

The Mexican Seismic Alert System, its public service since 1993

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With the aim to mitigate future seismic disasters in the metropolitan region of Mexico Valley, Mexico City Authorities required from CIRES in 1991 the experimental development of a *Sistema de Alerta Sísmica* (SAS), originally with 12 strong motion seismic detectors in the Guerrero Gap, capable to detect and forecast danger generated by strong seismic events, and broadcast warning signals in the Mexico City Valley, distant 320 km, bringing the population opportunity to reduce the seismic vulnerability with near to beneficial 60 s, prior to perceive the strong "s" wave effects. With the same objective during 2002 the Oaxaca State Authorities also required from CIRES the development of another EEW system which started operating 36-field seismic sensors in 2003. After the 2010 Haiti Caribbean disaster, with the agree of the Mexico Ministry of Government, the Civil Protection States Authorities decided the integration of the SAS developments and also shared their services, extending the sensors coverage over seismic active regions in the Pacific coast from Jalisco to Oaxaca, also over the South of the Neovolcanic axis in Guerrero and Puebla. Today, integrated as the SASMEX is operating 97 field stations from 130 originally programmed. SASMEX warning performance has been capable to detect and forecast seismic danger issuing 58 public alerts that announced strong seismic effects and 90 preventive ones, when they were estimated moderate. The SASMEX data catalog accumulates more than 9300 seismic records, generated by near than 4700 seismic events. SASMEX warning services broadcasts signals in Acapulco, Chilpancingo, Morelia, Oaxaca, Puebla, Toluca and Mexico City. To reduce any time delay to reach people under seismic risk, SASMEX automatically controls the signals to modulate the carriers broadcasted by the commercial Television and Radio stations integrated in this social service, also the signals of the NWR SAME international NOAA protocol and EAS-Public Alert, now issued to operate especial receivers SARMEX, which have the capability to operate with the SASMEX warning and more natural hazards or emergencies. Mexico City Government and Federal Government Ministry invested to buy little more than 88 thousand SARMEX receivers to provide the SASMEX seismic warning mainly inside the classrooms of public elementary schools as well as other public services: Metro, Hospitals, etc. The real seismic threaten and good SASMEX results motivated the local governments, and the federal one, to deem relevant expand geographic coverage of the sensors in seismic regions of the south of México, as well as the dissemination capacity of other alert notices trough the SARMEX receivers, useful to mitigate the vulnerability to populations under risk by other natural hazards. The SASMEX performance is notified across such diverse Internet platforms like Web, Blog, E-mail, Facebook, Twitter, RSS and web-socket protocols, emphasizing that due to the uncontrolled delays of these media and Apps, they should not be used to warn seismic alert signals.

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