Present-day current activity in an inactive canyon-channel system: the Gollum Channel System offshore southwest Ireland.

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The Gollum Channel System is a land-detached large-scale canyon-channel system situated offshore southwest Ireland on the Northeast Atlantic margin. The system is considered to have been inactive since the Last Glacial Maximum (LGM), but newly acquired geophysical seafloor and shallow subsurface data do suggest recent activity. To test the hypothesis of present-day (in)activity, high-resolution side-scan sonar, photography and bathymetry data were collected using an AUV in the upper slope (350-1000 m water depth) section of two of the channels. These data are presented alongside current meter data from a mooring station in one of the channels, which were used for quantification and validation of the AUV results. The presence of current ripples on the channel floor indicates that bottom currents acting here are capable of the (re)distribution of sediments. Additionally, some features in the AUV data are interpreted as patches of cold-water corals that depend on nutrient influx as well as a hard enough substrate to grow on, both of which may be promoted by bottom current activity. The current meter data show bottom currents had an average velocity of 15.1 cm/s and reached a maximum of 53.7 cm/s during the measurement period. Therefore, collectively, these datasets allow interpretation of the channel floor features visible within the AUV data with respect to the current regimes they represent, and vice versa. At present, bottom current activity seems prevalent in the channels, while activity from gravity flows has not been observed.