Tsunamis: Geology, Hazards and Risks

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Tsunamis: Geology, Hazards and Risks

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Foreword: Geological Society of Japan

We are delighted that this Special Publication on the link between geology and tsunamis has been published by the Geological Society of London. This volume brings together a collection of the latest knowledge on tsunami deposits from various locations around the globe and of various geological ages with the results of risk modelling. We believe that this publication will not only deepen the understanding of tsunami and high-energy (e.g. storm and swell) deposits by Earth scientists but also provide basic knowledge on tsunami impact, which can benefit all those working in the fields of disaster prevention and mitigation.

It was in the afternoon of 11 March 2011 when a large earthquake struck eastern Japan. This earthquake, later called 'the 2011 earthquake off the Pacific coast of Tohoku', generated a series of large tsunami waves, which repeatedly struck the coastal region of eastern Japan. As a direct result of this disaster, more than 20 000 people lost their lives or are listed as missing. Many Earth scientists in Japan felt a great sense of remorse and responsibility that they were unable to do more to protect the many victims, and to reduce the huge damage to property and infrastructure. This sense of regret was especially poignant, because at the time of the 2011 tsunami some Earth scientists had already identified the presence of several tsunami-deposit layers showing that the coastal region of NE Japan had been repeatedly struck by large tsunamis historically. But, unfortunately, this knowledge was insufficiently reflected in either social or industrial planning. In the Japanese research community there is a heightened desire to reflect deeply on the shortcomings of the past, and to be more active in suggesting new measures and directions that can lead to geohazard prevention and mitigation. More than 6 years after the disaster in NE Japan, this thought has not changed, and it will surely help guide our research for many years to come.

The events of 2011 formed the background for the signing of a memorandum of understanding (MoU) between the Geological Societies of Japan and London. As our first collaboration, our Societies agreed to hold a pair of symposia on tsunamis and geology, the first in Kagoshima in 2014 and the second in London in 2015, each associated with a field excursion. The outcomes of the first symposium were published in a thematic section, 'Geological records of storms, tsunamis and other extreme events', of *Island Arc* (Volume 25, Issue 5, 2016), the official English language journal of the Geological Society of Japan. This new Special Publication collects outcomes of the second symposium in London, and other contributions to the study of tsunamis and their deposits.

We express our heartfelt gratitude to the editors of this Special Publication: Ellie Scourse, Neil Chapman, David Tappin and Simon Wallis. We also thank the Great Britain Sasakawa Foundation for their support of this project, and Professor David Cope for his assistance. We are also grateful to the Japanese Embassy for hosting a post-meeting reception in London.

Yoshio Watanabe
President of the Geological Society of Japan
(June 2016–present)
Yasufumi Iryu
President of the Geological Society of Japan
(June 2014–May 2016)

Foreword: Geological Society of London

With Earth's growing population clustered increasingly on coastlines, tsunami hazards are of concern worldwide. This publication stems from two linked symposia on tsunami hazards that were organized in 2014 and 2015 in Japan and the UK. The significance of these symposia is that they marked the first outcomes of a bilateral co-operation agreement between the Geological Societies of London and Japan, initiated in 2013.

The 2014 Symposium (*Tsunami and their Geological Evidence*: 14 September 2014, Kagoshima, Japan) was held as part of the Annual Meeting of the Geological Society of Japan and focused principally on the geological evidence left by tsunamis on the Pacific Rim, whilst the second Symposium (*Tsunami Hazards and Risks: Using the Geological Record*: Arthur Holmes Meeting of the Geological Society of London, 25 September 2015, London, UK) focused more on the North Atlantic and Mediterranean regions, on tsunami modelling, and on hazard and risk assessment.

The symposia were not only valuable in establishing approaches to co-operation between the two Geological Societies, but also in bringing together geoscientists and risk assessors to assess tsunami hazards in an integrated manner, with a view to facilitating more quantitative and evidence-based evaluation of their scale, nature, location and timescales.

It was a great pleasure for the Geological Society of London to welcome the President of the Geological Society of Japan and other colleagues from Japan to the London symposium in 2015. The importance of the collaboration was recognized in a post-symposium reception that was kindly hosted by the Embassy of Japan and addressed by the Ambassador.

Our considerable thanks go to the Great Britain Sasakawa Foundation for facilitating contacts in both Japan and the UK, in particular to Professor David Cope for his help and enthusiasm in moving the project forward. The Foundation provided a multi-year grant, which not only helped support travel for some participants in the two symposia and the associated field excursions in central Japan and the Shetland Islands, but also extended to other joint activities of our two Societies. I would also like to thank the Lighthill Risk Network for additional financial support for the London symposium.

The linked symposia provide a model for what we hope will be many more years of fruitful collaboration between the Geological Societies of London and Japan.

Malcolm Brown
President, Geological Society of London