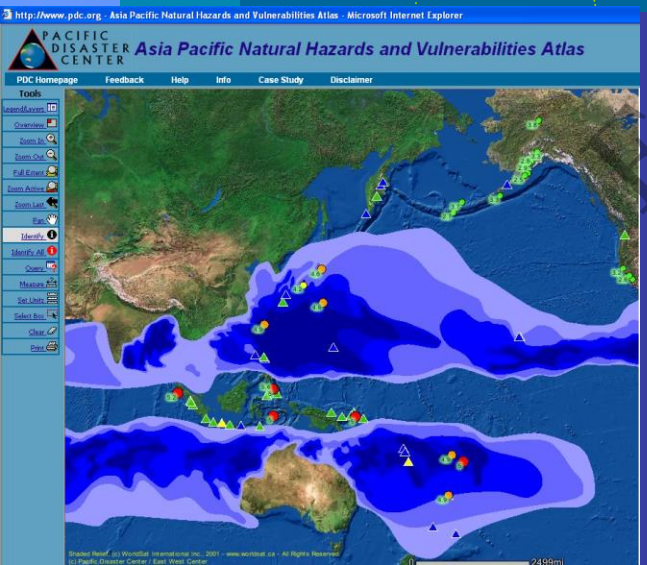
Fostering Disaster-Resilient Communities

Pacific Disaster Center: Challenges and Solutions for Risk Assessment and Disaster Early Warning



Mr. Chris Chiesa
Chief Information Officer
Pacific Disaster Center

cchiesa@pdc.org

Presentation Outline

- Overview of Pacific Disaster Center
- Disaster Management Challenges
- PDC Solutions and Operational Capabilities
  - Risk and Vulnerability Assessment
  - Disaster Early Warning
- Data Sharing via APNHIN

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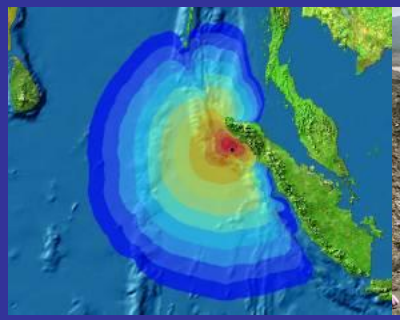
PDC Mission …

Provide applied information research and analysis support for the development of more effective policies, institutions, programs and information products for the disaster management and humanitarian assistance communities of the Asia Pacific region and beyond.

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NCDR Taiwan MoU 2008

So. Korea MoU 2007

Int'l "Best Practices" in DM Workshop 2007

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Facilities in the State of Hawaii

Federal Support Office
Ft. Shafter

State of Hawaii Support Office
Hawaii SCD, Diamond Head

Pacific Disaster Center
Maui Research & Technology Park, Maui

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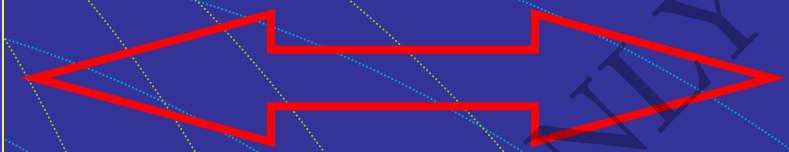
Building a Bridge



Science Community	Audience	Decision Makers
Peer Review		The Public
Low	Comfort with uncertainty	High
Complex	Vocabulary	Simple
Technical Groups	Associations	Very Public

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Our Center …

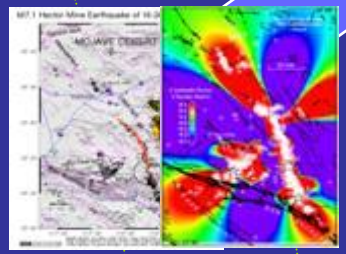
- Applied Science & Technology
- Information Products Supporting:
  - Policy & Decision Makers,
  - Disaster Managers
  - Humanitarian Assistance

Observation Systems /Data

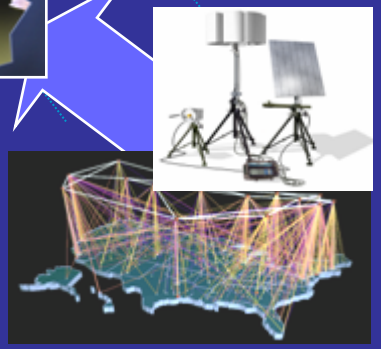
Integrating Information, Science, Technology

GIS, Visualization and Display Systems

Improve Decision-Support Capabilities



Advanced Applications, Algorithms, Models



Communication Systems and Networks

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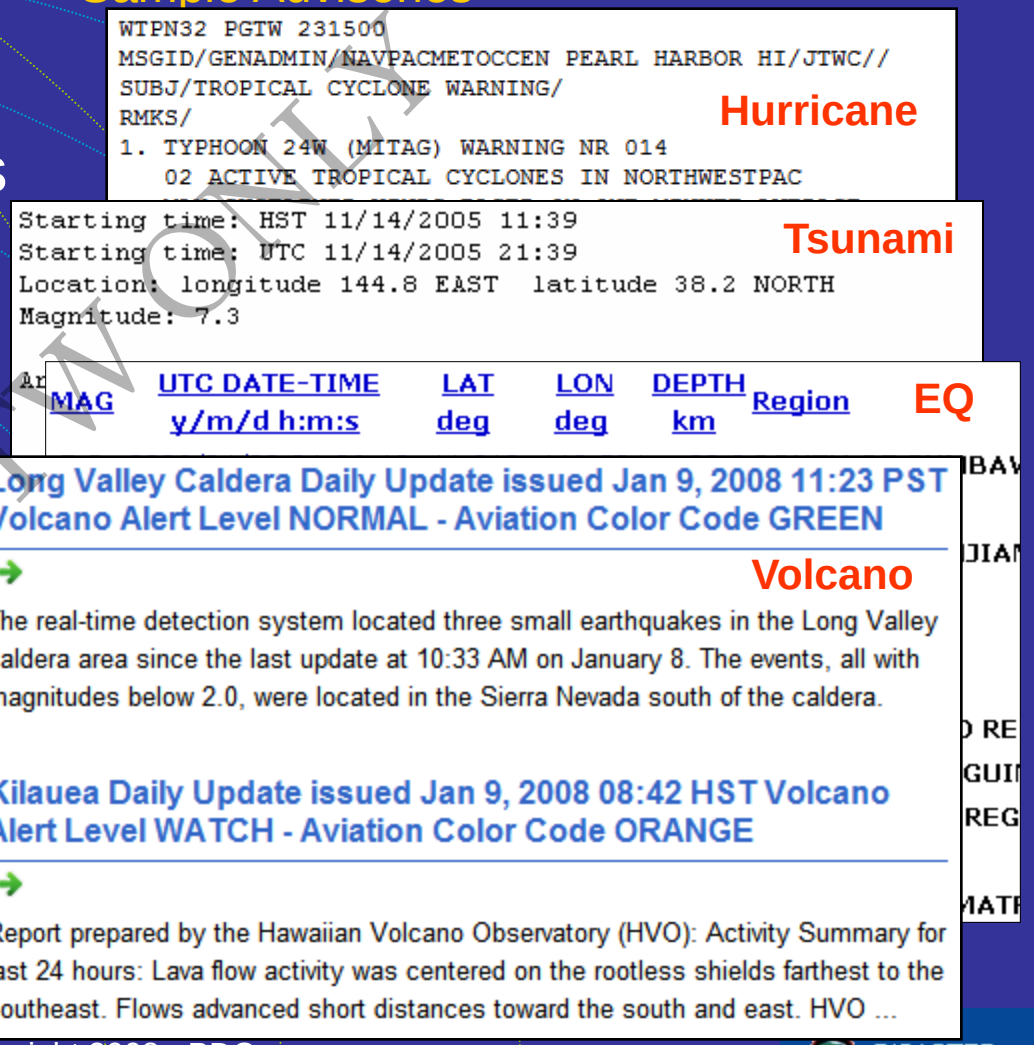
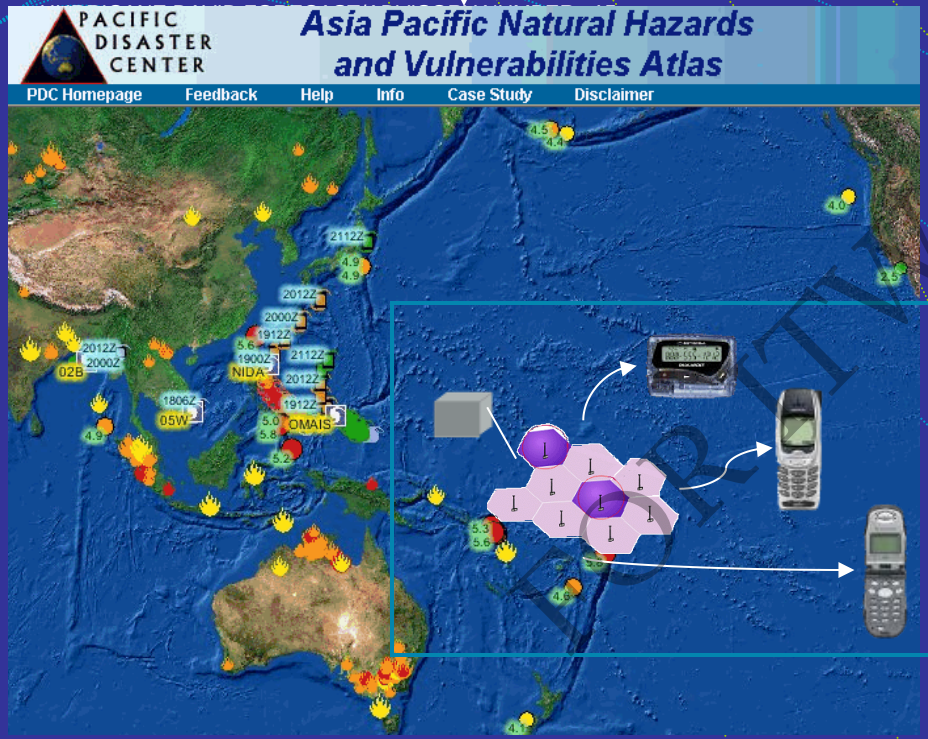
Disaster Management Challenges …

- It is difficult for Decision Makers to acquire, process and act upon existing hazard warnings:
  - Information is Scattered
  - Warnings are Hard to Integrate
  - Lack Situational Awareness
  - No context to understand Risk
  - Dissemination is Limited
- Time is *LIFE*

Sample Advisories



PDC Approach …



Multi Hazard Risk Assessment and Warning Dissemination

Internet

PDC – DisasterAWARE

GIS Applications

Model

Model

Model

Enterprise Services

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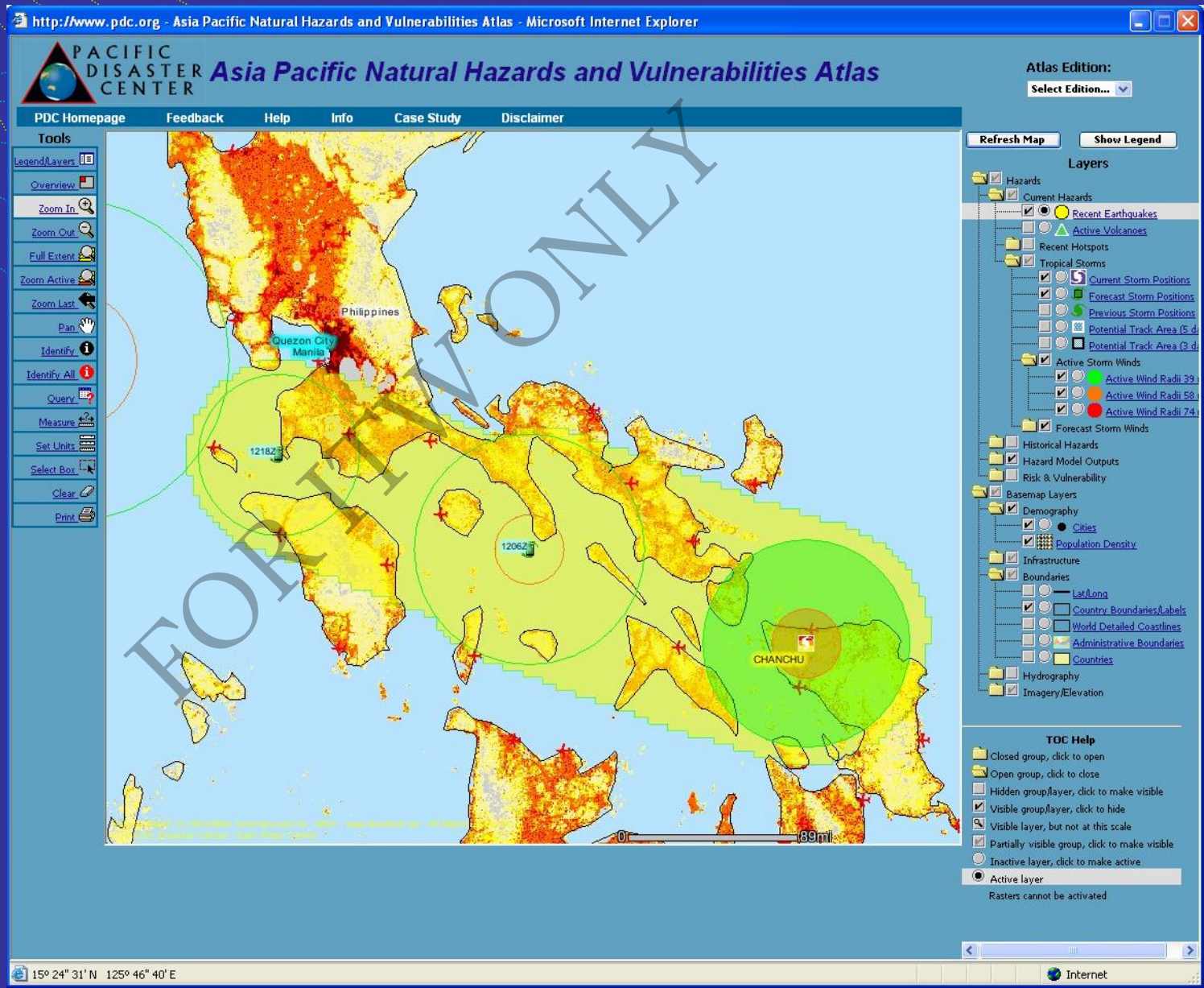
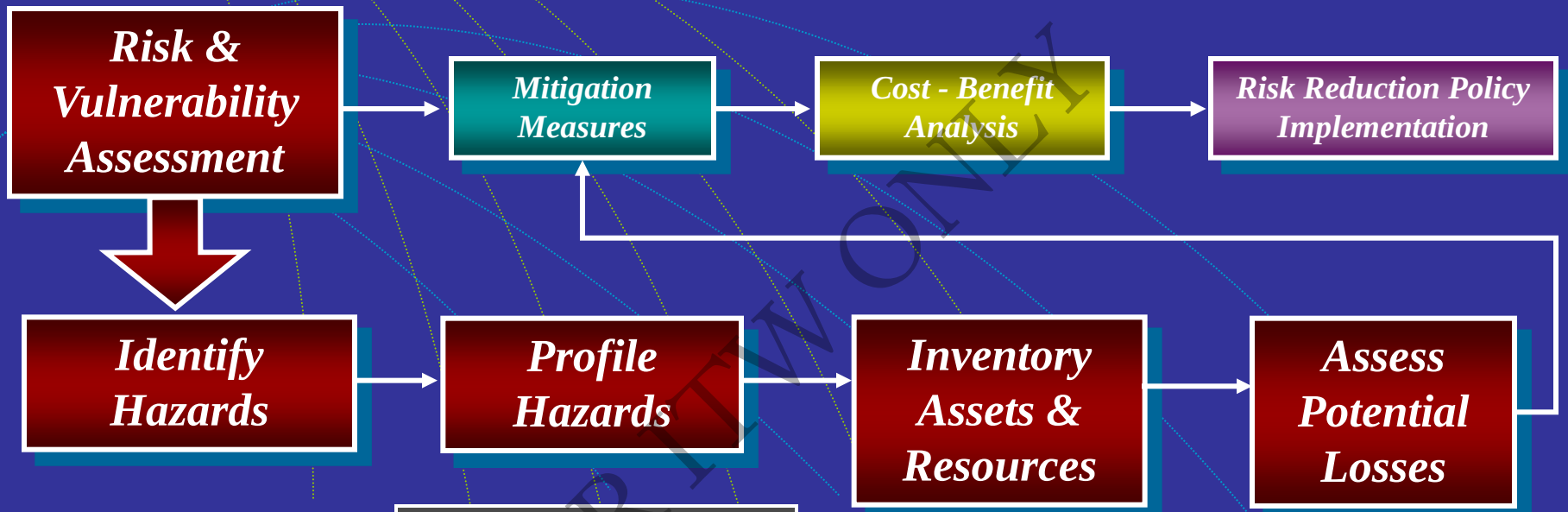
Simplify, Integrate, Understand Risk …

May 11, 2006

- Automate & Simplify
- Integrate …
- Intensity Zones (EQ & Storms)
- Infrastructure
- Hazard Zones (model-based)
- Population at Risk



RVA Implementation Strategy



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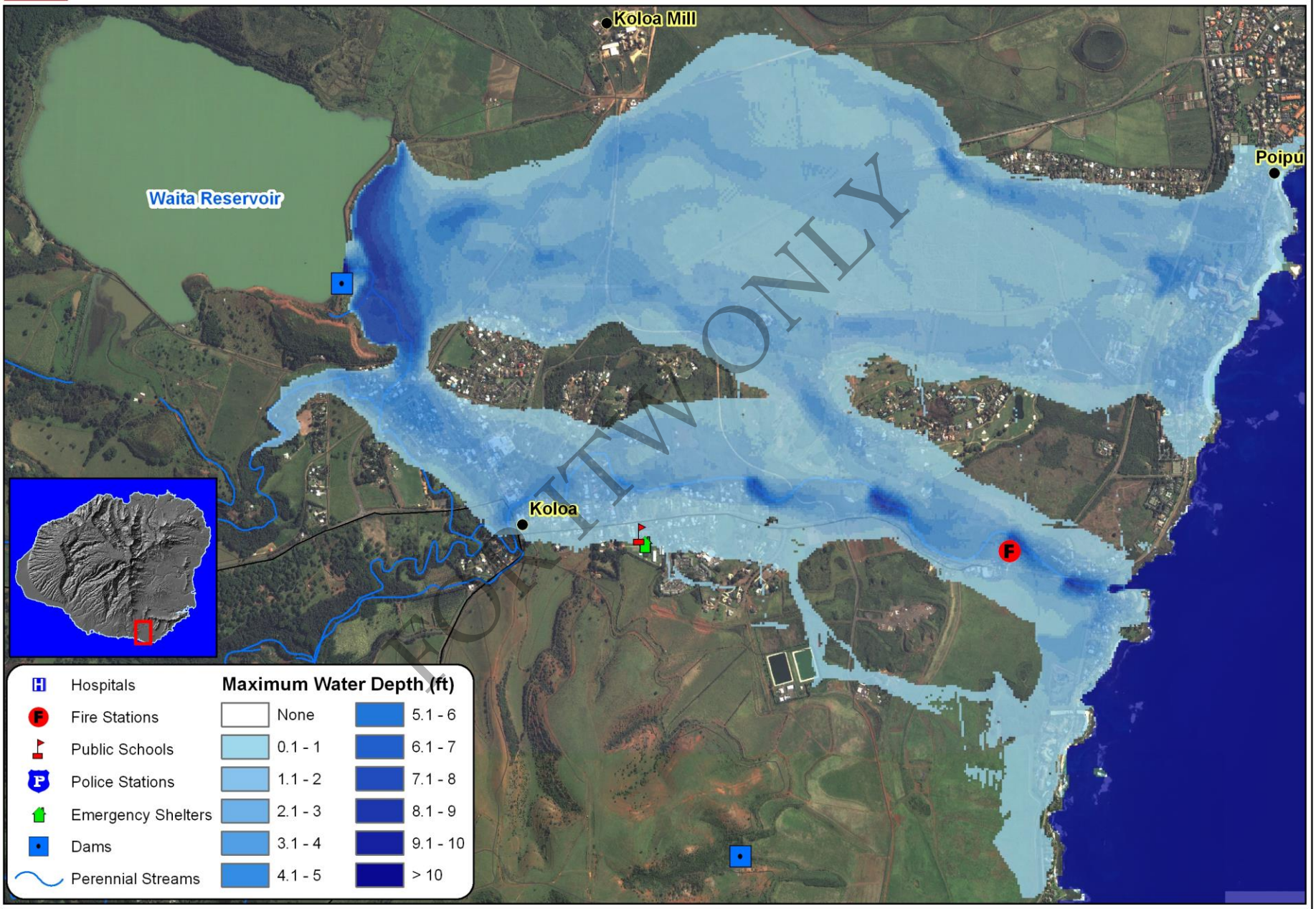
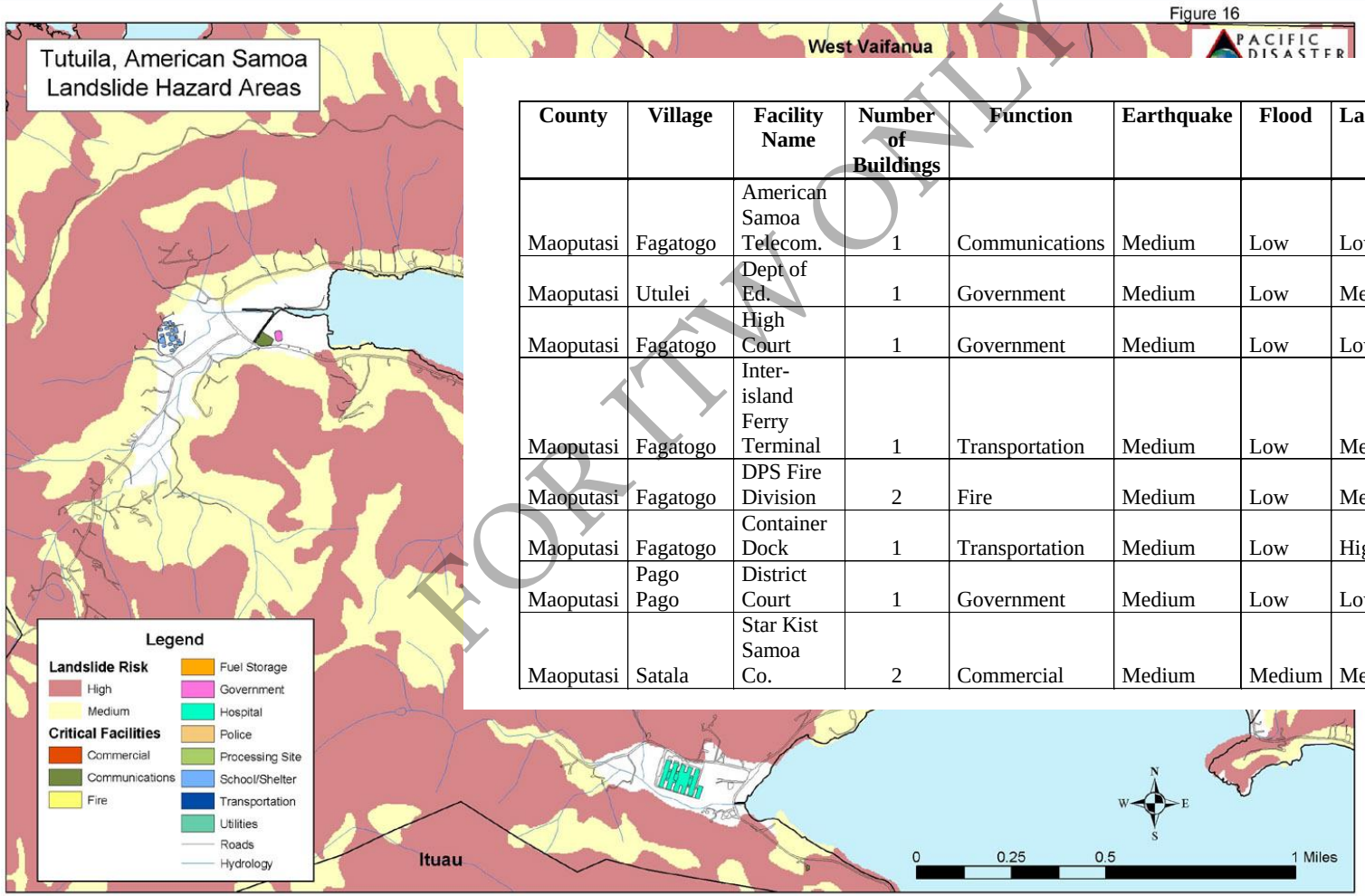
Dam Break Scenario: Waita Reservoir (HI00099), Kauai, Hawaii



This product depicts downstream flood potential using the DHI MIKE 21 model.

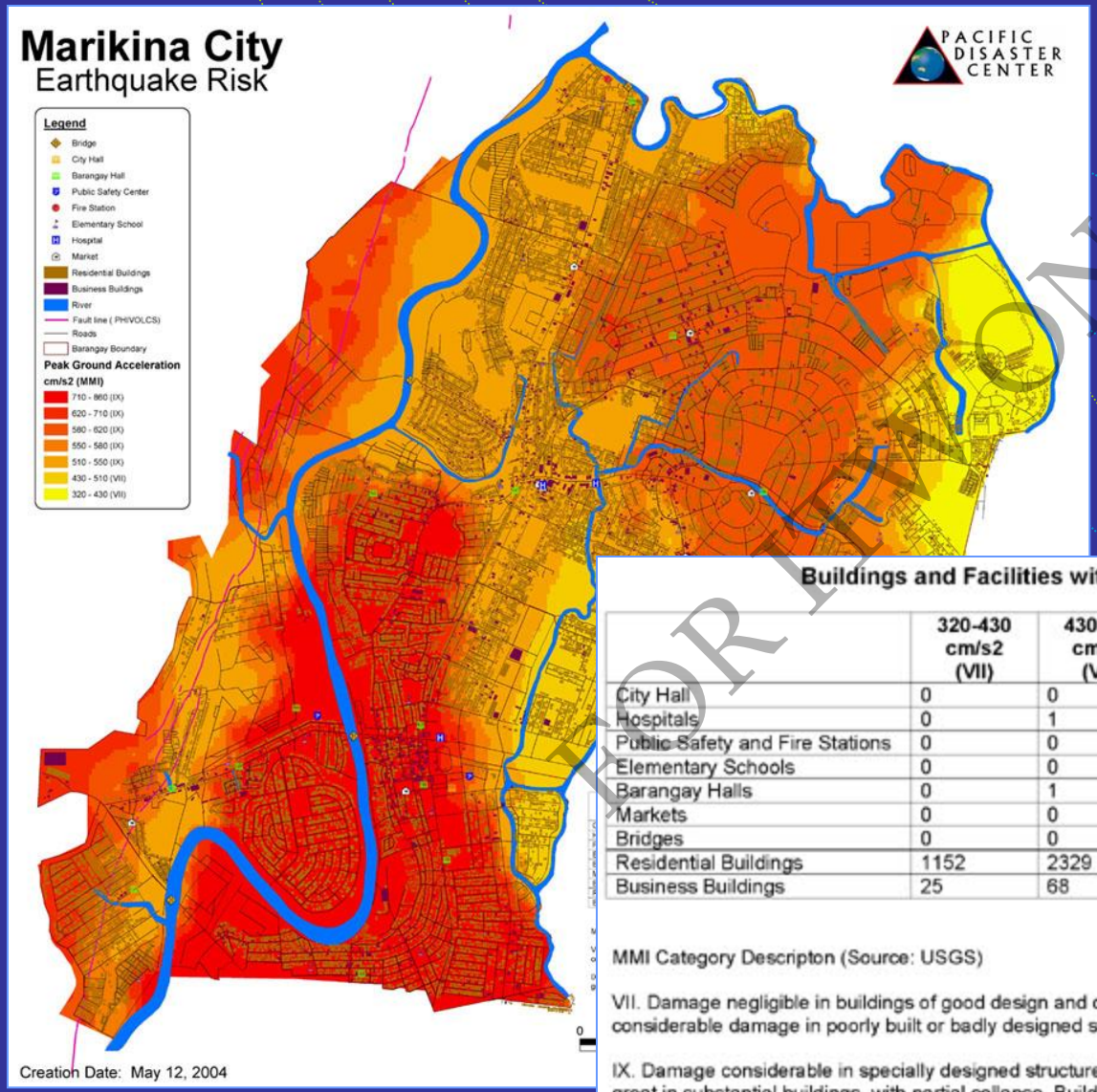
Landslide Hazard

Landslide Hazard displayed in context with Critical Facilities and basic infrastructure



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 Pago	District Court	1	Government	Medium	Low	Low	High
Maoputasi	Satala	Star Kist Samoa Co.	2	Commercial	Medium	Medium	Medium	High

Earthquake Vulnerability Map



Buildings and Facilities within Peak Ground Acceleration (PGA) Categories

	320-430 cm/s2 (VII)	430-510 cm/s2 (VII)	510-550 cm/s2 (IX)	550-580 cm/s2 (IX)	580-620 cm/s2 (IX)	620-710 cm/s2 (IX)	710-860 cm/s2 (IX)
City Hall	0	0	0	0	0	1	0
Hospitals	0	1	2	0	1	0	1
Public Safety and Fire Stations	0	0	1	0	2	0	1
Elementary Schools	0	0	8	3	5	1	5
Barangay Halls	0	1	3	1	3	1	5
Markets	0	0	3	2	2	0	1
Bridges	0	0	3	0	1	0	1
Residential Buildings	1152	2329	10298	6476	7672	1525	7255
Business Buildings	25	68	759	297	424	90	631

MMI Category Descripton (Source: USGS)

VII. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.

IX. Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.

Consequence Assessment

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Viet Nam Dyke Breach Assessment Report

1 *Purpose*

The purpose of this case study is to better understand the inundation and resulting impacts from hypothetical breaching of dykes along the Black and Red Rivers in northern Viet Nam. These scenarios approximate plans by D… even larger impacts to lives and… flooding conditions. Impact analys… mitigation options and evaluate pr… procedures. The scenario was … infrastructure and asset data colle… Disaster Management Committee…

2 *Background*

Water Diversion Loca…
Thuong Nong
Thach Dong
Dong Luan

3 *Consequence Analysi…*

3.1 Scenario Paran…

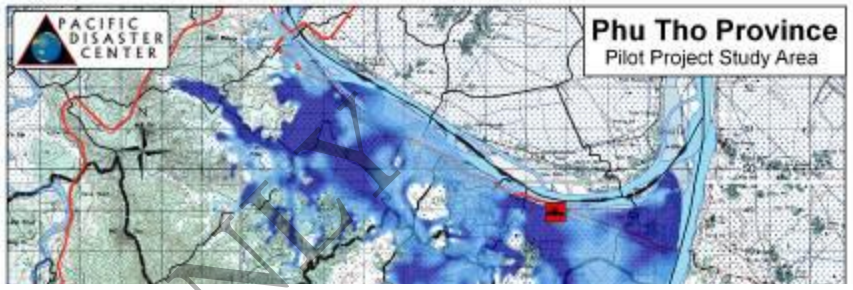
Dyke #1
River:
Height:
Rate Discharge:
Estimated Breach Size:

Dyke #3	Model Assumptions
River:	Black River
Height:	5 meters
Rate Discharge:	550 cubic meters/second
Estimated Breach Size:	137 meters

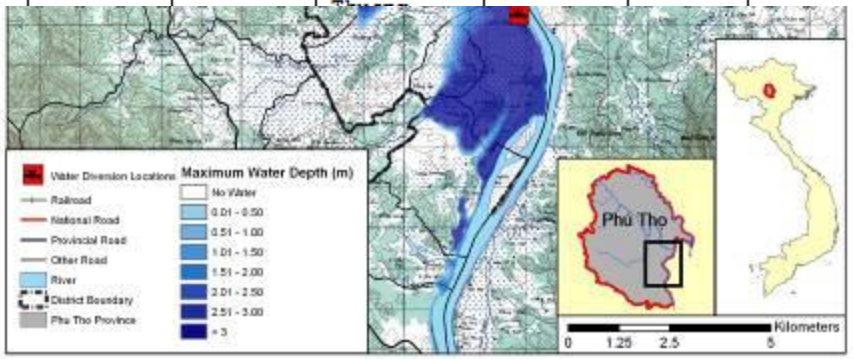
Dyke #4	Model Assumptions
River:	Red River
Height:	5 meters
Rate Discharge:	300 cubic meters/second
Estimated Breach Size:	56.5 meters

Hypothetical Scenario Vietnam Dyke Breach Scenario 11/3/2007

1



Infrastructure Type	Commune	Distance to Nearest Breach Location (km)*	Time to First Arrival (hours)	Name of Nearest Breach Location	Maximum Water Depth (m)	Latitude	Longitude
Pumping Station	X. DËu D…ng	0.87	2.57	Thuong Nong	3.44	21.2476	105.3134
School	X. DËu D…ng	2.11	8.98	Thuong Nong	1.02	21.2453	105.3008
School	X. DËu D…ng	1.90	8.34	Thuong Nong	1.00	21.2415	105.3031
Clinic	X. DÞ NËu	5.79	46.20	Thuong Nong	0.11	21.2425	105.2653
Commune Office with Police	X. DÞ NËu	5.89	42.35	Thuong Nong	0.54	21.2409	105.2644
Post Office	X. DÞ NËu	5.78	42.99	Thuong Nong	1.83	21.2413	105.2655



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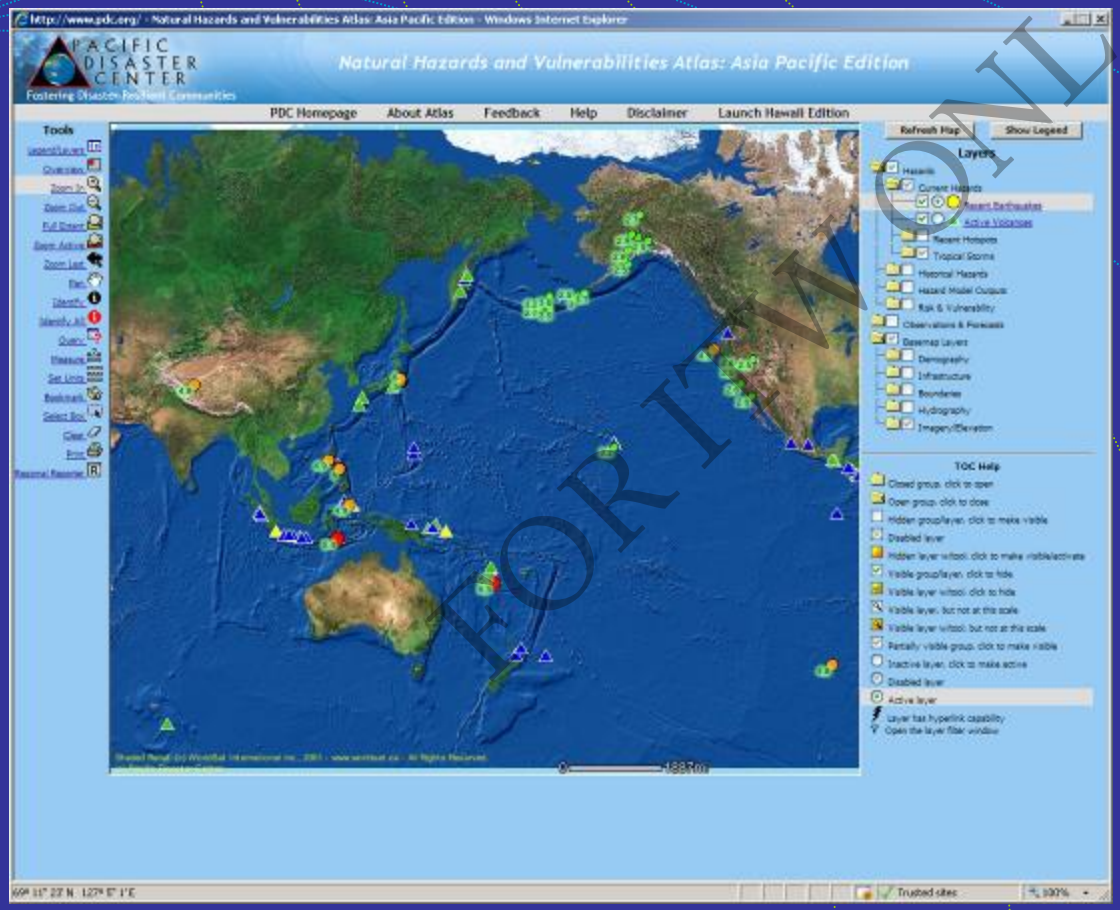
Asia Pacific Natural Hazards Atlas

Web-based, Geospatial Information Application Supporting Regional Hazard and Vulnerability Assessments



Natural Hazards

- Tropical Storms
- Wildfires
- Earthquakes
- Tsunamis
- Volcanoes
- Floods

Risk Exposure

- People
- Infrastructure

http://atlas.pdc.org

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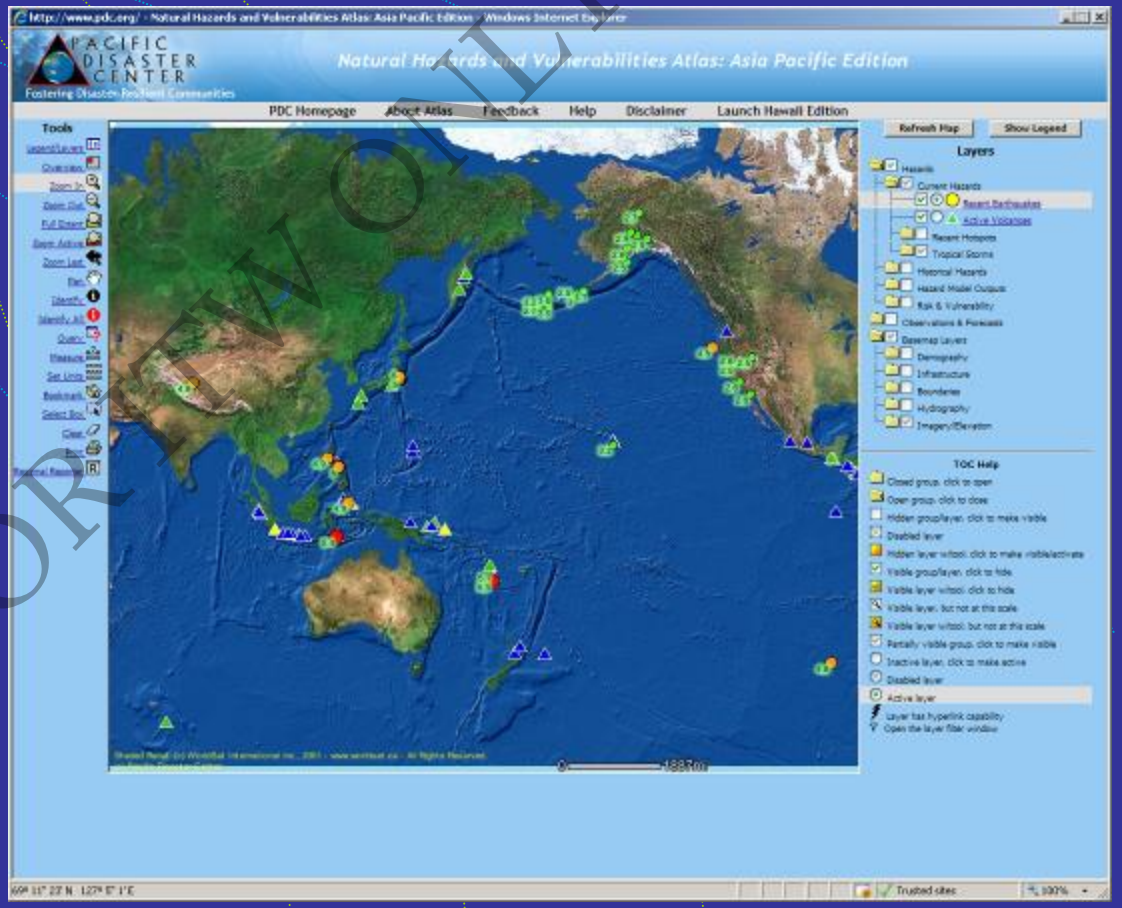
Global Natural Hazards Atlas

Web-based, Geospatial Information Application Supporting World-Wide Hazard and Vulnerability Assessments

The Global Edition expands upon the Asia Pacific Atlas by including Global Coverage plus…

- International Charter Activations
- GLIDE numbers
- Tsunami Travel Time
- Sea Surface Temperature
- USGS ShakeMap
- Avian Flu Cases
- And much more…



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Hawaii Hazards and Vulnerabilities Atlas

Municipal-level Information for Community-based Risk Assessment, Preparedness and Mitigation

- **Hawaii natural hazards and R & V data including:**
  - **Lava flows, FEMA flood zones, hazardous dams**
- **Emergency services including:**
  - **Police and fire stations, hospitals, shelters**
- **Public facilities including:**
  - **Schools, hotels, banks**
- **Transportation networks including:**
  - **Airports, seaports, bridges**
- **Elevation data including:**
  - **Shaded reliefs, 500 foot contours**
- **Imagery including:**
  - **Cloud-free Landsat, aerial photography**

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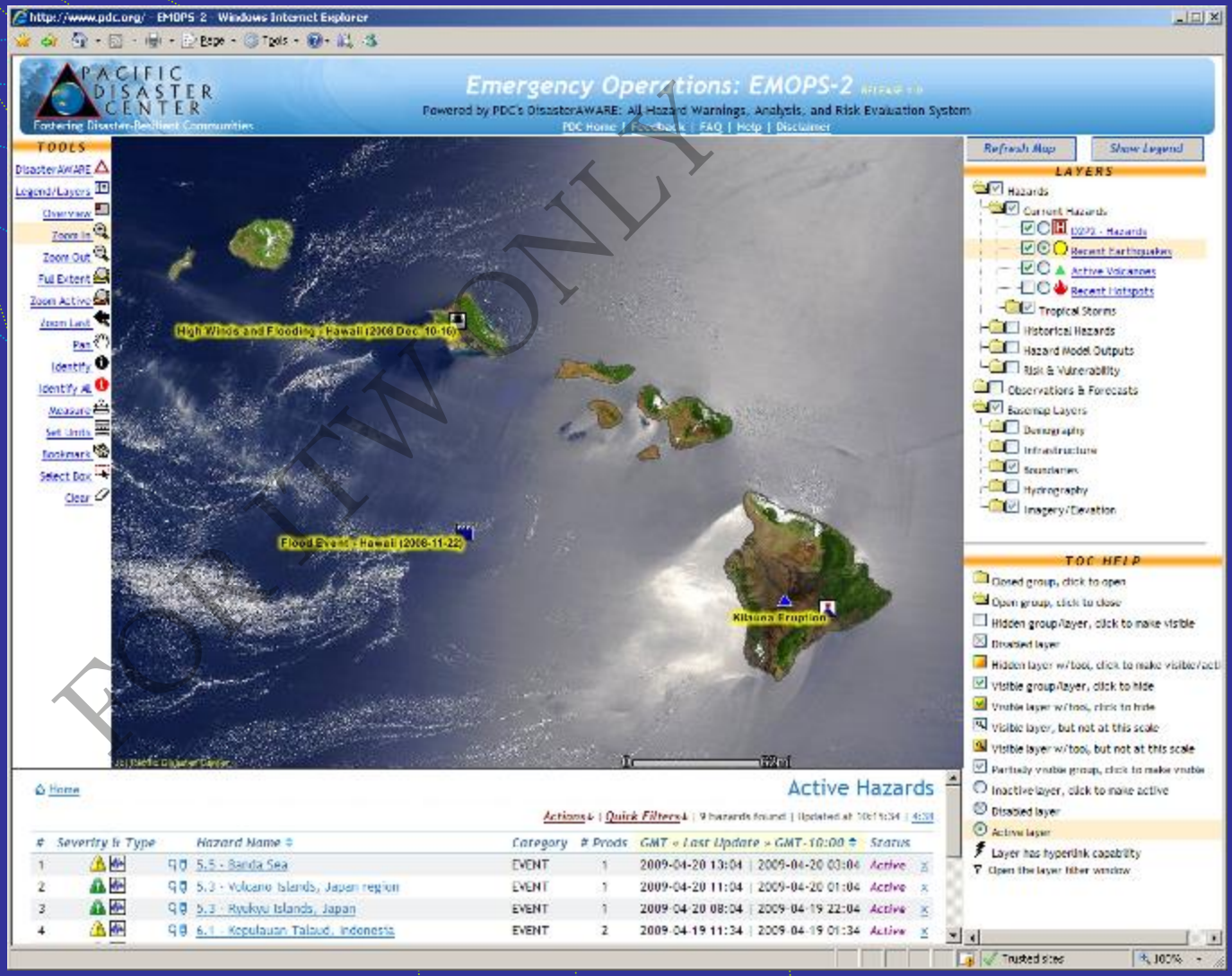
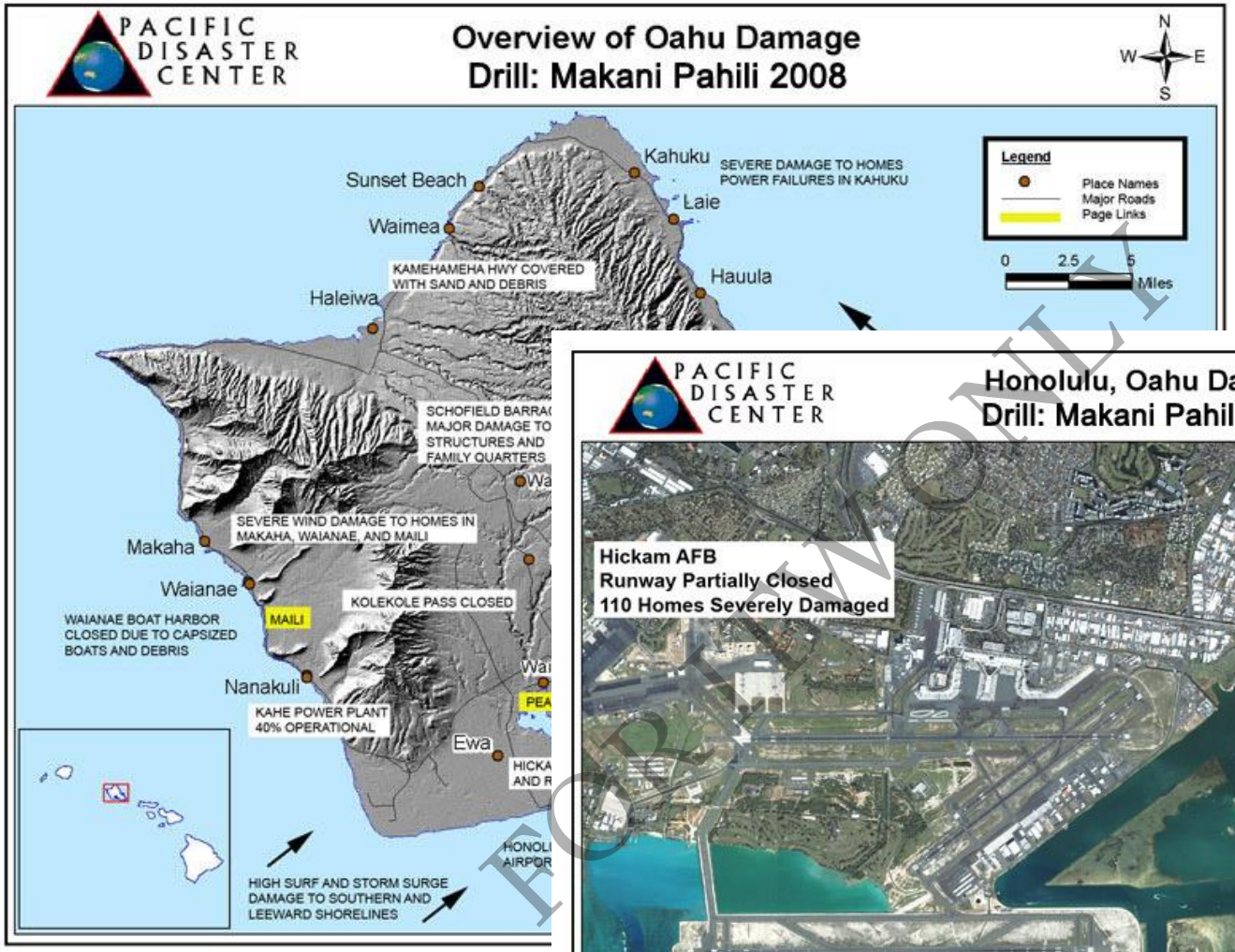
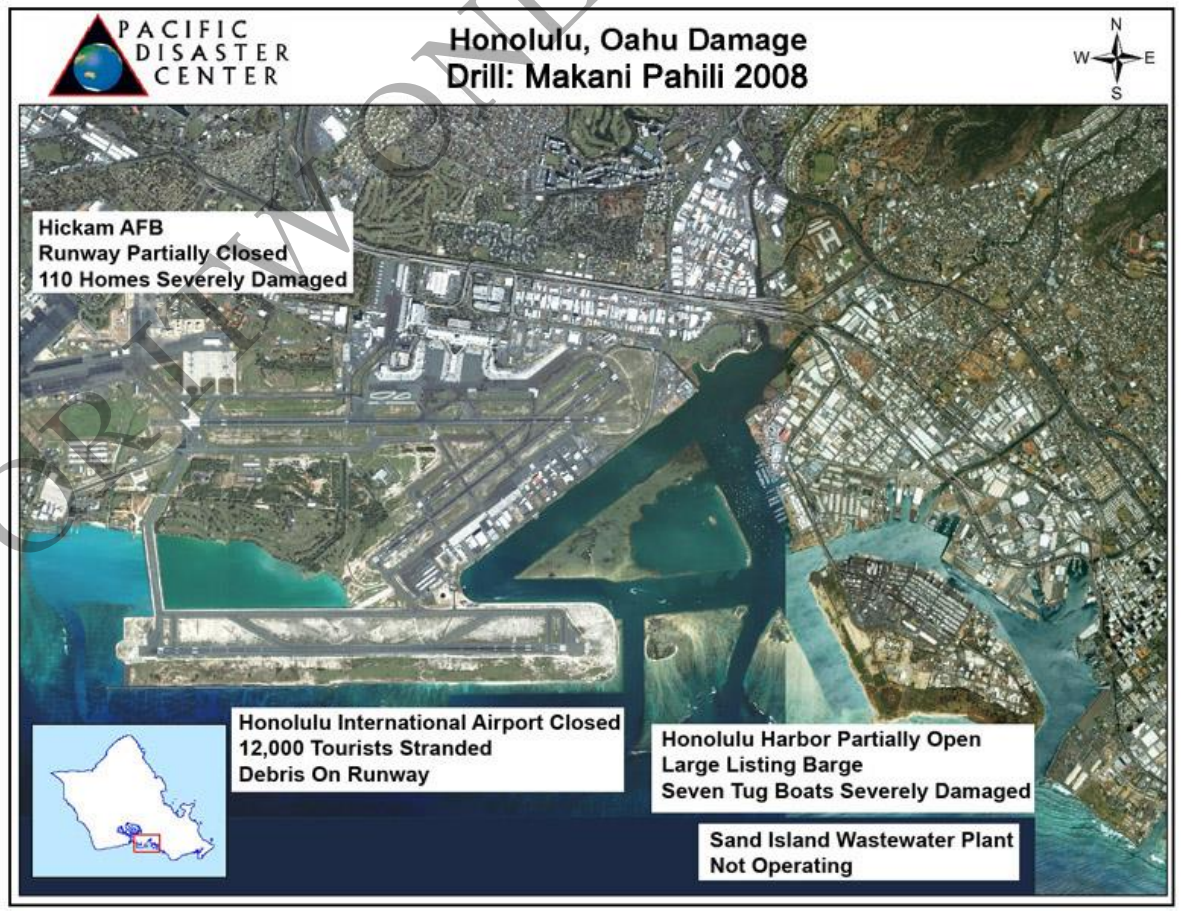
EMOPS 2.0 Decision Support System

- Local Level Data with access to PDC Integrated Hazards and Products
- Password-protected and restricted to emergency managers and decision-makers







Tropical Depression - Makani | Expired a

Available Product(s) 4 Products are hidden

Tropical Depression - Makani

Sitrep Damage Maps(1)

Advisory #26(6)

DisasterAWARE - National Disaster Warning Center, Thailand - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Search Favorites

Address http://mauidevas.pdc.org:8080/ndwc/html/ndwc-init.jsp Go Links

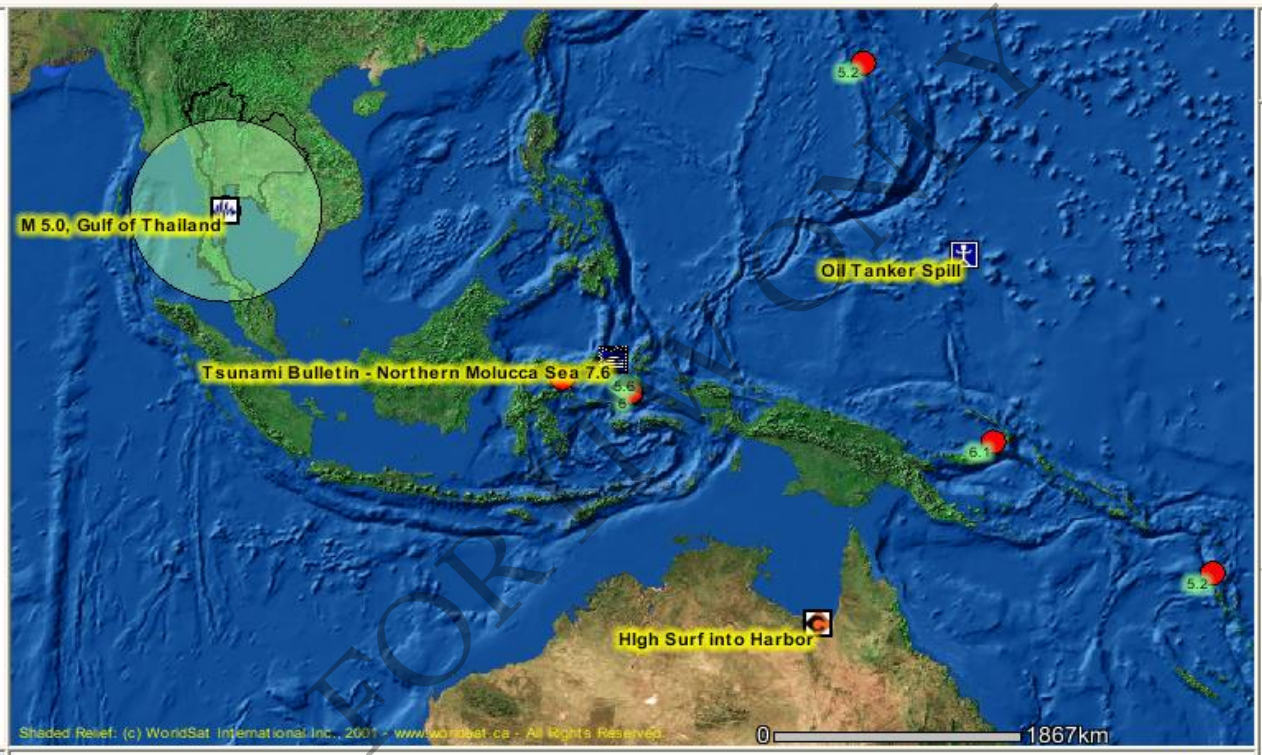
National Disaster Warning Center, Thailand

DisasterAWARE

Powered by Pacific Disaster Center

Tools

- Legend/Layers
- Overview
- Zoom In
- Zoom Out
- Full Extent
- Zoom Active
- Zoom Last
- Pan
- Identify
- Identify All
- Query
- Find
- Measure
- Set Units
- Bookmark
- Buffer
- Select Box
- Clear
- Print



Refresh Map | Legend | Reload Hazards

Layers

- Hazards
  - Current Hazards
    - Hazards
    - Recent Earthquakes
  - Historical Hazards
  - Hazard Model Outputs
    - Tsunami Travel Time
    - Possible Earthquake Damage
  - Risk & Vulnerability
- Historical Weather Data
- Basemap Layers
  - Demography
  - Infrastructure
  - Hydrography
  - Boundaries
  - Imagery/Elevation

TOC Help

- Closed group, click to open
- Open group, click to close
- Hidden group/layer, click to make visible
- Hidden layer w/tool, click to make visible/activa
- Visible group/layer, click to hide
- Visible layer w/tool, click to hide
- Visible layer, but not at this scale
- Visible layer w/tool, but not at this scale
- Partially visible group, click to make visible
- Inactive layer, click to make active
- Active layer
- Open the layer filter window
- Rasters cannot be activated

Tools

- Hazard Listing
- Automated Hazard Map
- Message Traffic
- Model Information

Administration

- User Preferences
- Administration

Updated at 11:57:10 | Auto-refresh in 4:14

Product listing for: Tsunami Bulletin - Northern Molucca Sea 7.6 Active

Back | Hazards | Actions

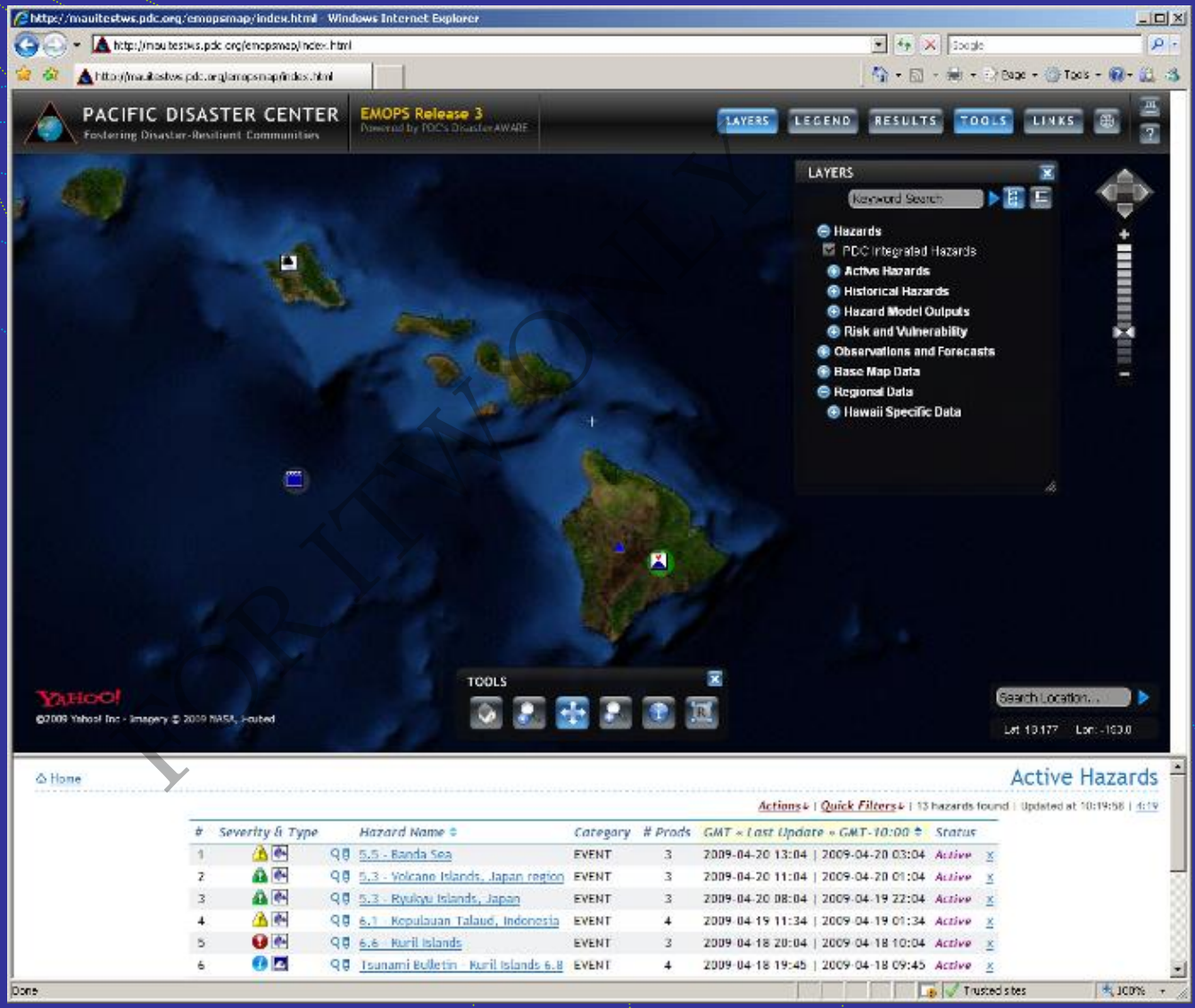
Products Last Update	
Tsunami Bulletin - Northern Molucca Sea 7.6	01/21/2007 02:32
Tsunami Information Bulletin 002 (PTWC)	01/21/2007 02:32
Tsunami ETA to Forecast Points	01/21/2007 01:53
Tsunami Travel Time Map (Thailand)	01/21/2007 01:53
Pacific Ocean Tsunami Travel Time Map	01/21/2007 01:53
Tsunami Information Bulletin 001 (PTWC)	01/21/2007 01:52

10° 17" 34' N 169° 48" 52' E

Internet

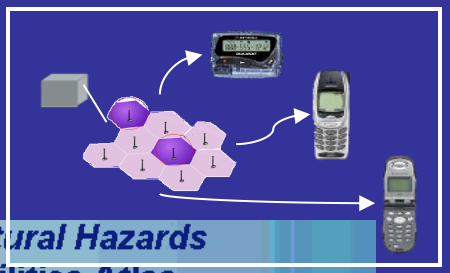
EMOPS Release 3

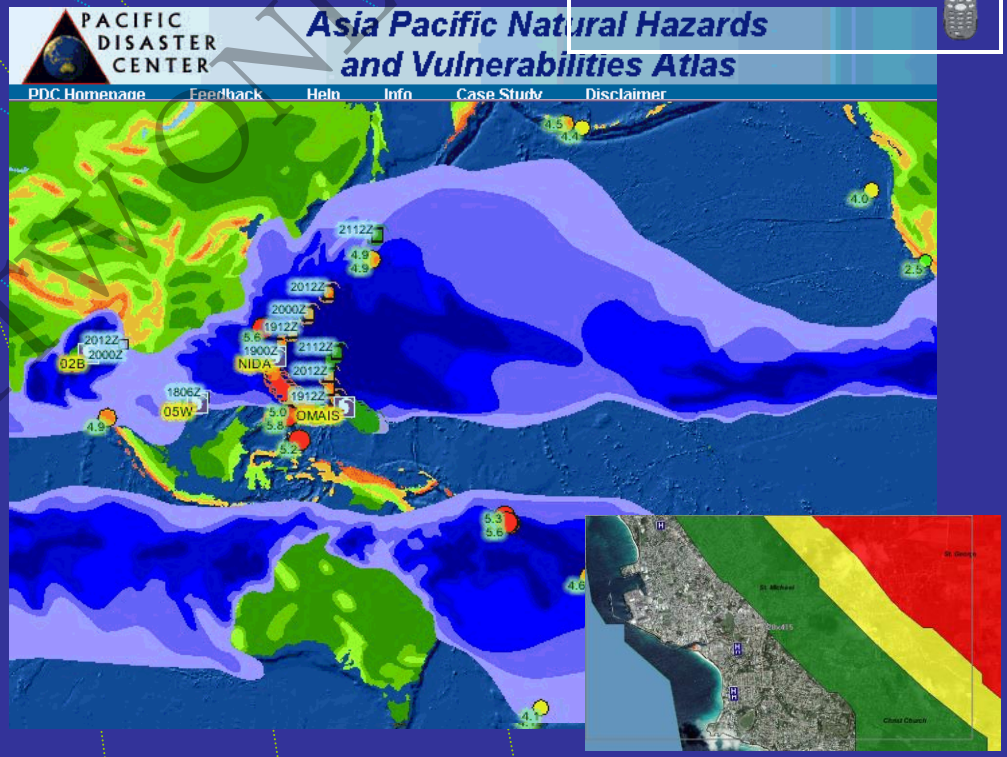
- Next generation of PDC EMOPS product
- Built on PDC's new Flash Viewer
- Able to integrate multiple sources and data feeds simultaneously



In Summary …

- Reducing Impacts By:
  - Integrate, Simplify, & Expedite Processes
  - Understand Dangers and Risks
  - Disseminate Warnings
  - Decide & Act on Latest Assessments





Multi Hazard Information and Warning

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