

### AR29 CTD Cast Sheet

Station Number: **A5**  
 Start date, time (UTC): **0640**  
**2018-04-21**

CTD cast number: **56**  
 End date, time (UTC): **0651**

Initials: **WZ**

Floater ID	Bottle	Target Depth	TOI	Nuts	<sup>14</sup> C	Chl a vol	Chl b vol	BSi	HPLC ID	HPLC vol	CO <sub>2</sub>	C/N	FCM	IFCB	IFCB S
10mab	1	74		✓											
	2	60		✓		290	290						F		
	3	40		✓		290	290						F		
	4	30		✓		288	287		111	1060			F	✓	
	5	20		✓		290	290						F		
Cmax	6	10		✓		288	287						F		
	7	Sfc				290	290		110	1097			F	✓	
	8	Sfc	✓	✓		#									
	9														
	10														
	11														
	12														
	13														
	14														
	15														
	16														
	17														
	18														
	19														
	20														
	21														
	22														
	23														
	24														
	Sam pler														

**Sampling depths – Fixed: Sfc, 10, 20, 30, 40, 60, 80, 100, 120, 150, 200, 250, 300**  
 Floating: Chl max, 10mab

### AR29 CTD Cast Sheet

Station Number: **A6**  
 Start date, time (UTC): **0730**  
**2018-04-21**

CTD cast number: **57**  
 End date, time (UTC): **0740**

Initials: **WZ**

Floater ID	Bottle	Target Depth	TOI	Nuts	<sup>14</sup> C	Chl a vol	Chl b vol	BSi	HPLC ID	HPLC vol	CO <sub>2</sub>	C/N	FCM	IFCB	IFCB S
10mab	1	80		✓											
	2	60		✓		290	290						F		
	3	40		✓		288	287		112	1060			F	✓	
Cmax	4	30		✓		290	290						F		
	5	20		✓											
	6	10		✓		290	290						F		
	7	Sfc				290	290		113	1057			F	✓	
	8	Sfc	✓	✓											
	9														
	10														
	11														
	12														
	13														
	14														
	15														
	16														
	17														
	18														
	19														
	20														
	21														
	22														
	23														
	24														
	Sampler														

**Sampling depths – Fixed: Sfc, 10, 20, 30, 40, 60, 80, 100, 120, 150, 200, 250, 300**  
 Floating: Chl max, 10mab

AR29 CTD Cast Sheet

Station Number: **A7**  
 Start date, time (UTC): **0820**  
**2018-04-21**

CTD cast number: **58**  
 End date, time (UTC): **0830**

Initials: **WZ**

Floater ID	Bottle	Target Depth	TOI	Nuts	<sup>14</sup> C	Chl a vol	Chl b vol	BSi	HPLC ID	HPLC vol	CO <sub>2</sub>	C/N	FCM	IFCB	IFCB S
10 mab	1	92		✓		290	290						F		
	2	80		✓		290	290						F		
	3	60		✓		290	290						F		
	4	40		✓		288	287		114	1060			F	✓	
	5	30		✓		290	290						F		
	6	20		✓		290	290						F		
	7	10		✓		290	290						F		
	8	Sfc				290	290		115	1057			F	✓	
	9	Sfc	✓	✓											
	10														
	11														
	12														
	13														
	14														
	15														
	16														
	17														
	18														
	19														
	20														
	21														
	22														
	23														
	24														
	Sam pler														

Sampling depths – Fixed: Sfc, 10, 20, 30, 40, 60, 80, 100, 120, 150, 200, 250, 300  
 Floating: Chl max, 10mab

AR29 CTD Cast Sheet

Station Number: **A8**  
 Start date, time (UTC): **09:17**  
**2018-04-21**

CTD cast number: **59**  
 End date, time (UTC): **10930**

Initials: **W2**

Floater ID	Bottle	Target Depth	TOI	Nuts	<sup>14</sup> C	Chl a vol	Chl b vol	BSI	HPLC ID	HPLC vol	CO <sub>2</sub>	C/N	FCM	IFCB	IFCBS
10mab	1	112		✓											
	2	100		✓											
	3	80		✓		290	290						F		
	4	60		✓		290	290						F		
	5	40		✓		283	288		116	1040			F	✓	
	6	30		✓		290	290						F		
	7	20		✓		290	290						F		
	8	10		✓									<del>MPD</del>		
	9	Sfc				290	290		117	1057			F	✓	
	10	Sfc	-	✓											
	11														
	12														
	13														
	14														
	15														
	16														
	17														
	18														
	19														
	20														
	21														
	22														
	23														
	24														
	Sampler														

Sampling depths – Fixed: Sfc, 10, 20, 30, 40, 60, 80, 100, 120, 150, 200, 250, 300  
 Floating: Chl max, 10mab

AR29 CTD Cast Sheet

Station Number: A9  
 Start date, time (UTC): ~~2018-04-21 1030~~  
 2018-04-21 1030

CTD cast number: 60  
 End date, time (UTC): ~~1052~~ 1052

Initials: WZ

Floater ID	Bottle	Target Depth	TOI	Nuts	<sup>14</sup> C	Chl a vol	Chl b vol	BSI	HPLC ID	HPLC vol	CO <sub>2</sub>	C/N	FCM	IFCB	IFCBS
10mab	1	120		✓											
	2	100		✓											
	3	80		✓		290	290						F		
WS	4	57				290	290						F		
	5	57	/	✓											
WS	6	38		✓		283	288		118	1060			F	✓	
WS	7	25		✓		290	290						F		
WS	8	16		✓		290	290						F		
WS	9	11		✓		290	290						F		
WS	10	6		✓		290	290						F		
JT	11	6													
WS	12	Sfc				290	290		119	1057			F	✓	
	13	Sfc	/	✓											
	14														
	15														
	16														
	17														
	18														
	19														
	20														
	21														
	22														
	23														
	24														
	Sampler														

Surf  
 6  
 11  
 16  
 25  
 38  
 57  
~~60~~

Sampling depths - Fixed: Sfc, 10, 20, 30, 40, 50, 60, 80, 100, 120, 150, 200, 250, 300

Floating: Chl max, 10mab 16 25 38 57  
6 11

SPAR: 120

AR29 CTD Cast Sheet

Station Number: A9  
 Start date, time (UTC): 11:40

CTD cast number: 61  
 End date, time (UTC): 11:47

Initials: W2

2018-04-21

Floater ID	Bottle	Target Depth	TOI	Nuts	<sup>14</sup> C	Chl a vol	Chl b vol	BSI	HPLC ID	HPLC vol	CO <sub>2</sub>	C/N	FCM	IFCB	IFCBS
JT	1	6													
JT	2	6													
JT	3	6													
JT	4	6													
JT	5	6													
JT	6	6													
JT	7	6													
JT	8	6													
JT	9	6													
JT	10	6													
	11														
	12														
	13														
	14														
	15														
	16														
	17														
	18														
	19														
	20														
	21														
	22														
	23														
	24														
	Sampler														

Sampling depths – Fixed: Sfc, 10, 20, 30, 40, 60, 80, 100, 120, 150, 200, 250, 300

Floating: Chl max, 10mab 6

IFCB & Attune initials run for grazing exp

AR29 CTD Cast Sheet

Station Number: A10  
 Start date, time (UTC): 1300

CTD cast number: 62  
 End date, time (UTC): 1315

Initials: WZ

2018-04-21

Floater ID	Bottle	Target Depth	TOI	Nuts	<sup>14</sup> C	Chl a vol	Chl b vol	BSI	HPLC ID	HPLC vol	CO <sub>2</sub>	C/N	FCM	IFCB	IFCBS
10 mmb	1	128		✓											
	2	100		✓											
	3	80		✓		290	290						F		
	4	60		✓		290	290						F		
	5	40		✓		290	290						F		
	6	30		✓		290	290						F		
	7	20		✓		288	283		120	1060			F	✓	
	8	10		✓		290	290						F		
	9	Sfc													
	10	Sfc	✓	✓		290	290		121	1057			F	✓	
	11														
	12														
	13														
	14														
	15														
	16														
	17														
	18														
	19														
	20														
	21														
	22														
	23														
	24														
	Sampler														

Sampling depths – Fixed: Sfc, 10, 20, 30, 40, 60, 80, 100, 120, 150, 200, 250, 300  
 Floating: Chl max, 10mab

AR29 CTD Cast Sheet

Station Number: **A11**  
 Start date, time (UTC): **1358**

CTD cast number: **63**  
 End date, time (UTC): **1407**

Initials: **W2**

2018-04-21

Floater ID	Bottle	Target Depth	TOI	Nuts	<sup>14</sup> C	Chl a vol	Chl b vol	BSI	HPLC ID	HPLC vol	CO <sub>2</sub>	C/N	FCM	IFCB	IFCBS
10mab	1	140		✓											
	2	120		✓											
	3	100		✓		290	290						F		
	4	80		✓		290	290						F		
	5	60		✓		290	290						F		
	6	40		✓		290	290						F		
	7	30		✓		290	290						F		
Chl max	8	20		✓		288	283		122	1060			F	✓	
	9	10		✓		290	290						F		
	10	Sfc				290	290		123	1057			F	✓	
	11	Sfc	/	✓											
	12														
	13														
	14														
	15														
	16														
	17														
	18														
	19														
	20														
	21														
	22														
	23														
	24														
	Sampler														

Sampling depths – Fixed: Sfc, 10, 20, 30, 40, 60, 80, 100, 120, 150, 200, 250, 300  
 Floating: Chl max, 10mab



AR29 CTD Cast Sheet

Station Number: A12

CTD cast number: 64

Initials: WZ

Start date, time (UTC): 14:50

End date, time (UTC): 15:10

2018-04-21

Floater ID	Bottle	Target Depth	TOI	Nuts	°C	Chl a vol	Chl b vol	BSI	HPLC ID	HPLC vol	CO <sub>2</sub>	C/N	FCM	IFCB	IFCBS
10 mab	1	268		✓											
	2	250		✓											
	3	200		✓											
	4	150		✓											
	5	120		✓		287	287								
	6	100		✓		290	290						F		
	7	80		✓		290	290						F		
	8	60		✓		290	290						F		
	9	40		✓		290	290						F		
	10	30		✓		290	290						F		
Chl max	11	20		✓		283	288		124	1060			F	✓	
	12	10		✓		290	290						F		
	13	Sfc				290	290		125	1057			F	✓	
	14	Sfc	-	✓											
	15														
	16														
	17														
	18														
	19														
	20														
	21														
	22														
	23														
	24														
	Sampler														

Sampling depths – Fixed: Sfc, 10, 20, 30, 40, 60, 80, 100, 120, 150, 200, 250, 300  
 Floating: Chl max, 10mab

AR29 CTD Cast Sheet

Station Number: A13  
 Start date, time (UTC): 15:50  
 2018-04-21

CTD cast number: 65  
 End date, time (UTC): 16:06

Initials: WZ

Floater ID	Bottle	Target Depth	TOI	Nuts	°C	Chl a vol	Chl b vol	BSI	HPLC ID	HPLC vol	CO <sub>2</sub>	C/N	FCM	IFCB	IFCBS
	1	300		✓											
	2	250		✓											
	3	200		✓											
	4	150		✓											
	5	120		✓											
	6	100		✓											
	7	80		✓		290	290						F		
WS	8	60		✓		290	290						F		
WS	9	40		✓		290	290						F		
WS	10	26													
	11	26	-	✓		290	290						F		
WS	12	17		✓		290	290		126	1060			F		
WS	13	12		✓		290	290						F		
WS	14	6		✓		288	287						F		
WS	15	Sfc													
	16	Sfc	-	✓		290	290		127	1057			F	✓	
	17	J													
	18														
	19														
	20														
	21														
	22														
	23														
	24														
	Sampler														

6  
6  
12  
17  
26  
40  
60

Sampling depths – Fixed: Sfc, 10, 20, 30, 40, 60, 80, 100, 120, 150, 200, 250, 300

Floating: Chl max, 10mab, 17, 26, 12, 17, 26, 12

SPAR: 1100

AR29 CTD Cast Sheet

Station Number: A14

CTD cast number: 66

Initials: C.Z.

Start date, time (UTC):

End date, time (UTC):

Apr 21, 16:39:40

Apr 21, 17:10:13

Floater ID	Bottle	Target Depth	TOI	Nuts	°C	Chl a vol	Chl b vol	BSI	HPLC ID	HPLC vol	CO <sub>2</sub>	C/N	FCM	IFCB	IFCBS
<del>JF</del>	1	300													
JF	2	300		✓							✓				
	3	250		✓											
JF	4	200		✓							✓				
	5	200													
	6	150		✓											
	7	120													
JF	8	120		✓							✓				
	9	100		✓											
JF	10	80		✓		290	290				✓		F		
	11	80													
	12	60		✓		290	290		128	1060			F	✓	
	13	40													
JF	14	40		✓		290	290				✓		F		
	15	30		✓		290	290						F		
JF	16	20		✓		290	290				✓		F		
	17	20													
	18	10		✓		287	288						F		
we	19	sfc	✓	✓		290	290		129	1057			F	✓	
JF	20	sfc									✓				
	21	sfc													
	22														
	23														
	24														
	Sampler														

Sampling depths – Fixed: Sfc, 10, 20, 30, 40, 60, 80, 100, 120, 150, 200, 250, 300

Floating: Chl max, 10mab ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓

VPR on

Water depth: 700 m

AR29 CTD Cast Sheet

Station Number: A15

CTD cast number: 67

Initials: C.Z.

Start date, time (UTC):

End date, time (UTC):

Apr 21. 17:41:19

18:09:51

Floater ID	Bottle	Target Depth	TQ	Nuts	°C	Chl a vol	Chl b vol	BSI	HPLC ID	HPLC vol	CO <sub>2</sub>	C/N	FCM	IFCB	IFCBS
	1	300		✓											
	2	250		✓											
	3	200		✓											
	4	150		✓											
	5	120		✓											
	6	100		✓		290	290						F		
	7	80		✓		290	290		130	1060			F	✓	
	8	60		✓		290	290						F		
	9	40		✓		290	290						F		
	10	30		✓		290	290						F		
	11	20		✓		290	290						F		
	12	10		✓		287	288						F		
zoe	13	sfc	✓	✓		290	290		131	1057			F	✓	
	14	sfc													
	15														
	16														
	17														
	18														
	19														
	20														
	21														
	22														
	23														
	24														
	Sampler														

Sampling depths – Fixed: Sfc, 10, 20, 30, 40, 60, 80, 100, 120, 150, 200, 250, 300  
 Floating: Chl max, 10mab ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓

-3

vPR on  
 water depth: 1120

AR29 CTD Cast Sheet

Station Number: *A16*

CTD cast number: *68*

Initials: *C-Z*

Start date, time (UTC):

End date, time (UTC):

*2018 Apr 21 18:45:20*

*19:12:49*

Floater ID	Bottle	Target Depth	TOI	Nuts	<sup>14</sup> C	Chl a vol	Chl b vol	BSI	HPLC ID	HPLC vol	CO <sub>2</sub>	C/N	FCM	IFCB	IFCBS
	1	300		✓											
	2	250		✓											
	3	200		✓											
	4	150		✓											
	5	120		✓											
	6	100		✓		290	290						F		
	7	80		✓		290	290						F		
	8	60		✓		290	290		132	1060			F	✓	
	9	40		✓		290	290						F		
	10	30		✓		290	290						F		
	11	20		✓		290	290						F		
	12	10		✓		288	287						F		
<i>zoe</i>	13	<i>sfc</i>	✓	✓		290	290		133	1057			F	✓	
	14	<i>sfc</i>													
	15														
	16														
	17														
	18														
	19														
	20														
	21														
	22														
	23														
	24														
	Sampler														

Sampling depths – Fixed: *Sfc, 10, 20, 30, 40, 60, 80, 100, 120, 150, 200, 250, 300*

Floating: Chl max, *10mab* ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓

*nPR on.*

*water depth: 1800 m*

AR29 CTD Cast Sheet

Station Number: **AS**  
 Start date, time (UTC): **0916**  
**2018-04-22**

CTD cast number: **69**  
 End date, time (UTC): **0925**

Initials: **WZ**

Floater ID	Bottle	Target Depth	TOI	Nuts	<sup>14</sup> C	Chl a vol	Chl b vol	BSI	HPLC ID	HPLC vol	CO <sub>2</sub>	C/N	FCM	IFCB	IFCBS
	1	Sfc											F	✓	
	2														
	3														
	4														
	5														
	6														
	7														
	8														
	9														
	10														
	11														
	12														
	13														
	14														
	15														
	16														
	17														
	18														
	19														
	20														
	21														
	22														
	23														
	24														
	Sampler														

Sampling depths – Fixed: Sfc, 10, 20, 30, 40, 60, 80, 100, 120, 150, 200, 250, 300  
 Floating: Chl max, 10mab

### AR29 CTD Cast Sheet

Station Number: **AG**  
 Start date, time (UTC): **10:35**  
**2018-04-22**

CTD cast number: **70**  
 End date, time (UTC): **10:43**

Initials: **WZ**

Floater ID	Bottle	Target Depth	TOI	Nuts	°C	Chl a vol	Chl b vol	BSI	HPLC ID	HPLC vol	CO <sub>2</sub>	C/N	FCM	IFCB	IFCBS
10 mab	1	79	-	✓											
WS	2	53		✓		283	283		134	1060			F	✓	
	3	53													
WS	4	35		✓		290	290						F		
	5	35													
WS	6	23		✓		290	290						F		
	7	23													
WS	8	15		✓		290	290						F		
	9	15													
WS	10	11		✓		290	290						F		
	11	11													
WS	12	5		✓		290	290						F		
	13	5													
WS	14	Sfc													
	15	Sfc	-	✓		290	290		135	1057			F	✓	
	16														
	17														
	18														
	19														
	20														
	21														
	22														
	23														
	24														
	Sampler														

0  
 5  
 11  
 15  
 23  
 35  
 53

Sampling depths – Fixed: Sfc, 10, 20, 30, 40, 60, 80, 100, 120, 150, 200, 250, 300

Floating: Chl max, 10m, 15, 23, 35, 53

SPAR: 140

AR29 CTD Cast Sheet

Station Number: **A7**  
 Start date, time (UTC): **2018-04-22 1130**

CTD cast number: **71**  
 End date, time (UTC): **11:40**

Initials: **W2**

Floater ID	Bottle	Target Depth	TOI	Nuts	<sup>14</sup> C	Chl a vol	Chl b vol	BSI	HPLC ID	HPLC vol	CO <sub>2</sub>	C/N	FCM	IFCB	IFCBS
	1														
	2														
	3														
	4														
	5														
	6														
	7														
	8														
	9														
	10														
	11														
	12														
	13														
	14														
	15														
	16														
	17														
	18														
	19														
	20														
	21														
	22														
	23														
	24														
	Sampler														

Sampling depths – Fixed: Sfc, 10, 20, 30, 40, 60, 80, 100, 120, 150, 200, 250, 300  
 Floating: Chl max, 10mab



AR29 CTD Cast Sheet

Station Number: **A8**  
 Start date, time (UTC): **12:20**  
**2018-04-22**

CTD cast number: **72**  
 End date, time (UTC): **12:30**

Initials: **WZ**

Floater ID	Bottle	Target Depth	TOI	Nuts	<sup>14</sup> C	Chl a vol	Chl b vol	BSI	HPLC ID	HPLC vol	CO <sub>2</sub>	C/N	FCM	IFCB	IFCBS
	1	35												✓	
	2														
	3														
	4														
	5														
	6														
	7														
	8														
	9														
	10														
	11														
	12														
	13														
	14														
	15														
	16														
	17														
	18														
	19														
	20														
	21														
	22														
	23														
	24														
	Sampler														

Sampling depths – Fixed: Sfc, 10, 20, 30, 40, 60, 80, 100, 120, 150, 200, 250, 300  
 Floating: Chl max, 10mab

### AR29 CTD Cast Sheet

Station Number: **A9**  
 Start date, time (UTC): **2018-04-22 1305**

CTD cast number: **73**  
 End date, time (UTC): **13:15**

Initials: **W2**

Floater ID	Bottle	Target Depth	TOI	Nuts	<sup>14</sup> C	Chl a vol	Chl b vol	BSI	HPLC ID	HPLC vol	CO <sub>2</sub>	C/N	FCM	IFCB	IFCBS
	1	Sfc												✓	
	2														
	3														
	4														
	5														
	6														
	7														
	8														
	9														
	10														
	11														
	12														
	13														
	14														
	15														
	16														
	17														
	18														
	19														
	20														
	21														
	22														
	23														
	24														
	Sampler														

**Sampling depths – Fixed: Sfc, 10, 20, 30, 40, 60, 80, 100, 120, 150, 200, 250, 300**  
**Floating: Chl max, 10mab**

AR29 CTD Cast Sheet

Station Number: A10

CTD cast number: 74

Initials: WZ

Start date, time (UTC): 13:50

End date, time (UTC): 1400

2018-04-22

Floater ID	Bottle	Target Depth	TOI	Nuts	1°C	Chl a vol	Chl b vol	BSI	HPLC ID	HPLC vol	CO <sub>2</sub>	C/N	FCM	IFCB	IFCBS
	1	surf												✓	
	2														
	3														
	4														
	5														
	6														
	7														
	8														
	9														
	10														
	11														
	12														
	13														
	14														
	15														
	16														
	17														
	18														
	19														
	20														
	21														
	22														
	23														
	24														
	Sampler														

Sampling depths – Fixed: Sfc, 10, 20, 30, 40, 60, 80, 100, 120, 150, 200, 250, 300  
 Floating: Chl max, 10mab

AR29 CTD Cast Sheet

Station Number: *A11*

CTD cast number: *75*

Initials: *WZ*

Start date, time (UTC): *14:42*

End date, time (UTC): *14:50*

*2018-04-22*

Floater ID	Bottle	Target Depth	TOI	Nuts	<sup>14</sup> C	Chl a vol	Chl b vol	BSI	HPLC ID	HPLC vol	CO <sub>2</sub>	C/N	FCM	IFCB	IFCBS
	1														
	2														
	3														
	4														
	5														
	6														
	7														
	8														
	9														
	10														
	11														
	12														
	13														
	14														
	15														
	16														
	17														
	18														
	19														
	20														
	21														
	22														
	23														
	24														
	Sampler														

Sampling depths – Fixed: Sfc, 10, 20, 30, 40, 60, 80, 100, 120, 150, 200, 250, 300

Floating: Chl max, 10mab

AR29 CTD Cast Sheet

Station Number: A12

CTD cast number: 76

Initials: C.Z.

Start date, time (UTC):

End date, time (UTC):

2018-04-22 15:22:28

15:44:41

Floater ID	Bottle	Target Depth	TOI	Nuts	<sup>14</sup> C	Chl a vol	Chl b vol	BSI	HPLC ID	HPLC vol	CO <sub>2</sub>	C/N	FCM	IFCB	IFCBS
Taylor	1	sfc.												✓	
	2														
	3														
	4														
	5														
	6														
	7														
	8	Observe density inversion around													
	9	22 ~ 27 m, also the surface layer (0 ~ 10 m)													
	10														
	11	was not well-mixed (CTD signal)													
	12														
	13														
	14														
	15														
	16														
	17														
	18														
	19														
	20														
	21														
	22														
	23														
	24														
	Sampler														

Sampling depths – Fixed: Sfc, 10, 20, 30, 40, 60, 80, 100, 120, 150, 200, 250, 300 –  
 Floating: Chl max, 10mab

VPR on

depth = 273 m.