

The geomorphological impact of the January 2005 hurricane strength storm on the Atlantic coastline of the Outer Hebrides

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Abstract

In January 2005 the Atlantic Coast of the Outer Hebrides was struck by winds in excess of 100 knots. Hurricane force winds set-up exceptionally high destructive waves. Elevated sea levels caused extensive flooding. In addition to property damage there was also loss of life by drowning. Storms and erosion are frequent in the Outer Hebrides but the severity of this event called into question the level of awareness of coastline vulnerability in specific localities. In addition, the debate on possible rise in sea level and increased storminess re-emerged not only in a theoretical context but also with a sense of application to real life problems.

The coastlines affected were all low-lying machair landforms with extensive sand and occasional shingle beaches. Machair is a type of calcareous sand dune system of great antiquity (in excess of 6 to 8000 years old). It is especially important for archaeological and conversational sites. For more than forty years geomorphological and archaeological research has demonstrated systematic erosion and reworking of the machair coastline, albeit with pronounced local differences. As a result of this research the hurricane impact of 2005 can be seen as an extreme event within a long-standing pattern. Nevertheless the strength of this event underlines the power of the Atlantic storm environment and possible impacts on both economic and cultural assets which are likely to need enhanced protection.