EVALUATION OF QUALITY TEMPERATURE FORECASTS IN KYIV (UKRAINE)

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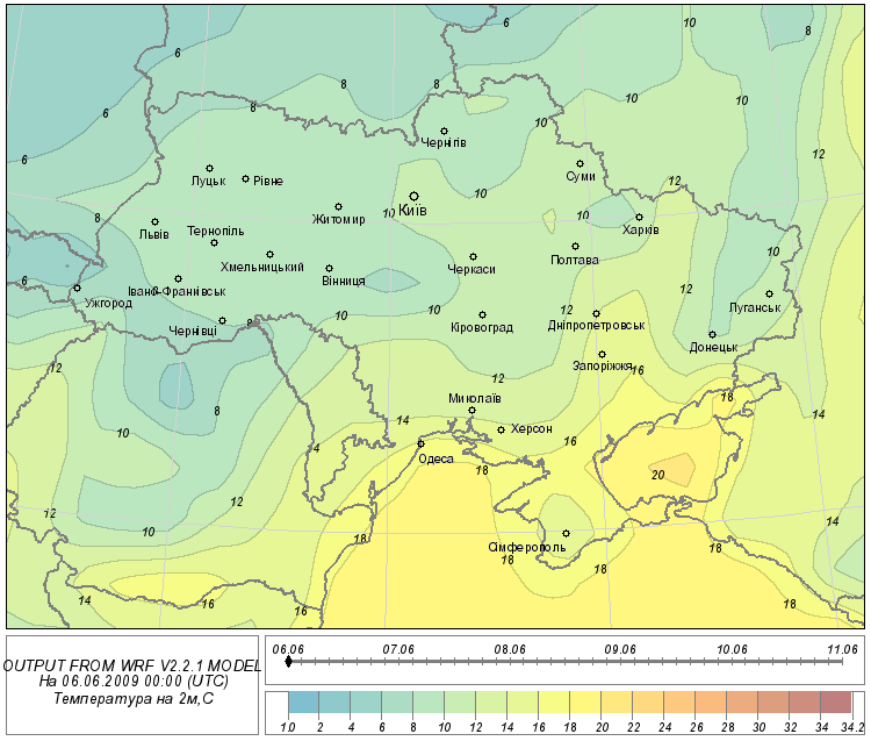
OVERVIEW

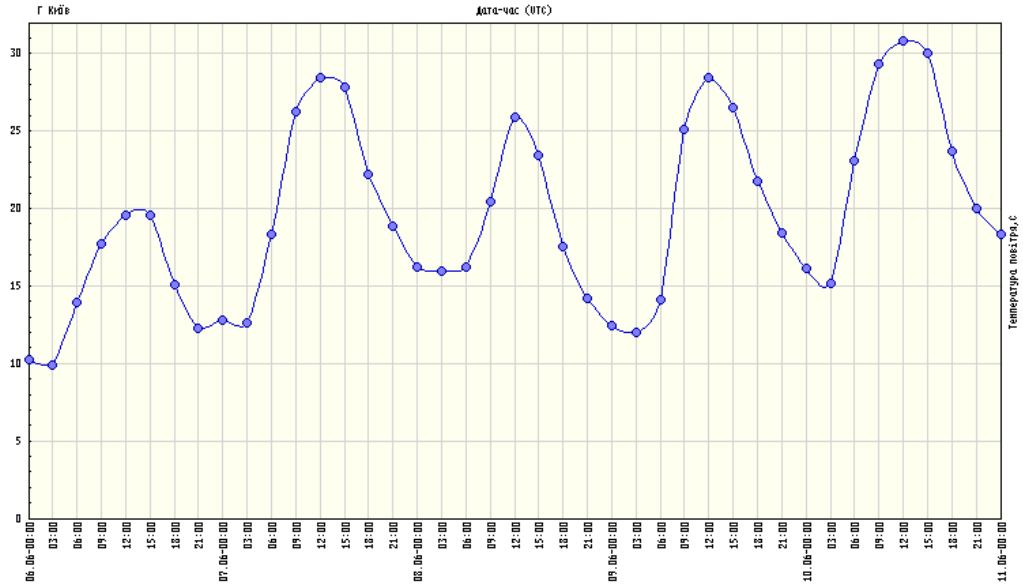
- Data
- Problem
- Data analysis
- Results
- Conclusion

Data


25°
30°
35°
40°
50°
45°
BELARUS
RUSSIA
POLAND
SLOVAKIA
HUNGARY
ROMANIA
MOLDOVA
Chernihiv
Lutsk
KIEV
Lviv
Kharkiv
Poltava
Cherkasy
Kremenchuk
Ivano-Frankivsk
Uzhhorod
Hoverla
Chernivtsi
Luhansk
Dnipropetrovsk
Donetsk
Zaporizhzhia
Kryvyy Rih
Mariupol
Mykolayiv
Odesa
Kherson
Sea of Azov
Simferopol
Black Sea
2500
1500
1000
500
250
m
km
100

WRF ARW MODEL





WRF ARW v.2.2.1 calcultation results
(ftemperature forecast)

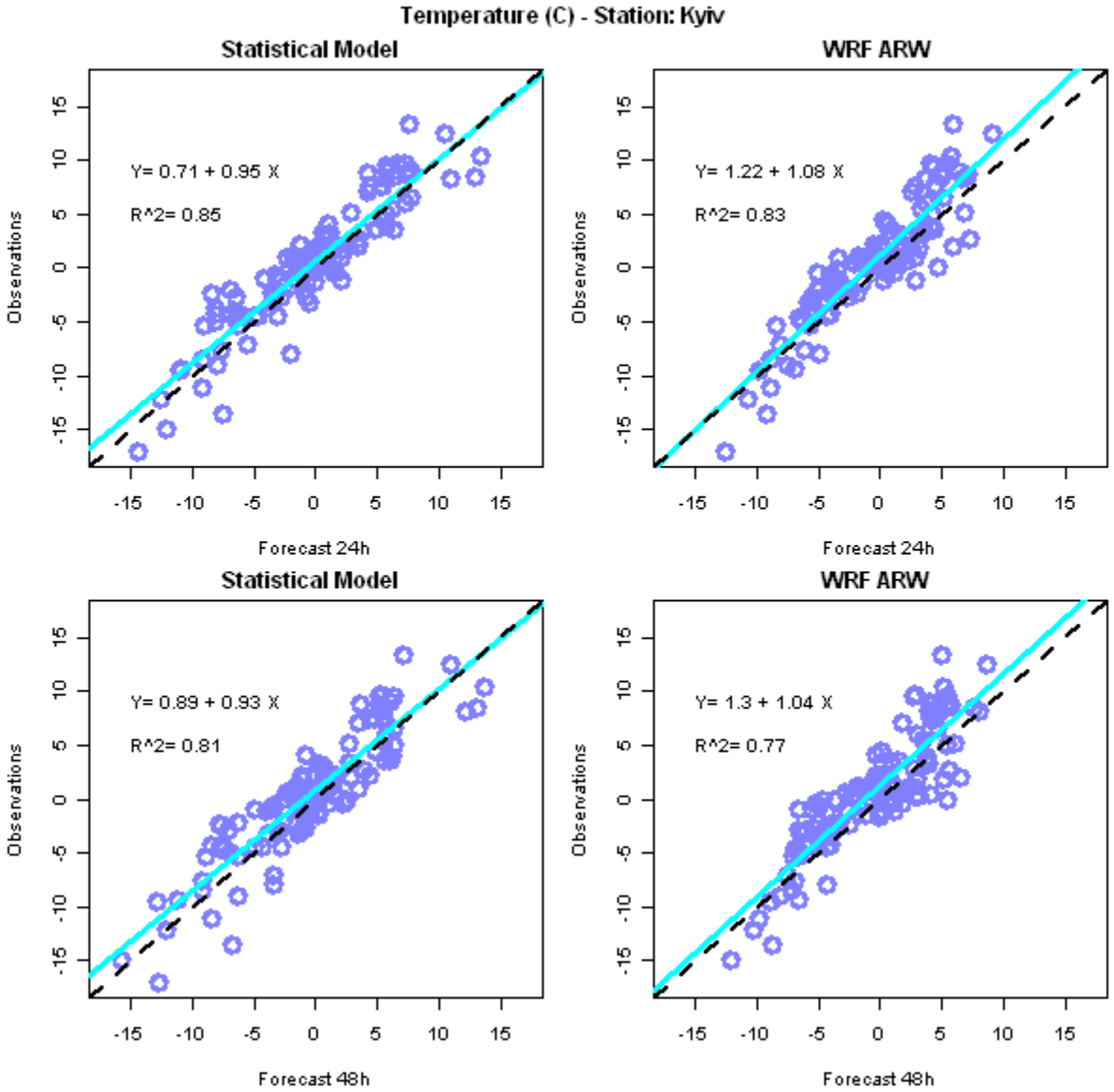
Problem

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
Y= 0.71 + 0.95 X
R^2= 0.85
Observations
Forecast 24h
WRF ARW
Y= 1.22 + 1.08 X
R^2= 0.83
Observations
Forecast 24h
Statistical Model
Y= 0.89 + 0.93 X
R^2= 0.81
Observations
Forecast 48h
WRF ARW
Y= 1.3 + 1.04 X
R^2= 0.77
Observations
Forecast 48h

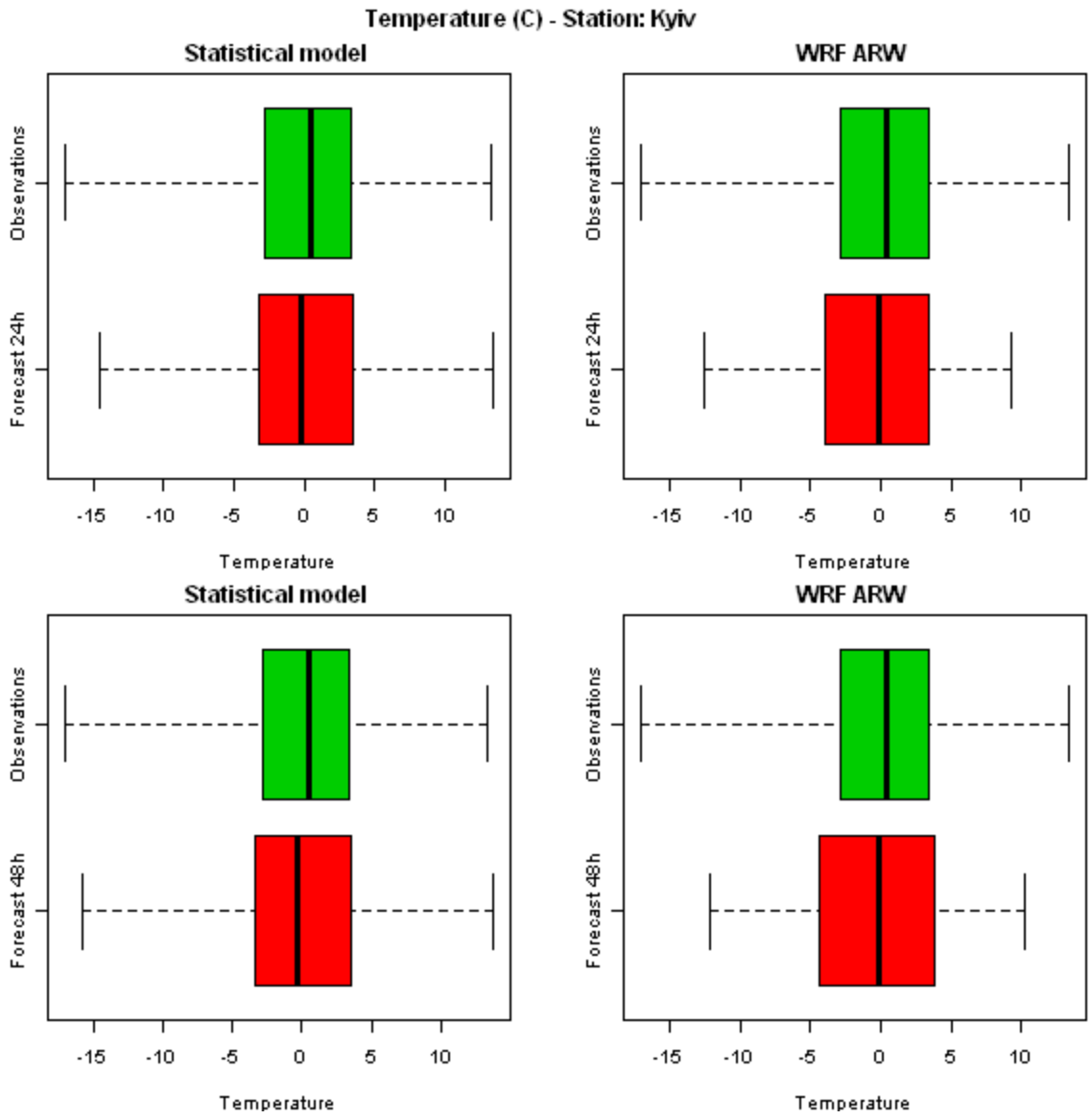

Temperature (C) - Station: Kyiv
Statistical model
WRF ARW
Observations
Forecast 24h
Forecast 48h
-15
-10
-5
0
5
10
Temperature

TABLE 1. Correlation and confidence intervals

Correlation	Statistical Model		WRF ARW	
	Forecast 24h	Forecast 48h	Forecast 24h	Forecast 48h
r	0.923 (0.890, 0.946) p-value < 2.2e-16	0.901 (0.860,0.931) p-value < 2.2e-16	0.911 (0.873,0.938) p-value < 2.2e-16	0.877 (0.826, 0.914) p-value < 2.2e-16

TABLE 2. Computed scores

Scores	Statistical Model		WRF ARW	
	Forecast 24h	Forecast 48h	Forecast 24h	Forecast 48h
ME	-0.722	-0.924	-1.172	-1.279
MAE	1.864	2.166	2.110	2.404
RMSE	2.302	2.639	2.590	2.936

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