



## **Sensitivity analysis using simple visualizations of the ACE index, to improve understanding of the driving parameters of tropical cyclone impact models**

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This study is focused on investigating how changes in configuration and control parameters affects simulated cyclone models in the North West Pacific Basin (including Japan, the East and South China Seas, the Philippine Sea and the Sea of Okhotsk). The study uses ensembles of cyclone storm tracks provided by the Global Climate Models (GCMs) and ensembles of observed historical storms.

These simulated storms are recalibrated and sampled based on current research methodologies. Therefore, wind fields are created around the storm track pressure centres and each step has a collection of control parameters for investigation and adjustment. The study is designed to provide a sensitivity analysis of these parameters with respect to their effect on the Accumulated Cyclone Energy (ACE) index which was chosen as a proxy for storm activity over a certain period (time scale or ensemble).

A web based platform was constructed to bring together the four aspects of the sensitivity analysis: model data selection, recalibration, sampling, and creation of wind fields. The platform brings together the four aspects, and their collections of easily adjustable control parameters, such that small and large changes can be monitored and the effects can be observed in the calculated ACE index and its visualization.

Comparing visual representations of ACE values for different input parameter groups allows the ACE Index's sensitivity to parameter changes to be investigated and be tested repeatedly. This allows a better understanding of potential drivers of losses from tropical cyclones which will benefit climate researchers and practitioners in the insurance industry.

The approach described here has been parameterized for easy extension to other basins around the world. Also, due to the parameterized approach, further aspects, methodologies and locations will be added for future investigation.