

Nuyina - MNF trace metal rosette log sheet

Voyage:	NUY2025_V03	Start time (UTC):	8:07
Cruise:	Denman V3	Bottom time (UTC):	
Date (AEDT):	9/03/2025	End time (UTC):	0:00
Station no.:	4	Lat:	-63.289
Deploy no.:	1	Long:	102.482
Waypoint no:	5	Section/region:	Bruce rise
Filename:			

ships-nav depth	2111.89	Data uploaded:	
Bottom depth (m):		Data downloaded:	
Trigger depth (m):		Battery start:	
Wire depth (m):		Battery finish:	
Max depth (m):		Pylon hosed down?	
		Nitrogen off?	

N.B. Start at bottom (i.e. at no. 1)	Rosette p	Niskin no	Target depth (m)	Sensor pressure (dbar)
Shallowest	12	B21	15	
↑	11	B20	30	
	10	B19	50	
	9	B18	100	
	8	B17	150	
	7	B16	200	
	6	B15	300	
	5	B14	500	
	4	B13	750	
	3	B12	1000	
	2	B11	1250	
Deepest	1	B10	1500	

Niskin no.	Nuts_1	ANU DFe	ANU TM	UTAS TM	sidero	Pb isotopes	U isotopes
	30 mL	250mL	1L	125mL	2L	1 to 5L	1L
12	X	X		X			
11	X	X		X			
10	X	X		X			
9	X	X		X			
8	X	X		X			
7	X	X		X			
6	X	X		X			
5	X	X		X			
4	X	X		X			
3	X	X		X			
2	X	X		X			
1							
Sampling protocol:	unfiltered	filtered	filtered	filtered	filtered	filtered	filtered
Storage protocol:	hydroch	acidified	acidified	acidified	-20C	acidified	acidified

Comments:

Tubing of filter cartridges didn't fit the taps properly, had to get smaller tubing to go in and hold while filtering
Used one filter cartridge for all sampling

Nuyina - MNF trace metal rosette log sheet			
Voyage:	NUY2025_V03	Start time (UTC):	19:27
Cruise:	Denman V3	Bottom time (UTC):	
Date (UTC):	12/03/2025	End time (UTC):	20.25
Station no.:	6	Lat:	-63.293
Deploy no.:	2	Long:	97.332
Waypoint no:	16	Section/region:	Bruce rise
Filename:			
ships-nav depth 1651.81		Data uploaded:	
Bottom depth (m):	2112.6	Data downloaded:	
Trigger depth (m):	1600	Battery start:	
Wire depth (m):	1900	Battery finish:	
Max depth (m):	1500	Pylon hosed down?	
		Nitrogen off?	

N.B. Start at bottom (i.e. at no. 1)	Rosette p	Niskin no	Target depth (m)	Sensor pres (dbar)	Comments
Shallowest	12	B21	15		
↑	11	B20	30		not triggered, empty
	10	B19	50		
	9	B18	100		not triggered, empty
	8	B17	125		not triggered, empty
	7	B16	150		
	6	B15	200		
	5	B14	250		
	4	B13	300		not triggered, empty
	3	B12	500		
	2	B11	750		half full, not triggered correctly
Deepest	1	B10	1000		

Niskin no.	Nuts_1	ANU DFe	ANU TM	UTAS TM	FeL	sidero	Pb isotopes
	30 mL	250mL	1L	125mL	500mL	2L	1 to 5L
12	X	X	X	X	X		X
11							
10	X	X	X	X	X		X
9							
8							
7	X	X	X	X	X		X
6	X	X	X	X	X		X
5	X	X	X	X	X		X
4							
3	X	X	X	X	X		X
2	X	X	X (little less than 1L)	X			
1	X	X	X	X	X		X
Sampling protocol:	unfiltered	filtered	filtered	filtered	filtered	filtered	filtered
Storage protocol:	hydrocher	acidified	acidified	acidified	-20C	-20C	acidified

Comments:
 Filtered with cartridges 1 and 2
 ANU Dfe has 2 250ml bottles with labelled niskin 5, one of them should be sampled from niskin 1 (asterix on label to mark)

Nuyina - MNF trace metal rosette log sheet			
Voyage:	NUY2025_V03	Start time (UTC):	
Cruise:	Denman V3	Bottom time (UTC):	
Date (UTC):	16/03/2025	End time (UTC):	2025-03-16 07:57:23 UTC
Station no.:	14	Lat:	-65.287
Deploy no.:	3	Long:	99.009
Waypoint no:	38	Section/region:	Denman Transect
Filename:	TMR3		
ships-nav depth 800.02		Data uploaded:	
Bottom depth (m):	800	Data downloaded:	
Trigger depth (m):		Battery start:	
Wire depth (m):	729	Battery finish:	
Max depth (m):	730	Pylon hosed down?	
		Nitrogen off?	

N.B. Start at bottom (i.e. at no. 1)	Rosette p	Niskin no	Target depth (m)	Sensor pres (dbar)	Comments
Shallowest	12	B21	15		Fired
↑	11	B20	40		
	10	B19	60		
	9	B18	75		
	8	B17	120		
	7	B16	160		Fired
	6	B15	240		
	5	B14	300		Fired
	4	B13	400		
	3	B12	500		
	2	B11	690		Fired
Deepest	1	B10	720		

Niskin no.	Nuts_1	ANU DFe	ANU TM	UTAS TM	FeL	sidero	Pb isotopes
	30 mL	250mL	1L	125mL	500mL	2L	1 to 5L
12	x	x	x	x	x	x	x
11							
10							
9							
8							
7	x	x	x	x	x	x	x
6							
5	x	x	x	x	x	x	x
4							
3							
2	x	x	x	x	x	x	x
1							
Sampling protocol:	unfiltered	filtered	filtered	filtered	filtered	filtered	filtered
Storage protocol:	hydrocher	acidified	acidified	acidified	-20C	-20C	acidified

Comments:
Niskins not opened correctly, bottles misfired

Nuyina - MNF trace metal rosette log sheet			
Voyage:	NUY2025_V03	Start time (UTC):	17/03/2025 2:19
Cruise:	Denman V3	Bottom time (UTC):	
Date (AEDT):	17/03/2025	End time (UTC):	
Station no.:	17	Lat:	-65.315
Deploy no.:	4	Long:	99.083
Waypoint no:	41	Section/region:	
Filename:			
ships-nav depth		849.32	Data uploaded:
Bottom depth (m):			Data downloaded:
Trigger depth (m):		810	Battery start:
Wire depth (m):			Battery finish:
Max depth (m):		800	Pylon hosed down?
			Nitrogen off?

N.B. Start at bottom (i.e. at no. 1)	Rosette #	Niskin no	Target depth (m)	Sensor pres (dbar)	Comments
Shallowest	12	B21	10		
↑	11	B20	30		
	10	B19	50		
	9	B18	85		
	8	B17	120		
	7	B16	190		
	6	B15	230		
	5	B14	330		
	4	B13	440		
	3	B12	550		
	2	B11	650		
Deepest	1	B10	750		

Niskin no.	Nuts_1	ANU DFe	ANU TM	UTAS TM	FeL	sidero	Pb isotopes	U isotopes	Pauline	
	30 mL	250mL	1L	125mL	500mL	2L	1 to 5L	1L	5L	
12	X	X	X	X	X		X		X	C14
11	X	X	X	X	X		X			
10	X	X	X	X	X		X		X	C14
9	X	X	X	X	X		X		X	C14
8	X	X	X	X	X		X			
7	X	X	X	X	X		X		X	Fe-spikes
6	X	X	X	X	X		X			
5	X	X	X	X	X		X			
4	X	X	X	X	X		X			
3	X	X	X	X	X		X			
2	X	X	X	X	X		X			
1	X	X	X	X	X		X			
Sampling protocol:	unfiltered	filtered	filtered	filtered	filtered	filtered	filtered	filtered	unfiltered	
Storage protocol:	hydrocher	acidified	acidified	acidified	-20C	-20C	acidified	acidified	incubations	

Comments:

Nuyina - MNF trace metal rosette log sheet			
Voyage:	NUY2025_V03	Start time (UTC):	17/03/2025 12:14
Cruise:	Denman V3	Bottom time (UTC):	
Date (AEDT):	17/03/2025	End time (UTC):	
Station no.:	21	Lat:	-65.505
Deploy no.:	5	Long:	99.238
Waypoint no:	45	Section/region:	Denman Tongue
Filename:			
ships-nav depth	674.5	Data uploaded:	
Bottom depth (m):		Data downloaded:	
Trigger depth (m):		Battery start:	
Wire depth (m):		Battery finish:	
Max depth (m):		Pylon hosed down?	
		Nitrogen off?	

N.B. Start at bottom (i.e. at no. 1)	Rosette p	Niskin no	Target depth (m)	Sensor pres (dbar)	Comments
Shallowest	12	B21	10		
↑	11	B20	20		
	10	B19	50		
	9	B18	75	Didn't close - 125 mL bottle filled	
	8	B17	100		
	7	B16	150		
	6	B15	200		
	5	B14	250		
	4	B13	300	DNF	
	3	B12	400		
	2	B11	500		
Deepest	1	B10	600		

Niskin no.	Nuts_1	ANU DFe	ANU TM	UTAS TM	FeL	sidero	Pb isotopes	U isotopes
	30 mL	250mL	1L	125mL	500mL	2L	1 to 5L	1L
12	X	X	X	X	X		X	
11	X	X	X	X	x		X	
10	X	X	X	X	x		X	
9				X				
8	X	X	X	X	x		X	
7	X	X	X	X	x		X	
6	X	X	X	X	x		X	
5	X	X	X	X	x		X	
4								
3	X	X	X	X	x		X	
2	X	X	X	X			X	
1	X	X	X	X	x		X	
Sampling protocol:	unfiltered	filtered	filtered	filtered	filtered	filtered	filtered	filtered
Storage protocol:	hydrocher	acidified	acidified	acidified	-20C	-20C	acidified	acidified

Comments:
9 didn't close properly so not sure which water depth was sampled- might not be worth analysing.

Nuyina - MNF trace metal rosette log sheet			
Voyage:	NUY2025_V03	Start time (UTC):	11:00
Cruise:	Denman V3	Bottom time (UTC):	
Date (UTC):	17/03/2025	End time (UTC):	
Station no.:	23	Lat:	-65.584
Deploy no.:	6	Long:	99.338
Waypoint no:	47	Section/region:	Denman Tongue
Filename:			
ships-nav depth		Data uploaded:	
Bottom depth (m):	570	Data downloaded:	
Trigger depth (m):	510	Battery start:	
Wire depth (m):		Battery finish:	
Max depth (m):	540	Pylon hosed down?	
		Nitrogen off?	

N.B. Start at bottom (i.e. at no. 1)	Rosette pos	Niskin no	Target depth (m)	Sensor pres (dbar)	Comments
Shallowest	12	B21	15		
↑	11	B20	46		
	10	B19	89		
	9	B18	120		Did not fire
	8	B17	150		
	7	B16	175		
	6	B15	210		
	5	B14	260		
	4	B13	280		
	3	B12	320		
	2	B11	450		
Deepest	1	B10	500		

Deep cast	Shallow cast
15	15
40	30
70	50
100	75
150	100
200	150
300	200
500	250
750	300
1000	350
1250	400
1500	500

Niskin no.	Nuts_1	ANU DFe	ANU TM	UTAS TM	FeL	sidero	Pb isotopes	U isotopes	Pauline	
	30 mL	250mL	1L	125mL	500mL	2L	1 to 5L	1L	5L	need to check
12	X	X	X	X			X		X	Pauline
11	X	X	X	X			X		X	Bacterial activity + FRRf
10	X	X	X	X			X		X	50 mL
9										X
8	X	X	X	X			X			X
7	X	X	X	X			X			X
6	X	X	X	X			X			
5	X	X	X	X			X			
4	X	X	X	X			X			
3	X	X	X	X			X			
2	X	X	X	X			X			
1	X	X	X	X			X			X
Sampling protocol:	unfiltered	filtered	filtered	filtered	filtered	filtered	filtered	filtered	filtered	unfiltered
Storage protocol:	hydrochem	(acidified)	acidified	acidified	-20C	-20C	acidified	acidified	incubations	

Comments:

Nuyina - MNF trace metal rosette log sheet			
Voyage:	NUY2025_V03	Start time (UTC):	15:10
Cruise:	Denman V3	Bottom time (UTC):	
Date (UTC):	18/03/2025	End time (UTC):	15:46
Station no.:	29	Lat:	-65.848
Deploy no.:	7	Long:	99.386
Waypoint no:	53	Section/region:	Denman Tongue
Filename:			
ships-nav depth	833.38	Data uploaded:	
Bottom depth (m):		Data downloaded:	
Trigger depth (m):		Battery start:	
Wire depth (m):		Battery finish:	
Max depth (m):		Pylon hosed down?	
		Nitrogen off?	

N.B. Start at bottom	Rosette pos	Niskin no	Target depth	Sensor pres	Comments
(i.e. at no. 1)			(m)	(dbar)	
Shallowest	12	B21	10		
↑	11	B20	40		
	10	B19	85		
	9	B18	135		Did not fire
	8	B17	170		
	7	B16	240		
	6	B15	300		
	5	B14	450		
	4	B13	550		
	3	B12	650		
	2	B11	720		
Deepest	1	B10	780		

Deep cast	Shallow cast
15	15
40	30
70	50
100	75
150	100
200	150
300	200
500	250
750	300
1000	350
1250	400
1500	500

Niskin no.	Nuts_1	ANU DFe	ANU TM	UTAS TM	FeL	sidero	Pb isotopes	U isotopes	Pauline
	30 mL	250mL	1L	125mL	500mL	2L	1 to 5L	1L	5L
12	X	X	X	X	X		X		
11	X	X	X	X	X		X		
10	X	X	X	X	X		X		
9									
8	X	X	X	X	X		X		
7	X	X	X	X	X		X		
6	X	X	X	X	X		X		
5	X	X	X	X	X		X		
4	X	X	X	X	X		X		
3	X	X	X	X	X		X		
2	X	X	X	X	X		X		
1	X	X	X	X	X		X		
Sampling protocol:	unfiltered	filtered	filtered	filtered	filtered	filtered	filtered	filtered	filtered
Storage protocol:	hydrochem	acidified	acidified	acidified	-20C	-20C	acidified	acidified	incubations

Comments:
Took two environmental blanks with 125ml bottles UTAS

Nuyina - MNF trace metal rosette log sheet			
Voyage:	NUY2025_V03	Start time (UTC):	22/03/2025 15:26
Cruise:	Denman V3	Bottom time (UTC):	
Date (UTC):	22/03/2025	End time (UTC):	
Station no.:	34	Lat:	-65.326
Deploy no.:	8	Long:	99.617
Waypoint no:	90	Section/region:	Denman Transect
Filename:			
ships-nav depth	563.83	Data uploaded:	
Bottom depth (m):	550	Data downloaded:	
Trigger depth (m):		Battery start:	
Wire depth (m):		Battery finish:	
Max depth (m):	500	Pylon hosed down?	
		Nitrogen off?	

N.B. Start at bottom (i.e. at no. 1)	Rosette pos	Niskin no	Target depth (m)	Sensor pres (dbar)	Comments
Shallowest	12	B21	10		
↑	11	B20	30		
	10	B19	50		DNF
	9	B18	70		
	8	B17	100		DNF
	7	B16	120		
	6	B15	140		
	5	B14	200		
	4	B13	300		
	3	B12	400		DNF
	2	B11	470		
Deepest	1	B10	500		

Deep cast	Shallow cast
15	15
40	30
70	50
100	75
150	100
200	150
300	200
500	250
750	300
1000	350
1250	400
1500	500

Niskin no.	Nuts_1	ANU DFe	ANU TM	UTAS TM	FeL	sidero	Pb isotopes	U isotopes	Pauline
	30 mL	250mL	1L	125mL	500mL	2L	1 to 5L	1L	5L
12	X	X	X	X	X		X		
11	X	X	X	X	X		X		
10									
9	X	X	X	X	X		X		
8									
7	X	X	X	X	X		X		
6	X	X	X	X	X		X		
5	X	X	X	X	X		X		
4	X	X	X	X	X		X		
3									
2	X	X	X	X	X		X		
1	X	X	X	X	X		X		
Sampling protocol:	unfiltered	filtered	filtered	filtered	filtered	filtered	filtered	filtered	filtered
Storage protocol:	hydrochem	acidified	acidified	acidified	-20C	-20C	acidified	acidified	incubations

Comments:

Nuyina - MNF trace metal rosette log sheet			
Voyage:	NUY2025_V03	Start time (UTC):	23/03/2025 8:04
Cruise:	Denman V3	Bottom time (UTC):	
Date (UTC):	23/03/2025	End time (UTC):	8:30
Station no.:	38	Lat:	-65.234
Deploy no.:	TMR 9	Long:	99.185
Waypoint no:	94	Section/region:	East
Filename:			
ships-nav depth	872.43	Data uploaded:	
Bottom depth (m):	885	Data downloaded:	
Trigger depth (m):	840	Battery start:	
Wire depth (m):		Battery finish:	
Max depth (m):	840	Pylon hosed down?	
		Nitrogen off?	

N.B. Start at bottom	Rosette pos	Niskin no	Target depth	Sensor pres	Comments
(i.e. at no. 1)					
Shallowest	12	B21	15		
↑	11	B20	30		
	10	B19	60		
	9	B18	75		
	8	B17	110		
	7	B16	150		
	6	B15	200		leaky
	5	B14	250		
	4	B13	300		
	3	B12	400		
	2	B11	600		
Deepest	1	B10	830		

Deep cast	Shallow cast
15	15
40	30
70	50
100	75
150	100
200	150
300	200
500	250
750	300
1000	350
1250	400
1500	500

Niskin no.	Nuts_1	ANU DFe	ANU TM	UTAS TM	FeL	sidero	Pb isotopes	U isotopes	Pauline
	30 mL	250mL	1L	125mL	500mL	2L	3L	1L	5L
12	X	X	X	X	X		X		
11	X	X	X	X	X		X		
10	X	X	X	X	X		X		
9	X	X	X	X	X		X		
8	X	X	X	X	X		X		
7	X	X	X	X	X		X		
6	X	X		X					
5	X	X	X	X	X		X		
4	X	X	X	X	X		X		
3	X	X	X	X	X		X		
2	X	X	X	X	X		X		
1	X	X	X	X	X		X		
Sampling protocol:	unfiltered	filtered	filtered	filtered	filtered	filtered	filtered	filtered	filtered
Storage protocol:	hydrochem	acidified	acidified	acidified	-20C	-20C	acidified	acidified	incubations

Comments:
Taryns Pb and U isotopes sampled in 3x 1L LDPE bottles
#6 low volume - only nuts, ANU dFe (250ml) + UTAS TM (125ml)

Nuyina - MNF trace metal rosette log sheet			
Voyage:	NUY2025_V03	Start time (UTC):	24/03/2025 11:56
Cruise:	Denman V3	Bottom time (UTC):	
Date (UTC):	24/03/2025	End time (UTC):	
Station no.:	44	Lat:	-65.111
Deploy no.:	10	Long:	99.351
Waypoint no:	101	Section/region:	
Filename:	TMR10		
ships-nav depth	855.48	Data uploaded:	
Bottom depth (m):		Data downloaded:	
Trigger depth (m):		Battery start:	
Wire depth (m):		Battery finish:	
Max depth (m):		Pylon hosed down?	
		Nitrogen off?	

N.B. Start at bottom (i.e. at no. 1)	Rosette pos	Niskin no	Target depth (m)	Sensor pres (dbar)	Comments
Shallowest	12	B21	15		
↑	11	B20	30		
	10	B19	50		
	9	B18	75		
	8	B17	100		
	7	B16	140		
	6	B15	210		
	5	B14	300		
	4	B13	400		
	3	B12	500		
	2	B11	600		
Deepest	1	B10	810		

Deep cast	Shallow cast
15	15
40	30
70	50
100	75
150	100
200	150
300	200
500	250
750	300
1000	350
1250	400
1500	500

Niskin no.	Nuts_1	ANU DFe	ANU TM	UTAS TM	FeL	sidero	Pb isotopes	U isotopes	Pauline
	30 mL	250mL	1L	125mL	500mL	2L	5L	1L	5L
12	X	X	X	X	X		X		
11	X	X	X	X	X		X		
10	X	X	X	X	X		X		
9	X	X	X	X	X		X		
8	X	X	X	X	X		X		
7	X	X	X	X	X		X		
6	X	X	X	X	X		X		
5	X	X	X	X	X		X		
4	X	X	X	X	X		X		
3	X	X	X	X	X		X		
2	X	X	X	X	X		X		
1	X	X	X	X	X		X		
Sampling protocol:	unfiltered	filtered	filtered	filtered	filtered	filtered	filtered	filtered	filtered
Storage protocol:	hydrochem	acidified	acidified	acidified	-20C	-20C	acidified	acidified	incubations

Comments:
 ANU bottles are acidified with increasing HCl
 250ml, instead of 250ul, 375ul was added (50% increase)
 1L, instead of 100ul, 1500ul was added (50% increase)

UTAS 125ml kept at 125ul HCl

Nuyina - MNF trace metal rosette log sheet			
Voyage:	NUY2025_V03	Start time (UTC):	
Cruise:	Denman V3	Bottom time (UTC):	
Date (UTC):	29/03/2025	End time (UTC):	20:57
Station no.:	64	Lat:	-64.500
Deploy no.:	11	Long:	99.999
Waypoint no:	128	Section/region:	Process station
Filename:			
ships-nav depth	546.51	Data uploaded:	
Bottom depth (m):	556	Data downloaded:	
Trigger depth (m):	500	Battery start:	
Wire depth (m):	525	Battery finish:	
Max depth (m):		Pylon hosed down?	
		Nitrogen off?	

N.B. Start at bottom	Rosette pos	Niskin no	Target depth	Sensor pres	Comments
(i.e. at no. 1)			(m)	(dbar)	
Shallowest	12	B21	10		
↑	11	B20	30		DNF
	10	B19	50		
	9	B18	75		
	8	B17	90		
	7	B16	125		
	6	B15	150		leaked
	5	B14	195		
	4	B13	220		DNF
	3	B12	300		
	2	B11	400		
Deepest	1	B10	500		DNF

Deep cast	Shallow cast
15	15
40	30
70	50
100	75
150	100
200	150
300	200
500	250
750	300
1000	350
1250	400
1500	500

Niskin no.	Nuts_1	ANU DFe	ANU TM	UTAS TM	FeL	sidero	Pb isotopes	U isotopes	Pauline
	30 mL	250mL	1L	125mL	500mL	2L	3/5L	1L	Bacterial proc
12	X	X	X	X	X	X	X 3L		X
11									
10	X	X	X	X	X	X	X 5L		X
9	X	X	X	X	X	X	X 3L		X
8	X	X	X	X	X	X	X 5L		X
7	X	X	X	X	X	X	X 3L		X
6	X	X	X	X	X				
5	X	X	X	X	X	X	X 3L		X
4									
3	X	X	X	X	X	X	X 5L		X
2	X	X	X	X	X	X	X 5L		
1									
Sampling protocol:	unfiltered	filtered	filtered	filtered	filtered	filtered	filtered	filtered	unfiltered
Storage protocol:	hydrochem	acidified	acidified	acidified	-20C	-20C	acidified	acidified	incubations

Comments:
Niskin 6 was leaking so not sure about the depth

Nuyina - MNF trace metal rosette log sheet

Voyage:

Cruise:

Date (UTC):

Station no.:

Deploy no.:

Waypoint no:

Filename:

NUY2025_V03

Denman V3

30/03/2025

64

12

128

Start time (UTC):

Bottom time (UTC):

End time (UTC):

Lat:

Long:

Section/region:

18:05

18:20

-64.502

99.998

Process station

ships-nav depth

545.86

Data uploaded:

Bottom depth (m):

556

Data downloaded:

Trigger depth (m):

70

Battery start:

Wire depth (m):

100

Battery finish:

Max depth (m):

60

Pylon hosed down?

Nitrogen off?

N.B. Start at bottom	Rosette pos	Niskin no	Target depth	Sensor pres	Comments
(i.e. at no. 1)			(m)	(dbar)	
Shallowest	12	B21	60		
↑	11	B20	60		
	10	B19	60		
	9	B18	60		
	8	B17	60		
	7	B16	60		
	6	B15	60		leaking
	5	B14	60		
	4	B13	60		leaking
	3	B12	60		
	2	B11	60		
Deepest	1	B10	60		

Deep cast	Shallow cast
15	15
40	30
70	50
100	75
150	100
200	150
300	200
500	250
750	300
1000	350
1250	400
1500	500

Niskin no.	Nuts_1	ANU DFe	ANU TM	UTAS TM	FeL	sidero	Matt inc	Pauline inc	Katie inc
	30 mL	250mL	1L	125mL	500mL	2L	1 to 5L	1L	5L
12	X			XXX			X	X	X
11							X	X	X
10							X	X	X
9							X	X	X
8							X	X	X
7							X	X	X
6							X	X	X
5							X	X	X
4							X	X	X
3							X	X	X
2							X	X	X
1							X	X	X
Sampling protocol:	unfiltered	filtered	filtered	filtered	filtered	filtered	unfiltered	unfiltered	unfiltered
Storage protocol:	hydrochem	(acidified)	acidified	acidified	-20C	-20C	incubations	incubations	incubations

Chla

FRRf

3L

4x 50ml

& 4L size fraction

Comments:

Nuyina - MNF trace metal rosette log sheet			
Voyage:	NUY2025_V03	Start time (UTC):	21:15
Cruise:	Denman V3	Bottom time (UTC):	
Date (UTC):	30/03/2025	End time (UTC):	22:26
Station no.:	64	Lat:	-64.500
Deploy no.:	13	Long:	100.000
Waypoint no:	128	Section/region:	Process station
Filename:			
ships-nav depth	547.13	Data uploaded:	
Bottom depth (m):	556	Data downloaded:	
Trigger depth (m):	510	Battery start:	
Wire depth (m):	535	Battery finish:	
Max depth (m):	500	Pylon hosed down?	
		Nitrogen off?	

N.B. Start at bottom (i.e. at no. 1)	Rosette pos	Niskin no	Target depth (m)	Sensor pres (dbar)	Comments
Shallowest	12	B21	15		
↑	11	B20	15		
	10	B19	30		
	9	B18	30		
	8	B17	60		
	7	B16	60		
	6	B15	60		
	5	B14	60		
	4	B13	60		
	3	B12	60		
	2	B11	500		
Deepest	1	B10	500		

Deep cast	Shallow cast
15	15
40	30
70	50
100	75
150	100
200	150
300	200
500	250
750	300
1000	350
1250	400
1500	500

Niskin no.	Nuts_1	ANU DFe	ANU TM	UTAS TM	FeL	sidero	Pb isotopes	Talitha	Pauline
	30 mL	250mL	1L	125mL	500mL	2L	2L	42L	C14 1L
12	X	XX	X	X	X		X		
11				X			X		X
10	X	X	X	X	X		X		
9		X		X			X		X
8								X	
7								X	
6								X	X
5								X	
4		X					X	X	
3	X	X	X		XXX		X	X filtered	
2		X		X			X		
1	X	X	X	X	X		X		
Sampling protocol:	unfiltered	filtered	filtered	filtered	filtered	filtered	filtered	unfiltered/filt	unfiltered
Storage protocol:	hydrochem	acidified	acidified	acidified	-20C	-20C	acidified	incubations	incubations

Chla
1L

FRRf
50ml

X

X

X

X

Comments:

Nuyina - MNF trace metal rosette log sheet			
Voyage:	NUY2025 V03	Start time (UTC):	21:06
Cruise:	Denman V3	Bottom time (UTC):	
Date (UTC):	4/04/2025	End time (UTC):	21:25
Station no.:	83	Lat:	-64.840
Deploy no.:	14	Long:	94.129
Waypoint no:	151	Section/region:	Shackleton Ice Shelf top V
Filename:			
ships-nav depth	290.05	Data uploaded:	
Bottom depth (m):	300	Data downloaded:	
Trigger depth (m):	250	Battery start:	
Wire depth (m):		Battery finish:	
Max depth (m):	260	Pylon hosed down?	
		Nitrogen off?	

N.B. Start at bottom (i.e. at no. 1)	Rosette pos	Niskin no	Target depth (m)	Sensor pres (dbar)	Comments
Shallowest	12	B21	10		
↑	11	B20	10		
	10	B19	25		
	9	B18	60		leaking
	8	B17	60		
	7	B16	80		
	6	B15	80		
	5	B14	110		
	4	B13	150		
	3	B12	200		
	2	B11	240		leaking
Deepest	1	B10	240		

Deep cast	Shallow cast
15	15
40	30
70	50
100	75
150	100
200	150
300	200
500	250
750	300
1000	350
1250	400
1500	500

Niskin no.	Nuts_1	ANU DFe	ANU TM	UTAS TM	FeL	sidero	Pb isotopes	U isotopes	Pauline
	30 mL	250mL	1L	125mL	500mL	2L	2L	1L	5L
12	X								
11	X	X	X	X	X		X		
10	X	X	X	X	X		X		
9	X								
8	X	X	X	X	X		X		
7	X	X	X	X	X		X		
6	X								
5	X	X	X	X	X		X		
4	X	X	X	X	X		X		
3	X	X	X	X	X		X		
2	X								
1	X	X	X	X	X		X		
Sampling protocol:	unfiltered	filtered	filtered	filtered	filtered	filtered	filtered	filtered	filtered
Storage protocol:	hydrochem	acidified	acidified	acidified	-20C	-20C	acidified	acidified	incubations

Comments:

Nuyina - MNF trace metal rosette log sheet			
Voyage:	NUY2025_V03	Start time (UTC):	8:06
Cruise:	Denman V3	Bottom time (UTC):	
Date (UTC):	5/04/2025	End time (UTC):	8:25
Station no.:	84	Lat:	-65.233
Deploy no.:	15	Long:	95.660
Waypoint no:	157	Section/region:	Shackleton Ice Shelf top V
Filename:			
ships-nav depth	507.56	Data uploaded:	
Bottom depth (m):	516	Data downloaded:	
Trigger depth (m):	480	Battery start:	
Wire depth (m):		Battery finish:	
Max depth (m):	470	Pylon hosed down?	
		Nitrogen off?	

N.B. Start at bottom (i.e. at no. 1)	Rosette pos	Niskin no	Target depth (m)	Sensor pres (dbar)	Comments
Shallowest	12	B21	15		
↑	11	B20	15		
	10	B19	35		DNF
	9	B18	35		
	8	B17	50		DNF
	7	B16	50		
	6	B15	100		
	5	B14	160		
	4	B13	160		
	3	B12	220		
	2	B11	350		DNF
Deepest	1	B10	470		DNF

Deep cast	Shallow cast
15	15
40	30
70	50
100	75
150	100
200	150
300	200
500	250
750	300
1000	350
1250	400
1500	500

Niskin no.	Nuts_1	ANU DFe	ANU TM	UTAS TM	FeL	sidero	Pb isotopes	U isotopes	Pauline
	30 mL	250mL	1L	125mL	500mL	2L	2L	1L	5L
12	X	X	X	X	X		X		
11	X	X	X	X	X		X		
10									
9	X	X	X	X	X		X		
8									
7	X	X	X	X	X		X		
6	X	X	X	X	X		X		
5	X	X	X	X	X		X		
4	X	X	X	X	X		X		
3	X	X	X	X	X		X		
2									
1									
Sampling protocol:	unfiltered	filtered	filtered	filtered	filtered	filtered	filtered	filtered	filtered
Storage protocol:	hydrochem	acidified	acidified	acidified	-20C	-20C	acidified	acidified	incubations

Comments:
2x 1L for Taryn

Nuyina - MNF trace metal rosette log sheet

Voyage:

NUY2025 V03

Start time (UTC):

22:06

Cruise:

Denman V3

Bottom time (UTC):

Date (UTC):

6/04/2025

End time (UTC):

22:31

Station no.:

92

Lat:

-65.102

Deploy no.:

17

Long:

95.147

Waypoint no:

159

Section/region:

Shackleton Ice Shelf top V

Filename:

ships-nav depth

546.03

Data uploaded:

Bottom depth (m):

555

Data downloaded:

Trigger depth (m):

520

Battery start:

Wire depth (m):

Battery finish:

Max depth (m):

540

Pylon hosed down?

Nitrogen off?

N.B. Start at bottom (i.e. at no. 1)	Rosette pos	Niskin no	Target depth (m)	Sensor pres (dbar)	Comments
Shallowest	12	B21	15		hook DNF
↑	11	B20	30		
	10	B19	60		
	9	B18	60		
	8	B17	110		bottom lid DNF
	7	B16	180		
	6	B15	180		
	5	B14	330		
	4	B13	370		hook DNF
	3	B12	430		hook DNF
	2	B11	520		hook DNF
Deepest	1	B10	520		hook DNF

Deep cast	Shallow cast
15	15
40	30
70	50
100	75
150	100
200	150
300	200
500	250
750	300
1000	350
1250	400
1500	500

Niskin no.	Nuts_1	ANU DFe	ANU TM	UTAS TM	UTAS TD	FeL	sidero	Pb isotopes	total dissolvable
	30 mL	250mL	1L	125mL	60mL	500mL	2L	2L	60mL
12									
11	X		X	X	X	X		X	X
10	X		X	X	X	X		X	X
9	X			X	X				
8									
7	X		X	X	X	X		X	X
6	X			X	X				
5	X		X	X	X	X		X	X
4									
3									
2									
1									
Sampling protocol:	unfiltered	filtered	filtered	filtered	unfiltered	filtered	filtered	filtered	unfiltered
Storage protocol:	hydrochem	acidified	acidified	acidified	acidified	-20C	-20C	acidified	acidified

Comments:

Nuyina - MNF trace metal rosette log sheet			
Voyage:	NUY2025_V03	Start time (UTC):	14:47
Cruise:	Denman V3	Bottom time (UTC):	
Date (UTC):	10/04/2025	End time (UTC):	
Station no.:	106	Lat:	-66.205
Deploy no.:	20	Long:	95.314
Waypoint no:	176	Section/region:	
Filename:			
ships-nav depth	395.82	Data uploaded:	
Bottom depth (m):		Data downloaded:	
Trigger depth (m):		Battery start:	
Wire depth (m):		Battery finish:	
Max depth (m):		Pylon hosed down?	
		Nitrogen off?	

N.B. Start at bottom (i.e. at no. 1)	Rosette pos	Niskin no	Target depth (m)	Sensor pres (dbar)	Comments
Shallowest	12	B21	15		
↑	11	B20	15		
	10	B19	30		
	9	B18	50		
	8	B17	90		
	7	B16	130		
	6	B15	160		
	5	B14	200		
	4	B13	250		
	3	B12	300		
	2	B11	350		
Deepest	1	B10	350		

Deep cast	Shallow cast
15	15
40	30
70	50
100	75
150	100
200	150
300	200
500	250
750	300
1000	350
1250	400
1500	500

Niskin no.	Nuts_1	ANU DFe	ANU TM	UTAS TM	FeL	sidero	Pb isotopes	total dissolvable	+Bsi+POC+FRRf	
	30 mL	250mL	1L	125mL	500mL	2L	2L	60mL	5L	oxygen
12										?
11	X		X	X	X		X	X	X	X
10	X		X	X	X		X	X	X	X
9	X		X	X	X		X	X	X	X
8	X		X	X	X		X	X	X	X
7	X		X	X	X		X	X	X	X
6	X		X	X	X		X	X	X	X
5	X		X	X	X		X	X	X	X
4	X		X	X	X		X	X	X	X
3	X		X	X	X		X	X	X	X
2	X		X	X	X		X	X	X	X
1										
Sampling protocol:	unfiltered	filtered	filtered	filtered	filtered	filtered	filtered	unfiltered	unfiltered	
Storage protocol:	hydrochem	acidified	acidified	acidified	-20C	-20C	acidified	acidified	bio team	

Comments:

Nuyina - MNF trace metal rosette log sheet			
Voyage:	NUY2025_V03	Start time (UTC):	21:47
Cruise:	Denman V3	Bottom time (UTC):	
Date (UTC):	11/04/2025	End time (UTC):	
Station no.:	109	Lat:	-66.022
Deploy no.:	21	Long:	95.200
Waypoint no:	178	Section/region:	Process station 2
Filename:			
ships-nav depth	755.5	Data uploaded:	
Bottom depth (m):	760	Data downloaded:	
Trigger depth (m):	130	Battery start:	
Wire depth (m):	200	Battery finish:	
Max depth (m):	200	Pylon hosed down?	
		Nitrogen off?	

N.B. Start at bottom (i.e. at no. 1)	Rosette pos	Niskin no	Target depth (m)	Sensor pres (dbar)	Comments
Shallowest	12	B21	15		
↑	11	B20	30		
	10	B19	30		
	9	B18	30		
	8	B17	88		
	7	B16	130		
	6	B15	130		
	5	B14	130		
	4	B13	130		
	3	B12	130		
	2	B11	130		
Deepest	1	B10	130		

Deep cast	Shallow cast
15	15
40	30
70	50
100	75
150	100
200	150
300	200
500	250
750	300
1000	350
1250	400
1500	500

Niskin no.	Nuts_1	ANU DFe	ANU TM	UTAS TM	FeL	Pauline LHL + LL	Talitha LL+HL	Pauline HL	C14	CHL + FRRf+BP
	30 mL	250mL	1L	125mL	500mL					
12	X								X	X
11	X							X	X	X
10	X							X		
9	X							X		
8	X								X	X
7	X					X	X			
6	X					X	X		X	X
5	X					X	X			
4	X			XXX	XXX	X	X			
3	X					X	X			
2	X					X	X			
1	X					X	X			
Sampling protocol:	unfiltered	filtered	filtered	filtered	filtered	unfiltered	unfiltered + fil	unfiltered	unfiltered	
Storage protocol:	hydrochem	(acidified)	acidified	acidified	-20C	incubations	incubations	incubations	incubations	

Comments:
Did some environmental blanks (n=4)

Nuyina - MNF trace metal rosette log sheet			
Voyage:	NUY2025_V03	Start time (UTC):	4:21
Cruise:	Denman V3	Bottom time (UTC):	4:33
Date (UTC):	12/04/2025	End time (UTC):	
Station no.:	109	Lat:	-66.021
Deploy no.:	22	Long:	95.200
Waypoint no:	178	Section/region:	Process station 2
Filename:			
ships-nav depth	753.14	Data uploaded:	
Bottom depth (m):		Data downloaded:	
Trigger depth (m):		Battery start:	
Wire depth (m):		Battery finish:	
Max depth (m):		Pylon hosed down?	
		Nitrogen off?	

N.B. Start at bottom (i.e. at no. 1)	Rosette pos	Niskin no	Target depth (m)	Sensor pres (dbar)	Comments
Shallowest	12	B21	15		
↑	11	B20	30		
	10	B19	60		
	9	B18	88		
	8	B17	110		
	7	B16	130		
	6	B15	160		
	5	B14	200		
	4	B13	350		
	3	B12	450		
	2	B11	550		
Deepest	1	B10	600		

Deep cast	Shallow cast
15	15
40	30
70	50
100	75
150	100
200	150
300	200
500	250
750	300
1000	350
1250	400
1500	500

Niskin no.	Nuts_1	ANU DFe	ANU TM	UTAS TM	FeL	sidero	Pb isotopes	tal dissolvat	Pauline
	30 mL	250mL	1L	125mL	500mL	2L	2L	60mL	BP
12	X	X	X	XX	X	X	X	XX	50mL
11	X	X	X	XX	X	X	X	XX	
10	X	X	X	XX	X	X	X	XX	
9	X	X	X	XX	X	X	X	XX	
8									
7									
6	X	X	X	XX	X	X	X	XX	
5	X	X	X	XX	X	X	X	XX	
4	X	X	X	XX	X	X	X	XX	
3	X	X	X	XX	X	X	X	XX	
2	X	X	X	XX	X	X	X	XX	
1	X	X	X	XX	X	X	X	XX	
Sampling protocol:	unfiltered	filtered	filtered	filtered	filtered	filtered	filtered	unfiltered	filtered
Storage protocol:	hydrochem	acidified	acidified	acidified	-20C	-20C	acidified	acidified	incubations

Comments:
Taryns bottle 22_10 (2) lid was open, water spilled and not acidified. So only 1 L at that depth
FeL duplicates (FLPE and LDPE)

Nuyina - MNF trace metal rosette log sheet			
Voyage:	NUY2025_V03	Start time (UTC):	14/04/2025 8:30
Cruise:	Denman V3	Bottom time (UTC):	
Date (UTC):	14/04/2025	End time (UTC):	
Station no.:	125	Lat:	-65.791
Deploy no.:	23	Long:	95.427
Waypoint no:	188	Section/region:	
Filename:			
ships-nav depth	1264.64	Data uploaded:	
Bottom depth (m):		Data downloaded:	
Trigger depth (m):		Battery start:	
Wire depth (m):		Battery finish:	
Max depth (m):		Pylon hosed down?	
		Nitrogen off?	

N.B. Start at bottom (i.e. at no. 1)	Rosette pos	Niskin no	Target depth (m)	Sensor pres (dbar)	Comments
Shallowest	12	B21	20		
↑	11	B20	50		
	10	B19	100		
	9	B18	140		
	8	B17	160		
	7	B16	250		
	6	B15	320		
	5	B14	400		top still open
	4	B13	600		
	3	B12	800		
	2	B11	1000		didn't close
Deepest	1	B10	1100		

Deep cast	Shallow cast
15	15
40	30
70	50
100	75
150	100
200	150
300	200
500	250
750	300
1000	350
1250	400
1500	500

Niskin no.	Nuts_1	ANU DFe	ANU TM	UTAS TM	FeL	sidero	Pb isotopes	Total dissolvable
	30 mL	250mL	1L	125mL	500mL	2L	2L	60mL
12	x		x	x	x		x	x
11	x		x	x	x		x	x
10	x		x	x	x		x	x
9	x		x	x	x		x	x
8	x		x	x	x		x	x
7	x		x	x	x		x	x
6	x		x	x	x		x	x
5	x		x	x	x		x	x
4	x		x	x	x		x	x
3	x		x	x	x		x	x
2								
1	x		x	x	x		x	x
Sampling protocol:	unfiltered	filtered	filtered	filtered	filtered	filtered	filtered	unfiltered
Storage protocol:	hydrochem	acidified	acidified	acidified	-20C	-20C	acidified	acidified

Comments:

Nuyina - MNF trace metal rosette log sheet			
Voyage:	NUY2025_V03	Start time (UTC):	15/04/2025 11:27
Cruise:	Denman V3	Bottom time (UTC):	
Date (UTC):	15/04/2025	End time (UTC):	
Station no.:	129	Lat:	-65.441
Deploy no.:	24	Long:	95.513
Waypoint no:	199	Section/region:	west shackleton NS
Filename:			
ships-nav depth	272.27	Data uploaded:	
Bottom depth (m):		Data downloaded:	
Trigger depth (m):		Battery start:	
Wire depth (m):		Battery finish:	
Max depth (m):		Pylon hosed down?	
		Nitrogen off?	

N.B. Start at bottom (i.e. at no. 1)	Rosette pos	Niskin no	Target depth (m)	Sensor pres (dbar)	Comments
Shallowest	12	B21	15		
↑	11	B20	15		
	10	B19	30		
	9	B18	60		
	8	B17	100		
	7	B16	100		
	6	B15	130		
	5	B14	130		
	4	B13	160		
	3	B12	200		
	2	B11	240		
Deepest	1	B10	240		

Deep cast	Shallow cast
15	15
40	30
70	50
100	75
150	100
200	150
300	200
500	250
750	300
1000	350
1250	400
1500	500

Niskin no.	Nuts_1	ANU DFe	ANU TM	UTAS TM	FeL	sidero	Pb isotopes	tal dissolvat	Pauline BP	BIO sampling Chla, bsi, poc, frff oxygen
	30 mL	250mL	1L	125mL	500mL	2L	2/5L	60mL	50mL	
12	X		X	X	XX			X		X
11	X						X 5L			XX
10	X		X	X	XX		X 2L	X		X
9	X		X	X	XX		X 2L	X		X
8	X		X	X	XX			X		X
7	X						X 5L			XX
6	X		X	X	XX			X		X
5	X						X 5L			XX
4	X		X	X	XX		X 2L	X		X
3	X		X	X	X		X 2L	X		X
2	X						X 5L			XX
1	X		X	X	XX			X		X
Sampling protocol:	unfiltered	filtered	filtered	filtered	filtered	filtered	filtered	unfiltered	filtered	
Storage protocol:	hydrochem	acidified	acidified	acidified	-20C	-20C	acidified	acidified	incubations	

Comments:
Used a lot of filters
FeL duplicates (LDPE and FLPE)

Nuyina - MNF trace metal rosette log sheet			
Voyage:	NUY2025_V03	Start time (UTC):	15:05
Cruise:	Denman V3	Bottom time (UTC):	
Date (UTC):	15/04/2025	End time (UTC):	
Station no.:	130	Lat:	-65.299
Deploy no.:	25	Long:	95.513
Waypoint no:	200	Section/region:	West shackleton NS
Filename:			
ships-nav depth	487.07	Data uploaded:	
Bottom depth (m):	491	Data downloaded:	
Trigger depth (m):	450	Battery start:	
Wire depth (m):		Battery finish:	
Max depth (m):	460	Pylon hosed down?	
		Nitrogen off?	

No coupled CTD, so no temperature, fluorescence, salinity, oxygen

N.B. Start at bottom (i.e. at no. 1)	Rosette pos	Niskin no	Target depth (m)	Sensor pres (dbar)	Comments
Shallowest	12	B21	15		
↑	11	B20	40		
	10	B19	60		
	9	B18	80		
	8	B17	100		
	7	B16	130		
	6	B15	160		
	5	B14	200		
	4	B13	250		
	3	B12	300		
	2	B11	400		
Deepest	1	B10	450		

Deep cast	Shallow cast
15	15
40	30
70	50
100	75
150	100
200	150
300	200
500	250
750	300
1000	350
1250	400
1500	500

Niskin no.	Nuts_1	ANU DFe	ANU TM	UTAS TM	FeL	sidero	Pb isotopes	Total dissolvable	Pauline	BIO sampling Chla, bsi, poc, frfr oxygen
	30 mL	250mL	1L	125mL	500mL	2L	1 to 5L	60mL	5L	
12	X		X	X	XX			X		X
11	X		X	X	XX			X		X
10	X		X	X	XX			X		X
9	X		X	X	XX			X		X
8	X		X	X	XX			X		X
7	X		X	X	XX			X		X
6	X		X	X	XX			X		X
5	X		X	X	XX			X		X
4	X		X	X	XX			X		X
3	X		X	X	XX			X		X
2	X		X	X	XX			X		X
1	X		X	X	XX			X		X
Sampling protocol:	unfiltered	filtered	filtered	filtered	filtered	filtered	filtered	unfiltered	unfiltered	
Storage protocol:	hydrochem	acidified	acidified	acidified	-20C	-20C	acidified	acidified	incubations	

Comments:
Filled up TM carboys, one shallow (20L) and one deep (10L)

Forgot to sample for d18O

Nuyina - MNF trace metal rosette log sheet

Voyage:

Cruise:

Date (UTC):

Station no.:

Deploy no.:

Waypoint no:

Filename:

NUY2025_V03

Denman V3

19/04/2025

138

26

205

Start time (UTC):

Bottom time (UTC):

End time (UTC):

Lat:

Long:

Section/region:

11:39

-64.587

94.171

Continental shelf

ships-nav depth

2404.43

Data uploaded:

Bottom depth (m):

2400

Data downloaded:

Trigger depth (m):

Battery start:

Wire depth (m):

Battery finish:

Max depth (m):

2300

Pylon hosed down?

Nitrogen off?

N.B. Start at bottom (i.e. at no. 1)	Rosette pos	Niskin no	Target depth (m)	Sensor pres (dbar)	Comments
Shallowest	12	B21	15		leaky
↑	11	B20	30		
	10	B19	60		leaky
	9	B18	100		
	8	B17	150		
	7	B16	250		
	6	B15	300		
	5	B14	500		
	4	B13	750		
	3	B12	1000		
	2	B11	1500		
Deepest	1	B10	2300		

Deep cast	Shallow cast
15	15
40	30
70	50
100	75
150	100
200	150
300	200
500	250
750	300
1000	350
1250	400
1500	500

Niskin no.	Nuts_1	ANU DFe	ANU TM	UTAS TM	FeL	sidero	Pb isotopes	Total dissolvable	Pauline	
	30 mL	250mL	1L	125mL	500mL	2L	2L	60mL	5L	oxygen
12	X	X	X	X	X		X (only 1L)	X		XX
11	X	X	X	X	X		X	X		XX
10	X	X	X	X	X		X	X		XX
9	X	X	X	X	X		X	X		XX
8	X	X	X	X	X		X	X		XX
7	X	X	X	X	X		X	X		XX
6	X	X	X	X	X		X	X		XX
5	X	X	X	X	X		X	X		XX
4	X	X	X	X	X		X	X		XX
3	X	X	X	X	X		X	X		XX
2	X	X	X	X	X		X	X		XX
1	X	X	X	X	X		X	X		XX
Sampling protocol:	unfiltered	filtered	filtered	filtered	filtered	filtered	filtered	unfiltered	unfiltered	
Storage protocol:	hydrochem	acidified	acidified	acidified	-20C	-20C	acidified	acidified	incubations	

Comments:

Draw water for: culturing carboys:

Deep: 1,2,3,4,5,6

Shallow: 7,8,9,10

Used deep for 50L carboy as well