

Name	Version	Type	Resolution (Time and Space)	Section(s)	Time Period	Citation, Link and DOI (Where Available)
Hadley Centre Sea Ice and Sea Surface Temperature dataset (HadISST)	1	In situ, remote sensing	Monthly 1° × 1°	2.4.3 2.4.5 3.5.1 3.7.3 3.7.6 3.7.7 3.8.1 7.4.4 9.2.1	1871–2020	Rayner et al. (2003) www.metoffice.gov.uk/hadobs/hadisst/
Hadley Centre HadNMAT2 night marine air temperature	2	In situ	Monthly 5° × 5°	CCB 2.3	1880–2010	Kent et al. (2013) www.metoffice.gov.uk/hadobs/hadnmat2/
Hadley Centre Sea Level Pressure (HadSLP)	2r	In situ, reanalysis	Monthly 5° × 5°	3.3.3	1850–2020	Allan and Ansell (2006) www.metoffice.gov.uk/hadobs/hadslp2/
Hadley Centre HadSST sea surface temperature	4	In situ	Monthly 5° × 5°	9.2.1 Atlas	1850–2020	Kennedy et al. (2019) www.metoffice.gov.uk/hadobs/
HadUK-Grid	1.0	In situ	Daily 0.009° × 0.009°	10.2.1	1862–2019	www.metoffice.gov.uk/climate/uk/data/haduk-grid/haduk-grid
Hawaii Ocean Time-series Data		In situ	Point-based	2.3.3	1988–2018	Dore et al. (2009) http://hahana.soest.hawaii.edu/hot/hot-dogs/interface.html
Global mean sea level reconstruction (Hay)		In situ	Annual Global mean	2.3.3	1901–2010	Hay et al. (2015)
Boulder stratospheric water vapor (Hegglin)		In situ		2.2.5	1980–2010	Hegglin et al. (2014)
Hamburg Ocean Atmosphere Parameters and Fluxes from Satellite data record (HOAPS4)		Remote sensing	6-hourly 0.5° × 0.5°	2.3.1	1987–2014	Andersson et al. (2010, 2017) https://wui.cmsaf.eu/safira/action/viewDoiDetails?acronym=HOAPS_V002 doi:10.5676/EUM_SAF_CM/HOAPS/V002
Glacier and ice sheet dataset (Hugonnet)		Remote sensing	Annual Point-based	2.3.2	2000–2019	Hugonnet et al. (2021)
Central European high-resolution gridded daily datasets (HYRAS)	1.0	In situ	Daily 0.5° × 0.5°, 0.25° × 0.25°	10.2.1	1951–2006	Frick et al. (2014)
IAGOS airborne ozone data		In situ	Intermittent	2.2.5 6.3.2	1994–2020	Cohen et al. (2018); Cooper et al. (2020); Gaudel et al. (2020) www.iagos-data.fr/ doi:10.25326/20
ICESat sea ice thickness data		Remote sensing	Intermittent 25 × 25 km	2.3.1	2003–2008	Kwok et al. (2009) http://nsidc.org/cryosphere/sotc/sea_ice.html
International Comprehensive Ocean–Atmosphere Data Set (ICOADS)	3.0	In situ	Frequency varies, point-based Monthly, 1° × 1°	2.3.1	1662–2019	Freeman et al. (2017) https://icoads.noaa.gov/
IFREMER4	4	Remote sensing	Daily 0.25° × 0.25°	9.2.1	1992–2017	de Boyer Montégut et al. (2004); Bentamy et al. (2017)
Integrated Global Radiosonde Archive (IGRA)		In situ	Point-based	8.3.1	1900–2019	Durre et al. (2006) https://data.noaa.gov/dataset/dataset/integrated-global-radiosonde-archive-igra-version-2
IMBIE Greenland and Antarctic ice sheet mass		Remote sensing	Regional aggregate	2.3.2 9.4.1 9.4.2	1992–2017	The IMBIE Team (2018, 2019, 2021)
Indian Monsoon Data Assimilation and Analysis (IMDAA)		Reanalysis	Sub-daily 0.11° × 0.11°	10.2.1	1979–2016	Mahmood et al. (2018)
Indian Institute of Tropical Meteorology (IITM) all-India rainfall		In situ	Monthly Time series	10.6.3	1871–1993	Parthasarathy et al. (1994)
IPRC subsurface temperature data		In situ	Monthly 1° × 1°	2.3.3	2005–2020	http://apdrc.soest.hawaii.edu/projects/Argo/data/gridded/On_standard_levels/index-1.html

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ISAS-15 temperature and salinity gridded fields		In situ	Monthly 1° × 1°	2.3.3	2002–2015	Gaillard et al. (2016); Kolodziejczyk et al. (2017) www.seanoe.org/data/00412/52367/
Ocean heat content (Ishii)		In situ	Annual Time series	2.3.3 9.2.2	1955–2020	Ishii et al. (2017)
JAMSTEC Database for time series stations K2 and S1		In situ	Point-based	5.3.2	1997–2018	Wakita et al. (2017) www.godac.jamstec.go.jp/catalog/data_catalog/metadataDisp/JAMSTEC_K2_S1?lang=en
Jena-MLS air–sea CO ₂ fluxes	2018	In situ	Daily 4° × 5°	5.2.1	1982–2017	Rödenbeck et al. (2013, 2014) www.bgc-jena.mpg.de/CarboScope/?ID=oc
Global mean sea level reconstruction (Jevrejeva)		In situ	Annual Global time series	2.3.3	1807–2009	Jevrejeva et al. (2014)
JMA-TRANSCOM		Reanalysis	Monthly 1° × 1°	3.6.1 3.8.2	1985–2008	Gurney et al. (2003)
Japanese Ocean Flux Data Sets with Use of Remote Sensing Observations (JOFURO3)	3	Remote sensing	Daily 0.25° × 0.25°	8.3.1	1988–2013	Tomita et al. (2017)
Belgium precipitation (Journée)		In situ	Daily 4 km ²	10.2.1	1981–2010	Journée et al. (2015)
Japan Meteorological Agency JRA-55 reanalysis		Reanalysis	3-hourly TL319 (approx. 55 km), 60 vertical levels	2.3.1 3.3.3 3.7.1 3.8.2 8.3.2 10.3.3 CCB 10.4	1958–2020	Kobayashi et al. (2015); Harada et al. (2016) https://jra.kishou.go.jp/JRA-55/index_en.html
JRA-25		Reanalysis	6-hourly T106 (approx. 120km)	10.3.3	1979–2004	Onogi et al. (2007) https://jra.kishou.go.jp/JRA-25/index_en.html
Kadow global temperature dataset		In situ	Monthly 5° × 5°	1.4.1 1.6.1 2.3.1 CCB 2.3 3.3.1 CCB 3.1	1850–2020	Kadow et al. (2020)
Kaplan Extended SST dataset	2	In situ	Monthly 5° × 5°	2.4.3 2.4.5 Atlas	1856–2019	Kaplan et al. (1998) www.esrl.noaa.gov/psd/data/gridded/data.kaplan_sst.html
Greenland Ice Sheet discharge (King)		Remote sensing	Annual Regional time series	9.4.1	1985–2018	King et al. (2020) https://datadryad.org/stash/dataset/doi:10.5061/dryad.qrfj6q5cb doi:10.5061/dryad.qrfj6q5cb
Kyoto cherry blossom data		In situ	Annual Point-based	2.3.4	801–2020	Aono and Saito (2010) http://atmenv.envi.osakafu-u.ac.jp/aono/kyophenotemp4/
LAI3g		Remote sensing	Monthly 0.5° × 0.5°	3.6.1 3.8.2	1982–2011	Zhu et al. (2013)
LandFlux-EVAL		In situ	Monthly	3.8.2 8.3.1	2000–2004	Mueller et al. (2013) www.iac.ethz.ch/groups/seneviratne/research/LandFlux-EVAL
Landsat Global Land Survey (GLS) database		Remote sensing	Daily Global images	8.3.1	1972–2019	Gutman et al. (2013)
LAQN (London)		In situ	15-minute	Box 10.3	1993–2019	www.londonair.org.uk
LDEO Global Ocean Surface Water Partial Pressure of CO ₂ Database		In situ	Point-based	5.3.2	1957–2018	Takahashi et al. (2014) www.nodc.noaa.gov/ocads/oceans/LDEO_Underway_Database/NDP-088_V2018.pdf
LEGOS sea level budget		Remote sensing	Monthly Global time series	2.3.3	1993–2020	Blazquez et al. (2018)

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Combined satellite and station data (Maidment)		Remote sensing, in situ	10-day 0.0375° × 0.0375°	10.2.1	1983–2012	Maidment et al. (2014)
Marshall SAM index		In situ	Monthly Regional means	2.4.1	1957–2020	Marshall (2003) www.nerc-bas.ac.uk/icd/gjma/sam.html
Princeton MEaSUREs		Reanalysis, remote sensing, in situ	Monthly 0.5° × 0.5°	8.3.1	1950–2019	Pan et al. (2012)
Multivariate ENSO Index (MEI)		In situ	Monthly	5.2.3	1977–2017	Wolter and Timlin (1998) www.esrl.noaa.gov/psd/enso/mei/
Historical greenhouse gas concentrations for climate modelling (Meinshausen)		In situ	Monthly 15° zonal means	2.2.3	1850–2014	Meinshausen et al. (2017) www.climatecollege.unimelb.edu.au/cmip6
MERRA Reanalysis	1	Reanalysis	3-hourly 0.5° × 0.66°	8.3.2	1979–2016	Rienecker et al. (2011)
MERRA-2 reanalysis	2	Reanalysis	Hourly 0.5 × 0.66°, 72 vertical levels	2.3.1 3.3.3 8.3.2	1980–2020	Gelaro et al. (2017) https://gmao.gsfc.nasa.gov/reanalysis/MERRA-2/
MERRA-2 reanalysis – Land	2	Reanalysis	6-hourly 0.5° × 0.66°, 72 vertical levels	8.3.1	1980–2020	Reichle (2012) http://gmao.gsfc.nasa.gov/pubs/office_notes
METROS (Tokyo)		In situ	15-minute	Box 10.3	2000–2005	Takahashi et al. (2011)
MIROC4-ACTM emission flux data	2018	Reanalysis	Monthly 1° × 1°	5.2.2	1996–2016	Patra et al. (2016, 2018); Saeki and Patra (2017) https://ebcrpa.jamstec.go.jp/~prabir/data/co2l2r84/s042_FaChOt_srcdf1/ https://ebcrpa.jamstec.go.jp/~prabir/data/ch4l2r53/gcp2019/ https://ebcrpa.jamstec.go.jp/~prabir/data/n2ol2r84/s037_edqman1/
MISR Component Global Aerosol Product	V4, Level 3	Remote sensing	Yearly 0.5° × 0.5° grid	2.2.6	2000–2020	Garay et al. (2017) https://cmr.earthdata.nasa.gov/search/concepts/C43677715-LARC.html
MOCCA (Ghent)		In situ	15-minute	Box 10.3	2016–2020	Vandemeulebroucke et al. (2019); Caluwaerts et al. (2020)
NASA Merged Ozone Data (MOD)	8.6	Remote sensing	Monthly 5° zonal means	2.2.6	1970–2020	Frith et al. (2017) https://acd-ext.gsfc.nasa.gov/Data_services/merged/index.html
MODIS Aerosol Optical Depth 550nm	MYD08_M3	Remote sensing	Monthly 1° × 1°	2.2.6	2003–2011	Platnick et al. (2003) https://adsweb.modaps.eosdis.nasa.gov/search/order
MODIS NDVI/EVI vegetation greenness index	6	Remote sensing	16-day 1 km	5.2.1	2000–2018	Myneni et al. (2015) doi:10.5067/MODIS/MCD15A2H.006
Moderate Resolution Imaging Spectro-radiometer (MODIS)	MCD12Q1	Remote sensing	Annual 500 m	8.3.1	2001–2019	Loveland and Belward (1997)
MPI-SOMFFN air–sea CO ₂ fluxes	2016	In situ	Monthly 1° × 1°	3.8.2 5.2.1	1982–2015	Landschützer et al. (2016) www.nodc.noaa.gov/ocads/oceans/SPCO2_1982_2015_ETH_SOM_FFNN.html
Ozone Multi-sensor Reanalysis (MSR)	2	Reanalysis	6-hourly 1° × 1°	2.2.5	1970–2019	Braesicke et al. (2018); Chipperfield et al. (2018); Weber et al. (2018b, 2020) www.temis.nl/protocols/O3global.php
Multi-Source Weighted-Ensemble Precipitation dataset (MSWEP)		Reanalysis, remote sensing, in situ	3-hourly 0.25° × 0.25°	8.3.1	1979–2015	Beck et al. (2017) https://wald.anu.edu.au/data_services/data/mswep-multi-source-weighted-ensem%2%ADble-pre%2%ADcip%2%ADi%2%ADta%2%ADtion/
MTE Gross Primary Productivity	May12	Reanalysis	Monthly 0.5° × 0.5°	3.8.2	1982–2011	Jung et al. (2011)

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Northern Hemisphere Blended Snow Cover Extent and Snow Mass Time Series (Mudryk)		Remote sensing, in situ	Monthly Time series	2.3.2 3.4.2 9.5.3	1980–2018	Mudryk et al. (2020) http://data.ec.gc.ca/data/climate/scientificknowledge/climate-research-publication-based-data/northern-hemisphere-blended-snow-extent-and-snow-mass-time-series/
NASA global mean sea level	4.2	Remote sensing	10-day Global time series	2.3.3	1993–2020	Beckley et al. (2016)
NASA Team Sea Ice Concentrations from Nimbus-7 SMMR and DMSP SSM/I-SSMIS Passive Microwave Data	1	Remote sensing	Monthly 25 km	3.4.1	1979–2019	Cavalieri et al. (1996) https://nsidc.org/data/nsidc-0051
NCEI Ocean Heat Content		In situ	Annual 1° × 1°	2.3.3 9.2.2 9.3.2	1955–2020	Levitus et al. (2012) www.ncei.noaa.gov/access/global-ocean-heat-content/
NCEP-NCAR Reanalysis		Reanalysis	Daily and monthly 2.5° × 2.5°	3.7.1 3.8.2 10.3.3	1980–2020	Kalnay et al. (1996) www.esrl.noaa.gov/psd/data/gridded/data.ncep_reanalysis.html
New Zealand temperature and rainfall datasets		In situ	Daily Point-based	Atlas 6.2	1870–2020	NIWA (2020)
NIWA d ¹³ C-CO ₂	2019	In situ	Monthly	5.2.1	1957–2015	Turnbull et al. (2017)
NOAA atmospheric gas measurements		In situ	Time resolution depends on gas Point-based	2.2.3 2.2.4 3.6.1 5.1.2 5.2.1 5.2.2 5.2.3	Varies depending on gas	Masarie and Tans (2004); Montzka et al. (2009, 2015); Hall et al. (2011); Dlugokencky and Tans (2019) www.esrl.noaa.gov/gmd/ccgg/
NOAA ESRL MLO Carbon dioxide		In situ	Monthly Point-based	3.6.1	1980–2014	Zeng et al. (2014) www.esrl.noaa.gov/gmd/ccgg/trends/data.html
NOAA Global Temp	5	In situ	Monthly 5° × 5°	1.3.6 10.6.4	1880–2020	Huang et al. (2020) www.ncdc.noaa.gov/data-access/marineocean-data/noaa-global-surface-temperature-noaaglobaltemp
NOAA Global Temp – Interim		In situ	Monthly 5° × 5°	1.4.1 1.6.1 2.3.1 3.3.1 CCB 2.3 CCB 3.1	1850–2020	Vose et al. (2021)
NOAA Merge ozone data (SBUV)	8.6	Remote sensing	Daily 5° zonal means	2.2.5	1978–2020	Wild et al. (2016) ftp://ftp.cpc.ncep.noaa.gov/SBUV_CDR/
NOAA reconstructed snow cover dataset		Remote sensing, in situ	Monthly Hemispheric time series	3.4.2 9.5.3	1915–1997	Brown (2002); Brown and Robinson (2011) https://nsidc.org/data/q02131
NOAA Climate Data Record of Sea Ice Concentration	3.0	Remote sensing	Monthly 25 km	2.3.2	1979–2020	Peng et al. (2013) https://nsidc.org/data/q02202
NOAA STAR satellite temperature	3.0	Remote sensing	Monthly 2.5° × 2.5°, 3 vertical layers	2.3.1	1979–2020	Zou and Wang (2011) www.star.nesdis.noaa.gov/smcd/emb/mscat/
National Oceanography Centre (NOC) surface flux and meteorological dataset	2.0	In situ	Monthly 1° × 1°	2.3.1	1973–2014	Berry and Kent (2011) http://badc.nerc.ac.uk/data/nocs_flux/
African Rainfall Climatology (Novella and Thiaw)	2.0	Remote sensing	Daily 0.1° × 0.1°	10.2.1	1983–2010	Novella and Thiaw (2013)
National Sea and Ice Data Center (NSIDC) sea ice index	3	Remote sensing	Daily 25 km	2.3.2	1978–2020	Fetterer et al. (2017) https://nsidc.org/data/G02135/versions/3

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NASA Water Vapor Project MEaSUREs (NVAP-M)		Remote sensing	Daily 1°	2.3.1	1988–2008	Vonder Haar et al. (2012) https://public.satproj.klima.dwd.de/data/GVAP_data_archive/v1.0/TCWV/long/
NYCMET-NET (New York)	2.0.0	In situ	15-minute	Box 10.3	Ongoing	http://nycmetnet.cuny.cuny.edu
OAFflux		Remote sensing	Daily 0.25° × 0.25°	2.3.1 9.2.1	1987–2019	Yu et al. (2008) http://oaf Flux.whoii.edu/
Ocean Colour Climate Change Initiative (OC-CCI)	4.2	Remote sensing	Daily 4 km	2.3.4	1997–2019	Sathyendranath et al. (2019) https://climate.esa.int/en/projects/ocean-colour/
Ocean Satellite Oceanographic Datasets for Acidification (OCEAN SODA-ETHZ)		Remote sensing	Monthly 1°	2.3.3	1985–2018	Gregor and Gruber (2021) doi:10.25921/m5wx-ja34
NOAA Optimum Interpolation SST (OISST)	2	In situ, remote sensing	Daily 0.25° × 0.25°	2.4.3	1981–2020	Reynolds et al. (2002); Banzon et al. (2016) www.ncdc.noaa.gov/oisst
OSISAF/ CCI sea ice concentration	450	Remote sensing	Monthly 25 km	2.3.2 3.4.1	1979–2015	Lavergne et al. (2019) http://osisaf.met.no/p/ice/
USA temperature (Oyler)		In situ	Daily 30-arcsec	10.2.1	1948–2012	Oyler et al. (2015)
Swiss Alps (Panziera)		Remote sensing	Sub-daily 0.01° × 0.01°	10.2.1	2005–2017	Panziera et al. (2018)
Gridded dataset of hourly precipitation in Germany (Paulat)		In situ	Hourly 0.06° × 0.06°	10.2.1	2001–2004	Paulat et al. (2008)
Portland State University (PDX) CH ₄ , d ¹³ C-CH ₄	2017	In situ	Daily–monthly	5.2.2	1977–2010	Rice et al. (2016)
PERSIANN-CDR		Remote sensing	Daily 0.25° × 0.25°	10.2.1	1982–2020	Ashouri et al. (2015) www.ncdc.noaa.gov/cdr/atmospheric/precipitation-persiann-cdr
Philadelphia plant data		In situ	Annual Point-based	2.3.4	1840–2010	Panchen et al. (2012)
PIOMAS Arctic sea ice reanalysis	2.1	Reanalysis	Monthly 4°–5°	7.2.2	1979–2020	Zhang and Rothrock (2003); Schweiger et al. (2011) http://psc.apl.uw.edu/research/projects/arctic-sea-ice-volume-anomaly/
PMEL ocean heat content		In situ	Annual Global time series	2.3.3	1950–2011	Lyman and Johnson (2014)
PROMICE Greenland Ice Sheet discharge		Remote sensing	Annual Regional time series	9.4.1	1986–2018	Mankoff et al. (2019) http://promice.org/PromiceDataPortal
PROMICE ice sheet mass balance		Remote sensing	Annual Regional time series	9.4.1	1995–2019	Colgan et al. (2019) http://promice.org/PromiceDataPortal
Purkey and Johnson ocean heat content		In situ	Annual Global mean	2.3.3	1981–2010	Purkey and Johnson (2010)
High Resolution Gridded Data for India (Rajeevan)	1.0	In situ	Daily 1° × 1°	10.6.3	1951–2003	Rajeevan et al. (2006)
Randolph Glacier Inventory	6	Remote sensing	Decametric shape files of glacier outlines, global 0.5° global grid of glacierized area	2.3.2 9.5.1	1955–2014	Scherler et al. (2018) www.glims.org/RGI/rgi60_dl.html
RAOB-CORE radiosonde dataset	1.7	In situ	Monthly 10° × 5°, 12 vertical levels	2.3.1 3.3.1	1958–2020	Haimberger et al. (2012) www.univie.ac.at/theoret-met/research/raobcore/
Global mean sea level reconstruction (Ray and Douglas)		In situ	Annual Global time series	2.3.3	1900–2010	Ray and Douglas (2011)

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REGEN global precipitation	1	In situ	Daily 1° × 1°	10.3.2	1950–2016	Contractor et al. (2020) https://researchdata.andis.org.au/rainfall-estimates-gridded-v1-2019/1408744 doi:10.25914/5ca4c380b0d44
RICH radiosonde dataset	1.7	In situ	Monthly 10° × 5°, 12 vertical levels	2.3.1 3.3.1	1958–2020	Haimberger et al. (2012) www.univie.ac.at/theoret-met/research/raobcore/
Antarctic ice mass balance (Rignot)		Remote sensing	Annual Regional average	2.3.2	1979–2017	Rignot et al. (2019)
ROCADA daily dataset Romania	1.0	In situ	Daily 0.1° × 0.1°	10.2.1	1961–2013	Dumitrescu et al. (2016)
MSG-based gridded datasets of clouds, precipitation and radiation (Roebeling and Holleman)		Remote sensing	Daily 0.27° × 0.27°	10.2.1	2005–2019	Roebeling and Holleman (2009)
ROM SAF radio occultation climate data record		Remote sensing	Monthly 5° latitude bins, 200 m vertical resolution	2.3.1	2001–2020	Gleisner et al. (2020) www.romsaf.org
Arctic permafrost layer temperature (Romanovsky)		In situ	Annual Site-based	2.3.2	1977–2020	Romanovsky et al. (2020)
Israel precipitation (Rostkier-Edelstein)		Reanalysis	Seasonal 0.02° × 0.02°	10.2.1	1991–2009	Rostkier-Edelstein et al. (2014)
Remote Sensing Systems (RSS) precipitation and water vapour	7	Remote sensing	2 per day 0.25° × 0.25°	2.3.1 3.3.2	1987–2020	Wentz (2013) www.remss.com/measurements/rain-rate/
Remote Sensing Systems RSS satellite temperature	4.0	Remote sensing	Monthly 2.5° × 2.5°, 5 vertical layers	2.3.1	1979–2020	Mears and Wentz (2017) www.remss.com/measurements/upper-air-temperature/
Rutgers University/NOAA snow cover extent dataset	V01r01	Remote sensing	Weekly 100–200 km	2.3.2 9.5.3	1966–2020	Estilow et al. (2015) https://climate.rutgers.edu/snowcover/
SAFRAN temperature and precipitation for France		Reanalysis	Hourly 8 km ²	10.2.1	1958–2008	Vidal et al. (2010)
SAT1 NASA satellite ozone data		Remote sensing	Daily 1° × 1°	2.2.5	2004–2020	Ziemke et al. (2019) https://acd-ext.gsfc.nasa.gov/Data_services/cloud_slice/new_data.html
SAT2 NASA satellite ozone data		Remote sensing	Daily 1° × 1°	2.2.5	2004–2020	Heue et al. (2016)
SAT3 NASA satellite ozone data		Remote sensing	Daily 1° × 1°	2.2.5	2004–2020	Leventidou et al. (2018)
Scripps atmospheric CO ₂ data		In situ	Weekly Point-based	1.2.1 2.2.3 5.2.1	1958–2019	Keeling et al. (2001, 2005) http://scrippsco2.ucsd.edu/data/atmospheric_co2/
SeaWiFS FAPAR Data	V2010.0	Remote sensing	Monthly 1 km	2.3.4	1998–2017	Gobron (2018) https://fapar.jrc.ec.europa.eu/Home.php
Norwegian seNorge2 precipitation	2.0	In situ	Daily 0.008° × 0.008°	10.2.1	1957–2019	Lussana et al. (2018)
Merged Precipitation in China (Shen)		In situ	Hourly 0.01° × 0.01°	10.2.1	2015	Shen et al. (2018)
The Surface Ocean CO ₂ Atlas (SOCAT)	6	In situ	Point-based	5.2.1	1957–2020	Bakker et al. (2016) www.socat.info/
Southern Oscillation Index (SOI)		In situ	Monthly Regional time series	2.4.2	1876–2020	Troup (1965) www.bom.gov.au/climate/current/soihtm1.shtml
Spain02	5.0	In situ	Daily 0.1° × 0.1°	10.2.1	1948–2002	Herrera et al. (2016)

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Arosa stratospheric ozone data (Staehelin)		In situ	Time resolution varies Point-based	2.2.5	1926–2020	Staehelin et al. (2018)
STAMMEX		In situ	Daily 0.1°, 0.25° and 0.5°	8.3.1	1931–2000	Zolina et al. (2014)
State University of New York (SUNY) radiosonde dataset		In situ	Monthly 10° × 10°	2.3.1	1958–2020	Zhou et al. (2021)
Stratospheric Water and Ozone Satellite Homogenized (SWOOSH)	2.5	Remote sensing	Monthly 2.5° zonal mean, 12 vertical levels	2.2.5	1984–2020	Davis et al. (2016) https://data.nodc.noaa.gov/cgi-bin/iso?id=gov.noaa.ncdc:C00958
Tibetan plateau growing season		In situ	Annual Point-based	2.3.4	1960–2014	B. Yang et al. (2017)
Merged TM4NO2A tropospheric NO ₂ dataset		Remote sensing	Monthly 0.25°	6.3.3	1996–2016	Georgoulias et al. (2019) www.temis.nl/airpollution/no2.php
Tropospheric Ozone Assessment Report (TOAR) surface ozone database		In situ	Hourly Point-based	6.3.2	1970–2020	Schultz et al. (2017); Tarasick et al. (2019) www.igacproject.org/activities/TOAR
Tohoku Univ. N ₂ O, d ¹⁵ N, ¹⁵ Na	2018	In situ	Irregular	5.2.3	1950–2000	Ishijima et al. (2007)
TOST composite ozonesonde product		In situ	Monthly 5° × 5° × 1 km	2.2.5 6.3.2	1965–2012	Tarasick et al. (2010); Liu et al. (2013); Gaudel et al. (2018)
TRMM Precipitation Radar 3A25	7	Remote sensing	Monthly 0.5°	8.3.1	1997–2014	Iguchi et al. (2000)
TRMM GPOF	GPOF	Remote sensing	Daily 0.25° × 0.25°	8.3.1	1997–2015	Stocker et al. (2018)
TRMM Microwave Imager (TRMM TMI)	TMI	Remote sensing	3 day 0.25° × 0.25°	8.3.1	1997–2015	Wentz et al. (2001)
TRMM Multi-Satellite Precipitation Analysis	7.0	Remote sensing	3-hourly 0.25° × 0.25°	10.2.1	1997–2018	Huffman et al. (2007); TRMM (2011); Z. Liu et al. (2012) https://disc.gsfc.nasa.gov/datasets/TRMM_3B42_7/summary
Tropical Rainfall Measuring Mission Precipitation Radar (TRMM PR)	PR	Remote sensing	Monthly 0.5° × 0.5°	8.3.1	1997–2015	Haddad et al. (1997)
TWIN (Taipei)		In situ	Hourly	Box 10.3	2004–2020	Chang et al. (2010)
University of Alabama at Huntsville (UAH) satellite temperature	6.0	Remote sensing	Monthly 3 vertical layers	2.3.1	1979–2020	Spencer et al. (2017) www.nsstc.uah.edu/climate/
UC Berkeley, N ₂ O, d ¹⁵ N, ¹⁵ Na	2018	In situ	Event	5.2.3	1900–1995	Park et al. (2012)
University of Colorado global mean sea level		Remote sensing	Monthly Global time series	2.3.3	1993–2017	Nerem et al. (2018)
UCAR/ NOAA radio occultation data		Remote sensing	Monthly 5° latitude bands	2.3.1	2002–2020	Steiner et al. (2020)
University of California at Irvine (UCI) atmospheric gas measurements		In situ	Several sampling periods per year Point-based	2.2.3	1984–2020	Simpson et al. (2012) http://cdiac.ornl.gov/tracegases.html
UEA-SI air-sea CO ₂ fluxes	2015	In situ	Monthly 2.5° × 2.5°	5.2.1	1985–2011	Jones et al. (2015) doi:10.1594/PANGAEA.849262
UHH sea ice product		In situ, remote sensing	Monthly Area average	2.3.2	1850–2020	Doerr et al. (2021) www.fdr.uni-hamburg.de/record/8559#.YEtN09xxXIU doi:10.25592/uhhfdm.8525
UrBAN (Helsinki)		In situ	Sub-hourly	Box 10.3	2004–2020	Wood et al. (2013) http://urban.fmi.fi
Global temperature dataset (Vaccaro)		In situ	Monthly 5° × 5°	2.3.1	1850–2020	Vaccaro et al. (2021)

Name	Version	Type	Resolution (Time and Space)	Section(s)	Time Period	Citation, Link and DOI (Where Available)
W5E5 bias-adjusted reanalysis	1.0	Reanalysis	Daily 0.5° × 0.5°	Atlas	1979–2016	Lange (2019) https://dataservices.gfz-potsdam.de/pik/showshort.php?id=escidoc:4855898 doi:10.5880/pik.2019.023
Sea ice data (Walsh)		Remote sensing, in situ	Monthly	2.3.2	1850–2020	Walsh et al. (2017)
WASWind marine wind data		In situ	Monthly 4° × 4°	2.4.4	1950–2011	Tokinaga and Xie (2011) https://climatedataguide.ucar.edu/climate-data/waswind-wave-and-anemometer-based-sea-surface-wind
WCRP/Palmer global sea level		Remote sensing, in situ	Monthly Global time series	2.3.3	1901–2018	WCRP Global Sea Level Budget Group (2018); Palmer et al. (2021)
Wegener Centre radio occultation dataset		Remote sensing	Monthly 0.1 km vertical resolution	2.3.1	2001–2020	Angerer et al. (2017)
Global mean sea level reconstruction (Wenzel and Schröter)		In situ	Monthly Global time series	2.3.3	1900–2009	Wenzel and Schröter (2014)
WFDE5	1.0	Reanalysis	Hourly 0.5°	10.3.3	1979–2018	Cucchi et al. (2020)
WMO Global Atmosphere Watch greenhouse gas measurements		In situ	Annual Point-based and global means	2.2.3	1984–2020	Tsutsumi et al. (2009); WMO (2019) https://gaw.kishou.go.jp/publications/global_mean_mole_fractions
World Ocean Atlas (WOA)	2018	In situ	Monthly 1° × 1°	3.5.1	2009	Levitus et al. (2012); Locarnini et al. (2019); Zweng et al. (2019) www.nodc.noaa.gov/OC5/woa18/woa18data.html
World Ozone and UV Data Center (WOUDC) ozone dataset		In situ	Monthly Global and zonal means	2.2.5	1964–2020	Fioletov et al. (2002) https://woudc.org/
Global Earth Observation for Integrated Water Resource Assessment (Earth2Observe) Water Resources Reanalysis v2 (WRR2)	2	Reanalysis	Monthly 0.5° × 0.5°	8.3.1	1979–2012	Schellekens et al. (2017)
Brazil gridded met data 1980–2013 (Xavier)		In situ	Daily 0.25° × 0.25°	10.2.1	1980–2013	Xavier et al. (2016) http://careyking.com/data-downloads/
Chile precipitation (Yang)		In situ	Daily 0.04° × 0.04°	10.2.1	2009–2014	Z. Yang et al. (2017) www.climatedatalibrary.cl/SOURCES/
Ocean heat content and thermocline sea level reconstruction (Zanna)		In situ	Annual Global means	2.3.3	1871–2017	Zanna et al. (2019)

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