



KAUA'I CLIMATE ADAPTATION PLAN

Tropical Cyclones

What are tropical cyclones?

Tropical cyclones are a range of events classified by wind speed, from Tropical Depressions (<39 mph maximum sustained wind speed) to Category 5 Hurricanes (> 156 mph maximum sustained wind speed). In addition to wind, tropical cyclones bring the threat of storm surges and rainfall-caused flooding.

The zone of the Earth where tropical cyclones are formed is shifting towards the poles due to global warming. A global-average migration of tropical cyclone activity is taking place as storms move away from the tropics at a rate of about one degree of latitude per decade.¹ With this, climate models project that more tropical cyclones will occur near Hawai'i.²

1. Kossin, J., Emanuel, K. & Vecchi, G. (2014) The poleward migration of the location of tropical cyclone maximum intensity. *Nature* 509, 349–352. <https://doi.org/10.1038/nature13278>
2. Murakami, H., Wang, B., Li, T. et al. (2013) Projected increase in tropical cyclones near Hawaii. *Nature Clim Change* 3, 749–754. <https://doi.org/10.1038/nclimate1890>



Tropical Cyclones



Storm surge



Coco Palms wind damage (FEMA)



Kekeha Suagar Company Facility damage (The National Archive)

Projected Changes and Related Impacts

3. Murakami, H., et al. (2013)

4. Global Warming and Hurricanes, an Overview of Research Results (2020) Geophysical Fluid Dynamics Laboratory, Princeton University, NOAA: <https://www.gfdl.noaa.gov/global-warming-and-hurricanes/>

Projected Changes

- Increased cyclone frequency due to new storm tracks that are projected to occur in the waters in Hawai'i³
- Increased cyclone intensity due to:
 - Higher sea surface temperature that contributes to more extreme weather
 - Increased frequency and strength of El Niño and La Niña events
- Increased average rainfall during a cyclone with additional global warming⁴

Related Impacts

- Higher coastal inundation levels from tropical cyclone storm surge due to sea level rise

Key Vulnerabilities



Over 8,000 people and 92 critical facilities exposed to Category 4 hurricane storm surge⁵



Homes



Water and power systems



Roads and highways

5. County of Kauai. (2021). County of Kauai Multi-Hazard Mitigation and Resilience Plan

How can I get involved?

- Attend an Open House
- Attend a Deep Dive session
- Share a story on the website
- Participate in an online survey
- Contact the Planning Department

Get in Touch

For more information on the Kaua'i Climate Adaptation Plan visit kauaiadaptation.com or scan the code below with your phone.

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