

Insights on Simulating Summer Warming of the Great Lakes: Understanding the Behavior of a Newly Developed Coupled Lake-Atmosphere Modeling System

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1. Tables S1 and S2

Introduction

The two supplementary tables provide the magnitude for the meteorological state variables and surface heat fluxes from WF2C and OWFC. The difference between WF2C and OWFC are also included in the tables. Tables S1 and S2 are for 2018 and 2019 respectively.

	Jun	Jul	Aug	Sep
LST (°C): WF2C	6.60	12.43	15.56	13.05
LST (°C): OWFC	6.49	11.36	14.36	12.72
LST (°C): WF2C minus OWFC	0.11	1.07	1.20	0.33
T2 (°C): WF2C	8.96	14.67	16.47	13.17
T2 (°C): OWFC	8.09	12.76	15.72	13.56
T2 (°C): WF2C minus OWFC	0.87	1.91	0.75	-0.39
T2-LST (°C): WF2C	2.37	2.25	0.91	0.11
T2-LST (°C): OWFC	1.61	1.40	1.36	0.84
T2-LST (°C): WF2C minus OWFC	0.76	0.84	-0.45	-0.73
Qsat-Qa (kg/kg): WF2C	1.24E-04	7.37E-05	8.87E-04	1.45E-03
Qsat-Qa (kg/kg): OWFC	4.65E-04	5.34E-04	4.24E-04	9.61E-04
Qsat-Qa (kg/kg): WF2C minus OWFC	-3.41E-04	-4.60E-04	4.64E-04	4.93E-04
Cloud Cover: WF2C	0.63	0.55	0.51	0.65
Cloud Cover: OWFC	0.65	0.66	0.53	0.63
Cloud Cover: WF2C minus OWFC	-0.02	-0.10	-0.02	0.02
Wind speed (m/s): WF2C	5.16	5.02	5.08	6.50
Wind speed (m/s): OWFC	5.11	4.98	5.03	6.58
Wind speed (m/s): WF2C minus OWFC	0.06	0.03	0.05	-0.08
ULW (W/m ²): WF2C	-337.24	-366.11	-381.91	-368.65
ULW (W/m ²): OWFC	-336.55	-360.52	-375.76	-367.09
ULW (W/m ²): WF2C minus OWFC	-0.69	-5.59	-6.15	-1.57
DLW (W/m ²): WF2C	309.90	335.54	336.36	318.93
DLW (W/m ²): OWFC	309.01	334.04	335.45	319.69
DLW (W/m ²): WF2C minus OWFC	0.89	1.50	0.91	-0.76
SH (W/m ²): WF2C	14.37	13.44	5.22	-2.78
SH (W/m ²): OWFC	9.36	6.08	6.35	1.41
SH (W/m ²): WF2C minus OWFC	5.01	7.36	-1.13	-4.19
LH (W/m ²): WF2C	-3.32	-1.64	-17.88	-39.58
LH (W/m ²): OWFC	-9.73	-13.74	-11.85	-31.11
LH (W/m ²): WF2C minus OWFC	6.41	12.10	-6.03	-8.47
NSW (W/m ²): WF2C	298.44	290.91	240.62	164.90
NSW (W/m ²): OWFC	299.39	284.68	237.56	165.71
NSW (W/m ²): WF2C minus OWFC	-0.95	6.23	3.06	-0.81
Net Heat (W/m ²): WF2C	281.65	271.55	180.62	69.99
Net Heat (W/m ²): OWFC	270.63	249.48	190.35	86.25
Net Heat (W/m ²): WF2C minus OWFC	11.02	22.07	-9.73	-16.26

Table S1. WF2C and OWFC's magnitude as well as their difference for LST, near surface air temperature (T2) over the lake, near surface air temperature over the lake minus LST, saturated specific humidity minus near-surface specific humidity over the lake, cloud cover over the lake, wind speed over the lake, ULW, DLW, SH, LH, NSW and Net Heat for 2018. Positive magnitude fluxes represent surface heat fluxes that put heat into the lake while negative magnitude fluxes represent surface heat fluxes that take heat from the lake.

	Jun	Jul	Aug	Sep
LST (°C): WF2C	6.24	13.00	14.86	12.00
LST (°C): OWFC	6.02	11.97	13.92	11.55
LST (°C): WF2C minus OWFC	0.22	1.03	0.94	0.45
T2 (°C): WF2C	7.92	14.81	15.65	12.55
T2 (°C): OWFC	7.24	12.79	15.75	13.33
T2 (°C): WF2C minus OWFC	0.68	2.02	-0.11	-0.78
T2-LST (°C): WF2C	1.68	1.80	0.78	0.55
T2-LST (°C): OWFC	1.22	0.82	1.83	1.78
T2-LST (°C): WF2C minus OWFC	0.46	0.98	-1.05	-1.23
Qsat-Qa (kg/kg): WF2C	1.63E-04	3.00E-04	1.13E-03	1.00E-03
Qsat-Qa (kg/kg): OWFC	3.91E-04	8.28E-04	4.19E-04	3.66E-04
Qsat-Qa (kg/kg): WF2C minus OWFC	-2.29E-04	-5.27E-04	7.13E-04	6.39E-04
Cloud Cover: WF2C	0.64	0.48	0.46	0.75
Cloud Cover: OWFC	0.66	0.59	0.46	0.73
Cloud Cover: WF2C minus OWFC	-0.02	-0.11	0.01	0.02
Wind speed (m/s): WF2C	4.74	4.81	5.24	6.33
Wind speed (m/s): OWFC	4.75	4.73	5.29	6.58
Wind speed (m/s): WF2C minus OWFC	-5.31E-04	0.08	-0.05	-0.24
ULW (W/m ²): WF2C	-335.42	-368.96	-378.09	-363.34
ULW (W/m ²): OWFC	-334.25	-363.50	-373.35	-361.27
ULW (W/m ²): WF2C minus OWFC	-1.17	-5.45	-4.74	-2.07
DLW (W/m ²): WF2C	304.90	331.44	321.97	325.08
DLW (W/m ²): OWFC	304.11	329.84	321.78	325.94
DLW (W/m ²): WF2C minus OWFC	0.79	1.60	0.20	-0.86
SH (W/m ²): WF2C	9.63	10.51	6.13	4.57
SH (W/m ²): OWFC	6.58	1.81	11.33	14.24
SH (W/m ²): WF2C minus OWFC	3.06	8.71	-5.19	-9.67
LH (W/m ²): WF2C	-3.42	-5.34	-21.95	-24.42
LH (W/m ²): OWFC	-7.59	-18.60	-9.72	-11.25
LH (W/m ²): WF2C minus OWFC	4.17	13.26	-12.22	-13.17
NSW (W/m ²): WF2C	291.47	307.84	249.10	150.63
NSW (W/m ²): OWFC	290.38	303.17	248.97	153.28
NSW (W/m ²): WF2C minus OWFC	1.09	4.67	0.13	-2.65
Net Heat (W/m ²): WF2C	266.43	274.50	174.97	90.74
Net Heat (W/m ²): OWFC	258.28	251.17	197.47	119.95
Net Heat (W/m ²): WF2C minus OWFC	8.15	23.33	-22.50	-29.21

Table S2. WF2C and OWFC's magnitude as well as their difference for LST, near surface air temperature (T2) over the lake, near surface air temperature over the lake minus LST, saturated specific humidity minus near-surface specific humidity over the lake, cloud cover over the lake, wind speed over the lake, ULW, DLW, SH, LH, NSW and Net Heat for 2019. Positive magnitude fluxes represent surface heat fluxes that put heat into the lake while negative magnitude fluxes represent surface heat fluxes that take heat from the lake.