

APPENDIX D DRIFT FIGURES

Test Run Data Collection and Modeling Report

for the

Dissolved Oxygen Facility Environmental Testing

for the

Savannah Harbor Expansion Project

Contract# W912HN-15-D-0023

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PREPARED FOR

**Army Corps of Engineers
Savannah District**
100 W Oglethorpe Avenue
Savannah, Georgia 31401-3640
Tel (912) 652-5026

PREPARED BY

LG2 Environmental Solutions, Inc.
10475 Fortune Parkway, Suite 201
Jacksonville, Florida 32256
Tel (904) 288-8631

Tetra Tech, Inc.
1899 Powers Ferry Rd SE, Suite 400
Atlanta, Georgia 30339
Tel (770) 738-6030

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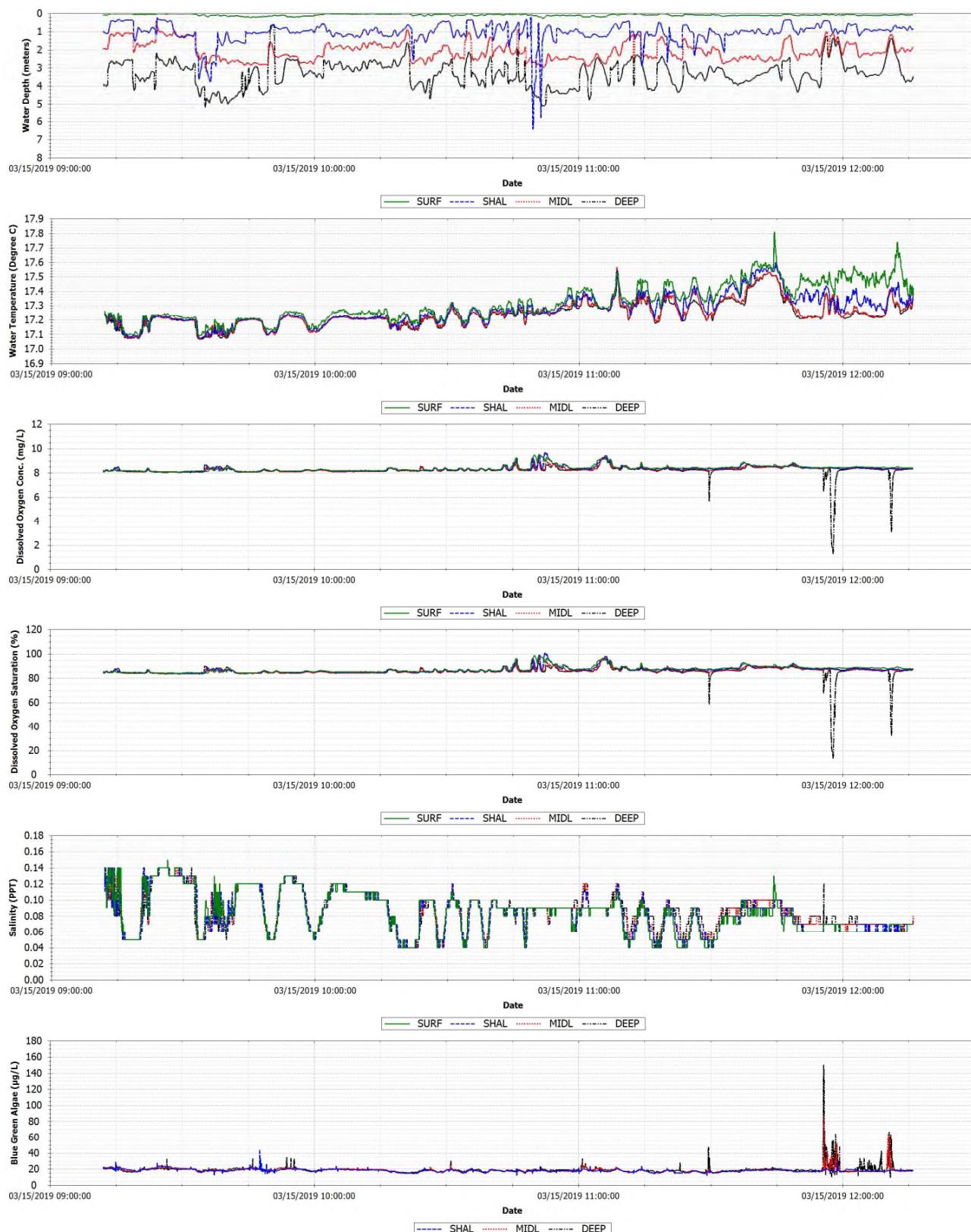
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D.1 BACK RIVER



Figure D-1 Back River March 15, 2019 ebb tide drift location map

**Figure D-2** Back River March 15, 2019 ebb tide drift observations

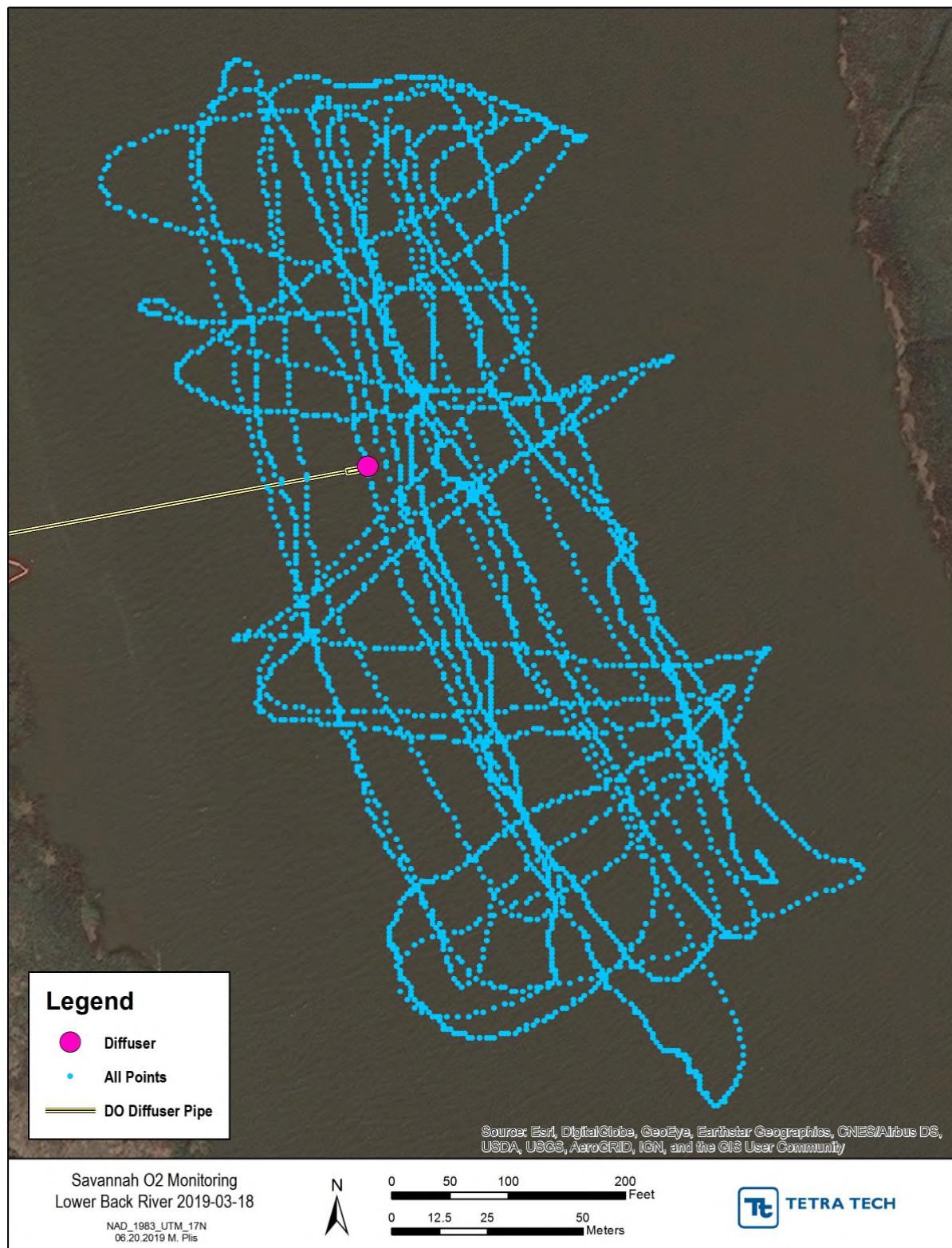
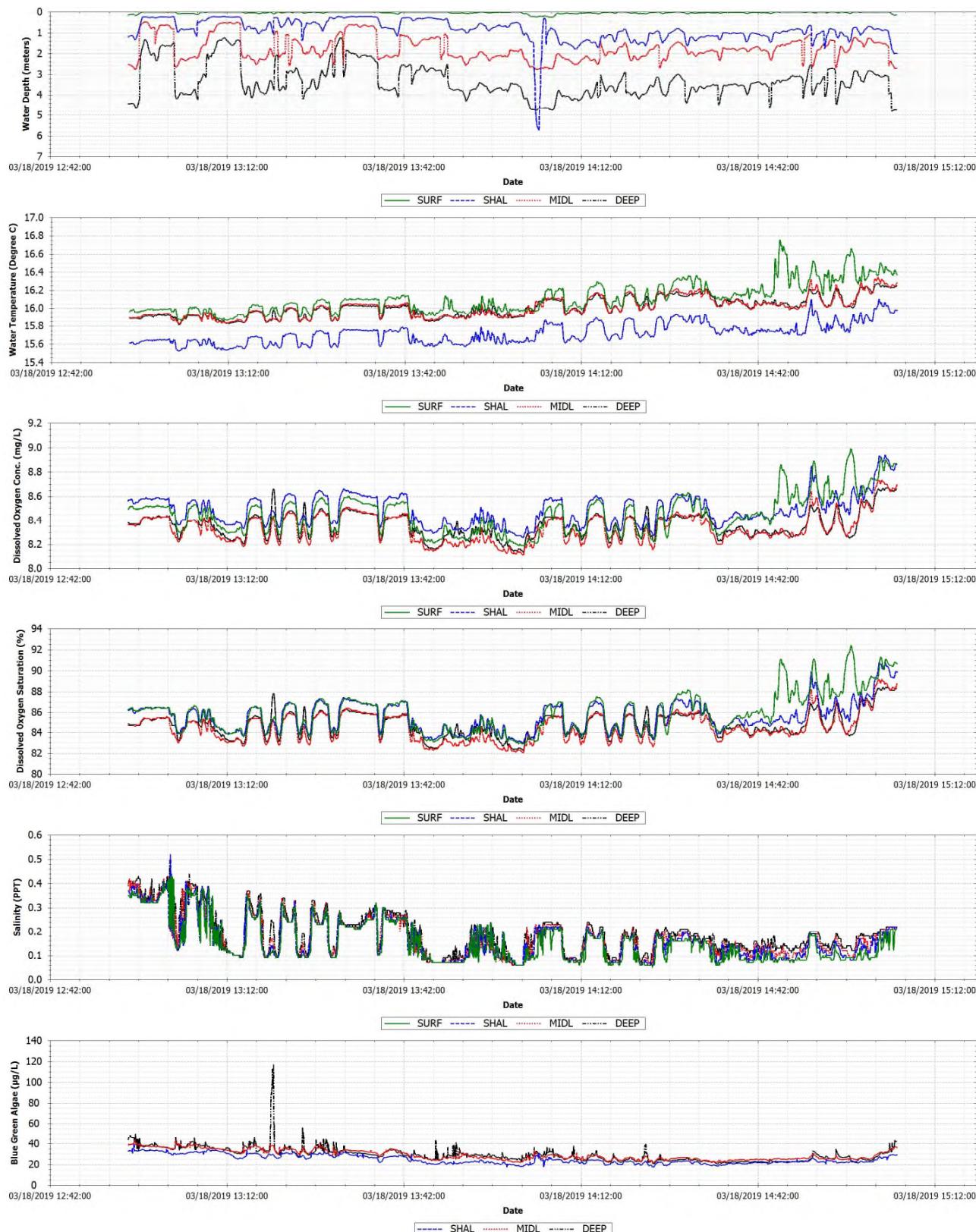


Figure D-3 Back River March 18, 2019 ebb tide drift location map

**Figure D-4** Back River March 18, 2019 ebb tide drift observations

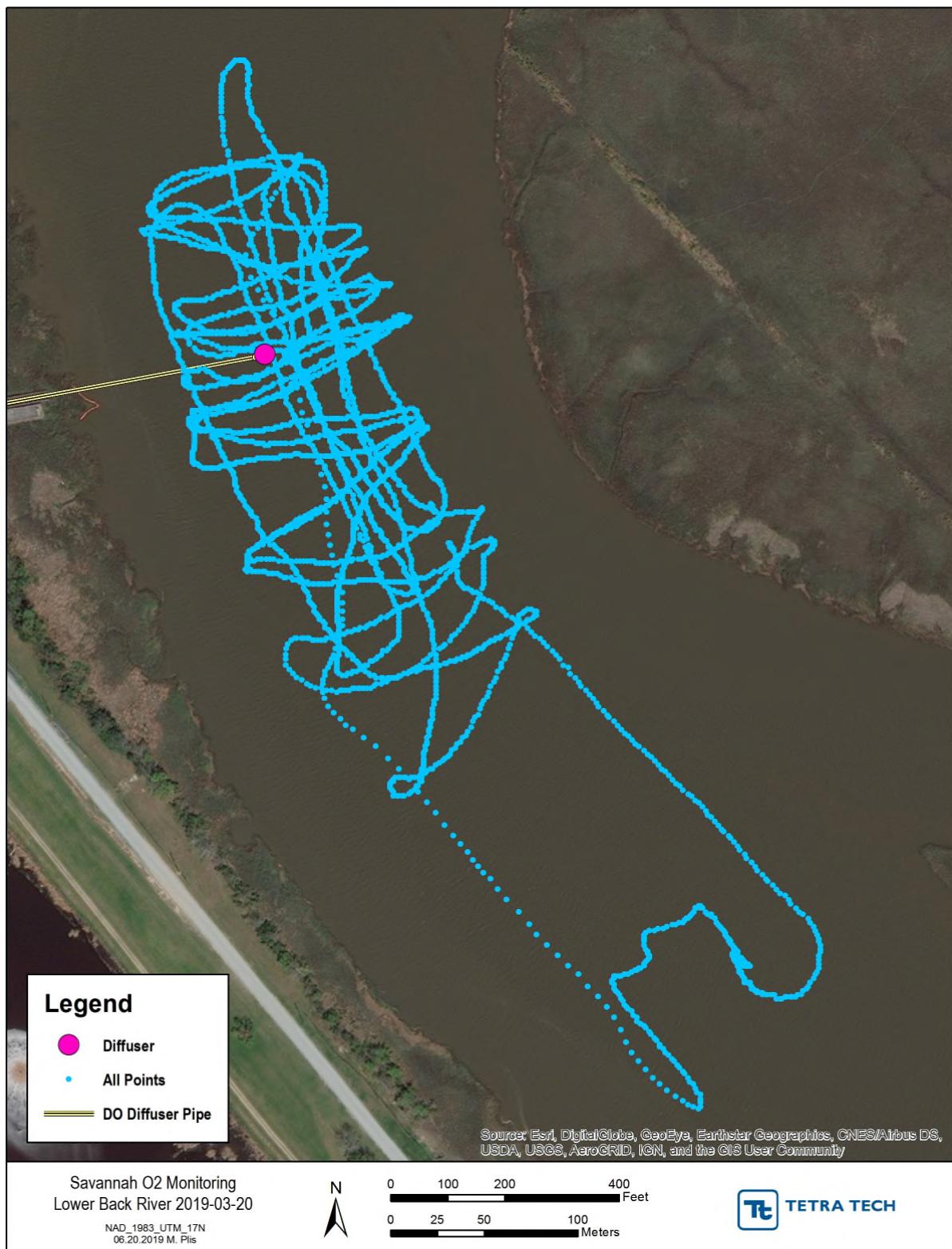
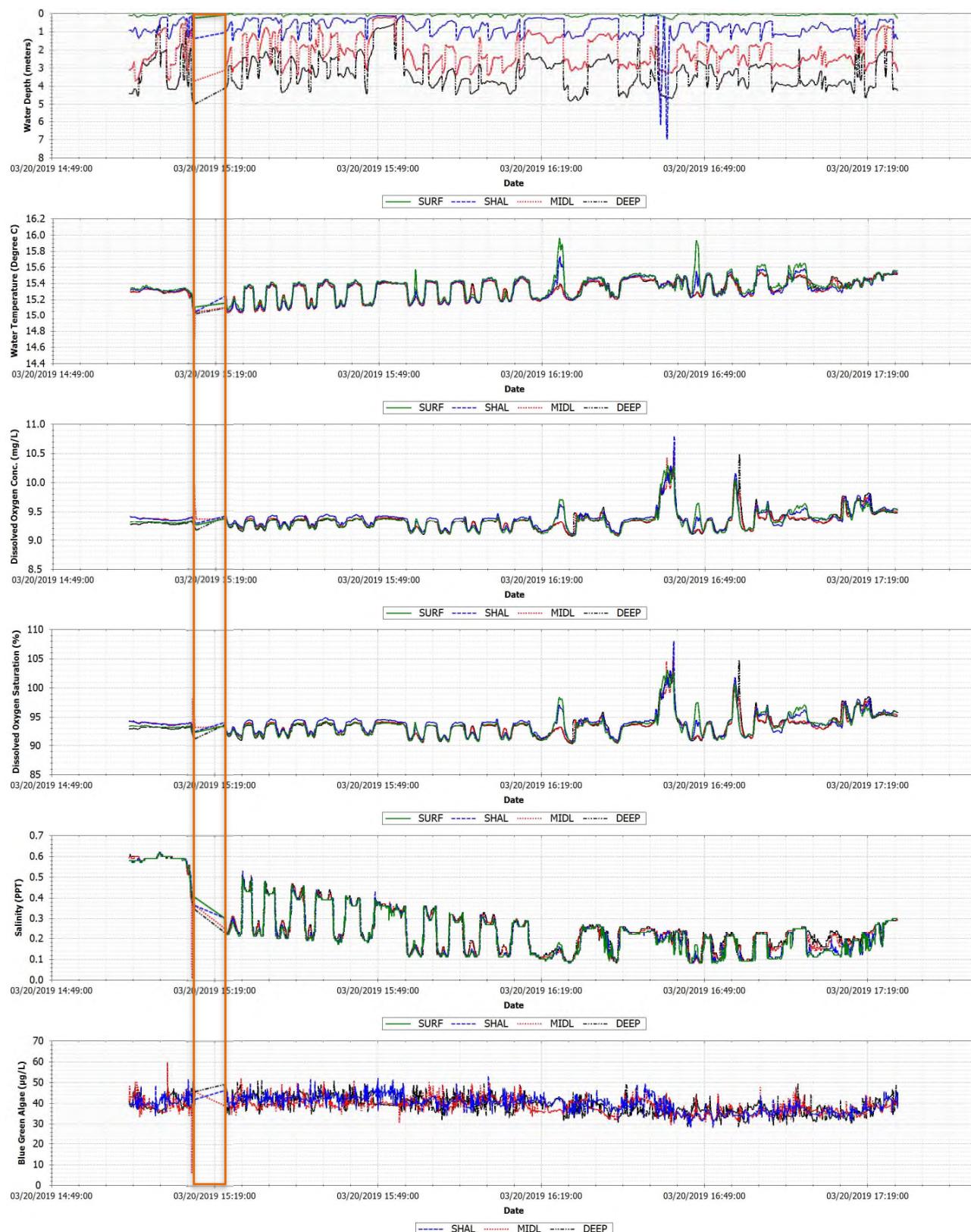


Figure D-5 Back River March 20, 2019 ebb tide drift location map



Note Orange box identifies period of data removed during QAQC process

Figure D-6 Back River March 20, 2019 ebb tide drift observations

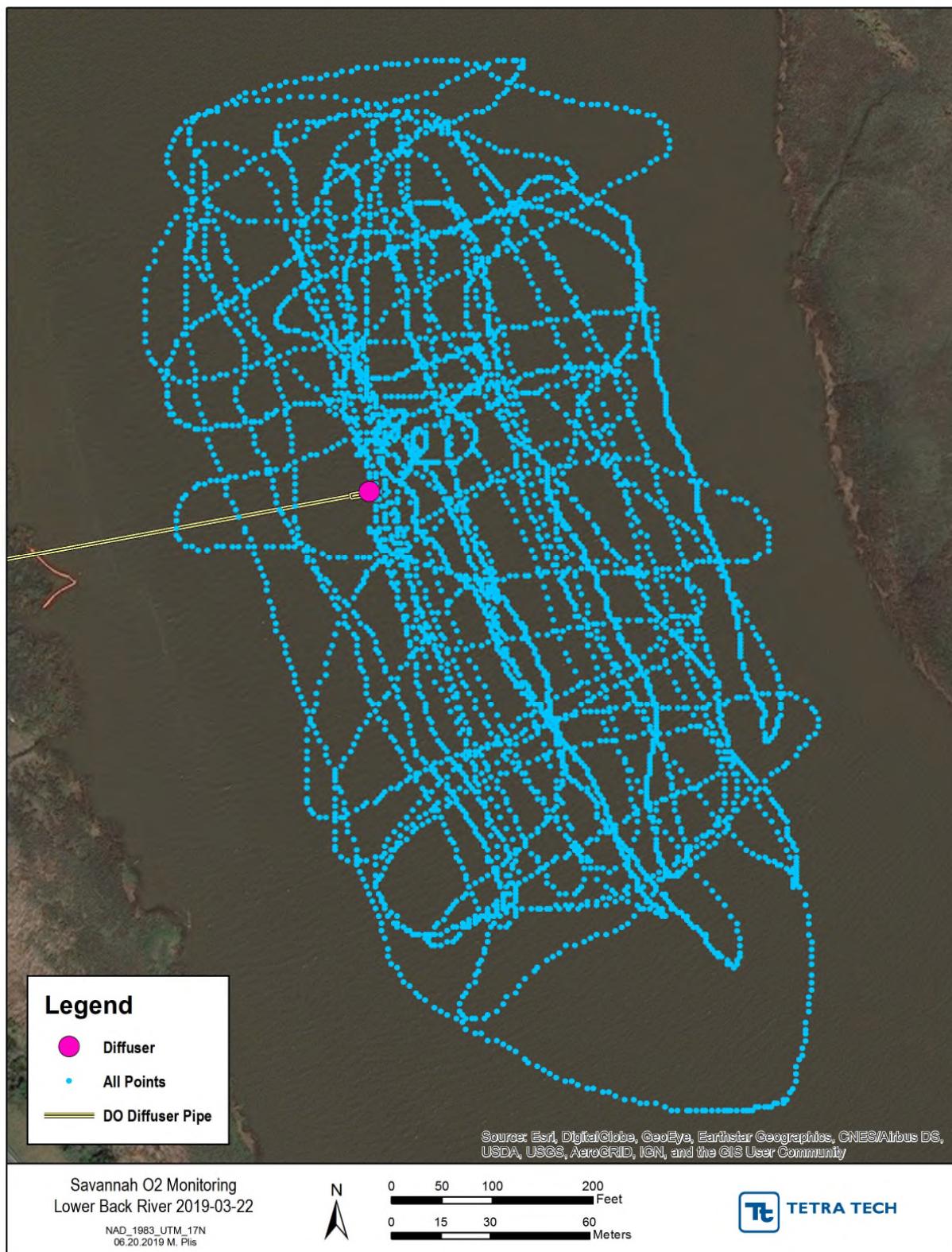


Figure D-7 Back River March 22, 2019 flood tide drift location map

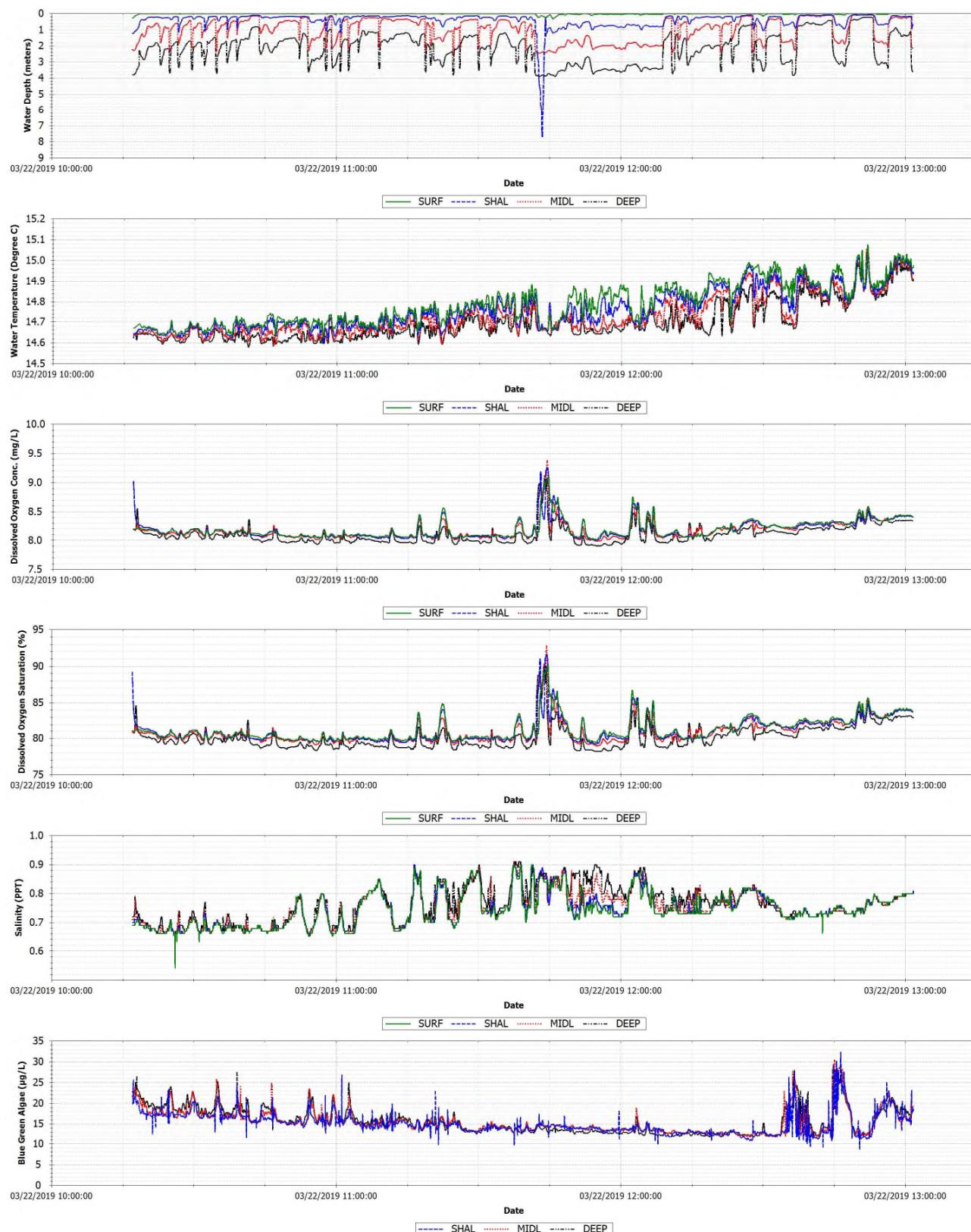
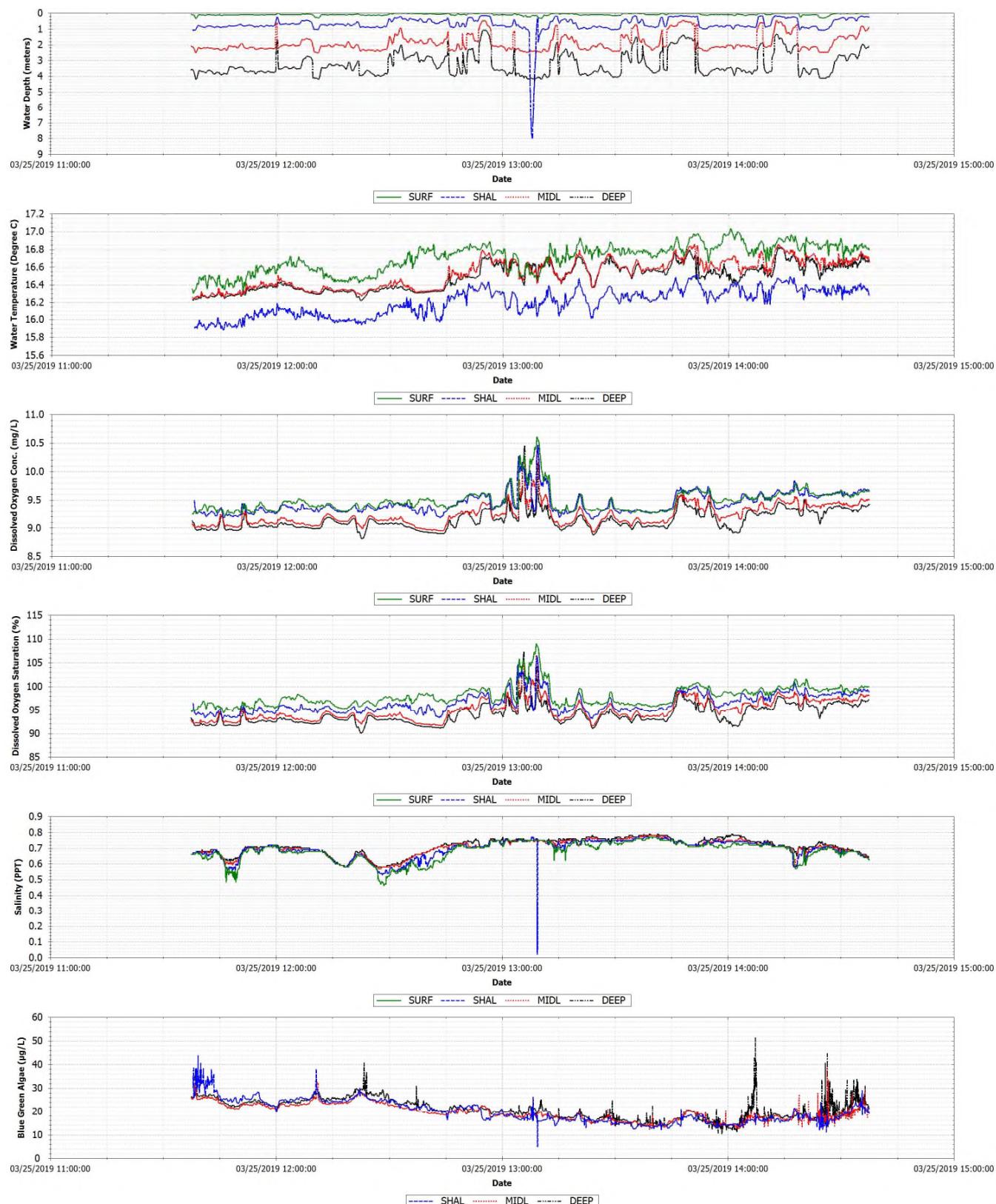
**Figure D-8** Back River March 22, 2019 flood tide drift observations



Figure D-9 Back River March 25, 2019 flood tide drift location map

**Figure D-10** Back River March 25, 2019 flood tide drift observations

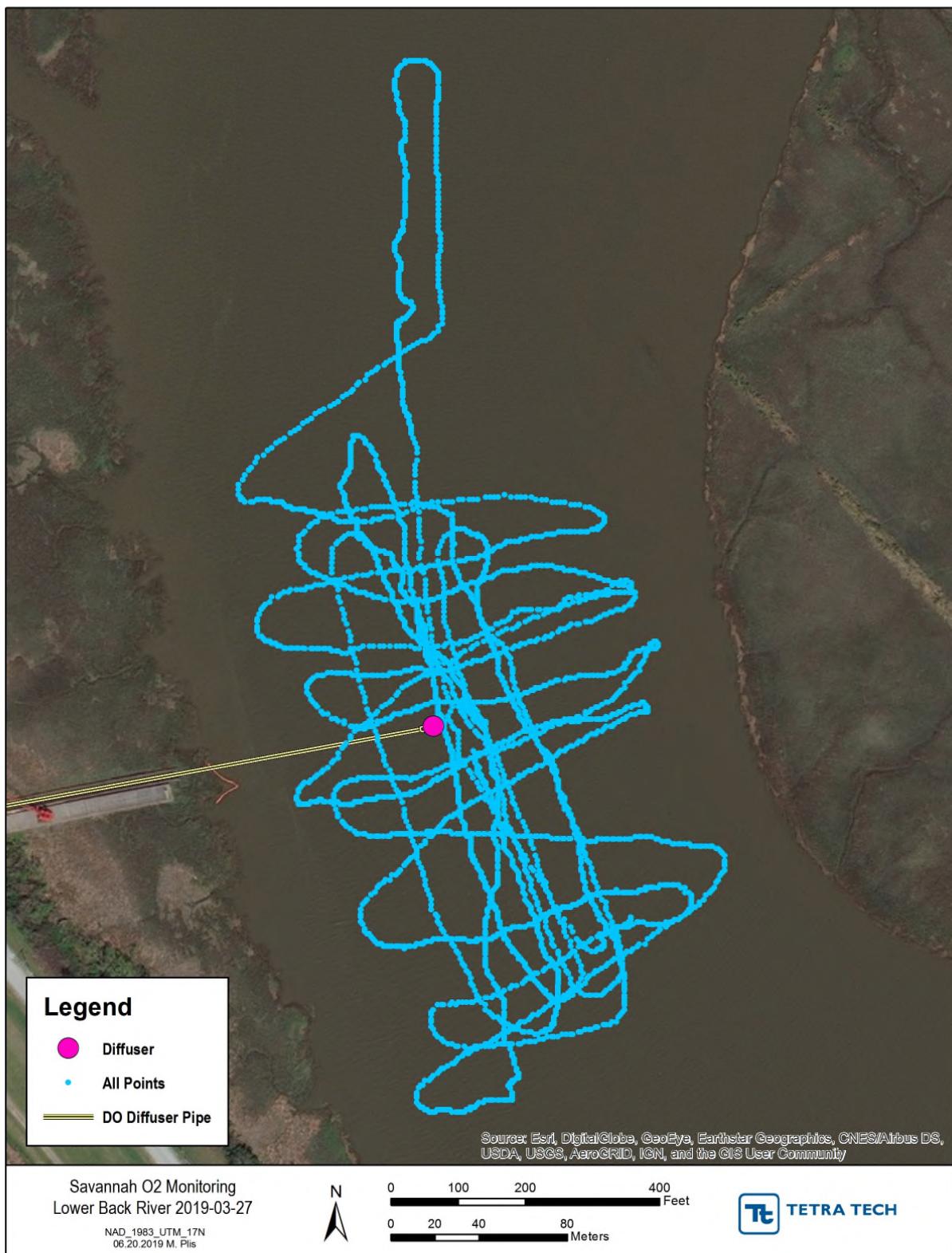
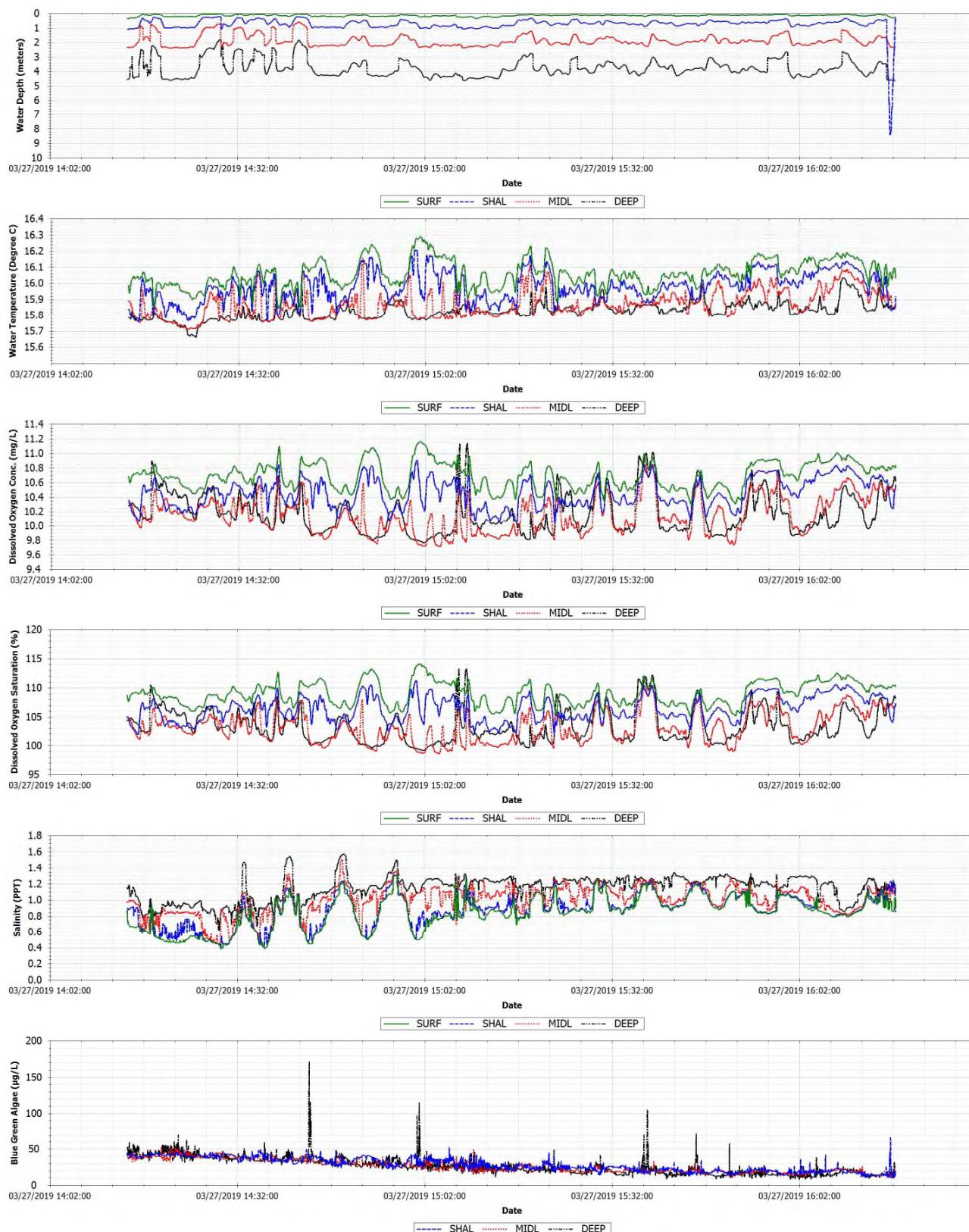


Figure D-11 Back River March 27, 2019 flood tide drift location map

**Figure D-12** Back River March 27, 2019 flood tide drift observations

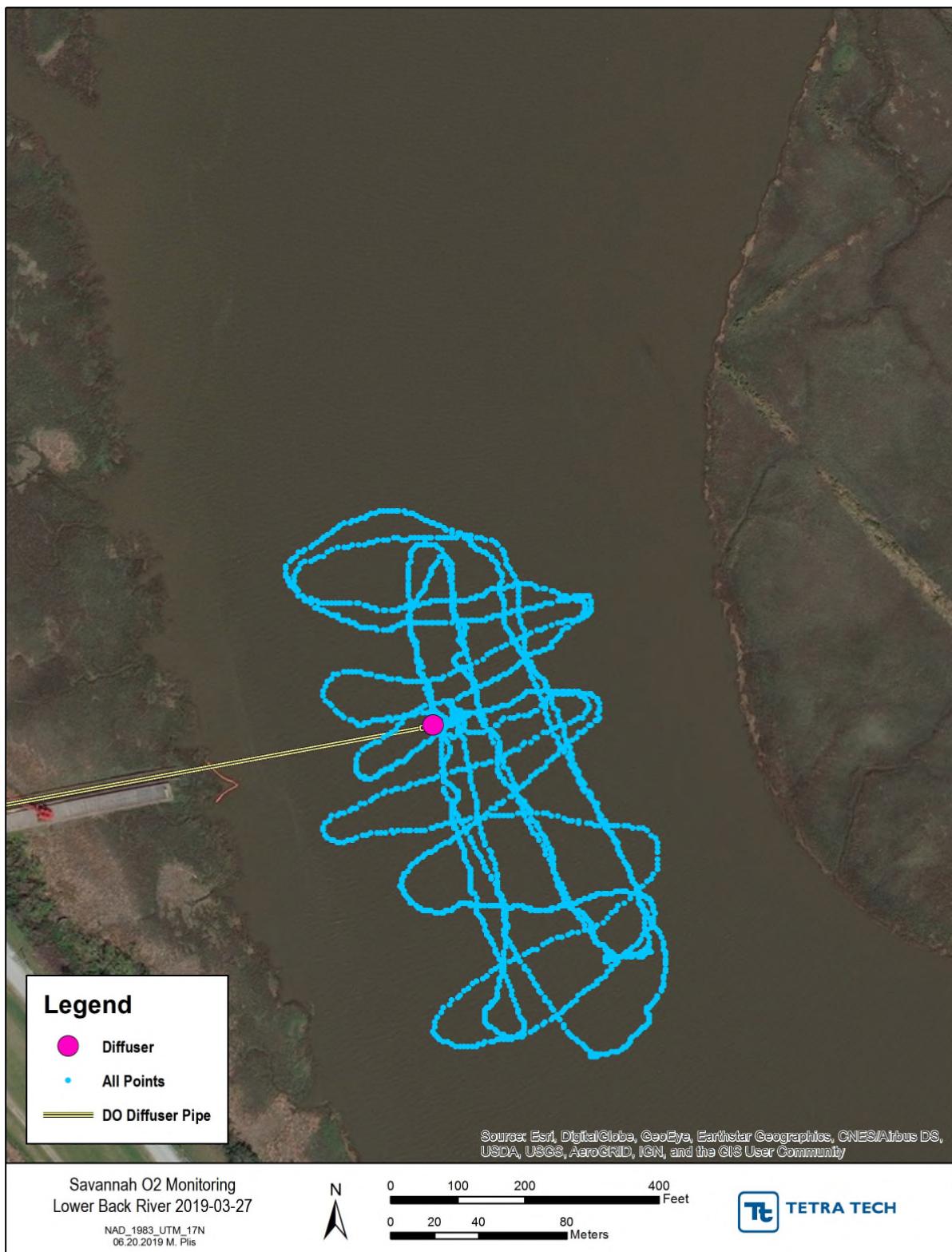
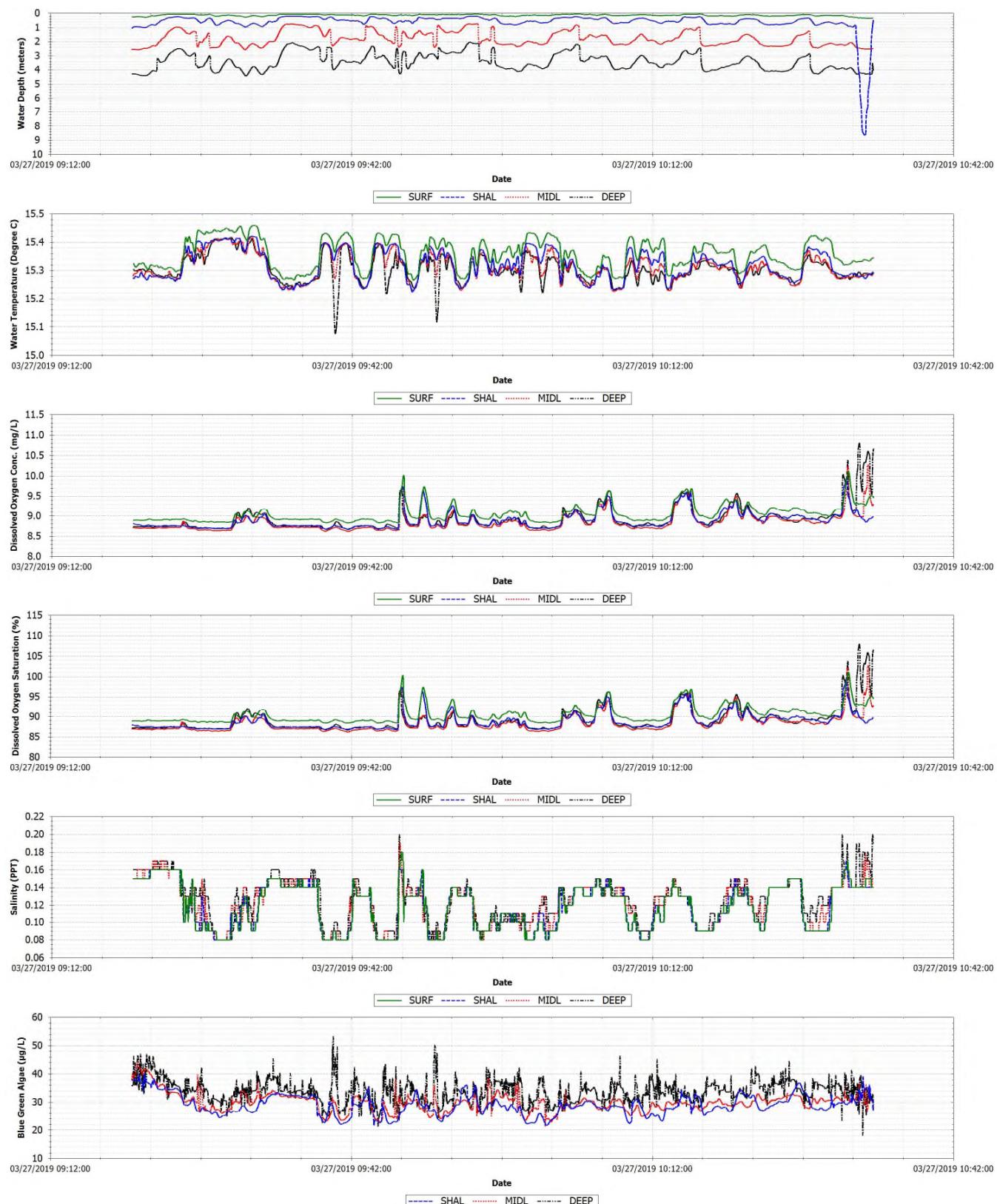


Figure D-13 Back River March 27, 2019 ebb tide drift location map

**Figure D-14** Back River March 27, 2019 ebb tide drift observations

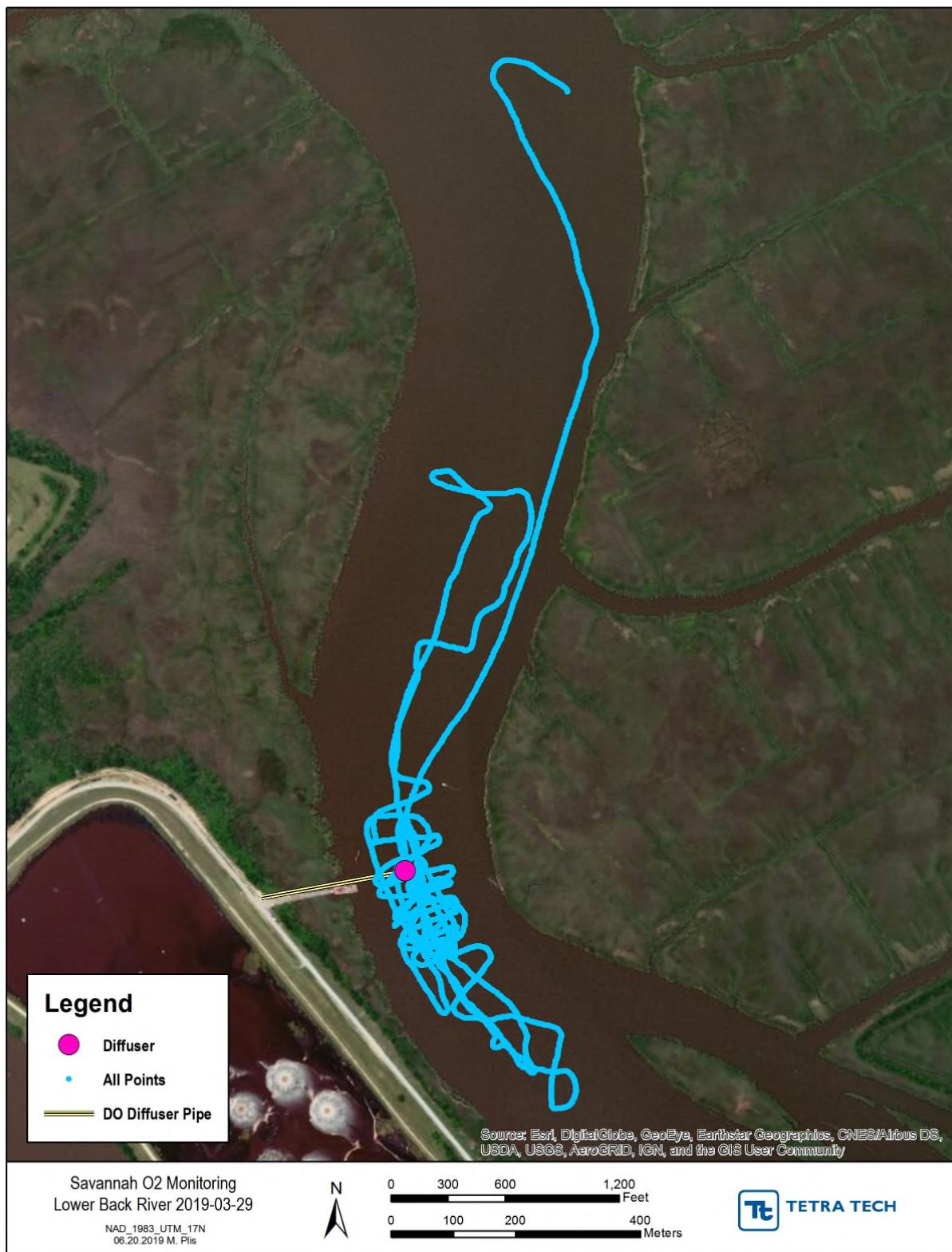


Figure D-15 Back River March 29, 2019 ebb tide dye drift location map

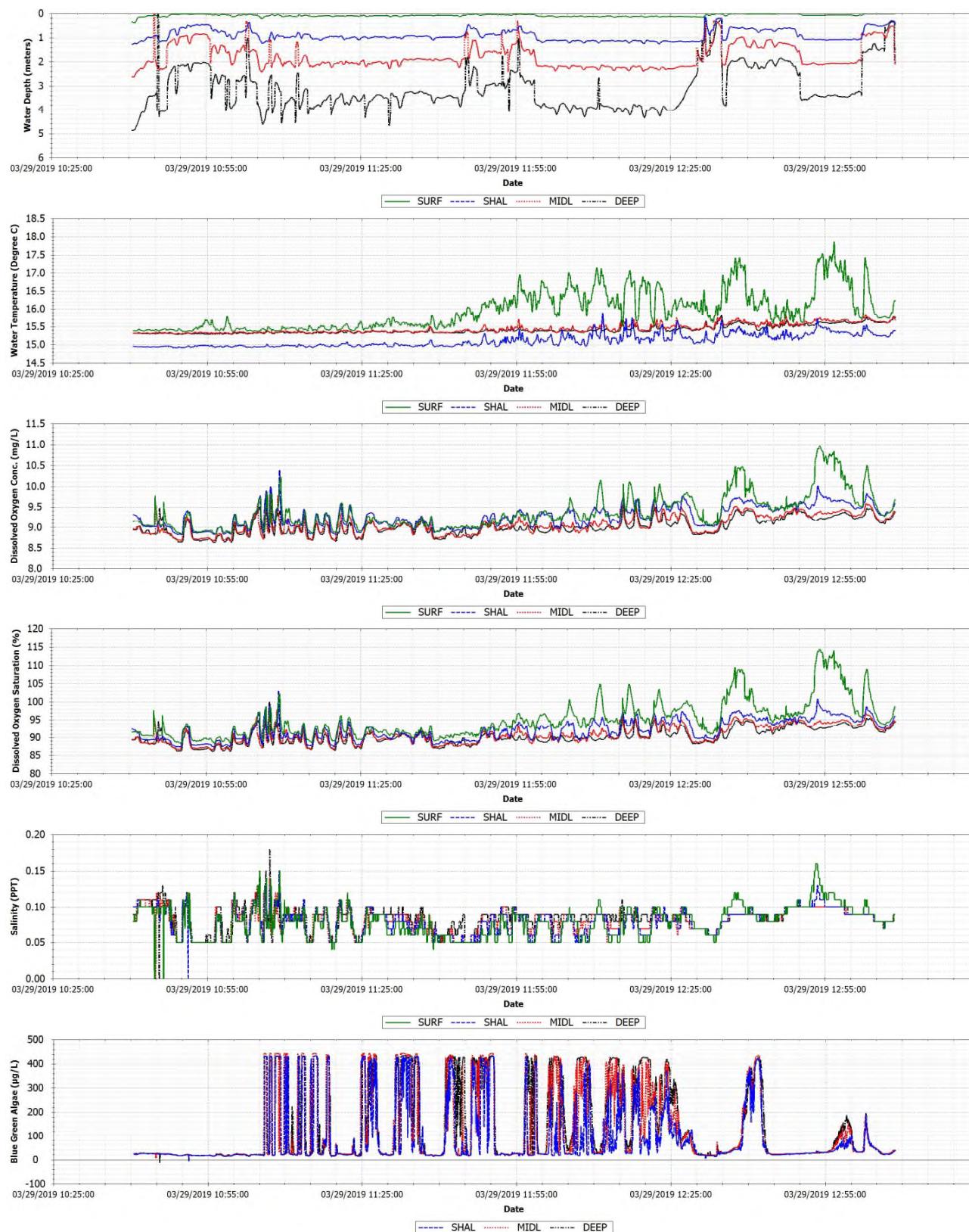
**Figure D-16** Back River March 29, 2019 ebb tide dye drift observations



Figure D-17 Back River April 1, 2019 ebb tide drift location map

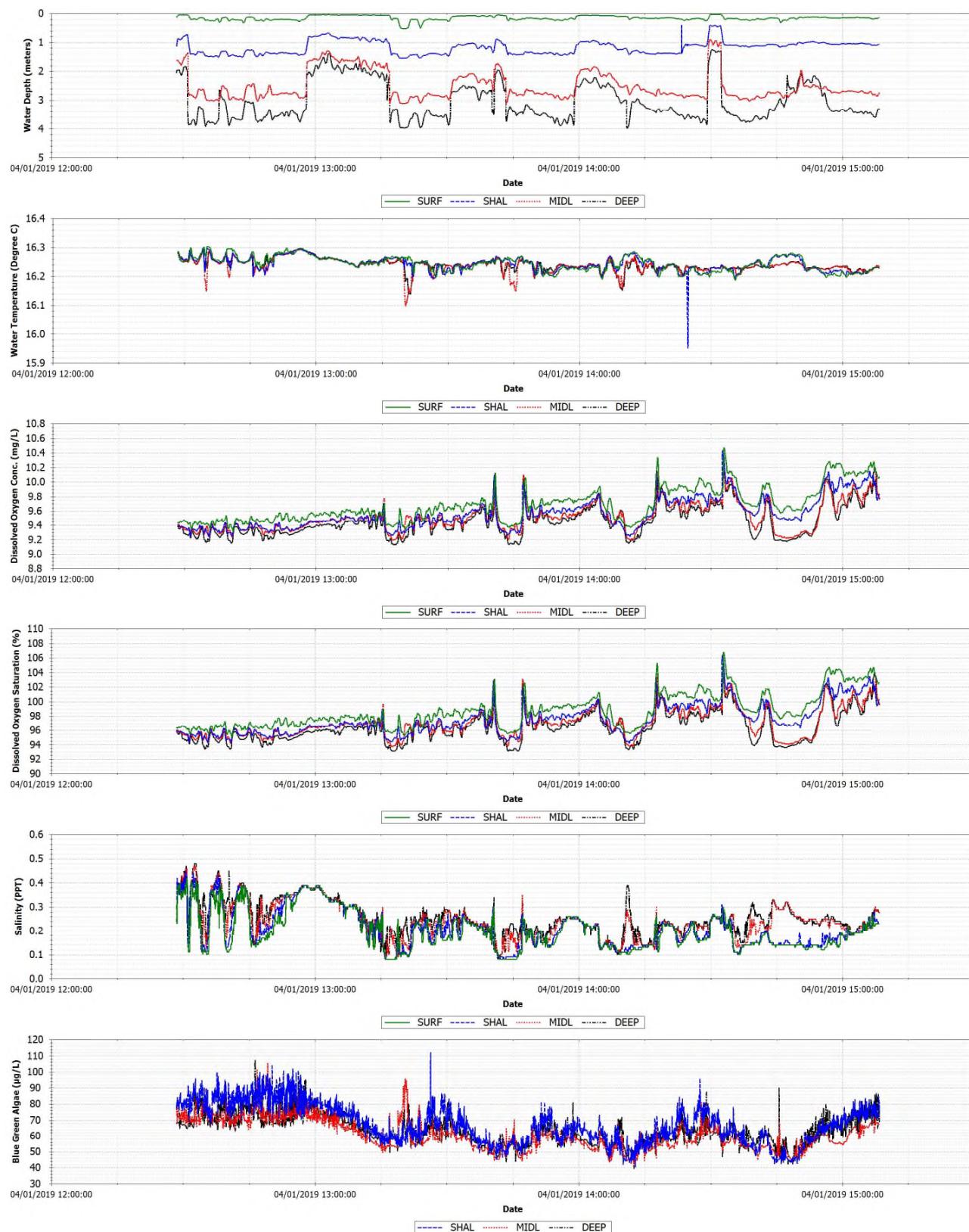
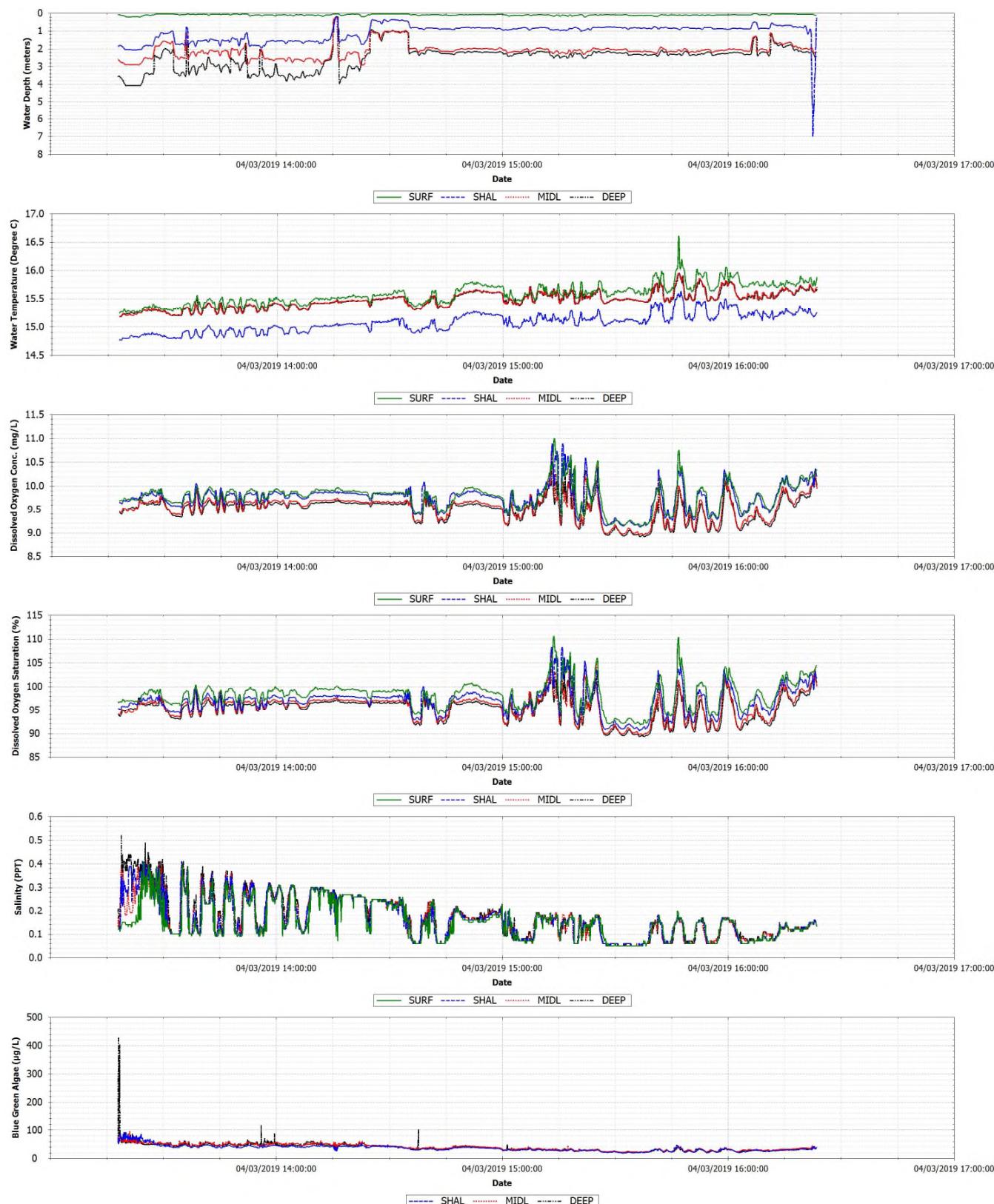
**Figure D-18** Back River April 1, 2019 ebb tide drift observations



Figure D-19 Back River April 3, 2019 ebb tide drift location map

**Figure D-20** Back River April 3, 2019 ebb tide drift observations

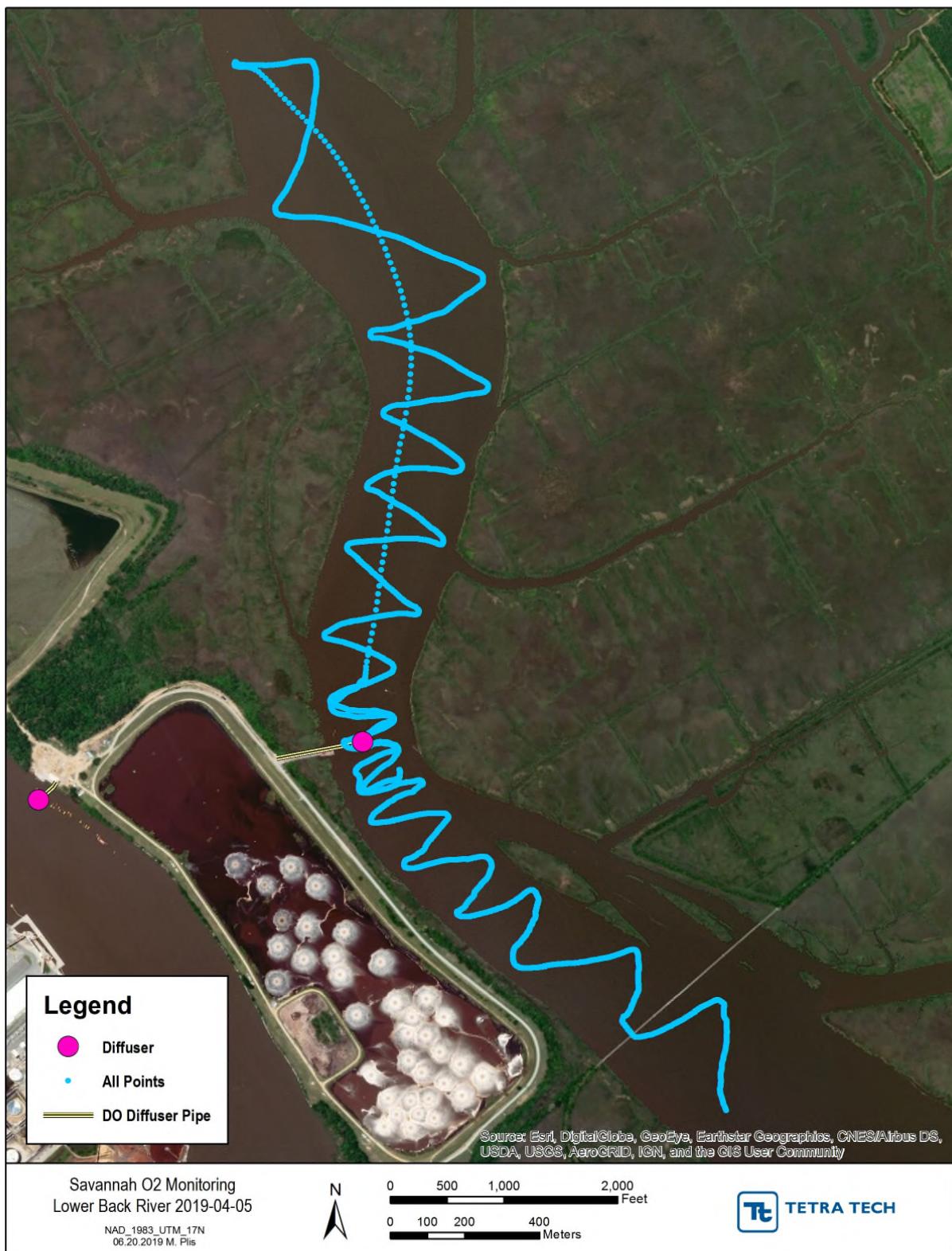
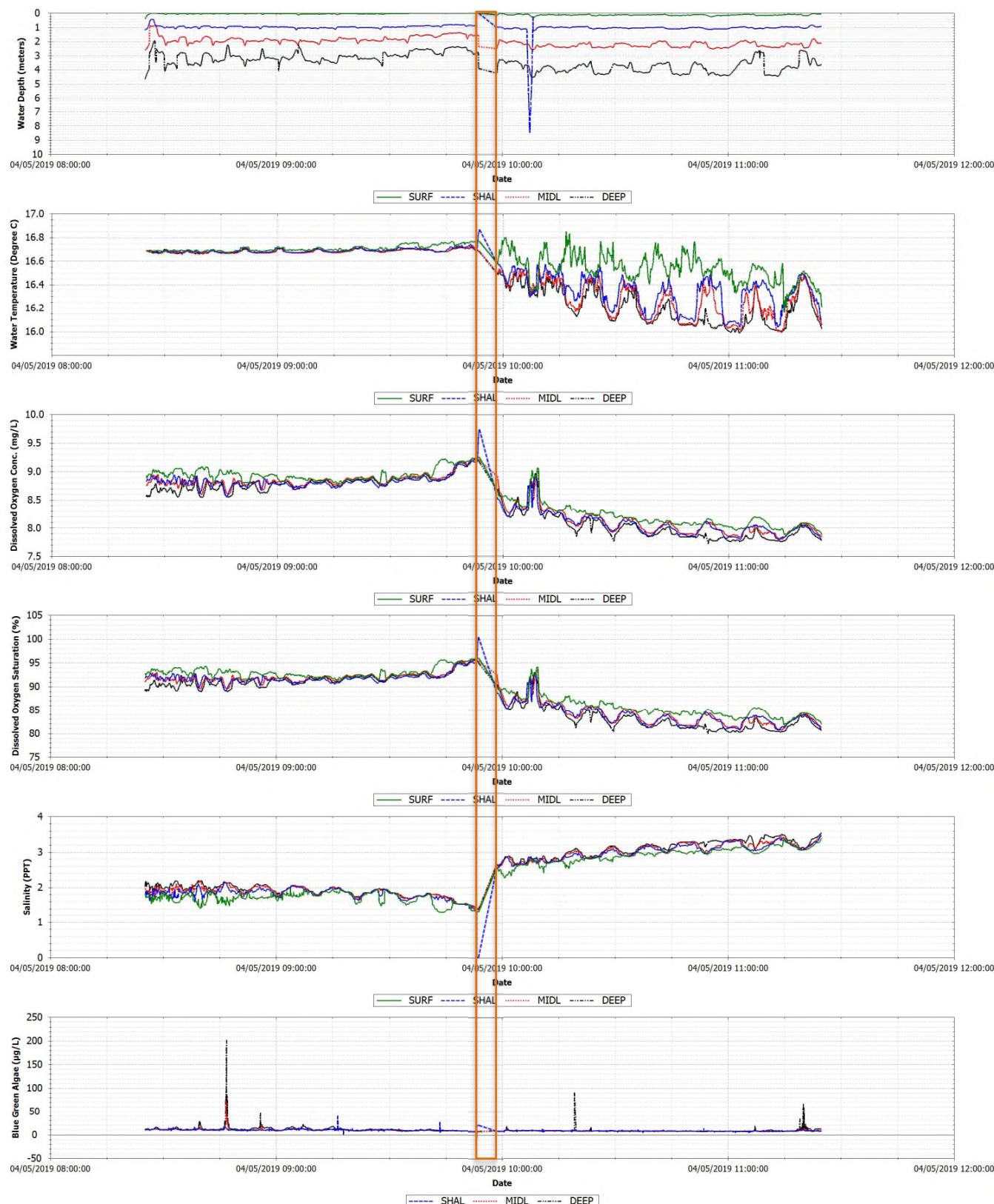


Figure D-21 Back River April 5, 2019 flood tide drift location map



Note Orange box identifies period of data removed during QAQC process

Figure D-22 Back River April 5, 2019 flood tide drift observations

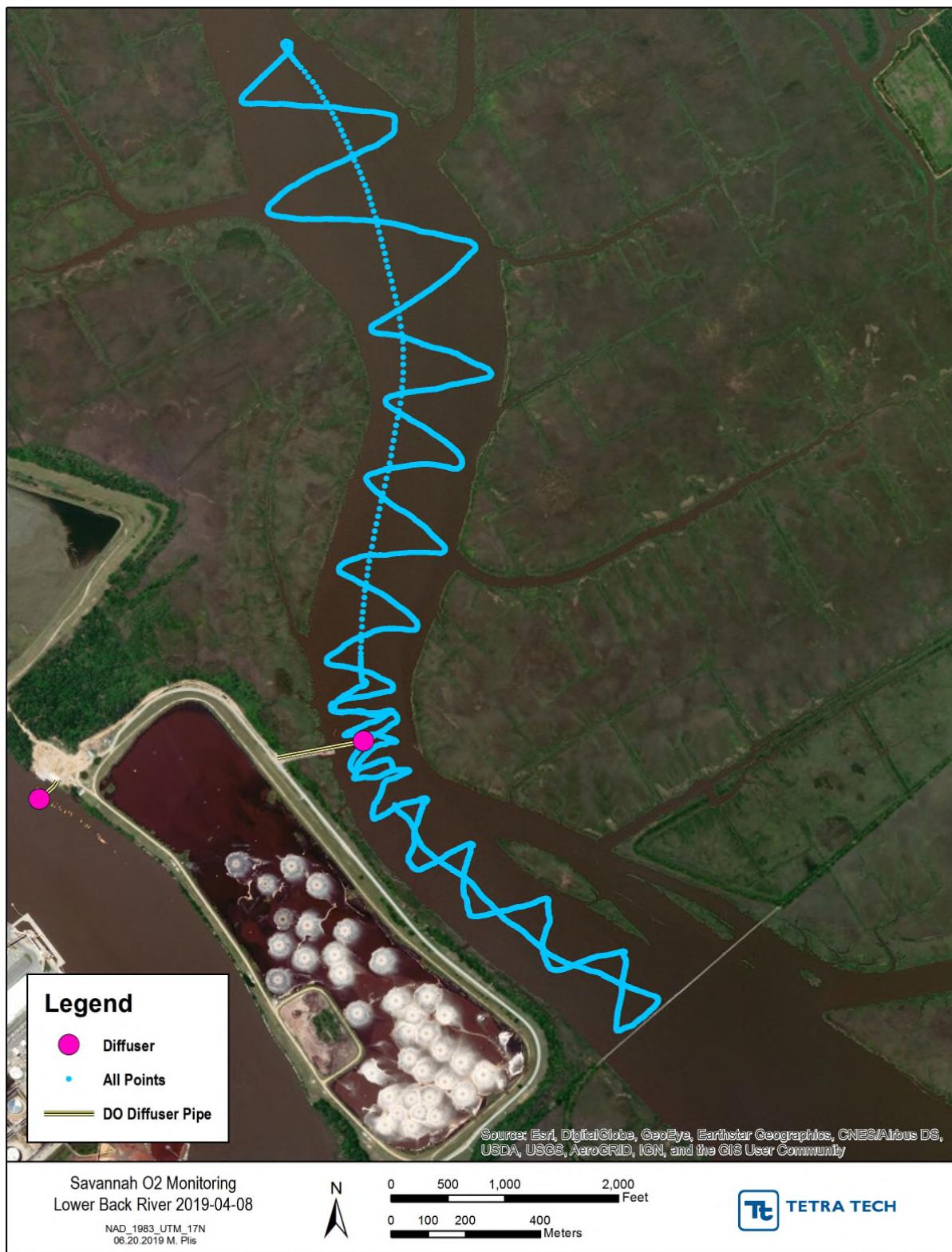
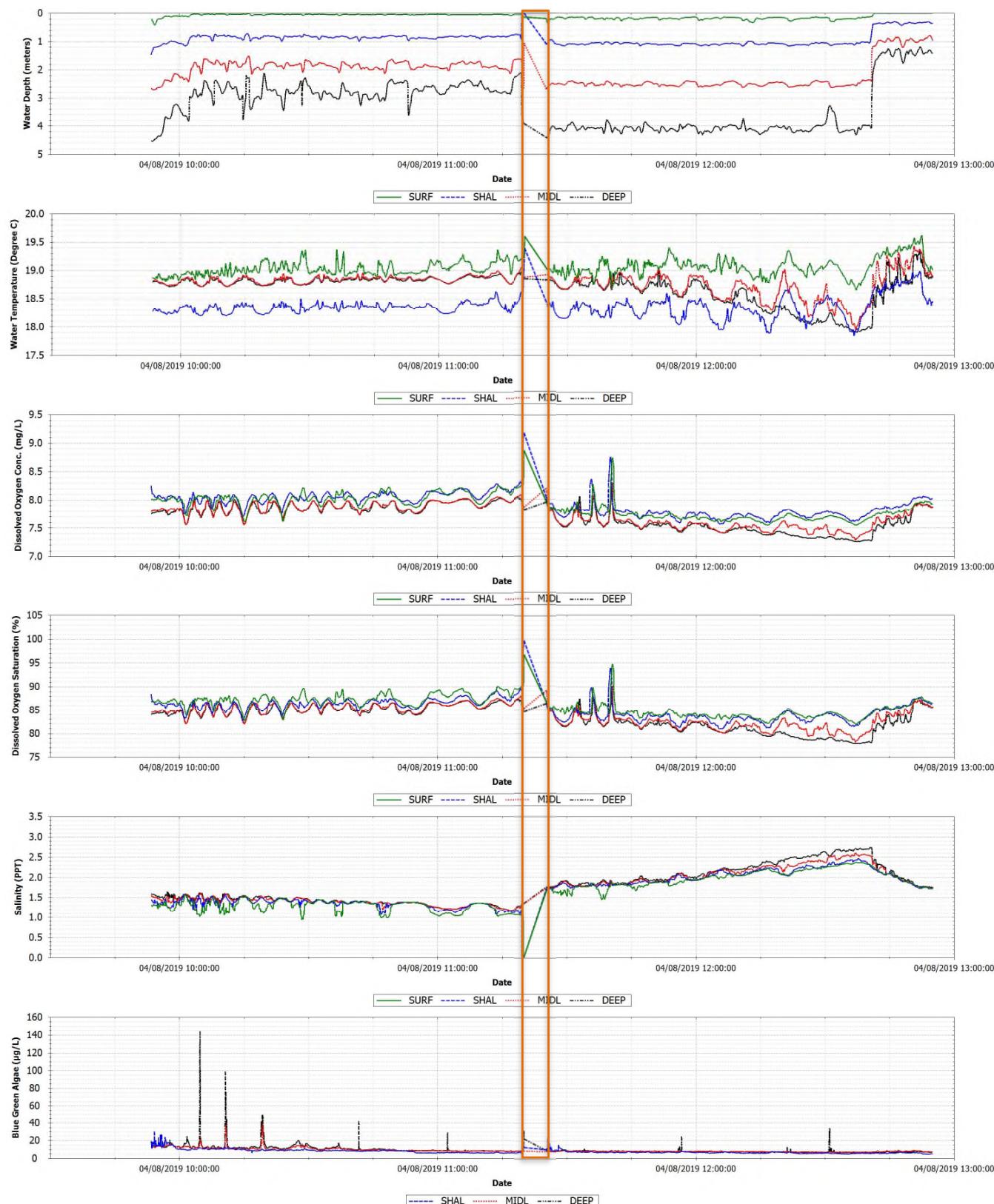


Figure D-23 Back River April 8, 2019 flood tide drift location map



Note Orange box identifies period of data removed during QAQC process

Figure D-24 Back River April 8, 2019 flood tide drift observations

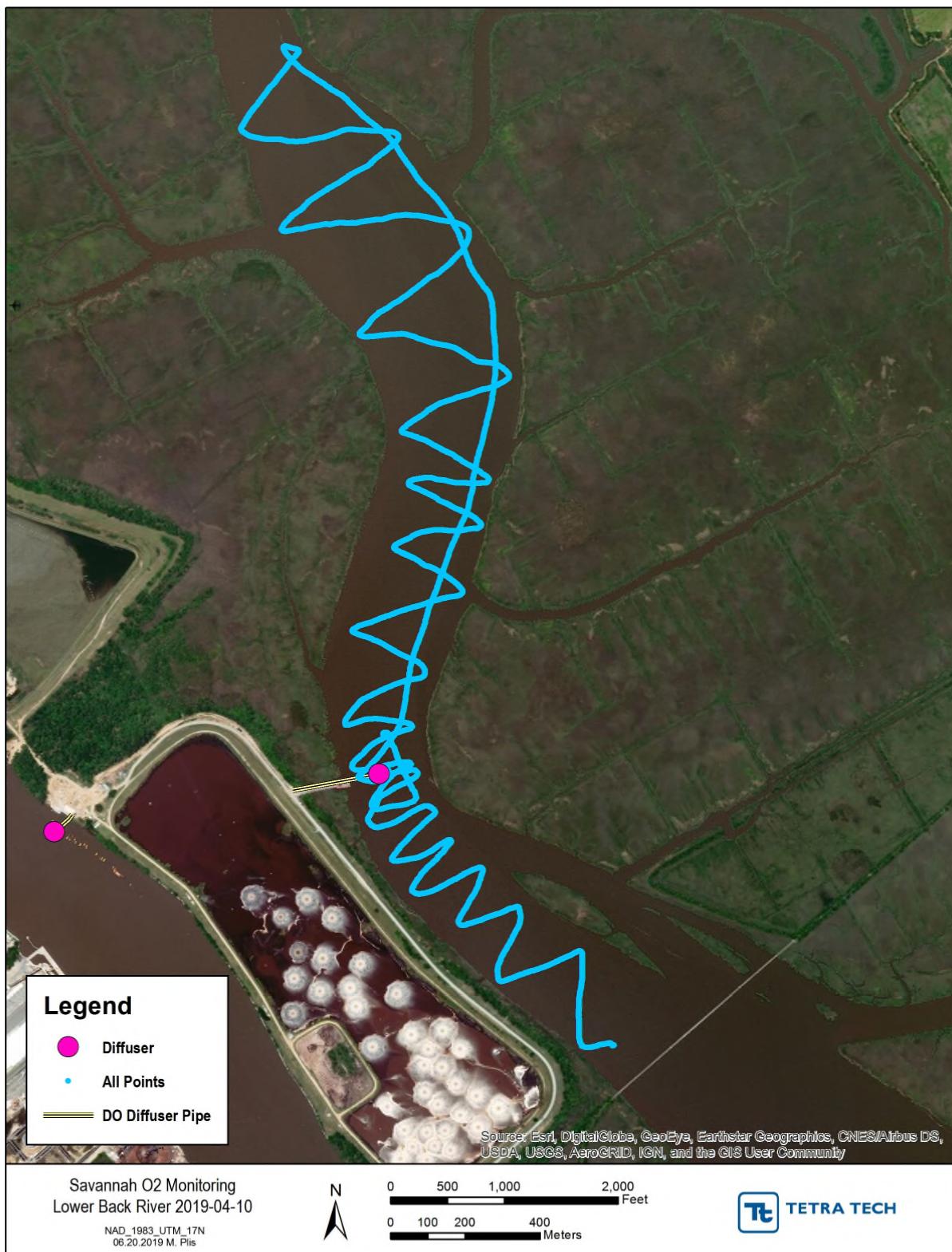


Figure D-25 Back River April 10, 2019 flood tide drift location map

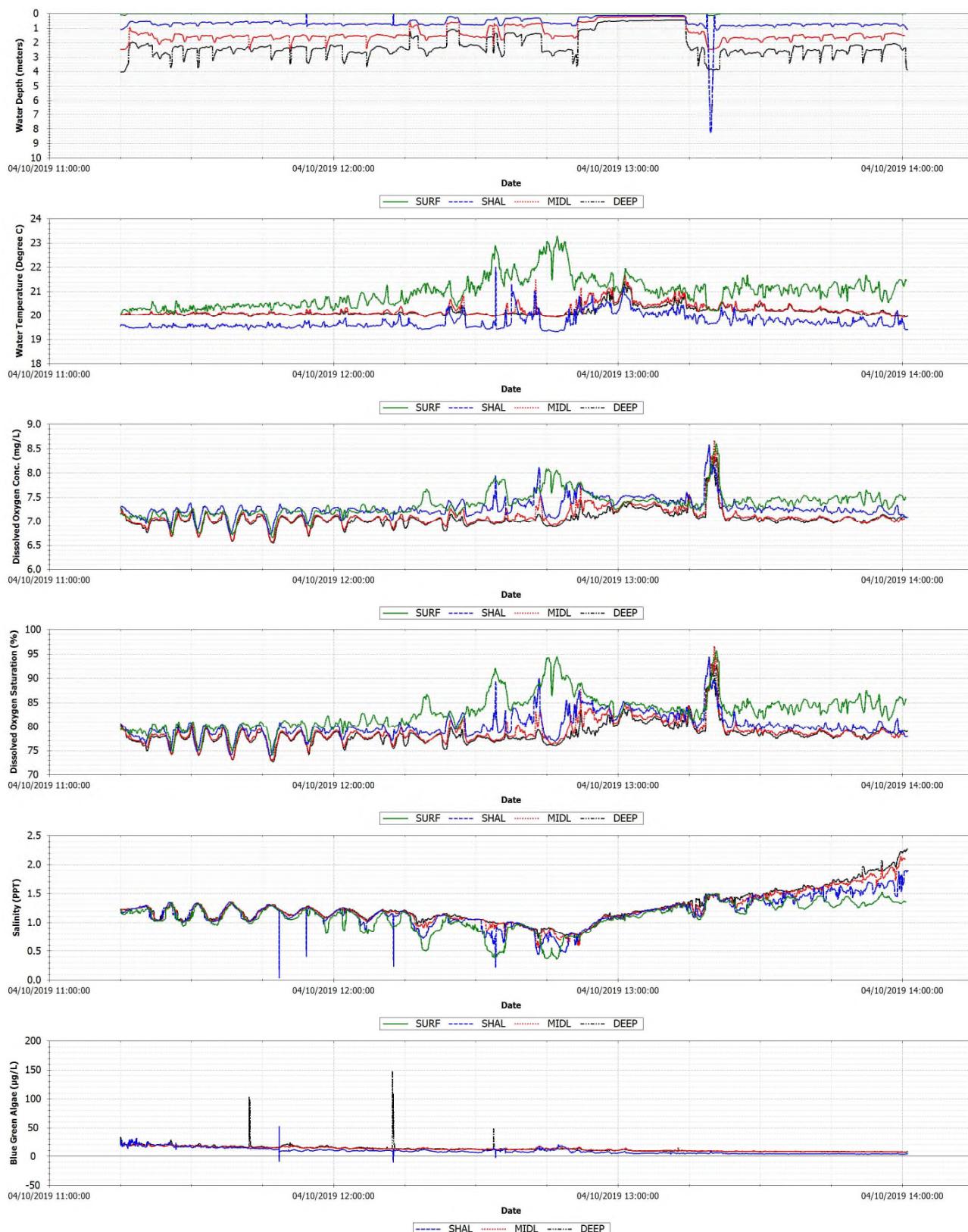
**Figure D-26** Back River April 10, 2019 flood tide drift observations



Figure D-27 Back River April 12, 2019 ebb tide dye drift location map boat 1

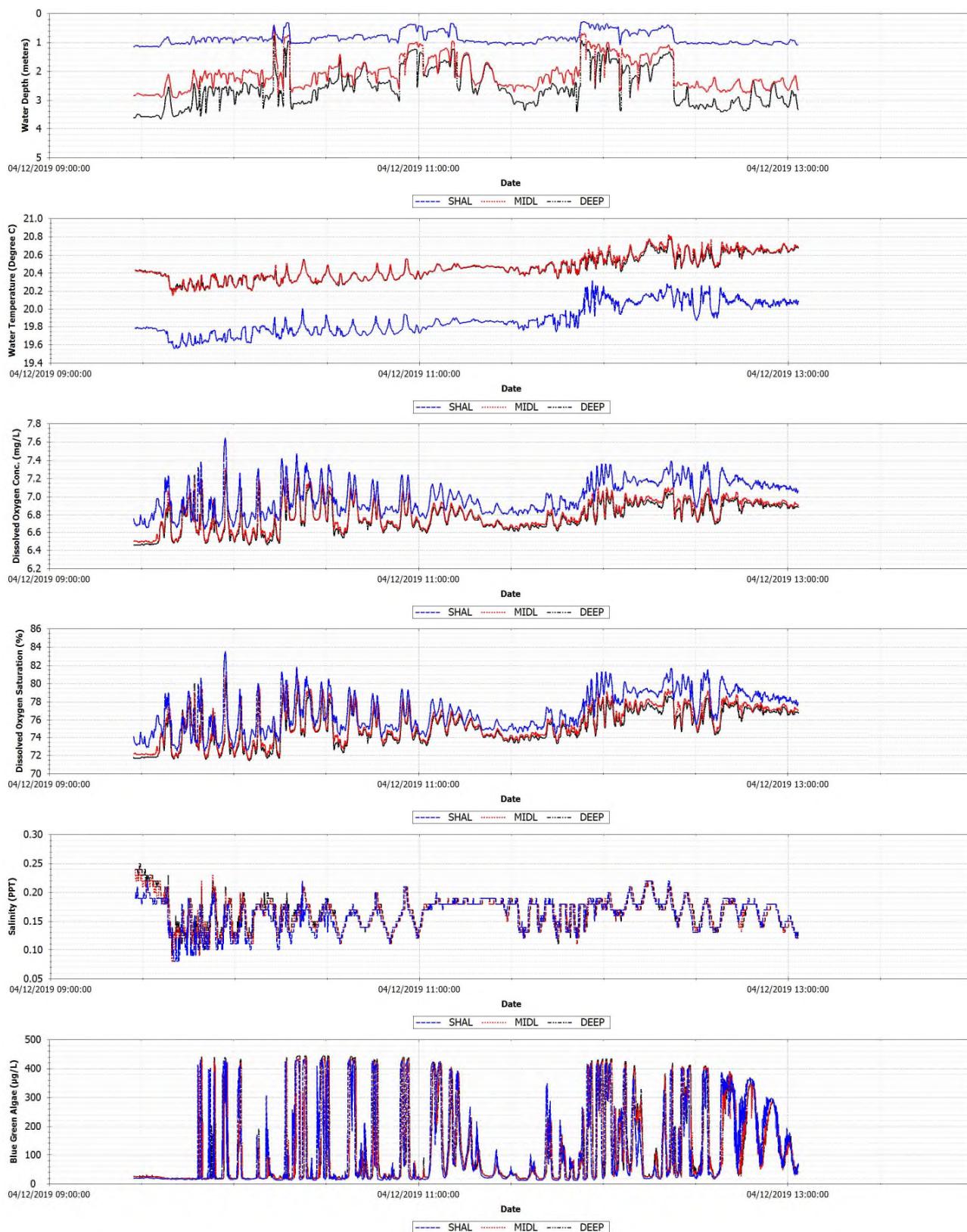
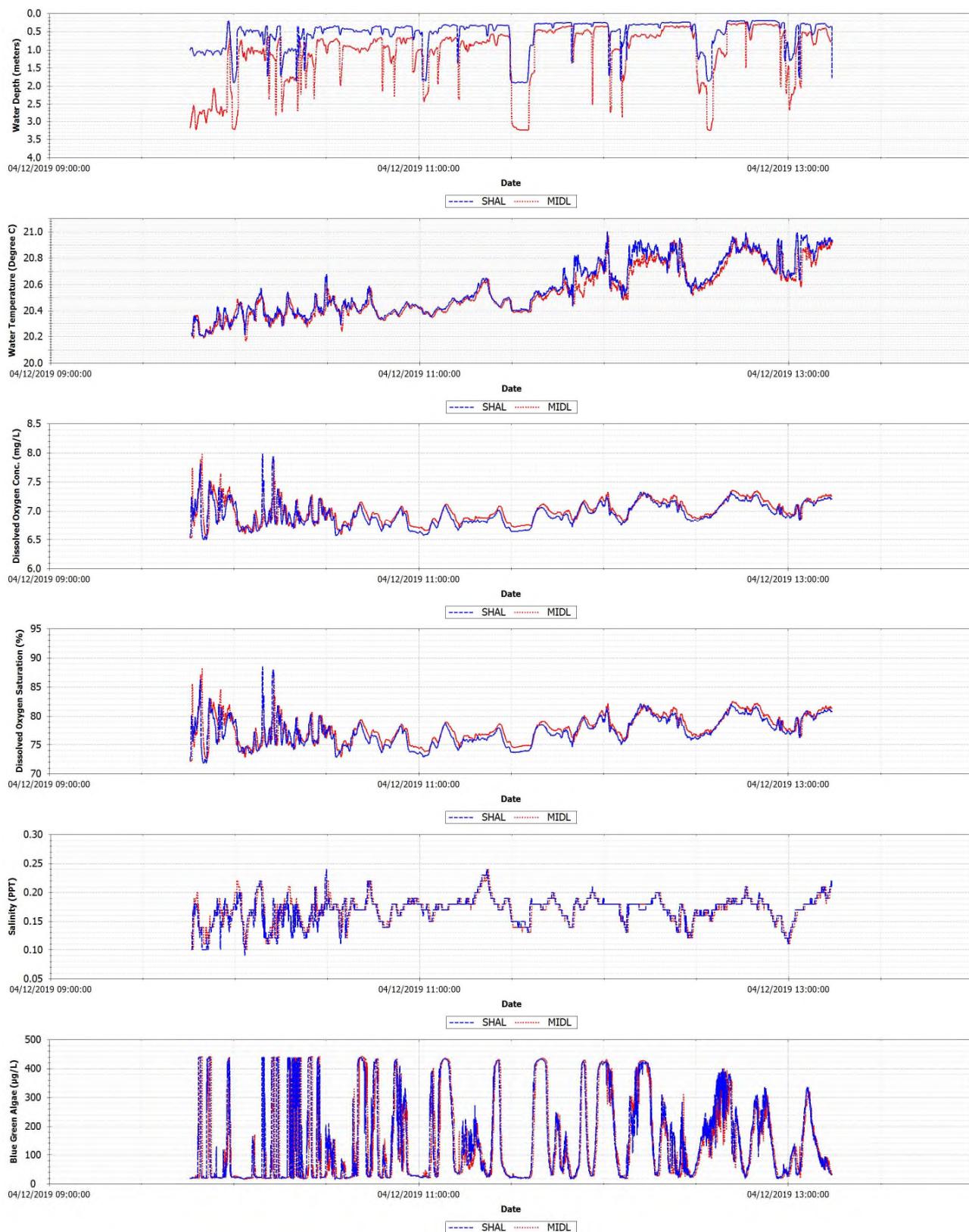


Figure D-28 Back River April 12, 2019 ebb tide dye drift observations boat 1



Figure D-29 Back River April 12, 2019 ebb tide dye drift location map boat 2

**Figure D-30** Back River April 12, 2019 ebb tide dye drift observations boat 2

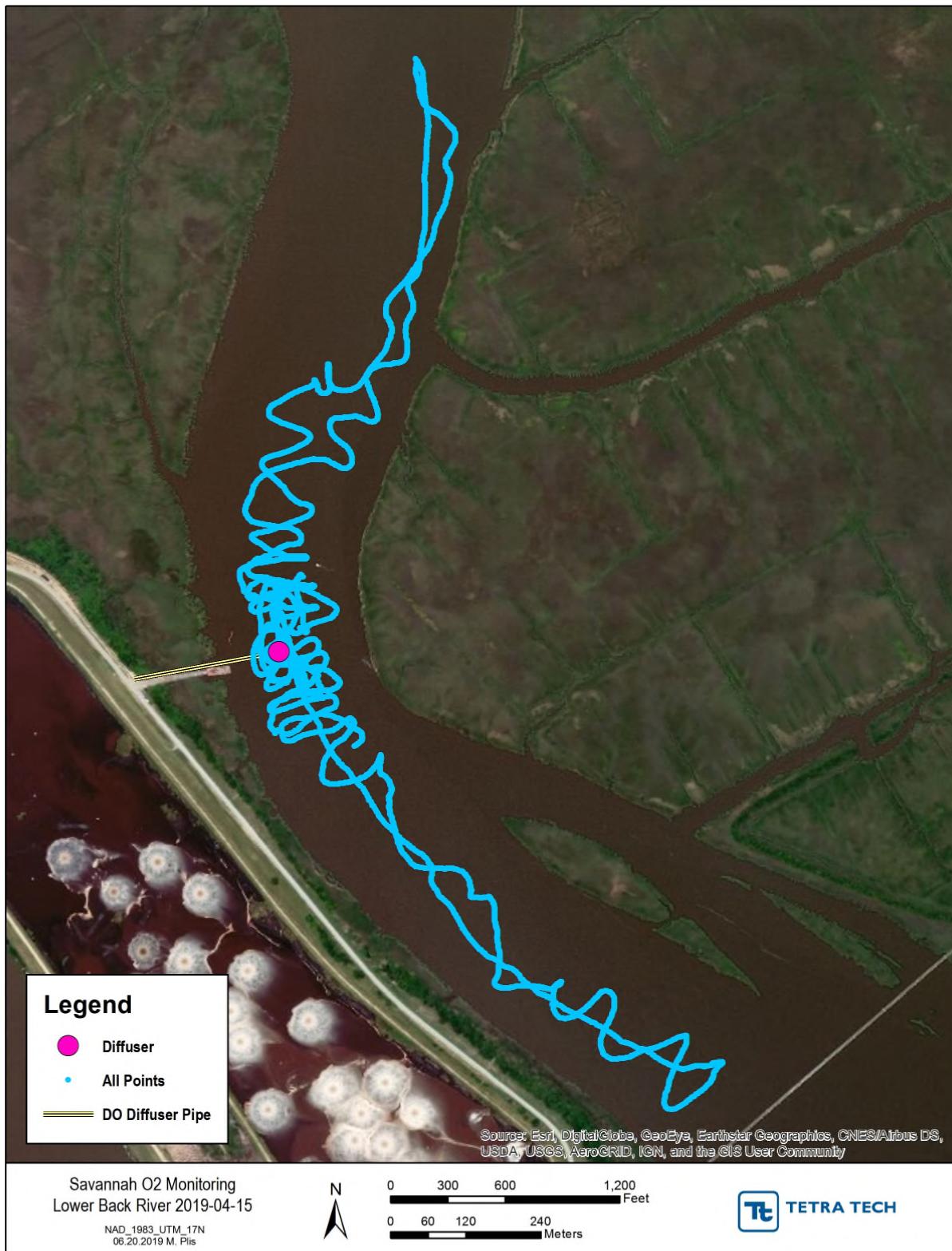
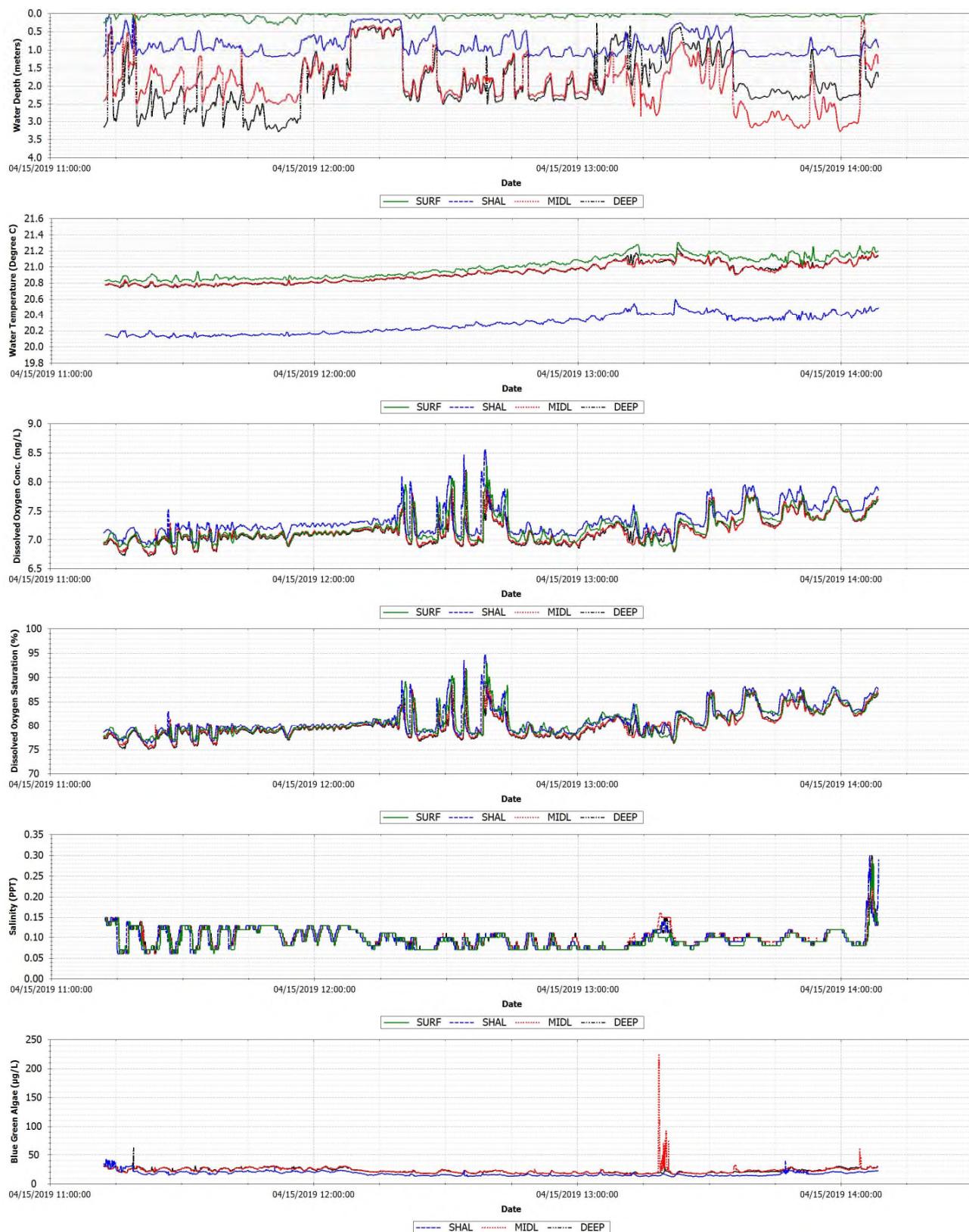


Figure D-31 Back River April 15, 2019 ebb tide drift location map

**Figure D-32** Back River April 15, 2019 ebb tide drift observations

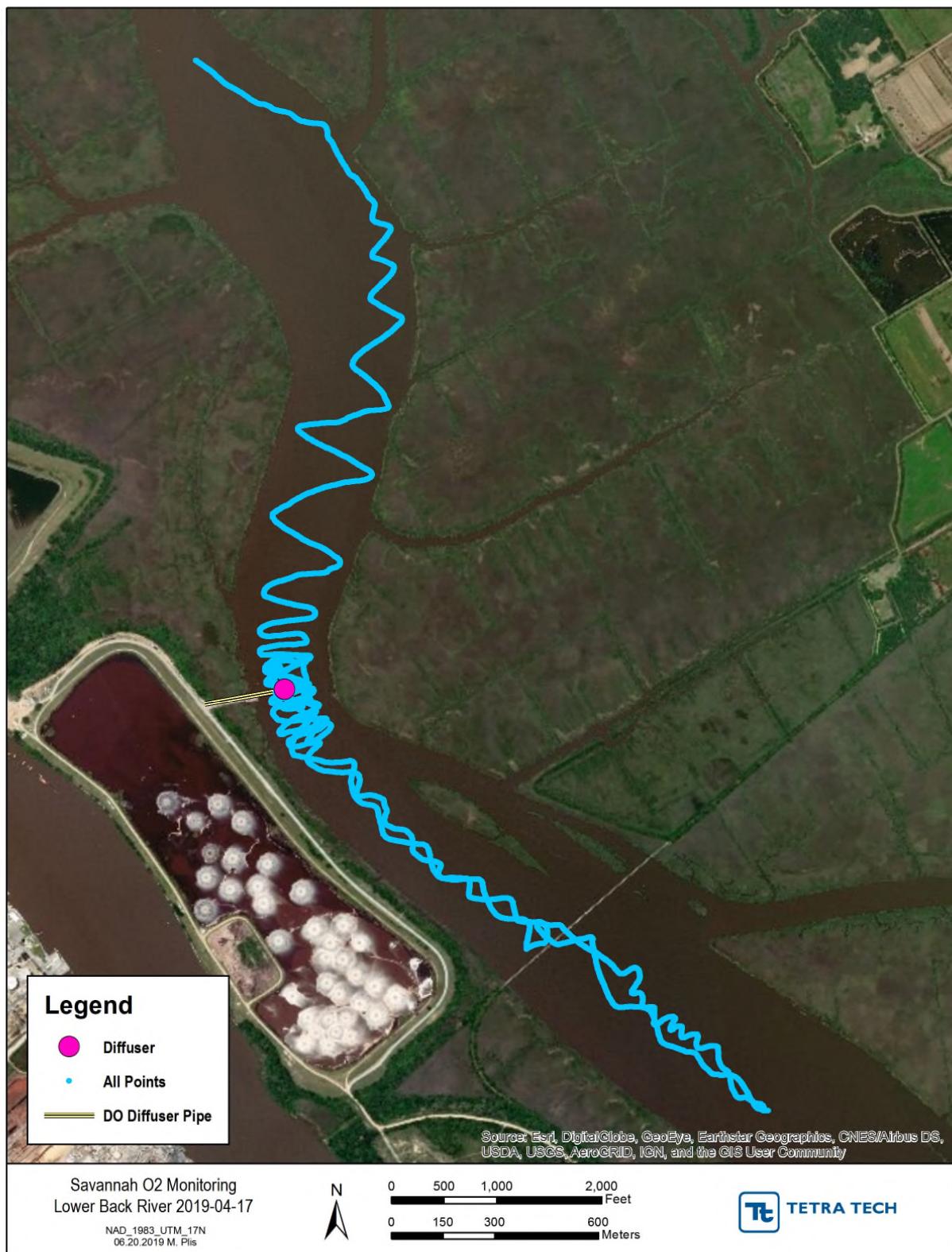


Figure D-33 Back River April 17, 2019 ebb tide drift location map

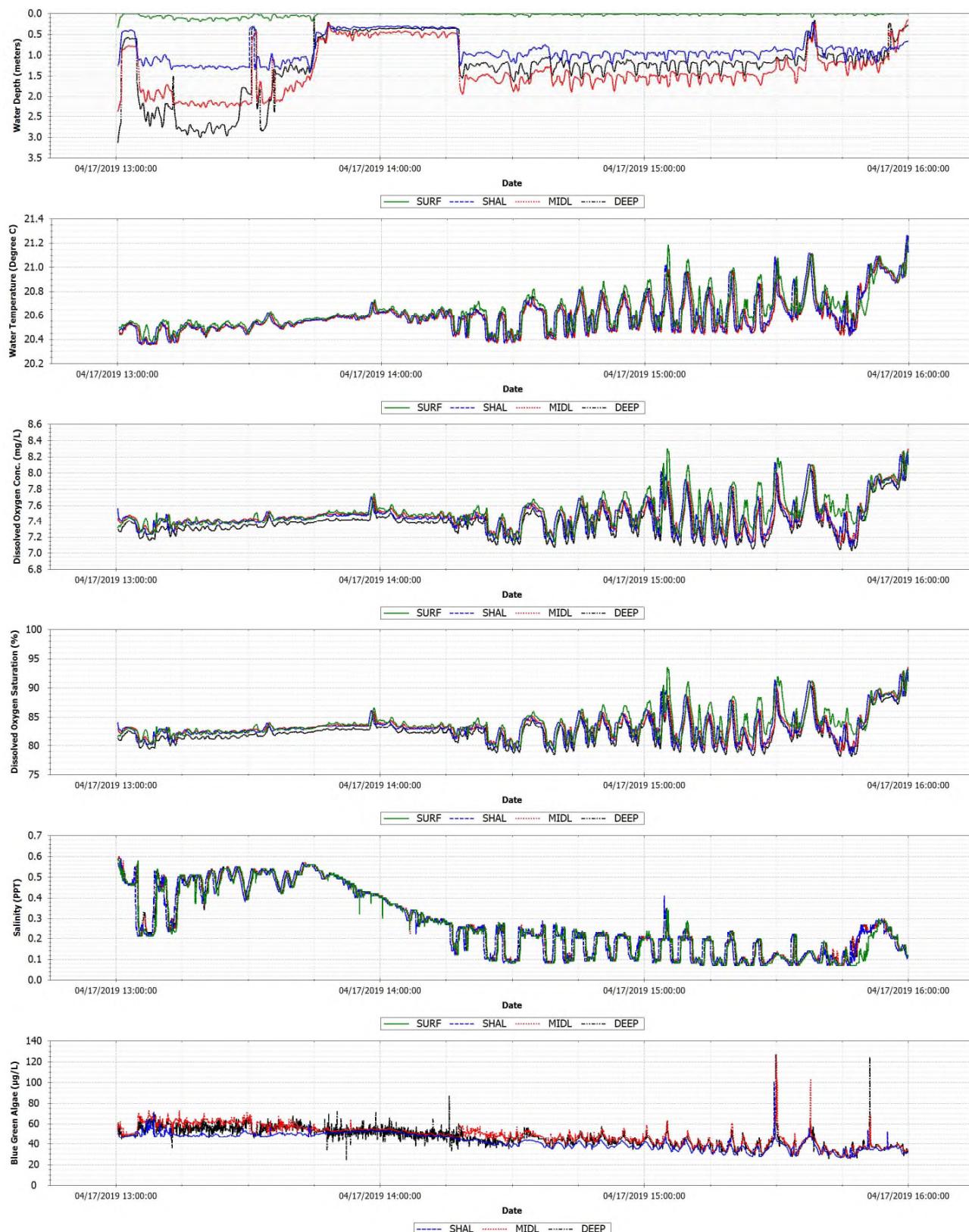
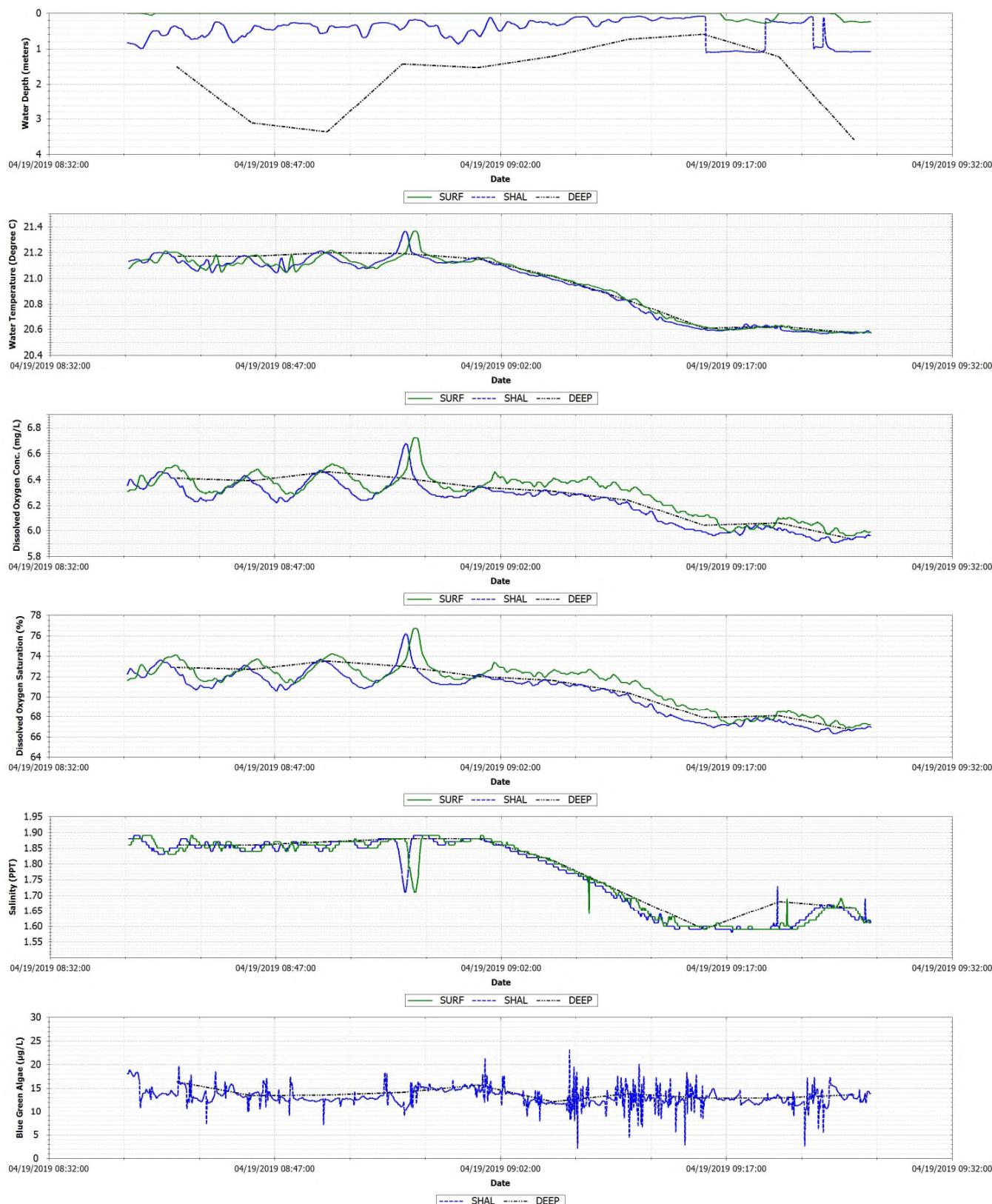
**Figure D-34** Back River April 17, 2019 ebb tide drift observations



Figure D-35 Back River April 19, 2019 flood tide drift location map

**Figure D-36** Back River April 19, 2019 flood tide drift observations

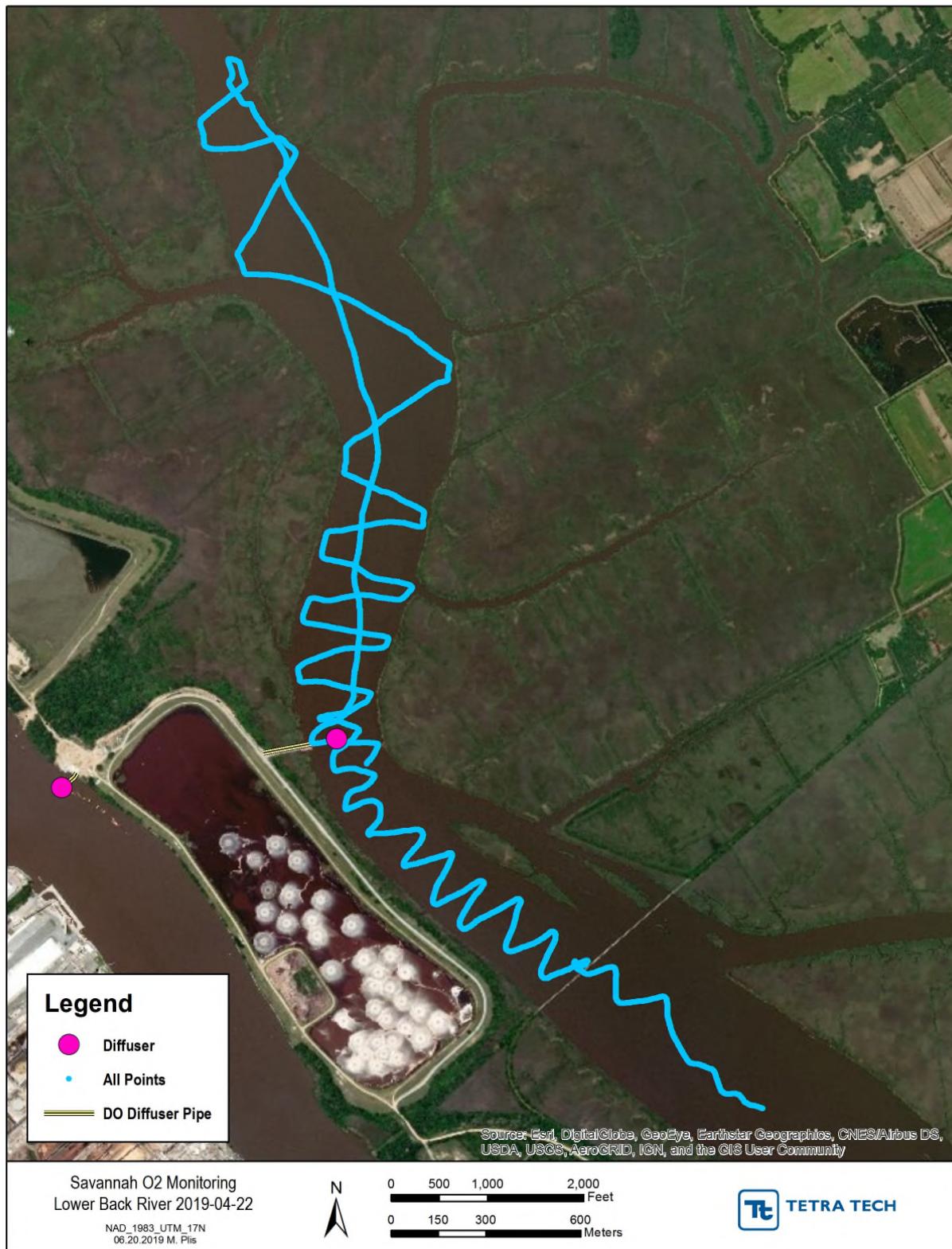
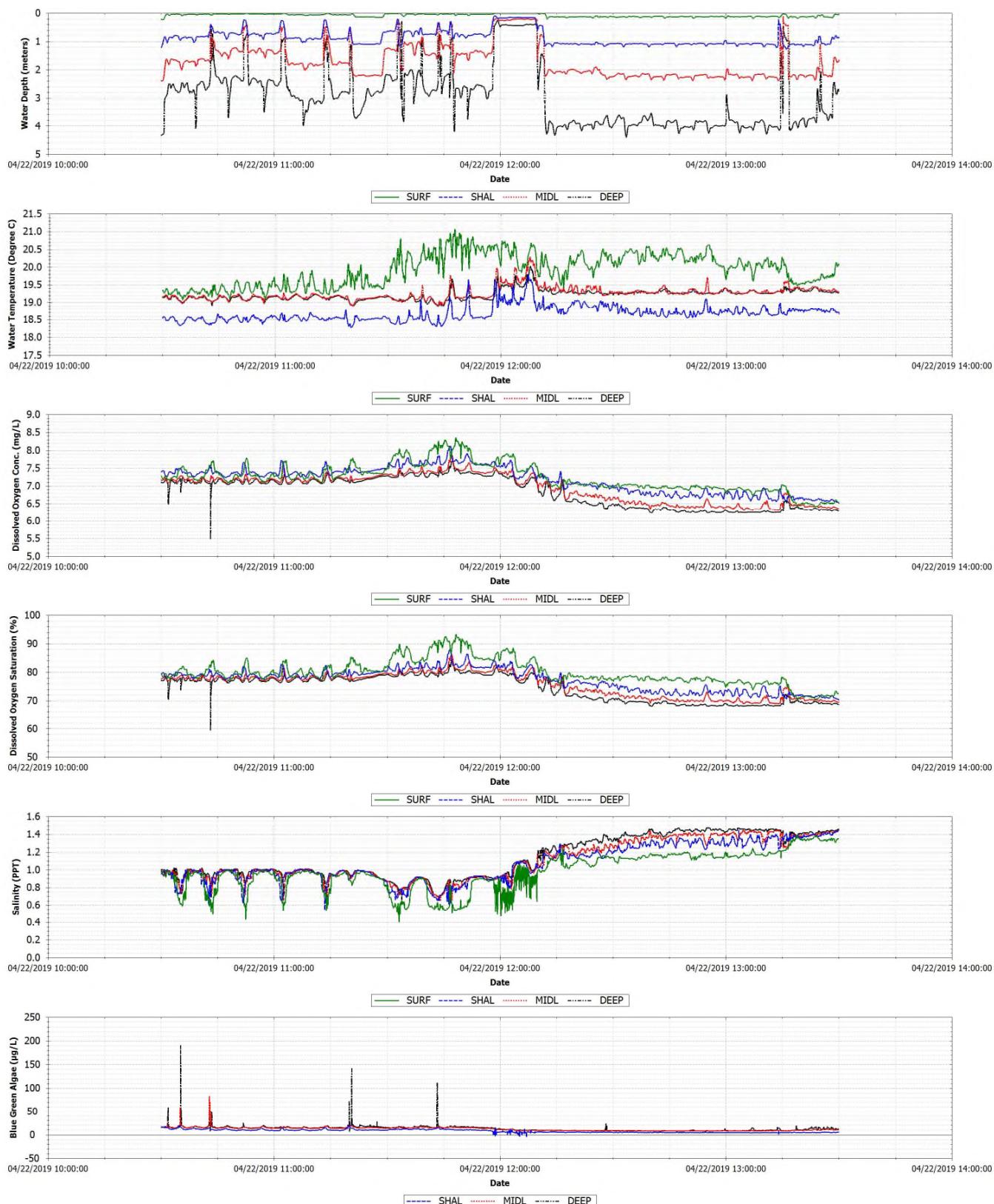


Figure D-37 Back River April 22, 2019 flood tide drift location map

**Figure D-38** Back River April 22, 2019 flood tide drift observations

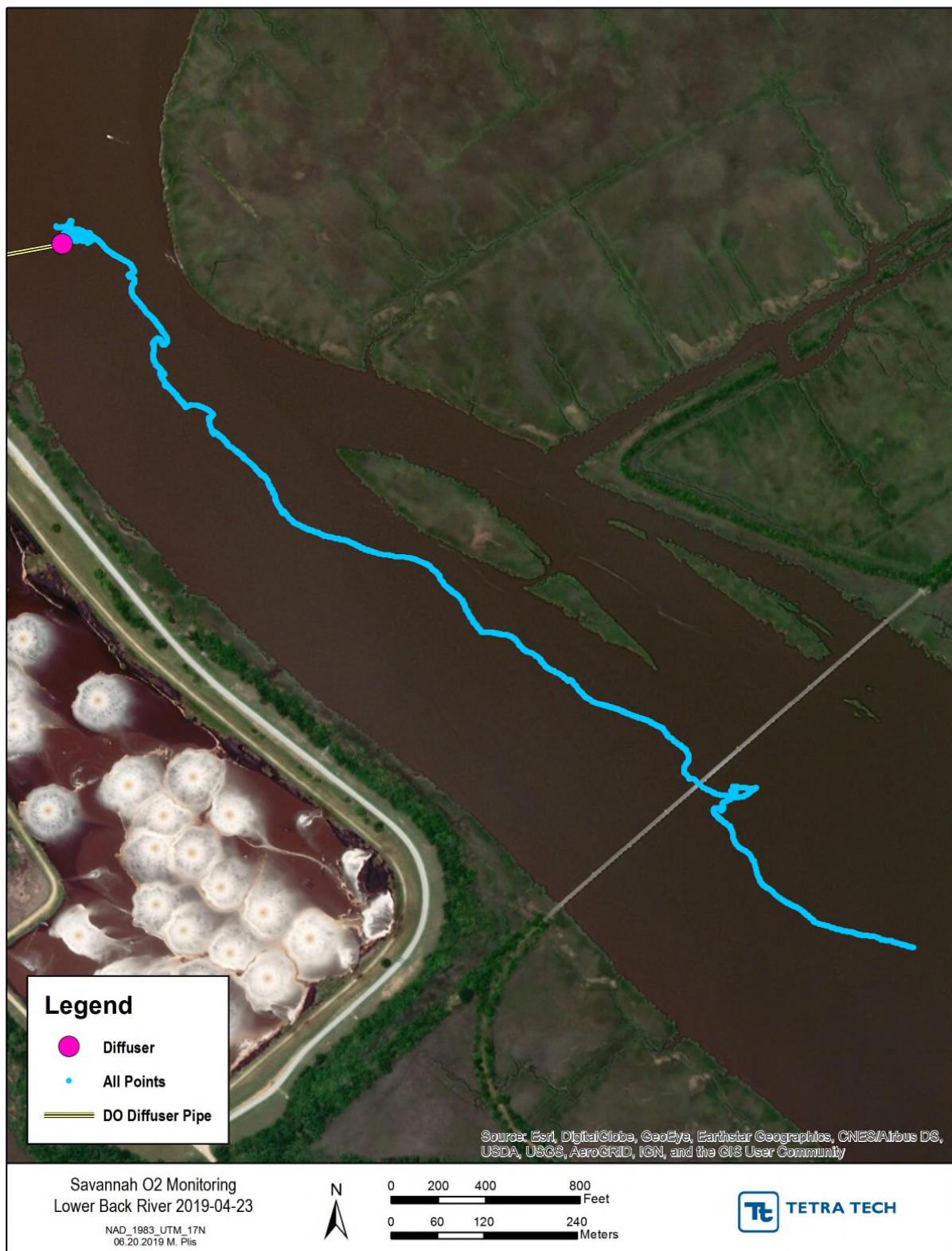


Figure D-39 Back River April 23, 2019 flood tide dye drift location map boat 1

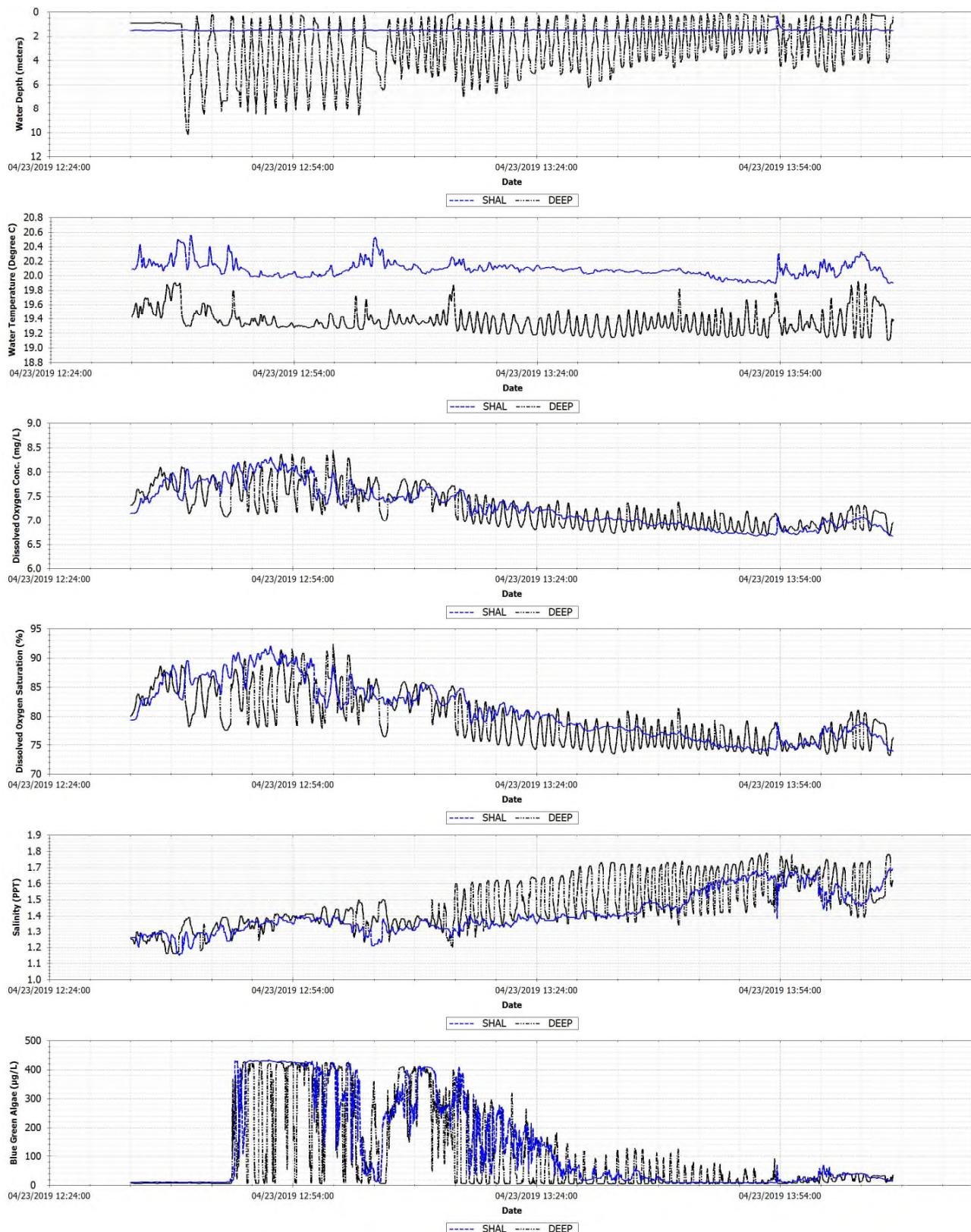


Figure D-40 Back River April 23, 2019 flood tide dye drift observations boat 1

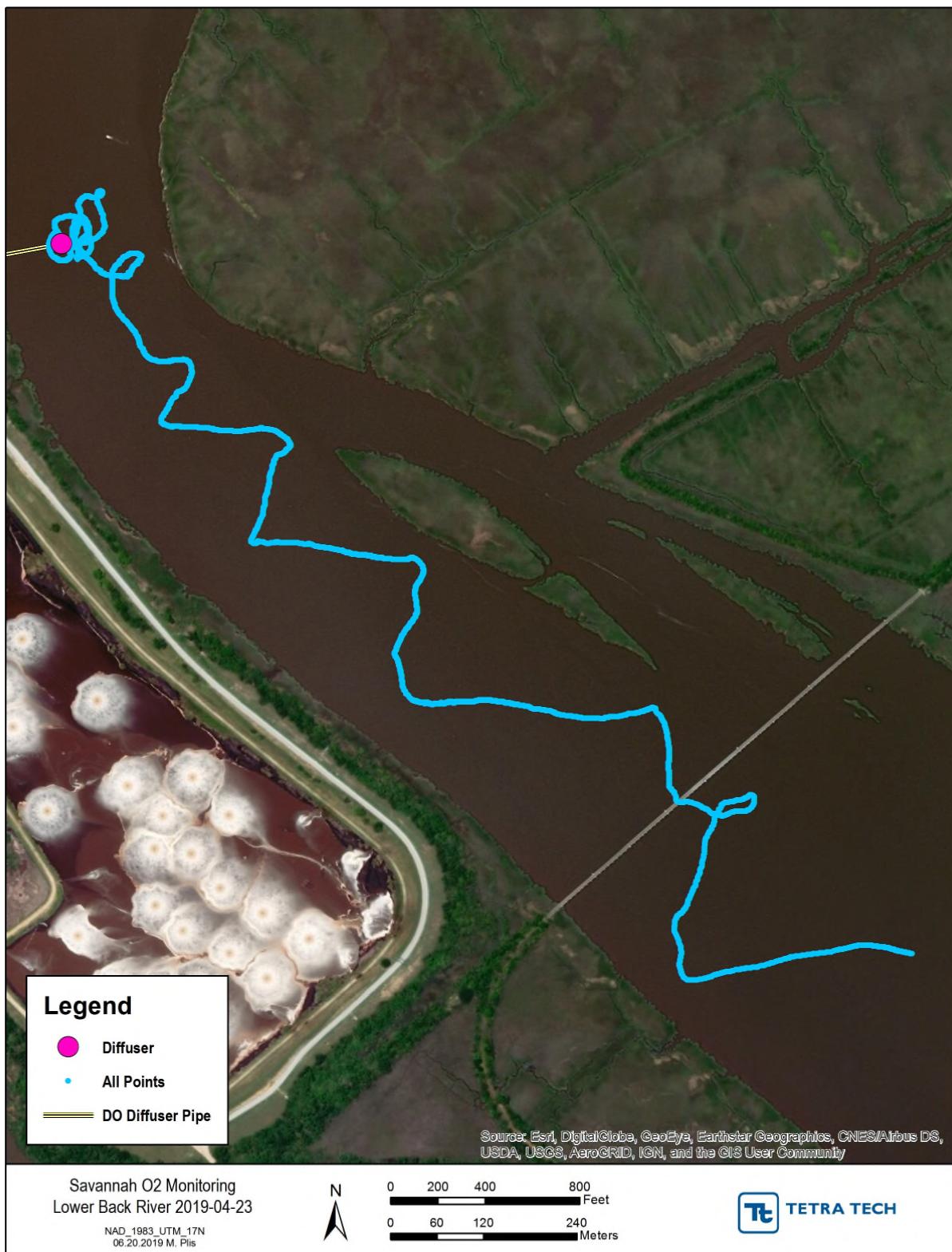


Figure D-41 Back River April 23, 2019 flood tide dye drift location map boat 2

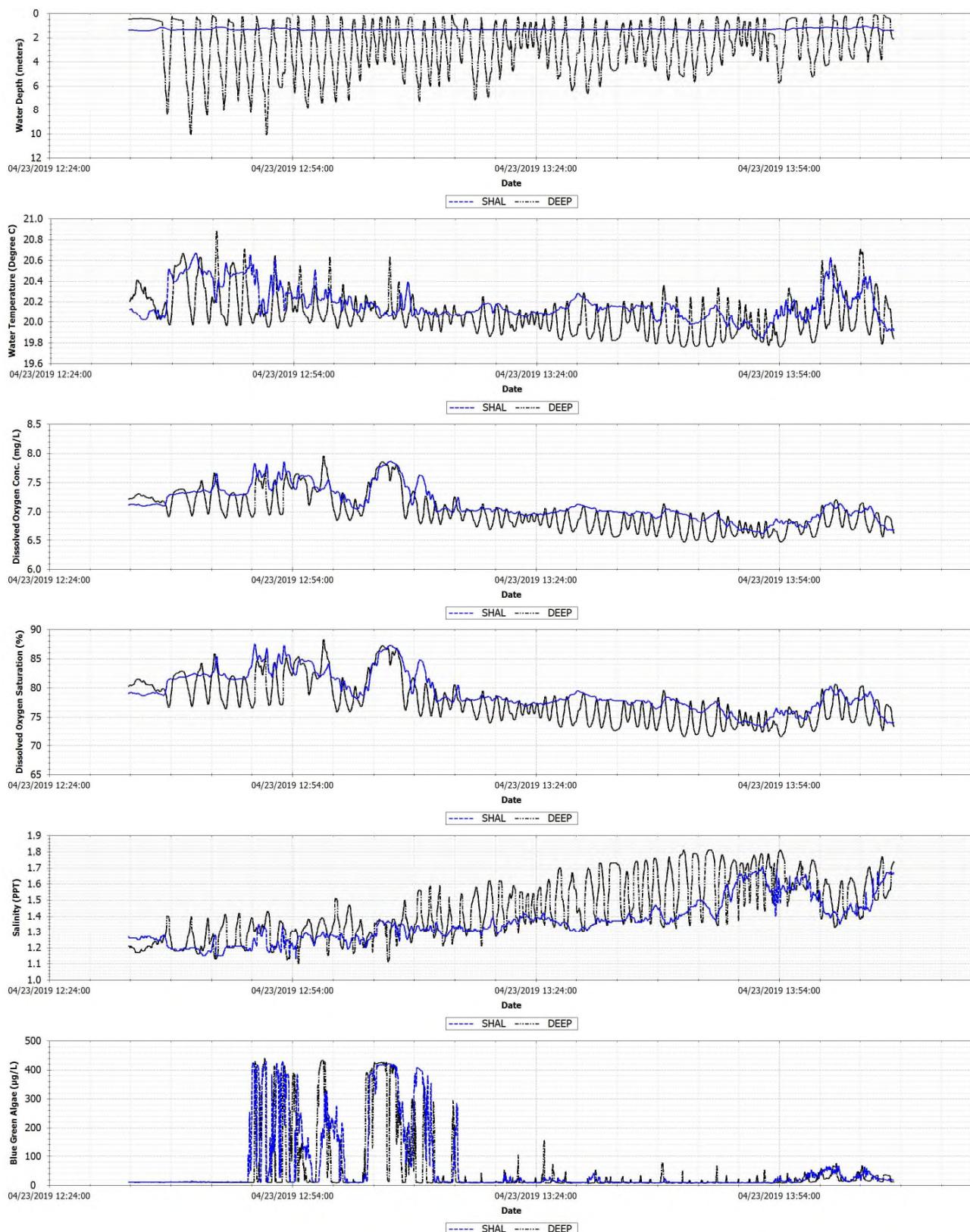


Figure D-42 Back River April 23, 2019 flood tide dye drift observations boat 2

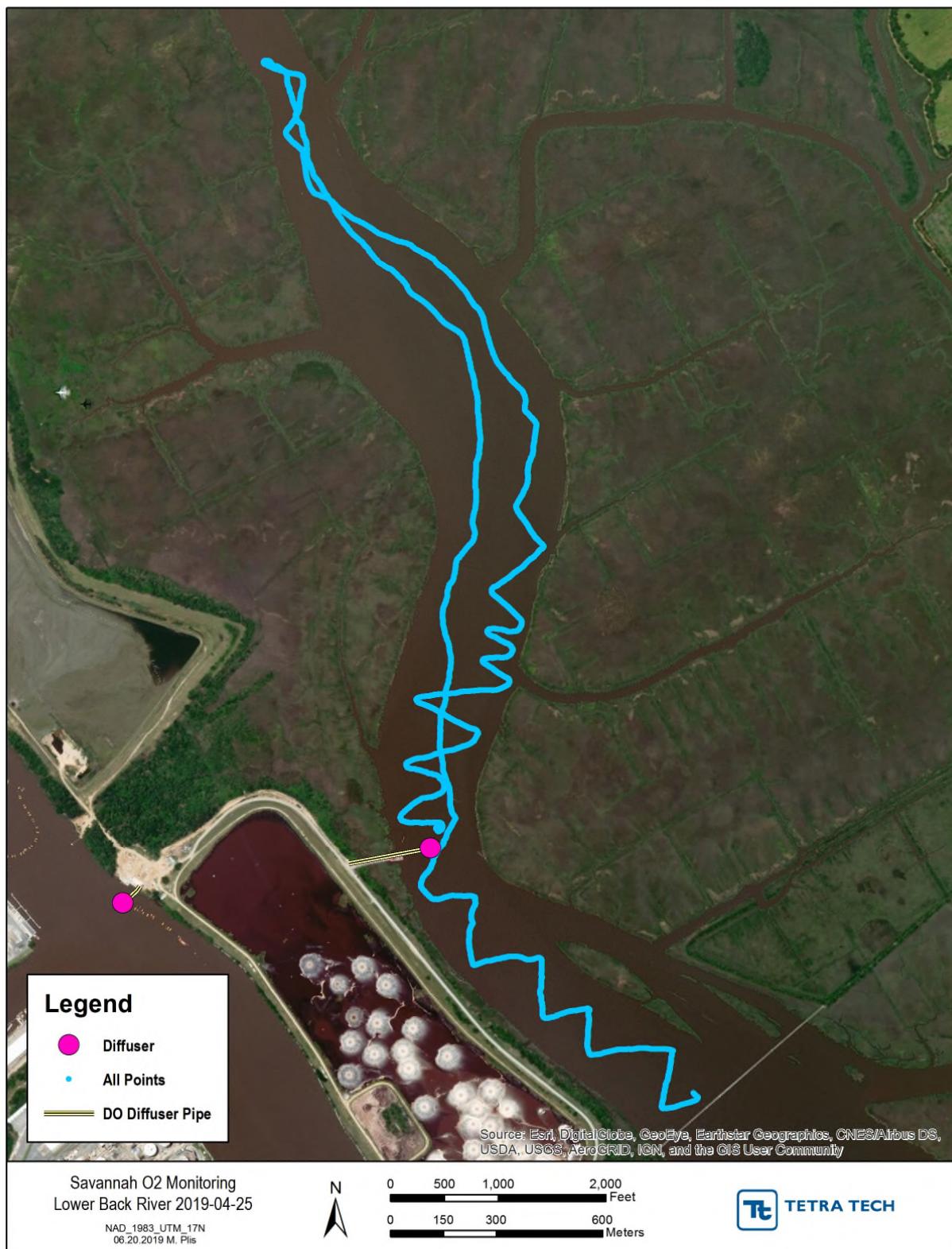
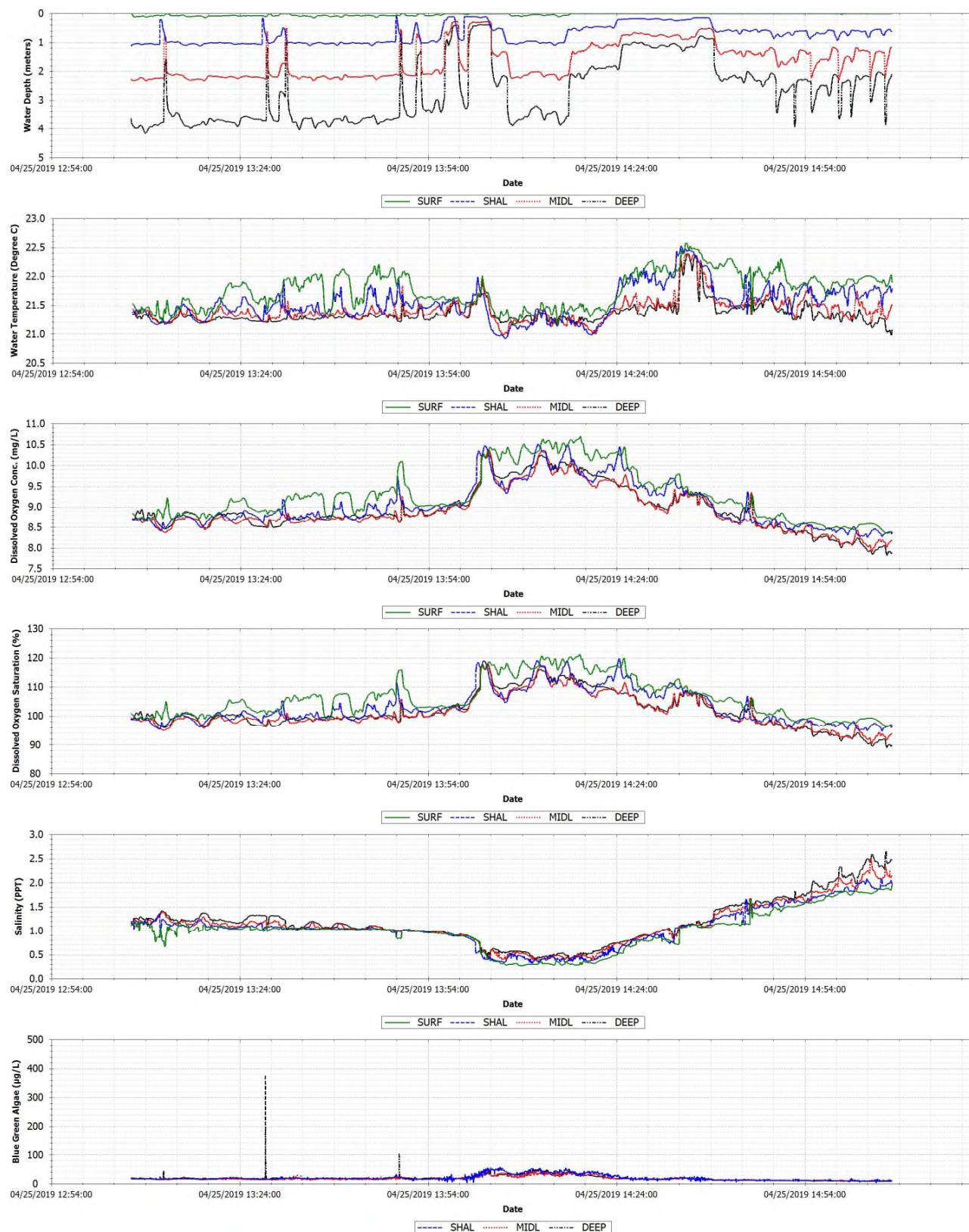


Figure D-43 Back River April 25, 2019 flood tide drift location map

**Figure D-44** Back River April 25, 2019 flood tide drift observations

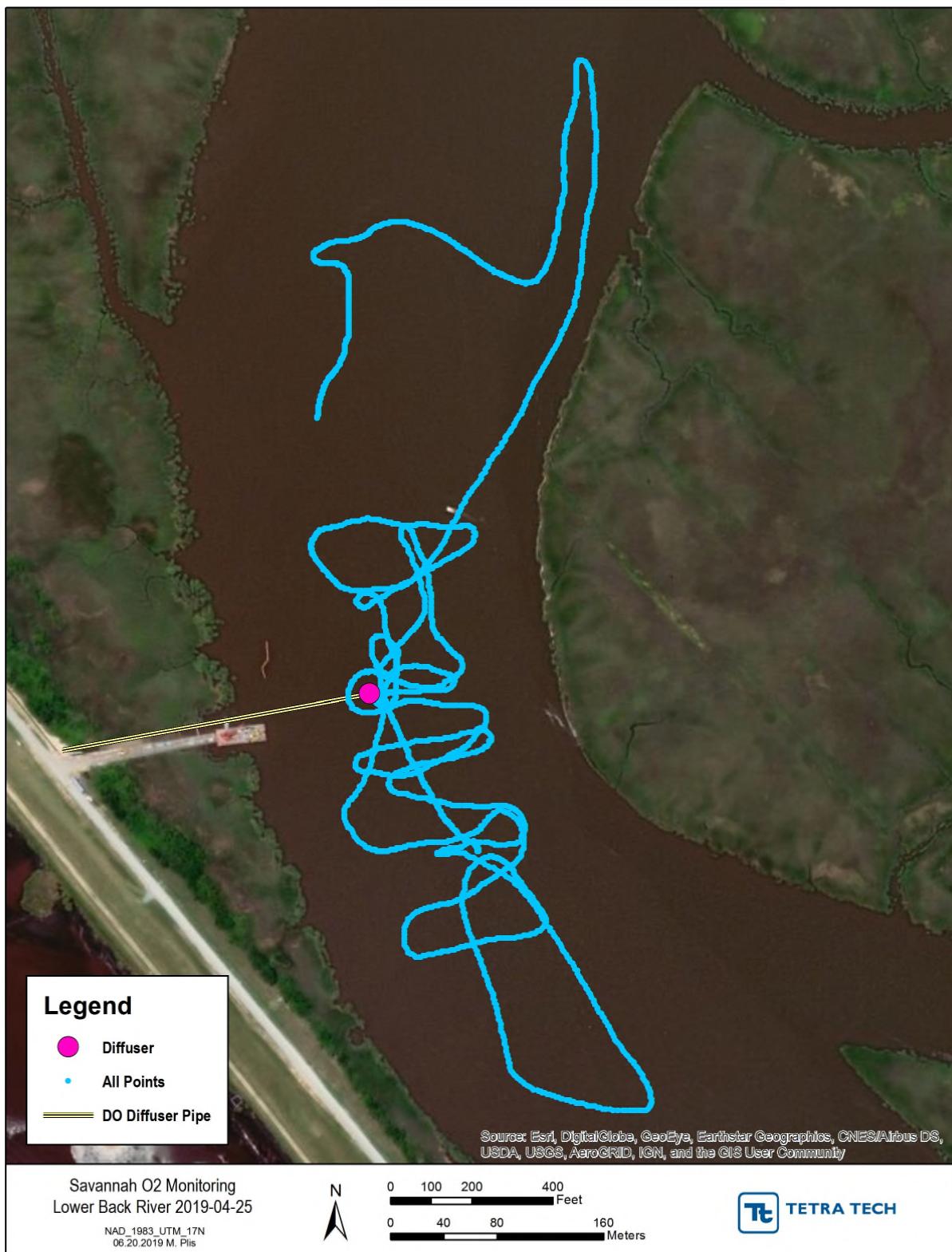
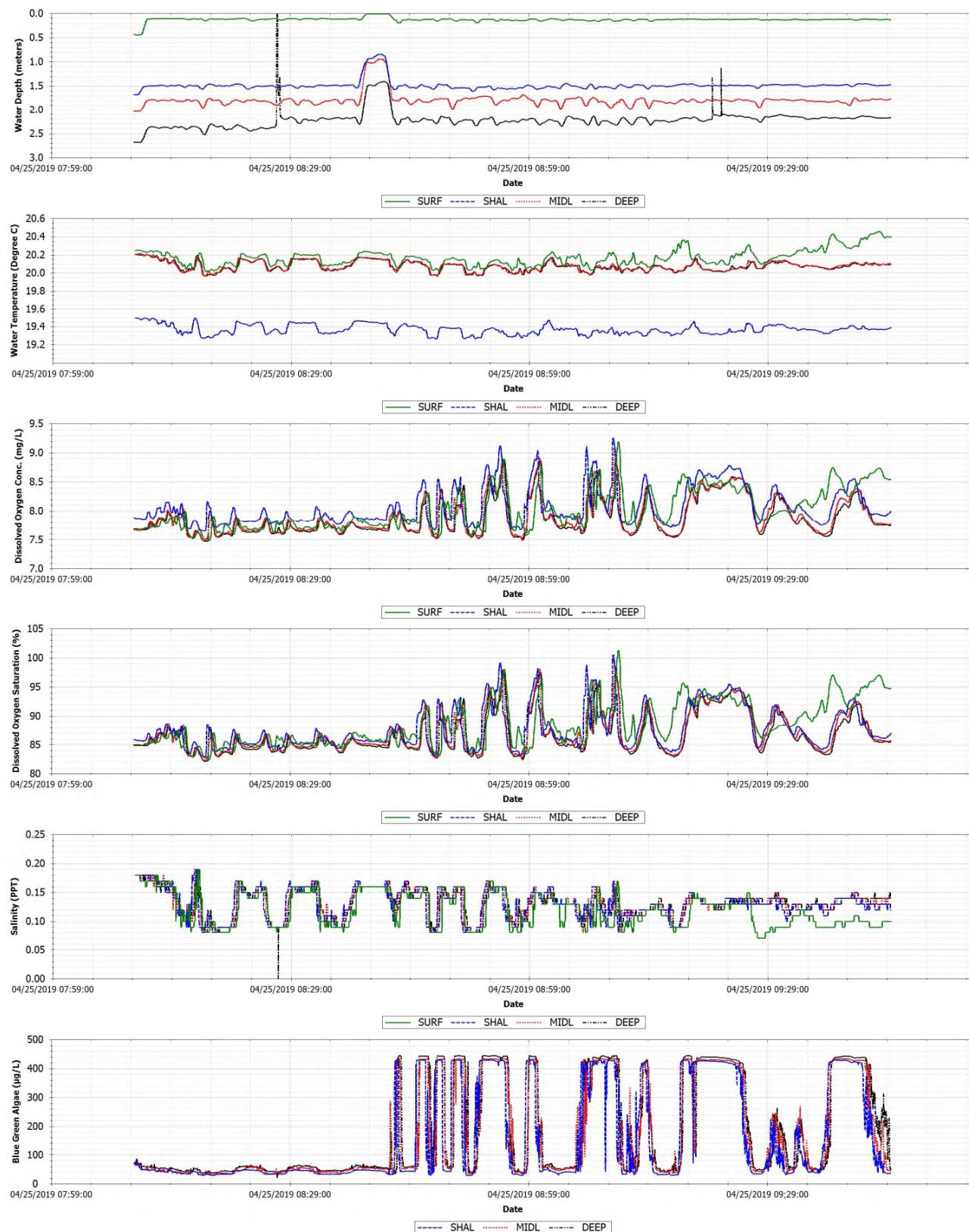


Figure D-45 Back River April 25, 2019 ebb tide drift location map

**Figure D-46** Back River April 25, 2019 ebb tide dye drift observations

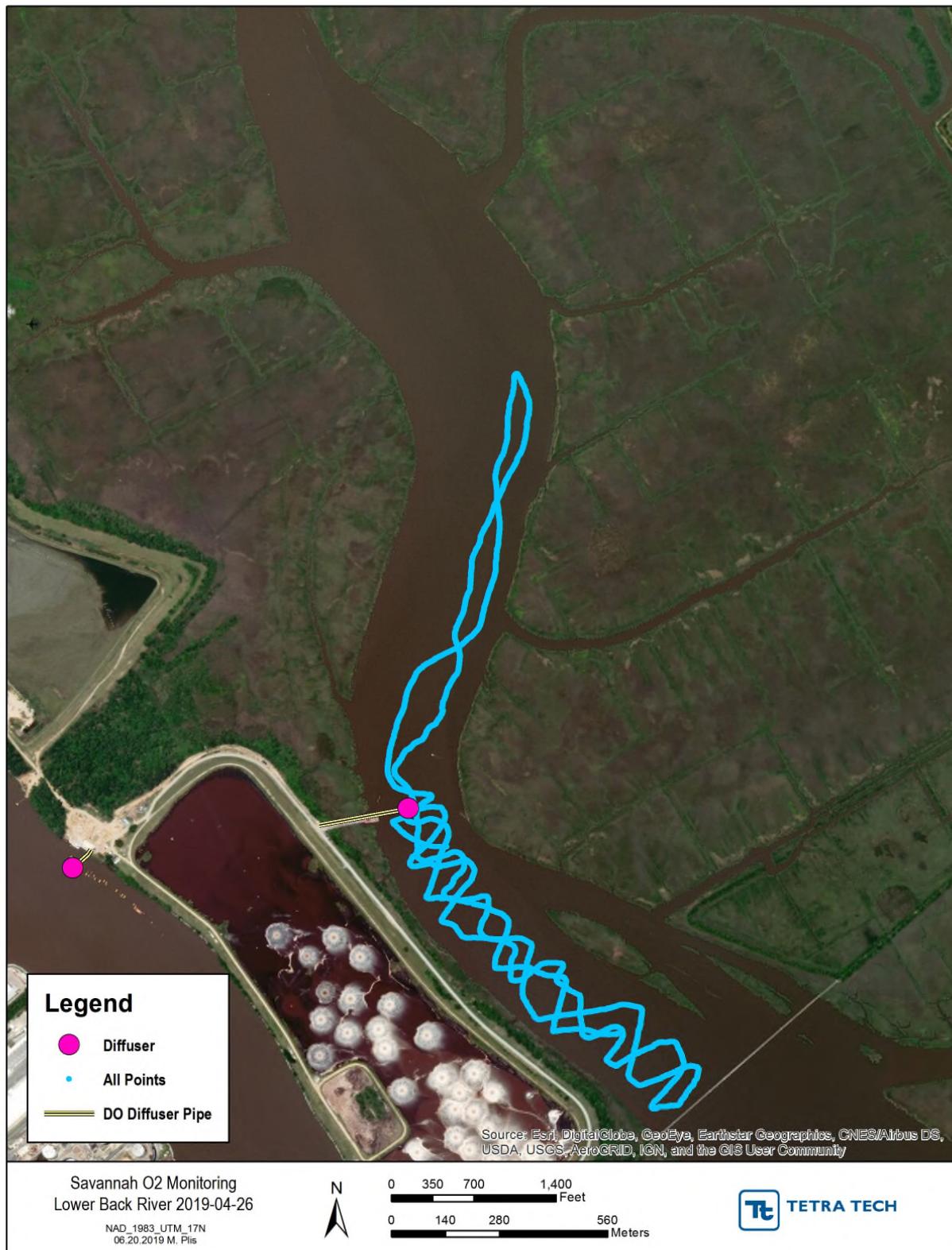
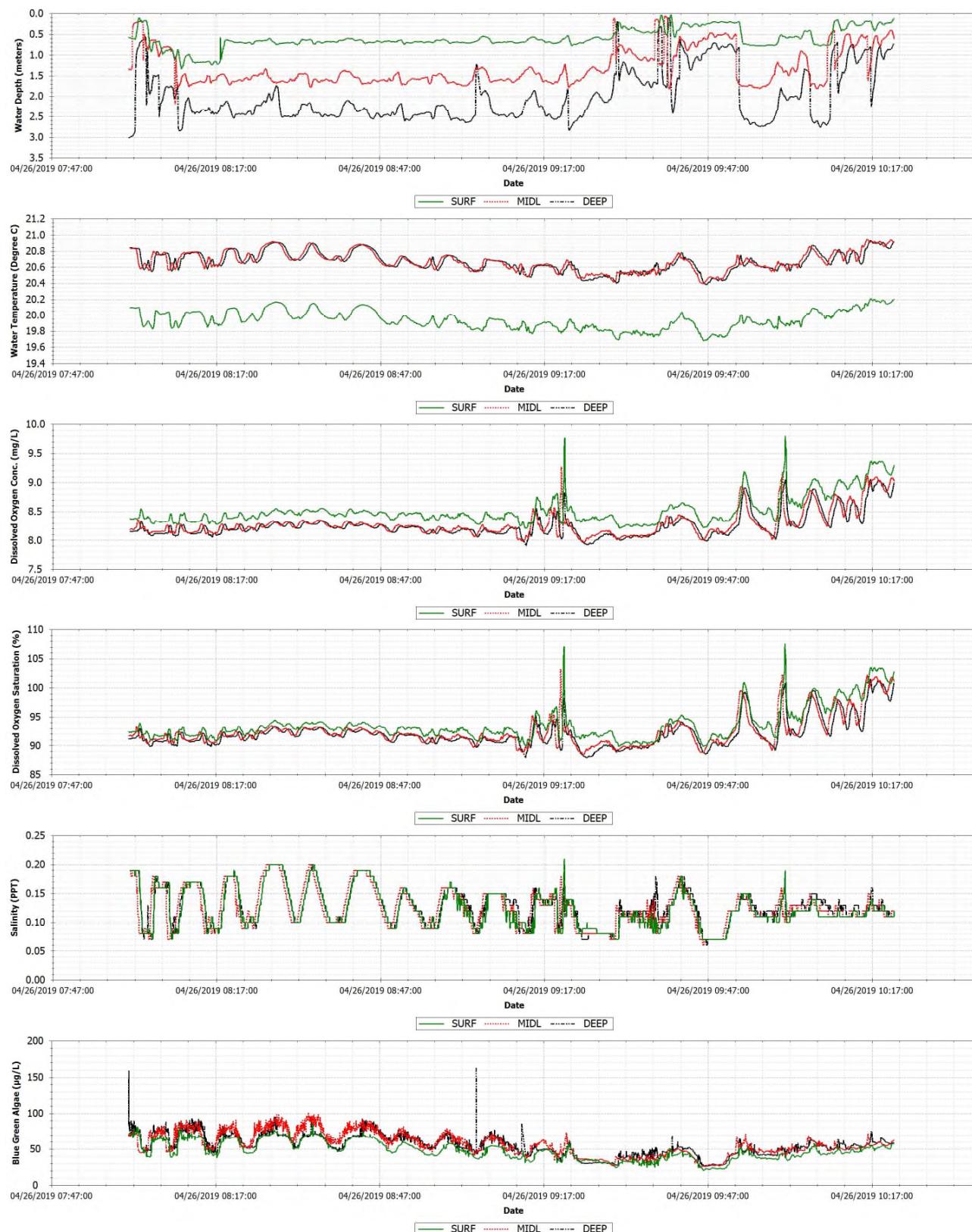


Figure D-47 Back River April 26, 2019 ebb tide drift location map boat 1

**Figure D-48** Back River April 26, 2019 ebb tide drift observations boat 1

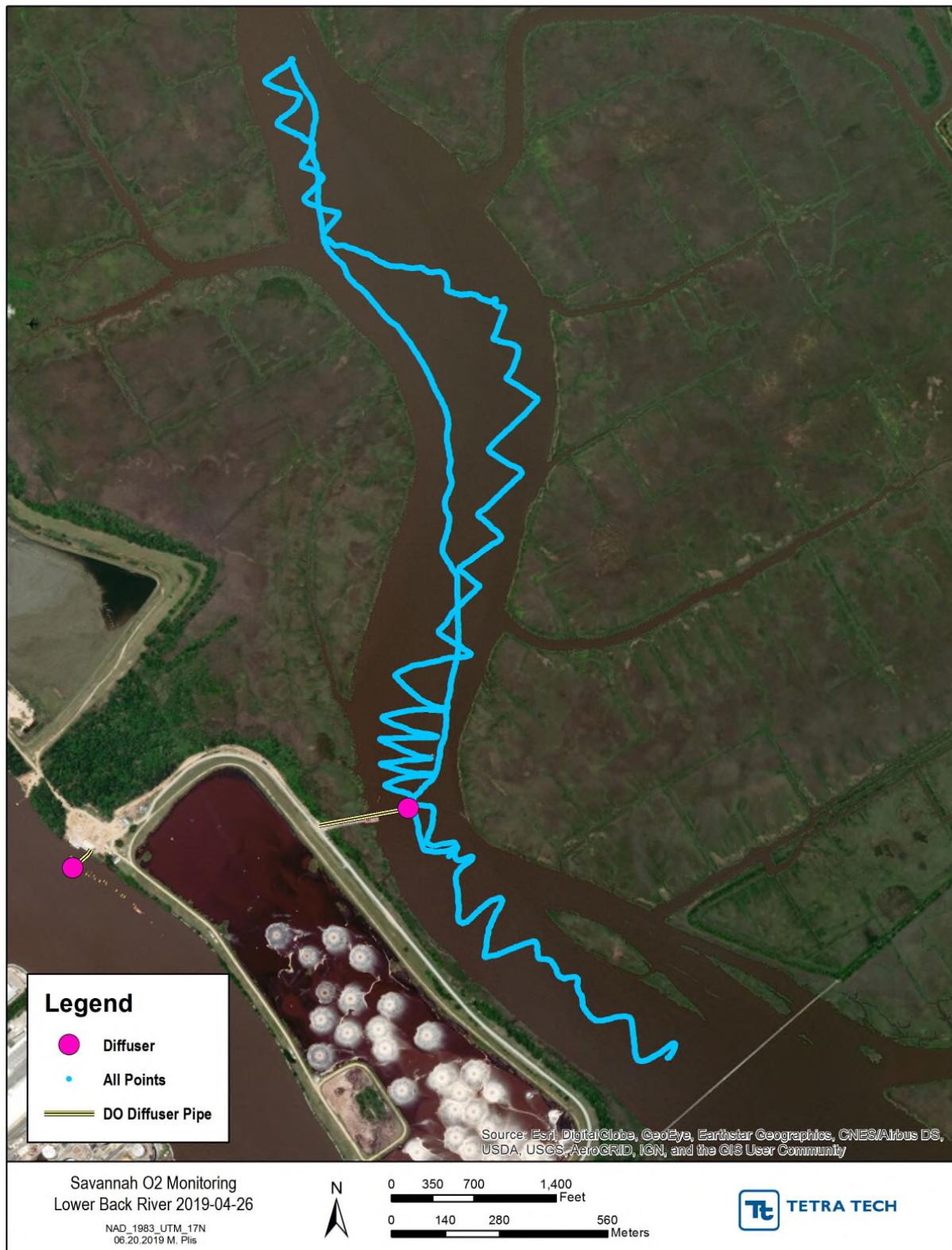
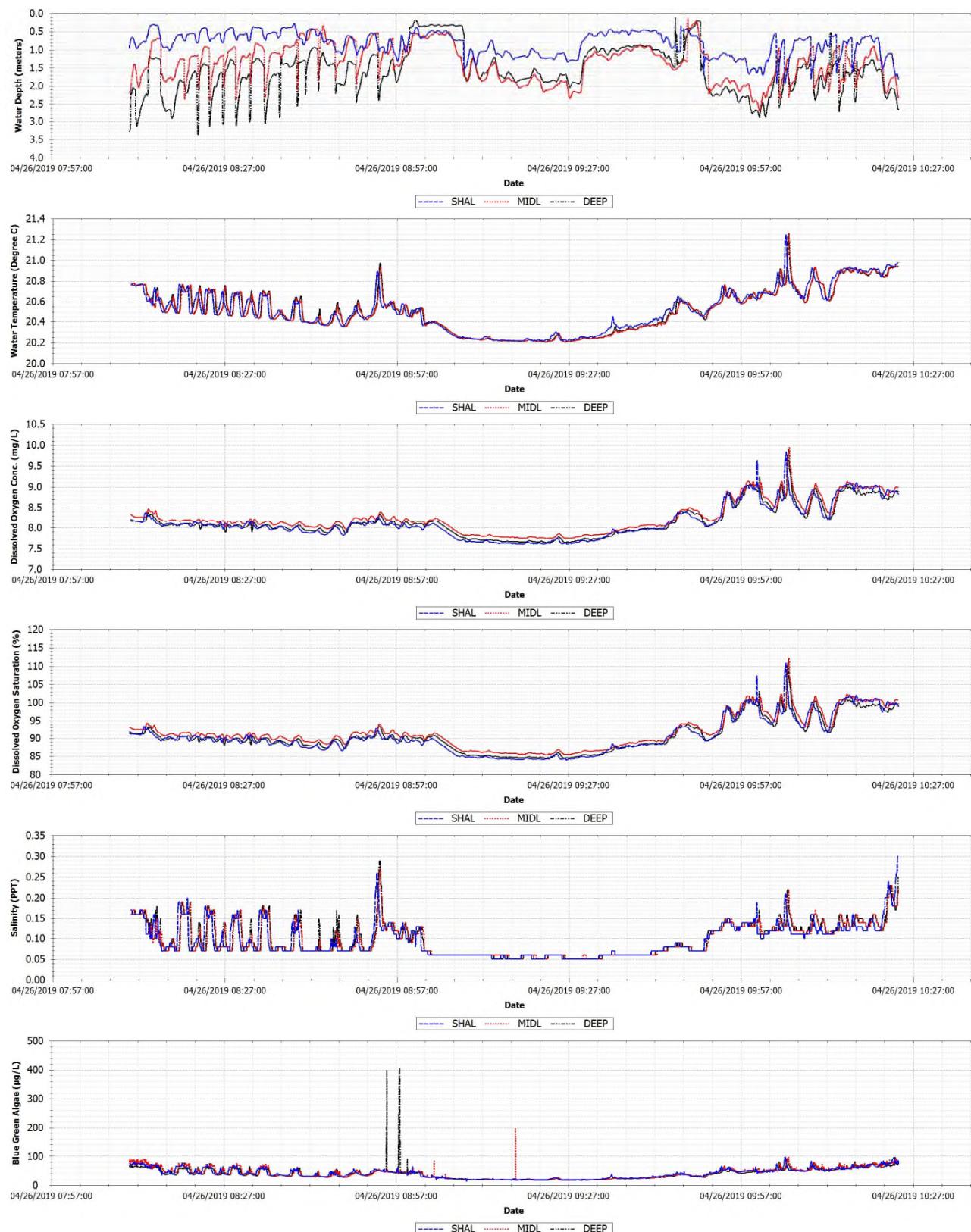


Figure D-49 Back River April 26, 2019 ebb tide drift location map boat 2

**Figure D-50** Back River April 26, 2019 ebb tide drift observations boat 2

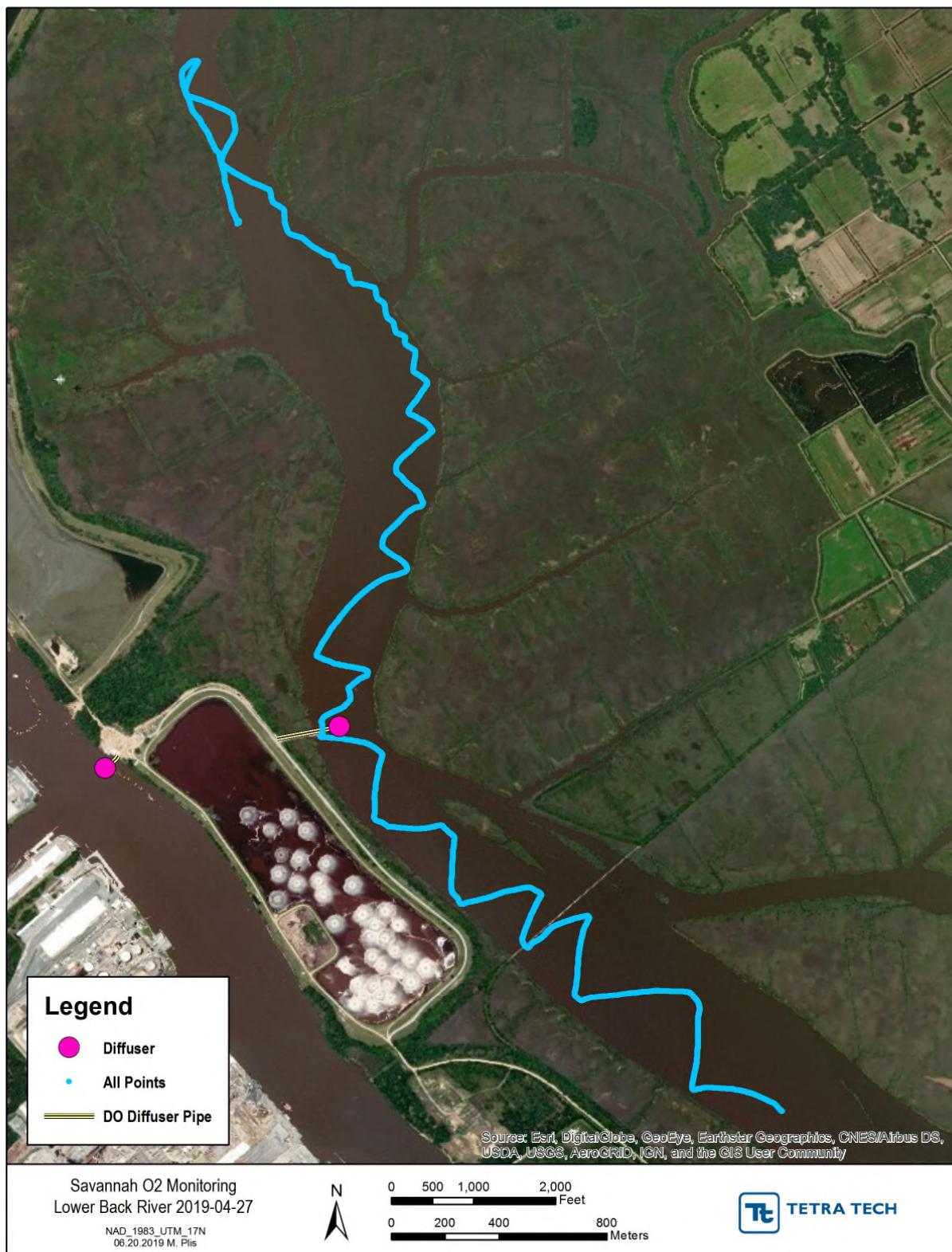


Figure D-51 Back River April 27, 2019 flood tide drift location map

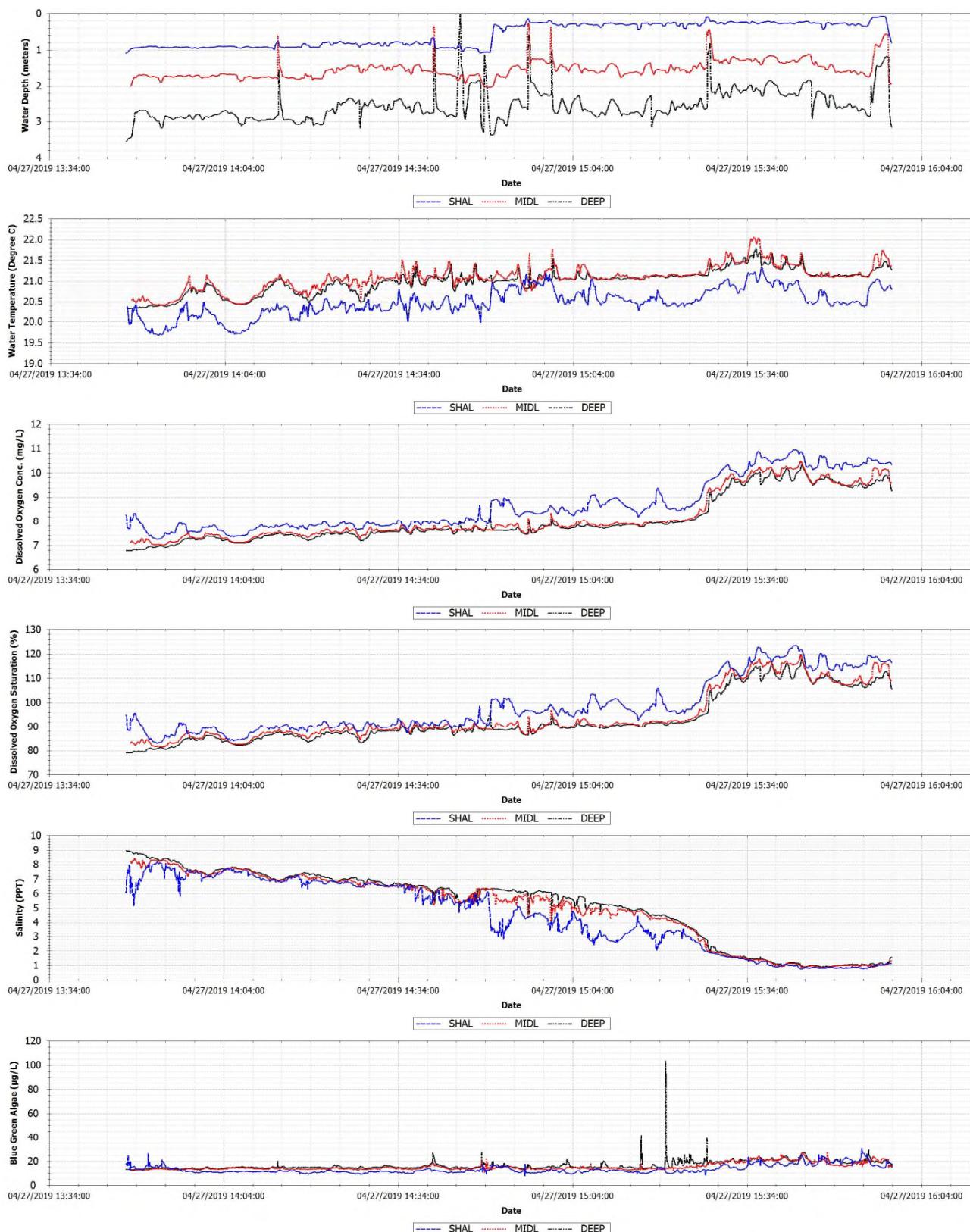
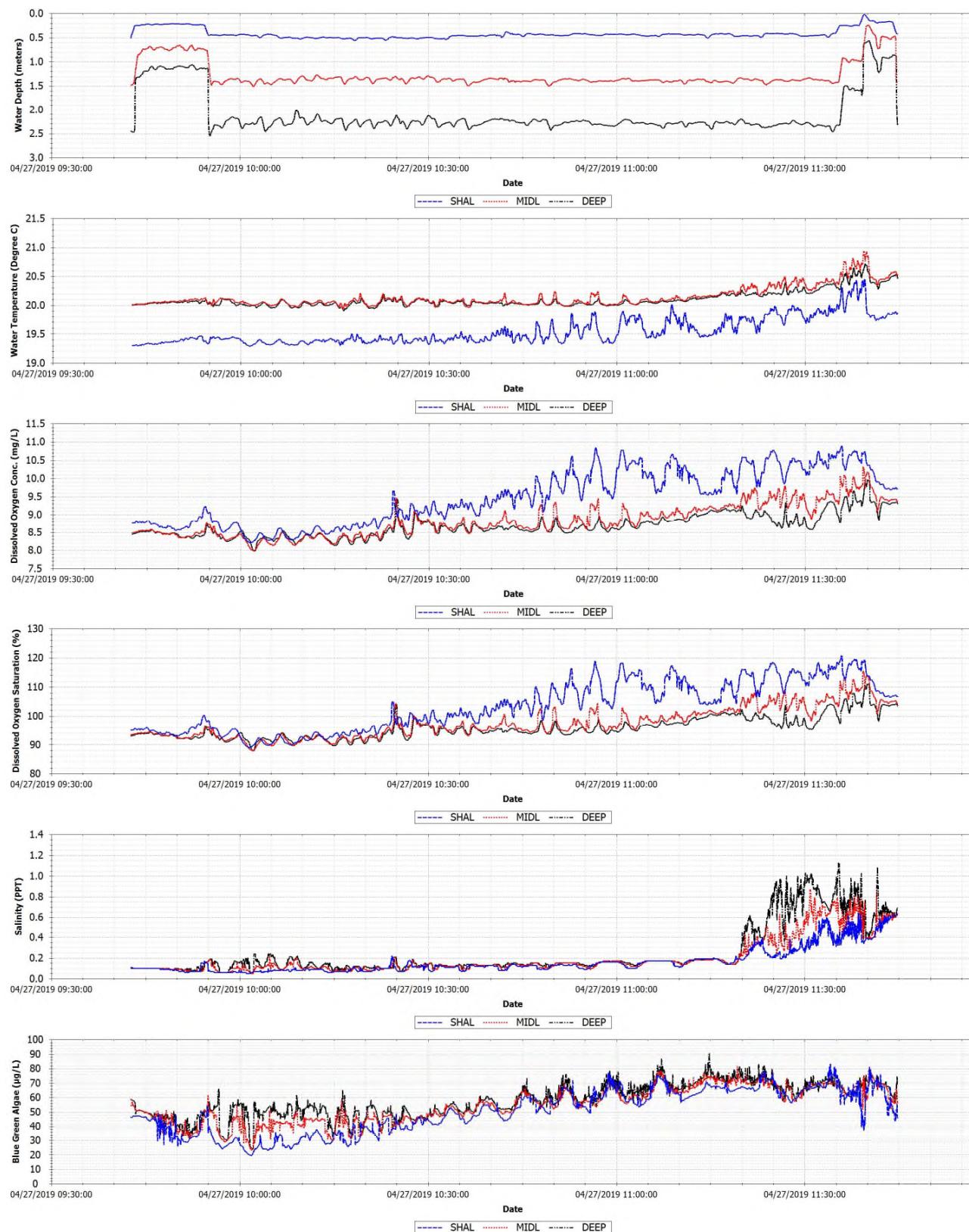
**Figure D-52** Back River April 27, 2019 flood tide drift observations



Figure D-53 Back River April 27, 2019 ebb tide drift location map

**Figure D-54** Back River April 27, 2019 ebb tide drift observations

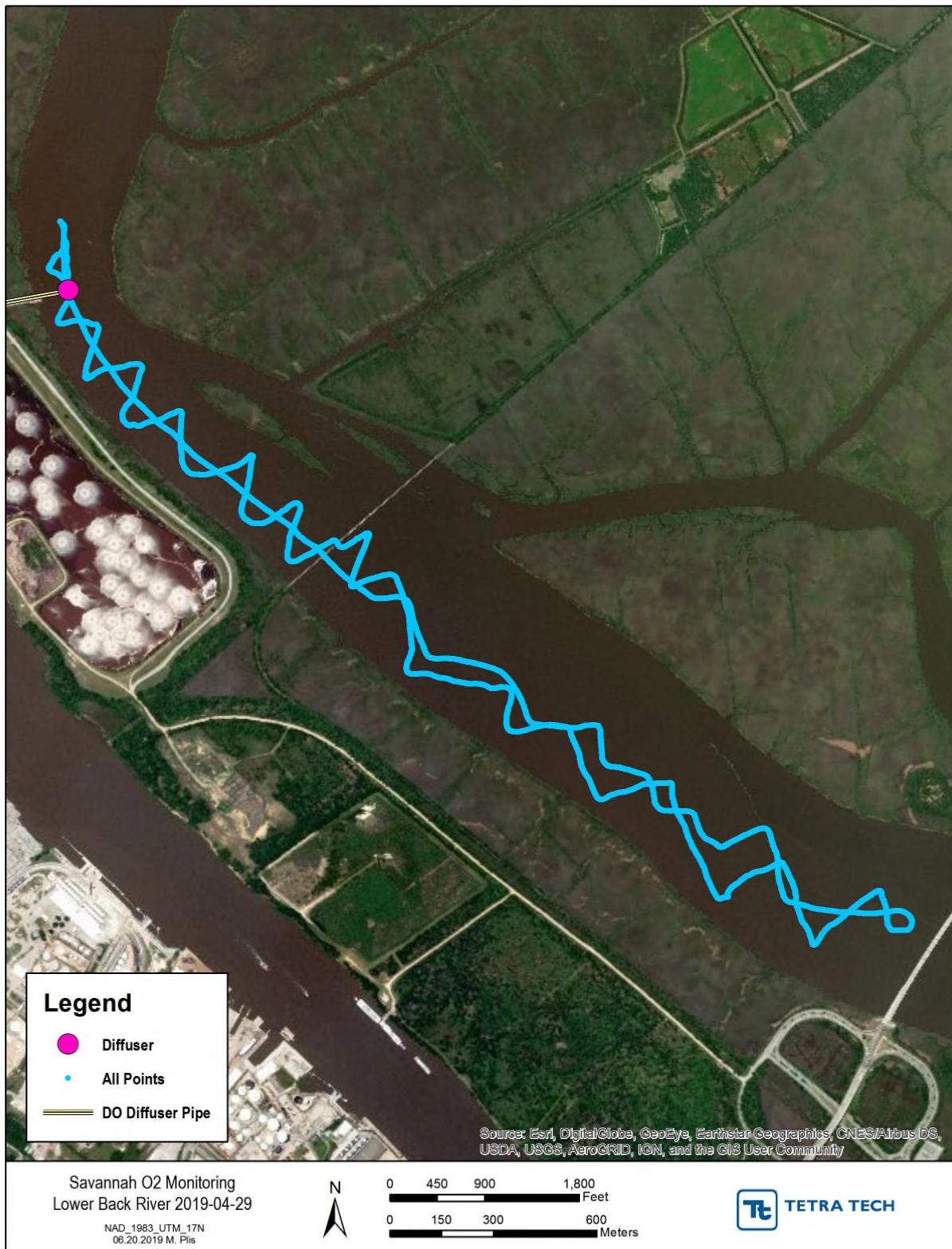


Figure D-55 Back River April 29, 2019 ebb tide drift location map

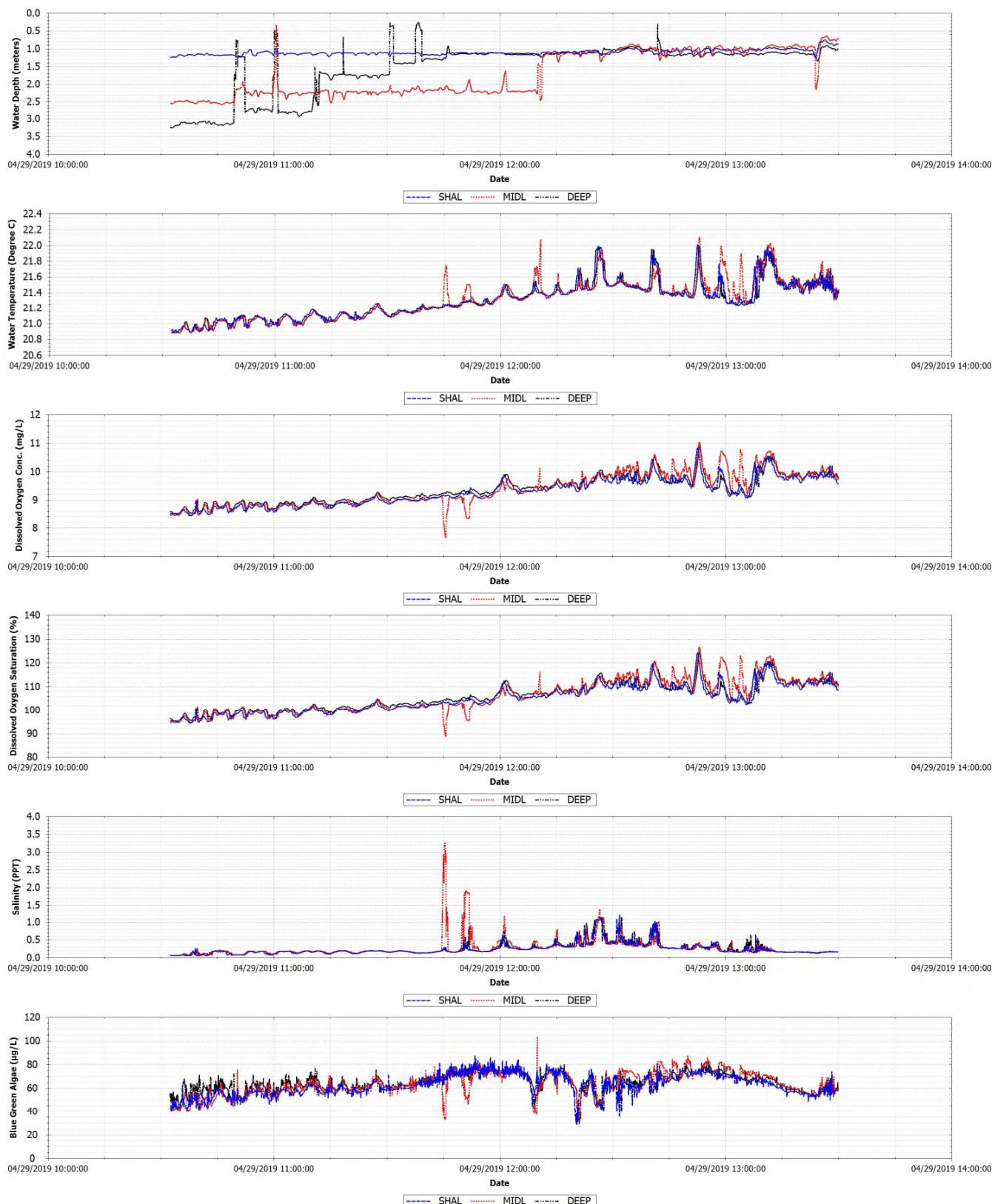
**Figure D-56** Back River April 29, 2019 ebb tide drift observations



Figure D-57 Back River May 1, 2019 ebb tide drift location map

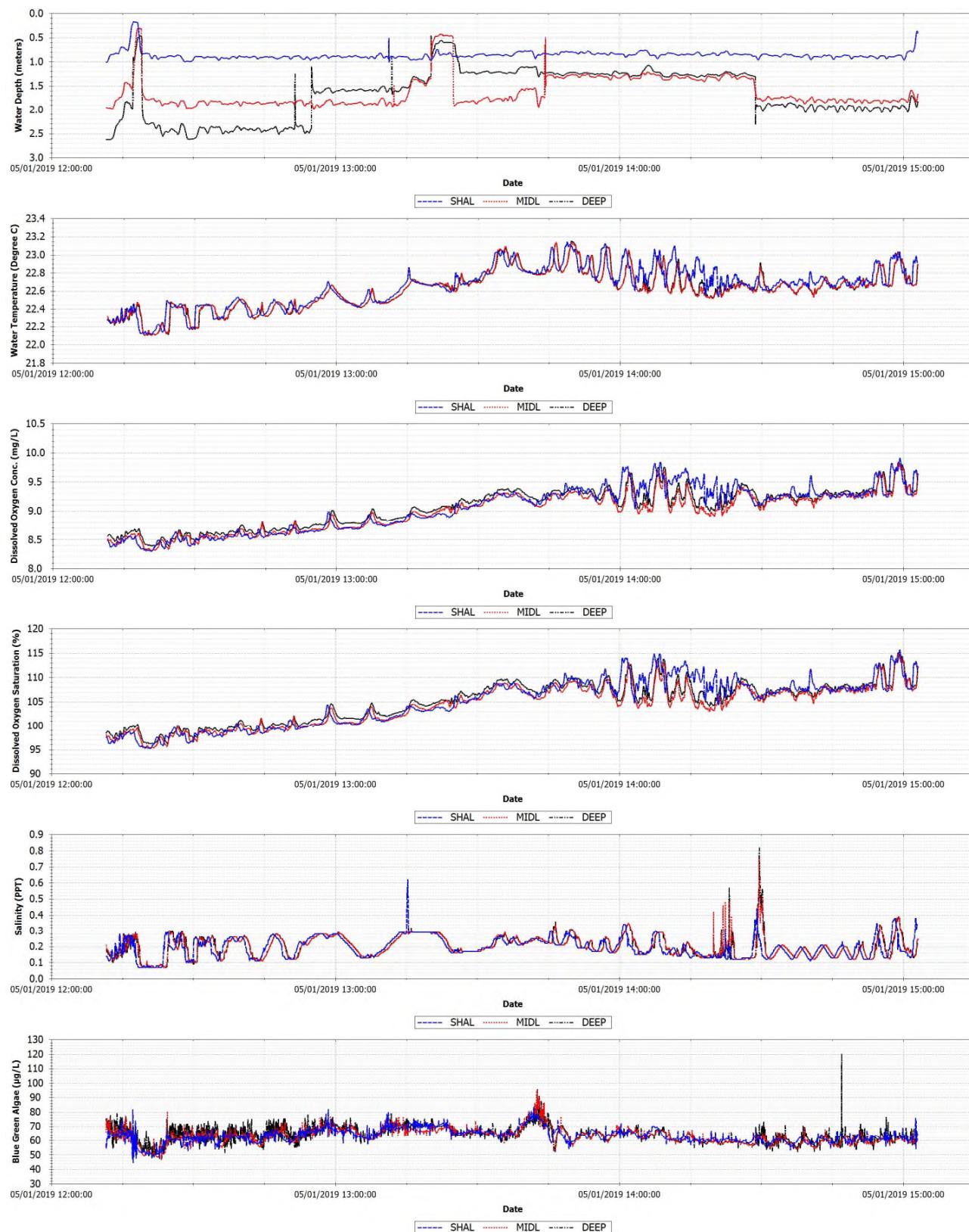
**Figure D-58** Back River May 1, 2019 ebb tide drift observations



Figure D-59 Back River May 3, 2019 flood tide drift location map

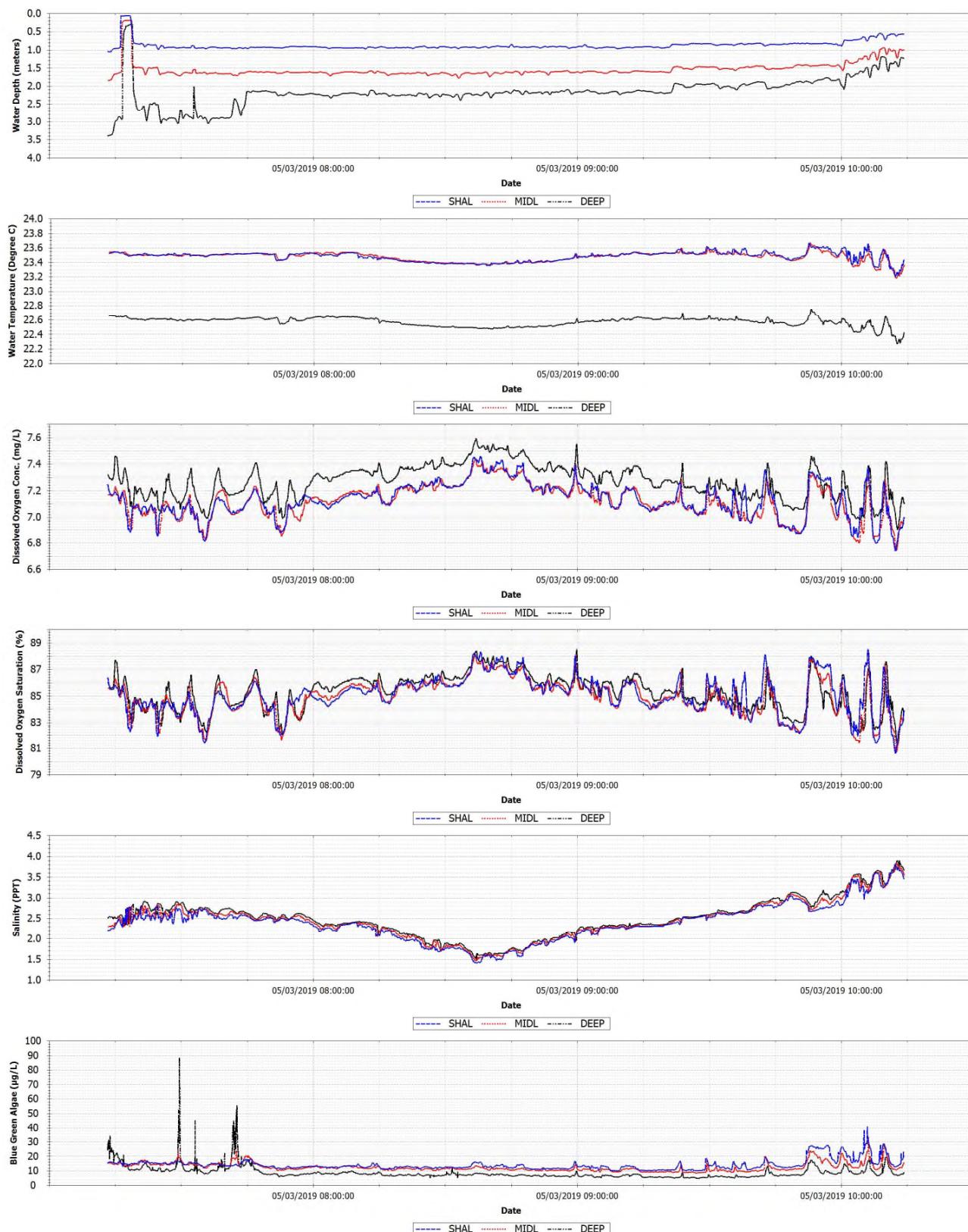
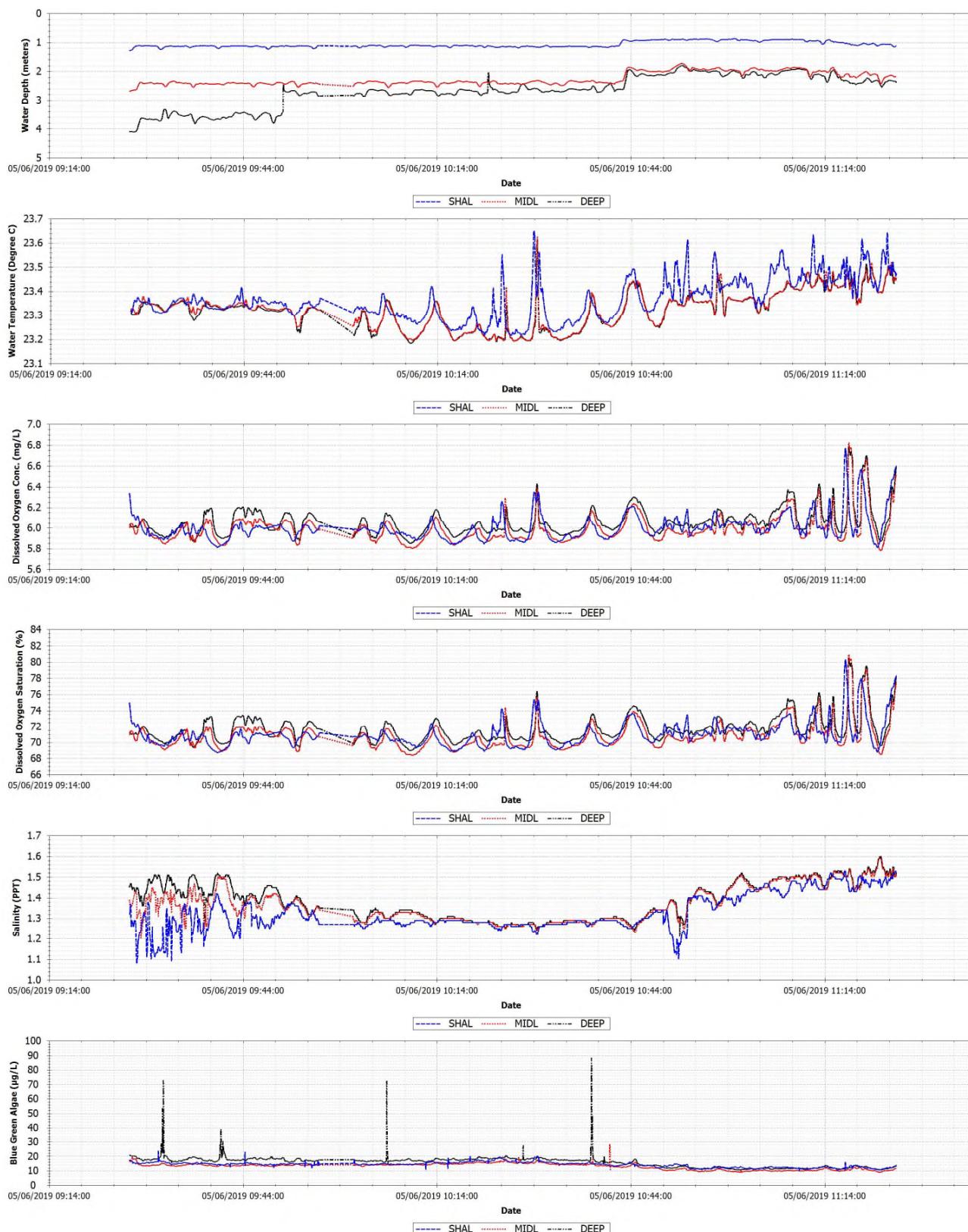
**Figure D-60** Back River May 3, 2019 flood tide drift observations



Figure D-61 Back River May 6, 2019 flood tide drift location map

**Figure D-62** Back River May 6, 2019 flood tide drift observations

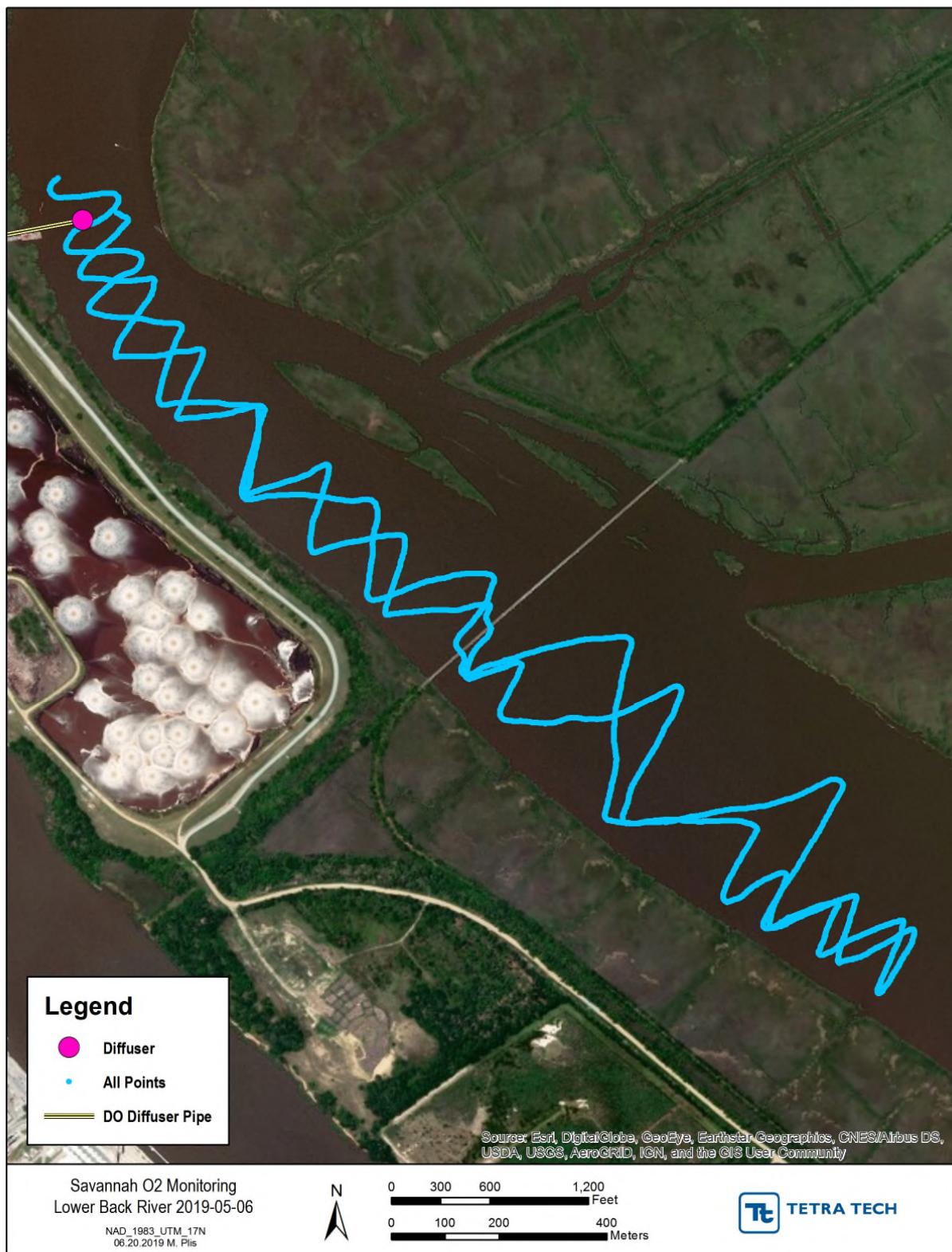


Figure D-63 Back River May 6, 2019 ebb tide drift location map

**Figure D-64** Back River May 6, 2019 ebb tide drift observations

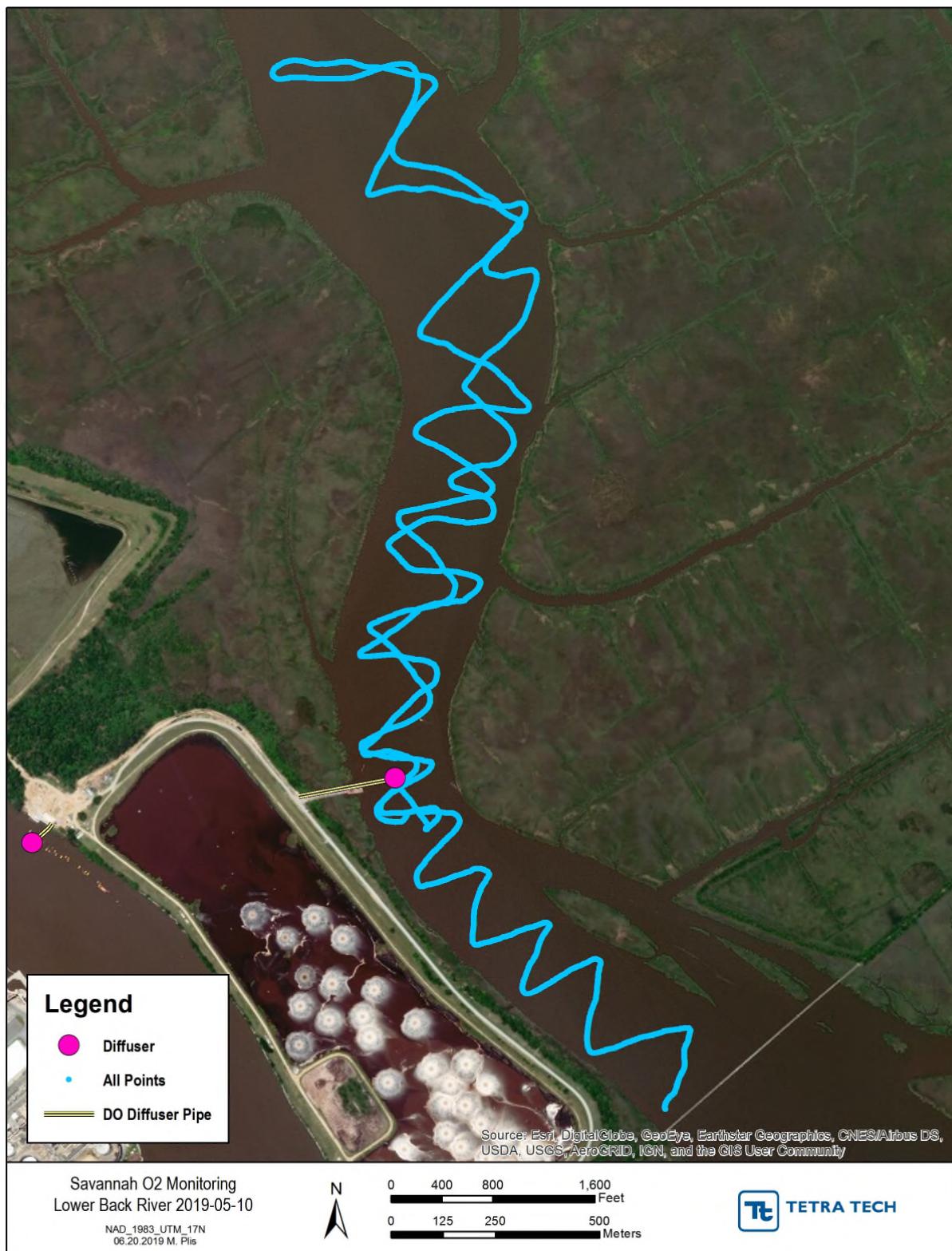
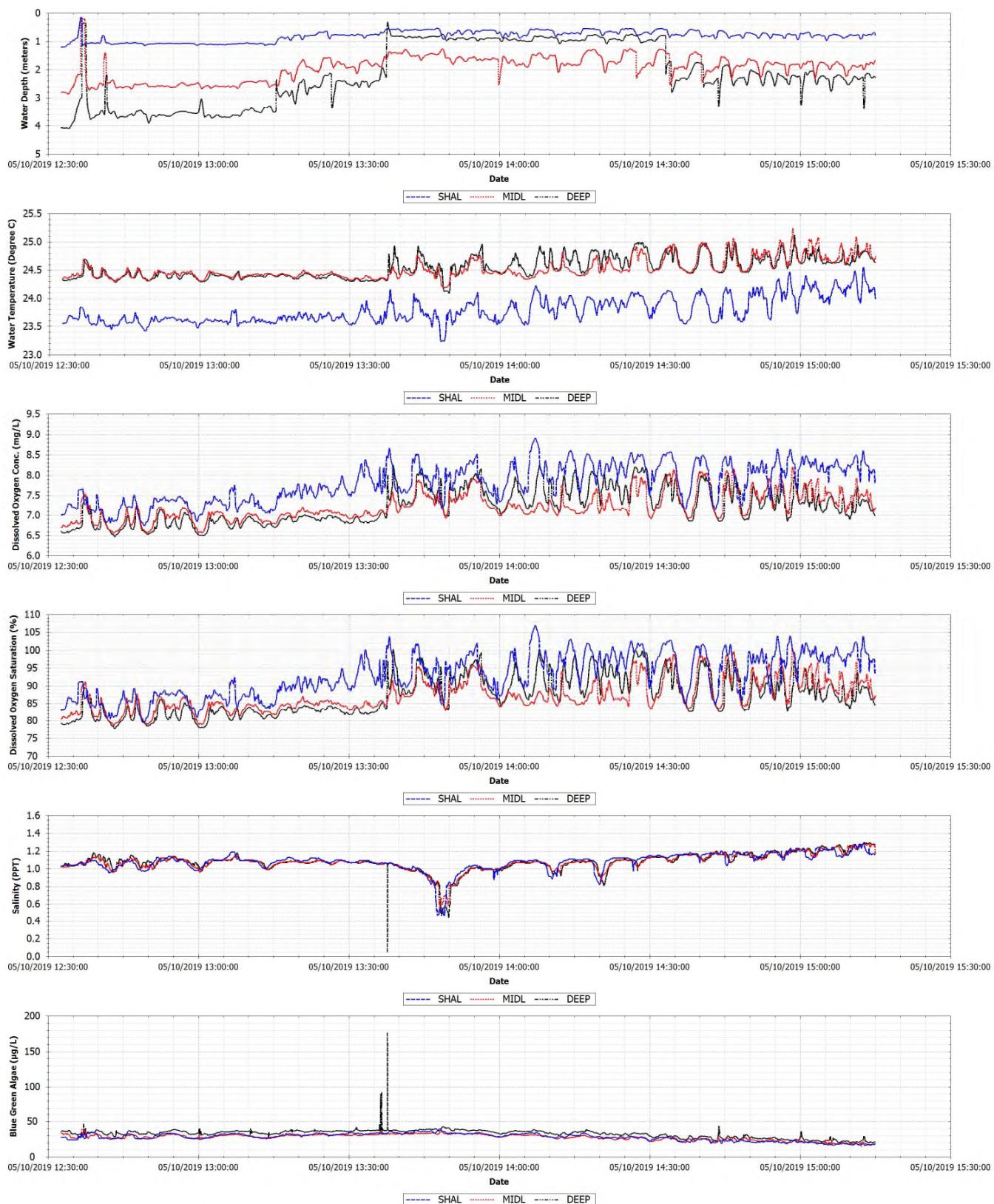


Figure D-65 Back River May 10, 2019 flood tide drift location map

**Figure D-66** Back River May 10, 2019 flood tide drift observations

D.2 FRONT RIVER

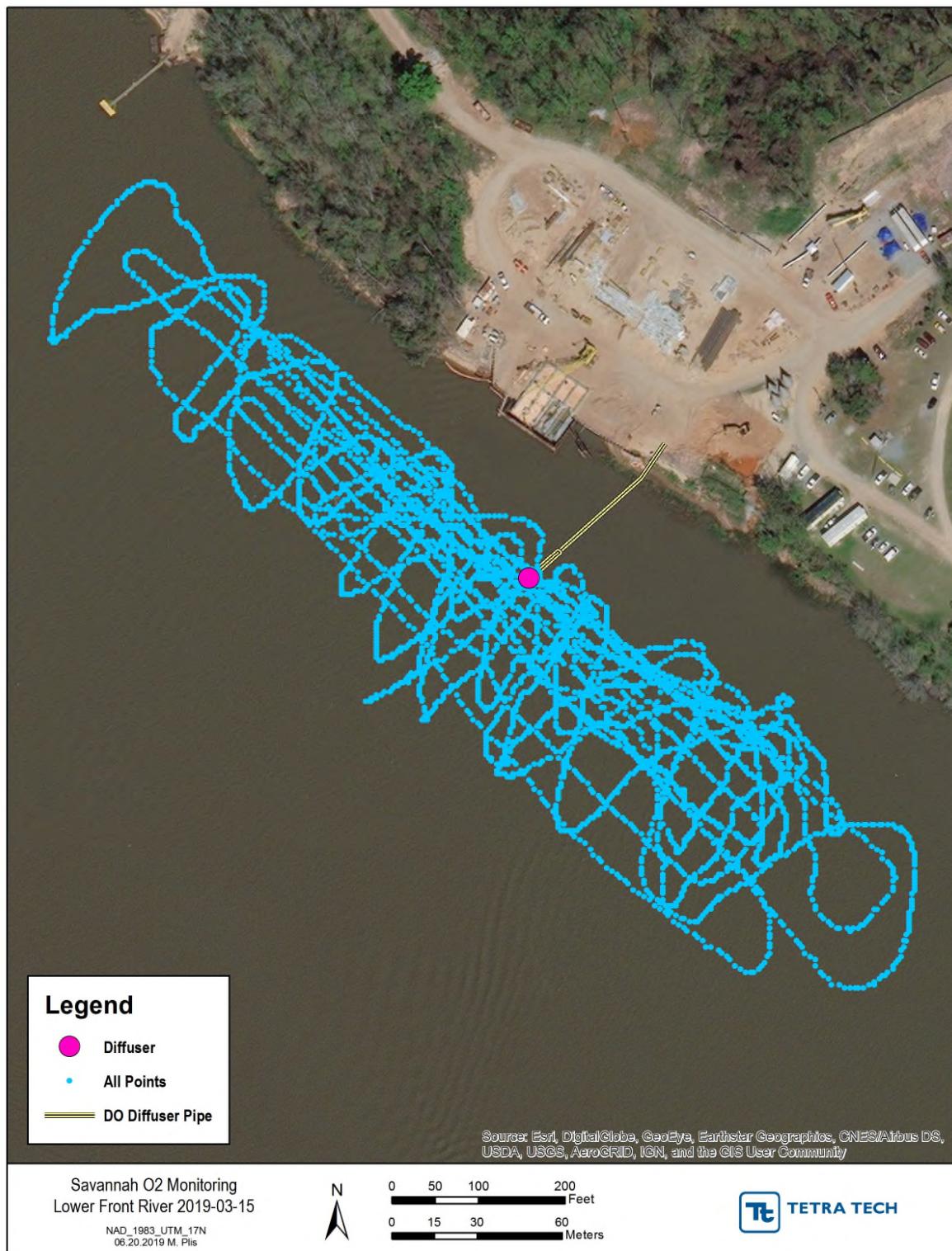
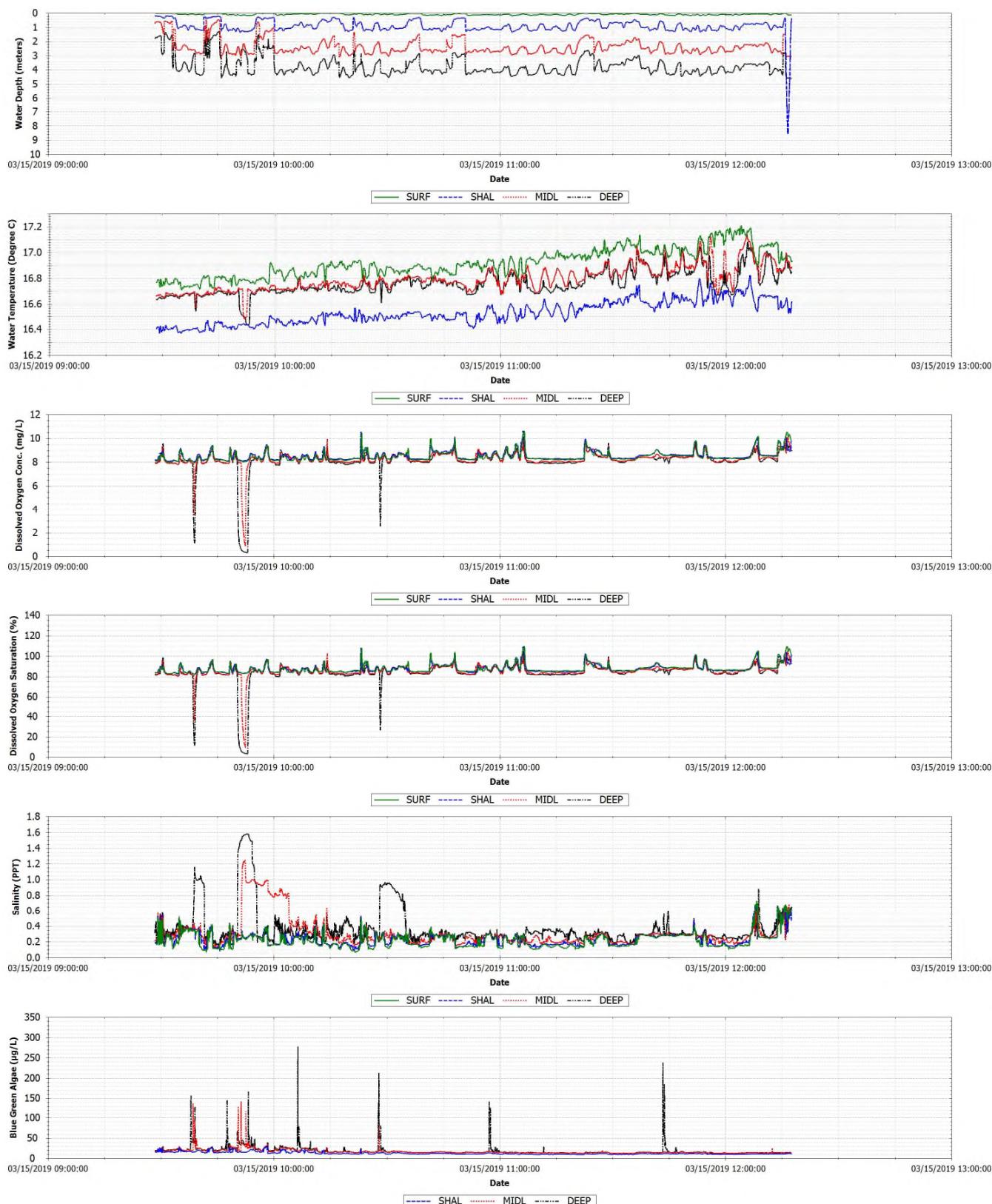


Figure D-67 Front River March 15, 2019 ebb tide drift location map

**Figure D-68** Front River March 15, 2019 ebb tide drift observations

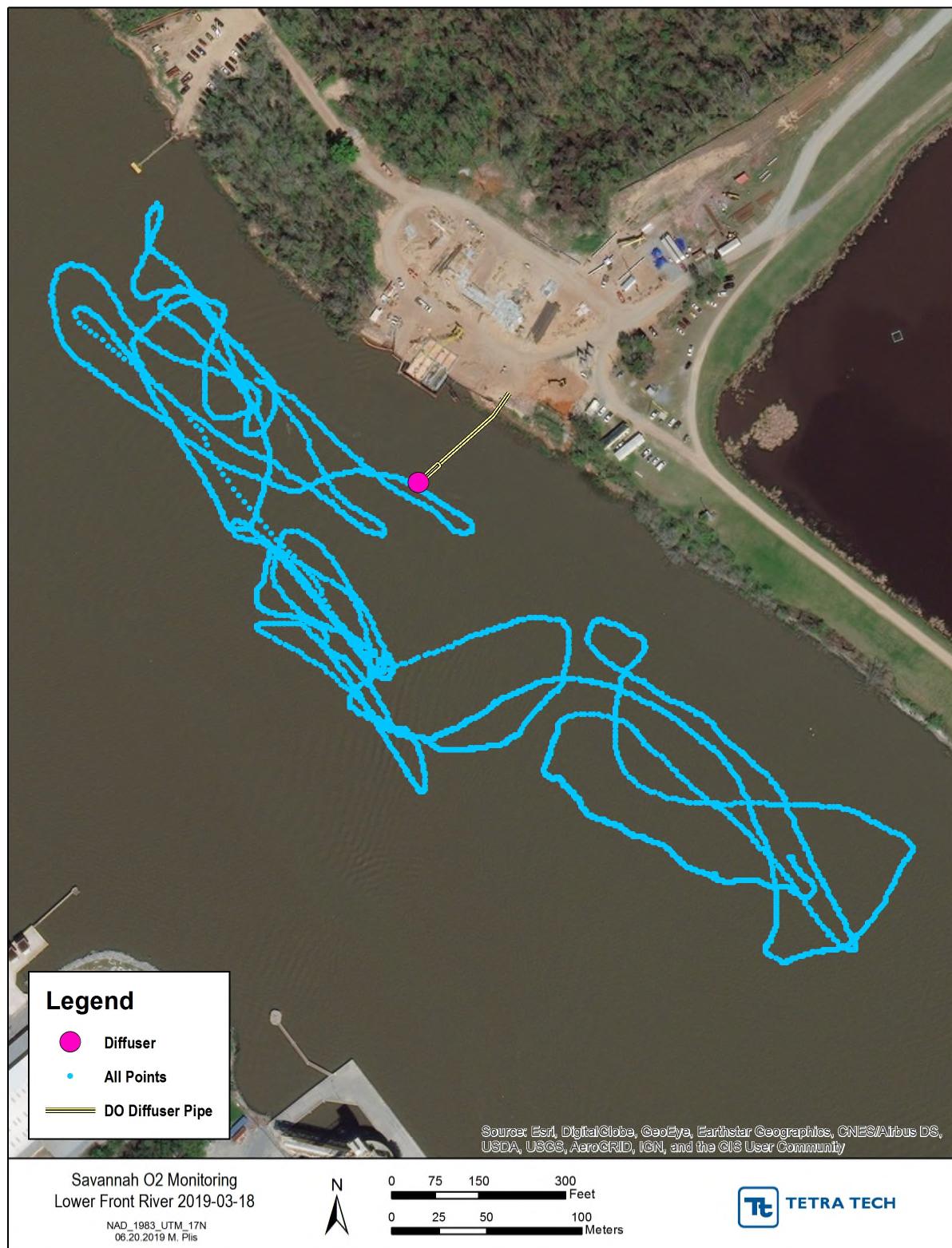
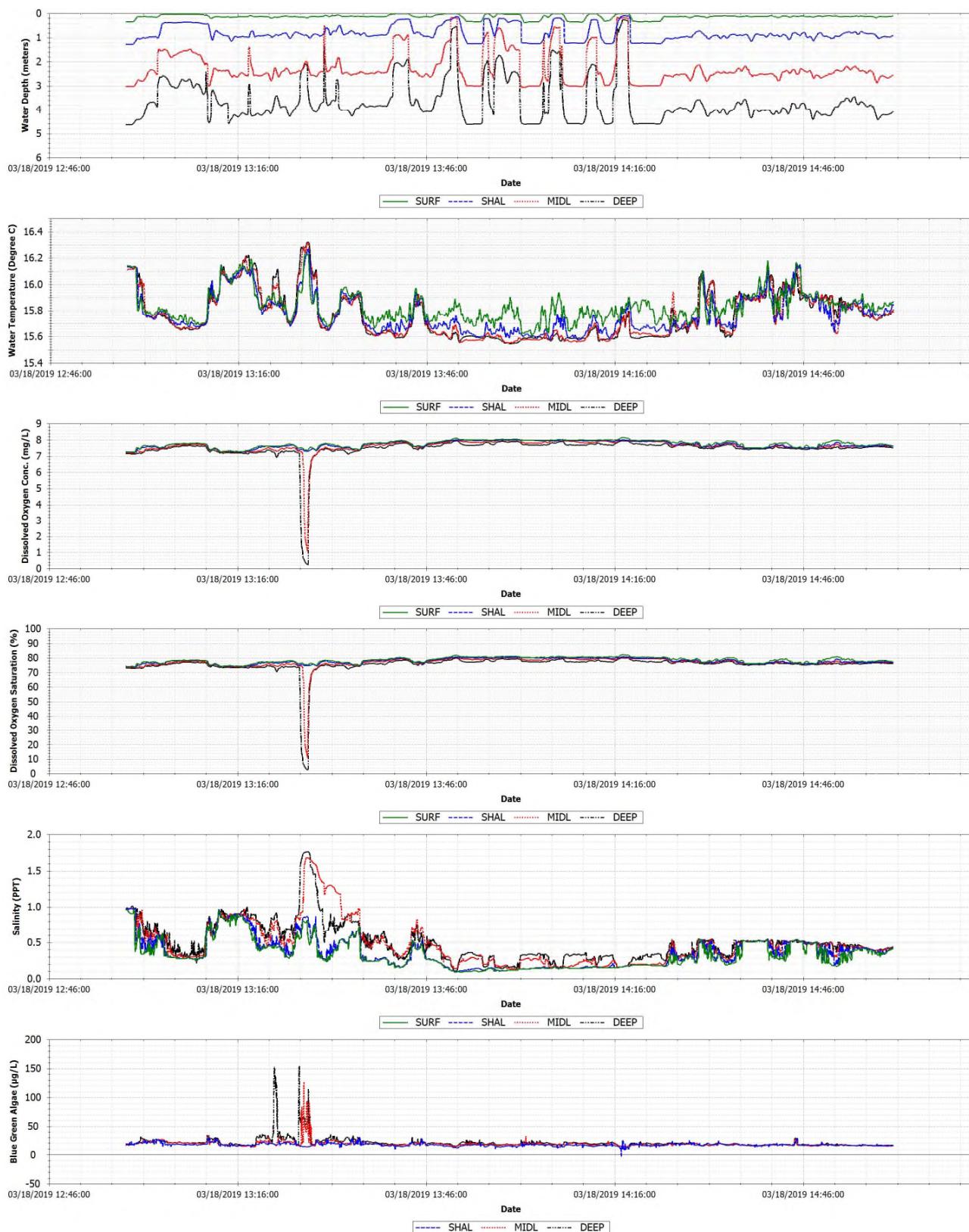


Figure D-69 Front River March 18, 2019 ebb tide drift location map

**Figure D-70** Front River March 18, 2019 ebb tide drift observations

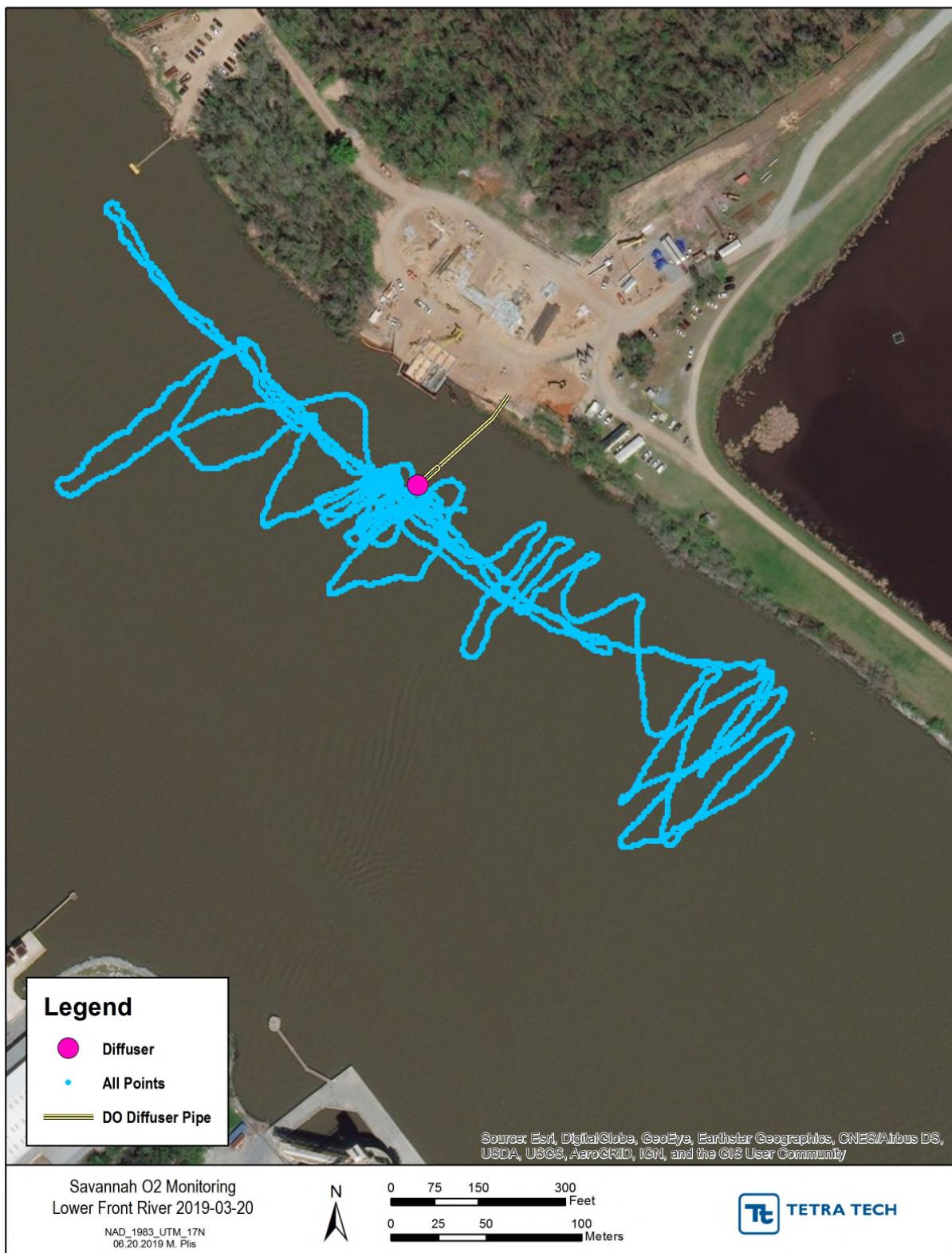
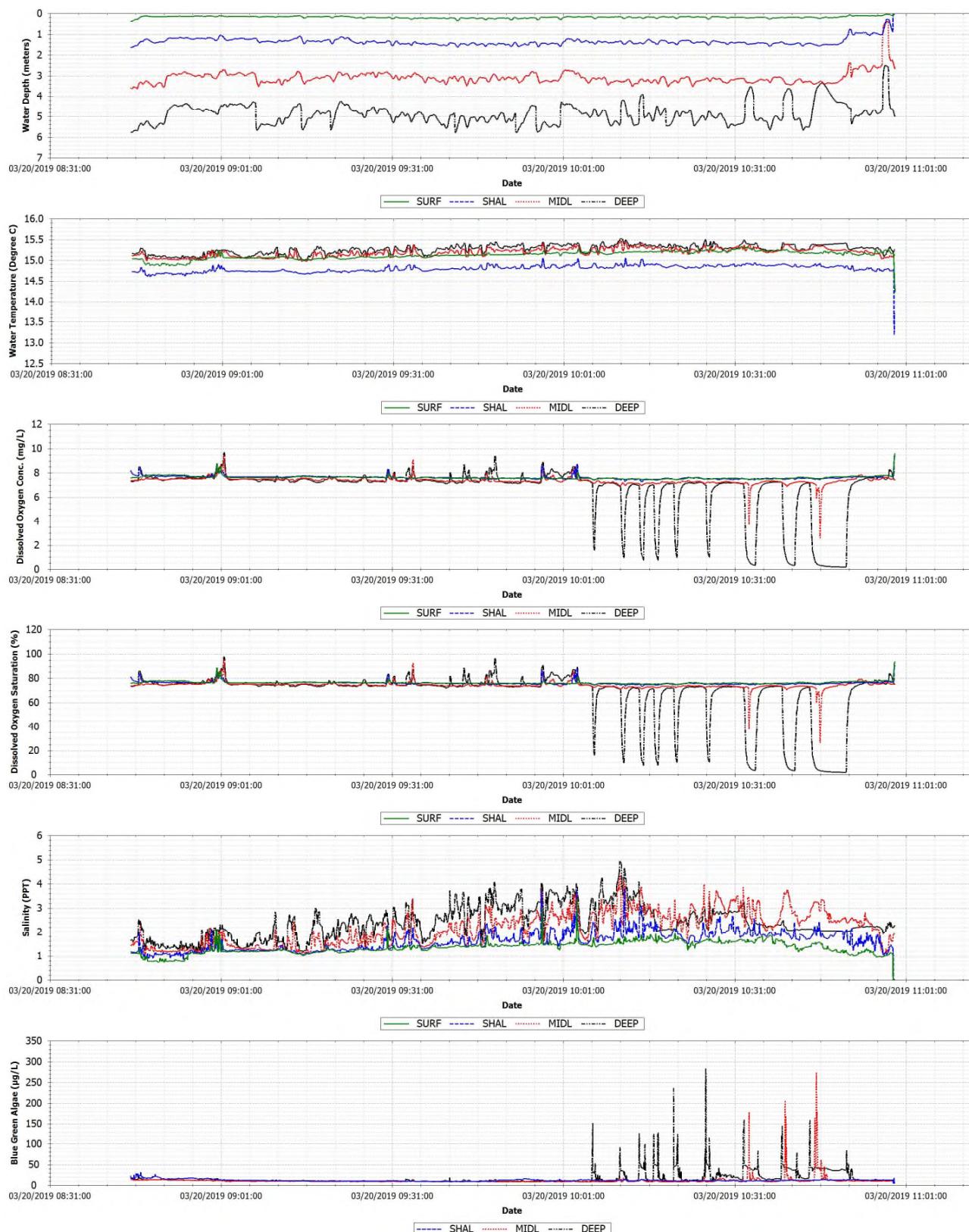


Figure D-71 Front River March 20, 2019 flood tide drift location map

**Figure D-72** Front River March 20, 2019 flood tide drift observations

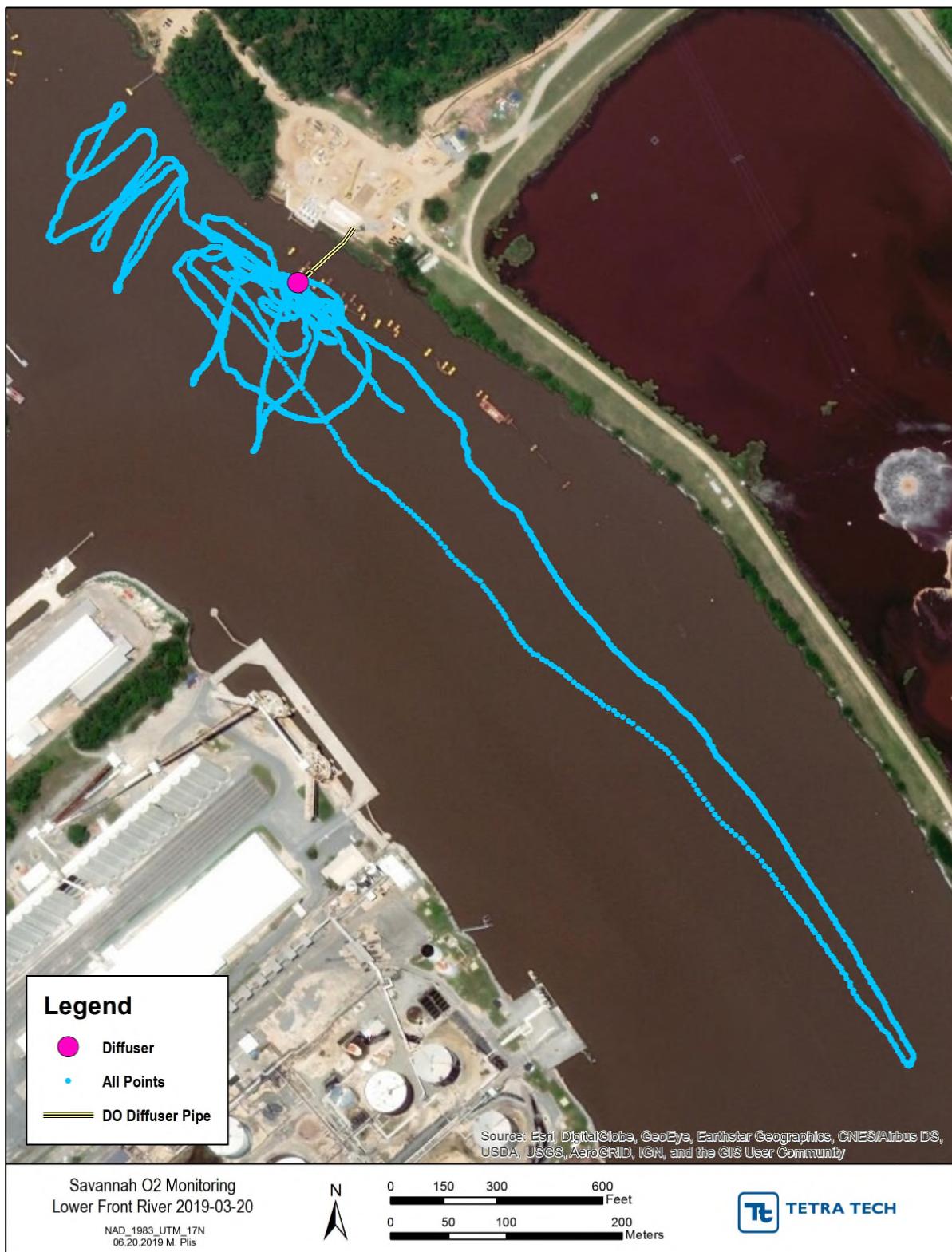
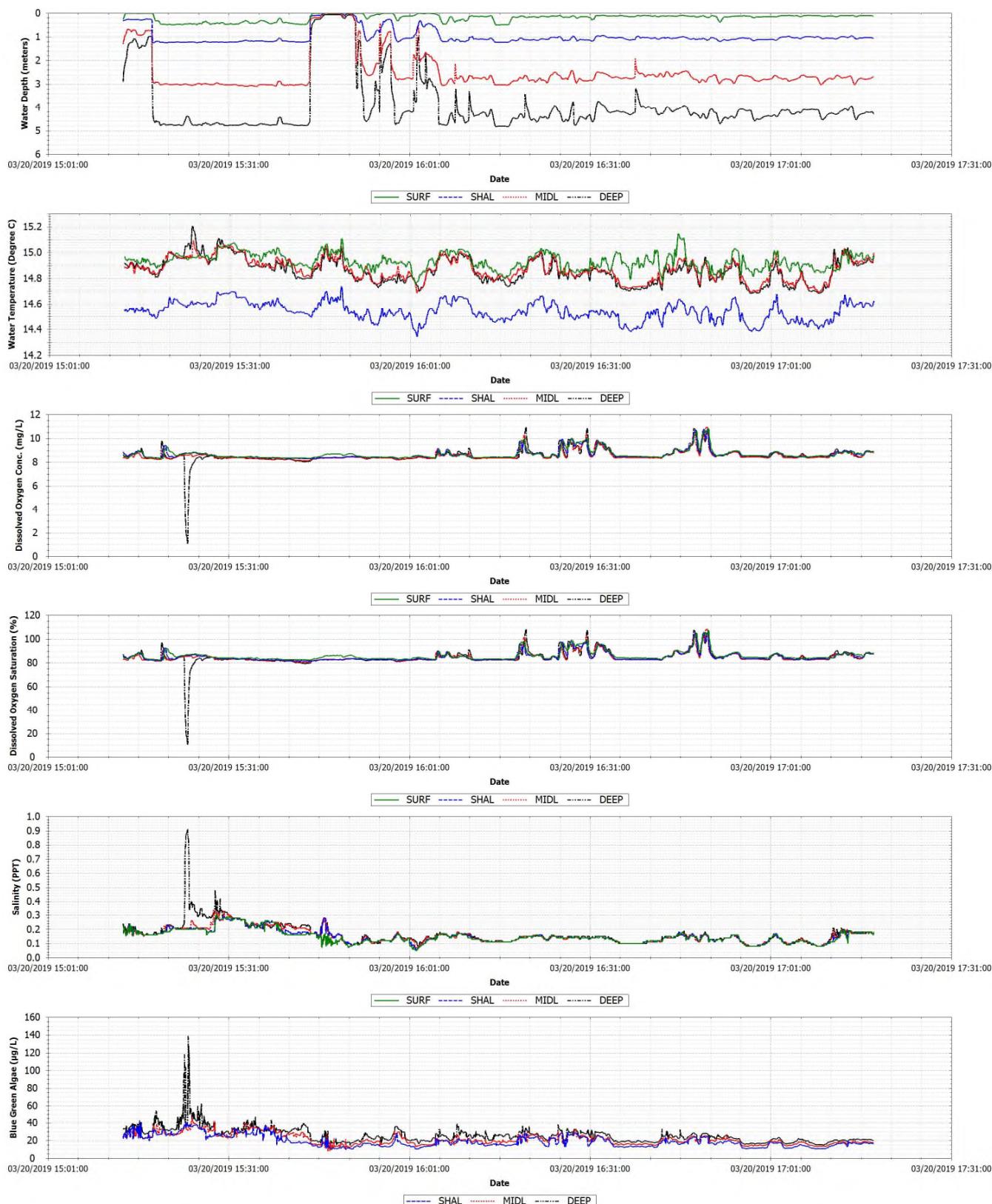


Figure D-73 Front River March 20, 2019 ebb tide drift location map

**Figure D-74** Front River March 20, 2019 ebb tide drift observations

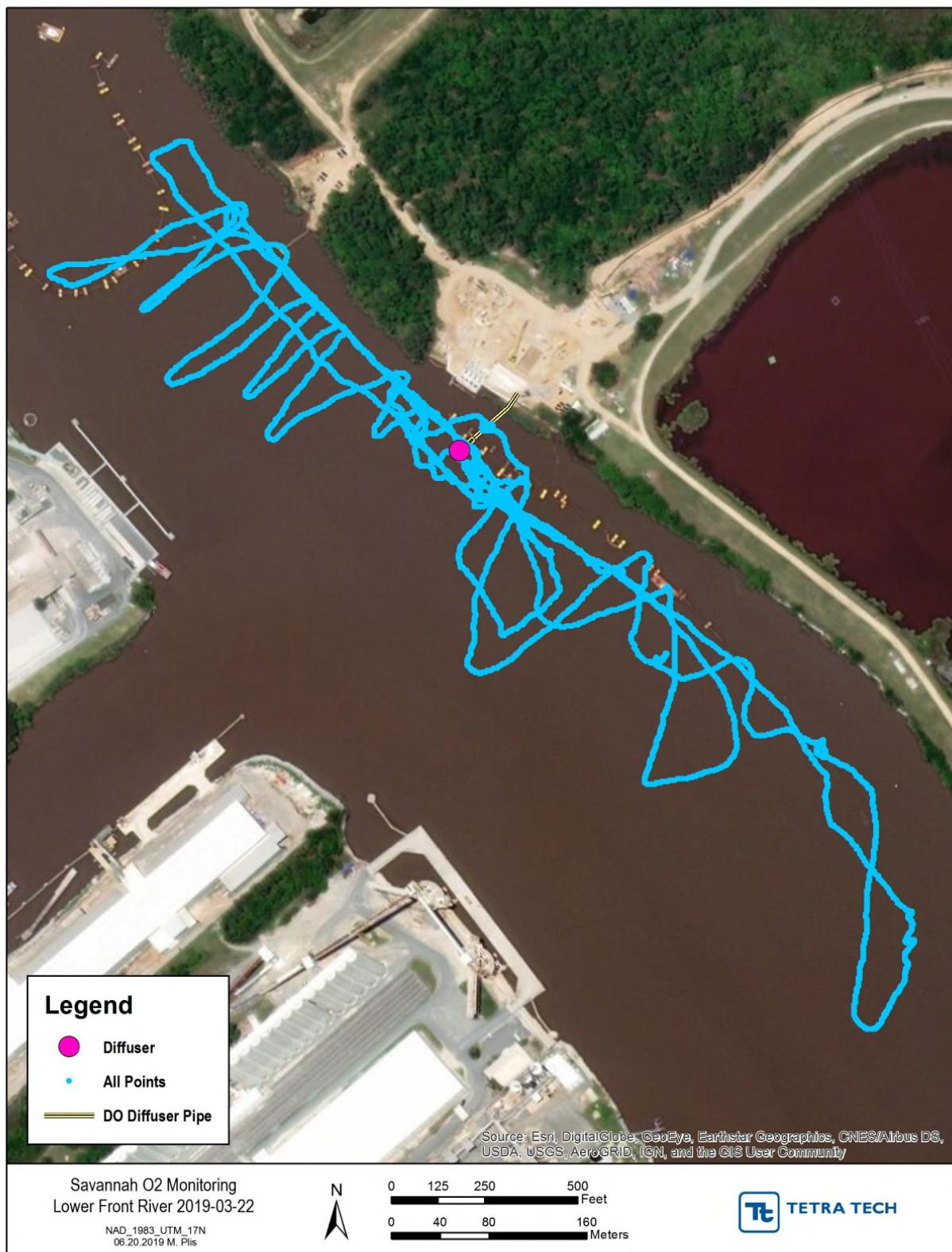
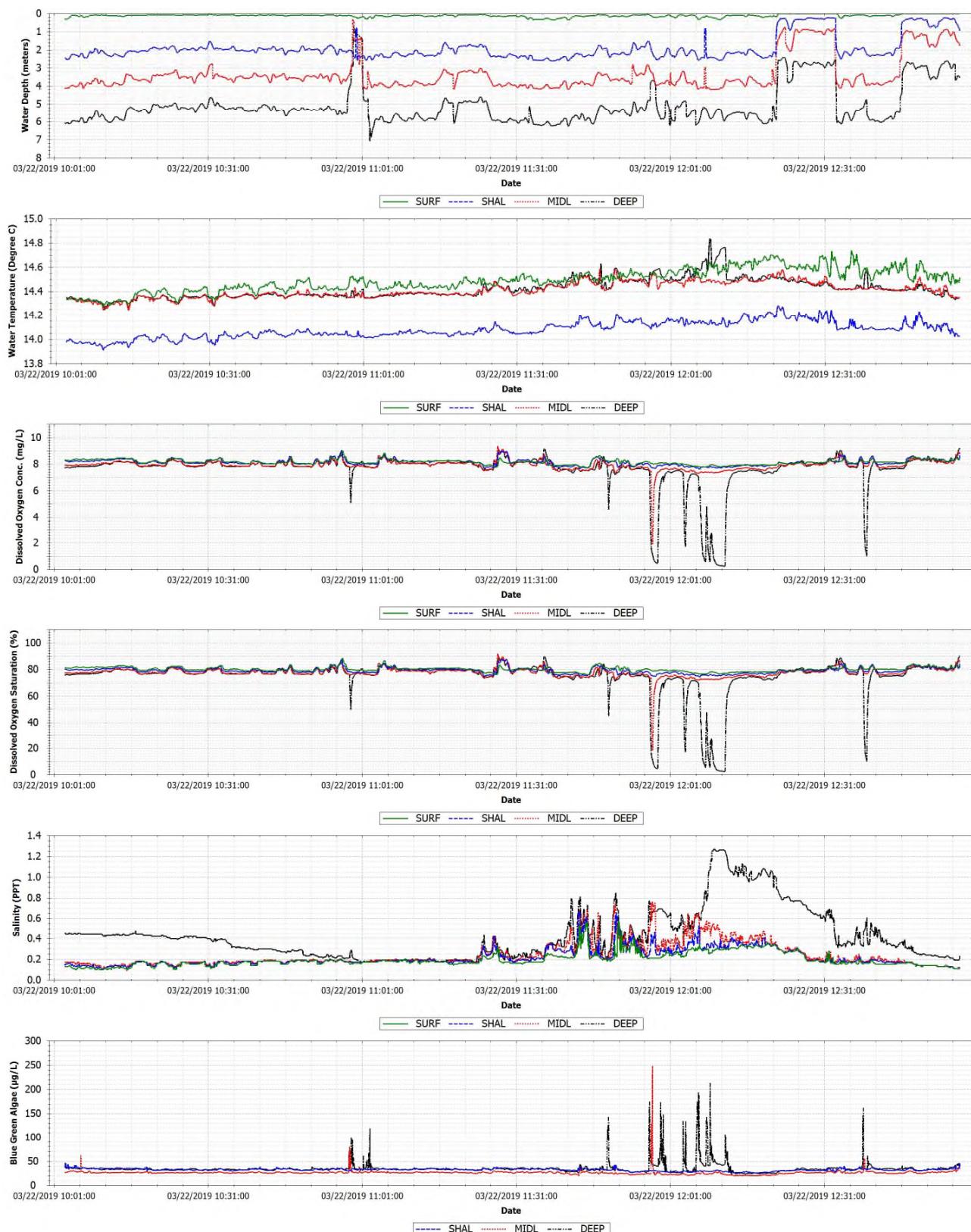


Figure D-75 Front River March 22, 2019 flood tide drift location map

**Figure D-76** Front River March 22, 2019 flood tide drift observations

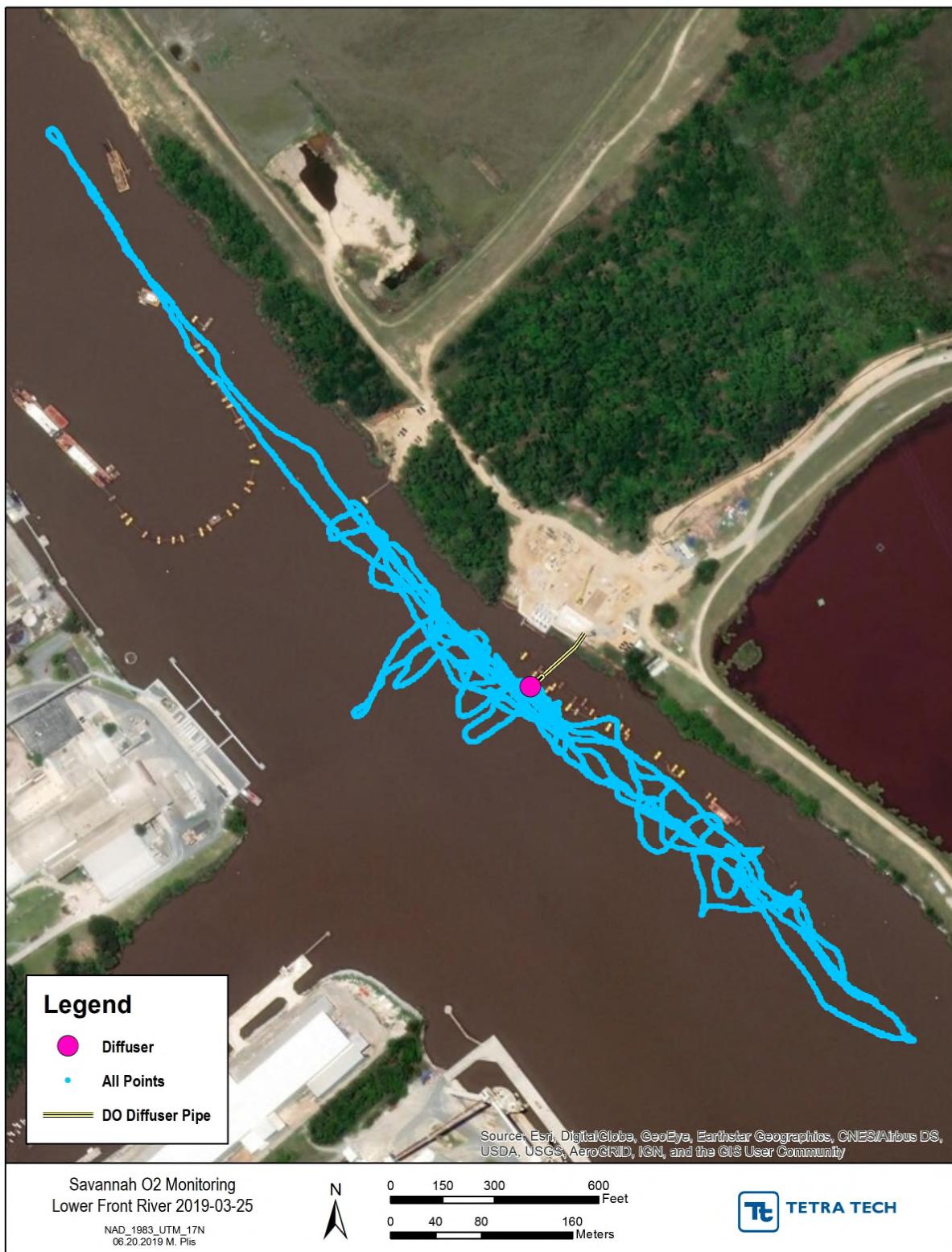


Figure D-77 Front River March 25, 2019 ebb tide drift location map

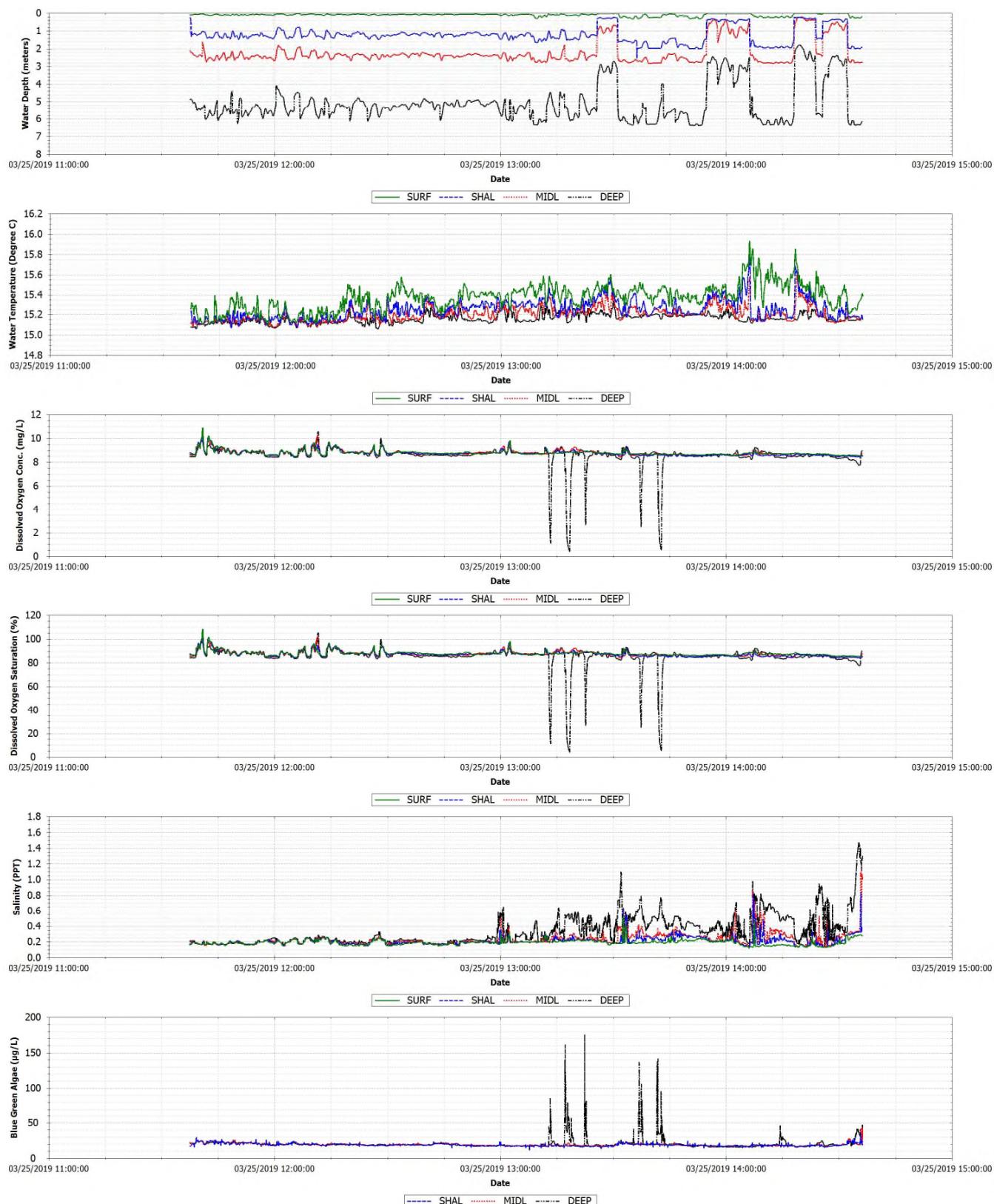
**Figure D-78** Front River March 25, 2019 ebb tide drift observations

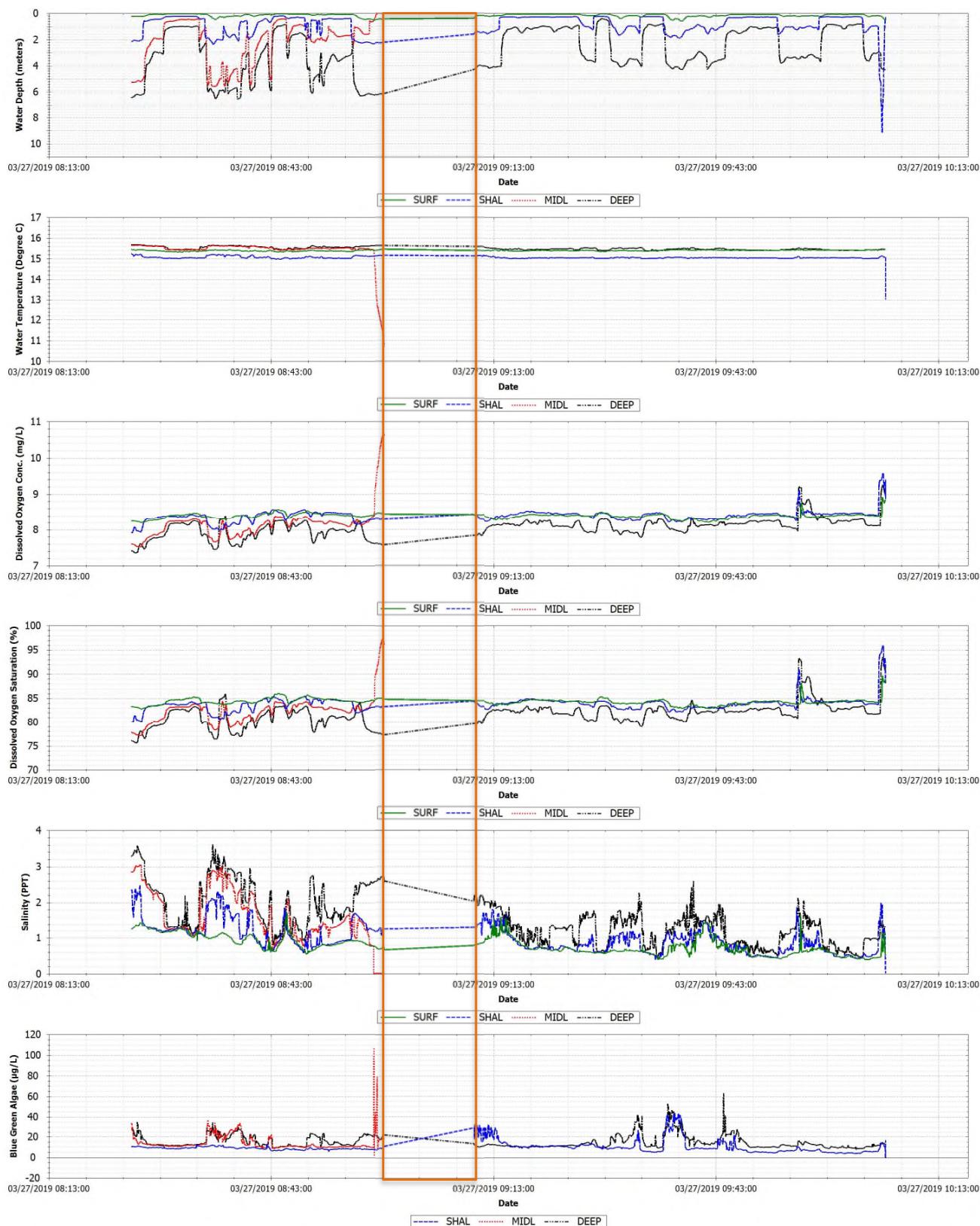


Figure D-79 Front River March 27, 2019 flood tide drift location map

**Figure D-80** Front River March 27, 2019 flood tide drift observations



Figure D-81 Front River March 27, 2019 ebb tide drift location map



Note Orange box identifies period of data removed during QAQC process

Figure D-82 Front River March 27, 2019 ebb tide drift observations

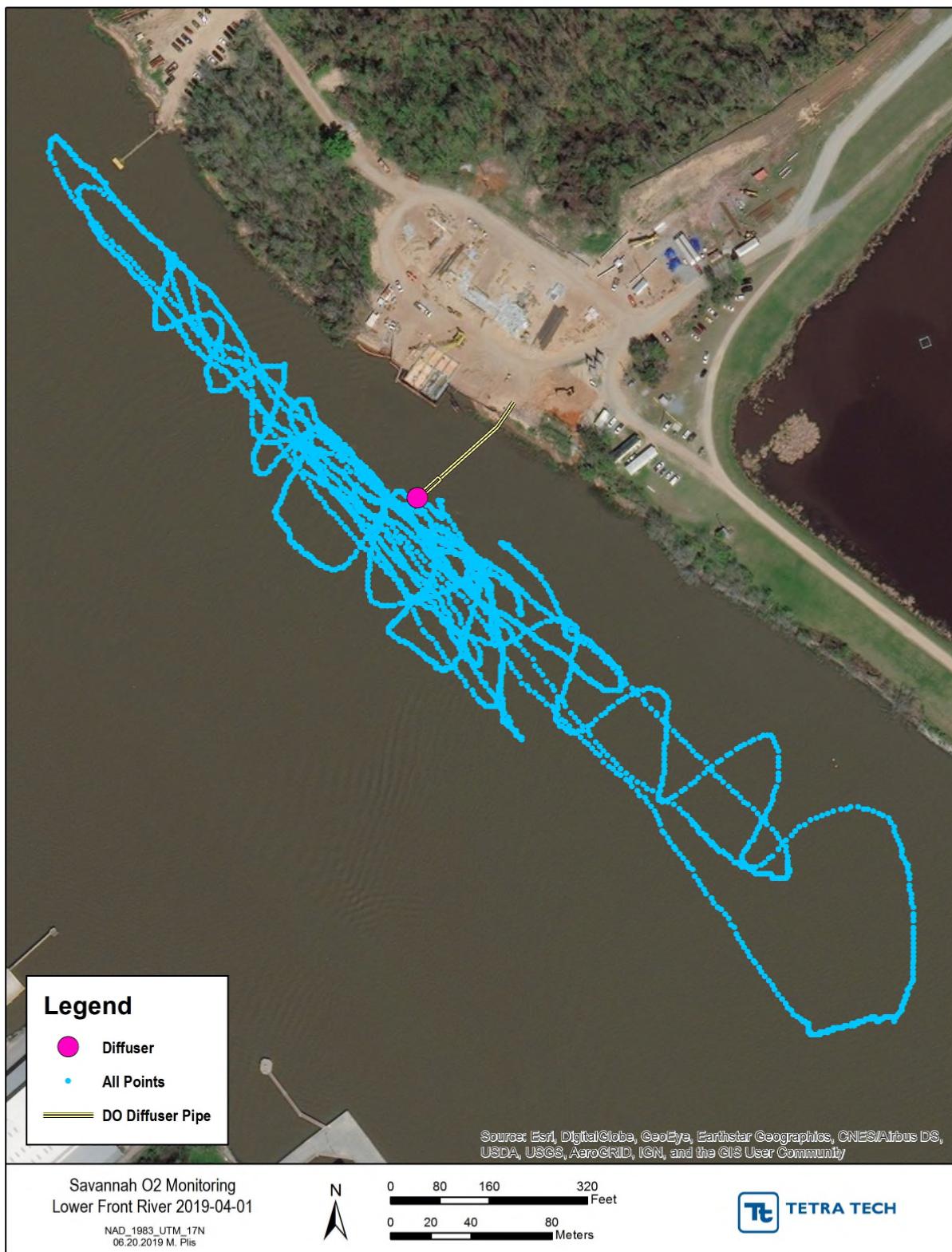


Figure D-83 Front River April 1, 2019 ebb tide drift location map

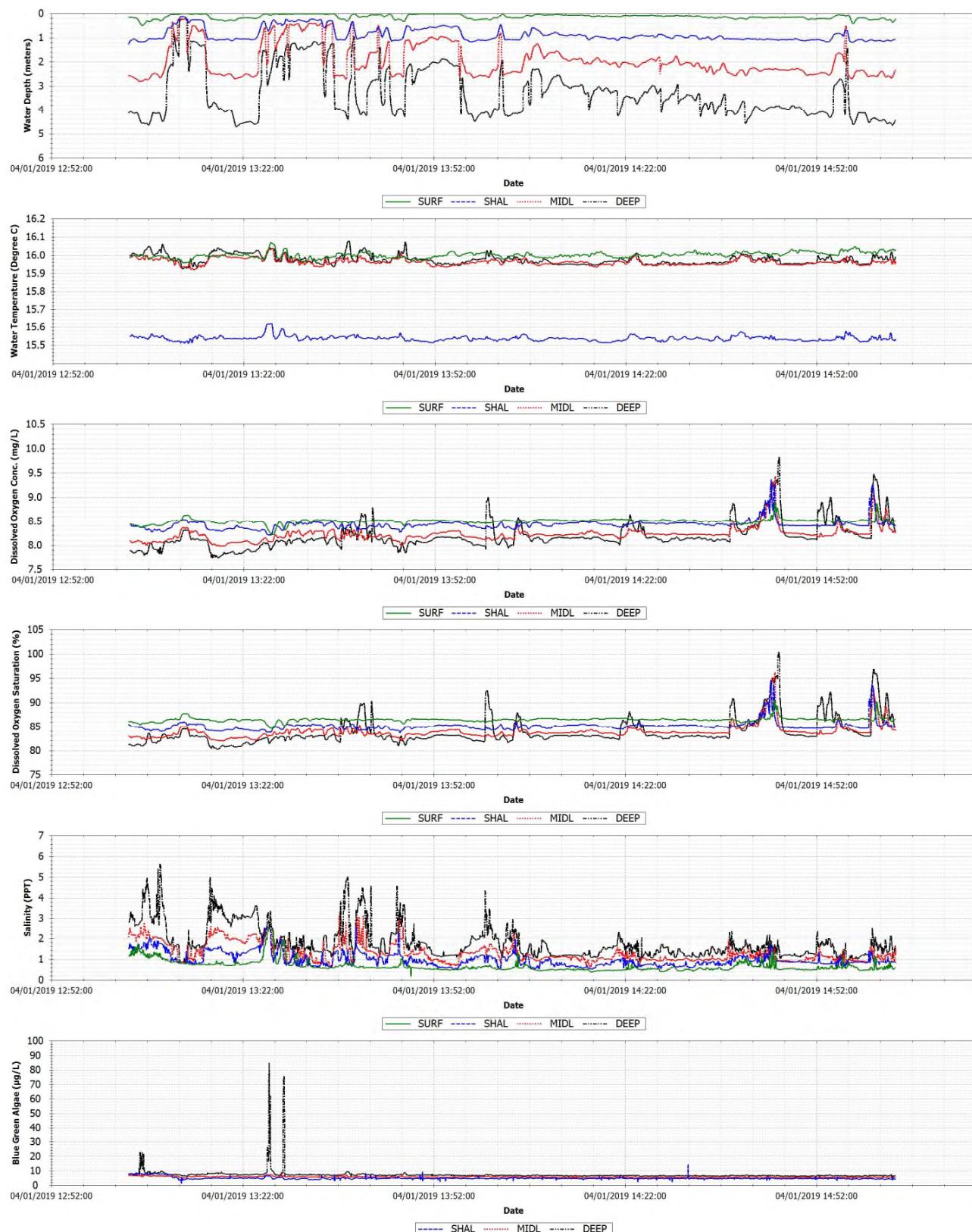
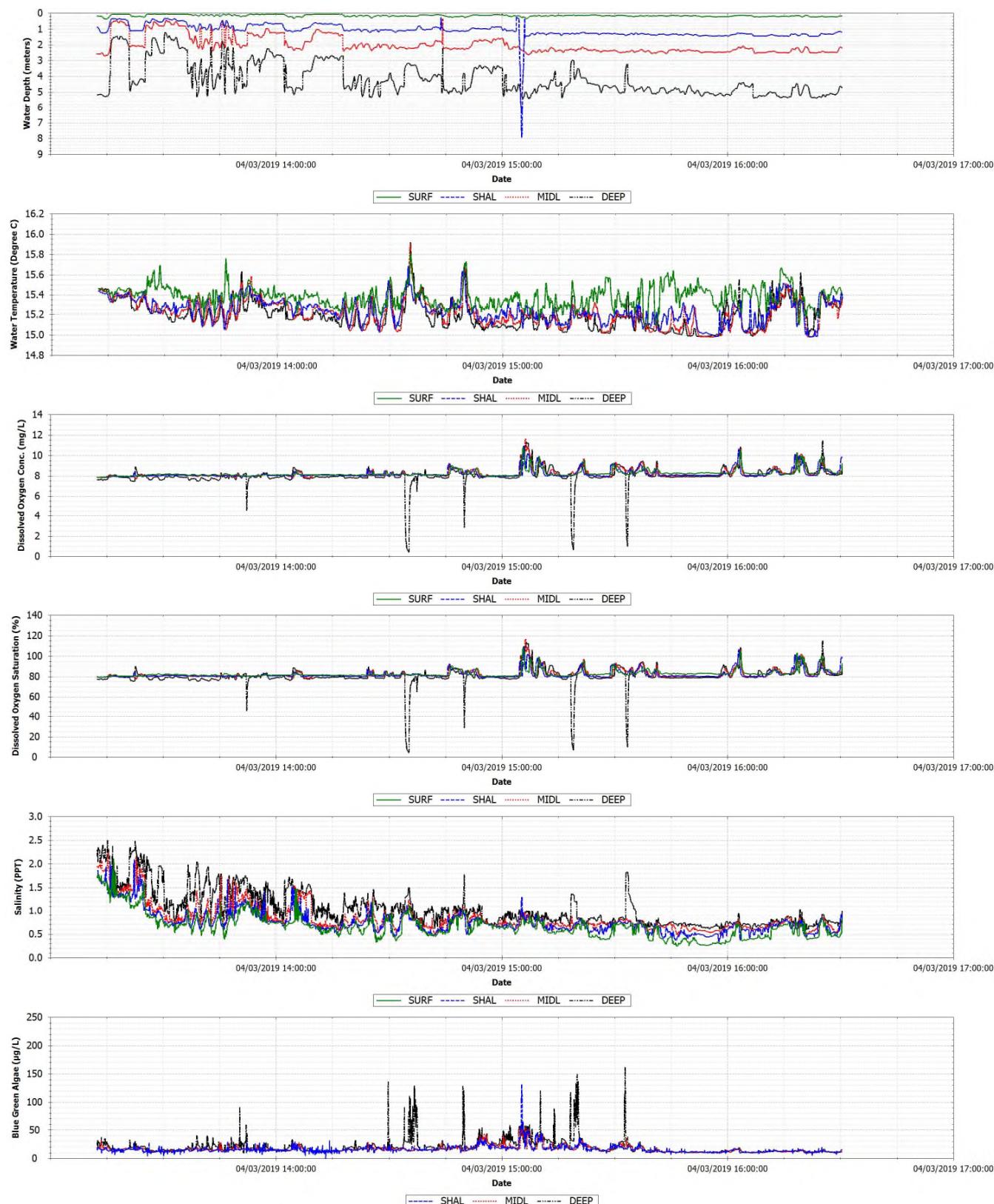
**Figure D-84** Front River April 1, 2019 ebb tide drift observations



Figure D-85 Front River April 3, 2019 ebb tide drift location map

**Figure D-86** Front River April 3, 2019 ebb tide drift observations

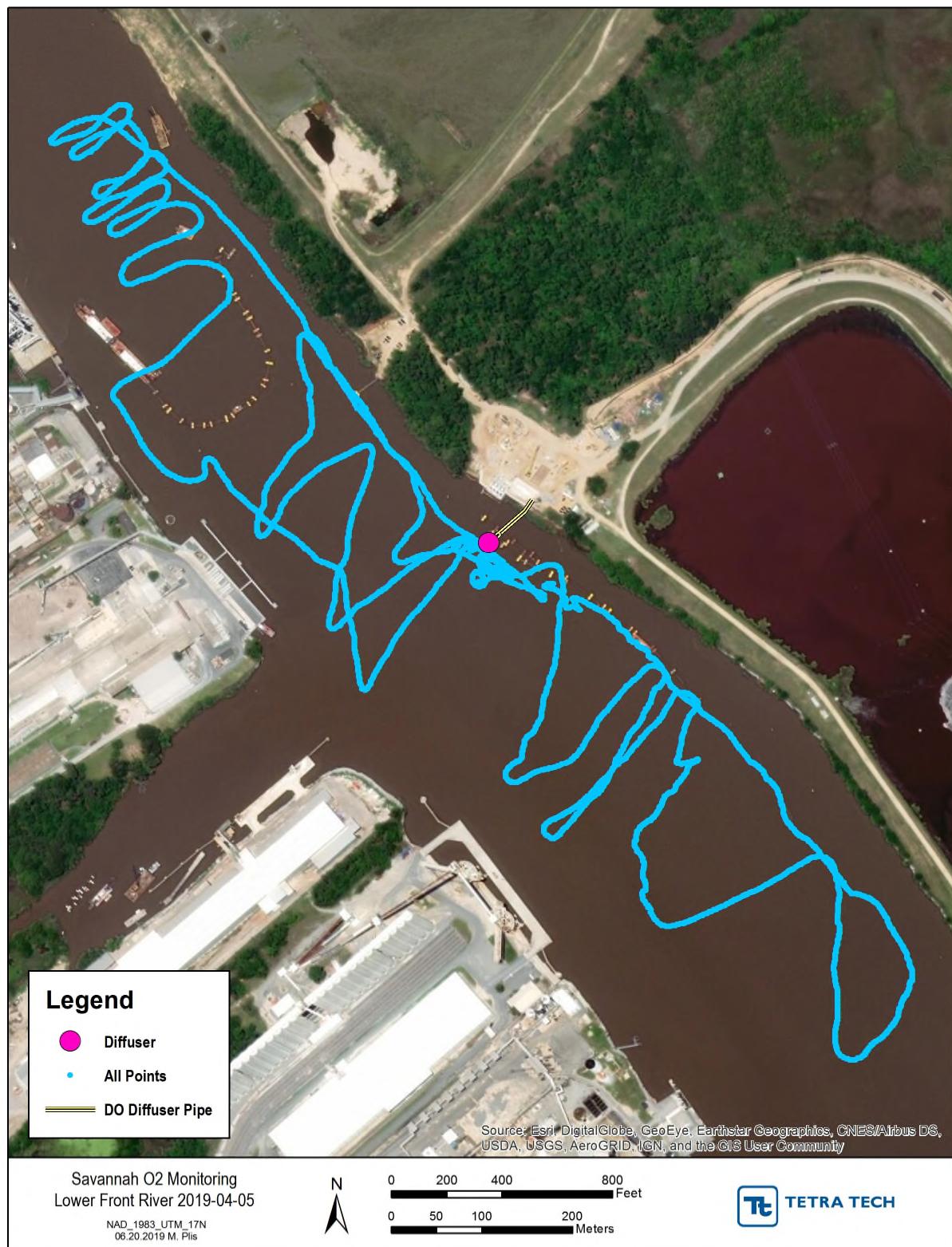
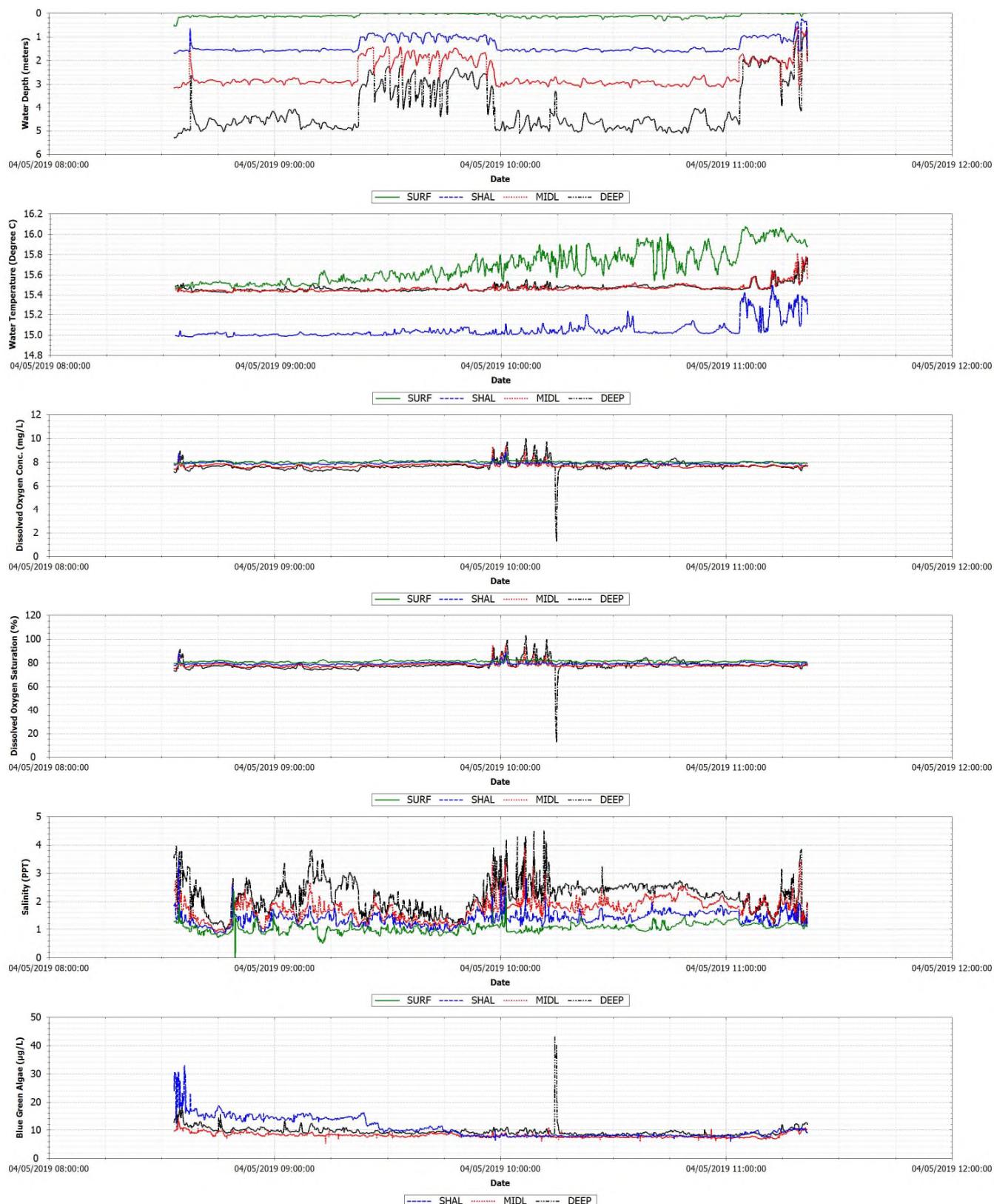


Figure D-87 Front River April 5, 2019 flood tide drift location map

**Figure D-88** Front River April 5, 2019 flood tide drift observations

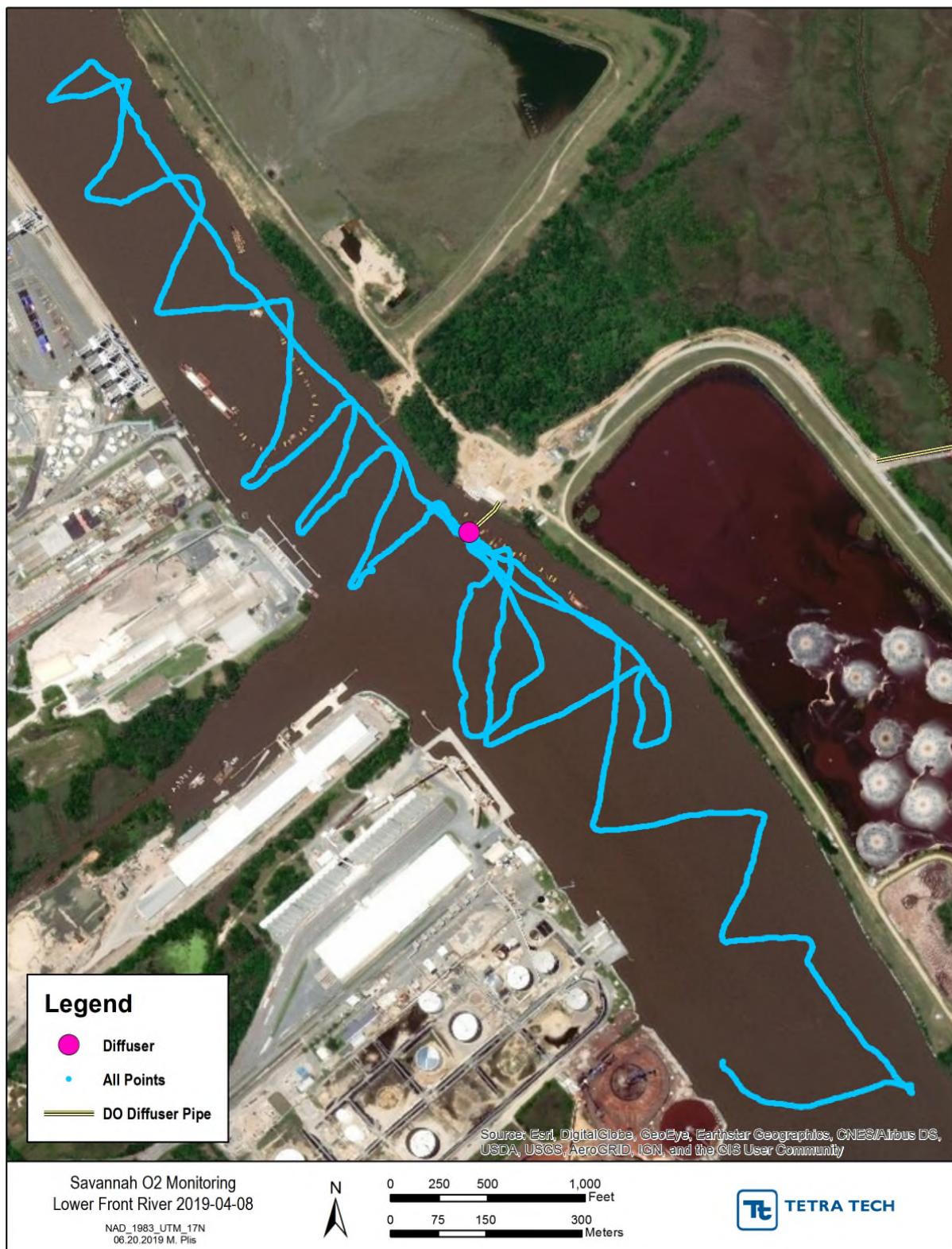


Figure D-89 Front River April 8, 2019 flood tide drift location map

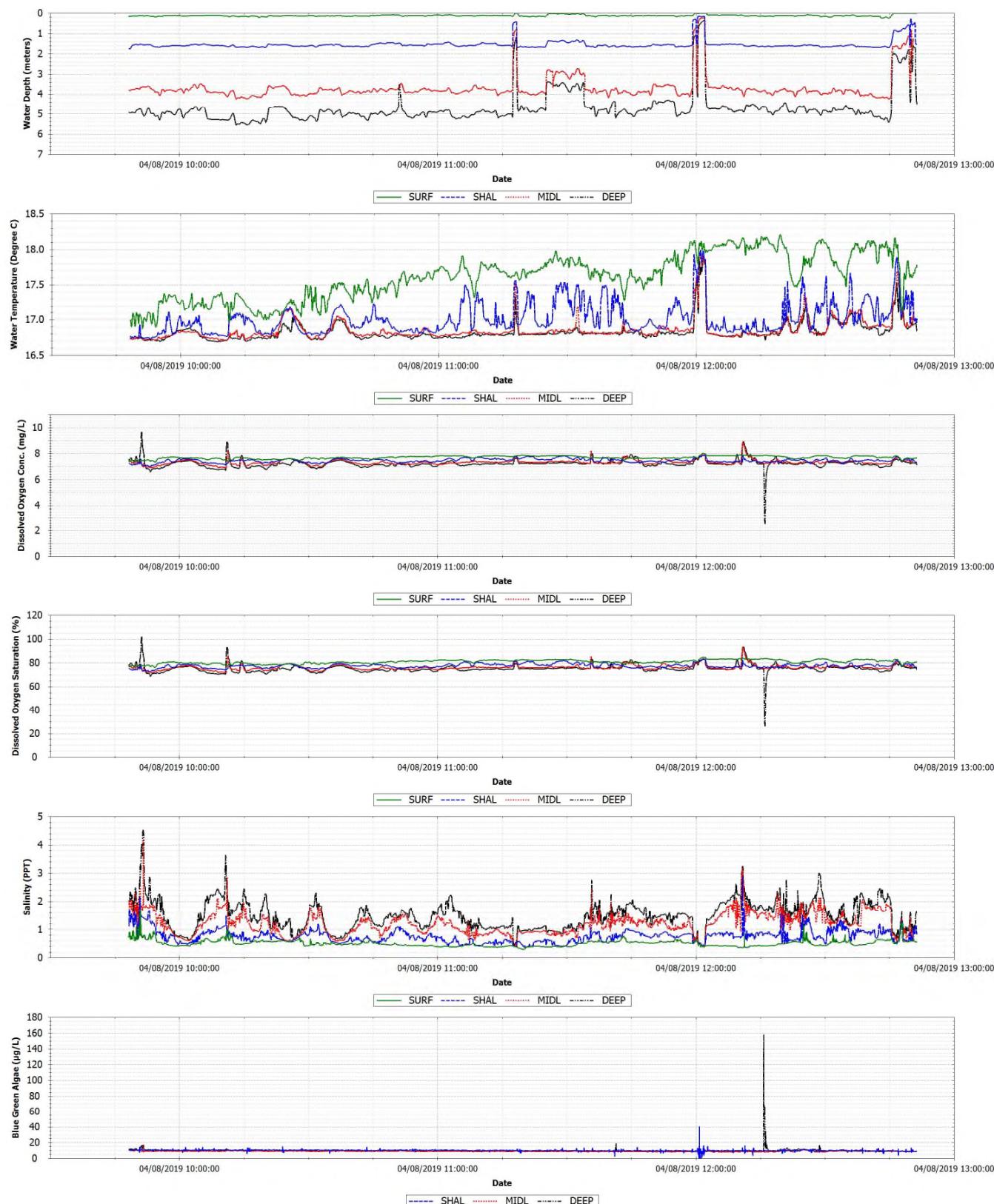
**Figure D-90** Front River April 8, 2019 flood tide drift observations



Figure D-91 Front River April 10, 2019 flood tide drift location map

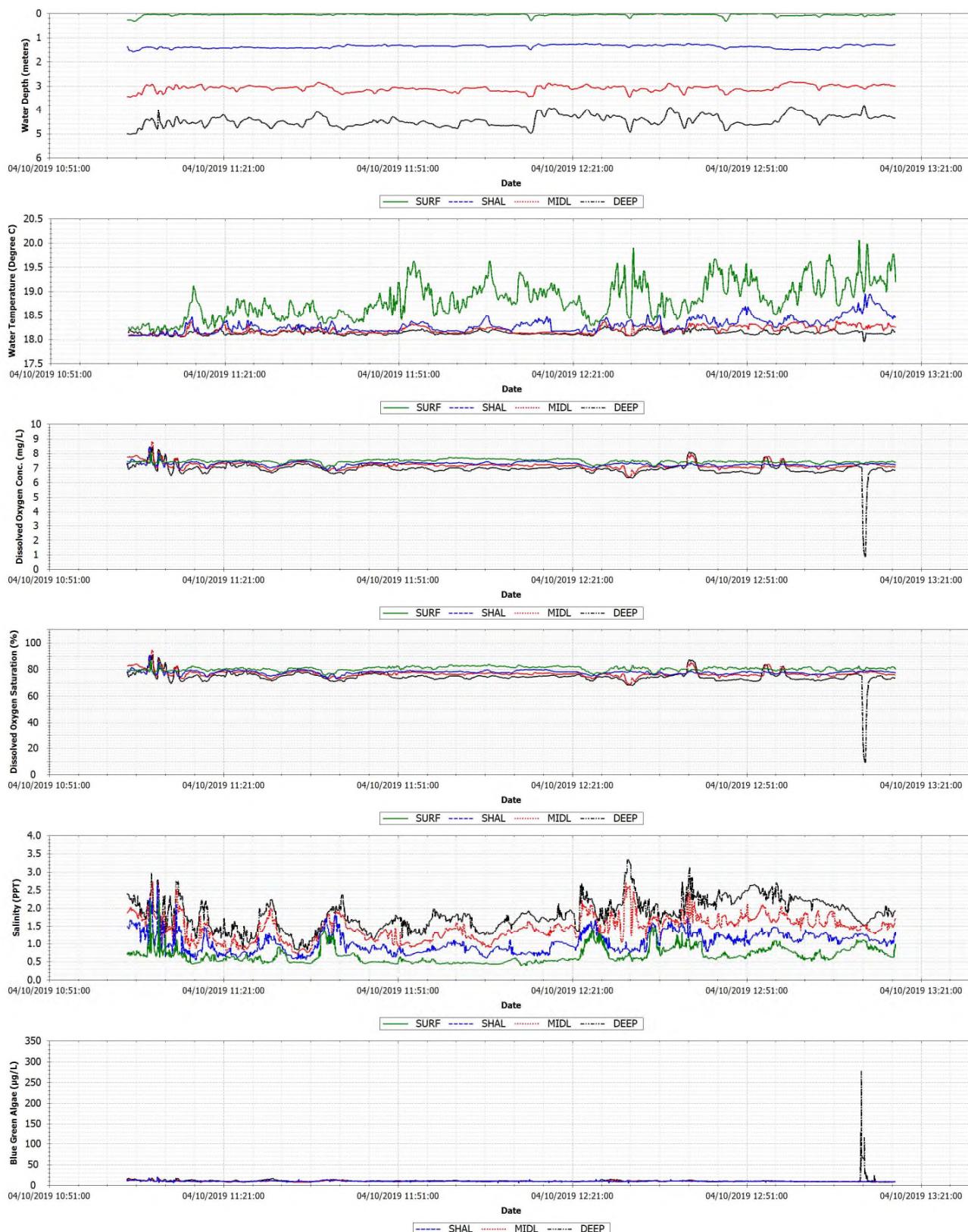
**Figure D-92** Front River April 10, 2019 flood tide drift observations



Figure D-93 Front River April 11, 2019 ebb tide dye drift location map boat 1 period 1

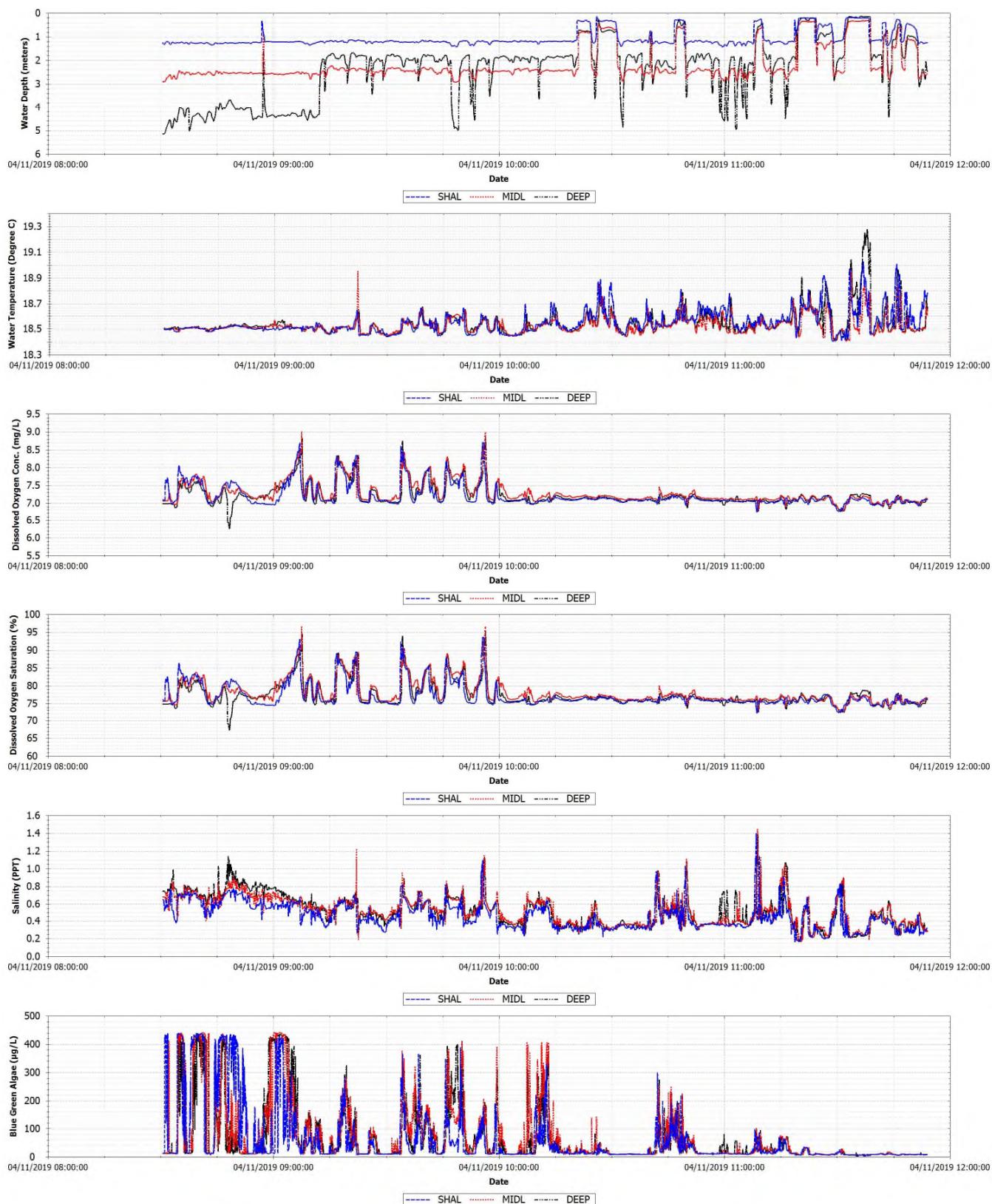
**Figure D-94** Front River April 11, 2019 ebb tide dye drift observations boat 1 period 1



Figure D-95 Front River April 11, 2019 ebb tide dye drift location map boat 1 period 2

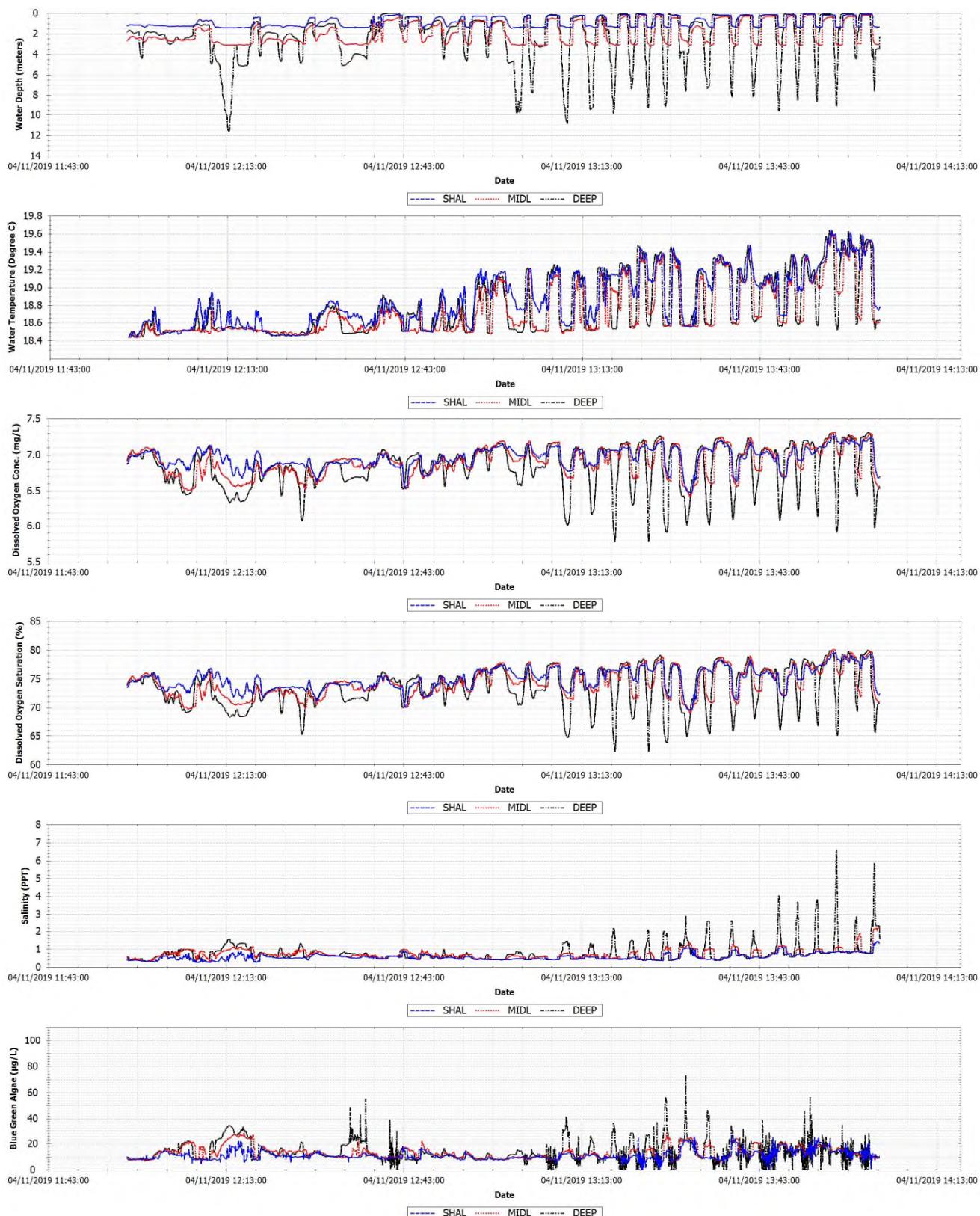


Figure D-96 Front River April 11, 2019 ebb tide dye drift observations boat 1 period 2

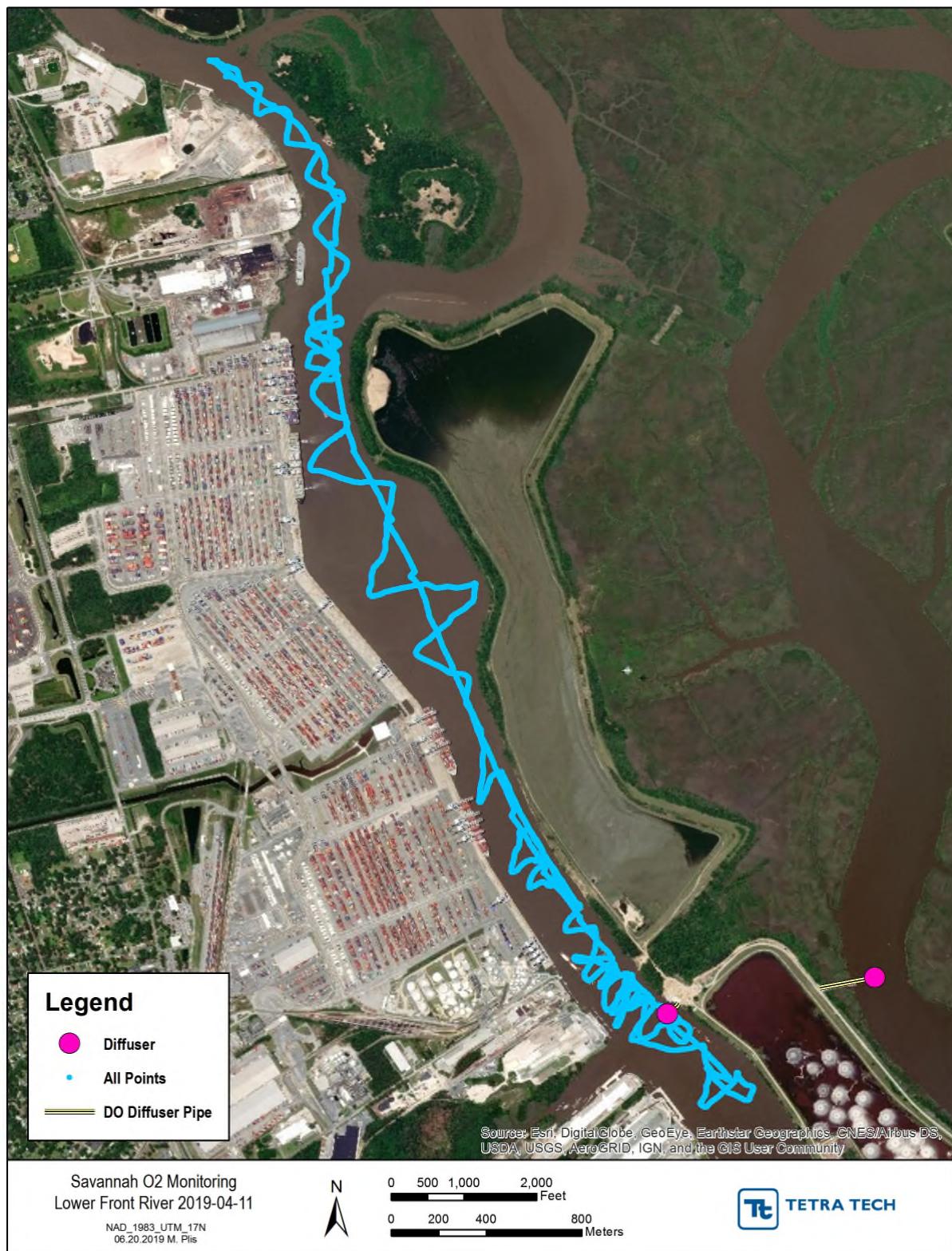
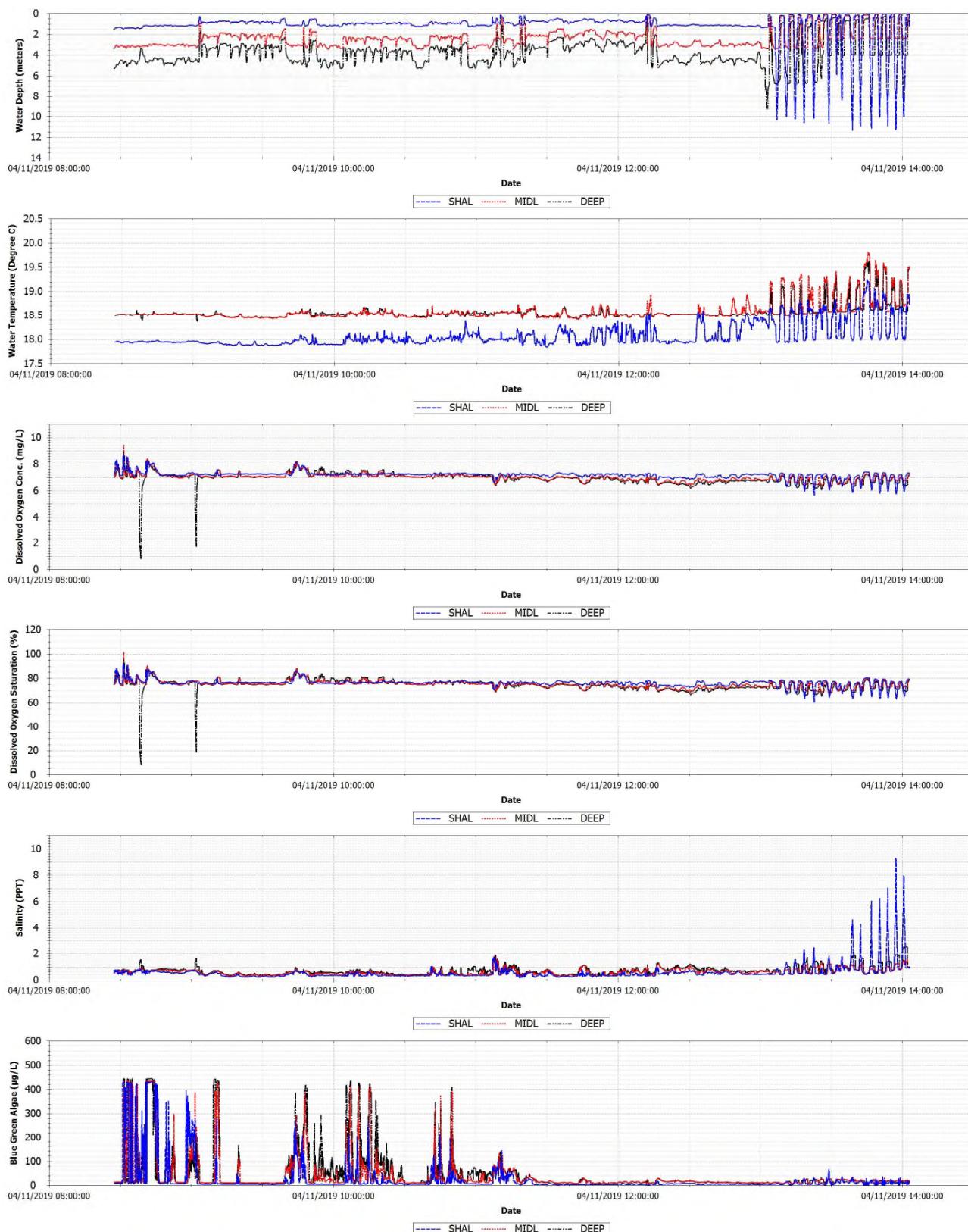


Figure D-97 Front River April 11, 2019 ebb tide dye drift location map boat 2

**Figure D-98** Front River April 11, 2019 ebb tide dye drift observations boat 2

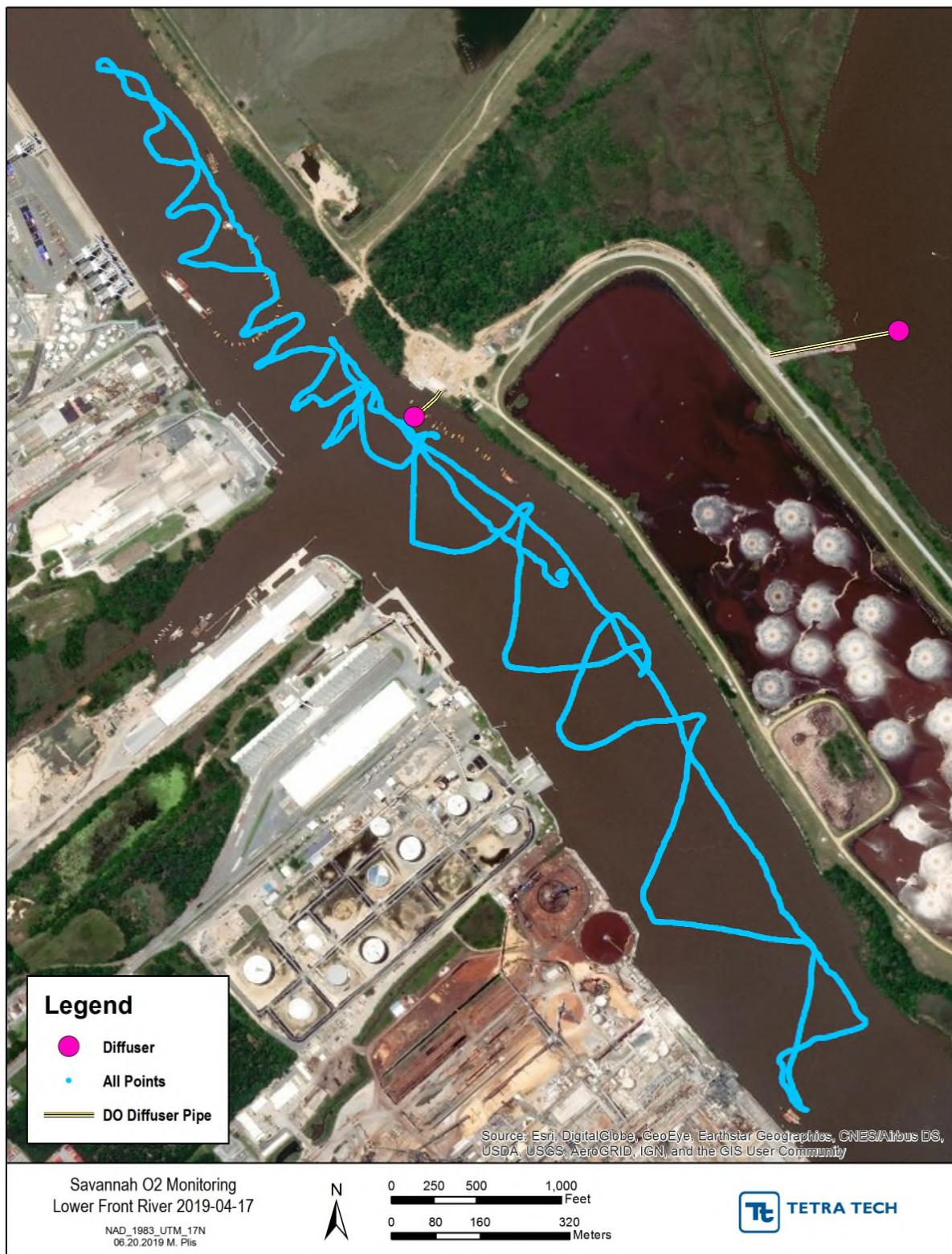


Figure D-99 Front River April 17, 2019 ebb tide drift location map

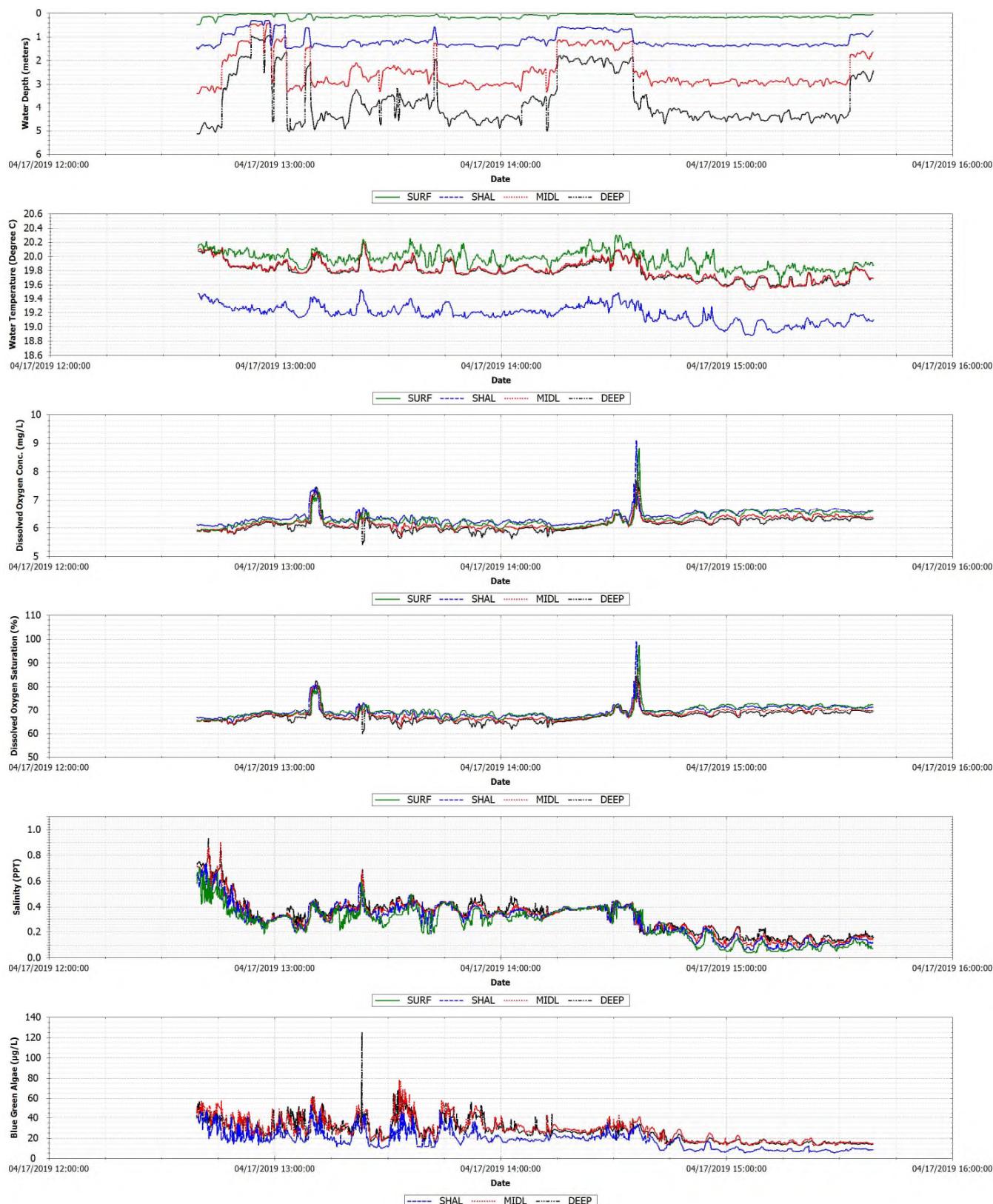
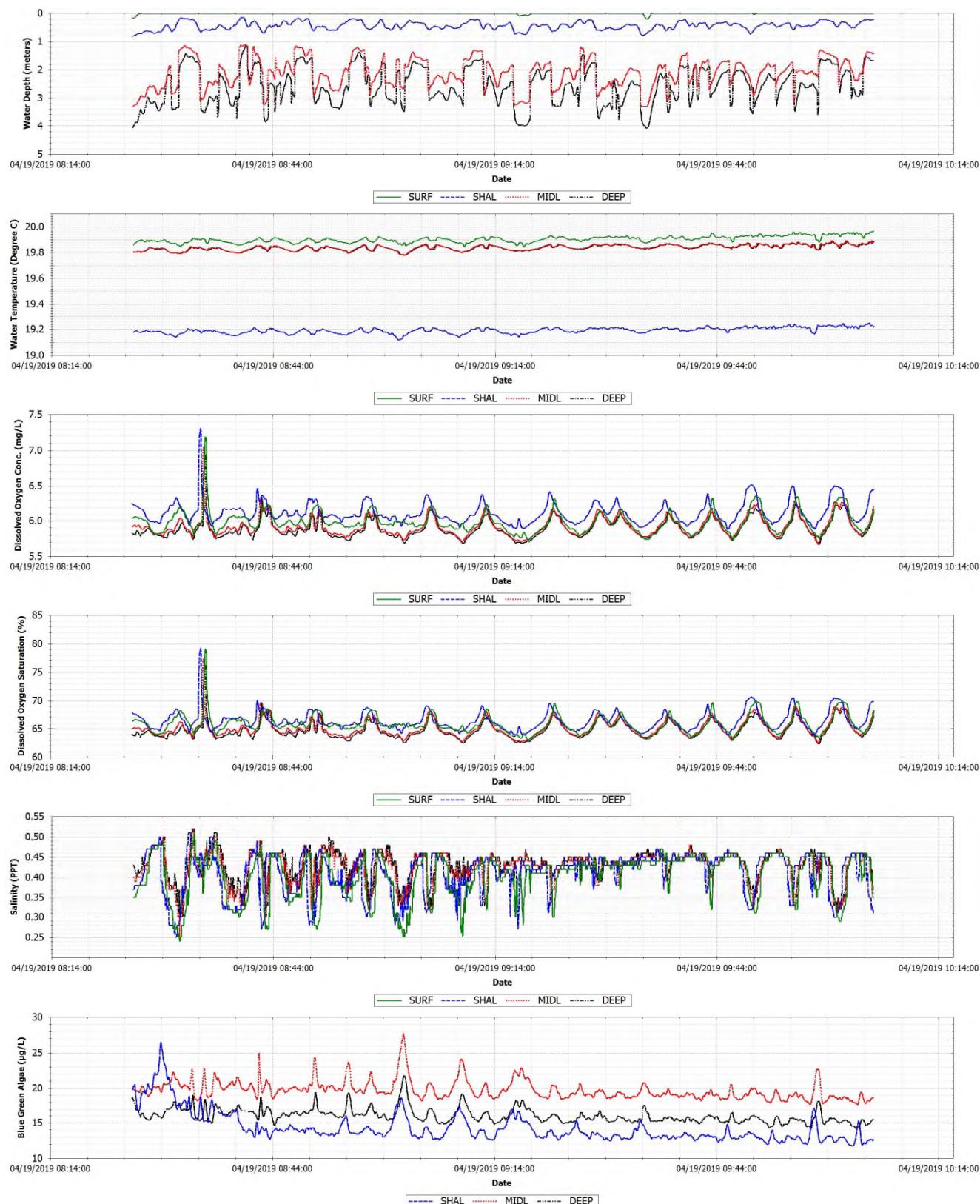
**Figure D-100** Front River April 17, 2019 ebb tide drift observations



Figure D-101 Front River April 19, 2019 flood tide drift location map

**Figure D-102** Front River April 19, 2019 flood tide drift observations

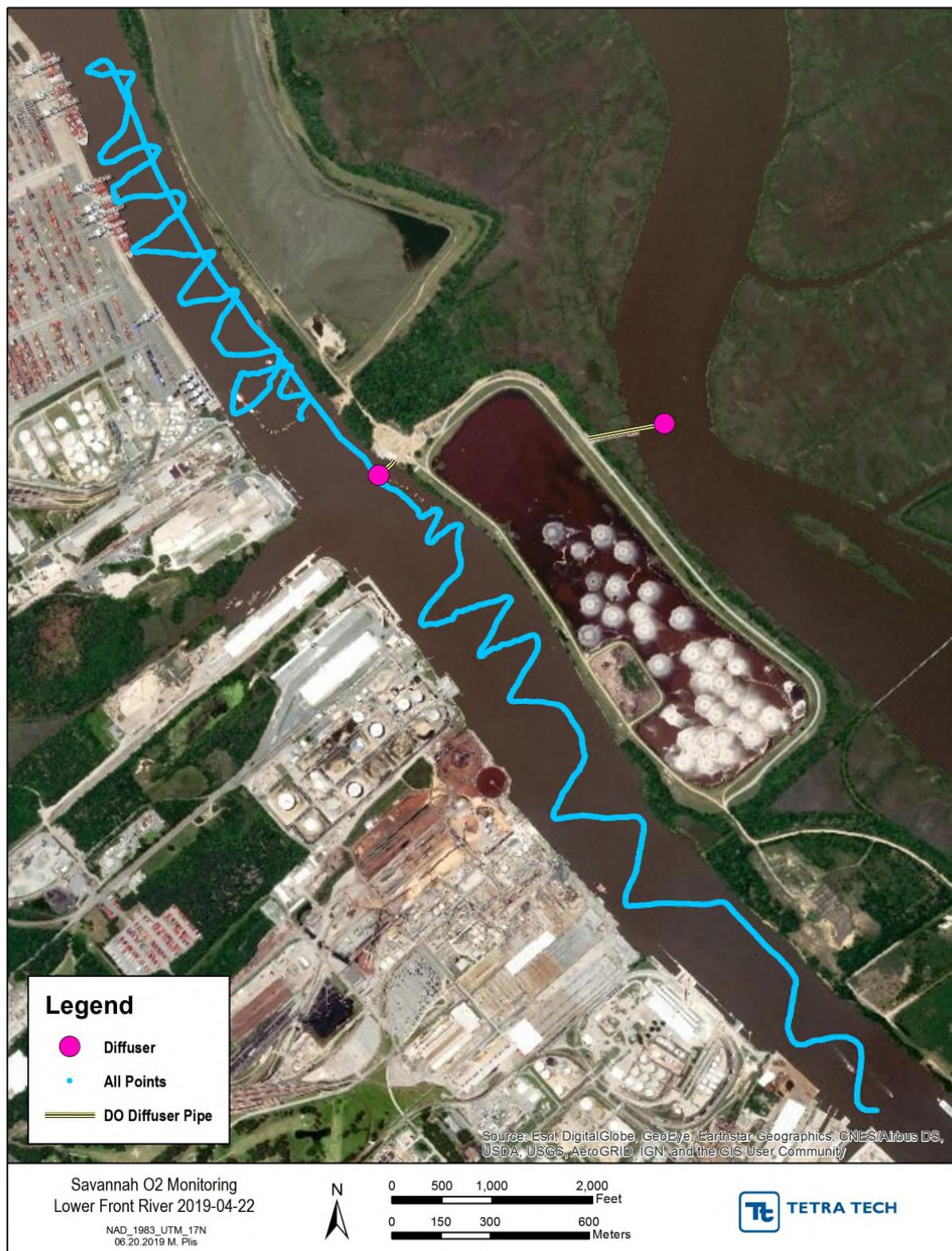
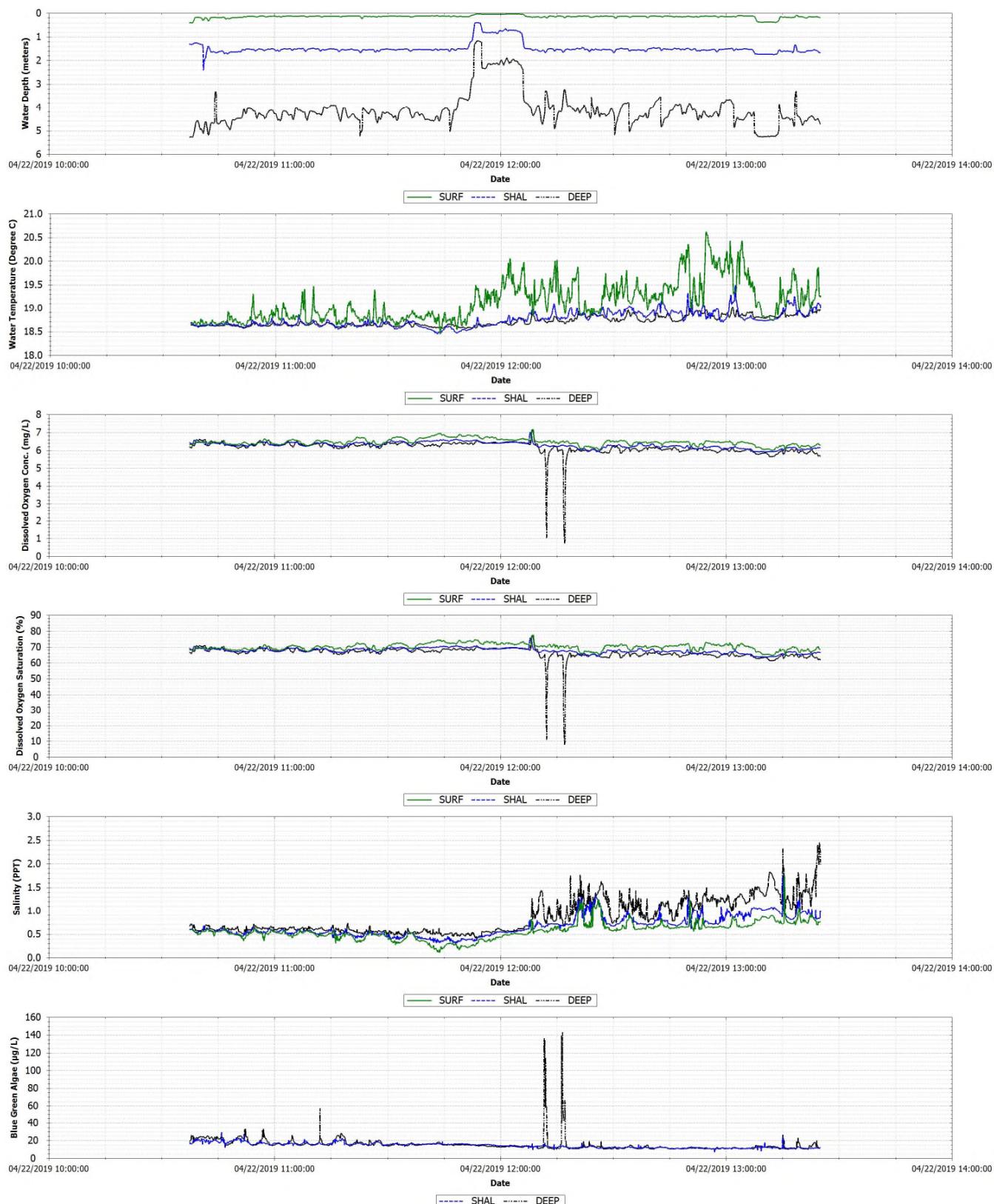


Figure D-103 Front River April 22, 2019 flood tide drift location map

**Figure D-104** Front River April 22, 2019 flood tide drift observations

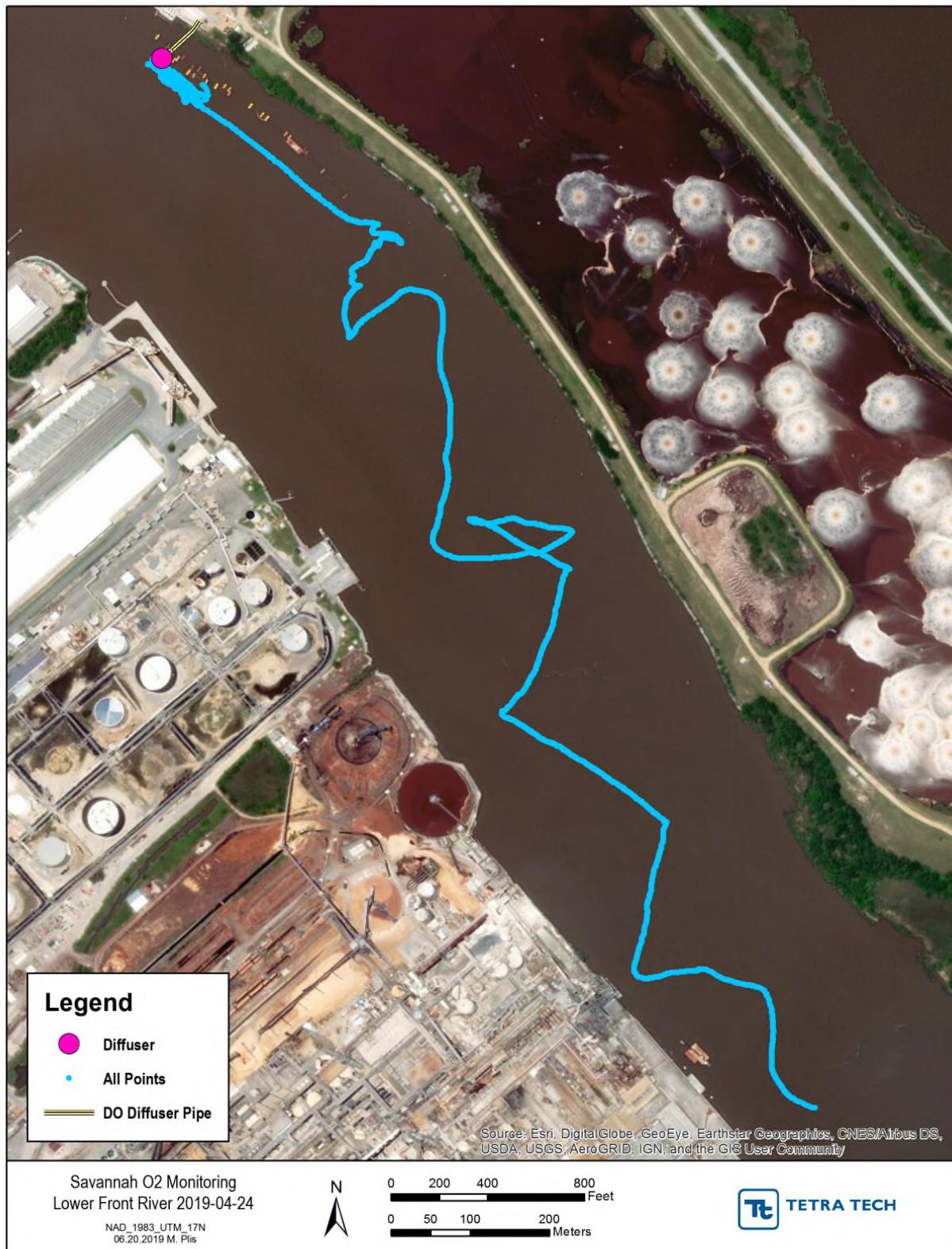
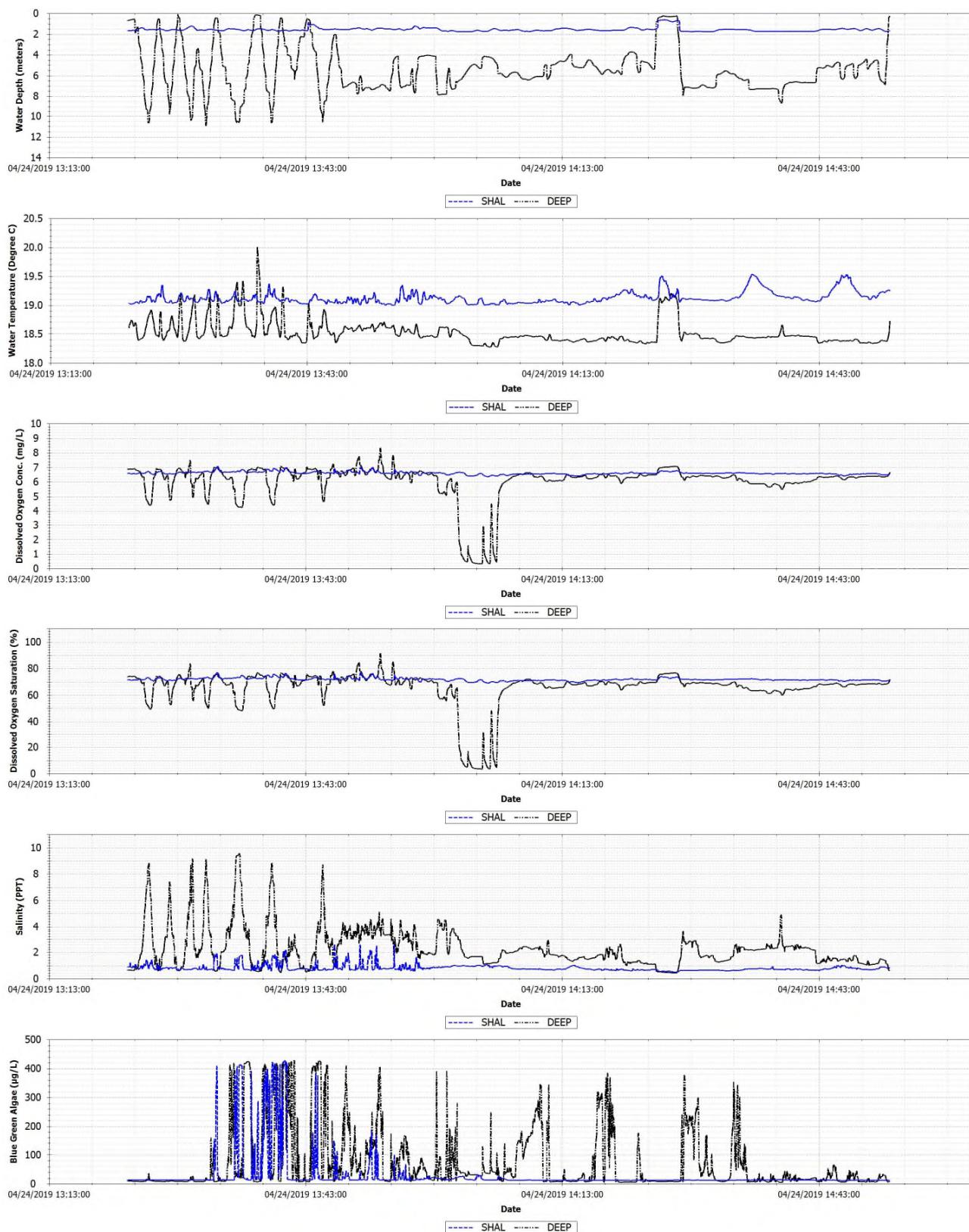


Figure D-105 Front River April 24, 2019 flood tide dye drift location map

**Figure D-106** Front River April 24, 2019 flood tide dye drift observations

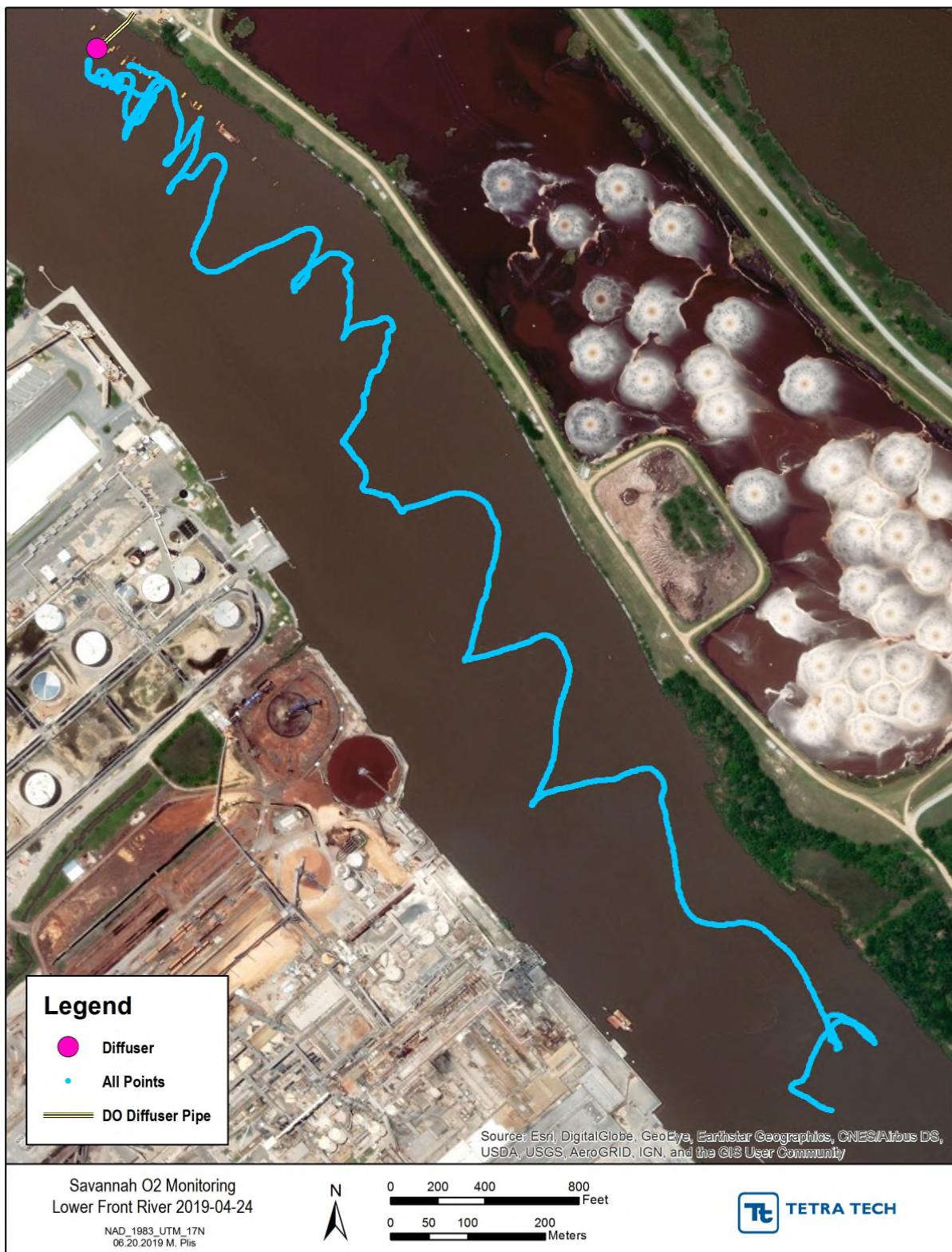


Figure D-107 Front River April 24, 2019 flood tide dye tide drift location map

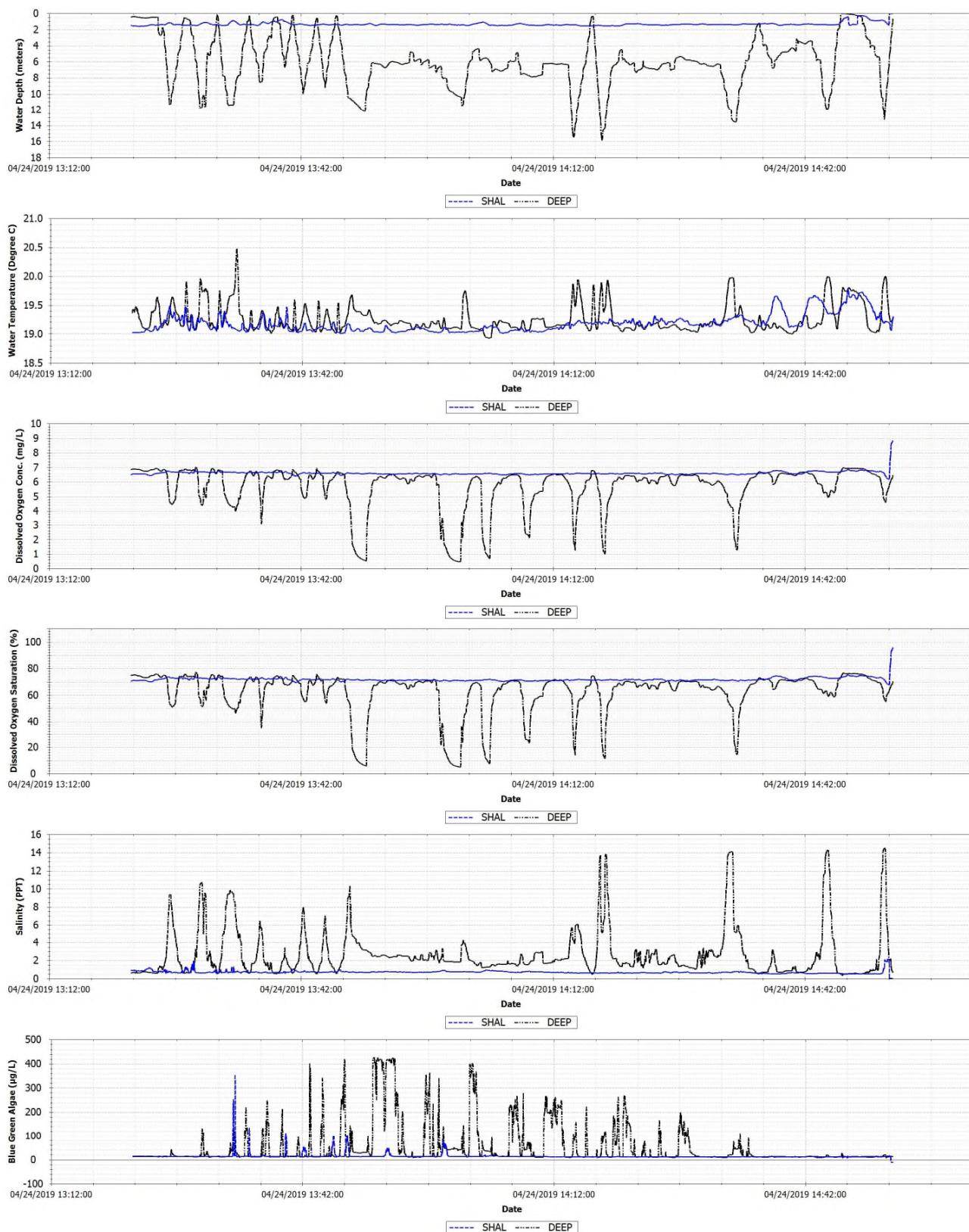


Figure D-108 Front River April 24, 2019 flood tide dye drift observations

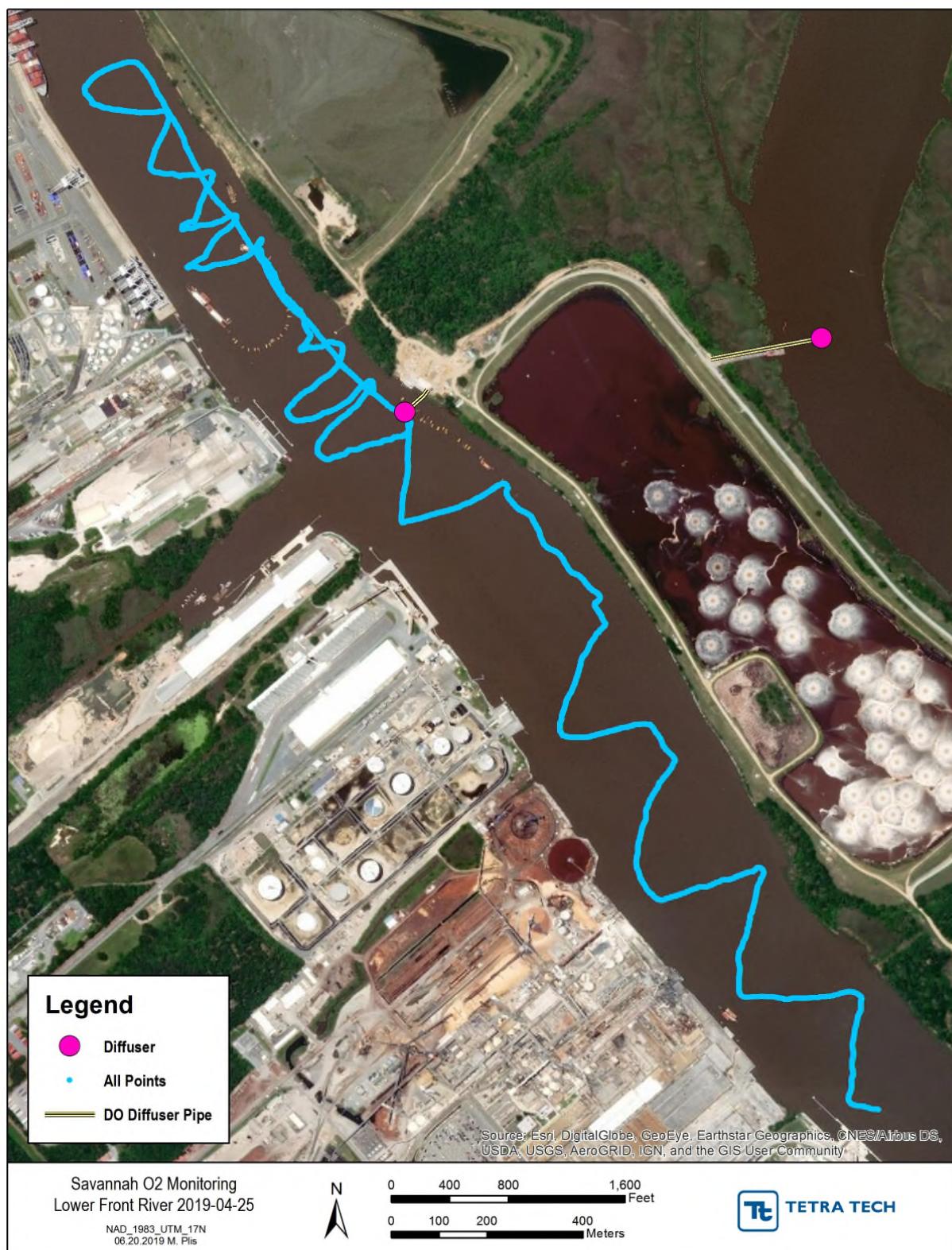
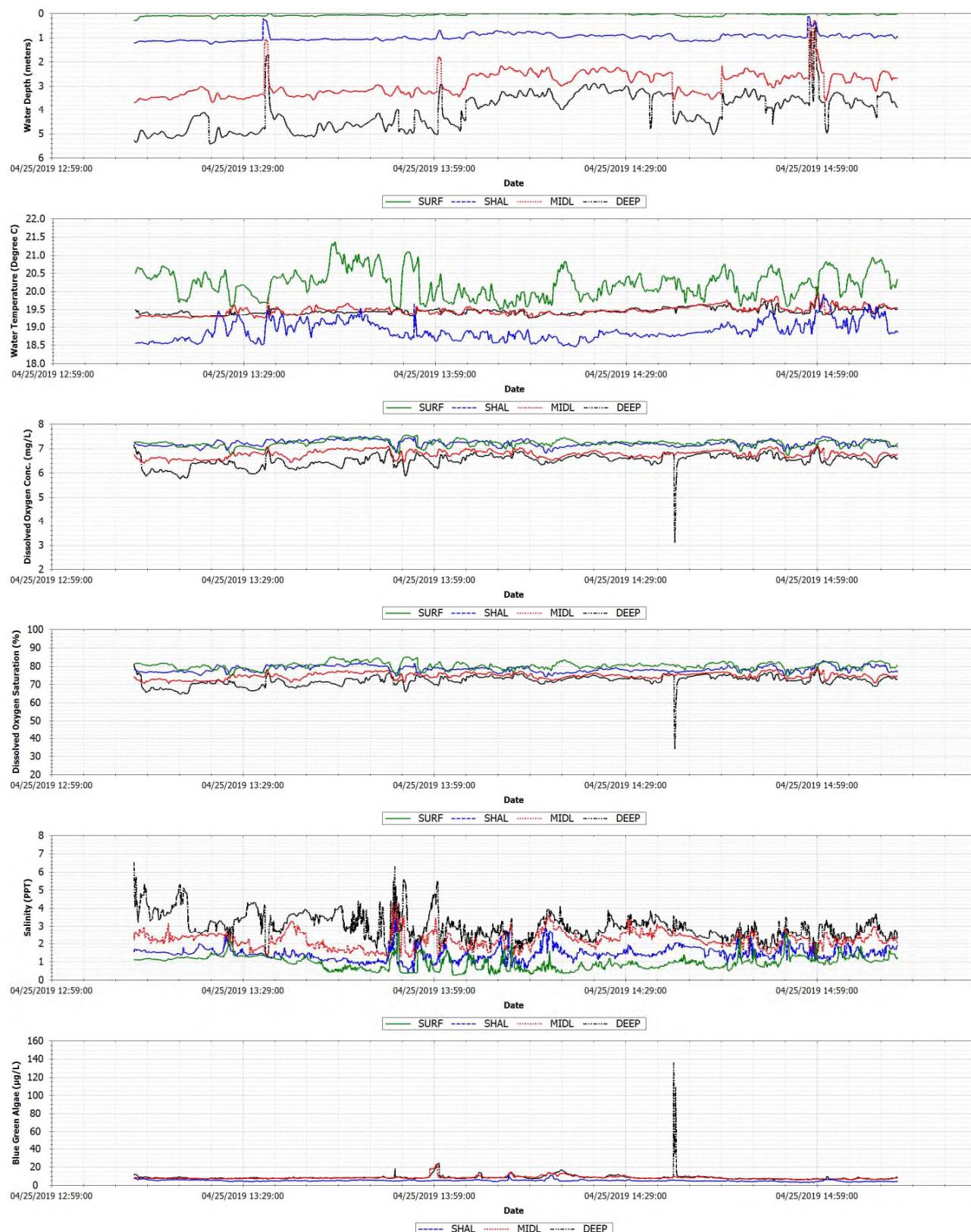


Figure D-109 Front River April 25, 2019 flood tide drift location map

**Figure D-110** Front River April 25, 2019 flood tide drift observations

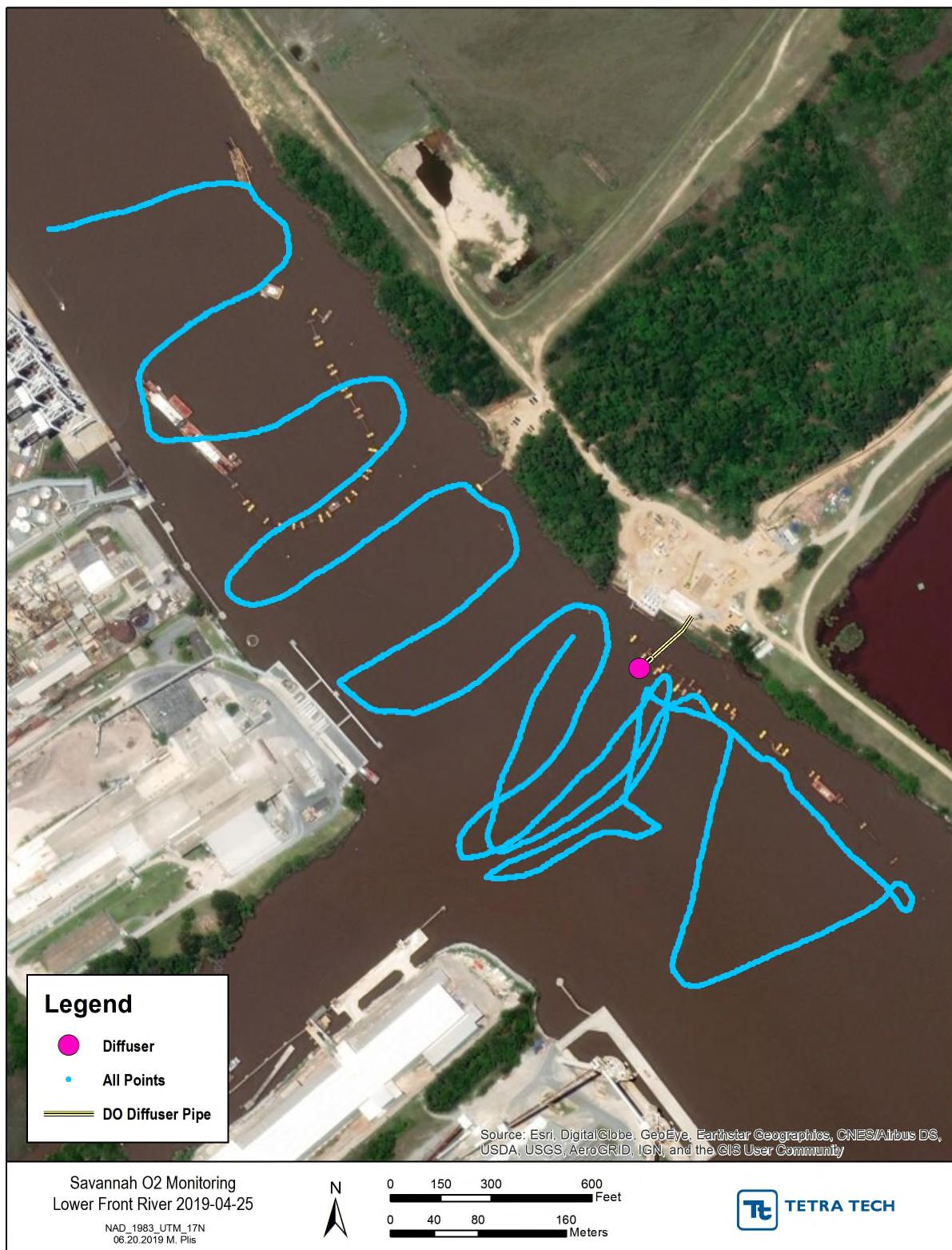
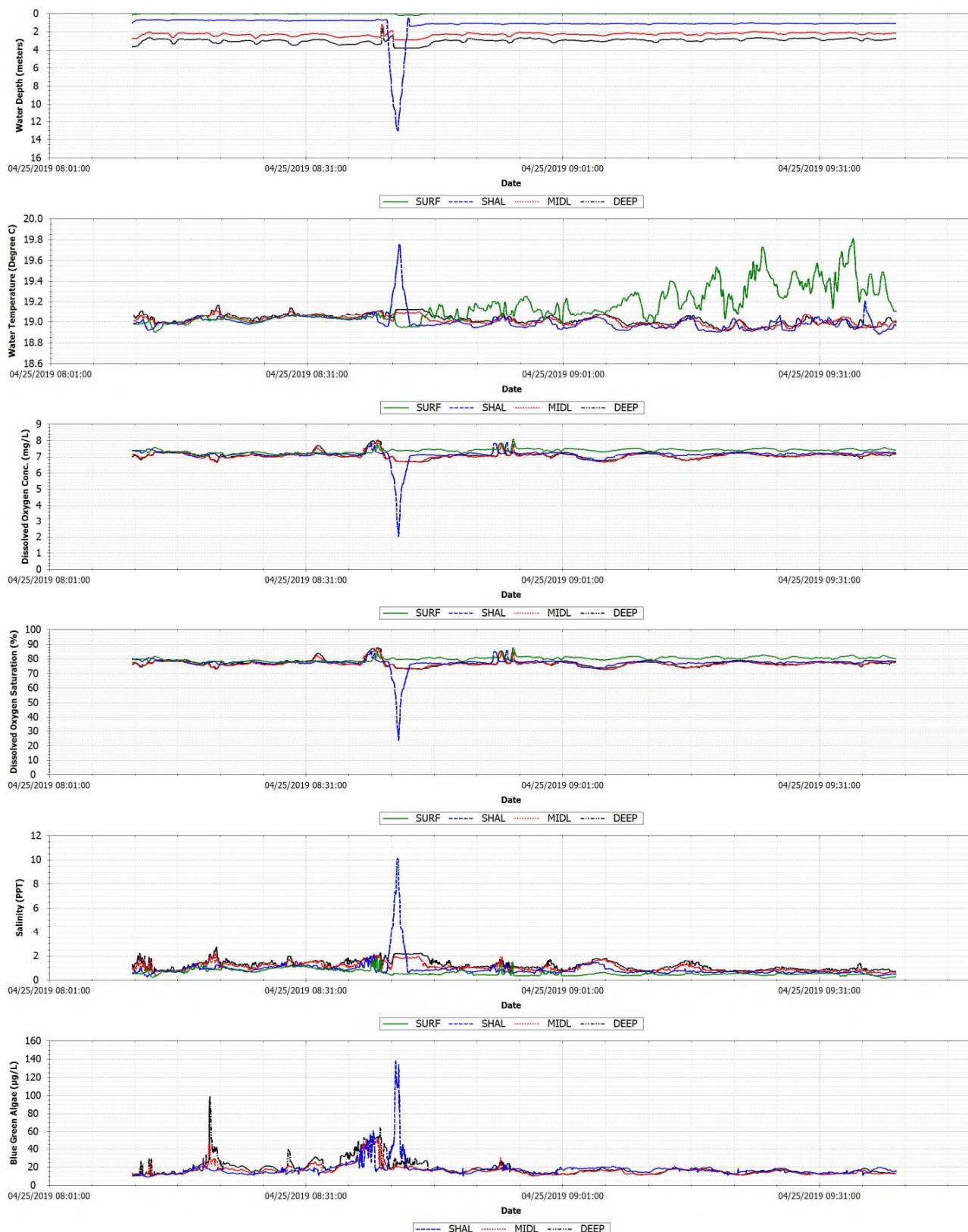


Figure D-111 Front River April 25, 2019 ebb tide drift location map

**Figure D-112** Front River April 25, 2019 ebb tide drift observations

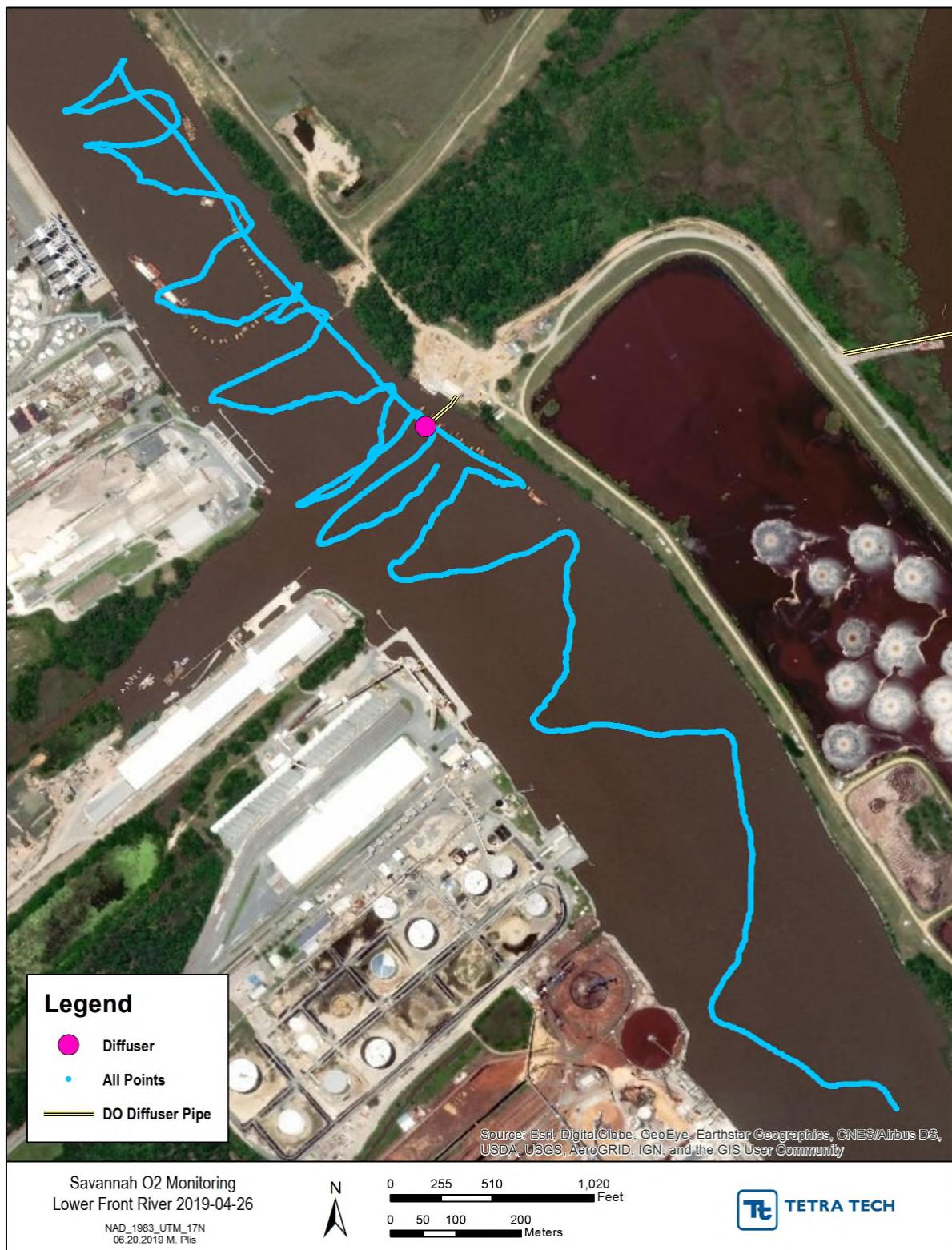
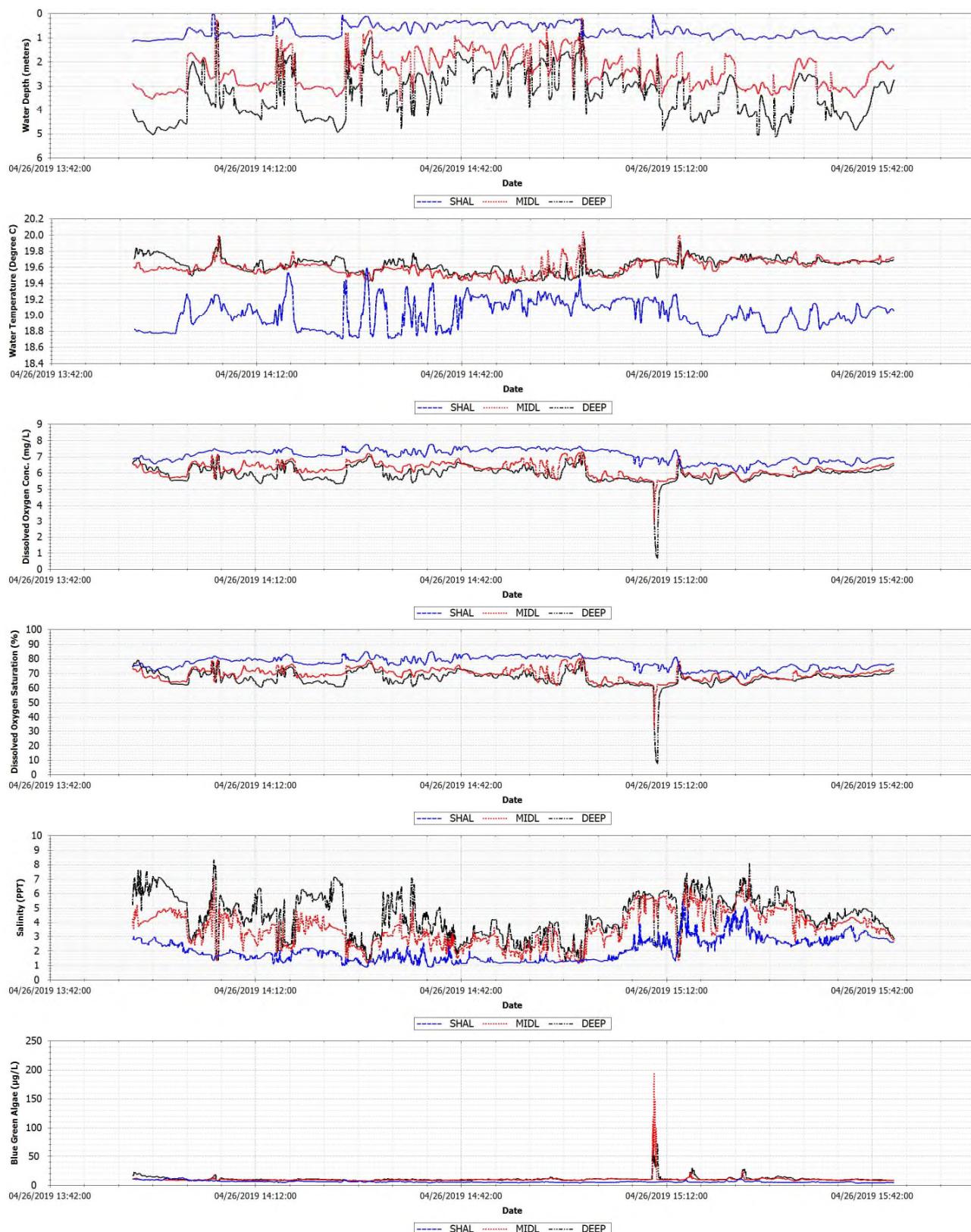


Figure D-113 Front River April 26, 2019 flood tide drift location map

**Figure D-114** Front River April 26, 2019 flood tide drift observations

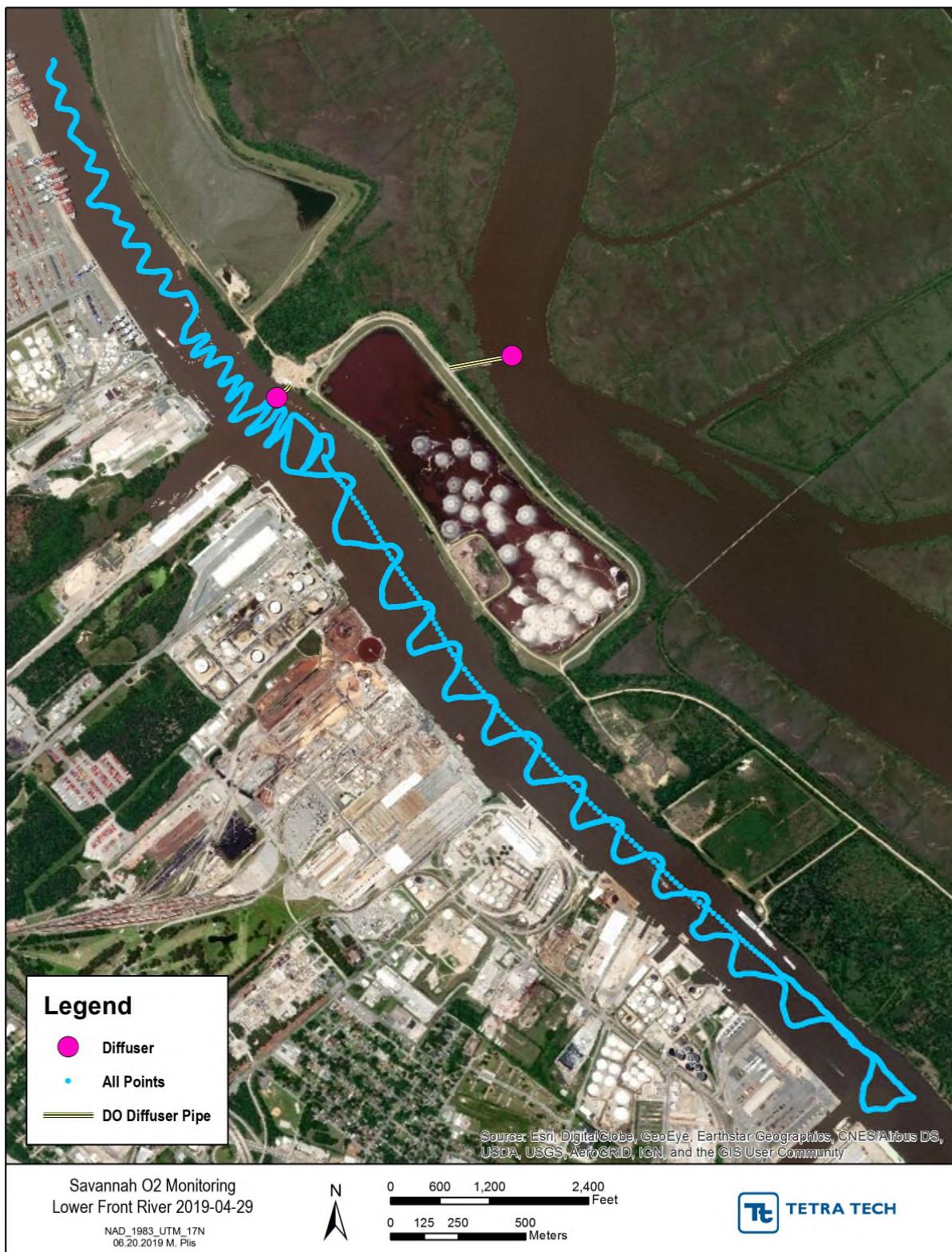
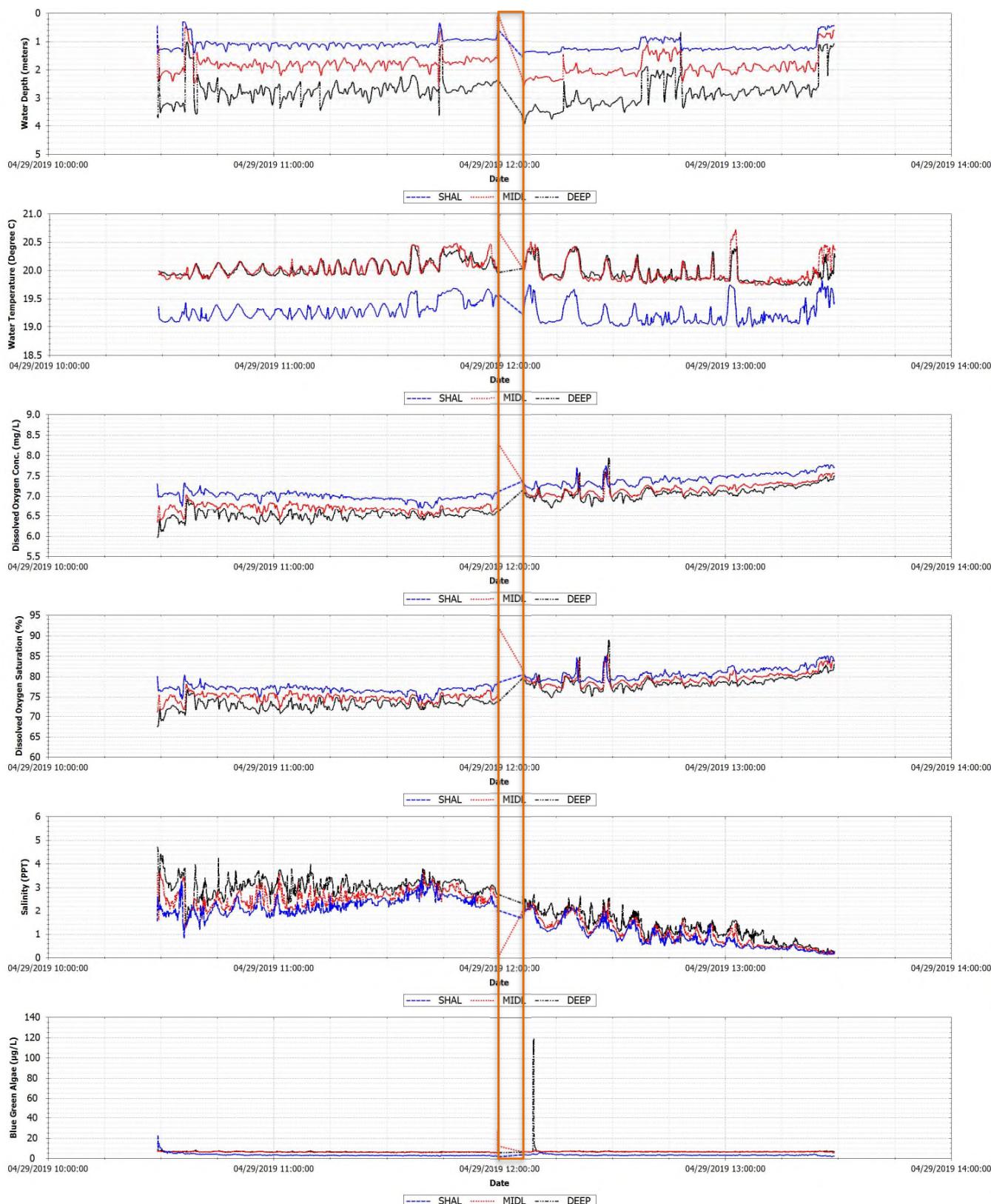


Figure D-115 Front River April 29, 2019 ebb tide drift location map



Note Orange box identifies period of data removed during QAQC process

Figure D-116 Front River April 29, 2019 ebb tide drift observations

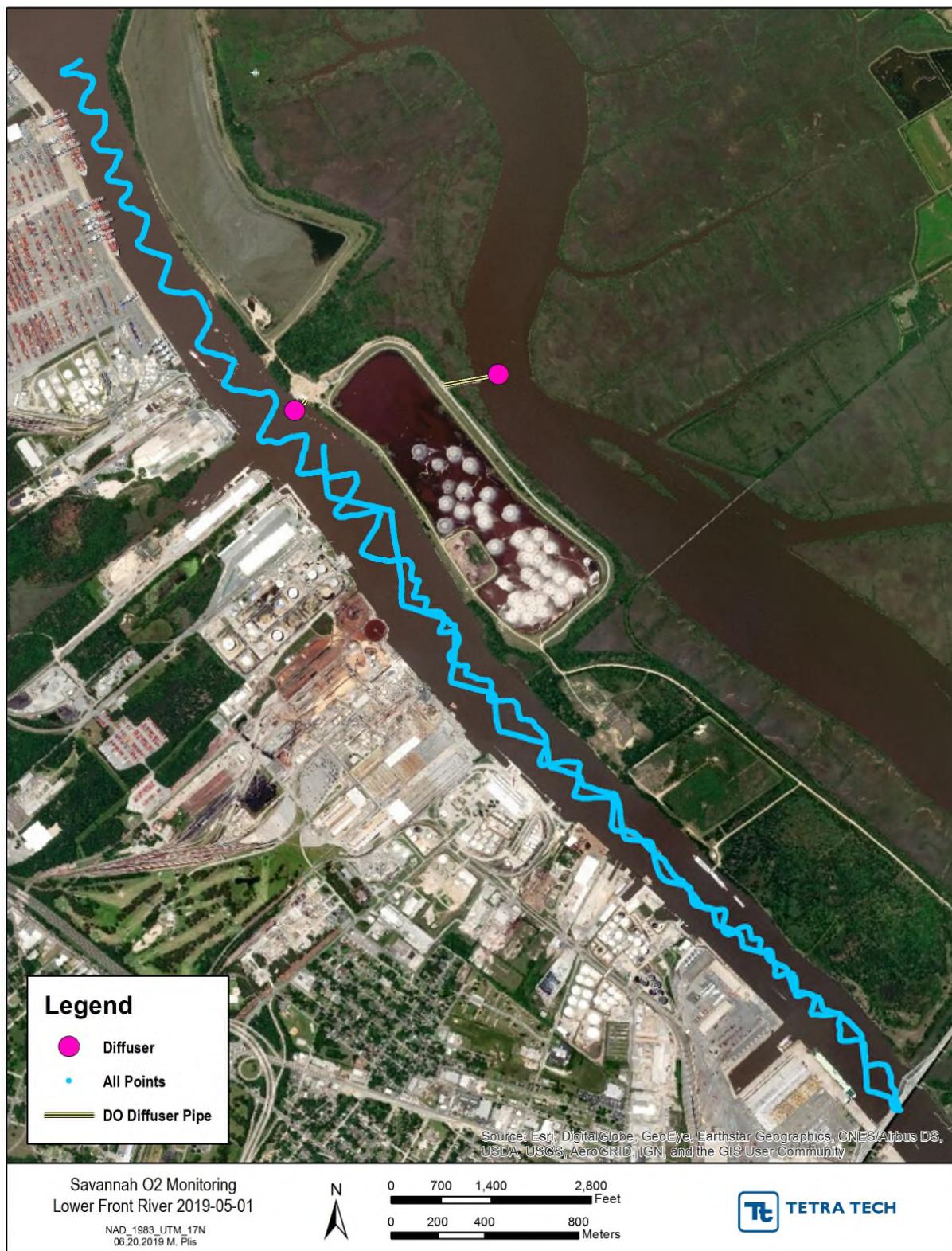
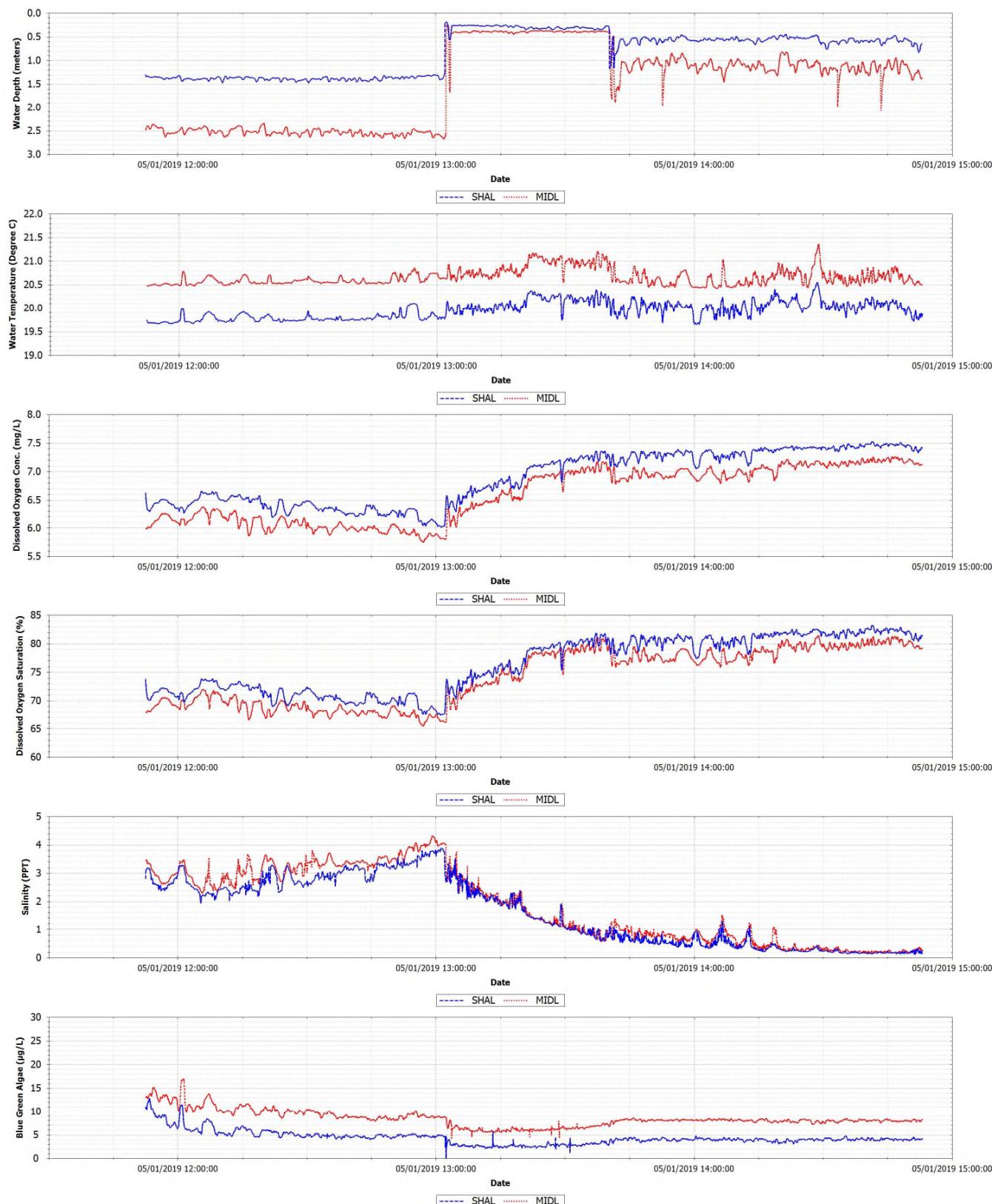


Figure D-117 Front River May 1, 2019 ebb tide drift location map

**Figure D-118** Front River May 1, 2019 ebb tide drift observations

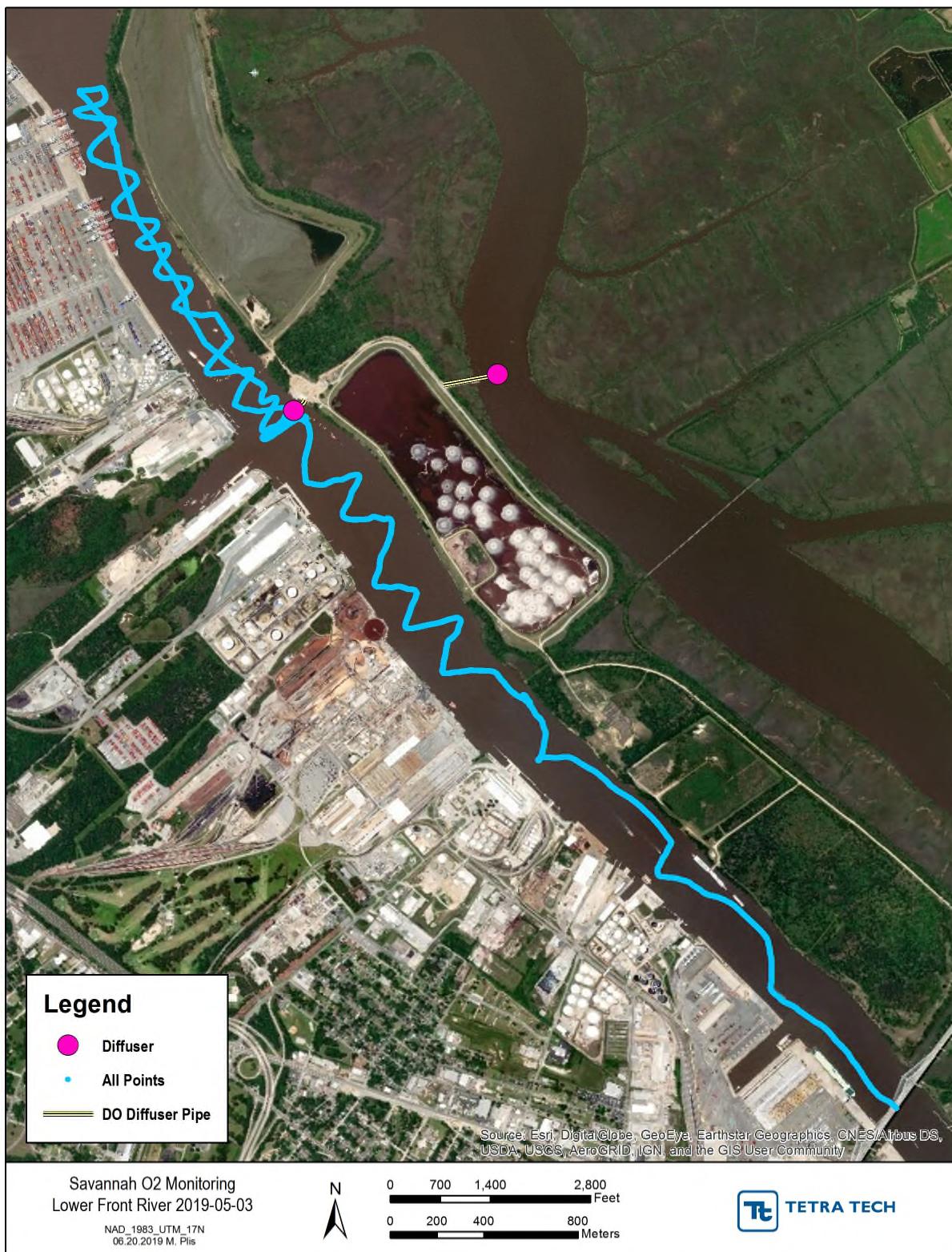


Figure D-119 Front River May 3, 2019 flood tide drift location map

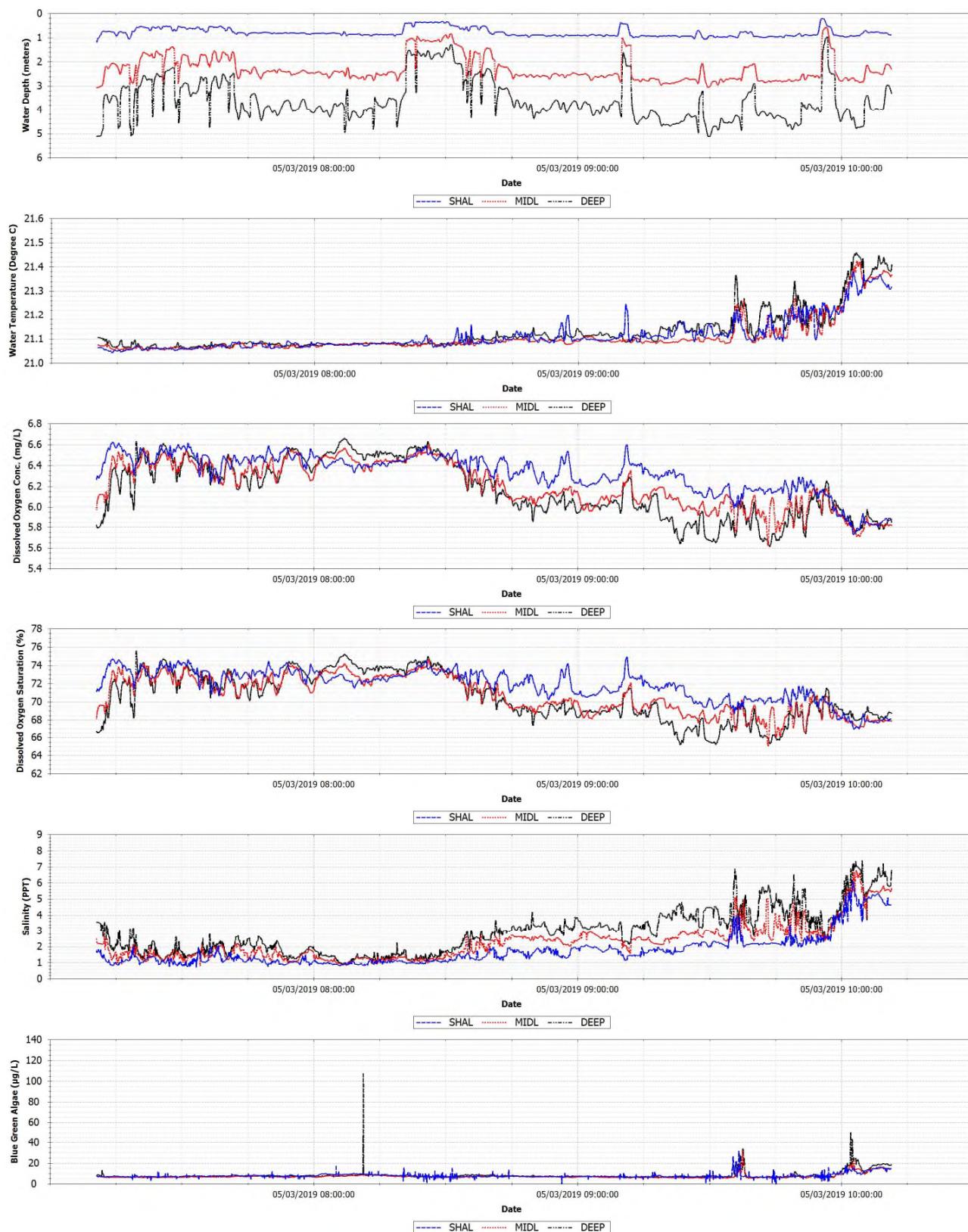
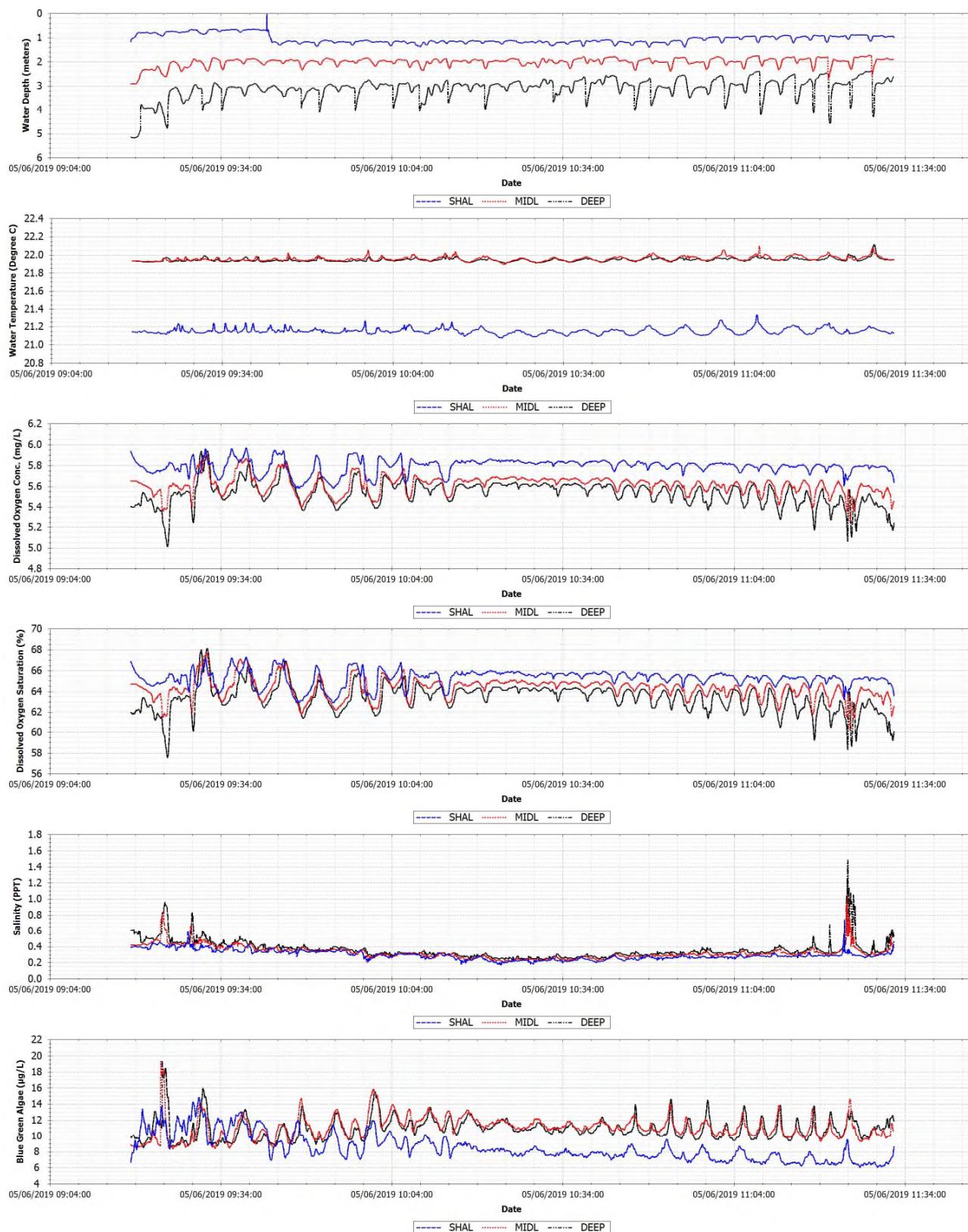
**Figure D-120** Front River May 3, 2019 flood tide drift observations



Figure D-121 Front River May 6, 2019 flood tide drift location map

**Figure D-122** Front River May 6, 2019 flood tide drift observations

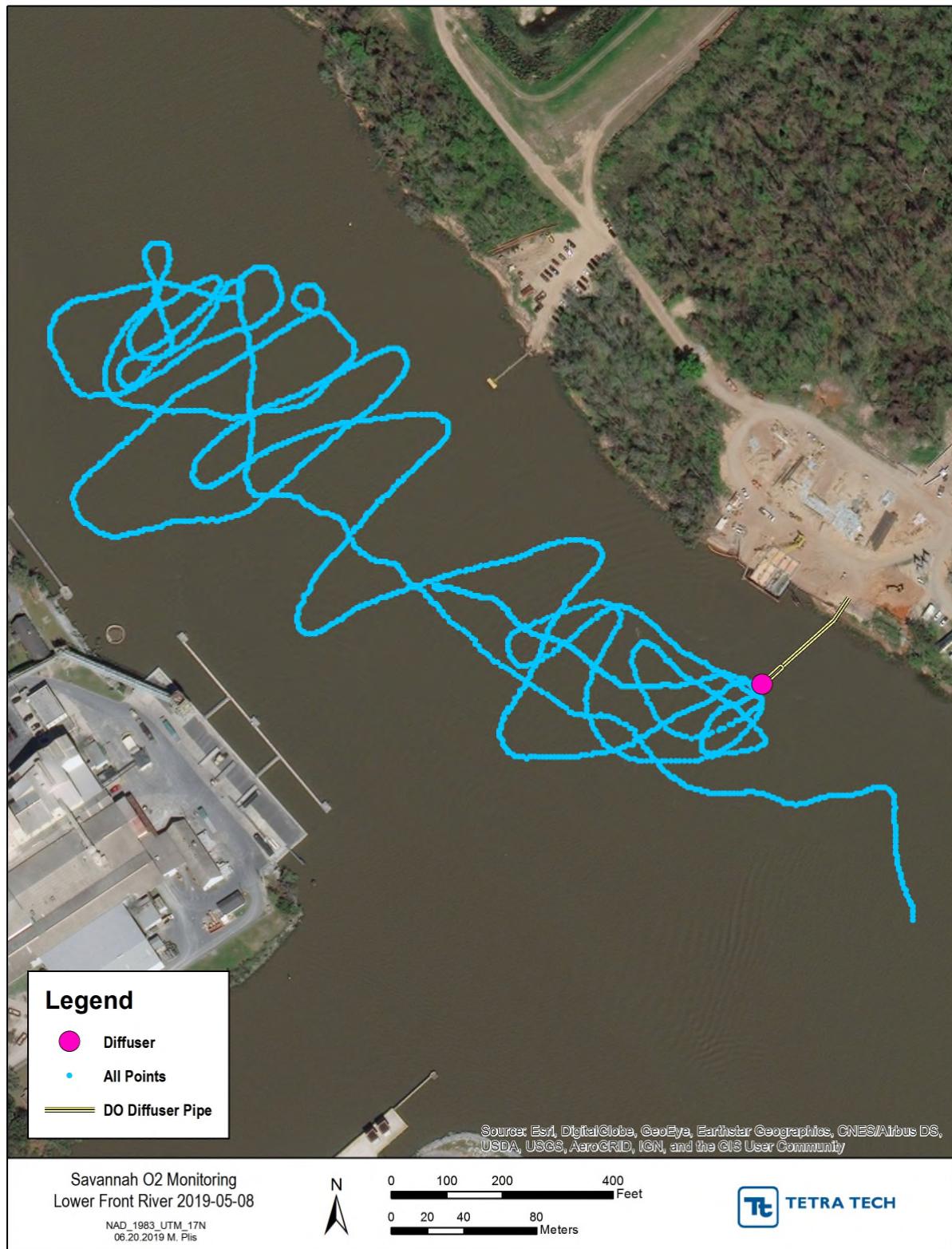


Figure D-123 Front River May 8, 2019 flood tide dye drift location map

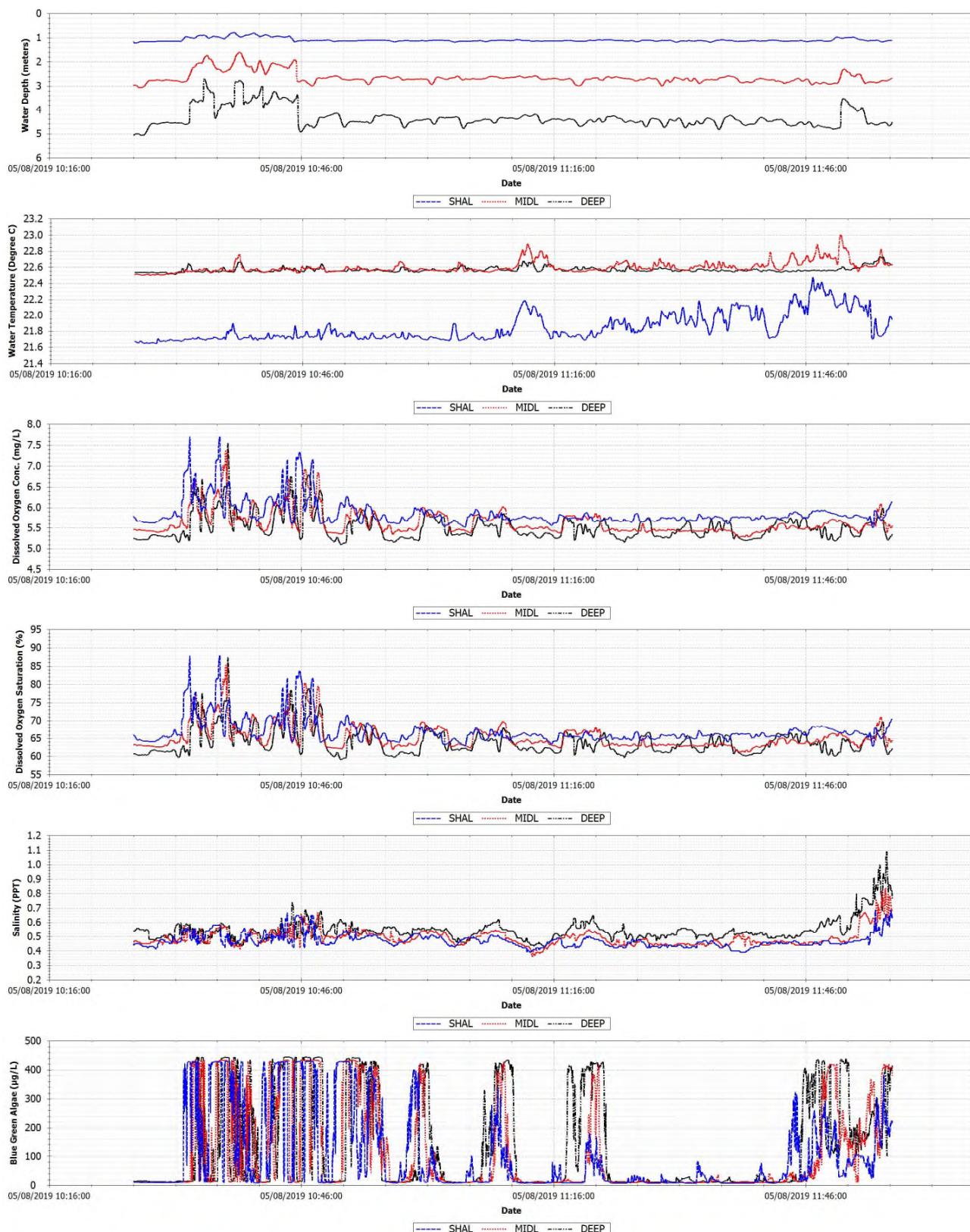
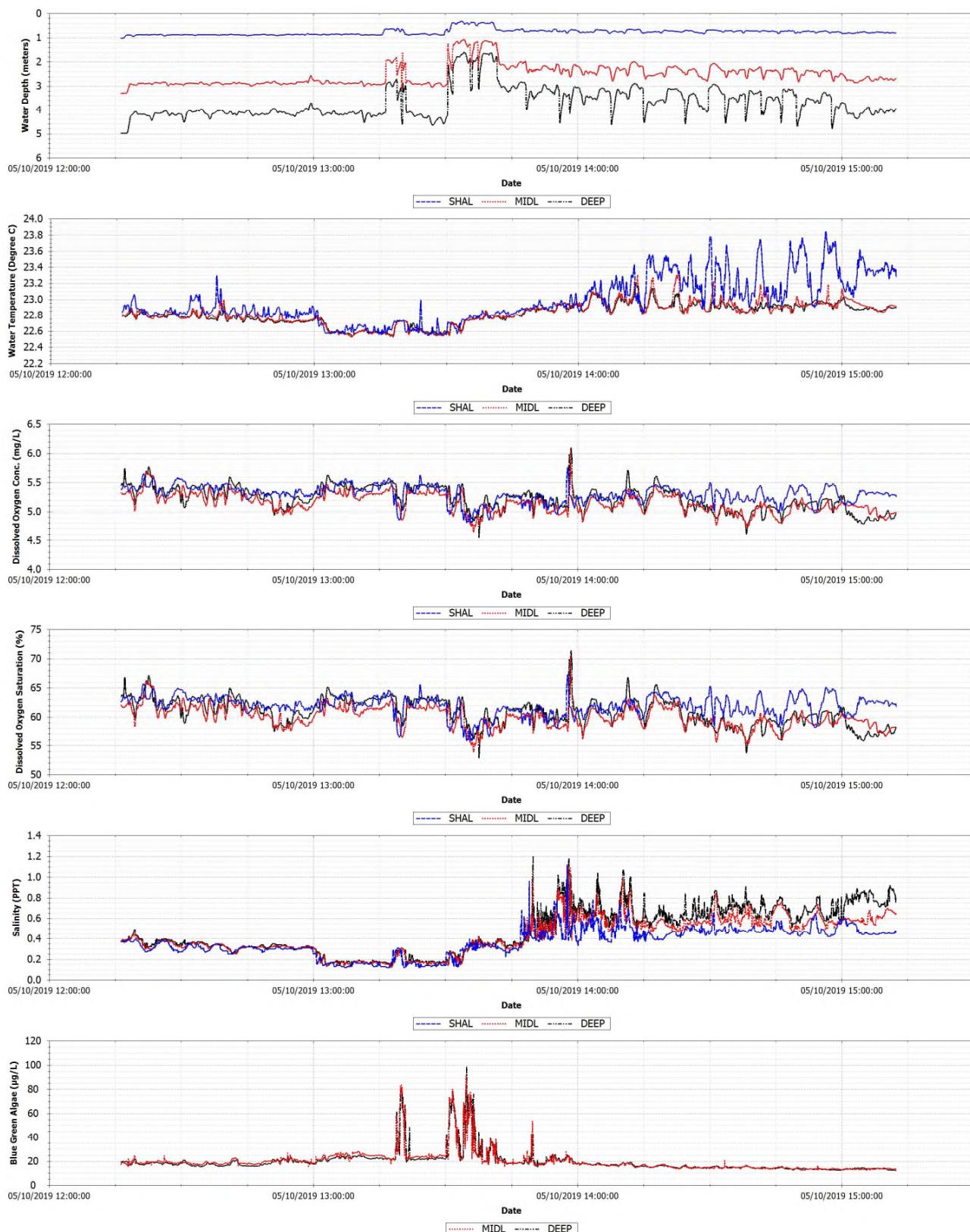
**Figure D-124** Front River May 8, 2019 flood tide dye drift observations



Figure D-125 Front River May 10, 2019 flood tide drift location map

**Figure D-126** Front River May 10, 2019 flood tide drift observations

APPENDIX E USGS DATA

Test Run Data Collection and Modeling Report

for the

Dissolved Oxygen Facility Environmental Testing

for the

Savannah Harbor Expansion Project

Contract# W912HN-15-D-0023

Tasks: 07 and 08

August 15, 2019

PREPARED FOR

**Army Corps of Engineers
Savannah District**
100 W Oglethorpe Avenue
Savannah, Georgia 31401-3640
Tel (912) 652-5026

PREPARED BY

LG2 Environmental Solutions, Inc.
10475 Fortune Parkway, Suite 201
Jacksonville, Florida 32256
Tel (904) 288-8631

Tetra Tech, Inc.
1899 Powers Ferry Rd SE, Suite 400
Atlanta, Georgia 30339
Tel (770) 738-6030

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E.1 DEFINITIONS AND LOCATION MAP

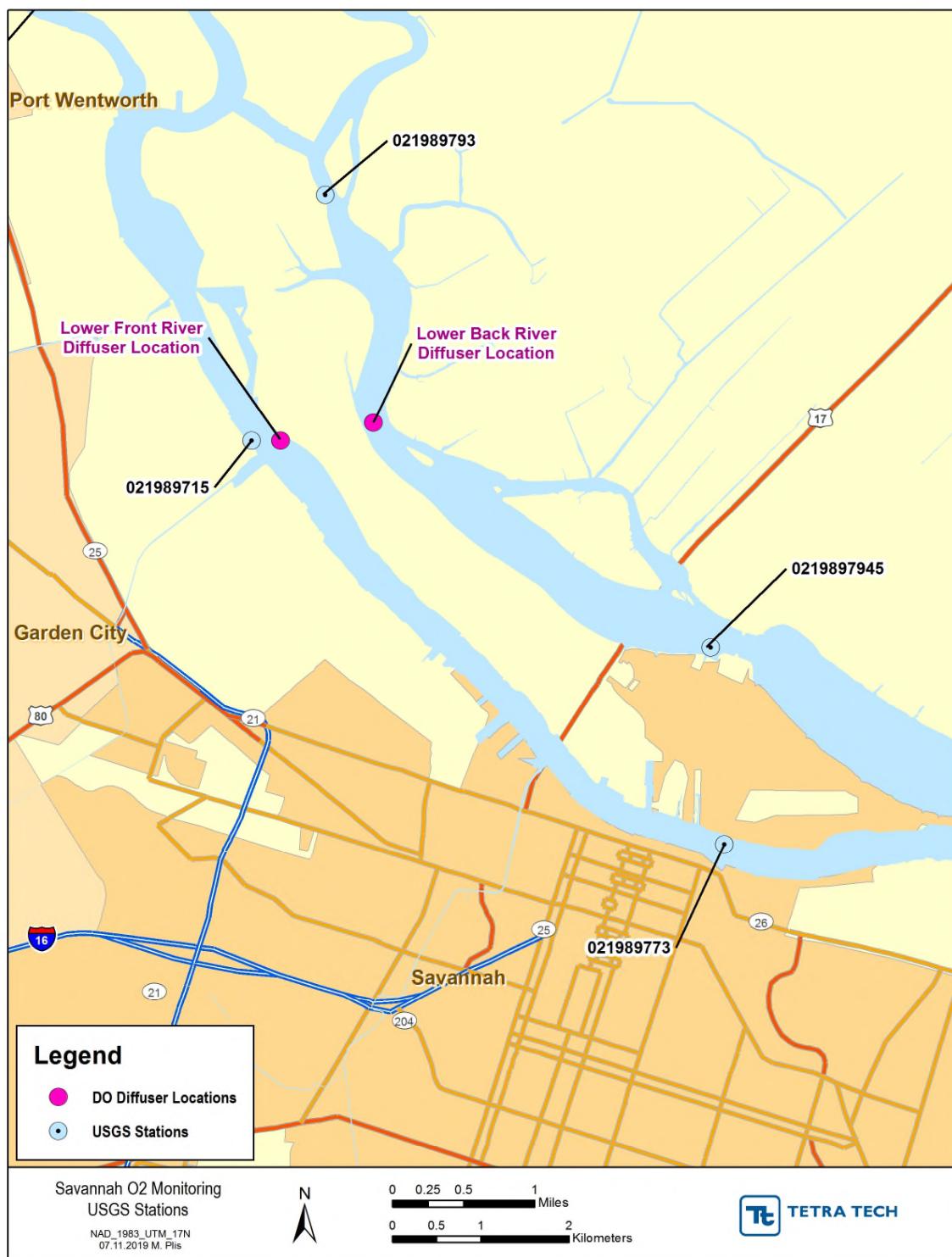


Figure E-1 Location of USGS gages used for Test Run sampling

Table E-1 Attributes of semi-permanent buoys used for the test run data collection

Station ID	Description
021989793	Little Back River at Hog Island, near Savannah, GA
0219897945	Back River 0.4 miles downstream US17, near Savannah, GA
021989715	Savannah River at Garden City, GA
021989773	Savannah River at USACE Dock, at Savannah, GA

Table E-2 Definitions of abbreviations

Abbreviation	Definition
BARO	barometric pressure
BGA_R	blue green algae concentration (surrogate for dye)
DOSAT	dissolved oxygen percent saturation
DOSAT (-23.28ft, NAVD88)	dissolved oxygen percent saturation [sampled at elevation -23.28ft, NAVD88]
DOSAT (-13.25ft NAVD88)	dissolved oxygen percent saturation [sampled at elevation -13.25ft NAVD88]
DO	dissolved oxygen, water, unfiltered
DO (-23.28ft, NAVD88)	dissolved oxygen, water, unfiltered [sampled at elevation -23.28ft, NAVD88]
DO (-13.25ft NAVD88)	dissolved oxygen, water, unfiltered [sampled at elevation -13.25ft NAVD88]
DEPTH	depth of sensor below water surface
FLOW	discharge
GH	gage height
pH	pH, water, unfiltered
pH (-13.25ft NAVD88)	pH, water, unfiltered [sampled at elevation -13.25ft NAVD88]
SAL	salinity, unfiltered
SAL (-23.28ft, NAVD88)	salinity, unfiltered [sampled at elevation -23.28ft, NAVD88]
SAL (-13.25ft NAVD88)	salinity, unfiltered [sampled at elevation -13.25ft NAVD88]
SPCOND	specific conductance, water, unfiltered, at 25 degrees Celsius
SPCOND (-23.28ft, NAVD88)	specific conductance, water, unfiltered, at 25 degrees Celsius [sampled at elevation -23.28ft, NAVD88]
SPCOND (-13.25ft NAVD88)	specific conductance, water, unfiltered, at 25 degrees Celsius [sampled at elevation -13.25ft NAVD88]
TURB	turbidity, water, unfiltered, monochrome near infra-red LED light, 780-900 nm, detection angle 90 +/- 2.5 degrees
TURB (-13.25ft NAVD88)	turbidity, water, unfiltered, monochrome near infra-red LED light, 780-900 nm, detection angle 90 +/- 2.5 degrees [sampled at elevation -13.25ft NAVD88]
VEL	mean water velocity
WTEMP	temperature, water
WTEMP (-23.28ft, NAVD88)	Temperature, water [sampled at elevation -23.28ft, NAVD88]
WTEMP (-13.25ft NAVD88)	Temperature, water [sampled at elevation -13.25ft NAVD88]

E.2 USGS 021989715 – GARDEN CITY – FRONT RIVER

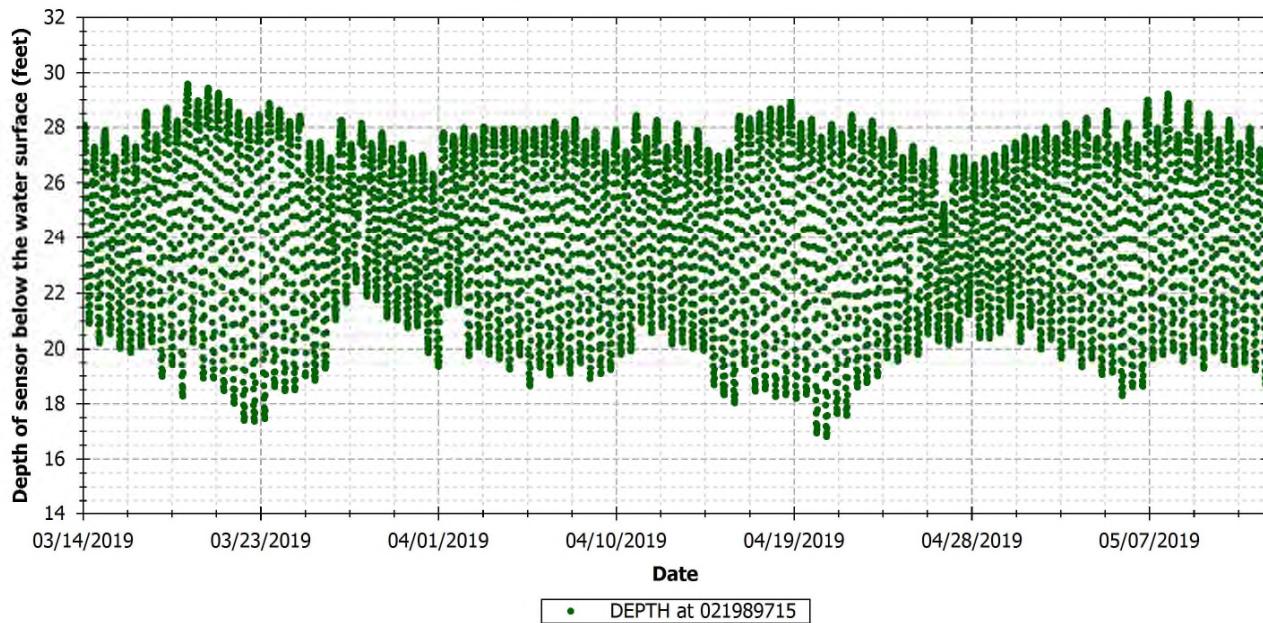


Figure E-2 USGS 021989715 (Front River) observed depth

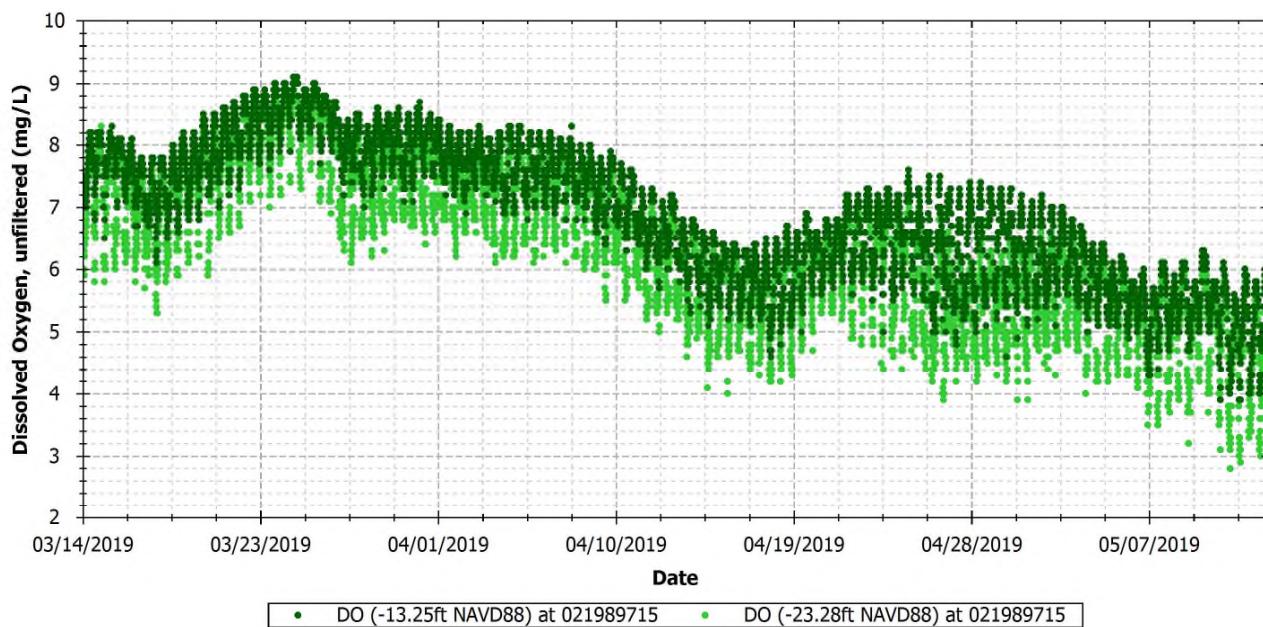


Figure E-3 USGS 021989715 (Front River) observed DO concentration

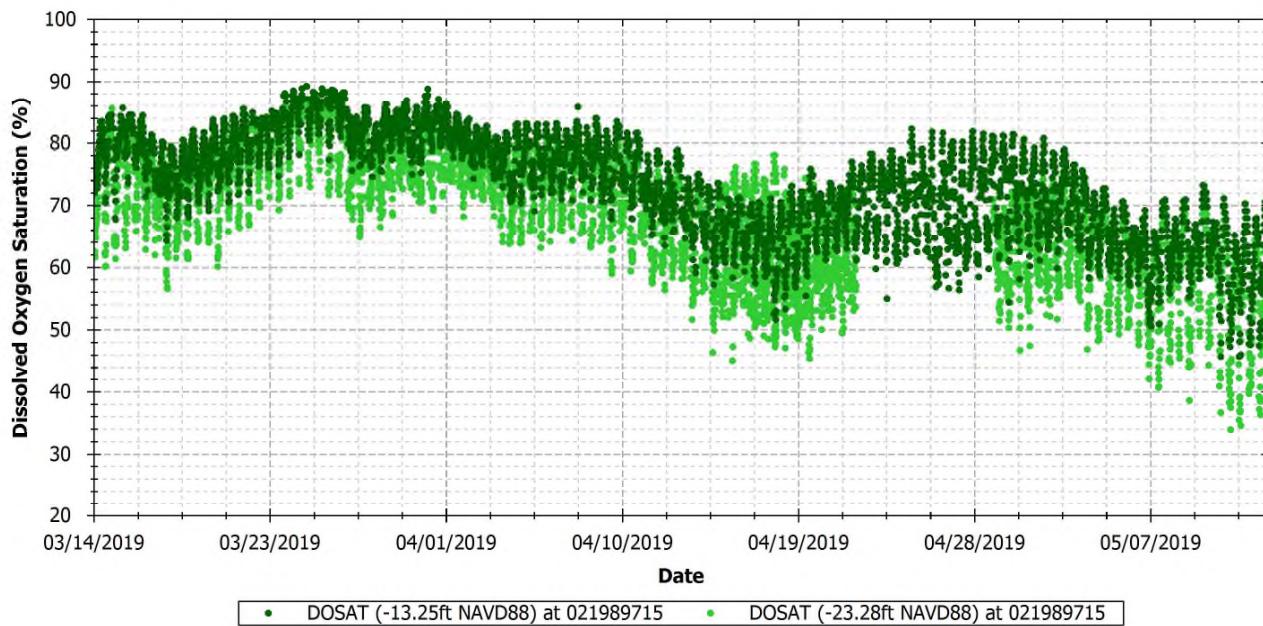


Figure E-4 USGS 021989715 (Front River) calculated DO saturation

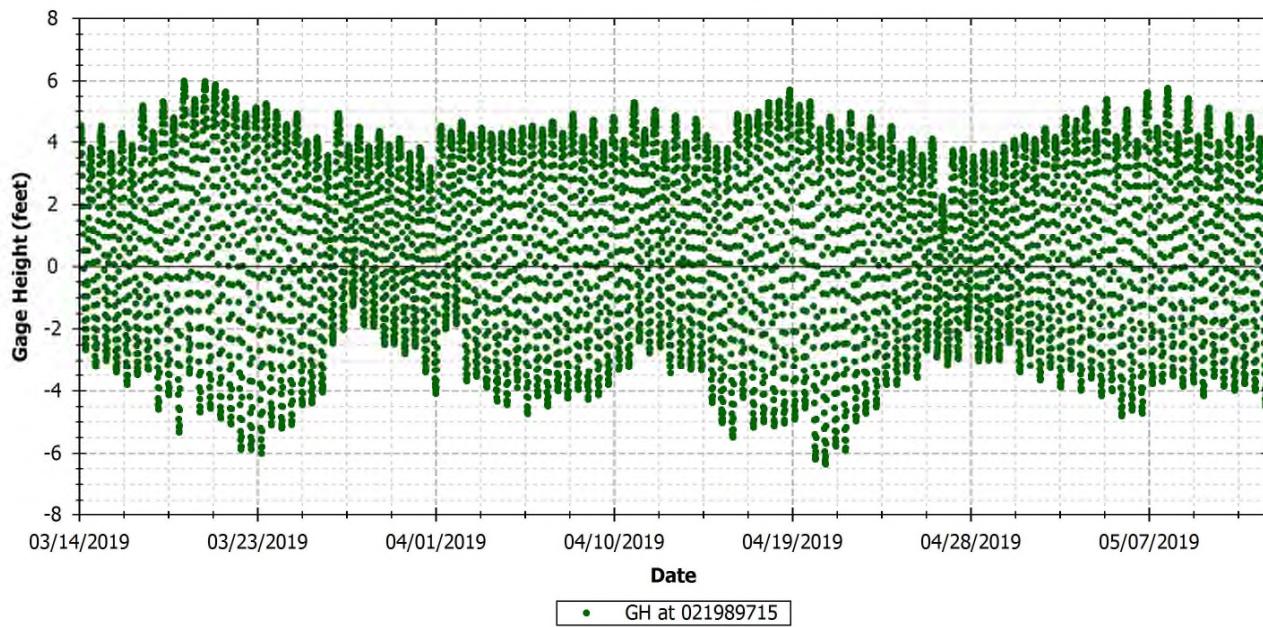


Figure E-5 USGS 021989715 (Front River) observed gage height

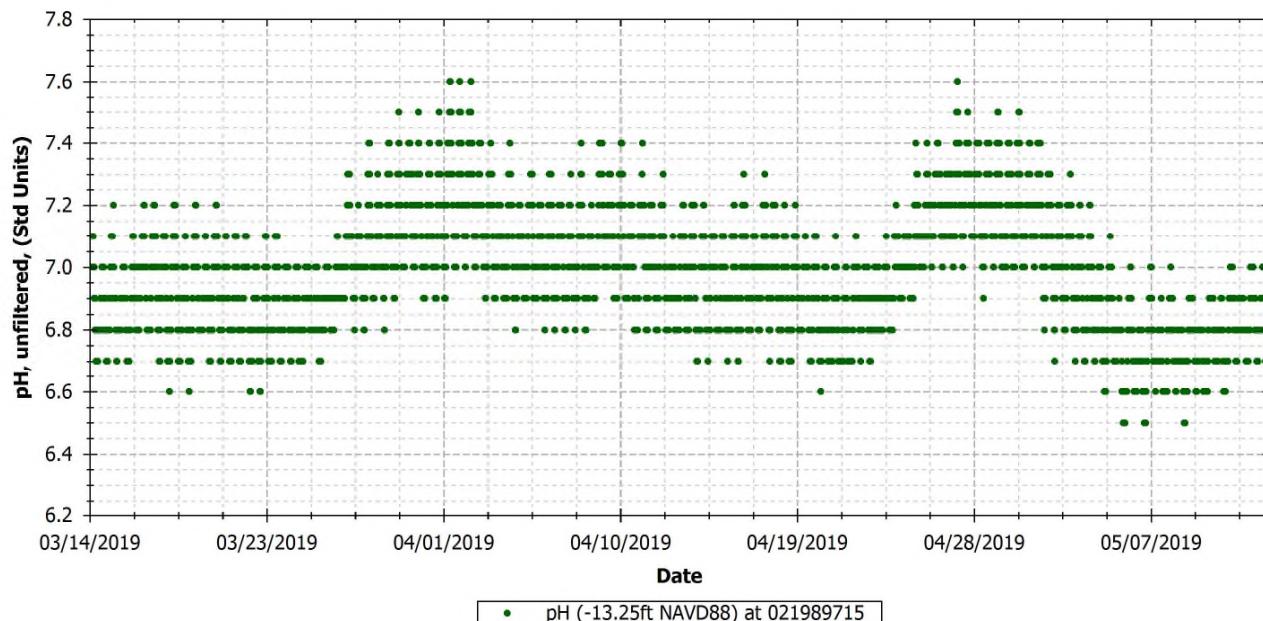


Figure E-6 USGS 021989715 (Front River) observed pH

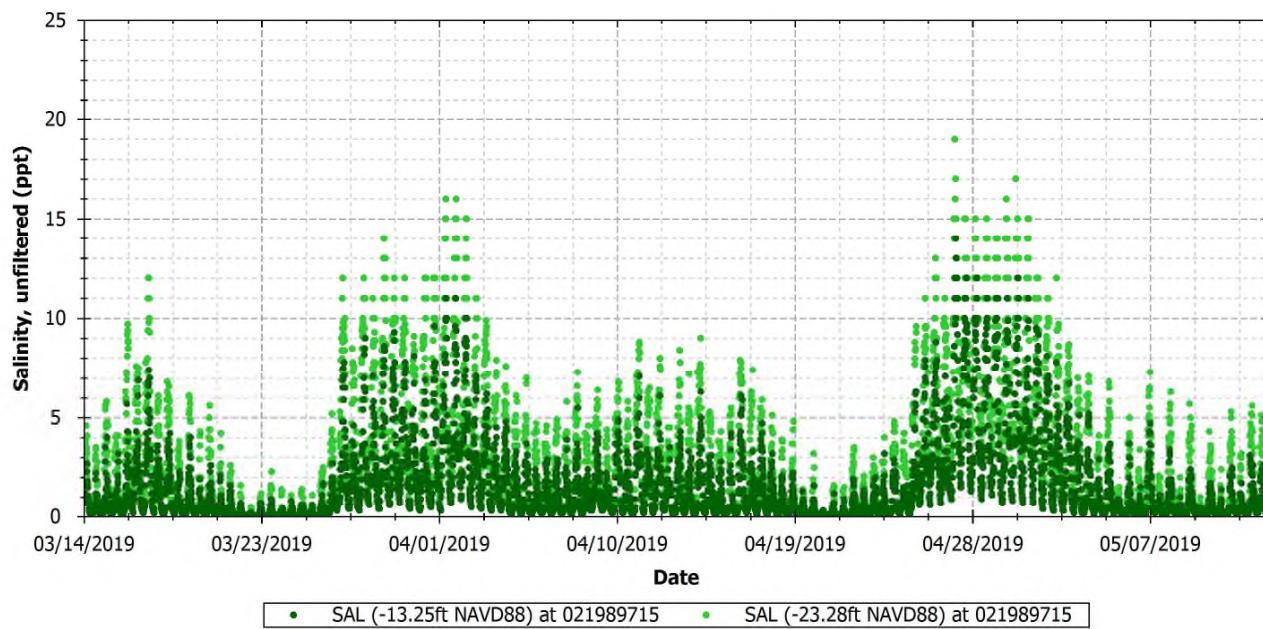


Figure E-7 USGS 021989715 (Front River) observed salinity

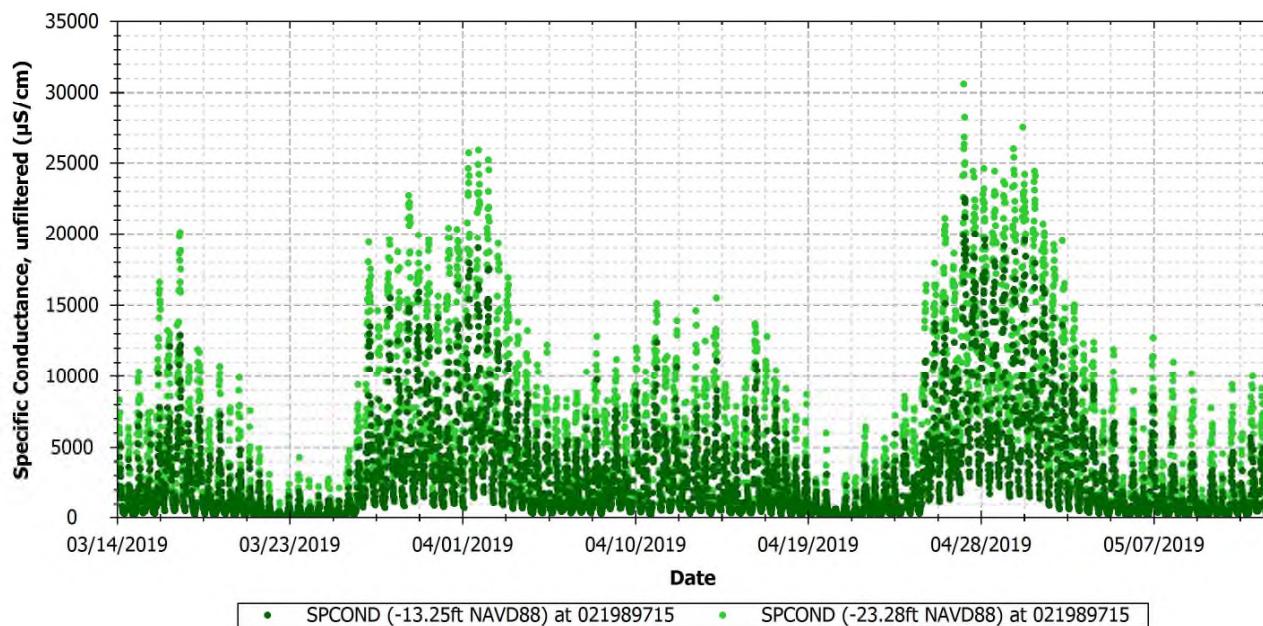


Figure E-8 USGS 021989715 (Front River) observed specific conductivity

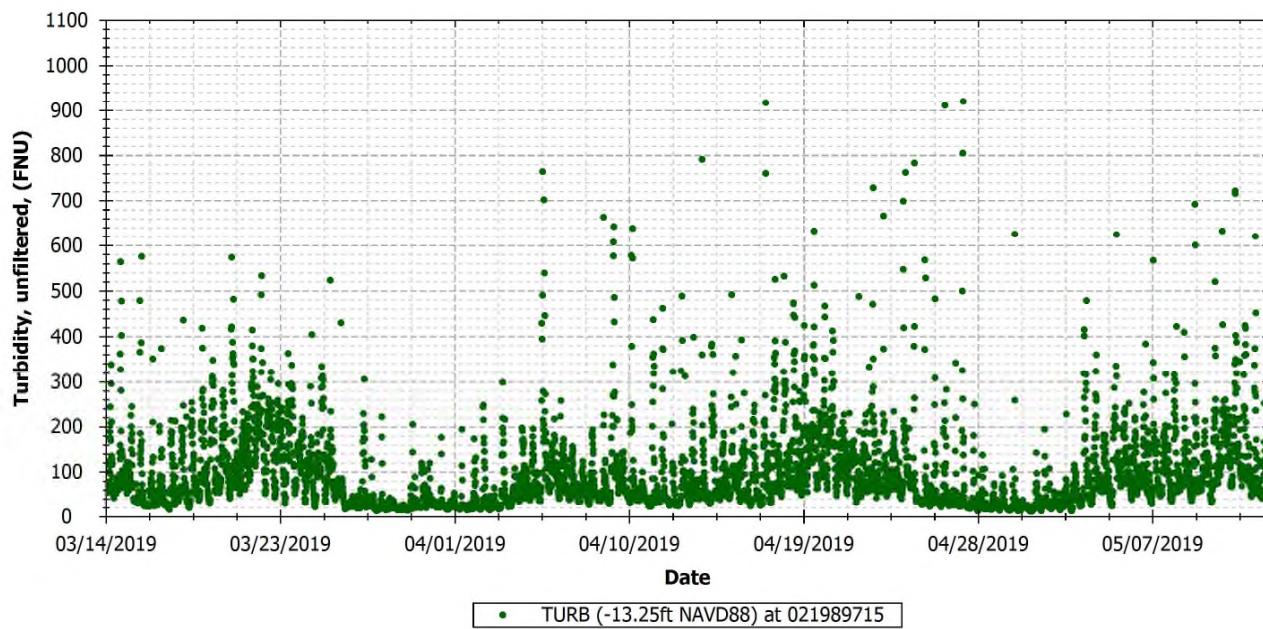


Figure E-9 USGS 021989715 (Front River) observed turbidity

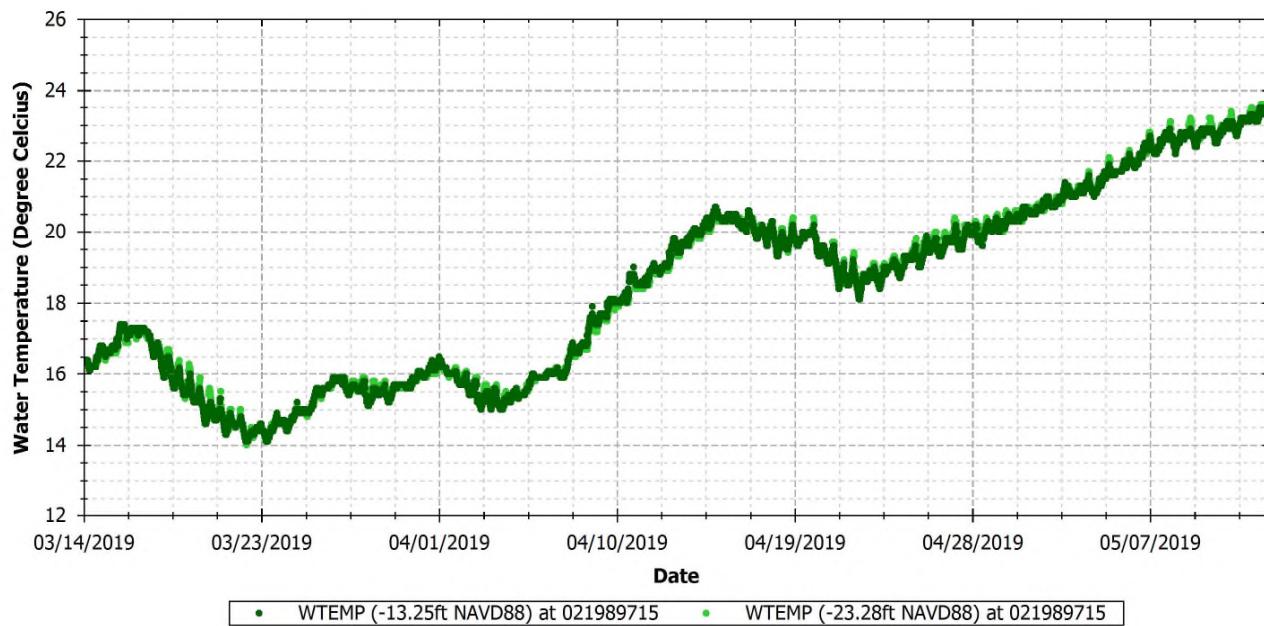


Figure E-10 USGS 021989715 (Front River) observed water temperature

E.3 USGS 021989773 – USACE DOCK – FRONT RIVER

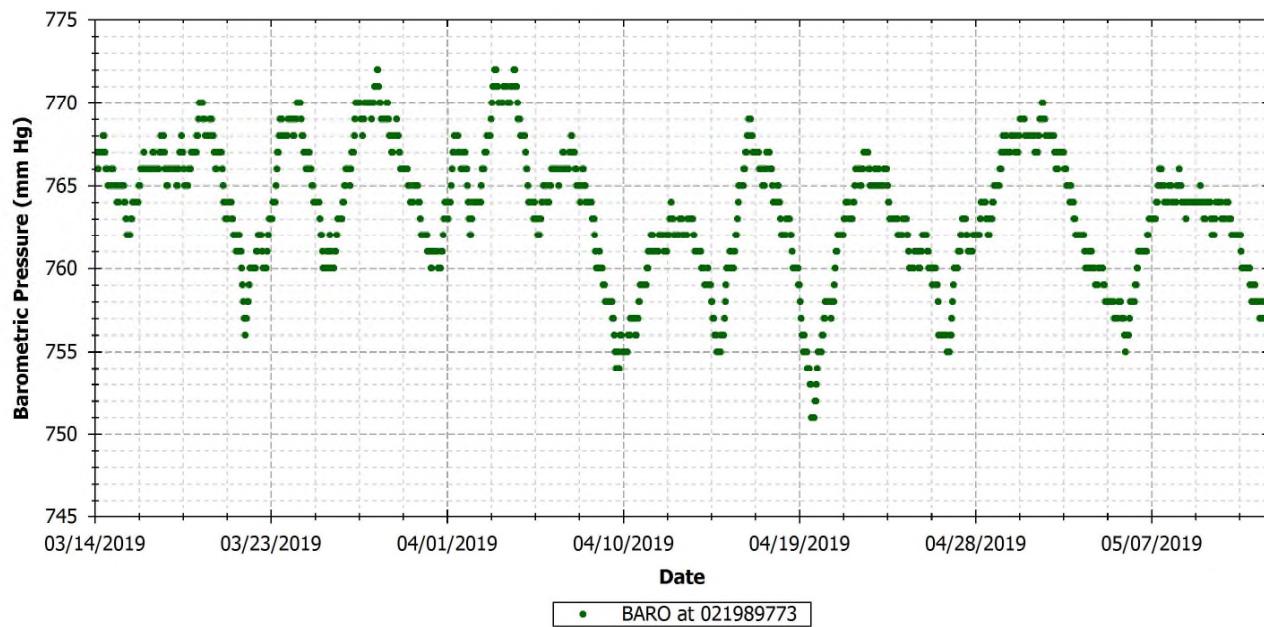


Figure E-11 USGS 021989773 (Front River) observed barometric pressure

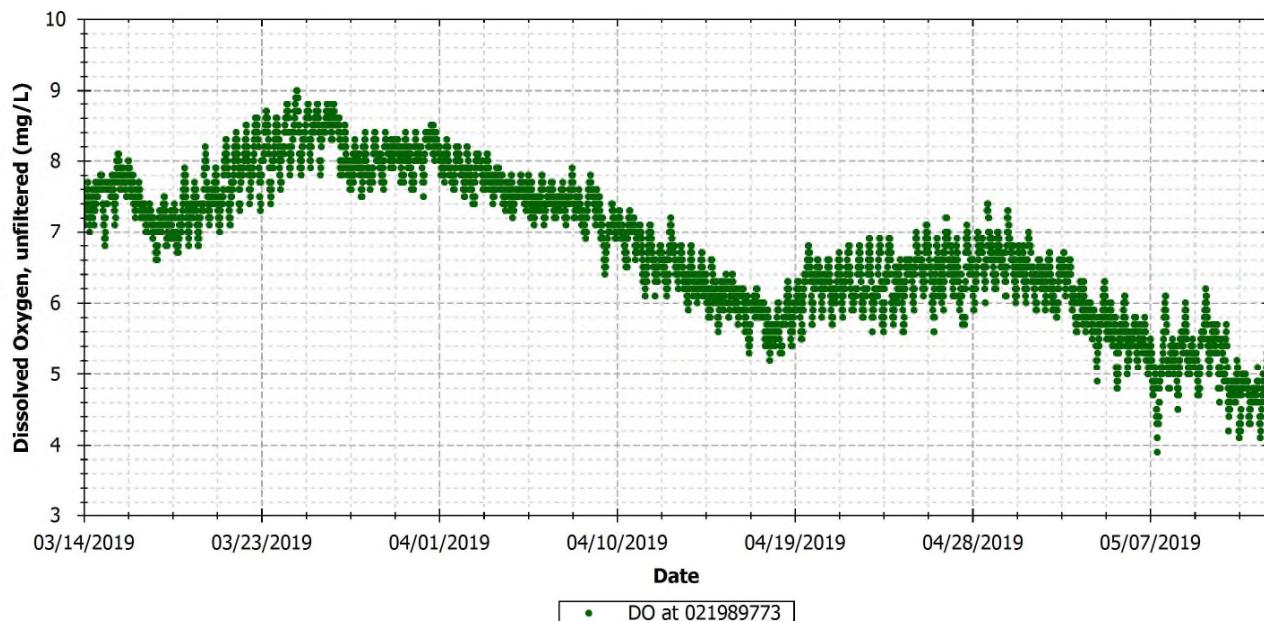


Figure E-12 USGS 021989773 (Front River) observed DO concentration

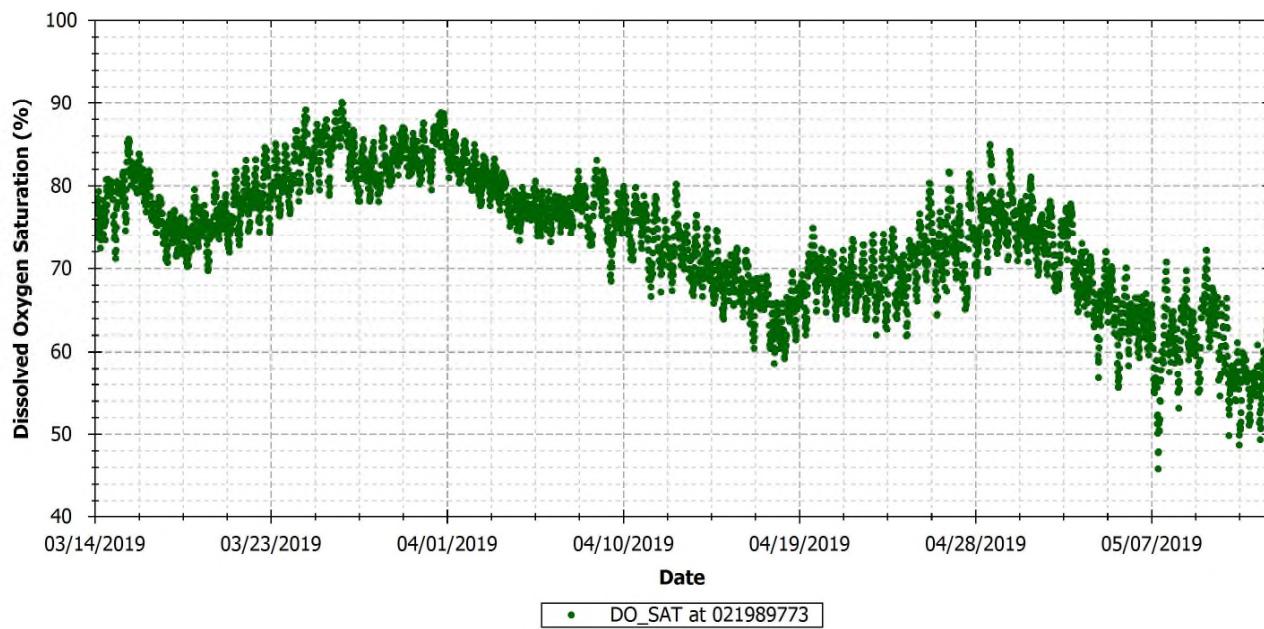


Figure E-13 USGS 021989773 (Front River) calculated DO saturation

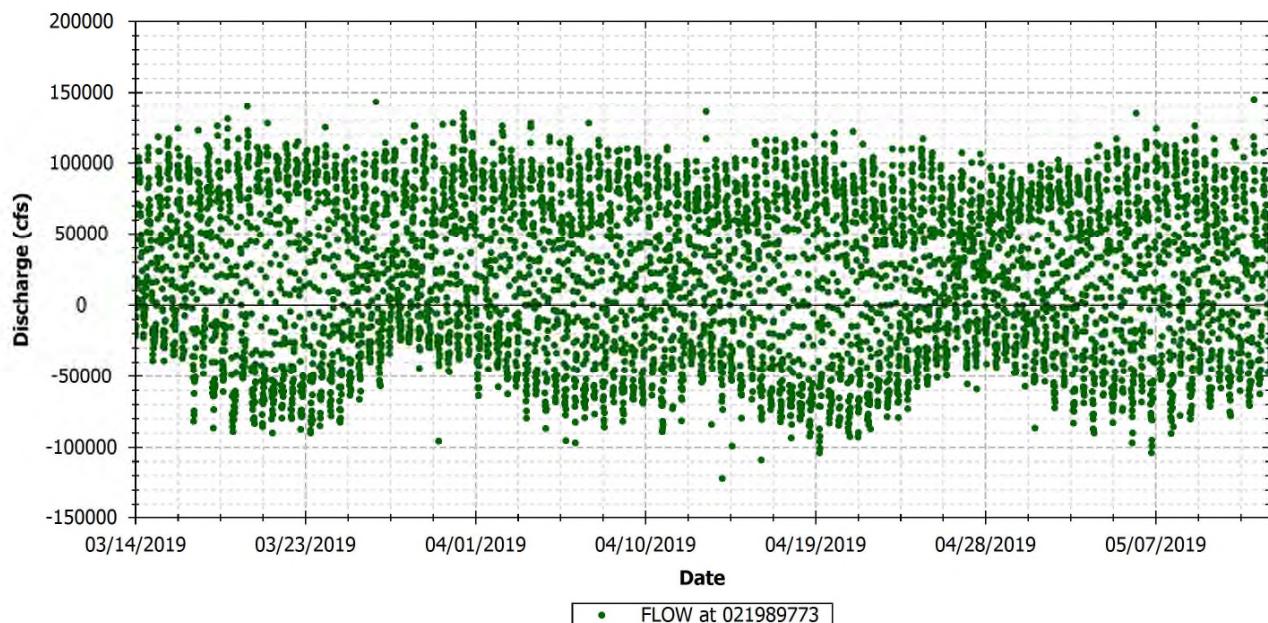


Figure E-14 USGS 021989773 (Front River) observed discharge

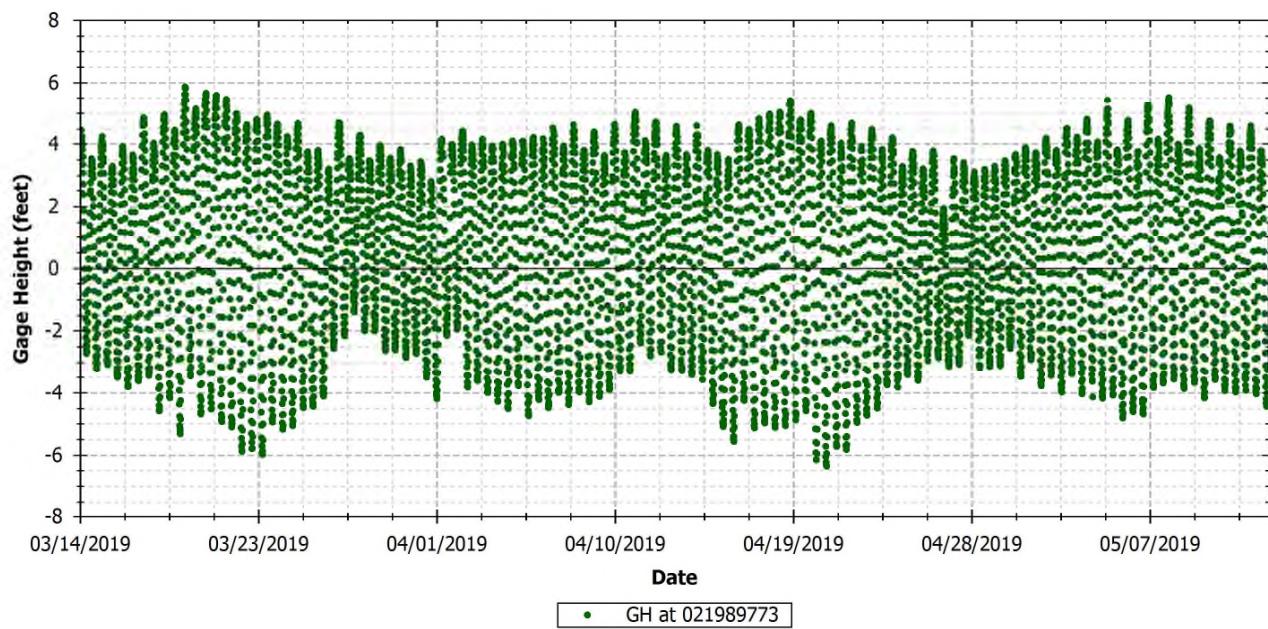


Figure E-15 USGS 021989773 (Front River) observed gage height

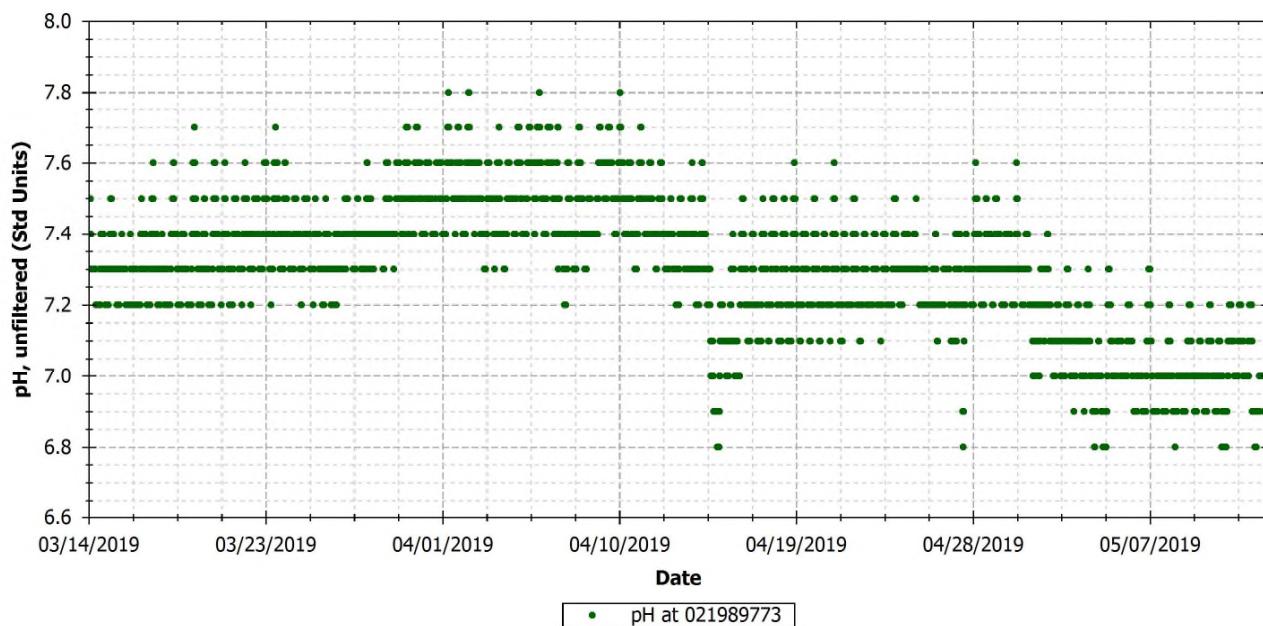


Figure E-16 USGS 021989773 (Front River) observed pH

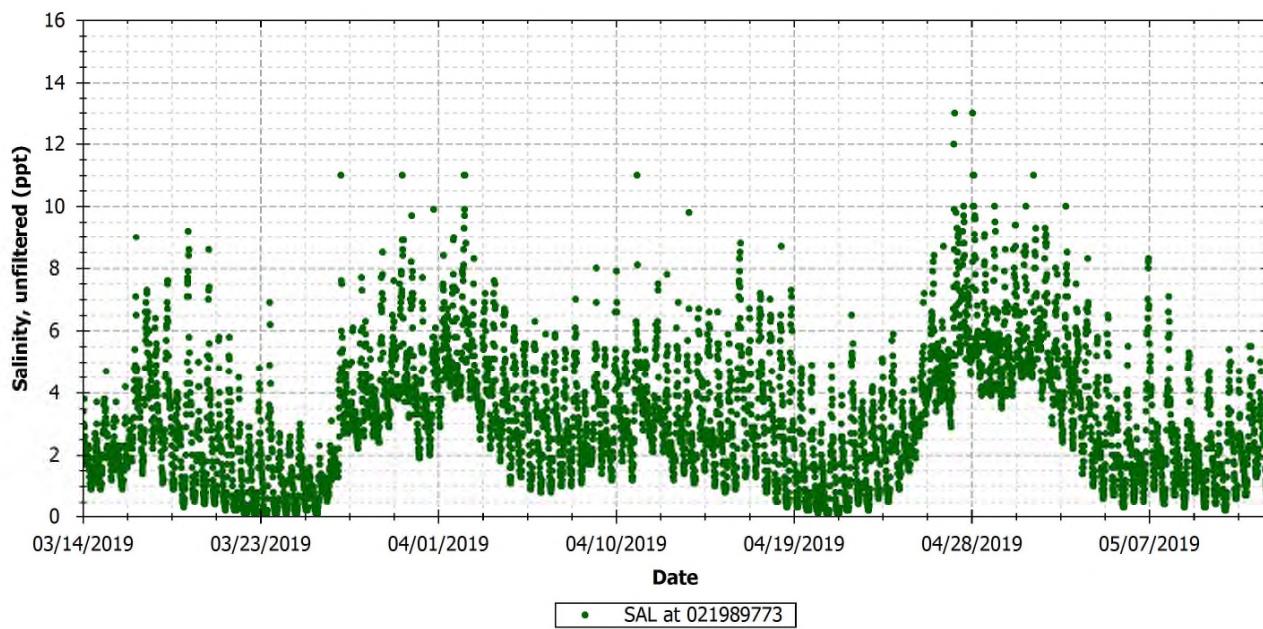


Figure E-17 USGS 021989773 (Front River) observed salinity

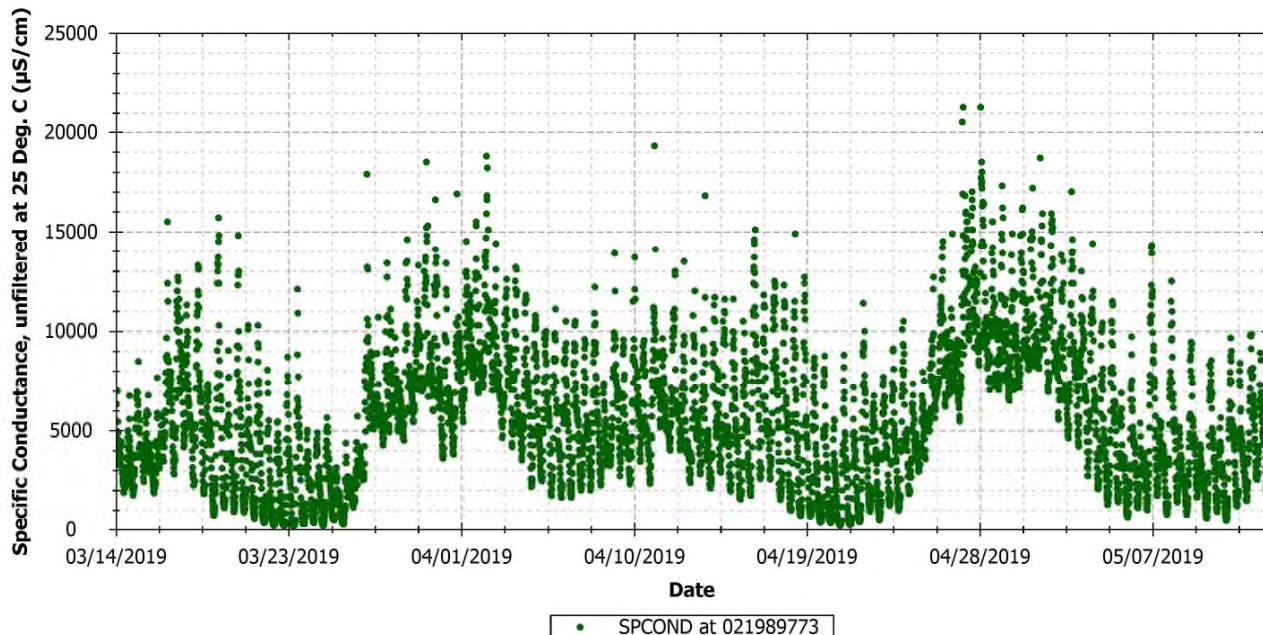


Figure E-18 USGS 021989773 (Front River) observed specific conductivity

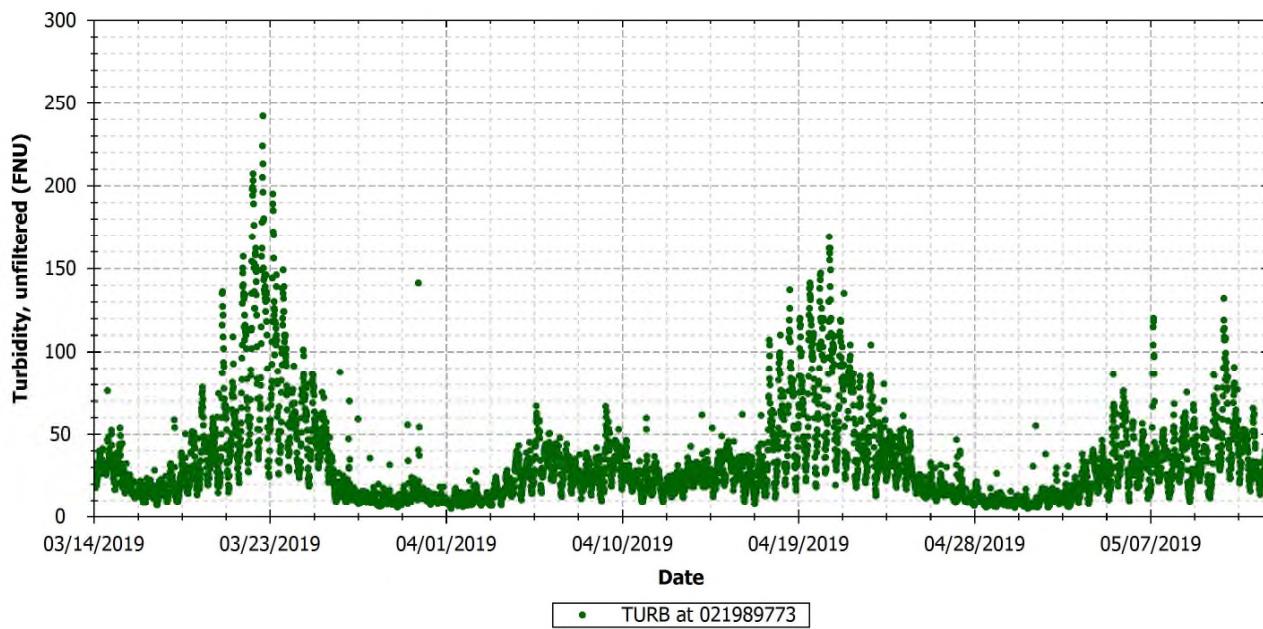


Figure E-19 USGS 021989773 (Front River) observed turbidity

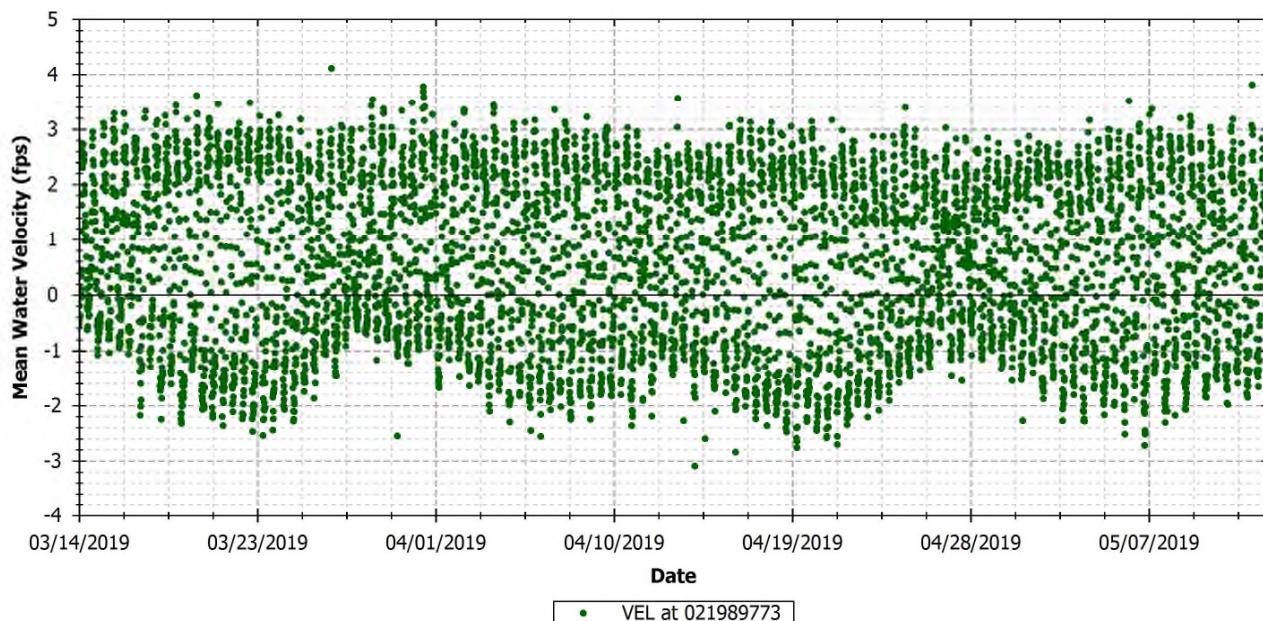


Figure E-20 USGS 021989773 (Front River) observed velocity

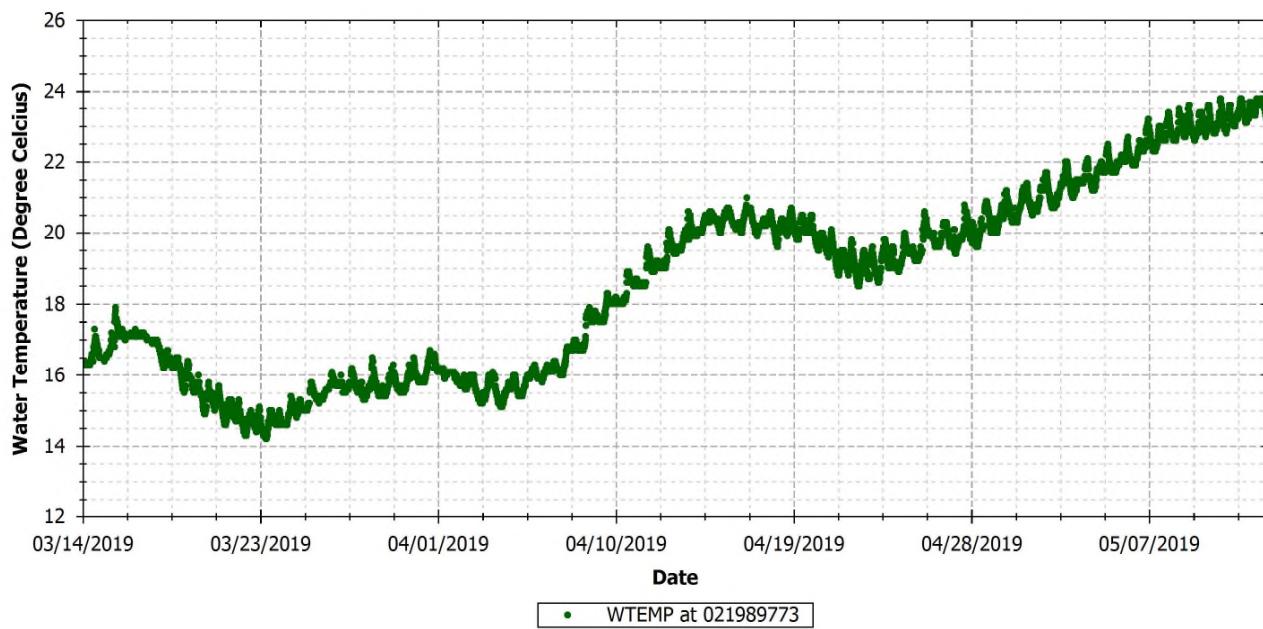


Figure E-21 USGS 021989773 (Front River) observed water temperature

E.4 USGS 021989793 – HOG ISLAND – BACK RIVER

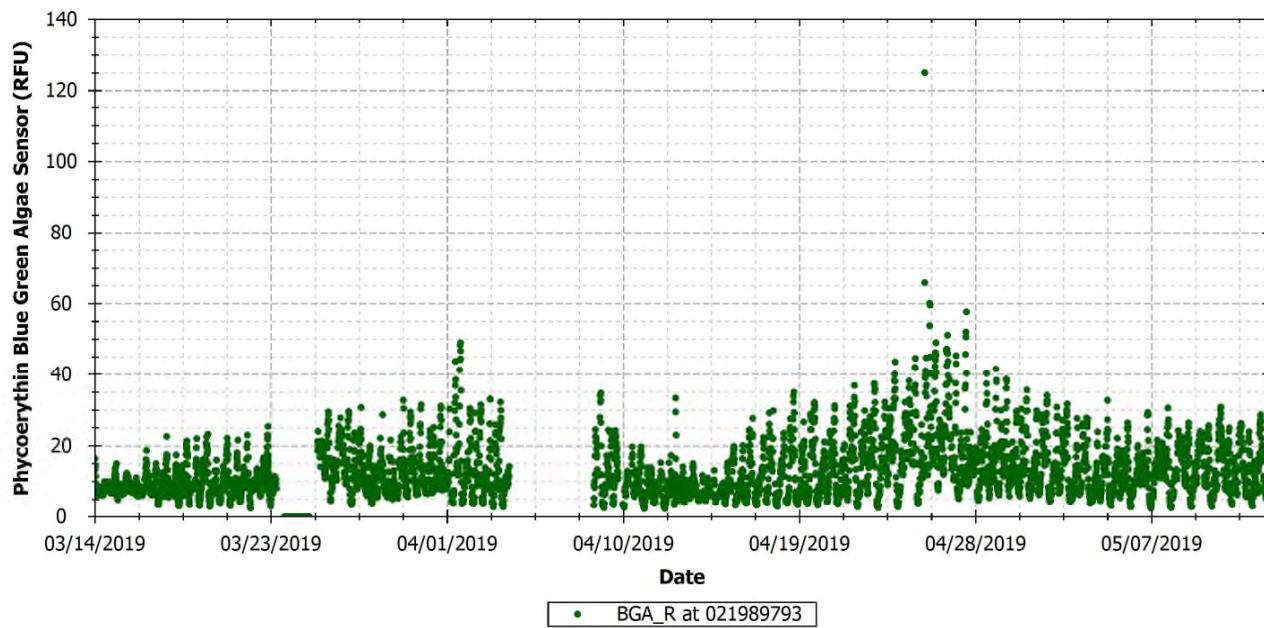


Figure E-22 USGS 021989793 (Back River) observed blue green algae

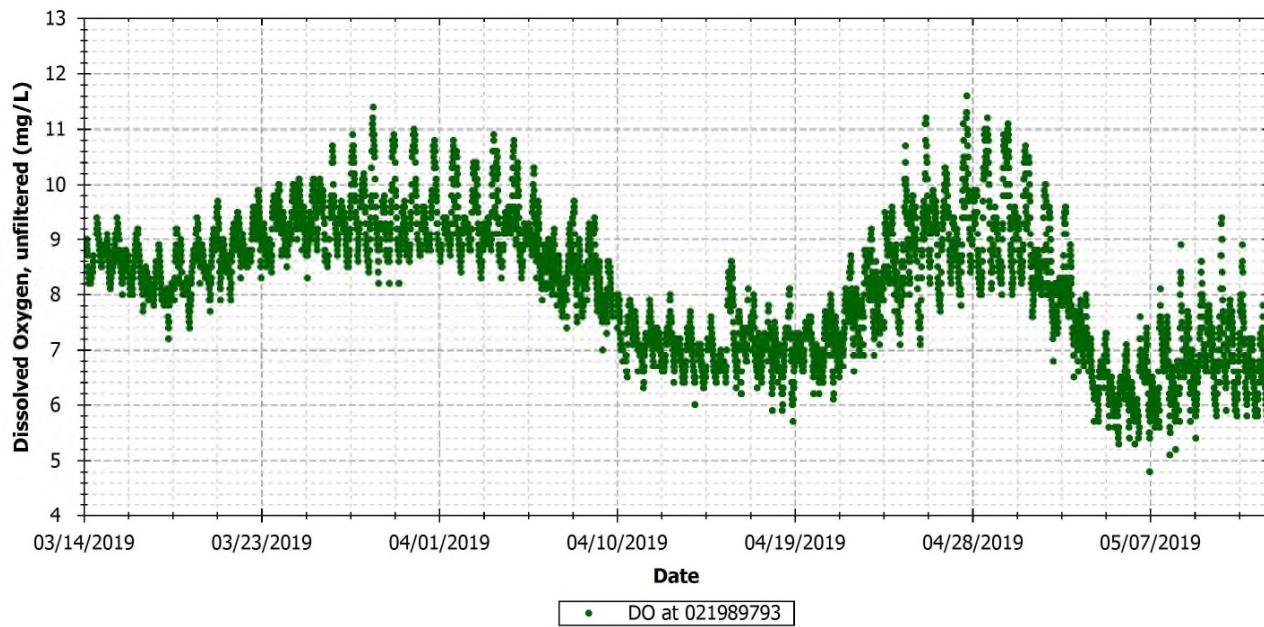


Figure E-23 USGS 021989793 (Back River) observed DO concentration

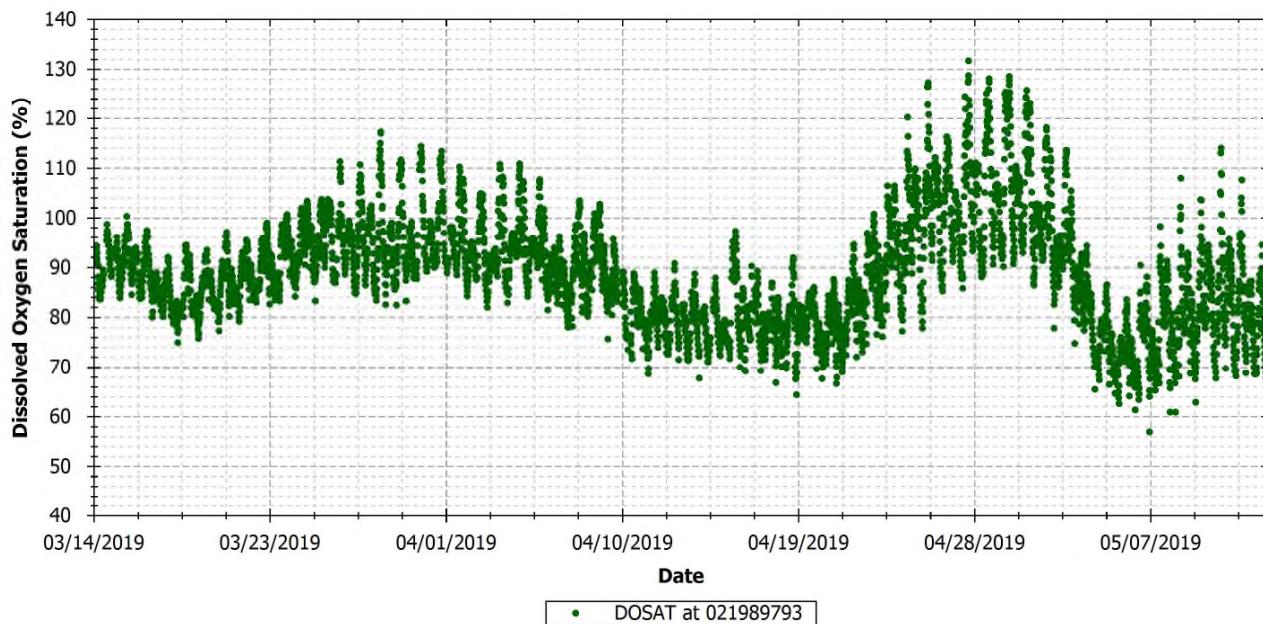


Figure E-24 USGS 021989793 (Back River) calculated DO saturation

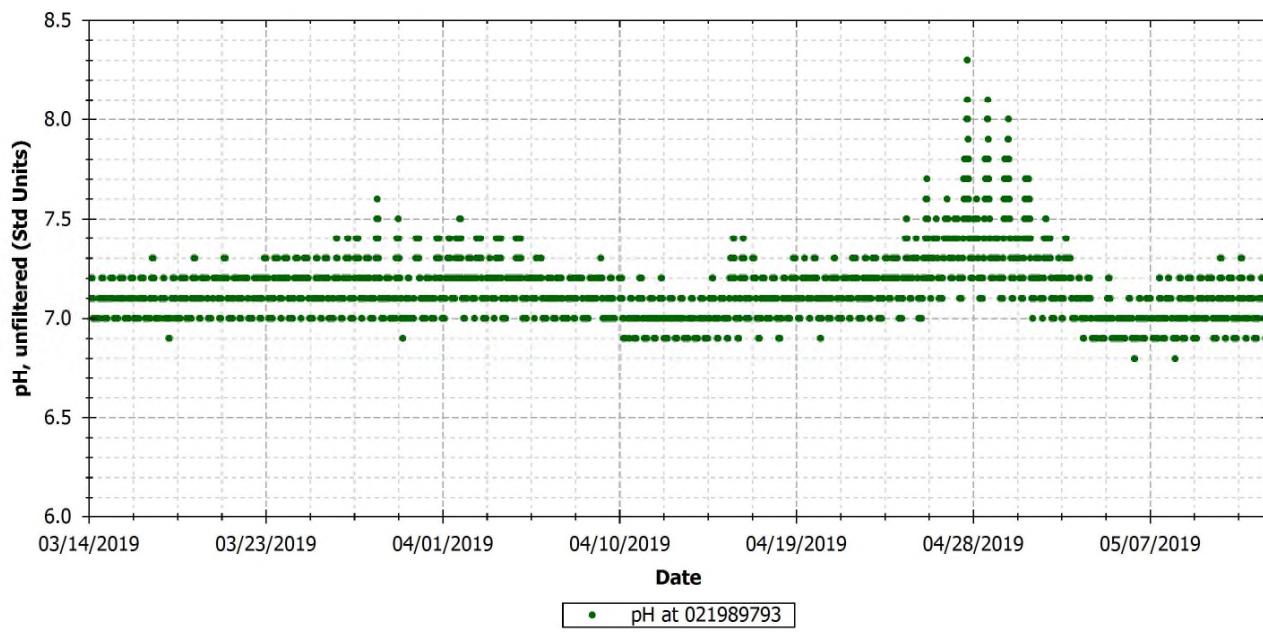


Figure E-25 USGS 021989793 (Back River) observed pH

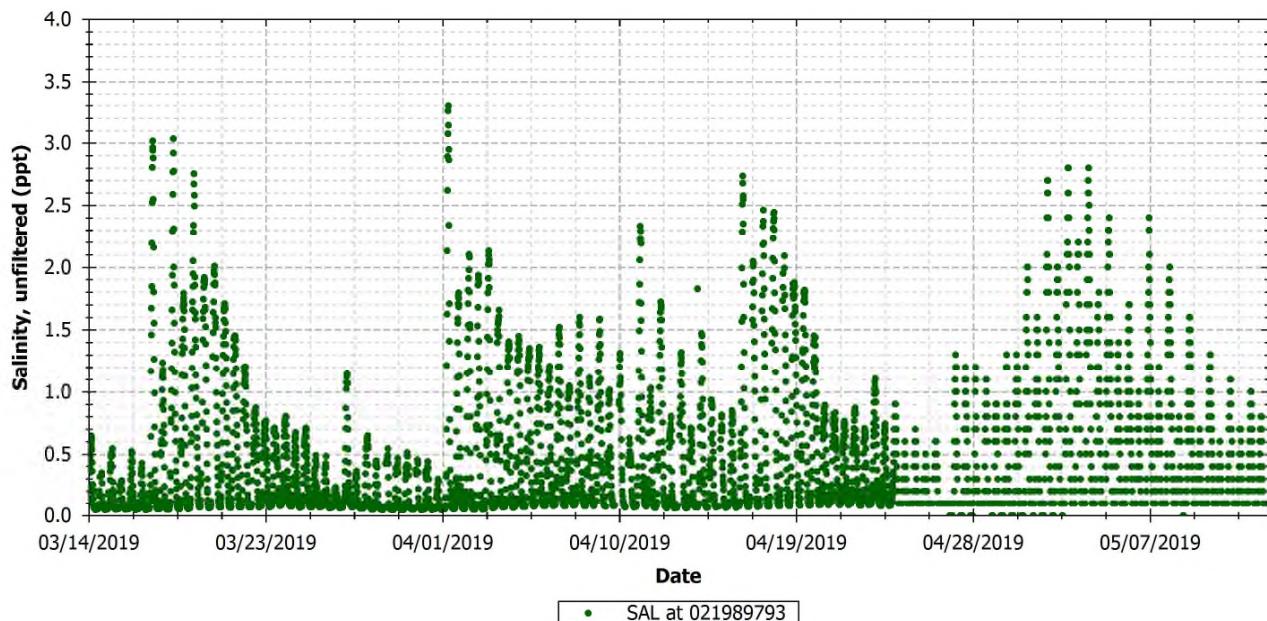


Figure E-26 USGS 021989793 (Back River) observed salinity

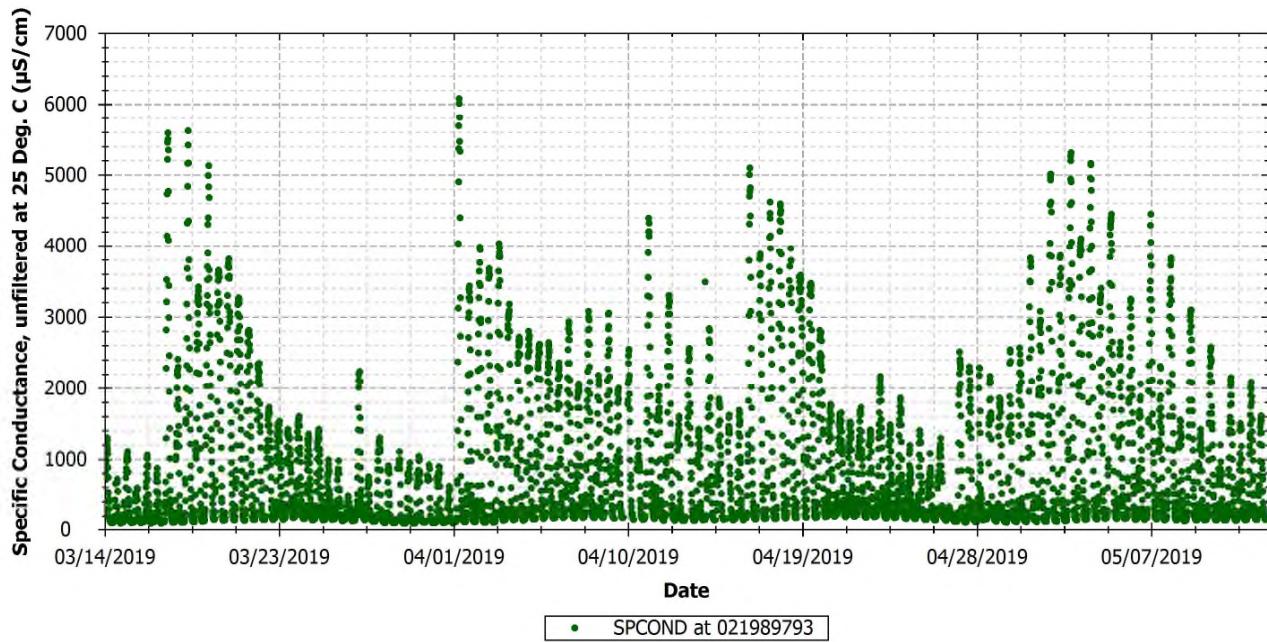


Figure E-27 USGS 021989793 (Back River) observed specific conductivity

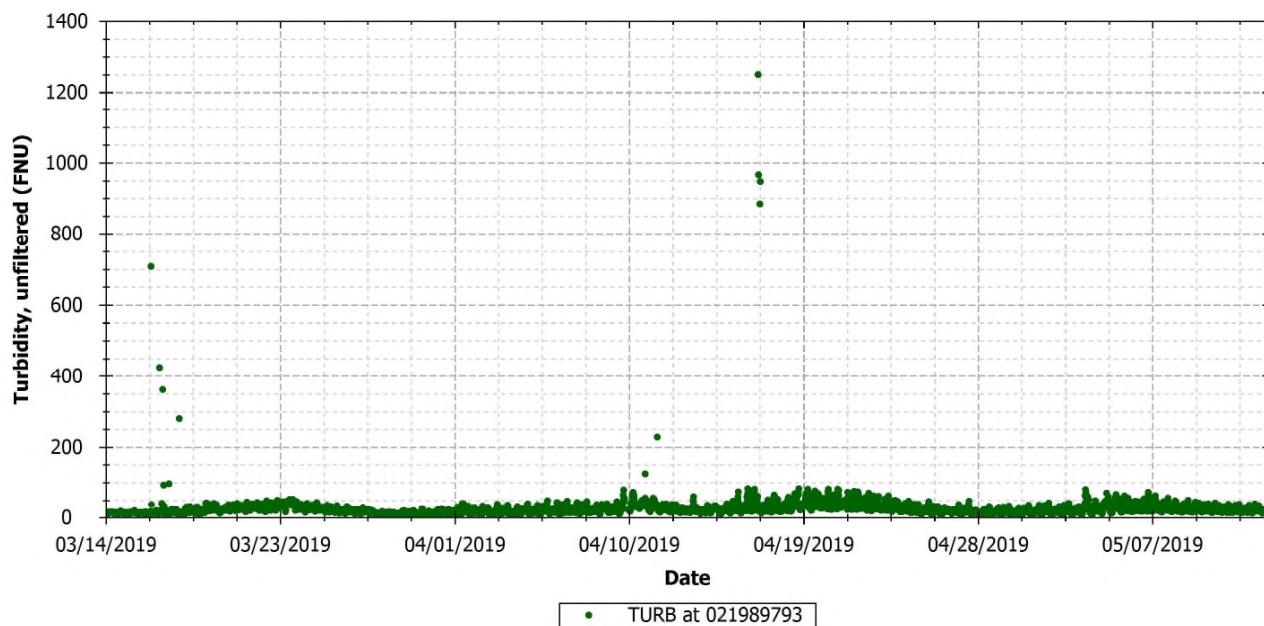


Figure E-28 USGS 021989793 (Back River) observed turbidity

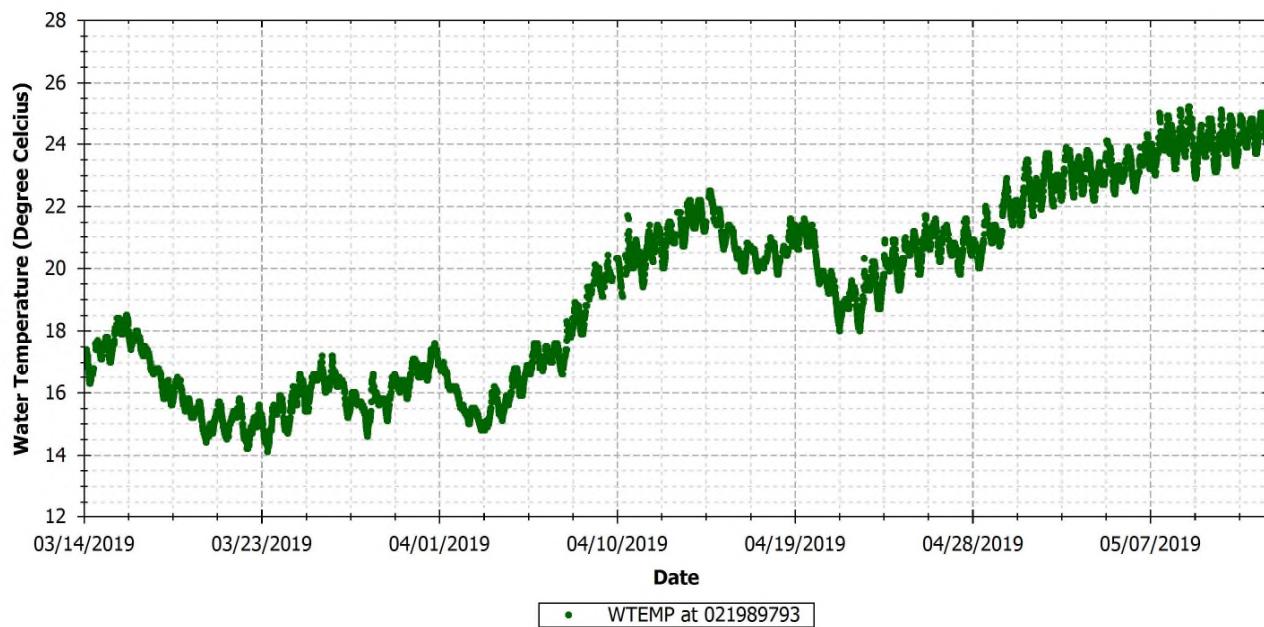


Figure E-29 USGS 021989793 (Back River) observed water temperature

E.5 USGS 0219897945 – US17 – BACK RIVER

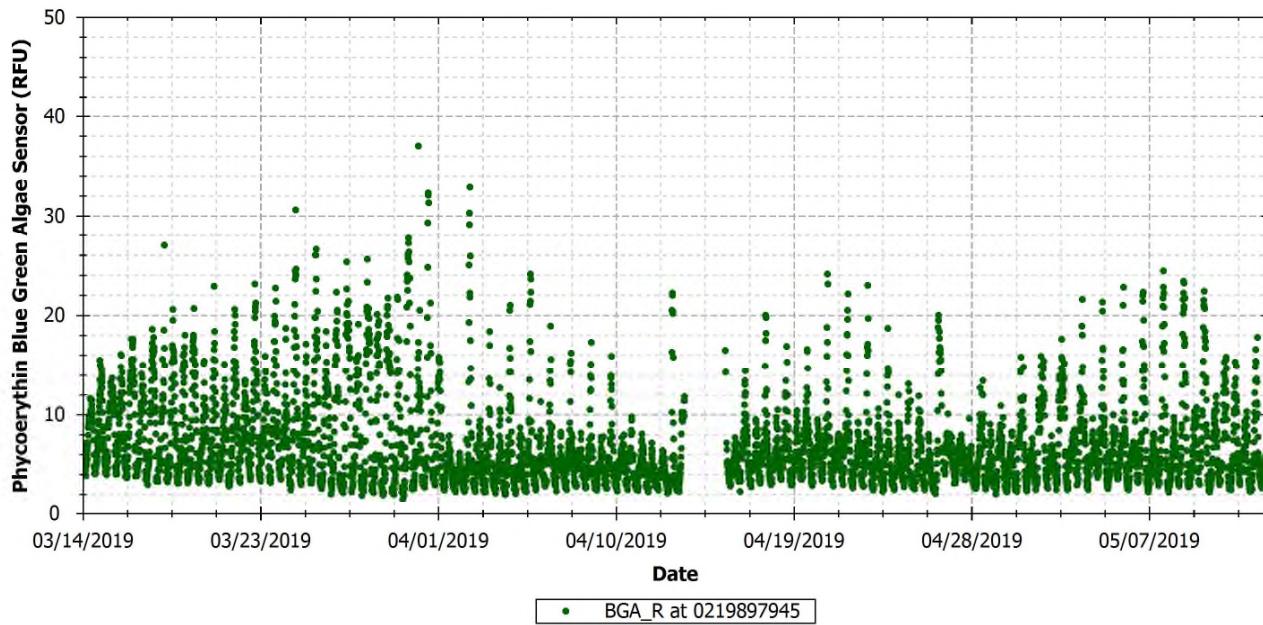


Figure E-30 USGS 0219897945 (Back River) observed blue green algae

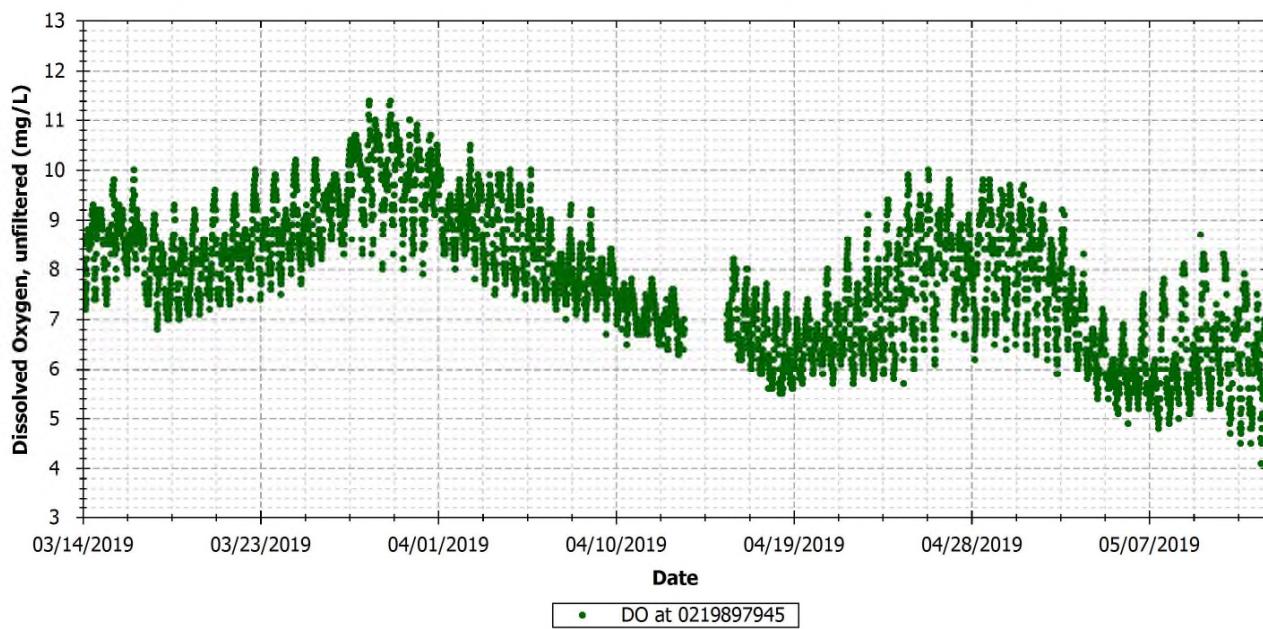


Figure E-31 USGS 0219897945 (Back River) observed DO concentration

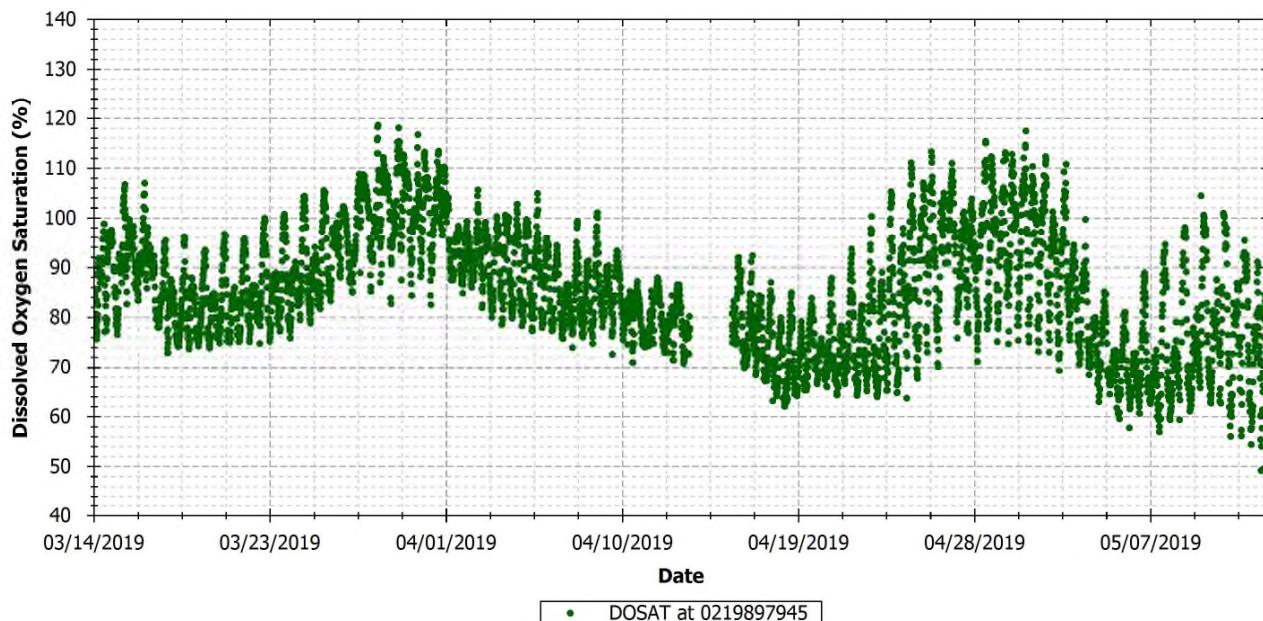


Figure E-32 USGS 0219897945 (Back River) calculated DO saturation

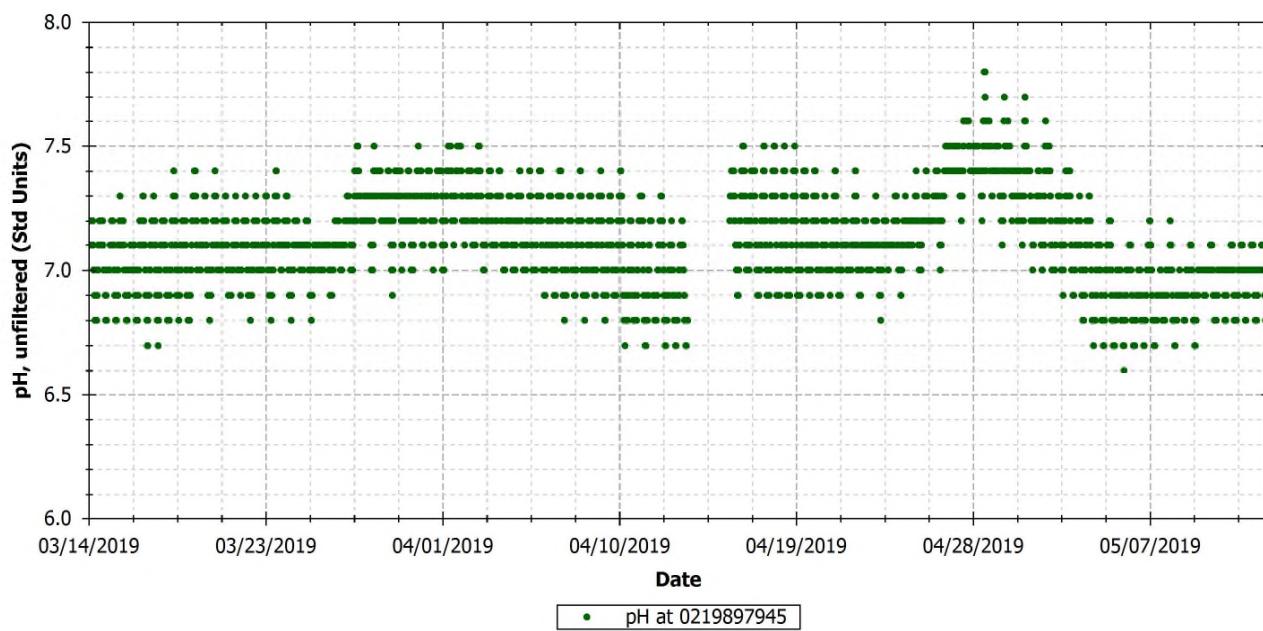


Figure E-33 USGS 0219897945 (Back River) observed pH

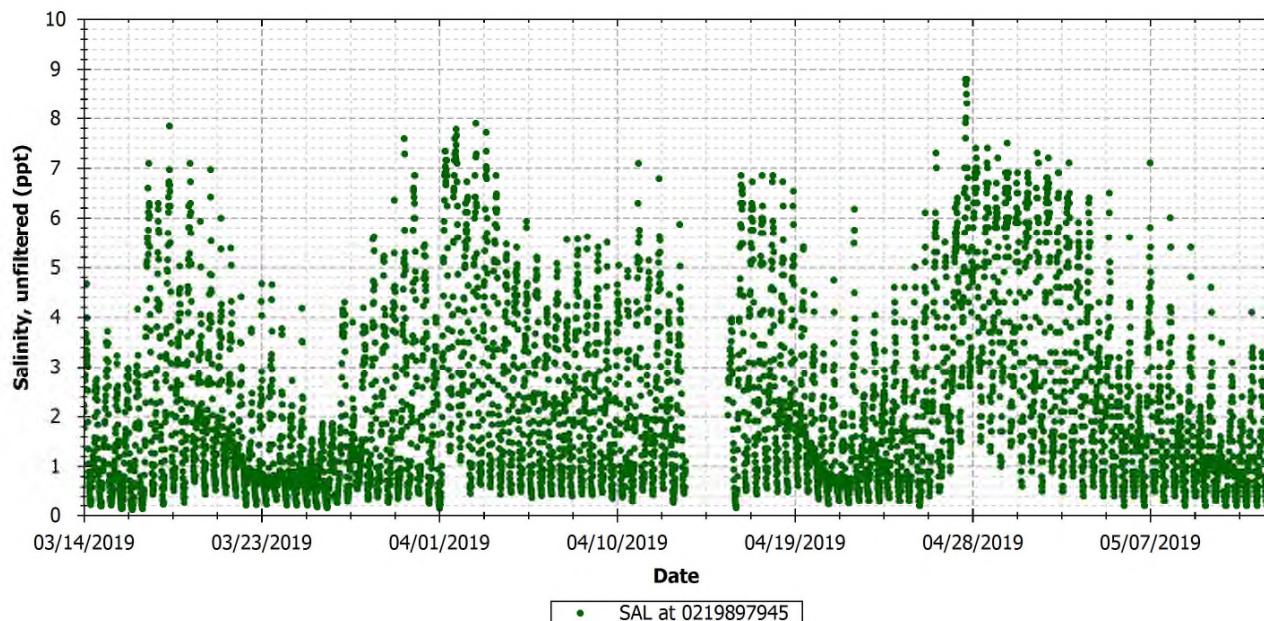


Figure E-34 USGS 0219897945 (Back River) observed salinity

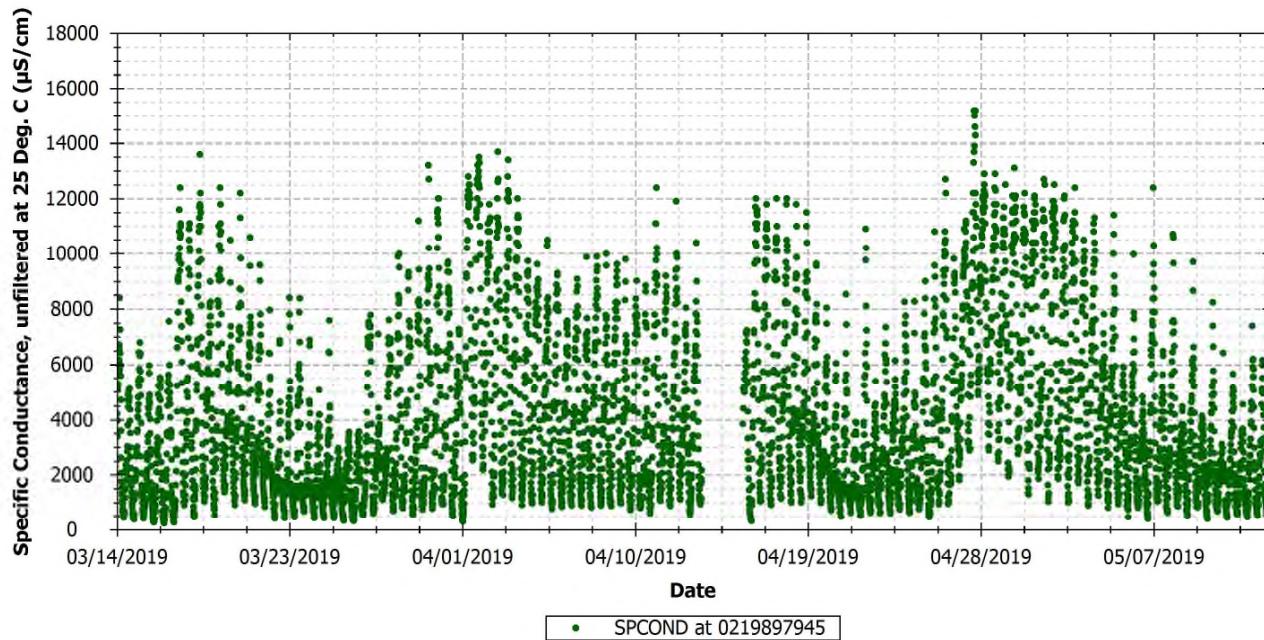


Figure E-35 USGS 0219897945 (Back River) observed specific conductivity

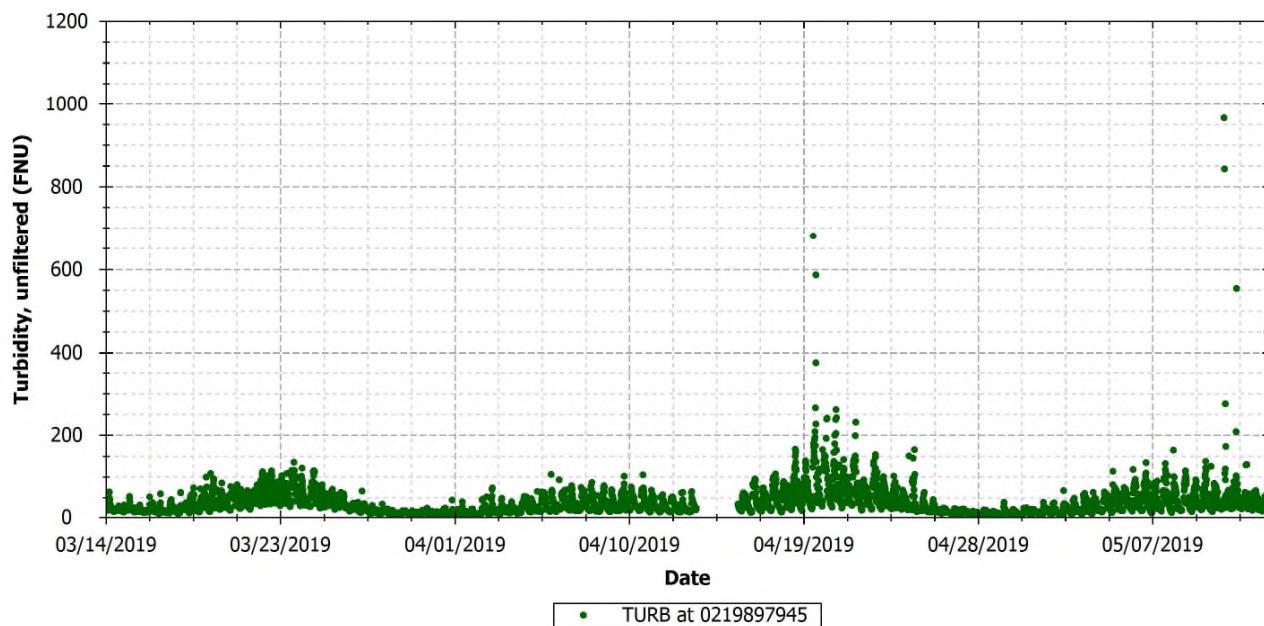


Figure E-36 USGS 0219897945 (Back River) observed turbidity

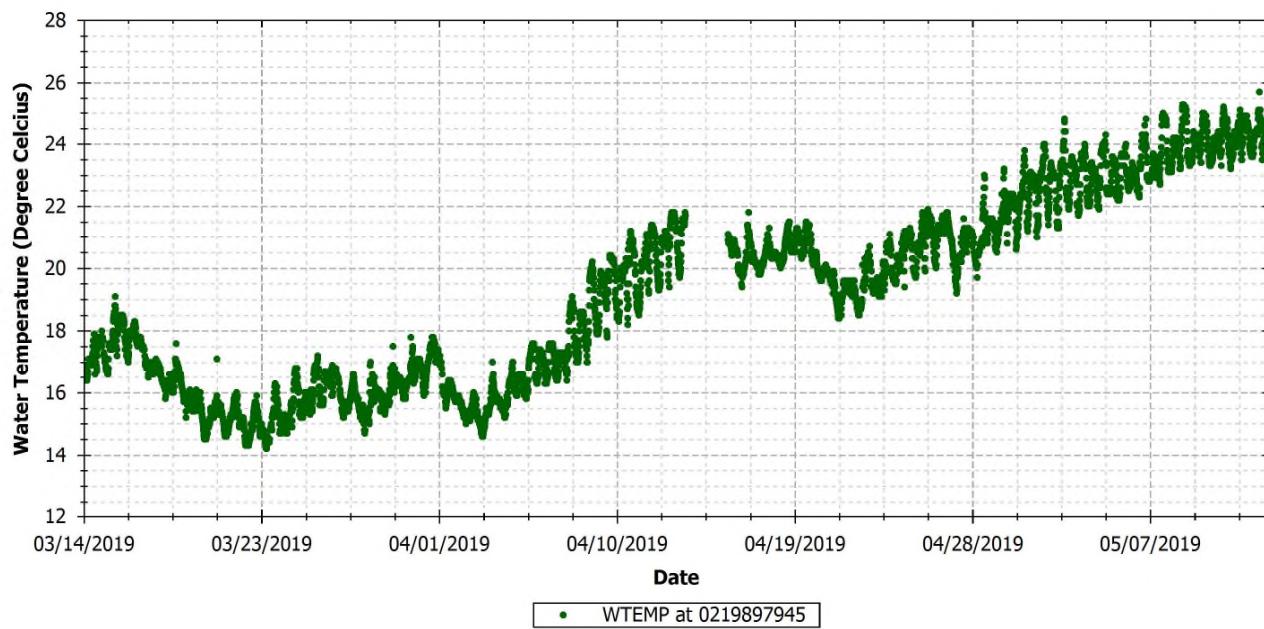


Figure E-37 USGS 0219897945 (Back River) observed water temperature

APPENDIX F USACE PLANT DATA

Test Run Data Collection and Modeling Report

for the

Dissolved Oxygen Facility Environmental Testing

for the

Savannah Harbor Expansion Project

Contract# W912HN-15-D-0023

Tasks: 07 and 08

August 15, 2019

PREPARED FOR

**Army Corps of Engineers
Savannah District**
100 W Oglethorpe Avenue
Savannah, Georgia 31401-3640
Tel (912) 652-5026

PREPARED BY

LG2 Environmental Solutions, Inc.
10475 Fortune Parkway, Suite 201
Jacksonville, Florida 32256
Tel (904) 288-8631

Tetra Tech, Inc.
1899 Powers Ferry Rd SE, Suite 400
Atlanta, Georgia 30339
Tel (770) 738-6030

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F.1 USACE PLANT DATA

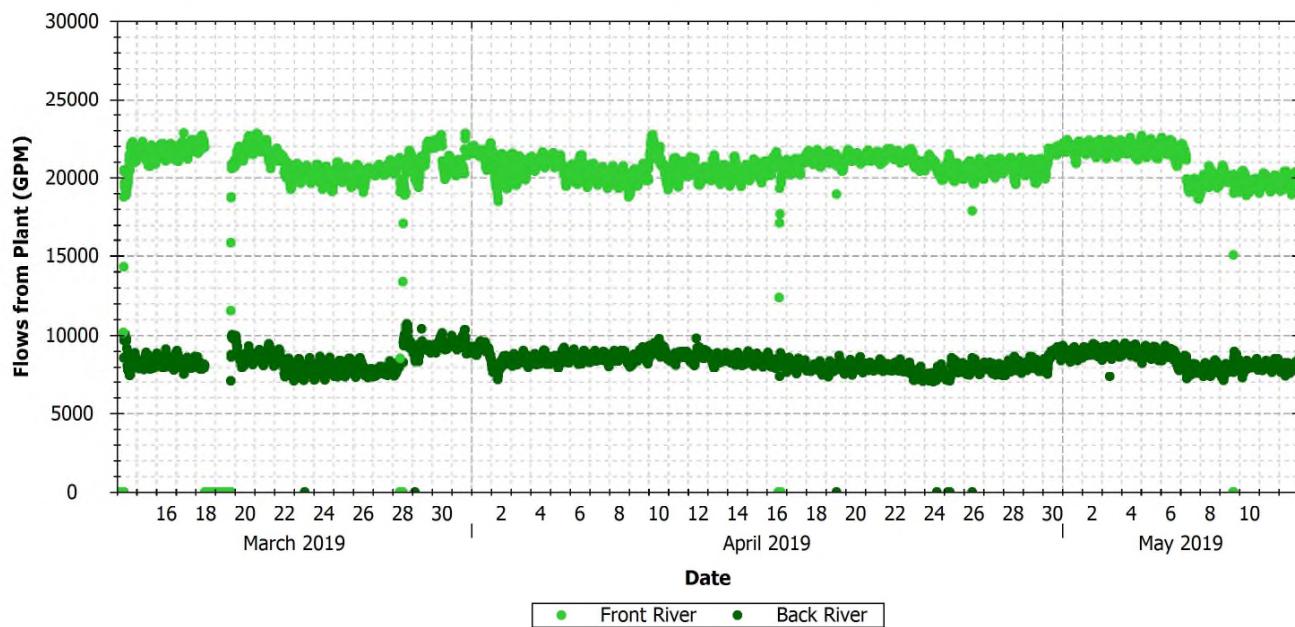


Figure F-1 Flows to Back River and lower Front River from the Plant for the test run period

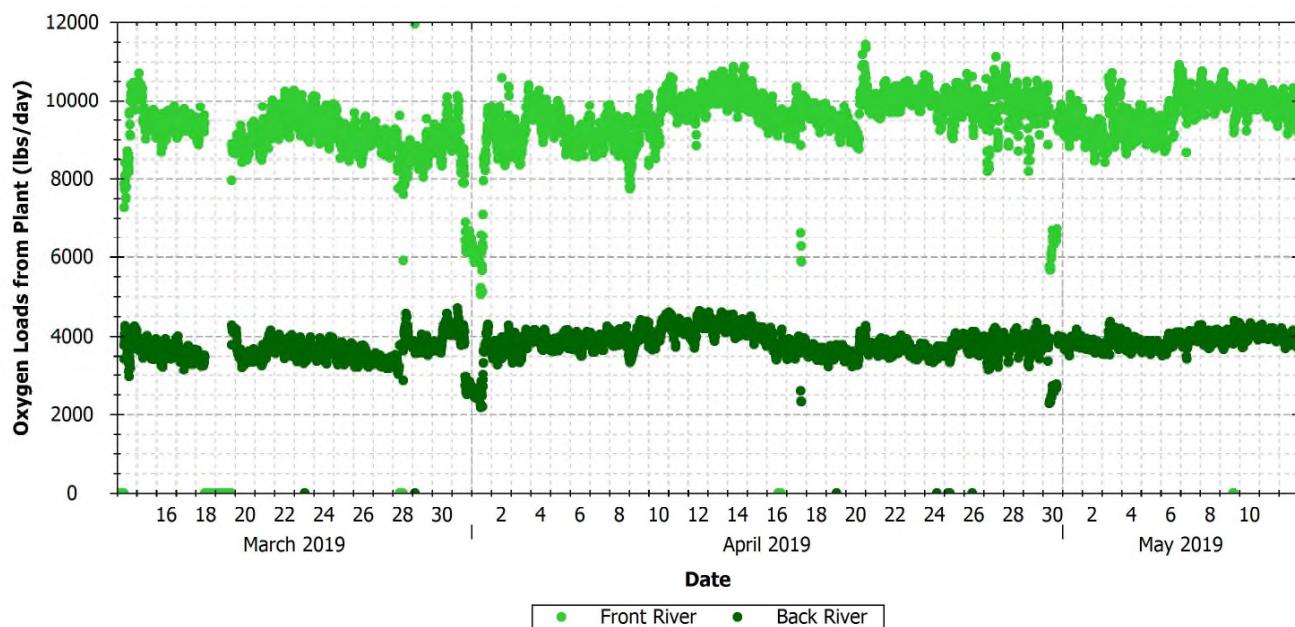


Figure F-2 Oxygen load to Back River and lower Front River from the Plant for the test run period

Table F-1 Test run daily flows and loads

Date	Plant Time on (min)	Lower Front River		Back River	
		Flow (gallons/day)	Oxygen Load (pounds/day)	Flow gallons/day)	Oxygen Load (pounds/day)
3/14/2019	930	19,332,222	5,978	7,940,027	2,443
3/15/2019	1,440	30,991,337	9,697	11,855,560	3,707
3/16/2019	1,440	31,260,769	9,375	11,972,276	3,592
3/17/2019	1,440	31,466,985	9,386	11,858,253	3,538
3/18/2019	660	14,571,288	4,263	5,378,603	1,574
3/19/2019	270	5,617,962	1,638	2,663,987	777
3/20/2019	1,440	31,280,165	8,883	12,428,220	3,530
3/21/2019	1,440	31,482,079	9,170	12,459,754	3,631
3/22/2019	1,440	29,856,148	9,554	11,711,066	3,744
3/23/2019	1,440	29,203,658	9,608	11,016,921	3,609
3/24/2019	1,440	28,889,934	9,377	11,291,640	3,663
3/25/2019	1,440	29,071,196	9,140	11,318,812	3,557
3/26/2019	1,440	29,061,921	9,015	11,196,239	3,473
3/27/2019	1,440	29,626,986	8,950	11,157,309	3,369
3/28/2019	1,440	28,240,171	8,289	10,605,943	3,057
3/29/2019	1,440	30,302,166	8,742	12,963,761	3,723
3/30/2019	1,440	31,026,605	9,073	13,531,005	3,964
3/31/2019	1,440	30,337,723	8,084	13,584,732	3,645
4/1/2019	1,440	31,034,186	7,212	13,138,677	3,054
4/2/2019	1,444	29,569,520	9,244	11,758,089	3,675
4/3/2019	1,446	29,917,009	9,226	12,274,216	3,786
4/4/2019	1,430	30,112,729	9,666	12,136,282	3,895
4/5/2019	1,440	29,835,541	9,350	12,306,234	3,857
4/6/2019	1,446	29,473,251	9,068	12,451,726	3,833
4/7/2019	1,434	28,864,677	9,034	12,370,649	3,872
4/8/2019	1,440	28,764,859	9,136	12,381,535	3,932
4/9/2019	1,440	28,789,973	9,189	12,377,024	3,951
4/10/2019	1,440	30,544,009	9,475	13,103,588	4,069
4/11/2019	1,440	29,325,225	9,939	12,499,954	4,238
4/12/2019	1,440	29,397,465	9,910	12,554,985	4,237
4/13/2019	1,440	29,388,332	10,250	12,317,073	4,298
4/14/2019	1,440	29,203,494	10,220	12,134,119	4,247

Date	Plant Time on (min)	Lower Front River		Back River	
		Flow (gallons/day)	Oxygen Load (pounds/day)	Flow gallons/day)	Oxygen Load (pounds/day)
4/15/2019	1,440	29,517,612	9,889	12,204,015	4,089
4/16/2019	1,261	26,174,184	8,352	10,436,693	3,333
4/17/2019	1,436	29,890,219	9,421	11,682,306	3,682
4/18/2019	1,440	30,628,869	9,684	11,404,992	3,606
4/19/2019	1,440	30,386,179	9,460	11,376,469	3,525
4/20/2019	1,440	30,665,897	9,543	11,534,715	3,590
4/21/2019	1,440	30,720,452	9,938	11,523,045	3,727
4/22/2019	1,440	30,887,901	10,038	11,485,156	3,733
4/23/2019	1,440	30,396,766	10,113	10,937,938	3,639
4/24/2019	1,440	29,806,128	10,008	10,587,353	3,540
4/25/2019	1,440	29,535,657	10,057	10,860,433	3,658
4/26/2019	1,440	29,478,226	9,937	11,268,170	3,791
4/27/2019	1,440	29,818,075	9,738	11,436,309	3,734
4/28/2019	1,440	29,831,813	9,946	11,463,988	3,821
4/29/2019	1,440	29,683,734	9,762	11,669,480	3,839
4/30/2019	1,440	30,820,817	8,362	12,447,749	3,370
5/1/2019	1,440	31,556,208	9,494	12,710,534	3,824
5/2/2019	1,440	31,663,997	9,166	12,943,596	3,745
5/3/2019	1,440	31,517,948	9,433	12,945,883	3,871
5/4/2019	1,440	31,499,742	9,296	12,986,798	3,831
5/5/2019	1,440	31,553,174	9,260	12,740,964	3,738
5/6/2019	1,440	31,390,083	9,614	12,476,618	3,816
5/7/2019	1,440	28,970,403	10,034	11,422,670	3,959
5/8/2019	1,440	28,614,650	10,122	11,245,799	3,978
5/9/2019	1,440	28,280,057	10,011	11,215,972	3,941
5/10/2019	1,440	28,416,004	9,976	11,573,445	4,063
5/11/2019	1,440	28,404,826	9,920	11,596,390	4,049
5/12/2019	1,440	28,467,013	9,732	11,437,177	3,909

APPENDIX G DYE STUDY DATA

Test Run Data Collection and Modeling Report

for the

Dissolved Oxygen Facility Environmental Testing

for the

Savannah Harbor Expansion Project

Contract# W912HN-15-D-0023

Tasks: 07 and 08

August 15, 2019

PREPARED FOR

**Army Corps of Engineers
Savannah District**
100 W Oglethorpe Avenue
Savannah, Georgia 31401-3640
Tel (912) 652-5026

PREPARED BY

LG2 Environmental Solutions, Inc.
10475 Fortune Parkway, Suite 201
Jacksonville, Florida 32256
Tel (904) 288-8631

Tetra Tech, Inc.
1899 Powers Ferry Rd SE, Suite 400
Atlanta, Georgia 30339
Tel (770) 738-6030

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G.1 BACK RIVER

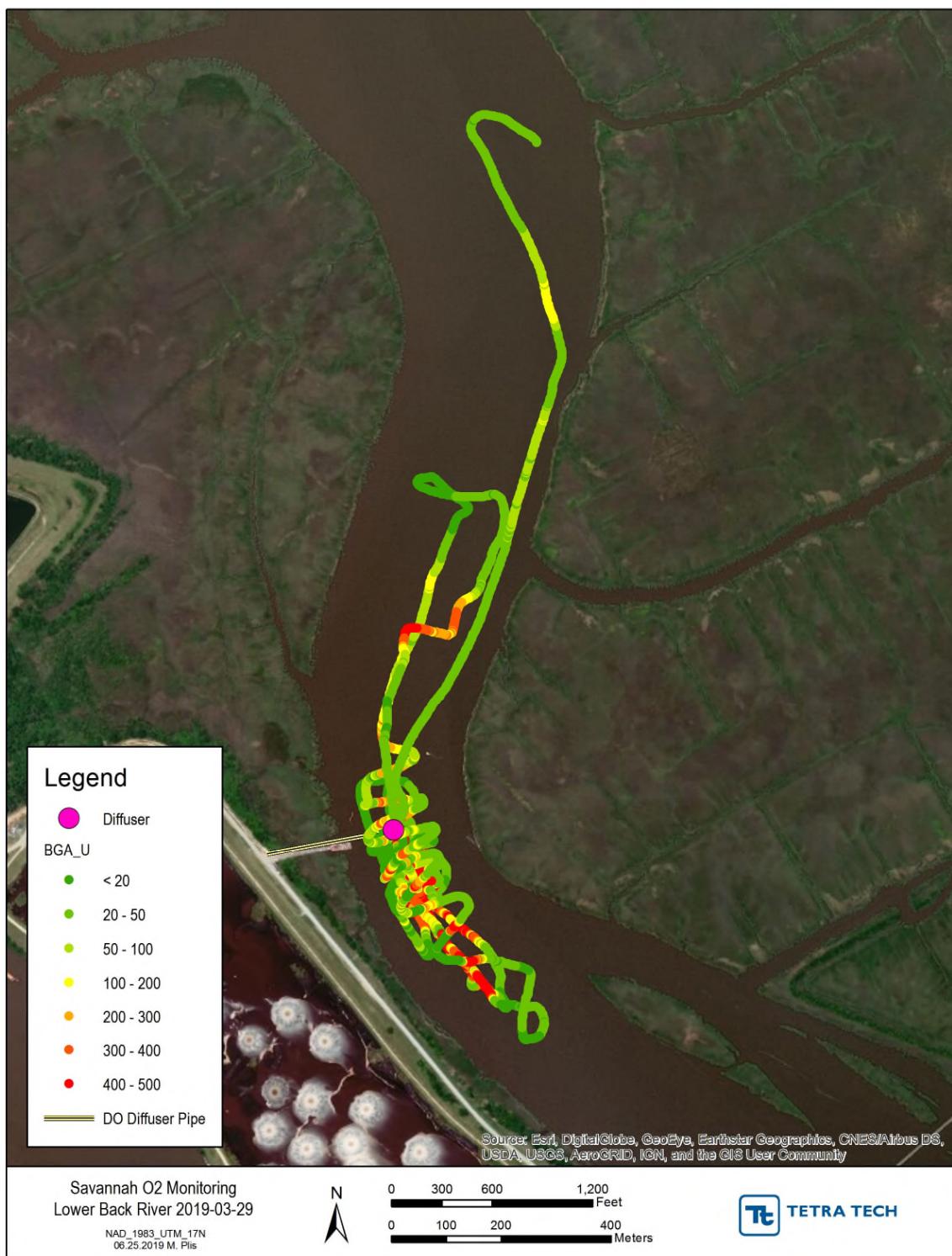


Figure G-1 Back River March 29, 2019 ebb tide dye drift points

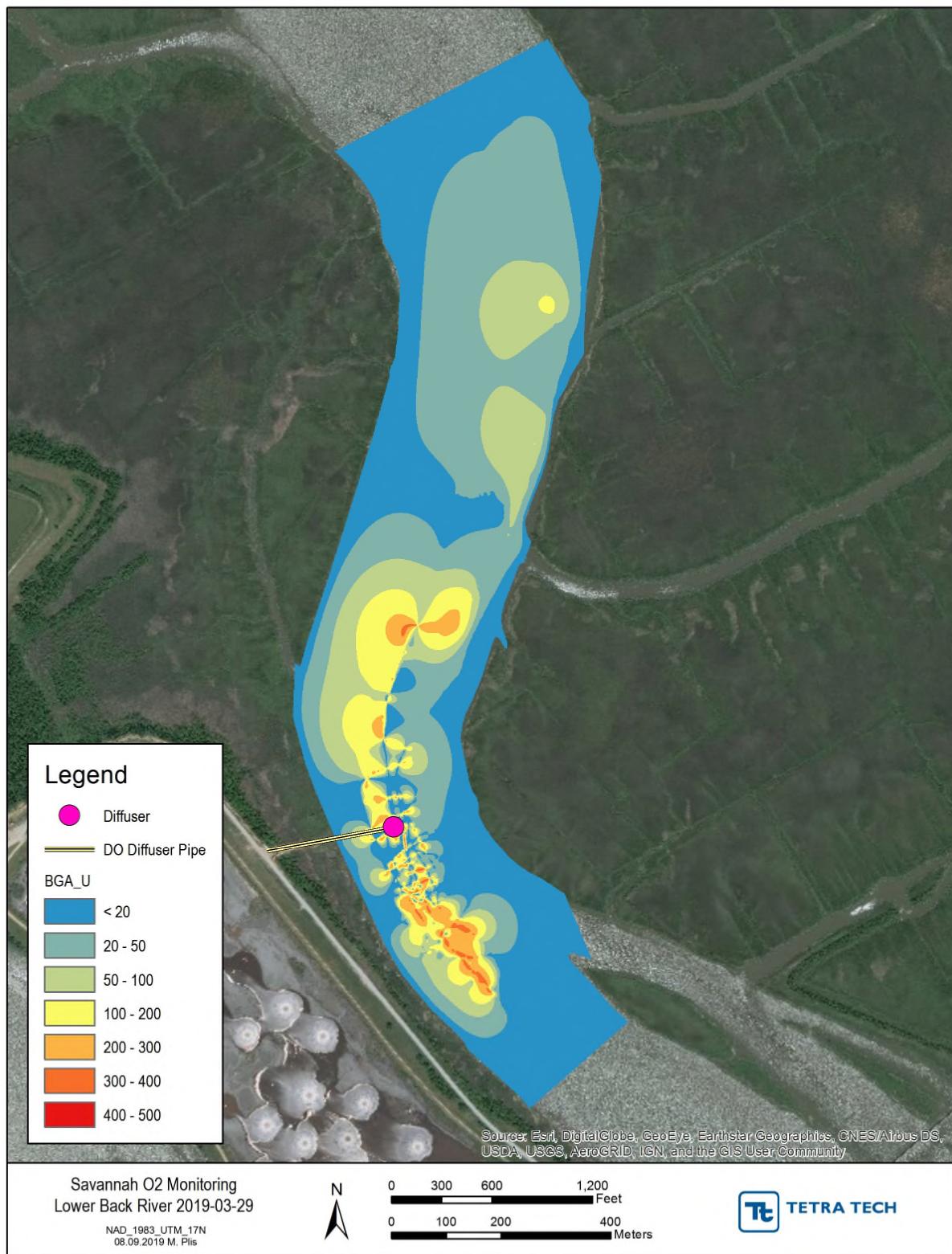


Figure G-2 Back River March 29, 2019 ebb tide dye drift raster interpolation

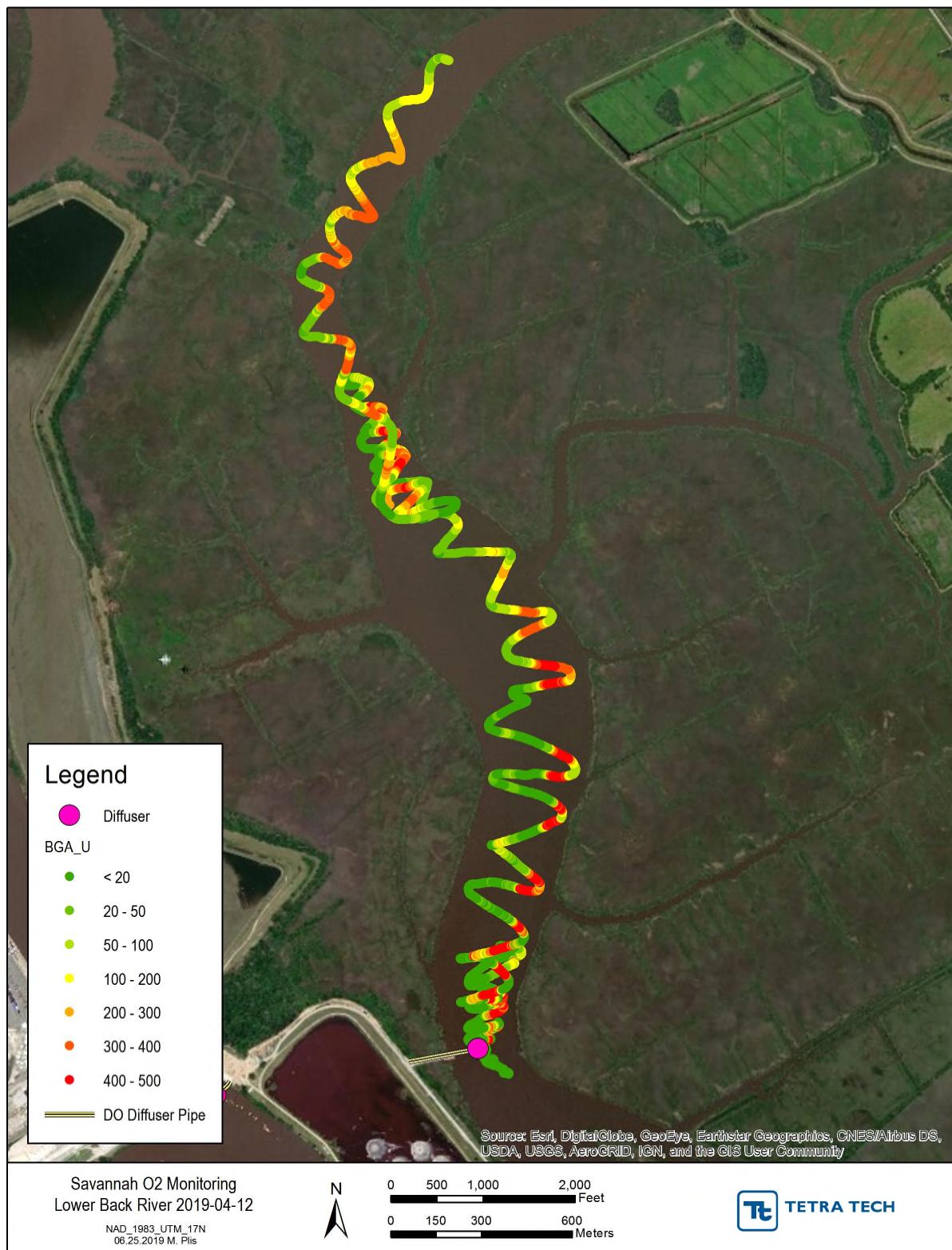


Figure G-3 Back River April 12, 2019 ebb tide dye drift boat 1 points

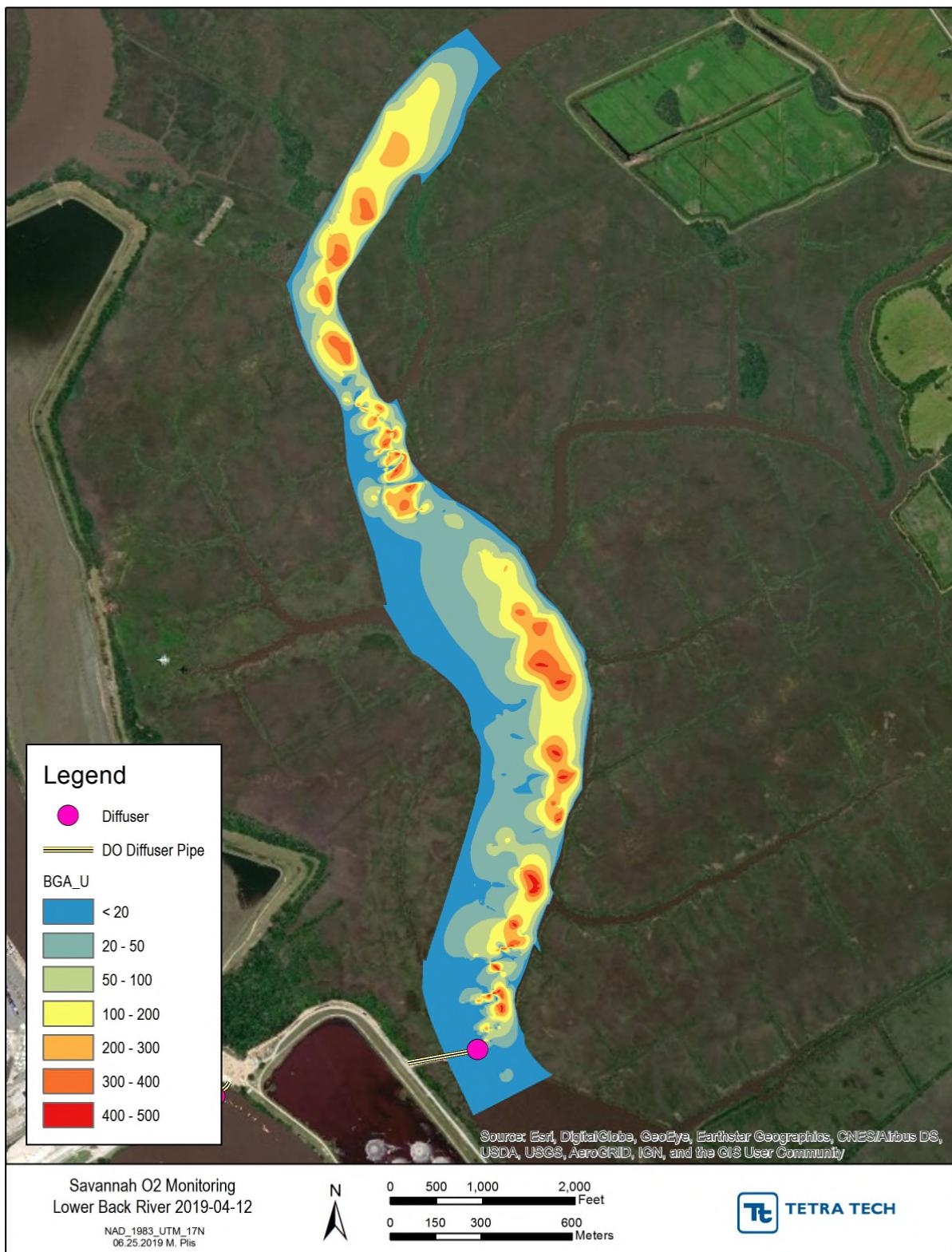


Figure G-4 Back River April 12, 2019 ebb tide dye drift boat 1 raster interpolation



Figure G-5 Back River April 12, 2019 ebb tide dye drift boat 2 points

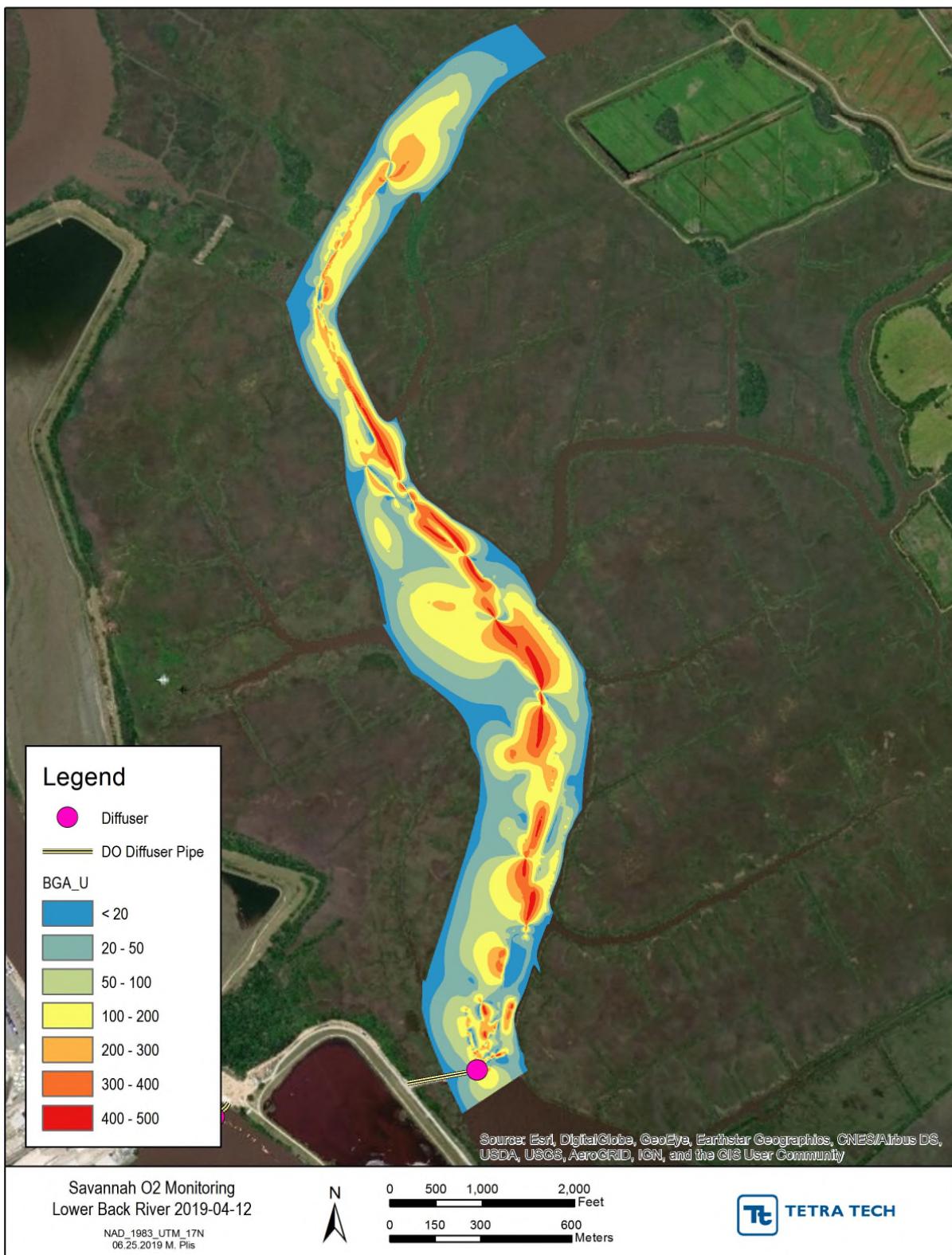


Figure G-6 Back River April 12, 2019 ebb tide dye drift boat 2 raster interpolation

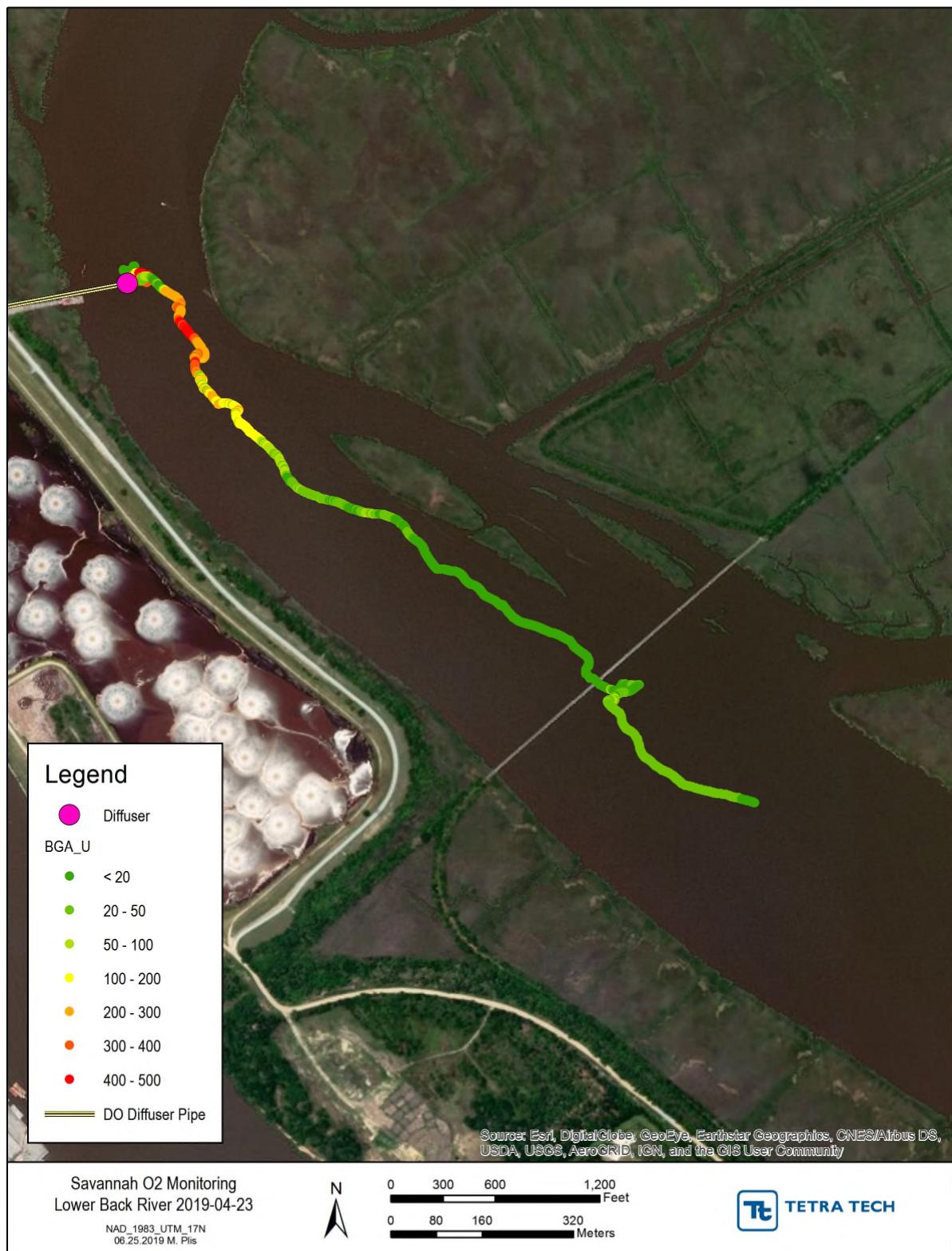


Figure G-7 Back River April 23, 2019 flood tide dye drift boat 1 points

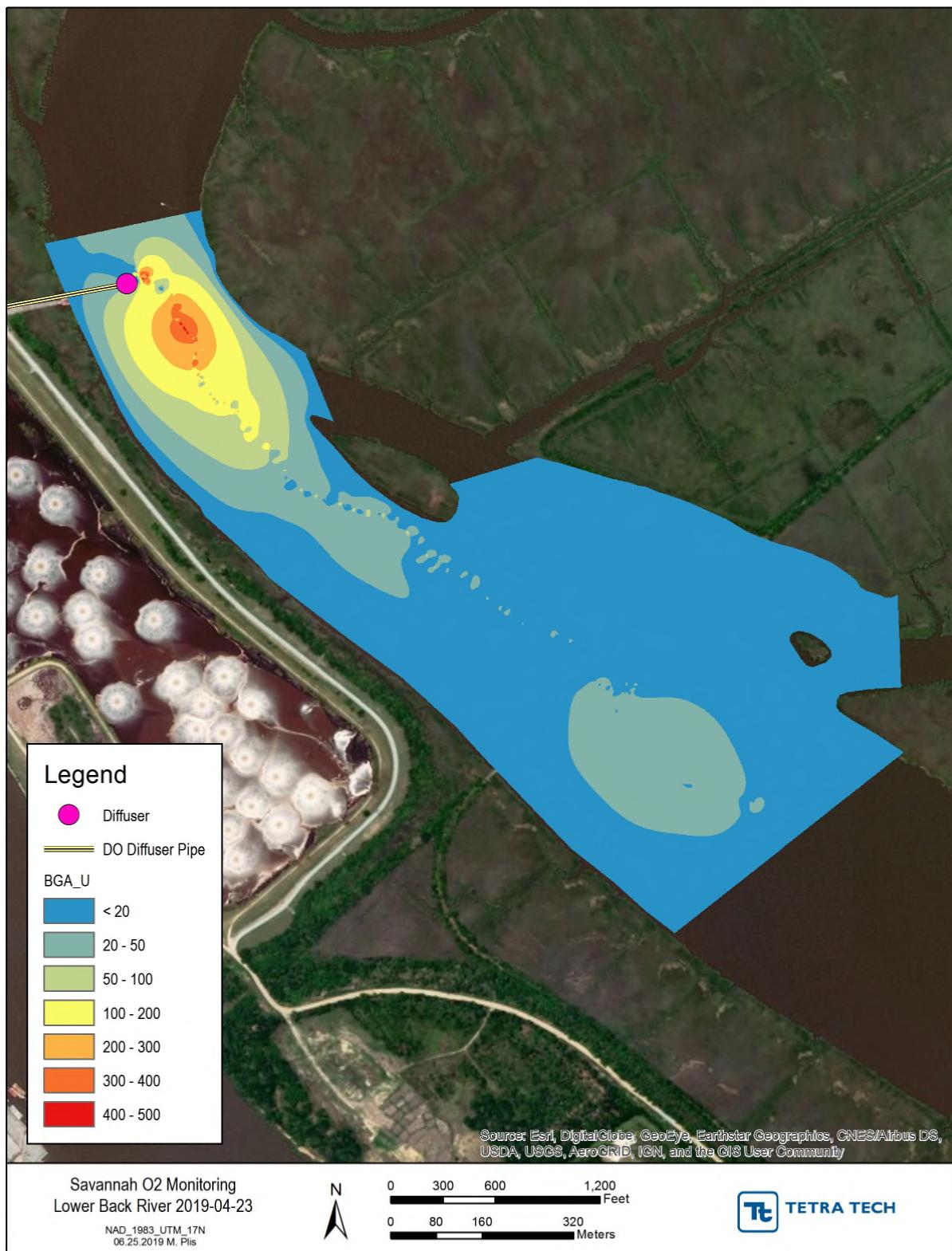


Figure G-8 Back River April 23, 2019 flood tide dye drift boat 1 raster interpolation

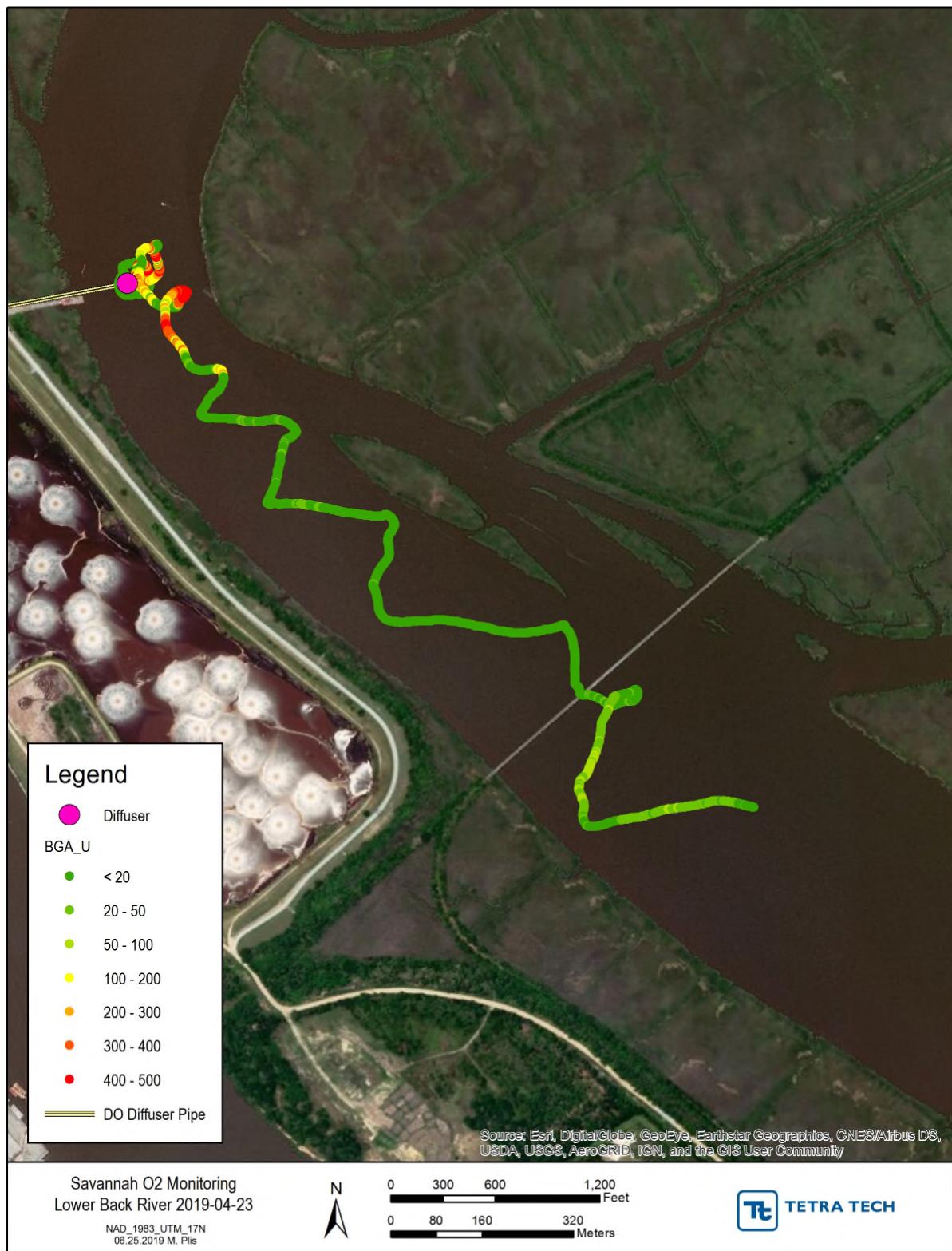


Figure G-9 Back River April 23, 2019 flood tide dye drift boat 2 points

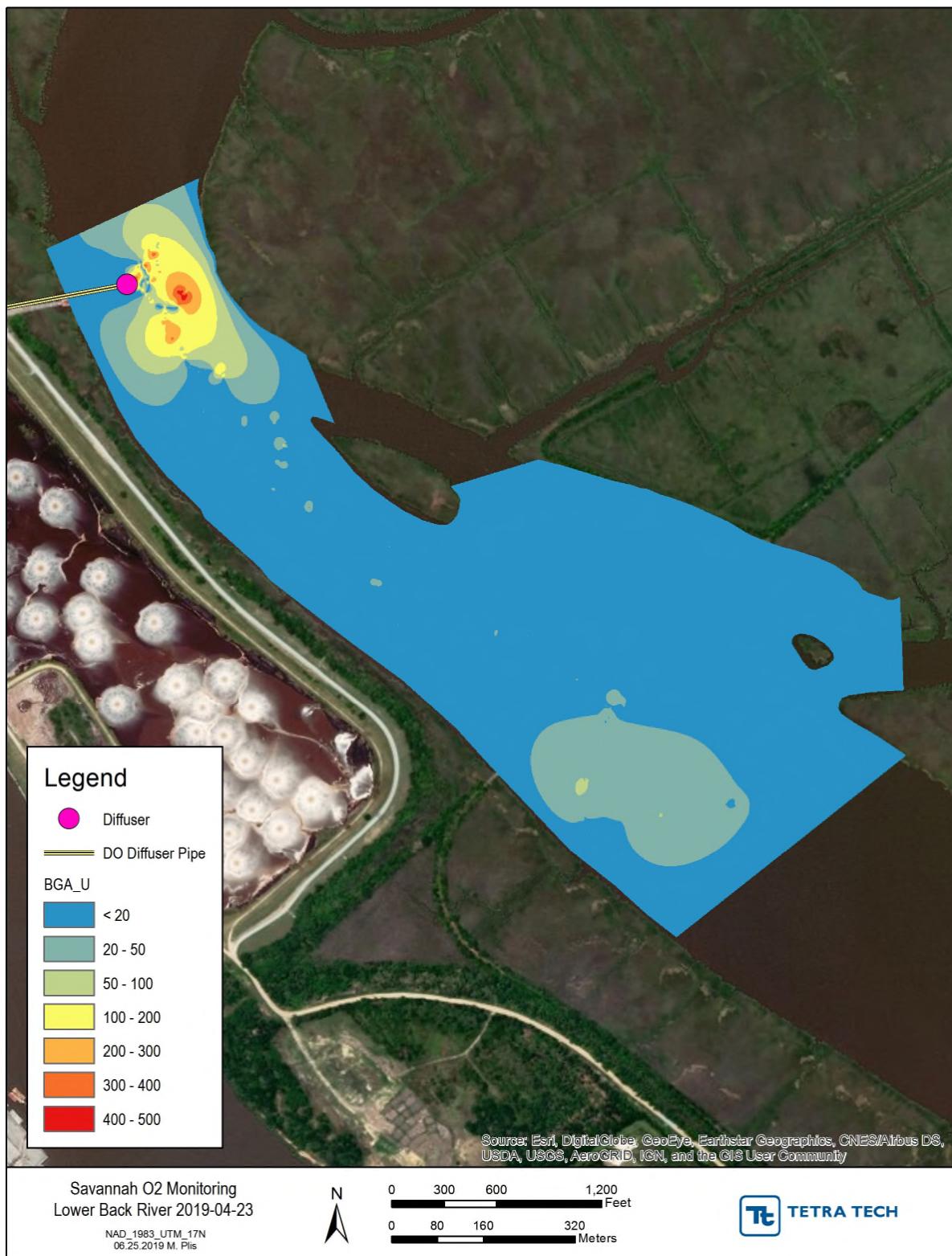


Figure G-10 Back River April 23, 2019 flood tide dye drift boat 2 raster interpolation

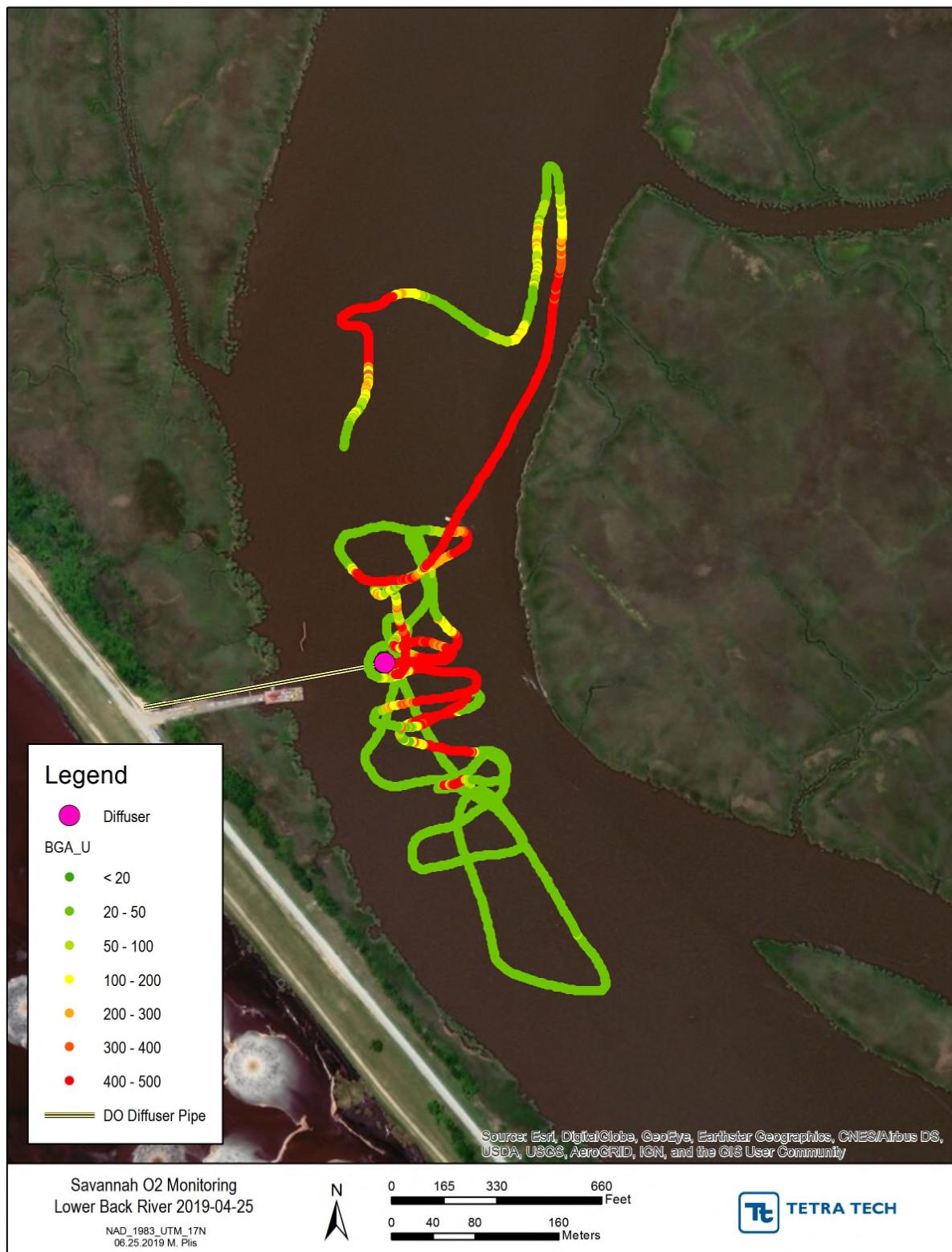


Figure G-11 Back River April 25, 2019 ebb tide dye points

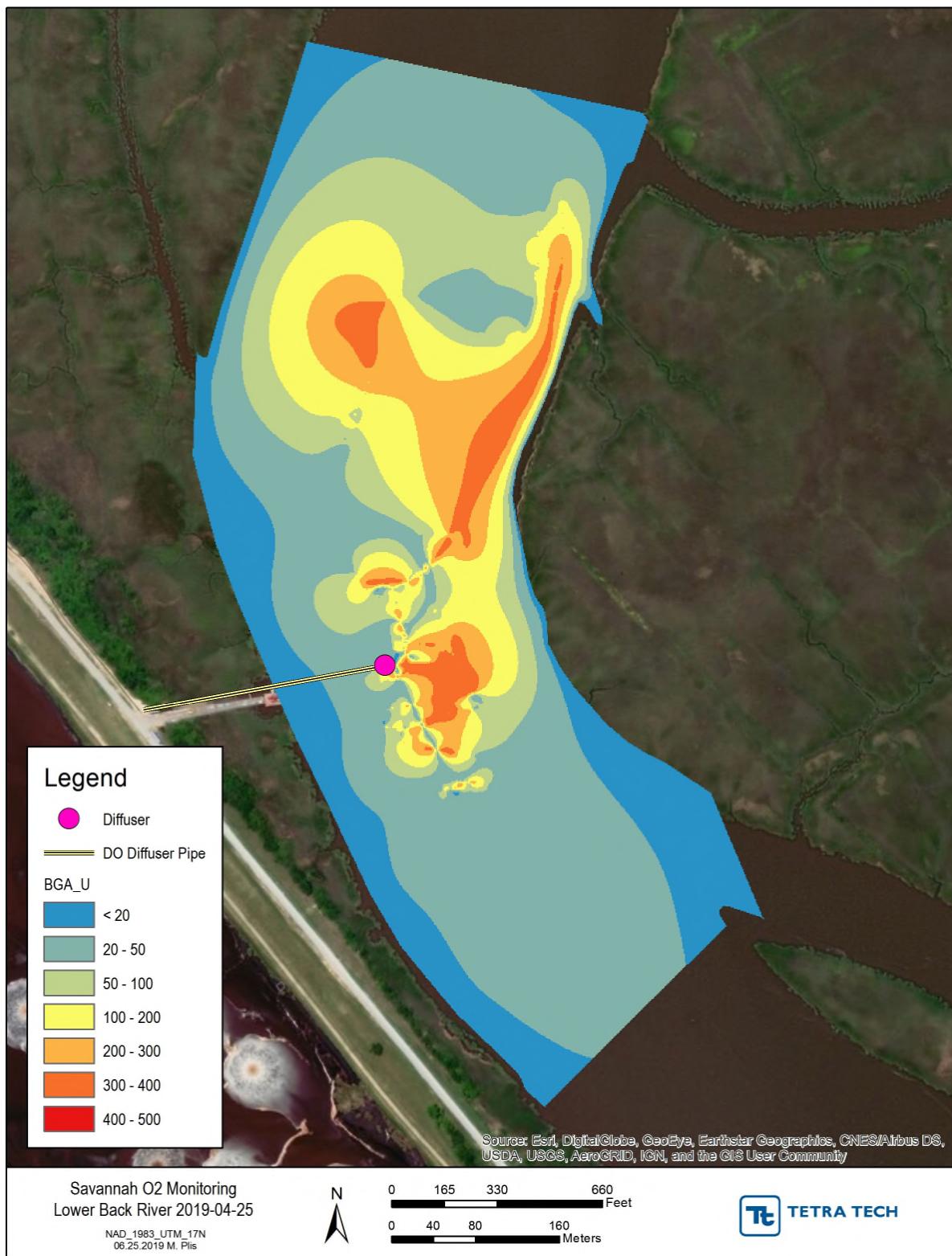
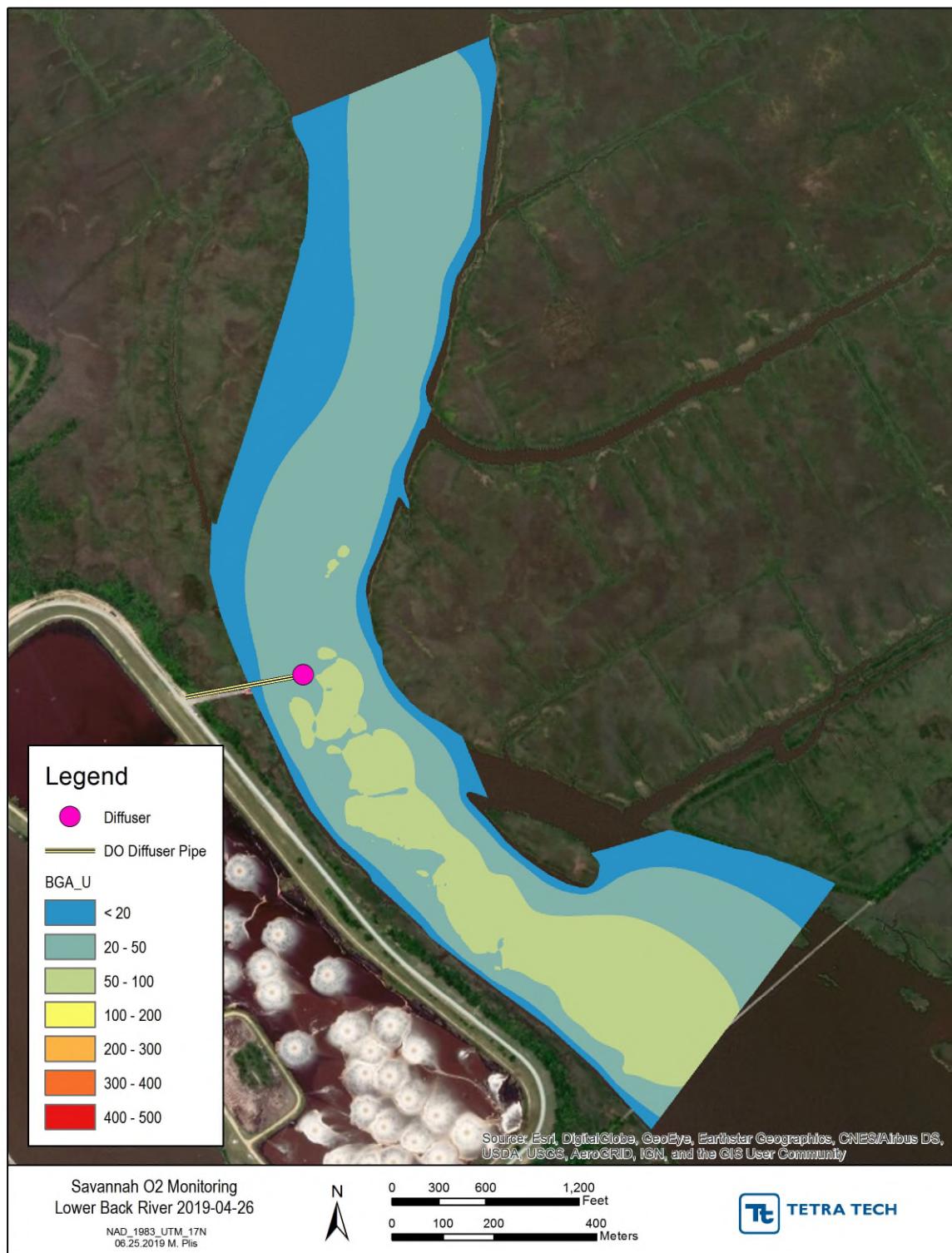


Figure G-12 Back River April 25, 2019 ebb tide dye raster interpolation



Note no dye release performed but tracking of previous day dye release was conducted

Figure G-13 Back River April 26, 2019 ebb tide drift boat 1 dye points



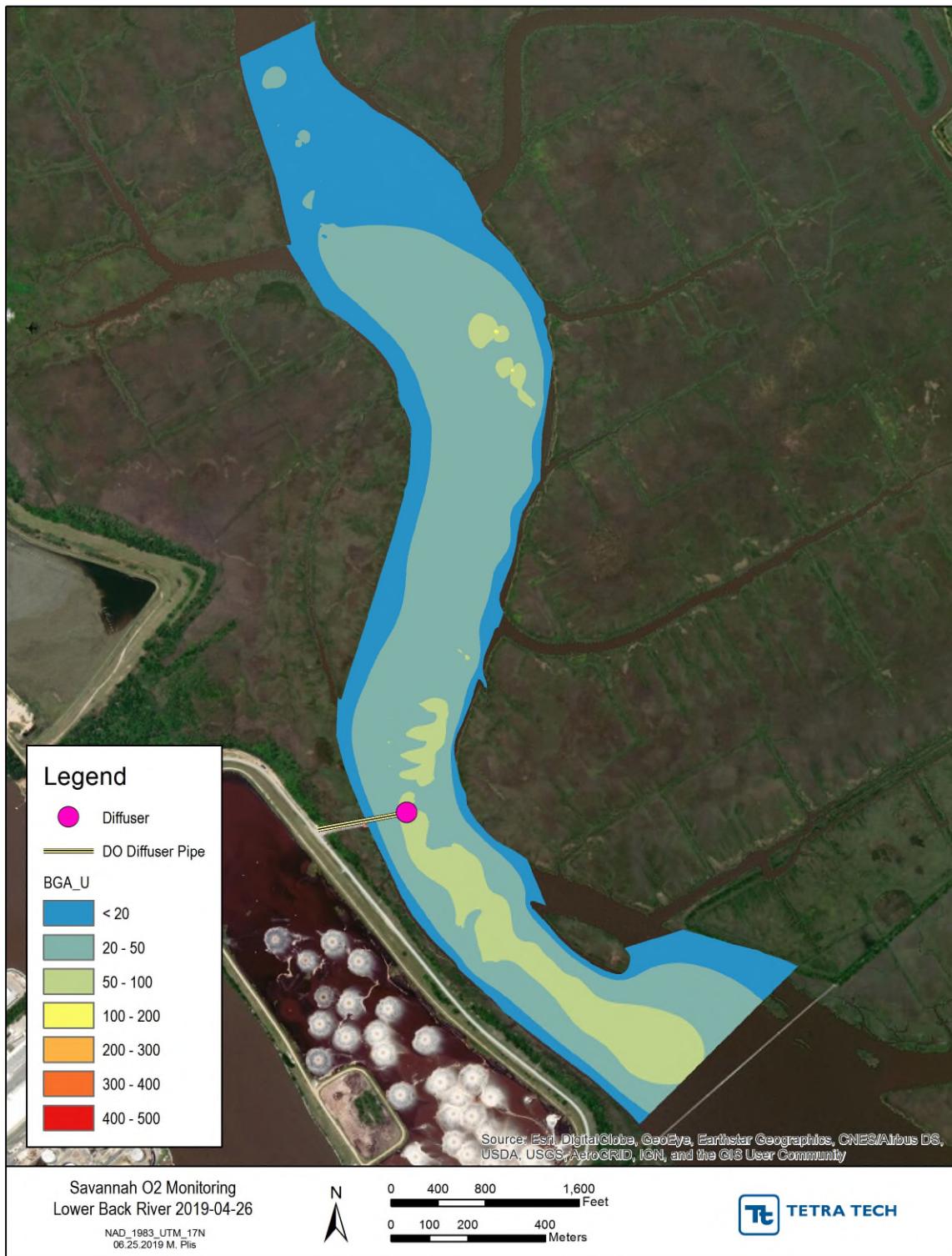
Note no dye release performed but tracking of previous day dye release was conducted

Figure G-14 Back River April 26, 2019 ebb tide drift boat 1 dye raster interpolation



Note no dye release performed but tracking of previous day dye release was conducted

Figure G-15 Back River April 26, 2019 ebb tide drift boat 2 dye points



Note no dye release performed but tracking of previous day dye release was conducted

Figure G-16 Back River April 26, 2019 ebb tide drift boat 2 dye raster interpolation

G.2 FRONT RIVER



Figure G-17 Front River April 11, 2019 ebb tide dye drift boat 1 period 1 points

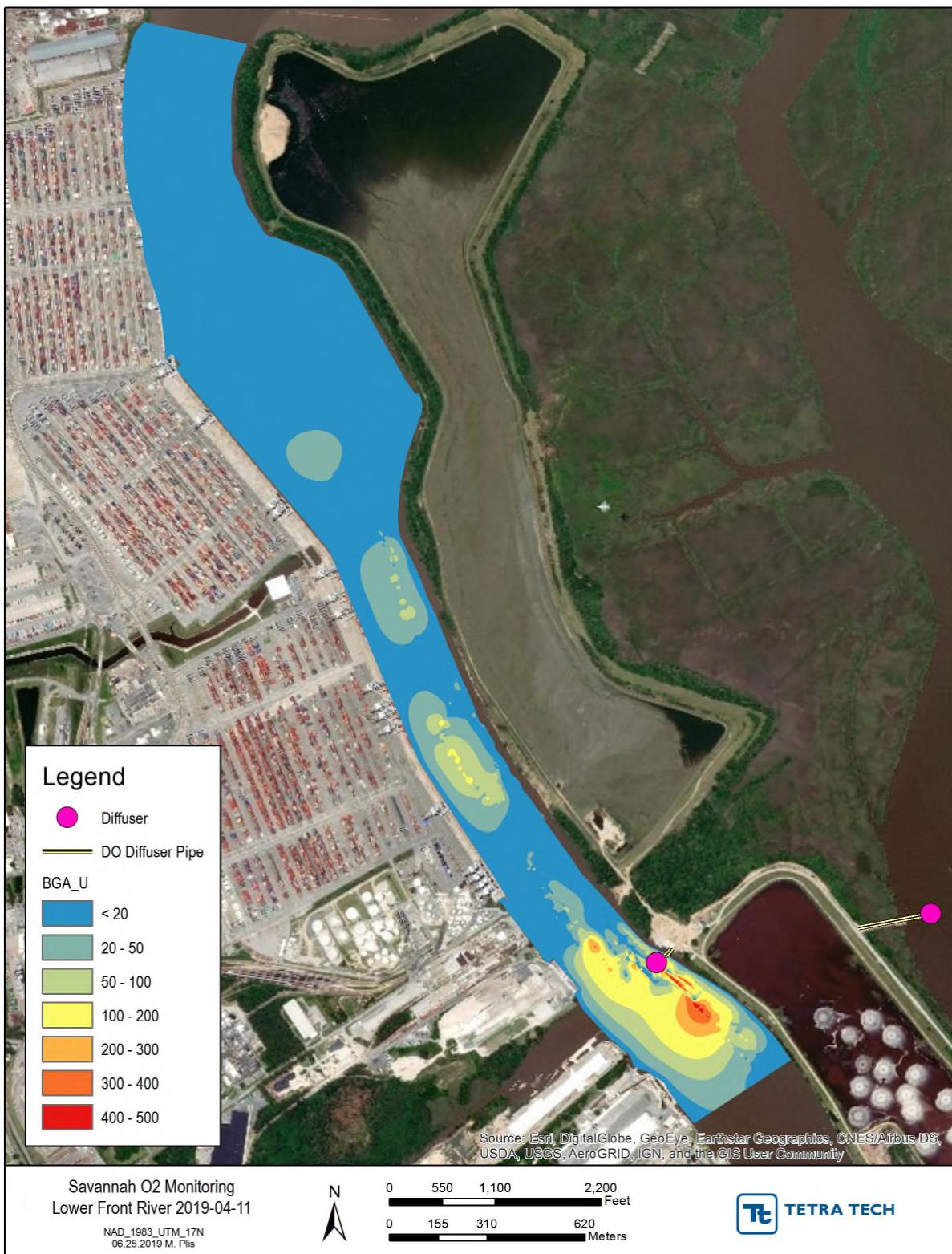


Figure G-18 Front River April 11, 2019 ebb tide dye drift boat 1 period 1 raster interpolation



Figure G-19 Front River April 11, 2019 ebb tide dye drift boat 1 period 2 points

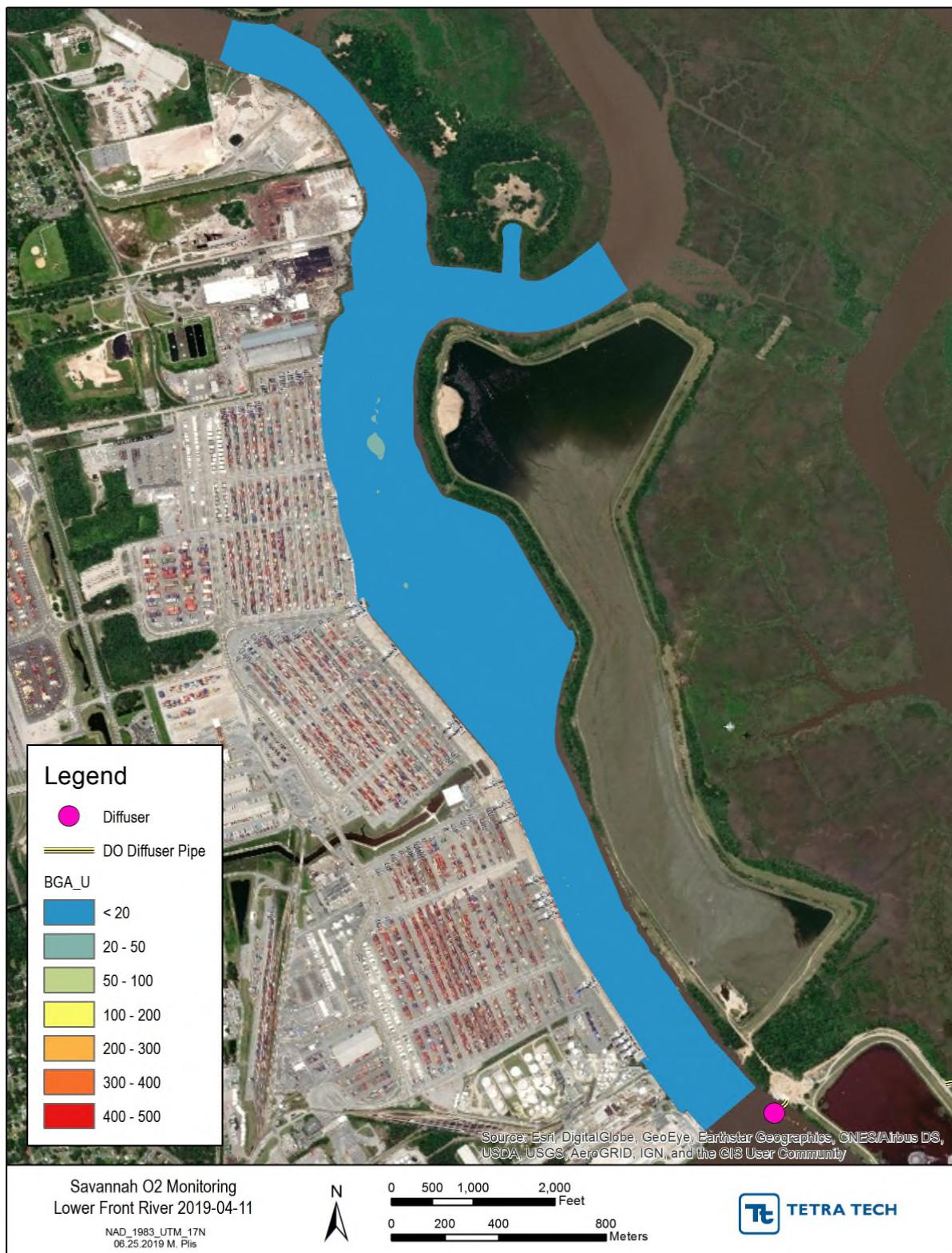


Figure G-20 Front River April 11, 2019 ebb tide dye drift boat 1 period 2 raster interpolation



Figure G-21 Front River April 11, 2019 ebb tide dye drift boat 2 points



Figure G-22 Front River April 11, 2019 ebb tide dye drift boat 2 raster interpolation

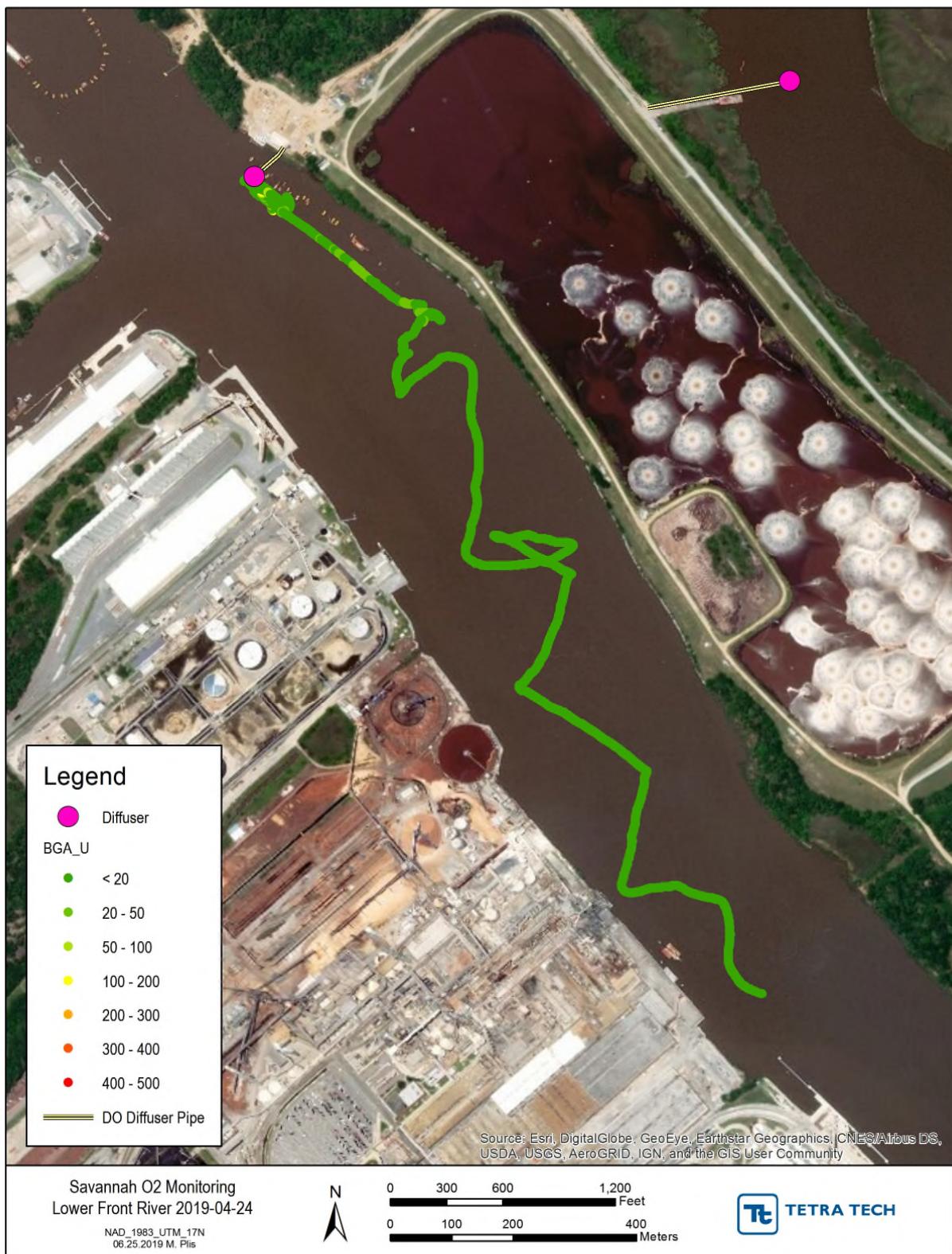


Figure G-23 Front River April 24, 2019 flood tide dye drift boat 1 points

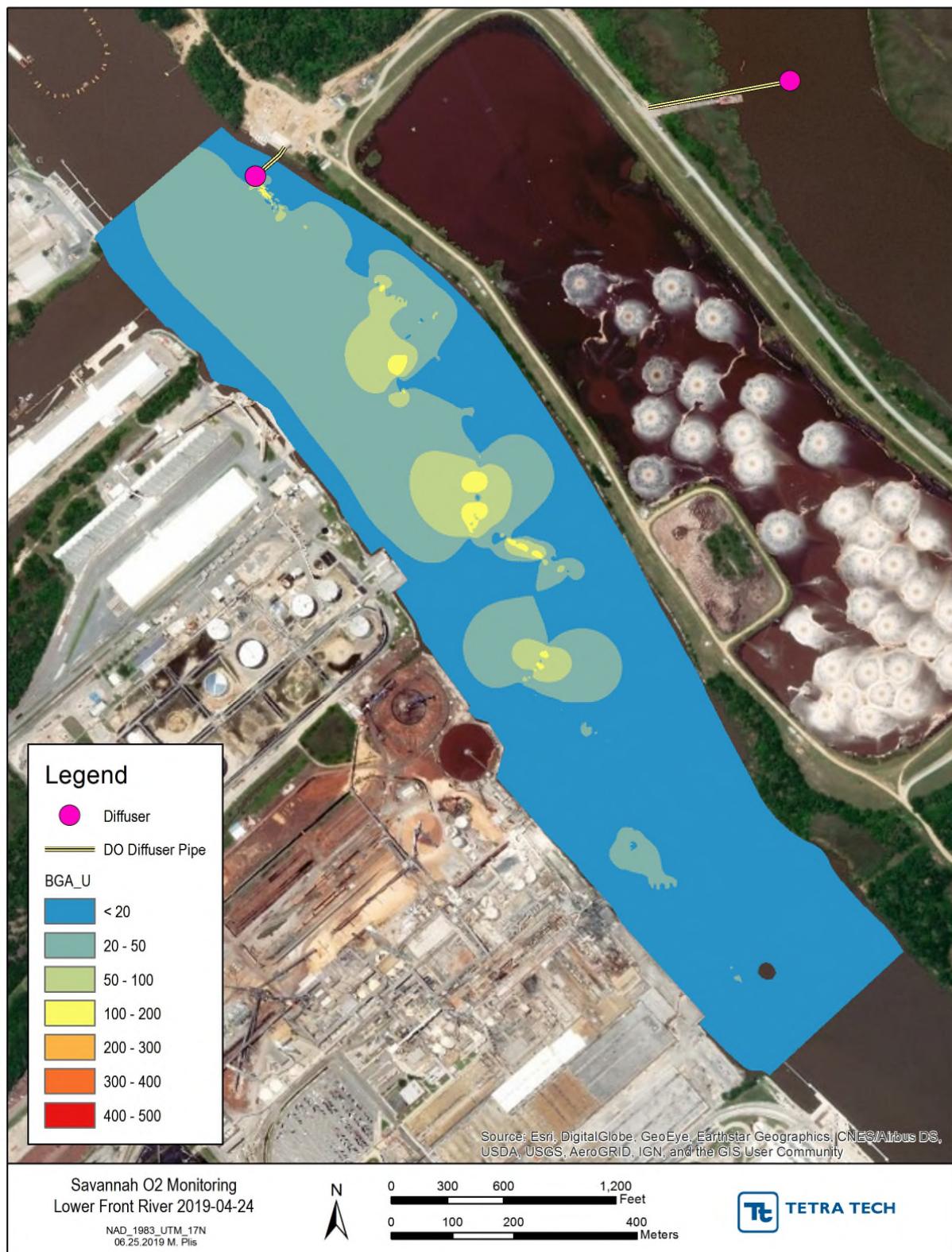


Figure G-24 Front River April 24, 2019 flood tide dye drift boat 1 raster interpolation

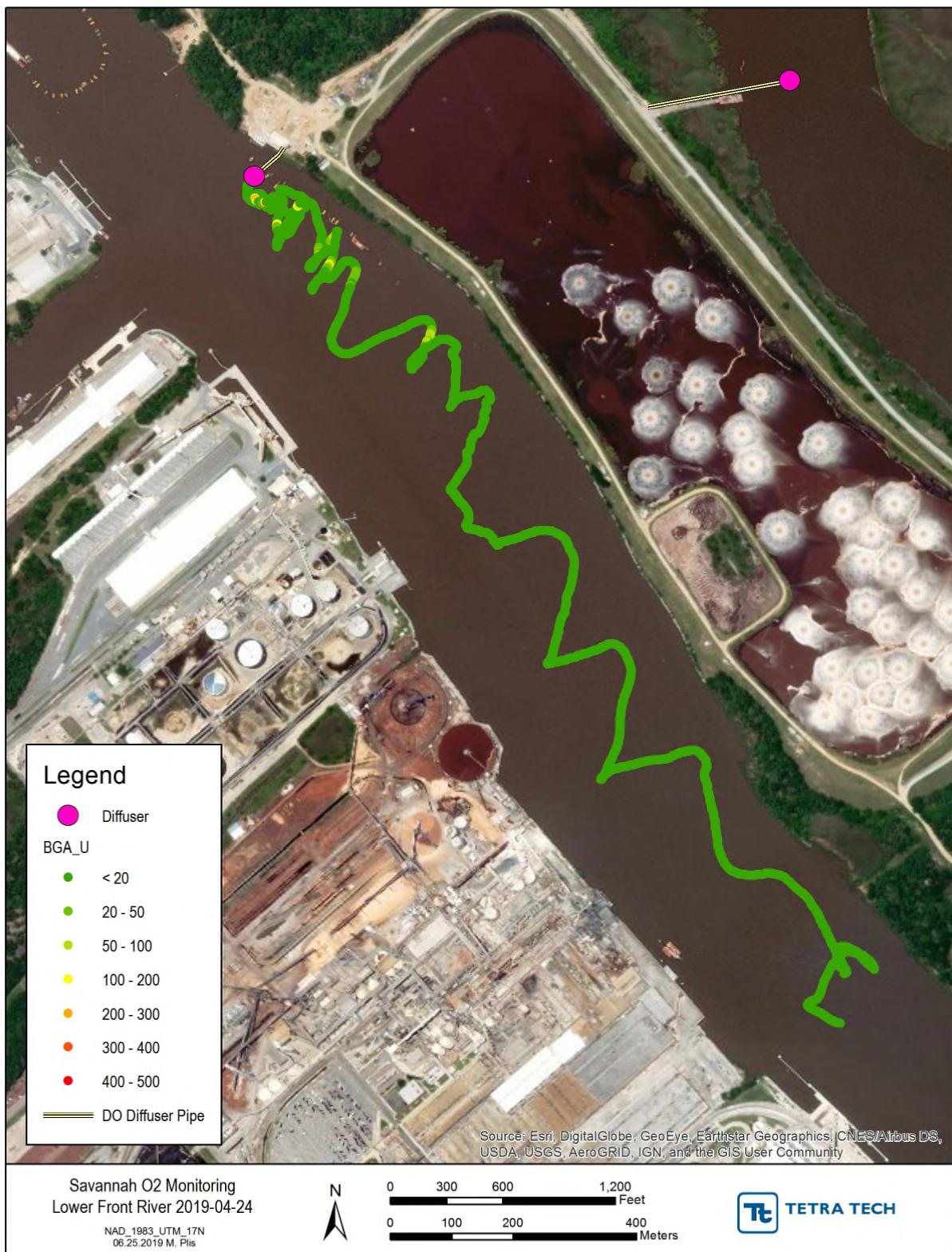


Figure G-25 Front River April 24, 2019 flood tide dye drift boat 2 points

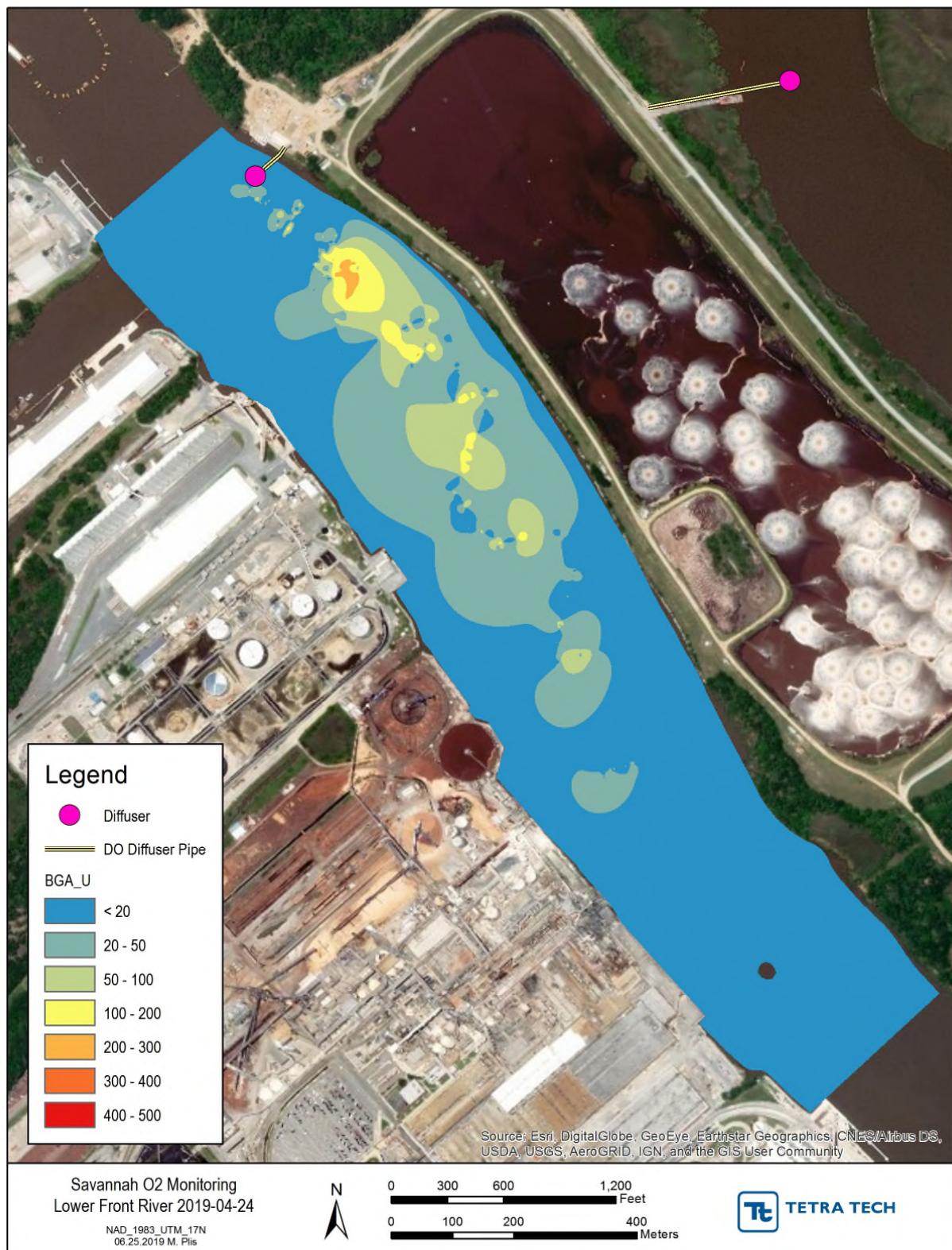


Figure G-26 Front River April 24, 2019 flood tide dye drift boat 2 raster interpolation

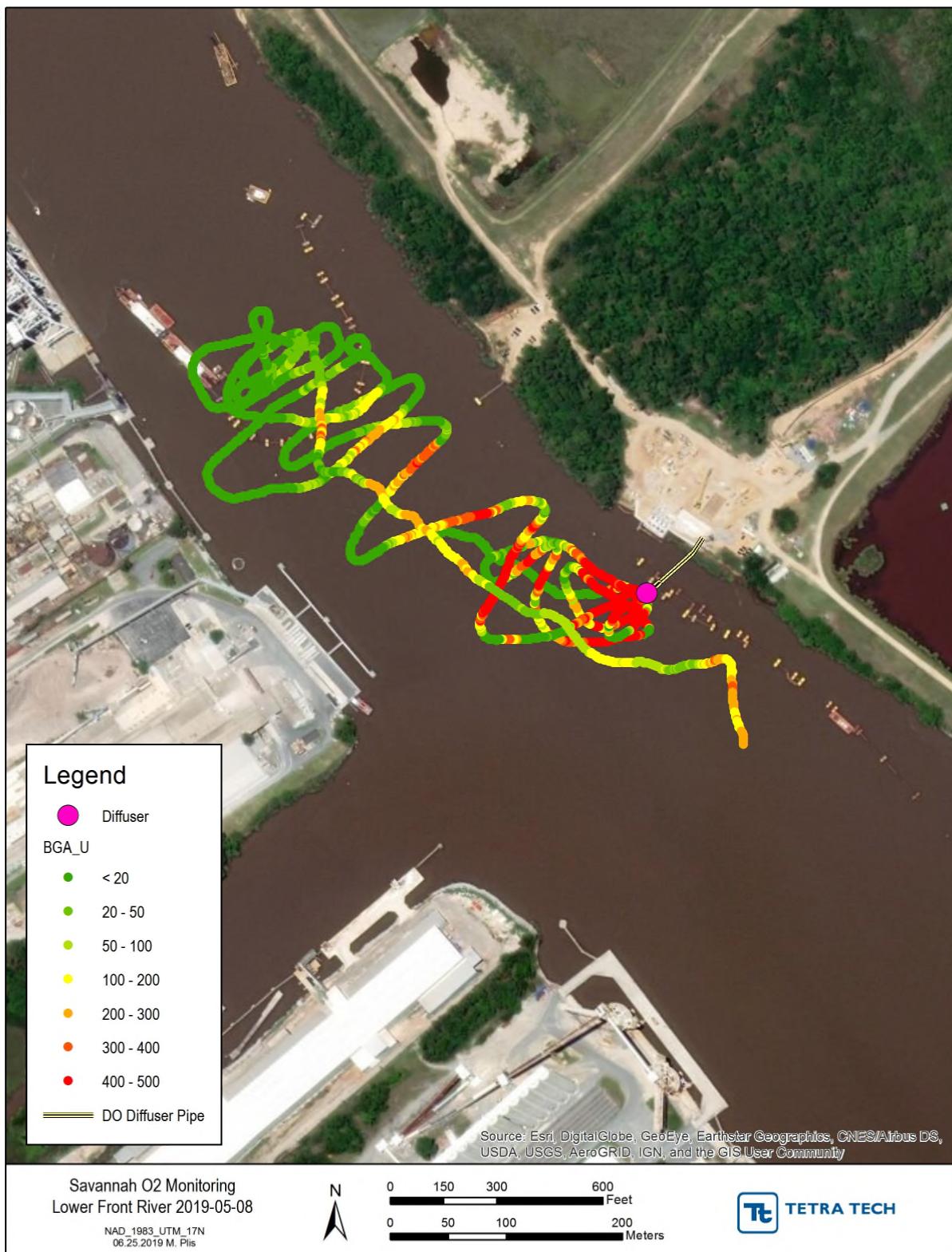


Figure G-27 Front River May 8, 2019 flood tide dye drift points

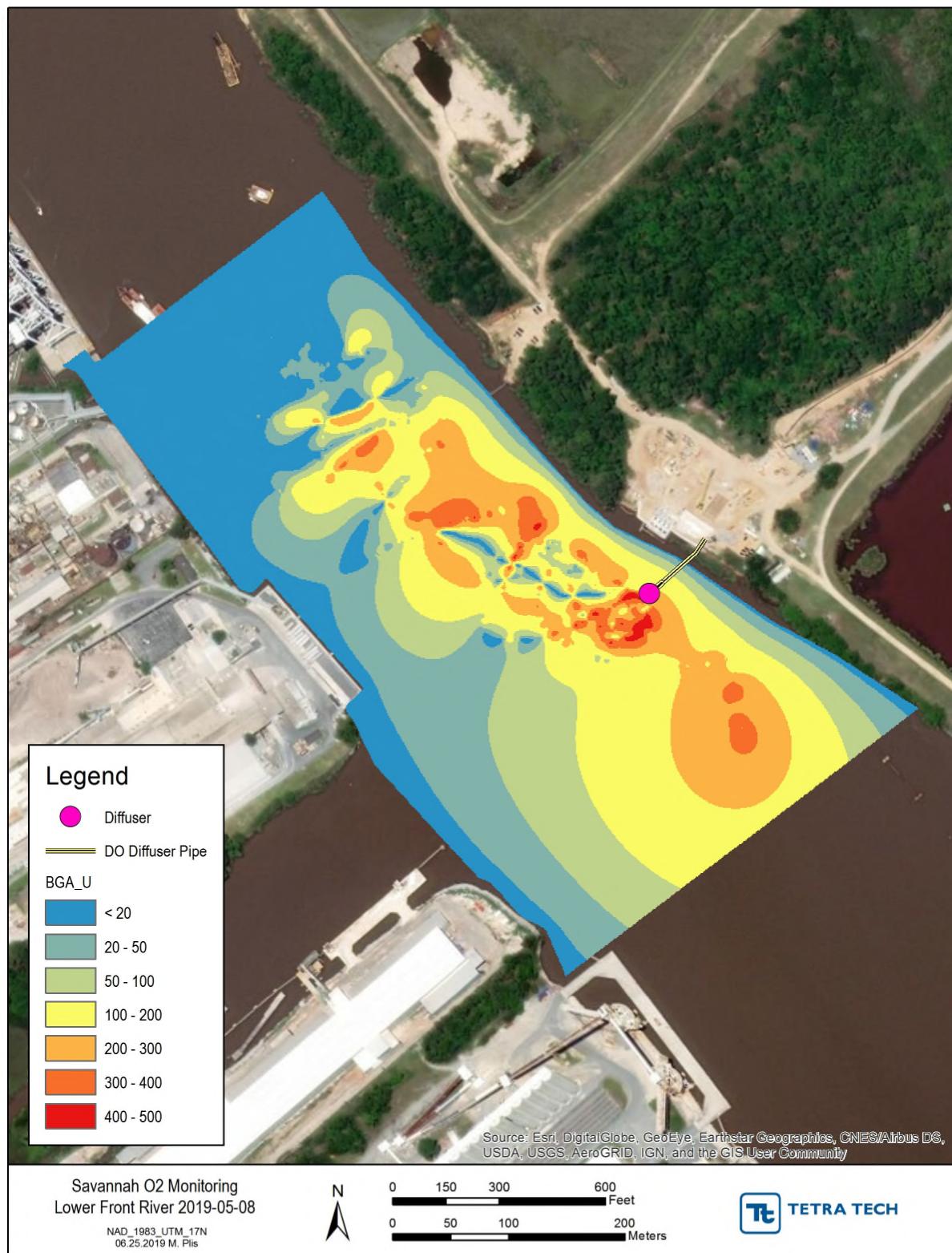


Figure G-28 Front River May 8, 2019 flood tide dye drift raster interpolation

APPENDIX H WATER COLUMN TRANSFER EFFICIENCY

Test Run Data Collection and Modeling Report

for the

Dissolved Oxygen Facility Environmental Testing

for the

Savannah Harbor Expansion Project

Contract# W912HN-15-D-0023

Tasks: 07 and 08

August 15, 2019

PREPARED FOR

Army Corps of Engineers
Savannah District
100 W Oglethorpe Avenue
Savannah, Georgia 31401-3640
Tel (912) 652-5026

PREPARED BY

LG2 Environmental Solutions, Inc.
10475 Fortune Parkway, Suite 201
Jacksonville, Florida 32256
Tel (904) 288-8631

Tetra Tech, Inc.
1899 Powers Ferry Rd SE, Suite 400
Atlanta, Georgia 30339
Tel (770) 738-6030

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H.1 WCTE CALCULATION SUMMARY TABLES

Table H-1 Front River daily WCTE inputs and outputs

Date	DO Loss Area (m ²)	Final Daily River Time (min)	Area weighted average Excess Oxygen (mg/L)	Depth (m)	Ka (1/day)	KL (m/day)	Daily River DO Loss (pounds/day)	Daily Plant DO Load (pounds/day)	Front River WCTE
3/14/2019	86	45	0.313	1.5	0.485	0.7	0.001	5,978	100.0%
3/15/2019	404	100	0.304	1.5	0.517	0.8	0.015	9,697	100.0%
3/16/2019	21	25	0.287	1.5	0.478	0.7	0.000	9,375	100.0%
3/17/2019	35	65	0.121	1.5	0.340	0.5	0.000	9,386	100.0%
3/18/2019	0	0	0.000	1.5	0.309	0.5	0.000	4,263	100.0%
3/19/2019	0	0	0.000	1.5	0.511	0.8	0.000	1,638	100.0%
3/20/2019	233	60	0.402	1.5	0.408	0.6	0.005	8,883	100.0%
3/21/2019	209	85	0.319	1.5	0.372	0.6	0.005	9,170	100.0%
3/22/2019	42	17	0.138	1.5	0.568	0.9	0.000	9,554	100.0%
3/23/2019	42	17	0.463	1.5	0.398	0.6	0.000	9,608	100.0%
3/24/2019	71	105	0.257	1.5	0.394	0.6	0.002	9,377	100.0%
3/25/2019	128	148	0.240	1.5	0.432	0.6	0.005	9,140	100.0%
3/26/2019	1,329	110	0.423	1.5	0.424	0.6	0.060	9,015	100.0%
3/27/2019	0	0	0.000	1.5	0.552	0.8	0.000	8,950	100.0%
3/28/2019	0	0	0.000	1.5	0.384	0.6	0.000	8,289	100.0%
3/29/2019	0	0	0.000	1.5	0.315	0.5	0.000	8,742	100.0%
3/30/2019	0	0	0.000	1.5	0.352	0.5	0.000	9,073	100.0%
3/31/2019	76	60	0.577	1.5	0.594	0.9	0.004	8,084	100.0%
4/1/2019	0	0	0.000	1.5	0.551	0.8	0.000	7,212	100.0%
4/2/2019	0	0	0.000	1.5	0.585	0.9	0.000	9,244	100.0%
4/3/2019	184	60	0.236	1.5	0.278	0.4	0.002	9,226	100.0%
4/4/2019	340	86	0.731	1.5	0.397	0.6	0.019	9,666	100.0%
4/5/2019	21	5	0.315	1.5	0.431	0.6	0.000	9,350	100.0%
4/6/2019	42	20	0.170	1.5	0.308	0.5	0.000	9,068	100.0%
4/7/2019	21	15	0.079	1.5	0.309	0.5	0.000	9,034	100.0%
4/8/2019	0	0	0.000	1.5	0.462	0.7	0.000	9,136	100.0%
4/9/2019	0	0	0.000	1.5	0.421	0.6	0.000	9,189	100.0%
4/10/2019	0	0	0.000	1.5	0.410	0.6	0.000	9,475	100.0%
4/11/2019	0	0	0.000	1.5	0.507	0.8	0.000	9,939	100.0%
4/12/2019	0	0	0.000	1.5	0.608	0.9	0.000	9,910	100.0%
4/13/2019	0	0	0.000	1.5	0.512	0.8	0.000	10,250	100.0%
4/14/2019	0	0	0.000	1.5	0.707	1.1	0.000	10,220	100.0%
4/15/2019	0	0	0.000	1.5	0.887	1.3	0.000	9,889	100.0%
4/16/2019	0	0	0.000	1.5	0.410	0.6	0.000	8,352	100.0%
4/17/2019	0	0	0.000	1.5	0.354	0.5	0.000	9,421	100.0%
4/18/2019	0	0	0.000	1.5	0.493	0.7	0.000	9,684	100.0%
4/19/2019	0	0	0.000	1.5	0.905	1.4	0.000	9,460	100.0%
4/20/2019	0	0	0.000	1.5	0.746	1.1	0.000	9,543	100.0%

Date	DO Loss Area (m ²)	Final Daily River Time (min)	Area weighted average Excess Oxygen (mg/L)	Depth (m)	Ka (1/day)	KL (m/day)	Daily River DO Loss (pounds/day)	Daily Plant DO Load (pounds/day)	Front River WCTE
4/21/2019	0	0	0.000	1.5	0.515	0.8	0.000	9,938	100.0%
4/22/2019	0	0	0.000	1.5	0.310	0.5	0.000	10,038	100.0%
4/23/2019	21	5	0.152	1.5	0.337	0.5	0.000	10,113	100.0%
4/24/2019	0	0	0.000	1.5	0.418	0.6	0.000	10,008	100.0%
4/25/2019	0	0	0.000	1.5	0.390	0.6	0.000	10,057	100.0%
4/26/2019	0	0	0.000	1.5	0.756	1.1	0.000	9,937	100.0%
4/27/2019	0	0	0.000	1.5	0.435	0.7	0.000	9,738	100.0%
4/28/2019	0	0	0.000	1.5	0.456	0.7	0.000	9,946	100.0%
4/29/2019	0	0	0.000	1.5	0.461	0.7	0.000	9,762	100.0%
4/30/2019	0	0	0.000	1.5	0.401	0.6	0.000	8,362	100.0%
5/1/2019	0	0	0.000	1.5	0.432	0.6	0.000	9,494	100.0%
5/2/2019	0	0	0.000	1.5	0.498	0.7	0.000	9,166	100.0%
5/3/2019	0	0	0.000	1.5	0.415	0.6	0.000	9,433	100.0%
5/4/2019	0	0	0.000	1.5	0.354	0.5	0.000	9,296	100.0%
5/5/2019	0	0	0.000	1.5	0.604	0.9	0.000	9,260	100.0%
5/6/2019	0	0	0.000	1.5	0.372	0.6	0.000	9,614	100.0%
5/7/2019	0	0	0.000	1.5	0.493	0.7	0.000	10,034	100.0%
5/8/2019	0	0	0.000	1.5	0.514	0.8	0.000	10,122	100.0%
5/9/2019	0	0	0.000	1.5	0.548	0.8	0.000	10,011	100.0%
5/10/2019	0	0	0.000	1.5	0.496	0.7	0.000	9,976	100.0%
5/11/2019	0	0	0.000	1.5	0.499	0.7	0.000	9,920	100.0%
5/12/2019	0	0	0.000	1.5	0.472	0.7	0.000	9,732	100.0%

Note Daily River DO Loss and resulting WCTE values are actual calculated loss (summed from individual areas) and not based on averages as presented in table

Table H-2 Back River daily WCTE inputs and outputs

Date	DO Loss Area (m ²)	Final Daily River Time (min)	Area weighted average Excess Oxygen (mg/L)	Depth (m)	Ka (1/day)	KL (m/day)	Daily River DO Loss (pounds/day)	Daily Plant DO Load (pounds/day)	Back River WCTE
3/14/2019	289	160	0.067	1.5	0.625	0.9	0.004	2,443	100.0%
3/15/2019	204	201	0.151	1.5	0.629	0.9	0.009	3,707	100.0%
3/16/2019	372	195	0.128	1.5	0.643	1.0	0.014	3,592	100.0%
3/17/2019	0	0	0.000	1.5	0.474	0.7	0.000	3,538	100.0%
3/18/2019	0	0	0.000	1.5	0.478	0.7	0.000	1,574	100.0%
3/19/2019	0	0	0.000	1.5	0.689	1.0	0.000	777	100.0%
3/20/2019	168	75	0.098	1.5	0.579	0.9	0.002	3,530	100.0%
3/21/2019	153	70	0.129	1.5	0.567	0.8	0.002	3,631	100.0%
3/22/2019	105	62	0.090	1.5	0.740	1.1	0.001	3,744	100.0%
3/23/2019	168	182	0.067	1.5	0.602	0.9	0.003	3,609	100.0%
3/24/2019	189	320	0.210	1.5	0.593	0.9	0.017	3,663	100.0%
3/25/2019	3,277	557	0.190	1.5	0.616	0.9	0.489	3,557	100.0%
3/26/2019	92,793	613	0.210	1.5	0.540	0.8	14.792	3,473	99.6%
3/27/2019	92,884	810	0.721	1.5	0.670	1.0	83.416	3,369	97.5%
3/28/2019	92,884	1,095	0.942	1.5	0.491	0.7	107.968	3,057	96.5%
3/29/2019	92,884	990	0.702	1.5	0.433	0.6	64.162	3,723	98.3%
3/30/2019	92,884	960	0.628	1.5	0.496	0.7	63.804	3,964	98.4%
3/31/2019	92,884	1,050	0.696	1.5	0.725	1.1	112.976	3,645	96.9%
4/1/2019	92,884	480	0.214	1.5	0.682	1.0	14.959	3,054	99.5%
4/2/2019	92,884	375	0.379	1.5	0.739	1.1	22.391	3,675	99.4%
4/3/2019	7,353	271	0.237	1.5	0.428	0.6	0.465	3,786	100.0%
4/4/2019	73,239	345	0.270	1.5	0.544	0.8	8.536	3,895	99.8%
4/5/2019	189	181	0.352	1.5	0.612	0.9	0.017	3,857	100.0%
4/6/2019	147	65	0.082	1.5	0.491	0.7	0.001	3,833	100.0%
4/7/2019	189	154	0.235	1.5	0.465	0.7	0.007	3,872	100.0%
4/8/2019	189	230	0.142	1.5	0.613	0.9	0.009	3,932	100.0%
4/9/2019	21	30	0.025	1.5	0.612	0.9	0.000	3,951	100.0%
4/10/2019	42	5	0.138	1.5	0.589	0.9	0.000	4,069	100.0%
4/11/2019	0	0	0.000	1.5	0.647	1.0	0.000	4,238	100.0%
4/12/2019	0	0	0.000	1.5	0.775	1.2	0.000	4,237	100.0%
4/13/2019	0	0	0.000	1.5	0.660	1.0	0.000	4,298	100.0%
4/14/2019	0	0	0.000	1.5	0.884	1.3	0.000	4,247	100.0%
4/15/2019	0	0	0.000	1.5	1.099	1.6	0.000	4,089	100.0%
4/16/2019	0	0	0.000	1.5	0.592	0.9	0.000	3,333	100.0%
4/17/2019	0	0	0.000	1.5	0.552	0.8	0.000	3,682	100.0%
4/18/2019	0	0	0.000	1.5	0.666	1.0	0.000	3,606	100.0%
4/19/2019	0	0	0.000	1.5	1.128	1.7	0.000	3,525	100.0%
4/20/2019	0	0	0.000	1.5	0.963	1.4	0.000	3,590	100.0%
4/21/2019	0	0	0.000	1.5	0.692	1.0	0.000	3,727	100.0%
4/22/2019	189	46	0.096	1.5	0.509	0.8	0.001	3,733	100.0%

Date	DO Loss Area (m ²)	Final Daily River Time (min)	Area weighted average Excess Oxygen (mg/L)	Depth (m)	Ka (1/day)	KL (m/day)	Daily River DO Loss (pounds/day)	Daily Plant DO Load (pounds/day)	Back River WCTE
4/23/2019	189	346	0.307	1.5	0.532	0.8	0.025	3,639	100.0%
4/24/2019	189	503	0.640	1.5	0.591	0.9	0.083	3,540	100.0%
4/25/2019	1,443,125	1,140	0.659	1.5	0.532	0.8	1,324.021	3,658	63.8%
4/26/2019	1,443,125	1,200	0.551	1.5	0.932	1.4	2,040.559	3,791	46.2%
4/27/2019	1,443,125	930	0.872	1.5	0.592	0.9	1,592.466	3,734	57.4%
4/28/2019	1,443,125	1,170	0.647	1.5	0.614	0.9	1,540.298	3,821	59.7%
4/29/2019	1,443,125	1,275	0.813	1.5	0.646	1.0	2,219.005	3,839	42.2%
4/30/2019	1,443,125	1,365	0.722	1.5	0.563	0.8	1,839.029	3,370	45.4%
5/1/2019	1,443,125	990	0.591	1.5	0.598	0.9	1,160.489	3,824	69.6%
5/2/2019	388,815	281	0.469	1.5	0.702	1.1	82.598	3,745	97.8%
5/3/2019	42	10	0.049	1.5	0.599	0.9	0.000	3,871	100.0%
5/4/2019	0	0	0.000	1.5	0.514	0.8	0.000	3,831	100.0%
5/5/2019	0	0	0.000	1.5	0.828	1.2	0.000	3,738	100.0%
5/6/2019	0	0	0.000	1.5	0.580	0.9	0.000	3,816	100.0%
5/7/2019	0	0	0.000	1.5	0.679	1.0	0.000	3,959	100.0%
5/8/2019	21	45	0.295	1.5	0.700	1.0	0.000	3,978	100.0%
5/9/2019	42	107	0.103	1.5	0.753	1.1	0.001	3,941	100.0%
5/10/2019	17,498	152	0.137	1.5	0.660	1.0	0.552	4,063	100.0%
5/11/2019	84	33	0.102	1.5	0.697	1.0	0.000	4,049	100.0%
5/12/2019	0	0	0.000	1.5	0.658	1.0	0.000	3,909	100.0%

Note Daily River DO Loss and resulting WCTE values are actual calculated loss (summed from individual areas) and not based on averages as presented in table

Table H-3 River combination WCTE results

Date	Front River Daily Plant DO Load (pounds/day)	Front River WCTE	Back River Daily Plant DO Load (pounds/day)	Back River WCTE	River Combination WCTE
3/14/2019	5,978	100.0%	2,443	100.0%	100.0%
3/15/2019	9,697	100.0%	3,707	100.0%	100.0%
3/16/2019	9,375	100.0%	3,592	100.0%	100.0%
3/17/2019	9,386	100.0%	3,538	100.0%	100.0%
3/18/2019	4,263	100.0%	1,574	100.0%	100.0%
3/19/2019	1,638	100.0%	777	100.0%	100.0%
3/20/2019	8,883	100.0%	3,530	100.0%	100.0%
3/21/2019	9,170	100.0%	3,631	100.0%	100.0%
3/22/2019	9,554	100.0%	3,744	100.0%	100.0%
3/23/2019	9,608	100.0%	3,609	100.0%	100.0%
3/24/2019	9,377	100.0%	3,663	100.0%	100.0%
3/25/2019	9,140	100.0%	3,557	100.0%	100.0%
3/26/2019	9,015	100.0%	3,473	99.6%	99.9%
3/27/2019	8,950	100.0%	3,369	97.5%	99.3%
3/28/2019	8,289	100.0%	3,057	96.5%	99.0%
3/29/2019	8,742	100.0%	3,723	98.3%	99.5%
3/30/2019	9,073	100.0%	3,964	98.4%	99.5%
3/31/2019	8,084	100.0%	3,645	96.9%	99.0%
4/1/2019	7,212	100.0%	3,054	99.5%	99.9%
4/2/2019	9,244	100.0%	3,675	99.4%	99.8%
4/3/2019	9,226	100.0%	3,786	100.0%	100.0%
4/4/2019	9,666	100.0%	3,895	99.8%	99.9%
4/5/2019	9,350	100.0%	3,857	100.0%	100.0%
4/6/2019	9,068	100.0%	3,833	100.0%	100.0%
4/7/2019	9,034	100.0%	3,872	100.0%	100.0%
4/8/2019	9,136	100.0%	3,932	100.0%	100.0%
4/9/2019	9,189	100.0%	3,951	100.0%	100.0%
4/10/2019	9,475	100.0%	4,069	100.0%	100.0%
4/11/2019	9,939	100.0%	4,238	100.0%	100.0%
4/12/2019	9,910	100.0%	4,237	100.0%	100.0%
4/13/2019	10,250	100.0%	4,298	100.0%	100.0%
4/14/2019	10,220	100.0%	4,247	100.0%	100.0%
4/15/2019	9,889	100.0%	4,089	100.0%	100.0%
4/16/2019	8,352	100.0%	3,333	100.0%	100.0%
4/17/2019	9,421	100.0%	3,682	100.0%	100.0%
4/18/2019	9,684	100.0%	3,606	100.0%	100.0%
4/19/2019	9,460	100.0%	3,525	100.0%	100.0%
4/20/2019	9,543	100.0%	3,590	100.0%	100.0%
4/21/2019	9,938	100.0%	3,727	100.0%	100.0%
4/22/2019	10,038	100.0%	3,733	100.0%	100.0%
4/23/2019	10,113	100.0%	3,639	100.0%	100.0%

Date	Front River Daily Plant DO Load (pounds/day)	Front River WCTE	Back River Daily Plant DO Load (pounds/day)	Back River WCTE	River Combination WCTE
4/24/2019	10,008	100.0%	3,540	100.0%	100.0%
4/25/2019	10,057	100.0%	3,658	63.8%	90.3%
4/26/2019	9,937	100.0%	3,791	46.2%	85.1%
4/27/2019	9,738	100.0%	3,734	57.4%	88.2%
4/28/2019	9,946	100.0%	3,821	59.7%	88.8%
4/29/2019	9,762	100.0%	3,839	42.2%	83.7%
4/30/2019	8,362	100.0%	3,370	45.4%	84.3%
5/1/2019	9,494	100.0%	3,824	69.6%	91.3%
5/2/2019	9,166	100.0%	3,745	97.8%	99.4%
5/3/2019	9,433	100.0%	3,871	100.0%	100.0%
5/4/2019	9,296	100.0%	3,831	100.0%	100.0%
5/5/2019	9,260	100.0%	3,738	100.0%	100.0%
5/6/2019	9,614	100.0%	3,816	100.0%	100.0%
5/7/2019	10,034	100.0%	3,959	100.0%	100.0%
5/8/2019	10,122	100.0%	3,978	100.0%	100.0%
5/9/2019	10,011	100.0%	3,941	100.0%	100.0%
5/10/2019	9,976	100.0%	4,063	100.0%	100.0%
5/11/2019	9,920	100.0%	4,049	100.0%	100.0%
5/12/2019	9,732	100.0%	3,909	100.0%	100.0%

H.2 DAILY DO LOSS AREA

Table H-4 Test Run period DO Loss Area

Date	Front River		Back River		
	Continuous Data Area (square meters)	Intermittent Data Area (square meters)	Continuous Data Area (square meters)	Intermittent Data Area (square meters)	Neap Tide Area (square meters)
3/14/2019	21	65	42	247	N/A
3/15/2019	21	383	189	15	N/A
3/16/2019	21	0	21	351	N/A
3/17/2019	21	14	0	0	N/A
3/18/2019	0	0	0	0	N/A
3/19/2019	0	0	0	0	N/A
3/20/2019	0	233	63	105	N/A
3/21/2019	21	188	21	132	N/A
3/22/2019	42	0	105	0	N/A
3/23/2019	42	0	168	0	N/A
3/24/2019	63	8	189	0	N/A
3/25/2019	63	65	189	3,088	N/A
3/26/2019	42	1,287	189	92,604	N/A
3/27/2019	0	0	189	50,594	92,884
3/28/2019	0	0	189	34,654	92,884
3/29/2019	0	0	189	16,428	92,884
3/30/2019	0	0	189	6,121	92,884
3/31/2019	0	76	189	0	92,884
4/1/2019	0	0	189	19,429	92,884
4/2/2019	0	0	189	15,588	92,884
4/3/2019	0	184	189	7,164	N/A
4/4/2019	42	298	189	73,050	N/A
4/5/2019	21	0	189	0	N/A
4/6/2019	42	0	147	0	N/A
4/7/2019	21	0	189	0	N/A
4/8/2019	0	0	189	0	N/A
4/9/2019	0	0	21	0	N/A
4/10/2019	0	0	42	0	N/A
4/11/2019	0	0	0	0	N/A
4/12/2019	0	0	0	0	N/A
4/13/2019	0	0	0	0	N/A
4/14/2019	0	0	0	0	N/A

Date	Front River		Back River		
	Continuous Data Area (square meters)	Intermittent Data Area (square meters)	Continuous Data Area (square meters)	Intermittent Data Area (square meters)	Neap Tide Area (square meters)
4/15/2019	0	0	0	0	N/A
4/16/2019	0	0	0	0	N/A
4/17/2019	0	0	0	0	N/A
4/18/2019	0	0	0	0	N/A
4/19/2019	0	0	0	0	N/A
4/20/2019	0	0	0	0	N/A
4/21/2019	0	0	0	0	N/A
4/22/2019	0	0	189	0	N/A
4/23/2019	21	0	189	0	N/A
4/24/2019	0	0	189	0	N/A
4/25/2019	0	0	168	344,224	1,443,125
4/26/2019	0	0	168	8,261	1,443,125
4/27/2019	0	0	168	244,253	1,443,125
4/28/2019	0	0	168	434,599	1,443,125
4/29/2019	0	0	189	494,415	1,443,125
4/30/2019	0	0	189	1,074,670	1,443,125
5/1/2019	0	0	189	426,282	1,443,125
5/2/2019	0	0	168	388,647	N/A
5/3/2019	0	0	42	0	N/A
5/4/2019	0	0	0	0	N/A
5/5/2019	0	0	0	0	N/A
5/6/2019	0	0	0	0	N/A
5/7/2019	0	0	0	0	N/A
5/8/2019	0	0	21	0	N/A
5/9/2019	0	0	42	0	N/A
5/10/2019	0	0	168	17,330	N/A
5/11/2019	0	0	84	0	N/A
5/12/2019	0	0	0	0	N/A



Figure H-1 March 14, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-2 March 14, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River



Figure H-3 March 15, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-4 March 15, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River



Figure H-5 March 16, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-6 March 16, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River



Figure H-7 March 17, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-8 March 17, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River

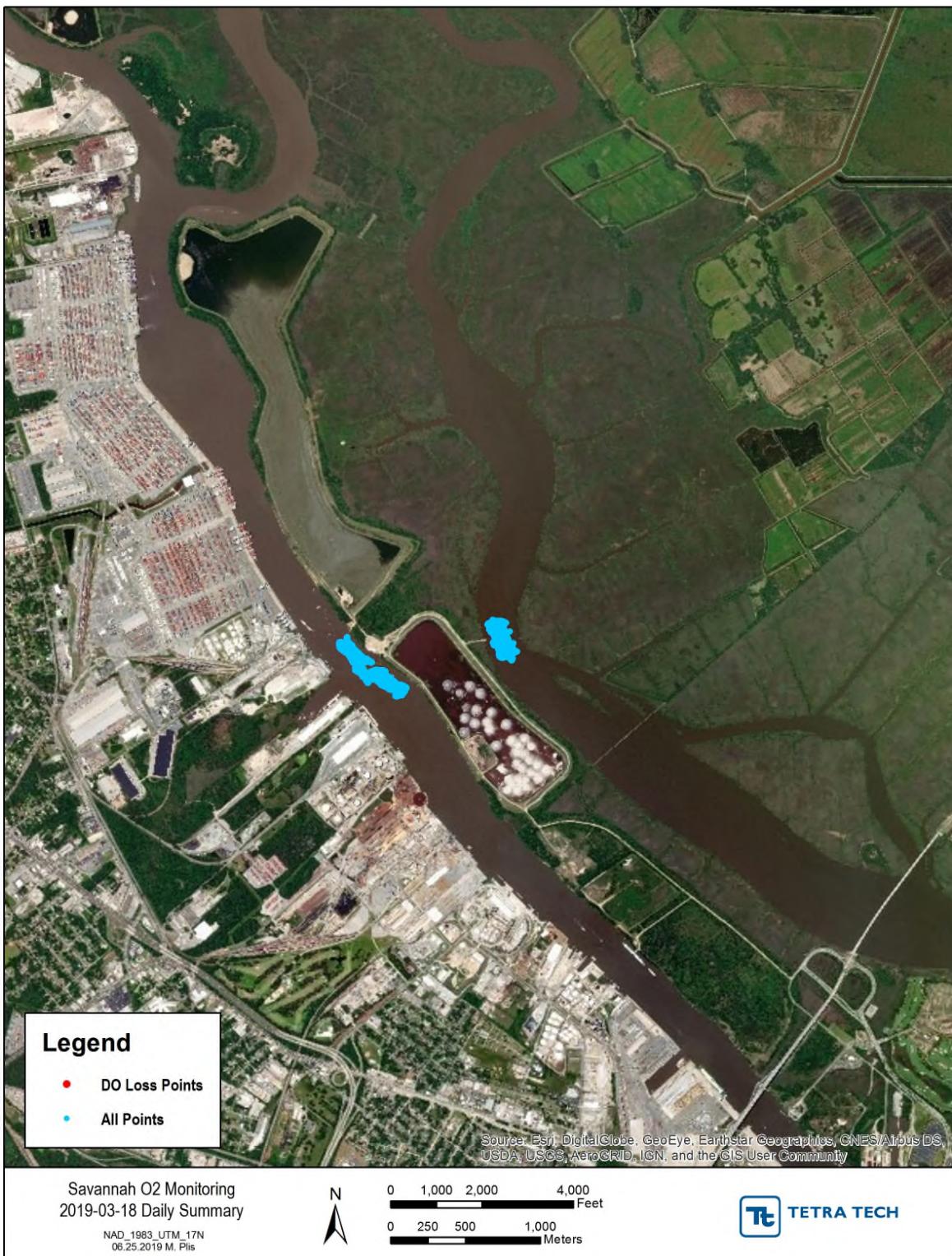


Figure H-9 March 18, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-10 March 18, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River

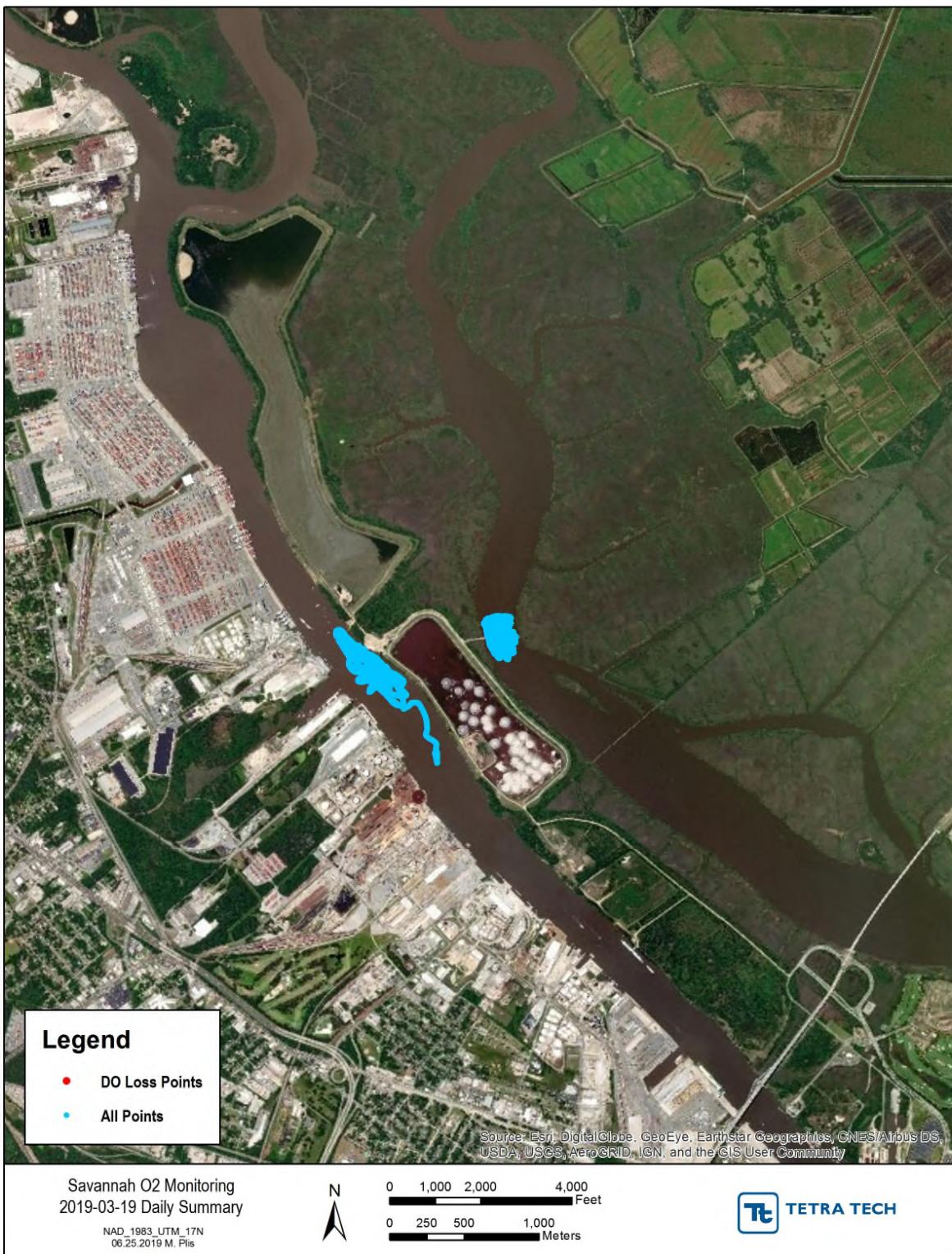


Figure H-11 March 19, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-12 March 19, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River



Figure H-13 March 20, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-14 March 20, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River

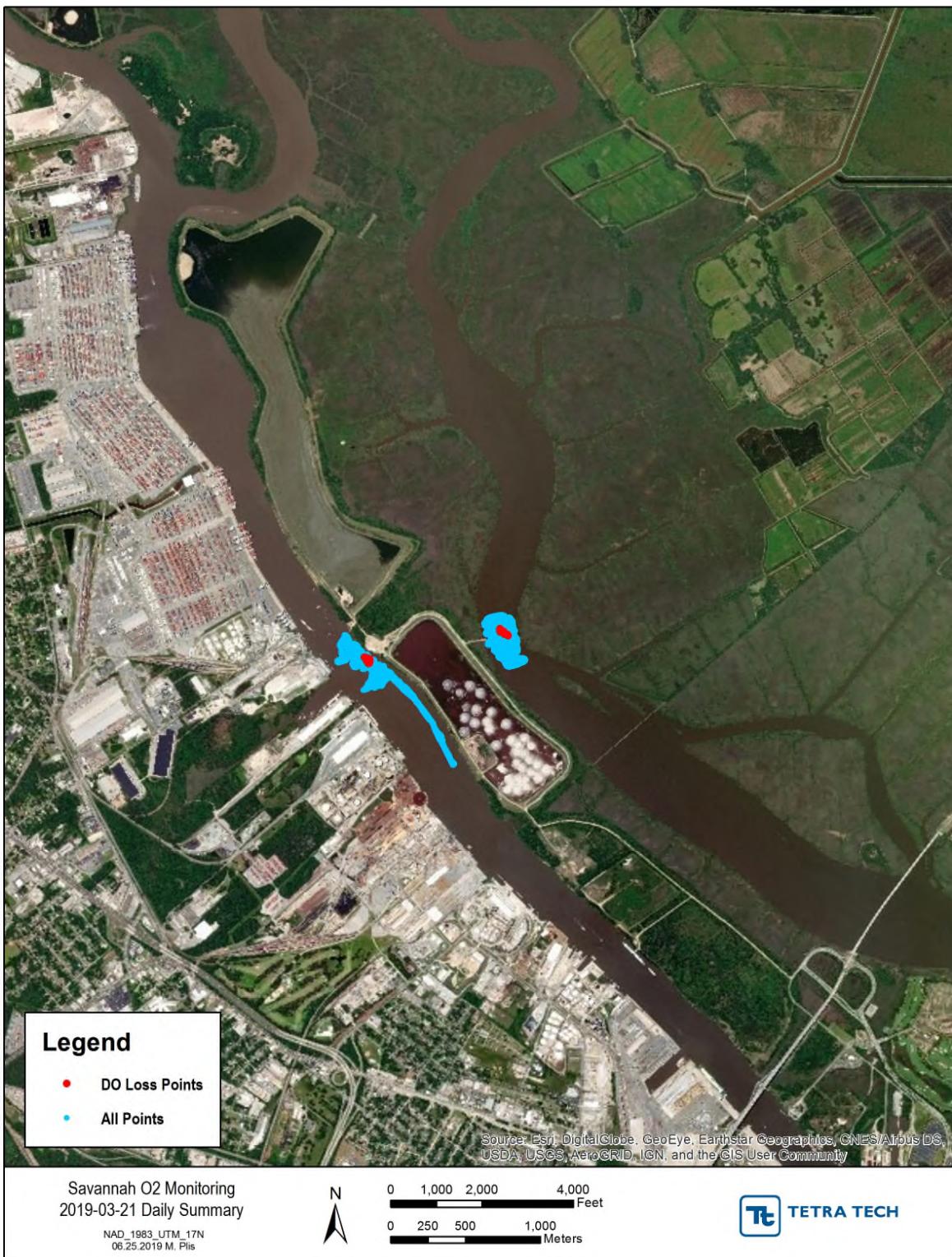


Figure H-15 March 21, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-16 March 21, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River

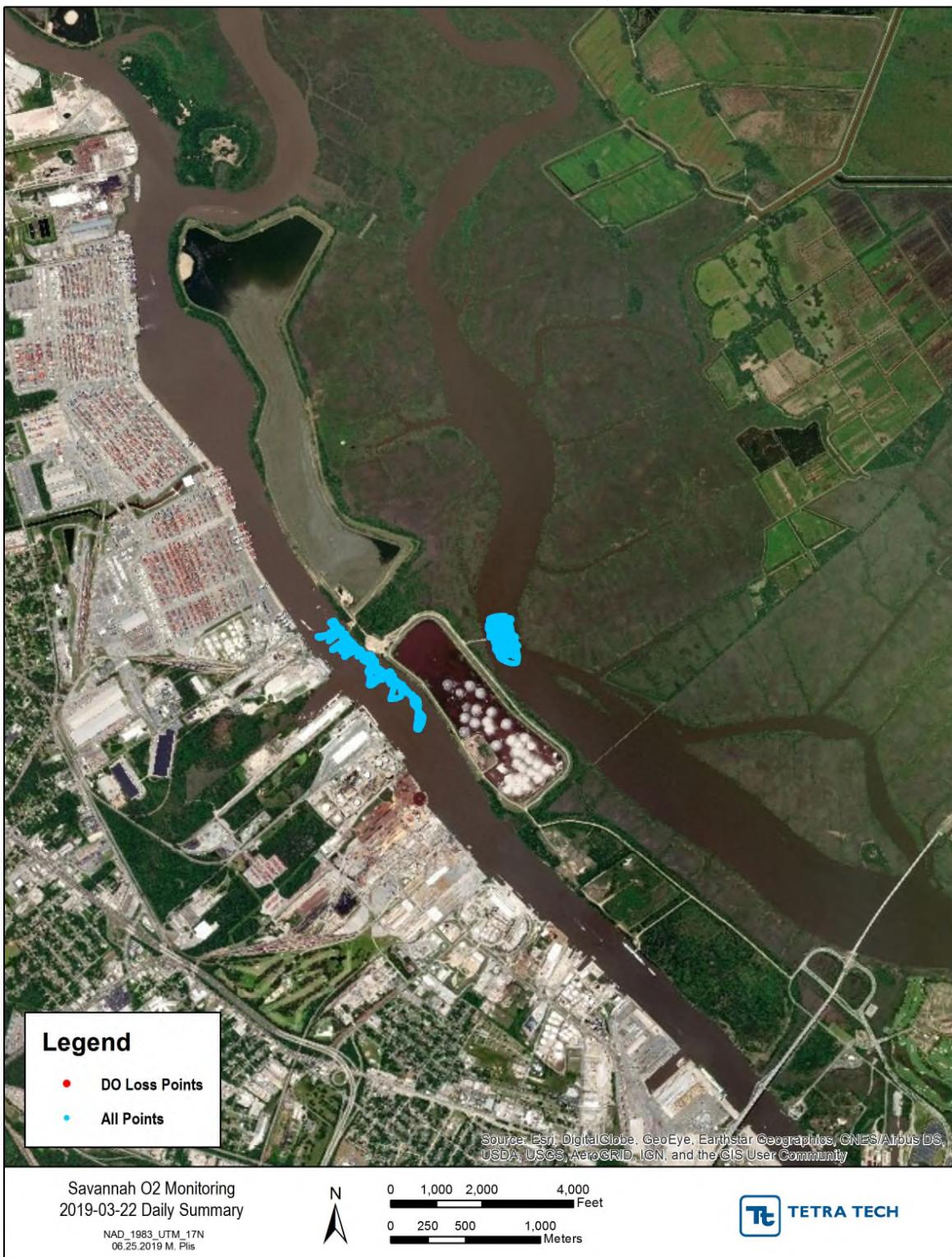


Figure H-17 March 22, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-18 March 22, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River

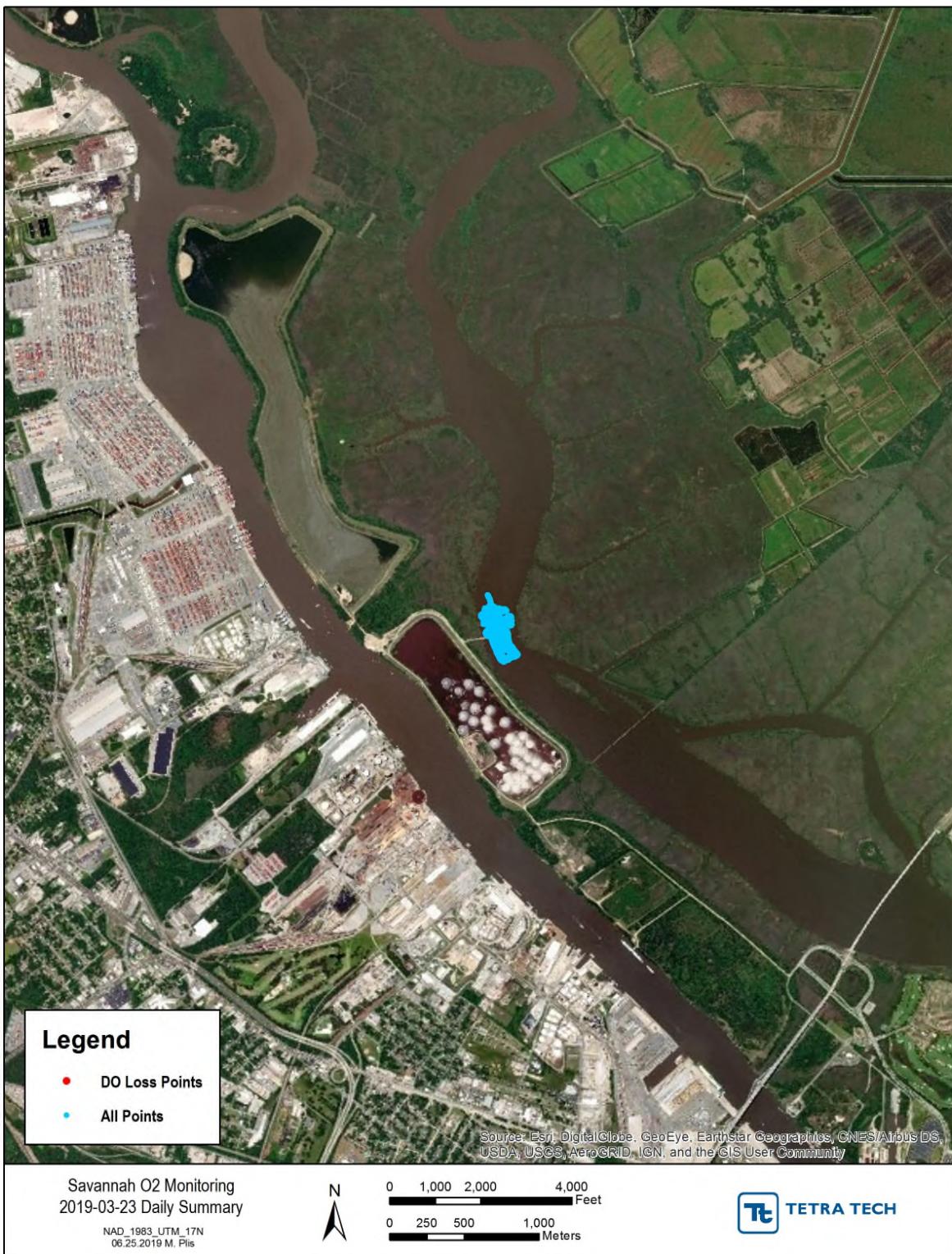


Figure H-19 March 23, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River

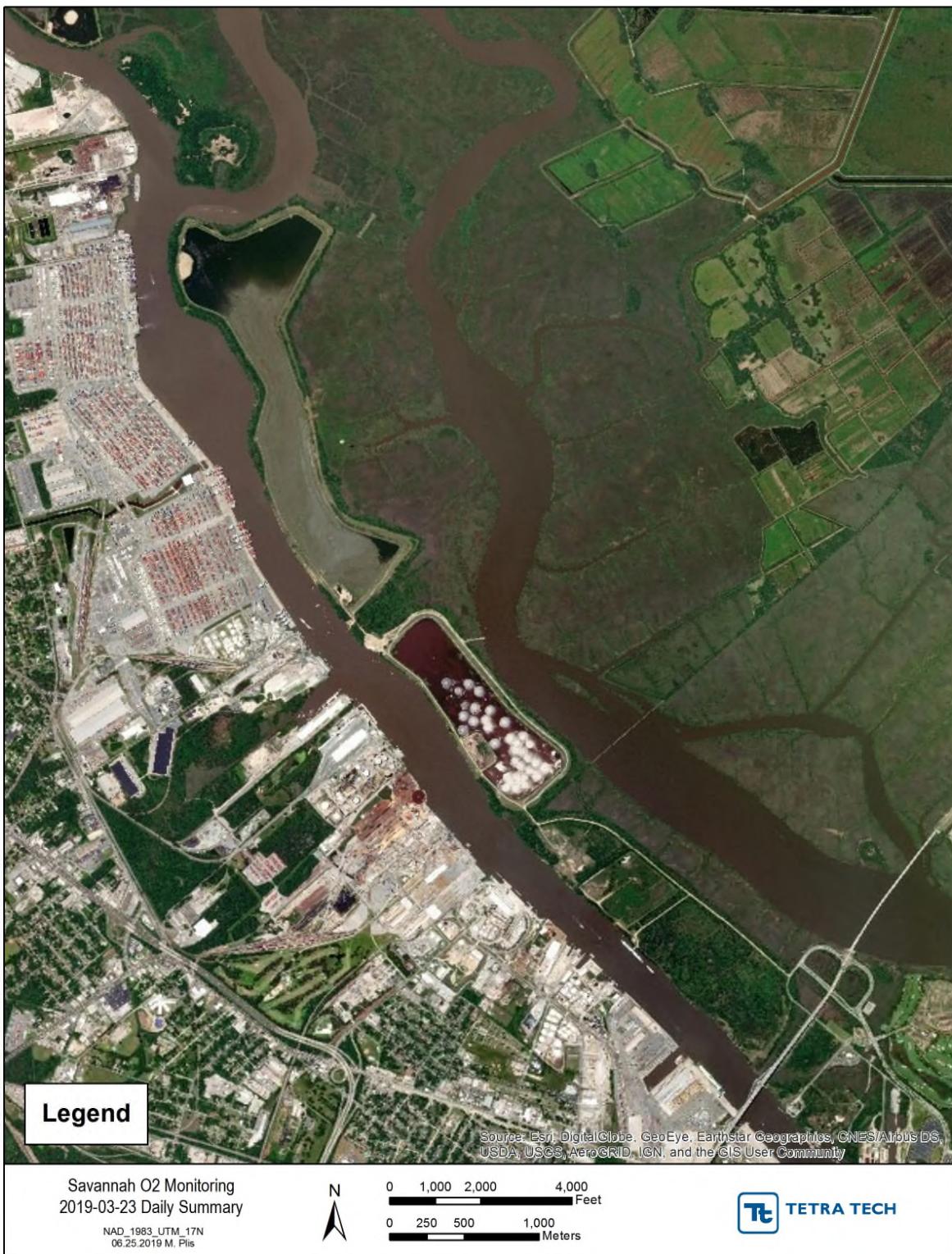


Figure H-20 March 23, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River



Figure H-21 March 24, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-22 March 24, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River



Figure H-23 March 25, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-24 March 25, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River



Figure H-25 March 26, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-26 March 26, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River



Figure H-27 March 27, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River

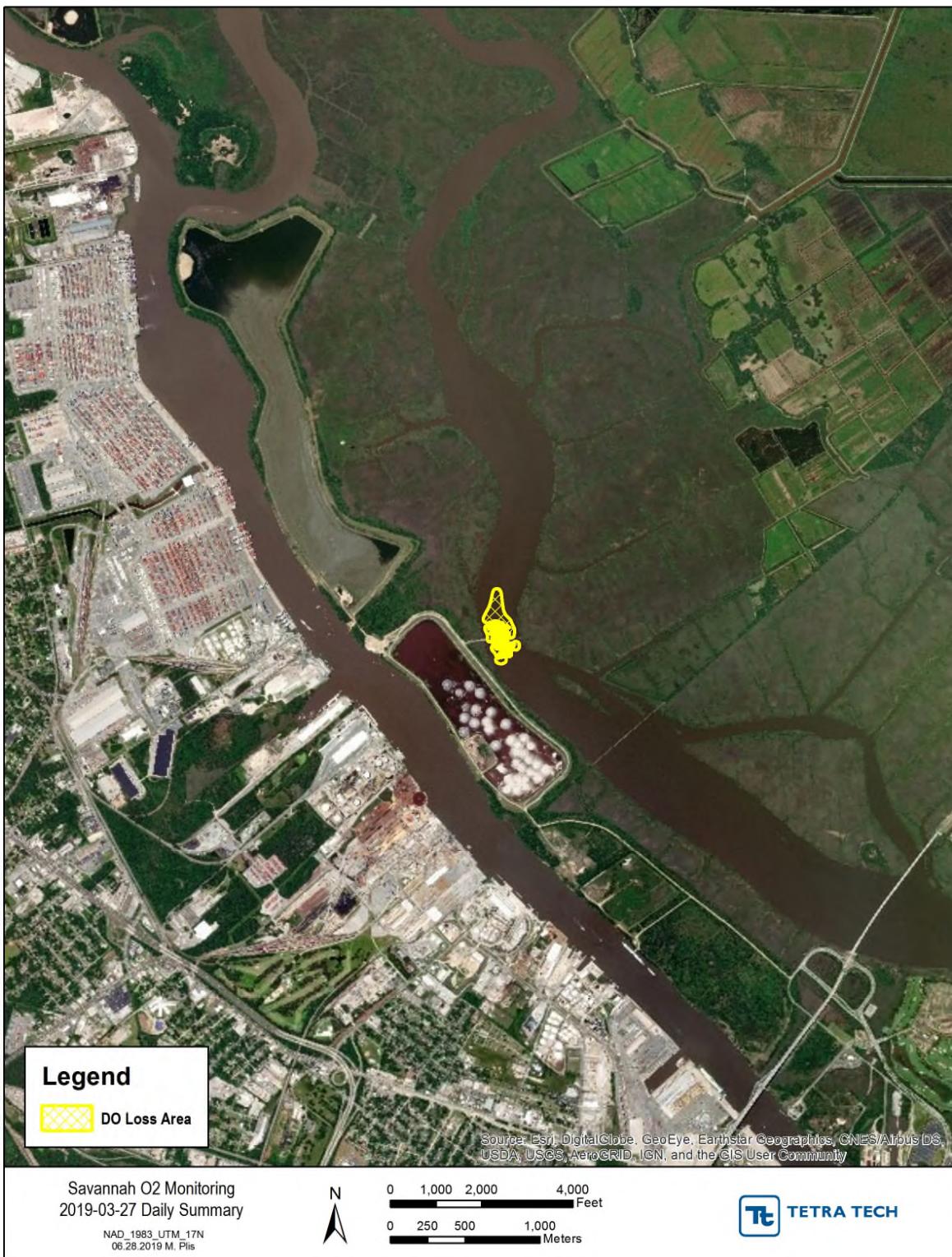


Figure H-28 March 27, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River



Figure H-29 March 28, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River

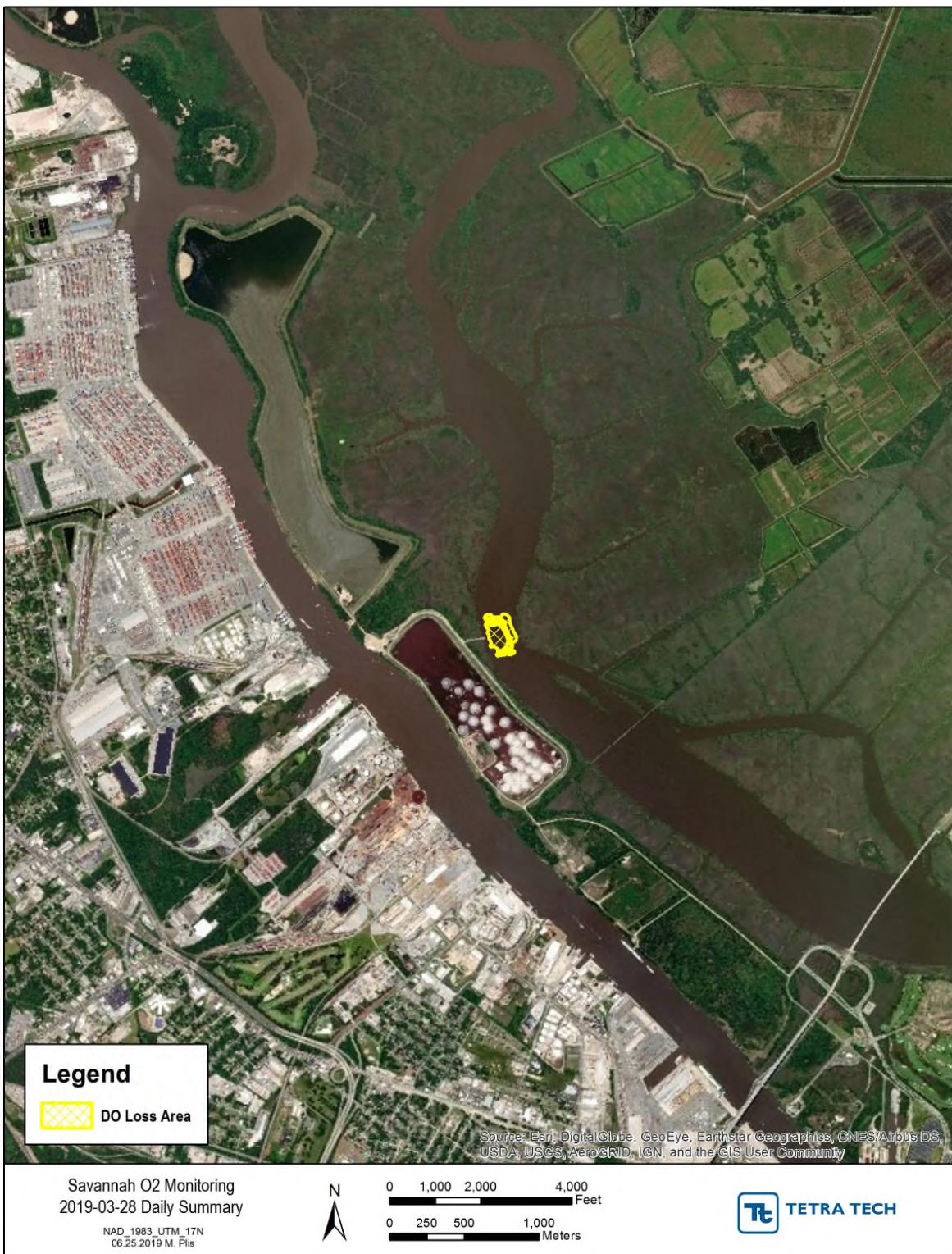


Figure H-30 March 28, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River



Figure H-31 March 29, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-32 March 29, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River



Figure H-33 March 30, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River

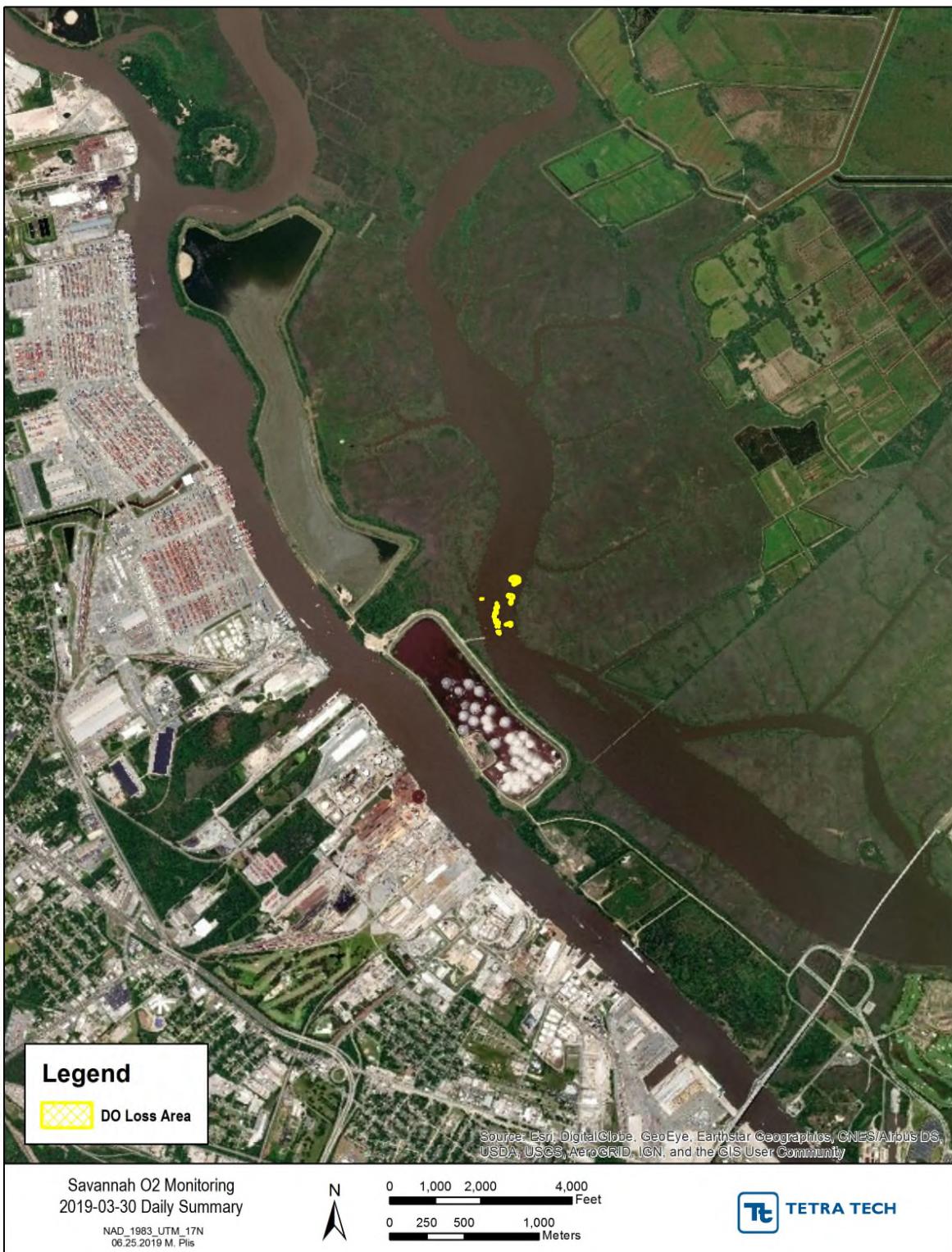


Figure H-34 March 30, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River



Figure H-35 March 31, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-36 March 31, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River



Figure H-37 April 1, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-38 April 1, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River

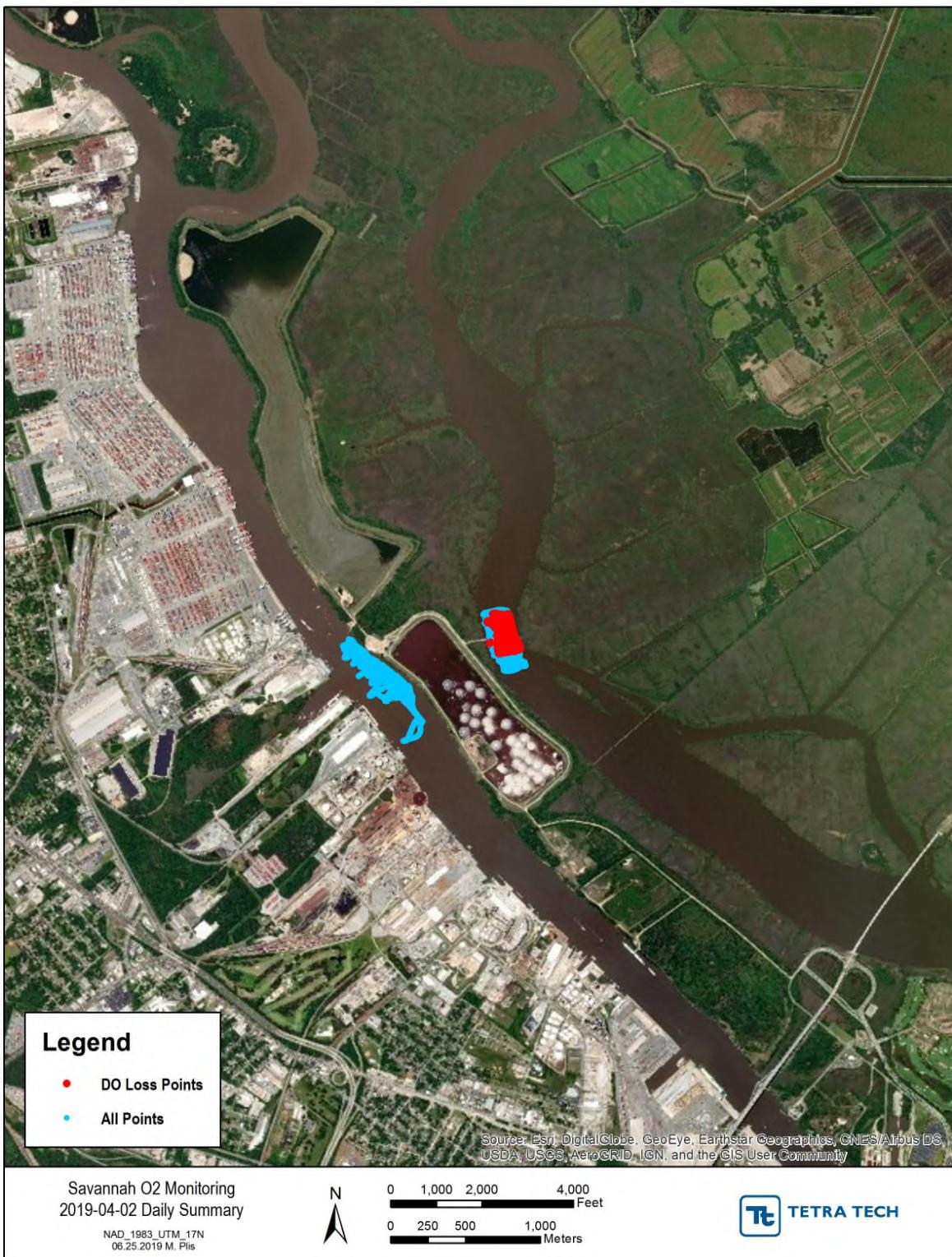


Figure H-39 April 2, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River

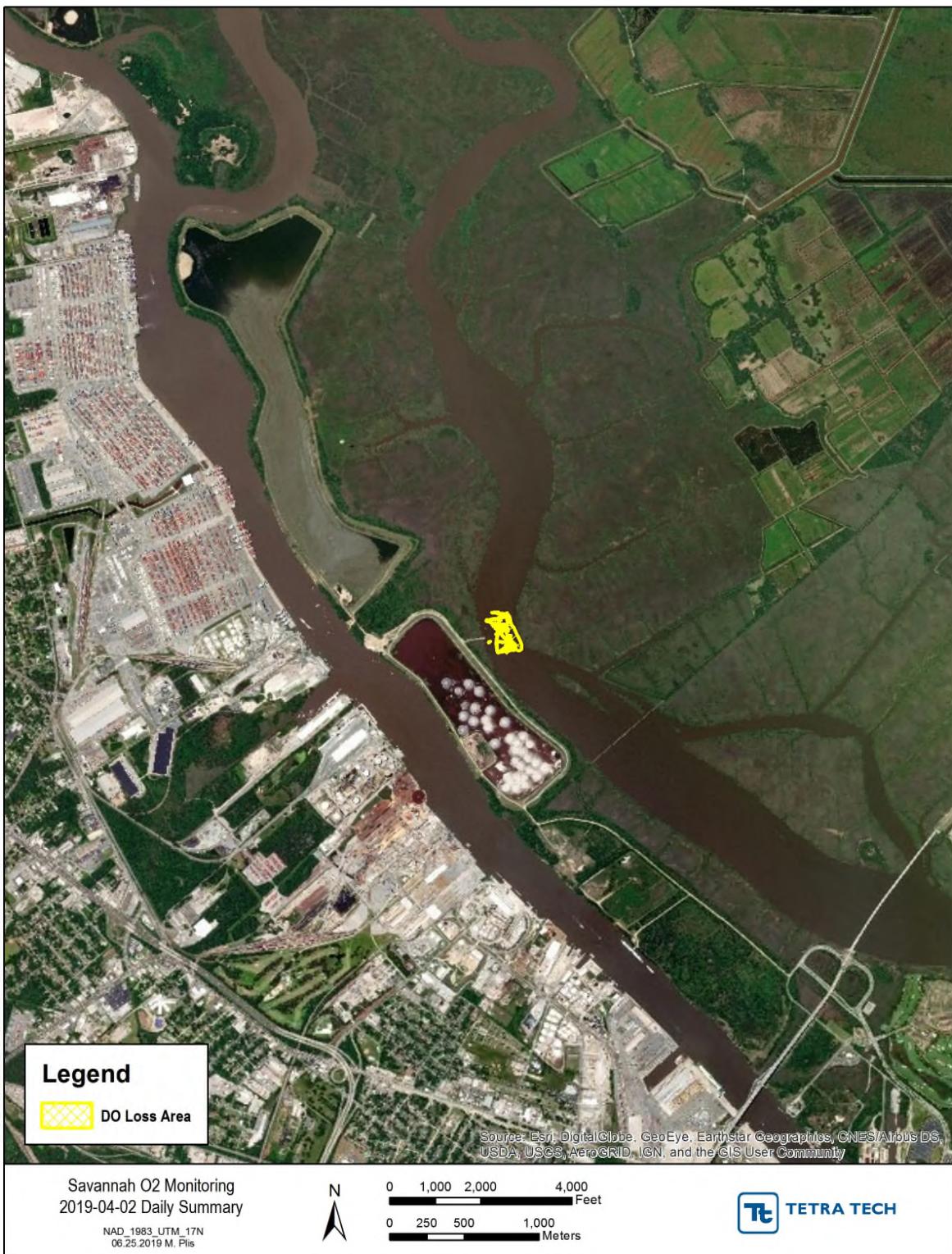


Figure H-40 April 2, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River



Figure H-41 April 3, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-42 April 3, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River



Figure H-43 April 4, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-44 April 4, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River



Figure H-45 April 5, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-46 April 5, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River



Figure H-47 April 6, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River

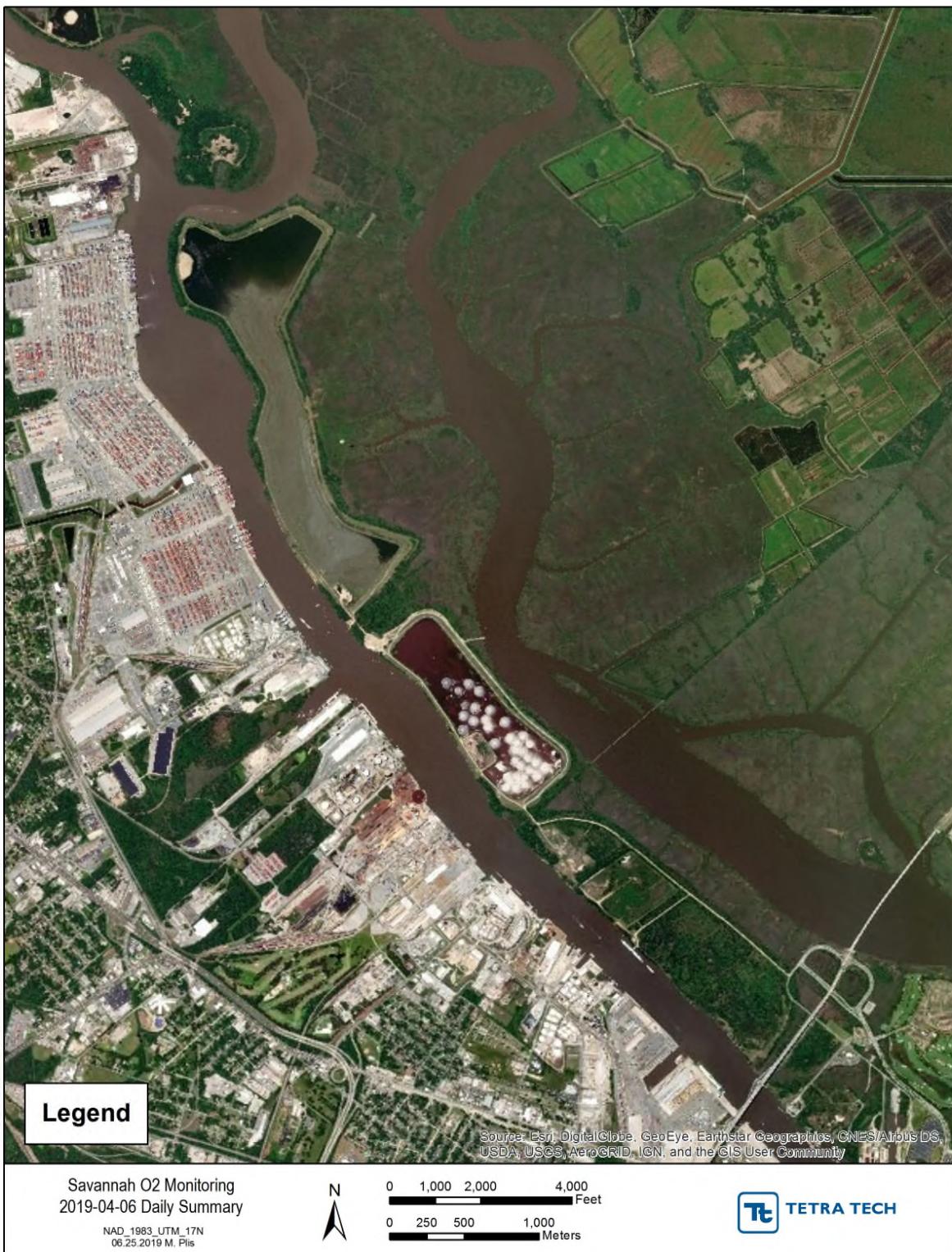


Figure H-48 April 6, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River



Figure H-49 April 7, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-50 April 7, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River



Figure H-51 April 8, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-52 April 8, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River



Figure H-53 April 9, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-54 April 9, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River



Figure H-55 April 10, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-56 April 10, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River



Figure H-57 April 11, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-58 April 11, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River



Figure H-59 April 12, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-60 April 12, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River



Figure H-61 April 13, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-62 April 13, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River



Figure H-63 April 14, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-64 April 14, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River



Figure H-65 April 15, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-66 April 15, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River



Figure H-67 April 16, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-68 April 16, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River



Figure H-69 April 17, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-70 April 17, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River



Figure H-71 April 18, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



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Figure H-73 April 19, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-74 April 19, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River



Figure H-75 April 20, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-76 April 20, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River



Figure H-77 April 21, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-78 April 21, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River



Figure H-79 April 22, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-80 April 22, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River



Figure H-81 April 23, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-82 April 23, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River



Figure H-83 April 24, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-84 April 24, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River



Figure H-85 April 25, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-86 April 25, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River



Figure H-87 April 26, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River

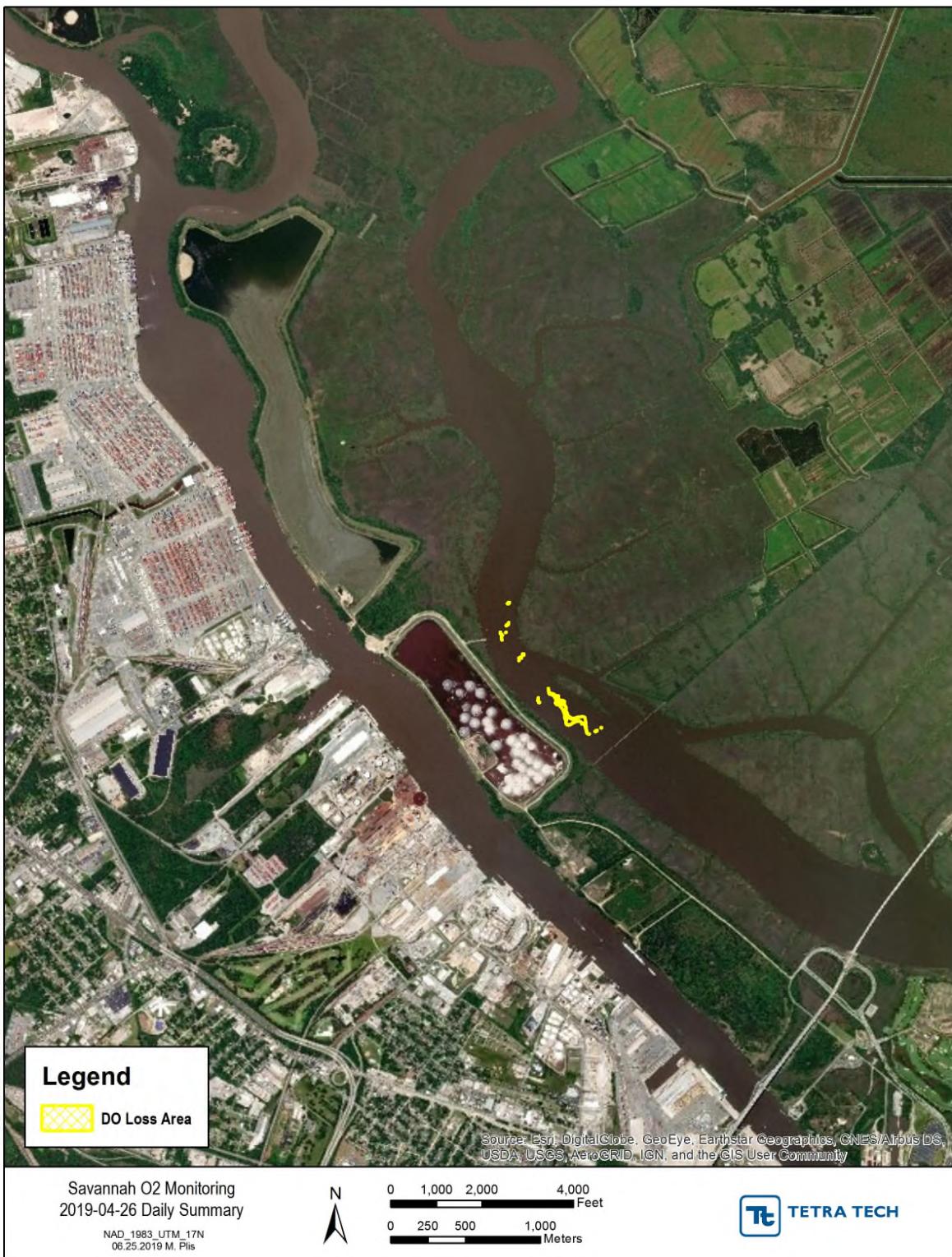


Figure H-88 April 26, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River



Figure H-89 April 27, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-90 April 27, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River



Figure H-91 April 28, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-92 April 28, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River



Figure H-93 April 29, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-94 April 29, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River



Figure H-95 April 30, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



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Figure H-97 May 1, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-98 May 1, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River

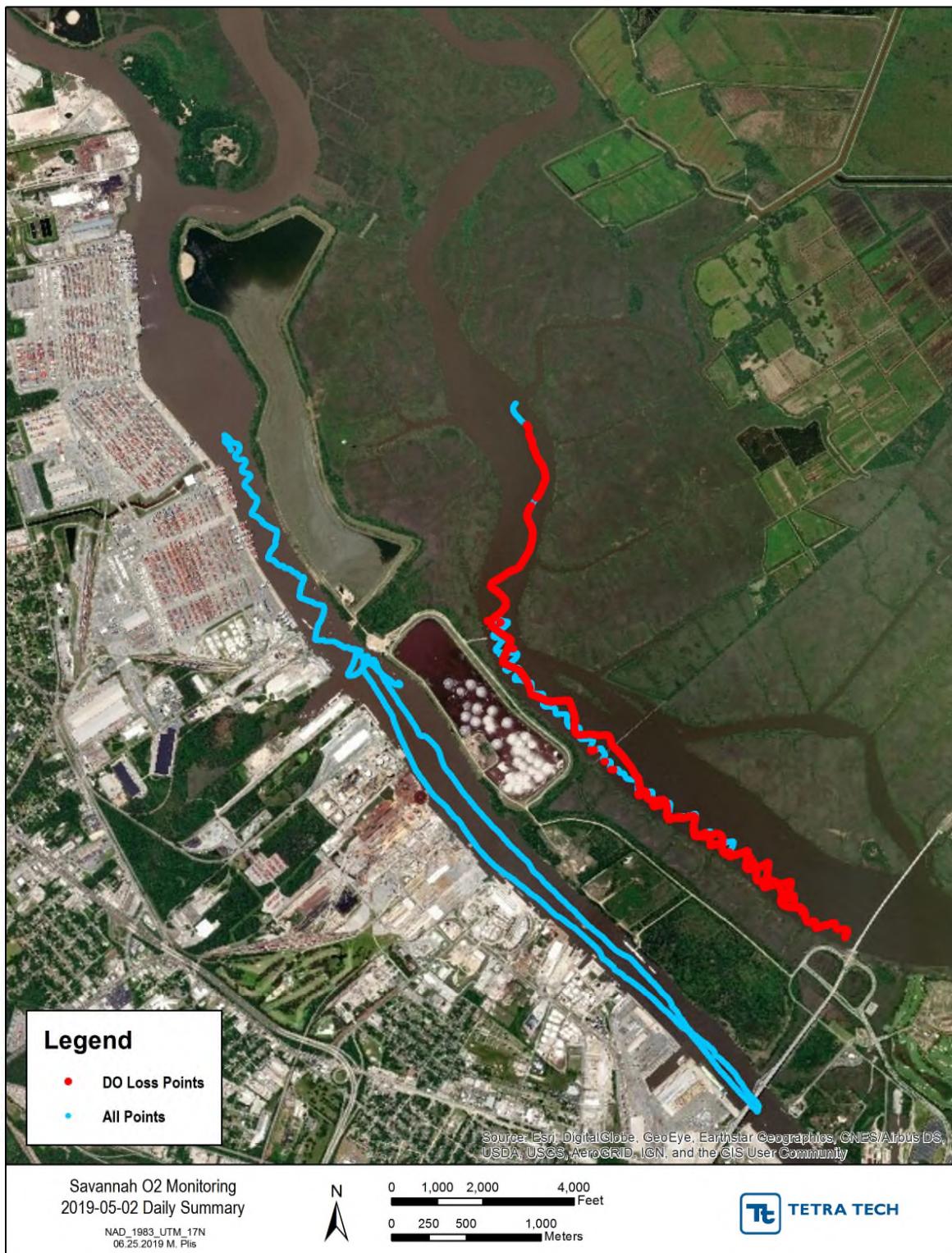


Figure H-99 May 2, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-100 May 2, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River



Figure H-101 May 3, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-102 May 3, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River



Figure H-103 May 4, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-104 May 4, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River



Figure H-105 May 5, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-106 May 5, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River



Figure H-107 May 6, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-108 May 6, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River



Figure H-109 May 7, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-110 May 7, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River



Figure H-111 May 8, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-112 May 8, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River



Figure H-113 May 9, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-114 May 9, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River



Figure H-115 May 10, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-116 May 10, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River

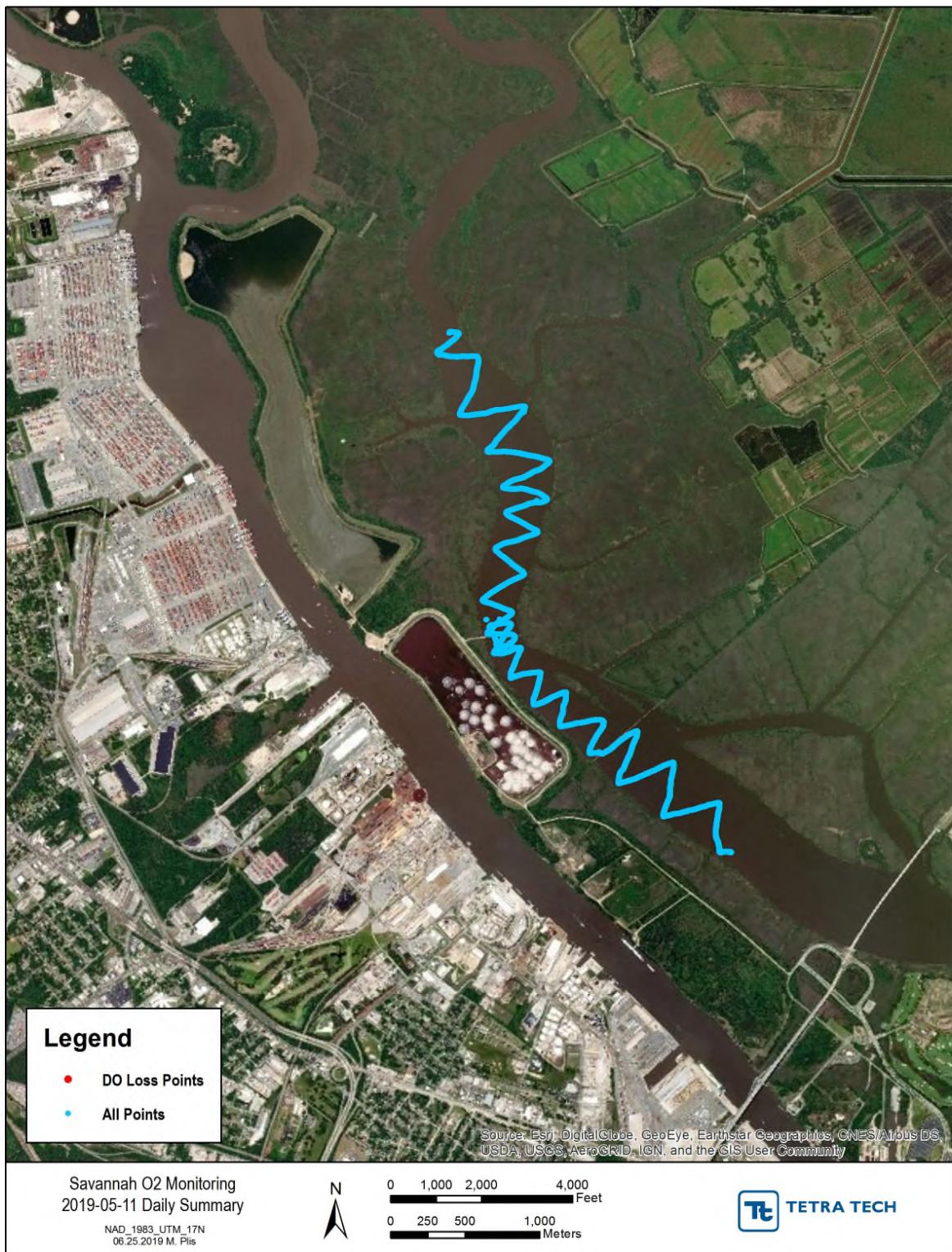


Figure H-117 May 11, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-118 May 11, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River



Figure H-119 May 12, 2019 Intermittent Surface data (blue) and Intermittent DO Loss data (red) for lower Front River and Back River



Figure H-120 May 12, 2019 Daily Intermittent data DO Loss Area for lower Front River and Back River

H.3 NEAP TIDE DO LOSS AREA



Figure H-121 Neap Tide March 27, 2019 to April 2, 2019 DO loss area for Back River

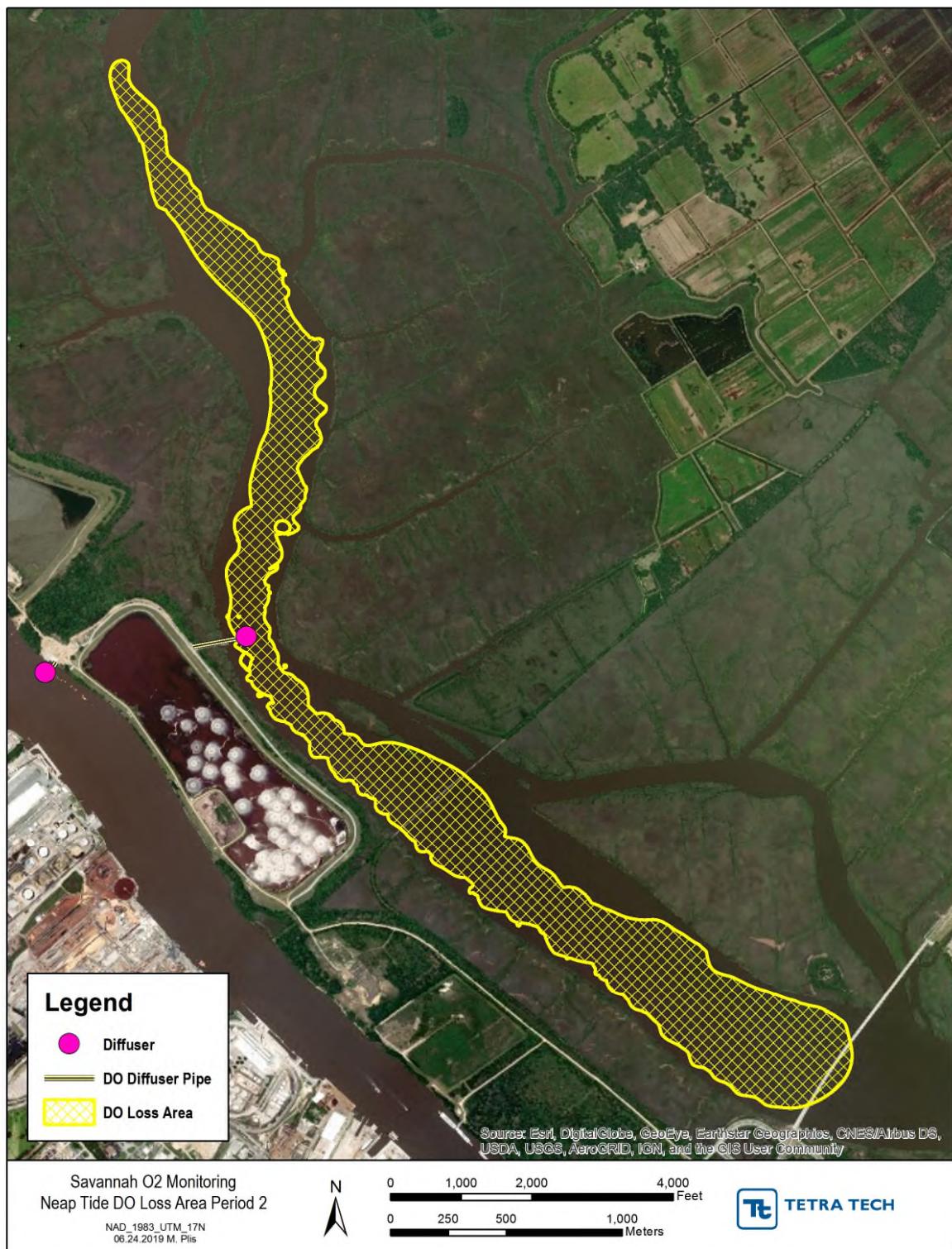


Figure H-122 Neap Tide April 25, 2019 to May 1, 2019 DO loss area for Back River

APPENDIX I 2018 SHEP MODEL VERIFICATION STATISTICS

Test Run Data Collection and Modeling Report for the Dissolved Oxygen Facility Environmental Testing for the Savannah Harbor Expansion Project

Contract# W912HN-15-D-0023

Tasks: 07 and 08

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PREPARED FOR

**Army Corps of Engineers
Savannah District**
100 W Oglethorpe Avenue
Savannah, Georgia 31401-3640
Tel (912) 652-5026

PREPARED BY

LG2 Environmental Solutions, Inc.
10475 Fortune Parkway, Suite 201
Jacksonville, Florida 32256
Tel (904) 288-8631

Tetra Tech, Inc.
1899 Powers Ferry Rd SE, Suite 400
Atlanta, Georgia 30339
Tel (770) 738-6030

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I.1 WATER SURFACE ELEVATION

Table I-1 2015 SHEP Model calibration statistics at select stations for water surface elevation from January 1, 2013 through April 30, 2014

Station	Measured (m MLLW)				Simulated (m MLLW)				R ²	Mean Abs Error (m MLLW)	RMS Error (m MLLW)	Norm RMS Error (m MLLW)	Index of Agrmt
	Mean	Median	5% tile	95% tile	Mean	Median	5% tile	95% tile					
02198840	1.89	2.17	0.60	2.86	1.80	1.94	0.56	3.04	0.92	0.20	0.25	0.13	0.97
02198920	1.45	1.74	-0.01	2.69	1.39	1.57	-0.05	2.85	0.97	0.15	0.19	0.11	0.99
02198950	1.60	1.88	0.14	2.84	1.40	1.57	0.03	2.84	0.97	0.21	0.25	0.14	0.98
02198980	1.21	1.40	0.00	2.36	1.26	1.44	0.00	2.47	0.99	0.07	0.09	0.06	1.00
02199000	1.31	1.54	-0.03	2.52	1.29	1.49	-0.05	2.61	0.99	0.08	0.10	0.06	1.00
021989715	1.69	1.97	0.22	2.96	1.33	1.52	-0.13	2.80	0.98	0.36	0.39	0.22	0.96
021989773	1.40	1.66	-0.02	2.66	1.32	1.52	-0.09	2.72	0.98	0.12	0.15	0.09	0.99
021989784	1.68	1.98	0.26	2.78	1.45	1.54	0.23	2.84	0.90	0.27	0.35	0.20	0.96
021989791	1.36	1.65	-0.02	2.46	1.45	1.57	0.17	2.85	0.94	0.19	0.24	0.14	0.98
021989792	1.57	1.84	0.17	2.73	1.38	1.51	0.08	2.79	0.95	0.22	0.27	0.16	0.98

Table I-2 2018 SHEP Model verification statistics at select stations for water surface elevation from January 1, 2014 through December 31, 2017

Station	Measured (m MLLW)				Simulated (m MLLW)				R ²	Mean Abs Error (m MLLW)	RMS Error (m MLLW)	Norm RMS Error (m MLLW)	Index of Agrmt
	Mean	Median	5% tile	95% tile	Mean	Median	5% tile	95% tile					
02198840	1.90	2.19	0.60	2.87	1.76	1.92	0.52	3.00	0.92	0.21	0.27	0.13	0.97
02198920	1.48	1.78	0.00	2.71	1.41	1.61	-0.09	2.86	0.97	0.15	0.20	0.12	0.99
02198950	1.64	1.94	0.17	2.85	1.43	1.61	0.02	2.85	0.97	0.23	0.27	0.15	0.98
02198980	1.26	1.46	0.03	2.40	1.30	1.49	0.00	2.51	0.99	0.09	0.11	0.07	1.00
02199000	1.36	1.61	0.00	2.54	1.32	1.54	-0.09	2.64	0.98	0.11	0.14	0.09	0.99
021989715	1.67	1.96	0.20	2.89	1.37	1.59	-0.14	2.82	0.96	0.31	0.36	0.20	0.96
021989773	1.46	1.74	0.03	2.68	1.35	1.57	-0.12	2.74	0.97	0.16	0.21	0.13	0.99
021989784	1.72	2.04	0.30	2.79	1.49	1.60	0.24	2.86	0.91	0.28	0.35	0.19	0.96
021989791	1.34	1.64	-0.05	2.45	1.44	1.57	0.13	2.83	0.94	0.19	0.24	0.15	0.98
021989792	1.61	1.90	0.19	2.75	1.41	1.56	0.08	2.80	0.95	0.23	0.28	0.16	0.98

I.2 FLOW**Table I-3** 2015 SHEP Model calibration statistics at select stations for flow from January 1, 2013 through April 30, 2014

Station	Measured (cms)				Simulated (cms)				R ²	Mean Abs Error (cms)	RMS Error (cms)	Norm RMS Error (cms)	Index of Agrmt
	Mean	Median	5% tile	95% tile	Mean	Median	5% tile	95% tile					
02198920	-314	-195	-1,437	869	-300	-351	-1,266	1,052	0.88	225	284	0	0.97
02198950	-38	12	-402	318	-36	-60	-316	345	0.87	71	87	0	0.96
02198980	-721	148	-6,964	5,810	-295	321	-5,575	5,677	0.95	821	1,049	0	0.98
021989773	-484	-199	-2,702	1,953	-341	-228	-2,430	2,257	0.93	373	463	0	0.98
021989792	-46	-23	-254	161	-50	-74	-204	152	0.67	62	82	1	0.89

Table I-4 2018 SHEP Model verification statistics at select stations for flow from January 1, 2014 through December 31, 2017

Station	Measured (cms)				Simulated (cms)				R ²	Mean Abs Error (cms)	RMS Error (cms)	Norm RMS Error (cms)	Index of Agrmt
	Mean	Median	5% tile	95% tile	Mean	Median	5% tile	95% tile					
02198920	267	445	-937	1,424	254	656	-1,119	1,261	0.88	230	291	0	0.97
02198950	26	73	-325	386	34	141	-355	316	0.85	72	92	0	0.96
02198980	465	1,375	-6,000	6,749	212	1,466	-6,098	5,766	0.94	905	1,112	0	0.98
021989773	345	705	-2,078	2,609	283	926	-2,361	2,449	0.92	387	492	0	0.98
021989792	39	68	-162	227	47	92	-155	197	0.66	61	78	1	0.89

I.3 VELOCITY**Table I-5** 2015 SHEP Model calibration statistics at select stations for velocity from January 1, 2013 through April 30, 2014

Station	Measured (cm/s)				Simulated (cm/s)				R ²	Mean Abs Error (cm/s)	RMS Error (cm/s)	Norm RMS Error (cm/s)	Index of Agrmt
	Mean	Median	5% tile	95% tile	Mean	Median	5% tile	95% tile					
02198840	-48.45	-46.19	-95.29	0.98	-49.57	-52.28	-95.88	-2.35	0.86	9.43	11.63	0.2	0.96
02198920	-22.57	-14.02	-93.38	47.77	-22.84	-22.47	-87.84	62.04	0.89	14.41	17.87	0.33	0.97
02198950	-9.28	-1.04	-67.19	45.11	-11.39	-12.83	-58.8	50.86	0.91	9.53	12.27	0.31	0.97
02198980	-13.27	0.56	-111.6	87.66	-5.68	5.21	-86.46	82.2	0.95	13.87	17.69	0.28	0.98
021989773	-15.19	-6.49	-81.21	56.41	-13.24	-8.77	-69.61	55.49	0.94	9.09	11.52	0.24	0.98
021989792	-12.51	-5.86	-60.03	37.57	-19.06	-34.72	-59.12	45.07	0.73	15.43	20.79	0.57	0.91

Table I-6 2018 SHEP Model verification statistics at select stations for velocity from January 1, 2014 through December 31, 2017

Station	Measured (cm/s)				Simulated (cm/s)				R ²	Mean Abs Error (cm/s)	RMS Error (cm/s)	Norm RMS Error (cm/s)	Index of Agrmt
	Mean	Median	5% tile	95% tile	Mean	Median	5% tile	95% tile					
02198840	24.23	30.90	-26.19	75.56	29.69	43.33	-22.52	72.61	0.89	9.94	12.58	0.31	0.96
02198920	20.24	30.18	-50.82	92.46	20.73	44.65	-65.12	88.30	0.89	14.59	18.37	0.34	0.97
02198950	7.65	14.75	-45.71	64.40	11.23	31.49	-52.26	59.11	0.91	10.18	12.75	0.33	0.97
02198980	9.47	23.39	-90.32	108.04	3.79	18.45	-76.59	77.03	0.93	17.56	21.60	0.37	0.97
021989773	11.22	21.67	-59.40	78.09	10.51	26.02	-52.85	63.06	0.93	10.23	13.07	0.29	0.98
021989792	11.07	17.88	-35.87	56.49	18.68	40.80	-45.46	57.84	0.74	15.36	20.28	0.58	0.91

I.4 WATER TEMPERATURE

Table I-7 2015 SHEP Model calibration statistics at select stations for water temperature from January 1, 2013 through April 30, 2014

Station	Measured (°C)				Simulated (°C)				R ²	Mean Abs Error (°C)	RMS Error (°C)	Norm RMS Error (°C)	Index of Agrmnt
	Mean	Median	5% tile	95% tile	Mean	Median	5% tile	95% tile					
02198810	12.43	13.10	6.20	18.90	12.33	12.85	6.56	18.63	0.93	0.77	1.03	0.08	0.98
02198820	12.90	13.40	6.70	18.30	13.08	13.59	7.08	18.54	0.95	0.59	0.79	0.06	0.99
02198840	17.41	18.20	8.70	25.70	17.77	18.56	8.71	26.33	1.00	0.44	0.55	0.03	1.00
02198920	17.78	18.40	8.80	26.10	18.03	18.75	8.72	26.67	0.99	0.45	0.56	0.03	1.00
02198950	16.46	16.50	7.60	25.80	17.08	17.04	7.82	26.89	0.99	0.81	0.99	0.06	0.99
02198955	15.40	15.90	10.90	19.60	15.71	15.55	11.88	19.73	0.95	0.55	0.74	0.05	0.98
02198980	17.46	17.30	8.90	28.10	17.33	17.87	7.89	27.69	0.98	0.82	0.98	0.05	0.99
021989715	17.94	18.30	9.00	26.40	18.09	18.48	8.81	26.90	0.99	0.45	0.58	0.03	1.00
021989773	18.08	18.60	9.10	26.80	18.18	18.53	8.85	27.13	0.98	0.65	0.83	0.04	1.00
021989784	17.70	18.50	8.80	26.30	18.40	19.30	8.98	27.43	0.98	0.99	1.23	0.07	0.99
021989791	17.69	18.40	8.70	26.30	18.48	19.44	8.99	27.56	0.98	0.99	1.23	0.06	0.99
021989792	16.46	16.30	7.60	26.10	17.16	16.85	7.80	27.18	0.98	0.97	1.19	0.07	0.99
021989793	13.39	13.80	7.10	19.50	13.81	14.33	7.68	19.78	0.92	0.91	1.12	0.08	0.98
0219897945	14.43	14.40	9.10	19.60	14.81	14.70	9.36	19.70	0.92	0.79	0.99	0.07	0.97
0219897993	17.17	17.00	8.60	27.20	17.26	17.67	8.01	27.32	0.99	0.56	0.69	0.04	1.00

Table I-8 2018 SHEP Model verification statistics at select stations for water temperature from January 1, 2014 through December 31, 2017

Station	Measured (°C)				Simulated (°C)				R ²	Mean Abs Error (°C)	RMS Error (°C)	Norm RMS Error (°C)	Index of Agrmnt
	Mean	Median	5% tile	95% tile	Mean	Median	5% tile	95% tile					
02198810	20.19	21.90	9.50	29.20	20.65	22.57	9.57	29.99	0.99	0.71	0.93	0.04	1.00
02198820	20.17	21.90	9.50	29.20	20.65	22.54	9.59	30.02	0.99	0.64	0.84	0.04	1.00
02198840	20.04	21.70	9.40	29.30	20.46	22.25	9.54	30.04	1.00	0.50	0.64	0.03	1.00
02198920	20.55	22.40	9.70	29.60	20.98	22.81	9.78	30.47	1.00	0.54	0.69	0.03	1.00
02198950	20.53	22.40	9.70	29.50	21.26	23.16	9.90	30.91	0.99	0.85	1.07	0.05	0.99
02198955	21.72	24.40	10.30	29.80	22.38	25.04	10.40	30.94	0.99	0.75	0.94	0.04	1.00
02198980	21.21	23.20	10.50	30.00	21.61	23.51	10.42	31.14	0.99	0.78	0.98	0.04	0.99
021989715	20.77	22.70	9.90	29.80	21.17	23.09	9.94	30.67	0.99	0.60	0.75	0.03	1.00
021989773	20.93	23.00	10.00	29.80	21.28	23.16	10.04	30.82	0.99	0.53	0.68	0.03	1.00
021989784	20.33	22.10	9.60	29.30	21.17	23.01	9.79	31.05	0.98	1.09	1.35	0.06	0.99
021989791	20.34	22.00	9.60	29.40	21.17	22.73	9.80	31.14	0.99	1.02	1.27	0.06	0.99
021989792	20.53	22.40	9.70	29.50	21.38	23.23	9.93	31.22	0.99	1.03	1.28	0.06	0.99
021989793	20.86	22.70	10.20	29.80	21.20	22.95	10.11	30.86	0.99	0.60	0.77	0.04	1.00
0219897945	20.94	22.90	10.00	29.90	21.60	23.55	10.18	31.27	0.99	0.87	1.08	0.05	0.99
0219897993	20.77	22.70	9.80	29.70	21.58	23.53	10.01	31.36	0.99	1.01	1.23	0.06	0.99

I.5 SALINITY

Table I-9 2015 SHEP Model calibration statistics at select stations for salinity from January 1, 2013 through April 30, 2014

Station	Measured (PSU)				Simulated (PSU)				R ²	Mean Abs Error (PSU)	RMS Error (PSU)	Norm RMS Error (PSU)	Index of Agrmt
	Mean	Median	5% tile	95% tile	Mean	Median	5% tile	95% tile					
02198840	0.05	0.05	0.04	0.06	0.01	0.00	0.00	0.05	0.54	0.04	0.05	1.80	0.48
02198920	2.69	1.32	0.04	10.30	2.36	2.01	0.07	6.69	0.83	1.12	1.78	0.48	0.90
021989715	4.17	3.83	0.13	11.30	4.41	4.53	0.05	10.42	0.87	1.00	1.34	0.24	0.96
021989773	6.27	6.41	0.67	13.50	9.88	10.91	0.82	17.16	0.71	3.70	4.46	0.50	0.79
021989784	0.13	0.09	0.04	0.41	0.34	0.13	0.00	1.54	0.36	0.28	0.51	1.74	0.48
021989791	0.24	0.12	0.04	0.90	0.79	0.54	0.01	2.66	0.48	0.57	0.85	1.28	0.65

Table I-10 2018 SHEP Model verification statistics at select stations for salinity from January 1, 2014 through December 31, 2017

Station	Measured (PSU)				Simulated (PSU)				R ²	Mean Abs Error (PSU)	RMS Error (PSU)	Norm RMS Error (PSU)	Index of Agrmt
	Mean	Median	5% tile	95% tile	Mean	Median	5% tile	95% tile					
02198840	0.02	0.00	0.00	0.10	0.01	0.00	0.00	0.06	0.04	0.02	0.09	3.03	0.28
02198920	3.11	2.40	0.00	10.00	3.35	3.49	0.18	7.96	0.76	1.27	1.77	0.41	0.91
021989715	5.14	5.30	0.30	11.60	6.48	7.12	0.65	11.83	0.74	1.86	2.29	0.35	0.89
021989773	7.53	8.10	1.20	14.00	6.81	7.29	1.08	13.20	0.77	1.46	2.00	0.25	0.93
021989784	0.21	0.10	0.00	0.70	0.51	0.24	0.00	2.09	0.08	0.44	0.73	1.86	0.48
021989791	0.35	0.20	0.10	1.30	1.19	1.02	0.01	3.40	0.24	0.92	1.29	1.53	0.58

I.6 DISSOLVED OXYGEN

Table I-11 2015 SHEP Model calibration statistics at select stations for dissolved oxygen from January 1, 2013 through April 30, 2014

Station	Measured (mg/L)				Simulated (mg/L)				R ²	Mean Abs Error (mg/L)	RMS Error (mg/L)	Norm RMS Error (mg/L)	Index of Agrmt
	Mean	Median	5% tile	95% tile	Mean	Median	5% tile	95% tile					
02198840	8.43	9.00	4.50	10.50	8.47	9.03	5.14	10.64	0.94	0.33	0.40	0.05	0.98
02198920	7.68	8.30	4.20	10.50	8.02	8.60	4.98	10.61	0.89	0.54	0.73	0.09	0.96
02198950	7.66	8.20	4.40	10.30	8.08	8.67	5.19	10.80	0.93	0.54	0.66	0.08	0.97
02198955	7.82	8.10	6.10	9.30	8.70	9.00	7.41	9.69	0.82	0.88	0.98	0.12	0.75
021989715	6.76	7.30	3.40	9.80	8.00	8.55	5.26	10.55	0.91	1.25	1.39	0.18	0.87
021989773	6.27	7.10	3.20	9.40	7.08	7.52	4.68	10.05	0.90	0.88	1.03	0.15	0.93
021989792	7.57	8.20	4.20	10.20	8.26	8.97	5.37	10.86	0.94	0.73	0.85	0.11	0.95
021989793	8.64	8.70	6.90	10.50	9.15	9.21	7.48	11.07	0.79	0.62	0.73	0.08	0.89
0219897945	8.02	8.20	6.40	9.70	8.23	8.37	6.69	10.05	0.67	0.54	0.64	0.08	0.89
0219897993	6.93	7.50	3.60	9.50	7.21	7.65	4.39	10.22	0.89	0.58	0.70	0.10	0.97

Table I-12 2018 SHEP Model verification statistics at select stations for dissolved oxygen from January 1, 2014 through December 31, 2017

Station	Measured (mg/L)				Simulated (mg/L)				R ²	Mean Abs Error (mg/L)	RMS Error (mg/L)	Norm RMS Error (mg/L)	Index of Agrmnt
	Mean	Median	5% tile	95% tile	Mean	Median	5% tile	95% tile					
02198840	7.81	7.70	6.00	10.20	7.63	7.75	5.80	9.67	0.71	0.60	0.76	0.10	0.91
02198920	6.44	6.90	2.40	9.80	6.88	7.11	4.11	9.47	0.76	0.92	1.19	0.17	0.91
02198950	6.53	6.70	3.40	9.70	7.10	7.30	4.44	9.78	0.79	0.82	1.06	0.15	0.92
02198955	5.62	5.90	1.80	9.40	6.71	6.74	4.28	9.48	0.80	1.22	1.52	0.24	0.86
021989715	5.68	6.00	2.30	9.40	7.11	7.43	4.46	9.92	0.88	1.49	1.72	0.26	0.84
021989773	5.37	5.50	2.30	9.10	6.22	6.44	3.61	9.25	0.85	1.00	1.25	0.21	0.91
021989792	6.60	6.80	4.00	9.70	7.33	7.59	4.82	9.93	0.73	0.96	1.19	0.17	0.88
021989793	6.61	6.90	3.90	9.70	7.04	7.29	4.28	9.93	0.75	0.84	1.07	0.15	0.91
0219897945	6.07	6.40	3.20	9.30	6.26	6.52	3.52	9.36	0.84	0.63	0.83	0.13	0.95
0219897993	5.98	6.20	3.30	9.10	6.32	6.55	3.87	9.21	0.84	0.61	0.80	0.13	0.95

APPENDIX J DATA COLLECTION QAQC

Test Run Data Collection and Modeling Report for the Dissolved Oxygen Facility Environmental Testing for the Savannah Harbor Expansion Project

Contract# W912HN-15-D-0023

Tasks: 07 and 08

August 15, 2019

PREPARED FOR

**Army Corps of Engineers
Savannah District**
100 W Oglethorpe Avenue
Savannah, Georgia 31401-3640
Tel (912) 652-5026

PREPARED BY

LG2 Environmental Solutions, Inc.
10475 Fortune Parkway, Suite 201
Jacksonville, Florida 32256
Tel (904) 288-8631

Tetra Tech, Inc.
1899 Powers Ferry Rd SE, Suite 400
Atlanta, Georgia 30339
Tel (770) 738-6030

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J.1 PLATFORM DATA

Data from sixteen (16) sondes were directly downloaded from the Datalogger maintained by Xylem. Campbell Scientific LoggerNet 4.5 program was used to access the datalogger on the platform. The deployed data sondes automatically upload data directly to the datalogger. To simplify the download process, the field personnel installed an SD card on the datalogger to store at least a month's worth of data. The staff from Xylem then extracted the weeks' worth of uploaded data to create a separate weekly data file. The QA/QC personnel then accessed the weekly datafile hosted on the SD card and downloaded using Campbell Scientific LoggerNet 4.5. The data were recorded at a sampling interval of 5 minutes and spanned the period from March 14, 2019 through May 12, 2019 for the Test Run sampling effort. **Table J-1** provides the sonde ID, location of the data sonde on the platform, and description of the data sondes used for Test Run sampling. **Figure J-1** shows the arrangement of sondes around the platform.

Table J-1 Data sondes used on the platform for Test Run study sampling

Sonde ID	Location on the platform	Description
L10-S	Northeast	Shallow sonde
L6-M	Northeast	Mid-depth sonde
L2-D	Northeast	Deep sonde
L9-S	Northwest	Shallow sonde
L5-M	Northwest	Mid-depth sonde
L1-D	Northwest	Deep sonde
L11-S	Southeast	Shallow sonde with algae-sensor
L7-M	Southeast	Mid-depth sonde
L3-D	Southeast	Deep sonde with algae-sensor
L12-S	Southwest	Shallow sonde
L8-M	Southwest	Mid-depth sonde
L4-D	Southwest	Deep sonde
L13-V	Between the northwest and southwest sondes	Sonde placed ~1.6 meters below the platform
L14-V	Between the northeast and southeast sondes	Sonde placed ~3.2 meters below the platform
L15-V	Between the northwest and southwest sondes	Sonde placed ~3.4 meters below the platform
L16-V	Between the northeast and southeast sondes	Sonde placed at ~1.8 meters below the platform

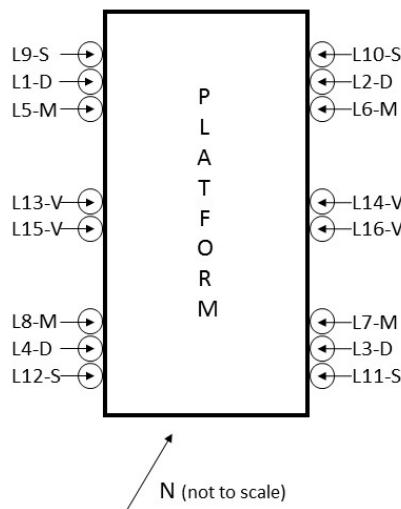


Figure J-1 Data sonde locations on the Back River platform

Table J-2 through **Table J-6** provide the constituents measured at the platform data sondes, PCodes assigned to the constituents for the database, and the raw data count for each sonde and constituent.

Table J-2 Data counts for sondes located on the northeast corner of the platform

PCode	Parameter Name	Units	Raw Data Count		
			L10-S	L6-M	L2-D
BGA_R	phycoerythin BGA	RFU	*	*	*
BGA_U	phycoerythin BGA	µg/L	*	*	*
CABLE	cable power	Volts	17,114	17,114	9,762
CHLA_R	chlorophyll a	RFU	*	*	*
CHLA_U	chlorophyll a	µg/L	*	*	*
DEPTH	water depth	meters	17,114	17,114	9,762
DO	dissolved oxygen	mg/L	17,114	17,114	9,762
DO_SAT	dissolved oxygen saturation	%	17,114	17,114	9,762
SAL	salinity	PSU	17,114	17,114	9,762
SPCOND_M	specific conductivity	mS/cm	17,114	17,114	9,762
WTEMP	water temperature	Degree C	17,104	17,106	9,754
Total			119,788	119,790	68,326

* Sonde not equipped with sensor, reported value was 0 (zero)

Table J-3 Data counts for sondes located on the northwest corner of the platform

PCode	Parameter Name	Units	Raw Data Count		
			L9-S	L5-M	L1-D
BGA_R	phycoerythin BGA	RFU	*	*	*
BGA_U	phycoerythin BGA	µg/L	*	*	*
CABLE	cable power	Volts	17,114	17,114	9,762
CHLA_R	chlorophyll a	RFU	*	*	*
CHLA_U	chlorophyll a	µg/L	*	*	*
DEPTH	water depth	meters	17,114	17,114	9,762
DO	dissolved oxygen	mg/L	17,114	17,114	9,762
DO_SAT	dissolved oxygen saturation	%	17,114	17,114	9,762
SAL	salinity	PSU	17,114	17,114	9,762
SPCOND_M	specific conductivity	mS/cm	17,114	17,114	9,762
WTEMP	water temperature	Degree C	17,111	17,113	9,760
Total			119,795	119,797	68,332

* Sonde not equipped with sensor, reported value was 0 (zero)

Table J-4 Data counts for sondes located on the southeast corner of the platform

PCode	Parameter Name	Units	Raw Data Count		
			L11-S	L7-M	L3-D
BGA_R	phycoerythin BGA	RFU	17,114	*	9,762
BGA_U	phycoerythin BGA	µg/L	17,114	*	9,762
CABLE	cable power	Volts	17,114	17,114	9,762
CHLA_R	chlorophyll a	RFU	17,114	*	9,762
CHLA_U	chlorophyll a	µg/L	17,114	*	9,762
DEPTH	water depth	meters	17,114	17,114	9,762
DO	dissolved oxygen	mg/L	17,114	17,114	9,762
DO_SAT	dissolved oxygen saturation	%	17,114	17,114	9,762
SAL	salinity	PSU	17,114	17,114	9,762
SPCOND_M	specific conductivity	mS/cm	17,114	17,114	9,762
WTEMP	water temperature	Degree C	17,106	17,003	9,756
Total			188,246	119,687	107,376

* Sonde not equipped with sensor, reported value was 0 (zero)

Table J-5 Data counts for sondes located on the southwest corner of the platform

PCode	Parameter Name	Units	Raw Data Count		
			L12-S	L8-M	L4-D
BGA_R	phycoerythin BGA	RFU	*	*	*
BGA_U	phycoerythin BGA	µg/L	*	*	*
CABLE	cable power	Volts	17,114	17,114	9,762
CHLA_R	chlorophyll a	RFU	*	*	*
CHLA_U	chlorophyll a	µg/L	*	*	*
DEPTH	water depth	meters	17,114	17,114	9,762
DO	dissolved oxygen	mg/L	17,114	17,114	9,762
DO_SAT	dissolved oxygen saturation	%	17,114	17,114	9,762
SAL	salinity	PSU	17,114	17,114	9,762
SPCOND_M	specific conductivity	mS/cm	17,114	17,114	9,762
WTEMP	water temperature	Degree C	17,113	17,113	9,762
Total			119,797	119,797	68,334

* Sonde not equipped with sensor, reported value was 0 (zero)

Table J-6 Data counts for sondes located on the sides of the platform

PCode	Parameter Name	Units	Raw Data Count			
			L13-V	L14-V	L15-V	L16-V
BGA_R	phycoerythin BGA	RFU	*	*	*	*
BGA_U	phycoerythin BGA	µg/L	*	*	*	*
CABLE	cable power	Volts	9,762	9,762	9,762	9,762
CHLA_R	chlorophyll a	RFU	*	*	*	*
CHLA_U	chlorophyll a	µg/L	*	*	*	*
DEPTH	water depth	meters	9,762	9,762	9,762	9,762
DO	dissolved oxygen	mg/L	9,762	9,762	9,762	9,762
DO_SAT	dissolved oxygen saturation	%	9,762	9,762	9,762	9,762
SAL	salinity	PSU	9,762	9,762	9,762	9,762
SPCOND_M	specific conductivity	mS/cm	9,762	9,762	9,762	9,762
WTEMP	water temperature	Degree C	9,493	9,494	9,490	9,492
Total			68,065	68,066	68,062	68,064

* Sonde not equipped with sensor, reported value was 0 (zero)

During the QA/QC check, unique observations and some inconsistencies in the data of the system were identified in the measured platform data and were separated from the consistent data in the processed data files and project database.

Based on the header information for specific conductivity (SPCOND) on the *.dat file downloaded from datalogger using Campbell Scientific LoggerNet 4.5, the units were reported as mS/cm. It was confirmed by Xylem that the units for SPCOND were mS/cm. The SPCOND concentrations for all continuously deployed sondes varied between 0.3 mS/cm and 12,045 mS/cm, with an average concentration of 1,923 mS/cm. To verify the range of SPCOND, two USGS monitoring stations located upstream (USGS 021989793) and downstream (USGS 0219897945) of the platform were evaluated. USGS 021989793 is located 1.42 miles upstream of the platform and USGS 0219897945 is located 2.45 miles downstream of the platform. During the period from March 14, 2019 through May 12, 2019, the USGS 0219897945 SPCOND varied between 304 µS/cm and 15,200 µS/cm with an average concentration of 4,614 µS/cm. At USGS 021989793, SPCOND varied between 88 µS/cm and 6,080 µS/cm, with an average concentration of 906 µS/cm. Based on the comparison, it was determined that the SPCOND concentrations from the data sondes at the platform were in µS/cm, not mS/cm as stated by Xylem.

On April 16, 2019 it was found that one of the platform anchors had become dislodged and the anchor line had become wrapped around the diffuser. Upon the discovery all of the platform sondes were removed while the anchor was reset. The sondes were redeployed on April 17, 2019 but the deep and variable depth sondes (L1-D, L2-D, L3-D, L4-D, L13-V, L14-V, L15-V, and L16-V) were not redeployed to reduce the overall drag on the platform.

The percentage of data that were removed during data QA/QC and will not be used for data analysis at each data sonde location is provided in **Table J-7**.

Table J-7 Percentage of values removed from the platform data set

Location	Sonde ID	Percent removed values (%)
Back River northeast corner	L10-S	0.03
	L6-M	0.02
	L2-D	0.07
Back River northwest corner	L9-S	0.02
	L5-M	0.01
	L1-D	0.03
Back River southeast corner	L11-S	0.02
	L7-M	0.71
	L3-D	0.06
Back River southwest corner	L12-S	0.01
	L8-M	0.00
	L4-D	0.01
Variable depths	L13-V	2.38
	L14-V	2.37
	L15-V	2.40
	L16-V	2.38

Note: Zeros (0) reported for BGA and chlorophyll a sondes were also removed but were not counted

J.2 SEMI-PERMANENT BUOY DATA

A total of one hundred forty-nine (149) semi-permanent buoy sonde datafiles were collected during Test Run sampling, with ninety (90) associated with the Back River diffuser and fifty-nine (59) associated with the lower Front River diffuser. Data collection was logged at five-minute intervals and spanned the period from March 14, 2019 through May 12, 2019. Data were retrieved from the semi-permanent buoy sondes and uploaded by the field team to the OneDrive. Each semi-permanent buoy datafile was named with a consistent file naming convention as follows:

Location_Direction_BeginDate_EndDate, where:

- o Location = LBR (Lower Back River) or LFR (Lower Front River)
- o Direction = N (north), NE (northeast), NW (northwest), S (south), SE (southeast), SW (southwest), and A (additional)
- o BeginDate = beginning date of data within the file
- o EndDate = ending date of data within the file

The QA/QC team downloaded each data file from the project OneDrive, archived the raw data on their server, reviewed and processed the data, uploaded the processed data into the project WRDB database, and plotted the data in timeseries format. **Table J-8** provides attribute information for each semi-permanent buoy used for Test Run data collection, including the location, station ID, latitude, longitude, and the number of raw data records collected at each location. **Table J-9** provides a list of constituents obtained for semi-permanent buoys and the number of raw records in the WRDB database for each constituent.

Table J-8 Attributes of semi-permanent buoys used for the Test Run study data collection

Location	Station ID	Latitude	Longitude	Raw Data Count
Back River northeast	LBR_NE	32.118109	-81.116927	195,878
Back River northwest	LBR_NW	32.117900	-81.117837	126,715
Back River southeast	LBR_SE	32.116314	-81.116134	129,750
Back River southwest	LBR_SW	32.115968	-81.117116	206,420
Lower Front River north	LFR_N	32.115920	-81.126515	138,273
Lower Front River south	LFR_S	32.115550	-81.126015	206,427
Lower Front River additional	LFR_A	32.116200	-81.126900	165,935
Total				1,169,398

Table J-9 Data counts for semi-permanent buoys constituents collected on the Front River and Back River

PCode	Parameter Name	Units	Raw Data Count
BATTERY	battery voltage	volts	111,256
BGA_R	phycoerythin BGA	RFU	65,106
BGA_U	phycoerythin BGA	µg/L	65,106
CHLA_R	chlorophyll a	RFU	65,106
CHLA_U	chlorophyll a	µg/L	65,106
COND	conductivity	µS/cm	17,413

PCode	Parameter Name	Units	Raw Data Count
DEPTH	water depth	meters	105,255
DEP_PSIA	water depth (pressure)	PSI	105,255
DO	dissolved oxygen	mg/L	113,959
DO_SAT	dissolved oxygen saturation	%	113,959
SALPPT	salinity	ppt	113,959
SPCOND	specific conductance	µS/cm	113,959
WTEMP	water temperature	°C	113,959
Total			1,169,398

Note: sondes equipped to measure BGA and chlorophyll *a* were installed at LFR_S, LFR_A, LBR_NE and LBR_SW

The semi-permanent buoy data were reviewed in timeseries plots to identify any sample dates and times which contained observed values which were inconsistent with the observed values sampled before and after the inconsistent values. Comparison of the inconsistent dates and times to field notes revealed that the inconsistent data were strongly correlated to times when the field crew was at a buoy retrieving the data. As an example, **Figure J-2** and **Figure J-3** present the depth and DO timeseries respectively at the lower Front River north buoy. The data points in red were identified as being inconsistent. All of the inconsistent data points were associated with beginning and ending times of the intermittent data retrievals.

All of the buoy sondes were pulled for calibration on April 9, 2019 around mid-day. A storm prevented the field team from redeploying the sondes immediately after recalibration. The sondes were redeployed around mid-day on April 10, 2019.

The buoy data for LBR_NE, LBR_SE, and LFR_A contain no depth observations for various periods of time. The field team investigated but couldn't determine the reason for the missing depth observations. It is unknown why those sondes during those periods did not record depth observations. The QA/QC team retained the data and considered it acceptable since it was known that the sampled depth was near the surface. Additionally, even though depth was missing, the other sampled constituents were in range and trending with the constituent observations when depths were being recorded.

As part of the missing depth investigation the field team replaced the LBR_SE sonde on April 4, 2019. Between April 4, 2019 and April 6, 2019, the replaced sonde shows a discontinuity in comparison to depths recorded before the missing period began and the depths recorded after April 6, 2019 (**Figure J-4**). The QA/QC theorizes that upon deployment an air bubble became trapped between the sondes pressure transducer (i.e. the instrument used to measure water depth) and the water column. When the field team downloaded data on April 6, 2019 the air bubble popped and the sonde subsequently started recording depth in range with depths recorded earlier during the Test Run.

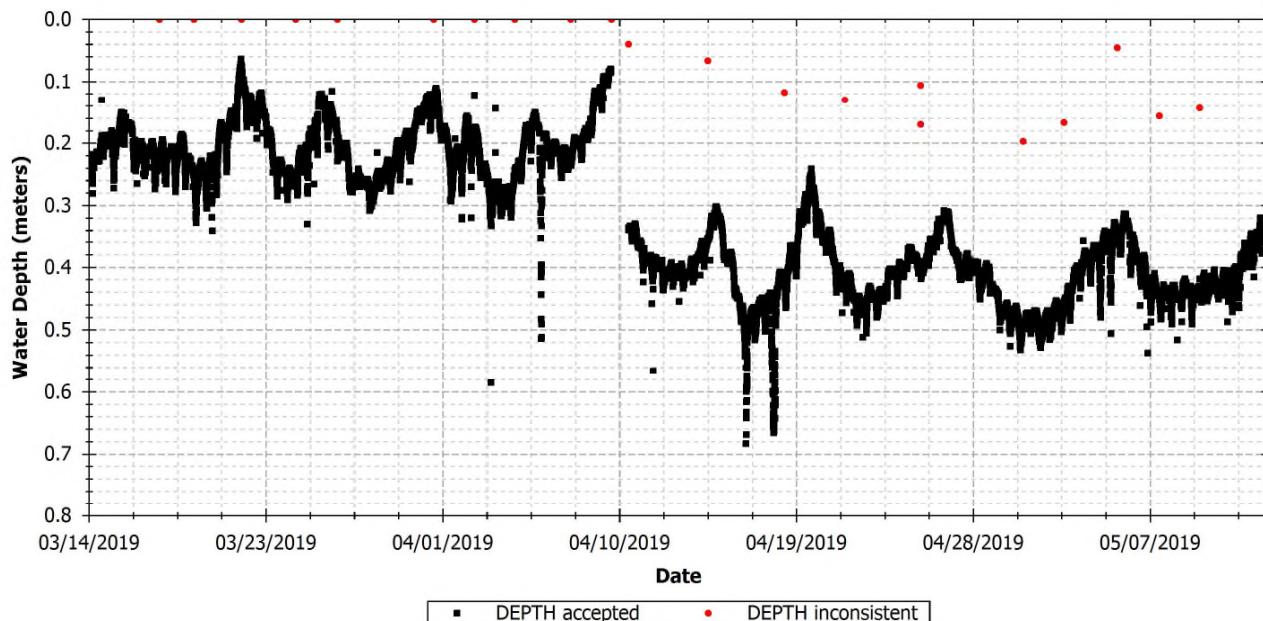


Figure J-2 Lower Front River north depth QA/QC timeseries

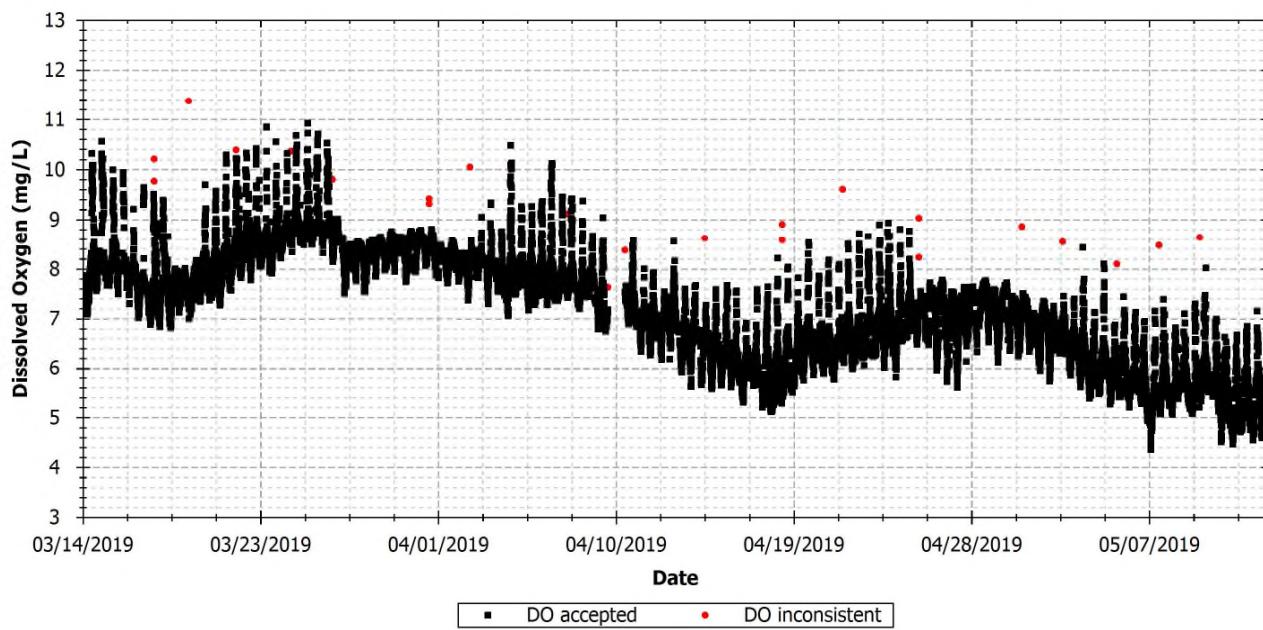
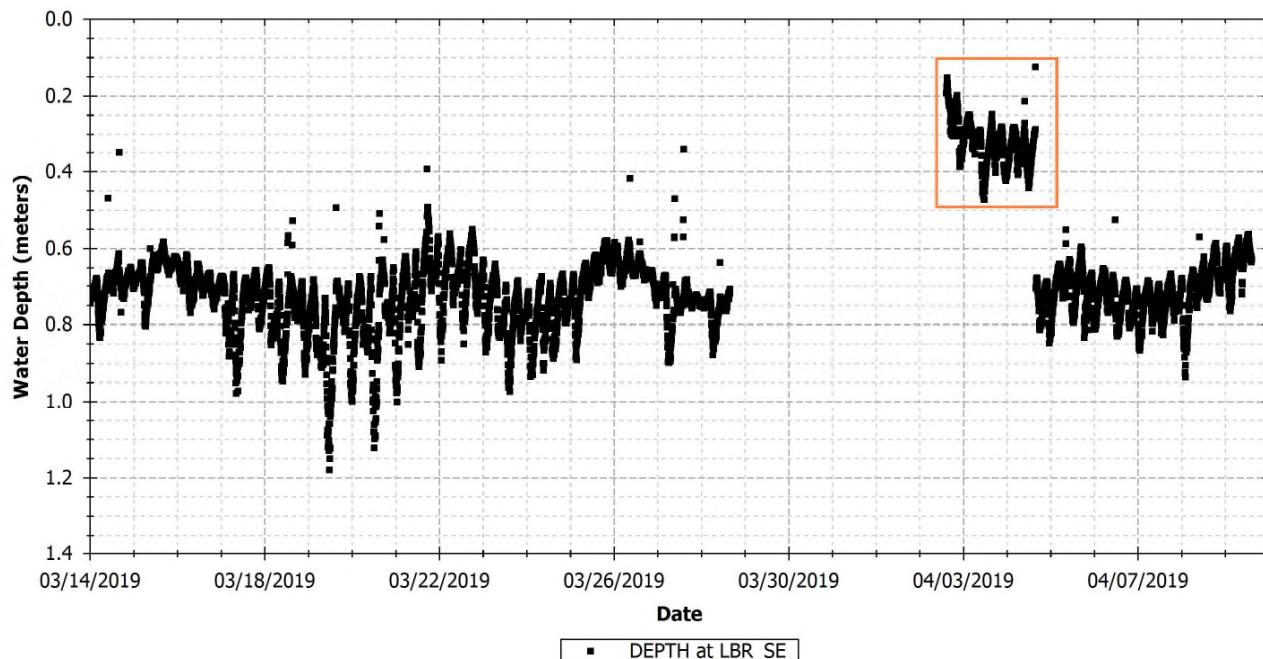


Figure J-3 Lower Front River north DO QA/QC timeseries



Note orange box identifies the period of time where depth sensor may have been cushioned by an air bubble

Figure J-4 Back River southeast depth QAQC timeseries

At each semi-permanent buoy, all dates and times identified as verified inconsistent were separated from the consistent data in the processed data files and project database. The percentage of inconsistency data for each semi-permanent buoy is provided in **Table J-10**.

Table J-10 Percentage of inconsistent values for semi-permanent buoys

Location	Station ID	Inconsistent values (%)
Back River northeast	LBR_NE	0.16
Back River northwest	LBR_NW	0.15
Back River southeast	LBR_SE	0.19
Back River southwest	LBR_SW	0.14
Front River north	LFR_N	0.14
Front River south	LFR_S	0.13
Front River additional	LFR_A	0.16

J.3 PROFILE DATA

A total of two hundred ninety-three (293) profiles were collected during the Test Run collection with one hundred eighty-one (181) collected near the Back River diffuser and one hundred twelve (112) collected near the lower Front River diffuser. The profile data were uploaded by the field team to the project OneDrive. Each profile was contained within its own *.csv or Excel workbook and was named with a consistent file naming convention as follows:

Location_Profile_Date_Sub-location_TT (#), where:

- Location = LBR (Lower Back River) or LFR (Lower Front River)
- Date = Sample Date
- Sub-location = location within river BNE (northeast buoy), BNW (northwest), BSE (southeast buoy), BSW (southwest buoy), Platform W (west side of platform), Platform E (east side of platform) (west side of platform), LFR N (north buoy), LFR S (south buoy), "blank" (traveling or combo profile in and out of plume), or DEEP (combo profile static sonde)
- TT = OT (outgoing tide), IT (incoming tide), LT (ebb tide), or HT (flood tide)
- # = sequential number to identify identically named profiles but at separate locations

The QA/QC team downloaded each data file from the project OneDrive, archived the raw data on their server, reviewed and processed the data, uploaded the data into the project WRDB database, and plotted the data in timeseries format. Each profile was assigned a unique station ID for the WRDB databases that consisted of a fourteen (14) digit character string. The station ID attribute captures the location and date and was assigned a chronological number based on the alphabetical sorting of the names of the files for each day.

For the combo profiles the latitude and longitude attributes from the data file collected with the hand-held device (i.e. profiling data file) were attributed into the data file collected in deployment mode (i.e. contained DEEP within the file name) based on time. For the sondes used in deployment mode, data logging was started and stopped before and after logging was started and stopped with the hand-held device. This resulted in data records in the deployment mode data files that were not associated with location information. For those data records the station ID was assigned a value of NONE_P since the locations of those data points were unknown.

Table J-11 and **Table J-12** provide identifying attribute information for each profile collected on the Back River and lower Front River respectively. The station name was assigned the name used in the raw data files sans the file extension (i.e. *.csv and *.xlsx). The tables also provide the profile type (i.e. stationary, traveling, or combo) as an attribute. **Table J-13** provides a list of constituents obtained for depth profiles and the number of raw records in the WRDB database for each constituent.

Table J-11 Attributes of depth profiles collected on the Back River

Station ID	Begin Date Time	End Date Time	Station Name	Type
LBR_031419_001	3/14/2019 16:19	3/14/2019 16:21	LBR_Profile_031419_BNE_HT	Stationary
LBR_031419_002	3/14/2019 10:14	3/14/2019 10:16	LBR_Profile_031419_BNE_LT	Stationary
LBR_031419_003	3/14/2019 16:13	3/14/2019 16:16	LBR_Profile_031419_BNW_HT	Stationary
LBR_031419_004	3/14/2019 15:59	3/14/2019 16:02	LBR_Profile_031419_BSE_HT	Stationary
LBR_031419_005	3/14/2019 9:56	3/14/2019 9:58	LBR_Profile_031419_BSE_LT	Stationary
LBR_031419_006	3/14/2019 16:08	3/14/2019 16:11	LBR_Profile_031419_BSW_HT	Stationary
LBR_031419_007	3/14/2019 10:02	3/14/2019 10:03	LBR_Profile_031419_BSW_LT	Stationary
LBR_031419_008	3/14/2019 15:43	3/14/2019 15:47	LBR_Profile_031419_E Platform_HT	Stationary
LBR_031419_009	3/14/2019 9:45	3/14/2019 9:47	LBR_Profile_031419_E Platform_LT	Stationary

Station ID	Begin Date Time	End Date Time	Station Name	Type
LBR_031419_010	3/14/2019 16:24	3/14/2019 16:55	LBR_Profile_031419_Plume_HT (2)	Traveler
LBR_031419_011	3/14/2019 14:48	3/14/2019 15:40	LBR_Profile_031419_Plume_HT	Traveler
LBR_031419_012	3/14/2019 10:20	3/14/2019 10:57	LBR_Profile_031419_Plume_LT	Traveler
LBR_031419_013	3/14/2019 9:42	3/14/2019 9:44	LBR_Profile_031419_W Platform (near S9)_LT	Stationary
LBR_031419_014	3/14/2019 15:48	3/14/2019 15:52	LBR_Profile_031419_W Platform_HT	Stationary
LBR_031419_015	3/14/2019 9:40	3/14/2019 9:41	LBR_Profile_031419_W Platform_LT	Stationary
LBR_031419_016	3/14/2019 10:09	3/14/2019 10:10	LBR_Profile_031419_BNW_LT	Stationary
LBR_031619_001	3/16/2019 17:51	3/16/2019 18:32	LBR_Profile_031619_Plume_HT (2)	Traveler
LBR_031619_002	3/16/2019 16:48	3/16/2019 17:49	LBR_Profile_031619_Plume_HT	Traveler
LBR_031619_003	3/16/2019 12:25	3/16/2019 13:25	LBR_Profile_031619_Plume_LT (2)	Traveler
LBR_031619_004	3/16/2019 11:22	3/16/2019 12:24	LBR_Profile_031619_Plume_LT	Traveler
LBR_031919_001	3/19/2019 8:52	3/19/2019 8:55	LBR_Profile_031919_E Platform_HT	Stationary
LBR_031919_002	3/19/2019 15:28	3/19/2019 15:31	LBR_Profile_031919_E Platform_LT	Stationary
LBR_031919_003	3/19/2019 9:03	3/19/2019 10:00	LBR_Profile_031919_HT	Traveler
LBR_031919_004	3/19/2019 8:43	3/19/2019 8:46	LBR_Profile_031919_LBR NE_HT	Stationary
LBR_031919_005	3/19/2019 15:22	3/19/2019 15:24	LBR_Profile_031919_LBR NE_LT	Stationary
LBR_031919_006	3/19/2019 8:36	3/19/2019 8:38	LBR_Profile_031919_LBR NW_HT	Stationary
LBR_031919_007	3/19/2019 15:18	3/19/2019 15:19	LBR_Profile_031919_LBR NW_LT	Stationary
LBR_031919_008	3/19/2019 8:22	3/19/2019 8:25	LBR_Profile_031919_LBR SE_HT	Stationary
LBR_031919_009	3/19/2019 15:08	3/19/2019 15:10	LBR_Profile_031919_LBR SE_LT	Stationary
LBR_031919_010	3/19/2019 8:29	3/19/2019 8:31	LBR_Profile_031919_LBR SW_HT	Stationary
LBR_031919_011	3/19/2019 15:13	3/19/2019 15:15	LBR_Profile_031919_LBR SW_LT	Stationary
LBR_031919_012	3/19/2019 15:44	3/19/2019 16:28	LBR_Profile_031919_LT (2)	Traveler
LBR_031919_013	3/19/2019 14:03	3/19/2019 15:06	LBR_Profile_031919_LT	Traveler
LBR_031919_014	3/19/2019 8:56	3/19/2019 9:00	LBR_Profile_031919_W Platform_HT	Stationary
LBR_031919_015	3/19/2019 15:32	3/19/2019 15:35	LBR_Profile_031919_W Platform_LT	Stationary
LBR_032119_001	3/21/2019 10:52	3/21/2019 10:54	LBR_Profile_032119_BNE_HT	Stationary
LBR_032119_002	3/21/2019 17:26	3/21/2019 17:27	LBR_Profile_032119_BNE_LT	Stationary
LBR_032119_003	3/21/2019 10:49	3/21/2019 10:50	LBR_Profile_032119_BNW_HT	Stationary
LBR_032119_004	3/21/2019 17:20	3/21/2019 17:22	LBR_Profile_032119_BNW_LT	Stationary
LBR_032119_005	3/21/2019 10:40	3/21/2019 10:42	LBR_Profile_032119_BSE_HT	Stationary
LBR_032119_006	3/21/2019 17:09	3/21/2019 17:10	LBR_Profile_032119_BSE_LT	Stationary
LBR_032119_007	3/21/2019 10:44	3/21/2019 10:46	LBR_Profile_032119_BSW_HT	Stationary
LBR_032119_008	3/21/2019 17:14	3/21/2019 17:16	LBR_Profile_032119_BSW_LT	Stationary
LBR_032119_009	3/21/2019 11:09	3/21/2019 12:00	LBR_Profile_032119_HT (2)	Traveler
LBR_032119_010	3/21/2019 9:40	3/21/2019 10:39	LBR_Profile_032119_HT	Traveler

Station ID	Begin Date Time	End Date Time	Station Name	Type
LBR_032119_011	3/21/2019 17:45	3/21/2019 18:28	LBR_Profile_032119_LT (2)	Traveler
LBR_032119_012	3/21/2019 16:00	3/21/2019 17:08	LBR_Profile_032119_LT	Traveler
LBR_032119_013	3/21/2019 10:57	3/21/2019 11:00	LBR_Profile_032119_Platform E_LT	Stationary
LBR_032119_014	3/21/2019 17:32	3/21/2019 17:34	LBR_Profile_032119_Platform E_LT	Stationary
LBR_032119_015	3/21/2019 11:01	3/21/2019 11:04	LBR_Profile_032119_Platform W_LT	Stationary
LBR_032119_016	3/21/2019 17:37	3/21/2019 17:39	LBR_Profile_032119_Platform W_LT	Stationary
LBR_032319_001	3/23/2019 10:04	3/23/2019 13:01	LBR_Profile_032319_LT	Traveler
LBR_032619_001	3/26/2019 13:55	3/26/2019 13:57	LBR_Profile_032619_BNE_LT	Stationary
LBR_032619_002	3/26/2019 9:03	3/26/2019 9:05	LBR_Profile_032619_BNE_LT	Stationary
LBR_032619_003	3/26/2019 14:00	3/26/2019 14:01	LBR_Profile_032619_BNW_LT	Stationary
LBR_032619_004	3/26/2019 8:56	3/26/2019 8:57	LBR_Profile_032619_BNW_LT	Stationary
LBR_032619_005	3/26/2019 14:13	3/26/2019 14:14	LBR_Profile_032619_BSE_LT	Stationary
LBR_032619_006	3/26/2019 8:46	3/26/2019 8:47	LBR_Profile_032619_BSE_LT	Stationary
LBR_032619_007	3/26/2019 14:06	3/26/2019 14:08	LBR_Profile_032619_BSW_LT	Stationary
LBR_032619_008	3/26/2019 8:51	3/26/2019 8:52	LBR_Profile_032619_BSW_LT	Stationary
LBR_032619_009	3/26/2019 14:19	3/26/2019 14:22	LBR_Profile_032619_Platform E_LT	Stationary
LBR_032619_010	3/26/2019 9:15	3/26/2019 9:17	LBR_Profile_032619_Platform E_LT	Stationary
LBR_032619_011	3/26/2019 14:23	3/26/2019 14:25	LBR_Profile_032619_Platform W_LT	Stationary
LBR_032619_012	3/26/2019 9:11	3/26/2019 9:13	LBR_Profile_032619_Platform W_LT	Stationary
LBR_032619_013	3/26/2019 14:28	3/26/2019 15:00	LBR_Profile_032619_LT(2)	Traveler
LBR_032619_014	3/26/2019 12:54	3/26/2019 13:54	LBR_Profile_032619_LT	Traveler
LBR_032619_015	3/26/2019 9:21	3/26/2019 9:53	LBR_Profile_032619_LT(2)	Traveler
LBR_032619_016	3/26/2019 8:19	3/26/2019 8:45	LBR_Profile_032619_LT	Traveler
LBR_032819_001	3/28/2019 16:09	3/28/2019 16:11	LBR_Profile_032819_BNE_LT	Stationary
LBR_032819_002	3/28/2019 10:23	3/28/2019 10:25	LBR_Profile_032819_BNE_LT	Stationary
LBR_032819_003	3/28/2019 15:58	3/28/2019 15:59	LBR_Profile_032819_BNW_LT	Stationary
LBR_032819_004	3/28/2019 10:19	3/28/2019 10:21	LBR_Profile_032819_BSE_LT	Stationary
LBR_032819_005	3/28/2019 15:48	3/28/2019 15:49	LBR_Profile_032819_BNW_LT	Stationary
LBR_032819_006	3/28/2019 10:08	3/28/2019 10:09	LBR_Profile_032819_BSE_LT	Stationary
LBR_032819_007	3/28/2019 15:52	3/28/2019 15:54	LBR_Profile_032819_BSW_LT	Stationary
LBR_032819_008	3/28/2019 10:12	3/28/2019 10:14	LBR_Profile_032819_BSW_LT	Stationary
LBR_032819_009	3/28/2019 16:19	3/28/2019 16:21	LBR_Profile_032819_Platform E_LT	Stationary
LBR_032819_010	3/28/2019 16:22	3/28/2019 16:24	LBR_Profile_032819_Platform W_LT	Stationary
LBR_032819_011	3/28/2019 16:26	3/28/2019 17:12	LBR_Profile_032819_LT (2)	Traveler
LBR_032819_012	3/28/2019 14:50	3/28/2019 15:47	LBR_Profile_032819_LT	Traveler
LBR_032819_013	3/28/2019 10:26	3/28/2019 10:57	LBR_Profile_032819_LT (2)	Traveler

Station ID	Begin Date Time	End Date Time	Station Name	Type
LBR_032819_014	3/28/2019 9:48	3/28/2019 10:08	LBR_Profile_032819_LT	Traveler
LBR_033019_001	3/30/2019 12:04	3/30/2019 12:07	LBR_Profile_033019_BNE_LT	Stationary
LBR_033019_002	3/30/2019 12:10	3/30/2019 12:12	LBR_Profile_033019_BNW_LT	Stationary
LBR_033019_003	3/30/2019 12:22	3/30/2019 12:23	LBR_Profile_033019_BSE_LT	Stationary
LBR_033019_004	3/30/2019 12:16	3/30/2019 12:18	LBR_Profile_033019_BSW_LT	Stationary
LBR_033019_005	3/30/2019 12:37	3/30/2019 14:13	LBR_Profile_033019_LT (2)	Traveler
LBR_033019_006	3/30/2019 10:28	3/30/2019 12:03	LBR_Profile_033019_LT	Traveler
LBR_033019_007	3/30/2019 12:28	3/30/2019 12:30	LBR_Profile_033019_Platform E_LT	Stationary
LBR_033019_008	3/30/2019 12:33	3/30/2019 12:35	LBR_Profile_033019_Platform W_LT	Stationary
LBR_040219_001	4/2/2019 15:05	4/2/2019 15:08	LBR_Profile_040219_BNE_LT	Stationary
LBR_040219_002	4/2/2019 14:57	4/2/2019 14:59	LBR_Profile_040219_BNW_LT	Stationary
LBR_040219_003	4/2/2019 14:36	4/2/2019 14:39	LBR_Profile_040219_BSE_LT	Stationary
LBR_040219_004	4/2/2019 14:49	4/2/2019 14:52	LBR_Profile_040219_BSW_LT	Stationary
LBR_040219_005	4/2/2019 15:30	4/2/2019 16:43	LBR_Profile_040219_LT (2)	Traveler
LBR_040219_006	4/2/2019 12:59	4/2/2019 14:34	LBR_Profile_040219_LT	Traveler
LBR_040219_007	4/2/2019 15:20	4/2/2019 15:24	LBR_Profile_040219_Platform E_LT	Stationary
LBR_040219_008	4/2/2019 15:15	4/2/2019 15:19	LBR_Profile_040219_Platform W_LT	Stationary
LBR_040419_001	4/4/2019 9:24	4/4/2019 9:26	LBR_Profile_040419_BNE_HT	Stationary
LBR_040419_002	4/4/2019 15:58	4/4/2019 15:59	LBR_Profile_040419_BNE_LT	Stationary
LBR_040419_003	4/4/2019 9:28	4/4/2019 9:30	LBR_Profile_040419_BNW_HT	Stationary
LBR_040419_004	4/4/2019 15:53	4/4/2019 15:54	LBR_Profile_040419_BNW_LT	Stationary
LBR_040419_005	4/4/2019 9:37	4/4/2019 9:39	LBR_Profile_040419_BSE_HT	Stationary
LBR_040419_006	4/4/2019 15:40	4/4/2019 15:41	LBR_Profile_040419_BSE_LT	Stationary
LBR_040419_007	4/4/2019 9:33	4/4/2019 9:35	LBR_Profile_040419_BSW_HT	Stationary
LBR_040419_008	4/4/2019 15:46	4/4/2019 15:47	LBR_Profile_040419_BSW_LT	Stationary
LBR_040419_009	4/4/2019 9:50	4/4/2019 10:50	LBR_Profile_040419_HT (2)	Traveler
LBR_040419_010	4/4/2019 8:26	4/4/2019 9:22	LBR_Profile_040419_HT	Traveler
LBR_040419_011	4/4/2019 16:12	4/4/2019 17:16	LBR_Profile_040419_LT (2)	Traveler
LBR_040419_012	4/4/2019 14:35	4/4/2019 15:40	LBR_Profile_040419_LT	Traveler
LBR_040419_013	4/4/2019 9:41	4/4/2019 9:45	LBR_Profile_040419_Platform E_HT	Stationary
LBR_040419_014	4/4/2019 16:08	4/4/2019 16:10	LBR_Profile_040419_Platform E_LT	Stationary
LBR_040419_015	4/4/2019 9:47	4/4/2019 9:49	LBR_Profile_040419_Platform W_HT	Stationary
LBR_040419_016	4/4/2019 16:05	4/4/2019 16:06	LBR_Profile_040419_Platform W_LT	Stationary
LBR_040619_001	4/6/2019 9:19	4/6/2019 11:28	LBR_Profile_040619_HT	Traveler
LBR_040919_001	4/9/2019 12:10	4/9/2019 12:12	LBR_Profile_040919_BNE_HT	Stationary
LBR_040919_002	4/9/2019 12:06	4/9/2019 12:07	LBR_Profile_040919_BNW_HT	Stationary

Station ID	Begin Date Time	End Date Time	Station Name	Type
LBR_040919_003	4/9/2019 12:15	4/9/2019 12:16	LBR_Profile_040919_BSE_HT	Stationary
LBR_040919_004	4/9/2019 12:19	4/9/2019 12:21	LBR_Profile_040919_BSW_HT	Stationary
LBR_040919_005	4/9/2019 12:43	4/9/2019 14:14	LBR_Profile_040919_HT (2)	Traveler
LBR_040919_006	4/9/2019 10:38	4/9/2019 12:01	LBR_Profile_040919_HT	Traveler
LBR_040919_007	4/9/2019 12:30	4/9/2019 12:32	LBR_Profile_040919_Platform_E_HT	Stationary
LBR_040919_008	4/9/2019 12:26	4/9/2019 12:29	LBR_Profile_040919_Platform_W_HT	Stationary
LBR_041319_001	4/13/2019 9:30	4/13/2019 12:02	LBR_Profile_041319_LT	Traveler
LBR_041819_001	4/18/2019 9:16	4/18/2019 9:19	LBR_Profile_041819_BNE_HT	Stationary
LBR_041819_002	4/18/2019 9:26	4/18/2019 9:27	LBR_Profile_041819_BNW_HT	Stationary
LBR_041819_003	4/18/2019 9:40	4/18/2019 9:41	LBR_Profile_041819_BSE_HT	Stationary
LBR_041819_004	4/18/2019 9:32	4/18/2019 9:34	LBR_Profile_041819_BSW_HT	Stationary
LBR_041819_005	4/18/2019 10:00	4/18/2019 10:59	LBR_Profile_041819_HT (2)	Traveler
LBR_041819_006	4/18/2019 8:35	4/18/2019 9:16	LBR_Profile_041819_HT	Traveler
LBR_041819_007	4/18/2019 14:55	4/18/2019 17:02	LBR_Profile_041819_LT	Traveler
LBR_041819_008	4/18/2019 9:55	4/18/2019 9:57	LBR_Profile_041819_Platform_E_HT	Stationary
LBR_041819_009	4/18/2019 9:51	4/18/2019 9:53	LBR_Profile_041819_Platform_W_HT	Stationary
LBR_042019_001	4/20/2019 11:03	4/20/2019 11:05	LBR_Profile_042019_BNE_HT	Stationary
LBR_042019_002	4/20/2019 10:57	4/20/2019 10:58	LBR_Profile_042019_BNW_HT	Stationary
LBR_042019_003	4/20/2019 11:09	4/20/2019 11:11	LBR_Profile_042019_BSE_HT	Stationary
LBR_042019_004	4/20/2019 11:13	4/20/2019 11:16	LBR_Profile_042019_BSW_HT	Stationary
LBR_042019_005	4/20/2019 11:30	4/20/2019 13:00	LBR_Profile_042019_HT(2)	Traveler
LBR_042019_006	4/20/2019 9:22	4/20/2019 10:51	LBR_Profile_042019_HT	Traveler
LBR_042019_007	4/20/2019 11:21	4/20/2019 11:24	LBR_Profile_042019_Platform_E_HT	Stationary
LBR_042019_008	4/20/2019 11:25	4/20/2019 11:26	LBR_Profile_042019_Platform_W_HT	Stationary
LBR_042819_001	4/28/2019 11:35	4/28/2019 11:37	LBR_Profile_042819_BNE_LT	Stationary
LBR_042819_002	4/28/2019 11:30	4/28/2019 11:31	LBR_Profile_042819_BNW_LT	Stationary
LBR_042819_003	4/28/2019 11:17	4/28/2019 11:18	LBR_Profile_042819_BSE_LT	Stationary
LBR_042819_004	4/28/2019 11:23	4/28/2019 11:25	LBR_Profile_042819_BSW_LT	Stationary
LBR_042819_005	4/28/2019 11:53	4/28/2019 13:30	LBR_Profile_042819_LT (2)	Traveler
LBR_042819_006	4/28/2019 9:52	4/28/2019 11:14	LBR_Profile_042819_LT	Traveler
LBR_042819_007	4/28/2019 11:44	4/28/2019 11:45	LBR_Profile_042819_Platform_E_LT	Stationary
LBR_042819_008	4/28/2019 11:42	4/28/2019 11:43	LBR_Profile_042819_Platform_W_LT	Stationary
LBR_043019_001	4/30/2019 11:23	4/30/2019 14:20	LBR_Profile_043019_Deep_LT	Combo
LBR_043019_002	4/30/2019 11:23	4/30/2019 14:20	LBR_Profile_043019_LT	Combo
LBR_050219_001	5/2/2019 14:26	5/2/2019 14:28	LBR_Profile_050219_BNE_LT	Stationary
LBR_050219_002	5/2/2019 14:22	5/2/2019 14:23	LBR_Profile_050219_BNW_LT	Stationary

Station ID	Begin Date Time	End Date Time	Station Name	Type
LBR_050219_003	5/2/2019 14:14	5/2/2019 14:15	LBR_Profile_050219_BSE_LT	Stationary
LBR_050219_004	5/2/2019 14:17	5/2/2019 14:19	LBR_Profile_050219_BSW_LT	Stationary
LBR_050219_005	5/2/2019 14:42	5/2/2019 15:54	LBR_Profile_050219_Deep_LT (2)	Combo
LBR_050219_006	5/2/2019 12:43	5/2/2019 13:53	LBR_Profile_050219_Deep_LT	Combo
LBR_050219_007	5/2/2019 14:42	5/2/2019 15:54	LBR_Profile_050219_LT (2)	Combo
LBR_050219_008	5/2/2019 12:43	5/2/2019 13:53	LBR_Profile_050219_LT	Combo
LBR_050419_001	5/4/2019 7:49	5/4/2019 10:45	LBR_Profile_050419_Deep_HT	Combo
LBR_050419_002	5/4/2019 7:49	5/4/2019 10:45	LBR_Profile_050419_HT	Combo
LBR_050719_001	5/7/2019 11:18	5/7/2019 11:20	LBR_Profile_050719_BNE_HT	Stationary
LBR_050719_002	5/7/2019 11:24	5/7/2019 11:25	LBR_Profile_050719_BNW_HT	Stationary
LBR_050719_003	5/7/2019 11:36	5/7/2019 11:38	LBR_Profile_050719_BSE_HT	Stationary
LBR_050719_004	5/7/2019 11:31	5/7/2019 11:33	LBR_Profile_050719_BSW_HT	Stationary
LBR_050719_005	5/7/2019 12:00	5/7/2019 13:03	LBR_Profile_050719_Deep_HT (2)	Combo
LBR_050719_006	5/7/2019 10:07	5/7/2019 11:08	LBR_Profile_050719_Deep_HT	Combo
LBR_050719_007	5/7/2019 11:57	5/7/2019 13:03	LBR_Profile_050719_HT (2)	Combo
LBR_050719_008	5/7/2019 10:07	5/7/2019 11:08	LBR_Profile_050719_HT	Combo
LBR_050719_009	5/7/2019 11:45	5/7/2019 11:46	LBR_Profile_050719_Platform_E_HT	Stationary
LBR_050719_010	5/7/2019 11:47	5/7/2019 11:48	LBR_Profile_050719_Platform_W_HT	Stationary
LBR_051119_001	5/11/2019 15:04	5/11/2019 15:06	LBR_Profile_051119_BNE_HT	Stationary
LBR_051119_002	5/11/2019 15:09	5/11/2019 15:10	LBR_Profile_051119_BNW_HT	Stationary
LBR_051119_003	5/11/2019 15:34	5/11/2019 15:35	LBR_Profile_051119_BSE_HT	Stationary
LBR_051119_004	5/11/2019 15:23	5/11/2019 15:25	LBR_Profile_051119_BSW_HT	Stationary
LBR_051119_005	5/11/2019 15:40	5/11/2019 17:00	LBR_Profile_051119_Deep_HT (2)	Combo
LBR_051119_006	5/11/2019 13:31	5/11/2019 14:56	LBR_Profile_051119_Deep_HT	Combo
LBR_051119_007	5/11/2019 15:39	5/11/2019 17:00	LBR_Profile_051119_HT (2)	Combo
LBR_051119_008	5/11/2019 13:31	5/11/2019 14:56	LBR_Profile_051119_HT	Combo
LBR_051219_001	5/12/2019 8:41	5/12/2019 11:32	LBR_Profile_051219_Deep_LT	Combo
LBR_051219_002	5/12/2019 8:39	5/12/2019 11:32	LBR_Profile_051219_LT	Combo

Table J-12 Attributes of depth profiles collected on the lower Front River

Station ID	Begin DateTime	End DateTime	Station Name	Type
LFR_031419_001	3/14/2019 15:22	3/14/2019 15:24	LFR_Profile_031419_LFR N_HT	Stationary
LFR_031419_002	3/14/2019 9:35	3/14/2019 9:36	LFR_Profile_031419_LFR N_LT	Stationary
LFR_031419_003	3/14/2019 15:18	3/14/2019 15:20	LFR_Profile_031419_LFR S_HT	Stationary
LFR_031419_004	3/14/2019 9:39	3/14/2019 9:40	LFR_Profile_031419_LFR S_LT	Stationary
LFR_031419_005	3/14/2019 9:50	3/14/2019 10:00	LFR_Profile_031419_Plume_LT (2)	Traveler

Station ID	Begin DateTime	End DateTime	Station Name	Type
LFR_031419_006	3/14/2019 9:08	3/14/2019 9:19	LFR_Profile_031419_Plume_LT	Traveler
LFR_031419_007	3/14/2019 15:30	3/14/2019 16:12	LFR_Profile_031419_Shallow_HT (2)	Traveler
LFR_031419_008	3/14/2019 14:39	3/14/2019 15:16	LFR_Profile_031419_Shallow_HT	Traveler
LFR_031419_009	3/14/2019 10:01	3/14/2019 10:47	LFR_Profile_031419_Shallow_LT (2)	Traveler
LFR_031419_010	3/14/2019 9:20	3/14/2019 9:33	LFR_Profile_031419_Shallow_LT	Traveler
LFR_031719_001	3/17/2019 13:09	3/17/2019 14:13	LFR_Profile_031719_Plume_LT (2)	Traveler
LFR_031719_002	3/17/2019 11:46	3/17/2019 13:09	LFR_Profile_031719_Plume_LT	Traveler
LFR_031919_001	3/19/2019 8:31	3/19/2019 9:34	LFR_Profile_031919_HT	Traveler
LFR_031919_002	3/19/2019 8:25	3/19/2019 8:28	LFR_Profile_031919_LFR_N_HT	Stationary
LFR_031919_003	3/19/2019 8:19	3/19/2019 8:23	LFR_Profile_031919_LFR_S_HT	Stationary
LFR_031919_004	3/19/2019 13:48	3/19/2019 16:00	LFR_Profile_031919_LT	Traveler
LFR_032119_001	3/21/2019 11:35	3/21/2019 11:36	LFR_Profile_032119_LFR_N_HT	Stationary
LFR_032119_002	3/21/2019 17:15	3/21/2019 17:16	LFR_Profile_032119_LFR_N_LT	Stationary
LFR_032119_003	3/21/2019 11:31	3/21/2019 11:32	LFR_Profile_032119_LFR_S_HT	Stationary
LFR_032119_004	3/21/2019 17:07	3/21/2019 17:09	LFR_Profile_032119_LFR_S_LT	Stationary
LFR_032119_005	3/21/2019 9:33	3/21/2019 11:28	LFR_Profile_032119_Plume_HT	Traveler
LFR_032119_006	3/21/2019 17:19	3/21/2019 17:50	LFR_Profile_032119_Plume_LT (2)	Traveler
LFR_032119_007	3/21/2019 15:57	3/21/2019 17:07	LFR_Profile_032119_Plume_LT	Traveler
LFR_032419_001	3/24/2019 10:38	3/24/2019 13:35	LFR_Profile_032419_HT	Traveler
LFR_032619_001	3/26/2019 14:14	3/26/2019 15:06	LFR_Profile_032619_HT(2)	Traveler
LFR_032619_002	3/26/2019 13:07	3/26/2019 13:52	LFR_Profile_032619_HT	Traveler
LFR_032619_003	3/26/2019 14:01	3/26/2019 14:04	LFR_Profile_032619_LFR_A_HT	Stationary
LFR_032619_004	3/26/2019 8:32	3/26/2019 8:34	LFR_Profile_032619_LFR_A_LT	Stationary
LFR_032619_005	3/26/2019 13:57	3/26/2019 13:58	LFR_Profile_032619_LFR_N_HT	Stationary
LFR_032619_006	3/26/2019 8:28	3/26/2019 8:30	LFR_Profile_032619_LFR_N_LT	Stationary
LFR_032619_007	3/26/2019 8:24	3/26/2019 8:25	LFR_Profile_032619_LFR_S_LT	Stationary
LFR_032619_008	3/26/2019 13:52	3/26/2019 13:54	LFR_Profile_032619_LFR_SHT	Stationary
LFR_032619_009	3/26/2019 8:36	3/26/2019 9:41	LFR_Profile_032619_LT (2)	Traveler
LFR_032619_010	3/26/2019 8:06	3/26/2019 8:23	LFR_Profile_032619_LT	Traveler
LFR_032619_011	3/26/2019 14:12	3/26/2019 14:13	LFR_Profile_032619_Plume_HT (2)	Traveler
LFR_032619_012	3/26/2019 14:07	3/26/2019 14:12	LFR_Profile_032619_Plume_HT	Traveler
LFR_032819_001	3/28/2019 15:57	3/28/2019 16:49	LFR_Profile_032819_HT (2)	Traveler
LFR_032819_002	3/28/2019 14:31	3/28/2019 15:44	LFR_Profile_032819_HT	Traveler
LFR_032819_003	3/28/2019 15:44	3/28/2019 15:46	LFR_Profile_032819_LFR_A_HT	Stationary
LFR_032819_004	3/28/2019 10:19	3/28/2019 10:20	LFR_Profile_032819_LFR_A_LT	Stationary
LFR_032819_005	3/28/2019 15:50	3/28/2019 15:51	LFR_Profile_032819_LFR_NHT	Stationary
LFR_032819_006	3/28/2019 10:12	3/28/2019 10:14	LFR_Profile_032819_LFR_N_LT	Stationary
LFR_032819_007	3/28/2019 15:54	3/28/2019 15:56	LFR_Profile_032819_LFR_SHT	Stationary
LFR_032819_008	3/28/2019 10:04	3/28/2019 10:06	LFR_Profile_032819_LFR_S_LT	Stationary
LFR_032819_009	3/28/2019 9:29	3/28/2019 10:03	LFR_Profile_032819_LT (1)	Traveler
LFR_032819_010	3/28/2019 10:24	3/28/2019 11:04	LFR_Profile_032819_LT (2)	Traveler
LFR_033119_001	3/31/2019 13:00	3/31/2019 13:02	LFR_Profile_033119_LFR_A_LT	Stationary

Station ID	Begin DateTime	End DateTime	Station Name	Type
LFR_033119_002	3/31/2019 12:55	3/31/2019 12:57	LFR_Profile_033119_LFR_N_LT	Stationary
LFR_033119_003	3/31/2019 12:49	3/31/2019 12:50	LFR_Profile_033119_LFR_S_LT	Stationary
LFR_033119_004	3/31/2019 13:03	3/31/2019 14:30	LFR_Profile_033119_LT (2)	Traveler
LFR_033119_005	3/31/2019 11:24	3/31/2019 12:48	LFR_Profile_033119_LT	Traveler
LFR_040219_001	4/2/2019 14:33	4/2/2019 14:34	LFR_Profile_040219_LFR_A_LT	Stationary
LFR_040219_002	4/2/2019 14:25	4/2/2019 14:27	LFR_Profile_040219_LFR_N_LT	Stationary
LFR_040219_003	4/2/2019 14:17	4/2/2019 14:18	LFR_Profile_040219_LFR_S_LT	Stationary
LFR_040219_004	4/2/2019 14:39	4/2/2019 16:11	LFR_Profile_040219_LT (2)	Traveler
LFR_040219_005	4/2/2019 12:45	4/2/2019 14:16	LFR_Profile_040219_LT	Traveler
LFR_040419_001	4/4/2019 9:34	4/4/2019 10:30	LFR_Profile_040419_HT (2)	Traveler
LFR_040419_002	4/4/2019 8:21	4/4/2019 9:22	LFR_Profile_040419_HT	Traveler
LFR_040419_003	4/4/2019 9:32	4/4/2019 9:33	LFR_Profile_040419_LFR_A_HT	Stationary
LFR_040419_004	4/4/2019 15:37	4/4/2019 15:40	LFR_Profile_040419_LFR_A_LT	Stationary
LFR_040419_005	4/4/2019 9:28	4/4/2019 9:29	LFR_Profile_040419_LFR_N_HT	Stationary
LFR_040419_006	4/4/2019 15:47	4/4/2019 15:48	LFR_Profile_040419_LFR_N_LT	Stationary
LFR_040419_007	4/4/2019 9:23	4/4/2019 9:24	LFR_Profile_040419_LFR_S_HT	Stationary
LFR_040419_008	4/4/2019 15:50	4/4/2019 15:53	LFR_Profile_040419_LFR_S_LT	Stationary
LFR_040419_009	4/4/2019 15:55	4/4/2019 16:55	LFR_Profile_040419_LT (2)	Traveler
LFR_040419_010	4/4/2019 14:26	4/4/2019 15:37	LFR_Profile_040419_LT	Traveler
LFR_040719_001	4/7/2019 9:18	4/7/2019 12:15	LFR_Profile_040719_HT	Traveler
LFR_040919_001	4/9/2019 12:22	4/9/2019 13:43	LFR_Profile_040919_HT (2)	Traveler
LFR_040919_002	4/9/2019 10:32	4/9/2019 12:10	LFR_Profile_040919_HT	Traveler
LFR_040919_003	4/9/2019 12:19	4/9/2019 12:21	LFR_Profile_040919_LFR_A_HT	Stationary
LFR_040919_004	4/9/2019 12:16	4/9/2019 12:17	LFR_Profile_040919_LFR_N_HT	Stationary
LFR_040919_005	4/9/2019 12:12	4/9/2019 12:14	LFR_Profile_040919_LFR_S_HT	Stationary
LFR_041419_001	4/14/2019 10:21	4/14/2019 12:30	LFR_Profile_041419_LT	Traveler
LFR_041819_001	4/18/2019 9:38	4/18/2019 10:37	LFR_Profile_041819_HT (2)	Traveler
LFR_041819_002	4/18/2019 8:12	4/18/2019 9:20	LFR_Profile_041819_HT	Traveler
LFR_041819_003	4/18/2019 9:22	4/18/2019 9:24	LFR_Profile_041819_LFR_A_HT	Stationary
LFR_041819_004	4/18/2019 9:29	4/18/2019 9:31	LFR_Profile_041819_LFR_N_HT	Stationary
LFR_041819_005	4/18/2019 9:34	4/18/2019 9:35	LFR_Profile_041819_LFR_S_HT	Stationary
LFR_041819_006	4/18/2019 14:43	4/18/2019 16:49	LFR_Profile_041819_LT	Traveler
LFR_042119_001	4/21/2019 11:31	4/21/2019 13:00	LFR_Profile_042119_HT (2)	Traveler
LFR_042119_002	4/21/2019 9:54	4/21/2019 11:16	LFR_Profile_042119_HT	Traveler
LFR_042119_003	4/21/2019 11:16	4/21/2019 11:18	LFR_Profile_042119_LFR_A_HT	Stationary
LFR_042119_004	4/21/2019 11:21	4/21/2019 11:23	LFR_Profile_042119_LFR_N_HT	Stationary
LFR_042119_005	4/21/2019 11:26	4/21/2019 11:31	LFR_Profile_042119_LFR_S_HT	Stationary
LFR_043019_001	4/30/2019 11:22	4/30/2019 14:31	LFR_Profile_043019_Deep_LT	Combo
LFR_043019_002	4/30/2019 13:13	4/30/2019 14:31	LFR_Profile_043019_LT (2)	Combo
LFR_043019_003	4/30/2019 11:22	4/30/2019 12:52	LFR_Profile_043019_LT	Combo
LFR_050119_001	5/1/2019 15:12	5/1/2019 15:14	Depot_Profile_050119_IT	Stationary
LFR_050219_001	5/2/2019 12:48	5/2/2019 16:00	LFR_Profile_050219_Deep_LT	Combo

Station ID	Begin DateTime	End DateTime	Station Name	Type
LFR_050219_002	5/2/2019 14:40	5/2/2019 14:41	LFR_Profile_050219_LFR_A_LT	Stationary
LFR_050219_003	5/2/2019 14:34	5/2/2019 14:35	LFR_Profile_050219_LFR_N_LT	Stationary
LFR_050219_004	5/2/2019 14:25	5/2/2019 14:26	LFR_Profile_050219_LFR_S_LT	Stationary
LFR_050219_005	5/2/2019 14:44	5/2/2019 16:00	LFR_Profile_050219_LT (2)	Combo
LFR_050219_006	5/2/2019 12:48	5/2/2019 14:24	LFR_Profile_050219_LT	Combo
LFR_050519_001	5/5/2019 8:21	5/5/2019 11:21	LFR_Profile_050519_Deep_HT	Combo
LFR_050519_002	5/5/2019 8:21	5/5/2019 11:20	LFR_Profile_050519_HT	Combo
LFR_050719_001	5/7/2019 11:52	5/7/2019 12:33	LFR_Profile_050719_Deep_HT (2)	Combo
LFR_050719_002	5/7/2019 10:03	5/7/2019 11:10	LFR_Profile_050719_Deep_HT	Combo
LFR_050719_003	5/7/2019 16:44	5/7/2019 18:45	LFR_Profile_050719_Deep_LT	Combo
LFR_050719_004	5/7/2019 11:33	5/7/2019 11:47	LFR_Profile_050719_HT (2)	Combo
LFR_050719_005	5/7/2019 11:51	5/7/2019 12:33	LFR_Profile_050719_HT (3)	Combo
LFR_050719_006	5/7/2019 10:03	5/7/2019 11:10	LFR_Profile_050719_HT	Combo
LFR_050719_007	5/7/2019 11:11	5/7/2019 11:13	LFR_Profile_050719_LFR_A_HT	Stationary
LFR_050719_008	5/7/2019 11:21	5/7/2019 11:22	LFR_Profile_050719_LFR_N_HT	Stationary
LFR_050719_009	5/7/2019 11:25	5/7/2019 11:27	LFR_Profile_050719_LFR_S_HT	Stationary
LFR_050719_010	5/7/2019 16:44	5/7/2019 18:45	LFR_Profile_050719_LT	Combo
LFR_050919_001	5/9/2019 11:10	5/9/2019 14:27	LFR_Profile_050919_Deep_HT	Combo
LFR_050919_002	5/9/2019 12:57	5/9/2019 14:27	LFR_Profile_050919_HT (2)	Combo
LFR_050919_003	5/9/2019 11:10	5/9/2019 12:45	LFR_Profile_050919_HT	Combo
LFR_050919_004	5/9/2019 12:46	5/9/2019 12:47	LFR_Profile_050919_LFR_A_HT	Stationary
LFR_050919_005	5/9/2019 12:51	5/9/2019 12:52	LFR_Profile_050919_LFR_N_HT	Stationary
LFR_050919_006	5/9/2019 12:55	5/9/2019 12:56	LFR_Profile_050919_LFR_S_HT	Stationary

Table J-13 Data counts for profile constituents collected on the Back River and lower Front River

PCode	Parameter Name	Units	Raw Data Count
BARO	barometric pressure	mm Hg	237,186
BATTERY	battery voltage	volts	296,752
BGA_R	phycoerythin BGA	RFU	296,752
BGA_U	phycoerythin BGA	µg/L	296,752
CHLA_R	chlorophyll a	RFU	296,752
CHLA_U	chlorophyll a	µg/L	296,752
COND	conductivity	µS/cm	62,924
DEPTH	water depth	meters	296,752
DEP_PSIA	water depth (pressure)	PSI	296,752
DO	dissolved oxygen	mg/L	296,752
DO_SAT	dissolved oxygen saturation	%	296,752

PCode	Parameter Name	Units	Raw Data Count
LAT	latitude	degrees	293,918
LON	longitude	degrees	293,918
SALPPT	salinity	PPT	296,752
SPCOND	specific conductance	µS/cm	296,752
WTEMP	water temperature	°C	296,752
Total			4,448,970

The profile data were reviewed in timeseries plots to identify any sample dates and times which contained observed values which were inconsistent with the observed values sampled before and after the inconsistent values. The identified inconsistent dates and times were correlated to times when the sondes were likely out of the water. As an example, **Figure J-5** and **Figure J-6** present the location map and depth and DO timeseries respectively of the LBR_040619_001 travelling profile. The orange polygon and box identify a period of time where the sondes were likely out of the water because during this period of time the boat was travelling nearly twenty (20) miles per hour between sampling locations.

For each profile, all dates and times identified as verified inconsistent were separated from the consistent data in the processed data files and project database. The percentage of inconsistency data for each profile is provided in **Table J-14**.



Note orange polygon identifies the period of time where boat was traveling over 20 miles per hour and the sonde was out of the water

Figure J-5 LBR_040619_001 travelling profile location map QA/QC

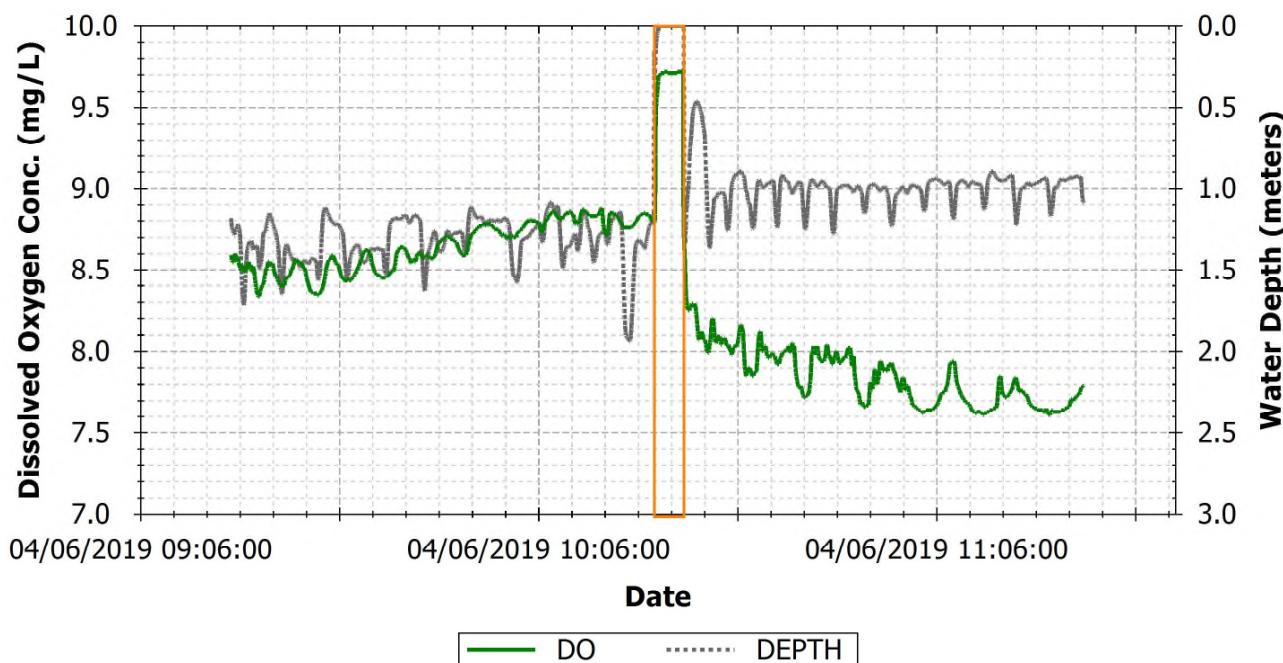


Figure J-6 LBR_040619_001 travelling profile depth and DO QA/QC

Table J-14 Percentage of inconsistent values for profile data

Station ID	Station Name	Inconsistent values (%)
LBR_031419_001	LBR_Profile_031419_BNE_LT	0.00
LBR_031419_002	LBR_Profile_031419_BNE_LT	0.00
LBR_031419_003	LBR_Profile_031419_BNW_LT	0.00
LBR_031419_004	LBR_Profile_031419_BSE_LT	0.00
LBR_031419_005	LBR_Profile_031419_BSW_LT	0.00
LBR_031419_006	LBR_Profile_031419_BSW_LT	0.00
LBR_031419_007	LBR_Profile_031419_BSW_LT	0.00
LBR_031419_008	LBR_Profile_031419_E Platform_LT	0.00
LBR_031419_009	LBR_Profile_031419_E Platform_LT	0.00
LBR_031419_010	LBR_Profile_031419_Plume_LT (2)	0.00
LBR_031419_011	LBR_Profile_031419_Plume_LT	0.00
LBR_031419_012	LBR_Profile_031419_Plume_LT	0.00
LBR_031419_013	LBR_Profile_031419_W Platform (near S9)_LT	0.00
LBR_031419_014	LBR_Profile_031419_W Platform_LT	0.00
LBR_031419_015	LBR_Profile_031419_W Platform_LT	0.00
LBR_031419_016	LBR_Profile_031419_BNW_LT	0.00

Station ID	Station Name	Inconsistent values (%)
LBR_031619_001	LBR_Profile_031619_Plume_HT (2)	0.00
LBR_031619_002	LBR_Profile_031619_Plume_HT	0.00
LBR_031619_003	LBR_Profile_031619_Plume_LT (2)	0.00
LBR_031619_004	LBR_Profile_031619_Plume_LT	0.00
LBR_031919_001	LBR_Profile_031919_E Platform_HT	0.00
LBR_031919_002	LBR_Profile_031919_E Platform_LT	0.00
LBR_031919_003	LBR_Profile_031919_HT	0.00
LBR_031919_004	LBR_Profile_031919_LBR NE_HT	0.00
LBR_031919_005	LBR_Profile_031919_LBR NE_LT	0.00
LBR_031919_006	LBR_Profile_031919_LBR NW_HT	0.00
LBR_031919_007	LBR_Profile_031919_LBR NW_LT	0.00
LBR_031919_008	LBR_Profile_031919_LBR SE_HT	0.00
LBR_031919_009	LBR_Profile_031919_LBR SE_LT	0.00
LBR_031919_010	LBR_Profile_031919_LBR SW_HT	0.00
LBR_031919_011	LBR_Profile_031919_LBR SW_LT	0.00
LBR_031919_012	LBR_Profile_031919_LT (2)	0.00
LBR_031919_013	LBR_Profile_031919_LT	0.00
LBR_031919_014	LBR_Profile_031919_W Platform_HT	0.00
LBR_031919_015	LBR_Profile_031919_W Platform_LT	0.00
LBR_032119_001	LBR_Profile_032119_BNE_HT	0.00
LBR_032119_002	LBR_Profile_032119_BNE_LT	0.00
LBR_032119_003	LBR_Profile_032119_BNW_HT	0.00
LBR_032119_004	LBR_Profile_032119_BNW_LT	0.00
LBR_032119_005	LBR_Profile_032119_BSE_HT	0.00
LBR_032119_006	LBR_Profile_032119_BSE_LT	0.00
LBR_032119_007	LBR_Profile_032119_BSW_HT	0.00
LBR_032119_008	LBR_Profile_032119_BSW_LT	0.00
LBR_032119_009	LBR_Profile_032119_HT (2)	0.00
LBR_032119_010	LBR_Profile_032119_HT	0.00
LBR_032119_011	LBR_Profile_032119_LT (2)	0.00
LBR_032119_012	LBR_Profile_032119_LT	0.00
LBR_032119_013	LBR_Profile_032119_Platform E_HT	0.00
LBR_032119_014	LBR_Profile_032119_Platform E_LT	0.00
LBR_032119_015	LBR_Profile_032119_Platform W_HT	0.00
LBR_032119_016	LBR_Profile_032119_Platform W_LT	0.00
LBR_032319_001	LBR_Profile_032319_HT	0.00

Station ID	Station Name	Inconsistent values (%)
LBR_032619_001	LBR_Profile_032619_BNE_LT	0.00
LBR_032619_002	LBR_Profile_032619_BNE_LT	0.00
LBR_032619_003	LBR_Profile_032619_BNW_LT	0.00
LBR_032619_004	LBR_Profile_032619_BNW_LT	0.00
LBR_032619_005	LBR_Profile_032619_BSE_LT	0.00
LBR_032619_006	LBR_Profile_032619_BSE_LT	0.00
LBR_032619_007	LBR_Profile_032619_BSW_LT	0.00
LBR_032619_008	LBR_Profile_032619_BSW_LT	0.00
LBR_032619_009	LBR_Profile_032619_Platform E_LT	0.00
LBR_032619_010	LBR_Profile_032619_Platform E_LT	0.00
LBR_032619_011	LBR_Profile_032619_Platform W_LT	0.00
LBR_032619_012	LBR_Profile_032619_Platform W_LT	0.00
LBR_032619_013	LBR_Profile_032619_HT(2)	0.00
LBR_032619_014	LBR_Profile_032619_HT	0.00
LBR_032619_015	LBR_Profile_032619_LT(2)	0.00
LBR_032619_016	LBR_Profile_032619_LT	0.00
LBR_032819_001	LBR_Profile_032819_BNE_LT	0.00
LBR_032819_002	LBR_Profile_032819_BNE_LT	0.00
LBR_032819_003	LBR_Profile_032819_BNW_LT	0.00
LBR_032819_004	LBR_Profile_032819_BSE_LT	0.00
LBR_032819_005	LBR_Profile_032819_BNW_LT	0.00
LBR_032819_006	LBR_Profile_032819_BSE_LT	0.00
LBR_032819_007	LBR_Profile_032819_BSW_LT	0.00
LBR_032819_008	LBR_Profile_032819_BSW_LT	0.00
LBR_032819_009	LBR_Profile_032819_Platform E_LT	0.00
LBR_032819_010	LBR_Profile_032819_Platform W_LT	0.00
LBR_032819_011	LBR_Profile_032819_HT (2)	0.00
LBR_032819_012	LBR_Profile_032819_HT	0.00
LBR_032819_013	LBR_Profile_032819_LT (2)	0.00
LBR_032819_014	LBR_Profile_032819_LT	0.00
LBR_033019_001	LBR_Profile_033019_BNE_LT	0.00
LBR_033019_002	LBR_Profile_033019_BNW_LT	0.00
LBR_033019_003	LBR_Profile_033019_BSE_LT	0.00
LBR_033019_004	LBR_Profile_033019_BSW_LT	0.00
LBR_033019_005	LBR_Profile_033019_LT (2)	0.00
LBR_033019_006	LBR_Profile_033019_LT	0.00

Station ID	Station Name	Inconsistent values (%)
LBR_033019_007	LBR_Profile_033019_Platform E_LT	0.00
LBR_033019_008	LBR_Profile_033019_Platform W_LT	0.00
LBR_040219_001	LBR_Profile_040219_BNE_LT	0.00
LBR_040219_002	LBR_Profile_040219_BNW_LT	0.00
LBR_040219_003	LBR_Profile_040219_BSE_LT	0.00
LBR_040219_004	LBR_Profile_040219_BSW_LT	0.00
LBR_040219_005	LBR_Profile_040219_LT (2)	0.00
LBR_040219_006	LBR_Profile_040219_LT	0.00
LBR_040219_007	LBR_Profile_040219_Platform E_LT	0.00
LBR_040219_008	LBR_Profile_040219_Platform W_LT	0.00
LBR_040419_001	LBR_Profile_040419_BNE_HT	0.00
LBR_040419_002	LBR_Profile_040419_BNE_LT	0.00
LBR_040419_003	LBR_Profile_040419_BNW_HT	0.00
LBR_040419_004	LBR_Profile_040419_BNW_LT	0.00
LBR_040419_005	LBR_Profile_040419_BSE_HT	0.00
LBR_040419_006	LBR_Profile_040419_BSE_LT	0.00
LBR_040419_007	LBR_Profile_040419_BSW_HT	0.00
LBR_040419_008	LBR_Profile_040419_BSW_LT	0.00
LBR_040419_009	LBR_Profile_040419_HT (2)	0.00
LBR_040419_010	LBR_Profile_040419_HT	0.00
LBR_040419_011	LBR_Profile_040419_LT (2)	0.00
LBR_040419_012	LBR_Profile_040419_LT	0.00
LBR_040419_013	LBR_Profile_040419_Platform E_HT	0.00
LBR_040419_014	LBR_Profile_040419_Platform E_LT	0.00
LBR_040419_015	LBR_Profile_040419_Platform W_HT	0.00
LBR_040419_016	LBR_Profile_040419_Platform W_LT	0.00
LBR_040619_001	LBR_Profile_040619_HT	4.30
LBR_040919_001	LBR_Profile_040919_BNE_HT	0.00
LBR_040919_002	LBR_Profile_040919_BNW_HT	0.00
LBR_040919_003	LBR_Profile_040919_BSE_HT	0.00
LBR_040919_004	LBR_Profile_040919_BSW_HT	0.00
LBR_040919_005	LBR_Profile_040919_HT (2)	0.00
LBR_040919_006	LBR_Profile_040919_HT	0.00
LBR_040919_007	LBR_Profile_040919_Platform_E_HT	0.00
LBR_040919_008	LBR_Profile_040919_Platform_W_HT	0.00
LBR_041319_001	LBR_Profile_041319_LT	1.62

Station ID	Station Name	Inconsistent values (%)
LBR_041819_001	LBR_Profile_041819_BNE_HT	0.00
LBR_041819_002	LBR_Profile_041819_BNW_HT	0.00
LBR_041819_003	LBR_Profile_041819_BSE_HT	0.00
LBR_041819_004	LBR_Profile_041819_BSW_HT	0.00
LBR_041819_005	LBR_Profile_041819_HT (2)	0.00
LBR_041819_006	LBR_Profile_041819_HT	0.00
LBR_041819_007	LBR_Profile_041819_LT	0.00
LBR_041819_008	LBR_Profile_041819_Platform_E_HT	0.00
LBR_041819_009	LBR_Profile_041819_Platform_W_HT	0.00
LBR_042019_001	LBR_Profile_042019_BNE_HT	0.00
LBR_042019_002	LBR_Profile_042019_BNW_HT	0.00
LBR_042019_003	LBR_Profile_042019_BSE_HT	0.00
LBR_042019_004	LBR_Profile_042019_BSW_HT	0.00
LBR_042019_005	LBR_Profile_042019_HT(2)	0.00
LBR_042019_006	LBR_Profile_042019_HT	0.00
LBR_042019_007	LBR_Profile_042019_Platform_E_HT	0.00
LBR_042019_008	LBR_Profile_042019_Platform_W_HT	0.00
LBR_042819_001	LBR_Profile_042819_BNE_LT	0.00
LBR_042819_002	LBR_Profile_042819_BNW_LT	0.00
LBR_042819_003	LBR_Profile_042819_BSE_LT	0.00
LBR_042819_004	LBR_Profile_042819_BSW_LT	0.00
LBR_042819_005	LBR_Profile_042819_LT (2)	0.00
LBR_042819_006	LBR_Profile_042819_LT	0.00
LBR_042819_007	LBR_Profile_042819_Platform_E_LT	0.00
LBR_042819_008	LBR_Profile_042819_Platform_W_LT	0.00
LBR_043019_001	LBR_Profile_043019_Deep_LT	0.00
LBR_043019_002	LBR_Profile_043019_LT	0.00
LBR_050219_001	LBR_Profile_050219_BNE_LT	0.00
LBR_050219_002	LBR_Profile_050219_BNW_LT	0.00
LBR_050219_003	LBR_Profile_050219_BSE_LT	0.00
LBR_050219_004	LBR_Profile_050219_BSW_LT	0.00
LBR_050219_005	LBR_Profile_050219_Deep_LT (2)	0.00
LBR_050219_006	LBR_Profile_050219_Deep_LT	0.00
LBR_050219_007	LBR_Profile_050219_LT (2)	0.00
LBR_050219_008	LBR_Profile_050219_LT	0.00
LBR_050419_001	LBR_Profile_050419_Deep_HT	0.00

Station ID	Station Name	Inconsistent values (%)
LBR_050419_002	LBR_Profile_050419_HT	0.00
LBR_050719_001	LBR_Profile_050719_BNE_HT	0.00
LBR_050719_002	LBR_Profile_050719_BNW_HT	0.00
LBR_050719_003	LBR_Profile_050719_BSE_HT	0.00
LBR_050719_004	LBR_Profile_050719_BSW_HT	0.00
LBR_050719_005	LBR_Profile_050719_Deep_HT (2)	0.00
LBR_050719_006	LBR_Profile_050719_Deep_HT	0.00
LBR_050719_007	LBR_Profile_050719_HT (2)	0.00
LBR_050719_008	LBR_Profile_050719_HT	0.00
LBR_050719_009	LBR_Profile_050719_Platform_E_HT	0.00
LBR_050719_010	LBR_Profile_050719_Platform_W_HT	0.00
LBR_051119_001	LBR_Profile_051119_BNE_HT	0.00
LBR_051119_002	LBR_Profile_051119_BNW_HT	0.00
LBR_051119_003	LBR_Profile_051119_BSE_HT	0.00
LBR_051119_004	LBR_Profile_051119_BSW_HT	0.00
LBR_051119_005	LBR_Profile_051119_Deep_HT (2)	0.00
LBR_051119_006	LBR_Profile_051119_Deep_HT	0.00
LBR_051119_007	LBR_Profile_051119_HT (2)	0.00
LBR_051119_008	LBR_Profile_051119_HT	0.00
LBR_051219_001	LBR_Profile_051219_Deep_LT	0.00
LBR_051219_002	LBR_Profile_051219_LT	0.00
LFR_031419_001	LFR_Profile_031419_LFR_N_HT	0.00
LFR_031419_002	LFR_Profile_031419_LFR_N_LT	0.00
LFR_031419_003	LFR_Profile_031419_LFR_S_HT	0.00
LFR_031419_004	LFR_Profile_031419_LFR_S_LT	0.00
LFR_031419_005	LFR_Profile_031419_Plume_LT (2)	0.00
LFR_031419_006	LFR_Profile_031419_Plume_LT	0.00
LFR_031419_007	LFR_Profile_031419_Shallow_HT (2)	0.00
LFR_031419_008	LFR_Profile_031419_Shallow_HT	0.00
LFR_031419_009	LFR_Profile_031419_Shallow_LT (2)	0.00
LFR_031419_010	LFR_Profile_031419_Shallow_LT	0.00
LFR_031719_001	LFR_Profile_031719_Plume_LT (2)	0.00
LFR_031719_002	LFR_Profile_031719_Plume_LT	0.00
LFR_031919_001	LFR_Profile_031919_HT	0.00
LFR_031919_002	LFR_Profile_031919_LFR_N_HT	0.00
LFR_031919_003	LFR_Profile_031919_LFR_S_HT	0.00

Station ID	Station Name	Inconsistent values (%)
LFR_031919_004	LFR_Profile_031919_LT	0.00
LFR_032119_001	LFR_Profile_032119_LFR_N_HT	0.00
LFR_032119_002	LFR_Profile_032119_LFR_N_LT	0.00
LFR_032119_003	LFR_Profile_032119_LFR_S_HT	0.00
LFR_032119_004	LFR_Profile_032119_LFR_S_LT	0.00
LFR_032119_005	LFR_Profile_032119_Plume_HT	0.00
LFR_032119_006	LFR_Profile_032119_Plume_LT (2)	0.00
LFR_032119_007	LFR_Profile_032119_Plume_LT	0.00
LFR_032419_001	LFR_Profile_032419_HT	0.00
LFR_032619_001	LFR_Profile_032619_HT(2)	0.00
LFR_032619_002	LFR_Profile_032619_HT	0.00
LFR_032619_003	LFR_Profile_032619_LFR_A_HT	0.00
LFR_032619_004	LFR_Profile_032619_LFR_A_LT	0.00
LFR_032619_005	LFR_Profile_032619_LFR_N_HT	0.00
LFR_032619_006	LFR_Profile_032619_LFR_N_LT	0.00
LFR_032619_007	LFR_Profile_032619_LFR_S_LT	0.00
LFR_032619_008	LFR_Profile_032619_LFR_S_HT	0.00
LFR_032619_009	LFR_Profile_032619_LT(2)	0.00
LFR_032619_010	LFR_Profile_032619_LT	0.00
LFR_032619_011	LFR_Profile_032619_Plume_HT (2)	0.00
LFR_032619_012	LFR_Profile_032619_Plume_HT	0.00
LFR_032819_001	LFR_Profile_032819_HT (2)	0.00
LFR_032819_002	LFR_Profile_032819_HT	0.00
LFR_032819_003	LFR_Profile_032819_LFR_A_HT	0.00
LFR_032819_004	LFR_Profile_032819_LFR_A_LT	0.00
LFR_032819_005	LFR_Profile_032819_LFR_N_HT	0.00
LFR_032819_006	LFR_Profile_032819_LFR_N_LT	0.00
LFR_032819_007	LFR_Profile_032819_LFR_S_HT	0.00
LFR_032819_008	LFR_Profile_032819_LFR_S_LT	0.00
LFR_032819_009	LFR_Profile_032819_LT (1)	0.00
LFR_032819_010	LFR_Profile_032819_LT (2)	0.00
LFR_033119_001	LFR_Profile_033119_LFR_A_LT	0.00
LFR_033119_002	LFR_Profile_033119_LFR_N_LT	0.00
LFR_033119_003	LFR_Profile_033119_LFR_S_LT	0.00
LFR_033119_004	LFR_Profile_033119_LT (2)	0.00
LFR_033119_005	LFR_Profile_033119_LT	0.00

Station ID	Station Name	Inconsistent values (%)
LFR_040219_001	LFR_Profile_040219_LFR_A_LT	0.00
LFR_040219_002	LFR_Profile_040219_LFR_N_LT	0.00
LFR_040219_003	LFR_Profile_040219_LFR_S_LT	0.00
LFR_040219_004	LFR_Profile_040219_LT (2)	0.00
LFR_040219_005	LFR_Profile_040219_LT	0.00
LFR_040419_001	LFR_Profile_040419_HT (2)	0.00
LFR_040419_002	LFR_Profile_040419_HT	0.00
LFR_040419_003	LFR_Profile_040419_LFR_A_HT	0.00
LFR_040419_004	LFR_Profile_040419_LFR_A_LT	0.00
LFR_040419_005	LFR_Profile_040419_LFR_N_HT	0.00
LFR_040419_006	LFR_Profile_040419_LFR_N_LT	0.00
LFR_040419_007	LFR_Profile_040419_LFR_S_HT	0.00
LFR_040419_008	LFR_Profile_040419_LFR_S_LT	0.00
LFR_040419_009	LFR_Profile_040419_LT (2)	0.00
LFR_040419_010	LFR_Profile_040419_LT	0.00
LFR_040719_001	LFR_Profile_040719_HT	0.00
LFR_040919_001	LFR_Profile_040919_HT (2)	0.00
LFR_040919_002	LFR_Profile_040919_HT	0.00
LFR_040919_003	LFR_Profile_040919_LFR_A_HT	0.00
LFR_040919_004	LFR_Profile_040919_LFR_N_HT	0.00
LFR_040919_005	LFR_Profile_040919_LFR_S_HT	0.00
LFR_041419_001	LFR_Profile_041419_LT	0.00
LFR_041819_001	LFR_Profile_041819_HT (2)	0.00
LFR_041819_002	LFR_Profile_041819_HT	0.00
LFR_041819_003	LFR_Profile_041819_LFR_A_HT	0.00
LFR_041819_004	LFR_Profile_041819_LFR_N_HT	0.00
LFR_041819_005	LFR_Profile_041819_LFR_S_HT	0.00
LFR_041819_006	LFR_Profile_041819_LT	0.00
LFR_042119_001	LFR_Profile_042119_HT (2)	0.00
LFR_042119_002	LFR_Profile_042119_HT	0.00
LFR_042119_003	LFR_Profile_042119_LFR_A_HT	0.00
LFR_042119_004	LFR_Profile_042119_LFR_N_HT	0.00
LFR_042119_005	LFR_Profile_042119_LFR_S_HT	0.00
LFR_043019_001	LFR_Profile_043019_Deep_LT	0.00
LFR_043019_002	LFR_Profile_043019_LT (2)	0.00
LFR_043019_003	LFR_Profile_043019_LT	0.00

Station ID	Station Name	Inconsistent values (%)
LFR_050119_001	Depot_Profile_050119_IT	0.00
LFR_050219_001	LFR_Profile_050219_Deep_LT	0.00
LFR_050219_002	LFR_Profile_050219_LFR_A_LT	0.00
LFR_050219_003	LFR_Profile_050219_LFR_N_LT	0.00
LFR_050219_004	LFR_Profile_050219_LFR_S_LT	0.00
LFR_050219_005	LFR_Profile_050219_LT (2)	0.00
LFR_050219_006	LFR_Profile_050219_LT	0.00
LFR_050519_001	LFR_Profile_050519_Deep_HT	0.00
LFR_050519_002	LFR_Profile_050519_HT	0.00
LFR_050719_001	LFR_Profile_050719_Deep_HT (2)	0.00
LFR_050719_002	LFR_Profile_050719_Deep_HT	7.24
LFR_050719_003	LFR_Profile_050719_Deep_LT	3.03
LFR_050719_004	LFR_Profile_050719_HT (2)	0.00
LFR_050719_005	LFR_Profile_050719_HT (3)	0.00
LFR_050719_006	LFR_Profile_050719_HT	0.00
LFR_050719_007	LFR_Profile_050719_LFR_A_HT	0.00
LFR_050719_008	LFR_Profile_050719_LFR_N_HT	0.00
LFR_050719_009	LFR_Profile_050719_LFR_S_HT	0.00
LFR_050719_010	LFR_Profile_050719_LT	3.00
LFR_050919_001	LFR_Profile_050919_Deep_HT	4.27
LFR_050919_002	LFR_Profile_050919_HT (2)	0.00
LFR_050919_003	LFR_Profile_050919_HT	8.27
LFR_050919_004	LFR_Profile_050919_LFR_A_HT	0.00
LFR_050919_005	LFR_Profile_050919_LFR_N_HT	0.00
LFR_050919_006	LFR_Profile_050919_LFR_S_HT	0.00
NONE_P		100.00
Total		1.12

J.4 DRIFT DATA

A total of two hundred eighteen (218) drift datafiles were collected during the Test Run sampling with one hundred fourteen (114) associated with the Back River diffuser and one hundred four (104) associated with the lower Front River diffuser. The drift datafiles were uploaded by the field team to the OneDrive. Each drift datafile was named with a consistent file naming convention as follows:

Location_Drift_Date_X _TT, where:

- o Location = LBR (Lower Back River) or LFR (Lower Front River)
- o Date = Sample Date
- o X = qualitative depth (deep drift, middle drift, shallow drift, or surface drift)
- o TT = OT (outgoing tide), IT (incoming tide), LT (ebb tide), or HT (flood tide)

The QA/QC team downloaded each data file from the project OneDrive and archived the raw data on their server, reviewed and processed the data, uploaded the data into the project WRDB database, and plotted the data in timeseries format. Each drift had the potential of having up to four (4) files that were collected simultaneously with one of the files attributed with latitude and longitude information. The QA/QC team grouped each individual drift data file in an Excel data file with each file copied into its own individual tab. The Excel file was then named as follows:

Location_Date_TT _Drift_Y, where:

- o Location = LBR (Lower Back River) or LFR (Lower Front River)
- o Date = Sample Date
- o TT = OT (outgoing tide), IT (incoming tide), LT (ebb tide), or HT (flood tide)
- o Y = drift number (1, 2, 3, etc. to account for potentially more than one set of drift sampling on the same river and tidal cycle)

Proper drift ID groupings were ensured by comparing the date and time constituents contained within the individual tabs in each Excel file. Grouping data by drift ID was necessary so that the data collected within the same drift could be linked together for further assessment and was used for data organization structure external of the WRDB database.

For each drift ID file, the latitude and longitude attributes from the tab collected with the hand-held device (i.e. typically the shallow data file) were attributed into the tabs collected in deployment mode (i.e. typically the deep, middle, and surface datafiles) based on time. Additionally, the data within each tab was assigned a unique station ID for the WRDB databases that consisted of an eighteen (18) digit character string. The station ID attribute captured the location and date and was assigned the drift number from the drift ID and the qualitative depth from the file naming convention.

For the sondes used in deployment mode, data logging was started and stopped before and after logging was started and stopped with the hand-held device. This resulted in data records in the deployment mode data files that were not associated with location information. For those data records the station ID was assigned a value of NONE since the locations of those data points were unknown.

Table J-15 and **Table J-16** provide attribute information for drift data collected on the Back River and lower Front River, respectively, including the drift ID, station ID, time of the beginning and ending of the collection period, and the average depth. **Table J-17** provides a list of constituents obtained for drift data and the number of raw records in the WRDB database for each constituent.

Table J-15 Attributes of drift data collected on the Back River

Drift ID	Station ID	Date Time Begin	Date Time End	Average Depth (meters)
LBR_031519_LT_D1	LBR_031519_LT_D1_DEEP	3/15/2019 09:12:05	3/15/2019 12:15:59	3.3
	LBR_031519_LT_D1_MIDL	3/15/2019 09:12:05	3/15/2019 12:15:59	2.1
	LBR_031519_LT_D1_SHAL	3/15/2019 09:12:06	3/15/2019 12:15:59	1.1
	LBR_031519_LT_D1_SURF	3/15/2019 09:12:06	3/15/2019 12:16:00	0.1
LBR_031819_LT_D1	LBR_031819_LT_D1_DEEP	3/18/2019 12:55:15	3/18/2019 15:05:37	3.3
	LBR_031819_LT_D1_MIDL	3/18/2019 12:55:15	3/18/2019 15:05:37	1.8
	LBR_031819_LT_D1_SHAL	3/18/2019 12:55:15	3/18/2019 15:05:38	0.9
	LBR_031819_LT_D1_SURF	3/18/2019 12:55:15	3/18/2019 15:05:37	0.0
LBR_032019_LT_D1	LBR_032019_LT_D1_DEEP	3/20/2019 15:03:15	3/20/2019 17:24:33	3.2
	LBR_032019_LT_D1_MIDL	3/20/2019 15:03:15	3/20/2019 17:24:33	2.1
	LBR_032019_LT_D1_SHAL	3/20/2019 15:03:15	3/20/2019 17:24:34	0.7
	LBR_032019_LT_D1_SURF	3/20/2019 15:03:15	3/20/2019 17:24:33	0.1
LBR_032219_HT_D1	LBR_032219_HT_D1_DEEP	3/22/2019 10:17:02	3/22/2019 13:01:44	2.2
	LBR_032219_HT_D1_MIDL	3/22/2019 10:17:01	3/22/2019 13:01:43	1.0
	LBR_032219_HT_D1_SHAL	3/22/2019 10:17:02	3/22/2019 13:01:44	0.4
	LBR_032219_HT_D1_SURF	3/22/2019 10:17:02	3/22/2019 13:01:44	0.0
LBR_032519_HT_D1	LBR_032519_HT_D1_DEEP	3/25/2019 11:37:24	3/25/2019 14:37:32	3.2
	LBR_032519_HT_D1_MIDL	3/25/2019 11:37:24	3/25/2019 14:37:32	1.9
	LBR_032519_HT_D1_SHAL	3/25/2019 11:37:23	3/25/2019 14:37:32	0.7
	LBR_032519_HT_D1_SURF	3/25/2019 11:37:24	3/25/2019 14:37:32	0.1
LBR_032719_HT_D1	LBR_032719_HT_D1_DEEP	3/27/2019 14:14:21	3/27/2019 16:17:23	3.8
	LBR_032719_HT_D1_MIDL	3/27/2019 14:14:22	3/27/2019 16:17:24	1.9
	LBR_032719_HT_D1_SHAL	3/27/2019 14:14:22	3/27/2019 16:17:24	0.7
	LBR_032719_HT_D1_SURF	3/27/2019 14:14:22	3/27/2019 16:17:24	0.1
LBR_032719_LT_D1	LBR_032719_LT_D1_DEEP	3/27/2019 09:20:08	3/27/2019 10:34:02	3.4
	LBR_032719_LT_D1_MIDL	3/27/2019 09:20:07	3/27/2019 10:34:01	1.8
	LBR_032719_LT_D1_SHAL	3/27/2019 09:20:08	3/27/2019 10:34:01	0.6
	LBR_032719_LT_D1_SURF	3/27/2019 09:20:08	3/27/2019 10:34:02	0.1
LBR_032919_DYE_D1	LBR_032919_DYE_D1_DEEP	3/29/2019 10:40:36	3/29/2019 13:08:40	3.1
	LBR_032919_DYE_D1_MIDL	3/29/2019 10:40:36	3/29/2019 13:08:40	1.8
	LBR_032919_DYE_D1_SHAL	3/29/2019 10:40:36	3/29/2019 13:08:39	0.9
	LBR_032919_DYE_D1_SURF	3/29/2019 10:40:35	3/29/2019 13:08:39	0.1

Drift ID	Station ID	Date Time Begin	Date Time End	Average Depth (meters)
LBR_040119_LT_D1	LBR_040119_LT_D1_DEEP	4/1/2019 12:28:29	4/1/2019 15:08:23	3.1
	LBR_040119_LT_D1_MIDL	4/1/2019 12:28:30	4/1/2019 15:08:24	2.5
	LBR_040119_LT_D1_SHAL	4/1/2019 12:28:30	4/1/2019 15:08:23	1.2
	LBR_040119_LT_D1_SURF	4/1/2019 12:28:30	4/1/2019 15:08:24	0.2
LBR_040319_LT_D1	LBR_040319_LT_D1_DEEP	4/3/2019 13:17:59	4/3/2019 16:23:31	2.5
	LBR_040319_LT_D1_MIDL	4/3/2019 13:18:00	4/3/2019 16:23:32	2.1
	LBR_040319_LT_D1_SHAL	4/3/2019 13:18:00	4/3/2019 16:23:31	1.1
	LBR_040319_LT_D1_SURF	4/3/2019 13:17:59	4/3/2019 16:23:31	0.1
LBR_040519_HT_D1	LBR_040519_HT_D1_DEEP	4/5/2019 08:25:10	4/5/2019 11:24:48	3.4
	LBR_040519_HT_D1_MIDL	4/5/2019 08:25:10	4/5/2019 11:24:48	2.0
	LBR_040519_HT_D1_SHAL	4/5/2019 08:25:10	4/5/2019 11:24:47	1.0
	LBR_040519_HT_D1_SURF	4/5/2019 08:25:10	4/5/2019 11:24:48	0.1
LBR_040819_HT_D1	LBR_040819_HT_D1_DEEP	4/8/2019 09:53:27	4/8/2019 12:55:03	3.2
	LBR_040819_HT_D1_MIDL	4/8/2019 09:53:27	4/8/2019 12:55:03	2.0
	LBR_040819_HT_D1_SHAL	4/8/2019 09:53:28	4/8/2019 12:55:03	0.9
	LBR_040819_HT_D1_SURF	4/8/2019 09:53:27	4/8/2019 12:55:03	0.1
LBR_041019_HT_D1	LBR_041019_HT_D1_DEEP	4/10/2019 11:15:04	4/10/2019 14:01:14	2.2
	LBR_041019_HT_D1_MIDL	4/10/2019 11:15:03	4/10/2019 14:00:35	1.4
	LBR_041019_HT_D1_SHAL	4/10/2019 11:15:04	4/10/2019 14:01:14	0.7
	LBR_041019_HT_D1_SURF	4/10/2019 11:15:03	4/10/2019 14:01:13	0.0
LBR_041219_DYE_D1	LBR_041219_DYE_D1_DEEP	4/12/2019 09:27:28	4/12/2019 13:03:26	2.6
	LBR_041219_DYE_D1_MIDL	4/12/2019 09:27:28	4/12/2019 13:03:26	2.1
	LBR_041219_DYE_D1_SHAL	4/12/2019 09:27:27	4/12/2019 13:03:26	0.9
LBR_041219_DYE_D2	LBR_041219_DYE_D2_MIDL	4/12/2019 09:45:48	4/12/2019 13:14:18	1.1
	LBR_041219_DYE_D2_SHAL	4/12/2019 09:45:47	4/12/2019 13:14:18	0.6
LBR_041519_LT_D1	LBR_041519_LT_D1_DEEP	4/15/2019 11:12:15	4/15/2019 14:08:29	1.9
	LBR_041519_LT_D1_MIDL	4/15/2019 11:12:15	4/15/2019 14:08:29	1.9
	LBR_041519_LT_D1_SHAL	4/15/2019 11:12:15	4/15/2019 14:08:30	0.9
	LBR_041519_LT_D1_SURF	4/15/2019 11:12:15	4/15/2019 14:08:29	0.1
LBR_041719_LT_D1	LBR_041719_LT_D1_DEEP	4/17/2019 13:00:26	4/17/2019 16:00:00	1.3
	LBR_041719_LT_D1_MIDL	4/17/2019 13:00:25	4/17/2019 15:59:59	1.4
	LBR_041719_LT_D1_SHAL	4/17/2019 13:00:26	4/17/2019 16:00:00	0.9
	LBR_041719_LT_D1_SURF	4/17/2019 13:00:25	4/17/2019 15:59:59	0.0

Drift ID	Station ID	Date Time Begin	Date Time End	Average Depth (meters)
LBR_041919_HT_D1	LBR_041919_HT_D1_DEEP	4/19/2019 08:40:30	4/19/2019 09:25:30	1.8
	LBR_041919_HT_D1_SHAL	4/19/2019 08:37:13	4/19/2019 09:26:37	0.5
	LBR_041919_HT_D1_SURF	4/19/2019 08:37:13	4/19/2019 09:26:37	0.0
LBR_042219_HT_D1	LBR_042219_HT_D1_DEEP	4/22/2019 10:30:01	4/22/2019 13:30:01	3.0
	LBR_042219_HT_D1_MIDL	4/22/2019 10:30:02	4/22/2019 13:30:02	1.7
	LBR_042219_HT_D1_SHAL	4/22/2019 10:30:01	4/22/2019 13:30:02	0.9
	LBR_042219_HT_D1_SURF	4/22/2019 10:30:02	4/22/2019 13:30:02	0.1
LBR_042319_DYE_D1	LBR_042319_DYE_D1_DEEP	4/23/2019 12:34:01	4/23/2019 14:07:57	2.9
	LBR_042319_DYE_D1_SHAL	4/23/2019 12:34:01	4/23/2019 14:07:57	1.5
LBR_042319_DYE_D2	LBR_042319_DYE_D2_DEEP	4/23/2019 12:33:47	4/23/2019 14:08:10	2.8
	LBR_042319_DYE_D2_SHAL	4/23/2019 12:33:47	4/23/2019 14:08:09	1.3
LBR_042519_HT_D1	LBR_042519_HT_D1_DEEP	4/25/2019 13:06:41	4/25/2019 15:07:53	2.7
	LBR_042519_HT_D1_MIDL	4/25/2019 13:06:41	4/25/2019 15:07:53	1.6
	LBR_042519_HT_D1_SHAL	4/25/2019 13:06:41	4/25/2019 15:07:54	0.7
	LBR_042519_HT_D1_SURF	4/25/2019 13:06:42	4/25/2019 15:07:54	0.0
LBR_042519_LT_D1	LBR_042519_LT_D1_DEEP	4/25/2019 08:09:21	4/25/2019 09:44:33	2.2
	LBR_042519_LT_D1_MIDL	4/25/2019 08:09:21	4/25/2019 09:44:33	1.8
	LBR_042519_LT_D1_SHAL	4/25/2019 08:09:21	4/25/2019 09:44:33	1.5
	LBR_042519_LT_D1_SURF	4/25/2019 08:09:22	4/25/2019 09:44:34	0.1
LBR_042619_LT_D1	LBR_042619_LT_D1_DEEP	4/26/2019 08:01:07	4/26/2019 10:21:03	2.0
	LBR_042619_LT_D1_MIDL	4/26/2019 08:01:07	4/26/2019 10:21:04	1.3
	LBR_042619_LT_D1_SURF	4/26/2019 08:01:08	4/26/2019 10:21:04	0.6
LBR_042619_LT_D2	LBR_042619_LT_D2_DEEP	4/26/2019 08:10:33	4/26/2019 10:24:25	1.6
	LBR_042619_LT_D2_MIDL	4/26/2019 08:10:33	4/26/2019 10:24:25	1.4
	LBR_042619_LT_D2_SHAL	4/26/2019 08:10:33	4/26/2019 10:24:26	0.8
LBR_042719_HT_D1	LBR_042719_HT_D1_DEEP	4/27/2019 13:47:12	4/27/2019 15:58:54	2.5
	LBR_042719_HT_D1_MIDL	4/27/2019 13:47:59	4/27/2019 15:58:53	1.5
	LBR_042719_HT_D1_SHAL	4/27/2019 13:47:11	4/27/2019 15:58:54	0.6
LBR_042719_LT_D1	LBR_042719_LT_D1_DEEP	4/27/2019 09:42:40	4/27/2019 11:44:48	2.1
	LBR_042719_LT_D1_MIDL	4/27/2019 09:42:40	4/27/2019 11:44:48	1.3
	LBR_042719_LT_D1_SHAL	4/27/2019 09:42:39	4/27/2019 11:44:48	0.4
LBR_042919_LT_D1	LBR_042919_LT_D1_DEEP	4/29/2019 10:32:26	4/29/2019 13:30:02	1.6
	LBR_042919_LT_D1_MIDL	4/29/2019 10:32:26	4/29/2019 13:30:02	1.7
	LBR_042919_LT_D1_SHAL	4/29/2019 10:32:26	4/29/2019 13:30:01	1.1

Drift ID	Station ID	Date Time Begin	Date Time End	Average Depth (meters)
LBR_050119_LT_D1	LBR_050119_LT_D1_DEEP	5/1/2019 12:11:35	5/1/2019 15:03:03	1.7
	LBR_050119_LT_D1_MIDL	5/1/2019 12:11:35	5/1/2019 15:03:03	1.6
	LBR_050119_LT_D1_SHAL	5/1/2019 12:11:35	5/1/2019 15:03:03	0.9
LBR_050319_HT_D1	LBR_050319_HT_D1_DEEP	5/3/2019 07:13:19	5/3/2019 10:14:17	2.2
	LBR_050319_HT_D1_MIDL	5/3/2019 07:13:20	5/3/2019 10:14:18	1.5
	LBR_050319_HT_D1_SHAL	5/3/2019 07:13:19	5/3/2019 10:14:17	0.9
LBR_050619_HT_D1	LBR_050619_HT_D1_DEEP	5/6/2019 09:26:25	5/6/2019 11:25:05	2.7
	LBR_050619_HT_D1_MIDL	5/6/2019 09:26:25	5/6/2019 11:25:05	2.3
	LBR_050619_HT_D1_SHAL	5/6/2019 09:26:26	5/6/2019 11:25:05	1.1
LBR_050619_LT_D1	LBR_050619_LT_D1_DEEP	5/6/2019 16:17:32	5/6/2019 18:17:20	1.7
	LBR_050619_LT_D1_MIDL	5/6/2019 16:17:31	5/6/2019 18:17:19	1.4
	LBR_050619_LT_D1_SHAL	5/6/2019 16:17:31	5/6/2019 18:17:19	0.8
LBR_051019_HT_D1	LBR_051019_HT_D1_DEEP	5/10/2019 12:32:35	5/10/2019 15:15:01	2.2
	LBR_051019_HT_D1_MIDL	5/10/2019 12:32:35	5/10/2019 15:15:01	1.9
	LBR_051019_HT_D1_SHAL	5/10/2019 12:32:36	5/10/2019 15:15:01	0.8
N/A	NONE	3/15/2019 08:57:54	5/10/2019 15:19:05	N/A

Table J-16 Attributes of drift data collected on the lower Front River

Drift ID	Station ID	Date Time Begin	Date Time End	Average Depth (meters)
LFR_031519_LT_D1	LFR_031519_LT_D1_DEEP	3/15/2019 09:28:27	3/15/2019 12:17:33	3.7
	LFR_031519_LT_D1_MIDL	3/15/2019 09:28:27	3/15/2019 12:17:33	2.4
	LFR_031519_LT_D1_SHAL	3/15/2019 09:28:27	3/15/2019 12:17:34	0.9
	LFR_031519_LT_D1_SURF	3/15/2019 09:28:28	3/15/2019 12:17:34	0.1
LFR_031819_LT_D1	LFR_031819_LT_D1_DEEP	3/18/2019 12:58:14	3/18/2019 15:00:22	3.7
	LFR_031819_LT_D1_MIDL	3/18/2019 12:58:14	3/18/2019 15:00:22	2.3
	LFR_031819_LT_D1_SHAL	3/18/2019 12:58:14	3/18/2019 15:00:21	0.8
	LFR_031819_LT_D1_SURF	3/18/2019 12:58:13	3/18/2019 15:00:21	0.1
LFR_032019_HT_D1	LFR_032019_HT_D1_DEEP	3/20/2019 08:45:10	3/20/2019 10:59:04	4.9
	LFR_032019_HT_D1_MIDL	3/20/2019 08:45:10	3/20/2019 10:59:04	3.1
	LFR_032019_HT_D1_SHAL	3/20/2019 08:45:10	3/20/2019 10:59:03	1.4
	LFR_032019_HT_D1_SURF	3/20/2019 08:45:10	3/20/2019 10:59:04	0.2

Drift ID	Station ID	Date Time Begin	Date Time End	Average Depth (meters)
LFR_032019_LT_D1	LFR_032019_LT_D1_DEEP	3/20/2019 15:13:29	3/20/2019 17:18:05	3.9
	LFR_032019_LT_D1_MIDL	3/20/2019 15:13:29	3/20/2019 17:18:05	2.5
	LFR_032019_LT_D1_SHAL	3/20/2019 15:13:29	3/20/2019 17:18:06	1.0
	LFR_032019_LT_D1_SURF	3/20/2019 15:13:30	3/20/2019 17:18:06	0.2
LFR_032219_HT_D1	LFR_032219_HT_D1_DEEP	3/22/2019 10:03:03	3/22/2019 12:57:21	5.1
	LFR_032219_HT_D1_MIDL	3/22/2019 10:03:04	3/22/2019 12:57:22	3.3
	LFR_032219_HT_D1_SHAL	3/22/2019 10:03:04	3/22/2019 12:57:22	1.9
	LFR_032219_HT_D1_SURF	3/22/2019 10:03:04	3/22/2019 12:57:22	0.1
LFR_032519_LT_D1	LFR_032519_LT_D1_DEEP	3/25/2019 11:37:28	3/25/2019 14:36:18	5.1
	LFR_032519_LT_D1_MIDL	3/25/2019 11:37:28	3/25/2019 14:36:18	2.2
	LFR_032519_LT_D1_SHAL	3/25/2019 11:37:27	3/25/2019 14:36:17	1.2
	LFR_032519_LT_D1_SURF	3/25/2019 11:37:28	3/25/2019 14:36:18	0.1
LFR_032719_HT_D1	LFR_032719_HT_D1_DEEP	3/27/2019 14:03:55	3/27/2019 16:07:37	4.0
	LFR_032719_HT_D1_MIDL	3/27/2019 14:03:56	3/27/2019 16:07:38	2.1
	LFR_032719_HT_D1_SHAL	3/27/2019 14:03:55	3/27/2019 16:07:38	1.0
	LFR_032719_HT_D1_SURF	3/27/2019 14:03:56	3/27/2019 16:07:38	0.1
LFR_032719_LT_D1	LFR_032719_LT_D1_DEEP	3/27/2019 08:24:07	3/27/2019 10:05:53	2.7
	LFR_032719_LT_D1_MIDL	3/27/2019 08:24:08	3/27/2019 09:03:40	1.8
	LFR_032719_LT_D1_SHAL	3/27/2019 08:24:08	3/27/2019 10:05:53	0.8
	LFR_032719_LT_D1_SURF	3/27/2019 08:24:07	3/27/2019 10:05:53	0.2
LFR_040119_LT_D1	LFR_040119_LT_D1_DEEP	4/1/2019 13:04:05	4/1/2019 15:04:25	3.3
	LFR_040119_LT_D1_MIDL	4/1/2019 13:04:05	4/1/2019 15:04:25	1.9
	LFR_040119_LT_D1_SHAL	4/1/2019 13:04:06	4/1/2019 15:04:26	0.9
	LFR_040119_LT_D1_SURF	4/1/2019 13:04:06	4/1/2019 15:04:26	0.1
LFR_040319_LT_D1	LFR_040319_LT_D1_DEEP	4/3/2019 13:12:26	4/3/2019 16:30:28	4.2
	LFR_040319_LT_D1_MIDL	4/3/2019 13:12:25	4/3/2019 16:30:27	2.0
	LFR_040319_LT_D1_SHAL	4/3/2019 13:12:26	4/3/2019 16:30:27	1.1
	LFR_040319_LT_D1_SURF	4/3/2019 13:12:26	4/3/2019 16:30:28	0.2
LFR_040519_HT_D1	LFR_040519_HT_D1_DEEP	4/5/2019 08:33:16	4/5/2019 11:21:36	4.1
	LFR_040519_HT_D1_MIDL	4/5/2019 08:33:16	4/5/2019 11:21:36	2.6
	LFR_040519_HT_D1_SHAL	4/5/2019 08:33:16	4/5/2019 11:21:36	1.4
	LFR_040519_HT_D1_SURF	4/5/2019 08:33:15	4/5/2019 11:21:35	0.1

Drift ID	Station ID	Date Time Begin	Date Time End	Average Depth (meters)
LFR_040819_HT_D1	LFR_040819_HT_D1_DEEP	4/8/2019 09:48:15	4/8/2019 12:51:23	4.7
	LFR_040819_HT_D1_MIDL	4/8/2019 09:48:16	4/8/2019 12:50:34	3.7
	LFR_040819_HT_D1_SHAL	4/8/2019 09:48:16	4/8/2019 12:51:23	1.5
	LFR_040819_HT_D1_SURF	4/8/2019 09:48:15	4/8/2019 12:51:23	0.1
LFR_041019_HT_D1	LFR_041019_HT_D1_DEEP	4/10/2019 11:04:25	4/10/2019 13:16:35	4.5
	LFR_041019_HT_D1_MIDL	4/10/2019 11:04:26	4/10/2019 13:16:36	3.1
	LFR_041019_HT_D1_SHAL	4/10/2019 11:04:25	4/10/2019 13:16:36	1.4
	LFR_041019_HT_D1_SURF	4/10/2019 11:04:26	4/10/2019 13:16:36	0.1
LFR_041119_DYE_D1	LFR_041119_DYE_D1_DEEP	4/11/2019 08:30:34	4/11/2019 11:54:04	2.4
	LFR_041119_DYE_D1_MIDL	4/11/2019 08:30:34	4/11/2019 11:54:04	2.2
	LFR_041119_DYE_D1_SHAL	4/11/2019 08:30:33	4/11/2019 11:54:04	1.1
LFR_041119_DYE_D2	LFR_041119_DYE_D2_DEEP	4/11/2019 11:56:15	4/11/2019 14:03:22	2.4
	LFR_041119_DYE_D2_MIDL	4/11/2019 11:56:16	4/11/2019 14:03:22	1.9
	LFR_041119_DYE_D2_SHAL	4/11/2019 11:56:16	4/11/2019 14:03:22	0.9
LFR_041119_DYE_D3	LFR_041119_DYE_D3_DEEP	4/11/2019 08:27:20	4/11/2019 14:03:08	3.8
	LFR_041119_DYE_D3_MIDL	4/11/2019 08:27:19	4/11/2019 14:03:07	2.4
	LFR_041119_DYE_D3_SHAL	4/11/2019 08:27:20	4/11/2019 14:03:08	1.2
LFR_041719_LT_D1	LFR_041719_LT_D1_DEEP	4/17/2019 12:39:20	4/17/2019 15:39:02	3.7
	LFR_041719_LT_D1_MIDL	4/17/2019 12:39:19	4/17/2019 15:39:01	2.5
	LFR_041719_LT_D1_SHAL	4/17/2019 12:39:20	4/17/2019 15:39:02	1.2
	LFR_041719_LT_D1_SURF	4/17/2019 12:39:19	4/17/2019 15:39:01	0.1
LFR_041919_HT_D1	LFR_041919_HT_D1_DEEP	4/19/2019 08:25:01	4/19/2019 10:05:15	2.6
	LFR_041919_HT_D1_MIDL	4/19/2019 08:25:02	4/19/2019 10:05:16	2.1
	LFR_041919_HT_D1_SHAL	4/19/2019 08:25:01	4/19/2019 10:05:16	0.4
	LFR_041919_HT_D1_SURF	4/19/2019 08:25:02	4/19/2019 10:05:16	0.0
LFR_042219_HT_D1	LFR_042219_HT_D1_DEEP	4/22/2019 10:37:23	4/22/2019 13:25:03	4.1
	LFR_042219_HT_D1_SHAL	4/22/2019 10:37:23	4/22/2019 13:25:03	1.5
	LFR_042219_HT_D1_SURF	4/22/2019 10:37:23	4/22/2019 13:25:03	0.1
LFR_042419_DYE_D1	LFR_042419_DYE_D1_DEEP	4/24/2019 13:22:10	4/24/2019 14:51:18	5.4
	LFR_042419_DYE_D1_SHAL	4/24/2019 13:22:10	4/24/2019 14:51:18	1.6
LFR_042419_DYE_D2	LFR_042419_DYE_D2_DEEP	4/24/2019 13:21:44	4/24/2019 14:52:30	6.0
	LFR_042419_DYE_D2_SHAL	4/24/2019 13:21:44	4/24/2019 14:52:30	1.3

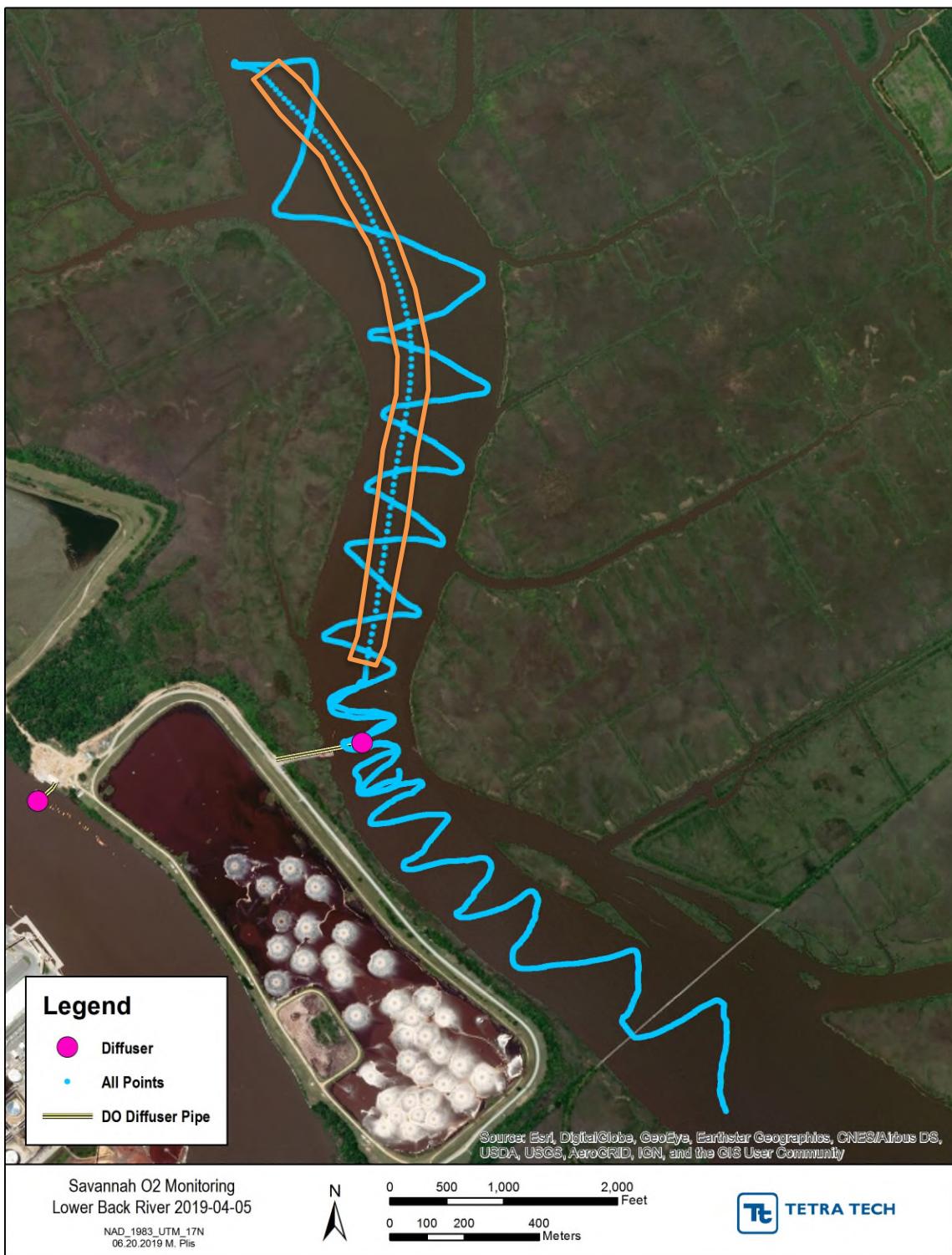
Drift ID	Station ID	Date Time Begin	Date Time End	Average Depth (meters)
LFR_042519_HT_D1	LFR_042519_HT_D1_DEEP	4/25/2019 13:11:57	4/25/2019 15:11:39	4.1
	LFR_042519_HT_D1_MIDL	4/25/2019 13:11:57	4/25/2019 15:11:39	2.9
	LFR_042519_HT_D1_SHAL	4/25/2019 13:11:57	4/25/2019 15:11:40	1.0
	LFR_042519_HT_D1_SURF	4/25/2019 13:11:58	4/25/2019 15:11:40	0.1
LFR_042519_LT_D1	LFR_042519_LT_D1_DEEP	4/25/2019 08:10:41	4/25/2019 09:39:59	3.0
	LFR_042519_LT_D1_MIDL	4/25/2019 08:10:42	4/25/2019 09:40:00	2.3
	LFR_042519_LT_D1_SHAL	4/25/2019 08:10:42	4/25/2019 09:40:00	1.2
	LFR_042519_LT_D1_SURF	4/25/2019 08:10:41	4/25/2019 09:39:59	0.0
LFR_042619_HT_D1	LFR_042619_HT_D1_DEEP	4/26/2019 13:54:05	4/26/2019 15:45:13	3.4
	LFR_042619_HT_D1_MIDL	4/26/2019 13:54:05	4/26/2019 15:45:13	2.4
	LFR_042619_HT_D1_SHAL	4/26/2019 13:54:06	4/26/2019 15:45:13	0.7
LFR_042919_LT_D1	LFR_042919_LT_D1_DEEP	4/29/2019 10:29:01	4/29/2019 13:29:03	2.7
	LFR_042919_LT_D1_MIDL	4/29/2019 10:29:02	4/29/2019 13:29:04	1.8
	LFR_042919_LT_D1_SHAL	4/29/2019 10:29:01	4/29/2019 13:29:03	1.1
LFR_050119_LT_D1	LFR_050119_LT_D1_MIDL	5/1/2019 11:52:32	5/1/2019 14:53:08	1.5
	LFR_050119_LT_D1_SHAL	5/1/2019 11:52:31	5/1/2019 14:53:08	0.8
LFR_050319_HT_D1	LFR_050319_HT_D1_DEEP	5/3/2019 07:10:36	5/3/2019 10:11:24	3.6
	LFR_050319_HT_D1_MIDL	5/3/2019 07:10:36	5/3/2019 10:11:24	2.3
	LFR_050319_HT_D1_SHAL	5/3/2019 07:10:36	5/3/2019 10:11:23	0.8
LFR_050619_HT_D1	LFR_050619_HT_D1_DEEP	5/6/2019 09:18:12	5/6/2019 11:32:04	3.1
	LFR_050619_HT_D1_MIDL	5/6/2019 09:18:12	5/6/2019 11:32:04	2.0
	LFR_050619_HT_D1_SHAL	5/6/2019 09:18:12	5/6/2019 11:32:04	1.1
LFR_050819_HT_DYE	LFR_050819_HT_DYE_DEEP	5/8/2019 10:26:02	5/8/2019 11:56:18	4.3
	LFR_050819_HT_DYE_MIDL	5/8/2019 10:26:02	5/8/2019 11:56:18	2.7
	LFR_050819_HT_DYE_SHAL	5/8/2019 10:26:01	5/8/2019 11:56:17	1.1
LFR_051019_HT_D1	LFR_051019_HT_D1_DEEP	5/10/2019 12:16:20	5/10/2019 15:12:24	3.7
	LFR_051019_HT_D1_MIDL	5/10/2019 12:16:19	5/10/2019 15:12:23	2.5
	LFR_051019_HT_D1_SHAL	5/10/2019 12:16:19	5/10/2019 15:12:23	0.8
N/A	NONE	3/15/2019 09:06:28	5/10/2019 15:13:58	N/A

Table J-17 Data counts for drift constituents collected on the Back River and the lower Front River

PCode	Parameter Name	Units	Raw Data Count
BARO	barometric pressure	mm Hg	281,065
BATTERY	battery voltage	volts	934,182
BGA_R	phycoerythin BGA sensor	RFU	827,256
BGA_U	phycoerythin BGA sensor	ug/L	827,256
CHLA_R	chlorophyll a	RFU	827,256
CHLA_U	chlorophyll a	ug/L	827,256
COND	conductivity	uS/cm	172,545
DEPTH	water depth	meters	1,014,314
DEP_PSIA	water depth	psia	1,014,314
DO	dissolved oxygen	mg/L	1,014,314
DO_SAT	dissolved oxygen saturation	%	1,014,314
LAT	latitude	degrees	972,337
LON	longitude	degrees	972,337
SALPPT	salinity	PPT	1,014,314
SPCOND	specific conductance	uS/cm	1,014,314
WTEMP	water temperature	°C	1,014,314
Total			13,741,688

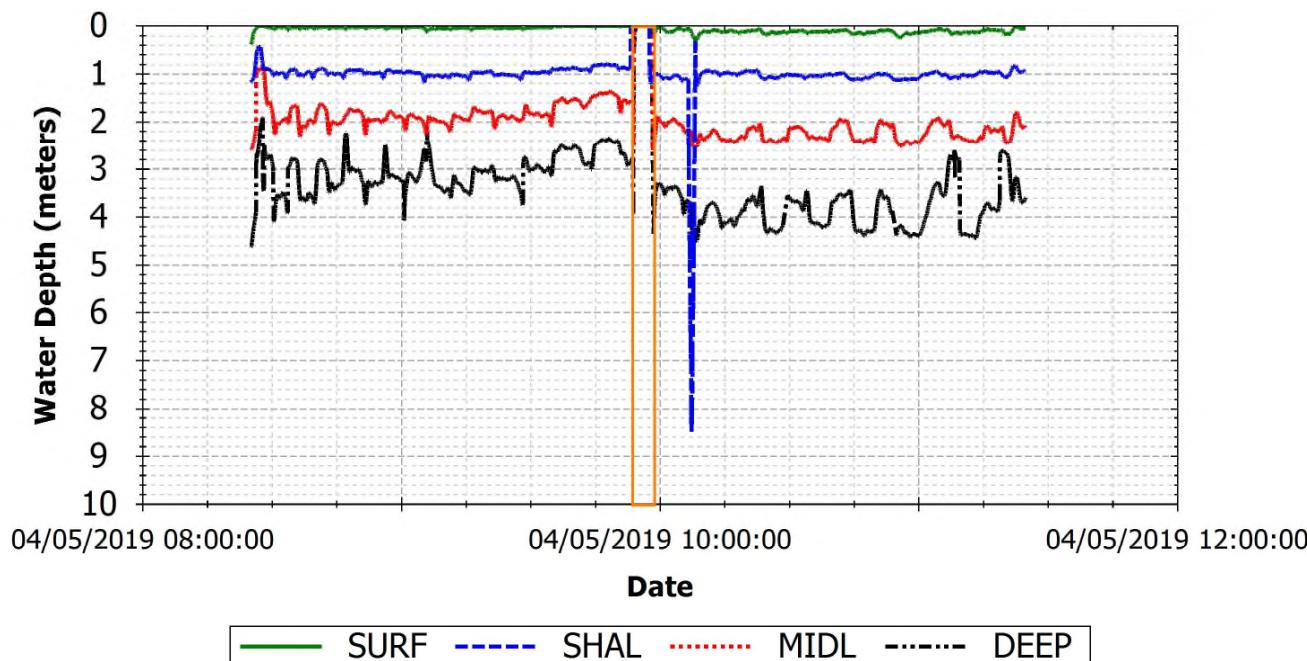
The drift data were reviewed in timeseries plots to identify any sample dates and times which contained observed values which were inconsistent with the observed values sampled before and after the inconsistent values. The identified inconsistent dates and times were correlated to times when the sondes were likely out of the water. As an example, **Figure J-7**, **Figure J-8** and **Figure J-9** present the location map, depth and DO timeseries respectively of the LBR_040519_HT_D1 drift. The orange box identifies a period of time where all of the sondes were likely out of the water and the boat was traveling at a speed greater than 20 miles per hour.

For each profile, all dates and times identified as verified inconsistent were separated from the consistent data in the processed data files and project database. The percentage of inconsistency data for each semi-permanent buoy is provided in **Table J-18**.



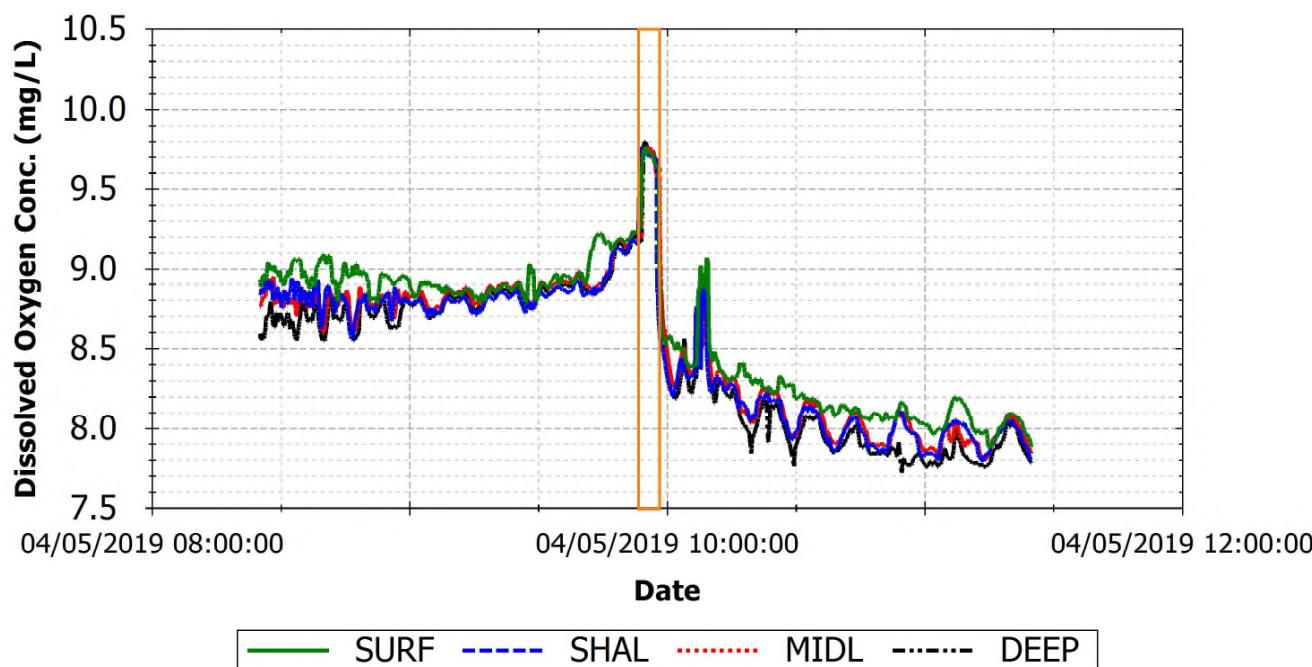
Note orange polygon identifies the period of time where boat was traveling over 20 miles per hour and all sondes were out of the water

Figure J-7 LBR_040519_HT_D1 drift location map QA/QC



Note orange box identifies the period of time where boat was traveling over 20 miles per hour and all sondes were out of the water

Figure J-8 LBR_040519_HT_D1 drift depth QA/QC timeseries



Note orange box identifies the period of time where boat was traveling over 20 miles per hour and all sondes were out of the water

Figure J-9 LBR_040519_HT_D1 drift DO QA/QC timeseries

Table J-18 Percentage of inconsistent values for drift data

Drift ID	Station ID	Inconsistent values (%)
LBR_031519_LT_D1	LBR_031519_LT_D1_DEEP	0.00
	LBR_031519_LT_D1_MIDL	0.00
	LBR_031519_LT_D1_SHAL	0.00
	LBR_031519_LT_D1_SURF	0.00
LBR_031819_LT_D1	LBR_031819_LT_D1_DEEP	0.00
	LBR_031819_LT_D1_MIDL	0.00
	LBR_031819_LT_D1_SHAL	0.00
	LBR_031819_LT_D1_SURF	0.00
LBR_032019_LT_D1	LBR_032019_LT_D1_DEEP	3.82
	LBR_032019_LT_D1_MIDL	3.82
	LBR_032019_LT_D1_SHAL	3.82
	LBR_032019_LT_D1_SURF	3.82
LBR_032219_HT_D1	LBR_032219_HT_D1_DEEP	0.00
	LBR_032219_HT_D1_MIDL	0.00
	LBR_032219_HT_D1_SHAL	0.00
	LBR_032219_HT_D1_SURF	0.00
LBR_032519_HT_D1	LBR_032519_HT_D1_DEEP	0.00
	LBR_032519_HT_D1_MIDL	0.00
	LBR_032519_HT_D1_SHAL	0.30
	LBR_032519_HT_D1_SURF	0.00
LBR_032719_HT_D1	LBR_032719_HT_D1_DEEP	0.00
	LBR_032719_HT_D1_MIDL	0.00
	LBR_032719_HT_D1_SHAL	0.00
	LBR_032719_HT_D1_SURF	0.00
LBR_032719_LT_D1	LBR_032719_LT_D1_DEEP	0.00
	LBR_032719_LT_D1_MIDL	0.00
	LBR_032719_LT_D1_SHAL	0.00
	LBR_032719_LT_D1_SURF	0.00
LBR_032919_DYE_D1	LBR_032919_DYE_D1_DEEP	0.00
	LBR_032919_DYE_D1_MIDL	0.00
	LBR_032919_DYE_D1_SHAL	0.00
	LBR_032919_DYE_D1_SURF	0.00
LBR_040119_LT_D1	LBR_040119_LT_D1_DEEP	0.00
	LBR_040119_LT_D1_MIDL	0.00
	LBR_040119_LT_D1_SHAL	0.10
	LBR_040119_LT_D1_SURF	0.00
LBR_040319_LT_D1	LBR_040319_LT_D1_DEEP	0.00
	LBR_040319_LT_D1_MIDL	0.00
	LBR_040319_LT_D1_SHAL	0.00
	LBR_040319_LT_D1_SURF	0.00

Drift ID	Station ID	Inconsistent values (%)
LBR_040519_HT_D1	LBR_040519_HT_D1_DEEP	2.25
	LBR_040519_HT_D1_MIDL	2.63
	LBR_040519_HT_D1_SHAL	2.62
	LBR_040519_HT_D1_SURF	2.63
LBR_040819_HT_D1	LBR_040819_HT_D1_DEEP	2.83
	LBR_040819_HT_D1_MIDL	2.83
	LBR_040819_HT_D1_SHAL	2.83
	LBR_040819_HT_D1_SURF	2.83
LBR_041019_HT_D1	LBR_041019_HT_D1_DEEP	0.00
	LBR_041019_HT_D1_MIDL	0.00
	LBR_041019_HT_D1_SHAL	0.00
	LBR_041019_HT_D1_SURF	0.24
LBR_041219_DYE_D1	LBR_041219_DYE_D1_DEEP	0.00
	LBR_041219_DYE_D1_MIDL	0.00
	LBR_041219_DYE_D1_SHAL	0.00
LBR_041219_DYE_D2	LBR_041219_DYE_D2_MIDL	0.00
	LBR_041219_DYE_D2_SHAL	0.00
LBR_041519_LT_D1	LBR_041519_LT_D1_DEEP	0.00
	LBR_041519_LT_D1_MIDL	0.00
	LBR_041519_LT_D1_SHAL	0.00
	LBR_041519_LT_D1_SURF	0.00
LBR_041719_LT_D1	LBR_041719_LT_D1_DEEP	0.00
	LBR_041719_LT_D1_MIDL	0.00
	LBR_041719_LT_D1_SHAL	0.00
	LBR_041719_LT_D1_SURF	0.00
LBR_041919_HT_D1	LBR_041919_HT_D1_DEEP	0.00
	LBR_041919_HT_D1_SHAL	0.00
	LBR_041919_HT_D1_SURF	0.00
LBR_042219_HT_D1	LBR_042219_HT_D1_DEEP	0.00
	LBR_042219_HT_D1_MIDL	0.00
	LBR_042219_HT_D1_SHAL	0.00
	LBR_042219_HT_D1_SURF	0.00
LBR_042319_DYE_D1	LBR_042319_DYE_D1_DEEP	0.00
	LBR_042319_DYE_D1_SHAL	0.00
LBR_042319_DYE_D2	LBR_042319_DYE_D2_DEEP	0.00
	LBR_042319_DYE_D2_SHAL	0.00
LBR_042519_HT_D1	LBR_042519_HT_D1_DEEP	0.00
	LBR_042519_HT_D1_MIDL	0.00
	LBR_042519_HT_D1_SHAL	0.00
	LBR_042519_HT_D1_SURF	0.00

Drift ID	Station ID	Inconsistent values (%)
LBR_042519_LT_D1	LBR_042519_LT_D1_DEEP	0.00
	LBR_042519_LT_D1_MIDL	0.00
	LBR_042519_LT_D1_SHAL	0.00
	LBR_042519_LT_D1_SURF	0.00
LBR_042619_LT_D1	LBR_042619_LT_D1_DEEP	0.00
	LBR_042619_LT_D1_MIDL	0.00
	LBR_042619_LT_D1_SURF	0.00
LBR_042619_LT_D2	LBR_042619_LT_D2_DEEP	0.00
	LBR_042619_LT_D2_MIDL	0.00
	LBR_042619_LT_D2_SHAL	0.00
LBR_042719_HT_D1	LBR_042719_HT_D1_DEEP	0.76
	LBR_042719_HT_D1_MIDL	0.00
	LBR_042719_HT_D1_SHAL	0.23
LBR_042719_LT_D1	LBR_042719_LT_D1_DEEP	0.00
	LBR_042719_LT_D1_MIDL	0.00
	LBR_042719_LT_D1_SHAL	0.00
LBR_042919_LT_D1	LBR_042919_LT_D1_DEEP	0.00
	LBR_042919_LT_D1_MIDL	0.55
	LBR_042919_LT_D1_SHAL	0.00
LBR_050119_LT_D1	LBR_050119_LT_D1_DEEP	0.00
	LBR_050119_LT_D1_MIDL	0.00
	LBR_050119_LT_D1_SHAL	0.00
LBR_050319_HT_D1	LBR_050319_HT_D1_DEEP	0.00
	LBR_050319_HT_D1_MIDL	0.00
	LBR_050319_HT_D1_SHAL	0.00
LBR_050619_HT_D1	LBR_050619_HT_D1_DEEP	0.00
	LBR_050619_HT_D1_MIDL	0.00
	LBR_050619_HT_D1_SHAL	0.00
LBR_050619_LT_D1	LBR_050619_LT_D1_DEEP	0.00
	LBR_050619_LT_D1_MIDL	0.00
	LBR_050619_LT_D1_SHAL	0.00
LBR_051019_LT_D1	LBR_051019_LT_D1_DEEP	0.00
	LBR_051019_LT_D1_MIDL	0.00
	LBR_051019_LT_D1_SHAL	0.00
LFR_031519_LT_D1	LFR_031519_LT_D1_DEEP	0.00
	LFR_031519_LT_D1_MIDL	0.00
	LFR_031519_LT_D1_SHAL	0.00
	LFR_031519_LT_D1_SURF	0.00
LFR_031819_LT_D1	LFR_031819_LT_D1_DEEP	0.00
	LFR_031819_LT_D1_MIDL	0.00
	LFR_031819_LT_D1_SHAL	0.00
	LFR_031819_LT_D1_SURF	0.00

Drift ID	Station ID	Inconsistent values (%)
LFR_032019_HT_D1	LFR_032019_HT_D1_DEEP	0.00
	LFR_032019_HT_D1_MIDL	0.00
	LFR_032019_HT_D1_SHAL	0.00
	LFR_032019_HT_D1_SURF	0.00
LFR_032019_LT_D1	LFR_032019_LT_D1_DEEP	0.00
	LFR_032019_LT_D1_MIDL	0.00
	LFR_032019_LT_D1_SHAL	0.00
	LFR_032019_LT_D1_SURF	0.00
LFR_032219_HT_D1	LFR_032219_HT_D1_DEEP	0.80
	LFR_032219_HT_D1_MIDL	0.00
	LFR_032219_HT_D1_SHAL	0.00
	LFR_032219_HT_D1_SURF	0.00
LFR_032519_LT_D1	LFR_032519_LT_D1_DEEP	0.00
	LFR_032519_LT_D1_MIDL	0.00
	LFR_032519_LT_D1_SHAL	0.00
	LFR_032519_LT_D1_SURF	0.00
LFR_032719_HT_D1	LFR_032719_HT_D1_DEEP	0.00
	LFR_032719_HT_D1_MIDL	0.00
	LFR_032719_HT_D1_SHAL	0.00
	LFR_032719_HT_D1_SURF	0.00
LFR_032719_LT_D1	LFR_032719_LT_D1_DEEP	6.20
	LFR_032719_LT_D1_MIDL	13.65
	LFR_032719_LT_D1_SHAL	6.20
	LFR_032719_LT_D1_SURF	6.20
LFR_040119_LT_D1	LFR_040119_LT_D1_DEEP	0.00
	LFR_040119_LT_D1_MIDL	0.00
	LFR_040119_LT_D1_SHAL	0.00
	LFR_040119_LT_D1_SURF	0.00
LFR_040319_LT_D1	LFR_040319_LT_D1_DEEP	0.00
	LFR_040319_LT_D1_MIDL	0.00
	LFR_040319_LT_D1_SHAL	0.00
	LFR_040319_LT_D1_SURF	0.00
LFR_040519_HT_D1	LFR_040519_HT_D1_DEEP	0.00
	LFR_040519_HT_D1_MIDL	0.00
	LFR_040519_HT_D1_SHAL	0.00
	LFR_040519_HT_D1_SURF	0.00
LFR_040819_HT_D1	LFR_040819_HT_D1_DEEP	0.00
	LFR_040819_HT_D1_MIDL	0.00
	LFR_040819_HT_D1_SHAL	0.00
	LFR_040819_HT_D1_SURF	0.00

Drift ID	Station ID	Inconsistent values (%)
LFR_041019_HT_D1	LFR_041019_HT_D1_DEEP	0.00
	LFR_041019_HT_D1_MIDL	0.00
	LFR_041019_HT_D1_SHAL	0.00
	LFR_041019_HT_D1_SURF	0.00
LFR_041119_DYE_D1	LFR_041119_DYE_D1_DEEP	0.00
	LFR_041119_DYE_D1_MIDL	0.00
	LFR_041119_DYE_D1_SHAL	0.00
LFR_041119_DYE_D2	LFR_041119_DYE_D2_DEEP	0.00
	LFR_041119_DYE_D2_MIDL	0.00
	LFR_041119_DYE_D2_SHAL	0.00
LFR_041119_DYE_D3	LFR_041119_DYE_D3_DEEP	0.00
	LFR_041119_DYE_D3_MIDL	0.00
	LFR_041119_DYE_D3_SHAL	0.00
LFR_041719_LT_D1	LFR_041719_LT_D1_DEEP	0.00
	LFR_041719_LT_D1_MIDL	0.00
	LFR_041719_LT_D1_SHAL	0.00
	LFR_041719_LT_D1_SURF	0.00
LFR_041919_HT_D1	LFR_041919_HT_D1_DEEP	0.00
	LFR_041919_HT_D1_MIDL	0.00
	LFR_041919_HT_D1_SHAL	0.00
	LFR_041919_HT_D1_SURF	0.00
LFR_042219_HT_D1	LFR_042219_HT_D1_DEEP	0.00
	LFR_042219_HT_D1_SHAL	0.00
	LFR_042219_HT_D1_SURF	0.00
LFR_042419_DYE_D1	LFR_042419_DYE_D1_DEEP	0.00
	LFR_042419_DYE_D1_SHAL	0.00
LFR_042419_DYE_D2	LFR_042419_DYE_D2_DEEP	0.00
	LFR_042419_DYE_D2_SHAL	0.00
LFR_042519_HT_D1	LFR_042519_HT_D1_DEEP	0.00
	LFR_042519_HT_D1_MIDL	0.00
	LFR_042519_HT_D1_SHAL	0.00
	LFR_042519_HT_D1_SURF	0.00
LFR_042519_LT_D1	LFR_042519_LT_D1_DEEP	0.00
	LFR_042519_LT_D1_MIDL	0.00
	LFR_042519_LT_D1_SHAL	0.00
	LFR_042519_LT_D1_SURF	0.00
LFR_042619_HT_D1	LFR_042619_HT_D1_DEEP	0.00
	LFR_042619_HT_D1_MIDL	0.00
	LFR_042619_HT_D1_SHAL	0.00
LFR_042919_LT_D1	LFR_042919_LT_D1_DEEP	3.46
	LFR_042919_LT_D1_MIDL	3.44
	LFR_042919_LT_D1_SHAL	3.46

Drift ID	Station ID	Inconsistent values (%)
LFR_050119_LT_D1	LFR_050119_LT_D1_MIDL	0.00
	LFR_050119_LT_D1_SHAL	0.00
LFR_050319_HT_D1	LFR_050319_HT_D1_DEEP	0.00
	LFR_050319_HT_D1_MIDL	0.00
	LFR_050319_HT_D1_SHAL	0.00
LFR_050619_HT_D1	LFR_050619_HT_D1_DEEP	0.00
	LFR_050619_HT_D1_MIDL	0.00
	LFR_050619_HT_D1_SHAL	0.00
LFR_050819_HT_DYE	LFR_050819_HT_DYE_DEEP	0.00
	LFR_050819_HT_DYE_MIDL	0.00
	LFR_050819_HT_DYE_SHAL	0.00
LFR_051019_HT_D1	LFR_051019_HT_D1_DEEP	0.00
	LFR_051019_HT_D1_MIDL	0.00
	LFR_051019_HT_D1_SHAL	0.00
NONE		100.00
Total		3.45

J.5 USGS DATA

USGS monitoring data were obtained from four gages located upstream and downstream of the Back River and lower Front River diffuser locations (**Figure J-10**). These stations were selected to evaluate the water quality further away from the DO injection diffusers. **Table J-19** provides the location, gage ID, and name of the USGS gages used for the WCTE study. Data were downloaded from the National Water Information System Web Interface (<https://waterdata.usgs.gov/ga/nwis/>) with a sampling interval of fifteen (15) minutes and spanned the period from March 14, 2019 through May 12, 2019. The QA/QC process for the USGS gage data ensured: (1) the requested period of data and requested constituents were received, and (2) the start of the next period of downloaded data coincided with the end of the previous periods download. All of the USGS data were assumed to be error free and were accepted as having no inconsistent data.

Table J-19 USGS gages data compiled for the Test Run sampling

Location	Gage ID	Name
Front River	USGS 021989715	Savannah River at Garden City, GA
Front River	USGS 021989773	Savannah River at USACE Dock, at Savannah, GA
Back River	USGS 021989793	Little Back River at Hog Island, near Savannah, GA
Back River	USGS 0219897945	Back River 0.4 miles downstream US17, near Savannah, GA

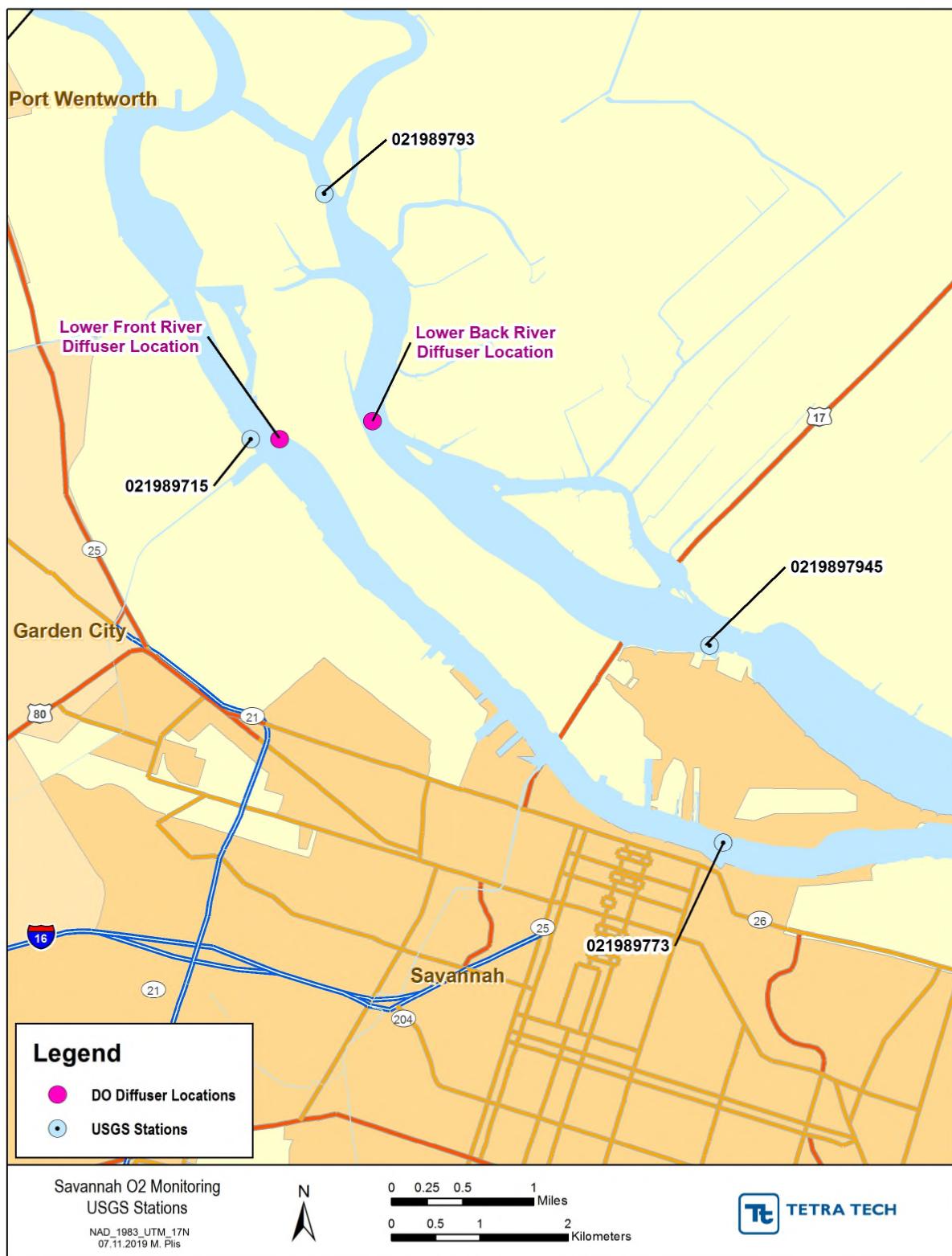


Figure J-10 Location of USGS gages used for the Test Run sampling

All of the downloaded USGS data were attributed with a time zone code (i.e. Eastern Daylight Time [EDT] and Eastern Standard Time [EST]). During data processing, the sample times were brought to a consistent time basis by subtracting one hour from all of the EDT time zone codes. Therefore, all of the USGS data in the processing workbooks and the project WRDB database have a time code of EST.

Table J-20 through **Table J-23** provide the constituents obtained and calculated for each USGS gage and the PCode assigned in the project WRDB database. Each constituent and value flagged as “provisional data subject to revision” by the USGS was flagged similarly in WRDB. The USGS assigns provisional designations to data they have not had a chance to fully QA/QC, and this designation is normally retained for a period of six months after data collection. In order for this flag to removed, the USGS data would need to be obtained again after the USGS has fully reviewed the data and removed the provisional flag.

The USGS did not report DO saturation values, but the constituents needed to manually calculate DO saturation were reported (i.e. temperature, salinity, and DO). Therefore, DO saturation for each USGS measurement was calculated based on the following equations (Thomann & Mueller, 1987):

$$(\ln C_{sf}) = -139.34411 + \frac{(1.575701 \times 10^5)}{T} - \frac{(6.642308 \times 10^7)}{T^2} + \frac{(1.243800 \times 10^{10})}{T^3} - \frac{(8.621949 \times 10^{11})}{T^4}$$

where,

C_{sf} = freshwater DO concentration at 100% saturation at 1 atm in mg/L

\ln = natural logarithm

T = temperature in Kelvin

$$(\ln C_{ss}) = (\ln C_{sf}) - S \left(1.7674 \times 10^{-2} - \frac{(1.0754 \times 10^1)}{T} + \frac{(2.1407 \times 10^3)}{T^2} \right)$$

where,

C_{ss} = saline water DO concentration at 100% saturation at 1 atm in mg/L

S = salinity in ppt

$$DOSAT = \frac{\text{Observed DO Concentration}}{C_{ss}} * 100$$

where,

DOSAT = DO percent saturation

Table J-20 Data counts for USGS 021989715 Savannah River at Garden City, GA

PCode	Parameter Name	Units	Data Count
DEPTH_B	Depth of sensor below water surface [-23.28ft NAVD88]	feet	5,721
DOSAT_B	DO Saturation [-23.28ft, NAVD88]	%	5,582
DOSAT_S	DO Saturation [-13.25ft NAVD88]	%	5,612
DOSOLATM_B	Saline water DO saturation concentration at 1 atm [-23.28ft, NAVD88]	mg/L	5,593
DOSOLATM_S	Saline water DO saturation concentration at 1 atm [-13.25ft NAVD88]	mg/L	5,614
DOUNF_B	Dissolved oxygen, water, unfiltered [-23.28ft, NAVD88]	mg/L	5,729
DOUNF_S	Dissolved oxygen, water, unfiltered, [-13.25ft NAVD88]	mg/L	5,750
GH	Gage height	feet	5,760
pHUNF_S	pH, water, unfiltered, field [-13.25ft NAVD88]	Standard Units	5,748
SALPPT_B	Salinity, water, unfiltered [-23.28ft, NAVD88]	ppt	5,593
SALPPT_S	Salinity, water, unfiltered [-13.25ft NAVD88]	ppt	5,614
SPCOND25_B	Specific conductance, water, unfiltered, at 25 degrees Celsius [-23.28ft, NAVD88]	µS/cm	5,729
SPCOND25_S	Specific conductance, water, unfiltered, at 25 degrees Celsius, [-13.25ft NAVD88]	µS/cm	5,756
TURB_S	Turbidity, water, unfiltered, monochrome near infra-red LED light, 780-900 nm, detection angle 90 +/-.2.5 degrees [-13.25ft NAVD88]	FNU	5,739
WTEMP_B	Temperature, water [-23.28ft, NAVD88]	Degree C	5,756
WTEMP_S	Temperature, water [-13.25ft NAVD88]	Degree C	5,756
Total			91,052

Note DOSAT_B, DOSAT_S, DOSOLATM_B, and DOSOLATM_S calculated by QA/QC team

Table J-21 Data counts for USGS 021989773 Savannah River at USACE Dock, at Savannah, GA

PCode	Parameter Name	Units	Data Count
ATEMP	Temperature, air ¹	Degree C	1,439
BARO	Barometric pressure ¹	mm of Hg	1,439
DOSOL_ATM	Saline water DO saturation concentration at 1 atm	mg/L	5,756
DO_SAT	DO saturation	%	5,756
DO_UNFIL	Dissolved oxygen, water, unfiltered	mg/L	5,757
FLOW	Discharge	cfs	5,751
GH	Gage height	feet	5,751
pH_UNFIL	pH, water, unfiltered, field	Standard Units	5,757
RAIN	Precipitation, total	inches	5,755
SALPPT_UN	Salinity, water, unfiltered	ppt	5,756
SPCOND_25	Specific conductance, water, unfiltered, at 25 degrees Celsius	µS/cm	5,756
TURB	Turbidity, water, unfiltered, monochrome near infra-red LED light, 780-900 nm, detection angle 90 +/- 2.5 degrees	FNU	5,754
VEL	Mean water velocity for discharge computation	fps	5,752
WDIR	Wind direction ¹	degrees clockwise from true north	1,439
WSPD	Wind speed ¹	mph	1,440
WTEMP	Temperature, water	Degree C	5,757
Total			74,815

¹ Reported at an hourly interval

Note DOSAT and DOSOLATM calculated by QA/QC team

Table J-22 Data counts for USGS 021989793 Little Back River at Hog Island, near Savannah, GA

PCode	Parameter Name	Units	Data Count
BGA_R	Phycoerythrin relative fluorescence (fPE), water, in situ, EXO	RFU	5,101
DOSOL_ATM	Saline water DO saturation concentration at 1 atm	mg/L	5,566
DO_SAT	DO saturation	%	5,543
DO_UNFIL	Dissolved oxygen, water, unfiltered	mg/L	5,587
pH_UNFIL	pH, water, unfiltered, field	Standard Units	5,580
SALPPT	Salinity, water, unfiltered, parts per thousand		5,585
SPCOND_25	Specific conductance, water, unfiltered, at 25 degrees Celsius	µS/cm	5,585
TURB	Turbidity, water, unfiltered, monochrome near infra-red LED light, 780-900 nm, detection angle 90 ±2.5 degrees	FNU	5,590
WTEMP	Temperature, water	Degree C	5,608
Total			49,745

Note DOSAT and DOSOLATM calculated by QA/QC team

Table J-23 Data counts for USGS 0219897945 Back River 0.4 miles downstream US17, near Savannah, GA

PCode	Parameter Name	Units	Data Count
BGA_R	Phycoerythrin relative fluorescence (fPE), water, in situ, EXO	RFU	5,491
DOSOL_ATM	Saline water DO saturation concentration at 1 atm	mg/L	5,515
DO_SAT	DO saturation	%	5,484
DO_UNFIL	Dissolved oxygen, water, unfiltered	mg/L	5,493
pH_UNFIL	pH, water, unfiltered, field	Standard Units	5,511
SALPPT	Salinity, water, unfiltered,	parts per thousand	5,523
SPCOND_25	Specific conductance, water, unfiltered, at 25 degrees Celsius	µS/cm	5,523
TURB	Turbidity, water, unfiltered, monochrome near infra-red LED light, 780-900 nm, detection angle 90 ±2.5 degrees	FNU	5,511
WTEMP	Temperature, water	Degree C	5,546
Total			49,597

Note DOSAT and DOSOLATM calculated by QA/QC team

J.6 USACE PLANT DATA

The Plant was constructed to be an off-stream system to increase DO concentrations in the Savannah River and estuary by introducing DO super-saturated water to the Back River and lower Front River. The Plant uses Speece Cones to increase the DO levels of water withdrawn from the lower Front River. The Plant contains four Speece Cones, although only a maximum of three Speece Cones will be on and operational at any given time. The Plant operation data provides information on water temperature, conductivity, and DO of the water drawn from lower Front River; oxygen flow level from the Speece Cones; and the flow distribution of the DO super-saturated water to the Back River and lower Front River. For the Test Run sampling effort, the Plant data were used to determine when the Plant was discharging DO super-saturated water (on), and not discharging DO super-saturated water (off). The Plant operation data was also used in the calculation of WCTE.

Plant data with a fifteen (15) minute interval were obtained two (2) times per week during the Test Run sampling by USACE staff and uploaded to the project OneDrive. A *.csv file contained the data for multiple parameters of the plant operation and the *.hdr file contained the corresponding header information. The Plant data files were downloaded from the OneDrive and the raw data files were archived on the QA/QC team internal server. During processing, the *.csv files were converted to Excel workbooks and the headers were inserted in the first row on the sheet. The Plant data contains output for three hundred twenty-one (321) parameters. The most useful raw plant data headers, and their corresponding definition, for calculating Plant oxygen loads and flows, are provided in **Table J-24**.

Table J-24 Raw plant data headers and definitions

Raw Plant Header	Definition
DEV.RW_SUPPLY_TEMP.SCALED_VALUE	Raw Water Temp (F)
DEV.RW_SUPPLY_COND.SCALED_VALUE	Raw Water Conductivity
DEV.RW_SUPPLY_DO.SCALED_VALUE	Raw Water DO
DEV.O2_FLOW_TOTAL	Total Oxygen Flow Into Cones (lbs/day)
DEV.H2O_FLOW_TOTAL	Total Effluent Water Flow (GPM)
DEV.O2_DAY_FLOW1	Oxygen Into River (lbs/day)
DEV.SPEECE_FLOW_T	Total SC Water Flow (GPM)
DEV.CONE1_EFF	Speece Cone 1 Efficiency
DEV.SPEECE1.SC_EFF_O2	Speece Cone 1 DO Out
DEV.SC1_OUT_TEMP_SCL.SCALED_VALUE	Speece Cone 1 Temperature (F)
DEV.SPEECE1.SC_FLOW	Speece Cone 1 Water Flow (PV)
DEV.SPEECE1.SPEECE_02_PV	Speece Cone 1 Oxygen Flow (PV)
DEV.CONE2_EFF	Speece Cone 2 Efficiency
DEV.SPEECE2.SC_EFF_O2	Speece Cone 2 DO Out
DEV.SC2_OUT_TEMP_SCL.SCALED_VALUE	Speece Cone 2 Temperature (F)
DEV.SPEECE2.SC_FLOW	Speece Cone 2 Water Flow (PV)
DEV.SPEECE2.SPEECE_02_PV	Speece Cone 2 Oxygen Flow (PV)
DEV.CONE3_EFF	Speece Cone 3 Efficiency
DEV.SPEECE3.SC_EFF_O2	Speece Cone 3 DO Out

Raw Plant Header	Definition
DEV.SC3_OUT_TEMP_SCL.SCALED_VALUE	Speece Cone 3 Temperature (F)
DEV.SPEECE3.SC_FLOW	Speece Cone 3 Water Flow (PV)
DEV.SPEECE3.SPEECE_02_PV	Speece Cone 3 Oxygen Flow (PV)
DEV.CONE4_EFF	Speece Cone 4 Efficiency
DEV.SPEECE4.SC_EFF_O2	Speece Cone 4 DO Out
DEV.SC4_OUT_TEMP_SCL.SCALED_VALUE	Speece Cone 4 Temperature (F)
DEV.SPEECE4.SC_FLOW	Speece Cone 4 Water Flow (PV)
DEV.SPEECE4.SPEECE_02_PV	Speece Cone 4 Oxygen Flow (PV)
DEV.EFF_COND_1_SCL.SCALED_VALUE	Effluent Conductivity
DEV.SR_FLOW_PID.PV	Savannah River Flow PID (PV) (GPM)
DEV.BR_FLOW_PID.PV	Back River Flow PID (PV) (GPM)

The parameter DEV.O2_DAY_FLOW1 [O2 Into River (lbs/day)] was used to assess Plant operation. If DEV.O2_DAY_FLOW1 was greater than zero then the Plant was considered to be on and if it was zero or less then the Plant was considered to be off. The parameters DEV.BR_FLOW_PID.PV [Back River Flow (GPM)] and DEV.SR_FLOW_PID.PV [Savannah River Flow (GPM)] were used to determine the percentage of the total flow going to the Back River and lower Front River respectively. The load of DO going to the Back River and lower Front River were calculated by finding the product of DEV.O2_DAY_FLOW1 [O2 Into River (lbs/day)] and the percentage of the flow going to the Back River and lower Front River respectively.

The DO loads calculated from the raw Plant data by the QA/QC team were used to calculate WCTE throughout the Test Run period. After completion of the Test Run, GHD performed QA/QC checks on the Plant data and provided updated timeseries of flow and DO loads to the Back River and lower Front River diffusers. The WCTE calculations were updated with the QA/QC'd plant values.

J.7 SEMI-PERMANENT BUOY AND PLATFORM COMPARED TO PROFILING

Table J-25 Profile and semi-permanent buoy comparison

Location	Tide	Date	Time	Depth (m)		DO Saturation (%)		DO (mg/L)		Salinity (PPT)		Temperature (°C)	
				Pro	Buoy	Pro	Buoy	Pro	Buoy	Pro	Buoy	Pro	Buoy
LFR_A	Ebb	3/26/2019	8:32	0.39	0.49	88.3	88.2	8.78	8.77	0.12	0.12	15.62	15.61
LFR_A	Flood	3/26/2019	14:01	0.45	0.83	90.3	89.2	8.88	8.82	0.91	0.57	15.89	15.78
LFR_A	Ebb	3/28/2019	10:19	0.44	0.73	83.3	82.9	8.42	8.32	0.71	0.74	14.68	15.02
LFR_A	Flood	3/28/2019	15:45	0.61	0.54	88.2	88.1	8.74	8.65	0.53	0.52	15.63	16.11
LFR_A	Ebb	3/31/2019	13:00	0.38	0.25	87.2	87.1	8.49	8.47	0.60	0.59	16.49	16.52
LFR_A	Ebb	4/2/2019	14:33	0.66	0.70	83.1	82.9	8.26	8.22	0.86	1.02	15.44	15.49
LFR_A	Flood	4/4/2019	9:32	0.64		77.6	77.7	7.77	7.72	2.29	1.66	14.72	15.21
LFR_A	Ebb	4/4/2019	15:38	0.63		83.4	83.2	8.30	8.27	0.24	0.24	15.54	15.61
LFR_A	Flood	4/9/2019	12:20	0.51		72.3	75.4	6.82	7.07	1.11	1.01	17.86	18.17

Location	Tide	Date	Time	Depth (m)		DO Saturation (%)		DO (mg/L)		Salinity (PPT)		Temperature (°C)	
				Pro	Buoy	Pro	Buoy	Pro	Buoy	Pro	Buoy	Pro	Buoy
LFR_A	Flood	4/18/2019	9:23	0.48	0.43	59.1	59.1	5.41	5.34	1.41	1.27	19.27	19.98
LFR_A	Flood	4/21/2019	11:17	0.32	0.80	72.3	70.5	6.76	6.52	0.14	0.14	18.58	19.06
LFR_A	Ebb	5/2/2019	14:40	0.48	0.59	78.4	78.9	6.95	6.98	0.47	0.29	21.21	21.32
LFR_A	Flood	5/7/2019	11:11	1.00	1.08	63.5	63.4	5.48	5.44	0.53	0.56	22.54	22.81
LFR_A	Flood	5/9/2019	12:46	1.41	0.49	65.6	65.4	5.64	5.60	0.46	0.41	22.74	23.02
LFR_N	Ebb	3/14/2019	9:35	0.39	0.22	81.9	82.3	8.04	8.09	0.19	0.17	16.21	16.18
LFR_N	Flood	3/14/2019	15:22	0.30	0.20	83.2	83.1	8.04	8.04	0.44	0.44	16.88	16.87
LFR_N	Flood	3/19/2019	8:25	0.68	0.26	74.5	74.2	7.36	7.31	1.33	1.36	15.63	15.67
LFR_N	Flood	3/21/2019	11:35	0.75	0.15	77.5	77.6	7.87	7.80	0.69	0.64	14.51	14.98
LFR_N	Ebb	3/21/2019	17:15	0.36	0.07	89.5	85.0	9.12	8.61	0.09	0.06	14.50	14.78
LFR_N	Ebb	3/26/2019	8:28	0.16	0.12	102.1	100.7	10.14	10.00	0.16	0.16	15.63	15.68
LFR_N	Flood	3/26/2019	13:57	0.30	0.16	88.2	90.0	8.69	8.85	0.97	0.55	15.81	16.05
LFR_N	Ebb	3/28/2019	10:13	0.44	0.29	83.0	82.4	8.37	8.24	0.95	0.78	14.77	15.17
LFR_N	Flood	3/28/2019	15:50	0.88	0.22	87.5	87.8	8.66	8.60	0.76	0.54	15.70	16.19
LFR_N	Ebb	3/31/2019	12:55	0.65	0.13	87.2	86.6	8.48	8.43	0.65	0.60	16.50	16.52
LFR_N	Ebb	4/2/2019	14:26	0.46	0.12	83.1	82.8	8.25	8.21	0.96	0.88	15.46	15.52
LFR_N	Flood	4/4/2019	9:29	0.93	0.27	77.4	77.3	7.76	7.68	1.96	1.71	14.72	15.23
LFR_N	Ebb	4/4/2019	15:47	0.54	0.25	94.5	92.6	9.40	9.18	0.44	0.46	15.53	15.70
LFR_N	Flood	4/9/2019	12:16	0.29	0.08	71.7	72.4	6.77	6.84	1.59	1.14	17.73	17.80
LFR_N	Flood	4/18/2019	9:29	0.48	0.41	60.3	60.4	5.52	5.44	1.35	1.42	19.29	20.01
LFR_N	Flood	4/21/2019	11:22	0.33	0.42	72.2	71.0	6.75	6.56	0.14	0.15	18.55	19.15
LFR_N	Ebb	5/2/2019	14:34	0.72	0.46	79.2	79.4	6.99	7.01	0.56	0.33	21.37	21.42
LFR_N	Flood	5/7/2019	11:21	0.80	0.45	63.4	64.1	5.46	5.48	0.55	0.53	22.59	22.99
LFR_N	Flood	5/9/2019	12:51	1.12	0.44	66.6	63.7	5.71	5.47	0.43	0.43	22.91	22.87
LFR_S	Ebb	3/14/2019	9:39	0.32	0.24	84.7	85.0	8.31	8.34	0.23	0.23	16.20	16.23
LFR_S	Flood	3/14/2019	15:18	0.26	0.27	82.3	81.5	7.97	7.89	0.49	0.55	16.76	16.77
LFR_S	Flood	3/19/2019	8:20	0.44	0.32	75.2	73.9	7.42	7.28	1.36	1.34	15.65	15.68
LFR_S	Flood	3/21/2019	11:31	0.94	0.21	78.0	77.8	7.90	7.81	0.68	0.60	14.61	15.04
LFR_S	Ebb	3/21/2019	17:08	0.24	0.08	90.4	90.1	9.22	9.11	0.08	0.07	14.46	14.82
LFR_S	Ebb	3/26/2019	8:24	0.89	0.21	102.2	108.0	10.16	10.73	0.17	0.16	15.63	15.68
LFR_S	Flood	3/26/2019	13:52	0.21	0.22	90.3	90.4	8.88	8.89	0.69	0.55	15.97	16.03
LFR_S	Ebb	3/28/2019	10:04	0.45	0.31	82.9	82.0	8.35	8.17	1.09	1.20	14.78	15.23
LFR_S	Flood	3/28/2019	15:55	0.67	0.32	85.9	87.4	8.54	8.54	1.00	0.70	15.43	16.31
LFR_S	Ebb	3/31/2019	12:50	0.77	0.19	87.7	87.0	8.50	8.43	0.89	0.86	16.60	16.60
LFR_S	Ebb	4/2/2019	14:18	1.46	0.21	82.6	82.4	8.19	8.17	1.12	0.96	15.45	15.53
LFR_S	Flood	4/4/2019	9:23	0.76	0.34	78.0	77.5	7.82	7.70	1.97	1.64	14.75	15.27
LFR_S	Ebb	4/4/2019	15:51	0.68	0.25	104.9	104.4	10.46	10.39	0.42	0.42	15.44	15.48
LFR_S	Flood	4/9/2019	12:12	0.20	0.15	73.1	74.6	6.91	7.00	1.01	0.95	17.80	18.16
LFR_S	Flood	4/18/2019	9:35	0.40	0.45	60.5	59.7	5.54	5.39	1.29	1.19	19.31	20.01
LFR_S	Flood	4/21/2019	11:26	0.43	0.47	71.4	70.6	6.69	6.52	0.18	0.18	18.46	19.16
LFR_S	Ebb	5/2/2019	14:25	1.79	0.48	77.3	77.7	6.83	6.85	0.81	0.77	21.21	21.34

Location	Tide	Date	Time	Depth (m)		DO Saturation (%)		DO (mg/L)		Salinity (PPT)		Temperature (°C)	
				Pro	Buoy	Pro	Buoy	Pro	Buoy	Pro	Buoy	Pro	Buoy
LFR_S	Flood	5/7/2019	11:25	0.53	0.47	64.2	65.8	5.50	5.62	0.59	0.53	22.87	23.14
LFR_S	Flood	5/9/2019	12:55	0.68	0.44	66.6	64.4	5.72	5.52	0.43	0.44	22.84	22.88
LBR_NE	Ebb	3/14/2019	10:15	0.21	0.43	92.5	92.2	9.08	9.02	0.11	0.10	16.24	16.40
LBR_NE	Flood	3/14/2019	16:19	0.55	0.51	94.4	93.8	9.01	8.89	0.87	0.85	17.40	17.70
LBR_NE	Flood	3/19/2019	8:44	0.26	1.06	75.6	75.1	7.33	7.25	4.51	4.58	15.58	15.77
LBR_NE	Ebb	3/19/2019	15:22	0.40	0.81	89.0	88.5	8.93	8.82	0.31	0.20	15.18	15.48
LBR_NE	Flood	3/21/2019	10:52	0.26	0.75	78.3	77.8	7.79	7.73	1.97	2.13	15.09	15.10
LBR_NE	Ebb	3/21/2019	17:26	0.29	0.50	92.7	92.2	9.24	9.20	0.18	0.17	15.47	15.48
LBR_NE	Ebb	3/26/2019	9:03	0.36	0.68	94.1	92.7	9.34	9.12	0.09	0.08	15.72	16.11
LBR_NE	Flood	3/26/2019	13:55	0.75	0.64	101.6	102.0	9.89	9.84	0.57	0.57	16.46	16.91
LBR_NE	Ebb	3/28/2019	10:24	0.43	0.65	86.9	87.9	8.79	8.89	0.07	0.09	14.83	14.80
LBR_NE	Flood	3/28/2019	16:09	0.48	0.32	114.0	115.8	11.13	11.29	1.59	1.64	16.07	16.11
LBR_NE	Ebb	3/30/2019	12:05	0.57	0.72	93.1	90.9	9.14	8.93	0.10	0.07	16.23	16.22
LBR_NE	Ebb	4/2/2019	15:06	0.57		93.0	91.2	9.39	9.12	0.11	0.10	14.94	15.34
LBR_NE	Flood	4/4/2019	9:24	0.45		92.1	90.9	8.96	8.84	2.87	3.00	15.88	15.84
LBR_NE	Ebb	4/4/2019	15:58	0.80		97.0	98.7	9.63	9.65	0.15	0.20	15.71	16.36
LBR_NE	Flood	4/9/2019	12:10	0.32		88.0	89.3	8.02	8.04	1.62	1.63	19.43	20.03
LBR_NE	Flood	4/18/2019	9:17	0.98	0.53	63.7	62.4	5.66	5.54	3.03	3.00	20.28	20.32
LBR_NE	Flood	4/20/2019	11:03	0.24	0.52	73.4	71.9	6.73	6.50	0.96	0.95	19.30	20.00
LBR_NE	Ebb	4/28/2019	11:36	0.80	0.60	97.6	95.0	8.92	8.55	0.09	0.08	19.73	20.47
LBR_NE	Ebb	5/2/2019	14:27	0.37		100.7	97.7	8.78	8.38	0.15	0.18	22.09	22.98
LBR_NE	Flood	5/7/2019	11:18	0.54	0.65	70.7	68.8	6.01	5.74	1.77	1.79	22.96	23.90
LBR_NE	Flood	5/11/2019	15:05	0.52	0.56	96.2	93.2	7.90	7.64	1.16	1.15	25.00	25.08
LBR_NW	Ebb	3/14/2019	10:09	0.32	0.50	85.1	82.9	8.35	8.10	0.05	0.05	16.23	16.49
LBR_NW	Flood	3/14/2019	16:14	0.40	0.41	96.8	96.3	9.20	9.09	0.87	0.87	17.57	17.93
LBR_NW	Flood	3/19/2019	8:37	0.38	0.57	75.7	73.7	7.34	7.19	4.27	2.62	15.60	15.92
LBR_NW	Ebb	3/19/2019	15:19	0.53	0.36	90.2	88.5	9.06	8.82	0.21	0.20	15.15	15.50
LBR_NW	Flood	3/21/2019	10:49	0.28	0.57	77.6	75.3	7.72	7.48	2.09	2.24	15.03	15.06
LBR_NW	Ebb	3/21/2019	17:21	0.43	0.50	94.7	93.7	9.41	9.29	0.13	0.13	15.62	15.77
LBR_NW	Ebb	3/26/2019	8:56	0.43	0.61	86.9	84.7	8.63	8.34	0.06	0.06	15.67	16.09
LBR_NW	Flood	3/26/2019	14:00	0.59	0.64	102.3	99.6	9.98	9.62	0.31	0.34	16.45	16.93
LBR_NW	Ebb	3/28/2019	10:19	0.40	0.39	87.2	86.4	8.82	8.73	0.06	0.06	14.82	14.88
LBR_NW	Flood	3/28/2019	15:58	0.45	0.35	110.5	108.9	10.81	10.65	1.07	1.14	16.13	16.08
LBR_NW	Ebb	3/30/2019	12:10	0.25	0.07	95.4	93.4	9.34	9.14	0.07	0.00	16.38	16.44
LBR_NW	Flood	4/4/2019	9:29	0.35	0.63	89.8	86.5	8.75	8.42	3.28	3.24	15.73	15.72
LBR_NW	Ebb	4/4/2019	15:53	0.62	0.69	113.3	109.6	11.02	10.57	0.18	0.17	16.64	17.05
LBR_NW	Flood	4/9/2019	12:07	0.35	0.48	85.7	83.5	7.83	7.53	1.60	1.62	19.34	19.94
LBR_NW	Flood	4/18/2019	9:26	1.60	0.83	62.3	61.3	5.53	5.45	3.16	2.91	20.24	20.32
LBR_NW	Flood	4/20/2019	10:58	0.32	0.64	70.5	69.2	6.46	6.25	0.99	0.97	19.30	20.03
LBR_NW	Ebb	4/28/2019	11:30	0.58	0.83	99.6	100.0	9.13	9.00	0.08	0.08	19.57	20.48

Location	Tide	Date	Time	Depth (m)		DO Saturation (%)		DO (mg/L)		Salinity (PPT)		Temperature (°C)	
				Pro	Buoy	Pro	Buoy	Pro	Buoy	Pro	Buoy	Pro	Buoy
LBR_NW	Ebb	5/2/2019	14:22	0.32	0.86	114.7	106.8	9.83	9.08	0.23	0.15	22.98	23.45
LBR_NW	Flood	5/7/2019	11:24	0.68	0.77	68.2	65.5	5.80	5.47	1.82	1.73	22.90	23.90
LBR_SE	Ebb	3/14/2019	9:57	0.46	0.47	84.7	83.9	8.32	8.19	0.11	0.11	16.20	16.51
LBR_SE	Flood	3/14/2019	16:00	0.51	0.35	96.8	96.9	9.25	9.19	0.90	0.90	17.31	17.64
LBR_SE	Flood	3/19/2019	8:23	0.43	0.83	76.2	75.4	7.37	7.24	4.62	4.70	15.61	15.95
LBR_SE	Ebb	3/19/2019	15:09	0.56	0.49	90.6	89.9	9.06	8.94	0.40	0.39	15.25	15.58
LBR_SE	Flood	3/21/2019	10:41	0.28	0.66	77.3	77.1	7.68	7.66	2.19	2.20	15.09	15.11
LBR_SE	Ebb	3/21/2019	17:09	1.29	0.39	93.6	93.1	9.32	9.26	0.21	0.21	15.57	15.59
LBR_SE	Ebb	3/26/2019	8:47	1.11	0.42	87.2	86.6	8.66	8.52	0.10	0.10	15.72	16.12
LBR_SE	Flood	3/26/2019	14:13	0.54	0.58	102.3	101.4	9.95	9.77	0.56	0.56	16.54	17.01
LBR_SE	Ebb	3/28/2019	10:08	1.58	0.64	87.7	88.3	8.89	8.95	0.11	0.10	14.71	14.75
LBR_SE	Flood	3/28/2019	15:48	0.99	0.71	108.9	110.0	10.64	10.74	1.54	1.46	16.06	16.09
LBR_SE	Ebb	3/30/2019	12:22	0.38	0.00	95.1	93.0	9.33	9.11	0.09	0.09	16.30	16.31
LBR_SE	Ebb	4/2/2019	14:37	0.55	0.00	94.0	93.0	9.50	9.32	0.12	0.13	14.86	15.26
LBR_SE	Flood	4/4/2019	9:37	0.41	0.21	88.8	81.4	8.65	7.92	3.24	2.96	15.73	15.81
LBR_SE	Ebb	4/4/2019	15:41	1.47	0.13	102.2	103.0	10.09	10.06	0.19	0.18	15.93	16.49
LBR_SE	Flood	4/9/2019	12:15	0.34	0.58	85.8	86.8	7.80	7.79	1.67	1.58	19.51	20.19
LBR_SE	Flood	4/18/2019	9:40	1.06	0.27	62.8	65.7	5.57	5.82	3.23	1.99	20.30	20.39
LBR_SE	Flood	4/20/2019	11:10	0.34	0.56	70.8	68.5	6.49	6.18	0.94	0.93	19.30	20.05
LBR_SE	Ebb	4/28/2019	11:18	0.47	0.83	98.8	98.3	9.05	8.84	0.11	0.11	19.62	20.57
LBR_SE	Ebb	5/2/2019	14:14	0.29	0.51	100.6	98.1	8.78	8.40	0.19	0.20	22.04	23.00
LBR_SE	Flood	5/7/2019	11:37	0.67	0.68	70.4	62.8	5.98	5.24	1.82	1.78	23.00	24.02
LBR_SE	Flood	5/11/2019	15:34	0.44	0.52	93.6	83.9	7.68	6.87	1.20	0.75	25.00	25.11
LBR_SW	Ebb	3/14/2019	10:02	0.33	0.44	84.0	83.3	8.27	8.15	0.05	0.05	16.14	16.44
LBR_SW	Flood	3/14/2019	16:09	0.69	0.54	95.8	94.8	9.11	8.96	0.88	0.87	17.50	17.83
LBR_SW	Flood	3/19/2019	8:29	0.48	1.00	75.5	74.7	7.31	7.19	4.55	4.42	15.61	15.94
LBR_SW	Ebb	3/19/2019	15:14	0.36	0.73	89.0	87.9	8.94	8.78	0.21	0.23	15.11	15.43
LBR_SW	Flood	3/21/2019	10:45	0.19	0.65	77.6	76.9	7.73	7.64	2.00	2.16	15.04	15.04
LBR_SW	Ebb	3/21/2019	17:15	0.40	0.57	90.8	90.1	9.09	9.02	0.07	0.07	15.31	15.34
LBR_SW	Ebb	3/26/2019	8:51	0.74	0.58	87.0	86.0	8.64	8.48	0.06	0.06	15.68	16.08
LBR_SW	Flood	3/26/2019	14:06	0.50	0.46	103.8	101.4	10.06	9.75	0.56	0.56	16.70	17.08
LBR_SW	Ebb	3/28/2019	10:12	0.47	0.63	86.6	86.6	8.76	8.76	0.06	0.06	14.83	14.86
LBR_SW	Flood	3/28/2019	15:53	0.48	0.68	108.2	107.0	10.60	10.50	1.43	1.43	15.95	15.88
LBR_SW	Ebb	3/30/2019	12:16	0.37	0.54	90.4	90.3	8.89	8.86	0.05	0.05	16.19	16.25
LBR_SW	Ebb	4/2/2019	14:49	0.64	0.61	90.6	90.0	9.16	9.02	0.05	0.06	14.87	15.25
LBR_SW	Flood	4/4/2019	9:33	0.56	0.73	89.0	87.9	8.67	8.56	3.21	3.16	15.69	15.74
LBR_SW	Ebb	4/4/2019	15:47	0.83	0.69	99.9	97.9	9.91	9.63	0.08	0.07	15.72	16.15
LBR_SW	Flood	4/9/2019	12:20	0.46	0.54	84.8	84.9	7.74	7.64	1.68	1.66	19.34	20.05
LBR_SW	Flood	4/18/2019	9:33	0.99	0.82	62.6	63.8	5.57	5.66	3.03	2.82	20.25	20.40
LBR_SW	Flood	4/20/2019	11:14	0.46	0.64	69.2	68.2	6.35	6.17	0.93	0.92	19.27	19.96
LBR_SW	Ebb	4/28/2019	11:24	0.57	0.82	96.9	92.7	8.90	8.38	0.09	0.08	19.49	20.25

Location	Tide	Date	Time	Depth (m)		DO Saturation (%)		DO (mg/L)		Salinity (PPT)		Temperature (°C)	
				Pro	Buoy	Pro	Buoy	Pro	Buoy	Pro	Buoy	Pro	Buoy
LBR_SW	Ebb	5/2/2019	14:18	0.33	0.85	99.1	94.7	8.68	8.17	0.08	0.08	21.89	22.67
LBR_SW	Flood	5/7/2019	11:31	0.50	0.86	69.0	65.5	5.87	5.47	1.80	1.78	22.90	23.90
LBR_SW	Flood	5/11/2019	15:24	0.52	0.78	88.4	77.8	7.27	6.39	1.14	1.15	24.92	24.96

Table J-26 Profile and platform comparison

Location	Tide	Date	Time	Depth (m)		DO Saturation (%)		DO (mg/L)		Salinity (PPT)		Temperature (°C)	
				Pro	Buoy	Pro	Buoy	Pro	Buoy	Pro	Buoy	Pro	Buoy
L9-S	Ebb	3/14/2019	9:40	1.30	1.19	86.10	90.24	8.46	8.81	0.05	0.07	16.19	16.50
L12-S	Ebb	3/14/2019	9:40	1.30	1.21	86.10	84.42	8.46	8.23	0.05	0.07	16.19	16.56
L13-V	Ebb	3/14/2019	9:40	1.94	1.86	85.70	84.18	8.43	8.23	0.05	0.08	16.17	16.43
L8-M	Ebb	3/14/2019	9:40	2.66	2.79	84.60	84.81	8.32	8.29	0.05	0.09	16.15	16.41
L5-M	Ebb	3/14/2019	9:40	2.66	2.85	84.60	83.77	8.32	8.18	0.05	0.09	16.15	16.48
L15-V	Ebb	3/14/2019	9:40	3.64	3.37	84.60	83.40	8.32	8.14	0.05	0.09	16.15	16.52
L1-D	Ebb	3/14/2019	9:40	4.20	4.29	84.40	84.49	8.31	8.26	0.05	0.10	16.14	16.42
L4-D	Ebb	3/14/2019	9:40	4.43	4.34	84.40	83.43	8.30	8.16	0.05	0.10	16.13	16.38
L12-S	Flood	3/14/2019	15:48	1.13	1.12	95.70	95.59	9.11	9.02	0.88	0.80	17.48	17.92
L9-S	Flood	3/14/2019	15:48	1.18	1.19	95.50	96.45	9.09	9.12	0.88	0.81	17.45	17.81
L13-V	Flood	3/14/2019	15:49	1.64	1.82	94.00	95.66	8.98	9.04	0.89	0.81	17.32	17.85
L8-M	Flood	3/14/2019	15:49	2.77	2.71	93.10	96.35	8.89	9.10	0.89	0.81	17.29	17.87
L5-M	Flood	3/14/2019	15:49	2.87	2.85	92.90	95.32	8.88	9.00	0.89	0.81	17.28	17.88
L15-V	Flood	3/14/2019	15:49	3.29	3.36	91.80	95.28	8.78	8.99	0.89	0.82	17.23	17.91
L4-D	Flood	3/14/2019	15:49	4.19	4.16	91.60	95.17	8.76	8.98	0.89	0.82	17.24	17.90
L1-D	Flood	3/14/2019	15:49	4.27	4.28	91.60	95.92	8.76	9.05	0.89	0.82	17.24	17.91
L12-S	Flood	3/19/2019	8:56	1.25	1.17	76.20	75.58	7.38	7.26	4.67	4.79	15.58	15.93
L9-S	Flood	3/19/2019	8:56	1.26	1.26	76.20	77.58	7.37	7.49	4.72	4.93	15.59	15.66
L13-V	Flood	3/19/2019	8:56	1.87	1.88	75.70	75.32	7.29	7.24	5.17	4.84	15.65	15.83
L8-M	Flood	3/19/2019	8:56	2.87	2.76	75.30	75.89	7.25	7.29	5.25	5.00	15.67	15.83
L5-M	Flood	3/19/2019	8:56	2.97	2.95	75.30	74.70	7.25	7.16	5.27	4.99	15.67	15.94
L15-V	Flood	3/19/2019	8:57	3.46	3.42	75.10	74.40	7.23	7.13	5.35	4.92	15.68	15.99
L4-D	Flood	3/19/2019	8:57	4.35	4.21	75.10	74.53	7.23	7.17	5.36	4.99	15.68	15.80
L1-D	Flood	3/19/2019	8:57	4.35	4.35	75.10	75.39	7.23	7.24	5.36	4.99	15.68	15.86
L9-S	Ebb	3/19/2019	15:32	1.49	1.18	89.40	93.83	8.98	9.40	0.21	0.31	15.13	15.20
L12-S	Ebb	3/19/2019	15:32	1.49	1.22	89.40	90.85	8.98	9.04	0.21	0.30	15.13	15.52
L13-V	Ebb	3/19/2019	15:33	1.88	1.87	89.30	90.40	8.96	9.02	0.25	0.30	15.14	15.40
L5-M	Ebb	3/19/2019	15:33	3.07	2.79	89.10	88.97	8.95	8.86	0.25	0.31	15.15	15.50
L8-M	Ebb	3/19/2019	15:33	3.07	2.79	89.10	90.15	8.95	9.01	0.25	0.31	15.15	15.35
L15-V	Ebb	3/19/2019	15:33	3.37	3.37	89.10	88.34	8.94	8.78	0.26	0.32	15.15	15.57
L4-D	Ebb	3/19/2019	15:33	3.86	4.26	89.00	88.35	8.93	8.83	0.27	0.31	15.17	15.32
L1-D	Ebb	3/19/2019	15:33	4.65	4.28	89.00	89.02	8.93	8.89	0.28	0.31	15.17	15.37

Location	Tide	Date	Time	Depth (m)		DO Saturation (%)		DO (mg/L)		Salinity (PPT)		Temperature (°C)	
				Pro	Buoy	Pro	Buoy	Pro	Buoy	Pro	Buoy	Pro	Buoy
L12-S	Flood	3/21/2019	11:01	1.52	0.91	79.70	79.01	7.92	7.86	2.15	1.73	15.07	15.17
L9-S	Flood	3/21/2019	11:01	1.52	1.16	79.70	81.59	7.92	8.17	2.15	1.79	15.07	14.81
L13-V	Flood	3/21/2019	11:01	1.52	1.69	79.70	79.04	7.92	7.88	2.15	1.73	15.07	15.05
L8-M	Flood	3/21/2019	11:02	2.88	2.49	77.00	79.55	7.65	7.94	2.35	1.75	15.04	14.98
L5-M	Flood	3/21/2019	11:02	2.88	2.71	77.00	78.33	7.65	7.79	2.35	1.75	15.04	15.16
L15-V	Flood	3/21/2019	11:02	3.19	3.32	76.70	78.13	7.61	7.76	2.40	1.73	15.06	15.24
L4-D	Flood	3/21/2019	11:02	3.99	3.91	76.70	78.29	7.61	7.82	2.41	1.76	15.06	14.96
L1-D	Flood	3/21/2019	11:02	4.18	4.19	76.50	79.23	7.59	7.90	2.42	1.77	15.05	15.01
L9-S	Ebb	3/21/2019	17:37	1.19	0.99	93.90	97.49	9.40	9.79	0.07	0.17	15.31	15.15
L12-S	Ebb	3/21/2019	17:37	1.19	1.10	93.90	94.02	9.40	9.38	0.07	0.16	15.31	15.47
L13-V	Ebb	3/21/2019	17:37	1.76	1.72	92.30	94.31	9.24	9.43	0.07	0.16	15.31	15.37
L5-M	Ebb	3/21/2019	17:37	2.86	2.62	91.60	93.54	9.17	9.33	0.07	0.17	15.31	15.48
L8-M	Ebb	3/21/2019	17:37	2.86	2.67	91.60	94.73	9.17	9.48	0.07	0.16	15.31	15.33
L15-V	Ebb	3/21/2019	17:37	3.23	3.22	91.00	93.33	9.11	9.29	0.08	0.16	15.31	15.55
L1-D	Ebb	3/21/2019	17:37	4.45	4.05	90.80	93.74	9.09	9.37	0.08	0.16	15.31	15.35
L4-D	Ebb	3/21/2019	17:37	4.45	4.12	90.80	93.08	9.09	9.32	0.08	0.16	15.31	15.30
L9-S	Ebb	3/26/2019	9:12	0.81	1.10	88.90	94.37	8.83	9.29	0.07	0.12	15.70	16.08
L12-S	Ebb	3/26/2019	9:12	0.81	1.18	88.90	90.97	8.83	8.91	0.07	0.12	15.70	16.32
L13-V	Ebb	3/26/2019	9:12	1.82	1.82	88.90	90.99	8.83	8.94	0.07	0.11	15.70	16.20
L5-M	Ebb	3/26/2019	9:12	2.69	2.71	88.80	90.30	8.82	8.86	0.07	0.11	15.71	16.27
L8-M	Ebb	3/26/2019	9:12	2.69	2.76	88.80	91.24	8.82	8.97	0.07	0.10	15.71	16.17
L15-V	Ebb	3/26/2019	9:12	3.65	3.29	88.90	90.51	8.82	8.86	0.08	0.12	15.71	16.35
L1-D	Ebb	3/26/2019	9:12	4.10	4.15	88.90	90.34	8.83	8.87	0.08	0.10	15.71	16.20
L4-D	Ebb	3/26/2019	9:12	4.10	4.22	88.90	89.64	8.83	8.81	0.08	0.11	15.71	16.15
L12-S	Flood	3/26/2019	14:23	0.72	1.09	103.20	106.59	10.02	10.22	0.49	0.40	16.62	17.29
L9-S	Flood	3/26/2019	14:23	1.83	1.15	103.10	109.54	10.02	10.56	0.49	0.41	16.62	17.03
L13-V	Flood	3/26/2019	14:23	1.83	1.79	103.10	100.86	10.02	9.75	0.49	0.42	16.62	16.86
L8-M	Flood	3/26/2019	14:24	2.65	2.68	102.80	100.62	9.99	9.74	0.55	0.50	16.59	16.79
L5-M	Flood	3/26/2019	14:24	2.65	2.74	102.80	99.60	9.99	9.63	0.55	0.50	16.59	16.84
L15-V	Flood	3/26/2019	14:24	3.57	3.32	102.60	100.06	9.97	9.67	0.55	0.50	16.58	16.88
L4-D	Flood	3/26/2019	14:24	4.18	4.15	102.20	99.46	9.94	9.63	0.55	0.52	16.55	16.78
L1-D	Flood	3/26/2019	14:24	4.18	4.20	102.20	100.26	9.94	9.70	0.55	0.52	16.55	16.82
L12-S	Flood	3/28/2019	16:22	1.16	1.21	111.00	112.43	10.81	10.97	1.60	1.32	16.19	16.17
L9-S	Flood	3/28/2019	16:22	1.16	1.26	111.00	116.95	10.81	11.47	1.60	1.35	16.19	15.92
L13-V	Flood	3/28/2019	16:22	1.95	1.89	111.00	113.07	10.81	11.06	1.60	1.31	16.17	16.07
L8-M	Flood	3/28/2019	16:22	3.13	2.79	110.40	113.17	10.77	11.07	1.60	1.32	16.09	16.06
L5-M	Flood	3/28/2019	16:22	3.13	2.88	110.40	112.20	10.77	10.95	1.60	1.32	16.09	16.16
L15-V	Flood	3/28/2019	16:23	3.49	3.42	110.20	111.60	10.76	10.89	1.60	1.31	16.08	16.16
L4-D	Flood	3/28/2019	16:23	4.45	4.24	110.00	111.48	10.74	10.91	1.61	1.33	16.06	16.02
L1-D	Flood	3/28/2019	16:23	4.45	4.34	110.00	111.86	10.74	10.94	1.61	1.33	16.06	16.08
L9-S	Ebb	3/30/2019	12:33	1.56	1.14	91.40	99.47	8.98	9.77	0.05	0.09	16.23	16.21

Location	Tide	Date	Time	Depth (m)		DO Saturation (%)		DO (mg/L)		Salinity (PPT)		Temperature (°C)	
				Pro	Buoy	Pro	Buoy	Pro	Buoy	Pro	Buoy	Pro	Buoy
L12-S	Ebb	3/30/2019	12:33	1.56	1.18	91.40	95.75	8.98	9.36	0.05	0.09	16.23	16.43
L13-V	Ebb	3/30/2019	12:33	1.81	1.82	90.40	95.26	8.89	9.34	0.06	0.09	16.14	16.27
L8-M	Ebb	3/30/2019	12:33	3.02	2.71	90.10	94.87	8.86	9.32	0.06	0.09	16.14	16.20
L5-M	Ebb	3/30/2019	12:33	3.02	2.74	90.10	94.16	8.86	9.23	0.06	0.09	16.14	16.32
L15-V	Ebb	3/30/2019	12:33	3.32	3.32	89.80	93.93	8.84	9.20	0.05	0.09	16.14	16.35
L1-D	Ebb	3/30/2019	12:34	3.72	4.19	90.00	93.61	8.85	9.20	0.06	0.09	16.16	16.20
L4-D	Ebb	3/30/2019	12:34	4.54	4.22	90.00	92.69	8.85	9.12	0.06	0.09	16.17	16.14
L9-S	Ebb	4/02/2019	15:16	1.13	1.10	92.80	101.01	9.37	10.17	0.08	0.18	14.89	15.04
L12-S	Ebb	4/02/2019	15:16	1.10	1.21	92.70	96.91	9.37	9.68	0.08	0.18	14.89	15.38
L13-V	Ebb	4/02/2019	15:16	1.82	1.83	92.40	97.23	9.34	9.74	0.08	0.21	14.88	15.27
L5-M	Ebb	4/02/2019	15:16	2.81	2.73	92.10	96.57	9.31	9.65	0.07	0.20	14.86	15.38
L8-M	Ebb	4/02/2019	15:16	2.81	2.73	92.10	97.70	9.31	9.79	0.07	0.20	14.86	15.23
L15-V	Ebb	4/02/2019	15:16	3.19	3.31	91.60	96.65	9.26	9.64	0.07	0.17	14.84	15.46
L1-D	Ebb	4/02/2019	15:17	4.15	4.16	91.60	97.02	9.26	9.71	0.09	0.23	14.84	15.26
L4-D	Ebb	4/02/2019	15:17	4.23	4.23	91.60	96.47	9.26	9.67	0.09	0.26	14.84	15.22
L12-S	Flood	4/4/2019	9:47	1.27	1.20	90.90	92.31	8.83	8.97	2.99	2.56	15.89	16.02
L9-S	Flood	4/4/2019	9:47	1.27	1.28	90.90	96.03	8.83	9.38	2.99	2.62	15.89	15.74
L13-V	Flood	4/4/2019	9:47	2.00	1.90	90.40	92.67	8.80	9.03	3.08	2.53	15.80	15.89
L8-M	Flood	4/4/2019	9:47	2.95	2.74	90.30	92.95	8.78	9.06	3.11	2.54	15.77	15.86
L5-M	Flood	4/4/2019	9:47	2.95	2.87	90.30	91.93	8.78	8.94	3.11	2.54	15.77	15.96
L15-V	Flood	4/4/2019	9:47	3.45	3.44	89.40	91.69	8.71	8.92	3.24	2.52	15.71	15.98
L4-D	Flood	4/4/2019	9:47	3.88	4.24	88.80	91.24	8.64	8.91	3.28	2.62	15.71	15.74
L1-D	Flood	4/4/2019	9:47	3.88	4.33	88.80	91.73	8.64	8.95	3.28	2.62	15.71	15.79
L9-S	Ebb	4/4/2019	16:05	1.23	1.18	95.60	105.39	9.51	10.37	0.07	0.15	15.61	16.09
L12-S	Ebb	4/4/2019	16:05	1.23	1.26	95.60	101.37	9.51	9.93	0.07	0.15	15.61	16.33
L13-V	Ebb	4/4/2019	16:06	2.09	1.89	95.70	101.77	9.52	9.99	0.07	0.15	15.62	16.22
L8-M	Ebb	4/4/2019	16:06	2.63	2.77	95.80	101.38	9.52	9.96	0.07	0.15	15.62	16.19
L5-M	Ebb	4/4/2019	16:06	2.63	2.80	95.80	100.39	9.52	9.85	0.07	0.14	15.62	16.27
L15-V	Ebb	4/4/2019	16:06	3.43	3.38	95.80	100.32	9.52	9.83	0.07	0.15	15.62	16.31
L1-D	Ebb	4/4/2019	16:06	4.79	4.25	95.70	100.24	9.52	9.84	0.07	0.13	15.62	16.20
L4-D	Ebb	4/4/2019	16:06	4.79	4.30	95.70	99.61	9.52	9.79	0.07	0.14	15.62	16.15
L12-S	Flood	4/09/2019	12:27	1.79	1.01	86.70	89.22	7.87	7.95	1.57	1.34	19.59	20.64
L9-S	Flood	4/09/2019	12:27	1.79	1.07	86.70	92.56	7.87	8.26	1.57	1.39	19.59	20.51
L13-V	Flood	4/09/2019	12:27	1.79	1.71	86.70	89.00	7.87	7.95	1.57	1.41	19.59	20.48
L8-M	Flood	4/09/2019	12:27	2.54	2.55	86.60	87.91	7.87	7.86	1.60	1.45	19.55	20.43
L5-M	Flood	4/09/2019	12:27	2.54	2.66	86.60	87.81	7.87	7.85	1.60	1.45	19.55	20.44
L15-V	Flood	4/09/2019	12:27	3.56	3.24	86.60	86.85	7.87	7.76	1.61	1.44	19.53	20.43
L4-D	Flood	4/09/2019	12:27	4.18	4.05	86.60	86.82	7.88	7.77	1.62	1.46	19.49	20.38
L1-D	Flood	4/09/2019	12:27	4.18	4.12	86.60	87.34	7.88	7.82	1.62	1.46	19.49	20.37
L12-S	Flood	4/18/2019	9:52	0.93	0.94	66.40	67.16	5.89	5.95	2.66	2.22	20.44	20.64
L9-S	Flood	4/18/2019	9:52	0.93	0.98	66.40	67.70	5.89	6.01	2.66	2.22	20.44	20.59

Location	Tide	Date	Time	Depth (m)		DO Saturation (%)		DO (mg/L)		Salinity (PPT)		Temperature (°C)	
				Pro	Buoy	Pro	Buoy	Pro	Buoy	Pro	Buoy	Pro	Buoy
L8-M	Flood	4/18/2019	9:52	2.42	2.44	65.30	67.30	5.79	5.97	3.16	2.22	20.32	20.57
L5-M	Flood	4/18/2019	9:52	2.42	2.69	65.30	66.86	5.79	5.93	3.16	2.22	20.32	20.59
L9-S	Flood	4/20/2019	11:25	1.36	0.96	71.60	73.53	6.57	6.62	0.94	1.06	19.26	20.16
L12-S	Flood	4/20/2019	11:25	1.36	1.01	71.60	72.99	6.57	6.57	0.94	1.06	19.26	20.22
L8-M	Flood	4/20/2019	11:25	2.26	2.50	71.30	73.02	6.54	6.58	0.95	1.07	19.27	20.14
L5-M	Flood	4/20/2019	11:25	2.26	2.64	71.30	72.70	6.54	6.55	0.95	1.07	19.27	20.15
L9-S	Ebb	4/28/2019	11:42	1.53	0.99	104.00	107.16	9.44	9.60	0.10	0.11	20.02	20.73
L12-S	Ebb	4/28/2019	11:42	1.53	1.17	104.00	108.22	9.44	9.70	0.10	0.11	20.02	20.72
L8-M	Ebb	4/28/2019	11:42	2.54	2.65	98.40	98.07	9.00	8.85	0.10	0.12	19.66	20.36
L5-M	Ebb	4/28/2019	11:42	2.54	2.70	98.40	97.85	9.00	8.83	0.10	0.12	19.66	20.37
L9-S	Flood	5/07/2019	11:47	1.24	1.04	74.90	73.55	6.31	6.11	1.69	1.69	23.46	24.21
L12-S	Flood	5/07/2019	11:47	1.24	1.16	74.90	73.51	6.31	6.10	1.69	1.70	23.46	24.23
L8-M	Flood	5/07/2019	11:48	2.55	2.65	73.60	72.86	6.21	6.06	1.70	1.73	23.37	24.13
L5-M	Flood	5/07/2019	11:48	2.55	2.75	73.60	72.42	6.21	6.02	1.70	1.73	23.37	24.15
L10-S	Ebb	3/14/2019	9:46	1.31	1.19	85.20	84.76	8.36	8.28	0.06	0.07	16.24	16.50
L11-S	Ebb	3/14/2019	9:46	1.31	1.21	85.20	85.18	8.36	8.32	0.06	0.07	16.24	16.49
L16-V	Ebb	3/14/2019	9:46	1.72	1.83	84.90	83.74	8.34	8.17	0.06	0.08	16.21	16.52
L6-M	Ebb	3/14/2019	9:46	3.01	2.68	84.40	83.27	8.30	8.14	0.06	0.08	16.15	16.42
L7-M	Ebb	3/14/2019	9:46	3.01	2.75	84.40	83.90	8.30	8.20	0.06	0.08	16.15	16.45
L14-V	Ebb	3/14/2019	9:46	3.34	3.39	84.30	83.85	8.29	8.18	0.06	0.09	16.14	16.52
L3-D	Ebb	3/14/2019	9:46	4.10	4.16	83.90	83.30	8.26	8.14	0.06	0.10	16.12	16.45
L2-D	Ebb	3/14/2019	9:46	4.10	4.17	83.90	83.40	8.26	8.14	0.06	0.10	16.12	16.49
L11-S	Flood	3/14/2019	15:43	1.47	1.14	97.10	96.25	9.23	9.10	0.87	0.79	17.55	17.85
L10-S	Flood	3/14/2019	15:43	1.47	1.23	97.10	95.40	9.23	9.01	0.87	0.79	17.55	17.87
L16-V	Flood	3/14/2019	15:43	1.47	1.81	97.10	95.09	9.23	8.98	0.87	0.80	17.55	17.88
L7-M	Flood	3/14/2019	15:43	3.04	2.69	94.20	95.59	8.99	9.03	0.89	0.82	17.34	17.85
L6-M	Flood	3/14/2019	15:43	3.04	2.70	94.20	94.78	8.99	8.96	0.89	0.82	17.34	17.83
L14-V	Flood	3/14/2019	15:44	3.39	3.35	93.70	95.66	8.94	9.03	0.89	0.82	17.33	17.93
L3-D	Flood	3/14/2019	15:44	4.32	4.09	93.60	95.37	8.94	9.01	0.89	0.83	17.33	17.88
L2-D	Flood	3/14/2019	15:44	4.32	4.19	93.60	95.21	8.94	8.99	0.89	0.82	17.33	17.89
L11-S	Flood	3/19/2019	8:52	1.57	1.20	76.00	76.17	7.35	7.32	4.76	4.84	15.59	15.85
L10-S	Flood	3/19/2019	8:52	1.57	1.30	76.00	75.62	7.35	7.28	4.76	4.85	15.59	15.82
L16-V	Flood	3/19/2019	8:52	1.84	1.88	75.70	74.88	7.32	7.19	4.90	4.84	15.61	15.93
L6-M	Flood	3/19/2019	8:52	3.04	2.76	75.50	74.62	7.29	7.17	5.04	4.89	15.64	15.86
L7-M	Flood	3/19/2019	8:52	3.04	2.81	75.50	75.34	7.29	7.24	5.04	4.87	15.64	15.87
L14-V	Flood	3/19/2019	8:52	3.46	3.41	75.30	74.98	7.25	7.19	5.19	4.90	15.67	15.98
L3-D	Flood	3/19/2019	8:52	3.81	4.17	75.20	74.36	7.24	7.13	5.25	4.97	15.67	15.92
L2-D	Flood	3/19/2019	8:52	4.68	4.27	75.10	74.42	7.23	7.28	5.26	1.64	15.67	15.98
L10-S	Ebb	3/19/2019	15:29	1.67	1.19	90.10	90.94	9.04	9.08	0.27	0.30	15.16	15.39
L11-S	Ebb	3/19/2019	15:29	1.67	1.21	90.10	91.47	9.04	9.12	0.27	0.30	15.16	15.44
L16-V	Ebb	3/19/2019	15:29	1.87	1.83	89.80	89.07	9.01	8.86	0.27	0.30	15.16	15.53

Location	Tide	Date	Time	Depth (m)		DO Saturation (%)		DO (mg/L)		Salinity (PPT)		Temperature (°C)	
				Pro	Buoy	Pro	Buoy	Pro	Buoy	Pro	Buoy	Pro	Buoy
L6-M	Ebb	3/19/2019	15:29	2.46	2.67	89.20	88.34	8.95	8.81	0.26	0.31	15.16	15.45
L7-M	Ebb	3/19/2019	15:29	2.46	2.80	89.20	88.79	8.95	8.85	0.26	0.32	15.16	15.47
L14-V	Ebb	3/19/2019	15:29	3.40	3.39	89.10	88.97	8.94	8.85	0.27	0.30	15.16	15.56
L2-D	Ebb	3/19/2019	15:29	4.04	4.17	88.90	88.07	8.92	8.77	0.28	0.18	15.17	15.55
L3-D	Ebb	3/19/2019	15:29	4.04	4.17	88.90	88.24	8.92	8.79	0.28	0.32	15.17	15.48
L11-S	Flood	3/21/2019	10:58	0.97	1.03	77.00	79.21	7.65	7.89	2.32	1.74	15.03	15.07
L10-S	Flood	3/21/2019	10:58	0.97	1.33	77.00	78.91	7.65	7.87	2.32	1.74	15.03	15.01
L16-V	Flood	3/21/2019	10:58	1.92	1.79	77.00	78.14	7.65	7.77	2.32	1.74	15.03	15.18
L7-M	Flood	3/21/2019	10:58	2.47	2.67	76.50	78.35	7.60	7.80	2.37	1.74	15.05	15.13
L6-M	Flood	3/21/2019	10:58	2.47	2.75	76.50	77.82	7.60	7.74	2.37	1.74	15.05	15.12
L14-V	Flood	3/21/2019	10:58	3.22	3.20	76.50	78.63	7.60	7.81	2.39	1.73	15.05	15.24
L3-D	Flood	3/21/2019	10:58	3.59	3.97	76.40	77.96	7.58	7.76	2.43	1.76	15.06	15.12
L2-D	Flood	3/21/2019	10:58	4.51	4.22	76.40	78.00	7.58	7.75	2.44	1.77	15.06	15.20
L10-S	Ebb	3/21/2019	17:32	1.27	1.02	90.60	94.27	9.08	9.43	0.07	0.16	15.30	15.35
L11-S	Ebb	3/21/2019	17:32	1.27	1.10	90.60	94.64	9.08	9.46	0.07	0.16	15.30	15.39
L16-V	Ebb	3/21/2019	17:32	1.72	1.69	90.60	93.54	9.07	9.32	0.07	0.16	15.30	15.50
L6-M	Ebb	3/21/2019	17:32	2.45	2.51	90.70	92.88	9.08	9.27	0.08	0.16	15.30	15.44
L7-M	Ebb	3/21/2019	17:32	2.45	2.64	90.70	93.69	9.08	9.35	0.08	0.17	15.30	15.46
L14-V	Ebb	3/21/2019	17:32	3.44	3.24	90.90	93.57	9.11	9.32	0.08	0.16	15.30	15.54
L2-D	Ebb	3/21/2019	17:32	3.92	3.99	95.50	92.76	9.56	9.25	0.08	0.06	15.29	15.52
L3-D	Ebb	3/21/2019	17:32	4.10	4.04	95.40	93.15	9.56	9.29	0.08	0.16	15.29	15.46
L10-S	Ebb	3/26/2019	9:15	0.77	1.11	89.30	91.40	8.87	8.97	0.07	0.13	15.72	16.25
L11-S	Ebb	3/26/2019	9:15	0.77	1.17	89.30	92.01	8.87	9.02	0.07	0.13	15.72	16.28
L16-V	Ebb	3/26/2019	9:15	1.73	1.76	89.30	90.99	8.86	8.91	0.07	0.13	15.72	16.34
L6-M	Ebb	3/26/2019	9:16	2.62	2.59	89.10	90.05	8.84	8.84	0.08	0.12	15.72	16.24
L7-M	Ebb	3/26/2019	9:16	2.62	2.71	89.10	90.85	8.84	8.91	0.08	0.13	15.72	16.27
L14-V	Ebb	3/26/2019	9:16	3.67	3.33	89.00	90.28	8.84	8.85	0.09	0.10	15.72	16.30
L2-D	Ebb	3/26/2019	9:16	4.17	4.06	88.90	89.82	8.82	8.81	0.09	0.11	15.72	16.28
L3-D	Ebb	3/26/2019	9:16	4.17	4.11	88.90	90.18	8.82	8.85	0.09	0.12	15.72	16.25
L11-S	Flood	3/26/2019	14:20	0.80	1.11	103.90	107.59	10.07	10.33	0.47	0.41	16.71	17.19
L10-S	Flood	3/26/2019	14:20	0.80	1.20	103.90	105.42	10.07	10.14	0.47	0.41	16.71	17.13
L16-V	Flood	3/26/2019	14:20	1.71	1.77	103.90	101.55	10.07	9.80	0.47	0.41	16.70	16.97
L6-M	Flood	3/26/2019	14:20	2.63	2.66	103.50	99.19	10.05	9.60	0.54	0.50	16.64	16.78
L7-M	Flood	3/26/2019	14:20	2.63	2.68	103.50	99.62	10.05	9.64	0.54	0.49	16.64	16.81
L14-V	Flood	3/26/2019	14:20	3.82	3.32	102.90	100.33	10.00	9.69	0.55	0.51	16.58	16.88
L3-D	Flood	3/26/2019	14:20	4.22	4.08	102.70	99.79	9.99	9.65	0.55	0.52	16.57	16.81
L2-D	Flood	3/26/2019	14:20	4.22	4.15	102.70	99.67	9.99	9.63	0.55	0.53	16.57	16.85
L11-S	Flood	3/28/2019	16:20	1.32	1.22	110.90	112.92	10.79	11.04	1.55	1.32	16.22	16.07
L10-S	Flood	3/28/2019	16:20	1.32	1.30	110.90	112.50	10.79	11.00	1.55	1.32	16.22	16.06
L16-V	Flood	3/28/2019	16:20	2.15	1.89	110.00	111.99	10.74	10.94	1.58	1.31	16.06	16.14
L7-M	Flood	3/28/2019	16:20	2.96	2.76	110.10	111.66	10.74	10.91	1.60	1.32	16.10	16.09

Location	Tide	Date	Time	Depth (m)		DO Saturation (%)		DO (mg/L)		Salinity (PPT)		Temperature (°C)	
				Pro	Buoy	Pro	Buoy	Pro	Buoy	Pro	Buoy	Pro	Buoy
L6-M	Flood	3/28/2019	16:20	2.96	2.76	110.10	110.87	10.74	10.84	1.60	1.32	16.10	16.05
L14-V	Flood	3/28/2019	16:20	3.79	3.42	110.40	112.15	10.76	10.93	1.65	1.32	16.12	16.20
L3-D	Flood	3/28/2019	16:20	3.80	4.15	110.10	111.49	10.75	10.89	1.66	1.32	16.06	16.10
L2-D	Flood	3/28/2019	16:20	3.80	4.26	110.10	110.80	10.75	10.82	1.66	1.35	16.06	16.13
L10-S	Ebb	3/30/2019	12:28	1.43	1.10	90.50	96.44	8.89	9.44	0.05	0.09	16.21	16.39
L11-S	Ebb	3/30/2019	12:28	1.43	1.18	90.50	96.65	8.89	9.46	0.05	0.09	16.21	16.38
L16-V	Ebb	3/30/2019	12:29	1.59	1.79	90.50	95.35	8.89	9.33	0.06	0.09	16.19	16.40
L6-M	Ebb	3/30/2019	12:29	2.74	2.63	90.60	93.65	8.90	9.19	0.06	0.09	16.19	16.26
L7-M	Ebb	3/30/2019	12:29	2.74	2.73	90.60	94.54	8.90	9.27	0.06	0.09	16.19	16.30
L14-V	Ebb	3/30/2019	12:29	2.84	3.35	91.30	93.64	8.97	9.18	0.07	0.09	16.21	16.30
L2-D	Ebb	3/30/2019	12:29	4.11	4.11	91.70	93.03	9.01	9.12	0.07	0.09	16.21	16.29
L3-D	Ebb	3/30/2019	12:29	4.11	4.13	91.70	93.28	9.01	9.15	0.07	0.09	16.21	16.25
L10-S	Ebb	4/02/2019	15:21	1.26	1.06	92.70	97.50	9.35	9.77	0.06	0.16	14.93	15.26
L11-S	Ebb	4/02/2019	15:21	1.26	1.19	92.70	97.68	9.35	9.78	0.06	0.19	14.93	15.30
L16-V	Ebb	4/02/2019	15:21	1.73	1.78	92.30	96.49	9.33	9.63	0.07	0.17	14.88	15.41
L6-M	Ebb	4/02/2019	15:21	2.75	2.59	92.20	95.94	9.32	9.59	0.07	0.18	14.87	15.34
L7-M	Ebb	4/02/2019	15:21	2.76	2.73	92.20	96.51	9.32	9.65	0.07	0.17	14.87	15.36
L14-V	Ebb	4/02/2019	15:21	3.32	3.34	93.40	96.82	9.43	9.66	0.12	0.22	14.89	15.45
L2-D	Ebb	4/02/2019	15:21	4.26	4.06	94.60	96.02	9.55	9.58	0.12	0.27	14.90	15.41
L3-D	Ebb	4/02/2019	15:21	4.26	4.13	94.60	96.59	9.55	9.64	0.12	0.30	14.90	15.38
L11-S	Flood	4/4/2019	9:41	1.37	1.22	91.20	92.88	8.86	9.04	2.97	2.57	15.89	15.92
L10-S	Flood	4/4/2019	9:41	1.37	1.28	91.20	92.53	8.86	9.01	2.96	2.58	15.89	15.90
L16-V	Flood	4/4/2019	9:42	1.89	1.89	90.90	92.03	8.83	8.95	3.01	2.56	15.85	15.99
L7-M	Flood	4/4/2019	9:42	2.76	2.78	90.50	91.78	8.81	8.94	3.07	2.54	15.79	15.92
L6-M	Flood	4/4/2019	9:42	2.76	2.79	90.50	91.33	8.81	8.90	3.07	2.54	15.79	15.89
L14-V	Flood	4/4/2019	9:42	3.43	3.43	88.60	92.07	8.63	8.95	3.25	2.55	15.69	15.99
L3-D	Flood	4/4/2019	9:43	4.46	4.18	88.50	91.33	8.62	8.90	3.25	2.62	15.70	15.86
L2-D	Flood	4/4/2019	9:43	4.46	4.29	88.50	90.72	8.62	8.83	3.25	2.70	15.70	15.87
L10-S	Ebb	4/4/2019	16:09	1.44	1.14	96.50	101.45	9.59	9.96	0.10	0.15	15.68	16.22
L11-S	Ebb	4/4/2019	16:09	1.44	1.24	96.50	101.82	9.59	9.99	0.10	0.15	15.68	16.24
L16-V	Ebb	4/4/2019	16:09	1.89	1.84	96.50	100.78	9.58	9.88	0.10	0.15	15.68	16.30
L6-M	Ebb	4/4/2019	16:09	2.49	2.68	96.30	99.67	9.57	9.79	0.09	0.14	15.66	16.21
L7-M	Ebb	4/4/2019	16:09	2.49	2.79	96.30	100.20	9.57	9.83	0.09	0.15	15.66	16.24
L14-V	Ebb	4/4/2019	16:09	3.42	3.41	96.20	100.74	9.56	9.87	0.09	0.14	15.65	16.32
L2-D	Ebb	4/4/2019	16:09	4.02	4.15	96.00	99.52	9.54	9.76	0.08	0.14	15.64	16.27
L3-D	Ebb	4/4/2019	16:09	4.22	4.19	95.90	99.99	9.54	9.81	0.08	0.14	15.63	16.23
L11-S	Flood	4/09/2019	12:30	1.57	1.03	86.80	89.50	7.88	7.98	1.54	1.36	19.60	20.56
L10-S	Flood	4/09/2019	12:30	1.57	1.07	86.80	89.09	7.88	7.95	1.54	1.37	19.60	20.57
L16-V	Flood	4/09/2019	12:31	1.88	1.69	86.70	88.88	7.88	7.93	1.54	1.39	19.60	20.54
L7-M	Flood	4/09/2019	12:31	2.48	2.55	86.50	88.53	7.86	7.91	1.57	1.44	19.56	20.46
L6-M	Flood	4/09/2019	12:31	2.48	2.58	86.50	87.28	7.86	7.81	1.57	1.44	19.56	20.40

Location	Tide	Date	Time	Depth (m)		DO Saturation (%)		DO (mg/L)		Salinity (PPT)		Temperature (°C)	
				Pro	Buoy	Pro	Buoy	Pro	Buoy	Pro	Buoy	Pro	Buoy
L14-V	Flood	4/09/2019	12:31	3.45	3.25	86.40	88.07	7.86	7.87	1.58	1.45	19.54	20.43
L3-D	Flood	4/09/2019	12:31	3.83	4.00	86.40	87.07	7.85	7.80	1.60	1.46	19.53	20.33
L2-D	Flood	4/09/2019	12:31	4.04	4.07	86.30	86.56	7.85	7.75	1.61	1.50	19.51	20.35
L11-S	Flood	4/18/2019	9:55	1.03	1.06	66.20	67.19	5.87	5.96	2.71	2.22	20.45	20.57
L10-S	Flood	4/18/2019	9:55	1.03	1.33	66.20	66.89	5.87	5.93	2.71	2.22	20.45	20.59
L7-M	Flood	4/18/2019	9:55	2.48	2.61	65.90	66.75	5.84	5.93	3.16	2.22	20.38	20.52
L6-M	Flood	4/18/2019	9:55	2.48	2.82	65.90	67.16	5.84	5.97	3.16	2.23	20.38	20.51
L11-S	Flood	4/20/2019	11:22	1.04	1.03	72.40	73.20	6.64	6.59	0.94	1.06	19.25	20.16
L10-S	Flood	4/20/2019	11:22	1.04	1.15	72.40	72.85	6.64	6.56	0.94	1.06	19.25	20.17
L7-M	Flood	4/20/2019	11:22	2.13	2.57	71.50	72.69	6.56	6.56	0.94	1.07	19.27	20.10
L6-M	Flood	4/20/2019	11:22	3.02	2.67	71.50	73.13	6.56	6.60	0.95	1.08	19.27	20.09
L10-S	Ebb	4/28/2019	11:44	0.99	1.13	101.80	106.34	9.25	9.54	0.10	0.12	19.96	20.65
L11-S	Ebb	4/28/2019	11:44	1.24	1.14	100.30	107.83	9.13	9.67	0.10	0.12	19.87	20.69
L6-M	Ebb	4/28/2019	11:44	2.96	2.66	97.90	98.48	8.97	8.89	0.09	0.12	19.59	20.31
L7-M	Ebb	4/28/2019	11:44	2.96	2.67	97.90	98.41	8.97	8.89	0.09	0.12	19.59	20.32
L11-S	Flood	5/07/2019	11:45	0.63	1.13	74.10	73.74	6.24	6.13	1.70	1.70	23.40	24.15
L10-S	Flood	5/07/2019	11:45	0.63	1.18	74.10	73.00	6.24	6.07	1.70	1.70	23.40	24.15
L7-M	Flood	5/07/2019	11:45	2.76	2.67	73.70	71.69	6.22	5.97	1.71	1.73	23.34	24.02
L6-M	Flood	5/07/2019	11:45	2.76	2.72	73.70	71.20	6.22	5.93	1.71	1.69	23.34	24.02