

# The Winds of New York City during Hurricane Sandy

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The primary objective of this miniproject would be to look at the meteorological conditions when Hurricane Sandy hit New York City the evening of 29 October 2012, assess what could have been done differently before landfall to mitigate its effects (which the authorities are already doing), then consider what improvements could be made if more complete data is available in the future.

By "more complete data", we mean how Warwick's new Centre for Urban Science , and its companion Center at New York University, plan to utilise multiple data streams from the NYC metropolitan region to improve planning. With one of those streams being the new capability to continuously record the winds, temperatures and tides.

With that goal in mind, the student will need to find relevant meteorological data during Hurricane Sandy that is easily downloaded from the US National Weather Service.

This should including weather charts at various scales and data on rainfall and the storm surges. This data could then be supplemented by data from our NYU-CUSP partners on when subway entrances, transit lines (subway, elevated, commuter rail) and automobile routes (bridges, tunnels in particular) were closed.

All of this is what was available at the time, or shortly thereafter.

The final part of the project is to use data that was not available at the time, but which could be in the future from new measurements, simulations, or models based upon secondary observations. Some of this will come from simulations using the relatively new atmospheric model for mesoscale prediction, the Weather Research Forecast model, developed primarily at the National Center for Atmospheric Research in Boulder, Colorado. Professor R Kerr just took the WRF tutorial run by the Norwegian Meteorological Office in Bergen and will provide the data generated from one of test calculations at his completion of the course.

The PhD project that could follow would involve more extensive calculations of events like Sandy either in NYC (NYC has an intense local storm with hurricane force winds about every two years) or in the UK, plus the incorporation of data from the LIDAR and IR devices for wind and temperature measurements that Professor R Green in engineering is developing and which NYU-CUSP will be positioning on World Trade Center I after it is completed.

Similar opportunities for case studies will exist through our collaborators at Monash, where Jean Armstrong has an existing instrumentation collaboration with Roger Green and Brian Sawford will provide contacts with the urban meteorology group at the local CSIRO.

All with the goal of being better prepared for the next time, which will probably happen sooner than we think.