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Evaluation of Extreme Weather Events: Using ECMWF's Reforecast Data

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The frequency and intensity of extreme weather events, like heat waves, are increasing significantly due to climate change. These events have different effects on various socio-economic sectors worldwide, which directly affect people's lives. This study aims to quantify how quickly the probability of these severe events changes and use this information to predict short-term extreme events. By integrating this measure into socio-economic predictive models, we can better understand the potential impact of climate change on different regions and populations, allowing for the development of more effective adaptation strategies. This study used ECMWF's Reforecast data to statistically analyze the probabilities of extreme temperatures in the Pacific Northwest region and the time taken in decades for local temperatures to change, which will result in a doubling of these risks. The findings indicate an increasing probability of extreme temperatures with every unit increment in Global Land Surface Temperature Anomaly in more than 80 per cent of the region. Moreso, with the current rate of global warming ($\sim 0.32\text{K/decade}$) the estimated time that the local temperature changes will result in a doubled risk of such extreme temperatures is averaging 0.2 of a decade over the PNW region.