

POST-DISASTER BRIDGE DAMAGE ASSESSMENT USING REMOTELY-SENSED IMAGES

Ronald T. Eguchi
Beverley J. Adams
Charles K. Huyck

ImageCat, Inc.
Union Bank of California Building
400 Oceangate, Suite 1050
Long Beach, California, 91367
rte@imagecatinc.com

ABSTRACT

In extreme events, such as natural disasters and terrorist attacks, the performance of critical transportation elements is a major concern. Serious damage to these components can have far reaching implications, including the impedance of critical emergency response actions, and ultimately, the loss of human life. In answer to the need for effective incident response and recovery efforts, remote sensing technologies offer near-real post-disaster damage assessment. This paper documents the methodological development of preliminary damage detection algorithms for highway bridges. *Bridge Hunter* tracks down bridges of interest in remote sensing coverage, while *Bridge Doctor* diagnoses their damage state. The algorithms are used to distinguish between damage scenarios of highway bridges that: (a) collapsed and (b) recorded no damage following the 1994 Northridge earthquake. Following a terrorist attack or natural disaster, these damage detection algorithms would enable rapid damage assessment of numerous bridges across a wide geographic area. This research was completed under the DOT-funded NCRST (National Consortium on Remote Sensing for Transportation) research program . Additional support was provided by the Multidisciplinary Center for Earthquake Engineering Research under its Federal Highway Administration Contract.

KEYWORDS: Remote sensing, highway bridges, damage detection, bridge hunter, bridge doctor, Northridge earthquake, Caltrans