

ANNUAL REPORT ON GEOTRACES ACTIVITIES IN SPAIN

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National collaborators

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- Samples for artificial (i.e. ^{236}U , Pu isotopes, ^{137}Cs , ^{90}Sr , ^{129}I) and natural (i.e. ^7Be , ^{210}Po and ^{210}Pb) radionuclides from French GEOVIDE cruise (May- 2014) to undertake an integrated oceanographic transect in the North Atlantic Ocean and Labrador Sea (GEOTRACES GA01 section) are in process.
- Participation in the German cruise PS94 (GEOTRACES GN04) on August 2015 to undertake an integrated oceanographic transect in the Arctic Ocean collecting samples and collaborating with other groups to measure artificial (i.e. ^{236}U , Pu isotopes, ^{129}I) and natural (i.e. ^{234}Th , ^{210}Po and ^{210}Pb) radionuclides. Samples are in process.
- Participation in the Eddies cruise (GEOTRACES GPpr11) on board RV Investigator collecting samples for Th-234 in order to evaluate exportation and remineralization of C.

GEOTRACES-related projects

- PROJECT TITLE: Nuevos Retos en la investigación de cañones submarinos: Indicadores del Estado ambiental y Variabilidad espacio- temporal – El papel de los temporales (NUREIEV). IP: Miquel Canals (U. of Barcelona). Funded by Ministerio de Economía y Competitividad, CTM2013-44598-R.
- PROJECT TITLE: Mezcla y Dispersión en el Transporte de Energía y Solutos (MeDistraes). IP: Jesus Carrera y Maaten W Saaltink. Funded by Ministerio de Economía y Competitividad. CGL2013-48869-C2-2-R, 2014-2016.
- PROJECT TITLE: Effect of the ocean acidification and warming in the biogeochemical cycle of Fe in the North Atlantic. IP: J. Magdalena Santana-Casiano, M. González-Dávila (ULPGC). Funded by Ministerio de Economía y Competitividad. CTM2014-53342-P.
- PROJECT TITLE: Aportes de metales traza a la zona costera durante diferentes períodos oceanográficos. Influencia del fitoplancton sobre la concentración de metales traza (MEFIO). IP - Coordinator: C. García Soto (IEO). Funded by Ministerio de Economía y Competitividad. CTM2011-28792-C02-02.
- PROJECT TITLE: Estudio del contenido de metales traza en el golfo de Cádiz: influencia de los ríos Guadamar, Tinto, Odiel y Guadalquivir. IP: A. Tovar Sánchez (ICMAN). Funded by Ministerio de Economía y Competitividad. CTM2014-59244-C3-3-R.

- PROJECT TITLE: COST Action: Network On Technology-Critical Elements: From Environmental Processes To Human Health Threats. IP: A. Cobelo García (IIM). Funded by European Union (H2020).

GEOTRACES-related articles

- Casacuberta, N., Masqué, P., Henderson, G., Rutgers van-der-Loeff, M., Bauch, D., Vockenhuber, C., Daraoui, A., Walther, C., Synal, H.-A., and Christl, M. (2016). First data of ^{236}U in the Arctic Ocean and implications of using $^{236}\text{U}/^{238}\text{U}$ and $^{129}\text{I}/^{236}\text{U}$ as a new dual tracer. *Earth and Planetary Science Letters*, 440, 127-134.
- A. López, M. Rico, J. M. Santana-Casiano, A. G. González and M. González-Dávila. 2015. Phenolic profile of *Dunaliella tertiolecta* growing under high levels of copper and iron. *Environ. Sci. Pollution Res.* 22: 14820-14828.
- A. G. González, N. Pérez-Almeida, J. M. Santana-Casiano, F. J. Millero and M. González-Dávila 2016. Redox interaction of Fe and Cu in seawater. *Mar. Chem.* 179:12-22.
- G. Samperio, J. M. Santana-Casiano and M. González-Dávila. 2016. Effect of ocean warming and acidification on the Fe(II) oxidation rate in oligotrophic and eutrophic natural waters. *Biogeochemistry*. DOI 10.1007/s10533-016-0192-x.
- Almécija, C., Sharma, M., Cobelo-García, A., Santos-Echeandía, J., Caetano, M. 2015. Osmium and platinum decoupling in the environment: evidences in intertidal sediments (Tagus Estuary, SW Europe). *Environmental Science and Technology*, 49: 6545–6553. Doi: 10.1021/acs.est.5b00591.
- Cervantes-Duarte, R., Prego, R., Gaxiola-Castro, G., López-López, S., Aguirre-Bahena, F., Murillo-Murillo, I. 2015. Half-yearly patterns of upwelling and primary production in the euphotic zone of the shelf off southern Baja California. *Estuarine, Coastal and Shelf Science*, 157: 51-58. doi: 10.1016/j.ecss.2015.02.008.
- Cobelo-García, A., Filella, M., Croot, P., Frazzoli, C., Du Laing, G., Ospina-Alvarez, N., Rauch, S., Salaun, P., Schäfer, J., Zimmermann, S. 2015. COST Action TD1407: network on technology critical elements (NOTICE) – from environmental processes to human health threats. *Environmental Science and Pollution Research*, 22: 15188-15194. doi: 10.1007/s11356-015-5221-0.
- Neira, P., Cobelo-García, A., Besada, V., Santos-Echeandía, J., Bellas, J. 2015. Evidence of increased anthropogenic emissions of platinum: time-series analysis of mussels (1991-2011) of an urban beach. *Science of the Total Environment*, 514: 366-370. doi: 10.1016/j.scitotenv.2015.02.016 .
- Trezzi G, Garcia-Orellana J, Santos-Echeandía J, Rodellas V, Garcia-Solsona E, García-Fernández G, Masque P. 2016. The influence of a metal-enriched mining waste deposit on submarine groundwater discharge to the coastal sea. *Marine Chemistry* 178, 35-45.
- Bokuniewicz H, Cochran JK, Garcia-Orellana J, Rodellas V, Daniel JWR, Heilbrun C. 2015. Intertidal Percolation through Beach Sands as a Source of ^{224}Ra to Long Island Sound, New York and Connecticut, U.S.A. *Journal of Marine Research* 73, 127 – 140.
- Trezzi G., Garcia-Orellana J, Rodellas V, Santos-Echeandía J, Tovar-Sanchez J, Garcia-Solsona E, Masque P. Relevance of submarine groundwater discharge as a source of dissolved trace metals to the North Western Mediterranean Sea. *Marine Chemistry*, Submitted.

- Álvarez-Vázquez, M.A., Prego, R., Caetano, M., 2015. Fluvial transport patterns of dissolved trace metals to the Ria of Cedeira. En: Panorámica Interdisciplinar sobre el Agua (P. Membiela, N. Casado & M.I. Cebreiros, Eds.), pp. 53-57. Educación Editora, ISBN: 978-84-15524-23-6. Digital CSIC: <http://hdl.handle.net/10261/110021>.

Contributions to conferences

- Shelley, R., Roca-Martí, M., Castrillejo, M., Masque, P. and Santhou, G. (2016). CT11A-07: Estimation of Trace Element Atmospheric Deposition Fluxes to the Atlantic Ocean (> 40°N) During Spring 2014 (GEOVIDE, GEOTRACES GA01). AGU-ASLO 2016 Ocean Sciences Meeting. 21-26 February 2016, New Orleans (USA).
- Christl, M., Casacuberta, N., Henderson, G.M., Rutgers van der Loeff, M., Vockenhuber, C., - Bauch, D. and Walther, C. (2016). T14B-0129: Artificial Radionuclides (236U and 129I) in the Arctic and North Atlantic Ocean. AGU-ASLO 2016 Ocean Sciences Meeting. 21-26 February 2016, New Orleans (USA).
- Tang, Y., Stewart, G., Masque, P., Church, T.M., Castrillejo, M. and Choi, H.Y. (2016). T24A-0143: The Relationship Between Particulate Composition and 210Po and 210Pb Content along Three GEOTRACES Transects. AGU-ASLO 2016 Ocean Sciences Meeting. 21-26 February 2016, New Orleans (USA).
- The emissions of the submarine volcano of El Hierro Island and the effect on the physico-chemical properties of seawater. J. M. Santana-Casiano, M. González-Dávila, E. Fraile-Nuez. VIII SIMPOSIO SOBRE EL MARGEN IBÉRICO ATLÁNTICO (MIA15), 21 - 23 September 2015, Málaga.
- Persistence of Fe(II) in seawater due to the effect of organic exudates from D. Tertiolecta. Aridane G. Gonzalez, J. Magdalena Santana-Casiano, M. Gonzalez-Davila, M. Rico, A. Lopez, N. Perez-Almeida, M. Soares de Tangil, A. Martel. Ocean Sciences Meeting, 21-26 February 2016, New Orleans.
- C. Almécija, A. Cobelo-García, M. Sharma, J. Santos-Echeandía, M. Caetano. Contrasting geochemical behaviour and sources of osmium and platinum in the environment as revealed from intertidal sediments. Oral. 13th International Estuarine Biogeochemistry Symposium (13th IEBS). Burdeos (Francia). 7-10 Junio 2015.
- M. Abdou, J. Schäfer, A. Cobelo-García, P. Neira, J. Petit, D. Auger, G. Blanc, J.-F. Chiffolleau. Long-term records of platinum contamination and sources in sediments and oysters from a fluvial-estuarine system (Gironde estuary, SW France). Poster. 13th International Estuarine Biogeochemistry Symposium (13th IEBS). Burdeos (Francia). 7-10 Junio 2015.
- M.A. Álvarez-Vázquez, M. Caetano, M^a.C. Pedrosa-García, S. Calvo, E. de Uña-Álvarez, B. Quintana, C. Vale, R. Prego. Natural and human enrichment of trace elements in estuarine sediments during the Anthropocene in the northwestern Iberian rias. Oral. ECSA 55 Unbounded boundaries and shifting baselines: Estuaries and coastal seas in a rapidly changing world. London (U.K.). 6-9 September 2015.
- R. Prego, M.A. Álvarez-Vázquez, M.D. Doval, J. Santos-Echeandía, E. de Uña-Álvarez, A. Cobelo-García and C. García-Soto. Land-Sea exchange of nutrient salts and organic matter in a small ria: anthropogenic disturbance of river contributions and ria budget implications. Poster. ECSA 55 Unbounded boundaries and shifting baselines: Estuaries and coastal seas in a rapidly changing world. London (U.K.). 6-9 September 2015.

- A. Cobelo-García, C. Almécija-Pereda, J. Santos-Echeandía, J. Schäfer, P. Neira, M. Abdou. The environmental geochemistry of platinum: recent advances for an emerging inorganic contaminant. Conferencia plenaria (invitado). 10th International Conference – Processes in Isotopes and Molecules. Cluj-Napoca (Rumania). 23-25 Septiembre 2015.
- V. Rodellas, J. Garcia-Orellana, P. Masqué, M. Feldman, Y. Weinstein. Evaluating Submarine Groundwater Discharge as a source of nutrients to the Mediterranean Sea using ²²⁸Ra. Goldschmidt 2015, Prague 16-21 August 2015.
- M. Castrillejo, N. Casacuberta, M. Christl, J. Garcia-Orellana, P. Masqué, C. Vockenhuber, H. A. Synal.. First transect of ²³⁶U and ¹²⁹I in the Mediterranean Sea. Goldschmidt 2015, Prague 16-21 August 2015.
- J. Scholten, J. Garcia-Orellana, P. Masque, C. Rocha, M. Schlüter, T. Stieglitz, P. van Beek. Submarine groundwater discharge in Europe and effects on coastal zones. Euromarine Foresight Symposium "Future Coast – Europe. Berlin-Brandenburg Academy of Sciences and Humanities (BBAW), from the 5th to the 7th of October 2015.

PhD defenses

- Giada Trezzi. Assessing the significance of submarine groundwater discharge as source of trace metals and Sr to the Mediterranean Sea. Advisors: Jordi Garcia-Orellana and Pere Masqué. Universitat Autònoma de Barcelona. 29/07/2016.
- Clara Almécija-Pereda. Geochemical behaviour and sources of platinum group elements in anthropogenically-impacted sediments. Advisors: Antonio Cobelo Garcia and Juan Santos Echeandía. Universidade de Vigo 29/5/2015.

Other cruises

- VULCANA1015. Vulcanología Canaria Submarina. Organized by Instituto Español de Oceanografía. From October 13th to 23th, 2015 in the area of the submarine volcano of El Hierro. Chemical parameters measured: pH, total alkalinity, total dissolved inorganic carbon, Fe(II) and O₂.
- POS494. Submarine volcano of El Hierro. Organized by GEOMAR, Kiel. From February 7th to 15th, 2016. Chemical parameters measured: Fe(II) and pH.
- VULCANA0316. Vulcanología Canaria Submarina. Organized by Instituto Español de Oceanografía. From March 7th to 17th, 2016 in the area of the submarine volcano of El Hierro. Chemical parameters measured: pH, total alkalinity, total dissolved inorganic carbon, Fe(II) and O₂.

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