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The effects of wave climate change and variability on the loads on the Dutch water defences

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Knowledge of the effects of climate change and variability on nearshore waves and resulting hydraulic loads is paramount for the design and assessment of water defences, in particular for assessing future flood risks for the Netherlands and the Dutch Caribbean islands. The water defences in these regions are subject to two types of storms, namely tropical and extratropical, both of which need to be taken into account in the assessment of the effects of climate change and variability on nearshore waves. This study proposes to downscale the climate projections produced by the Inter-governmental Panel on Climate Change into hydraulic loads in the Dutch North Sea and Caribbean waters. The approach followed takes into account sea and water level variations, tropical and extratropical storms, including potential effects of tropical storms travelling into the Northeast North Atlantic and possibly affecting the North Sea.