



# Killer waves on the airwaves: New media, traditional media, and student conceptualization of tsunamis

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## INTRODUCTION

This paper addresses the hypothesis that, after 26 Dec. 2004, media coverage, and more specifically “new media,” affected students’ understanding of, and interest in, tsunamis. To test this hypothesis, 13 years of media reports on tsunamis were reviewed and 146 students surveyed regarding their knowledge of the phenomenon in the aftermath of the 11 March 2011 Japan earthquake and tsunami.

## BACKGROUND

The overarching goal of science educators is the achievement of scientific literacy (National Research Council, 1996). The means for achieving it vary, but it has been suggested that covering material relevant to students’ lives (Cervato et al., 2009, and references therein) and leveraging students’ fascination about natural disasters help them develop deeper understandings of these phenomena (e.g., Welch, 2006). Lee (1999) studied Florida children’s conception of hurricanes after they experienced Hurricane Andrew in 1992. She argued that since learning through personal experience may lead to understanding that is not compatible with the nature of science or scientific knowledge, it is important to be aware of students’ ways of knowing and thinking about science.

Students who do not live in areas impacted by natural disasters learn about these events through news media, movies, or in school (e.g., Parham et al., 2011). A study of the impact of news media on students’ understanding of earthquakes (Barrow and Haskins, 1996) suggests that while mass media expose them to the cause and effects of earthquakes more than direct experience, the focus of media on large, devastating events can fuel the misconception that tectonic plates move only rarely.

Since Barrow and Haskins’s (1996) study, the spectrum of mass media has expanded from print and TV and radio broadcasting to include “new media,” such as YouTube and other Internet sources. Houston et al. (2008) found that while reports of Hurricane Katrina and other disasters represent teachable moments for youth, their portrayal in the media has been so influential as to cause post-traumatic stress symptoms in younger viewers.

## TSUNAMI IN NEW AND TRADITIONAL MEDIA

To test whether the media deserve credit for the sudden increase in worldwide concern regarding tsunami, the occurrence of the term “tsunami” in major world publications since December 1997 using the LexisNexis Academic news database was collected.

The major world publications file of LexisNexis includes more than 700 news sources known for their content reliability. The search protocol for this study approximates the method used in a more general study of occurrences of geoscience terms in the news (Cervato et al., 2009), though the search was restricted to the topic “natural disasters” to exclude non-geologic usages of *tsunami*. Out of 309 occurrences in a random 14-day period in February 2011, 87 (28%) were categorized under “natural disasters”; others were in categories as varied as “elections” and “health and medicine.”

Pre–December 2004 data were collected for one-year intervals. Beyond 26 Dec. 2004, daily averages were computed within three-month bins (Fig. 1). To capture the effect of the 11 Mar. 2011 tsunami, the Dec. 2010 to Mar. 2011 period is plotted twice: once from 11 Dec. 2010 to 10 Mar. 2011 and once from 29 Dec. 2010 to 28 Mar. 2011.

Prior to 2004, the most recent significant tsunami event occurred on 17 July 1998 in Papua New Guinea, sparking 1.38 average daily news reports over one year. Afterward, tsunami reports averaged <1 per day until 26 Dec. 2004. In the two weeks thereafter, the term occurred 12,530 times (835 daily average occurrences). The daily occurrence until Mar. 2005 was 161. In the following year, this gradually declined to ~30. After the one-year anniversary of the Sumatra event, coverage stayed at ~15 reports per day, rising slightly when three other tsunamis hit the news. The M9.0 earthquake near Japan on 11 Mar. 2011 generated a tsunami wave across the Pacific Ocean and a wave of media interest comparable yet smaller than the one at the end of 2004: 9194 news reports in the 14 days following the event—an average of 656 daily reports.

The 2004 event coincided with the birth of YouTube, which made its official debut in November 2004, meaning dozens of amateur videos taken by tourists who witnessed the event were suddenly readily available on the Internet.

Google Earth, another new media source released in 2005, allows people to visualize the effects of natural disasters with unprecedented speed and detail. While “before and after” satellite images of areas affected by the 2004 tsunami were posted on the NASA site 15 days after the event (<http://tinyurl.com/3sxhuwg>), Google Earth released higher resolution pre- and post-event images of the 2011 Japan tsunami less than two days after the event (<http://tinyurl.com/49arhx9>).

Widespread coverage of tsunamis in the media coincided with deeper coverage of tsunamis in many introductory geoscience curricula, as suggested by the jump from two pages in the first edition of an introductory geology textbook (Marshak, 2001) to five pages in the third edition (Marshak, 2008).



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