

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



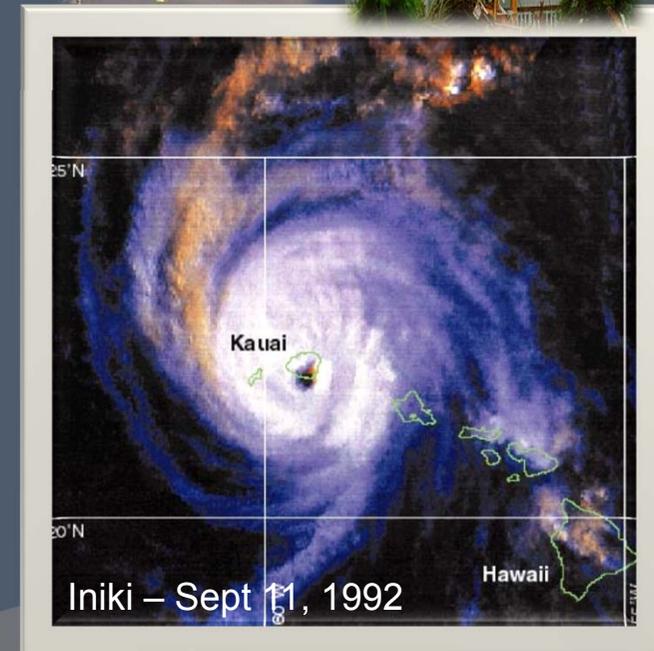
Fostering Disaster-Resilient Communities ...

(c) Copyright 2012 PDC

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**

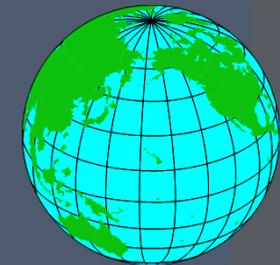
- Sustainable communities, safer nations, and a more secure world through Disaster Risk Reducing

◎ Goal: **Disaster Resiliency**

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

◎ Mission: **Reduce Disaster Risks**

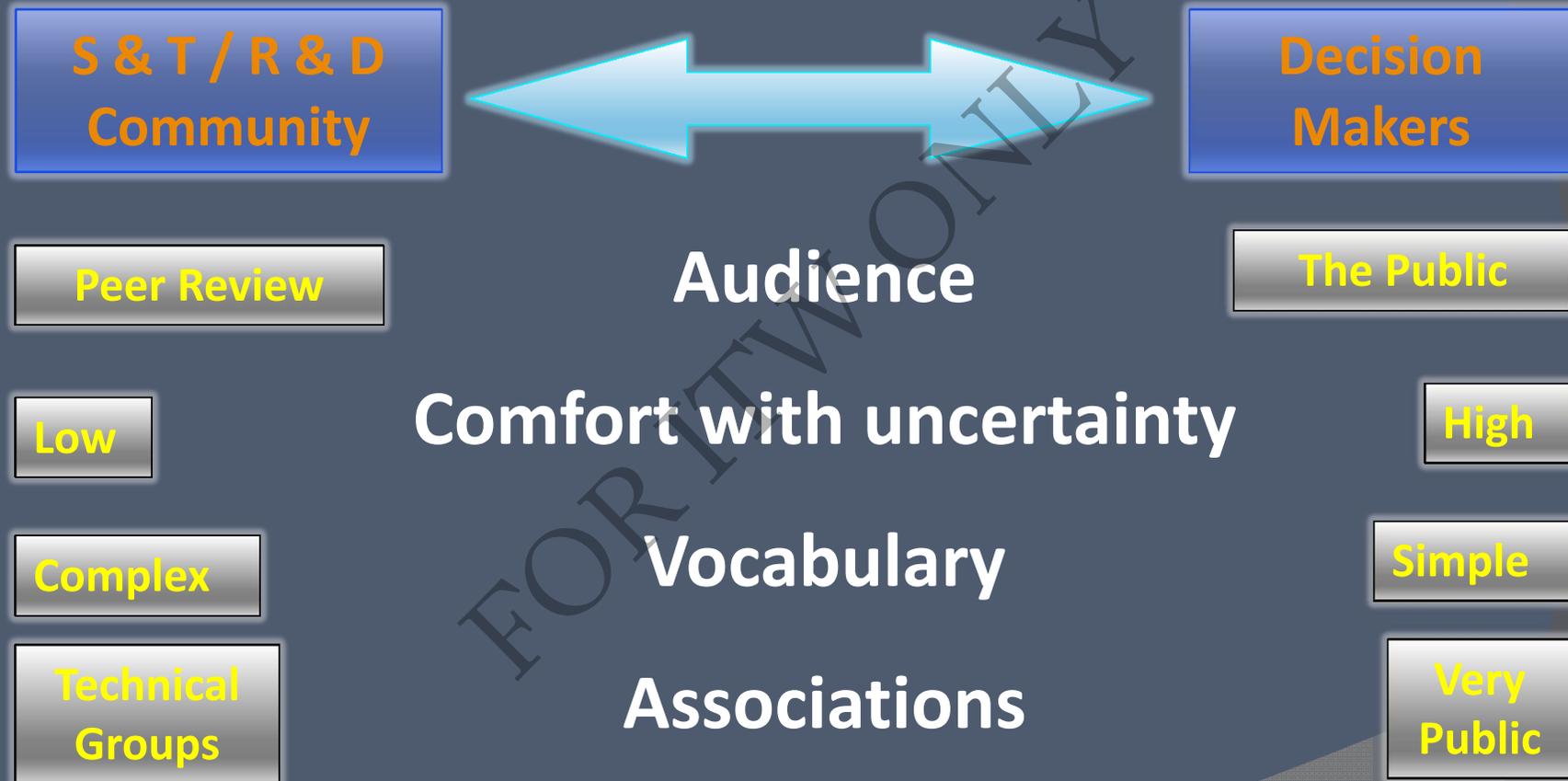
- Provide applied information research and evidence-base analysis supporting development of more effective disaster risk reduction (**DRR**) policies and practices; and applications and information products supporting Humanitarian Assistance and Disaster Relief (**HA/DR**) operators and practitioners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

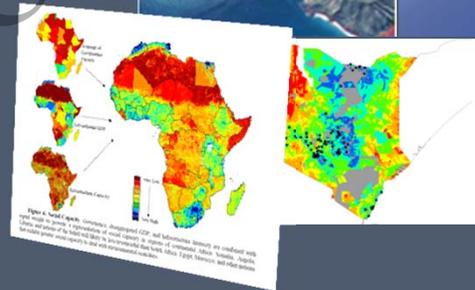
- Applied Science & Technology
- Capability Building
- Evidence-Based Information Products
 - Policy & Decision Makers
 - Disaster Managers
 - Planners
 - Humanitarian Assist. Missions



Observation Systems, Data Collection



GIS, Visualization and Display Systems



Advanced Applications, Models, Risk & Vulnerability Assessment



Improve Decision-Support Capabilities



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

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

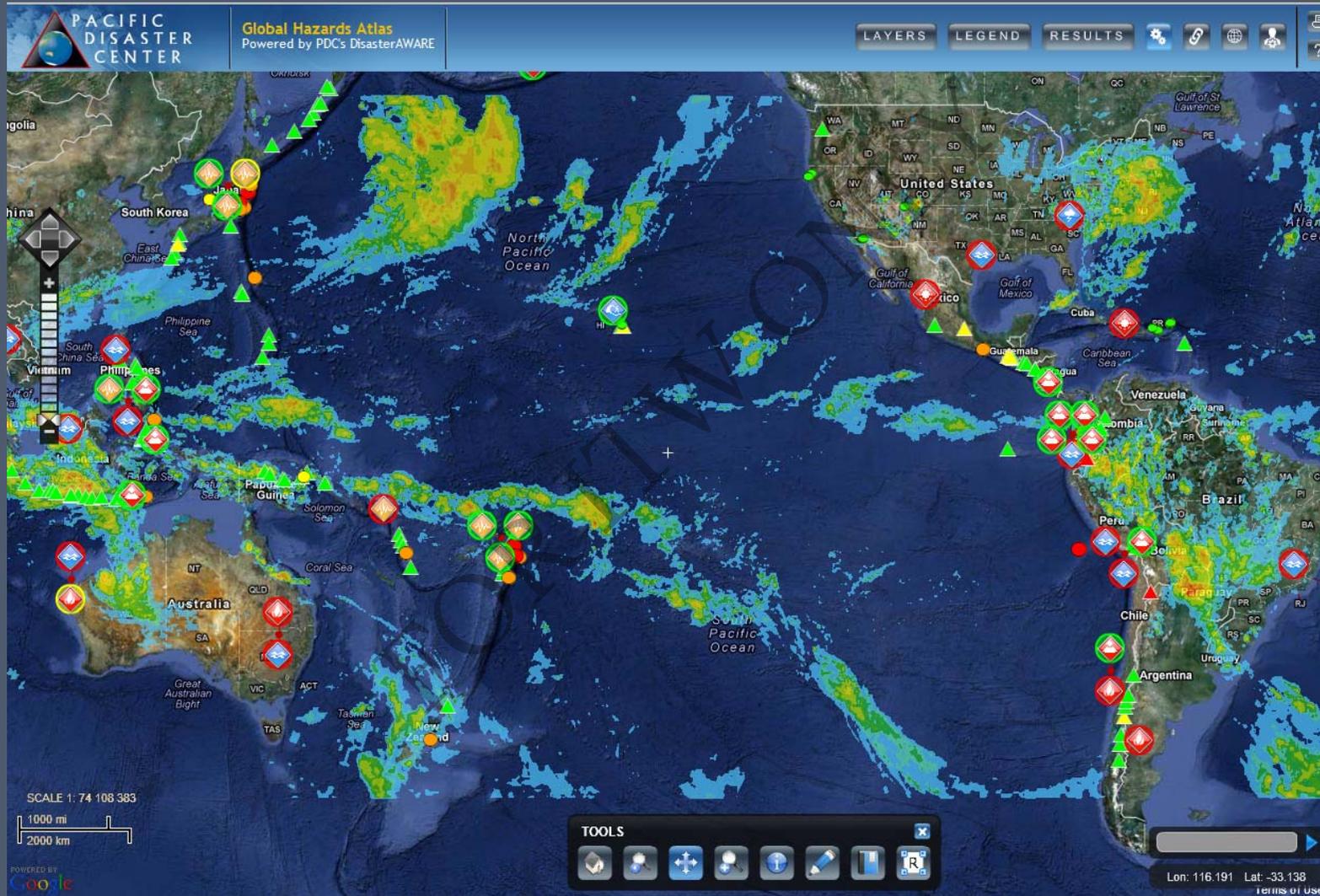
FOR ITW ONLY

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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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).

Social Media and Mobile Applications



PACIFIC DISASTER CENTER WWW.PDC.ORG

FREE

DISASTER ALERT 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. [#fb](http://cp.pdc.org/x/ahx)

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. [#fb](http://cp.pdc.org/x/ahw)

8 hours ago



disasteraware DisasterAWARE

[ADV] UPDATE #4, Tropical Depression - Eighteen, NW Pacific Ocean, Winds 30 kt, Gusts 40 kt, reported by JTWC. [#fb](http://cp.pdc.org/x/ahu)

14 hours ago



disasteraware DisasterAWARE

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

14 hours ago



PDC Hazard Information

Tropical Storm - Maria

REGIONAL REPORT

OVERVIEW

CYCLONE 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

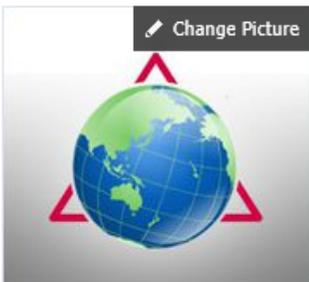
Last Update: September 12, 2011 15:00:36 GMT

Resources / Information

Frequently Asked Questions (FAQ)



Powered by PDC's DisasterAWARE



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

Edit Page



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/U4q5y9>
 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

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

degreaamerica.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”



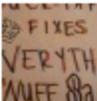
Pacific Disaster Center
[WATCH] UPDATE #21, Tropical Storm - Roke, NW Pacific Ocean, Winds 40 kt, Gusts 50 kt, reported by JTWC. <http://t.co/EvW0NggY>

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

“Global” community

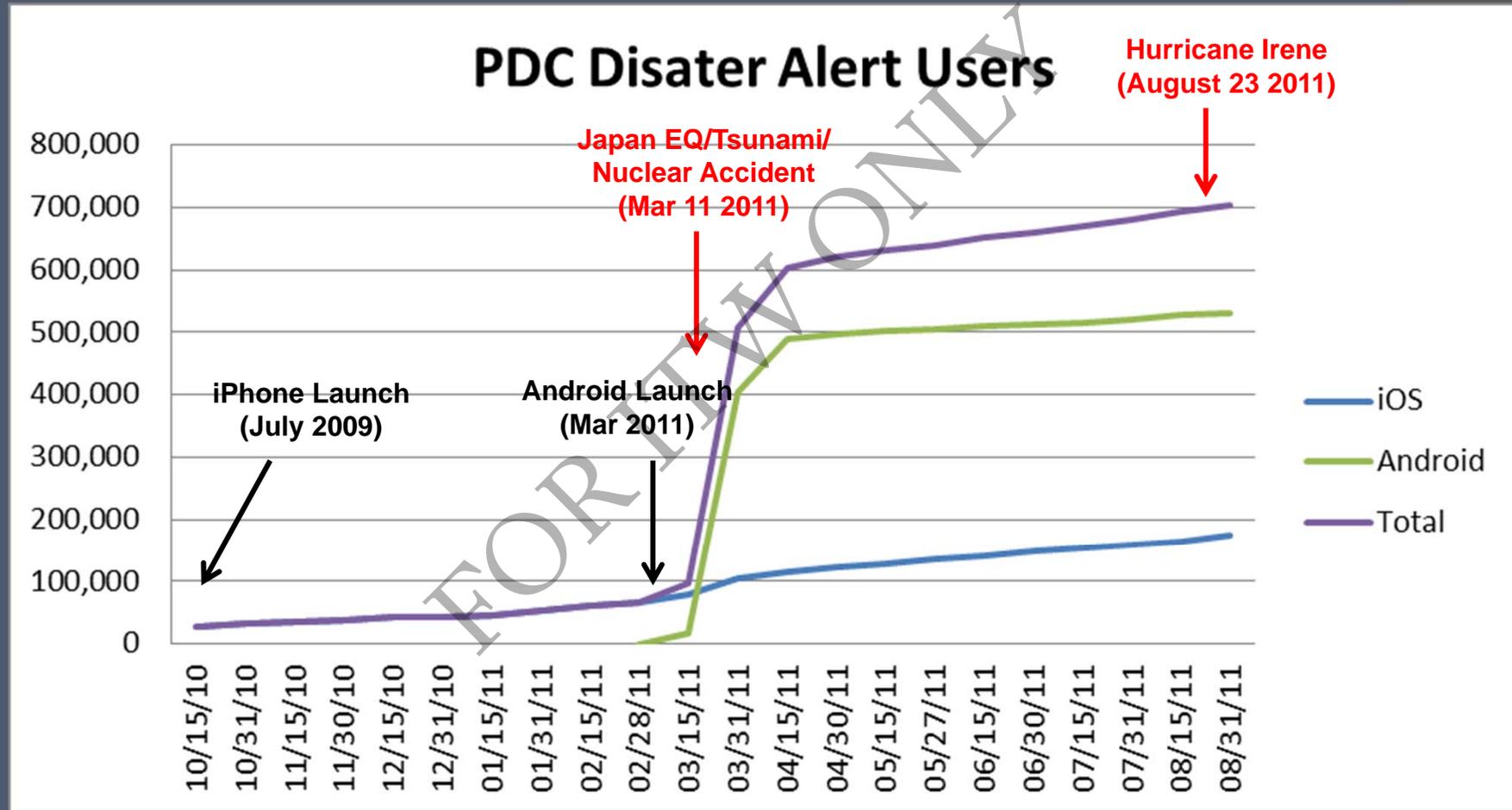
Melchor Y. Go likes this.

Write a comment...

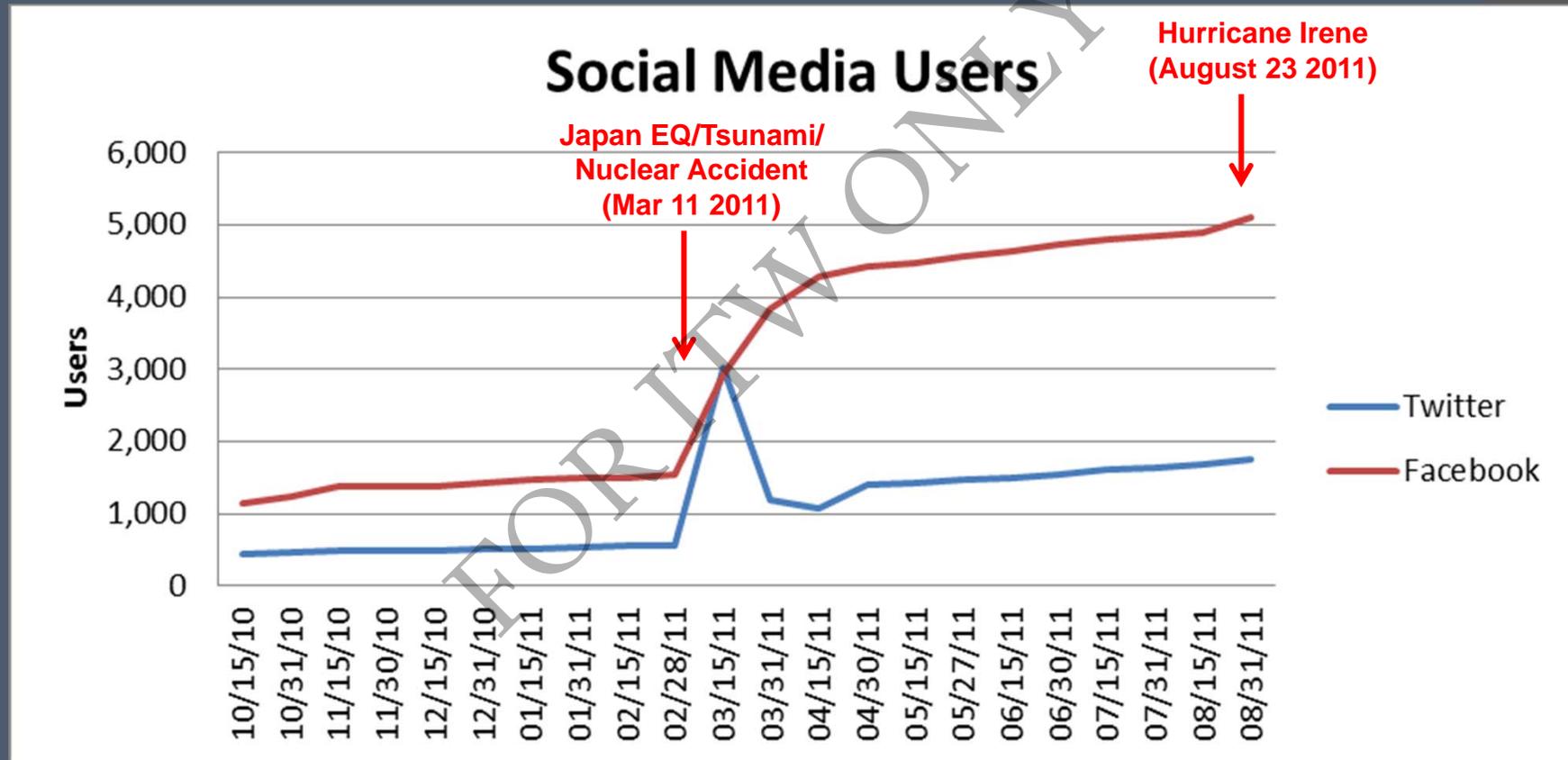


Isidoro Méndez Gloria
Se fue Calvin y no nos dejo nada!!
Like · Comment · July 9 at 3:11pm

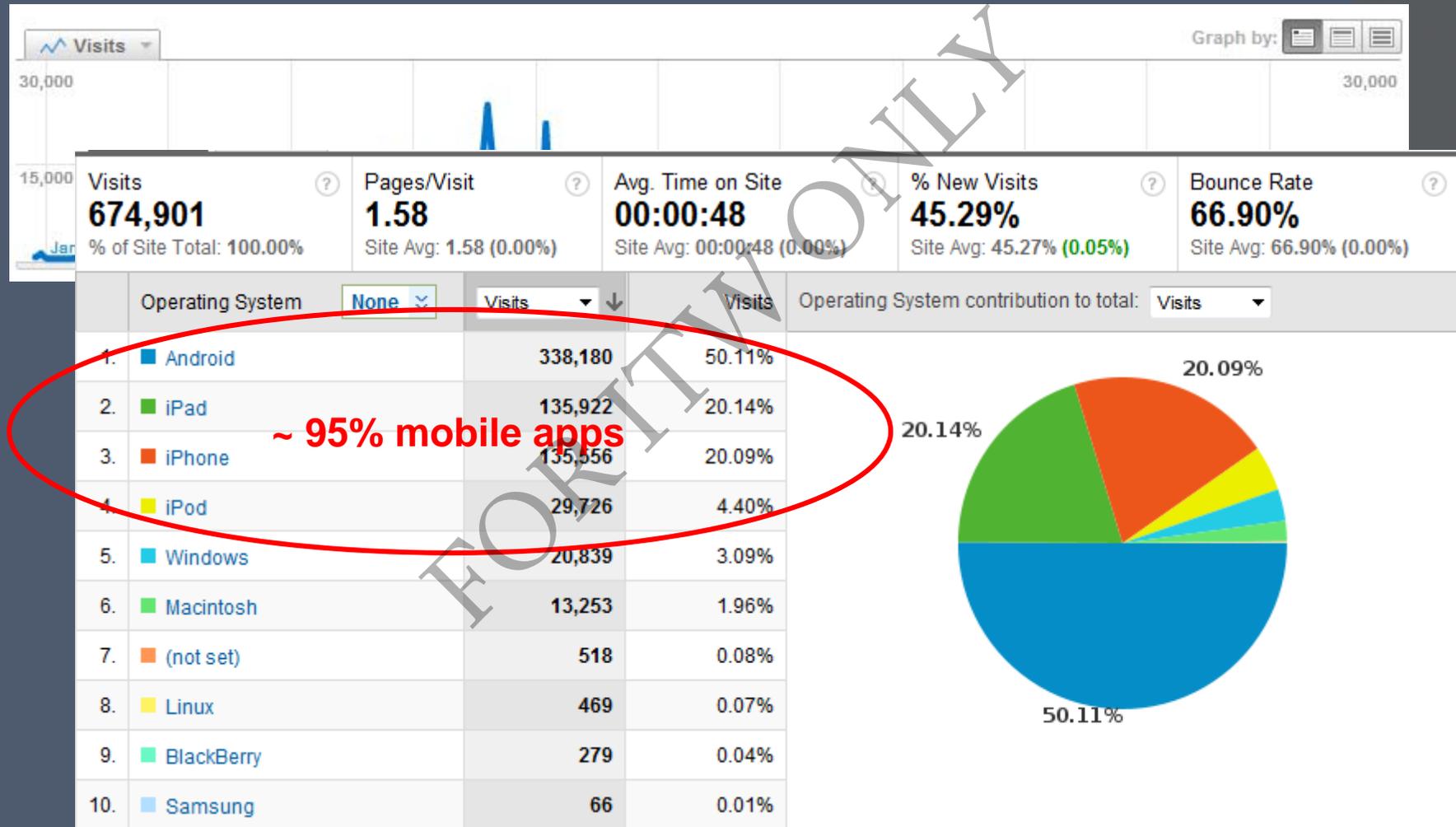
Disaster Alert Users (>1M)



Facebook & Twitter Users



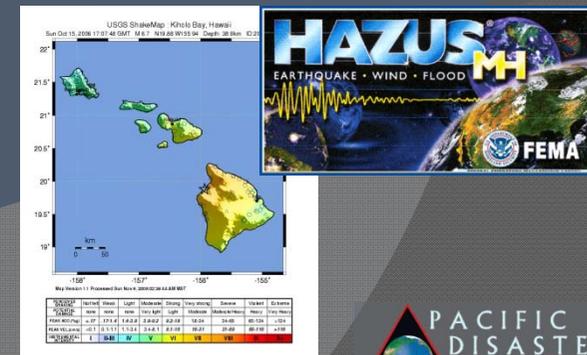
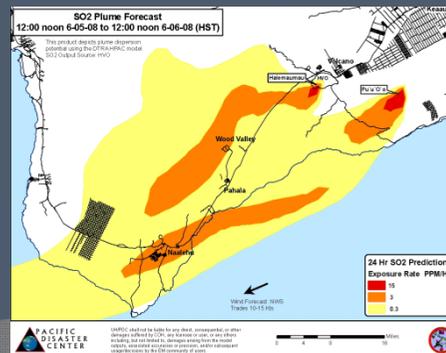
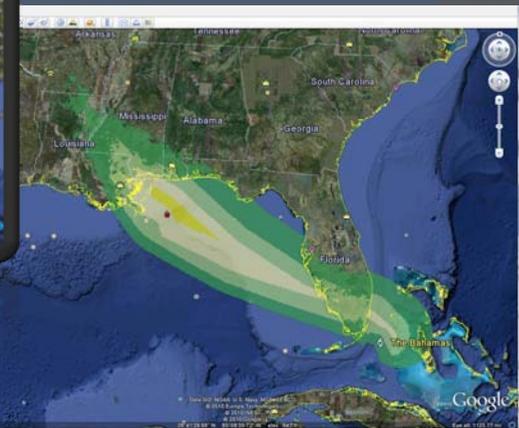
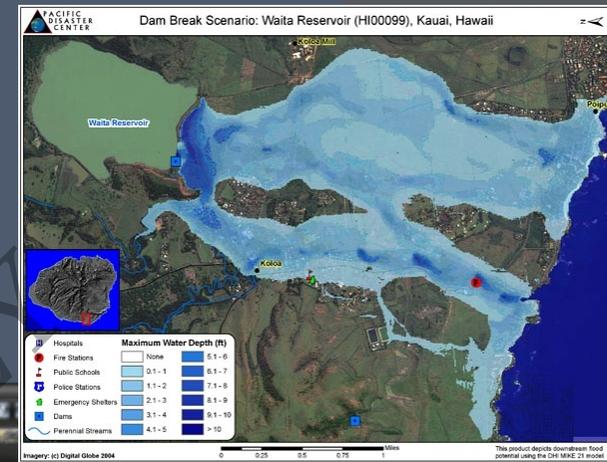
PDC Hazard Warning Summary Access (1/1/11 thru 9/11/11)



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)

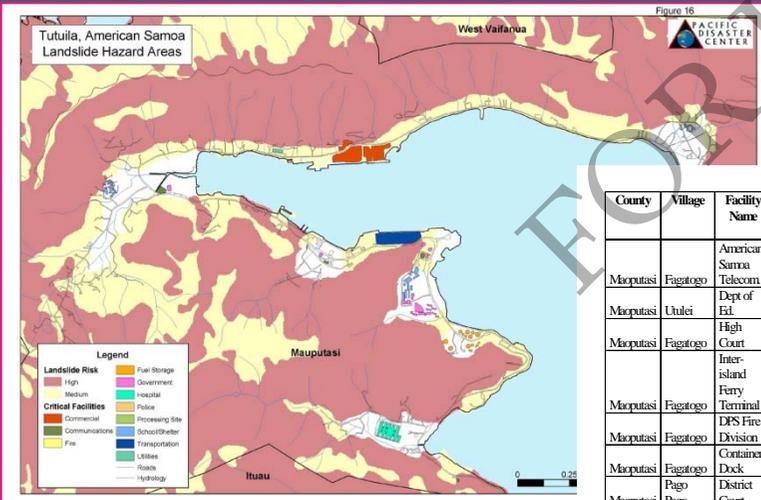
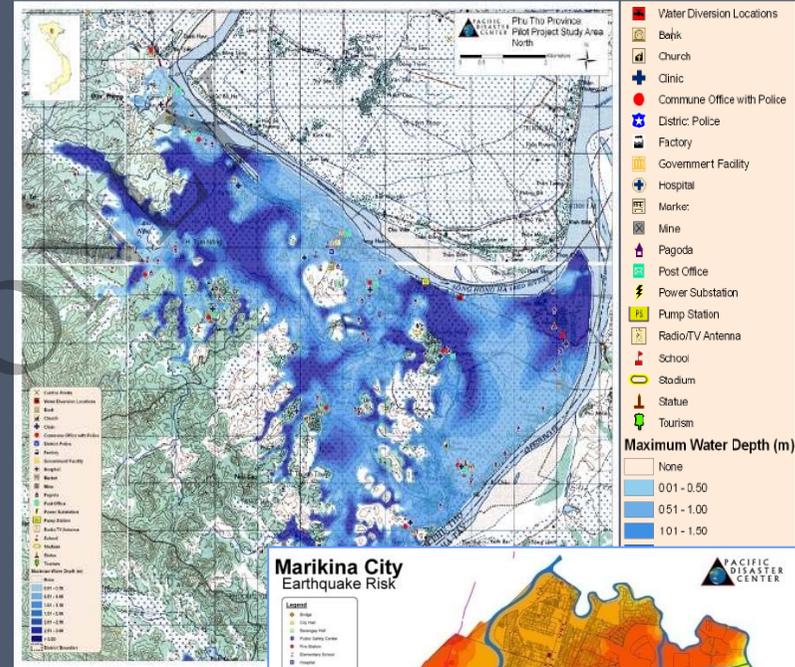


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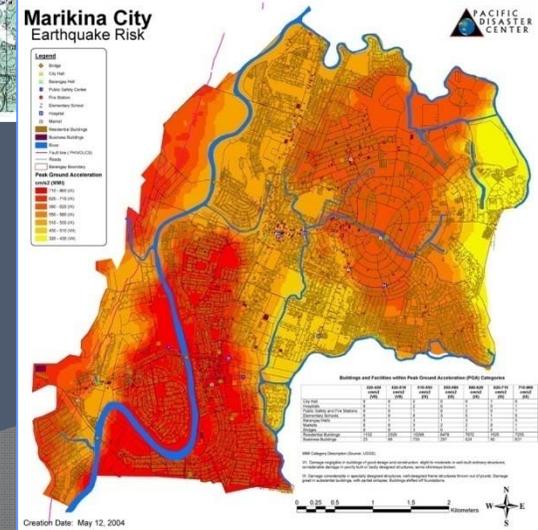


Risk Assessment and Mitigation

- 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
Maoputasi	Fagatogo	American Samoa Telecom	1	Communications	Medium	Low	Low	High
Maoputasi	Utulei	Dept of Ed.	1	Government	Medium	Low	Medium	High
Maoputasi	Fagatogo	High Court	1	Government	Medium	Low	Low	High
Maoputasi	Fagatogo	Inter-island Ferry Terminal	1	Transportation	Medium	Low	Medium	High
Maoputasi	Fagatogo	DPS Fire Division	2	Fire	Medium	Low	Medium	High
Maoputasi	Fagatogo	Container Dock	1	Transportation	Medium	Low	High	High
Maoputasi	Pago	District Court	1	Government	Medium	Low	Low	High
Maoputasi	Satala	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

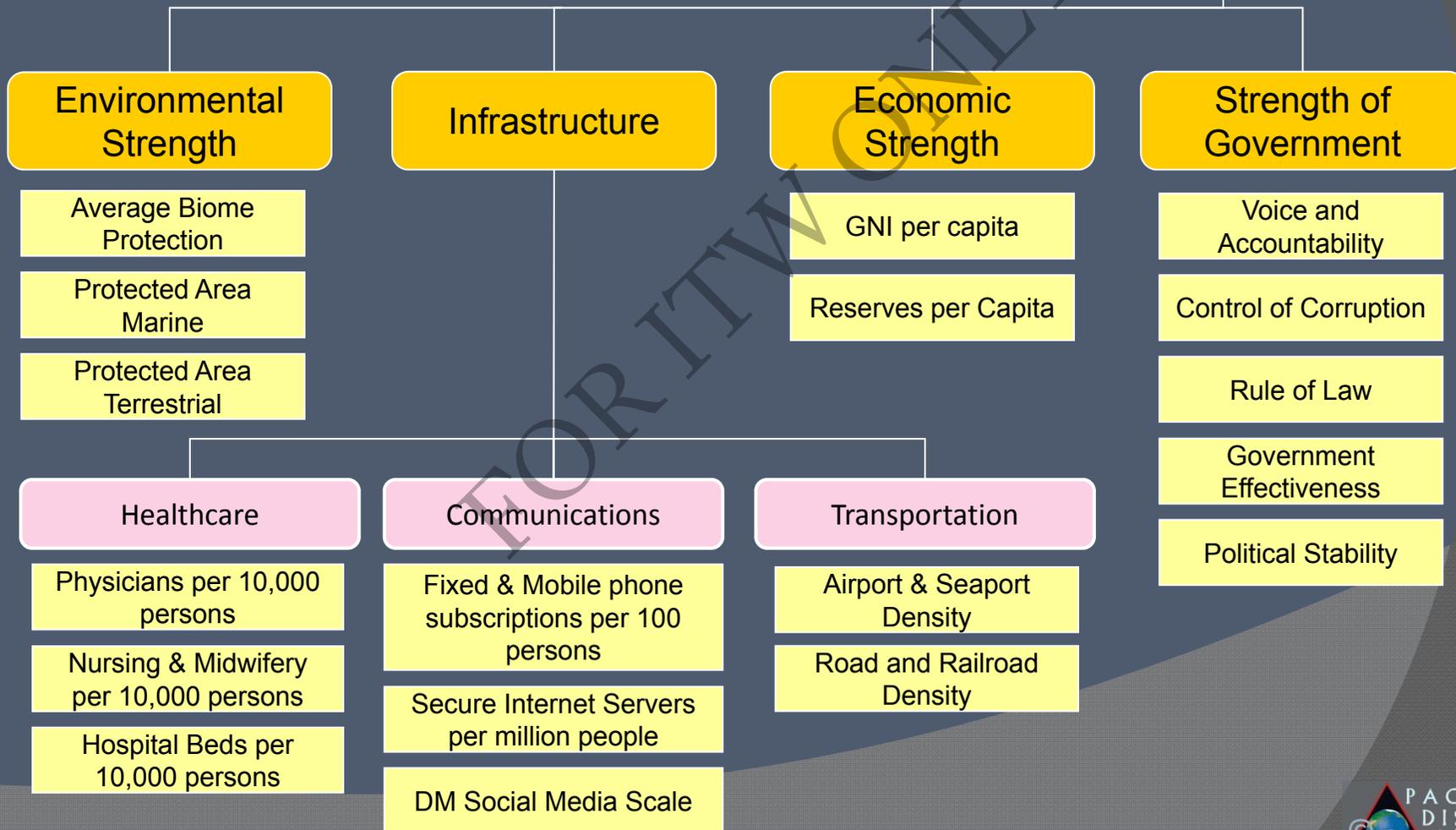
- Governance
- Economic Strength
- Infrastructure
 - Comms
 - Transport
 - Healthcare
- Environmental Strength

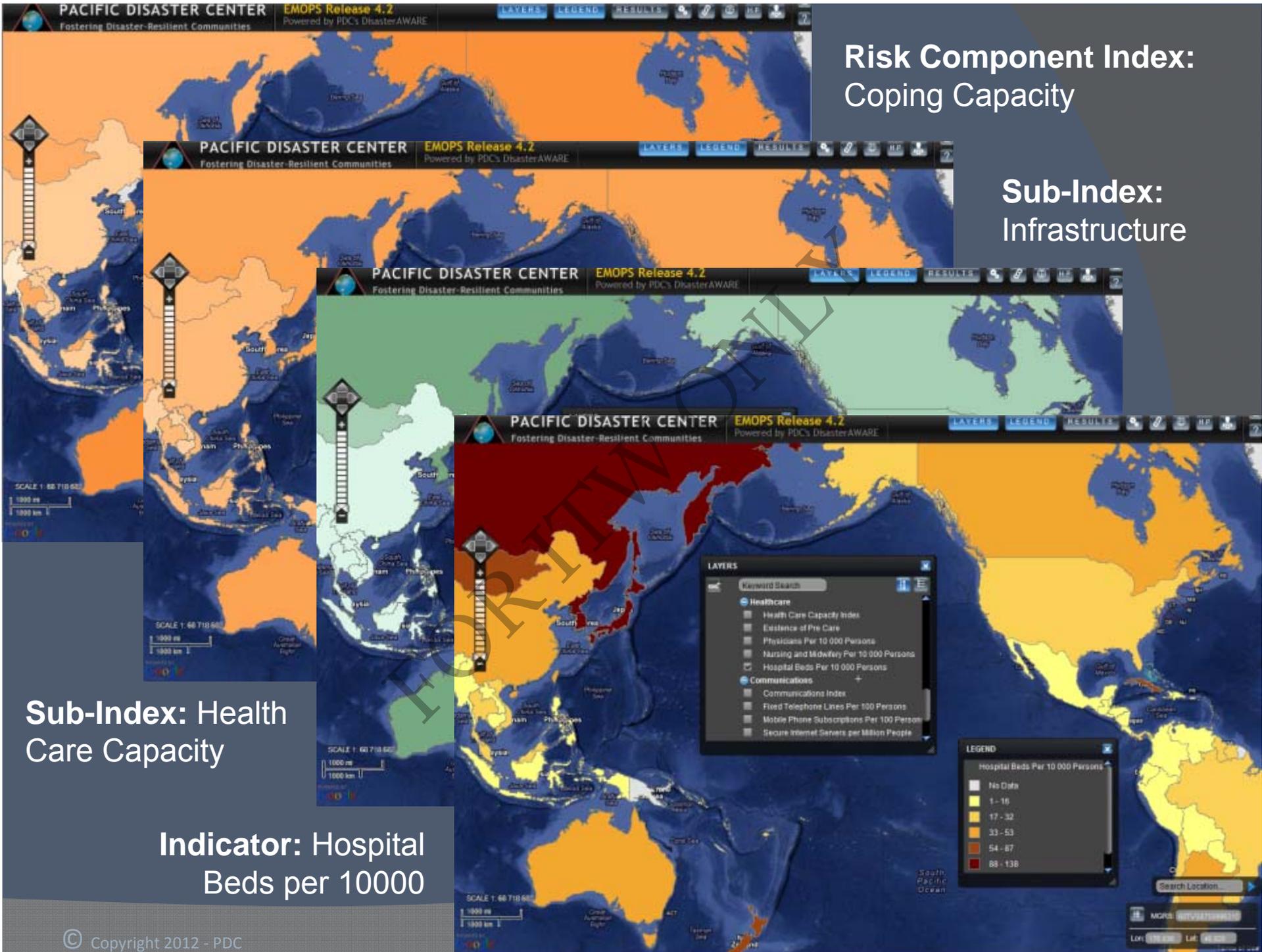
Global RVA Index Approach

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)

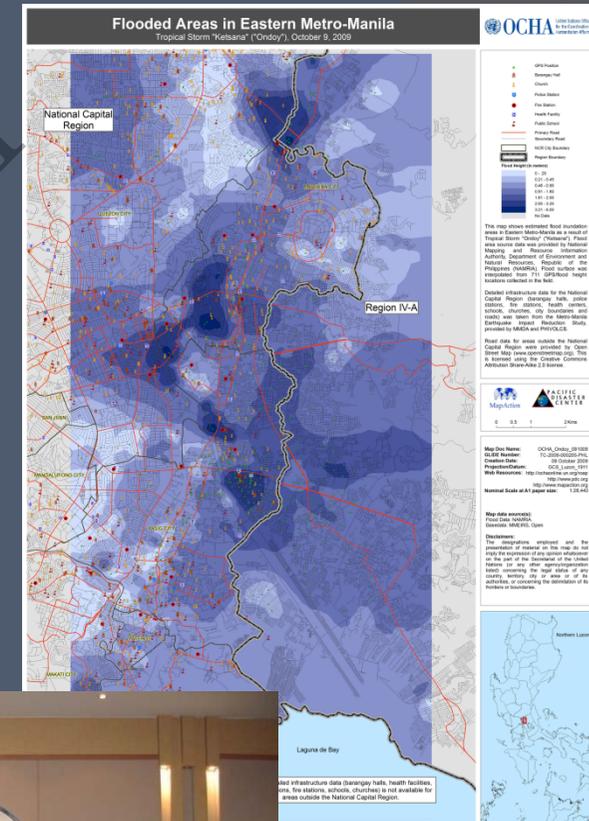


Countries to which PDC provides direct support (Red).
Countries that sought PDC resources (Blue)

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

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