



Catastrophic flooding origin of shelf valley systems in the English Channel

S. Gupta (1), J.S. Collier (1), A. Palmer-Felgate (1) and G. Potter (2)

(1) Dept. Earth Science & Engineering, Imperial College, South Kensington Campus, Exhibition Road London, SW7 2AZ, UK, (2) UK Hydrographic Office, Admiralty Way, Taunton, Somerset, TA1 2DN, UK

Late Quaternary episodes of sea-level lowering exposed large expanses of the English Channel shelf during glacial periods leading to the development of an English Channel mega-river system that integrated major north-western European rivers such as the Rhine and Seine with the Thames and flowed to the Celtic Sea continental margin. On the eastern English Channel shelf, extensive bedrock-incised valleys form an anastomosing network, however the controls on their genesis and evolution remain enigmatic due to a lack of detailed morphological data. Suggested mechanisms for valley incision include fluvial erosion in response to sea-level lowering, tidal or glacial scouring, and catastrophic flooding. Here, we analyse a new regional bathymetric map of part of the English Channel derived from high-resolution sonar data, which shows the morphology of the valley for the first time. We describe the morphology of the submerged valley system, and analyse geomorphic features revealed by the sonar data. These features are indicative of erosion by high magnitude water discharges. We discuss the mechanisms responsible for these high discharges and highlight implications of our results for drainage evolution in NW Europe.