

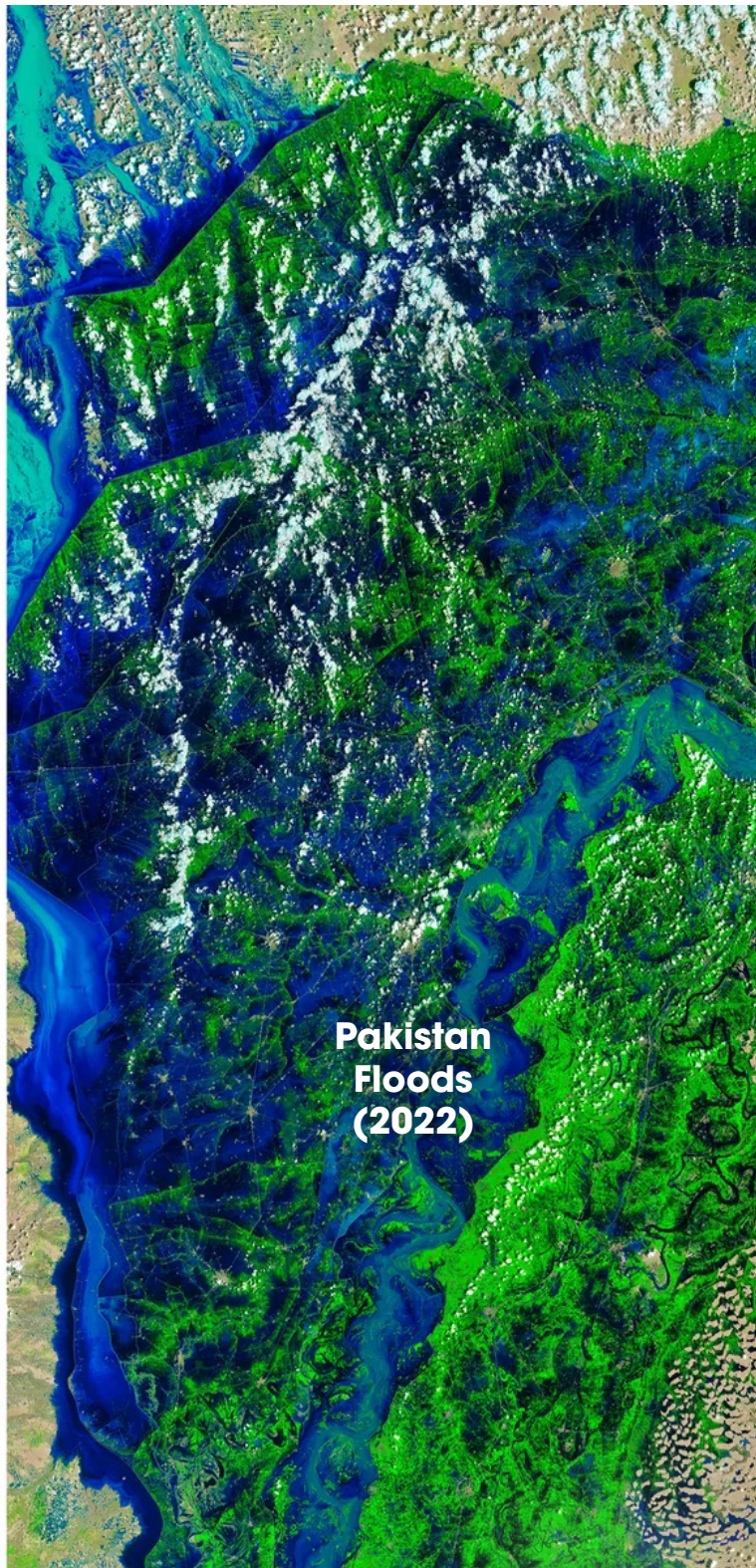
Safer world.

Pacific Disaster Center
Accomplishments
Report





Pakistan



Pakistan
Floods
(2022)

Photo credit: NASA MODIS satellite imagery.

AUG 4

AUG 28

Pakistan's worst climate disaster in recorded history

Read about PDC's new global flood prediction and early warning technology to help communities like Pakistan act early to save lives. More on Page 6.

1,700+
Deaths

33 Million
Affected

7.9 Million
Displaced

\$30 Billion
Property
Damage

11ft
Flood
Depth

In 2022, Pacific Disaster Center (PDC) was honored to receive the **United Nations once-in-a lifetime Sasakawa Award** in recognition of our 25 years of excellence working toward Disaster Risk Reduction. This year's award theme focused on "Building resilience through a multi-hazard approach," for which PDC received first place. Our PDC Hawai'i 'ohana (family) sends an immense mahalo (thank you), to our nominating partners from The Bahamas, Panama, and the ASEAN Coordinating Centre for Humanitarian Assistance on Disaster Management (AHA Centre).

Yet, we realize there is so much more to do. So, we take this opportunity to share this award with all of our partners around the globe, and with the like-minded, hard-working humanitarians who have a passion for helping the vulnerable among us and reducing disaster risk to make life better for all citizens.

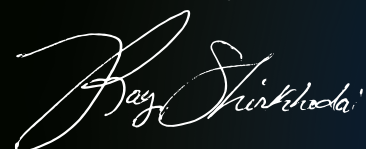
This year, our pursuit of scientific and technological innovations to protect lives and livelihoods was only emboldened by the growing complexity and severity of hazards we are all facing. PDC aided response to several unprecedented disasters including **Category 4 Hurricane Ian in Florida**, catastrophic **floods in Pakistan**, and multiple typhoons, earthquakes, and other hazards around the world. To help communities prepare for and adapt to these ongoing challenges, we have expanded our partnership alliance to help numerous disaster-prone nations—completing national baseline assessments and increasing operational use of our free, multi-hazard early warning platform, DisasterAWARE.

Through our NASA Disasters program collaboration, **PDC helped launch the world's first global flood prediction and early warning technology**. With this new capability, the world's citizens and entire humanitarian and disaster management community are now able to anticipate floods and estimate impacts in ways previously not possible, as well as receive early warning in order to act early to save lives.

Other life-saving innovations are likewise reflected in **the Center's AI for Humanity Program**—the backbone of PDC's suite of AI technologies and robust analytics that extend global hazard coverage and aid evidence-based decision making. PDC's AI technology is also integral to the information provided in DisasterAWARE.

Navigating into new areas of research, PDC released the **first-ever global gender trend analysis** in partnership with the U.S. Indo-Pacific Command's Office of Women, Peace and Security. This analysis provides a methodical means to assess women's participation in peace-building and security initiatives and was featured in the U.S. Congressional report on the subject. This year, PDC also released its first Global Climate Change Impact analysis—visualizing climate risks and potential impacts of multiple climate hazards by the year 2050. These innovative efforts, combined with those of our global partner network, are accelerating the global community's quest to anticipate risks and to take early action to limit loss and suffering, as we work together to co-create a safer future and safer world for all.

PDC Executive Director Ray Shirkhodai

A handwritten signature in white ink that reads "Ray Shirkhodai". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.



The **SASAKAWA** AWARD UNDRR
2022 WINNER

PDC Acceptance Speech, United Nations Sasakawa Award Ceremony, Bali, Indonesia (2022)

“ We share this award with all like-minded, hard-working humanitarians with a passion for helping the vulnerable among us and reducing disaster risk to make life better for all citizens.

— PDC Executive Director Ray Shirkhodai

” [More on Page 1](#)



GLOBAL PLATFORM FOR
DISASTER RISK REDUCTION



BALI, INDONESIA
23-28 MAY 2022

7th Session of the Global Platform for Disaster Risk Reduction

From Risk to Resilience:

Towards Sustainable Development for All in a COVID-19 Transformed World

Bali - Indonesia | 23 - 28 May 2022

GP2022

CONTENTS

MORE THAN 25 YEARS OF ADVANCEMENTS IN GLOBAL
DISASTER RISK REDUCTION

INSIDE 2022

Highlights	1	Our Global Impact by the Numbers	3
AI for Humanity™ Deep Learning Brings Deep Insights	5	Enhanced Decision Making through Advanced Data Science and Modeling	6
Assessments and Analytics Promote Risk-intelligent Societies	7	Closing the Gap in Multi-hazard Early Warning and Risk Intelligence	9
Exercising Preparedness Worldwide	11	Building a Safer World Through Global Partner Alliances	13

HIGHLIGHTS

2022



United Nations Sasakawa Award Ceremony, Bali, Indonesia (2022)



The PDC ‘ohana (family) sends an immense mahalo (thank you), from Hawai’i to our nominating partners in The Bahamas, Panama (pictured above), and the ASEAN Coordinating Centre for Humanitarian Assistance on Disaster Management (AHA Centre).

PDC receives prestigious United Nations Sasakawa Award for Disaster Risk Reduction

The University of Hawai’i’s Pacific Disaster Center (PDC) was named laureate of the prestigious United Nations Sasakawa Award for Disaster Risk Reduction during the Global Platform for Disaster Risk Reduction (GPDRR) in Bali, Indonesia on May 25, 2022. “This award is given every three years to individuals or institutions that have **made substantive impact in reducing disaster risk,**” said Mami Mizutori, special representative of the secretary-general for disaster risk reduction, during the opening ceremony. The UN Sasakawa Award for 2022 focuses on “**Building resilience through a multi-hazard approach.**”

The Center was nominated for its **national baseline assessment program** which helps countries put risk information into action by operationalizing the goals of the United Nations Sendai Framework for Disaster Risk Reduction. Read more at:

<https://www.pdc.org/un-sasakawa-award-2022/>.

More on Page 8



Ray Shirkhodai presents at World AI Summit

PDC Executive Director Ray Shirkhodai was invited to chair the Healthy Cities Track at the World Artificial Intelligence (AI) Summit in Amsterdam in October 2022.

Shirkhodai presented among thought leaders and innovators from around the world during the globally recognized forum, sharing developments in the Center’s **AI for Humanity** program.

More on Page 5



Ray Shirkhodai
Executive Director and Chief Information Officer
Pacific Disaster Center

Taets Art and Event Park
Amsterdam Noord



#wsai22
#aibrains



World’s first global flood prediction and early warning technology



“This new technology covers the face of the globe, enabling us to observe flood risk and anticipate the likelihood of floods in ways never before possible.”

— Dr. Shanna N. McClain, Disasters Program Manager for NASA’s Earth Science Applied Sciences Program

More on Page 6

PDC and NASA Disasters program partners have developed a new life-saving technology to assess flood severity across the globe and to make flood early warning freely available.

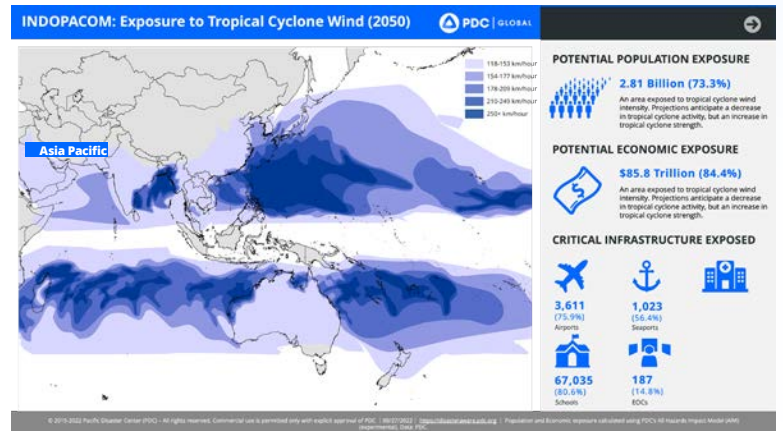


New 2050 Global Climate Change Impact Analysis

Get a glimpse of PDC’s new Global Climate Change Impact Analysis that investigates five different types of weather-related climate risks projected for countries around the globe by the year 2050.

Also learn about a regional study on climate change conducted by PDC to assess risk and target investment for the Asia Pacific Region.

More on Page 7



OUR GLOBAL IMPACT

BY THE NUMBERS



Hurricane Ian aftermath (2022). Florida, United States.
Photo credit: Joe Burbank

DISASTER RESPONSE SUPPORT

 **2.1 Million** SmartAlerts Issued

139k+
Automated, self-serve risk analysis products to aid response (Powered by PDC's AI for Humanity™)



5
Joint Products (JADE) by PDC, WFP, UNOCHA

30
Specialized PDC Products

RESPONSE ACTIVITIES



DISASTER-AWARE HAZARDS AND ALERTS

disasteraware.pdc.org

19,000+
Automated Hazards Reported

213,000+
Automated Hazard Brief Reports

25,500
Professional Users
(Up 46% from 2020)

6,900+
Data Layers (**1,300+** New Layers)

DISASTER-AWARE CURATED HAZARDS

2,400
Hazards Manually Curated by PDC to fill Gaps in Reporting

5% of Hazards were Created Using PDC's AI Hazard Curator

1 New hazard: Severe Weather

KEY RESPONSE EVENTS

- Hurricane Ian (U.S.)
- Typhoon Nalgae (Philippines)
- Typhoon Noru (Viet Nam, Philippines)
- Hurricane Julia (Central America)
- Hurricane Lisa (Belize)
- Hurricane Nicole (The Bahamas, Dominican Republic, Puerto Rico, U.S.)
- Hurricane Bonnie (Costa Rica, Nicaragua)
- Hurricane Fiona (Puerto Rico, Dominican Republic)
- Hurricane Alex (Cuba, Florida U.S.)
- Winter Storm (Northeast U.S.)
- Flooding (Midwest U.S.)
- Flooding (Pakistan)
- Flooding and Potential Dam Failure (Suriname)
- Earthquake (Philippines)
- Volcano and Tsunami (Tonga)
- Oil Spill (Peru)
- Potential Dam Failure (Ukraine)

 **2.4 Million**
Total Downloads of Disaster Alert





OUR GLOBAL IMPACT

BY THE NUMBERS

EXERCISES & TRAINING SUPPORTED

18
Exercises Worldwide

52 Countries Engaged
34 Exercise Events

716 Training Participants
52 DisasterAWARE Trainings

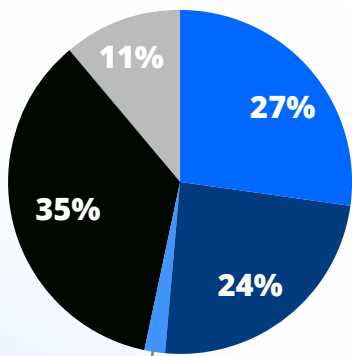


PDC supports training and exercises in multiple countries during USNS Comfort Deployment "Continuing Promise" humanitarian assistance/disaster relief mission (2022)

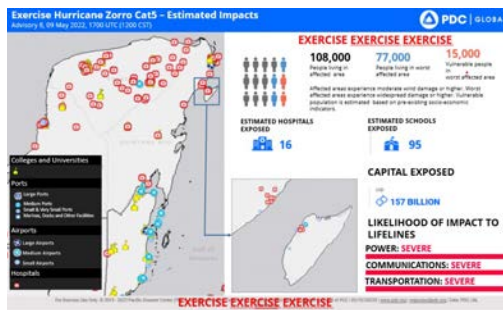
EXERCISE SCENARIOS

7 Tropical Cyclones **2** Floods **4** Earthquakes **2** Tsunamis **1** Biomedical **1** Climate Change **1** Search and Rescue

DISASTER AWARE TRAINING PARTICIPANT BREAKDOWN



- U.S. DoD
- National Guard
- U.S. / Local Govt
- Partner Nations
- Nongovernmental Organizations (NGOs)



Tradewinds 2022 hurricane exercise in Mexico. Exercise support and DisasterAWARE products provided by PDC.

KEY EXERCISES

- Pacific Endeavor/MCIP
- Bahamas RIC 22-1
- Able Resolve
- NGB Hurricane TTX
- Makani Pahili
- Kenya TTX
- Bahamas RIC 22-2
- Tradewinds 22
- Viet Nam DMEA
- HURREX 22
- CAN Workshop
- RIMPAC
- Continuing Promise (Guatemala, Honduras, Colombia, Dominican Republic, Haiti)
- Timor-Leste Flood

NEW DATA FOR DECISION MAKING

1,300+
New Data Layers

270
New Global Climate Change Impact Data Layers

964
National Baseline Assessment Layers

69% of New Data Originated from National Baseline Assessments

75
Countries with Subnational Data

AI FOR HUMANITY™

DEEP LEARNING BRINGS DEEP INSIGHTS

PDC's AI for Humanity program is the knowledge backbone of PDC—bridging life-saving gaps in global hazard detection, early warning, and risk information to better protect the world's most vulnerable populations.

HAZARD AUTOMATION & DETECTION

New expert hazard discovery system filled major gaps in global hazard detection, early warning and risk intelligence in 2022.

17,000+ AI-Curated Hazard Descriptions



Expert System

Big Data Analysis

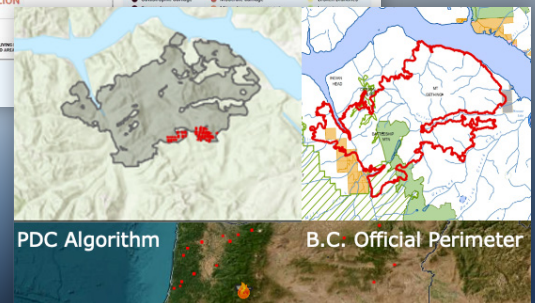
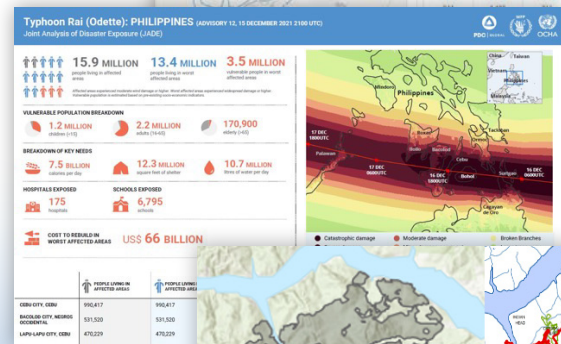
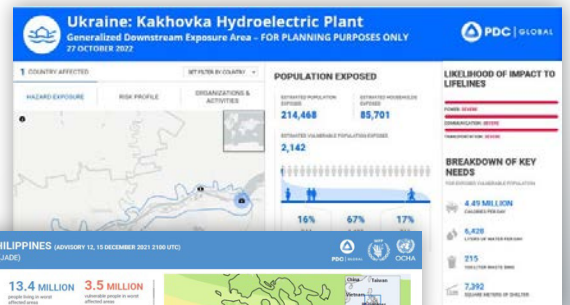
Natural Language Processing and Translation

AI KNOWLEDGE BACKBONE

↓ DisasterAWARE Global Hazard Content



ENHANCED HAZARD CONTENT AND RISK INSIGHTS



Enhanced Precision of Wildfire Detection

PDC's new wildfire hazard algorithm is trained on past official perimeters and utilizes updated geostatistical processing to more accurately predict the extent of wildfires in real-time.

Save lives
Save lives
Save lives
Save lives

Speed.
Scalability.
Reliability.
Global Coverage.

ENHANCED DECISION MAKING

THROUGH ADVANCED DATA SCIENCE AND MODELING

PDC's advanced data science and modeling technologies expanded insights and depth of hazard content—improving thematic coverage of risk information globally and increasing hazard monitoring and reporting capabilities.



19,000+
Automated Hazards

139,000+
Automated Self-Serve Risk Analysis Products



NASA WORLD'S FIRST GLOBAL FLOOD PREDICTION AND EARLY WARNING TECHNOLOGY

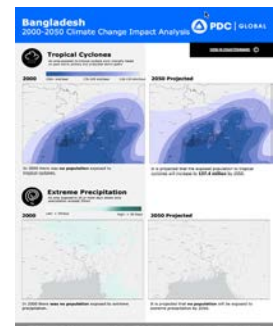
3

Global assessments completed using enhanced data processing and modeling

20

Unique regional assessments

01 2050 CLIMATE CHANGE IMPACT ANALYSIS



02 GLOBAL RISK AND VULNERABILITY ASSESSMENT



03 WOMEN, PEACE AND SECURITY ANALYSIS



More on Pages 7 and 8

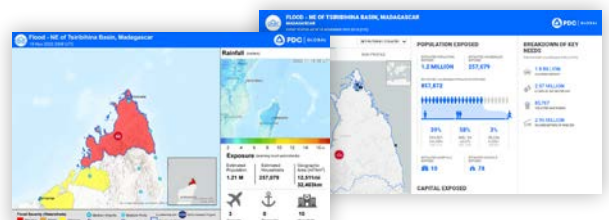
Streamlined data processing and scientific modeling allowed PDC to complete several assessments in 2022. Through these efforts, results were integrated into automated mapping products and DisasterAWARE situational awareness and needs reports. PDC also expanded sources for near real-time hazard notification and modeling and enhanced its exposure data with new climate model data.



NASA's "Model of Models" detects flood risk by combining various sources of flood and satellite information globally and then issuing updates to PDC's DisasterAWARE platform two times daily.



DisasterAWARE creates hazards, assigns severity and issues early warning. It also generates a human-readable hazard description using PDC's AI for Humanity natural language processing.



Automated exposure and risk analyses are performed by PDC's proprietary All-hazards Impact Model (AIM) built into DisasterAWARE. This information is output into automated products and Event Brief reports.

ASSESSMENTS & ADVANCED ANALYTICS

PROMOTE RISK-INTELLIGENT SOCIETIES



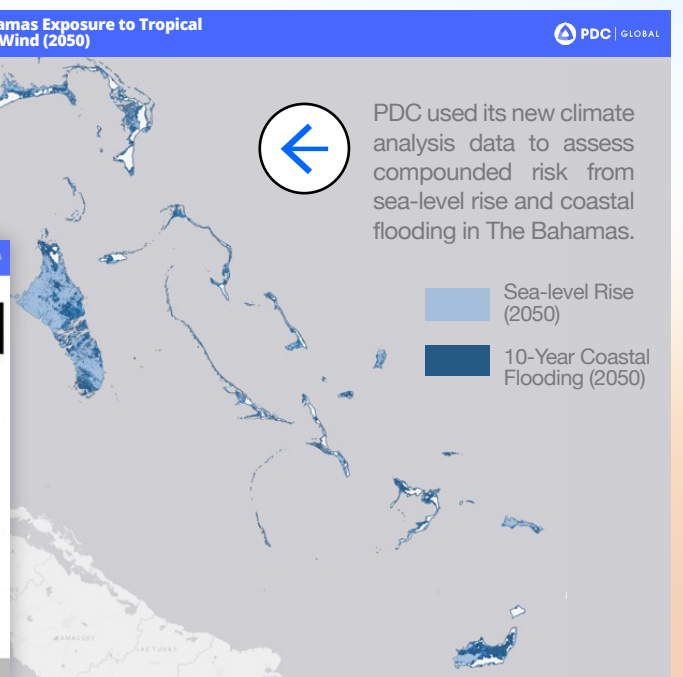
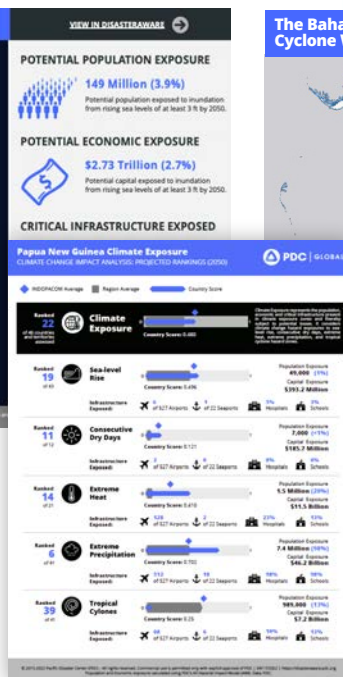
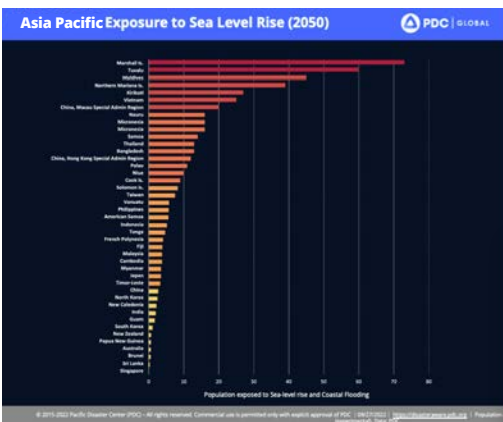
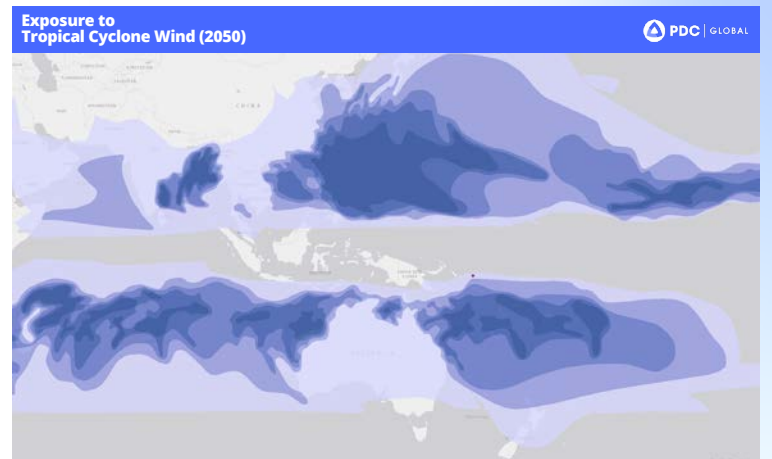
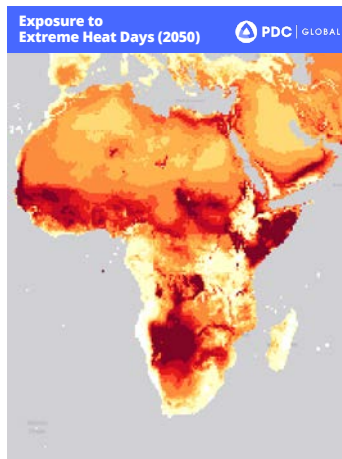
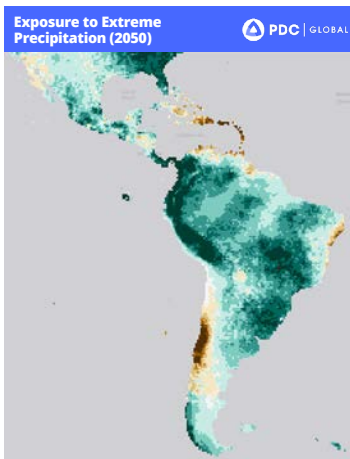
**NOW AVAILABLE
IN DISASTERWARE**

270 New global climate change impact layers

Visit disasteraware.pdc.org

NEW 2050 GLOBAL CLIMATE IMPACT ANALYSIS RELEASED BY PDC

PDC released a new detailed examination of climate change impacts into the year 2050—providing greater insight into the ability of countries to withstand destabilizing shocks from climate-influenced hazards.



PDC used its new climate analysis data to assess compounded risk from sea-level rise and coastal flooding in The Bahamas.

In partnership with the Center for Excellence in Disaster Management and Humanitarian Assistance, PDC completed an analysis for the Asia Pacific Region to identify the drivers of climate risk at the country level to help inform strategic actions and investments.

ASSESSMENTS & ADVANCED ANALYTICS

PROMOTE RISK-INTELLIGENT SOCIETIES

This year, PDC received the United Nations Sasakawa Award for Disaster Risk Reduction, recognizing the Center's National Disaster Preparedness Baseline Assessment Program (NDPBA). The NDPBA helps countries put risk information into action and operationalizes the goals of the United Nations Sendai Framework for Disaster Risk Reduction. Read more at: <https://www.pdc.org/un-sasakawa-award-2022/>.



NATIONAL BASELINE ASSESSMENTS

33 Total Nations Completed

- | | |
|--------------------------|----------------------------------|
| Antigua and Barbuda | Jamaica |
| Argentina | Kenya |
| Barbados | Nepal |
| Bahamas | Nicaragua |
| Belize | Palau |
| Cabo Verde | Panama |
| Colombia | Paraguay |
| Commonwealth of Dominica | Peru |
| Djibouti | Philippines |
| Dominican Republic | Saint Kitts and Nevis |
| El Salvador | Saint Lucia |
| Ghana | Saint Vincent and The Grenadines |
| Grenada | Sierra Leone |
| Guatemala | Suriname |
| Guyana | Trinidad and Tobago |
| Honduras | Viet Nam |
| Indonesia | |

11 Nations Underway or Beginning in 2023

TOTAL
964

New country layers added in 2022 to support decision making

Download completed reports at www.pdc.org/research

In 2022, PDC released the first-ever global gender trend analysis in partnership with the USINDOPACOM, USSOUTHCOM, and USNORTHCOM—exploring women's participation in peace-building and security initiatives. The **final analysis was featured in the U.S. Congressional report** on Women Peace and Security. Other analyses include PDC's Global Risk and Vulnerability Assessment and an analysis of the interrelationship of disaster risk indicators to issues of modern slavery and human trafficking.



Global Risk & Vulnerability Assessment

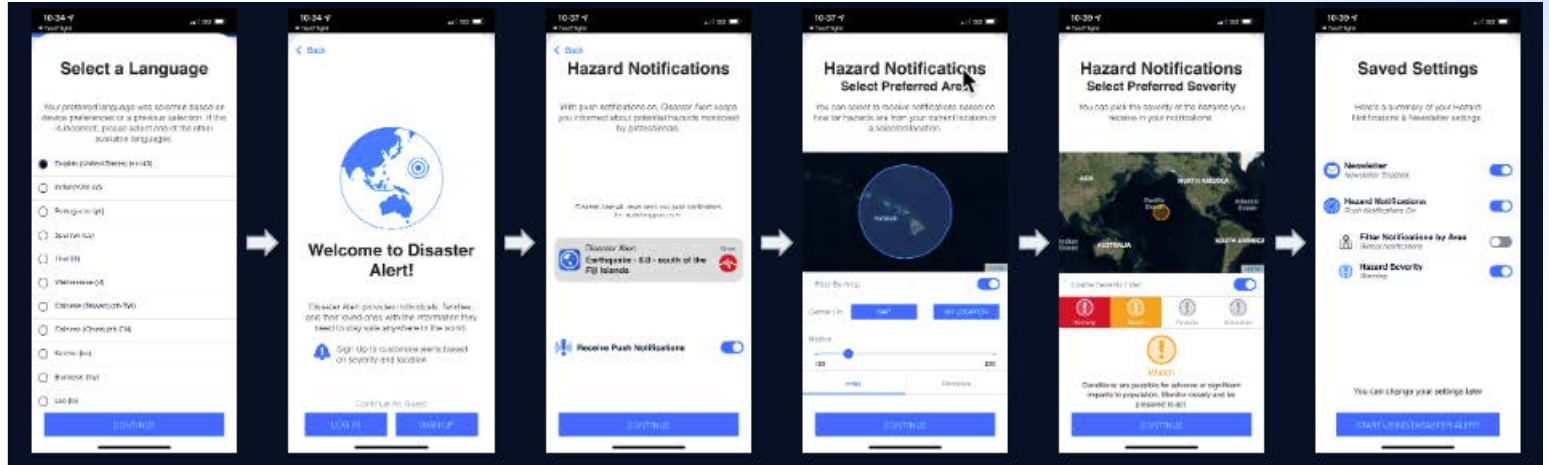


CLOSING THE GAP IN MULTI-HAZARD EARLY WARNING

AND RISK INTELLIGENCE

Disaster Alert™ What's New

2.4 Million Downloads of Disaster Alert



This year, PDC released a new version of our free, multi-hazard early warning app, Disaster Alert. The new app includes a personalized, user-friendly registration that contextualizes hazard and alert content to users' needs and interests.

REMOTE DEPLOYMENTS OF DISASTER AWARE

Years in Service

AHA CENTRE (DMRS)
ASEAN Region

10+
Since 2012

INDONESIA (InAWARE)
Indonesia's National / Regional Disaster Management

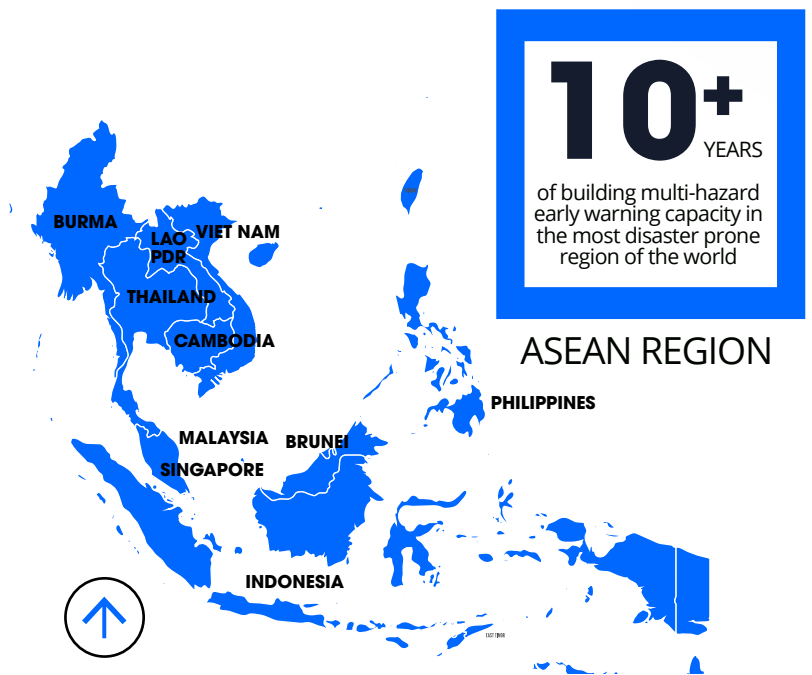
8+
Since 2014

PHILIPPINES (PhiAWARE)
Philippine's National / Regional Disaster Management

2
Since 2021

International Atomic Energy Agency (EENS)
Global Nuclear Facilities

1
Since 2022



ASEAN REGION

668 million people

living within ASEAN are covered by the DMRS multi-hazard early warning system that is powered by PDC's Disaster AWARE platform.

2022 OPERATIONAL USER HIGHLIGHTS

Albania
Brunei
Cambodia
Guyana
Indonesia

Jamaica
Kosovo
Laos
Malaysia
Myanmar

Nicaragua
North Macedonia
Panama
Philippines

Singapore
The Bahamas
Timor-Leste

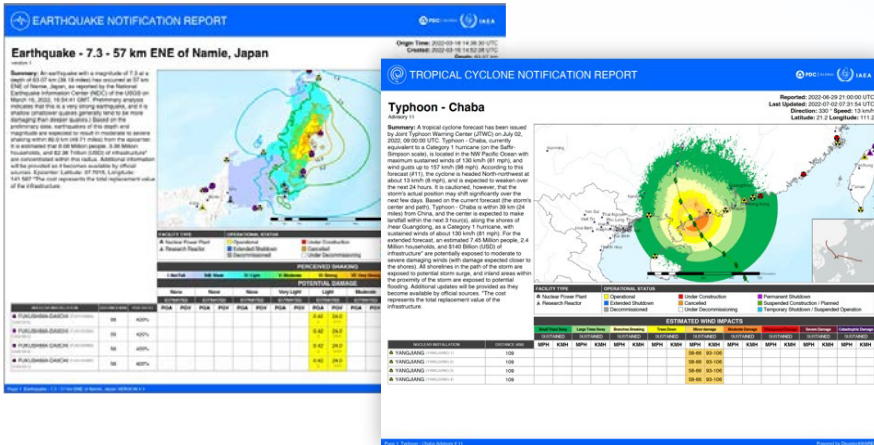
5

nations participated in PDC's advanced early warning capabilities program—institutionalizing the use of Disaster AWARE Pro in their national emergency operations centers.

CLOSING THE GAP IN MULTI-HAZARD EARLY WARNING

AND RISK INTELLIGENCE

SAFETY OF WORLD'S NUCLEAR FACILITIES protected by DisasterAWARE Early Warning Technology



The International Atomic Energy Agency (IAEA)'s new External Events Notification System, powered by PDC's DisasterAWARE, was in full operational use this year to support planning and response to several events including earthquakes, typhoons, floods, and more.

DISASTERAWARE IMMERSION FOR THE BAHAMAS



The Bahamas completed its first year of a three-year training program to institutionalize DisasterAWARE into the National EOC as the main decision support platform.

U.S. FUNDS MAJOR EXPANSION OF PHILIPPINES' MULTI-HAZARD RISK AND EARLY WARNING SYSTEM



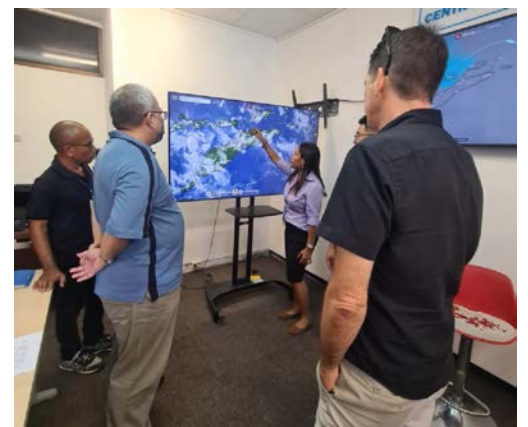
PhilAWARE was used to respond to large-scale hazards in 2002 and received new funding to build greater regional and localized use of the system. See <https://www.pdc.org/u-s-funds-major-expansion-of-philaware>.

DISASTERAWARE TO POWER BALKANS REGIONAL EARLY WARNING CAPACITY



Read more at <https://www.pdc.org/balkans-early-warning-kick-off-2022>.

NEW EARLY WARNING CAPACITY FOR TIMOR-LESTE



Read more at <https://www.pdc.org/reducing-disaster-risk-in-timor-leste>.

EXERCISING PREPAREDNESS

WORLDWIDE

Following a two-year hiatus from in-person exercise and training support due to the COVID-19 global pandemic, PDC was called upon to participate in a whopping 18 exercises around the world involving 52 partner nations.



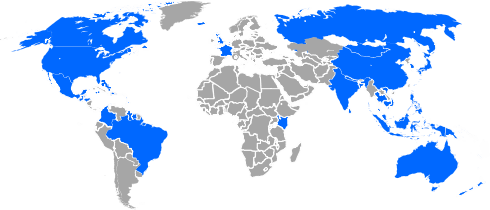
18
EXERCISES
SUPPORTED
GLOBALLY IN 2022

52

Partner Nations
Worldwide

716

Training
Participants



PDC ASSISTS WITH RIMPAC, THE WORLD'S LARGEST INTERNATIONAL MARITIME EXERCISE

USNS CONTINUING PROMISE MISSION EXERCISES

5

Nations



USNS Continuing Promise Mission, Colombia Exercise (2022)



USNS Continuing Promise Mission, Colombia Exercise (2022)



USNS Continuing Promise Mission, Honduras Exercise (2022)

PDC was asked by Navy South and USSOUTHCOM to support the deployment of the USNS Comfort to Guatemala, Honduras, Colombia, Dominican Republic and Haiti. PDC designed a tabletop exercise leveraging DisasterAWARE Pro alerting, modeling, and collaboration tools for each port stop to meet objectives identified by each country team and NDMO.



Category 4 hurricane scenario simulation and response through DisasterAWARE

PDC was invited to provide exercise scenario support and technical expertise during the Humanitarian Assistance / Disaster Relief (HADR) portion of Rim of the Pacific (RIMPAC)—the world's largest international maritime exercise.

EXERCISING PREPAREDNESS

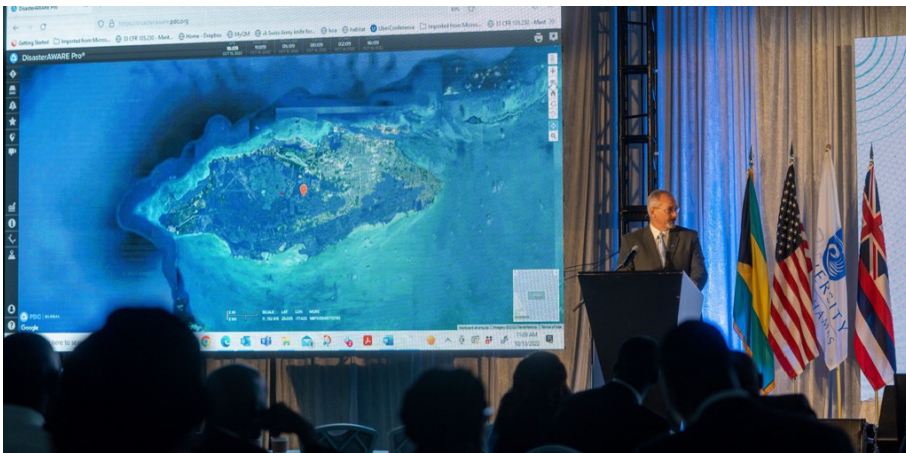
WORLDWIDE

TRADEWINDS 2022



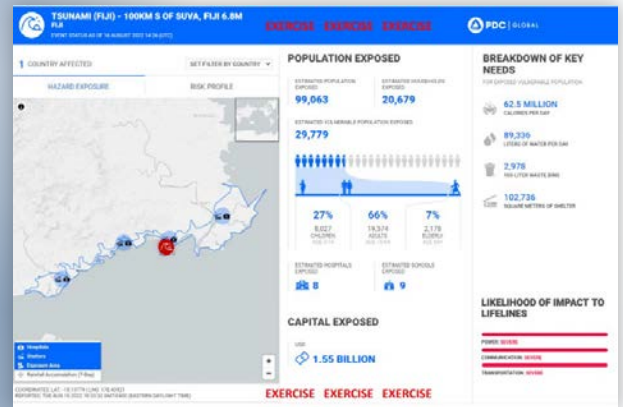
Canada, USSOUTHCOM and PDC joined forces for Tradewinds 2022—the largest multinational exercise for the region. PDC supported the HADR component of the exercise which took place in Mexico, playing a key role in its design and execution using DisasterAWARE and facilitating the event with national and regional partners.

UNITED NATIONS INTERNATIONAL DAY FOR DISASTER RISK REDUCTION (IDDRR) Nationally Televised Training on DisasterAWARE Pro



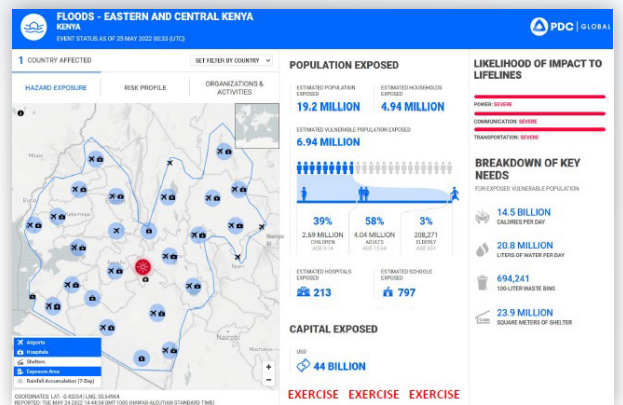
PDC was invited to participate in The Bahamas Disaster Risk Reduction Summit, which took place during the U.N. IDDRR. PDC provided DisasterAWARE Pro training to attendees at the summit, which was broadcast nationally to public viewers.

PACIFIC ENDEAVOR



During Pacific Endeavor, a virtual tabletop exercise took place based on a tsunami striking Suva, Fiji. The scenario was chosen due to the January 2022 tsunami that struck the neighboring nation of Tonga. PDC used real-world data and geography to model the tsunami and potential effects on infrastructure.

KENYA TABLETOP EXERCISE



PDC was asked by USAID to support a flooding tabletop exercise in Kenya. PDC supported the USAID-led exercise by providing data and situational products derived from its National Baseline Assessment program and DisasterAWARE Pro.

RESTORATION ISLAND CAYES



Two exercises were completed with The Bahamas in April and June, focusing on the National Emergency Operations Center and Family Island Administrators and their staff. PDC managed the exercise using its DisasterAWARE Pro platform—providing scenario injects and tracking the progress of the storms.

BUILDING A SAFER WORLD

THROUGH GLOBAL PARTNER ALLIANCES



100+

PARTNER ENGAGEMENTS GLOBALLY

7

 New Memorandums of Understanding (MOUs)

100+

 Active MOUs

WORLD FOOD PROGRAMME (WFP) AND FOOD AND AGRICULTURE ORGANIZATION (FAO)



Working together to address food security and critical logistics during times of disasters, WFP adopts PDC exposure and early warning analytics in concert with PDC's other UN and IFRC Partners.



U.N. SATELLITE PROGRAM

PDC is working with UN partners to advance alignment of early warning exposure and advanced analytics, as well as to expand the JADE Partnership by adding earth observation in secondary phase of response.



NEW EARTHQUAKE MONITORING, ALERTING, AND IMPACT MODELING TECHNOLOGIES TO COME

“

We look forward to helping PDC enhance its exposure modeling and early alerting capabilities in the creation of a new joint analytical product.

— Dr. Kishor Jaiswal, USGS Research Structural Engineer and a Lead Loss Model Developer (PAGER)

”

Read more at <https://www.pdc.org/safer-together-usgs-and-pdc/>



BUILDING A SAFER WORLD

THROUGH GLOBAL PARTNER ALLIANCES

UNIVERSITY OF THE BAHAMAS AND UH PARTNER IN ISLAND SUSTAINABILITY ON INTERNATIONAL DAY FOR DISASTER RISK REDUCTION

“

The advancement in the partnership between UB and UH builds on the long history between our two island communities and strengthens PDC’s commitment to evidence-based decision making.



— PDC Executive Director
Ray Shirkhodai

”



Philip Edward Davis, Prime Minister of The Commonwealth of The Bahamas, presented Pacific Disaster Center with a plaque recognizing the PDC’s contributions to the nation’s disaster risk reduction goals.

Read more at <https://www.pdc.org/pdc-uh-ub>

INTEGRATION OF PDC TOOLS AND ANALYSIS INTO AHA CENTRE OPERATIONS



PDC provides onsite liaison support to the ASEAN AHA Centre. As long-term partners, together, we work to amplify their mission through the application of evidence-based assessments and DisasterAWARE technology—building a safer region and a safer world together.

UNITED NATIONS OFFICE FOR DISASTER RISK REDUCTION

Advancing U.N. Sendai Framework Globally and Regionally

In 2022, PDC served as Technical Partner for UN Secretary General Program for “Early Warning for All” with The World Meteorological Organization. In addition, the Center’s National Baseline Assessment serving countries in Africa, Asia, Latin and South America, Caribbean, and Oceania, is the only operationalized approach to Sendai Framework.



PDC CO-CHAIRS GLOBAL IMWG

PDC co-chairs the United Nation’s Global Information Management Working Group for GIS (IMWG) with UNICEF. The focus of the IMWG is to improve inclusion and accessibility to GIS technology to all partners in the humanitarian and development space.



OTHER KEY COLLABORATIONS IN 2022



