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Reappraisal of single station locations reported by the South African National Seismograph Network during the period 2000 to 2005

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We investigated 1 380 earthquake epicenters that were located through the single-station location method during routine data analysis of the South African National Seismograph Network for the period October 2010 to December 2012. Epicenter locations determined through single-station analysis prompted reports of an increase in seismicity originating from residents in the towns of Ceres and Tulbagh. This coincided with a partial interruption of seismological services at the Council for Geoscience due to an upgrade of the South African National Seismograph Network. These claims could not be substantiated from waveform recordings analyzed during this study. Moreover, the practice of evaluating earthquake epicenters through single-station locations was expanded during the period under review to other selective areas of the Republic of South Africa with limited success. A small percentage (25%) of the seismic events originally located with the single-station location method could be substantiated through phase readings identified on waveforms provided by the Incorporated Research Institutions for Seismology.
In conclusion, the authors acknowledge that the single-station location methodology is founded on well established and sound scientific principles but cautions that its use in routine seismic data analysis at regional distances should be applied with care and oversight.

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