

Assessing storm events for energy meteorology: using media and scientific reports to track a North Sea autumn storm.

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Important issues for energy meteorology are to assess meteorological conditions for normal operating conditions and extreme events for the ultimate limit state of engineering structures. For the offshore environment in northwest Europe, energy meteorology encompasses weather conditions relevant for petroleum production infrastructure and also the new field of offshore wind energy production. Autumn and winter storms are an important issue for offshore operations in the North Sea. The weather in this region is considered as challenging for extreme meteorological events as the Gulf of Mexico with its attendant hurricane risk. The rise of the Internet and proliferation of digital recording devices has placed a much greater amount of information in the public domain than was available to national meteorological agencies even 20 years ago. This contribution looks at reports of meteorology and infrastructure damage from a storm in the autumn of 2006 to trace the spatial and temporal record of meteorological events. Media reports give key information to assess the events of the storm. The storm passed over northern Europe between Oct.31–Nov. 2, 2006, and press reports from the time indicate that its most important feature was a high surge that inundated coastal areas. Sections of the Dutch and German North Sea coast were affected, and there was record flooding in Denmark and East Germany in the southern Baltic Sea. Extreme wind gusts were also reported that were strong enough to damage roofs and trees, and there was even tornado recorded near the Dutch-German border. Offshore, there were a series of damage reports from ship and platforms that were linked with sea state, and reports of rogue waves were explicitly mentioned. Many regional government authorities published summaries of geophysical information related to the storm, and these form part of a regular series of online winter storm reports that started as a public service about 15 years ago. Depending on the issuing authority, these reports include wind speed and atmospheric pressure for a number of stations. However, there is also important ancillary information that includes satellite images, weather radar pictures, sea state recordings, tide gauge records, and coastal surveys. When collated together, the literature survey gives good view of events related to the autumn storm. The key information from media reports is backed up by quantitative numbers from the scientific literature. For energy meteorology in the offshore environment, there is an outline of extreme wave events that may be important to help define the ultimate limit state of engineering structures and the return periods of extreme waves. While this contribution focusses on events from an old storm in the autumn of 2006, more severe regional storms have occurred since then, and the scientific literature indicates that these may be linked with climate warming. Literature surveys may help to fully define extreme meteorological conditions offshore and benefit different branches of the energy industry in Europe.