

IODP Expedition 346 & IFREMER objectives

Integrated Ocean Drilling Program (IODP) Expedition 346 (29 July–27 September 2013) drilled seven sites (total recovery of 6135 m) covering a wide latitudinal range in the Japan Sea and East China Sea (Figure 1). The main objectives of Expedition 346 was to (1) address the timing of the onset of orbital and millennial scale variability of the East Asian Monsoon; (2) reconstruct orbital and millennial-scale paleoceanographic changes in the Japan Sea during at least the last 5 m.y.; (3) reconstruct the ventilation history of the Japan Sea, and its relation with the nature of the influx through the Tsushima Strait and/or the intensity of winter cooling; and (4) monitor the history of the Yangtze River discharge in the northern end of the East China Sea as it reflects variation and evolution in East Asian summer monsoon (All details about IODP Expedition 346 are available here: http://iodp.tamu.edu/scienceops/expeditions/asian_monsoon.html).

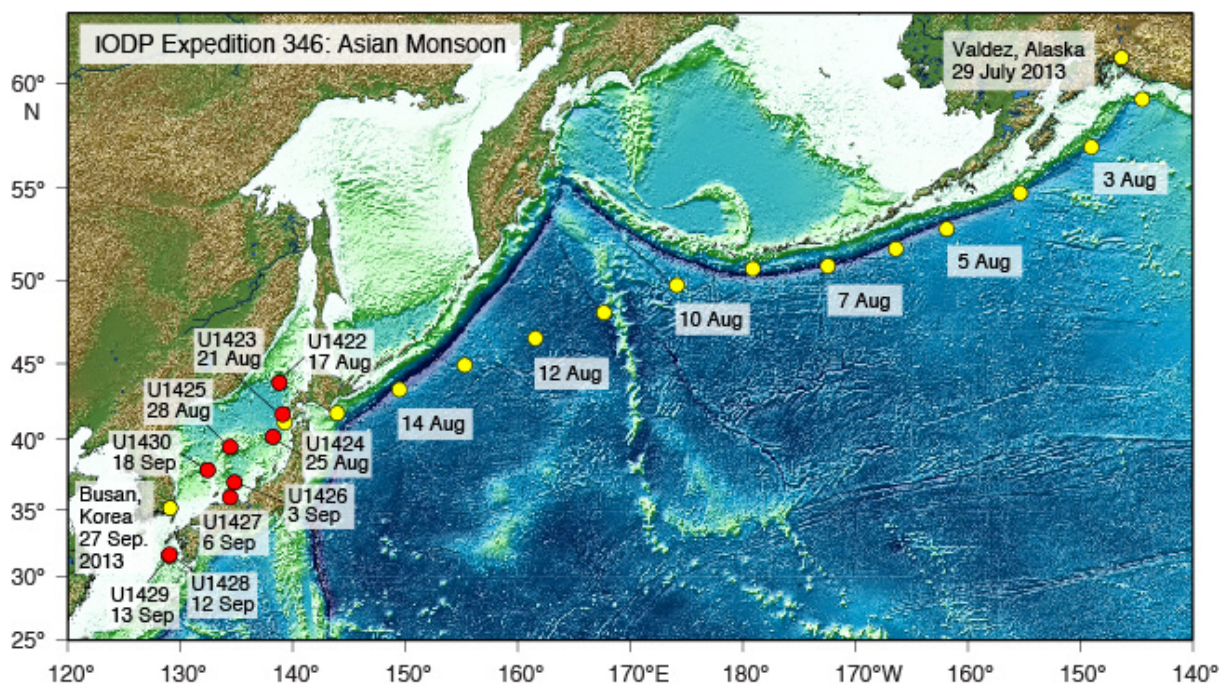


Figure 1 : IODP Expedition 346. Red circles indicate the location of the seven sites drilled during the expedition (http://iodp.tamu.edu/scienceops/expeditions/asian_monsoon.html).

In the framework of IODP Expedition 346, IFREMER scientists (Samuel Toucanne, Germain Bayon, Joël Etoubleau) will focus on the evolution of the discharge and of the drainage area of the Yangtze and Yellow rivers (with regard to the tectonic uplift of the Himalayan and Tibetan Plateau) and of the continental erosion (with regard to tectonic and climate changes - East Asian Monsoon, glaciations of the Himalaya-Tibet region, etc.) through the study of site U1428/U1429 (East China Sea, Okinawa Trough; ~180 meter long; ~400,000 years; more details on http://iodp.tamu.edu/scienceops/sitesumm/346/346_ss1428_1429.html). In details, we will use neodymium (Nd) and hafnium (Hf) isotopic ratios to discriminate between both weathering and provenance signals of the Yangtze and Yellow rivers at site U1428/U1429. The Nd isotopic signature of terrigenous sediments is retained during continental weathering and subsequent transport, thereby providing direct information on the geographical provenance of sediment (Goldstein et al., 1984). Hafnium isotopes exhibit globally similar behavior but are also prone to substantial fractionation during chemical weathering, because

incongruent dissolution of silicate rocks leads to products of erosion having very distinctive but systematic Hf isotopic signatures. The decoupling between Nd and Hf isotopes occurs during alteration of silicate rocks, and so is mainly apparent in the weathering products (i.e. clays, coarse-grained sediments, river waters) (Bayon et al., 2012).

In addition to coupled Nd-Hf analysis, IFREMER will also focus on silicon (Si) isotopes in order to discuss the evolution of weathering intensity. Si isotopes have now a proven potential for tracing silicate weathering processes (Georg et al., 2006). While most silicate rocks display uniform Si isotopic compositions ($\delta^{30}\text{Si} \sim -0.3 \pm 0.2 \text{ ‰}$), their alteration leads to weathering products on continents having very distinctive Si isotopic ratios. Interestingly, direct relationships have been reported between the degree of Si isotopic fractionation in soils, clay mineralogy, and some of the factors controlling continental weathering such as rainfall, all of which strongly suggests that the $\delta^{30}\text{Si}$ composition of clays is controlled by chemical weathering intensity.

Finally, in addition to isotopic ratio, the bulk major element composition and trace elements (including Rare Earth elements, REE) will be determined by wavelength-dispersive X-ray fluorescence (WD-XRF) and ICP-MS analysis, respectively. Please note that all this geochemical analysis will be realised in IFREMER with the "Pôle Spectrométrie Océan" (IFREMER-CNRS-UBO-IUEM) facilities (see details on <http://www.pso-brest.org/>).

LabexMER International Post-doctoral Fellowships in Marine Sciences

LabexMER "A changing ocean" is a cluster of Excellence ("Labex") funded by the French "Investment for future" program, supported by French Ministry of Research and Education. LabexMER offers international fellowships, and recruits young creative scientists through a new international post-doctoral fellowship program (<http://www.labexmer.eu/en/international/postdoctoral-fellowships>). It allows young scientists to propose their own research project in marine sciences (within the LabexMER research axes) to be carried out in one or several LabexMER laboratories. Applicants must have received their doctoral degree within the past 3 years at the closing date of the call (April 2014). This condition of 3 years maximum after the thesis is considered either from the defense date or the graduation date (most advantageous case) and can be extended in special cases (maternity, illness ...). Applicants showing more than 3 years after thesis (maximum 3 years + 6 months) will be considered if they can provide a support letter from one member of the LabexMER Scientific Committee. Since this program is targeted at international young scientists, applicants holding a French doctoral degree are eligible for the award only if they demonstrate extensive international research experience acquired during or after their PhD. (all about eligibility criterias on <http://www.labexmer.eu/en/international/postdoctoral-fellowships>). The postdoctoral appointment is for a period of two years. Recipients of the awards will receive a gross salary of about 2700€/per month (note that rent for apartment in and around Brest is about 350-500€/per month). In addition, support is available for travel expenses, equipment, and supplies. Work contract will include national health and dental insurance, as well as retirement and unemployment benefits.

In the framework of LabexMER Research Axis 4, entitled "Sediment transfer from the coast to the abyss" (<http://www.labexmer.eu/en/research/sediment-transfer>), we would invite young scientists interested in sedimentary geochemistry to propose their own research project in relation with the IODP 346 Expedition and IFREMER's objectives on site U1428/U1429.

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