EVALUATION OF QUALITY TEMPERATURE FORECASTS IN KYIV (UKRAINE)

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OVERVIEW

• Data
• Problem
• Data analysis
• Results
• Conclusion
Data
WRF ARW v.2.2.1 calculation results (temperature forecast)
Problem

Investigate the performance of the Statistical and WRF models
Data analysis

• Scatter plot
• Box-plot
• Fit Linear Regression Model
• Correlation
• Scores (ME, MAE, RMSE)
Results

Temperature (C) - Station: Kyiv

**Statistical Model**

- **Forecast 24h**
  - $Y = 0.71 + 0.95 \times X$
  - $R^2 = 0.85$

- **Forecast 48h**
  - $Y = 0.89 + 0.93 \times X$
  - $R^2 = 0.81$

**WRF ARW**

- **Forecast 24h**
  - $Y = 1.22 + 1.08 \times X$
  - $R^2 = 0.83$

- **Forecast 48h**
  - $Y = 1.3 + 1.04 \times X$
  - $R^2 = 0.77$
### TABLE 1. Correlation and confidence intervals

<table>
<thead>
<tr>
<th>Correlation</th>
<th>Statistical Model</th>
<th>WRF ARW</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Forecast 24h</td>
<td>Forecast 48h</td>
</tr>
<tr>
<td>(r)</td>
<td>0.923</td>
<td>0.901</td>
</tr>
<tr>
<td></td>
<td>(0.890, 0.946)</td>
<td>(0.860, 0.931)</td>
</tr>
<tr>
<td></td>
<td>p-value &lt; 2.2e-16</td>
<td>p-value &lt; 2.2e-16</td>
</tr>
</tbody>
</table>

### TABLE 2. Computed scores

<table>
<thead>
<tr>
<th>Scores</th>
<th>Statistical Model</th>
<th>WRF ARW</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Forecast 24h</td>
<td>Forecast 48h</td>
</tr>
<tr>
<td>ME</td>
<td>-0.722</td>
<td>-0.924</td>
</tr>
<tr>
<td>MAE</td>
<td>1.864</td>
<td>2.166</td>
</tr>
<tr>
<td>RMSE</td>
<td>2.302</td>
<td>2.639</td>
</tr>
</tbody>
</table>
Conclusions

• Statistical model is more accurate than WRF model at both 24 and 48 hour lead time
• Both models have tendency to increase error with time