A new geological map for the " Baie de Seine -Pays de Caux " area at the 1:250,000 scale – Sedimentary and tectonic evolution during Cretaceous

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To update the geological mapping over the French continental shelfthat mostly dates back to the 70s-80s, BRGM has carried out series of studies and surveys since the early 2000s with the fruitful collaboration of several institutes (CNRS, Universities, Ifremer…) as the one started in 2007 with the University of Caen – Basse-Normandie within the framework of Benabdellouahed PhD thesis (2011).Offshore very-high resolution seismic and geological sampling surveys (2007 to 2009)resulted in a detailed revision of the stratigraphy and structural scheme of the *Baie de Seine (BdS)*. This unprecedented level of details encourages us completing the data set in order to produce anupdated versionof the geological map of the area.

Since 2013, three very high seismic surveys (MERCAUX 2013 and 2015, TREMOR 2014) combined with geological sampling have been carried out by BRGM and collaborators (CNRS; Universitiesof Caen – Basse-Normandie, Rennes 1, and Lille 1; Polytech Mons). Together with bathymetric data from SHOM, seismic data interpretation allows us to extend our geological understanding to the surrounding areas.

In the northern *BdS* and offshore *Pays de Caux*, seismic data provided detail images of the Cretaceous series from the erosion unconformity over Jurassic deposits (K/J), to the onset of Cenozoic sedimentation. The older Cretaceous deposits are correlated to the Wealdianfacies (lower Cretaceous) and are recognized NE of a large structural feature that includes both*Fécamp-Lillebonne (FL)* and *Nord-Baie-de-Seine (NBdS)* faults.The transgressive Apto-Albian deposits described onshore are clearly visible above the K/J erosionsurface to the west. The Upper Cretaceous (Cenomanian to Santonian-Maastrichtian chalks) is well developed as a stacking of sedimentary bodies revealing a transgressive trend towards the west. Within each of these sedimentary bodies, reflections show mostly progradational/regressive trend with evidence of a forced regression (channels), probably at the Mid-Late Cenomanian transition. Seismic data also provide high resolution images of the contourite-like geometries described along the coastal cliffs of Normandy (Lasseur, 2007), thus allowing first glance tridimensional reconstruction.Finally, seismic profiles image the structures that affect the area and show clear evidences of large tectonic inversion between Jurassic and Cenozoic. Both *FL* and *NBdS* faults definitely play a role in terms of sediment distribution and preservation during Cretaceous and then Cenozoic, and can be seen as the structural limit of the *BdS* area.

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