North European Storm Study Extension (NEXT)

The JIP is concerned with the production of historical wind, wave and current model data, known as "hindcasts", covering extended historical periods. The model currently starts in 1964 and the wind and wave model data extend to 2016. The current model data stops in 1995 at the present time.

Participants:

bp, Chevron, ConocoPhillips, equinor, ExxonMobil, HSE Health & Safety Executive, MarathonOil, Rijkswaterstaat Ministry of Infrastructure and the Environment, Shell, TOTAL

Principle service provider:

Oceanweather Inc. (OWI)

What is the problem:

The development of metocean criteria such as the "100-year wave", for example, is a critical input into the design process for new structures and for re-assessment of existing structures. Additionally, knowledge of the "normal" climate is an important input into operability and weather windows analyses. In order to get statistically robust estimates of both the extreme and normal conditions at a site a long duration of local data is required. Typically, though, there are little or no data available at the start of a project and even for re-analysis there may be only a few years of measured data available. Without long-term model data, therefore, there is a very high uncertainty associated with any derived criteria.

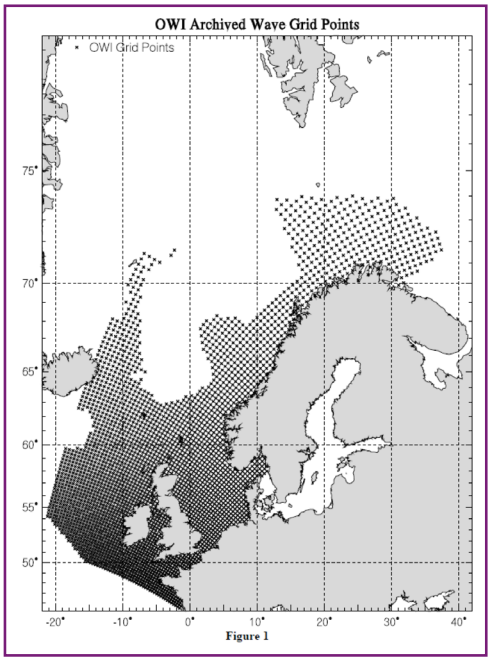

Figure 1

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International Association of Oil & Gas Producers

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What is the solution:

Reconstruction of long-term climate data based on detailed historical atmospheric, ground-based, marine-based and satellite data allows the past wind and atmospheric synoptic conditions to be re-created. These can then be applied to global or regional numerical wave and hydrodynamic models of the oceans to develop the wave and current conditions that were present through the hindcast period. The resultant climate can then be compared against in-situ and satellite measurements to allow model calibration and validation.

Progress to date:

The JIP has been running since 1994 and has produced data sets that have been used as input for the majority of all offshore installations in the North Sea. The data sets have also been used for operational analyses across the region and supported safe and efficient offshore activities for over two decades.

Next steps:

Extending the hindcast periods both forwards and backwards to provide longer data sets and captures additional significant storm events, including for example the destructive storm of January 1953. Extension and improvement of the current hindcast to cover a longer continuous period that overlaps with continuous waves.

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