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Globally consistent tropical cyclones impact forecast system for population displacement

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Tropical cyclones (TCs) displace millions of people every year. Displaced people are subject to heightened risks to their physical and mental well-being. We present the first results of a TC impact forecast system for population displacement, aiding the decision-making process for planning early prevention and mitigation actions. For example, planning precautionary evacuations and the allocation of humanitarian aid. We work closely with the Internal Displacement Monitoring Centre (IDMC) to develop a global TC impact forecast system that predicts the number of people potentially affected or displaced.

We build the impact forecast system using a python-based, open-source, globally consistent platform called CLIMADA (CLIMate ADAptation). The platform integrates probabilistic hazard, exposure, and vulnerability information to compute the potential impacts from TC events. The first prototype of the forecast system extracts information from ECMWF ensemble TC forecast tracks, a global population layer at ~1km resolution, and vulnerability functions that relate the exposed people to the intensity of TC wind speed. We show case studies of recent TC events to reveal the potential of the displacement forecast system, the uncertainties of the forecast results

The displacement forecast system will provide richer information for decision-makers and help improve warnings. The open-source data and codes of this implementation are also transferable to other users, hazards, and impact types.