

Global tropical cyclone model intercomparison

How much do modeled tropical cyclone impacts depend on the hazard set choice?

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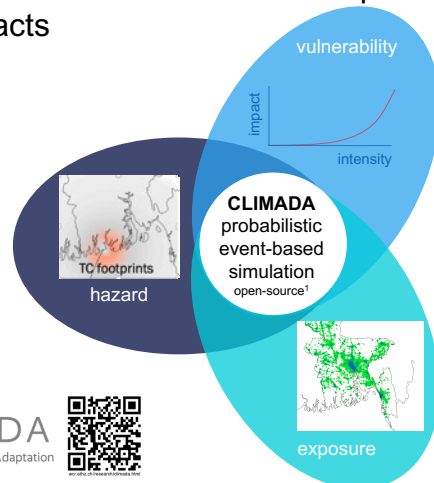
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TC tracks:

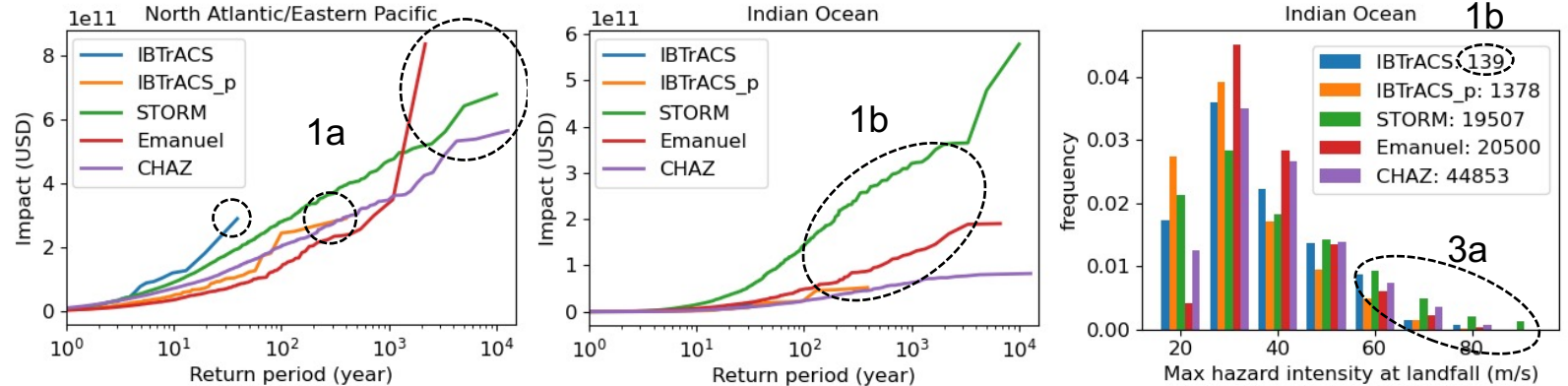
- **observed** storms (IBTrACS)
- **probabilistic events** obtained from IBTrACS (in CLIMADA; Aznar-Siguan and Bresch, 2019)
- **statistical-dynamical** Emanuel et al. (2006, 2008)
- **statistical-dynamical** CHAZ (Lee et al., 2018)
- **fully statistical** STORM (Bloemendaal et al., 2020)

Risk assessment:

Global model intercomparison of different synthetic tropical cyclone (TC) track sets using the CLIMADA platform, which integrates hazard, exposure and vulnerability to calculate TC risk and to quantify socio-economic impacts



Results:



model	type	years/# tracks	climate data / climate change?	open source
IBTrACS	observational	1980-2018		yes
IBTrACS_p	probabilistic	1980-2018	Knutson approach	yes
STORM	fully statistical	10'000 years	ERA5 / not yet	yes
Emanuel	statistical-dynamical	20500 tracks 1979-2019	ERA 5 / yes	no
CHAZ	statistical-dynamical	400 x 32 years	ERA interim / yes	no

2a

2b

Key findings:

- choice of event set is important:
 - when studying **tail events**. (1a)
 - for basins with **smaller historical event sets** (1b) or small areas → Indian Ocean
 - different model types (2a) yield hazard sets of varying **length/size** (2b) and different hazard **intensities** and **frequencies** (3a).
- differences in impacts can partly be explained by the varying distribution of hazard intensities at landfall between event sets (3a).