

## **The intensity of tropical cyclones at landfall**

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Tropical cyclones are amongst the most damaging weather phenomena affecting 100s of millions of people and causing Billions of pounds of damage every year. While significant reduction of track errors has been recently achieved, the intensity forecasts remain extremely challenging with rapid intensification and de-intensification often not correctly predicted. This is particularly important as the cyclone makes landfall. The interaction of the tropical cyclones with the ocean is known to be a key process as the upper ocean is an important heat source to the atmosphere. This project will examine intensification and de-intensification mechanisms during the landfall process. For example, tropical cyclones generate sea surface large waves which break (through whitecapping and depth-induced breaking) as the cyclone reaches shallow water, and makes landfall. Very recent research in our group has highlighted that as waves break they can bring deeper, colder water up to the sea-surface and thus de-intensify the cyclone at the critical land falling stage. The project will test this mechanism and others in the latest generation of coupled atmosphere-ocean-wave models run by the National Oceanography Centre (the CASE partner for this project). Then you will simulate real cases of tropical cyclones in South East Asia to investigate the impact that these and other processes have on tropical cyclone intensity at land fall.