A regional study of atmospheric gravity waves using the USArray Transportable Array

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We have developed a novel technique to investigate gravity wave occurrence and propagation across the USArray Transportable Array (TA) network and have applied it to atmospheric pressure data recorded from Jan 1, 2010 through 2014. We divided the stations in this time range into 3,600 non-overlapping triads. Each triad is most sensitive to propagating gravity waves in the 1-6 hour period range. In this poster we report two lines of research with this new dataset. First, we study an individual large event in which atmospheric gravity waves are observed to cross the TA. We also study the long-term occurrence statistics of gravity waves and compare them to satellite observations of convective clouds and gravity waves in the stratosphere. We discuss plans for future work when the network is redeployed in Alaska.

In the recent past our research has been presented to the general public via televised lectures and seminars. This outreach will continue in the coming year.

For an in-depth case study we selected a large, isolated, convective system that occurred within the footprint of the TA on June 28-29, 2011. Observations were compared with output from a numerical model to better understand the sources of the waves. Model and recorded pressures at two time points are shown here. The model was forced with a 3D time-dependent latent heating field that mimicked the latent heating inside the storms. The colorbars give pressure in Pa.