

YOUNG PROFESSIONALS VIRTUAL FORUMS (YPVF)
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SATELLITE-BASED SYNTHETIC APERTURE RADAR (SAR) APPLICATIONS TO THE 2011
JAPAN TOHOKU EARTHQUAKE AND TSUNAMI**Abstract**

On March 11, 2011 the Great Tohoku Earthquake and Tsunami that occurred approximately 70 kilometres off the coast of Japan caused catastrophic devastation. Tohoku was the most powerful earthquake to hit Japan, followed by the tsunami, with the total damage resulting in the most expensive natural disaster in world history. The applications and benefits of satellite-based synthetic aperture radar (SAR) for disaster management and decision support following the 2011 Japan Tohoku Earthquake and Tsunami are presented. The basic principles of radar are described, along with its benefits as a tool for disaster management, including the applications of SAR interferometry (InSAR) to the Tohoku Earthquake and Tsunami. SAR missions continue to expand our understanding of natural hazards, and can assist in rescue operations, contributing to the disaster management cycle of preparedness, response, recovery and mitigation. InSAR in particular can be utilized to accurately and rapidly produce damage assessment products that can continue to improve and provide decision support to policymakers and further inform the public, thus improving recovery planning and reducing the loss of lives and property. Examples of the Tohoku disaster data handoff of past, current and planned satellite-based SAR-derived products are provided from the GEO Tohoku-Oki Supersite, the Advanced Rapid Imaging and Analysis (ARIA) Project and the Earthquake Data Enhanced Cyber-Infrastructure for Disaster Evaluation and Response (E-DECIDER) Project. Through efforts such as the ARIA Project's in bringing geodetic imaging capabilities to operational levels, to the easily accessible data from the Group on Earth Observation's Geohazard Supersites and E-DECIDER, near real-time products for earthquakes will continue to expand and be developed. The growing number of InSAR missions and rapidly developing ease of access to the data and analysis by scientists and end users will continue to advance scientific research and contribute to the reduction in the loss of life from natural hazards such as the 2011 Japan Tohoku Earthquake and Tsunami. The rapid development and expansion of InSAR technology continues to be applicable to a wide range of situations, including understanding the effects of the Tohoku earthquake, to determining the likelihood of future earthquakes, volcanic eruptions, and landslides.