CASE STUDY

09 April 2026

Historic Hawai'i Flooding

PDC advanced capabilities aids response to Hawai'i's worst flooding in 20 years

Flooding Event Synopsis

Week of March 9–15, 2026: First Kona low develops and impacts the islands

Week of March 16–22, 2026: Second Kona low follows immediately after, compounding impacts

Back-to-back severe storm systems struck the Hawaiian islands between March 9-22, 2026, unleashing the most destructive flooding the state had seen in over two decades. This rare weather phenomenon was the result of two "Kona low" pressure systems that triggered flash floods, landslides, threats of dam failure, and widespread infrastructure damage across multiple islands.

- Severity: **60+ inches of rainfall** (cumulative)
- Areas Impacted: **6 islands** (Kauai, O'ahu, Maui, Hawai'i Island, Moloka'i)
- Total Estimated Damages: **$1 Billion+** (preliminary estimates)
- Evacuations: **5,500+** (population evacuated)

LOSSES REPORTED STATEWIDE

as of 08 April 2026

$832 Million

- Airports: **$225.9M** (**10 of 14** airports damaged)
- Seaports: **$6.2M** (**9** seaports damaged)
- Highways: **$129.7M** (estimated damages)
- Agriculture: **$23M+** (estimated economic losses)
- Hospitals: **1** hospital, **5** clinics damaged
- Public Schools: **150 of 940** schools damaged

Key Response Challenges

1 – Multi-Island Situational Awareness and Response Coordination: Simultaneously managing threats from flooding, landslides, and potential dam failures requires immediate access to real-time, authoritative hazard information, as well as population, infrastructure, and critical risk data to inform effective decisions. This information is often siloed across agencies. Furthermore, achieving a unified operational picture across Hawai'i's dispersed islands is inherently difficult without tools to support sharing of information.

2 – Access to Multi-Hazard Information and Critical Data: Storm intensity, flash flood conditions, landslide risks, and dam vulnerabilities varied significantly by island and evolved rapidly, making it challenging for county and state agencies to track the full scope of impacts in real time and allocate resources where needed most.

3 – Rapid Quantification of Impacts Pre- and Post-Landfall: Obtaining reliable estimates of impacts to population and infrastructure requires rapid synthesis of complex data in order to quickly and effectively inform response, resource prioritization, and recovery planning. Few, if any agencies have this resource while responding to a disaster.

Integrating Statewide Situational Awareness

Coordinating life-saving response across the dispersed island chain demanded a level of integrated **situational awareness and advanced impact analysis that only PDC could provide.** The compound nature of the event—simultaneous flooding, landslides, and dam failure risk across multiple islands as well as a key weather radar outage—created an unprecedented demand for authoritative hazard information and shared situational awareness. Consolidated, scientifically vetted information was provided to decision makers through a single common operational picture, accessible to all agencies via the Center's DisasterAWARE ecosystem. DisasterAWARE was essential for bridging critical information gaps and obtaining rapid impact estimates to help direct resources.

Hawai'i Emergency Management Agency leverages PDC advanced analytics and DisasterAWARE ecosystem to monitor potential dam failure and other risks during historic flooding event.

CASE STUDY
Historic Hawai'i Flooding Response

PDC | GLOBAL

Real-Time Analysis Transforms Complex Data into Lifesaving Action

PDC staff were deployed across multiple operational locations—including USARPAC, TJFLCC, HIEMA, and MEMA—providing direct, on-site analytical support throughout the event.

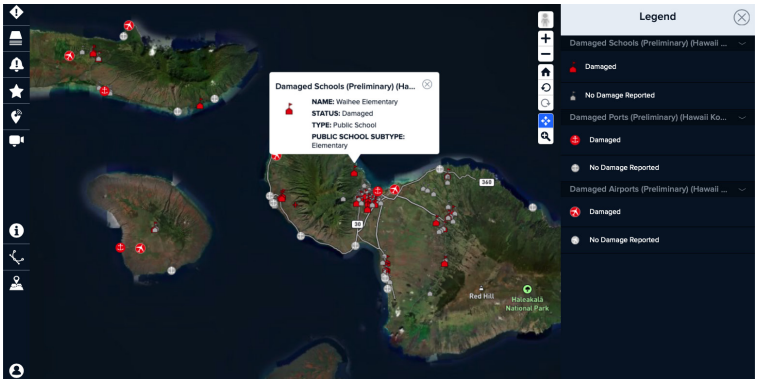
New and updated data layers were rapidly integrated by staff in real time into DisasterAWARE as the event evolved, including new radar data for Hawai'i, updated flood zone layers, and updated dam flood inundation data. By centralizing this information, decision makers at HIEMA, MEMA, USARPAC, and the Theater Joint Force Land Component Command (TJFLCC) could access the same authoritative picture without risk of acting on conflicting or outdated data from disparate sources.

Critically, the DisasterAWARE COP enabled county and state agencies across the islands to contribute and view Situation Reports (SitReps) in a shared environment—ensuring that updated impact information from Kauai, O'ahu, Maui, Hawai'i Island, and Moloka'i was visible to all decision makers simultaneously.

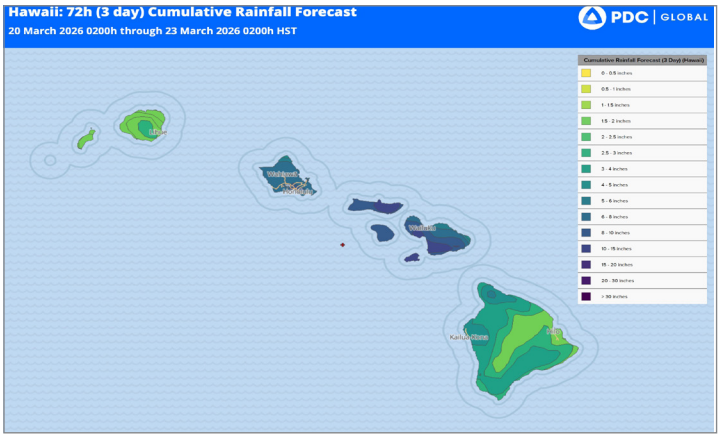
This shared technology was especially vital given that Hawai'i's primary Moloka'i weather radar—serving O'ahu, Maui, Lanai, and surrounding islands—was offline for the duration of both Kona low systems. With forecasters unable to rely on this critical detection tool, the ability to share SitReps and integrate multi-source observational data through a common platform became a frontline compensating measure.

Beyond data aggregation, PDC's advanced analytical capabilities transformed hazard information into actionable intelligence—rapidly and continuously. Refined analytical products were delivered daily, including population and infrastructure exposure estimates for flood zones, and time-sensitive dam break analyses of potential downstream impacts of threatened dams such as the Wahiawa Dam on O'ahu, landslide probability maps with exposure estimates, and 100-year flood hazard exposure assessments at the community level across multiple islands.

As response operations transitioned into sustained recovery, PDC continued to support state, county, and DOW partners across Hawai'i by maintaining shared situational awareness through DisasterAWARE with official Damage Assessment and Needs Analysis (DANA) for the state.

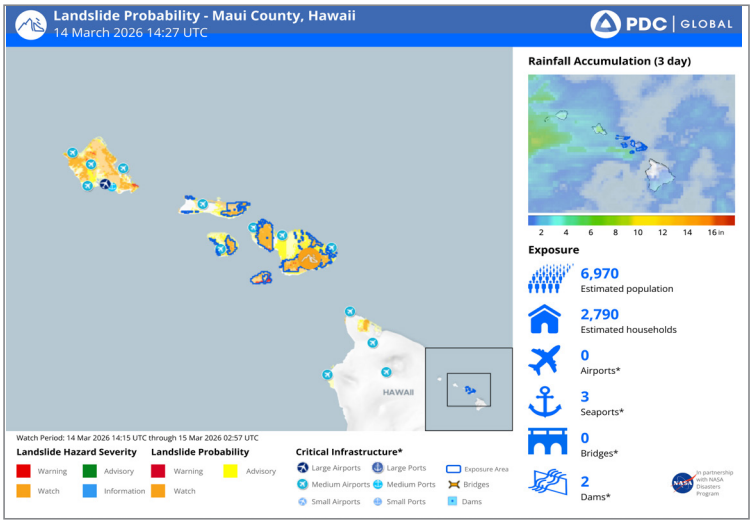


Pre-impact integration of high-resolution rainfall data into DisasterAWARE



Downstream dam flood potential and evacuation zones

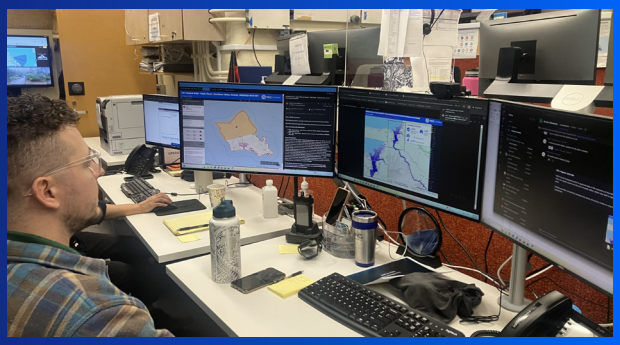
PDC landslide probability estimates



CASE STUDY
Historic Hawai'i Flooding Response

PDC | GLOBAL

PDC Support Highlights



Decision-makers statewide share situational awareness using PDC's DisasterAWARE technology ecosystem during back-to-back storms that caused flash flooding, landslides, severe damage to highways, electrical outages, critical infrastructure damage, and more.

40+
Advanced Analytical Products

20
EOC shifts staffed by PDC statewide

30%
of PDC staff activated to support response

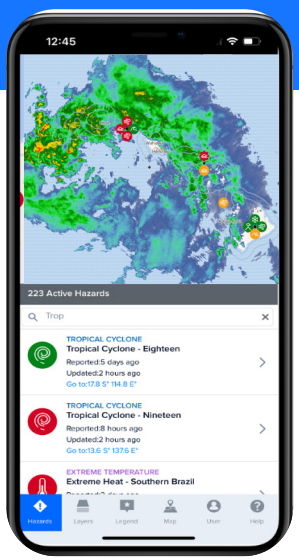
7
DOW, State, and County response agencies supported

37+
Coordination calls supported statewide

30%
Increase in DisasterAWARE usage

New / updated data in DisasterAWARE

- New Radar, Hawai'i (New)
- Building footprints Hawai'i (New)
- 3-Day Rainfall Accumulation Forecast (New)
- Hawai'i Flood Zones (Updated)
- Hawai'i Dams (Updated)

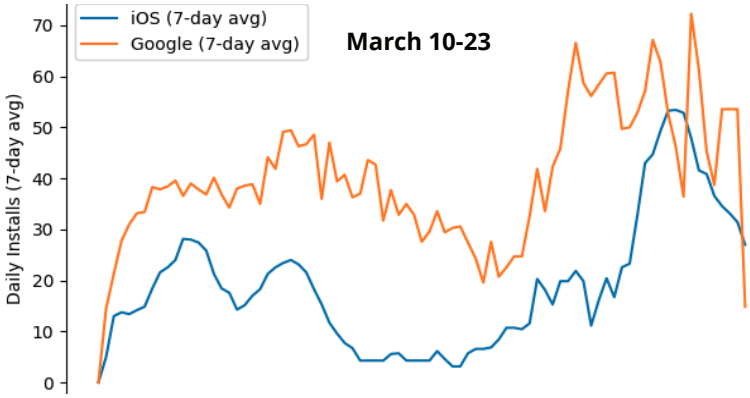


Public Access to Real-Time Hazard Info

PDC's Disaster Alert Mobile App

Real-time hazard information was also served to the public through PDC's mobile app.

↑ 100%+
increase in app downloads



MAJOR OUTCOMES

PDC's ability to scale operations and deliver integrated, data-driven decision support across extended and complex disaster events, **strengthened coordination between state and DOW partners** and enabled more timely and informed response to protect communities across Hawai'i.

Consolidation of hazard data into a single COP eliminated information silos across agencies and islands, allowing fast, seamless coordination of actions during a multi-hazard event that would have been far more difficult to manage through disparate information sources spread across multiple locations.

PDC's rapid analytical products reduced the time needed to understand impacts, transforming data into insights about population exposure, infrastructure risk, and dam failure potential within minutes—enabling faster, more effective life-saving decisions throughout the event.

DisasterAWARE helped bridged several data gaps, enabling decision makers to share situational awareness in real time. By enabling shared SitReps, multi-source data integration, and continuous cross-agency situational awareness—decision makers were never operating with incomplete or conflicting information.

Source: PDC-generated data and products.