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Coastal Environmental Change During Sea-Level Highstands: A Global Synthesis with implications for management of future coastal change

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Tsunami sedimentation and runup in the Shetland Islands, Scotland

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Abstract

The Shetland Islands lie to the north of the mainland of Great Britain and investigation in low-lying coastal lake basins has revealed a body of evidence relating to tsunami inundation and sedimentation throughout the Holocene.

Detailed lithostratigraphical and biostratigraphical analyses, supported by AMS dating of plant macrofossils

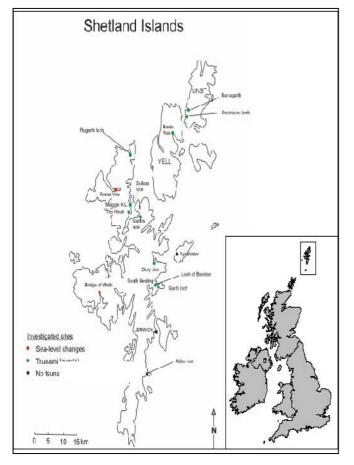


Figure 1. Location of the study area

preserved within lake and peat moss sediments have provided a chronology of tsunami activity throughout the island chain. Three separate events have been recorded. The oldest dated to c. 7200 radiocarbon years BP is equated with the Storegga slide tsunami and has been located in six basins to date. The stratigraphy at one site indicates a possible run up of the tsunami of at least 20m and possibly



Figure 2. Boulders within the exposed tsunami section at Sullom Voe, Shetland.

up to 35 m above sea level. Three lake basins provide evidence of tsunami inundation at c. 4900-4600 BP, with run up in excess of 7m. This event has also been located on the Norwegian west coast.

The youngest event present in the Shetland Islands is dated at c. 1500 years BP and is found within 2 lakes to date with a suggested run up of 5-6m above high tide. All of the basins are located to the eastern side of Shetland within inner fjords and bays. The lack of a detailed chronology relating to the relative sea level history of the area hampers the ability to accurately reconstruct run up, although work in progress, will allow a reassessment of these values in the future.

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