



* "...natural disasters displaced more people than war."

In 2013, natural disasters displaced more people than war, with 22 million people forced to flee earthquakes and extreme weather.*

In 2013 alone, disasters displaced more people than the number living in the state of New York. However, the most devastating disasters of the year did not happen in the U.S., they happened in The Philippines, India, and Mexico.

The Philippines was recovering from an earthquake that had killed hundreds and displaced 350,000, when Typhoon Haiyan struck in the same area, adding more than 6,000 fatalities and displacing another 3.6 million. Meantime, Mexico suffered a pair of hurricanes—Ingrid and Manuel—coming from the east and the west during the same September days. The following month, Cyclone Phailin affected millions in India, forcing the evacuation of more than 1.1 million just in the state of Odisha.

While we cannot stop hazards from occurring, PDC is reducing disaster impacts and risks by making the latest science and technology available to disaster managers, helping to increase resilience through improved early warning, preparedness, response, and enhanced partner capacities.



PDC in action

PDC assists with and provides risk and vulnerability assessments, modeling and visualization, information integration and analysis, exercise support, and capacity enhancement measures. These efforts help disaster managers and the communities they serve to better mitigate, prepare for, respond to, and recover from disasters.

hazards and disaster events

In 2013, the disaster landscape was dominated by massive tropical cyclones and storms, led by Super Typhoon Haiyan. In the face of these events, we worked to minimize loss of life and property by collecting data, providing tools for analysis and visualization, and using technology to disseminate actionable information to key decision makers and responders.

- * **8.0 M Earthquake in the Santa Cruz Islands** (February)
- * **Tropical Cyclone Mahasen in the Indian Ocean** (May)
- * **Royal Gorge Wildfire in Colorado** (June)
- * **Tropical Storm Andrea in the Caribbean Sea and Atlantic Ocean** (June)
- * **Paraguay Severe and Widespread Flooding** (June-July)
- * **Tropical Storm Chantal in the Caribbean** (July)
- * **Tropical Storm Flossie in Hawaii** (July)
- * **Volcanic Eruption near Mexico City** (July)
- * **Tropical Storm Gabrielle affecting Puerto Rico, Hispaniola, and the western Atlantic** (September)
- * **Hurricane Ingrid and Hurricane Manuel in Mexico** (September)
- * **Tropical Storm Humberto, Tropical Storm Gabrielle, and Tropical Depression 10 in the Caribbean Sea and Atlantic Ocean** (September)
- * **Super Typhoon Usagi and Typhoon Wutip in Vietnam** (September)
- * **7.2 M Earthquake in the Philippines** (October)
- * **Super Typhoon Haiyan in the Philippines & Vietnam** (November)





exercise support

Even the best tools in the world are useless without thorough training and exercise. In 2013, PDC provided training and exercise support in disaster management (DM) and humanitarian assistance and disaster relief (HA/DR) around the world. We helped with scenario development, simulations, hazard modeling, application training, staff planning, and more for a variety of stakeholders, exercises, and hazards, including both meteorological and geological hazards.

- * **NORTHCOM Exercise Resolute Angel** (April)
- * **Caribbean Community Disaster Relief Unit Annual Training Workshop Table Top Exercise** (April)
- * **PACOM-Philippines Balikatan 2013** (May)
- * **MPAT Tempest Express 22 Staff Planning Workshop** (Bangladesh, May)
- * **Exercise Ardent Sentry 2013** (Atlantic, May)
- * **FEMA Exercise Blue Surge** (Caribbean and Atlantic, May)
- * **Guam Homeland Security Hurricane Exercise Pakyo** (May-June)
- * **HING Dual-Status Commander Table Top Exercise** (June)
- * **Makani Pahili, Hawaii's Statewide Hurricane Exercise** (June)
- * **Exercise TRADEWINDS 2013 Key Leaders Engagement Seminar** (Caribbean, June)
- * **U.S.-Indonesia Joint Exercise Gema Bhakti** (June)
- * **PACOM Pacific Endeavor 2013** (August)
- * **Palau-American Samoa Exercise Lightning Rescue** (August)
- * **ASEAN Regional Disaster Emergency Response Simulation Exercise 2013** (October)
- * **Regional Tsunami Preparedness Exercise 2013** (Western Pacific, December)
- * **Asia Pacific Intelligence Chiefs Conference Multinational Table Top Exercise** (December)



global

Information Services

Global Information Services Supporting Event Monitoring, Exposure, and Impact Estimation: When every second matters, reliability, accuracy, and timeliness of relevant information may literally define the difference between life and death. Over the year, the Center continued to maintain, update, and improve its data collection and processing methods for the thousands of relevant layers, and numerous information services.

Anticipatory Sciences and Socio-Economic Risk and Vulnerability Assessment (RVA): Anticipating disaster shocks, and understanding factors contributing to a community's resilience provide the most compelling means to reduce disaster risks in the long run, and to mitigate the consequences of disasters. Pushing the limits in this area, PDC expanded the temporal coverage of both data and analysis, enabling users to explore changes in resilience over time.



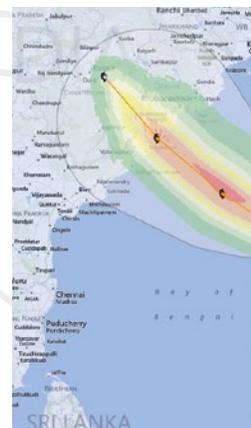
Decision Support Platforms and Applications: In a world overrun by information overflow, having access to the right tools to facilitate exchange and integrate relevant information is key to the decision making process. The

DisasterAWARE suite of decision support applications includes a variety of Internet-based applications for specific user communities and social networks, plus Disaster Alert for mobile tablets and smart phones. In 2013, all DisasterAWARE applications went through major enhancements and incremental releases.

✳ impact: Enhanced capabilities can deliver critical hazard, risk, and disaster-impact information to the right audiences at the right time.



By accessing the DisasterAWARE platform, the Disaster Alert mobile app provides users with near real-time access to data on active hazards globally—showing events that are designated potentially hazardous to people, property, or assets.



international

International Cooperation Programs and Partnerships

ASEAN Disaster Monitoring and Response System

(DMRS) Deployed: In 2012, PDC was awarded a contract by USAID to help enhance ASEAN Humanitarian Assistance Coordination Centre (AHA Centre) disaster monitoring and decision support systems, based on the DisasterAWARE platform. The deployment of the system, known as DMRS, was completed in 2013, making DMRS the very first, and still the only, regional disaster monitoring system in Southeast Asia. DMRS also earned semifinal honors as USAID's worldwide best Science and Technology Project.

Vietnam Flood Monitoring and Early Warning – Phase II:

Aiming to enhance Vietnam's national and provincial Disaster Management capabilities to forecast, monitor, and assess likely impacts from storms and floods, USAID OFDA awarded PDC a grant to establish a Vietnam national version of DisasterAWARE, called VinAWARE. During this project, as PDC worked toward the deployment of the platform, the Center also facilitated the execution of data-sharing MOUs between key ministries and stakeholders. As resultant data became available, PDC worked to automate the integration of key data feeds and provide in-depth training to national and provincial authorities.

Early Warning, Decision Support, and Capacity

Enhancement in Indonesia – InAWARE: Working closely with Indonesian authorities to help enhance the nation's early warning, disaster reduction, and related decision-making capabilities, USAID OFDA awarded PDC a three-year grant for the establishment of InAWARE, an Indonesian national version of DisasterAWARE.

National Disaster Preparedness Baseline Assessments:

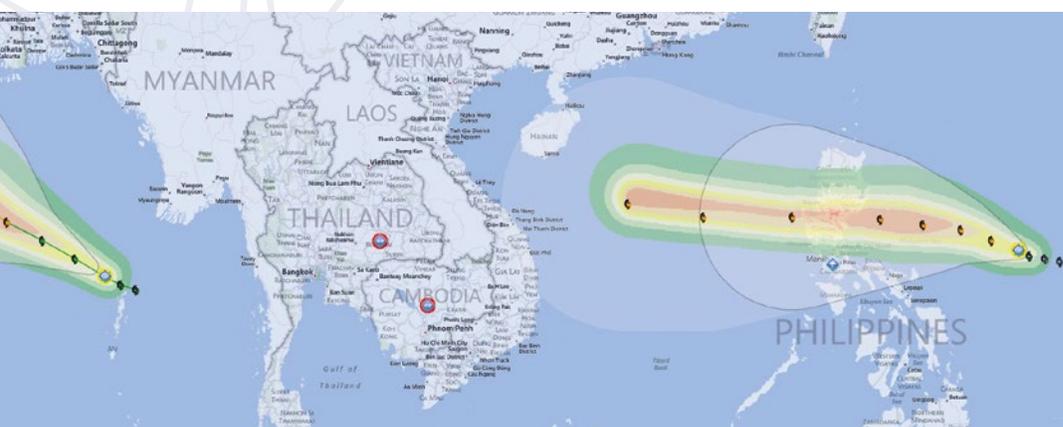
PDC began engagement on a regional effort designed to develop, implement, and conduct national and sub-national assessments focused on risk and vulnerability identification, as well as existing disaster management capacities for select countries in South America.



Partner Nations and Civil-Military Communications

The global DisasterAWARE platform, accessed through the Emergency Operations system (EMOPS), is available free-of-charge to disaster management professionals. DisasterAWARE is widely used, not only by a host of U.S. domestic agencies, but also internationally by the United Nations, national disaster management organizations (NDMO), and intergovernmental and nongovernmental organizations (I/NGO). During 2013, this platform was greatly enhanced to support mobile operational needs.

✳ impact: Improved partnership, cooperation, and awareness enhance capabilities and bring tools and technology to regions, nations, and communities who need them.



Tropical Cyclone Nari near the Philippines and Tropical Cyclone Phailin in the Bay of Bengal.

national

Applications and Products Supporting DoD HA/DR Missions

DisasterAWARE and Dashboard: Three major and six incremental releases delivered major enhancements to DoD's custom DisasterAWARE system—RAPIDS—improving disaster alerting services, security, system availability, and user interface redesigns to allow mobile access. This system also resulted in two major DoD partnership opportunities: an in-system “Dashboard” for SOUTHCOM and adoption by the DTRA Biosurveillance Portal (BSP) Joint Program Executive Office (JPEO) as its sole situational awareness tool.

Capability- and Data-augmentation and Leveraging

Projects: PDC's Biosurveillance Information Service (BioServ) continued to grow from a collaboration with the U.S. Army Public Health Command (USAPHC), Naval Medical Research Unit 2 (NAMRU-2), and Navy Environmental and Preventative Medicine Unit 6. Related map layers for emergency services, infrastructure, demography, and base maps were also added to DisasterAWARE.



Comprehensive Support to DoD and Client Capacity Enhancements

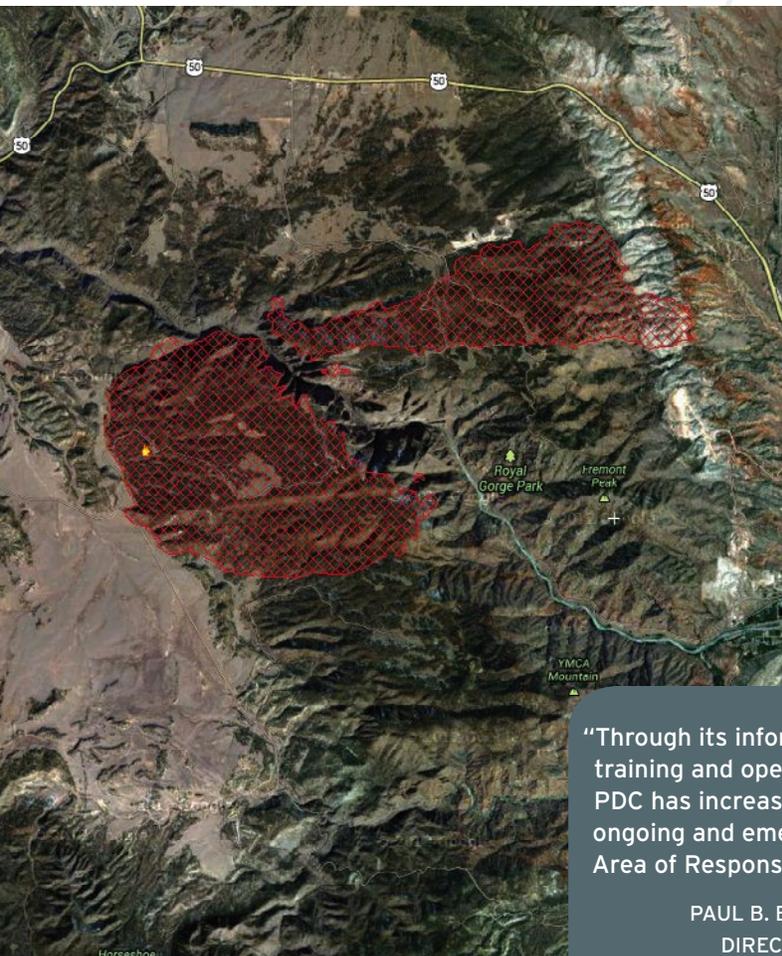
PDC continued providing full-time on-site support to the Office of the Secretary of Defense (OSD) Global Situational Awareness Facility (GSAF), located in the Pentagon.

Collaboration with SOUTHCOM also reached new heights in 2013-2014, leading to a series of long-term projects, including National Baseline Assessments, Rapid Open Geospatial User-driven Enterprise (ROGUE) Joint Capability Technology Demonstration (JCTD), and continued operational support through the RAPIDS Dashboard, liaison services, event and exercise support, and training.

✦ impact: Civil-military partnerships increase disaster resilience through education, technology, and institutional support.

The Royal Gorge Wildfire location and burn perimeter map incorporated into DisasterAWARE.

Potential track for Tropical Storm Flossie as it tracked toward the Hawaiian Islands.



“Through its information technology resources, training and operational support activities, the PDC has increased USPACOM's awareness of ongoing and emerging hazards in USPACOM's Area of Responsibility (AOR).”

PAUL B. BECKER, REAR ADMIRAL, U.S. NAVY
DIRECTOR FOR INTELLIGENCE, USPACOM

hawaii

Disaster Management

As our home state of Hawaii is susceptible to a variety of hazards and potential disasters from land, sea, and sky, PDC works hand-in-hand with Hawaii civil and military agencies and organizations to foster resilience within all communities.

Hawaii – Disaster Management Support: PDC supported authorities by providing DisasterAWARE training and support to Hawaii Emergency Management Agency (HI-EMA) and Hawaii National Guard (HING), and by actively participating in various interagency and multiagency homeland security and disaster risk management forums, including Hawaii Emergency Preparedness Executive Committee (HEPEC); Hawaii State Earthquake Advisory Committee (HSEAC); and Pacific Risk Management Ohana (PRiMO). Support was also provided to the disaster management community through access to the early warning platform for disaster events, drills, and exercises.

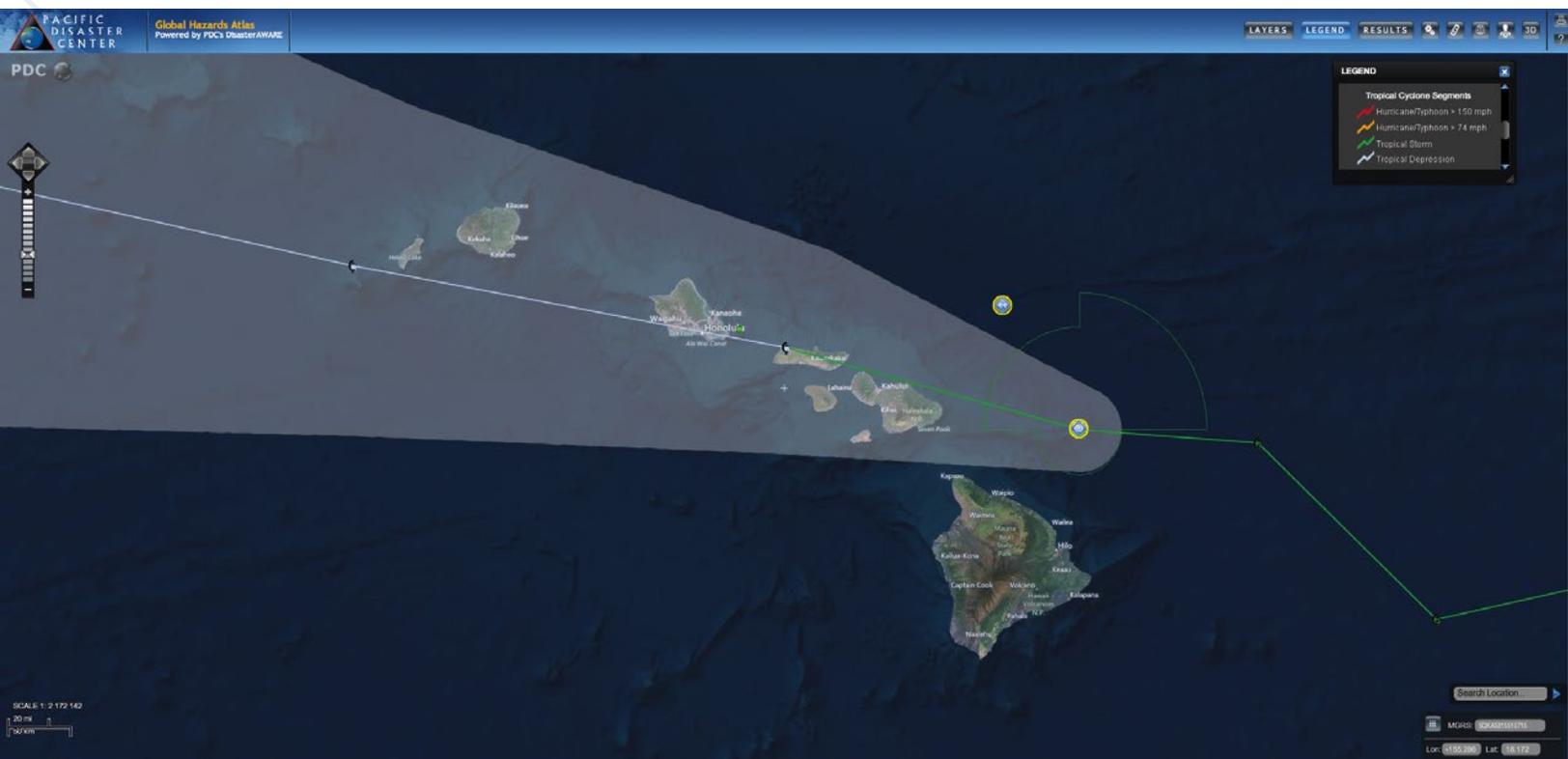
University of Hawaii-PACOM Partnership: PDC was a key player in the inception (starting in 2011) and evolution of the PACOM-University of Hawaii (UH) partnership aimed at enhancing “resilience” and strengthening “whole-of-society” involvement in addressing challenges that lead to instability.

State of Hawaii: The State of Hawaii Office of Information Management partnered with PDC, and supported a project



to use the DisasterAWARE platform for monitoring potential cyber attacks. The project involves using the existing capabilities to review cyber logs and other related information to identify possibly malicious activities, notify the operators, and display ingress and egress to physical locations on a DisasterAWARE map.

✳ impact: Close cooperation between PDC and authorities in Hawaii helps bridge the gap between information, science, technology, and emergency managers.



select conferences and workshops

January - March

National Geospatial-Intelligence Agency course on Geospatial Intelligence in support of Humanitarian Assistance and Disaster Relief missions (HAWAII)

Third International Workshop on Global Flood Monitoring and Modeling (MARYLAND)

PACOM Science and Technology Conference (HAWAII)

ASEAN Capacity Building Forum on Risk Assessment (THAILAND)

International Visitor Leadership Program for South Korea (HAWAII)

UN-SPIDER Technical Advisory Mission to Vietnam (VIETNAM)

April - June

SOUTHCOM Humanitarian Assistance & Humanitarian Civic Assistance Program Managers Conference and Workshop (FLORIDA)

UN-SPIDER Training Workshop on Space Technology on Flood Hazard Mapping, Flood Forecast, and Rapid Mapping (BANGLADESH)

Asia Pacific Disaster Risk Reduction & Resilience (APDR3) Network Indonesia Symposium on Disaster Risk Reduction and Resilience (INDONESIA)

July - September

Hawaii State Disaster Resiliency Stakeholders Conference (HAWAII)

The World Bank East Asia and the Pacific (EAP) Disaster Management Team at the Global Facility for Disaster Reduction and Recovery (JAKARTA)

Stakeholder Meeting on the Utilization of Space-based Information for Disaster Risk Management (WASHINGTON DC)

Bio-Preparedness in the Asia-Pacific Workshop (HAWAII)

October - December

Technical Meeting: Human Security in the New Information Age—How Social Media Impacts Military Missions, Gov. to Gov. Coordination, and International Relations (BELGIUM)

Chengdu Forum on the United Nations Initiative on Global Geospatial Information Management “Global Map for Sustainable Development: Development and Application in Urban Hazard Mapping” (CHINA)

Hawaii Emergency Preparedness and Homeland Security Workshop (HAWAII)

Overseas Humanitarian, Disaster Assistance, and Civic Aid Workshop (WASHINGTON DC)

Taiwan National Science and Technology Center for Disaster Reduction Tenth Anniversary Celebration and International Forum on Technology Development for Disaster Risk Reduction (TAIWAN)

Second ASEAN Agreement on Disaster Management and Emergency Response (AADMER) Partnership Conference (VIETNAM)

partners, clients, and funding organizations

Disaster Management and Humanitarian Assistance

All Partners Access Network (APAN)
American Red Cross (ARC)
Asia-Pacific Economic Cooperation (APEC)
Association of Southeast Asian Nations (ASEAN)
Humanitarian Assistance Coordination Centre (AHA Centre)
Badan Nasional Penanggulangan Bencana-Indonesia (BNPBI)
Federal Emergency Management Agency (FEMA)
Hawaii Emergency Management Agency (HI-EMA)
Hawaii National Guard (HING)
Joint Program Executive Office-Chemical and Biological Defense (JPEO-CBD) BioSurveillance Program (BSP)
National Emergency Management Agency (NEMA) of The Bahamas

National Science and Technology Center for Disaster Reduction-Taiwan (NCDR)
Pacific Risk Management Ohana (PRIMO)
R3ADY - Asia Pacific South Pacific Applied Geoscience Commission (SOPAC)
State of Hawaii: Office of the Governor, county civil defense agencies, HEPEC, HSCD, DCCA
United Nations: UNOCHA, UN-SPIDER, and others
U.S. Agency for International Development (USAID): Office of Foreign Disaster Assistance (OFDA), U.S. Business Chamber of Commerce
U.S. Army Corps of Engineers (USACE): Institute for Water Resources (IWR), Pacific Ocean Division (POD)
U.S. Department of Defense: PACOM, NORTHCOM, SOUTHCOM, EUCOM, AFRICOM

U.S. Department of Homeland Security (DHS):
U.S. Coast Guard
U.S. Department of State Humanitarian Information Unit (HIU)
U.S. Office of the Secretary of Defense Global Situational Awareness Facility (OSD GSAF)
U.S. Trade and Development Agency (USTDA)
Vietnam Ministry of Agriculture and Rural Development (MARD)
The World Bank (WB)
Research, Education, and Training
Armed Forces Health Surveillance Center (AFHSC)
Asia Pacific Center for Security Studies (APCSS)
Center for Excellence in Disaster Management and Humanitarian Assistance (COE DMHA)
Center for Strategic and International Studies (CSIS)

National Defense University (NDU)
National Telecommunications and Information Administration (NTIA)
Naval Postgraduate School (NPS)
University of Hawaii (UH)
Universitas of Gadjah Mada (UGM)
U.S. Forest Service (USFS)
Water Resource University of Vietnam (WRU)
Major Data Providers
Defense Threat Reduction Agency (DTRA)
National Aeronautics and Space Administration (NASA)
National Center for Medical Intelligence (NCMI)
National Geospatial-Intelligence Agency (NGA)

National Oceanic and Atmospheric Administration (NOAA):
NWS, CSC, PSC
Pacific Tsunami Warning Center (PTWC)
U.S. Department of Veterans Affairs (VA)
U.S. Geological Survey (USGS)
Private Sector
Development Alternatives Inc. (DAI)
DHI
Environmental Systems Research Institute (Esri)
Hawaii Hotel and Visitor Industry Security Association (HHVISA)
Kinetic Analysis Corporation
Nathan Associates, Inc.
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Pacific Disaster Center (PDC) develops and applies information and technology solutions to foster disaster-resilient communities. PDC was established by the U.S. Government and is managed by the University of Hawaii. The content of this document does not reflect the position or policy of the U.S. Government.

*The Guardian reporting on a study by the Norwegian Refugee Council.