

ANNUAL REPORT ON GEOTRACES ACTIVITIES IN IRELAND (ÉIRE)

June 1st, 2015 to April 30th, 2016

National and international service

- Ireland is represented on the International GEOTRACES Standards and Intercalibration committee by Prof. Peter Croot (also the national contact for GEOTRACES and IMBER).

New Results

- Titanium in the South Pacific: New data from a transect across the South Pacific during Sonne expedition SO245 indicates that Ti may be scavenged by iron from hydrothermal vents. Dissolved titanium across this transect was extremely low in surface waters indicating the lack of dust inputs in this region.
- Radium Quartet in the North East Atlantic: Measurements of the Radium quartet were undertaken during CE15011 in the North East Atlantic. Samples for ^{223}Ra , ^{224}Ra and ^{226}Ra were measured using a RADDEC and ^{228}Ra is being assessed by ^{224}Ra in-growth over time. Preliminary data indicate higher concentrations of ^{223}Ra and ^{224}Ra in the vicinity of the Irish continental shelf and particularly close to the Porcupine margin with lowest concentrations in the Rockall Trough. ^{227}Ac appears to be extremely low throughout this region based on measurements of the supported ^{223}Ra .

Cruises

- NUIG participated in the recent GEOTRACES process cruise SO245 onboard the *RV Sonne* from Antofagasta, Chile to Wellington, New Zealand (Dec 2015 – Jan 2016). Unfortunately, due to contamination problems with the pump CTD (previously used in the Baltic for clean Trace Metal work) no clean Fe samples were obtained (onboard analysis using FIA with luminol chemiluminescence with good performance for SAFe and GEOTRACES samples), however samples for other less contamination prone metals were taken. Shipboard measurements of Titanium from the normal CTD were made across the transect using an established voltammetric method.
- The radium quartet was measured in the North East Atlantic during Celtic Explorer expedition CE15011. This work forms part of an iCRAG (www.icrag-centre.org) project using radium isotopes to follow shelf exchange processes for CDOM and trace metals along the western continental shelf of Ireland. A further cruise is planned for October 2016 to carry out more inshore work.

Other activities

- Contribution to European Marine Board position paper on Deep-sea research: Prof Peter Croot was a co-author on the position paper that was launched in Sept 2015 in Aveiro, Portugal. More details can be found on the web at <http://www.marineboard.eu/deep-sea-research>, including links to the position paper and policy brief.

- COST Action TD1407: Network on technology-critical elements (NOTICE), Prof Peter Croot is a co-chair of WG1 which is involved in intercalibration efforts for TCEs (e.g. REE, Pt group etc).
- The Marine Institute (Oranmore) is developing expertise for determination of trace metals in marine, coastal and transitional waters (V, Cr*, Mn, Co, Ni*, Cu*, Zn*, As*, Ag*, Cd*, Pb*, U) quantification by Agilent ICP-MS 7700x, *= INAB accreditation, all other metals are fully validated and ready for accreditation in 2017, Hg by CVAFS (Gold trap) currently in validation process with accreditation expected in 2017 (for more details contact: andrew.morrissey@marine.ie).

New publications (involving GEOTRACES researchers in Ireland):

- 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 (19), 15188-15194.
- Mawji, E., Schlitzer, R., Dodas, E.M., Abadie, C., Abouchami, W., Anderson, R.F., Baars, O., Bakker, K., Baskaran, M., Bates, N.R., Bluhm, K., Bowie, A., Bown, J., Boye, M., Boyle, E.A., Branellec, P., Bruland, K.W., Brzezinski, M.A., Bucciarelli, E., Buesseler, K., Butler, E., Cai, P., Cardinal, D., Casciotti, K., Chaves, J., Cheng, H., Chever, F., Church, T.M., Colman, A.S., Conway, T.M., Croot, P.L., Cutter, G.A., de Baar, H.J.W., de Souza, G.F., Dehairs, F., Deng, F., Dieu, H.T., Dulaquais, G., Echegoyen-Sanz, Y., Lawrence Edwards, R., Fahrbach, E., Fitzsimmons, J., Fleisher, M., Frank, M., Friedrich, J., Fripiat, F., Galer, S.J.G., Gamo, T., Solsona, E.G., Gerringa, L.J.A., Godoy, J.M., Gonzalez, S., Grossteffan, E., Hatta, M., Hayes, C.T., Heller, M.I., Henderson, G., Huang, K.-F., Jeandel, C., Jenkins, W.J., John, S., Kenna, T.C., Klunder, M., Kretschmer, S., Kumamoto, Y., Laan, P., Labatut, M., Lacan, F., Lam, P.J., Lannuzel, D., le Moigne, F., Lechtenfeld, O.J., Lohan, M.C., Lu, Y., Masqué, P., McClain, C.R., Measures, C., Middag, R., Moffett, J., Navidad, A., Nishioka, J., Noble, A., Obata, H., Ohnemus, D.C., Owens, S., Planchon, F., Pradoux, C., Puigcorbé, V., Quay, P., Radic, A., Rehkämper, M., Remenyi, T., Rijkenberg, M.J.A., Rintoul, S., Robinson, L.F., Roeske, T., Rosenberg, M., van der Loeff, M.R., Ryabenko, E., Saito, M.A., Roshan, S., Salt, L., Sarthou, G., Schauer, U., Scott, P., Sedwick, P.N., Sha, L., Shiller, A.M., Sigman, D.M., Smethie, W., Smith, G.J., Sohrin, Y., Speich, S., Stichel, T., Stutsman, J., Swift, J.H., Tagliabue, A., Thomas, A., Tsunogai, U., Twining, B.S., van Aken, H.M., van Heuven, S., van Ooijen, J., van Weerlee, E., Venchiarutti, C., Voelker, A.H.L., Wake, B., Warner, M.J., Woodward, E.M.S., Wu, J., Wyatt, N., Yoshikawa, H., Zheng, X.-Y., Xue, Z., Zieringer, M., Zimmer, L.A., 2015. The GEOTRACES Intermediate Data Product 2014. *Marine Chemistry* 177, Part 1, 1-8.
- McGrath, T., McGovern, E., Cave, R.R., Kivimäe, C., 2015. The Inorganic Carbon Chemistry in Coastal and Shelf Waters Around Ireland. *Estuaries and Coasts* 39 (1), 27-39.
- Rogers, A.D., Brierley, A., Croot, P., Cunha, M.R., Danovaro, R., Devey, C., Hoel, A.H., Ruhl, H.A., Sarradin, P.-M., Trevisanut, S., van den Hove, S., Vieira, H., Visbeck, M., 2015. Delving Deeper: Critical challenges for 21st century deep-sea research. . In: Larkin, K.E., Donaldson, K. and McDonough, N. (Ed.), Position Paper 22 of the European Marine Board, Ostend, Belgium. .