

Kocaeli (Izmit) Earthquake of August 17, 1999

Early in the morning on Tuesday, August 17, 1999, a magnitude 7.4 earthquake struck along the Anatolian fault in the northwestern region of Turkey. Epicentered approximately 11 km southeast of the industrial city of Izmit (Kocaeli), the earthquake lasted 45 seconds and was felt over thousands of square miles in Turkey's most densely populated region. Commercial and residential buildings from Adapazari to Istanbul collapsed resulting in a large-scale loss of life. Within days, MCEER dispatched four researchers to the region — several as part of the Earthquake Engineering Research Institute (EERI) reconnaissance team — to examine the earthquake's impacts. The team included: **Michel Bruneau**, Deputy Director of MCEER and Professor, Department of Civil, Structural and Environmental Engineering, University at Buffalo, who focused on building damage; **John Mander**, Associate Professor, Department of Civil, Structural and Environmental Engineering, University at Buffalo, who focused on damage to highways; **William Mitchell**, Professor of Political Science and Director of Middle East Studies, Baylor University, who focused on social, political and emergency response; and **Charles Scawthorn**, Senior Vice President, EQE International, who provided a preliminary report describing the overall event, with a focus on lifelines and fire following earthquake. In addition, a University at Buffalo civil engineering graduate student, Natali Sigaher, was visiting family in Istanbul when the earthquake occurred. She joined the team and provided an account of the hours and days immediately following the earthquake.

A number of briefings on the earthquake are planned in the coming weeks. The first was held September 10 at the University at Buffalo primarily for students in the Department of Civil, Structural and Environmental Engineering, to begin the department's seminar series for 1999-2000. The speakers were Apostolos Papageorgiou, Professor of Engineering Seismology, Natali Sigaher, Michel Bruneau and John Mander. Additional dates and locations will be posted on MCEER's web site (<http://mceer.buffalo.edu>).

The initial observations and impressions of the team are presented in *MCEER Response*, a 12-page special report, which is available via the web site. The web site also features a 28-page preliminary report of the earthquake by Charles Scawthorn, EQE International, as well as numerous photographs of the area taken by the reconnaissance team. Links to other sites containing information about the earthquake are provided, in particular, EQNet at <http://www.eqnet.org>, EERI's site at <http://www.eeri.org> and EQE International's site at <http://www.eqe.com>.

Additional post-earthquake reconnaissance trips by other investigators are planned in the coming weeks. A more detailed reconnaissance report will also be developed for publication later this year. ❖

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The Kocaeli (Izmit) Earthquake

These photographs were provided by MCEER reconnaissance team members Michel Bruneau, John Mander, William Mitchell, Charles Scawthorn and Natali Sigaher ([see page 1 for more detailed information](#)).



Considering the magnitude of the fault rupture, damage to engineered structures on the highway system was slight. These photos show damage to sections of the E80 motorway near Adapazari.



Much of the damage to reinforced concrete buildings was not surprising, nor unexpected. Engineered structures that had been built according to modern codes survived, while many non-engineered structures collapsed, causing large scale loss of life.



Many donations were sent to the affected areas, but there was no organized distribution effort (top). Aftershocks caused many people to camp

outside (middle) and drinking water was obtained primarily via tanker trucks or bottled water (below).



Surface faulting was common near Golcuk (above); the fault rupture is visible next to this damaged manufacturing facility, under construction at the time of the earthquake.