

Belgium

Meetings

- ASLO 2013, New Orleans:
 - Cavagna A.-J., B. Quéguiner, F. Planchon, S. Jacquet, I. Closet, F. Dehairs, Production regime and potential for carbon export in the naturally iron fertilised Kerguelen area (Southern Ocean).
 - Dehairs F., T. Trull, C. Fernandez, D; Davies, A.-J. Cavagna, A.E. Piniella, Nitrate isotopic composition in the Kerguelen area (Southern Ocean) during KEOPS 2.
 - Jacquet S., F. Dehairs, A.J. Cavagna, F. Planchon, Ivia Closset, D. Cardinal Seasonal variability of mesopelagic organic carbon remineralization in the naturally iron-fertilized Kerguelen area (Southern Ocean).
 - de Brauwere A. et al., Putting the pieces together: A multi-tracer model to quantitatively identify the major processes related to the fertilized bloom on the Kerguelen Plateau (Southern Ocean).
- GRC on polar oceans, Ventura, USA, March 2013:
 - Nitrogen isotopic distribution in Antarctic Sea Ice; poster by F. Fripiat.
- The 45th International Liège colloquium: Primary production in the ocean: From the synoptic to the global scale:
 - Cavagna A.-J. and F. Dehairs, Primary production and potential for carbon export in naturally iron-fertilized waters in the Southern Ocean.
 - Roukaerts A., Cavagna A.J., Dehairs F., Carbon and Nitrogen uptake rates in the East Antarctic sea-ice zone (SIPEX II preliminary results).
 - Fonseca Batista D., F. Dehairs, L. Brunelli, C. Gil-Fernandez, M. Rembauville, D. Ribicic, T. Schwenke, Fixed-nitrogen and atmospheric N₂ contribution to biological productivity along a North-South transect in the Eastern Atlantic Ocean.
- Goldschmidt Conference, Montreal, June 2012: Session on biogeochemical cycling of nutrients and metals in high latitude marine environments.
 - Nitrate ($\delta^{15}\text{N}$) isotopic distribution in Antarctic Sea Ice; poster by F. Fripiat.
- AGU fall meeting 2012, San Francisco: Session on Source, Sinks, and Speciation of marine micronutrient trace elements.
 - A. de Brauwere “Putting the pieces together: A multi-tracer model to quantitatively identify the major processes related to the fertilized bloom on the Kerguelen Plateau (Southern Ocean), poster.
- ASLO 2012, Lake Biwa (July 8-13):
 - Cavagna A.J., F. Dehairs, B. Quéguiner, C. Fernandez, M. Elskens, D. Lefèvre, Regimes of production and potential for carbon export in naturally iron-fertilized waters in the Southern Ocean.
- Symposium on Iron in the Oceans, 4 October 2012, Texel:
 - Schoemann, V., de Jong, J.T.M., Lannuzel, D., Hassler, C., Dellile, B., de Baar, H. Iron as a source of bioavailable iron to the Southern Ocean.
 - De Jong, J.T.M., Schoemann, V., de Baar, H., Lannuzel, D., Tison, J.-L., Mattielli, N. Dissolved and particulate Fe and Zn isotopes in Antarctic waters. Symposium on Iron in the Oceans, 4 October 2012. Texel, The Netherlands.
 - Rob Middag, R., Laan, P., Gerringa, L.J.A. van Aken, H.M., Schoemann, V., de Jong, J.T.M., van Haren, H., Hein J. W. de Baar, H.J.W. Sources and fluxes of Iron in the Atlantic Ocean; Symposium on Iron in the Oceans, 4 October 2012. Texel, The Netherlands. Oral presentation
- GEOTRACES Workshop – Stable isotopes of biologically important trace metals. 13-14 September 2012, London, UK:

Schoemann, V., de Jong, J.T.M., Lannuzel, D., Dellile, B., Chou, L., Becquevort, S., Mattielli, N., de Baar, H., Tison, J.L. Iron isotopes in Antarctic sea ice. Poster presentation. De Jong, J.T.M., Schoemann, V., de Baar, H., Tison, J.-L., Ackley, S., Mattielli, N. Dissolved and particulate Fe and Zn isotopes in the Bellingshausen Sea, Antarctica. Oral presentation.

- SOLAS Open Science Conference, 7- 10 May 2012, Cle Elum, WA, USA: Schoemann, V., Lannuzel, D., Delille, B., de Baar, H., Tison, J.-L. Sea ice as a source of bioavailable iron. Invited plenary talk. Schoemann, V., de Jong, J.T.M., Lannuzel, D., Dellile, B., Chou, L., Becquevort, S., Mattielli, N., de Baar, H., Tison, J.L. Iron stable isotopes : a tool to trace biological processes in Antarctic sea ice. Poster presentation.
- Goldschmidt Conference 2012, 24-29 June 2012, Montreal, Canada: De Baar, H., M. Rijkenberg, L. Gerringa, R. Middag, M. van Hulst, P. Laan, V. Schoemann, J. de Jong, A. Sterl, H. van Aken. Contrasting Biogeochemical Cycling of Iron and Aluminium along the GEOTRACES West Atlantic Section. Oral presentation.
- Ocean Sciences Meeting, 20-24 February 2012, Salt Lake City, Utah, USA: Hassler, C., L. Norman, R. Watson, M. Doblin, C. Nichols, G. McTainsh, L. Clementson, V. Schoemann. Impact of various iron sources to Tasman Sea phytoplankton: From bioavailability to community shift. Poster presentation.

Cruises

- Antarctic Winter Ecosystem & Climate Study ANT XXIX/6 (AWECS): 8 Jun-12 Aug 2013, Weddell Sea sector, RV Polarstern; trace metals (e.g. Fe, Cu, Zn, Mn, Cd) and isotopes (Fe, Zn) in sea ice, brines and seawater.
- Sea Ice Physics and Ecosystem eXperiment (SIPEX 2): Sep. - Nov. 2012; Australian-Antarctic Basin; R/V Aurora Australis; C, N uptake; nitrate isotopic composition
- European Universities and Research On board Polarstern in the Atlantic (EUROPA); Oct.-Nov. 2012; Bremerhaven – Cape Town; R/V Polarstern (ANT 29/1): C, N uptake; N₂ fixation; nitrate isotopic composition
- YROSIAE (Scott Base, Antarctica), Sea Ice in the McMurdo Sound, Nov. 2011-Dec. 2012: $\delta^{15}\text{N}$ (particulate nitrogen, total dissolvable nitrogen, ammonium, nitrate), $\delta^{18}\text{O}$ (nitrate), $\delta^{30}\text{Si}$ (biogenic silica, dissolved silicon), dissolved and particulate trace metals concentrations (e.g. Fe, Zn, Cu, Mn) and isotopic composition ($\delta^{56}\text{Fe}$ and $\delta^{66}\text{Zn}$).
- IceArc ARK XXVII/3 on board the RV Polarstern in central Arctic. 2 Aug-8 Oct 2012: dissolved and particulate trace metals concentrations (e.g. Fe, Zn, Cu, Mn) isotopic composition ($\delta^{56}\text{Fe}$ and $\delta^{66}\text{Zn}$).
- ICELIPIDS (Dumont D'Urville, Antarctica), Sea Ice in Terre Adélie, Apr. -Nov. 2011: $\delta^{15}\text{N}$ (particulate nitrogen, total dissolvable nitrogen, ammonium, nitrate), $\delta^{18}\text{O}$ (nitrate), $\delta^{30}\text{Si}$ (biogenic silica, dissolved silicon).

New funding

- Belgian Science Policy, Science for Sustainable Development programme; “BioGeochemical cycles in the SOUTHERN ocean: Role within the Earth System” (BIGSOUTH); 2011 – 2014.
- Flanders Research Foundation, “The biological carbon pump and role of diazotrophs in open ocean carbon export”; 2011-2014.
- Fonds de la Recherche Scientifique (FNRS), “Year-Round Ocean-Sea-Ice-Atmosphere Exchanges”; 2011-2013.

New results

- Primary production, new production, POC export and mesopelagic remineralisation in the (naturally) iron-fertilised Kerguelen area (KEOPS 2)
- N, O isotopic composition of whole water column nitrate in the Kerguelen area (KEOPS 2)
- Sea-ice primary production, NO₃, NH₄, Si uptake; N, O isotopic composition of sea-ice nitrate (SIPEX 2)
- Primary production, new production, N₂-fixation; C, N isotopic composition of suspended matter; N, O isotopic composition of nitrate in upper 700m (EUROPA)
- Whole water column dissolved Ba concentrations along CLIVAR/WOCE I9S line (R/V Aurora Australis, AU 1203; Jan. – Feb. 2012)
- Nitrogen isotopic composition (PN, TDN, NO₃) in pack ice from the Weddell Sea (ISPOL, Dec. 2004), the Bellingshausen Sea (SIMBA, Oct. 2007), and Dumont D'Urville (ICELIPIDS, Apr. - Nov. 2011).
- Silicon isotopic composition (dissolved silicon) in landfast sea ice from a small Greenlandic bay (March. 2010).
- Trace metals concentrations (Fe, Ni, Cu, Zn, Pb, Al, Mn and Cd) in snow, seawater, brines and sea ice in Central Arctic (IceArc, Aug.-Oct 2012) and in McMurdo Sound (YROSIAE, Nov.-Dec 2011).

Relevant publications

- Baeyens W., Bowie A., Buesseler K., Elskens M., Gao Y., Lamborg C., Leermakers M., Remenyi T., Zhang H., 2011. Size-fractionated labile trace elements in the Northwest Pacific and Southern Oceans, *Marine Chemistry*, 126, 108 – 113.
- de Brauwere, A., Fripiat F., Cardinal D., Cavagna A.J., De Ridder F., André L. and Elskens, M. (2012). Isotopic model of oceanic silicon cycling: The Kerguelen Plateau case study. *Deep-Sea Research I*, 70, 42-59.
- Cavagna A.-J., F. Dehairs, V. Woule-Ebongué, S. Bouillon, F. Planchon, B. Delille, I. Bouloubassi, 2013. Whole water column distribution and carbon isotopic composition of POC-bulk, cholesterol and brassicasterol from the Cape Basin to the northern Weddell Gyre, *Biogeosciences*, 10, 2787-2801.
- de Brauwere A., F. Fripiat, D. Cardinal, A.-J. Cavagna, L. André and M. Elskens (2012). Isotopic model of oceanic silicon cycling: The Kerguelen Plateau case study, *Deep Sea Research I*, 70, 42-59.
- de Jong, J., V. Schoemann, D. Lannuzel, H. de Baar, J.-L. Tison. Natural iron fertilization of the Atlantic Southern Ocean by continental shelf sources of the Antarctic Peninsula. *Journal of Geophysical Research*, 117, G01029, doi:10.1029/2011JG001679.
- Fripiat F., A.-J. Cavagna, F. Dehairs, A. de Brauwere, L. André, and D. Cardinal, 2012. Processes controlling the Si-isotopic composition in the Southern Ocean and application for paleoceanography, *Biogeosciences*, 9, 2443-2457, doi:10.5194/bg-9-2443-2012
- Fripiat F., J.-L. Tison, L. André, D. Notz, and B. Delille, 2013. Biogenic silica recycling in sea ice inferred from Si-isotopes: Constraints from winter Arctic first-year sea ice, Submitted to *Biogeochemistry*.
- Fripiat F., D.M. Sigman, S.E Fawcett, P.A. Rafter, M.A. Weigand, and J.-L. Tison, 2013. Sea Ice nitrogen biogeochemical dynamics as reflected in the nitrogen isotopes, in preparation.
- Gledhill M, Hassler CS and Schoemann V (2013) The environmental bioinorganic chemistry of aquatic microbial organisms. *Frontiers in Microbiology*, 4, 100. doi: 10.3389/fmicb.2013.00100
- Hassler, C.S., V. Schoemann, M. Boye, A. Tagliabue, M. Rozmarynowycz and R.M.L. McKay. (2012) Iron availability in the Southern Ocean. *Oceanography and Marine Biology: An annual review*. 50, 1-64.

- Maiti K., K.O. Buesseler, S.M. Pike, C. Benitez-Nelson, P. Cai, W. Chen, K. Cochran, M. Dai, F. Dehairs, B. Gasser, R. P. Kelly, P. Masque, L. Miller, J.-C. Miquel, S. B. Moran, P.J. Morris, F. Peine, F. Planchon, A.A. Renfro, M. Rutgers van der Loeff, P. Santschi, R. Turnewitsch, J.T. Waples, C. Xu, 2012. Intercalibration studies of short lived Thorium-234 in the water column and marine particles, *Limnology & Oceanography - Methods*, 10, 631-642.
- Planchon F., A.-J. Cavagna, D. Cardinal, L. André and F. Dehairs, 2013. Late summer particulate organic carbon export from mixed layer to mesopelagic twilight zone in Atlantic sector of Southern Ocean, *Biogeosciences*, 10, 803-820.
- Schmidt S., J. Harlay, A.V. Borges, S. Groom, B. Delille, N. Røevros, S. Christodoulou and L. Chou, 2012. Particle export during a bloom of *Emiliana huxleyi* in the North-Western Bay of Biscay, *Journal of Marine Systems*, doi: 10.1016/j.jmarsys.2011.12.005 (in press).
- Vogt, M., C., O'Brien, J. Peloquin, V. Schoemann, E. Breton, M. Estrada, J. Gibson, D. Karentz, M.A. Van Leeuwe, J. Stefels, C. Widdicombe, L. Peperzak. (2012). Global marine plankton functional type biomass distributions: *Phaeocystis* spp. *Earth System Science Data*. 4 (1), 107-120.

Submitted by: F. Dehairs, M. Elskens, M. Leermakers, W. Baeyens, L. Chou, F. Fripiat, V. Schoemann, J.T.M. de Jong