Computer Generated Maintenance Recommendations with and without Automatic Nowcasting

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Foreca is a full-scale global weather service provider. Foreca's road maintenance customers are mostly in the Northern Europe where Foreca currently forecasts road conditions for approximately 200.000 km of roads with around 1500 road weather stations. Even in this relatively homogeneous area maintenance practices vary widely. For the weather forecasting component of an MDSS an important variable is the minimum lead time required for action. Road maintainers require forecasts at all lead times for planning purposes but if the minimum lead time is over six hours then nowcasting techniques are mostly irrelevant. For a minimum lead time of two hours, however, nowcasting techniques dominate.

Over the past year, Foreca has been developing computer generated maintenance recommendations. During the winter 2015-2016, selected pilot customers have evaluated the recommendations in two very different settings: in a meteorologist-supervised area, and in an area with completely automated forecast production with no meteorologist intervention. We wish to highlight two key features of the system, one technical and one philosophical. On the technical side, to support the short lead time operations in the area with no meteorologist supervision we leveraged a previously developed automatic nowcasting system, which uses satellite and radar data. A key enabling technology for the nowcasting system is the Meteosat-PRIME satellite. Its multi-spectral data makes it possible to detect clouds sufficiently well even in the presence of strong inversions with very low surface temperatures. On the philosophical side, when creating the recommendations we never aimed for completely robotized operations. We aimed for a system, which would also act as a teaching tool for personnel. Thus, the recommendations are not only about the sequence of maintenance tasks but also include practical advice regarding the uncertainties in the situation at hand. The recommendations help ensure consistent quality via practical weather situation dependent advice, reducing the chance for human error.

We will present verification results for the automatic nowcasting system along with some success and failure case examples. We will also present case examples of the recommendations and feedback from the pilot customers.