

## The Impact of Japan's March 11th Earthquake and Tsunami on Libraries and the Conduct of Research and Publications in Japan

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# The Impact of Japan's March 11<sup>th</sup> Earthquake and Tsunami on Libraries and the Conduct of Research and Publications in Japan

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## Abstract:

On March 11, 2011, a great earthquake struck northeastern Japan. For the libraries at the two campuses of the National Institute of Materials Science in Tsukuba, the biggest problems resulting from the earthquake were thousands of books being thrown off shelves and damage to electronically controlled bookshelves. Following weeks of aftershocks, the Japanese government instituted a program to reduce electricity usage and to slash all government spending. This affected all publicly-funded research institutes. Other negative consequences of the earthquake were that many overseas researchers and students returned to their own countries, and the remaining researchers were forced to spend a higher proportion of their working lives at their desks while waiting for experimental facilities to be repaired—in some cases for at least a year. The damage caused by the earthquake to physical infrastructure clearly shows how vital it is to digitize a library's resources. Social networks such as Twitter proved to be very useful in keeping researchers informed about library services. I believe that in the future, it will be increasingly important for libraries to: (1) make their resources available on the Internet, (2) decentralize resources, and (3) establish interoperability with other libraries.

## 1. Effect of great earthquake and libraries in Japan

This year, a massive 8.9 earthquake struck Japan on March 11. The earthquake produced an enormous tsunami which devastated the Tohoku region in northeastern Japan. This region is still experiencing major aftershocks (Figure 1). Many volunteers are continuing to work in this region to help rebuild the affected towns, and to help return the lives of the

survivors to some semblance of normality. Many of the libraries in this region were seriously damaged, and people are still in the process of cleaning and repairing damaged books, and in restoring normal library services. As a result of the work of the volunteers, web portals have been established by librarians to ask for more assistance and to report on the recovery process to the Japanese community<sup>1-5)</sup>.

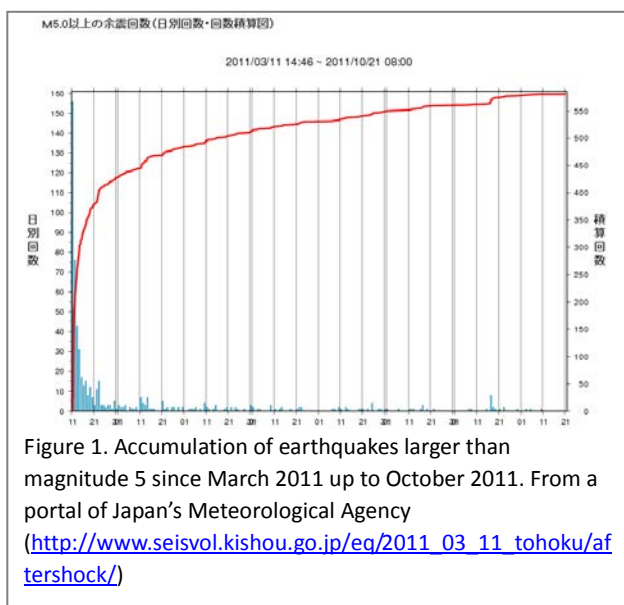


Figure 1. Accumulation of earthquakes larger than magnitude 5 since March 2011 up to October 2011. From a portal of Japan's Meteorological Agency ([http://www.seisvol.kishou.go.jp/eq/2011\\_03\\_11\\_tohoku/af\\_tershock/](http://www.seisvol.kishou.go.jp/eq/2011_03_11_tohoku/af_tershock/))

The library of the National Institute for Materials Science (NIMS), Japan, where the author works, is located some 240 km from the epicenter of the earthquake. This library suffered relatively little damage, but even with the help of a group of research and admin colleagues, it still took a

month to re-shelve the hundreds of books which had been thrown to the floor when the earthquake struck. (Figure 2) Other volunteers initiated a project to repair damaged books, and they are still active in this work.



Figure 2. Library of National Institute for Materials Science (NIMS) on March 11, 2011

The earthquake also seriously damaged a lot of sensitive experimental equipment, and interrupted experiments in progress. While researchers were waiting for equipment to be repaired or replaced, they were unable to continue with their experimental work, and therefore had time to catch up with their reading. A number of major publishers offered NIMS assistance in the form of free access to their journals and databases, and Tokyo University established a unified authentication system that allowed library consortia member universities to access their online journals. It quickly organized an interoperable collaboration between university libraries and those of academic societies and commercial publishers.

One major problem caused by the earthquake was widespread power blackouts. As a result, servers in areas of Japan shut down, and in those areas institutional internal networks and access to the internet were cut off for a week. Due to the crisis at the nuclear power plant in Fukushima following the earthquake, the government was forced to establish systems to conserve electricity for several months. Restrictions on power usage led to the loss of normal internet services. However, cell phone services were usually maintained throughout blackout periods, so many librarians were able to use

cell phone-based internet services, not only for internal communications, but also for the distribution of information about library services to users. The use of social networking eventually led to the creation of a wiki-based portal site for librarians, where ideas about recovery could be shared and archived<sup>2,3)</sup>.

One positive consequence of this disaster was that it made clear to librarians the value of converting library resources into a digital format and in having those e-resources kept online on servers remote from the library. For example, the library at NIMS lost gateway services during blackouts and while damaged servers were being restored, but most of its e-resources continued to be accessible from employees' homes and from many public places. Publishers' apps for tablet devices were also found to be a useful alternative to the library's gateway. Clearly, it is not practical or desirable to host all library services at NIMS in case of such emergencies. The disaster made clear the importance of establishing a centralized online library, perhaps hosted overseas, which will allow continuous online access to e-resources belonging to Japanese organizations. Judging from other disasters around the world, such universal library services will be essential in the future.

## 2. Research and Publication in Japan

### (1) Research and Institutional Repository

During the period 2008 – 2010 NIMS developed an institutional repository, NIMS eSciDoc in partnership with the Max Planck Digital Library. Our aim was for this repository to serve as a research-oriented digital library rather than simply as a replacement collection of subscription journals. NIMS eSciDoc was designed to focus on researchers' needs by providing: (i) a self-archiving library, (ii) a system to

facilitate outreach for research projects, (iii) individual homepages for researchers and (iv) a directory service for researchers. The directory service created by NIMS, called SAMURAI (Figure 3), had over 450,000 page-views in the last year. NIMS has added to NIMS eSciDoc other digitized library materials, such as monographs, research reports, reprints of papers, etc. Researchers at NIMS were also invited to contribute their research materials in print or in digital form, and most of these materials are included in NIMS eSciDoc.

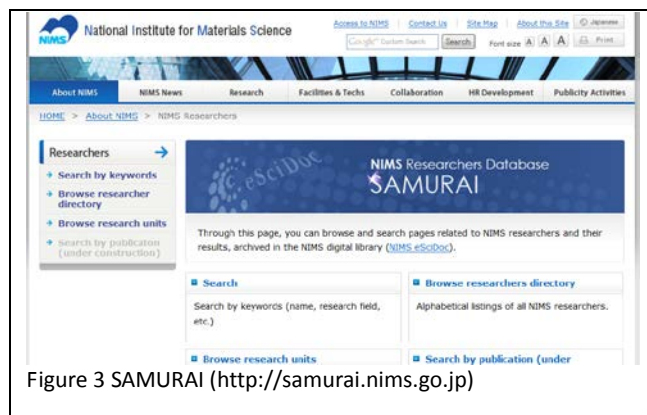


Figure 3 SAMURAI (<http://samurai.nims.go.jp>)

### (2) Research and Publishing

The significance and value of the open-access model of publishing, which has for some years been well understood by Japanese librarians, is now gaining greater acceptance amongst researchers. This is mainly because some major journals have now introduced open access as a publishing option for authors. However, the Japanese government and other funding agencies in Japan have not yet introduced any scheme to make open-access publishing mandatory for the research they fund. Research funding and evaluation systems in Japan are not keeping up with global developments.

NIMS publishes an open-access English-language journal, *Science and Technology of Advanced Materials* (STAM), which is free for both authors and readers. STAM is a source of timely and in-depth

information for materials scientists worldwide. It covers research in many areas of materials science, including metals, inorganic and organic materials, biocompatible materials, and nanotechnology. According to Thomson Reuters, STAM now ranks 34th out of 222 journals worldwide in the category of Materials Science & Multidisciplinary, and is ranked 1st among journals covering materials science in Japan.

For many years, there has been a large gap between librarians and researchers in terms of their understanding and therefore acceptance of the open-access model of publishing. In recent years, this gap has narrowed considerably. Japanese academic societies which publish journals are also increasingly willing to consider the idea of open access.

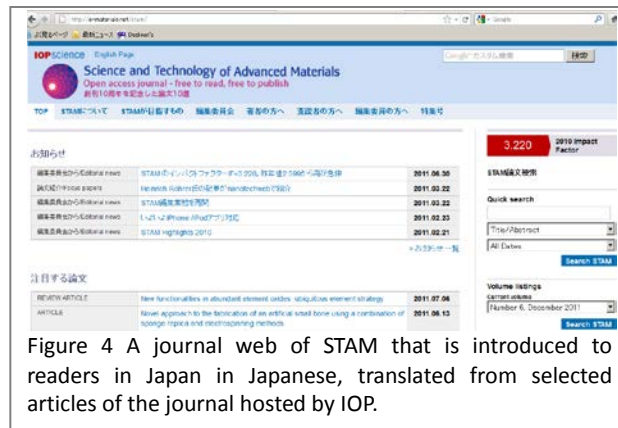


Figure 4 A journal web of STAM that is introduced to readers in Japan in Japanese, translated from selected articles of the journal hosted by IOP.

### 3. Conclusions

1. We recognize that it is increasingly important for libraries to:
2. Make our resources available in digital form on the Internet.
3. Decentralize e-resources through mirroring and collaborative hosting.
4. Establish interoperability with other libraries.
5. Manage availability of open access flexibly depending on situations under disasters.

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