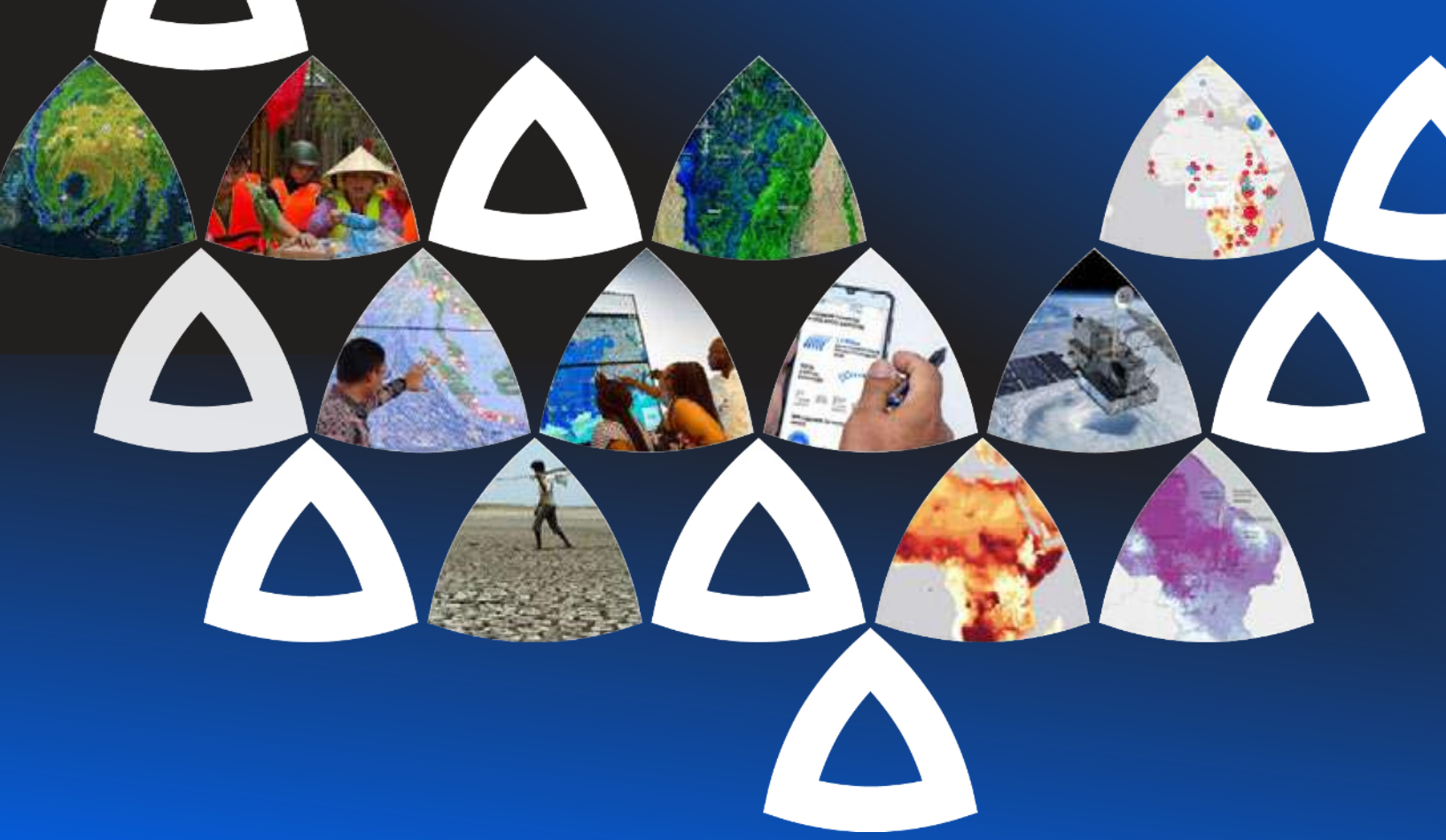


PDC | GLOBAL

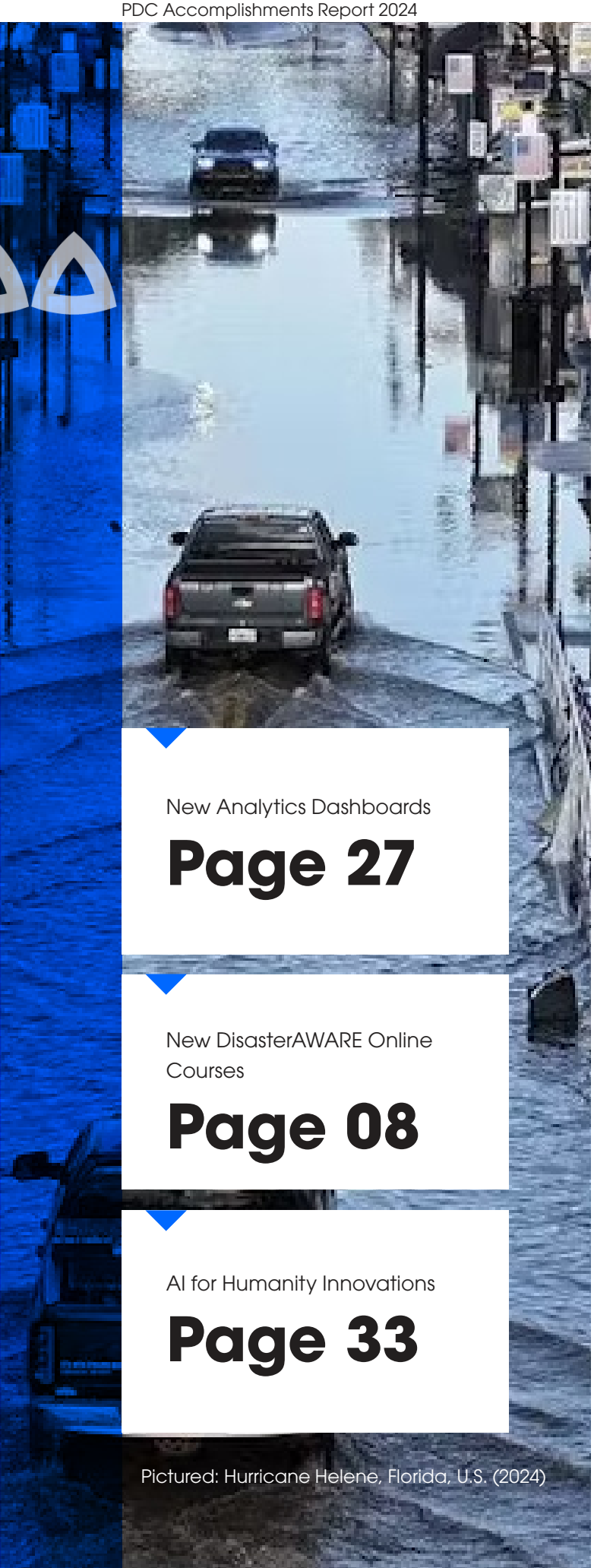
Pacific Disaster Center

Annual Accomplishments Report

Safer world.

2024

Contents



New Analytics Dashboards

Page 27

New DisasterAWARE Online Courses

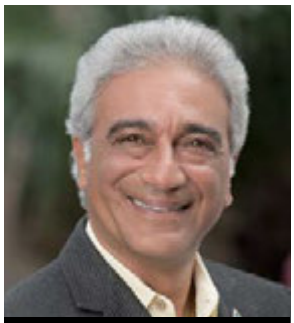
Page 08

AI for Humanity Innovations

Page 33

Pictured: Hurricane Helene, Florida, U.S. (2024)

Message from PDC's Executive Director



PDC Executive Director Ray Shirkhodai

The now-familiar pattern of intense and intensifying weather-related disasters continued in 2024. Our work over the past year highlights the pivotal role the Center is playing in building national and international resilience amidst this challenging global context.

This year underscored the urgency of science-based disaster management tools and information, as devastating tropical cyclones like Man-Yi in the Philippines, Beryl and Sara in the Caribbean and Central America, and Hurricane Helene in the United States, levied unprecedented destruction along their paths. Similarly, other parts of the world were plagued by severe flooding and landslides as seen in Colombia, Bolivia, and Papua New Guinea, and catastrophic wildfires such as those experienced in Ecuador, Peru, Chile, Brazil, and Australia's Northern Territory. There were simply too many catastrophes to count.

These events tested the resilience of communities worldwide. Exacerbated by an increasingly volatile geopolitical landscape, they further complicated the decision-making process by leaders and disaster and emergency managers.

The need for timely, accurate, and science-based solutions has never been more critical to protecting livelihoods and saving lives. Cutting-edge tools like PDC's DisasterAWARE and its advanced analytics are more essential now than ever to delivering Early Warning for All and providing real-time, actionable insights. These innovations are supporting effective decision-making and emergency responses across multiple nations and sectors of society, helping to better protect lives and critical infrastructure worldwide.

(Continued next page...)

(Message from PDC's Executive Director Continued)

To address the compounding threats, PDC advanced global early warning and conducted comprehensive risk assessments in 2024. By integrating data science, machine learning, and geospatial technology, PDC delivered precise hazard modeling and risk forecasts with remarkable speed and accuracy, empowering communities and governments to prepare for and respond to disasters more effectively.

Collaboration with scientific and academic data providers—such as space agencies, weather organizations, and international disaster risk reduction networks—enabled PDC to deliver precise, real-time hazard impact analytics and early warning. These partnerships amplified the reach and accuracy of DisasterAWARE, ensuring timely response efforts and strengthening resilience in vulnerable regions.

As the impacts of a rapidly changing hazard landscape necessitate adaptation strategies by our partners, PDC helped demonstrate the critical importance of collaboration and scientific innovation in building a safer, more resilient world. The organization's efforts in 2024 highlight its enduring commitment to reducing vulnerability and safeguarding lives globally. PDC looks forward to 2025 with an understanding that useful legacy approaches of the past may not ensure positive outcomes for the complex, intersectional challenges ahead. Yet, my sincere hope, and strong belief, is that together we will be successful in meeting these challenges with knowledge, innovation, and a commitment to protect that which we hold dear.

Pictured: Deadly flooding and landslide, Colombia (2024)

Pictured: Wildfire encroaches on Quito, Ecuador (2024)

Typhoon Yagi impacts Southeast Asia (2024)

Winner of the 2022 UN Sasakawa Award for Disaster Risk Reduction, the University of Hawai'i's Pacific Disaster Center is a global leader in disaster risk reduction. Recognized for its National Disaster Preparedness Baseline Assessment and DisasterAWARE platform, the Center is helping nations worldwide operationalize the goals of the Sendai Framework for Disaster Risk Reduction and Sustainable Development Goals. For more than 28 years, PDC has enabled its partners with indispensable tools and insights to support evidence-based decision-making. The innovative applications of the Center's science, technology, and advanced analytics continue to grow in demand as PDC works with diverse communities to save lives and build resilience for a safer world.

Early Warning for All

DisasterAWARE® Performance Indicators

Make better decisons, faster.

Albania's national, municipal, and Red Cross stakeholders exercise a major wildfire scenario using PDC's DisasterAWARE Pro platform. The exercise was part of a larger PDC project to increase early warning, risk analysis, and response capacities among Balkans partner nations. (More on Page 22.)

"Only 38 percent of countries report having comprehensive multi-hazard monitoring, observation, and forecasting systems."

— Celeste Saulo
U.N. World Meteorological Organization Secretary-General

PDC's multi-hazard early warning and risk intelligence platform, DisasterAWARE, continued growth in global market reach in 2024. During this year alone, the professional user base grew by more than 25% and the platform was operationalized by national governments, international and nongovernmental organizations, and remained the platform of choice for several multinational preparedness exercises around the globe. Through the amazing partnerships PDC has cultivated with scientific, academic, and disaster management agencies, we've made significant strides in helping to close the early warning gap worldwide.

The collaboration between PDC and NASA, the U.S. Geological Survey, NOAA, the U.S. Forest Service, International Federation for Red Cross and Red Crescent (IFRC), USAID, World Food Programme (WFP), United Nations, and so many others have not only helped get DisasterAWARE into the hands of practitioners, but have created new sources of real-time global early warning information. These innovations are exclusively provided by PDC to support the professional community and the general public, making sure populations around the world have access to early warning at no cost through PDC's Disaster Alert mobile app.

Pictured: The AHA Centre uses a custom version of PDC's DisasterAWARE, known as DMRS, to coordinate a multinational response to Super Typhoon Yagi, which badly impacted Viet Nam, Thailand, Laos, Myanmar, and the Philippines. (More on Page 18.)

DisasterAWARE
Growing reach and demand

Market Reach
31,000
Professional users

85
Countries use DisasterAWARE operationally

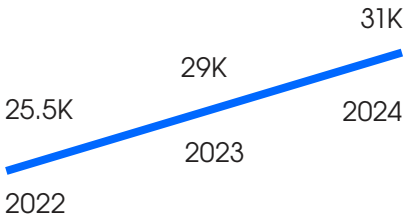
3.2 Million
Disaster Alert downloads (total all years)

3.9 Million
Smart Alerts delivered

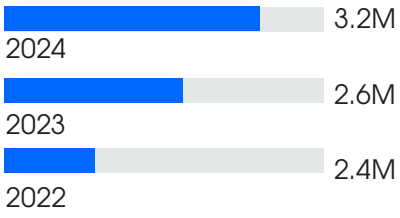
682,000
Hazard / Event Brief reports provided

Key Performance Metrics

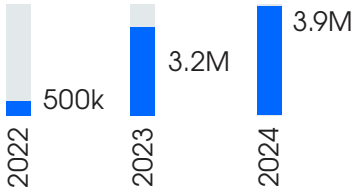
DisasterAWARE Pro Users **+ 25.5%**



Disaster Alert app downloads **+15.8%**



Smart Alerts delivered **+680%**



DisasterAWARE Event Brief

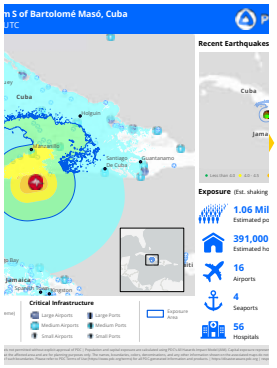
Advanced Hazard Analytics within Minutes

Our DisasterAWARE Event Brief and automated hazard analysis products are built on PDC's advanced modeling and analytics engine, which are continuously updated each year. Event brief gives decision makers accurate, on-demand analytics about who and what will be impacted, key demographics of populations exposed, humanitarian needs, and impacts to critical lifelines.

Event Brief Updates

Event brief now includes the newest population, vulnerability, demographic, household, and capital exposure data to better anticipate hazard impacts. Event Brief was also updated to include geopolitical hazards.

Near Real-Time Hazard Analysis Products



Earthquake

products were updated with a new automation and processing backbone and improved impact analytics

Tropical Cyclone

products now provide new wind exposure information, impact analytics, and upgraded processing

Geopolitical

products are now enhanced with new impact analytics and served with an improved processing backbone

Canada-Specific

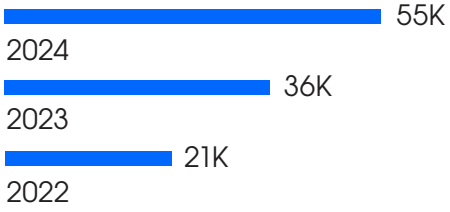
hazard information newly integrated from the Meteorological Service of Canada

55,000+

Global hazards created in DisasterAWARE

(**54k+** Automated / **<1k** Manually Curated)

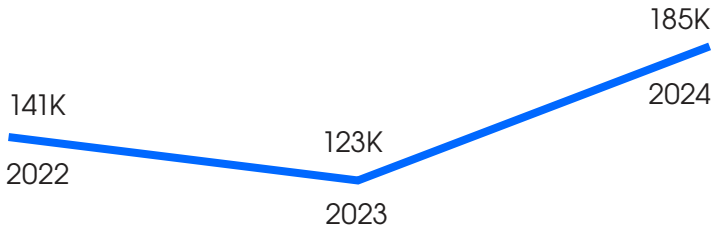
+157%



187,000+

Near real-time hazard analysis products generated

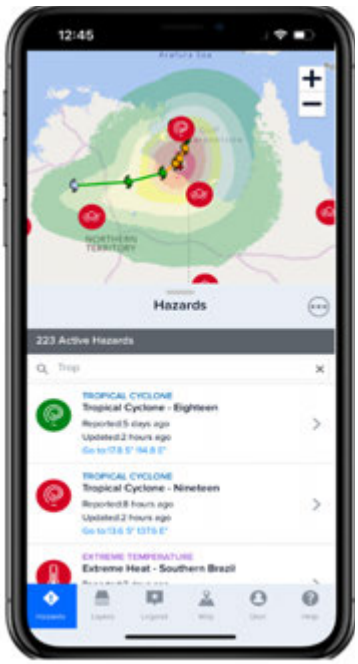
+32.6%



Disaster Alert™

NEW!

New Smart Location Tracking alerts you to hazards anytime, anywhere you travel around the globe.



3.2 Million downloads

Rated number one by Emergency Preparedness Pod and available for free to the public on both the Android and iOS platforms.

GET IT ON Google Play

Download on the App Store

Near real-time products by hazard type:

Natural

Earthquake	Flood	Landslide	Tornado	Tsunami	Tropical Cyclone	Volcano	Wildfire	Winter Storm
2,096	32,480	16,917	8,445	105	3,002	10,028	38,044	747

Geopolitical

Accident	Active Shooter	Civil Unrest	Combat	Cyber Attack	Occurrence	Political Conflict	Terrorism	Weapons
746	76	578	4,912	202	1	89	2,064	5

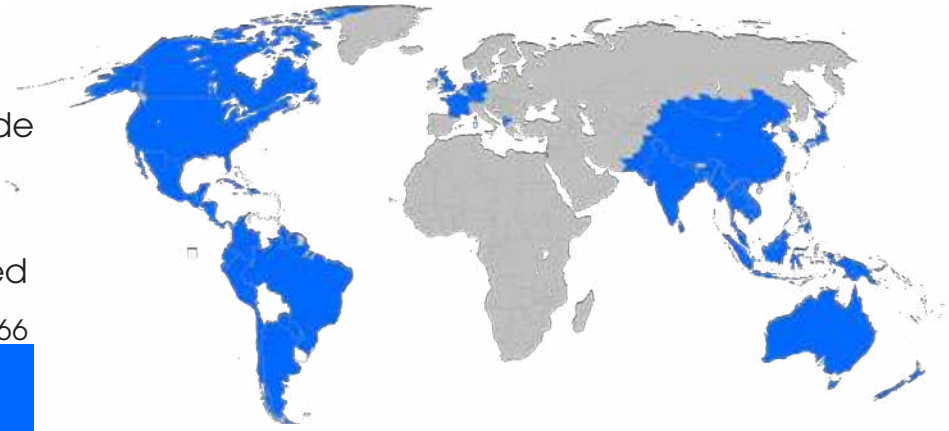
Early Warning for All

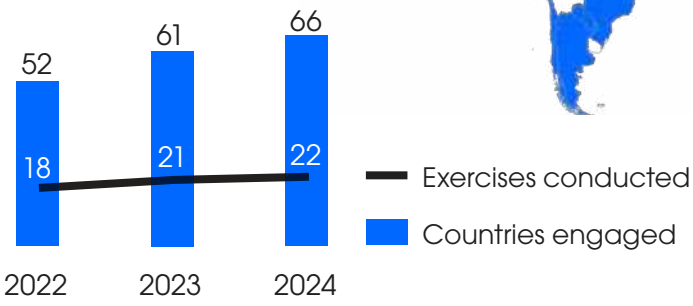
Scenario Design for Improved Preparedness

Exercises and Trainings

22
Exercises Worldwide

66
Countries Engaged

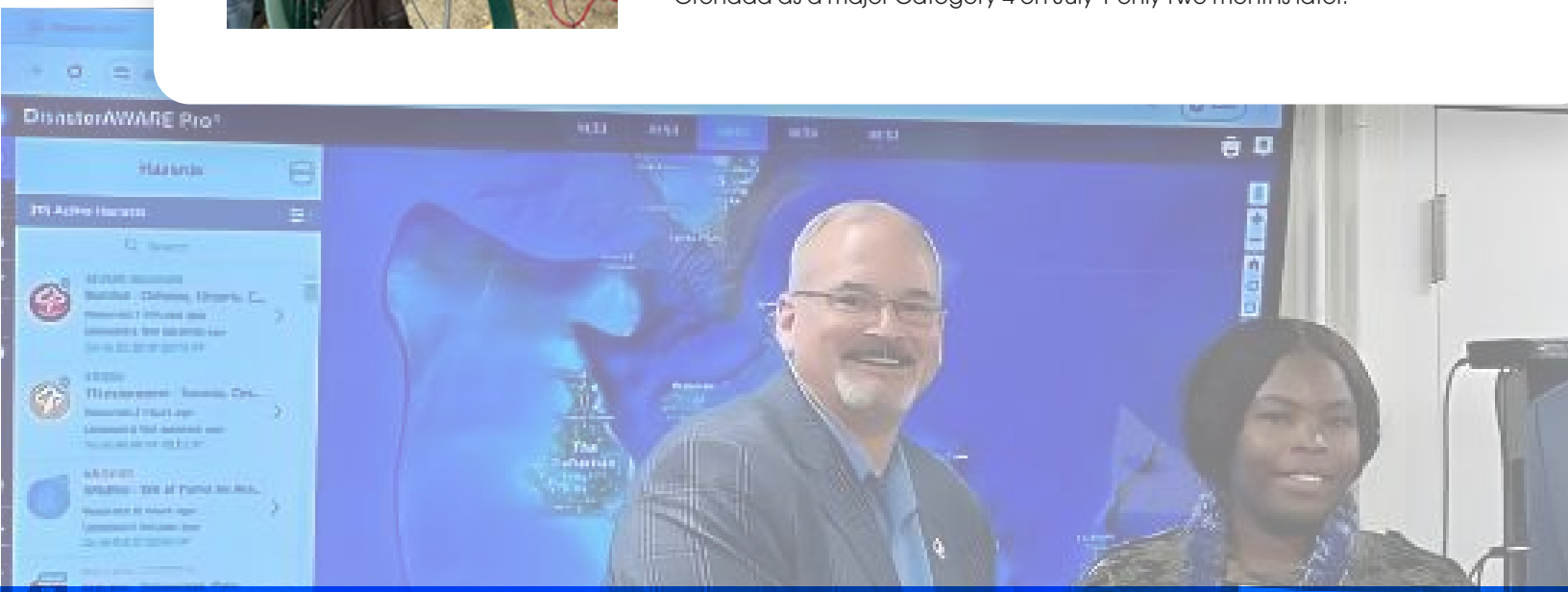




PDC's Exercise and Training program is not only one of the most significant drivers of the year-to-year growth in the adoption of DisasterAWARE—exposing hundreds of participants to PDC's robust data and analytical tools—but it's also a vital instrument for promoting international cooperation and disaster readiness. In 2024, PDC helped develop realistic exercise scenarios that were simulated during large-scale multinational exercises with DisasterAWARE, which served as the platform of choice and Common Operating Picture for both U.S. government and international partners alike. Expanding its reach further, PDC launched a new self-paced, online training course program, giving hundreds of new users access to DisasterAWARE training from remote geographies around the world. Visit www.pdc.org/quickstart for the introductory course.

Tradewinds Multinational Exercise and PDC baseline assessment analytics support response to Hurricane Beryl

PDC aided exercise scenario development and the Command Post and Tabletop Exercise portions of Tradewinds 2024, leveraging realistic scenario data derived from PDC's recently completed National Disaster Preparedness Baseline Assessments throughout the Caribbean—including Barbados and Grenada. The event took place in Barbados and involved more than 1,000 participants from 20 countries resulting in better regional preparedness to Hurricane Beryl ,which made initial landfall in Grenada as a major Category 4 on July 1 only two months later.



A new brigade of DisasterAWARE Pro Trainers

In partnership with The Bahamas Disaster Risk Management Authority, PDC certified a cadre of **12 new DisasterAWARE Pro trainers.** These new DisasterAWARE experts will help augment the Center's training reach and capacity within the Caribbean region and empower stronger partnerships and expertise between Caribbean countries in the adoption of DisasterAWARE for improved planning, hazard monitoring, early warning, and response.

69
Total training sessions worldwide

1,327
Total Participants

DisasterAWARE online courses improve global reach and reduce costs

PDC launched four new self-guided online training courses in 2024 to expand its training reach and capacity, helping to reduce the need for in-person training.

The courses include a new Quick Start introductory training and three hazard-specific training courses tailored to floods, landslides, and wildfires.

↓ 25%
In-person trainings

↑ 24%
Participant growth

2024 Exercises

Global Highlights

Rim of the Pacific Exercise (RIMPAC)

During RIMPAC 2024—the world's largest international maritime exercise—PDC provided real-time estimated impacts, simulating a Category 4 hurricane headed for fictitious islands in the Pacific. During simulation, PDC provided realistic situational awareness products, damage and needs assessments, and critical lifeline status. PDC's DisasterAWARE Exercise platform was used as the real-time common operating picture to provide updated scenario information throughout the duration of the humanitarian portion of the exercise. RIMPAC is a biennial exercise that takes place on even-numbered years from Honolulu, Hawaii and is designed to sustain cooperative relationships that are critical to the safety of sea lanes and security across the world's interconnected oceans. This year's RIMPAC exercise featured several major participants in the humanitarian assistance and disaster relief portion of the exercise including: U.S. Navy, U.S. Army, U.S. Coast Guard, Japan Maritime Self-Defense Force, Republic of Korea Navy, Royal Canadian Navy, and the Chilean Navy.

Seychelles Maritime Oil Spill Exercise

At the request of the U.S. Ambassador to Mauritius and the country of Seychelles, PDC supported the Western Indian Maritime Oil Spill Response Tabletop Exercise. The event was hosted at the Regional Coordination Operations Center (RCOC) in Victoria, Seychelles and was followed by a DisasterAWARE demonstration to 48 participants from seven countries under the RCOC.

Continuing Promise 2024

At the invitation of U.S. Navy 4th Fleet and U.S. Southern Command (USSOUTHCOM), PDC joined Continuing Promise 2024, a humanitarian mission by the U.S. Navy that aims to strengthen medical readiness and the ability of partner nations within the Caribbean, Central and South America to respond to public health disasters and humanitarian crises.

Total number of scenarios exercised globally by hazard type (2024)

Extreme Heat	Drought	Earthquake	Flood	Landslide	Oil Spill	Search and Rescue	Tsunami	Tropical Cyclone	Volcano	Wildfire	Winter Storm
1	4	4	3	4	2	3	2	6	1	4	1

Early Warning for All

Respond Fast and Effectively

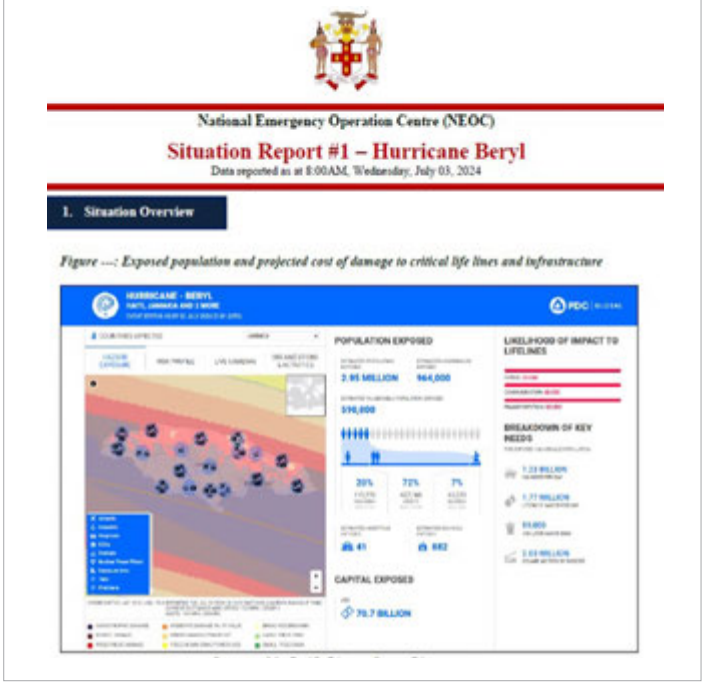
Michelle Edwards, Deputy Director General of Jamaica's Office of Disaster Preparedness and Emergency Management

"We are grateful for your continued support through the Hurricane season in providing planning products to support our response. These products were useful in support to Jamaica response to Hurricane Beryl and Tropical Storm Rafel and the sub-regional response efforts."

International disaster response collaboration

PDC's high-performance, all-hazard impact model and advanced analytics were leveraged by partners worldwide during yet another record-breaking year of disasters in 2024. Our automated, near real-time Event Brief was quickly accessed by national and international partners to aid their planning and response to extreme hurricanes, volcanos, earthquakes, tsunamis, wildfires, and landslides, as well as a wide spectrum of man-made catastrophes. Using the most reliable, scientifically-verified data in the world, PDC developed specialized impact analysis products to augment partner capabilties around the globe.

Jamaica Situation Report #1 - Hurricane Beryl


National Emergency Operation Centre (NEOC)

Situation Report #1 – Hurricane Beryl

Data reported as at 8:00AM, Wednesday, July 03, 2024

1. Situation Overview

Figure ---: Exposed population and projected cost of damage to critical life lines and infrastructure

Jamaica leverages its longstanding relationship with PDC as well as Event Brief to plan and prepare for Major Hurricane Beryl

77 Events Supported

62 Direct Support Requests

1 Major Activation

47 Countries Served

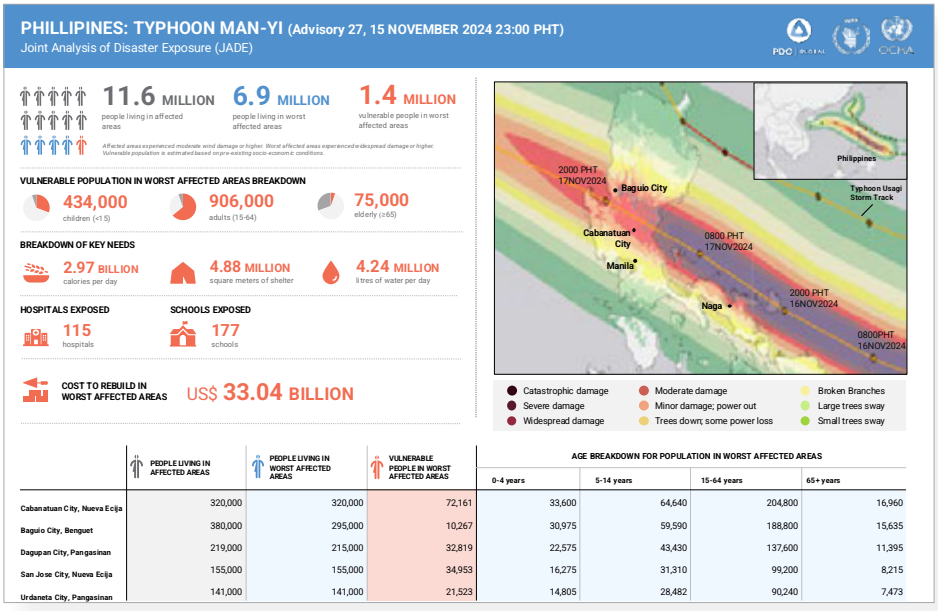
3 JADE Products

(Joint Analysis of Disaster Exposure)

- » Hurricane Beryl
- » Typhoon Man-Yi
- » Typhoon Yagi

PDC WFP OCHA

25	17	15	6	11	3
Tropical cyclones	Floods, storms, landslides	Wildfires	Volcanic Events	Earthquakes, tsunamis	Manmade



PHILLIPINES: TYPHOON MAN-YI (Advisory 27, 15 NOVEMBER 2024 23:00 PHT)
Joint Analysis of Disaster Exposure (JADE)

PDC WFP OCHA

11.6 MILLION people living in affected areas
6.9 MILLION people living in worst affected areas
1.4 MILLION vulnerable people in worst affected areas

Affected areas experienced moderate wind damage or higher. Worst affected areas experienced widespread damage or higher. Vulnerable population is estimated based on pre-existing socio-economic conditions.

VULNERABLE POPULATION IN WORST AFFECTED AREAS BREAKDOWN
434,000 children (<15)
906,000 adults (15-64)
75,000 elderly (≥65)

BREAKDOWN OF KEY NEEDS
2.97 BILLION calories per day
4.88 MILLION square meters of shelter
4.24 MILLION litres of water per day

HOSPITALS EXPOSED
115 hospitals

SCHOOLS EXPOSED
177 schools

COST TO REBUILD IN WORST AFFECTED AREAS US$ 33.04 BILLION

Philippines
2000 PHT 17NOV2024
Baguio City
Typhoon Usagi Storm Track
Cabanatuan City
0800 PHT 17NOV2024
Manila
Naga
2000 PHT 16NOV2024
0800PHT 16NOV2024

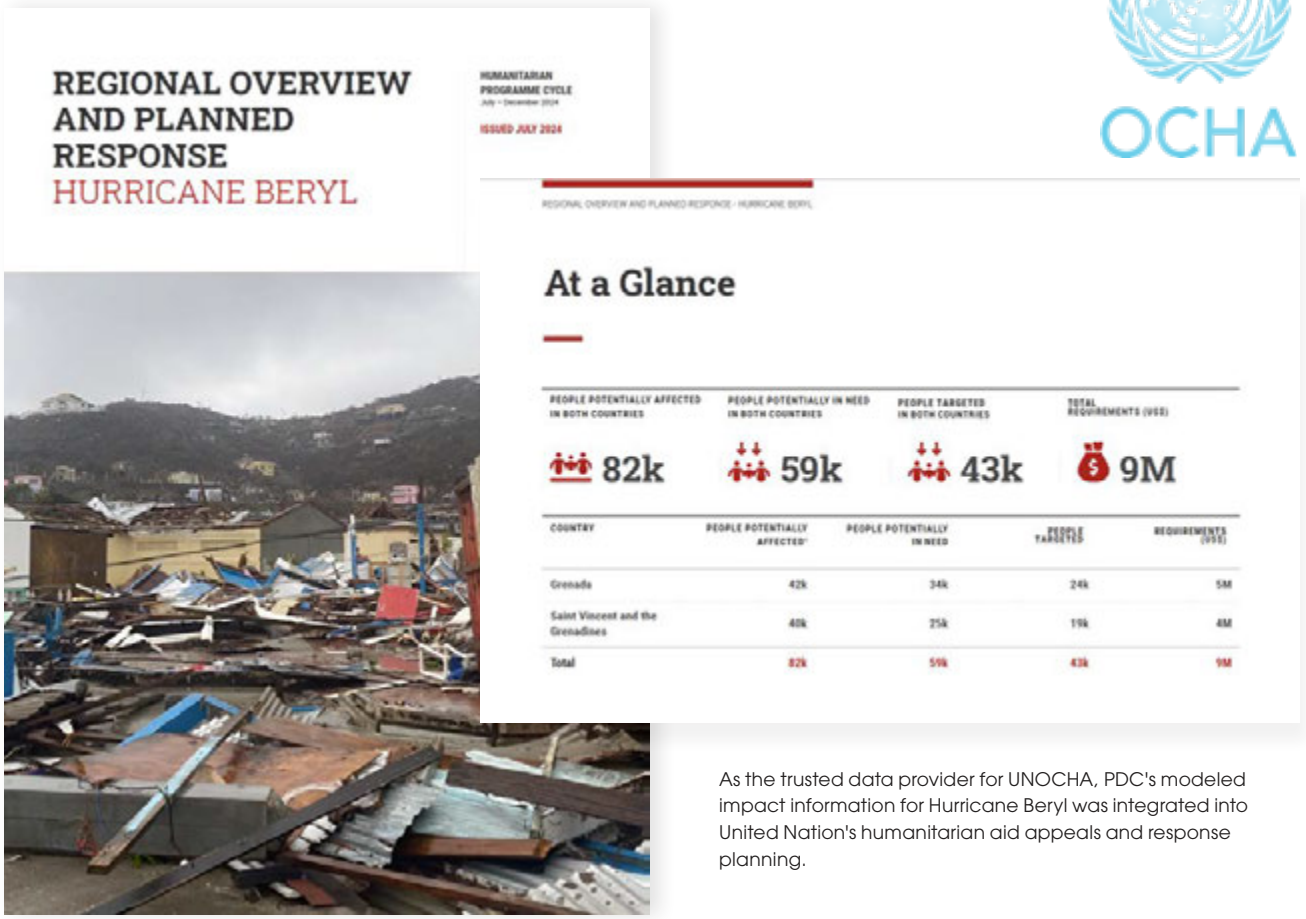
Catastrophic damage
Severe damage
Widespread damage
Moderate damage
Minor damage; power out
Trees down; some power loss
Broken Branches
Large trees sway
Small trees sway

	PEOPLE LIVING IN AFFECTED AREAS	PEOPLE LIVING IN WORST AFFECTED AREAS	VULNERABLE PEOPLE IN WORST AFFECTED AREAS	AGE BREAKDOWN FOR POPULATION IN WORST AFFECTED AREAS			
				0-4 years	5-14 years	15-64 years	65+ years
Cabanatuan City, Nueva Ecija	320,000	320,000	72,161	33,600	64,640	204,800	16,960
Baguio City, Benguet	380,000	295,000	10,267	30,975	59,590	188,800	15,635
Dagupan City, Pangasinan	219,000	215,000	32,819	22,575	43,430	137,600	11,395
San Jose City, Nueva Ecija	155,000	155,000	34,953	16,275	31,310	99,200	8,215
Urdaneta City, Pangasinan	141,000	141,000	21,523	14,805	28,482	90,240	7,473

The JADE product combines unique data from PDC, WFP, and UNOCHA to render highly reliable disaster impact estimates.

2024 Disaster Response

Products Showcase

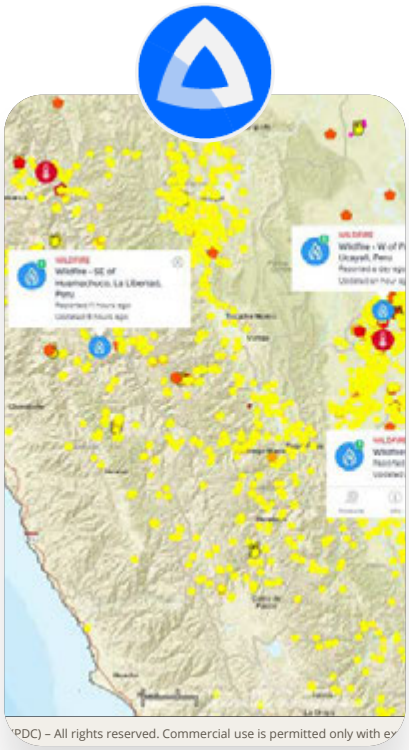


OCHA

As the trusted data provider for UNOCHA, PDC's modeled impact information for Hurricane Beryl was integrated into United Nation's humanitarian aid appeals and response planning.

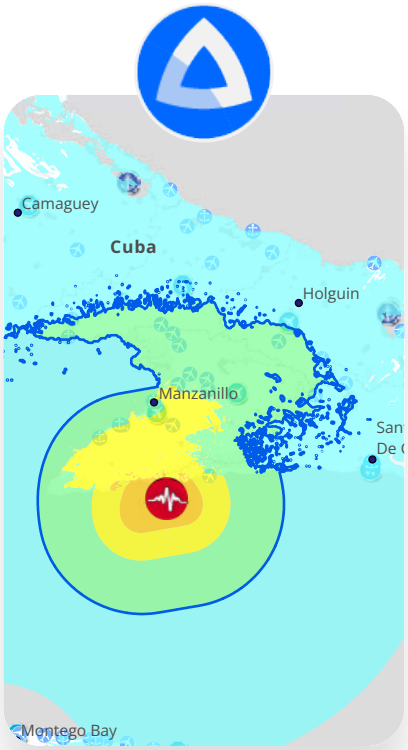
PDC's worldclass analytics supported disaster events around the world in 2024

- Hurricane Helene
- Typhoon Yagi
- Landslides in Papua New Guinea and Nepal
- Hurricane Beryl
- Oil Spill in Trinidad and Tobago
- Earthquake and Tsunami in Taiwan
- Earthquakes in the Philippines, Chile, Peru, and Indonesia
- Volcanic activity globally
- Wildfires in the Western U.S., Central and South America, Belize, Chile, and Colombia



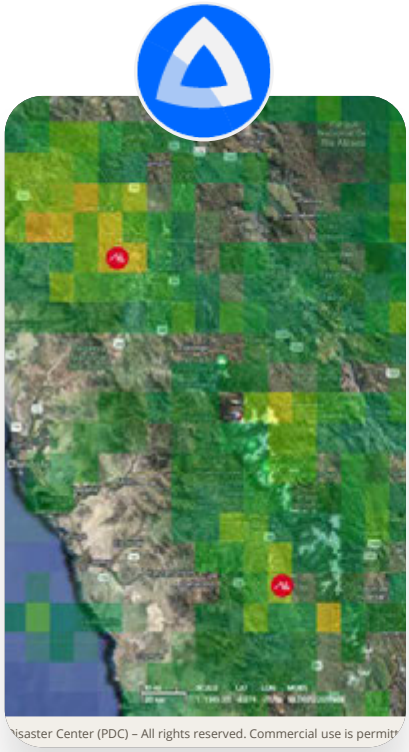
Peru
Wildfire Observations
(wildfire locations, intensity, hazard exposure)

Jamaica
Hurricane Beryl Impacts
(critical infrastructure exposed to severe impacts)

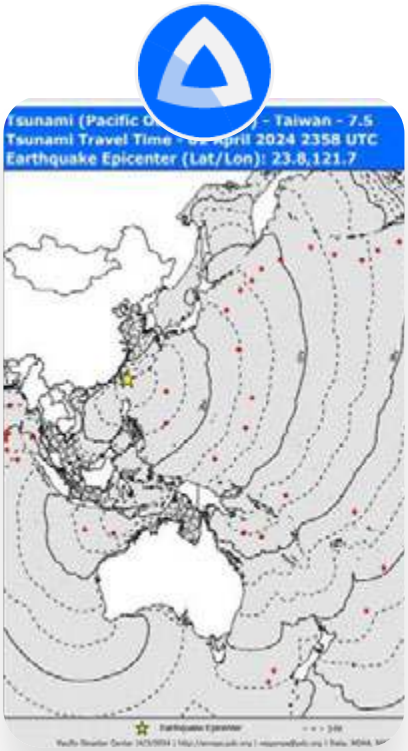


Cuba
Hazard Impacts in Data-Poor Environments
(Event Brief earthquake impact estimates)

Grenada
Hurricane Beryl Damages
(utilizing PDC's NDPBA data to help assess damages to infrastructure)

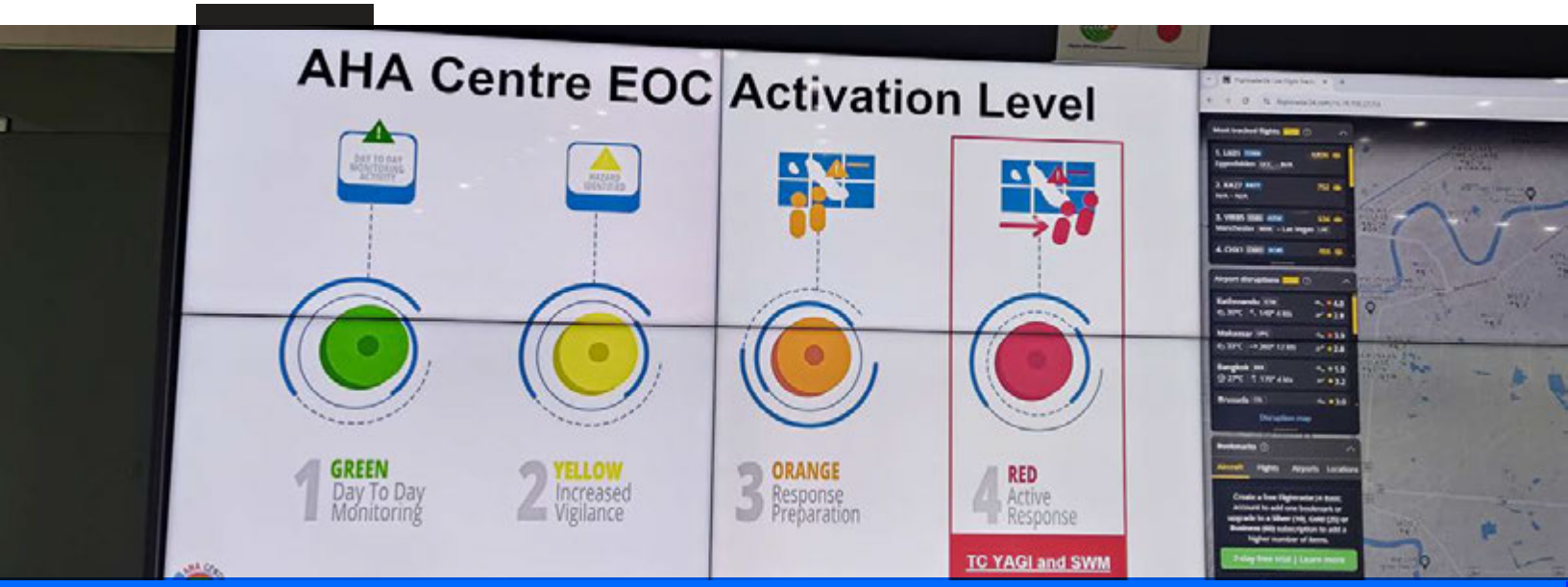


Peru
Rainfall Accumulation
(includes exclusive PDC-NASA landslide predictive warning information)

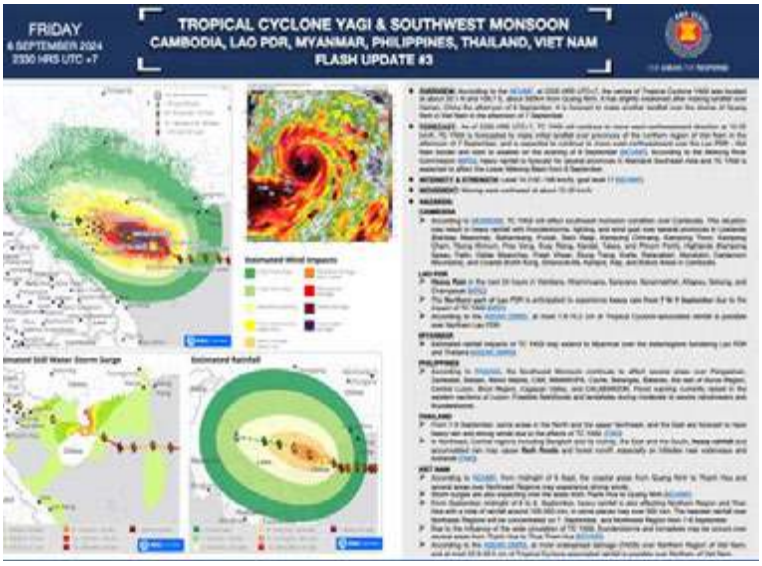


Taiwan
Tsunami Travel Time
(includes earthquake epicenters, buoys, wave travel times)

Early Warning for All
Operational Use of DisasterAWARE by Partner Nations



Protecting ASEAN with DMRS



The AHA Centre used its DMRS capabilities to constantly monitor Super Typhoon Yagi, which caused devastating impacts across Viet Nam, Myanmar, Laos, Thailand, and the Philippines. Situational products and humanitarian flash appeals were created by the AHA Centre using advanced analytics and modeled impact estimates from PDC.

670+ Million
People Protected

49,000+ Hazards Added

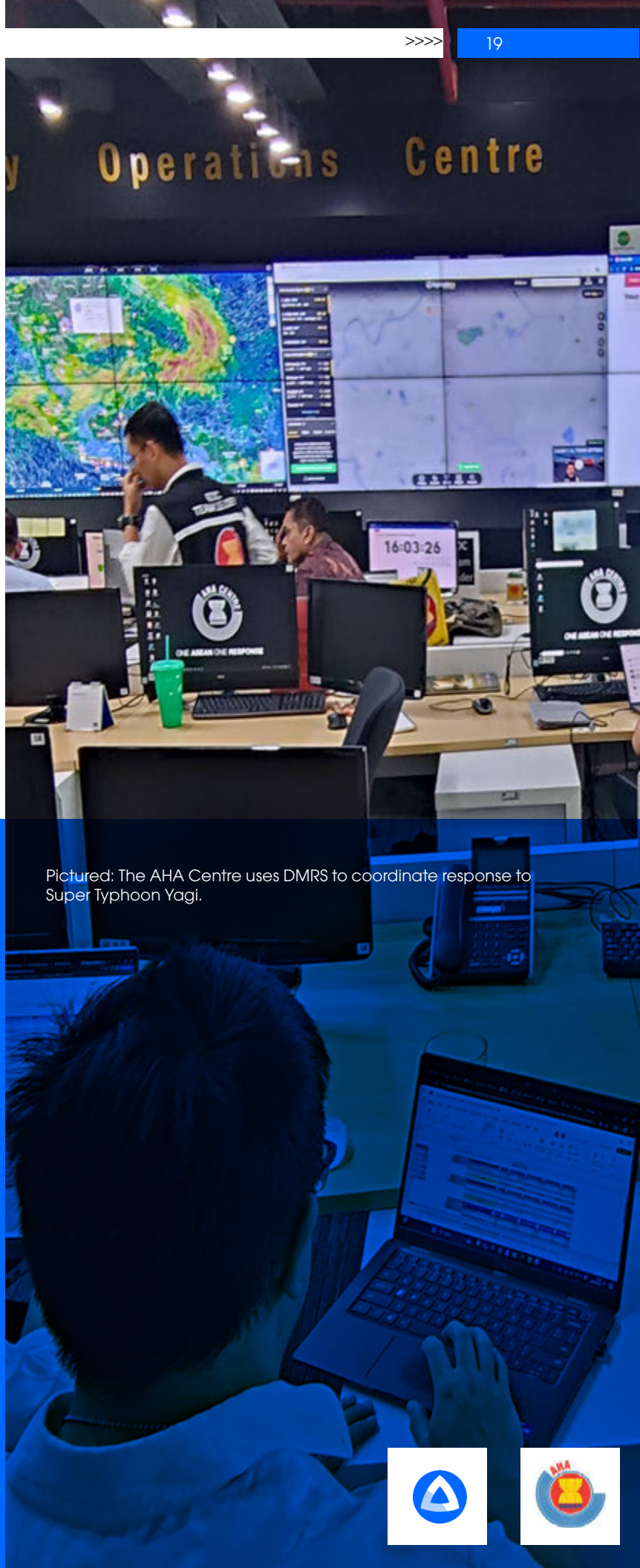
12 Years in Operation

More than fifteen years of collaboration between PDC and the ASEAN Coordinating Centre for Humanitarian Assistance on Disaster Management (AHA Centre) provide a shining example of early warning capacity development through partnership. The AHA Centre's custom version of DisasterAWARE, known as the Disaster Monitoring and Response System, is used for disaster planning and response in support of all 10 member states of ASEAN, protecting hundreds of millions from the destructive impacts of disasters.

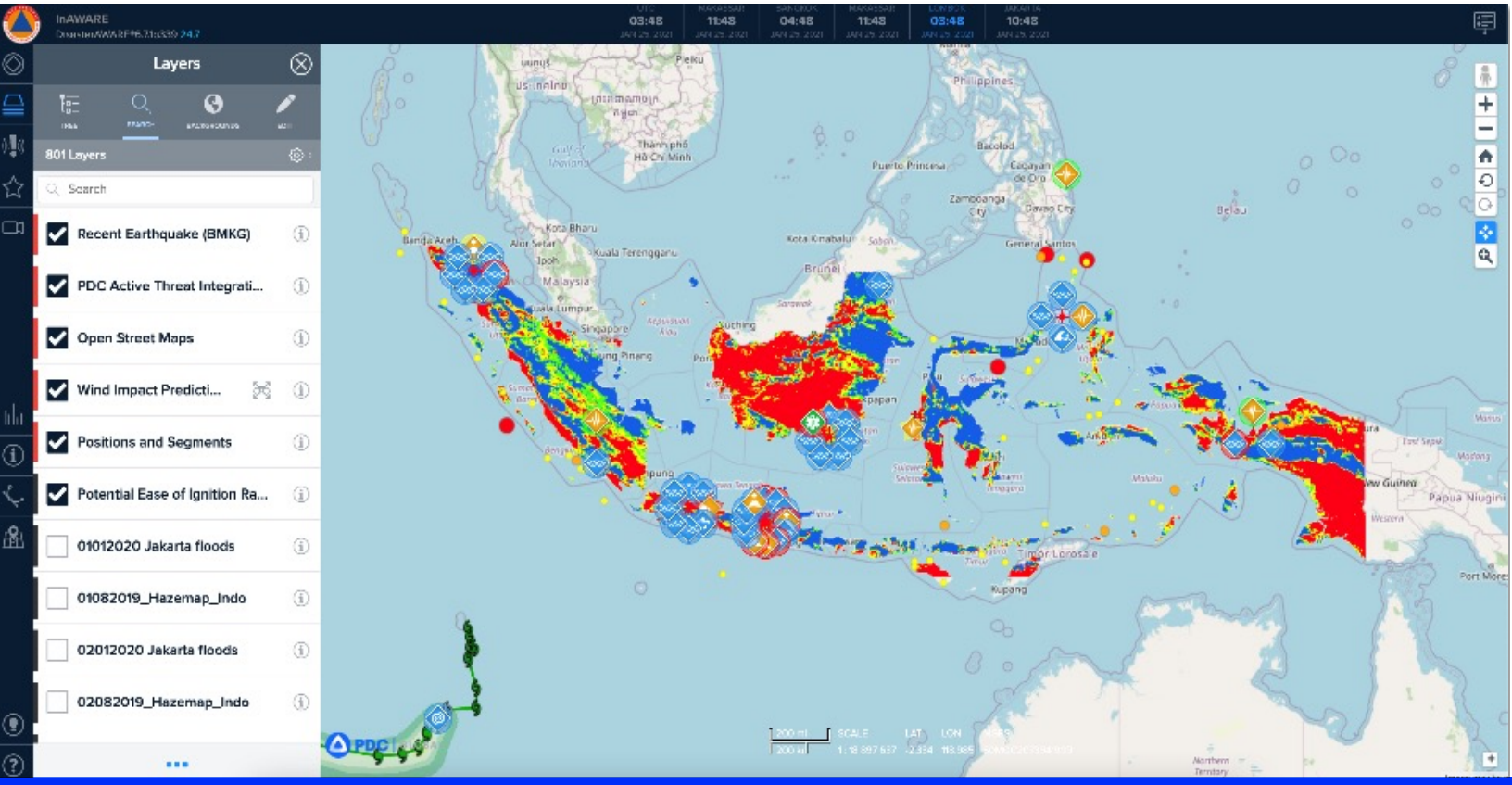
Pictured: PDC and the AHA Centre reaffirmed their shared dedication to disaster risk reduction during a Memorandum of Intent Signing Ceremony in May 2024. Read more at https://www.pdc.org/pdc-aha-centre-moi-2024/

The work we've done with PDC over the years to enhance DMRS, as well as their expertise in risk assessment and predictive analytics has been integral to our operations and to the overall disaster risk reduction objectives of the region.

—AHA Centre Executive Director Mr. Lee Yam Ming



Pictured: The AHA Centre uses DMRS to coordinate response to Super Typhoon Yagi.



Renewed Collaboration with Indonesia on InAWARE

PDC kicked-off a new InAWARE project in partnership with the national disaster management organization of Indonesia, Badan Nasional Penanggulangan Bencana (BNPB). The project improved automated hazard early warning information, infrastructure data, and information-sharing between agencies. Several in-depth trainings were completed during the project, which was made possible through generous funding support from USAID.

277.5 Million
People Protected

2,649
Hazards Added

10
Years in Operation

Pictured: The Philippines Office of Civil Defense along with several other national stakeholders are shown with PDC for the hand-off ceremony of PhilAWARE—a national early warning system built on the latest version of PDC's DisasterAWARE and enhanced with the Philippine's own data.

A Safer Philippines with PhilAWARE

117.3 Million

People Protected

56,746 Hazards Added

4 Years in Operation

1 Train the Trainer Session

Pictured: PDC conducts expert Train the Trainer session with key Philippines OCD stakeholders.

The PhilAWARE system is a custom version of PDC's DisasterAWARE platform that has been used operationally for four years. The system was updated in 2024 with the latest version of DisasterAWARE and enhanced with hazard alerting information from the Philippine Institute of Volcanology and Seismology (PHIVOLCS) and Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA) along with other critical national data.

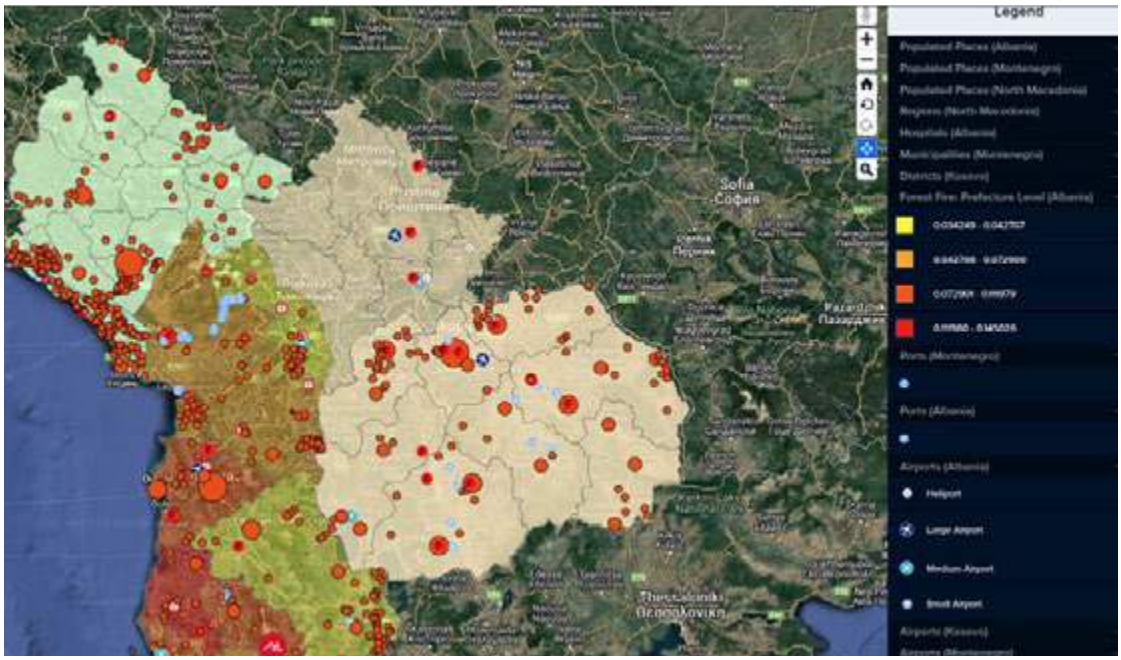
» Integrated and operationalized local forecast data, regional weather observations, risk and climate data.

DisasterAWARE Pro Brings New Capacity to Timor-Leste

1.3 Million

People Protected

2 Years in Operation



Lifesaving Early Warning for the Balkans via DisasterAWARE Pro

5 Million

People Protected

200+ Exercise Participants

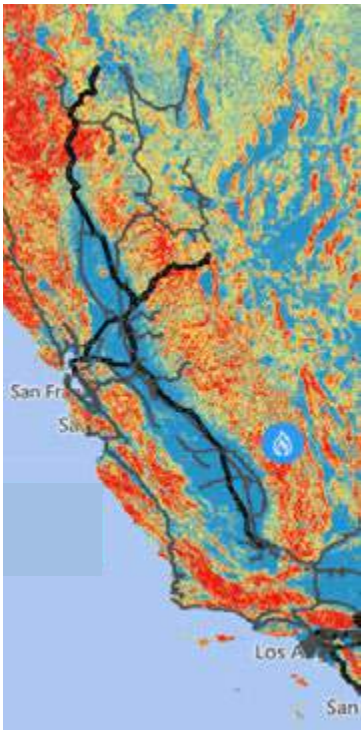
3 Years in Operation

Through sponsorship from the U.S. Forest Service and USAID, PDC continued its collaboration with Albania, Kosovo, and Montenegro, as well as local chapters of the Red Cross and a variety of national hydrological and meteorological agencies to increase early warning capacity in the Balkans. In 2024, partners worked with PDC to incorporate critical regional and national datasets into DisasterAWARE to improve disaster preparedness and response capacity within the region, especially for wildfires, landslides, and earthquakes.

Balkans Multinational Exercise

PDC conducted a scenario-based multinational Tabletop Exercise (TTX) simulating a cross-border winter storm and cascading flood, landslide and avalanche hazards requiring mutual assistance and multinational response coordination.

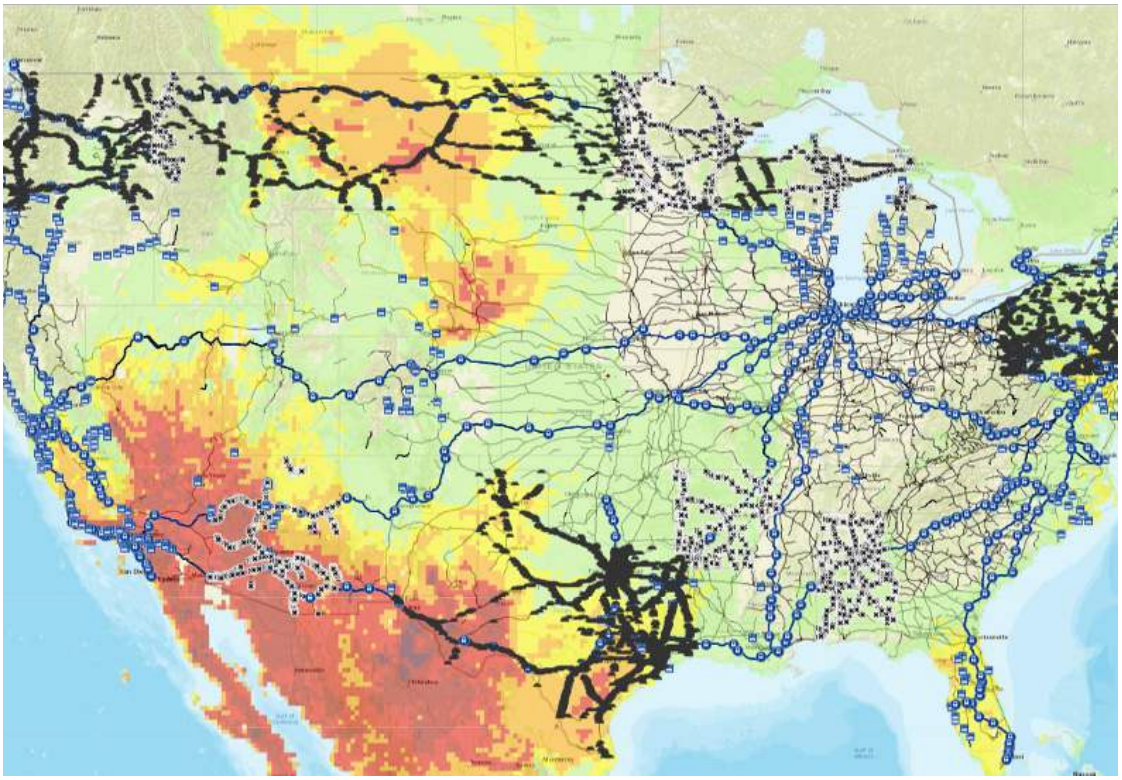
The Center also helped institutionalize the operational use of DisasterAWARE within the Balkan nations' Emergency Operations Centers (EOCs) including in-person and virtual training with staff in three countries.



New wildfire suppression difficulty index

U.S. Rail Infrastructure Hazard Monitoring and Early Warning

- In partnership with the Federal Railroad Administration and U.S. Department of Transportation, PDC assembled a master rail network layer from multiple datasets.
- PDC helped identify and visualize new fire risk data layers for use in a new fire risk alerting system.
- An initial design was developed by PDC for a daily Rail Network Fire Risk Alerting System using the Asset Protection features and the new fire risk layers in DisasterAWARE.
- The proof of concept designed by PDC is flexible and able to be adapted to other types of infrastructure risk in other industries.



Advanced Analytics
Transforming Big Data into Actionable Insights

Growing Demand for Risk Insights

PDC Global Risk Assessments **+800%**

2024 **27**

2023 **4**

2022 **3**

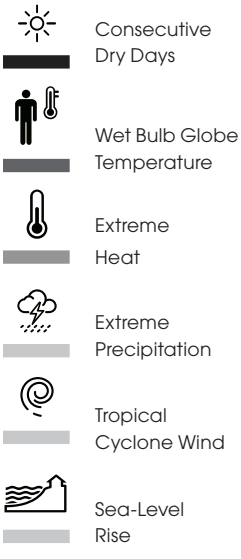
- **1** Global Disaster Risk Index (2024)
- **1** Fragility Index
- **1** Food Security Index
- **1** Personal Security Index
- **1** Subnational Vulnerability Index
- **22** 2050 Anticipatory Risk Index

"The best way to predict your future is to create it."

— Abraham Lincoln

Analytics for Security and Resilience

PDC's Analytics Lab continued to streamline and automate analytical processes to improve our robust data science backbone. In 2024, we accelerated our rapid assessment capacity nearly tenfold, completing 27 global assessments and numerous national assessments. These new capabilities are helping to meet the growing demand for reliable risk insights and supporting the operational use of analytics for decision making through PDC's Early Warning for All offerings. These initiatives continue to enable more effective planning and prioritization of disaster risk reduction actions and interventions.

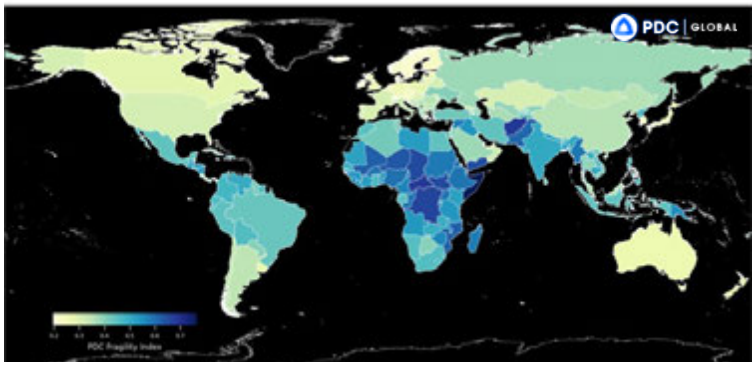


1 Billion or 13% of world's population live in high fragility states

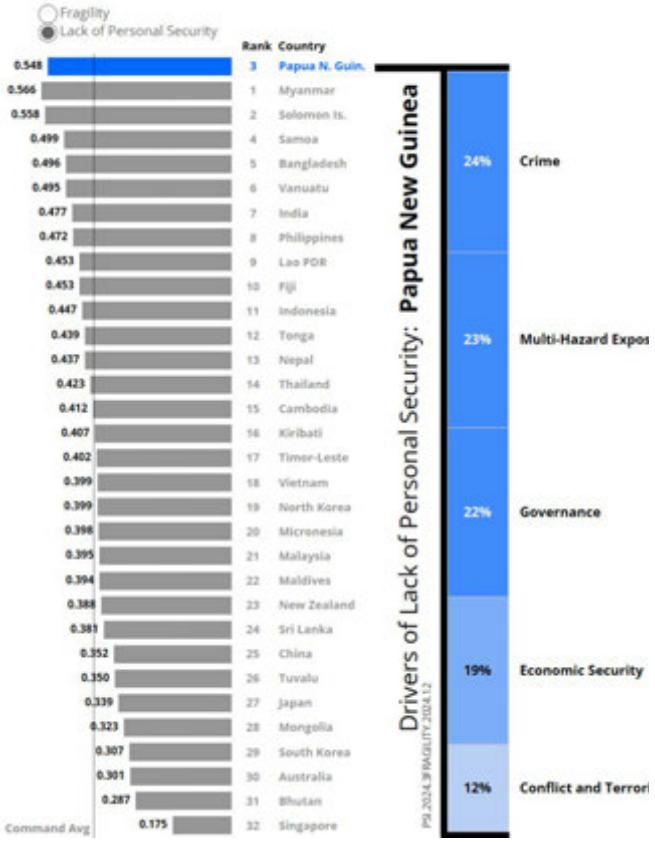
Fragility Index

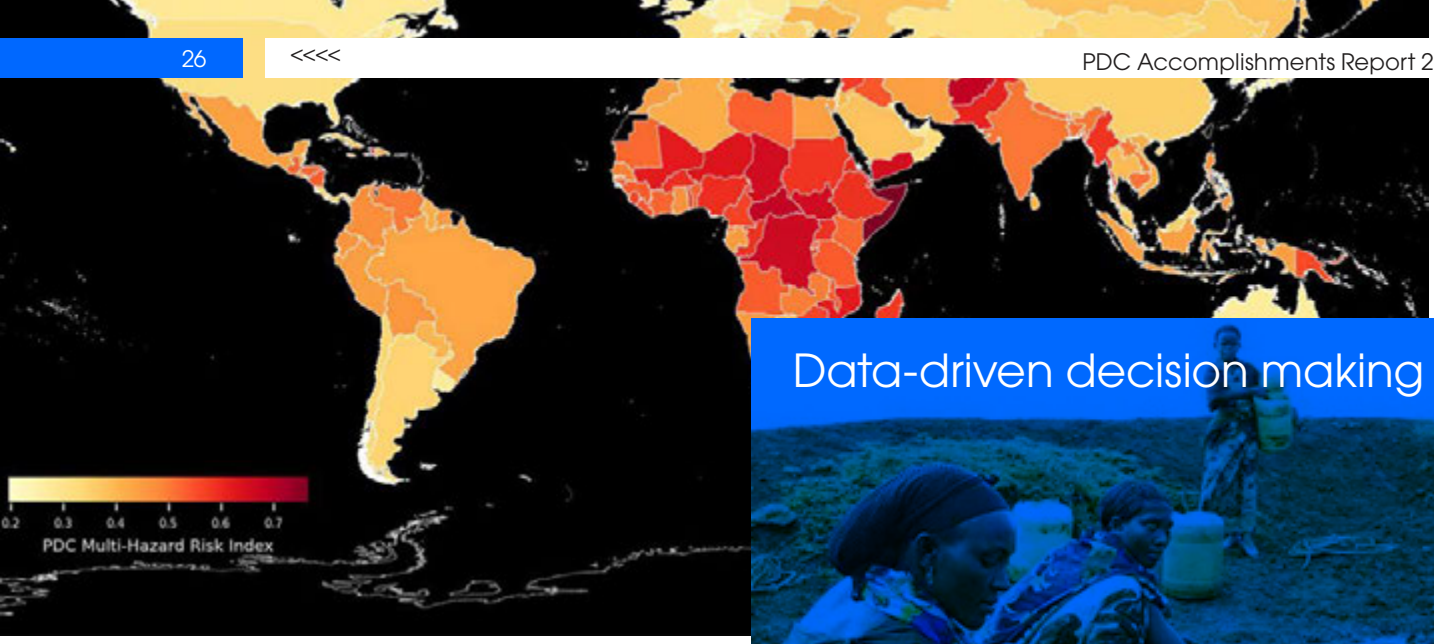
Insights fostering greater stability.

PDC's Fragility Assessment was updated for the entire globe in 2024. The assessment examines the components of state fragility and provides a country-level comparison of the ability of countries to respond to and recover from destabilizing shocks.



ASIA PACIFIC REGION



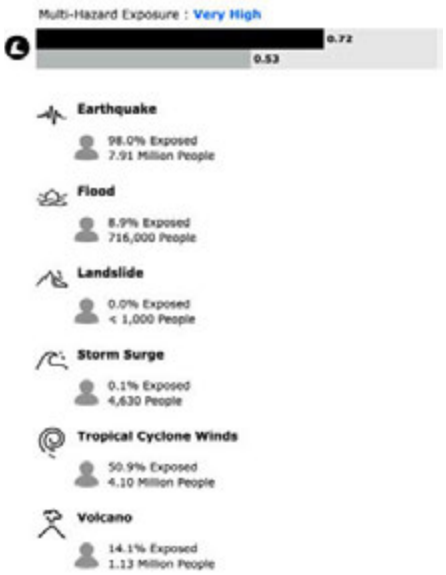


2024 Global Disaster Risk Index

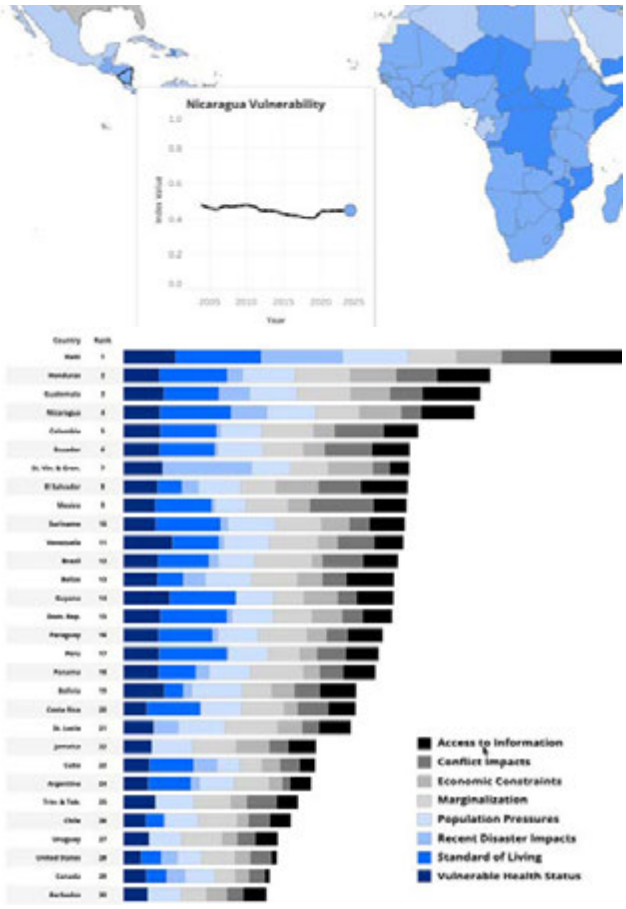
Supporting effective disaster risk reduction.

PDC's 2024 Global Disaster Risk Index offers disaster risk trends at a global scale. The index spans a 20-year time scale and is PDC's first published index to support disaster management decision makers with risk reduction insights.

PDC's index is used by U.S. government agencies, nongovernmental and international organizations worldwide to understand the underlying drivers of disaster risk and better prioritize interventions and investments to reduce losses. See the 2024 update at analytics.pdc.org/disaster-risk.

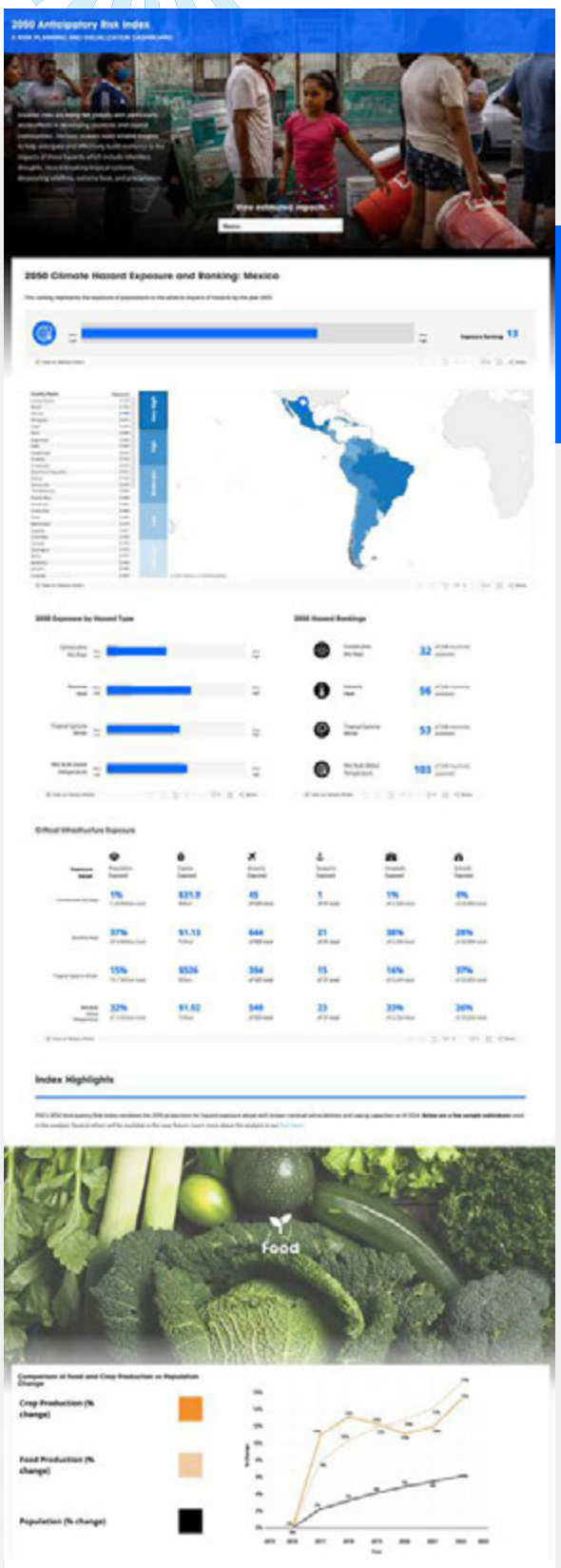


20+ Years of Global Disaster Risk Trend Analysis



NEW!

Advanced Analytics Dashboards



Visit analytics.pdc.org/anticipated-risk.

PDC's data science innovations are the backbone of our new visualization dashboards, providing public access to our 2024 **Global Disaster Risk Index** and our **2050 Anticipatory Risk Index.**

Building disaster resilient communities with faster and more reliable insights.

Visit analytics.pdc.org/disaster-risk.

Advanced Analytics
PDC Analytics Lab Showcase

2050 Anticipatory Risk Index

Leveraging more than 20 years of expertise in disaster risk analysis, PDC completed a comprehensive assessment of the potential impacts of hazards in the coming years. Based on the best scientific data available, we investigated the potentially destructive forces of six types of hazards: consecutive dry days, extreme heat, extreme precipitation, wet bulb globe temperature, tropical cyclone winds, and sea-level rise.

Working with extremely large global datasets, projections were calculated for the years 2030, 2040, and 2050 using different greenhouse gas and carbon emissions scenarios (RCP 4.5 / SSP2 and RCP 8.5 / SSP5) to aid long-term disaster management planning and resilience-building efforts.

Visit analytics.pdc.org/anticipated-risk to explore some of the results.

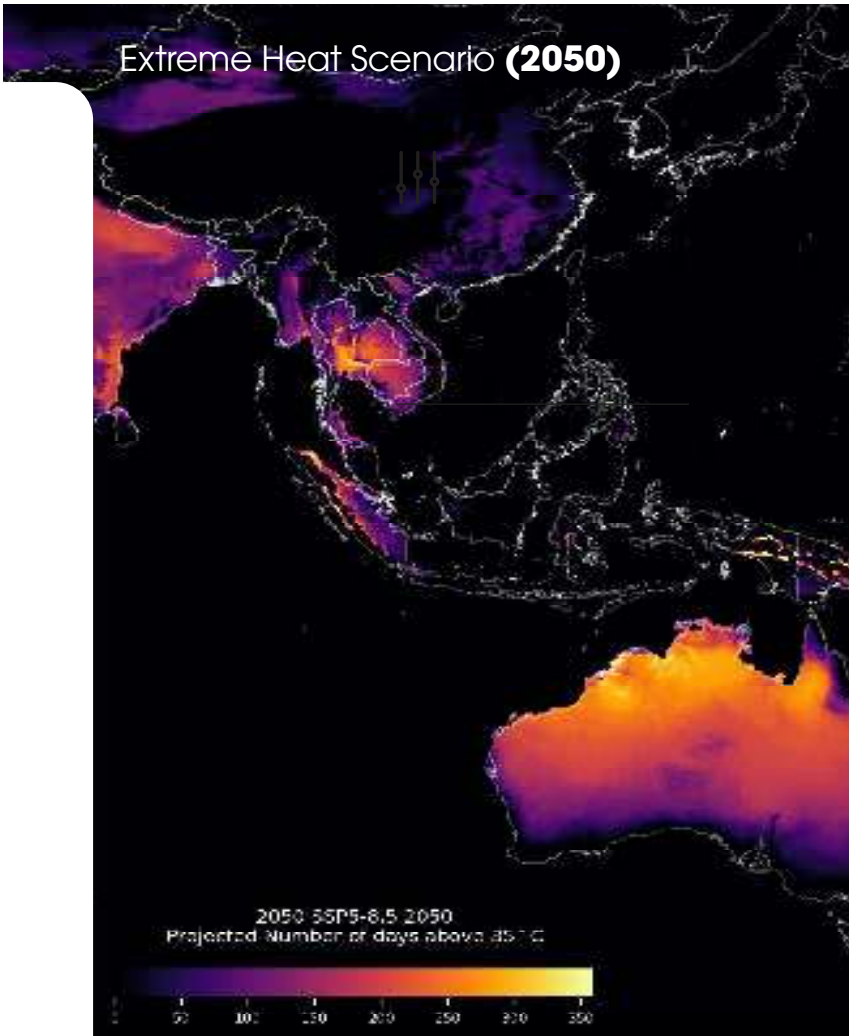
Scenarios

RCP 4.5 / SSP2

RCP 8.5 / SSP5

2030, 2040, 2050 Projections

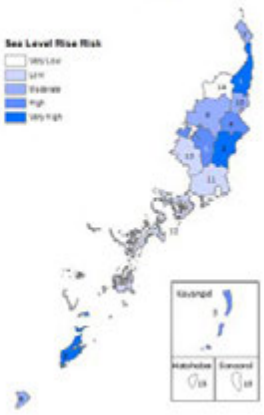
- Consecutive Dry Days
- Wet Bulb Globe Temperature
- Extreme Heat
- Extreme Precipitation
- Tropical Cyclone Wind
- Sea-Level Rise

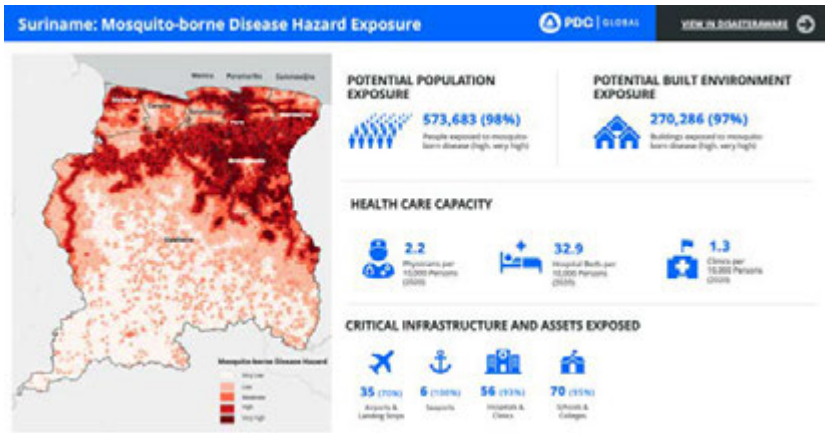


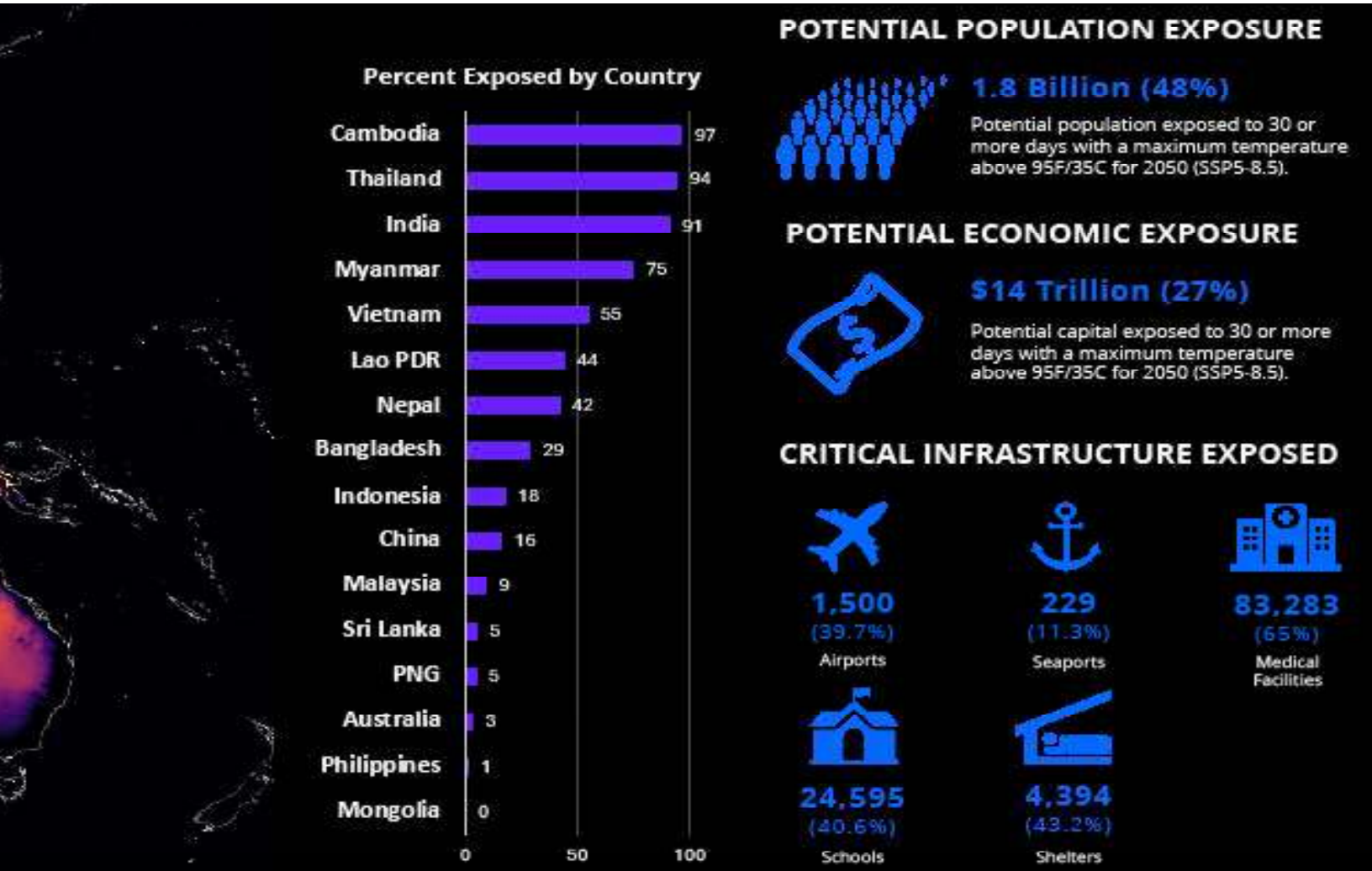
Hyper-Local Impact Analytics

SEA LEVEL RISE RISK BY STATE

RANK	STATE	INDEX SCORE	VULNERABILITY RANK	EXPOSURE RANK	% Exposed Considered Vulnerable
1	Ngaraard	0.579	4	4	68%
2	Ngchesar	0.552	1	6	66%
3	Peleliu	0.544	7	3	54%
4	Melekeok	0.523	6	5	59%
5	Koyangel	0.509	9	2	63%
6	Ngatpang	0.443	2	11	66%
7	Ngarchelong	0.35	8	9	69%
8	Ngaremlengui	0.298	11	7	43%
9	Angaur	0.293	10	10	70%
10	Ngiwal	0.147	14	12	52%
11	Airai	0.131	15	8	46%
12	Koror	0.087	16	1	14%
13	Aimeliik	0.079	13	13	69%
14	Ngardmau	0.063	12	14	70%
15	Hatohobei	0	5	15	0%
15	Sonsorol	0	3	15	0%

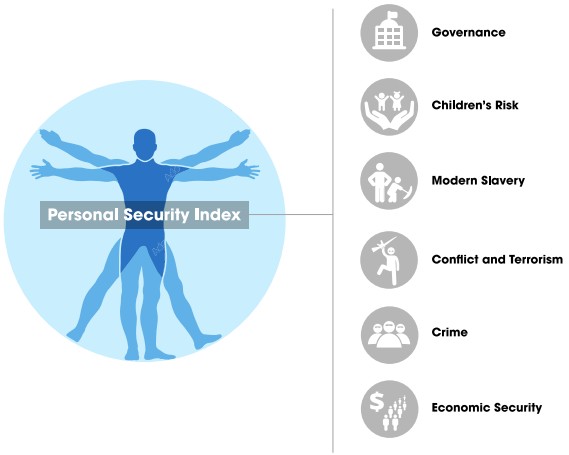


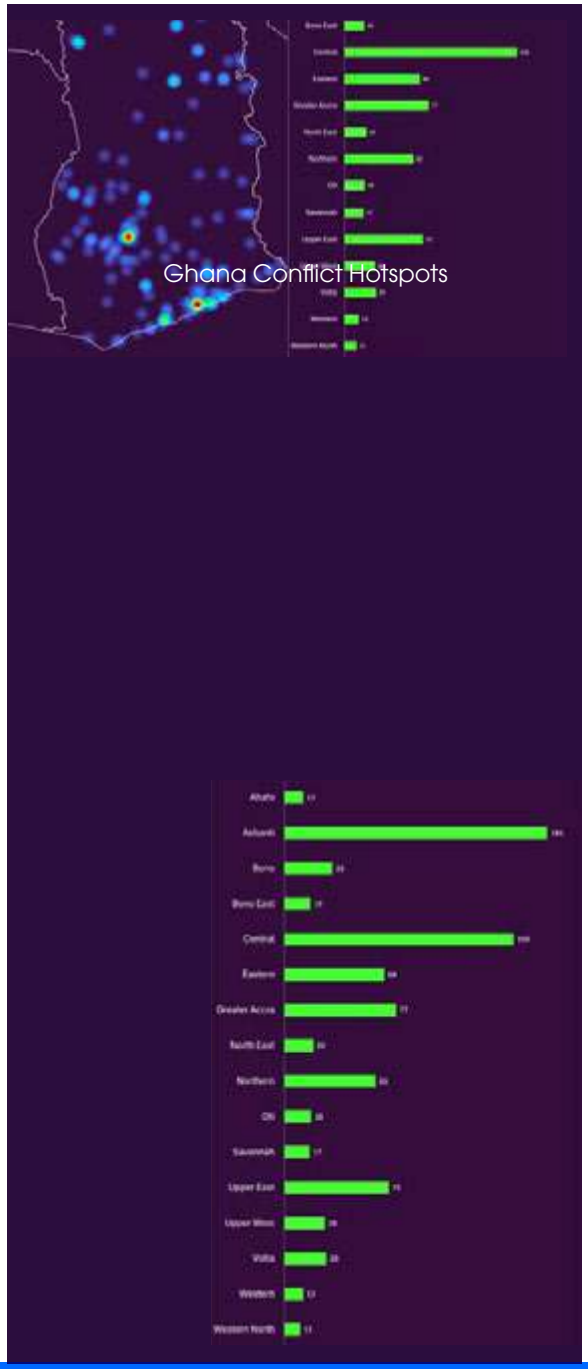




Personal Security Index

PDC's new Personal Security Index provides a country-level measure of societal safety and well-being. The index integrates data on violence, governance, economic conditions, and disaster exposure to provide a measure of where individuals are at higher risk of violence, exploitation, and insecurity.





Food Security Index

PDC's Food Security Index provides a comprehensive assessment of factors that contribute to food insecurity, examining physical and social access to food, dietary quality, and nutritional deficiencies, while also considering environmental factors, economic challenges and food production.

The index aids in identifying at-risk populations, addressing root causes, and designing targeted actions to improve food security.

National Disaster Preparedness Baseline Assessments

PDC's National Disaster Preparedness Baseline Assessment (NDPBA) helps countries assess risk and apply it to early warning, disaster preparedness, policy and planning, sustainable development, and resilience-building initiatives. The NDPBA is the only program recognized by the United Nations to help countries operationalize the goals of the Sendai Framework for Disaster Risk Reduction—providing an evidence-based foundation for actions to be taken and investments to be made in achieving long-term resilience. Visit www.pdc.org/ndpba.

8
National Assessments Finalized (2024)

- Antigua and Barbuda
- Barbados
- Dominica
- Ghana
- Grenada
- Saint Lucia
- Saint Kitts and Nevis
- Suriname

In Progress

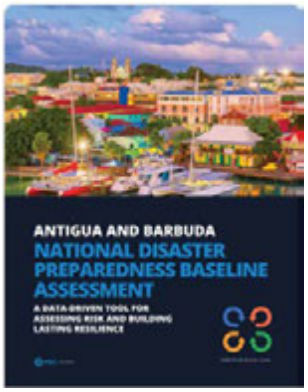
5 National Assessments (2024-2025)
- Colombia
- Ecuador
- Madagascar
- Suriname
- Thailand

1 Risk & Resilience Analysis (R2A2) (2024-2025)
- Honduras

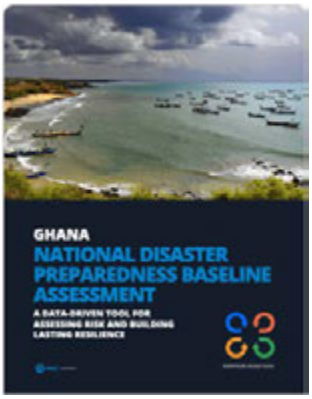
100 Subnational Assessments

80 Individual Hazard Risk Assessments

Latin America and the Caribbean (7)



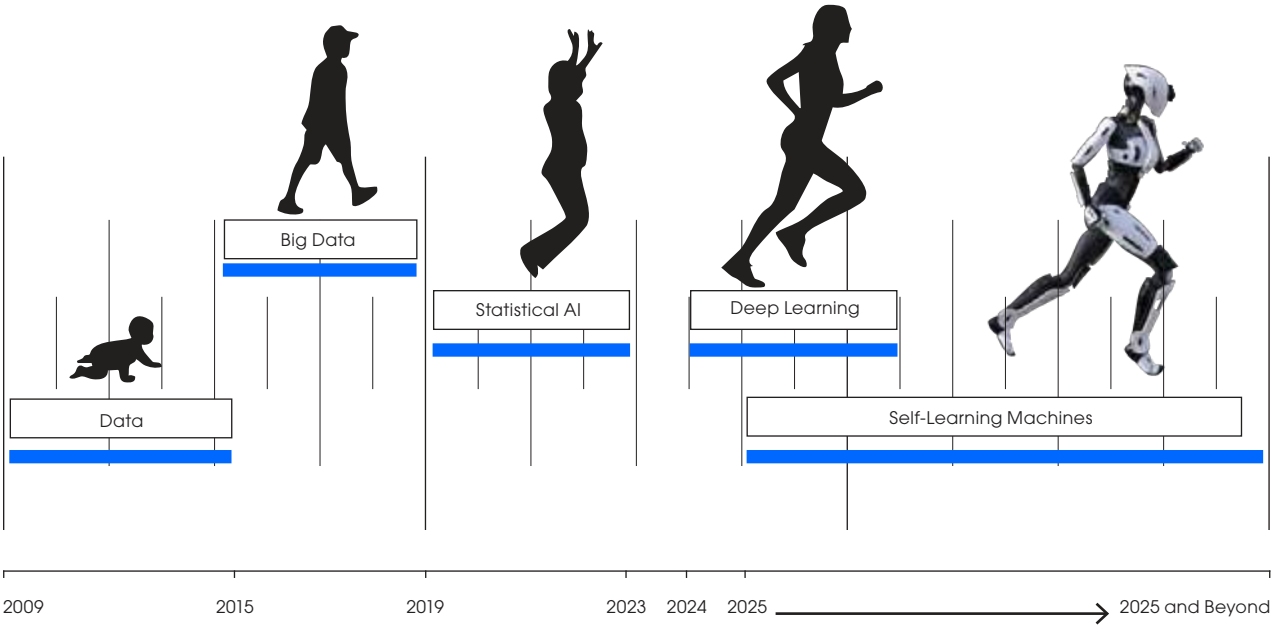
Africa (1)



R2A2 Honduras (1)

AI for Humanity™
Evolutionary Timeline

Leveraging advanced data science and AI technologies, PDC continues to evolve its early warning offerings. These advancements have become a new international standard—providing decision makers and populations around the globe with the best information, in the easiest to understand format, with unprecedented speed in order to save lives, reduce losses, and build more disaster resilient communities.



2009 Automated integration of data and data updates from authoritative, scientific data sources to provide real-time global early warning for all.

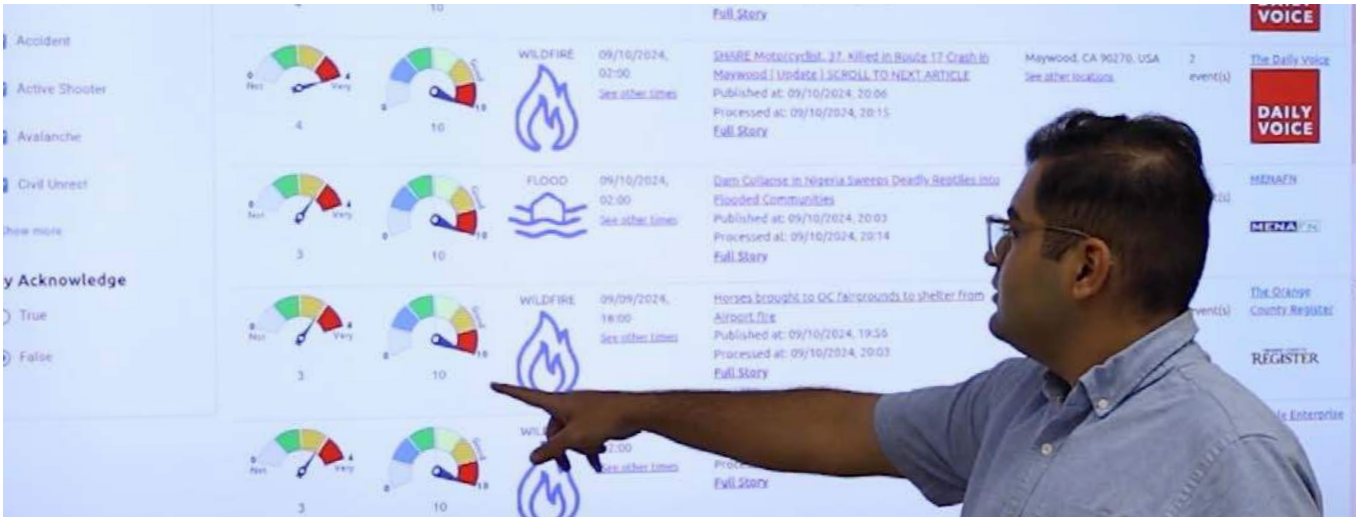
2015 Processed big data for geospatial visualization and integration into DisasterAWARE. Included thousands of large datasets for on-demand situational analysis, planning, and advanced decision support during disaster response.

2019 Real-time computational analysis of relational big data with AI-enabled natural language processing (NLP) to translate complex scientific information into human readable, actionable early warning information.

2023 to present Trained NLP and refined methods to generate improved hazard information as well as filled major gaps in hazard coverage with PDC's AI Hazard Finder tool. Hazard Finder is an AI NLP utility that reads articles, locates hard-to-find events, and presents them for validation (via supervised training) and curation within DisasterAWARE. Further experimentation in AI-generated insights providing contextual information based on user profile, hazard type, and location.

2025 and beyond Self-learning machines to generate the "so what" and "what to do" for every hazard taking place around the globe within minutes of an event. Experimentation with NLP for reaching vision impaired and other vulnerable groups.

AI for Humanity™
Hazard Finder



PDC's AI Hazard Finder is an advanced natural language processing and generative AI utility designed to reduce the manual labor and time involved with curating global hazard content. Gone are the days of PDC staff searching hundreds of daily news and scientific hazard sources from around the world for updates. These repetitive and time consuming tasks are now performed by Hazard Finder with greater speed and accuracy than ever before possible.

New Generative AI and NLP Enhancements

- » Further integration with PDC's Hazardification Architecture, including exposure estimation, automated products, and more
- » Using Generative AI and Natural Language Processing (NLP) to increase global hazard detection including hazard type, location, and time
- » Continued efficiency through reduction of manual hazard curation
- » New interactive map to allow manual adjustment of AI-generated exposure area

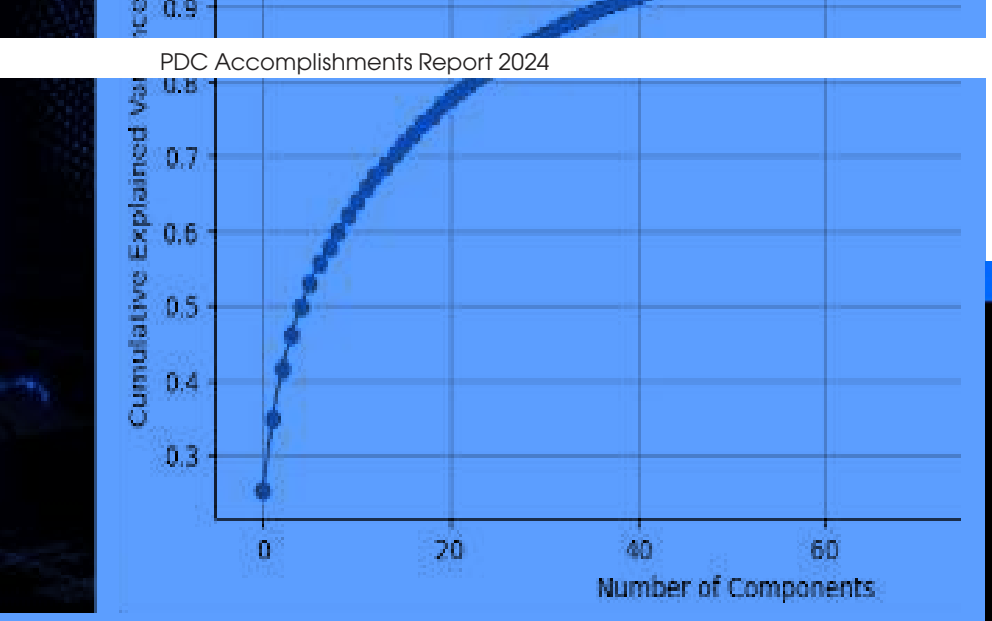
AI for Humanity™
Rapid Analysis with Machine Learning

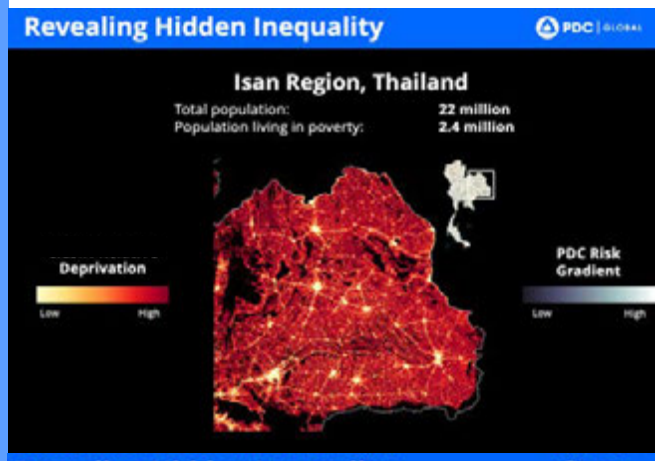
Machine learning drives our algorithms for analyzing and forecasting vulnerabilities as well as making informed recommendations to mitigate long-term disaster risks.

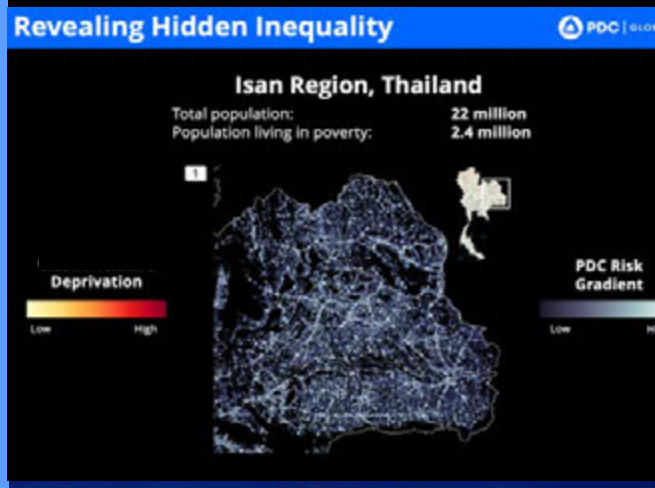
New machine learning algorithms were deployed by PDC in 2024 to improve the scalability and speed of the Center's global assessments as well as help uncover new data relationships for an improved understanding of potential disaster risks.

PDC's machine learning algorithms helped rapidly identify patterns and new dimensions for analysis that reduced redundancies and the amount of data required for meaningful assessments.

Temporal analyses like those enabled by PDC's machine learning, were previously very time consuming. Now they can be quickly conducted across country groups over large time spans. This added dimension of analysis will help inform future projection models and aid decision makers with prioritization of actions and investments to build long-term resilience.


Cumulative Explained Variance
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0
20
40
60
Number of Components


Revealing Hidden Inequality
PDC
Isan Region, Thailand
Total population: 22 million
Population living in poverty: 2.4 million
Deprivation
Low
High
PDC Risk Gradient
Low
High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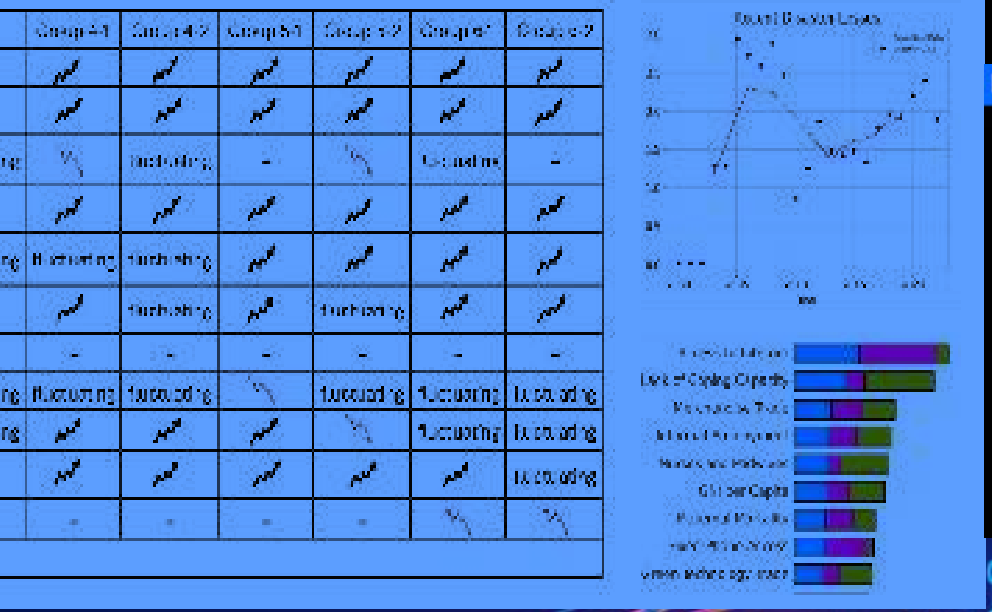

Safer world.

2024

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