Recent Impacts and Discoveries arising from the use of Cloud-Hosted Real-time Data Services for the Geosciences (CHORDS)

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Cloud-Hosted Real-time Data Services for the Geosciences (CHORDS), an EarthCube Building Block, addresses the ever-increasing importance of real-time scientific data, particularly in mission critical scenarios, where informed decisions must be made rapidly. Many of the phenomenon occurring within the geosciences, ranging from hurricanes and severe weather, to earthquakes, tsunamis, volcanoes and floods, can benefit from continuous sampling of real-time data so that transient signals may be detected. In many regions of the world, valuable real-time measurements are sparse or non-existent. We highlight new science and societal impacts enabled by CHORDS, particularly in the African continent.

CHORDS was used for positioning observations on the eastern flank of the active Ol Doinyo Lengai volcano in Tanzania to detect, in real-time, surface motions that indicated potential volcanic deformation on the eastern flank of the volcano. Because the signals were observed in real-time it was possible to inform Tanzanian collaborators within seconds of the observation, who then rapidly deployed a field team to investigate. The field team confirmed the real-time sensors were operating properly and obtained reports from the surrounding community of (1) low magnitude seismicity, (2) changes in crater geometry, and (3) increased ash emissions after the initial January 2017 signals were detected through CHORDS.

CHORDS is being used for atmospheric measurements that are being taken by 3D-printed weather stations in five locations in Zambia (3d-zambia.chordsrt.com) and six locations in Kenya (3d-kenya.chordsrt.com). These measurements are used by local farmers to manage their crops and by local radio stations to broadcast the current conditions to the local community. The stations in Kenya are partnered with GLOBE schools (www.globe.gov).
Students are able to use the data for math and science to learn about their local weather and climate.