HCA12-07.4Am

SPAIN

NATIONAL REPORT

TO THE 12th HYDROGRAPHIC COMMISSION ON ANTARCTICA MEETING

MONTEVIDEO, URUGUAY
10 TO 12 OCTOBER 2012

1. Hydrographic Service

Instituto Hidrográfico de la Marina (IHM), Spain.

2. Surveys

As stated in the report to the last HCA meeting, a number of hydrographic surveys had been planned for the months of January and February of 2012. These surveys were actually carried out.

Spain operates two scientific stations in the South Shetland Islands: The “Juan Carlos I” at Livingston Island, and the “Gabriel de Castilla” at Decepción Island. In addition to these two stations, a provisional scientific camp, “Campamento Byers”, was established in the Byers peninsula, also in Livingston Island.

Figure 1. Spanish scientific stations in South Shetland Islands

The operation of those scientific stations and the carrying out of scientific projects are tasks derived from the Spanish Antarctic National Plan. These tasks have driven the efforts made by the Spanish Government to guarantee the safe navigation of logistic and research vessels in the vicinity of the stations and in the areas of interest for the scientific projects. The Spanish Navy, through the IHM, has been carrying out hydrographic surveys, mostly in the South Shetland Islands, since 1989.

The fact that the provisional scientific camp in the Bayers Peninsula in Livingston Island has been increasing its activities during the past few years was what originated the need for new hydrographic surveys in the area. In 2009 and 2010, a hydrographic commission carried out several opportunity surveys in the approaching area to the camp. These opportunity surveys were performed by the Spanish Navy Oceanographic Research Vessel “Las Palmas”, which has no hydrographic capability itself. The Spanish Navy Oceanographic Research Vessel “Hespérides” does have hydrographic capability, but most of the time it is committed to carry out scientific projects during the Spanish Antarctic campaigns.

The last 2011-2012 Spanish Antarctic campaign, however, has been very productive hydrographically speaking, since most of the time that the “Hespérides” operated in the area was dedicated exclusively to hydrography. This was due to the approval by the Ministry of Science and Innovation of a survey plan to guarantee the safe navigation of the “Hésperides” and “Las Palmas” during their support operations to the Spanish scientific stations.

The effort made by the Spanish Navy during the hydrographic surveys carried out from January 27th to February 24th, 2012 focused on:

- Updating the existing bathymetry data in the vicinity of the Spanish scientific stations, in particular in the approaches to the scientific camp “Campamento Byers”, where there existed areas never sounded.

- Updating the Spanish Chart Scheme in Antarctica, in particular the two INTernational charts that Spain is committed to maintain: INT 9121, and INT 9128.

- Collaborating with several scientific research projects.

- Obtaining soundings along Main Shipping Routes (MSR) wherever possible, in particular along the transect from Livingston Island to Elephant Island.

The meteorological conditions in the area were quite favourable most of the time, which resulted in a quite productive sounding rate.

2.1. Coverage of new surveys

The Spanish nautical chart scheme in Antarctica (South Shetland Islands) is shown in figure 2.

The hydrographic campaign that was performed during the months of January and February 2012 was named “HIDROSHETLAND 2012” and focused on the areas shown in figure 3.

The areas that were effectively surveyed during the campaign are shown in figure 4 and 5. An important result is that nearly 90% of the areas shown were surveyed with multibeam sounders, allowing full bottom coverage.

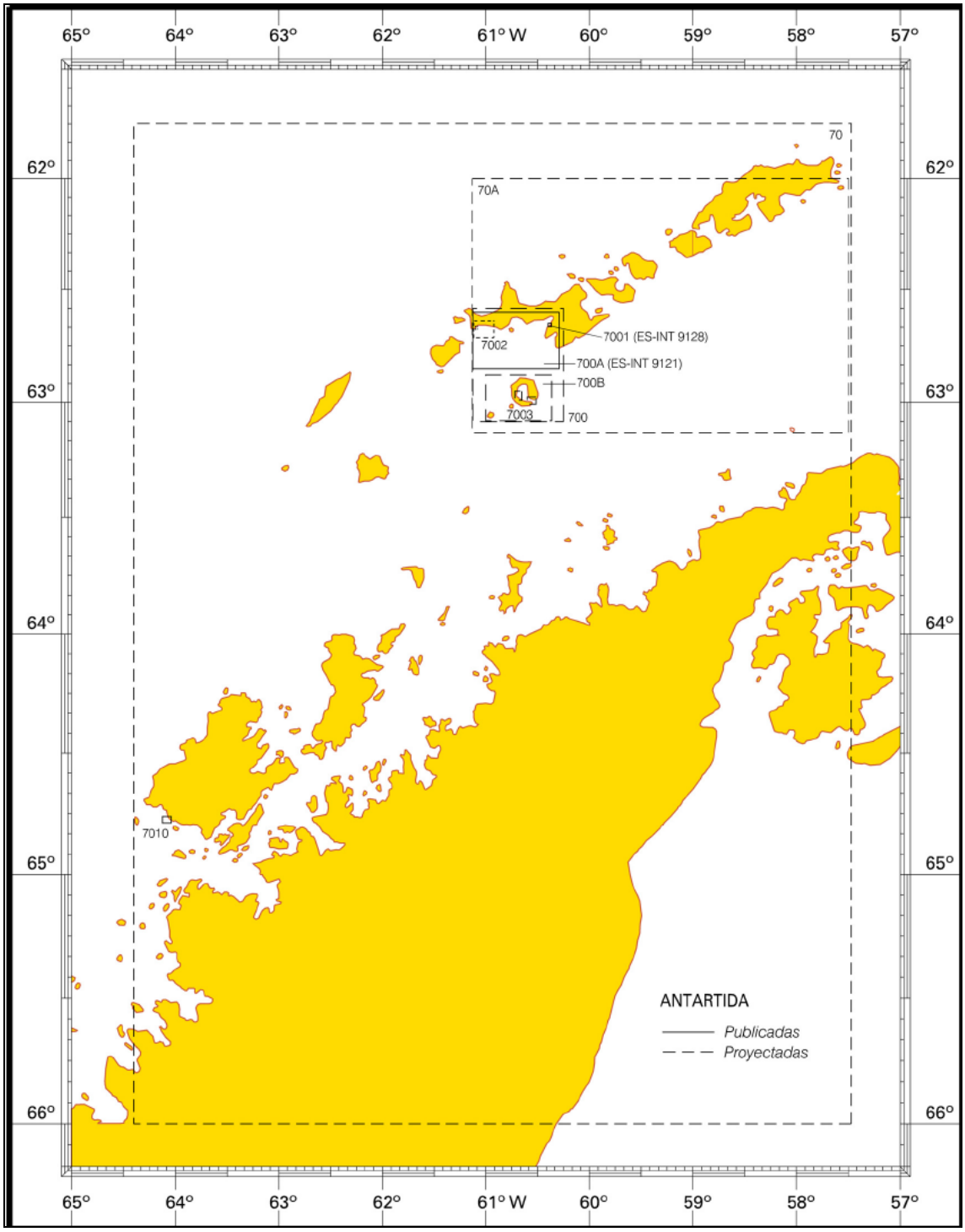

Figure 2. Spanish chart scheme in Antarctica

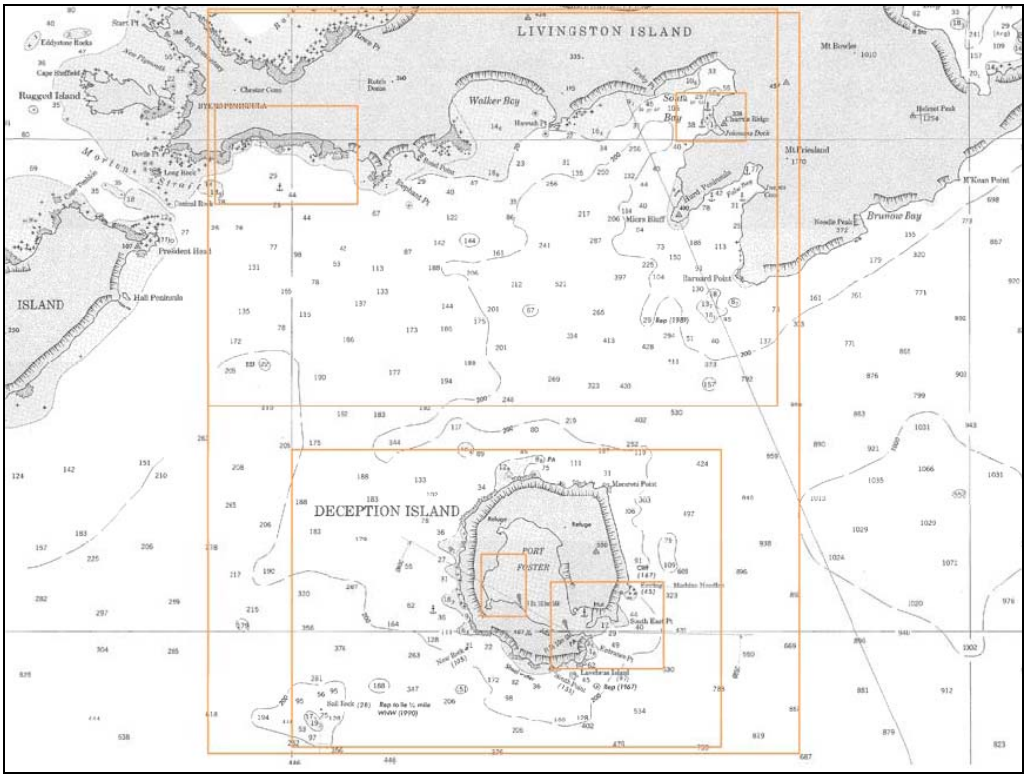

Figure 3. Survey planning HIDROSHETLAND 2012

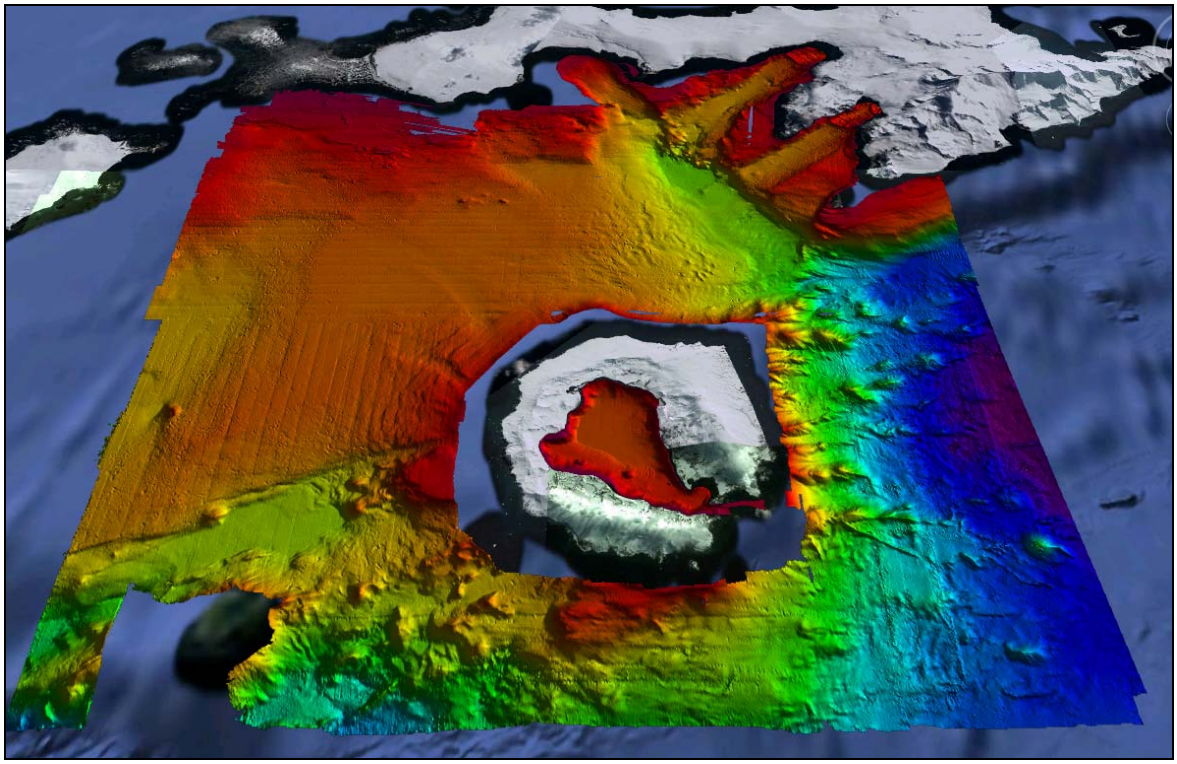

Figure 4. Areas surveyed during HIDROSHETLAND 2012

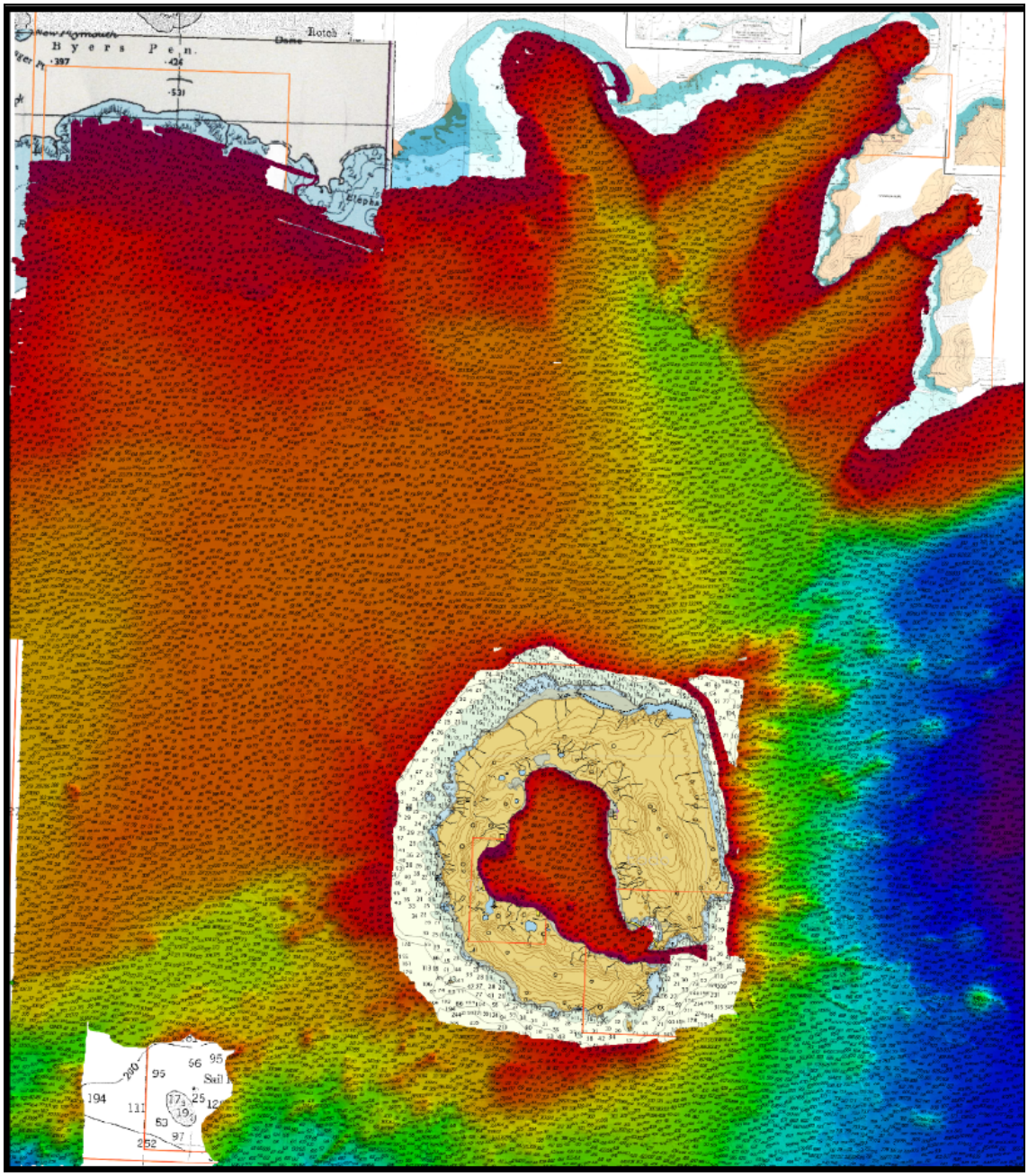

Figure 5. Fair sheet of the area surveyed

2.2. New technologies and / or equipment

The surveys were carried out both on board the Oceanographic Research Vessel "Hespérides" and on board an inflatable boat. The ship carries two hull-mounted multibeam sounders, which cover dephts ranging from very shallow waters down to 11000 meters.

The Spanish Navy has made an effort to allocate funds for a program of modernization of hydrographic equipment. The acquisition of a portable shallow water multibeam sounder is part of that program, and it was installed on a "zodiac"

type inflatable boat. This made it possible to obtain shallow soundings very close to the coast were it is not safe for the ship to operate.

Figure 6. Spanish Navy Oceanographic Research Vessel "Hespérides"

The shallow water multibeam mounted on the boat became a fundamental tool to acquire soundings in many places where in the past they could not be obtained. It is an interferometric sounder, which allows precise shallow soundings to be obtained across a sweeping swath up to 12 times the depth.

Figure 7. Sounding with a shallow water portable multibeam sounder

The simultaneous survey work on the ship and on the boat resulted in a nearly complete bottom coverage of Port Foster, in Decepcion Island (Figure 8). At first, only the anchoring and approching areas to the scientic station “Gabriel de Castilla” were planned to be surveyed, but since the weather and sea conditions were quite mild, the whole Foster Bay was surveyed.

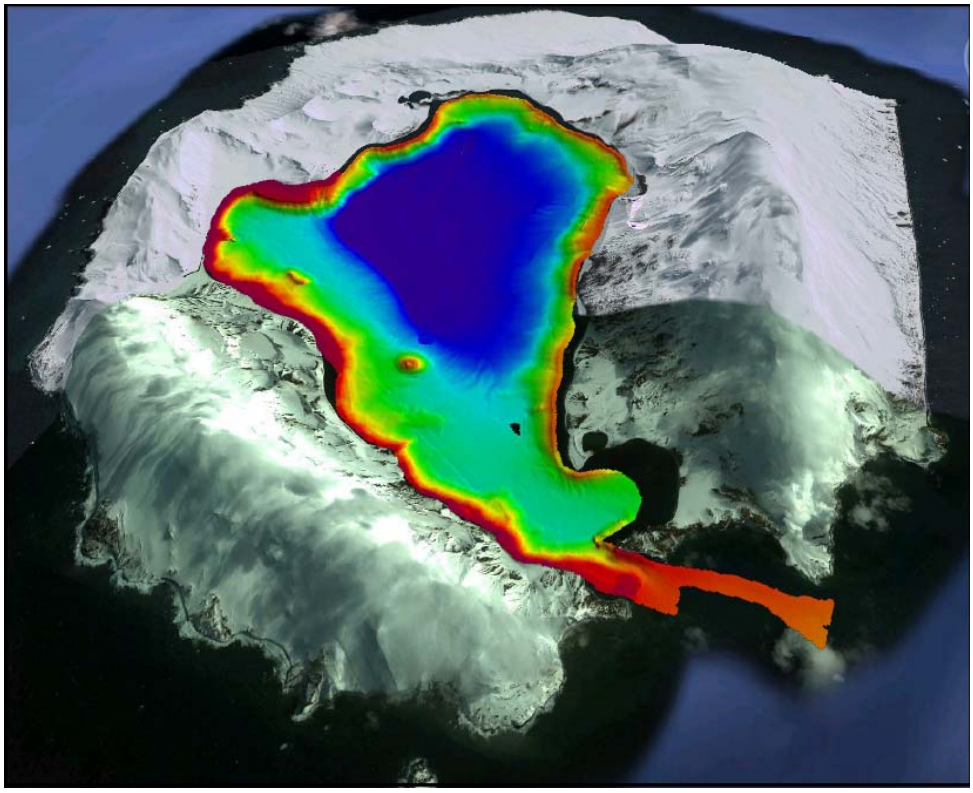

Figure 8. Multibeam survey of Port Foster, Decepcion Island

As for land control surveys is concerned, the favourable weather conditions also allowed the team to determine geographically several stretches of coastline in the surroundings of the scientific stations. This was carried out with portable Differential GPS equipment.

Figure 9. Land surveys - coastline delimitation

3. New Charts and updates

INT Charts

Spain has updated its national paper scheme chart for Antarctic. INT 9121 and INT 9128 are Spain´s responsibility. Once the new data from the HIDROSHETLAND 2012 campaign have been processed, these two INT charts will be updated. The publication dates are 2012 / 2013.

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As the new surveys allow producing new editions of INT 9121 and INT 9128, the related ENC production will also take place. These new ENC's will be distributed via the IC-ENC RENC.

National paper charts

The Spanish national paper chart scheme for Antarctic including the relevant INT charts, is shown in Annex I.

It should be noted that both the chart limits and the scale of the Chart 7002 (- Campamento de Byers. Isla Livingston, Península Byers -) have been modified.

4. New publications and updates

New editions:

The 2013 edition of "Catalogue of Nautical Charts and other Publications", which includes the Spanish Chart Scheme in the Antarctic, is planned to be published in first quarter 2013.

5. S-55

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6. Capacity Building

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7. Oceanographic Activities

Tide Gauge Network:

In order to refer the soundings obtained during the hydrographic survey to the chart datum, a bottom pressure sensor was placed in the vicinity of the scientific base “Juan Carlos I” in Livingston Island, and another one in the vicinity of the scientific base “Gabriel de Castilla” in Decepción Island. Then, their vertical distance to fixed bench marks were measured. At the end of the surveys, the bottom pressure sensors were recovered.

Figure 10. Bottom pressure sensor for tide measuring

The University of Cádiz (UCA) has been monitoring tides both in Livingston Island and in Decepción Island for the last two years by leaving one bottom pressure sensor in each island for the winter. Currently there are two sensors recording tides in the two islands.

Figure 11. Levelling tide bench marks

8. Other activities

Main Shipping Routes (MSR):

Since a scientific project was carried out in the vicinity of Elephant Island, opportunity soundings were taken along an identified Main Shipping Route during the transit from and to the island.

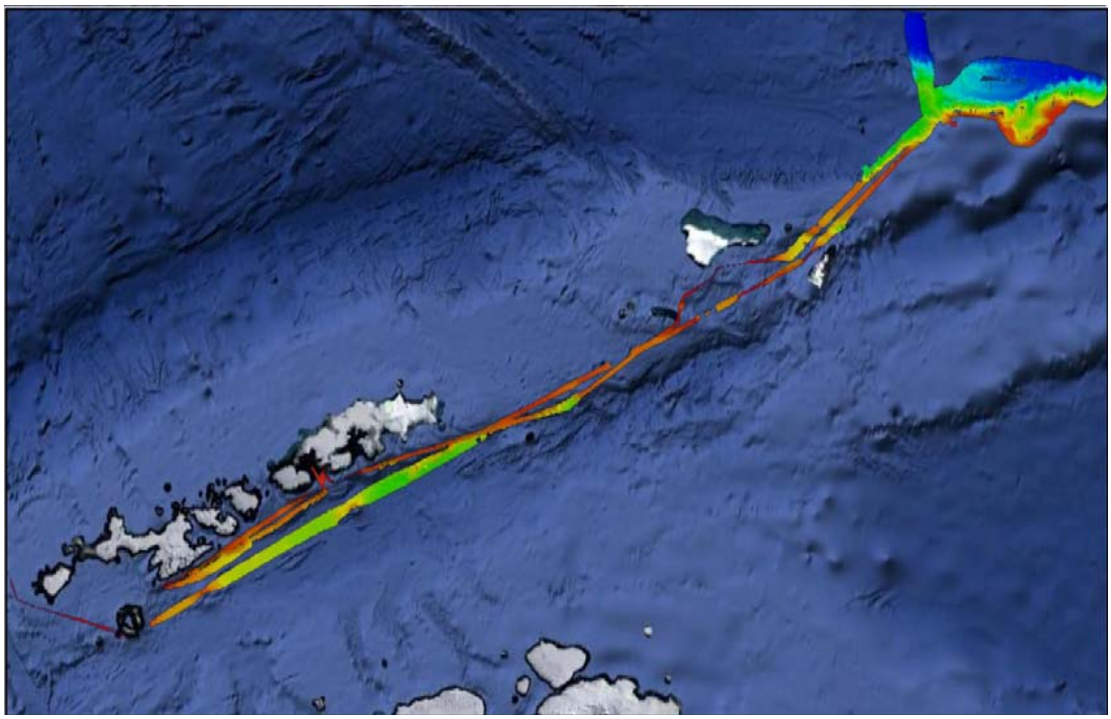

Figure 12. Opportunity soundings taken along a MSR

9. Miscellanea

- UKHO passed some bathymetric data within Port Foster, Decepción Island, to IHM prior to the survey. These data were used for planning purposes.

- The Geographical Information System (GIS) tool for Antarctica, developed by IHB, was used for survey planning purposes.

10. Future actions

- IHM, as part of the Spanish Navy, will continue to support Spain´s National Antarctic Plan, with its hydrographic means.

- IHM will continue to maintain the Spanish Antarctic chart scheme, including the two INT charts under its responsibility.

- IHM will continue to exchange data as needed with other HCA members. In this regard, and as agreed in the 10th HCA meeting, Spain will release the recently obtained bathymetric data, once processed, to Argentina, producer of INT chart 9120 – Decepción Island.

ANNEX I – SPANISH CHART SCHEME IN ANTARCTICA

NÚM.	TÍTULO	ESCALA 1: (φr)	MARCOS				DIMENSIONES (mm)		CARTAS A CADUCAR
			NORTE	SUR	ESTE	OESTE			
70	Isla Rey Jorge y costa norte de la península Antártica a isla Anvers y estrecho Bransfield.	450 000 (63°30' S)	61° 45,00' S	66° 00,00' S	57° 30,00' W	64° 24,00' W	750 x 1051		
70A 1776 (GB)	Isla Livingston, a isla Rey Jorge.	200 000 (62°20' S)	62° 00,00' S	63° 07,90' S	57° 30,00' W	61° 13,50' W	964 x 634		
700	Costa Sur de la isla de Livingston a isla Decepción. Islas Shetland del Sur, estrecho Bransfield.	60 000 (62°50' S)	62° 35,00' S	63° 05,00' S	60° 15,00' W	61° 07,50' W	743 x 929		
700A INT 9121 (ES)	De punta Barnard a Campamento Byers . Isla Livingston, costa Sur.	40 000 (62°42,50' S)	62° 34,85' S	62° 51,00' S	60° 17,00' W	61° 07,50' W	1077 x 750		004ANT
	Plano adjunto: Isla Media Luna	25 000 (62°35,50' S)	62° 34,40' S	62° 36,95' S	59° 51,80' W	59° 57,60' W	199 x 190		003ANT
700B	Isla Decepción. Islas Shetland del Sur, estrecho Bransfield.	30 000 (62°59' S)	62° 52,75' S	63° 04,75' S	60°22,00' W	61° 00,00' W	1071 x 743		
7001 INT 9128 (ES)	Base Juan Carlos I.	5 000 (62°41' S)	62° 39,00' S	62° 39,90' S	60° 22,20' W	60° 24,00' W	307 x 334		001-002-004ANT
7002	Campamento Byers. Isla Livingston, peninsula Byers.	10 000	62° 38,40' S	62° 42,80' S	60° 55,40' W	61° 06,90' W	982 x 818		
	Plano inserto: Zona de Desembarco.	6 000 (62°40' S)	62° 39,80' S	62° 40,60' S	61° 04,80' W	61° 06,00' W	171 x 248		
7003	Bahía Fumarolas y Fuelles de Neptuno. Isla Decepción, islas Shetland del Sur.								
	A. Base Gabriel de Castilla.	10 000 (62°58,75' S)	62° 57,00' S	62° 59,50' S	60° 39,25' W	60° 43,25' W	338 x 464		
	B. Fuelles de Neptuno.	12 500 (63°00' S)	62° 58,10' S	63° 01,60' S	60° 27,10' W	60° 37,10' W	676 x 520		
7010	Arthur Harbor. Archipiélago Palmer, isla Anvers.	5 000 (64°46,50' S)	64° 45,70' S	64° 47,30' S	64° 02,40' W	64° 07,35' W	785 x 595		011ANT