



The Holocene turbidite events in the Lofoten Basin and the associated Andøya Canyon system, mid- Norwegian margin.

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The Andøya Canyon system is the most pronounced of the ten canyon systems identified on the mid-Norwegian margin. None of these canyon systems are linked to any present active drainage area and are interpreted to be basically non-active transport systems since the last glacial maximum and the deglaciation period. Our knowledge on these canyon systems is however still fairly limited as no stratigraphical analyses or high-resolution acoustic data sets have been available from these areas. The main target area for analysing the long term history of the canyon has been to study the distal part of this system, named the Lofoten Basin Channel, and its accumulation area in the Lofoten Basin. The Lofoten Basin area is characterized by repeated stacks of extensive turbidite units where the details in the stratigraphical succession can be studied in undisturbed settings. A c. 3000 km² of high-resolution multibeam data (EM300) along with three gravity cores have been collected from the Lofoten Basin area. The stratigraphical analyses carried out of the cores have revealed that the sedimentary process dominating consists of commonly single turbidite deposits units interbedded with thin units of hemipelagic sedimentation. The results of the radiocarbon dating have revealed that turbidites have been transported through this channel system at least twice during the Holocene. The two uppermost turbidite sequences dated give a maximum age of 7.9 ka ¹⁴C BP for the lower sequence and an age of ca. 4.0 ka ¹⁴C BP for the upper and the younger event. The upper sequence is of a similar age as the Trænadjupet Slide failure and the lower sequence has an age close to the Storegga

Slide failure event, taking into consideration the erosive lower boundary of that sequence. The location of the cores analysed, far from both the Trænadjupet Slide and the Storegga Slide, must indicate that the instability in these canyon systems during the Holocene period has most probably been influenced by these large-scale failure events. What has triggered the release of these turbidites is still not understood, but earthquakes or tsunami waves associated with the mega scale Trænadjupet Slide and the Storegga Slide events are found to be the most likely mechanism at least during the Holocene Interglacial period.