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# *"BRIDGES"*

## *The former Sicily-Malta land bridge*

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## CRUISE REPORT


***30 dec 2025 – 6 jan 2026***

## 1. ABSTRACT

Sicily and Malta/Gozo, an area of the central Mediterranean that was completely exposed during the Last Glacial Maximum (LGM, 33 to 18 kyrs BP). This period is defined as the most recent time when continental ice sheets reached their maximum extent and sea level was at its lowest (about -130 m), as evidenced by aim of the survey well-described in the Gaia Blu ship time application.

In this project, we aimed to reconstruct the palaeo-geographic configuration of the former land bridge between southeastern numerous proxy records. We planned to collect new high-resolution geophysical data (Multibeam echosounder and high-resolution seismic profiles) and integrate them with advanced Glacial Isostatic Adjustment (GIA) models that simulate the horizontal displacement of coastlines in response to sea level rise. In addition, we planned to conduct laboratory analyses on newly recovered sediment cores, including radiocarbon measurements on carbonate biogenic fraction, to constrain the position of the paleo-shoreline during the LGM. Determining the position of the coastline before sea level rise is crucial not only for palaeo-geographic reconstructions but also for underwater archaeology. Numerous studies have shown the existence of early Palaeolithic coastal communities in the Mediterranean during the LGM and have demonstrated that the sea and offshore islands were central to understanding ancient settlement and land use, especially during periods of low sea level. The reconstruction of former land bridges and corridors therefore has significant implications for human settlement, megaherbivore distribution, landscape preferences, and dispersal and expansion routes from the mainland to distant islands.

**Keywords**: cruise report, Last Glacial Maximum, geophysical survey

## 2. CRUISE TEAM

The BRIDGES cruise was a multidisciplinary scientific proposal based on the collaboration between the ISMAR-CNR, the OGS, and the Univ. of Malta.

| Name | Role | Position | Affiliation |
|---|---|---|---|
| M. Filomena Loreto | Party Chief | Researcher | CNR-ISMAR |
| Emanuele Lodolo | Co-Chief | Researcher | OGS - Trieste |
| Andrea Caburlotto | Samp. Surveyor | Researcher | OGS - Trieste |
| G. Matilde Ferrante | Geoph. Operator | Researcher | OGS - Trieste |
| Renata Lucchi | Samp. Surveyor | Researcher | OGS - Trieste |
| Fernando Gois Smith | Geoph. Operator | Researcher | OGS - Trieste |
| Julia Fonseca | Geoph. Operator | Researcher | OGS - Trieste |
| Enrico Milia | Geoph. Operator | Master student | Cagliari Univ. |

## 3. FIELD ACTIVITIES

The often-prohibitive sea conditions and strong winds during the campaign, with significant wave heights frequently exceeding 2 m, forced the bridge to stop operations. In total, we operated in the study area for no more than 24 hours. As a result, we were unable to achieve the planned scientific objectives. Additionally, mobilization and demobilization activities, along with long transit times from Naples to the target areas and to the disembarkation port in Cagliari, further reduced the time available for data acquisition. We therefore

request a reallocation of ship time during a more suitable period for these activities, preferably in summer or early autumn 2026.
Below we provide a summary of the acquisition system used.

**Multibeam echosounder (Kongsberg EM 2040)**. A total of 344 km of high-resolution swath bathymetry were acquired with the Kongsberg EM 2040 (200–400 kHz; 800 beams). Maximum port and starboard steering angles were set to 60°, and beam spacing was set to equidistant. To ensure adequate coverage, adjacent swaths were planned with ~20% overlap. Onboard acquisition software was used to generate a preliminary Digital Terrain Model (DTM) with a 1×1 m grid cell size.

**Sub-bottom profiler (Knudsen CHIRP 3260)**. A total of 344 km of high-resolution sub-bottom profiles were acquired with a Knudsen CHIRP 3260 operating on two channels (3.5 kHz and 12.0 kHz). To maximize penetration, the 3.5 kHz channel was selected as the primary channel. CHIRP data were collected concurrently with Multibeam acquisition. To minimize acoustic interference between the Multibeam and CHIRP systems, pinging was externally synchronized via a K-Sync system, resulting in an average ping interval of ~0.6 s. Data were acquired in proprietary raw format and subsequently converted to SEG-Y using Knudsen proprietary software. To account for rough sea conditions, data were automatically heave-compensated using the heave sensor and the acquisition software's integrated filtering. Several tests were performed to identify optimal acquisition parameters for the study area under the prevailing sea state, the selected settings are reported in TABLE 3.

**CTD casts (Valeport)**. CTD casts were conducted before and after the Multibeam surveys to measure key water-column parameters (temperature, salinity, dissolved oxygen) used to calibrate sound-speed (water-velocity) profiles.

Figure 1 shows the gridded Multibeam area covered during the 24 hours of operation, whereas Figure 2 shows the original program of the cruise.

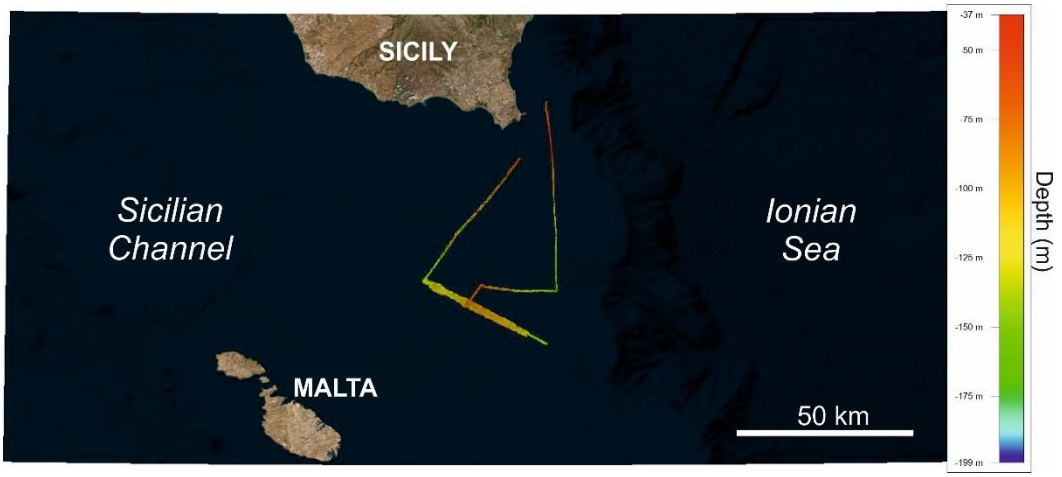


*FIGURE 1 – Map of the geophysical data (Multibeam + CHIRP) acquired during the "BRIDGES" project.*


*FIGURE 2 – Comparison between the planned survey area and the mapped area during the "BRIDGES" project.*

| Sub-Bottom Profiler | | | | Survey: BRIDGES | Survey Area: SC | | | Vessel: R/V Gaia Blu | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Acquisition system: | | Knudsen | | | | | | | | | | | |
| Date | Time (UTC) | File name | Area | Latitude (N) | Longitude (E) | Speed (kt) | Heading (deg) | Depth (m) | Pulse lenght (ms) | Pulse power (no unit) | Range (m) | Operator | Remarks |
| 01/01/2026 | 13.19 | RAW_063 | Transit | 36.454983 | 15.018127 | 11.0 | 224.6 | 97 | 1 | 1 | 100 | GMF | SOL |
| 01/01/2026 | 14:14 | RAW_063 | Transit | 36.331925 | 14.894733 | 11.0 | 171.4 | 112.39 | 1 | 1 | 100 | Caburlotto | EOL - Sonda |
| 01/01/2026 | 14:57 | RAW_064 | BRIDGES | 36.330824 | 14.892879 | 6.7 | 208 | 119.22 | 1 | 1 | 100 | Caburlotto | SOL - Linea perpendicolare - Starting Line (aumento velocità 8.5kn) |
| 01/01/2026 | 15:37 | RAW_064 | BRIDGES | 36.265697 | 14.836197 | 8.5 | 172.7 | 129.67 | 1 | 1 | 100 | Caburlotto | EOL |
| 01/01/2026 | 15:40 | RAW_065 | BRIDGES | 36.261838 | 14.841919 | 9.5 | 172.68 | 129.67 | 1 | 1 | 100 | Caburlotto | SOL - (Heading reale 180-172.68=8°) |
| 01/01/2026 | 17.49 | RAW_065 | BRIDGES | 36.105668 | 15.211589 | 9.0 | 172.7 | 126 | 1 | 1 | 100 | Caburlotto | EOL |
| 01/01/2026 | 17.55 | RAW_066 | BRIDGES | 36.105342 | 15.216240 | 8.2 | 314.4 | 136.55 | 1 | 1 | 100 | Caburlotto | SOL |
| 01/01/2026 | 18:32 | RAW_066 | BRIDGES | 36.150753 | 15.108958 | 9.1 | 314 | | 1 | 1 | 100 | Julia | EOL |
| 01/01/2026 | 18:33 | RAW_067 LINEA VUOTA | BRIDGES | 36.151335 | 15.107727 | 9.0 | - | - | 1 | 1 | 100 | Julia | Linea vuota: solo 27 tracce |
| 01/01/2026 | 18:33 | RAW_068 | BRIDGES | 36.151375 | 15.107632 | | | | 1 | 1 | 100 | Julia | SOL |
| 01/01/2026 | 20:08 | RAW_068 | BRIDGES | 36.265479 | 14.835758 | 5.9 | 319.3 | 129.82 | 1 | 1 | 100 | Julia | EOL |
| 01/01/2026 | 20:11 | RAW_069 | BRIDGES | 36.266847 | 14.837117 | 5.9 | 130.7 | 129.91 | 1 | 1 | 100 | Julia | SOL |
| 01/01/2026 | 20:32 | RAW_069 | BRIDGES | 36.241897 | 14.895786 | 9.4 | 117.7 | 121.13 | 1 | 1 | 100 | Julia | Change from equiangle to equidistance |
| 01/01/2026 | 22:06 | RAW_069 | BRIDGES | 36.132753 | 15.158105 | 7.5 | 307.3 | 122.54 | 1 | 1 | 100 | Julia | EOL |
| 01/01/2026 | 22:07 | RAW_070 | BRIDGES | 36.132753 | 15.158105 | 7.5 | 307.3 | 122.54 | 1 | 1 | 100 | Julia | SOL - AT 23:45 velocity reduced by traffic |
| 02-01-2026 | 00:03 | RAW_070 | BRIDGES | 36.267944 | 14.837781 | 5.5 | 287.4 | 130.17 | 1 | 1 | 100 | Julia | EOL |
| 02-01-2026 | 00:08 | RAW_071 | BRIDGES | 36.264559 | 14.834369 | 5.3 | 139.0 | 130.41 | 1 | 1 | 100 | Julia | SOL |
| 02-01-2026 | 02:06 | RAW_071 | BRIDGES | 36.127682 | 15.154561 | 4.7 | 129.3 | 120.97 | 1 | 1 | 100 | Julia | EOL |
| 02-01-2026 | 02:10 | RAW_072 | BRIDGES | 36.125627 | 15.153108 | 4.5 | 313.8 | 119.89 | 1 | 1 | 100 | Julia | SOL |
| 02-01-2026 | 04:02 | RAW_072 | BRIDGES | 36.263522 | 14.832536 | 9.1 | 305.5 | 130.44 | 1 | 1 | 100 | Fernando | EOL |
| 02-01.2026 | 04:07 | RAW_073 | BRIDGES | 36.262290 | 14.832393 | 9.2 | 129.5 | 130.57 | 1 | 1 | 100 | Fernando | SOL |
| 02-01-20206 | 06:01 | RAW_073 | BRIDGES | 36.126168 | 15.150294 | 9.3 | 115.5 | 118.45 | 1 | 1 | 100 | Fernando | EOL |
| 02-01-2026 | 06:04 | RAW_074 | BRIDGES | 36.124243 | 15.151280 | 8.1 | 306.3 | 118.72 | 1 | 1 | 100 | Fernando | SOL |
| 02-01-2026 | 07:59 | RAW_074 | BRIDGES | 36.261621 | 14.831072 | 9.8 | 301.4 | 130.57 | 1 | 1 | 100 | Fernando | EOL |
| 02-01-2026 | 08:03 | RAW_075 | BRIDGES | 36.260123 | 14.831354 | 8.5 | 113.5 | 130.73 | 1 | 1 | 100 | Fernando | SOL |
| 02-01-2026 | 08:33 | RAW_075 | BRIDGES | 31.222141 | 14.917271 | 5.8 | 136.5 | 118.37 | 1 | 1 | 100 | Fernando | EOL - STOP FOR CTD |
| 02-01-2026 | 09:00 | RAW_076 | BRIDGES | 36.221221 | 14.920877 | 2.7 | 130.4 | 117.67 | 1 | 1 | 100 | Fernando | SOL |
| 02-01-2026 | 09:22 | RAW_076 | BRIDGES | 36.196635 | 14.963097 | 8.8 | 92.3 | 84.87 | 1 | 1 | 100 | Fernando | ENL - BEFORE TURNING N |
| 02-01-2026 | 09:25 | RAW_077 | BRIDGES | 36.200944 | 14.967837 | 9.1 | 21.2 | 81.23 | 1 | 1 | 100 | Fernando | SOL - TRANSFER 2 |
| 02-01-2026 | 09:47 | RAW_077 | BRIDGES | 36.252218 | 15.012487 | 10.0 | 45.3 | 79.56 | 1 | 1 | 100 | Fernando | EOL - TRANSFER 2 |
| 02-01-2026 | 09:48 | RAW_078 | BRIDGES | 36.253001 | 15.015219 | 10.1 | 95.8 | 76.94 | 1 | 1 | 100 | Fernando | SOL - HEADING X1 - v reduced at 15.13° (close to x2) to 8 kn |
| 02-01-2026 | 10:15 | RAW_078 | BRIDGES | 36.237747 | 15.124945 | 11.4 | 94.1 | 112.65 | 1 | 1 | 100 | Fernando | EOL |
| 02-01-2026 | 10:17 | RAW_079 | BRIDGES | 36.237679 | 15.125528 | 11.4 | 93.6 | 112.91 | 1 | 1 | 100 | Fernando | SOL |
| 02-01-2026 | 10:43 | RAW_079 | BRIDGES | 36.237513 | 15.222219 | | | | 1 | 1 | 100 | Fernando | EOL |
| 02-01-2026 | 10:43 | RAW_080 LINEA VUOTA | BRIDGES | | | | | | | | | | |
| 02-01-2026 | 10:45 | RAW_081 | BRIDGES | 36.237341 | 15.227716 | | | | 1 | 1 | 100 | Fernando | SOL |
| 02-01-2026 | 10:51 | RAW_081 | BRIDGES | 36.366434 | 15.248462 | 8.2 | 356.5 | 132.03 | 1 | 1 | 100 | Fernando | EOL -X2 |
| 02-01-2026 | 10:54 | RAW_082 | BRIDGES | 36.238538 | 15.250868 | 5.5 | 349.8 | 143.09 | 1 | 1 | 100 | Fernando | SOL - HEADING X3 |
| 02-01-2026 | 11.28 | RAW_082 | BRIDGES | 36.314784 | 15.248185 | 8.5 | 357 | 138.16 | 1 | 1 | 100 | Caburlotto | EOL - Crash SIS |
| 02-01-2026 | 11.30 | RAW_083 | BRIDGES | 36.318617 | 15.248197 | 8.3 | 356.9 | 138.50 | 1 | 1 | 100 | Caburlotto | SOL - HEADING X3 restart |
| 02-01-2026 | 11.51 | RAW_083 | BRIDGES | 36.366434 | 15.248462 | 8.2 | 356.5 | 132.03 | 1 | 1 | 100 | Caburlotto | EOL |
| 02-01-2026 | 11.52 | RAW_084 | TRANSIT | 36.366434 | 15.248462 | 8.2 | 356.5 | 132.03 | 1 | 1 | 100 | Caburlotto | SOL - TRANSFER 3 - Gain Value 8 dB |
| 02-01-2026 | 13:11 | RAW_084 | TRANSIT | 36.641397 | 15.228316 | 10.9 | 350 | 53.93 | 1 | 1 | 100 | Caburlotto | EOL - TRANSFER 3 - Gain Value 8 dB |
| 02-01-2026 | 13:12 | RAW_086 | TRANSIT | 36.641397 | 15.228316 | 10.9 | 350 | 53.93 | 1 | 1 | 100 | Caburlotto | SOL - TRANSFER 3 - Gain Value 8 dB |
| 02-01-2026 | 14:48 | RAW_086 | TRANSIT | 36.773095 | 15.226287 | | | 123 | 1 | 1 | 100 | Caburlotto | EOL - TRANSFER 3 - Gain Value 8 dB |

*TABLE 1 – Log of the CHIRP acquisition.*

| Multibeam | | | | | Survey: BRIDGES | | | | Survey Area: SC | | Vessel: R/V Gaia Blu | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Acquisition system: | | EM2040 | | | | | | | | | | | |
| Date | Time (UTC) | File name | Area | Line | Latitude (N) | Longitude (E) | Speed (kt) | Heading (deg) | Depth (m) | Water column (Y/N) | Operator | Remarks | |
| 01-01-2026 | 12:31 | 0001 | Transit | | 36.572851 | 15.134291 | 11.0 | 216.9 | 66.33 | Y | Julia | SOL | |
| 01-01-2026 | 14:14 | 0007 | Transit | | 36.331925 | 14.894733 | 11.0 | 171.4 | 112.39 | Y | Enrico | EOL | |
| 01-01-2026 | 14:29 | CTD_01 | BRIDGES | | 36.199268 | 14.536195 | 0 | - | - | - | Enrico | Sonda CTD a mare | |
| 01-01-2026 | 14:33 | CTD_01 | BRIDGES | | 36.195537 | 14.533683 | 0 | - | - | - | Enrico | Sonda CTD fondo mare profondità 118m | |
| 01-01-2026 | 14:37 | CTD_01 | BRIDGES | | 36.195553 | 14.533678 | 0 | - | - | - | Enrico | Sonda CTD a bordo | |
| 01-01-2026 | 14:57 | 0008 | BRIDGES | | 36.330824 | 14.892879 | 6.7 | 218.7 | 199.22 | Y | Enrico | SOL (aumento velocità 8.5kn) | |
| 01-01-2026 | 15:37 | 0010 | BRIDGES | | 36.265676 | 14.836197 | 5 | 172.7 | 129.67 | Y | Enrico | EOL | |
| 01-01-2026 | 15:40 | 0011 | BRIDGES | | 36.265676 | 14.836197 | 9.4 | 172.7 | 129.67 | Y | Enrico | SOL (Heading reale 180-172.68=8°) | |
| 01-01-2026 | 17:49 | 0019 | BRIDGES | | 36.105064 | 15.216672 | 5.5 | 172.7 | 136.55 | Y | Enrico | EOL | |
| 01-01-2026 | 17:49 | 0020 | BRIDGES | | 36.105064 | 15.216672 | 9.5 | 314.4 | 136.55 | Y | Enrico | SOL (apertura beam 65°) | |
| 01-01-2026 | 20:08 | 0031 | BRIDGES | | 36.265479 | 14.835758 | 5.9 | 319.3 | 129.82 | Y | Julia | EOL | |
| 01-01-2026 | 20:10 | 0032 | BRIDGES | | 36.266847 | 14.837117 | 5.9 | 130.7 | 129.91 | Y | Julia | SOL . change from auto angular coverage to MANUAL | |
| 01-01-2026 | 20:32 | 0033 | BRIDGES | | 36.241897 | 14.895786 | 9.4 | 117.7 | 121.13 | Y | Julia | Change from equiangle to equidistance | |
| 01-01-2026 | 22:04 | 0041 | BRIDGES | | 36.131242 | 15.157747 | 5.5 | 95.8 | 122.51 | Y | Julia | EOL | |
| 01-01-2026 | 22:06 | 0042 | BRIDGES | | 36.132753 | 15.158105 | 7.5 | 307.3 | 122.54 | Y | Julia | SOL | |
| 02-01-2026 | 00:03 | 0051 | BRIDGES | | 36.267944 | 14.837781 | 5.5 | 287.4 | 130.17 | Y | Julia | EOL | |
| 02-01-2026 | 00:03 | 0053 | BRIDGES | | 32.268064 | 14.837118 | 5.2 | 267.2 | 130.18 | Y | Julia | SOL | |
| 02-01-2026 | 02:06 | 0062 | BRIDGES | | 36.127682 | 15.154561 | 4.7 | 129.3 | 120.97 | Y | Julia | EOL | |
| 02-01-2026 | 02:10 | 0063 | BRIDGES | | 36.125627 | 15.153108 | 4.5 | 313.8 | 119.89 | Y | Julia | SOL | |
| 02-01-2026 | 04:02 | 0063 | BRIDGES | | 36.263522 | 14.832536 | 9.1 | 305.5 | 130.44 | Y | Fernando | EOL | |
| 02-01.2026 | 04:07 | 0073 | BRIDGES | | 36.262290 | 14.832393 | 9.2 | 129.5 | 130.57 | y | Fernando | SOL | |
| 02-01-20206 | 06:01 | 0082 | BRIDGES | | 36.126168 | 15.150294 | 9.3 | 115.5 | 118.45 | y | Fernando | EOL | |
| 02-01-2026 | 06:04 | 0083 | BRIDGES | | 36.124243 | 15.151280 | 8.1 | 306.3 | 118.72 | Y | Fernando | SOL | |
| 02-01-2026 | 07:59 | 0092 | BRIDGES | | 36.261621 | 14.831072 | 9.8 | 301.4 | 130.57 | Y | Fernando | EOL | |
| 02-01-2026 | 08:03 | 0093 | BRIDGES | | 36.260123 | 14.831354 | 8.5 | 113.5 | 130.73 | Y | Fernando | SOL | |
| 02-01-2026 | 08:33 | 0095 | BRIDGES | | 31.222141 | 14.917271 | 5.8 | 136.5 | 118.37 | Y | Fernando | EOL - STOP FOR CTD | |
| 02-01-2026 | 09:00 | 0096 | BRIDGES | | 36.221221 | 14.920877 | 2.7 | 130.4 | 117.67 | Y | Fernando | SOL | |
| 02-01-2026 | 09:22 | 0097 | BRIDGES | | 36.196635 | 14.963097 | 8.8 | 92.3 | 84.87 | Y | Fernando | ENL - BEFORE TURNING N | |
| 02-01-2026 | 09:25 | 0098 | BRIDGES | | 36.200944 | 14.967837 | 9.1 | 21.2 | 81.23 | Y | Fernando | SOL - TRANSFER 2 | |
| 02-01-2026 | 09:47 | 0099 | BRIDGES | | 36.252218 | 15.012487 | 10.0 | 45.3 | 79.56 | Y | Fernando | EOL - TRANSFER 2 | |
| 02-01-2026 | 09:48 | 0100 | BRIDGES | | 36.253001 | 15.015219 | 10.1 | 95.8 | 76.94 | Y | Fernando | SOL - HEADING X1 | |
| 02-01-2026 | 10:15 | 0101 | BRIDGES | | 36.237747 | 15.124945 | 11.4 | 94.1 | 112.65 | Y | Fernando | EOL - HEADING X2 | |
| 02-01-2026 | 11:28 | 0106 | BRIDGES | | 36.314784 | 15.248185 | 8.5 | 356.9 | 138.16 | Y | Enrico | EOL - Crash sistem GAIA (HEADING X3) | |
| 02-01-2026 | 11:30 | 0107 | BRIDGES | | 36.318617 | 15.248197 | 8.3 | 356.9 | 138.50 | Y | Enrico | SOL - Reboot sistem GAIA | |
| 02-01-2026 | 11:51 | 0108 | BRIDGES | | 36.366434 | 15.248462 | 8.2 | 356.5 | 132.03 | Y | Enrico | EOL - X3 reached | |
| 02-01-2026 | 11:52 | 0109 | Transit | | 36.366434 | 15.248462 | 8.2 | 356.5 | 132.03 | Y | Enrico | SOL - TRANSFER 3 | |
| 02-01-2026 | 13:49 | 0115 | Transit | | 36.695076 | 15.218465 | 11.1 | 345.7 | 76.75 | Y | Enrico | Stop of water coloumn acquisition | |
| 02-01-2026 | 13:57 | | Transit | | 36.427208 | 15.130768 | 4.22 | | | N | Enrico | Interruzione del EM2040 | |

*TABLE 2 – Log of the Multibeam acquisition.*

| | |
|---|---|
| Pulse lenght (ms) | 1-2 |
| Pulse power | 1-4 |
| Gain mode | Manual |
| Gain Value | 8-12 dB |
| Acquisition range (ms) | 50-500 |
| Phase Mode | Auto |
| Overlap | 50% |
| Sound speed (m/s) | 1519 |

*TABLE 3 – CHIRP Acquisition parameters.*

## 4. VERY PRELIMINARY CONSIDERATIONS

As mentioned, the extremely short data acquisition time does not currently allow us to develop even an approximate understanding of the study area. However, it can be anticipated that the currently available bathymetric maps (e.g., EmodNet) contain substantial gaps and do not accurately represent the morphology of the seabed between Malta and Sicily. Despite being in waters relatively close to the coast, where various vessels have passed for millennia, and in modern times with advanced equipment for high-resolution bathymetric reconstruction, there are still unknown areas. The limited Multibeam surveys conducted so far indicate that the ancient land bridge between Malta and Sicily is much more complex than shown by the available bathymetric maps and features a series of morphological highs that in some cases resemble coral reefs. We are not yet able to map these morphological elements, but it is reasonable to anticipate that the ancient emerged corridor could have been represented by a landscape similar to a series of islands elongated in a preferential N-S direction, accompanied by coral reefs in the distal parts and separated by lagoons of varying size and extent. Figure 3 shows small portions of these morphological elements and sections of CHIRP profiles and Multibeam swaths. During the surveys, we also identified from seismic data the beginning of the post-LGM marine transgression, with the presence of ravinement surfaces. A further study campaign is strongly recommended to verify these hypotheses.

As a final remark, we emphasize that submerged areas surrounding our country remain largely unknown, even in coastal areas, and, despite the availability of high-resolution survey equipment, seabed mapping is still at an early, largely exploratory stage.

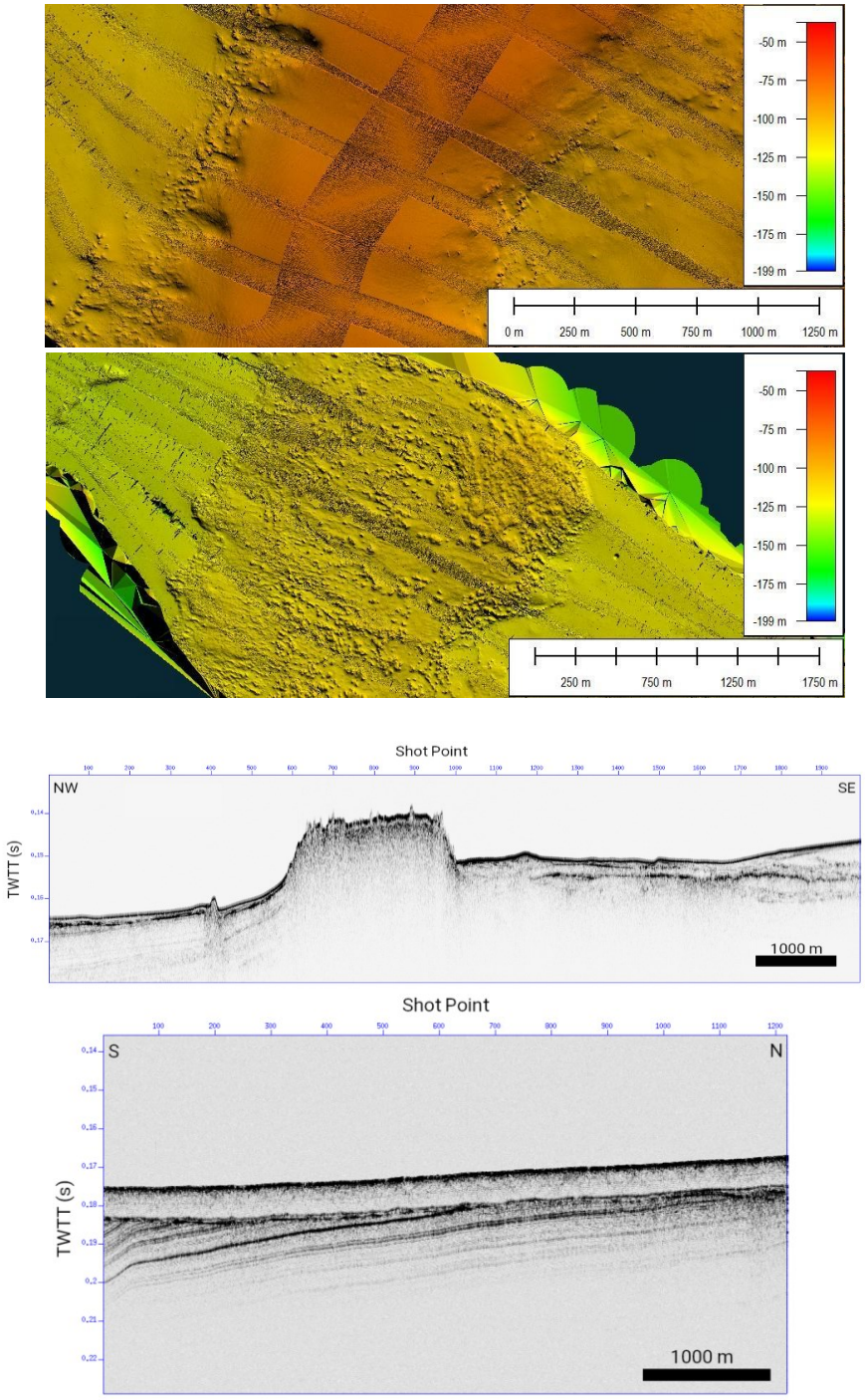


*FIGURE 3 – top: examples of unprocessed Multibeam data across two morphological highs recognized in the southern part of the BRIDGES survey; bottom: two CHIRP profiles showing a possible coral reef feature (?) and a ravinement surface generated by the post-LGM marine transgression.*