

One network may hide others – toward a comprehensive scenario for neogene superimposed valley networks along the English Channel.

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The English Channel has been an area of intense geological investigation for decades, spanning various subjects such as structural and basin evolution between variscan and alpine orogenic cycles or sediment transport over a wide platform under tidal and storm currents. Among these subjects, one specific feature of the English Channel is the occurrence of a complex network of channels with clear morphological expression at the seabed. Since the beginning of the 20<sup>th</sup> century, and more pragmatically since the 1970s and the development of high-resolution seismic acquisition, this network has been the focus of several studies that proposed various scenarii for its origin and age. The existence of two superimposed networks had already been proposed in the late 70's. In 2015, in the framework of the geological mapping of the French continental shelf, BRGM acquired a dense grid of very high resolution marine seismic (MERCAUX 2015 cruise). Interpretation of these (i) confirms that several networks are superimposed, and (ii) details the real complexity and discontinuity of the older network(s) associated to the "Fosses de la Manche" system. Finally, thanks to high quality oil exploration seismic data (courtesy of HIS), we were able to reveal a local unexpected increase of bedrock incision and associated sedimentary fill up to c. 350 m. These observations and subsequent implications for networks origin and development are discussed with respect to regional geological settings and controlling parameters. Their significance in terms of source-to-sink features is a key aspect as the English Channel is certainly an important zone of sediment transfer during Neogene, collecting from a large catchment and delivering to the Western Approaches, the Celtic Sea and the Bay of Biscay abyssal plains. Drilling selected targets to provide groundtruthing sounds now like the obvious next step.