Storm Trajectory Documentation:

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This set of data was developed and employed in the study:

Lukens, K. E., E. H. Berbery, and K. I. Hodges, 201x: The imprint of strong-storm tracks on winter weather in North America, *J. Climate (revised October 2017).*

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Date created: 19 October 2017

File location: http://cicsmd.umd.edu/data-downloads/data-sets/

Data information:

Temporal resolution: 6-hourly time steps; 3-month seasons.

Spatial resolution: 361x720 (latitude x longitude); 0.5-degree x 0.5-degree.

Data source: National Centers for Environmental Prediction (NCEP)
Climate Forecast System Reanalysis (CFSR; Saha et al. 2010).

ASCII files contain storm center trajectories objectively tracked on the sphere in the Northern Hemisphere (NH) or Southern Hemisphere (SH) following the Lagrangian approach (TRACK) discussed in Hoskins and Hodges (2002).

Storms are identified as potential vorticity (PV) anomalies at the 320 K isentropic level every 6 hours beginning at midnight UTC in either the NH or SH and corresponding 3-month season. To be considered a storm, PV maxima (minima) in the Northern (Southern) Hemisphere must exceed 0.5 (-0.5) Potential Vorticity Units (PVU, where 1 PVU = 10^{-6} K m^2 kg^{-1} s^{-1}).

Filename description:

File names: = traj.PV320_**MIN**.**TRACK_CIRC**.**HH**.**SSS**.**YYYY**

traj = storm trajectories

PV320_**MIN** = [PV320] potential vorticity on the 320 K isentropic surface;
[**MIN**] minimum PVU required for storm identification of PV anomalies.
Options for **MIN**: **0.5** (for NH), **-0.5** (for SH).

TRACK_CIRC = [**TRACK**] set of storms included in the file.
O*ptions for* **TRACK**: **tr** (all identified storms pre-tracking filtering), **ff** (storms from *tr* files after the tracking filtering, i.e., storms that last at least 2 days (i.e., 8 time steps) and travel farther than 1000 km);
[**CIRC**] PV maxima (*option*: **pos**) or minima (*option*: **neg**) used to identify storm centers. Maxima are used for NH; minima for SH.

HH = chosen hemisphere (*options*: **NH**, **SH**).

SSS	= chosen 3-month season (*example option*: **DJF** (for December-January-February)).
YYYY	= chosen year (*example option*: **2010**).

File header and format description:

TRACK_NUM	= indicates number of individual storm trajectories identified.
TRACK_ID	= trajectory identification number assigned by TRACK.
START_TIME	= time at which the storm is initially identified. The format is YYYYMMDDHH, where YYYY is the 4-digit year, MM the 2-digit month, DD the 2-digit day, and HH the 2-digit hour in UTC (i.e., 00, 06, 12, or 18 Z).
POINT_NUM	= number of time steps the individual storm (as identified by TRACK_ID) exists in the data.
Column (1)	= 6-hourly time steps during which the storm exists in the 3-month season. The format is the same as that for *START_TIME*.
Column (2)	= latitude coordinates in degrees ranging from -90 to 90 (South to North) of storm centers.
Column (3)	= longitude coordinates in degrees ranging from 0 to 359.5 (West to East) of storm centers.
Column (4)	= intensity in PVU of storm center at corresponding time step and spatial coordinates.

When using the trajectory data, please cite:

Lukens, K. E., E. H. Berbery, and K. I. Hodges, 201x: The imprint of strong-storm tracks on winter weather in North America, *J. Climate (revised October 2017).*

Resources:

Hoskins, B. J., and K. I. Hodges, 2002: New perspectives on the Northern Hemisphere winter storm tracks. *J. Atmos. Sci.*, **59**, 1041-1061.

Saha, S., and coauthors, 2010: The NCEP Climate Forecast System Reanalysis. *Bull. Amer. Meteor. Soc.*, **91**, 1015-1057, doi: 10.1175/2010BAMS3001.1.