California Ocean Plan. The seven standards are defined as follows:

30-day Geometric Mean: The following standards are based on the geometric mean of the five most recent samples from each site.

- (1) Total coliform density shall not exceed 1000 CFU/100 mL;
- (2) Fecal coliform density shall not exceed 200 CFU/100 mL;
- (3) *Enterococcus* density shall not exceed 35 CFU/100 mL

Single Sample Maximums:

¹ Bordner, R., J. Winter, and P. Scarpino (eds.). (1978). Microbiological Methods for Monitoring the Environment: Water and Wastes, EPA Research and Development, EPA-600/8-78-017. 337 p.

- (1) Total coliform density shall not exceed 10,000 CFU/100 mL;
- (2) Fecal coliform density shall not exceed 400 CFU/100 mL;
- (3) *Enterococcus* density shall not exceed 104 CFU/100 mL;
- (4) Total coliform density shall not exceed 1,000 CFU/100 mL when the fecal coliform/total coliform ratio exceeds 0.1.

Quality controls of bacteriological data include laboratory and field duplicate analyses. Laboratory duplicates are performed on approximately 10% of the water quality samples, while field duplicates are performed six times a month (see Appendix A). Laboratory duplicates represent two aliquots of the original sample that are split in the laboratory and analyzed by the same analyst using identical procedures within the same analytical run. The results of these analyses provide a measure of intra-analyst precision. In contrast, field duplicates represent two separate samples collected at the same time from the same site, which are handled under identical circumstances and treated the same throughout field and lab procedures. The results of these analyses provide a measure of precision associated with sample collection, preservation, storage, and lab procedures. The sign test (see Gilbert, 1987²) is used to statistically compare both the results from the laboratory duplicates, as well as the results from the field duplicates. These data will be further analyzed in the City's 2021 Quality Assurance Report, which will be completed in March 2022.

SUMMARY OF RESULTS

As of October 2020, new 2019 Ocean Plan Water Quality Objectives are included for a six-week rolling geometric mean of *Enterococcus* density, which shall not to exceed 30 cfu/100 ml, and a Statistical Threshold Value (STV) for *Enterococcus*, which shall not exceed 110 cfu/100 ml for more than 10% of samples per month (see Appendix B).

Additionally, the final project report for the 2021 Point Loma Wastewater Treatment Plant (PLWTP) Chlorine Reduction Study is included as Appendix C. This study occurred in response to a nationwide chlorine shortage that caused an unplanned, necessary reduction in chlorine disinfection of PLWTP effluent from June 15, 2021 through August 18, 2021. To assess any potential effects on receiving waters resulting from decreased disinfection, the City's Environmental Monitoring and Technical Services Division conducted semi-weekly sampling of the PLWTP Effluent (PLE) and at a select group of offshore monitoring stations closest to the outfall. The results from this additional monitoring are included herein.

Shore Stations

- The eight shore stations (D4, D5, D7, D8-B, D9, D10, D11, D12) were sampled on September 1, 8, 15, 22, and 29.
- During September, each of the shore stations was in compliance with the various 2015 California Ocean Plan (Ocean Plan) water contact standards.
- Nothing of sewage origin was observed at any of the shore stations.
- Over the years, elevated bacteria levels at shore and kelp bed stations have tended to be associated with rainfall events, heavy recreational use, or the presence of seabirds or decaying kelp and surf grass. See the City of San Diego's most recent *Biennial Receiving Waters*

2 Gilbert, R.O. (1987). Statistical Methods for Environmental Pollution Monitoring. Van Nostrand Reinhold Co., New York.

Monitoring and Assessment Report for the Point Loma and South Bay Ocean Outfalls for details (<https://www.sandiego.gov/public-utilities/sustainability/ocean-monitoring/reports>).

Kelp Bed Stations

- The eight kelp bed water quality stations (A1, A6, A7, C4, C5, C6, C7, C8) were sampled on September 7, 13, 22, and 28.
- During September, each of the kelp stations was in compliance with the various 2015 California Ocean Plan (Ocean Plan) water contact standards.
- Water column temperatures ranged from 12.86 to 19.47°C. The difference between surface and bottom waters ranged from 1.84 to 5.97°C.
- Chlorophyll *a* concentrations ranged from 0.53 to 3.62 µg/L.
- Nothing of sewage origin was observed at any of the kelp stations.

Offshore Stations

- Quarterly water quality sampling was not conducted during September at the offshore stations. The next quarterly sampling is scheduled for November 2021.



TABLES AND FIGURES

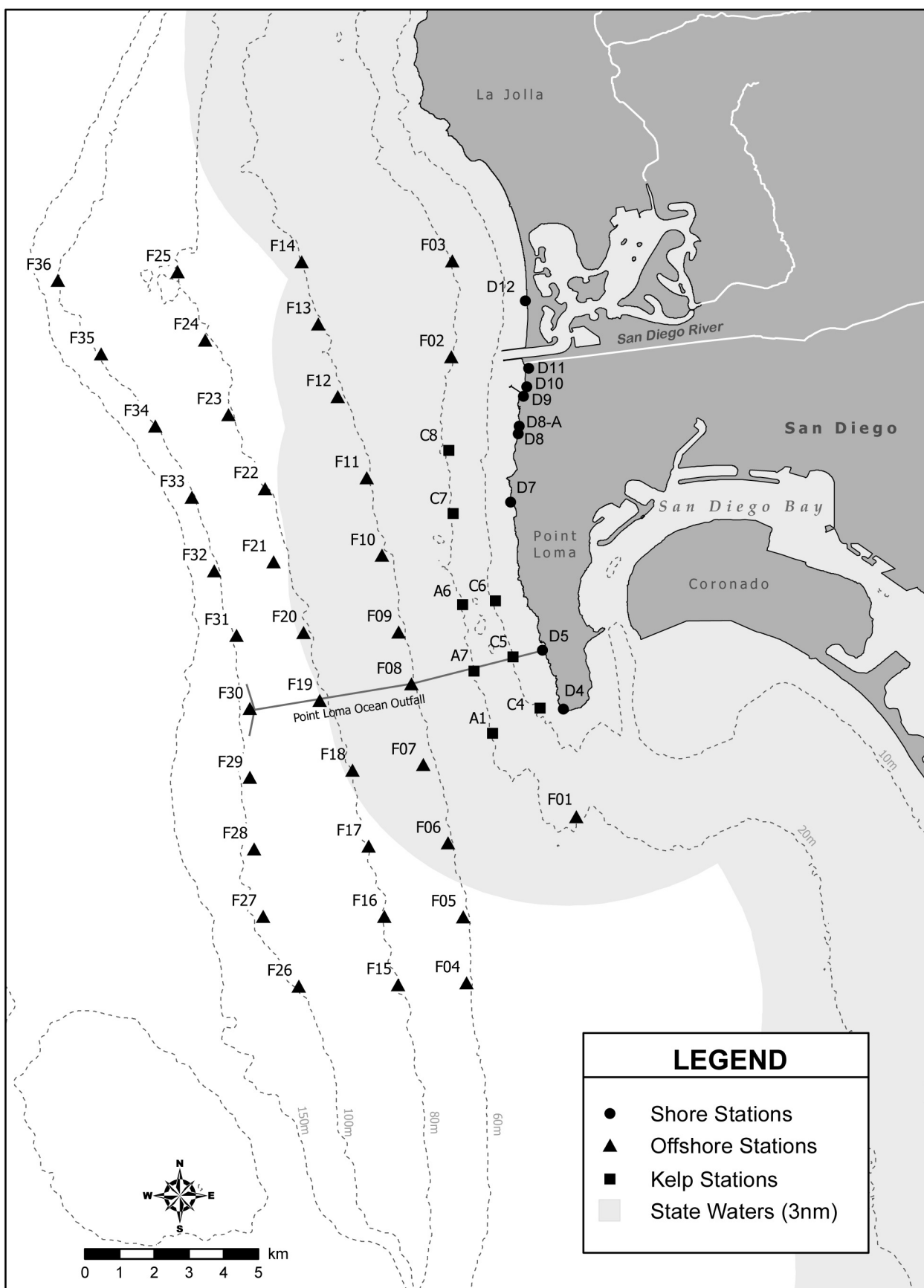


Figure 1.1 Station Map

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Shore Stations

Table 2.1

Summary of compliance with the Ocean Plan's 30-day Geometric Mean standard for total coliform bacteria at the PLOO shore stations. Data are based on the geometric mean of the five most recent samples from each site over the previous 30 days unless otherwise noted (*). Values >1,000 CFU/100 mL exceed the standard.

Date	D4	D5	D7	D8-B	D9	D10	D11	D12
01 Sep 2021	3	6	58	37	18	61	44	8
02 Sep 2021	3	6	58	37	18	61	44	8
03 Sep 2021	4	5	75	36	18	61	41	11
04 Sep 2021	4	5	75	36	18	61	41	11
05 Sep 2021	4	5	75	36	18	61	41	11
06 Sep 2021	4	5	75	36	18	61	41	11
07 Sep 2021	4	5	75	36	18	61	41	11
08 Sep 2021	5	6	58	32	18	49	35	8
09 Sep 2021	5	6	58	32	18	49	35	8
10 Sep 2021	6	8	42	20	19	34	19	6
11 Sep 2021	6	8	42	20	19	34	19	6
12 Sep 2021	6	8	42	20	19	34	19	6
13 Sep 2021	6	8	42	20	19	34	19	6
14 Sep 2021	6	8	42	20	19	34	19	6
15 Sep 2021	8	10	58	20	19	38	20	8
16 Sep 2021	8	10	58	20	19	38	20	8
17 Sep 2021	11	15	75	20	19	37	15	6
18 Sep 2021	11	15	75	20	19	37	15	6
19 Sep 2021	11	15	75	20	19	37	15	6
20 Sep 2021	11	15	75	20	19	37	15	6
21 Sep 2021	11	15	75	20	19	37	15	6
22 Sep 2021	13	16	72	20	19	33	12	8
23 Sep 2021	13	16	72	20	19	33	12	8
24 Sep 2021	11	15	56	20	22	37	13	6
25 Sep 2021	11	15	56	20	22	37	13	6
26 Sep 2021	11	15	56	20	22	37	13	6
27 Sep 2021	11	15	56	20	22	37	13	6
28 Sep 2021	11	15	56	20	22	37	13	6
29 Sep 2021	13	25	52	32	27	33	14	9
30 Sep 2021	13	25	52	32	27	33	14	9

* Geometric mean calculated using n<5
 ns = not sampled

Table 2.2

Summary of compliance with the Ocean Plan's 30-day Geometric Mean standard for fecal coliform bacteria at the PLOO shore stations. Data are based on the geometric mean of the five most recent samples from each site over the previous 30 days unless otherwise noted (*). Values >200 CFU/100 mL exceed the standard.

Date	D4	D5	D7	D8-B	D9	D10	D11	D12
01 Sep 2021	2	2	6	5	2	7	7	2
02 Sep 2021	2	2	6	5	2	7	7	2
03 Sep 2021	2	2	8	5	2	8	6	2
04 Sep 2021	2	2	8	5	2	8	6	2
05 Sep 2021	2	2	8	5	2	8	6	2
06 Sep 2021	2	2	8	5	2	8	6	2
07 Sep 2021	2	2	8	5	2	8	6	2
08 Sep 2021	2	2	6	4	2	8	7	2
09 Sep 2021	2	2	6	4	2	8	7	2
10 Sep 2021	2	2	3	2	3	5	4	2
11 Sep 2021	2	2	3	2	3	5	4	2
12 Sep 2021	2	2	3	2	3	5	4	2
13 Sep 2021	2	2	3	2	3	5	4	2
14 Sep 2021	2	2	3	2	3	5	4	2
15 Sep 2021	2	2	3	2	3	4	4	2
16 Sep 2021	2	2	3	2	3	4	4	2
17 Sep 2021	2	2	3	2	3	4	3	2
18 Sep 2021	2	2	3	2	3	4	3	2
19 Sep 2021	2	2	3	2	3	4	3	2
20 Sep 2021	2	2	3	2	3	4	3	2
21 Sep 2021	2	2	3	2	3	4	3	2
22 Sep 2021	2	2	5	2	3	3	3	2
23 Sep 2021	2	2	5	2	3	3	3	2
24 Sep 2021	2	2	4	2	3	4	3	2
25 Sep 2021	2	2	4	2	3	4	3	2
26 Sep 2021	2	2	4	2	3	4	3	2
27 Sep 2021	2	2	4	2	3	4	3	2
28 Sep 2021	2	2	4	2	3	4	3	2
29 Sep 2021	2	2	5	2	3	3	3	2
30 Sep 2021	2	2	5	2	3	3	3	2

* Geometric mean calculated using n<5

ns = not sampled

Table 2.3

Summary of compliance with the Ocean Plan's 30-day Geometric Mean standard for *Enterococcus* at the PLOO shore stations. Data are based on the geometric mean of the five most recent samples from each site over the previous 30 days unless otherwise noted (*). Values >35 CFU/100 mL exceed the standard.

Date	D4	D5	D7	D8-B	D9	D10	D11	D12
01 Sep 2021	2	2	7	4	2	5	10	3
02 Sep 2021	2	2	7	4	2	5	10	3
03 Sep 2021	2	2	7	4	2	6	11	2
04 Sep 2021	2	2	7	4	2	6	11	2
05 Sep 2021	2	2	7	4	2	6	11	2
06 Sep 2021	2	2	7	4	2	6	11	2
07 Sep 2021	2	2	7	4	2	6	11	2
08 Sep 2021	2	2	7	4	3	6	9	3
09 Sep 2021	2	2	7	4	3	6	9	3
10 Sep 2021	2	2	4	2	4	3	5	3
11 Sep 2021	2	2	4	2	4	3	5	3
12 Sep 2021	2	2	4	2	4	3	4	3
13 Sep 2021	2	2	4	2	4	3	4	3
14 Sep 2021	2	2	4	2	4	3	4	3
15 Sep 2021	2	2	4	2	3	3	4	2
16 Sep 2021	2	2	4	2	3	3	4	2
17 Sep 2021	2	2	5	2	4	3	3	3
18 Sep 2021	2	2	5	2	4	3	3	3
19 Sep 2021	2	2	5	2	4	3	3	3
20 Sep 2021	2	2	5	2	4	3	3	3
21 Sep 2021	2	2	5	2	4	3	3	3
22 Sep 2021	2	2	4	3	3	2	3	2
23 Sep 2021	2	2	4	3	3	2	3	2
24 Sep 2021	2	2	4	3	4	3	3	3
25 Sep 2021	2	2	4	3	4	3	3	3
26 Sep 2021	2	2	4	3	4	3	3	3
27 Sep 2021	2	2	4	3	4	3	3	3
28 Sep 2021	2	2	4	3	4	3	3	3
29 Sep 2021	2	2	3	3	3	2	3	2
30 Sep 2021	2	2	3	3	3	2	3	2

* Geometric mean calculated using n<5
 ns = not sampled

Table 2.4

Summary of compliance at the PLOO shore stations with the Ocean Plan's Single Sample Maximum standard for total coliform bacteria, which states that total coliform density shall not exceed 10,000 CFU/100 mL.

Date	D4	D5	D7	D8-B	D9	D10	D11	D12
01 Sep 2021	IC	IC	IC	IC	IC	IC	IC	IC
08 Sep 2021	IC	IC	IC	IC	IC	IC	IC	IC
15 Sep 2021	IC	IC	IC	IC	IC	IC	IC	IC
22 Sep 2021	IC	IC	IC	IC	IC	IC	IC	IC
29 Sep 2021	IC	IC	IC	IC	IC	IC	IC	IC

IC = In Compliance

E = Exceedance

ns = not sampled

ND = no data

Table 2.5

Summary of compliance at the PLOO shore stations with the Ocean Plan's Single Sample Maximum standard for fecal coliform bacteria, which states that fecal coliform density shall not exceed 400 CFU/100 mL.

Date	D4	D5	D7	D8-B	D9	D10	D11	D12
01 Sep 2021	IC	IC	IC	IC	IC	IC	IC	IC
08 Sep 2021	IC	IC	IC	IC	IC	IC	IC	IC
15 Sep 2021	IC	IC	IC	IC	IC	IC	IC	IC
22 Sep 2021	IC	IC	IC	IC	IC	IC	IC	IC
29 Sep 2021	IC	IC	IC	IC	IC	IC	IC	IC

IC = In Compliance

E = Exceedance

ns = not sampled

ND = no data

Table 2.6

Summary of compliance at the PLOO shore stations with the Ocean Plan's Single Sample Maximum standard for *Enterococcus* bacteria, which states that *Enterococcus* density shall not exceed 104 CFU/100 mL.

Date	D4	D5	D7	D8-B	D9	D10	D11	D12
01 Sep 2021	IC	IC	IC	IC	IC	IC	IC	IC
08 Sep 2021	IC	IC	IC	IC	IC	IC	IC	IC
15 Sep 2021	IC	IC	IC	IC	IC	IC	IC	IC
22 Sep 2021	IC	IC	IC	IC	IC	IC	IC	IC
29 Sep 2021	IC	IC	IC	IC	IC	IC	IC	IC

IC = In Compliance

E = Exceedance

ns = not sampled

ND = no data

Table 2.7

Summary of compliance at the PLOO shore stations with the Ocean Plan's Single Sample Maximum standard for total coliform bacteria and the fecal/total coliform ratio (F:T), which states that total coliform density shall not exceed 1,000 CFU/100 mL when F:T > 0.1.

Date	D4	D5	D7	D8-B	D9	D10	D11	D12
01 Sep 2021	IC	IC	IC	IC	IC	IC	IC	IC
08 Sep 2021	IC	IC	IC	IC	IC	IC	IC	IC
15 Sep 2021	IC	IC	IC	IC	IC	IC	IC	IC
22 Sep 2021	IC	IC	IC	IC	IC	IC	IC	IC
29 Sep 2021	IC	IC	IC	IC	IC	IC	IC	IC

IC = In Compliance

E = Exceedance

ns = not sampled

ND = no data

Table 2.8

Summary of water quality parameters at the PLOO shore stations for each sample date. Densities of total coliform (Total), fecal coliform (Fecal), and *Enterococcus* (Entero) are reported as CFU/100 mL. The fecal:total coliform ratio (F:T) is unitless. Comments follow the data summary.

Station	Date	Time	Total	Fecal	Entero	F:T
D4	01 Sep 2021	748	2e	2e	<2	1.00
D4	08 Sep 2021	1106	<20	<2	<2	0.10
D4	15 Sep 2021	813	<20	<2	<2	0.10
D4	22 Sep 2021	803	<20	<2	<2	0.10
D4	29 Sep 2021	829	<20	<2	2e	0.10
D5	01 Sep 2021	737	6e	<2	<2	0.33
D5	08 Sep 2021	1050	<20	<2	<2	0.10
D5	15 Sep 2021	839	<20	<2	2e	0.10
D5	22 Sep 2021	822	<20	<2	<2	0.10
D5	29 Sep 2021	810	<200	<2	<2	0.01
D7	01 Sep 2021	808	40e	<2	8e	0.05
D7	08 Sep 2021	950	<20	2e	4e	0.10
D7	15 Sep 2021	907	<200	<2	4e	0.01
D7	22 Sep 2021	851	60e	38e	2e	0.63
D7	29 Sep 2021	906	40e	12e	<2	0.30
D8-B	01 Sep 2021	824	20e	2e	<2	0.10
D8-B	08 Sep 2021	936	<20	<2	4e	0.10
D8-B	15 Sep 2021	930	<20	<2	<2	0.10
D8-B	22 Sep 2021	913	<20	<2	6e	0.10
D8-B	29 Sep 2021	924	<200	2e	<2	0.01
D9	01 Sep 2021	836	30e	<2	<2	0.07
D9	08 Sep 2021	917	20e	6e	30e	0.30
D9	15 Sep 2021	1010	<20	4e	<2	0.20
D9	22 Sep 2021	930	20e	<2	2e	0.10
D9	29 Sep 2021	937	60e	<2	<2	0.03
D10	01 Sep 2021	849	80e	8e	2e	0.10
D10	08 Sep 2021	854	20e	8e	6e	0.40
D10	15 Sep 2021	1021	60e	<2	2e	0.03
D10	22 Sep 2021	1003	<20	<2	<2	0.10
D10	29 Sep 2021	950	20e	<2	<2	0.10
D11	01 Sep 2021	902	12e	2e	4e	0.17
D11	08 Sep 2021	840	20e	12e	4e	0.60
D11	15 Sep 2021	1035	20e	2e	<2	0.10
D11	22 Sep 2021	1022	6e	<2	<2	0.33
D11	29 Sep 2021	1004	<20	<2	<2	0.10
D12	01 Sep 2021	946	<2	<2	<2	1.00
D12	08 Sep 2021	818	2e	2e	6e	1.00
D12	15 Sep 2021	1104	<20	<2	<2	0.10
D12	22 Sep 2021	1103	<20	<2	<2	0.10
D12	29 Sep 2021	1037	42	<2	<2	0.05

ns = not sampled

ND = no data

Table 2.9

Summary of visual observations made during the month for each PLOO shore station by sample date.

Station	Date	Parameter	Value
D4	01 Sep 2021	Arrive Time	748
D4	01 Sep 2021	Weather	Cloudy
D4	01 Sep 2021	Wind Speed (kts)	2.4
D4	01 Sep 2021	Wind Dir	S
D4	01 Sep 2021	Animal Life	Bird-2
D4	01 Sep 2021	Floatables	None
D4	01 Sep 2021	Water Color	Green
D4	01 Sep 2021	Current Direction	N
D4	01 Sep 2021	Water Temp (C)	19.7
D4	01 Sep 2021	Wave Height Low (ft)	2
D4	01 Sep 2021	High Tide (ft)	3.52
D4	01 Sep 2021	High Tide Time	805
D4	01 Sep 2021	Low Tide (ft)	0.81
D4	01 Sep 2021	Low Tide Time	59
D4	01 Sep 2021	Comments	Algae
D4	08 Sep 2021	Arrive Time	1050
D4	08 Sep 2021	Weather	Cloudy
D4	08 Sep 2021	Wind Speed (kts)	2.5
D4	08 Sep 2021	Wind Dir	S
D4	08 Sep 2021	Animal Life	
D4	08 Sep 2021	Floatables	Foam
D4	08 Sep 2021	Water Color	Green
D4	08 Sep 2021	Current Direction	S
D4	08 Sep 2021	Water Temp (C)	22.2
D4	08 Sep 2021	Wave Height Low (ft)	2
D4	08 Sep 2021	High Tide (ft)	5.22
D4	08 Sep 2021	High Tide Time	1043
D4	08 Sep 2021	Low Tide (ft)	-0.15
D4	08 Sep 2021	Low Tide Time	435
D4	08 Sep 2021	Comments	Kelp; Seagrass; Algae
D4	15 Sep 2021	Arrive Time	813
D4	15 Sep 2021	Weather	Cloudy
D4	15 Sep 2021	Wind Speed (kts)	0.8
D4	15 Sep 2021	Wind Dir	S
D4	15 Sep 2021	Animal Life	Pelican-4; Seagull-1
D4	15 Sep 2021	Floatables	None
D4	15 Sep 2021	Water Color	Green
D4	15 Sep 2021	Current Direction	
D4	15 Sep 2021	Water Temp (C)	19
D4	15 Sep 2021	Wave Height Low (ft)	1
D4	15 Sep 2021	High Tide (ft)	3.73
D4	15 Sep 2021	High Tide Time	708
D4	15 Sep 2021	Low Tide (ft)	0.12
D4	15 Sep 2021	Low Tide Time	5
D4	15 Sep 2021	Comments	Water clear; Surfer/Paddle boarder-4; Trash-1; Kelp; Algae; Seagrass
D4	22 Sep 2021	Arrive Time	803
D4	22 Sep 2021	Weather	Sunny
D4	22 Sep 2021	Wind Speed (kts)	0
D4	22 Sep 2021	Wind Dir	
D4	22 Sep 2021	Animal Life	Bird-2
D4	22 Sep 2021	Floatables	None
D4	22 Sep 2021	Water Color	Green

Station	Date	Parameter	Value
D4	22 Sep 2021	Current Direction	S
D4	22 Sep 2021	Water Temp (C)	19.6
D4	22 Sep 2021	Wave Height Low (ft)	1
D4	22 Sep 2021	High Tide (ft)	5.3
D4	22 Sep 2021	High Tide Time	1028
D4	22 Sep 2021	Low Tide (ft)	0.49
D4	22 Sep 2021	Low Tide Time	425
D4	22 Sep 2021	Comments	Water turbid; Surfer/Paddle boarder-5; Boater/Kayaker-2; Trash-1; Kelp; Seagrass; Algae
D4	29 Sep 2021	Arrive Time	829
D4	29 Sep 2021	Weather	Cloudy
D4	29 Sep 2021	Wind Speed (kts)	2.5
D4	29 Sep 2021	Wind Dir	S
D4	29 Sep 2021	Animal Life	Bird-2; Pelican-1
D4	29 Sep 2021	Floatables	Foam
D4	29 Sep 2021	Water Color	Green
D4	29 Sep 2021	Current Direction	N
D4	29 Sep 2021	Water Temp (C)	19.5
D4	29 Sep 2021	Wave Height Low (ft)	2
D4	29 Sep 2021	High Tide (ft)	3.53
D4	29 Sep 2021	High Tide Time	744
D4	29 Sep 2021	Low Tide (ft)	3.41
D4	29 Sep 2021	Low Tide Time	1024
D4	29 Sep 2021	Comments	Water turbid; Surfer/Paddle boarder-17; Boater/Kayaker-7; Trash-1; Kelp; Seagrass; Algae
D5	01 Sep 2021	Arrive Time	737
D5	01 Sep 2021	Weather	Overcast
D5	01 Sep 2021	Wind Speed (kts)	0.6
D5	01 Sep 2021	Wind Dir	N
D5	01 Sep 2021	Animal Life	Pelican-1
D5	01 Sep 2021	Floatables	None
D5	01 Sep 2021	Water Color	Green
D5	01 Sep 2021	Current Direction	N
D5	01 Sep 2021	Water Temp (C)	20
D5	01 Sep 2021	Wave Height Low (ft)	2
D5	01 Sep 2021	High Tide (ft)	3.52
D5	01 Sep 2021	High Tide Time	805
D5	01 Sep 2021	Low Tide (ft)	0.81
D5	01 Sep 2021	Low Tide Time	59
D5	01 Sep 2021	Comments	Water clear; Trash-1; Kelp; Person/Walker/Jogger-3
D5	08 Sep 2021	Arrive Time	1106
D5	08 Sep 2021	Weather	Partly cloudy
D5	08 Sep 2021	Wind Speed (kts)	0
D5	08 Sep 2021	Wind Dir	
D5	08 Sep 2021	Animal Life	Seagull-1
D5	08 Sep 2021	Floatables	Foam
D5	08 Sep 2021	Water Color	Green
D5	08 Sep 2021	Current Direction	S
D5	08 Sep 2021	Water Temp (C)	22.3
D5	08 Sep 2021	Wave Height Low (ft)	1
D5	08 Sep 2021	High Tide (ft)	5.22
D5	08 Sep 2021	High Tide Time	1043
D5	08 Sep 2021	Low Tide (ft)	-0.15
D5	08 Sep 2021	Low Tide Time	435
D5	08 Sep 2021	Comments	Algae; Seagrass; Kelp
D5	15 Sep 2021	Arrive Time	839
D5	15 Sep 2021	Weather	Cloudy

Station	Date	Parameter	Value
D5	15 Sep 2021	Wind Speed (kts)	2.1
D5	15 Sep 2021	Wind Dir	W
D5	15 Sep 2021	Animal Life	
D5	15 Sep 2021	Floatables	Foam
D5	15 Sep 2021	Water Color	Green
D5	15 Sep 2021	Current Direction	
D5	15 Sep 2021	Water Temp (C)	20.5
D5	15 Sep 2021	Wave Height Low (ft)	3
D5	15 Sep 2021	High Tide (ft)	3.73
D5	15 Sep 2021	High Tide Time	708
D5	15 Sep 2021	Low Tide (ft)	0.12
D5	15 Sep 2021	Low Tide Time	5
D5	15 Sep 2021	Comments	Algae; Seagrass; Kelp
D5	22 Sep 2021	Arrive Time	822
D5	22 Sep 2021	Weather	Sunny
D5	22 Sep 2021	Wind Speed (kts)	6
D5	22 Sep 2021	Wind Dir	N
D5	22 Sep 2021	Animal Life	Bird-1
D5	22 Sep 2021	Floatables	Foam; Film
D5	22 Sep 2021	Water Color	Green
D5	22 Sep 2021	Current Direction	S
D5	22 Sep 2021	Water Temp (C)	20
D5	22 Sep 2021	Wave Height Low (ft)	2
D5	22 Sep 2021	High Tide (ft)	5.3
D5	22 Sep 2021	High Tide Time	1028
D5	22 Sep 2021	Low Tide (ft)	0.49
D5	22 Sep 2021	Low Tide Time	425
D5	22 Sep 2021	Comments	Algae; Kelp
D5	29 Sep 2021	Arrive Time	810
D5	29 Sep 2021	Weather	Cloudy
D5	29 Sep 2021	Wind Speed (kts)	2.1
D5	29 Sep 2021	Wind Dir	SE
D5	29 Sep 2021	Animal Life	
D5	29 Sep 2021	Floatables	Foam; Film
D5	29 Sep 2021	Water Color	Green
D5	29 Sep 2021	Current Direction	N
D5	29 Sep 2021	Water Temp (C)	20.1
D5	29 Sep 2021	Wave Height Low (ft)	3
D5	29 Sep 2021	High Tide (ft)	3.53
D5	29 Sep 2021	High Tide Time	744
D5	29 Sep 2021	Low Tide (ft)	3.41
D5	29 Sep 2021	Low Tide Time	1024
D5	29 Sep 2021	Comments	Kelp; Seagrass; Algae
D7	01 Sep 2021	Arrive Time	808
D7	01 Sep 2021	Weather	Cloudy
D7	01 Sep 2021	Wind Speed (kts)	4.12
D7	01 Sep 2021	Wind Dir	S
D7	01 Sep 2021	Animal Life	
D7	01 Sep 2021	Floatables	None
D7	01 Sep 2021	Water Color	Green
D7	01 Sep 2021	Current Direction	N
D7	01 Sep 2021	Water Temp (C)	20.4
D7	01 Sep 2021	Wave Height Low (ft)	2
D7	01 Sep 2021	High Tide (ft)	3.52
D7	01 Sep 2021	High Tide Time	805
D7	01 Sep 2021	Low Tide (ft)	0.81
D7	01 Sep 2021	Low Tide Time	59

Station	Date	Parameter	Value
D7	01 Sep 2021	Comments	Water clear; Surfer/Paddle boarder-1; Trash-1; Kelp; Algae; Seagrass
D7	08 Sep 2021	Arrive Time	950
D7	08 Sep 2021	Weather	Cloudy
D7	08 Sep 2021	Wind Speed (kts)	1.3
D7	08 Sep 2021	Wind Dir	S
D7	08 Sep 2021	Animal Life	Pelican-1
D7	08 Sep 2021	Floatables	Foam
D7	08 Sep 2021	Water Color	Green
D7	08 Sep 2021	Current Direction	S
D7	08 Sep 2021	Water Temp (C)	22.2
D7	08 Sep 2021	Wave Height Low (ft)	1
D7	08 Sep 2021	High Tide (ft)	5.22
D7	08 Sep 2021	High Tide Time	1043
D7	08 Sep 2021	Low Tide (ft)	-0.15
D7	08 Sep 2021	Low Tide Time	435
D7	08 Sep 2021	Comments	Water clear; Surfer/Paddle boarder-13; Trash-1; Algae; Sea-grass; Kelp
D7	15 Sep 2021	Arrive Time	907
D7	15 Sep 2021	Weather	Cloudy
D7	15 Sep 2021	Wind Speed (kts)	0.8
D7	15 Sep 2021	Wind Dir	N
D7	15 Sep 2021	Animal Life	
D7	15 Sep 2021	Floatables	Foam
D7	15 Sep 2021	Water Color	Green
D7	15 Sep 2021	Current Direction	S
D7	15 Sep 2021	Water Temp (C)	21
D7	15 Sep 2021	Wave Height Low (ft)	2
D7	15 Sep 2021	High Tide (ft)	3.73
D7	15 Sep 2021	High Tide Time	708
D7	15 Sep 2021	Low Tide (ft)	0.12
D7	15 Sep 2021	Low Tide Time	5
D7	15 Sep 2021	Comments	Water turbid; Surfer/Paddle boarder-22; Trash-1; Algae; Sea-grass; Kelp; Person/Walker/Jogger-4
D7	22 Sep 2021	Arrive Time	851
D7	22 Sep 2021	Weather	Sunny
D7	22 Sep 2021	Wind Speed (kts)	0.8
D7	22 Sep 2021	Wind Dir	N
D7	22 Sep 2021	Animal Life	Seagull-8
D7	22 Sep 2021	Floatables	Foam; Film
D7	22 Sep 2021	Water Color	Green
D7	22 Sep 2021	Current Direction	S
D7	22 Sep 2021	Water Temp (C)	20.6
D7	22 Sep 2021	Wave Height Low (ft)	3
D7	22 Sep 2021	High Tide (ft)	5.3
D7	22 Sep 2021	High Tide Time	1028
D7	22 Sep 2021	Low Tide (ft)	0.49
D7	22 Sep 2021	Low Tide Time	425
D7	22 Sep 2021	Comments	Water turbid; Surfer/Paddle boarder-2; Trash-1; Kelp; Sea-grass; Algae; Person/Walker/Jogger-2
D7	29 Sep 2021	Arrive Time	906
D7	29 Sep 2021	Weather	Sunny
D7	29 Sep 2021	Wind Speed (kts)	3.1
D7	29 Sep 2021	Wind Dir	N
D7	29 Sep 2021	Animal Life	Seagull-5
D7	29 Sep 2021	Floatables	Foam
D7	29 Sep 2021	Water Color	Green

Station	Date	Parameter	Value
D7	29 Sep 2021	Current Direction	N
D7	29 Sep 2021	Water Temp (C)	20.6
D7	29 Sep 2021	Wave Height Low (ft)	3
D7	29 Sep 2021	High Tide (ft)	3.53
D7	29 Sep 2021	High Tide Time	744
D7	29 Sep 2021	Low Tide (ft)	3.41
D7	29 Sep 2021	Low Tide Time	1024
D7	29 Sep 2021	Comments	Water turbid; Surfer/Paddle boarder-12; Trash-1; Seagrass; Algae; Kelp; Person/Walker/Jogger-1
D8-B	01 Sep 2021	Arrive Time	824
D8-B	01 Sep 2021	Weather	Cloudy
D8-B	01 Sep 2021	Wind Speed (kts)	2.7
D8-B	01 Sep 2021	Wind Dir	W
D8-B	01 Sep 2021	Animal Life	
D8-B	01 Sep 2021	Floatables	Foam
D8-B	01 Sep 2021	Water Color	Green
D8-B	01 Sep 2021	Current Direction	N
D8-B	01 Sep 2021	Water Temp (C)	20.4
D8-B	01 Sep 2021	Wave Height Low (ft)	2
D8-B	01 Sep 2021	High Tide (ft)	3.52
D8-B	01 Sep 2021	High Tide Time	805
D8-B	01 Sep 2021	Low Tide (ft)	0.81
D8-B	01 Sep 2021	Low Tide Time	59
D8-B	01 Sep 2021	Comments	Water turbid; Trash-2; Kelp; Algae; Person/Walker/Jogger-2
D8-B	08 Sep 2021	Arrive Time	936
D8-B	08 Sep 2021	Weather	Cloudy
D8-B	08 Sep 2021	Wind Speed (kts)	3.3
D8-B	08 Sep 2021	Wind Dir	W
D8-B	08 Sep 2021	Animal Life	Bird-1
D8-B	08 Sep 2021	Floatables	None
D8-B	08 Sep 2021	Water Color	Green
D8-B	08 Sep 2021	Current Direction	N
D8-B	08 Sep 2021	Water Temp (C)	22.3
D8-B	08 Sep 2021	Wave Height Low (ft)	0
D8-B	08 Sep 2021	High Tide (ft)	5.22
D8-B	08 Sep 2021	High Tide Time	1043
D8-B	08 Sep 2021	Low Tide (ft)	-0.15
D8-B	08 Sep 2021	Low Tide Time	435
D8-B	08 Sep 2021	Comments	Algae; Kelp
D8-B	15 Sep 2021	Arrive Time	930
D8-B	15 Sep 2021	Weather	Partly cloudy
D8-B	15 Sep 2021	Wind Speed (kts)	3.3
D8-B	15 Sep 2021	Wind Dir	W
D8-B	15 Sep 2021	Animal Life	Bird-2
D8-B	15 Sep 2021	Floatables	Foam
D8-B	15 Sep 2021	Water Color	Brown
D8-B	15 Sep 2021	Current Direction	S
D8-B	15 Sep 2021	Water Temp (C)	20.7
D8-B	15 Sep 2021	Wave Height Low (ft)	2
D8-B	15 Sep 2021	High Tide (ft)	3.73
D8-B	15 Sep 2021	High Tide Time	708
D8-B	15 Sep 2021	Low Tide (ft)	0.12
D8-B	15 Sep 2021	Low Tide Time	5
D8-B	15 Sep 2021	Comments	Water turbid; Surfer/Paddle boarder-6; Trash-1; Kelp; Sea-grass; Algae
D8-B	22 Sep 2021	Arrive Time	913
D8-B	22 Sep 2021	Weather	Sunny

Station	Date	Parameter	Value
D8-B	22 Sep 2021	Wind Speed (kts)	1.7
D8-B	22 Sep 2021	Wind Dir	NE
D8-B	22 Sep 2021	Animal Life	
D8-B	22 Sep 2021	Floatables	Foam; Film
D8-B	22 Sep 2021	Water Color	Brown
D8-B	22 Sep 2021	Current Direction	S
D8-B	22 Sep 2021	Water Temp (C)	19.9
D8-B	22 Sep 2021	Wave Height Low (ft)	3
D8-B	22 Sep 2021	High Tide (ft)	5.3
D8-B	22 Sep 2021	High Tide Time	1028
D8-B	22 Sep 2021	Low Tide (ft)	0.49
D8-B	22 Sep 2021	Low Tide Time	425
D8-B	22 Sep 2021	Comments	Water turbid; Trash-1; Kelp; Algae; Person/Walker/Jogger-2
D8-B	29 Sep 2021	Arrive Time	924
D8-B	29 Sep 2021	Weather	Sunny
D8-B	29 Sep 2021	Wind Speed (kts)	3
D8-B	29 Sep 2021	Wind Dir	SW
D8-B	29 Sep 2021	Animal Life	
D8-B	29 Sep 2021	Floatables	Foam
D8-B	29 Sep 2021	Water Color	Brown
D8-B	29 Sep 2021	Current Direction	N
D8-B	29 Sep 2021	Water Temp (C)	20.8
D8-B	29 Sep 2021	Wave Height Low (ft)	3
D8-B	29 Sep 2021	High Tide (ft)	3.53
D8-B	29 Sep 2021	High Tide Time	744
D8-B	29 Sep 2021	Low Tide (ft)	3.41
D8-B	29 Sep 2021	Low Tide Time	1024
D8-B	29 Sep 2021	Comments	Water turbid; Surfer/Paddle boarder-13; Trash-1; Kelp; Algae; Seagrass
D9	01 Sep 2021	Arrive Time	836
D9	01 Sep 2021	Weather	Cloudy
D9	01 Sep 2021	Wind Speed (kts)	4.8
D9	01 Sep 2021	Wind Dir	S
D9	01 Sep 2021	Animal Life	Dog-2
D9	01 Sep 2021	Floatables	Foam
D9	01 Sep 2021	Water Color	Green
D9	01 Sep 2021	Current Direction	N
D9	01 Sep 2021	Water Temp (C)	20.4
D9	01 Sep 2021	Wave Height Low (ft)	2
D9	01 Sep 2021	High Tide (ft)	3.52
D9	01 Sep 2021	High Tide Time	805
D9	01 Sep 2021	Low Tide (ft)	0.81
D9	01 Sep 2021	Low Tide Time	59
D9	01 Sep 2021	Comments	Water clear; Trash-1; Kelp; Algae; Person/Walker/Jogger-5
D9	08 Sep 2021	Arrive Time	917
D9	08 Sep 2021	Weather	Cloudy
D9	08 Sep 2021	Wind Speed (kts)	2.3
D9	08 Sep 2021	Wind Dir	S
D9	08 Sep 2021	Animal Life	
D9	08 Sep 2021	Floatables	None
D9	08 Sep 2021	Water Color	Green
D9	08 Sep 2021	Current Direction	N
D9	08 Sep 2021	Water Temp (C)	22.5
D9	08 Sep 2021	Wave Height Low (ft)	1
D9	08 Sep 2021	High Tide (ft)	5.22
D9	08 Sep 2021	High Tide Time	1043
D9	08 Sep 2021	Low Tide (ft)	-0.15
D9	08 Sep 2021	Low Tide Time	435

Station	Date	Parameter	Value
D9	08 Sep 2021	Comments	Water clear; Surfer/Paddle boarder-6; Trash-1; Kelp; Algae; Person/Walker/Jogger-2
D9	15 Sep 2021	Arrive Time	1010
D9	15 Sep 2021	Weather	Sunny
D9	15 Sep 2021	Wind Speed (kts)	4.9
D9	15 Sep 2021	Wind Dir	W
D9	15 Sep 2021	Animal Life	
D9	15 Sep 2021	Floatables	Foam
D9	15 Sep 2021	Water Color	Green
D9	15 Sep 2021	Current Direction	S
D9	15 Sep 2021	Water Temp (C)	21.3
D9	15 Sep 2021	Wave Height Low (ft)	3
D9	15 Sep 2021	High Tide (ft)	3.73
D9	15 Sep 2021	High Tide Time	708
D9	15 Sep 2021	Low Tide (ft)	0.12
D9	15 Sep 2021	Low Tide Time	5
D9	15 Sep 2021	Comments	Water turbid; Surfer/Paddle boarder-11; Trash-1; Kelp; Sea-grass; Algae
D9	22 Sep 2021	Arrive Time	930
D9	22 Sep 2021	Weather	Sunny
D9	22 Sep 2021	Wind Speed (kts)	1.1
D9	22 Sep 2021	Wind Dir	NW
D9	22 Sep 2021	Animal Life	
D9	22 Sep 2021	Floatables	Foam; Film
D9	22 Sep 2021	Water Color	Green
D9	22 Sep 2021	Current Direction	S
D9	22 Sep 2021	Water Temp (C)	20.2
D9	22 Sep 2021	Wave Height Low (ft)	3
D9	22 Sep 2021	High Tide (ft)	5.3
D9	22 Sep 2021	High Tide Time	1028
D9	22 Sep 2021	Low Tide (ft)	0.49
D9	22 Sep 2021	Low Tide Time	425
D9	22 Sep 2021	Comments	Water turbid; Surfer/Paddle boarder-5; Trash-1; Algae; Kelp
D9	29 Sep 2021	Arrive Time	937
D9	29 Sep 2021	Weather	Sunny
D9	29 Sep 2021	Wind Speed (kts)	4.5
D9	29 Sep 2021	Wind Dir	SW
D9	29 Sep 2021	Animal Life	Dog-1
D9	29 Sep 2021	Floatables	Foam
D9	29 Sep 2021	Water Color	Green
D9	29 Sep 2021	Current Direction	N
D9	29 Sep 2021	Water Temp (C)	20.8
D9	29 Sep 2021	Wave Height Low (ft)	2
D9	29 Sep 2021	High Tide (ft)	3.53
D9	29 Sep 2021	High Tide Time	744
D9	29 Sep 2021	Low Tide (ft)	3.41
D9	29 Sep 2021	Low Tide Time	1024
D9	29 Sep 2021	Comments	Water turbid; Surfer/Paddle boarder-7; Trash-1; Algae; Kelp; Seagrass; Person/Walker/Jogger-1
D10	01 Sep 2021	Arrive Time	849
D10	01 Sep 2021	Weather	Cloudy
D10	01 Sep 2021	Wind Speed (kts)	5
D10	01 Sep 2021	Wind Dir	SW
D10	01 Sep 2021	Animal Life	Dog-2
D10	01 Sep 2021	Floatables	None
D10	01 Sep 2021	Water Color	Green
D10	01 Sep 2021	Current Direction	N

Station	Date	Parameter	Value
D10	01 Sep 2021	Water Temp (C)	20.5
D10	01 Sep 2021	Wave Height Low (ft)	2
D10	01 Sep 2021	High Tide (ft)	3.52
D10	01 Sep 2021	High Tide Time	805
D10	01 Sep 2021	Low Tide (ft)	0.81
D10	01 Sep 2021	Low Tide Time	59
D10	01 Sep 2021	Comments	Water clear; Boogie boarder/Swimmer-1; Surfer/Paddle boarder-5; Trash-1; Kelp; Seagrass; Person/Walker/Jogger-10
D10	08 Sep 2021	Arrive Time	854
D10	08 Sep 2021	Weather	Cloudy
D10	08 Sep 2021	Wind Speed (kts)	3.8
D10	08 Sep 2021	Wind Dir	S
D10	08 Sep 2021	Animal Life	Seagull-2
D10	08 Sep 2021	Floatables	None
D10	08 Sep 2021	Water Color	Green
D10	08 Sep 2021	Current Direction	N
D10	08 Sep 2021	Water Temp (C)	22.5
D10	08 Sep 2021	Wave Height Low (ft)	1
D10	08 Sep 2021	High Tide (ft)	5.22
D10	08 Sep 2021	High Tide Time	1043
D10	08 Sep 2021	Low Tide (ft)	-0.15
D10	08 Sep 2021	Low Tide Time	435
D10	08 Sep 2021	Comments	Water clear; Surfer/Paddle boarder-16; Trash-1; Kelp; Seagrass; Person/Walker/Jogger-12
D10	15 Sep 2021	Arrive Time	1021
D10	15 Sep 2021	Weather	Sunny
D10	15 Sep 2021	Wind Speed (kts)	3.8
D10	15 Sep 2021	Wind Dir	W
D10	15 Sep 2021	Animal Life	Bird-6
D10	15 Sep 2021	Floatables	Foam
D10	15 Sep 2021	Water Color	Green
D10	15 Sep 2021	Current Direction	S
D10	15 Sep 2021	Water Temp (C)	21.7
D10	15 Sep 2021	Wave Height Low (ft)	2
D10	15 Sep 2021	High Tide (ft)	3.73
D10	15 Sep 2021	High Tide Time	708
D10	15 Sep 2021	Low Tide (ft)	0.12
D10	15 Sep 2021	Low Tide Time	5
D10	15 Sep 2021	Comments	Water turbid; Surfer/Paddle boarder-33; Trash-1; Kelp; Seagrass; Person/Walker/Jogger-16
D10	22 Sep 2021	Arrive Time	1003
D10	22 Sep 2021	Weather	Sunny
D10	22 Sep 2021	Wind Speed (kts)	6.3
D10	22 Sep 2021	Wind Dir	W
D10	22 Sep 2021	Animal Life	Bird-6; Seagull-4
D10	22 Sep 2021	Floatables	Foam
D10	22 Sep 2021	Water Color	Green
D10	22 Sep 2021	Current Direction	S
D10	22 Sep 2021	Water Temp (C)	20.7
D10	22 Sep 2021	Wave Height Low (ft)	3
D10	22 Sep 2021	High Tide (ft)	5.3
D10	22 Sep 2021	High Tide Time	1028
D10	22 Sep 2021	Low Tide (ft)	0.49
D10	22 Sep 2021	Low Tide Time	425
D10	22 Sep 2021	Comments	Water clear; Surfer/Paddle boarder-21; Trash-1; Kelp; Seagrass; Person/Walker/Jogger-27

Station	Date	Parameter	Value
D10	29 Sep 2021	Arrive Time	950
D10	29 Sep 2021	Weather	Sunny
D10	29 Sep 2021	Wind Speed (kts)	5
D10	29 Sep 2021	Wind Dir	SW
D10	29 Sep 2021	Animal Life	Bird-4; Seagull-3
D10	29 Sep 2021	Floatables	None
D10	29 Sep 2021	Water Color	Green
D10	29 Sep 2021	Current Direction	N
D10	29 Sep 2021	Water Temp (C)	21.1
D10	29 Sep 2021	Wave Height Low (ft)	4
D10	29 Sep 2021	High Tide (ft)	3.53
D10	29 Sep 2021	High Tide Time	744
D10	29 Sep 2021	Low Tide (ft)	3.41
D10	29 Sep 2021	Low Tide Time	1024
D10	29 Sep 2021	Comments	Water turbid; Boogie boarder/Swimmer-3; Surfer/Paddle boarder-34; Trash-1; Kelp; Seagrass; Person/Walker/Jogger-17
D11	01 Sep 2021	Arrive Time	902
D11	01 Sep 2021	Weather	Cloudy
D11	01 Sep 2021	Wind Speed (kts)	5.5
D11	01 Sep 2021	Wind Dir	SW
D11	01 Sep 2021	Animal Life	Dog-1
D11	01 Sep 2021	Floatables	None
D11	01 Sep 2021	Water Color	Green
D11	01 Sep 2021	Current Direction	N
D11	01 Sep 2021	Water Temp (C)	20.3
D11	01 Sep 2021	Wave Height Low (ft)	2
D11	01 Sep 2021	High Tide (ft)	3.52
D11	01 Sep 2021	High Tide Time	805
D11	01 Sep 2021	Low Tide (ft)	0.81
D11	01 Sep 2021	Low Tide Time	59
D11	01 Sep 2021	Comments	Water clear; Surfer/Paddle boarder-15; Trash-1; Kelp; Seagrass; Person/Walker/Jogger-15
D11	08 Sep 2021	Arrive Time	840
D11	08 Sep 2021	Weather	Cloudy
D11	08 Sep 2021	Wind Speed (kts)	0.3
D11	08 Sep 2021	Wind Dir	S
D11	08 Sep 2021	Animal Life	Dog-2
D11	08 Sep 2021	Floatables	None
D11	08 Sep 2021	Water Color	Green
D11	08 Sep 2021	Current Direction	S
D11	08 Sep 2021	Water Temp (C)	22.4
D11	08 Sep 2021	Wave Height Low (ft)	2
D11	08 Sep 2021	High Tide (ft)	5.22
D11	08 Sep 2021	High Tide Time	1043
D11	08 Sep 2021	Low Tide (ft)	-0.15
D11	08 Sep 2021	Low Tide Time	435
D11	08 Sep 2021	Comments	Water clear; Surfer/Paddle boarder-16; Trash-1; Kelp; Seagrass; Person/Walker/Jogger-8
D11	15 Sep 2021	Arrive Time	1035
D11	15 Sep 2021	Weather	Sunny
D11	15 Sep 2021	Wind Speed (kts)	4.9
D11	15 Sep 2021	Wind Dir	W
D11	15 Sep 2021	Animal Life	Bird-1; Dog-3; Seagull-1
D11	15 Sep 2021	Floatables	Foam
D11	15 Sep 2021	Water Color	Brown
D11	15 Sep 2021	Current Direction	S
D11	15 Sep 2021	Water Temp (C)	20.9

Station	Date	Parameter	Value
D11	15 Sep 2021	Wave Height Low (ft)	2
D11	15 Sep 2021	High Tide (ft)	3.73
D11	15 Sep 2021	High Tide Time	708
D11	15 Sep 2021	Low Tide (ft)	0.12
D11	15 Sep 2021	Low Tide Time	5
D11	15 Sep 2021	Comments	Water turbid; Surfer/Paddle boarder-21; Trash-1; Algae; Kelp; Seagrass; Person/Walker/Jogger-20
D11	22 Sep 2021	Arrive Time	1022
D11	22 Sep 2021	Weather	Sunny
D11	22 Sep 2021	Wind Speed (kts)	6.4
D11	22 Sep 2021	Wind Dir	W
D11	22 Sep 2021	Animal Life	Dog-2
D11	22 Sep 2021	Floatables	Foam
D11	22 Sep 2021	Water Color	Green
D11	22 Sep 2021	Current Direction	S
D11	22 Sep 2021	Water Temp (C)	20.3
D11	22 Sep 2021	Wave Height Low (ft)	3
D11	22 Sep 2021	High Tide (ft)	5.3
D11	22 Sep 2021	High Tide Time	1028
D11	22 Sep 2021	Low Tide (ft)	0.49
D11	22 Sep 2021	Low Tide Time	425
D11	22 Sep 2021	Comments	Water clear; Surfer/Paddle boarder-31; Trash-1; Kelp; Seagrass; Person/Walker/Jogger-13
D11	29 Sep 2021	Arrive Time	1004
D11	29 Sep 2021	Weather	Sunny
D11	29 Sep 2021	Wind Speed (kts)	4.2
D11	29 Sep 2021	Wind Dir	S
D11	29 Sep 2021	Animal Life	Seagull-1
D11	29 Sep 2021	Floatables	None
D11	29 Sep 2021	Water Color	Green
D11	29 Sep 2021	Current Direction	N
D11	29 Sep 2021	Water Temp (C)	21
D11	29 Sep 2021	Wave Height Low (ft)	2
D11	29 Sep 2021	High Tide (ft)	3.53
D11	29 Sep 2021	High Tide Time	744
D11	29 Sep 2021	Low Tide (ft)	3.41
D11	29 Sep 2021	Low Tide Time	1024
D11	29 Sep 2021	Comments	Water turbid; Surfer/Paddle boarder-14; Trash-1; Kelp; Seagrass; Algae; Person/Walker/Jogger-9
D12	01 Sep 2021	Arrive Time	946
D12	01 Sep 2021	Weather	Partly cloudy
D12	01 Sep 2021	Wind Speed (kts)	8.1
D12	01 Sep 2021	Wind Dir	SW
D12	01 Sep 2021	Animal Life	
D12	01 Sep 2021	Floatables	None
D12	01 Sep 2021	Water Color	Green
D12	01 Sep 2021	Current Direction	N
D12	01 Sep 2021	Water Temp (C)	22
D12	01 Sep 2021	Wave Height Low (ft)	2
D12	01 Sep 2021	High Tide (ft)	3.52
D12	01 Sep 2021	High Tide Time	805
D12	01 Sep 2021	Low Tide (ft)	0.81
D12	01 Sep 2021	Low Tide Time	59
D12	01 Sep 2021	Comments	Water clear; Boogie boarder/Swimmer-3; Surfer/Paddle boarder-5; Trash-1; Kelp; Seagrass; Person/Walker/Jogger-13
D12	08 Sep 2021	Arrive Time	818

Station	Date	Parameter	Value
D12	08 Sep 2021	Weather	Cloudy
D12	08 Sep 2021	Wind Speed (kts)	0
D12	08 Sep 2021	Wind Dir	
D12	08 Sep 2021	Animal Life	Bird-2
D12	08 Sep 2021	Floatables	None
D12	08 Sep 2021	Water Color	Blue
D12	08 Sep 2021	Current Direction	N
D12	08 Sep 2021	Water Temp (C)	23.4
D12	08 Sep 2021	Wave Height Low (ft)	1
D12	08 Sep 2021	High Tide (ft)	5.22
D12	08 Sep 2021	High Tide Time	1043
D12	08 Sep 2021	Low Tide (ft)	-0.15
D12	08 Sep 2021	Low Tide Time	435
D12	08 Sep 2021	Comments	Water clear; Boogie boarder/Swimmer-1; Trash-1; Seagrass; Kelp; Person/Walker/Jogger-5
D12	15 Sep 2021	Arrive Time	1104
D12	15 Sep 2021	Weather	Sunny
D12	15 Sep 2021	Wind Speed (kts)	5
D12	15 Sep 2021	Wind Dir	W
D12	15 Sep 2021	Animal Life	Bird-1; Dolphin-2; Pelican-1; Seagull-124
D12	15 Sep 2021	Floatables	Foam
D12	15 Sep 2021	Water Color	Green
D12	15 Sep 2021	Current Direction	S
D12	15 Sep 2021	Water Temp (C)	22.8
D12	15 Sep 2021	Wave Height Low (ft)	2
D12	15 Sep 2021	High Tide (ft)	3.73
D12	15 Sep 2021	High Tide Time	708
D12	15 Sep 2021	Low Tide (ft)	0.12
D12	15 Sep 2021	Low Tide Time	5
D12	15 Sep 2021	Comments	Water turbid; Boogie boarder/Swimmer-8; Trash-1; Kelp; Seagrass; Person/Walker/Jogger-24
D12	22 Sep 2021	Arrive Time	1103
D12	22 Sep 2021	Weather	Sunny
D12	22 Sep 2021	Wind Speed (kts)	5.6
D12	22 Sep 2021	Wind Dir	W
D12	22 Sep 2021	Animal Life	
D12	22 Sep 2021	Floatables	Foam
D12	22 Sep 2021	Water Color	Green
D12	22 Sep 2021	Current Direction	S
D12	22 Sep 2021	Water Temp (C)	23.2
D12	22 Sep 2021	Wave Height Low (ft)	2
D12	22 Sep 2021	High Tide (ft)	5.3
D12	22 Sep 2021	High Tide Time	1028
D12	22 Sep 2021	Low Tide (ft)	0.49
D12	22 Sep 2021	Low Tide Time	425
D12	22 Sep 2021	Comments	Water clear; Boogie boarder/Swimmer-4; Trash-1; Kelp; Seagrass; Person/Walker/Jogger-30
D12	29 Sep 2021	Arrive Time	1037
D12	29 Sep 2021	Weather	Sunny
D12	29 Sep 2021	Wind Speed (kts)	5.2
D12	29 Sep 2021	Wind Dir	SW
D12	29 Sep 2021	Animal Life	Bird-3; Seagull-24
D12	29 Sep 2021	Floatables	None
D12	29 Sep 2021	Water Color	Green
D12	29 Sep 2021	Current Direction	N
D12	29 Sep 2021	Water Temp (C)	21.8
D12	29 Sep 2021	Wave Height Low (ft)	2
D12	29 Sep 2021	High Tide (ft)	3.53

Station	Date	Parameter	Value
D12	29 Sep 2021	High Tide Time	744
D12	29 Sep 2021	Low Tide (ft)	3.41
D12	29 Sep 2021	Low Tide Time	1024
D12	29 Sep 2021	Comments	Water clear; Boogie boarder/Swimmer-7; Trash-1; Kelp; Sea-grass; Person/Walker/Jogger-19

Kelp Stations

Table 3.1

Summary of compliance with the Ocean Plan's 30-day Geometric Mean standard for total coliform bacteria at the PLOO kelp stations. Data are based on the geometric mean of the five most recent samples from each site over the previous 30 days unless otherwise noted (*). Values >1,000 CFU/100 mL exceed the standard.

Date	A1	A6	A7	C4	C5	C6	C7	C8
01 Sep 2021	3	3	3	3	2	5	2	3
02 Sep 2021	3	3	3	3	2	5	2	3
03 Sep 2021	3	3	3	3	2	5	2	3
04 Sep 2021	3	3	3	3	2	5	2	3
05 Sep 2021	3	3	3	3	2	5	2	3
06 Sep 2021	3	3	3	3	2	5	2	3
07 Sep 2021	3	3	3	3	3	4	2	2
08 Sep 2021	2	2	2	3	3	3	2	3
09 Sep 2021	2	2	2	3	3	3	2	3
10 Sep 2021	2	2	2	3	3	3	2	3
11 Sep 2021	2	2	2	3	3	3	2	3
12 Sep 2021	2	2	2	3	3	3	2	3
13 Sep 2021	2	2	3	3	3	4	2	2
14 Sep 2021	2	2	3	3	3	4	2	2
15 Sep 2021	2	2	3	3	3	4	2	2
16 Sep 2021	3	2	3	3	4	5	2	3
17 Sep 2021	3	2	3	3	4	5	2	3
18 Sep 2021	3	2	3	3	4	5	2	3
19 Sep 2021	3	2	3	3	4	5	2	3
20 Sep 2021	3	2	3	3	4	5	2	3
21 Sep 2021	3	2	3	3	4	5	2	3
22 Sep 2021	2	3	4	3	5	4	2	2
23 Sep 2021	3	4	5	2	7	4	2	2
24 Sep 2021	3	4	5	2	7	4	2	2
25 Sep 2021	3	4	5	2	7	4	2	2
26 Sep 2021	3	4	5	2	7	4	2	2
27 Sep 2021	3	4	5	2	7	4	2	2
28 Sep 2021	2	3	5	2	5	3	2	2
29 Sep 2021	2	3	5	2	5	3	2	2
30 Sep 2021	3	4	6	2	7	4	2	2

* Geometric mean calculated using n<5

Table 3.2

Summary of compliance with the Ocean Plan's 30-day Geometric Mean standard for fecal coliform bacteria at the PLOO kelp stations. Data are based on the geometric mean of the five most recent samples from each site over the previous 30 days unless otherwise noted (*). Values >200 CFU/100 mL exceed the standard.

Date	A1	A6	A7	C4	C5	C6	C7	C8
01 Sep 2021	2	2	2	2	2	2	2	2
02 Sep 2021	2	2	2	2	2	2	2	2
03 Sep 2021	2	2	2	2	2	2	2	2
04 Sep 2021	2	2	2	2	2	2	2	2
05 Sep 2021	2	2	2	2	2	2	2	2
06 Sep 2021	2	2	2	2	2	2	2	2
07 Sep 2021	2	2	2	2	2	2	2	2
08 Sep 2021	2	2	2	2	2	2	2	2
09 Sep 2021	2	2	2	2	2	2	2	2
10 Sep 2021	2	2	2	2	2	2	2	2
11 Sep 2021	2	2	2	2	2	2	2	2
12 Sep 2021	2	2	2	2	2	2	2	2
13 Sep 2021	2	2	2	2	2	2	2	2
14 Sep 2021	2	2	2	2	2	2	2	2
15 Sep 2021	2	2	2	2	2	2	2	2
16 Sep 2021	2	2	2	2	2	2	2	2
17 Sep 2021	2	2	2	2	2	2	2	2
18 Sep 2021	2	2	2	2	2	2	2	2
19 Sep 2021	2	2	2	2	2	2	2	2
20 Sep 2021	2	2	2	2	2	2	2	2
21 Sep 2021	2	2	2	2	2	2	2	2
22 Sep 2021	2	2	2	2	3	2	2	2
23 Sep 2021	2	2	2	2	4	2	2	2
24 Sep 2021	2	2	2	2	4	2	2	2
25 Sep 2021	2	2	2	2	4	2	2	2
26 Sep 2021	2	2	2	2	4	2	2	2
27 Sep 2021	2	2	2	2	4	2	2	2
28 Sep 2021	2	2	2	2	3	2	2	2
29 Sep 2021	2	2	2	2	3	2	2	2
30 Sep 2021	2	2	2	2	4	2	2	2

* Geometric mean calculated using n<5

Table 3.3

Summary of compliance with the Ocean Plan's 30-day Geometric Mean standard for *Enterococcus* at the PLOO kelp stations. Data are based on the geometric mean of the five most recent samples from each site over the previous 30 days unless otherwise noted (*). Values >35 CFU/100 mL exceed the standard.

Date	A1	A6	A7	C4	C5	C6	C7	C8
01 Sep 2021	2	2	2	2	2	2	2	2
02 Sep 2021	2	2	2	2	2	2	2	2
03 Sep 2021	2	2	2	2	2	2	2	2
04 Sep 2021	2	2	2	2	2	2	2	2
05 Sep 2021	2	2	2	2	2	2	2	2
06 Sep 2021	2	2	2	2	2	2	2	2
07 Sep 2021	2	2	2	2	2	2	2	2
08 Sep 2021	2	2	2	2	2	2	2	2
09 Sep 2021	2	2	2	2	2	2	2	2
10 Sep 2021	2	2	2	2	2	2	2	2
11 Sep 2021	2	2	2	2	2	2	2	2
12 Sep 2021	2	2	2	2	2	2	2	2
13 Sep 2021	2	2	2	2	2	2	2	2
14 Sep 2021	2	2	2	2	2	2	2	2
15 Sep 2021	2	2	2	2	2	2	2	2
16 Sep 2021	2	2	2	2	2	2	2	2
17 Sep 2021	2	2	2	2	2	2	2	2
18 Sep 2021	2	2	2	2	2	2	2	2
19 Sep 2021	2	2	2	2	2	2	2	2
20 Sep 2021	2	2	2	2	2	2	2	2
21 Sep 2021	2	2	2	2	2	2	2	2
22 Sep 2021	2	2	2	2	2	2	2	2
23 Sep 2021	2	2	2	2	2	2	2	2
24 Sep 2021	2	2	2	2	2	2	2	2
25 Sep 2021	2	2	2	2	2	2	2	2
26 Sep 2021	2	2	2	2	2	2	2	2
27 Sep 2021	2	2	2	2	2	2	2	2
28 Sep 2021	2	2	2	2	2	2	2	2
29 Sep 2021	2	2	2	2	2	2	2	2
30 Sep 2021	2	2	2	2	2	2	2	2

* Geometric mean calculated using n<5

Table 3.4

Summary of compliance at the PLOO kelp stations with the Ocean Plan's Single Sample Maximum standard for total coliform bacteria, which states that total coliform density shall not exceed 10,000 CFU/100 mL.

Date	A1	A6	A7	C4	C5	C6	C7	C8
07 Sep 2021	IC	IC	IC	IC	IC	IC	IC	IC
13 Sep 2021	IC	IC	IC	IC	IC	IC	IC	IC
22 Sep 2021	IC	IC	IC	IC	IC	IC	IC	IC
28 Sep 2021	IC	IC	IC	IC	IC	IC	IC	IC

IC = In Compliance

E = Exceedance

ns = not sampled

ND = no data

Table 3.5

Summary of compliance at the PLOO kelp stations with the Ocean Plan's Single Sample Maximum standard for fecal coliform bacteria, which states that fecal coliform density shall not exceed 400 CFU/100 mL.

Date	A1	A6	A7	C4	C5	C6	C7	C8
07 Sep 2021	IC	IC	IC	IC	IC	IC	IC	IC
13 Sep 2021	IC	IC	IC	IC	IC	IC	IC	IC
22 Sep 2021	IC	IC	IC	IC	IC	IC	IC	IC
28 Sep 2021	IC	IC	IC	IC	IC	IC	IC	IC

IC = In Compliance

E = Exceedance

ns = not sampled

ND = no data

Table 3.6

Summary of compliance at the PLOO kelp stations with the Ocean Plan's Single Sample Maximum standard for *Enterococcus* bacteria, which states that *Enterococcus* density shall not exceed 104 CFU/100 mL.

Date	A1	A6	A7	C4	C5	C6	C7	C8
07 Sep 2021	IC	IC	IC	IC	IC	IC	IC	IC
13 Sep 2021	IC	IC	IC	IC	IC	IC	IC	IC
22 Sep 2021	IC	IC	IC	IC	IC	IC	IC	IC
28 Sep 2021	IC	IC	IC	IC	IC	IC	IC	IC

IC = In Compliance

E = Exceedance

ns = not sampled

ND = no data

Table 3.7

Summary of compliance at the PLOO kelp stations with the Ocean Plan's Single Sample Maximum standard for total coliform bacteria and the fecal/total coliform ratio (F:T), which states that total coliform density shall not exceed 1,000 CFU/100 mL when F:T > 0.1.

Date	A1	A6	A7	C4	C5	C6	C7	C8
07 Sep 2021	IC	IC	IC	IC	IC	IC	IC	IC
13 Sep 2021	IC	IC	IC	IC	IC	IC	IC	IC
22 Sep 2021	IC	IC	IC	IC	IC	IC	IC	IC
28 Sep 2021	IC	IC	IC	IC	IC	IC	IC	IC

IC = In Compliance

E = Exceedance

ns = not sampled

ND = no data

Table 3.8

Summary of water quality parameters at the PLOO kelp stations for each sample date. Densities of total coliform (Total), fecal coliform (Fecal) and *Enterococcus* (Entero) bacteria are reported as CFU/100 mL; the fecal:total coliform ratio (F:T) is unitless; values for temperature (Temp, °C), transmissivity (XMS, %), dissolved oxygen (DO, mg/L), salinity (Sal, ppt) and pH were extracted from CTD profile data for depths closest to those at which the bacteriological samples were collected. Comments follow the data summary.

Station	Date	Time	Depth	Total	Fecal	Entero	F:T	Temp	XMS	DO	Sal	pH
A1	07 Sep 2021	829	1	<2	<2	<2	1.00	18.8	80.07	8.3	33.49	8.0
A1	07 Sep 2021	829	12	<2	<2	<2	1.00	14.7	76.05	7.7	33.56	7.9
A1	07 Sep 2021	829	18	<2	<2	<2	1.00	14.4	77.28	7.3	33.55	7.9
A1	13 Sep 2021	808	1	<2	<2	<2	1.00	18.2	78.71	8.1	33.47	8.0
A1	13 Sep 2021	808	12	8e	2e	<2	0.25	13.9	84.86	7.1	33.53	7.9
A1	13 Sep 2021	808	18	8e	2e	<2	0.25	13.6	84.69	6.7	33.51	7.8
A1	22 Sep 2021	805	1	2e	<2	<2	1.00	15.6	79.75	8.4	33.41	8.0
A1	22 Sep 2021	805	12	<2	<2	<2	1.00	13.2	86.24	7.5	33.41	7.9
A1	22 Sep 2021	805	18	2e	<2	<2	1.00	13.0	86.36	6.9	33.45	7.8
A1	28 Sep 2021	815	1	<2	<2	<2	1.00	19.0	83.78	8.1	33.49	8.0
A1	28 Sep 2021	815	12	2e	<2	<2	1.00	14.7	83.41	8.0	33.46	7.9
A1	28 Sep 2021	815	18	<2	<2	<2	1.00	13.6	83.41	7.1	33.43	7.9
A6	07 Sep 2021	854	1	<2	2e	<2	1.00	18.9	76.94	7.6	33.47	8.0
A6	07 Sep 2021	854	12	<2	<2	<2	1.00	14.5	78.99	7.2	33.57	7.9
A6	07 Sep 2021	854	18	<2	<2	<2	1.00	13.5	81.95	6.3	33.58	7.9
A6	13 Sep 2021	833	1	<2	<2	<2	1.00	18.2	81.57	7.7	33.47	8.0
A6	13 Sep 2021	833	12	2e	<2	2e	1.00	15.2	82.57	7.1	33.50	7.9
A6	13 Sep 2021	833	18	8e	<2	2e	0.25	13.9	83.75	6.5	33.55	7.9
A6	22 Sep 2021	834	1	6e	<2	<2	0.33	17.4	75.77	8.8	33.44	8.1
A6	22 Sep 2021	834	12	4e	<2	<2	0.50	13.3	86.55	7.4	33.44	7.9
A6	22 Sep 2021	834	18	22e	2e	<2	0.09	13.0	86.89	7.0	33.44	7.9
A6	28 Sep 2021	835	1	<2	<2	<2	1.00	18.6	81.76	8.3	33.47	8.1
A6	28 Sep 2021	835	12	<2	<2	<2	1.00	14.4	84.54	7.6	33.41	7.9
A6	28 Sep 2021	835	18	<2	<2	<2	1.00	13.9	83.94	7.2	33.42	7.9
A7	07 Sep 2021	841	1	<2	<2	<2	1.00	18.2	82.23	8.0	33.49	8.0
A7	07 Sep 2021	841	12	2e	<2	2e	1.00	14.1	78.35	7.0	33.54	7.9
A7	07 Sep 2021	841	18	4e	<2	<2	0.50	13.9	79.59	6.8	33.53	7.9
A7	13 Sep 2021	820	1	<2	<2	<2	1.00	18.4	77.78	8.2	33.47	8.0
A7	13 Sep 2021	820	12	4e	2e	<2	0.50	14.9	83.48	7.2	33.50	7.9
A7	13 Sep 2021	820	18	20e	<2	2e	0.10	14.1	83.99	6.6	33.51	7.9
A7	22 Sep 2021	816	1	<2	<2	<2	1.00	17.1	70.59	8.5	33.42	8.0
A7	22 Sep 2021	816	12	8e	<2	<2	0.25	13.2	86.24	7.4	33.42	7.9
A7	22 Sep 2021	816	18	44	10e	<2	0.23	12.9	86.27	6.6	33.47	7.9
A7	28 Sep 2021	825	1	4e	<2	<2	0.50	18.6	82.38	8.3	33.47	8.0
A7	28 Sep 2021	825	12	<2	<2	<2	1.00	14.9	83.43	8.2	33.41	8.0
A7	28 Sep 2021	825	18	<2	<2	<2	1.00	13.7	84.08	7.0	33.43	7.9
C4	07 Sep 2021	1008	1	<2	<2	<2	1.00	17.9	75.03	8.6	33.52	8.1
C4	07 Sep 2021	1008	3	<2	<2	<2	1.00	17.2	74.61	8.6	33.55	8.1
C4	07 Sep 2021	1008	9	<2	<2	<2	1.00	16.3	75.62	8.0	33.56	8.0

Station	Date	Time	Depth	Total	Fecal	Entero	F:T	Temp	XMS	DO	Sal	pH
C4	13 Sep 2021	942	1	<2	<2	<2	1.00	17.5	77.84	7.6	33.40	8.0
C4	13 Sep 2021	942	3	<2	<2	<2	1.00	17.4	77.82	7.6	33.48	8.0
C4	13 Sep 2021	942	9	<2	2e	<2	1.00	14.4	70.50	6.4	33.55	7.9
C4	22 Sep 2021	939	1	<2	<2	<2	1.00	17.8	77.29	8.4	33.44	8.1
C4	22 Sep 2021	939	3	<2	<2	<2	1.00	16.6	77.62	8.3	33.57	8.1
C4	22 Sep 2021	939	9	<2	<2	<2	1.00	13.9	78.96	6.2	33.49	7.9
C4	28 Sep 2021	944	1	<2	2e	<2	1.00	18.7	80.70	7.7	33.47	8.0
C4	28 Sep 2021	944	3	2e	<2	<2	1.00	18.5	80.63	7.7	33.48	8.0
C4	28 Sep 2021	944	9	<2	<2	<2	1.00	15.3	74.08	6.2	33.41	7.8
C5	07 Sep 2021	955	1	2e	<2	<2	1.00	18.3	77.38	8.1	33.50	8.0
C5	07 Sep 2021	955	3	<20	<2	<2	0.10	18.3	77.13	8.1	33.51	8.0
C5	07 Sep 2021	955	9	<2	<2	<2	1.00	15.3	76.82	7.7	33.54	8.0
C5	13 Sep 2021	932	1	<2	<2	<2	1.00	18.1	78.64	7.7	33.47	8.0
C5	13 Sep 2021	932	3	<2	<2	<2	1.00	18.0	79.06	7.7	33.48	8.0
C5	13 Sep 2021	932	9	<20	<2	<2	0.10	15.2	70.04	6.8	33.54	7.9
C5	22 Sep 2021	929	1	<20	22e	<2	1.10	17.7	77.00	8.7	33.46	8.1
C5	22 Sep 2021	929	3	<20	64	<2	3.20	16.7	75.74	8.5	33.51	8.1
C5	22 Sep 2021	929	9	<2	<2	<2	1.00	14.2	84.65	7.4	33.45	8.0
C5	28 Sep 2021	935	1	<2	<2	<2	1.00	18.7	80.22	7.8	33.47	8.0
C5	28 Sep 2021	935	3	<2	2e	<2	1.00	18.6	73.27	7.7	33.47	8.0
C5	28 Sep 2021	935	9	<2	<2	<2	1.00	15.8	82.01	6.6	33.47	7.9
C6	07 Sep 2021	944	1	<2	<2	<2	1.00	18.7	73.08	7.4	33.50	8.0
C6	07 Sep 2021	944	3	<2	<2	<2	1.00	17.0	71.78	7.1	33.78	8.0
C6	07 Sep 2021	944	9	<2	<2	<2	1.00	15.1	79.99	7.0	33.55	7.9
C6	13 Sep 2021	922	1	<20	<2	<2	0.10	18.2	77.73	7.8	33.47	8.0
C6	13 Sep 2021	922	3	20e	<2	<2	0.10	17.8	75.95	7.5	33.53	8.0
C6	13 Sep 2021	922	9	<20	<2	<2	0.10	14.1	58.01	6.6	33.56	7.9
C6	22 Sep 2021	917	1	<2	<2	<2	1.00	17.7	75.07	8.7	33.44	8.1
C6	22 Sep 2021	917	3	2e	<2	10e	1.00	15.9	74.30	8.5	33.60	8.1
C6	22 Sep 2021	917	9	<2	<2	2e	1.00	14.2	81.34	7.3	33.48	7.9
C6	28 Sep 2021	922	1	<2	<2	<2	1.00	18.6	78.69	8.0	33.44	8.0
C6	28 Sep 2021	922	3	<2	<2	<2	1.00	18.6	80.34	8.0	33.46	8.0
C6	28 Sep 2021	922	9	<2	<2	<2	1.00	15.7	82.63	7.0	33.45	7.9
C7	07 Sep 2021	909	1	<2	<2	<2	1.00	19.0	83.97	8.1	33.42	8.0
C7	07 Sep 2021	909	12	<2	<2	<2	1.00	14.4	79.06	7.1	33.53	7.9
C7	07 Sep 2021	909	18	<2	<2	<2	1.00	13.6	82.58	5.9	33.57	7.8
C7	13 Sep 2021	848	1	<2	2e	<2	1.00	18.2	76.90	8.6	33.46	8.1
C7	13 Sep 2021	848	12	<2	<2	<2	1.00	17.1	80.19	8.9	33.48	8.1
C7	13 Sep 2021	848	18	<2	<2	<2	1.00	13.7	82.49	6.5	33.39	7.8
C7	22 Sep 2021	843	1	<2	<2	<2	1.00	16.9	73.81	8.6	33.45	8.0
C7	22 Sep 2021	843	12	<2	<2	<2	1.00	13.5	85.93	7.0	33.47	7.9
C7	22 Sep 2021	843	18	2e	<2	2e	1.00	13.1	86.22	6.7	33.46	7.9
C7	28 Sep 2021	848	1	<2	<2	<2	1.00	18.3	82.30	8.2	33.45	8.0
C7	28 Sep 2021	848	12	<2	<2	<2	1.00	14.2	84.13	7.7	33.42	7.9
C7	28 Sep 2021	848	18	<2	<2	<2	1.00	14.1	83.99	7.4	33.42	7.9

Station	Date	Time	Depth	Total	Fecal	Entero	F:T	Temp	XMS	DO	Sal	pH
C8	07 Sep 2021	921	1	<2	<2	<2	1.00	19.5	82.80	8.2	33.49	8.1
C8	07 Sep 2021	921	12	<2	<2	<2	1.00	14.2	78.67	7.3	33.53	7.9
C8	07 Sep 2021	921	18	<2	<2	<2	1.00	13.9	78.30	7.0	33.60	7.9
C8	13 Sep 2021	900	1	<2	<2	<2	1.00	18.4	76.78	8.4	33.47	8.1
C8	13 Sep 2021	900	12	<2	<2	<2	1.00	16.2	78.15	8.5	33.45	8.0
C8	13 Sep 2021	900	18	<2	<2	<2	1.00	13.8	81.38	7.0	33.62	7.9
C8	22 Sep 2021	857	1	<2	<2	<2	1.00	17.6	70.03	8.6	33.48	8.1
C8	22 Sep 2021	857	12	<2	<2	<2	1.00	13.9	83.72	7.2	33.46	7.9
C8	22 Sep 2021	857	18	<2	2e	<2	1.00	13.2	84.99	6.7	33.48	7.9
C8	28 Sep 2021	902	1	<2	<2	<2	1.00	18.4	79.52	8.3	33.44	8.1
C8	28 Sep 2021	902	12	<2	<2	<2	1.00	14.7	83.64	7.9	33.41	8.0
C8	28 Sep 2021	902	18	<2	<2	<2	1.00	14.1	84.24	7.4	33.42	7.9

ns = not sampled

ND = no data

Table 3.9

Summary of visual observations made during the month for each PLOO kelp bed station by sample date.

Station	Date	Parameter	Value
A1	07 Sep 2021	Depth (m)	20
A1	07 Sep 2021	Arrive Time	829
A1	07 Sep 2021	Depart Time	837
A1	07 Sep 2021	Air Temp (C)	19.6
A1	07 Sep 2021	Weather	Overcast
A1	07 Sep 2021	Visibility (mi)	10
A1	07 Sep 2021	Wind Speed (kts)	2
A1	07 Sep 2021	Wind Dir	E
A1	07 Sep 2021	Water Color	Blueish-Green
A1	07 Sep 2021	Wave Ht Low (ft)	3
A1	07 Sep 2021	Wave Period (sec)	15
A1	07 Sep 2021	Sea State	Light Chop
A1	07 Sep 2021	High Tide (ft)	5.97
A1	07 Sep 2021	High Tide Time	2200
A1	07 Sep 2021	Low Tide (ft)	-0.26
A1	07 Sep 2021	Low Tide Time	406
A1	07 Sep 2021	Comments	Kelp debris
A1	13 Sep 2021	Depth (m)	18
A1	13 Sep 2021	Arrive Time	808
A1	13 Sep 2021	Depart Time	812
A1	13 Sep 2021	Air Temp (C)	18
A1	13 Sep 2021	Weather	Overcast
A1	13 Sep 2021	Visibility (mi)	2
A1	13 Sep 2021	Wind Speed (kts)	5.9
A1	13 Sep 2021	Wind Dir	N
A1	13 Sep 2021	Water Color	Green
A1	13 Sep 2021	Wave Ht Low (ft)	3
A1	13 Sep 2021	Wave Period (sec)	19
A1	13 Sep 2021	Sea State	Regular Swell
A1	13 Sep 2021	High Tide (ft)	5.31
A1	13 Sep 2021	High Tide Time	1436
A1	13 Sep 2021	Low Tide (ft)	0.51
A1	13 Sep 2021	Low Tide Time	2248
A1	13 Sep 2021	Comments	none
A1	22 Sep 2021	Depth (m)	19
A1	22 Sep 2021	Arrive Time	805
A1	22 Sep 2021	Depart Time	815
A1	22 Sep 2021	Air Temp (C)	18.8
A1	22 Sep 2021	Weather	Clear
A1	22 Sep 2021	Visibility (mi)	7
A1	22 Sep 2021	Wind Speed (kts)	5.8
A1	22 Sep 2021	Wind Dir	N
A1	22 Sep 2021	Water Color	Blueish-Green
A1	22 Sep 2021	Wave Ht Low (ft)	2
A1	22 Sep 2021	Wave Period (sec)	18
A1	22 Sep 2021	Sea State	Calm
A1	22 Sep 2021	High Tide (ft)	5.3
A1	22 Sep 2021	High Tide Time	1030
A1	22 Sep 2021	Low Tide (ft)	0.61
A1	22 Sep 2021	Low Tide Time	418
A1	22 Sep 2021	Comments	Kelp
A1	28 Sep 2021	Depth (m)	17
A1	28 Sep 2021	Arrive Time	816

Station	Date	Parameter	Value
A1	28 Sep 2021	Depart Time	821
A1	28 Sep 2021	Air Temp (C)	18
A1	28 Sep 2021	Weather	Overcast
A1	28 Sep 2021	Visibility (mi)	10
A1	28 Sep 2021	Wind Speed (kts)	4.6
A1	28 Sep 2021	Wind Dir	SW
A1	28 Sep 2021	Water Color	Blueish-Green
A1	28 Sep 2021	Wave Ht Low (ft)	2
A1	28 Sep 2021	Wave Period (sec)	14
A1	28 Sep 2021	Sea State	Calm
A1	28 Sep 2021	High Tide (ft)	4.33
A1	28 Sep 2021	High Tide Time	1406
A1	28 Sep 2021	Low Tide (ft)	1.15
A1	28 Sep 2021	Low Tide Time	2318
A1	28 Sep 2021	Comments	Kelp present
A6	07 Sep 2021	Depth (m)	16
A6	07 Sep 2021	Arrive Time	854
A6	07 Sep 2021	Depart Time	856
A6	07 Sep 2021	Air Temp (C)	20.3
A6	07 Sep 2021	Weather	Overcast
A6	07 Sep 2021	Visibility (mi)	10
A6	07 Sep 2021	Wind Speed (kts)	4.2
A6	07 Sep 2021	Wind Dir	SE
A6	07 Sep 2021	Water Color	Blueish-Green
A6	07 Sep 2021	Wave Ht Low (ft)	3
A6	07 Sep 2021	Wave Period (sec)	15
A6	07 Sep 2021	Sea State	Light Chop
A6	07 Sep 2021	High Tide (ft)	5.97
A6	07 Sep 2021	High Tide Time	2200
A6	07 Sep 2021	Low Tide (ft)	-0.26
A6	07 Sep 2021	Low Tide Time	406
A6	07 Sep 2021	Comments	Kelp debris
A6	13 Sep 2021	Depth (m)	18
A6	13 Sep 2021	Arrive Time	833
A6	13 Sep 2021	Depart Time	840
A6	13 Sep 2021	Air Temp (C)	17.9
A6	13 Sep 2021	Weather	Overcast
A6	13 Sep 2021	Visibility (mi)	2
A6	13 Sep 2021	Wind Speed (kts)	14.3
A6	13 Sep 2021	Wind Dir	N
A6	13 Sep 2021	Water Color	Green
A6	13 Sep 2021	Wave Ht Low (ft)	3
A6	13 Sep 2021	Wave Period (sec)	19
A6	13 Sep 2021	Sea State	Regular Swell
A6	13 Sep 2021	High Tide (ft)	5.31
A6	13 Sep 2021	High Tide Time	1436
A6	13 Sep 2021	Low Tide (ft)	0.51
A6	13 Sep 2021	Low Tide Time	2248
A6	13 Sep 2021	Comments	none
A6	22 Sep 2021	Depth (m)	21
A6	22 Sep 2021	Arrive Time	830
A6	22 Sep 2021	Depart Time	835
A6	22 Sep 2021	Air Temp (C)	18.9
A6	22 Sep 2021	Weather	Clear
A6	22 Sep 2021	Visibility (mi)	7
A6	22 Sep 2021	Wind Speed (kts)	15.8
A6	22 Sep 2021	Wind Dir	N
A6	22 Sep 2021	Water Color	Blueish-Green

Station	Date	Parameter	Value
A6	22 Sep 2021	Wave Ht Low (ft)	2
A6	22 Sep 2021	Wave Period (sec)	18
A6	22 Sep 2021	Sea State	Calm
A6	22 Sep 2021	High Tide (ft)	5.3
A6	22 Sep 2021	High Tide Time	1030
A6	22 Sep 2021	Low Tide (ft)	0.61
A6	22 Sep 2021	Low Tide Time	418
A6	22 Sep 2021	Comments	Late arrival; Time and depth edited using GPS csv
A6	28 Sep 2021	Depth (m)	17
A6	28 Sep 2021	Arrive Time	839
A6	28 Sep 2021	Depart Time	845
A6	28 Sep 2021	Air Temp (C)	18.3
A6	28 Sep 2021	Weather	Overcast
A6	28 Sep 2021	Visibility (mi)	10
A6	28 Sep 2021	Wind Speed (kts)	5.5
A6	28 Sep 2021	Wind Dir	NW
A6	28 Sep 2021	Water Color	Blueish-Green
A6	28 Sep 2021	Wave Ht Low (ft)	2
A6	28 Sep 2021	Wave Period (sec)	14
A6	28 Sep 2021	Sea State	Calm
A6	28 Sep 2021	High Tide (ft)	4.33
A6	28 Sep 2021	High Tide Time	1406
A6	28 Sep 2021	Low Tide (ft)	1.15
A6	28 Sep 2021	Low Tide Time	2318
A6	28 Sep 2021	Comments	Kelp present
A7	07 Sep 2021	Depth (m)	19
A7	07 Sep 2021	Arrive Time	841
A7	07 Sep 2021	Depart Time	848
A7	07 Sep 2021	Air Temp (C)	20
A7	07 Sep 2021	Weather	Overcast
A7	07 Sep 2021	Visibility (mi)	10
A7	07 Sep 2021	Wind Speed (kts)	2.8
A7	07 Sep 2021	Wind Dir	SE
A7	07 Sep 2021	Water Color	Blueish-Green
A7	07 Sep 2021	Wave Ht Low (ft)	3
A7	07 Sep 2021	Wave Period (sec)	15
A7	07 Sep 2021	Sea State	Light Chop
A7	07 Sep 2021	High Tide (ft)	5.97
A7	07 Sep 2021	High Tide Time	2200
A7	07 Sep 2021	Low Tide (ft)	-0.26
A7	07 Sep 2021	Low Tide Time	406
A7	07 Sep 2021	Comments	Kelp debris
A7	13 Sep 2021	Depth (m)	19
A7	13 Sep 2021	Arrive Time	820
A7	13 Sep 2021	Depart Time	826
A7	13 Sep 2021	Air Temp (C)	17.9
A7	13 Sep 2021	Weather	Overcast
A7	13 Sep 2021	Visibility (mi)	2
A7	13 Sep 2021	Wind Speed (kts)	18.8
A7	13 Sep 2021	Wind Dir	NW
A7	13 Sep 2021	Water Color	Green
A7	13 Sep 2021	Wave Ht Low (ft)	3
A7	13 Sep 2021	Wave Period (sec)	19
A7	13 Sep 2021	Sea State	Regular Swell
A7	13 Sep 2021	High Tide (ft)	5.31
A7	13 Sep 2021	High Tide Time	1436
A7	13 Sep 2021	Low Tide (ft)	0.51
A7	13 Sep 2021	Low Tide Time	2248

Station	Date	Parameter	Value
A7	13 Sep 2021	Comments	none
A7	22 Sep 2021	Depth (m)	1
A7	22 Sep 2021	Arrive Time	816
A7	22 Sep 2021	Depart Time	825
A7	22 Sep 2021	Air Temp (C)	19.2
A7	22 Sep 2021	Weather	Clear
A7	22 Sep 2021	Visibility (mi)	7
A7	22 Sep 2021	Wind Speed (kts)	6.5
A7	22 Sep 2021	Wind Dir	N
A7	22 Sep 2021	Water Color	Blueish-Green
A7	22 Sep 2021	Wave Ht Low (ft)	2
A7	22 Sep 2021	Wave Period (sec)	18
A7	22 Sep 2021	Sea State	Calm
A7	22 Sep 2021	High Tide (ft)	5.3
A7	22 Sep 2021	High Tide Time	1030
A7	22 Sep 2021	Low Tide (ft)	0.61
A7	22 Sep 2021	Low Tide Time	418
A7	22 Sep 2021	Comments	Kelp
A7	28 Sep 2021	Depth (m)	19
A7	28 Sep 2021	Arrive Time	828
A7	28 Sep 2021	Depart Time	831
A7	28 Sep 2021	Air Temp (C)	18.3
A7	28 Sep 2021	Weather	Overcast
A7	28 Sep 2021	Visibility (mi)	10
A7	28 Sep 2021	Wind Speed (kts)	3.6
A7	28 Sep 2021	Wind Dir	NW
A7	28 Sep 2021	Water Color	Blueish-Green
A7	28 Sep 2021	Wave Ht Low (ft)	2
A7	28 Sep 2021	Wave Period (sec)	14
A7	28 Sep 2021	Sea State	Calm
A7	28 Sep 2021	High Tide (ft)	4.33
A7	28 Sep 2021	High Tide Time	1406
A7	28 Sep 2021	Low Tide (ft)	1.15
A7	28 Sep 2021	Low Tide Time	2318
A7	28 Sep 2021	Comments	Kelp present; Boat Presenp
C4	07 Sep 2021	Depth (m)	12
C4	07 Sep 2021	Arrive Time	1008
C4	07 Sep 2021	Depart Time	1011
C4	07 Sep 2021	Air Temp (C)	20.5
C4	07 Sep 2021	Weather	Overcast
C4	07 Sep 2021	Visibility (mi)	10
C4	07 Sep 2021	Wind Speed (kts)	2.5
C4	07 Sep 2021	Wind Dir	SE
C4	07 Sep 2021	Water Color	Blueish-Green
C4	07 Sep 2021	Wave Ht Low (ft)	3
C4	07 Sep 2021	Wave Period (sec)	15
C4	07 Sep 2021	Sea State	Light Chop
C4	07 Sep 2021	High Tide (ft)	5.97
C4	07 Sep 2021	High Tide Time	2200
C4	07 Sep 2021	Low Tide (ft)	-0.26
C4	07 Sep 2021	Low Tide Time	406
C4	07 Sep 2021	Comments	none
C4	13 Sep 2021	Depth (m)	12
C4	13 Sep 2021	Arrive Time	942
C4	13 Sep 2021	Depart Time	1005
C4	13 Sep 2021	Air Temp (C)	18.3
C4	13 Sep 2021	Weather	Overcast

Station	Date	Parameter	Value
C4	13 Sep 2021	Visibility (mi)	2
C4	13 Sep 2021	Wind Speed (kts)	6.8
C4	13 Sep 2021	Wind Dir	N
C4	13 Sep 2021	Water Color	Green
C4	13 Sep 2021	Wave Ht Low (ft)	3
C4	13 Sep 2021	Wave Period (sec)	19
C4	13 Sep 2021	Sea State	Regular Swell
C4	13 Sep 2021	High Tide (ft)	5.31
C4	13 Sep 2021	High Tide Time	1436
C4	13 Sep 2021	Low Tide (ft)	0.51
C4	13 Sep 2021	Low Tide Time	2248
C4	13 Sep 2021	Comments	none
C4	22 Sep 2021	Depth (m)	11
C4	22 Sep 2021	Arrive Time	939
C4	22 Sep 2021	Depart Time	944
C4	22 Sep 2021	Air Temp (C)	19.6
C4	22 Sep 2021	Weather	Clear
C4	22 Sep 2021	Visibility (mi)	7
C4	22 Sep 2021	Wind Speed (kts)	6.5
C4	22 Sep 2021	Wind Dir	N
C4	22 Sep 2021	Water Color	Green
C4	22 Sep 2021	Wave Ht Low (ft)	2
C4	22 Sep 2021	Wave Period (sec)	18
C4	22 Sep 2021	Sea State	Calm
C4	22 Sep 2021	High Tide (ft)	5.3
C4	22 Sep 2021	High Tide Time	1030
C4	22 Sep 2021	Low Tide (ft)	0.61
C4	22 Sep 2021	Low Tide Time	418
C4	22 Sep 2021	Comments	Kelp
C4	28 Sep 2021	Depth (m)	11
C4	28 Sep 2021	Arrive Time	948
C4	28 Sep 2021	Depart Time	951
C4	28 Sep 2021	Air Temp (C)	18.4
C4	28 Sep 2021	Weather	Overcast
C4	28 Sep 2021	Visibility (mi)	10
C4	28 Sep 2021	Wind Speed (kts)	2.9
C4	28 Sep 2021	Wind Dir	S
C4	28 Sep 2021	Water Color	Blueish-Green
C4	28 Sep 2021	Wave Ht Low (ft)	2
C4	28 Sep 2021	Wave Period (sec)	14
C4	28 Sep 2021	Sea State	Calm
C4	28 Sep 2021	High Tide (ft)	4.33
C4	28 Sep 2021	High Tide Time	1406
C4	28 Sep 2021	Low Tide (ft)	1.15
C4	28 Sep 2021	Low Tide Time	2318
C4	28 Sep 2021	Comments	Kelp present; Six boats
C5	07 Sep 2021	Depth (m)	1
C5	07 Sep 2021	Arrive Time	955
C5	07 Sep 2021	Depart Time	958
C5	07 Sep 2021	Air Temp (C)	20.8
C5	07 Sep 2021	Weather	Overcast
C5	07 Sep 2021	Visibility (mi)	10
C5	07 Sep 2021	Wind Speed (kts)	3.7
C5	07 Sep 2021	Wind Dir	SW
C5	07 Sep 2021	Water Color	Blueish-Green
C5	07 Sep 2021	Wave Ht Low (ft)	3
C5	07 Sep 2021	Wave Period (sec)	15
C5	07 Sep 2021	Sea State	Light Chop

Station	Date	Parameter	Value
C5	07 Sep 2021	High Tide (ft)	5.97
C5	07 Sep 2021	High Tide Time	2200
C5	07 Sep 2021	Low Tide (ft)	-0.26
C5	07 Sep 2021	Low Tide Time	406
C5	07 Sep 2021	Comments	none
C5	13 Sep 2021	Depth (m)	11
C5	13 Sep 2021	Arrive Time	932
C5	13 Sep 2021	Depart Time	937
C5	13 Sep 2021	Air Temp (C)	18
C5	13 Sep 2021	Weather	Overcast
C5	13 Sep 2021	Visibility (mi)	2
C5	13 Sep 2021	Wind Speed (kts)	13
C5	13 Sep 2021	Wind Dir	N
C5	13 Sep 2021	Water Color	Green
C5	13 Sep 2021	Wave Ht Low (ft)	3
C5	13 Sep 2021	Wave Period (sec)	19
C5	13 Sep 2021	Sea State	Regular Swell
C5	13 Sep 2021	High Tide (ft)	5.31
C5	13 Sep 2021	High Tide Time	1436
C5	13 Sep 2021	Low Tide (ft)	0.51
C5	13 Sep 2021	Low Tide Time	2248
C5	13 Sep 2021	Comments	none
C5	22 Sep 2021	Depth (m)	11
C5	22 Sep 2021	Arrive Time	929
C5	22 Sep 2021	Depart Time	932
C5	22 Sep 2021	Air Temp (C)	19.7
C5	22 Sep 2021	Weather	Clear
C5	22 Sep 2021	Visibility (mi)	7
C5	22 Sep 2021	Wind Speed (kts)	5.3
C5	22 Sep 2021	Wind Dir	N
C5	22 Sep 2021	Water Color	Green
C5	22 Sep 2021	Wave Ht Low (ft)	2
C5	22 Sep 2021	Wave Period (sec)	18
C5	22 Sep 2021	Sea State	Calm
C5	22 Sep 2021	High Tide (ft)	5.3
C5	22 Sep 2021	High Tide Time	1030
C5	22 Sep 2021	Low Tide (ft)	0.61
C5	22 Sep 2021	Low Tide Time	418
C5	22 Sep 2021	Comments	Kelp
C5	28 Sep 2021	Depth (m)	11
C5	28 Sep 2021	Arrive Time	938
C5	28 Sep 2021	Depart Time	940
C5	28 Sep 2021	Air Temp (C)	18.3
C5	28 Sep 2021	Weather	Overcast
C5	28 Sep 2021	Visibility (mi)	10
C5	28 Sep 2021	Wind Speed (kts)	2.9
C5	28 Sep 2021	Wind Dir	S
C5	28 Sep 2021	Water Color	Blueish-Green
C5	28 Sep 2021	Wave Ht Low (ft)	2
C5	28 Sep 2021	Wave Period (sec)	14
C5	28 Sep 2021	Sea State	Calm
C5	28 Sep 2021	High Tide (ft)	4.33
C5	28 Sep 2021	High Tide Time	1406
C5	28 Sep 2021	Low Tide (ft)	1.15
C5	28 Sep 2021	Low Tide Time	2318
C5	28 Sep 2021	Comments	Kelp present
C6	07 Sep 2021	Depth (m)	9

Station	Date	Parameter	Value
C6	07 Sep 2021	Arrive Time	944
C6	07 Sep 2021	Depart Time	946
C6	07 Sep 2021	Air Temp (C)	20.7
C6	07 Sep 2021	Weather	Overcast
C6	07 Sep 2021	Visibility (mi)	10
C6	07 Sep 2021	Wind Speed (kts)	5.1
C6	07 Sep 2021	Wind Dir	SE
C6	07 Sep 2021	Water Color	Blueish-Green
C6	07 Sep 2021	Wave Ht Low (ft)	3
C6	07 Sep 2021	Wave Period (sec)	15
C6	07 Sep 2021	Sea State	Light Chop
C6	07 Sep 2021	High Tide (ft)	5.97
C6	07 Sep 2021	High Tide Time	2200
C6	07 Sep 2021	Low Tide (ft)	-0.26
C6	07 Sep 2021	Low Tide Time	406
C6	07 Sep 2021	Comments	none
C6	13 Sep 2021	Depth (m)	10
C6	13 Sep 2021	Arrive Time	922
C6	13 Sep 2021	Depart Time	927
C6	13 Sep 2021	Air Temp (C)	18
C6	13 Sep 2021	Weather	Overcast
C6	13 Sep 2021	Visibility (mi)	2
C6	13 Sep 2021	Wind Speed (kts)	11.2
C6	13 Sep 2021	Wind Dir	N
C6	13 Sep 2021	Water Color	Green
C6	13 Sep 2021	Wave Ht Low (ft)	3
C6	13 Sep 2021	Wave Period (sec)	19
C6	13 Sep 2021	Sea State	Regular Swell
C6	13 Sep 2021	High Tide (ft)	5.31
C6	13 Sep 2021	High Tide Time	1436
C6	13 Sep 2021	Low Tide (ft)	0.51
C6	13 Sep 2021	Low Tide Time	2248
C6	13 Sep 2021	Comments	none
C6	22 Sep 2021	Depth (m)	10
C6	22 Sep 2021	Arrive Time	917
C6	22 Sep 2021	Depart Time	922
C6	22 Sep 2021	Air Temp (C)	19.8
C6	22 Sep 2021	Weather	Clear
C6	22 Sep 2021	Visibility (mi)	7
C6	22 Sep 2021	Wind Speed (kts)	9.1
C6	22 Sep 2021	Wind Dir	N
C6	22 Sep 2021	Water Color	Green
C6	22 Sep 2021	Wave Ht Low (ft)	2
C6	22 Sep 2021	Wave Period (sec)	18
C6	22 Sep 2021	Sea State	Calm
C6	22 Sep 2021	High Tide (ft)	5.3
C6	22 Sep 2021	High Tide Time	1030
C6	22 Sep 2021	Low Tide (ft)	0.61
C6	22 Sep 2021	Low Tide Time	418
C6	22 Sep 2021	Comments	Kelp
C6	28 Sep 2021	Depth (m)	9
C6	28 Sep 2021	Arrive Time	928
C6	28 Sep 2021	Depart Time	932
C6	28 Sep 2021	Air Temp (C)	18.4
C6	28 Sep 2021	Weather	Overcast
C6	28 Sep 2021	Visibility (mi)	10
C6	28 Sep 2021	Wind Speed (kts)	5.8
C6	28 Sep 2021	Wind Dir	W

Station	Date	Parameter	Value
C6	28 Sep 2021	Water Color	Blueish-Green
C6	28 Sep 2021	Wave Ht Low (ft)	2
C6	28 Sep 2021	Wave Period (sec)	14
C6	28 Sep 2021	Sea State	Calm
C6	28 Sep 2021	High Tide (ft)	4.33
C6	28 Sep 2021	High Tide Time	1406
C6	28 Sep 2021	Low Tide (ft)	1.15
C6	28 Sep 2021	Low Tide Time	2318
C6	28 Sep 2021	Comments	Kelp present
C7	07 Sep 2021	Depth (m)	18
C7	07 Sep 2021	Arrive Time	909
C7	07 Sep 2021	Depart Time	911
C7	07 Sep 2021	Air Temp (C)	20.5
C7	07 Sep 2021	Weather	Overcast
C7	07 Sep 2021	Visibility (mi)	10
C7	07 Sep 2021	Wind Speed (kts)	2.7
C7	07 Sep 2021	Wind Dir	SE
C7	07 Sep 2021	Water Color	Blueish-Green
C7	07 Sep 2021	Wave Ht Low (ft)	3
C7	07 Sep 2021	Wave Period (sec)	15
C7	07 Sep 2021	Sea State	Light Chop
C7	07 Sep 2021	High Tide (ft)	5.97
C7	07 Sep 2021	High Tide Time	2200
C7	07 Sep 2021	Low Tide (ft)	-0.26
C7	07 Sep 2021	Low Tide Time	406
C7	07 Sep 2021	Comments	Kelp debris
C7	13 Sep 2021	Depth (m)	18
C7	13 Sep 2021	Arrive Time	848
C7	13 Sep 2021	Depart Time	853
C7	13 Sep 2021	Air Temp (C)	17.7
C7	13 Sep 2021	Weather	Overcast
C7	13 Sep 2021	Visibility (mi)	2
C7	13 Sep 2021	Wind Speed (kts)	10.7
C7	13 Sep 2021	Wind Dir	N
C7	13 Sep 2021	Water Color	Green
C7	13 Sep 2021	Wave Ht Low (ft)	3
C7	13 Sep 2021	Wave Period (sec)	19
C7	13 Sep 2021	Sea State	Regular Swell
C7	13 Sep 2021	High Tide (ft)	5.31
C7	13 Sep 2021	High Tide Time	1436
C7	13 Sep 2021	Low Tide (ft)	0.51
C7	13 Sep 2021	Low Tide Time	2248
C7	13 Sep 2021	Comments	none
C7	22 Sep 2021	Depth (m)	18
C7	22 Sep 2021	Arrive Time	843
C7	22 Sep 2021	Depart Time	848
C7	22 Sep 2021	Air Temp (C)	19.1
C7	22 Sep 2021	Weather	Clear
C7	22 Sep 2021	Visibility (mi)	7
C7	22 Sep 2021	Wind Speed (kts)	4.6
C7	22 Sep 2021	Wind Dir	N
C7	22 Sep 2021	Water Color	Blueish-Green
C7	22 Sep 2021	Wave Ht Low (ft)	2
C7	22 Sep 2021	Wave Period (sec)	18
C7	22 Sep 2021	Sea State	Calm
C7	22 Sep 2021	High Tide (ft)	5.3
C7	22 Sep 2021	High Tide Time	1030
C7	22 Sep 2021	Low Tide (ft)	0.61

Station	Date	Parameter	Value
C7	22 Sep 2021	Low Tide Time	418
C7	22 Sep 2021	Comments	Kelp debris
C7	28 Sep 2021	Depth (m)	18
C7	28 Sep 2021	Arrive Time	857
C7	28 Sep 2021	Depart Time	901
C7	28 Sep 2021	Air Temp (C)	18.4
C7	28 Sep 2021	Weather	Overcast
C7	28 Sep 2021	Visibility (mi)	10
C7	28 Sep 2021	Wind Speed (kts)	0
C7	28 Sep 2021	Wind Dir	N
C7	28 Sep 2021	Water Color	Blueish-Green
C7	28 Sep 2021	Wave Ht Low (ft)	2
C7	28 Sep 2021	Wave Period (sec)	14
C7	28 Sep 2021	Sea State	Calm
C7	28 Sep 2021	High Tide (ft)	4.33
C7	28 Sep 2021	High Tide Time	1406
C7	28 Sep 2021	Low Tide (ft)	1.15
C7	28 Sep 2021	Low Tide Time	2318
C7	28 Sep 2021	Comments	Kelp present
C8	07 Sep 2021	Depth (m)	20
C8	07 Sep 2021	Arrive Time	921
C8	07 Sep 2021	Depart Time	923
C8	07 Sep 2021	Air Temp (C)	21
C8	07 Sep 2021	Weather	Overcast
C8	07 Sep 2021	Visibility (mi)	10
C8	07 Sep 2021	Wind Speed (kts)	1.3
C8	07 Sep 2021	Wind Dir	SE
C8	07 Sep 2021	Water Color	Blueish-Green
C8	07 Sep 2021	Wave Ht Low (ft)	3
C8	07 Sep 2021	Wave Period (sec)	15
C8	07 Sep 2021	Sea State	Light Chop
C8	07 Sep 2021	High Tide (ft)	5.97
C8	07 Sep 2021	High Tide Time	2200
C8	07 Sep 2021	Low Tide (ft)	-0.26
C8	07 Sep 2021	Low Tide Time	406
C8	07 Sep 2021	Comments	Kelp debris
C8	13 Sep 2021	Depth (m)	19
C8	13 Sep 2021	Arrive Time	900
C8	13 Sep 2021	Depart Time	906
C8	13 Sep 2021	Air Temp (C)	17.9
C8	13 Sep 2021	Weather	Overcast
C8	13 Sep 2021	Visibility (mi)	2
C8	13 Sep 2021	Wind Speed (kts)	8.9
C8	13 Sep 2021	Wind Dir	N
C8	13 Sep 2021	Water Color	Green
C8	13 Sep 2021	Wave Ht Low (ft)	3
C8	13 Sep 2021	Wave Period (sec)	19
C8	13 Sep 2021	Sea State	Regular Swell
C8	13 Sep 2021	High Tide (ft)	5.31
C8	13 Sep 2021	High Tide Time	1436
C8	13 Sep 2021	Low Tide (ft)	0.51
C8	13 Sep 2021	Low Tide Time	2248
C8	13 Sep 2021	Comments	none
C8	22 Sep 2021	Depth (m)	20
C8	22 Sep 2021	Arrive Time	857
C8	22 Sep 2021	Depart Time	902
C8	22 Sep 2021	Air Temp (C)	19.3

Station	Date	Parameter	Value
C8	22 Sep 2021	Weather	Clear
C8	22 Sep 2021	Visibility (mi)	7
C8	22 Sep 2021	Wind Speed (kts)	5.6
C8	22 Sep 2021	Wind Dir	N
C8	22 Sep 2021	Water Color	Green
C8	22 Sep 2021	Wave Ht Low (ft)	2
C8	22 Sep 2021	Wave Period (sec)	18
C8	22 Sep 2021	Sea State	Calm
C8	22 Sep 2021	High Tide (ft)	5.3
C8	22 Sep 2021	High Tide Time	1030
C8	22 Sep 2021	Low Tide (ft)	0.61
C8	22 Sep 2021	Low Tide Time	418
C8	22 Sep 2021	Comments	none
C8	28 Sep 2021	Depth (m)	20
C8	28 Sep 2021	Arrive Time	909
C8	28 Sep 2021	Depart Time	912
C8	28 Sep 2021	Air Temp (C)	18.4
C8	28 Sep 2021	Weather	Overcast
C8	28 Sep 2021	Visibility (mi)	10
C8	28 Sep 2021	Wind Speed (kts)	1.2
C8	28 Sep 2021	Wind Dir	N
C8	28 Sep 2021	Water Color	Blueish-Green
C8	28 Sep 2021	Wave Ht Low (ft)	2
C8	28 Sep 2021	Wave Period (sec)	14
C8	28 Sep 2021	Sea State	Calm
C8	28 Sep 2021	High Tide (ft)	4.33
C8	28 Sep 2021	High Tide Time	1406
C8	28 Sep 2021	Low Tide (ft)	1.15
C8	28 Sep 2021	Low Tide Time	2318
C8	28 Sep 2021	Comments	none

Table 3.10

Summary of CTD profile data from the PLOO kelp stations for each sample date.

Station	Date	Depth (m)	Temp (°C)	XMS (‰)	DO (mg/L)	Sal (ppt)	pH	Dens (σ -t)	Chlor (μ g/L)
A1	07 Sep 2021	1	18.77	80.07	8.3	33.49	8.0	23.9	1.37
A1	07 Sep 2021	2	18.63	79.90	8.3	33.52	8.0	24.0	1.35
A1	07 Sep 2021	3	18.41	79.38	8.3	33.52	8.0	24.0	1.46
A1	07 Sep 2021	4	17.99	78.25	8.3	33.56	8.0	24.2	1.60
A1	07 Sep 2021	5	17.40	78.19	8.4	33.60	8.0	24.3	1.79
A1	07 Sep 2021	6	16.64	77.88	8.4	33.60	8.0	24.5	1.97
A1	07 Sep 2021	7	16.05	77.96	8.3	33.59	8.0	24.7	2.11
A1	07 Sep 2021	8	15.68	78.61	8.1	33.57	8.0	24.7	2.21
A1	07 Sep 2021	9	15.37	77.70	8.0	33.56	7.9	24.8	2.39
A1	07 Sep 2021	10	15.20	76.56	7.9	33.56	7.9	24.8	2.70
A1	07 Sep 2021	11	14.87	76.03	7.8	33.56	7.9	24.9	3.09
A1	07 Sep 2021	12	14.70	76.05	7.7	33.56	7.9	24.9	3.54
A1	07 Sep 2021	13	14.61	76.10	7.6	33.54	7.9	24.9	3.53
A1	07 Sep 2021	14	14.57	76.24	7.5	33.53	7.9	24.9	3.62
A1	07 Sep 2021	15	14.54	76.49	7.5	33.53	7.9	24.9	3.62
A1	07 Sep 2021	16	14.54	76.80	7.5	33.53	7.9	24.9	3.55
A1	07 Sep 2021	17	14.53	77.05	7.4	33.53	7.9	24.9	3.49
A1	07 Sep 2021	18	14.42	77.28	7.3	33.55	7.9	25.0	3.34
A1	07 Sep 2021	19	14.20	77.86	7.1	33.57	7.9	25.0	3.25
A1	07 Sep 2021	20	14.11	78.53	7.0	33.55	7.9	25.0	3.13
A1	13 Sep 2021	1	18.23	78.71	8.1	33.47	8.0	24.0	1.94
A1	13 Sep 2021	2	18.19	79.31	8.1	33.48	8.0	24.1	2.00
A1	13 Sep 2021	3	18.05	78.43	8.1	33.49	8.0	24.1	2.10
A1	13 Sep 2021	4	17.64	77.11	8.2	33.51	8.0	24.2	2.29
A1	13 Sep 2021	5	17.05	77.09	8.1	33.56	8.0	24.4	2.52
A1	13 Sep 2021	6	16.52	78.00	8.0	33.53	8.0	24.5	2.75
A1	13 Sep 2021	7	16.33	79.03	7.9	33.48	8.0	24.5	2.78
A1	13 Sep 2021	8	16.09	79.72	7.8	33.53	7.9	24.6	2.82
A1	13 Sep 2021	9	15.35	80.91	7.5	33.57	7.9	24.8	2.72
A1	13 Sep 2021	10	14.65	83.02	7.4	33.58	7.9	25.0	2.55
A1	13 Sep 2021	11	14.35	83.41	7.3	33.51	7.9	25.0	2.32
A1	13 Sep 2021	12	13.86	84.86	7.1	33.53	7.9	25.1	2.06
A1	13 Sep 2021	13	13.67	85.29	6.9	33.51	7.9	25.1	1.93
A1	13 Sep 2021	14	13.63	85.26	6.8	33.50	7.9	25.1	1.64
A1	13 Sep 2021	15	13.60	85.28	6.8	33.50	7.9	25.1	1.61
A1	13 Sep 2021	16	13.58	85.28	6.8	33.50	7.8	25.1	1.46
A1	13 Sep 2021	17	13.56	85.11	6.7	33.51	7.8	25.1	1.33
A1	13 Sep 2021	18	13.55	84.69	6.7	33.51	7.8	25.1	1.40
A1	22 Sep 2021	1	15.56	79.75	8.4	33.41	8.0	24.6	1.68
A1	22 Sep 2021	2	15.22	80.15	8.4	33.45	8.0	24.7	1.71
A1	22 Sep 2021	3	14.92	81.10	8.2	33.42	8.0	24.8	1.74
A1	22 Sep 2021	4	14.57	81.26	8.1	33.48	8.0	24.9	1.74
A1	22 Sep 2021	5	14.06	82.33	8.0	33.43	8.0	25.0	1.83
A1	22 Sep 2021	6	13.83	83.62	8.0	33.42	8.0	25.0	1.76
A1	22 Sep 2021	7	13.75	84.35	7.9	33.41	7.9	25.0	1.81
A1	22 Sep 2021	8	13.52	84.75	7.7	33.42	7.9	25.1	1.93
A1	22 Sep 2021	9	13.46	85.41	7.6	33.42	7.9	25.1	1.75
A1	22 Sep 2021	10	13.27	85.59	7.7	33.41	7.9	25.1	1.65
A1	22 Sep 2021	11	13.18	86.12	7.7	33.40	7.9	25.1	1.68
A1	22 Sep 2021	12	13.18	86.24	7.5	33.41	7.9	25.1	1.70
A1	22 Sep 2021	13	13.16	86.03	7.4	33.42	7.9	25.1	1.82
A1	22 Sep 2021	14	13.15	86.25	7.3	33.42	7.9	25.1	1.65
A1	22 Sep 2021	15	13.16	86.40	7.3	33.42	7.9	25.1	1.62

Station	Date	Depth (m)	Temp (°C)	XMS (‰)	DO (mg/L)	Sal (ppt)	pH	Dens (σ-t)	Chlor (µg/L)
A1	22 Sep 2021	16	13.08	86.30	7.1	33.44	7.9	25.2	1.55
A1	22 Sep 2021	17	13.07	86.36	7.0	33.44	7.9	25.2	1.50
A1	22 Sep 2021	18	13.04	86.36	6.9	33.45	7.8	25.2	1.43
A1	22 Sep 2021	19	12.86	86.42	6.6	33.51	7.8	25.3	1.26
A1	28 Sep 2021	1	18.96	83.78	8.1	33.49	8.0	23.9	1.06
A1	28 Sep 2021	2	18.72	83.86	8.1	33.54	8.0	24.0	1.04
A1	28 Sep 2021	3	17.87	83.49	8.0	33.52	8.0	24.2	1.11
A1	28 Sep 2021	4	16.75	82.88	8.0	33.64	8.0	24.5	1.28
A1	28 Sep 2021	5	15.81	82.69	8.2	33.49	8.0	24.6	1.46
A1	28 Sep 2021	6	15.61	82.66	8.3	33.44	8.0	24.6	1.70
A1	28 Sep 2021	7	15.51	82.89	8.3	33.41	8.0	24.6	1.83
A1	28 Sep 2021	8	15.43	82.85	8.4	33.41	8.0	24.7	1.96
A1	28 Sep 2021	9	15.31	83.09	8.4	33.40	8.0	24.7	2.05
A1	28 Sep 2021	10	15.16	83.24	8.5	33.39	8.0	24.7	2.09
A1	28 Sep 2021	11	15.04	83.26	8.4	33.39	8.0	24.7	2.20
A1	28 Sep 2021	12	14.70	83.41	8.0	33.46	7.9	24.9	2.27
A1	28 Sep 2021	13	13.93	84.02	7.5	33.47	7.9	25.0	2.14
A1	28 Sep 2021	14	13.68	83.65	7.2	33.45	7.9	25.1	1.82
A1	28 Sep 2021	15	13.65	83.42	7.2	33.43	7.9	25.0	1.81
A1	28 Sep 2021	16	13.62	83.38	7.2	33.43	7.9	25.1	1.73
A1	28 Sep 2021	17	13.62	83.21	7.1	33.43	7.9	25.1	1.89
A1	28 Sep 2021	18	13.62	83.41	7.1	33.43	7.9	25.1	1.86
A6	07 Sep 2021	1	18.92	76.94	7.6	33.47	8.0	23.9	1.10
A6	07 Sep 2021	2	18.72	77.05	7.6	33.56	8.0	24.0	1.12
A6	07 Sep 2021	3	17.95	77.68	7.8	33.59	8.0	24.2	1.08
A6	07 Sep 2021	4	17.47	78.16	7.9	33.57	8.0	24.3	1.24
A6	07 Sep 2021	5	17.09	78.28	8.0	33.59	8.0	24.4	1.47
A6	07 Sep 2021	6	16.61	78.44	8.1	33.57	8.0	24.5	1.65
A6	07 Sep 2021	7	16.32	78.42	8.1	33.56	8.0	24.6	1.87
A6	07 Sep 2021	8	15.89	78.36	8.2	33.56	8.0	24.7	2.01
A6	07 Sep 2021	9	15.30	78.04	8.2	33.56	8.0	24.8	2.25
A6	07 Sep 2021	10	15.16	78.04	8.1	33.52	8.0	24.8	2.44
A6	07 Sep 2021	11	14.86	78.04	7.8	33.56	8.0	24.9	2.64
A6	07 Sep 2021	12	14.51	78.99	7.2	33.57	7.9	25.0	2.89
A6	07 Sep 2021	13	14.35	80.20	6.8	33.57	7.9	25.0	2.70
A6	07 Sep 2021	14	14.25	80.90	6.6	33.56	7.9	25.0	2.54
A6	07 Sep 2021	15	14.10	81.57	6.5	33.58	7.9	25.1	2.25
A6	07 Sep 2021	16	13.91	81.68	6.5	33.57	7.9	25.1	2.11
A6	07 Sep 2021	17	13.73	81.43	6.4	33.59	7.9	25.2	2.05
A6	07 Sep 2021	18	13.50	81.95	6.3	33.58	7.9	25.2	1.94
A6	07 Sep 2021	19	13.46	82.53	6.1	33.56	7.8	25.2	1.95
A6	13 Sep 2021	1	18.20	81.57	7.7	33.47	8.0	24.1	1.43
A6	13 Sep 2021	2	18.14	81.36	7.7	33.48	8.0	24.1	1.41
A6	13 Sep 2021	3	18.14	81.51	7.7	33.48	8.0	24.1	1.50
A6	13 Sep 2021	4	17.92	80.80	7.7	33.50	8.0	24.1	1.57
A6	13 Sep 2021	5	17.67	79.63	7.6	33.51	8.0	24.2	1.65
A6	13 Sep 2021	6	17.38	79.55	7.6	33.49	8.0	24.3	1.84
A6	13 Sep 2021	7	16.91	79.93	7.5	33.58	8.0	24.4	2.14
A6	13 Sep 2021	8	16.06	80.29	7.4	33.54	8.0	24.6	2.15
A6	13 Sep 2021	9	15.95	80.16	7.4	33.50	8.0	24.6	2.27
A6	13 Sep 2021	10	15.86	81.02	7.4	33.51	7.9	24.6	2.24
A6	13 Sep 2021	11	15.33	82.26	7.3	33.53	7.9	24.8	2.14
A6	13 Sep 2021	12	15.23	82.57	7.1	33.50	7.9	24.8	2.06
A6	13 Sep 2021	13	15.11	82.98	7.0	33.50	7.9	24.8	1.78
A6	13 Sep 2021	14	14.96	83.17	6.9	33.51	7.9	24.8	1.62
A6	13 Sep 2021	15	14.78	83.49	6.9	33.51	7.9	24.9	1.45
A6	13 Sep 2021	16	14.65	83.67	6.8	33.52	7.9	24.9	1.22
A6	13 Sep 2021	17	14.13	83.45	6.6	33.56	7.9	25.0	1.17

Station	Date	Depth (m)	Temp (°C)	XMS (‰)	DO (mg/L)	Sal (ppt)	pH	Dens (σ-t)	Chlor (µg/L)
A6	13 Sep 2021	18	13.94	83.75	6.5	33.55	7.9	25.1	1.06
A6	22 Sep 2021	1	17.40	75.77	8.8	33.44	8.1	24.2	1.72
A6	22 Sep 2021	2	17.32	75.49	8.8	33.45	8.1	24.2	1.87
A6	22 Sep 2021	3	16.23	78.36	8.6	33.66	8.1	24.7	1.86
A6	22 Sep 2021	4	14.88	79.58	8.5	33.52	8.0	24.9	1.86
A6	22 Sep 2021	5	14.64	80.36	8.1	33.47	8.0	24.9	1.90
A6	22 Sep 2021	6	14.18	83.05	7.7	33.48	8.0	25.0	1.95
A6	22 Sep 2021	7	13.78	84.43	7.6	33.49	8.0	25.1	1.84
A6	22 Sep 2021	8	13.64	85.29	7.6	33.45	8.0	25.1	1.65
A6	22 Sep 2021	9	13.52	85.72	7.5	33.44	7.9	25.1	1.52
A6	22 Sep 2021	10	13.41	86.04	7.5	33.45	7.9	25.1	1.45
A6	22 Sep 2021	11	13.33	86.31	7.4	33.44	7.9	25.1	1.39
A6	22 Sep 2021	12	13.31	86.55	7.4	33.44	7.9	25.1	1.37
A6	22 Sep 2021	13	13.23	86.61	7.3	33.44	7.9	25.1	1.43
A6	22 Sep 2021	14	13.11	86.82	7.2	33.45	7.9	25.2	1.35
A6	22 Sep 2021	15	13.08	86.83	7.2	33.45	7.9	25.2	1.26
A6	22 Sep 2021	16	13.06	86.78	7.1	33.45	7.9	25.2	1.26
A6	22 Sep 2021	17	13.04	86.90	7.0	33.44	7.9	25.2	1.21
A6	22 Sep 2021	18	13.03	86.89	7.0	33.44	7.9	25.2	1.24
A6	22 Sep 2021	19	13.03	86.91	7.1	33.44	7.9	25.2	1.28
A6	22 Sep 2021	20	13.02	86.94	7.1	33.44	7.9	25.2	1.32
A6	22 Sep 2021	21	13.01	86.96	7.0	33.44	7.9	25.2	1.29
A6	28 Sep 2021	1	18.58	81.76	8.3	33.47	8.1	24.0	1.74
A6	28 Sep 2021	2	18.55	81.70	8.3	33.47	8.1	24.0	1.78
A6	28 Sep 2021	3	18.39	81.52	8.3	33.48	8.1	24.0	1.80
A6	28 Sep 2021	4	18.00	81.31	8.2	33.51	8.0	24.1	1.93
A6	28 Sep 2021	5	17.53	80.99	8.1	33.48	8.0	24.2	2.15
A6	28 Sep 2021	6	16.26	81.32	7.8	33.60	8.0	24.6	2.24
A6	28 Sep 2021	7	15.05	83.16	7.8	33.46	8.0	24.8	1.91
A6	28 Sep 2021	8	14.70	83.93	7.8	33.44	8.0	24.8	1.68
A6	28 Sep 2021	9	14.48	84.24	7.8	33.41	8.0	24.9	1.75
A6	28 Sep 2021	10	14.44	84.36	7.8	33.41	8.0	24.9	1.59
A6	28 Sep 2021	11	14.40	84.49	7.6	33.41	7.9	24.9	1.58
A6	28 Sep 2021	12	14.37	84.54	7.6	33.41	7.9	24.9	1.44
A6	28 Sep 2021	13	14.26	84.64	7.5	33.43	7.9	24.9	1.37
A6	28 Sep 2021	14	14.11	84.49	7.4	33.42	7.9	24.9	1.35
A6	28 Sep 2021	15	14.02	84.34	7.4	33.42	7.9	25.0	1.35
A6	28 Sep 2021	16	13.90	83.97	7.3	33.43	7.9	25.0	1.36
A6	28 Sep 2021	17	13.87	83.87	7.2	33.42	7.9	25.0	1.40
A6	28 Sep 2021	18	13.87	83.94	7.2	33.42	7.9	25.0	1.38
A7	07 Sep 2021	1	18.20	82.23	8.0	33.49	8.0	24.1	1.13
A7	07 Sep 2021	2	17.99	81.08	7.8	33.54	8.0	24.2	1.08
A7	07 Sep 2021	3	16.95	80.23	7.8	33.66	8.0	24.5	1.10
A7	07 Sep 2021	4	16.04	80.23	7.9	33.62	8.0	24.7	1.15
A7	07 Sep 2021	5	15.57	79.18	7.9	33.58	8.0	24.8	1.42
A7	07 Sep 2021	6	15.42	77.22	8.0	33.52	8.0	24.7	1.94
A7	07 Sep 2021	7	15.36	76.80	8.0	33.54	8.0	24.8	2.39
A7	07 Sep 2021	8	15.12	76.65	7.9	33.54	8.0	24.8	2.85
A7	07 Sep 2021	9	14.96	76.60	7.7	33.55	8.0	24.9	3.08
A7	07 Sep 2021	10	14.40	76.65	7.5	33.60	7.9	25.0	3.18
A7	07 Sep 2021	11	14.15	77.28	7.2	33.55	7.9	25.0	3.44
A7	07 Sep 2021	12	14.06	78.35	7.0	33.54	7.9	25.1	3.36
A7	07 Sep 2021	13	13.98	78.92	7.0	33.54	7.9	25.1	3.28
A7	07 Sep 2021	14	13.96	79.14	6.9	33.53	7.9	25.1	3.23
A7	07 Sep 2021	15	13.96	79.37	6.9	33.53	7.9	25.1	3.19
A7	07 Sep 2021	16	13.96	79.34	6.9	33.53	7.9	25.1	3.01
A7	07 Sep 2021	17	13.96	79.33	6.9	33.53	7.9	25.1	3.11
A7	07 Sep 2021	18	13.94	79.59	6.8	33.53	7.9	25.1	3.07

Station	Date	Depth (m)	Temp (°C)	XMS (‰)	DO (mg/L)	Sal (ppt)	pH	Dens (σ-t)	Chlor (µg/L)
A7	07 Sep 2021	19	13.92	79.81	6.8	33.54	7.9	25.1	2.95
A7	07 Sep 2021	20	13.92	79.93	6.7	33.53	7.9	25.1	2.93
A7	13 Sep 2021	1	18.40	77.78	8.2	33.47	8.0	24.0	2.17
A7	13 Sep 2021	2	18.21	77.84	8.2	33.48	8.0	24.1	2.23
A7	13 Sep 2021	3	17.85	77.12	8.2	33.53	8.0	24.2	2.34
A7	13 Sep 2021	4	17.39	77.95	8.2	33.54	8.0	24.3	2.49
A7	13 Sep 2021	5	17.14	78.07	8.2	33.47	8.0	24.3	2.61
A7	13 Sep 2021	6	16.82	78.04	8.1	33.54	8.0	24.4	2.67
A7	13 Sep 2021	7	16.16	78.65	7.7	33.55	8.0	24.6	2.69
A7	13 Sep 2021	8	15.50	80.22	7.5	33.53	7.9	24.7	2.83
A7	13 Sep 2021	9	15.32	81.87	7.4	33.50	7.9	24.7	2.74
A7	13 Sep 2021	10	15.20	82.17	7.2	33.49	7.9	24.8	2.41
A7	13 Sep 2021	11	14.98	82.81	7.2	33.50	7.9	24.8	2.07
A7	13 Sep 2021	12	14.91	83.48	7.2	33.50	7.9	24.8	1.77
A7	13 Sep 2021	13	14.66	83.50	7.1	33.50	7.9	24.9	1.54
A7	13 Sep 2021	14	14.51	83.87	7.1	33.49	7.9	24.9	1.44
A7	13 Sep 2021	15	14.47	84.11	7.0	33.50	7.9	24.9	1.36
A7	13 Sep 2021	16	14.21	84.04	6.9	33.53	7.9	25.0	1.34
A7	13 Sep 2021	17	14.02	83.94	6.7	33.52	7.9	25.0	1.30
A7	13 Sep 2021	18	14.06	83.99	6.6	33.51	7.9	25.0	1.14
A7	13 Sep 2021	19	13.71	83.29	6.5	33.56	7.9	25.1	0.96
A7	22 Sep 2021	1	17.14	70.59	8.5	33.42	8.0	24.3	1.83
A7	22 Sep 2021	2	17.18	74.95	8.4	33.42	8.0	24.3	1.82
A7	22 Sep 2021	3	15.61	77.18	8.4	33.73	8.0	24.9	1.91
A7	22 Sep 2021	4	14.77	79.23	8.4	33.48	8.0	24.9	1.88
A7	22 Sep 2021	5	14.54	80.77	8.1	33.47	8.0	24.9	1.93
A7	22 Sep 2021	6	14.04	82.29	7.8	33.53	8.0	25.0	1.90
A7	22 Sep 2021	7	13.67	84.19	7.7	33.46	7.9	25.1	1.87
A7	22 Sep 2021	8	13.49	84.85	7.8	33.43	8.0	25.1	1.70
A7	22 Sep 2021	9	13.35	85.00	7.7	33.44	7.9	25.1	1.73
A7	22 Sep 2021	10	13.26	85.79	7.5	33.43	7.9	25.1	1.84
A7	22 Sep 2021	11	13.21	86.08	7.4	33.42	7.9	25.1	1.81
A7	22 Sep 2021	12	13.18	86.24	7.4	33.42	7.9	25.1	1.85
A7	22 Sep 2021	13	13.14	86.35	7.3	33.43	7.9	25.1	1.66
A7	22 Sep 2021	14	13.11	86.49	7.2	33.44	7.9	25.2	1.59
A7	22 Sep 2021	15	13.07	86.55	7.0	33.45	7.9	25.2	1.60
A7	22 Sep 2021	16	13.03	86.54	6.9	33.46	7.9	25.2	1.49
A7	22 Sep 2021	17	12.96	86.44	6.8	33.47	7.9	25.2	1.28
A7	22 Sep 2021	18	12.95	86.27	6.6	33.47	7.9	25.2	1.28
A7	28 Sep 2021	1	18.56	82.38	8.3	33.47	8.0	24.0	1.45
A7	28 Sep 2021	2	18.52	82.37	8.2	33.48	8.0	24.0	1.46
A7	28 Sep 2021	3	18.47	82.43	8.3	33.47	8.1	24.0	1.51
A7	28 Sep 2021	4	18.30	82.44	8.2	33.50	8.1	24.1	1.60
A7	28 Sep 2021	5	17.67	82.42	8.2	33.48	8.0	24.2	1.66
A7	28 Sep 2021	6	17.06	82.37	7.9	33.59	8.0	24.4	1.63
A7	28 Sep 2021	7	15.71	82.62	7.8	33.53	8.0	24.7	1.70
A7	28 Sep 2021	8	15.35	82.94	8.2	33.43	8.0	24.7	1.68
A7	28 Sep 2021	9	15.21	83.46	8.4	33.41	8.0	24.7	1.75
A7	28 Sep 2021	10	15.08	83.41	8.4	33.40	8.0	24.7	1.90
A7	28 Sep 2021	11	15.01	83.43	8.4	33.40	8.0	24.7	2.07
A7	28 Sep 2021	12	14.91	83.43	8.2	33.41	8.0	24.8	2.15
A7	28 Sep 2021	13	14.50	83.79	7.9	33.45	8.0	24.9	2.18
A7	28 Sep 2021	14	14.23	84.13	7.7	33.43	7.9	24.9	2.03
A7	28 Sep 2021	15	14.15	84.27	7.5	33.42	7.9	24.9	1.80
A7	28 Sep 2021	16	14.06	84.42	7.3	33.43	7.9	25.0	1.62
A7	28 Sep 2021	17	13.80	84.53	7.1	33.46	7.9	25.0	1.49
A7	28 Sep 2021	18	13.69	84.08	7.0	33.43	7.9	25.0	1.24

Station	Date	Depth (m)	Temp (°C)	XMS (‰)	DO (mg/L)	Sal (ppt)	pH	Dens (σ-t)	Chlor (µg/L)
C4	07 Sep 2021	1	17.86	75.03	8.6	33.52	8.1	24.2	1.37
C4	07 Sep 2021	2	17.59	75.07	8.6	33.54	8.1	24.3	1.34
C4	07 Sep 2021	3	17.20	74.61	8.6	33.55	8.1	24.4	1.39
C4	07 Sep 2021	4	17.01	74.28	8.5	33.52	8.0	24.4	1.51
C4	07 Sep 2021	5	16.99	74.37	8.5	33.51	8.0	24.4	1.77
C4	07 Sep 2021	6	16.95	74.60	8.4	33.51	8.0	24.4	2.01
C4	07 Sep 2021	7	16.90	74.94	8.4	33.52	8.0	24.4	2.18
C4	07 Sep 2021	8	16.74	75.20	8.2	33.53	8.0	24.4	2.25
C4	07 Sep 2021	9	16.34	75.62	8.0	33.56	8.0	24.6	2.17
C4	07 Sep 2021	10	16.14	76.35	7.8	33.53	8.0	24.6	2.02
C4	07 Sep 2021	11	16.06	75.63	7.7	33.52	8.0	24.6	1.60
C4	07 Sep 2021	12	16.02	73.58	7.6	33.52	8.0	24.6	1.27
C4	13 Sep 2021	1	17.49	77.84	7.6	33.40	8.0	24.2	0.77
C4	13 Sep 2021	2	17.46	77.90	7.6	33.47	8.0	24.2	0.78
C4	13 Sep 2021	3	17.40	77.82	7.6	33.48	8.0	24.2	0.79
C4	13 Sep 2021	4	17.28	79.60	7.5	33.48	8.0	24.3	0.82
C4	13 Sep 2021	5	16.96	79.95	7.4	33.53	8.0	24.4	0.84
C4	13 Sep 2021	6	16.15	78.35	7.2	33.59	8.0	24.6	0.90
C4	13 Sep 2021	7	15.34	77.61	7.0	33.62	8.0	24.8	1.00
C4	13 Sep 2021	8	14.64	74.41	6.7	33.57	7.9	24.9	0.98
C4	13 Sep 2021	9	14.41	70.50	6.4	33.55	7.9	25.0	0.96
C4	13 Sep 2021	10	14.15	64.15	6.3	33.55	7.9	25.0	0.91
C4	13 Sep 2021	11	14.02	56.77	6.2	33.52	7.9	25.0	0.80
C4	13 Sep 2021	12	14.04	52.67	6.2	33.49	7.9	25.0	0.80
C4	22 Sep 2021	1	17.83	77.29	8.4	33.44	8.1	24.1	1.14
C4	22 Sep 2021	2	17.66	77.28	8.3	33.49	8.1	24.2	1.14
C4	22 Sep 2021	3	16.57	77.62	8.3	33.57	8.1	24.5	1.17
C4	22 Sep 2021	4	15.67	79.75	8.1	33.58	8.0	24.7	1.25
C4	22 Sep 2021	5	15.20	81.37	7.8	33.51	8.0	24.8	1.33
C4	22 Sep 2021	6	14.90	82.19	7.3	33.51	8.0	24.8	1.39
C4	22 Sep 2021	7	14.42	81.76	6.8	33.53	7.9	25.0	1.30
C4	22 Sep 2021	8	14.09	81.13	6.4	33.51	7.9	25.0	1.20
C4	22 Sep 2021	9	13.93	78.96	6.2	33.49	7.9	25.0	1.09
C4	22 Sep 2021	10	13.86	75.38	6.2	33.47	7.9	25.0	0.96
C4	22 Sep 2021	11	13.86	73.57	6.1	33.47	7.9	25.0	0.83
C4	28 Sep 2021	1	18.66	80.70	7.7	33.47	8.0	23.9	1.41
C4	28 Sep 2021	2	18.63	80.70	7.7	33.48	8.0	23.9	1.41
C4	28 Sep 2021	3	18.51	80.63	7.7	33.48	8.0	24.0	1.44
C4	28 Sep 2021	4	18.41	80.59	7.5	33.49	8.0	24.0	1.55
C4	28 Sep 2021	5	17.29	80.80	7.0	33.62	8.0	24.4	1.69
C4	28 Sep 2021	6	16.11	81.19	6.3	33.53	7.9	24.6	1.66
C4	28 Sep 2021	7	15.66	79.81	6.1	33.47	7.9	24.6	1.34
C4	28 Sep 2021	8	15.36	76.98	6.1	33.44	7.8	24.7	0.93
C4	28 Sep 2021	9	15.28	74.08	6.2	33.41	7.8	24.7	0.65
C4	28 Sep 2021	10	15.27	67.49	6.2	33.41	7.8	24.7	0.57
C4	28 Sep 2021	11	15.27	65.60	6.2	33.41	7.8	24.7	0.53
C5	07 Sep 2021	1	18.30	77.38	8.1	33.50	8.0	24.0	1.01
C5	07 Sep 2021	2	18.30	77.09	8.1	33.50	8.0	24.1	0.99
C5	07 Sep 2021	3	18.28	77.13	8.1	33.51	8.0	24.1	1.00
C5	07 Sep 2021	4	18.25	77.01	8.1	33.50	8.0	24.1	1.11
C5	07 Sep 2021	5	18.12	77.05	7.8	33.52	8.0	24.1	1.11
C5	07 Sep 2021	6	17.03	77.52	7.6	33.73	8.0	24.5	1.22
C5	07 Sep 2021	7	15.77	77.60	7.7	33.62	8.0	24.7	1.30
C5	07 Sep 2021	8	15.48	75.46	7.7	33.57	8.0	24.8	1.59
C5	07 Sep 2021	9	15.31	76.82	7.7	33.54	8.0	24.8	1.96
C5	07 Sep 2021	10	15.27	78.24	7.6	33.52	8.0	24.8	2.21
C5	07 Sep 2021	11	15.16	79.28	7.3	33.54	8.0	24.8	2.55

Station	Date	Depth (m)	Temp (°C)	XMS (‰)	DO (mg/L)	Sal (ppt)	pH	Dens (σ-t)	Chlor (µg/L)
C5	13 Sep 2021	1	18.05	78.64	7.7	33.47	8.0	24.1	1.00
C5	13 Sep 2021	2	18.05	77.00	7.7	33.47	8.0	24.1	0.99
C5	13 Sep 2021	3	17.96	79.06	7.7	33.48	8.0	24.1	1.01
C5	13 Sep 2021	4	17.78	79.37	7.6	33.49	8.0	24.2	1.04
C5	13 Sep 2021	5	17.24	80.61	7.5	33.56	8.0	24.4	1.10
C5	13 Sep 2021	6	16.74	79.15	7.5	33.51	8.0	24.4	1.20
C5	13 Sep 2021	7	16.44	74.67	7.3	33.52	8.0	24.5	1.27
C5	13 Sep 2021	8	15.73	74.46	7.0	33.56	8.0	24.7	1.25
C5	13 Sep 2021	9	15.16	70.04	6.8	33.54	7.9	24.8	1.10
C5	13 Sep 2021	10	14.18	57.63	6.6	33.66	7.9	25.1	0.94
C5	13 Sep 2021	11	13.59	45.64	6.4	33.59	7.9	25.2	0.85
C5	22 Sep 2021	1	17.68	77.00	8.7	33.46	8.1	24.2	1.59
C5	22 Sep 2021	2	17.27	76.92	8.6	33.50	8.1	24.3	1.62
C5	22 Sep 2021	3	16.66	75.74	8.5	33.51	8.1	24.4	1.68
C5	22 Sep 2021	4	16.28	75.98	8.3	33.51	8.1	24.5	1.83
C5	22 Sep 2021	5	15.02	79.84	8.1	33.54	8.0	24.8	2.01
C5	22 Sep 2021	6	14.71	82.56	7.8	33.48	8.0	24.9	2.20
C5	22 Sep 2021	7	14.55	83.48	7.6	33.47	8.0	24.9	1.99
C5	22 Sep 2021	8	14.33	84.24	7.4	33.47	8.0	24.9	1.82
C5	22 Sep 2021	9	14.24	84.65	7.4	33.45	8.0	24.9	1.61
C5	22 Sep 2021	10	14.02	83.80	7.3	33.48	7.9	25.0	1.34
C5	22 Sep 2021	11	13.83	79.00	7.2	33.45	7.9	25.0	1.18
C5	28 Sep 2021	1	18.67	80.22	7.8	33.47	8.0	23.9	1.42
C5	28 Sep 2021	2	18.61	76.43	7.8	33.47	8.0	24.0	1.45
C5	28 Sep 2021	3	18.55	73.27	7.7	33.47	8.0	24.0	1.55
C5	28 Sep 2021	4	18.37	76.86	7.5	33.49	8.0	24.0	1.62
C5	28 Sep 2021	5	17.83	78.37	7.2	33.52	8.0	24.2	1.59
C5	28 Sep 2021	6	17.02	78.92	7.0	33.51	8.0	24.4	1.41
C5	28 Sep 2021	7	16.56	79.69	6.9	33.47	7.9	24.4	1.11
C5	28 Sep 2021	8	16.23	81.22	6.8	33.47	7.9	24.5	0.98
C5	28 Sep 2021	9	15.78	82.01	6.6	33.47	7.9	24.6	1.03
C5	28 Sep 2021	10	15.38	81.45	6.4	33.47	7.9	24.7	0.80
C5	28 Sep 2021	11	15.14	78.80	6.2	33.44	7.8	24.7	0.70
C6	07 Sep 2021	1	18.74	73.08	7.4	33.50	8.0	23.9	0.69
C6	07 Sep 2021	2	18.56	72.43	7.3	33.53	8.0	24.0	0.72
C6	07 Sep 2021	3	17.04	71.78	7.1	33.78	8.0	24.6	0.73
C6	07 Sep 2021	4	15.81	73.39	7.1	33.62	8.0	24.7	0.81
C6	07 Sep 2021	5	15.51	76.64	7.2	33.59	8.0	24.8	1.06
C6	07 Sep 2021	6	15.29	77.82	7.3	33.56	8.0	24.8	1.41
C6	07 Sep 2021	7	15.19	78.77	7.3	33.55	7.9	24.8	1.71
C6	07 Sep 2021	8	15.16	79.36	7.2	33.54	7.9	24.8	1.90
C6	07 Sep 2021	9	15.07	79.99	7.0	33.55	7.9	24.8	2.11
C6	07 Sep 2021	10	14.97	79.29	6.6	33.55	7.9	24.9	2.00
C6	13 Sep 2021	1	18.17	77.73	7.8	33.47	8.0	24.1	1.25
C6	13 Sep 2021	2	18.14	77.76	7.7	33.48	8.0	24.1	1.25
C6	13 Sep 2021	3	17.79	75.95	7.5	33.53	8.0	24.2	1.26
C6	13 Sep 2021	4	17.52	69.57	7.3	33.49	8.0	24.2	1.35
C6	13 Sep 2021	5	17.33	66.09	7.1	33.50	8.0	24.3	1.36
C6	13 Sep 2021	6	16.73	65.61	6.9	33.60	8.0	24.5	1.33
C6	13 Sep 2021	7	15.68	67.21	6.9	33.57	7.9	24.7	1.24
C6	13 Sep 2021	8	15.03	70.80	6.7	33.60	7.9	24.9	1.13
C6	13 Sep 2021	9	14.07	58.01	6.6	33.56	7.9	25.1	0.98
C6	13 Sep 2021	10	14.39	54.56	6.4	33.38	7.9	24.9	0.88
C6	22 Sep 2021	1	17.67	75.07	8.7	33.44	8.1	24.2	1.86
C6	22 Sep 2021	2	17.35	74.98	8.6	33.54	8.1	24.3	1.87

Station	Date	Depth (m)	Temp (°C)	XMS (‰)	DO (mg/L)	Sal (ppt)	pH	Dens (σ-t)	Chlor (µg/L)
C6	22 Sep 2021	3	15.87	74.30	8.5	33.60	8.1	24.7	1.88
C6	22 Sep 2021	4	15.56	75.91	8.3	33.48	8.0	24.7	1.98
C6	22 Sep 2021	5	15.34	78.06	8.1	33.49	8.0	24.7	2.31
C6	22 Sep 2021	6	14.89	81.02	8.0	33.49	8.0	24.8	2.57
C6	22 Sep 2021	7	14.82	83.09	7.9	33.43	8.0	24.8	2.56
C6	22 Sep 2021	8	14.50	83.59	7.7	33.49	8.0	24.9	2.25
C6	22 Sep 2021	9	14.24	81.34	7.3	33.48	7.9	25.0	1.93
C6	22 Sep 2021	10	13.99	77.22	7.1	33.49	7.9	25.0	1.66
C6	28 Sep 2021	1	18.60	78.69	8.0	33.44	8.0	23.9	1.70
C6	28 Sep 2021	2	18.66	80.15	8.0	33.45	8.0	23.9	1.60
C6	28 Sep 2021	3	18.58	80.34	8.0	33.46	8.0	23.9	1.55
C6	28 Sep 2021	4	18.24	79.87	7.9	33.52	8.0	24.1	1.68
C6	28 Sep 2021	5	17.26	80.17	7.7	33.57	8.0	24.4	1.96
C6	28 Sep 2021	6	16.71	82.31	7.7	33.45	8.0	24.4	2.03
C6	28 Sep 2021	7	16.55	84.29	7.5	33.50	8.0	24.5	1.42
C6	28 Sep 2021	8	15.95	83.97	7.3	33.48	8.0	24.6	1.16
C6	28 Sep 2021	9	15.69	82.63	7.0	33.45	7.9	24.6	0.90
C7	07 Sep 2021	1	18.96	83.97	8.1	33.42	8.0	23.8	0.87
C7	07 Sep 2021	2	18.46	83.87	8.0	33.55	8.0	24.0	0.93
C7	07 Sep 2021	3	16.29	82.39	7.9	33.70	8.0	24.7	0.92
C7	07 Sep 2021	4	15.52	79.72	7.8	33.58	8.0	24.8	1.18
C7	07 Sep 2021	5	15.05	78.37	7.7	33.59	8.0	24.9	1.82
C7	07 Sep 2021	6	14.83	77.62	7.6	33.53	8.0	24.9	2.30
C7	07 Sep 2021	7	14.73	77.66	7.5	33.54	7.9	24.9	2.89
C7	07 Sep 2021	8	14.63	78.13	7.4	33.52	7.9	24.9	3.19
C7	07 Sep 2021	9	14.62	78.12	7.3	33.52	7.9	24.9	3.41
C7	07 Sep 2021	10	14.56	78.21	7.2	33.53	7.9	24.9	3.39
C7	07 Sep 2021	11	14.46	78.68	7.2	33.53	7.9	25.0	3.35
C7	07 Sep 2021	12	14.43	79.06	7.1	33.53	7.9	25.0	3.22
C7	07 Sep 2021	13	14.36	79.10	7.0	33.54	7.9	25.0	3.15
C7	07 Sep 2021	14	14.34	79.90	7.0	33.53	7.9	25.0	3.10
C7	07 Sep 2021	15	14.33	80.16	7.0	33.53	7.9	25.0	3.18
C7	07 Sep 2021	16	14.26	80.60	6.8	33.55	7.9	25.0	2.99
C7	07 Sep 2021	17	13.72	81.07	6.4	33.62	7.9	25.2	2.72
C7	07 Sep 2021	18	13.63	82.58	5.9	33.57	7.8	25.2	2.63
C7	13 Sep 2021	1	18.23	76.90	8.6	33.46	8.1	24.0	1.86
C7	13 Sep 2021	2	18.22	63.37	8.6	33.46	8.1	24.0	1.92
C7	13 Sep 2021	3	18.17	76.85	8.6	33.47	8.1	24.1	1.91
C7	13 Sep 2021	4	17.97	77.79	8.7	33.48	8.1	24.1	1.98
C7	13 Sep 2021	5	17.95	78.53	8.7	33.45	8.1	24.1	1.98
C7	13 Sep 2021	6	17.77	78.82	8.7	33.47	8.1	24.2	2.01
C7	13 Sep 2021	7	17.73	79.22	8.9	33.45	8.1	24.1	2.11
C7	13 Sep 2021	8	17.68	79.51	8.9	33.46	8.1	24.2	2.13
C7	13 Sep 2021	9	17.63	79.62	8.9	33.45	8.1	24.2	2.16
C7	13 Sep 2021	10	17.62	79.68	9.0	33.44	8.1	24.2	2.14
C7	13 Sep 2021	11	17.48	80.04	8.9	33.46	8.1	24.2	2.19
C7	13 Sep 2021	12	17.13	80.19	8.9	33.48	8.1	24.3	2.26
C7	13 Sep 2021	13	16.91	79.50	8.7	33.47	8.0	24.4	2.24
C7	13 Sep 2021	14	16.85	78.83	8.5	33.46	8.0	24.4	2.32
C7	13 Sep 2021	15	16.81	78.63	8.3	33.46	8.0	24.4	2.52
C7	13 Sep 2021	16	16.13	79.85	7.8	33.60	8.0	24.6	2.53
C7	13 Sep 2021	17	13.69	83.26	7.1	33.81	7.9	25.3	2.58
C7	13 Sep 2021	18	13.71	82.49	6.5	33.39	7.8	25.0	2.50
C7	22 Sep 2021	1	16.92	73.81	8.6	33.45	8.0	24.3	2.53
C7	22 Sep 2021	2	16.20	75.22	8.4	33.59	8.0	24.6	2.60
C7	22 Sep 2021	3	15.17	77.60	8.3	33.47	8.0	24.8	2.52
C7	22 Sep 2021	4	15.14	78.34	8.2	33.45	8.0	24.7	2.65

Station	Date	Depth (m)	Temp (°C)	XMS (‰)	DO (mg/L)	Sal (ppt)	pH	Dens (σ-t)	Chlor (µg/L)
C7	22 Sep 2021	5	14.84	78.52	8.1	33.48	8.0	24.8	2.70
C7	22 Sep 2021	6	14.60	80.10	7.8	33.48	8.0	24.9	2.84
C7	22 Sep 2021	7	14.50	82.01	7.5	33.46	8.0	24.9	2.83
C7	22 Sep 2021	8	14.25	83.38	7.4	33.51	7.9	25.0	2.52
C7	22 Sep 2021	9	13.71	84.51	7.2	33.50	7.9	25.1	2.30
C7	22 Sep 2021	10	13.83	84.57	7.1	33.43	7.9	25.0	2.00
C7	22 Sep 2021	11	13.56	85.71	7.0	33.48	7.9	25.1	1.66
C7	22 Sep 2021	12	13.52	85.93	7.0	33.47	7.9	25.1	1.56
C7	22 Sep 2021	13	13.24	86.28	6.9	33.49	7.9	25.2	1.43
C7	22 Sep 2021	14	13.11	86.62	6.8	33.48	7.9	25.2	1.35
C7	22 Sep 2021	15	13.08	86.77	6.7	33.46	7.9	25.2	1.18
C7	22 Sep 2021	16	13.09	86.51	6.7	33.46	7.9	25.2	1.17
C7	22 Sep 2021	17	13.09	86.21	6.7	33.46	7.9	25.2	1.00
C7	22 Sep 2021	18	13.09	86.22	6.7	33.46	7.9	25.2	0.98
C7	28 Sep 2021	1	18.34	82.30	8.2	33.45	8.0	24.0	1.61
C7	28 Sep 2021	2	18.25	81.55	8.3	33.46	8.0	24.0	1.59
C7	28 Sep 2021	3	18.09	81.15	8.3	33.46	8.0	24.1	1.75
C7	28 Sep 2021	4	17.52	81.01	8.4	33.51	8.0	24.2	1.86
C7	28 Sep 2021	5	17.06	81.34	8.5	33.46	8.0	24.3	2.07
C7	28 Sep 2021	6	16.24	81.02	8.1	33.54	8.0	24.6	2.26
C7	28 Sep 2021	7	15.49	81.67	7.3	33.47	7.9	24.7	2.34
C7	28 Sep 2021	8	15.04	82.75	7.2	33.48	7.9	24.8	1.93
C7	28 Sep 2021	9	14.80	83.50	7.3	33.44	7.9	24.8	1.61
C7	28 Sep 2021	10	14.70	83.90	7.3	33.42	7.9	24.8	1.43
C7	28 Sep 2021	11	14.43	83.81	7.5	33.45	7.9	24.9	1.40
C7	28 Sep 2021	12	14.20	84.13	7.7	33.42	7.9	24.9	1.45
C7	28 Sep 2021	13	14.17	84.36	7.7	33.42	7.9	24.9	1.66
C7	28 Sep 2021	14	14.14	84.35	7.6	33.41	7.9	24.9	1.84
C7	28 Sep 2021	15	14.08	84.37	7.5	33.42	7.9	25.0	1.77
C7	28 Sep 2021	16	14.06	84.21	7.5	33.42	7.9	24.9	1.90
C7	28 Sep 2021	17	14.06	84.28	7.4	33.42	7.9	25.0	1.77
C7	28 Sep 2021	18	14.06	83.99	7.4	33.42	7.9	25.0	1.85
C8	07 Sep 2021	1	19.47	82.80	8.2	33.49	8.1	23.7	1.12
C8	07 Sep 2021	2	19.30	83.03	8.2	33.50	8.1	23.8	1.09
C8	07 Sep 2021	3	18.60	82.78	8.0	33.63	8.1	24.1	1.14
C8	07 Sep 2021	4	16.43	82.06	8.0	33.73	8.0	24.7	1.23
C8	07 Sep 2021	5	15.95	79.88	8.0	33.58	8.0	24.7	1.64
C8	07 Sep 2021	6	15.60	78.07	7.9	33.55	8.0	24.7	2.26
C8	07 Sep 2021	7	15.48	77.81	8.0	33.53	8.0	24.7	2.90
C8	07 Sep 2021	8	15.20	77.82	8.0	33.54	8.0	24.8	3.21
C8	07 Sep 2021	9	14.74	78.10	8.0	33.55	8.0	24.9	3.21
C8	07 Sep 2021	10	14.51	78.14	7.8	33.54	8.0	25.0	3.18
C8	07 Sep 2021	11	14.32	78.34	7.5	33.54	8.0	25.0	3.22
C8	07 Sep 2021	12	14.25	78.67	7.3	33.53	7.9	25.0	3.31
C8	07 Sep 2021	13	14.26	78.69	7.3	33.53	7.9	25.0	3.39
C8	07 Sep 2021	14	14.26	78.69	7.2	33.53	7.9	25.0	3.37
C8	07 Sep 2021	15	14.26	78.63	7.2	33.53	7.9	25.0	3.40
C8	07 Sep 2021	16	14.26	78.55	7.2	33.53	7.9	25.0	3.44
C8	07 Sep 2021	17	14.26	78.46	7.1	33.53	7.9	25.0	3.39
C8	07 Sep 2021	18	13.95	78.30	7.0	33.60	7.9	25.1	3.43
C8	07 Sep 2021	19	13.55	79.80	6.5	33.59	7.9	25.2	3.37
C8	07 Sep 2021	20	13.50	80.85	6.2	33.57	7.9	25.2	3.12
C8	13 Sep 2021	1	18.40	76.78	8.4	33.47	8.1	24.0	1.68
C8	13 Sep 2021	2	18.24	77.31	8.4	33.50	8.1	24.1	1.73
C8	13 Sep 2021	3	17.84	76.88	8.6	33.52	8.1	24.2	1.77
C8	13 Sep 2021	4	17.62	76.30	8.7	33.50	8.1	24.2	1.90
C8	13 Sep 2021	5	17.03	76.28	8.7	33.57	8.1	24.4	2.11
C8	13 Sep 2021	6	16.39	77.36	8.6	33.49	8.0	24.5	2.37

Station	Date	Depth (m)	Temp (°C)	XMS (‰)	DO (mg/L)	Sal (ppt)	pH	Dens (σ-t)	Chlor (µg/L)
C8	13 Sep 2021	7	16.36	77.57	8.6	33.46	8.0	24.5	2.71
C8	13 Sep 2021	8	16.30	77.66	8.5	33.45	8.0	24.5	2.87
C8	13 Sep 2021	9	16.24	77.86	8.5	33.45	8.0	24.5	2.95
C8	13 Sep 2021	10	16.20	78.08	8.5	33.45	8.0	24.5	3.12
C8	13 Sep 2021	11	16.20	78.04	8.5	33.44	8.0	24.5	3.23
C8	13 Sep 2021	12	16.19	78.15	8.5	33.45	8.0	24.5	3.14
C8	13 Sep 2021	13	16.15	78.21	8.4	33.45	8.0	24.5	3.20
C8	13 Sep 2021	14	16.12	78.40	8.3	33.45	8.0	24.5	3.30
C8	13 Sep 2021	15	16.11	78.56	8.3	33.45	8.0	24.5	3.20
C8	13 Sep 2021	16	15.87	79.08	8.0	33.51	8.0	24.6	3.00
C8	13 Sep 2021	17	14.82	80.58	7.6	33.74	8.0	25.0	2.98
C8	13 Sep 2021	18	13.82	81.38	7.0	33.62	7.9	25.2	2.86
C8	13 Sep 2021	19	13.50	80.53	6.5	33.57	7.9	25.2	2.71
C8	22 Sep 2021	1	17.60	70.03	8.6	33.48	8.1	24.2	2.45
C8	22 Sep 2021	2	16.35	70.16	8.6	33.62	8.0	24.6	2.51
C8	22 Sep 2021	3	15.35	73.69	8.6	33.52	8.0	24.8	2.59
C8	22 Sep 2021	4	14.60	78.63	8.7	33.46	8.0	24.9	2.50
C8	22 Sep 2021	5	14.41	79.05	8.5	33.45	8.0	24.9	2.32
C8	22 Sep 2021	6	14.09	80.56	7.9	33.45	8.0	25.0	2.36
C8	22 Sep 2021	7	14.07	81.78	7.6	33.44	8.0	25.0	2.45
C8	22 Sep 2021	8	14.07	82.02	7.6	33.44	8.0	25.0	2.56
C8	22 Sep 2021	9	14.02	82.68	7.4	33.45	7.9	25.0	2.49
C8	22 Sep 2021	10	14.03	83.01	7.4	33.45	7.9	25.0	2.23
C8	22 Sep 2021	11	13.99	83.46	7.3	33.46	7.9	25.0	2.19
C8	22 Sep 2021	12	13.95	83.72	7.2	33.46	7.9	25.0	2.05
C8	22 Sep 2021	13	13.89	84.30	7.1	33.47	7.9	25.0	1.87
C8	22 Sep 2021	14	13.83	84.58	7.1	33.46	7.9	25.0	1.61
C8	22 Sep 2021	15	13.60	84.92	7.0	33.50	7.9	25.1	1.54
C8	22 Sep 2021	16	13.59	84.69	6.8	33.46	7.9	25.1	1.38
C8	22 Sep 2021	17	13.34	84.52	6.7	33.51	7.9	25.2	1.13
C8	22 Sep 2021	18	13.19	84.99	6.7	33.48	7.9	25.2	0.97
C8	22 Sep 2021	19	13.12	85.04	6.6	33.47	7.9	25.2	0.91
C8	28 Sep 2021	1	18.44	79.52	8.3	33.44	8.1	24.0	2.29
C8	28 Sep 2021	2	18.50	79.57	8.2	33.46	8.1	24.0	2.29
C8	28 Sep 2021	3	18.13	79.57	8.3	33.50	8.1	24.1	2.39
C8	28 Sep 2021	4	17.59	79.94	8.5	33.48	8.1	24.2	2.38
C8	28 Sep 2021	5	17.31	79.56	8.6	33.45	8.0	24.2	2.48
C8	28 Sep 2021	6	17.17	79.24	8.6	33.44	8.0	24.3	2.63
C8	28 Sep 2021	7	16.51	79.71	8.6	33.50	8.0	24.5	2.72
C8	28 Sep 2021	8	15.81	80.92	8.6	33.48	8.0	24.6	2.66
C8	28 Sep 2021	9	15.26	81.01	8.5	33.45	8.0	24.7	2.69
C8	28 Sep 2021	10	15.01	81.37	8.4	33.42	8.0	24.8	2.87
C8	28 Sep 2021	11	14.69	82.59	8.1	33.42	8.0	24.8	2.80
C8	28 Sep 2021	12	14.66	83.64	7.9	33.41	8.0	24.8	2.41
C8	28 Sep 2021	13	14.52	83.76	7.9	33.42	8.0	24.9	1.91
C8	28 Sep 2021	14	14.27	83.71	8.0	33.41	8.0	24.9	1.81
C8	28 Sep 2021	15	14.27	83.63	8.0	33.40	8.0	24.9	1.99
C8	28 Sep 2021	16	14.19	84.01	7.8	33.41	8.0	24.9	2.21
C8	28 Sep 2021	17	14.11	84.37	7.5	33.42	7.9	24.9	2.05
C8	28 Sep 2021	18	14.09	84.24	7.4	33.42	7.9	24.9	1.54
C8	28 Sep 2021	19	14.08	83.64	7.3	33.42	7.9	24.9	1.24
C8	28 Sep 2021	20	14.08	83.28	7.2	33.42	7.9	24.9	1.10

NA = not available

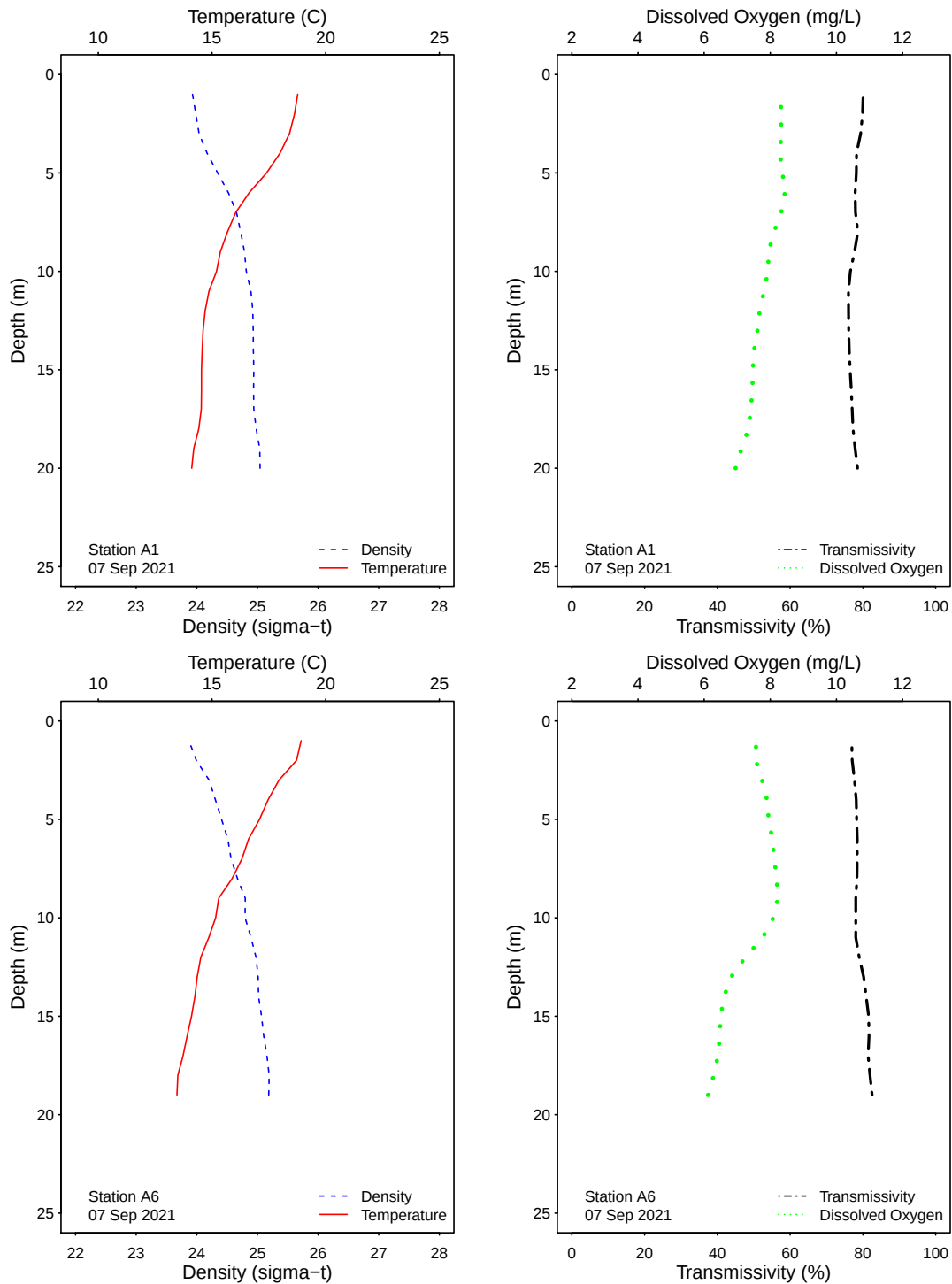


Figure 3.1: Graphics of CTD profile data from the PLOO kelp stations for each sample date.

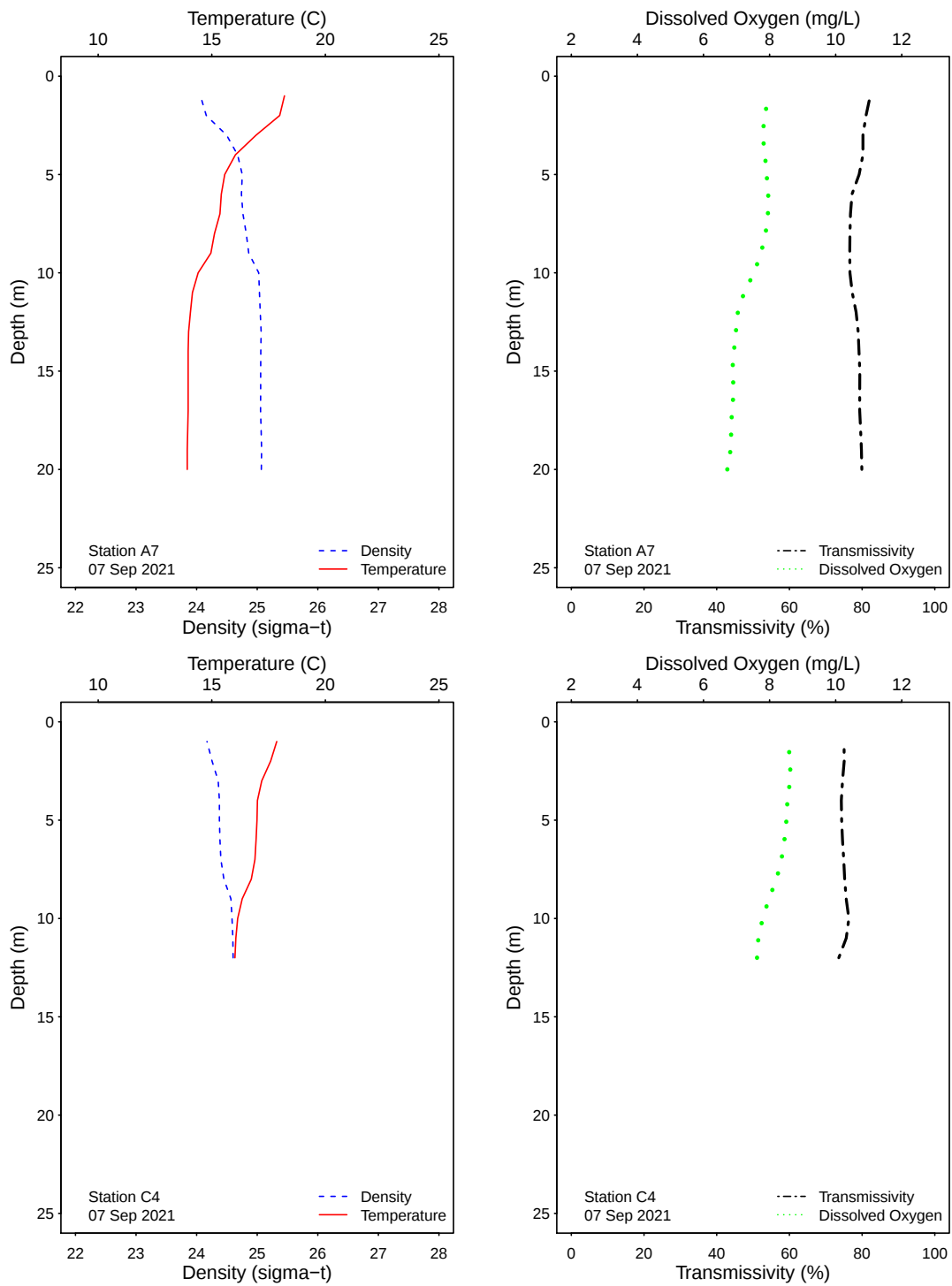


Figure 3.1: Graphics of CTD profile data from the PLOO kelp stations for each sample date.

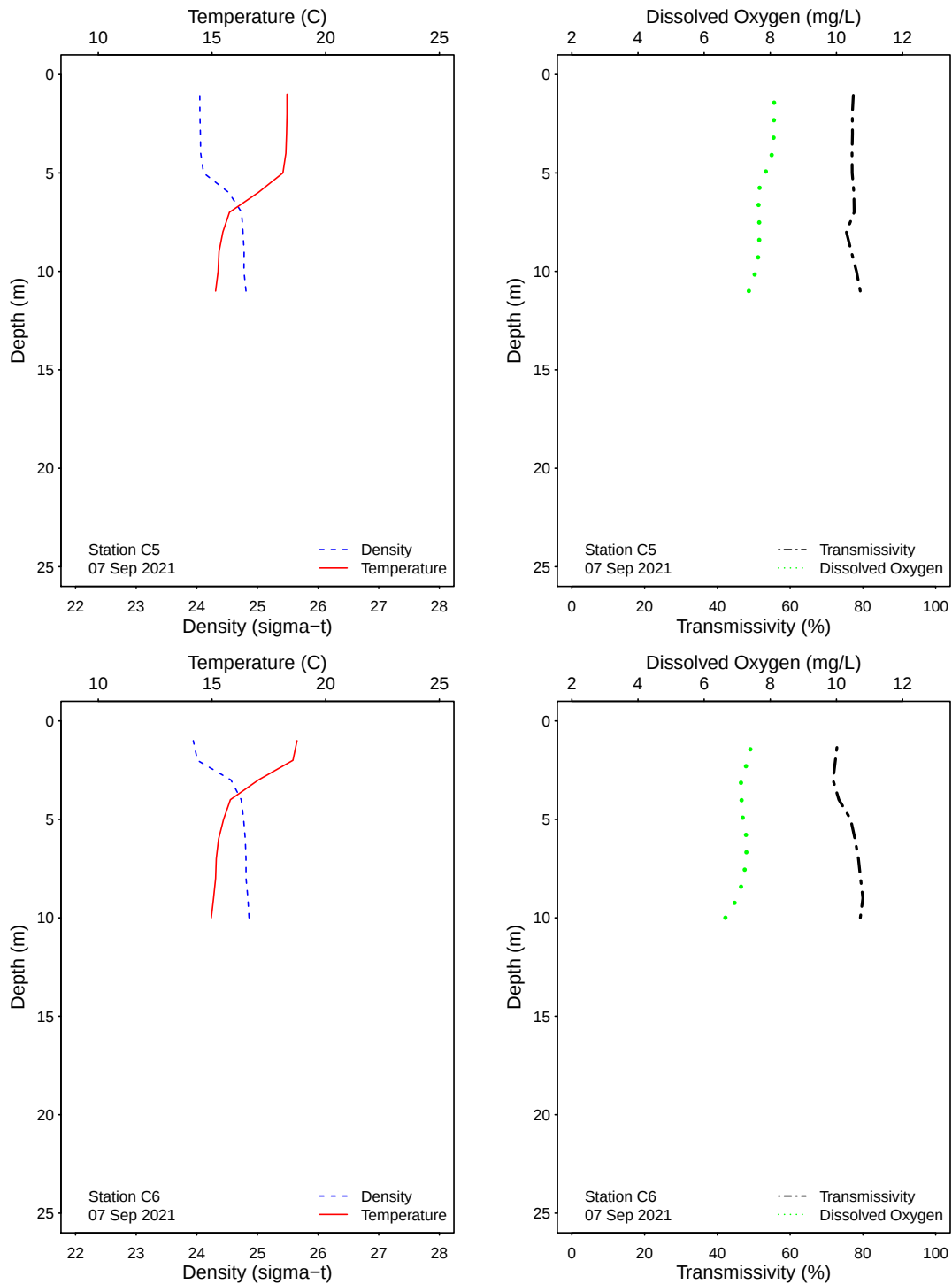


Figure 3.1: Graphics of CTD profile data from the PLOO kelp stations for each sample date.

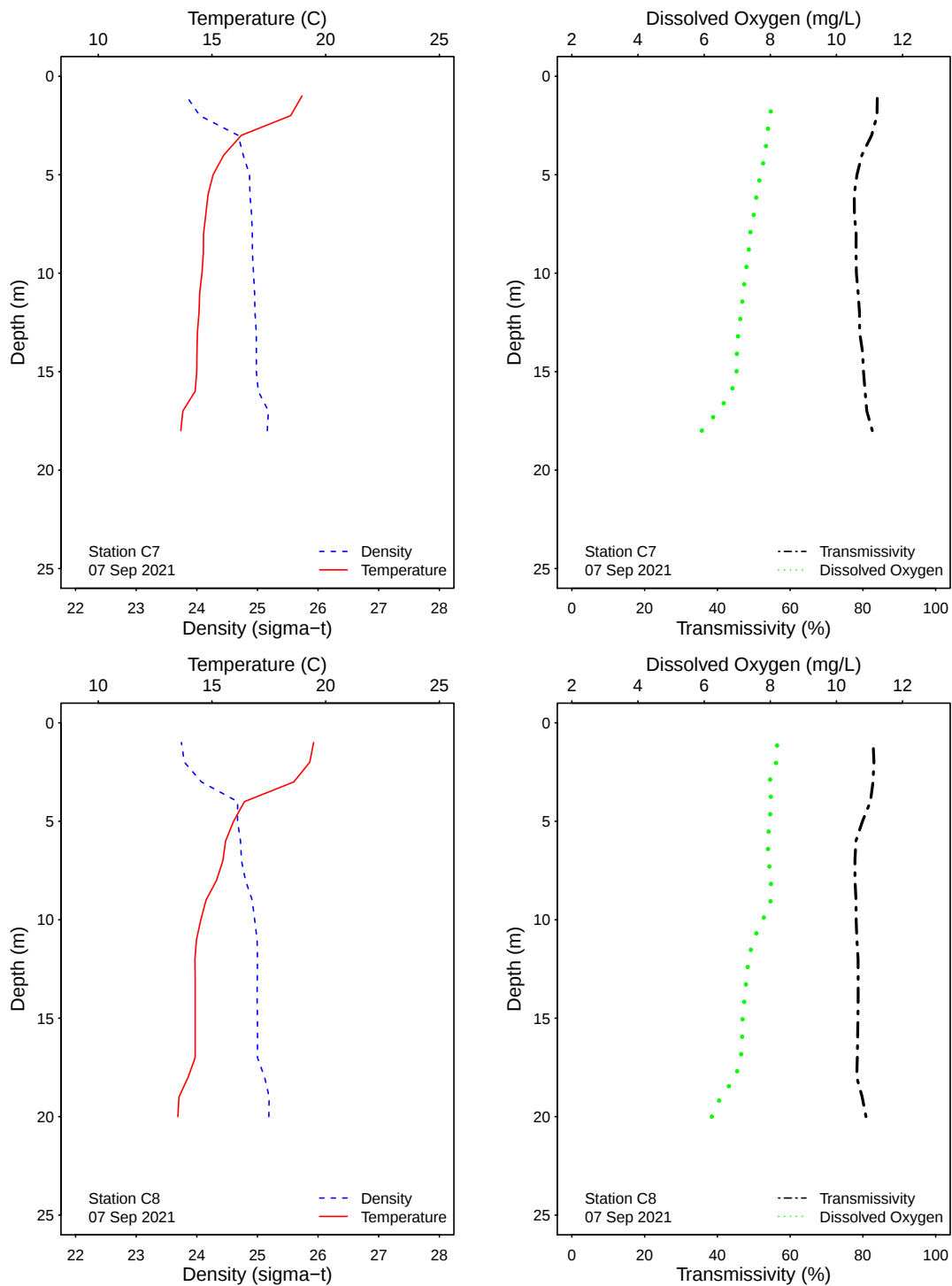


Figure 3.1: Graphics of CTD profile data from the PLOO kelp stations for each sample date.

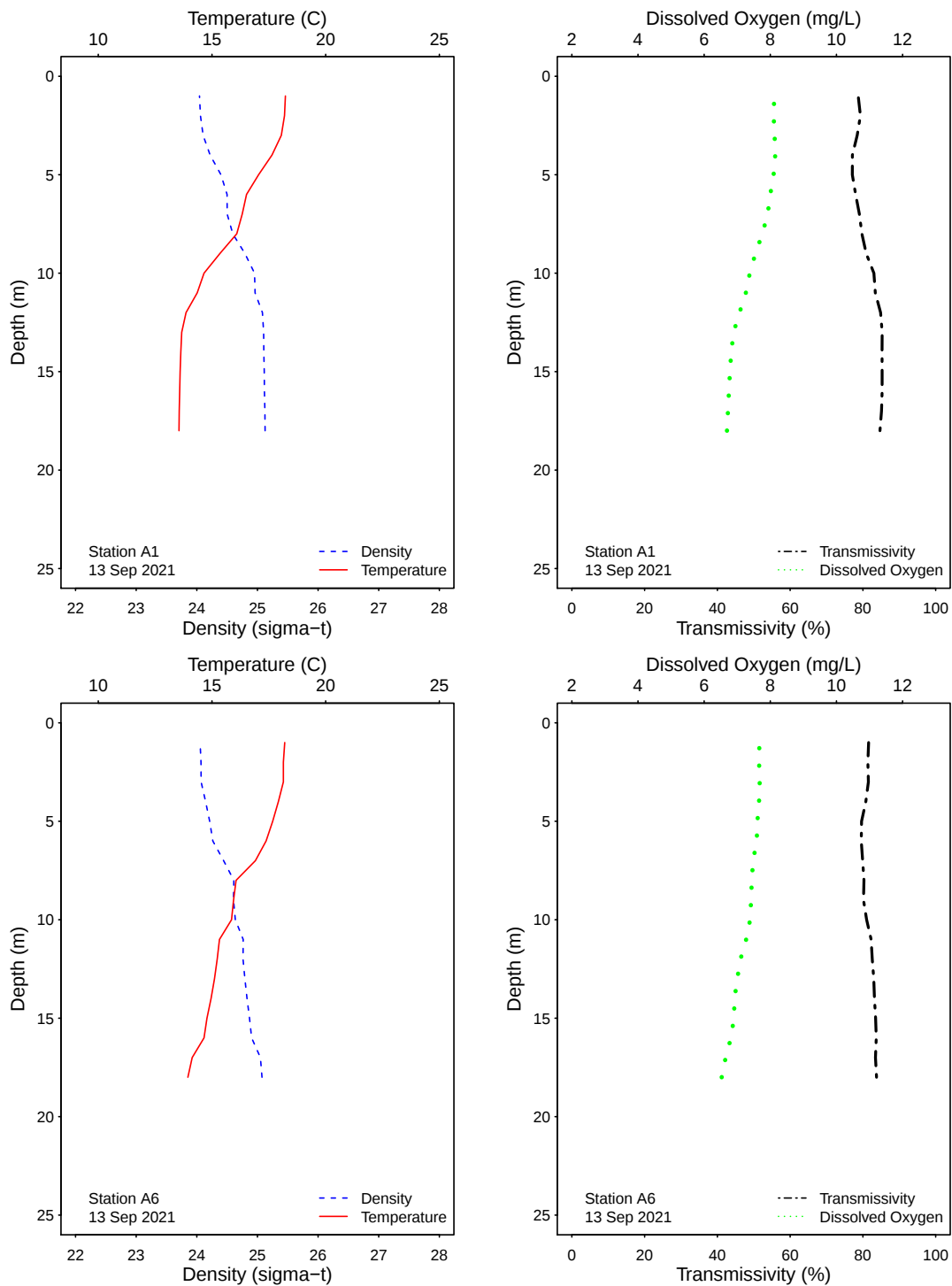


Figure 3.1: Graphics of CTD profile data from the PLOO kelp stations for each sample date.

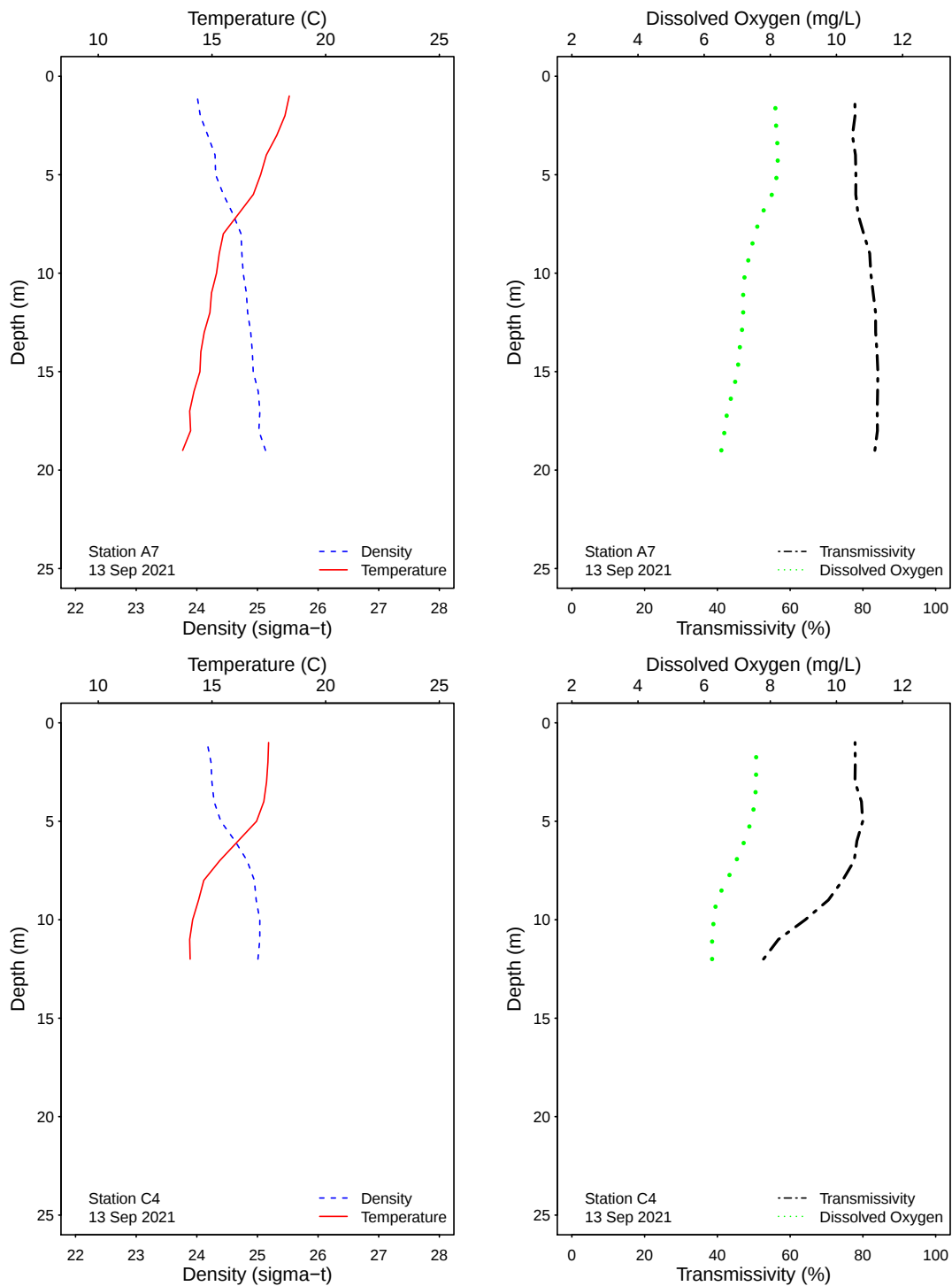


Figure 3.1: Graphics of CTD profile data from the PLOO kelp stations for each sample date.

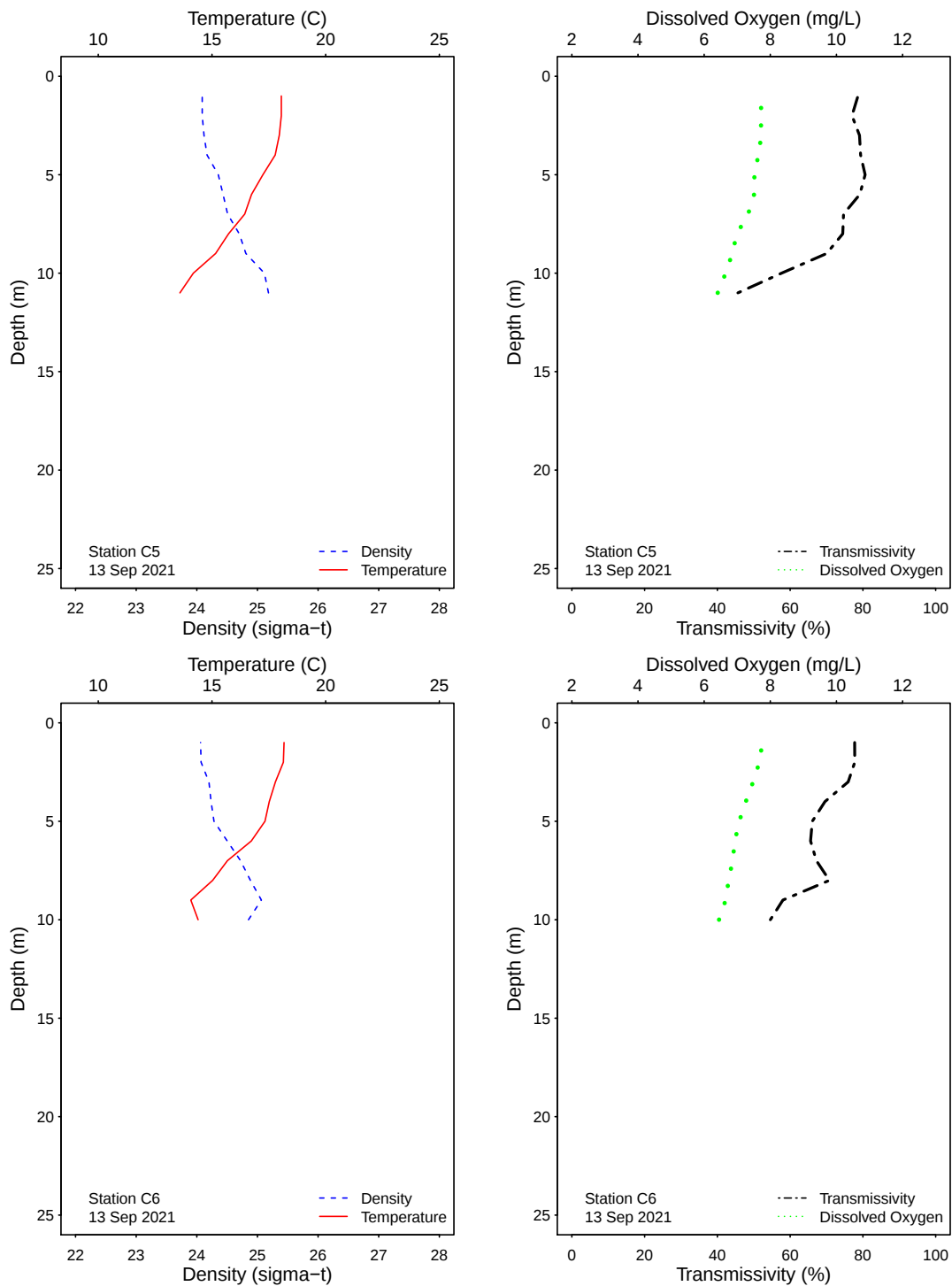


Figure 3.1: Graphics of CTD profile data from the PLOO kelp stations for each sample date.

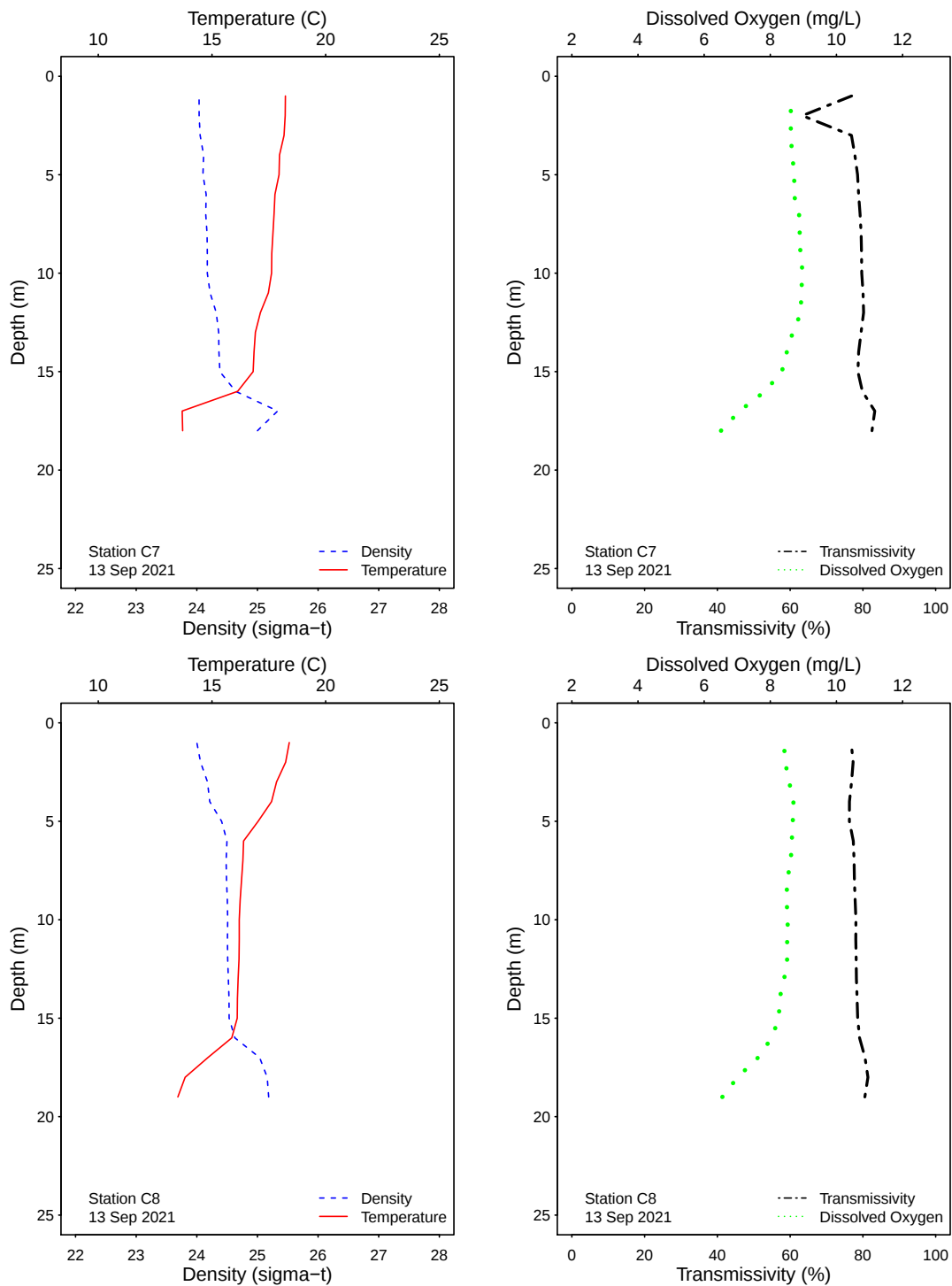


Figure 3.1: Graphics of CTD profile data from the PLOO kelp stations for each sample date.

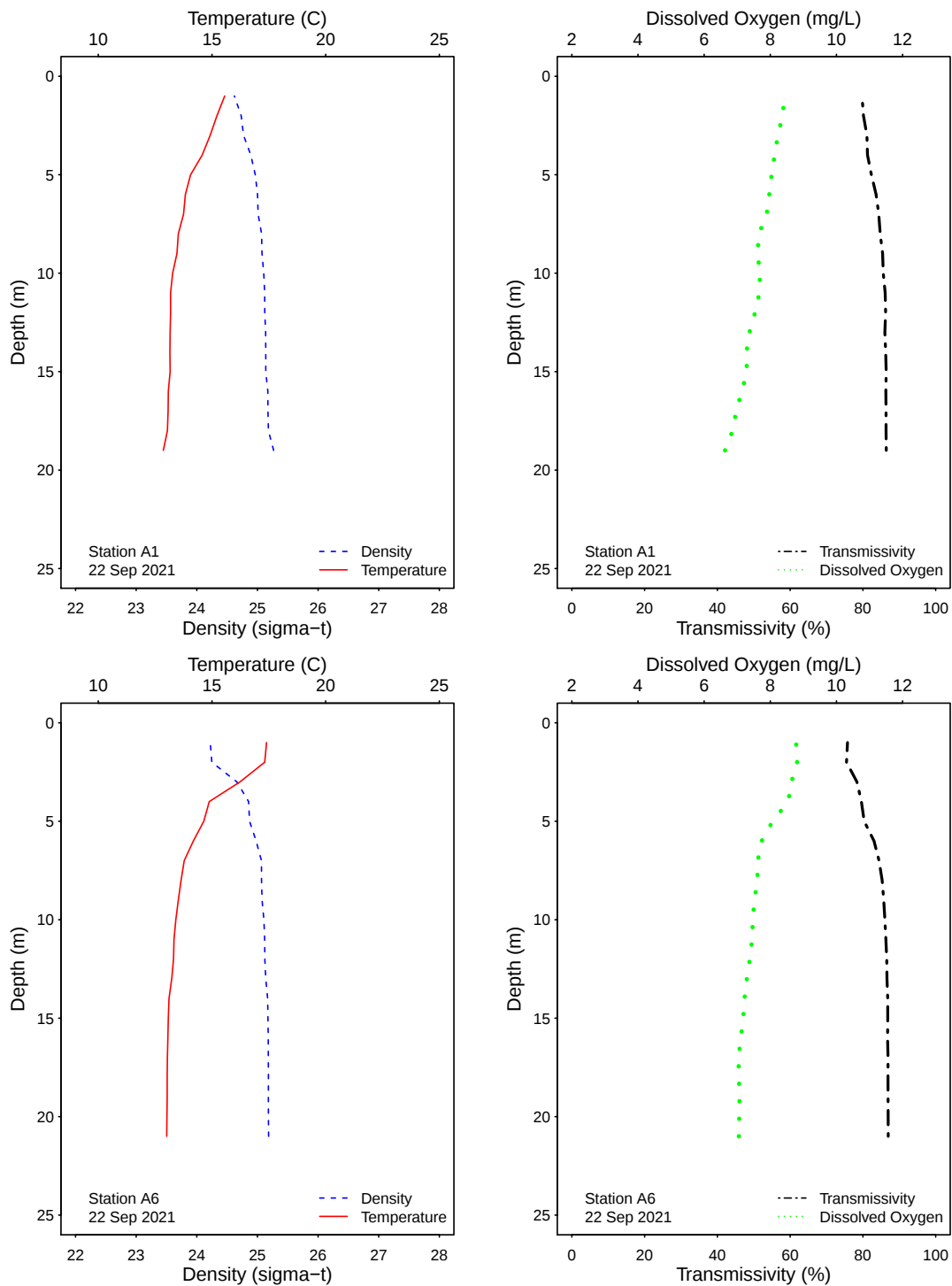


Figure 3.1: Graphics of CTD profile data from the PLOO kelp stations for each sample date.

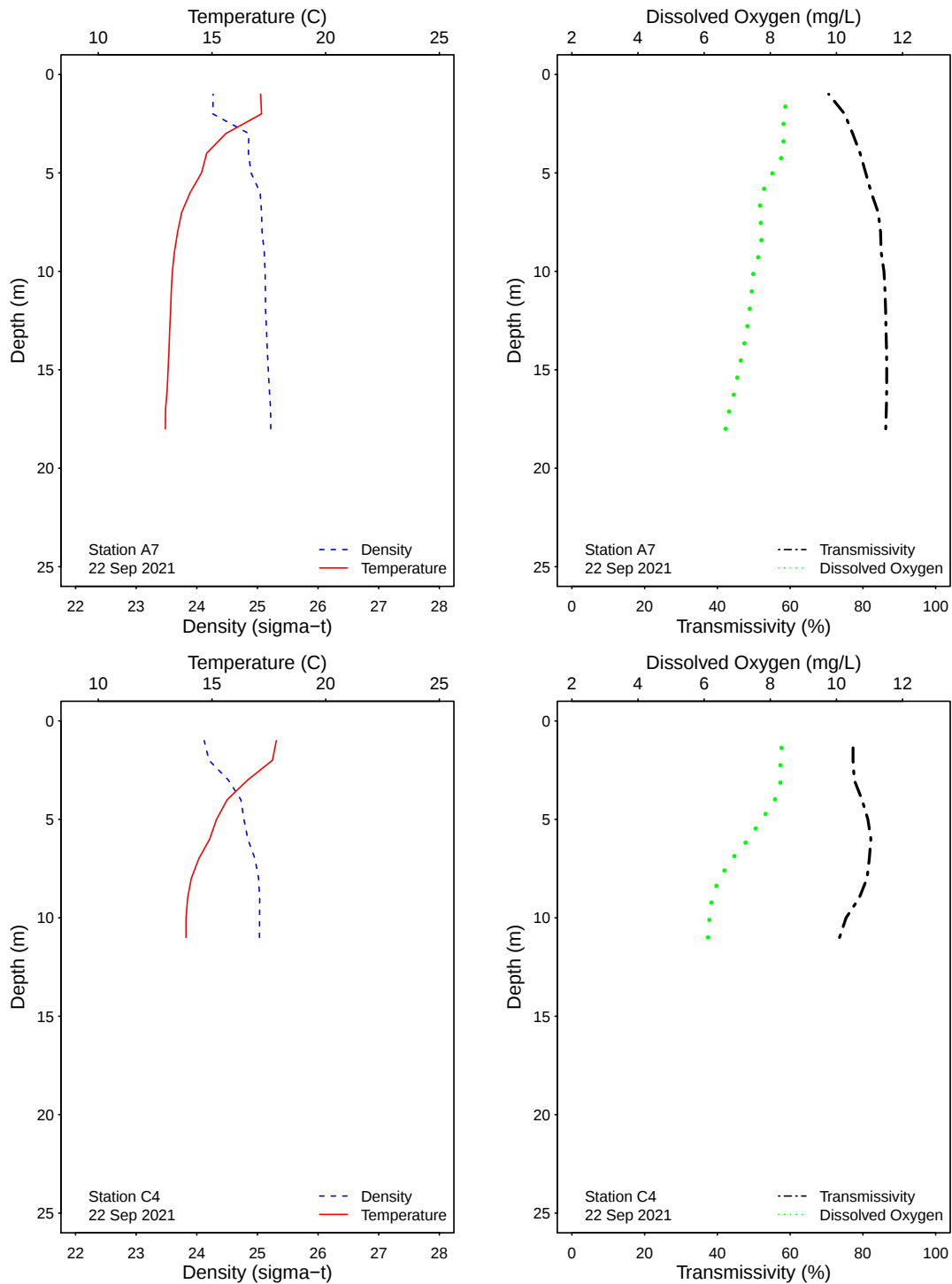


Figure 3.1: Graphics of CTD profile data from the PLOO kelp stations for each sample date.

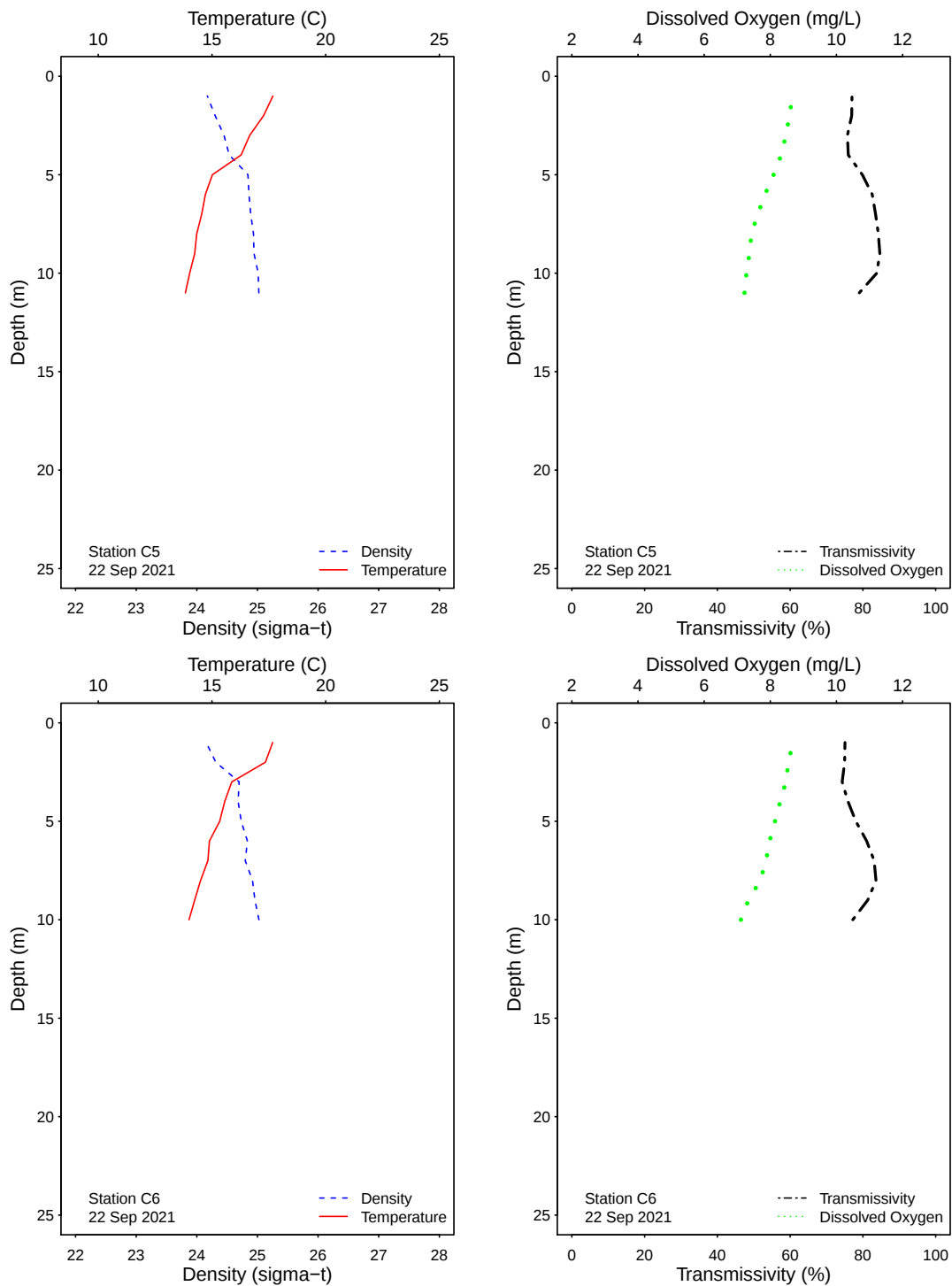


Figure 3.1: Graphics of CTD profile data from the PLOO kelp stations for each sample date.

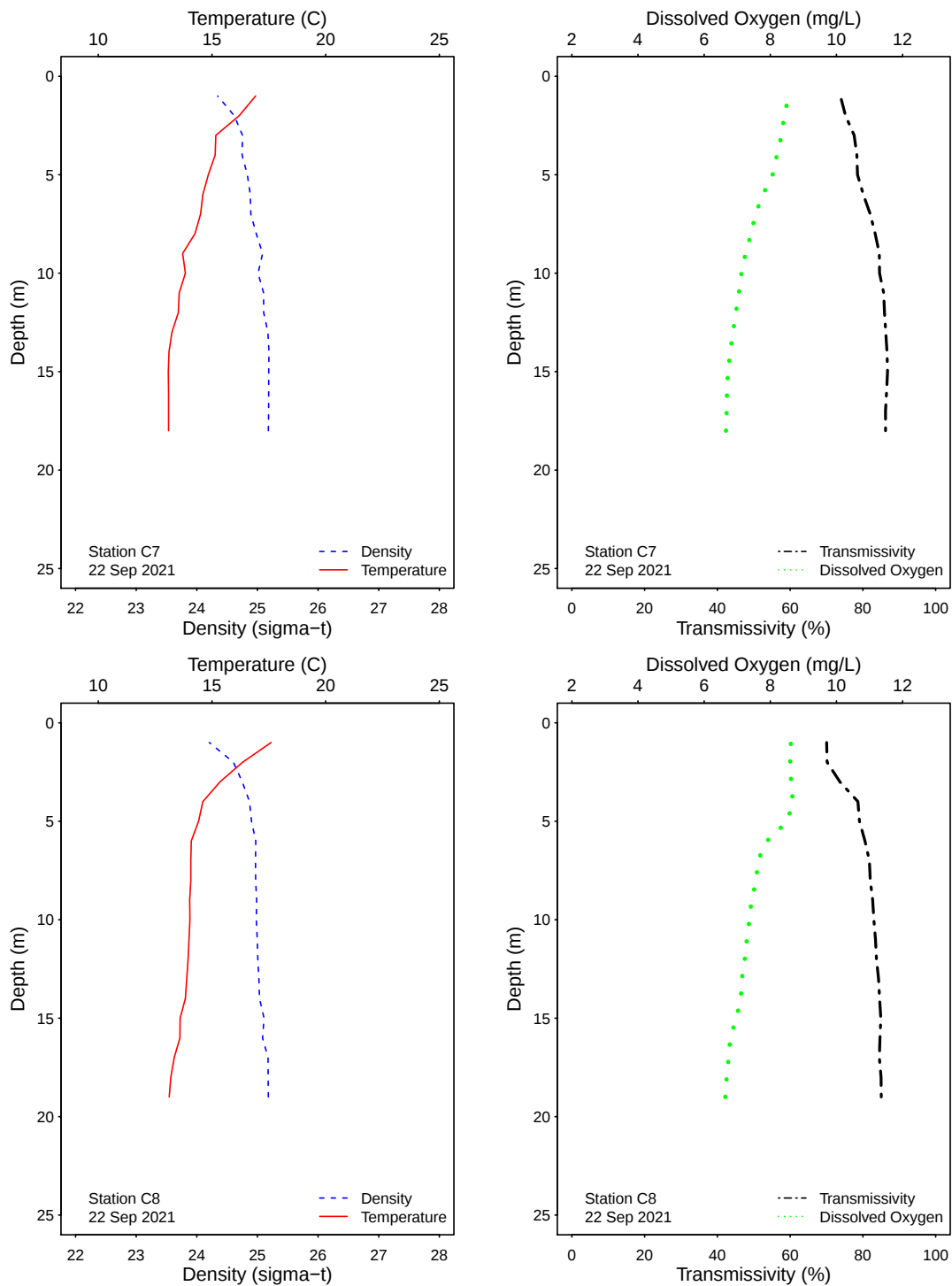


Figure 3.1: Graphics of CTD profile data from the PLOO kelp stations for each sample date.

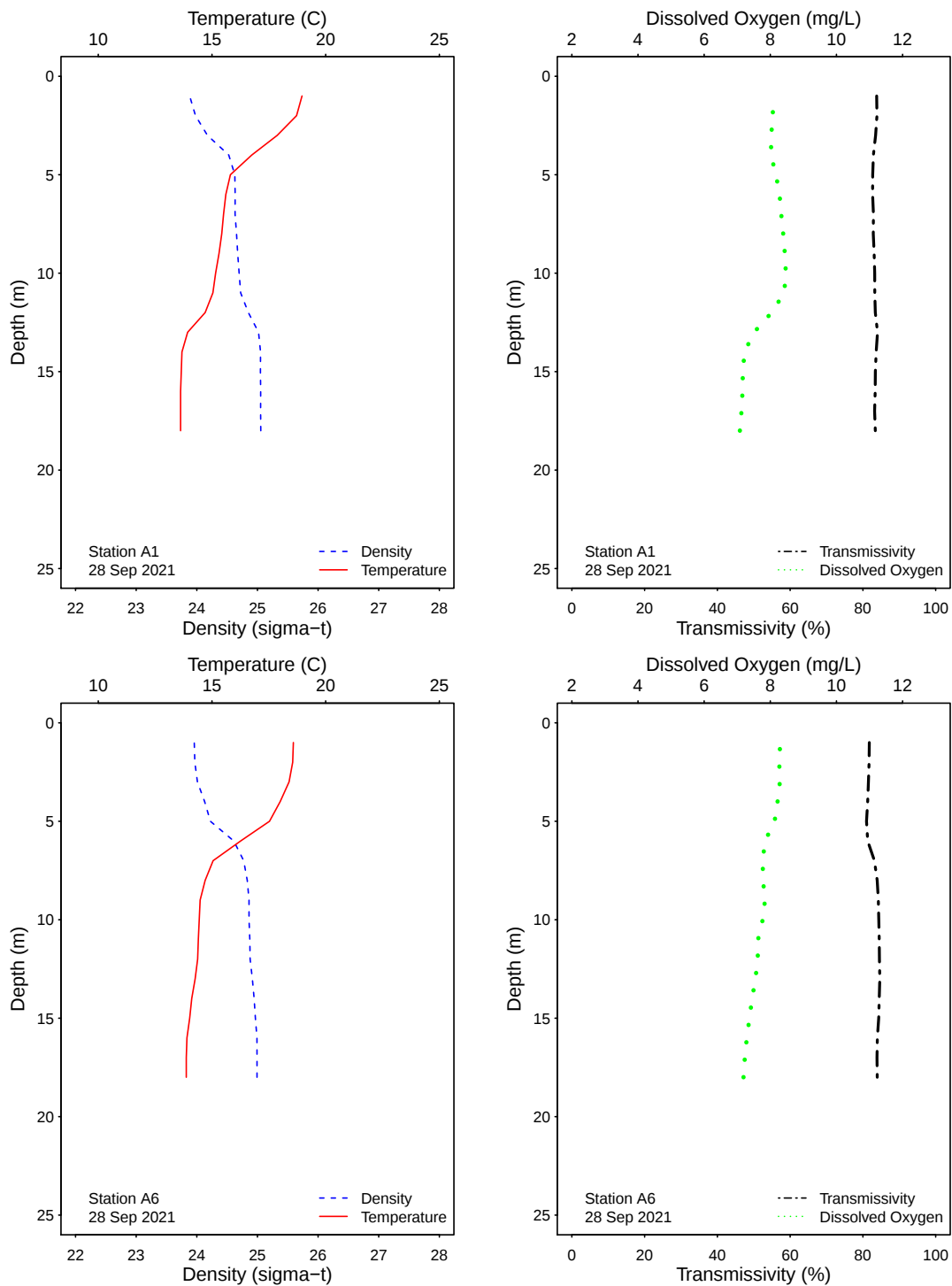


Figure 3.1: Graphics of CTD profile data from the PLOO kelp stations for each sample date.

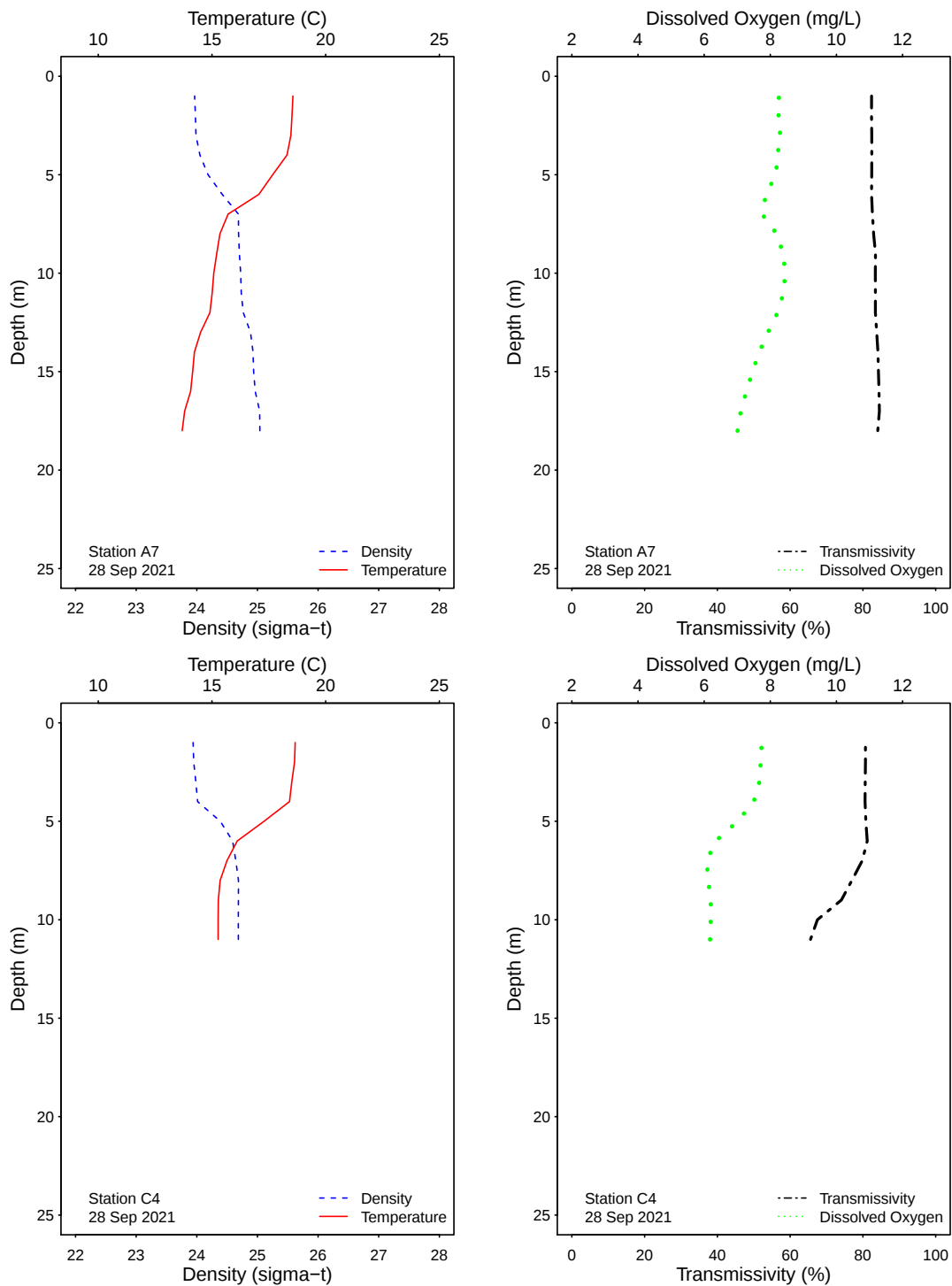


Figure 3.1: Graphics of CTD profile data from the PLOO kelp stations for each sample date.

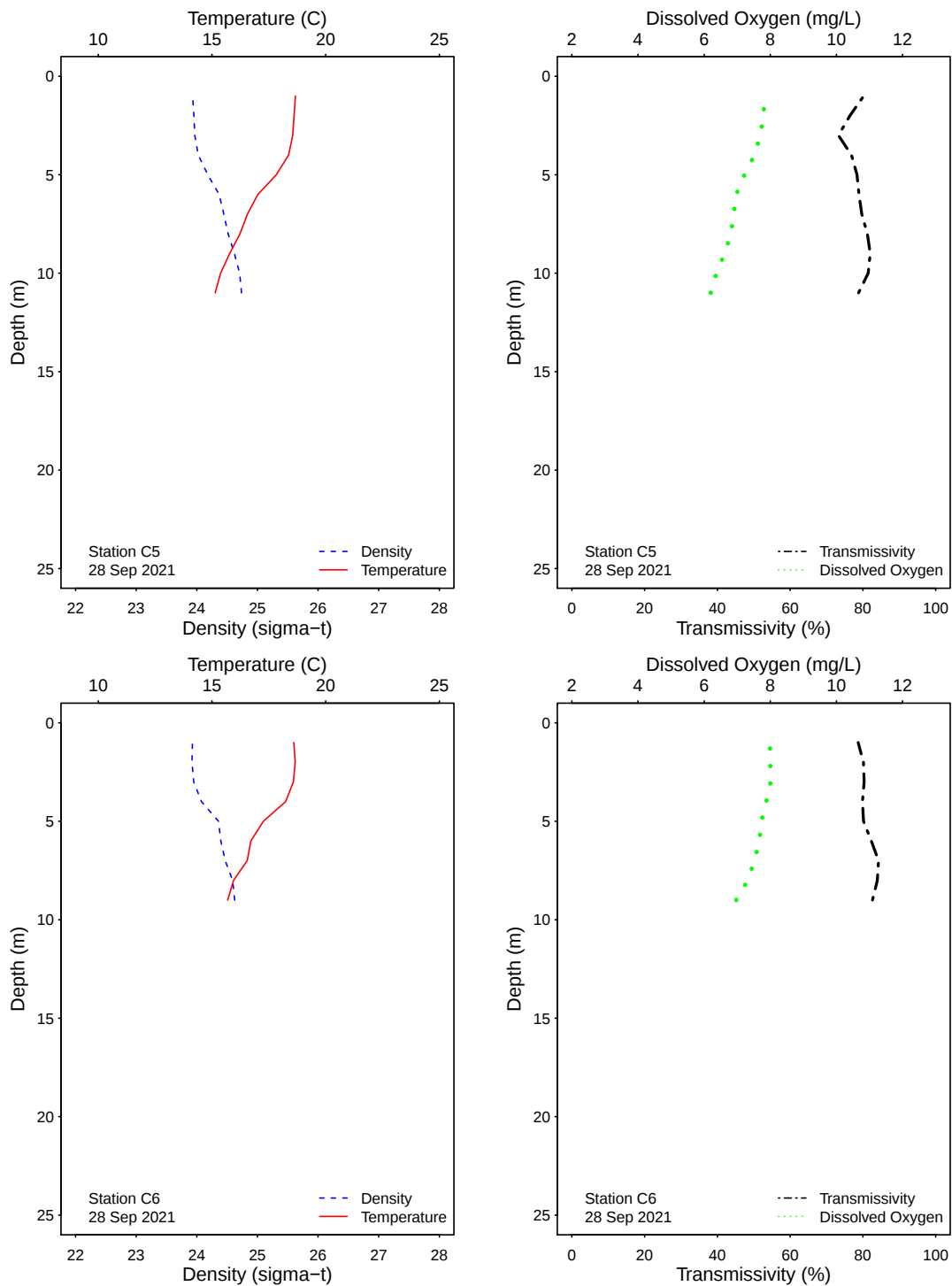


Figure 3.1: Graphics of CTD profile data from the PLOO kelp stations for each sample date.

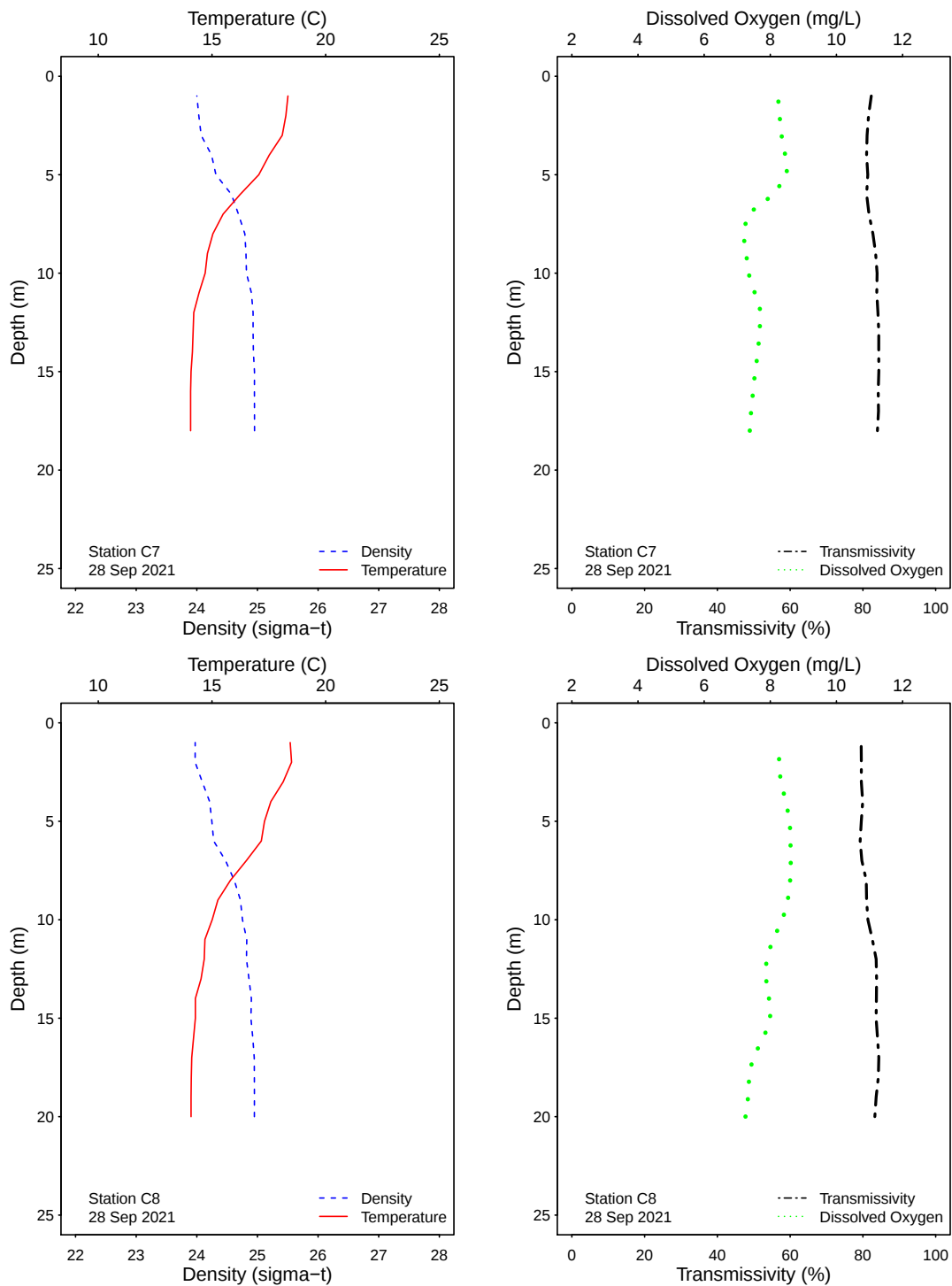


Figure 3.1: Graphics of CTD profile data from the PLOO kelp stations for each sample date.

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APPENDIX A

Quality Assurance

Table A.1

Summary of bacteriological quality assurance field and lab duplicate sample analyses at selected PLOO stations. Densities of total coliform (Total), fecal coliform (Fecal), and *Enterococcus* (Entero) are reported as CFU/100 mL.

Station	Date	Depth	Analyst	Procedure	Total	Fecal	Entero
A7	07 Sep 2021	18	BS	LAB DUPLICATE	<2	2e	<2
A7	13 Sep 2021	18	CRE	LAB DUPLICATE	2e	<2	<2
A7	22 Sep 2021	18	HF	LAB DUPLICATE	40	4e	<2
A7	28 Sep 2021	18	CRE	LAB DUPLICATE	<2	<2	<2
C7	07 Sep 2021	18	BS	LAB DUPLICATE	<2	<2	<2
C7	13 Sep 2021	18	CRE	LAB DUPLICATE	2e	<2	<2
C7	22 Sep 2021	18	HF	LAB DUPLICATE	6e	2e	<2
C7	28 Sep 2021	18	CRE	LAB DUPLICATE	<2	<2	<2
C8	07 Sep 2021	12	BS	LAB DUPLICATE	4e	<2	<2
C8	13 Sep 2021	12	CRE	LAB DUPLICATE	<2	<2	<2
C8	22 Sep 2021	12	HF	LAB DUPLICATE	2e	<2	<2
C8	28 Sep 2021	12	CRE	LAB DUPLICATE	<2	<2	<2
D12	01 Sep 2021		CRE	FIELD DUPLICATE	<2	<2	<2
D12	01 Sep 2021		CRE	LAB DUPLICATE	<2	<2	2e
D12	08 Sep 2021		KA	FIELD DUPLICATE	<20	2e	6e
D12	08 Sep 2021		KA	LAB DUPLICATE	<20	4e	4e
D12	15 Sep 2021		CRE	FIELD DUPLICATE	<20	<2	<2
D12	15 Sep 2021		CRE	LAB DUPLICATE	<20	<2	<2
D12	22 Sep 2021		CRE	FIELD DUPLICATE	<20	<2	<2
D12	22 Sep 2021		KA	LAB DUPLICATE	<20	<2	<2
D12	29 Sep 2021		JF	FIELD DUPLICATE	20e	<2	<2
D12	29 Sep 2021		JF	LAB DUPLICATE	20e	<2	<2

ns = not sampled

ND = no data

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APPENDIX B

New 2019 Ocean Plan Water Quality Objectives

Shore Stations

Table B.1

Summary of compliance with the Ocean Plan's 6-week Geometric Mean standard for *Enterococcus* at the PLOO shore stations. Data are based on the geometric mean of the five most recent samples from each site over the previous 6 weeks unless otherwise noted (*). Values >30 CFU/100 mL exceed the standard.

Date	D4	D5	D7	D8-B	D9	D10	D11	D12
01 Sep 2021	2	2	6	3	2	5	10	3
02 Sep 2021	2	2	6	3	2	5	10	3
03 Sep 2021	2	2	6	3	2	5	10	3
04 Sep 2021	2	2	6	3	2	5	10	3
05 Sep 2021	2	2	6	3	2	5	10	3
06 Sep 2021	2	2	6	3	2	5	10	3
07 Sep 2021	2	2	6	3	2	5	10	3
08 Sep 2021	2	2	6	4	3	5	9	3
09 Sep 2021	2	2	6	4	3	5	9	3
10 Sep 2021	2	2	6	4	3	5	9	3
11 Sep 2021	2	2	6	4	3	5	9	3
12 Sep 2021	2	2	6	4	3	5	9	3
13 Sep 2021	2	2	6	4	3	5	9	3
14 Sep 2021	2	2	6	4	3	5	9	3
15 Sep 2021	2	2	6	4	3	5	7	3
16 Sep 2021	2	2	6	4	3	5	7	3
17 Sep 2021	2	2	6	4	3	5	7	3
18 Sep 2021	2	2	6	4	3	5	7	3
19 Sep 2021	2	2	6	4	3	5	7	3
20 Sep 2021	2	2	6	4	3	5	7	3
21 Sep 2021	2	2	6	4	3	5	7	3
22 Sep 2021	2	2	4	3	3	3	4	2
23 Sep 2021	2	2	4	3	3	3	4	2
24 Sep 2021	2	2	4	3	3	3	3	2
25 Sep 2021	2	2	4	3	3	3	3	2
26 Sep 2021	2	2	4	3	3	3	3	2
27 Sep 2021	2	2	4	3	3	3	3	2
28 Sep 2021	2	2	4	3	3	3	3	2
29 Sep 2021	2	2	4	3	3	2	3	2
30 Sep 2021	2	2	4	3	3	2	3	2

* Geometric mean calculated using n<5

ns = not sampled

Table B.2

Summary of compliance at the PLOO shore stations with the Ocean Plan's Statistical Threshold Value standard for *Enterococcus* bacteria, which states that *Enterococcus* density shall not exceed 110 CFU/100 mL in more than 10% of samples per month.

Date	D4	D5	D7	D8-B	D9	D10	D11	D12
September	IC	IC	IC	IC	IC	IC	IC	IC

IC = In Compliance

E = Exceedance

ns = not sampled

ND = no data

Kelp Stations

Table B.3

Summary of compliance with the Ocean Plan's 6-week Geometric Mean standard for *Enterococcus* at the PLOO kelp stations. Data are based on the geometric mean of the five most recent samples from each site over the previous 6 weeks unless otherwise noted (*). Values >30 CFU/100 mL exceed the standard.

Date	A1	A6	A7	C4	C5	C6	C7	C8
01 Sep 2021	2	2	2	2	2	2	2	2
02 Sep 2021	2	2	2	2	2	2	2	2
03 Sep 2021	2	2	2	2	2	2	2	2
04 Sep 2021	2	2	2	2	2	2	2	2
05 Sep 2021	2	2	2	2	2	2	2	2
06 Sep 2021	2	2	2	2	2	2	2	2
07 Sep 2021	2	2	2	2	2	2	2	2
08 Sep 2021	2	2	2	2	2	2	2	2
09 Sep 2021	2	2	2	2	2	2	2	2
10 Sep 2021	2	2	2	2	2	2	2	2
11 Sep 2021	2	2	2	2	2	2	2	2
12 Sep 2021	2	2	2	2	2	2	2	2
13 Sep 2021	2	2	2	2	2	2	2	2
14 Sep 2021	2	2	2	2	2	2	2	2
15 Sep 2021	2	2	2	2	2	2	2	2
16 Sep 2021	2	2	2	2	2	2	2	2
17 Sep 2021	2	2	2	2	2	2	2	2
18 Sep 2021	2	2	2	2	2	2	2	2
19 Sep 2021	2	2	2	2	2	2	2	2
20 Sep 2021	2	2	2	2	2	2	2	2
21 Sep 2021	2	2	2	2	2	2	2	2
22 Sep 2021	2	2	2	2	2	2	2	2
23 Sep 2021	2	2	2	2	2	2	2	2
24 Sep 2021	2	2	2	2	2	2	2	2
25 Sep 2021	2	2	2	2	2	2	2	2
26 Sep 2021	2	2	2	2	2	2	2	2
27 Sep 2021	2	2	2	2	2	2	2	2
28 Sep 2021	2	2	2	2	2	2	2	2
29 Sep 2021	2	2	2	2	2	2	2	2
30 Sep 2021	2	2	2	2	2	2	2	2

* Geometric mean calculated using n<5

Table B.4

Summary of compliance at the PLOO kelp stations with the Ocean Plan's Statistical Threshold Value standard for *Enterococcus* bacteria, which states that *Enterococcus* density shall not exceed 110 CFU/100 mL in more than 10% of samples per month.

Date	A1	A6	A7	C4	C5	C6	C7	C8
September	IC	IC	IC	IC	IC	IC	IC	IC

IC = In Compliance

E = Exceedance

ns = not sampled

ND = no data

APPENDIX C

Point Loma Wastewater
Treatment Plant
Chlorine Reduction
Study 2021

September 30, 2021

Mr. David W. Gibson, Executive Officer
California Regional Water Quality Control Board
San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108

Attention: POTW Compliance Unit

Dear Mr. Gibson:

Enclosed is the final project report for the 2021 Point Loma Wastewater Treatment Plant (PLWTP) Chlorine Reduction Study. This study occurred in response to a nationwide chlorine shortage that caused an unplanned, necessary reduction in chlorine disinfection of PLWTP effluent from June 15, 2021 through August 18, 2021. To assess any potential effects on receiving waters resulting from decreased disinfection, the City's Environmental Monitoring and Technical Services Division conducted semi-weekly sampling of the PLWTP Effluent (PLE) and at a select group of offshore monitoring stations closest to the outfall. The results from this additional monitoring are included herein.

Sincerely,



Peter S. Vroom, Ph.D.
Deputy Public Utilities Director

PSV:akl

Point Loma Wastewater Treatment Plant Chlorine Reduction Study 2021

Introduction

In 2021, the US experienced a nationwide chlorine shortage, which severely restricted the use of this essential disinfectant. Low chlorine supplies were mainly tied to a chemical fire that destroyed a chlorine manufacturer's facility in Louisiana (BioLab, Inc.) after hurricane Laura's landfall in August 2020, leaving two other domestic companies, Clearon Corp. and Occidental Petroleum, to fulfill the high demand.

In June 2021, the chlorine shortage began to affect public utility agencies who had to allocate the reduced supply between drinking water and wastewater disinfection. So as not to compromise the safety of drinking water, the City of San Diego's Public Utilities Department made the difficult decision to reduce chlorine disinfection at the Point Loma Wastewater Treatment Plant (PLWTP) to preserve supplies. The reduction in chlorine disinfection began on June 15, 2021 when the disinfection rate was lowered by 33% from 6 ppm to 4 ppm and then lowered a further 25% to 3 ppm the following day, on June 16, 2021. A full chlorination dose rate of 6 ppm was restarted on August 18, 2021.

To assess any potential effects on receiving waters, resulting from the reduction in disinfection at the PLWTP, the City's Environmental Monitoring and Technical Services Division (EMTS) immediately began additional semi-weekly sampling of the PLWTP Effluent (PLE) and a select group of offshore monitoring stations closest to the outfall. However, it is important to note that these sampling stations are not subject to regulatory compliance requirements. Results of this sampling effort are detailed below.

Methods

Point Loma Effluent Sampling

PLE is sampled at the treatment plant via a small hose coming off the effluent flow line. Under normal sampling conditions, this station is sampled on a weekly basis. However, during the period of reduced chlorination at the PLWTP, the station was sampled semi-weekly. A single sample was collected twice per week in a 100 mL IDEXX sterile sample container containing a small amount of sodium thiosulfate, following standard sampling procedures. Sample bottles were filled using aseptic sampling techniques, and samples were put on ice until returned to the lab for analysis. A total of 18 samples were collected between June 18, 2021 and August 16, 2021. Each sample was analyzed for the presence of three types of fecal indicator bacteria used in the assessment of water quality, including fecal coliform, total coliform, and *Enterococcus* (per permit requirements).

Receiving Water Sampling

To assess the effects of chlorine reduction on receiving water quality, three existing water quality stations (F29, F30, and F31), which are closest to the Point Loma Ocean Outfall (PLOO) discharge site, were chosen for additional sampling (see Figure 1). Typically, these stations, along with 33 other offshore PLOO stations, are sampled on a quarterly basis in winter (February), spring (May), summer (August), and fall (November) to monitor water quality conditions and to estimate dispersion of the PLOO wastewater plume.

However, during the period of chlorine reduction, a total of 44 additional seawater samples were collected at each station (F29, F30, and F31) between June 19, 2021 and August 17, 2021. The additional samples were analyzed for the presence of *Enterococcus* bacteria (per permit requirements). One sample was taken at each of four discrete depths (25, 60, 80, and 98 m) over 11 separate sampling days. These samples were collected using a rosette sampler fitted with Niskin bottles surrounding a central Conductivity, Temperature, and Depth (CTD) instrument.

Statistical Analysis

To control the scope of analysis, and to facilitate a robust statistical comparison of the data between the samples collected during the period of chlorine reduction and prior to the reduction, analyses were limited to an equal number of samples before and after the reduction was implemented. Thus, if 11 samples were collected during the period of chlorine reduction, then the preceding 11 samples collected prior to the reduction were used for comparison. As data were not normally distributed, a non-parametric Mann-Whitney *U* test was performed to assess the effect of the chlorine reduction on water quality for both PLE and receiving waters. Data are reported below as Mean $\pm$ Standard Error.

Results

During the period of reduced chlorine disinfection at the PLWTP, levels of fecal coliform and total coliform rose by a statistically significant amount in the PLE (i.e. p -value ≤ 0.05 ; Table 1). Fecal coliform increased by 42% from approximately $6.9 \pm 1.3 \times 10^6$ to $9.7 \pm 1.8 \times 10^6$ MPN/100mL (Mann-Whitney $U = 269.5$, $p \leq 0.05$), and total coliform increased by 81% from approximately 16.8 ± 2.5 MM to 30.4 ± 5.1 MM MPN/100 mL (Mann-Whitney $U = 256.5$, $p \leq 0.05$; Table 1). In contrast, levels of *Enterococcus* bacteria appeared to go down during the period of reduced chlorination, from approximately $115 \pm 32 \times 10^3$ to $85 \pm 9 \times 10^3$ CFU/100 mL, however, no statistically significant difference was observed (Mann-Whitney $U = 328$, $p = 0.887$; Table 1).

At offshore stations surrounding the PLOO (F29, F30, and F31), levels of *Enterococcus* bacteria appeared to increase at all depths in line with the reduction in chlorination, with the exception of the 25-m depth samples, which showed little to no variance and collectively ranged from just 2.0 to 12.0 CFU/100 mL regardless of chlorination level (Table 2). Despite the apparent increase in levels of *Enterococcus* bacteria at the 60-m, 80-m, and 98-m depths, almost no statistically significant difference was observed at these sites as a result of the reduced chlorine disinfection (i.e. p -value > 0.05 ; Table 2). In fact, only the 80-m samples at station F29 showed a statistically significant increase in *Enterococcus* bacteria (Mann-Whitney $U = 93.5$, $p \leq 0.05$) during the period of reduced chlorination, from 52 ± 25 CFU/100 mL to 443 ± 140 CFU/100 mL, which equated to an 845% increase in these bacteria levels (Table 2).

Summary

A reduction in chlorination at the PLWTP resulted in a statistically significant increase in total coliform and fecal coliform bacteria in the PLE, and in levels of *Enterococcus* bacteria observed at a single station depth at the PLOO discharge site (i.e. F29, 80 m). Under normal chlorination (i.e. 6 ppm), it is typical to observe elevated *Enterococcus* levels ≥ 104 CFU/mL in the 80 m depth samples at stations F29, F30, and F31, and also at the 60 m depth samples at station F30 (Table 2). These sample locations coincide with the wastewater plume's dispersion trajectory and rise height and so are more likely to exhibit elevated

bacterial levels. Despite the apparent increase in *Enterococcus* bacteria at these stations as a result of the chlorine disinfection reduction, the wastewater plume remained trapped at depth, ensuring low bacteria levels in surface waters and minimal to zero impact on human health (Table 2).

Further assessment of these data will be conducted as part of the City's 2020-2021 Biennial Report, which is due to be completed by July 1, 2022.

Tables and Figures

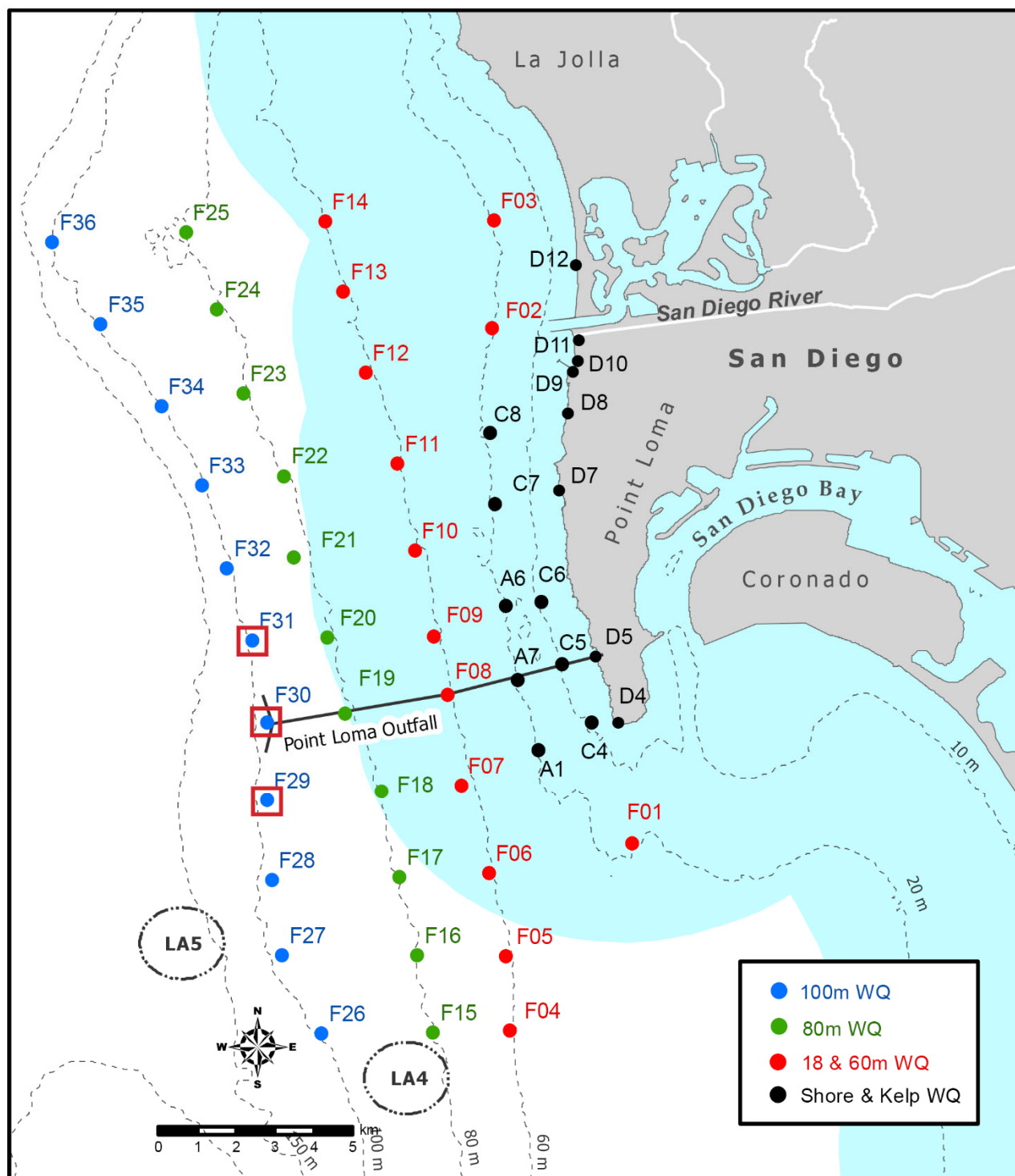


Figure 1

Water quality (WQ) monitoring station locations sampled around the Point Loma Ocean outfall (PLOO) as part of the City of San Diego's Ocean Monitoring Program. Light blue shading represents State jurisdictional waters. Red squares indicate stations sampled for chlorine reduction study (i.e. F29, F30, and F31).

Table 1

Fecal indicator bacteria levels in the Point Loma Effluent before and during a reduction in chlorine disinfection at the Point Loma Wastewater Treatment Plant.

	Pre-Chlorination Reduction (Feb 16, 2021– June 14, 2021)				Chlorination Reduction (June 18, 2021-Aug 16, 2021)				
Fecal Indicator Bacteria	N	Range Low - High		Mean ± SE	N	Range Low - High		Mean ± SE	p-value
Enterococcus (CFU/100 mL)	18	10,000 - 600,000		114,722 ± 32,220	18	39,000 - 150,000		85,389 ± 9,318	0.887
Fecal Coliform (MPN/100 mL)	18	1,700,000 - 24,000,000		6,861,111 ± 1,328,819	18	3,300,000 - 35,000,000		9,727,778 ± 1,812,805	0.043*
Total Coliform (MPN/100 mL)	18	3,300,000 - 35,000,000		16,755,556 ± 2,528,533	18	7,900,000 - 92,000,000		30,383,333 ± 5,056,790	0.015*

**Denotes a statistically significant result.*

Table 2

Enterococcus bacteria levels (CFU/100 mL) in receiving waters at stations F29, F30, and F31 before and during a reduction in chlorine disinfection at the Point Loma Wastewater Treatment Plant.

Station F29	Pre-Chlorination Reduction (Nov 17, 2018 - May 11, 2021)				Chlorination Reduction (June 19, 2021-Aug 17, 2021)				p-value [#]
Depth (m)	N	Range Low - High		Mean ± SE	N	Range Low - High		Mean ± SE	
25	11	2.0	- 12.0	2.9 ± 0.9	11	2.0	- -	2.0 ± -	
60	11	2.0	- 40.0	7.8 ± 3.6	11	2.0	- 580.0	64.4 ± 51.8	0.322
80	11	2.0	- 240.0	52.4 ± 25.2	11	2.0	- 1200.0	442.7 ± 140.2	0.029*
98	11	2.0	- 220.0	26.5 ± 19.5	11	2.0	- 560.0	76.7 ± 49.7	0.566

Station F30	Pre-Chlorination Reduction (Nov 17, 2018 - May 11, 2021)				Chlorination Reduction (June 19, 2021-Aug 17, 2021)				p-value [#]
Depth (m)	N	Range Low - High		Mean ± SE	N	Range Low - High		Mean ± SE	
25	11	2.0	- -	2.0 ± -	11	2.0	- -	2.0 ± -	
60	11	2.0	- 700.0	182.9 ± 79.4	11	2.0	- 2600.0	433.5 ± 239.2	0.843
80	11	2.0	- 900.0	224.2 ± 81.3	11	18.0	- 1200.0	440.7 ± 122.9	0.189
98	11	2.0	- 300.0	55.1 ± 25.7	11	2.0	- 580.0	98.5 ± 52.9	1.000

Station F31	Pre-Chlorination Reduction (Nov 17, 2018 - May 11, 2021)				Chlorination Reduction (June 19, 2021-Aug 17, 2021)				p-value [#]
Depth (m)	N	Range Low - High		Mean ± SE	N	Range Low - High		Mean ± SE	
25	11	2.0	- -	2.0 ± -	11	2.0	- 6.0	2.5 ± 0.4	
60	11	2.0	- 320.0	40.7 ± 29.0	11	2.0	- 540.0	69.5 ± 47.8	0.704
80	11	2.0	- 400.0	96.2 ± 38.8	11	2.0	- 3200.0	402.5 ± 283.6	0.620
98	11	2.0	- 40.0	12.7 ± 4.0	11	2.0	- 280.0	46.9 ± 25.1	0.639

*Denotes a statistically significant result.

[#]Statistical comparisons could not be performed on data from the 25 m depth contour due to lack of variance (i.e. all data points equal the same value).