

10<sup>th</sup> Hydrographic Commission on Antarctica (HCA) Meeting  
British Antarctic Survey (BAS), Cambridge,  
United Kingdom, 20-22 September 2010



## SERVICIO DE HIDROGRAFIA NAVAL – ARGENTINA

### REPORT ON TECHNICAL VISIT TO MV “MINERVA”

#### 1. INTRODUCTION

As stated in

**Action 9/1 - HCA Chair**, in liaison with Argentina, Chile and New Zealand, and with cooperation from IAATO, to coordinate the visit of hydrographic surveyors from Argentina, Chile and New Zealand to at least one IAATO ship, when calling in ports on her way to Antarctica, to advice on the collection and rendering of hydrographic data, and report experience at HCA10.

SHN technical staff SHN made two visits to the MV “MINERVA”:

1. The first one was on Saturday 20 FEB during the ship stop at Buenos Aires port on her way to the Antarctic season. In this occasion the Master was Captain John Moulds, who was very kind as we held a very fruitful meeting:

- We gave him a HCA form for “*Collection and Rendering of Hydrographic Data*” as well as Argentine paper charts and tidal predictions from Antarctica.

- He gave us the data collected by the Minerva and some other ships during previous cruises, all stored together in his navigational system.

- He also showed us an interesting collection of home-made maps of different places previously visited containing exploratory coastlines and bathymetry. Unluckily this data was not available in digital format (neither vector nor raster), so he was unable to deliver it to us.

The data was downloaded in Transas 2500 and 3000 format (.CR\_ and .CRA) but we could not open the files even having the 3000 system at SHN. Copy of the files was submitted to IHB.

2. On her way back northwards after the Antarctic Summer season, we paid a new visit to the MINERVA, this time on Saturday 06 MAR, again in Buenos Aires. This time, Captain Giovanni B. Biasutti was the Master. He kindly looked for another format for us to be able to see the data and find a way to export the Transas format to ASCII (.CSV). Copy of the files was submitted to IHB.

## 2. DATA ANALYSIS

- Transas format could not be used on this occasion. ASCII (.CSV) files structure obtained by exporting Transas files was very complex and needed some processing steps to convert it to an usable data set. Although these files included different kind of features (exploratory coastlines obtained with survey boat, beacons and signals, toponymy and soundings), only soundings were converted and used in this opportunity. Examples of .CSV objects are given in **ANNEX 1**.
- As both Captains agreed, files are an integration of data from different ships (and boats) along the years with no date/time for each sounding data.
- Since the data came from different sources and from a long time series, it is affected by different drafts, water levels, sensor offsets, water sound speeds and maybe horizontal datums, they cannot be considered as a unique data set.
- Data coverage was analyzed in relation to coherence with nautical charts or official data, and different categories were found:
  - In some places data coverage is complementary and coherent with nautical charts. (Bottom of Bahia Esperanza, Arctowski Base area, Isla Decepcion . Decepcion Island. -See **ANNEX 2**-)
  - In some others data quality cannot be checked because of the lack of data in nautical charts. (Isla Media Luna – Half-Moon Island, Puerto Mikkelsen – Mikkelsen Harbour, Isla Despedida – Farewell Rock, – See **ANNEX 3**-)
  - Some other times data is overlapped, but it does not match with depths in nautical charts. (Pasaje Principe Carlos – Prince Charles Strait, Isla Kaiser – Kaiser Island, Caleta Cierva – Cierva Point, - See **ANNEX 4**-).
- Both Captains agreed that officers are very busy during the cruise and they have not enough time to take care of the requested data collection or to complete the Data Rendering Form, which they find complex and too long.

## 3. CONCLUSIONS

- Since the already collected data does not fulfill any hydrographic standard, it should not be used as source data for cartographic purposes, BUT as it has a wide coverage involving some unsurveyed places or uncharted places by HOs, it would be useful to make use of it for preliminary plans that could help to design further hydrographic operations in such places.
- Places usually visited by IAATO ships are sometimes unsurveyed or uncharted, so it would be important to improve data collection quality for future operations by those ships in order to make it useful for HOs.

Possible actions to be taken:

- A. To maximize data gathering possibilities, covering not only bathymetry but also navigational aids status, information for updating / improving sailing directions / antarctic pilots and general MSI information, it would be important to put riders from HOs onboard IAATO ships whenever possible.
- B. To develop a simple and economic data logger (black box) with CPU, memory, built-in GPS and serial ports (NMEA 0183) for input from echosounder and GPS external antenna/optional DGPS and stored data output. A commercial option is the Brookhouse NMEA 0183 data Logger, specially designed for bathymetry capturing.

<http://brookhouseonline.com/nmealogger.htm>

The mentioned device would allow to standardize data collection format, codifying ship's name (ZZZZ) date and time, position (latitude and longitude) and depth

(e.g.

ZZZZ,MM/DD/YYYY,HH/MM/SS,DD°MM'SS.SS"S,DDD°MM'SS.SS"W,XX.YY  
)

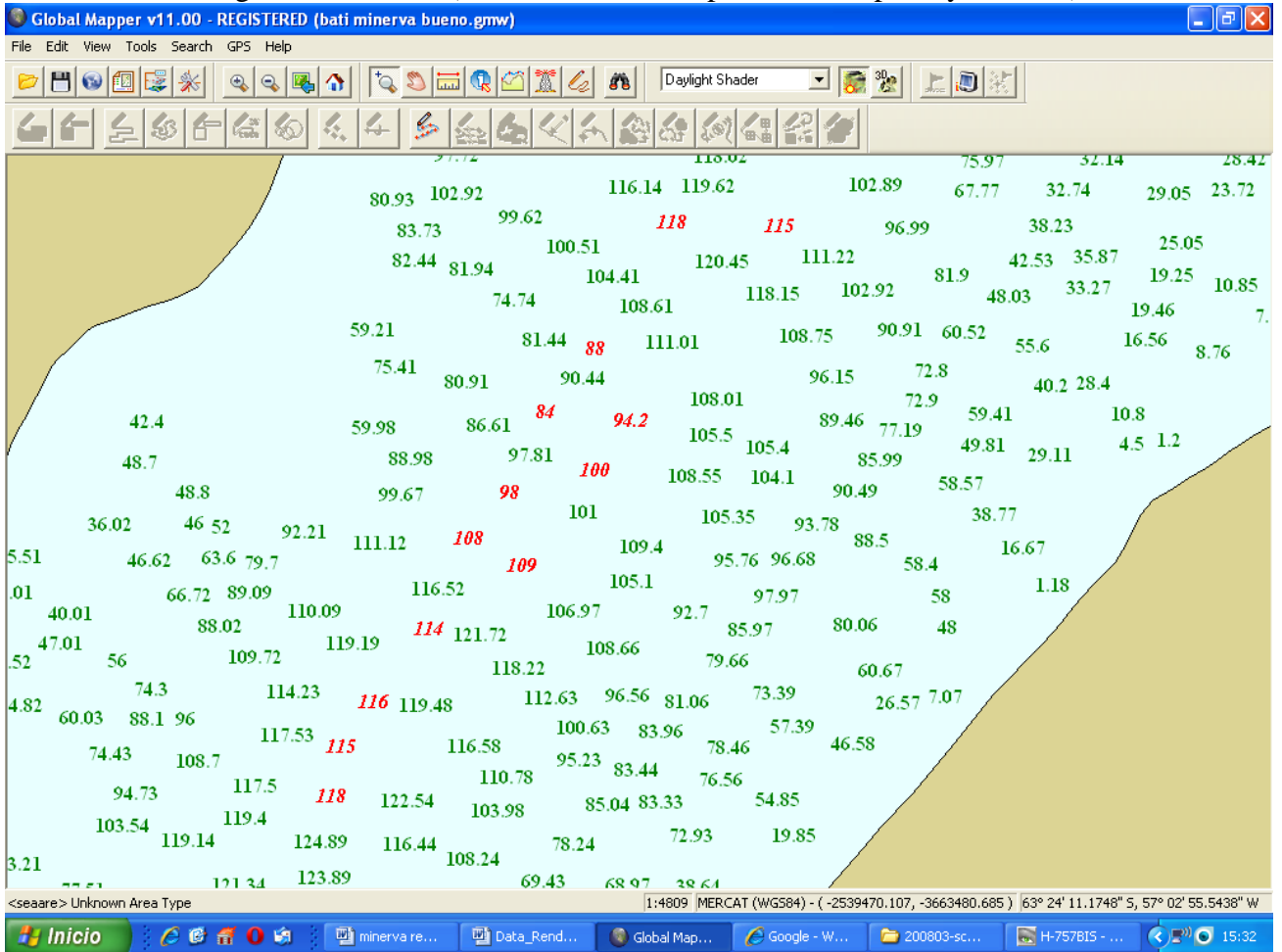
- C. As a complement of action B., to simplify meta-data sheet to make it quicker and friendly to the bridge officers. An example of reduced data rendering form is given in **ANNEX 5**

**ANNEX 1. Original .CSV data and converted files example.**

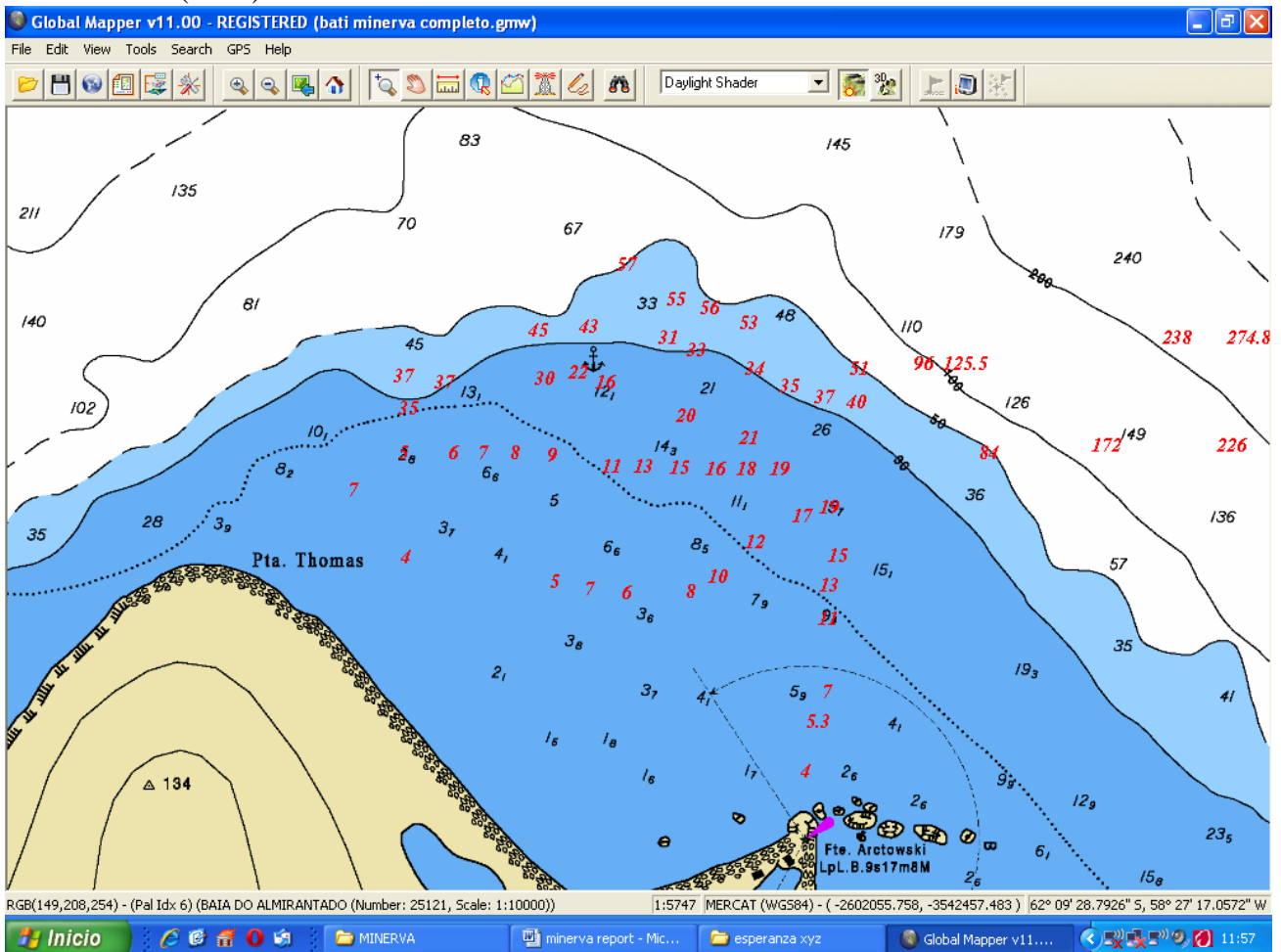
Original .CSV file	Converted .TXT file
<b>Object=Depth</b>	64°44.206194S 62°36.919434W 138.00
Value=138.00m	64°44.279336S 62°37.007812W 165.00
Lat 64°44.206194S Lon 62°36.919434W	64°44.360602S 62°37.106689W 194.00
;	64°44.440613S 62°37.216309W 194.00
<b>Object=Light</b>	64°44.551247S 62°37.469482W 167.00
Lat 64°08.499746S Lon 60°59.440918W	64°44.627082S 62°37.721924W 201.00
;	64°44.707705S 62°37.985107W 252.00
<b>Object=Buoy</b>	64°44.797698S 62°38.319580W 349.00
Lat 54°16.926171S Lon 36°28.268066W	64°44.867898S 62°38.609863W 397.00
;	64°44.973087S 62°39.118164W 400.00
<b>Object=Line</b>	64°45.072021S 62°39.627197W 315.00
Color=CYAN	64°45.149915S 62°40.012695W 254.00
Style=DOUBLE_LINE	64°45.227596S 62°40.387695W 250.00
Point0000 Lat 64°50.702133S Lon 62°31.896729W	64°45.312563S 62°40.773193W 225.00
Point0001 Lat 64°50.693831S Lon 62°31.900391W	64°45.383364S 62°41.144531W 221.00
Point0002 Lat 64°50.684284S Lon 62°31.910400W	64°45.450415S 62°41.427490W 201.00
Point0003 Lat 64°50.664151S Lon 62°31.907959W	
Point0004 Lat 64°50.645263S Lon 62°31.898438W	
;	
<b>Object=Text</b>	
Color=BLACK	
Text=P. Espora	
Lat 54°54.560547S Lon 67°29.716064W	
;	
Object=Text	
Color=DARK BLUE	
Text=Gentoo	
Lat 64°50.955950S Lon 62°31.338623W	
;	
;	

# ANNEX 2

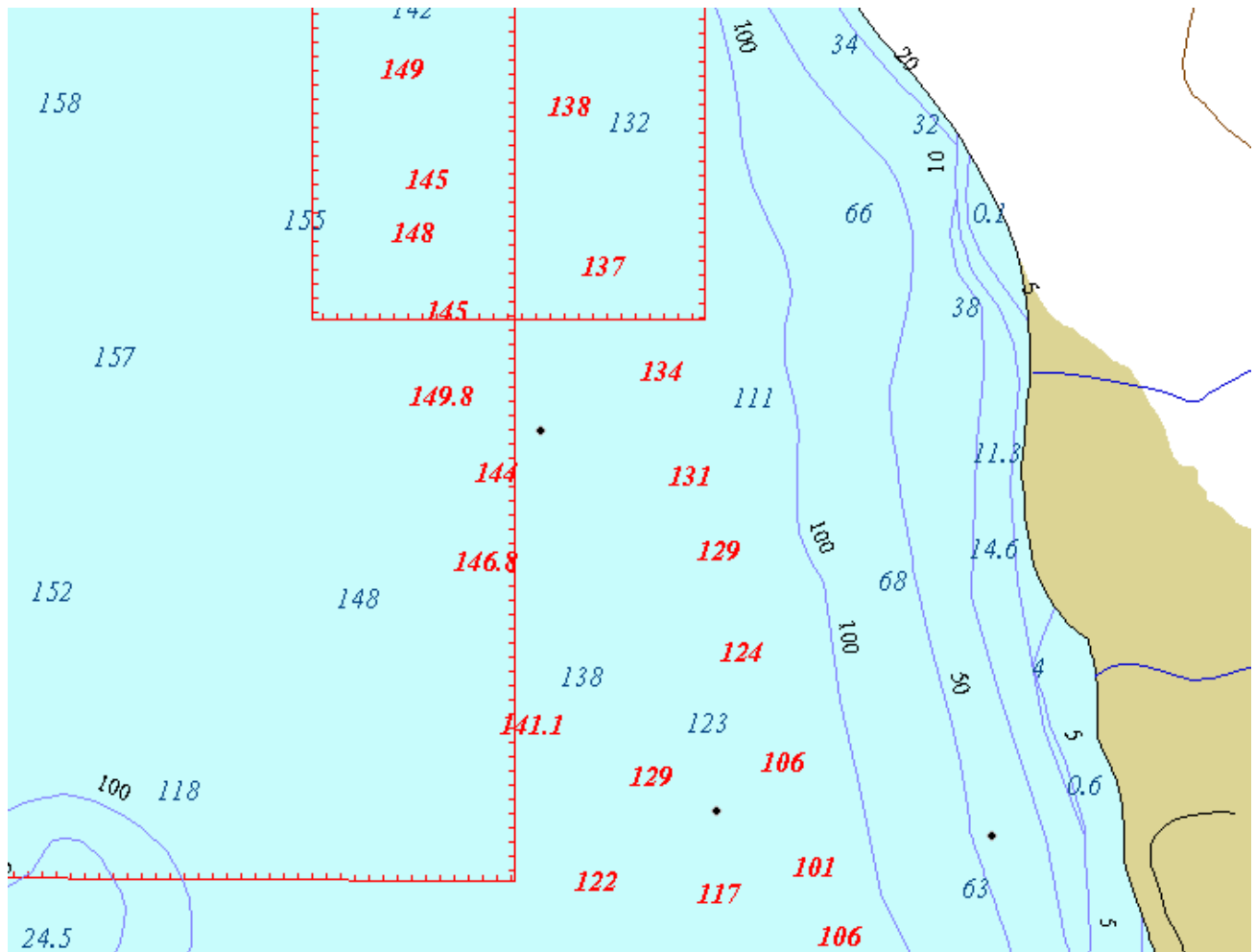
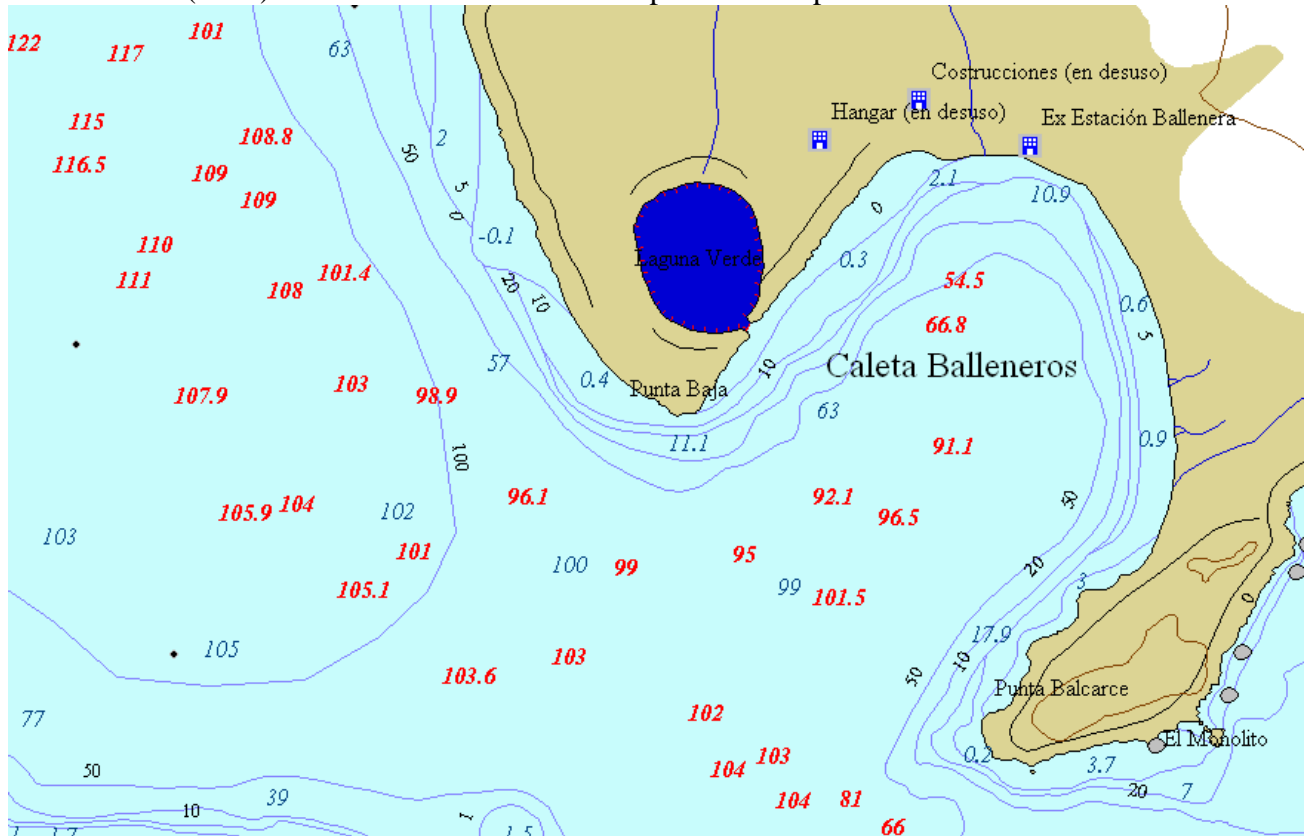
## Minerva in RED against SHN data (Bottom of Bahia Esperanza – Hope Bay. Glacier)

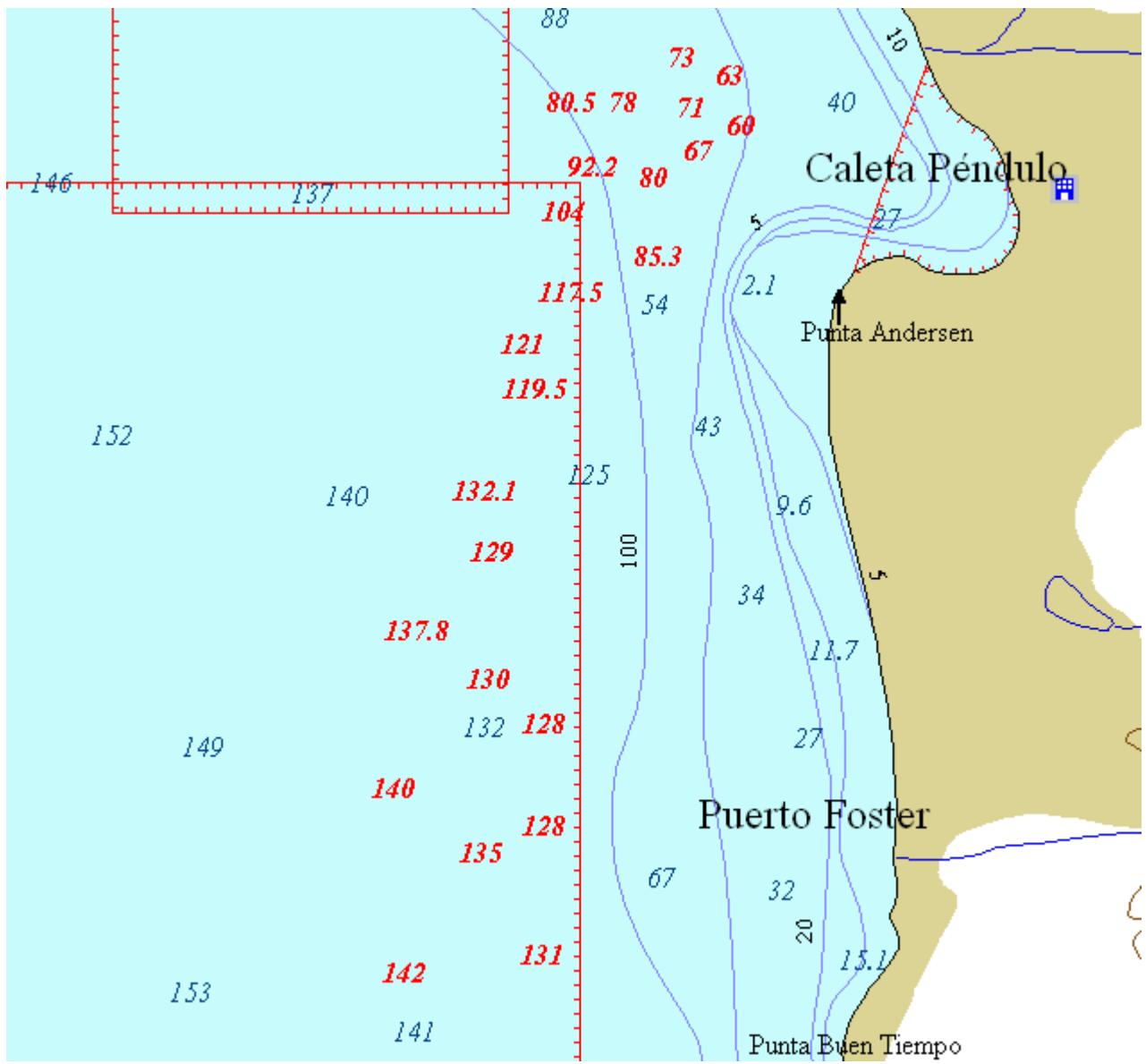


## Minerva data (RED) over Brazilian Chart 25121 BAIA DO ALMIRANTADO

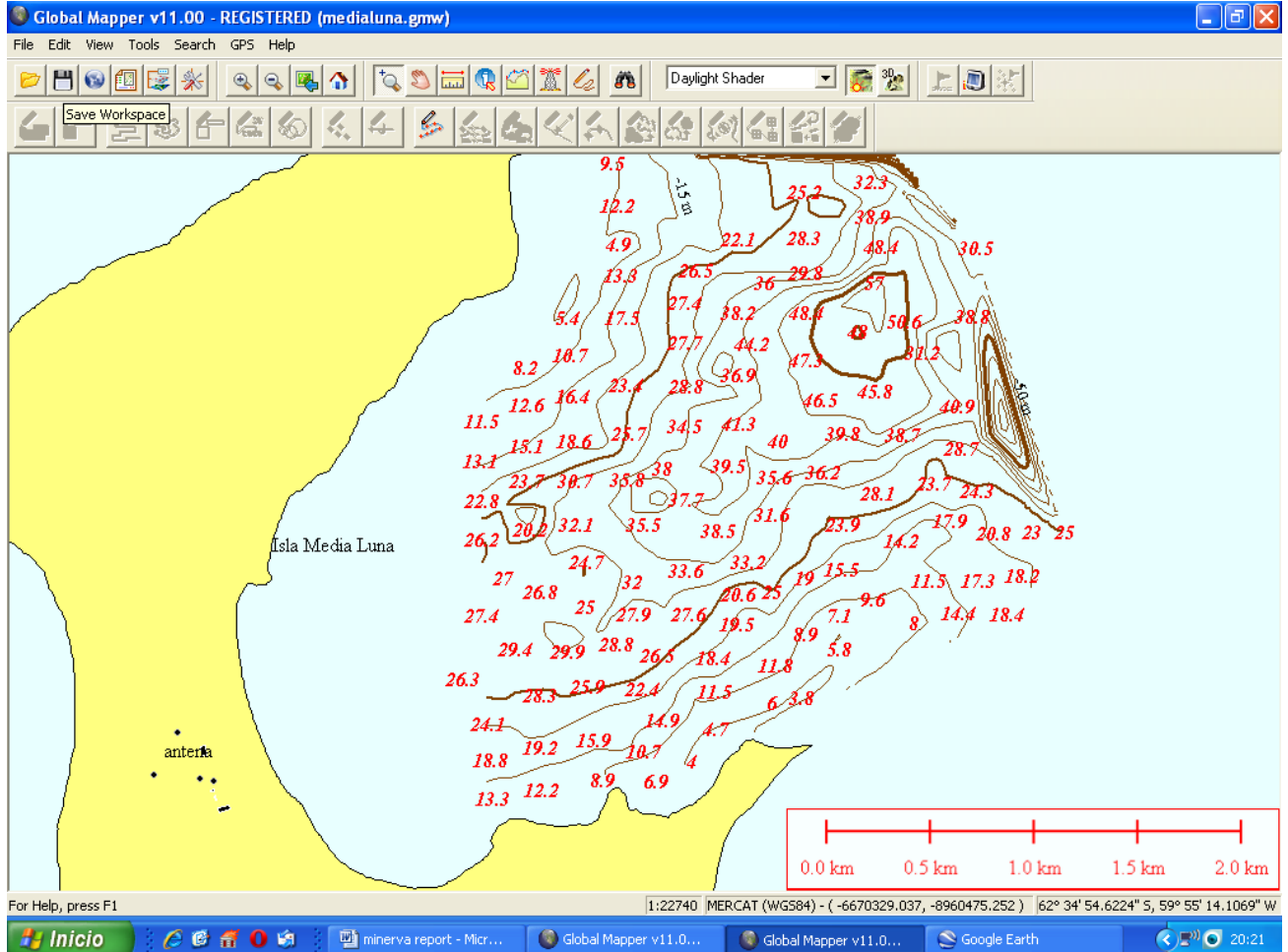


Minerva data (RED) over AR INT 9120 Isla Decepción - Deception Island – Caleta Balleneros.

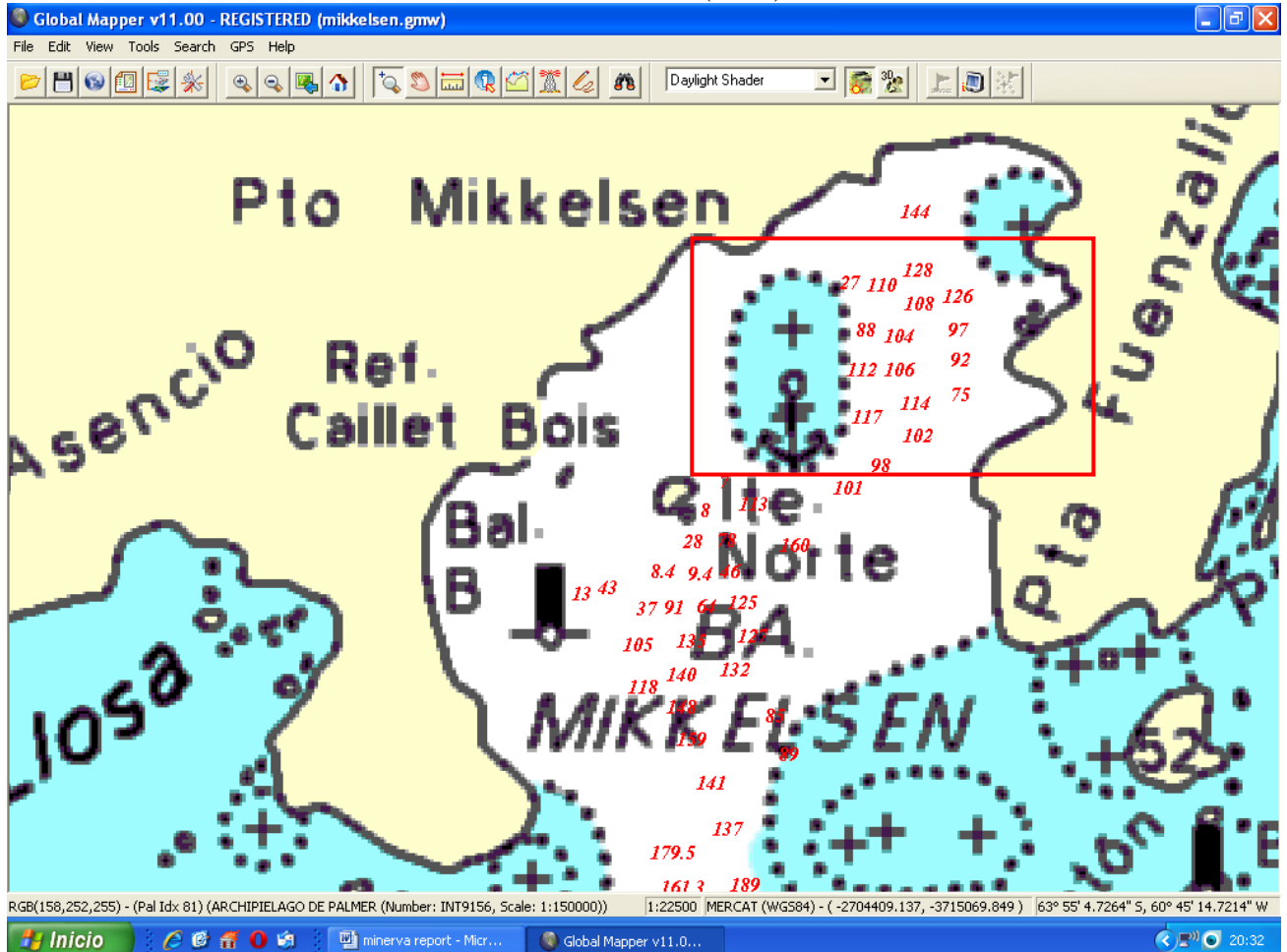




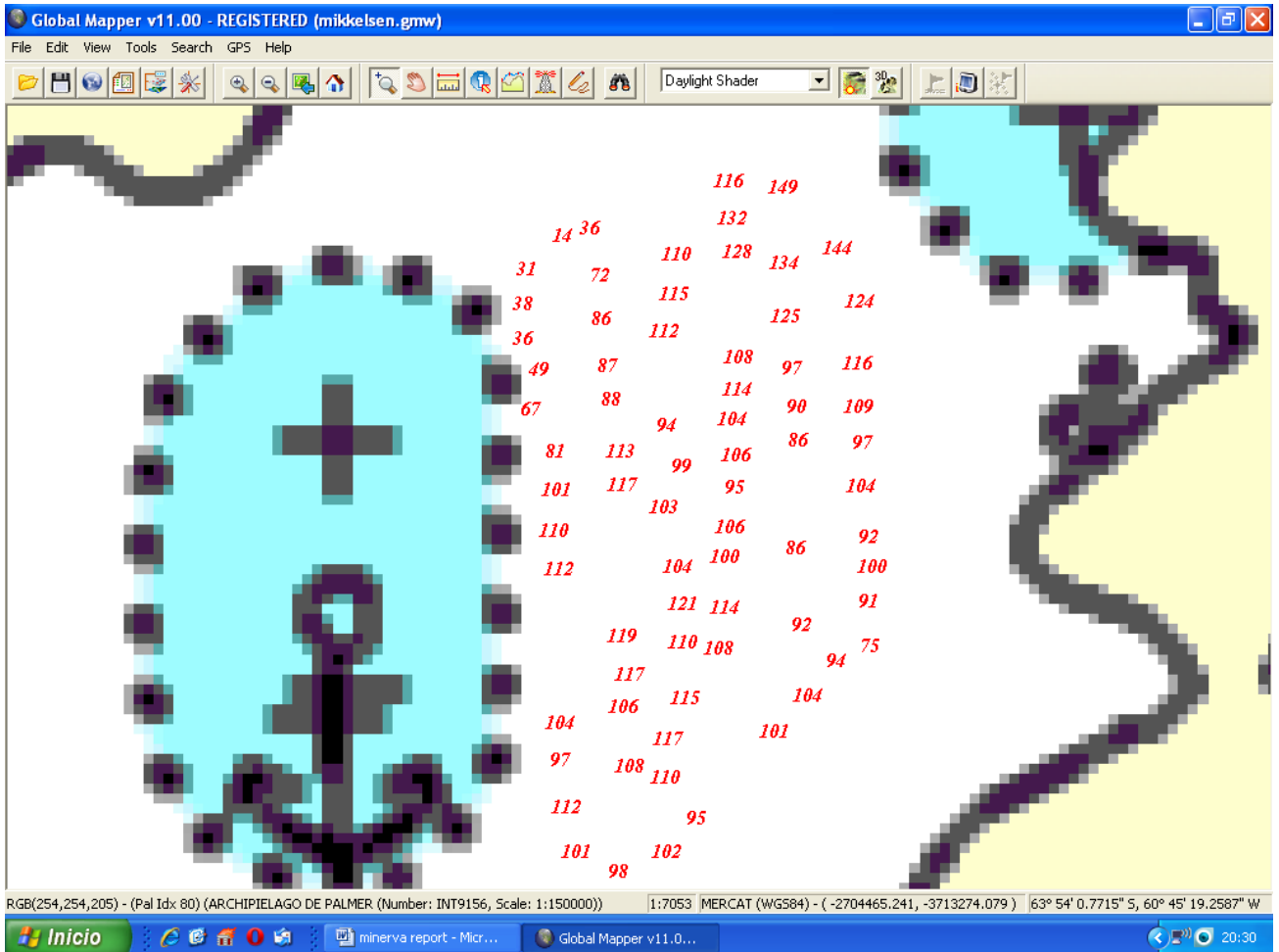
ANNEX 3  
Minerva data in Half Moon Island



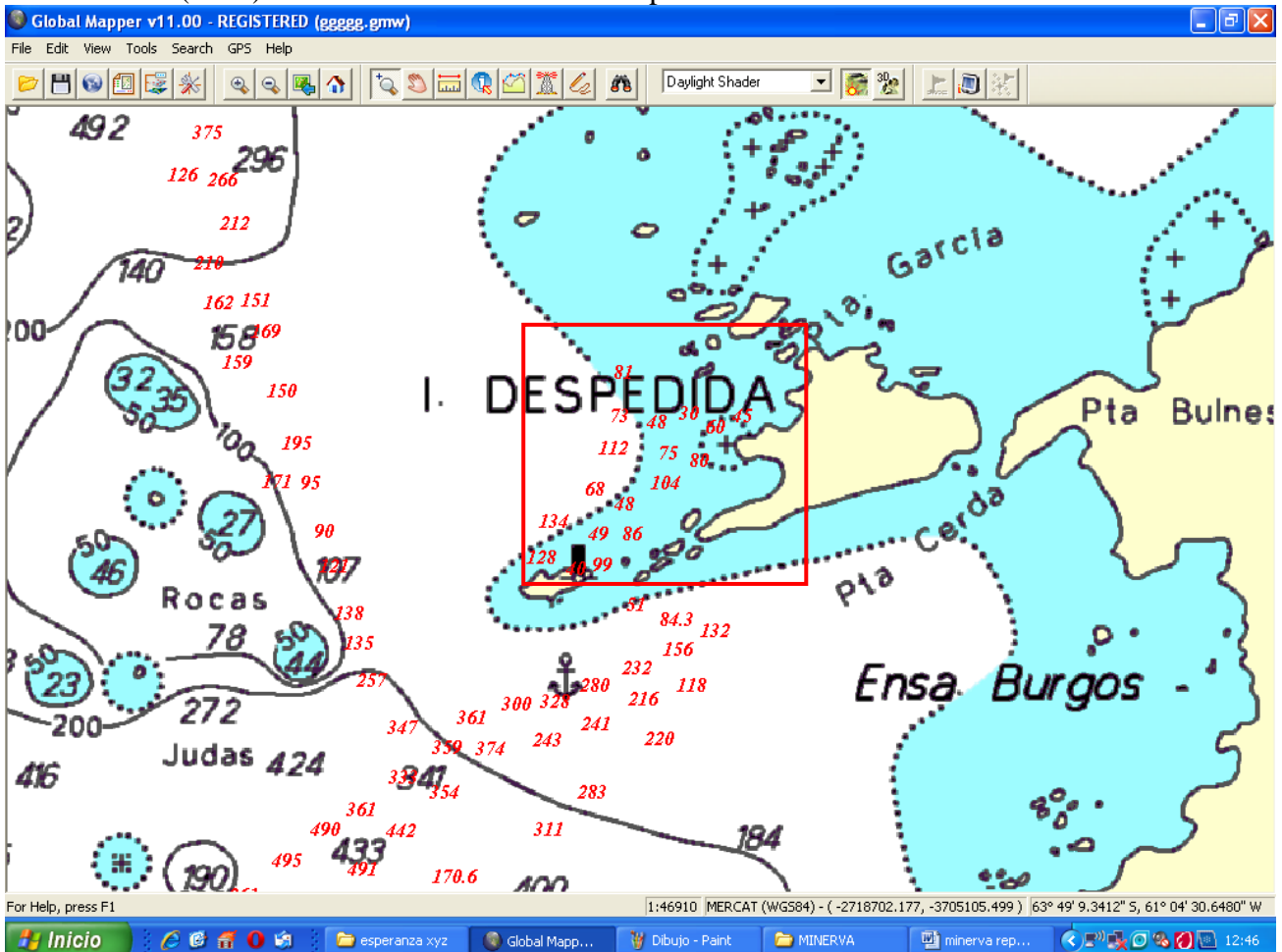
MINERVA data over AR INT 9156 at Port Mikkelsen (RED)

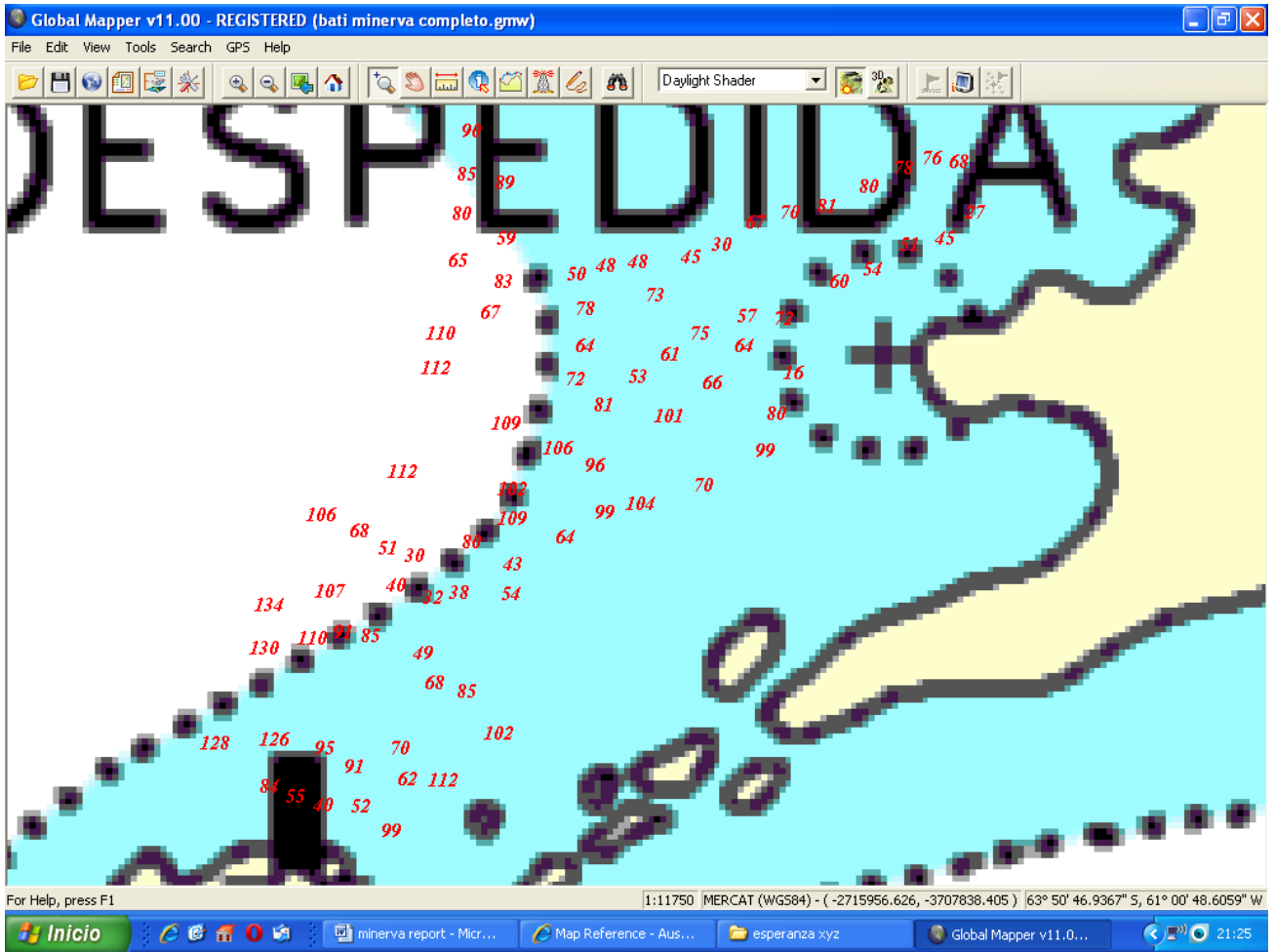






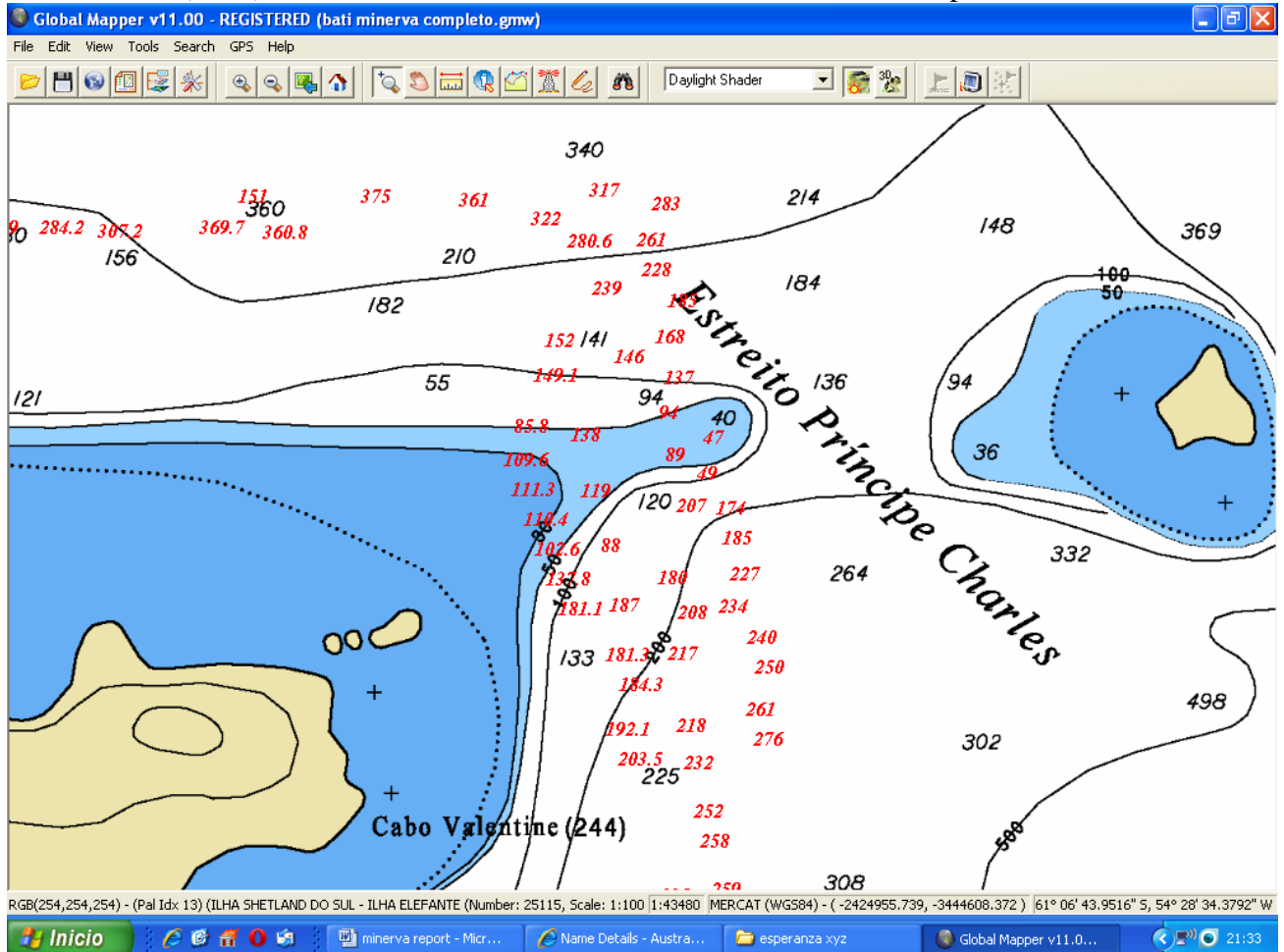
Minerva data (RED) over AR INT 9156 at Isla Despedida – Farewell Island.



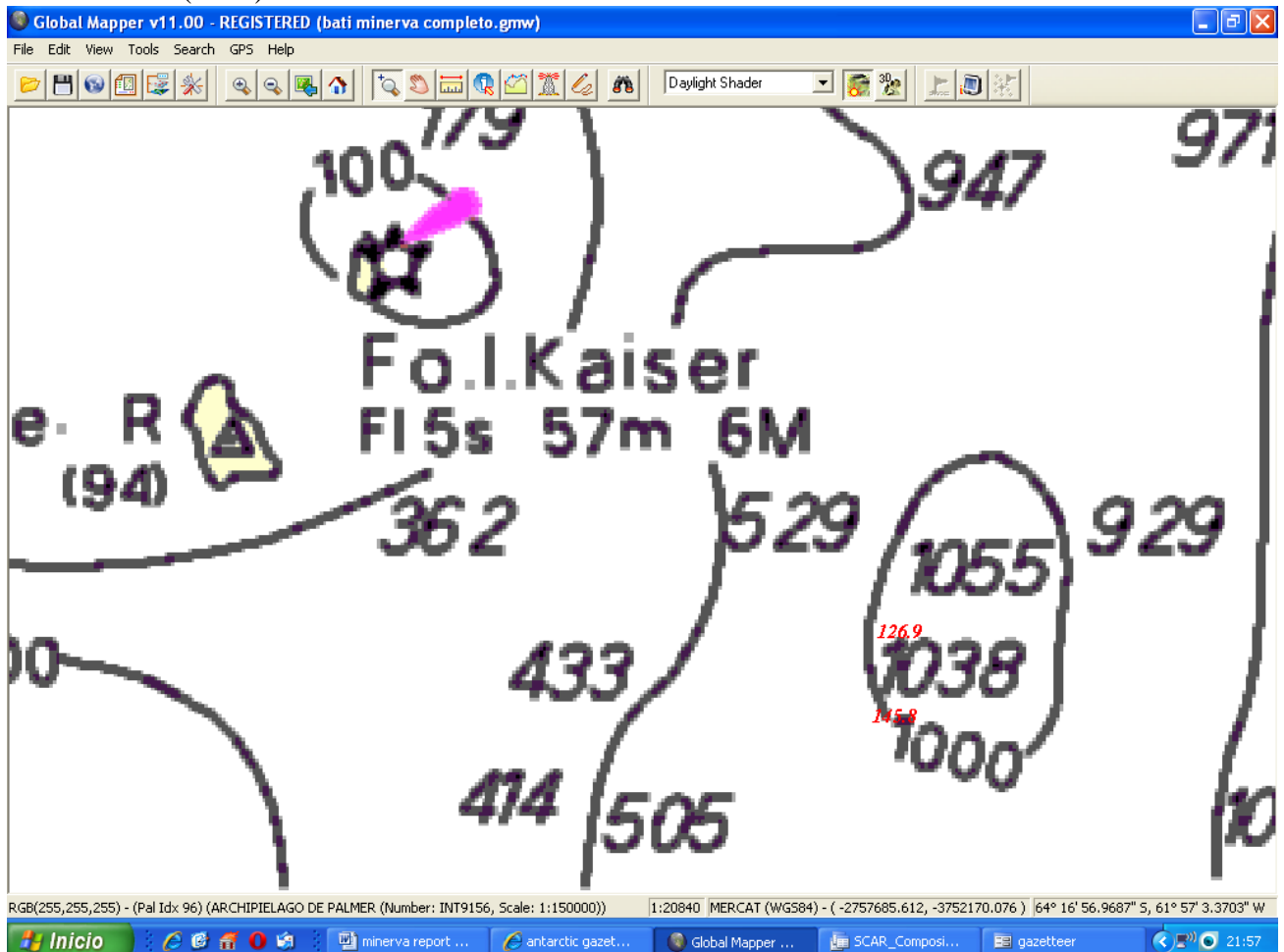


ANNEX 4

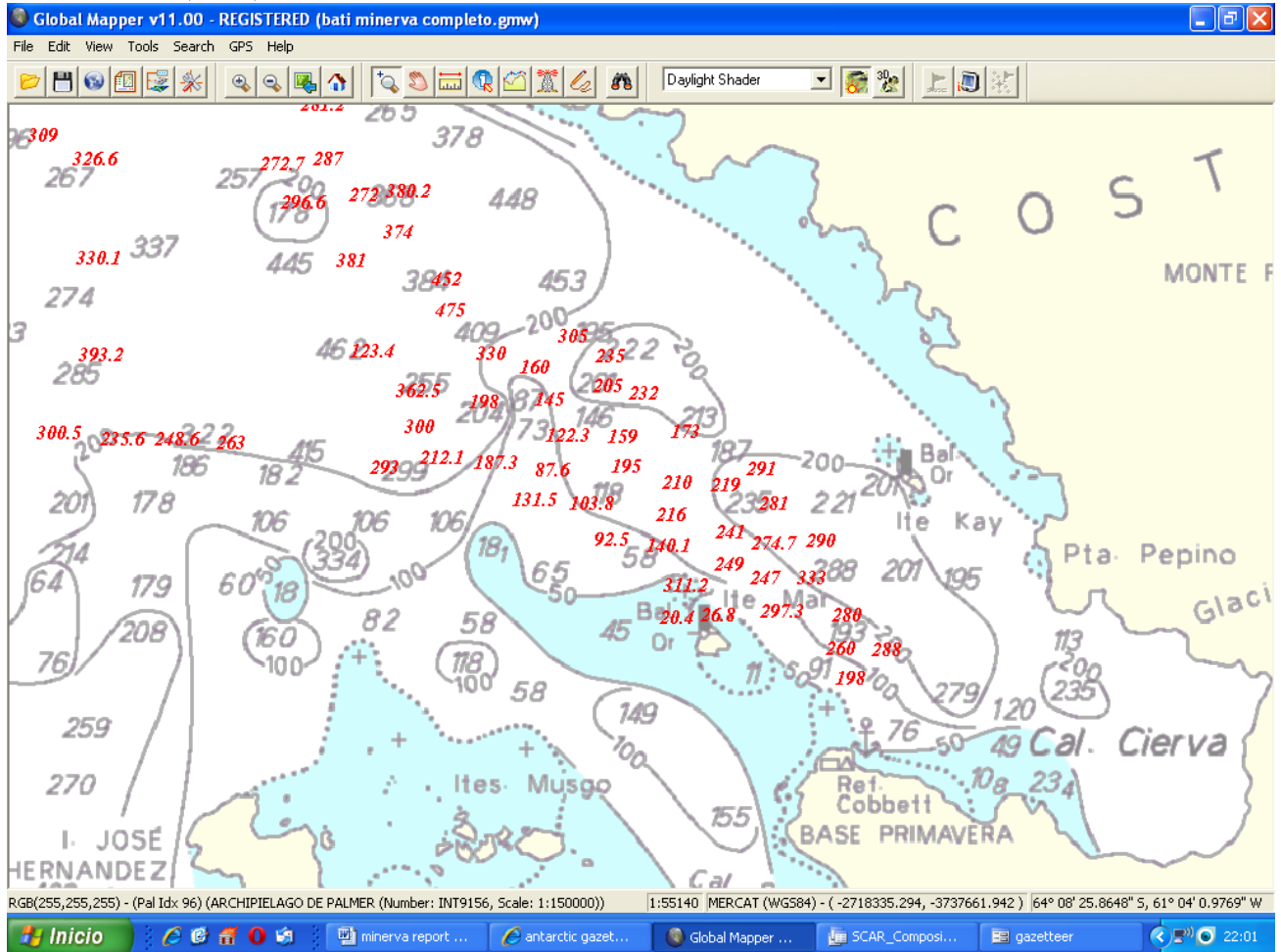
Minerva data (RED) over Brazilian chart 25115 Prince Charles Strait – Elephant Island



Minerva data (RED) over AR INT 9156 Chart near Kaiser Island



Minerva data (RED) over AR INT 9156 Chart. Caleta Cierva – Cierva Point.





# ANNEX 5

## IHO Collection and Rendering of Bathymetric Data Form

(To be used by Ships of Opportunity-SOO<sup>1</sup> in Antarctica)

The objective of this IHO Form is to facilitate the provision of the essential information required by the appropriate National Hydrographic Office to make use of the bathymetric data collected by a SOO in Antarctica.

This Form is fundamental for processing and interpretation of collected bathymetry, and should be submitted together with the bathymetric files to the:

**International Hydrographic Organization**  
 4 quai Antoine 1er B.P. 445 MC 98011 Monaco Cedex, MONACO  
 Phone +377 93108100 Fax + 377 93108140 e-mail [info@ihb.mc](mailto:info@ihb.mc)

General Area	Antarctic Peninsula	<input type="checkbox"/> <sup>2</sup>	South Georgia	<input type="checkbox"/>	Other (Please specify)	<input type="checkbox"/>
	South Orkneys	<input type="checkbox"/>	South Shetlands	<input type="checkbox"/>		
Location						
Name of Vessel				Draught : (in meters)		
Name of Captain				Date :		
Echo Sounder (Note 2)	Manufacturer		Name /Type			
	Multibeam/Swathe	<input type="checkbox"/>	Single Beam	<input type="checkbox"/>	Survey line (spacing in metres)	
Scale Setting	Zero depth recorded from:	Sea Surface?	<input type="checkbox"/>	Under Keel?	<input type="checkbox"/>	
Sound Velocity	Correction made?	YES (if YES) Metres per second	<input type="checkbox"/>	NO	<input type="checkbox"/>	
Transducer displacement applied:	N/A	<input type="checkbox"/>	YES	<input type="checkbox"/>	NO	<input type="checkbox"/>
<b>Details of transducer displacement:</b>						
X offset = Port (-) or Starboard (+) from GPS receiver		Y offset = Aft (-) or Fwd (+) from GPS receiver		Z offset = Above (-) or Below (+) from GPS receiver		
.....metres		.....metres		.....metres		

**Note**

1. The speed of sound in sea water in metres per second equivalent to the stylus speed.
2. Whether soundings have been corrected from *Echo-sounding correction tables*.
3. Zero Scale Setting. That is whether depths are recorded from the sea surface or from under the keel.
4. Where the displacement of the transducers from the position of the GPS receiver or other instrument used to fix is appreciable, the amount of this displacement and whether allowance has been made for it should be reported.

<sup>1</sup>SOO for the purpose of this Form is any ship, with the exception of hydrographic and research platforms, volunteer to collect hydrographic data during routine transit utilizing her own equipment.

<sup>2</sup> To tick box, double click on box> default value > activate.