FINAL REPORT

Update of Climate Change Study of Nepal
(RFP No.: DHM/CD/C/RFP/04-2080/81)

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List of Abbreviations

Acronym	Full Form	Acronym	Full Form
Aphrodite	Asian Precipitation – Highly-Resolved Observational Data Integration Towards Evaluation of Water Resources	**R1mm**	Number of rainy days
AR6	Sixth Assessment Report	**R95ptot**	Very Wet Days
C_d	Cumulative Daily Rainfall Anomaly	**R99ptot**	Extreme Wet Days
CDD	Consecutive Dry Days	**RCMs**	Regional Climate
CDO	Climate Data Operators	**RCPs**	Representative Concentration
CMIP6	Coupled Model Intercomparison Project Phase 6	**RITI**	RITI Consultancy
COV	Coefficient of Variation	**RSQUARE**	Coefficient of
CSDI	Cold Spell Duration Index	**RSR**	Root Mean Square Error to Standard
CWD	Consecutive Wet Days	**Rx1day**	Monthly Maximum 1-day precipitation
DHM	Department of Hydrology and Meteorology	**SD**	Standard Deviation
DTR	Diurnal Temperature Range	**SDR**	Standard Deviation
EC-Earth	European community Earth	**SSPs**	Socioeconomic
ERA5	European Centre for Medium-Range Weather Forecasts Reanalysis v5	**TASMAX**	Maximum Temperature
GCMs	General Circulation Models	**TASMEAN**	Mean Temperature
GHGs	Greenhouse gases	**TASMIN**	Minimum Temperature
GISS	Goddard Institute for Space Studies	**TN10p**	Cold Nights
GLOFs	Glacier Lake Flood Outbursts	**TN90p**	Warm Nights
IPCC	Intergovernmental Panel on Climate Change	**TOR**	Terms of Reference
MOFE	Ministry of Forests and Environment	**TSS**	Taylor Skill Score
MOHC	Met Office Hadley Centre	**TX10p**	Cold Days
NA	Not Applicable	**TX90p**	Warm Days
NAP	National Adaptation Plan	**WPs**	Work Packages
NASA	National Aeronautics and Space Administration	**WSDI**	Warm Spell Duration Index
PBIAS	Percentage Bias	**WSL**	Windows Subsystem
QGIS	Quantum Geographic Information System		

1 INTRODUCTION

During 2011–2020, the global surface temperature has increased by 1.1°C compared to 1850–1900; indisputably due to anthropogenic activities, primarily through greenhouse gas (GHG) emissions[1]. This is commonly referred to as global warming, a component of climate change characterized by shifts in climate patterns and the occurrence of extreme weather events such as heavy rainfall, glacier lake flood outbursts (GLOFs), intense storms, heatwaves, and devastating wildfires. Climate change poses a persistent global challenge with far-reaching environmental, social, and economic consequences.

Nepal, situated within the intricate Himalayan landscape, ranks among the world's most vulnerable nations to the threats posed by climate change. The Government of Nepal has taken steps to mitigate these threats, focusing on assisting vulnerable communities in adapting to the impacts of climate change[2]. Effective adaptation measures must rest on a foundation of observed evidence, grounded in scientific principles, and validated across the space and time of interest. This can be only fulfilled through 1) comprehensive investigation of historical climate utilizing latest data, 2) downscaling coarse resolution climate data to high-resolution sufficient enough to capture the regional climate and projecting future climate until period of interest and 3) synthesizing the results in concise, convenient, and comprehensible format to a broad audience.

Acknowledging the pivotal role of the Department of Hydrology and Meteorology (DHM) in addressing climate hazards and related challenges in collaboration with the National Adaptation Plan (NAP) and various government agencies spanning agriculture and disaster management sectors, and recognizing the regulatory mandate stipulated in the "Environment Protection Regulation-2077" which requires the periodic updates on Nepal's climate change status, a contract agreement was signed between DHM and RITI Consultancy Pvt. Ltd. in Feb, 2024 for the updating of climate change assessment in Nepal hereafter known as project entitled: “Update of Climate Change Study of Nepal”.

[1] IPCC, 2023: Sections. In: Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, H. Lee and J. Romero (eds.)]. IPCC, Geneva, Switzerland, pp. 35-115, doi: 10.59327/IPCC/AR6-9789291691647

[2] DHM, 2017. Observed Climate Trend Analysis in the Districts and Physiographic Regions of Nepal (1971-2014). Department of Hydrology and Meteorology, Kathmandu

1.1 Objective

The major objectives of the project are as follows:

- To evaluate the performance of the Couple Model Intercomparison Project Phase 6 (CMIP6) Simulation for Nepal.
- To downscale CMIP6 projection data for Nepal.
- To prepare a report on future climate change over Nepal under different climate change scenarios for different periods.

1.2 Scope

The scope of the project was to:

- Assess the performance of at least 20 Global Climate Models (GCMs) of Couple Model Intercomparison Project phase 6 (CMIP6) to simulate historical observation during 1981–2010 using reference data provided/recommended by DHM.
  - Undertake review of available literature, reports and documents.
  - Interpolate monthly data (Precipitation and mean temperature) of climate models at of reference dataset recommended by DHM for Nepal during historical period.
  - Skill assessment of historical simulations of GCMs based on reference dataset for Nepal.
  - Select four best performing models for Nepal based on the skill scores.
- Downscale daily precipitation, maximum and minimum temperature data from the four best performing models statistically for historical (1981–2010) and future period (2021–2100 and under two scenarios known as Shared Socioeconomic Pathways (SSPs): SSP2-4.5 and SSP5-8.5) at 0.25°×0.25° spatial resolution covering whole Nepal.
- Perform following analysis of precipitation and temperature of downscaled model's and their ensemble mean for future three tri-decadal periods (2016–2045, 2036–2065, 2071–2100) under two socioeconomic scenarios: SSP2-4.5 and SSP5-8.5) at national, provincial and district level; and physiographic level.
  - Spatial and temporal analysis (mean and spread) of the best performing models' simulation and their ensemble data.
  - Trend analysis of reference dataset, individual model's simulations and their ensemble data (monthly, seasonal and annual) including long-term period (2021- 2100) at national level.
  - Extreme indices analysis.
  - Trend analysis of extreme indices.
- Prepare manual for data analysis and visualization including codes used for analysis.
- Provide tools/programme used in the data analysis in digital format.
- Provide all the datasets used in the study in digital format.

2 STUDY AREA

The study area primarily covers the entire Nepal. Considering the rationale behind the study and role of DHM, having a mandate of providing hydro-meteorological services to general public and various stakeholders including national and international organizations, we extended the study area, looking beyond the administrative boundaries and working on hydrological boundaries defined by the major river basins of Nepal (Figure 1). The extent of analysis will be 79.25°E to 89.25°E and 26°N to 31°N. This would widen the scope of study to the extent where DHM is continuously providing its services such as weather forecasting, flood forecasting, hydro-meteorological data service, climate information and agro-meteorological information services.

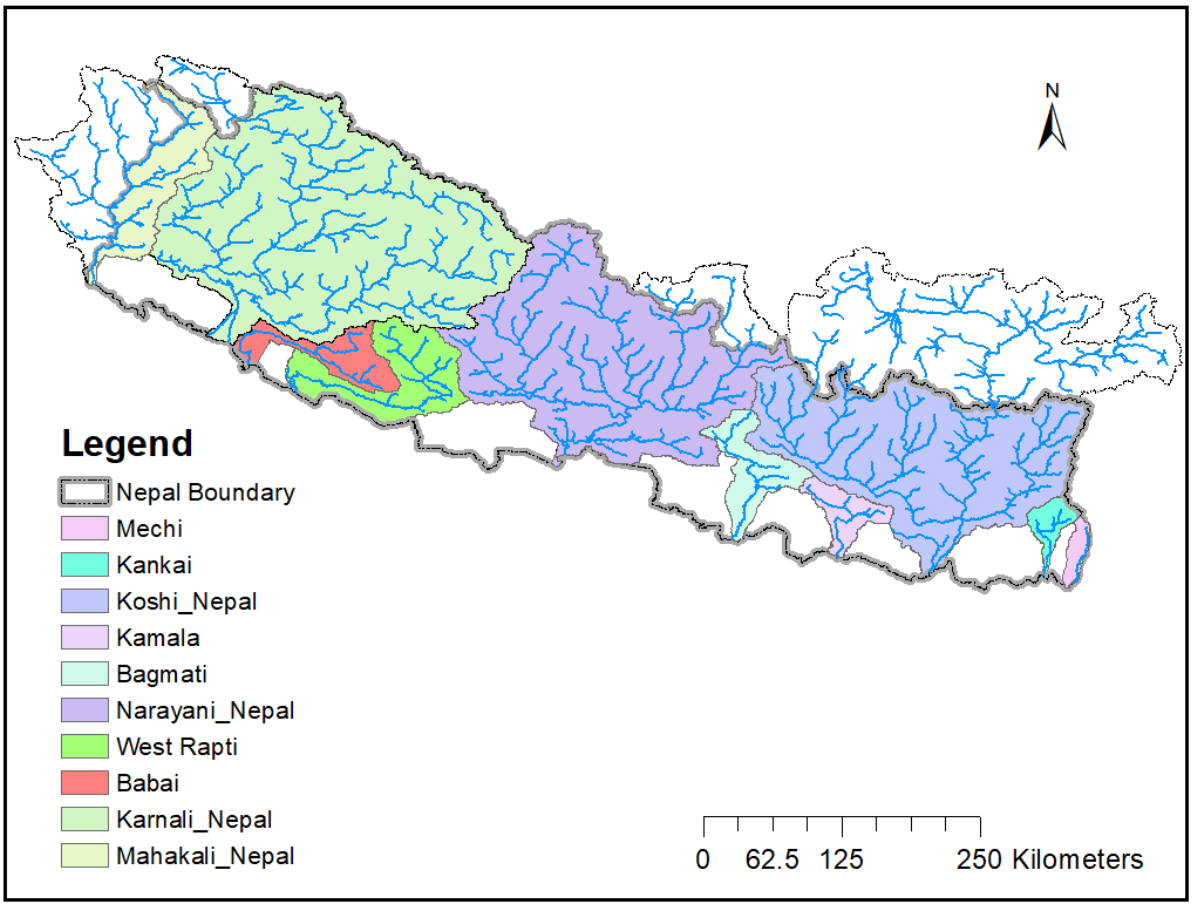

Figure 1: Study area map with river networks and basins.

3 LITERATURE REVIEW

This chapter discusses the fundamental aspects of climate change and its analysis in context of the project.

3.1 General Circulation Models

General Circulation Models (GCMs) are based on Navier-Stokes equations on a rotating sphere to simulate the earth's atmosphere and oceans, and not free from uncertainty due to internal climate variability and errors in the representation of the earth's system process[3,4]. To address this mostly ensemble of GCMs is taken into account such that it helps in quantifying uncertainties in the projection. However, selection of GCMs for such an ensemble is another challenge as the number of GCMs are increasing on newer CMIP. Climate models are often chosen based on their ability to accurately replicate current and recent climates[5,6]. This method might omit the possible future climatic conditions. Alternatively, the envelope approach involves selecting an ensemble of models that span a wide range of projections for key climatological variables, aiming to capture all potential future scenarios. However, this method overlooks the varying skill levels of individual models, potentially missing important projections. These divergent approaches result in distinct model ensembles, leading to differing projections and uncertainties in climate change assessments. The uncertainty stemming from variations in model projections is a significant challenge in such studies, often overshadowing other sources of uncertainty[7,8]. Consequently, careful selection of climate models is paramount in conducting climate change impact assessments, presenting a complex and critical task. Table 1 highlights the strengths and limitations of these methods.

[3] Roberts, C. D., Palmer, M. D., McNeall, D. & Collins, M. Quantifying the likelihood of a continued hiatus in global warming. Nat. Clim. Chang. 5, 337–342 (2015).

[4] Her, Y. et al. Uncertainty in hydrological analysis of climate change: multi-parameter vs. multi-GCM ensemble predictions. Sci. Rep. 9, 1–22 (2019).

[5] Pierce, D. W., T. P. Barnett, B. D. Santer, and P. J. Gleckler (2009), Selecting global climate models for regional climate change studies., Proc. Natl. Acad. Sci. U. S. A., 106(21), 8441 – 8446, doi:10.1073/pnas.0900094106.

[6] Biemans, H., L. H. Speelman, F. Ludwig, E. J. Moors, A J. Wiltshire, P. Kumar, D. Gerten, and P. Kabat (2013), Future water resources for food production in ÿve South Asian river basins and potential for adaptation – A modeling study., Sci. Total Environ., 468-469, S117 – S131, doi:10.1016/j.scitotenv.2013.05.092.

[7] Finger, D., G. Heinrich, A. Gobiet, and A. Bauder (2012), Projections of future water resources and their uncertainty in a glacierized catchment in the Swiss Alps and the subsequent e^{a}ects on hydropower production during the 21st century, Water Resour. Res., 48(2), 1 – 20, doi:10.1029/2011WR010733.

[8] Minville, M., F. Brissette, and R. Leconte (2008), Uncertainty of the impact of climate change on the hydrology of a nordic watershed, J. Hydrol., 358(1-2), 70 – 83, doi:10.1016/j.jhydrol.2008.05.033.

Table 1: Ensemble selection approaches with their strength and limitations.

Skill assessment approach	Envelope approach
Assumes that the skill of climate models is same throughout the simulation period.	Assumes that all climate models are equally plausible
Accuracy oriented	Precision oriented
Can utilize variety of skill scores that evaluates annual cycle, timeseries pattern, extreme indices and so on as selection criteria	Considers only changes in the annual means as criteria for selection
Susceptible towards missing possible future climatic conditions	Includes complete range of future climatic conditions
Helps to narrow down the climate model uncertainty using only skillful GCMs.	Introduction of wide range of uncertainty might miss the important details

As we know that each method has its own strength and limitations, we chose to follow the skill assessment approach, which is more aligned to the ToR description and has more control over selection criteria. Moreover, this method reduces the level of model uncertainty. Here four GCMs were selected out of 37 GCMs from Coupled Model Intercomparison Project Phase 6 (CMIP6) based on their performance over the control period (1981–2010). Each GCM's performance was evaluated based on its statistical alignment with the observed data, and they were ranked using a scoring system.

3.2 Climate scenarios

The latest released climate scenarios are called Shared Socioeconomic Pathways (SSPs) from IPCC based on global socio-economic development trends, which is included in 6th Assessment Report (AR6). There are five contrasting shared socio-economic pathways that depict the plausible alternative future states of the society and environment (Figure 2). The SSPs are based on five narratives including sustainable development, middle-of the road development, regional rivalry, inequality and fossil-fueled development[9]. Among five SSPs, in this study two shared socio-economic pathways (SSPs) i.e., SSP2 known as the middle of the road, and SSP5 known as fossils fueled development were considered. These two scenarios were selected to address the uncertainty from the different socio-economic evolution likely to occur in future. SSP2-4.5 represents the medium Greenhouse gases (GHGs)' emission with a radiative forcing of 4.5 w/m^2 in 2100 whereas, the SSP5-8.5 scenario represents high GHGs emission scenario enough to produce a radiative forcing of 8.5 w/m^2 in 2100.

[9] Riahi K, Van Vuuren DP, Kriegler E, Edmonds J, Oneill BC, Fujimori S, Bauer N, Calvin K, Dellink R, Fricko O (2017) The shared socioeconomic pathways and their energy, land use, and greenhouse gas emissions implications: an overview. Global Environ Change 42:153–168

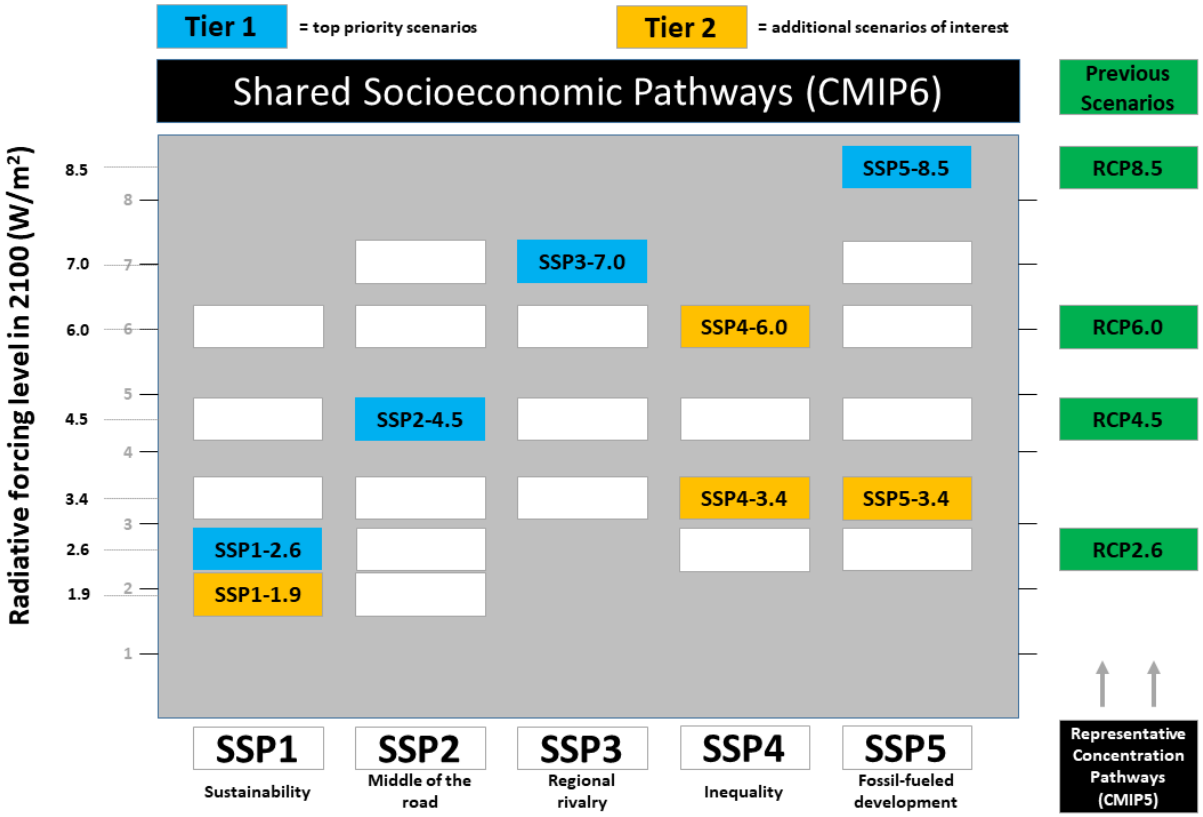

Figure 2: SSPs and year 2100 radiative forcing combinations used in CMIP5[10]

Coupled Model Intercomparison Project (CMIP) has coordinated five past large model intercomparison projects CMIP1 to CMIP5. The latest phase of the project is CMIP6. Details on CMIP6 GCMs including data can be found on the CMIP6 website[11].

According to IPCC sixth assessment report (AR6), there was a rising trend in the observed global surface temperature during 2011–2020 period with respect to 1850–1900. According to the publication, global surface temperature was 1.09 [0.95 to 1.2] °C higher in 2011–2020 than 1850–1900. Global warming will continue to increase in the near term (2021–2040) likely than not to reach 1.5°C even under the very low GHG emission scenario (SSP1-1.9) and likely or very likely to exceed 1.5°C under higher emissions scenarios. Global warming declines back to below 1.5°C by the end of the 21st century in some scenarios and modelled pathways. The report provides the following the best estimates [and very likely ranges] of rise in global surface temperature for the different scenarios for 2081-2100:

- SSP1-1.9 scenario: 1.4 [1.0 to 1.8] °C
- SSP1-2.6 scenario: 1.8 [1.3 to 2.4] °C
- SSP2-4.5 scenario: 2.7 [2.1 to 3.5] °C
- SSP3-7.0 scenario: 3.6 [2.8 to 4.6] °C
- SSP5-8.5 scenario: 4.4 [3.3 to 5.7] °C

[10] https://climate-scenarios.canada.ca/?page=cmip6-overview-notes
[11] https://esgf-index1.ceda.ac.uk/search/cmip6-ceda/

3.3 Downscaling and bias correction

Data from GCMs are too coarse for most of the applications. Thus, it is essential to reproduce fine resolution climate information based on relationship between local conditions and large-scale climatic/atmospheric phenomenon. This process of deriving finer climate information from coarser is called as downscaling and can be achieved in two different ways: i) Dynamic downscaling: where regional climate models are embedded within driving GCMs to simulate the local climate and ii) Statistical downscaling: where relationships between local and global climate variables are established at historical period which is assumed to be true during future period thus deriving fine resolution future dataset. Both methods have their own strength and limitations as discussed in Table 2. Given the resources available and nature of project, we chose statistical downscaling over dynamic downscaling.

Table 2: Downscaling approaches, their strengths and limitations.

Dynamic downscaling	Statistical downscaling
Simulates the regional level climate with boundary conditions from the driving GCM.	Downscales the GCM simulations based on statistical relationship between predictor (usually large-scale variables) and predictand (regional variables) established at historical period.
More reliable as it is based on law of physics however uncertainty in GCM propagates along with RCM.	Assumes static relationships between predictor and predictand which is likely to change in future.
More resource hungry method	More efficient method

On the other hand, climate models are subjected to systematic errors due to their inherent imperfections, involving conceptualization, discretization, and spatial averaging within the grid cells[12,13]. Several studies discuss several methods for bias correction[4,14] among which the empirical quantile mapping technique will be used for precipitation and temperature[13]. Quantile mapping is the process of establishing a transfer function to harmonise the quantiles of GCM variables with those of observed variables, thus minimizing bias in the distribution of the variable. Among several methods of statistical downscaling, quantile mapping holds the reputation of having consistent performance for different variables and under different physiography. Hence, it was selected for the project.

[12] Teutschbein, C. & Seibert, J. Regional climate models for hydrological impact studies at the catchment scale: A review of recent modeling strategies. Geogr. Compass 4, 834–860 (2010).

[13] Gudmundsson, L., Bremnes, J. B., Haugen, J. E. & Engen-Skaugen, T. Technical Note: Downscaling RCM precipitation to the sta-tion scale using statistical transformations—A comparison of methods. Hydrol. Earth Syst. Sci. 16, 3383–3390 (2012).

[14] Shrestha, M., Acharya, S. C. & Shrestha, P. K. Bias correction of climate models for hydrological modelling—Are simple methods still useful?. Meteorol. Appl. 24, 531–539 (2017).

3.4 Climate Change Study for Nepal

Department of Hydrology and Meteorology (DHM), Nepal had conducted a study on the analysis of trend in the observed climatic variables (precipitation, maximum temperature, and minimum temperature) using data of 1971-2014 duration[15]. According to the report, the trend of annual and seasonal maximum temperature over Nepal was significantly positive, while the minimum temperature shows significantly positive trend only in monsoon season. There was no significant trend in precipitation in any season. All Nepal annual maximum temperature trend was 0.056°C/year and annual minimum temperature trend was 0.002°C/year but it was insignificant.

Ministry of Forests and Environment (MOFE), Government of Nepal had conducted a study on climate change scenarios for Nepal considering GCMs from CMIP5 project[16]. The study considered two Representative Concentration Pathway (RCP) scenarios: RCP 4.5 and RCP8.5. The reference period was 1981–2010, the medium-term was 2016–2045 (30s) and the long-term was 2036–2065 (50s) periods. The key findings of the study were as follows: Average annual precipitation was likely to increase by 2–6% in the medium-term period and by 8–12% in the long-term period. The monsoon, post-monsoon, and winter seasons may receive higher precipitation, but pre-monsoon precipitation might decline for both future periods and RCPs. Average annual mean temperature continues to rise, by about 0.9–1.1°C in the medium-term period and 1.3–1.8°C in the long-term period. Winter and post-monsoon temperatures increase at a higher rate than in other seasons for both future periods and RCPs. The rise in temperature was likely to be sharper in the high mountains than in areas at lower elevations.

[15] DHM. Observed Climate Trend Analysis in the Districts and Physiographic Regions of Nepal (1971-2014). Department of Hydrology and Meteorology, Kathmandu (2017).

[16] MoFE. Climate change scenarios for Nepal for National Adaptation Plan (NAP). Ministry of Forests and Environment, Kathmandu (2019).

4 DATA

Two distinct Asian Precipitation – Highly-Resolved Observational Data Integration Towards Evaluation of Water Resources (Aphrodite) products were gathered for project area analysis: one with a 5km resolution covering Nepal and the other with a 25km resolution encompassing areas beyond Nepal's borders, both presented in gridded format (Table 3). While these datasets exhibited minimal divergence, with only a few variances noted in the higher Himalayas, discernible disparities in values were observed across the national boundary, indicating subtle discrepancies at various time intervals. Notably, both Aphrodite datasets showed no instances of missing data during the reference period (1981–2010).

The GCM data were acquired through download from the CMIP6 data portal. Due to variations in date formats across different GCM datasets, discrepancies were addressed by adhering to the Gregorian calendar, accounting for leap years. Any gaps in data corresponding to unavailable dates were mitigated through linear interpolation over time. Additionally, all GCM data underwent resampling to a common 100km grid utilizing bilinear interpolation.

Table 3: Data and their sources. ERA5: European Centre for Medium-Range Weather Forecasts (ECMWF) Reanalysis Version 5

Data	Spatiotemporal resolution	Duration	Source
Precipitation (Aphrodite)	5 × 5km/Daily (Inside Nepal) 25 × 25km/Daily (Outside Nepal)	1981 – 2010	DHM http://aphrodite.st.hirosaki-u.ac.jp/download/
Minimum temperature	Point/Daily	1981 – 2010	DHM
Maximum temperature	Point/Daily	1981 – 2010	DHM
Minimum & maximum temperature outside Nepal	25 × 25 km/Daily	1981 – 2010	ERA5 https://cds.climate.copernicus.eu/cdsapp#!/dataset/reanalysis-era5-single-levels?tab=form
GCMs data	50 × 50 km/Daily 100 × 100 km/Daily 250 × 250 km/Daily	1981 – 2100	CMIP6 https://esgf-data.dkrz.de/search/cmip6-dkrz/

Table 4 shows the list of GCMs selected for the analysis after sorting. These GCMs were selected based on data availability at 250km resolution at daily temporal scale for all three variables: precipitation, maximum and minimum temperature.

Table 4: List of selected GCMs[17]

SN	GCMs	SN	GCMs
1	ACCESS-CM2	20	HadGEM3-GC31-LL
2	ACCESS-ESM1-5	21	HadGEM3-GC31-MM
3	BCC-CSM2-MR	22	IITM-ESM
4	CMCC-CM2-SR5	23	INM-CM4-8
5	CMCC-ESM2	24	INM-CM5-0
6	CNRM-CM6-1	25	IPSL-CM6A-LR
7	CNRM-CM6-1-HR	26	KACE-1-0-G
8	CNRM-ESM2-1	27	KIOST-ESM
9	E3SM-1-0	28	MIROC6
10	E3SM-2-0	29	MPI-ESM1-2-HR
11	E3SM-2-0-NARRM	30	MPI-ESM1-2-LR
12	EC-Earth3	31	MRI-ESM2-0
13	EC-Earth3-AerChem	32	NESM3
14	EC-Earth3-CC	33	NorESM2-LM
15	EC-Earth3-Veg	34	NorESM2-MM
16	FGOALS-f3-L	35	SAM0-UNICON
17	FGOALS-g3	36	TaiESM1
18	GFDL-CM4	37	UKESM1-0-LL
19	GFDL-ESM4		

[17] https://esgf-data.dkrz.de/search/cmip6-dkrz/

5 APPROACH AND METHODOLOGY

This section provides an in-depth explanation of the approach and methodology for executing the assignment. The section follows the guidelines set by the Terms of Reference, while fulfilling the shortcomings through consultation with DHM. As per the ToR we had three work packages (WPs) correspondent to the objectives of the assignment. The overall methodology is shown in Figure 3. Provided hereafter is a succinct summary of our approach and methodology.

5.1 WP1: Performance evaluation of CMIP6 GCMs' over Nepal

Our approach to WP1 was to first construct the high resolution observed data with available gage stations and satellite products and then acquire the GCM data at highest common resolution possible, with simulations during period of analysis (1981–2100), resample both GCM and observed data to common resolution and evaluate the model performance based on selected indicators. The activities under WP1 are divided into three phases:

5.1.1 Phase1: Data collection and quality control

The quality of the results is heavily contingent on the quality of the input data, as encapsulated by "garbage in, garbage out." It was imperative to exercise control over the quality of the available data. The raw data inevitably encounters issues such as outliers, missing values, and inconsistencies. To address these concerns, we applied both visual inspection and statistical measures as highlighted in Table 5. These measures were applied only for temperature data because we used Aphrodite product for precipitation which has already gone through rigorous quality control measures. We read the data using line plots, box plots were used to check outliers and probability distribution function along with histogram was plotted to check the distribution of the data followed by double mass curve to examine consistency in data. Furthermore, we assigned "NA" (representing internal R missing values) for any missing dates. We then considered only those stations which have both minimum and maximum temperature data available. For all the cases where maximum temperature was less than or equal to minimum temperature, we flipped the value. We also assigned "NA" to all those data which were found to be beyond historical extremes (-15°C> T > 46.4°C) measured within Nepal. Additionally, all those temperature data beyond ±4.417standard deviation of available data were considered outliers and assigned "NA". Finally, we applied different techniques to fill in missing data. At first, we checked for those dates when none of the stations had data, under such condition, we applied temporal interpolation. For any error we simply copied data from the earlier day. Lastly, we applied universal kriging to fill all missing values. The data preprocessing was crucial to ensure the integrity and reliability of subsequent analyses and results.

Table 5: Steps adopted for data quality control

Steps	Condition	Action	Remarks
A	**VISUAL INSPECTION**		
1	Read data	Line plot	R
2	Check for outliers	Box plot	R
3	Check the distribution	Pdf and histogram plot	R
4	Consistency check	Double Mass Curve	R
B	**CHECK FOR CONSISTENCY**		

Steps	Condition	Action	Remarks
1	Check if all dates are available	Create dates and assign NA	Excel
2	Check if all stations are same for both maximum and minimum temperature	Create stations and assign NA values for consistency	R
3	Check if all Maximum temperature ≥ Minimum temperature	Flip values	R
4	Check outliers -15°C > T > 46.4°C	If true, assign NA	R
5	Check outliers -4.417SD > T > 4.417 SD	If true, assign NA	R
C	**MISSING DATA IMPUTATION**		
1	Check for dates when none of the station have data	If true interpolate from earlier day. If error, then copy from previous day	R
6	Check if NA values	If true, use kriging method to interpolate data in desired grid	R

5.1.2 Phase2: Preparation of gridded observed data

Following quality control, we transformed both Aphrodite data (5km and 25km) to 10km grid by mean aggregation and bilinear interpolation. Subsequently, the resulting datasets were integrated, such that the originally higher resolution data gets priority within national boundary. We employed universal kriging to convert minimum and maximum temperature gauge data within Nepal to 10 km resolution gridded data, which was integrated with 10km resampled ERA5 data. During the integration universally kriged data derived from gage data replaced the ERA5 data inside Nepal while ERA5 data remained intact outside Nepal's border. Our choice of 10km grid size was informed by the significant climatic variations across the country, primarily driven by its diverse geography and availability of precipitation data despite the theoretical grid size of 17km, as obtained from equation (1).

$$Grid\ size = \sqrt{\frac{Area\ of\ Nepal}{Number\ of\ stations}} \quad (1)$$

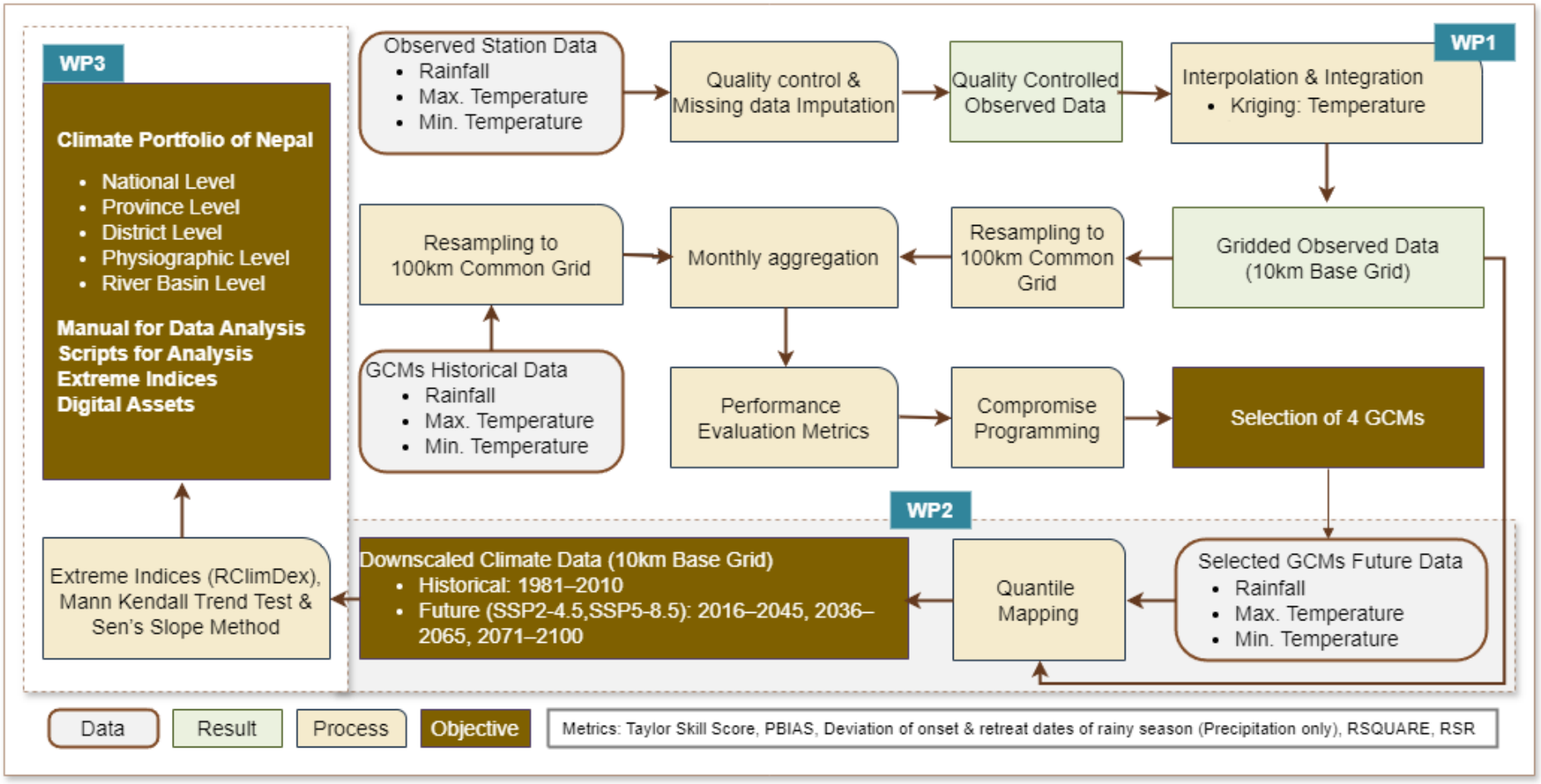

Figure 3: Methodological Framework

5.1.3 Phase3: Model performance evaluation

All the quality controlled observed data and historical GCMs' data were aggregated to 100km common grid and at monthly scale for performance evaluation. Several performance evaluation metrics were evaluated as shown in equations (2) through (6). All metrics were applied to precipitation whereas, onset and retreat date from equation (6) were not applied to temperature data.

$$TSS = \frac{(1 + R_m)^4}{4(SDR_m + 1/SDR_m)^2} \quad (2)$$

$$RSR = \sqrt{\frac{\sum_{m=1}^{n}(sim_m - obs_m)^2}{\sum_{m=1}^{n}(obs_m - \overline{obs_m})^2}} \quad (3)$$

$$RSQUARE = \frac{\left[\sum_{m=1}^{n}\left(obs_m - \overline{obs}\right)\left(sim_m - \overline{sim}\right)\right]^2}{\sum_{m=1}^{n}\left(obs_m - \overline{obs}\right)^2 * \sum_{m=1}^{n}(sim_m - \overline{sim})^2} \quad (4)$$

$$PBIAS = \frac{\sum_{m=1}^{n} sim_m - \sum_{m=1}^{n} obs_m}{\sum_{m=1}^{n} obs_m} * 100\% \quad (5)$$

$$C_d = \sum_{i=1}^{n}[P_i - \bar{P}] \quad (6)$$

Where TSS, RSR, RSQUARE, PBIAS and C_d represent Taylor skill score, root mean square error to standard deviation, coefficient of determination, percentage bias and cumulative daily rainfall anomaly[18,19]. Obs and Sim represent observed and simulated values. Subscript m represents monthly while i represent daily value. R is the correlation between observed and simulated monthly rainfall while SDR is the ratio between standard deviation of simulated and observed monthly rainfall. P_i represents precipitation for day i, n is the number of days in a year (366 for leap year), and $\overline{P}$ represents climatology of annual mean precipitation. The onset date of the rainy season is defined as the day after which the cumulative anomaly reaches the minimum while the retreat date is defined as the day on which the cumulative anomaly reaches the maximum. Compromise programming was employed to calculate score and rank the GCMs as illustrated by equation (7)[20] .

$$L_p = \left[\sum_{j=1}^{n} w_j^p \left|f_j^* - f_j\right|\right]^{1/p} \quad (7)$$

Here, f_j is the normalized value of the metric j for the climate model; f_j* is the normalized ideal value for the metric j; w_j is the weight assigned to the metric; n is the total number of metrics considered; and p is the power factor. Equal weights to all metrics and a power factor of 2 (squared Euclidean distance) were used during the analysis. A smaller value of L_p indicates a better performance of the model and was used to determine the rank of climate models. Four best performing models were selected for further analysis.

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[18] Misra, V., Bhardwaj, A. and Mishra, A. (2018) Local onset and demise of the Indian summer monsoon. Climate Dynamics, 51(5), 1609–1622. https://doi.org/10.1007/s00382-017-3924-2.

[19] Noska, R. and Misra, V. (2016) Characterizing the onset and demise of the Indian summer monsoon. Geophysical Research Letters, 43(9), 4547–4554. https://doi.org/10.1002/2016GL068409

[20] Raju, K.S., Sonali, P. and Kumar, D.N. (2017) Ranking of CMIP5-based global climate models for India using compromise programming. Theoretical and Applied Climatology, 128 (3), 563–574. https://doi.org/10.1007/s00704-015-1721-6.

5.2 WP2: Downscaling selected GCMs and future climate projection

In WP2, our strategy involved the careful selection of suitable statistical downscaling methods for various climate variables. This selection process was informed by an extensive review of relevant literature. We then applied the chosen method to downscale historical and future climate data, effectively capturing the nuances of the regional climate. Selected four GCMs data were downscaled to 10km base grid using quantile mapping method. Particularly empirical quantile mapping was applied[21] to daily data at each grid. To facilitate this analysis, we employed the "qmap" R-package, which works based on the following equations.

$$P_{his,d}{}^{*} = F_{obs,m}^{-1}\left[F_{his,m}\left(P_{his,d}\right)\right] \quad (1)$$

$$P_{fut,d}{}^{*} = F_{obs,m}^{-1}\left[F_{his,m}\left(P_{fut,d}\right)\right] \quad (2)$$

$$T_{his,d}{}^{*} = F_{obs,m}^{-1}\left[F_{his,m}\left(T_{his,d}\right)\right] \quad (3)$$

$$T_{fut,d}{}^{*} = F_{obs,m}^{-1}\left[F_{his,m}\left(T_{fut,d}\right)\right] \quad (4)$$

where P and T refer to precipitation and temperature. Subscripts his, obs, and sim indicate the historical, observed, and simulated data of corresponding variables while d, m, and * represent daily, monthly and corrected data of the respective variables or function. $F_{his,m}$ refers to the cumulative distribution function (CDF) for historical data for a month and $F_{obs,m}^{-1}$ is the inverse CDF of the observed data for the same month.

The efficacy of downscaling was evaluated based on TSS, RMSE, RSR, RSQUARE and PBIAS.

[21] Gudmundsson, L., Bremnes, J. B., Haugen, J. E., and Engen-Skaugen, T.: Technical Note: Downscaling RCM precipitation to the station scale using statistical transformations – a comparison of methods, Hydrol. Earth Syst. Sci., 16, 3383–3390, https://doi.org/10.5194/hess-16-3383-2012, 2012.

5.3 WP3: Development of climate portfolio of Nepal

Our approach to WP3 involved projecting future climate conditions based on downscaled GCM data. These projections were subjected to a comprehensive analysis, evaluating various climate change metrics, including mean changes, uncertainty, trends, and extreme events. To ascertain the significance of such climate change, we employed the Mann-Kendall trend test at a 95% confidence level.

Furthermore, we extended the analysis to a river basin level, expanding the study area. This extension was in consideration of the potential future interest of the Department of Hydrology and Meteorology (DHM) in conducting hydrological analyses and the added benefits it might bring to national climate resilience efforts. This approach was particularly crucial as climate dynamics are the driving force behind the water cycle, and a comprehensive understanding of hydro-climatic conditions necessitates transcending national boundaries in favor of natural boundaries.

Climate is the average value of atmospheric variables over a 30-year period. Hence, we considered three future periods uniform to earlier study by government of Nepal[22] i.e., medium term (2016–2045), long-term (2036–2065) and end of century (2071–2100). Simultaneously, the historical period encompasses a 30-year span, from 1981 to 2010. All the analyses were conducted within these specified periods across three distinct timeframes: monthly, seasonal (as defined by DHM), and annual, encompassing both administrative boundaries (national, provincial, and district) and natural features (physiographic regions and major river basins). The analysis includes mean change, trend analysis and evaluation of extreme climate indices. Apart from selected variables (precipitation, minimum and maximum temperature), we also incorporated mean daily temperature and diurnal temperature range (DTR) in the analysis to further enhance reader's comprehension. The extreme climate indices were calculated using the RClimDex package. The specified extreme indices to be computed, is illustrated in Table 6 as outlined in the Terms of Reference (ToR).

Table 6: Overview of selected twelve climate extreme indices.

Index	Definition	Description
Number of rainy days (R1mm, days)	Annual count of days when PRCP≥ nn mm	nn is a user defined threshold: Let RRij be the daily precipitation amount on day i in period j. Count the number of days where: RRij ≥ nn mm
Consecutive dry days (CDD, days)	Maximum length of dry spell	Maximum number of consecutive days with RR < 1mm: Let RRij be the daily precipitation amount on day i in period j. Count the largest number of consecutive days where: RRij < 1mm
Consecutive wet days (CWD, days)	Maximum length of wet spell	Maximum number of consecutive days with RR ≥ 1mm: Let RRij be the daily precipitation amount on day i in period j. Count the largest number of consecutive days where: RRij ≥ 1mm
Cold spell duration index (CSDI, days)	Annual count of days with at least 6 consecutive days when TN < 10th percentile	Let TNij be the daily minimum temperature on day i in period j and let TNin10 be the calendar day 10th percentile centred on a 5-day window for the base period 1961-1990. Then the number of days per period is summed where, in intervals of at least 6 consecutive days: TNij < TNin10

[22] MoFE, 2019. Climate change scenarios for Nepal for National Adaptation Plan (NAP). Ministry of Forests and Environment, Kathmandu

Index	Definition	Description
Warm spell duration index (WSDI, days)	Annual count of days with at least 6 consecutive days when TX > 90th percentile	Let TXij be the daily maximum temperature on day i in period j and let TXin90 be the calendar day 90th percentile centred on a 5-day window for the base period 1961-1990. Then the number of days per period is summed where, in intervals of at least 6 consecutive days: TXij > TXin90
Monthly maximum 1-day precipitation (Rx1day, mm)	Monthly maximum 1-day precipitation	Let RRij be the daily precipitation amount on day i in period j. The maximum 1-day value for period j are: Rx1dayj = max (RRij)
Very wet days (R95ptot, mm)	Annual total PRCP when RR > 95p	Let RRwj be the daily precipitation amount on a wet day w (RR ≥ 1.0mm) in period i and let RRwn95 be the 95th percentile of precipitation on wet days in the 1961-1990 period. If W represents the number of wet days in the period, then: R95pj=sum (RRwj where RRwj > RRwn95
Extreme wet days (R99ptot, mm)	Annual total PRCP when RR > 99p	Let RRwj be the daily precipitation amount on a wet day w (RR ≥ 1.0mm) in period i and let RRwn99 be the 99th percentile of precipitation on wet days in the 1961-1990 period. If W represents the number of wet days in the period, then: R99pj=sum (RRwj where RRwj > RRwn99
Cold nights (TN10p, %)	Percentage of days when TN < 10th percentile	Let TNij be the daily minimum temperature on day i in period j and let TNin10 be the calendar day 10th percentile centred on a 5-day window for the base period 1961-1990. The percentage of time for the base period is determined where: TNij < TNin10[23]
Cold days (TX10p, %)	Percentage of days when TX < 10th percentile	Let TXij be the daily maximum temperature on day i in period j and let TXin10 be the calendar day 10th percentile centred on a 5-day window for the base period 1961-1990. The percentage of time for the base period is determined where: TXij < TXin10[23]
Warm nights (TN90p, %)	Percentage of days when TN > 90th percentile	Let TNij be the daily minimum temperature on day i in period j and let TNin90 be the calendar day 90th percentile centred on a 5-day window for the base period 1961-1990. The percentage of time for the base period is determined where: TNij > TNin90[23]
Warm days (TX90p, %)	Percentage of days when TX > 90th percentile	Let TXij be the daily maximum temperature on day i in period j and let TXin90 be the calendar day 90th percentile centred on a 5-day window for the base period 1961-1990. The percentage of time for the base period is determined where: TXij > TXin90[23]

[23] To avoid possible inhomogeneity across the in-base and out-base periods, the calculation for the base period (1961-1990) requires the use of a bootstrap procedure. Details are described in Zhang et al. (2005).

5.4 Software

Throughout the assignment, we employed state-of-the-art open-source software developed by internationally recognized institutions as outlined in Table 7.

Table 7: Summary of software utilized during the assignment.

Software	Purpose	Developer
Climate Data Operators (CDO) in Windows Subsystem for Linux (WSL) with Ubuntu 20.04.4 LTS distribution	To access, modify and analyze gridded timeseries climate data.	Max Planck Institute for Meteorology
R programming language (Packages: RClimDex, mice, qmap, raster, ncdf4, tidyverse etc.)	Missing data imputation Conversion of raster time-series data to tabular format Aggregate and resample data. Quantile mapping To conduct geospatial analysis and automate it. To visualize geospatial data and prepare maps and charts	
Quantum Geographic Information System (QGIS)	To visualize geospatial data and prepare maps.	Gary Sherman & Open-Source Geospatial Foundation
Panoply	To visualize gridded timeseries climate data.	National Aeronautics and Space Administration (NASA)'s Goddard Institute for Space Studies (GISS)
Excel, Word, PowerPoint	To conduct general purpose office works	Microsoft Corporation Inc.

5.5 Knowledge transfer

Knowledge transfer occurred through two primary methods: 1) consultation meetings and 2) sharing of reports, datasets, and tools. We maintained continuous communication with the client through formal and informal meetings to discuss methodology, work progress, and any modifications in the project. Regular meetings were held during the inception, interim, draft, and final reporting stages, along with separate consultation meetings at the beginning and conclusion of the project. Furthermore, we have shared digital copy of reports, data, and scripts with the DHM.

6 RESULTS AND DISCUSSION

This section presents a comprehensive description of the outputs achieved during the assignment.

6.1 Baseline climatology

Nepal received an average annual rainfall of approximately 1,336mm from 1981 to 2010, exhibiting significant spatiotemporal variability across the country. The wettest area identified is Pokhara and its vicinity, where average annual precipitation exceeds 4,000mm (Figure 4). Following closely, the northern part of Sankhuwasabha experiences the second highest precipitation levels, ranging between 3,500–4,000mm annually. Conversely, the driest regions include the upper belt of Mustang and Dolpa, the tri-junction of Humla, Bajhang, and Darchula, and the northernmost tip of Solukhumbu district, all receiving less than 500mm of average annual rainfall. Most regions in Nepal typically receive around 1,500mm of rainfall, except for the High-Himalayan region which records notably lower precipitation levels at 680mm compared to other physiographic regions.

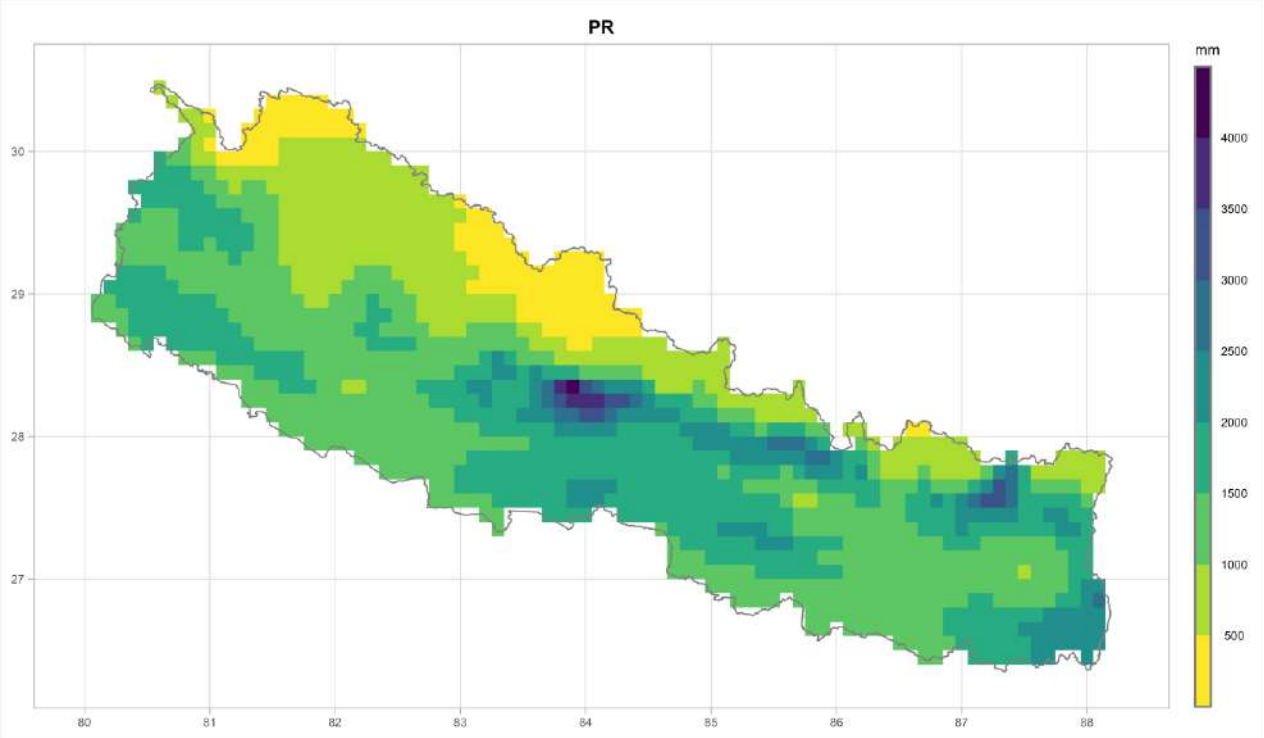

Figure 4: Spatial variation of average annual precipitation during the baseline period (1981–2010)

From 1981 to 2010, Nepal experienced an average annual mean temperature of 14.5°C nationwide (Table 8). Despite its compact size, the country exhibits a wide range of average annual mean temperatures, varying from 1.2°C in the High-Himalayan region to 24.7°C in the Terai. This temperature gradient follows a clear North-South pattern, with temperature increasing from the High-Himalayan to the Terai region. The Terai region, known as the hottest region, can reach average annual maximum temperatures as high as 30.5°C, whereas the High-Himalayan, the coolest region, can see average annual minimum temperatures drop to -2.8°C. Notably, the High-Himalayan region stands out with a significantly narrower diurnal temperature range of 7.9°C, whereas other regions typically experience ranges around 11°C. Figure 5 depicts the spatial distribution of average annual mean, maximum, and minimum temperatures, as well as diurnal temperature range across Nepal.

Table 8: Seasonal precipitation and temperature across physiographical regions during baseline period (1981–2010)

Physiography	Winter	Pre-Monsoon	Monsoon	Post-monsoon	Annual
Precipitation					
High-Himalaya	51	107	486	36	680
High-Mountain	75	200	1104	62	1441
Mid-mountain	62	213	1241	61	1577
Siwalik	55	163	1329	67	1613
Terai	44	150	1286	68	1548
Nepal	**58**	**170**	**1050**	**57**	**1336**
Mean temperature					
High-Himalaya	-3.3	0.6	5.4	0.2	1.2
High-Mountain	5.7	11.9	16.2	10.4	11.6
Mid-mountain	12.0	19.9	23.4	17.8	18.7
Siwalik	15.5	24.8	27.6	22.0	23.0
Terai	17.0	26.6	29.2	23.9	24.7
Nepal	**8.2**	**15.2**	**19.0**	**13.5**	**14.5**
Maximum Temperature					
High-Himalaya	0.6	4.2	9.2	4.8	5.1
High-Mountain	11.2	17.5	20.5	16.1	16.7
Mid-mountain	18.3	26.4	27.6	23.7	24.3
Siwalik	22.2	31.9	31.7	28.1	28.8
Terai	23.8	33.8	33.1	30.0	30.5
Nepal	**13.9**	**21.0**	**23.1**	**19.1**	**19.6**
Minimum Temperature					
High-Himalaya	-7.1	-3	1.6	-4.5	-2.8
High-Mountain	0.1	6.3	11.9	4.7	6.4
Mid-mountain	5.6	13.3	19.1	11.8	13.1
Siwalik	8.8	17.6	23.4	15.8	17.1
Terai	10.2	19.4	25.2	17.8	18.8
Nepal	**2.5**	**9.4**	**14.9**	**7.8**	**9.3**
Diurnal temperature range					
High-Himalaya	7.7	7.2	7.6	9.3	7.9
High-Mountain	11.1	11.2	8.6	11.4	10.3
Mid-mountain	12.7	13.1	8.5	11.9	11.2
Siwalik	13.4	14.3	8.3	12.3	11.7
Terai	13.6	14.4	7.9	12.2	11.7
Nepal	**11.4**	**11.6**	**8.2**	**11.3**	**10.3**

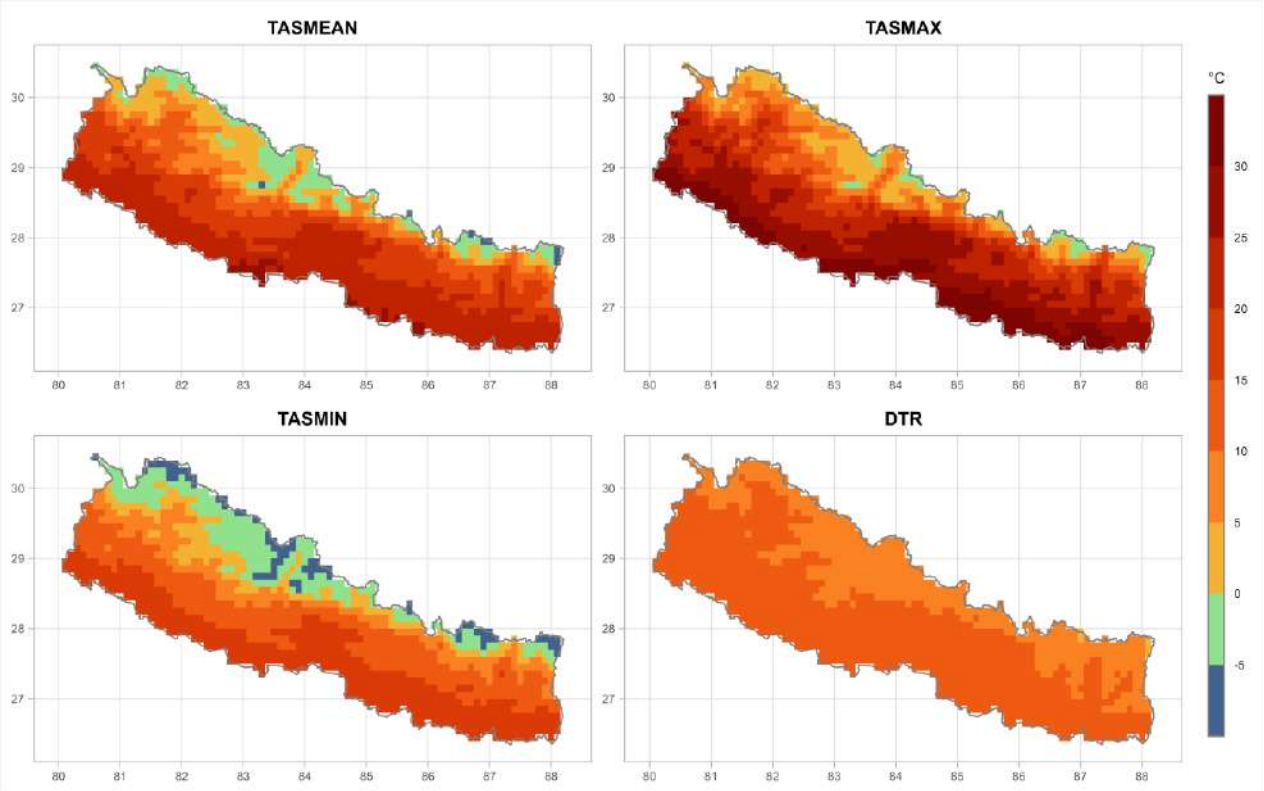

Figure 5: Spatial variation of average annual mean, maximum, and minimum temperatures, as well as diurnal temperature range, during the baseline period (1981–2010)

6.2 Model performance during historical period

A majority of the CMIP6 GCMs exhibited a tendency to overestimate precipitation during the baseline period (1981–2010). Among the 37 GCMs evaluated, 7 demonstrated a negative bias while 30 exhibited a positive one.

Where, highlights that GCMs such as ACCESS-ESM1-5, CMCC-CM2-SR5, CMCC-ESM2, and FGOALS-g3 struggled to accurately reproduce the precipitation climatology, whereas all the European community Earth (EC-Earth) System and Met Office Hadley Centre (MOHC) models namely EC-Earth3-AerChem, EC-Earth3-CC, EC-Earth3, EC-Earth3-Veg, HadGEM3-GC31-MM, UKESM1-0-LL and HadGEM3-GC31-LL consistently yielded excellent results across multiple indicators. Alongside, MPI-ESM1-2-HR and NorESM2-MM also demonstrated comparable performance levels across most indicators. However, none of these models performed well in terms of PBIAS, primarily due to its limitation in assessing mean bias while overlooking spatiotemporal variation. This limitation becomes apparent when considering that FGOALS-g3, despite ranking second-best according to PBIAS (-0.04), performed poorly in reproducing daily precipitation climatology (Figure 6). This raises the question of utilizing PBIAS for further analysis as it might do more harm than good in acquiring reliable results. Moreover, any bias presented in GCMs would be eradicated after bias-correction. To understand the effect of exclusion of any indices in model selection, we have analyzed three different cases where, Case 0: Includes all the indicators, Case 1: Omits the PBIAS and Case 2: Omits PBIAS and RSQUARE. Each case was investigated for equal and variable weight (equation(8)), which doesn't produce much difference in the list of top ten GCMs (**refer Appendix I**). Hence, we moved with inclusion of all the indicators. Nevertheless, KACE-1-0-G, FGOALS-g3, CNRM-CM6-1, UKESM1-0-LL, and CNRM-ESM2-1 emerged as the top five performing models in terms of PBIAS.

$$\text{Weight} = \frac{\sum \sigma_i}{\sigma_i} \quad (8)$$

Where, σ_i is standard deviation for an indicator

Table 9: GCMs' rank, score and performance metrics across all variables. The ideal values are: TSS:1, RSR: 0, RSQUARE: 1, PBIAS: 0, ΔOnset: 0 and ΔRetreat: 0. Least score represents best performing model.

			Precipitation						Maximum Temperature				Minimum Temperature			
Rank	Score	GCMs	TSS	RSR	RSQUARE	PBIAS	|ΔOnset|	|ΔRetreat|	TSS	RSR	RSQUARE	PBIAS	TSS	RSR	RSQUARE	PBIAS
1	0.131	HadGEM3-GC31-MM	0.63	0.72	0.62	0.19	20	2	0.94	0.36	0.95	0.17	0.94	0.34	0.95	0.55
2	**0.137**	**EC-Earth3-CC**	**0.64**	**0.72**	**0.64**	**0.27**	**6**	**2**	**0.94**	**0.50**	**0.94**	**0.29**	**0.95**	**0.35**	**0.96**	**0.67**
3	0.138	EC-Earth3-Veg	0.64	0.73	0.64	0.26	12	3	0.94	0.51	0.95	0.29	0.96	0.35	0.96	0.69
4	0.139	EC-Earth3	0.64	0.70	0.62	0.19	19	5	0.94	0.52	0.95	0.30	0.95	0.36	0.96	0.74
5	0.140	EC-Earth3-AerChem	0.68	0.65	0.66	0.24	17	7	0.94	0.56	0.95	0.33	0.96	0.38	0.96	0.80
6	0.141	UKESM1-0-LL	0.46	0.84	0.42	0.06	3	6	0.89	0.41	0.89	0.15	0.93	0.29	0.93	0.29
7	**0.142**	**HadGEM3-GC31-LL**	**0.57**	**0.77**	**0.55**	**0.22**	**18**	**6**	**0.89**	**0.44**	**0.89**	**0.18**	**0.91**	**0.34**	**0.91**	**0.40**
8	**0.144**	**MPI-ESM1-2-HR**	**0.50**	**0.96**	**0.51**	**0.45**	**3**	**5**	**0.93**	**0.46**	**0.93**	**0.26**	**0.95**	**0.25**	**0.96**	**0.23**
9	**0.144**	**NorESM2-MM**	**0.48**	**1.12**	**0.58**	**0.41**	**24**	**14**	**0.92**	**0.39**	**0.92**	**0.18**	**0.94**	**0.24**	**0.94**	**0.14**
10	0.146	ACCESS-CM2	0.40	0.84	0.36	0.13	0	0	0.89	0.48	0.90	0.22	0.92	0.28	0.93	0.11
11	0.151	MRI-ESM2-0	0.37	0.88	0.32	0.09	9	2	0.91	0.55	0.93	0.29	0.95	0.26	0.96	0.21
12	0.151	SAM0-UNICON	0.47	1.01	0.48	0.43	12	9	0.93	0.46	0.94	0.25	0.93	0.36	0.95	0.54
13	0.152	KACE-1-0-G	0.39	0.88	0.34	0.02	21	22	0.84	0.45	0.85	0.01	0.88	0.37	0.88	0.24
14	0.153	GFDL-ESM4	0.46	0.92	0.44	0.21	18	4	0.91	0.53	0.92	0.29	0.94	0.40	0.96	0.78
15	0.155	NorESM2-LM	0.42	1.02	0.40	0.12	16	4	0.79	0.47	0.81	0.12	0.84	0.38	0.88	0.22
16	0.159	INM-CM4-8	0.52	0.99	0.52	0.71	4	8	0.86	0.53	0.90	0.27	0.83	0.40	0.86	0.33
17	0.159	MPI-ESM1-2-LR	0.45	1.07	0.46	0.64	10	1	0.87	0.56	0.87	0.29	0.91	0.31	0.91	0.26
18	0.160	MIROC6	0.40	1.25	0.43	0.78	10	3	0.82	0.49	0.83	0.07	0.89	0.35	0.88	0.08
19	0.161	FGOALS-f3-L	0.32	1.06	0.26	0.15	14	6	0.90	0.53	0.92	0.27	0.93	0.38	0.95	0.64
20	0.164	INM-CM5-0	0.50	1.01	0.50	0.66	50	6	0.88	0.52	0.90	0.27	0.84	0.42	0.86	0.45
21	0.165	KIOST-ESM	0.33	0.84	0.32	0.19	31	11	0.79	0.51	0.80	0.03	0.91	0.57	0.91	1.26
22	0.166	E3SM-2-0-NARRM	0.46	1.06	0.46	0.58	20	3	0.89	0.63	0.89	0.35	0.89	0.42	0.89	0.58
23	0.166	CMCC-CM2-SR5	0.01	1.08	0.00	0.60	9	2	0.94	0.35	0.94	0.17	0.94	0.26	0.95	0.06
24	0.169	E3SM-2-0	0.39	1.22	0.41	0.64	16	4	0.89	0.61	0.90	0.34	0.89	0.42	0.90	0.57
25	0.172	CNRM-ESM2-1	0.27	0.99	0.20	0.09	22	5	0.87	0.65	0.91	0.34	0.89	0.53	0.93	0.98
26	0.172	TaiESM1	0.24	2.27	0.53	1.39	15	1	0.93	0.38	0.94	0.18	0.93	0.31	0.95	0.27
27	0.173	NESM3	0.46	1.18	0.50	0.83	8	10	0.87	0.80	0.87	0.48	0.90	0.35	0.91	0.47
28	0.175	IITM-ESM	0.35	1.19	0.32	0.74	2	9	0.87	0.66	0.87	0.37	0.88	0.43	0.88	0.68
29	0.176	CNRM-CM6-1	0.27	0.97	0.21	0.06	24	5	0.87	0.71	0.91	0.39	0.89	0.59	0.93	1.18
30	0.176	BCC-CSM2-MR	0.46	1.06	0.46	0.69	99	68	0.88	0.52	0.88	0.24	0.91	0.35	0.92	0.41
31	0.178	CMCC-ESM2	0.01	1.08	0.00	0.57	75	45	0.94	0.36	0.94	0.18	0.94	0.25	0.95	0.02
32	0.182	ACCESS-ESM1-5	0.01	1.08	0.00	0.38	32	9	0.88	0.64	0.88	0.36	0.90	0.30	0.92	0.13
33	0.184	E3SM-1-0	0.35	1.55	0.49	0.90	19	2	0.88	1.00	0.90	0.63	0.93	0.31	0.93	0.35
34	0.185	IPSL-CM6A-LR	0.28	1.05	0.21	0.22	43	7	0.90	0.75	0.93	0.45	0.88	0.76	0.95	1.68
35	0.188	CNRM-CM6-1-HR	0.41	0.82	0.38	0.11	98	72	0.88	0.78	0.94	0.45	0.89	0.71	0.96	1.53
36	0.191	GFDL-CM4	0.42	1.05	0.41	0.33	140	119	0.89	0.66	0.92	0.37	0.92	0.46	0.95	0.90
37	0.249	FGOALS-g3	0.03	1.22	0.01	0.04	25	13	0.00	1.13	0.34	0.14	0.00	1.60	0.41	2.99

The daily maximum and minimum temperature climatology is shown in Figure 7 and Figure 8 respectively.

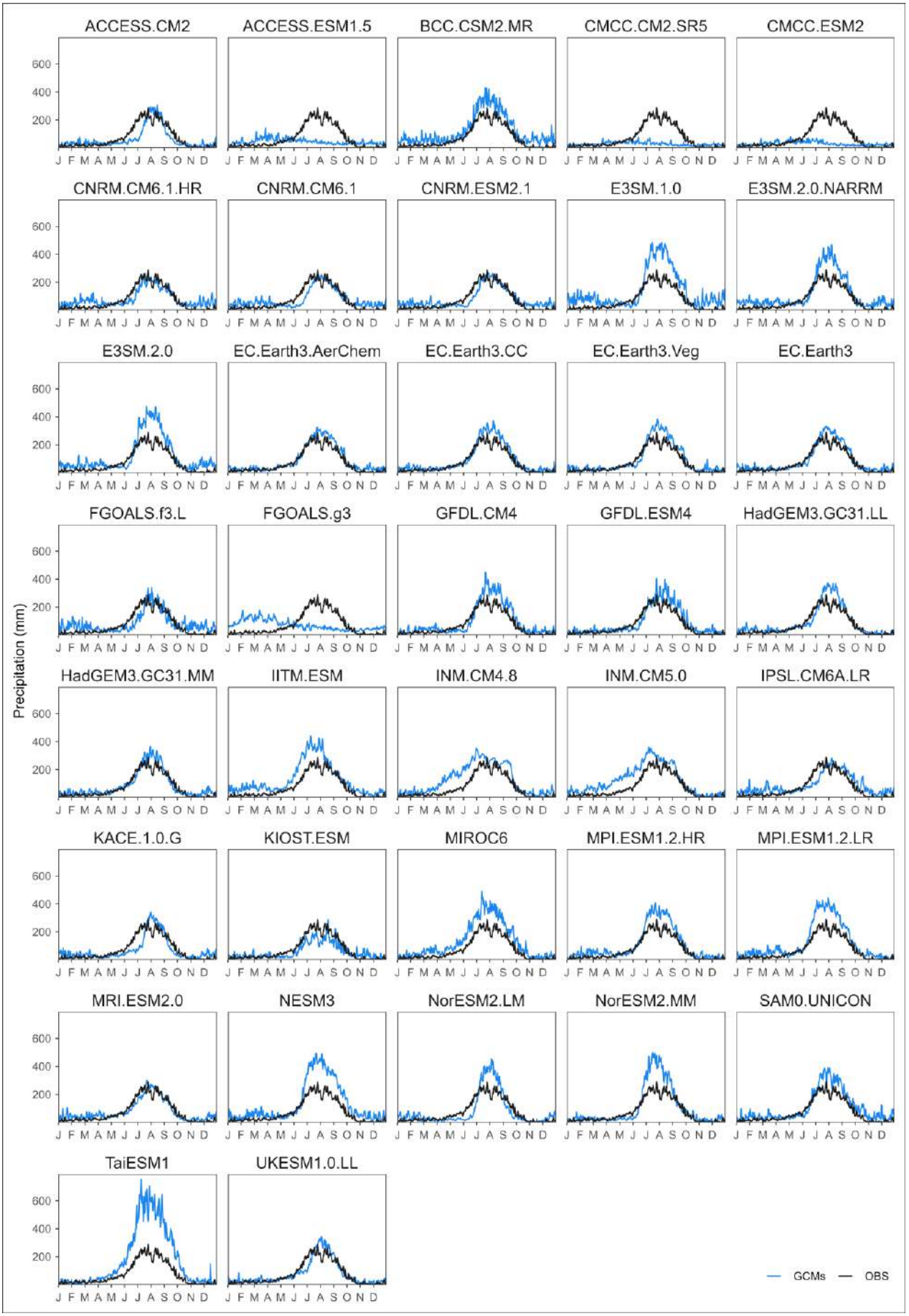

Figure 6: Comparison of daily precipitation climatology (mm) between observed and GCM data during the baseline period (1981–2010).

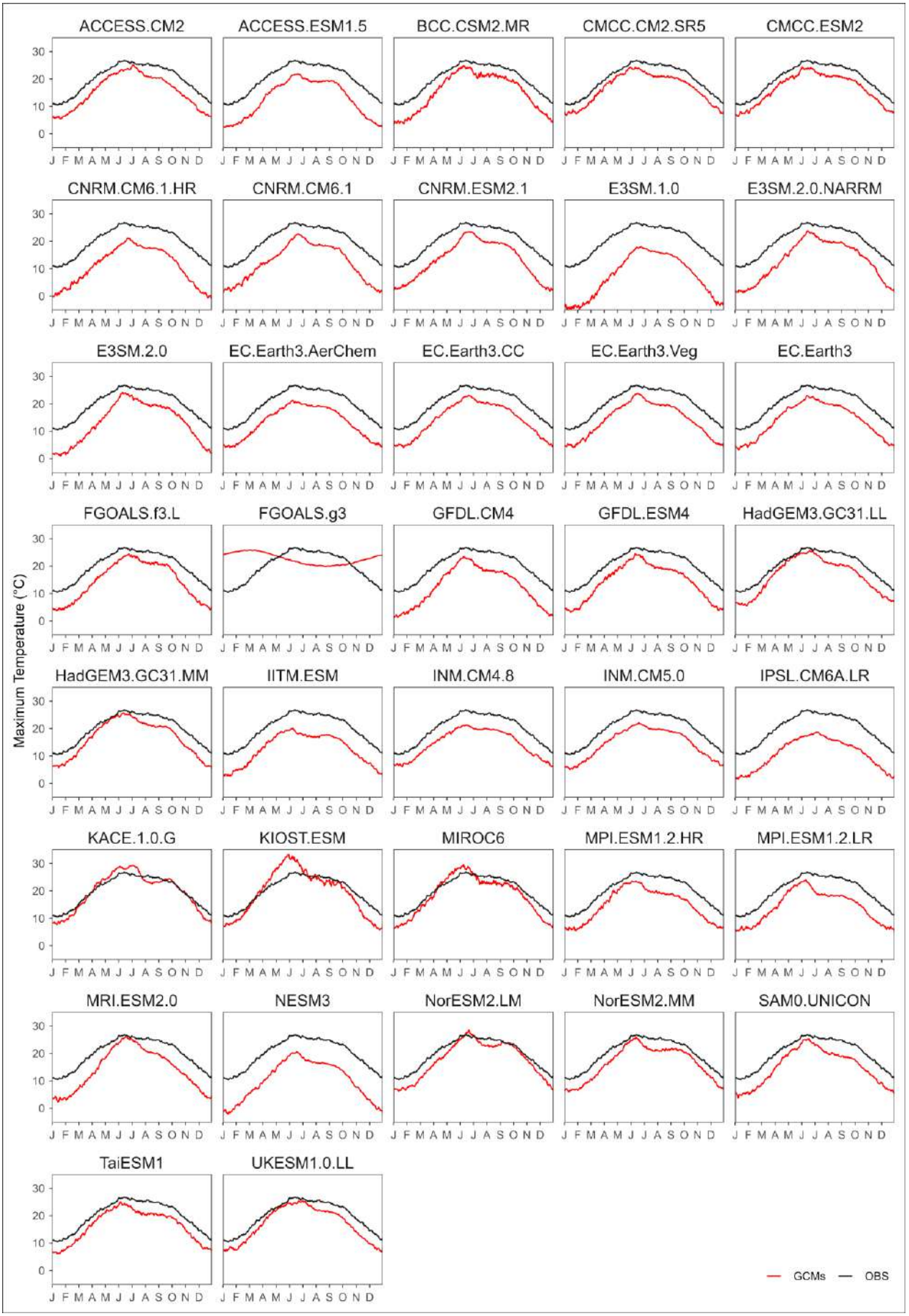

Figure 7: Comparison of daily maximum temperature climatology (mm) between observed and GCM data during the baseline period (1981–2010).

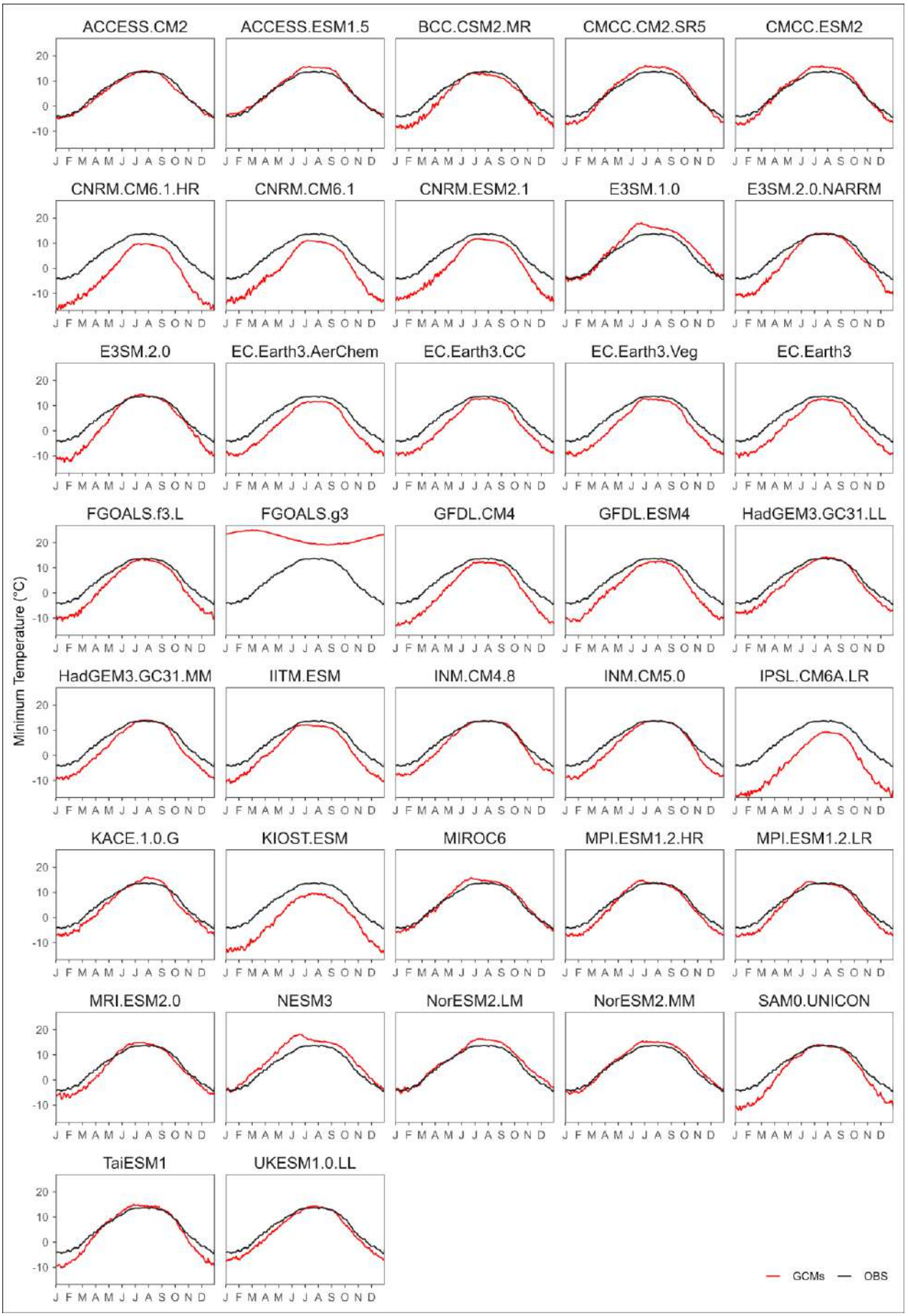

Figure 8: Comparison of daily minimum temperature climatology (mm) between observed and GCM data during the baseline period (1981–2010).

6.3 Downscaling and bias-correction efficacy

While the primary goal of downscaling is to derive high-resolution climate data and correct biases, it is crucial to assess the effectiveness of the chosen method. Therefore, we calculated several statistical indicators namely: TSS, RMSE, RSR, RSQUARE, and PBIAS, both before and after downscaling, as detailed in Table 10. All models exhibited improved performance post-downscaling and eliminate biases across all variables, confirming their efficacy. The standard deviation on raw simulation of mean climatology were 209mm (18%), 0.98℃ (5%), 1.94℃ (21%) for precipitation, maximum and minimum temperature respectively which were eventually reduced to zero post-downscaling. This shows that GCMs were more coherent at simulating maximum, temperature, precipitation and finally minimum temperature.

Table 10: Performance of downscaling and bias correction

Precipitation										
	TSS		RMSE		RSR		RSQUARE		PBIAS	
GCM	Before	After	Before	After	Before	After	Before	After	Before	After
EC-Earth3-CC	0.60	0.71	87.6	70.0	0.73	0.58	0.58	0.70	27%	0%
HadGEM3-GC31-LL	0.52	0.70	95.1	72.2	0.79	0.60	0.49	0.68	22%	0%
MPI-ESM1-2-HR	0.49	0.72	110.0	67.9	0.91	0.56	0.47	0.71	45%	0%
NorESM2-MM	0.47	0.71	127.9	70.2	1.06	0.58	0.52	0.70	41%	0%
Maximum temperature										
EC-Earth3-CC	0.89	0.97	7.5	2.3	0.53	0.16	0.89	0.97	-29%	0%
HadGEM3-GC31-LL	0.83	0.98	6.9	2.1	0.49	0.15	0.83	0.98	-18%	0%
MPI-ESM1-2-HR	0.88	0.98	7.0	2.1	0.50	0.15	0.88	0.98	-26%	0%
NorESM2-MM	0.85	0.98	6.3	2.0	0.45	0.14	0.86	0.98	-18%	0%
Minimum temperature										
EC-Earth3-CC	0.92	0.98	5.6	2.1	0.38	0.14	0.92	0.98	-67%	0%
HadGEM3-GC31-LL	0.86	0.98	5.8	2.0	0.39	0.14	0.87	0.98	-40%	0%
MPI-ESM1-2-HR	0.93	0.98	4.3	2.0	0.29	0.14	0.92	0.98	-23%	0%
NorESM2-MM	0.90	0.98	4.7	2.0	0.32	0.14	0.90	0.98	14%	0%

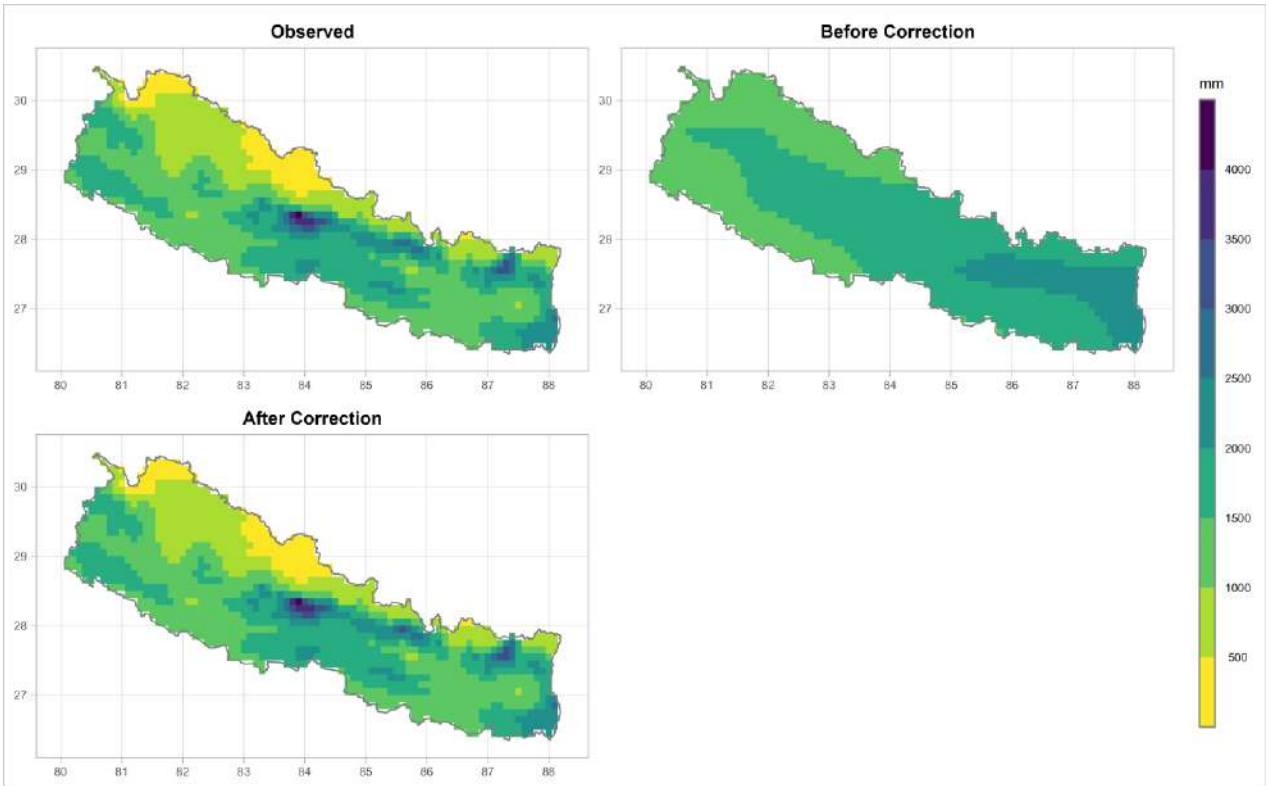

Figure 9: Comparison of observed and simulated average annual precipitation before and after downscaling. The "before" and "after" correction panels display the ensemble mean values

derived from the selected GCMs.

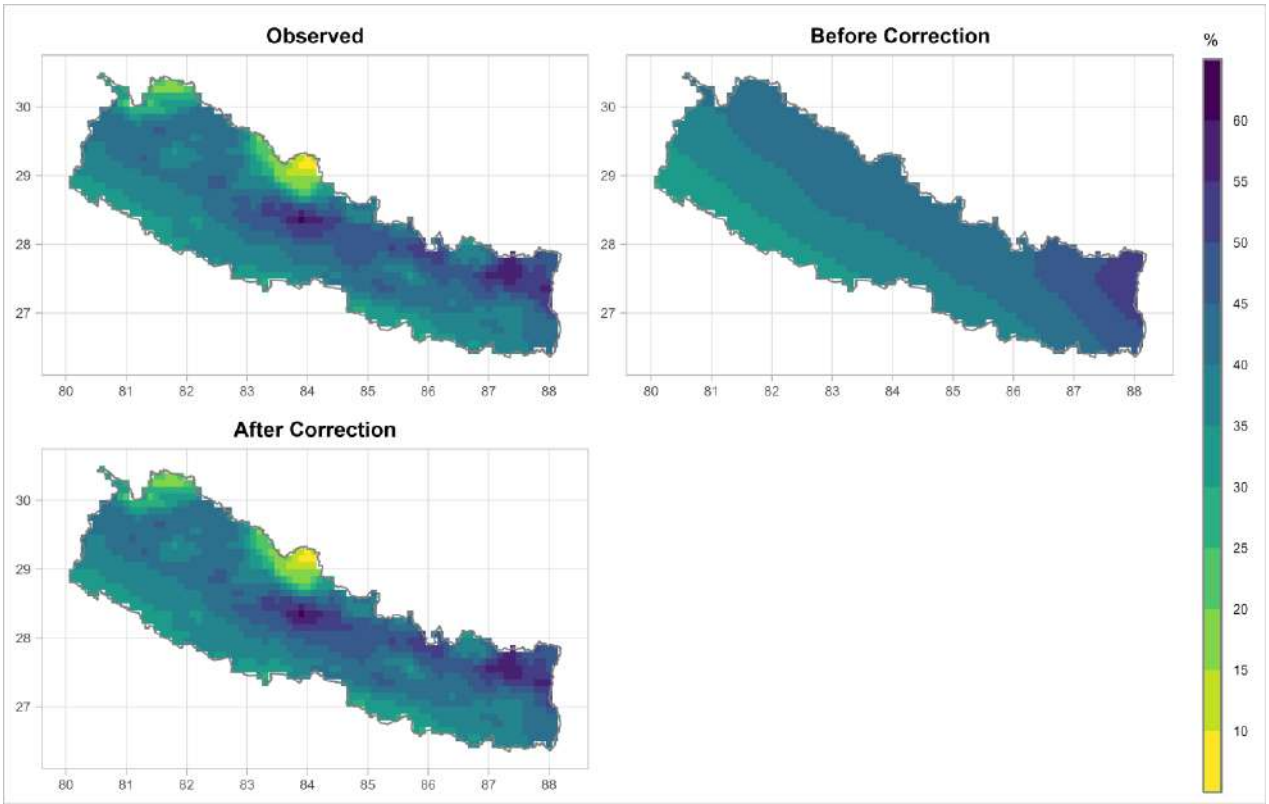

Figure 10: Comparison of rainy days (rainfall>=1mm in %) in observed and simulated data before and after downscaling. The "before" and "after" correction panels display the ensemble mean values derived from the selected GCMs.

The spatial distribution of variables shows no significant differences between the post-downscaling and observed annual values, as illustrated in Figure 9, Figure 11 and Figure 12. A similar result is observed for the number of rainy days, as shown in Figure 10. This consistency is due to the empirical quantile mapping technique, which maps zero values in the observed data to specific simulated values, which effectively acts as a threshold below which all days are classified as non-rainy, thereby maintaining the total count of rainy days. Between 1981 and 2010, approximately 40.1% of days across Nepal were rainy. Prior to downscaling, the ensemble average for rainy days was 40.7%. This value was adjusted to align with the observed data following the downscaling process.

Figure 13 illustrates the temporal variation in simulated variables before and after downscaling, compared to the observed values. Our analysis reveals a notable annual bias between observed and simulated variables, though the overall annual cycle pattern is somewhat preserved. Specifically, the raw simulations tend to overestimate monsoonal rainfall, exhibiting a higher degree of uncertainty, while temperature simulations show the opposite trend, capturing peak values more accurately than lower values. Nevertheless, post-downscaling, the simulated values align much more closely with the observed data across all temporal scales demonstrating the effectiveness of the downscaling process.

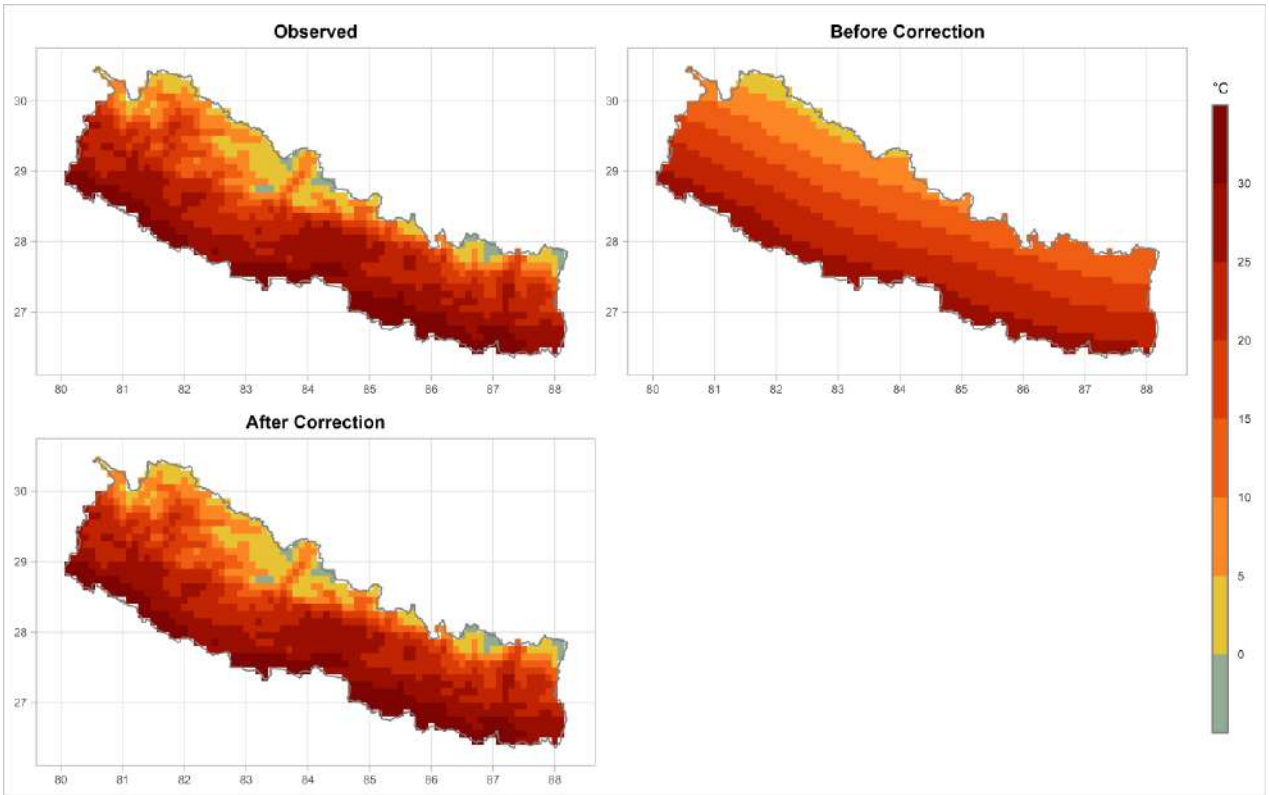

Figure 11: Comparison of observed and simulated average annual maximum temperature before and after downscaling. The "before" and "after" correction panels display the ensemble mean values derived from the selected GCMs.

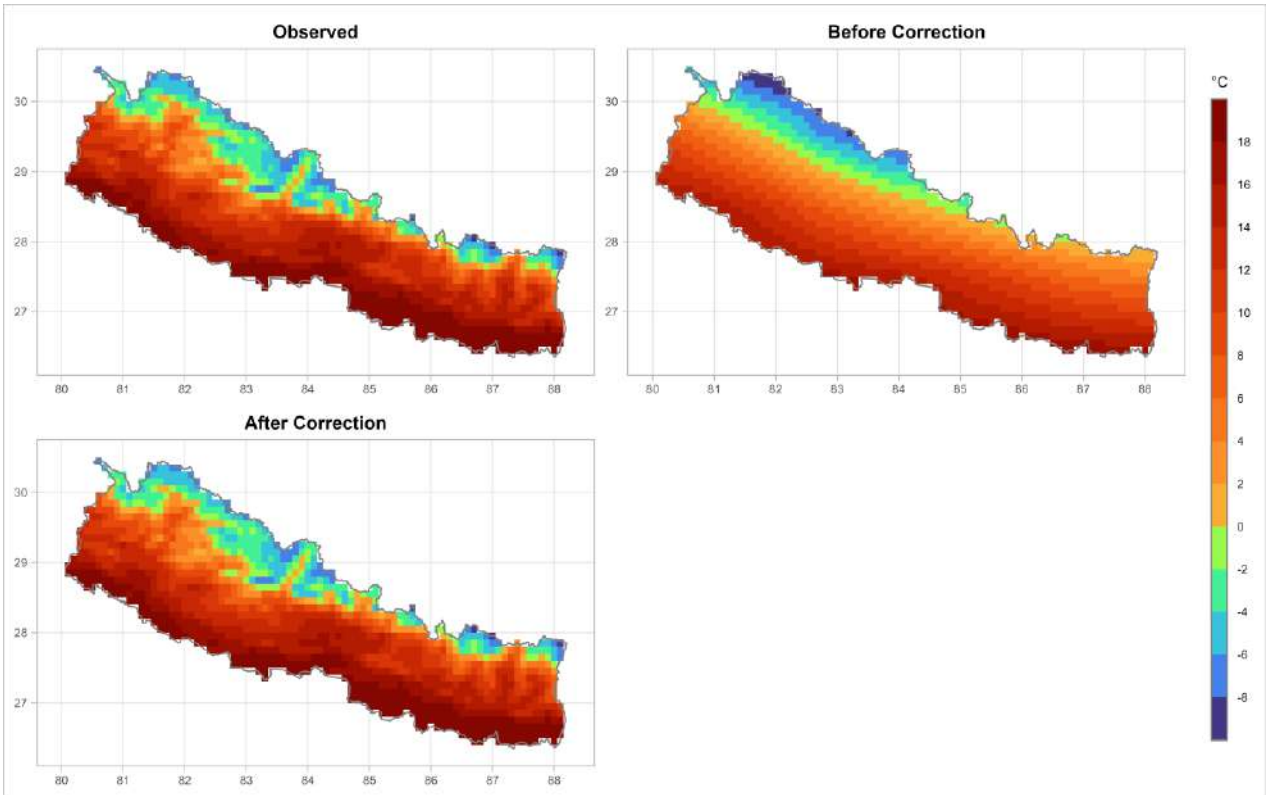

Figure 12: Comparison of observed and simulated average annual minimum temperature before and after downscaling. The "before" and "after" correction panels display the ensemble mean values derived from the selected GCMs.

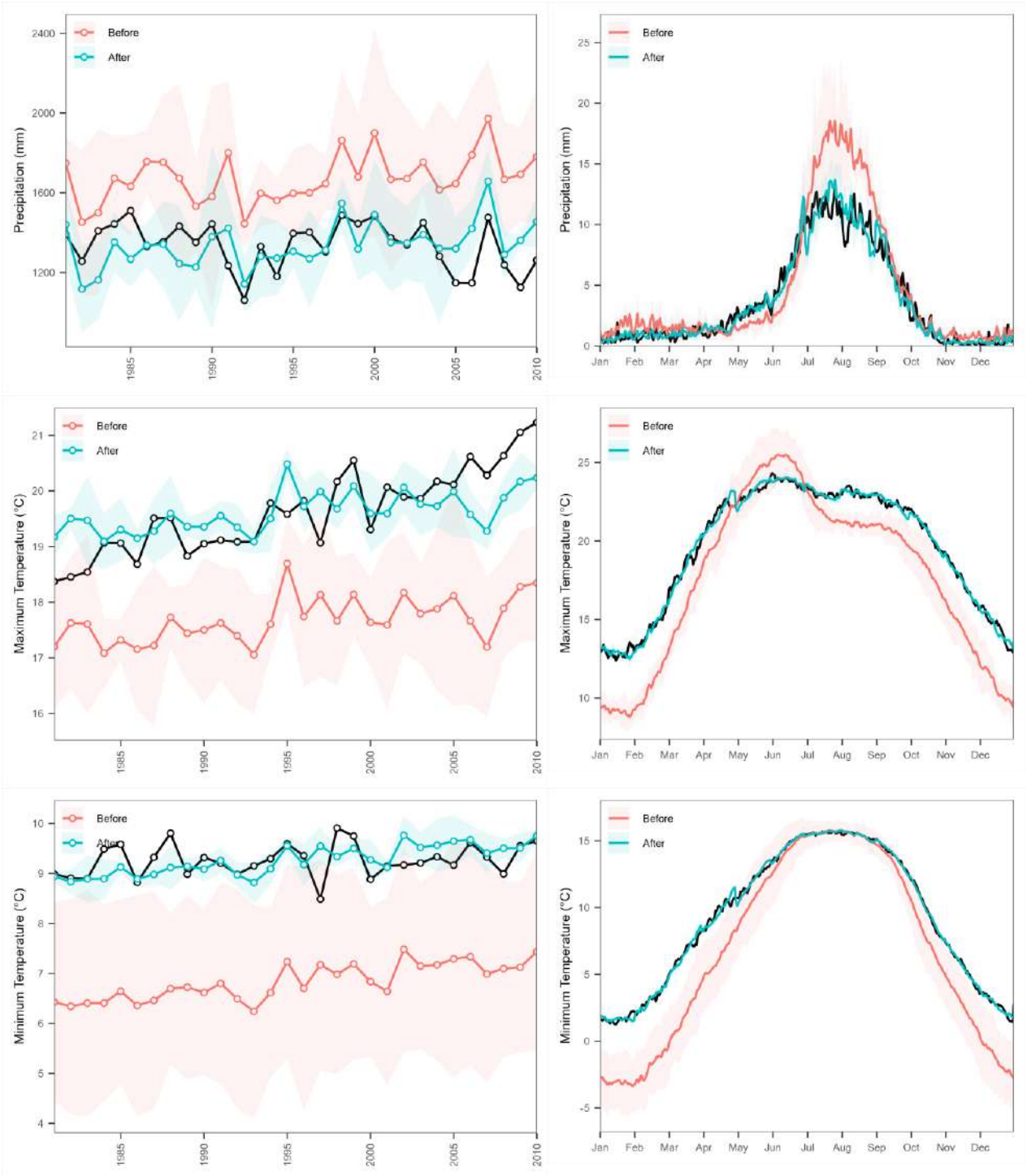

Figure 13: Temporal distribution of observed and GCMs' simulation before and after downscaling. The left panels illustrate annual timeseries of precipitation (top), maximum temperature (mid) and minimum temperature (bottom), whereas the right panels illustrate annual cycle. The black line represents the observed data whereas red and blue ribbons represent ± one standard deviation of GCM values from the ensemble mean.

6.4 Future climate scenarios

Future climate projections indicate that Nepal is expected to experience higher temperatures and increased precipitation in the coming years. Table 11 illustrates that average annual precipitation is projected to vary between 7% to 37% across the country compared to the baseline period (1981–2010), with spatial variations evident. According to Figure 14, annual precipitation is unlikely to exceed a 50% increase in any region of Nepal under the SSP2-4.5 scenario. However, drier regions such as the northern belt of Mustang and the tri-junction of Humla, Bajhang, and Darchula district could potentially experience up to a 110% increase in annual rainfall by the end of the century under the SSP5-8.5 scenario. It is important to interpret these figures cautiously, as even a slight increase in precipitation volume can significantly increase the percentage change. We found that until the 2050s, most parts of the country are likely to receive less than a 20% increase in precipitation compared to the baseline period under both scenarios. Examining temporal variations, dry season like winter is anticipated to become drier, while the wet season (monsoon) is expected to become much wetter, increasing the likelihood of extreme climatic events. Winter precipitation is projected to decrease by 11 to 16% by the end of the century, while monsoon precipitation is expected to increase by 16 to 43% (Table 11).

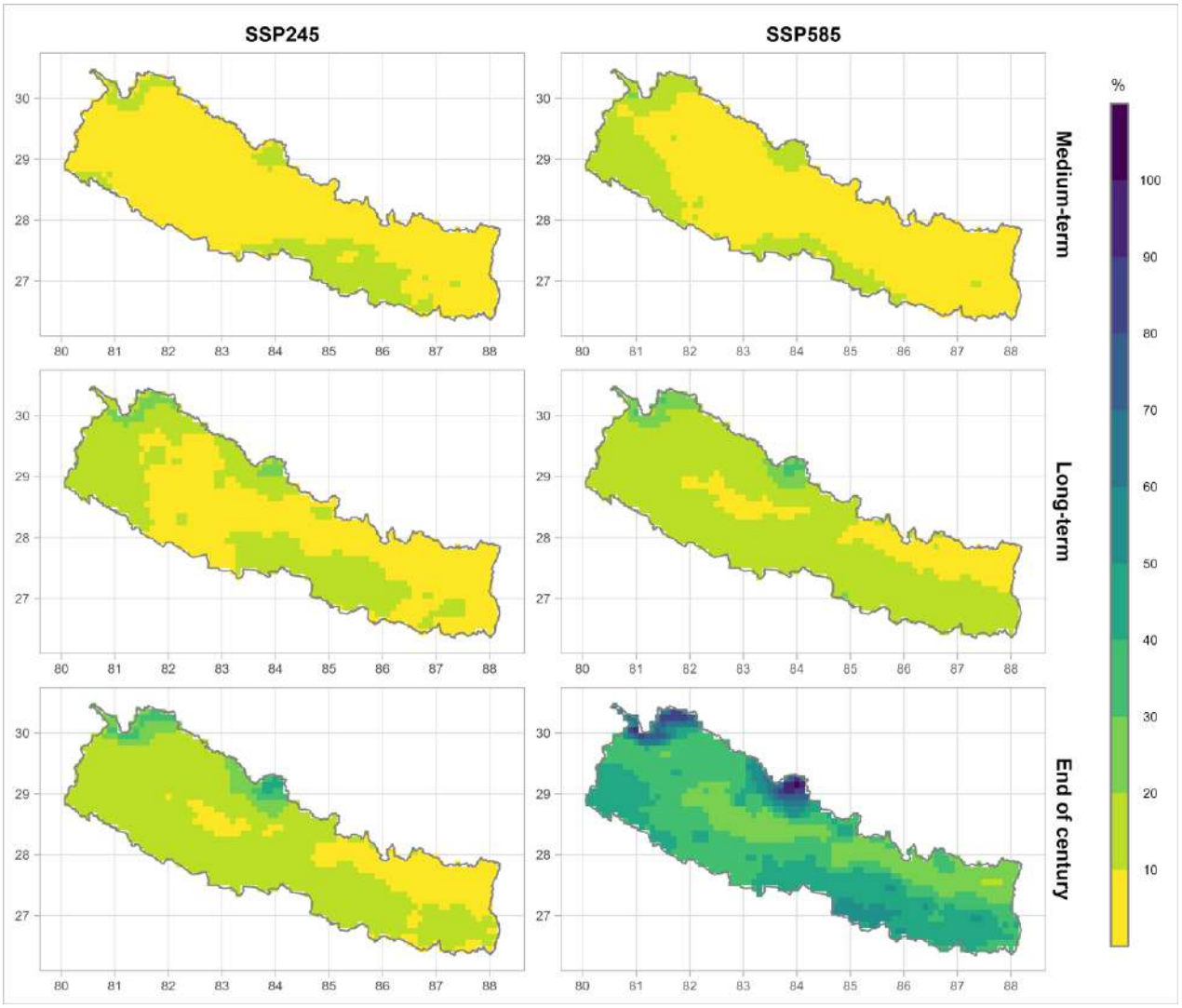

Figure 14: Spatiotemporal variation of projected change in annual precipitation (%) during medium-term, long-term and end of century compared to the baseline period (1981–2010). Results are ensemble average of selected four models with left panels representing SSP2-4.5, and the right panels representing SSP5-8.5 scenarios.

Nepal is anticipated to be hotter in future compared to the baseline period with an increase in average annual temperature between 2.4°C to 4.3°C. Both maximum and minimum temperatures are expected to rise, leading to an overall increase in mean temperature (Figure 15, Figure 16 and Figure 18). By the end of the century, most regions in Nepal are likely to experience a rise in mean temperature not more than 4.5°C under the SSP2-4.5 scenario, however under SSP5-8.5 scenario, some areas could see an increase up to 7°C. Until 2050s, the average annual mean temperature in the lower belts (except Himalayan regions) is anticipated to rise not more than 1.5°C (2°C) under SSP2-4.5 (SSP5-8.5) scenario. The High-Himalayan region is anticipated to be more severely affected than other regions.

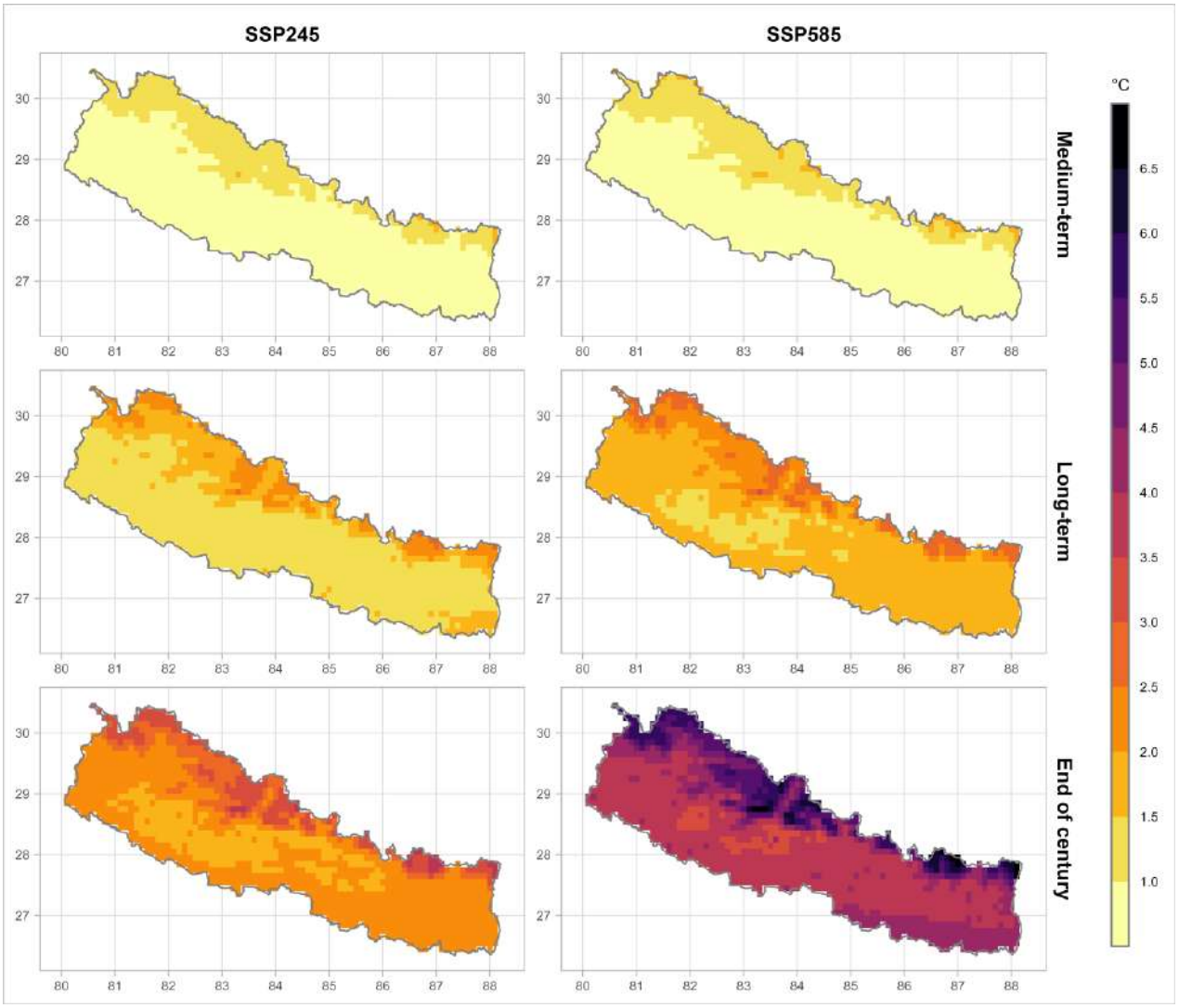

Figure 15: Spatiotemporal variation of projected change in average annual mean temperature (°C) during medium-term, long-term and end of century compared to the baseline period (1981–2010). Results are ensemble average of selected four models with left panels representing SSP2-4.5, and the right panels representing SSP5-8.5 scenarios.

The winter season is projected to experience the highest rise in temperature compared to other seasons, while the monsoon season is expected to see the smallest temperature rise. We found that the maximum temperature is likely to increase more than minimum temperature particularly in the winter season, indicating a positive change in diurnal temperature range (Table 11). Conversely, during the pre-monsoon and monsoon seasons, minimum temperatures are rising more than maximum temperatures, suggesting a negative change in diurnal temperature range. The seasonal change in variables across different future periods are illustrated in Appendix II.

Table 11: Seasonal change in average precipitation (%), mean, maximum and minimum temperature along with diurnal temperature range (°C) compared to the baseline period (1981-2010)

Precipitation		**% Change SSP245**			**% Change SSP585**		
Season	**1990s (mm)**	**2030s**	**2050s**	**2080s**	**2030s**	**2050s**	**2080s**
Winter	58	1%	-6%	-16%	-10%	-9%	-11%
Pre-Monsoon	170	7%	0%	5%	7%	10%	14%
Monsoon	1050	8%	13%	16%	9%	15%	43%
Post-monsoon	57	-8%	-7%	5%	2%	9%	43%
Annual	1336	7%	10%	13%	8%	13%	37%
Mean temperature		**Absolute Change SSP245**			**Absolute Change SSP585**		
Season	**1990s (°C)**	**2030s**	**2050s**	**2080s**	**2030s**	**2050s**	**2080s**
Winter	8	1.1	1.8	2.8	1.1	2.1	5.0
Pre-monsoon	15	0.8	1.6	2.3	1.0	1.8	4.4
Monsoon	19	0.8	1.4	2.1	0.8	1.7	3.5
Post-monsoon	13	0.8	1.4	2.3	0.9	1.8	4.4
Annual	14	0.9	1.6	2.4	0.9	1.8	4.3
Maximum temperature		**Absolute Change SSP245**			**Absolute Change SSP585**		
Season	**1990s (°C)**	**2030s**	**2050s**	**2080s**	**2030s**	**2050s**	**2080s**
Winter	14	1.2	2	3.2	1.2	2.4	5.5
Pre-Monsoon	21	0.7	1.5	2.2	0.8	1.6	4
Monsoon	23	0.7	1.2	1.9	0.6	1.4	3.1
Post-monsoon	19	0.8	1.4	2.3	0.8	1.8	4.4
Annual	20	0.9	1.6	2.4	0.9	1.8	4.2
Minimum temperature		**Absolute Change SSP245**			**Absolute Change SSP585**		
Season	**1990s (°C)**	**2030s**	**2050s**	**2080s**	**2030s**	**2050s**	**2080s**
Winter	3	1	1.5	2.3	0.9	1.8	4.4
Pre-Monsoon	9	0.9	1.6	2.4	1.1	2	4.7
Monsoon	15	0.9	1.5	2.2	1	1.9	3.9
Post-monsoon	8	0.8	1.4	2.3	0.9	1.8	4.3
Annual	9	0.9	1.5	2.3	0.9	1.8	4.3
Diurnal temperature range		**Absolute Change SSP245**			**Absolute Change SSP585**		
Season	**1990s (°C)**	**2030s**	**2050s**	**2080s**	**2030s**	**2050s**	**2080s**
Winter	11	0.2	0.5	0.9	0.3	0.6	1.1
Pre-monsoon	12	-0.2	-0.1	-0.2	-0.3	-0.4	-0.7
Monsoon	8	-0.2	-0.3	-0.3	-0.4	-0.5	-0.8
Post-monsoon	11	0.0	0.0	0.0	-0.1	0.0	0.1
Annual	10	0.0	0.1	0.1	0.0	0.0	-0.1

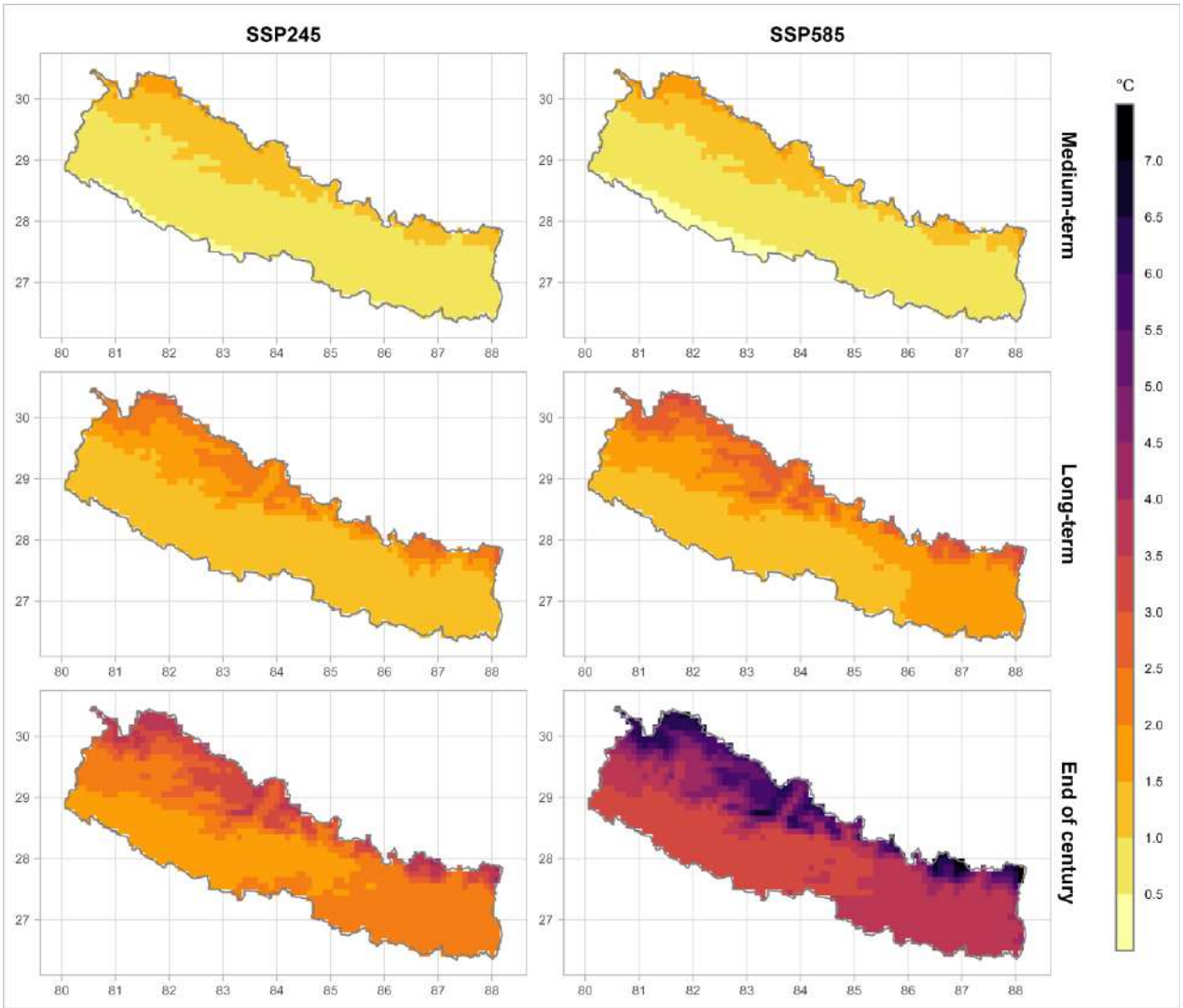

Figure 16: Spatiotemporal variation of projected change in average annual maximum temperature (°C) during medium-term, long-term and end of century compared to the baseline period (1981–2010). Results are ensemble average of selected four models with left panels representing SSP2-4.5, and the right panels representing SSP5-8.5 scenarios.

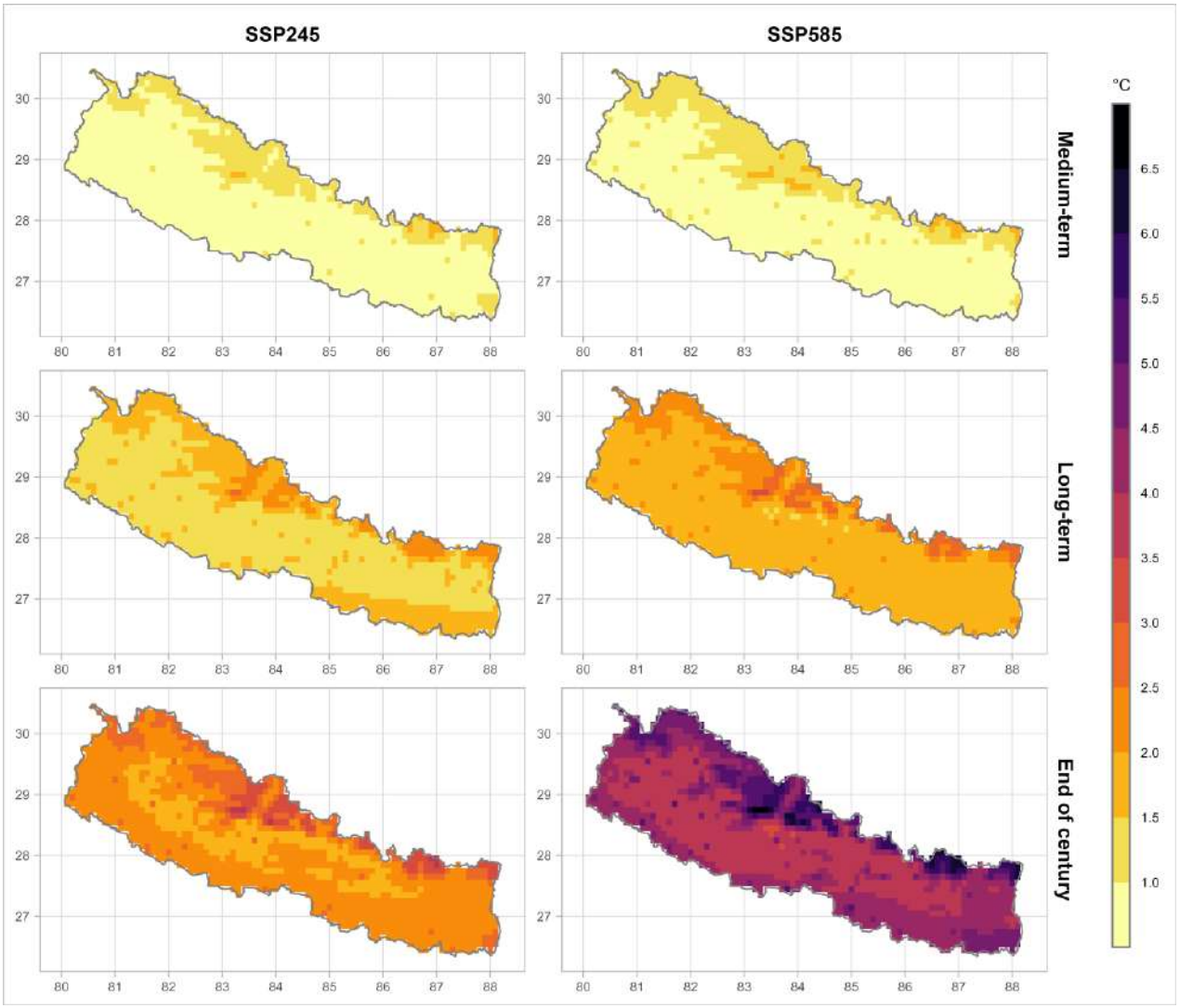

Figure 17: Spatiotemporal variation of projected change in average annual minimum temperature (°C) during medium-term, long-term and end of century compared to the baseline period (1981–2010). Results are ensemble average of selected four models with left panels representing SSP2-4.5, and the right panels representing SSP5-8.5 scenarios.

There was considerable spatial variation in diurnal temperature range suggesting differential rise in minimum and maximum temperature across regions (Figure 18 and **refer Appendix II for the seasonal diurnal temperature range**). The northern belt of Nepal is projected to experience an increase in DTR, implying a greater rise in maximum temperatures compared to minimum temperatures at higher altitudes. Conversely, the southern belt is expected to see a decrease in DTR, suggesting a larger increase in minimum temperatures relative to maximum temperatures at lower altitudes. In summary, maximum temperatures are anticipated to rise more significantly at higher altitudes, while minimum temperatures are expected to rise more at lower altitudes.

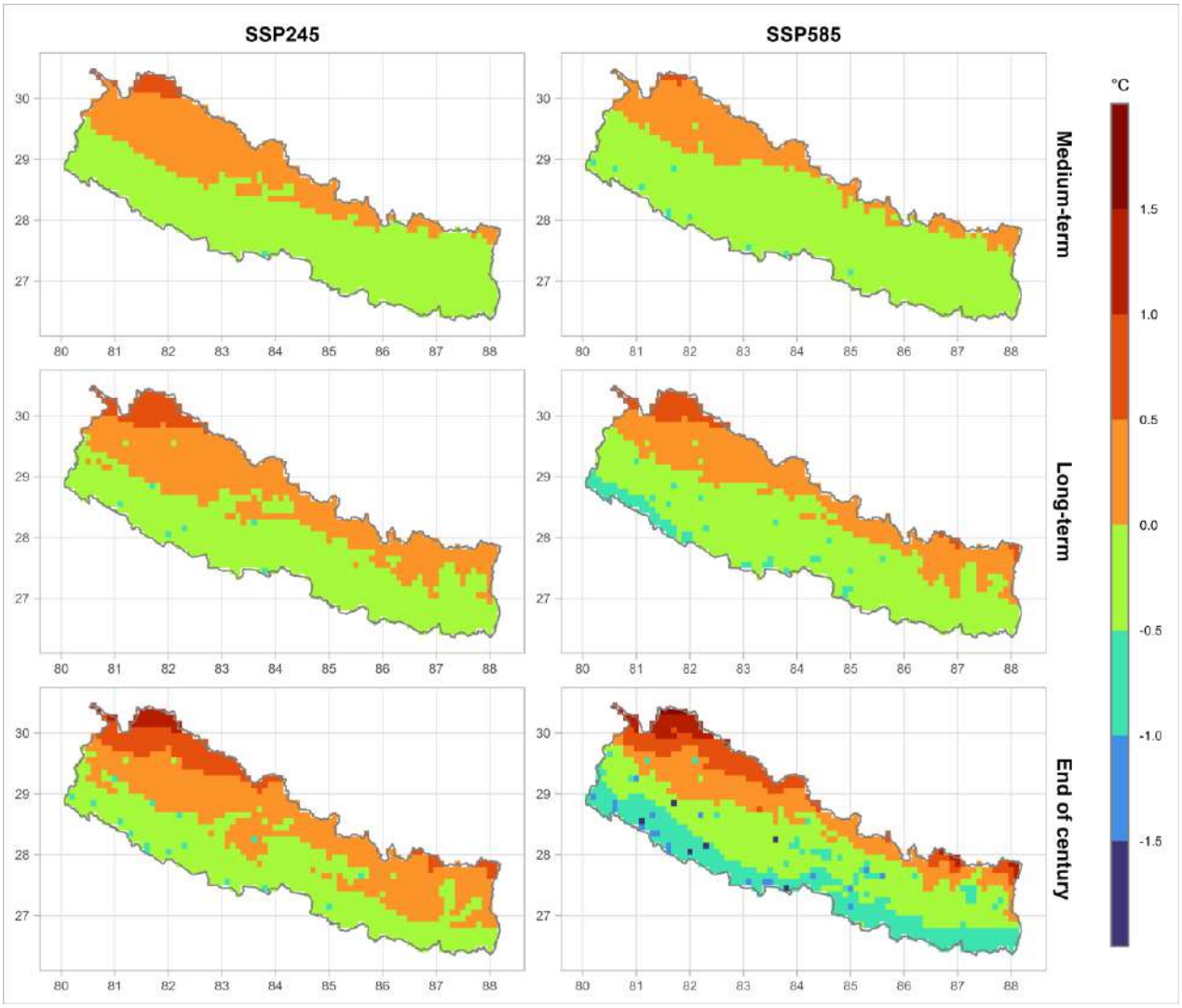

Figure 18: Spatiotemporal variation of projected change in average annual diurnal temperature (°C) during medium-term, long-term and end of century compared to the baseline period (1981–2010). Results are ensemble average of selected four models with left panels representing SSP2-4.5, and the right panels representing SSP5-8.5 scenarios.

The trend analysis of climate variables reveals a significant increasing trend in both maximum and minimum temperatures, whereas precipitation trends are generally not significant at the 95% confidence level. Table 12 displays the Sen's slope for Nepal and its physiographical divisions for precipitation, maximum and minimum temperatures highlighting the significant results under 95% confidence intervals. Precipitation trends are only significant at the end of the century under SSP2-4.5 and during the long term and end of the century under the SSP5-8.5 scenario. In contrast, annual minimum temperatures show a consistently significant increasing trend throughout the century under both scenarios. Maximum temperatures exhibit a similar trend, although the increase is not significant by the end of the century under the SSP2-4.5 scenario.

Table 12: Sen's slope for precipitation over national, physiographical divisions of Nepal for precipitation (mm/yr), maximum and minimum temperature (℃). Significant values are highlighted in color: light orange indicates an increasing trend, while light blue denotes a decreasing trend.

		SSP2-4.5			SSP5-8.5		
Regions	**Baseline**	**2030s**	**2050s**	**2080s**	**2030s**	**2050s**	**2080s**
Precipitation							
Nepal	5.97	2.97	1.34	6.03	0.44	8.98	11.62
High-Himalaya	1.85	1.63	2.46	2.58	0.97	4.57	7.01
High-Mountain	3.84	2.82	2.81	4.67	0.88	8.18	10.54
Mid-mountain	6.79	3.88	1.38	7.52	0.51	9.82	13.71
Siwalik	9.42	3.33	1.24	8.19	-2.49	12.57	13.07
Terai	9.03	2.21	0.58	8.64	-2.29	10.96	13.82
Maximum temperature							
Nepal	0.03	0.04	0.03	0.01	0.03	0.05	0.07
High-Himalaya	0.04	0.05	0.04	0.01	0.04	0.06	0.09
High-Mountain	0.03	0.03	0.03	0.01	0.03	0.04	0.06
Mid-mountain	0.02	0.03	0.03	0.01	0.03	0.04	0.06
Siwalik	0.02	0.03	0.03	0.01	0.02	0.04	0.06
Terai	0.01	0.03	0.04	0.01	0.02	0.05	0.06
Minimum temperature							
Nepal	0.03	0.03	0.03	0.01	0.03	0.05	0.07
High-Himalaya	0.04	0.04	0.03	0.02	0.04	0.06	0.08
High-Mountain	0.03	0.03	0.03	0.01	0.03	0.04	0.07
Mid-mountain	0.03	0.03	0.03	0.01	0.03	0.05	0.07
Siwalik	0.02	0.03	0.03	0.01	0.03	0.05	0.07
Terai	0.03	0.03	0.03	0.01	0.03	0.06	0.08

6.5 Uncertainty in climate projection

We found substantial model uncertainty in precipitation projection compared to maximum and minimum temperatures. This is characterized by an increase in absolute uncertainty (standard deviation) over time, accompanied by a decrease in relative uncertainty (coefficient of variation). For instance, under the SSP2-4.5 scenario, precipitation uncertainty rises from 115 mm in the medium term to 145 mm by the end of the century. Similar trends are noted under the SSP5-8.5 scenario, where higher absolute uncertainty (standard deviation) is accompanied by lower relative uncertainty (coefficient of variation) (see Table 13). In contrast, the uncertainty in temperature projections is considerably lower, ranging from 21% to 44%, with similar levels of uncertainty observed for both maximum and minimum temperatures.

Table 13: Model uncertainty in climate projection. Standard deviation represents absolute uncertainty across GCMs, while the coefficient of variation indicates relative uncertainty.

	Baseline	SSP2-4.5			SSP5-8.5		
Variable	**1980s**	**2030s**	**2050s**	**2080s**	**2030s**	**2050s**	**2080s**
Actual data							
Precipitation (mm)	1136	95	128	168	107	172	494
Maximum Temperature (℃)	19.6	0.9	1.6	2.4	0.9	1.8	4.2
Minimum Temperature (℃)	9.3	0.9	1.5	2.3	0.9	1.8	4.3
Standard Deviation							
Precipitation (mm)	0	115	116	145	122	110	282
Maximum Temperature (℃)	0	0.3	0.4	0.6	0.3	0.5	0.9
Minimum Temperature (℃)	0	0.3	0.4	0.5	0.4	0.5	0.9
Coefficient of Variation (COV) (%)							
Precipitation	0	120	91	86	114	64	57
Maximum Temperature	0	33	25	25	33	28	21
Minimum Temperature	0	33	27	22	44	28	21

Figure 19, illustrates the increasing thickness of the ribbon over time, represented by ±one standard deviation, which indicates a growing divergence in results among GCMs. Accompanied by excessive noises, precipitation projection exhibits significantly more variability compared to temperature data. Detailed measure of uncertainty across different regions of Nepal is provided in Appendix I.

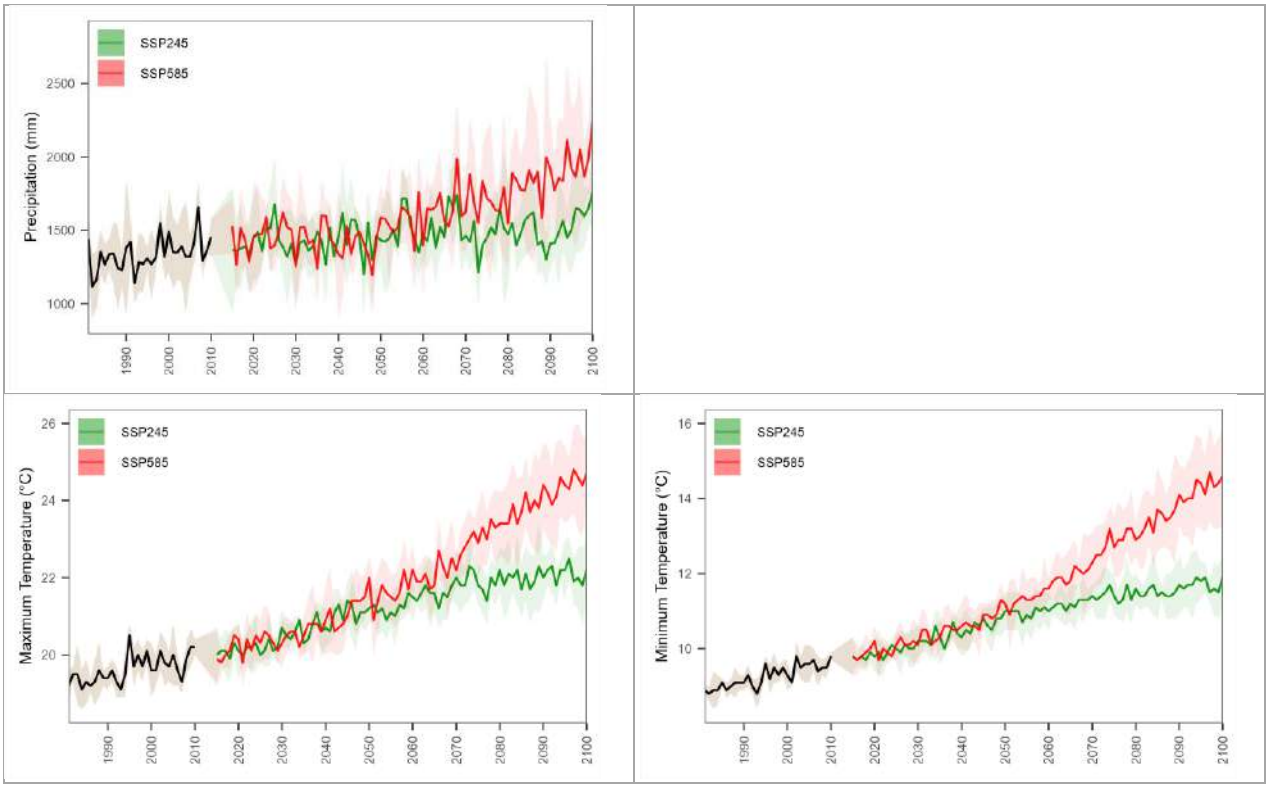

Figure 19: Timeseries of precipitation (top left), maximum temperature (bottom left) and minimum temperature (bottom right) during baseline (1981–2010) and future period (2015–2100). The black line represents the historical data while grey, red and green ribbons represent ± one standard deviation from the ensemble mean.

6.6 Climate extremes

This section examines extreme climatic conditions using twelve selected indices, with six indices each for precipitation and temperature. Table 14 illustrates the projected extreme indices nationwide with highlighted values suggesting significant positive (light orange) and negative (light blue) trends. The monthly maximum precipitation is projected to increase by 6 to 25 mm, while the number of rainy days is expected to remain relatively stable. Additionally, the volume of precipitation from very wet and extreme wet days is anticipated to rise, signaling an intensification of precipitation. Conversely, consecutive dry days are likely to increase, indicating longer dry spells. The trend in consecutive wet days is mixed, decreasing under the SSP2-4.5 scenario but increasing under the SSP5-8.5 scenario.

Table 14: Projected extreme indices over Nepal compared to the baseline period (1981–2010). Significant values are highlighted in color: light orange indicates an increasing trend, while light blue denotes a decreasing trend.

		SSP2-4.5			SSP5-8.5		
Indices	Baseline	2030s	2050s	2080s	2030s	2050s	2080s
Number of rainy days (R1mm, days)	172	172	172	172	174	174	177
Consecutive dry days (CDD, days)	51	56	58	58	59	57	57
Consecutive wet days (CWD, days)	95	94	96	91	100	98	98
Cold spell duration index (CSDI, days)	9	2	1	0	2	0	0
Warm spell duration index (WSDI, days)	12	41	85	154	44	111	268
Monthly maximum 1-day precipitation (Rx1day, mm)	39	45	48	52	45	51	64
Very wet days (R95ptot, mm)	244	333	378	429	344	412	729
Extreme wet days (R99ptot, mm)	68	120	158	198	130	180	415
Cold nights (TN10p, %)	10	3	1	0	3	1	0
Cold days (TX10p, %)	10	5	2	1	4	2	0
Warm nights (TN90p, %)	10	31	49	68	33	57	93
Warm days (TX90p, %)	10	22	36	53	22	41	79

Regarding temperature, a significant rise in warm spells is expected ranging from 12 to 154 days under SSP2-4.5, while cold spells are projected to decrease, from 9 to 0 days under the same scenario. The proportion of colder days and nights is anticipated to decrease, while warmer days and nights are expected to increase. In summary, future climate projections suggest an intensification of precipitation, longer dry and warm spells, and an increase in warm days and nights over Nepal.

Table 15 displays the projected Sen's slope for extreme indices nationwide. It highlights that most temperature extremes show significant trends, while only a few precipitation extremes, specifically monthly maximum 1-day precipitation, very wet and extreme wet days, exhibit significant trends under SSP5-8.5 scenario. Moreover, the cold spell duration index shows no significant trend at the end of century, as it has reached the extreme limit of zero.

Table 15: Sen's slope of extreme indices in Nepal. Significant values are highlighted in color: light orange indicates an increasing trend, while blue denotes a decreasing trend.

		SSP2-4.5			SSP5-8.5		
Indices	**Baseline**	**2030s**	**2050s**	**2080s**	**2030s**	**2050s**	**2080s**
Number of rainy days (R1mm, days)	0.11	-0.05	-0.03	0.20	0.07	0.14	0.23
Consecutive dry days (CDD, days)	0.26	0.48	-0.21	-0.24	0.20	0.13	-0.19
Consecutive wet days (CWD, days)	0.25	0.31	-0.10	0.20	0.00	0.12	-0.03
Cold spell duration index (CSDI, days)	-0.42	-0.11	0.00	0.00	-0.04	0.00	0.00
Warm spell duration index (WSDI, days)	0.39	1.77	2.57	0.82	1.78	3.77	3.01
Monthly maximum 1-day precipitation (Rx1day, mm)	0.13	-0.01	0.27	0.22	-0.08	0.46	0.62
Very wet days (R95ptot, mm)	3.39	3.59	1.21	3.07	-0.61	6.69	10.35
Extreme wet days (R99ptot, mm)	1.57	1.99	1.66	1.08	-1.39	5.52	9.73
Cold nights (TN10p, %)	-0.42	-0.12	-0.04	0.00	-0.09	-0.05	0.00
Cold days (TX10p, %)	-0.24	-0.16	-0.04	-0.01	-0.08	-0.09	-0.01
Warm nights (TN90p, %)	0.43	0.80	0.88	0.30	0.94	1.27	0.38
Warm days (TX90p, %)	0.26	0.66	0.67	0.16	0.62	1.01	0.66

7 CONCLUSION

Nepal's climate during baseline (1981 to 2010) demonstrated considerable spatiotemporal variation. Average annual precipitation across the country was approximately 1,336 mm, with high precipitation in Pokhara and northern Sankhuwasabha (over 4,000 mm) and much lower levels in Mustang, Dolpa, and northern Solukhumbu (under 500 mm). Most regions received around 1,500 mm, while the High-Himalayan region had notably less at 680 mm. Whereas, temperatures ranged from an average of 1.2°C in the High-Himalayan region to 24.7°C in the Terai, with the Terai reaching maximum temperature up to 30.5°C and the High-Himalayan region seeing minimum as low as -2.8°C. The diurnal temperature range for Nepal is observed between 0 to 10°C while the High-Himalayan region observed narrowest diurnal temperature range.

Model evaluations revealed that many CMIP6 GCMs overestimate precipitation during baseline period. Models from EC-Earth and the Met Office Hadley Centre performed better, while others, like FGOALS-g3, showed poor performance despite favorable PBIAS scores. Although various indicators were used to identify the best-performing models, the selection process was minimally affected by indicators such as PBIAS and RSQUARE. Furthermore, empirical quantile mapping proved effective in enhancing model performance and eliminating bias during downscaling.

Future projections indicate a 7% to 37% increase in average annual precipitation, with a potential increase up to 110% in drier regions by century's end under SSP5-8.5 scenario. Conversely, winter precipitation may decrease by 11% to 16%, while monsoon precipitation could rise by 16% to 43%. On the other hand, temperature is projected to increase by 2.4°C to 4.3°C by the end of the century, with the High-Himalayan region experiencing the most significant warming. Winter will see the largest temperature rise, while the monsoon will experience the smallest increase. Maximum temperatures are expected to rise more than minimum temperatures in winter, with the trend reversing during pre-monsoon and monsoon seasons.

Future climate projections for Nepal predict an intensification of precipitation, characterized by increased monthly maximum precipitation and greater volumes of very wet and extreme wet days, while the number of rainy days is expected to remain relatively stable. Concurrently, longer dry and warm spells are anticipated, with a decrease in the proportion of colder days and nights and an increase in warmer days and nights.

at summary, Nepal is projected to experience a notable intensification of precipitation, with increases in maximum and minimum temperatures. The variability in precipitation projections and the higher model uncertainty highlight the need for cautious interpretation and ongoing refinement of climate projections.

FINAL REPORT ANNEXURE

Update of Climate Change Study of Nepal
(RFP No.: DHM/CD/C/RFP/04-2080/81)

AUGUST 2024

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8 PROJECT SUMMARY

During 2011–2020, the global surface temperature has increased by 1.1°C compared to 1850–1900; indisputably due to anthropogenic activities, primarily through greenhouse gas (GHG) emissions[24]. This is commonly referred to as global warming, a component of climate change characterized by shifts in climate patterns and the occurrence of extreme weather events such as heavy rainfall, glacier lake flood outbursts (GLOFs), intense storms, heatwaves, and devastating wildfires. Climate change poses a persistent global challenge with far-reaching environmental, social, and economic consequences.

Nepal, situated within the intricate Himalayan landscape, ranks among the world's most vulnerable nations to the threats posed by climate change. The Government of Nepal has taken steps to mitigate these threats, focusing on assisting vulnerable communities in adapting to the impacts of climate change[25]. Effective adaptation measures must rest on a foundation of observed evidence, grounded in scientific principles, and validated across the space and time of interest. This can be only fulfilled through 1) comprehensive investigation of historical climate utilizing latest data, 2) downscaling coarse resolution climate data to high-resolution sufficient to capture the regional climate and projecting future climate until period of interest and 3) synthesizing the results in concise, convenient, and comprehensible format to a broad audience.

Acknowledging the pivotal role of the Department of Hydrology and Meteorology (DHM) in addressing climate hazards and related challenges in collaboration with the National Adaptation Plan (NAP) and various government agencies spanning agriculture and disaster management sectors, and recognizing the regulatory mandate stipulated in the "Environment Protection Regulation-2077" which requires the periodic updates on Nepal's climate change status, a contract agreement was signed between DHM and RITI Consultancy Pvt. Ltd. in Feb, 2024 for the updating of climate change assessment in Nepal hereafter known as project entitled: “Update of Climate Change Study of Nepal”.

The objectives of the project were as follows:

- To evaluate the performance of the Couple Model Intercomparison Project Phase 6 (CMIP6) Simulation for Nepal.
- To downscale CMIP6 projection data for Nepal.
- To prepare a report on future climate change over Nepal under different climate change scenarios for different periods.

The scope of the project was to:

- Assess the performance of at least 20 Global Climate Models (GCMs) of Couple Model Intercomparison Project phase 6 (CMIP6) to simulate historical observation during 1981–2010 using reference data provided/recommended by DHM.
  - Undertake review of available literature, reports and documents.
  - Interpolate monthly data (Precipitation and mean temperature) of climate models at of reference dataset recommended by DHM for Nepal during historical period.

[24] IPCC, 2023: Sections. In: Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, H. Lee and J. Romero (eds.)]. IPCC, Geneva, Switzerland, pp. 35-115, doi: 10.59327/IPCC/AR6-9789291691647

[25] DHM, 2017. Observed Climate Trend Analysis in the Districts and Physiographic Regions of Nepal (1971-2014). Department of Hydrology and Meteorology, Kathmandu

- Skill assessment of historical simulations of GCMs based on reference dataset for Nepal.
- Select four best performing models for Nepal based on the skill scores.

- Downscale daily precipitation, maximum and minimum temperature data from the four best performing models statistically for historical (1981–2010) and future period (2021–2100 and under two scenarios known as Shared Socioeconomic Pathways (SSPs): SSP2-4.5 and SSP5-8.5) at 0.25°×0.25° spatial resolution covering whole Nepal.
- Perform following analysis of precipitation and temperature of downscaled model's and their ensemble mean for future three tri-decadal periods (2016–2045, 2036–2065, 2071–2100) under two socioeconomic scenarios: SSP2-4.5 and SSP5-8.5) at national, provincial and district level; and physiographic level.
  - Spatial and temporal analysis (mean and spread) of the best performing models' simulation and their ensemble data.
  - Trend analysis of reference dataset, individual model's simulations and their ensemble data (monthly, seasonal and annual) including long-term period (2021- 2100) at national level.
  - Extreme indices analysis.
  - Trend analysis of extreme indices.
- Prepare manual for data analysis and visualization including codes used for analysis.
- Provide tools/programme used in the data analysis in digital format.
- Provide all the datasets used in the study in digital format.

9 ANNEX I: TABLES

Table 9.1: Effects of indicators under consideration on model selection

Case 0: Inclusion of all indicators				Case 1: Omission of PBIAS				Case 2: Omission of PBIAS & RSQUARE			
Score	GCMs	Wt. score	GCMs	Score	GCMs	Wt. score	GCMs	Score	GCMs	Wt. score	GCMs
0.131	HadGEM3-GC31-MM	0.146	HadGEM3-GC31-MM	0.151	HadGEM3-GC31-MM	0.172	EC-Earth3-CC	0.177	HadGEM3-GC31-MM	0.193	HadGEM3-GC31-MM
0.137	EC-Earth3-CC	0.151	EC-Earth3-CC	0.151	EC-Earth3-CC	0.173	HadGEM3-GC31-MM	0.179	EC-Earth3-CC	0.195	EC-Earth3-CC
0.138	EC-Earth3-Veg	0.152	EC-Earth3-Veg	0.153	EC-Earth3-Veg	0.173	EC-Earth3-AerChem	0.182	EC-Earth3-Veg	0.199	EC-Earth3-Veg
0.139	EC-Earth3	0.153	EC-Earth3-AerChem	0.153	EC-Earth3-AerChem	0.174	EC-Earth3-Veg	0.184	EC-Earth3-AerChem	0.200	EC-Earth3-AerChem
0.140	EC-Earth3-AerChem	0.154	EC-Earth3	0.156	EC-Earth3	0.177	EC-Earth3	0.186	EC-Earth3	0.202	EC-Earth3
0.141	UKESM1-0-LL	0.157	HadGEM3-GC31-LL	0.163	MPI-ESM1-2-HR	0.188	HadGEM3-GC31-LL	0.189	MPI-ESM1-2-HR	0.207	HadGEM3-GC31-LL
0.142	HadGEM3-GC31-LL	0.160	UKESM1-0-LL	0.166	HadGEM3-GC31-LL	0.190	MPI-ESM1-2-HR	0.190	UKESM1-0-LL	0.209	MPI-ESM1-2-HR
0.144	MPI-ESM1-2-HR	0.161	NorESM2-MM	0.169	NorESM2-MM	0.192	NorESM2-MM	0.190	HadGEM3-GC31-LL	0.211	UKESM1-0-LL
0.144	NorESM2-MM	0.163	MPI-ESM1-2-HR	0.170	UKESM1-0-LL	0.198	UKESM1-0-LL	0.195	ACCESS-CM2	0.218	ACCESS-CM2
0.146	ACCESS-CM2	0.168	ACCESS-CM2	0.172	SAM0-UNICON	0.198	SAM0-UNICON	0.201	NorESM2-MM	0.220	NorESM2-MM
0.151	MRI-ESM2-0	0.170	SAM0-UNICON	0.175	ACCESS-CM2	0.199	INM-CM4-8	0.201	SAM0-UNICON	0.221	SAM0-UNICON
0.151	SAM0-UNICON	0.172	KACE-1-0-G	0.175	GFDL-ESM4	0.203	GFDL-ESM4	0.202	MRI-ESM2-0	0.221	INM-CM4-8
0.152	KACE-1-0-G	0.172	NorESM2-LM	0.178	MRI-ESM2-0	0.205	MPI-ESM1-2-LR	0.204	GFDL-ESM4	0.225	GFDL-ESM4
0.153	GFDL-ESM4	0.172	GFDL-ESM4	0.179	INM-CM4-8	0.206	ACCESS-CM2	0.206	INM-CM4-8	0.226	MPI-ESM1-2-LR
0.155	NorESM2-LM	0.174	INM-CM4-8	0.180	MPI-ESM1-2-LR	0.208	INM-CM5-0	0.207	MPI-ESM1-2-LR	0.227	MRI-ESM2-0
0.159	INM-CM4-8	0.174	MRI-ESM2-0	0.186	E3SM-2-0-NARRM	0.211	E3SM-2-0-NARRM	0.214	NorESM2-LM	0.232	NorESM2-LM
0.159	MPI-ESM1-2-LR	0.177	MPI-ESM1-2-LR	0.187	INM-CM5-0	0.212	MRI-ESM2-0	0.214	KACE-1-0-G	0.234	MIROC6
0.160	MIROC6	0.179	MIROC6	0.188	FGOALS-f3-L	0.213	NESM3	0.215	FGOALS-f3-L	0.235	E3SM-2-0-NARRM
0.161	FGOALS-f3-L	0.180	INM-CM5-0	0.189	MIROC6	0.213	MIROC6	0.216	MIROC6	0.235	INM-CM5-0
0.164	INM-CM5-0	0.184	E3SM-2-0-NARRM	0.189	NESM3	0.214	NorESM2-LM	0.216	E3SM-2-0-NARRM	0.236	KACE-1-0-G
0.165	KIOST-ESM	0.184	FGOALS-f3-L	0.190	NorESM2-LM	0.215	TaiESM1	0.216	CMCC-CM2-SR5	0.239	FGOALS-f3-L
0.166	E3SM-2-0-NARRM	0.185	KIOST-ESM	0.190	E3SM-2-0	0.217	E3SM-2-0	0.218	INM-CM5-0	0.242	E3SM-2-0
0.166	CMCC-CM2-SR5	0.188	E3SM-2-0	0.191	KACE-1-0-G	0.219	KACE-1-0-G	0.221	E3SM-2-0	0.243	NESM3
0.169	E3SM-2-0	0.191	NESM3	0.191	TaiESM1	0.222	FGOALS-f3-L	0.224	NESM3	0.245	IITM-ESM
0.172	CNRM-ESM2-1	0.191	TaiESM1	0.196	IITM-ESM	0.225	IITM-ESM	0.224	IITM-ESM	0.247	KIOST-ESM
0.172	TaiESM1	0.194	BCC-CSM2-MR	0.197	CMCC-CM2-SR5	0.226	E3SM-1-0	0.225	KIOST-ESM	0.251	CMCC-CM2-SR5
0.173	NESM3	0.195	CNRM-ESM2-1	0.198	KIOST-ESM	0.227	KIOST-ESM	0.230	CNRM-ESM2-1	0.254	TaiESM1
0.175	IITM-ESM	0.196	IITM-ESM	0.200	CNRM-ESM2-1	0.229	BCC-CSM2-MR	0.234	CNRM-CM6-1	0.254	CNRM-ESM2-1
0.176	CNRM-CM6-1	0.198	CNRM-CM6-1	0.200	E3SM-1-0	0.234	CNRM-ESM2-1	0.234	TaiESM1	0.258	CNRM-CM6-1
0.176	BCC-CSM2-MR	0.199	CMCC-CM2-SR5	0.203	CNRM-CM6-1	0.236	CNRM-CM6-1	0.241	ACCESS-ESM1-5	0.266	E3SM-1-0
0.178	CMCC-ESM2	0.203	E3SM-1-0	0.204	BCC-CSM2-MR	0.242	IPSL-CM6A-LR	0.243	E3SM-1-0	0.267	BCC-CSM2-MR
0.182	ACCESS-ESM1-5	0.206	CNRM-CM6-1-HR	0.208	IPSL-CM6A-LR	0.242	CMCC-CM2-SR5	0.245	CMCC-ESM2	0.269	IPSL-CM6A-LR
0.184	E3SM-1-0	0.207	IPSL-CM6A-LR	0.214	CMCC-ESM2	0.243	CNRM-CM6-1-HR	0.245	IPSL-CM6A-LR	0.275	ACCESS-ESM1-5
0.185	IPSL-CM6A-LR	0.210	GFDL-CM4	0.214	ACCESS-ESM1-5	0.251	GFDL-CM4	0.246	BCC-CSM2-MR	0.279	CMCC-ESM2
0.188	CNRM-CM6-1-HR	0.211	CMCC-ESM2	0.215	CNRM-CM6-1-HR	0.256	ACCESS-ESM1-5	0.264	CNRM-CM6-1-HR	0.287	CNRM-CM6-1-HR
0.191	GFDL-CM4	0.212	ACCESS-ESM1-5	0.223	GFDL-CM4	0.257	CMCC-ESM2	0.277	GFDL-CM4	0.301	GFDL-CM4
0.249	FGOALS-g3	0.256	FGOALS-g3	0.300	FGOALS-g3	0.314	FGOALS-g3	0.336	FGOALS-g3	0.345	FGOALS-g3

Table 9.2: EC-Earth System Model's configuration. IFS: Atmosphere, NEMO: Ocean, LPJ-GUESS: Vegetation, TM5: Atmospheric chemistry, PISCES: Marine biogeochemistry, PISM: Land ice.

Configuration	IFS	NEMO	LPJ-GUESS	TM5	PISCES	PISM	CMIP6 MIP participation
EC-Earth3	✓	✓					CMIP, DCPP, LS3MIP, PAMIP, RFMIP, ScenarioMIP, VolMIP, CORDEX, DynVarMIP, SIMIP, VIACSAB
EC-Earth3-LR	✓	✓					CMIP, PMIP
EC-Earth3-Veg	✓	✓	✓				CDRMIP, CMIP, LUMIP, LS3MIP, ScenarioMIP
EC-Earth3-Veg-LR	✓	✓	✓				CMIP, PMIP, ScenarioMIP
EC-Earth3-AerChem	✓	✓		✓			AerChemMIP, CMIP, RFMIP
EC-Earth3-CC	✓	✓	✓	✓	✓		C4MIP, DCPP, CDRMIP, CMIP, LUMIP, OMIP, ScenarioMIP
EC-Earth3-GrisIS	✓	✓				✓	CMIP, ISMIP6, PMIP
EC-Earth3-HR	✓	✓					CMIP, DCPP, HighResMIP

Table 9.3: Change in future seasonal precipitation (%) compared to the baseline period (1981-2010) within the physiographical divisions of Nepal

Physiography	Baseline (mm)	SSP245			SSP585		
		2030s	2050s	2080s	2030s	2050s	2080s
High-Himalaya							
Winter	51	1	-1	-6	-4	-3	-3
Pre-Monsoon	107	7	3	9	6	12	12
Monsoon	486	34	69	94	45	76	229
Post-monsoon	36	-4	-3	1	1	2	16
Annual	680	38	68	98	48	86	254
High-Mountain							
Winter	75	0	-4	-11	-7	-7	-8
Pre-Monsoon	200	11	3	11	14	20	23
Monsoon	1104	63	114	141	78	125	370
Post-monsoon	62	-7	-4	1	0	1	25
Annual	1441	67	108	142	85	139	409
Mid-mountain							
Winter	62	1	-4	-11	-7	-6	-8
Pre-Monsoon	213	14	0	9	16	20	31
Monsoon	1241	102	158	192	114	182	528
Post-monsoon	61	-5	-4	3	1	6	27
Annual	1577	112	149	193	124	202	578
Siwalik							
Winter	55	2	-5	-11	-6	-5	-7
Pre-Monsoon	163	13	-3	6	13	17	29
Monsoon	1329	137	188	232	148	222	629
Post-monsoon	67	-6	-6	4	1	6	29
Annual	1613	146	175	231	157	241	680
Terai							
Winter	44	2	-4	-9	-4	-4	-6
Pre-Monsoon	150	12	-5	2	10	12	30
Monsoon	1286	143	181	217	148	223	629
Post-monsoon	68	-3	-4	8	3	13	30
Annual	1548	154	168	217	157	244	682

Table 9.4: Absolute uncertainty (standard deviation) in projected change in future seasonal precipitation (mm) compared to the baseline period (1981-2010) within the physiographical divisions of Nepal

	Baseline	SSP245			SSP585		
Physiography	(mm)	2030s	2050s	2080s	2030s	2050s	2080s
High-Himalaya							
Winter	51	6	9	7	6	3	4
Pre-Monsoon	107	12	12	11	3	8	16
Monsoon	486	34	43	69	58	54	129
Post-monsoon	36	4	2	6	7	7	5
Annual	680	45	53	82	58	66	142
High-Mountain							
Winter	75	8	13	9	10	5	8
Pre-Monsoon	200	21	19	17	12	5	29
Monsoon	1104	75	84	114	113	98	214
Post-monsoon	62	5	6	11	9	11	8
Annual	1441	95	98	133	105	106	241
Mid-mountain							
Winter	62	10	14	9	9	7	9
Pre-Monsoon	213	23	20	18	21	10	37
Monsoon	1241	109	117	151	155	128	304
Post-monsoon	61	6	8	16	13	14	11
Annual	1577	135	132	168	138	128	341
Siwalik							
Winter	55	10	14	9	10	9	10
Pre-Monsoon	163	19	15	14	21	11	33
Monsoon	1329	137	142	163	187	141	336
Post-monsoon	67	9	9	23	12	17	16
Annual	1613	160	155	175	170	138	371
Terai							
Winter	44	9	12	8	9	9	8
Pre-Monsoon	150	19	13	17	18	13	40
Monsoon	1286	155	167	180	188	132	349
Post-monsoon	68	11	12	27	16	19	19
Annual	1548	178	182	192	176	130	391

Table 9.5: Change in future seasonal precipitation (%) compared to the baseline period (1981-2010) within the provinces of Nepal

Basins	Baseline (mm)	SSP245			SSP585		
		2030s	2050s	2080s	2030s	2050s	2080s
Winter							
Bagmati	46	0	-5	-11	-8	-7	-8
Gandaki	58	-2	-5	-11	-8	-6	-8
Karnali	68	1	-2	-8	-5	-4	-4
Koshi	38	1	-4	-9	-6	-7	-9
Lumbini	58	0	-6	-12	-7	-4	-7
Madhesh	31	2	-3	-8	-5	-4	-6
Sudurpaschim	97	5	0	-9	-2	-4	-4
Pre-Monsoon							
Bagmati	201	12	-4	1	13	12	24
Gandaki	198	13	3	15	14	19	25
Karnali	114	8	4	12	8	18	15
Koshi	235	10	-7	-4	13	6	28
Lumbini	132	11	-2	10	12	19	24
Madhesh	159	14	-6	-3	10	8	26
Sudurpaschim	153	15	10	20	15	32	33
Monsoon							
Bagmati	1289	118	154	180	99	178	540
Gandaki	1112	83	134	175	96	163	439
Karnali	615	43	91	120	67	95	277
Koshi	1195	92	119	134	71	145	476
Lumbini	1205	102	153	205	132	186	494
Madhesh	1149	148	167	184	128	215	631
Sudurpaschim	1043	87	170	214	146	179	493
Post-monsoon							
Bagmati	64	-3	-1	4	3	10	27
Gandaki	57	-6	-5	2	1	4	23
Karnali	40	-7	-7	-1	-2	-3	17
Koshi	76	1	5	11	6	19	26
Lumbini	57	-9	-10	0	-2	-1	24
Madhesh	64	0	-2	8	5	18	25
Sudurpaschim	48	-7	-8	-1	-3	-5	34
Annual							
Bagmati	1600	127	145	175	108	194	583
Gandaki	1425	88	128	181	104	180	479
Karnali	837	45	86	123	68	106	305
Koshi	1543	104	113	132	84	164	522
Lumbini	1451	104	135	204	135	199	534
Madhesh	1403	163	156	181	139	237	675
Sudurpaschim	1340	100	172	223	156	202	556

Table 9.6: Absolute uncertainty (standard deviation) in projected change in future seasonal precipitation (mm) compared to the baseline period (1981-2010) within the provinces of Nepal

	Baseline	SSP245			SSP585		
Provinces	(mm)	2030s	2050s	2080s	2030s	2050s	2080s
Winter							
Bagmati	46	10	12	8	7	6	8
Gandaki	58	9	10	9	7	5	5
Karnali	68	7	13	9	9	5	6
Koshi	38	8	10	7	7	6	7
Lumbini	58	12	13	11	9	9	10
Madhesh	31	8	11	5	7	6	6
Sudurpaschim	97	11	19	14	14	10	12
Pre-Monsoon							
Bagmati	201	19	16	16	28	22	38
Gandaki	198	21	21	20	17	11	30
Karnali	114	15	16	17	5	14	21
Koshi	235	23	16	26	21	22	45
Lumbini	132	17	15	10	15	3	24
Madhesh	159	17	12	18	27	23	37
Sudurpaschim	153	22	23	27	11	22	37
Monsoon							
Bagmati	1289	135	121	183	138	130	362
Gandaki	1112	82	84	116	126	106	227
Karnali	615	38	50	67	81	66	123
Koshi	1195	125	137	189	127	98	350
Lumbini	1205	99	107	91	182	125	227
Madhesh	1149	195	171	207	158	124	392
Sudurpaschim	1043	74	123	122	163	140	238
Post-monsoon							
Bagmati	64	15	13	18	15	14	19
Gandaki	57	3	5	9	10	11	9
Karnali	40	8	3	10	5	9	7
Koshi	76	12	19	20	20	17	12
Lumbini	57	5	5	17	7	14	14
Madhesh	64	18	16	29	19	19	20
Sudurpaschim	48	15	9	18	11	14	22
Annual							
Bagmati	1600	167	132	192	115	121	409
Gandaki	1425	103	99	135	113	110	260
Karnali	837	47	62	87	82	82	135
Koshi	1543	158	153	196	115	89	398
Lumbini	1451	116	120	102	169	125	249
Madhesh	1403	224	186	212	143	113	440
Sudurpaschim	1340	82	137	151	159	163	265

Table 9.7: Change in future seasonal precipitation (%) compared to the baseline period (1981-2010) within the districts of Nepal

	Baseline	SSP245			SSP585		
Districts	(mm)	2030s	2050s	2080s	2030s	2050s	2080s
Winter							
Achham	108	3	-3	-13	-5	-6	-7
Arghakhanchi	58	0	-6	-13	-8	-5	-8
Baglung	65	-1	-5	-12	-8	-5	-8
Baitadi	110	6	1	-10	-2	-5	-5
Bajhang	98	5	1	-8	-3	-4	-2
Bajura	100	1	-2	-10	-6	-6	-5
Banke	53	1	-6	-10	-6	-5	-6
Bara	38	1	-4	-10	-7	-4	-7
Bardiya	69	2	-6	-12	-4	-5	-7
Bhaktapur	46	0	-4	-11	-8	-7	-7
Bhojpur	37	1	-3	-8	-6	-7	-9
Chitwan	47	1	-5	-11	-7	-4	-7
Dadeldhura	108	6	0	-11	-2	-5	-6
Dailekh	83	1	-4	-12	-6	-5	-7
Dang	54	0	-7	-11	-7	-5	-8
Darchula	92	8	5	-3	0	-1	3
Dhading	51	-1	-6	-11	-8	-7	-8
Dhankuta	30	1	-3	-7	-5	-6	-7
Dhanusha	27	2	-2	-7	-4	-4	-6
Dolakha	43	-1	-4	-9	-7	-7	-8
Dolpa	45	0	0	-5	-4	-1	-2
Doti	111	5	-1	-12	-3	-5	-6
Gorkha	56	-3	-6	-11	-9	-8	-9
Gulmi	64	0	-5	-13	-8	-5	-9
Humla	65	3	2	-4	-3	-2	0
Ilam	38	1	-5	-9	-7	-8	-10
Jajarkot	85	-1	-6	-13	-8	-7	-9
Jhapa	33	1	-4	-9	-5	-6	-9
Jumla	82	-1	-2	-9	-6	-5	-5
Kailali	83	4	-2	-11	-1	-4	-6
Kalikot	92	0	-4	-11	-7	-7	-7
Kanchanpur	76	5	0	-9	0	-3	-5
Kapilbastu	47	0	-7	-11	-8	-4	-7
Kaski	83	-3	-8	-15	-11	-10	-12
Kathmandu	47	0	-4	-11	-8	-7	-7
Kavrepalanchok	41	1	-3	-10	-7	-6	-7
Khotang	36	2	-3	-8	-6	-6	-8
Lalitpur	52	1	-5	-13	-9	-8	-9
Lamjung	72	-3	-7	-14	-10	-9	-11
Mahottari	28	2	-3	-7	-5	-3	-6
Makwanpur	47	1	-5	-12	-8	-6	-8
Manang	59	-3	-5	-11	-8	-7	-8

	Baseline	SSP245			SSP585		
Districts	(mm)	2030s	2050s	2080s	2030s	2050s	2080s
Morang	34	2	-3	-9	-5	-6	-9
Mugu	76	0	-1	-8	-5	-4	-4
Mustang	28	1	0	-4	-3	-1	-1
Myagdi	63	-2	-5	-11	-8	-6	-8
Nawalparasi-E	55	2	-5	-13	-8	-4	-7
Nawalparasi-W	52	2	-5	-12	-7	-2	-6
Nuwakot	57	-1	-6	-13	-9	-9	-9
Okhaldhunga	33	1	-3	-7	-5	-5	-7
Palpa	53	1	-5	-12	-7	-3	-7
Panchthar	44	0	-5	-10	-8	-9	-11
Parbat	68	-1	-5	-13	-8	-6	-9
Parsa	37	1	-4	-10	-6	-4	-6
Pyuthan	60	0	-6	-12	-8	-5	-8
Ramechhap	34	1	-3	-8	-6	-5	-6
Rasuwa	48	-2	-5	-10	-8	-8	-8
Rautahat	32	1	-4	-9	-5	-4	-6
Rolpa	70	-1	-6	-13	-8	-6	-9
Rukum-E	65	-1	-4	-10	-7	-4	-7
Rukum-W	77	-1	-5	-12	-8	-6	-9
Rupandehi	49	1	-6	-11	-7	-3	-6
Salyan	65	0	-6	-12	-7	-5	-8
Sankhuwasabha	51	-1	-5	-10	-8	-9	-11
Saptari	29	2	-2	-8	-4	-4	-7
Sarlahi	31	2	-3	-8	-6	-4	-6
Sindhuli	37	2	-3	-9	-6	-5	-7
Sindhupalchok	55	-2	-6	-12	-9	-9	-10
Siraha	29	2	-3	-8	-5	-4	-7
Solukhumbu	32	0	-3	-6	-5	-5	-6
Sunsari	33	2	-3	-9	-5	-6	-8
Surkhet	81	1	-6	-13	-5	-5	-8
Syangja	57	0	-5	-12	-8	-4	-7
Tanahu	59	0	-5	-13	-8	-6	-9
Taplejung	42	-1	-5	-9	-7	-8	-9
Terhathum	38	0	-4	-9	-7	-7	-9
Udayapur	32	2	-2	-8	-5	-5	-7
Pre-Monsoon							
Achham	167	15	8	18	16	31	31
Arghakhanchi	142	10	-2	10	13	17	23
Baglung	189	12	1	14	15	20	22
Baitadi	204	21	14	26	21	42	42
Bajhang	161	15	12	20	15	33	29
Bajura	151	11	8	16	13	25	21
Banke	92	9	-3	11	11	19	24
Bara	175	17	-7	-2	13	11	30
Bardiya	99	11	-2	13	13	24	29

	Baseline	SSP245			SSP585		
Districts	(mm)	2030s	2050s	2080s	2030s	2050s	2080s
Bhaktapur	198	14	-5	-3	13	11	24
Bhojpur	249	12	-7	-4	15	8	29
Chitwan	213	16	-5	4	16	16	31
Dadeldhura	168	19	12	23	18	38	40
Dailekh	139	11	2	14	13	24	26
Dang	114	9	-3	10	12	19	24
Darchula	165	16	14	22	14	34	34
Dhading	224	13	1	8	15	16	29
Dhankuta	187	11	-6	-3	11	5	28
Dhanusha	155	13	-7	-4	8	5	22
Dolakha	183	7	-3	0	10	9	17
Dolpa	79	6	3	9	4	11	9
Doti	170	18	11	22	18	36	37
Gorkha	194	12	4	13	13	17	24
Gulmi	195	14	1	14	17	22	27
Humla	107	7	6	12	6	17	14
Ilam	255	10	-10	-5	14	4	48
Jajarkot	146	9	1	12	11	21	18
Jhapa	261	8	-14	-11	11	-1	48
Jumla	142	9	6	14	9	20	14
Kailali	112	14	5	17	13	28	34
Kalikot	147	11	5	14	12	24	20
Kanchanpur	97	14	7	17	12	27	34
Kapilbastu	104	10	-3	7	10	14	21
Kaski	352	19	7	29	25	32	42
Kathmandu	224	13	-5	-1	14	13	29
Kavrepalanchok	177	11	-6	-3	12	10	22
Khotang	196	11	-5	-3	13	9	23
Lalitpur	207	16	-4	-2	15	12	25
Lamjung	289	17	7	23	20	27	36
Mahottari	149	13	-7	-4	8	6	22
Makwanpur	216	15	-6	0	16	14	29
Manang	102	8	3	11	7	12	11
Morang	234	11	-14	-9	9	1	40
Mugu	129	8	7	15	7	18	13
Mustang	47	5	2	6	3	7	6
Myagdi	182	10	2	15	12	18	18
Nawalparasi-E	237	18	-5	8	18	20	38
Nawalparasi-W	152	14	-4	7	13	17	28
Nuwakot	247	13	-2	5	15	16	32
Okhaldhunga	179	11	-4	-2	12	9	21
Palpa	183	13	-2	11	14	18	28
Panchthar	280	12	-6	-2	17	7	34
Parbat	282	17	5	24	22	28	35
Parsa	157	15	-6	1	13	13	29

	Baseline	SSP245			SSP585		
Districts	(mm)	2030s	2050s	2080s	2030s	2050s	2080s
Pyuthan	146	10	-2	10	13	19	22
Ramechhap	173	9	-5	-2	12	9	18
Rasuwa	129	6	1	5	7	9	13
Rautahat	156	17	-4	-1	10	9	26
Rolpa	154	12	-1	11	15	21	21
Rukum-E	141	9	0	10	11	18	16
Rukum-W	148	10	0	11	11	20	18
Rupandehi	123	12	-5	6	10	14	24
Salyan	114	11	-2	10	12	20	21
Sankhuwasabha	341	12	-7	-2	19	11	27
Saptari	161	11	-9	-7	7	3	25
Sarlahi	160	15	-6	-2	11	8	25
Sindhuli	198	15	-6	-3	14	10	25
Sindhupalchok	220	9	-3	2	12	12	23
Siraha	157	12	-7	-5	8	5	22
Solukhumbu	138	6	-3	0	9	7	14
Sunsari	220	13	-12	-9	9	3	36
Surkhet	121	12	1	13	13	24	27
Syangja	257	17	3	20	20	25	37
Tanahu	332	20	2	20	25	29	49
Taplejung	259	9	-5	-1	16	8	20
Terhathum	260	11	-7	-3	15	6	25
Udayapur	181	12	-7	-4	10	6	25
Monsoon							
Achham	1008	79	158	193	130	163	451
Arghakhanchi	1229	108	161	216	131	199	529
Baglung	1514	81	145	187	107	173	458
Baitadi	1096	73	164	202	143	176	500
Bajhang	908	66	150	181	116	152	433
Bajura	715	47	107	130	77	107	304
Banke	1016	85	127	184	129	152	407
Bara	1352	183	211	240	165	268	774
Bardiya	1228	118	183	243	173	199	535
Bhaktapur	1091	128	164	190	101	184	573
Bhojpur	1094	90	121	139	73	146	481
Chitwan	1418	163	214	260	159	261	709
Dadeldhura	1127	94	189	241	169	202	568
Dailekh	902	63	121	150	101	126	356
Dang	1156	92	135	191	124	166	447
Darchula	860	62	143	182	118	153	436
Dhading	1338	99	140	166	96	164	466
Dhankuta	806	84	115	138	78	150	466
Dhanusha	1053	135	145	153	113	192	574
Dolakha	1047	66	89	102	51	98	323
Dolpa	408	27	61	87	40	66	197

	Baseline	SSP245			SSP585		
Districts	(mm)	2030s	2050s	2080s	2030s	2050s	2080s
Doti	1122	95	193	240	165	201	561
Gorkha	949	71	113	145	79	136	379
Gulmi	1406	109	175	228	133	212	567
Humla	358	34	83	112	54	82	248
Ilam	1524	124	165	187	91	203	667
Jajarkot	1034	59	118	149	92	126	354
Jhapa	1854	166	207	221	115	248	802
Jumla	582	37	82	108	57	85	247
Kailali	1374	139	224	288	210	241	628
Kalikot	568	43	90	111	66	91	262
Kanchanpur	1318	137	220	290	208	238	624
Kapilbastu	1282	120	154	217	143	201	516
Kaski	1990	124	210	273	147	256	669
Kathmandu	1361	126	168	194	102	188	576
Kavrepalanchok	1027	121	153	176	90	171	549
Khotang	1032	93	121	133	75	143	465
Lalitpur	1299	153	190	217	120	216	668
Lamjung	1464	99	162	208	114	197	525
Mahottari	1048	138	149	160	114	194	583
Makwanpur	1482	179	224	261	152	267	782
Manang	369	33	60	88	39	72	211
Morang	1424	147	183	199	118	232	705
Mugu	503	31	76	103	49	77	226
Mustang	170	21	43	67	26	49	152
Myagdi	1196	60	116	156	81	137	370
Nawalparasi-E	1576	183	245	303	190	305	806
Nawalparasi-W	1522	178	229	295	192	300	769
Nuwakot	1744	123	172	204	111	196	575
Okhaldhunga	1013	94	122	135	72	136	457
Palpa	1386	144	200	252	156	251	653
Panchthar	1109	74	101	121	56	128	433
Parbat	2070	125	211	269	152	255	664
Parsa	1238	166	199	233	155	252	707
Pyuthan	1140	88	144	191	114	171	467
Ramechhap	978	85	109	123	62	120	401
Rasuwa	795	48	73	94	48	86	256
Rautahat	1191	164	180	202	141	233	690
Rolpa	1098	69	126	162	96	143	395
Rukum-E	984	46	95	123	70	108	296
Rukum-W	1119	61	121	155	92	133	369
Rupandehi	1436	161	208	277	180	272	693
Salyan	952	74	131	172	108	143	411
Sankhuwasabha	1374	72	99	116	56	117	408
Saptari	1075	120	139	140	107	181	517
Sarlahi	1196	161	180	201	130	227	696

	Baseline	SSP245			SSP585		
Districts	**(mm)**	**2030s**	**2050s**	**2080s**	**2030s**	**2050s**	**2080s**
Sindhuli	1273	156	189	214	115	217	699
Sindhupalchok	1579	92	128	150	76	140	442
Siraha	1023	117	130	135	99	171	511
Solukhumbu	978	57	79	88	44	87	298
Sunsari	1350	147	180	191	123	228	681
Surkhet	1131	91	158	199	140	167	461
Syangja	1624	138	209	261	156	257	667
Tanahu	1445	141	205	249	149	249	656
Taplejung	1036	43	60	74	26	73	282
Terhathum	884	66	90	111	54	117	387
Udayapur	1059	114	138	147	91	169	527
Post-monsoon							
Achham	49	-8	-10	-2	-3	-6	32
Arghakhanchi	57	-10	-10	1	-2	0	23
Baglung	60	-9	-7	0	-1	0	23
Baitadi	50	-8	-6	0	-2	-5	40
Bajhang	46	-6	-6	0	-1	-4	34
Bajura	46	-8	-8	-1	-2	-4	23
Banke	51	-8	-11	-1	-4	-4	23
Bara	67	-3	-4	7	4	14	27
Bardiya	53	-8	-12	-3	-5	-6	29
Bhaktapur	55	-2	-3	4	1	12	26
Bhojpur	72	2	4	7	6	19	24
Chitwan	68	-7	-6	5	2	8	27
Dadeldhura	51	-8	-8	-2	-3	-6	42
Dailekh	43	-8	-9	-2	-4	-6	21
Dang	57	-9	-11	0	-3	-2	25
Darchula	42	-6	-4	1	-1	-4	30
Dhading	54	-4	-2	3	2	7	23
Dhankuta	54	4	3	9	5	21	18
Dhanusha	61	2	0	9	6	20	22
Dolakha	57	-1	1	3	3	9	23
Dolpa	30	-5	-5	1	1	0	13
Doti	53	-8	-10	-2	-3	-7	41
Gorkha	48	-4	-2	2	2	5	22
Gulmi	53	-9	-8	0	-1	0	21
Humla	34	-5	-5	-1	-2	-3	15
Ilam	91	5	8	22	6	33	33
Jajarkot	57	-11	-11	-3	-4	-6	21
Jhapa	115	3	9	30	9	39	45
Jumla	42	-7	-8	-1	-2	-3	18
Kailali	50	-7	-10	-2	-4	-5	34
Kalikot	43	-8	-9	-2	-3	-5	21
Kanchanpur	52	-6	-10	-2	-4	-6	42
Kapilbastu	59	-9	-10	3	0	2	26

	Baseline	SSP245			SSP585		
Districts	(mm)	2030s	2050s	2080s	2030s	2050s	2080s
Kaski	100	-11	-6	3	1	3	35
Kathmandu	60	-2	-3	4	2	11	28
Kavrepalanchok	56	-1	-2	4	2	12	26
Khotang	60	2	3	5	5	17	20
Lalitpur	65	-3	-4	4	1	13	28
Lamjung	73	-7	-4	3	2	5	31
Mahottari	59	1	-1	8	5	17	23
Makwanpur	74	-5	-3	6	2	12	30
Manang	41	-5	-4	1	2	3	19
Morang	99	2	6	22	9	34	37
Mugu	40	-7	-7	-2	-1	-3	13
Mustang	21	-3	-3	2	2	3	12
Myagdi	63	-9	-7	1	-1	1	23
Nawalparasi-E	73	-9	-8	4	1	7	30
Nawalparasi-W	74	-10	-11	6	2	8	29
Nuwakot	68	-4	-2	3	3	9	30
Okhaldhunga	57	1	1	3	3	14	21
Palpa	62	-9	-9	4	1	5	25
Panchthar	72	4	6	13	4	21	24
Parbat	83	-11	-7	2	-1	2	29
Parsa	62	-4	-4	5	3	11	25
Pyuthan	52	-9	-9	0	-2	-1	22
Ramechhap	52	-1	1	3	3	11	20
Rasuwa	46	-2	0	2	3	5	19
Rautahat	64	-1	-4	7	5	17	26
Rolpa	55	-10	-9	-2	-4	-4	21
Rukum-E	53	-9	-7	-2	-3	-3	18
Rukum-W	63	-12	-10	-3	-5	-6	22
Rupandehi	72	-10	-11	5	1	5	30
Salyan	53	-10	-11	-2	-5	-6	22
Sankhuwasabha	92	-2	6	6	6	11	29
Saptari	67	2	2	12	8	25	23
Sarlahi	70	0	-3	8	5	18	28
Sindhuli	77	-1	1	7	5	18	30
Sindhupalchok	75	-3	0	4	4	9	32
Siraha	62	2	1	9	7	21	22
Solukhumbu	48	1	3	3	5	10	19
Sunsari	95	1	4	17	9	30	33
Surkhet	49	-8	-11	-3	-5	-7	26
Syangja	64	-8	-7	4	1	5	26
Tanahu	67	-8	-7	4	2	6	28
Taplejung	72	0	5	7	4	10	22
Terhathum	57	3	4	9	4	18	19
Udayapur	67	1	2	8	6	20	22
Annual							

	Baseline	SSP245			SSP585		
Districts	(mm)	2030s	2050s	2080s	2030s	2050s	2080s
Achham	1332	88	153	197	138	182	507
Arghakhanchi	1486	108	143	213	134	212	567
Baglung	1827	82	135	189	113	187	494
Baitadi	1460	91	173	218	160	210	578
Bajhang	1213	79	156	194	127	177	494
Bajura	1012	52	105	135	82	122	342
Banke	1212	86	106	183	131	163	448
Bara	1631	198	195	235	175	289	824
Bardiya	1448	122	163	241	177	212	586
Bhaktapur	1391	139	152	179	107	199	616
Bhojpur	1452	105	116	134	88	167	526
Chitwan	1746	173	199	257	169	280	761
Dadeldhura	1453	110	192	252	183	229	644
Dailekh	1167	68	110	150	105	140	396
Dang	1381	91	114	190	127	177	488
Darchula	1159	80	158	201	131	183	502
Dhading	1667	107	133	166	104	180	510
Dhankuta	1078	100	109	136	89	170	505
Dhanusha	1295	152	136	151	122	214	613
Dolakha	1330	71	83	96	57	109	354
Dolpa	561	28	59	91	40	76	217
Doti	1455	109	193	249	177	224	633
Gorkha	1247	77	109	149	85	151	415
Gulmi	1718	113	163	229	140	229	606
Humla	564	39	86	119	55	95	276
Ilam	1907	139	158	194	105	232	738
Jajarkot	1322	56	103	145	89	133	384
Jhapa	2263	178	198	231	130	279	885
Jumla	847	38	77	111	58	96	274
Kailali	1619	151	216	292	218	260	690
Kalikot	850	45	82	113	69	103	297
Kanchanpur	1543	149	216	297	216	256	695
Kapilbastu	1493	121	133	215	145	213	555
Kaski	2524	128	204	289	162	282	733
Kathmandu	1691	137	156	186	109	205	625
Kavrepalanchok	1300	132	142	166	98	187	590
Khotang	1324	107	115	127	86	163	501
Lalitpur	1623	167	177	206	127	233	712
Lamjung	1898	107	159	220	127	220	581
Mahottari	1284	153	139	157	122	213	623
Makwanpur	1819	191	210	255	162	286	833
Manang	570	33	54	90	39	79	233
Morang	1790	162	172	202	132	260	773
Mugu	748	31	75	108	49	87	248
Mustang	266	24	41	72	28	58	168

	Baseline	SSP245			SSP585		
Districts	(mm)	2030s	2050s	2080s	2030s	2050s	2080s
Myagdi	1504	59	106	161	85	150	403
Nawalparasi-E	1942	194	227	303	200	328	866
Nawalparasi-W	1799	183	208	296	200	322	820
Nuwakot	2117	130	161	199	119	212	627
Okhaldhunga	1282	106	116	129	82	154	492
Palpa	1684	149	185	255	164	271	700
Panchthar	1505	89	95	122	69	147	480
Parbat	2503	131	204	282	165	279	720
Parsa	1493	179	185	230	165	271	755
Pyuthan	1397	88	126	188	117	183	502
Ramechhap	1237	93	102	116	71	134	433
Rasuwa	1018	50	68	91	50	93	279
Rautahat	1443	181	169	200	151	255	736
Rolpa	1376	70	109	158	99	154	428
Rukum-E	1243	44	83	122	71	118	323
Rukum-W	1406	58	106	151	91	142	400
Rupandehi	1680	163	186	276	184	288	741
Salyan	1184	75	112	168	109	152	445
Sankhuwasabha	1858	82	93	109	73	130	453
Saptari	1331	135	130	137	118	205	559
Sarlahi	1457	177	169	199	141	250	743
Sindhuli	1584	172	180	209	128	240	747
Sindhupalchok	1929	97	120	143	83	152	488
Siraha	1271	132	122	131	109	192	548
Solukhumbu	1195	64	76	84	53	98	325
Sunsari	1698	163	169	191	137	255	742
Surkhet	1383	95	142	196	143	179	505
Syangja	2002	147	200	272	170	283	722
Tanahu	1902	153	195	261	166	278	724
Taplejung	1408	52	56	71	39	83	314
Terhathum	1238	81	84	108	66	133	422
Udayapur	1339	129	131	143	103	190	567

Table 9.8: Absolute uncertainty (standard deviation) in projected change in future seasonal precipitation (mm) compared to the baseline period (1981-2010) within the districts of Nepal

	Baseline	SSP245			SSP585		
Districts	(mm)	2030s	2050s	2080s	2030s	2050s	2080s
Winter							
Achham	108	11	19	15	15	12	12
Arghakhanchi	58	14	15	11	9	9	10
Baglung	65	11	13	10	8	7	7
Baitadi	110	11	21	15	16	8	15
Bajhang	98	9	18	13	13	8	9
Bajura	100	8	17	12	13	7	9
Banke	53	10	11	9	10	10	10
Bara	38	11	13	6	7	6	8
Bardiya	69	12	14	11	14	14	14
Bhaktapur	46	12	13	9	8	7	10
Bhojpur	37	9	12	8	6	5	7
Chitwan	47	12	14	9	8	7	9
Dadeldhura	108	13	22	16	16	12	17
Dailekh	83	9	15	12	13	10	11
Dang	54	11	12	9	9	9	9
Darchula	92	9	19	14	13	6	11
Dhading	51	9	9	7	7	5	7
Dhankuta	30	7	10	7	6	5	6
Dhanusha	27	7	10	5	6	5	5
Dolakha	43	9	10	7	5	5	7
Dolpa	45	6	9	7	5	3	4
Doti	111	13	21	16	17	13	16
Gorkha	56	8	8	7	7	6	5
Gulmi	64	13	16	12	9	8	9
Humla	65	5	13	9	8	3	6
Ilam	38	8	10	7	8	7	7
Jajarkot	85	10	16	12	12	7	9
Jhapa	33	6	10	6	9	8	6
Jumla	82	7	14	11	10	6	7
Kailali	83	14	18	15	16	16	16
Kalikot	92	8	15	12	13	9	8
Kanchanpur	76	13	18	15	13	14	16
Kapilbastu	47	12	13	9	8	10	10
Kaski	83	10	12	10	10	5	6
Kathmandu	47	11	12	8	8	6	9
Kavrepalanchok	41	11	13	8	7	6	8
Khotang	36	9	12	8	6	6	7
Lalitpur	52	14	16	10	9	8	11
Lamjung	72	10	11	10	8	5	6
Mahottari	28	7	10	4	6	5	6
Makwanpur	47	12	14	8	8	7	10
Manang	59	6	7	7	7	3	4

	Baseline	SSP245			SSP585		
Districts	(mm)	2030s	2050s	2080s	2030s	2050s	2080s
Morang	34	7	12	7	9	8	6
Mugu	76	6	14	9	9	4	5
Mustang	28	5	6	5	3	2	3
Myagdi	63	8	10	8	8	5	5
Nawalparasi-E	55	16	19	12	9	9	10
Nawalparasi-W	52	16	18	13	10	12	11
Nuwakot	57	11	12	8	8	6	9
Okhaldhunga	33	8	10	7	5	5	7
Palpa	53	15	16	12	9	9	9
Panchthar	44	9	10	7	8	6	9
Parbat	68	11	12	10	9	6	7
Parsa	37	10	12	6	7	6	8
Pyuthan	60	13	14	12	9	9	10
Ramechhap	34	9	10	6	5	5	7
Rasuwa	48	7	6	6	6	5	6
Rautahat	32	9	11	4	6	5	6
Rolpa	70	12	14	12	10	9	10
Rukum-E	65	9	12	10	8	6	7
Rukum-W	77	11	15	11	10	7	9
Rupandehi	49	14	15	12	9	12	11
Salyan	65	11	13	10	11	10	11
Sankhuwasabha	51	10	10	8	8	5	10
Saptari	29	7	11	5	8	8	5
Sarlahi	31	9	11	5	6	5	7
Sindhuli	37	10	13	7	7	6	8
Sindhupalchok	55	10	11	9	7	6	9
Siraha	29	7	11	5	7	6	5
Solukhumbu	32	7	8	6	4	4	6
Sunsari	33	7	12	7	9	8	6
Surkhet	81	12	16	12	14	13	13
Syangja	57	12	14	11	8	7	8
Tanahu	59	12	14	11	8	6	8
Taplejung	42	8	8	6	8	4	9
Terhathum	38	8	9	7	7	5	8
Udayapur	32	8	12	7	7	7	6
Pre-Monsoon							
Achham	167	22	24	26	13	17	36
Arghakhanchi	142	17	16	10	17	6	23
Baglung	189	20	20	15	18	6	24
Baitadi	204	29	32	36	17	30	51
Bajhang	161	24	26	29	10	26	38
Bajura	151	20	22	24	9	20	30
Banke	92	14	12	11	11	3	23
Bara	175	20	15	17	33	27	46
Bardiya	99	16	13	15	11	6	27

	Baseline	SSP245			SSP585		
Districts	(mm)	2030s	2050s	2080s	2030s	2050s	2080s
Bhaktapur	198	21	16	15	31	22	41
Bhojpur	249	25	17	28	27	26	41
Chitwan	213	21	17	14	34	23	41
Dadeldhura	168	24	26	30	15	24	44
Dailekh	139	19	19	21	11	12	30
Dang	114	16	14	10	12	3	24
Darchula	165	24	26	32	10	32	42
Dhading	224	22	23	23	27	22	45
Dhankuta	187	21	14	23	17	17	46
Dhanusha	155	18	12	20	24	22	35
Dolakha	183	17	13	15	21	18	28
Dolpa	79	10	11	11	4	9	12
Doti	170	25	26	29	15	21	42
Gorkha	194	21	23	24	18	15	38
Gulmi	195	21	21	15	23	8	27
Humla	107	14	17	20	7	22	22
Ilam	255	27	20	34	17	23	90
Jajarkot	146	20	20	19	8	12	27
Jhapa	261	30	21	41	19	27	101
Jumla	142	19	19	20	7	17	23
Kailali	112	18	17	21	12	12	32
Kalikot	147	20	21	22	9	17	29
Kanchanpur	97	14	15	18	10	14	30
Kapilbastu	104	15	13	6	14	7	19
Kaski	352	34	38	39	32	20	48
Kathmandu	224	23	21	18	33	26	50
Kavrepalanchok	177	17	14	15	29	23	35
Khotang	196	20	15	22	24	23	34
Lalitpur	207	22	16	16	33	24	39
Lamjung	289	29	34	35	26	21	49
Mahottari	149	17	12	18	25	23	36
Makwanpur	216	21	16	16	36	26	41
Manang	102	12	12	12	3	5	15
Morang	234	29	19	37	19	24	81
Mugu	129	17	17	20	6	19	20
Mustang	47	7	7	6	2	4	7
Myagdi	182	19	19	16	12	5	21
Nawalparasi-E	237	27	23	19	36	24	46
Nawalparasi-W	152	20	15	11	24	17	28
Nuwakot	247	25	26	25	31	27	55
Okhaldhunga	179	18	13	17	25	22	30
Palpa	183	21	20	15	25	14	30
Panchthar	280	25	19	28	21	23	54
Parbat	282	28	30	26	29	14	35
Parsa	157	16	12	13	31	24	39

	Baseline	SSP245			SSP585		
Districts	(mm)	2030s	2050s	2080s	2030s	2050s	2080s
Pyuthan	146	18	18	11	16	3	24
Ramechhap	173	17	13	16	25	21	28
Rasuwa	129	14	14	13	12	12	25
Rautahat	156	18	12	17	29	23	40
Rolpa	154	20	20	13	15	4	26
Rukum-E	141	18	17	13	9	6	22
Rukum-W	148	21	21	17	9	9	26
Rupandehi	123	18	15	9	18	12	25
Salyan	114	17	16	13	10	4	24
Sankhuwasabha	341	29	20	30	32	31	36
Saptari	161	20	13	23	18	20	44
Sarlahi	160	16	12	17	30	24	38
Sindhuli	198	19	14	20	33	28	37
Sindhupalchok	220	20	19	19	26	23	43
Siraha	157	18	12	21	22	22	33
Solukhumbu	138	14	10	13	16	15	20
Sunsari	220	27	18	34	20	23	69
Surkhet	121	18	17	18	11	8	29
Syangja	257	27	28	25	30	17	38
Tanahu	332	34	38	37	40	28	61
Taplejung	259	21	16	23	22	22	25
Terhathum	260	25	18	28	24	23	38
Udayapur	181	20	14	22	22	22	38
Monsoon							
Achham	1008	70	103	103	146	123	211
Arghakhanchi	1229	112	109	97	191	136	258
Baglung	1514	95	94	109	161	125	232
Baitadi	1096	78	131	128	164	156	255
Bajhang	908	76	112	125	137	134	239
Bajura	715	54	72	82	90	88	153
Banke	1016	68	94	73	163	95	161
Bara	1352	238	199	232	205	165	452
Bardiya	1228	80	116	104	201	118	188
Bhaktapur	1091	147	124	198	145	145	409
Bhojpur	1094	121	132	191	134	103	374
Chitwan	1418	164	143	187	191	164	388
Dadeldhura	1127	78	145	135	185	163	274
Dailekh	902	52	64	66	117	85	135
Dang	1156	89	102	71	179	119	206
Darchula	860	75	114	133	136	138	247
Dhading	1338	104	97	147	121	113	275
Dhankuta	806	105	120	172	111	82	338
Dhanusha	1053	187	169	204	139	109	378
Dolakha	1047	84	82	130	92	84	248
Dolpa	408	24	31	53	51	44	96

	Baseline	SSP245			SSP585		
Districts	(mm)	2030s	2050s	2080s	2030s	2050s	2080s
Doti	1122	80	139	132	178	155	273
Gorkha	949	65	72	117	94	90	219
Gulmi	1406	114	110	119	194	145	283
Humla	358	30	47	75	60	62	129
Ilam	1524	175	207	266	169	136	481
Jajarkot	1034	60	68	75	120	91	144
Jhapa	1854	233	270	325	213	164	559
Jumla	582	38	46	66	71	65	117
Kailali	1374	84	151	128	228	157	257
Kalikot	568	42	51	59	77	68	116
Kanchanpur	1318	74	163	141	227	167	276
Kapilbastu	1282	130	134	92	209	146	268
Kaski	1990	127	133	181	195	169	342
Kathmandu	1361	149	132	208	155	151	396
Kavrepalanchok	1027	145	123	198	134	134	419
Khotang	1032	116	122	183	125	98	362
Lalitpur	1299	176	144	224	166	167	471
Lamjung	1464	97	104	157	144	132	292
Mahottari	1048	192	167	204	141	114	379
Makwanpur	1482	198	161	236	183	179	498
Manang	369	28	33	55	51	42	115
Morang	1424	194	215	270	172	124	483
Mugu	503	30	41	68	58	56	110
Mustang	170	15	22	40	33	28	82
Myagdi	1196	72	74	95	116	95	193
Nawalparasi-E	1576	180	162	194	242	192	411
Nawalparasi-W	1522	178	163	159	248	183	374
Nuwakot	1744	139	131	203	159	150	362
Okhaldhunga	1013	116	116	181	121	107	371
Palpa	1386	143	134	140	211	162	315
Panchthar	1109	107	127	172	111	91	330
Parbat	2070	136	136	166	215	178	329
Parsa	1238	205	168	200	185	153	399
Pyuthan	1140	91	94	88	172	122	232
Ramechhap	978	105	97	156	103	98	323
Rasuwa	795	48	53	88	62	61	159
Rautahat	1191	222	191	221	176	147	416
Rolpa	1098	74	79	78	147	104	188
Rukum-E	984	56	59	71	106	81	150
Rukum-W	1119	67	74	81	133	98	165
Rupandehi	1436	168	160	131	247	174	342
Salyan	952	65	76	74	141	92	165
Sankhuwasabha	1374	107	116	172	128	103	328
Saptari	1075	158	154	187	130	88	353
Sarlahi	1196	221	191	237	169	143	450

	Baseline	SSP245			SSP585		
Districts	(mm)	2030s	2050s	2080s	2030s	2050s	2080s
Sindhuli	1273	192	170	249	162	152	511
Sindhupalchok	1579	114	112	175	129	120	313
Siraha	1023	157	147	183	121	88	339
Solukhumbu	978	76	78	125	89	75	243
Sunsari	1350	190	201	253	166	112	459
Surkhet	1131	65	91	86	162	107	172
Syangja	1624	138	132	158	214	171	326
Tanahu	1445	134	130	175	189	163	343
Taplejung	1036	74	84	119	84	70	232
Terhathum	884	94	109	152	101	78	297
Udayapur	1059	142	141	195	125	91	366
Post-monsoon							
Achham	49	15	6	17	10	15	19
Arghakhanchi	57	3	7	16	8	14	12
Baglung	60	4	2	11	7	10	9
Baitadi	50	16	13	18	13	14	24
Bajhang	46	15	9	15	11	13	20
Bajura	46	12	6	10	8	10	10
Banke	51	8	8	19	6	17	18
Bara	67	18	15	29	18	18	21
Bardiya	53	12	10	22	10	20	24
Bhaktapur	55	16	14	20	18	15	22
Bhojpur	72	12	19	20	21	18	15
Chitwan	68	14	12	21	15	15	16
Dadeldhura	51	17	12	21	14	15	30
Dailekh	43	10	5	12	6	11	10
Dang	57	6	6	18	6	15	18
Darchula	42	15	13	15	11	9	18
Dhading	54	10	9	13	11	11	16
Dhankuta	54	9	18	18	22	19	10
Dhanusha	61	20	17	29	18	20	19
Dolakha	57	11	12	13	14	11	16
Dolpa	30	5	2	7	5	6	5
Doti	53	18	9	22	13	17	29
Gorkha	48	7	7	7	10	9	15
Gulmi	53	2	5	12	8	12	9
Humla	34	10	5	8	6	6	6
Ilam	91	14	26	27	29	22	10
Jajarkot	57	10	5	13	5	12	9
Jhapa	115	18	32	35	36	28	19
Jumla	42	10	3	9	6	9	6
Kailali	50	15	10	22	12	18	27
Kalikot	43	10	4	10	7	10	8
Kanchanpur	52	19	13	26	16	20	38
Kapilbastu	59	4	8	20	9	16	16

	Baseline	SSP245			SSP585		
Districts	(mm)	2030s	2050s	2080s	2030s	2050s	2080s
Kaski	100	5	6	12	12	14	12
Kathmandu	60	16	14	19	17	14	23
Kavrepalanchok	56	18	15	20	19	16	23
Khotang	60	11	16	19	19	17	15
Lalitpur	65	19	15	23	18	16	23
Lamjung	73	8	9	10	13	13	17
Mahottari	59	19	15	28	16	18	21
Makwanpur	74	19	14	25	16	16	21
Manang	41	1	5	4	10	9	9
Morang	99	19	28	35	30	28	23
Mugu	40	9	4	7	6	7	4
Mustang	21	3	4	5	6	6	5
Myagdi	63	4	3	9	8	10	7
Nawalparasi-E	73	12	13	22	17	18	15
Nawalparasi-W	74	9	12	24	17	17	15
Nuwakot	68	14	13	16	16	14	23
Okhaldhunga	57	13	15	19	18	16	16
Palpa	62	5	10	17	13	15	11
Panchthar	72	11	18	19	20	13	7
Parbat	83	3	6	12	11	14	9
Parsa	62	16	13	24	16	15	17
Pyuthan	52	4	5	14	6	13	11
Ramechhap	52	12	12	16	14	12	16
Rasuwa	46	6	7	7	9	8	14
Rautahat	64	19	16	31	20	20	21
Rolpa	55	6	3	13	5	12	12
Rukum-E	53	6	2	9	5	8	8
Rukum-W	63	9	4	13	5	12	9
Rupandehi	72	6	11	25	14	18	16
Salyan	53	8	4	16	5	13	14
Sankhuwasabha	92	13	18	14	17	13	14
Saptari	67	16	19	30	21	25	20
Sarlahi	70	22	18	33	20	21	24
Sindhuli	77	21	18	28	20	21	24
Sindhupalchok	75	15	15	16	17	15	25
Siraha	62	18	17	28	20	21	19
Solukhumbu	48	9	13	11	16	11	13
Sunsari	95	20	26	35	28	29	25
Surkhet	49	11	6	17	8	15	17
Syangja	64	3	8	13	12	13	9
Tanahu	67	9	9	15	14	14	13
Taplejung	72	9	14	9	13	9	7
Terhathum	57	8	16	15	19	13	7
Udayapur	67	15	18	24	20	21	18
Annual							

	Baseline	SSP245			SSP585		
Districts	(mm)	2030s	2050s	2080s	2030s	2050s	2080s
Achham	1332	79	119	133	142	140	238
Arghakhanchi	1486	133	127	107	179	136	282
Baglung	1827	115	109	124	147	126	254
Baitadi	1460	94	152	166	161	191	291
Bajhang	1213	84	131	157	141	166	268
Bajura	1012	63	87	111	93	112	177
Banke	1212	73	99	82	151	96	178
Bara	1631	268	218	240	184	150	509
Bardiya	1448	82	120	116	186	118	208
Bhaktapur	1391	183	138	207	117	134	459
Bhojpur	1452	157	147	198	118	91	422
Chitwan	1746	196	162	198	165	154	436
Dadeldhura	1453	88	160	164	177	188	302
Dailekh	1167	62	75	90	108	95	156
Dang	1381	101	114	81	167	118	228
Darchula	1159	85	132	168	139	173	275
Dhading	1667	131	112	166	99	110	326
Dhankuta	1078	134	137	182	105	79	387
Dhanusha	1295	218	183	207	125	99	424
Dolakha	1330	112	91	136	74	77	283
Dolpa	561	31	40	66	53	57	102
Doti	1455	87	153	162	172	176	302
Gorkha	1247	89	88	139	79	95	261
Gulmi	1718	137	128	133	178	145	309
Humla	564	36	58	98	67	87	143
Ilam	1907	210	230	280	166	132	559
Jajarkot	1322	74	85	97	116	104	163
Jhapa	2263	271	297	345	213	162	652
Jumla	847	49	62	90	74	86	132
Kailali	1619	90	156	147	215	163	285
Kalikot	850	52	68	87	75	85	137
Kanchanpur	1543	80	166	159	219	180	301
Kapilbastu	1493	148	151	96	199	144	290
Kaski	2524	156	155	215	172	173	393
Kathmandu	1691	185	149	221	127	143	456
Kavrepalanchok	1300	179	135	202	109	121	465
Khotang	1324	148	134	188	108	88	403
Lalitpur	1623	215	157	229	136	151	520
Lamjung	1898	128	127	189	125	140	348
Mahottari	1284	220	180	206	126	101	426
Makwanpur	1819	233	172	242	153	163	550
Manang	570	42	44	69	48	52	132
Morang	1790	235	244	292	169	125	567
Mugu	748	40	54	93	63	79	123
Mustang	266	21	28	46	34	37	84

	Baseline	SSP245			SSP585		
Districts	(mm)	2030s	2050s	2080s	2030s	2050s	2080s
Myagdi	1504	88	87	112	108	102	212
Nawalparasi-E	1942	217	190	211	218	186	464
Nawalparasi-W	1799	208	187	165	233	178	408
Nuwakot	2117	174	150	223	134	147	425
Okhaldhunga	1282	147	125	185	102	96	410
Palpa	1684	170	154	151	194	161	349
Panchthar	1505	140	142	175	99	78	373
Parbat	2503	161	155	189	196	178	365
Parsa	1493	230	185	205	166	139	446
Pyuthan	1397	111	111	99	159	122	253
Ramechhap	1237	133	103	158	82	85	358
Rasuwa	1018	67	62	100	53	65	187
Rautahat	1443	252	207	226	160	136	468
Rolpa	1376	94	98	91	133	105	205
Rukum-E	1243	73	75	86	99	87	164
Rukum-W	1406	84	93	101	126	108	182
Rupandehi	1680	192	180	135	236	171	371
Salyan	1184	77	87	84	130	93	174
Sankhuwasabha	1858	149	130	173	106	80	366
Saptari	1331	187	173	198	125	88	404
Sarlahi	1457	253	205	241	151	132	503
Sindhuli	1584	229	179	252	137	139	564
Sindhupalchok	1929	147	126	190	108	118	368
Siraha	1271	187	161	188	110	82	382
Solukhumbu	1195	99	87	128	80	68	268
Sunsari	1698	230	229	272	161	113	536
Surkhet	1383	74	99	103	150	111	190
Syangja	2002	165	153	176	193	170	367
Tanahu	1902	169	154	204	160	160	408
Taplejung	1408	103	96	115	71	54	251
Terhathum	1238	124	122	155	87	65	332
Udayapur	1339	174	157	201	112	86	414

Table 9.9: Change in future seasonal precipitation (%) compared to the baseline period (1981-2010) within the basins of Nepal

	Baseline	SSP245			SSP585		
Basins	(mm)	2030s	2050s	2080s	2030s	2050s	2080s
Winter							
Babai	62	0	-6	-12	-6	-5	-8
Bagmati	43	1	-4	-11	-7	-6	-8
Gandaki	55	-1	-5	-11	-8	-6	-8
Kamala	31	2	-2	-8	-5	-4	-6
Kankai	38	0	-5	-9	-7	-8	-10
Karnali	75	2	-1	-8	-4	-4	-4
Koshi	34	0	-3	-7	-5	-6	-6
Mahakali	111	10	5	-5	1	-2	2
Mechi	34	1	-4	-9	-5	-7	-10
West-Rapti	59	-1	-7	-12	-8	-5	-8
Pre-Monsoon							
Babai	110	11	-2	11	13	21	25
Bagmati	195	16	-5	-2	14	11	26
Gandaki	188	12	2	12	13	17	24
Kamala	177	13	-6	-4	10	7	23
Kankai	254	10	-9	-5	14	4	46
Karnali	124	10	5	13	9	21	19
Koshi	150	6	-3	1	9	7	15
Mahakali	180	17	13	23	16	37	37
Mechi	272	7	-13	-10	13	-1	53
West-Rapti	127	10	-2	10	13	19	22
Monsoon							
Babai	1080	92	151	202	133	168	469
Bagmati	1363	169	202	230	133	237	733
Gandaki	1084	87	133	171	95	161	440
Kamala	1087	129	151	165	100	183	577
Kankai	1471	117	156	177	86	192	634
Karnali	683	50	104	135	79	109	312
Koshi	748	50	71	89	44	87	287
Mahakali	1015	72	157	209	141	174	494
Mechi	1880	159	199	216	108	242	786
West-Rapti	1112	83	130	178	114	156	421
Post-monsoon							
Babai	55	-10	-12	-2	-5	-5	25
Bagmati	71	-2	-3	6	3	15	30
Gandaki	55	-6	-4	2	1	4	22
Kamala	69	1	1	8	6	20	25
Kankai	88	5	7	21	6	32	32
Karnali	41	-7	-7	-1	-2	-3	21
Koshi	47	1	3	5	4	10	18
Mahakali	47	-7	-4	1	-1	-4	37
Mechi	111	6	11	32	8	41	45

	Baseline	SSP245			SSP585		
Basins	(mm)	2030s	2050s	2080s	2030s	2050s	2080s
West-Rapti	54	-9	-10	0	-3	-2	23
Annual							
Babai	1307	94	131	200	136	179	511
Bagmati	1672	183	190	223	143	257	782
Gandaki	1382	91	126	174	102	176	479
Kamala	1364	146	143	161	111	206	618
Kankai	1851	132	149	184	99	220	702
Karnali	923	54	102	140	83	123	348
Koshi	980	57	68	87	51	98	314
Mahakali	1353	92	172	228	157	206	570
Mechi	2297	172	194	229	123	275	874
West-Rapti	1352	83	111	177	116	168	458

Table 9.10: Absolute uncertainty (standard deviation) in projected change in future seasonal precipitation (mm) compared to the baseline period (1981-2010) within the basins of Nepal

	Baseline	SSP245			SSP585		
Basins	(mm)	2030s	2050s	2080s	2030s	2050s	2080s
Winter							
Babai	62	11	13	10	11	11	11
Bagmati	43	12	14	8	8	6	9
Gandaki	55	9	10	8	7	5	6
Kamala	31	8	11	6	6	6	6
Kankai	38	8	10	7	8	7	8
Karnali	75	7	14	11	10	6	7
Koshi	34	7	8	6	5	4	6
Mahakali	111	11	22	16	16	7	15
Mechi	34	6	9	7	9	8	7
West-Rapti	59	11	13	10	9	9	9
Pre-Monsoon	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Babai	110	16	14	13	11	3	25
Bagmati	195	19	14	17	33	25	40
Gandaki	188	19	20	18	18	12	30
Kamala	177	18	13	21	28	24	34
Kankai	254	26	19	32	17	22	85
Karnali	124	17	18	19	6	16	25
Koshi	150	14	9	12	14	13	20
Mahakali	180	25	28	33	12	33	44
Mechi	272	30	21	40	19	28	110
West-Rapti	127	17	16	11	14	0	24
Monsoon							
Babai	1080	76	95	84	171	107	183
Bagmati	1363	205	174	246	177	169	497
Gandaki	1084	86	84	119	122	105	234
Kamala	1087	168	153	209	136	112	401
Kankai	1471	166	196	253	161	130	460
Karnali	683	45	63	77	93	80	145
Koshi	748	64	69	107	75	64	205
Mahakali	1015	84	136	139	157	155	261
Mechi	1880	228	266	315	211	166	546
West-Rapti	1112	81	92	73	164	110	195
Post-monsoon							
Babai	55	9	6	19	6	16	18
Bagmati	71	20	17	28	19	19	23
Gandaki	55	5	6	10	11	11	10
Kamala	69	20	18	28	19	21	20
Kankai	88	14	25	26	28	21	10
Karnali	41	10	4	11	6	9	10
Koshi	47	7	11	9	13	9	10
Mahakali	47	17	15	20	14	11	23
Mechi	111	16	33	34	37	25	16

	Baseline	SSP245			SSP585		
Basins	(mm)	2030s	2050s	2080s	2030s	2050s	2080s
West-Rapti	54	5	5	16	5	13	14
Annual							
Babai	1307	84	103	94	157	108	198
Bagmati	1672	242	186	251	152	155	552
Gandaki	1382	108	99	136	108	107	268
Kamala	1364	202	165	213	118	102	449
Kankai	1851	200	217	265	157	125	533
Karnali	923	54	76	100	94	98	161
Koshi	980	86	78	111	65	58	229
Mahakali	1353	96	153	174	157	192	289
Mechi	2297	263	291	333	211	160	642
West-Rapti	1352	96	104	84	152	110	216

Table 9.11: Sen's slope for annual precipitation (mm/year) over different regions of Nepal. Significant values are highlighted in color: light orange indicates an increasing trend, while light blue denotes a decreasing trend.

		SSP245			SSP585		
Regions	**Baseline**	**2030s**	**2050s**	**2080s**	**2030s**	**2050s**	**2080s**
Provinces							
Koshi	3.95	2.92	0.29	6.20	2.50	4.04	12.16
Madhesh	7.99	1.54	-0.45	7.58	-0.53	10.72	13.57
Bagmati	5.92	3.40	0.33	6.91	-0.29	8.50	12.35
Gandaki	4.71	2.21	1.57	6.82	0.33	8.98	10.36
Lumbini	8.17	1.86	3.50	8.64	-2.83	11.45	9.60
Karnali	3.66	1.47	3.41	2.59	0.04	6.11	8.66
Sudurpaschim	7.77	4.07	4.37	3.17	-1.29	11.40	13.34
Districts							
Achham	6.79	2.63	4.81	3.90	-1.47	9.95	13.25
Arghakhanchi	8.04	2.35	2.54	10.49	-1.95	11.38	10.76
Baglung	7.03	2.87	2.15	7.15	-0.70	11.84	10.43
Baitadi	8.14	4.89	5.70	3.11	-0.79	11.08	16.18
Bajhang	5.87	3.43	5.56	2.70	0.06	9.66	14.22
Bajura	3.67	1.99	4.77	2.08	0.50	7.24	9.70
Banke	5.75	0.49	3.08	4.43	-4.52	9.09	7.79
Bara	10.55	2.03	-2.17	9.90	-2.10	15.31	15.08
Bardiya	9.05	0.88	4.25	5.36	-5.10	11.97	9.31
Bhaktapur	4.68	4.60	-0.28	7.54	-0.44	9.93	12.11
Bhojpur	4.04	3.44	0.44	6.56	2.53	4.44	13.02
Chitwan	10.03	2.74	0.99	10.65	-0.66	14.09	15.44
Dadeldhura	9.75	4.77	4.83	4.04	-2.19	12.24	15.54
Dailekh	4.96	1.00	3.75	3.03	-1.60	8.69	10.27
Dang	7.36	1.49	2.79	7.33	-3.47	9.75	9.04
Darchula	5.98	4.30	5.03	2.03	0.59	9.35	14.68
Dhading	5.50	3.74	0.73	6.47	0.26	8.52	10.37
Dhankuta	3.10	2.49	1.27	5.39	2.70	3.39	11.84
Dhanusha	5.59	1.76	-0.13	5.94	1.22	9.15	13.22
Dolakha	3.00	2.81	0.57	5.58	0.00	5.03	8.38
Dolpa	1.94	0.81	3.10	2.67	0.81	4.34	6.54
Doti	9.05	3.98	4.95	5.06	-2.29	12.16	16.50
Gorkha	3.20	2.73	1.65	4.89	0.68	7.20	9.03
Gulmi	7.85	3.19	2.05	9.68	-0.67	13.09	11.75
Humla	2.25	2.06	3.25	1.16	1.76	5.24	8.84
Ilam	4.96	3.52	0.43	6.90	4.79	3.42	19.16
Jajarkot	4.93	1.51	4.23	3.13	-0.87	8.56	10.32
Jhapa	6.48	1.76	0.47	8.29	4.27	4.18	21.23
Jumla	2.44	1.35	3.96	2.25	0.11	6.04	7.68

Regions	Baseline	SSP245			SSP585		
		2030s	2050s	2080s	2030s	2050s	2080s
Kavrepalanchok	4.36	3.70	-0.53	6.72	0.35	8.55	12.81
Kailali	11.28	3.59	2.49	5.69	-5.37	12.82	11.49
Kalikot	2.84	0.86	4.11	2.71	-0.55	6.47	8.93
Kanchanpur	12.42	5.89	2.65	4.17	-4.66	11.52	14.24
Kapilbastu	8.68	1.16	2.25	10.64	-3.73	10.86	9.44
Kaski	7.78	5.01	3.35	10.80	1.40	13.90	14.73
Kathmandu	6.11	4.51	-0.05	8.31	-0.20	9.41	13.17
Khotang	3.82	2.85	0.42	6.37	1.83	4.23	12.14
Lalitpur	5.83	4.93	-0.43	7.29	-1.73	12.06	13.63
Lamjung	5.55	4.02	2.41	6.80	1.35	10.39	12.17
Mahottari	6.58	1.07	-1.18	6.25	1.12	9.90	14.03
Makwanpur	8.34	5.06	-0.53	7.79	-2.29	13.53	17.21
Manang	1.47	0.53	2.04	3.66	1.17	4.26	6.53
Morang	5.88	2.67	0.06	7.86	3.66	4.92	17.40
Mugu	2.18	1.61	3.89	1.89	0.96	5.38	7.25
Mustang	1.07	0.25	1.72	2.49	0.37	3.27	5.09
Myagdi	4.60	2.21	2.83	5.20	0.40	8.91	10.01
Nawalparasi-E	12.38	3.12	1.29	14.33	-1.18	17.22	15.51
Nawalparasi-W	13.05	1.09	2.41	14.64	-2.84	17.56	12.47
Nuwakot	6.96	4.70	1.87	8.29	-0.85	9.86	12.85
Okhaldhunga	3.64	2.41	0.22	6.57	0.97	5.10	11.76
Palpa	10.66	2.60	1.78	12.06	-1.81	14.46	12.43
Panchthar	3.39	2.46	1.10	4.91	3.25	2.66	12.02
Parbat	9.71	5.70	2.54	10.03	-0.25	14.58	13.33
Parsa	9.04	1.57	-0.69	9.38	-1.96	14.66	14.84
Pyuthan	6.30	2.37	2.68	8.23	-1.14	10.25	9.49
Ramechhap	3.22	2.55	0.42	5.70	0.31	5.02	9.89
Rasuwa	1.88	1.68	1.03	3.30	0.38	4.21	6.90
Rautahat	9.37	1.36	-1.81	8.45	-1.16	13.97	14.23
Rolpa	5.48	1.46	3.63	6.09	-1.14	10.58	9.91
Rukum-E	3.66	1.44	3.47	3.43	0.01	7.81	8.78
Rukum-W	5.35	1.57	4.39	3.95	-0.94	8.74	10.36
Rupandehi	12.55	1.35	2.46	12.88	-3.19	14.69	10.38
Salyan	5.96	1.26	4.37	4.73	-2.39	10.17	9.98
Sankhuwasabha	3.42	3.61	0.78	6.95	1.76	3.97	11.96
Saptari	3.85	-0.90	0.55	5.94	1.34	5.86	13.15
Sarlahi	8.49	1.56	-1.62	8.35	0.16	12.46	15.39
Sindhuli	6.41	4.46	-0.33	7.43	0.12	9.80	16.15
Sindhupalchok	4.72	4.16	1.93	7.38	0.12	6.69	11.25
Siraha	4.63	1.38	-0.19	5.21	0.98	6.96	12.28
Solukhumbu	3.06	2.81	0.20	5.45	0.33	3.58	7.00
Sunsari	5.24	1.68	0.95	7.87	3.32	6.03	16.66

		SSP245			SSP585		
Regions	**Baseline**	**2030s**	**2050s**	**2080s**	**2030s**	**2050s**	**2080s**
Surkhet	7.24	1.85	4.31	4.15	-3.44	10.72	10.66
Syangja	10.79	4.74	2.62	11.07	-0.78	14.88	13.31
Tanahu	9.51	4.52	0.96	10.93	1.06	13.51	12.86
Taplejung	1.94	2.25	0.25	4.07	1.07	2.28	8.12
Terhathum	3.18	2.59	0.38	4.63	2.40	1.81	11.13
Udayapur	4.41	2.07	0.61	6.27	1.69	5.32	12.34
Basins							
Mahakali	8.12	5.10	5.57	1.93	-0.63	10.42	16.55
West-Rapti	6.03	1.34	2.81	6.46	-2.13	10.23	9.04
Babai	7.11	1.76	4.02	5.37	-3.71	11.19	10.24
Koshi	2.14	1.83	0.90	4.38	0.83	3.62	7.30
Gandaki	4.87	2.33	1.55	6.43	0.23	9.20	11.00
Bagmati	7.50	4.32	-1.24	7.71	-1.13	14.14	15.77
Kamala	5.45	2.32	0.39	6.55	1.29	8.00	13.84
Kankai	4.83	3.08	0.70	6.39	4.58	3.35	17.98
Mechi	6.08	3.69	2.22	8.66	4.83	4.75	23.76
Karnali	4.46	1.71	3.61	2.61	-0.22	7.26	9.22

Table 9.12: Change in future seasonal maximum temperature (℃) compared to the baseline period (1981-2010) within the physiographical divisions of Nepal

	Baseline	SSP245			SSP585		
Physiography	**(℃)**	**2030s**	**2050s**	**2080s**	**2030s**	**2050s**	**2080s**
High-Himalaya							
Winter	0.6	2.1	3.2	4.9	2.1	3.8	8.0
Pre-Monsoon	4.2	1.0	1.8	2.6	1.2	2.0	4.8
Monsoon	9.2	1.0	1.6	2.5	1.0	2.0	4.3
Post-monsoon	4.8	1.2	1.9	3.1	1.2	2.5	5.7
Annual	5.1	1.3	2.1	3.2	1.4	2.5	5.6
High-Mountain							
Winter	11.2	1.4	2.1	3.2	1.3	2.5	5.5
Pre-Monsoon	17.5	0.7	1.5	2.0	0.9	1.6	3.9
Monsoon	20.5	0.7	1.2	1.8	0.7	1.4	2.9
Post-monsoon	16.1	0.9	1.4	2.4	0.9	1.9	4.4
Annual	16.7	0.9	1.5	2.3	0.9	1.8	4.1
Mid-mountain							
Winter	18.3	0.9	1.5	2.4	0.9	1.8	4.3
Pre-Monsoon	26.4	0.5	1.3	1.9	0.6	1.4	3.6
Monsoon	27.6	0.6	1.1	1.7	0.6	1.3	2.7
Post-monsoon	23.7	0.7	1.2	2.1	0.6	1.6	3.9
Annual	24.3	0.7	1.3	2.0	0.7	1.5	3.6
Siwalik							
Winter	22.2	0.7	1.5	2.4	0.7	1.7	4.2
Pre-Monsoon	31.9	0.4	1.3	2.0	0.5	1.3	3.7
Monsoon	31.7	0.6	1.1	1.8	0.5	1.2	2.7
Post-monsoon	28.1	0.5	1.1	1.9	0.5	1.4	3.6
Annual	28.8	0.6	1.2	2.0	0.6	1.4	3.5
Terai							
Winter	23.8	0.8	1.6	2.7	0.8	1.8	4.6
Pre-Monsoon	33.8	0.3	1.3	2.0	0.4	1.3	3.7
Monsoon	33.1	0.6	1.2	1.9	0.6	1.3	2.8
Post-monsoon	30.0	0.5	1.1	1.9	0.5	1.4	3.7
Annual	30.5	0.5	1.3	2.1	0.5	1.4	3.6

Table 9.13: Absolute uncertainty (standard deviation) in projected change in future seasonal maximum temperature (℃) compared to the baseline period (1981-2010) within the physiographical divisions of Nepal

	Baseline	SSP245			SSP585		
Physiography	(℃)	2030s	2050s	2080s	2030s	2050s	2080s
High-Himalaya							
Winter	0.6	0.4	0.7	1.4	0.6	1.0	1.4
Pre-Monsoon	4.2	0.4	0.7	0.4	0.3	0.5	1.0
Monsoon	9.2	0.3	0.4	0.5	0.3	0.4	0.9
Post-monsoon	4.8	0.5	0.6	0.7	0.5	0.9	1.0
Annual	5.1	0.2	0.5	0.6	0.3	0.6	0.9
High-Mountain							
Winter	11.2	0.3	0.5	1.0	0.4	0.7	1.2
Pre-Monsoon	17.5	0.4	0.5	0.4	0.3	0.4	0.8
Monsoon	20.5	0.2	0.3	0.4	0.3	0.3	0.7
Post-monsoon	16.1	0.4	0.5	0.6	0.4	0.7	1.0
Annual	16.7	0.2	0.3	0.5	0.3	0.5	0.8
Mid-mountain							
Winter	18.3	0.3	0.4	0.8	0.3	0.6	1.2
Pre-Monsoon	26.4	0.4	0.5	0.5	0.5	0.7	1.0
Monsoon	27.6	0.2	0.3	0.4	0.2	0.4	0.7
Post-monsoon	23.7	0.3	0.5	0.7	0.4	0.6	1.0
Annual	24.3	0.3	0.3	0.5	0.3	0.5	0.9
Siwalik							
Winter	22.2	0.3	0.4	0.8	0.5	0.7	1.2
Pre-Monsoon	31.9	0.5	0.5	0.7	0.7	0.9	1.3
Monsoon	31.7	0.3	0.4	0.4	0.3	0.5	0.7
Post-monsoon	28.1	0.3	0.5	0.8	0.4	0.7	1.2
Annual	28.8	0.3	0.4	0.6	0.4	0.6	1.0
Terai							
Winter	23.8	0.4	0.4	0.9	0.6	0.9	1.3
Pre-Monsoon	33.8	0.5	0.6	0.8	0.8	1.0	1.4
Monsoon	33.1	0.3	0.4	0.5	0.3	0.5	0.8
Post-monsoon	30.0	0.3	0.5	0.9	0.4	0.7	1.3
Annual	30.5	0.3	0.4	0.7	0.5	0.8	1.1

Table 9.14: Change in future seasonal maximum temperature (℃) compared to the baseline period (1981-2010) within the provinces of Nepal

	Baseline	SSP245			SSP585		
Provinces	**(℃)**	**2030s**	**2050s**	**2080s**	**2030s**	**2050s**	**2080s**
Winter							
Bagmati	16.2	1.1	1.8	2.8	1.1	2.1	4.9
Gandaki	9.8	1.4	2.2	3.4	1.4	2.6	5.8
Karnali	7.5	1.7	2.6	4.0	1.7	3.1	6.6
Koshi	14.7	1.1	2.0	3.2	1.2	2.4	5.6
Lumbini	19.5	0.9	1.6	2.5	0.9	1.8	4.4
Madhesh	24.0	0.8	1.7	2.8	0.8	1.9	4.8
Sudurpaschim	14.8	1.2	1.9	3.1	1.2	2.3	5.2
Pre-Monsoon							
Bagmati	23.4	0.5	1.3	2.0	0.6	1.4	3.8
Gandaki	15.8	0.7	1.5	2.1	0.9	1.6	4.0
Karnali	13.3	1.0	1.8	2.4	1.2	1.9	4.5
Koshi	20.7	0.5	1.3	1.9	0.6	1.4	3.6
Lumbini	29.2	0.5	1.3	1.9	0.5	1.3	3.6
Madhesh	33.4	0.3	1.3	2.1	0.3	1.3	3.8
Sudurpaschim	23.2	0.7	1.5	2.2	0.8	1.6	4.2
Monsoon							
Bagmati	25.0	0.6	1.2	1.8	0.6	1.3	2.9
Gandaki	18.8	0.7	1.2	1.9	0.7	1.5	3.2
Karnali	17.1	0.8	1.3	2.0	0.7	1.6	3.5
Koshi	22.8	0.7	1.4	2.1	0.8	1.6	3.3
Lumbini	29.2	0.6	1.1	1.7	0.5	1.2	2.7
Madhesh	32.8	0.6	1.2	1.9	0.6	1.3	2.8
Sudurpaschim	25.0	0.7	1.3	1.9	0.6	1.5	3.1
Post-monsoon							
Bagmati	21.3	0.8	1.4	2.3	0.8	1.8	4.3
Gandaki	14.6	0.9	1.5	2.5	0.9	1.9	4.5
Karnali	12.2	1.0	1.6	2.6	1.0	2.0	4.7
Koshi	19.7	0.9	1.6	2.7	1.0	2.2	5.1
Lumbini	25.4	0.5	1.0	1.8	0.5	1.3	3.4
Madhesh	30.0	0.6	1.3	2.2	0.6	1.7	4.2
Sudurpaschim	20.3	0.7	1.2	2.1	0.7	1.6	3.9
Annual							
Bagmati	21.8	0.7	1.4	2.2	0.8	1.6	3.8
Gandaki	15.1	0.9	1.6	2.5	1.0	1.9	4.3
Karnali	13.0	1.1	1.8	2.7	1.1	2.1	4.7
Koshi	19.7	0.9	1.6	2.5	0.9	1.9	4.3
Lumbini	26.2	0.6	1.2	2.0	0.5	1.4	3.4
Madhesh	30.3	0.6	1.4	2.2	0.6	1.5	3.8
Sudurpaschim	21.2	0.9	1.5	2.4	0.9	1.8	4.1

Table 9.15: Absolute uncertainty (standard deviation) in projected change in future seasonal maximum temperature (℃) compared to the baseline period (1981-2010) within the provinces of Nepal

	Baseline	SSP245			SSP585		
Provinces	(℃)	2030s	2050s	2080s	2030s	2050s	2080s
Winter							
Bagmati	16.2	0.3	0.5	0.8	0.4	0.7	1.1
Gandaki	9.8	0.3	0.5	1.0	0.4	0.7	1.1
Karnali	7.5	0.3	0.6	1.1	0.4	0.8	1.2
Koshi	14.7	0.3	0.6	1.0	0.6	0.9	1.5
Lumbini	19.5	0.3	0.4	0.8	0.4	0.7	1.1
Madhesh	24.0	0.4	0.4	0.9	0.7	1.0	1.4
Sudurpaschim	14.8	0.4	0.6	1.0	0.3	0.7	1.2
Pre-Monsoon							
Bagmati	23.4	0.4	0.5	0.6	0.5	0.7	1.1
Gandaki	15.8	0.4	0.6	0.4	0.4	0.5	1.1
Karnali	13.3	0.4	0.6	0.3	0.3	0.4	0.9
Koshi	20.7	0.3	0.5	0.6	0.5	0.8	0.9
Lumbini	29.2	0.5	0.5	0.7	0.6	0.8	1.3
Madhesh	33.4	0.5	0.6	0.9	0.9	1.2	1.4
Sudurpaschim	23.2	0.4	0.6	0.4	0.4	0.5	1.1
Monsoon							
Bagmati	25.0	0.2	0.3	0.5	0.3	0.4	0.8
Gandaki	18.8	0.2	0.3	0.5	0.3	0.4	0.8
Karnali	17.1	0.3	0.3	0.4	0.2	0.3	0.7
Koshi	22.8	0.2	0.4	0.6	0.3	0.5	0.9
Lumbini	29.2	0.3	0.4	0.5	0.3	0.5	0.7
Madhesh	32.8	0.2	0.4	0.5	0.3	0.6	0.9
Sudurpaschim	25.0	0.4	0.3	0.4	0.3	0.4	0.6
Post-monsoon							
Bagmati	21.3	0.3	0.4	0.6	0.4	0.6	1.0
Gandaki	14.6	0.3	0.5	0.5	0.4	0.7	0.9
Karnali	12.2	0.5	0.6	0.7	0.5	0.8	1.0
Koshi	19.7	0.3	0.5	0.7	0.5	0.8	1.3
Lumbini	25.4	0.4	0.5	0.7	0.4	0.7	1.0
Madhesh	30.0	0.3	0.5	0.9	0.5	0.7	1.5
Sudurpaschim	20.3	0.5	0.6	0.7	0.5	0.7	0.9
Annual							
Bagmati	21.8	0.2	0.3	0.6	0.4	0.6	0.9
Gandaki	15.1	0.2	0.4	0.5	0.3	0.5	0.8
Karnali	13.0	0.3	0.4	0.6	0.3	0.5	0.8
Koshi	19.7	0.3	0.4	0.7	0.4	0.7	1.1
Lumbini	26.2	0.3	0.4	0.6	0.4	0.6	0.9
Madhesh	30.3	0.3	0.4	0.7	0.6	0.8	1.1
Sudurpaschim	21.2	0.3	0.4	0.6	0.3	0.5	0.8

Table 9.16: Change in future seasonal maximum temperature (℃) compared to the baseline period (1981-2010) within the districts of Nepal

	Baseline	SSP245			SSP585		
Districts	**(℃)**	**2030s**	**2050s**	**2080s**	**2030s**	**2050s**	**2080s**
Winter							
Achham	17.7	1.0	1.6	2.6	1.0	1.9	4.5
Arghakhanchi	19.0	0.7	1.4	2.4	0.7	1.7	4.2
Baglung	12.7	1.1	1.8	2.8	1.1	2.1	4.9
Baitadi	17.1	1.1	1.7	2.8	1.1	2.1	4.7
Bajhang	8.5	1.7	2.5	4.0	1.6	3.0	6.6
Bajura	10.6	1.6	2.3	3.6	1.5	2.8	5.9
Banke	22.9	0.7	1.5	2.4	0.7	1.7	4.1
Bara	23.9	0.7	1.6	2.6	0.7	1.8	4.5
Bardiya	22.7	0.7	1.4	2.3	0.7	1.6	3.9
Bhaktapur	18.0	0.9	1.5	2.4	0.9	1.8	4.2
Bhojpur	18.0	0.9	1.6	2.6	0.9	1.9	4.6
Chitwan	23.2	0.7	1.4	2.3	0.7	1.6	4.1
Dadeldhura	18.0	0.9	1.5	2.5	0.9	1.9	4.4
Dailekh	17.0	1.0	1.6	2.6	0.9	1.9	4.5
Dang	21.4	0.8	1.5	2.4	0.7	1.7	4.1
Darchula	7.3	1.9	2.8	4.3	1.8	3.3	7.1
Dhading	17.6	1.0	1.6	2.4	1.0	1.8	4.3
Dhankuta	19.6	0.8	1.6	2.6	0.9	1.9	4.6
Dhanusha	24.2	0.8	1.7	2.9	0.8	1.9	4.9
Dolakha	8.3	1.5	2.3	3.6	1.5	2.8	6.3
Dolpa	0.9	2.0	3.0	4.7	2.0	3.6	7.6
Doti	17.0	1.0	1.6	2.6	0.9	1.9	4.5
Gorkha	9.7	1.4	2.1	3.3	1.4	2.5	5.6
Gulmi	17.9	0.9	1.5	2.4	0.9	1.7	4.2
Humla	2.7	2.4	3.4	5.3	2.3	4.1	8.2
Ilam	18.4	0.9	1.7	2.8	1.0	2.0	5.0
Jajarkot	13.3	1.2	1.8	2.9	1.1	2.2	5.0
Jhapa	23.9	0.8	1.6	2.9	0.8	2.0	5.1
Jumla	7.0	1.7	2.5	3.9	1.6	3.0	6.4
Kailali	21.9	0.8	1.4	2.3	0.7	1.7	4.0
Kalikot	11.4	1.4	2.0	3.3	1.3	2.5	5.5
Kanchanpur	22.9	0.7	1.4	2.4	0.7	1.7	4.0
Kapilbastu	23.5	0.7	1.5	2.4	0.7	1.7	4.2
Kaski	12.0	1.3	1.9	3.0	1.2	2.3	5.2
Kathmandu	18.0	0.9	1.5	2.4	0.9	1.8	4.2
Kavrepalanchok	18.3	0.9	1.5	2.4	0.9	1.8	4.3
Khotang	18.3	0.8	1.6	2.6	0.9	1.9	4.7
Lalitpur	17.4	0.8	1.5	2.4	0.8	1.7	4.3
Lamjung	12.5	1.2	1.9	2.9	1.2	2.2	4.9
Mahottari	24.1	0.7	1.6	2.8	0.7	1.9	4.7
Makwanpur	20.6	0.8	1.4	2.4	0.8	1.7	4.2
Manang	-1.0	2.1	3.0	4.7	2.0	3.6	7.8

	Baseline	SSP245			SSP585		
Districts	(℃)	2030s	2050s	2080s	2030s	2050s	2080s
Morang	22.9	0.8	1.7	2.9	0.8	2.0	5.0
Mugu	5.6	1.9	2.8	4.4	1.8	3.3	6.9
Mustang	0.7	2.1	3.0	4.7	2.0	3.6	7.6
Myagdi	6.6	1.5	2.3	3.6	1.5	2.7	6.2
Nawalparasi-E	22.5	0.8	1.5	2.4	0.8	1.7	4.3
Nawalparasi-W	23.5	0.7	1.5	2.5	0.7	1.7	4.4
Nuwakot	18.6	0.9	1.5	2.3	0.9	1.7	4.0
Okhaldhunga	16.8	1.0	1.7	2.7	1.0	2.0	4.7
Palpa	19.9	0.8	1.5	2.4	0.8	1.7	4.3
Panchthar	15.4	1.0	1.7	2.8	1.1	2.1	4.9
Parbat	17.1	0.9	1.5	2.3	0.9	1.7	4.1
Parsa	23.7	0.7	1.5	2.5	0.7	1.7	4.4
Pyuthan	18.3	0.9	1.5	2.4	0.8	1.7	4.2
Ramechhap	14.7	1.1	1.8	2.9	1.1	2.2	5.1
Rasuwa	5.4	1.6	2.5	3.8	1.6	3.0	6.5
Rautahat	24.2	0.7	1.6	2.7	0.7	1.8	4.7
Rolpa	15.4	0.9	1.6	2.5	0.9	1.8	4.4
Rukum-E	8.7	1.4	2.2	3.4	1.4	2.6	5.9
Rukum-W	14.7	1.1	1.7	2.7	1.0	2.0	4.7
Rupandehi	23.6	0.7	1.6	2.5	0.7	1.8	4.4
Salyan	18.4	0.8	1.4	2.3	0.8	1.7	4.1
Sankhuwasabha	9.5	1.4	2.3	3.5	1.5	2.7	6.1
Saptari	24.2	0.7	1.8	3.0	0.8	2.0	5.1
Sarlahi	24.0	0.8	1.7	2.7	0.8	1.9	4.7
Sindhuli	21.5	0.8	1.5	2.5	0.8	1.8	4.4
Sindhupalchok	11.7	1.3	2.0	3.1	1.3	2.4	5.4
Siraha	24.1	0.7	1.7	2.9	0.8	1.9	4.9
Solukhumbu	4.5	1.6	2.6	4.1	1.7	3.2	7.3
Sunsari	23.8	0.8	1.7	2.9	0.8	2.0	5.0
Surkhet	20.0	0.8	1.4	2.3	0.8	1.6	4.0
Syangja	19.8	0.8	1.4	2.3	0.8	1.7	4.1
Tanahu	21.6	0.8	1.4	2.2	0.8	1.6	4.0
Taplejung	5.2	1.6	2.6	4.1	1.6	3.1	7.1
Terhathum	17.2	1.0	1.7	2.6	1.0	2.0	4.6
Udayapur	22.1	0.8	1.7	2.8	0.9	2.0	4.9
Pre-Monsoon							
Achham	27.0	0.6	1.4	2.0	0.7	1.4	3.8
Arghakhanchi	28.2	0.5	1.3	1.9	0.5	1.2	3.5
Baglung	19.8	0.6	1.3	1.9	0.7	1.3	3.5
Baitadi	25.9	0.7	1.5	2.1	0.8	1.5	4.0
Bajhang	14.8	0.9	1.7	2.4	1.1	1.9	4.6
Bajura	17.3	0.9	1.7	2.3	1.1	1.8	4.3
Banke	34.2	0.4	1.3	1.9	0.5	1.3	3.7
Bara	33.5	0.4	1.4	2.1	0.4	1.3	3.9
Bardiya	34.0	0.5	1.3	1.9	0.5	1.3	3.6

	Baseline	SSP245			SSP585		
Districts	(℃)	2030s	2050s	2080s	2030s	2050s	2080s
Bhaktapur	25.6	0.5	1.3	2.0	0.6	1.4	3.7
Bhojpur	24.7	0.4	1.2	1.8	0.5	1.3	3.4
Chitwan	32.8	0.4	1.3	2.0	0.5	1.3	3.8
Dadeldhura	27.5	0.6	1.4	2.0	0.7	1.4	3.9
Dailekh	26.3	0.6	1.3	1.9	0.6	1.3	3.6
Dang	31.8	0.4	1.3	1.9	0.5	1.2	3.6
Darchula	13.2	1.1	1.9	2.6	1.3	2.1	5.0
Dhading	25.2	0.6	1.4	2.0	0.7	1.4	3.8
Dhankuta	26.7	0.4	1.2	1.8	0.5	1.3	3.4
Dhanusha	33.4	0.3	1.3	2.1	0.4	1.3	3.8
Dolakha	13.1	0.7	1.5	2.1	0.8	1.6	4.0
Dolpa	4.7	1.0	1.9	2.5	1.2	2.0	4.8
Doti	26.2	0.6	1.4	2.0	0.7	1.4	3.9
Gorkha	15.2	0.8	1.6	2.2	1.0	1.7	4.2
Gulmi	26.4	0.5	1.3	1.9	0.6	1.3	3.4
Humla	6.7	1.3	2.2	2.9	1.6	2.4	5.4
Ilam	25.3	0.3	1.1	1.8	0.4	1.2	3.4
Jajarkot	21.1	0.7	1.4	2.0	0.8	1.5	3.8
Jhapa	32.1	0.3	1.2	2.0	0.3	1.3	3.6
Jumla	12.6	0.9	1.7	2.3	1.1	1.8	4.4
Kailali	33.0	0.5	1.3	1.9	0.5	1.3	3.7
Kalikot	18.8	0.7	1.5	2.1	0.8	1.6	4.0
Kanchanpur	34.3	0.5	1.3	2.0	0.5	1.4	3.9
Kapilbastu	34.2	0.4	1.4	2.0	0.4	1.3	3.7
Kaski	18.5	0.7	1.4	2.0	0.8	1.5	3.8
Kathmandu	25.5	0.6	1.4	2.0	0.7	1.5	3.8
Kavrepalanchok	25.9	0.5	1.3	2.0	0.6	1.4	3.6
Khotang	25.2	0.5	1.2	1.9	0.5	1.3	3.4
Lalitpur	25.0	0.4	1.2	1.9	0.5	1.3	3.5
Lamjung	18.9	0.7	1.4	2.0	0.8	1.5	3.8
Mahottari	33.4	0.3	1.3	2.1	0.3	1.3	3.8
Makwanpur	29.2	0.4	1.3	2.0	0.5	1.3	3.6
Manang	2.3	1.0	1.8	2.5	1.2	2.0	4.7
Morang	31.0	0.2	1.1	1.9	0.3	1.2	3.5
Mugu	10.3	1.1	1.8	2.5	1.3	2.0	4.7
Mustang	4.2	1.1	1.8	2.5	1.2	2.0	4.7
Myagdi	12.0	0.8	1.5	2.1	0.9	1.6	4.0
Nawalparasi-E	32.1	0.5	1.4	2.1	0.6	1.4	3.8
Nawalparasi-W	33.9	0.4	1.3	2.0	0.4	1.2	3.7
Nuwakot	26.2	0.6	1.4	2.0	0.7	1.5	3.8
Okhaldhunga	23.7	0.5	1.2	1.9	0.5	1.3	3.4
Palpa	29.1	0.4	1.3	1.9	0.5	1.2	3.6
Panchthar	21.4	0.5	1.2	1.8	0.5	1.3	3.3
Parbat	24.8	0.6	1.3	1.8	0.6	1.3	3.4
Parsa	33.4	0.4	1.4	2.2	0.4	1.3	3.9

	Baseline	SSP245			SSP585		
Districts	(℃)	2030s	2050s	2080s	2030s	2050s	2080s
Pyuthan	27.3	0.5	1.3	1.9	0.6	1.3	3.5
Ramechhap	21.2	0.5	1.3	1.9	0.6	1.4	3.6
Rasuwa	9.7	0.9	1.6	2.3	1.0	1.8	4.4
Rautahat	33.9	0.3	1.3	2.1	0.3	1.3	3.9
Rolpa	23.7	0.5	1.3	1.8	0.6	1.3	3.4
Rukum-E	15.0	0.7	1.5	2.1	0.8	1.5	3.9
Rukum-W	22.5	0.7	1.4	2.0	0.8	1.4	3.6
Rupandehi	34.2	0.4	1.4	2.1	0.4	1.3	3.8
Salyan	27.9	0.5	1.3	1.9	0.6	1.3	3.5
Sankhuwasabha	14.0	0.7	1.4	2.1	0.8	1.6	3.9
Saptari	33.0	0.2	1.2	2.0	0.3	1.2	3.6
Sarlahi	33.4	0.4	1.3	2.1	0.4	1.3	3.9
Sindhuli	29.8	0.4	1.3	2.0	0.5	1.3	3.7
Sindhupalchok	17.4	0.7	1.5	2.1	0.8	1.6	4.0
Siraha	33.0	0.3	1.3	2.1	0.4	1.3	3.7
Solukhumbu	8.2	0.7	1.5	2.2	0.8	1.7	4.2
Sunsari	32.2	0.2	1.1	1.9	0.3	1.2	3.5
Surkhet	30.2	0.6	1.3	1.9	0.6	1.3	3.6
Syangja	28.4	0.5	1.3	1.9	0.6	1.3	3.5
Tanahu	30.4	0.6	1.4	2.1	0.7	1.4	3.8
Taplejung	8.5	0.7	1.5	2.1	0.8	1.6	4.0
Terhathum	23.7	0.4	1.2	1.8	0.5	1.3	3.4
Udayapur	30.2	0.3	1.2	1.9	0.4	1.3	3.5
Monsoon							
Achham	28.2	0.6	1.1	1.7	0.5	1.2	2.7
Arghakhanchi	28.4	0.6	1.1	1.7	0.5	1.2	2.6
Baglung	21.9	0.6	1.0	1.6	0.5	1.2	2.7
Baitadi	27.5	0.7	1.3	1.9	0.7	1.4	2.9
Bajhang	18.3	0.9	1.5	2.3	0.9	1.8	3.7
Bajura	20.7	0.8	1.2	1.9	0.7	1.5	3.2
Banke	33.2	0.5	1.1	1.7	0.4	1.1	2.6
Bara	32.9	0.6	1.2	1.9	0.5	1.3	2.7
Bardiya	33.1	0.5	1.1	1.7	0.5	1.2	2.6
Bhaktapur	26.8	0.6	1.1	1.7	0.6	1.3	2.7
Bhojpur	26.3	0.7	1.2	1.9	0.7	1.4	2.9
Chitwan	32.6	0.6	1.1	1.8	0.5	1.2	2.7
Dadeldhura	28.3	0.6	1.2	1.8	0.6	1.3	2.8
Dailekh	27.4	0.6	1.1	1.6	0.5	1.2	2.6
Dang	31.2	0.5	1.1	1.7	0.4	1.1	2.6
Darchula	17.2	1.0	1.6	2.4	0.9	1.9	4.1
Dhading	26.7	0.7	1.1	1.7	0.6	1.3	2.8
Dhankuta	27.9	0.7	1.3	1.9	0.8	1.5	2.9
Dhanusha	32.9	0.6	1.2	1.9	0.6	1.3	2.8
Dolakha	16.4	0.8	1.4	2.1	0.8	1.6	3.4
Dolpa	9.7	0.9	1.5	2.3	0.9	1.8	4.1

	Baseline	SSP245			SSP585		
Districts	(℃)	2030s	2050s	2080s	2030s	2050s	2080s
Doti	27.3	0.6	1.2	1.8	0.6	1.3	2.8
Gorkha	18.4	0.7	1.3	1.9	0.7	1.5	3.2
Gulmi	27.3	0.6	1.1	1.7	0.6	1.2	2.6
Humla	12.3	1.1	1.7	2.5	1.1	2.1	4.4
Ilam	26.7	0.7	1.2	1.9	0.7	1.5	2.9
Jajarkot	23.1	0.7	1.1	1.7	0.6	1.3	2.7
Jhapa	32.2	0.8	1.4	2.0	0.8	1.5	3.0
Jumla	16.5	0.8	1.3	1.9	0.7	1.5	3.3
Kailali	32.4	0.6	1.1	1.8	0.5	1.2	2.7
Kalikot	21.4	0.7	1.2	1.8	0.6	1.3	2.9
Kanchanpur	33.5	0.6	1.2	1.8	0.5	1.3	2.8
Kapilbastu	33.2	0.5	1.1	1.7	0.4	1.2	2.6
Kaski	21.0	0.7	1.2	1.9	0.7	1.4	3.0
Kathmandu	26.9	0.6	1.1	1.7	0.6	1.3	2.7
Kavrepalanchok	27.1	0.6	1.2	1.8	0.6	1.3	2.7
Khotang	26.5	0.7	1.3	1.9	0.8	1.5	3.0
Lalitpur	26.1	0.5	1.1	1.7	0.5	1.2	2.6
Lamjung	21.5	0.7	1.2	1.8	0.7	1.4	2.9
Mahottari	32.8	0.6	1.2	1.9	0.6	1.3	2.8
Makwanpur	29.6	0.6	1.1	1.7	0.5	1.2	2.6
Manang	7.2	1.0	1.6	2.5	0.9	2.0	4.3
Morang	31.1	0.7	1.3	2.0	0.7	1.4	2.9
Mugu	15.1	0.9	1.4	2.1	0.9	1.7	3.6
Mustang	9.4	1.0	1.5	2.3	0.9	1.9	4.1
Myagdi	15.4	0.8	1.3	2.0	0.7	1.5	3.3
Nawalparasi-E	32.1	0.6	1.1	1.7	0.5	1.2	2.7
Nawalparasi-W	33.2	0.6	1.2	1.8	0.5	1.3	2.7
Nuwakot	27.7	0.6	1.1	1.7	0.6	1.3	2.7
Okhaldhunga	25.2	0.7	1.2	1.9	0.7	1.4	3.0
Palpa	29.3	0.6	1.2	1.8	0.6	1.3	2.7
Panchthar	23.6	0.8	1.3	2.0	0.8	1.6	3.1
Parbat	26.4	0.6	1.0	1.6	0.5	1.2	2.5
Parsa	32.8	0.6	1.2	1.8	0.5	1.2	2.7
Pyuthan	27.8	0.6	1.1	1.7	0.5	1.2	2.6
Ramechhap	23.1	0.7	1.3	1.9	0.7	1.5	3.0
Rasuwa	13.5	0.8	1.4	2.2	0.8	1.7	3.6
Rautahat	33.2	0.5	1.2	1.9	0.5	1.2	2.7
Rolpa	24.8	0.6	1.1	1.6	0.5	1.2	2.5
Rukum-E	17.8	0.7	1.2	1.8	0.6	1.4	3.0
Rukum-W	24.4	0.6	1.0	1.6	0.5	1.2	2.6
Rupandehi	33.4	0.5	1.1	1.7	0.4	1.1	2.6
Salyan	28.3	0.5	1.0	1.6	0.4	1.1	2.4
Sankhuwasabha	17.5	0.9	1.5	2.2	0.9	1.8	3.6
Saptari	32.4	0.6	1.3	2.0	0.7	1.4	2.9
Sarlahi	32.9	0.6	1.2	1.9	0.6	1.3	2.8

	Baseline	SSP245			SSP585		
Districts	(℃)	2030s	2050s	2080s	2030s	2050s	2080s
Sindhuli	30.2	0.6	1.2	1.9	0.6	1.3	2.8
Sindhupalchok	20.2	0.7	1.2	1.9	0.7	1.4	3.1
Siraha	32.6	0.6	1.2	1.9	0.6	1.3	2.9
Solukhumbu	12.0	1.0	1.7	2.5	1.0	2.0	4.1
Sunsari	32.1	0.6	1.2	1.9	0.7	1.4	2.9
Surkhet	30.3	0.6	1.1	1.7	0.5	1.2	2.6
Syangja	29.2	0.6	1.1	1.7	0.6	1.3	2.7
Tanahu	31.1	0.7	1.2	1.8	0.6	1.3	2.8
Taplejung	12.8	1.0	1.7	2.5	1.1	2.0	4.0
Terhathum	25.7	0.7	1.2	1.9	0.7	1.4	2.9
Udayapur	30.5	0.6	1.2	1.9	0.7	1.4	2.9
Post-monsoon							
Achham	23.3	0.7	1.2	2.0	0.7	1.5	3.5
Arghakhanchi	24.7	0.6	1.1	1.9	0.5	1.4	3.5
Baglung	17.8	0.8	1.3	2.2	0.8	1.7	4.2
Baitadi	22.7	0.7	1.2	2.0	0.7	1.6	3.7
Bajhang	13.4	1.0	1.6	2.6	1.0	2.1	4.8
Bajura	15.6	0.9	1.5	2.4	1.0	1.9	4.5
Banke	29.2	0.3	0.8	1.5	0.3	1.0	3.0
Bara	29.9	0.6	1.2	2.2	0.6	1.6	4.1
Bardiya	28.9	0.4	0.8	1.5	0.3	1.1	2.9
Bhaktapur	23.1	0.8	1.3	2.1	0.8	1.7	4.0
Bhojpur	23.2	0.8	1.4	2.4	0.8	2.0	4.7
Chitwan	29.0	0.6	1.1	1.9	0.5	1.4	3.6
Dadeldhura	23.9	0.5	1.0	1.8	0.5	1.3	3.4
Dailekh	22.6	0.6	1.1	1.9	0.6	1.4	3.6
Dang	27.4	0.4	1.0	1.7	0.4	1.2	3.3
Darchula	12.1	1.0	1.6	2.7	1.0	2.1	5.0
Dhading	22.7	0.7	1.2	2.1	0.7	1.6	3.9
Dhankuta	25.0	0.8	1.4	2.4	0.8	1.9	4.7
Dhanusha	30.2	0.6	1.3	2.3	0.6	1.7	4.2
Dolakha	12.8	1.0	1.7	2.8	1.1	2.2	5.2
Dolpa	5.0	1.2	1.9	3.1	1.3	2.5	5.6
Doti	22.7	0.6	1.1	2.0	0.6	1.5	3.6
Gorkha	14.2	1.0	1.6	2.5	1.0	2.0	4.6
Gulmi	23.4	0.6	1.1	1.9	0.6	1.5	3.6
Humla	6.9	1.2	1.9	3.0	1.2	2.4	5.3
Ilam	23.8	0.8	1.5	2.6	0.9	2.1	5.1
Jajarkot	18.5	0.7	1.3	2.1	0.7	1.6	4.0
Jhapa	29.6	0.8	1.4	2.4	0.8	1.9	4.6
Jumla	11.7	1.1	1.7	2.7	1.1	2.1	4.9
Kailali	28.2	0.3	0.8	1.5	0.3	1.1	2.9
Kalikot	16.6	0.8	1.4	2.3	0.8	1.8	4.3
Kanchanpur	29.4	0.3	0.8	1.5	0.2	1.0	2.9
Kapilbastu	29.8	0.4	0.9	1.7	0.3	1.2	3.1

	Baseline	SSP245			SSP585		
Districts	(℃)	2030s	2050s	2080s	2030s	2050s	2080s
Kaski	16.9	0.9	1.4	2.3	0.9	1.8	4.3
Kathmandu	23.1	0.7	1.2	2.1	0.7	1.6	3.9
Kavrepalanchok	23.6	0.7	1.3	2.1	0.7	1.7	4.1
Khotang	23.5	0.8	1.5	2.5	0.9	2.0	4.8
Lalitpur	22.6	0.7	1.3	2.2	0.7	1.7	4.1
Lamjung	17.3	0.8	1.4	2.3	0.9	1.8	4.1
Mahottari	30.1	0.6	1.2	2.2	0.6	1.6	4.1
Makwanpur	26.1	0.7	1.2	2.1	0.7	1.6	4.0
Manang	3.1	1.2	2.0	3.2	1.3	2.5	5.7
Morang	28.6	0.7	1.4	2.4	0.8	1.9	4.5
Mugu	9.9	1.1	1.8	2.8	1.2	2.2	4.9
Mustang	4.8	1.1	1.8	2.9	1.2	2.3	5.4
Myagdi	11.2	1.0	1.7	2.7	1.0	2.1	5.0
Nawalparasi-E	28.3	0.6	1.1	1.9	0.6	1.5	3.5
Nawalparasi-W	29.7	0.5	1.0	1.8	0.4	1.3	3.3
Nuwakot	23.6	0.7	1.2	2.0	0.8	1.6	3.8
Okhaldhunga	22.0	0.8	1.4	2.5	0.9	2.0	4.7
Palpa	25.7	0.6	1.1	1.9	0.5	1.4	3.5
Panchthar	20.5	0.9	1.5	2.7	1.0	2.2	5.2
Parbat	22.2	0.8	1.3	2.1	0.8	1.6	3.8
Parsa	29.7	0.6	1.2	2.1	0.5	1.5	4.0
Pyuthan	23.9	0.6	1.1	1.9	0.6	1.4	3.6
Ramechhap	19.7	0.9	1.5	2.5	0.9	2.0	4.7
Rasuwa	9.7	1.0	1.6	2.7	1.0	2.1	4.9
Rautahat	30.3	0.6	1.2	2.2	0.5	1.6	4.1
Rolpa	20.7	0.7	1.2	2.0	0.6	1.5	3.9
Rukum-E	13.6	0.9	1.5	2.5	0.9	1.9	4.7
Rukum-W	19.7	0.8	1.3	2.2	0.8	1.7	4.0
Rupandehi	30.0	0.4	0.9	1.7	0.4	1.2	3.2
Salyan	24.0	0.5	1.0	1.8	0.5	1.3	3.4
Sankhuwasabha	14.0	1.1	1.7	2.9	1.1	2.4	5.4
Saptari	30.2	0.6	1.3	2.3	0.7	1.7	4.3
Sarlahi	30.0	0.6	1.3	2.2	0.6	1.7	4.2
Sindhuli	27.1	0.7	1.3	2.2	0.7	1.7	4.2
Sindhupalchok	16.3	0.9	1.5	2.5	1.0	2.0	4.6
Siraha	30.0	0.7	1.3	2.3	0.7	1.7	4.3
Solukhumbu	8.8	1.1	1.9	3.2	1.2	2.6	5.9
Sunsari	29.6	0.7	1.4	2.4	0.8	1.8	4.5
Surkhet	25.8	0.5	1.0	1.7	0.5	1.2	3.2
Syangja	25.2	0.7	1.2	2.0	0.7	1.5	3.7
Tanahu	27.0	0.7	1.2	2.0	0.7	1.5	3.6
Taplejung	9.4	1.2	1.9	3.1	1.3	2.6	5.9
Terhathum	22.4	0.8	1.4	2.5	0.9	2.0	4.9
Udayapur	27.8	0.7	1.3	2.3	0.7	1.8	4.5
Annual							

	Baseline	SSP245			SSP585		
Districts	(℃)	2030s	2050s	2080s	2030s	2050s	2080s
Achham	24.5	0.7	1.3	2.0	0.7	1.5	3.5
Arghakhanchi	25.4	0.6	1.2	1.9	0.6	1.3	3.4
Baglung	18.4	0.8	1.4	2.1	0.7	1.5	3.7
Baitadi	23.7	0.8	1.4	2.2	0.8	1.6	3.8
Bajhang	14.2	1.1	1.8	2.8	1.1	2.1	4.8
Bajura	16.5	1.0	1.7	2.5	1.0	2.0	4.4
Banke	30.2	0.5	1.2	1.9	0.5	1.3	3.3
Bara	30.3	0.6	1.4	2.2	0.6	1.5	3.7
Bardiya	30.0	0.6	1.2	1.9	0.5	1.3	3.3
Bhaktapur	23.7	0.7	1.3	2.0	0.7	1.5	3.5
Bhojpur	23.3	0.7	1.4	2.2	0.8	1.6	3.8
Chitwan	29.7	0.6	1.3	2.0	0.6	1.4	3.5
Dadeldhura	24.8	0.7	1.3	2.0	0.7	1.5	3.6
Dailekh	23.7	0.7	1.3	2.0	0.7	1.5	3.5
Dang	28.3	0.5	1.2	1.9	0.5	1.3	3.3
Darchula	12.9	1.2	2.0	3.0	1.2	2.3	5.2
Dhading	23.4	0.7	1.3	2.0	0.7	1.5	3.6
Dhankuta	25.1	0.6	1.3	2.1	0.7	1.6	3.7
Dhanusha	30.4	0.6	1.4	2.3	0.6	1.5	3.8
Dolakha	13.0	0.9	1.7	2.5	1.0	2.0	4.5
Dolpa	5.5	1.3	2.0	3.1	1.3	2.4	5.4
Doti	23.7	0.7	1.3	2.1	0.7	1.5	3.6
Gorkha	14.7	1.0	1.6	2.5	1.0	1.9	4.3
Gulmi	24.1	0.7	1.2	1.9	0.6	1.4	3.4
Humla	7.7	1.4	2.2	3.3	1.5	2.6	5.7
Ilam	23.8	0.7	1.4	2.2	0.8	1.7	3.9
Jajarkot	19.4	0.8	1.4	2.2	0.8	1.6	3.8
Jhapa	29.7	0.6	1.4	2.3	0.7	1.6	3.9
Jumla	12.4	1.1	1.7	2.6	1.1	2.0	4.6
Kailali	29.2	0.6	1.2	1.9	0.6	1.4	3.4
Kalikot	17.5	0.9	1.5	2.3	0.8	1.7	4.0
Kanchanpur	30.4	0.5	1.2	1.9	0.5	1.3	3.3
Kapilbastu	30.5	0.5	1.2	1.9	0.4	1.3	3.4
Kaski	17.5	0.8	1.4	2.2	0.8	1.7	3.9
Kathmandu	23.7	0.7	1.3	2.0	0.7	1.5	3.5
Kavrepalanchok	24.1	0.6	1.2	2.0	0.6	1.4	3.5
Khotang	23.7	0.6	1.3	2.1	0.7	1.6	3.7
Lalitpur	23.1	0.6	1.2	2.0	0.6	1.4	3.5
Lamjung	17.9	0.9	1.5	2.2	0.9	1.7	3.9
Mahottari	30.3	0.6	1.4	2.2	0.6	1.5	3.8
Makwanpur	26.7	0.6	1.2	2.0	0.6	1.4	3.5
Manang	3.3	1.3	2.0	3.1	1.3	2.4	5.5
Morang	28.6	0.6	1.4	2.3	0.7	1.6	3.9
Mugu	10.7	1.2	1.9	2.9	1.3	2.3	4.9
Mustang	5.2	1.3	2.0	3.0	1.3	2.4	5.3

	Baseline	SSP245			SSP585		
Districts	(℃)	2030s	2050s	2080s	2030s	2050s	2080s
Myagdi	11.7	1.0	1.6	2.5	1.0	1.9	4.5
Nawalparasi-E	29.1	0.6	1.3	2.0	0.6	1.4	3.5
Nawalparasi-W	30.4	0.5	1.2	2.0	0.5	1.3	3.4
Nuwakot	24.4	0.7	1.3	2.0	0.7	1.5	3.5
Okhaldhunga	22.2	0.7	1.4	2.2	0.8	1.6	3.8
Palpa	26.3	0.6	1.3	2.0	0.6	1.4	3.5
Panchthar	20.5	0.8	1.4	2.3	0.8	1.7	3.9
Parbat	23.0	0.7	1.2	1.9	0.7	1.4	3.3
Parsa	30.2	0.5	1.3	2.1	0.5	1.4	3.6
Pyuthan	24.7	0.6	1.2	1.9	0.6	1.4	3.3
Ramechhap	20.0	0.8	1.4	2.2	0.8	1.7	3.9
Rasuwa	9.9	1.1	1.8	2.7	1.1	2.1	4.7
Rautahat	30.6	0.6	1.4	2.2	0.6	1.5	3.8
Rolpa	21.5	0.7	1.3	2.0	0.7	1.4	3.5
Rukum-E	14.2	0.9	1.5	2.4	0.8	1.7	4.2
Rukum-W	20.7	0.8	1.4	2.1	0.8	1.6	3.6
Rupandehi	30.6	0.5	1.3	2.0	0.5	1.3	3.4
Salyan	25.0	0.6	1.2	1.9	0.6	1.3	3.3
Sankhuwasabha	14.1	0.9	1.7	2.6	1.0	2.0	4.6
Saptari	30.2	0.5	1.3	2.2	0.5	1.5	3.8
Sarlahi	30.4	0.5	1.3	2.2	0.5	1.4	3.7
Sindhuli	27.4	0.7	1.3	2.1	0.7	1.5	3.7
Sindhupalchok	16.7	0.9	1.6	2.4	1.0	1.8	4.2
Siraha	30.2	0.5	1.3	2.2	0.5	1.5	3.8
Solukhumbu	8.7	1.1	1.9	2.9	1.1	2.3	5.2
Sunsari	29.6	0.6	1.4	2.3	0.7	1.6	3.9
Surkhet	27.0	0.6	1.2	1.9	0.6	1.3	3.3
Syangja	26.0	0.7	1.2	1.9	0.6	1.4	3.4
Tanahu	27.9	0.7	1.3	2.0	0.7	1.4	3.5
Taplejung	9.3	1.1	1.9	2.9	1.2	2.3	5.1
Terhathum	22.5	0.8	1.4	2.2	0.8	1.7	3.8
Udayapur	27.9	0.6	1.3	2.2	0.6	1.6	3.8

Table 9.17: Absolute uncertainty (standard deviation) in projected change in future seasonal maximum temperature (℃) compared to the baseline period (1981-2010) within the districts of Nepal

	Baseline	SSP245			SSP585		
Districts	(℃)	2030s	2050s	2080s	2030s	2050s	2080s
Winter							
Achham	17.7	0.3	0.4	0.8	0.2	0.6	1.1
Arghakhanchi	19.0	0.3	0.3	0.8	0.4	0.7	1.1
Baglung	12.7	0.3	0.5	0.9	0.4	0.7	1.1
Baitadi	17.1	0.3	0.5	0.9	0.3	0.6	1.2
Bajhang	8.5	0.4	0.7	1.2	0.4	0.8	1.4
Bajura	10.6	0.3	0.5	1.0	0.4	0.7	1.2
Banke	22.9	0.4	0.4	0.8	0.4	0.7	1.0
Bara	23.9	0.4	0.4	0.9	0.7	0.9	1.3
Bardiya	22.7	0.4	0.5	0.8	0.4	0.7	1.0
Bhaktapur	18.0	0.3	0.4	0.7	0.4	0.6	1.1
Bhojpur	18.0	0.3	0.5	0.9	0.5	0.8	1.3
Chitwan	23.2	0.3	0.3	0.8	0.4	0.7	1.2
Dadeldhura	18.0	0.4	0.5	0.9	0.3	0.6	1.2
Dailekh	17.0	0.3	0.4	0.8	0.3	0.6	1.2
Dang	21.4	0.3	0.4	0.8	0.4	0.7	1.1
Darchula	7.3	0.5	0.8	1.4	0.5	1.0	1.5
Dhading	17.6	0.2	0.4	0.7	0.3	0.6	1.0
Dhankuta	19.6	0.3	0.5	0.9	0.5	0.8	1.4
Dhanusha	24.2	0.5	0.4	0.9	0.8	1.0	1.5
Dolakha	8.3	0.3	0.5	1.1	0.5	0.8	1.3
Dolpa	0.9	0.3	0.6	1.4	0.5	0.8	1.1
Doti	17.0	0.3	0.5	0.8	0.3	0.6	1.2
Gorkha	9.7	0.3	0.5	0.9	0.4	0.7	1.1
Gulmi	17.9	0.2	0.4	0.8	0.3	0.7	1.1
Humla	2.7	0.5	0.8	1.7	0.5	1.1	1.3
Ilam	18.4	0.4	0.5	1.0	0.6	0.9	1.6
Jajarkot	13.3	0.3	0.5	0.9	0.3	0.6	1.1
Jhapa	23.9	0.5	0.7	1.1	0.8	1.1	1.9
Jumla	7.0	0.3	0.5	1.1	0.4	0.7	1.1
Kailali	21.9	0.4	0.5	0.8	0.3	0.7	1.1
Kalikot	11.4	0.3	0.5	0.9	0.4	0.7	1.2
Kanchanpur	22.9	0.4	0.5	0.8	0.4	0.7	1.0
Kapilbastu	23.5	0.4	0.4	0.8	0.5	0.8	1.1
Kaski	12.0	0.3	0.5	0.8	0.4	0.7	1.1
Kathmandu	18.0	0.2	0.4	0.7	0.3	0.6	1.0
Kavrepalanchok	18.3	0.3	0.4	0.7	0.4	0.7	1.2
Khotang	18.3	0.3	0.5	0.9	0.5	0.8	1.3
Lalitpur	17.4	0.3	0.4	0.8	0.4	0.7	1.1
Lamjung	12.5	0.2	0.5	0.8	0.4	0.6	1.0
Mahottari	24.1	0.4	0.4	0.9	0.8	1.0	1.4
Makwanpur	20.6	0.3	0.4	0.7	0.5	0.7	1.1

	Baseline	SSP245			SSP585		
Districts	(℃)	2030s	2050s	2080s	2030s	2050s	2080s
Manang	-1.0	0.4	0.7	1.4	0.6	0.9	1.3
Morang	22.9	0.4	0.6	1.0	0.8	1.0	1.7
Mugu	5.6	0.2	0.6	1.3	0.4	0.8	1.0
Mustang	0.7	0.4	0.6	1.4	0.5	0.9	1.1
Myagdi	6.6	0.3	0.6	1.1	0.4	0.7	1.3
Nawalparasi-E	22.5	0.3	0.4	0.8	0.4	0.7	1.2
Nawalparasi-W	23.5	0.3	0.3	0.8	0.5	0.8	1.3
Nuwakot	18.6	0.2	0.3	0.6	0.3	0.5	0.9
Okhaldhunga	16.8	0.3	0.5	0.8	0.5	0.7	1.2
Palpa	19.9	0.3	0.3	0.8	0.4	0.7	1.3
Panchthar	15.4	0.3	0.5	1.0	0.5	0.8	1.5
Parbat	17.1	0.2	0.4	0.7	0.3	0.6	1.0
Parsa	23.7	0.4	0.4	0.8	0.7	0.9	1.3
Pyuthan	18.3	0.3	0.4	0.8	0.3	0.7	1.1
Ramechhap	14.7	0.3	0.5	0.9	0.5	0.7	1.2
Rasuwa	5.4	0.3	0.6	1.1	0.5	0.8	1.2
Rautahat	24.2	0.4	0.4	0.9	0.8	1.0	1.4
Rolpa	15.4	0.3	0.4	0.8	0.3	0.6	1.1
Rukum-E	8.7	0.3	0.6	1.0	0.4	0.8	1.3
Rukum-W	14.7	0.3	0.4	0.8	0.3	0.6	1.1
Rupandehi	23.6	0.4	0.4	0.8	0.5	0.8	1.2
Salyan	18.4	0.3	0.4	0.8	0.3	0.6	1.1
Sankhuwasabha	9.5	0.3	0.6	1.1	0.5	0.8	1.4
Saptari	24.2	0.5	0.5	1.0	0.9	1.2	1.7
Sarlahi	24.0	0.4	0.4	0.8	0.7	0.9	1.4
Sindhuli	21.5	0.3	0.4	0.8	0.5	0.8	1.2
Sindhupalchok	11.7	0.3	0.5	0.8	0.4	0.7	1.1
Siraha	24.1	0.4	0.5	0.9	0.8	1.0	1.6
Solukhumbu	4.5	0.3	0.7	1.3	0.6	1.0	1.6
Sunsari	23.8	0.4	0.5	1.0	0.8	1.0	1.7
Surkhet	20.0	0.3	0.4	0.8	0.3	0.6	1.1
Syangja	19.8	0.2	0.3	0.8	0.3	0.6	1.1
Tanahu	21.6	0.2	0.3	0.7	0.3	0.6	1.1
Taplejung	5.2	0.3	0.7	1.4	0.6	1.0	1.8
Terhathum	17.2	0.3	0.5	0.9	0.5	0.8	1.3
Udayapur	22.1	0.4	0.5	0.9	0.6	0.9	1.5
Pre-Monsoon							
Achham	27.0	0.4	0.5	0.4	0.4	0.5	1.0
Arghakhanchi	28.2	0.5	0.5	0.7	0.6	0.8	1.3
Baglung	19.8	0.4	0.5	0.5	0.4	0.5	1.0
Baitadi	25.9	0.4	0.6	0.4	0.4	0.5	1.1
Bajhang	14.8	0.4	0.7	0.3	0.3	0.4	1.0
Bajura	17.3	0.4	0.6	0.3	0.3	0.4	0.8
Banke	34.2	0.5	0.6	0.7	0.7	0.9	1.3
Bara	33.5	0.5	0.6	0.9	0.9	1.1	1.4

	Baseline	SSP245			SSP585		
Districts	(℃)	2030s	2050s	2080s	2030s	2050s	2080s
Bardiya	34.0	0.5	0.5	0.7	0.6	0.8	1.3
Bhaktapur	25.6	0.4	0.5	0.6	0.6	0.7	1.0
Bhojpur	24.7	0.3	0.4	0.5	0.5	0.7	0.9
Chitwan	32.8	0.5	0.6	0.8	0.7	1.0	1.4
Dadeldhura	27.5	0.5	0.6	0.5	0.5	0.5	1.2
Dailekh	26.3	0.5	0.5	0.4	0.4	0.5	1.0
Dang	31.8	0.5	0.5	0.7	0.7	0.9	1.3
Darchula	13.2	0.5	0.7	0.3	0.4	0.5	1.1
Dhading	25.2	0.4	0.5	0.5	0.5	0.6	1.1
Dhankuta	26.7	0.3	0.5	0.6	0.6	0.8	1.0
Dhanusha	33.4	0.5	0.6	0.9	0.9	1.2	1.3
Dolakha	13.1	0.4	0.5	0.4	0.4	0.5	0.9
Dolpa	4.7	0.4	0.6	0.3	0.2	0.4	0.9
Doti	26.2	0.4	0.5	0.5	0.4	0.5	1.2
Gorkha	15.2	0.4	0.6	0.5	0.4	0.5	1.1
Gulmi	26.4	0.4	0.5	0.5	0.5	0.7	1.1
Humla	6.7	0.4	0.7	0.3	0.3	0.5	0.8
Ilam	25.3	0.4	0.6	0.7	0.6	0.9	1.1
Jajarkot	21.1	0.4	0.5	0.4	0.4	0.5	1.0
Jhapa	32.1	0.4	0.7	1.0	0.8	1.2	1.5
Jumla	12.6	0.4	0.6	0.3	0.2	0.4	0.8
Kailali	33.0	0.5	0.6	0.6	0.6	0.7	1.3
Kalikot	18.8	0.4	0.5	0.3	0.3	0.4	0.9
Kanchanpur	34.3	0.5	0.6	0.6	0.6	0.7	1.4
Kapilbastu	34.2	0.5	0.6	0.9	0.8	1.0	1.6
Kaski	18.5	0.3	0.5	0.5	0.4	0.5	1.1
Kathmandu	25.5	0.4	0.5	0.5	0.5	0.7	1.0
Kavrepalanchok	25.9	0.4	0.5	0.6	0.6	0.7	1.0
Khotang	25.2	0.3	0.5	0.5	0.5	0.7	0.9
Lalitpur	25.0	0.4	0.5	0.6	0.6	0.8	1.1
Lamjung	18.9	0.3	0.6	0.4	0.4	0.5	1.1
Mahottari	33.4	0.5	0.5	0.8	0.9	1.1	1.4
Makwanpur	29.2	0.4	0.5	0.7	0.7	0.9	1.2
Manang	2.3	0.5	0.7	0.4	0.3	0.5	1.2
Morang	31.0	0.4	0.6	0.9	0.8	1.1	1.4
Mugu	10.3	0.4	0.6	0.3	0.2	0.4	0.8
Mustang	4.2	0.4	0.7	0.4	0.2	0.4	1.0
Myagdi	12.0	0.4	0.5	0.4	0.3	0.5	1.0
Nawalparasi-E	32.1	0.5	0.6	0.8	0.7	0.9	1.4
Nawalparasi-W	33.9	0.5	0.6	1.0	0.8	1.1	1.6
Nuwakot	26.2	0.4	0.5	0.5	0.5	0.6	1.0
Okhaldhunga	23.7	0.3	0.5	0.5	0.5	0.7	0.9
Palpa	29.1	0.5	0.5	0.8	0.7	0.9	1.3
Panchthar	21.4	0.3	0.5	0.6	0.5	0.7	1.0
Parbat	24.8	0.3	0.5	0.5	0.4	0.6	1.0

	Baseline	SSP245			SSP585		
Districts	(℃)	2030s	2050s	2080s	2030s	2050s	2080s
Parsa	33.4	0.5	0.6	0.9	0.9	1.1	1.4
Pyuthan	27.3	0.4	0.5	0.6	0.5	0.7	1.1
Ramechhap	21.2	0.4	0.5	0.5	0.5	0.7	0.9
Rasuwa	9.7	0.4	0.6	0.4	0.4	0.5	1.1
Rautahat	33.9	0.5	0.6	0.9	0.9	1.2	1.4
Rolpa	23.7	0.4	0.5	0.5	0.5	0.6	1.1
Rukum-E	15.0	0.4	0.5	0.4	0.4	0.5	1.0
Rukum-W	22.5	0.4	0.5	0.4	0.3	0.4	1.0
Rupandehi	34.2	0.5	0.6	1.0	0.8	1.1	1.6
Salyan	27.9	0.5	0.6	0.6	0.5	0.7	1.2
Sankhuwasabha	14.0	0.3	0.5	0.5	0.4	0.6	0.8
Saptari	33.0	0.5	0.6	0.9	0.9	1.2	1.4
Sarlahi	33.4	0.5	0.6	0.8	0.9	1.1	1.3
Sindhuli	29.8	0.4	0.5	0.7	0.7	0.9	1.1
Sindhupalchok	17.4	0.3	0.5	0.4	0.4	0.6	1.0
Siraha	33.0	0.4	0.6	0.9	0.8	1.1	1.3
Solukhumbu	8.2	0.4	0.6	0.5	0.4	0.5	0.9
Sunsari	32.2	0.5	0.6	0.9	0.8	1.1	1.3
Surkhet	30.2	0.5	0.5	0.5	0.5	0.6	1.2
Syangja	28.4	0.4	0.5	0.6	0.5	0.7	1.1
Tanahu	30.4	0.4	0.5	0.6	0.5	0.7	1.3
Taplejung	8.5	0.3	0.5	0.5	0.4	0.6	0.9
Terhathum	23.7	0.3	0.5	0.6	0.5	0.7	0.9
Udayapur	30.2	0.4	0.5	0.7	0.7	0.9	1.1
Monsoon							
Achham	28.2	0.4	0.3	0.3	0.3	0.3	0.6
Arghakhanchi	28.4	0.3	0.4	0.4	0.3	0.4	0.7
Baglung	21.9	0.2	0.2	0.3	0.2	0.3	0.6
Baitadi	27.5	0.3	0.3	0.3	0.3	0.3	0.6
Bajhang	18.3	0.3	0.3	0.3	0.3	0.3	0.7
Bajura	20.7	0.3	0.3	0.3	0.2	0.3	0.6
Banke	33.2	0.4	0.5	0.5	0.4	0.5	0.7
Bara	32.9	0.2	0.5	0.6	0.3	0.6	0.9
Bardiya	33.1	0.4	0.5	0.5	0.4	0.5	0.7
Bhaktapur	26.8	0.2	0.3	0.4	0.2	0.4	0.7
Bhojpur	26.3	0.2	0.3	0.5	0.2	0.4	0.8
Chitwan	32.6	0.2	0.4	0.4	0.3	0.4	0.8
Dadeldhura	28.3	0.4	0.4	0.3	0.3	0.4	0.6
Dailekh	27.4	0.3	0.3	0.3	0.3	0.4	0.5
Dang	31.2	0.4	0.5	0.4	0.3	0.5	0.7
Darchula	17.2	0.3	0.3	0.3	0.3	0.3	0.8
Dhading	26.7	0.2	0.3	0.4	0.2	0.4	0.8
Dhankuta	27.9	0.2	0.3	0.5	0.2	0.4	0.7
Dhanusha	32.9	0.2	0.4	0.5	0.2	0.6	0.9
Dolakha	16.4	0.2	0.4	0.6	0.3	0.5	0.9

	Baseline	SSP245			SSP585		
Districts	(℃)	2030s	2050s	2080s	2030s	2050s	2080s
Dolpa	9.7	0.3	0.3	0.5	0.3	0.4	0.9
Doti	27.3	0.4	0.3	0.3	0.3	0.4	0.6
Gorkha	18.4	0.2	0.3	0.6	0.3	0.4	0.9
Gulmi	27.3	0.3	0.3	0.4	0.3	0.3	0.6
Humla	12.3	0.3	0.3	0.3	0.3	0.2	0.8
Ilam	26.7	0.2	0.3	0.5	0.3	0.5	0.8
Jajarkot	23.1	0.3	0.3	0.3	0.3	0.3	0.5
Jhapa	32.2	0.2	0.3	0.5	0.3	0.5	0.7
Jumla	16.5	0.2	0.3	0.4	0.3	0.3	0.7
Kailali	32.4	0.5	0.5	0.5	0.4	0.5	0.7
Kalikot	21.4	0.3	0.3	0.3	0.3	0.3	0.6
Kanchanpur	33.5	0.5	0.4	0.5	0.4	0.5	0.8
Kapilbastu	33.2	0.4	0.5	0.5	0.3	0.6	0.8
Kaski	21.0	0.2	0.3	0.5	0.2	0.3	0.8
Kathmandu	26.9	0.2	0.3	0.4	0.2	0.4	0.7
Kavrepalanchok	27.1	0.2	0.3	0.5	0.2	0.4	0.8
Khotang	26.5	0.2	0.3	0.5	0.2	0.4	0.8
Lalitpur	26.1	0.2	0.4	0.4	0.3	0.4	0.8
Lamjung	21.5	0.2	0.3	0.5	0.2	0.4	0.9
Mahottari	32.8	0.2	0.4	0.5	0.3	0.6	0.9
Makwanpur	29.6	0.2	0.4	0.5	0.3	0.5	0.8
Manang	7.2	0.3	0.4	0.7	0.3	0.5	1.2
Morang	31.1	0.2	0.3	0.5	0.3	0.5	0.7
Mugu	15.1	0.2	0.3	0.4	0.2	0.3	0.8
Mustang	9.4	0.2	0.3	0.5	0.2	0.4	0.8
Myagdi	15.4	0.2	0.3	0.4	0.2	0.3	0.8
Nawalparasi-E	32.1	0.2	0.4	0.5	0.3	0.4	0.8
Nawalparasi-W	33.2	0.3	0.5	0.5	0.3	0.5	0.8
Nuwakot	27.7	0.2	0.3	0.4	0.2	0.4	0.8
Okhaldhunga	25.2	0.2	0.3	0.5	0.3	0.5	0.8
Palpa	29.3	0.3	0.4	0.4	0.3	0.4	0.7
Panchthar	23.6	0.2	0.3	0.6	0.2	0.4	0.8
Parbat	26.4	0.2	0.2	0.3	0.2	0.3	0.6
Parsa	32.8	0.2	0.5	0.6	0.3	0.6	0.9
Pyuthan	27.8	0.3	0.4	0.4	0.2	0.4	0.6
Ramechhap	23.1	0.2	0.4	0.5	0.2	0.4	0.8
Rasuwa	13.5	0.2	0.4	0.5	0.3	0.4	0.9
Rautahat	33.2	0.2	0.5	0.6	0.3	0.6	0.9
Rolpa	24.8	0.2	0.3	0.3	0.2	0.4	0.5
Rukum-E	17.8	0.2	0.3	0.3	0.3	0.3	0.6
Rukum-W	24.4	0.2	0.3	0.3	0.2	0.3	0.5
Rupandehi	33.4	0.3	0.5	0.5	0.3	0.6	0.8
Salyan	28.3	0.3	0.4	0.4	0.3	0.4	0.5
Sankhuwasabha	17.5	0.3	0.4	0.6	0.3	0.5	0.9
Saptari	32.4	0.2	0.3	0.5	0.2	0.6	0.9

	Baseline	SSP245			SSP585		
Districts	(℃)	2030s	2050s	2080s	2030s	2050s	2080s
Sarlahi	32.9	0.2	0.4	0.5	0.3	0.5	0.9
Sindhuli	30.2	0.2	0.3	0.5	0.3	0.5	0.8
Sindhupalchok	20.2	0.2	0.3	0.5	0.2	0.4	0.8
Siraha	32.6	0.2	0.4	0.5	0.2	0.6	0.9
Solukhumbu	12.0	0.3	0.5	0.7	0.3	0.6	1.0
Sunsari	32.1	0.2	0.3	0.5	0.3	0.5	0.8
Surkhet	30.3	0.4	0.4	0.4	0.3	0.4	0.6
Syangja	29.2	0.2	0.3	0.3	0.2	0.4	0.6
Tanahu	31.1	0.2	0.3	0.4	0.2	0.3	0.7
Taplejung	12.8	0.3	0.5	0.7	0.4	0.6	1.0
Terhathum	25.7	0.2	0.3	0.5	0.2	0.4	0.8
Udayapur	30.5	0.2	0.3	0.5	0.2	0.5	0.8
Post-monsoon							
Achham	23.3	0.5	0.5	0.7	0.4	0.6	0.9
Arghakhanchi	24.7	0.3	0.5	0.7	0.5	0.7	1.1
Baglung	17.8	0.4	0.5	0.6	0.4	0.6	1.0
Baitadi	22.7	0.5	0.6	0.6	0.5	0.6	0.8
Bajhang	13.4	0.6	0.6	0.7	0.5	0.8	1.0
Bajura	15.6	0.6	0.6	0.6	0.5	0.7	1.0
Banke	29.2	0.4	0.6	0.9	0.5	0.7	1.0
Bara	29.9	0.4	0.5	1.0	0.5	0.8	1.5
Bardiya	28.9	0.4	0.6	0.9	0.5	0.7	1.0
Bhaktapur	23.1	0.3	0.4	0.6	0.4	0.6	1.0
Bhojpur	23.2	0.3	0.4	0.7	0.4	0.7	1.3
Chitwan	29.0	0.3	0.5	0.7	0.4	0.6	1.2
Dadeldhura	23.9	0.4	0.6	0.7	0.5	0.6	0.9
Dailekh	22.6	0.4	0.5	0.7	0.5	0.6	1.0
Dang	27.4	0.4	0.6	0.9	0.5	0.7	1.1
Darchula	12.1	0.6	0.7	0.7	0.6	0.8	1.0
Dhading	22.7	0.3	0.4	0.5	0.4	0.6	0.9
Dhankuta	25.0	0.3	0.4	0.7	0.5	0.7	1.4
Dhanusha	30.2	0.3	0.4	0.9	0.5	0.7	1.5
Dolakha	12.8	0.3	0.5	0.6	0.4	0.7	1.1
Dolpa	5.0	0.6	0.6	0.7	0.6	0.9	1.0
Doti	22.7	0.4	0.6	0.7	0.5	0.6	1.0
Gorkha	14.2	0.3	0.4	0.5	0.4	0.6	0.9
Gulmi	23.4	0.3	0.4	0.6	0.4	0.6	1.0
Humla	6.9	0.7	0.7	0.7	0.6	0.9	1.1
Ilam	23.8	0.4	0.5	0.9	0.5	0.8	1.5
Jajarkot	18.5	0.4	0.6	0.7	0.5	0.7	1.0
Jhapa	29.6	0.4	0.4	0.9	0.6	0.8	1.6
Jumla	11.7	0.6	0.6	0.7	0.5	0.8	1.0
Kailali	28.2	0.4	0.6	0.9	0.5	0.7	1.0
Kalikot	16.6	0.5	0.5	0.7	0.5	0.7	1.0
Kanchanpur	29.4	0.4	0.6	0.9	0.5	0.7	1.0

	Baseline	SSP245			SSP585		
Districts	(℃)	2030s	2050s	2080s	2030s	2050s	2080s
Kapilbastu	29.8	0.4	0.5	0.9	0.5	0.7	1.2
Kaski	16.9	0.3	0.5	0.5	0.4	0.7	0.9
Kathmandu	23.1	0.3	0.4	0.5	0.4	0.6	0.9
Kavrepalanchok	23.6	0.3	0.4	0.6	0.4	0.6	1.1
Khotang	23.5	0.3	0.4	0.7	0.4	0.7	1.3
Lalitpur	22.6	0.3	0.4	0.7	0.4	0.6	1.1
Lamjung	17.3	0.3	0.4	0.5	0.4	0.6	0.9
Mahottari	30.1	0.3	0.5	0.9	0.5	0.8	1.4
Makwanpur	26.1	0.3	0.5	0.8	0.4	0.7	1.2
Manang	3.1	0.5	0.6	0.6	0.5	0.9	1.0
Morang	28.6	0.3	0.4	0.9	0.5	0.8	1.6
Mugu	9.9	0.6	0.7	0.6	0.5	0.8	1.0
Mustang	4.8	0.5	0.6	0.6	0.5	0.9	0.9
Myagdi	11.2	0.4	0.6	0.6	0.5	0.8	1.0
Nawalparasi-E	28.3	0.3	0.5	0.7	0.4	0.6	1.1
Nawalparasi-W	29.7	0.4	0.5	0.8	0.5	0.7	1.2
Nuwakot	23.6	0.2	0.4	0.5	0.4	0.5	0.8
Okhaldhunga	22.0	0.3	0.4	0.7	0.4	0.7	1.3
Palpa	25.7	0.3	0.5	0.7	0.4	0.6	1.0
Panchthar	20.5	0.3	0.5	0.8	0.5	0.8	1.5
Parbat	22.2	0.3	0.4	0.5	0.4	0.6	0.9
Parsa	29.7	0.3	0.5	1.0	0.4	0.8	1.4
Pyuthan	23.9	0.3	0.4	0.7	0.4	0.6	1.0
Ramechhap	19.7	0.3	0.4	0.7	0.4	0.7	1.2
Rasuwa	9.7	0.3	0.5	0.6	0.4	0.7	1.0
Rautahat	30.3	0.3	0.5	1.0	0.5	0.8	1.4
Rolpa	20.7	0.3	0.5	0.7	0.4	0.6	1.0
Rukum-E	13.6	0.4	0.5	0.6	0.5	0.7	1.1
Rukum-W	19.7	0.4	0.5	0.6	0.4	0.6	1.0
Rupandehi	30.0	0.3	0.5	0.8	0.4	0.7	1.2
Salyan	24.0	0.4	0.5	0.7	0.5	0.6	1.0
Sankhuwasabha	14.0	0.3	0.5	0.7	0.4	0.8	1.2
Saptari	30.2	0.3	0.4	0.9	0.5	0.8	1.6
Sarlahi	30.0	0.3	0.5	0.9	0.4	0.7	1.4
Sindhuli	27.1	0.3	0.4	0.8	0.4	0.7	1.3
Sindhupalchok	16.3	0.3	0.4	0.5	0.4	0.6	0.9
Siraha	30.0	0.3	0.4	0.9	0.4	0.7	1.5
Solukhumbu	8.8	0.4	0.6	0.7	0.5	0.8	1.2
Sunsari	29.6	0.3	0.4	0.8	0.5	0.7	1.6
Surkhet	25.8	0.4	0.5	0.7	0.5	0.6	1.0
Syangja	25.2	0.3	0.4	0.6	0.4	0.6	0.9
Tanahu	27.0	0.3	0.4	0.5	0.4	0.6	0.9
Taplejung	9.4	0.4	0.6	0.7	0.5	0.8	1.2
Terhathum	22.4	0.3	0.5	0.7	0.4	0.7	1.4
Udayapur	27.8	0.3	0.4	0.8	0.5	0.7	1.4

	Baseline	SSP245			SSP585		
Districts	(℃)	2030s	2050s	2080s	2030s	2050s	2080s
Annual							
Achham	24.5	0.3	0.3	0.4	0.3	0.4	0.8
Arghakhanchi	25.4	0.3	0.4	0.6	0.4	0.6	0.9
Baglung	18.4	0.2	0.3	0.5	0.3	0.5	0.8
Baitadi	23.7	0.3	0.3	0.5	0.3	0.4	0.8
Bajhang	14.2	0.3	0.4	0.5	0.3	0.5	0.9
Bajura	16.5	0.2	0.3	0.5	0.3	0.4	0.8
Banke	30.2	0.4	0.4	0.6	0.4	0.6	1.0
Bara	30.3	0.3	0.4	0.8	0.5	0.8	1.2
Bardiya	30.0	0.4	0.4	0.6	0.4	0.6	0.9
Bhaktapur	23.7	0.2	0.3	0.5	0.3	0.5	0.9
Bhojpur	23.3	0.2	0.3	0.6	0.4	0.6	1.0
Chitwan	29.7	0.3	0.3	0.6	0.4	0.6	1.0
Dadeldhura	24.8	0.4	0.4	0.5	0.4	0.5	0.9
Dailekh	23.7	0.3	0.3	0.5	0.3	0.5	0.8
Dang	28.3	0.3	0.3	0.6	0.4	0.6	1.0
Darchula	12.9	0.3	0.5	0.6	0.3	0.5	0.9
Dhading	23.4	0.2	0.3	0.5	0.3	0.5	0.9
Dhankuta	25.1	0.3	0.4	0.6	0.5	0.7	1.0
Dhanusha	30.4	0.3	0.4	0.8	0.6	0.8	1.2
Dolakha	13.0	0.2	0.4	0.6	0.4	0.5	0.9
Dolpa	5.5	0.2	0.4	0.6	0.2	0.5	0.8
Doti	23.7	0.3	0.3	0.5	0.3	0.5	0.8
Gorkha	14.7	0.2	0.4	0.5	0.3	0.5	0.9
Gulmi	24.1	0.2	0.3	0.5	0.3	0.5	0.8
Humla	7.7	0.3	0.5	0.7	0.3	0.6	0.8
Ilam	23.8	0.3	0.5	0.7	0.5	0.7	1.1
Jajarkot	19.4	0.3	0.3	0.5	0.3	0.4	0.8
Jhapa	29.7	0.3	0.5	0.8	0.6	0.9	1.2
Jumla	12.4	0.2	0.4	0.5	0.3	0.4	0.8
Kailali	29.2	0.4	0.4	0.6	0.4	0.6	0.9
Kalikot	17.5	0.2	0.3	0.5	0.3	0.4	0.8
Kanchanpur	30.4	0.4	0.4	0.6	0.4	0.6	1.0
Kapilbastu	30.5	0.4	0.4	0.7	0.4	0.7	1.1
Kaski	17.5	0.2	0.3	0.5	0.3	0.5	0.9
Kathmandu	23.7	0.2	0.3	0.5	0.3	0.5	0.9
Kavrepalanchok	24.1	0.2	0.3	0.5	0.4	0.6	0.9
Khotang	23.7	0.2	0.4	0.6	0.4	0.6	1.0
Lalitpur	23.1	0.2	0.3	0.6	0.4	0.6	0.9
Lamjung	17.9	0.2	0.3	0.5	0.3	0.5	0.8
Mahottari	30.3	0.3	0.4	0.7	0.6	0.8	1.1
Makwanpur	26.7	0.2	0.3	0.6	0.4	0.6	1.0
Manang	3.3	0.3	0.5	0.7	0.3	0.5	1.0
Morang	28.6	0.3	0.5	0.8	0.6	0.8	1.2
Mugu	10.7	0.2	0.4	0.5	0.2	0.4	0.7

	Baseline	SSP245			SSP585		
Districts	(℃)	2030s	2050s	2080s	2030s	2050s	2080s
Mustang	5.2	0.2	0.4	0.6	0.2	0.5	0.7
Myagdi	11.7	0.2	0.4	0.5	0.3	0.5	0.9
Nawalparasi-E	29.1	0.3	0.3	0.6	0.4	0.6	1.0
Nawalparasi-W	30.4	0.3	0.4	0.7	0.5	0.7	1.1
Nuwakot	24.4	0.2	0.3	0.5	0.3	0.5	0.8
Okhaldhunga	22.2	0.2	0.3	0.6	0.4	0.6	0.9
Palpa	26.3	0.3	0.3	0.6	0.4	0.6	1.0
Panchthar	20.5	0.2	0.4	0.7	0.4	0.6	1.0
Parbat	23.0	0.2	0.3	0.5	0.3	0.4	0.8
Parsa	30.2	0.3	0.4	0.7	0.5	0.8	1.1
Pyuthan	24.7	0.3	0.3	0.5	0.3	0.5	0.9
Ramechhap	20.0	0.2	0.4	0.6	0.3	0.6	0.9
Rasuwa	9.9	0.2	0.4	0.6	0.3	0.5	1.0
Rautahat	30.6	0.3	0.4	0.8	0.5	0.8	1.1
Rolpa	21.5	0.2	0.3	0.5	0.3	0.5	0.8
Rukum-E	14.2	0.2	0.4	0.5	0.3	0.5	0.8
Rukum-W	20.7	0.2	0.3	0.5	0.3	0.4	0.7
Rupandehi	30.6	0.4	0.4	0.7	0.5	0.8	1.1
Salyan	25.0	0.3	0.3	0.5	0.3	0.5	0.9
Sankhuwasabha	14.1	0.2	0.5	0.7	0.4	0.6	1.0
Saptari	30.2	0.3	0.4	0.8	0.6	0.9	1.2
Sarlahi	30.4	0.3	0.4	0.7	0.5	0.8	1.1
Sindhuli	27.4	0.3	0.3	0.6	0.5	0.7	1.0
Sindhupalchok	16.7	0.2	0.3	0.5	0.3	0.5	0.8
Siraha	30.2	0.3	0.4	0.7	0.5	0.8	1.2
Solukhumbu	8.7	0.3	0.4	0.7	0.4	0.7	1.1
Sunsari	29.6	0.3	0.4	0.7	0.6	0.8	1.2
Surkhet	27.0	0.3	0.3	0.5	0.3	0.5	0.8
Syangja	26.0	0.2	0.3	0.5	0.3	0.5	0.8
Tanahu	27.9	0.2	0.3	0.5	0.3	0.5	0.9
Taplejung	9.3	0.3	0.5	0.8	0.4	0.8	1.1
Terhathum	22.5	0.2	0.4	0.6	0.4	0.6	0.9
Udayapur	27.9	0.3	0.3	0.7	0.5	0.8	1.1

Table 9.18: Change in future seasonal maximum temperature (℃) compared to the baseline period (1981-2010) within the basins of Nepal

	Baseline	SSP245			SSP585		
Basins	**(℃)**	**2030s**	**2050s**	**2080s**	**2030s**	**2050s**	**2080s**
Winter							
Babai	20.2	0.8	1.5	2.3	0.8	1.7	4.1
Bagmati	20.9	0.8	1.5	2.5	0.8	1.8	4.4
Gandaki	10.4	1.3	2.1	3.3	1.3	2.5	5.5
Kamala	22.7	0.7	1.6	2.7	0.8	1.8	4.6
Kankai	17.9	0.9	1.7	2.8	1.0	2.0	5.0
Karnali	7.8	1.7	2.5	3.9	1.6	2.9	6.3
Koshi	6.1	1.5	2.4	3.7	1.6	2.9	6.1
Mahakali	12.0	1.4	2.1	3.3	1.3	2.5	5.6
Mechi	23.6	0.8	1.7	2.9	0.9	2.0	5.2
West-Rapti	19.4	0.8	1.5	2.4	0.8	1.8	4.2
Pre-Monsoon	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Babai	30.5	0.5	1.3	1.9	0.5	1.2	3.5
Bagmati	29.4	0.4	1.3	2.0	0.5	1.3	3.7
Gandaki	16.9	0.8	1.6	2.2	0.9	1.7	4.2
Kamala	31.3	0.3	1.2	2.0	0.4	1.3	3.6
Kankai	24.6	0.4	1.1	1.8	0.4	1.3	3.4
Karnali	14.2	0.9	1.7	2.4	1.1	1.8	4.5
Koshi	12.3	0.9	1.8	2.4	1.1	1.9	4.6
Mahakali	19.7	0.8	1.6	2.3	0.9	1.7	4.5
Mechi	31.7	0.3	1.2	2.0	0.4	1.4	3.8
West-Rapti	29.1	0.5	1.3	1.9	0.5	1.3	3.6
Monsoon							
Babai	30.2	0.5	1.1	1.7	0.5	1.2	2.6
Bagmati	29.8	0.5	1.1	1.7	0.5	1.2	2.7
Gandaki	20.5	0.7	1.3	2.0	0.7	1.5	3.3
Kamala	31.3	0.6	1.2	1.9	0.6	1.3	2.8
Kankai	26.1	0.7	1.3	2.0	0.8	1.5	3.0
Karnali	18.3	0.8	1.4	2.1	0.8	1.6	3.5
Koshi	18.2	0.9	1.6	2.4	0.9	1.9	3.8
Mahakali	24.2	0.8	1.3	2.0	0.7	1.5	3.3
Mechi	32.0	0.7	1.3	2.0	0.8	1.5	3.0
West-Rapti	29.1	0.6	1.1	1.7	0.5	1.2	2.6
Post-monsoon							
Babai	26.1	0.5	1.0	1.7	0.4	1.2	3.2
Bagmati	26.5	0.6	1.2	2.1	0.6	1.6	4.1
Gandaki	15.9	0.9	1.5	2.5	0.9	1.9	4.5
Kamala	28.4	0.7	1.3	2.3	0.7	1.8	4.3
Kankai	23.2	0.9	1.6	2.7	0.9	2.2	5.2
Karnali	13.1	1.0	1.6	2.6	1.0	2.1	4.7
Koshi	12.4	1.2	1.9	3.0	1.3	2.5	5.4
Mahakali	18.8	0.9	1.5	2.4	0.9	1.9	4.3
Mechi	29.4	0.8	1.5	2.5	0.9	2.0	4.7

	Baseline	SSP245			SSP585		
Basins	**(℃)**	**2030s**	**2050s**	**2080s**	**2030s**	**2050s**	**2080s**
West-Rapti	25.2	0.5	1.0	1.8	0.5	1.3	3.4
Annual							
Babai	27.1	0.6	1.2	1.9	0.6	1.3	3.3
Bagmati	26.9	0.6	1.3	2.1	0.6	1.5	3.6
Gandaki	16.3	1.0	1.6	2.5	1.0	1.9	4.3
Kamala	28.7	0.6	1.3	2.1	0.6	1.5	3.7
Kankai	23.2	0.7	1.4	2.3	0.8	1.7	4.0
Karnali	13.8	1.1	1.8	2.7	1.1	2.1	4.7
Koshi	12.8	1.1	1.8	2.8	1.2	2.2	4.8
Mahakali	19.1	1.0	1.7	2.5	1.0	1.9	4.4
Mechi	29.4	0.7	1.4	2.3	0.7	1.7	4.0
West-Rapti	26.1	0.6	1.2	1.9	0.5	1.3	3.3

Table 9.19: Absolute uncertainty (standard deviation) in projected change in future seasonal maximum temperature (℃) compared to the baseline period (1981-2010) within the basins of Nepal

	Baseline	SSP245			SSP585		
Basins	**(℃)**	**2030s**	**2050s**	**2080s**	**2030s**	**2050s**	**2080s**
Winter							
Babai	20.2	0.3	0.4	0.8	0.3	0.7	1.1
Bagmati	20.9	0.3	0.4	0.8	0.5	0.8	1.2
Gandaki	10.4	0.2	0.5	0.9	0.4	0.7	1.0
Kamala	22.7	0.4	0.4	0.9	0.6	0.9	1.4
Kankai	17.9	0.4	0.5	1.0	0.6	0.9	1.6
Karnali	7.8	0.3	0.6	1.1	0.4	0.8	1.1
Koshi	6.1	0.3	0.5	1.0	0.5	0.8	1.1
Mahakali	12.0	0.3	0.6	1.1	0.4	0.7	1.3
Mechi	23.6	0.5	0.6	1.1	0.8	1.0	1.9
West-Rapti	19.4	0.3	0.4	0.8	0.4	0.7	1.1
Pre-Monsoon	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Babai	30.5	0.5	0.5	0.6	0.6	0.8	1.3
Bagmati	29.4	0.4	0.5	0.7	0.7	0.9	1.2
Gandaki	16.9	0.4	0.6	0.5	0.4	0.6	1.1
Kamala	31.3	0.4	0.5	0.7	0.7	1.0	1.2
Kankai	24.6	0.4	0.5	0.7	0.6	0.8	1.1
Karnali	14.2	0.4	0.6	0.3	0.3	0.4	0.9
Koshi	12.3	0.3	0.6	0.5	0.3	0.6	1.0
Mahakali	19.7	0.4	0.6	0.3	0.3	0.4	1.2
Mechi	31.7	0.4	0.7	1.0	0.9	1.2	1.5
West-Rapti	29.1	0.5	0.5	0.7	0.6	0.8	1.3
Monsoon							
Babai	30.2	0.4	0.4	0.4	0.3	0.5	0.6
Bagmati	29.8	0.2	0.4	0.5	0.3	0.5	0.8
Gandaki	20.5	0.2	0.3	0.5	0.2	0.4	0.8
Kamala	31.3	0.2	0.4	0.5	0.3	0.5	0.8
Kankai	26.1	0.2	0.4	0.5	0.3	0.5	0.7
Karnali	18.3	0.3	0.3	0.4	0.3	0.3	0.7
Koshi	18.2	0.3	0.4	0.6	0.3	0.5	0.9
Mahakali	24.2	0.4	0.3	0.3	0.2	0.3	0.6
Mechi	32.0	0.2	0.3	0.5	0.3	0.5	0.8
West-Rapti	29.1	0.3	0.4	0.4	0.3	0.4	0.6
Post-monsoon							
Babai	26.1	0.4	0.6	0.8	0.5	0.6	1.0
Bagmati	26.5	0.3	0.5	0.8	0.4	0.7	1.2
Gandaki	15.9	0.3	0.5	0.6	0.4	0.8	0.9
Kamala	28.4	0.3	0.4	0.8	0.5	0.7	1.3
Kankai	23.2	0.3	0.5	0.9	0.5	0.8	1.6
Karnali	13.1	0.6	0.6	0.7	0.5	0.8	1.0
Koshi	12.4	0.3	0.6	0.6	0.5	0.8	1.0
Mahakali	18.8	0.6	0.7	0.7	0.6	0.7	0.9

	Baseline	SSP245			SSP585		
Basins	**(℃)**	**2030s**	**2050s**	**2080s**	**2030s**	**2050s**	**2080s**
Mechi	29.4	0.4	0.5	0.9	0.6	0.8	1.7
West-Rapti	25.2	0.3	0.5	0.7	0.4	0.7	1.0
Annual							
Babai	27.1	0.3	0.3	0.5	0.4	0.6	0.9
Bagmati	26.9	0.3	0.4	0.6	0.4	0.7	1.0
Gandaki	16.3	0.2	0.4	0.5	0.3	0.5	0.9
Kamala	28.7	0.3	0.4	0.7	0.5	0.7	1.1
Kankai	23.2	0.2	0.5	0.7	0.5	0.7	1.1
Karnali	13.8	0.3	0.4	0.5	0.3	0.5	0.8
Koshi	12.8	0.2	0.5	0.7	0.3	0.6	0.9
Mahakali	19.1	0.3	0.4	0.5	0.3	0.5	0.9
Mechi	29.4	0.3	0.5	0.8	0.6	0.8	1.3
West-Rapti	26.1	0.3	0.3	0.6	0.4	0.6	0.9

Table 9.20: Sen's slope for maximum temperature (°C/year) over different regions of Nepal. Significant values are highlighted in color: light orange indicates an increasing trend, while light blue denotes a decreasing trend.

Regions	Baseline	SSP245			SSP585		
		2030s	2050s	2080s	2030s	2050s	2080s
Provinces							
Koshi	0.02	0.03	0.03	0.01	0.03	0.05	0.07
Madhesh	0.01	0.03	0.04	0.01	0.02	0.05	0.06
Bagmati	0.02	0.03	0.03	0.01	0.03	0.04	0.06
Gandaki	0.03	0.04	0.03	0.01	0.03	0.05	0.07
Lumbini	0.02	0.03	0.03	0.01	0.03	0.04	0.06
Karnali	0.04	0.04	0.03	0.01	0.04	0.05	0.07
Sudurpaschim	0.03	0.04	0.03	0.01	0.03	0.04	0.07
Districts							
Achham	0.03	0.03	0.03	0.01	0.03	0.04	0.06
Arghakhanchi	0.02	0.03	0.03	0.01	0.03	0.04	0.06
Baglung	0.03	0.03	0.03	0.01	0.03	0.04	0.06
Baitadi	0.03	0.03	0.03	0.01	0.03	0.04	0.06
Bajhang	0.04	0.04	0.03	0.01	0.04	0.05	0.08
Bajura	0.04	0.04	0.03	0.01	0.03	0.05	0.07
Banke	0.01	0.03	0.03	0.01	0.03	0.04	0.06
Bara	0.01	0.04	0.04	0.01	0.02	0.05	0.06
Bardiya	0.02	0.03	0.03	0.01	0.03	0.04	0.05
Bhaktapur	0.02	0.03	0.03	0.00	0.03	0.04	0.05
Bhojpur	0.02	0.03	0.03	0.01	0.03	0.05	0.06
Chitwan	0.02	0.03	0.03	0.01	0.02	0.04	0.06
Dadeldhura	0.02	0.03	0.03	0.01	0.03	0.04	0.06
Dailekh	0.03	0.03	0.03	0.01	0.03	0.04	0.06
Dang	0.02	0.03	0.03	0.01	0.03	0.04	0.06
Darchula	0.04	0.05	0.03	0.01	0.04	0.05	0.08
Dhading	0.02	0.03	0.03	0.01	0.03	0.04	0.06
Dhankuta	0.02	0.03	0.03	0.01	0.03	0.05	0.06
Dhanusha	0.01	0.04	0.04	0.01	0.02	0.06	0.06
Dolakha	0.03	0.04	0.03	0.01	0.03	0.05	0.07
Dolpa	0.04	0.05	0.03	0.01	0.04	0.05	0.08
Doti	0.02	0.03	0.03	0.01	0.03	0.04	0.06
Gorkha	0.03	0.04	0.03	0.01	0.03	0.04	0.07
Gulmi	0.02	0.03	0.03	0.01	0.03	0.04	0.06
Humla	0.05	0.05	0.03	0.01	0.04	0.06	0.09
Ilam	0.01	0.03	0.03	0.01	0.03	0.05	0.06
Jajarkot	0.03	0.04	0.03	0.01	0.03	0.04	0.06
Jhapa	0.01	0.03	0.04	0.00	0.03	0.06	0.06
Jumla	0.04	0.04	0.03	0.01	0.03	0.05	0.07
Kavrepalanchok	0.02	0.03	0.03	0.01	0.03	0.04	0.06

Regions	Baseline	SSP245			SSP585		
		2030s	2050s	2080s	2030s	2050s	2080s
Kailali	0.02	0.03	0.03	0.01	0.03	0.04	0.05
Kalikot	0.03	0.04	0.03	0.01	0.03	0.04	0.07
Kanchanpur	0.02	0.03	0.03	0.01	0.03	0.04	0.06
Kapilbastu	0.01	0.03	0.04	0.01	0.03	0.04	0.06
Kaski	0.03	0.04	0.03	0.01	0.03	0.04	0.06
Kathmandu	0.02	0.03	0.03	0.00	0.02	0.04	0.06
Khotang	0.02	0.03	0.03	0.01	0.03	0.05	0.06
Lalitpur	0.02	0.03	0.03	0.01	0.03	0.04	0.06
Lamjung	0.03	0.03	0.03	0.01	0.03	0.04	0.06
Mahottari	0.01	0.04	0.04	0.01	0.02	0.05	0.06
Makwanpur	0.02	0.03	0.03	0.01	0.03	0.04	0.06
Manang	0.04	0.05	0.03	0.01	0.04	0.06	0.08
Morang	0.01	0.03	0.04	0.01	0.02	0.06	0.06
Mugu	0.04	0.05	0.03	0.01	0.04	0.05	0.08
Mustang	0.04	0.05	0.03	0.01	0.04	0.05	0.08
Myagdi	0.04	0.04	0.03	0.01	0.03	0.05	0.07
Nawalparasi-E	0.02	0.03	0.03	0.01	0.02	0.04	0.06
Nawalparasi-W	0.01	0.03	0.04	0.01	0.02	0.04	0.06
Nuwakot	0.02	0.03	0.03	0.01	0.02	0.04	0.06
Okhaldhunga	0.02	0.03	0.03	0.01	0.03	0.05	0.06
Palpa	0.02	0.03	0.03	0.01	0.03	0.04	0.06
Panchthar	0.02	0.03	0.03	0.01	0.03	0.05	0.06
Parbat	0.02	0.03	0.03	0.01	0.02	0.04	0.06
Parsa	0.01	0.03	0.04	0.01	0.02	0.05	0.06
Pyuthan	0.02	0.03	0.03	0.01	0.03	0.04	0.06
Ramechhap	0.02	0.03	0.03	0.01	0.03	0.05	0.06
Rasuwa	0.03	0.04	0.03	0.01	0.03	0.05	0.07
Rautahat	0.01	0.04	0.04	0.01	0.02	0.05	0.06
Rolpa	0.02	0.03	0.03	0.01	0.03	0.04	0.06
Rukum-E	0.03	0.04	0.03	0.01	0.03	0.05	0.07
Rukum-W	0.03	0.03	0.03	0.01	0.03	0.04	0.06
Rupandehi	0.01	0.03	0.04	0.01	0.03	0.04	0.06
Salyan	0.02	0.03	0.03	0.01	0.03	0.04	0.06
Sankhuwasabha	0.03	0.04	0.03	0.01	0.03	0.06	0.07
Saptari	0.01	0.03	0.04	0.01	0.02	0.06	0.06
Sarlahi	0.01	0.03	0.04	0.01	0.02	0.05	0.06
Sindhuli	0.01	0.03	0.03	0.01	0.03	0.05	0.06
Sindhupalchok	0.03	0.04	0.03	0.01	0.03	0.04	0.06
Siraha	0.01	0.03	0.04	0.01	0.02	0.06	0.06
Solukhumbu	0.03	0.04	0.04	0.01	0.04	0.06	0.08
Sunsari	0.01	0.03	0.04	0.01	0.02	0.06	0.06
Surkhet	0.02	0.03	0.03	0.01	0.03	0.04	0.06
Syangja	0.02	0.03	0.03	0.01	0.03	0.04	0.06
Tanahu	0.02	0.03	0.03	0.01	0.02	0.04	0.06

Regions	Baseline	SSP245			SSP585		
		2030s	2050s	2080s	2030s	2050s	2080s
Taplejung	0.03	0.04	0.04	0.01	0.04	0.06	0.08
Terhathum	0.02	0.03	0.03	0.01	0.03	0.05	0.06
Udayapur	0.01	0.03	0.04	0.01	0.02	0.05	0.06
Basins							
Mahakali	0.04	0.04	0.03	0.01	0.03	0.05	0.07
West-Rapti	0.02	0.03	0.03	0.01	0.03	0.04	0.06
Babai	0.02	0.03	0.03	0.01	0.03	0.04	0.06
Koshi	0.03	0.04	0.03	0.01	0.04	0.06	0.07
Gandaki	0.03	0.04	0.03	0.01	0.03	0.04	0.07
Bagmati	0.01	0.03	0.03	0.01	0.02	0.05	0.06
Kamala	0.01	0.03	0.04	0.01	0.02	0.05	0.06
Kankai	0.02	0.03	0.03	0.01	0.03	0.05	0.06
Mechi	0.01	0.03	0.04	0.01	0.03	0.06	0.07
Karnali	0.04	0.04	0.03	0.01	0.03	0.05	0.07

Table 9.21: Change in future seasonal minimum temperature (℃) compared to the baseline period (1981-2010) within the physiographical divisions of Nepal

	Baseline	SSP245			SSP585		
Physiography	**(℃)**	**2030s**	**2050s**	**2080s**	**2030s**	**2050s**	**2080s**
High-Himalaya							
Winter	-7.1	1.2	1.9	2.9	1.2	2.2	5.4
Pre-Monsoon	-3.0	1.2	1.9	2.7	1.4	2.3	5.3
Monsoon	1.6	1.3	2.1	3.0	1.4	2.6	5.2
Post-monsoon	-4.5	0.6	1.1	2.0	0.8	1.5	4.1
Annual	-2.8	1.2	1.9	2.8	1.3	2.3	5.2
High-Mountain							
Winter	0.1	0.8	1.3	2.0	0.8	1.6	4.0
Pre-Monsoon	6.3	0.9	1.4	2.1	1.0	1.8	4.2
Monsoon	11.9	0.9	1.4	2.1	1.0	1.8	3.9
Post-monsoon	4.7	0.6	1.2	2.0	0.8	1.6	3.8
Annual	6.4	0.8	1.3	2.0	0.9	1.7	3.9
Mid-mountain							
Winter	5.6	0.8	1.3	2.0	0.8	1.5	4.0
Pre-Monsoon	13.3	0.9	1.5	2.3	1.0	1.8	4.4
Monsoon	19.1	0.8	1.3	1.9	0.9	1.6	3.4
Post-monsoon	11.8	0.8	1.4	2.3	0.9	1.9	4.2
Annual	13.1	0.8	1.4	2.1	0.9	1.7	3.9
Siwalik							
Winter	8.8	0.9	1.4	2.1	0.8	1.6	4.2
Pre-Monsoon	17.6	0.9	1.6	2.4	1.0	1.9	4.6
Monsoon	23.4	0.7	1.3	1.9	0.8	1.6	3.3
Post-monsoon	15.8	0.9	1.6	2.6	1.1	2.2	4.8
Annual	17.1	0.8	1.4	2.2	0.9	1.7	4.0
Terai							
Winter	10.2	1.0	1.6	2.4	0.9	1.8	4.6
Pre-Monsoon	19.4	0.9	1.7	2.5	1.0	2.0	4.8
Monsoon	25.2	0.8	1.4	2.0	0.9	1.7	3.4
Post-monsoon	17.8	0.9	1.7	2.7	1.1	2.3	5.1
Annual	18.8	0.9	1.6	2.3	0.9	1.9	4.4

Table 9.22: Absolute uncertainty (standard deviation) in projected change in future seasonal minimum temperature (°C) compared to the baseline period (1981-2010) within the physiographical divisions of Nepal

	Baseline	SSP245			SSP585		
Physiography	(°C)	2030s	2050s	2080s	2030s	2050s	2080s
High-Himalaya							
Winter	-7.1	0.2	0.4	0.7	0.1	0.4	1.0
Pre-Monsoon	-3.0	0.3	0.4	0.6	0.2	0.4	1.0
Monsoon	1.6	0.6	0.7	0.9	0.7	0.8	1.1
Post-monsoon	-4.5	0.2	0.1	0.3	0.3	0.2	0.8
Annual	-2.8	0.2	0.4	0.5	0.4	0.5	0.9
High-Mountain							
Winter	0.1	0.1	0.3	0.5	0.2	0.3	0.9
Pre-Monsoon	6.3	0.3	0.4	0.6	0.3	0.5	0.9
Monsoon	11.9	0.4	0.5	0.7	0.5	0.7	1.0
Post-monsoon	4.7	0.2	0.1	0.3	0.3	0.3	0.6
Annual	6.4	0.2	0.3	0.5	0.3	0.4	0.9
Mid-mountain							
Winter	5.6	0.2	0.3	0.3	0.2	0.3	0.7
Pre-Monsoon	13.3	0.3	0.4	0.6	0.4	0.6	1.0
Monsoon	19.1	0.3	0.5	0.7	0.4	0.7	1.2
Post-monsoon	11.8	0.2	0.2	0.2	0.4	0.4	0.5
Annual	13.1	0.3	0.4	0.5	0.3	0.5	0.9
Siwalik							
Winter	8.8	0.3	0.3	0.3	0.3	0.3	0.7
Pre-Monsoon	17.6	0.5	0.5	0.7	0.5	0.7	1.1
Monsoon	23.4	0.4	0.5	0.8	0.5	0.8	1.4
Post-monsoon	15.8	0.3	0.3	0.2	0.5	0.4	0.5
Annual	17.1	0.4	0.4	0.6	0.4	0.5	1.0
Terai							
Winter	10.2	0.4	0.4	0.2	0.4	0.4	0.6
Pre-Monsoon	19.4	0.5	0.5	0.8	0.5	0.8	1.2
Monsoon	25.2	0.4	0.6	0.9	0.5	0.8	1.5
Post-monsoon	17.8	0.4	0.4	0.2	0.5	0.5	0.6
Annual	18.8	0.5	0.5	0.6	0.5	0.6	1.1

Table 9.23: Change in future seasonal minimum temperature (℃) compared to the baseline period (1981-2010) within the provinces of Nepal

	Baseline	SSP245			SSP585		
Provinces	(℃)	2030s	2050s	2080s	2030s	2050s	2080s
Winter							
Bagmati	4.2	0.9	1.4	2.1	0.8	1.6	4.3
Gandaki	-0.3	1.0	1.6	2.5	1.0	1.9	4.7
Karnali	-2.8	1.0	1.6	2.5	1.0	1.9	4.5
Koshi	3.7	1.0	1.6	2.3	0.8	1.7	4.6
Lumbini	7.0	0.9	1.5	2.2	0.8	1.7	4.1
Madhesh	10.4	1.0	1.7	2.4	0.9	1.8	4.8
Sudurpaschim	2.5	0.9	1.4	2.2	0.9	1.7	4.2
Pre-Monsoon							
Bagmati	11.3	0.9	1.6	2.4	1.0	1.9	4.6
Gandaki	5.7	1.0	1.7	2.5	1.2	2.1	4.8
Karnali	2.9	0.9	1.6	2.3	1.1	2.0	4.6
Koshi	10.2	1.0	1.7	2.5	1.0	1.9	4.9
Lumbini	15.6	0.8	1.6	2.4	1.0	1.9	4.5
Madhesh	19.5	0.8	1.6	2.5	0.9	1.9	4.7
Sudurpaschim	9.9	0.9	1.6	2.4	1.1	2.0	4.6
Monsoon							
Bagmati	16.9	0.8	1.4	2.0	0.9	1.7	3.6
Gandaki	10.8	1.0	1.6	2.4	1.1	2.0	4.1
Karnali	8.2	1.0	1.6	2.4	1.1	2.1	4.3
Koshi	15.7	1.1	1.7	2.4	1.1	2.0	4.1
Lumbini	21.0	0.7	1.3	1.9	0.8	1.6	3.3
Madhesh	25.1	0.8	1.3	1.9	0.9	1.6	3.2
Sudurpaschim	15.9	0.9	1.5	2.2	1.0	1.9	3.9
Post-monsoon							
Bagmati	10.1	0.7	1.3	2.2	0.9	1.8	4.2
Gandaki	4.2	0.7	1.3	2.1	0.9	1.6	4.0
Karnali	1.0	0.6	1.1	2.0	0.8	1.6	4.0
Koshi	9.4	0.9	1.5	2.4	1.0	1.9	4.5
Lumbini	13.5	0.8	1.5	2.4	1.0	2.0	4.5
Madhesh	18.1	1.0	1.7	2.7	1.1	2.3	5.2
Sudurpaschim	7.7	0.7	1.4	2.3	1.0	2.0	4.5
Annual							
Bagmati	11.2	0.9	1.5	2.2	0.9	1.8	4.1
Gandaki	5.7	0.9	1.6	2.4	1.0	1.9	4.4
Karnali	2.9	1.0	1.6	2.4	1.1	2.0	4.4
Koshi	10.3	1.0	1.6	2.4	1.0	1.9	4.5
Lumbini	14.9	0.8	1.5	2.2	0.9	1.8	4.0
Madhesh	18.9	0.9	1.5	2.3	0.9	1.8	4.3
Sudurpaschim	9.7	0.9	1.5	2.2	1.0	1.9	4.2

Table 9.24: Absolute uncertainty (standard deviation) in projected change in future seasonal minimum temperature (°C) compared to the baseline period (1981-2010) within the provinces of Nepal

	Baseline	SSP245			SSP585		
Provinces	(°C)	2030s	2050s	2080s	2030s	2050s	2080s
Winter							
Bagmati	4.2	0.1	0.3	0.3	0.2	0.3	0.7
Gandaki	-0.3	0.1	0.4	0.6	0.2	0.4	0.9
Karnali	-2.8	0.1	0.3	0.6	0.2	0.4	1.0
Koshi	3.7	0.3	0.3	0.2	0.3	0.3	0.5
Lumbini	7.0	0.3	0.4	0.5	0.4	0.4	0.8
Madhesh	10.4	0.4	0.4	0.2	0.4	0.4	0.5
Sudurpaschim	2.5	0.1	0.3	0.5	0.3	0.4	1.0
Pre-Monsoon							
Bagmati	11.3	0.3	0.3	0.5	0.3	0.5	0.9
Gandaki	5.7	0.3	0.4	0.5	0.2	0.4	0.9
Karnali	2.9	0.3	0.4	0.7	0.3	0.6	1.0
Koshi	10.2	0.4	0.4	0.5	0.4	0.5	0.9
Lumbini	15.6	0.4	0.5	0.7	0.5	0.8	1.2
Madhesh	19.5	0.5	0.5	0.7	0.6	0.7	1.1
Sudurpaschim	9.9	0.4	0.5	0.9	0.4	0.7	1.2
Monsoon							
Bagmati	16.9	0.4	0.4	0.7	0.4	0.6	1.2
Gandaki	10.8	0.4	0.5	0.7	0.5	0.7	1.1
Karnali	8.2	0.5	0.6	0.8	0.6	0.8	1.1
Koshi	15.7	0.4	0.6	0.7	0.5	0.7	1.2
Lumbini	21.0	0.5	0.6	0.8	0.6	0.8	1.5
Madhesh	25.1	0.4	0.6	0.8	0.4	0.8	1.5
Sudurpaschim	15.9	0.4	0.6	0.8	0.6	0.8	1.3
Post-monsoon							
Bagmati	10.1	0.2	0.2	0.2	0.4	0.3	0.4
Gandaki	4.2	0.1	0.2	0.2	0.3	0.2	0.5
Karnali	1.0	0.2	0.1	0.4	0.3	0.2	0.8
Koshi	9.4	0.2	0.3	0.2	0.4	0.4	0.5
Lumbini	13.5	0.2	0.3	0.2	0.4	0.4	0.6
Madhesh	18.1	0.4	0.3	0.2	0.5	0.5	0.6
Sudurpaschim	7.7	0.3	0.2	0.3	0.4	0.4	0.8
Annual							
Bagmati	11.2	0.2	0.3	0.4	0.3	0.4	0.8
Gandaki	5.7	0.2	0.3	0.4	0.3	0.5	0.8
Karnali	2.9	0.2	0.4	0.6	0.4	0.5	0.9
Koshi	10.3	0.3	0.3	0.4	0.3	0.4	0.8
Lumbini	14.9	0.4	0.4	0.6	0.4	0.6	1.1
Madhesh	18.9	0.4	0.4	0.5	0.5	0.6	1.0
Sudurpaschim	9.7	0.3	0.4	0.7	0.4	0.6	1.1

Table 9.25: Change in future seasonal minimum temperature (℃) compared to the baseline period (1981-2010) within the districts of Nepal

	Baseline	SSP245			SSP585		
Districts	**(℃)**	**2030s**	**2050s**	**2080s**	**2030s**	**2050s**	**2080s**
Winter							
Achham	4.7	0.7	1.2	1.9	0.7	1.5	3.7
Arghakhanchi	7.0	0.8	1.4	2.0	0.7	1.6	3.9
Baglung	1.9	0.9	1.5	2.2	0.9	1.7	4.2
Baitadi	3.8	0.8	1.2	2.0	0.8	1.6	4.0
Bajhang	-2.4	1.0	1.5	2.4	1.0	1.9	4.5
Bajura	-1.0	0.8	1.3	2.1	0.8	1.6	3.9
Banke	9.4	0.9	1.4	2.2	0.8	1.7	4.2
Bara	10.1	1.0	1.6	2.4	0.8	1.8	4.8
Bardiya	9.3	0.8	1.3	2.1	0.7	1.6	4.1
Bhaktapur	4.3	0.9	1.5	2.2	0.8	1.7	4.4
Bhojpur	5.7	0.9	1.3	1.9	0.7	1.4	4.1
Chitwan	9.3	0.9	1.4	2.2	0.8	1.7	4.3
Dadeldhura	5.2	0.8	1.3	2.1	0.8	1.6	4.1
Dailekh	4.5	0.8	1.3	2.0	0.8	1.5	3.8
Dang	8.5	0.8	1.4	2.0	0.7	1.6	3.9
Darchula	-3.4	0.9	1.4	2.3	1.0	1.8	4.5
Dhading	4.9	0.8	1.3	2.0	0.7	1.5	4.0
Dhankuta	7.0	0.9	1.4	2.1	0.8	1.5	4.3
Dhanusha	10.6	1.1	1.7	2.5	0.9	1.9	4.9
Dolakha	-1.4	1.1	1.7	2.5	1.0	1.9	4.8
Dolpa	-7.1	1.3	2.0	3.1	1.2	2.4	5.5
Doti	4.4	0.8	1.3	2.0	0.8	1.6	3.9
Gorkha	-0.5	0.9	1.5	2.3	0.9	1.8	4.5
Gulmi	5.6	0.8	1.3	1.9	0.7	1.5	3.7
Humla	-7.2	1.0	1.6	2.5	1.1	1.9	4.5
Ilam	6.9	1.0	1.5	2.1	0.8	1.6	4.3
Jajarkot	1.7	0.8	1.3	2.0	0.7	1.6	3.9
Jhapa	10.4	1.1	1.7	2.6	0.9	1.9	5.2
Jumla	-3.5	0.9	1.5	2.4	0.9	1.8	4.5
Kailali	8.5	0.8	1.3	2.1	0.8	1.6	4.1
Kalikot	0.2	0.8	1.3	2.1	0.8	1.6	4.0
Kanchanpur	9.0	0.8	1.4	2.2	0.8	1.7	4.2
Kapilbastu	10.2	0.9	1.5	2.2	0.8	1.6	4.1
Kaski	1.3	1.0	1.6	2.4	0.9	1.8	4.5
Kathmandu	4.8	0.9	1.4	2.1	0.8	1.6	4.3
Kavrepalanchok	5.6	0.8	1.3	2.0	0.7	1.5	4.1
Khotang	6.0	0.9	1.3	1.9	0.7	1.4	4.1
Lalitpur	4.7	0.8	1.3	2.0	0.8	1.6	4.1
Lamjung	1.3	0.9	1.5	2.2	0.9	1.7	4.2
Mahottari	10.5	1.0	1.6	2.4	0.9	1.8	4.7
Makwanpur	7.5	0.8	1.4	2.1	0.7	1.6	4.2
Manang	-7.7	1.5	2.2	3.4	1.4	2.6	6.1

	Baseline	SSP245			SSP585		
Districts	(℃)	2030s	2050s	2080s	2030s	2050s	2080s
Morang	9.7	1.1	1.7	2.5	0.9	1.8	4.9
Mugu	-5.0	1.0	1.6	2.5	1.0	1.9	4.5
Mustang	-7.2	1.3	2.0	3.0	1.3	2.3	5.3
Myagdi	-2.4	1.1	1.8	2.7	1.1	2.1	5.0
Nawalparasi-E	8.9	0.9	1.5	2.2	0.8	1.7	4.2
Nawalparasi-W	9.8	0.9	1.5	2.2	0.8	1.7	4.2
Nuwakot	5.4	0.8	1.2	1.9	0.7	1.4	3.8
Okhaldhunga	5.2	0.8	1.3	1.9	0.7	1.5	4.1
Palpa	7.6	0.8	1.3	2.0	0.7	1.5	3.8
Panchthar	4.3	0.9	1.3	1.9	0.7	1.4	4.1
Parbat	4.8	0.8	1.3	1.9	0.7	1.5	3.6
Parsa	10.1	0.9	1.5	2.3	0.8	1.8	4.5
Pyuthan	6.0	0.9	1.4	2.0	0.8	1.6	3.8
Ramechhap	3.3	0.9	1.4	2.1	0.8	1.6	4.2
Rasuwa	-3.4	1.1	1.7	2.5	1.0	1.9	4.7
Rautahat	10.6	1.0	1.6	2.4	0.9	1.8	4.7
Rolpa	3.8	0.8	1.3	2.0	0.7	1.6	3.9
Rukum-E	-1.1	1.1	1.7	2.6	1.0	2.0	4.8
Rukum-W	2.5	0.8	1.3	2.1	0.8	1.6	3.9
Rupandehi	10.3	0.9	1.5	2.3	0.8	1.7	4.3
Salyan	5.9	0.7	1.2	1.9	0.7	1.5	3.7
Sankhuwasabha	-0.4	1.1	1.7	2.3	1.0	1.8	4.6
Saptari	10.9	1.0	1.6	2.4	0.8	1.7	4.8
Sarlahi	10.3	1.0	1.6	2.4	0.8	1.8	4.7
Sindhuli	8.2	0.9	1.4	2.1	0.8	1.6	4.3
Sindhupalchok	0.8	0.9	1.4	2.1	0.8	1.6	4.2
Siraha	10.6	1.0	1.6	2.4	0.8	1.8	4.8
Solukhumbu	-3.5	1.3	2.0	2.7	1.1	2.1	5.3
Sunsari	10.3	1.0	1.6	2.4	0.8	1.8	4.9
Surkhet	6.9	0.7	1.2	2.0	0.7	1.5	3.8
Syangja	6.8	0.8	1.3	1.9	0.7	1.5	3.7
Tanahu	7.8	0.8	1.3	2.0	0.7	1.6	4.0
Taplejung	-3.0	1.1	1.7	2.3	1.0	1.8	4.8
Terhathum	5.3	0.9	1.3	1.9	0.7	1.4	4.1
Udayapur	8.8	1.0	1.6	2.3	0.9	1.7	4.6
Pre-Monsoon							
Achham	12.6	0.9	1.5	2.2	1.0	1.9	4.2
Arghakhanchi	15.3	0.8	1.6	2.3	0.9	1.8	4.4
Baglung	8.8	0.8	1.5	2.3	1.0	1.9	4.4
Baitadi	11.6	0.9	1.6	2.3	1.1	2.0	4.5
Bajhang	3.6	0.9	1.6	2.3	1.1	2.0	4.5
Bajura	5.2	0.8	1.4	2.1	1.0	1.8	4.0
Banke	18.9	0.8	1.7	2.6	1.0	2.0	4.8
Bara	19.2	0.9	1.7	2.6	1.0	2.0	4.9
Bardiya	18.7	0.8	1.6	2.5	1.0	2.0	4.6

	Baseline	SSP245			SSP585		
Districts	(℃)	2030s	2050s	2080s	2030s	2050s	2080s
Bhaktapur	12.1	0.9	1.6	2.3	1.0	1.9	4.5
Bhojpur	12.9	0.8	1.5	2.2	0.9	1.7	4.6
Chitwan	18.1	0.9	1.6	2.4	1.0	1.9	4.6
Dadeldhura	13.4	0.9	1.6	2.4	1.1	2.0	4.6
Dailekh	12.4	0.8	1.4	2.2	1.0	1.8	4.2
Dang	17.6	0.8	1.5	2.4	0.9	1.9	4.5
Darchula	2.2	1.0	1.7	2.4	1.2	2.1	4.8
Dhading	12.2	0.9	1.5	2.3	1.0	1.8	4.4
Dhankuta	14.5	0.9	1.6	2.4	0.9	1.8	4.7
Dhanusha	19.7	0.8	1.6	2.5	0.8	1.9	4.8
Dolakha	4.1	1.0	1.7	2.5	1.1	2.0	4.9
Dolpa	-2.8	1.2	1.9	2.8	1.4	2.3	5.2
Doti	12.4	0.8	1.5	2.3	1.0	1.9	4.4
Gorkha	5.2	1.1	1.7	2.5	1.2	2.0	4.8
Gulmi	13.6	0.7	1.4	2.1	0.9	1.7	4.1
Humla	-2.9	1.1	1.7	2.4	1.3	2.1	4.9
Ilam	14.1	0.9	1.5	2.3	0.9	1.7	4.5
Jajarkot	8.7	0.8	1.4	2.1	0.9	1.7	4.0
Jhapa	18.8	1.0	1.8	2.6	0.9	2.0	5.1
Jumla	2.1	0.9	1.5	2.2	1.1	1.9	4.3
Kailali	17.8	0.8	1.6	2.4	1.0	2.0	4.7
Kalikot	6.8	0.8	1.4	2.1	1.0	1.8	4.0
Kanchanpur	18.5	0.9	1.7	2.6	1.1	2.1	5.0
Kapilbastu	19.6	0.8	1.7	2.5	0.9	1.9	4.6
Kaski	7.7	1.0	1.7	2.4	1.2	2.0	4.7
Kathmandu	12.2	1.0	1.6	2.4	1.1	1.9	4.7
Kavrepalanchok	13.1	0.8	1.5	2.2	0.9	1.8	4.4
Khotang	13.4	0.8	1.4	2.2	0.8	1.6	4.4
Lalitpur	12.3	0.9	1.6	2.3	1.0	1.8	4.4
Lamjung	7.8	0.9	1.5	2.3	1.1	1.8	4.4
Mahottari	19.5	0.9	1.7	2.5	0.9	1.9	4.8
Makwanpur	15.7	0.8	1.5	2.3	0.9	1.8	4.4
Manang	-3.7	1.3	2.1	3.1	1.6	2.6	5.7
Morang	18.2	0.8	1.6	2.5	0.8	1.8	4.8
Mugu	-0.1	1.1	1.6	2.3	1.2	2.0	4.5
Mustang	-3.1	1.2	1.9	2.8	1.5	2.3	5.2
Myagdi	3.2	1.0	1.8	2.6	1.2	2.1	4.8
Nawalparasi-E	17.7	0.9	1.6	2.4	1.0	1.9	4.5
Nawalparasi-W	19.2	0.9	1.7	2.6	1.0	2.0	4.7
Nuwakot	12.7	0.9	1.5	2.2	1.0	1.8	4.4
Okhaldhunga	12.3	0.8	1.5	2.2	0.9	1.7	4.3
Palpa	15.9	0.8	1.5	2.3	0.9	1.8	4.3
Panchthar	10.9	0.8	1.5	2.2	0.8	1.7	4.5
Parbat	12.2	0.8	1.4	2.1	1.0	1.7	4.0
Parsa	19.2	0.8	1.6	2.4	0.9	1.9	4.6

	Baseline	SSP245			SSP585		
Districts	(℃)	2030s	2050s	2080s	2030s	2050s	2080s
Pyuthan	14.3	0.7	1.4	2.2	0.9	1.7	4.2
Ramechhap	10.0	0.9	1.6	2.3	1.0	1.8	4.5
Rasuwa	1.5	1.0	1.7	2.5	1.2	2.0	4.8
Rautahat	19.8	0.8	1.6	2.4	0.9	1.9	4.7
Rolpa	11.4	0.7	1.4	2.2	0.9	1.8	4.2
Rukum-E	5.1	0.9	1.6	2.4	1.1	2.0	4.6
Rukum-W	9.7	0.8	1.4	2.1	0.9	1.8	4.1
Rupandehi	19.7	0.8	1.6	2.5	0.9	1.9	4.6
Salyan	14.2	0.7	1.4	2.2	0.9	1.8	4.2
Sankhuwasabha	5.0	1.0	1.7	2.4	1.1	1.9	4.9
Saptari	19.8	0.8	1.6	2.5	0.8	1.8	4.8
Sarlahi	19.3	0.9	1.7	2.5	0.9	1.9	4.8
Sindhuli	16.4	0.9	1.6	2.3	0.9	1.8	4.5
Sindhupalchok	6.8	0.9	1.6	2.3	1.1	1.8	4.5
Siraha	19.5	0.8	1.6	2.4	0.8	1.8	4.8
Solukhumbu	1.2	1.1	1.8	2.6	1.2	2.1	5.2
Sunsari	18.9	0.9	1.7	2.5	0.9	1.9	4.9
Surkhet	15.6	0.8	1.5	2.3	1.0	1.9	4.3
Syangja	14.7	0.9	1.5	2.3	1.0	1.8	4.3
Tanahu	15.9	0.9	1.6	2.4	1.0	1.9	4.5
Taplejung	1.4	1.1	1.8	2.5	1.2	2.0	5.0
Terhathum	12.2	0.9	1.5	2.3	0.9	1.7	4.6
Udayapur	17.1	0.9	1.6	2.4	0.9	1.8	4.7
Monsoon							
Achham	18.8	0.8	1.3	1.8	0.9	1.6	3.4
Arghakhanchi	20.5	0.6	1.2	1.7	0.7	1.4	3.1
Baglung	13.8	0.8	1.4	2.0	0.9	1.7	3.5
Baitadi	18.0	0.8	1.4	2.0	1.0	1.7	3.6
Bajhang	9.3	1.0	1.6	2.3	1.1	2.1	4.3
Bajura	11.2	0.8	1.4	2.1	1.0	1.8	3.9
Banke	24.7	0.7	1.3	2.0	0.8	1.6	3.4
Bara	24.9	0.8	1.3	1.9	0.9	1.6	3.3
Bardiya	24.6	0.7	1.3	1.9	0.8	1.6	3.3
Bhaktapur	18.5	0.8	1.3	1.9	0.9	1.6	3.3
Bhojpur	18.7	0.9	1.4	2.0	0.9	1.7	3.6
Chitwan	24.1	0.7	1.2	1.8	0.8	1.5	3.2
Dadeldhura	19.5	0.7	1.3	1.9	0.9	1.6	3.4
Dailekh	18.0	0.8	1.4	1.9	0.9	1.7	3.5
Dang	22.9	0.7	1.3	1.9	0.8	1.6	3.3
Darchula	8.0	1.1	1.8	2.6	1.3	2.3	4.6
Dhading	18.1	0.8	1.3	1.9	0.9	1.6	3.4
Dhankuta	20.5	0.8	1.3	2.0	0.9	1.6	3.5
Dhanusha	25.3	0.8	1.3	2.0	0.9	1.6	3.3
Dolakha	9.2	1.1	1.8	2.6	1.2	2.2	4.4
Dolpa	1.7	1.2	2.0	2.9	1.4	2.5	5.0

	Baseline	SSP245			SSP585		
Districts	(℃)	2030s	2050s	2080s	2030s	2050s	2080s
Doti	18.4	0.8	1.4	2.0	0.9	1.7	3.6
Gorkha	10.4	1.1	1.7	2.5	1.2	2.1	4.3
Gulmi	19.0	0.7	1.1	1.7	0.7	1.4	3.0
Humla	2.8	1.2	1.9	2.7	1.4	2.4	5.0
Ilam	19.7	1.0	1.5	2.2	1.0	1.8	3.7
Jajarkot	14.1	0.8	1.3	1.9	0.9	1.7	3.5
Jhapa	25.1	1.0	1.5	2.2	1.0	1.8	3.6
Jumla	7.6	0.9	1.6	2.3	1.1	2.0	4.2
Kailali	23.8	0.8	1.3	2.0	0.9	1.7	3.4
Kalikot	12.4	0.8	1.3	2.0	0.9	1.7	3.7
Kanchanpur	24.8	0.8	1.4	2.0	0.9	1.7	3.5
Kapilbastu	25.1	0.7	1.3	1.9	0.8	1.5	3.2
Kaski	13.0	0.9	1.5	2.2	1.0	1.9	3.8
Kathmandu	18.4	0.8	1.4	2.0	0.9	1.7	3.6
Kavrepalanchok	18.9	0.7	1.2	1.7	0.8	1.5	3.2
Khotang	19.0	0.8	1.3	1.9	0.9	1.6	3.4
Lalitpur	18.1	0.8	1.3	1.9	0.9	1.6	3.3
Lamjung	13.3	0.9	1.4	2.1	1.0	1.8	3.8
Mahottari	25.1	0.8	1.3	1.9	0.9	1.6	3.2
Makwanpur	21.3	0.8	1.2	1.8	0.8	1.5	3.2
Manang	0.3	1.4	2.3	3.3	1.6	2.8	5.5
Morang	24.0	0.9	1.5	2.1	1.0	1.8	3.5
Mugu	5.6	1.1	1.7	2.5	1.2	2.2	4.6
Mustang	1.6	1.3	2.1	3.0	1.4	2.5	5.1
Myagdi	7.8	1.0	1.7	2.5	1.2	2.1	4.2
Nawalparasi-E	23.7	0.6	1.1	1.7	0.7	1.4	3.0
Nawalparasi-W	24.9	0.8	1.3	1.9	0.9	1.6	3.3
Nuwakot	18.8	0.7	1.2	1.8	0.8	1.5	3.3
Okhaldhunga	17.6	0.8	1.3	1.9	0.9	1.6	3.4
Palpa	21.2	0.7	1.2	1.8	0.8	1.5	3.1
Panchthar	16.6	1.0	1.5	2.2	1.1	1.9	3.9
Parbat	17.9	0.6	1.1	1.6	0.7	1.3	3.0
Parsa	24.8	0.8	1.3	1.9	0.9	1.6	3.2
Pyuthan	19.6	0.7	1.2	1.7	0.7	1.4	3.1
Ramechhap	15.5	0.9	1.4	2.0	0.9	1.7	3.6
Rasuwa	6.2	1.2	1.9	2.7	1.3	2.3	4.6
Rautahat	25.3	0.8	1.3	1.9	0.9	1.6	3.2
Rolpa	16.5	0.7	1.3	1.8	0.8	1.6	3.3
Rukum-E	9.8	0.9	1.6	2.3	1.0	1.9	4.0
Rukum-W	15.3	0.8	1.3	1.9	0.9	1.6	3.5
Rupandehi	25.2	0.7	1.3	1.9	0.8	1.6	3.3
Salyan	19.6	0.7	1.2	1.8	0.8	1.5	3.2
Sankhuwasabha	10.4	1.2	1.9	2.7	1.3	2.3	4.7
Saptari	25.3	0.9	1.4	2.0	0.9	1.7	3.3
Sarlahi	25.0	0.8	1.3	1.9	0.9	1.6	3.3

	Baseline	SSP245			SSP585		
Districts	(℃)	2030s	2050s	2080s	2030s	2050s	2080s
Sindhuli	22.2	0.7	1.2	1.8	0.8	1.5	3.1
Sindhupalchok	12.2	0.9	1.5	2.2	1.0	1.9	4.0
Siraha	25.1	0.8	1.3	1.9	0.9	1.6	3.3
Solukhumbu	5.6	1.4	2.2	3.1	1.5	2.6	5.1
Sunsari	24.8	0.8	1.4	2.0	0.9	1.7	3.4
Surkhet	21.5	0.7	1.2	1.8	0.8	1.5	3.2
Syangja	20.6	0.7	1.1	1.7	0.8	1.4	3.0
Tanahu	22.3	0.7	1.2	1.7	0.8	1.4	3.2
Taplejung	6.4	1.4	2.1	3.1	1.5	2.6	5.1
Terhathum	18.2	0.9	1.5	2.2	1.0	1.8	3.8
Udayapur	22.9	0.8	1.3	1.9	0.9	1.6	3.3
Post-monsoon							
Achham	10.5	0.7	1.3	2.2	0.9	1.9	4.2
Arghakhanchi	13.4	0.7	1.4	2.2	0.9	1.9	4.2
Baglung	7.0	0.7	1.3	2.1	0.8	1.7	3.9
Baitadi	9.4	0.8	1.4	2.4	1.0	2.0	4.6
Bajhang	1.5	0.7	1.2	2.1	0.9	1.8	4.3
Bajura	3.2	0.7	1.2	2.0	0.9	1.7	4.1
Banke	16.6	0.9	1.6	2.6	1.1	2.2	5.0
Bara	17.6	1.0	1.8	2.8	1.2	2.4	5.3
Bardiya	16.4	0.8	1.5	2.5	1.0	2.1	4.8
Bhaktapur	10.8	0.9	1.5	2.4	1.0	2.0	4.5
Bhojpur	12.0	0.8	1.4	2.3	1.0	1.9	4.3
Chitwan	16.5	0.9	1.6	2.6	1.1	2.2	4.9
Dadeldhura	11.1	0.8	1.4	2.4	1.0	2.0	4.5
Dailekh	10.2	0.6	1.2	2.1	0.8	1.8	4.2
Dang	15.3	0.8	1.5	2.4	1.0	2.1	4.6
Darchula	0.1	0.7	1.2	2.2	0.9	1.9	4.5
Dhading	10.9	0.7	1.3	2.1	0.9	1.7	4.0
Dhankuta	13.7	0.9	1.6	2.5	1.0	2.0	4.6
Dhanusha	18.4	1.0	1.8	2.8	1.1	2.3	5.3
Dolakha	3.1	0.7	1.2	2.1	0.8	1.6	3.9
Dolpa	-4.5	0.6	1.1	2.0	0.8	1.5	4.0
Doti	10.1	0.8	1.4	2.4	1.0	2.0	4.5
Gorkha	3.9	0.7	1.2	2.0	0.8	1.5	3.8
Gulmi	11.7	0.8	1.4	2.1	0.9	1.8	4.0
Humla	-4.6	0.5	1.0	1.8	0.8	1.5	4.0
Ilam	13.4	0.9	1.5	2.4	1.0	2.0	4.5
Jajarkot	6.7	0.6	1.1	2.0	0.8	1.6	3.9
Jhapa	18.1	1.1	1.9	2.9	1.2	2.4	5.3
Jumla	0.2	0.6	1.1	1.9	0.8	1.5	3.9
Kailali	15.4	0.7	1.4	2.4	1.0	2.0	4.7
Kalikot	4.8	0.6	1.1	2.0	0.8	1.6	3.9
Kanchanpur	16.0	0.9	1.6	2.6	1.1	2.2	4.9
Kapilbastu	17.6	0.9	1.6	2.5	1.1	2.2	4.9

	Baseline	SSP245			SSP585		
Districts	(℃)	2030s	2050s	2080s	2030s	2050s	2080s
Kaski	6.2	0.8	1.4	2.2	1.0	1.8	4.1
Kathmandu	11.2	0.8	1.4	2.3	1.0	1.9	4.4
Kavrepalanchok	11.9	0.8	1.3	2.2	0.9	1.8	4.2
Khotang	12.4	0.8	1.4	2.3	0.9	1.8	4.3
Lalitpur	11.0	0.8	1.4	2.3	1.0	2.0	4.4
Lamjung	6.3	0.7	1.3	2.1	0.9	1.7	3.9
Mahottari	18.2	1.0	1.7	2.7	1.1	2.3	5.2
Makwanpur	14.2	0.9	1.5	2.4	1.0	2.1	4.6
Manang	-5.1	0.7	1.3	2.2	0.9	1.6	4.3
Morang	17.2	1.1	1.8	2.8	1.2	2.3	5.2
Mugu	-1.7	0.5	1.0	1.8	0.7	1.4	3.9
Mustang	-4.5	0.6	1.1	1.9	0.7	1.4	3.8
Myagdi	1.5	0.7	1.3	2.1	0.9	1.7	4.0
Nawalparasi-E	16.1	0.9	1.5	2.5	1.0	2.1	4.7
Nawalparasi-W	17.2	1.0	1.7	2.7	1.2	2.3	5.3
Nuwakot	11.5	0.7	1.3	2.1	0.9	1.7	3.9
Okhaldhunga	11.2	0.8	1.3	2.2	0.9	1.8	4.0
Palpa	14.1	0.8	1.4	2.3	1.0	1.9	4.3
Panchthar	10.2	0.8	1.4	2.2	0.9	1.8	4.2
Parbat	10.6	0.8	1.3	2.1	0.9	1.7	3.8
Parsa	17.6	0.9	1.6	2.6	1.1	2.2	5.1
Pyuthan	12.3	0.7	1.3	2.2	0.9	1.8	4.1
Ramechhap	8.9	0.8	1.4	2.2	0.9	1.8	4.1
Rasuwa	0.3	0.6	1.1	1.9	0.8	1.4	3.7
Rautahat	18.3	0.9	1.7	2.7	1.1	2.3	5.2
Rolpa	9.4	0.6	1.2	2.1	0.8	1.7	4.0
Rukum-E	3.2	0.6	1.2	2.0	0.8	1.6	4.0
Rukum-W	7.8	0.6	1.2	2.1	0.8	1.7	4.1
Rupandehi	17.8	0.9	1.6	2.5	1.1	2.2	4.9
Salyan	12.0	0.7	1.4	2.2	0.9	1.9	4.2
Sankhuwasabha	4.3	0.8	1.3	2.1	0.9	1.7	4.0
Saptari	18.6	1.1	1.9	2.9	1.2	2.4	5.5
Sarlahi	17.9	1.0	1.7	2.8	1.1	2.3	5.2
Sindhuli	15.2	0.9	1.5	2.5	1.0	2.1	4.6
Sindhupalchok	5.7	0.6	1.1	2.0	0.8	1.5	3.7
Siraha	18.2	1.1	1.8	2.8	1.2	2.4	5.4
Solukhumbu	0.3	0.7	1.3	2.2	0.9	1.6	4.1
Sunsari	17.9	1.1	1.8	2.8	1.2	2.4	5.3
Surkhet	13.3	0.7	1.4	2.3	0.9	1.9	4.4
Syangja	13.2	0.8	1.4	2.3	1.0	1.9	4.2
Tanahu	14.6	0.8	1.5	2.4	1.0	1.9	4.4
Taplejung	0.9	0.7	1.2	2.1	0.8	1.6	4.0
Terhathum	11.5	0.8	1.4	2.3	0.9	1.8	4.3
Udayapur	16.1	0.9	1.6	2.6	1.1	2.1	4.9
Annual							

	Baseline	SSP245			SSP585		
Districts	(℃)	2030s	2050s	2080s	2030s	2050s	2080s
Achham	12.4	0.7	1.3	2.0	0.8	1.6	3.8
Arghakhanchi	14.7	0.7	1.3	2.0	0.8	1.6	3.8
Baglung	8.5	0.8	1.4	2.1	0.9	1.7	4.0
Baitadi	11.5	0.8	1.3	2.1	0.9	1.8	4.0
Bajhang	3.7	0.9	1.5	2.3	1.0	1.9	4.4
Bajura	5.3	0.8	1.4	2.1	1.0	1.8	4.0
Banke	18.1	0.8	1.5	2.3	0.9	1.9	4.2
Bara	18.6	0.9	1.6	2.3	0.9	1.9	4.4
Bardiya	17.9	0.8	1.5	2.2	0.9	1.8	4.2
Bhaktapur	12.1	0.9	1.4	2.2	0.9	1.8	4.1
Bhojpur	12.9	0.9	1.4	2.1	0.9	1.7	4.1
Chitwan	17.7	0.8	1.4	2.2	0.9	1.7	4.0
Dadeldhura	13.0	0.8	1.4	2.2	1.0	1.8	4.1
Dailekh	12.0	0.7	1.3	2.0	0.8	1.6	3.8
Dang	16.7	0.8	1.4	2.2	0.9	1.8	4.0
Darchula	2.4	1.0	1.6	2.4	1.1	2.1	4.6
Dhading	12.1	0.9	1.4	2.1	0.9	1.7	3.9
Dhankuta	14.5	0.9	1.5	2.2	0.9	1.7	4.2
Dhanusha	19.1	0.9	1.6	2.4	0.9	1.9	4.4
Dolakha	4.3	1.0	1.6	2.4	1.1	1.9	4.5
Dolpa	-2.6	1.1	1.8	2.7	1.2	2.2	5.0
Doti	12.1	0.7	1.3	2.1	0.9	1.7	4.0
Gorkha	5.3	1.0	1.6	2.4	1.1	1.9	4.4
Gulmi	13.1	0.8	1.3	1.9	0.8	1.6	3.6
Humla	-2.3	1.0	1.6	2.4	1.1	2.0	4.6
Ilam	14.1	0.9	1.5	2.2	0.9	1.7	4.2
Jajarkot	8.4	0.8	1.3	2.1	0.9	1.7	3.8
Jhapa	18.7	1.0	1.7	2.5	1.0	2.0	4.7
Jumla	2.2	0.9	1.5	2.3	1.0	1.9	4.3
Kailali	17.1	0.8	1.4	2.2	0.9	1.8	4.1
Kalikot	6.7	0.8	1.3	2.0	0.9	1.7	3.9
Kanchanpur	17.8	0.9	1.5	2.3	1.0	1.9	4.3
Kapilbastu	18.8	0.8	1.4	2.2	0.8	1.7	4.0
Kaski	7.7	0.9	1.5	2.2	1.0	1.8	4.2
Kathmandu	12.3	0.9	1.4	2.2	0.9	1.7	4.2
Kavrepalanchok	13.0	0.8	1.3	2.0	0.8	1.6	3.9
Khotang	13.3	0.8	1.3	2.0	0.8	1.6	3.9
Lalitpur	12.2	0.8	1.3	2.0	0.8	1.6	3.9
Lamjung	7.8	0.9	1.4	2.2	1.0	1.7	4.0
Mahottari	18.9	0.9	1.6	2.3	0.9	1.9	4.3
Makwanpur	15.3	0.8	1.4	2.1	0.9	1.7	4.0
Manang	-3.6	1.3	2.1	3.1	1.4	2.5	5.5
Morang	17.9	0.9	1.6	2.4	0.9	1.9	4.5
Mugu	0.4	0.9	1.5	2.3	1.0	1.9	4.3
Mustang	-2.8	1.2	1.9	2.8	1.3	2.3	5.0

	Baseline	SSP245			SSP585		
Districts	(℃)	2030s	2050s	2080s	2030s	2050s	2080s
Myagdi	3.1	1.0	1.6	2.5	1.1	2.0	4.5
Nawalparasi-E	17.3	0.8	1.4	2.1	0.8	1.7	3.9
Nawalparasi-W	18.5	0.8	1.5	2.2	0.9	1.8	4.2
Nuwakot	12.7	0.8	1.3	2.0	0.9	1.6	3.8
Okhaldhunga	12.1	0.9	1.4	2.1	0.9	1.7	3.9
Palpa	15.3	0.8	1.4	2.0	0.8	1.7	3.8
Panchthar	11.0	0.9	1.5	2.2	0.9	1.7	4.2
Parbat	12.0	0.8	1.3	1.9	0.8	1.5	3.5
Parsa	18.5	0.9	1.5	2.3	1.0	1.9	4.3
Pyuthan	13.7	0.7	1.3	2.0	0.8	1.6	3.7
Ramechhap	10.0	0.9	1.4	2.2	0.9	1.7	4.1
Rasuwa	1.6	1.1	1.7	2.5	1.2	2.1	4.6
Rautahat	19.1	0.9	1.5	2.3	0.9	1.8	4.3
Rolpa	10.9	0.7	1.3	2.0	0.8	1.6	3.8
Rukum-E	4.8	0.9	1.6	2.4	1.0	1.9	4.4
Rukum-W	9.5	0.7	1.3	2.0	0.8	1.6	3.8
Rupandehi	18.9	0.8	1.5	2.2	0.9	1.8	4.2
Salyan	13.6	0.7	1.3	2.0	0.8	1.6	3.7
Sankhuwasabha	5.4	1.0	1.6	2.4	1.0	1.9	4.6
Saptari	19.2	1.0	1.6	2.4	0.9	1.9	4.5
Sarlahi	18.8	0.8	1.5	2.3	0.9	1.8	4.3
Sindhuli	16.1	0.8	1.4	2.1	0.9	1.7	4.0
Sindhupalchok	6.9	0.9	1.5	2.2	1.0	1.8	4.1
Siraha	18.9	0.9	1.6	2.4	0.9	1.9	4.4
Solukhumbu	1.4	1.1	1.8	2.7	1.2	2.1	5.0
Sunsari	18.6	0.9	1.6	2.4	0.9	1.8	4.4
Surkhet	15.0	0.8	1.4	2.1	0.9	1.7	3.9
Syangja	14.5	0.7	1.3	1.9	0.8	1.6	3.7
Tanahu	15.8	0.8	1.4	2.1	0.9	1.7	3.9
Taplejung	1.9	1.1	1.8	2.6	1.2	2.1	4.8
Terhathum	12.4	0.9	1.4	2.1	0.9	1.7	4.1
Udayapur	16.8	0.9	1.5	2.3	0.9	1.8	4.3

Table 9.26: Absolute uncertainty (standard deviation) in projected change in future seasonal minimum temperature (°C) compared to the baseline period (1981-2010) within the districts of Nepal

	Baseline	SSP245			SSP585		
Districts	(°C)	2030s	2050s	2080s	2030s	2050s	2080s
Winter							
Achham	4.7	0.1	0.4	0.5	0.3	0.3	1.0
Arghakhanchi	7.0	0.2	0.4	0.4	0.3	0.4	0.7
Baglung	1.9	0.2	0.4	0.5	0.3	0.4	1.0
Baitadi	3.8	0.1	0.4	0.6	0.2	0.3	1.1
Bajhang	-2.4	0.1	0.3	0.6	0.2	0.4	1.1
Bajura	-1.0	0.1	0.3	0.5	0.2	0.4	1.0
Banke	9.4	0.3	0.4	0.4	0.4	0.4	0.8
Bara	10.1	0.4	0.4	0.2	0.4	0.4	0.5
Bardiya	9.3	0.3	0.4	0.5	0.4	0.4	1.0
Bhaktapur	4.3	0.1	0.3	0.3	0.2	0.3	0.8
Bhojpur	5.7	0.3	0.3	0.1	0.2	0.2	0.4
Chitwan	9.3	0.3	0.3	0.3	0.3	0.3	0.7
Dadeldhura	5.2	0.2	0.4	0.5	0.3	0.4	1.1
Dailekh	4.5	0.1	0.4	0.5	0.2	0.3	1.0
Dang	8.5	0.3	0.4	0.4	0.4	0.4	0.7
Darchula	-3.4	0.1	0.3	0.6	0.2	0.5	1.1
Dhading	4.9	0.1	0.3	0.4	0.2	0.3	0.7
Dhankuta	7.0	0.3	0.3	0.1	0.3	0.2	0.4
Dhanusha	10.6	0.4	0.5	0.2	0.4	0.4	0.5
Dolakha	-1.4	0.2	0.3	0.5	0.2	0.3	0.8
Dolpa	-7.1	0.2	0.4	0.7	0.1	0.4	1.1
Doti	4.4	0.2	0.4	0.5	0.3	0.3	1.0
Gorkha	-0.5	0.1	0.4	0.6	0.1	0.3	0.8
Gulmi	5.6	0.2	0.4	0.4	0.3	0.3	0.8
Humla	-7.2	0.3	0.3	0.7	0.2	0.5	0.8
Ilam	6.9	0.3	0.3	0.0	0.3	0.2	0.3
Jajarkot	1.7	0.1	0.4	0.5	0.2	0.3	1.0
Jhapa	10.4	0.5	0.5	0.1	0.5	0.4	0.4
Jumla	-3.5	0.1	0.3	0.6	0.2	0.4	1.2
Kailali	8.5	0.2	0.4	0.5	0.4	0.3	1.0
Kalikot	0.2	0.1	0.4	0.5	0.3	0.3	1.1
Kanchanpur	9.0	0.3	0.4	0.5	0.4	0.4	0.9
Kapilbastu	10.2	0.4	0.4	0.4	0.4	0.4	0.7
Kaski	1.3	0.2	0.4	0.6	0.2	0.4	1.1
Kathmandu	4.8	0.1	0.3	0.4	0.2	0.2	0.8
Kavrepalanchok	5.6	0.1	0.3	0.3	0.2	0.2	0.7
Khotang	6.0	0.3	0.3	0.2	0.2	0.2	0.5
Lalitpur	4.7	0.2	0.3	0.3	0.2	0.3	0.7
Lamjung	1.3	0.1	0.4	0.5	0.2	0.4	0.9
Mahottari	10.5	0.4	0.4	0.2	0.4	0.4	0.5
Makwanpur	7.5	0.2	0.3	0.3	0.3	0.3	0.6

	Baseline	SSP245			SSP585		
Districts	(℃)	2030s	2050s	2080s	2030s	2050s	2080s
Manang	-7.7	0.2	0.5	0.9	0.2	0.5	1.2
Morang	9.7	0.5	0.4	0.1	0.4	0.4	0.4
Mugu	-5.0	0.2	0.2	0.6	0.1	0.3	0.9
Mustang	-7.2	0.3	0.4	0.8	0.2	0.5	1.0
Myagdi	-2.4	0.2	0.5	0.7	0.2	0.5	1.2
Nawalparasi-E	8.9	0.3	0.3	0.4	0.3	0.4	0.7
Nawalparasi-W	9.8	0.3	0.4	0.3	0.3	0.4	0.6
Nuwakot	5.4	0.1	0.3	0.4	0.1	0.2	0.7
Okhaldhunga	5.2	0.2	0.3	0.2	0.2	0.2	0.5
Palpa	7.6	0.2	0.4	0.4	0.3	0.4	0.7
Panchthar	4.3	0.3	0.3	0.1	0.2	0.2	0.3
Parbat	4.8	0.1	0.4	0.5	0.2	0.4	0.9
Parsa	10.1	0.3	0.3	0.2	0.4	0.4	0.5
Pyuthan	6.0	0.2	0.4	0.4	0.3	0.4	0.8
Ramechhap	3.3	0.2	0.3	0.3	0.2	0.3	0.7
Rasuwa	-3.4	0.2	0.3	0.7	0.2	0.4	0.8
Rautahat	10.6	0.4	0.3	0.2	0.4	0.4	0.5
Rolpa	3.8	0.2	0.4	0.6	0.3	0.4	1.0
Rukum-E	-1.1	0.1	0.4	0.6	0.2	0.4	1.2
Rukum-W	2.5	0.1	0.4	0.6	0.2	0.3	1.0
Rupandehi	10.3	0.3	0.4	0.4	0.4	0.4	0.7
Salyan	5.9	0.2	0.4	0.5	0.3	0.3	0.9
Sankhuwasabha	-0.4	0.2	0.3	0.4	0.2	0.2	0.5
Saptari	10.9	0.5	0.4	0.2	0.5	0.4	0.5
Sarlahi	10.3	0.4	0.4	0.2	0.4	0.4	0.5
Sindhuli	8.2	0.3	0.3	0.2	0.3	0.3	0.5
Sindhupalchok	0.8	0.2	0.3	0.5	0.2	0.3	0.7
Siraha	10.6	0.5	0.4	0.2	0.4	0.4	0.5
Solukhumbu	-3.5	0.2	0.4	0.5	0.2	0.3	0.7
Sunsari	10.3	0.5	0.4	0.2	0.4	0.4	0.4
Surkhet	6.9	0.2	0.4	0.5	0.3	0.3	1.0
Syangja	6.8	0.2	0.3	0.4	0.3	0.3	0.8
Tanahu	7.8	0.2	0.3	0.4	0.2	0.4	0.8
Taplejung	-3.0	0.2	0.3	0.4	0.1	0.2	0.5
Terhathum	5.3	0.2	0.3	0.1	0.2	0.2	0.4
Udayapur	8.8	0.4	0.3	0.1	0.3	0.3	0.5
Pre-Monsoon							
Achham	12.6	0.4	0.5	0.8	0.4	0.7	1.2
Arghakhanchi	15.3	0.4	0.4	0.7	0.4	0.7	1.1
Baglung	8.8	0.3	0.4	0.7	0.3	0.6	1.1
Baitadi	11.6	0.4	0.6	0.9	0.4	0.7	1.3
Bajhang	3.6	0.3	0.5	0.9	0.4	0.6	1.1
Bajura	5.2	0.3	0.4	0.8	0.3	0.6	1.0
Banke	18.9	0.6	0.6	0.9	0.6	0.9	1.5
Bara	19.2	0.5	0.5	0.7	0.5	0.7	1.1

	Baseline	SSP245			SSP585		
Districts	(℃)	2030s	2050s	2080s	2030s	2050s	2080s
Bardiya	18.7	0.5	0.6	1.0	0.6	0.9	1.5
Bhaktapur	12.1	0.3	0.4	0.5	0.3	0.5	0.9
Bhojpur	12.9	0.4	0.4	0.5	0.3	0.5	0.9
Chitwan	18.1	0.4	0.5	0.6	0.5	0.7	1.0
Dadeldhura	13.4	0.5	0.6	0.9	0.5	0.8	1.3
Dailekh	12.4	0.4	0.5	0.8	0.4	0.7	1.2
Dang	17.6	0.5	0.5	0.8	0.5	0.8	1.3
Darchula	2.2	0.4	0.5	0.9	0.3	0.6	1.2
Dhading	12.2	0.2	0.3	0.5	0.2	0.5	0.8
Dhankuta	14.5	0.4	0.4	0.5	0.4	0.6	1.0
Dhanusha	19.7	0.5	0.5	0.7	0.6	0.7	1.1
Dolakha	4.1	0.2	0.3	0.4	0.2	0.4	0.9
Dolpa	-2.8	0.3	0.4	0.6	0.2	0.4	0.9
Doti	12.4	0.4	0.6	0.9	0.5	0.8	1.3
Gorkha	5.2	0.2	0.3	0.4	0.2	0.4	0.8
Gulmi	13.6	0.3	0.4	0.6	0.3	0.5	1.0
Humla	-2.9	0.3	0.4	0.7	0.2	0.6	1.0
Ilam	14.1	0.5	0.4	0.6	0.5	0.6	0.9
Jajarkot	8.7	0.4	0.4	0.7	0.4	0.6	1.0
Jhapa	18.8	0.6	0.6	0.8	0.7	0.8	1.2
Jumla	2.1	0.3	0.4	0.7	0.3	0.5	0.9
Kailali	17.8	0.5	0.7	1.0	0.6	0.9	1.5
Kalikot	6.8	0.3	0.4	0.8	0.3	0.6	1.0
Kanchanpur	18.5	0.5	0.7	1.0	0.6	0.9	1.5
Kapilbastu	19.6	0.5	0.4	0.7	0.5	0.8	1.2
Kaski	7.7	0.3	0.4	0.5	0.3	0.5	1.0
Kathmandu	12.2	0.3	0.4	0.4	0.3	0.5	0.9
Kavrepalanchok	13.1	0.3	0.4	0.5	0.4	0.5	0.9
Khotang	13.4	0.4	0.3	0.5	0.4	0.5	0.9
Lalitpur	12.3	0.4	0.4	0.5	0.4	0.6	0.9
Lamjung	7.8	0.3	0.3	0.5	0.2	0.4	0.8
Mahottari	19.5	0.5	0.5	0.7	0.5	0.7	1.1
Makwanpur	15.7	0.4	0.4	0.6	0.4	0.6	1.0
Manang	-3.7	0.3	0.4	0.5	0.2	0.4	0.9
Morang	18.2	0.6	0.5	0.7	0.6	0.7	1.2
Mugu	-0.1	0.2	0.4	0.6	0.3	0.5	0.8
Mustang	-3.1	0.2	0.4	0.4	0.1	0.3	0.9
Myagdi	3.2	0.3	0.4	0.6	0.3	0.5	1.0
Nawalparasi-E	17.7	0.4	0.4	0.6	0.4	0.6	1.0
Nawalparasi-W	19.2	0.5	0.4	0.7	0.5	0.8	1.1
Nuwakot	12.7	0.2	0.3	0.4	0.2	0.4	0.9
Okhaldhunga	12.3	0.3	0.3	0.4	0.3	0.5	0.8
Palpa	15.9	0.3	0.4	0.6	0.4	0.6	1.0
Panchthar	10.9	0.4	0.4	0.5	0.4	0.5	0.8
Parbat	12.2	0.3	0.3	0.5	0.3	0.5	0.9

	Baseline	SSP245			SSP585		
Districts	(℃)	2030s	2050s	2080s	2030s	2050s	2080s
Parsa	19.2	0.5	0.5	0.7	0.5	0.7	1.1
Pyuthan	14.3	0.3	0.4	0.7	0.4	0.7	1.1
Ramechhap	10.0	0.3	0.3	0.4	0.4	0.5	0.9
Rasuwa	1.5	0.2	0.3	0.4	0.2	0.3	0.8
Rautahat	19.8	0.5	0.4	0.6	0.5	0.7	1.1
Rolpa	11.4	0.4	0.4	0.8	0.4	0.7	1.2
Rukum-E	5.1	0.4	0.4	0.7	0.4	0.6	1.1
Rukum-W	9.7	0.4	0.4	0.7	0.4	0.6	1.0
Rupandehi	19.7	0.5	0.5	0.7	0.5	0.7	1.1
Salyan	14.2	0.4	0.5	0.9	0.5	0.7	1.3
Sankhuwasabha	5.0	0.3	0.3	0.4	0.2	0.3	0.8
Saptari	19.8	0.6	0.5	0.8	0.6	0.8	1.3
Sarlahi	19.3	0.5	0.5	0.6	0.5	0.7	1.1
Sindhuli	16.4	0.4	0.4	0.6	0.5	0.6	1.0
Sindhupalchok	6.8	0.2	0.3	0.4	0.2	0.3	0.8
Siraha	19.5	0.5	0.5	0.7	0.5	0.7	1.2
Solukhumbu	1.2	0.2	0.3	0.4	0.2	0.4	0.9
Sunsari	18.9	0.5	0.5	0.8	0.6	0.8	1.2
Surkhet	15.6	0.4	0.6	0.9	0.5	0.8	1.3
Syangja	14.7	0.3	0.3	0.6	0.3	0.5	1.0
Tanahu	15.9	0.3	0.4	0.5	0.3	0.5	1.0
Taplejung	1.4	0.3	0.3	0.4	0.2	0.4	0.6
Terhathum	12.2	0.4	0.3	0.5	0.4	0.5	0.8
Udayapur	17.1	0.5	0.4	0.6	0.5	0.7	1.1
Monsoon							
Achham	18.8	0.4	0.5	0.7	0.5	0.7	1.3
Arghakhanchi	20.5	0.4	0.5	0.8	0.5	0.7	1.4
Baglung	13.8	0.4	0.5	0.7	0.5	0.7	1.2
Baitadi	18.0	0.4	0.6	0.8	0.5	0.8	1.4
Bajhang	9.3	0.4	0.5	0.8	0.5	0.8	1.1
Bajura	11.2	0.4	0.5	0.6	0.5	0.6	0.9
Banke	24.7	0.5	0.7	1.0	0.6	0.9	1.6
Bara	24.9	0.4	0.5	0.8	0.5	0.8	1.5
Bardiya	24.6	0.5	0.6	0.9	0.6	0.9	1.6
Bhaktapur	18.5	0.3	0.4	0.6	0.4	0.6	1.1
Bhojpur	18.7	0.4	0.5	0.7	0.4	0.7	1.3
Chitwan	24.1	0.3	0.4	0.6	0.4	0.6	1.3
Dadeldhura	19.5	0.5	0.6	0.9	0.5	0.8	1.5
Dailekh	18.0	0.4	0.5	0.8	0.5	0.7	1.3
Dang	22.9	0.5	0.6	0.9	0.6	0.9	1.6
Darchula	8.0	0.5	0.6	0.8	0.6	0.8	1.1
Dhading	18.1	0.3	0.4	0.6	0.4	0.6	1.1
Dhankuta	20.5	0.4	0.4	0.7	0.4	0.6	1.3
Dhanusha	25.3	0.4	0.5	0.8	0.5	0.8	1.5
Dolakha	9.2	0.4	0.6	0.7	0.5	0.7	1.1

	Baseline	SSP245			SSP585		
Districts	(℃)	2030s	2050s	2080s	2030s	2050s	2080s
Dolpa	1.7	0.5	0.7	0.9	0.6	0.8	1.2
Doti	18.4	0.4	0.6	0.8	0.6	0.8	1.4
Gorkha	10.4	0.4	0.5	0.6	0.5	0.7	1.0
Gulmi	19.0	0.3	0.4	0.6	0.4	0.6	1.3
Humla	2.8	0.4	0.6	0.8	0.6	0.8	1.0
Ilam	19.7	0.4	0.5	0.7	0.5	0.7	1.2
Jajarkot	14.1	0.4	0.5	0.7	0.5	0.7	1.2
Jhapa	25.1	0.4	0.6	0.8	0.5	0.8	1.4
Jumla	7.6	0.4	0.5	0.8	0.5	0.7	1.0
Kailali	23.8	0.5	0.6	1.0	0.6	1.0	1.7
Kalikot	12.4	0.4	0.5	0.7	0.5	0.6	1.1
Kanchanpur	24.8	0.5	0.7	1.1	0.6	1.0	1.8
Kapilbastu	25.1	0.5	0.6	0.9	0.6	0.9	1.6
Kaski	13.0	0.4	0.5	0.6	0.5	0.6	1.0
Kathmandu	18.4	0.3	0.5	0.7	0.4	0.6	1.1
Kavrepalanchok	18.9	0.3	0.4	0.6	0.4	0.6	1.2
Khotang	19.0	0.3	0.5	0.7	0.4	0.7	1.3
Lalitpur	18.1	0.3	0.4	0.6	0.4	0.6	1.2
Lamjung	13.3	0.4	0.4	0.6	0.4	0.6	1.0
Mahottari	25.1	0.4	0.5	0.8	0.5	0.8	1.5
Makwanpur	21.3	0.3	0.4	0.6	0.4	0.6	1.2
Manang	0.3	0.6	0.7	0.9	0.7	0.9	1.1
Morang	24.0	0.4	0.6	0.8	0.4	0.8	1.4
Mugu	5.6	0.4	0.6	0.7	0.6	0.7	1.0
Mustang	1.6	0.5	0.6	0.9	0.6	0.8	1.1
Myagdi	7.8	0.4	0.6	0.7	0.6	0.7	1.1
Nawalparasi-E	23.7	0.3	0.4	0.6	0.4	0.6	1.3
Nawalparasi-W	24.9	0.4	0.5	0.7	0.5	0.7	1.4
Nuwakot	18.8	0.3	0.4	0.6	0.4	0.5	1.0
Okhaldhunga	17.6	0.3	0.5	0.7	0.4	0.7	1.2
Palpa	21.2	0.4	0.4	0.6	0.4	0.6	1.3
Panchthar	16.6	0.4	0.5	0.7	0.4	0.7	1.2
Parbat	17.9	0.3	0.4	0.5	0.4	0.5	1.1
Parsa	24.8	0.4	0.5	0.8	0.5	0.8	1.5
Pyuthan	19.6	0.4	0.5	0.7	0.5	0.7	1.4
Ramechhap	15.5	0.4	0.5	0.7	0.4	0.7	1.2
Rasuwa	6.2	0.4	0.5	0.7	0.5	0.7	1.0
Rautahat	25.3	0.4	0.5	0.8	0.5	0.8	1.5
Rolpa	16.5	0.4	0.5	0.8	0.5	0.8	1.4
Rukum-E	9.8	0.5	0.6	0.8	0.6	0.8	1.3
Rukum-W	15.3	0.4	0.6	0.8	0.5	0.7	1.3
Rupandehi	25.2	0.4	0.5	0.8	0.5	0.8	1.5
Salyan	19.6	0.4	0.6	0.8	0.5	0.8	1.5
Sankhuwasabha	10.4	0.5	0.6	0.7	0.6	0.7	1.0
Saptari	25.3	0.4	0.6	0.8	0.5	0.8	1.6

	Baseline	SSP245			SSP585		
Districts	(℃)	2030s	2050s	2080s	2030s	2050s	2080s
Sarlahi	25.0	0.4	0.5	0.8	0.5	0.8	1.5
Sindhuli	22.2	0.3	0.4	0.7	0.4	0.7	1.3
Sindhupalchok	12.2	0.3	0.5	0.7	0.4	0.6	1.0
Siraha	25.1	0.4	0.5	0.8	0.4	0.8	1.5
Solukhumbu	5.6	0.6	0.7	0.8	0.6	0.8	1.1
Sunsari	24.8	0.4	0.6	0.8	0.5	0.8	1.5
Surkhet	21.5	0.4	0.5	0.8	0.5	0.8	1.4
Syangja	20.6	0.3	0.4	0.6	0.4	0.6	1.2
Tanahu	22.3	0.3	0.4	0.6	0.4	0.6	1.1
Taplejung	6.4	0.6	0.8	0.8	0.7	0.9	1.0
Terhathum	18.2	0.4	0.5	0.7	0.4	0.6	1.2
Udayapur	22.9	0.4	0.5	0.8	0.4	0.7	1.4
Post-monsoon							
Achham	10.5	0.3	0.2	0.4	0.4	0.4	0.7
Arghakhanchi	13.4	0.2	0.2	0.2	0.4	0.4	0.5
Baglung	7.0	0.1	0.1	0.2	0.3	0.2	0.5
Baitadi	9.4	0.3	0.2	0.4	0.4	0.4	0.9
Bajhang	1.5	0.3	0.2	0.4	0.3	0.3	0.8
Bajura	3.2	0.3	0.1	0.4	0.3	0.3	0.7
Banke	16.6	0.4	0.3	0.2	0.5	0.5	0.6
Bara	17.6	0.3	0.3	0.2	0.5	0.5	0.6
Bardiya	16.4	0.4	0.4	0.4	0.5	0.5	0.7
Bhaktapur	10.8	0.2	0.2	0.2	0.3	0.3	0.4
Bhojpur	12.0	0.2	0.2	0.2	0.4	0.4	0.5
Chitwan	16.5	0.2	0.2	0.2	0.4	0.4	0.4
Dadeldhura	11.1	0.3	0.3	0.4	0.5	0.4	0.8
Dailekh	10.2	0.3	0.2	0.4	0.3	0.4	0.6
Dang	15.3	0.3	0.3	0.2	0.5	0.4	0.5
Darchula	0.1	0.3	0.2	0.4	0.3	0.3	0.9
Dhading	10.9	0.1	0.1	0.2	0.3	0.3	0.3
Dhankuta	13.7	0.3	0.3	0.2	0.4	0.4	0.4
Dhanusha	18.4	0.4	0.4	0.2	0.6	0.5	0.7
Dolakha	3.1	0.2	0.1	0.2	0.3	0.3	0.6
Dolpa	-4.5	0.2	0.2	0.4	0.3	0.2	0.9
Doti	10.1	0.3	0.3	0.3	0.4	0.4	0.7
Gorkha	3.9	0.1	0.1	0.2	0.2	0.2	0.4
Gulmi	11.7	0.2	0.2	0.2	0.3	0.3	0.4
Humla	-4.6	0.3	0.3	0.4	0.3	0.2	0.8
Ilam	13.4	0.3	0.3	0.2	0.5	0.4	0.4
Jajarkot	6.7	0.2	0.1	0.3	0.3	0.3	0.7
Jhapa	18.1	0.4	0.3	0.2	0.6	0.5	0.4
Jumla	0.2	0.2	0.1	0.4	0.3	0.3	0.9
Kailali	15.4	0.4	0.4	0.4	0.5	0.5	0.7
Kalikot	4.8	0.2	0.1	0.3	0.3	0.3	0.7
Kanchanpur	16.0	0.4	0.4	0.4	0.6	0.6	0.8

	Baseline	SSP245			SSP585		
Districts	(℃)	2030s	2050s	2080s	2030s	2050s	2080s
Kapilbastu	17.6	0.4	0.3	0.2	0.6	0.4	0.6
Kaski	6.2	0.0	0.2	0.2	0.3	0.2	0.4
Kathmandu	11.2	0.1	0.2	0.2	0.3	0.3	0.4
Kavrepalanchok	11.9	0.2	0.2	0.2	0.4	0.3	0.4
Khotang	12.4	0.2	0.3	0.2	0.4	0.3	0.5
Lalitpur	11.0	0.2	0.2	0.2	0.4	0.3	0.4
Lamjung	6.3	0.1	0.2	0.2	0.3	0.2	0.3
Mahottari	18.2	0.4	0.4	0.2	0.6	0.5	0.7
Makwanpur	14.2	0.2	0.2	0.2	0.4	0.4	0.4
Manang	-5.1	0.1	0.2	0.2	0.3	0.2	0.6
Morang	17.2	0.4	0.3	0.1	0.6	0.5	0.5
Mugu	-1.7	0.2	0.2	0.4	0.3	0.2	0.9
Mustang	-4.5	0.1	0.2	0.3	0.3	0.2	0.8
Myagdi	1.5	0.1	0.2	0.2	0.3	0.2	0.5
Nawalparasi-E	16.1	0.2	0.3	0.2	0.4	0.4	0.4
Nawalparasi-W	17.2	0.3	0.3	0.2	0.5	0.4	0.6
Nuwakot	11.5	0.1	0.1	0.2	0.3	0.2	0.4
Okhaldhunga	11.2	0.2	0.2	0.2	0.4	0.3	0.5
Palpa	14.1	0.2	0.3	0.2	0.4	0.3	0.4
Panchthar	10.2	0.2	0.3	0.2	0.4	0.4	0.4
Parbat	10.6	0.1	0.2	0.2	0.3	0.3	0.4
Parsa	17.6	0.3	0.3	0.2	0.5	0.5	0.6
Pyuthan	12.3	0.2	0.2	0.2	0.3	0.3	0.5
Ramechhap	8.9	0.1	0.2	0.2	0.3	0.3	0.4
Rasuwa	0.3	0.1	0.1	0.2	0.2	0.2	0.6
Rautahat	18.3	0.4	0.3	0.2	0.5	0.5	0.7
Rolpa	9.4	0.2	0.1	0.3	0.3	0.3	0.6
Rukum-E	3.2	0.1	0.1	0.3	0.2	0.3	0.7
Rukum-W	7.8	0.2	0.1	0.3	0.3	0.3	0.7
Rupandehi	17.8	0.3	0.3	0.2	0.5	0.4	0.5
Salyan	12.0	0.2	0.2	0.3	0.4	0.3	0.6
Sankhuwasabha	4.3	0.2	0.2	0.2	0.3	0.3	0.6
Saptari	18.6	0.4	0.3	0.2	0.7	0.5	0.6
Sarlahi	17.9	0.3	0.4	0.2	0.6	0.5	0.7
Sindhuli	15.2	0.2	0.3	0.2	0.5	0.4	0.5
Sindhupalchok	5.7	0.1	0.1	0.2	0.2	0.3	0.5
Siraha	18.2	0.4	0.4	0.2	0.6	0.5	0.6
Solukhumbu	0.3	0.2	0.1	0.2	0.3	0.3	0.6
Sunsari	17.9	0.4	0.3	0.1	0.6	0.5	0.5
Surkhet	13.3	0.3	0.3	0.3	0.4	0.4	0.7
Syangja	13.2	0.2	0.2	0.2	0.4	0.3	0.4
Tanahu	14.6	0.1	0.2	0.2	0.4	0.3	0.3
Taplejung	0.9	0.2	0.2	0.2	0.4	0.4	0.5
Terhathum	11.5	0.2	0.3	0.2	0.4	0.4	0.4
Udayapur	16.1	0.3	0.3	0.2	0.5	0.4	0.5

	Baseline	SSP245			SSP585		
Districts	(℃)	2030s	2050s	2080s	2030s	2050s	2080s
Annual							
Achham	12.4	0.3	0.4	0.6	0.4	0.5	1.0
Arghakhanchi	14.7	0.3	0.4	0.5	0.4	0.5	1.0
Baglung	8.5	0.3	0.4	0.5	0.4	0.5	1.0
Baitadi	11.5	0.3	0.5	0.7	0.4	0.6	1.2
Bajhang	3.7	0.2	0.4	0.6	0.3	0.5	1.0
Bajura	5.3	0.2	0.4	0.5	0.3	0.5	0.9
Banke	18.1	0.4	0.5	0.7	0.5	0.7	1.2
Bara	18.6	0.4	0.4	0.5	0.5	0.5	1.0
Bardiya	17.9	0.4	0.5	0.7	0.5	0.7	1.3
Bhaktapur	12.1	0.3	0.3	0.4	0.3	0.4	0.8
Bhojpur	12.9	0.3	0.3	0.4	0.3	0.4	0.8
Chitwan	17.7	0.3	0.3	0.5	0.4	0.5	0.9
Dadeldhura	13.0	0.3	0.5	0.7	0.4	0.6	1.2
Dailekh	12.0	0.3	0.4	0.6	0.4	0.5	1.1
Dang	16.7	0.4	0.5	0.6	0.5	0.6	1.1
Darchula	2.4	0.2	0.4	0.6	0.4	0.6	1.0
Dhading	12.1	0.2	0.3	0.3	0.3	0.4	0.7
Dhankuta	14.5	0.3	0.4	0.4	0.4	0.4	0.8
Dhanusha	19.1	0.5	0.5	0.5	0.5	0.6	1.1
Dolakha	4.3	0.2	0.3	0.4	0.3	0.3	0.7
Dolpa	-2.6	0.2	0.4	0.5	0.3	0.5	1.0
Doti	12.1	0.3	0.5	0.7	0.4	0.6	1.1
Gorkha	5.3	0.2	0.3	0.4	0.2	0.4	0.7
Gulmi	13.1	0.3	0.3	0.5	0.4	0.5	0.9
Humla	-2.3	0.2	0.3	0.5	0.4	0.4	0.8
Ilam	14.1	0.4	0.4	0.4	0.4	0.4	0.8
Jajarkot	8.4	0.3	0.4	0.6	0.4	0.5	1.0
Jhapa	18.7	0.5	0.5	0.5	0.5	0.5	0.9
Jumla	2.2	0.2	0.4	0.6	0.3	0.5	1.0
Kailali	17.1	0.4	0.5	0.7	0.5	0.7	1.2
Kalikot	6.7	0.3	0.4	0.6	0.4	0.5	1.0
Kanchanpur	17.8	0.5	0.6	0.8	0.5	0.7	1.3
Kapilbastu	18.8	0.4	0.4	0.6	0.5	0.6	1.0
Kaski	7.7	0.2	0.3	0.5	0.3	0.5	0.9
Kathmandu	12.3	0.3	0.3	0.4	0.3	0.4	0.8
Kavrepalanchok	13.0	0.3	0.3	0.4	0.3	0.4	0.8
Khotang	13.3	0.3	0.3	0.4	0.3	0.4	0.8
Lalitpur	12.2	0.2	0.3	0.4	0.3	0.4	0.8
Lamjung	7.8	0.2	0.3	0.4	0.3	0.4	0.7
Mahottari	18.9	0.4	0.5	0.5	0.5	0.5	1.0
Makwanpur	15.3	0.3	0.3	0.4	0.3	0.4	0.9
Manang	-3.6	0.2	0.4	0.5	0.3	0.5	0.8
Morang	17.9	0.5	0.5	0.5	0.5	0.5	0.9
Mugu	0.4	0.1	0.3	0.5	0.3	0.4	0.9

	Baseline	SSP245			SSP585		
Districts	(℃)	2030s	2050s	2080s	2030s	2050s	2080s
Mustang	-2.8	0.2	0.3	0.4	0.3	0.4	0.8
Myagdi	3.1	0.2	0.4	0.6	0.4	0.5	0.9
Nawalparasi-E	17.3	0.3	0.3	0.5	0.4	0.5	0.8
Nawalparasi-W	18.5	0.3	0.4	0.5	0.5	0.5	1.0
Nuwakot	12.7	0.2	0.3	0.3	0.2	0.3	0.7
Okhaldhunga	12.1	0.3	0.3	0.4	0.3	0.4	0.8
Palpa	15.3	0.3	0.3	0.5	0.4	0.5	0.9
Panchthar	11.0	0.3	0.4	0.4	0.3	0.4	0.7
Parbat	12.0	0.2	0.3	0.4	0.3	0.4	0.9
Parsa	18.5	0.4	0.4	0.5	0.5	0.5	0.9
Pyuthan	13.7	0.3	0.4	0.6	0.4	0.5	1.0
Ramechhap	10.0	0.3	0.3	0.4	0.3	0.4	0.8
Rasuwa	1.6	0.2	0.3	0.4	0.2	0.3	0.7
Rautahat	19.1	0.4	0.4	0.5	0.5	0.6	1.0
Rolpa	10.9	0.3	0.4	0.6	0.4	0.5	1.1
Rukum-E	4.8	0.3	0.4	0.6	0.4	0.5	1.1
Rukum-W	9.5	0.2	0.4	0.6	0.4	0.5	1.1
Rupandehi	18.9	0.3	0.4	0.6	0.5	0.6	1.0
Salyan	13.6	0.3	0.4	0.6	0.4	0.6	1.1
Sankhuwasabha	5.4	0.3	0.4	0.4	0.3	0.4	0.8
Saptari	19.2	0.5	0.5	0.5	0.5	0.5	1.0
Sarlahi	18.8	0.4	0.4	0.5	0.5	0.5	1.0
Sindhuli	16.1	0.3	0.4	0.4	0.4	0.5	0.9
Sindhupalchok	6.9	0.2	0.3	0.4	0.2	0.3	0.7
Siraha	18.9	0.4	0.5	0.5	0.5	0.5	1.0
Solukhumbu	1.4	0.3	0.4	0.4	0.3	0.4	0.8
Sunsari	18.6	0.5	0.5	0.5	0.5	0.5	1.0
Surkhet	15.0	0.4	0.5	0.7	0.4	0.6	1.2
Syangja	14.5	0.3	0.3	0.4	0.3	0.4	0.9
Tanahu	15.8	0.2	0.3	0.4	0.3	0.4	0.8
Taplejung	1.9	0.3	0.4	0.5	0.4	0.4	0.7
Terhathum	12.4	0.3	0.3	0.4	0.3	0.4	0.7
Udayapur	16.8	0.4	0.4	0.4	0.4	0.5	0.9

Table 9.27: Change in future seasonal minimum temperature (℃) compared to the baseline period (1981-2010) within the basins of Nepal

	Baseline	SSP245			SSP585		
Basins	**(℃)**	**2030s**	**2050s**	**2080s**	**2030s**	**2050s**	**2080s**
Winter							
Babai	7.4	0.8	1.3	2.0	0.7	1.5	3.9
Bagmati	7.6	1.0	1.5	2.2	0.8	1.7	4.4
Gandaki	-1.1	1.1	1.7	2.6	1.0	2.0	4.9
Kamala	9.3	1.0	1.5	2.3	0.8	1.7	4.5
Kankai	6.6	1.0	1.5	2.1	0.8	1.6	4.3
Karnali	-3.3	1.1	1.6	2.5	1.0	2.0	4.7
Koshi	-7.3	1.5	2.3	3.2	1.3	2.5	5.9
Mahakali	-2.6	1.1	1.7	2.7	1.1	2.1	5.2
Mechi	9.7	1.1	1.7	2.5	0.8	1.8	5.0
West-Rapti	6.9	0.8	1.4	2.1	0.8	1.6	3.9
Pre-Monsoon	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Babai	16.2	0.8	1.5	2.4	1.0	1.9	4.5
Bagmati	15.9	0.9	1.6	2.4	0.9	1.9	4.6
Gandaki	5.6	1.1	1.8	2.6	1.2	2.1	4.9
Kamala	17.8	0.9	1.6	2.4	0.9	1.8	4.7
Kankai	13.7	0.9	1.5	2.2	0.8	1.7	4.5
Karnali	2.9	1.0	1.7	2.5	1.2	2.1	4.8
Koshi	-0.1	1.1	1.8	2.6	1.3	2.1	5.1
Mahakali	4.9	1.0	1.8	2.6	1.2	2.2	5.0
Mechi	18.2	0.9	1.6	2.5	0.8	1.8	4.9
West-Rapti	15.5	0.8	1.5	2.3	0.9	1.8	4.4
Monsoon							
Babai	21.7	0.7	1.3	1.9	0.9	1.6	3.3
Bagmati	21.7	0.7	1.2	1.8	0.8	1.5	3.2
Gandaki	11.7	1.0	1.6	2.4	1.1	2.0	4.1
Kamala	23.5	0.8	1.3	1.9	0.9	1.6	3.2
Kankai	19.3	0.9	1.4	2.1	0.9	1.7	3.6
Karnali	9.0	1.0	1.7	2.4	1.1	2.1	4.3
Koshi	7.3	1.3	1.9	2.7	1.4	2.3	4.6
Mahakali	12.9	1.0	1.7	2.4	1.1	2.1	4.2
Mechi	24.1	1.0	1.6	2.3	1.1	1.9	3.7
West-Rapti	20.8	0.7	1.3	1.9	0.8	1.6	3.3
Post-monsoon							
Babai	14.0	0.7	1.4	2.3	0.9	1.9	4.5
Bagmati	14.6	0.9	1.5	2.5	1.0	2.1	4.7
Gandaki	4.3	0.8	1.4	2.4	1.0	1.8	4.4
Kamala	16.6	1.0	1.7	2.7	1.1	2.2	5.0
Kankai	13.0	0.8	1.5	2.3	1.0	1.9	4.4
Karnali	1.1	0.7	1.3	2.2	1.0	1.8	4.4
Koshi	-1.1	1.0	1.7	2.8	1.1	2.0	4.9
Mahakali	3.4	0.9	1.7	2.9	1.2	2.5	5.7
Mechi	17.3	1.0	1.8	2.8	1.1	2.3	5.2

	Baseline	SSP245			SSP585		
Basins	**(℃)**	**2030s**	**2050s**	**2080s**	**2030s**	**2050s**	**2080s**
West-Rapti	13.4	0.7	1.4	2.3	0.9	1.9	4.4
Annual							
Babai	15.5	0.8	1.4	2.1	0.8	1.7	3.9
Bagmati	15.6	0.8	1.4	2.1	0.9	1.7	4.1
Gandaki	5.8	1.0	1.6	2.5	1.1	2.0	4.5
Kamala	17.4	0.9	1.5	2.2	0.9	1.8	4.2
Kankai	13.7	0.9	1.5	2.2	0.9	1.7	4.1
Karnali	3.1	1.0	1.6	2.4	1.1	2.0	4.5
Koshi	0.4	1.3	2.0	2.8	1.3	2.3	5.1
Mahakali	5.5	1.0	1.7	2.6	1.2	2.2	4.9
Mechi	17.9	1.0	1.7	2.5	1.0	2.0	4.6
West-Rapti	14.8	0.8	1.4	2.1	0.9	1.7	3.9

Table 9.28: Absolute uncertainty (standard deviation) in projected change in future seasonal minimum temperature (℃) compared to the baseline period (1981-2010) within the basins of Nepal

	Baseline	SSP245			SSP585		
Basins	**(℃)**	**2030s**	**2050s**	**2080s**	**2030s**	**2050s**	**2080s**
Winter							
Babai	7.4	0.3	0.4	0.5	0.4	0.3	0.9
Bagmati	7.6	0.3	0.3	0.2	0.3	0.3	0.6
Gandaki	-1.1	0.2	0.4	0.6	0.2	0.4	0.8
Kamala	9.3	0.4	0.4	0.2	0.3	0.3	0.5
Kankai	6.6	0.3	0.3	0.0	0.3	0.2	0.3
Karnali	-3.3	0.1	0.3	0.6	0.2	0.4	1.0
Koshi	-7.3	0.2	0.4	0.7	0.2	0.5	0.6
Mahakali	-2.6	0.2	0.4	0.7	0.3	0.4	1.2
Mechi	9.7	0.5	0.4	0.1	0.4	0.4	0.3
West-Rapti	6.9	0.3	0.4	0.5	0.4	0.4	0.8
Pre-Monsoon	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Babai	16.2	0.5	0.5	0.9	0.5	0.8	1.4
Bagmati	15.9	0.4	0.4	0.6	0.5	0.6	1.0
Gandaki	5.6	0.3	0.3	0.5	0.2	0.5	0.9
Kamala	17.8	0.5	0.4	0.6	0.5	0.7	1.0
Kankai	13.7	0.5	0.5	0.5	0.5	0.6	0.9
Karnali	2.9	0.3	0.5	0.7	0.3	0.6	1.0
Koshi	-0.1	0.2	0.3	0.4	0.1	0.3	0.9
Mahakali	4.9	0.4	0.6	0.9	0.4	0.7	1.3
Mechi	18.2	0.6	0.5	0.7	0.6	0.8	1.1
West-Rapti	15.5	0.4	0.5	0.8	0.5	0.8	1.3
Monsoon							
Babai	21.7	0.5	0.6	0.9	0.6	0.9	1.5
Bagmati	21.7	0.3	0.5	0.7	0.4	0.7	1.3
Gandaki	11.7	0.4	0.5	0.7	0.5	0.7	1.1
Kamala	23.5	0.4	0.5	0.7	0.4	0.7	1.4

Kankai	19.3	0.4	0.5	0.8	0.4	0.7	1.2
Karnali	9.0	0.5	0.6	0.8	0.6	0.8	1.1
Koshi	7.3	0.4	0.5	0.7	0.5	0.7	1.1
Mahakali	12.9	0.4	0.6	0.8	0.6	0.8	1.3
Mechi	24.1	0.4	0.6	0.8	0.5	0.8	1.3
West-Rapti	20.8	0.5	0.6	0.8	0.6	0.8	1.5
Post-monsoon							
Babai	14.0	0.3	0.3	0.3	0.4	0.4	0.6
Bagmati	14.6	0.2	0.3	0.2	0.5	0.4	0.5
Gandaki	4.3	0.1	0.2	0.2	0.3	0.2	0.5
Kamala	16.6	0.3	0.3	0.2	0.5	0.4	0.6
Kankai	13.0	0.3	0.3	0.2	0.5	0.4	0.4
Karnali	1.1	0.2	0.2	0.3	0.3	0.3	0.8
Koshi	-1.1	0.2	0.2	0.2	0.5	0.5	0.9
Mahakali	3.4	0.2	0.2	0.5	0.5	0.5	0.9
Mechi	17.3	0.4	0.3	0.2	0.6	0.5	0.4
West-Rapti	13.4	0.2	0.2	0.2	0.4	0.4	0.6
Annual							
Babai	15.5	0.4	0.5	0.7	0.5	0.6	1.1
Bagmati	15.6	0.3	0.4	0.4	0.4	0.5	0.9
Gandaki	5.8	0.2	0.3	0.5	0.3	0.4	0.8
Kamala	17.4	0.4	0.4	0.5	0.4	0.4	0.9
Kankai	13.7	0.4	0.4	0.4	0.4	0.4	0.8
Karnali	3.1	0.2	0.4	0.6	0.4	0.5	1.0
Koshi	0.4	0.2	0.3	0.4	0.3	0.4	0.8
Mahakali	5.5	0.2	0.4	0.7	0.4	0.6	1.2
Mechi	17.9	0.5	0.5	0.5	0.5	0.5	0.9
West-Rapti	14.8	0.4	0.4	0.6	0.5	0.6	1.1

Table 9.29: Sen's slope for minimum temperature (℃/year) over different regions of Nepal. Significant values are highlighted in color: light orange indicates an increasing trend, while light blue denotes a decreasing trend.

		SSP245			SSP585		
Regions	**Baseline**	**2030s**	**2050s**	**2080s**	**2030s**	**2050s**	**2080s**
Provinces							
Koshi	0.03	0.03	0.03	0.01	0.03	0.06	0.08
Madhesh	0.03	0.03	0.03	0.01	0.03	0.06	0.08
Bagmati	0.03	0.03	0.03	0.01	0.03	0.05	0.07
Gandaki	0.03	0.03	0.03	0.02	0.03	0.05	0.07
Lumbini	0.03	0.03	0.03	0.01	0.03	0.05	0.07
Karnali	0.03	0.03	0.03	0.01	0.04	0.05	0.07
Sudurpaschim	0.03	0.03	0.03	0.01	0.04	0.05	0.07
Districts							
Achham	0.03	0.03	0.03	0.01	0.03	0.05	0.06
Arghakhanchi	0.02	0.03	0.03	0.01	0.03	0.05	0.06
Baglung	0.03	0.03	0.03	0.01	0.03	0.04	0.07
Baitadi	0.03	0.03	0.03	0.01	0.03	0.05	0.07
Bajhang	0.03	0.03	0.03	0.01	0.04	0.05	0.07
Bajura	0.03	0.03	0.03	0.01	0.03	0.05	0.07
Banke	0.03	0.03	0.04	0.02	0.04	0.05	0.07
Bara	0.03	0.03	0.03	0.01	0.03	0.06	0.08
Bardiya	0.03	0.03	0.04	0.01	0.04	0.05	0.07
Bhaktapur	0.03	0.03	0.03	0.01	0.03	0.05	0.07
Bhojpur	0.02	0.03	0.03	0.01	0.03	0.05	0.08
Chitwan	0.03	0.03	0.03	0.01	0.03	0.05	0.07
Dadeldhura	0.03	0.03	0.03	0.01	0.04	0.05	0.07
Dailekh	0.02	0.03	0.03	0.01	0.03	0.05	0.07
Dang	0.03	0.03	0.03	0.01	0.03	0.05	0.07
Darchula	0.04	0.03	0.03	0.01	0.04	0.05	0.08
Dhading	0.03	0.03	0.03	0.01	0.03	0.05	0.07
Dhankuta	0.03	0.03	0.03	0.01	0.03	0.05	0.08
Dhanusha	0.03	0.03	0.03	0.01	0.03	0.06	0.08
Dolakha	0.03	0.04	0.03	0.01	0.03	0.05	0.07
Dolpa	0.03	0.03	0.03	0.02	0.04	0.06	0.08
Doti	0.03	0.03	0.03	0.01	0.03	0.05	0.07
Gorkha	0.03	0.03	0.03	0.02	0.03	0.05	0.07
Gulmi	0.02	0.03	0.03	0.01	0.03	0.04	0.06
Humla	0.04	0.03	0.03	0.01	0.03	0.05	0.08
Ilam	0.03	0.03	0.03	0.01	0.03	0.05	0.08
Jajarkot	0.02	0.03	0.03	0.01	0.03	0.05	0.07
Jhapa	0.03	0.04	0.03	0.01	0.03	0.07	0.08
Jumla	0.03	0.03	0.03	0.02	0.03	0.05	0.07
Kavrepalanchok	0.02	0.03	0.03	0.01	0.03	0.05	0.07
Kailali	0.03	0.03	0.03	0.01	0.04	0.05	0.07

Regions	Baseline	SSP245			SSP585		
		2030s	2050s	2080s	2030s	2050s	2080s
Kalikot	0.03	0.03	0.03	0.01	0.03	0.05	0.07
Kanchanpur	0.03	0.03	0.04	0.02	0.04	0.05	0.07
Kapilbastu	0.03	0.03	0.04	0.01	0.03	0.05	0.07
Kaski	0.03	0.03	0.03	0.01	0.03	0.05	0.07
Kathmandu	0.03	0.03	0.03	0.01	0.03	0.05	0.07
Khotang	0.02	0.03	0.03	0.01	0.03	0.05	0.08
Lalitpur	0.02	0.03	0.03	0.01	0.03	0.05	0.07
Lamjung	0.03	0.03	0.03	0.02	0.03	0.04	0.07
Mahottari	0.03	0.03	0.03	0.01	0.03	0.06	0.08
Makwanpur	0.03	0.03	0.03	0.01	0.03	0.05	0.07
Manang	0.04	0.04	0.04	0.02	0.04	0.06	0.08
Morang	0.03	0.03	0.03	0.01	0.03	0.06	0.08
Mugu	0.03	0.03	0.03	0.02	0.04	0.05	0.07
Mustang	0.04	0.04	0.03	0.02	0.04	0.05	0.08
Myagdi	0.03	0.03	0.03	0.02	0.04	0.05	0.07
Nawalparasi-E	0.03	0.03	0.03	0.01	0.03	0.05	0.07
Nawalparasi-W	0.03	0.03	0.03	0.01	0.03	0.05	0.07
Nuwakot	0.03	0.03	0.03	0.01	0.03	0.04	0.07
Okhaldhunga	0.02	0.03	0.03	0.01	0.03	0.05	0.07
Palpa	0.02	0.03	0.03	0.01	0.03	0.05	0.07
Panchthar	0.03	0.03	0.03	0.01	0.03	0.05	0.08
Parbat	0.02	0.03	0.03	0.01	0.03	0.04	0.06
Parsa	0.03	0.03	0.03	0.01	0.03	0.06	0.08
Pyuthan	0.02	0.03	0.03	0.01	0.03	0.04	0.06
Ramechhap	0.03	0.03	0.03	0.01	0.03	0.05	0.07
Rasuwa	0.03	0.04	0.03	0.02	0.03	0.05	0.07
Rautahat	0.03	0.03	0.03	0.01	0.03	0.06	0.08
Rolpa	0.02	0.03	0.03	0.01	0.03	0.04	0.06
Rukum-E	0.03	0.03	0.03	0.01	0.04	0.05	0.07
Rukum-W	0.03	0.03	0.03	0.01	0.03	0.04	0.07
Rupandehi	0.03	0.03	0.03	0.01	0.03	0.05	0.07
Salyan	0.02	0.03	0.03	0.01	0.03	0.05	0.07
Sankhuwasabha	0.03	0.03	0.03	0.01	0.03	0.05	0.08
Saptari	0.03	0.03	0.03	0.01	0.03	0.06	0.08
Sarlahi	0.03	0.03	0.03	0.01	0.03	0.06	0.08
Sindhuli	0.03	0.03	0.03	0.01	0.03	0.05	0.07
Sindhupalchok	0.03	0.03	0.03	0.01	0.03	0.05	0.07
Siraha	0.03	0.03	0.03	0.01	0.03	0.06	0.08
Solukhumbu	0.03	0.04	0.03	0.01	0.03	0.06	0.08
Sunsari	0.03	0.03	0.03	0.01	0.03	0.06	0.08
Surkhet	0.03	0.03	0.03	0.01	0.03	0.05	0.07
Syangja	0.02	0.03	0.03	0.01	0.03	0.04	0.06
Tanahu	0.03	0.03	0.03	0.01	0.03	0.05	0.07
Taplejung	0.04	0.04	0.03	0.01	0.03	0.06	0.08

Regions	Baseline	SSP245			SSP585		
		2030s	2050s	2080s	2030s	2050s	2080s
Terhathum	0.03	0.03	0.03	0.01	0.03	0.05	0.08
Udayapur	0.03	0.03	0.03	0.01	0.03	0.06	0.08
Basins							
Mahakali	0.04	0.03	0.04	0.01	0.04	0.06	0.08
West-Rapti	0.02	0.03	0.03	0.01	0.03	0.05	0.07
Babai	0.02	0.03	0.03	0.01	0.03	0.05	0.07
Koshi	0.04	0.04	0.03	0.02	0.04	0.06	0.08
Gandaki	0.03	0.03	0.03	0.01	0.03	0.05	0.07
Bagmati	0.03	0.03	0.03	0.01	0.03	0.05	0.07
Kamala	0.03	0.03	0.03	0.01	0.03	0.05	0.08
Kankai	0.03	0.03	0.03	0.01	0.03	0.05	0.08
Mechi	0.03	0.04	0.03	0.01	0.03	0.06	0.08
Karnali	0.03	0.03	0.03	0.02	0.04	0.05	0.07

Table 9.30: Extreme indices for physiographical divisions of Nepal. Significant values are highlighted in color: light orange indicates an increasing trend, while light blue denotes a decreasing trend.

		SSP245			SSP585		
Physiography	**Baseline**	**2030s**	**2050s**	**2080s**	**2030s**	**2050s**	**2080s**
Number of rainy days (R1mm, days)							
High-Himalaya	157	157	157	158	160	159	163
High-Mountain	189	188	188	189	190	189	191
Mid-mountain	176	175	175	176	178	177	181
Siwalik	158	159	158	158	162	161	165
Terai	150	151	150	149	152	151	155
Consecutive dry days (CDD, days)							
High-Himalaya	48	55	56	57	57	55	56
High-Mountain	44	49	50	50	52	50	52
Mid-mountain	54	58	59	60	60	60	60
Siwalik	59	64	64	68	67	69	69
Terai	65	67	70	73	72	74	74
Consecutive wet days (CWD, days)							
High-Himalaya	76	74	77	74	80	76	80
High-Mountain	111	110	111	106	112	112	110
Mid-mountain	103	100	100	96	104	104	102
Siwalik	81	80	78	75	84	80	80
Terai	62	66	63	63	66	64	65
Cold spell duration index (CSDI, days)							
High-Himalaya	9	2	1	0	2	0	0
High-Mountain	9	2	1	0	2	0	0
Mid-mountain	9	2	1	0	2	0	0
Siwalik	10	3	1	0	3	1	0
Terai	12	3	1	0	4	1	0
Warm spell duration index (WSDI, days)							
High-Himalaya	11	43	80	141	43	103	255
High-Mountain	11	41	78	143	43	105	256
Mid-mountain	12	36	80	149	41	105	261
Siwalik	13	30	73	141	35	94	250
Terai	13	29	75	146	35	99	251
Monthly maximum 1-day precipitation (Rx1day, mm)							
High-Himalaya	19	24	25	28	23	27	36
High-Mountain	31	37	39	42	37	41	53
Mid-mountain	47	53	56	61	54	60	75
Siwalik	62	72	75	83	72	80	100
Terai	64	72	76	83	72	81	100
Very wet days (R95ptot, mm)							
High-Himalaya	105	146	174	214	149	191	366
High-Mountain	226	300	350	406	308	379	667

		SSP245			SSP585		
Physiography	**Baseline**	**2030s**	**2050s**	**2080s**	**2030s**	**2050s**	**2080s**
Mid-mountain	295	400	455	513	421	505	875
Siwalik	343	471	519	597	492	575	979
Terai	340	460	505	573	482	579	977
Extreme wet days (R99ptot, mm)							
High-Himalaya	30	49	68	89	54	76	201
High-Mountain	59	96	134	177	110	154	368
Mid-mountain	82	140	185	234	153	215	488
Siwalik	102	176	227	285	190	255	571
Terai	99	167	200	248	170	231	531
Cold nights (TN10p, %)							
High-Himalaya	10	3	2	0	3	1	0
High-Mountain	10	3	1	0	3	1	0
Mid-mountain	10	3	1	0	3	1	0
Siwalik	10	3	1	0	3	1	0
Terai	10	3	1	0	3	1	0
Cold days (TX10p, %)							
High-Himalaya	10	4	2	1	4	2	0
High-Mountain	10	4	2	1	4	2	0
Mid-mountain	11	5	3	1	5	2	0
Siwalik	11	6	3	2	6	3	1
Terai	11	6	3	2	6	3	1
Warm nights (TN90p, %)							
High-Himalaya	10	29	43	59	32	50	87
High-Mountain	10	29	45	64	32	53	91
Mid-mountain	10	31	49	69	33	57	93
Siwalik	10	29	47	68	31	56	93
Terai	10	29	48	68	31	56	93
Warm days (TX90p, %)							
High-Himalaya	10	24	35	51	24	41	78
High-Mountain	10	23	35	51	23	41	77
Mid-mountain	10	20	34	52	21	40	77
Siwalik	10	17	32	49	18	37	75
Terai	10	17	32	50	18	37	75

Table 9.31: Extreme indices for provinces of Nepal. Significant values are highlighted in color: light orange indicates an increasing trend, while light blue denotes a decreasing trend.

		SSP245			SSP585		
Provinces	**Baseline**	**2030s**	**2050s**	**2080s**	**2030s**	**2050s**	**2080s**
Number of rainy days (R1mm, days)							
Bagmati	168	168	167	167	170	169	172
Gandaki	174	172	173	175	175	175	177
Karnali	148	146	146	148	150	151	153
Koshi	175	175	174	172	177	174	176
Lumbini	145	145	144	146	148	148	150
Madhesh	136	138	136	135	139	138	141
Sudurpaschim	148	149	149	151	152	153	156
Consecutive dry days (CDD, days)							
Bagmati	60	64	66	67	64	68	66
Gandaki	51	58	59	60	60	59	59
Karnali	49	54	54	56	55	54	55
Koshi	56	64	66	66	66	66	69
Lumbini	59	64	67	67	69	68	68
Madhesh	73	77	79	83	82	83	84
Sudurpaschim	53	59	59	57	57	57	56
Consecutive wet days (CWD, days)							
Bagmati	94	91	94	89	94	92	91
Gandaki	88	88	92	86	96	92	89
Karnali	61	61	63	61	65	62	63
Koshi	83	80	78	72	82	73	73
Lumbini	66	65	65	63	68	65	65
Madhesh	39	39	38	37	38	38	37
Sudurpaschim	65	67	69	67	70	68	71
Cold spell duration index (CSDI, days)							
Bagmati	9	2	1	0	1	0	0
Gandaki	9	2	1	0	2	0	0
Karnali	9	2	1	0	2	0	0
Koshi	9	2	1	0	2	0	0
Lumbini	9	3	1	0	3	1	0
Madhesh	11	2	1	0	3	1	0
Sudurpaschim	8	2	1	0	2	0	0
Warm spell duration index (WSDI, days)							
Bagmati	12	38	78	144	41	104	254
Gandaki	11	38	74	136	42	97	244
Karnali	11	39	68	128	40	91	238
Koshi	12	35	78	147	42	108	257
Lumbini	13	30	65	126	31	82	230
Madhesh	12	26	68	138	32	92	239
Sudurpaschim	12	37	67	122	35	83	228

		SSP245			SSP585		
Provinces	**Baseline**	**2030s**	**2050s**	**2080s**	**2030s**	**2050s**	**2080s**
Monthly maximum 1-day precipitation (Rx1day, mm)							
Bagmati	59	70	72	76	70	79	98
Gandaki	44	51	53	59	52	58	73
Karnali	28	35	37	41	35	38	53
Koshi	56	65	71	73	66	76	90
Lumbini	65	70	74	85	72	80	101
Madhesh	79	91	94	103	91	101	125
Sudurpaschim	58	70	75	80	70	72	98
Very wet days (R95ptot, mm)							
Bagmati	325	439	478	532	427	531	906
Gandaki	277	373	420	475	380	457	748
Karnali	150	201	232	270	205	240	437
Koshi	329	420	460	514	430	536	870
Lumbini	329	441	483	552	457	517	838
Madhesh	365	495	512	572	488	599	988
Sudurpaschim	296	372	451	487	414	450	767
Extreme wet days (R99ptot, mm)							
Bagmati	99	169	191	242	167	239	522
Gandaki	79	115	146	206	129	184	403
Karnali	43	73	97	122	81	103	237
Koshi	99	164	201	238	172	249	510
Lumbini	100	151	189	233	162	205	423
Madhesh	114	198	214	264	195	266	571
Sudurpaschim	94	151	196	231	174	194	437
Cold nights (TN10p, %)							
Bagmati	10	3	1	0	2	1	0
Gandaki	10	3	1	0	3	1	0
Karnali	10	3	2	0	3	1	0
Koshi	10	3	1	0	3	1	0
Lumbini	10	3	1	0	3	1	0
Madhesh	10	3	1	0	3	1	0
Sudurpaschim	10	3	2	0	3	1	0
Cold days (TX10p, %)							
Bagmati	11	5	3	1	5	2	0
Gandaki	10	5	2	1	4	2	0
Karnali	10	5	3	1	4	2	0
Koshi	11	5	2	1	4	2	0
Lumbini	10	6	4	2	6	3	1
Madhesh	11	6	3	2	6	3	1
Sudurpaschim	11	6	4	2	5	3	1
Warm nights (TN90p, %)							
Bagmati	10	31	48	67	33	55	93
Gandaki	10	29	45	63	32	52	90

		SSP245			SSP585		
Provinces	**Baseline**	**2030s**	**2050s**	**2080s**	**2030s**	**2050s**	**2080s**
Karnali	10	27	41	58	30	49	87
Koshi	10	33	49	66	33	55	93
Lumbini	10	26	44	64	29	53	91
Madhesh	10	29	47	66	30	54	92
Sudurpaschim	10	27	42	61	30	52	89
Warm days (TX90p, %)							
Bagmati	11	21	34	51	21	40	77
Gandaki	10	22	34	50	22	39	75
Karnali	11	22	33	48	22	38	74
Koshi	10	21	34	52	22	41	78
Lumbini	10	17	30	46	17	34	71
Madhesh	10	16	31	49	18	36	72
Sudurpaschim	10	20	31	46	20	35	72

Table 9.32: Extreme indices for districts of Nepal. Significant values are highlighted in color: light orange indicates an increasing trend, while light blue denotes a decreasing trend.

		SSP245			SSP585		
Districts	Baseline	2030s	2050s	2080s	2030s	2050s	2080s
Number of rainy days (R1mm, days)							
Achham	152	152	152	154	156	156	159
Arghakhanchi	146	146	145	147	148	148	151
Baglung	174	172	172	174	175	174	176
Baitadi	153	154	154	156	157	158	162
Bajhang	153	152	153	155	156	157	160
Bajura	161	159	160	161	163	164	165
Banke	128	129	127	130	132	132	135
Bara	135	136	135	134	138	137	141
Bardiya	124	125	124	126	128	129	132
Bhaktapur	144	144	144	144	147	146	151
Bhojpur	169	169	168	166	171	168	171
Chitwan	156	156	156	157	159	158	161
Dadeldhura	142	143	143	145	146	147	151
Dailekh	144	143	143	145	147	147	150
Dang	136	136	136	137	139	139	142
Darchula	149	149	151	153	152	154	159
Dhading	174	173	174	175	176	176	178
Dhankuta	144	145	143	141	145	142	146
Dhanusha	129	131	129	127	131	129	134
Dolakha	174	173	172	172	175	174	177
Dolpa	134	132	133	135	136	136	139
Doti	147	148	148	149	151	152	155
Gorkha	170	170	171	172	172	173	174
Gulmi	159	158	158	160	160	160	163
Humla	128	127	130	130	131	133	136
Ilam	165	165	163	161	165	162	165
Jajarkot	158	156	156	157	160	160	161
Jhapa	154	154	152	149	153	150	153
Jumla	155	152	153	155	156	157	158
Kailali	130	131	131	133	134	135	139
Kalikot	147	145	146	148	149	150	152
Kanchanpur	123	125	125	127	128	129	134
Kapilbastu	127	128	127	128	131	130	133
Kaski	204	201	203	204	204	204	204
Kathmandu	155	156	155	155	158	157	161
Kavrepalanchok	146	147	146	145	150	148	152
Khotang	162	162	161	159	164	161	165
Lalitpur	156	156	155	155	159	158	161
Lamjung	189	187	189	190	190	190	191
Mahottari	126	128	126	124	128	127	132
Makwanpur	164	164	164	164	167	166	169
Manang	138	137	139	139	140	140	145

		SSP245			SSP585		
Districts	Baseline	2030s	2050s	2080s	2030s	2050s	2080s
Morang	145	145	143	141	145	142	145
Mugu	155	152	154	156	157	157	159
Mustang	77	77	79	80	78	80	87
Myagdi	182	180	181	183	182	183	184
Nawalparasi-E	150	151	150	152	152	153	156
Nawalparasi-W	134	135	134	136	137	137	140
Nuwakot	176	175	175	176	177	177	179
Okhaldhunga	160	160	159	158	162	161	164
Palpa	148	147	147	149	149	150	153
Panchthar	182	181	179	177	182	179	180
Parbat	192	189	190	192	191	191	193
Parsa	138	139	138	138	142	141	145
Pyuthan	150	149	149	150	152	152	154
Ramechhap	163	163	162	161	165	164	167
Rasuwa	167	167	167	167	169	168	171
Rautahat	127	130	128	127	131	130	134
Rolpa	155	154	153	155	157	157	159
Rukum-E	162	160	160	162	164	163	165
Rukum-W	161	159	159	160	163	162	164
Rupandehi	125	126	125	126	128	128	131
Salyan	137	137	136	138	140	140	143
Sankhuwasabha	198	196	195	194	198	195	196
Saptari	133	135	133	130	135	133	135
Sarlahi	131	133	131	130	134	133	137
Sindhuli	155	155	155	153	157	155	159
Sindhupalchok	180	180	179	180	181	180	183
Siraha	133	135	133	131	135	134	137
Solukhumbu	164	164	163	162	166	164	168
Sunsari	143	144	142	139	143	141	144
Surkhet	138	138	137	138	141	141	144
Syangja	170	170	171	172	172	172	174
Tanahu	171	171	172	173	173	173	176
Taplejung	192	191	189	187	192	189	190
Terhathum	169	169	167	165	170	167	169
Udayapur	147	148	147	145	149	147	151
Consecutive dry days (CDD, days)							
Achham	53	58	58	58	57	56	57
Arghakhanchi	60	67	69	69	70	70	69
Baglung	50	56	58	59	57	57	57
Baitadi	51	58	59	57	55	55	55
Bajhang	50	57	57	55	55	54	54
Bajura	43	51	49	50	50	49	49
Banke	60	66	68	67	67	65	68
Bara	73	77	80	82	80	81	80
Bardiya	68	73	74	74	73	73	74

		SSP245			SSP585		
Districts	Baseline	2030s	2050s	2080s	2030s	2050s	2080s
Bhaktapur	69	75	77	80	74	82	78
Bhojpur	57	65	67	66	65	67	67
Chitwan	66	71	72	74	72	76	74
Dadeldhura	56	60	61	60	58	59	59
Dailekh	55	61	61	60	60	61	61
Dang	60	66	67	68	71	71	70
Darchula	51	57	57	57	57	56	54
Dhading	55	61	61	63	63	63	65
Dhankuta	68	73	76	76	77	79	80
Dhanusha	77	76	82	87	83	84	85
Dolakha	55	60	61	62	62	62	63
Dolpa	53	59	59	61	61	60	59
Doti	55	60	60	59	59	60	58
Gorkha	55	61	61	63	63	62	62
Gulmi	57	63	64	66	67	67	66
Humla	46	53	52	50	53	52	50
Ilam	60	67	70	69	70	70	76
Jajarkot	47	54	53	54	54	54	55
Jhapa	66	72	80	79	76	77	83
Jumla	46	53	52	54	52	51	52
Kailali	62	68	70	67	68	70	67
Kalikot	51	57	56	57	55	54	55
Kanchanpur	64	69	72	70	68	70	67
Kapilbastu	67	73	75	76	75	78	77
Kaski	42	48	49	50	51	48	49
Kathmandu	65	71	73	75	70	77	74
Kavrepalanchok	70	76	77	77	76	81	79
Khotang	59	66	69	68	67	69	71
Lalitpur	66	72	74	75	71	78	74
Lamjung	50	58	57	58	58	56	58
Mahottari	76	79	84	87	84	85	86
Makwanpur	64	69	69	72	69	73	72
Manang	48	56	55	56	56	55	55
Morang	70	78	82	84	83	83	89
Mugu	41	47	45	47	48	45	45
Mustang	66	73	73	76	71	74	72
Myagdi	48	53	54	57	56	54	54
Nawalparasi-E	65	71	74	76	73	78	75
Nawalparasi-W	70	74	76	78	79	82	80
Nuwakot	55	59	60	62	62	62	63
Okhaldhunga	63	69	70	71	69	73	73
Palpa	64	71	72	74	71	74	74
Panchthar	52	59	62	62	63	63	65
Parbat	47	52	54	55	57	54	55
Parsa	75	79	80	84	81	84	82

		SSP245			SSP585		
Districts	Baseline	2030s	2050s	2080s	2030s	2050s	2080s
Pyuthan	60	66	68	69	70	70	69
Ramechhap	61	67	69	71	69	71	71
Rasuwa	50	56	56	58	58	58	58
Rautahat	75	76	81	82	80	83	82
Rolpa	54	61	62	62	62	62	63
Rukum-E	48	54	54	57	56	55	55
Rukum-W	47	53	52	53	53	53	54
Rupandehi	71	77	78	79	79	83	80
Salyan	60	65	66	64	66	66	67
Sankhuwasabha	48	54	55	57	56	56	56
Saptari	74	78	84	89	82	84	92
Sarlahi	73	75	80	80	80	82	82
Sindhuli	64	69	72	74	72	74	75
Sindhupalchok	51	56	57	59	59	60	61
Siraha	72	74	79	83	80	81	83
Solukhumbu	61	65	67	69	68	69	69
Sunsari	71	77	79	84	81	82	89
Surkhet	60	65	67	66	67	66	65
Syangja	56	64	64	64	64	65	65
Tanahu	56	64	63	66	64	65	66
Taplejung	51	57	57	60	58	59	59
Terhathum	57	65	66	66	67	68	68
Udayapur	66	70	74	74	73	76	79
Consecutive wet days (CWD, days)							
Achham	66	68	69	66	70	67	70
Arghakhanchi	58	60	58	58	62	57	59
Baglung	101	100	101	97	106	103	100
Baitadi	63	64	68	66	66	67	69
Bajhang	69	70	74	71	72	73	75
Bajura	65	68	70	67	68	69	70
Banke	45	45	42	45	47	42	43
Bara	39	39	39	38	40	38	37
Bardiya	51	52	51	50	53	49	51
Bhaktapur	49	48	49	46	50	46	47
Bhojpur	64	63	59	57	60	57	60
Chitwan	74	74	73	70	78	73	71
Dadeldhura	56	56	56	55	58	57	57
Dailekh	63	63	63	62	66	64	64
Dang	52	52	51	52	54	50	51
Darchula	61	64	67	64	66	66	67
Dhading	103	99	101	99	104	101	99
Dhankuta	37	37	35	32	35	35	36
Dhanusha	30	31	29	28	31	30	30
Dolakha	99	96	97	95	99	94	95
Dolpa	50	52	53	51	54	51	51

		SSP245			SSP585		
Districts	Baseline	2030s	2050s	2080s	2030s	2050s	2080s
Doti	63	65	66	63	68	65	68
Gorkha	89	87	88	83	94	87	86
Gulmi	79	79	80	74	83	81	77
Humla	30	32	33	33	31	30	34
Ilam	57	59	54	51	57	54	54
Jajarkot	79	78	82	77	81	80	81
Jhapa	46	47	44	41	43	42	44
Jumla	56	56	58	55	58	55	56
Kailali	53	56	55	55	57	54	56
Kalikot	50	50	49	49	50	47	49
Kanchanpur	47	51	50	50	51	48	47
Kapilbastu	38	40	38	39	39	37	37
Kaski	122	121	123	119	127	123	123
Kathmandu	74	72	72	71	76	72	72
Kavrepalanchok	54	54	53	49	54	50	49
Khotang	67	66	64	62	66	61	64
Lalitpur	73	73	73	73	76	73	70
Lamjung	103	101	102	97	107	102	101
Mahottari	29	29	29	27	30	30	28
Makwanpur	87	86	85	85	91	87	84
Manang	35	34	33	34	33	33	35
Morang	40	41	38	35	38	37	38
Mugu	48	47	51	48	49	48	49
Mustang	12	12	12	13	12	12	15
Myagdi	101	102	104	99	107	104	102
Nawalparasi-E	56	57	56	57	60	57	56
Nawalparasi-W	42	45	43	43	43	41	41
Nuwakot	107	107	106	106	109	107	106
Okhaldhunga	71	70	70	68	73	67	68
Palpa	52	54	53	55	57	51	52
Panchthar	77	79	74	68	73	69	68
Parbat	120	117	118	116	126	123	118
Parsa	50	49	48	48	49	46	46
Pyuthan	73	73	74	71	76	74	72
Ramechhap	82	82	81	78	85	79	77
Rasuwa	93	92	93	90	94	90	90
Rautahat	31	31	31	30	32	31	30
Rolpa	77	78	79	75	81	82	78
Rukum-E	86	88	88	84	88	88	89
Rukum-W	81	80	83	78	84	83	83
Rupandehi	36	38	36	37	37	36	36
Salyan	60	58	59	61	62	58	60
Sankhuwasabha	108	101	99	94	105	97	94
Saptari	32	34	32	30	33	32	32
Sarlahi	33	33	33	32	34	33	32

		SSP245			SSP585		
Districts	Baseline	2030s	2050s	2080s	2030s	2050s	2080s
Sindhuli	54	56	53	52	57	51	52
Sindhupalchok	111	107	110	109	111	110	111
Siraha	33	33	31	31	33	32	32
Solukhumbu	89	88	86	83	90	84	84
Sunsari	37	38	36	34	36	36	37
Surkhet	64	65	65	64	67	65	67
Syangja	84	86	85	79	90	85	82
Tanahu	76	77	75	73	81	76	76
Taplejung	93	90	86	79	85	82	80
Terhathum	50	53	51	45	50	47	48
Udayapur	42	43	41	40	41	41	40
Cold spell duration index (CSDI, days)							
Achham	8	2	1	0	2	0	0
Arghakhanchi	9	2	1	0	3	1	0
Baglung	9	2	1	0	2	0	0
Baitadi	8	2	1	0	2	0	0
Bajhang	8	2	1	0	2	0	0
Bajura	8	2	1	0	2	0	0
Banke	9	4	1	0	3	1	0
Bara	10	2	1	0	2	1	0
Bardiya	9	4	1	1	3	1	0
Bhaktapur	9	2	1	0	1	0	0
Bhojpur	9	2	1	0	2	0	0
Chitwan	9	2	1	0	2	0	0
Dadeldhura	8	2	1	0	2	1	0
Dailekh	8	3	1	0	3	0	0
Dang	9	3	1	0	3	1	0
Darchula	8	2	1	0	2	0	0
Dhading	9	2	1	0	1	0	0
Dhankuta	9	2	1	0	2	1	0
Dhanusha	11	2	1	0	3	1	0
Dolakha	9	2	1	0	1	0	0
Dolpa	9	2	1	0	3	1	0
Doti	8	2	1	0	2	0	0
Gorkha	9	3	1	0	1	0	0
Gulmi	9	2	1	0	2	0	0
Humla	9	2	1	0	2	0	0
Ilam	9	2	1	0	2	1	0
Jajarkot	8	2	1	0	2	0	0
Jhapa	10	3	1	0	3	1	0
Jumla	9	2	1	0	2	1	0
Kailali	9	3	1	1	3	1	0
Kalikot	8	2	1	0	2	0	0
Kanchanpur	10	4	1	1	3	1	0
Kapilbastu	10	3	1	0	3	1	0

		SSP245			SSP585		
Districts	Baseline	2030s	2050s	2080s	2030s	2050s	2080s
Kaski	8	2	1	0	2	0	0
Kathmandu	9	2	1	0	1	0	0
Kavrepalanchok	9	2	1	0	1	0	0
Khotang	9	2	1	0	2	0	0
Lalitpur	9	2	1	0	1	0	0
Lamjung	9	2	1	0	1	0	0
Mahottari	10	2	1	0	3	1	0
Makwanpur	9	2	1	0	2	0	0
Manang	8	2	1	0	2	0	0
Morang	10	3	1	0	3	1	0
Mugu	8	2	1	0	2	1	0
Mustang	9	2	1	0	2	0	0
Myagdi	8	2	1	0	2	0	0
Nawalparasi-E	9	3	1	0	2	0	0
Nawalparasi-W	9	2	1	0	3	1	0
Nuwakot	9	2	1	0	2	0	0
Okhaldhunga	9	2	1	0	1	0	0
Palpa	9	2	1	0	2	1	0
Panchthar	9	2	1	0	2	0	0
Parbat	8	2	1	0	2	0	0
Parsa	10	2	1	0	2	1	0
Pyuthan	8	2	1	0	3	1	0
Ramechhap	9	2	1	0	1	0	0
Rasuwa	9	3	1	0	2	0	0
Rautahat	10	2	1	0	3	1	0
Rolpa	8	3	1	0	3	1	0
Rukum-E	8	2	1	0	2	0	0
Rukum-W	8	2	1	0	2	0	0
Rupandehi	10	3	1	0	3	1	0
Salyan	8	3	1	0	3	1	0
Sankhuwasabha	10	2	1	0	2	0	0
Saptari	10	2	1	0	3	1	0
Sarlahi	10	2	1	0	2	1	0
Sindhuli	10	2	1	0	2	0	0
Sindhupalchok	9	2	1	0	2	0	0
Siraha	11	2	1	0	3	1	0
Solukhumbu	9	2	1	0	1	0	0
Sunsari	10	3	1	0	3	1	0
Surkhet	8	3	1	0	3	1	0
Syangja	8	2	1	0	2	0	0
Tanahu	9	2	1	0	2	0	0
Taplejung	9	2	1	0	2	1	0
Terhathum	9	2	1	0	2	1	0
Udayapur	10	2	1	0	2	1	0

Warm spell duration index (WSDI, days)

		SSP245			SSP585		
Districts	Baseline	2030s	2050s	2080s	2030s	2050s	2080s
Achham	12	35	63	119	33	81	223
Arghakhanchi	13	29	65	124	32	82	230
Baglung	12	35	68	130	38	89	236
Baitadi	12	36	62	112	31	77	215
Bajhang	11	39	64	118	36	84	227
Bajura	11	37	62	117	36	82	225
Banke	13	25	59	109	27	70	212
Bara	13	26	66	132	31	87	235
Bardiya	13	25	57	106	27	68	206
Bhaktapur	11	35	73	138	38	97	249
Bhojpur	11	33	75	143	41	105	252
Chitwan	11	28	65	128	32	86	235
Dadeldhura	12	33	61	110	31	76	212
Dailekh	12	34	64	121	34	82	225
Dang	13	27	61	116	28	75	221
Darchula	11	39	65	119	38	86	230
Dhading	11	37	75	139	40	99	251
Dhankuta	11	31	74	144	38	104	250
Dhanusha	12	25	68	139	32	93	237
Dolakha	11	40	79	141	44	106	255
Dolpa	10	38	65	122	39	89	231
Doti	12	34	62	114	32	78	217
Gorkha	11	39	74	133	42	97	243
Gulmi	12	33	70	130	35	88	237
Humla	10	40	65	118	39	86	229
Ilam	11	30	71	143	38	103	249
Jajarkot	12	35	65	125	36	85	229
Jhapa	11	26	67	139	34	97	236
Jumla	11	37	62	119	37	84	226
Kailali	13	28	58	106	28	69	204
Kalikot	11	36	64	122	36	84	226
Kanchanpur	14	28	58	105	27	68	199
Kapilbastu	13	25	58	113	27	73	219
Kaski	12	37	70	131	40	93	236
Kathmandu	11	36	76	141	39	100	252
Kavrepalanchok	11	33	73	137	38	97	249
Khotang	11	33	74	142	39	103	251
Lalitpur	12	33	71	136	37	95	245
Lamjung	11	38	72	132	40	95	240
Mahottari	11	26	68	139	32	92	238
Makwanpur	12	30	69	132	34	92	241
Manang	10	39	70	128	41	92	235
Morang	11	26	68	141	34	97	238
Mugu	10	38	62	115	37	83	220
Mustang	10	39	69	125	41	92	235

		SSP245			SSP585		
Districts	Baseline	2030s	2050s	2080s	2030s	2050s	2080s
Myagdi	11	37	68	128	39	91	234
Nawalparasi-E	12	29	67	128	32	85	234
Nawalparasi-W	12	24	58	118	27	76	223
Nuwakot	11	37	75	141	41	100	252
Okhaldhunga	11	33	74	140	39	101	250
Palpa	12	29	66	127	32	85	233
Panchthar	12	32	72	140	39	103	250
Parbat	11	35	69	131	38	91	238
Parsa	13	25	64	128	30	84	232
Pyuthan	13	30	65	125	33	84	231
Ramechhap	11	35	75	140	41	102	251
Rasuwa	11	41	77	136	43	101	248
Rautahat	12	26	65	134	31	88	235
Rolpa	13	33	65	124	35	84	230
Rukum-E	11	36	66	127	38	87	233
Rukum-W	12	35	66	125	36	86	231
Rupandehi	12	24	59	116	27	75	221
Salyan	13	30	61	115	31	76	223
Sankhuwasabha	12	37	74	137	43	103	252
Saptari	11	24	66	136	31	92	232
Sarlahi	12	26	68	137	32	91	239
Sindhuli	11	30	72	142	36	97	246
Sindhupalchok	11	40	78	142	44	104	255
Siraha	12	26	69	141	32	94	238
Solukhumbu	11	39	76	138	44	104	254
Sunsari	11	26	68	142	34	97	238
Surkhet	13	30	60	112	30	75	218
Syangja	12	33	70	132	36	91	240
Tanahu	12	33	72	135	37	94	244
Taplejung	11	35	70	133	41	100	249
Terhathum	11	32	72	140	40	103	251
Udayapur	11	28	72	145	35	100	246
Monthly maximum 1-day precipitation (Rx1day, mm)							
Achham	54	66	71	76	67	70	91
Arghakhanchi	72	77	81	93	79	89	110
Baglung	53	58	61	70	60	68	85
Baitadi	62	72	77	85	74	77	107
Bajhang	50	63	68	72	64	65	90
Bajura	33	43	45	47	42	44	62
Banke	68	77	81	91	80	85	105
Bara	97	111	114	123	112	124	147
Bardiya	84	98	103	111	100	103	129
Bhaktapur	63	77	78	82	76	85	109
Bhojpur	56	65	71	74	66	77	91
Chitwan	85	97	102	112	99	111	135

		SSP245			SSP585		
Districts	Baseline	2030s	2050s	2080s	2030s	2050s	2080s
Dadeldhura	74	86	93	102	88	90	124
Dailekh	43	52	56	62	54	58	78
Dang	67	72	76	88	74	82	103
Darchula	49	60	63	68	62	64	86
Dhading	49	59	61	65	59	67	84
Dhankuta	55	65	72	74	66	78	93
Dhanusha	81	92	96	103	91	102	127
Dolakha	35	41	43	45	41	49	59
Dolpa	21	25	27	30	25	30	42
Doti	72	85	93	100	86	89	120
Gorkha	36	44	46	49	44	50	64
Gulmi	70	75	80	92	78	88	109
Humla	26	34	37	39	33	35	52
Ilam	85	98	107	109	99	115	132
Jajarkot	40	47	50	57	48	53	71
Jhapa	111	125	137	138	129	146	170
Jumla	27	33	34	37	33	36	49
Kailali	88	102	109	115	104	106	133
Kalikot	30	38	39	42	37	40	56
Kanchanpur	93	106	113	120	107	108	139
Kapilbastu	80	85	90	102	87	97	120
Kaski	70	77	80	87	79	87	105
Kathmandu	61	71	73	77	72	81	99
Kavrepalanchok	62	74	76	80	74	83	104
Khotang	56	65	69	73	65	75	90
Lalitpur	80	97	97	103	96	108	137
Lamjung	52	60	62	67	61	67	82
Mahottari	80	91	96	102	90	101	126
Makwanpur	95	114	115	125	113	131	162
Manang	23	28	29	34	28	33	47
Morang	96	111	121	124	113	127	147
Mugu	23	28	30	31	27	30	42
Mustang	16	20	21	26	21	25	37
Myagdi	41	46	48	56	48	55	71
Nawalparasi-E	100	109	116	128	114	126	151
Nawalparasi-W	110	120	128	143	127	140	168
Nuwakot	60	69	72	76	70	79	94
Okhaldhunga	52	62	66	69	61	72	89
Palpa	84	90	95	106	94	104	127
Panchthar	52	62	67	71	63	76	88
Parbat	75	82	86	94	84	93	112
Parsa	87	101	105	115	102	114	138
Pyuthan	63	67	70	82	70	78	98
Ramechhap	45	54	57	60	53	63	78
Rasuwa	24	31	32	34	31	36	48

		SSP245			SSP585		
Districts	Baseline	2030s	2050s	2080s	2030s	2050s	2080s
Rautahat	91	105	107	114	104	114	137
Rolpa	50	55	58	69	57	63	84
Rukum-E	34	39	40	50	41	47	62
Rukum-W	43	49	51	60	50	56	73
Rupandehi	102	109	115	127	114	125	149
Salyan	57	64	69	80	66	72	97
Sankhuwasabha	47	53	58	60	55	64	78
Saptari	76	89	96	103	90	99	124
Sarlahi	91	104	108	114	103	114	139
Sindhuli	85	102	104	111	99	111	141
Sindhupalchok	47	54	57	59	55	62	74
Siraha	72	84	88	96	83	94	119
Solukhumbu	34	39	43	44	40	48	59
Sunsari	93	107	116	120	108	120	142
Surkhet	63	74	79	87	76	80	105
Syangja	79	85	89	97	88	97	115
Tanahu	71	78	81	87	80	88	105
Taplejung	33	38	43	44	39	48	60
Terhathum	45	54	59	62	55	67	80
Udayapur	68	78	84	89	78	89	109
Very wet days (R95ptot, mm)							
Achham	281	357	422	461	392	430	718
Arghakhanchi	358	479	523	600	493	567	900
Baglung	339	448	503	565	455	532	860
Baitadi	319	388	461	500	428	477	799
Bajhang	250	327	395	428	345	393	697
Bajura	185	240	291	324	253	291	510
Banke	302	380	412	484	406	426	691
Bara	453	619	653	698	601	722	1194
Bardiya	362	474	522	584	510	522	866
Bhaktapur	309	425	460	513	415	515	902
Bhojpur	313	405	439	491	414	519	855
Chitwan	429	595	636	710	596	715	1162
Dadeldhura	352	427	517	567	480	521	883
Dailekh	222	280	326	359	308	333	568
Dang	317	406	442	520	424	466	768
Darchula	243	316	380	420	339	392	677
Dhading	297	405	446	490	406	485	825
Dhankuta	258	346	378	430	363	456	762
Dhanusha	342	464	472	526	456	559	910
Dolakha	223	285	313	363	280	356	608
Dolpa	94	128	153	185	130	163	311
Doti	342	425	517	560	481	518	881
Gorkha	219	296	332	390	302	364	634
Gulmi	380	508	559	631	513	603	969

		SSP245			SSP585		
Districts	Baseline	2030s	2050s	2080s	2030s	2050s	2080s
Humla	112	149	183	217	154	189	358
Ilam	468	588	660	738	617	773	1258
Jajarkot	235	303	343	388	317	352	607
Jhapa	583	748	830	907	768	943	1524
Jumla	150	197	232	264	202	238	419
Kailali	402	507	587	650	573	590	958
Kalikot	158	203	234	262	211	241	421
Kanchanpur	401	502	593	653	552	577	966
Kapilbastu	371	491	515	611	493	568	891
Kaski	511	667	749	830	663	793	1264
Kathmandu	342	461	500	565	450	560	954
Kavrepalanchok	298	404	432	490	386	488	865
Khotang	295	390	417	460	393	488	808
Lalitpur	382	526	563	622	506	624	1083
Lamjung	361	472	530	606	483	575	944
Mahottari	334	454	468	517	444	544	908
Makwanpur	453	625	671	740	610	745	1275
Manang	101	135	153	188	133	172	321
Morang	474	623	684	752	645	796	1261
Mugu	126	168	205	235	167	203	371
Mustang	45	65	77	104	68	90	189
Myagdi	270	354	401	463	347	421	705
Nawalparasi-E	506	701	749	839	710	833	1310
Nawalparasi-W	504	682	715	826	700	815	1263
Nuwakot	385	508	560	628	509	614	1039
Okhaldhunga	273	364	394	440	356	448	775
Palpa	426	577	619	701	584	689	1061
Panchthar	313	389	434	488	402	506	833
Parbat	526	678	761	846	687	809	1267
Parsa	411	563	595	650	560	676	1103
Pyuthan	320	418	459	527	434	496	802
Ramechhap	243	320	350	389	309	395	690
Rasuwa	151	204	230	275	203	254	452
Rautahat	401	540	556	608	519	631	1058
Rolpa	275	361	397	458	372	417	701
Rukum-E	208	276	309	355	282	329	551
Rukum-W	254	329	373	421	346	386	659
Rupandehi	459	616	646	758	629	725	1133
Salyan	261	334	373	438	358	390	670
Sankhuwasabha	325	404	450	501	425	511	848
Saptari	340	460	483	525	474	570	898
Sarlahi	405	551	567	622	529	648	1085
Sindhuli	396	538	572	627	508	637	1115
Sindhupalchok	325	421	465	532	410	510	861
Siraha	311	425	439	489	424	517	838

		SSP245			SSP585		
Districts	Baseline	2030s	2050s	2080s	2030s	2050s	2080s
Solukhumbu	203	266	297	338	265	334	566
Sunsari	444	588	630	689	603	735	1172
Surkhet	299	387	436	487	422	447	742
Syangja	471	631	690	763	640	751	1164
Tanahu	433	583	633	715	587	702	1124
Taplejung	227	276	308	354	283	356	600
Terhathum	251	318	350	405	335	421	695
Udayapur	322	436	458	509	442	541	883
Extreme wet days (R99ptot, mm)							
Achham	87	146	185	210	164	179	399
Arghakhanchi	111	147	183	243	154	209	444
Baglung	93	136	182	229	146	195	444
Baitadi	100	153	200	239	177	200	452
Bajhang	81	136	180	205	154	183	404
Bajura	55	92	120	139	101	125	280
Banke	94	148	191	232	166	192	359
Bara	139	224	251	311	225	301	664
Bardiya	115	198	249	293	223	236	464
Bhaktapur	95	163	184	237	163	232	516
Bhojpur	96	157	194	230	167	241	508
Chitwan	137	207	258	320	227	319	656
Dadeldhura	117	163	218	257	195	213	505
Dailekh	64	114	147	170	129	145	307
Dang	98	143	175	216	149	187	383
Darchula	79	133	170	197	142	172	388
Dhading	86	146	179	227	153	215	465
Dhankuta	83	145	180	212	159	226	474
Dhanusha	111	188	207	240	171	244	531
Dolakha	60	107	126	158	106	153	340
Dolpa	29	46	61	80	47	68	166
Doti	115	169	221	264	195	215	496
Gorkha	61	101	131	176	114	167	363
Gulmi	116	165	209	274	172	233	516
Humla	36	61	78	95	61	81	195
Ilam	144	223	284	343	253	365	741
Jajarkot	64	109	139	171	116	145	320
Jhapa	178	285	358	410	319	448	862
Jumla	42	69	84	100	68	93	206
Kailali	124	191	253	291	235	239	490
Kalikot	45	76	93	106	79	98	219
Kanchanpur	129	173	226	276	210	215	469
Kapilbastu	110	134	168	230	152	204	410
Kaski	141	207	269	352	223	319	663
Kathmandu	96	167	192	248	164	240	525
Kavrepalanchok	96	168	186	230	157	222	502

		SSP245			SSP585		
Districts	Baseline	2030s	2050s	2080s	2030s	2050s	2080s
Khotang	91	154	184	214	154	225	477
Lalitpur	127	220	245	295	206	298	641
Lamjung	99	152	197	261	173	242	508
Mahottari	108	192	207	241	173	243	539
Makwanpur	158	250	295	353	253	360	767
Manang	33	52	61	80	53	72	176
Morang	147	253	308	356	273	380	734
Mugu	35	59	77	92	62	83	187
Mustang	15	27	33	48	30	42	106
Myagdi	73	117	143	188	120	161	373
Nawalparasi-E	160	227	290	368	255	347	716
Nawalparasi-W	162	211	273	368	255	336	690
Nuwakot	105	173	217	282	189	263	575
Okhaldhunga	85	146	162	202	134	201	447
Palpa	130	175	223	303	204	274	556
Panchthar	96	153	187	233	170	251	510
Parbat	144	209	271	338	214	297	651
Parsa	127	199	233	289	201	280	599
Pyuthan	99	133	168	216	142	186	408
Ramechhap	75	135	149	185	127	185	404
Rasuwa	40	71	88	113	72	111	250
Rautahat	126	209	227	272	195	269	586
Rolpa	79	122	159	201	129	160	366
Rukum-E	56	95	123	158	101	130	295
Rukum-W	69	118	153	191	122	155	345
Rupandehi	140	168	219	302	206	269	549
Salyan	82	127	171	215	139	165	366
Sankhuwasabha	91	141	178	223	158	224	477
Saptari	108	181	215	250	188	256	511
Sarlahi	128	227	242	283	202	277	622
Sindhuli	135	236	264	321	220	305	679
Sindhupalchok	86	145	173	219	146	209	462
Siraha	102	165	190	225	157	233	487
Solukhumbu	56	90	111	138	98	141	313
Sunsari	141	249	297	338	265	360	707
Surkhet	91	155	201	239	182	203	396
Syangja	137	189	246	327	217	294	618
Tanahu	123	188	236	310	211	290	600
Taplejung	61	93	124	156	104	157	344
Terhathum	77	125	157	198	142	205	424
Udayapur	103	178	210	241	174	255	524
Cold nights (TN10p, %)							
Achham	10	3	2	0	3	1	0
Arghakhanchi	10	3	1	0	3	1	0
Baglung	10	3	1	0	3	1	0

		SSP245			SSP585		
Districts	Baseline	2030s	2050s	2080s	2030s	2050s	2080s
Baitadi	10	3	2	1	3	1	0
Bajhang	10	3	2	1	3	1	0
Bajura	10	3	2	1	3	1	0
Banke	10	3	2	1	3	1	0
Bara	10	3	1	0	3	1	0
Bardiya	10	4	2	1	3	1	0
Bhaktapur	10	3	1	0	2	1	0
Bhojpur	10	3	1	0	3	1	0
Chitwan	10	3	1	0	3	1	0
Dadeldhura	10	3	2	0	3	1	0
Dailekh	10	3	2	0	3	1	0
Dang	10	3	1	0	3	1	0
Darchula	10	3	2	1	3	1	0
Dhading	10	3	1	0	3	1	0
Dhankuta	10	3	1	0	3	1	0
Dhanusha	10	3	1	0	3	1	0
Dolakha	10	3	2	0	3	1	0
Dolpa	10	4	2	1	3	1	0
Doti	10	3	2	1	3	1	0
Gorkha	10	3	2	1	3	1	0
Gulmi	10	3	1	0	3	1	0
Humla	10	4	2	1	4	1	0
Ilam	10	3	1	0	3	1	0
Jajarkot	10	3	2	0	3	1	0
Jhapa	10	3	1	0	3	1	0
Jumla	10	3	2	1	3	1	0
Kailali	10	4	2	1	3	1	0
Kalikot	10	3	2	1	3	1	0
Kanchanpur	10	4	2	1	3	1	0
Kapilbastu	10	3	1	0	3	1	0
Kaski	10	3	1	0	3	1	0
Kathmandu	10	3	1	0	2	1	0
Kavrepalanchok	10	3	1	0	2	1	0
Khotang	10	3	1	0	3	1	0
Lalitpur	10	3	1	0	2	1	0
Lamjung	10	3	2	0	3	1	0
Mahottari	10	3	1	0	3	1	0
Makwanpur	10	3	1	0	2	1	0
Manang	10	3	2	1	3	1	0
Morang	10	3	1	0	3	1	0
Mugu	10	4	2	1	4	1	0
Mustang	10	3	2	1	3	1	0
Myagdi	10	3	1	0	3	1	0
Nawalparasi-E	10	3	1	0	3	1	0
Nawalparasi-W	10	3	1	0	3	1	0

		SSP245			SSP585		
Districts	Baseline	2030s	2050s	2080s	2030s	2050s	2080s
Nuwakot	10	3	1	0	3	1	0
Okhaldhunga	10	3	1	0	3	1	0
Palpa	10	3	1	0	3	1	0
Panchthar	10	3	1	1	3	1	0
Parbat	10	3	1	0	3	1	0
Parsa	10	3	1	0	3	1	0
Pyuthan	10	3	1	0	3	1	0
Ramechhap	10	3	1	0	3	1	0
Rasuwa	10	4	2	1	3	1	0
Rautahat	10	3	1	0	3	1	0
Rolpa	10	3	1	0	3	1	0
Rukum-E	10	3	1	0	3	1	0
Rukum-W	10	3	2	0	3	1	0
Rupandehi	10	3	1	0	3	1	0
Salyan	10	3	1	0	3	1	0
Sankhuwasabha	10	3	2	1	3	1	0
Saptari	10	3	1	0	3	1	0
Sarlahi	10	3	1	0	3	1	0
Sindhuli	10	3	1	0	3	1	0
Sindhupalchok	10	3	2	0	3	1	0
Siraha	10	3	1	0	3	1	0
Solukhumbu	10	3	2	1	3	1	0
Sunsari	10	3	1	0	3	1	0
Surkhet	10	3	2	0	3	1	0
Syangja	10	3	1	0	3	1	0
Tanahu	10	3	1	0	3	1	0
Taplejung	10	3	2	1	3	1	0
Terhathum	10	3	1	1	3	1	0
Udayapur	10	3	1	0	3	1	0
Cold days (TX10p, %)							
Achham	11	6	4	2	5	3	1
Arghakhanchi	11	6	4	2	6	3	1
Baglung	10	5	3	2	5	3	1
Baitadi	11	6	4	2	6	3	1
Bajhang	11	5	3	1	5	2	0
Bajura	10	5	3	1	5	2	0
Banke	11	7	4	3	7	4	1
Bara	11	6	3	2	6	4	1
Bardiya	11	7	4	3	7	4	1
Bhaktapur	10	5	3	1	5	3	0
Bhojpur	10	5	2	1	5	2	0
Chitwan	11	6	3	2	6	3	1
Dadeldhura	11	6	4	2	6	4	1
Dailekh	11	6	3	2	6	3	1
Dang	10	6	4	2	7	4	1

		SSP245			SSP585		
Districts	Baseline	2030s	2050s	2080s	2030s	2050s	2080s
Darchula	11	5	3	1	5	2	0
Dhading	10	5	3	1	5	2	0
Dhankuta	10	5	3	1	5	3	0
Dhanusha	11	6	3	2	7	4	1
Dolakha	10	4	2	1	4	2	0
Dolpa	10	4	2	1	4	2	0
Doti	11	6	4	2	6	3	1
Gorkha	11	4	2	1	4	2	0
Gulmi	10	6	3	2	6	3	1
Humla	10	4	2	1	4	2	0
Ilam	10	5	3	1	5	2	0
Jajarkot	11	5	3	2	5	3	0
Jhapa	11	5	3	2	6	3	0
Jumla	10	5	3	1	5	2	0
Kailali	11	7	4	3	7	4	1
Kalikot	11	5	3	2	5	3	0
Kanchanpur	11	7	5	3	7	4	1
Kapilbastu	11	7	4	3	7	4	1
Kaski	10	5	3	1	5	2	0
Kathmandu	10	5	3	1	5	2	0
Kavrepalanchok	11	5	3	1	5	3	0
Khotang	11	5	3	1	5	2	0
Lalitpur	11	5	3	2	5	3	0
Lamjung	10	5	2	1	4	2	0
Mahottari	11	6	3	2	7	4	1
Makwanpur	11	6	3	2	6	3	1
Manang	10	4	2	1	4	2	0
Morang	11	6	3	2	6	3	0
Mugu	10	4	3	1	4	2	0
Mustang	10	4	2	1	4	2	0
Myagdi	10	5	3	1	5	2	0
Nawalparasi-E	11	6	3	2	6	3	1
Nawalparasi-W	11	6	4	2	7	4	1
Nuwakot	11	5	2	1	5	2	0
Okhaldhunga	11	5	3	1	5	2	0
Palpa	11	6	3	2	6	3	1
Panchthar	11	5	2	1	4	2	0
Parbat	10	5	3	2	5	3	0
Parsa	11	6	3	2	6	4	1
Pyuthan	10	6	4	2	6	3	1
Ramechhap	11	5	3	1	5	2	0
Rasuwa	10	4	2	1	4	2	0
Rautahat	11	6	3	2	7	4	1
Rolpa	10	6	3	2	6	3	1
Rukum-E	10	5	3	1	5	3	0

		SSP245			SSP585		
Districts	Baseline	2030s	2050s	2080s	2030s	2050s	2080s
Rukum-W	10	5	3	2	5	3	1
Rupandehi	11	6	4	2	7	4	1
Salyan	10	6	4	2	6	3	1
Sankhuwasabha	11	4	2	1	4	2	0
Saptari	11	6	3	2	7	4	1
Sarlahi	11	6	3	2	6	3	1
Sindhuli	11	5	3	2	6	3	0
Sindhupalchok	10	4	2	1	4	2	0
Siraha	11	6	3	2	6	3	1
Solukhumbu	10	4	2	1	4	2	0
Sunsari	11	6	3	2	6	3	1
Surkhet	11	6	4	2	6	3	1
Syangja	11	6	3	2	5	3	1
Tanahu	11	5	3	2	5	3	0
Taplejung	10	4	2	1	4	2	0
Terhathum	11	5	2	1	4	2	0
Udayapur	11	6	3	2	6	3	0
Warm nights (TN90p, %)							
Achham	10	26	42	61	30	51	89
Arghakhanchi	10	26	44	64	29	52	91
Baglung	10	28	44	64	30	52	91
Baitadi	10	26	41	61	30	51	89
Bajhang	10	26	39	57	30	49	86
Bajura	10	25	38	56	29	48	86
Banke	10	24	41	60	27	49	89
Bara	10	28	45	65	30	54	92
Bardiya	10	24	40	60	28	49	89
Bhaktapur	10	30	46	66	32	55	93
Bhojpur	10	32	47	65	32	54	92
Chitwan	10	28	46	66	30	55	92
Dadeldhura	10	26	41	62	29	52	90
Dailekh	10	26	42	62	29	51	90
Dang	10	25	42	61	28	50	90
Darchula	10	26	38	55	30	48	85
Dhading	10	30	46	65	32	54	92
Dhankuta	10	31	48	66	32	54	93
Dhanusha	10	28	45	65	29	53	92
Dolakha	10	31	46	63	33	52	90
Dolpa	10	27	39	56	29	46	84
Doti	10	26	42	62	30	52	90
Gorkha	10	29	43	61	32	50	89
Gulmi	10	28	45	65	30	53	92
Humla	10	25	36	49	28	43	79
Ilam	10	31	48	65	31	53	93
Jajarkot	10	27	42	62	29	51	90

		SSP245			SSP585		
Districts	Baseline	2030s	2050s	2080s	2030s	2050s	2080s
Jhapa	10	31	47	65	30	53	92
Jumla	10	26	39	56	29	48	86
Kailali	10	24	40	60	28	49	89
Kalikot	10	26	40	59	29	50	88
Kanchanpur	10	24	39	59	27	49	88
Kapilbastu	10	25	42	61	27	50	90
Kaski	10	29	44	63	32	52	90
Kathmandu	10	30	46	66	32	54	92
Kavrepalanchok	10	30	47	66	32	55	93
Khotang	10	31	47	66	32	54	93
Lalitpur	10	30	46	67	31	55	93
Lamjung	10	29	44	62	32	51	90
Mahottari	10	28	45	65	29	53	92
Makwanpur	10	29	46	67	31	55	93
Manang	10	29	42	59	31	48	87
Morang	10	30	47	65	30	53	92
Mugu	10	26	37	53	29	45	82
Mustang	10	27	40	56	30	46	83
Myagdi	10	28	43	62	31	51	89
Nawalparasi-E	10	28	46	66	30	54	92
Nawalparasi-W	10	26	44	63	28	52	91
Nuwakot	10	30	46	65	32	53	92
Okhaldhunga	10	31	47	66	32	55	93
Palpa	10	28	45	65	30	53	92
Panchthar	10	31	47	63	32	52	91
Parbat	10	28	45	64	31	53	91
Parsa	10	28	45	65	29	53	92
Pyuthan	10	26	43	63	29	52	91
Ramechhap	10	31	47	66	33	55	92
Rasuwa	10	30	43	60	32	49	87
Rautahat	10	28	45	65	29	53	91
Rolpa	10	26	43	63	29	52	91
Rukum-E	10	27	42	61	30	51	90
Rukum-W	10	27	42	62	29	51	90
Rupandehi	10	26	43	62	28	51	90
Salyan	10	26	42	62	29	51	90
Sankhuwasabha	10	32	46	61	33	51	89
Saptari	10	29	45	64	29	52	91
Sarlahi	10	28	45	65	30	53	92
Sindhuli	10	30	47	67	31	55	93
Sindhupalchok	10	30	45	63	32	52	90
Siraha	10	29	46	65	30	53	92
Solukhumbu	10	32	46	62	33	51	89
Sunsari	10	30	46	65	30	53	92
Surkhet	10	25	42	62	29	51	90

		SSP245			SSP585		
Districts	Baseline	2030s	2050s	2080s	2030s	2050s	2080s
Syangja	10	28	46	66	31	54	92
Tanahu	10	29	46	66	31	54	93
Taplejung	10	31	44	58	31	49	87
Terhathum	10	31	47	63	32	52	91
Udayapur	10	30	47	67	31	54	93
Warm days (TX90p, %)							
Achham	10	19	30	45	19	34	70
Arghakhanchi	10	17	29	46	17	34	71
Baglung	10	20	32	48	20	37	73
Baitadi	10	19	29	44	19	34	69
Bajhang	10	22	31	46	22	37	72
Bajura	10	22	31	46	22	36	71
Banke	10	15	27	41	15	29	67
Bara	11	16	30	48	17	35	72
Bardiya	10	15	26	40	15	29	66
Bhaktapur	10	20	33	50	20	38	75
Bhojpur	10	20	33	51	21	40	76
Chitwan	10	17	30	47	18	35	72
Dadeldhura	10	18	28	42	17	32	68
Dailekh	10	19	30	45	19	35	71
Dang	10	15	28	43	15	31	69
Darchula	10	22	31	46	22	37	72
Dhading	10	21	34	50	21	39	76
Dhankuta	10	19	33	52	21	40	76
Dhanusha	10	16	31	49	18	36	72
Dolakha	10	22	35	51	23	41	78
Dolpa	10	22	32	47	23	38	73
Doti	10	18	29	44	18	33	69
Gorkha	10	23	34	49	23	39	75
Gulmi	10	19	31	47	19	36	73
Humla	11	23	32	47	23	38	73
Ilam	10	19	33	52	21	40	75
Jajarkot	10	20	31	46	20	36	72
Jhapa	10	17	31	50	20	38	72
Jumla	11	22	32	47	22	37	72
Kailali	10	16	26	40	15	30	66
Kalikot	10	21	31	47	21	36	71
Kanchanpur	10	15	26	39	15	29	64
Kapilbastu	10	15	27	42	15	30	68
Kaski	10	22	33	48	22	38	73
Kathmandu	10	21	33	50	21	39	76
Kavrepalanchok	10	20	33	50	20	38	75
Khotang	10	20	33	51	21	40	76
Lalitpur	10	19	32	49	20	38	74
Lamjung	10	22	33	49	22	39	74

		SSP245			SSP585		
Districts	Baseline	2030s	2050s	2080s	2030s	2050s	2080s
Mahottari	11	16	31	49	17	36	72
Makwanpur	10	18	31	49	19	36	73
Manang	11	23	33	48	23	39	74
Morang	10	17	32	50	19	38	72
Mugu	10	22	32	46	23	37	71
Mustang	11	23	33	48	23	39	74
Myagdi	11	22	32	48	22	37	73
Nawalparasi-E	10	17	30	47	18	35	72
Nawalparasi-W	10	15	28	44	16	32	69
Nuwakot	10	21	34	50	22	39	76
Okhaldhunga	10	20	33	51	21	39	76
Palpa	10	17	30	47	17	35	72
Panchthar	10	20	33	51	21	41	76
Parbat	10	21	32	48	20	37	73
Parsa	10	16	29	47	17	34	71
Pyuthan	10	18	30	46	18	34	72
Ramechhap	10	21	34	51	22	40	76
Rasuwa	11	23	35	50	23	40	76
Rautahat	11	16	30	48	17	35	72
Rolpa	10	19	30	46	19	35	71
Rukum-E	10	21	32	47	21	37	73
Rukum-W	10	20	31	47	20	36	72
Rupandehi	10	15	28	43	15	31	69
Salyan	10	17	28	44	17	32	70
Sankhuwasabha	10	22	34	51	23	41	77
Saptari	10	16	30	49	18	36	71
Sarlahi	10	16	31	49	18	36	72
Sindhuli	10	18	32	50	19	38	74
Sindhupalchok	10	23	35	51	23	41	77
Siraha	10	16	31	50	18	37	72
Solukhumbu	10	22	35	51	23	41	77
Sunsari	10	17	32	50	19	38	72
Surkhet	10	17	28	43	16	32	69
Syangja	10	19	32	48	19	36	73
Tanahu	10	20	32	49	20	37	74
Taplejung	10	22	34	50	23	41	77
Terhathum	10	20	33	51	22	40	76
Udayapur	10	18	32	51	19	39	74

Table 9.33: Extreme indices for basins of Nepal. Significant values are highlighted in color: light orange indicates an increasing trend, while light blue denotes a decreasing trend.

		SSP245			SSP585		
Basin	**Baseline**	**2030s**	**2050s**	**2080s**	**2030s**	**2050s**	**2080s**
Number of rainy days (R1mm, days)							
Babai	133	133	132	134	136	137	139
Bagmati	152	153	152	151	156	154	158
Gandaki	172	170	171	173	173	173	176
Kamala	146	147	146	144	148	147	151
Kankai	168	168	166	164	168	165	167
Karnali	150	148	149	150	152	153	155
Koshi	168	168	168	167	170	168	171
Mahakali	154	154	155	157	157	158	163
Mechi	159	159	157	154	159	156	158
West-Rapti	144	143	143	144	146	146	149
Consecutive dry days (CDD, days)							
Babai	62	67	69	68	69	69	70
Bagmati	66	73	75	75	74	77	76
Gandaki	53	60	60	61	61	61	60
Kamala	67	71	75	77	75	78	79
Kankai	59	65	69	69	69	69	74
Karnali	50	55	55	56	55	55	56
Koshi	59	64	65	67	66	68	66
Mahakali	49	56	57	55	54	54	52
Mechi	64	70	77	76	74	74	82
West-Rapti	58	64	65	65	68	66	67
Consecutive wet days (CWD, days)							
Babai	54	53	53	55	56	52	54
Bagmati	64	62	62	61	65	59	59
Gandaki	91	91	93	88	97	93	91
Kamala	43	41	40	39	42	40	40
Kankai	59	63	57	53	59	55	56
Karnali	64	66	68	64	69	67	70
Koshi	83	81	82	76	81	75	78
Mahakali	63	67	70	68	68	68	70
Mechi	51	52	49	47	50	49	49
West-Rapti	64	63	62	63	66	64	64
Cold spell duration index (CSDI, days)							
Babai	9	3	1	0	3	1	0
Bagmati	10	2	1	0	2	0	0
Gandaki	9	2	1	0	1	0	0
Kamala	10	2	1	0	2	1	0
Kankai	9	2	1	0	2	1	0
Karnali	9	2	1	0	2	0	0

		SSP245			SSP585		
Basin	**Baseline**	**2030s**	**2050s**	**2080s**	**2030s**	**2050s**	**2080s**
Koshi	10	3	1	0	2	1	0
Mahakali	9	2	1	0	2	0	0
Mechi	10	2	1	0	3	1	0
West-Rapti	9	3	1	0	3	1	0
Warm spell duration index (WSDI, days)							
Babai	13	28	60	113	29	74	219
Bagmati	12	31	72	139	35	96	245
Gandaki	11	40	76	139	42	100	248
Kamala	12	28	72	144	35	97	244
Kankai	11	30	72	143	38	103	250
Karnali	11	39	69	129	39	91	239
Koshi	11	42	81	144	47	110	259
Mahakali	12	38	67	118	37	84	227
Mechi	11	27	68	140	35	98	238
West-Rapti	13	29	63	121	30	79	227
Monthly maximum 1-day precipitation (Rx1day, mm)							
Babai	68	77	81	93	79	84	110
Bagmati	89	107	108	114	105	116	146
Gandaki	45	51	54	59	52	59	74
Kamala	74	87	90	96	84	96	119
Kankai	81	93	102	104	94	110	126
Karnali	32	40	43	45	40	42	58
Koshi	28	33	36	38	34	41	50
Mahakali	60	70	73	83	73	75	102
Mechi	108	120	131	131	123	141	163
West-Rapti	60	64	68	79	66	74	93
Very wet days (R95ptot, mm)							
Babai	308	393	439	511	423	452	770
Bagmati	423	578	614	671	548	681	1170
Gandaki	269	372	412	465	377	454	743
Kamala	339	461	478	534	445	559	929
Kankai	449	563	629	705	588	738	1202
Karnali	170	225	269	304	236	275	486
Koshi	167	221	249	287	224	288	503
Mahakali	303	380	453	499	420	461	784
Mechi	579	754	831	921	771	954	1534
West-Rapti	297	379	420	490	397	441	727
Extreme wet days (R99ptot, mm)							
Babai	98	157	202	250	177	203	415
Bagmati	141	236	264	318	224	306	679
Gandaki	78	119	153	206	135	188	407
Kamala	112	192	215	257	181	262	560
Kankai	139	214	273	330	245	351	717

		SSP245			SSP585		
Basin	**Baseline**	**2030s**	**2050s**	**2080s**	**2030s**	**2050s**	**2080s**
Karnali	50	86	109	135	97	119	272
Koshi	47	82	100	128	90	129	292
Mahakali	96	157	195	239	178	205	461
Mechi	176	288	350	422	317	435	880
West-Rapti	90	135	169	207	140	177	364
Cold nights (TN10p, %)							
Babai	10	3	1	0	3	1	0
Bagmati	10	3	1	0	3	1	0
Gandaki	10	3	2	0	3	1	0
Kamala	10	3	1	0	3	1	0
Kankai	10	3	1	0	3	1	0
Karnali	10	3	2	0	3	1	0
Koshi	10	4	2	1	3	1	0
Mahakali	10	3	2	0	3	1	0
Mechi	10	3	1	0	3	1	0
West-Rapti	10	3	1	0	3	1	0
Cold days (TX10p, %)							
Babai	11	6	4	2	6	4	1
Bagmati	11	6	3	2	6	3	1
Gandaki	10	5	2	1	4	2	0
Kamala	11	6	3	2	6	3	1
Kankai	10	5	3	1	5	2	0
Karnali	10	5	3	1	4	2	0
Koshi	11	4	2	1	4	2	0
Mahakali	11	5	3	2	5	3	0
Mechi	11	5	3	2	5	3	0
West-Rapti	10	6	4	2	6	3	1
Warm nights (TN90p, %)							
Babai	10	25	42	62	28	51	90
Bagmati	10	29	47	67	31	55	93
Gandaki	10	30	45	64	32	52	90
Kamala	10	30	47	67	31	54	93
Kankai	10	32	47	65	31	53	92
Karnali	10	27	41	58	30	49	87
Koshi	10	31	45	60	32	50	87
Mahakali	10	26	41	59	30	50	87
Mechi	10	31	47	65	31	54	92
West-Rapti	10	26	43	63	28	51	91
Warm days (TX90p, %)							
Babai	10	16	28	43	16	31	69
Bagmati	10	18	32	50	19	37	74
Gandaki	11	22	34	50	22	39	76
Kamala	10	17	32	51	19	38	74

		SSP245			SSP585		
Basin	Baseline	2030s	2050s	2080s	2030s	2050s	2080s
Kankai	11	19	33	52	21	40	75
Karnali	11	22	33	48	22	38	74
Koshi	10	23	36	52	24	43	79
Mahakali	11	21	31	45	20	36	71
Mechi	10	18	32	50	20	38	73
West-Rapti	10	17	29	45	17	33	71

10 ANNEX II: FIGURES

Figure 10.1: Spatial distribution of observed (1981–2010) seasonal precipitation (%).

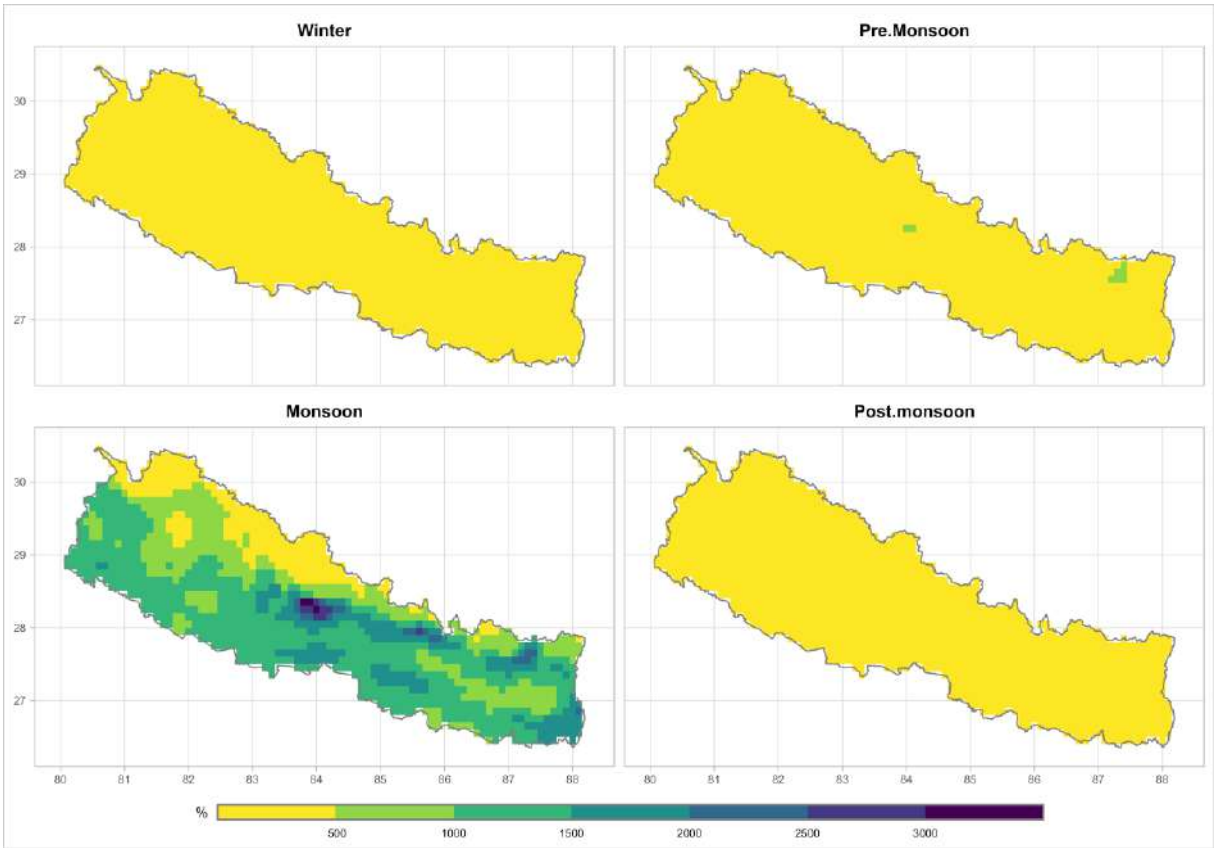

Figure 10.2 Spatial distribution of observed (1981–2010) seasonal mean temperature (°C).

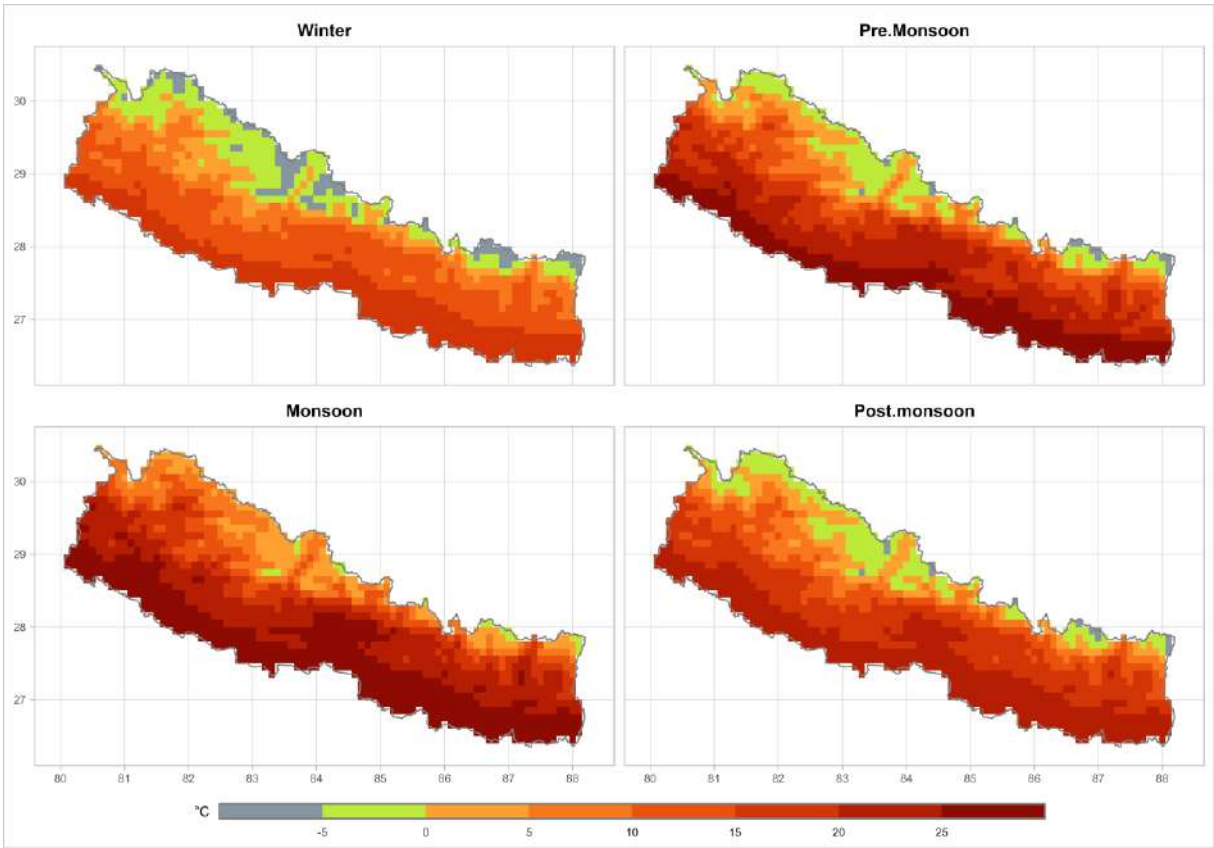

Figure 10.3: Spatial distribution of observed (1981–2010) seasonal maximum temperature (°C).

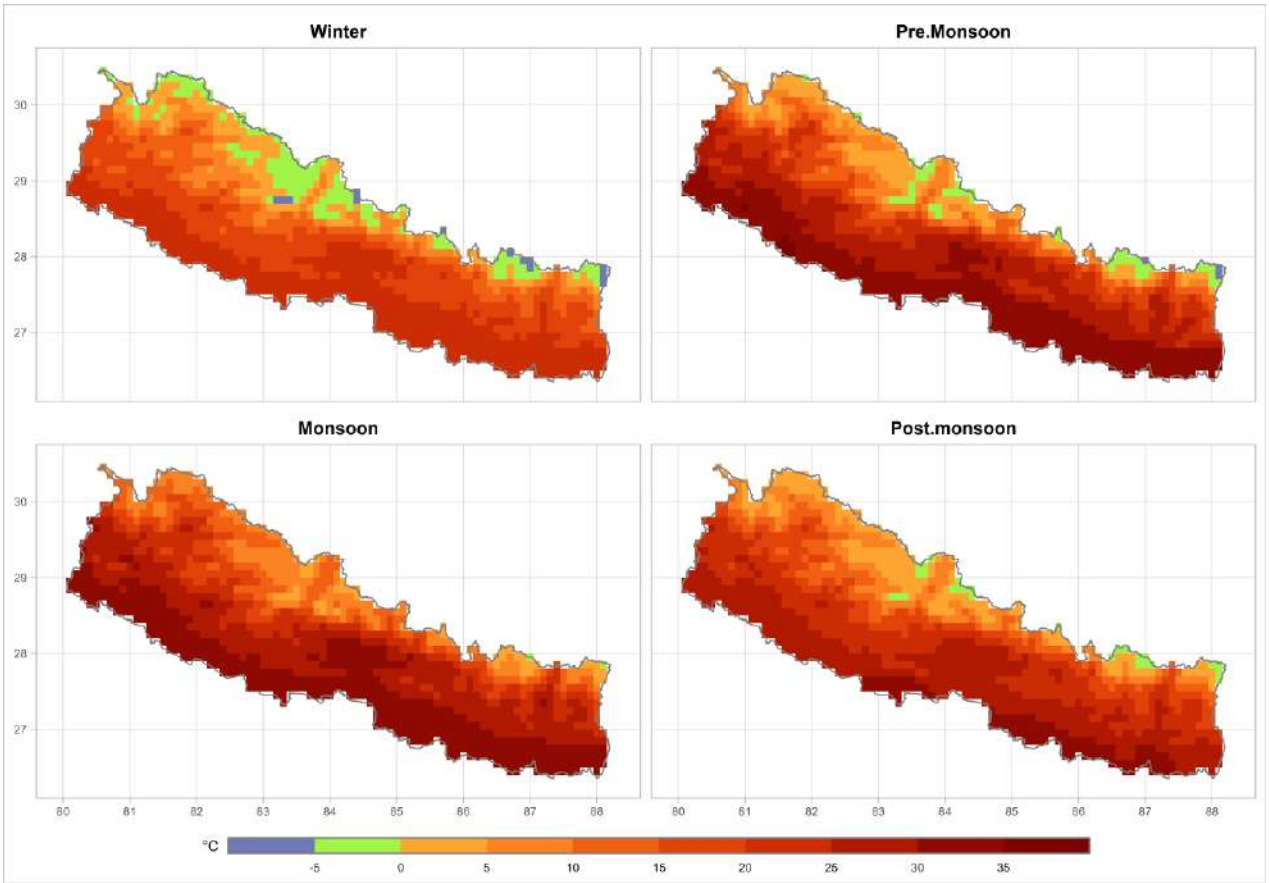

Figure 10.4: Spatial distribution of observed (1981–2010) seasonal minimum temperature (°C).

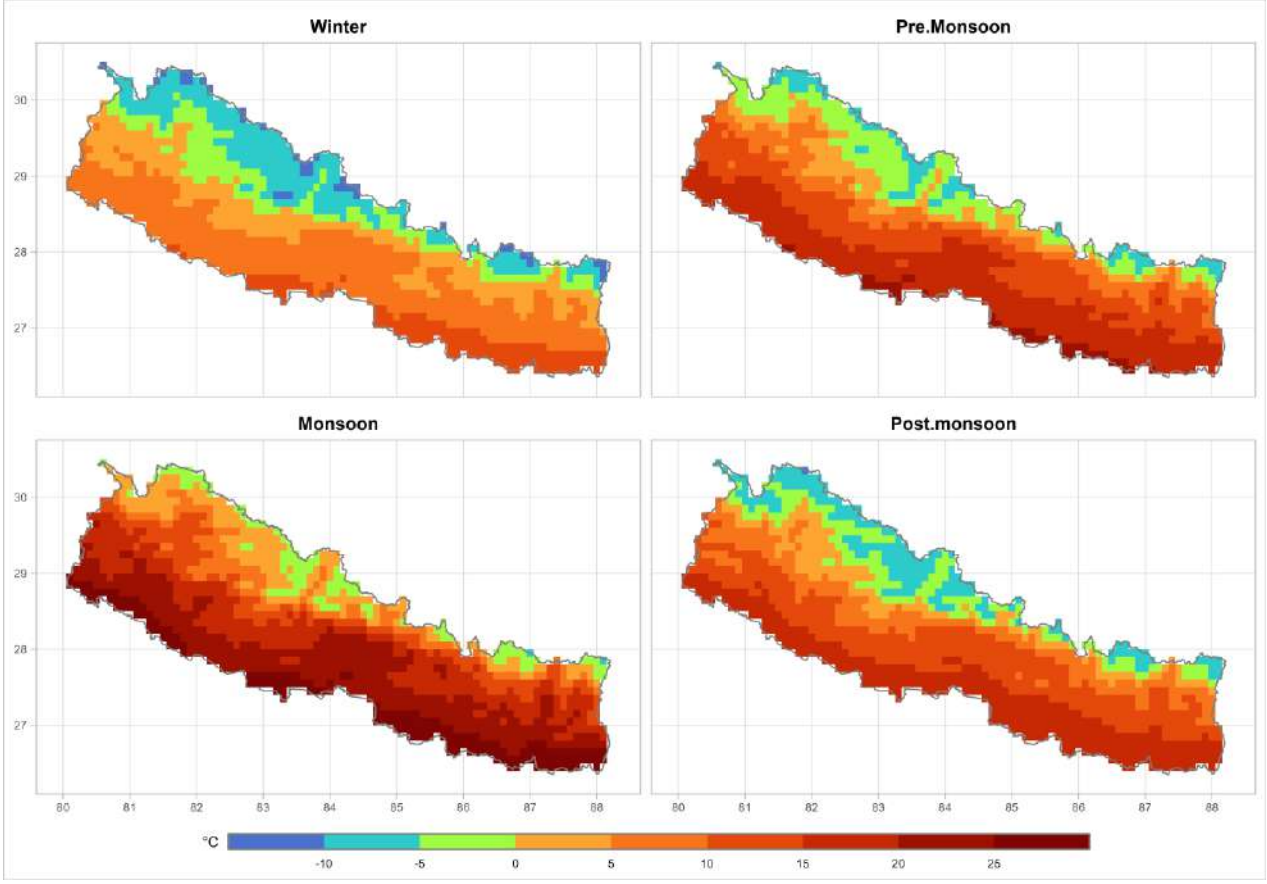

Figure 10.5: Spatial distribution of observed (1981–2010) seasonal diurnal temperature range (°C).

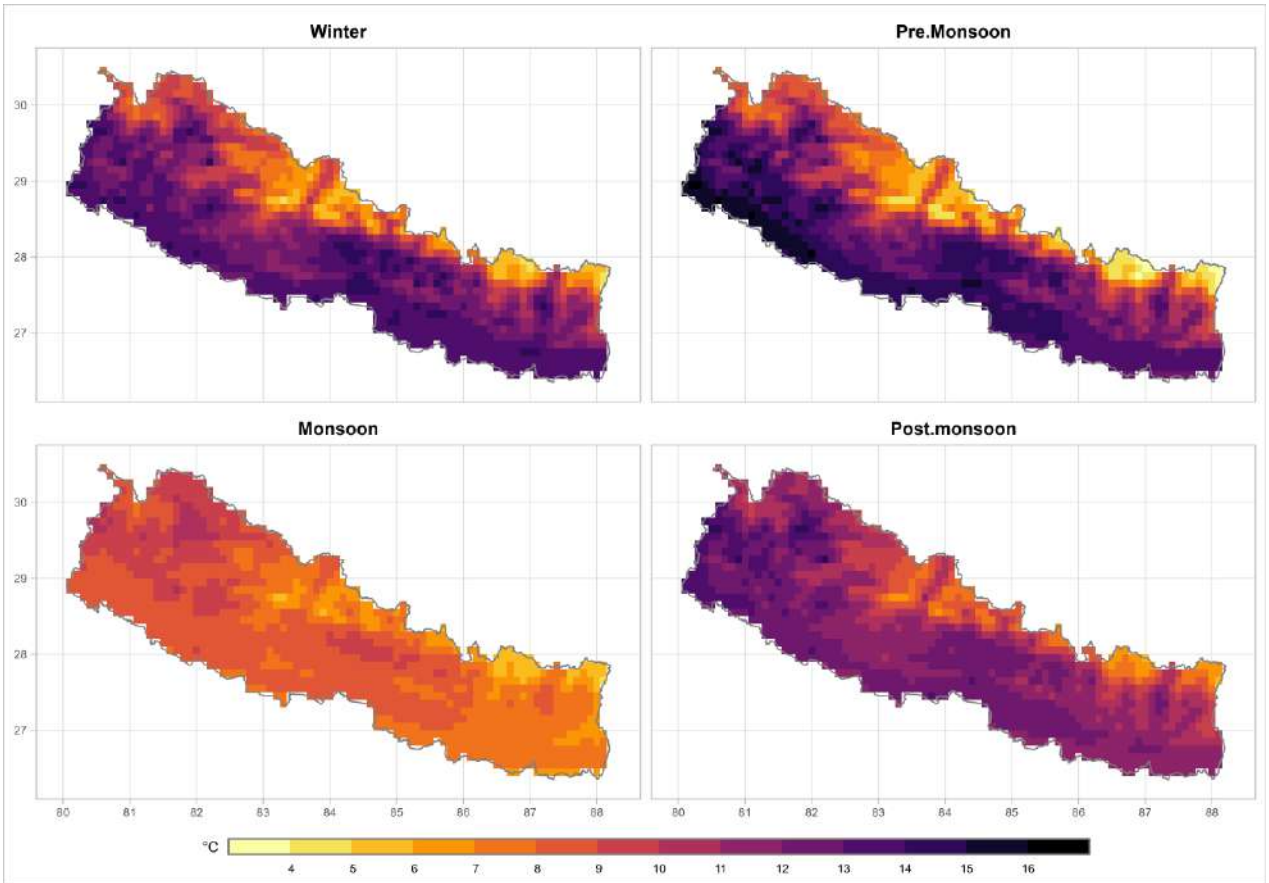
Winter
Pre.Monsoon
Monsoon
Post.monsoon
30
29
28
27
80
81
82
83
84
85
86
87
88
°C
4
5
6
7
8
9
10
11
12
13
14
15
16

Figure 10.6: Spatiotemporal variation of projected change in seasonal precipitation (%) during medium-term, long-term and end of century compared to the baseline period (1981–2010) for SSP2-4.5 scenario. Results are an ensemble average of selected four models.

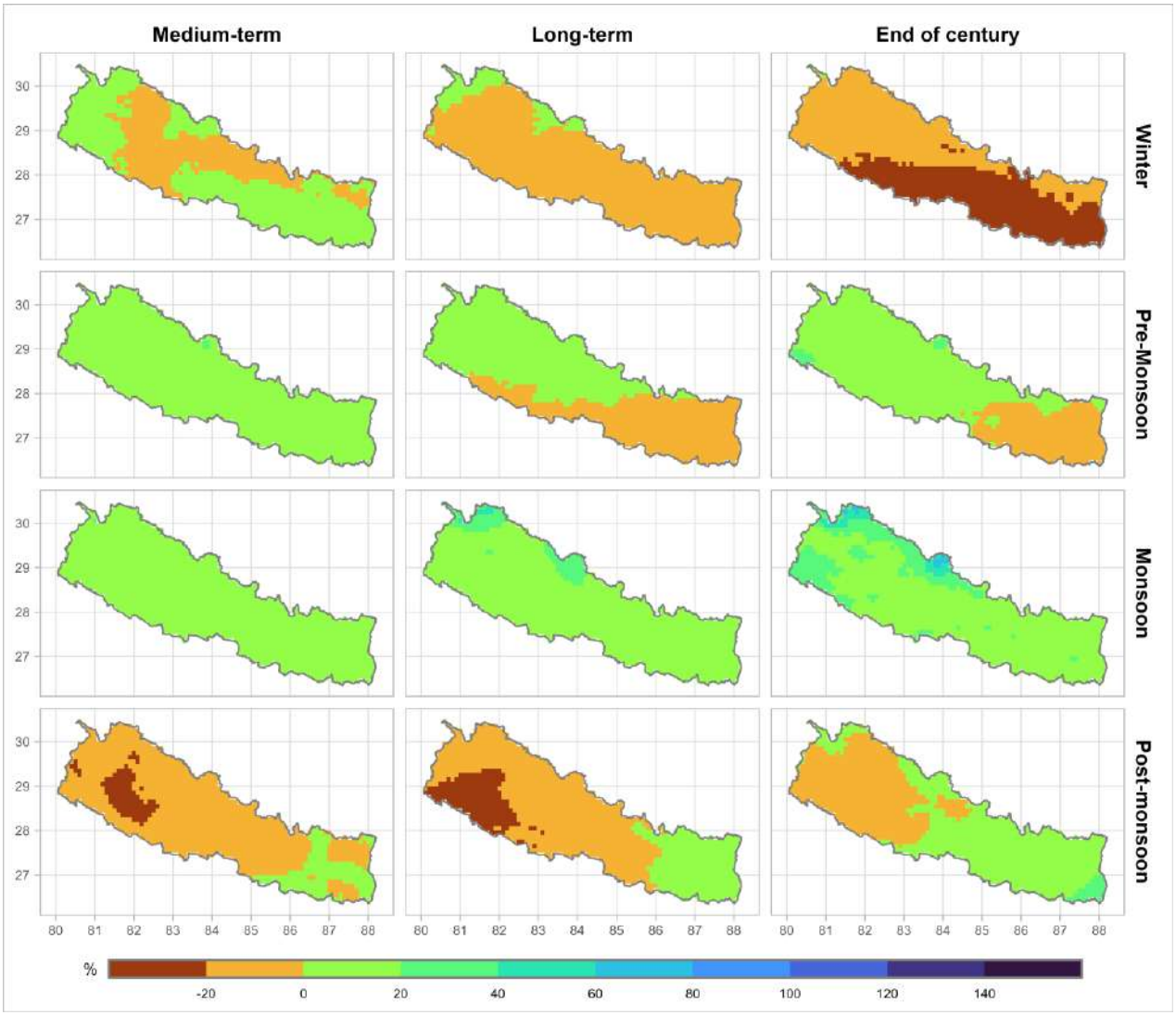

Figure 10.7: Spatiotemporal variation of projected change in seasonal precipitation (%) during medium-term, long-term and end of century compared to the baseline period (1981–2010) for SSP5-8.5 scenario. Results are an ensemble average of selected four models.

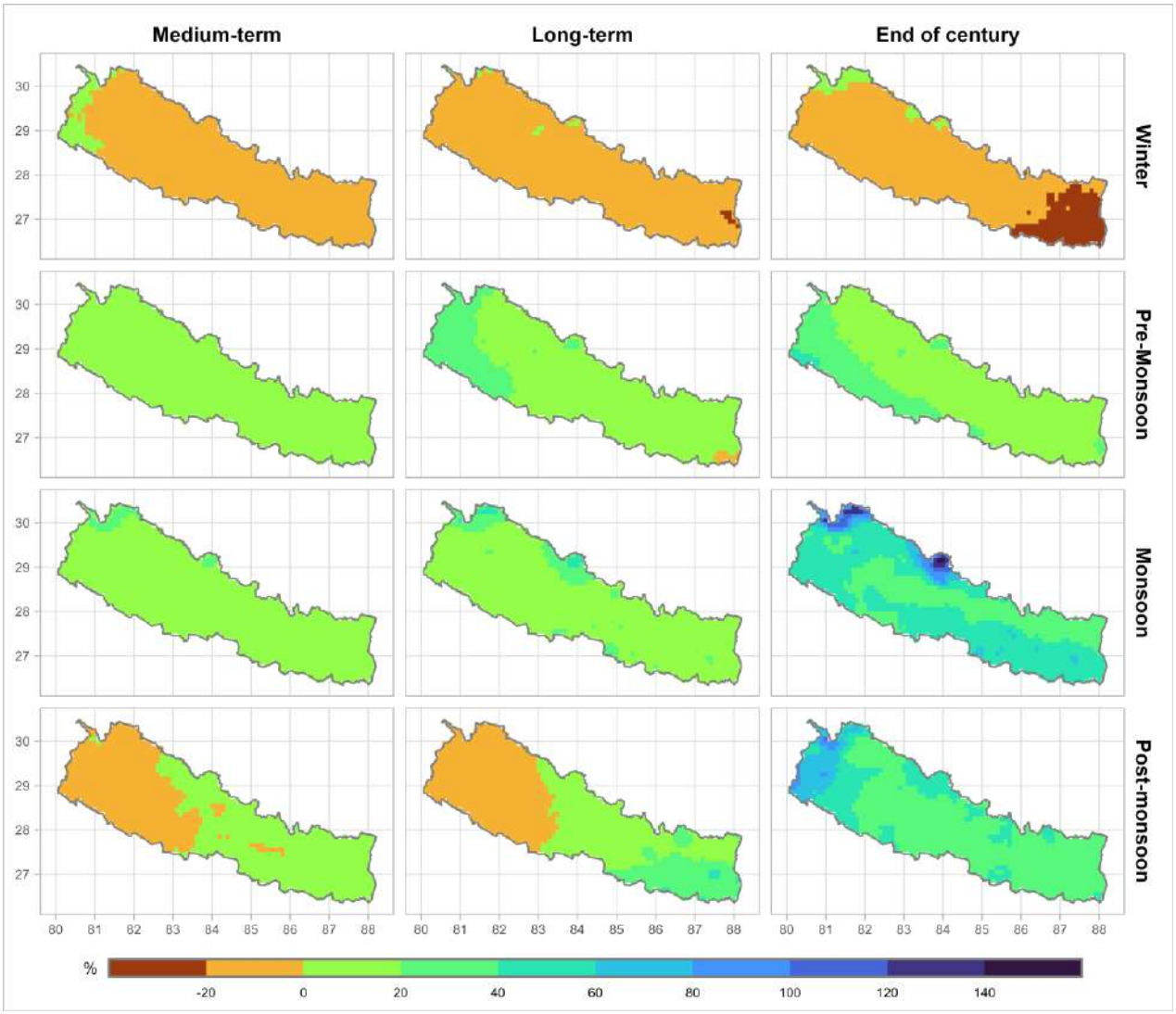

Figure 10.8: Spatiotemporal variation of projected change in seasonal mean temperature (°C) during medium-term, long-term and end of century compared to the baseline period (1981–2010) for SSP5-8.5 scenario. Results are an ensemble average of selected four models.

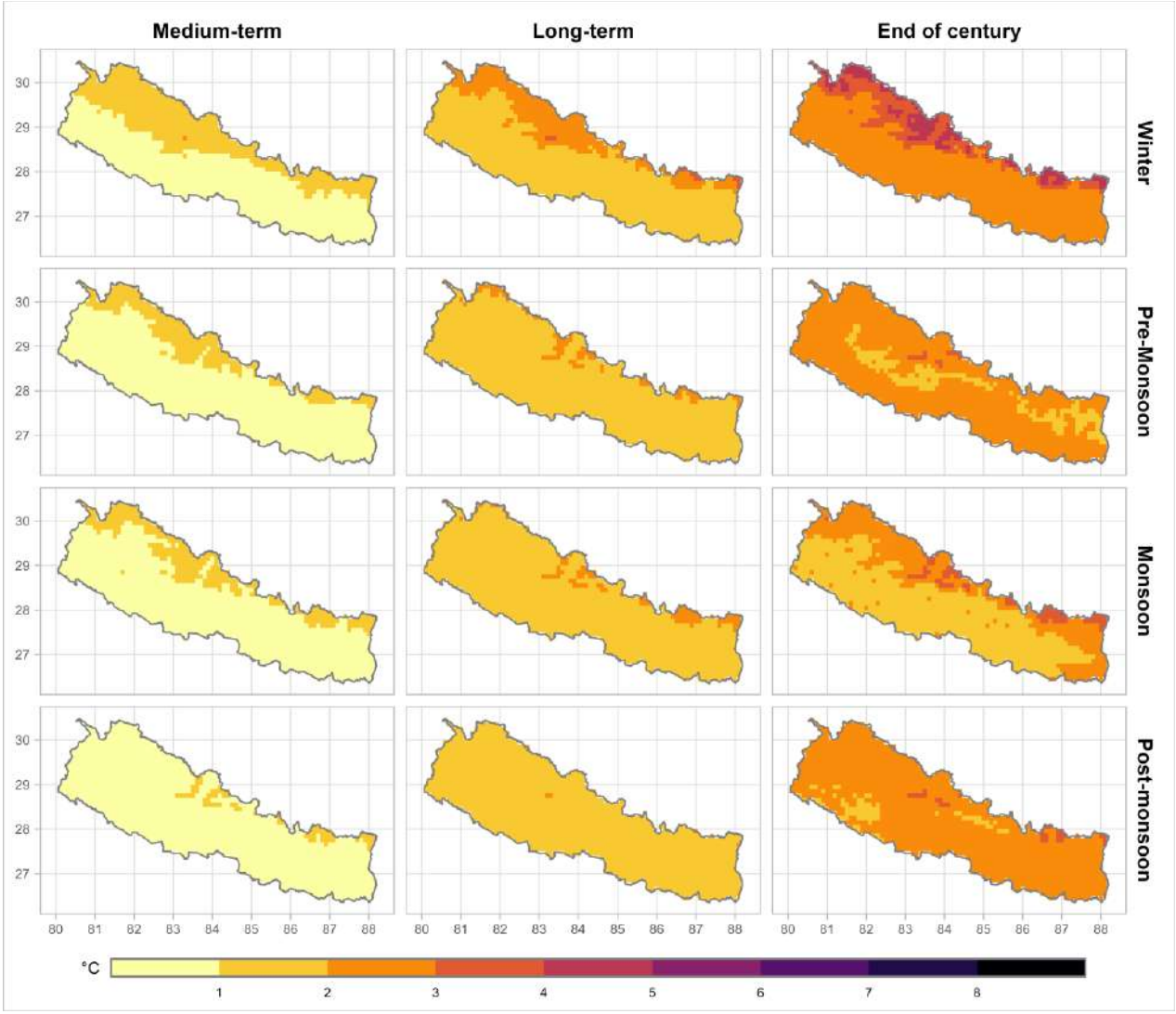

Figure 10.9: Spatiotemporal variation of projected change in seasonal mean temperature (°C) during medium-term, long-term and end of century compared to the baseline period (1981–2010) for SSP5-8.5 scenario. Results are an ensemble average of selected four models.

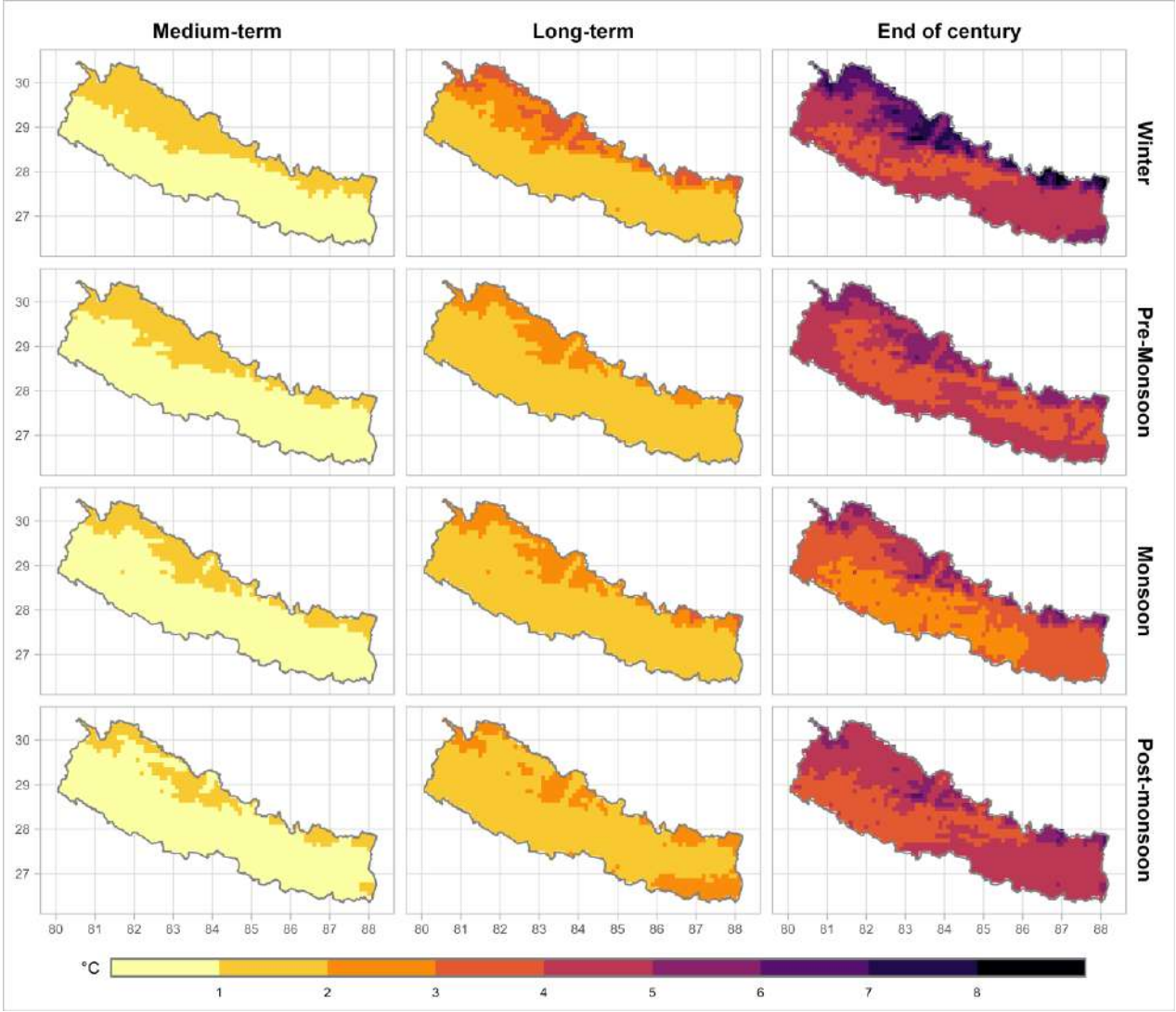

Figure 10.10: Spatiotemporal variation of projected change in seasonal maximum temperature (°C) during medium-term, long-term and end of century compared to the baseline period (1981–2010) for SSP2-4.5 scenario. Results are an ensemble average of selected four models.

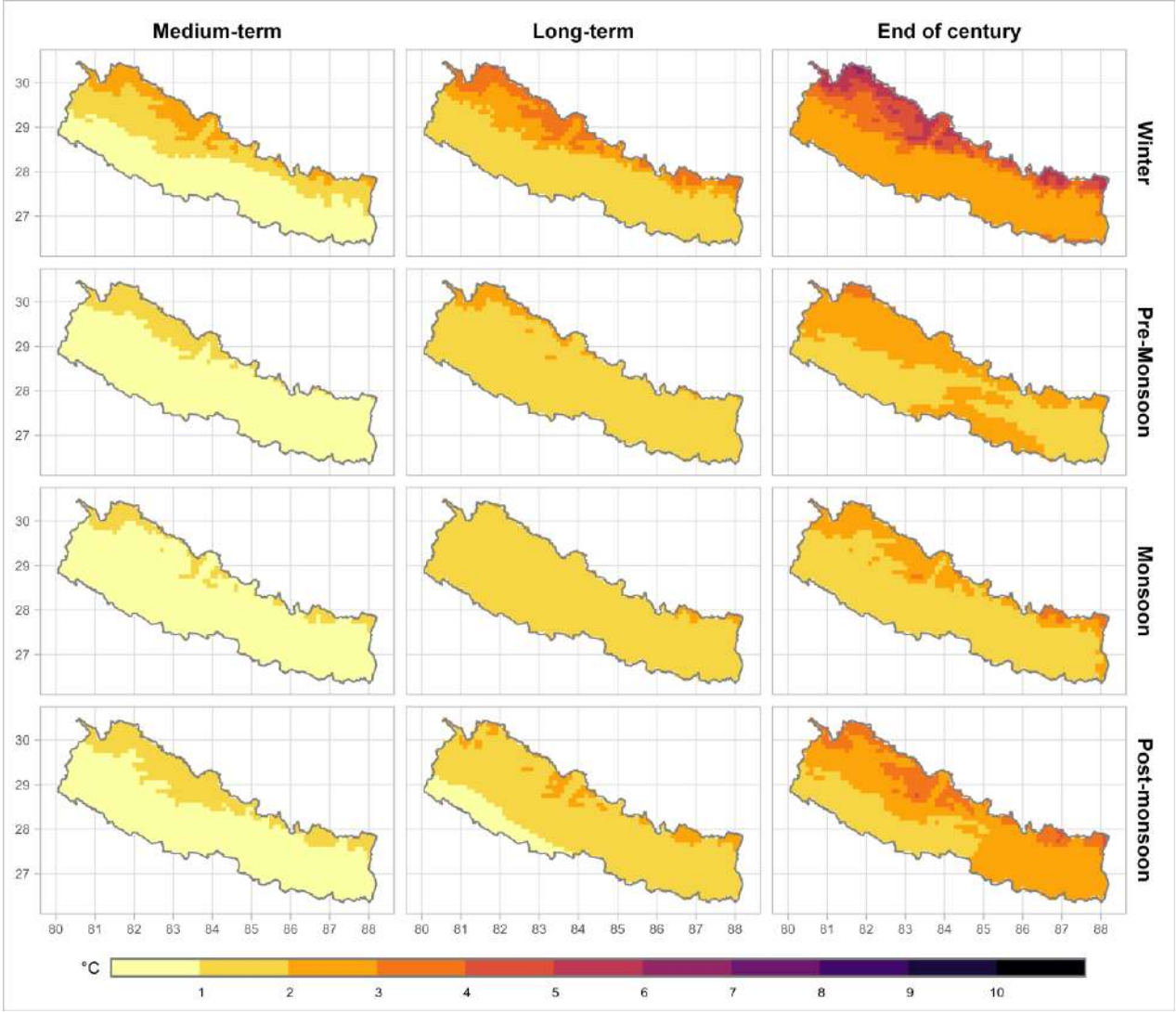

Figure 10.11: Spatiotemporal variation of projected change in seasonal maximum temperature (°C) during medium-term, long-term and end of century compared to the baseline period (1981–2010) for SSP5-8.5 scenario. Results are an ensemble average of selected four models.

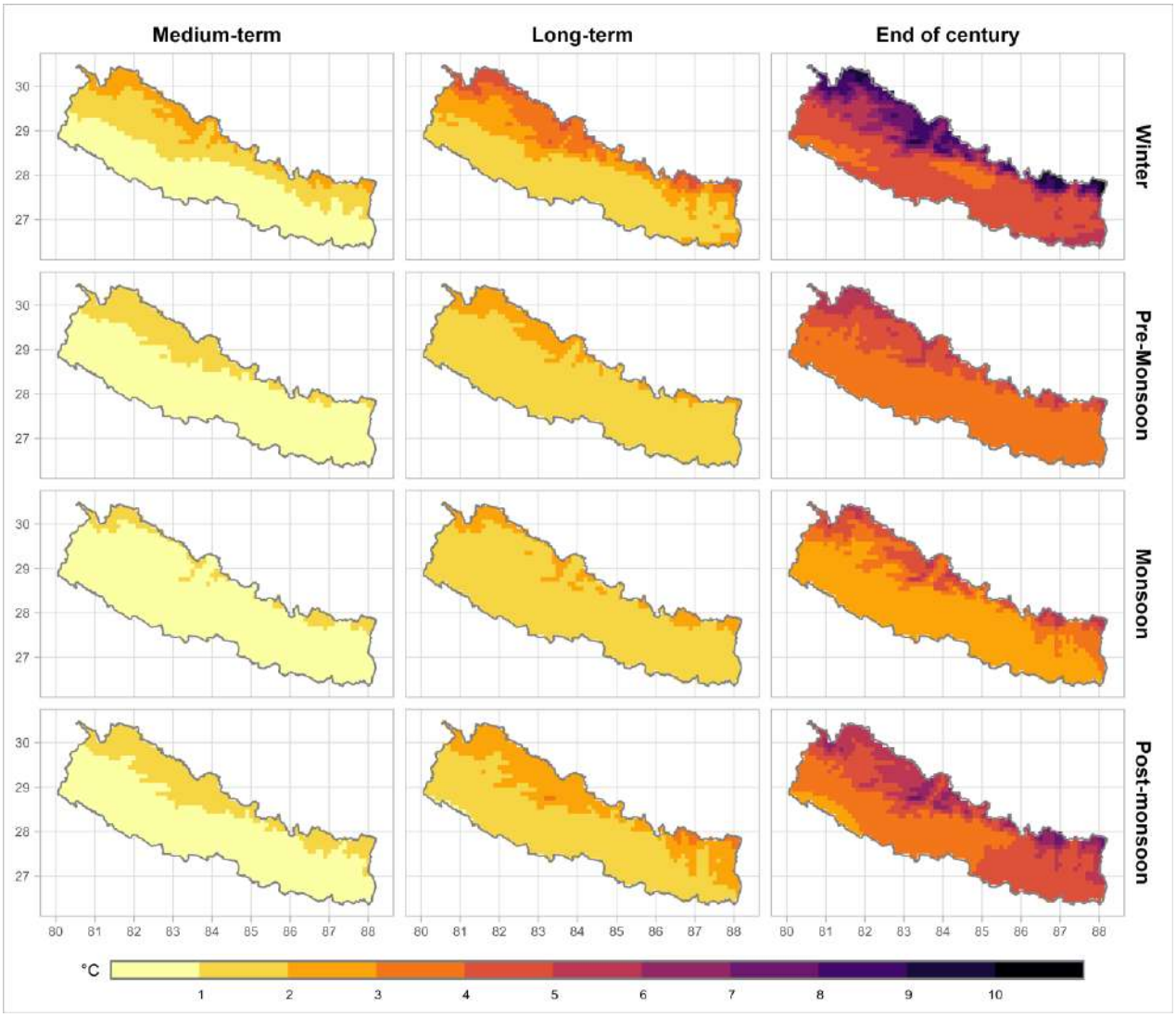

Figure 10.12: Spatiotemporal variation of projected change in seasonal minimum temperature (°C) during medium-term, long-term and end of century compared to the baseline period (1981–2010) for SSP2-4.5 scenario. Results are an ensemble average of selected four models.

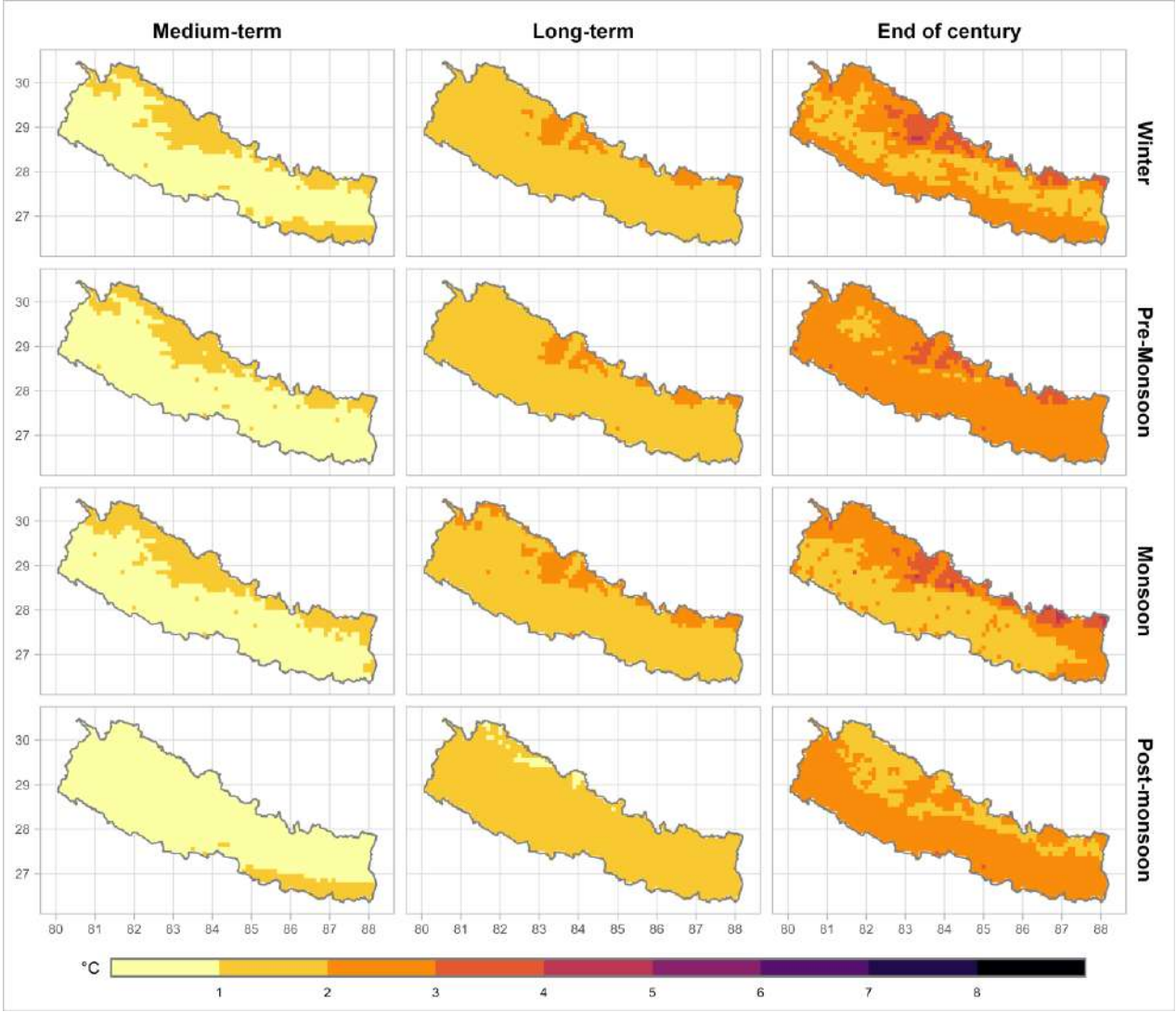

Figure 10.13: Spatiotemporal variation of projected change in seasonal minimum temperature (°C) during medium-term, long-term and end of century compared to the baseline period (1981–2010) for SSP5-8.5 scenario. Results are an ensemble average of selected four models.

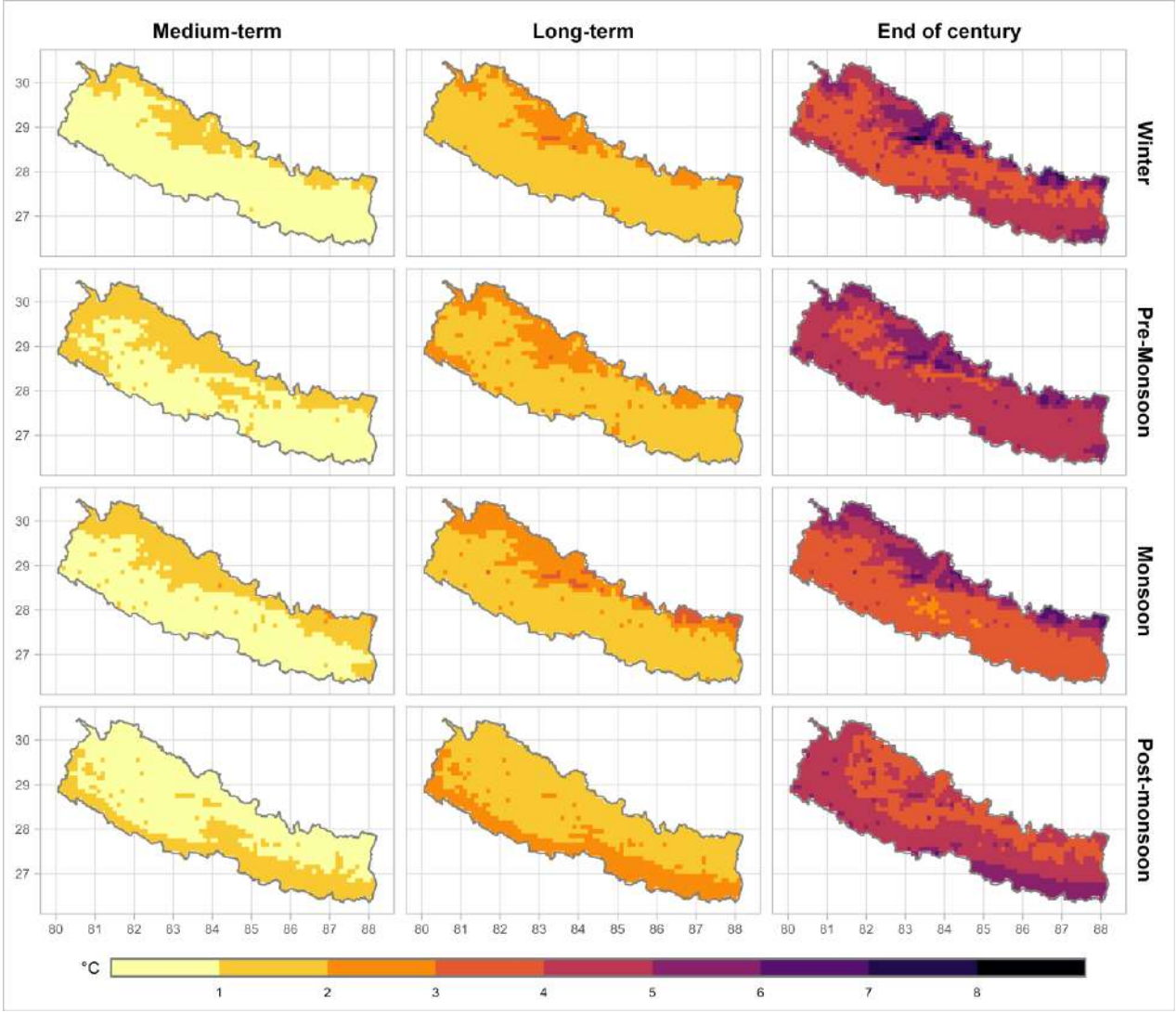

Figure 10.14: Spatiotemporal variation of projected change in seasonal diurnal temperature range (°C) during medium-term, long-term and end of century compared to the baseline period (1981–2010) for SSP2-4.5 scenario. Results are an ensemble average of selected four models

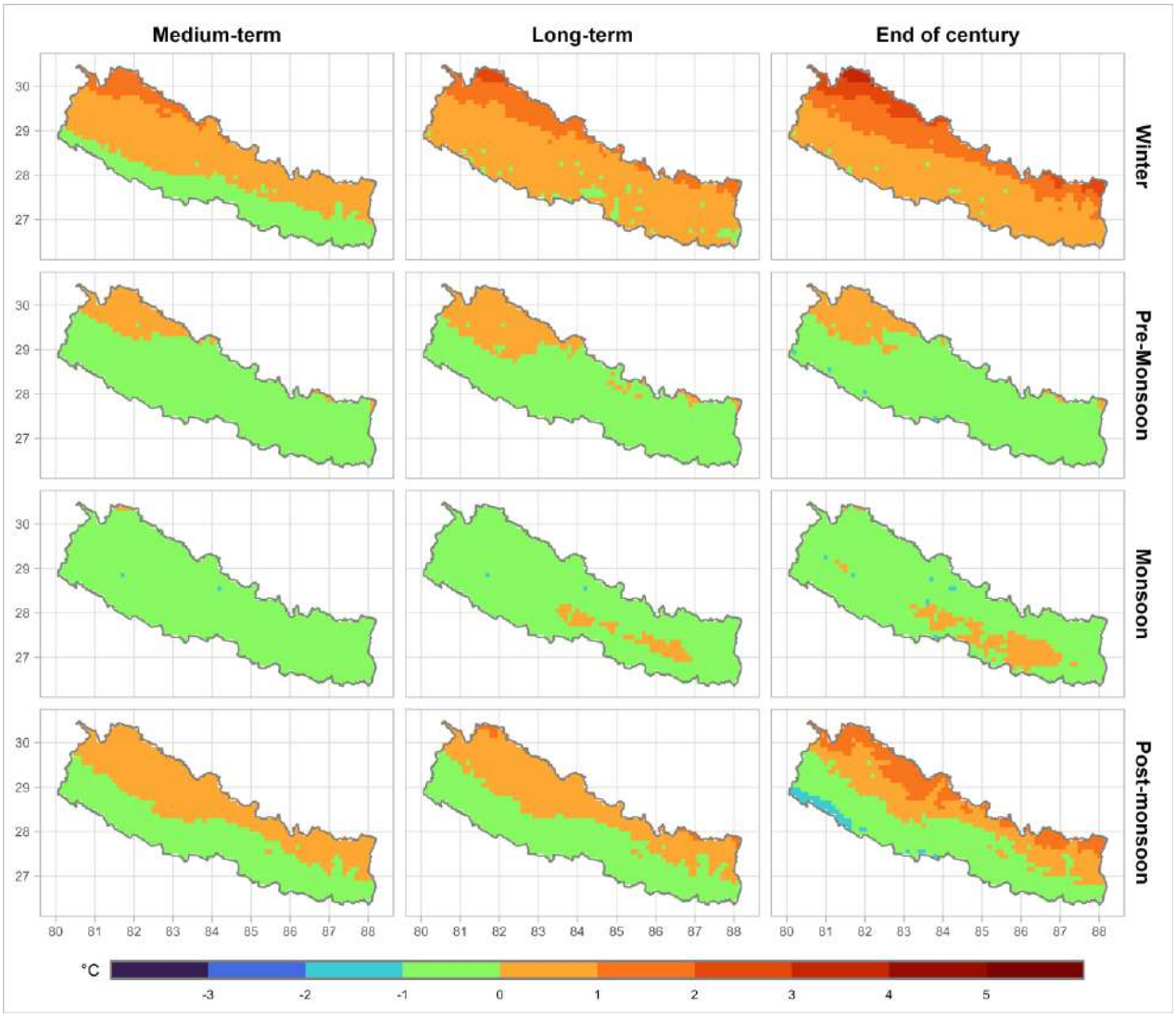

Figure 10.15: Spatiotemporal variation of projected change in seasonal diurnal temperature range (°C) during medium-term, long-term and end of century compared to the baseline period (1981–2010) for SSP5-8.5 scenario. Results are an ensemble average of selected four models