



Machine learning algorithms for meteorological event classification in the coastal area using in-situ data

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The problem is considered of classification of local atmospheric meteorological events in the coastal area such as sea breezes, fogs and storms. The in-situ meteorological data as wind speed and direction, temperature, humidity and turbulence are used as predictors.

Local atmospheric events of 2013–2014 were analysed manually to train classification algorithms in the coastal area of English Channel in Dunkirk (France). Then, ultrasonic anemometer data and LIDAR wind profiler data were used as predictors. A few algorithms were applied to determine meteorological events by local data such as a decision tree, the nearest neighbour classifier, a support vector machine.

The comparison of classification algorithms was carried out, the most important predictors for each event type were determined. It was shown that in more than 80 percent of the cases machine learning algorithms detect the meteorological class correctly.

We expect that this methodology could be applied also to classify events by climatological in-situ data or by modelling data. It allows estimating frequencies of each event in perspective of climate change.