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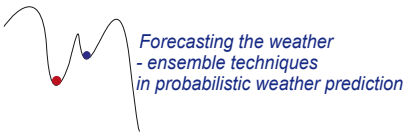

Verification of forecasts from the 2010 Vancouver Olympic Games

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The Vancouver Winter Olympics and ParaOlympics provided an opportunity to focus research and development on the problems of high resolution weather forecasting in mountainous terrain. During the Olympics period and for several months afterward, the Meteorological Service of Canada ran four different models in real time, including a global model at 1 degree resolution and two local area models at 2.5 km and 1 km resolution. The fourth model is an experimental urban model run for the Vancouver area at a resolution of 100m. The scheduling of these model runs was determined by the needs of the Olympic organizing committee (VANOC). In addition to the raw model forecasts, products from several nowcast systems and statistically processed model forecasts were also tested.

To facilitate verification of the forecasts, all available forecast products were prepared in a common table format, which was made available to the Olympic forecast center as guidance. The team of forecasters then produced "sport forecasts" for several weather elements at all Olympic sites, valid at each 15 minutes for the first two hours and hourly after that to 24h. Forecast tables for the sport forecasts are also available.

The forecasts are being verified in two ways: First and foremost, a "user-oriented" verification is being carried out for the Olympic venues and for the period of the Olympics. Since the user, VANOC, had specified in advance in considerable detail their threshold values of importance for decision-making at each venue for each relevant weather element, we could design the verification to match these thresholds. This verification consists of contingency tables and related scores for the weather elements of importance at each specific venue. Since the user-requirements are for essentially point locations, even for a 1 km model, the verification is done on a pointwise basis. One interesting feature of this effort is that, in advance of the Olympics, the forecasters and modelers chose the model gridpoints which were most representative of the venues; these are not necessarily the nearest gridpoints.

The second verification is intended to answer broader questions about the merits of high resolution modeling in mountainous areas, and to determine whether there is any additional benefit to be gained by increasing the resolution to 1 km compared to 2.5 km. For this second verification, we are using the longer verification period (February to August, 2010) and evaluating the principal surface forecast variables temperature, wind and precipitation. This verification will also be done on a pointwise basis, since the mountains preclude the collection of observation data with high enough spatial resolution over most of the model domains.

In the presentation, the design and rationale of the verification method will be discussed, and interesting results from both the user-oriented and more general model verification will be shown.