# Climate network analysis of extreme events: Tropical Cyclones.

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We construct climate networks based on surface air temperature data to identify distinct signatures of tropical cyclones in the region of the Indian Ocean, which have serious economic and ecological consequences. The climate network shows a discontinuous phase transition in the size of the normalised largest cluster and the susceptibility during cyclonic events. We analyze these quantities for a year (2016) which had three successive cyclones, viz Cyclone Kyant, cyclone Nada and cyclone Vardah, and compare these with years where a single cyclone, cyclone Ockhi (2017) and   was seen. The microtransitions and jumps in susceptibility in these two cases show distinct patterns and scaling behaviour. The signatures of the cyclones can be seen in other quantities like the degree distributions and other network characterizers. The nodes of high degree show rough correlation with the cyclone paths, and also have potential as predictors. We discuss the implications of these results for further analysis.
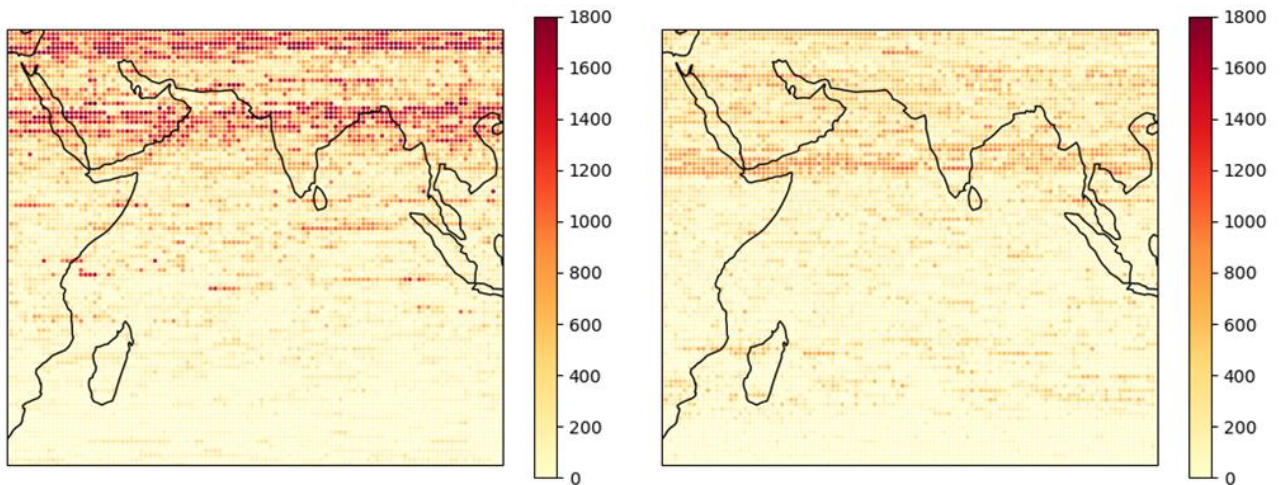
(a) Degree distribution at C=0.75 before of very severe cyclonic storm Cyclone Ockhi (29 Nov-6 Dec) 16th to 30th Nov, 2017. (b) Degree distribution at C=0.75 during very severe cyclonic storm Cyclone Ockhi (29Nov ,-6 Dec), 1-15 December 2017.