

National Science and Technology Center for Disaster Reduction
International Training Workshop for Natural Disaster Reduction 2012:
Application of Information Technology on Disaster Risk Reduction
and Emergency Preparedness

Taipei, Taiwan

14-18 May 2012

Pacific Disaster Center:
Applying Information, Science and Technology
in Support of Disaster Resiliency

Chris Chiesa

Deputy Executive Director

Pacific Disaster Center

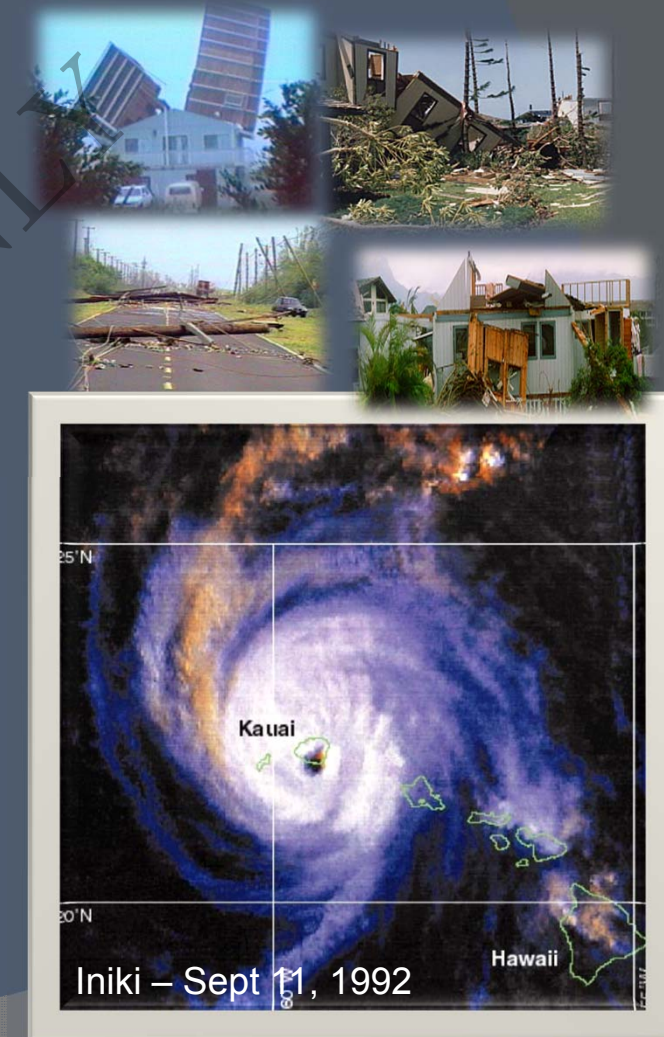
www.pdc.org



University of Hawaii: Managing Partnering

PDC Concept & Origin

- Conceived in the aftermath of Hurricane Iniki (Impacted Kauai on Sept 11, 1992)
- A center to establish access to new, innovative, and more effective information resources supporting all levels of emergency management to **better prepare for** and **respond to** disasters.
- Today, PDC is an acknowledged leader in using the application of science and technology to advance international best practices in **Disaster Risk Reduction (DRR)**.
- University of Hawaii: Managing Partner ('06)



Avoid Hazards => Disasters => Crises

● Vision: **Safer & More Secure World**

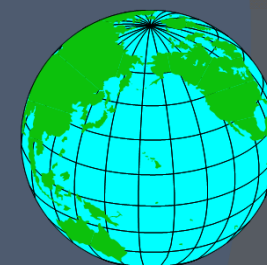
- Sustainable communities, safer nations, and a more secure world through Disaster Risk Reducing

● Goal: **Disaster Resiliency**

- Foster disaster-resilient communities through information, science, technology, and exchange

● Mission: **Reduce Disaster Risks**

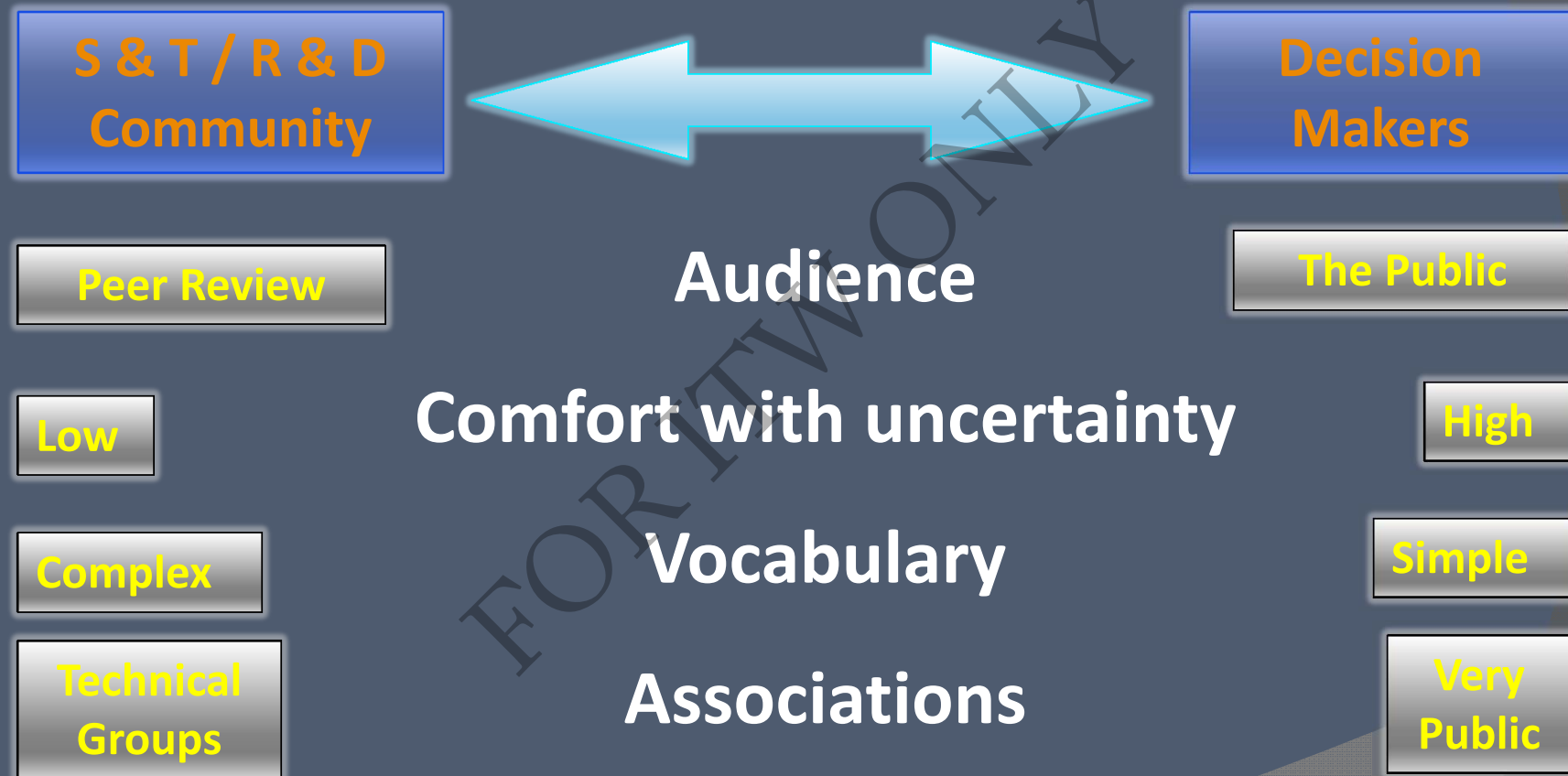
- Provide applied information research and evidence-base analysis supporting development of more effective disaster risk reduction (**DRR**) policies and practices; and applications and information products supporting Humanitarian Assistance and Disaster Relief (**HA/DR**) operators and practitioners in the Asia Pacific region and beyond.



Asia Pacific:

- 38% of World's Disasters
- 80% of World's Casualties

PDC Role: Building a Bridge

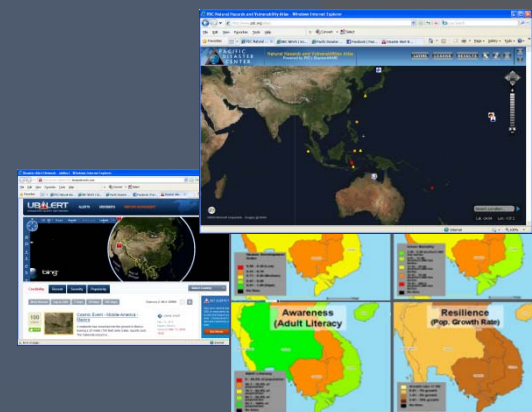


PDC's Integrated Approach

- Applied Science & Technology
- Capability Building
- Evidence-Based Information Products
 - Policy & Decision Makers
 - Disaster Managers
 - Planners
 - Humanitarian Assist. Missions



Observation Systems ,
Data Collection

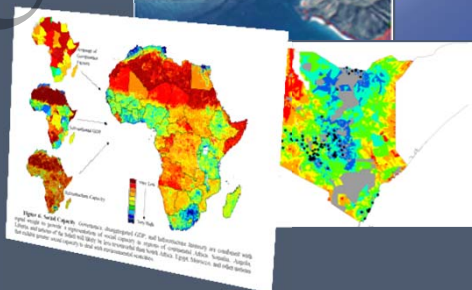


GIS, Visualization and
Display Systems

Integrating Information,
Science, Technology



Improve
Decision-Support
Capabilities



Advanced Applications, Models,
Risk & Vulnerability Assessment



Communication Systems and
Networks



DM Challenges & Gaps ...

● Inadequate Tools for the Decision Makers

- Information is Scattered
- Warnings are Hard to Quickly Digest
- Lack Situational Awareness
- No Risk Context
- Dissemination is Limited

● Time is LIFE

- Information not easily understood isn't particularly useful



Overcoming Challenges

Mobile Apps, Social Media

Tools for Decision Makers

- Simplify, Integrate, & Expedite Processing
- Understand Exposure
- Disseminate Early Warning
- Support Decisions Based on Latest Assessments

Info for Policy Makers & Planners

- Assess Socio-Econ Risks & Vulnerabilities

Capacity for Practitioners

- Training & Exercise
- Workshops



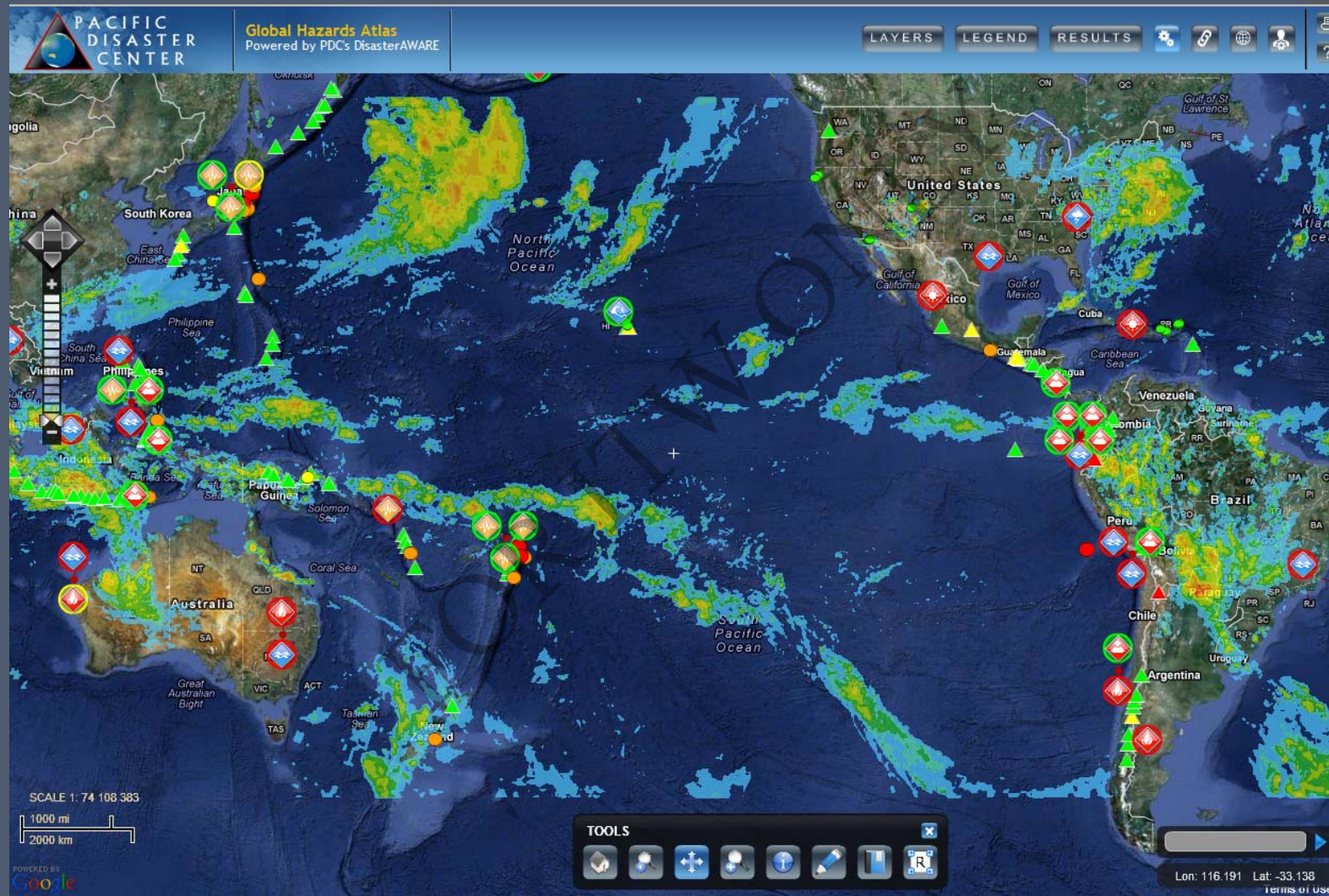
Disaster Monitoring and Early Warning

DisasterAWARE

- Integrated Multi-hazard Hazard Monitoring
- Disaster Early Warning
- Automated / Integrated Modeling
- Exposure (Risk) Maps & Historical Hazard data
- Customized Impact Modeling
- AND
- Intra-Agency Info Sharing
 - User-provided Situation Reports
 - Damage Assessment
- Wide Dissemination
 - Web
 - Social Media
 - Mobile Apps



PDC Global Hazards Atlas



<http://www.pdc.org/atlas>

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PDC INTEGRATED ACTIVE HAZARDS

HAZARD NAME
TYPE
SEVERITY
STATUS
MORE INFO

LAYERS

- KML+ Keyword Search
- ☒ PDC Integrated Active Hazards
 - ☐ Population Density
 - ☐ Live Cameras
 - ☒ Hazards and Events
 - ☒ Recent Active Events
 - ☒ Active Hazard Models
 - ☒ International Disaster Activations
 - ☒ Risk and Vulnerability
 - ☒ Historical Hazards
 - ☒ Observations and Forecasts
 - ☒ Base Map Data

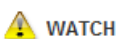
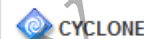
TOOLS



PDC Hazard Information

Tropical Storm - Maria

REGIONAL REPORT



Be the first of your friends to like this.



Status: UPDATE Source: NWS

Reported: September 06, 2011 21:00:00 GMT

Last Update: September 12, 2011 15:00:36 GMT

Resources / Information

Frequently Asked Questions (FAQ)



Powered by PDC's DisasterAWARE

Lon: -139.219 Lat: -40.313

[Terms of Use](#)

Warning Notification / Subscription



Emergency Operations: EMOPS

Powered by PDC's DisasterAWARE: All-Hazard Warnings, Analysis, and Risk Evaluation System

Subscription Service

Please select from the following services:

[My Information](#) ↓

❖ **TROPICAL CYCLONE COORDINATION WORKSHEET (TCCW)**

TCCWs are based on information from NWS storm advisories, plus calculations of the closest approaches to key cities in Hawaii and predicted times of arrival.

❖ **EVENT_CYCLONE_WARNING**

Hazard subscription for Tropical Cyclone Event at the Warn severity level.

Method(s):

☒ E-mail

Region(s):

☐ [Atlantic](#)

☐ [Hawaii](#)

☐ [Indian](#)

☐ [Pacific](#)

Note: If no regions are selected then the entire world is used for the method(s).

❖ **EVENT_CYCLONE_WATCH**

Hazard subscription for Tropical Cyclone Event at the Watch severity level.

Method(s):

☐ E-mail

Region(s):

☐ [Atlantic](#)

☐ [Hawaii](#)

☐ [Indian](#)

☐ [Pacific](#)

Note: If no regions are selected then the entire world is used for the method(s).

Mobile Public Disaster Alert Application

- *Disaster Alert* provides a listing and an interactive map of Active Hazards occurring around the globe.
- Available for **Android** and **iPhone** via the Android Market and iTunes on-line stores.



Interactive map



Hazards list



Details of an event

Social Media and Mobile Applications



FREE

FOR IOS
&
ANDROID
OS

DisasterAWARE

@disasteraware Maui, Hawaii

Pacific Disaster Center is an applied science, information and technology center, working to reduce disaster risks and impacts to peoples' lives and property.

<http://www.pdc.org/>

Following



Tweet to @disasteraware

Tweets

Favorites

Following

Followers

Lists

3 new tweets

**disasteraware** DisasterAWARE

[ADV] UPDATE #5, Tropical Depression - Eighteen, NW Pacific Ocean, Winds 30 kt, Gusts 40 kt, reported by JTWC.

cp.pdc.org/x/ahx #fb

8 hours ago



Favorite



Retweet

Reply

**disasteraware** DisasterAWARE

[WATCH] UPDATE #24, Tropical Storm - Maria, Atlantic Ocean, Winds 45 kt, Gusts 55 kt, reported by NWS. cp.pdc.org/x/ahw #fb

8 hours ago

**disasteraware** DisasterAWARE

[ADV] UPDATE #4, Tropical Depression - Eighteen, NW Pacific Ocean, Winds 30 kt, Gusts 40 kt, reported by JTWC.

cp.pdc.org/x/ahu #fb

14 hours ago

**disasteraware** DisasterAWARE

[WATCH] UPDATE #23, Tropical Storm - Maria, Atlantic Ocean, Winds 50 kt, Gusts 60 kt, reported by NWS. cp.pdc.org/x/aht #fb

14 hours ago



PDC Hazard Information

Tropical Storm - Maria

REGIONAL REPORT

OVERVIEW



CYCLONE WATCH



WATCH

MESSAGE & ADVISORY



Like

Be the first of your friends to like this.

**Status:** UPDATE **Source:** NWS**Reported:** September 06, 2011 21:00:00 GMT**Last Update:** September 12, 2011 15:00:36 GMT[Resources / Information](#)[Frequently Asked Questions \(FAQ\)](#)

Powered by PDC's DisasterAWARE

Change Picture



PACIFIC
DISASTER
CENTER

WWW.PDC.ORG

DISASTER ALERT
MOBILE APP



IPHONE/IPAD
ANDROID

Wall

Hidden Posts

Info

Tools

News

Photos

Notes

Links

EDIT

About

Edit

Fostering disaster-resilient
communities through information,
science, tech...

More

Pacific Disaster Center

Non-Profit Organization · Kihei, Hawaii · Edit Info



Wall

Pacific Disaster Center · Everyone (Top Posts) ▾

Share: Status Photo Link Video Question

Write something...



Pacific Disaster Center

[ADV] UPDATE #5, Tropical Depression - Eighteen, NW Pacific Ocean, Winds 30 kt, Gusts 40 kt, reported by JTWC. <http://t.co/UyvzD2o>

8 hours ago via Selective Tweets · Like · Comment · Share



Pacific Disaster Center

[WATCH] UPDATE #24, Tropical Storm - Maria, Atlantic Ocean, Winds 45 kt, Gusts 55 kt, reported by NWS. <http://t.co/qvyPfdp>

8 hours ago via Selective Tweets · Like · Comment · Share



Rebecca Devereaux This is a really cool app I have on my phone
and wanted to share it with you> You can see things being tracked
all over the globe with daily updates

4 hours ago · Like

Write a comment...



Pacific Disaster Center

[ADV] UPDATE #4, Tropical Depression - Eighteen, NW Pacific Ocean, Winds 30 kt, Gusts 40 kt, reported by JTWC. <http://t.co/IU4q5y9>

11 hours ago via Selective Tweets · Like · Comment · Share



Pacific Disaster Center

[WATCH] UPDATE #23, Tropical Storm - Maria, Atlantic Ocean, Winds 50 kt, Gusts 60 kt, reported by NWS. <http://t.co/8OfKHns>

11 hours ago via Selective Tweets · Like · Comment · Share



Pacific Disaster Center

[WATCH] UPDATE #22, Tropical Storm - Maria, Atlantic Ocean, Winds 50 kt, Gusts 60 kt, reported by NWS. <http://t.co/wXTUkoq>

17 hours ago via Selective Tweets · Like · Comment · Share

Edit Page

Admins (6) [?]

See All



Use Facebook as Pacific Disaster Center

Notifications 64 ▾

Promote with an Ad

View Insights

Invite Friends

Quick Tips

Get more people to like your Page with
Facebook Ads today!

Sample Ad: Pacific Disaster Center



The text of your ad will
go here.

Like · Chris Chiesa likes this.

Get More Likes

Sponsored

Create an Ad

Hilo Free Event Sept. 28

anthonymorrisonregistration.com

Free Educational Seminar
Sept. 28th in Hilo. Learn
to make money using
simple methods online
today. No technical
experience needed!

Disaster Relief Work

degreeamerica.com

Get an Accredited Degree
in Emergency
Management. Find
Programs and Apply
today.

Social Media “Community”



Pacific Disaster Center

[INFO] NEW TSUNAMI, Hawaiian Islands; Off East Coast Of Honshu Japan - 6.6, reported by PTWC. <http://t.co/Dmb3PYAp>

PDC-generated “alert”



Pacific Disaster Center

[WATCH] UPDATE #21, Tropical Storm - Roke, NW Pacific Ocean, Winds 40 kt, Gusts 50 kt, reported by JTWC. <http://t.co/EvW0NggY>

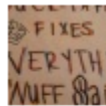
User Feedback



Leo Gonzalez

Post more info on 4.5 quake in Virginia in the last hour...aswell as 7.0 in northern peru today thnx..

User-generated “alerts”



David Lowe

Help

“Help...”



Pacific Disaster Center

[WATCH] NEW , Tropical Storm - Calvin, NW Pacific Ocean, Winds 55 kt, Gusts 70 kt, reported by JTWC. <http://cp.pdc.org/x/9v6>

3,199 Impressions · 0.03% Feedback

Like · Comment · July 9 at 3:16pm via Selective Tweets

Melchor Y. Go likes this.

Write a comment...

“Global” community

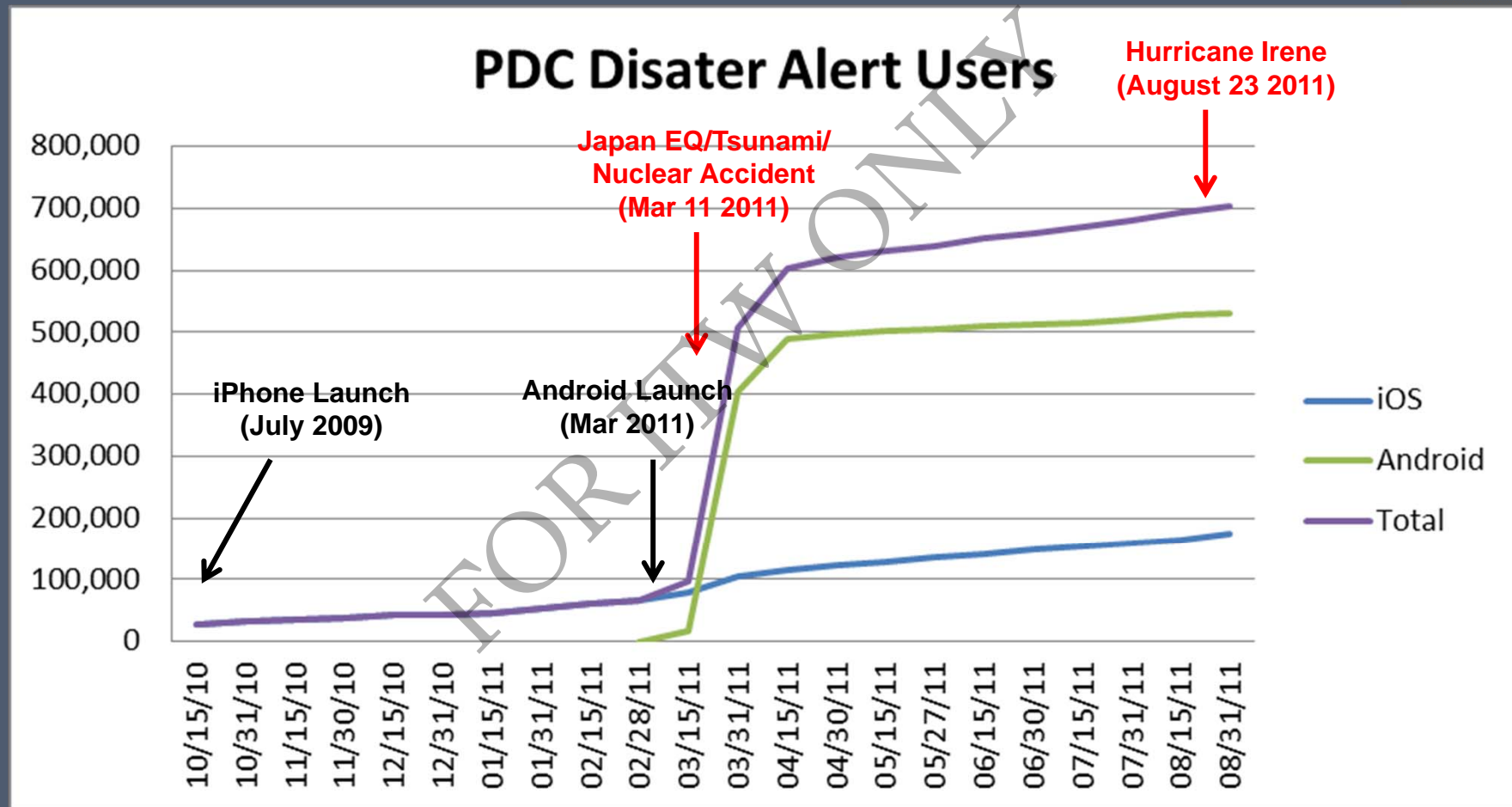


Isidoro Méndez Gloria

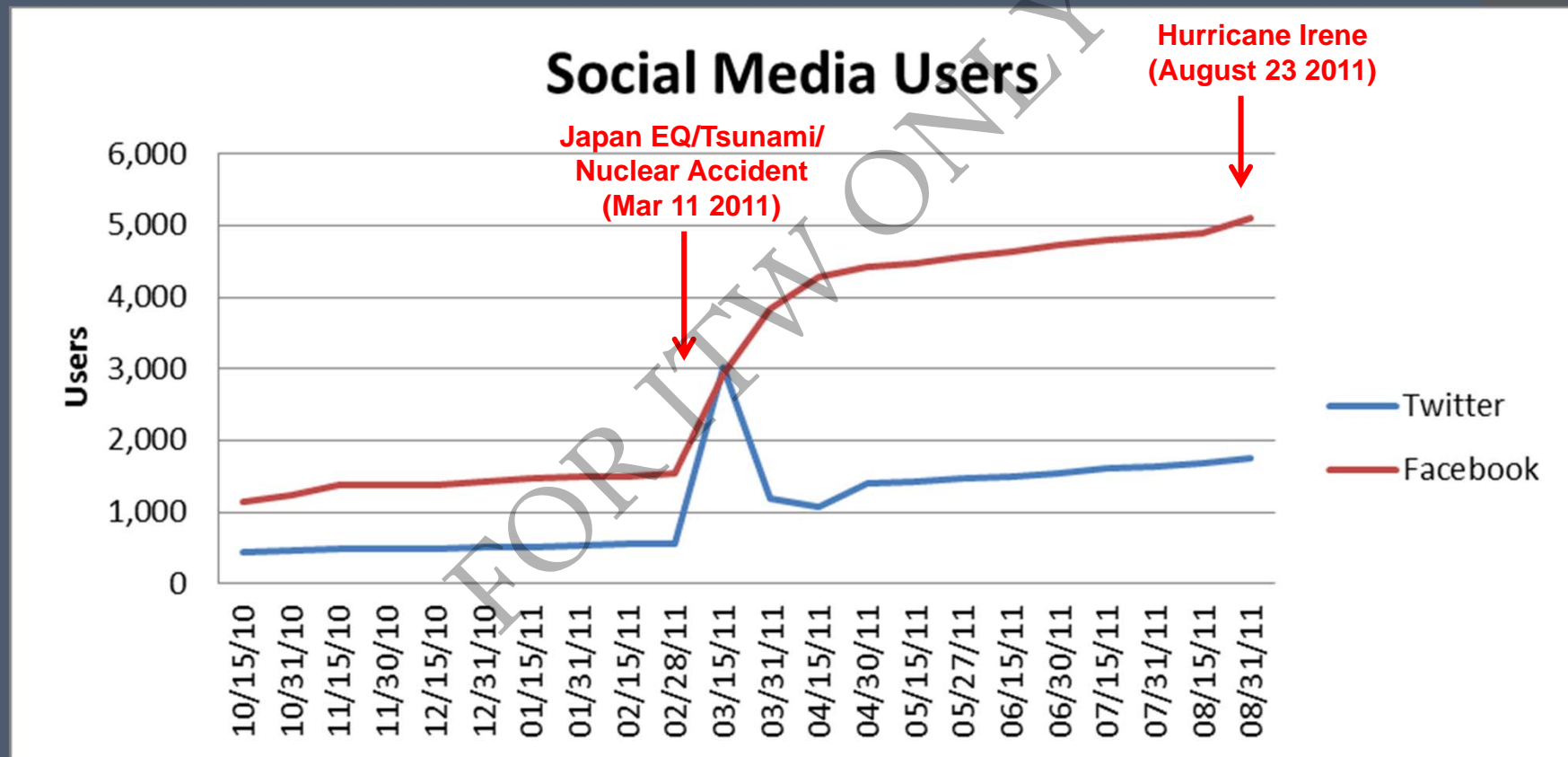
Se fue Calvin y no nos dejo nada!!

Like · Comment · July 9 at 3:11pm

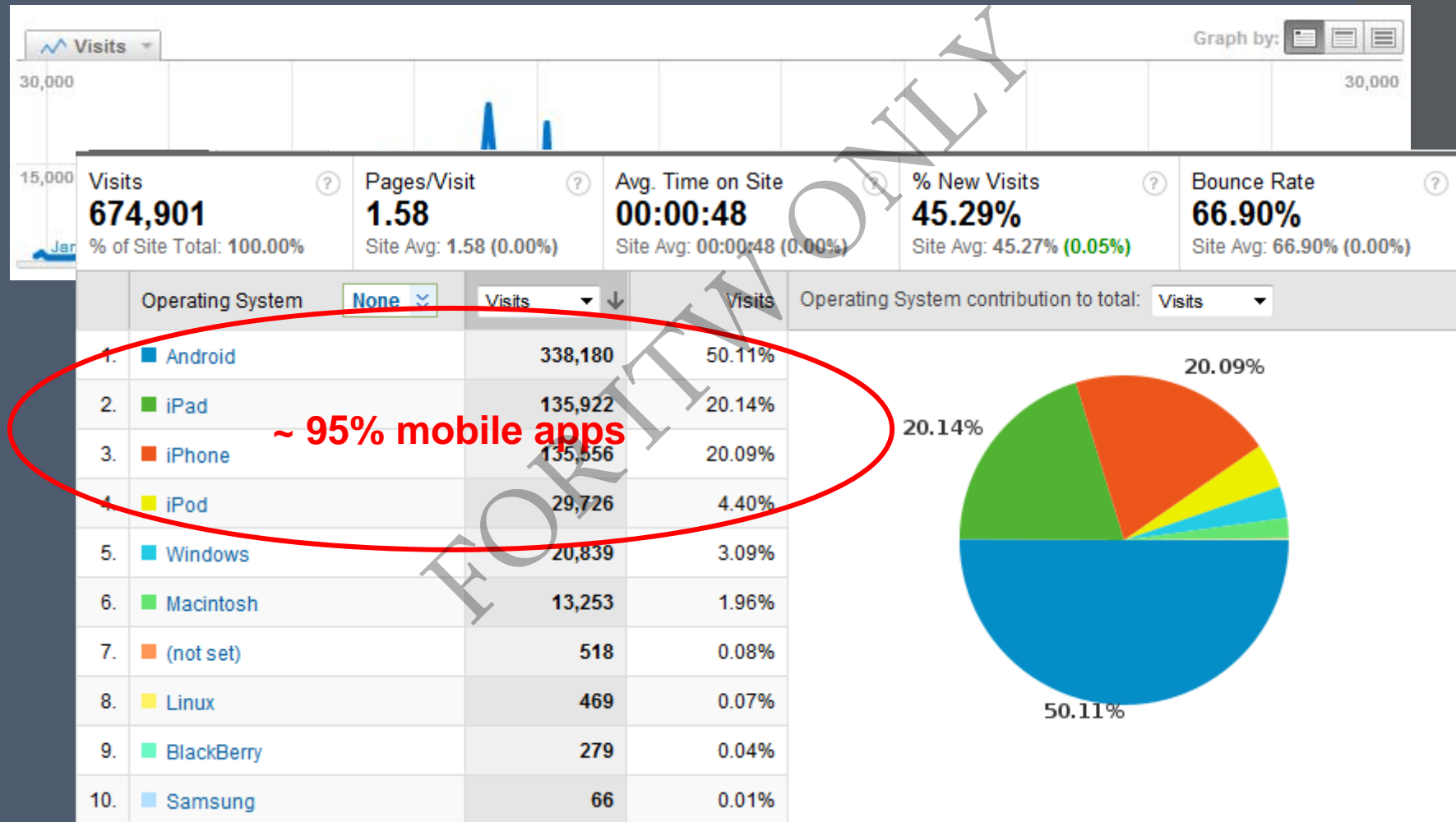
Disaster Alert Users (>1M)



Facebook & Twitter Users



PDC Hazard Warning Summary Access (1/1/11 thru 9/11/11)



Hazard Modeling & Risk and Vulnerability Assessment

Hazard Modeling Capabilities

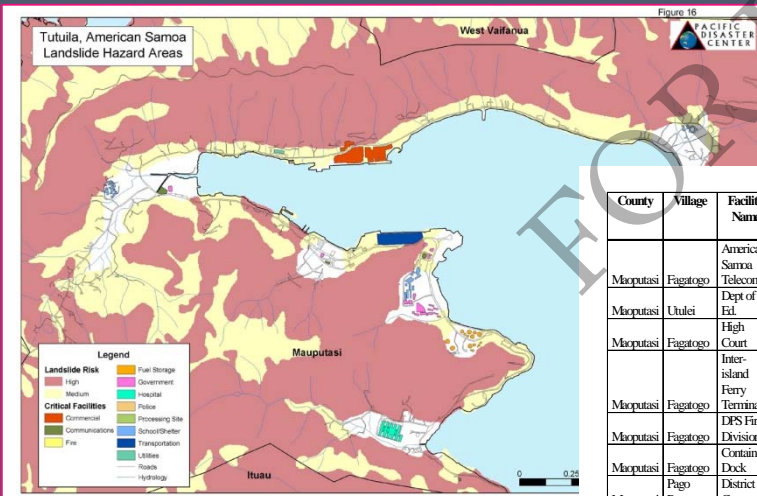
- Floods / Dam Failures
 - “MIKE 11/21” (DHI, inc.)
- Hurricanes
 - “CATS” (DTRA)
 - “TAOS” (KA Corp)
- Earthquakes
 - “ShakeMap” (USGS)
 - “HAZUS-MH” (DHS/FEMA)
- Tsunamis
 - “TTT” (NOAA)
- Plume Modeling
 - “HPAC” (DTRA)



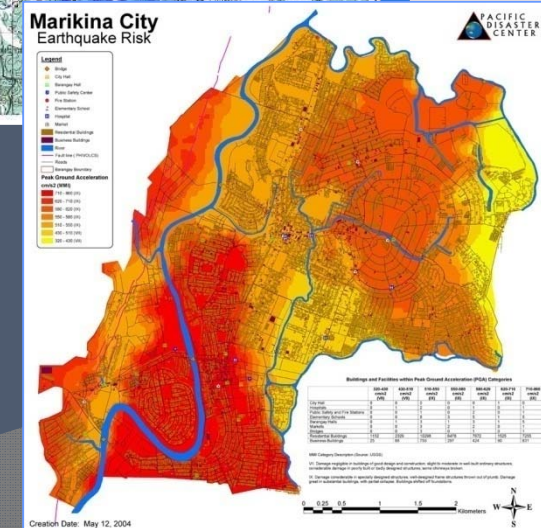
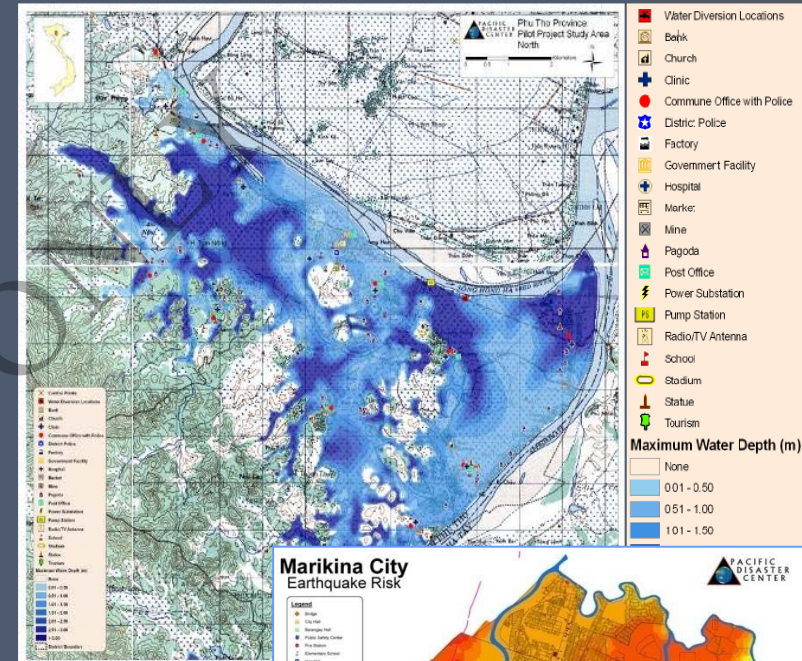
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Risk Assessment and Mitigation

- **American Samoa – Multi-Hazard Assessment and Mitigation Plan**
- **Marikina City (Manila) – Flood and Seismic Risk Assessment**
- **Phu Tho Province (Vietnam) – Flood Risk Assessment and Early Warning**



County	Village	Facility Name	Number of Buildings	Function	Earthquake	Flood	Landslide	Storm Surge / Tsunami
Mauputasi	Fagatogo	American Samoa Telecom	1	Communications	Medium	Low	Low	High
Mauputasi	Utulei	Dept of Ed.	1	Government	Medium	Low	Medium	High
Mauputasi	Fagatogo	High Court	1	Government	Medium	Low	Low	High
Mauputasi	Fagatogo	Inter-island Ferry Terminal	1	Transportation	Medium	Low	Medium	High
Mauputasi	Fagatogo	DFS Fire Division	2	Fire	Medium	Low	Medium	High
Mauputasi	Fagatogo	Container Dock	1	Transportation	Medium	Low	High	High
Mauputasi	Pago	District Court	1	Government	Medium	Low	Low	High
Mauputasi	Satula	Star Kist Samoa Co.	2	Commercial	Medium	Medium	Medium	High



Global RVA Components

Multi-Hazard Exposure

- Raw Exposure
 - Pop
 - GDP
- Relative Exposure
 - Pop
 - GDP

Vulnerability

- Health Status
- Access to Clean Water
- Access to Info
- Economic Constraints
- Marginalization
- Population Pressures
- Environmental Stress
- Recent Impacts
- Displaced Populations

Coping Capacity

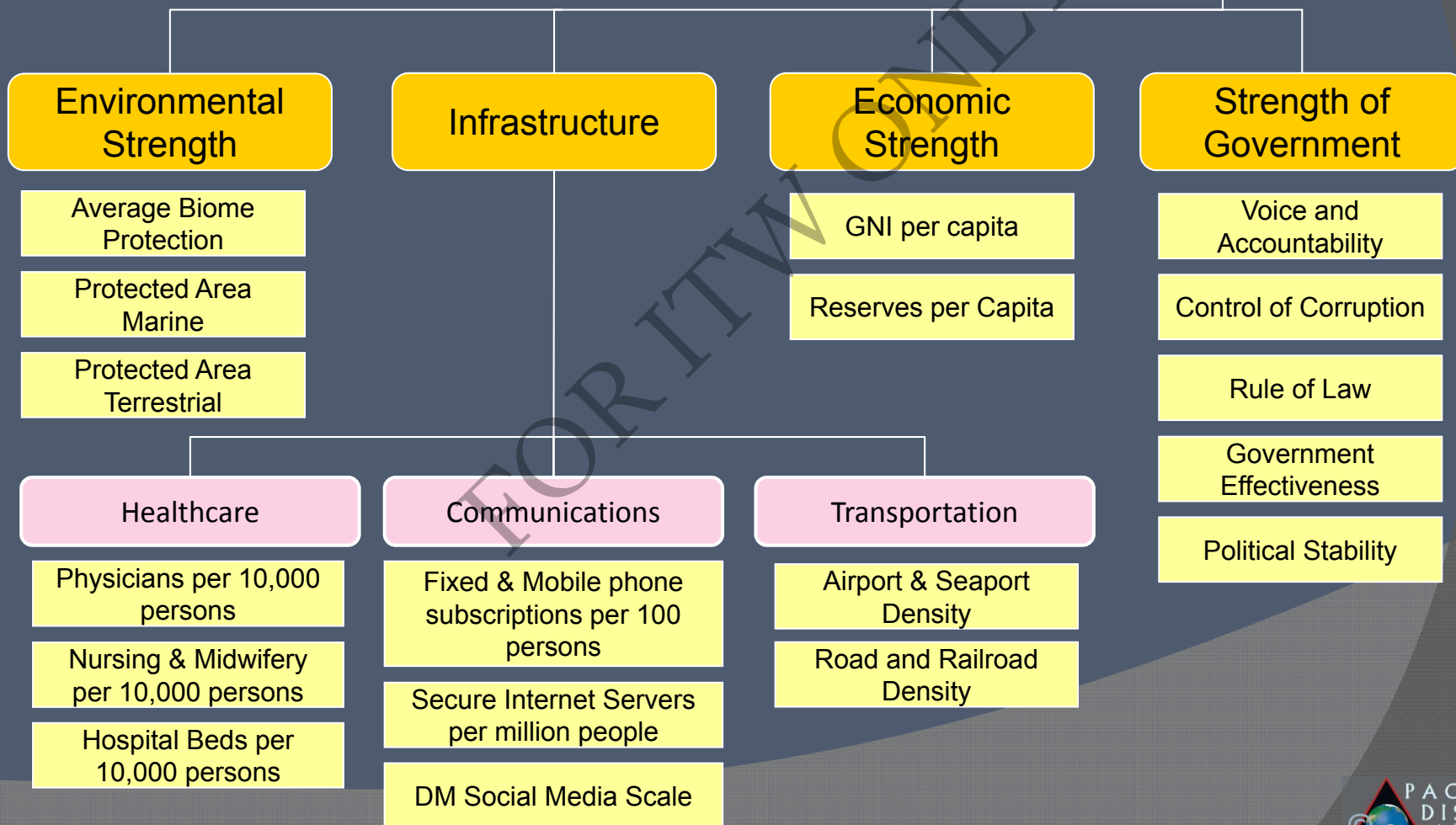
- Governance
- Economic Strength
- Infrastructure
 - Comms
 - Transport
 - Healthcare
- Environmental Strength

Global RVA Index Approach

MH Exposure

Vulnerability

Coping Capacity



Risk Component Index:
Coping Capacity

Sub-Index:
Infrastructure

Sub-Index: Health
Care Capacity

Indicator: Hospital
Beds per 10000

Partnerships

FOR ITW ONLY

PDC's Reach

Over 15,000 visits from 114 countries / territories
(typical monthly access results)

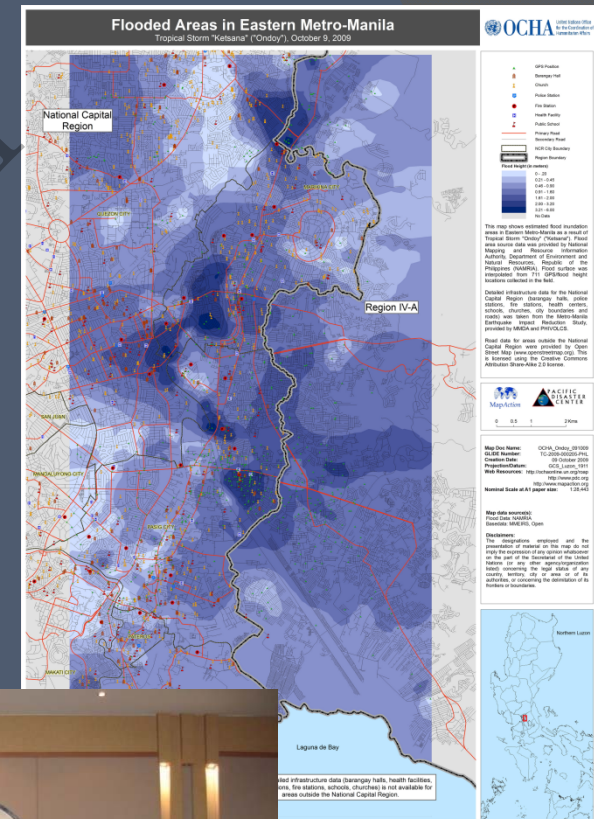


Countries to which PDC provides direct support (Red).
Countries that sought PDC resources (Blue)

International Networks

Capacity Building and Disaster Response Information Support

- ◎ Asia-Pacific Economic Cooperation (APEC)
 - Emergency Preparedness Working Group (EPWG)
 - Hazard Mapping and RVA Workshop
- ◎ Association of Southeast Asian Nations (ASEAN)
 - Committee on Disaster Management (ACDM)
 - ASEAN Humanitarian Assistant Coordinating (AHA) Centre ICT Gap Analysis
 - ASEAN AHA Centre Disaster Monitoring and Response System (DMRS)
- ◎ United Nations
 - UNDP, UN OCHA, UNESCAP
 - SPIDER
- ◎ I/NGO's
 - IFRC
 - Mercy Corps, Humanity Road, etc.



Capacity Development with National DM Partners

Disaster Management Skills and Decision Support Applications

● Vietnam

- National Disaster Risk Management Program
 - DM Education and Training Program
 - Damage and Needs Assessment
- National Disaster Management Center
 - Flood modeling and early warning



● Thailand

- National Disaster Warning Center
 - Tsunami early warning
 - Flood early warning (proposed)



● Indonesia

- National Agency for Disaster Management (BNPB)
 - Disaster early warning

International Partnership Testimonies

- ❑ **Taiwan – National Center for Disaster Reduction – Typhoon Morakot**
“... During ... Typhoon Morakot, instant assistance provided by PDC does [mal] help us during the most difficult time. Partnership between PDC and NCDR is the best practice of international cooperation and collaboration ...”
Wei-Sen Li, Deputy Director, NCDR
- ❑ **UN OCHA - Major event support: Typhoon Nargis**
“... thank you for PDC's support during the early stages of the Myanmar cyclone response. ... [Support provided by our] PDC colleagues was highly valued by all.”
Terje Skavdal, Head, UNOCHA, Regional Office for Asia and the Pacific
- ❑ **Thailand - National Disaster Warning Center (NDWC)**
“ ... PDC was the first organization to provide experts and assistance to help Thailand set up its early warning system [following the tsunami] ... I would like to again extend my grateful appreciation to PDC”
Vice Minister, Dr. Smith Dharmasaroja, Thailand
- ❑ **Cambodia – ASEAN Ministerial Meeting on Disaster Management**
“ ... ASEAN Countries will further exert [their] outmost efforts in managing and reducing regional disasters ... I would like to thank ... Pacific Disaster Center [and others] ... who have provided technical support”
Prime Minister of Cambodia, H.E. Samdech Hun Sen
- ❑ **Pakistan – Earthquake Support**
“ ... It was really heart warming to see the excellent work of the PDC ... May I add that all such works, in the interest of overall humanity, be widely distributed and global as well as regional responses be sought.”
Prime Minister's Secretariat, ERRA, Islamabad, Pakistan, MAJ M. Hussain
- ❑ **Sri Lanka – NGO: Mercy Corp**
“Your imagery will have a profound impact on return to normalcy for people in this district.”
Mercy Corp GIS Coordinator in Sri Lanka, Glenn Brooks
- ❑ **Philippines – National Disaster Coordinating Council (NDCC)**
“... please allow me to extend our heartfelt thanks and appreciation to the PDC for supporting the initiatives and projects of the Council to make it more relevant and attuned to global trends in addressing the concerns of disaster management at the national, regional and global settings... to take a more proactive and scientific approach to disaster management ...”
Administrator and Executive Officer, NDCC, Philippines, COL Elma C. Aldea

Chris Chiesa
cchiesa@pdc.org



PACIFIC
DISASTER
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Fostering Disaster-Resilient Communities

For more Information:
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