MapGES 2019: Summer 2019 cruise on board of N/I Arquipélago

(July-August-September 2019; Mid Atlantic Ridge, Faial & Pico islands)

CRUISE REPORT

Objective: to explore seamounts of the Azorean archipelago to better understand the distribution patterns of VMEs and commercial fish species. A special interest was placed in exploring deep-sea areas along the Mid Atlantic Ridge and close to islands of the central group. The device used in this survey corresponds to the low-cost drift-cam video platform designed and developed at IMAR.

Vessel: N/I Arquipélago

Chief scientist: Telmo Morato

Scientific team: Telmo Morato, Carlos Dominguez-Carrió, Sérgio Gomes, Gerald H. Taranto, Jordi Blasco, Manuela Ramos, Laurence Fauconnet, Cristina G. Zárate, Marina Carreiro-Silva

Main achievements:

1. Successfully tested the new design of the low-cost drift-cam system developed at IMAR
2. Exploration of over 80 km of seabed down to 750 m depth in 8 different areas for which little or no information of its benthic communities was available
3. Discovery of new sites that host diverse coral gardens and sponge grounds that were unknown to science
4. New data on the distribution of VMEs in the seamounts of the Mid-Atlantic Ridge

Cruise summary:

The main objective of the MapGES 2019 cruise was to identify and characterize megabenthic communities dwelling between 200 and 750 m depth in areas of the Mid Atlantic Ridge and small seamounts close to the islands of Faial and Pico. The images were recorded using a low-cost, custom-made drift-cam system designed and developed at IMAR (Fig. 1), currently capable of working at depths of 750 m, with a live-view signal sent to surface. The drift-cam system is equipped with a 4K resolution camera that records high-quality images to identify as many of the species that make up the benthic ecosystem of the Azores deep-sea. It also has low-cost sensors that provide depth (max. 1000 m) and temperature (-2°C to 35°C) records every second. As occurred in previous cruises, the main limiting factor to explore the deep-sea ecosystem with this video device is the presence of abandoned fishing lines. The new egg-shaped design facilitates the disentanglement from such gears once the drift-cam system gets caught, although their presence still limits the possibility to safely explore seamounts that are heavily fished.

Fig. 1. Image of the drift-cam system being deployed from the side of the vessel and the crew of N/I Arquipélago maneuvering the hydraulic winch to correctly position the system with respect of the seabed.

The MapGES 2019 cruise spanned for a total of 21 effective days of work at sea, in which 8 different areas were explored by means of visual methods (Fig. 2). A total of 150 deployments were made throughout the whole cruise, which add up to more than 109 hours of bottom time. The number of dives performed in each area was based on the size of the seamounts to be explored, the meteorological conditions and the ecological significance of the communities found. Overall, more than 80 linear km of seabed were investigated considering all areas, with 6 km in front of the volcano Capelinhos to more than 16 km in Area 1, which encompasses the mounds of Cavala, Beta, Ferradura and A6. The average dive length was 550 m, with 16 dives covering more than 1 linear km of seabed. Such long dives provide an idea of the great capacity of the drift-cam system developed at IMAR to easily explore deep-sea areas when sea conditions are favorable. The system got caught a total of 7 times in fishing lines throughout the cruise, but came back to surface in perfect conditions in all cases.

The next sections provide information about the number of dives and its location in each of the surveyed area. Due to the extensive number of dives performed in this cruise, only the main benthic communities identified in each area are shortly described.

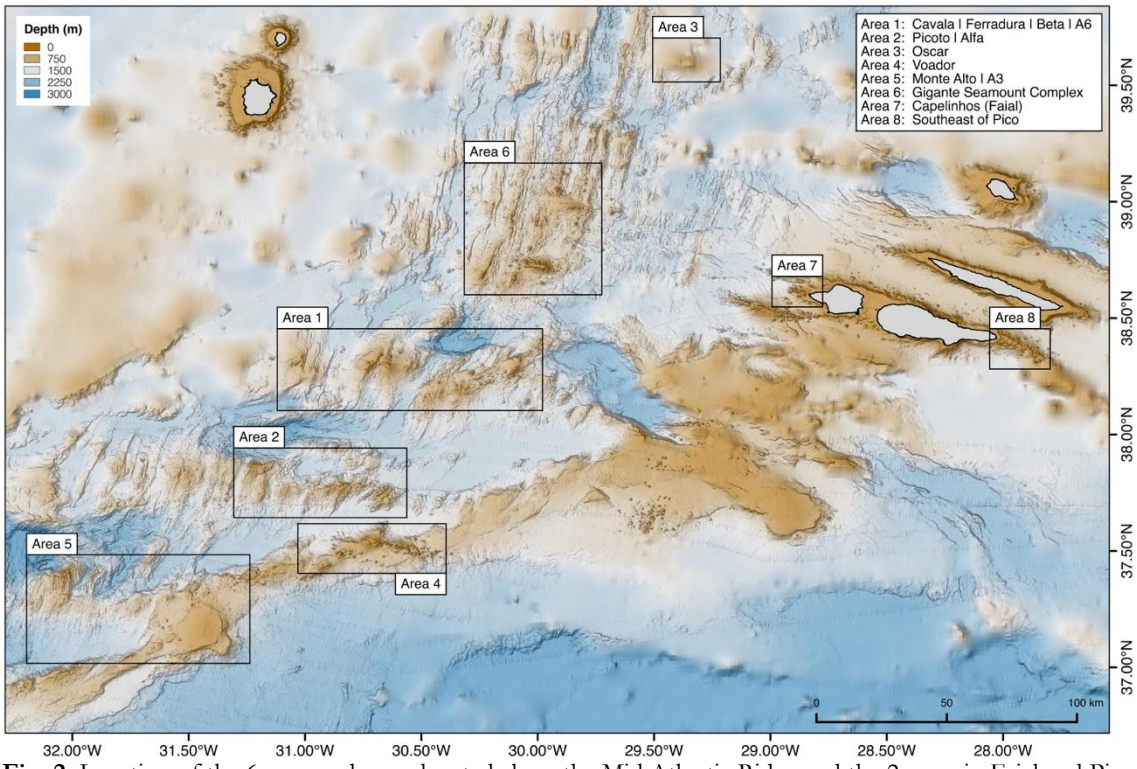

Fig. 2. Location of the 6 surveyed areas located along the Mid Atlantic Ridge and the 2 areas in Faial and Pico islands.

Area 1 Beta, Cavala, Ferradura & A6 seamounts

The 4 seamounts that make up Area 1 were explored between the 26th and the 30th of July 2019. A total of 35 dives were carried out during these days, with the highest number of deployments performed in Cavala seamount (Fig. 3). Overall, more than 16 km of seabed were filmed at depths between 335 and 745 m, which correspond to 3.1 km in A6, 3.8 km in Ferradura, 5.5 km in Cavala and 3.5 km in Beta. Details of each specific dive are provided in Table 2.

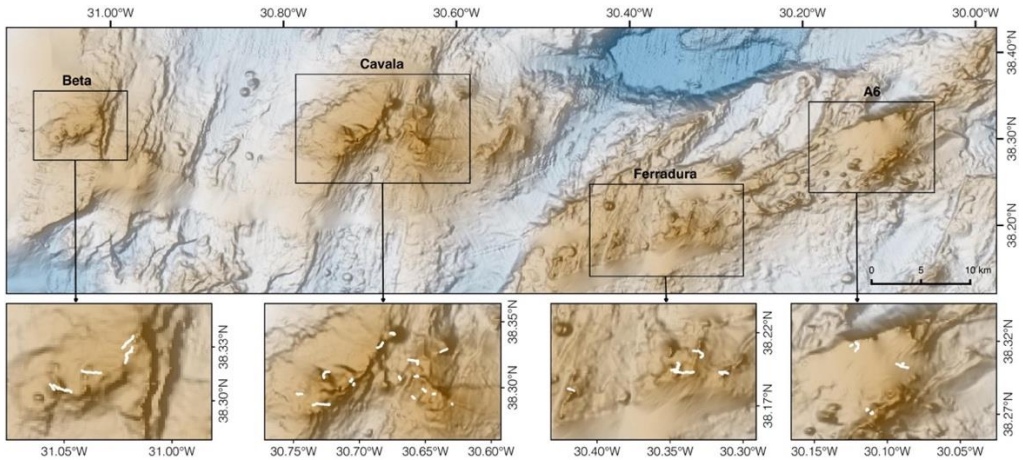

Fig. 3. Location of the dives performed with the drift-cam camera system on the different mounts that make up Area 1: Beta, Cavala, Ferradura and A6. The exact GPS location of each dive is provided in Table 2.

Table 2. Main characteristics of the different drift-cam deployments carried out in Area 1, which encompasses the seamounts Beta, Cavala, Ferradura and A6.

			Time		Start position		End position		Depth (m)	Dist.
St	Mound	Date	Start	End	Lat. (N)	Long. (W)	Lat. (N)	Long. (W)	start - end	(m)
8	A6	26/07/19	08:24	09:53	38º 17.016'	30º 06.086'	38º 16.783'	30º 05.376'	465 - 497	1110
9	A6	26/07/19	10:26	10:46	38º 16.385'	30º 06.705'	38º 16.231'	30º 06.666'	612 - 520	290
10	A6	26/07/19	11:27	12:12	38º 16.393'	30º 06.744'	38º 16.397'	30º 06.848'	637 - 699	150
11	A6	26/07/19	14:04	14:40	38º 19.069'	30º 07.397'	38º 19.008'	30º 07.529'	644 - 679	220
12	A6	26/07/19	15:03	15:41	38º 18.922'	30º 07.194'	38º 18.805'	30º 07.315'	413 - 462	270
13	A6	26/07/19	16:34	17:05	38º 18.285'	30º 05.337'	38º 18.232'	30º 05.365'	466 - 457	100
14	A6	26/07/19	18:00	18:53	38º 18.267'	30º 05.657'	38º 18.121'	30º 05.147'	364 - 546	780
15	A6	26/07/19	20:26	21:19	38º 19.154'	30º 07.322'	38º 19.090'	30º 07.202'	636 - 445	210
16	Ferradura	27/07/19	07:58	09:14	38º 12.421'	30º 20.068'	38º 12.195'	30º 19.729'	666 - 618	640
17	Ferradura	27/07/19	09:48	11:56	38º 11.992'	30º 20.749'	38º 11.588'	30º 20.820'	656 - 474	750
18	Ferradura	27/07/19	13:38	14:01	38º 11.674'	30º 20.974'	38º 11.689'	30º 20.699'	548 - 481	400
19	Ferradura	27/07/19	14:27	16:23	38º 11.604'	30º 20.730'	38º 11.584'	30º 20.026'	548 - 482	1020
20	Ferradura	27/07/19	16:45	17:16	38º 11.519'	30º 18.900'	38º 11.497'	30º 18.843'	617 - 573	90
21	Ferradura	27/07/19	17:27	18:54	38º 11.579'	30º 18.966'	38º 11.525'	30º 18.620'	653 - 557	510
22	Ferradura	27/07/19	20:39	21:37	38º 10.909'	30º 25.179'	38º 10.823'	30º 24.932'	618 - 624	390
23	Cavala	28/07/19	07:57	09:04	38º 19.639'	30º 38.309'	38º 19.765'	30º 37.914'	504 - 646	610
24	Cavala	28/07/19	09:31	11:06	38º 19.233'	30º 39.817'	38º 19.122'	30º 39.276'	663 - 440	810
25	Cavala	28/07/19	11:32	12:26	38º 18.510'	30º 39.485'	38º 18.494'	30º 39.325'	447 - 349	230
26	Cavala	28/07/19	13:28	14:13	38º 17.589'	30º 39.612'	38º 17.559'	30º 39.495'	636 - 631	170
27	Cavala	28/07/19	14:28	15:32	38º 17.929'	30º 39.131'	38º 17.825'	30º 39.007'	440 - 401	260
28	Cavala	28/07/19	15:47	16:41	38º 17.713'	30º 38.628'	38º 17.705'	30º 38.554'	343 - 336	100
29	Cavala	28/07/19	16:58	17:32	38º 17.287'	30º 37.805'	38º 17.283'	30º 37.781'	434 - 461	30
30	Cavala	28/07/19	17:58	19:07	38º 18.465'	30º 40.190'	38º 18.513'	30º 40.256'	614 - 673	130
31	Cavala	30/07/19	09:28	10:56	38º 20.462'	30º 40.623'	38º 20.440'	30º 40.439'	530 - 530	270
32	Cavala	30/07/19	11:17	12:28	38º 19.820'	30º 41.215'	38º 20.079'	30º 40.897'	495 - 636	660
33	Cavala	30/07/19	13:52	14:32	38º 18.266'	30º 42.395'	38º 18.422'	30º 42.316'	407 - 386	310
34	Cavala	30/07/19	14:57	15:37	38º 18.091'	30º 42.283'	38º 18.219'	30º 42.272'	540 - 434	230
35	Cavala	30/07/19	15:51	17:24	38º 18.422'	30º 43.616'	38º 18.603'	30º 43.541'	418 - 478	350
36	Cavala	30/07/19	17:43	19:27	38º 17.182'	30º 44.146'	38º 17.289'	30º 43.500'	443 - 373	960
37	Cavala	30/07/19	20:43	21:46	38º 17.730'	30º 44.860'	38º 17.706'	30º 44.556'	608 - 572	440
38	Beta	30/07/19	07:55	08:45	38º 18.465'	31º 03.432'	38º 18.305'	31º 03.275'	745 - 562	370
39	Beta	30/07/19	08:55	10:49	38º 18.451'	31º 03.256'	38º 18.300'	31º 02.866'	658 - 693	630
40	Beta	30/07/19	11:04	12:27	38º 18.784'	31º 02.475'	38º 18.842'	31º 02.010'	673 - 592	680
41	Beta	30/07/19	13:40	15:13	38º 19.429'	31º 01.344'	38º 19.831'	31º 01.123'	611 - 604	810
42	Beta	30/07/19	15:27	17:12	38º 19.007'	31º 01.316'	38º 19.539'	31º 01.084'	540 - 580	1040

The seamounts of Area 1 host a diverse benthic ecosystem, with several structurally complex benthic communities identified in all of them. In most cases, the communities were dominated by octocoral species or large sponges. The most common community identified in the deepest areas explored corresponded to that dominated by the primnoids *Narella bellissima* and *Narella versluysi*, with several accompanying species (Fig. 4a). In some areas, the anthozoan *Anthomastus* cf. *agaricus* reached some very high densities within this community, although other less common species were also identified, including the black coral *Leiopathes expansa* and the sea urchin of the genus cf. *Echinus*. At those depths, some of the large rocky outcrops were mostly colonized by a larger number of sponge species, most of which encrusting, together with several erect specimens such as the endemic *Macandrewia azorica* (Fig. 4b). Interestingly, some areas at those depths were characterized by the presence of large amounts of coral rubble whose origin is still to be determined. The vast majority of these soft bottom areas had coral pieces scattered over the seafloor, in some cases covering the entire surface available, a situation also noticeable in some rocky areas.

Slope areas in Area 1 also host some very large colonies of the bubblegum coral *Paragorgia johnsoni* in its red and white morphs (Fig. 4c), reaching some of very large sizes. As expected, the summit areas of the seamounts of Area 1 were also characterized by large octocoral species. In most cases, there existed a dominance of the whip coral *Viminella flagellum*, becoming the most common species of all in certain sectors. This species was sometimes observed in association with large sponges of the species cf. *Characella pachastrelloides* (Fig. 4d), while in other points appeared together with the gorgonian corals *Acanthogogia* cf. *hirsuta, Dentomuricea* aff. *meteor* and *Callogorgia verticillata*, as well as very large colonies of

Paracalyptrophora josephinae. Interestingly, several sectors of the summit, especially in the shallowest areas visited, hosted some very dense aggregations of the yellow sea fan *Dentomuricea* aff. *meteor* (Fig. 4e). Some deep-sea sharks were also observed throughout the dives carried out in Area 1, mainly belonging to the species *Dalatias licha* (Fig. 4f).

Some of the areas identified in Area 1 fit the FAO definition of what constitutes a VME. A thorough study of each seamount will be carried out to better understand patters of species distribution across this sector of the Mid-Atlantic Ridge.

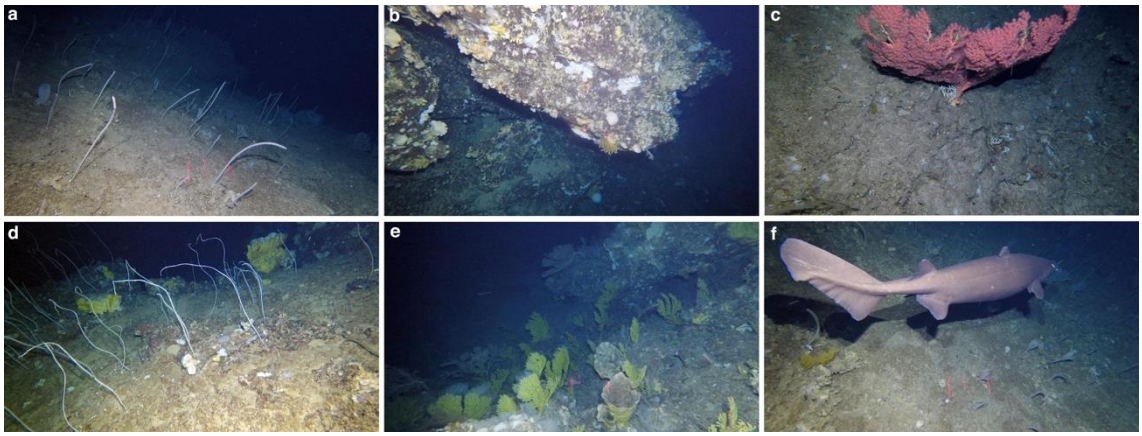

Fig. 4. Some examples of images recorded in Area 1. (a) Aggregation of the Primnoid corals *Narella versluysi* and *Narella bellissima* in the deepest areas explored. (b) Vertical cliffs and outcropping rocks colonized by a large variety of encrusting sponges. (c) One example of the large sizes that the corals *Paragorgia johnsoni* can reach on the slopes of the seamounts found in Area 1. (d) Large outcropping rocks with the whip coral *Viminella flagellum* and some very large sponges of the species cf. *Characella pachastrelloides*. (e) One of the dense aggregations of the yellow sea fan *Dentomuricea* aff. *meteor* in summit areas characterized by large boulders and outcropping rocks. (f) A large shark of the species *Dalatias licha* gently swimming in front of the camera.

Area 2 Picoto & Alfa seamounts

The two seamounts of Area 2 were explored between the 1st and the 2nd of July 2019. A total of 12 dives were carried out in this area, with 5 deployments performed in Picoto seamount during the 1st of August and 7 dives in Alfa during the 2nd of August (Fig. 5).

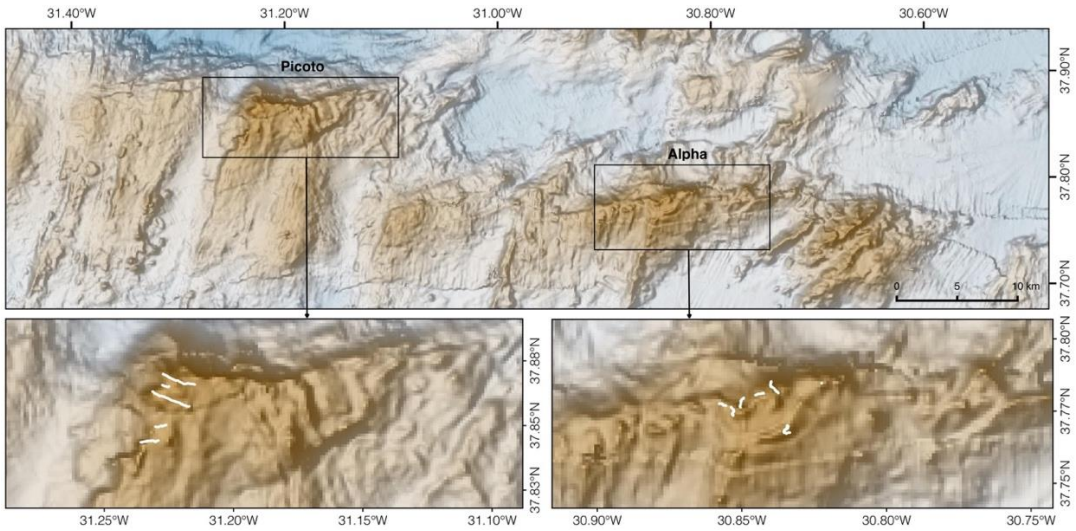

Fig. 5. Location of the dives performed with the drift-cam system on the two mounts that make up Area 2: Picoto and Alfa. The exact GPS location of each dive is provided in Table 3.

From the 12 dives performed in Area 2, one dive had to be aborted in Alfa seamount when the drift-cam system reached the seabed, and no images were obtained during this deployment. The remaining dives were successful, although a considerable number of abandoned fishing lines were registered in these two seamounts. This was especially the case in Alfa seamount, where large cables could be observed entangled around outcropping rocks. In most cases, the vessel crew was able to avoid any entanglement by lifting the drift-cam system when the camera approached the abandoned lines. However, the drift-cam got caught in a fishing line in two occasions. In both cases, and after some work done by the vessel crew, the system got free from the lines and was recovered with no damage on the structure, the electronic components nor the umbilical. Overall, more than 8 km of seabed were filmed in Area 2 at depths between 450 and 745 m. Details of each specific dive are provided in Table 3.

Table 3. Main characteristics of the different drift-cam deployments carried out in Picoto and Alfa seamounts

			Time		Start Position		End position		Depth (m)	Dist.
St	Mound	Date	Start	End	Lat. (N)	Long. (W)	Lat. (N)	Long. (W)	start-end	(m)
44	Picoto	01/08/19	08:07	09:45	37º 51.797'	31º 13.943'	37º 51.396'	31º 12.889'	469 - 590	1710
45	Picoto	01/08/19	10:10	12:02	37º 52.205'	31º 13.700'	37º 51.963'	31º 12.850'	664 - 536	1320
46	Picoto	01/08/19	14:04	15:51	37º 50.555'	31º 14.200'	37º 50.639'	31º 13.612'	590 - 528	870
47	Picoto	01/08/19	16:05	17:25	37º 50.977'	31º 13.836'	37º 51.017'	31º 13.499'	543 - 543	490
48	Picoto	01/08/19	17:39	18:04	37º 51.529'	31º 13.700'	37º 51.940'	31º 13.378'	491 - 462	890
49	Alfa	02/08/19	07:59	09:06	37º 46.688'	30º 51.587'	37º 46.574'	30º 51.295'	603 - 477	470
50	Alfa	02/08/19	10:11	11:10	37º 46.625'	30º 51.238'	37º 46.370'	30º 51.227'	498 - 486	470
51	Alfa	02/08/19	11:26	12:27	37º 46.774'	30º 50.965'	37º 46.537'	30º 51.076'	515 - 458	460
52	Alfa	02/08/19	13:49	14:43	37º 46.827'	30º 50.480'	37º 46.844'	30º 50.776'	510 - 559	430
53	Alfa	02/08/19	14:58	16:04	37º 46.799'	30º 50.212'	37º 47.200'	30º 50.425'	554 - 745	800
54	Alfa	02/08/19	16:22	16:56	37º 47.009'	30º 49.348'	37º 47.185'	30º 49.337'	608 - 590	320
55	Alfa	02/08/19	17:14	18:27	37º 46.183'	30º 50.090'	37º 46.070'	30º 49.974'	567 - 620	260

The number of benthic communities encountered in Area 2 was smaller than that from Area 1, but this could be related to the smaller area covered. The deepest sectors explored were mainly characterized by clean slopping walls with small cnidarians, such as *Pleurocorallium johnsoni* and *Anthomastus* cf. *agaricus*, as well as the yellow laminate sponge cf. *Poecillastra compressa* (Fig. 6a). Some areas of coral rubble of an unknown origin were observed in between the rocky outcrops, with no visible fauna associated to them. In some sections, the color of the rock changed to a darker tone, hosting a different community characterized by the presence of a wide variety of encrusting and erect sponges, as well as several glass sponges (Fig. 6b). Moving to shallower areas, the whip coral *Viminella flagellum* became the dominant megabenthic species, with a few dense patches (Fig. 6c). Interestingly, in between the *V. flagellum* colonies, some very large *Callogorgia verticillata* could be observed (Fig. 6d). Within this community, very large specimens of the fishes *Conger conger* and *Polyprion americanus* could be observed swimming in between the corals (Fig. 6e), together with some deep-sea sharks.

Some of the areas identified in Area 2 fit the FAO definition of what constitutes a VME. A thorough study of the two seamounts will be carried out to better understand patters of species distribution across this sector of the Mid-Atlantic Ridge.

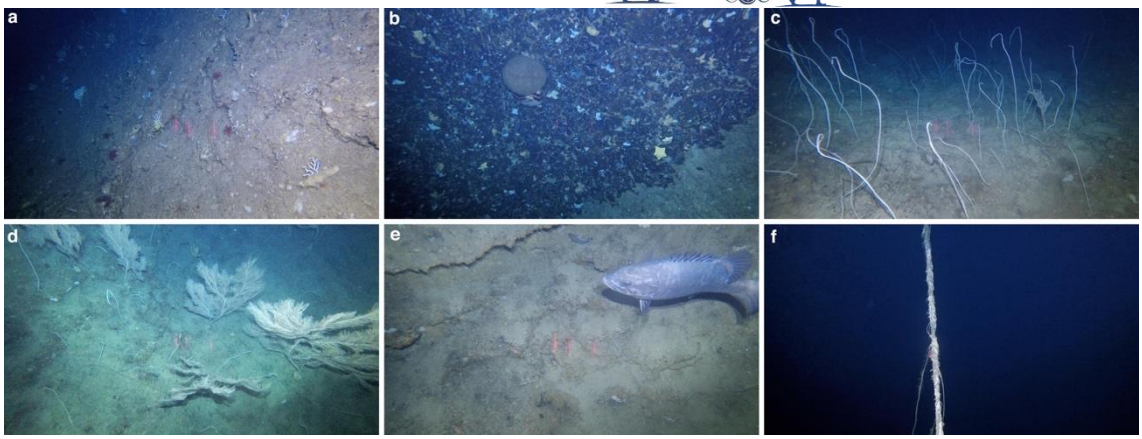

Fig. 6. Some examples of images recorded in Area 2. (a) Clear outcropping rocks with *Pleurocorallium johnsoni* and *Anthomastus* cf. *agaricus*. (b) Aspect of the black rocky outcrops colonized by encrusting sponges, together with some other larger species such as *Craniella longipilis*. (c) *Viminella flagellum* aggregation on the shallowest areas explored. (d) Some of the very large colonies of *Callogorgia verticillata* observed in some sectors of Area 2. (e) An Atlantic wreckfish *Polyprion americanus* swimming in front of the camera. (f) Image of one of the fishing lines in which the drift-cam system got entangled minutes before the crew members managed to get it released.

Area 3 Oscar seamount

Area 3 corresponds exclusively to Oscar seamount, an elongated underwater feature that stretches for more than 12 km. A total of 15 dives were carried out in this seamount (Fig. 7) during the 13th and 14th of August, covering more than 9.3 linear km of seabed. All dives were performed in a relatively small depth range, between the shallowest parts of the summit at 500 m depth down to around 700 m. No issues with the device neither with fishing lines were reported from the dives carried out in Oscar seamount. Details of each specific dive are provided in Table 4.

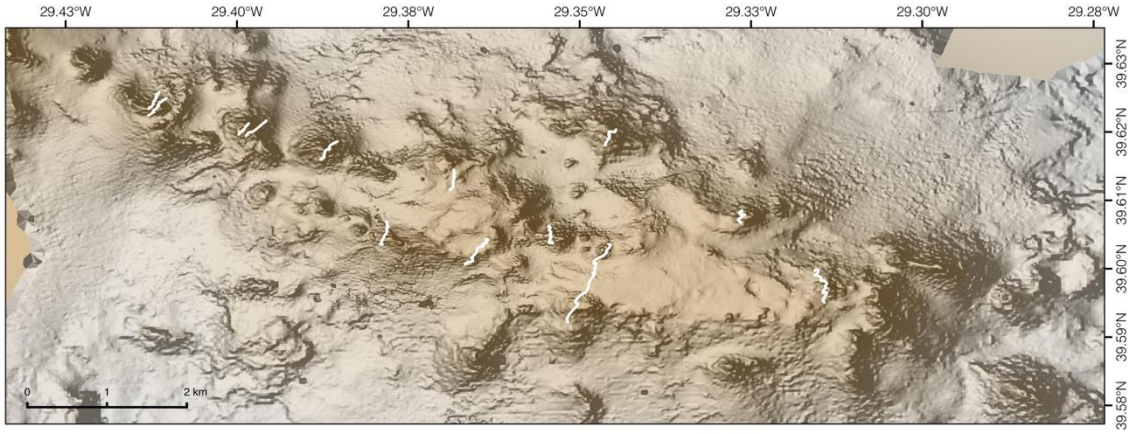

Fig. 7. Location of the dives performed with the drift-cam system on Oscar seamount. The exact GPS location of each dive is provided in Table 4.

Table 4. Main characteristics of the different drift-cam deployments carried out in Oscar seamount.

St	Mound	Date	Time		Start position		End position		Depth (m)	Dist.
			Start	End	Lat. (N)	Long. (W)	Lat. (N)	Long. (W)	Start - end	(m)
56	Oscar	13/08/19	08:54	10:06	39º 35.643'	29º 18.840'	39º 35.980'	29º 18.936'	603 - 662	630
57	Oscar	13/08/19	10:35	12:27	39º 35.470'	29º 21.075'	39º 36.274'	29º 20.733'	559 - 519	1560
58	Oscar	13/08/19	13:55	15:36	39º 36.044'	29º 21.977'	39º 36.256'	29º 21.740'	579 - 506	510
59	Oscar	13/08/19	16:10	17:06	39º 36.199'	29º 22.719'	39º 36.465'	29º 22.682'	543 - 617	490
60	Oscar	13/08/19	17:23	18:20	39º 36.102'	29º 22.619'	39º 36.377'	29º 22.656'	587 - 577	510
61	Oscar	13/08/19	18:31	19:24	39º 36.675'	29º 22.125'	39º 35.934'	29º 22.091'	577 - 564	1370
62	Oscar	14/08/19	08:03	09:03	39º 37.785'	29º 26.028'	39º 38.125'	29º 25.747'	585 - 675	740
63	Oscar	14/08/19	09:19	10:02	39º 37.356'	29º 24.792'	39º 37.629'	29º 24.584'	581 - 656	580
64	Oscar	14/08/19	10:10	10:55	39º 37.298'	29º 24.824'	39º 37.542'	29º 24.555'	590 - 642	590
65	Oscar	14/08/19	11:15	11:47	39º 37.144'	29º 23.923'	39º 37.325'	29º 23.699'	576 - 690	460
66	Oscar	14/08/19	11:58	12:32	39º 37.166'	29º 23.994'	39º 37.329'	29º 23.824'	580 - 586	380
67	Oscar	14/08/19	13:42	14:40	39º 36.942'	29º 23.309'	39º 37.152'	29º 23.078'	590 - 648	510
68	Oscar	14/08/19	15:41	16:40	39º 35.203'	29º 21.244'	39º 35.409'	29º 21.268'	522 - 535	380
69	Oscar	14/08/19	16:54	17:58	39º 37.060'	29º 20.757'	39º 37.264'	29º 20.661'	605 - 623	400
70	Oscar	14/08/19	18:14	19:09	39º 36.387'	29º 19.595'	39º 36.512'	29º 19.593'	553 - 558	230

Oscar seamount was mainly characterized by four coral-dominated benthic communities, distributed along the upper part of the slope and the summit. The most discernable community found in areas of hard substrate was dominated by colonies of the primnoid coral *Callogorgia verticillata* (Fig. 8a), with colonies displaying very large sizes. Some rocky outcrops were covered by colonies of the cup coral *Leptopsammia formosa,* reaching very high densities (Fig. 8b). On some of the hard substrates found on the upper part of the slope and on the summit, aggregations of the yellow sea fan of the genus *Acanthogorgia* could also be identified (Fig. 8c). Another commonly observed species aggregation corresponded to the association between the small white coral *Pleurocorallium johnsoni* and the laminate sponge cf. *Poecillastra compressa*, mainly observed on hard substrates. Also common was the presence of a yellow sea star of the Goniasteridae family (Fig. 8d), which appeared on the rocky outcrops of most dives. The presence of coral rubble was common on most of the dives (Fig. 8e), with its size and frequency varying across the different areas explored. There were some soft-bottom areas in between the coral deposits, mainly formed by sand and small gravels that were colonized by scleractinians of the genus *Flabellum*. Several large individuals of the commercial fish species *Polyprion americanus* were observed in different parts of the seamount (Fig. 8f), as well as a few deep-sea sharks of the species *Dalatias licha*.

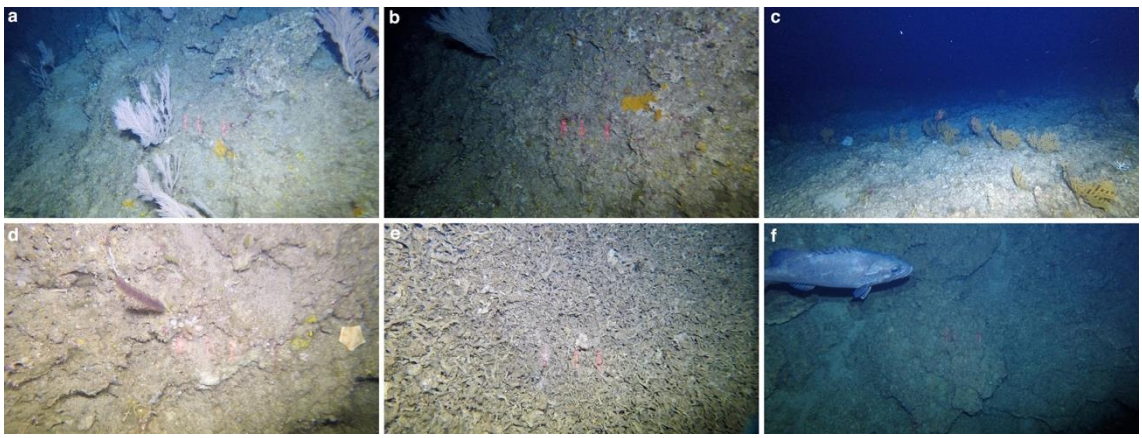

Fig. 8. Some examples of images recorded in Oscar seamount. (a) One of the numerous aggregations of the large gorgonian coral *Callogorgia verticillata* on hard substrates on the upper part of the slope. (b) Outcropping rock covered with a high number of cup corals of the species *Leptopsammia formosa*, a very common scleractinian species found in the *C. verticillata* aggregations, together with other soft corals and orange encrusting sponges. (c) Summit area with high densities of sea fans of the genus *Acanthogorgia*. (d) Colony of the black coral *Parantipathes hirondelle* together with a sea star of the Goniasteridae family, both species commonly observed in a large number of dives. (e). Large deposits of coral rubble from an unknown origin. (f) A large specimen of the species *Polyprion americanus* gently swimming in front of the camera.

Some of the areas identified in Area 3 fit the FAO definition of what constitutes a VME. A thorough study of the video images recorded will be carried out to better understand patters of species distribution across the different areas of Oscar seamount.

Area 4 Voador seamount

Area 4 corresponds to Voador seamount, a very large elongated feature that stretches east to west for more than 40 km. A total of 14 dives were carried out in this seamount during the 16th and 21st of August, covering more than 7.1 linear km of seabed (Fig. 9). The objective of these dives was to explore the summit areas and the upper slope, covering a depth range between 250 m and 580 m depth. No issues with the device neither with fishing lines can be reported from the dives carried out in Voador seamount. Details of each specific dive are provided in Table 5.

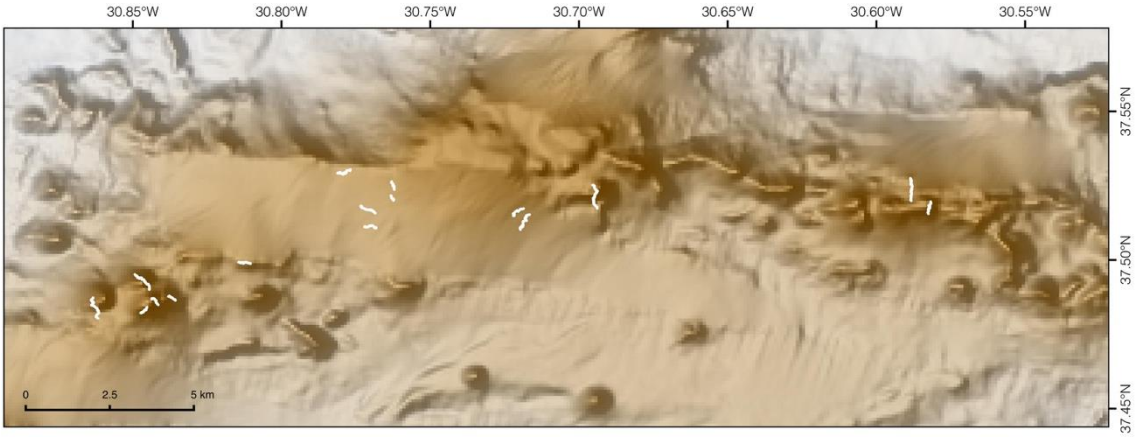

Fig. 9. Location of the dives performed with the drift-cam system on Voador seamount. The exact GPS location of each dive is provided in Table 5.

Table 5. Main characteristics of the different drift-cam deployments carried out in Voador seamount.

			Time		Start position		End position		Depth (m)	Dist.
St	Mound	Date	Start	End	Lat. (N)	Long. (W)	Lat. (N)	Long. (W)	start - end	(m)
74	Voador	16/08/19	07:58	09:24	37º 31.012'	30º 41.603'	37º 31.564'	30º 41.703'	589 - 380	1030
75	Voador	16/08/19	09:46	11:05	37º 30.614'	30º 43.170'	37º 30.940'	30º 43.012'	503 - 367	640
76	Voador	16/08/19	11:15	12:08	37º 30.869'	30º 43.299'	37º 31.072'	30º 43.089'	387 - 320	480
77	Voador	16/08/19	13:43	14:37	37º 30.645'	30º 46.310'	37º 30.656'	30º 46.092'	490 - 543	320
78	Voador	16/08/19	14:48	16:12	37º 31.076'	30º 46.381'	37º 30.938'	30º 46.109'	379 - 315	470
79	Voador	16/08/19	16:29	17:37	37º 31.732'	30º 46.808'	37º 31.718'	30º 46.696'	499 - 473	160
80	Voador	16/08/19	18:00	18:28	37º 31.200'	30º 45.742'	37º 31.339'	30º 45.820'	259 - 265	280
81	Voador	16/08/19	18:44	19:17	37º 31.402'	30º 45.729'	37º 31.626'	30º 45.783'	281 - 319	420
84	Voador	21/08/19	08:01	08:56	37º 29.907'	30º 48.596'	37º 29.962'	30º 48.931'	579 - 574	500
85	Voador	21/08/19	09:13	09:51	37º 29.167'	30º 50.116'	37º 29.269'	30º 50.298'	516 - 445	320
86	Voador	21/08/19	11:09	12:23	37º 28.937'	30º 50.817'	37º 29.055'	30º 50.711'	402 - 350	260
87	Voador	21/08/19	13:47	14:38	37º 29.213'	30º 50.623'	37º 29.033'	30º 50.462'	316 - 386	400
88	Voador	21/08/19	14:55	16:21	37º 29.751'	30º 50.972'	37º 29.358'	30º 50.617'	482 - 446	890
89	Voador	21/08/19	16:38	17:50	37º 29.291'	30º 51.800'	37º 28.765'	30º 51.643'	518 - 575	1000

Most areas of the summit and the slopes explored in Voador seamount were mainly composed of rocky outcrops and large boulders, although a few sandy patches could also be observed. In the rocky areas of the slopes, the megabenthic community was generally composed of sponge species, especially when the rock had a darker coloration (Fig. 10a). Encrusting sponges were commonly observed throughout the hard substrates, accompanied by several large sponges, some of them reaching very large sizes (Fig. 10b). Very dense aggregations of *Candidella imbricata* were found in some of the shallowest areas, mainly developing over rocky outcrops and large boulders (Fig. 10c). In some restricted areas, large *Callogorgia verticillata* colonies could be observed, with very little fauna associated (Fig. 10d).

Some large colonies of the primnoid *Paracalyptrophora josephinae* were observed with a hydroid species whose identification still remains to be determined (Fig. 10e). Although most dives occurred on hard grounds, some sedimentary areas were also filmed. In this case, the number of invertebrate species that could be identified was very low, and related to some echinoderms such as sea urchins of the genus cf. *Echinus*. In the sandy areas, some deposits of gravels could be observed, in some cases occupying a very large proportion of the seabed. Most of these deposits seem to have a lithogenic origin, although some small pieces of coral rubble could also be observed. A couple of large six-gill sharks curiously passed swimming in front of the camera (Fig. 10f).

Some of the areas identified in Area 4 fit the FAO definition of what constitutes a VME. A thorough study of these seamount will be carried out to better understand patters of species distribution across its different sectors.

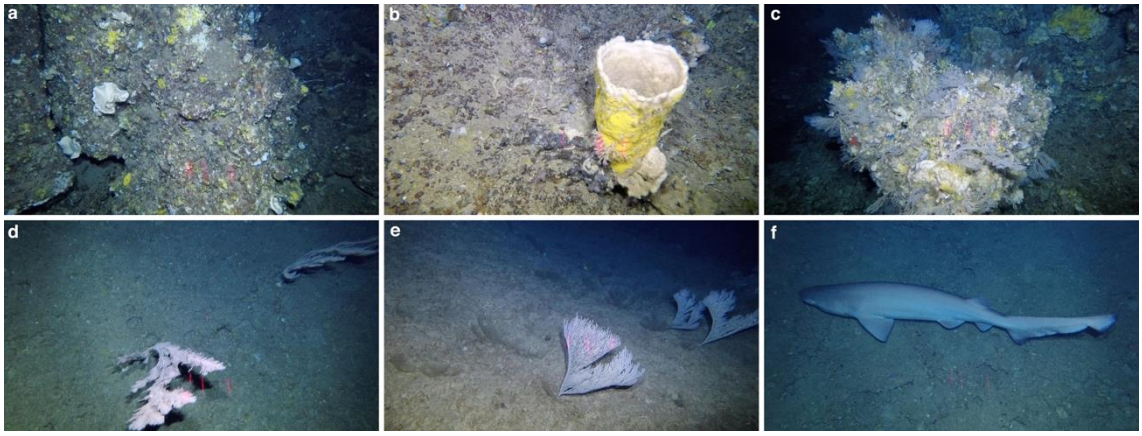

Fig. 10 Some examples of images recorded in Voador seamount. (a) Some of the various species of Porifera observed on the large rocky outcrops and vertical walls. (b) One of the many giant sponges observed on the slopes. (c) A large boulder covered in gorgonian corals. (d) Large colonies of *Callogorgia verticillata* on clean flat rock. (e) Some *Paracalyptrophora josephinae* and large hydrozoans. (f) A six-gill shark *Hexanchus griseus* gently swimming in front of the drift cam.

Area 5 Monte Alto & A3 seamounts

The 2 seamounts that make up Area 5 were explored on the 17th, 22nd and 23rd of August 2019. A total of 12 dives were carried out during these 3 days (Fig. 11), with the same number of dives performed in each underwater feature (details of all dives are provided in Table 6). The six dives performed in Monte Alto seamount aimed to explore its flat summit, while the six dives performed in A3 seamount also aimed to reach the upper slope, reaching depths of 550 m. The dives in A3 surveyed a relatively small area, with only a distance of 2.3 linear km between the dives located furthest apart. Considering both seamounts, more than 8 km of seabed were filmed at depths between 345 and 575 m, which correspond to 4.6 km in Monte Alto and 3.9 km in A3.

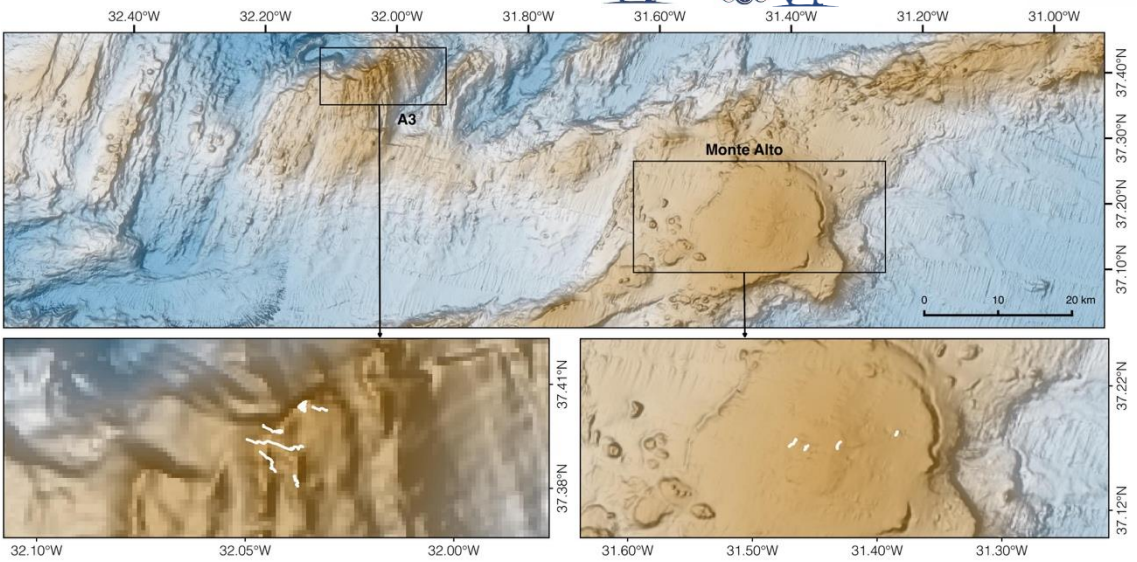

Fig. 11. Location of the dives performed with the drift-cam system on the seamounts Monte Alto and A6. The exact GPS location of each dive is provided in Table 6.

As expected, the percentage of soft substrates on the summit of Monte Alto seamount was very large, and most dives covered extensive sandy areas. Some of these soft-bottom areas were characterized by the presence of ripples, most likely caused by the action of bottom currents. In this homogenous habitat, the number of species identified was rather low, with two species that stood out above the rest and were present in most dives: a solitary scleractinian coral of the genus Flabellum and a yellow/orange sea star of the Goniasteridae family. When the substrate became coarser and the rock outcropped, there was a sharp increase in the number of invertebrate species, clearly dominated by Porifera, with some boulders scattered along the sand sometimes colonized by large colonies of the whip coral *Viminella flagellum*, generally in low densities.

Table 6. Main characteristics of the different drift-cam deployments carried out in the seamounts Monte Alto and A3.

			Time		Start position		End position		Depth (m)	Dist.
St	Mound	Date	Start	End	Lat. (N)	Long. (N)	Lat. (N)	Long. (N)	start - end	(m)
82	Monte Alto	17/08/19	08:07	09:14	37º 31.172'	30º 35.296'	37º 31.699'	30º 35.305'	411 - 554	970
83	Monte Alto	17/08/19	09:38	10:15	37º 30.892'	30º 34.951'	37º 31.230'	30º 34.864'	383 - 346	630
90	A3	22/08/19	07:52	08:54	37º 24.326'	32º 02.322'	37º 24.267'	32º 01.786'	473 - 530	790
91	A3	22/08/19	09:11	10:41	37º 23.772'	32º 03.013'	37º 23.720'	32º 02.136'	563 - 554	1290
92	A3	22/08/19	10:57	11:54	37º 24.035'	32º 02.779'	37º 23.875'	32º 02.445'	499 - 468	570
93	A3	22/08/19	13:54	15:02	37º 23.644'	32º 02.807'	37º 23.333'	32º 02.559'	448 - 552	680
94	A3	22/08/19	15:29	16:28	37º 23.324'	32º 02.298'	37º 23.084'	32º 02.253'	492 - 556	440
95	A3	22/08/19	17:26	18:24	37º 24.347'	32º 02.087'	37º 24.255'	32º 02.180'	501 - 507	210
96	Monte Alto	23/08/19	07:43	08:43	37º 10.725'	31º 27.977'	37º 10.209'	31º 28.168'	485 - 516	990
97	Monte Alto	23/08/19	09:00	09:45	37º 10.380'	31º 27.313'	37º 10.034'	31º 27.531'	454 - 471	710
98	Monte Alto	23/08/19	10:02	11:08	37º 10.521'	31º 25.759'	37º 10.107'	31º 25.954'	386 - 397	810
99	Monte Alto	23/08/19	11:31	12:23	37º 11.002'	31º 22.972'	37º 10.739'	31º 23.167'	454 - 546	560

In A3 seamount, the most common species observed was the whip coral *Viminella flagellum* (Fig. 12a-b), which appeared forming dense aggregations in some areas. Sporadically, a very large specimen of the sponge species *Characella pachastrelloides* was observed (Fig. 12c). In some areas, the color of the rock appeared very dark, with a community characterized by a large number of sponge species (Fig. 12d-e). Also noticeable was the presence of coral rubble, either in between the rocks or on top of sandy and gravelly areas (Fig. 12f).

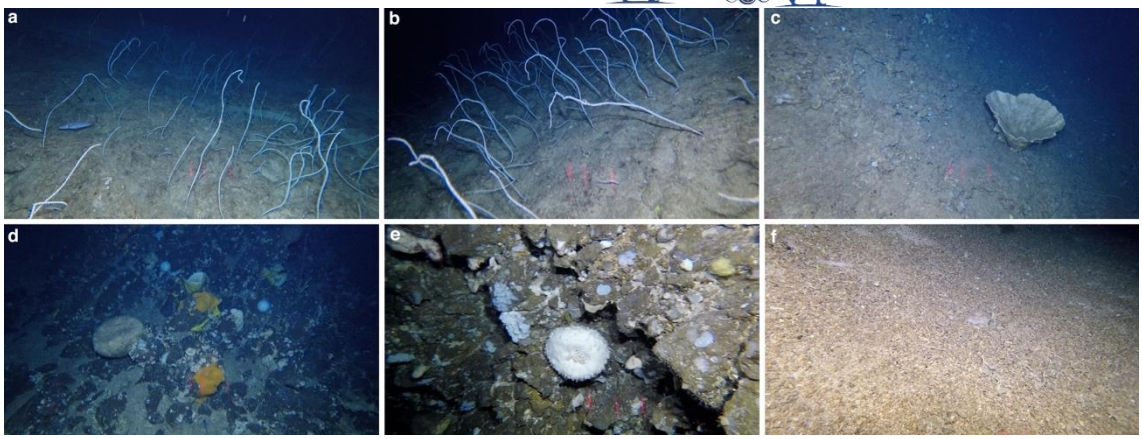

Fig. 12. Some examples of images recorded in Area 5. (a-b) Aggregation of the whip coral *Viminella flagellum* in relatively high densities. (c) One very large and solitary Characella pachastrelloides found on one of the slopes, close to the summit. (d-e) Sponge assemblage found on the darker outcropping rocks, with a wide variety of species of diverse colors. (f) Coral rubble completely covering a flat sandy area in dive 93.

Area 6 Gigante Seamount Complex

The 6 underwater features explored in Area 6 correspond to the seamounts Gigante and 127, as well as several smaller mounds commonly named Agulhas do Gigante (Fig. 13). The two larger seamounts have an east-to-west orientation, while all the Agulhas explored are all oriented alongside the general direction of the MAR, north to south. A total of 29 dives were carried out between the 27th and the 30th of August 2019, covering more than 15 linear km of seabed. The number of dives was highly irregular across mounds and was based on the amount of previous information available and the ecological interest of each feature (details of each specific dive are provided in Table 7). A very large bathymetric range was explored across the whole Gigante Seamount complex, covering depths between the shallowest summits at 180 m depth all the way to the end of the slopes at around 800 m depth.

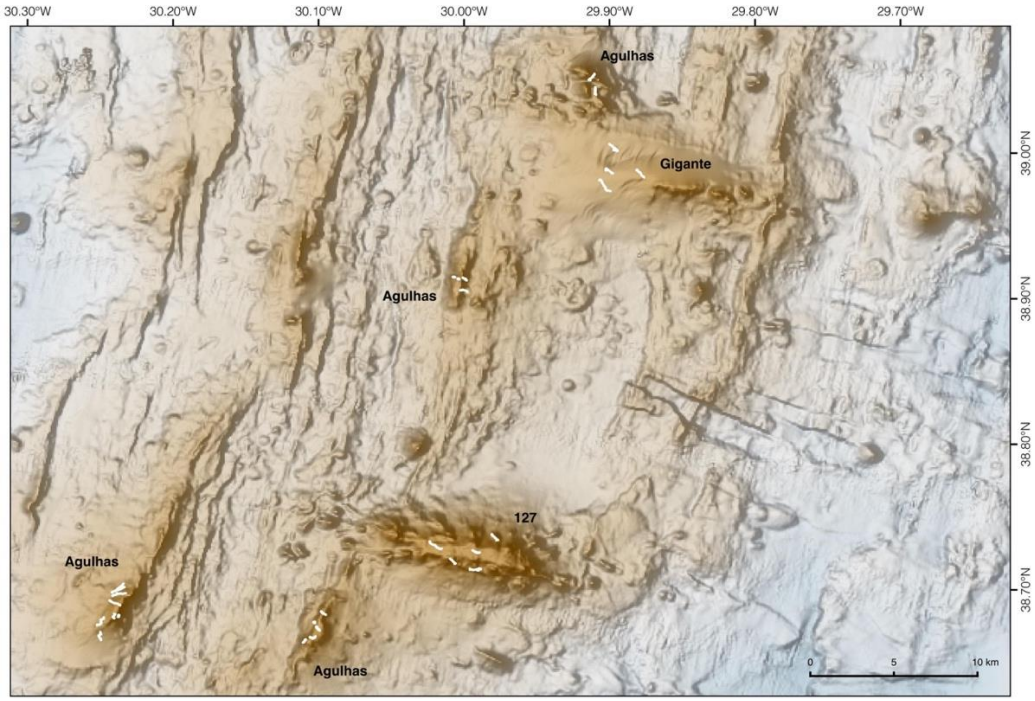

Fig. 13. Location of the dives performed with the drift-cam system on the Gigante Seamount Complex. The exact GPS location of each dive is provided in Table 7.

Table 7. Main characteristics of the different drift-cam deployments carried out in the several features explored in the Gigante Seamount Complex.

			Time		Start position		End position		Depth	Dist.
St	Mound	Date	Start	End	Lat. (N)	Long. (W)	Lat.	Long.	start-end	(m)
100	127	27/08/19	07:53	08:11	38º 43.525'	29º 59.376'	38º 43.524'	29º 59.527'	232 - 180	210
101	127	27/08/19	08:44	09:50	38º 43.553'	29º 59.354'	38º 43.641'	29º 59.667'	216 - 231	480
102	127	27/08/19	10:25	11:03	38º 42.875'	29º 59.390'	38º 42.890'	29º 59.265'	468 - 475	180
103	127	27/08/19	11:15	12:37	38º 42.829'	29º 59.756'	38º 42.842'	29º 59.347'	476 - 454	590
104	Agulhas	27/08/19	14:08	15:09	38º 41.111'	30º 05.902'	38º 40.931'	30º 05.653'	540 - 497	490
105	Agulhas	27/08/19	15:30	16:15	-	-	-	-	-	-
106	Agulhas	27/08/19	16:21	17:36	38º 40.481'	30º 06.111'	38º 40.347'	30º 05.951'	519 - 491	330
107	Agulhas	27/08/19	17:51	18:49	38º 39.954'	30º 06.535'	38º 39.790'	30º 06.673'	558 - 536	360
108	Agulhas	27/08/19	20:26	21:22	38º 40.083'	30º 06.133'	38º 39.998'	30º 06.228'	463 - 462	200
109	Agulhas	28/08/19	08:26	09:57	38º 41.369'	30º 14.192'	38º 41.570'	30º 14.634'	427 - 465	730
110	Agulhas	28/08/19	10:13	10:52	-	-	-	-	-	-
111	Agulhas	28/08/19	11:20	12:23	38º 41.021'	30º 14.442'	38º 40.832'	30º 14.423'	435 - 432	350
112	Agulhas	28/08/19	13:47	14:51	38º 40.265'	30º 15.009'	38º 39.866'	30º 14.971'	558 - 671	740
113	Agulhas	28/08/19	15:11	16:11	38º 40.879'	30º 14.857'	38º 40.481'	30º 15.128'	509 - 557	830
114	Agulhas	28/08/19	16:32	18:00	38º 42.254'	30º 14.060'	38º 41.839'	30º 14.599'	556 - 568	1090
115	Agulhas	28/08/19	18:13	18:57	38º 42.16'	30º 14.014'	38º 41.961'	30º 14.407'	511 - 533	670
116	Agulhas	28/08/19	20:33	21:36	38º 41.869'	30º 13.971'	38º 41.764'	30º 14.483'	427 - 483	760
117	127	29/08/19	08:23	09:38	38º 43.699'	30º 00.922'	38º 43.986'	30º 01.441'	260 - 378	910
118	127	29/08/19	10:18	11:11	38º 43.082'	30º 00.357'	38º 43.305'	30º 00.593'	365 - 236	530
119	127	29/08/19	11:35	12:31	38º 44.057'	29º 58.607'	38º 44.229'	29º 58.852'	454 - 542	470
120	Gigante	29/08/19	14:35	15:15	38º 59.167'	29º 53.865'	38º 59.293'	29º 54.166'	242 - 194	490
121	Gigante	29/08/19	15:35	16:43	38º 58.439'	29º 53.978'	38º 58.876'	29º 54.494'	550 - 442	1090
122	Gigante	29/08/19	17:06	17:34	38º 59.011'	29º 52.580'	38º 59.318'	29º 52.877'	332 - 194	710
123	Gigante	29/08/19	18:04	18:24	39º 00.089'	29º 53.707'	39º 00.255'	29º 53.981'	445 - 412	500
124	Gigante	29/08/19	18:42	19:19	39º 00.110'	29º 53.668'	39º 00.379'	29º 54.004'	446 - 497	690
125	Agulhas	30/08/19	08:21	09:41	39º 02.415'	29º 54.548'	39º 02.788'	29º 54.644'	710 - 695	700
126	Agulhas	30/08/19	10:57	12:54	39º 03.000'	29º 54.793'	39º 03.308'	29º 54.639'	697 - 698	610
127	Agulhas	30/08/19	14:22	15:48	38º 54.343'	30º 00.142'	38º 54.266'	29º 59.814'	658 - 795	490
128	Agulhas	30/08/19	16:00	16:58	38º 54.903'	30º 00.415'	38º 54.921'	30º 00.376'	738 - 675	60
129	Agulhas	30/08/19	17:30	18:19	38º 54.821'	30º 00.226'	38º 54.804'	30º 00.283'	594 - 592	80
130	Agulhas	30/08/19	18:27	19:39	38º 54.760'	29º 59.886'	38º 54.887'	30º 00.067'	552 - 507	350

Five dives covering approximately 3.5 km explored the western side of Gigante seamount, complementing the dives performed on the eastern side by the ROV Luso in 2018. The dives ranged from 550 m up to about 200 m depth. The 7 dives performed on seamount 127 covered approximately 3.4 km and explored a bathymetric range of about 400 m (180-542 m depth), also aiming to complement the work done in 2018. The other 4 smaller mounds (named Agulhas for their slim morphology) were never explored before, but proved difficult to survey with the drift-cam system, especially their deepest areas. The very steep slopes of the sides of the mounds were characterized by strong bottom currents that flow alongside these features, making the approach towards the deep seabed very difficult. In a few occasions, the planned dive had to be aborted after reaching the bottom, mostly due to the difficulties encountered when trying to keep a stable position with respect to the seabed. Aiming to reduce the potential loss of the equipment, the deepest areas of those mounds, especially the ones closer to seamount 127, were barely investigated. Overall, 17 successful dives were performed in the 4 different Agulhas investigated, covering a distance of almost 9 km.

Overall, the Gigante seamount complex was a difficult area to survey due to the strong bottom currents that seem to be a common feature of its ridges, especially alongside the flanks of the Agulhas west of Gigante and 127 seamounts. Also, the large number of fishing lines that have been abandoned on the summits of Gigante and 127 seamounts during the last years generated some complex situations. The drift-cam became entangled in 3 occasions, which implied the immediate end of the dive and the effort of the crew to get it disentangled. Luckily, in all occasions the system could be released from the lines and none of the electronic pieces neither the external structure suffered any damages.

In Gigante and 127 seamount, soft sediments generally contained high percentages of biogenic material and were colonized mostly by small sponges and some solitary scleractinians of the genus *Flabellum*. Most hard-substrate areas of the summits were characterized by the whip coral *Viminella flagellum*, at times reaching very high densities, together with other octocorals and antipatharians, encrusting sponges and some large Porifera (Fig. 14a). Interestingly, and not observed in previous seamounts, some orange morphs of *Viminella flagellum* were observed in certain parts of the summits (Fig. 14b). Further work will be carried out in the lab to determine the relationships between the different colorations of this whip corals based on collected specimens from other surveys. *Anthias anthias* was by far the most abundant fish in the summit, observed in high numbers in certain areas (Fig. 14c), also with sightings of *Hoplostethus mediterraneus*, *Trachurus* sp., *Pontinus kuhlii* and *Helicolenus dactylopterus*.

The summits of the several Agulhas explored were mainly characterized by sparse V*iminella flagellum* colonies accompanied by a few colonies of the white coral *Pleurocorallium johnsoni* and some large sponges (Fig. 14e). One of the Agulhas was explored to the maximum depths that can be reached by the drift cam, since bottom currents during the time it was sampled were not as strong as in the previous features. The composition of the substrate at 650-800 m depth was different to the one observed in the other Agulhas, with some large lava flows only colonized by some small hexactinellid sponges (Fig. 14e) and some sea urchins.
Some of the areas identified in Area 4 fit the FAO definition of what constitutes a VME. A thorough study of these seamount will be carried out to better understand patters of species distribution across its different sectors.

Some of the areas identified in the Gigante Seamount Complex fit the FAO definition of what constitutes a VME. A thorough study of the images recorded will be carried out to better understand patters of species distribution across the whole seamount complex.

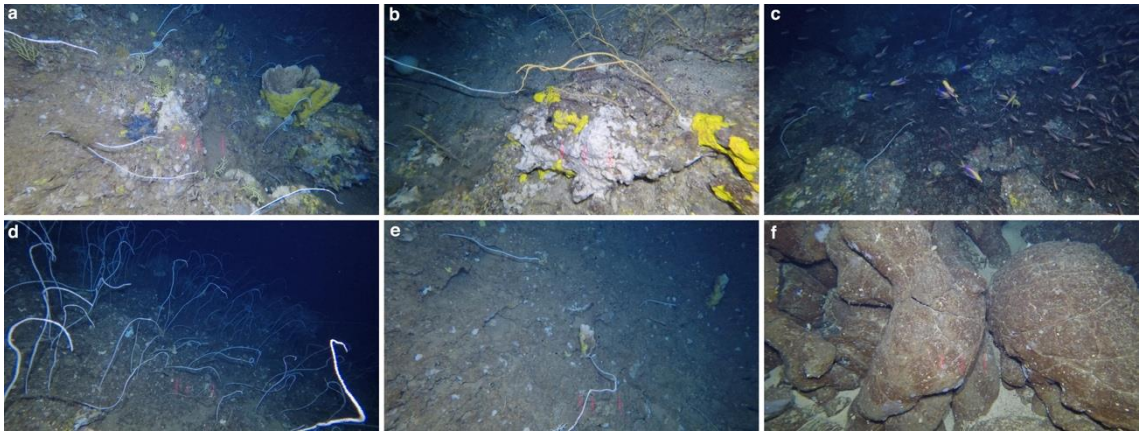

Fig. 14. Some examples of images recorded in Area 6. (a) Aggregation of the whip coral *Viminella flagellum* with some large sponges. (b) Some colonies of the orange morph of the coral *Viminella flagellum*. (c) Aggregation of fishes of the species *Anthias anthias*. (d) A monospecific aggregation of the whip coral *Viminella flagellum*. (e) Aspect of the summit of the Agulhas seamounts, with sparse colonies of *Viminella flagellum* and some large porifera. (f) Lava flows on the deepest part of the Agulhas.

Area 7 Capelinhos (Faial)

Area 7 corresponds to the immediate slopes west of Capelinhos volcano, on the westernmost part of Faial island. A total of 10 dives were carried out in this area during two days of work (Fig. 15), the 15th of August and the 1st of September. Almost 6.5 linear km of seabed were covered, exploring a depth range between 100 and 650 m. No issues with the device neither with fishing lines can be reported from the dives carried out in Capelinhos area. Details of each specific dive are provided in Table 8.

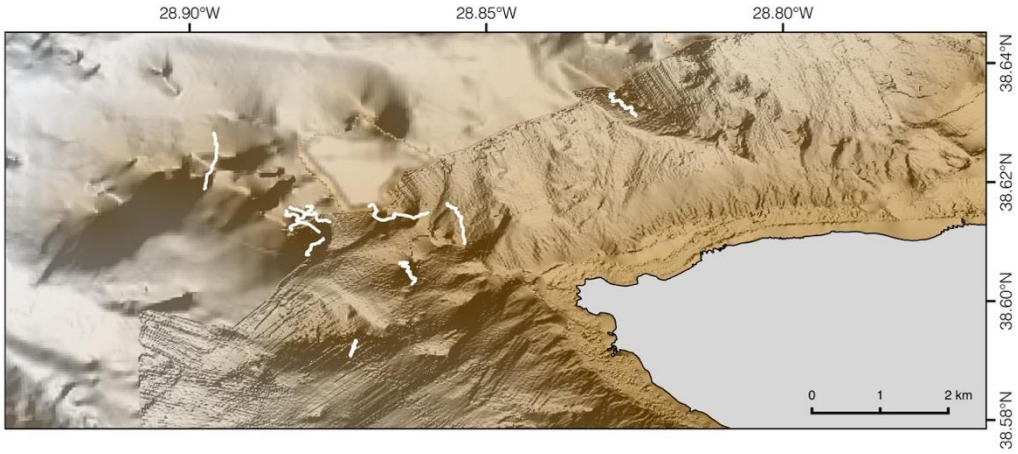

Fig. 15. Location of the dives performed with the drift-cam system on Capelinhos area. The exact GPS location of each dive is provided in Table 8.

In Area 7, some aggregations of soft coral species were recorded (Fig. 16a), together with black coral colonies (Fig. 16b), as well as many sponges to be identified. A wide variety of fish species were also observed, including *Pontinus kuhlii*, *Phycis phycis*, *Anthias anthias* and *Helicolenus dactylopterus*. Further deep, aggregations of *Acanthogorgia sp.* were recorded (Fig. 16c), generally associated to a few other large and structuring species. Aggregations of primnoid coral *Callogorgia verticillata* (Fig. 16d) were also observed, as well as some large hydrozoan colonies (Fig. 16d). Between 300 and 450 m depth, the hydrocoral *Errina dabneyi* was identified (Fig. 16f) in association with other octocoral species. The deepest dives reported the lowest diversity of all, with most areas dominated by sand and boulders.

Table 8. Main characteristics of the different drift-cam deployments carried out in Capelinhos area, west of Faial island.

			Time		Start position		End position		Depth	Dist.
St	Area	Date	Start	End	Lat. (N)	Long. (W)	Lat. (N)	Long. (W)	start-end	(m)
71	Capelinhos	15/08/19	13:56	15:29	38º 35.419'	28º 52.329'	38º 35.622'	28º 52.294'	565 - 402	370
72	Capelinhos	15/08/19	15:49	16:59	38º 36.456'	28º 52.764'	38º 36.646'	28º 52.682'	498 - 450	370
73	Capelinhos	15/08/19	17:09	18:11	38º 36.700'	28º 52.968'	38º 36.922'	28º 52.849'	315 - 482	440
131	Capelinhos	01/09/19	09:32	10:24	38º 36.887'	28º 51.597'	38º 36.947'	28º 52.260'	254 - 271	960
132	Capelinhos	01/09/19	10:43	11:41	38º 36.803'	28º 52.581'	38º 37.057'	28º 53.060'	418 - 479	830
133	Capelinhos	01/09/19	11:56	12:35	38º 36.770'	28º 52.781'	38º 36.996'	28º 53.052'	328 - 447	570
134	Capelinhos	01/09/19	13:37	14:48	38º 37.140'	28º 53.845'	38º 37.688'	28º 53.756'	525 - 642	1020
135	Capelinhos	01/09/19	15:26	16:28	38º 36.601'	28º 51.211'	38º 37.034'	28º 51.424'	108 - 316	850
136	Capelinhos	01/09/19	16:48	17:45	38º 36.181'	28º 51.739'	38º 36.393'	28º 51.872'	258 - 157	430
137	Capelinhos	01/09/19	18:09	19:23	38º 37.869'	28º 49.486'	38º 38.091'	28º 49.708'	477 - 409	520

Some of the areas identified in Area 7 fit the FAO definition of what constitutes a VME. A thorough study of the video images will be carried out to better understand patters of species distribution across its different sectors.

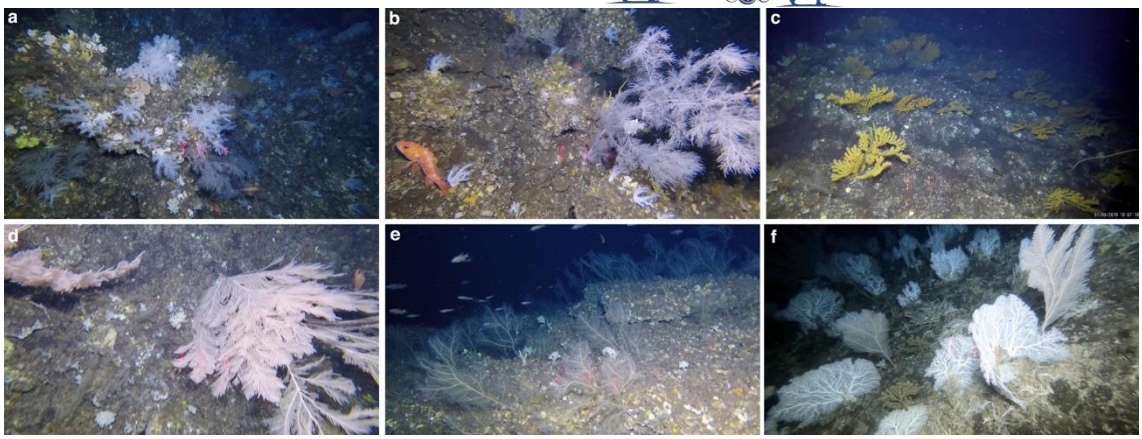

Fig. 16. Some examples of images recorded in Area 7. (a) Aggregation of soft corals. (b) A large black coral colony in between soft corals. (c) The yellow sea fan *Acanthogorgia* sp. (d) Some large colonies of the primnoid coral *Callogorgia verticillata*. (e) Aggregation of hydroids. (f) The stylasterid coral *Errina dabneyi*.

Area 8 Seamounts southeast of Pico

Area 8 corresponds to a series of small seamounts found on the southeasternmost point of the isle of Pico island. It is very likely that this set of seamounts stretches for more than 80 km, although in this cruise only mounds located within 35 km from the coast were explored. After 2 days of work, a total of 13 dives were carried out in this area (Fig. 17), covering more than 7 linear km of seabed. The dives allowed us to explore 11 of these small seamounts, covering depths between 220 and 535 m. The central part of the study area could not be investigated as planned due to the presence of fishing vessels operating during the two days allocated for Pico island. This explains the asymmetric distribution of the drift-cam deployments in this area.

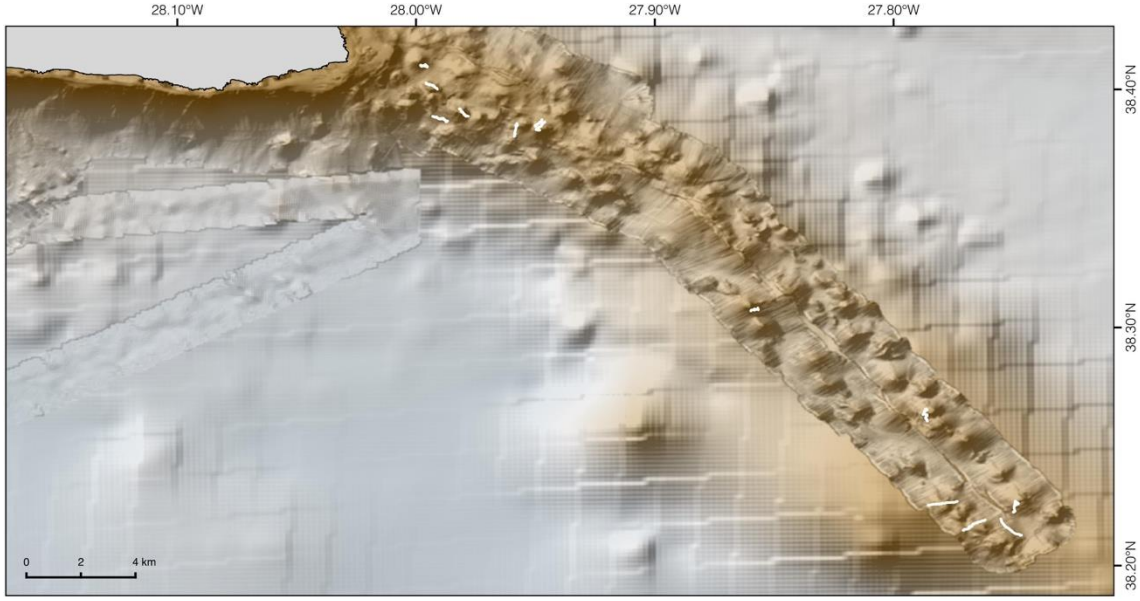

Fig. 17. Location of the dives performed with the drift-cam system on the seamounts south-east of Pico island. The exact GPS location of each dive is provided in Table 9.

Together with the Gigante Seamount Complex, this area represented the most difficult to explore due to the large amount of fishing lines that were observed laying over the seafloor, especially in those mounts closest to shore. In two occasions, the drift-cam got seriously

entangled in fishing lines that were floating a few meters above the seabed. After some work, the crew members managed to get the system free from the ropes and safely back to surface, with no damage to the external frame nor the electronic components. In other two occasions, the dives had to be aborted due to the presence of several abandoned long lines. Details of each specific dive are provided in Table 9.

Table 9. Main characteristics of the different drift-cam deployments carried out in the seamounts SE of Pico.

			Time		Start position		End position		Depth	Dist.
St	Area	Date	Start	End	Lat. (N)	Long. (W)	Lat. (N)	Long. (W)	start-end	(m)
138	SE Pico	02/09/19	08:00	08:59	38º 13.141'	27º 45.708'	38º 12.858'	27º 46.313'	369 - 333	1020
139	SE Pico	02/09/19	09:17	10:19	38º 13.621'	27º 46.410'	38º 13.517'	27º 47.216'	377 - 442	1180
140	SE Pico	02/09/19	10:45	11:59	38º 12.769'	27º 44.790'	38º 13.213'	27º 45.361'	434 - 478	1160
141	SE Pico	02/09/19	13:41	15:23	38º 13.347'	27º 44.992'	38º 13.526'	27º 44.932'	425 - 325	340
142	SE Pico	02/09/19	15:58	17:24	38º 15.674'	27º 47.166'	38º 15.906'	27º 47.223'	456 - 322	430
143	SE Pico	02/09/19	18:22	19:23	38º 18.488'	27º 51.415'	38º 18.479'	27º 51.585'	428 - 338	240
144	SE Pico	03/09/19	09:04	10:18	38º 23.141'	27º 57.462'	38º 22.826'	27º 57.509'	340 - 483	580
145	SE Pico	03/09/19	10:32	10:57	38º 23.239'	27º 56.837'	38º 23.017'	27º 57.033'	306 - 271	500
146	SE Pico	03/09/19	11:12	11:51	38º 23.176'	27º 56.764'	38º 23.173'	27º 56.877'	245 - 280	160
147	SE Pico	03/09/19	13:46	14:32	38º 23.328'	27º 58.690'	38º 23.528'	27º 58.912'	330 - 293	490
148	SE Pico	03/09/19	14:47	15:48	38º 23.209'	27º 59.206'	38º 23.331'	27º 59.524'	499 - 535	510
149	SE Pico	03/09/19	16:06	16:55	38º 24.018'	27º 59.467'	38º 24.136'	27º 59.724'	223 - 239	430
150	SE Pico	03/09/19	17:11	18:16	38º 24.579'	27º 59.713'	38º 24.556'	27º 59.837'	306 - 265	180

The top of the different small seamounts explored was generally dominated by several species of octocorals, whose abundances varied across and within mounds. The presence of colonies of many structural species intermixing between themselves at varying densities generated a very interesting seabed habitat. Dense aggregations of the hydrocoral *Errina dabneyi* (Fig. 18a) were observed in a few dives, which had a high number of associated species including several corals and demersal fish species. Aggregations of the sea fan *Acanthogorgia* sp. were also found in some summits (Fig. 18b), generally accompanied by other coral and sponge species, such as the primnoid *Paracalyptrophora josephinae* (Fig. 18c). The yellow sea fan *Dentomuricea* aff. *meteor* also appeared within the *Acanthogorgia* aggregations, reaching some high densities (Fig. 18d). Also within this same community, dense aggregations of the primnoid *Callogorgia verticillata* could be identified, generally with low sizes (Fig. 18e). Finally, a reef formed by corals of the azooxanthellate scleractinian of the genus *Eguchipsammia* was also found (Fig. 18f).

Some of the areas identified in Area 8 fit the FAO definition of what constitutes a VME. A thorough study of the video images will be carried out to better understand patters of species distribution across its different sectors.

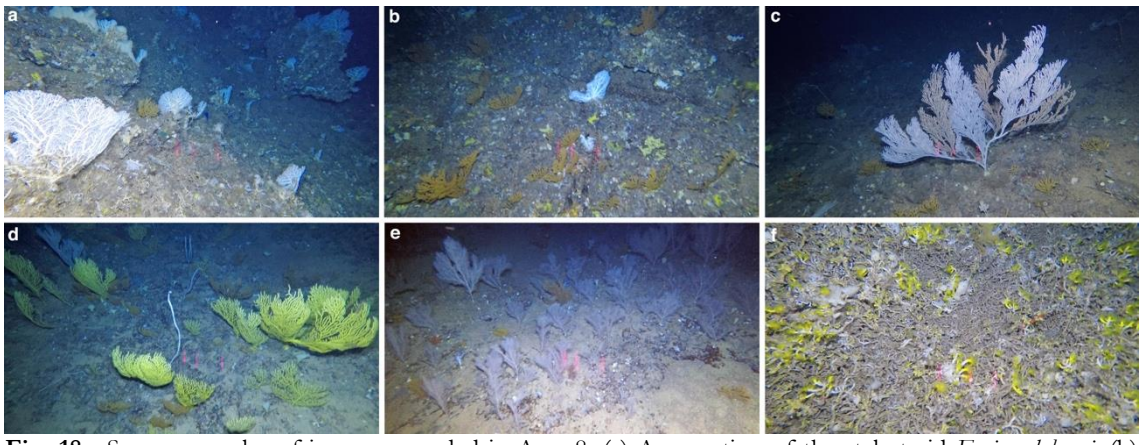

Fig. 18. Some examples of images recorded in Area 8. (a) Aggregation of the stylasterid *Errina dabneyi*. (b) Some high densities of *Acanthogorgia* sp. (c) Large colony of the primnoid *Paracalyptrophora josephinae*. (d) Large yellow sea fans of the species *Dentomuricea* aff. *meteor*. (e) A very dense aggregation of *Callogorgia* verticillata on mixed substrates. (f) Aspect of the *Eguchipsammia* reef.