

# **Process Book**

## **Objective**

The objective of this project is to outline the 3 disasters that hit Japan starting in March of 2011. The first was the Tōhoku earthquake. A magnitude 9.0 earthquake that hit 70 kilometers off the coast of Japan on Friday 11 March 2011. The earthquake triggered powerful tsunami waves reaching heights of up to 40.5 metres. These waves damaged the backup generators at the Fukushima Daiichi nuclear power plant. Without generators, the plant could not maintain adequate cooling, this led to explosions and meltdowns.

This project will outline the three disasters with visualizations created from data collected during and after the events. Through the use of a timeline, each disaster will be visualized in a way that shows their impact and relationship.

## **Visualization Inspiration**

The following web pages are just some of those that have assisted us in our visualization process:

### **General Visualization Inspiration**

<http://www.visualcomplexity.com/vc/>

<http://blog.visual.ly/20-great-infographics-of-2012/>

<http://gizmodo.com/the-best-data-visualizations-of-2013-1485611407>

<http://www.informationisbeautifulawards.com/2013-winners/>

<http://flowingdata.com/2013/12/16/data-and-visualization-year-in-review-2013/>

<http://blog.visual.ly/20-great-visualizations-of-2011/>

<http://www.roadtolarissa.com/population-division-fullscreen.html>

[http://www.nytimes.com/interactive/2014/03/25/us/smoking-rate-map.html?\\_r=1](http://www.nytimes.com/interactive/2014/03/25/us/smoking-rate-map.html?_r=1)

<http://blog.marinexplore.com/15-beautiful-ocean-data-visualizations/>

<http://abeautifulwww.com/2007/05/20/visualizing-the-power-struggle-in-wikipedia/>

## **Fukushima Information**

[http://www.brookings.edu/~media/research/files/reports/2012/3/natural%20disaster%20review%20ferris/03\\_natural\\_disaster\\_review\\_ferris.pdf](http://www.brookings.edu/~media/research/files/reports/2012/3/natural%20disaster%20review%20ferris/03_natural_disaster_review_ferris.pdf)

[http://www.malasrpskaprodavnica.com/user/japan/4\\_Japan\\_2\\_0/page.jsp](http://www.malasrpskaprodavnica.com/user/japan/4_Japan_2_0/page.jsp)

[http://www.tawakilagi.com/?attachment\\_id=8318](http://www.tawakilagi.com/?attachment_id=8318)

<http://www.theguardian.com/world/gallery/2011/mar/14/japan-tsunami-aftermath-in-pictures?picture=372611737>

<http://www.fukushima.ans.org>

<http://www.forbes.com/sites/jamesconca/2014/03/16/radioactive-fukushima-waters-arrive-at-west-coast-of-america/>

<http://brunologreco.blogspot.ca/2011/03/earthquake-tsunami-nuclear-crisis.html>

<http://nursing.stanbridge.edu/?p=9554>

<http://www.theguardian.com/world/gallery/2011/mar/14/japan-tsunami-aftermath-in-pictures?picture=372611717>

<http://www.csmonitor.com/Environment/Energy-Voices/2013/1101/After-Fukushima-Japan-divided-over-future-of-nuclear-energy>

<http://www.gallup.com/poll/153452/americans-favor-nuclear-power-year-fukushima.aspx>

<http://safetyfirst.nei.org/wordpress/wp-content/uploads/2012/01/splash.swf>

<http://www.world-nuclear-news.org/RS-Novel-study-puts-Fukushima-doses-into-perspective-2502147.html>

<http://www.engineerlive.com/content/23349>

<http://www.afterchernobyl.com/#about>

<http://www.independentaustralia.net/life/life-display/fukushima-cancer-spike-and-nuclear-industry-denial,5960>

<http://www.nature.com/bjc/journal/v104/n1/full/6605967a.html#bib12>

<http://ajw.asahi.com/article/0311disaster/fukushima/AJ201402080047>

<http://www.abc.net.au/news/2014-03-10/plan-to-send-residents-back-to-fukushima-meets-opposition/5311046>

[www.brookings.edu/blogs/up-front/posts/2013/03/11-japan-earthquake-ferris-solis](http://www.brookings.edu/blogs/up-front/posts/2013/03/11-japan-earthquake-ferris-solis)

<http://www.scidev.net/global/climate-change/feature/nuclear-power-after-fukushima-facts-and-figures-1.html>

<http://blogs.reuters.com/edward-hadas/2012/03/07/the-lesson-of-fukushima/>

[www.msnbc.com/msnbc/us-invests-big-nuclear-power](http://www.msnbc.com/msnbc/us-invests-big-nuclear-power)

<http://ajw.asahi.com/article/0311disaster/fukushima/AJ201402080047>

<http://www.japantimes.co.jp/life/2013/03/10/people/two-years-on-fukushima-evacuees-seek-justice-and-a-normal-life/>

<http://www.accuweather.com/en/weather-news/top-5-most-expensive-natural-d/47459>

<http://www.umcor.org/UMCOR/Resources/News->

<Stories/2014/March/0311japanlongrecovery>

<http://jungminjamiekim.blogspot.com/>

<https://lh3.ggpht.com/->

[wYskuLgLTc/TdY04u7k8MI/AAAAAAAAABQ/FiWOMKQhJEO/s1600/gss-110311-japanquake-01\\_grid-12x3.jpg](wYskuLgLTc/TdY04u7k8MI/AAAAAAAAABQ/FiWOMKQhJEO/s1600/gss-110311-japanquake-01_grid-12x3.jpg)

[https://lh3.ggpht.com/-ifQwXSf5MMw/TdYhUTKqFSI/AAAAAAAAAAo/O6lgKbw1zig/s1600/ss-110312-japan-quake-day2-24\\_ss\\_full.jpg](https://lh3.ggpht.com/-ifQwXSf5MMw/TdYhUTKqFSI/AAAAAAAAAAo/O6lgKbw1zig/s1600/ss-110312-japan-quake-day2-24_ss_full.jpg)

[https://lh3.ggpht.com/-d3Ym\\_iz3Prs/TdYhVsvKMeI/AAAAAAAAAAs/pVigDNhWjCE/s1600/ss-110314-japanQuake-jc-12\\_ss\\_full.jpg](https://lh3.ggpht.com/-d3Ym_iz3Prs/TdYhVsvKMeI/AAAAAAAAAAs/pVigDNhWjCE/s1600/ss-110314-japanQuake-jc-12_ss_full.jpg)

[www.ibtimes.com/womens-world-cup-victor-japans-suffering-and-glory-touching-stories-behind-scene-645877](http://www.ibtimes.com/womens-world-cup-victor-japans-suffering-and-glory-touching-stories-behind-scene-645877)

<http://www.asianaccess.org/a2blog/gallery/6/tsunami-damaged-wall.jpg>

<http://thekaufmannpost.net/on-the-triple-disaster-in-japan-governance-and-the-earthquake-tsunami-and-nuclear-crises/>

<http://megsnogginbloggin.wordpress.com/2011/03/15/the-frailty-and-resiliency-of-the-human-condition/>

<http://shineyourlight-shineyourlight.blogspot.com/2011/03/7-rescue-and-recovery-under-nuke.html>

<http://www.accuweather.com/en/weather-news/top-5-most-expensive-natural-d/47459>

<https://www.who.edu/oceanus/feature/japan-triple-disaster>

<http://www.japan-talk.com/jt/new/21-scary-statistics-about-the-2011-japan-earthquake>

## **Fukushima Photos**

[http://www.travelskyline.net/wallpapers/aizuwakamatsu\\_castle\\_fukushima\\_japan-1600x1200.jpg](http://www.travelskyline.net/wallpapers/aizuwakamatsu_castle_fukushima_japan-1600x1200.jpg)

<http://megsnogginbloggin.files.wordpress.com/2011/03/man-helps-baby.jpg>

## **Japan Visualizations**

<http://jciv.iidj.net/map/fukushima/>

<https://worldmap.harvard.edu/japanmap/>

<http://www.nytimes.com/interactive/2011/03/13/world/asia/satellite-photos-japan-before-and-after-tsunami.html>

## **Target Audience**

The audience for this project is anyone who is interested in the events that led up to the nuclear meltdown at the Fukushima power plant. Through the use of the visualizations, the project will create a storyline that will outline all three disasters and how they are related.

Our intention is to present this data in a summarized format that is recognizable by everyone so that it can be used to influence important decision-making processes.

## **Earthquake/Tsunami/Nuclear Map Visualization**

We have created a preliminary primary visualization depicting sample earthquake, tsunami and radiation data from our data collection. (Please see “visualizations/googlemap.html” and “website/fukushima website rough draft.jpg” for visualization placement.)

We may choose to style certain data differently as the project progresses, complete the legend, and expand upon slider functionality. We also plan to include narratives and multimedia elements for each event in this map to provide background information and help bridge the information together for our readers.

## **Japanese Polling Visualization**

Our main visualization will be a mapping of disaster data pertaining to the Triple Disaster. However, because we are excited about this topic and because we believe our work can influence the world in positive ways, we are producing more than one visualization for our website.

We are currently working on collecting survey data from the Japanese to produce yet another visualization. The survey questions will be offered in Japanese and English and placed on a compelling website that we are marketing online to the Japanese. We have experience in marketing similar websites. This website will be sharable via Facebook, Twitter, LinkedIn and other social media platforms. We are collecting this data over the period of the next two weeks. The survey questions are as follows:

1. What is your age?

a. Number

2. What is your gender?

a. Male

b. Female

3. In which prefecture do you currently reside?

a. List of prefectures

4. What is the highest level of education you have completed?

a. High school

b. Some college

c. College graduate

d. Graduate school

e. Professional degree

(Note: If university-level is indicated, Japanese .edu email verification will be optional and included in data.)

5. What is your income?

a. Number

6. What is your ISP? (Note: Will not appear as question. Useful for determining spam responses. IP/ISP data will be obtained automatically from PHP query.)

7. Were you involved in the Japan Triple Disaster?

- a. Yes
- b. No

8. (If so), what was your level of involvement? (Check all that apply)

- a. Displaced from home
- b. Injured friend/family
- c. Missing friend/family
- d. Death of friend/family
- e. Income change due to disaster

9. If you experienced an income change as a result of the disaster, please enter before and after income.

- a. Before Income
- b. After Income

(Note: Most involved have lost significant income as a result of the disaster.)

10. If you were displaced, please select the prefecture in which you resided before the Triple Disaster.



- a. List of prefectures

11. Do you support the continued production of nuclear power in Japan?

- a. Yes
- b. No

(Background note: Three years ago, Japan swore off nuclear power. But now after a recent election, the Nuclear Regulation Authority plans to restart the previously closed NPPs after safety checks. A [recent survey](#) indicated 19 percent approved, 45 percent disapproved and 32 percent were undecided.)

12. Do you support the continued production of nuclear power in Fukushima?

- a. Yes
- b. No

(Note: The Japanese government has recently planned to restart the power plant in Fukushima, despite the fact that it is in a location that has been known for “great” Tsunamis over the course of Japanese history [Please see “website/fukushima website rough draft.jpg” for initial story on 700 year old stone warning about occupation of Fukushima area.]

13. How did TEPCO handle the nuclear situation?

- a. Scale of 1-10

14. Do you agree with the government's recent decision to lift the evacuation order of the no-entry zone around Fukushima?

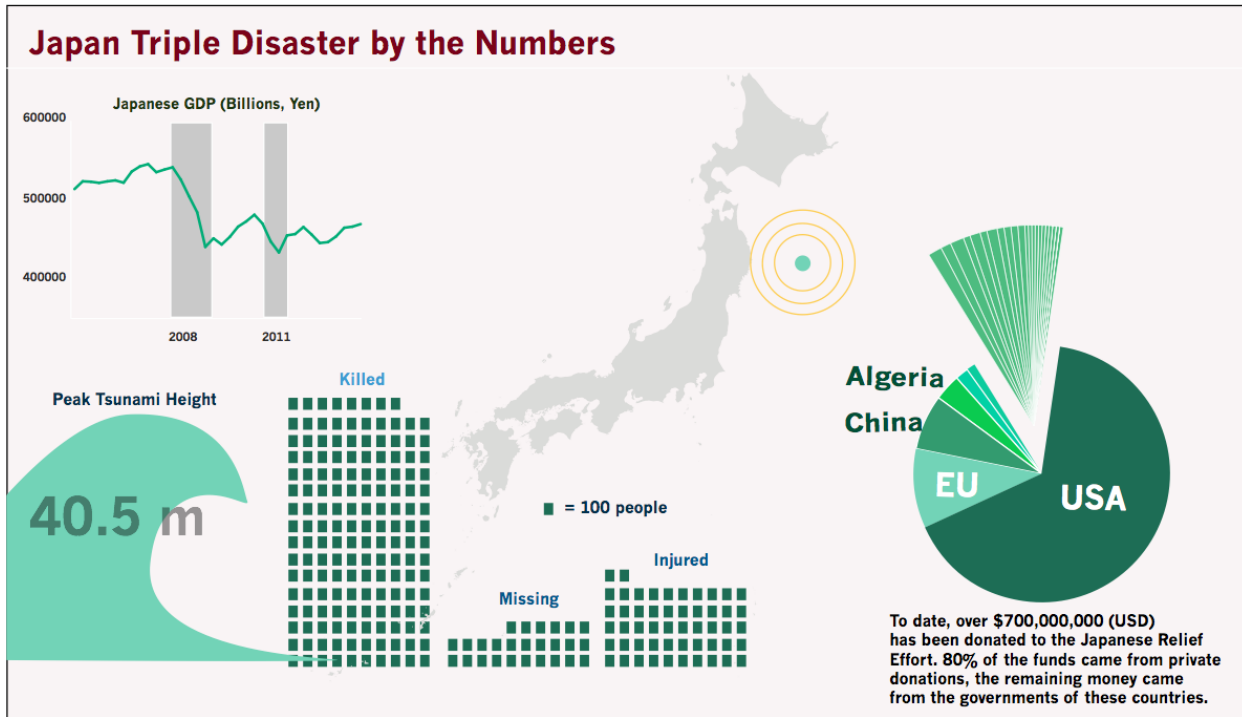
- a. Yes
- b. No

(Note: Japan lifted the evacuation order this month on part of the no-entry zone around the crippled Fukushima plant for the first time since the nuclear disaster struck three years ago. But many evacuees say they won't return, citing fears over radioactive fallouts.)

Please refer to "website/fukushima website rough draft.jpg" for visualization placement.

## **Statistics Visualization**

To further explore the impact of the triple disaster (earthquake, tsunami, and nuclear meltdown), we will create an infographic style presentation of various statistics related to the disaster, as well as how Japan compares to other countries that have experienced disasters.



(A static mock-up of our visualization)

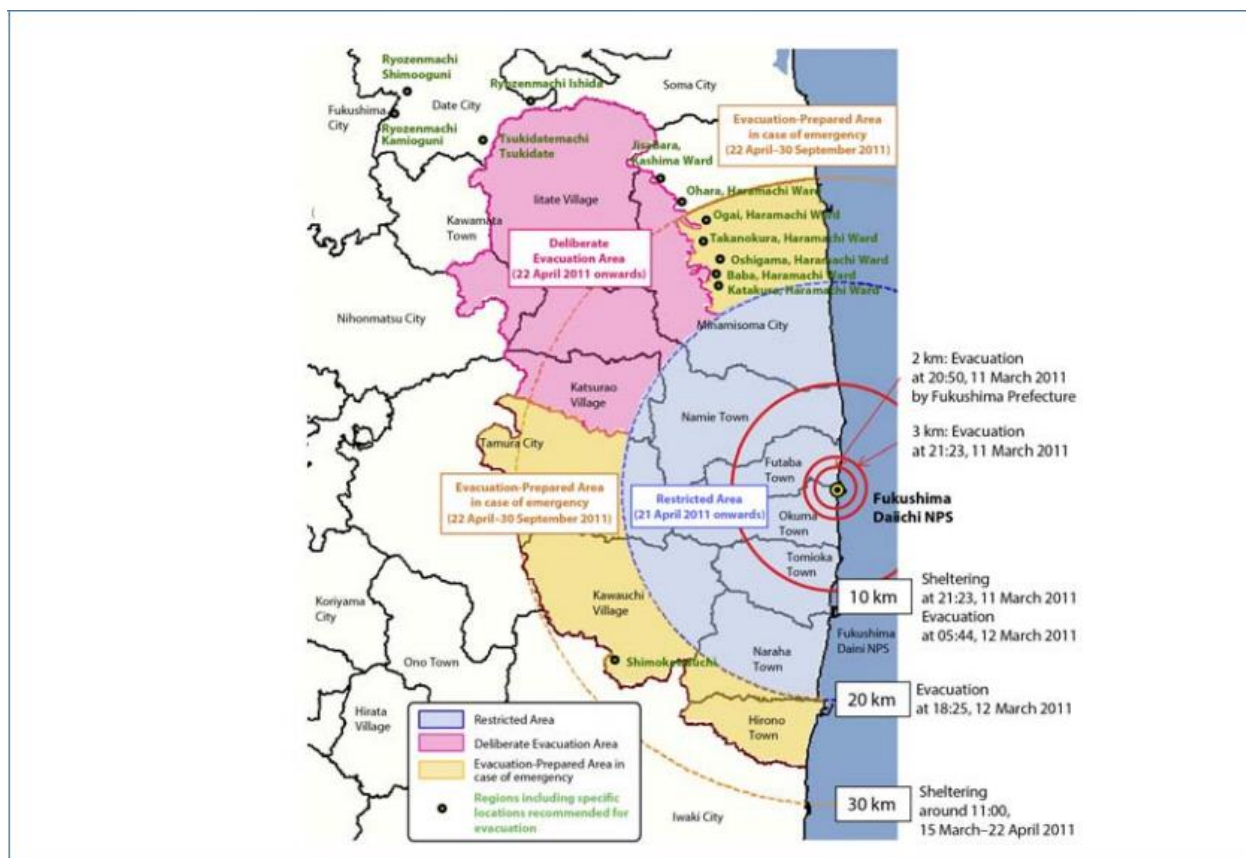
Japan's triple disaster is an interesting case because of Japan's wealth and industry. While the death toll of the disaster was high (15,000+ lost their lives), it does not even make it on to the list of the 10 deadliest disasters. Contrastingly, the Haitian earthquake of 2010 and the Indian Ocean tsunami of 2004 both claimed almost a quarter million lives, but their reported economic losses were substantially lower than that of Japan's. Highlighting these

disparities will allow the audience to gain a perspective not commonly shown in the media.



(A static visualization from The Economist)

The interactive nature of our project will be largely contained in the mapping of the triple



disaster, but we will try to incorporate some interaction into the infographic to maintain the audience's attention.

We also plan to show the Fukushima evacuation zone and the number of people in shelters/temporary housing due to the nuclear emergency.

The data we plan to present is:

Japan GDP trends-- shows the macroeconomic impact of the event ( [FRED, St. Louis Fed](#))

Private and government aid donations ([UN OCHA](#) )

Damage, casualty, and injuries data: ([Japan National Police](#))

Costliest disasters: ([Munich Re](#))

Deadliest disasters: ([Munich Re](#))

Evacuation / Shelter data: ([CatDat](#))

## **Fukushima Website Donation Visualization**

Once our main visualizations and website is complete, we will be marketing our website domain to the general public via social media and search engines. There are a few online APIs which make fund-raising simpler. We will be placing highly visible donation links on our website and hooking our website up to one of these donation APIs. We will then create a visualization that pulls the donation data via API and displays the donations realized from our website over time.