Cruise report: Condor, Voador and Banco Açores seamounts, Azores

(5-14 August 2010)

Projects: CoralFISH (IMAR, FP7), CONDOR (UAc, EEA), CORAZON (IMAR, FCT), Hermione (UAc, FP7)

Objectives: to conduct fishing experiments in areas with and without cold-water corals, to identify new areas with cold-water corals, conduct acoustic transects on top of the Voador seamount, and deploy colonization cages on Condor seamount.

Ship: NRP "Almirante Gago Coutinho"
Cruise leader:

Leg1- Ricardo Serrão Santos;

Leg2- Fernando Tempera

Scientific team:

Leg 1- Ricardo Santos, Fernando Tempera, Filipe Porteiro, Marina C. Silva, Andreia Henriques, Eva Giacomello, Ana Branco (LNEG) e Pedro Ferreira (LNEG)

Leg 2- Fernando Tempera, Telmo Morato, Marina C. Silva, Andreia Henriques, Pedro Ribeiro, Ana Branco (LNEG) e Pedro Ferreira (LNEG)

Trip Summary

Date	Description
05/08/2010	Departure from Horta harbour at around 10:45. Arrival at Condor seamount at 13:00. After arriving to the first sampling point the Vessel's dynamic positioning system failed and the ROV LUSO dive was cancelled. The system was ready again at 22:00 and checked until early in the morning next day.
06/08/2010	Early in the morning we were visited by members of the Government of Portugal, the Regional Government of the Azores, and the Portuguese Navy. Visitors had the opportunity to follow the first ROV dive in Condor seamount. The ROV dive L10D19 DOP C03 took place from 10:40 to 19:15 at depths ranging from 500m to 300m depth. During the transect a few stops were made to collect samples of organisms, sediment and rocks, and water. After the dive a sound velocity profiler (SVP) was preformed followed by multibeam and backscatter survey in the south flank of Condor seamount.
07/08/2010	The second ROV dive L10D20 DOP C03a was made in the same transect between 1100m and 800m depth. The dive took place between 09:55 and 20:45. During the transect a few stops were made to collect samples of organisms, sediment and rocks, and water. After the dive a sound velocity profiler (SVP) was preformed followed by multibeam and backscatter survey in the south flank of Faial-Pico channel.
08/08/2010	From 10:37 until 11:42 a third dive was made to recover the ADCP equipment that was stuck in the bottom. A fourth ROV dive L10D22 DOP C03b was made between 835 and 717m depth to finish the same transect and to deploy the colonization cages. This dive started at 15:00 and was cancelled at 19:35 due to failure in a propeller. During the transect a few stops were made to collect samples of organisms, sediment and rocks. The ROV propeller was replaced. At 21:00 the scientific team was changed and the multibeam and backscatter survey started between the Condor seamount and the

Voador seamount, 120 nautical miles SW of Faial island.

09/08/2010 Arrival at the Voador seamount at 12:00. A fishing vessel was located close to the dive site but with no interference in the diving process. The ROV LUSO dive L10D23 DOP VOA4 started at 14:55 but was cancelled at 110m depth due to a failure in the new propeller. While the ROV team was trying to fix the propeller, the multibeam and backscatter survey started in Voador seamount. Late at night the ROV team found out that a new propeller was needed. It was decided to steam to Açores Bank closer to Faial island and wait for news from Argus. A sound velocity profiler (SVP) was preformed followed by multibeam and backscatter survey during the transit.

10/08/2010 Arrival at Açores bank at 08:00. After new contacts with Argus and Lisbon the propeller was sent to Horta. Its arrival was due at 14:00 of the 11th of August. The scientific team decided to wait for the part and the cruise was not cancelled. The plans were modified to accommodate this delay. Instead of surveying the Voador seamount (120 nm away) it was decided to do a bathymetry survey in the Açores and Princess Alice bank and to allocate the dives to this new study area. The whole day was filled with the multibeam and backscatter survey.

11/08/2010 Most of the day was spent continuing the multibeam and backscatter survey in Açores bank. At 14:00 the propeller arrived at Horta airport and by 15:30 it was being delivered to the NRP Almirante Gago Coutinho. The ROV team changed the part and multibeam and backscatter survey continued. A dive was planned for 06:00 next morning in the south flank of Açores bank.

12/08/2010 The first ROV Luso dive L10D24_DOP_AC1 was made in Açores bank from 7:26 to 12:25 from depths ranging from 916m to 507m. During this dive large areas of coral rubble mainly of *Lophelia* and *Madrepora* were seen at the base of a vertical wall. At the summit of the wall no coral reefs or communities were observed. During the transect a few stops were made to collect samples of organisms, sediment, rocks and water. The transect was interrupted because the ROV could follow the right heading. A second dive L10D25_DOP_AC2 was made on the west side of the south flank of Açores bank between 13:40 and 17:35. The depths sampled ranged from 625m to 202m depth. The first part of the dive was dominated by sandy bottom with few organisms. At about 15:37 a large wall with Stylasteridae corals was spotted and plenty of coral rubbles of Stylasteridae were observed at the base. This area was covered by lost longline gear and the ROV pilots' were forced to interrupt the dive and ascend to 180m in the water column. The bottom was touched down again at 210m depth. This area was dominated by mixed bottom of sand and rocks and the biological communities were dominated *Viminella*, hidrarians, *Errina* and yellow Alcyonidae. During the transect one stop was made to collect samples of organisms, sediment, rocks and water. After the dives multibeam and backscatter survey was made in Princesa Alice bank.

13/08/2010 The ROV dive procedures started at 06:30 but problems with the ROV positioning system delayed the deployment. The dive L10D26 DOP PA1 started at 09:14in the SW flank of Princesa Alice seamount. The sandy bottom at 1590m was reached at 10:35. During the first minutes of the dive few deep-sea benthic organisms and fish and area pillow lava were spotted. At 11:03 the contact with the ROV was lost and the dive immediately cancelled. The ROV was brought to the ship at 12:18 and checks started.

Suring this period the multibeam and backscatter survey in Princesa Alice bank was continued. By 15:00 the cruise was cancelled and we start steaming towards Horta harbour.

Dives with ROV Luso

Number of dives =

Average distance covered =

Total distance covered =

Location of the transects = see Table 1 and Figures 1 and 2

MAPA LOCALIZAÇÃO MERGULHOS CONDOR

Figure 1- Map showing the location of the ROV Luso dives in Condor seamount.

MAPA LOCALIZAÇÃO MERGULHOS AÇORES/PAL

Figure 2- Map showing the location of the ROV Luso dives in Açores seamount.

Table 1- Location of the ROV Luso dives.

Date	Code	Location	Latitude	Longitude	Distance	Duration	Depth 0	Depth 1
06/08/2010	L10D19 DOP C03	Condor	38°32.385' N	28°59.041' W		09:12	1092	794
			38°31.684' N	28°59.442 ' W				
07/08/2010	L10D20 DOP C03a	Condor	38°33.704' N	28°57.892' W		07:37	535	297
			38°32.821' N	28°58.675' W				
08/08/2010	L10D21 DOP ADCP	Condor	38°31.860' N	29°01.879' W		01:20	224	227
			38°31.877' N	29°01.945' W				
	L10D22 DOP C03b	Condor	38°32.661' N	28°58.000' W		02:17	833	716
			38°32.563' N	28°58.185' W				
09/08/2010	L10D23 DOP VOA4	Voador	37°56.033' N	30°75.334' W	Cancelled			
12/08/2010	L10D24 DOP AC1	Açores	38°08.107' N	29°14.412' W		03:41	916	507
			38°08.438'N	29°13.862'W				
	L10D25 DOP AC2	Açores	38°06.464'N	29°10.603'W		03:01	628	202
			38°06.639'N	29°10.120'W				
13/08/2010	L10D26 DOP	PAlice	38°00.746'N	29°26.146'W	Cancelled	00:35	1590	1526

	PA1						
			38°00.811'N	29°26.013'W			
TOTAL							

Biological sampling

During the 7 dives with the ROV Luso 12 biological samples (Table 2) and 5 samples of water (Table 3) were collected.

Table 2- Biological samples collected during the cruise.

Date	Code	Location	Latitude	Longitude	Depth (m)	Code Olex	Samples
06/08/2010	L10D19-DOPC03	Condor	38°32.322'N	28°58.991'W	486	A1	*Viminella* sp. (A1_1)
06/08/2010	L10D19-DOPC03	Condor	38°32.201'N	28°59.078'W	468	A2	Sponge lolipop (A2_1); Hydrocoral white (A2_2); Sponges NI (A2_4); Gastropod (A2_5); Sponge NI (A2_6); Bryozoans (A2_7); Shrimp NI (A2_8); Crab and shrimp (A2_9); Sponge NI (A2_10); Sea urchin (A2_11);
06/08/2010	L10D19-DOPC03	Condor	38°31.935'N	28°59.27'W	442	A3	Sponge NI (A3_1); Hydrarians (A3_2); Crab hermit (A3_3); Gorgonians NI (A3_4);
06/08/2010	L10D19-DOPC03	Condor	38°31.879'N	28°59.301'W	420	A4	Nudibranch live Nudibranch egg masses (A4_1); Sponge NI (A4_2)
07/08/2010	L10D20-DOPC03a	Condor	38°33.676'N	28°57.928'W	1095	A1	*Acanella arbuscula* (A1-1); Polychaeta (A1-2), *Galathea* (A1-3); Gastropoda (A1-4); Shrimp (A1-5);
07/08/2010	L10D20-DOPC03a	Condor	38°33.346'N	28°58.191'W	1002	A2	*Candidella* (A2-1); Nudibranch (A2-2); Sea star (A2-3); Scleractinean coral yellow (A2-4)
07/08/2010	L10D20-DOPC03a	Condor	38°33.316'N	28°58.229'W	979	A3	Ophiuridea (A3-1)
07/08/2010	L10D20-DOPC03a	Condor	38°32.833'N	28°58.678'W	795	A4	Anthozoa (A4-1): Sponge NI (A4-2); *Pheronema* sp. (A4-3); *Crypthellia* (A4-4);
08/08/2010	L10D20-DOPC03b	Condor	38°32.706'N	28°58.03'W	828	A1	*Candidella* sp. (A1_1); Amphipoda (A1_2); Gastropod (A1_3); Gastropod (A1_4); Bryozoa (A1_5);

							Galathea (A1_6); Worm (A1_7); Sea urchin (A1_8); Scleractinean (A1-9)
12/08/2010	L10D24-DOP AC1	Açores	38°04.916	29°08.649	893	A1	Scleractinean coral rubble (A1)
12/08/2010	L10D25-DOP AC2	Açores			517	A1	Scleractinean and hydrocoral rubble (A1)
12/08/2010	L10D25-DOP AC2	Açores	38°06.641'N	29°10.141'W	200	A2	*Viminella* (A2); bryozoa (A2); sponges (A2); gastropod (A2); polychaeta (A2); Alcyonacea (A2)

Table 3- Biological samples collected during the cruise.

Date	Code	Location	Latitude	Longitude	Depth (m)	Code Olex	Samples
06/08/2010	L10D19-DOPC03	Condor	38°31.884'N	28°59.303'W	419	NB1 & NB2	Nutrients and DIC (L10D19-DOPC03 NB1) POM (L10D19-DOPCO3 NB2)
07/08/2010	L10D20-DOPC03a	Condor	38°33.345'N	28°58.190'W	1001	N1 & N2	Nutrients and DIC (L10D20-DOPC03a N1) POM (L10D20-DOPC03a N2)
07/08/2010	L10D20-DOPC03a	Condor	38°32.831'N	28°58.677'W	795	N3 & N4	Nutrients and DIC (L10D-DOPC03a N3) POM (L10D20-DOPC03a N4)
12/08/2010	L10D24-DOP AC1	Açores	38°08.438'N	29°13.862'W	507	N1 & N2	Nutrients and DIC (L10D24-DOP AC1 N1) POM (L10D24-DOP AC1 N2)
12/08/2010	L10D25-DOP AC2	Açores	38°06.641'N	29°10.141'W	200	N1	POM (L10D25-DOP AC2 N1)

Geological sampling (Pedro Ferreira)

Table 4- Geological samples collected during the cruise.

Date	Code	Location	Latitude	Longitude	Depth (m)	Code Olex	Samples
06/08/2010	L10D19-DOPC03	Condor	38°31.935'N	28°59.27o'W	442.11	A3	Sediment (L10 D19-DOP C03 S1)
06/08/2010	L10D19-DOPC03	Condor	38°31.941'N	28°59.254'W	441.12	R1	Rock (L10 D19-DOP C03 R1)
06/08/2010	L10D19-DOPC03	Condor	38°31.884'N	28°59.303'W	419	NB1	Rock (L10 D19-DOP C03 R2) Sediment (L10 D19-DOP C03 S2)
07/08/2010	L10D20-DOPC03a	Condor	38°33.708'N	28°57.925'W	1092	R1	Rock (L10 D20-DOP C03A R1)
07/08/2010	L10D20-DOPC03a	Condor	38°33.704'N	28°57.923'W	1092	S1	Sediment (L10 D20-DOP C03A S1)
08/08/2010	L10D22-DOPC03b	Condor	38°32.706'N	28°58.030'W	828	A1R1	Rock (L10 D22-DOP C03B R1)

12/08/2010	L10D24-DOP AC1	Açores	38°04.895'N	29°08.682'W	924	S1R1	Sediment and rock
12/08/2010	L10D24-DOP AC1	Açores	38°08.438'N	29°13.862'W	507	R2	Rock
12/08/2010	L10D25-DOP AC2	Açores	38°06.641'N	29°10.141'W	200	R1	Rock

Multibeam and backscatter surveys

The multibeam and backscatter surveys were performed with transects in the different study areas. Multibeam and backscatter data was also collected during transit periods.

Condor seamount

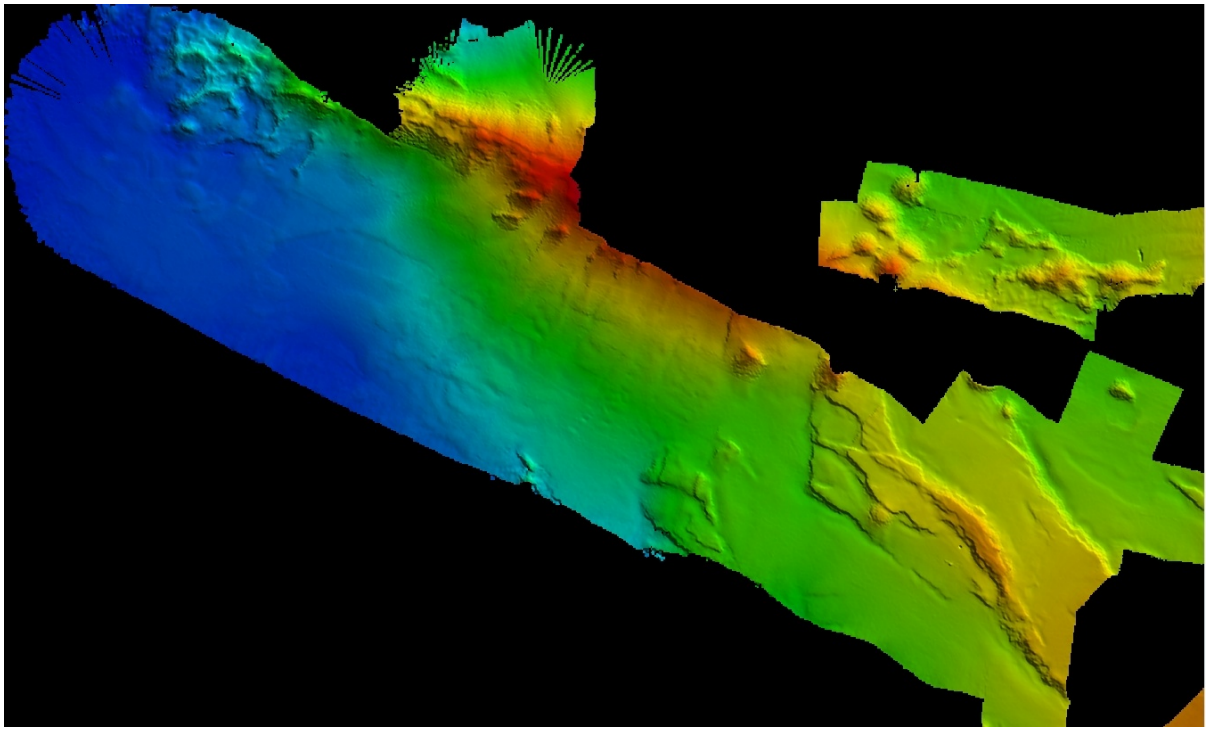

Figure 3- Map showing the bathymetry surveys in the Condor seamount.

South flank of Faial-Pico channel

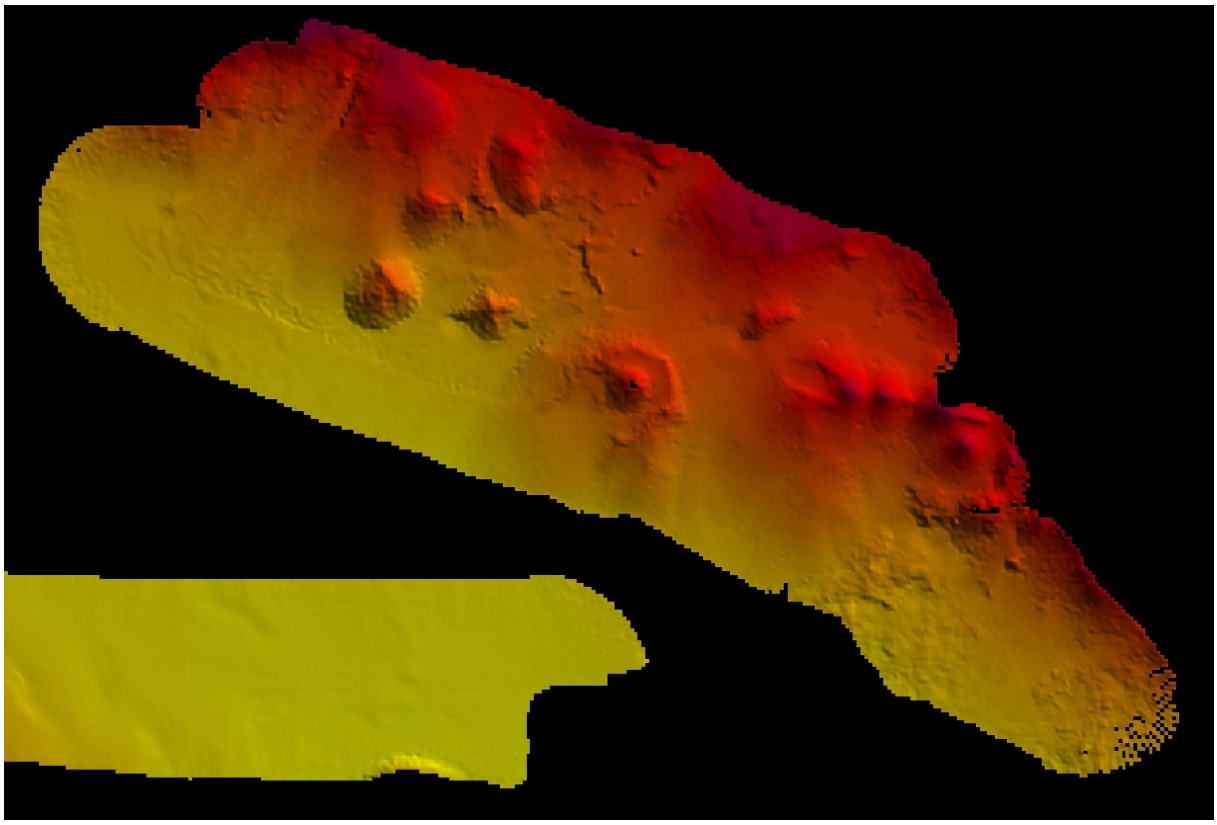

Figure 4- Map showing the bathymetry surveys in the south flank of Faial-Pico channel.

Voador seamount

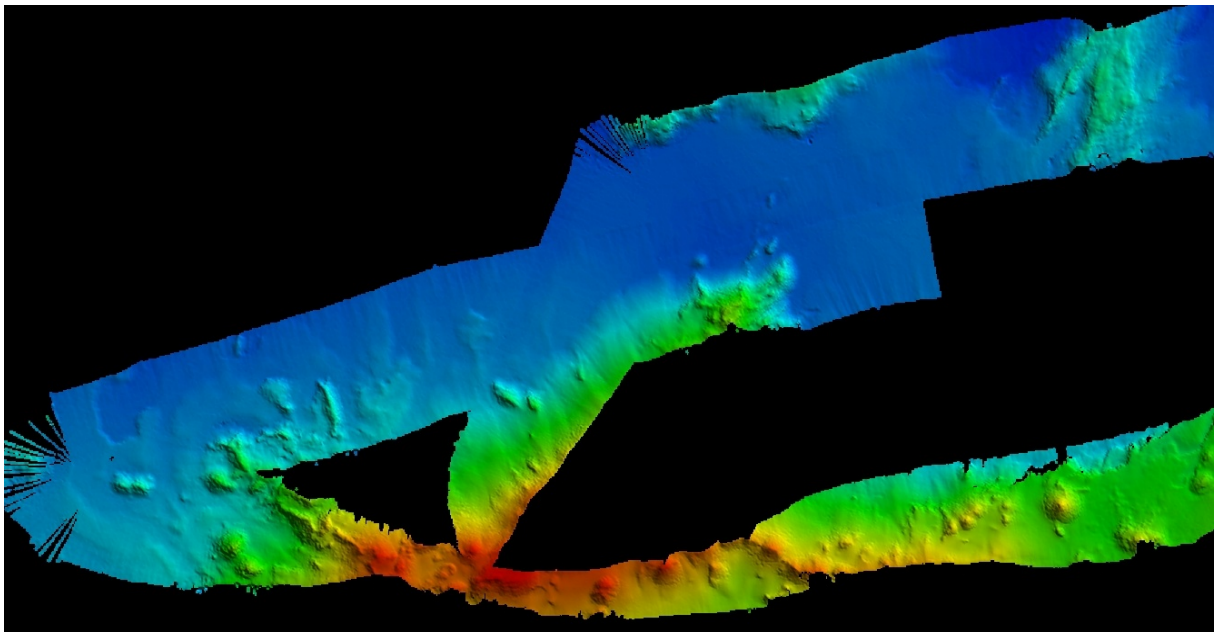

Figure 5- Map showing the bathymetry surveys in the Voador seamount.

Açores and Princesa Alice seamounts

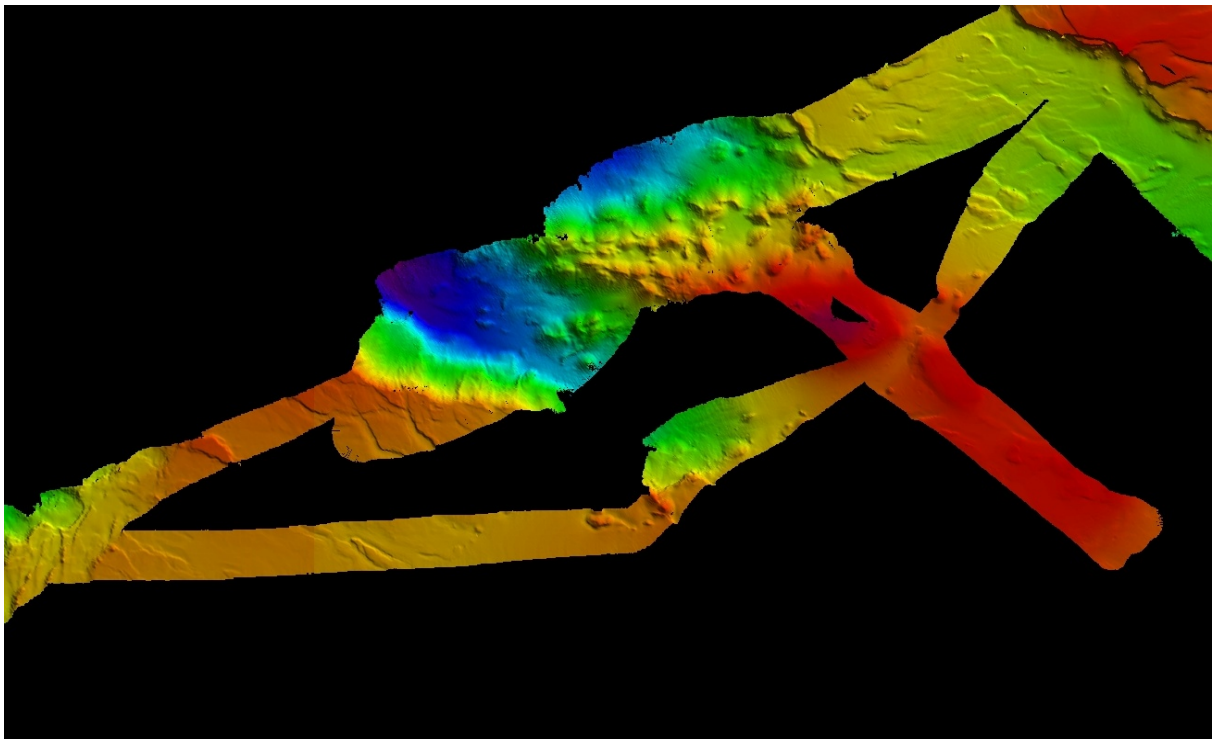

Figure 6- Map showing the bathymetry surveys in the Açores and Princesa Alice seamounts.

Transits

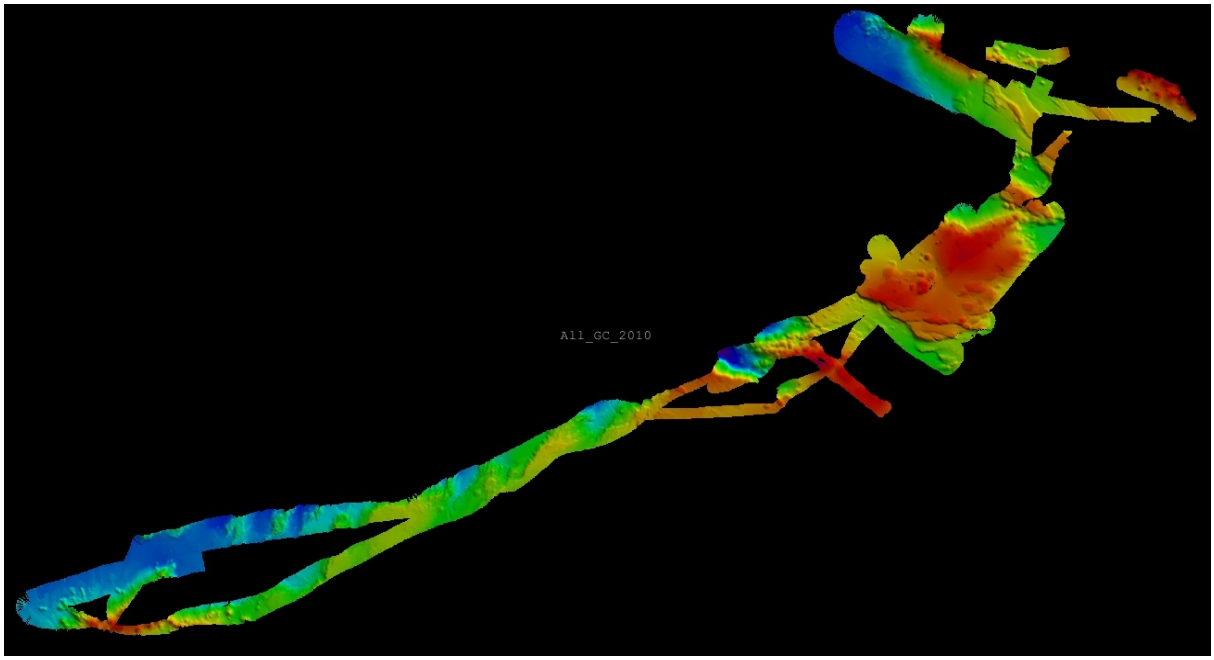

Figure 7- Map showing the full bathymetry surveys set including transits.