

Safer world.



2020 - 2021
ACCOMPLISHMENTS REPORT



PDC supported the response to eruption of La Soufrière Volcano, St. Vincent and the Grenadines (2021)

2020- 2021

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PDC Executive Director, Ray Shirkhodai



Asia and the Pacific is the most disaster-prone region in the world. Countries need our continued support to help them prepare, respond and recover when disasters strike. [PDC] research and tools will greatly enhance national governments' ability to withstand multiple shocks and contribute to the resilience-building of families and communities.

—Nobel Laureate World Food Programme Regional Director for Asia and the Pacific, John Aylieff



REASON FOR OPTIMISM

A MESSAGE FROM PDC EXECUTIVE DIRECTOR RAY SHIRKHODAI

As the world heads into 2022, a long and uncertain road lies ahead in humanity's fight against COVID-19 and climate change. Despite significant gains in science and medicine, global suffering has lingered into another year, outpacing the previous year with more than 2.5 million global deaths and a wave of serious economic shocks. The impacts of COVID-19 have collided with a widespread increase in climate-driven natural disasters, misinformation campaigns, economic uncertainties, supply chain woes, and other conflicts and crises that threaten stability, peace, and safety for the world's population.

Yet, in the midst of these challenging times, there remains hope in the power of science, information, and technology to help lift us out of darkness. Over the years, history has shown us how scientific advancements can ease human suffering and improve our quality of life. In 2021, through scientific collaboration and public-private partnership, multiple COVID-19 vaccines were developed in record time and distributed worldwide. This was a monumental and historic human achievement made possible through science.

Likewise, the field of disaster reduction made rapid advancements thanks to science and technology—helping decision makers to better face the existential challenges of climate change as seen through relentless flooding, wildfires, cyclones, biological threats, and myriad man made and natural hazard phenomenon.

At PDC, fueled by our undying optimism, we are proud to have contributed to some of these advancements in new science, information, and technology. In 2021, we equipped more than 20,000 disaster managers and decision makers worldwide with the most advanced scientific tools and information. Our DisasterAWARE platform is being used by the largest organizations in the world to aid rapid response, save lives, reduce suffering, and mitigate long-term risks. Through the system, users can utilize our groundbreaking all-hazards impact model for a one-click analysis of humanitarian needs during large-scale disaster events. We also continue to expand our data holdings to provide the largest inventory of scientifically-vetted data for planning, response, and recovery. Through these innovations we are bridging the knowledge gap and helping others to create a safer and brighter future for all of humankind.

A handwritten signature in white ink that reads "Ray Shirkhodai".

Learn more at www.pdc.org



GLOBAL IMPACTS

& LIFE-SAVING EFFORTS



20

PDC RESPONSE ACTIVATIONS



RESPONSE PRODUCTS
to help anticipate disaster impacts and support effective decision making

140k+

Near real-time automated products

176

Specialized partner products



PDC supported response to catastrophic flooding throughout Guyana (2021)

- 7** Tropical Cyclones
- 4** Earthquakes and Tsunamis
- 2** Wildfires
- 2** Floods
- 1** Pandemic
- 4** Volcanoes

GLOBAL MONITORING AND ALERTING



DISASTER AWARE
disasteraware.pdc.org

15,000+

Hazards Reported



500k+

SmartAlerts Issued

- 18**

Natural Hazards

- 9**

New Geopolitical Hazards



25,000+

Professional Users (Up 40% from 2020)



PDC supported response to Mount Nyiragongo Eruption, Democratic Republic of Congo (2021)

TRAINING DELIVERED

DisasterAWARE



U.S. DoD

283

Nations



Partner Nations

871

Total Participants

71

Training Sessions



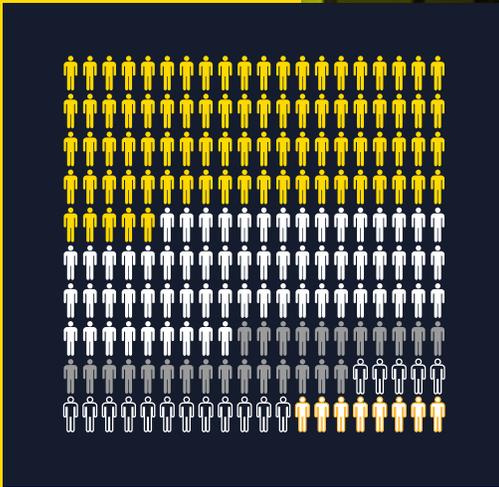
Civil Emergency Management



National Guard



Other U.S. Govt



PDC, U.S. Northern Command, and The Bahamas jointly conduct Command Post Exercise (2021)

GLOBAL IMPACTS

& LIFE-SAVING EFFORTS

DATA LAYERS

to support planning and response



6,500+

Total Layers

1,000

New Layers

400

Layer Updates

26

Countries with Subnational Data



New Global Hospital Data



New Women, Peace and Security Data



Exercise Scenarios

11

Exercises

41

Nations



Tropical Cyclone

25

Exercise Events

3

Combatant Commands



Earthquake



Biomedical



Terrorism



Trafficking in Persons



PDC supported response to Hurricane Henri Flash Flood, U.S., New Jersey (2021)



BIG DATA & ANALYTICS

INFORMING DECISIONS FOR A SAFER WORLD

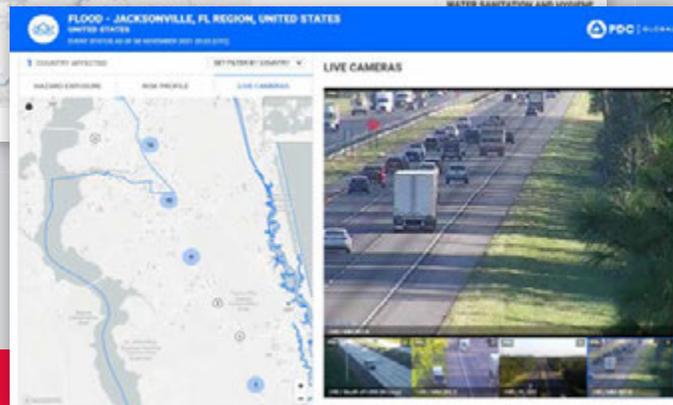
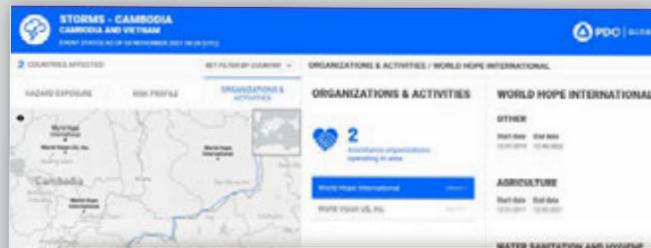
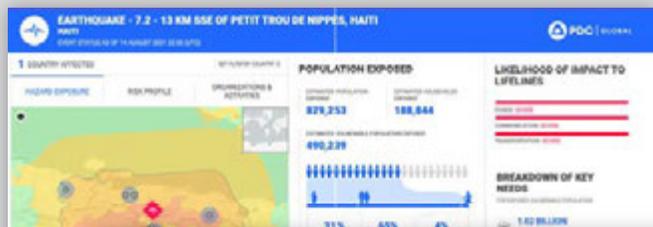
“ PDC’s new Event Brief fundamentally changes how response agencies deliver aid. By allowing decision makers to quickly and accurately anticipate hazard impacts, we are speeding up service delivery exponentially—ultimately saving lives and reducing suffering.

—Dr. Erin Hughey
PDC Director of Global Operations



EVENT BRIEF

One-click hazard analysis in near real-time

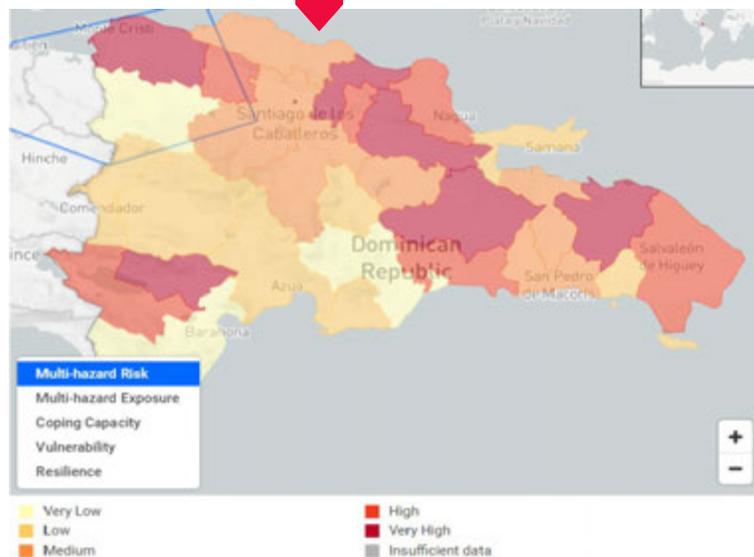


- ✓ Population Exposure
- ✓ Infrastructure and Capital Exposure
- ✓ Impacts to Critical Lifelines
- ✓ Humanitarian Needs
- ✓ National and Subnational Risk Info
- ✓ Live Cameras
- ✓ News and Weather
- ✓ Much More

BIG DATA & ANALYTICS

EVENT BRIEF

Event Brief is available through DisasterAWARE and leverages PDC's Global Risk and Vulnerability Assessment. It now includes subnational information from the Center's National Baseline Assessment covering nearly 20% of all nations worldwide.



In 2021, PDC launched Event Brief—a groundbreaking, near real-time report that provides critical information to aid rapid response to large-scale events happening anywhere in the world. Event Brief operates in near real-time and **helps anticipate hazard impacts and save lives** by quickly answering questions such as: What happened? Where did it happen? How bad is it? What actions need to be taken?

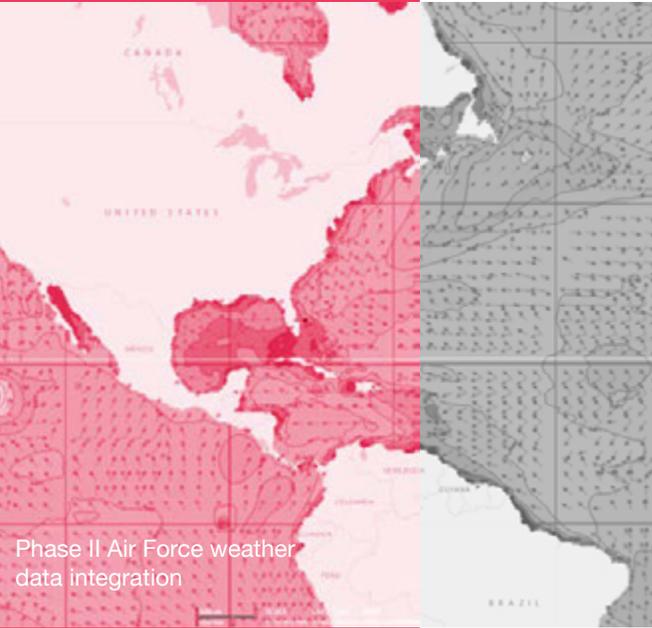


Access Event Brief through DisasterAWARE Pro or request access at disasteraware.pdc.org.

Event Brief leverages PDC's vast scientific information, our proprietary research on risk, vulnerability, and disaster preparedness, and the Center's one-of-a-kind global All-hazards Impact Model (AIM). The speed and scientific accuracy of analysis produced in the report is unlike anything available today.

PDC's Event Brief supported response to the recent 7.2-Magnitude earthquake in Haiti (2021)

6,500+
total data layers



BIG DATA & ANALYTICS

EXPANDED DATA HOLDINGS

PDC continues to increase its data holdings through ongoing research and data-sharing partnerships. We make this data available at no cost to the disaster management and humanitarian assistance community through our DisasterAWARE platform.



1,000

NEW Data Layers

26

Subnational data holdings for 26 nations including the following new countries:

Belize (30)

Indonesia (141)

Panama (115)

Philippines (23)

The Bahamas (113)

Trinidad and Tobago (9)



New Global Hospital Data



New Women, Peace and Security Data

	Boundaries
	Biosurveillance
	Climate Change Projections
	Conflict
	Demographics
	Economic
	Hazards
	Humanitarian Aid
	Hydrology / Hydrography
	Infrastructure
	Natural Resources
	Observations and Forecasts
	Risk and Vulnerability
	Women, Peace and Security



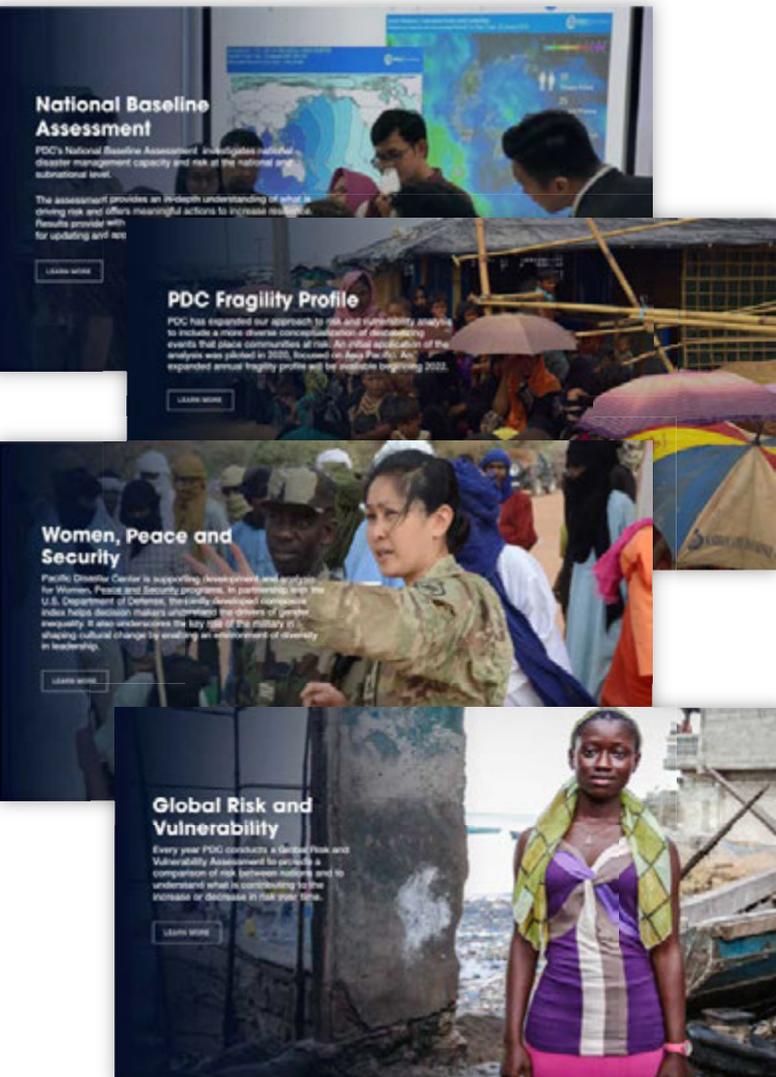
NEW types of data and expanded inventory. Request access at disasteraware.pdc.org.

ADVANCED RESEARCH

ASSESSING NATIONAL PREPAREDNESS, FRAGILITY, WOMEN, PEACE AND SECURITY

PDC continues to advance its National Baseline Assessment—providing nations with the necessary tools to operationalize use of assessment results and data in order to increase disaster resilience and reduce disaster risk. The baseline assessment bridges critical knowledge gaps and encourages disaster management data sharing between organizations and nations. Our work remains **on track to conduct subnational assessments for 20% of the world by 2022**. All findings and data are made available in DisasterAWARE Pro throughout the process.

Additionally, we've expanded our research into other risk-related topics such as women, peace and security, and national fragility to support global humanitarian efforts.



NDPBA program made possible through generous support from our partners.



NATIONAL BASELINE ASSESSMENTS

6

Nations Completed / Data Layers Added (2021)

- Belize (30)
- Indonesia (141)
- Panama (115)
- Philippines (23)
- The Bahamas (113)
- Trinidad and Tobago (9)

12

Nations to be Completed / Data Layers Added (2022)

- Cabo Verde (6)
- Djibouti
- Guyana (90)
- Nepal (30)
- Palau (14)

EASTERN CARIBBEAN

- Antigua and Barbuda
- Barbados
- Commonwealth of Dominica
- Grenada
- St. Kitts and Nevis
- St. Lucia
- St. Vincent and the Grenadines

TOTAL

571

New layers to support decision making

179

Countries layers updated

Learn more at www.pdc.org/research

87

NEW WPS DATA LAYERS

Request access at
disasteraware.pdc.org



WPS BENEFITS & OBJECTIVES

- ✓ Supports DoD operationalization of WPS and the global WPS agenda
- ✓ Supports ongoing DoD efforts to integrate gender perspectives across the combatant command areas of responsibility.
- ✓ Supports an inclusive, human-centered security approach that considers gender perspectives across the security and conflict continuum.
- ✓ Offers a data-driven approach to providing meaningful opportunities for participation of women in decision-making processes related to peace, security, conflict, and crises worldwide.
- ✓ Facilitates greater understanding of how gender shapes security needs and outcomes of an entire affected population—ensuring human rights are protected, especially during conflict and crisis.

Learn more at www.pdc.org/wps

WPS research made possible through generous support from our partners.

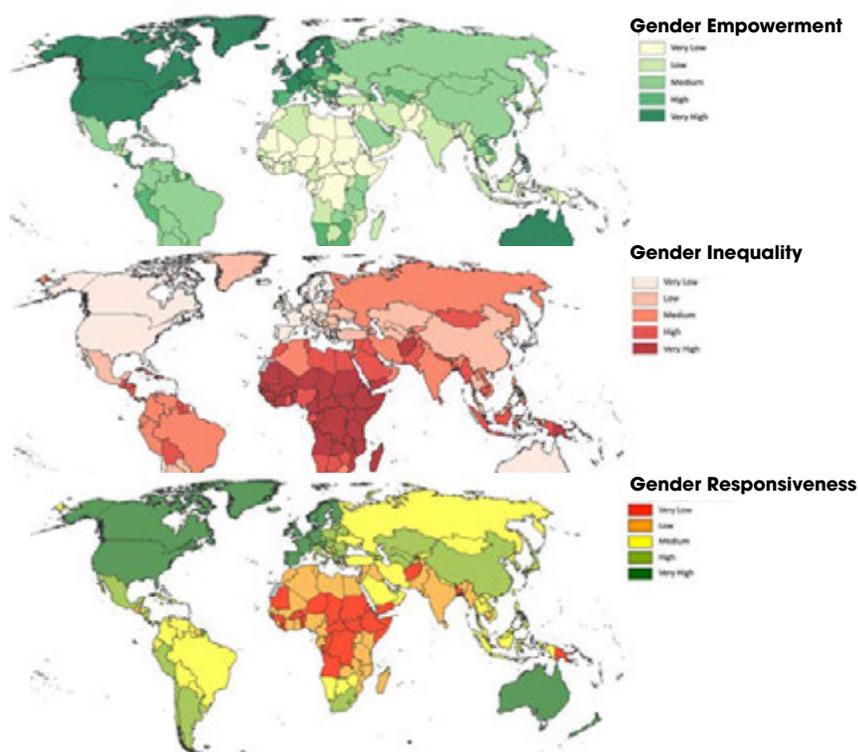


ADVANCED RESEARCH

WOMEN, PEACE AND SECURITY (WPS)

PDC is supporting development of a new analysis for Women, Peace and Security programs. In partnership with the U.S. Department of Defense, the jointly developed composite index helps decision makers understand the drivers of gender inequality. It also underscores the key role of the military in shaping cultural change by enabling an environment of diversity in leadership.

WPS ANALYSIS RESULTS NOW AVAILABLE IN DISASTER-AWARE PRO



ADVANCED RESEARCH

PDC FRAGILITY PROFILE

50

NEW FRAGILITY DATA LAYERS

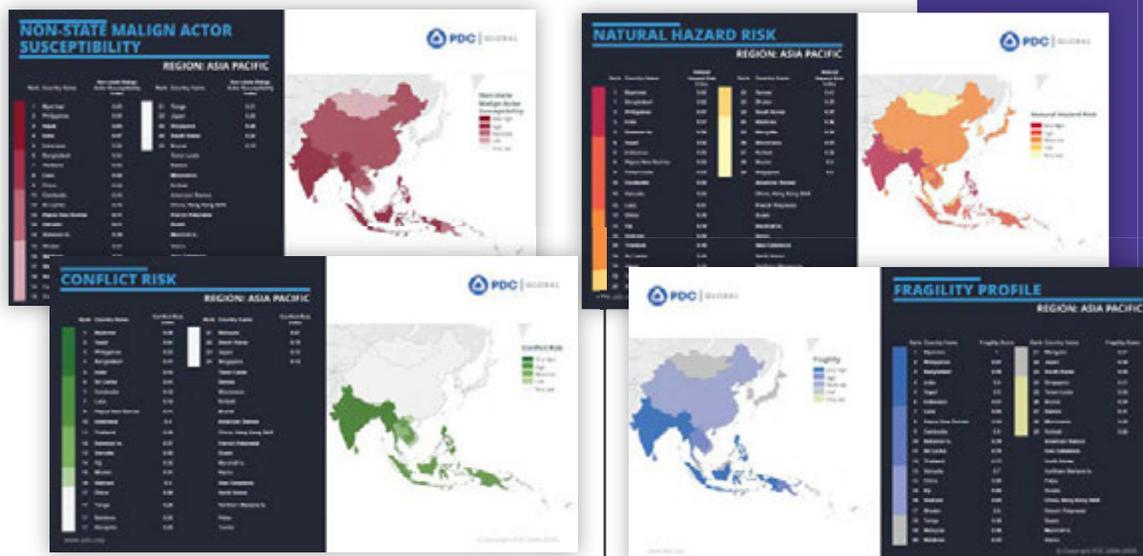
Request access at disasteraware.pdc.org



PDC expanded the approach to our risk and vulnerability analysis to include a more diverse conceptualization of destabilizing events that place communities at risk. An initial application of the analysis was piloted in 2020, focusing on Asia Pacific. PDC's Fragility Profile is an in-depth analysis which provides new insight into the ability of countries to withstand destabilizing shocks. Using a multi-dimensional approach, the analysis identifies key drivers of fragility to guide strategic investment. An expanded annual fragility profile will be available beginning in 2022.

FRAGILITY PROFILE BENEFITS & OBJECTIVES

- ✓ This detailed examination of critical data provides decision makers with new insight into the ability of countries to withstand destabilizing shocks.
- ✓ Further, this analysis identifies the drivers of instability and provides a strategic roadmap for investments that reduce fragility.



Learn more at www.pdc.org/pdc-fragility-profile

STATE-OF-THE ART TECHNOLOGY

HAZARD IMPACT MODELING, DISASTER AWARE, AND AI FOR HUMANITY

It may be that 2021 is the crowning year for technical achievement at PDC. We would have been proud to launch only one of the new technologies we developed this year.

Our many accomplishments include the launch of DisasterAWARE Pro 7.0, our new automated Event Brief, continued development on our hazard-finding artificial intelligence, and the complete overhaul of our All-Hazards Impact Model.

ALL-HAZARDS IMPACT MODEL (AIM) 3.0

The overhaul and automation of AIM was perhaps our most important undertaking of 2021. Its new capabilities feed nearly all of PDC's products including our DisasterAWARE System, our new Event Brief, and our specialized partner products.

AIM 3.0
All-hazards Impact Model

Highest Resolution Available

1000 x better

Unlike any global hazard exposure model available today

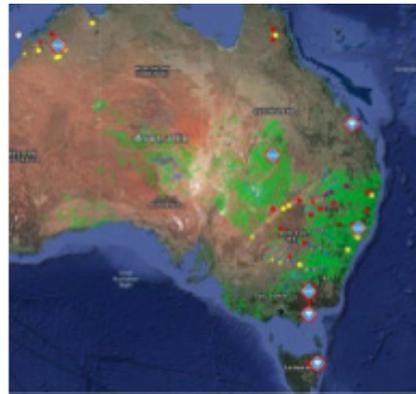
Accurately estimates population, capital, and key infrastructure exposure for multiple hazards, as well as specific humanitarian needs down to a scale of 30 x 30 meters, anywhere in the world.

Revolutionizing impact modeling

- 1.3 Million people exposed to shaking intensity of VI (Strong) and above
- 27 hospitals exposed
- 207 schools exposed
- 4.1 Billion kits per day
- 5 Million liters of water
- 48,000 100-liter waste bins
- 6 Million sq meters of shelter

69% adults 15-64 yrs, 14% children <15 yrs, 17% elderly >64 yrs

Learn more at pdc.org/aim.



NASA / PDC MODELING PARTNERSHIP

World's only global flood and landslide model

Through its ongoing collaboration with NASA, PDC will soon be able to extend the world's only globally-scaled landslide and flood monitoring and early warning. Flood modeled data provided by NASA will be released in 2021 to DisasterAWARE with landslide data following in early 2022.



Finest resolution exposure estimates

Estimates population and capital exposure with precision down to a 30 x 30 meter radius. Uses multiple data sources to perform estimates including Facebook, WorldPop, Global Exposure (GAR), and more.



Global coverage for any type of hazard

Allows for the estimation of any hazard, anywhere in the world that has an associated polygon, including data-poor environments.



Estimates by sector / age demographic

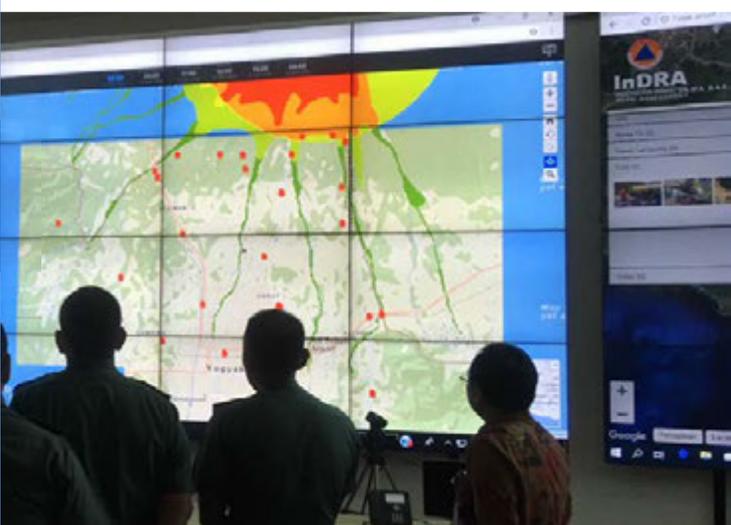
Provides exposure estimates with breakdowns by sector and age group. Includes estimates for schools and hospitals and age breakdowns in 5-year increments for vulnerable populations.



DISASTER/AWARE

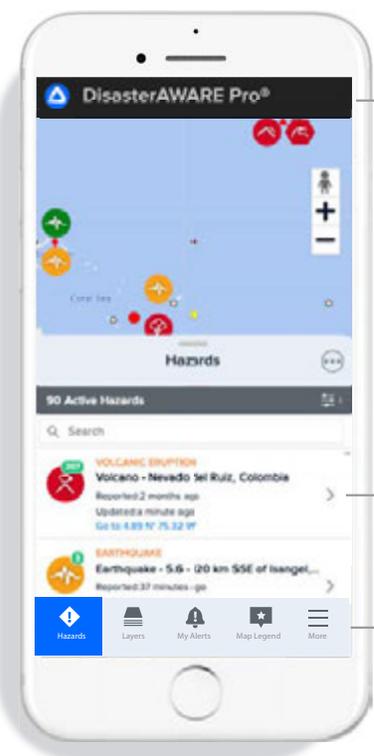
Request access at disasteraware.pdc.org

25,000+
Professional Users
(Increased 40% from 2020)



STATE-OF-THE ART TECHNOLOGY

DISASTER/AWARE PRO 7.0 NEWEST FEATURES

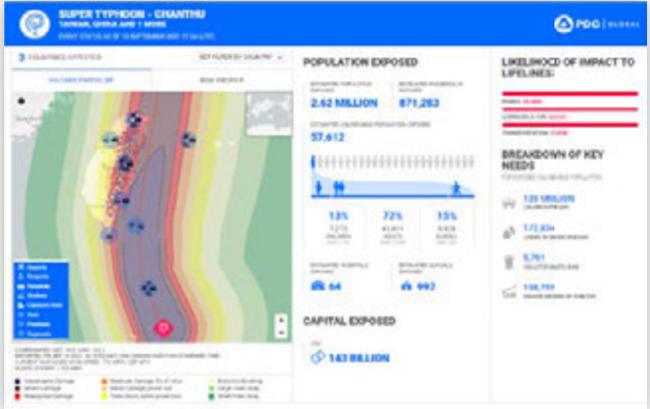


- Full brand integration.
- New map printing capabilities. (desktop only)
- New hazard icon colors to indicate severity of a hazard at-a-glance.
- New tab bar for mobile users to easily access key app features.

Online help and tutorials: www.disasteraware.org

EVENT BRIEF

Event Brief is PDC's new groundbreaking, near real-time report in DisasterAWARE that provides critical information to aid rapid response to large-scale events anywhere in the world. Read more about Event Brief on Page 3.



REMOTE DEPLOYMENTS OF DISASTER/AWARE

See Page 14 for more.

4 National systems **10** Nations supported **1** New system



DISASTER ALERT (PUBLIC APP)

Disaster Alert ranked number one by Emergency Preparedness Pod

DISASTER ALERT™

★★★★★ Avg mobile app rating



STATE-OF-THE ART TECHNOLOGY

DISASTERAWARE PROFESSIONAL TRAINING AND RESOURCE CENTER

With each new edition of DisasterAWARE, PDC provides online tutorials and interactive training resources to support tens of thousands of disaster management practitioners on how to the system.

www.disasteraware.org/tutorials

30⁺

Training Modules Updated

12

Interactive Tutorials Updated

DisasterAWARE Pro®
Tutorials and Help
Search online learning and support

[Download User Guide](#)

Browse by topic
[DisasterAWARE Professional Version Only](#)

Getting started
System requirements
User access and logging in
Map navigation basics
Receive early warning with SmartAlert
Account, language, and time zone preferences

Monitor multiple hazards
Hazard types, symbology, and meaning
Locate hazard information
Advanced hazard search
Quickly access key hazard information

Anticipate hazard impacts with Event Brief
How to access Event Brief
Hazard Exposure tab
Risk Profile tab
Live Camera tab
Organizations and Activities tab
Supplemental info (weather, news...)
Event Brief thumbnails

Data layers to support decision making
Explore data layers
Layer properties and data sources
Access country-specific layers
View risk and vulnerability layers
View historical hazard layers
Identify tool
Bookmark frequently used layers
Favorite and recent layers

Create custom maps
Change your default background map
Import and share your own data layers
Combine layers for more informed decision making
Add drawings, text, and images to maps
Print Maps

Bookmark and share information
Bookmark and share information
Edit Bookmarks
Share your products in DisasterAWARE

Customize your workspace
Customize your default map
Customize your layers list

Advanced monitoring tools and capabilities
Track the safety of your assets
Live cams
Track media updates / hot spots
Area Brief

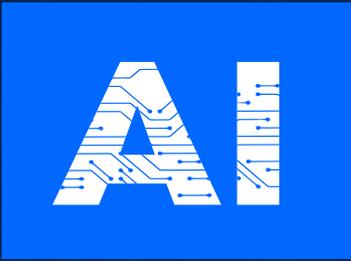
Watch a tutorial

BEGINNER MODULES

- User access and logging in**
Est. Time: 6 Minutes
- Map navigation basics**
Est. Time: 10 Minutes
- Receive early warning with SmartAlert**
Est. Time: 12 Minutes
- Quickly access key hazard information**
Est. Time: 10 Minutes
- Explore data layers**
Est. Time: 8 Minutes
- Live Cams**
Est. Time: 6 Minutes
- Identify Tool**
Est. Time: 4 Minutes

ADVANCED MODULES

- Track the safety of your assets**
Est. Time: 15 Minutes
- Create custom maps**
Est. Time: 5 Minutes
- Track media updates / hot spots**
Est. Time: 8 Minutes



STATE-OF-THE ART TECHNOLOGY

AI FOR HUMANITY

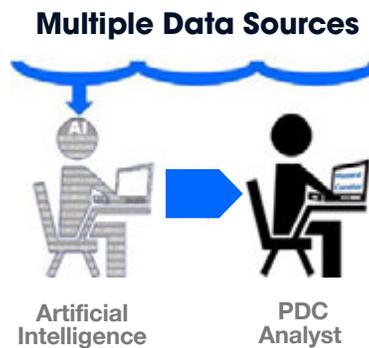
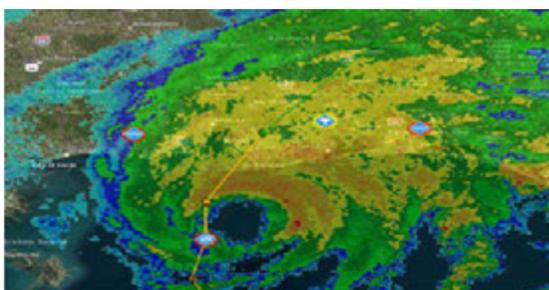
Life-saving applications for Artificial Intelligence

PDC continued innovation on its artificial intelligence (AI) applications designed to help reduce disaster risks, enhance delivery of critical information for decision making, and further humanitarian goals.

HAZARD FINDER AI

Exponentially speeds manual hazard curation and DisasterAWARE integration

Hazard Finder is an expert system that analyzes daily reports from thousands of credible news outlets, searching for and finding potential hazards. The initial version of this artificial intelligence was deployed for experimental operational use in 2021—massively scaling PDC’s global hazard detection and reporting capabilities.



1,800+

Hazards found and quickly created

All day (24/7) global hazard detection



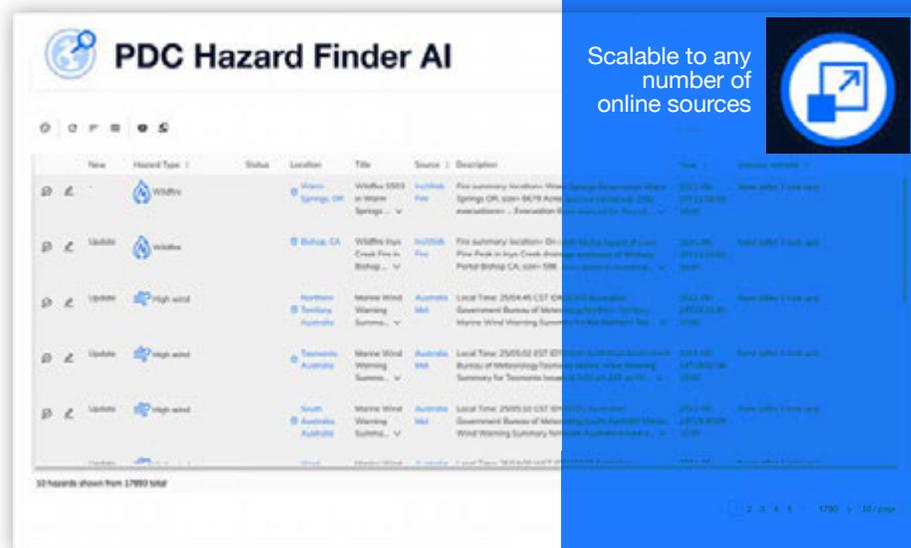
Exponentially faster than manual process



Can detect all hazard types



Scalable to any number of online sources



Learn more at pdc.org/ai-for-humanity

SMART DESCRIPTIONS AI

PDC continues to enhance its natural language processing AI program in DisasterAWARE. Smart Descriptions transform scientific data from multiple sources into easily-understood hazard descriptions that improve situational awareness and decision making for response.



PDC supports Pacific Endeavor Multinational Exercise (2021)

11

Exercises

41

Nations

25

Exercise Events

3

Combatant Commands

Exercise Scenarios



Tropical Cyclone



Earthquake



Biomedical



Terrorism



Trafficking in Persons

EXERCISING PREPAREDNESS

AT HOME AND ABROAD

EXERCISE HIGHLIGHTS

Pacific Endeavor Multinational Communications Interoperability Program (MCIP)

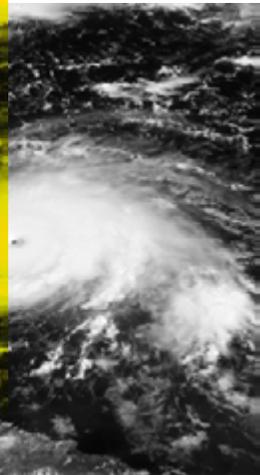
PDC supported the Pacific Endeavor MCIP virtual table top exercise. The scenario was based on Tropical Cyclone Yasa which struck Fiji in December of 2020. By manipulating real-world response products, the exercise provided the most realistic experience possible for participants in a virtual exercise environment.

Women, Peace and Security

Supported the U.S. Northern Command's training and exercise on Women, Peace and Security (WPS), providing lessons learned and WPS considerations during real world events, using response experience from 2019 Hurricane Dorian as a guide.

Tradewinds 21

During the Tradewinds 2021 capabilities workshop in Guyana, PDC use of DisasterAWARE for a simulated oil spill scenario—identifying population and infrastructure that may potentially be affected by the spill.



Exercises Completed	
Able Resolve	NORTHCOM Women, Peace and Security L100
Bahamas Restoration Island Cayes 21-1	Pacific Endeavor/MCIP
Bahamas Restoration Island Cayes 21-2	Pacific Fury
National Guard Bureau Hurricane TTX	Pacific Sentry
National Guard Bureau COOP/COG	Tradewinds 21
NetHope Crisis Simulation	



TRAINING DELIVERED

DisasterAWARE

871

Total Participants

283

Nations

71

Training Sessions



U.S. DoD

32%

Partner Nations

13%

Civil Emergency Management

9%

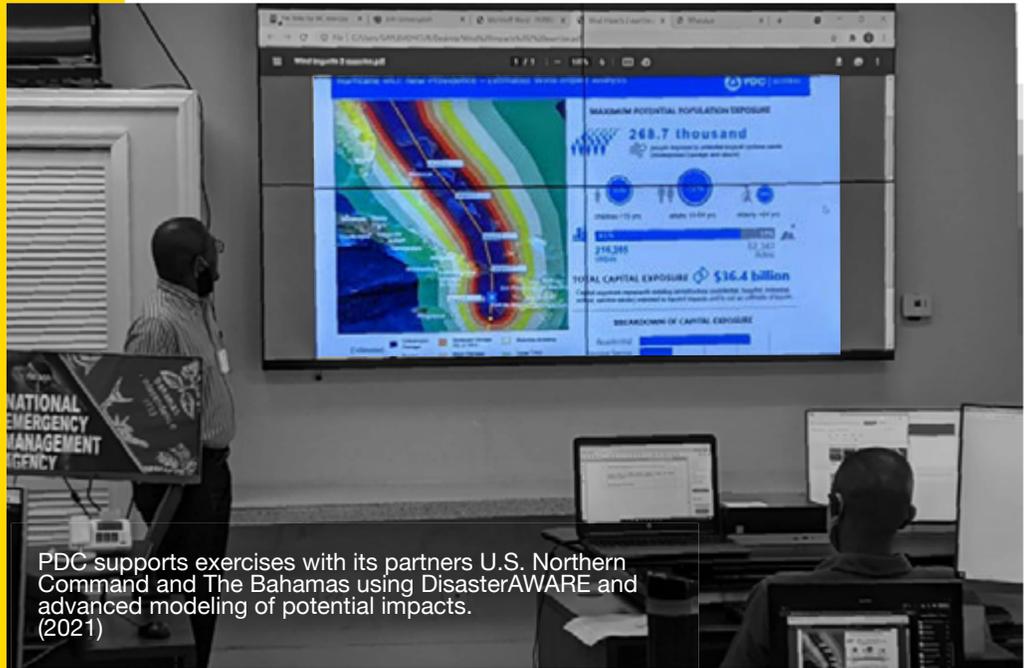
National Guard

4%

Other U.S. Govt

EXERCISING PREPAREDNESS

AT HOME AND ABROAD



PDC supports exercises with its partners U.S. Northern Command and The Bahamas using DisasterAWARE and advanced modeling of potential impacts. (2021)

EXERCISE HIGHLIGHTS (CONTINUED)

Bahamas Restoration Island Cayes

At the request of the U.S. Northern Command and The Bahamas National Emergency Management Agency (NEMA) two exercises were completed with The Bahamas in 2021. One scenario was based on a realistic category 5 hurricane akin to Hurricane Dorian of 2019, tracking through the entire island chain and causing significant damage. PDC managed the overall exercise and used DisasterAWARE to provide injects and track the progress of the storms.

Gender Considerations During Dorian



Sheltering: - Capacities - Privacy - Security - Family Separation



Medical: - Clinics non/minimal operations - Limited female medical services - Limited supplies - Psychological support



Security: - Non-evacuees - Trafficking - Violence against women

Learn more about training and exercises:
www.pdc.org/training-and-exercises

PARTNERSHIPS DRIVING CHANGE

REDUCING DISASTER RISK THROUGH GLOBAL ALLIANCES

INTERNATIONAL ATOMIC ENERGY AGENCY (IAEA)

Nuclear power plants all over the world are exposed to natural hazards such as earthquakes, tsunamis, hurricanes, floods, fires and volcanoes. This is why PDC and IAEA have partnered to develop of a one-of-a-kind advanced technology system to expand the level of alerts for natural-hazard risks to nuclear facilities. **The project kicked off in 2021** and will be developed and operationalized with PDC's development partner Tenefit over the next three years. Read more at: www.pdc.org/iaea-kick-off.



NASA / PDC GLOBAL FLOOD & LANDSLIDE MODELING

Read more at www.pdc.org/nasa-pdc-flood-early-warning



DisasterAWARE Remote Partner Deployments

DisasterAWARE is being used worldwide to support daily hazard monitoring, early warning, and life-saving operations.

4 National systems **10** Nations supported **1** New system

New Data Layers Added

New! **396 PhilAWARE** Supports the Philippines National Government
300 ThaiAWARE Supports Thailand's National Government
158 InAWARE Supports Indonesia's National Government
437 DMRS Supports all of ASEAN through the AHA Centre

152 Personnel Trained **38%** Female Trainees

645+ Million People

The four systems deployed for operational use above cover one of the most populous and disaster-prone regions in the world.

PARTNERSHIPS DRIVING CHANGE

136

Virtual Partnership Events Attended

10

Signed Memorandums of Understanding

5

In-person Events

- BlueDot
- Federal Emergency Management Agency
- IFRC
- International Atomic Energy Agency
- Local Islands Network 2030
- International Emergency Management Society
- UNOCHA Regional Office for West Africa, Regional Office for Latin America and the Caribbean
- World Food Programme Regional Bureau for Southern Africa
- More

PDC built upon existing partnerships and expanded new partnerships with United Nations agencies, NGOs, and industry partners globally—advancing our shared Humanitarian Assistance and Disaster Relief missions. Our collective efforts improve innovations in the field of disaster management and humanitarian outcomes.

PDC'S KEY CONFERENCES AND SPEAKING ENGAGEMENTS

- UNOCHA Information Management Working Group (Co-chaired January 2021)
- European Union's Horizon 2020 HERoS (Presented February 2021)
- Safe, Responsible, Fair and Equitable use of Human Mobility Data Exploratory Seminar (Presented April 2021)
- IFRC Pre-Hurricane Conference (Presented June 2021)
- NATO Crisis Management & Disaster Response Center of Excellence Annual Conference (Presented June 2021)
- FEMA Region X / Washington Emergency Management (Presented September / October 2021)
- WHO Global Outbreak Alert and Response Network (GOARN) (Presented September 2021)
- U.N. World Data Forum (Presented October 2021)
- World Summit of Artificial Intelligence (Presented November 2021)
- U.N. Regional Symposium on Effective Governance and Digital Transformation for Building Back Better (Presented November 2021)



INTERNATIONAL FEDERATION OF RED CROSS (IFRC)



Read more about the recent agreement between PDC and IFRC and our important partnership initiatives at: <https://www.pdc.org/pdc-red-cross/>

WE THANK OUR MANY PARTNERS (TOO MANY TO LIST)





PACIFIC DISASTER CENTER
2020-2021 ACCOMPLISHMENTS REPORT

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**Safer
world.**