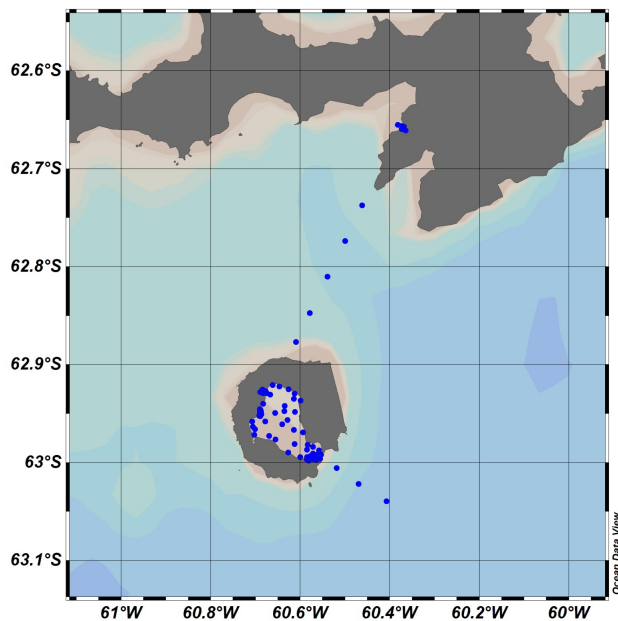


ANNUAL REPORT ON GEOTRACES ACTIVITIES IN SPAIN

May 1st, 2024 to April 30th, 2025

GEOTRACES or GEOTRACES relevant cruises

- DICHOSO project: Contribution of Water Masses of **Deception Island** to biogeochemical inventories of the **Southern Ocean**: current budgets and future trends. IP: Antonio Tovar-Sánchez & Isabel Emma Huertas Cabilla. Second Campaign: January 15 – February 17, 2025. Deception Island, Antarctic.



New projects and/or funding

- Spanish Science Foundation (AEI). Seeking the accurate quantification of the Particulate Organic Carbon Sink in the ocean (SPOCK). From: 01/09/2024 to: 31/08/2027. 210 000 €
- IMPLACOST (1/MAC/2/2.4/0009) 2025-2028 <https://proyectoimplacost.org/>
- PLANCLIMAC2 (1/MAC/2/2.4/0006) 2025-2028 <https://proyectoplanclimac2.org/>

Outreach activities conducted (please list any outreach/educational material available that could be shared through the GEOTRACES web site) (We are particularly interested in recordings from webinars from GEOTRACES research)

- Villa-Alfageme, M., 2024. Observing and measuring the biological pump: building a global database. A History forum for Science, Strategy, and Environment in the Mediterranean. On-line. Published in You Tube. November 2024.
- Villa-Alfageme, M., 2025. Guardián del carbono: Océano y cambio climático, in: Pint of Science. Sevilla, May 2025
- BLOG (<https://eacfe-quima.blogspot.com/>)
- Feria Internacional del Mar (FIMAR)

- Coussy, V. (2025). La importancia de saber más sobre los ciclos de metales en el océano. *Feria Internacional del Mar (FIMAR)*
- Suárez Betancor, L. (2025). Los Ligandos y el Hierro: Un binomio fundamental para la vida en los océanos. *Feria Internacional del Mar (FIMAR)*
- Miniferia de la Ciencia y la Innovación en Canarias 2025, La Palma, 22/05/2025-24/05/2025.

New GEOTRACES or GEOTRACES-relevant publications (published or in press) (If possible, please identify those publications acknowledging SCOR funding)

- Santos-Echeandía, J., Bernárdez, P., Orellana, J.G., Rodellas, V., Bruach, J.M., Cartes, J.E., 2025. Unravelling the anthropogenic pressures in deep waters of the N Iberian Peninsula in the last centuries through the study of sediment cores. *Science of the Total Environment*, 975, 179221. <https://doi.org/10.1016/j.scitotenv.2025.179221>
- Gema Ruiz-Gutiérrez, Erica Sparaventi, Berta Galan Corta, Antonio Tovar-Sánchez, Javier R. Viguri Fuente. Kinetic and equilibrium analysis of penguin guano trace elements release to Antarctic seawater and snow meltwater. **Science of the Total Environment**, 174684, 2024. <https://doi.org/10.1016/j.scitotenv.2024.174684>
- Oleg Belyaev, I. Emma Huertas, Gabriel Navarro, Silvia Amaya Vías, Mercedes De La Paz, Erica Sparaventi, Sergio Heredia, Camila F. Sukekava, Luis M. Laglera, Antonio Tovar-Sanchez. Hydrothermal alteration of seawater biogeochemistry in Deception Island (South Shetland Islands, Antarctica). **Frontiers in Marine Science**. Volume 11. 2024. <https://doi.org/10.3389/fmars.2024.1432122>
- Petiteau, L., Boyd, P.W., Villa-Alfageme, M., Vioque, I., Le Moigne, F.A.C., Baker, K., Lacour, L., Rohr, T., Strzepek, R.F., Bressac, M., 2025. Microbial remineralization is a depth - varying contributor to particle flux attenuation in the Southern Ocean. *Global Biogeochem. Cycles* Accepted.
- Williams, J.R., Giering, S.L.C., Baker, C.A., Pabortsava, K., Briggs, N., East, H., Espinola, B., Blackbird, S., Le Moigne, F.A.C., Villa-Alfageme, M., Poulton, A.J., Carvalho, F., Pebody, C., Saw, K., Moore, C.M., Henson, S.A., Sanders, R., Martin, A.P., 2025. Inefficient transfer of diatoms through the subpolar Southern Ocean twilight zone. *Nat. Geosci.* 18, 72–77. <https://doi.org/10.1038/s41561-024-01602-2>
- Major, W., Giering, S.L.C., Ainsworth, J., Belcher, A., Blackbird, S., Bridger, M., Briggs, N., Carvalho, F., Clément, L., Cook, K., Dumousseaud, C., Espinola, B., Evans, C., Fielding, S., Hartmann, M., Henson, S., Iversen, M., Kiriakoulakis, K., Lampitt, R., Lovecchio, E., Martin, A., Mayor, D., Moore, M., Pabortsava, K., Pebody, C., Peel, K., Preece, C., Poulton, A., Rayne, R., Saw, K., Stinchcombe, M., Stowasser, G., Tarling, G.A., Thomalla, S., Villa-Alfageme, M., Wolff, G.A., Sanders, R., 2024. Active and passive organic carbon fluxes during a bloom in the Southern Ocean (South Georgia). *Sci. Data* 11, 1392. <https://doi.org/10.1038/s41597-024-04151-w>
- Arnone, V., Santana-Casiano, J. M., González-Dávila, M., Sarthou, G., Krisch, S., Lodeiro, P., ... & González, A. G. (2024). Distribution of copper-binding ligands in Fram Strait and influences from the Greenland Shelf (GEOTRACES GN05). *Science*

of the Total Environment, 909, 168162.
<https://doi.org/10.1016/j.scitotenv.2023.168162>

- Baudet, C., Bucciarelli, E., Sarthou, G., Boulart, C., Pelleter, E., Goddard-Dwyer, M., ... & Planquette, H. (2024). A hydrothermal plume on the Southwest Indian Ridge revealed by a multi-proxy approach: Impact on iron and manganese distributions (GEOTRACES GS02). Marine Chemistry, 265, 104401.
<https://doi.org/10.1016/j.marchem.2024.104401>
- Chowdhury, S., Berthelot, H., Baudet, C., González-Santana, D., Reeder, C. F., l'Helguen, S., ... & Benavides, M. (2024). Fronts divide diazotroph communities in the Southern Indian Ocean. FEMS Microbiology Ecology, 100(8), fiae095.
<https://doi.org/10.1093/femsec/fiae095>
- González-Dávila, M., Maldonado, M. T., González, A. G., Guo, J., González-Santana, D., Martel, A., & Santana-Casiano, J. M. (2024). Cu transport and complexation by the marine diatom *Phaeodactylum tricornutum*: Implications for trace metal complexation kinetics in the surface ocean. Science of the Total Environment, 919, 170752.
<https://doi.org/10.1016/j.scitotenv.2024.170752>
- González-Santana, D., González-Dávila, M., González, A. G., Medina-Escuela, A., Fariña, D., & Santana-Casiano, J. M. (2024). Hot spot volcano emissions as a source of natural iron fertilization in the ocean. Science of the Total Environment, 957, 177638.
<https://doi.org/10.1016/j.scitotenv.2024.177638>
- González-Santana, D., Segovia, M., González-Dávila, M., Ramírez, L., González, A. G., Pozzo-Pirotta, L. J., ... & Santana-Casiano, J. M. (2024). Ocean alkalinity enhancement using sodium carbonate salts does not lead to measurable changes in Fe dynamics in a mesocosm experiment. Biogeosciences, 21(11), 2705-2715.
<https://doi.org/10.5194/bg-21-2705-2024>

Completed GEOTRACES PhD or Master theses (please include the URL link to the pdf file of the thesis, if available)

- TITLE: The Role of Penguins in the Recycling of Trace Metals in Antarctica and Their Ecological Impact
PhD CANDIDATE: Erica Sparaventi
UNIVERSITY: CSIC / University of Cádiz
FACULTY/SCHOOL: ICMAN
SUPERVISORS: Antonio Tovar-Sánchez, Araceli Rodríguez Romero
Place, Date: Puerto Real, December 2, 2024
GRADE: Pass – Outstanding
- TITLE: Development of a new radiochemical method for carbon flux measurement in the North Atlantic
MASTER CANDIDATE: A. Rodríguez López
UNIVERSITY: University of Sevilla
SUPERVISORS: María Villa Alfageme
Place, Date: Sevilla, 2025
GRADE: Pass – Outstanding

- TITLE: Distribution of trace metals along the saline gradient in the Vigo Ría: influence of dissolved organic matter
MASTER CANDIDATE: Mauro Mosquera Regueiro
UNIVERSITY: CSIC-IEO / University of Vigo
SUPERVISORS: Juan Santos Echeandía, Paula Sánchez Marín
Place, Date: Vigo, July 2024
GRADE: Pass – Outstanding

GEOTRACES presentations in international conferences

- TITLE: Dissolved REEs in the River Ulla basin: sources and transport to the Ría of Arosa (NW Iberian Peninsula).
AUTHORS: Prego, R., G. Farinango, M.A. Álvarez-Vázquez
CONGRESS: 24-ISMS (International Symposium on Marine Science). XXII-SIQUIMAR (Seminario Ibérico de Química Marina)
PLACE: Valencia, 10-12th July 2024
- TITLE: DEveloping rePOsitories for CARBON export quantification in the ocean
AUTHORS: Villa-Alfageme, M., Vioque, I., Gonzalez-Gonzalez, B., Abascal-Ruiz, U., López-Rodríguez, Á., Hurtado-Bermúdez, S.J.
CONGRESS: Innovazul Forum 2024
PLACE: Cádiz, Spain, 21st November 2024
- TITLE: Analysis of Export and Transfer Efficiency around the PAP-Site Observatory: an update from the APERO project. <https://doi.org/10.5194/egusphere-egu25-13345>
AUTHORS: López Rodríguez, Á., González González, B., Hurtado Bermúdez, S., Le Moigne, F., Gesson, M., Villa Alfageme, M.
CONGRESS: EGU Gen. Assembly 2025
PLACE: Vienna, Austria April 2025
- TITLE: Parameterization of sinking velocity rates in the Atlantic Ocean. <https://doi.org/10.5194/egusphere-egu25-5016>
AUTHORS: Villa-Alfageme, M., Melgar, L., López-Rodríguez, Á., Abascal-Ruiz, U., González-González, B.
CONGRESS: EGU Gen. Assembly 2025
PLACE: Vienna, Austria April 2025
- TITLE: The Diatom Disconnect: Retention near surface waters limits carbon transfer to the deep ocean. <https://doi.org/10.5194/egusphere-egu25-19855>
AUTHORS: Giering, S.L.C., Williams, J.R., Baker, C., Pabortsava, K., Blackbird, S., Martin, A., Poulton, A., Briggs, N., Carvalho, F., Le Moigne, F., Villa-Alfageme, M., Henson, S., Espinola, B., Iversen, M., Liu, Z., Moore, M., Passow, U., Romanelli, E., Thevar, T., Sanders, R.
CONGRESS: EGU Gen. Assembly 2025

PLACE: Vienna, Austria April 2025

- TITLE: Comparison of voltametric methods to determine the chemical speciation of dissolved copper in seawater

AUTHORS: Maria Sol Hernández-Conesa, Xosé Antón Álvarez-Salgado, Mar Nieto-Cid, Juan Santos-Echeandía, Paula Sánchez-Marín

CONGRESS: 24-ISMS (International Symposium on Marine Science). XXII-SIQUIMAR (Seminario Ibérico de Química Marina)

PLACE: Valencia, 10-12th July 2024

- TITLE: Dissolved iron cycling in the Mar Menor (SE Spain) under different singular environmental events: levels and organic speciation.

AUTHORS: Juan Santos-Echeandía, Maria Pilar Ponce Roa, Aridane G. González, Geraldine Sarthou, Paula Sánchez-Marín

CONGRESS: 24-ISMS (International Symposium on Marine Science). XXII-SIQUIMAR (Seminario Ibérico de Química Marina)

PLACE: Valencia, 10-12th July 2024

- TITLE: Two years of monitoring the Fe (II) oxidation rate constants in coastal seawater affected by the La Palma eruption (No. EGU25-6045).

AUTHORS: Bullón-Téllez, A., Santana-Casiano, J. M., González-Santana, M., González, A. G., & González-Santana, D.

CONGRESS: Copernicus Meetings. EGU Gen. Assembly 2025

PLACE: Vienna, Austria April 2025

- TITLE: Evolution of the Fe(II) oxidation kinetic constants after the 2021 La Palma eruption

AUTHORS: Bullón-Téllez, A., Santana-Casiano, J.M., González-Dávila, M., González, A.G., & González-Santana, D.

CONGRESS: 24-ISMS (International Symposium on Marine Science). XXII-SIQUIMAR (Seminario Ibérico de Química Marina)

PLACE: Valencia, 10-12th July 2024

- TITLE: Iron binding ligands in the southern ocean, winter and spring (Scale cruise 2019).

AUTHORS: Coussy, V. P. J., Santana-Casiano, J. M., González-Dávila, M., González-Santana, D., Mtshali, T., Ryan-Keogh, T., & González González, A.

CONGRESS: 24-ISMS (International Symposium on Marine Science). XXII-SIQUIMAR (Seminario Ibérico de Química Marina)

PLACE: Valencia, 10-12th July 2024

- TITLE: Multiparametric study to understand the coastal blue carbon in the Canary Islands (No. EGU25-7272).

AUTHORS: González, A. G., González-Santana, D., Castro-Álamo, A., Curbelo-Hernández, D., Santana-Casiano, J. M., Bullón-Téllez, A., ... & González-Dávila, M.

CONGRESS: Copernicus Meetings. EGU Gen. Assembly 2025

PLACE: Vienna, Austria April 2025

- TITLE: Volcanic Eruptions as Drivers of Coastal Iron Fertilization (No. EGU25-9497).
AUTHORS: González-Santana, D., González-Dávila, M., González, A. G., Medina-Escuela, A., Fariña, D., & Santana-Casiano, J. M.
CONGRESS: Copernicus Meetings. EGU Gen. Assembly 2025
PLACE: Vienna, Austria April 2025
- TITLE: Evolution of iron size fractionation in surface waters during an aerial volcanic eruption.
AUTHORS: González Santana, D., González-Dávila, M., González, A. G., & Santana-Casiano, J. M.
CONGRESS: 24-ISMS (International Symposium on Marine Science). XXII-SIQUIMAR (Seminario Ibérico de Química Marina)
PLACE: Valencia, 10-12th July 2024
- TITLE: Fe response in an acidified ocean. FeRIA Project (No. EGU25-8284).
AUTHORS: Santana-Casiano, J. M., González-Dávila, M., González, A. G., Bullón-Téllez, A., Castro-Álamo, A., Coussy, V., ... & González-Santana, D.
CONGRESS: Copernicus Meetings. EGU Gen. Assembly 2025
PLACE: Vienna, Austria April 2025
- TITLE: Fe (III) reduced to Fe (II) by Tryptophan in seawater.
AUTHORS: Suárez Betancor, L., González-Santana, D., González, A. G., González-Dávila, M., & Santana-Casiano, J. M.
CONGRESS: 24-ISMS (International Symposium on Marine Science). XXII-SIQUIMAR (Seminario Ibérico de Química Marina)
PLACE: Valencia, 10-12th July 2024
- TITLE: Spectrophotometric measurements to know the role of individual organic ligands on the Fe redox chemistry in seawater
AUTHORS: Suárez Betancor, L., González-Santana, D., González, A.G., González-Dávila, M., & Santana-Casiano, J. M.
CONGRESS: Ocean Optics XXVI
PLACE: Las Palmas de Gran Canaria, Spain, 6-11 October 2024.
- TITLE: Fe(II) regeneration by Tryptophan in seawater at nanomolar levels (No. EGU25-4064).
AUTHORS: Suárez-Betancor, L., González, A.G., González-Dávila, M., & Santana-Casiano, J.M.
CONGRESS: Copernicus Meetings. EGU Gen. Assembly 2025
PLACE: Vienna, Austria April 2025