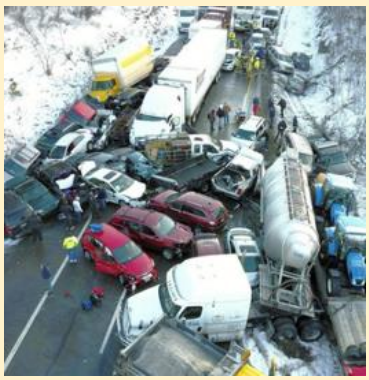
Transportation Applications Team

This team focuses on the development of impacts-based decision support tools to help detect and anticipate threats to the transportation sector. We work collaboratively with the National Weather Service (NWS) and the Federal Aviation Administration (FAA) to develop the next generation of products and tools for use within operations, with particular focus on decision support for transportation-related warnings/advisories (e.g., blizzards, aircraft hail encounters, icing, etc). Highlights from ongoing projects are below. We are excited to collaborate on projects that address all phases of transportation including ground, air, and water.

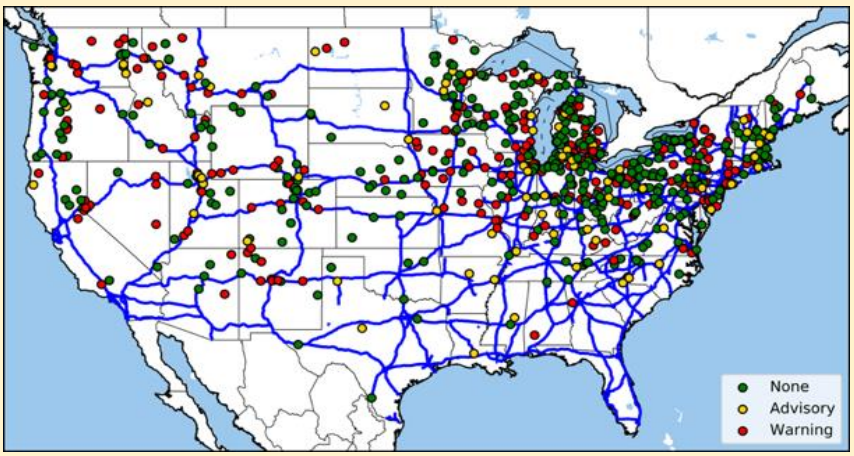
For more information, please contact Dr. Heather Reeves (heather.d.reeves-1@ou.edu)

Team Members

Alexander Eddy
Shawn Handler
Dr. Heather Reeves
Dr. Andrew Rosenow
Daniel Tripp

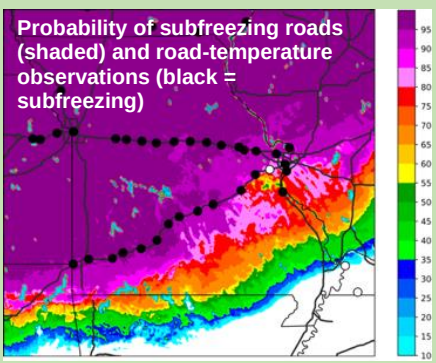


Dozens of vehicles involved in deadly pileup on Interstate 78
– CBS 14 Feb 2016



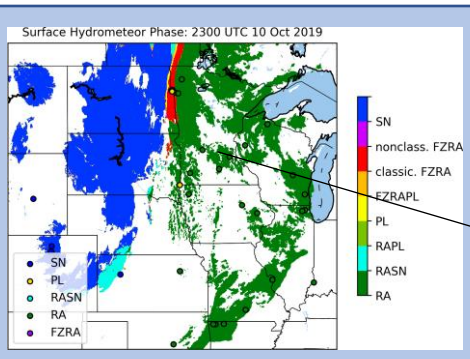
A recent study led by summer undergraduate researcher, Joe Burzdak shows that only 46% of all snow-related fatalities on roads have an NWS advisory or warning. This includes the 36-car pile-up in central PA in Feb 2016 (shown on left). Ongoing collaborative efforts with the NWS are looking to turn these statistics around.

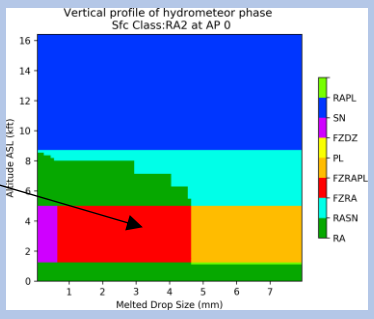
2 killed, more than 100 vehicles crash on icy Missouri roads
– Associated Press 4 Feb 2018



A new tool under development by CIMMS researcher Shawn Handler allows forecasters to anticipate the probability roads are subfreezing and, hence, whether they are likely to accumulate snow/ice or allow for flash freezes, like the one that led to this 24-car pile-up that occurred in central Missouri in February 2018 (left panel). We are looking to transition this product into NWS operations in the next two years as a special component of their Winter Storms Severity Index.

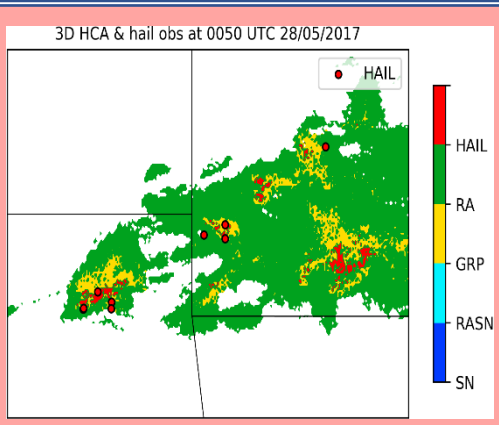
Saskatchewan plan crash survivor recalls people screaming...
– Globe and Mail 14 Dec 2017



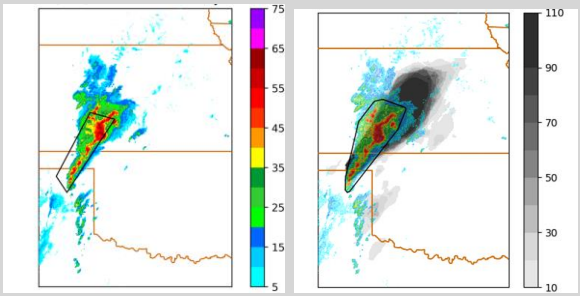


Precipitation type has obvious impacts on road safety, but did you know that the FAA is phasing in new laws that will limit terminal air space activities for certain types of aircraft when freezing drizzle is present? These laws require a more enhanced discrimination of hydrometeor phase than is possible with existing algorithms. CIMMS researcher, Andrew Rosenow, is working collaboratively with the Doppler Radar Research Group and OU graduate student, Nathan Lis, to develop the next-generation, hydrometeor-phase algorithm that will be transitioned the NWS and FAA in coming years. This algorithm includes additional surface categories not available with current algorithms and a full 3D diagnosis of hydrometeor phase across the entire drop-size distribution within terminal airspaces of commercial airports.

'Scariest flight of my life:' Hail smashes nose of plane that flew into towering storm
– The Washington Post 5 June 2018



While rare, hail encounters by airliners do still occur because it can be very difficult to discern whether hail exists at flight level. CIMMS researchers Shawn Handler and Alexander Eddy have implemented a three-dimensional hydrometeor phase algorithm that can detect hail aloft. This algorithm is expected to transition into operations in FY2022.



Example of a convective sigmet as they are currently generated (left) and an automatically-detected sigmet along with the 0-2 h probability of a sigmet (right).

CIMMS researchers Alexander Eddy and Heather Reeves are collaborating with forecasters at the NWS/Aviation Weather Center and the FAA to transform the way convective sigmets are produced. They are developing artificial intelligence (AI) to automatically detect storms that pose a threat to the safety of flight and to grade these according to their impacts. This same AI is being applied to short-range forecasts to provide guidance on the 0-2 h probability of a convective sigmet.