March
2022

East Moclett, The North Sound
Visual Survey Report

1. Introduction

This baseline visual survey report has been prepared by Cooke Aquaculture Scotland (CAS) in support of a SEPA CAR Licence application for a proposed marine fish farm in North Sound, Orkney; East Moclett. The visual survey was completed on 10/8/2021 at the proposed location by Roving Eye Enterprises on behalf of CAS. The survey followed the procedure as per the methods outlined in SEPA's Aquaculture Manual (Baseline Survey, Visual – Standard).

This report used the video data collected at the location to describe and characterise the baseline benthic environment and in particular, highlight any species or habitats of conservation importance.

2. Survey Methodology

2.1 Survey Design

The visual transects for the proposed East Moclett site were determined using outputs from a particle tracking model and guidance stated in the Baseline Survey & Seabed and Quality Monitoring Plan Design (SEPA, 2019). Modelling identified that particle deposition primarily occurs along a NW bearing, aligned with residual bed currents. Due to uncertainties in the numerical model, the length of the transects were extended to well beyond the likely impact area, resulting in approximately 1.5km transects. Horizontal transect spacing was taken at 400m, allowing detailed assessment of the central and peripheral seabed. This provides a precautionary approach that catalogues the benthic environment in the immediate area beneath the site, whilst also extending well beyond any likely impacted area. Transects were agreed in advance of the survey in consultation with SEPA and NatureScot. Planned survey transects are detailed in Table 2.1 and Figure 2.1. Actual survey transects are shown in Figure 2.2 and Table 2.2.

Table 2.1. The planned visual benthic survey transects at the proposed East Moclett site.

	Start		End	
Transect	Easting (OSGB)	Northing (OSGB)	Easting (OSGB)	Northing (OSGB)
T1	352735.00	1047794.00	351993.00	1048981.00
T2	353074.00	1048006.00	352333.00	1049193.00
T3	353414.00	1048218.00	352672.00	1049405.00

Table 2.2. The actual visual benthic survey transects at the proposed East Moclett site.

	Start		End	
Transect	Easting (OSGB)	Northing (OSGB)	Easting (OSGB)	Northing (OSGB)
T1	352756.23	1047795.53	352000.00	1049586.18
T2	353060.17	1047988.00	352399.05	1049186.12
T3	353415.62	1048213.70	352676.49	1049411.99

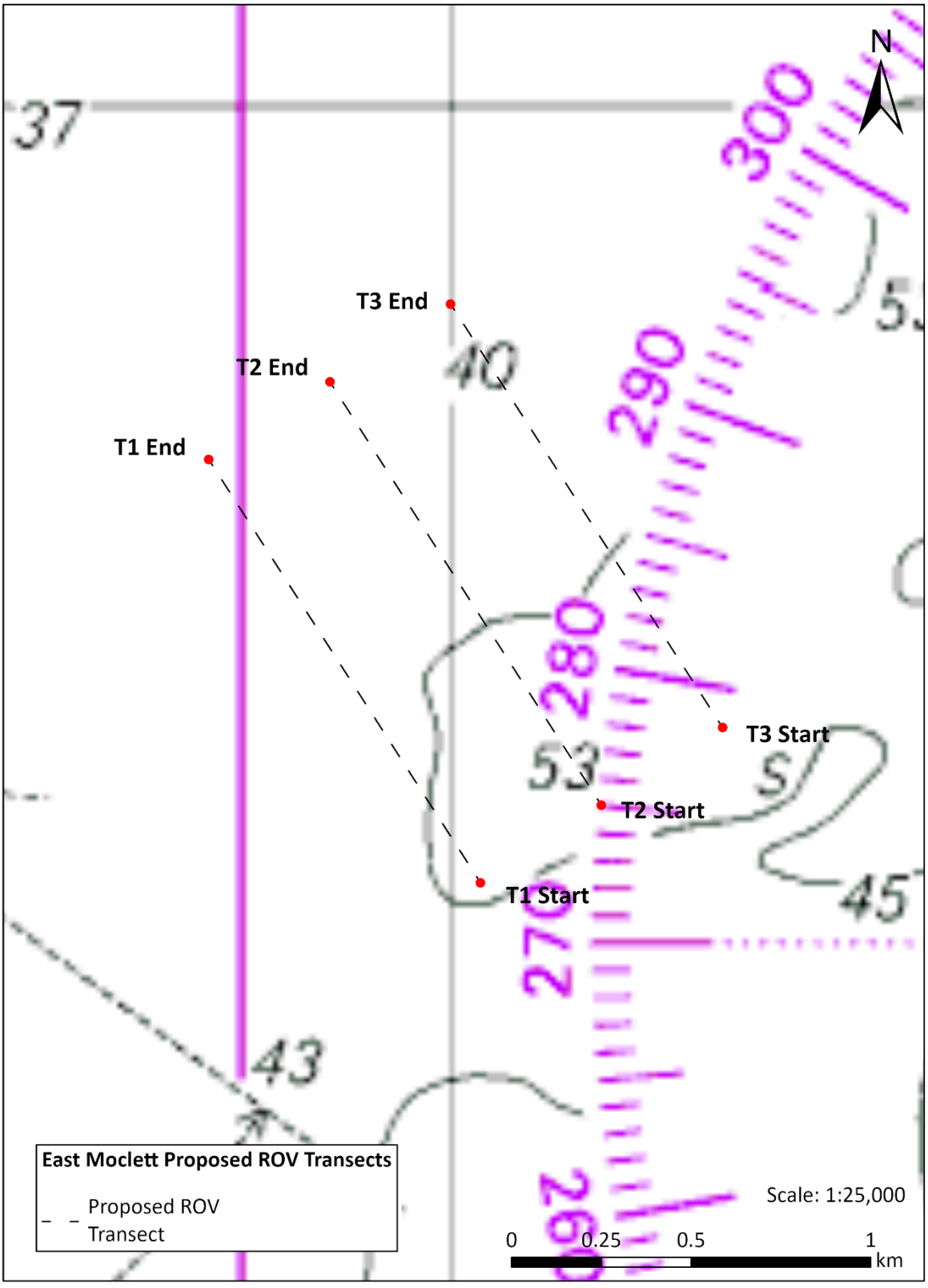

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Figure 2.1. The locations of the planned visual benthic survey transects at the proposed East Moclett site.

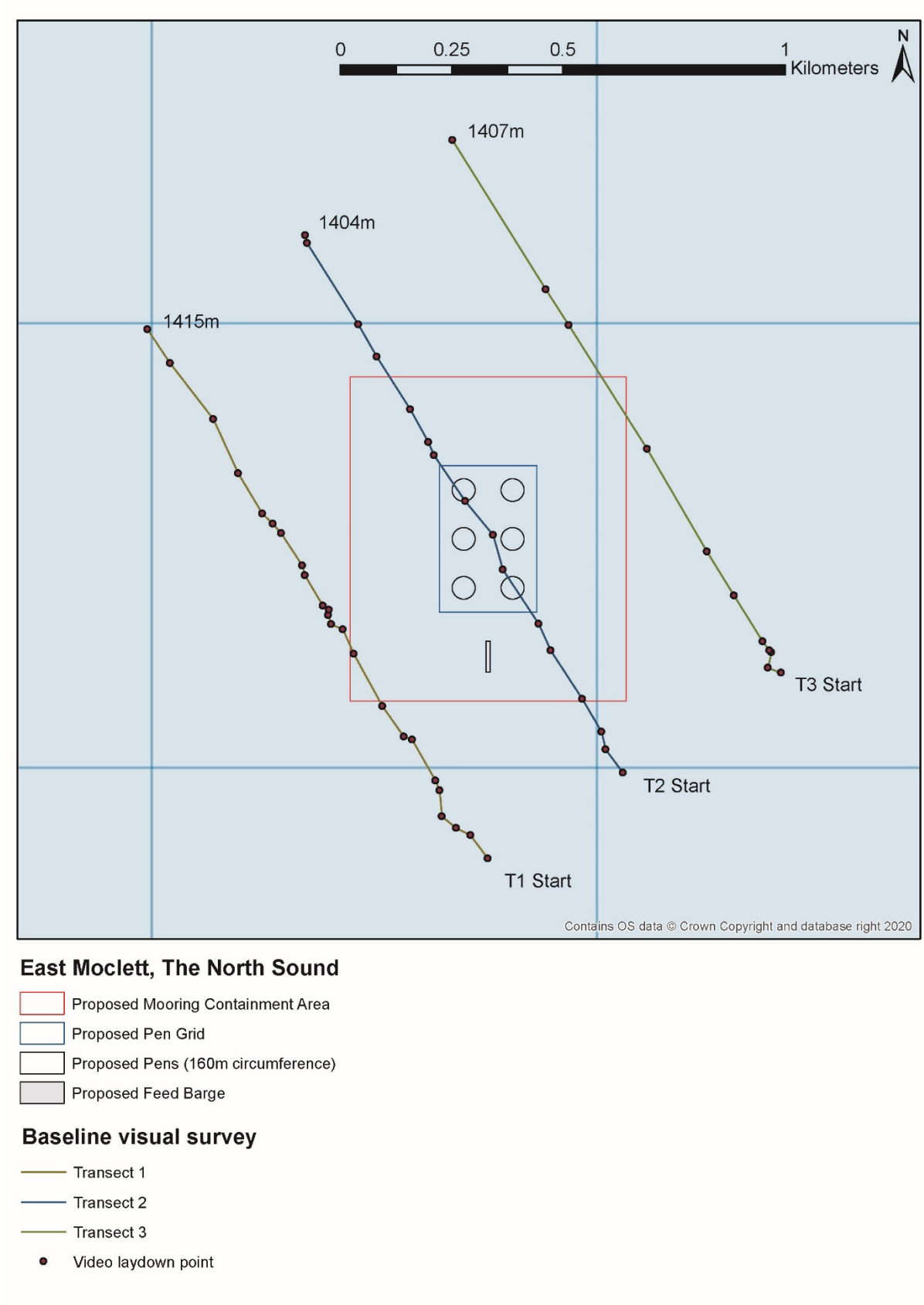


Figure 2.2. East Moclett Baseline visual survey locations

2.2 Survey Analysis and Interpretation

Survey video footage was inspected by CAS and used to describe the biota and seabed characteristics in the area. The Marine Nature Conservation Review SACFOR abundance scale was used to quantify any species found on the footage (Hiscock, 1996). Biotope types were identified and classified according to the JNCC Marine Habitat Classification for Britain and Ireland (JNCC, 2015).

3. Survey observations

3.1 Seabed characteristics

There are minor variations in sediment type across the survey area with fine sand changing to coarse sand and some presence of stone and pebble material. Observations on the video footage show the possible presence of muddy sand, however, this has been cross-referenced with the baseline benthic survey undertaken at the site which found no mud in the area so classified as fine sand. The area depth was fairly uniform across the area between 40m and 50m.

3.2 Biota

Species presence was moderate to sparse across all three transects with identifiable relationships between benthos type and species. Fish species included Goby spp, spotted ray (*Raja montagui*), ballan wrasse (*Labrus bergylta*) and cuckoo wrasse (*Labrus mixtus*), and flatfish spp, alongside other smaller, unidentified fish species that often occurred in shoals in the vicinity of the rocky areas. The fine sand areas were frequently shown to have lug worm casts (*Arenicola marina*) and other burrows. Crustacea were present although not numerous, with hermit crabs and spiny squat lobsters (*Galathea strigosa*) being noted.

King scallops (*Pecten maximus*) were noted throughout the three survey transects in some frequency across the area. Common sea urchins (*Echinus esculentus*) were numerous relative to the rocky areas with seven-armed starfish (*Luidia ciliaris*), common starfish (*Asterias rubens*) and two examples of common sunstars (*Crossaster papposus*) also being noted but in low frequencies. Brittle stars (*Ophiothrix fragilis*) were also noted. Seaweed cover was common, with notable occurrences of hornwrack (*Flustra foliacea*) amongst the larger stone/rock patches.

Footage photos can be found in Appendix 2 and the locations of these captures are shown in Figure 3.1. Appendix 1 has details of the biota descriptions for each photo.

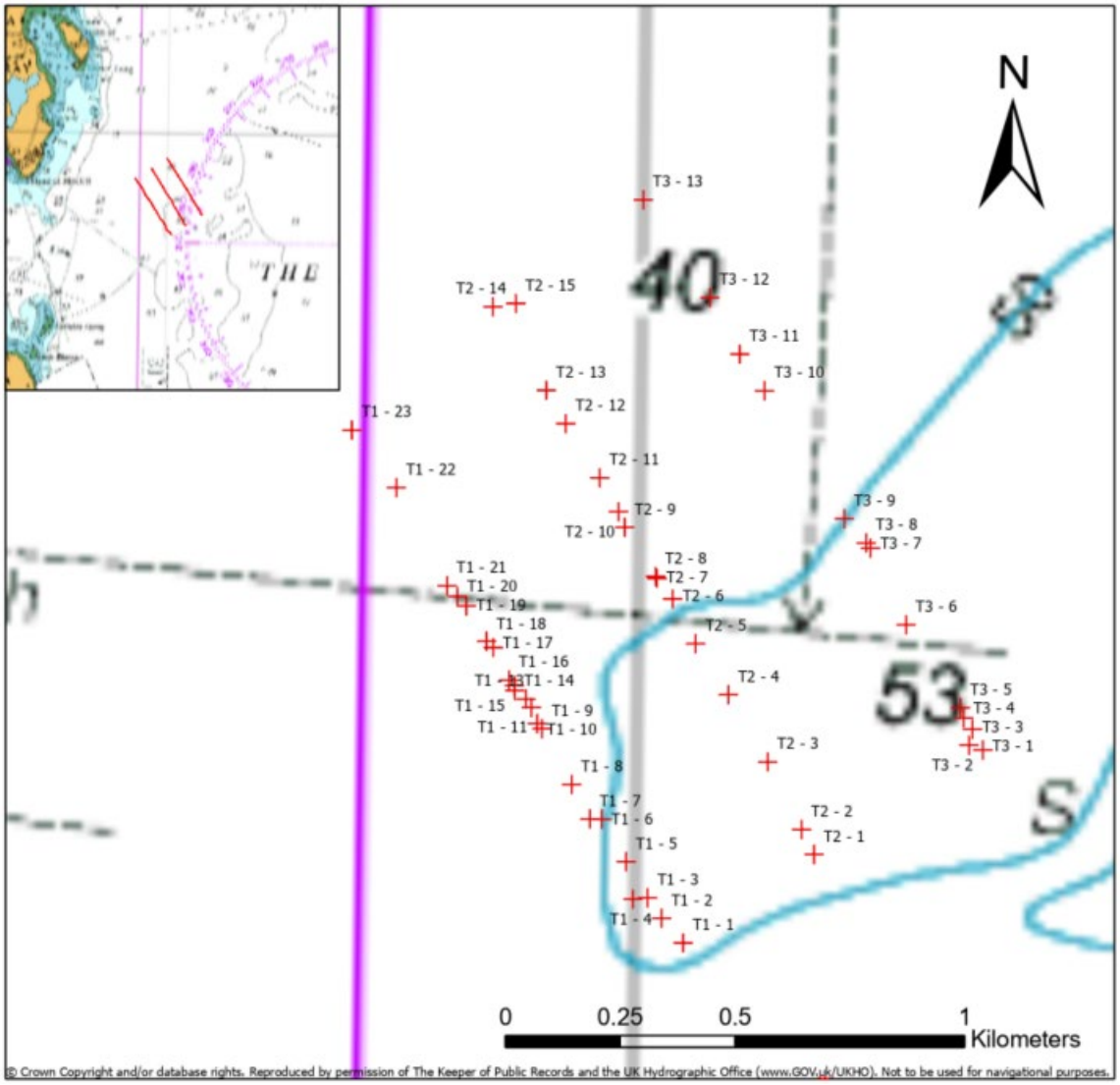


Figure 3.1. Locations of the photos taken from the footage of the visual survey at East Moclett.

4. Description of Biotopes

The seabed sediments across the survey were predominantly composed of coarse and fine sand. All seafloor habitats known in UK waters are classified into biotopes (JNCC, 2015). The survey area displayed characteristics of the following biotope types as described below:

Circalittoral coarse sediment (SS.SCS.CCS)

Areas of coarse sandy sediment were dominant throughout the survey with unstable cobbles and pebbles, gravels and coarse sands. These areas were dominant at the southern ends of the transects.

Circalittoral mixed sediment (SS.SMx.CMx)

A diverse mixed sediment habitat is predominant throughout the survey including well mixed gravelly sands or very poorly sorted mosaics of shell, cobbles and pebbles embedded in or lying upon sand. This is consistent with the biotope SS.SMx.CMx. These are most prevalent to the NW of the site, predominantly out with the proposed MCA area, and relative to a shallowing of bathymetry.

Echinoderms and crustose communities (CR.MCR.EcCr)

Wave-exposed, moderately strong tide-swept bedrock and boulders are prevalent throughout the survey consistent with the biotope CR.MCR.EcCr. Large boulders and rocks were seen in all transects with sea urchins (*Echinus esculentus*) and red encrusting algae consistent with the sub-biotope CR.MCR.EcCR.FaAICr.

Sublittoral sands and muddy sands (SS.SSa)

There is evidence of fine sands in a moderately exposed area from the survey footage. The majority of these areas could be sub-classified as circalittoral fine sand. They may also be classified as muddy sand, however, the baseline benthic survey found no evidence of mud in the area so this sub-biotope may not be present.

1. References

Hiscock, K. (1996) Marine Nature Conservation Review: Rationale and methods. Coasts and seas of the United Kingdom. MNCR series. JNCC [online].

JNCC (2015) The Marine Habitat Classification for Britain and Ireland Version 15.03. Available from: https://mhc.jncc.gov.uk/

Appendix 1

Table 3 describes the location, substrate and biota for each image shown in Appendix 2. The SACFOR scale of abundance (S = Superabundant, A = Abundant, C = Common, F = Frequent, O = Occasional, R = Rare) has been used to estimate abundance of individuals observed (JNSS, 2015) and their corresponding percentage cover.

Table 3. Descriptions of images taken from the visual survey at the proposed East Moclett site.

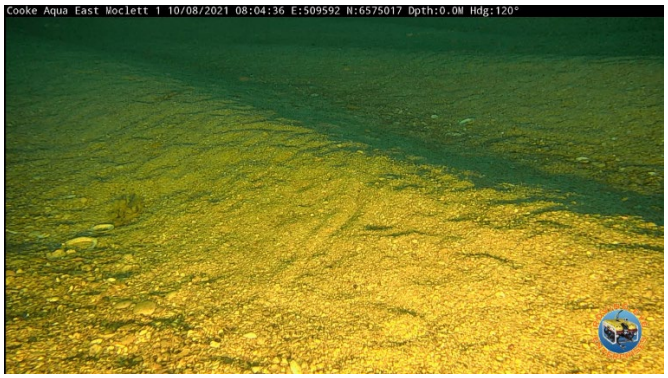
Image	Easting	Northing	Depth (m)	Substrate	Biota	SACFOR	% cover
T1 – 1	352763.2	1047793.4	49.9	Coarse Sand	Possible Hornwrack (*Flustra foliacea*)	R	< 1%
T1 – 2	352716.0	1047847.1	50.0	Coarse Sand	No discernible biota	-	-
T1 – 3	352685.7	1047891.6	50.0	Coarse Sand	No discernible biota	-	-
T1 – 4	352653.6	1047889.1	49.9	Coarse Sand	No discernible biota	-	-
T1 – 5	352638.8	1047970.3	49.6	Coarse Sand	No discernible biota	-	-
T1 – 6	352586.2	1048063.1	49.4	Fine Sand	Burrows present Possible lugworm casts (*Arenicola marina*)	- C	- 25%
T1 – 7	352560.2	1048063.5	49.3	Coarse sand/ Stone Material	No discernible biota	-	-
T1 – 8	352520.3	1048138.1	48.6	Stone Material	No discernible biota	-	-
T1 – 9	352456.2	1048260.1	47.0	Coarse sand/ Stone Material	No discernible biota	-	-
T1 – 10	352445.3	1048271.3	46.8	Fine Sand	Burrows present	-	-
T1 – 11	352432.9	1048306.5	46.5	Fine Sand	Unidentified sea cucumber	O	< 1%
T1 – 12	352421.4	1048009.6	47.7	Fine Sand	Spiny squat lobster (*Galathea strigosa*) Hornwrack (*Flustra foliacea*) Common sea urchin (*Echinus esculentus*)	F S F	3% > 80% 3%
T1 – 13	352421.1	1048324.7	46.5	Boulders	*Securiflustra securifrons* on boulders	A	15%
T1 – 14	352396.4	1048343.0	46.5	Fine Sand and Boulders	No discernible biota	-	-
T1 – 15	352395.6	1048354.0	46.5	Coarse Sand	No discernible biota	-	-

T1 – 16	352384.0	1048366.0	46.5	Fine Sand	Hermit crab (*Pagurus prideaux*) with cloak anemone (A*damsia palliata*) Sand goby (*Pomatoschistus minutus*)	A F	15% 5%
T1 – 17	352349.8	1048436.7	46.3	Fine/ Medium Sand	No discernible biota	-	-
T1 – 18	352335.0	1048451.0	46.2	Fine Sand	Burrows present	-	-
T1 – 19	352291.1	1048527.6	46.0	Sand/ Stone Mixed Sediment	No discernible biota	-	-
T1 – 20	352271.5	1048547.9	45.9	Sand/ Stone Mixed Sediment	King scallop (*Pecten maximus*)	O	< 1%
T1 – 21	352248.8	1048571.3	45.7	Sand/ Stone Mixed Sediment	No discernible biota	-	-
T1 – 22	352139.0	1048785.0	44.1	Fine Sand	Unidentified sea anemone Fish spp. Possible poor cod (*Trisopterus minutus*)	R O	< 1% <1%
T1 – 23	352041.9	1048910.4	43.8	Medium/ Coarse Sand	No discernible biota	-	-
T2 – 1	353048.1	1047986.2	50.8	Fine Sand	Burrows present	-	-
T2 – 2	353021.0	1048040.6	50.9	Medium/ Coarse Sand	Hermit crab (*Pagurus prideaux*) Sand goby (*Pomatoschistus minutus*) (3 seconds before)	R R	< 1% <1%
T2 – 3	352947.2	1048187.7	51.1	Sand/ Stone Mixed Sediment	No discernible biota	-	-
T2 – 4	352861.3	1048334.0	50.8	Sand/ Stone Mixed Sediment	No discernible biota	-	-
T2 – 5	352790.0	1048445.1	49.6	Sand/ Stone Mixed Sediment	No discernible biota	-	-
T2 – 6	352740.5	1048542.9	48.0	Fine sand	Burrows present	-	-
T2 – 7	352706.1	1048587.4	47.1	Fine sand	Spotted ray (*Raja montagui*)	S	10 %
T2 – 8	352703.2	1048591.5	47.1	Fine sand, boulders	Hornwrack (*Flustra foliacea*)	A	30 %
T2 – 9	352635.8	1048698.5	45.6	Sand/ Stone Mixed Sediment	No discernible biota	-	-

T2 – 10	352622.3	1048732.7	45.2	Fine sand	Burrows present	-	-
T2 – 11	352581.4	1048806.3	44.1	Sand/ Stone Mixed Sediment	No discernible biota	-	-
T2 – 12	352507.1	1048924.5	42.1	Sand/ Stone Mixed Sediment	No discernible biota	-	-
T2 – 13	352465.2	1048997.1	41.3	Sand/ Stone Mixed Sediment	Long clawed squat lobster (*Munida rugosa*)	C	9%
T2 – 14	352348.9	1049178.9	41.5	Sand/ Stone Mixed Sediment	Long clawed squat lobster (*Munida rugosa*)	O	<1 %
T2 – 15	352399.1	1049186.1	41.1	Medium/ Coarse Sand	Black brittle star (*Ophiocomina nigra*) Sand mason worm (*Lanice conchilega*)	F O	5 % 1%
T3 – 1	353415.6	1048213.7	51.7	Medium/ Coarse Sand	No discernible biota	-	-
T3 – 2	353385.8	1048224.2	51.7	Medium/ Coarse Sand	No discernible biota	-	-
T3 – 3	353393.3	1048259.0	51.7	Medium/ Coarse Sand	No discernible biota	-	-
T3 – 4	353373.7	1048283.3	51.7	Medium/ Coarse Sand	No discernible biota	-	-
T3 – 5	353367.0	1048305.4	51.7	Fine Sand	Burrows present Possible lugworm casts (*A. marina*)	-	-
T3 – 6	353248.7	1048486.3	51.5	Fine/ Medium Sand	Burrows present	-	-
T3 – 7	353171.2	1048653.4	50.4	Fine/ Medium Sand	No discernible biota	-	-
T3 – 8	353161.3	1048664.6	50.3	Boulders	Common sea urchin (*Echinus esculentus*) Poor cod (*Trisopterus minutus*)	O O	<1 % <1 %
T3 – 9	353114.1	1048717.3	49.6	Sand/ Stone Mixed Sediment	No discernible biota	-	-
T3 – 10	352940.3	1048996.0	44.6	Fine Sand	Hornwrack (*Flustra foliacea*) *Securiflustra securifrons*	A A	20 % 11%
T3 – 11	352886.5	1049075.8	43.2	Coarse Sand	No discernible biota	-	-
T3 – 12	352821.3	1049198.8	40.5	Fine Sand/ Boulders	No discernible biota	-	-
T3 – 13	352676.5	1049412.0	39.7	Medium/ Coarse Sand	Black brittle star (*Ophiocomina nigra*)	O	1 %

Appendix 2

TRANSECT 1



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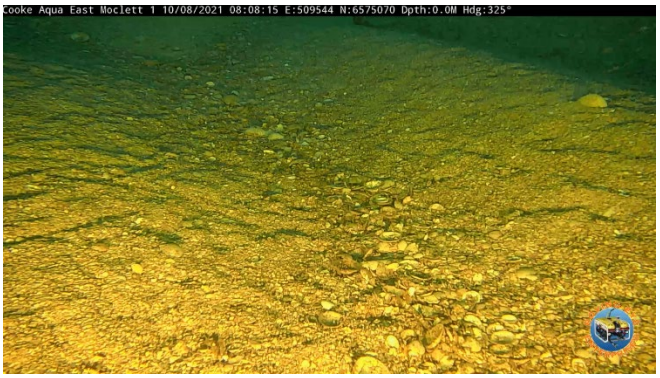

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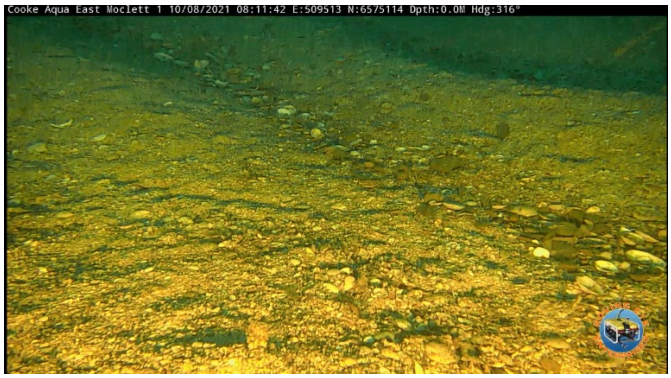

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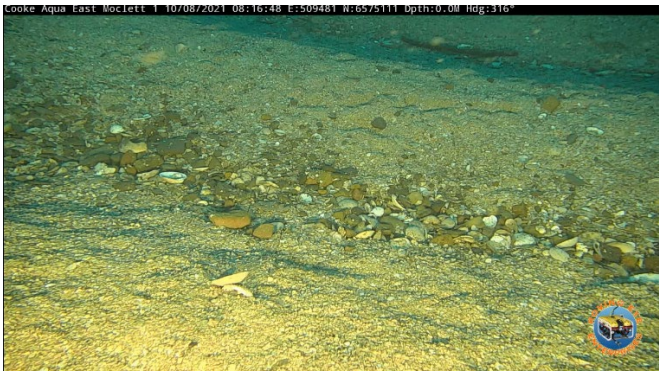

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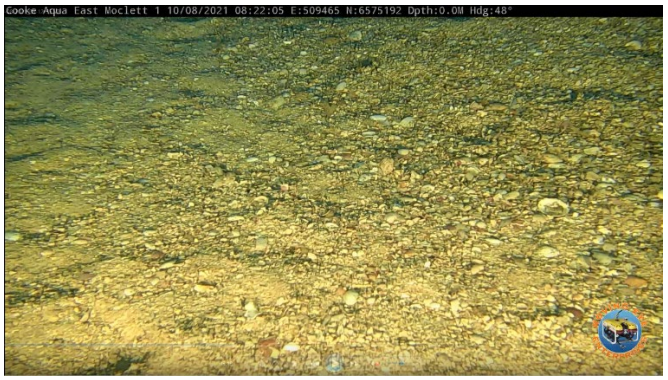

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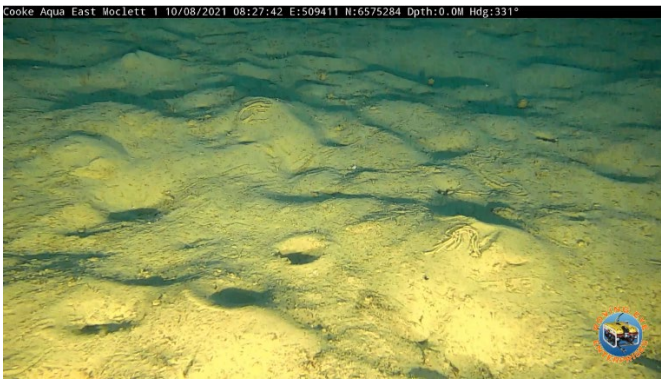

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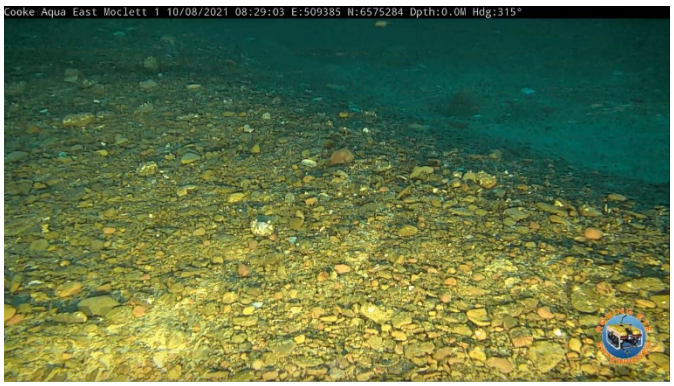

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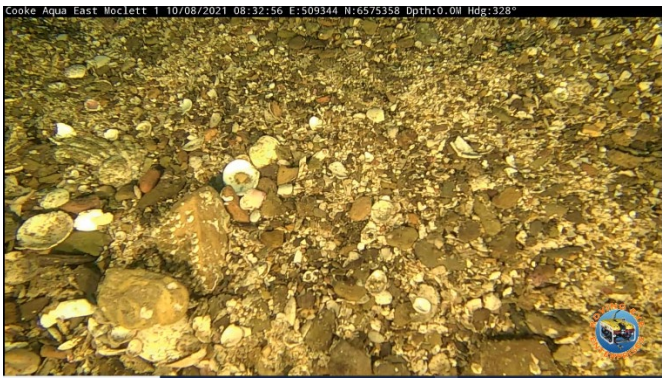

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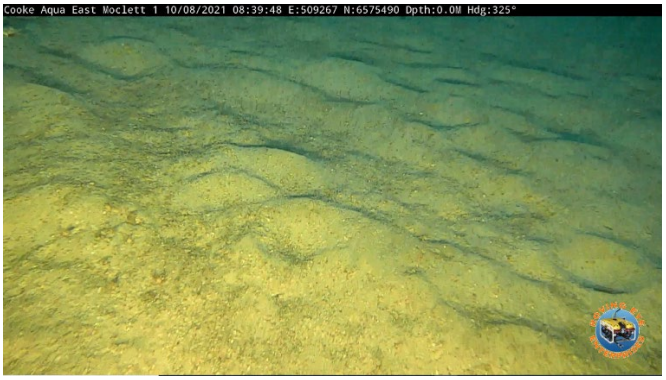
T1 - 9



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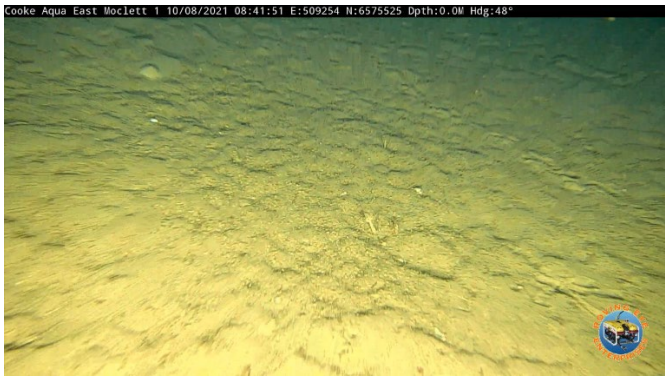

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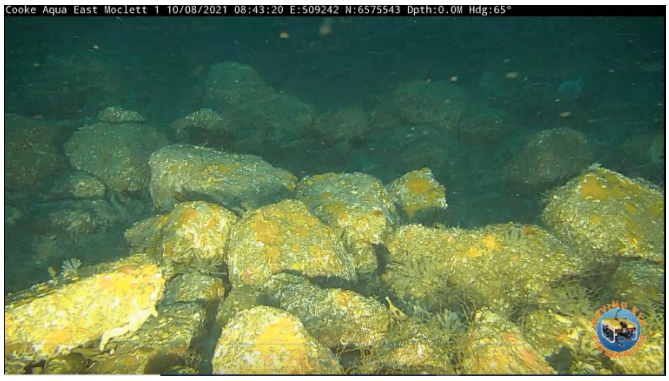

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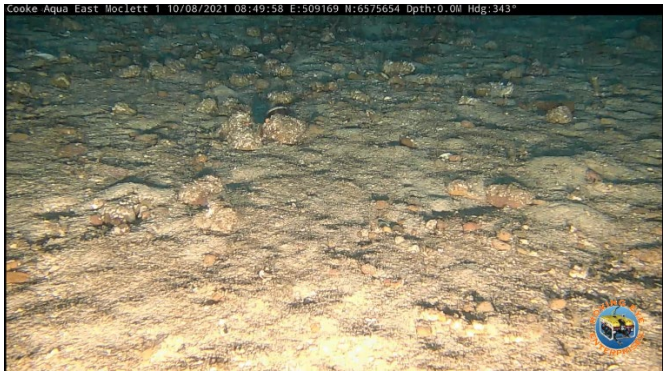
T1 - 14

T1 - 15

T1 - 16



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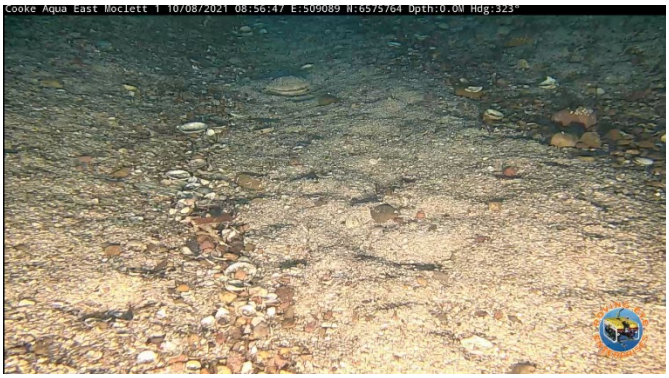
T1 – 18

T1 – 19



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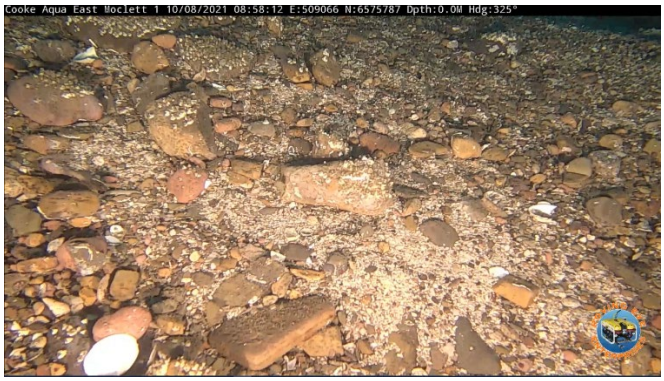
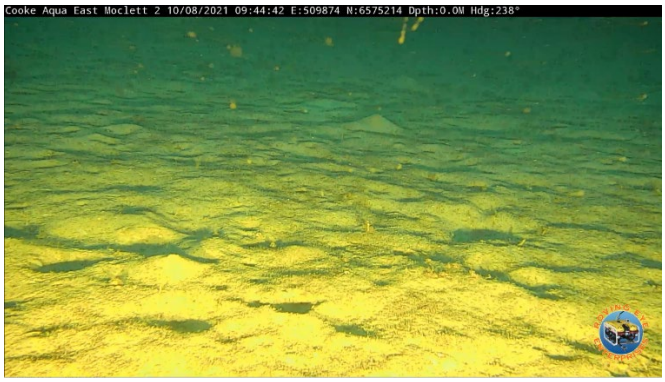


T1 – 21

T1 - 22

T1 – 23

TRANSECT 2



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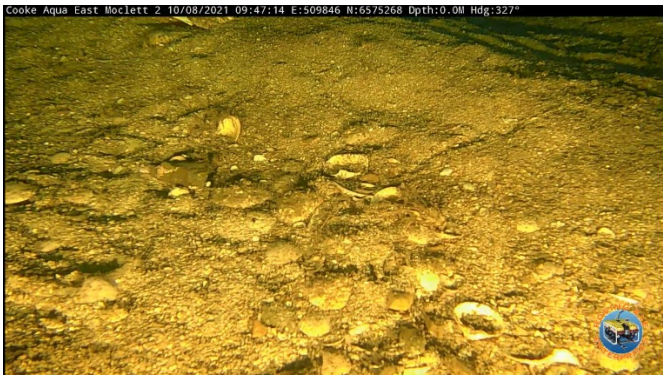

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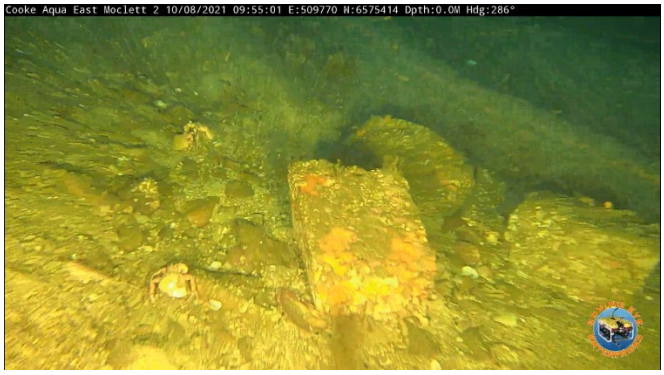

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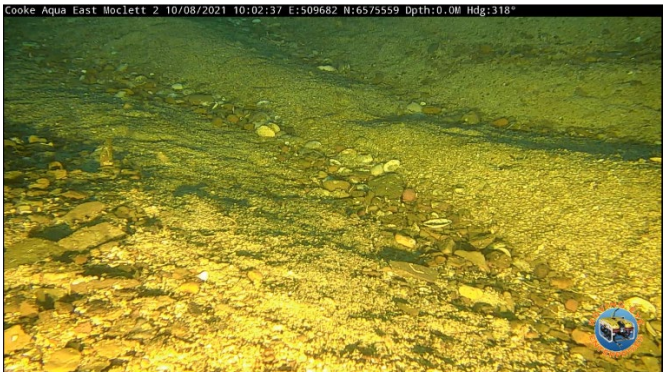

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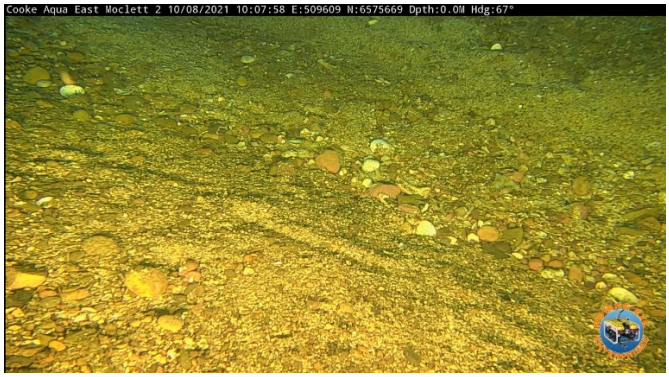

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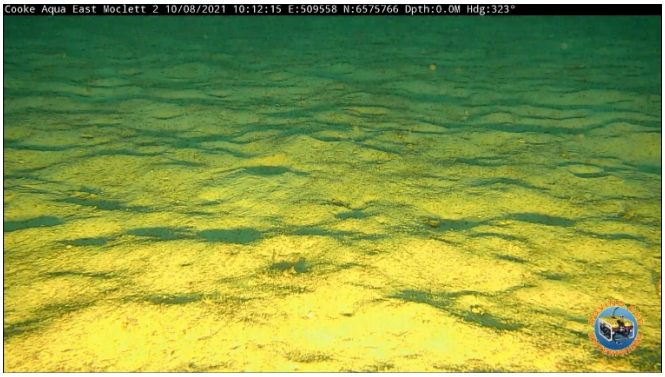
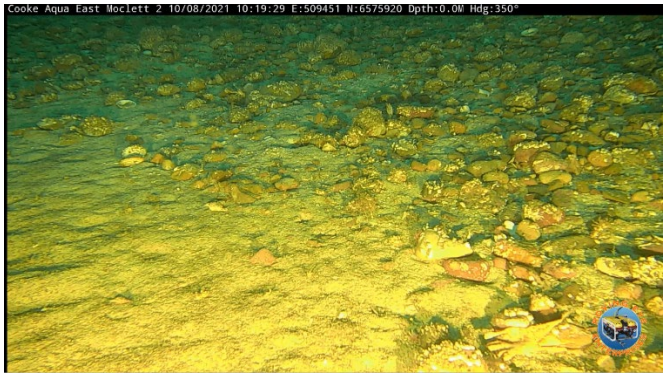


T2 – 6

T2 - 7

T2 – 8



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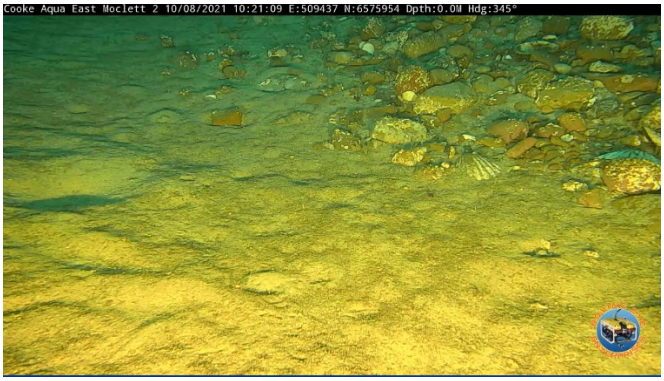

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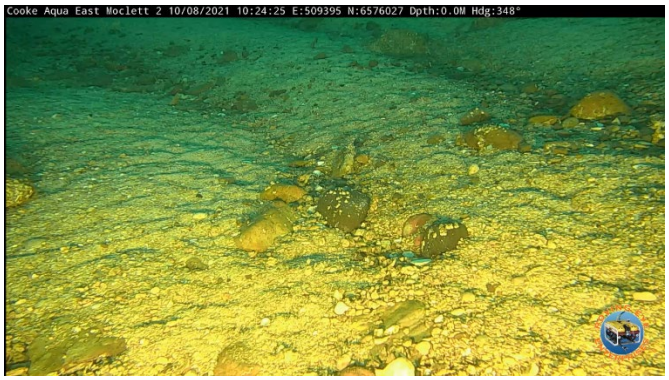
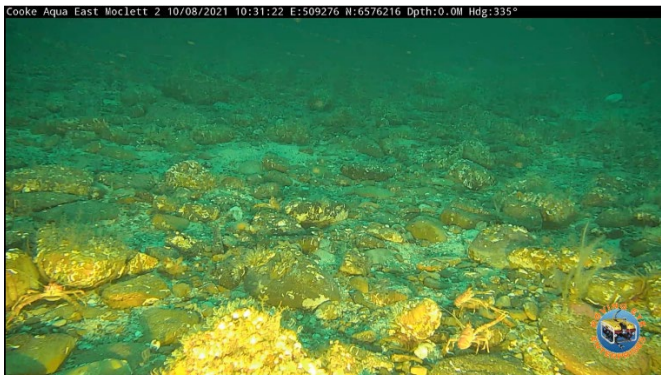


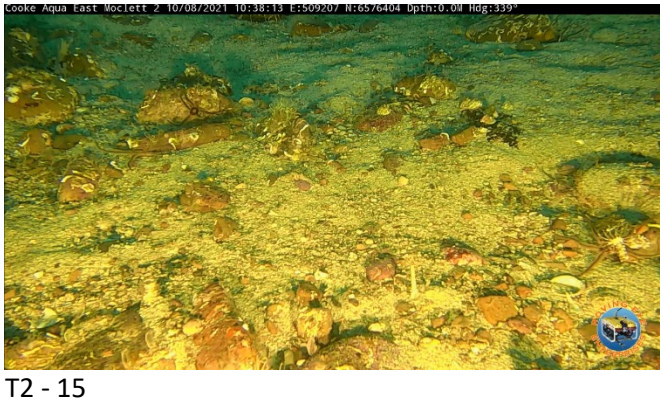
T2 – 11

T2 – 12



T2 – 13

T2 – 14



T2 - 15

TRANSECT 3

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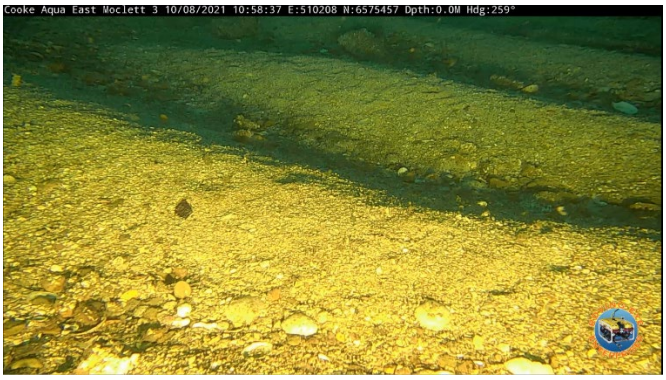
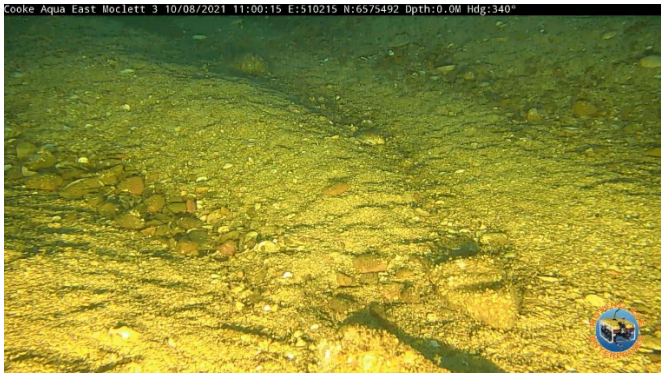
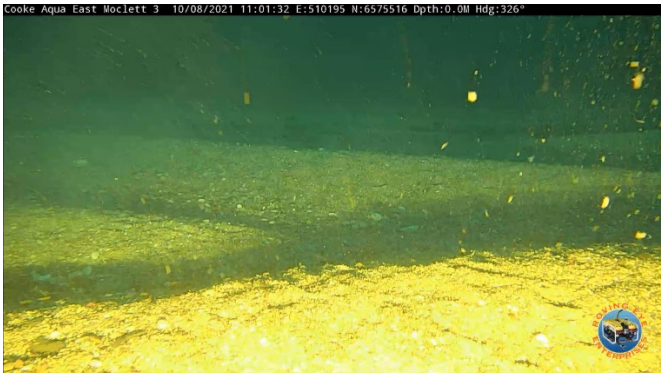


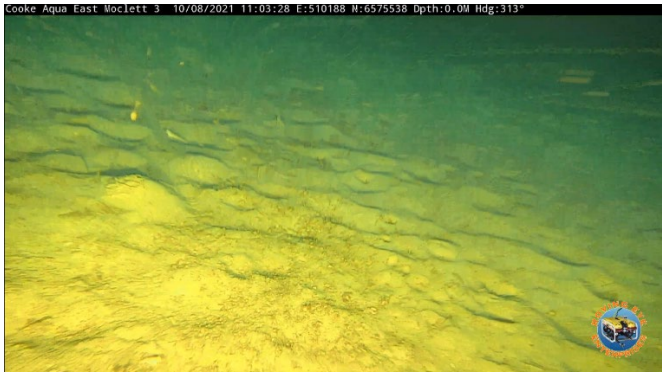
T3 – 2



T3 - 3

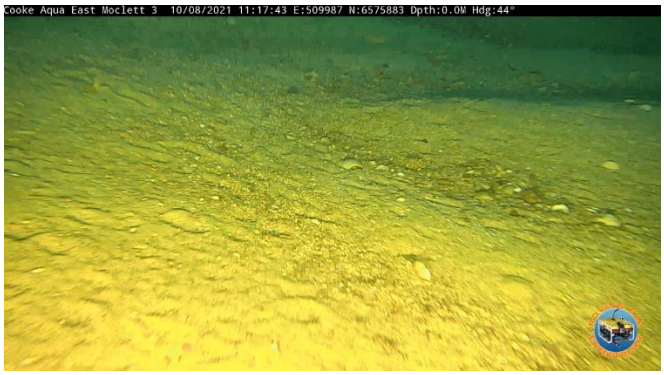


T3 - 4

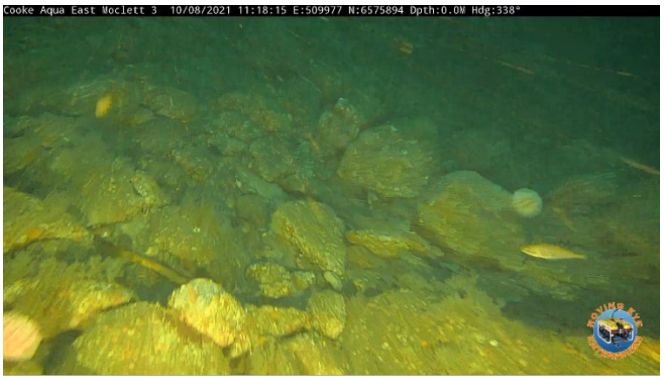


T3 - 5

T3 - 6



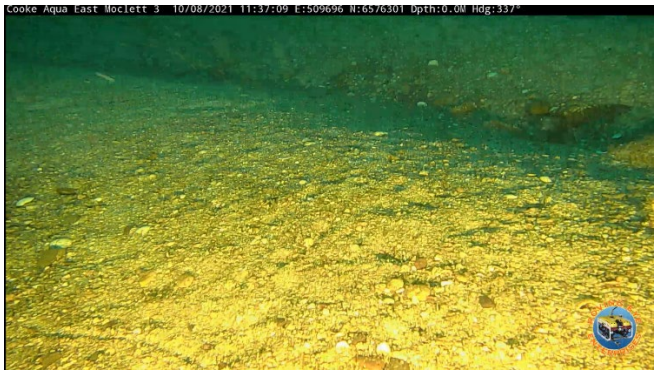
T3 – 7



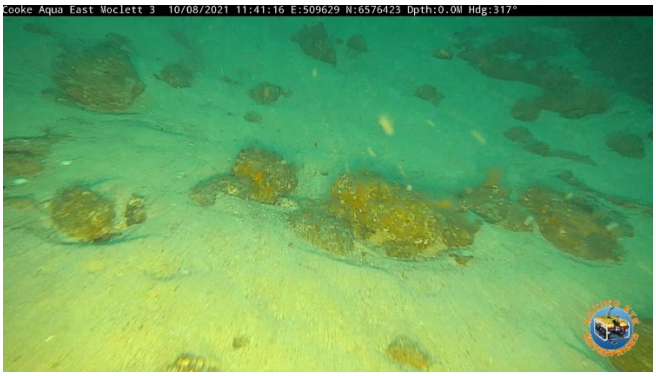
T3 - 8

T3 – 9

T3 – 10



T3 – 11



T3 – 12

T3 - 13