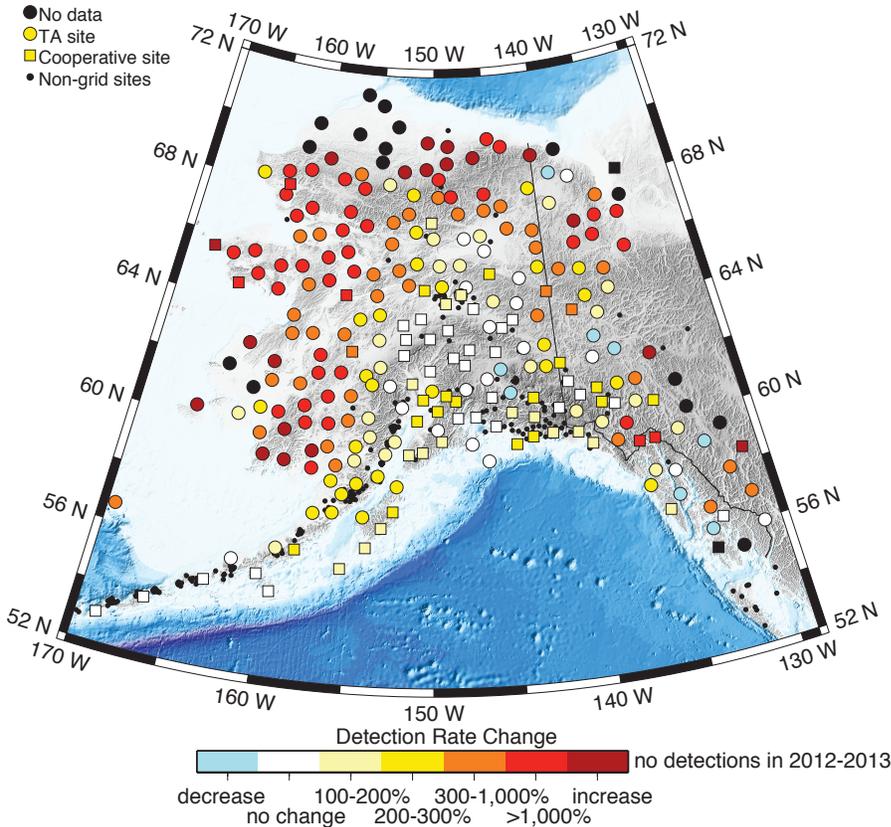


The Impact of USArray on Earthquake Monitoring in Alaska

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Seismic network coverage in Alaska has fundamentally changed with the presence of the USArray Transportable Array (TA) stations. These new stations have provided an unprecedented opportunity to expand earthquake reporting in areas of Alaska that have not previously been instrumented. The Alaska Earthquake Center has been incorporating all TA data into its standard earthquake analysis. The TA network is currently the second largest contributor of phase picks in Alaska earthquake catalog, after the AK network operated by the Alaska Earthquake Center. Recent increases in reported earthquakes (about 45,000 in 2017 and 55,000 in 2018) are directly attributable to the additional TA stations, especially in the northern and western mainland Alaska. In some regions, the earthquake detection threshold has decreased by as much as two units of magnitude. With the TA installation complete in 2017, the detection threshold over the entire mainland Alaska region is $M \sim 1.5$. The new stations have also led to a decrease in hypocentral location errors, which are now more uniform over the entire mainland Alaska region. The uniformity of the TA network has made it possible, for the first time, to make quantitatively valid comparisons of microseismic activity in different parts of the state. Among other observations, this uniform coverage has helped demonstrate that the quiescence that has long been inferred in the central and western Arctic Slope region appears to be real, and not just an artifact of network coverage. This combined network should, with time, provide vastly better data for seismic hazard assessments in an area of increasing national interest.



Change in rate of earthquake detections 2012-2013 vs 2017-2018 time periods. Blue color indicates decrease in detection rate; white color – no change; yellow colors – slight increase; orange and red colors – significant increase; and dark red color indicates sites where no activity was detected in 2012-2013 within the search radius, but some activity detected in 2017-2018. Black symbols indicate sites with no data in either time period. New TA sites are shown as circles and cooperative sites as squares.