

# Metadata

Field	Value
<b>Dataset Name</b>	Northern Hemisphere Extratropical Cyclone Tracks from ERA-5
<b>Dataset General Type</b>	cyclone tracks
<b>Dataset Type</b>	Dataset
<b>Dataset Level</b>	1.1
<b>Program Website</b>	
<b>Keyword Vocabulary</b>	Polar Data Catalogue
<b>Keyword Vocabulary URL</b>	<a href="https://www.polardata.ca/pdcinput/public/keywordlibrary">https://www.polardata.ca/pdcinput/public/keywordlibrary</a>
<b>Theme</b>	
<b>Title</b>	Atmosphere
<b>URL</b>	<a href="https://canwin-datahub.ad.umanitoba.ca/data/en/group/modelling">https://canwin-datahub.ad.umanitoba.ca/data/en/group/modelling</a>
<b>Dataset Status</b>	Complete
<b>Maintenance and Update Frequency</b>	As needed
<b>Dataset Last Revision Date</b>	2026-01-14
<b>Dataset DOI</b>	10.34992/ebnw-s681

Field	Value
<b>Metadata Creation Date</b>	2026
<b>Publisher</b>	CanWIN
<b>Dataset Authors</b>	
<b>Dataset Authors 1</b>	
<b>Name</b>	Crawford, Alex
<b>Type of Name</b>	Personal
<b>Email</b>	<a href="mailto:alex.crawford@umanitoba.ca">alex.crawford@umanitoba.ca</a>
<b>Affiliation</b>	Agriculture and Agri Food Canada
<b>ORCID ID</b>	0000-0003-1561-290X
	ORCID
	<a href="http://orcid.org/">http://orcid.org/</a>
<b>Contributors</b>	
<b>Contributors 1</b>	
<b>Name</b>	Serreze, Mark C
<b>Role</b>	ProjectMember

Field	Value
<b>Email</b>	
<b>Affiliation</b>	National Snow and Ice Data Center, Cooperative Institute for Research in Environmental Sciences, University of Colorado Boulder
<b>ORCID ID</b>	0000-0002-3699-302X
	ORCID
	<a href="http://orcid.org/">http://orcid.org/</a>
<b>Contributors 2</b>	
<b>Name</b>	Sommer, Nathan
<b>Role</b>	ProjectMember
<b>Email</b>	<a href="mailto:nsommer@wooster.edu">nsommer@wooster.edu</a>
<b>Affiliation</b>	College of Wooster
<b>ORCID ID</b>	ORCID
	ORCID
	<a href="http://orcid.org/">http://orcid.org/</a>
<b>Project Data Curator</b>	Alex D Crawford

Field	Value
<b>Project Data Curator email</b>	<a href="mailto:alex.crawford@umanitoba.ca">alex.crawford@umanitoba.ca</a>
<b>Project Data Curator Affiliation</b>	Centre for Earth Observation Science - University of Manitoba
<b>Dataset Collection Start Date</b>	1979-01-01
<b>Dataset Collection End Date</b>	2024-12-31
<b>Sample Collection</b>	
<b>Activity Collection Type</b>	
<b>Preferred citation</b>	
<b>Analytical Instrument</b>	
<b>Analytical Method</b>	
<b>Licence Name or Copyright Statement</b>	Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International
<b>Copyright Statement</b>	
<b>Licence Type</b>	Open
<b>Embargo Date</b>	
<b>Licence URL</b>	<a href="https://spdx.org/licenses">https://spdx.org/licenses</a>

Field	Value
<b>Terms of Access</b>	CanWIN datasets are licensed individually, however most are licensed under the Creative Commons Attribution 4.0 International (CC BY 4.0) Public License. Details for the licence applied can be found using the Licence URL link provided with each dataset. By using data and information provided on this site you accept the terms and conditions of the License. Unless otherwise specified, the license grants the rights to the public to use and share the data and results derived therefrom as long as the proper acknowledgment is given to the data licensor (citation), that any alteration to the data is clearly indicated, and that a link to the original data and the license is made available.
<b>Terms of Use</b>	By accessing this data you agree to [CanWIN's Terms of Use](https://dev.uni-manitoba.links.com.au/data/publication/canwin-data-statement/resource/5b942a87-ef4e-466e-8319-f588844e89c0).
<b>Awards</b>	
<b>Related Resources</b>	
<b>Related Resources 1</b>	
<b>Related Resource Name</b>	
<b>Resource Code</b>	10.24381/cds.adbb2d47
<b>Identifier Type</b>	
<b>Relationship To This Dataset</b>	
<b>Resource Type</b>	Online Resource
<b>Type</b>	Model
<b>Series Name</b>	
<b>Related Resources 2</b>	

Field	Value
<b>Related Resource Name</b>	
<b>Resource Code</b>	
<b>Identifier Type</b>	
<b>Relationship To This Dataset</b>	
<b>Resource Type</b>	Online Resource
<b>Type</b>	
<b>Series Name</b>	
<b>Related Resources 3</b>	
<b>Related Resource Name</b>	Mean Pressure at Sea-level from ERA-5
<b>Resource Code</b>	
<b>Identifier Type</b>	DOI
<b>Relationship To This Dataset</b>	IsRequiredBy
<b>Resource Type</b>	Online Resource
<b>Type</b>	
<b>Series Name</b>	
<b>Related Resources 4</b>	
<b>Related Resource Name</b>	ETOPO1 Ice Surface
<b>Resource Code</b>	10.7289/V5C8276M

Field	Value
<b>Identifier Type</b>	DOI
<b>Relationship To This Dataset</b>	IsReferencedBy
<b>Resource Type</b>	Online Resource
<b>Type</b>	Dataset
<b>Series Name</b>	
<b>Related Resources 5</b>	
<b>Related Resource Name</b>	CEOS/NSIDC Cyclone Detection and Tracking Algorithm
<b>Resource Code</b>	10.5281/zenodo.4356161
<b>Identifier Type</b>	DOI
<b>Relationship To This Dataset</b>	IsRequiredBy
<b>Resource Type</b>	Online Resource
<b>Type</b>	Software
<b>Series Name</b>	
<b>Publications</b>	
<b>Publications 1</b>	

Field	Value
<b>Publication Name</b>	Estimating Southern Ocean Storm Positions With Seismic Observations
<b>Identifier Code</b>	<a href="https://doi.org/10.1029/2019JC015898">https://doi.org/10.1029/2019JC015898</a>
<b>Identifier Type</b>	DOI
<b>Relationship to this dataset</b>	IsSupplementedBy
<b>Resource Type</b>	Online Resource
<b>Publication Type</b>	JournalArticle
<b>Publications 2</b>	
<b>Publication Name</b>	Sea ice loss and Arctic cyclone activity from 1979 to 2014
<b>Identifier Code</b>	<a href="https://doi.org/10.1175/JCLI-D-16-0542.1">https://doi.org/10.1175/JCLI-D-16-0542.1</a>
<b>Identifier Type</b>	DOI
<b>Relationship to this dataset</b>	IsSupplementedBy
<b>Resource Type</b>	Online Resource
<b>Publication Type</b>	JournalArticle
<b>Publications 3</b>	



Field	Value
<b>Publication Name</b>	Does the summer Arctic Frontal Zone influence Arctic Ocean cyclone activity?
<b>Identifier Code</b>	
<b>Identifier Type</b>	DOI
<b>Relationship to this dataset</b>	IsSupplementedBy
<b>Resource Type</b>	Online Resource
<b>Publication Type</b>	
<b>Publications 4</b>	
<b>Publication Name</b>	Projected Changes in the Arctic Frontal Zone and Summer Arctic Cyclone Activity in the CESM Large Ensemble
<b>Identifier Code</b>	<a href="https://doi.org/10.1175/JCLI-D-17-0296.1">https://doi.org/10.1175/JCLI-D-17-0296.1</a>
<b>Identifier Type</b>	DOI
<b>Relationship to this dataset</b>	IsSupplementedBy
<b>Resource Type</b>	Online Resource
<b>Publication Type</b>	JournalArticle
<b>Publications 5</b>	
<b>Publication Name</b>	Synoptic Climatology of Rain-on-Snow Events in Alaska

Field	Value
<b>Identifier Code</b>	<a href="https://doi.org/10.1175/MWR-D-19-0311.1">https://doi.org/10.1175/MWR-D-19-0311.1</a>
<b>Identifier Type</b>	DOI
<b>Relationship to this dataset</b>	IsSupplementedBy
<b>Resource Type</b>	Online Resource
<b>Publication Type</b>	JournalArticle
<b>Publications 6</b>	
<b>Publication Name</b>	Impacts of synoptic-scale cyclones on Arctic sea-ice concentration: a systematic analysis
<b>Identifier Code</b>	<a href="https://doi.org/10.1017/aog.2020.23">https://doi.org/10.1017/aog.2020.23</a>
<b>Identifier Type</b>	DOI
<b>Relationship to this dataset</b>	IsSupplementedBy
<b>Resource Type</b>	Online Resource
<b>Publication Type</b>	JournalArticle
<b>Publications 7</b>	
<b>Publication Name</b>	Sensitivity of Northern Hemisphere Cyclone Detection and Tracking Results to Fine Spatial and Temporal Resolution Using ERA5

Field	Value
<b>Identifier Code</b>	<a href="https://journals.ametsoc.org/view/journals/mwre/149/8/MWR-D-20-0417.1.xml">https://journals.ametsoc.org/view/journals/mwre/149/8/MWR-D-20-0417.1.xml</a>
<b>Identifier Type</b>	URL
<b>Relationship to this dataset</b>	IsCitedBy
<b>Resource Type</b>	Online Resource
<b>Publication Type</b>	JournalArticle
<b>Publications 8</b>	
<b>Publication Name</b>	The Influence of the Arctic Frontal Zone on Summer Cyclone Activity Today and in the Future (Doctoral Dissertation)
<b>Identifier Code</b>	<a href="https://scholar.colorado.edu/concern/graduate_thesis_or_dissertations/6395w720f">https://scholar.colorado.edu/concern/graduate_thesis_or_dissertations/6395w720f</a>
<b>Identifier Type</b>	URL
<b>Relationship to this dataset</b>	IsContinuedBy
<b>Resource Type</b>	Online Resource
<b>Publication Type</b>	Dissertation
<b>Spatial regions</b>	northern-hemisphere

Field	Value
<b>Spatial extent West Bound Longitude</b>	-180.0
<b>Spatial extent East Bound Longitude</b>	180.0
<b>Spatial extent South Bound Latitude</b>	0.0
<b>Spatial extent North Bound Latitude</b>	90.0

## Data and Resources

Field	Value
<b>URL</b>	<a href="https://zenodo.org/records/7562953">https://zenodo.org/records/7562953</a>
<b>Name</b>	CEOS/NSIDC Extratropical Cyclone Tracking (CNECT) Algorithm
<b>Description</b>	<p>This algorithm has two steps: 1) detection of cyclone centers and areas and 2) tracking of those features. Center detection is based on local minima in sea-level pressure (within a 200 km radius) that have a pressure gradient of at least 7.5 hPa/1000 km. The area of storms and presence of single- and multi-center cyclones are determined using last-closed isobars. Tracking is based on the nearest neighbor to a predicted cyclone propagation location. Cyclone size, intensity, propagation, and interactions (e.g., splitting and merging with other storms) are tabulated at each observation time.</p>
<b>Format</b>	Python
<b>Resource Category</b>	scripts

Field	Value
<b>URL</b>	<a href="https://canwin-datahub.ad.umanitoba.ca/data/dataset/4be4d01a-a14b-483f-a1a6-6ead0974fa57/resource/69811381-b58c-4621-b73d-baf1758706f0/download/supplemental-metadata-column-headers-and-units.pdf">https://canwin-datahub.ad.umanitoba.ca/data/dataset/4be4d01a-a14b-483f-a1a6-6ead0974fa57/resource/69811381-b58c-4621-b73d-baf1758706f0/download/supplemental-metadata-column-headers-and-units.pdf</a>
<b>Name</b>	Supplemental Metadata- Column Headers and Units
<b>Description</b>	Additional metadata, which includes variable headers, units, and descriptions, as well as an overview of the script applied. (Last updated in Version 13.3)
<b>Format</b>	PDF
<b>Resource Category</b>	documents
<b>URL</b>	<a href="https://canwin-datahub.ad.umanitoba.ca/data/dataset/4be4d01a-a14b-483f-a1a6-6ead0974fa57/resource/a7ed8d55-63d1-4d7f-aa6f-63fc106e2176/download/cycloneparams.pkl">https://canwin-datahub.ad.umanitoba.ca/data/dataset/4be4d01a-a14b-483f-a1a6-6ead0974fa57/resource/a7ed8d55-63d1-4d7f-aa6f-63fc106e2176/download/cycloneparams.pkl</a>
<b>Name</b>	Cyclone Parameters File
<b>Description</b>	This cyclone parameters file records the input parameters used for the cyclone detection and tracking code to produce the files in this database. It can be opened using pandas in Python via <code>pandas.read_pickle(\$FILEPATH\$)</code> , where <code>\$FILEPATH\$</code> is the path to where this file is stored on your computer.
<b>Format</b>	pkl
<b>Resource Category</b>	supplemental
<b>URL</b>	<a href="https://canwin-datahub.ad.umanitoba.ca/data/dataset/4be4d01a-a14b-483f-a1a6-6ead0974fa57/resource/c31c6ec8-2fa8-4d62-8c4f-0ee2d18beedd/download/cnect-nh-era5-1940-1949.zip">https://canwin-datahub.ad.umanitoba.ca/data/dataset/4be4d01a-a14b-483f-a1a6-6ead0974fa57/resource/c31c6ec8-2fa8-4d62-8c4f-0ee2d18beedd/download/cnect-nh-era5-1940-1949.zip</a>

Field	Value
<b>Name</b>	Northern Hemisphere Extratropical Cyclone Tracks from ERA5: 1940-1949
<b>Description</b>	<p>Folder containing CSV files that describe extratropical cyclone tracks detected from the ERA5 atmospheric analysis using version 13.2 of the CEOS/NSIDC extratropical cyclone tracking algorithm (as described in Crawford et al., 2021; <a href="https://doi.org/10.1175/MWR-D-20-0417.1">https://doi.org/10.1175/MWR-D-20-0417.1</a>). Storms are detected with a 3-h temporal resolution and 25-km spatial resolution for the period 1940-1949. All storms whose ending time (cyclolysis) occurs in the same month are grouped into a single CSV file and can be identified by their unique system number (sid). The monthly files are organized within folders for each year. See accompanying metadata file for more details (e.g., descriptions and units for each column). This algorithm explicitly tracks each center of a multi-center cyclones, but in this database, each multi-center cyclone is represented only by its primary center -- i.e., the entire storm system is being represented by the location and area. Only storm systems that meet the following four criteria are included: lifespan of at least 24 hours, track length of at least 1000 km, observed at least once over an elevation less than 500 m, and observed at least once at at a distance of at least 500 km from its origin point are included.</p>
<b>Format</b>	ZIP
<b>Resource Category</b>	data
<b>URL</b>	<a href="https://canwin-datahub.ad.umanitoba.ca/data/dataset/4be4d01a-a14b-483f-a1a6-6ead0974fa57/resource/d9f63012-7041-48ba-bed2-1bf6e77fa75d/download/cnect-nh-era5-1950-1959.zip">https://canwin-datahub.ad.umanitoba.ca/data/dataset/4be4d01a-a14b-483f-a1a6-6ead0974fa57/resource/d9f63012-7041-48ba-bed2-1bf6e77fa75d/download/cnect-nh-era5-1950-1959.zip</a>
<b>Name</b>	Northern Hemisphere Extratropical Cyclone Tracks from ERA5: 1950-1959

Field	Value
<b>Description</b>	<p>Folder containing CSV files that describe extratropical cyclone tracks detected from the ERA5 atmospheric analysis using version 13.2 of the CEOS/NSIDC extratropical cyclone tracking algorithm (as described in Crawford et al., 2021; <a href="https://doi.org/10.1175/MWR-D-20-0417.1">https://doi.org/10.1175/MWR-D-20-0417.1</a>). Storms are detected with a 3-h temporal resolution and 25-km spatial resolution for the period 1950-1959. All storms whose ending time (cyclolysis) occurs in the same month are grouped into a single CSV file and can be identified by their unique system number (sid). The monthly files are organized within folders for each year. See accompanying metadata file for more details (e.g., descriptions and units for each column). This algorithm explicitly tracks each center of a multi-center cyclones, but in this database, each multi-center cyclone is represented only by its primary center -- i.e., the entire storm system is being represented by the location and area. Only storm systems that meet the following four criteria are included: lifespan of at least 24 hours, track length of at least 1000 km, observed at least once over an elevation less than 500 m, and observed at least once at a distance of at least 500 km from its origin point are included.</p>
<b>Format</b>	ZIP
<b>Resource Category</b>	data
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<b>Name</b>	Northern Hemisphere Extratropical Cyclone Tracks from ERA5: 1960-1969

Field	Value
<b>Description</b>	<p>Folder containing CSV files that describe extratropical cyclone tracks detected from the ERA5 atmospheric analysis using version 13.2 of the CEOS/NSIDC extratropical cyclone tracking algorithm (as described in Crawford et al., 2021; <a href="https://doi.org/10.1175/MWR-D-20-0417.1">https://doi.org/10.1175/MWR-D-20-0417.1</a>). Storms are detected with a 3-h temporal resolution and 25-km spatial resolution for the period 1960-1969. All storms whose ending time (cyclolysis) occurs in the same month are grouped into a single CSV file and can be identified by their unique system number (sid). The monthly files are organized within folders for each year. See accompanying metadata file for more details (e.g., descriptions and units for each column). This algorithm explicitly tracks each center of a multi-center cyclones, but in this database, each multi-center cyclone is represented only by its primary center -- i.e., the entire storm system is being represented by the location and area. Only storm systems that meet the following four criteria are included: lifespan of at least 24 hours, track length of at least 1000 km, observed at least once over an elevation less than 500 m, and observed at least once at at a distance of at least 500 km from its origin point are included.</p>
<b>Format</b>	ZIP
<b>Resource Category</b>	data
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<b>Name</b>	Northern Hemisphere Extratropical Cyclone Tracks from ERA5: 1970-1979



Field	Value
<b>Description</b>	<p>Folder containing CSV files that describe extratropical cyclone tracks detected from the ERA5 atmospheric analysis using version 13.2 of the CEOS/NSIDC extratropical cyclone tracking algorithm (as described in Crawford et al., 2021; <a href="https://doi.org/10.1175/MWR-D-20-0417.1">https://doi.org/10.1175/MWR-D-20-0417.1</a>). Storms are detected with a 3-h temporal resolution and 25-km spatial resolution for the period 1970-1979. All storms whose ending time (cyclolysis) occurs in the same month are grouped into a single CSV file and can be identified by their unique system number (sid). The monthly files are organized within folders for each year. See accompanying metadata file for more details (e.g., descriptions and units for each column). This algorithm explicitly tracks each center of a multi-center cyclones, but in this database, each multi-center cyclone is represented only by its primary center -- i.e., the entire storm system is being represented by the location and area. Only storm systems that meet the following four criteria are included: lifespan of at least 24 hours, track length of at least 1000 km, observed at least once over an elevation less than 500 m, and observed at least once at a distance of at least 500 km from its origin point are included.</p>
<b>Format</b>	ZIP
<b>Resource Category</b>	data
<b>URL</b>	<a href="https://canwin-datahub.ad.umanitoba.ca/data/dataset/4be4d01a-a14b-483f-a1a6-6ead0974fa57/resource/6240a835-2ea4-470a-9cc7-7d2ff8276bcb/download/cnect-nh-era5-1980-1989.zip">https://canwin-datahub.ad.umanitoba.ca/data/dataset/4be4d01a-a14b-483f-a1a6-6ead0974fa57/resource/6240a835-2ea4-470a-9cc7-7d2ff8276bcb/download/cnect-nh-era5-1980-1989.zip</a>
<b>Name</b>	Northern Hemisphere Extratropical Cyclone Tracks from ERA5: 1980-1989

Field	Value
<b>Description</b>	<p>Folder containing CSV files that describe extratropical cyclone tracks detected from the ERA5 atmospheric analysis using version 13.2 of the CEOS/NSIDC extratropical cyclone tracking algorithm (as described in Crawford et al., 2021; <a href="https://doi.org/10.1175/MWR-D-20-0417.1">https://doi.org/10.1175/MWR-D-20-0417.1</a>). Storms are detected with a 3-h temporal resolution and 25-km spatial resolution for the period 1980-1989. All storms whose ending time (cyclolysis) occurs in the same month are grouped into a single CSV file and can be identified by their unique system number (sid). The monthly files are organized within folders for each year. See accompanying metadata file for more details (e.g., descriptions and units for each column). This algorithm explicitly tracks each center of a multi-center cyclones, but in this database, each multi-center cyclone is represented only by its primary center -- i.e., the entire storm system is being represented by the location and area. Only storm systems that meet the following four criteria are included: lifespan of at least 24 hours, track length of at least 1000 km, observed at least once over an elevation less than 500 m, and observed at least once at a distance of at least 500 km from its origin point are included.</p>
<b>Format</b>	ZIP
<b>Resource Category</b>	data
<b>URL</b>	<a href="https://canwin-datahub.ad.umanitoba.ca/data/dataset/4be4d01a-a14b-483f-a1a6-6ead0974fa57/resource/83f7269e-c4f5-4690-bd50-71e4d0476890/download/cnect-nh-era5-1990-1999.zip">https://canwin-datahub.ad.umanitoba.ca/data/dataset/4be4d01a-a14b-483f-a1a6-6ead0974fa57/resource/83f7269e-c4f5-4690-bd50-71e4d0476890/download/cnect-nh-era5-1990-1999.zip</a>
<b>Name</b>	Northern Hemisphere Extratropical Cyclone Tracks from ERA5: 1990-1999

Field	Value
<b>Description</b>	<p>Folder containing CSV files that describe extratropical cyclone tracks detected from the ERA5 atmospheric analysis using version 13.2 of the CEOS/NSIDC extratropical cyclone tracking algorithm (as described in Crawford et al., 2021; <a href="https://doi.org/10.1175/MWR-D-20-0417.1">https://doi.org/10.1175/MWR-D-20-0417.1</a>). Storms are detected with a 3-h temporal resolution and 25-km spatial resolution for the period 1990-1999. All storms whose ending time (cyclolysis) occurs in the same month are grouped into a single CSV file and can be identified by their unique system number (sid). The monthly files are organized within folders for each year. See accompanying metadata file for more details (e.g., descriptions and units for each column). This algorithm explicitly tracks each center of a multi-center cyclones, but in this database, each multi-center cyclone is represented only by its primary center -- i.e., the entire storm system is being represented by the location and area. Only storm systems that meet the following four criteria are included: lifespan of at least 24 hours, track length of at least 1000 km, observed at least once over an elevation less than 500 m, and observed at least once at at a distance of at least 500 km from its origin point are included.</p>
<b>Format</b>	ZIP
<b>Resource Category</b>	data
<b>URL</b>	<a href="https://canwin-datahub.ad.umanitoba.ca/data/dataset/4be4d01a-a14b-483f-a1a6-6ead0974fa57/resource/8d5d2c9e-196b-4dbe-ac87-6a6cebcf0ae2/download/cnect-nh-era5-2000-2009.zip">https://canwin-datahub.ad.umanitoba.ca/data/dataset/4be4d01a-a14b-483f-a1a6-6ead0974fa57/resource/8d5d2c9e-196b-4dbe-ac87-6a6cebcf0ae2/download/cnect-nh-era5-2000-2009.zip</a>
<b>Name</b>	Northern Hemisphere Extratropical Cyclone Tracks from ERA5: 2000-2009

Field	Value
<b>Description</b>	<p>Folder containing CSV files that describe extratropical cyclone tracks detected from the ERA5 atmospheric analysis using version 13.2 of the CEOS/NSIDC extratropical cyclone tracking algorithm (as described in Crawford et al., 2021; <a href="https://doi.org/10.1175/MWR-D-20-0417.1">https://doi.org/10.1175/MWR-D-20-0417.1</a>). Storms are detected with a 3-h temporal resolution and 25-km spatial resolution for the period 2000-2009. All storms whose ending time (cyclolysis) occurs in the same month are grouped into a single CSV file and can be identified by their unique system number (sid). The monthly files are organized within folders for each year. See accompanying metadata file for more details (e.g., descriptions and units for each column). This algorithm explicitly tracks each center of a multi-center cyclones, but in this database, each multi-center cyclone is represented only by its primary center -- i.e., the entire storm system is being represented by the location and area. Only storm systems that meet the following four criteria are included: lifespan of at least 24 hours, track length of at least 1000 km, observed at least once over an elevation less than 500 m, and observed at least once at at a distance of at least 500 km from its origin point are included.</p>
<b>Format</b>	ZIP
<b>Resource Category</b>	data
<b>URL</b>	<a href="https://canwin-datahub.ad.umanitoba.ca/data/dataset/4be4d01a-a14b-483f-a1a6-6ead0974fa57/resource/70bf8f2c-83da-4c88-bfbc-fe0a17a73796/download/cnect-nh-era5-2010-2019.zip">https://canwin-datahub.ad.umanitoba.ca/data/dataset/4be4d01a-a14b-483f-a1a6-6ead0974fa57/resource/70bf8f2c-83da-4c88-bfbc-fe0a17a73796/download/cnect-nh-era5-2010-2019.zip</a>
<b>Name</b>	Northern Hemisphere Extratropical Cyclone Tracks from ERA5: 2010-2019

Field	Value
<b>Description</b>	<p>Folder containing CSV files that describe extratropical cyclone tracks detected from the ERA5 atmospheric analysis using version 13.2 of the CEOS/NSIDC extratropical cyclone tracking algorithm (as described in Crawford et al., 2021; <a href="https://doi.org/10.1175/MWR-D-20-0417.1">https://doi.org/10.1175/MWR-D-20-0417.1</a>). Storms are detected with a 3-h temporal resolution and 25-km spatial resolution for the period 2010-2019. All storms whose ending time (cyclolysis) occurs in the same month are grouped into a single CSV file and can be identified by their unique system number (sid). The monthly files are organized within folders for each year. See accompanying metadata file for more details (e.g., descriptions and units for each column). This algorithm explicitly tracks each center of a multi-center cyclones, but in this database, each multi-center cyclone is represented only by its primary center -- i.e., the entire storm system is being represented by the location and area. Only storm systems that meet the following four criteria are included: lifespan of at least 24 hours, track length of at least 1000 km, observed at least once over an elevation less than 500 m, and observed at least once at a distance of at least 500 km from its origin point are included.</p>
<b>Format</b>	ZIP
<b>Resource Category</b>	data
<b>URL</b>	<a href="https://canwin-datahub.ad.umanitoba.ca/data/dataset/4be4d01a-a14b-483f-a1a6-6ead0974fa57/resource/ced01a53-f2ca-48fd-809c-cd99b83b7431/download/cnect-nh-era5-2020.zip">https://canwin-datahub.ad.umanitoba.ca/data/dataset/4be4d01a-a14b-483f-a1a6-6ead0974fa57/resource/ced01a53-f2ca-48fd-809c-cd99b83b7431/download/cnect-nh-era5-2020.zip</a>
<b>Name</b>	Northern Hemisphere Extratropical Cyclone Tracks from ERA5: 2020

Field	Value
<b>Description</b>	<p>Folder containing CSV files that describe extratropical cyclone tracks detected from the ERA5 atmospheric analysis using version 13.2 of the CEOS/NSIDC extratropical cyclone tracking algorithm (as described in Crawford et al., 2021; <a href="https://doi.org/10.1175/MWR-D-20-0417.1">https://doi.org/10.1175/MWR-D-20-0417.1</a>). Storms are detected with a 3-h temporal resolution and 25-km spatial resolution for the year 2020. All storms whose ending time (cyclolysis) occurs in the same month are grouped into a single CSV file and can be identified by their unique system number (sid). The monthly files are organized within folders for each year. See accompanying metadata file for more details (e.g., descriptions and units for each column). This algorithm explicitly tracks each center of a multi-center cyclones, but in this database, each multi-center cyclone is represented only by its primary center -- i.e., the entire storm system is being represented by the location and area. Only storm systems that meet the following four criteria are included: lifespan of at least 24 hours, track length of at least 1000 km, observed at least once over an elevation less than 500 m, and observed at least once at a distance of at least 500 km from its origin point are included.</p>
<b>Format</b>	ZIP
<b>Resource Category</b>	data
<b>URL</b>	<a href="https://canwin-datahub.ad.umanitoba.ca/data/dataset/4be4d01a-a14b-483f-a1a6-6ead0974fa57/resource/9b63b1ad-f5f1-4b4a-9c4b-8ca0a913a6b1/download/cnect-nh-era5-2021.zip">https://canwin-datahub.ad.umanitoba.ca/data/dataset/4be4d01a-a14b-483f-a1a6-6ead0974fa57/resource/9b63b1ad-f5f1-4b4a-9c4b-8ca0a913a6b1/download/cnect-nh-era5-2021.zip</a>
<b>Name</b>	Northern Hemisphere Extratropical Cyclone Tracks from ERA5: 2021

Field	Value
<b>Description</b>	<p>Folder containing CSV files that describe extratropical cyclone tracks detected from the ERA5 atmospheric analysis using version 13.2 of the CEOS/NSIDC extratropical cyclone tracking algorithm (as described in Crawford et al., 2021; <a href="https://doi.org/10.1175/MWR-D-20-0417.1">https://doi.org/10.1175/MWR-D-20-0417.1</a>). Storms are detected with a 3-h temporal resolution and 25-km spatial resolution for the year 2021. All storms whose ending time (cyclolysis) occurs in the same month are grouped into a single CSV file and can be identified by their unique system number (sid). The monthly files are organized within folders for each year. See accompanying metadata file for more details (e.g., descriptions and units for each column). This algorithm explicitly tracks each center of a multi-center cyclones, but in this database, each multi-center cyclone is represented only by its primary center -- i.e., the entire storm system is being represented by the location and area. Only storm systems that meet the following four criteria are included: lifespan of at least 24 hours, track length of at least 1000 km, observed at least once over an elevation less than 500 m, and observed at least once at a distance of at least 500 km from its origin point are included.</p>
<b>Format</b>	ZIP
<b>Resource Category</b>	data
<b>URL</b>	<a href="https://canwin-datahub.ad.umanitoba.ca/data/dataset/4be4d01a-a14b-483f-a1a6-6ead0974fa57/resource/e9ef2608-e3f1-4edf-b987-281bd13b1e62/download/cnect-nh-era5-2022.zip">https://canwin-datahub.ad.umanitoba.ca/data/dataset/4be4d01a-a14b-483f-a1a6-6ead0974fa57/resource/e9ef2608-e3f1-4edf-b987-281bd13b1e62/download/cnect-nh-era5-2022.zip</a>
<b>Name</b>	Northern Hemisphere Extratropical Cyclone Tracks from ERA5: 2022

Field	Value
<b>Description</b>	<p>Folder containing CSV files that describe extratropical cyclone tracks detected from the ERA5 atmospheric analysis using version 13.2 of the CEOS/NSIDC extratropical cyclone tracking algorithm (as described in Crawford et al., 2021; <a href="https://doi.org/10.1175/MWR-D-20-0417.1">https://doi.org/10.1175/MWR-D-20-0417.1</a>). Storms are detected with a 3-h temporal resolution and 25-km spatial resolution for the year 2022. All storms whose ending time (cyclolysis) occurs in the same month are grouped into a single CSV file and can be identified by their unique system number (sid). The monthly files are organized within folders for each year. See accompanying metadata file for more details (e.g., descriptions and units for each column). This algorithm explicitly tracks each center of a multi-center cyclones, but in this database, each multi-center cyclone is represented only by its primary center -- i.e., the entire storm system is being represented by the location and area. Only storm systems that meet the following four criteria are included: lifespan of at least 24 hours, track length of at least 1000 km, observed at least once over an elevation less than 500 m, and observed at least once at a distance of at least 500 km from its origin point are included.</p>
<b>Format</b>	ZIP
<b>Resource Category</b>	data
<b>URL</b>	<a href="https://canwin-datahub.ad.umanitoba.ca/data/dataset/4be4d01a-a14b-483f-a1a6-6ead0974fa57/resource/8bc6e96f-b50c-4fef-906c-16fc1ca98522/download/cnect-nh-era5-2023.zip">https://canwin-datahub.ad.umanitoba.ca/data/dataset/4be4d01a-a14b-483f-a1a6-6ead0974fa57/resource/8bc6e96f-b50c-4fef-906c-16fc1ca98522/download/cnect-nh-era5-2023.zip</a>
<b>Name</b>	Northern Hemisphere Extratropical Cyclone Tracks from ERA5: 2023



Field	Value
<b>Description</b>	<p>Folder containing CSV files that describe extratropical cyclone tracks detected from the ERA5 atmospheric analysis using version 13.2 of the CEOS/NSIDC extratropical cyclone tracking algorithm (as described in Crawford et al., 2021; <a href="https://doi.org/10.1175/MWR-D-20-0417.1">https://doi.org/10.1175/MWR-D-20-0417.1</a>). Storms are detected with a 3-h temporal resolution and 25-km spatial resolution for the year 2023. All storms whose ending time (cyclolysis) occurs in the same month are grouped into a single CSV file and can be identified by their unique system number (sid). The monthly files are organized within folders for each year. See accompanying metadata file for more details (e.g., descriptions and units for each column). This algorithm explicitly tracks each center of a multi-center cyclones, but in this database, each multi-center cyclone is represented only by its primary center -- i.e., the entire storm system is being represented by the location and area. Only storm systems that meet the following four criteria are included: lifespan of at least 24 hours, track length of at least 1000 km, observed at least once over an elevation less than 500 m, and observed at least once at a distance of at least 500 km from its origin point are included.</p>
<b>Format</b>	ZIP
<b>Resource Category</b>	data
<b>URL</b>	<a href="https://canwin-datahub.ad.umanitoba.ca/data/dataset/4be4d01a-a14b-483f-a1a6-6ead0974fa57/resource/a5befcfe-1b51-48a4-ae05-159b8db5ef2c/download/cnect-nh-era5-2024.zip">https://canwin-datahub.ad.umanitoba.ca/data/dataset/4be4d01a-a14b-483f-a1a6-6ead0974fa57/resource/a5befcfe-1b51-48a4-ae05-159b8db5ef2c/download/cnect-nh-era5-2024.zip</a>
<b>Name</b>	Northern Hemisphere Extratropical Cyclone Tracks from ERA5: 2024

Field	Value
<b>Description</b>	<p>Folder containing CSV files that describe extratropical cyclone tracks detected from the ERA5 atmospheric analysis using version 13.2 of the CEOS/NSIDC extratropical cyclone tracking algorithm (as described in Crawford et al., 2021; <a href="https://doi.org/10.1175/MWR-D-20-0417.1">https://doi.org/10.1175/MWR-D-20-0417.1</a>). Storms are detected with a 3-h temporal resolution and 25-km spatial resolution for the year 2024. All storms whose ending time (cyclolysis) occurs in the same month are grouped into a single CSV file and can be identified by their unique system number (sid). The monthly files are organized within folders for each year. See accompanying metadata file for more details (e.g., descriptions and units for each column). This algorithm explicitly tracks each center of a multi-center cyclones, but in this database, each multi-center cyclone is represented only by its primary center -- i.e., the entire storm system is being represented by the location and area. Only storm systems that meet the following four criteria are included: lifespan of at least 24 hours, track length of at least 1000 km, observed at least once over an elevation less than 500 m, and observed at least once at a distance of at least 500 km from its origin point are included.</p>
<b>Format</b>	ZIP
<b>Resource Category</b>	data
<b>URL</b>	<a href="https://canwin-datahub.ad.umanitoba.ca/data/dataset/4be4d01a-a14b-483f-a1a6-6ead0974fa57/resource/fdfbc60e-ea0b-4d2c-81f2-f21b8a5a5660/download/cnect-nh-era5-2025.zip">https://canwin-datahub.ad.umanitoba.ca/data/dataset/4be4d01a-a14b-483f-a1a6-6ead0974fa57/resource/fdfbc60e-ea0b-4d2c-81f2-f21b8a5a5660/download/cnect-nh-era5-2025.zip</a>
<b>Name</b>	Northern Hemisphere Extratropical Cyclone Tracks from ERA5: 2025

Field	Value
<b>Description</b>	<p>Folder containing CSV files that describe extratropical cyclone tracks detected from the ERA5 atmospheric analysis using version 13.2 of the CEOS/NSIDC extratropical cyclone tracking algorithm (as described in Crawford et al., 2021; <a href="https://doi.org/10.1175/MWR-D-20-0417.1">https://doi.org/10.1175/MWR-D-20-0417.1</a>). Storms are detected with a 3-h temporal resolution and 25-km spatial resolution for the year 2024. All storms whose ending time (cyclolysis) occurs in the same month are grouped into a single CSV file and can be identified by their unique system number (sid). The monthly files are organized within folders for each year. See accompanying metadata file for more details (e.g., descriptions and units for each column). This algorithm explicitly tracks each center of a multi-center cyclones, but in this database, each multi-center cyclone is represented only by its primary center -- i.e., the entire storm system is being represented by the location and area. Only storm systems that meet the following four criteria are included: lifespan of at least 24 hours, track length of at least 1000 km, observed at least once over an elevation less than 500 m, and observed at least once at a distance of at least 500 km from its origin point are included.</p>
<b>Format</b>	ZIP
<b>Resource Category</b>	data

## Related Publications

Field	Value
<b>Title</b>	The Response of extratropical cyclone propagation in the Northern Hemisphere to global warming
<b>URL</b>	<a href="https://canwin-datahub.ad.umanitoba.ca/data/en/publication/the-response-of-extratropical-cyclone-propagation-in-the-northern-hemisphere-to-global-warming">https://canwin-datahub.ad.umanitoba.ca/data/en/publication/the-response-of-extratropical-cyclone-propagation-in-the-northern-hemisphere-to-global-warming</a>