Geophysical Research Abstracts
Vol. 17, EGU2015-7325, 2015
EGU General Assembly 2015

From fluvial to deep-sea deposits; a source to sink analysis of the early Eocene Pyrenean foreland basin, Spain

Louis Honegger (1), Sébastien Castelltort (1), Julian Clark (2), Thierry Adatte (3), Cai Puigdefàbregas (4), Mason Dykstra (2), and Andrea Fildani (2)

(1) Département des Sciences de la Terre, Université de Genève, Genève, Switzerland (louis.honegger@etu.unige.ch), (2) Statoil, Austin, TX, USA, (3) Institut des Sciences de la Terre, Université de Lausanne, Lausanne, Switzerland, (4) Institut de Ciències de la Terra (CSIC), Barcelona, Spain

Cyclicities in the sedimentary record have long been documented in a broad spectrum of sedimentary environment and through a wide time and space scale; the longstanding debate is about the various origins that have been put forward to explain them. Among these explanations, two are standing out: eustastic sea level changes and sediment supply variations. In the deep water system of the lower-middle Eocene Ainsa basin - Southern Pyrenees (Spain) - as well as in its fluvial counterparts in the Tremp-Graus basin, stratigraphic cyclicity in the form of repetitive packages of sand and marl of intermediate timescales (10e4 to 10e6 years) have long been recognized and are typically imputed to eustatic changes. So far, most of the studies have focused either on the deep water system or on their fluvial counterparts without a detailed effort concerning the correlation between the two. While eustatic variations are well known to have taken place during these periods and are thus plausible causes of the observed cyclicities, our aim is to evaluate the possible role of sediment supply variations in generating or modifying such cyclicities by accurately linking the distal and proximal environments. This is particularly important in order to understand how sediment supply variations are tied to climate and tectonics in the source area over multi-millennial timescales and how the deep-sea sediments are recording these variations to reconstruct the Earth's history of surface response to climate change. To address these issues a stratigraphical and multi-proxy approach was undertaken in both basins where we focus on the middle Eocene Castissent formation, a major fluvial excursion and its deep marine time-equivalent: the Arro-Gerbe section. XRF geochemistry and stable isotopes were made on four increasingly distal cross-sections to attempt to trace environmental signals across the whole source-to-sink system. These analyses allow us to discuss hypotheses of climatic and eustatic controls of cyclicity.