

Title: Environmental impacts over the seabed and benthic communities of submarine cable installation in the Biscay Marine Energy Platform (*bimep*).

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Abstract for Poster presentation

The Biscay Marine Energy Platform (*bimep*) is an offshore infrastructure for the demonstration and testing of wave energy harnessing devices promoted by the Basque Entity of Energy (Ente Vasco de la Energía - EVE). *Bimep* is located close to Arminza town (Basque Country, Northern Spain) and it consists on an 5.3 km² sea area between 50 and 90 m depths where four static submarine cables will be placed, operating at 13kV and 5MW.

On the first of June 2009, the General Council on Environmental Quality Assessment of the Ministry of Rural, Marine and Natural Environment of the Spanish Government, on the light of the Environmental Impact Study (EIS) of the *bimep* project undertaken by AZTI in 2008, decided not to submit the project to the whole Environmental Impact Assessment (EIA) process. Nevertheless, the Environmental Impact Statement (EIS) of the Ministry, taking into account the great uncertainties about some predicted environmental impacts, underlined the need to implement the proposed Environmental Monitoring Program (EMP) of the EIS. Among other environmental factors, substratum alteration was foreseen to occur during the commissioning stage of the submarine cables and consequently may affect related benthic habitats and species. Hence, on August 29 of 2013, the EVE entrusted to AZTI to carry out the EMP of the installation of the submarine cables in *bimep*, which consist on: (i) a seabed characterisation with a multi-beam echo sounder; (ii) a characterization of benthic communities and seabed disturbance by means of a visual inspection with a submarine camera attached to a Remote Operated Vehicle (ROV) all along the submarine cable route and the mooring areas.

The results obtained were compared with those obtained during the preoperational phase of the EMP (carried on 2012), showing that the observed impacts were in the range of those predicted in the EIS of *bimep*.

Sponsor



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Environmental impacts over the seabed and benthic communities of submarine cable installation in the Biscay Marine Energy Platform (bimep)

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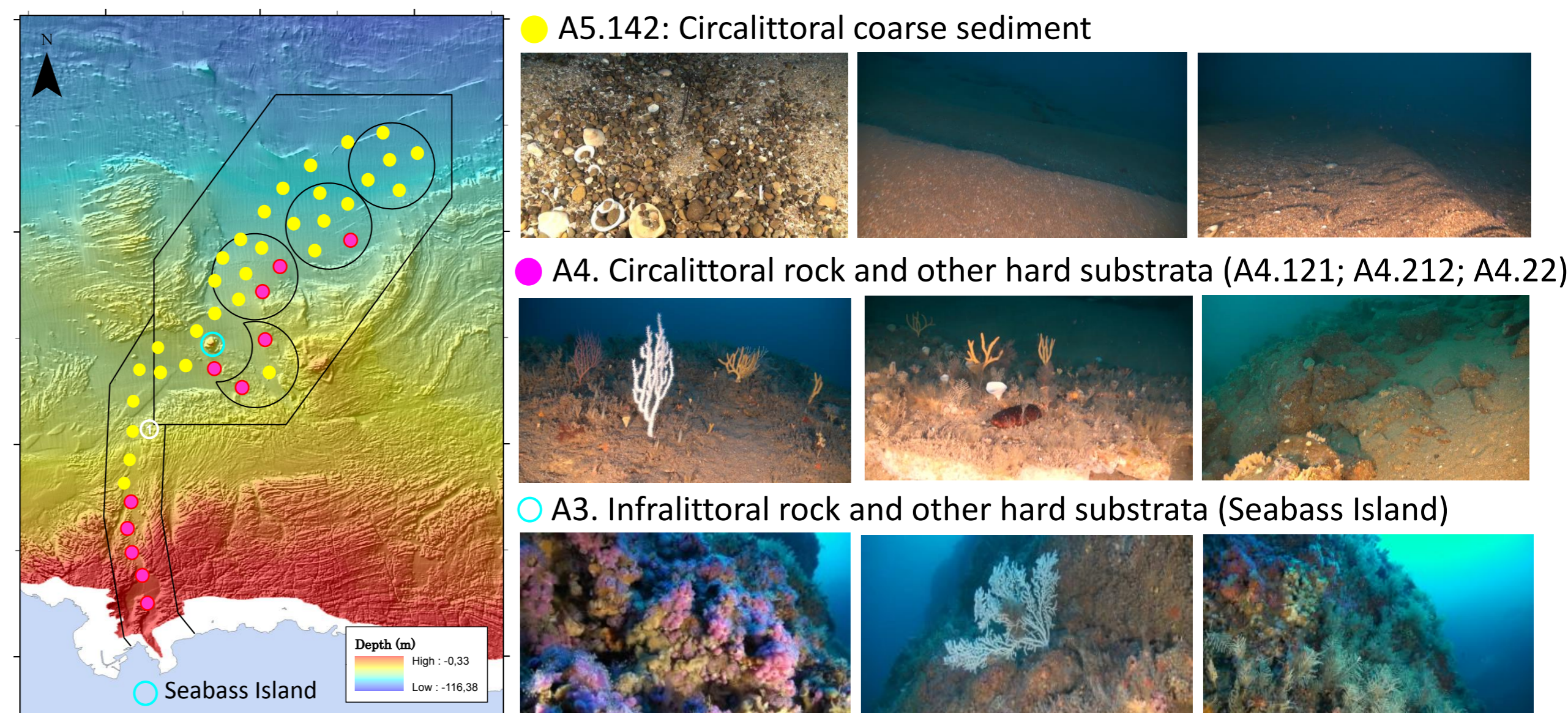
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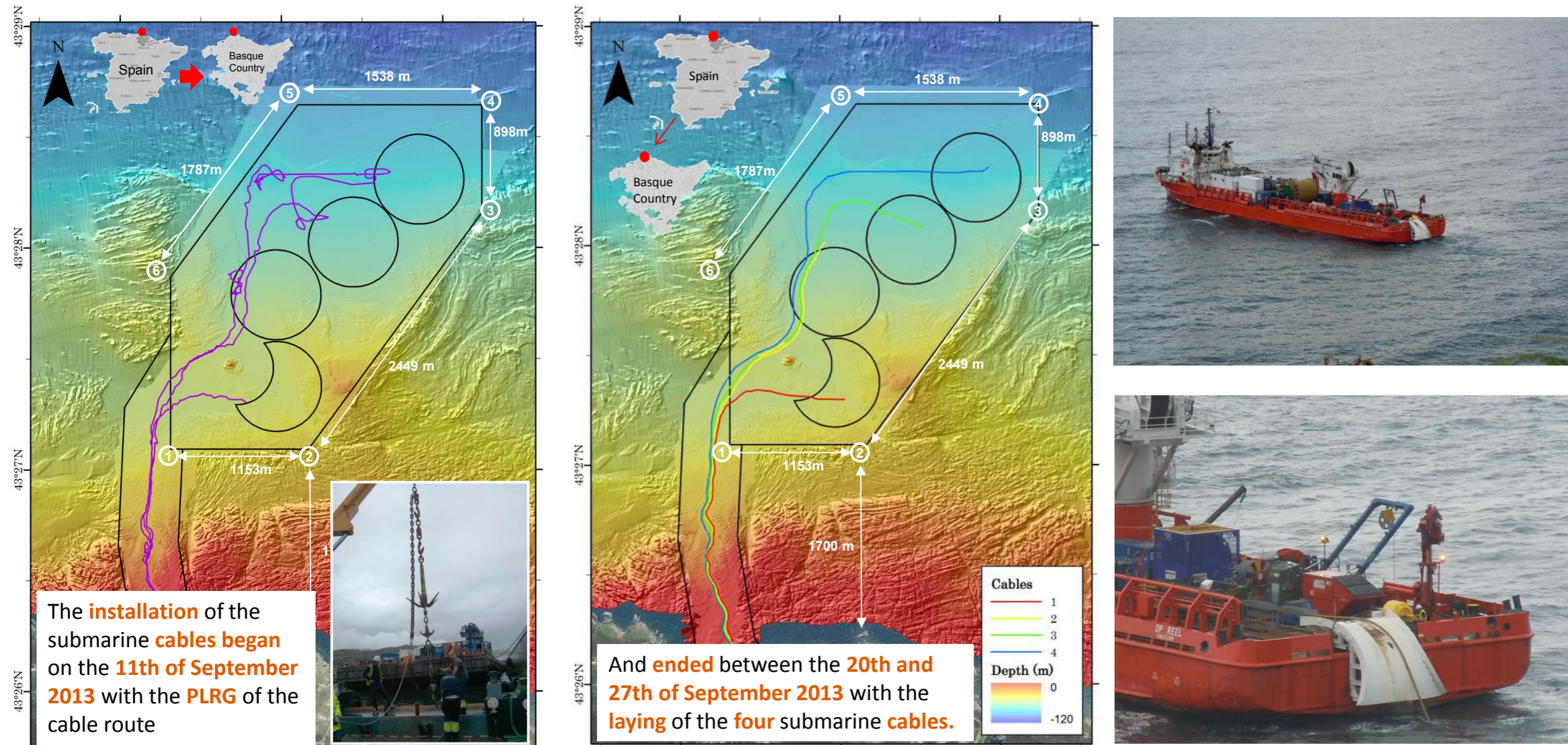
1. INTRODUCTION

- On the first of June 2009, the General Council on Environmental Quality Assessment of the **Ministry of Rural, Marine and Natural Environment of the Spanish Government**, on the light of the **Environmental Impact Study (EIS)** of the **BIMEP project** (www.bimep.com) undertaken by **AZTI**, decided to **not submit** the project to the whole Environmental Impact Assessment (EIA) process.
- Anyway, the **Environmental Impact Statement (EIS)** of the Ministry, taking into account the great uncertainties about some predicted environmental impacts, underlined the **need to implement** the proposed **Environmental Monitoring Program (EMP)** of the EIS. Among other environmental factors, **substratum alteration** was foreseen to occur during the commissioning stage of the submarine cables and consequently may affect related **benthic habitats** and **species**.
- Consequently, on August 29th of 2013, the **Basque Entity of Energy** (promotor of the BIMEP project) entrusted to **AZTI** to carry out the environmental monitoring plan of the installation of the submarine cables in bimep. The main **objective** was to **monitor** and check the environmental **impacts** over the seabed and **benthic communities**.
- According to the **EIS** and **EMP** of the **preoperational phase** of bimep, seabed and benthic communities are dominated by **circalittoral coarse sediments** and **rock and other hard substrata** (see image on the right) with a **singular structure** named **Seabass Island** which is a sea mountain with **high biodiversity** values.
- Consequently, **two mitigating measures** were suggested: (i) to plan de cable route over soft sediments; (ii) to maintain a security distance of 100 m of the cable route from the “Seabass Island”



2. THE BIMEP PROJECT

- Promoted by the **Basque Entity of Energy (EVE)**, BIMEP represents an **offshore test site** for the demonstration of **wave energy converters (WEC)**. It consists of 5,3 km² sea area between 50 and 90 m depths where **four static submarine cables will be placed, operating at 13kV and 5MW**. Wave energy generation devices will be connected to these cables through dynamic submarine cables.



3. METHODOLOGY

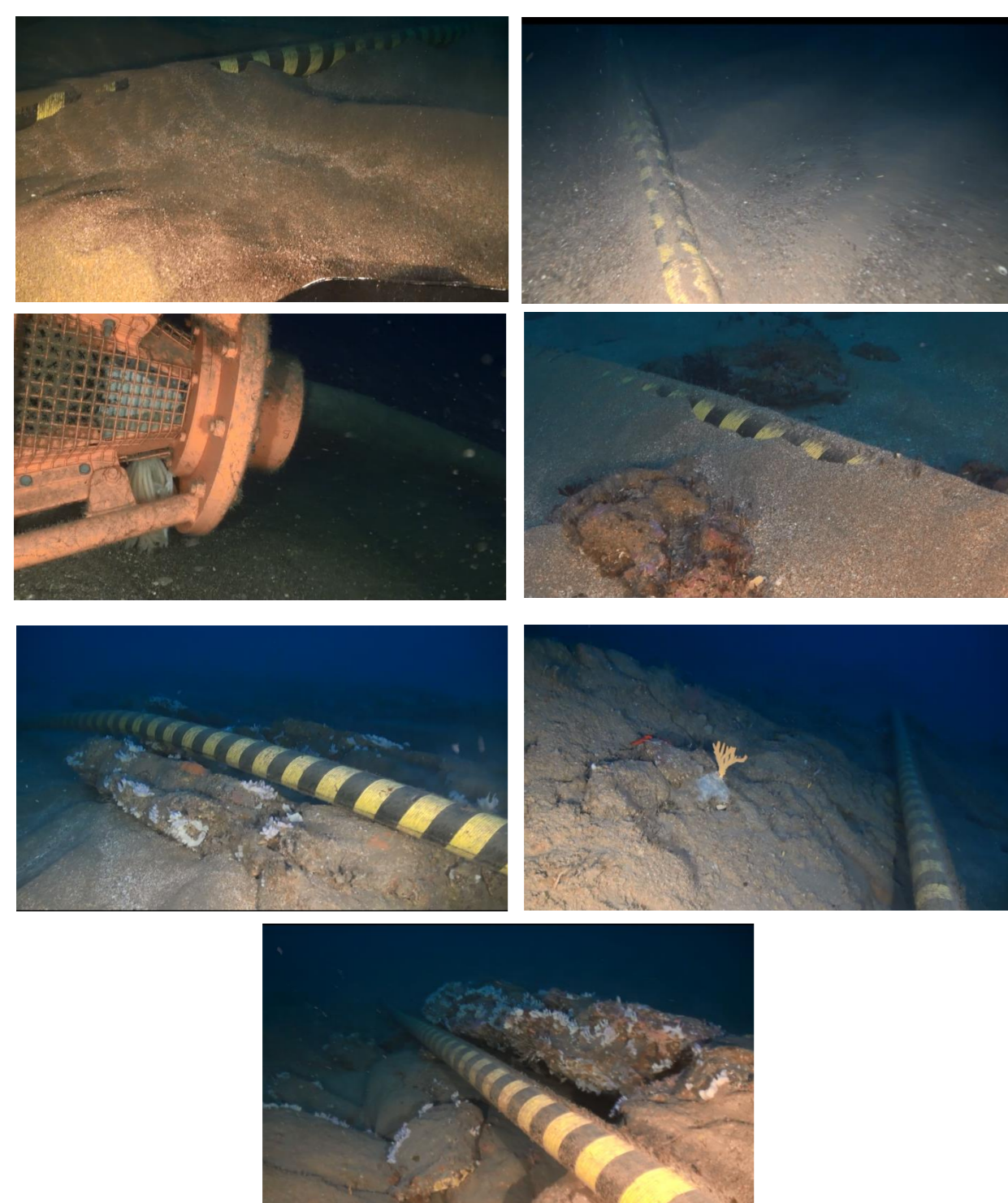
- Seabed characterisation:** Using a high resolution **RESON SeaBat 7125 multibeam echosounder**. As result of that methodology, a **0,5m resolution seafloor digital elevation model** was produced



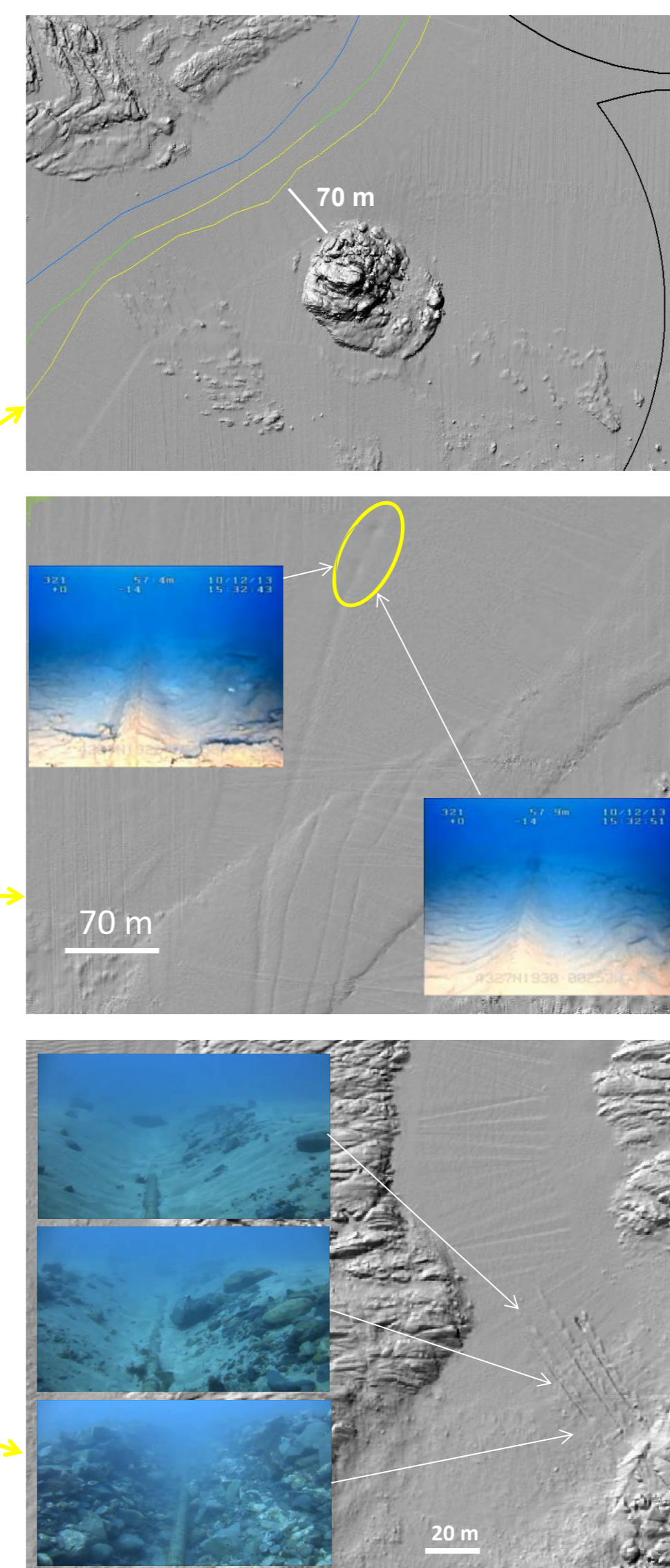
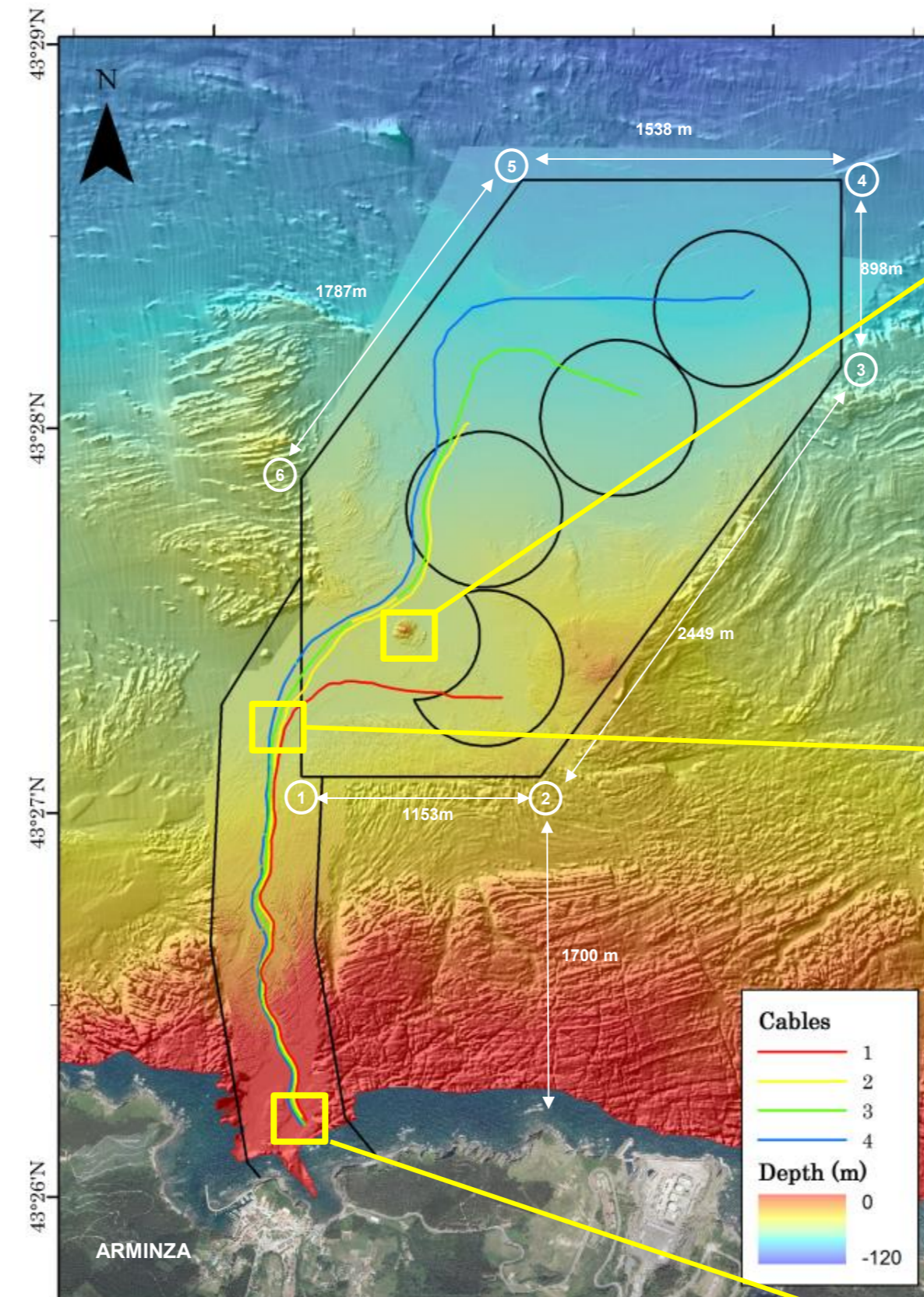
- Visual inspection:** With a underwater video camera attached to a **Seaeye Falcon Remote Operated Vehicle (ROV)** in 38 points distributed all along the submarine cable route and the mooring areas (yellow popoints in the figure on the left) and in 5 points by scuba-divers (red points in the figure on the left)

4. RESULTS

No significant alterations were observed in **most part of the cable route** over the seafloor and benthic communities. The cable simply remains lay down in the seafloor and even buried by the sediment dynamics itself. In some stretches of the cable route, this has been lay-down over rocky substratum but there have not seen impacts over the benthic communities in this substrate.



The obtained results show three main impact points in the cable route



Regarding the submarine mountain known as “Seabass Island”, the distance between the cable and the mountain is about 70 m, 30 m below the minimum distance established in the EIS. Nevertheless, no impacts were observed over the benthic communities in this geological structure which maintain the biological richness and value observed in the EIS and in the preoperational EMP, demonstrating the effectiveness of the protection measures proposed in the EIS of bimep.

Another alteration which can be observed is the effect on the seafloor of the cable burial attempts in some stretches of the cable route. Hence it was observed a removal of sediments and benthic communities in an area of 2-3 m at each side of the cable.

One of the most significant alterations can be observed in the outcrop of the submarine cable coming from the beach man hole through a tunnelling and channelling technique known as Horizontal Directional Drilling (HDD). As we can see in the figure on the left, a trench of about 60 m long and 2-3 m at each side of the cable was undertaken for each cable route.

5. CONCLUSION

Funded by BIMEP S.A. and carried out by the Marine Research Division of AZTI-Tecnalia, the EMP of the submarine cables installation in bimep showed that the **observed impacts are in the range and even below of those predicted in the EIS of bimep** (assessed as non-significant) and the effectiveness of the protection measures proposed in the EIS of bimep for the preservation of the biological values of the singular submarine mountain known as “Seabass Island”

Acknowledgements