

## Supplementary Information

Figure S1. Boston City Boundary with stations chosen in various density blocks (light yellow is low population density, light orange to orange is medium to medium-high density, and red represents high density).

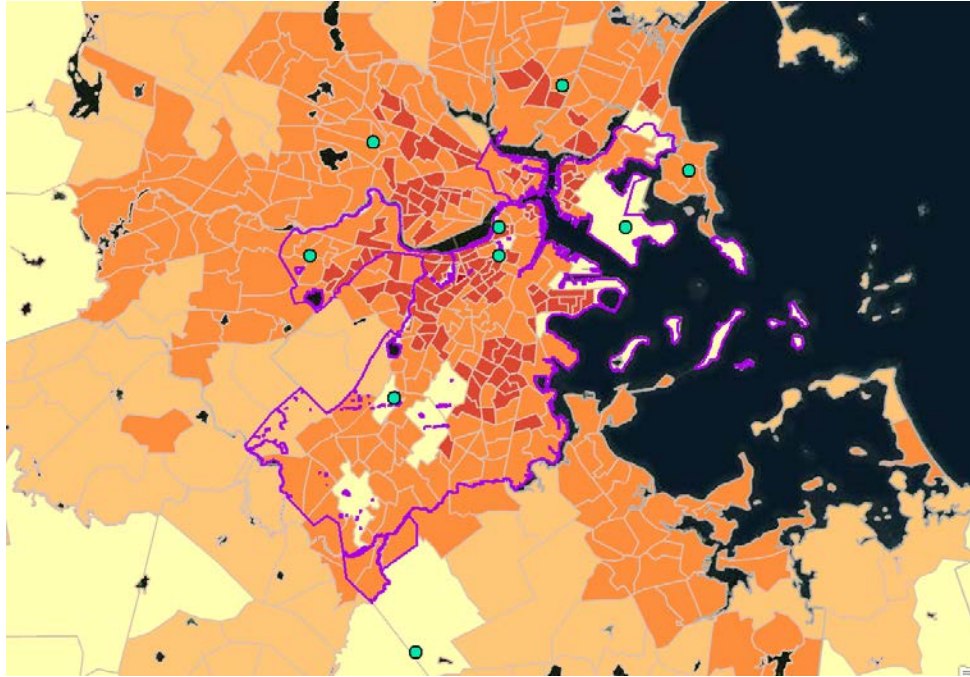


Figure S2. Same as Figure S1, but for the NYC area.

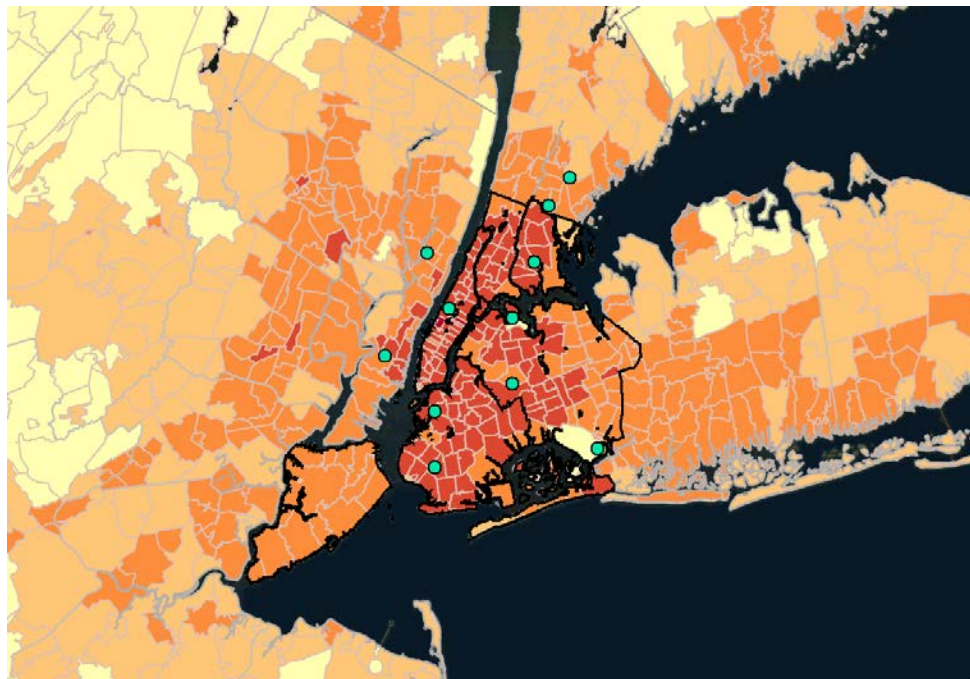


Figure S3. Land-based station vs. grid-average Metdata for selected stations with continuous data from 1997-2016 for the Boston area.

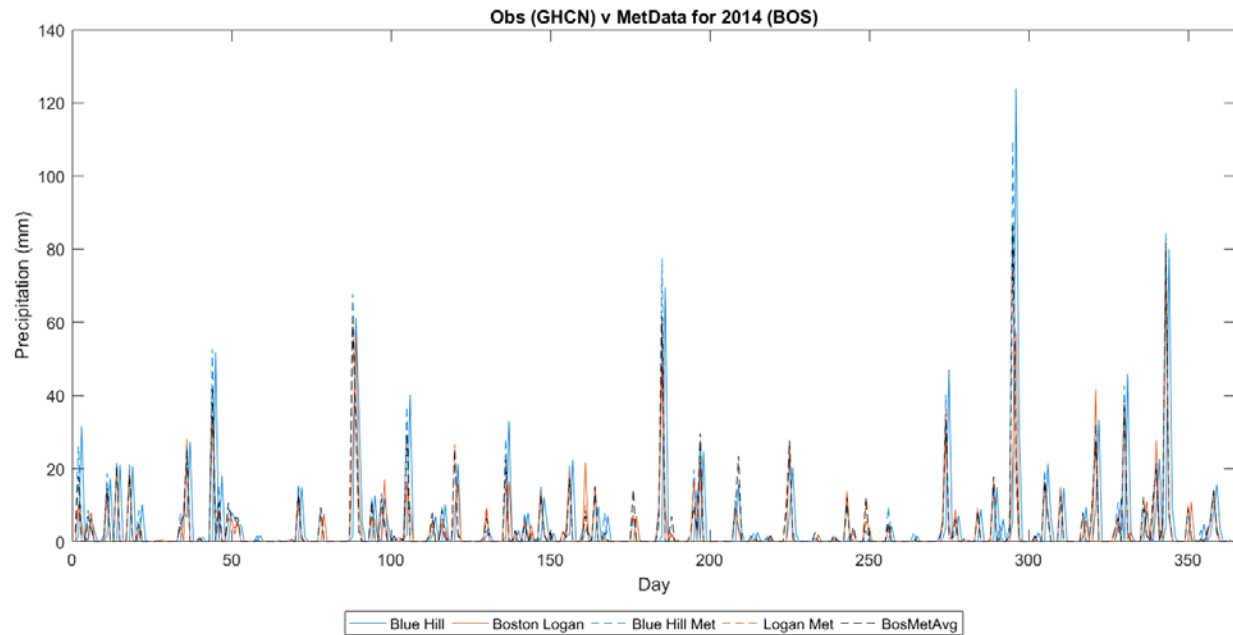


Figure S4. Same as figure S3, but for the NYC area.

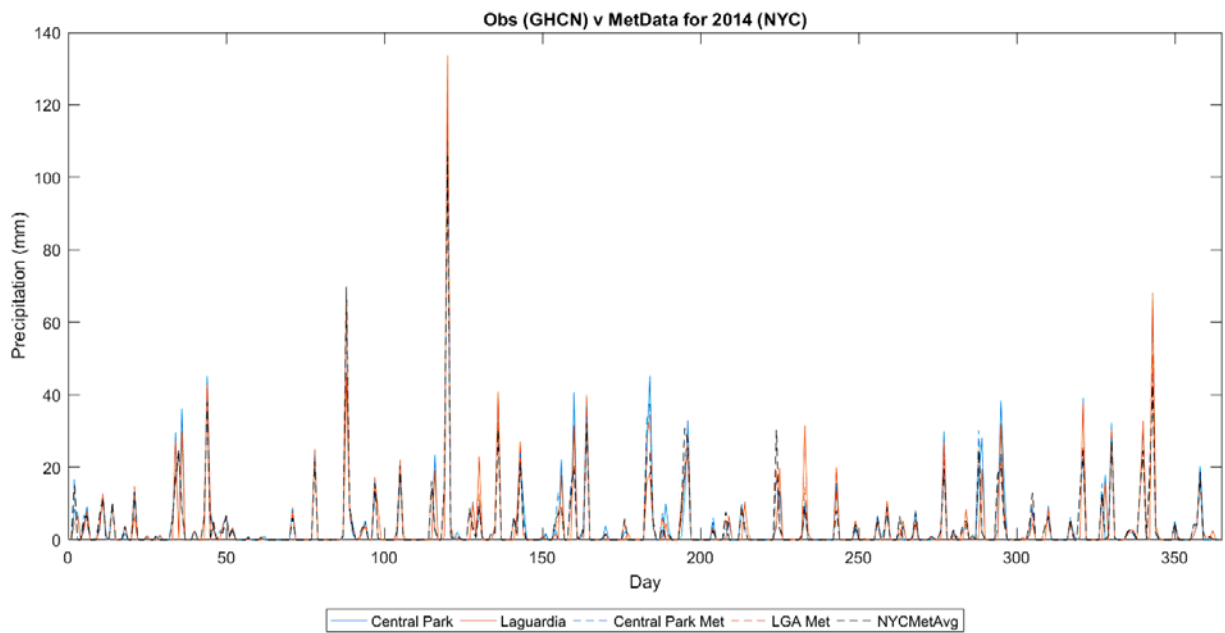


Figure S5.

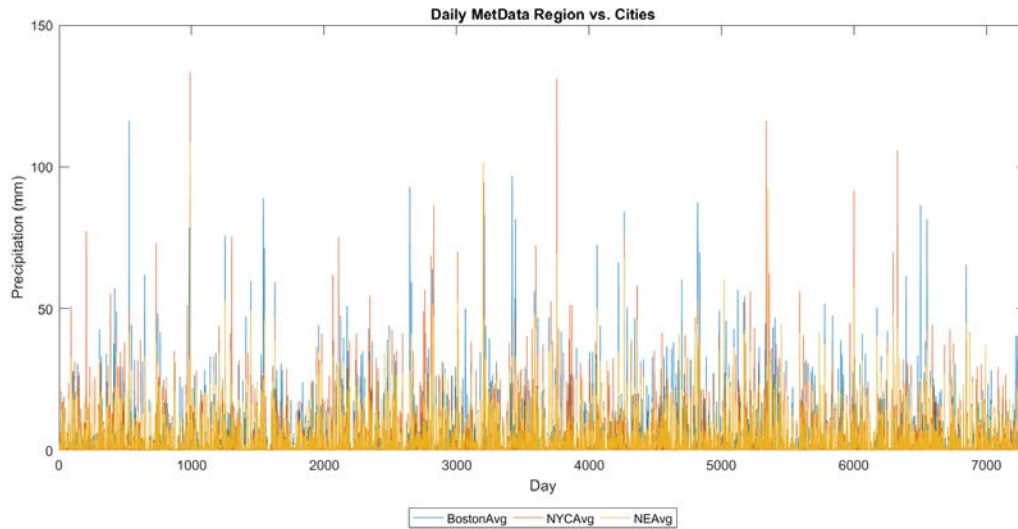


Table S1. Summary of selected GHCN stations, location, and data start and end dates.

BOS_Station_Name	Station_ID	Lat	Lon	Start	End
BOSTON MA US (Logan)	GHCND:USW00014739	42.36	-71.01	12/31/1935	present
BOSTON 0.5 WSW MA US	GHCND:US1MASF0001	42.36	-71.07	2/25/2009	present
BRIGHTON 0.5 W MA US	GHCND:US1MASF0004	42.35	-71.16	8/2/2011	12/25/2016
JAMAICA PLAIN MA US	GHCND:USC00193890	42.3	-71.12	8/14/1962	present
WINCHESTER 0.7 SE MA US	GHCND:US1MAMD0007	42.45	-71.14	6/20/2009	present
WINTHROP 0.2 N MA US	GHCND:US1MASF0002	42.38	-70.98	12/2/2009	present
BLUE HILL MA US	GHCND:USC00190736	42.21	-71.11	12/31/1892	present
CHELSEA 0.8 N MA US	GHCND:US1MASF0010	42.41	-71.04	6/20/2015	present
CAMBRIDGE 0.9 NNW MA US	GHCND:US1MAMD0011	42.39	-71.13	2/23/2010	present
NYC_Station_Name	Station_ID	Lat	Lon	Start	End
Middle Village	GHCND:US1NYQN0002	40.71	-73.88	2/1/2011	present
Palisades Park	GHCND:US1NJBG0018	40.85	-74	2/6/2008	present
Upper Brooklyn	GHCND:US1NYKN0025	40.68	-73.99	11/28/2013	present
Central Park	GHCND:USW00094728	40.79	-73.97	12/31/1868	present
LGA	GHCND:USW00014732	40.78	-73.88	10/6/1939	present
JFK	GHCND:USW00094789	40.64	-73.76	7/16/1948	present
LowBrook	GHCND:US1NYKN0003	40.62	-73.99	11/17/2008	5/30/2009
Jersey City	GHCND:USC00284339	40.74	-74.06	11/30/1905	5/30/1997
Mt Vernon	GHCND:USC00305618	40.9	-73.83	11/23/1914	12/30/1941
Bronx	GHCND:USC00300961	40.84	-73.85	10/31/1894	2/2/2014
Eastchester	GHCND:USC00302291	40.93	-73.8	6/12/1944	11/29/1958

Table S2. Parameters set in the RCM3 model run.

iproj	LAMCON	Map projection
iy	74	# grid points in y direction
jx	85	# grid points in x direction
ds	60.0	Grid point separation (km)
clat	42	Central latitude of domain (deg)
clon	-73	Central longitude of domain (deg)
ntypec	10	Resolution of the global terrain and land-use data
IDATE1	2005100700	Simulation start date
IDATE2	2005101200	Simulation end date
SSTYP	OI_WK	SST dataset
DATTYP	NNRP2	Global analysis dataset