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## Joint US and Japanese team launches major new earthquake study of Tokyo

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**Tokyo, 3 September, 2003 – Swiss Re today announced its sponsorship of a new scientific study, to be conducted by a joint team of US and Japanese scientists. The study aims for an improved understanding of the probability of earthquake occurrence in the Greater Tokyo area.**

The research team will apply detailed stress-transfer modelling for the first time in Japan to derive a probability assessment. Apart from its scientific focus, the results will also be beneficial for the insurance industry worldwide in their hazard assessment efforts. The study will also complement the comprehensive, government-sponsored seismic hazard map of Japan currently in development.

The study will be led by Ross Stein of the US Geological Survey (USGS) and Shinji Toda of the Active Fault Research Center (part of the former Geological Survey of Japan). Key participants also include Kenji Satake of the ARFC, Yoshimitsu Okada of the National Research Institute for Earth Science and Disaster Prevention (NIED), and Wayne Thatcher, Fred Pollitz, Tom Parsons, Bill Bakun, Jim Dietrich and Marleen Nyst of the USGS.

The scientific objective of this study is to develop a comprehensive description and understanding of earthquake occurrence in Greater Tokyo, which will lead to probability forecasts for large earthquakes striking the region in the years to come. Achieving this goal relies on a unique collaborative effort, uniting specific Japanese capabilities with data resources and expertise in advanced stress-transfer calculations already successfully applied for California and other seismic-prone regions of the world, such as Turkey.

Swiss Re's chief risk officer Bruno Porro said, "By fostering cooperation between some of the leading scientific institutions in Japan and the US in the field of geological hazards, we hope not only to improve the global knowledge base on Japanese earthquake risks, but also to provide greater impetus for cutting-edge products such as catastrophe bonds – a large number of which have originated from Japan."

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Initial work on the Swiss Re-sponsored study began in May 2003, and results are expected to be published for public and scientific community reference before the end of 2004. A summary of the research aims and methods, as well as more information on stress-transfer modelling, is available in Japanese and English from <http://www.swissre.com> (under Research & Publications/ Swiss Re Top Topics / Natural Catastrophes).

## **Notes to Editor**

### **About Japan and Earthquakes**

Japan is among the most seismically active countries in the world, and together with California, the most-studied of earthquake-prone areas. The devastating 1995 Kobe earthquake greatly accelerated relevant research efforts. A landmark project is being conducted by the Japanese government and led by the Committee for Study on Seismicity and Seismic Hazard to create a comprehensive seismic hazard map of Japan (publication by mid-2005). The research team and Swiss Re intend that the sponsored study complement and contribute to this project.

Tokyo is one of the world's most densely populated metropolitan areas with a high concentration of residential and commercial buildings as well as industrial facilities. For any property insurer writing Japanese property exposure, a major earthquake in Tokyo is one of the key loss scenarios for which to be prepared. In 1923, the Greater Tokyo region suffered one of the world's most destructive earthquakes, known as the Great Kanto earthquake, resulting in 143,000 fatalities, destroying two-thirds of Tokyo, and all of Yokohama. Today, the population of Greater Tokyo is six times larger than it was in 1923. A repeat of the Great Kanto earthquake would cause uncounted casualties and enormous property damage.

Swiss Re is one of the world's largest reinsurers of natural hazard risk. It recently published an updated guide on natural catastrophe assessment for underwriters, entitled *Natural catastrophes and reinsurance*. Every year, the company's Economics Research team publishes an annual edition of *sigma*, the leading journal on economic trends in the insurance industry, devoted to natural catastrophes. Both are available from <http://www.swissre.com>.

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## Swiss Re

Swiss Re is one of the world's leading reinsurers and the world's largest life and health insurer. The company operates through more than 70 offices in over 30 countries. Swiss Re has been in the reinsurance business since its foundation in Zurich, Switzerland in 1863. Through its three business groups Property & Casualty, Life & Health and Financial Services, Swiss Re offers a wide variety of products to manage capital and risk. Traditional reinsurance products, including a broad range of property & casualty as well as life and health covers and related services, are complemented by insurance-based corporate finance solutions and supplementary services for comprehensive risk management. Swiss Re is rated "AA" by Standard & Poor's, "Aa1" by Moody's and "A++" by AM Best.

## About the research team

**Ross Stein** (*Principal Investigator*) is a geophysicist at the U.S. Geological Survey. He received his Ph.D. from Stanford University in 1980, and was Observatory Post-Doctoral Fellow at Columbia University in 1981. Stein is a Fellow of the American Geophysical Union and the Geological Society of America, and was an Editor of the *Journal of Geophysical Research—Solid Earth & Planets* in 1986-1989. Stein received the Eugene M. Shoemaker Distinguished Achievement Award of the USGS in 2000. He has co-authored three papers on Japanese earthquakes. Stein led the cooperative R&D Agreement between Swiss Re and the USGS focused on the likelihood of an earthquake damaging Istanbul.

**Shinji Toda** (*Principal Investigator*) is a scientist in the Fault Modeling Team of the Active Fault Research Center, Geological Survey of Japan, National Institute of Advanced Industrial Science and Technology. Toda received his Ph.D. from Tohoku University in 1999. He was a Visiting Scientist at the U.S. Geological Survey during 1996-1997, and a Research Associate at the Earthquake Research Institute of the University of Tokyo during 1999-2001. Toda's study of a 2000 seismic super-swarm 150 km south of Tokyo generated significant press interest in Japan. What makes Toda unique is his skill in both paleoseismology—the identification of ancient earthquakes from geological analysis—and in geophysical modeling of Coulomb stress triggering.

**Kenji Satake** is Leader of the Earthquake Hazard Assessment Team at the Active Fault Research Center, Geological Survey of Japan, National Institute of Advanced Industrial Science and Technology. He received his Ph.D. from the University of Tokyo in 1987. He was

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a Visiting Research Associate at Caltech from 1998 to 1999, and was an Assistant Professor at the University of Michigan in 1990-1995. He has been at the Geological Survey of Japan since 1995. Satake is well known for developing a robust method to invert tsunami waveforms for the study of earthquake source process. He has used tsunami as well as seismic, geodetic, and historical data to study great earthquakes in subduction zones and undersea landslides.

**Yoshimitsu Okada** has directed much of the earthquake research carried out by the Japanese government for the past 15 years. Remarkably, he is also author of two of the most widely cited papers in all of geophysics and seismology. Since 2001, Okada has been Director of the Strategic Planning Department for the National Research Institute for Earth Science and Disaster Prevention (NIED), and was previously Director of the Earthquake Research Center of NIED. Since 1996, he has been a member of The Panel on Earthquake Research for the U.S.-Japan Development and Utilization of Natural Resources. Since 2001, he has been Vice President of the Coordinating Committee for Earthquake Prediction for the Japanese government. He presides over the NIED seismic network of Tokyo.