Determining the atmospheric and oceanic conditions that are favourable or unfavourable for tropical cyclone (TC) genesis has long been a matter of great interest. Until recently, determining the favourability of a particular climate for TC genesis has been achieved through three methods: 1) combining large-scale environmental parameters such as sea surface temperature, shear, and stability into a single "genesis parameter" that can vary in space and time; 2) counting the number of tropical cyclone-like vortices simulated in global climate models; 3) counting the number of tropical cyclones in a higher-resolution, regional model with boundary conditions from a global model.

We present a new method that allows for much higher resolution simulations and more direct control over the surrounding environment. A doubly-periodic domain is initialized with pre-defined profiles of temperature, humidity, and wind as a function of height. These profiles may be idealized, may come from observations, or from future climate scenarios. With small modifications to the equations of motion, the winds can be balanced so that the wind profiles remain nearly constant across the domain as the simulation proceeds. The development, or decline, of a pre-cursor tropical cyclone disturbance embedded in this environment is then simulated. The rate of development (or failure) is an indicator of the favourability of that particular sounding and wind profile for TC genesis. Along with TC genesis, the point-downscaling technique can be used to evaluate favourability of particular soundings for rapid intensification and other structural changes.