

Appendix A
August 2010

**Assessment of 2007 WRF Meteorological Modeling in support of
Regional Air Quality Modeling in the Ozone Transport Region (OTR) for 2007**

Appendix A of Technical Support Document

In this document comparisons of the measured parameters to WRF simulations are displayed, which are referred to in the main portion of the TSD. Detailed information on the model input and output is available from NYSDEC. Please contact Gopal Sistla at 518-402-8402 or by e-mail at gxstla@gw.dec.state.ny.us For details on data release, please contact Ms. Anna Garcia of the OTC by Phone: (202) 508-3840 or by Email: agarcia@otcair.org. The analysis is performed for the portion of the modeling domain defined for air quality analysis, and the sub-region of MANE-VU within are displayed in Figure A-1. The horizontal grid spacing is 12 km.

Figure A-1 Display of WRF Modeling domains at 36 and 12 km, the 12 km Air Quality Modeling domain shown shaded and the MANE-VU domain shown in blue (p3)

Figures A2-A13 display, on a monthly basis the daily averages and bias between measured (TDL) and predicted (WRF) wind speed (p4-p9)

Figures B1-B12 display, on a monthly basis the daily averages and bias between measured (TDL) and predicted (WRF) wind direction (p10-p15)

Figures C1-C12 display, on a monthly basis the daily averages and bias between measured (TDL) and predicted (WRF) temperature (p16-p21)

Figures D1-D12 display, on a monthly basis the daily averages and bias between measured (TDL) and predicted (WRF) mixing ratio (p22-p27)

Figures E1-E7 display, the computed correlation coefficients between measured (TDL) and predicted (WRF) for wind speed, temperature, and mixing ratio from April to October on a daily basis (p28-p31)

Figures F1-F12 display, on a monthly basis the daily averages and bias between measured (CASTNet) and predicted (WRF) wind speed, wind direction, and temperature (p31-p37)

Figures G1-G12 display, spatial distribution of monthly (January to December) precipitation based on measured (Stage4) and WRF predicted amounts (P38-p49)

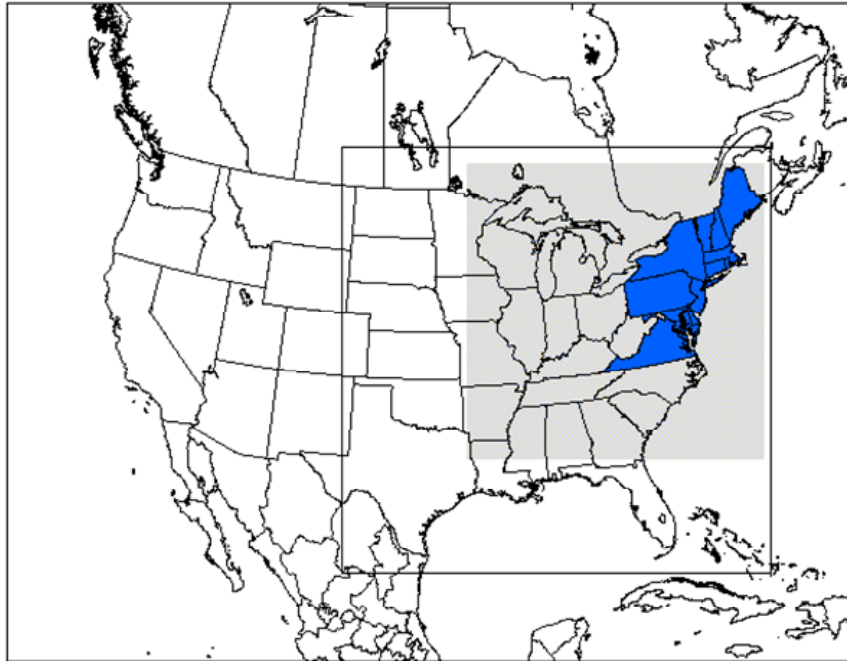


Figure A-1 Display of WRF Modeling domains at 36 and 12 km, the 12 km Air Quality Modeling domain shown shaded and the MANE-VU domain shown in blue

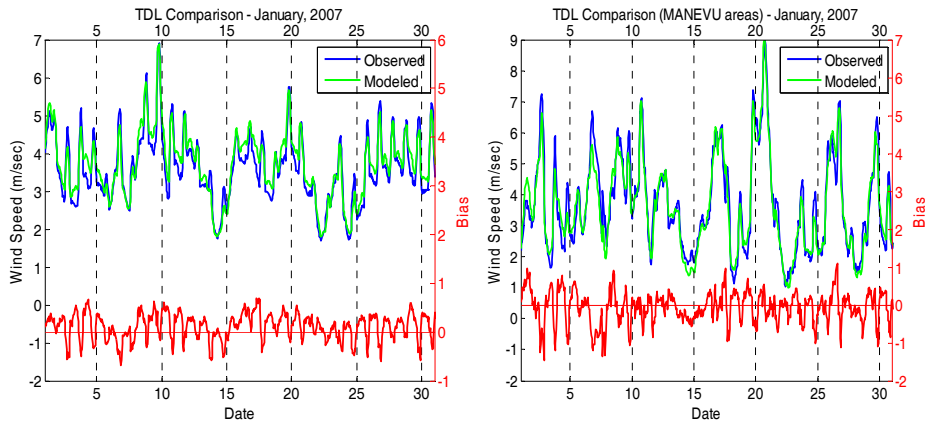


Figure A-2 Comparison of daily average wind speed and bias over the 12 km air quality domain and MANEVU region for January, 2007 for TDL and WRF data

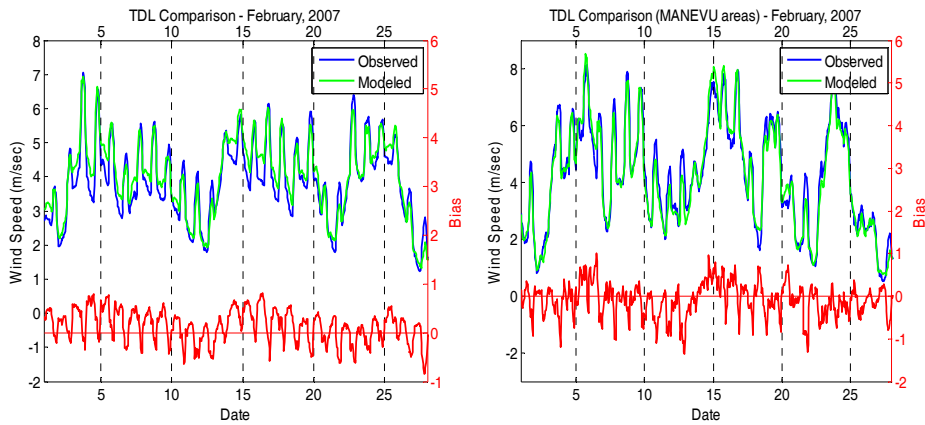


Figure A-3 Comparison of daily average wind speed and bias over the 12 km air quality domain and MANEVU region for February, 2007 for TDL and WRF data

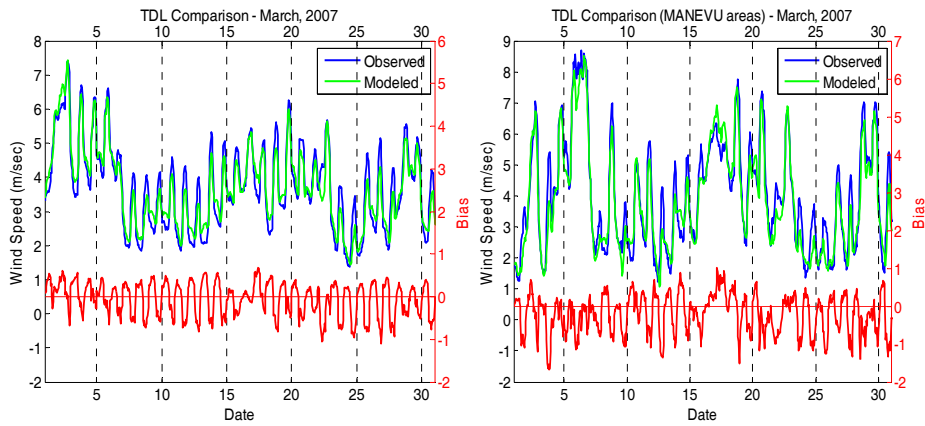


Figure A-4 Comparison of daily average wind speed and bias over the 12 km air quality domain and MANEVU region for March, 2007 for TDL and WRF data

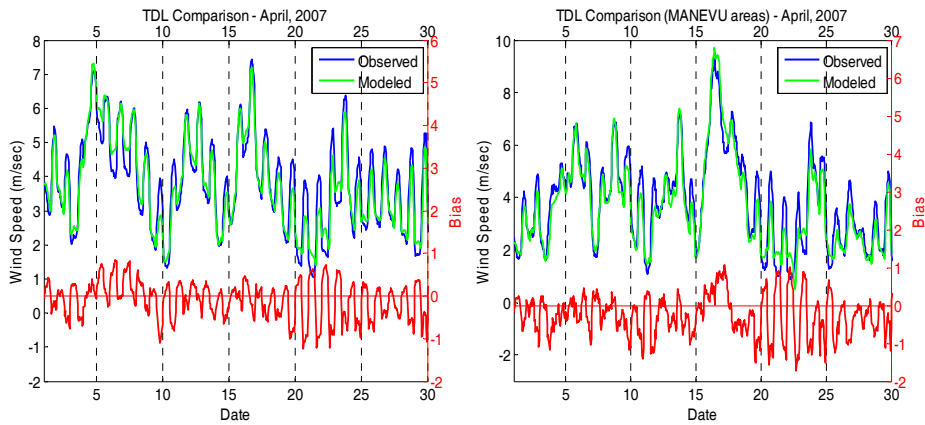


Figure A-5 Comparison of daily average wind speed and bias over the 12 km air quality domain and MANEVU region for April, 2007 for TDL and WRF data

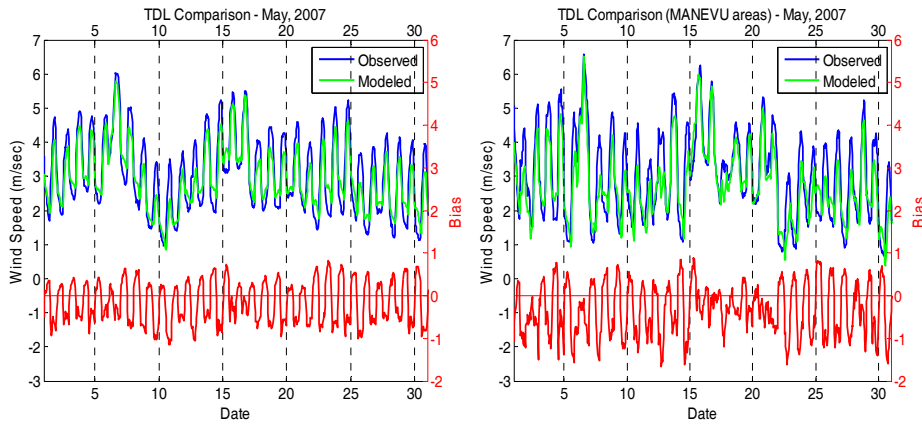


Figure A-6 Comparison of daily average wind speed and bias over the 12 km air quality domain and MANEVU region for May, 2007 for TDL and WRF data

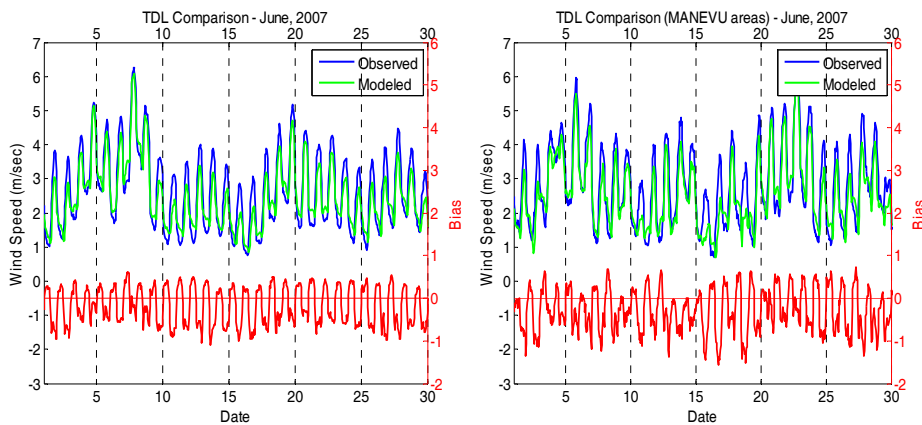


Figure A-7 Comparison of daily average wind speed and bias over the 12 km air quality domain and MANEVU region for June, 2007 for TDL and WRF data

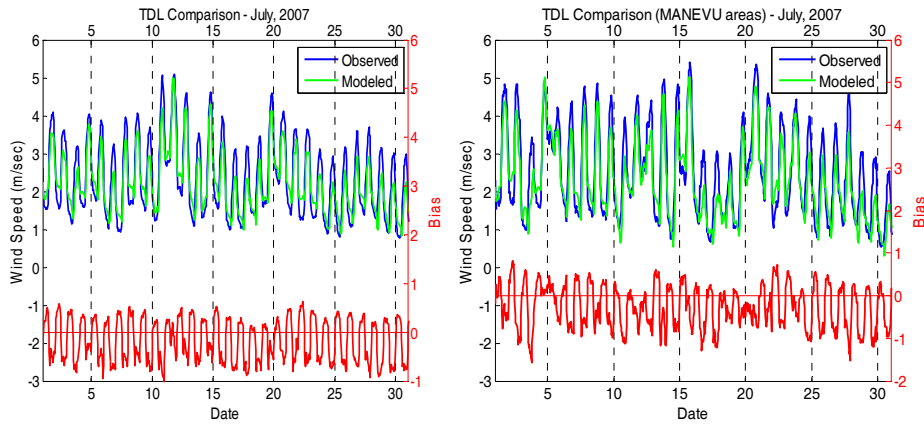


Figure A-8 Comparison of daily average wind speed and bias over the 12 km air quality domain and MANEVU region for July, 2007 for TDL and WRF data

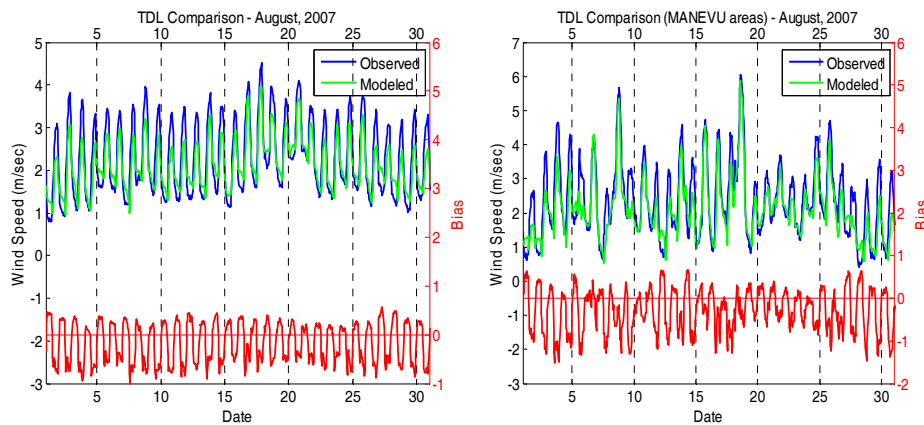


Figure A-9 Comparison of daily average wind speed and bias over the 12 km air quality domain and MANEVU region for August, 2007 for TDL and WRF data

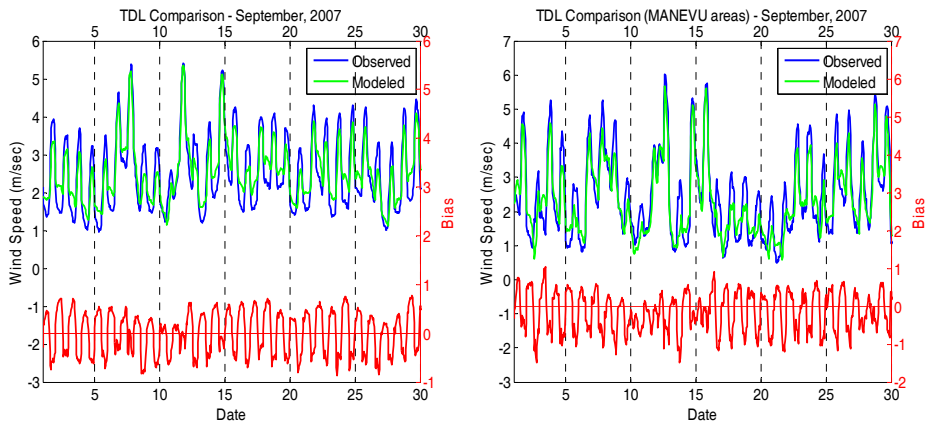


Figure A-10 Comparison of daily average wind speed and bias over the 12 km air quality domain and MANEVU region for September, 2007 for TDL and WRF data

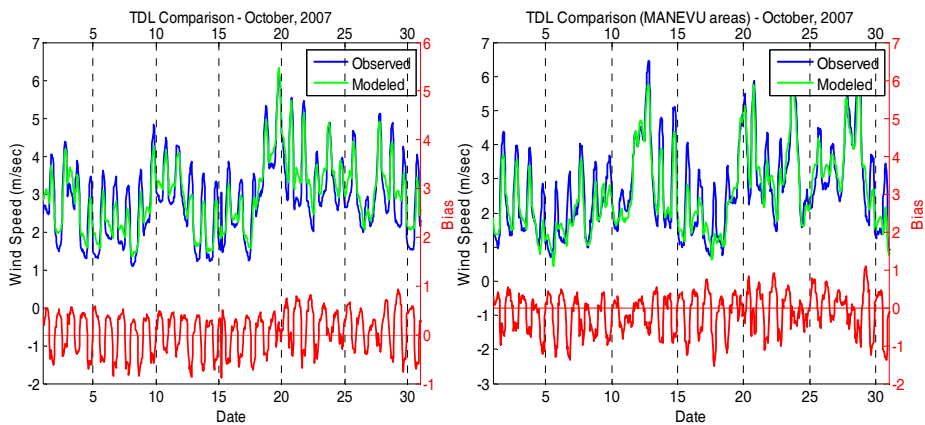


Figure A-11 Comparison of daily average wind speed and bias over the 12 km air quality domain and MANEVU region for October, 2007 for TDL and WRF data

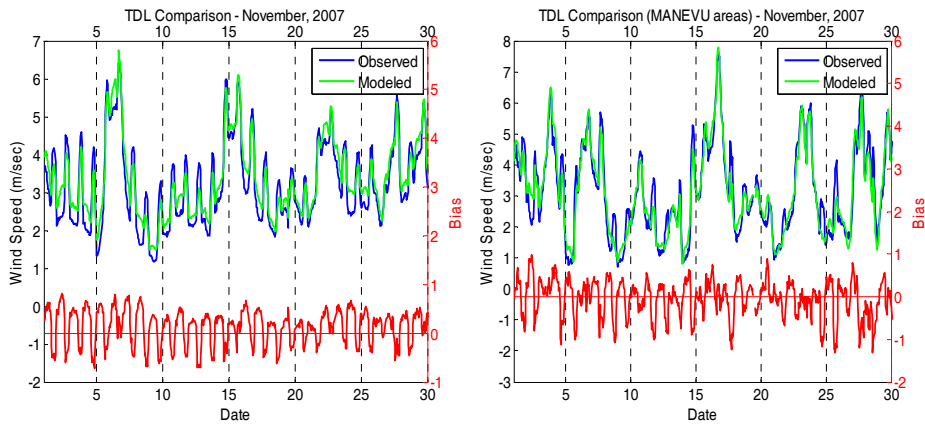


Figure A-12 Comparison of daily average wind speed and bias over the 12 km air quality domain and MANEVU region for November, 2007 for TDL and WRF data

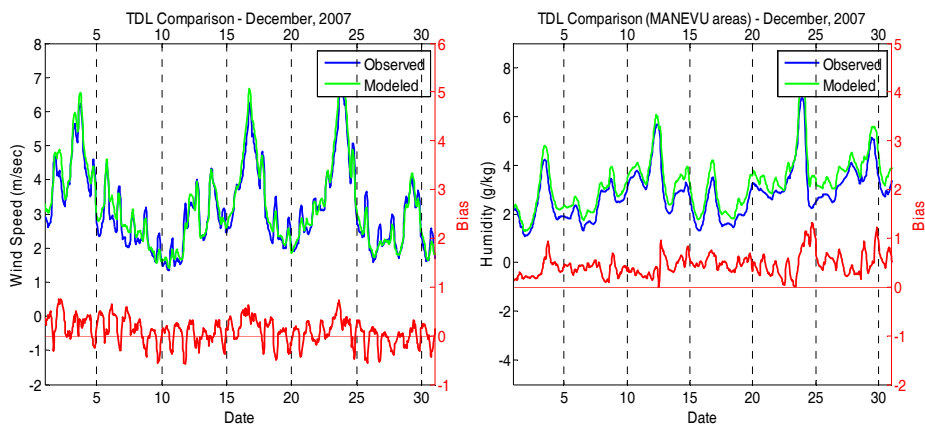


Figure A-13 Comparison of daily average wind speed and bias over the 12 km air quality domain and MANEVU region for December, 2007 for TDL and WRF data

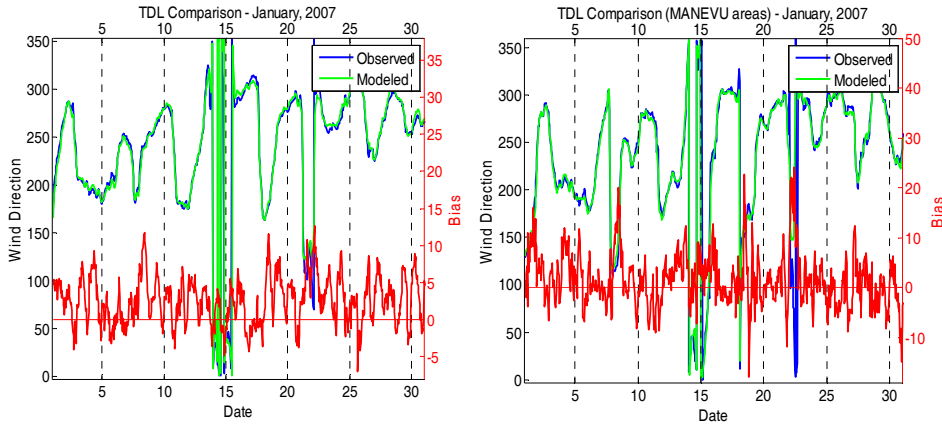


Figure B-1 Comparison of daily average wind direction and bias over the 12 km air quality domain and MANEVU region for January, 2007 for TDL and WRF data

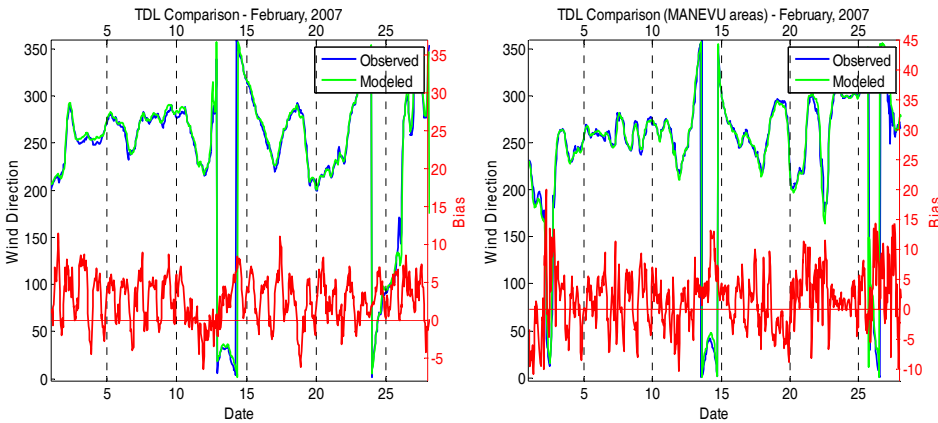


Figure B-2 Comparison of daily average wind direction and bias over the 12 km air quality domain and MANEVU region for February, 2007 for TDL and WRF data

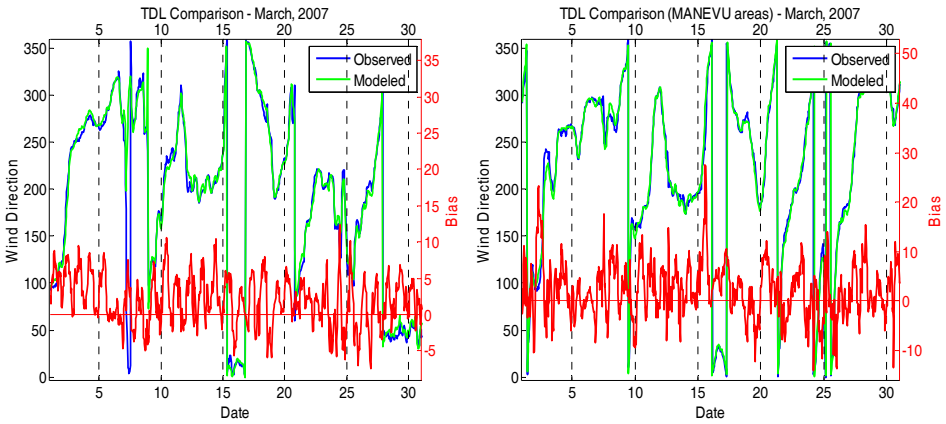


Figure B-3 Comparison of daily average wind direction and bias over the 12 km air quality domain and MANEVU region for March, 2007 for TDL and WRF data

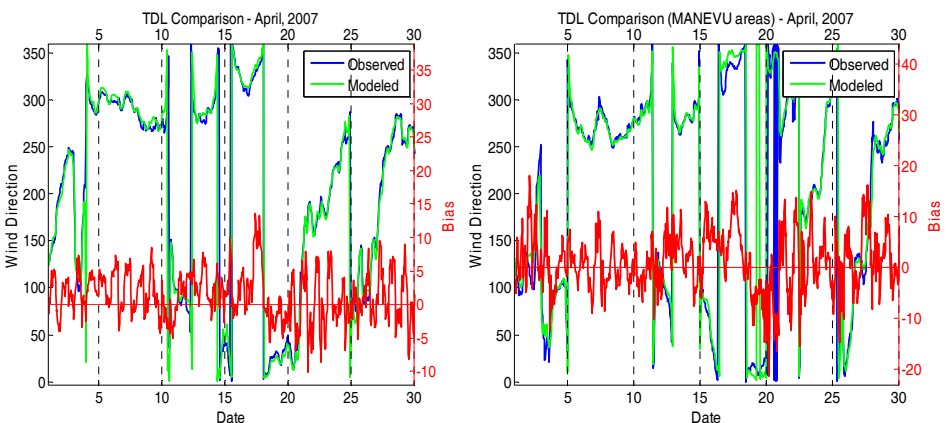


Figure B-4 Comparison of daily average wind direction and bias over the 12 km air quality domain and MANEVU region for April, 2007 for TDL and WRF data

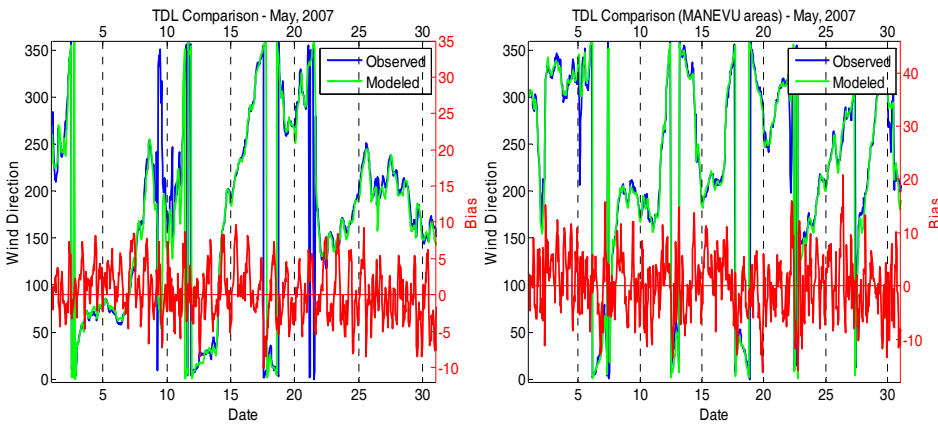


Figure B-5 Comparison of daily average wind direction and bias over the 12 km air quality domain and MANEVU region for May, 2007 for TDL and WRF data

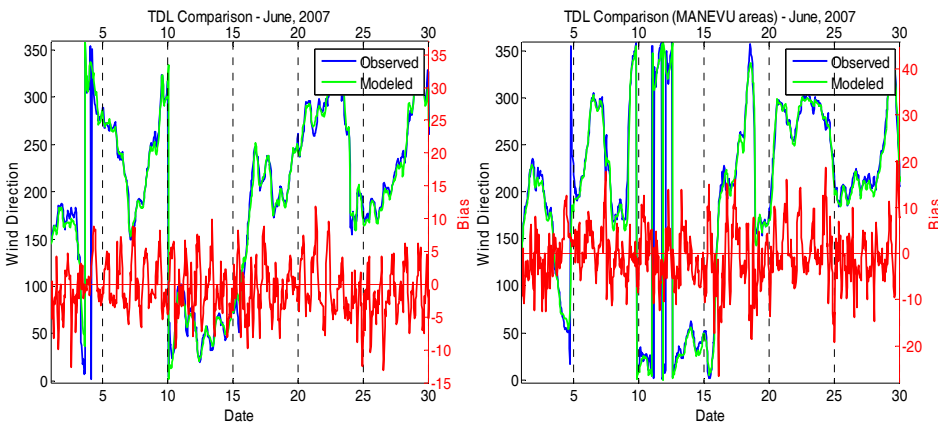


Figure B-6 Comparison of daily average wind direction and bias over the 12 km air quality domain and MANEVU region for June, 2007 for TDL and WRF data

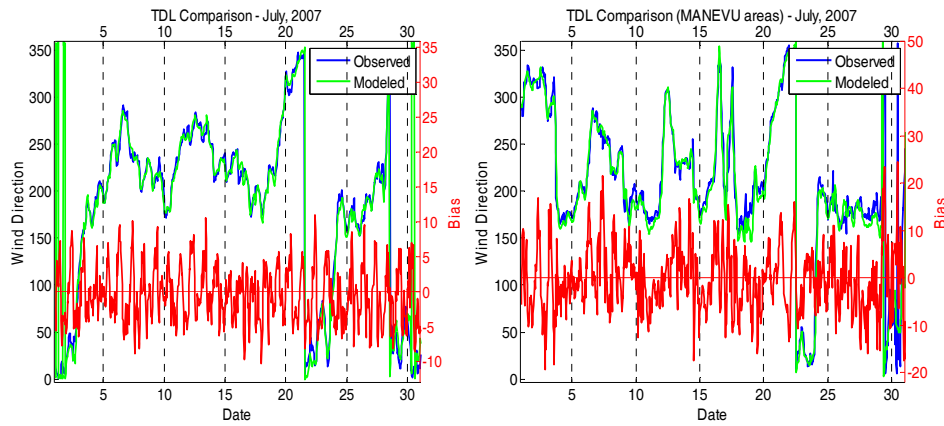


Figure B-7 Comparison of daily average wind direction and bias over the 12 km air quality domain and MANEVU region for July, 2007 for TDL and WRF data

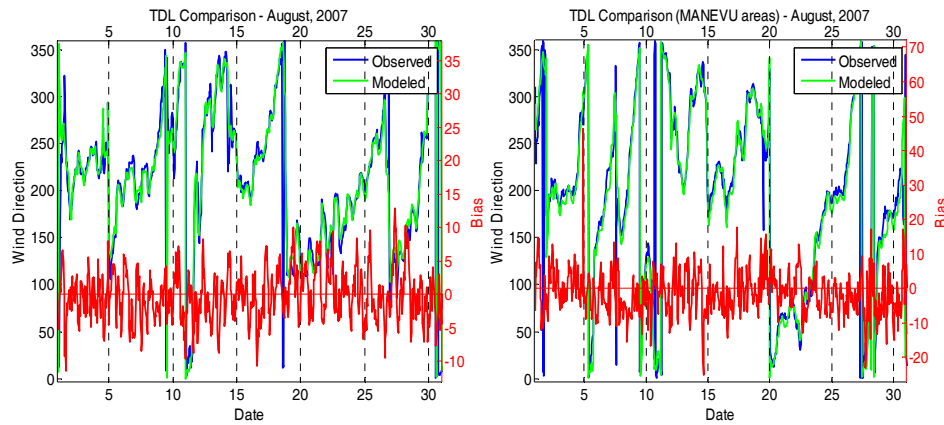


Figure B-8 Comparison of daily average wind direction and bias over the 12 km air quality domain and MANEVU region for August, 2007 for TDL and WRF data

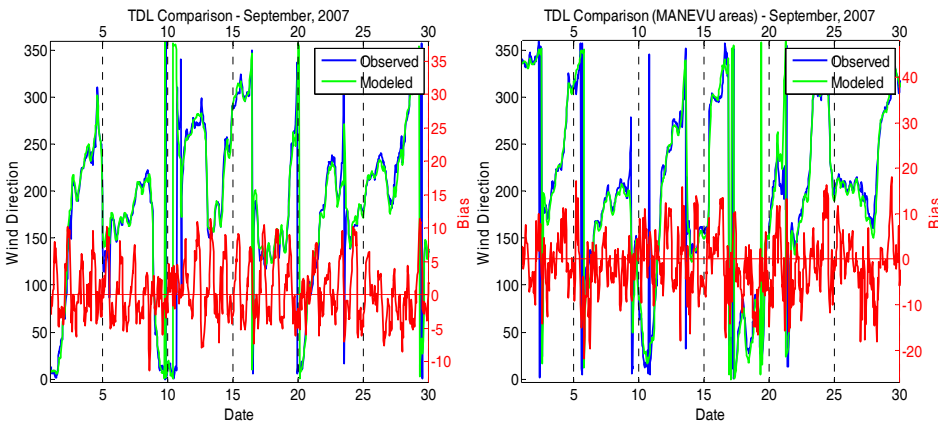


Figure B-9 Comparison of daily average wind direction and bias over the 12 km air quality domain and MANEVU region for September, 2007 for TDL and WRF data

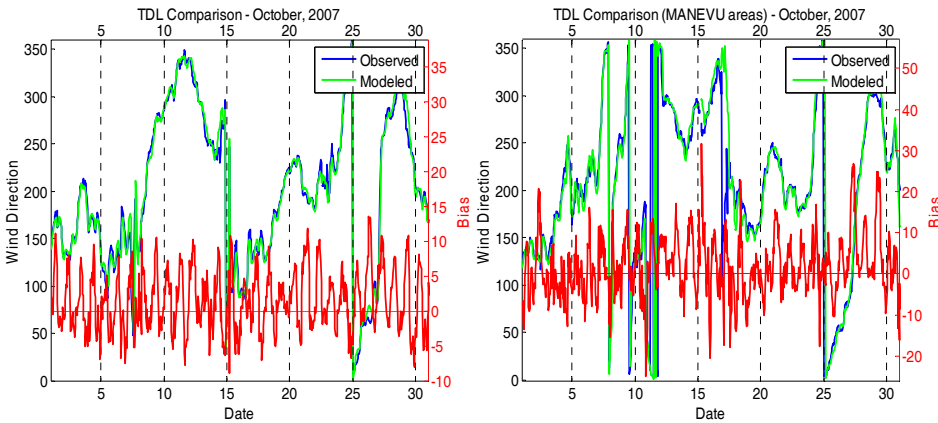


Figure B-10 Comparison of daily average wind direction and bias over the 12 km air quality domain and MANEVU region for October, 2007 for TDL and WRF data

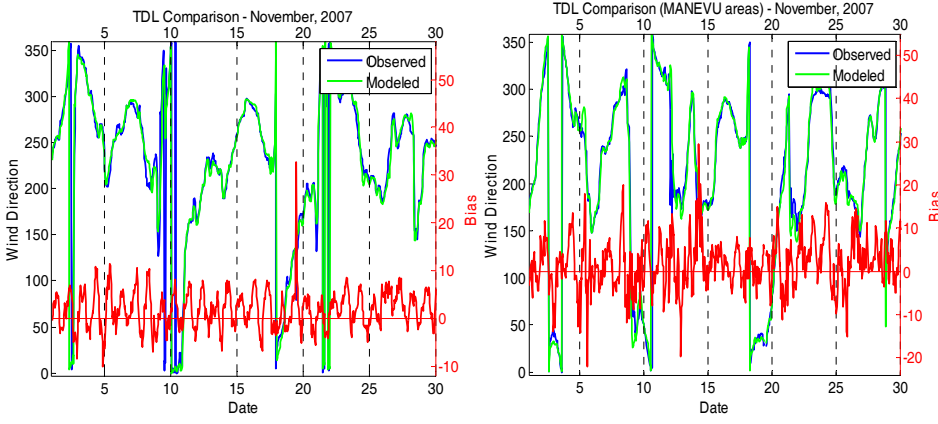


Figure B-11 Comparison of daily average wind direction and bias over the 12 km air quality domain and MANEVU region for November, 2007 for TDL and WRF data

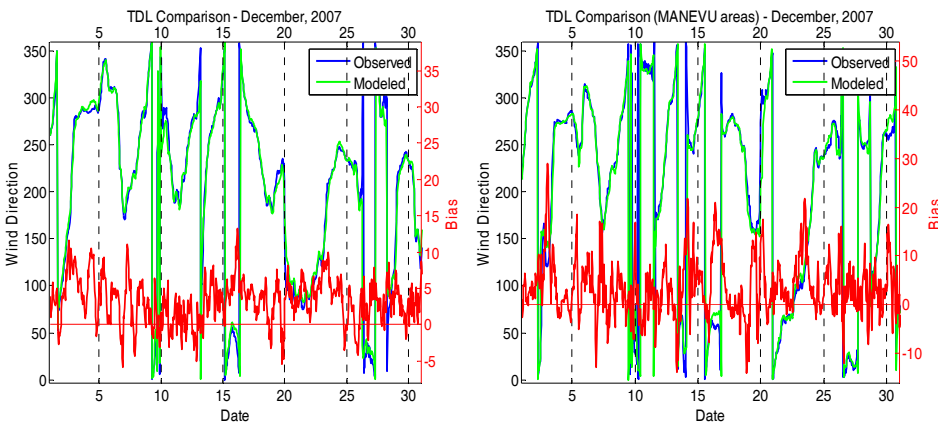


Figure B-12 Comparison of daily average wind direction and bias over the 12 km air quality domain and MANEVU region for December, 2007 for TDL and WRF data

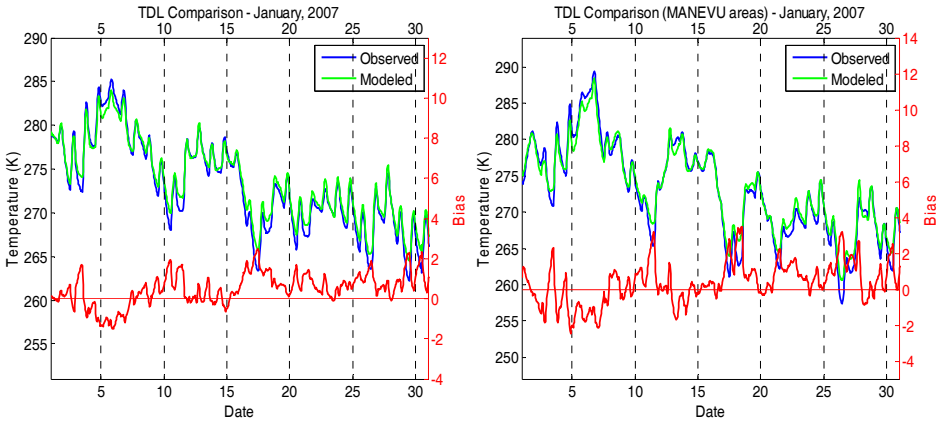


Figure C-1 Comparison of daily average temperature and bias over the 12 km air quality domain and MANEVU region for January, 2007 for TDL and WRF data

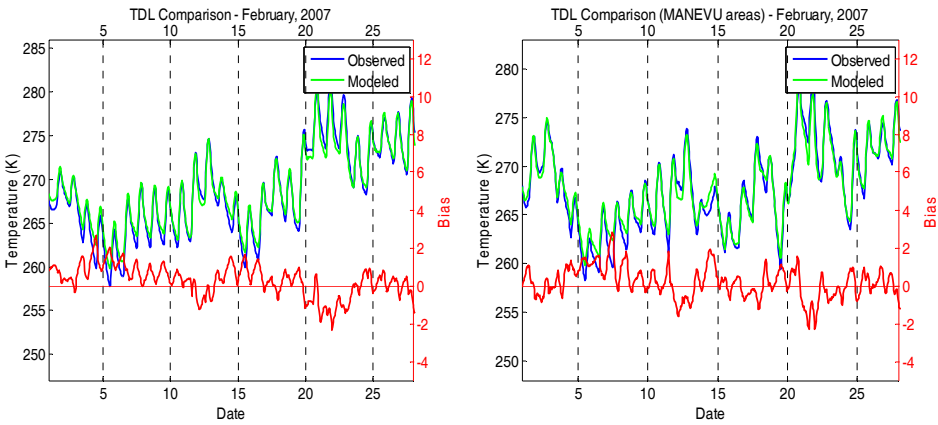


Figure C-2 Comparison of daily average temperature and bias over the 12 km air quality domain and MANEVU region for February, 2007 for TDL and WRF data

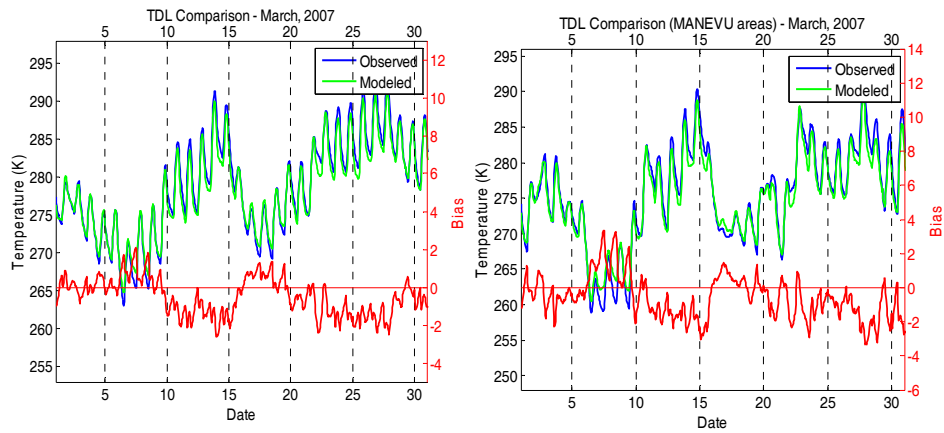


Figure C-3 Comparison of daily average temperature and bias over the 12 km air quality domain and MANEVU region for March, 2007 for TDL and WRF data

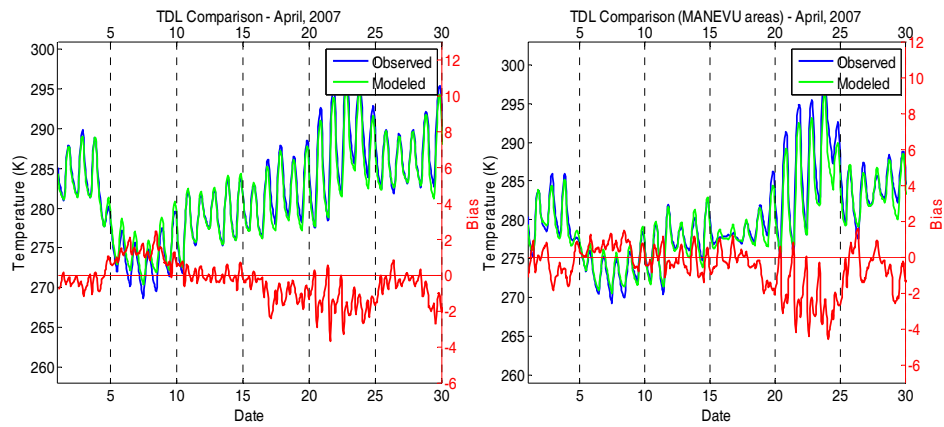


Figure C-4 Comparison of daily average temperature and bias over the 12 km air quality domain and MANEVU region for April, 2007 for TDL and WRF data

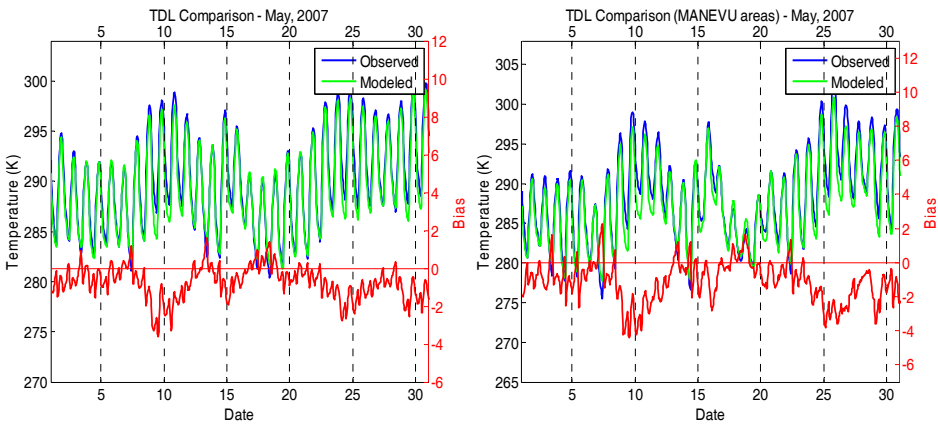


Figure C-5 Comparison of daily average temperature and bias over the 12 km air quality domain and MANEVU region for May, 2007 for TDL and WRF data

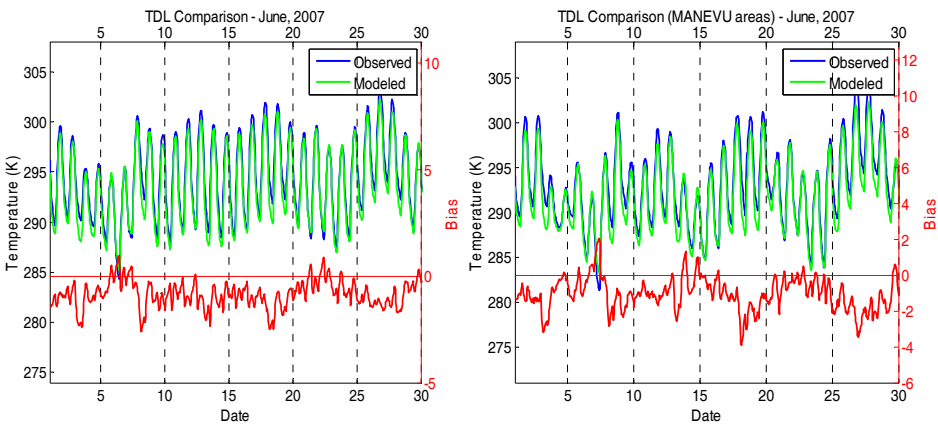


Figure C-6 Comparison of daily average temperature and bias over the 12 km air quality domain and MANEVU region for June, 2007 for TDL and WRF data

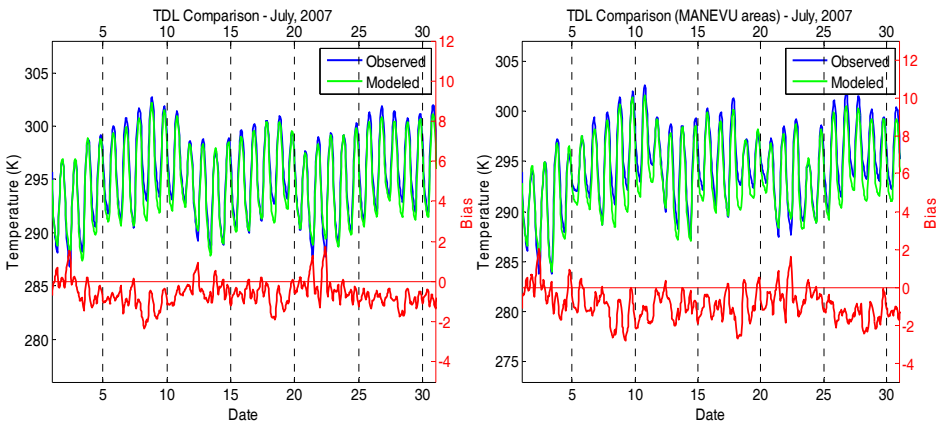


Figure C-7 Comparison of daily average temperature and bias over the 12 km air quality domain and MANEVU region for July, 2007 for TDL and WRF data

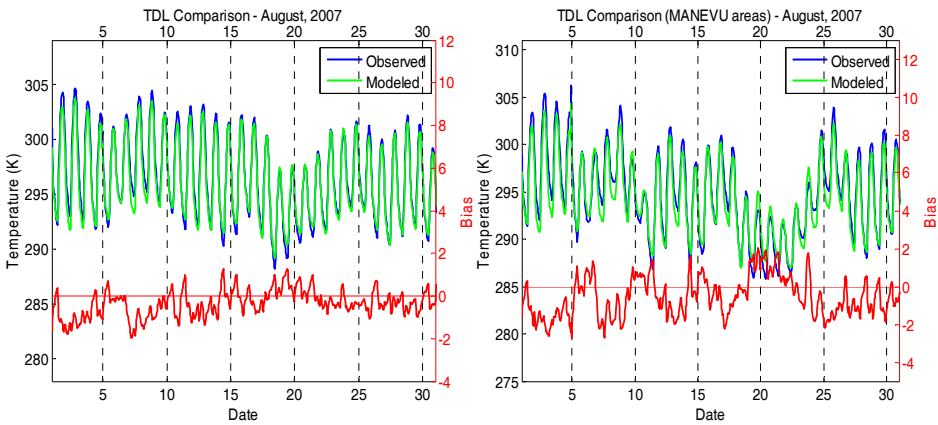


Figure C-8 Comparison of daily average temperature and bias over the 12 km air quality domain and MANEVU region for August, 2007 for TDL and WRF data

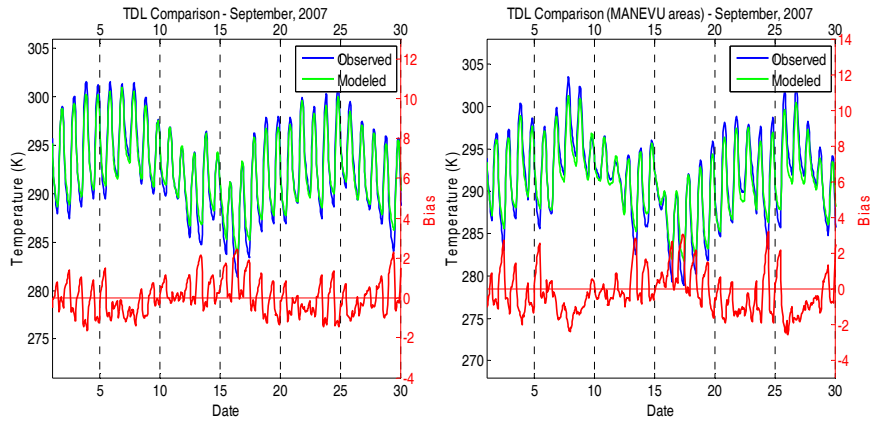


Figure C-9 Comparison of daily average temperature and bias over the 12 km air quality domain and MANEVU region for September, 2007 for TDL and WRF data

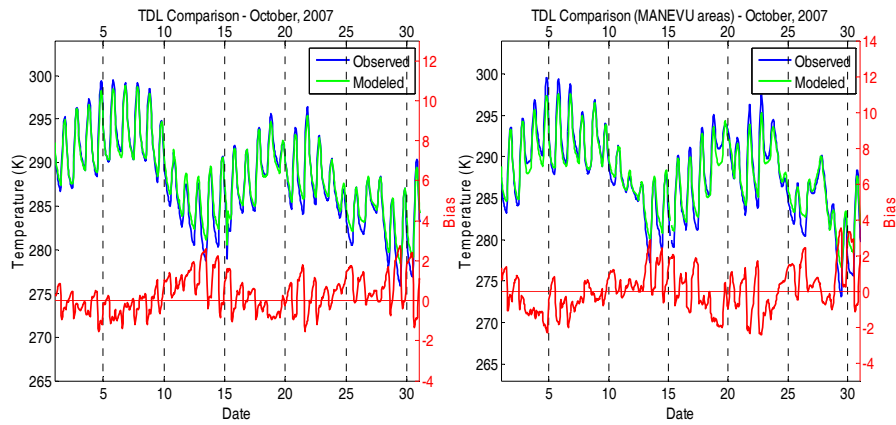


Figure C-10 Comparison of daily average temperature and bias over the 12 km air quality domain and MANEVU region for October, 2007 for TDL and WRF data

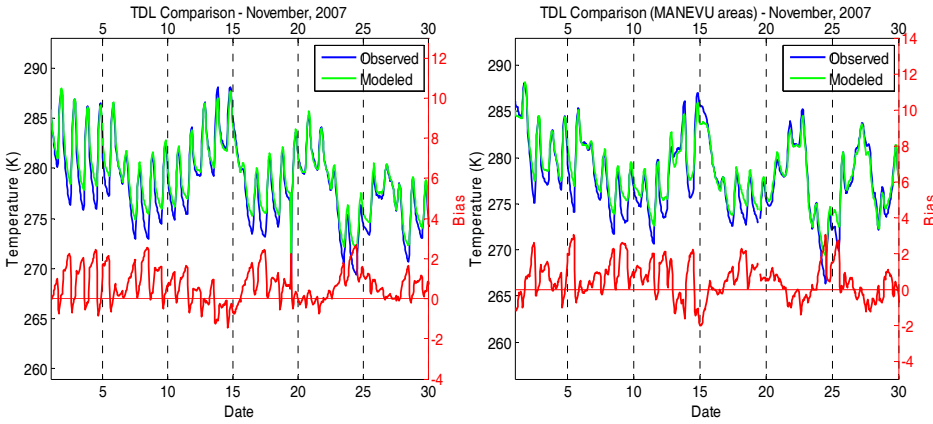


Figure C-11 Comparison of daily average temperature and bias over the 12 km air quality domain and MANEVU region for November, 2007 for TDL and WRF data

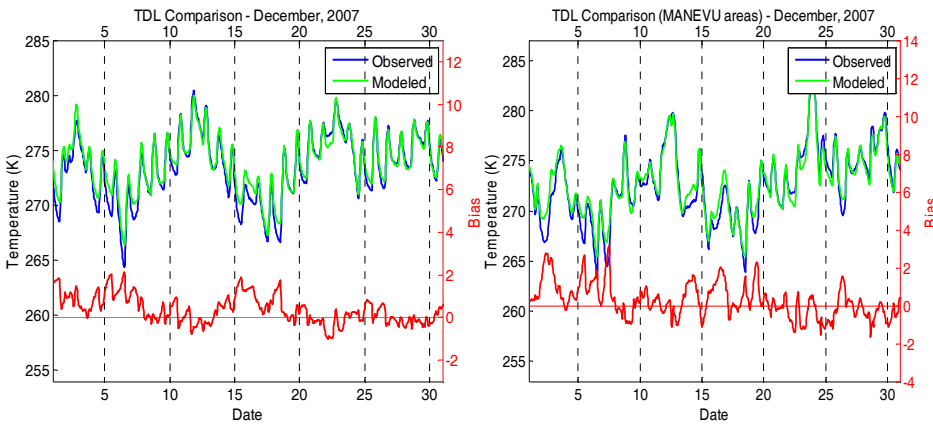


Figure C-12 Comparison of daily average temperature and bias over the 12 km air quality domain and MANEVU region for December, 2007 for TDL and WRF data

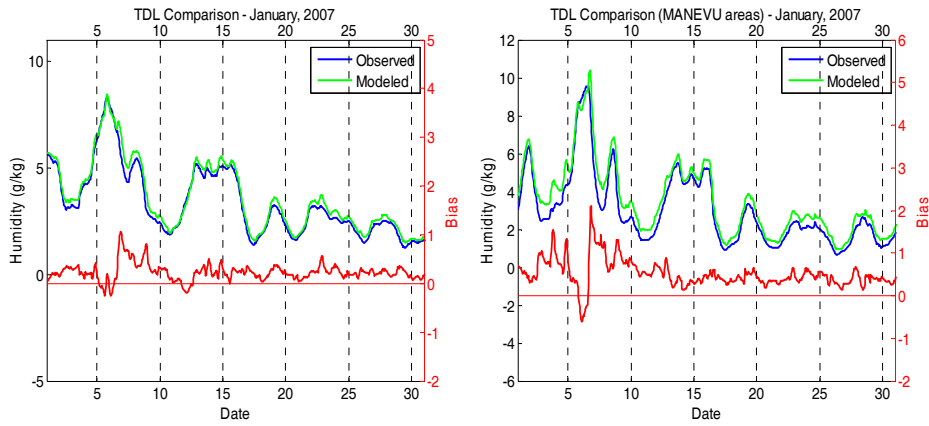


Figure D-1 Comparison of daily average mixing ratio (humidity) and bias over the 12 km air quality domain and MANEVU region for January, 2007 for TDL and WRF data

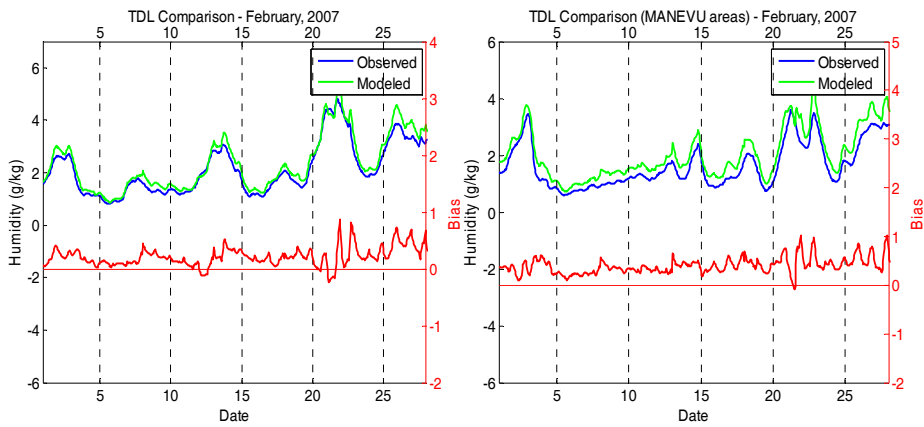


Figure D-2 Comparison of daily average mixing ratio (humidity) and bias over the 12 km air quality domain and MANEVU region for February, 2007 for TDL and WRF data

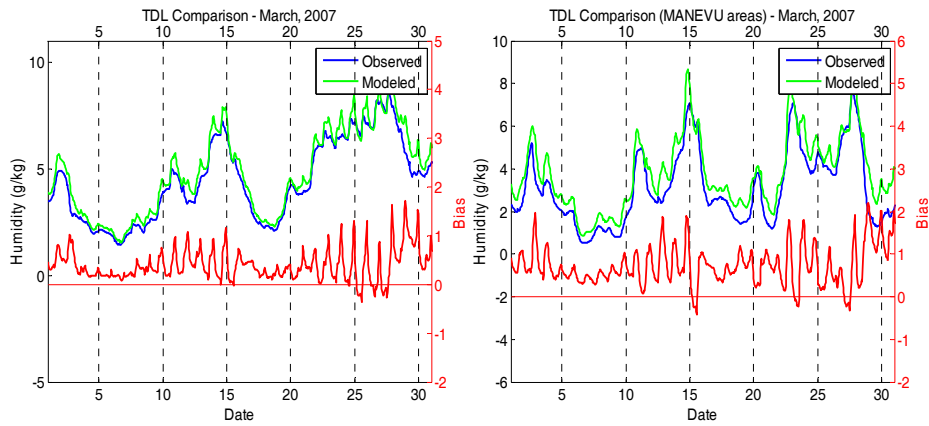


Figure D-3 Comparison of daily average mixing ratio (humidity) and bias over the 12 km air quality domain and MANEUVU region for March, 2007 for TDL and WRF data

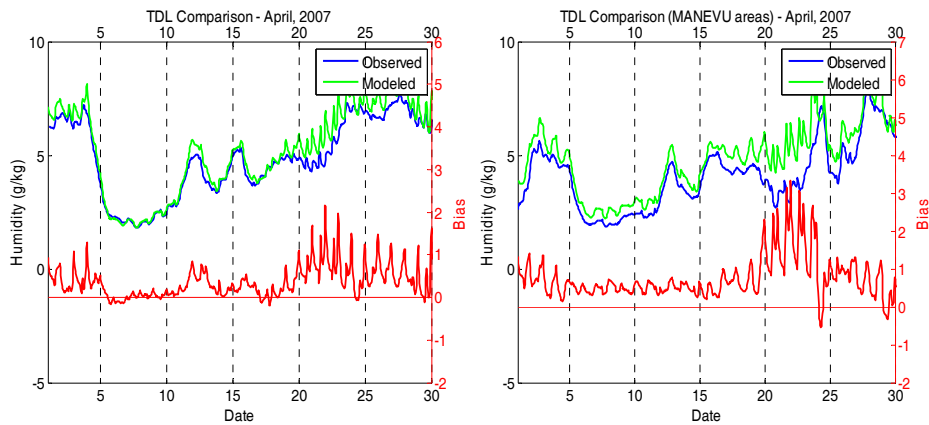


Figure D-4 Comparison of daily average mixing ratio (humidity) and bias over the 12 km air quality domain and MANEUVU region for April, 2007 for TDL and WRF data

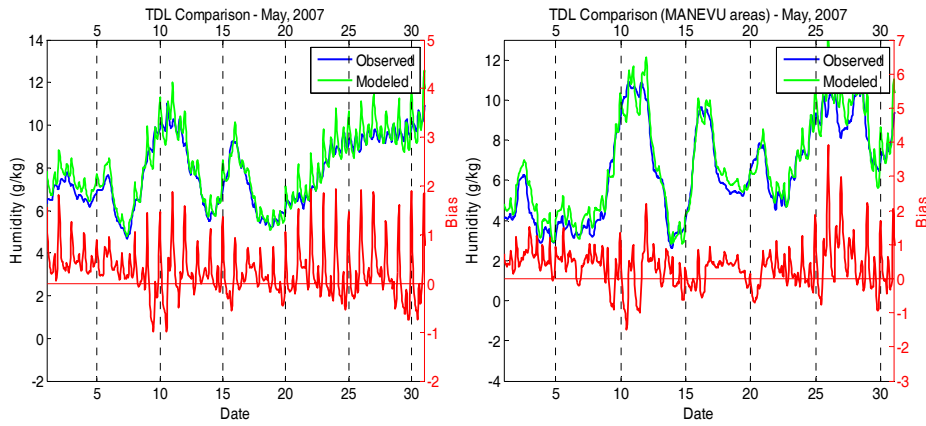


Figure D-5 Comparison of daily average mixing ratio (humidity) and bias over the 12 km air quality domain and MANEVU region for May, 2007 for TDL and WRF data

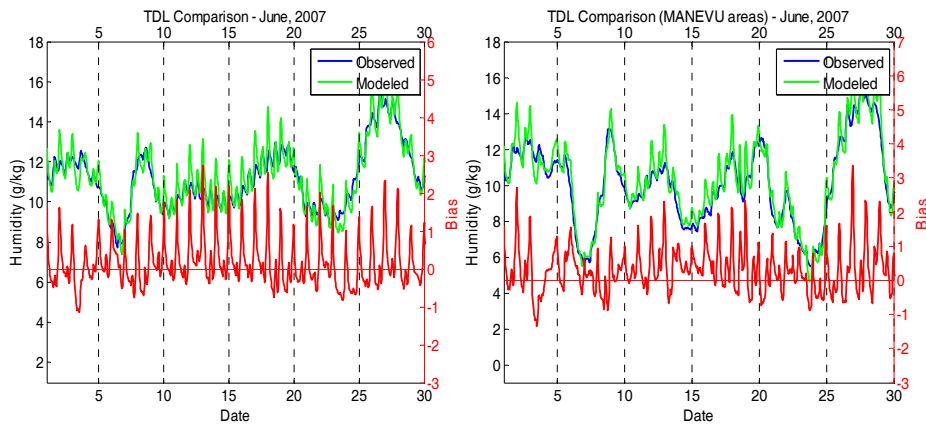


Figure D-6 Comparison of daily average mixing ratio (humidity) and bias over the 12 km air quality domain and MANEVU region for June, 2007 for TDL and WRF data

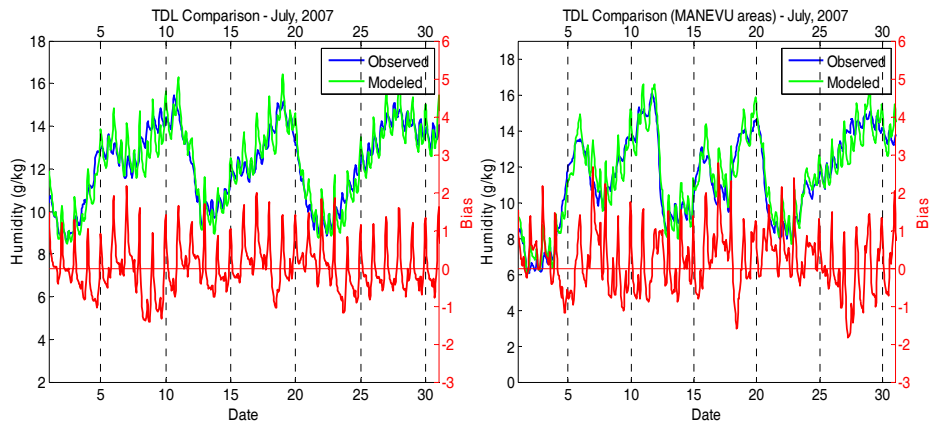


Figure D-7 Comparison of daily average mixing ratio (humidity) and bias over the 12 km air quality domain and MANEVU region for July, 2007 for TDL and WRF data

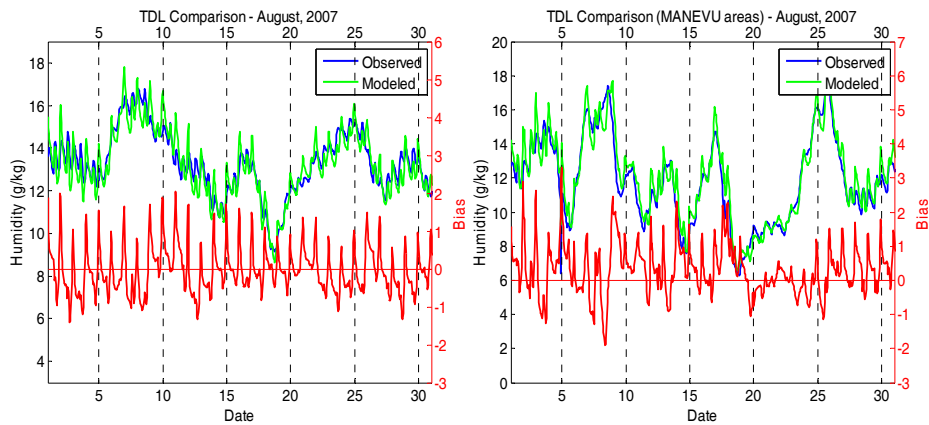


Figure D-8 Comparison of daily average mixing ratio (humidity) and bias over the 12 km air quality domain and MANEVU region for August, 2007 for TDL and WRF data

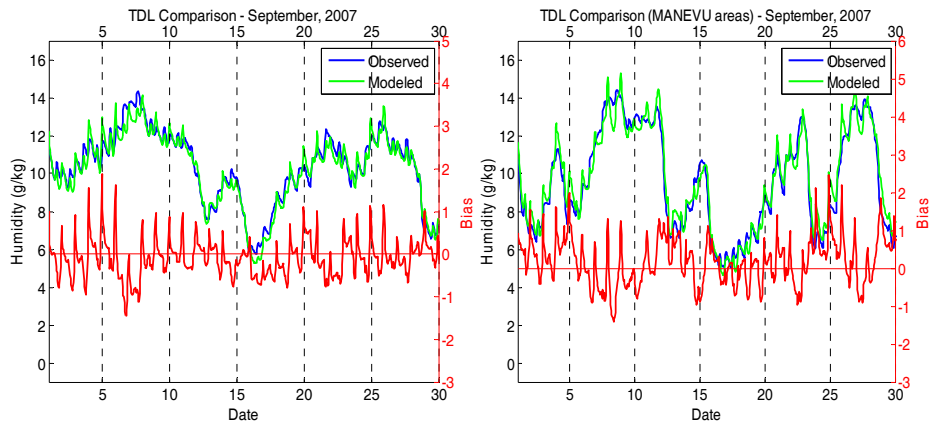


Figure D-9 Comparison of daily average mixing ratio (humidity) and bias over the 12 km air quality domain and MANEVU region for September, 2007 for TDL and WRF data

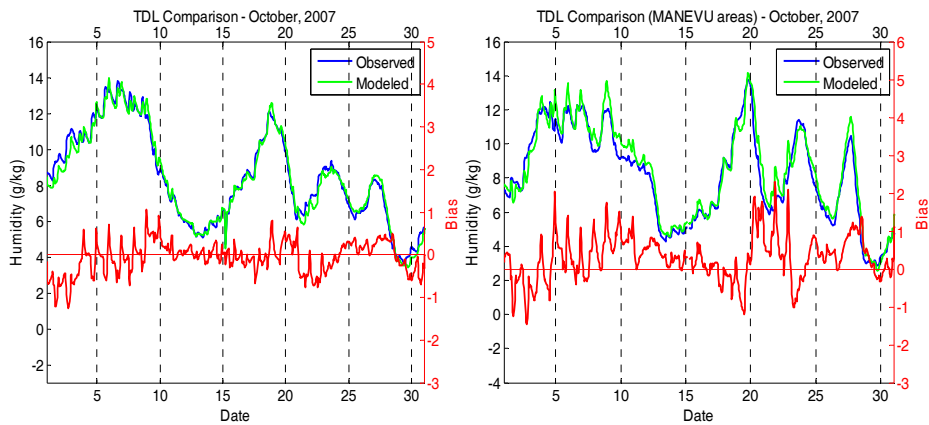


Figure D-10 Comparison of daily average mixing ratio (humidity) and bias over the 12 km air quality domain and MANEVU region for October, 2007 for TDL and WRF data

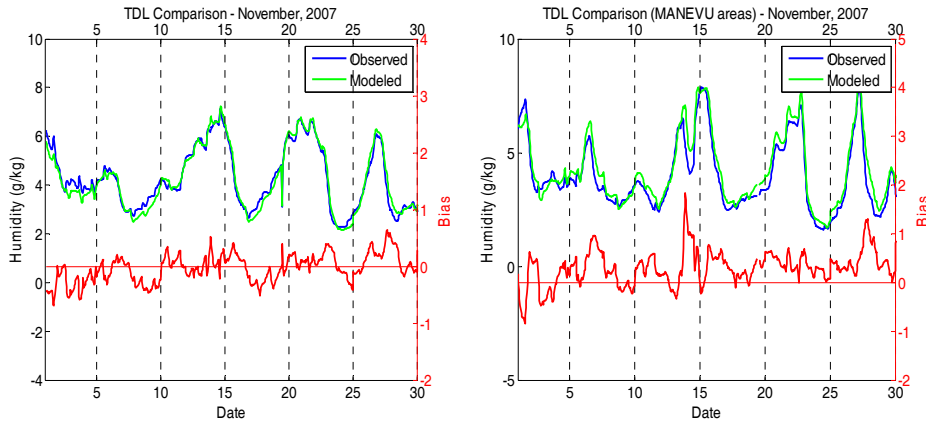


Figure D-11 Comparison of daily average mixing ratio (humidity) and bias over the 12 km air quality domain and MANEUV region for November, 2007 for TDL and WRF data

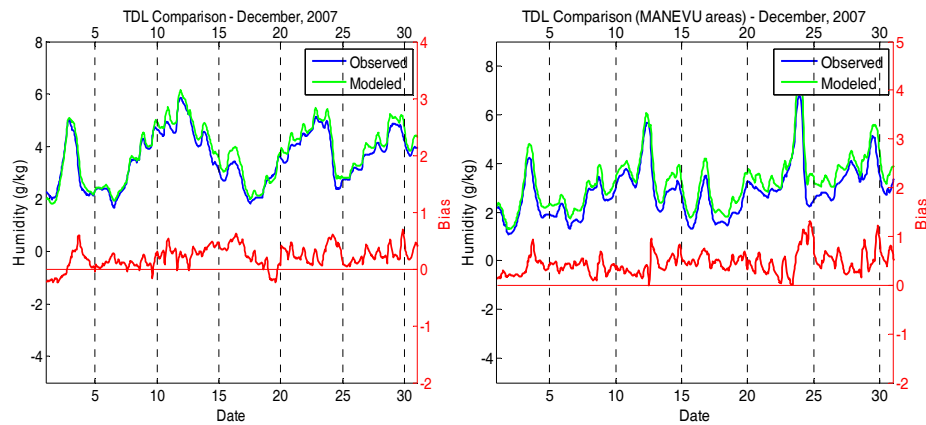


Figure D-12 Comparison of daily average mixing ratio (humidity) and bias over the 12 km air quality domain and MANEUV region for December, 2007 for TDL and WRF data

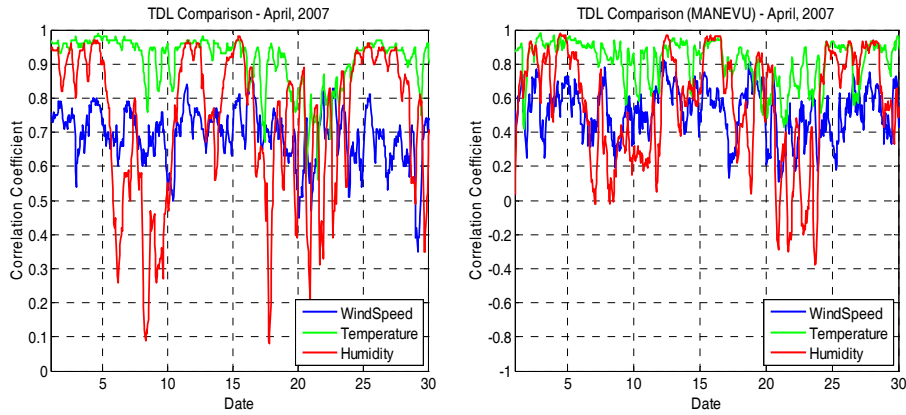


Figure E-1 Comparison of daily correlation coefficient for wind speed, temperature, and mixing ratio over the 12 km air quality domain and MANEVU region for April, 2007 for TDL and WRF data

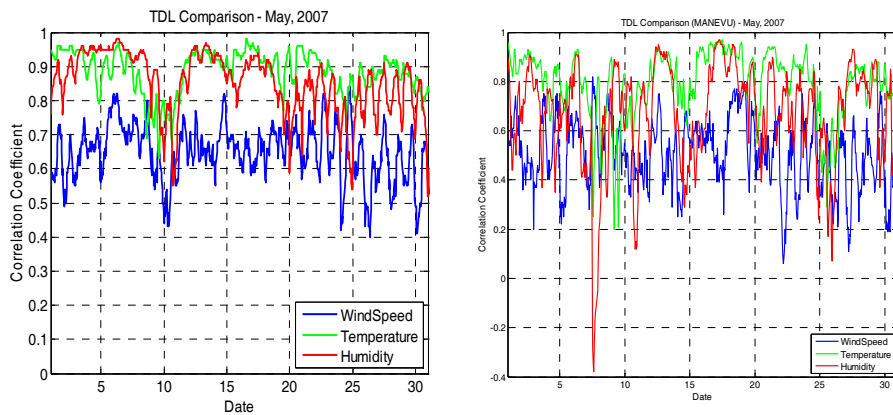


Figure E-2 Comparison of daily correlation coefficient for wind speed, temperature, and mixing ratio over the 12 km air quality domain and MANEVU region for May, 2007 for TDL and WRF data

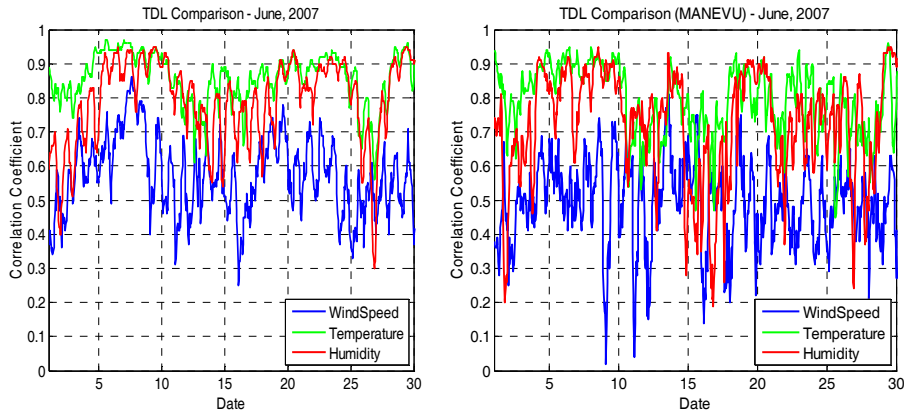


Figure E-3 Comparison of daily correlation coefficient for wind speed, temperature, and mixing ratio over the 12 km air quality domain and MANEVU region for June, 2007 for TDL and WRF data

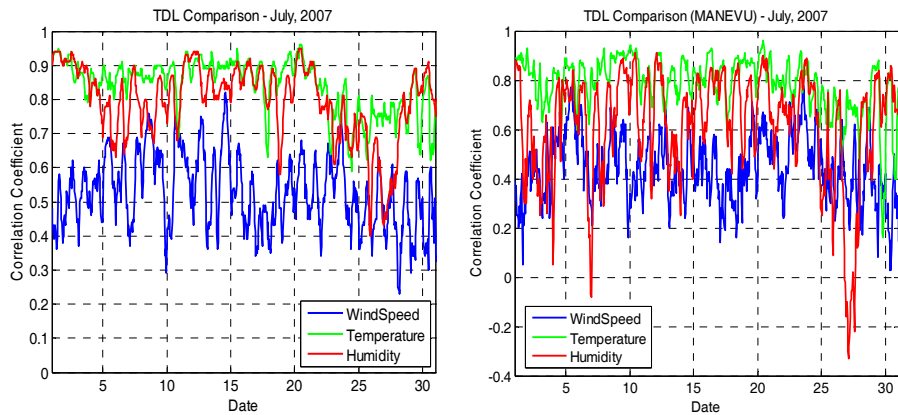


Figure E-4 Comparison of daily correlation coefficient for wind speed, temperature, and mixing ratio over the 12 km air quality domain and MANEVU region for July, 2007 for TDL and WRF data

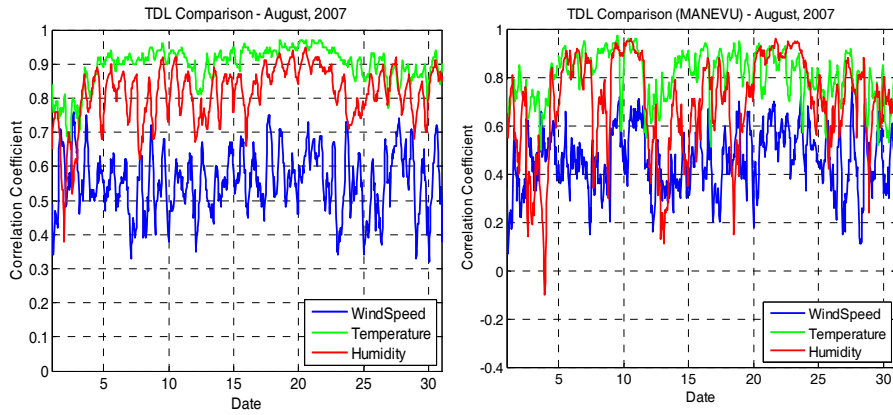


Figure E-5 Comparison of daily correlation coefficient for wind speed, temperature, and mixing ratio over the 12 km air quality domain and MANEVU region for August, 2007

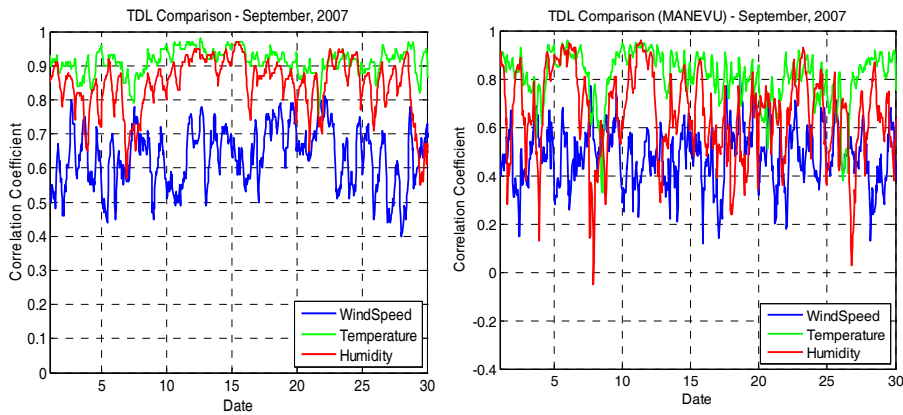


Figure E-6 Comparison of daily correlation coefficient for wind speed, temperature, and mixing ratio over the 12 km air quality domain and MANEVU region for September, 2007 for TDL and WRF data

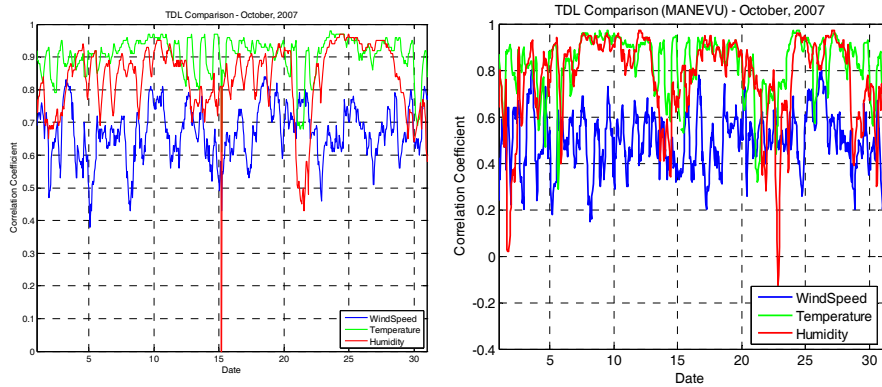


Figure E-7 Comparison of daily correlation coefficient for wind speed, temperature, and mixing ratio over the 12 km air quality domain and MANEVU region for October, 2007 for TDL and WRF data

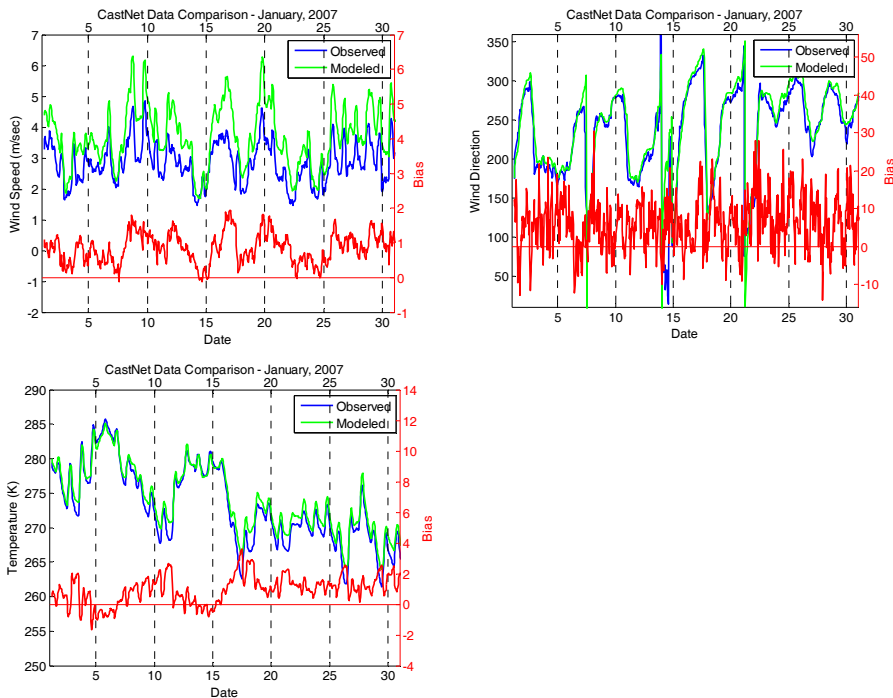


Figure F-1 Comparison of daily average wind speed, wind direction, and temperature over the 12 km air quality domain and MANEVU region for January, 2007 for CASTNet and WRF data

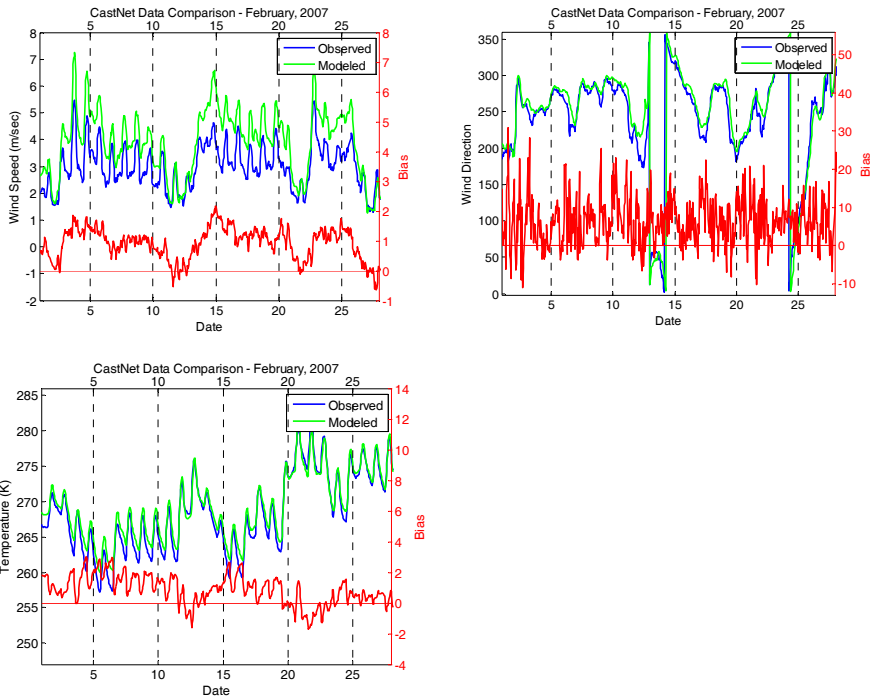


Figure F-2 Comparison of daily average wind speed, wind direction, and temperature over the 12 km air quality domain and MANEVU region for February, 2007 for CASTNet and WRF data

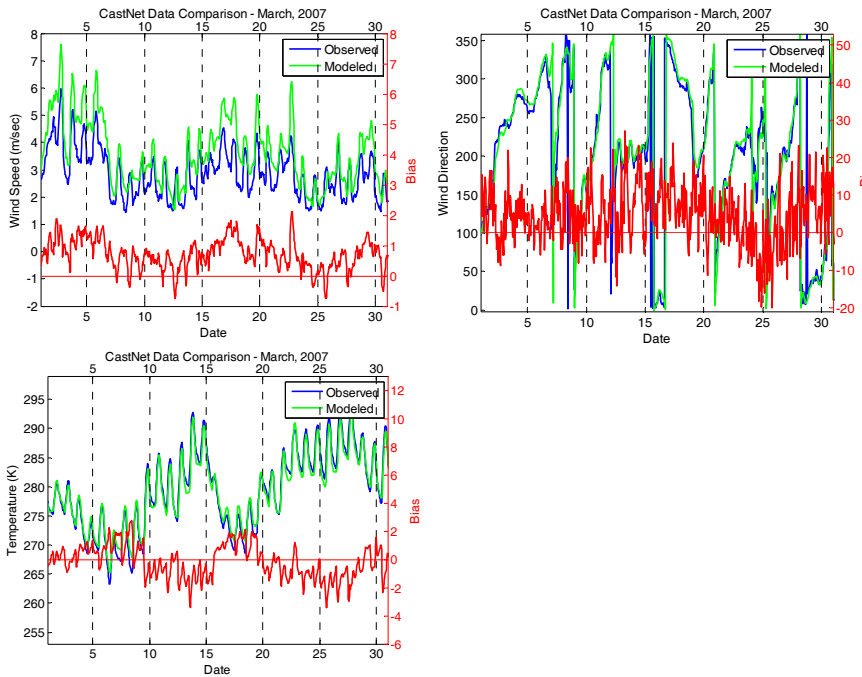


Figure F-3 Comparison of daily average wind speed, wind direction, and temperature over the 12 km air quality domain and MANEVU region for March, 2007 for CASTNet and WRF data

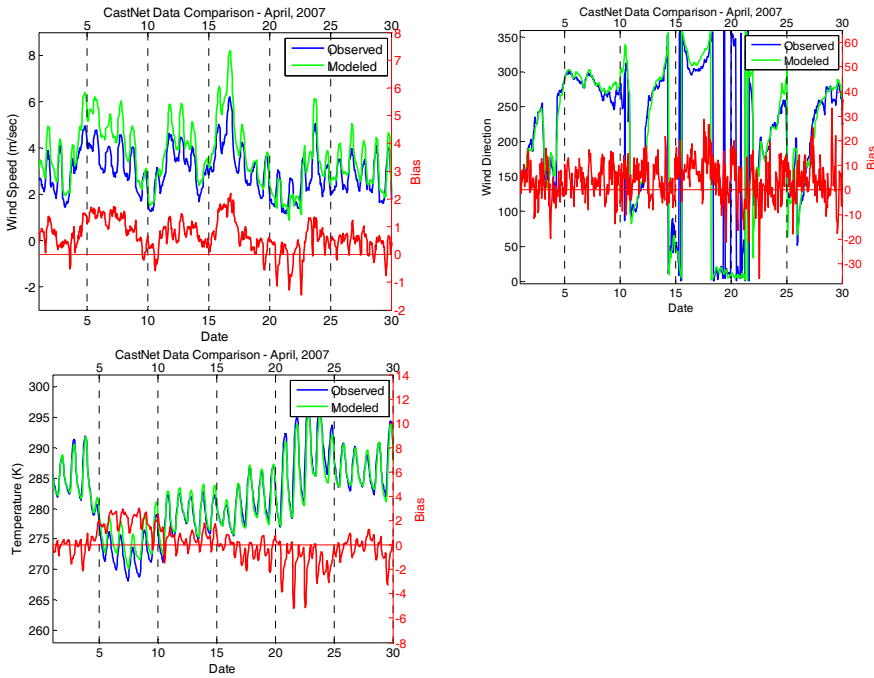


Figure F-4 Comparison of daily average wind speed, wind direction, and temperature over the 12 km air quality domain and MANEVU region for April, 2007 for CASTNet and WRF data

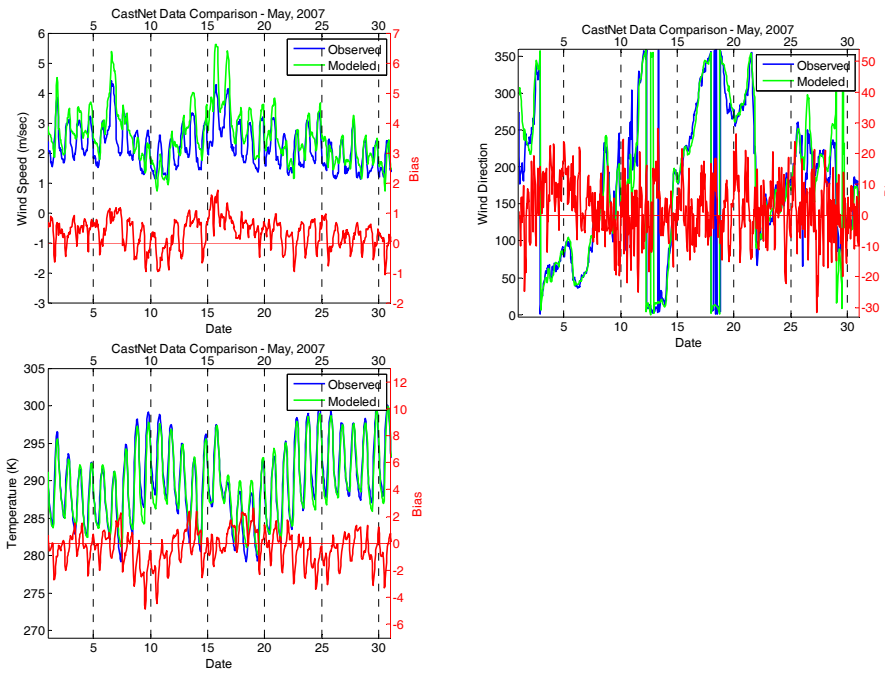


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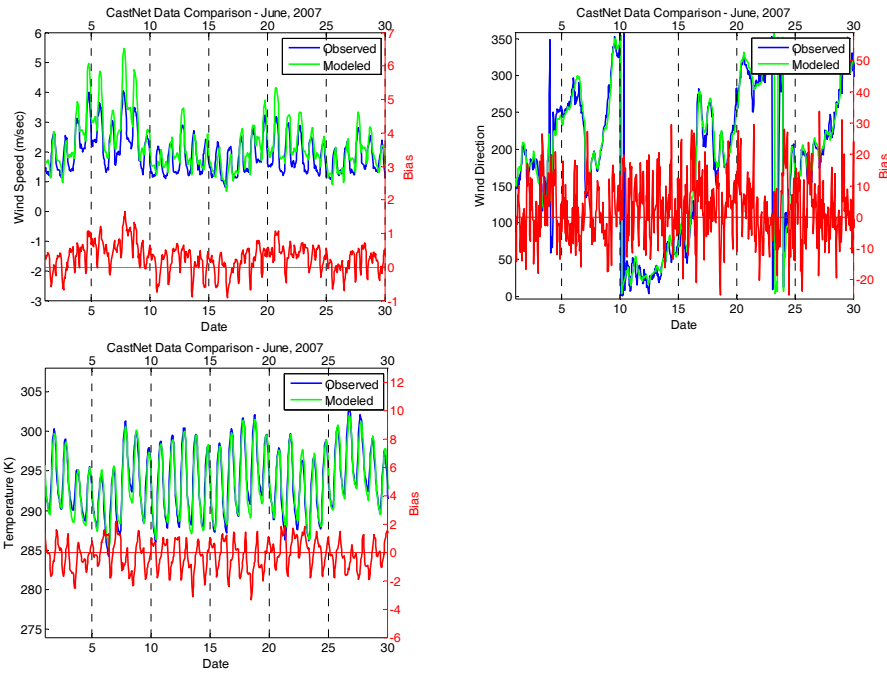


Figure F-6 Comparison of daily average wind speed, wind direction, and temperature over the 12 km air quality domain and MANEVU region for June, 2007 for CASTNet and WRF data

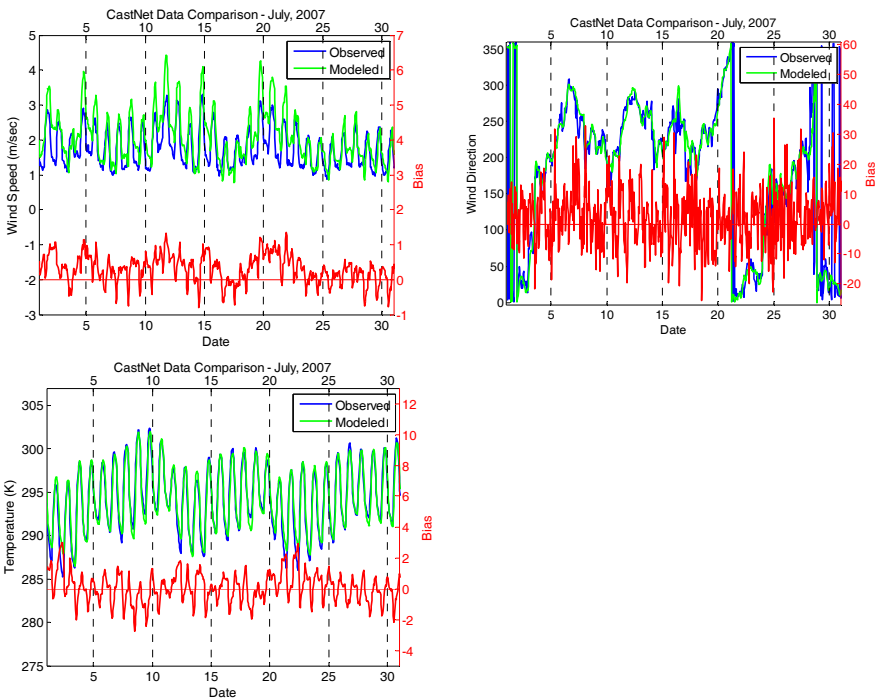


Figure F-7 Comparison of daily average wind speed, wind direction, and temperature over the 12 km air quality domain and MANEVU region for July, 2007 for CASTNet and WRF data

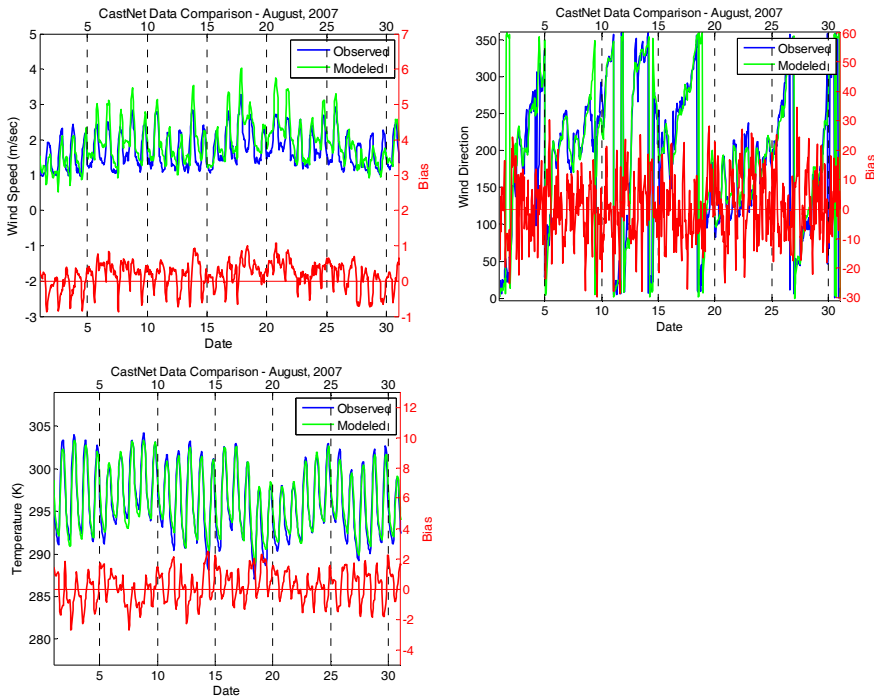


Figure F-8 Comparison of daily average wind speed, wind direction, and temperature over the 12 km air quality domain and MANEVU region for August, 2007 for CASTNet and WRF data

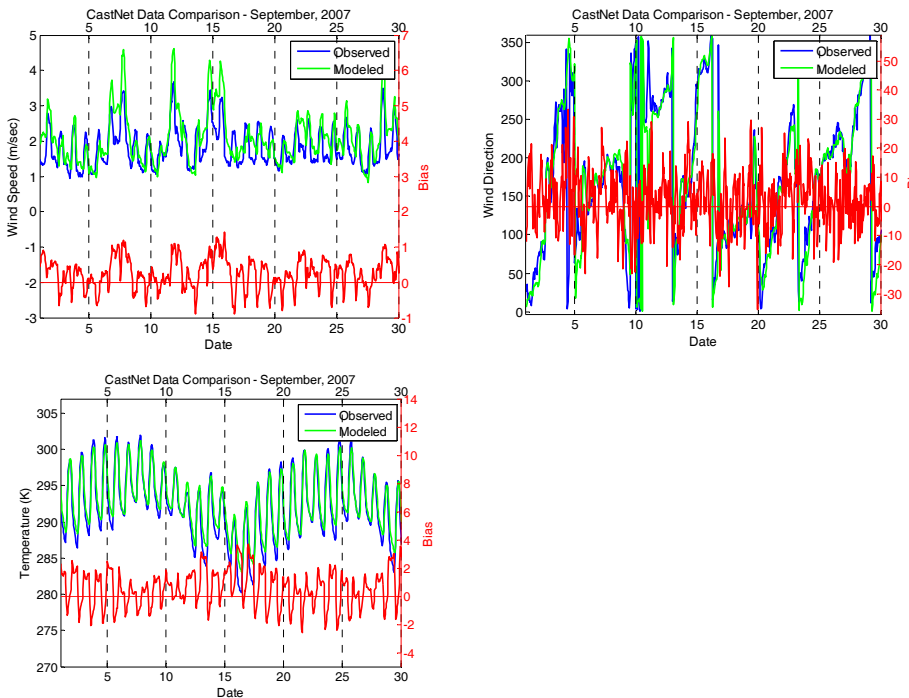


Figure F-9 Comparison of daily average wind speed, wind direction, and temperature over the 12 km air quality domain and MANEVU region for September, 2007 for CASTNet and WRF data

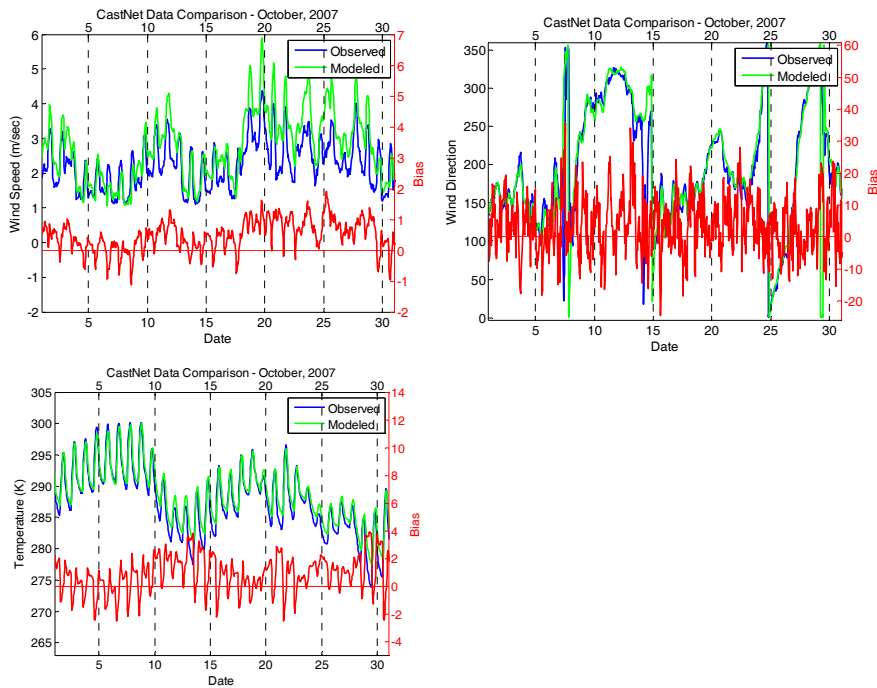


Figure F-10 Comparison of daily average wind speed, wind direction, and temperature over the 12 km air quality domain and MANEVU region for October, 2007 for CASTNet and WRF data

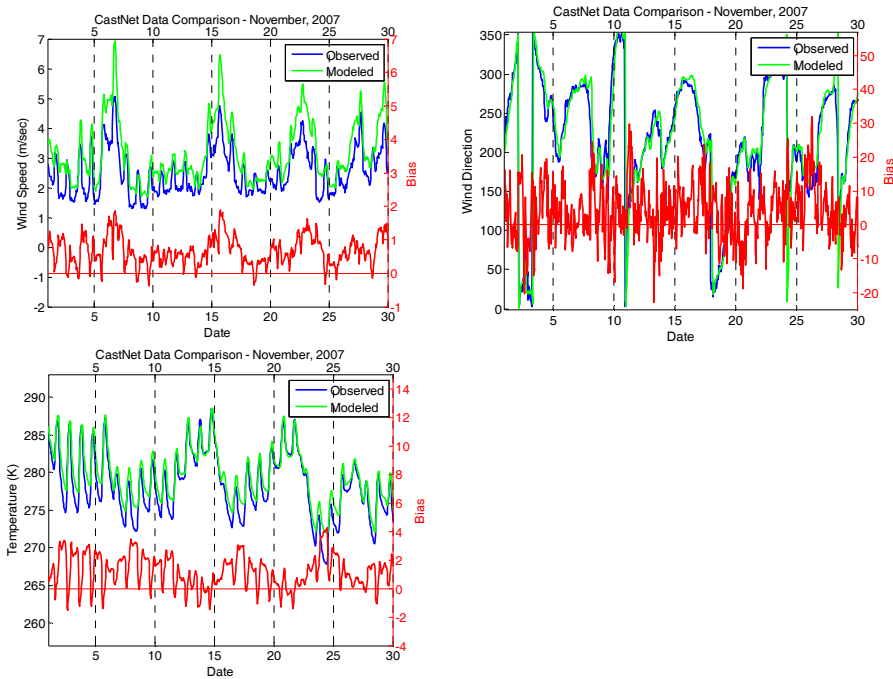


Figure F-11 Comparison of daily average wind speed, wind direction, and temperature over the 12 km air quality domain and MANEVU region for November, 2007 for CASTNet and WRF data

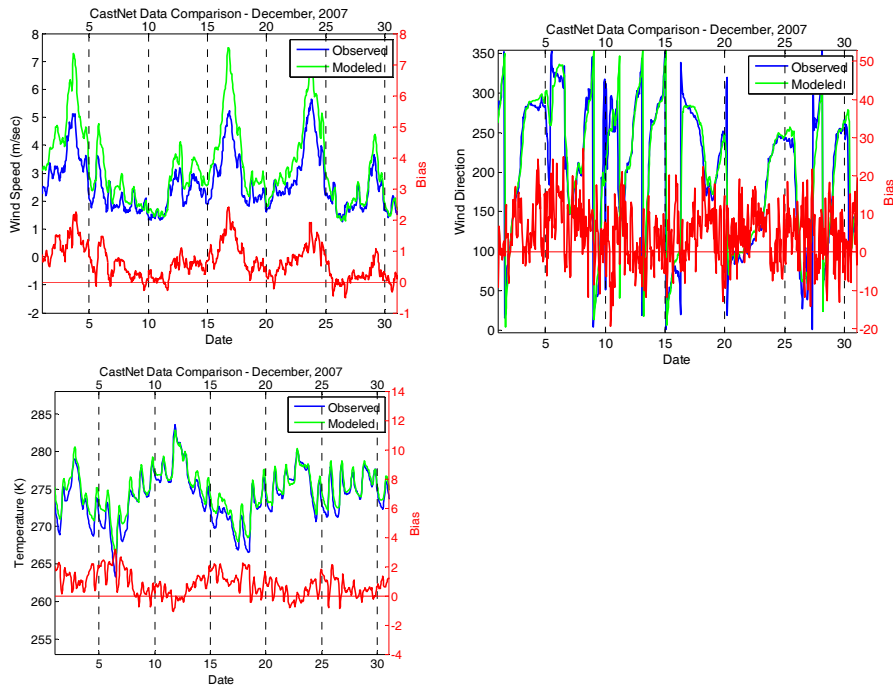
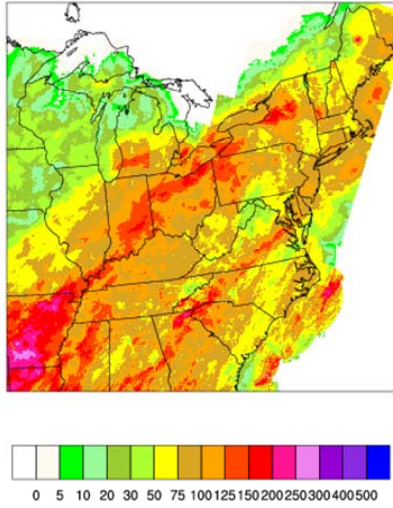


Figure F-12 Comparison of daily average wind speed, wind direction, and temperature over the 12 km air quality domain and MANEVU region for December, 2007 for CASTNet and WRF data

Stage4 Monthly Precipitation (mm) 200701



WRF Monthly Precip (mm) for 200701

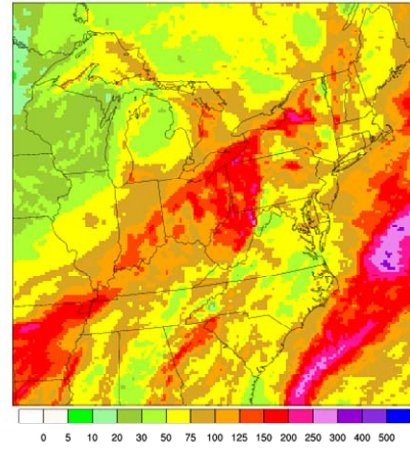
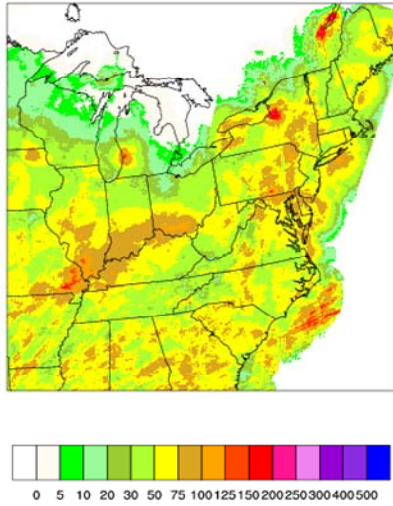


Figure G-1 Monthly precipitation amounts based on measured (Stage4) and WRF simulation for January, 2007

Stage4 Monthly Precipitation (mm) 200702



WRF Monthly Precip (mm) for 200702

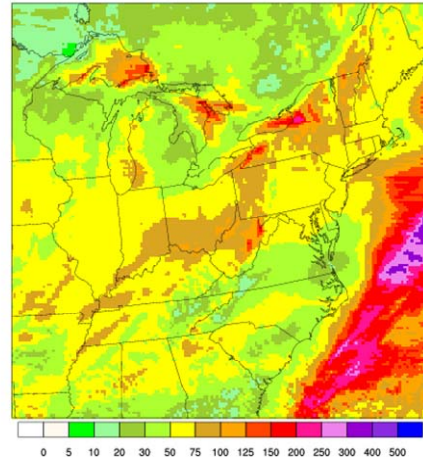
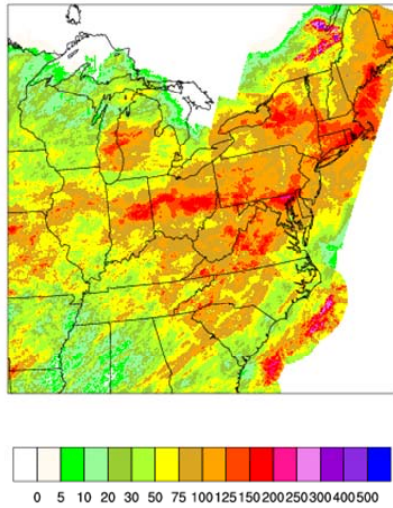


Figure G-2 Monthly precipitation amounts based on measured (Stage4) and WRF simulation for February, 2007

Stage4 Monthly Precipitation (mm) 200703



WRF Monthly Precip (mm) for 200703

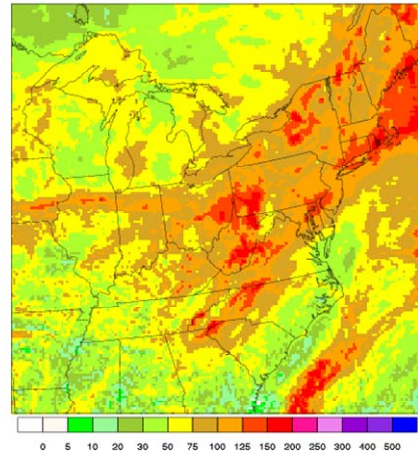
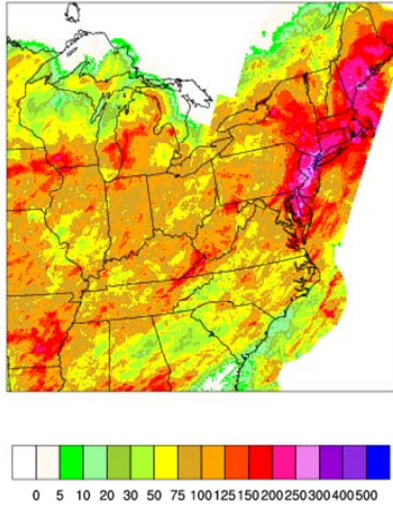


Figure G-3 Monthly precipitation amounts based on measured (Stage4) and WRF simulation for March, 2007

Stage4 Monthly Precipitation (mm) 200704



WRF Monthly Precip (mm) for 200704

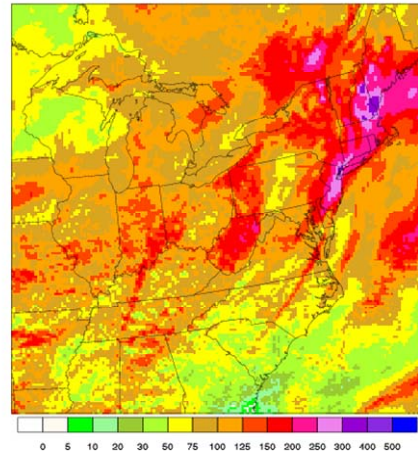
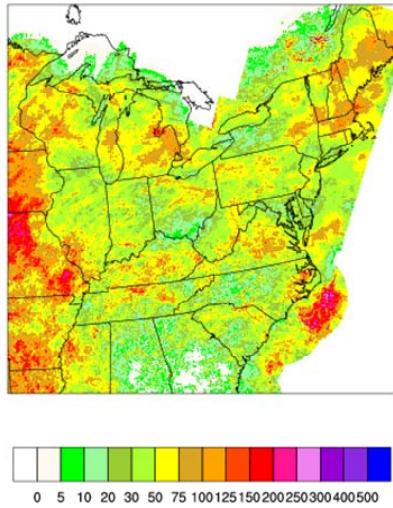


Figure G-4 Monthly precipitation amounts based on measured (Stage4) and WRF simulation for April, 2007

Stage4 Monthly Precipitation (mm) 200705



WRF Monthly Precip (mm) for 200705

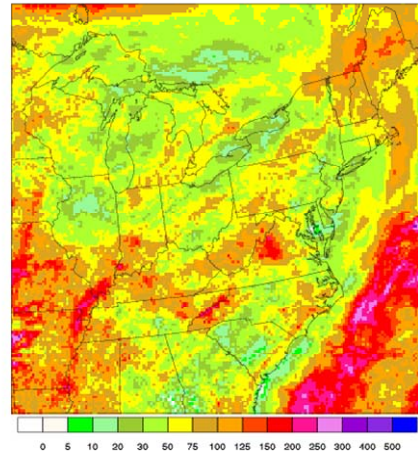
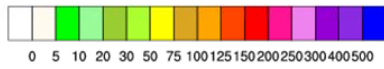
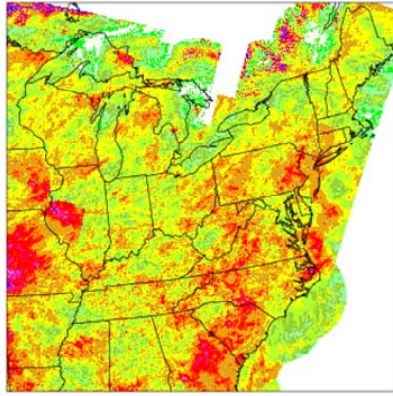


Figure G-5 Monthly precipitation amounts based on measured (Stage4) and WRF simulation for May, 2007

Stage4 Monthly Precipitation (mm) 200706



WRF Monthly Precip (mm) for 200706

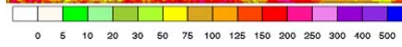
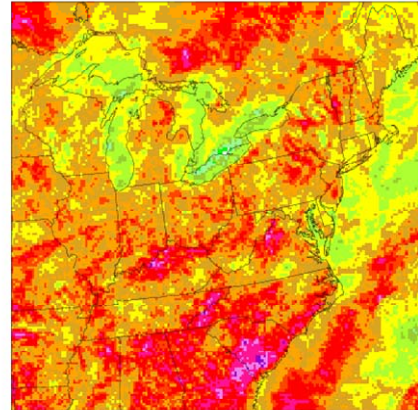
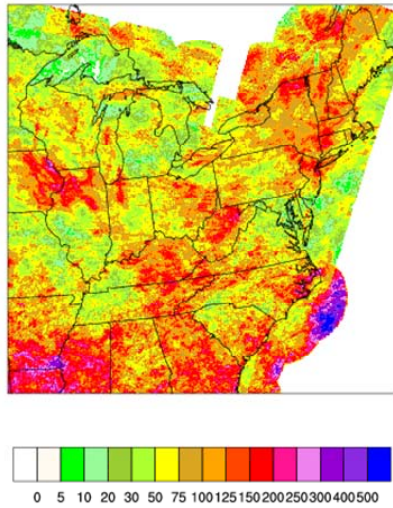


Figure G-6 Monthly precipitation amounts based on measured (Stage4) and WRF simulation for June, 2007

Stage4 Monthly Precipitation (mm) 200707



WRF Monthly Precip (mm) for 200707

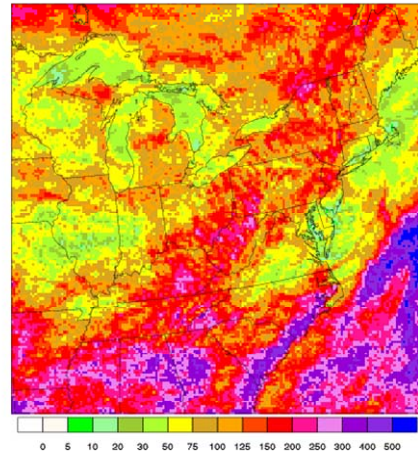
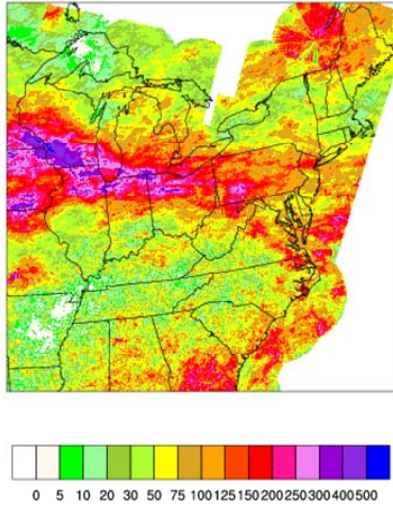


Figure G-7 Monthly precipitation amounts based on measured (Stage4) and WRF simulation for July, 2007

Stage4 Monthly Precipitation (mm) 200708



WRF Monthly Precip (mm) for 200708

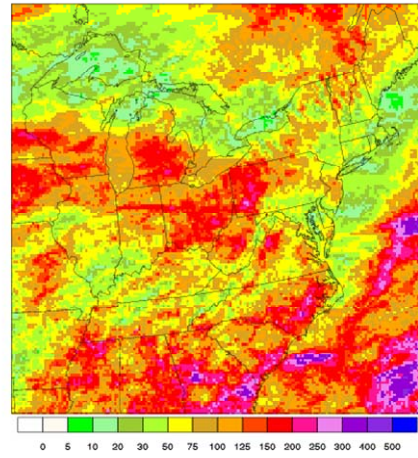
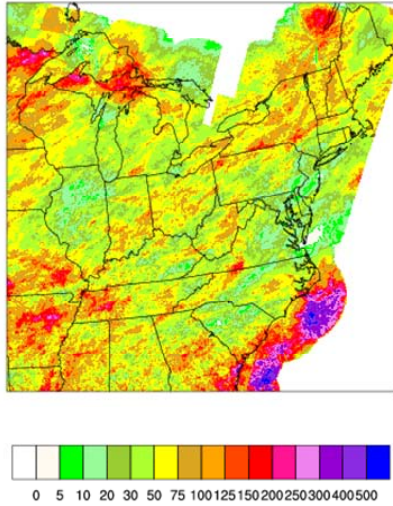


Figure G-8 Monthly precipitation amounts based on measured (Stage4) and WRF simulation for August, 2007

Stage4 Monthly Precipitation (mm) 200709



WRF Monthly Precip (mm) for 200709

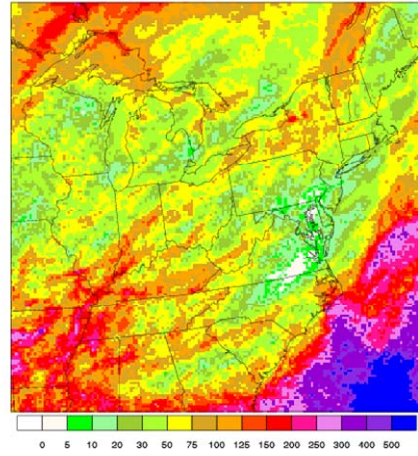
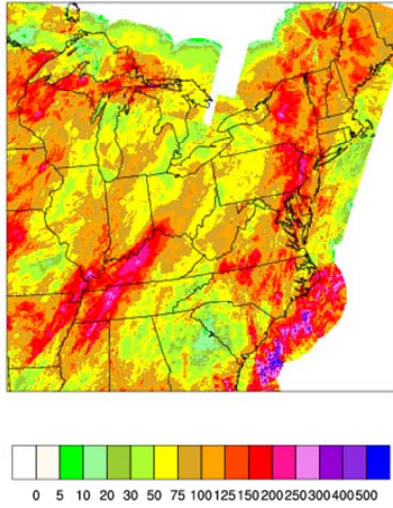


Figure G-9 Monthly precipitation amounts based on measured (Stage4) and WRF simulation for September, 2007

Stage4 Monthly Precipitation (mm) 200710



WRF Monthly Precip (mm) for 200710

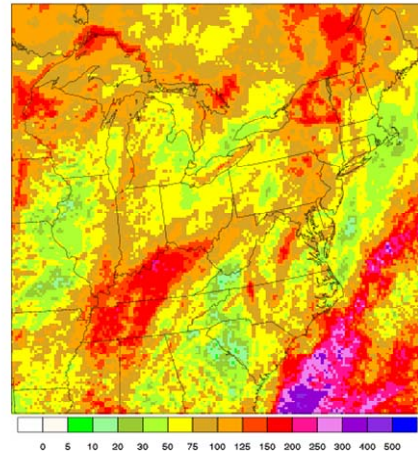
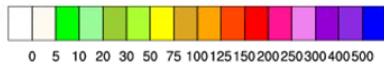
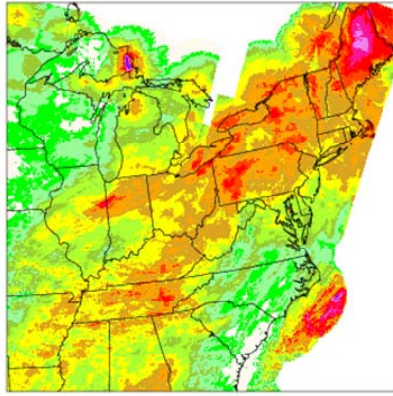


Figure G-10 Monthly precipitation amounts based on measured (Stage4) and WRF simulation for October, 2007

Stage4 Monthly Precipitation (mm) 200711



WRF Monthly Precip (mm) for 200711

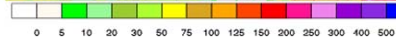
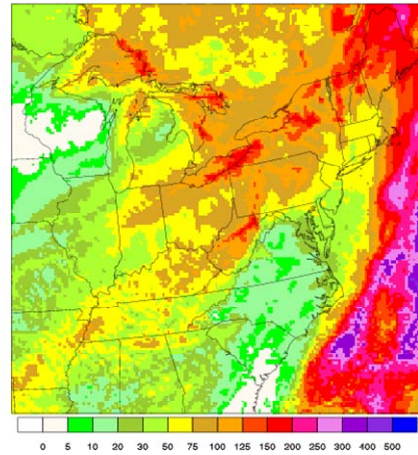
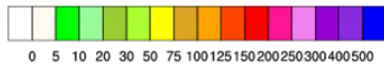
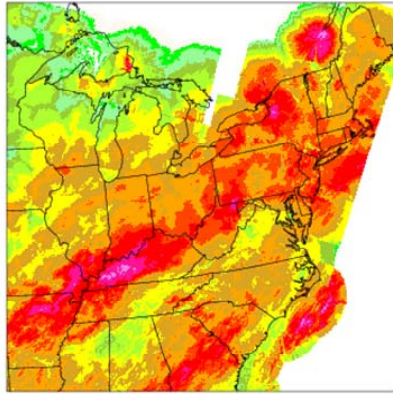


Figure G-11 Monthly precipitation amounts based on measured (Stage4) and WRF simulation for November, 2007

Stage4 Monthly Precipitation (mm) 200712



WRF Monthly Precip (mm) for 200712

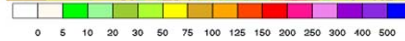
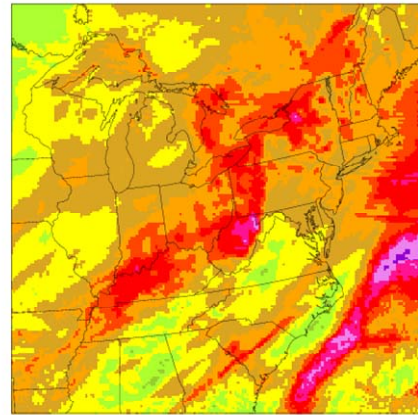


Figure G-12 Monthly precipitation amounts based on measured (Stage4) and WRF simulation for December, 2007