FORECASTING OF AIRBORNE POLLEN CONCENTRATIONS: ONE YEAR OF WEEKLY PUBLISHED FORECASTS

INFORMATION ABOUT POLLEN CONCENTRATIONS IN AMBIENT AIR ARE NECESSARY FOR

ARPA FVG FORECASTING METHODS

In the year 2015, the team of the Regional Environment Protection Agency of the Friuli Venezia Giulia Region (ARPA FVG) developed 3 different forecasting methods.

Two of them were able to predict the beginning, abundance and duration of the presence of pollen from the POACEAE and URTICACEAE pollen in the atmosphere of two Allergenic Plant Families monitored in the Friuli Venezia Giulia region, in the North-East of Italy.

RESULTS

The results of this first year of forecasting activity are here presented through the analysis of the data for the Families of Poaceae and Urticaceae.

WEEKLY DATA

The forecasting model (ARMA) provides weekly data on the abundance of each monitored taxon; each forecasting rate is associated in the bulletin to a per cent confidence index of the forecast itself.

EFFECTIVENESS OF THE FORECASTS

The effectiveness of forecasting ARMA method was checked by comparing the forecasts with the observed data.

The observed reliability does not differ significantly from the one expected, with the exception of Poaceae at Tolmezzo station.

The situation is attributable to a prolongation of the period of pollen detection, even at low levels, occurring in the year 2006 for about two months beyond the flowering period forecasted by the model.

RELIABLE METHOD

After the first year of activity, our forecasting model provided results not statistically different from the observed one, this supported it’s reliability in forecasting of the abundance of the concentrations of pollen from Poaceae and Urticaceae families detected at pollen monitoring stations in Friuli Venezia Giulia.

BIBLIOGRAPHY

http://dati.arpa.fvg.it/245.html
http://www.pollnet.it/default_it.asp

The forecasts are weekly published on the ARPA FVG website (http://dati.arpa.fvg.it/245.html)

The three forecasting methods are described in a paper published on Aerobiologia (see Bibliography)

In literature, several studies are addressed on forecasting the presence of pollen grains in ambient air; however, they require:

- complex algorithms based on meteorological parameters which inherit the uncertainty and the short term forecast of them
- long historical series of weather data and combined pollen monitoring to produce reliable results

ARMA

AUTOREGRESSIVE MOVING AVERAGE

In the year 2016, the forecasting service was activated on the ARPA FVG web site, and the application of one of the two forecasting methods developed ARMA was extended to all taxa monitored in the routines as well.

POACEAE

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<th>expected reliability</th>
<th>observed reliability</th>
<th>significant differences/ ns/ significant differences (Chi-square test)</th>
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<td>77</td>
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<td>ns</td>
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<tr>
<td>UD1</td>
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<tr>
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URTICACEAE

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