

 **OUR IMPACT**

**2018—2019 Accomplishments**



*DisasterAWARE used by 18 countries and AHA Centre for ADMM+ Exercise*

**Better solutions.  
Fewer disasters.**

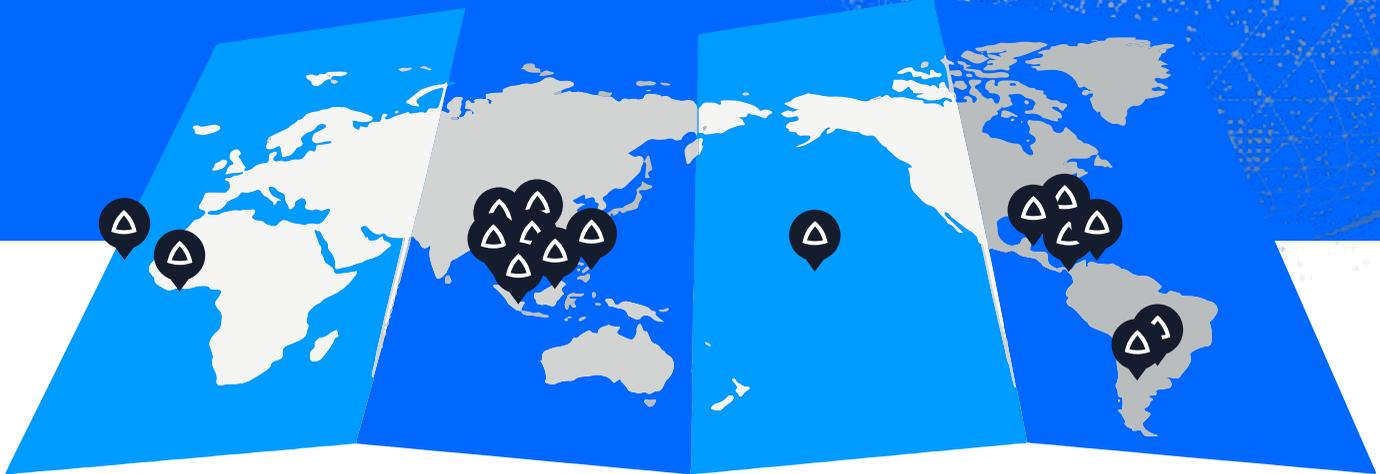


Worldwide Engagements  
(2018-2019)

**Safer  
world.**

# Reducing disaster risk at home and around the world

Pacific Disaster Center (PDC) provided significant research, science, and technology to help communities in the U.S. and nations abroad—many located in the most disaster-prone regions of the world—to reduce disaster risk and save lives. During 2018 and 2019, PDC worked with government agencies and nongovernmental organizations (NGOs) to build national capacity for early warning, hazard monitoring, and decision support in nine countries throughout Southeast Asia. It also conducted significant exercises, regional risk assessments, and performed National Disaster Preparedness Baseline Assessments in 11 countries—all with a focus on improving resilience for the most vulnerable populations.



2018 - 2019

## 52 Major projects with

62 National Governments

8 Regional Organizations



MORE...



25  
60+

Disaster Preparedness and Response Exercises Worldwide  
Participating Nations



11

National Disaster Preparedness Baseline Assessments (NDPBA)



9

National Early Warning and Decision Support Capacity Development Projects



7

Risk and Vulnerability Assessments (RVA)



3.5+ Billion

People living within project areas

2.5+ Billion (72%)  
Low-Moderate Resilience

### What's new



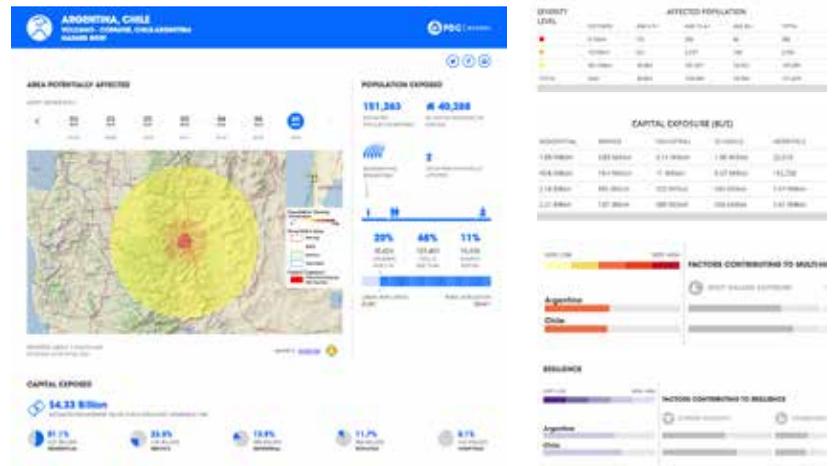
#### Artificial Intelligence and Big Data Innovations

##### HAZARD BRIEF

The DisasterAWARE Hazard Brief now uses PDC's All-hazards Impact Model (AIM)® to provide big data computations of potential hazard impacts to populations, as well as building and infrastructure losses. Hazard Brief aids decision makers with an at-a-glance analysis of what, where, and how severe a hazard's impacts might be before an event occurs or within seconds of its occurrence.

##### SMART DESCRIPTIONS FOR HAZARDS

PDC's machine-generated natural language algorithm assembles data points about a hazard and generates descriptive text that can be easily understood by decision makers and the public.



##### BEFORE



##### TROPICAL CYCLONE Tropical Cyclone - Kenneth

A message for Tropical Cyclone - Kenneth was issued by NWS at August 23, 21:00:00 GMT for the E Pacific Ocean. Maximum Sustained Winds: 35 kt, 40 mph, 65 kph Wind Gusts of: 45 kt, 52 mph, 83 kph.

##### AFTER



##### TROPICAL CYCLONE Tropical Cyclone - Kenneth

A tropical cyclone forecast has been issued by Joint Typhoon Warning Center (JTWC) on August 23, 2019, 21:00:00 GMT. Tropical Cyclone - Kenneth, currently equivalent to a Category 4 hurricane (on the Saffir-Simpson scale), is located in the S Indian Ocean with maximum sustained winds of 222 km/h (138 mph), and wind gusts up to 268 km/h (167 mph). According to this forecast (#11), the cyclone is headed West at about 20 km/h (13 mph) and is expected to weaken over the next 24 hours. It is cautioned, however, that the storm's actual position may shift significantly over the next few days.

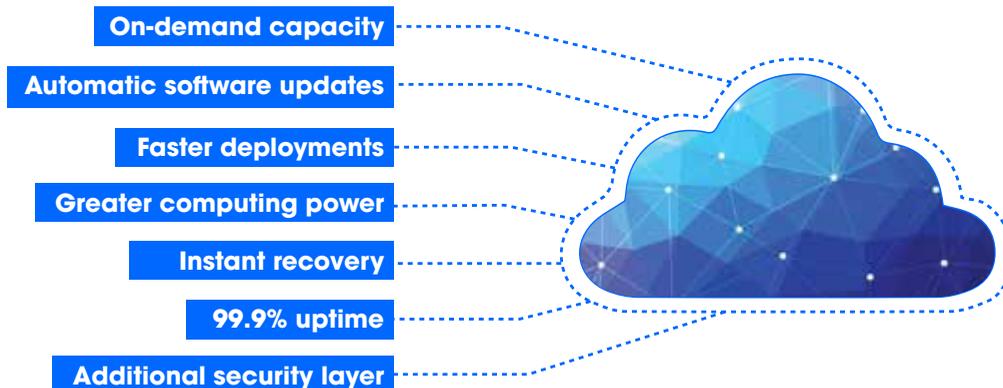


### Geopolitical Hazard Monitoring

9 types of geopolitical hazards

Professional versions of DisasterAWARE now include hazard monitoring for geopolitical hazards. With PDC's proprietary severity algorithm, organizations can now quickly identify incidents that may pose a threat.

### New Cloud Computing



#### Key Advantages

**Scalable. Reliable. Flexible. Fast.**

To ensure maximum uptime, speed, and scalability for our users, PDC transitioned its DisasterAWARE application and data services to the cloud. We now have on-demand ability to increase bandwidth and storage while providing greater security and reliability.





# Disaster AWARE®

## REAL-WORLD APPLICATIONS (2019)

Regional and National Capacity Development Program for Hazard Monitoring, Early Warning, and Decision Support

**We build more than great technology.  
We build long-term capacity.**



In 2019, with funding support from USAID/OFDA, PDC launched a new Regional and National Capacity Development Program in partnership with the AHA Centre that is designed to provide new hazard monitoring, early warning, and decision support capabilities to participating ASEAN Member States and their Emergency Operations Centers (EOCs).

## 9 National EOCs 1 Regional EOC

### 1 DEPLOYMENT OF NEW CUSTOM SYSTEMS

Customize and deploy new national versions of DisasterAWARE.

- + **PhiAWARE** (The Philippines)
- + **MyAWARE** (Malaysia)

### 2 UPGRADE AND ENHANCE EXISTING SYSTEMS

Previously implemented systems will be upgraded and enhanced.

- + **DMRS** (Regional System)
- + **InAWARE** (Indonesia)
- + **ThaiAWARE** (Thailand)
- + **VinAWARE** (Viet Nam)

### 3 LEVERAGE AHA CENTRE SYSTEM

Institutionalize the operational use of AHA Centre's Disaster Monitoring & Response System (DMRS) with select ASEAN member states.

- + **Brunei**
- + **Cambodia**
- + **Lao PDR**
- + **Singapore**



**645 Million**  
people within the ASEAN region

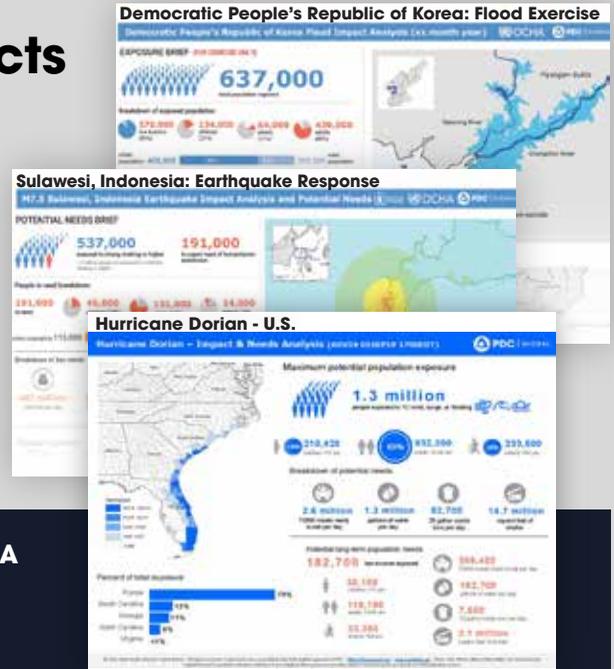
Brunei . . . . .	.4 M	Myanmar . . . . .	56 M
Cambodia . . . . .	16 M	Philippines . . . . .	104 M
Indonesia . . . . .	261 M	Singapore . . . . .	6 M
Lao PDR . . . . .	7 M	Thailand . . . . .	68 M
Malaysia . . . . .	31 M	Viet Nam . . . . .	96 M



# ANTICIPATORY SCIENCE

## Anticipating potential hazard impacts and humanitarian needs

PDC broadened use of its All-hazards Impact Model (AIM) for situational analysis products. These products support major response efforts throughout the U.S. and around the world. PDC also partnered with FEMA and the U.N. Office for the Coordination of Humanitarian Affairs (OCHA) and World Food Programme on joint products. These leverage PDC modeling capabilities which combine unique datasets provided by each of these organizations to more accurately anticipate economic and population impacts as well as humanitarian needs.



### ALL-HAZARDS IMPACT MODEL



## Converting science into action

### GLOBAL AND SUBNATIONAL RISK AND VULNERABILITY ASSESSMENT

PDC's global risk and vulnerability assessment (RVA) was utilized nationally and regionally. The assessment helps decision makers identify the probability of hazards and where they might occur, the likely severity of impact, and populations most at risk. Results are also used to determine where to invest in humanitarian assistance and disaster relief capabilities to build resilience, lower vulnerability, and save lives.



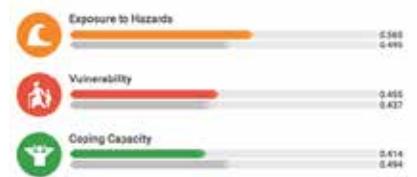
### Sample Results

#### EXPOSURE TO HAZARDS



#### COMPONENTS OF RISK

COMPARED TO AVERAGE NATIONAL SCORE



Below are the four thematic areas with the weakest relative scores:



# DATA & ANALYTICS

## NATIONAL DISASTER PREPAREDNESS BASELINE ASSESSMENT (NDPBA) PROGRAM



2018-2019 PDC Support

**15 Nations**  
(415 Million People)

**6%** of Global Population

### RISK AND VULNERABILITY RESULTS



Vulnerability

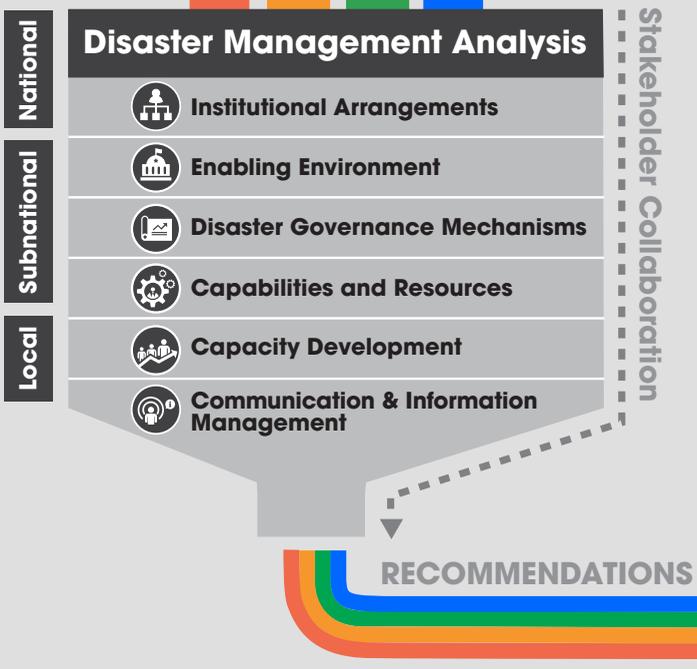
Multi-hazard Exposure

Coping Capacity

DM Capabilities

## Enhanced data and analytics to address the urgent global crisis

The increasing frequency and severity of disasters requires a comprehensive and data-driven solution. PDC's National Disaster Preparedness Baseline Assessment (NDPBA) is more than just an assessment, it's a systematic approach to address the urgent crisis facing the world. The NDPBA is the first and only system designed to operationalize the United Nations' Sustainable Development Goals and the Priorities for Action defined in the U.N. Sendai Framework for Disaster Risk Reduction. The baseline assessment offers a roadmap to building disaster resilient communities into the future—providing the necessary tools, scientific data, and evidence-based practices for a safer world.



### Disaster Management Analysis

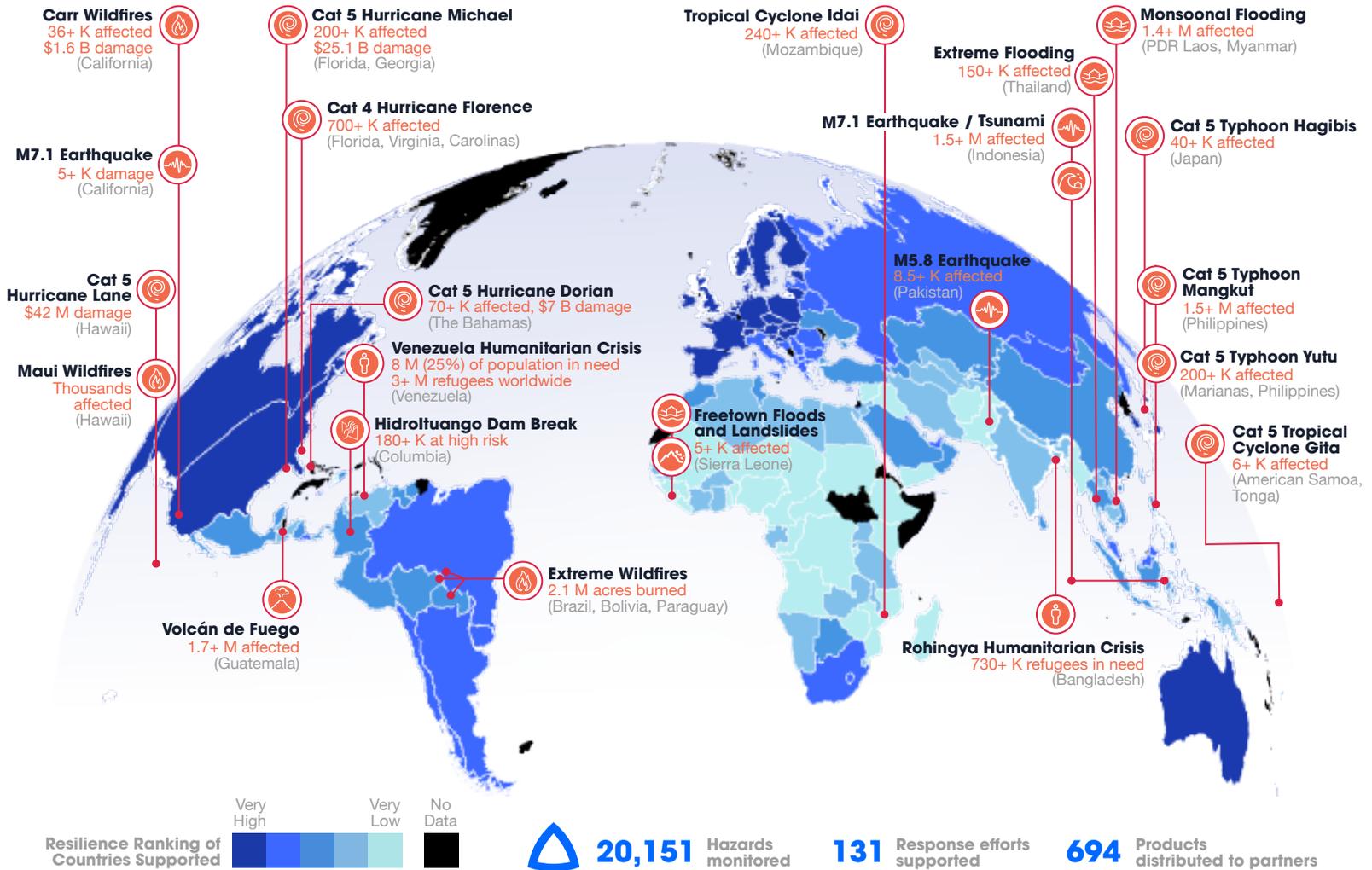
PDC's Disaster Management Analysis contextualizes risk and vulnerability to guide actions to reduce risk and build lasting resilience.



**5-Year Action Strategy**

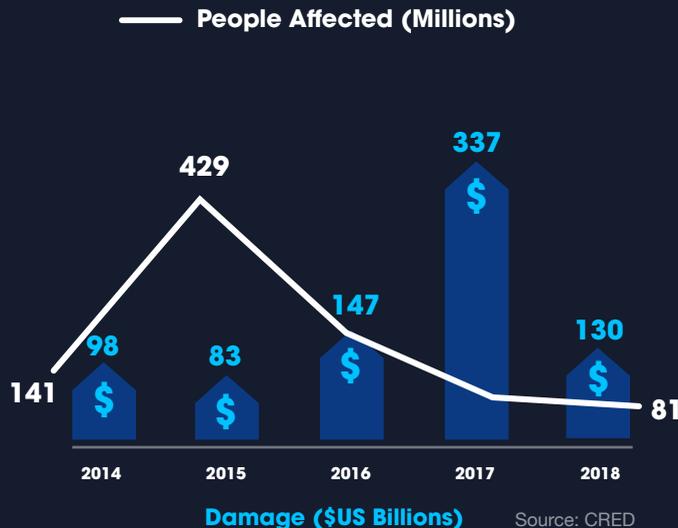
# GLOBAL DISASTER RESPONSE SUPPORT

2018 - 2019 snapshot of major response efforts PDC supported



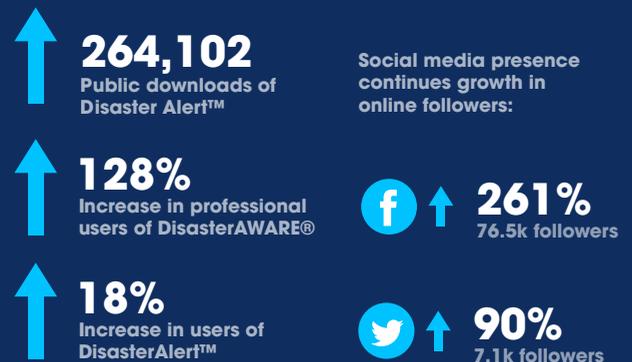
## 5-Year Trends

### Natural Disaster Impacts Worldwide



### Information saves lives.

(2014-2018)





# 2019 HURRICANE DORIAN

## PDC Response and Relief Operations in The Bahamas



In records going back over a century, there are no cases where an Atlantic Category 5 hurricane has impacted a land area for as long as Dorian battered the Bahamas.



— Jeff Masters  
Meteorologist, Weather Underground

### Organizations we supported:



Bahamas NEMA



BNGIS Centre



U.S. NORTHCOM



CDEMA



U.S. Coast Guard



USAID/OFDA



PAHO/WHO



World Food Programme



OCHA

### Hundreds of NGOs



PDC's advanced modeling capabilities and mapped products helped accurately anticipate the nature and extent of impacts from Dorian so that we could protect the most at-risk communities and coordinate life-saving humanitarian relief. These products were used daily in planning and public outreach, and in briefing national officials, including the Prime Minister, to prepare effectively. In addition, PDC team members gathered, analyzed, and disseminated critical information that helped organize crucial emergency support functions with the responsibility for evacuation and relief, public health and human services, search and rescue, and the restoration of critical public infrastructure.

— Captain Stephen M. Russell  
Director, National Emergency Management Agency, The Bahamas



PDC provides on-site emergency relief and recovery guidance to response teams on heavily-hit Abaco Island.



Humanitarian relief agencies and NGOs rely on PDC products to plan daily response operations.

## HURRICANE DORIAN SITUATION OVERVIEW

Displaced: **70,000**

Missing: **400+** Deaths: **60+**

PDC Support: **187** pre- and post-impact analysis products



PDC information, maps, and analytical products support disaster relief efforts by U.S. Northern Command, including logistics for deployment of USAID.



PDC provides disaster response leadership and coordination for Emergency Support Function 5 (ESF-5) Information and Planning Unit at The Bahamas National Emergency Operations Center (EOC), as well as on the most heavily impacted islands of Abaco and Grand Bahama.

## Increasing global cooperation and preparedness

### ADMM+ 18-COUNTRY MULTINATIONAL EXERCISE



**JULY 29 - AUGUST 2, 2019**—Based out of Kuala Lumpur, Malaysia, 18 nations came together, alongside regional and international organizations, for the Humanitarian Assistance/Disaster Relief (HA/DR) communications and staffing exercise sponsored by the ASEAN Defence Ministers' Meeting – Plus. The exercise was one of the most ambitious combined disaster response exercises in Southeast Asia to date, for which PDC developed the scenario and script and enabled communications with DisasterAWARE.



OSD-P



USAID/OFDA



INDOPACOM



CFE-DM



AHA CENTRE



PDC was invited by ASEAN to co-host a panel examining advanced applications of Artificial Intelligence in disaster risk reduction during

## Growing visibility of AI and Big Data in Disaster Risk Reduction



the ASEAN Workshop on Disaster Reporting and Big Data for Disaster Management in Jakarta, Indonesia (March 2019).



## Partnering on new disaster management capacity

PDC signs a Memorandum of Understanding with the Philippines during kick-off of project for PhilAWARE and National Disaster Preparedness Baseline Assessment (NDPBA).



**25**  
**EXERCISES**  
**SUPPORTED**  
(2018 – 2019)

**80** DisasterAWARE Trainings Supporting Preparedness and Response

**2019 Activities**

- Pacific Sentry Exercise CPX** (Hawaii)
- APCSS Comprehensive Crisis Management TTX** (Hawaii)
- Pandemic Coordination Workshop and TTX** (Hawaii)
- Malaysia HADR Civil-Military TTX** (Malaysia)
- Pacific Environmental Security Forum TTX** (New Zealand)
- Restoration Island Cays TTX** (The Bahamas)
- Makani Pahili Exercise** (Hawaii)
- ADMM+ Expert Working Group TTX** (Malaysia)
- Pacific Endeavor FTX** (Papua New Guinea and Nepal)
- Gobi Wolf TTX and CPX** (Mongolia)
- Disaster Response and Medical Capabilities TTX** (Buhtan)

**FTX** = Field Training Exercise  
**TTX** = Tabletop Exercise  
**CPX** = Command Post Exercise (Functional Exercise)

 <p><b>Scenario-based Training</b></p>	 <p><b>Tabletop Exercises</b></p>
 <p><b>Functional Exercises</b></p>	 <p><b>Full-scale Exercises</b></p>



# Safer world.

PDC develops and applies information and technology solutions to foster disaster resilient communities. PDC was established by the U.S. Government in 1996 and is managed by the University of Hawaii. The content of this document does not necessarily reflect the position or policy of the U.S. Government.

**Mahalo to our valued partners**

We partner with so many outstanding organizations around the world, simply too many to list, for whom we are grateful. For 2018 and 2019, a special recognition goes out to:

- ➔ U.S. Department of Defense (INDOPACOM, NORTHCOM, SOUTHCOM, AFRICOM);
- ➔ ASEAN Humanitarian Assistance (AHA) Centre;
- ➔ United Nations Office for the Coordination of Humanitarian Affairs (OCHA);
- ➔ U.S. Interagency Partners (FEMA, USAID, NASA, USGS, NOAA);
- ➔ World Food Programme (WFP);
- ➔ International Displacement Monitoring Center (IDMC);
- ➔ ACAPS;
- ➔ Humanitarian OpenStreetMap Team (HOTOSM); and
- ➔ Many more partners with whom we've collaborated...