Universitat de les Illes Balears

SEA LEVEL AND MARINE CLIMATE RESEARCH GROUP

SCIENTIFIC/TECHNICAL RECORD DURING THE LAST FIVE YEARS (1919-2023)

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Presentation

The major research lines of the Sea Level and Climate research group are:

1. Long-term (interannual to interdecadal) Sea Level variability and Climate. The main objectives of this line are:

1a) To understand the long-term sea level variability observed in the Mediterranean Sea and the NE sector of the Atlantic Ocean. We pay particular attention to explain the observed variability in terms of the different contributing processes, namely the atmospheric component (mechanical forcing of Sea Level by atmospheric pressure and wind), the steric component (derived from changes in the density of the water column) and the mass component (derived from changes in the regional amount of mass, which in turn depend on the melting of continental ice and the redistribution of mass within the World ocean).

1b) To obtain regional marine climate scenarios for the 21st century. The projected variables are temperature, salinity, currents, the steric component of sea level, the atmospheric component of sea level and waves. The research not only focuses on projecting changes in the mean values, but also in the distribution of extremes of sea level and other parameters such as temperature (heat waves) and significant wave height. See this Table for a list of current and projected simulations.

2. High-frequency Sea Level Oscillations: meteotsunamis or meteorological tsunamis are atmospherically induced ocean waves in the tsunami frequency band. They affect coasts in a damaging way in a number of places in the World Ocean. These destructive waves are not related to any seismic activity, volcanic explosions, submarine landslides or meteorite impacts, but to atmospheric forcing: atmospheric gravity waves, pressure jumps, frontal passages, squalls, tropical cyclones, or similar. The main objective of this line is to improve the knowledge on the sources and atmospheric characteristics of the meteotsunamis, its interaction with coastal waters and amplification when approaching and hitting the shoreline.

Staff

Permanent

Damià Gomis Bosch (Catedrático de Universidad)
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Joan Puigdefábregas

Scientific publications

Published articles

2023

1. Liu, L.; Morton, Y.J.; Cheng, P-H; **Amores, A.;** Wright, C.J.; Hoffmann, L. (2023) Concentric Traveling Ionospheric Disturbances (CTIDs) Triggered by the 2022 Tonga Volcanic Eruption. Journal of Geophysical Research: Space Physics. https://doi.org/10.1029/2022JA030656
2. Ramirez-Romero, E.; **Amores, A.;** Diaz, D.; Muñoz, A.; Catalan, I.; Molinero, J.C.; Ospina-Alvarez, A.. (2023) Atmospheric–ocean coupling drives prevailing and synchronic dispersal patterns of marine species with long pelagic durations. Scientific Reports. https://doi.org/10.1038/s41598-023-29543-7
3. Martín, A.; **Amores, A.;** Orfila, A.; **Toomey, T.; Marcos**, M. (2023) Coastal extreme sea levels in the Caribbean Sea induced by tropical cyclones. Nat Hazards and Earth Sys. Sci. https://doi.org/10.5194/nhess-23-587-2023
4. **Villalonga, J.; Amores, A.; Monserrat, S.; Marcos, M.; Gomis, D.; Jordà, G.**(2023) Observational study of the heterogeneous global meteotsunami generated after the Hunga Tonga-Hunga Ha'apai Volcano eruption. Scientific Reports. https://doi.org/10.1038/s41598-023-35800-6
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9. Malagón-Santos, V.; Slangen, A.B.A.; Hermans, T.H.J.; Dangendorf, S.; **Marcos, M.**; Maher, N.. (2023) Improving statistical projections of ocean dynamic sea-level change using pattern recognition techniques. Ocean Science 19, 499-515. https://doi.org/10.5194/os-19-499-2023

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20. Camargo, C.M.L.; Riva, R.E.M.; Hermans, T.H.J.; Schütt, E. M., **Marcos, M.;** Hernandez-Carrasco, I., Slangen, A.B.A. (2022) Regionalizing the Sea-level Budget With Machine Learning Techniques, EGUsphere [preprint], https://doi.org/10.5194/egusphere-2022-876

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2020

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65. **Amores, A.; Jordà, G.; Monserrat, S.** (2019) Ocean Eddies in the Mediterranean Sea From Satellite Altimetry: Sensitivity to Satellite Track Location. Front. Mar. Sci. 6:703. https://10.3389/fmars.2019.00703

66. Rashid, M. M.; Wahl, T.; Chambers, D.; **Calafat, F. M.**; Sweet, W. (2019). An extreme sea level indicator for the contiguous United States coastline. Scientific Data 6, 326. https://doi.org/10.1038/s41597-019-0333-x

67. Benveniste, J. et al. (2019) Requirements for a Coastal Hazards Observing System. Frontiers in Marine Science, 6. https://doi.org/10.3389/fmars.2019.00348

68. Piecuch, C. G.; **Calafat, F. M.**; Dangendorf, S.; **Jordà, G.** (2019) The Ability of Barotropic Models to Simulate Historical Mean Sea Level Changes from Coastal Tide Gauge Data. Surveys in Geophysics, 40, 1399-1435. https://doi.org/10.1007/s10712-019-09537-9

Books, chapters of books, monographies

2022

Marcos, M.; Wöppelmann, G.; **Calafat, F.M.**; Vacchi, M.; **Amores, A.** (2022) Chapter 5 - Mediterranean Sea level, Editor(s): Katrin Schroeder, Jacopo Chiggiato, Oceanography of the Mediterranean Sea, Elsevier, 2022, Pages 125-159, ISBN 9780128236925, 10.1016/B978-0-12-823692-5.00012-1

2020

Gomis, D.; Jordà, G.; Balbín, R.; Reñones, O.; Vázquez, M. (2020) Context oceanogràfic de l'illa de Cabrera. Arxipèlag de Cabrera: Història Natural. Monografies de la Societat d'Història Natural de les Balears, 30. 738 pp. ISBN 978-84-09-23487-5

2019

Gomis, D. The Interdisciplinary Laboratory on Climate Change of the University of the Balearic Islands. Humanities and Higher Education: Synergies between Science, Technology and Humanities. 543 pp.. Ed. Global University Network for Innovation (GUNi). ISBN: 978-84-09-14675-8

Scientific Projects

2023

Name of the project: Disentangling the drivers of European coastal sea-level extremes (DRICOEX)
Funding institution or bodies: Agencia Estatal de Investigación. Convocatoria 2022 Incentivación a la Consolidación Investigadora.
Head researcher: PI: A. Amores
Budget: 174.966,00 €
Dates: 01/09/2023 – 31/08/2025

Name of the project: Affordable Tide Gauges (ATG) for Selected Communities of CoastWAVE Project)
Funding institution or bodies: UNESCO
Head researcher: PI: G. Jordà
Budget: 24.125,00 €
Dates: 01/05/2023 – 31/10/2023

Name of the project: LIFE AdaptCalaMillor
Funding institution or bodies: European Comission (LIFE-2021-SAP-CLIMA Call)
Head researcher: PI (UIB): L. Gómez, **M. Marcos**; PI(CSIC): A. Orfila
Budget: 1.376.000 €
Dates: 01/01/2023 – 01/04/2027

2022

Name of the project: Novel technologies for an integrated monitoring system in the coastal zone (Tech2Coast)
Funding institution or bodies: Agencia Estatal de Investigación. Convocatoria 2021 Proyectos Transición Ecológica y Transición Digital
Head researcher: PIs: A. Orfila, **M. Marcos**
Budget: 120.000 €
Dates: 01/12/2022 – 30/11/2024

Name of the project: DEcadal predictability of coastal exTremE sea levels under ClimaTe change (DETECT)
Funding institution or bodies: Agencia Estatal de Investigación. Convocatoria 2021 Proyectos de Generación de Conocimiento
Head researcher: PI (UIB): **M. Marcos**
Budget: 106000 €
Dates: 01/09/2022 – 31/08/2025

Name of the project: Past, present and future of the Asian Mega-Deltas: the role of space observations
Funding institution or bodies: International Space Science Institute
Head researcher: PIs: M. Becker (Univ La Rochelle), **M. Marcos**
Budget: ~40.000 €
Dates: 2022-2023

Name of the project: Hoteles-observatorio (HOBS). Efecto del cambio climático en la dinámica de las playas: inundación y erosión
Funding institution or bodies: BALEAR DE INVERSIONES FINANCIERAS S.L. (Iberostar Hoteles)
Head researcher: PI: **M. Marcos**, A. Orfila
Budget: 180.000 €
Dates: 01/09/2022 – 01/09/2025

Name of the project: Sea Level CCI+ Phase 2: Assessment of the impact of coastal observations on global sea level reconstructions (NOC).
Funding institution or bodies: European Space Agency
Head researcher: PI: **F. M. Calafat (NOC)**, Jean-Francois Legeais (Magellium)
Budget: 300,000 €
Dates: 2022 – 2024

Name of the project: Explaining and Predicting the Ocean Conveyor (EPOC)
Funding institution or bodies: European Union's Horizon Europe programme
Head researcher: PI: Eleanor Frajka-Williams (University of Hamburg); **Co-I: F. M. Calafat (NOC)**
Budget: 8,000,000 €
Dates: 2022 – 2027

Name of the project: UK Coastal Hazards: Multi-hazard controls on Flooding and Erosion (CHAMFER)
Funding institution or bodies: UK Research and Innovation
Head researcher: PI: Laurent Amoudry (NOC); **Co-I: F. M. Calafat (NOC)**
Budget: 3,000,000 €
Dates: 2022 – 2027

2021

Name of the project: Asistencia técnica para el testeo y la monitorización de un sistema de predicción de áreas de acumulación en áreas marinas protegidas del mediterráneo dentro del proyecto 'plastic busters"e
Funding institution or bodies: IEO
Head researcher: PI: **G. Jordà**
Budget: 41.019 €
Dates: 2021 – 2022

Name of the project: DECIMATE: Descubriendo el medio marino con tecnología de bajo coste
Funding institution or bodies: FECYT
Head researcher: PIs: **G. Jordà, D. Gomis**
Budget: 32.000 €
Dates: 2021 – 2022

Name of the project: Understanding the Connection Between Coastal Sea Level and Open Ocean Variability Through Space Observations
Funding institution or bodies: International Space Science Institute
Head researcher: PI: **F. M. Calafat (NOC)**
Budget: ~40,000 €
Dates: 2021 – 2022

Name of the project: 4DAtlantic - Ocean Heat Content
Funding institution or bodies: European Space Agency
Head researcher: PI: **F. M. Calafat (NOC)**, Michael Ablain (Magellium)
Budget: 500,000 €
Dates: 2021 – 2023

Name of the project: Optimising co-benefit solutions (Co-Opt)
Funding institution or bodies: UK Research and Innovation
Head researcher: PI: Laurent Amoudry (NOC); **Co-I: F. M. Calafat (NOC)**
Budget: 675,000 €
Dates: 2021 – 2024

2020

Name of the project: Policy Advice for climate-resilient economic development.
Funding institution or bodies: Deutsche Gesellschaft für Internationale Zusammenarbeït GmbH
Head researcher: I.P.: Gabriel Jordà. IP UIB: D. Gomis
Budget: 33.000 €
Dates: 2020 – 2021

Name of the project: HydroCoastal: coastal ocean and inland water altimetry
Funding institution or bodies: European Space Agency
Head researcher: PI: **F. M. Calafat (NOC)**, David Cotton (SatOC, UK)
Budget: 100,000 €
Dates: 2020 – 2022

2019

Name of the project: Morfodinámica de playas protegidas en el Mediterráneo frente al cambio climático - MOCCA
Funding institution or bodies: Ministerio de Ciencia, Innovación y Universidades
Head researcher: M. Marcos, A. Orfila
Dates: 01/01/2019 - 31/12/2021
Budget: 108.900 Euros

Name of the project: VENOM: Variabilidad Espacial del Nivel del Mar en el Mediterráneo occidental
Funding institution or bodies: Ministerio de Ciencia, Innovación y Universidades (PGC2018-099285-B-C21)
Head researcher: D. Gomis
Dates: Junio 2019 - Septiembre 2022
Budget: 104.000€

Name of the project: VENOM: Variabilidad Espacial del Nivel del Mar en el Mediterráneo occidental
Funding institution or bodies: Ministerio de Ciencia, Innovación y Universidades (PGC2018-099285-B-C22)
Head researcher: G. Jordà
Dates: Junio 2019 - Septiembre 2022
Budget: 23.000€

Name of the project: Desarrollo de un modelo predictivo para determinar "Hot Spots" de basura marina en el Mediterràneo en el marco del "Proyecto PLASTIC BUSTERS MPAs"
Head researcher: G. Jordà.
Dates: 2019
Budget: 44.000€

Name of the project: Sea Level CCI+ Phase 1: coastal sea-level analysis using satellite altimetry data.
Funding institution or bodies: European Space Agency
Head researcher: PI: Jean-Francois Legeais (Magellium), **F. M. Calafat (NOC)**
Budget: 500,000 €
Dates: 2019 – 2022

Presentations at national and international Conferences

2023

1. Nil Carrion; Albert Falqués; Francesca Ribas; Daniel Calvete; Rinse de Swart; Ruth Durán; Candela Marco-Peretó; **Marta Marcos; Angel Amores; Tim Toome**y; Àngels Fernández-Mora; Jorge Guillén. Morphodynamic modelling of an embayed Mediterranean beach: effect of the forcing sources, EGU General Assembly 2023, Abril 2023, Viena, Austria
2. Víctor Malagón-Santos; Aimée B.A. Slangen; Tim H.J. Hermans; Sönke Dangendorf; **Marta Marcos**; Nicola Maher. Removing Internal Variability as a Means of Improving Regional Emulation of Ocean Dynamic Sea-Level Change, EGU General Assembly 2023, Abril 2023, Viena, Austria
3. **M. Agulles Gámez; M. Marcos; Á. Amores; T. Toomey**. The impact of spatio-temporal resolution in simulating storm surges along European coasts, International Union of Geodesy and Geophysics, July 2023, Berlin, Alemania
4. J.M. Sayol; **M. Marcos**; D. García-García; I. Vigo.. Seasonal and inter-annual variability of Mediterranean Sea overturning circulation: a model-based analysis, International Union of Geodesy and Geophysics, July 2023, Berlin, Alemania
5. **T. Toomey**; T. Wahl; **M. Marcos**; A. Rodriguez Enriquez; **M. Agulles; A. Amores;** A. Orfila. Wave setup representation at Mediterranean scale: Empirical and modelling-based multi-approach analysis, International Union of Geodesy and Geophysics, July 2023, Berlin, Alemania
6. **Villalonga, J.; Gomis, D.; Jordà, G.** Observational study of the global meteotsunami generated after the Hunga Tonga - Hunga Ha'apai Volcano eruption. 2nd EuroSea Tide Gauge Network Workshop. May 2023, Madrid, Spain.
7. Ramos-Alcántara, J.; **Gomis, D.; Jordà, G..** Mediterranean coastal sea level reconstruction based on tide gauge observations. 2nd EuroSea Tide Gauge Network Workshop. May 2023, Madrid, Spain.
8. **Jordà, G.; Villalonga, J.;** Puigdefàbregas, J.; Font, A.; Frank-Comas, A.; Melo, C.; Ramos, J.; **Gomis, D.**. Implementation of a low-cost ultra-dense tide gauge network in the Balearic Islands (VENOM Network). 2nd EuroSea Tide Gauge Network Workshop. May 2023, Madrid, Spain.
9. **Villalonga, J**.; Pascual, J.; Puigdefábregas, J.; González, A.; **Gomis, D.; Jordà, G.** A 30 years record of meteotsunami events in the eastern Iberian coast. Workshop CLIVAR-ES 2023: Towards an integrated view of climate. January 2023, Madrid, Spain.
10. Ramos-Alcántara, J.; **Agulles, M.; Gomis, D.; Jordà, G.** Análisis de las contribuciones a los eventos extremos del nivel del mar en el Mediterráneo Occidental y escenarios de inundación costera en el futuro. Workshop CLIVAR-ES 2023: Towards an integrated view of climate. January 2023, Madrid, Spain.
11. **Gomis, D.** The real meaning of Climate Change and its affection in southern Europe. Keynote presentation at the Southern European Pilots Meeting. February 2023, Barcelona, Spain.
12. Hibbert, F.D.; **M. Marcos**; A. Valentine; E. Garrett; W. R. Gehrels. Assessing sea-level change of the last 300 years using tide gauge and proxy records. EGU General Assembly, Abril 2023, Viena, Austria
13. Sánchez-Román, A., A. Pascual, M.-I. Pujol, G. Taburet, **M. Marcos** and Y. Faugère. Assessment of DUACS Sentinel-3A altimetry data in the coastal band of the European Seas: comparison with tide gauge measurements. OSTST 2020 Virtual Meeting. 19 – 23 Octubre 2020

2022

14. I. Manso-Narvarte, A. Caballero, I. Hernández-Carrasco, A. Orfila, M. Santos, U. Cotano, **G. Jordà**, A. Declerck, M. Delpey and A. Rubio. VII Expanding Ocean Frontiers 2022, Las Palmas (España), 6-8 Julio 2022, "Simulating Anchovy Eggs and Larvae advection in the SE-BOB", Abstract number: EOF-009. https://isms-canarias.com/programa-eof.
15. **Marcos, M.**, Sea level observations. Panelist at Sea Level Rise Conference 2022, Venice (Italy), 17-18 October 2022
16. N. Carrión, A. Falqués, F. Ribas, D. Calvete, R. Durán, C. Marco, **M. Marcos, A. Amores, T. Toomey** and J. Guillén: Morphodynamic modelling of an embayed beach: role of the input forcing sources. XI Jorandas de Geomorfología Litoral, Santiago de Compostela, 5-6 May 2022
17. **Marcos, M.**: Sea level rise in the Mediterranean and Black Seas. Keynote, Knowledge Hub on Sae Level Rise: Black and Mediterranean Sea Scoping Workshop, online 5-6 May 2022

18. Oelsmann, J., **Marcos, M.**, Passaro, M., Sánchez, L., Dettmering, D., and Seitz, F.: The impact of continuous space and time-resolving vertical land motion on relative sea level change, EGU General Assembly 2022, Vienna, Austria, 23–27 May 2022, EGU22-5281, https://doi.org/10.5194/egusphere-egu22-5281, 2022.
19. Machado Lima de Camargo, C., **Marcos, M.,** Hernandez-Carrasco, I., Hermans, T. H. J., Riva, R. E. M., and Slangen, A. B. A.: Regionalizing the Sea-level Budget Using a Neural Network Approach, EGU General Assembly 2022, Vienna, Austria, 23–27 May 2022, EGU22-3512, https://doi.org/10.5194/egusphere-egu22-3512, 2022.
20. **Marcos, M**., Haigh, I. D., Talke, S. A., Hart-Davis, M., Dettmering, D., Woodworth, P. L., and Hunter, J. R.: The new GESLA-3 tide gauge data set and its quality control for tidal studies, EGU General Assembly 2022, Vienna, Austria, 23–27 May 2022, EGU22-3944, https://doi.org/10.5194/egusphere-egu22-3944, 2022.
21. **Luque, P., Marcos, M.**, Gómez-Pujol, L., and Orfila, A.: On the Evolution of Beach Shoreline According to Equilibrium Profile, EGU General Assembly 2022, Vienna, Austria, 23–27 May 2022, EGU22-3000, https://doi.org/10.5194/egusphere-egu22-3000, 2022.
22. **Amores, A., Marcos, M.**, Le Cozannet, G., and Hinkel, J.: Coastal flooding and mean sea-level rise allowances in atoll island, EGU General Assembly 2022, Vienna, Austria, 23–27 May 2022, EGU22-1595, https://doi.org/10.5194/egusphere-egu22-1595, 2022.
23. **Toomey, T., Amores, A., Marcos, M.,** and Orfila, A.: Extreme sea levels and wind-waves in the Mediterranean Sea since 1950, EGU General Assembly 2022, Vienna, Austria, 23–27 May 2022, EGU22-1262, https://doi.org/10.5194/egusphere-egu22-1262, 2022.
24. **Marcos, M., T. Toomey, A. Amores,** A. Orfila: Extreme sea levels and wind-waves in the Mediterranean Sea since 1950, Sea Level Workshop: from global to coastal, from past to future, Brest, France, 1-3 June 2022, https://2022-sealevel.sciencesconf.org/, 2022
25. **Amores, A., M. Marcos**, Gonéri Le Cozannet, Jochen Hinkel: Coastal flooding and mean sea-level rise allowances in atoll island, Sea Level Workshop: from global to coastal, from past to future, Brest, France, 1-3 June 2022, https://2022-sealevel.sciencesconf.org/, 2022
26. Ramos, J.; **Agulles, M.; Gomis, D.; Jordà, G.** Extreme sea level events in the Western Mediterranean: analysis of the main contributions based on high-frequancy tide gauge records. VII Expanding Ocean Frontiers (EOF) conference. Las Palmas de Gran Canaria, 2022.
27. **Villalonga, J.; Amores, A.; Monserrat, S.; Marcos, M.; Gomis, D.; Jordà, G.** The sea level reponse to the Hunga Tonga - Hunga Ha'apai volcano eruption: a global meteotsunami. VII Expanding Ocean Frontiers (EOF) conference. Las Palmas de Gran Canaria, 2022.
28. **Herrada, E. A.**; Puigdefàbregas, J.; **Agulles, M**.; Ramos, J.; Frank, A.; **Villalonga, J.; Gomis, D.; Jordà, G**. Raising awareness of the impact of climate change on coastal regions. A citizen science-based approach within the SECOSTA project. European Geophysical Union General Assembly. Viena, 2022.
29. **Villalonga, J.; Amores, A.; Monserrat, S.; Gomis, D.; Jordà, G.** Observational characterization of meteotsunami triggering in the Balearic Islands from an ultra-dense observational network. European Geophysical Union General Assembly. Viena, 2022.
30. Ramos, J.; **Gomis, D.; Jordà, G.** Mediterranean coastal sea level reconstruction based on tide gauge observations. European Geophysical Union General Assembly. Viena, 2022.
31. Mourre, B.; **Amores, A.**; Jansà, A.; **Marcos, M.; Monserrat, S.;** Santana, A.; Tintoré, **J.; Villalonga, J.; Jordà, G.; Gomis, D.** Oceanic response in the Balearic Islands to atmospheric pressure waves triggered by 2022 Hunga Tonga eruption: a modelling study. 2nd World Conference on Meteotsunamis. Maó (Menorca), 2022.
32. Ramos, J.; **Agulles, M.; Gomis, D.; Jordà, G**. Extreme sea level events in the western mediterranean: analysis of the main contributions based on tide gauge records. 2nd World Conference on Meteotsunamis. Maó (Menorca), 2022.
33. **Jordà, G.; Villalonga, J**.; Pascual, J.; Puigdefàbregas, J.; González, A.; **Gomis, D.** A 30 years record of meteotsunami events in the eastern Iberian coast. 2nd World Conference on Meteotsunamis. Maó (Menorca), 2022.
34. **Villalonga, J.; Amores, A.; Monserrat, S.; Gomis, D.; Jordà, G.** Observational characterization of meteotsunami triggering in the Balearic Islands from an ultra-dense observational network. 2nd World Conference on Meteotsunamis. Maó (Menorca), 2022.

35. **Villalonga, J.; Amores, A.; Monserrat, S.; Marcos, M.; Gomis, D.; Jordà, G.** Observational study of the sea level response to the shock wave generated by the Hunga-Tonga Volcano explosion: a global meteotsunami?. 2nd World Conference on Meteotsunamis. Maó (Menorca), 2022.
36. **Amores, A.; Monserrat, S.; Marcos, M.;** Argüeso, D.; **Villalonga, J.; Jordà, G.; Gomis, D.** Numerical simulation of atmospheric Lamb waves generated by the2022 Hun ga-Tonga volcanic eruption. 2nd World Conference on Meteotsunamis. Maó (Menorca), 2022
37. **Monserrat, S.** Rissaga, the Balearic meteotsunami: where it all began . 2nd World Conference on Meteotsunamis. Maó (Menorca), 2022.
38. **Agulles, M.**; Ramos, J.; **Gomis, D.; Jordà, G.** Extreme sea level events in the Western Mediterranean: analysis of the main contributions based on high-frequency tide gauge records. 5th International Conference on Advances in Extreme Value Analysis and Application to Natural Hazards. May 2022, Orlando (USA).

2021

39. **Toomey, T., Amores, A., Marcos, M.,** Orfila, A., and Romero, R.: Coastal risks induced by Mediterranean hurricanes, EGU General Assembly 2021, online, 19–30 Apr 2021, EGU21-11999, https://doi.org/10.5194/egusphere-egu21-11999, 2021.
40. Martín, A., **Amores, A.,** Orfila, A., and **Marcos, M**.: Coastal extreme sea levels in the Caribbean Sea induced by tropical cyclones, EGU General Assembly 2021, online, 19–30 Apr 2021, EGU21-7564, https://doi.org/10.5194/egusphere-egu21-7564, 2021.
41. **A. Amores**. Ocean Swells along the Global Coastlines and Their Climate Projections for the Twenty-First Century. COWCLIP meeting. Online, May 2021
42. **M. Marcos**. Coastal impacts of mean sea-level rise and marine extremes. III Congreso de Jóvenes Investigadores del Mar. Granada, septiembre 2021. Ponencia invitada.
43. **Gomis, D.** El LINCC-UIB: un enfoque multidisciplinar para estudiar y afrontar el Cambio Climático. Conferència invitada. : Congreso Nacional del Medio Ambiente - CONAMA 2020. Madrid, 2021.
44. Frank-Comas, A.; Puigdefàbregas, J.; Tomàs-Ferrer, J.; Font, A.; **Agulles, M**.; Soto-Navarro, J.; **Gomis, D.; Villalonga**, J.; Ramos, J.; Melo, C.; **Jordà, G.** Implementation of a low-cost ultra-dense tide gauge network in the Balearic Islands. 9th international Workshop on Marine Technology. Vigo, 2021.
45. **Villalonga, J.; Gomis, D.; Amores, A.; Jordà, G.** Observational characterization of Balearic Island meteotsunamis at an unprecedented high spatial resolution. VI Expanding Ocean Frontiers (EOF) conference. Barcelona, 2021.
46. Ramos, J.; **Gomis, D.; Jordà, G.** Mediterranean coastal sea level reconstruction based on tide gauge observations. VI Expanding Ocean Frontiers (EOF) conference. Barcelona, 2021.
47. Frank-Comas, A.; Puigdefàbregas, J.; Tomàs-Ferrer, J.; Font, A.; **Agulles, M.;** Soto-Navarro, J.; **Gomis, D.; Villalonga, J.**; Ramos, J.; Melo, C.; **Jordà, G.** Implementation of a low-cost ultra-dense tide gauge network in the Balearic Islands. VI Expanding Ocean Frontiers (EOF) conference. Barcelona, 2021.

2020

48. Sánchez-Román, A., A. Pascual, M.-I. Pujol, G. Taburet, **M. Marcos** and Y. Faugère. Assessment of DUACS Sentinel-3A altimetry data in the coastal band of the European Seas: comparison with tide gauge measurements. OSTST 2020 Virtual Meeting. 19 – 23 October 2020.
49. **Marcos., M.**, B. Puyol, **A. Amores**, B. Pérez Gómez, M. A. Fraile, S. A. Talke: Historical tide-gauge sea-level observations in Alicante and Santander (Spain) since the 19th century. Workshop on Sea Level Data Archaeolog, IOC/UNESCO. París, France, 2020.
50. **Marcos, M**. Impacts of mean sea-level rise and marine extremes on islands. EGU General Assembly 2020, Austria, 2020. Ponencia invitada.
51. **Marcos, M.**, B. Puyol, **A. Amores**, B. Pérez Gómez, M. A. Fraile, S. A. Talke. Historical tide-gauge sea-level observations in Alicante and Santander (Spain) since the 19th century. EGU General Assembly 2020. Austria, 2020.

2019

52. Sánchez-Román, A., I. Pujol, Y. Faugère, G. Taburet, P. Prandi, **M. Marcos**, **A. Pascual**. Assessment of CMEMS tide gauge network in the European Seas: contribution to the tide gauge blacklisting. PQWG-2019 meeting. 12-14 marzo 2019.

53. Le Cozannet, G., V. Duvat, J. Hinkel, **M. Marcos**, R. Van De Wal, P. Walker. Services climatiques port l'adaptation côtiere à l'élévation du niveau de la mer: le projet INSeaPTION. Journées REFMAR. Paris, France. 2019.
54. **Marcos, M.,** J. Rohmer, M. Vousdoukas, L. Mentaschi, G. Le Cozannet, **A. Amores**. Increased extreme coastal water levels due to the combined action of storm surges and wind-waves. Fourth International conference on Advances in Extreme Value Analysis and Application to Natural Hazard. Paris, France. 2019.
55. **Marcos, M.** Global to local coastal modelling as a climate service for coastal adaptation. Workshop on WCRP Grand Challenge and Climate Services. Orléans, France. 2019. Ponencia invitada.
56. **Marcos, M.,** J. Rohmer, M. Vousdoukas, L. Mentaschi, G. Le Cozannet, **A. Amores**. Increased extreme coastal water levels due to the combined action of storm surges and wind-waves. American Geophysical Union Fall Meeting 2019. San Francisco, Estados Unidos de América. 2019.
57. **Amores, A., M. Marcos,** R. Pedreros G. Le Cozannet, J. Rohmer, A. Shareef. Waves and sea-level rise induced flooding in the Maldives. American Geophysical Union Fall Meeting 2019. San Francisco, Estados Unidos de América. 2019.
58. Sánchez Román, A., Y. Faugère, M.I. Pujol, G. Taburet, **M. Marcos**, A. Pascual. Data quality assessment of altimetry products in the European Seas with in-situ observations from the CMEMS tide gauge network. EGU2019. 7 – 12 Abril 2019. Vienna, Austria.
59. Morales-Márquez, V., A. Orfila, **M. Marcos**, G. Simarro. Relationship of extreme wave climate with long-term patterns in the North Atlantic Ocean and Mediterranean Sea. EGU 2019. Viena, Austria. 2019.

Student supervision

PhD and Master Theses in progress

Pau Luque (09/2022-08/2025). Programa de doctorado Física UIB. Universitat de les Illes Balears. Supervisors: **M. Marcos**, A. Orfila.

Tim Toomey (10/2020-09/2024). Programa de doctorado Física UIB. Universitat de les Illes Balears. Supervisors: **M. Marcos**, A. Orfila, **A. Amores**

Joan Mateu Horrach Pou. UIB, Master of advanced Physics. Título: Western Boundary Current circulation in the Labrador Sea from satellite and in-situ observations. Supervisors: J. Karstense, **A. Amores**, A. Pascual

Joan Villalonga Llauger (2022-2025). Programa de doctorado Física UIB. Título. Caracterització dels Meteotsunamis de les Illes Balears a partir d'una xarxa observacional ultra-densa. Supervisors: **G. Jordà, D. Gomis**

Jorge Ramos Alcántara (2022-2025). Programa de doctorado Física UIB. Título. Análisis de la variabilidad del nivel del mar costero en el Mediterráneo Occidental a diferentes escalas espacio-temporales. Supervisors: **G. Jordà, D. Gomis**

PhD, Master Theses and other student Supervision

2022

Supervisores: **Marcos, M.; Amores, A.**
Título: Coastal extreme sea levels in the Caribbean Sea induced by tropical ciclones.
University issuing the qualification: Máster en Física Avanzada y Matemática Aplicada, UIB
Student: Ariadna Martin
Mark: Excellent

Supervisor: **Jordà, G.; Gomis, D.**
Project title: Contrato Margarita Salas, MINECO
Posdoc: Camilo Melo

2021

Supervisores: **Jordà, G.; Amores, A.**
Título: Study of meteotsunamis with a high temporal resolution observational network in the Balearic Islands.
University issuing the qualification: Máster en Física Avanzada y Matemática Aplicada, UIB
Student: Joan Villalonga
Mark: Excellent

2020

Supervisor: **Marcos, M.**
Project title: Contrato competitivo postdoctoral UIB 2019
Postdoc: A. Amores

Supervisor: **Marcos, M.**
Project title: Contrato competitivo postdoctoral CAIB 2019
Postdoc: A. Amores

2019

Supervisor: **Marcos, M.**
Project title: Impactos medioambientales y económicos del cambio climático en las costas españolas
Type of Project: Tesis Doctoral
Student: Alejandra Rodríguez Enríquez
University issuing the qualification: Universidad de las Islas Baleares. Facultad de Ciencias

Supervisor: **Marcos, M.**
Project title: Estimation of uncertainties in coastal risks assessments.
Type of Project: Trabajo de Investigación.
Student: Corentin Cariou
University issuing the qualification: Ecole National Supérieur de Techniques Avancées Bretagne

Supervisor: **Marcos, M.**
Project title: Numerical simulation of a medicane in wind-wave field.
Type of Project: Trabajo de Investigación.
Student: Adrien Rosier.
University issuing the qualification: Ecole National Supérieur de Techniques Avancées Bretagne

Supervisor: **Jordà, G., Gomis, D.**
Project title: Contrato Titulado Superior del Programa "Empleo Joven", MINECO
Predoc: Joaquim Tomàs / Aida Frank

PhD Review committees

2022

Marcos, M. PhD thesis committee: The contribution of short-waves to storm surges in coastal zones. Laura LAvaud, Université de La Rochelle, January 2022

Marcos, M. PhD thesis committee: Projections régionales haute-résolution spatiale du niveau de la mer sur les côtes d'Europe de l'Ouest sur le 21ème siècle. Alisée Chaigneau, Université de Toulouse, December 2022

2020

Marcos, M. PhD thesis committee: "Global warming impact on transitional coastal environments: a methodology for knowledge-based management and decision making", Juan del Rosal Salido (Universidad de Granada), November 2020

Gomis, D. PhD thesis committee: "Els fluxos d'energia en el sistema acoblat oceà-atmosfera i el seu impacte en el clima de la Terra". Josep-Miquel Roca i Sans (Universitat Politècnica de Catalunya), november 2020.

Gomis, D.. PhD thesis committee: "Submesoscale dynamics in the Western Mediterranean Sea". Esther Capó Truyols (Univ. de les Iles Balears), January 2020.

2019

Marcos, M. PhD thesis committee: "Patterns of phytoplankton and primary production variability in the Mediterranean Sea based on remote sensing data", Paula M. Salgado (Universidad de las Islas Baleares). May 2019.

Scientific advisory committees

Marcos, M. Member of the GLOSS Advisory Committee (since July 2022)

Marcos, M. Member of the Committee of design the Marine Science Degree at UIB (2022)

Marcos, M. Member of the Advisory Committee of ClimEx (Evolution of extreme sea levels in the contaxt of climate change), ANR France (2022-2025)

Marcos, M. Member of the JPI knowledge hub (KH) on sea level rise (since 2021)

Marcos, M. Member of WCRP Grand Challenge on Regional Sea Level Change and Coastal Impacts (03/2020-07/2022)

Marcos, M. Comité Scientifique de l'Infrastructure de recherche Littorale et Cotière (ILICO). Entidad de la que depende: IFREMER. (10/2017-)

Marcos, M. Comité de Expertos para el "Pla Litoral de Ponent". Ajuntament de Palma. (05/2016-)

Marcos, M. Member of EuroGOOS Tide Gauges Task Team (2015-)

Gomis, D. Member of the MedCLIVAR SG (2012-2023)

Gomis, D. Comité Científico de la Agencia de la Reserva de la Biosfera de Menorca, CIM (2009-)

Gomis, D. Consell Balear del Clima, CAIB (2021-)

Jordà, G. Comité de expertos sobre Cambio Climático, CAIB. (2021-)

Editorial Boards

Marcos, M. Member of the Editorial Board (Specialty Chief Editor) of Frontiers in Marine Science. Section Coastal Ocean Processes. 2017-