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## CV summary

Bàrbara Barceló-Llull obtained her PhD in Physical Oceanography at the U. de Las Palmas de Gran Canaria (Spain) in September 2017 with Cum Laude and International PhD mentions. After her PhD, she was a postdoctoral researcher at IMEDEA (Spain) in 2018 and at the U. of Washington (UW, USA) from December 2018 until June 2020. The UW is recognized as one of the world's best universities in Oceanography, ranked 1st between 2018 and 2021 from the ShanghaiRanking's global ranking. Since June 2020, she has continued her postdoctoral research at IMEDEA (María de Maeztu Excellence Unit 2023-2027), first as task leader of the H2020 EuroSea project and later leading her own project.

Her research focuses on in situ and satellite ocean observations to understand mesoscale and submesoscale dynamics and their impact on marine ecosystems. These fine-scale processes regulate heat, carbon, and marine organism distributions, and understanding their 3D structure is a major challenge in physical oceanography. She has advanced knowledge of fine-scale ocean dynamics, with applications to satellite oceanography, climate, and conservation. At UW, she developed an innovative Lagrangian method to improve the resolution of sea surface salinity observations from NASA's SMAP satellite, enabling new insights into salinity-driven density fronts. At IMEDEA, she was a key contributor to the SWOT NASA/CNES satellite validation, leading a task of the H2020 EuroSea project to optimize ocean sampling strategies, coordinating international collaborations, and publishing codes and recommendations adopted by the SWOT Science Team. She has also advanced knowledge of fine-scale 3D hydrodynamics, exploiting historical glider observations and in situ multi-platform observations from the PRE-SWOT and PUMP experiments. Since 2020, she has led the only Spanish group participating in the SWOT Science Team (co-PI VERSO project). Her codes and recommendations have contributed to plan regional SWOT validation, including the FaSt-SWOT experiments.

She has secured competitive funding as PI for two high-impact projects (~175.000€) to initiate her future line of research. She leads the interdisciplinary project Connectivity of Marine Protected Areas in the Balearic Islands (Vicenç Mut program, 120.000€) and has been granted 45 days of access to SOCIB's glider fleet for the project MonSubHeat: Monitoring the Subsurface Signature of Marine Heatwaves in the Balearic Sea. Through this funding, she has initiated a research program focusing on the influence of mesoscale variability on large-scale ocean circulation and climate, the drivers and impacts of extreme oceanic events such as marine heatwaves, and the role of ocean dynamics in biodiversity conservation. Additionally, she will leverage new SWOT satellite observations in Antarctica as part of the Coupling II project, providing unprecedented insights into fine-scale ocean dynamics in this region. This research program contributes to the UN Ocean Decade (2021–2030). In total, she leads 3 projects and has participated in 14 additional projects.

She has published 8 first-author peer-reviewed papers in high-impact Q1 journals, and 8 additional papers and 2 book chapters as co-author (second author in 2 papers and 1 book chapter). She has 3 manuscripts under review. She led 2 deliverables and participated in an additional deliverable for

the EU during EuroSea; she contributed to 7 additional reports. She actively promotes open science by publishing datasets and codes in public repositories. She has disseminated her work through 27 communications at national and international conferences, being co-author of 33 more communications. She organized a session in the EGU General Assembly in 2019. She was a member of the scientific committee of the VIII Encuentro Oceanografía Física conference in 2024. She co-chaired 4 sessions in 2 international conferences. She participated in 4 oceanographic experiments (67 days in total). She supervised 4 master's theses, 2 with JAE Intro fellowships. Among them, 1 is now a data scientist in the private sector, and 3 are pursuing their PhD. One of these PhD students is now under her supervision, funded by an FPU fellowship. She also supervises a master's student with a JAE Intro fellowship. She participated in 2 master's thesis evaluation committees at the UIB and assessed a master thesis for the U. Auckland (New Zealand). She has reviewed manuscripts for several journals, such as Nature Communications. She was guest editor of two special issues in Remote Sensing. During 2020-2021 she was a member of the Commission for communication and scientific dissemination at IMEDEA. She actively participated in organizing and developing outreach activities, including designing the short documentary *Ilusiones científicas* (2021). She has led workshops and seminars and created a video series on YouTube sharing insights into her life as a scientist with the general public (55.000+ views).

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## Education

- 2014 - 2017 **Ph.D., Physical Oceanography**, *Instituto de oceanografía y cambio global, IOCAG*, Universidad de Las Palmas de Gran Canaria, Spain.  
 Thesis: '*Shedding light into mesoscale dynamics and vertical motion through synthetic and in situ observations*'. Date of defense: 25-09-2017. Supervisors: Pablo Sangrà, Ananda Pascual, Enric Pallàs-Sanz and Ángeles Marrero-Díaz. Pre-doctoral grant from the Spanish National Research Program associated to the PUMP project (BES-2013-065459).
- 2012 - 2014 **M.Sc., Physics**, Universitat de les Illes Balears, Spain, 120 ECTS.  
 Thesis: '*Quasi-geostrophic vertical motion from satellite and in-situ observations: impact on South East Pacific nitrate distribution through a Lagrangian simulation*'. Supervisors: Ananda Pascual and Evan Mason
- 2011 - 2012 **M.Sc., Renewable energies**, Universidad Camilo José Cela, Spain, 71 ECTS.
- 2006 - 2011 **B.Sc., Physics**, Universidad de Salamanca, Spain.

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## Professional experience

- 2023 - present **Postdoctoral grant (Connectivitat de la xarxa d'Àrees Marines Protegides de les Illes Balears project, funded by the Vicenç Mut program from the Balearic Government, PD/008/2022, 120.000€)**, *Institut Mediterrani d'Estudis Avançats, IMEDEA (Unidad de Excelencia María de Maeztu 2023-2027)*, Mallorca, Spain.  
 Supervisor: Josep Alós

- 2020 - 2023 **Postdoctoral position (H2020 EuroSea project, funded by the European Commission, BG-07-2019-2020)**, *Institut Mediterrani d'Estudis Avançats, IMEDEA (Unidad de Excelencia María de Maeztu 2023-2027)*, Mallorca, Spain.  
Supervisor: Ananda Pascual
- 2018 - 2020 **Postdoctoral position ((Sub)mesoscale Salinity Variability at Fronts project, funded by the NASA, NNX17AK04G)**, *Applied Physics Laboratory, University of Washington*, Seattle, USA.  
Supervisor: Kyla Drushka
- 2017 - 2018 **Postdoctoral position (PRE-SWOT project, CTM2016-78607-P)**, *Institut Mediterrani d'Estudis Avançats, IMEDEA*, Mallorca, Spain.  
Supervisor: Ananda Pascual
- 2014 - 2017 **Ph.D. student (PUMP project, CTM2012-33355)**, *Universidad de Las Palmas de Gran Canaria*, Las Palmas, Spain.  
Supervisors: Pablo Sangrà, Ananda Pascual, Enric Pallàs-Sanz and Ángeles Marrero-Díaz.
- 2012 - 2013 **Research assistant (E-MOTION project, CTM2012-31014)**, *Institut Mediterrani d'Estudis Avançats, IMEDEA*, Mallorca, Spain.  
Supervisor: Ananda Pascual

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## Research project participation

1. *Name of the project:* Relationship between the Atlantic meridional overturning circulation and coastal sea level: New insights from next-generation satellite observations

*PI:* Christopher G. Piecuch (WHOI, USA), and Julius Oelsmann (Tulane University, USA)

*Funding entity:* International Space Science Institute (ISSI) in Bern, Switzerland

*Call:* ISSI/ISSI-BJ 2025 Joint Call for Proposals for International Teams in the Space & Earth Sciences

*Link to the call:* <https://www.issibern.ch/call-for-proposals-2025-for-international-teams-in-space-and-earth-sciences/>

*Start-End date:* 13/06/2025 - 13/06/2027

*Total amount:* The ISSI supports two 5-day International Team meetings in Bern for all 12 core Team members as well as two additional early-career researchers, covering accommodation, local expenses, meeting infrastructure, childcare support, and travel for Team leaders.

2. *Name of the project:* MonSubHeat: Monitoring the subsurface signature of Marine Heatwaves in the Balearic Sea (0044)  
*PI:* **Bàrbara Barceló-Llull**  
*Funding entity:* Balearic Islands Coastal Observing and Forecasting System (SOCIB)  
*Call:* Glider Fleet Competitive Open Access (SOCIB 2024 N.2 AAC)  
*Link to the call:* <https://www.socib.es/en/what-we-do/access/access-to-the-glider-fleet>  
*Start-End date:* 15/01/2025 - 15/12/2025  
*Total value of access granted:* 54.831,60€ (45 days of free access to the glider, valued at 1.218,48€/day)
3. *Name of the project:* Coupling II: Ocean Dynamics and Connectivity between the Bransfield Current System and the Western Boundary Current System of the Weddell Sea (PID2023-148583NB-C21)  
*PIs:* Miguel Borja Aguiar González; Francisco José Machín Jiménez  
*Project website:* <https://polarcoupling.com/>  
*Funding entity:* Spanish National Research Program and European Regional Development Fund (MINECO-FEDER)  
*Start-End date:* 01/09/2024 - 31/08/2028  
*Total amount:* 257.500€
4. *Name of the project:* Ocean observations and indicators for climate and assessments (ObsSea4Clim) (No. 101136548)  
*PIs:* S. Olsen, V. Combes  
*Funding entity:* European Research Executive Agency  
*Call:* HORIZON-CL6-2023-CLIMATE-01  
*Start-End date:* 01/02/2024- 31/01/2028  
*Total amount:* 5.996.902€
5. *Name of the project:* RATJADA: Contribución al efecto de las Áreas Marinas Protegidas en el mantenimiento de la biodiversidad de condrictios batoideos de las Islas Baleares utilizando marcado electrónico (GOIBE299455/2024 BIOPRO2024-009)  
*PI:* Josep Alós Crespí  
*Funding entity:* Balearic Government  
*Start-End date:* 01/01/2024 - 29/09/2025  
*Total amount:* 116.900€

6. *Name of the project:* Connectivitat de la xarxa d'Àrees Marines Protegides de les Illes Balears (PD/008/2022)  
*PI:* **Bàrbara Barceló-Llull**  
*Funding entity:* Vicenç Mut program from the Balearic Government  
*Start-End date:* 01/12/2023 - 30/11/2026  
*Total amount:* 120.000€
7. *Name of the project:* VERSO: FINE SCALE [VER]TICAL EXCHANGE IN THE UPPER OCEAN – [S]W[O]T (continuation)  
*PIs:* Ananda Pascual; Baptiste Mourre; Antonio Sánchez Román; **Bàrbara Barceló-Llull**; Laura Gómez-Navarro  
*Funding entity:* SWOT Science Team - CNES/NASA/EUMETSAT  
*Start-End date:* 01/05/2024 - 01/05/2027
8. *Name of the project:* METARAOR: Population and managerial consequences of fish behavioral variation in marine fish species (PID2022-139349OB-I00)  
*PI:* Josep Alós Crespi  
*Funding entity:* Spanish National Research Program and European Regional Development Fund (MINECO-FEDER)  
*Start-End date:* 01/09/2023 - 31/08/2026  
*Total amount:* 303.750€
9. *Name of the project:* 4DMED-Sea (CNR-ESA-2022-4DMED-SEA)  
*PIs:* B. Buongiorno Nardelli; I. Hernández-Carrasco  
*Funding entity:* European Space Agency  
*Call:* ESA AO/1-11311/22/I-DT EXPRO+  
*Website:* <http://ricerca.ismar.cnr.it/4DMED/index.html>  
*Start-End date:* 22/06/2023 - 21/06/2025  
*Total amount:* 699.869,40 €
10. *Name of the project:* FaSt-SWOT: Fine-Scale ocean currents from integrated multi-platform experiments and numerical simulations: contribution to the new SWOT satellite mission (PID2021-122417NB-I00)  
*PIs:* Ananda Pascual; Baptiste Mourre  
*Funding entity:* Spanish National Research Program and European Regional Development Fund (MINECO-FEDER)  
*Start-End date:* 01/09/2022 - 31/08/2026  
*Total amount:* 198.440€
11. *Name of the project:* VERSO: FINE SCALE [VER]TICAL EXCHANGE IN THE UPPER OCEAN – [S]W[O]T  
*PIs:* Ananda Pascual; Evan Mason; Antonio Sánchez Román; **Bàrbara Barceló-Llull**; Ronan Fablet  
*Funding entity:* SWOT Science Team - CNES/NASA/EUMETSAT  
*Start-End date:* 01/05/2020 - 01/05/2024

12. *Name of the project:* EUROSEA: IMPROVING AND INTEGRATING EUROPEAN OCEAN OBSERVING AND FORECASTING SYSTEMS FOR SUSTAINABLE USE OF THE OCEANS (BG-07-2019-2020)  
*PIs:* Toste Tanhua; Ananda Pascual  
*Funding entity:* European Commission (H2020)  
*Start-End date:* 01/11/2019 - 30/11/2023  
*Total amount:* 12.000.000€
13. *Name of the project:* (Sub)mesoscale Salinity Variability at Fronts (NNX17AK04G)  
*PI:* Kyla Drushka  
*Funding entity:* National Aeronautics and Space Administration (NASA)  
*Start-End date:* 20/04/2017 - 19/04/2020  
*Total amount:* \$99.595
14. *Name of the project:* PRE-SWOT: INTERCAMBIOS VERTICALES DE MESOESCALA Y SUBMESOESCALA A PARTIR DE EXPERIMENTOS MULTI-PLATAFORMA Y SIMULACIONES NUMERICAS: ACTIVIDADES PREVIAS AL LANZAMIENTO DEL SATELITE SWOT (CTM2016-78607-P)  
*PIs:* Ananda Pascual; John Allen  
*Funding entity:* Spanish National Research Program and European Regional Development Fund (MINECO-FEDER)  
*Start-End date:* 01/01/2017 - 31/12/2019  
*Total amount:* 146.000€
15. *Name of the project:* MULTI-SUB: MESOSCALE AND SUB-MESOSCALE VERTICAL EXCHANGES FROM MULTI-PLATFORM EXPERIMENTS AND SUPPORTING MODELING SIMULATIONS: ANTICIPATING SWOT LAUNCH  
*PIs:* Ananda Pascual  
*Funding entity:* SWOT Science Team - CNES/NASA/EUMETSAT  
*Start-End date:* 01/12/2015 - 01/12/2019
16. *Name of the project:* FLUXES: FLUJOS DE CARBONO EN UN SISTEMA DE AFLORAMIENTO COSTERO (CABO BLANCO, NW DE AFRICA); MODULACION A SUBMESOESCALA DE LA PRODUCCION, EXPORTACION Y CONSUMO DE CARBONO (CTM2015- 69392-C3-3-R)  
*PIs:* Ángel Rodríguez Santana; Antonio Martínez Marrero  
*Funding entity:* Spanish National Research Program and European Regional Development Fund (MINECO-FEDER)  
*Start-End date:* 01/01/2016 a 31/12/2019  
*Total amount:* 139.150€

17. *Name of the project:* E-MOTION: Ocean mesoscale Eddies and vertical MOTION: new perspectives from a combination of satellite, model and in situ data (CTM2012-31014)  
*PIs:* Ananda Pascual  
*Funding entity:* Spanish National Research Program  
*Start-End date:* 01/01/2013 - 31/12/2015  
*Total amount:* 38.000€
18. *Name of the project:* PUMP: ESTUDIO DE LA BOMBA VERTICAL OCEANICA EN REMOLINOS DE MESOSCALA (CTM2012-33355)  
*PIs:* Pablo Sangrà Inciarte  
*Funding entity:* Spanish National Research Program  
*Start-End date:* 01/01/2013 - 31/12/2015  
*Total amount:* 222.300€

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## Publications

1. Fernández-Álvarez, B., **Barceló-Llull, B.** and Pascual, A. Tracking Marine Heatwaves in the Balearic Sea: Temperature Trends and the Role of Detection Methods. *Accepted in Ocean Sciences, EGUsphere [preprint]* DOI: <https://doi.org/10.5194/egusphere-2024-4065>
2. Verger-Miralles, E., Mourre, B., Gómez-Navarro, L., **Barceló-Llull, B.**, Casas, B., Cutolo, E., Díaz-Barroso, L., d'Ovidio, F., Tarry, D. R., Zarokanellos, N. D. and Pascual, A. SWOT enhances small-scale eddy detection in the Mediterranean Sea. *Accepted in Geophysical Research Letters, preprint available on ESS Open Archive.* DOI: <https://doi.org/10.22541/essoar.173315547.75973902/v1>
3. **Barceló-Llull, B.**, Rosselló, P., Combes, V., Sánchez-Román, A., Pujol, M. I. and Pascual, A. (2025). Kuroshio Extension and Gulf Stream dominate the Eddy Kinetic Energy intensification observed in the Global Ocean. *Sci. Rep.*, 15, 21754. DOI: <https://doi.org/10.1038/s41598-025-06149-9>
4. Edwards, C. A., De Mey-Frémaux, P., **Barceló-Llull, B.**, Charria, G., Choi, B.-J., Halliwell, G. R., Hole, L. R., Kerry, C., Kourafalou, V. H., Kurapov, A. L., Moore, A. M., Mourre, B., Oddo, P., Pascual, A., Roughan, M., Skandrani, C., Storto, A., Vervatis, V. and Wilkin, J. L. (2024). Assessing impacts of observations on ocean circulation models with examples from coastal, shelf, and marginal seas. *Front. Mar. Sci.*, Volume 11. DOI: [10.3389/fmars.2024.1458036](https://doi.org/10.3389/fmars.2024.1458036)

5. Tanhua, T., Le Traon, P.-Y., Köstner, N., Eparkhina, D., Navarro, G., Bonnet Dunbar, M., Speich, S., Pascual, A., Von Schuckmann, K., Liguori, G., Karstensen, J., Hassoun, A. E. R., Van Doorn, E., **Barceló-Llull, B.**, Pérez-Gómez, B., Cusack, C., Heslop, E., Lara-Lopez, A., Petihakis, G., Telszewski, M., Piotr Palacz, A., Wilmer-Becker, K., Pearlman, J. S., Muñiz Piniella, Á., Heymans, J. J. and Lips, I. (2024). Towards a sustained and fit-for-purpose European Ocean Observing and Forecasting System. *Front. Mar. Sci.*, 11:1394549. DOI: <https://doi.org/10.3389/fmars.2024.1394549>
6. **Barceló-Llull, B.** and Pascual, A. (2023). Recommendations for the design of in situ sampling strategies to reconstruct fine-scale ocean currents in the context of SWOT satellite mission. *Front. Mar. Sci.*, 10:1082978. DOI: <https://doi.org/10.3389/fmars.2023.1082978>
7. Mason, E., **Barceló-Llull, B.**, Sánchez-Román, A., Rodríguez-Tarry, D., Cutolo, E., Delepouille, A., Ruiz, S. and Pascual, A. (2022). Chapter 8: Fronts, eddies and mesoscale circulation in the Mediterranean Sea. Book title: Oceanography of the Mediterranean Sea. An Introductory Guide. Editors: Schroeder, K. and Chiggiato, J. Publisher: *Elsevier*. ISBN: 978-0-12-823692-5
8. Tzortzis, R., Doglioli, A. M., Barrillon, S., Petrenko, A. A., d'Ovidio, F., Izard, L., Thyssen, M., Pascual, A., **Barceló-Llull, B.**, Cyr, F., Tedetti, M., Bhairy, N., Garreau, P., Dumas, F., and Gregori, G. (2021). Impact of moderately energetic fine-scale dynamics on the phytoplankton community structure in the western Mediterranean Sea. *Biogeosciences*, 18, 6455-6477. DOI: <https://doi.org/10.5194/bg-18-6455-2021>
9. **Barceló-Llull, B.**, Pascual, A., Sánchez-Román, A., Cutolo, E., d'Ovidio, F., Fifani, G., Ser-Giacomi, E., Ruiz, S., Mason, E., Cyr, F., Doglioli, A., Mourre, B., Allen, J. T., Alou-Font, E., Casas, B., Díaz-Barroso, L., Dumas, F., Gómez-Navarro, L. and Muñoz, C. (2021). Fine-Scale Ocean Currents Derived From in situ Observations in Anticipation of the Upcoming SWOT Altimetric Mission. *Front. Mar. Sci.*, 8:679844. DOI: <https://doi.org/10.3389/fmars.2021.679844>
10. International Altimetry Team (2021). Altimetry for the future: Building on 25 years of progress. *Advances in Space Research*, 68(2), 319-363. DOI: <https://doi.org/10.1016/j.asr.2021.01.022>
11. **Barceló-Llull, B.**, Drushka, K. and Gaube, P. (2021). Lagrangian reconstruction to extract small-scale salinity variability from SMAP observations. *Journal of Geophysical Research: Oceans*, 126, e2020JC016477. DOI: <https://doi.org/10.1029/2020JC016477>



12. Martínez-Marrero, A., **Barceló-Llull, B.**, Pallàs-Sanz, E., Aguiar-González, B., Estrada-Allis, S. N., Gordo, C., Grisolia, D., Rodríguez-Santana, A. and Arístegui, J. (2019). Near-inertial wave trapping near the base of an anticyclonic mesoscale eddy under normal atmospheric conditions. *Journal of Geophysical Research: Oceans*, 124(11), 8455-8467. DOI: <https://doi.org/10.1029/2019JC015168>
13. **Barceló-Llull, B.**, Pascual, A., Ruiz, S., Escudier, R., Torner, M. and Tintoré, J. (2019). Temporal and spatial hydrodynamic variability in the Mallorca channel (western Mediterranean Sea) from eight years of underwater glider data. *Journal of Geophysical Research: Oceans*, 124(4), 2769-2786. DOI: <https://doi.org/10.1029/2018JC014636>
14. Estrada-Allis, S. N., **Barceló-Llull, B.**, Pallàs-Sanz, E., Rodríguez-Santana, A., Souza, J. M. A. C., Mason, E., McWilliams, J. C. and Sangrà, P. (2019). Vertical Velocity Dynamics and Mixing in an Anticyclone near the Canary Islands. *J. Phys. Oceanogr.*, 49(2), 431-451, DOI: <https://doi.org/10.1175/JPO-D-17-0156.1>
15. **Barceló-Llull, B.**, Pascual, A., Mason, E. and Mulet, S. (2018). Comparing a Multivariate Global Ocean State Estimate With High-Resolution *in Situ* Data: An Anticyclonic Intrathermocline Eddy Near the Canary Islands. *Front. Mar. Sci.*, 5(66), DOI: <https://doi.org/10.3389/fmars.2018.00066>
16. **Barceló-Llull, B.**, Pallàs-Sanz, E., Sangrà, P., Martínez-Marrero, A., Estrada-Allis, S. N. and Arístegui, J. (2017). Ageostrophic secondary circulation in a subtropical intrathermocline eddy. *J. Phys. Oceanogr.*, 47(5), 1107-1123, DOI: <http://dx.doi.org/10.1175/JPO-D-16-0235.1>
17. **Barceló-Llull, B.**, Sangrà, P., Pallàs-Sanz, E., Barton, E. D., Estrada-Allis, S. N., Martínez-Marrero, A., Aguiar-González, B., Grisolia, D., Gordo, C., Rodríguez-Santana, A., Marrero-Díaz, A. and Arístegui, J. (2017). Anatomy of a subtropical intrathermocline eddy. *Deep-Sea Res.*, 124, 126-139, DOI: <http://dx.doi.org/10.1016/j.dsr.2017.03.012>. \*Selected for the front cover of Volume 124 by the editor Igor Belkin. [https://doi.org/10.1016/S0967-0637\(17\)30172-3](https://doi.org/10.1016/S0967-0637(17)30172-3)
18. **Barceló-Llull, B.**, Mason, E., Capet, A. and Pascual, A. (2016). Impact of vertical and horizontal advection on nutrient distribution in the southeast Pacific. *Ocean Sci.*, 12, 1003-1011, DOI: <http://dx.doi.org/10.5194/os-12-1003-2016>
19. Rio, M.-H., Pascual, A., Poulain, P.-M., Menna, M., **Barceló, B.** and Tintoré, J. (2014). Computation of a new Mean Dynamic Topography for the Mediterranean Sea from model outputs, altimeter measurements and oceanographic in-situ data. *Ocean Sci.*, 10, 731-744, DOI: <http://dx.doi.org/10.5194/os-10-731-2014>

20. Tintoré, J. *et al.* (2013). The Impact of New Multi-platform Observing Systems in Science, Technology Development and Response to Societal Needs; from Small to Large Scales. *Computer Aided Systems Theory - EUROCAST 2013*, Springer Berlin Heidelberg, 8112, 341-348, DOI: [http://dx.doi.org/10.1007/978-3-642-53862-9\\_44](http://dx.doi.org/10.1007/978-3-642-53862-9_44)
21. Tintoré, J. *et al.* (2013). SOCIB: The Balearic Islands Coastal Ocean Observing and Forecasting System Responding to Science, Technology and Society Needs. *Mar. Technol. Soc. J.*, 47(1), 101-117, DOI: <http://dx.doi.org/10.4031/MTSJ.47.1.10>

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## Reports

1. Barrientos, N., Vaquer-Sunyer, R., Juza, M., Vargas-Yáñez, M., Gomis, D., Pascual, A., **Barceló-Llull, B.**, Balbín, R., Jordà, G. and Marcos, M. (2024). Temperatura de la mar Balear. In: Vaquer-Sunyer, R.; Barrientos, N.; Gouraguine, A. (eds.). Informe Mar Balear 2024, DOI: <http://doi.org/10.62135/IAJB7896>
2. Barrientos, N., Vaquer-Sunyer, R., Juza, M., Vargas-Yáñez, M., Gomis, D., Pascual, A., **Barceló-Llull, B.**, Balbín, R., Jordà, G. and Marcos, M. (2024). Temperatura del mar Balear. In: Vaquer-Sunyer, R.; Barrientos, N.; Gouraguine, A. (eds.). Informe Mar Balear 2024, DOI: <https://doi.org/10.62135/LDBJ9344>
3. Mourre, B., Pascual, A., Gómez-Navarro, L., Balaguer, P., **Barceló-Llull, B.**, *et al.* (2024). FaSt-SWOT 2023 Cruise Report. FaSt-SWOT project, DOI: <https://doi.org/10.20350/digitalCSIC/16077>
4. Pascual, A., Mourre, B., Balaguer, P., **Barceló-Llull, B.**, *et al.* (2023). FaSt-SWOT Cruise Plan: Fine-Scale ocean currents from integrated multi-platform experiments and numerical simulations: contribution to the new SWOT satellite mission (FaSt-SWOT, PID2021-122417NB-I00). FaSt-SWOT project, 56pp., DOI: <https://doi.org/10.20350/digitalCSIC/15276>
5. Speich, S., Pascual, A., Dayan, H., **Barceló-Llull, B.**, Balmaseda, M., Cusack, C., Dabrowski, T., Graves, I., Horsburgh, K., Lips, U., McAdam, R., Masina, S., Navarro, G., She, J. & von Schuckmann, K. (2022). Development of targeted indicators and their uncertainties for demonstrators and Forecasts. EuroSea project, Deliverable 2.4, DOI: [https://doi.org/10.3289/eurosea\\_d2.4](https://doi.org/10.3289/eurosea_d2.4)
6. Mulet, S., Boone, C., **Barceló-Llull, B.**, Zarokanellos, N., Pascual, A., Manso-Narvarte, I., Caballero, A., Rubio, A., Bretagnon, M. & Mangin, A. (2022). Synthesis of satellite validation results. EuroSea project, Deliverable 4.5, DOI: [https://doi.org/10.3289/eurosea\\_d4.5](https://doi.org/10.3289/eurosea_d4.5)

7. **Barceló-Llull, B.**, Pascual, A., Albert, A., Beauchamp, M., Fablet, R., Guinehut, S., Hernández-Lasheras, J., Herrero González, M., Jousset, S., Leroux, S., Mourre, B. & Mulet, S. (2022). Analysis of the OSSEs with multi-platform in situ data and impact on fine-scale structures. EuroSea project, Deliverable 2.3, DOI: [https://doi.org/10.3289/eurosea\\_d2.3\\_v2](https://doi.org/10.3289/eurosea_d2.3_v2)
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## Student supervision

1. **Blanca Fernández Álvarez** (in progress). PhD thesis: *Marine Heat Waves in the Balearic Sea*. Universitat de les Illes Balears. Granted an FPU fellowship. Supervisors: A. Pascual, **B. Barceló-Llull**.
2. **Cristina Martí Solana** (03/10/2024; 9.7). Master's thesis: *Detection of salinity fronts from satellite observations*. Master's Degree in Advanced Physics and Applied Mathematics. Universitat de les Illes Balears. Supervisors: V. Combes, **B. Barceló-Llull**.
3. **Blanca Fernández Álvarez** (28/06/2024; 10 MH). Master's thesis: *Marine Heat Waves in the Balearic Sea*. Master's Degree in Oceanography. Universidad de Las Palmas de Gran Canaria. Supervisors: A. Pascual, **B. Barceló-Llull**.
4. **Marta Veny López** (September-October 2023). Supervision of a PhD student stay at IMEDEA. Home Institution: Instituto de Oceanografía y Cambio Global (IOCAG) – Departamento de Física, Universidad de las Palmas de Gran Canaria (ULPGC). Supervisors of the stay: S. Ruiz, **B. Barceló-Llull**.
5. **Elisabet Verger Miralles** (14/09/2023; 9.6). Master's thesis: *Mesoscale ocean structure reconstruction through data collection and analysis in the framework of the FAST-SWOT project*. Master's Degree in Advanced Physics and Applied Mathematics. Universitat de les Illes Balears. Supervisors: A. Pascual, **B. Barceló-Llull**, A. Amores.
6. **Helena Antich Homar** (19/10/2022; 9.5). Master's thesis: *Procesado de datos y entrenamiento de la red neuronal de un sistema IoT para predecir las trayectorias de *Pygoscelis Antarcticus* a partir de variables oceanográficas*. Master's degree in Intelligent Systems. Universitat de les Illes Balears. Supervisors: **B. Barceló-Llull**, A. Pascual, M. Barranco.

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## Teaching experience

1. **Teaching assistant** at the Universitat de les Illes Balears, Spain. 20353 - Mechanics (20 hours). Degree in Construction. Academic year 2024-25. <https://www.uib.eu/Learn/estudis-de-grau/grau/edificacio/GEED-P/20353/>.

2. **Teaching assistant** at the Universitat de les Illes Balears, Spain. 20356 - Fundamentals of Facilities (43 hours). Degree in Construction. Academic year 2023-24. <https://www.uib.eu/Learn/estudis-de-grau/grau/edificacio/GEED-P/20356/>.
3. **Guest lecturer** at the Universitat de les Illes Balears (UIB), Spain. 21054 - Physical Oceanography. Degree in Physics. Academic year 2022-23. Delivered one lecture of 2 hours by invitation.
4. **Certification PROFESORA AYUDANTE DOCTORA**. Agencia Nacional de Evaluación de la Calidad y Acreditación (ANECA). November 2022.

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## Outreach activities

1. *Type of activity:* Live video on YouTube. International Women's Day.  
*Title of the activity:* ¿Abandonar o resistir? Maternidad y conciliación en la carrera científica  
*Role:* Moderator.  
*Place:* YouTube.  
*Date:* 05/03/2025  
*Link:* <https://www.youtube.com/live/2xIq23p3T9Q>
2. *Type of activity:* FaSt-SWOT documentary.  
*Title of the activity:* Del espacio al Mediterráneo: Persiguiendo corrientes marinas.  
*Role:* Participation, revision.  
*Place:* YouTube.  
*Date:* 09/11/2023  
*Link:* [https://youtu.be/WQd9LeIdLSk?si=Eff\\_xSEMSMhKQ-ex](https://youtu.be/WQd9LeIdLSk?si=Eff_xSEMSMhKQ-ex)
3. *Type of activity:* Presentation of the FaSt-SWOT documentary.  
*Title of the activity:* Estreno del corto documental “Del espacio al Mediterráneo: Persiguiendo corrientes marinas”.  
*Place:* IMEDEA.  
*Date:* 08/11/2023  
*Link:* [https://imedeo.uib-csic.es/divulgacion-y-comunicacion/noticias/?new\\_id=2041](https://imedeo.uib-csic.es/divulgacion-y-comunicacion/noticias/?new_id=2041)
4. *Type of activity:* Live video on YouTube.  
*Title of the activity:* Directo proyecto FaSt-SWOT - Día Mundial de los Océanos.  
*Role:* Original idea, scriptwriting, organization, moderator, dissemination on social media.  
*Place:* YouTube.  
*Date:* 08/06/2023  
*Link:* [https://www.youtube.com/live/\\_mim-lSua4?feature=share](https://www.youtube.com/live/_mim-lSua4?feature=share)

5. *Type of activity:* Stories on Instagram.  
*Title of the activity:* Dissemination of the FaSt-SWOT experiment.  
*Place:* Instagram.  
*Date:* 25-27/04/2023  
*Link:* <https://www.instagram.com/stories/highlights/17965615391215848/>
6. *Type of activity:* Tweets on Twitter.  
*Title of the activity:* Dissemination of the FaSt-SWOT experiment.  
*Place:* Twitter.  
*Date:* 25/04/2023 and 27/04/2023  
*Links:* [https://twitter.com/bbarcelo\\_ocean/status/1650837240354947072](https://twitter.com/bbarcelo_ocean/status/1650837240354947072),  
[https://twitter.com/bbarcelo\\_ocean/status/1650972225502076932](https://twitter.com/bbarcelo_ocean/status/1650972225502076932),  
[https://twitter.com/bbarcelo\\_ocean/status/1651548870868971521](https://twitter.com/bbarcelo_ocean/status/1651548870868971521)
7. *Type of activity:* Interview.  
*Title of the activity:* The new wave of oceanographers: Bàrbara Barceló-Llull.  
*Place:* SWOT-AdAC website.  
*Date:* 21/04/2023  
*Link:* <https://www.swot-adac.org/news/the-new-wave-of-oceanographers-barbara-ba>
8. *Type of activity:* Taller para la Ocean Night.  
*Title of the activity:* Moviéndonos en el océano.  
*Place:* IMEDEA.  
*Date:* 01/12/2022
9. *Type of activity:* Talleres para la Semana de la Ciencia y la Tecnología.  
*Title of the activity:* Moviéndonos en el océano.  
*Place:* IMEDEA.  
*Date:* 25/11/2022 and 29/11/2022  
*Link:* [https://imedeaiuib-csic.es/divulgacion-y-comunicacion/noticias/?new\\_id=1991](https://imedeaiuib-csic.es/divulgacion-y-comunicacion/noticias/?new_id=1991)
10. *Type of activity:* Tweet on Twitter.  
*Title of the activity:* Report: Recommendations for the design of in situ experiments to validate SWOT!!  
*Place:* Twitter.  
*Date:* 15/11/2022  
*Link:* [https://twitter.com/bbarcelo\\_ocean/status/1592509065963663361](https://twitter.com/bbarcelo_ocean/status/1592509065963663361)
11. *Type of activity:* Virtual Poster on Twitter.  
*Title of the activity:* Virtual Poster Session during the FilaChange workshop  
*Place:* Twitter.  
*Date:* 26/08/2022  
*Link:* [https://twitter.com/SWOT\\_AdAC/status/1563197631635292161](https://twitter.com/SWOT_AdAC/status/1563197631635292161)

12. *Type of activity:* Tweet on Twitter.  
*Title of the activity:* Open and free codes to evaluate in situ sampling strategies aimed at reconstructing fine-scale ocean currents  
*Place:* Twitter.  
*Date:* 05/07/2022  
*Link:* [https://twitter.com/bbarcelo\\_ocean/status/1544244579439988737](https://twitter.com/bbarcelo_ocean/status/1544244579439988737)
13. *Type of activity:* Documentary, International Day of Women and Girls in Science at IMEDEA.  
*Title of the activity:* Ilusiones científicas.  
*Place:* Published on YouTube.  
*Date:* 11/02/2021  
*Link:* <https://youtu.be/IVexfmEDMRg>
14. *Type of activity:* Microcharlas virtuales con científicos/as, CSIC Science and Technology Week.  
*Title of the activity:* Els corrents marins: Què són? Per què són importants? Com els podem observar?  
*Place:* online.  
*Date:* 11/11/2020  
*Link:* <https://youtu.be/bGwi7niAqno>

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## Merits, achievements and experience

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|----------------|--|
| RESEARCH STAYS | <p><b>Centro de investigación científica y de educación superior de Ensenada, CICESE, México</b>, 2016, 120 days.<br/>         Pre-doctoral mobility grant from the Spanish National Research Program (EEBB-I-15-09833). Supervisor: Enric Pallàs-Sanz</p> <p><b>Centro de investigación científica y de educación superior de Ensenada, CICESE, México</b>, 2015, 120 days.<br/>         Pre-doctoral mobility grant from the Spanish National Research Program (EEBB-I-16-11015). Supervisor: Enric Pallàs-Sanz</p> <p><b>Institut Mediterrani d'Estudis Avançats, IMEDEA, Spain</b>, 2015, 30 days.<br/>         Supervisor: Ananda Pascual</p> |
| CRUISES        | <p><b>FaSt-SWOT</b>, <i>Fine-Scale ocean currents from integrated multi-platform experiments and numerical simulations: contribution to the new SWOT satellite mission</i>, R/V García del Cid, April-May 2023, 8 days.</p> <p><b>BioSWOT-Med</b>, <i>Biological applications of the satellite Surface Water and Ocean Topography in the Mediterranean</i>, R/V L'Atalante, April-May 2023, 25 days.</p> <p><b>PRE-SWOT</b>, <i>Mesoscale and sub-mesoscale vertical exchanges from multi-platform experiments and supporting modeling simulations: anticipating SWOT launch</i>, R/V García del Cid, May 2018, 12 days.</p>                       |

	<b>PUMP</b> , <i>Study of the Vertical Oceanic Pump in mesoscale eddies</i> , R/V Hespérides, September 2014, 22 days.
COMMISSION PARTICIPATION	<p><b>Member of the Commission for communication and scientific dissemination at IMEDEA (CSIC-UIB)</b>, 2020-2021.</p> <p><b>Member of the Scientific Committee of the VIII Encuentro Oceanografía Física conference (EOF 2024)</b>, 2024.</p>
SESSION ORGANISING	<b>The realm of (sub)mesoscale dynamics: variability, impact, and new challenges</b> , <i>EGU General Assembly</i> , Vienna, Austria, 2019.
SESSION CHAIRING	<p><b>Session 2.4 - Open Ocean</b>, <i>30 Years of Progress in Radar Altimetry Symposium</i>, Montpellier, France, 2024.</p> <p><b>Session 2.3 - Open Ocean</b>, <i>30 Years of Progress in Radar Altimetry Symposium</i>, Montpellier, France, 2024.</p> <p><b>Oral Session 5a. Ocean methods: instrumentation, remote sensing and numerical methods</b>, <i>VIII Encuentro Oceanografía Física conference (EOF 2024)</i>, Valencia, Spain, 2024.</p> <p><b>Oral Session 6a. Operational oceanography and marine weather</b>, <i>VIII Encuentro Oceanografía Física conference (EOF 2024)</i>, Valencia, Spain, 2024.</p>
PEER REV.	<p><b>Ocean Sciences</b>, 2025.</p> <p><b>Nature Communications</b>, 2023.</p> <p><b>Journal of Geophysical Research: Oceans</b>, 2024, 2022, 2019.</p> <p><b>Geophysical Research Letters</b>, 2020.</p> <p><b>Journal of Marine Systems</b>, 2019.</p> <p><b>Ocean Dynamics</b>, 2019, 2018.</p>
GUEST EDITOR	<p><b>Special Issue: "Applications of Satellite Altimetry in Ocean Observation"</b>, <i>Remote Sensing</i>, 2023-2025, <a href="https://www.mdpi.com/journal/remotesensing/special_issues/OT3DF5K943">https://www.mdpi.com/journal/remotesensing/special_issues/OT3DF5K943</a>.</p> <p><b>Special Issue: "Application of Remote Sensing for the Study of Coastal and Shelf Seas Dynamics"</b>, <i>Remote Sensing</i>, 2023-2024, <a href="https://www.mdpi.com/journal/remotesensing/special_issues/6T38DXQ3Y5">https://www.mdpi.com/journal/remotesensing/special_issues/6T38DXQ3Y5</a>.</p>
ADDITIONAL TRAINING	<p><b>GODAE OceanView International School</b>, Mallorca, Spain, 2-13 October 2017.</p> <p>*Registration and accommodation grant (GOV International School directors).</p>

**International workshop FineMed 2017**, *Marseilles, France*, 26-28 June 2017, Scientific Committee: F. d'Ovidio (LOCEAN, Paris, France), A. Doglioli (MIO, Marseille, France), G. Grégori (MIO, Marseille, France), P. Testor (LOCEAN, Paris, France), B. Fach (METU, Erdemli, Turkey).

\*Travel grant (SWOT Science Team).

**A Short Course on Time Series Analysis**, *UIB, Mallorca, Spain*, 26-30 Jan 2015, Prof. Dudley B. Chelton (CEOAS, Oregon State University, USA).

**Initiation to physical oceanography**, *Institut Mediterrani d'Estudis Avançats, IMEDEA, Mallorca, Spain*, 24 May 2012 -12 Oct 2012, 440 hours, Supervisors: Ananda Pascual and Evan Mason.

**Técnicas avanzadas para el tratamiento numérico y representación gráfica de datos (7a edición)**, *Universidad de Salamanca, Spain*, 2011, 40 hours.

**Presentaciones y comunicaciones orales: estrategias y nuevas tecnologías (6a edición)**, *Universidad de Salamanca, Spain*, 2011, 40 hours.

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## Skills

COMPUTING: Linux; Mac

Python; Matlab

L<sup>A</sup>T<sub>E</sub>X; NetCDF

Analysis of remote sensing and *in situ* data

Experienced user of the *py-eddy-tracker* code for mesoscale eddy tracking

Inference of vertical motions through omega equations

Lagrangian simulations through Parcels module in Python and ROMS Offline

LANGUAGES: English – fluent

Spanish – native speaker

Catalan – native speaker