AR6 WGI Report – List of corrigenda to be implemented

The corrigenda listed below will be implemented in the Chapter during copy-editing.

CHAPTER 2 SUPPLEMENTARY MATERIAL

Document (Chapter, Annex, Supp. Mat…)	Section	Page :Line (based on the final pdf FGD version)	Detailed info on correction to make
Chapter 2SM			Update the Data Table in each chapter Supplementary Material with omitted data citations for climate model data.
Chapter 2 SM	Author list	Page 1 Line 30	Replace "Hong Kong" with "Hong Kong, China"
Chapter 2 SM	2.SM.1	2.SM-3:-	In Table 2.SM.1: Row 1, Column 1: "**Figure number / Table number / Chapter section (for calculations)**" replace with **"Figure / Table number"**
Chapter 2 SM	2.SM.1	2.SM-3:-	In Table 2.SM.1: Row 2, Column 9: Add "Converted to GMST based on equations in Hansen et al. (2013)"
Chapter 2 SM	2.SM.1	2.SM-3:-	In Table 2.SM.1: Row 2, Column 6: Delete "Converted to GMST based on equations in Hansen et al. (2013)"
Chapter 2 SM	2.SM.1	2.SM-5:-	In Table 2.SM.1: Row 7, Column 7: Delete "zenodo"
Chapter 2 SM	2.SM.1	2.SM-6:-	In Table 2.SM.1: Row 2, Column 7: Delete "zenodo"
Chapter 2 SM	2.SM.1	2.SM-6:-	In Table 2.SM.1: Row 3, Column 7: Delete "zenodo"
Chapter 2 SM	2.SM.1	2.SM-13:-	In Table 2.SM.1: Row 4, Column 7: Delete "https://zenodo.org/xxxx"
Chapter 2 SM	2.SM.1	2.SM-13:-	In Table 2.SM.1: Row 4, Column 6: Add "https://gml.noaa.gov/ccgg/trends/global.html"
Chapter 2 SM	2.SM.1	2.SM-14:-	In Table 2.SM.1: Row 1, Column 7: Delete "zenodo"
Chapter 2 SM	2.SM.1	2.SM-14:-	In Table 2.SM.1: Row 2, Column 7: Delete "zenodo"
Chapter 2 SM	2.SM.1	2.SM-14:-	In Table 2.SM.1: Row 3, Column 7: Delete "zenodo"
Chapter 2 SM	2.SM.1	2.SM-14:-	In Table 2.SM.1: Row 4, Column 7: Delete "zenodo"
Chapter 2 SM	2.SM.1	2.SM-14:-	In Table 2.SM.1: Row 5, Column 7: Delete "zenodo"
Chapter 2 SM	2.SM.1	2.SM-14:-	In Table 2.SM.1: Row 6, Column 7: Delete "zenodo"
Chapter 2 SM	2.SM.1	2.SM-15:-	In Table 2.SM.1: Row 1, Column 8: Add "Engel, et al (2018), Global Ozone Research and Monitoring Project–Report No. 58, World Meteorological Organization, Geneva, Switzerland, 2018."
Chapter 2 SM	2.SM.1	2.SM-15:-	In Table 2.SM.1: Row 1, Column 7: Delete "zenodo"
Chapter 2 SM	2.SM.1	2.SM-16:-	In Table 2.SM.1: Row 3, Column 7: Add "https://gml.noaa.gov/ccgg/trends/global.html"

Chapter 2 SM	2.SM.1	2.SM-18:-	In Table 2.SM.1: Row 3, Column 8: Add "Weber et al. 2018 ; Weber et al. 2020"
Chapter 2 SM	2.SM.1	2.SM-18:-	In Table 2.SM.1: Row 5, Column 8: Add "Solar Backscatter Ultraviolet Radiometer (SBUV) NOAA Cohesive data record (COH) v8.6 "
Chapter 2 SM	2.SM.1	2.SM-18:-	In Table 2.SM.1: Row 6, Column 8: Add "Solar Backscatter Ultraviolet Radiometer (SBUV) NASA Merged Ozone Data Set (MOD) v8.6 (release 6): updated from: Frith, S. M., N. A. Kramarova, R. S. Stolarski, R. D. McPeters, P. K. Bhartia, and G. J. Labow (2014), Recent changes in total column ozone based on the SBUV Version 8.6 Merged Ozone Data Set, J. Geophys. Res. Atmos., 119, 9735-9751, doi:10.1002/2014JD021889."
Chapter 2 SM	2.SM.1	2.SM-18:-	In Table 2.SM.1: Row 7, Column 8: Add "WOUDC data: updated from: Fioletov et al. 2002; JGR, Global and zonal total ozone variations estimated from ground-based and satellite measurements: 1964–2000. Fioletov, V. E., G. E. Bodeker, A. J. Miller, R. D. McPeters, and R. Stolarski, 2002: Global and zonal total ozone variations estimated from ground-based and satellite measurements: 1964–2000. J. Geophys. Res., 107, 4647, https://doi.org/10.1029/2001JD001350"
Chapter 2 SM	2.SM.1	2.SM-19:-	In Table 2.SM.1: Row 2, Column 7: Add "https://join.fz-juelich.de/ https://gml.noaa.gov/aftp/data/ozwv/SurfaceOzone/Historical/"
Chapter 2 SM	2.SM.1	2.SM-20:-	In Table 2.SM.1: Row 2, Column 7: Add "https://climate.esa.int/en/projects/ozone/ http://www.iup.uni-bremen.de/UVSAT/datasets/tropospheric-ozone-ccd "
Chapter 2 SM	2.SM.1	2.SM-21:-	In Table 2.SM.1: Row 1, Column 6: Delete "Will be available through the code uploaded onto DMS "
Chapter 2 SM	2.SM.1	2.SM-21:-	In Table 2.SM.1: Row 2, Column 6: Delete "Will be available through the code uploaded onto DMS "
Chapter 2 SM	2.SM.1	2.SM-21:-	In Table 2.SM.1: Row 3, Column 6: Delete "Will be available through the code uploaded onto DMS "
Chapter 2 SM	2.SM.1	2.SM-21:-	In Table 2.SM.1: Row 4, Column 6: Delete "Will be available through the code uploaded onto DMS "
Chapter 2 SM	2.SM.1	2.SM-21:-	In Table 2.SM.1: Row 5, Column 6: Delete "Will be available through the code uploaded onto DMS "
Chapter 2 SM	2.SM.1	2.SM-22:-	In Table 2.SM.1: Row 1, Column 6: Delete "Will be available through the code uploaded onto DMS "
Chapter 2 SM	2.SM.1	2.SM-26:-	In Table 2.SM.1: Row 5, Column 7: Delete "None as yet. Once public, will appear through: "
Chapter 2 SM	2.SM.1	2.SM-26:-	In Table 2.SM.1: Row 5, Column 8: Add "Morice et al. (2021)"
Chapter 2 SM	2.SM.1	2.SM-26:-	In Table 2.SM.1: Row 6, Column 8: Add "Vose et al. (2021)"
Chapter 2 SM	2.SM.1	2.SM-26:-	In Table 2.SM.1: Row 7, Column 8: Add "Rohde and Hausfather (2020)"
Chapter 2 SM	2.SM.1	2.SM-26:-	In Table 2.SM.1: Row 6, Column 8: "ftp://ftp.ncdc.noaa.gov/pub /data/cmb/ersst/v5/2020.gr I.dat/interim/ (expected to be superseded)" replace with "https://www.ncei.noaa.gov/pub/data/cmb/ersst/v5/2020.grl.dat/ "
Chapter 2 SM	2.SM.1	2.SM-27:-	In Table 2.SM.1: Row 3, Column 8: Add "Morice et al. (2021)"

Chapter 2 SM	2.SM.1	2.SM-27:-	In Table 2.SM.1: Row 4, Column 8: Add "Vose et al. (2021)"
Chapter 2 SM	2.SM.1	2.SM-27:-	In Table 2.SM.1: Row 5, Column 8: Add "Rohde and Hausfather (2020)"
Chapter 2 SM	2.SM.1	2.SM-27:-	In Table 2.SM.1: Row 4, Column 8: "ftp://ftp.ncdc.noaa.gov/pub /data/cmb/ersst/v5/2020.gr l.dat/interim/ (expected to be superseded)" replace with "https://www.ncei.noaa.gov/pub/data/cmb/ersst/v5/2020.grl.dat/ "
Chapter 2 SM	2.SM.1	2.SM-30:-	In Table 2.SM.1: Row 4, Column 7: Add "ftp://aspen.atmos.albany.edu/data/UA-HRD/"
Chapter 2 SM	2.SM.1	2.SM-31:-	In Table 2.SM.1: Row 5, Column 5: Add "https://www.romsaf.org/licence.php"
Chapter 2 SM	2.SM.1	2.SM-42:-	In Table 2.SM.1: Row 2, Column 7: Add "**doi:10.1029/2007JC004252**"
Chapter 2 SM	2.SM.1	2.SM-42:-	In Table 2.SM.1: Row 3, Column 7: Add "**doi:10.1029/2009JC005312**"
Chapter 2 SM	2.SM.1	2.SM-42:-	In Table 2.SM.1: Row 5, Column 6: Add "**doi:10.3189/172756411795931778 doi:10.1029/2010GL042652 doi:10.1029/2008GL034457**"
Chapter 2 SM	2.SM.1	2.SM-43:-	In Table 2.SM.1: Row 3, Column 7: Add "**doi:10.1016/j.quascirev.2016.04.008**"
Chapter 2 SM	2.SM.1	2.SM-44:-	In Table 2.SM.1: Row 2, Column 7: Add "**doi:10.1038/s41586-019-1071-0 doi:10.5194/tc-14-1043-2020**"
Chapter 2 SM	2.SM.1	2.SM-44:-	In Table 2.SM.1: Row 4, Column 2: "Special Report on the Ocean and Cryosphere in a Changing Climate (SROCC)" replace with "Global glacier ice mass change"
Chapter 2 SM	2.SM.1	2.SM-44:-	In Table 2.SM.1: Row 4, Column 7: Add "https://www.ipcc.ch/srocc/"
Chapter 2 SM	2.SM.1	2.SM-44:-	In Table 2.SM.1: Row 4, Column 8: "SROCC" replace with "IPCC (2019), IPCC Special Report on the Ocean and Cryosphere in a Changing Climate"
Chapter 2 SM	2.SM.1	2.SM-44:-	In Table 2.SM.1: Row 5, Column 7: Add "**DOI: 10.1038/s41586-021-03436-z**"
Chapter 2 SM	2.SM.1	2.SM-45:-	In Table 2.SM.1: Row 4, Column 8: Add "Blazquez et al. (2018)"
Chapter 2 SM	2.SM.1	2.SM-45:-	In Table 2.SM.1: Row 4, Column 7: Add "doi: 10.1093/gji/"
Chapter 2 SM	2.SM.1	2.SM-46:-	In Table 2.SM.1: Row 2, Column 8: Add "King B.A.; McDonagh E.; Desbruyeres D.(2021)."
Chapter 2 SM	2.SM.1	2.SM-46:-	In Table 2.SM.1: Row 3, Column 8: Add "Cabanes, C., A. Gourazel, K. von Schuckmann, M. Hamon, G. Reverdin, C. Coatanoan, F. Gaillard, S. Pouliquen, P.-Y. Le Traon, 2012."
Chapter 2 SM	2.SM.1	2.SM-46:-	In Table 2.SM.1: Row 5, Column 8: Add "http://apdrc.soest.hawaii.edu/projects/Argo/data/Documentation/gridded-var.pdf"
Chapter 2 SM	2.SM.1	2.SM-46:-	In Table 2.SM.1: Row 5, Column 4: Add "global_ohc_iprc_20052018_0-2000m_lat60-60_potential_ZJ.nc"
Chapter 2 SM	2.SM.1	2.SM-47:-	In Table 2.SM.1: Row 2, Column 4: Add "global_ohc_jamstec_20052018_0-2000m_lat60-60_ZJ_potential.nc"
Chapter 2 SM	2.SM.1	2.SM-47:-	In Table 2.SM.1: Row 3, Column 4: Add "global_ohc_scripps_20052018_0-2000m_lat60-60_ZJ.nc"
Chapter 2 SM	2.SM.1	2.SM-47:-	In Table 2.SM.1: Row 3, Column 8: Add "Argo (2020). Argo float data and metadata from Global Data Assembly Centre (Argo GDAC) - Snapshot of Argo GDAC of August 10st 2020. SEANOE. https://doi.org/10.17882/42182#76230"
Chapter 2 SM	2.SM.1	2.SM-49:-	In Table 2.SM.1: Row 5, Column 8: Add "Su, H.; Zhang, H.; Geng, X.; Qin, T.; Lu, W.; Yan, X.-H. OPEN: A New Estimation of Global Ocean Heat Content for Upper 2000 Meters from Remote Sensing Data. Remote Sens. 2020, 12, 2294. https://doi.org/10.3390/rs12142294"
Chapter 2 SM	2.SM.1	2.SM-50:-	In Table 2.SM.1: Row 8, Column 7: Add "https://cchdo.ucsd.edu/search?q=cf_netcdf"
Chapter 2 SM	2.SM.1	2.SM-53:-	In Table 2.SM.1: Row 3, Column 8: Add "https://www.aviso.altimetry.fr/fileadmin/ documents/data/products/indic/msl/MSL_reprocessing_201402.pdf"

Chapter 2 SM	2.SM.1	2.SM-53:-	In Table 2.SM.1: Row 5, Column 8: Add “Watson, C., White, N., Church, J. et al. Unabated global mean sea-level rise over the satellite altimeter era. Nature Clim Change 5, 565–568 (2015). https://doi.org/10.1038/nclimate2635 Church, J. A. and N.J. White (2011), Sea-level rise from the late 19th to the early 21st Century. Surveys in Geophysics, doi:10.1007/s10712-011-9119-1“
Chapter 2 SM	2.SM.1	2.SM-55:-	In Table 2.SM.1: Row 4, Column 7: Add “https://doi.org/10.1038/s41467-020-17887-x https://doi.org/10.1594/PANGAEA.904186 “
Chapter 2 SM	2.SM.1	2.SM-55:-	In Table 2.SM.1: Row 5, Column 7: Add “https://doi.org/10.1594/PANGAEA.904186“
Chapter 2 SM	2.SM.1	2.SM-56:-	In Table 2.SM.1: Row 2, Column 7: Add “https://doi.org/10.1594/PANGAEA.901229“
Chapter 2 SM	2.SM.1	2.SM-60:-	In Table 2.SM.1: Row 2, Column 4: “Figure 7.17k” replace with “Figure 7.13k”
Chapter 2 SM	2.SM.1	2.SM-60:-	In Table 2.SM.1: Row 3, Column 4: “Figure 7.17b” replace with “Figure 7.13b”
Chapter 2 SM	2.SM.1	All Table 2.SM.12	Delete “Archive link will be made available”

Chapter 2: Changing state of the climate system - Supplementary Material

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Date: August 2021

This document is subject to copy-editing, corrigenda and trickle backs.

2.SM.1 Data Table

[START TABLE 2.SM.1 HERE]

Table 2.SM.1: Input Data Table. Input datasets and code used to create chapter figures.

Figure number / Table number / Chapter section (for calculations)	Dataset / Codename	Type	Filename / Specificities	License type	Dataset / Code citation	Dataset / Code URL	Related publication / Software used	Notes
CCB2.1 Figure 1	Hansen – Cenozoic (60 to 0.02 Ma GMST reconstruction from benthic marine isotope stack	Input dataset		CC0 for metadata CC-BY for data	Converted to GMST based on equations in Hansen et al. (2013)	http://www.columbia.edu/~mhs119/Sensitivity+SL+CO2/Table.txt (accessed 3/27/2021)	Hansen et al. (2013); isotope dataset from Zachos et al. (2008)	Added 0.36°C to adjust GMST estimated for 1961-1900 to 1850-1900.
	Westerhold – Cenozoic (60 to 0.02 Ma) GMST reconstruction from benthic marine isotope splice, binned & interpolated (CENOGRID)	Input dataset	https://doi.pangaea.de/10.1594/PANGAEA.917717?format=html#mcol6_ds13915407; 2000-year-binned dataset	CC0 for metadata CC-BY for data	Converted to GMST based on equations in Hansen et al. (2013)	https://doi.org/10.1594/PANGAEA.917717 (accessed 1/11/2020)	Westerhold et al. (2020)	Added 0.36°C to adjust GMST estimated for 1961-1900 to 1850-1900.
	Snyder – Pleistocene (1 to 0.02 Ma) GMST reconstruction from sea surface temperature stack	Input dataset	https://www.nature.com/articles/nature19798" https://www.nature.com/articles/nature19798 (Supplementary Data)			https://static-content.springer.com/esm/art%3A10.1038%2Fnature19798/MediaObjects/41586_2016_BFnature19798_MOESM258_ESM.xlsx	Snyder (2016)	

	Shakun – 20 to 12 ka global mean surface temperature reconstruction	Input dataset	https://www.nature.com/articles/nature10915#Sec14 (Supplementary Data, Temperature Stacks tab)				Shakun et al. (2012)	Added 0.24°C to splice temperature at 12 ka to Holocene temperature reconstruction.
	Kaufman – Holocene global mean surface temperature reconstruction (Temp12k multi-method)	Input dataset	https://www.ncei.noaa.gov/pub/data/paleo/reconstructions/kaufman2020/temp12k_allmethods_percentiles.csv			https://www.ncdc.noaa.gov/paleo/study/29712 (accessed 1/11/2020)	Kaufman et al., (2020a; 2020b)	Median ensemble reconstruction.
	1850 to 2020 global mean surface temperature (AR6 assessed mean)	Same as Figure 2.11c						
Figure 2.2a	Total Solar Irradiance (TSI) reconstruction PMIP4 SATRIRE-M solar forcing data	Input dataset	SSI_14C_cycle_yearly_cmip_v20160613_fc.nc			https://pmip4.lsce.ipsl.fr/doku.php/data:solar_satire (accessed 7 December 2020)	Jungclaus et al. (2017)	The right axis is the ERF derived on the basis of TSI as in Section 7.3.4.4.

Figure 2.2a, b	Total Solar Irradiance (TSI) reconstruction CMIP6 solar forcing data	Input dataset	solarforcing-ref-mon_input4MIPs_solar_CMIP_SOLARIS-HEPPA-3-2_gn_18500101-22991231.nc			https://solarisheppa.geomar.de/cmip6 (accessed 7 December 2020)	Matthes et al. (2017)	
Figure 2.2b	Total Solar Irradiance (TSI) time series CMIP5 solar forcing data	Input dataset	TSI_WLS_mon_1882_2008.txt			http://solarisheppa.geomar.de/cmip5 (accessed 7 December 2020)	Lean (2000); Wang et al. (2005)	TSI by definition includes the UV range, 200-400 nm, contributing particularly strongly to the TSI changes
	Total Solar Irradiance (TSI) time series	Input dataset	TSI_Composite.txt			https://spot.colorado.edu/~koppg/TSI/ (accessed 7 December 2020)	Dudok de Wit et al. (2017) .	
Figure 2.2c	Reconstructed volcanic stratospheric sulfur injections and aerosol optical depth, 500 BCE to 1900 CE, version 3. World Data Center for Climate (WDCC) at DKRZ	Input dataset	eVolv2k_v3_ds_1.nc	**CC BY-NC-SA 2.0 DE**	Toohey and Sigl (2019)	https://cera-www.dkrz.de/WDCC/ui/cerasearch/entry?acronym=eVolv2k_v3 (accessed 7 December 2020)	Toohey and Sigl (2017)	
Figure 2.2c, d	Stratospheric Aerosol Optical Depth (SAOD)	Input dataset	CMIP_1850_2014_extinction_550nm_strat_only_v3.nc			ftp://iacftp.ethz.ch/pub_read/luo/CMIP6/ (accessed 7 December 2020)	Luo (2018)	See unit bars for a visual guide as to scale mismatch. TSI values refer to changes in solar radiation and do not account for the spherical Earth.
Figure 2.2d	Stratospheric Aerosol Optical Depth (SAOD)	Input dataset	tau.map_2012.12.txt			https://data.giss.nasa.gov/modelforce/strataer/ (accessed 7 December 2020)	Sato et al. (1993); Luo (2018)	
Table 2.1	Atmospheric CO_2 during 1995-2014	Input dataset	Refer to file in zenodo			zenodo	NOAA, references in Annex 5	The uncertainty of CO_2 in 1995 and 2014 is assumed the same as that of 2019.

								To estimate centennial rate of change, the CO_2 data are extrapolated using the mean rate of change during 1995 to 2014.
	Atmospheric CO_2 during 1850-1900	Input dataset	Refer to file in zenodo			zenodo	Ahn et al., (2012); Bauska et al., (2015); MacFarling Meure et al., (2006); Siegenthaler et al., (2005); Annex 5; Meinshausen et al. (2017)	
	Atmospheric CO_2 during 1850-1900 (CMIP6)	Input dataset				zenodo	Meinshausen et al. (2017)	
	Atmospheric CO_2 during the last millennium (1000-1750)	Input dataset	Fig2.4_data_Feb_2021			https://www.ncdc.noaa.gov/paleo/study/18316 ; https://data.csiro.au/collections/collection/CIcsiro:37077v1; https://www.ncdc.noaa.gov/paleo-search/study/2488	Ahn et al. (2012); Rubino et al. (2019); Siegenthaler et al. (2005)	Rate of CO2 concentration change (ppm/century) was estimated from 100-year running mean average for each ice core record
	Atmospheric CO_2 during MH	Input dataset	Ice core CO2.xls			https://www.ncdc.noaa.gov/paleo/study/17975	Monnin et al. (2004)	CO_2 is averaged during the given time period
	Atmospheric CO_2 during LDT	Input dataset	Ice core CO2.xls			https://www.ncdc.noaa.gov/paleo-search/study/18636 ; https://www.ncdc.noaa.gov/paleo-search/study/17975	Bereiter et al. (2015); Marcott et al. (2014)	rate of CO2 concentration change (ppm/century) was estimated from 100-year running mean average for each ice core record

	Atmospheric CO_2 during LGM	Input dataset	Ice core CO2.xls		(Ahn & Brook, 2014) Schmitt et al. (2012a)	https://www.ncdc.noaa.gov/paleo-search/study/18636 ; https://www.ncdc.noaa.gov/paleo-search/study/17975 ; https://www.ncdc.noaa.gov/paleo/study/6178	Bereiter et al. (2015); Ahn & Brook (2008); Ahn et al. (2014); Marcott et al. (2014); Schmitt et al. (2012b)	CO_2 is averaged during the given time period
	Atmospheric CO_2 during LIG	Input dataset	Ice core CO2.xls		Schneider et al. (2013a) Köhler et al. (2017)	https://www.ncdc.noaa.gov/paleo-search/study/17975	Petit et al. (1999); Schneider et al. (2013b); Lourantou et al. (2010)	CO_2 is averaged during the given time period
	Atmospheric CO_2 during MPWP (KM5c)	Input dataset				http://www.pangaea.de/ https://paleo-co2.org/		
	Atmospheric CO_2 during EECO	Input dataset				http://www.pangaea.de/ https://paleo-co2.org/		
	Atmospheric CO_2 during PETM	Input dataset				http://www.pangaea.de/ https://paleo-co2.org/		To calculate the average rate of CO2 change across the PETM a Monte Carlo approach was used to fully propagate the uncertainty in age and CO2 estimates. A normal distribution for the uncertainty on the CO2 estimates across the PETM from Anagnostou et al. (2020) was assumed, whereas for the onset duration a uniform

								probability was assumed from 3-20 kyr.
Figure 2.3a	Atmospheric CO_2 0 to 22.6 myrs estimated from $\delta^{11}B$ Planktic Foraminifera (the Planktic-HO-SI-LE option of Sosdian et al. 2018)	Input dataset	Sosdian.txt	CC BY 4.0 (Sosdian et al., 2018); CC BY-NC-ND (Chalk et al., 2017); Free access (Bartoli et al., 2011)	(Bartoli et al., 2011; Martínez-Botí et al., 2015)		Sosdian et al. (2018) plus recalculations of: Hönisch et al. (2009) ; Chalk et al. (2017) ; Bartoli et al. (2011) ; Martinez-Boti et al. (2015)	See note below regarding the quality of the Plio-Pleistocene data in this dataset.
	Atmospheric CO_2 from 33 to 56.3 myr estimated from $\delta^{11}B$ Planktic Foraminifera	Input dataset	Anagnostou.txt	CC BY 4.0 (Anagnostou et al., 2020)	(Anagnostou et al., 2016; 2020; Gutjahr et al., 2017; Pearson et al., 2009)		Anagnostou et al. (2020) plus recalculations of : Pearson et al. (2009); Anagnostou et al. (2016); Gutjahr et al. (2017); Harper et al. (2020); Henehan et al. (2020) ; Penman et al. (2014)	
	Atmospheric CO_2 from 0 to 450 myr estimated from $\delta^{13}C$ of Phytane	Input dataset	wit.txt	CC BY-NC 4.0		https://advances.sciencemag.org/content/suppl/2018/11/26/4.11.eaat4556.DC1	Witkowski et al. (2018)	
	Atmospheric CO_2 estimated Alkenone $\delta^{13}C$	Input dataset	Akenonecompilation.txt				Stoll et al. (2019) ; Pagani et al. (2005, 2011); Zhang et al. (2013)	For <22.9 Ma the data CO_2 is calculated using the model of Stoll et al. (2019), for >22.9 Ma a diffusive model is used as outlined in Pagani et al. (2005). Following Rae et al. (2021), the $\delta^{13}C$ alkenone based CO_2 estimates of Stoll et al. (2019) are used for

								<23 Ma in preference to those of Super et al. (2018) and Pagani et al. (2010) due to the more accurate model applied by Stoll et al. (2019) to account for non-diffusive CO_2 uptake by alkenone producing coccolithophorids at low CO_2.
	Atmospheric CO_2 over the last 450 million years estimated using $\delta^{13}C$ in palaeosol CaCO3 and plant stomata	Input dataset	PhanCO2F.txt	CC BY 4.0	(Foster et al., 2017)		Foster et al. (2017)	
	Smoothed fit through all the above data	Input dataset	PhanCO2sm.exp.txt					Smoothed fit through all the above data using the methods described in Foster et al. (2017).
Figure 2.3b	Atmospheric CO_2 estimated Alkenone $\delta^{13}C$	Input dataset	Akenone compilation.txt				Stoll et al. (2019) ; Pagani et al. (2005, 2011); Zhang et al. (2013)	For <22.9 Ma the data CO_2 is calculated using the model of Stoll et al. (2019), for >22.9 Ma a diffusive model is used as outlined in Pagani et al. (2005). Following Rae et al. (2021), the $\delta^{13}C$ alkenone based CO_2 estimates of Stoll et al. (2019) are used for <23 Ma in preference to those of Super et al. (2018) and Pagani et al. (2010) due to the

								more accurate model applied by Stoll et al. (2019) to account for non-diffusive CO_2 uptake by alkenone producing coccolithophorids at low CO_2.
	Atmospheric CO_2 0 to 22.6 myrs estimated from $\delta^{11}B$ Planktic Foraminifera (the Planktic-HO-SI-LE option of Sosdian et al. 2018)	Input dataset	Sosdian.txt	CC BY 4.0 (Sosdian et al., 2018); CC BY-NC-ND (Chalk et al., 2017); Free access (Bartoli et al., 2011)	(Bartoli et al., 2011; Martínez-Botí et al., 2015)		Sosdian et al. (2018) plus recalculations of: Hönisch et al. (2009) ; Chalk et al. (2017) ; Bartoli et al. (2011) ; Martinez-Boti et al. (2015)	
	Atmospheric CO_2 from 33 to 56.3 myr estimated from $\delta^{11}B$ Planktic Foraminifera	Input dataset	Anagnostou.txt	CC BY 4.0 (Anagnostou et al., 2020) (Henehan et al., 2020)	(Anagnostou et al., 2016; 2020; Gutjahr et al., 2017; Henehan et al., 2020; Pearson et al., 2009)		Anagnostou et al. (2020) plus recalculations of : Pearson et al. (2009); Anagnostou et al. (2016); Gutjahr et al. (2017); Harper et al. (2020); Henehan et al. (2020)	
	Atmospheric CO_2 from 0 to 450 myr estimated from $\delta^{13}C$ of Phytane	Input dataset	wit.txt	CC BY-NC 4.0		https://advances.sciencemag.org/content/suppl/2018/11/26/4.11.eaat4556.DC1	Witkowski et al. (2018)	
Figure 2.3c	Atmospheric CO_2 estimated Alkenone $\delta^{13}C$	Input dataset	Akenone compilation.txt				Stoll et al. (2019) ; Pagani et al. (2005, 2011); Zhang et al. (2013)	For <22.9 Ma the data CO_2 is calculated using the model of Stoll et al. (2019), for >22.9 Ma a diffusive model is used as outlined in Pagani et al. (2005).

								Following Rae et al. (2021), the $\delta^{13}C$ alkenone based CO_2 estimates of Stoll et al. (2019) are used for <23 Ma in preference to those of Super et al. (2018) and Pagani et al. (2010) due to the more accurate model applied by Stoll et al. (2019) to account for non-diffusive CO_2 uptake by alkenone producing coccolithophorids at low CO_2.
	Antarctic Ice Core CO_2 from various sources	Input dataset	Ice_core.txt	CC BY 4.0(Siegenthaler et al., 2005)	(Bereiter et al., 2015)		Petit et al. (1999); Siegenthaler et al. (2005); Bereiter et al. (2015)	
	Atmospheric CO_2 from 0 to 3500 ka estimated from $\delta^{11}B$ Planktic Foraminifera	Input dataset	Plio_Pleisto_Final.txt	Open access (de la Vega et al. 2020)	(Bartoli et al., 2011; Dyez et al., 2018; Martínez-Botí et al., 2015)		De la Vega (2020) plus recalculation of Martinez-Boti et al. (2015) Bartoli et al. (2011) data recalculated by Sosdian et al. (2018) Other datasets as published: Chalk et al. (2017) Hönisch et al. (2009) Raitzsch et al. (2018) Dyez et al., (2018)	These data are preferred for this interval than the recalculations in Sosdian.txt because the Plio-Pleistocene data reported in Sosdian et al. (2018) are not representative due to the large uncertainties propagated in the long-term Neogene reconstruction (i.e. seawater composition; see Sosdian et al.,

								2018 for more details).
	Figure 2.3 code	Code	CO2_IPCC_colours_clear.R			https://github.com/gavinfosterd11B/IPCC-AR5-Figure-2.3		
Figure 2.4a Atmospheric CO2 concentration during the last 800,000 years	EPICA Dome C – 800KYr CO2 Data; Antarctic Ice Cores Revised 800KYr CO2 Data	Input dataset	Fig2.4_data_Nov_2020		Lüthi et al. (2008); Bereiter et al. (2015)	https://www.ncdc.noaa.gov/paleo-search/study/6091; https://www.ncdc.noaa.gov/paleo-search/study/17975	Petit et al. (1999)	
Figure 2.4a Atmospheric CO2 concentration during the glacial termination	WAIS Divide Ice Core 9-23KYrBP CO2 Data; Antarctic Ice Cores Revised 800KYr CO2 Data	Input dataset	Fig2.4_data_Nov_2020		Marcott et al. (2014); Bereiter et al. (2015)	https://www.ncdc.noaa.gov/paleo-search/study/18636; https://www.ncdc.noaa.gov/paleo-search/study/17975		
Figure 2.4a Atmospheric CH4 concentration during the last 800,000 years	EPICA Dome C – 800KYr Methane Data	Input dataset	Fig2.4_data_Nov_2020		Loulergue et al. (2008)	https://www.ncdc.noaa.gov/paleo-search/study/6093		
Figure 2.4a Atmospheric N2O concentration during the last 800,000 years	EPICA Dronning Maud Land, EPICA Dome C – 140KYr N2O Data, 800KYr N2O Data	Input dataset	Fig2.4_data_Nov_2020		Schilt et al. (2010); Köhler et al. (2017)	https://www.ncdc.noaa.gov/paleo-search/study/8615 https://doi.pangaea.de/10.1594/PANGAEA.871273		

Figure 2.4b Atmospheric CO2 concentration during the last 2,000 years	WAIS Divide Core 1,200 Year Atmospheric CO2 and CO2 Stable Isotope Data; Law Dome Ice Core 2000-Year CO2, CH4, N20 and d13C-CO2; EPICA Dronning Maud Land, EPICA South Pole – CO2 Data for the Last Millennium; West Antarctic Ice Sheet (WAIS) Ice Core WDC – 05a 1000 Year CO2 Data	Input dataset	Fig2.4_data_Nov_2020	https://confluence.csiro.au/display/daphelp/CSIRO+Data+Licence	Bauska et al. (2015); Rubino et al. (2019); Siegenthaler et al. (2005); Ahn et al. (2012)	https://www.ncdc.noaa.gov/paleo/study/18316; https://data.csiro.au/collections/collection/CIcsiro:37077v1; https://www.ncdc.noaa.gov/paleo-search/study/2488 https://www.ncdc.noaa.gov/paleo/study/12949	MacFarling Meure et al. (2006)	
Figure 2.4b Atmospheric CH4 concentration during the last 2,000 years	Law Dome Ice Core 2000-Year CO2, CH4, N2O and d13C-CO2	Input dataset	Fig2.4_data_Nov_2020	https://confluence.csiro.au/display/daphelp/CSIRO+Data+Licence	Rubino et al. (2019);	https://data.csiro.au/collections/collection/CIcsiro:37077v1	Mitchell et al. (2013)	
Figure 2.4b Atmospheric N2O concentration during the last 2,000 years	NEEM and Styx Polar Ice Cores 2,000 Year Nitrous Oxide Data; Law Dome Ice Core 2000-Year CO2, CH4, N2O and d13C-CO2; EPICA Dome C – Nitrous Oxide, CO2, and CH4 Data	Input dataset	Fig2.4_data_Nov_2020	https://confluence.csiro.au/display/daphelp/CSIRO+Data+Licence	(Flückiger et al., 1999; Rubino et al., 2019; Ryu et al., 2020)	https://www.ncdc.noaa.gov/paleo-search/study/30752; https://data.csiro.au/collections/collection/CIcsiro:37077v1 https://www.ncdc.noaa.gov/paleo/study/2457	Machida et al. (1995); Sowers (2001)	
Table 2.2	Global annual mean mixing ratios of WMGHGs: CO2/CH4 (NOAA)	Input Dataset	See Annex III			https://zenodo.org/xxxx	Updated from Conway et al. (1994); Dlugokencky et al. (1994); Masarie and Tans (2004)	Derived from measurements in the remote, unpolluted troposphere

	Global annual mean mixing ratios of WMGHGs: N2O/SF6 (NOAA)	Input Dataset	See Annex III			zenodo	Updated from Hall et al. (2011)	Derived from measurements in the remote, unpolluted troposphere
	Global annual mean mixing ratios of WMGHGs: other (NOAA)	Input Dataset	See Annex III			zenodo	Updated from Montzka et al. (2015)	Derived from measurements in the remote, unpolluted troposphere
	Global annual mean mixing ratios of WMGHGs: all (AGAGE)	Input Dataset	See Annex III			zenodo	Updated from Prinn et al. (2018); Rigby et al. (2014)	Derived from measurements in the remote, unpolluted troposphere
	Global annual mean mixing ratios of WMGHGs: CO2 (SIO)	Input Dataset	See Annex III			zenodo	Updated from Keeling et al. (2005)	Derived from measurements at Mauna Loa, Hawaii and South Pole
	Global annual mean mixing ratios of WMGHGs (UCI)	Input Dataset	See Annex III			zenodo	Updated from Simpson et al. (2012)	
	Global annual mean mixing ratios of WMGHGs (CSIRO)	Input Dataset	See Annex III			zenodo	Updated from Kirschke et al. (2013); Langenfelds et al. (2002)	
	Global annual mean mixing ratios of WMGHGs (WMO-GAW)	Input Dataset	See Annex III	Free and open access		https://gaw.kishou.go.jp/publications/global_mean_mole_fractions#content1 (accessed November 30 2020)	Updated from (WMO, 2019)	WMO global means include data from NOAA, AGAGE, CSIRO, and SIO, and may include observations subject to regional and local influence
	Global annual mean mixing ratios of WMGHGs (CMIP6)	Input Dataset	See Annex III				Updated from Meinshausen et al. (2017)	May include observations subject to regional and local influence

	CFC-114, CFC-113	Input Dataset	See Annex III			zenodo		CFC-114 is a combination of CFC-114 and an unquantified amount of the minor isomer CFC-114a. CFC-113 includes the minor isomer CFC-113a. For ERF, the 2019 CFC-114 value was adjusted by factor 0.98 to be consistent with values used in WMO (2018).
	Lifetime (except SF6, CH4, and N2O)	Input Dataset			(Witkowski et al., 2018)	https://advances.sciencemag.org/content/4/11/eaat4556/tab-figures-data	Appendix A in (WMO, 2018)	
	SF6 lifetime						(Kovács et al., 2017; E. A. Ray et al., 2017)	
	CH4 lifetime		See Chapter 6					Total atmospheric lifetime of 9.1 ±0.9 years (1 s.d.) and the perturbation residence time of 11.8±1.8 years, respectively (see 6.3.1).
	N2O liftime		See Chapter 5				(Prather et al., 2015)	N2O atmospheric lifetime is 116 ± 9 years (1 s.d.) and perturbation residence time 109 ± 10 years (see 5.2.3; Prather et al., 2015).

Figure 2.5a	CO_2 from Scripps Institution of Oceanography (SIO) based on measurements from Mauna Loa, Hawaii and South Pole	Input Dataset	See Annex III				Keeling et al. (2005)	At monthly time resolution based on measurements from Mauna Loa, Hawaii and South Pole (deseasonalised).
	CO_2 from Commonwealth Scientific and Industrial Research Organization, Aspendale, Australia (CSIRO)	Input dataset	See Annex III				Kirschke et al. (2013); Langenfelds et al. (2002)	At monthly time resolution.
	CO_2 from National Oceanic and Atmospheric Administration, Global Monitoring Laboratory (NOAA/GML)	Input dataset	See Annex III					At quasi-weekly time resolution.
Figure 2.5b	CH_4 from National Oceanic and Atmospheric Administration (NOAA)	Input dataset	See Annex III				Conway et al. (1994); Dlugokencky et al. (1994); Masarie and Tans (1995)	
	CH_4 from Advanced Global Atmospheric Gases Experiment (AGAGE)	Input dataset	See Annex III				Prinn et al. (2018); Rigby et al. (2014)	
	CH_4 from Commonwealth Scientific and Industrial Research Organization, Aspendale, Australia (CSIRO)	Input dataset	See Annex III				Kirschke et al. (2013); Langenfelds et al. (2002)	

	CH_4 from University of California, Irvine (UCI)	Input dataset	See Annex III				Simpson et al. (2012)	
Figure 2.5c	N_2O from National Oceanic and Atmospheric Administration (NOAA)	Input dataset	See Annex III				Conway et al. (1994); Dlugokencky et al. (1994); Masarie and Tans (1995)	Insufficient and noisy data prevent the calculation of accurate growth rates for N_2O prior to 1995.
	N_2O from Advanced Global Atmospheric Gases Experiment (AGAGE)	Input dataset	See Annex III				Prinn et al. (2018); Rigby et al. (2014)	
	N_2O from Commonwealth Scientific and Industrial Research Organization, Aspendale, Australia (CSIRO)	Input dataset	See Annex III				Kirschke et al. (2013); Langenfelds et al. (2002)	
Figure 2.6	Climate Model Intercomparison Project – Phase 6 (CMIP6)	Input Dataset	See Annex III				Meinshausen et al. (2017)	
	National Oceanic and Atmospheric Administration (NOAA)	Input Dataset	See Annex III				Montzka et al. (2009)	

	Advanced Global Atmospheric Gases Experiment (AGAGE)	Input Dataset	See Annex III				Prinn et al. (2018); Rigby et al. (2014)	
Figure 2.7	Multi Sensor Reanalysis (MSR-2) of total ozone	Input dataset				https://www.temis.nl/protocols/O3global.php (date accessed 24 February 2021)	Braesicke et al. (2018); Blunden (2020); Chipperfield et al. (2018); Weber et al. (2018, 2020)	The values are given in Dobson units (see glossary).
	GOME-type Total Ozone (GTO) data record GOME/SCIA/OMI	Input dataset		https://climate.esa.int/en/terms-and-conditions/		http://www.esa-ozone-cci.org/?q=node/163		
	GOME-SCIAMACHY-GOME-2A (GSG) total ozone time series	Input dataset		https://www.uni-bremen.de/en/data-privacy/disclaimer		http://www.iup.uni-bremen.de/gome/wfdoas	Weber et al. (2018, 2020),	
	Solar Backscatter Ultraviolet Radiometer (SBUV) NOAA Cohesive data record (COH) v8.6	Input dataset				ftp://ftp.cpc.ncep.noaa.gov/SBUV_CDR		
	Solar Backscatter Ultraviolet Radiometer (SBUV) NASA Merged Ozone Data Set (MOD) v8.6 (release 6)	Input dataset				http://acdb-ext.gsfc.nasa.gov/Data_services/merged		
	World Ozone and Ultraviolet Radiation Data Centre (WOUDC)	Input dataset				http://woudc.org/archive/Projects-Campaigns/ZonalMeans		

Figure 2.8a	Surface stations	Input dataset	Archive link will be made available	CC BY 4.0 (Cooper et al., 2020)	(Cooper et al., 2020)		Cooper et al. (2020); Wang et al. (2019)	High elevation surface sites are >1500 m a.s.l.
	IAGOS	Input dataset	Archive link will be made available			https://doi.org/10.25326/20	Gaudel et al. (2020); Cohen et al. (2018)	Above Europe, northeastern USA, southeastern USA, western North America, NE China, SE Asia, southern India, Persian Gulf, Malaysia / Indonesia, Gulf of Guinea and northern South America.
Figure 2.8b	IAGOS	Input dataset	Archive link will be made available			https://doi.org/10.25326/20	Gaudel et al. (2020); Cohen et al. (2018)	Mid-troposphere (700–300 hPa; about 3–9 km and 7 regions of the upper troposphere (about 10–12 km)
	Sondes	Input dataset	Archive link will be made available			ftp://aftp.cmdl.noaa.gov/data/ozwv/Ozonesonde	Chang et al. (2020)	Analysed using a similar method as the aircraft observations) above Hilo, Hawaii, which are representative of the central North Pacific region
Figure 2.8c	TOST composite ozonesonde product	Input dataset	Archive link will be made available			http://woudc.org/archive/products/ozone/vertical-ozone-profile/ozonesonde/1.0/tost/ ; https://woudc.org/archive/products/ozone/vertical-ozone-	Gaudel et al. (2018)	

						profile/ozonesonde/1.0/tost/tropospheric_column/TROPOSPHERIC_OZONE_DATA/ANNUAL/SEA_LEVEL/		
	SAT1 (TOMS, OMI/MLS)	Input dataset	Archive link will be made available			https://acd-ext.gsfc.nasa.gov/Data_services/cloud_slice/new_data.html (accessed 20 Nov 2019)	Ziemke et al. (2019)	
	SAT2 (GOME, SCIAMACHY, OMI, GOME-2A, GOME-2B)	Input dataset	Archive link will be made available				Heue et al. (2016)	
	SAT3 (GOME, SCIAMACHY, GOME-II)	Input dataset	Archive link will be made available				Leventidou et al. (2018)	
	OMI/MLS tropospheric column ozone	Input dataset	Archive link will be made available			https://acd-ext.gsfc.nasa.gov/Data_services/cloud_slice/new_data.html (accessed 20 Nov 2019)	Ziemke et al. (2019)	Conversion of DU to tropospheric weighted average ozone mixing ratios is based on data from URL link.
		Software	plot_tropospheric_ozone_trends_for_IPCC_AR6_Chapter_2.m					
Figure 2.9a,b	Non sea salt sulfate ice core data	Input dataset			Will be available through the code uploaded onto DMS		Wendl et al. (2015); Osmont et al. (2018)	Arctic (Svalbard,78.82°N / 17.43°E)
		Input dataset			Will be available through the code uploaded onto DMS		Olivier et al. (2006)	Russia (Belukha, 49.81°N / 86.58°E)

		Input dataset			Will be available through the code uploaded onto DMS		Engardt et al. (2017); Sigl et al. (2018)	Europe (Colle Gnifetti, 45.93°N / 7.88°E)
		Input dataset			Will be available through the code uploaded onto DMS		Kellerhals et al. (2010)	South America (Illimani, 16.62°S / 67.77°W) ex-sulphate, corrected for mineral dust input
		Input dataset			Will be available through the code uploaded onto DMS		Sigl et al. (2014)	Antarctica (stacked sulphate record from Antarctica including the four ice cores DIV2010, 77.95°S / 95.96°W; B40, 70.0°S / 0.06°E; Talos Dome, 72.48°S / 159.46°E, and DFS10, 77.40°S / 39.62°W)
	Refractory black carbon ice core data	Input dataset			Will be available through the code uploaded onto DMS		Arienzo et al. (2017)	BC from the B40 core
		Input dataset			Will be available through the code uploaded onto DMS		McConnell et al. (2007); Sigl et al. (2015; 2013, 2018); Keegan et al. (2014); Mernild et al. (2015)	BC in addition from Greenland (stacked rBC record from Greenland including the four ice cores NEEM-2011-S1, 77.45°N / 51.06°W; D4, 71.4°N / 44.0°W; TUNU2013, 78.0°N / 33.88°W; and Summit2010, 72.6°N / 38.5°W)

		Input dataset			Will be available through the code uploaded onto DMS		Lim et al. (2017) reproduced from Sigl et al. (2018) and Osmont et al. (2019)	Eastern Europe (Elbrus, 43.35°N / 42.43°E) The record for Eastern Europe goes back to 1820 only.
								Sulphate concentrations were not corrected for sea-salt input, which is negligible at the ice core locations. The exception is Antarctica, for which non-sea-salt sulphate is shown, calculated from total sulphur concentrations using sodium concentrations as a sea-salt tracer and assuming a sulphur to sodium ratio in bulk sea water of 0.084. Non-sea-salt sulphate was calculated from the non-sea-salt sulphur concentration using [nssSO_4^{2-}] = [nssS]*3 for conversion.
Figure 2.9c	First link: MODIS Aerosol Parameters Integrated Climate Data Center (ICDC) Second link: MODerate Resolution Imaging Spectroradiometer	Input dataset	MOD08_D3 (Terra), MYD08_D3 (Aqua)	Second link: https://modaps.modaps.eosdis.nasa.gov/services/faq/LAADS_Data-	Platnick et al. (2015)	https://icdc.cen.uni-hamburg.de/en/modis-aerosol-properties.html; https://ladsweb.modaps.eosdis.nasa.gov/search/order/	Levy et al. (2010); Santer et al. (2008) ;	MODIS and MISR data from the Terra satellite are analysed starting 2000, and are enhanced by MODIS on Aqua starting 2002. Areas without crosses show trend that is significant at the 0.9

	MODIS AOD			Use_Citation_Policies.pdf				level (two-sided t-test with correction. Superimposed are the trends in annual-mean AOD from the AERONET surface sunphotometer network for 2000–2019
	Multi-Angle Imaging Spectroradiometer MISR AOD	Input dataset	MIL3MAEN			https://opendap.larc.nasa.gov/opendap/MISR/MIL3YAEN.004	Garay et al. (2017)	
	AErosol RObotic NETwork AERONET AOD	Input dataset	Level 2.0, V3, monthly			https://aeronet.gsfc.nasa.gov/data_push/AOT_Level2_Monthly.tar.gz	Holben et al. (1998); Giles et al. (2019); Santer et al. (2008)	
	AERONET AODf	Input dataset	Level 2.0, V3, monthly			https://aeronet.gsfc.nasa.gov/data_push/AOT_Level2_Monthly.tar.gz	Holben et al. (1998); Giles et al. (2019)	
Figure 2.9d	MODerate Resolution Imaging Spectroradiometer MODIS AODf	Input dataset	MOD08_D3 (Terra), MYD08_D3 (Aqua)	Licence link for LAADS DAAC: https://modaps.modaps.eosdis.nasa.gov/services/faq/LAADS_Data-Use_Citation_Policies.pdf	Platnick et al. (2015)	https://icdc.cen.uni-hamburg.de/en/modis-aerosol-properties.html; https://ladsweb.modaps.eosdis.nasa.gov/search/order/	Levy et al. (2010)	

	Multi-Angle Imaging Spectroradiometer MISR AODf	Input dataset	MIL3MAEN			https://opendap.larc.nasa.gov/opendap/MISR/MIL3YAEN.004	Garay et al. (2017)	
Figure 2.10	Effective Radiative Forcings (ERF)	Input dataset	Forcing time series			See Annex III	Section 7.3	ERF of changes to the atmospheric composition are shown for the gases carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), ozone (O_3), and halogenated gases. Aerosol changes include the sum of the ERF due to aerosol – radiation and aerosol – cloud interactions. Other anthropogenic forcings include stratospheric ozone, stratospheric water vapour, land use / land cover changes, black carbon deposition on snow, and contrails. Volcanic ERF is defined such that there is zero mean forcing in the past 2.5 kyr. The sum of the best estimates for all forcings is shown as the total forcing. Further uncertainty ranges are provided in Figures 7.10 and 7.11.

Figure 2.11a	Holocene global mean surface temperature reconstruction (Temp12k multi-method)	Input dataset	https://www.ncei.noaa.gov/pub/data/paleo/reconstructions/kaufman2020/temp12k_allmethods_percentiles.csv			https://www.ncdc.noaa.gov/paleo/study/29712 (accessed 1/11/2020)	Kaufman et al. (2020a; 2020b)	Multi-method reconstruction, 5-95 percentile
	Last millennium global mean surface temperature reconstruction (PAGES2k multi method) PAGES2k Common Era Surface Temperature Reconstructions	Input dataset	https://www.ncei.noaa.gov/pub/data/paleo/pages2k/neukom2019temp/recons/Full_ensemble_median_and_95pct_range.txt			https://www.ncdc.noaa.gov/paleo/study/26872 (accessed 1/11/2020)	PAGES 2k Consortium (2019; 2017)	Median ensemble reconstruction, adjusted to mean of 1850-1900 from the reconstruction (+ 0.38°C)
	1900-2020 global mean surface temperature (multi-dataset mean)	Same as in panel (c) of this figure						
Figure 2.11b, c	HadCRUT Version 5.0	Input dataset	Archive link will be made available	https://www.metoffice.gov.uk/about-us/legal/tandc#Use-of-Crown-Copyright		https://www.metoffice.gov.uk/hadobs/	Morice et al. (2021)	Trends have been calculated where data are present in both the first and last decade and for at least 70% of all years within the period using OLS. Significance is

	NOAAGlobalTemp Version 5 – Arctic variant (not yet officially named)	Input dataset	Archive link will be made available			ftp://ftp.ncdc.noaa.gov/pub/data/cmb/ersst/v5/2020.grl.dat/interim/ (expected to be superseded)	Vose et al. (2021)	assessed with AR(1) correction as described in (Santer et al., 2008) and denoted by stippling.
	Berkeley Earth	Input dataset	Archive link will be made available			http://berkeleyearth.org/archive/data/	Rohde and Hausfather (2020)	
	FREVA-CLINT/climateronstructionAl: Updated reconstruction Version 1.0.1	Input dataset	Archive link will be made available	Open access	Kadow et al. (2020)	http://doi.org/10.5281/zenodo.3873044		
	China-MST	Input dataset	Archive link will be made available				Sun et al. (2021)	
CCB2.3 Table 1	HadCRUT Version 5.0	Input dataset	Archive link will be made available	https://www.metoffice.gov.uk/about-us/legal/tandc#Use-of-Crown-Copyright		None as yet. Once public, will appear through: https://www.metoffice.gov.uk/hadobs/		
	NOAAGlobalTemp Version – Arctic variant (not yet officially named)	Input dataset	Archive link will be made available			ftp://ftp.ncdc.noaa.gov/pub/data/cmb/ersst/v5/2020.grl.dat/interim/ (expected to be superseded)		
	Berkeley Earth	Input dataset	Archive link will be made available			http://berkeleyearth.org/archive/data/		

	Global temperature reconstructions version 2	Input dataset	Archive link will be made available		Cowtan and Way (2014)	https://pure.york.ac.uk/portal/en/datasets/global-temperature-reconstructions-version-2-cowtan-and-way(20ee85c3-f53c-4ab6-8e50-270b0ddd3686).html		
	FREVA-CLINT/climateronstructionAl: Updated reconstruction Version 1.0.1	Input dataset	Archive link will be made available	Open access	Kadow et al. (2020)	http://doi.org/10.5281/zenodo.3873044		
CCB2.3 Figure 1	HadCRUT Version 5.0	Input dataset	Archive link will be made available	https://www.metoffice.gov.uk/about-us/legal/tandc#Use-of-Crown-Copyright		https://www.metoffice.gov.uk/hadobs/hadcrut5/		
	NOAAGlobalTemp Version – Arctic variant (not yet officially named)	Input dataset	Archive link will be made available			ftp://ftp.ncdc.noaa.gov/pub/data/cmb/ersst/v5/2020.grl.dat/interim/ (expected to be superseded)		
	Berkeley Earth	Input dataset	Archive link will be made available			http://berkeleyearth.org/archive/data/		
	Global temperature reconstructions version 2	Input dataset	Archive link will be made available		Cowtan and Way (2014)	https://pure.york.ac.uk/portal/en/datasets/global-temperature-reconstructions-version-2-cowtan-and-way(20ee85c3-f53c-4ab6-8e50-270b0ddd3686).html		

	FREVA-CLINT/climateronstructionAI: Updated reconstruction Version 1.0.1	Input dataset	Archive link will be made available	Open access	Kadow et al. (2020)	http://doi.org/10.5281/zenodo.3873044		
Table 2.3	HadCRUT Version 5.0	Input dataset	Archive link will be made available	https://www.metoffice.gov.uk/about-us/legal/tandc#Use-of-Crown-Copyright		https://www.metoffice.gov.uk/hadobs/	Morice et al. (2021)	
	NOAAGlobalTemp Version 5 – Arctic variant (not yet officially named)	Input dataset	Archive link will be made available			ftp://ftp.ncdc.noaa.gov/pub/data/cmb/ersst/v5/2020.grl.dat/interim/ (expected to be superseded)	Vose et al. (2021)	
	Berkeley Earth	Input dataset	Archive link will be made available			http://berkeleyearth.org/archive/data/	Rohde and Hausfather (2020)	
	FREVA-CLINT/climateronstructionAI: Updated reconstruction Version 1.0.1	Input dataset	Archive link will be made available	Open access	Kadow et al. (2020)	http://doi.org/10.5281/zenodo.3873044		
	China-MST	Input dataset	Archive link will be made available				Sun et al. (2021)	
	GISTEMP Version 4	Input dataset	Archive link will be made available			https://data.giss.nasa.gov/gistemp/	Lenssen et al. (2019)	
	Global temperature reconstructions version 2	Input dataset	Archive link will be made available	CC BY 4.0	Cowtan and Way (2014)	https://doi.org/10.15124/20ee85c3-f53c-4ab6-8e50-270b0ddd3686	Cowtan and Way (2014)	

	GraphEM-infilled temperature data	Input dataset	Archive link will be made available	https://creativecommons.org/licenses/by/4.0/legalcode	Vaccaro et al (2021)	https://zenodo.org/record/4469607		
Table 2.4	HadCRUT Version 5.0	Input dataset	Archive link will be made available	https://www.metoffice.gov.uk/about-us/legal/tandc#Use-of-Crown-Copyright		https://www.metoffice.gov.uk/hadobs/	Morice et al. (2021)	
	NOAAGlobalTemp Version 5 – Arctic variant (not yet officially named)	Input dataset	Archive link will be made available			ftp://ftp.ncdc.noaa.gov/pub/data/cmb/ersst/v5/2020.grl.dat/interim/ (expected to be superseded)	Vose et al. (2021)	
	GISTEMP Version 4	Input dataset	Archive link will be made available			https://data.giss.nasa.gov/gistemp/	Lenssen et al. (2019)	
	Berkeley Earth	Input dataset	Archive link will be made available			http://berkeleyearth.org/archive/data/	Rohde and Hausfather (2020)	
	China-MST	Input dataset	Archive link will be made available				Sun et al. (2021)	
	FREVA-CLINT/climateronstructionAl: Updated reconstruction Version 1.0.1	Input dataset	Archive link will be made available	Open access	Kadow et al. (2020)	http://doi.org/10.5281/zenodo.3873044		
	Global temperature reconstructions version 2	Input dataset	Archive link will be made available	CC BY 4.0	Cowtan and Way (2014)	https://doi.org/10.15124/20ee85c3-f53c-4ab6-8e50-270b0ddd3686	Cowtan and Way (2014)	
	GraphEM-infilled temperature data	Input dataset	Archive link will be made available	https://creativecommons.org/licenses/by/4.0/legalcode	Vaccaro et al (2021)	https://zenodo.org/record/4469607		

	ERA5 Version 5.1	Input dataset	Archive link will be made available	https://cds.climate.copernicus.eu/api/v2/terms/static/licence-to-use-copernicus-products.pdf		https://www.ecmwf.int/en/forecasts/datasets/reanalysis-datasets/era5	Hersbach et al. (2020)	
Table 2.5	RAOBCORE Version 1.7	Input dataset	Archive link will be made available			ftp://srvx1.img.univie.ac.at/pub/	Haimberger et al. (2012)	The running variance is plotted against the end of the 30-year period concerned. All values are expressed as a ratio with the 1900−1970 variance (for Niño 3.4, the 1900−1970 variance is estimated by scaling the observed 1950−2018 variance with the ratio of the SOI variances from 1900−1970 and 1950−2018).
	RICH Version 1.7	Input dataset	Archive link will be made available			ftp://srvx1.img.univie.ac.at/pub/	Haimberger et al. (2012)	
	SUNY	Input dataset	Archive link will be made available				Zhou et al (2021)	
	UAH Version 6.0	Input dataset	Archive link will be made available			https://www.nsstc.uah.edu/climate/	Spencer et al. (2017)	
	RSS Version 4.0	Input dataset	Archive link will be made available			http://www.remss.com/measurements/upper-air-temperature/	Mears and Wentz (2017)	
	ERA5 Version 5.1	Input dataset	Archive link will be made available	https://cds.climate.copernicus.eu/api/v2/terms/static/licence-to-use-copernicus-products.pdf		https://www.ecmwf.int/en/forecasts/datasets/reanalysis-datasets/era5	Hersbach et al. (2020)	

	STAR Version 3.0	Input dataset	Archive link will be made available			ftp://ftp.star.nesdis.noaa.gov/pub/smcd/emb/mscat/data/SSU/SSU_v3.0/	Zou and Qian (2016)	
Figure 2.12	ERA5 Version 5.1	Input dataset	Archive link will be made available	https://cds.climate.copernicus.eu/api/v2/terms/static/licence-to-use-copernicus-products.pdf		https://www.ecmwf.int/en/forecasts/datasets/reanalysis-datasets/era5	Hersbach et al. (2020)	
	RAOBCORE Version 1.7	Input dataset	Archive link will be made available			ftp://srvx1.img.univie.ac.at/pub/	Haimberger et al. (2012)	
	RICH Version 1.7	Input dataset	Archive link will be made available			ftp://srvx1.img.univie.ac.at/pub/	Haimberger et al. (2012)	
	Radio Occultation Meteorology Satellite Application Facility (ROM SAF) CDR (and ICDR) Version 1.0	Input dataset	Archive link will be made available			https://www.romsaf.org/product_archive.php	Gleisner et al. (2019)	
	University Corporation for Atmospheric Research / National Oceanic and Atmospheric Administration (UCAR/NOAA)	Input dataset	Archive link will be made available			https://cdaac-www.cosmic.ucar.edu/	Steiner et al. (2020)	

	Wegener Center (WEGC) Ops v5.6	Input dataset	Archive link will be made available	CC-BY 4.0		http://doi.org/10.25364/WEGC/OPS5.6:2020.1	Angerer et al. (2017)	
	Atmospheric InfraRed Sounder (AIRS) Version 6.0	Input dataset	Archive link will be made available			https://cmr.earthdata.nasa.gov/search/concepts/C1238517301-GES_DISC.html	Susskind et al. (2014)	
Figure 2.13a	Met Office Hadley Centre HadISDH.blend gridded global surface specific humidity version 1.0.0.2019f	Input dataset	https://www.metoffice.gov.uk/hadobs/hadisdh/data/HadISDH.blendq.1.0.0.2019f_FLATgridIDPHABClocalSHIPboth5by5_anoms8110_JAN2020_cf.nc	http://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/		https://www.metoffice.gov.uk/hadobs/hadisdh/downloadblend1002020.html	Willett et al. (2013; 2014; 2020;); Santer et al. (2008)	Blend (land and marine) in situ monitoring product.
Figure 2.13b	Met Office Hadley Centre HadISDH.blend gridded global surface specific humidity version 1.0.0.2019f	Input dataset	HadISDH.blendq.1.0.0.2019f_FLATgridIDPHABClocalSHIPboth5by5_anoms8110_JAN2020_cf.nc	http://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/		https://www.metoffice.gov.uk/hadobs/hadisdh/downloadblend1002020.html	Willett et al., (2013; 2014; 2020)	
	ERA5 Specific humidity	Input dataset	qERA5.nc	https://www.romsaf.org/product_archive.php		https://cds.climate.copernicus.eu/cdsapp#!/dataset/reanalysis-era5-pressure-levels-monthly-means?tab=form (accessed 29 January 2021)	Hersbach et al. (2019; 2020);	

	The Japanese 55-year Reanalysis (JRA55) Specific humidity	Input dataset	jraq19732019.nc	CC BY 4.0	Japan Meteorological Agency (2013)	https://rda.ucar.edu/datasets/ds628.1/ (accessed 29 January 2021)	Kobayashi et al. (2015)	
	20th Century Reanalysis V3 (20CRv3) Specific humidity	Input dataset	shum.2m.mon.mean.nc			ftp://ftp2.psl.noaa.gov/Datasets/20thC_ReanV3/Monthlies/2mSI-MO/shum.2m.mon.mean.nc ; https://psl.noaa.gov/data/gridded/data.20thC_ReanV3.monolevel.html	Slivinski et al. (2019)	
Figure 2.13c	Met Office Hadley Centre HadISDH.blend gridded global surface relative humidity version 1.0.0.2019f	Input dataset	HadISDH.blendRH.1.0.0.2019f_FLATgridIDPHABClocalSHIPboth5by5_anoms8110_JAN2020_cf.nc	https://www.metoffice.gov.uk/about-us/legal/tandc#Use-of-Crown-Copyright		https://www.metoffice.gov.uk/hadobs/hadisdh/downloadblend1002020.html	Willett et al., (2013; 2014; 2020)	Blend (land and marine) in situ monitoring product.
Figure 2.13d	Met Office Hadley Centre HadISDH.blend gridded global surface relative humidity version 1.0.0.2019f	Input dataset	HadISDH.blendRH.1.0.0.2019f_FLATgridIDPHABClocalSHIPboth5by5_anoms8110_JAN2020_cf.nc	https://www.metoffice.gov.uk/about-us/legal/tandc#Use-of-Crown-Copyright		https://www.metoffice.gov.uk/hadobs/hadisdh/downloadblend1002020.html	(Willett et al., 2013, 2014; 2020)	

	ERA5 Relative humidity	Input dataset	RHERA5.nc	https://cds.climate.copernicus.eu/api/v2/terms/static/licence-to-use-copernicus-products.pdf		https://cds.climate.copernicus.eu/cdsapp#!/dataset/reanalysis-era5-pressure-levels-monthly-means?tab=form (accessed 30 January 2021)	Hersbach et al. (2019; 2020);	
	The Japanese 55-year Reanalysis (JRA55) Relative humidity	Input dataset	jrarh19732019.nc	CC BY 4.0	Japan Meteorological Agency (2013)	https://rda.ucar.edu/datasets/ds628.1/ (accessed 30 January 2021)	Kobayashi et al. (2015)	
	20th Century Reanalysis V3 (20CRv3) Relative humidity	Input dataset	rhum.2m.mon.mean.nc			ftp://ftp2.psl.noaa.gov/Datasets/20thC_ReanV3/Monthlies/2mSI-MO/rhum.2m.mon.mean.nc ; https://psl.noaa.gov/data/gridded/data.20thC_ReanV3.monolevel.html	Slivinski et al. (2019)	
Figure 2.14	ERA5	Input dataset	tcwvera5.nc	https://cds.climate.copernicus.eu/api/v2/terms/static/licence-to-use-copernicus-products.pdf		https://cds.climate.copernicus.eu/cdsapp#!/dataset/reanalysis-era5-single-levels-monthly-means?tab=overview (accessed 21 December 2020)	Hersbach et al. (2019; 2020);	Reanalyses covering the 1979-2019 period
	The Japanese 55-year Reanalysis (JRA55)	Input dataset	jrapwat19792019.nc	CC BY 4.0	Japan Meteorological Agency (2013)	https://rda.ucar.edu/datasets/ds628.1/ (accessed 21 December 2020)	Kobayashi et al. (2015)	

	20th Century Reanalysis V3 (20CRv3)	Input dataset	pr_wtr.eatm.mon.mean.nc			ftp://ftp2.psl.noaa.gov/Datasets/20thC_ReanV3/Monthlies/miscSI-MO/pr_wtr.eatm.mon.mean.nc ; https://psl.noaa.gov/data/gridded/data.20thC_ReanV3.monolevel.html	Slivinski et al. (2019)	
	The Hamburg Ocean Atmosphere Parameters and Fluxes from Satellite (HOAPS) v4	Input dataset	HOAPS4.nc		Andersson et al. (2017)	https://wui.cmsaf.eu/safira/action/viewDoiDetails?acronym=HOAPS_V002	Andersson et al. (2017) (Product User Manual SSM/I and SSMIS)	Observations covering the 1979-2019 period.
	Remote Sensing Systems (REMSS) v7	Input dataset	tpw_v07r01_198801_202012.nc4.nc			ftp://ftp.remss.com/vapor/monthly_1deg/ ; http://www.remss.com/measurements/atmospheric-water-vapor/tpw-1-deg-product/	Wentz and Meissner (2007)	
	NASA Water Vapor Project MEaSURsS (NVAP-M)	Input dataset	TCWV_MERGED_NVAPM_TOTAL_V01_long_commongrid_198801_200812_v1.0.nc			https://public.satproj.klima.dwd.de/data/GVAP_data_archive/v1.0/TCWV/long/ (accessed 6 November 2020)	Vonder Haar, Bytheway and Forsythe (2012)	
Figure 2.15 a, d	Climatic Research Unit (CRU) Time-series (TS) data version 4.04	Input dataset	https://crudata.uea.ac.uk/cru/data/hrg/cru_ts_4.04/cruts.2004151855.v4.04/pre/cru_ts4.04.1901.2019.pre.dat.nc.gz			https://crudata.uea.ac.uk/cru/data/hrg/cru_ts_4.04/cruts.2004151855.v4.04/pre/	Harris et al. (2020)	Data products have been masked to regions with an observational constraint.

Figure 2.15 b, e	Global Precipitation Climatology Centre (GPCC) version 2020	Input dataset	gpcc_v2020_f.nc	https://www.dwd.de/EN/service/imprint/imprint_node.html		https://opendata.dwd.de/climate_environment/GPCC/html/fulldata-monthly_v2020_doi_download.html	Becker et al. (2013)	
Figure 2.15c	Climatic Research Unit (CRU) Time-series (TS) data version 4.04	Input dataset	https://crudata.uea.ac.uk/cru/data/hrg/cru_ts_4.04/cruts.2004151855.v4.04/pre/cru_ts4.04.1901.2019.pre.dat.nc.gz			https://crudata.uea.ac.uk/cru/data/hrg/cru_ts_4.04/cruts.2004151855.v4.04/pre/	Harris et al. (2020)	
	Global Historical Climatology Network Monthly (GHCN) – Version 4	Input dataset	GHCNv4-pave_BASE1961-1990.dat			https://www.ncei.noaa.gov/data/global-historical-climatology-network-monthly/v4beta/	Updated from Vose et al. (1992)	
	Global Precipitation Climatology Project (GPCP) version 2.3 combined precipitation data set	Input dataset	ftp://ftp.cdc.noaa.gov/Datasets/gpcp/precip.mon.mean.nc			https://psl.noaa.gov/data/gridded/data.gpcp.html	Adler et al. (2018)	Land-only
	Global Precipitation Climatology Centre (GPCC) version 2020	Input dataset	gpcc_v2020_f.nc			https://opendata.dwd.de/climate_environment/GPCC/html/fulldata-monthly_v2020_doi_download.html	Becker et al. (2013)	
Figure 2.15f	Global Precipitation Climatology Project (GPCP) version 2.3	Input dataset	ftp://ftp.cdc.noaa.gov/Datasets/gpcp/precip.mon.mean.nc			https://psl.noaa.gov/data/gridded/data.gpcp.html	Adler et al. (2018)	

Table 2.6	Global Precipitation Climatology Centre (GPCC) version 2020	Input dataset	gpcc_v2020_f.nc			https://opendata.dwd.de/climate_environment/GPCC/html/fulldata-monthly_v2020_doi_download.html	Becker et al. (2013)	
	Climatic Research Unit (CRU) Time-series (TS) data version 4.04	Input dataset	https://crudata.uea.ac.uk/cru/data/hrg/cru_ts_4.04/cruts.2004151855.v4.04/pre/cru_ts4.04.1901.2019.pre.dat.nc.gz			https://crudata.uea.ac.uk/cru/data/hrg/cru_ts_4.04/cruts.2004151855.v4.04/pre/	Harris et al. (2020)	
	Global Historical Climatology Network (GHCN) Monthly - Version 4	Input dataset	GHCNv4-pave_BASE1961-1990.dat			https://www.ncei.noaa.gov/data/global-historical-climatology-network-monthly/v4beta/	Vose et al. (1992)	
	Global Precipitation Climatology Project (GPCP) version 2.3	Input dataset	ftp://ftp.cdc.noaa.gov/Datasets/gpcp/precip.mon.mean.nc			https://psl.noaa.gov/data/gridded/data.gpcp.html	Adler et al. (2018)	
Figure 2.16a	ERA5 total precipitation and evaporation	Input dataset	era5_tp_2.nc era5_evap_2.nc	https://cds.climate.copernicus.eu/api/v2/terms/static/licence-to-use-copernicus-products.pdf		https://cds.climate.copernicus.eu/cdsapp#!/dataset/reanalysis-era5-single-levels-monthly-means?tab=form (accessed 19 December 2020)	Hersbach et al. (2019; 2020); Santer et al. (2008)	Blue shading shows regions that have moistened at the surface [δ(P-E) > 0] and red shading shows regions that have dried [δ (P-E) < 0]. The X indicates regions where the trends are non-significant at the p = 0.1 level.

Figure 2.16b, c, d	ERA5 total precipitation and evaporation	Input dataset	era5_tp_2.nc era5_evap_2.nc	https://cds.climate.copernicus.eu/api/v2/terms/static/licence-to-use-copernicus-products.pdf		https://cds.climate.copernicus.eu/cdsapp#!/dataset/reanalysis-era5-single-levels-monthly-means?tab=form (accessed 19 December 2020)	Hersbach et al. (2020)	
	Japanese 55-year Reanalysis (JRA-55) precipitation minus evaporation	Input dataset	fcst_phy2m125		Japan Meteorological Agency (2013) https://doi.org/10.5065/D60G3H5B	http://search.diasjp.net/en/dataset/JRA55 (accessed 19 December 2020)	Kobayashi et al. (2015)	
	20th Century Reanalysis version 3 (20CRv3) precipitation minus evaporation	Input dataset	lhtfl.mon.mean.nc, prate.mon.mean.nc			ftp://ftp.cdc.noaa.gov/Datasets/20thC_ReanV3/Monthlies/sfcFlxSI/lhtfl.mon.mean.nc; ftp://ftp.cdc.noaa.gov/Datasets/20thC_ReanV3/Monthlies/sfcSI/prate.mon.mean.nc ; https://psl.noaa.gov/data/gridded/data.20thC_ReanV3.monolevel.html (accessed 19 December 2020)	Slivinski et al. (2019)	

	Climate Forecast System Reanalysis (CFSR) precipitation minus evaporation	Input dataset	flxf06.gdas.grb2			https://www.ncei.noaa.gov/data/climate-forecast-system/access/reanalysis/monthly-means/ (accessed 19 December 2020)	Saha et al. (2010)	
	ERA20C precipitation minus evaporation	Input dataset	ERA20C_MMfcst_1978-2010.nc			https://www.ecmwf.int/en/forecasts/datasets/reanalysis-datasets/era-20c (accessed 19 December 2020)	Poli et al. (2016)	
	ERA20CM precipitation minus evaporation	Input dataset	ERA20CM_FLX.nc			https://www.ecmwf.int/en/forecasts/datasets/reanalysis-datasets/era-20cm-model-integrations (accessed 19 December 2020)	Hersbach et al. (2015)	
	Modern-Era Retrospective analysis for Research and Applications (MERRA) precipitation minus evaporation Version 5.2.0	Input dataset	tavgM_2d_flx_Nx		Global Modeling and Assimilation Office (GMAO) (2008)	https://disc.sci.gsfc.nasa.gov/datasets?keywords=%22MERRA%22%20tavgM_2d_flx_Nx&page=1 (accessed 19 December 2020)	Rienecker et al. (2011)	
	Modern-Era Retrospective analysis for Research and Applications, version 2 (MERRA-2) precipitation minus evaporation Version 5.12.4	Input dataset	tavgM_2d_flx_Nx DOI : 10.5067/0JRLVL8YV2Y4		Global Modeling and Assimilation Office (GMAO) (2015)	https://disc.sci.gsfc.nasa.gov/datasets?keywords=%22MERRA%22%20tavgM_2d_flx_Nx&page=1 (accessed 19 December 2020)	Gelaro et al. (2017)	
Figure 2.17	ERA5	Input dataset	Monthly averaged reanalysis, V-component of	https://cds.climate.copernicus.eu/api/v2/ter		https://cds.climate.copernicus.eu/cdsapp#!/dataset/reanalysis-era5-pressure-	Hersbach et al. (2019; 2020)	The edge of the Hadley Cell is taken as the average latitude of the zero cross of

			Wind, all pressure levels	ms/static/licence-to-use-copernicus-products.pdf		levels-monthly-means?tab=form (accessed 19 December 2020)		mean meridional mass streamfunction averaged between 800 and 400 hPa (Studholme & Gulev, 2018). Hadley Cell intensity is taken as the vertically averaged maximum value of the meridional stream function between 900 and 200 hPa in each overturning cell
	ERA-Interim	Input dataset	Monthly means of daily means, V-component of Wind, all pressure levels			https://apps.ecmwf.int/datasets/data/interim-full-moda/levtype=pl/ (accessed 19 December 2020)	Dee et al. (2011)	
	Japanese 55-year Reanalysis (JRA-55)	Input dataset	JRA-55/Hist/Monthly//anl_p125/anl_p125_vgrd.{YEAR}{MONTH}.nc		Japan Meteorological Agency (2013)	http://search.diasjp.net/en/dataset/JRA55 (accessed 19 December 2020)	Kobayashi et al. (2015)	
	Modern-Era Retrospective analysis for Research and Applications, version 2 (MERRA-2)	Input dataset	M2IMNPASM.5.12.4:MERRA2_100.instM_3d_asm_Np.{YEAR}{MONTH}.nc4		Global Modeling and Assimilation Office (GMAO) (2015)	https://disc.gsfc.nasa.gov/datasets/M2IMNPASM_5.12.4/summary?keywords=merra2 (accessed 19 December 2020)	Gelaro et al. (2017)	
Figure 2.18	ERA5 zonal wind	Input dataset	https://cds.climate.copernicus.eu/cdsapp#!/dataset/reanalysis-era5-pressure-levels-monthly-means?tab=form	https://cds.climate.copernicus.eu/api/v2/terms/static/licence-to-use-copernicus-products.pdf		https://cds.climate.copernicus.eu/cdsapp#!/dataset/reanalysis-era5-pressure-levels-monthly-means?tab=form	Hersbach et al. (2019; 2020); Santer et al. (2008)	

Figure 2.19a	HadISD station wind speed v2.0.2.2017f	Input dataset	https://www.metoffice.gov.uk/hadobs/hadisd/v202_2017f/station_download.html More than 8000 stations	https://www.metoffice.gov.uk/about-us/legal/tandc#Use-of-Crown-Copyright		https://www.metoffice.gov.uk/hadobs/hadisd/	Dunn et al. (2016)	To improve readability of plots, all datasets (including land station data) are interpolated into a uniform 4×4 longitude-latitude grid. Trends for HadISD were computed only if at least 36 years had values and each year has at least 3 seasons of observations available.
Figure 2.19b	ERA5 surface wind	Input dataset	https://cds.climate.copernicus.eu/cdsapp#!/dataset/reanalysis-era5-pressure-levels-monthly-means?tab=form	https://cds.climate.copernicus.eu/api/v2/terms/static/licence-to-use-copernicus-products.pdf		https://cds.climate.copernicus.eu/cdsapp#!/dataset/reanalysis-era5-single-levels-monthly-means?tab=form	Hersbach et al. (2019; 2020);	
Figure 2.19c	Cross-Calibrated Multi-Platform (CCMP) gridded surface vector winds, version 2	Input dataset	http://data.remss.com/ccmp/v02.0		Wentz et al. (2015)	http://www.remss.com/measurements/ccmp/	Atlas et al. (2011)	
Figure 2.19d	Objectively Analyzed Air-Sea Heat Fluxes (OAFlux) data set surface wind, release 3	Input dataset	ftp://ftp.whoi.edu/pub/science/oaflux/wind_v1			http://oaflux.whoi.edu/data.html	Yu et al. (2008)	

Figure 2.20	Ocean and Sea Ice Satellite Application Facility (OSISAF); NOAA/NSIDC Climate Data Record of Passive Microwave Sea Ice Concentration version 3: NASA Team (NOAA CDR) v3.0); NASA Bootstrap (NOAA CDR) v3.0; Gridded Monthly Sea Ice Extent and Concentration, 1850 Onward, version 2 - Walsh NSIDC G10010 (Arctic only); UHH Sea Ice Area Product	Input dataset	SIA_nh_September_1850-2020.csv SIA_nh_March_1850-2020.csv SIA_sh_September_1979-2020.csv SIA_sh_February_1979-2020.csv	Doerr et al. (2021): https://creativecommons.org/licenses/by/4.0/legalcode	Walsh et al. (2019) https://doi.org/10.7265/jj4s-tq79 Doerr et al. (2021)	OSISAF: OSI-450 and OSI-430-b under http://osisaf.met.no/p/ice/#conc-reproc-v2 NASA Team and Bootstrap: https://nsidc.org/data/g02202	OSISAF: Lavergne et al. (2019) NASA Bootstrap: Comiso (2017) NASA Team: Cavalieri et al. (1996) Walsh: Walsh et al. (2019; 2017) Doerr et al. (2021)	Sea ice area values have been calculated from sea ice concentration fields provided by OSISAF/CCI, NASA Team, and NASA Bootstrap from NOAA CDR 3.0
Figure 2.21	Arctic sea ice thickness from submarine transects	Input dataset			Rothrock et al. (2008)			The orbit inclination of both satellite altimeters allows mapping of Arctic sea ice to 88 °N.
	Ice, Clouds, and Land Elevation Satellite (ICESat)	Input dataset			Kwok et al. (2009**)**			
	CryoSat-2 European Space Agency (ESA)	Input dataset				https://science-pds.cryosat.esa.int/	Kwok and Cunningham (2015)	
	Electromagnetic (EM)	Input dataset					Haas et al. (2008, 2010, 2011)	
	Operation IceBridge	Input dataset			Studinger (2013, 2014) ; Paden et al. (2014)	ATM L1B elevation and echo strength: https://doi.org/10.5067/19SIM5TXKPGT ;	Kwok and Kacimi (2018)	

						Narrow swath ATM L1B elevation and echo strength: https://doi.org/10.5067/CXEQS8KVIXEI ; Snow radar L1B geolocated radar echo strength profiles: https://doi.org/10.5067/FAZTWP500V70		
Figure 2.22	Northern Hemisphere Blended Snow Cover Extent and Snow Mass Time Series	Input dataset (for Snow cover extent only)	1922-1991 : SCE_NH_index_april.nc 1967-2018 : SCE_timeseries.nc	Open access	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/ (accessed 16 December 2020)	Mudryk et al. (2020); Brown (2000; 2002)	Data are from multi-observation dataset, based on method of Mudryk et al. (2020) for the satellite era (1967–2018) with the earlier part of the record based on in situ data (Brown, 2000;2002), recalibrated to the multi-observational dataset as described in Mudryk et al. (2020).
Figure 2.23a	A global compilation of glacier advances and retreats for the past two millennia grouped by 17 regions (excluding Antarctica)	Input dataset	Data stored locally but link will be made available once archived		(Solomina et al., 2016)		Solomina et al. (2016)	Time series is based on 275 studied glaciers in both hemispheres from an extensive compilation. The increasing number of glaciers with recorded advances between the12th and 19th century represents both widespread glacier expansion and better preservation of

								evidence left during more recent advances, especially where those advances were large and therefore obliterated evidence of younger advances.
Figure 2.23b	Global and regional glacier mass changes from 1961 to 2016	Input dataset	Zemp_etal_results_global.xlsx	https://creativecommons.org/licenses/by/4.0/legalcode	Zemp et al. (2019; 2020)		Zemp et al. (2020) Table 1	From 450 glacial and 19,130 geodetic glacier datasets
	GRACE satellite mission	Input dataset	annual_MB_Gtyr.mat			https://gracefo.jpl.nasa.gov/data/grace-fo-data/	Wouters et al. (2019)	
	Special Report on the Ocean and Cryosphere in a Changing Climate (SROCC)	Input dataset	SROCC_table_A2.xlsx				SROCC	
	Hugonnet et al. (2021)	Input dataset	table_hugonnet_regions_10yr_ar6period.xlsx		Hugonnet et al. (2021)			
Figure 2.24	Ice Sheet Mass Balance Inter-comparison Exercise (IMBIE) 2019 Greenland Dataset	Input dataset	imbie_dataset_greenland_dynamics-2020_02_28.xlsx			http://imbie.org/data-downloads/ (accessed 16 December 2020)	Greenland: IMBIE Consortium (2020)	
	Ice Sheet Mass Balance Inter-comparison Exercise (IMBIE) 2018 Antarctic Dataset	Input dataset	imbie_dataset-2018_07_23.xlsx			http://imbie.org/data-downloads/ (accessed 16 December 2020)	Antarctic: IMBIE Consortium (2018)	

Figure 2.25	State of Climate in 2019 Arctic Permafrost Temperature Data	Input dataset	May be available through link			https://gtnp.arcticportal.org/	Romanovsky et al (2017; 2020); updated from SROCC Ch 3	Regions are those described in (Romanovsky et al., 2020; 2017). Nordic region and Russia / Siberia 1974–2019 (note: six sites started 1998 or later); high and eastern Canadian Arctic 1978–2019 (note: four sites initiated 2008); northern Alaska, Northwest Territories and eastern Siberia 1978–2019 (note: four sites initiated 2003 or later); Interior Alaska & Central Mackenzie Valley discontinuous permafrost 1983–2019 (note: one site initiated 2001)
Figure 2.26	CSIRO	Input dataset	gmts.2019-11-27.mat			https://www.dropbox.com/sh/1crel1zq3bcmjq9/AADiidW4nJwVI5_kdLzKIB7Ba?dl=0	Wijffels et al. (2016); Roemmich et al. (2015)	
	ISAS-15	Input dataset	GOHC_2005_2018.mat			https://www.dropbox.com/sh/rgc99ra61q8y2wg/AAD4I3wZ5uBTFVrrXjcy5Hmaa?dl=0	Kolodziejczyk et al. (2017); Gaillard et al. (2016)	
	LEGOS	Input dataset	/V1.2/OHC_LEGOS1.dat			https://www.dropbox.com/sh/vyz1091l104lrpz/AAC_zyqrXhaNORGtNVPdL8iIa?dl=0 ; https://marine.copernicus.eu/access-data		This OHC solution is based on the altimetry-based sea-level from CMEMS (www.marine.copernicus.eu), the gravimetry-based ocean mass

								from the GRACE LEGOS V1.2 updated from Blazquez et al. (2018), and the expansion efficiency of heat from Meyssignac et al (2019). Annual Sub annual frequencies have been removed Uncertainties are expressed at 90% confidence level (1.65 sigma)
	NOC	Input dataset				https://www.dropbox.com/sh/a3wtx5rr2rns4bh/AAA8HoXLBs4qig5tFXHrIUJ3a?dl=0		
	CORA v5.2 Area Averaged Ocean Heat Content Anomaly	Input dataset	INSITU_GLO_TS_REP_OBSERVATIONS_013_001_b.	http://marine.copernicus.eu/services-portfolio/service-commitments-and-licence/		https://www.dropbox.com/sh/gwgmia1xns6t1mt/AAAkx1244scq_TOmfaQsqKn8a?dl=0 http://marine.copernicus.eu		Period : 2005-2018. Used climatology : 2005-2017. Global between 60°N-60°S.'
	CSIRO-BOA Area Averaged Ocean Heat Content Anomaly (0-700m)	Input dataset				https://www.dropbox.com/sh/g4yysjvw9mqpkb5/AAAMYwMSHiGiZ9uKj0IAAS-Ja?dl=0	CSIO website (argo) : http://www.argo.ucsd.edu/Gridded_fields.html	Period : 2005-2018. Used climatology : 2005-2017. Global between 60°N-60°S.
	IPRC	Input dataset				https://www.dropbox.com/sh/yc9jclqrdyh14uc/AABy		Period : 2005-2018. Used climatology :

						o_4H0e-ITCig6Xgjebs1a?dl=0 IPRC website (argo) : http://apdrc.soest.hawaii.edu/projects/Argo/data/gridded/On_standard_levels/index-1.html		2005-2017. Global between 60°N-60°S.
	JAMSTEC	Input dataset				https://www.dropbox.com/sh/gm67r4qm1r3lxp2/AABBgtEvsibMXrPOSxsu7emma?dl=0	'JAMSTEC website (argo) : http://www.jamstec.go.jp/ARGO/argo_web/argo/?page_id=83&lang=en	Period : 2005-2018. Used climatology : 2005-2017. Global between 60°N-60°S.
	Scripps	Input dataset				https://www.dropbox.com/sh/9ojeql7caccjqcl/AAD1gg5Ake0sn9nCLxEF4_9na?dl=0		Period : 2005-2018. Used climatology : 2005-2017. Global between 60°N-60°S
	KvS11	Input dataset	CORA5.1 : INSITU_GLO_TS_REP_OBSERVATIONS_013_001_b.	http://marine.copernicus.eu/services-portfolio/service-commitments-and-licence/		https://www.dropbox.com/sh/lca41zwv9vv4i2m/AADsRmKtofG9prda_eTKiKO_a?dl=0	von Schuckmann & Le Traon (2011)	Period : 2005-2018. Used climatology : same years. Global between 60°N-60°S.'
	Cheng17	Input dataset	2019_10_25/IAP_OHC_estimate_update.txt			https://www.dropbox.com/sh/tskdbmvntpmnm0g/AADKpG7Am-wQLqD1oAHS1n-Na?dl=0 Accessed 19/03/2019	Cheng & Zhu (2016); Cheng et al. (2017)	Unit of OHC: *10^22 Joules Smoothed-OHC is 12-month running mean. Baseline: 2006-2015 Note: in this version (v3), we included the Arctic Ocean,

								improved land mask, and used updated CH14 XBT correction. Information of updated CH14 scheme for XBT data provided in http://159.226.119.60/cheng/ and https://www.nodc.noaa.gov/OC5/XBT_BIAS/xbt_bias.html Note: Reliable records are after 1955 Link to Ocean Gridded Temperature Analysis: ftp://ds1.iap.ac.cn/ftp/cheng/CZ16_v3_IAP_Temperature_gridded_1month_netcdf/ OR: http://ddl.escience.cn/f/FiL0
	GCOS20	Input dataset	GCOS_all_heat_content_1960-2018_ZJ_v22062020.nc			https://www.dropbox.com/sh/99xpvl4tlc9r5c2/AADDvOnKGYzVU__NcW-Eabwma?dl=0	Von Schuckmann et al. (2020)	Period : 1960-2018.
	EN4	Input dataset				https://www.dropbox.com/sh/te1ol2kazaet1gs/AAAyUSAXSG969PGbnstnbccga?dl=0	Good et al. (2013)	

						https://www.metoffice.gov.uk/hadobs/en4/download-en4-2-1.html		
	Lev12-NCEI	Input dataset				https://www.dropbox.com/sh/un7zkln9d0mfigj/AADtaHXhF1oZJjMck8hOahcya?dl=0 https://www.ncei.noaa.gov/access/global-ocean-heat-content/	Levitus et al. (2012)	
	Ish17v7.3	Input dataset			Ishii et al. (2017)	https://www.dropbox.com/sh/pct4t51wg3e8ggh/AAAV0wGWXn8KARNvW49gn5WZa?dl=0 https://climate.mri-jma.go.jp/pub/ocean/ts/v7.3/ (Accessed 21/01/2021)		
	PMEL	Input dataset				https://www.dropbox.com/sh/8ken8wamye6rxk6/AADy_1InfSqpUFF0BNmmcT7ja?dl=0 (Accessed 27/03/2019)	Lyman & Johnson (2014) Johnson et al. (2018)	
	Su20-OPEN	Input dataset	OHC_recons_Su/2020_11_14_WF/OPEN_ToCatia.mat			https://www.dropbox.com/sh/o5l3gqararkxddv/AABBstLQnLks-LyHdc-ukGdBa?dl=0		
	Zanna	Input dataset				https://www.dropbox.com/sh/1wd75jd5umilvdf/AAABHlBwQZxCJa3GIMWgspq2a?dl=0	Zanna et al. (2019)	

						https://laurezanna.github.io/#about https://zenodo.org/record/4603700#.YG5vEC3L0lI		
	Desb17					https://www.dropbox.com/sh/82uxgu2ew4ankgi/AADuy_aDsdl1mw1Gj0cbmXi5a?dl=0	Desbruyeres et al. (2017) ; Purkey & Johnson (2010)	Desbruyeres published an estimate of the full-depth GOHC and ThSLR during the 2000's using a blended Argo-hydrography product : 1.45 ZJ/yr and 0.2 mm/yr, respectively.
Table 2.7	Cheng ocean heat content	Input dataset			Cheng et al. (2017)	http://159.226.119.60/cheng/		
	CSIRO ocean heat content / thermosteric sea level	Input dataset			Domingues et al. (2008)	https://www.cmar.csiro.au/sealevel/thermal_expansion_ocean_heat_timeseries.html		
	EN4 ocean subsurface profiles	Input dataset		Non-Commercial Government License (UK)	Good et al (2013)	https://www.metoffice.gov.uk/hadobs/en4/		
	Ishii et al ocean heat content / thermosteric sea level	Input dataset		https://www.jma.go.jp/jma/en/copyright.html	Ishii et al. (2017)	https://www.data.jma.go.jp/gmd/kaiyou/english/ohc/ohc_data_en.html		
	NCEI Ocean Heat Content / thermosteric sea level	Input dataset			Levitus et al. (2012)	https://www.ncei.noaa.gov/access/global-ocean-heat-content/		
	Purkey and Johnson ocean heat content / thermosteric sea level	Input dataset			Purkey and Johnson (2010)		Desbruyères et al (2016)	

	Zanna et al ocean heat content / thermosteric sea level	Input dataset			Zanna et al. (2019)	https://laurezanna.github.io/post/ohc_pnas_dataset/		
Figure 2.27	Durack and Wijffels (2010)	Input dataset	DurackandWijffels_GlobalOceanChanges_19500101-20191231__210122-205355_beta.nc		Durack and Wijffels (2010)	https://www.cmar.csiro.au/oceanchange/download.php		
			DurackandWijffels_GlobalOceanChanges_19700101-20191231__210122-205448_beta.nc					
Figure 2.28	KE2018 Kemp et al. (2018)	Input dataset				https://www.dropbox.com/s/6nna1xdsfvqziwn/sealevel.xlsx?dl=0 (Accessed 27/07/2020)	Kemp et al. (2018)	
	RD2011 Ray & Douglas (2011)	Input dataset				https://www.dropbox.com/s/6nna1xdsfvqziwn/sealevel.xlsx?dl=0 (Accessed 27/07/2020)	Ray & Douglas (2011)	
	JE2014 Jevrejeva et al. (2014)	Input dataset				https://www.dropbox.com/s/6nna1xdsfvqziwn/sealevel.xlsx?dl=0 (Accessed 27/07/2020) https://www.psmsl.org/products/reconstructions/gslGPChange2014.txt	Jevrejeva et al. (2014)	https://www.sciencedirect.com/science/article/abs/pii/S0921818113002750?via%3Dihub
	DA2017 Dangendorf et al. (2017)	Input dataset				https://www.dropbox.com/s/6nna1xdsfvqziwn/sealevel.xlsx?dl=0 (Accessed 27/07/2020)	Dangendorf et al. (2017)	

	DA2019 Dangendorf et al. (2019)	Input dataset				https://www.dropbox.com/s/6nna1xdsfvqziwn/sealevel.xlsx?dl=0 (Accessed 27/07/2020)	Dangendorf et al. (2019)	
	CW2011 Church & White (2011)	Input dataset				https://www.dropbox.com/sh/yqxi73t6l7mbapp/AABdh4zVUjTlmpon4nstYgXca?dl=0 https://www.cmar.csiro.au/sealevel/GMSL_SG_2011_up.html https://www.cmar.csiro.au/sealevel/sl_data_cmar.html	Church & White (2011) ; Church et al. (2011)	
	WS2014 Wenzel & Schroter (2014)	Input dataset				https://www.dropbox.com/sh/e9n2p4d89br233q/AABDMt4ZFPlgdS658LXkFk8Fa?dl=0 (Accessed 5/8/2020) http://store.pangaea.de/Publications/WenzelM_SchroeterJ_2014/WS2014_RSLA_EOF_decomposition.nc	Wenzel & Schroter (2014)	
	HA2015 Hay et al. (2015)	Input dataset				https://www.dropbox.com/sh/ubvlpanfjkj9oxt/AAB5GekySRF-80pVzCnWWfQ6a?dl=0 https://static-content.springer.com/esm/art%3A10.1038%2Fnature14093/MediaObjects/41586_2015_BFnature14093_MOESM60_ESM.xls (Accessed 24/09/2020)	Hay et al. (2014; 2015, 2017)	

	FR2018 Frederikse et al. (2018)	Input dataset				https://www.dropbox.com/sh/89sh77lvjpadwpl/AADiSEDBA-nzbzKa2-tfD9JFa?dl=0 (Accessed 01/09/2020)	Frederikse et al. (2018)	
	FR2020 Frederikse et al. (2020)	Input dataset				https://www.dropbox.com/sh/lvrysjuccqic5je/AACWcbC4gmbEvvdUzorED8kLa?dl=0 https://github.com/thomasfrederikse/sealevelbudget_20c. https://zenodo.org/record/3862995#.YG3rQxNKglI	Frederikse et al. (2020)	
	AVISO	Input dataset	netcdf file: MSL_Serie_MERGED_Global_AVISO_GIA_Adjust_Filter2m.nc			https://www.dropbox.com/sh/jzjbzqx0x2ehtlv/AAAvdT6bLYyNgpMjTkkLyo5oa?dl=0 https://www.aviso.altimetry.fr/index.php?id=1599		
	EU CMEMS	Input dataset				https://www.dropbox.com/sh/8zaziptcs40tk2o/AAB_s8m5C6Lm_BU2jvObU4DOa?dl=0 http://www.esa-sealevel-cci.org/products	Ablain et al. (2017, 2019) ; WCRP Global Sea Level Budget Group (2018)	
	CSIRO	Input dataset				https://www.dropbox.com/sh/y2eb3uqx99gjox4/AAA8AhrhpUiRakna9gKJ1y6Pa?dl=0		

						https://www.cmar.csiro.au/sealevel/sl_data_cmar.html		
	CU (Nerem et al. (2018))	Input dataset				https://www.dropbox.com/sh/4930xp6v110q65k/AABk5b2oSkPWXnuScFL7iD07a?dl=0 https://sealevel.colorado.edu/	Nerem et al. (2018)	
	ESA (Legeais et al. (2018))	Input dataset				https://www.dropbox.com/sh/prso9p9sa99nw9l/AAAmhADZJWyINLX5bd5EeItda?dl=0	Legeais et al. (2018) ; Quartly et al. (2017)	
	NASA (Beckley et al. (2017))	Input dataset	GMSL_TPJAOS_199209_201411.txt		Beckley et al. (2017)	https://www.dropbox.com/sh/giqkd23763fqbjs/AABOSOoMojE3cSuajM5LoA0Aa?dl=0 https://podaac.jpl.nasa.gov/MEaSUREs-SSH?sections=about%2Bdata		If this data is used please cite Beckley et al. (2016)
	NOAA	Input dataset	slr_sla_gbl_free_txj1j2_90.nc			https://www.dropbox.com/sh/5sccjwsijplbc9b/AADbU26hWwrbyd4_mvD5uCNUa?dl=0 https://www.star.nesdis.noaa.gov/socd/lsa/SeaLevelRise/LSA_SLR_timeseries.php		
	LEGOS (Blazquez et al. (2018))	Input dataset			Blazquez et al. (2018)	https://www.dropbox.com/sh/j6mgodlgtt0fnto/AAArZyPhbsV3dCgpnGb4vXMPa?dl=0 ftp://ftp.legos.obs-mip.fr/pub/soa/gravimetrie		

						/grace_legos/V1.2/ocean_mass_and_contributors.dat		
	Palmer et al. (2021) (1901-1993) + WCRP GSLB group (1993-2018)	Input dataset	gmsl_altimeter+TG_ensemble_12022021.mat		Palmer et al. (2021) ; WCRP Global Sea Level Budget Group (2018)	https://www.dropbox.com/s/a5wx1k15fd84czh/GOHC_GThSL_timeseries.mat?dl=0		
	Spratt and Lisiecki (2016)	Input dataset				https://www.dropbox.com/sh/ahprl53ibnqfp3f/AABjeYtZBcDjVjBnRmGiISqIa?dl=0 http://www.ncdc.noaa.gov/paleo/study/19982	Spratt and Lisiecki (2016)	Preferred reconstruction: Figure 2c - composite of the short (0–431 ka) and long (431–798 ka) time windows
Figure 2.29a	High-resolution boron isotope-based CO_2 record; Table mmc5 for the Pliocene (0 to 3.5 myr) and the older than 3.5 myr data from Table mmc4, using the G17 reconstruction of seawater d11B OA_IPCC_clean.R Panel a	Input dataset	Anag2020.txt Sos.GR.txt	CC BY 4.0	Anagnostou et al. (2020) Sosdian et al. (2018)		Anagnostou et al. (2016); Pearson et al. (2009); Harper et al. (2020); Gutjahr et al. (2017); Henehan et al. (2020); Badger et al. (2013); Bartoli et al. (2011); Chalk et al. (2017); Foster et al. (2012); Greenop et al. (2014); Hönisch et al. (2009); Martínez-Botí et al. (2015); Seki et al. (2010); Sosdian et al. (2018)	
Figure 2.29b	Data from mmc5 – Sosdian et al. (2018) OA_IPCC_clean.R Panel b	Input dataset	Plio.pH.txt	CC BY 4.0	Sosdian et al. (2018)		Anagnostou et al. (2016); Bartoli et al. (2011); Chalk et al. (2017); Gutjahr et al. (2017); Hönisch et al.	

							(2009); Martínez-Botí et al. (2015); Seki et al. (2010); Sosdian et al. (2018)	
Figure 2.29c	Boron isotope records OA_IPCC_clean.R Panel c	Input dataset	Shao.txt		Shao et al. (2019)		Shao et al. (2019); Martinez-Boti et al. (2015); Palmer et al. (2010); Pearson and Palmer (2003); Gray et al. (2018); Ezat et al. (2017); Foster (2008); Henehan et al. (2013); Foster and Sexton (2014); Naik et al. (2015)	
Figure 2.29d	BATS pH	Input dataset	Ocean_pH_BAT.txt		http://bats.bios.edu/bats-data/	http://bats.bios.edu/bats-data/	Bates and Johnson (2020)	
	HOT pH	Input dataset	Ocean_pH_HOT.txt		Karl and Lukas (1996)	https://hahana.soest.hawaii.edu/hot/crequest/main.html	Dore et al. (2009)	
	Copernicus Marine Environment Monitoring Service (CMEMS) pH	Input dataset	global_omi_health_carbon_ph_area_averaged_1985_P20200930.nc		Gehlen et al. (2020)	https://resources.marine.copernicus.eu/?option=com_csw&view=details&product_id=GLOBAL_OMI_HEALTH_carbon_ph_area_averaged	Gehlen et al. (2020)	
	OceanSODA-ETHZ	Input dataset	ipcc_oceanSODA_pH_65N-65S_1985-2019_annualAvg_areaWeighted.csv		Gregor and Gruber (2021)	https://www.ncei.noaa.gov/access/metadata/landing-page/bin/iso?id=gov.noaa.nodc:0220059	Gregor and Gruber (2021)	

Figure 2.30	Barrow CO_2	Input dataset		Open access		https://www.esrl.noaa.gov/gmd/dv/data/index.php?site=BRW&parameter_name=Carbon%2BDioxide	Graven et al. (2013)	
	Mauna Loa CO_2	Input dataset		Open access		https://www.esrl.noaa.gov/gmd/dv/data/index.php?site=MLO&parameter_name=Carbon%2BDioxide	Graven et al. (2013)	
Figure 2.31	Ocean Colour Climate Change Initiative (OC-CCI Version 4.2)	Input dataset	OC-CCI Version 4.2	Free and Open		https://catalogue.ceda.ac.uk/uuid/99348189bd33459cbd597a58c30d8d10 ; https://climate.esa.int/en/projects/ocean-colour/; www.oceancolour.org	Sathyendranath et al. (2019); Santer et al. (2008)	The climatology and trends are calculated from climate-quality ocean-colour products generated as part of the Climate Change Initiative of the European Space Agency. These are multi-sensor products, with inter-sensor bias correction applied to minimise artefacts in trends, with processing algorithms selected after round-robin comparisons
Figure 2.32a	Cherry blossom peak bloom in Kyoto, Japan	Input dataset		Open access		http://atmenv.envi.osakafu-u.ac.jp/aono/kyophenotemp4/	Aono & Saito (2010)	
Figure 2.32b	Grape harvest in Beaune, France	Input dataset				https://www.euroclimhist.unibe.ch/en/	Labbe et al. (2019)	
Figure 2.32c	Spring phenology index in eastern China	Input dataset	Archive link will be made available				Ge et al. (2014)	
Figure 2.32d	Full flower of Piedmont species in Philadelphia, USA	Input dataset	Archive link will be made available				Panchen et al. (2012)	

Figure 2.32e	Grape harvest in Central Victoria, Australia	Input dataset	Archive link will be made available				Webb et al. (2011)	
Figure 2.32f	Start of growing season in Tibetan Plateau, China	Input dataset		Open access		https://www.ncdc.noaa.gov/paleo-search/study/22641	Yang et al. (2017)	
Figure 2.33	MERIS	Input dataset		Open access		http://earth.esa.int/level3/meris-level3/	Gobron (2018)	
	MODIS-TIP	Input dataset		Open access		https://ladsweb.modaps.eosdis.nasa.gov/	Gobron (2018)	
	SeaWIFS v 2010.0	Input dataset		Open access		http://fapar.jrc.ec.europa.eu/	Gobron (2018)	
Figure 2.34 CO_2	Refer to Table 2.1 and Section 2.2.3							LM age range is from 1000 to 1750 CE; MPWP value is for interglacial KM5c, 95% range
Figure 2.34 CO_2 rate of change	Refer to Table 2.1 and Section 2.2.3							LM age range is from 1000 to 1750 CE based on data from Law Dome; last deglacial transition is maximum rate based on data from WAIS Divide
Figure 2.34 Temperature relative to 1850-1900	Refer to Section 2.3.1.1 and 4-dataset mean for modern and 1850-1900							Modern and 1850-1900 is based on 4-dataset mean; LM warmest and coldest 20-year periods are 873-892 CE and 1454-1473 CE, respectively, from PAGES 2k Consortium(2019)

Figure 2.34 Glacier extent relative to 1850-1900al	Refer to Section 2.3.2.3 and CCB2.4 for MPWP							1850-1900 and LM are based on Solomina et al., (2016); MH is based on Solomina et al., (2015)
Figure 2.34 Northern tree line relative to 1850-1900	Refer to Section 2.3.4.3.2							Modern based on Binney et al. (2009); LM and MH are based on MacDonald et al. (2008) and Binney et al. (2017); LGM is based on Williams et al. (2011) and Binney et al. (2017); LIG is based on CAPE Last Interglacial Project Members (2006); MPWP is based on Salzmann et al. (2008; 2013)
Figure 2.34 Sea level relative to 1900	Refer to Section 2.3.3.3							Modern is for 2018; 1850-1900 and LM are from Kemp et al. (2018); LIG and EECO are *likely* ranges
Figure 2.34 Sea level rate of change	Refer to Section 2.3.3.3							Modern is for 1993-2018; LM values are maximum centennial rates of lowering and rising: –1.1 to –0.2 (1020-1120 CE) and –0.1 to 0.7 (1460-1560 CE), respectively, from Kemp et al. (2018); LGT is for meltwater pulse 1A about 14.6-14.3 ka

CCB2.4 Figure 1a (left side)	Multi-model mean, annual near-surface air temperature (PlioMIP2) The Pliocene Model Intercomparison Project Phase 2	Input dataset	Replotted from Haywood et al. (2020) (Figure 1b); supplement file: data_for_1b_1d.nc			https://doi.org/10.5194/cp-16-2095-2020-supplement	Haywood et al. (2020)	
	Site-level proxy data, sea-surface temperature for KM5c	Input dataset	McClymont et al. (2020a) (UK37 using BAYSPLINE (column 14), and Mg/Ca using BAYMAG (column 16), both for KM5c). Same as Figure 7.17k	CC BY-4.0		https://doi.org/10.1594/PANGAEA.911847 (accessed 1/11/2020)	McClymont et al. (2020b)	
	Site-level proxy data, terrestrial temperature for MPWP	Input dataset	Same as Figure 7.17b				Salzmann et al. (2013); Vieira et al. (2018)	
CCB2.4 Figure 1a (right side)	Multi-model mean, annual precipitation rate (PlioMIP2) The Pliocene Model Intercomparison Project Phase 2	Input dataset	Replotted from Haywood et al. (2020) (Figure 5b) supplement file: data_for_5b_5c.nc			https://doi.org/10.5194/cp-16-2095-2020-supplement	Haywood et al. (2020)	
	Site-level proxy data, terrestrial precipitation rate for MPWP	Input dataset					Ager et al. (1994); Fauquette et al. (1999); Demske et al. (2002); Dodson and Macphail (2004); Brigham-Grette et al.	Site-level data from individual studies.

							(2013); Sniderman et al. (2016); Vieira et al. (2018)	
CCB2.4 Figure 1b (top)	Biome distributions MPWP (PRISM4)	Input dataset	Replotted from Dowsett et al. (2016) (Figure 3c)				Dowsett et al. (2016)	
CCB2.4 Figure 1b (bottom)	Biome distributions present-day (BOME4)	Input dataset	Replotted from Salzmann et al. (2008) (Figure 1b)				Salzmann et al. (2008)	
CCB2.4 Figure 1c (top)	Modelled ice sheet extent, Greenland, MPWP	Input dataset	Replotted from Haywood et al. (2019) (Figure 4a)				Haywood et al. (2019)	
CCB2.4 Figure 1c (bottom)	Modelled ice sheet extent, Antarctica, MPWP	Input dataset	Replotted from Dolan et al. (2018) (Figure 3e)				Dolan et al. (2018)	
Figure 2.35	Southern Annular Mode (SAM) Index 1,000 Year Annual Reconstruction – Dätwyler et al. (2018)	Input dataset	Reconstructions_Annual_LC.txt			https://www1.ncdc.noaa.gov/pub/data/paleo/reconstructions/datwyler2017/	Dätwyler et al. (2018)	
	Southern Annular Mode (SAM) Index 1,000 Year DJF Reconstruction – Dätwyler et al. (2018)	Input dataset	Reconstructions_DJF_LC.txt			https://www1.ncdc.noaa.gov/pub/data/paleo/reconstructions/datwyler2017/	Dätwyler et al. (2018)	
	Southern Annular Mode (SAM) Index 600 Year DJF Tree Ring Reconstruction – Villalba et al. (2012)	Input dataset	villalba2012sam.txt			ftp://ftp.ncdc.noaa.gov/pub/data/paleo/treering/reconstructions/villalba2012sam.txt ; https://www.ncdc.noaa.gov/paleo-search/	Villalba et al. (2012)	

	Southern Annular Mode (SAM) Index 1000 Year Reconstruction – Abram et al. (2014)	Input dataset	abram2014sam.txt			ftp://ftp.ncdc.noaa.gov/pub/data/paleo/contributions_by_author/abram2014/abram2014sam.txt ; https://www.ncdc.noaa.gov/paleo-search/	Abram et al. (2014)	
	Observation-based Southern Hemisphere Annular Mode Index (SAM Marshall)	Input dataset	newsam.1957.2007.txt			https://legacy.bas.ac.uk/met/gjma/sam.html	Marshall (2003)	
	Southern Annular Mode (SAM) 20th Century Reanalysis v2c (20CRv2c)	Input dataset	sam.20crv2c.long.data			https://psl.noaa.gov/data/20thC_Rean/timeseries/monthly/SAM/sam.20crv2c.long.data	Gong and Wang (1999)	
	Seasonal Southern Hemisphere Annular Mode (SAM) Reconstructions – SAM Fogt	Input dataset	recons_mean7100.txt			http://polarmet.osu.edu/ACD/sam/sam_recon.html	Fogt et al. (2009); Jones et al. (2009)	
	Antarctic Oscillation (AAO) (NCEP) – SAM NCEP	Input dataset	monthly.aao.index.b79.current.ascii			https://www.cpc.ncep.noaa.gov/products/precip/CWlink/daily_ao_index/aao/aao.shtml	Mo (2000)	
Figure 2.36	Stahle et al. (1998) Southern Oscillation Index Reconstruction	Input dataset	Archive link may be provided			http://www.ncdc.noaa.gov/paleo-search/study/6238	Stahle et al. (1998)	Individual studies represented with grey lines, while the overlying thick blue line is the mean reconstruction and the dashed black lines the *very likely* range for the period where there
	Nino 3 Index Reconstruction	Input dataset				http://www.ncdc.noaa.gov/paleo-search/study/6250	Cook (2000)	

	Mann et al. (2000) El Niño Reconstructions	Input dataset	Archive link may be provided			http://www.meteo.psu.edu/holocene/public_html/shared/research/old/mbh99b.html	Mann et al. (2000)	are sufficient data to estimate it
	Evans et al. (2001) Proxy-Based Pacific SST Reconstructions	Input dataset	Archive link may be provided			ftp://ftp.ncdc.noaa.gov/pub/data/paleo/coral/east_pacific/sst_evans2002/	Evans et al. (2001)	
	Evans et al. (2002) Proxy-Based Pacific SST Reconstructions	Input dataset	Archive link may be provided			http://www.ncdc.noaa.gov/paleo-search/study/6348	Evans et al. (2002)	
	Cook et al. (2008) 700 Year Tree-Ring ENSO Index Reconstructions	Input dataset	Archive link may be provided			http://www.ncdc.noaa.gov/paleo-search/study/8704	Cook et al. (2008)	
	Braganza et al. (2009) Multiproxy ENSO Reconstructions	Input dataset	Archive link may be provided			http://www.ncdc.noaa.gov/paleo-search/study/8409	Braganza et al. (2009)	
	McGregor et al. (2010) 350 Year Unified ENSO Proxy Reconstructions	Input dataset	Archive link may be provided			http://www.ncdc.noaa.gov/paleo-search/study/8732	McGregor et al. (2010)	

	Nino 3.4 SST 460 Year Reconstructions	Input dataset	Archive link may be provided			http://www.ncdc.noaa.gov/paleo-search/study/11749	Wilson et al. (2010)	
	1100 Year ENSO Index Reconstruction	Input dataset	Archive link may be provided			http://www.ncdc.noaa.gov/paleo-search/study/11194	Li et al. (2011)	
	700 Year ENSO Nino 3.4 Index Reconstruction	Input dataset	Archive link may be provided			http://www.ncdc.noaa.gov/paleo-search/study/14632	Li et al. (2013)	
	Central Equatorial Pacific Nino 3.4 850 Year SST Reconstruction	Input dataset	Archive link may be provided			http://www.ncdc.noaa.gov/paleo-search/study/13684	Emile-Geay et al. (2013)	
	PAGES Ocean 2K 400 Year Coral Data and Tropical SST Record	Input dataset	Archive link may be provided			http://www.ncdc.noaa.gov/paleo-search/study/17955	Tierney et al. (2015)	
	Southern Oscillation Index (SOI)	Input dataset	Archive link may be provided	**Creative Commons (CC) Attribution 3.0 licence**		http://www.bom.gov.au/climate/current/soi2.shtml	Troup (1965)	
	Nino 3.4 (from Extended Reconstructed Sea Surface Temperature (ERSST) v5)	Input dataset	Archive link may be provided			https://www.cpc.ncep.noaa.gov/data/indices/	Huang et al. (2017)	
Figure 2.37	Centennial-scale sea surface temperature	Input dataset	ftp://ftp.cdc.noaa.gov/Datasets/			https://psl.noaa.gov/data/gridded/data.cobe2.html	Hirahara et al. (2014)	

	analysis and its uncertainty, version 2 (COBE)		COBE2/sst.mon.mean.nc					
	NOAA Extended Reconstructed Sea Surface Temperature V5 (ERSST)	Input dataset	ftp://ftp.cdc.noaa.gov/Datasets/noaa.ersst.v5/sst.mnmean.nc			https://psl.noaa.gov/data/gridded/data.noaa.ersst.v5.html	Huang et al. (2017)	
	Hadley Centre Sea Ice and Sea Surface Temperature data set (HadISST)	Input dataset	https://www.metoffice.gov.uk/hadobs/hadisst/data/HadISST_sst.nc.gz	http://www.nationalarchives.gov.uk/doc/non-commercial-government-licence/version/2/		https://www.metoffice.gov.uk/hadobs/hadisst/	Rayner et al. (2003)	
	Kaplan Extended SST V2 (KAPLAN)	Input dataset	ftp://ftp.cdc.noaa.gov/Datasets/kaplan_sst/sst.mon.anom.nc			https://www.psl.noaa.gov/data/gridded/data.kaplan_sst.html	Kaplan et al. (1998)	
	NOAA Optimum Interpolation (OI) Sea Surface Temperature V2 (OISST)	Input dataset	ftp://ftp.cdc.noaa.gov/Datasets/noaa.oisst.v2/sst.mnmean.nc			https://www.psl.noaa.gov/data/gridded/data.noaa.oisst.v2.html	Reynolds et al. (2002)	
Figure 2.38	Centennial-scale sea surface temperature analysis and its uncertainty, version 2 (COBE)	Input dataset	ftp://ftp.cdc.noaa.gov/Datasets/COBE2/sst.mon.mean.nc			https://psl.noaa.gov/data/gridded/data.cobe2.html	Hirahara et al. (2014)	Both indices are based on annual data, with the long-term mean and linear trend removed using the least-squares method and then low-pass filtered using a 10-year running mean.
	NOAA Extended Reconstructed Sea Surface Temperature V5 (ERSST)	Input dataset	ftp://ftp.cdc.noaa.gov/Datasets/noaa.ersst.v5/sst.mnmean.nc			https://psl.noaa.gov/data/gridded/data.noaa.ersst.v5.html	Huang et al. (2017)	

	Hadley Centre Sea Ice and Sea Surface Temperature data set (HadISST)	Input dataset	https://www.metoffice.gov.uk/hadobs/hadisst/data/HadISST_sst.nc.gz			https://www.metoffice.gov.uk/hadobs/hadisst/	Rayner et al. (2003)	
	Kaplan Extended SST V2 (KAPLAN)	Input dataset	ftp://ftp.cdc.noaa.gov/Datasets/kaplan_sst/sst.mon.anom.nc			https://www.psl.noaa.gov/data/gridded/data.kaplan_sst.html	Kaplan et al. (1998)	

[END TABLE 2.SM.1 HERE]

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