

# Memory Platform for Disasters - Raising Awareness to Typhoon and Earthquake Disasters

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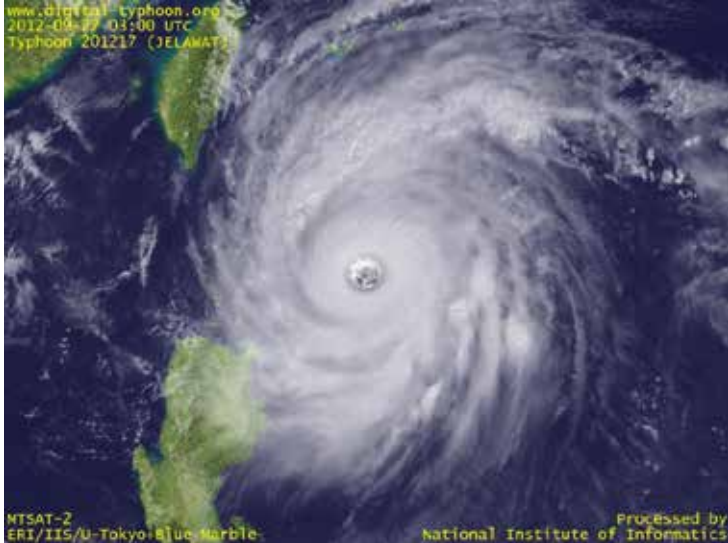
# Self Introduction



Asanobu KITAMOTO  
National Institute of  
Informatics (NII)  
SOKENDAI

- Started research in image processing and databases, later multimedia analysis.
- **Data-driven approaches** for earth environment, disasters, and humanities.
- **Open science** for sharing research data and multi-disciplinary collaboration.

# Disasters and Memories



- **Disasters** – a natural or man-made event that causes a significant negative change on communities, societies and mankind.
- **Memories** – records and knowledge of the past, that can be organized for the next disaster.

# Memory Institutions

- Libraries, museums, and archives – organizations that keep the memories of communities in different approaches.
- Unified view more than domain-specific approaches on the roles of organizations.
- Only institutions? Bottom-up activities can also take part in keeping memories.

# Memory Platform

Digital  
Library

Digital  
Museum

Digital  
Archive

Memory Platform

**Memory platform** is an information infrastructure to maintain digital resources about personal and collective memories.

# Basic Requirements

- **Temporal dimension** : essential (before and after the disaster).
- **Spatial dimension** : desirable (to understand the extent of the disaster).
- **Aggregation** : resources are collected and integrated from multiple sources.
- **Awareness** : offer opportunities to know about the past and prepare for the future.

# Four Case Studies

Case	Temporal	Spatial	Aggregation	Awareness
<b>Isewan Typhoon</b>	Yes (timeline)	Yes (mapping)	Yes (many sources)	Yes (projection)
<b>311 Memories</b>	Yes (timeline)	No	No	Yes (aesthetic)
<b>Bam 3DCG</b>	No (only before)	Yes (3D, only one site)	Yes (many sources)	No
<b>Memory Hunting</b>	Yes (before and after)	Yes (matching landscape)	Yes / No (crowd-sourcing)	Yes (move to the site)

# ISEWAN TYPHOON MEMORIES 2009



# Digital Typhoon

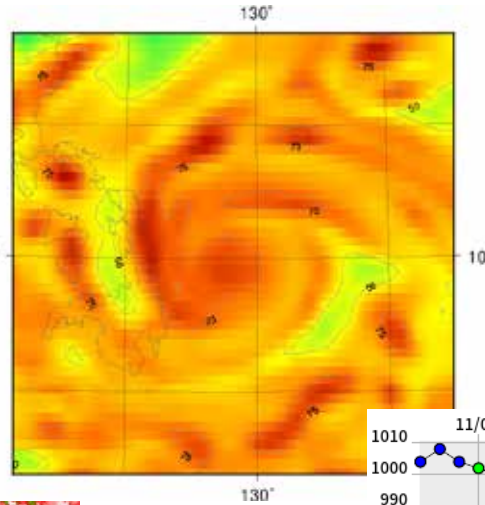
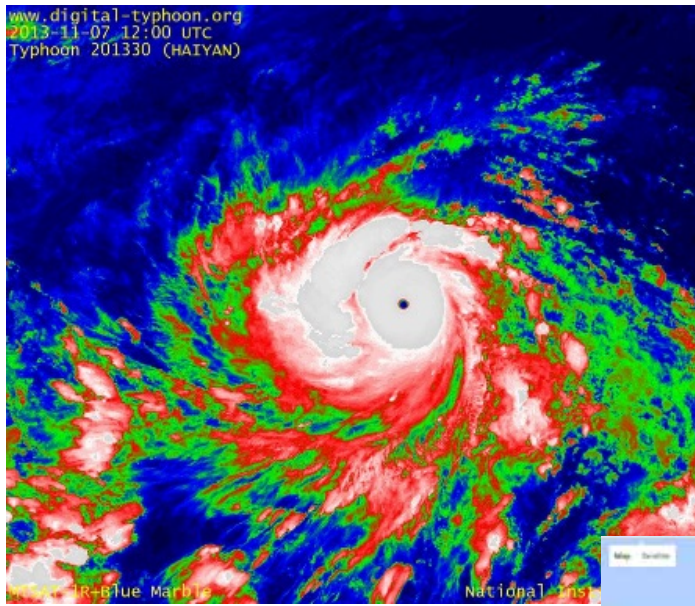
<http://agora.ex.nii.ac.jp/digital-typhoon/>

The screenshot displays the 'Digital Typhoon: Typhoon Images and Information' website. The header includes navigation links like 'Home', 'Earth', 'Digital Typhoon', and 'Japanese'. A 'Real-time Typhoon Information' section features three columns for typhoons T 201006, T 201007, and T 201008, each with a satellite image and key statistics. To the right, a 'Number of Typhoons' box shows 'This year = 8 (Best Track) (Forecast Track)' and 'Average = 14.3 (1951-2006)'. Below this is a 'Latest Typhoon Information' list with links to news, local information, and disaster data. The bottom section, 'Typhoon Database', offers various search criteria such as 'Search by Metadata', 'Search by Date / Season', and 'Search by Map'. A 'Meteorological Satellite Images' section shows a satellite view of the Earth with a typhoon over the Pacific Ocean, dated '2010-09-01 11:00 (UTC)'.

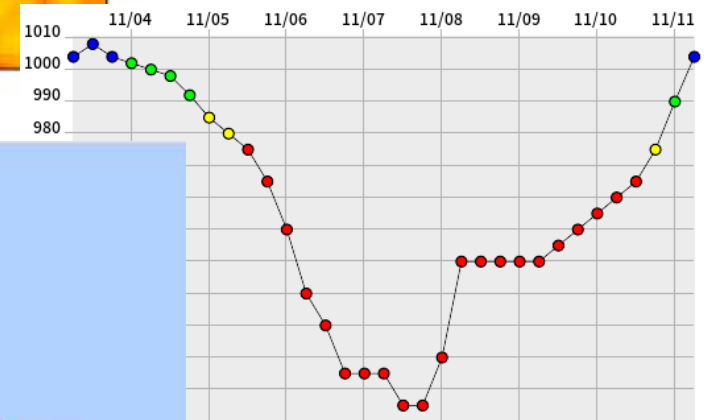
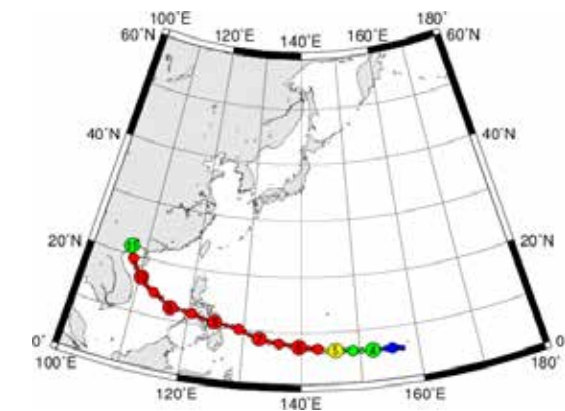
- Heterogeneous sources are integrated and indexed in near **real-time**.
- **Past data** can be searched in the context of the **current situation**.
- **Scientists and citizens** use the websites for work, business, hobby.

One of the most famous typhoon information Website. About 160 million page views in 13 years.

# Typhoon Haiyan (2013)

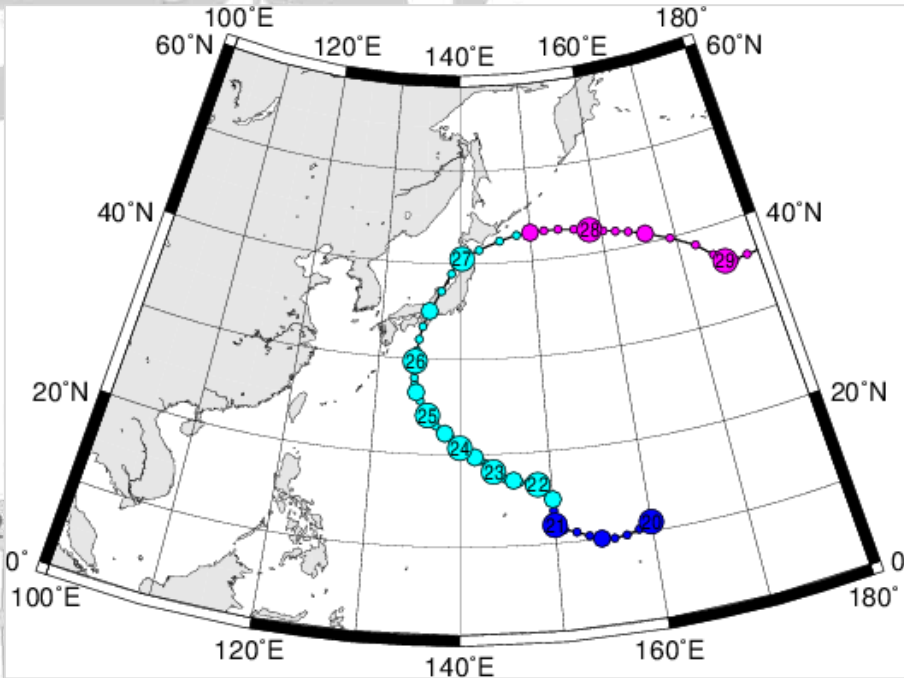


Storm tide 6-7m?  
Death toll 6000-7000



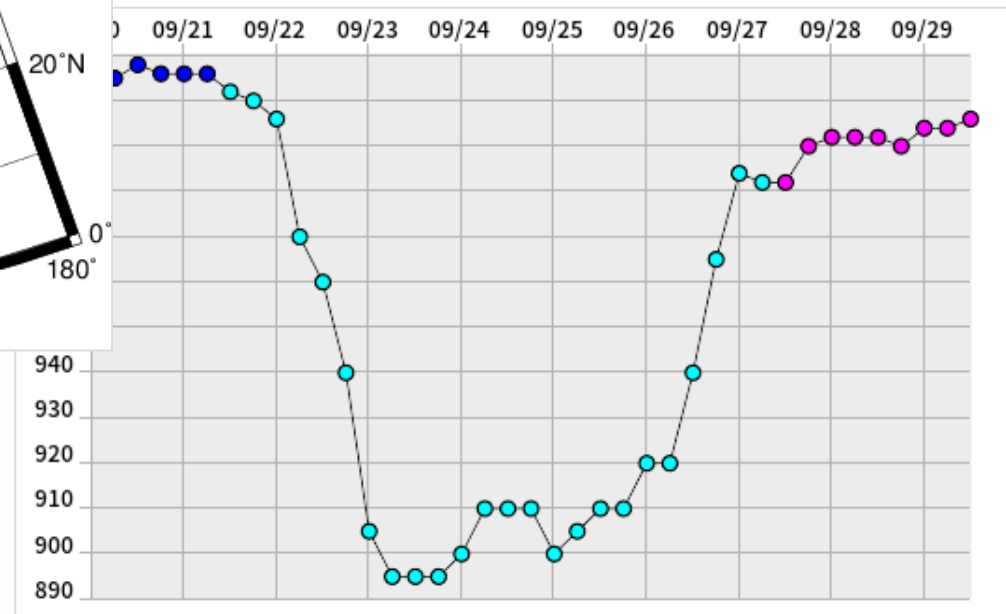
# Isewan Typhoon Vera (1959)

<http://agora.ex.nii.ac.jp/digital-typhoon/summary/wnp/s/195915.html.ja>



Storm tide 4-5m above ground.  
Death toll 5000+.

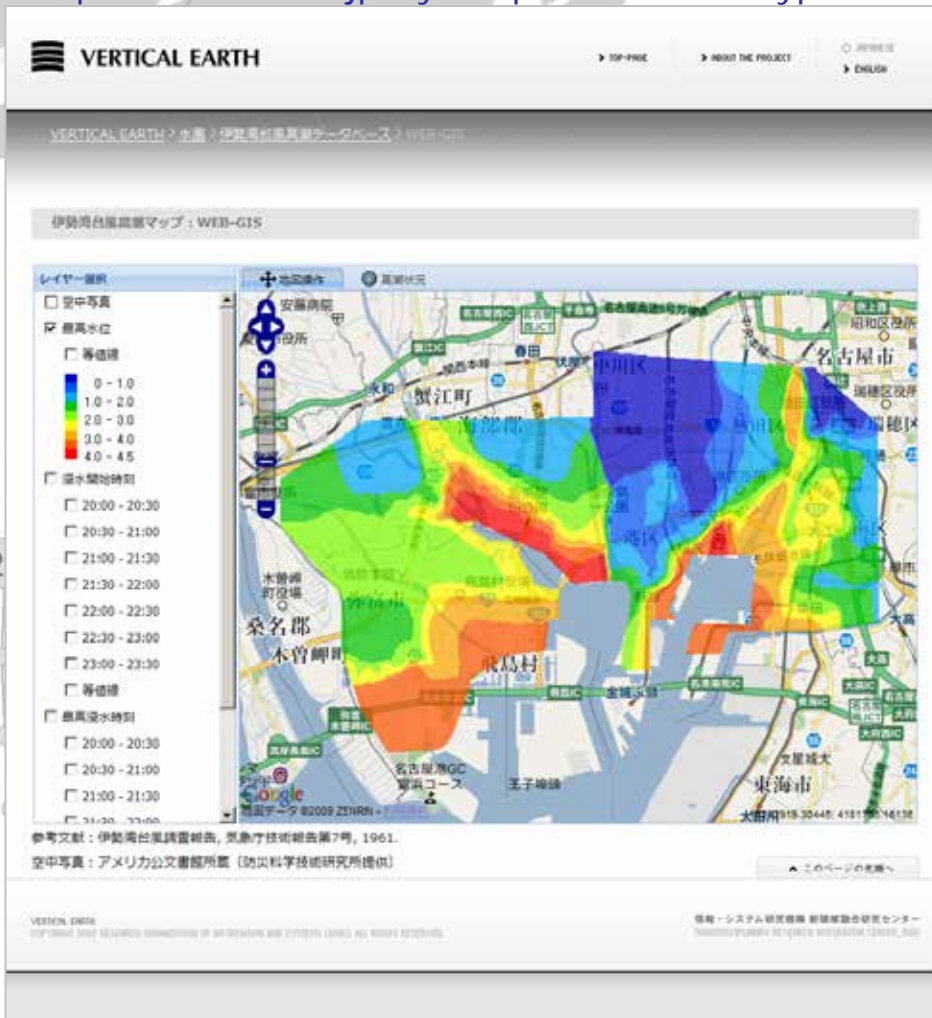
- The major affected area :  
the coast of Ise bay,  
including Nagoya City.





# Storm Tide Database

<http://earth.nii.ac.jp/hydrosphere/isewan-typhoon/>



- The onset time, highest time, and highest tide was digitized from an analog map.
- Aerial photograph was also digitized.
- Aggregated data was georeferenced.

2016/7/23

Disaster Risk Reduction in Asia

伊勢湾台風50年



# Awareness



Disaster Risk Reduction in Asia

台湾風50年



13



# GREAT EAST JAPAN EARTHQUAKE AND 311 MEMORIES



March 11, 2011

Digital archiving activity started on  
the day of the earthquake



2016/7/23

<http://agora.ex.nii.ac.jp/earthquake/201103-eastjapan/>  
Disaster Risk Reduction in Asia  
Kamaishi, Iwate, 2011/8/31

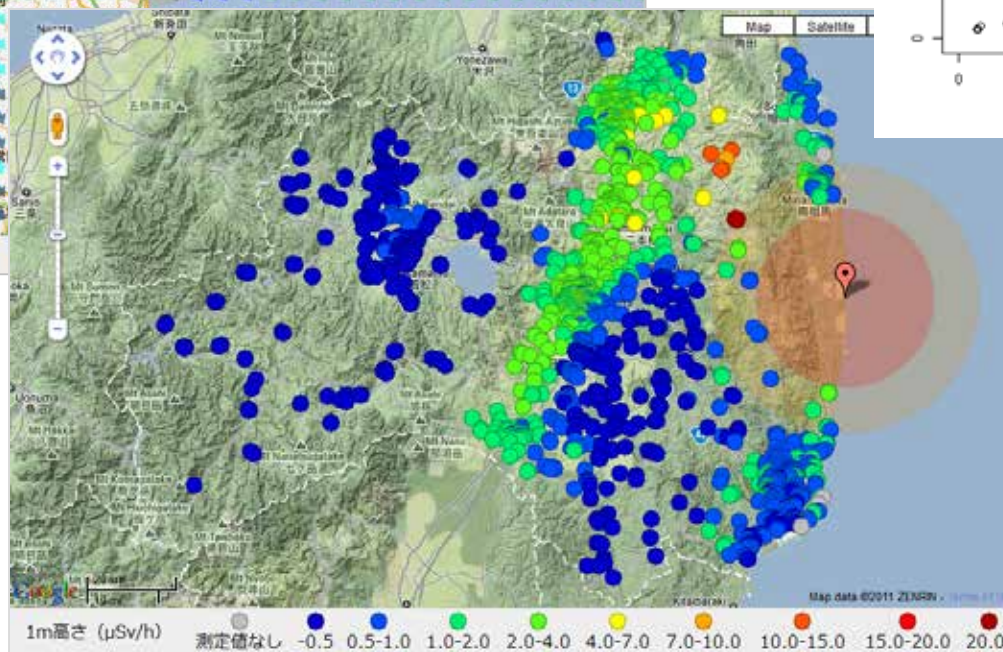
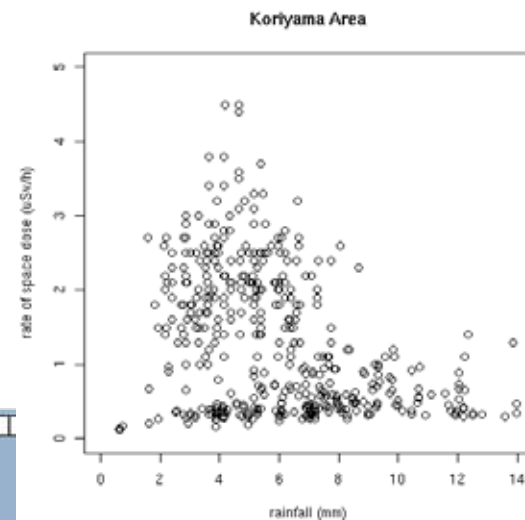


< 最初 > < -24時 > < -6時 > < -1時 > **2012-01-26 15:00 JST** < +1時 > < +6時 > < +24時 > 最後 >

地図 航空写真

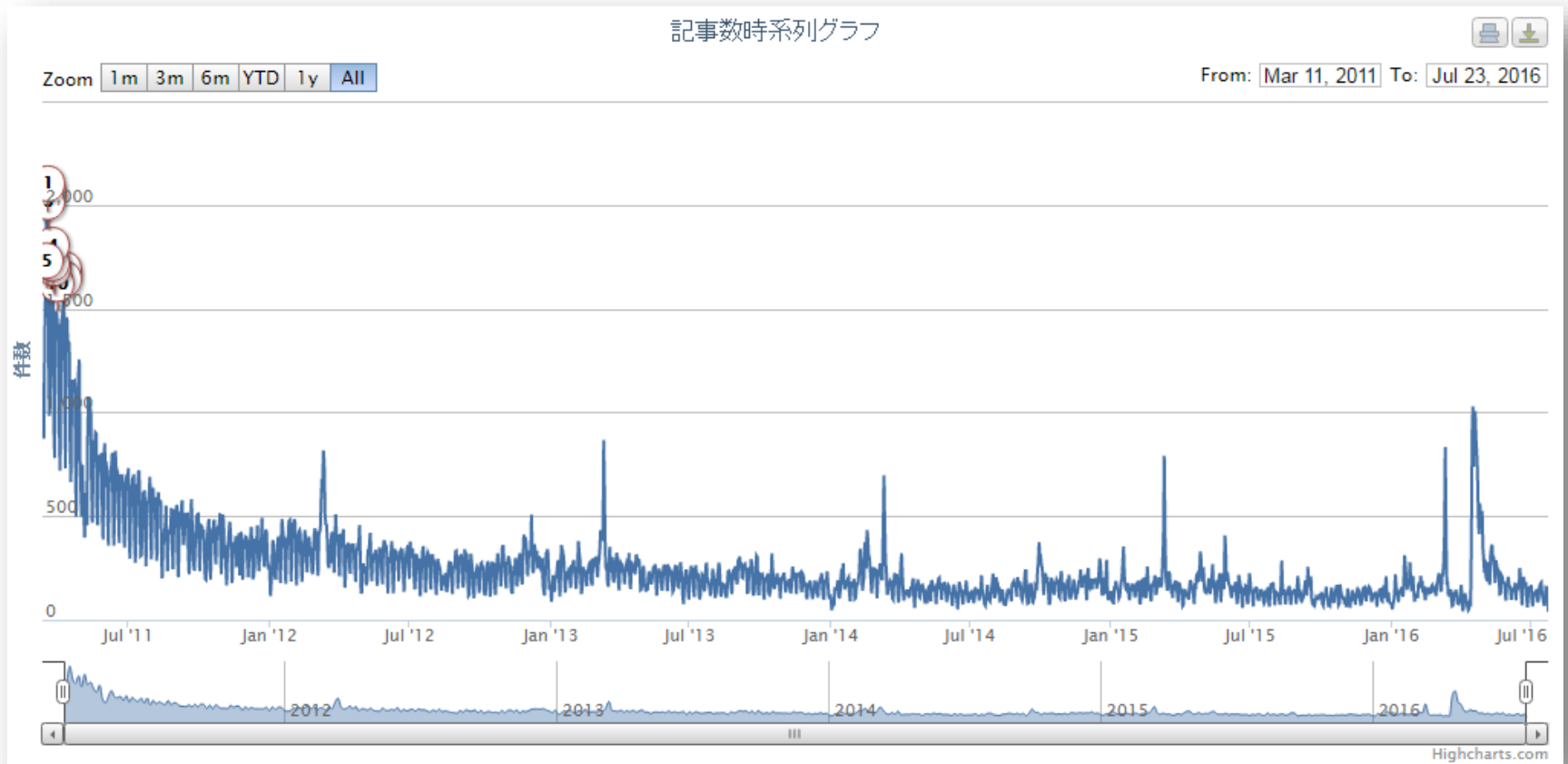
風速 Wind Speed (m/s)

3

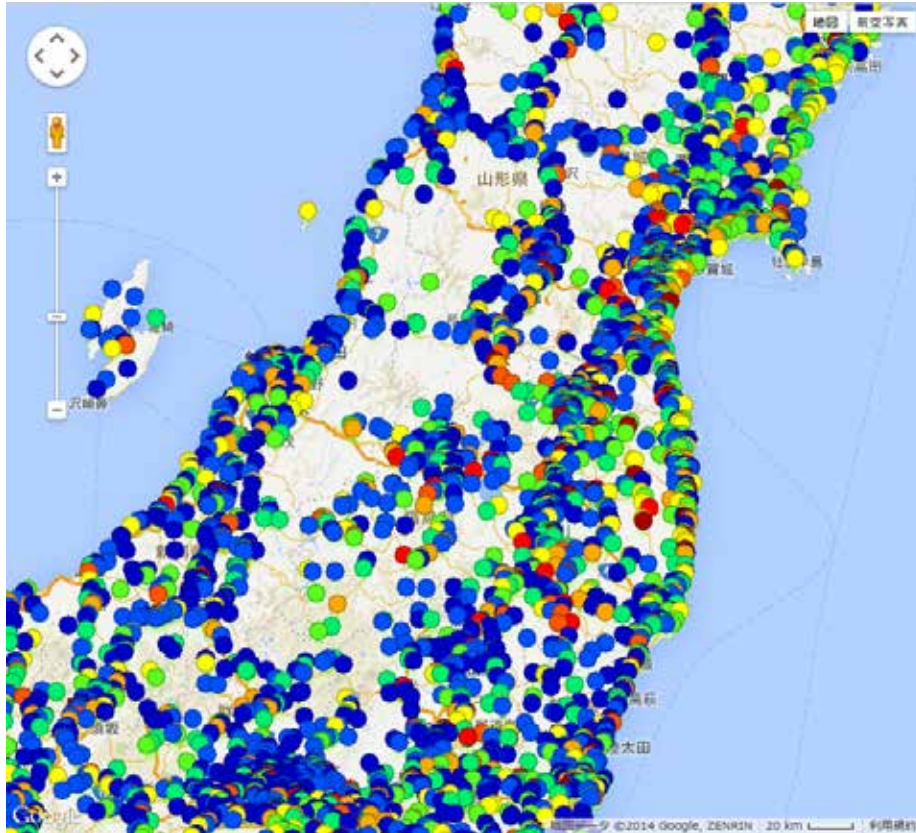
[illegible]

# Media News Archive

Daily articles from Yahoo! News since March 11.



# Spatial Mapping



News analysis: <http://goo.gl/2DZbW>

GeoNLP: <http://goo.gl/5Jq1T>

- 400,000+ online news about the earthquake were analyzed.
- GeoNLP automatically disambiguated place names in text.
- Not only the name of administrative regions, but also facility names.

# Temporal Mapping (311 Memories)

# 3D RECONSTRUCTION OF THE CITADEL OF BAM

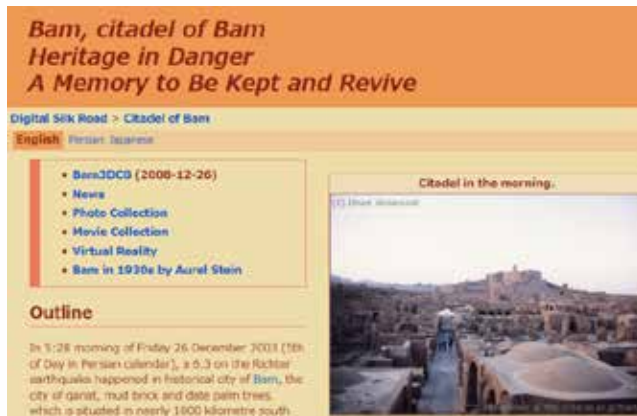


# December 26, 2003



# Project History

December 31, 2003



January 2004



April – June, 2006

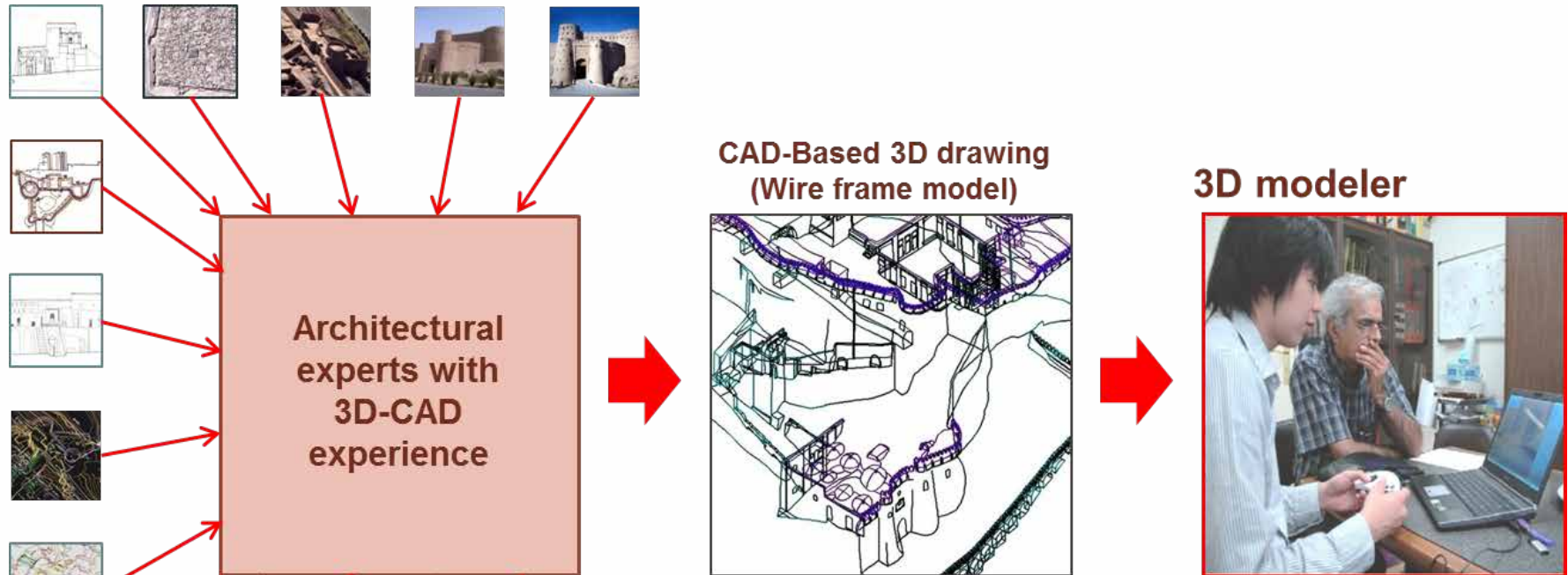


December 26, 2008



# Integration of Heterogeneous Data

**Estimating missing information is a critical problem!**





# 3D Reconstruction of Bam

# MEMORY HUNTING

# Before and After the Disaster



DailyMail online: <http://www.dailymail.co.uk/news/article-2099811/Eleven-months-tsunami-earthquake-ravaged-Japan-new-pictures-incredible-progress-multi-billion-pound-clear-up.html>



# メモリーハンティング

MemoryHunt is a mobile app to search for the location of the memory. (only Android. iOS in the future)

<http://dsr.nii.ac.jp/memory-hunting/>





# Memory Hunting at Aceh



Memory Hunt in Aceh (Collaboration with CIAS, Kyoto University, Prof. Nishi and Prof. Yamamoto, Video by Mr. Mahruza Murdani)

# Man-Made Disasters



# CONCLUSION



# Four Case Studies

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# Summary

- **Memory platform** unifies the concept of libraries, museums, and archives.
- Disaster memory platform should focus on **temporal as well as spatial dimensions**.
- **From cyber to physical world** for stimulating human actions and raise awareness.
- **Generalize case studies** to identify effective approaches for maximizing awareness.

# More Information

- **Digital Typhoon**
  - <http://agora.ex.nii.ac.jp/digital-typhoon/>
- **Isewan Typhoon Memories 2009**
  - <http://memories.eye.tc/isewan-typhoon-2009/>
- **Digital Archives of 2011 GEJ Earthquake**
  - <http://agora.ex.nii.ac.jp/earthquake/201103-eastjapan/>
- **Bam Archive**
  - <https://dsr.nii.ac.jp/bam/>
- **Memory Hunting**
  - <http://dsr.nii.ac.jp/memory-hunting/>