Influence of the Pavement Type on the Road Surface Temperature

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THE POROUS ASPHALT PROJECT
EXPERIENCE AND EXPECTATIONS

- **NOISE REDUCTION**
- **MORE EXPENSIVE TO APPLY**
- **LOWER DURABILITY**
- **TRAFFIC SAFETY (SLIPPERY?)**
- **WINTER MAINTENANCE**
- **MODEL ASPECTS**

THE ’REAL’ ROAD

Macadam

(John Laudon Mcadam)

1756-1835

THE THEORETICAL ROAD

MATERIAL:

ALBEDO

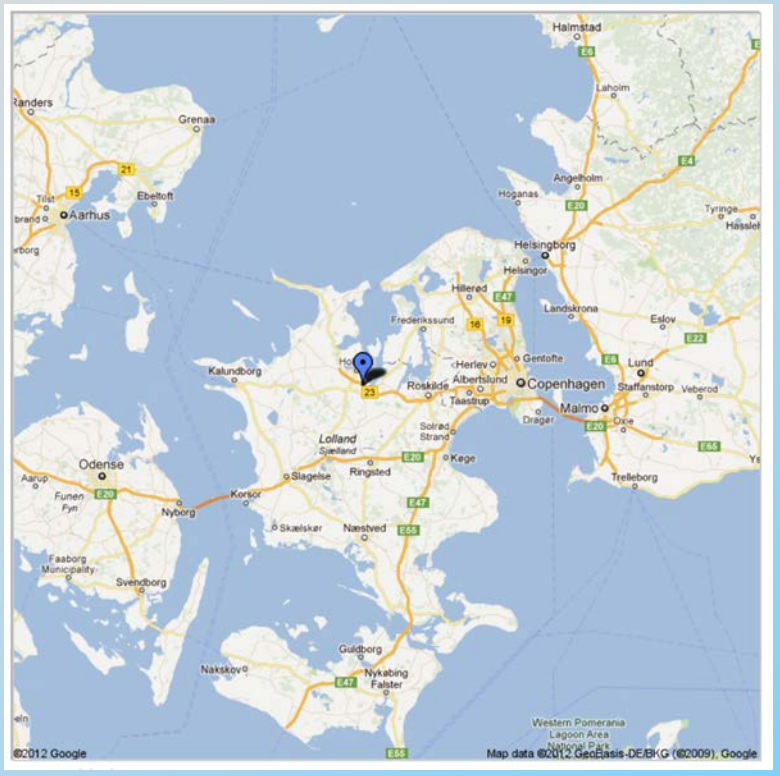
EMISSIVITY

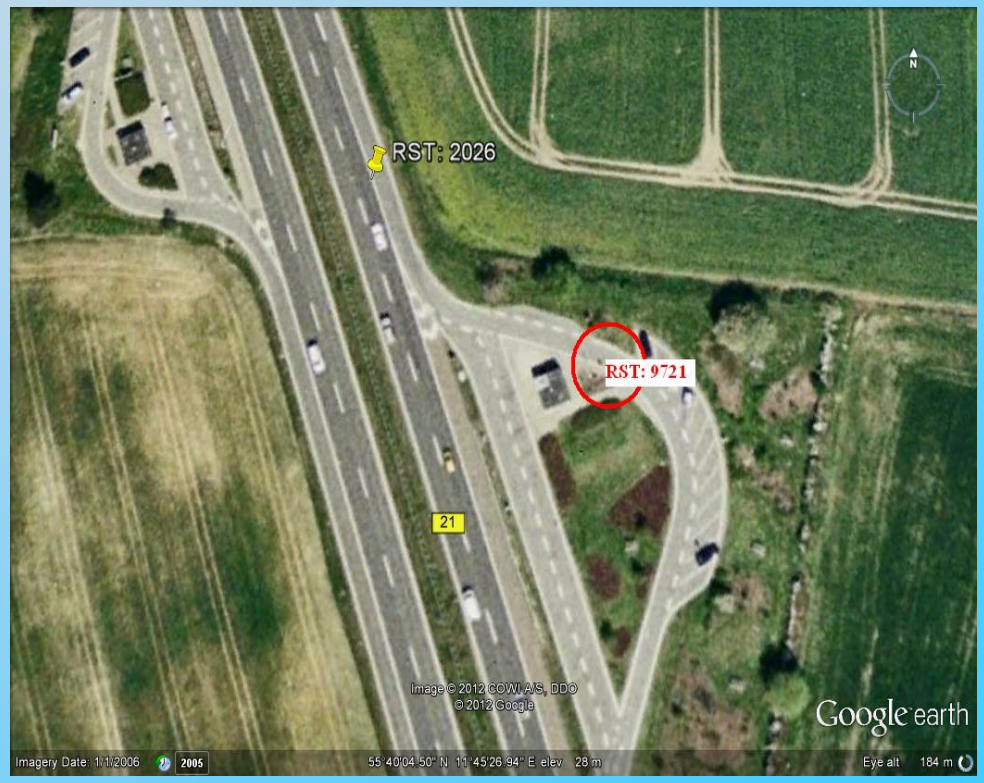
DENSITY

HEAT CAPACITY

HEAT CONDUCTION

LOCATION OF ROAD STATION 2026 AND 9721





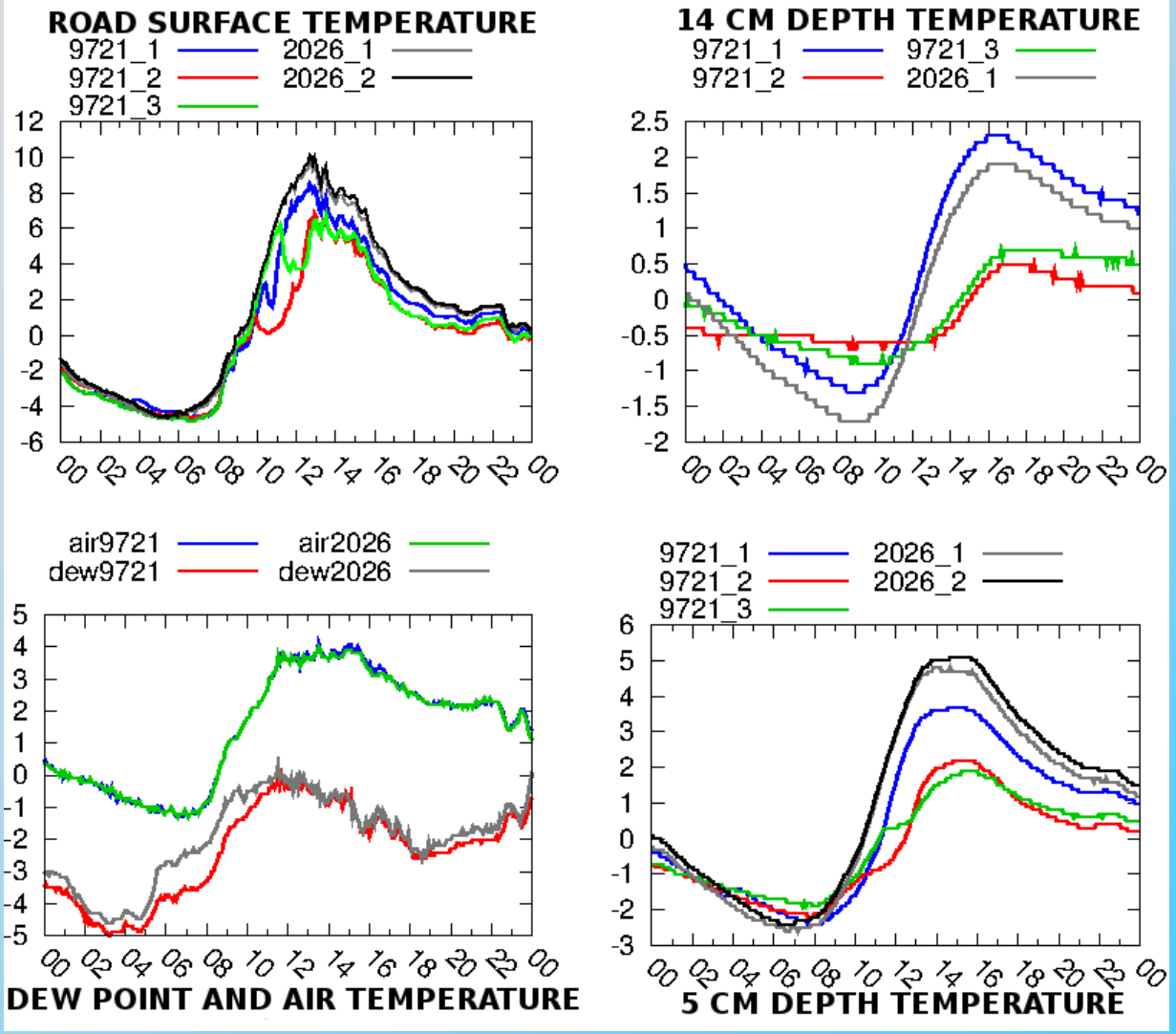
ENVIROMENT

ROAD STATION 2026

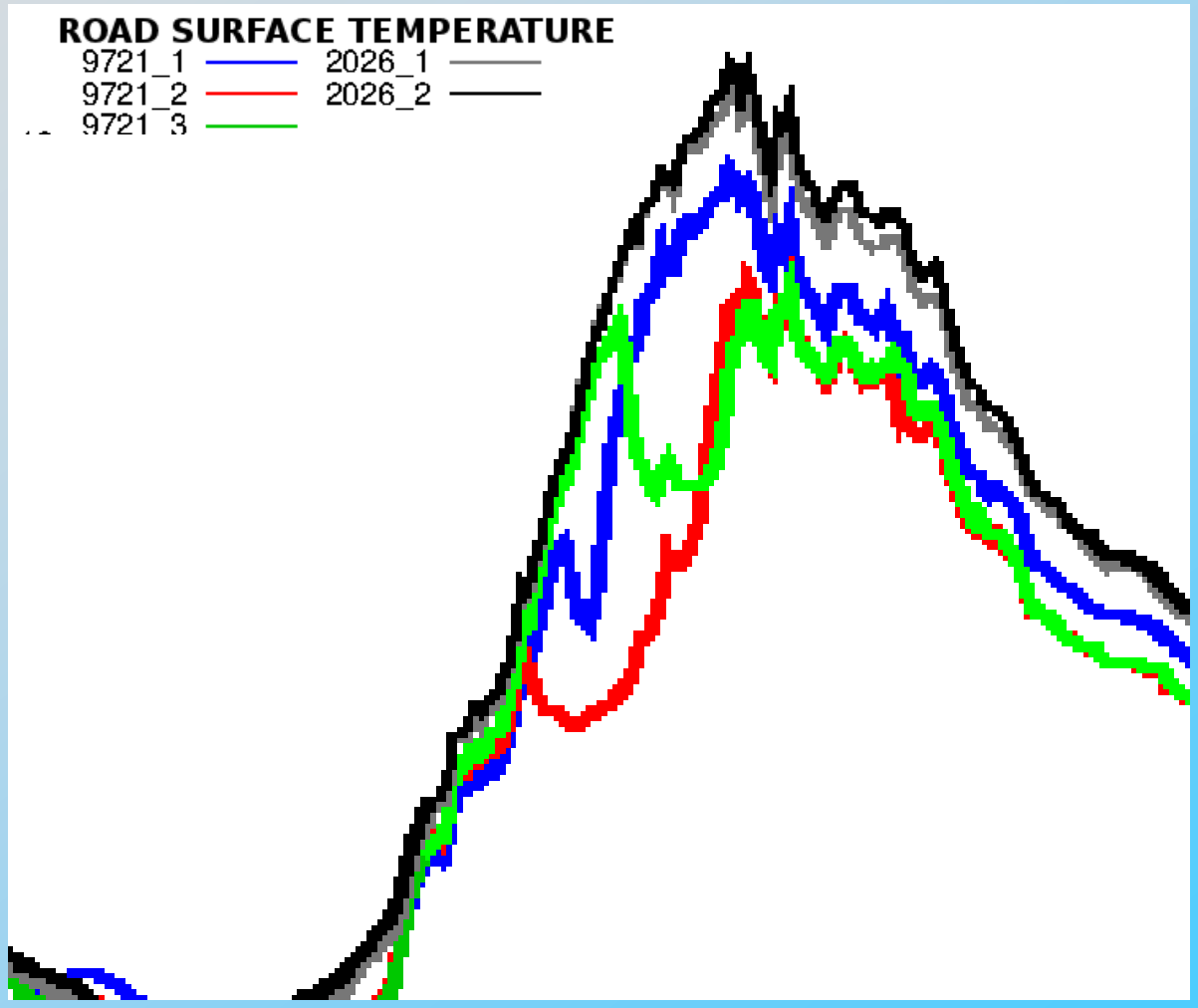
ROAD STATION 9721 – POROUS

ROAD STATION 9721 – DENSE ASPHALT

20 FEBRUARY 2012
UNEVEN SOLAR HEATING

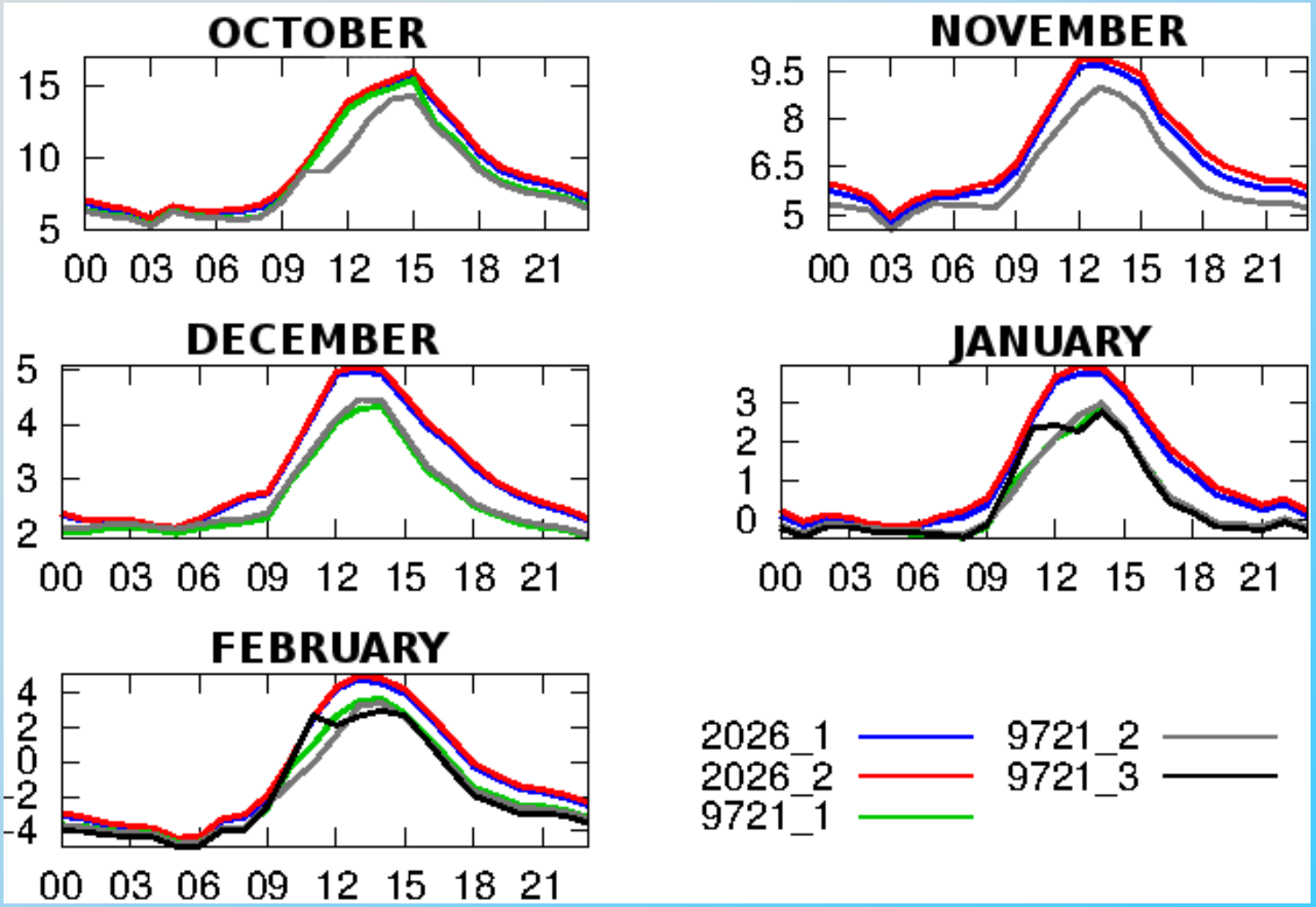


20 FEBRUARY 2012
DIFFERENTIAL SOLAR HEATING



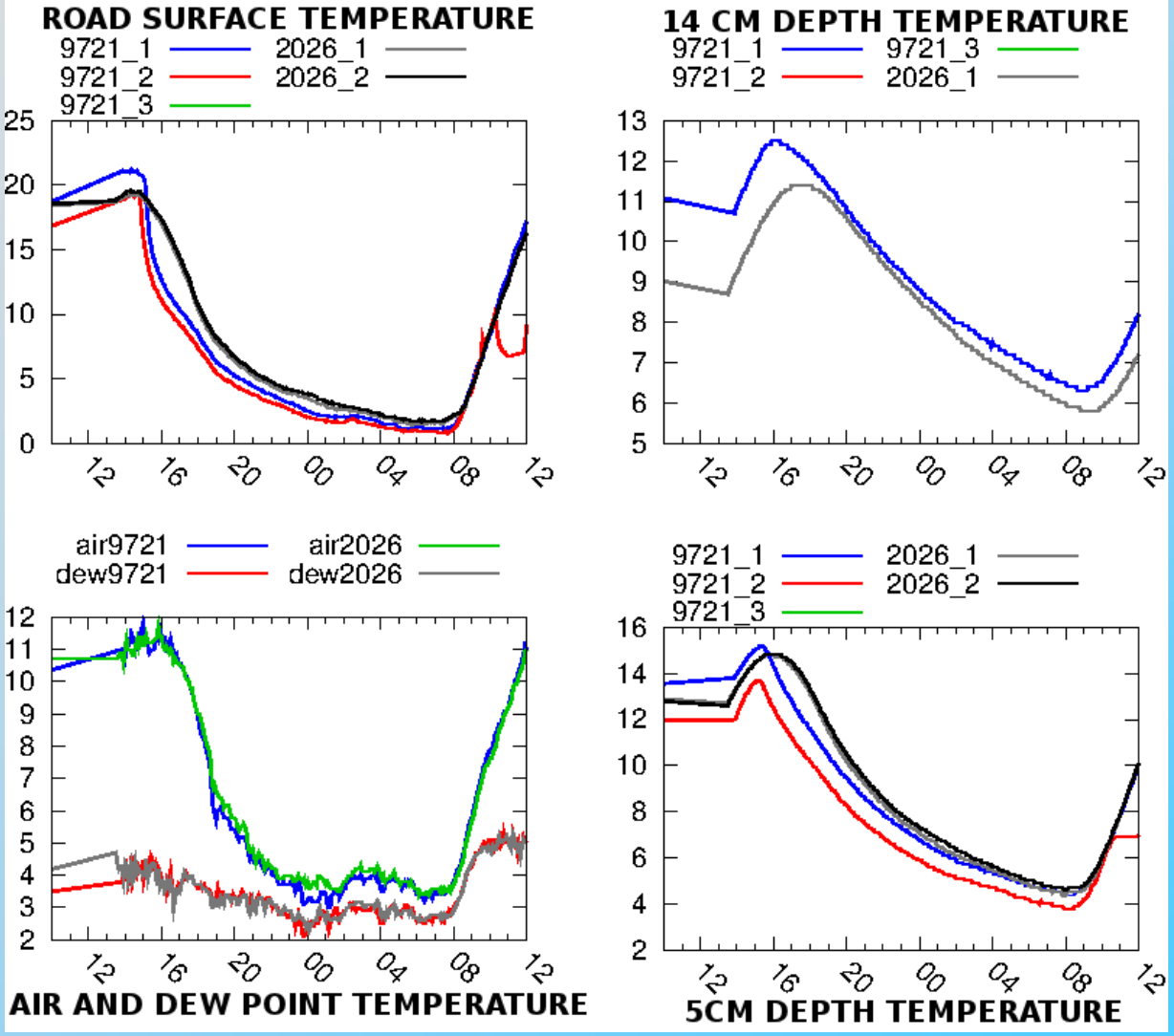
FACTS

STATISTIC FOR ROAD SURFACE TEMPERATURE



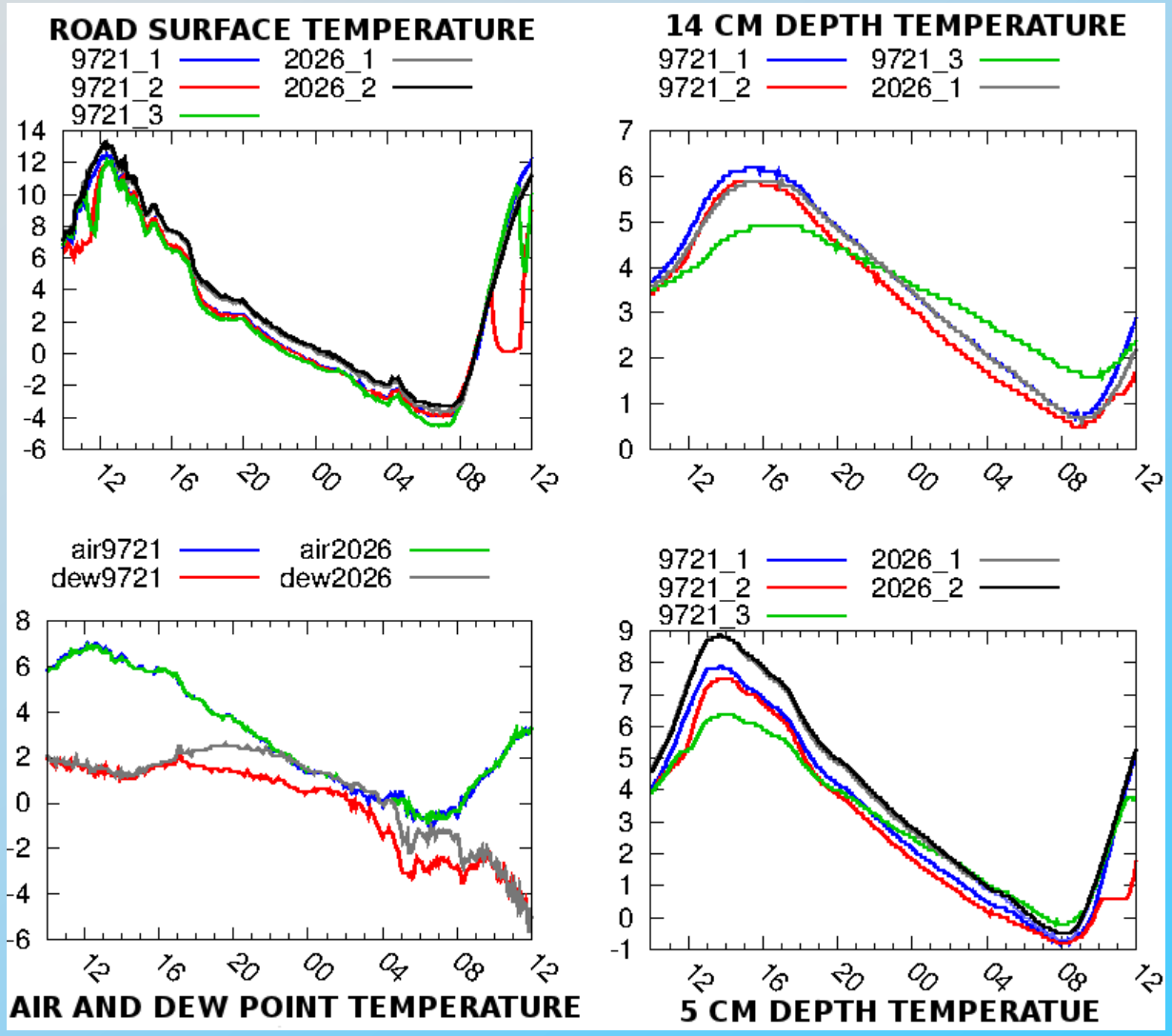
FIRST CASE WITH ROAD SURFACE TEMPERATURE NEAR 0

15 oktober 2011



LATE CASE WITH COLD ROADS

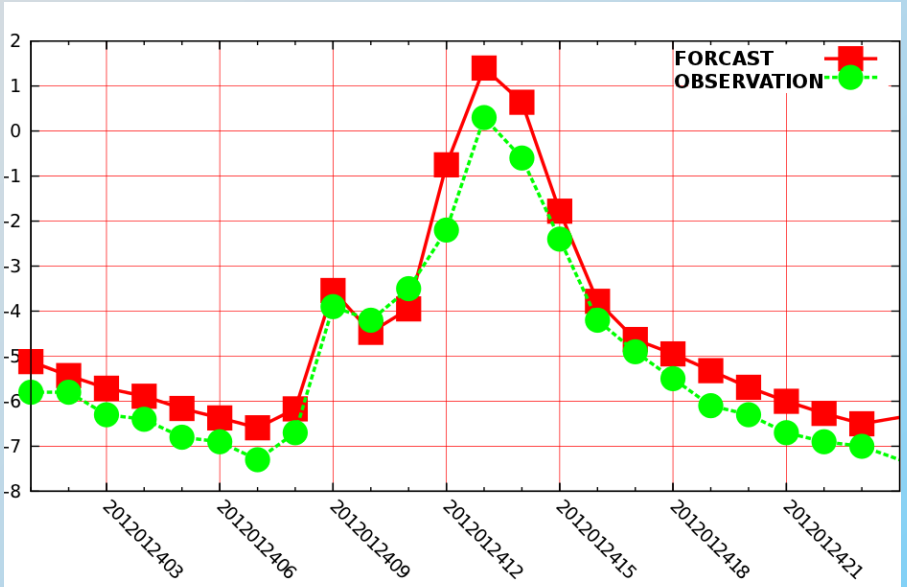
26 februar 2012



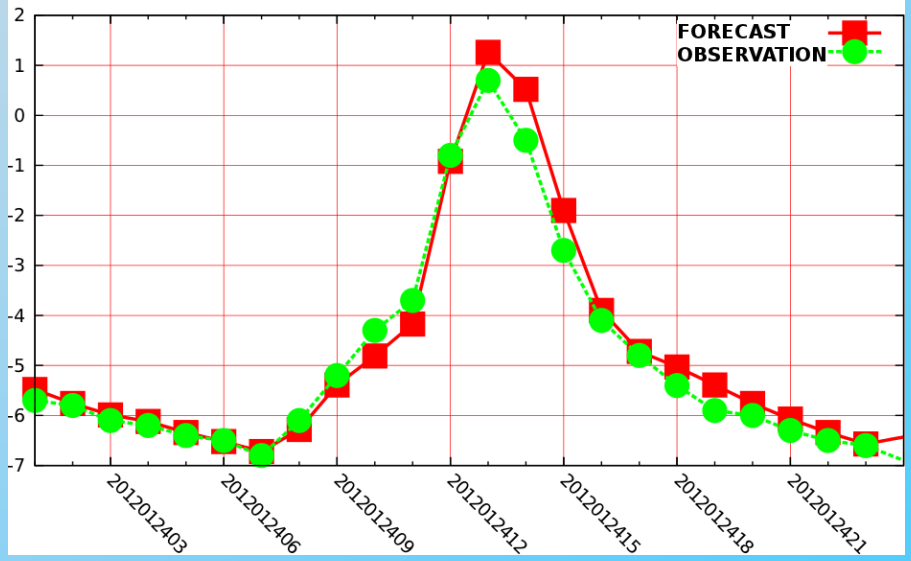
24 HOUR FORECAST EXAMPLE

OPTIMIZED FOR DRAINAGE ASPHALT

DENSE ASPHALT



POROUS ASPHALT



MODEL PERFORMANCE

VERIFICATION OF 3 HOUR FORECAST

ID	Type	All 2011/2012 BIAS	All 2011/2012 MAE
202601	Ref	-0.40	0.81
202602	Ref	-0.47	0.85
972101	Dense	-0.23	0.84
972102	Porous	-0.31	0.83
972103	Rubber	-	-
N		1747	1747

CONCLUSION

- POROUS ASPHALT DID NOT DIFFER MUCH FROM DENSE ASPHALT WITH RESPECT TO THERMAL PROPERTIES
- THERE IS NO NEED TO MAKE A SPECIAL FORECAST MODEL FOR POROUS ASPHALT
- FURTHER STUDIES OF SNOW AND RAIN CASES WILL BE EXAMINATED

THANK YOU FOR LISTENING
QUESTIONS?

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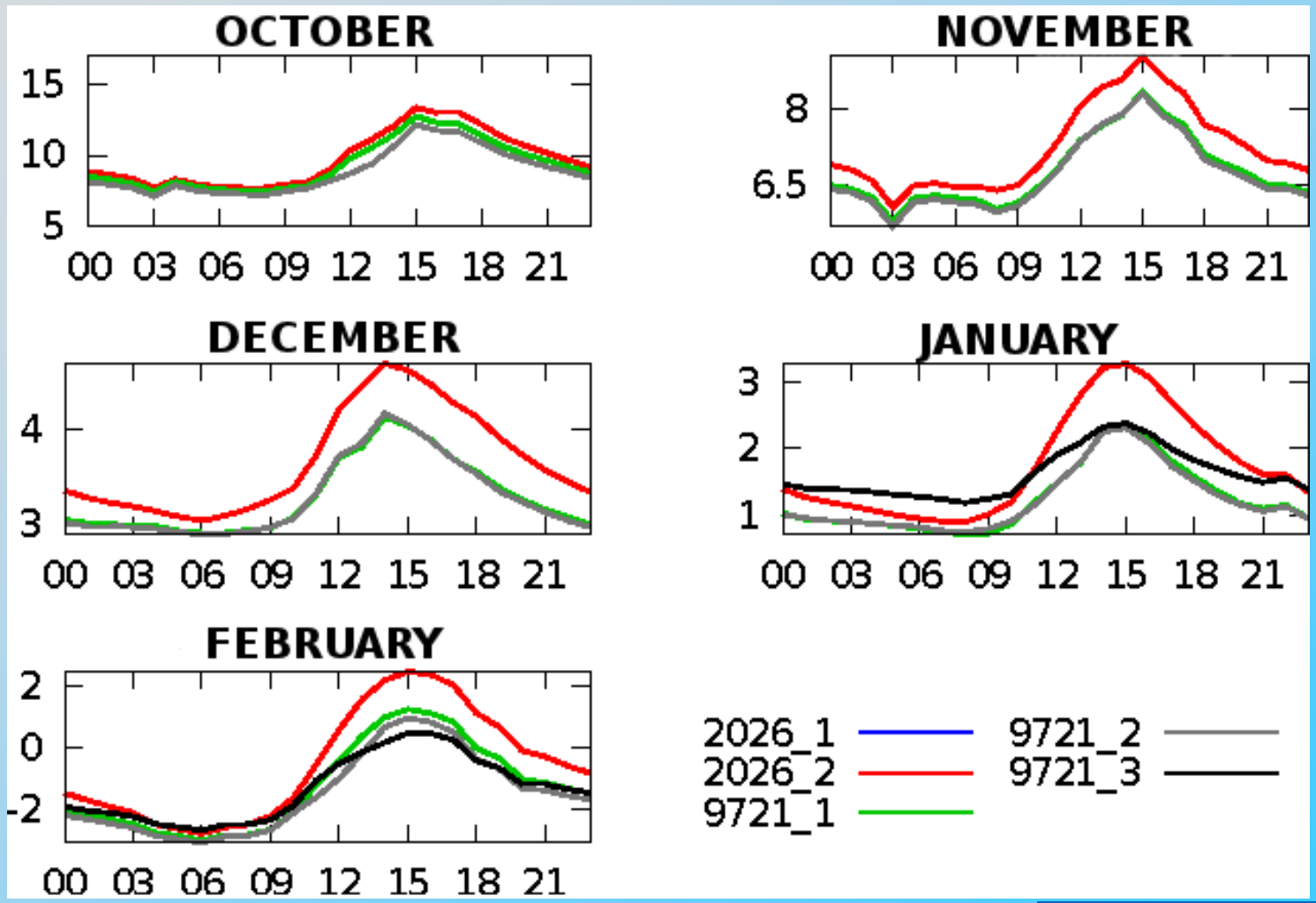
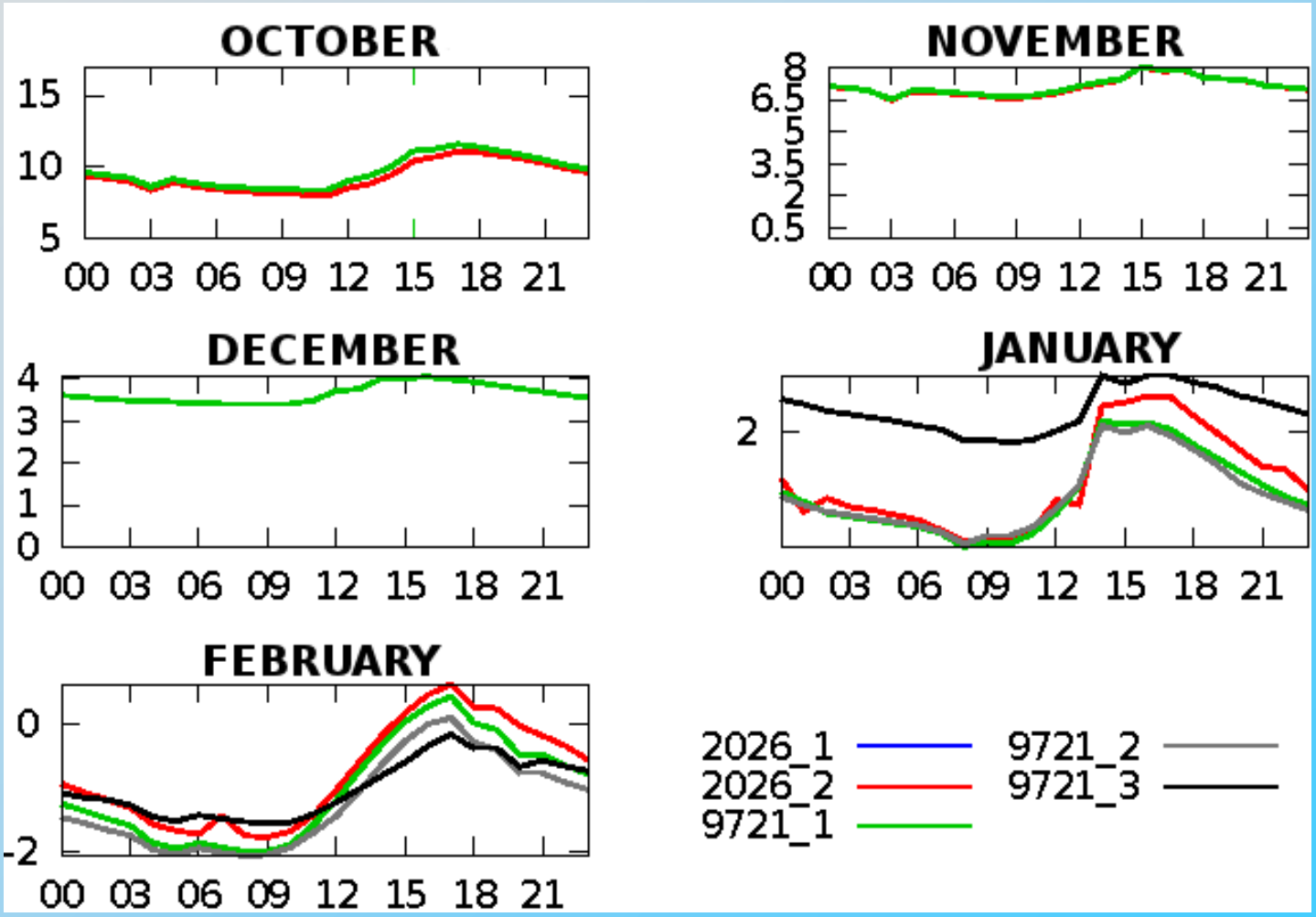
FACTS

STATISTIC FOR 5 CM DEPTH TEMPERATURE



FACTS

STATISTIC FOR 14 DEPTH TEMPERATURE



MODEL PERFORMANCE

VERIFICATION OF 3 HOUR FORECAST

ID	Type	October 2011 BIAS	November 2011 BIAS	December 2011 BIAS	January 2012 BIAS	February 2012 BIAS	October 2011 MAE	November 2011 MAE	December 2011 MAE	January 2012 MAE	February 2012 MAE
202601	Ref	0.60	-0.18	-0.59	-0.50	-0.31	0.91	0.86	0.84	0.80	0.72
202602	Ref	0.55	-0.25	-0.62	-0.61	-0.36	0.92	0.87	0.87	0.89	0.73
972101	Ref	0.73	-0.03	-0.43	-0.35	-0.04	0.98	0.89	0.79	0.85	0.82
972102	Porous	0.55	-0.07	-0.47	-0.40	-0.24	0.85	0.89	0.80	0.81	0.85
972103	Rubber	-	-	-	-0.41	-0.29	-	-	-	0.96	1.13
N		84	196	566	550	351	84	196	566	550	351

OBSERVED VERSUS FORECASTED TEMPERATURE PROFILE