Central Pacific Hurricane Center, Honolulu, HI
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Remembering Iniki 20 Years Later

Tropical Cyclone Hazards

When it comes to tropical cyclone hazards it's a triple threat. Three significant weather hazards accompany these storms, each of which can inflict terrible impacts on their own. When combined they can become catastrophic. The hazards are damaging wind, flooding rain, and storm surge. We'll examine each a bit closer below.

Damaging Winds: Tropical cyclones in the Central Pacific are defined in three different groups based on wind speed. They are as follows…

Tropical Depression – Sustained winds up to 38 mph
Tropical Storm – Sustained winds between 39 and 73 mph
Hurricane – Sustained winds of 74 mph or higher

In addition to sustained winds, frequent gusts to significantly stronger values are likely within the storm. As a tropical cyclone gets better organized the strongest sustained winds can be found closest to the storm's center. If the storm has an "eye" the strongest winds are found along the edges of the eye.

Strong damaging winds can significantly damage or destroy structures, vegetation, and other items. They generate flying debris which can be deadly and can cause significant damage of its own. During Iniki winds gusted higher than 150 mph.

Wind Caused Tree Damage Near Princeville (Iniki)

Roof Damage to Hanapepe Armory (Iniki)

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Flooding Rain: Rainfall associated with a tropical cyclone can be catastrophic. Tropical cyclone flooding is the deadliest hazard. In other words, more people die due to flooding in tropical cyclones than by any other hazard. Not only can very significant amounts of rainfall occur during a storm, but much the rain can come during a short period of time. In the state of Hawaii the terrain of our islands amplifies rainfall with many areas prone to flash flooding along steeply sloping streams dropping from the mountains to the sea. Iniki produced 8 to 10 inches of rain.

When it comes to flooding, the majority of people die in vehicles trying to cross flooded roads and/or streams. When tropical cyclones threaten the area, avoid areas near streams, and never drive across a flooded roadway.

Stream Access Flooding Damage (Iniki)

Cars Pushed By Floodwaters (Iniki)

Storm Surge: Strong winds associated with tropical cyclones can push the surface of the ocean up onto land causing significant flooding and damage. As winds push along the surface of the ocean they pile up water, then when a storm makes landfall, this piled up water gets pushed onshore. Typically the storm surge is maximized on the right side of the storm and close to where the winds are strongest. Pounding surf also adds destructive power to the surge. During Iniki the storm surge was 3 to 4 feet above normal tide level.

Storm Surge Along the Waianae Coast (Iniki)

Storm Surge Damaged Homes (Iniki)

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