

A New Climatology for Investigating Storminess Influences on the Extratropics

Mike Bauer
Columbia University/NASA GISS

George Tselioudis
Columbia University/NASA GISS

William B. Rossow
City College of New York

The MAP Climatology of Mid-latitude Storminess (MCMS) project is a set of tools for examining the extra-tropical cyclones found in numerical analyses such as climate models and reanalysis products.

At its core the MCMS software is a series of algorithmic filters for winnowing likely cyclones from sea level pressure (SLP) data. Special care is taken to minimize known limitations of using SLP to identify cyclones including problems associated with steep or high topography. MCMS stores detailed statistics concerning the actions of each filter. MCMS also stores a file detailing the rationale behind each discarded center. The value of these two steps will be discussed.

MCMS provides a detailed life history for each retained cyclone including estimates of its position, trajectory and geometry (size, shape). MCMS estimates the geometry of each cyclone with the outermost closed contour that uniquely surrounds it. MCMS also allows for additional contours to surround and link multiple cyclones (e.g., cyclone families).

MCMS provides tools to manipulate and analyze its output. For example, there is a tool to use cyclone geometry as a cyclone and non-cyclone partition/screen and one to create adaptive cyclone-centric composites. MCMS composites, because they only include information from inside each cyclone's assigned geometry, greatly reduce the contamination from nearby cyclones when compared to traditional methods. Both the compositing and partitioning can be done with any suitable data field that can be matched to the SLP source used by MCMS. Examples of this will be shown.

MCMS output from a number of reanalysis products will be made publicly available shortly. We will also distribute the MCMS software itself. Modifications, improvements and additions are welcome.

Corresponding Author:

Name: Mike Bauer

Organization: Department of Applied Physics and Applied Mathematics, Columbia University and NASA Goddard Institute for Space Studies (GISS)

Address: NASA/GISS, Columbia University
2880 Broadway, rm 320A
New York, NY 10025 USA

Email Address: mpb20@columbia.edu