

Updated Population Metadata for United States Historical Climatology Network Stations

TIMOTHY W. OWEN

National Climatic Data Center, Asheville, North Carolina

KEVIN P. GALLO

Office of Research and Applications, NOAA/NESDIS, Camp Springs, Maryland

(Manuscript received 11 October 1999, in final form 17 February 2000)

ABSTRACT

The United States Historical Climatology Network (HCN) serial temperature dataset is comprised of 1221 high-quality, long-term climate observing stations. The HCN dataset is available in several versions, one of which includes population-based temperature modifications to adjust urban temperatures for the “heat-island” effect. Unfortunately, the decennial population metadata file is not complete as missing values are present for 17.6% of the 12 210 population values associated with the 1221 individual stations during the 1900–90 interval. Retrospective grid-based populations, within a fixed distance of an HCN station, were estimated through the use of a gridded population density dataset and historically available U.S. Census county data. The grid-based populations for the HCN stations provide values derived from a consistent methodology compared to the current HCN populations that can vary as definitions of the area associated with a city change over time. The use of grid-based populations may minimally be appropriate to augment populations for HCN climate stations that lack any population data, and are recommended when consistent and complete population data are required. The recommended urban temperature adjustments based on the HCN and grid-based methods of estimating station population can be significantly different for individual stations within the HCN dataset.