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The Pacific Disaster Center's Comprehensive Response to the Indian Ocean Tsunami

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EAST-WEST CENTER

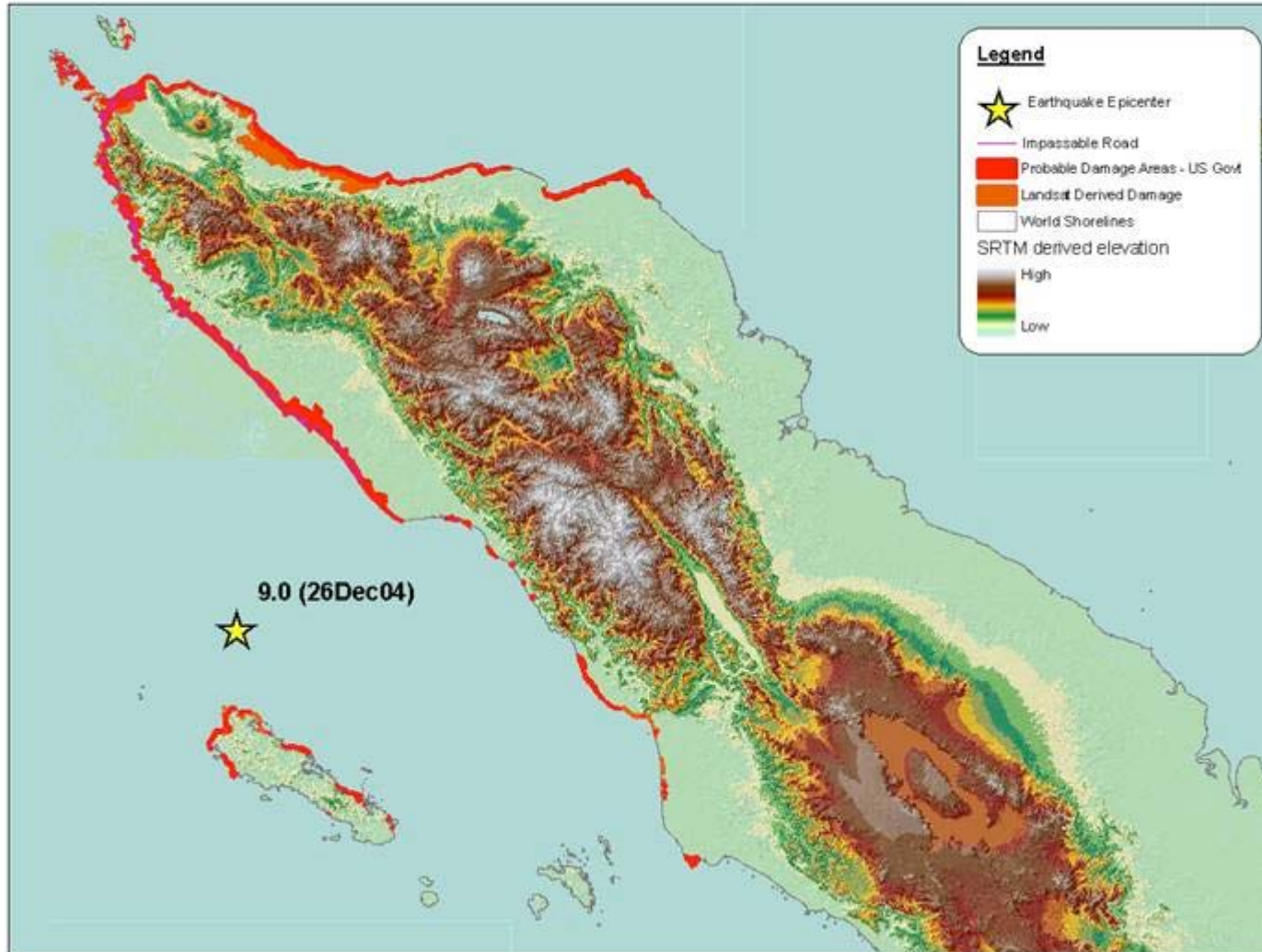




Abstract

In response to the 26 December 2004 earthquake and resulting tsunami, the Pacific Disaster Center (PDC) immediately sprang into action. Within days, PDC launched the ArcIMS software-based Indian Ocean Tsunami Response Geospatial Information Service and a related Map Viewer, providing high-resolution satellite imagery and GIS information to hundreds of organizations and their staff. Working in close collaboration with Mercy Corps, the United Nations, and a number of other organizations, PDC received and processed hundreds of images, totaling more than 1 TB of information, received via the U.S. Government's Commercial Satellite Imagery Library (CSIL). PDC also deployed GIS analysts to provide direct support to response and recovery efforts in Thailand and Indonesia where they collected and applied geospatial information required to assess damage to infrastructure, locate refuge camps, and land relief supply-laden helicopters. PDC also established an earthquake notification system to provide timely warning to relief workers potentially exposed to harmful aftershocks.

Sumatra, Indonesia Tsunami Damage Areas



Geospatial Data Processing and Distribution

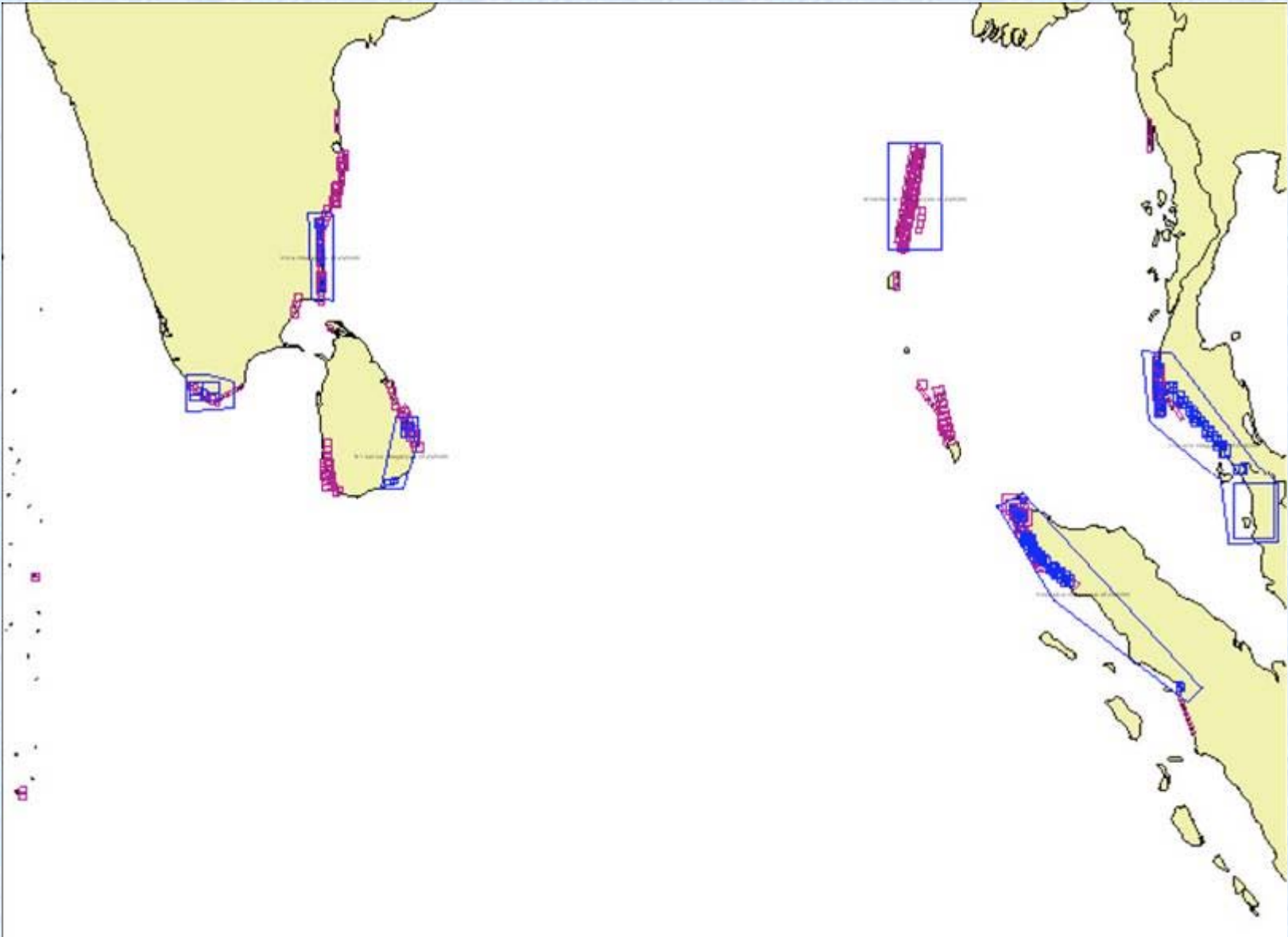
- Launched ArcIMS-based "*Indian Ocean Tsunami Geospatial Information Service*" and the corresponding Internet-based *Map Viewer*. (<http://www.pdc.org/tsunami>)
- Obtained and processed high-resolution satellite imagery from NGA's "Commercial Satellite Imagery Library" (CSIL)
- Providing on-line access to the GIS data via the Internet map service, the viewer, and the ftp site at Maui High Performance Computing Center (MHPCC)



Tsunami Response Map Viewer



PDC Processed ClearView Imagery





Data Processing - Relationships and Coordination

- **Mercy Corps Int'l** (NGO) Seattle, WA and Portland, OR. - Remote sensing analysts volunteered to help PDC process the tsunami-related imagery.
- **UN GIS Unit**– Analysts have concentrated on Pan-Sharpener Ikonos imagery related to the disaster and have shared this with PDC.
- **Maui High Performance Computing Center** – Hosted a password-protected FTP site to allow authorized users to download PDC/MC/UN-processed high-resolution imagery (ECW compressed)











Tsunami Response (Cont.)

- **In-country GIS Data Collection & Support**
 - Used to characterize conditions in the disaster zone for USPACOM Joint Task Force (JTF-532) / Combined Support Force (CSF-532).
 - Determined geographic extent of damage.
 - Identified high population densities for Humanitarian Assistance target areas.
 - Used in identification of damaged areas to target P-3 flyovers (to acquire higher resolution imagery of downed bridges, roads, etc. for determining main supply routes, hospital locations, helicopter landing zones, refuge camps.)
 - Supported field data collection efforts in Thailand and Indonesia with NDMO



In-Country Support



**Joint Task Force -536
MPAT Office Morning SITREP**

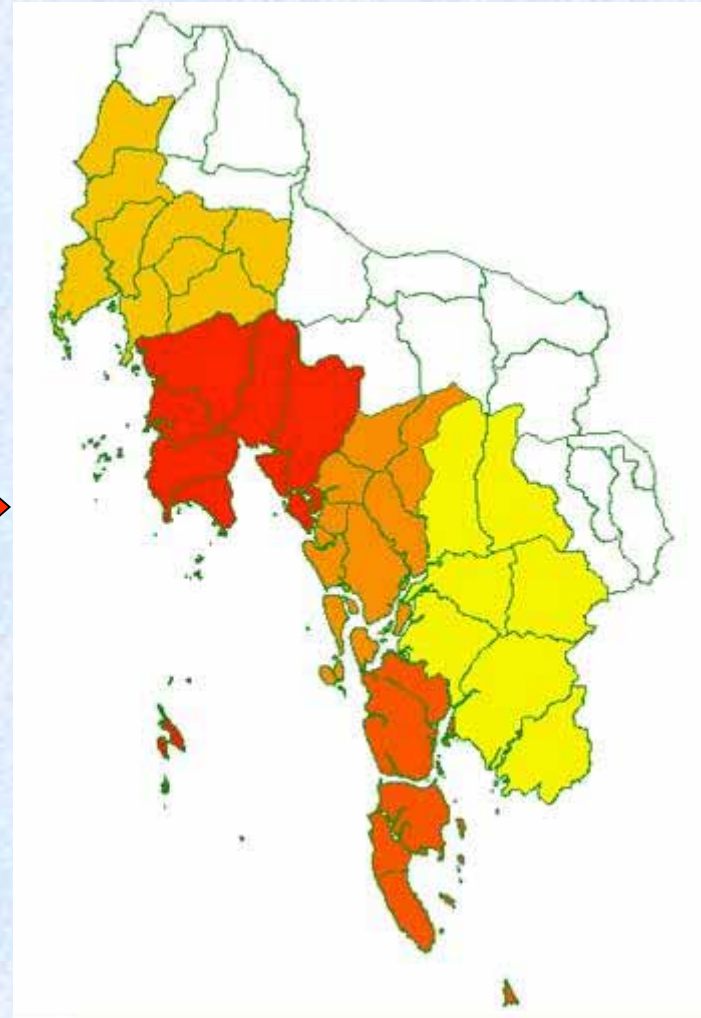


**Field Data Collection
and Mapping**



รายงานข้อมูลจำนวนผู้บาดเจ็บ และช่วยเหลือที่ได้รับ เขต ๖
จากเหตุการณ์แผ่นดินไหว และคลื่นสึนามิ
จังหวัดกระบี่ 11 มี. ๕๙

รพ. ที่	ส่วนที่	อำเภอ	ตำบล	หมู่ ที่	ชื่อหมู่บ้าน	จำนวนราษฎร			
						ทั้งหมด (คน)	บาดเจ็บ	ช่วยเหลือ (คน/เดือน)	
101	เมืองกระบี่	อำเภอ	ตำบล	1	คลองพิ	4:8	20	100	
				2	อำเภอ	1:151	47	348	
				3	คลองวัง	5:0	22	271	
				4	พาดิน	2:5	11	68	
				5	บ้านทุ่ง	5:5	27	158	
				6	คลองพัน	1:1	13	82	
				7	เกาะพิศิ	4:3	57	328	
				8	แหลมทอง	1:8	29	201	
				เขาคราม	1	บ้านทุ่ง	6:8	12	60
					2	หนองจิก	3:7	22	156
					3	โพหนัง	2:7	19	115
				คลองประสงค์	1	เขาหิน	1:8	10	52
					2	เกาะกลาง	3:1	60	318
				ไสไทย	1	คลองประสงค์	1:2	72	493
					2	คลองท่า	1:1	52	388
					3	สวนพริก	1:8	9	62
				ไสไทย	1	หนองก	2:3	12	65
					2	คลองไหล	2:1	18	115
					3	ไสไทย	4:6	20	114
				เขาทอง	1	อำเภอนา	1:9	30	183
					2	แหลมโพธิ์	1:5	44	231
					3	คลองหิน	1:11	49	206
					4	โนนระ	1:8	15	108
					5	เขาทอง	1:7	28	173
					6	ท่าคน	1:3	43	189
					7	น้ำโตนโตน	1:30	39	136
					8	ท่าพรุ	1:1	8	45
									1:10



Tsunami 26 December - Microsoft Internet Explorer

Address: <http://203.202.1.120/twserverlet/twautologin?KD=Tsunami+Relief&Username=guest&L=1>

Hot Topics for Guest, 18 Mar 2005 6:22 PM - Tsunami 26 December

thoughtweb

Home Help
Map search
My Interests

Tsunami Relief

Indonesia
Country

Overview
Collaboration
Research
Search The Web

Topics
Countries
Impacted Region
Locations
Needs
Priorities
Responders
Responder Types
Threats
Tsunami Sciences


Indonesia is the world's largest archipelagic state and lies between the Indian Ocean and the Pacific Ocean. Coastline: 54,716 km Population: 238 million

Dead	Missing	Displaced
166,320	74,454	1,100,000

Locations

- Aceh
- Banda Aceh
- Medan
- Meulobah
- Nias
- Northwest Coast, Sumatra
- Sabang
- Simuelue

INDONESIA



Threats

Priorities

Needs

Batu - refrigerated storage

Done Internet

<http://www.thoughtweb.com/relief>



Lessons/Observations/Needs

- PDC received & processed nearly 1.5TB of high-resolution imagery in the weeks following the tsunami
 - Relief organizations (MIL & NGO) had very little band-width in many cases, esp. those in the field
 - JTF/CSF 536 utilized commercial internet; <100kb
 - Ability to “value add” also very limited in the field
-
- Pre-established relationships with data providers and processing collaborators greatly expedites getting information products to HA/DR organizations
 - Reliable, open, high-capacity bandwidth is required to take advantage of geospatial resource (imagery and value-added maps); should be a standard component of field/forward EOC's
 - Development of simple tools to create basic HA/DR products in the field, with limited training, is desirable



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Visit the Tsunami Map Viewer at:

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Visit APNHIN at:

<http://apnhin.pdc.org>