Projection of Thermal Bioclimate of Egypt for the Paris Agreement Goals

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Table S1. CMIP6 GCMs used in the study.

Institution / Country	Model	Resolution
Canadian Centre for Climate Modelling and Analysis, Victoria, Canada	CanESM5	2.79°×2.81°
EC-Earth Consortium, Netherlands/Ireland	EC-Earth3-Veg	0.35°×0.35°
	EC-Earth3-Veg-LR	0.35°×0.35°
Chinese Academy of Sciences Flexible Global Ocean-Atmosphere–Land System model, China	FGOALS-g3	2.00°×2.00°
Geophysical Fluid Dynamics Laboratory, NJ, USA	GFDL-ESM4	1.00°×1.25°
Institute Pierre Simon Laplace (IPSL), Paris, France	IPSL-CM6A-LR	2.50°×1.27°
Japan Agency for Marine-Earth Science and Technology (JAMSTEC), Kanagawa, Japan	MIROC6	1.40°×1.40°
Meteorological Research Institute, Ibaraki, Japan	MRI-ESM2-0	1.125°×1.125°

Table S2. Description of thermal bioclimatic indicators, where T_{avg} is the mean temperature.

Name	Description	Equation	Unit
Bio-1 Annual mean temperature	Annual mean temperature	$Bio-1=\frac{\sum_{i=1}^{i=12} Tavg_i}{12}$	°C
Bio-2 Diurnal temperature range	Annual mean diurnal range	$Bio-2=\frac{\sum_{i=1}^{i=12}(Tmax_i-Tmin_i)}{12}$	°C
Bio-3 Isothermality	Day-to-night temperatures oscillate relative to annual oscillations	$Bio-3=\frac{Bio-2}{Bio-7}\times 100$	%

Name	Description	Equation	Unit
Bio-4 Temperature variation within a year	The amount of temperature variation over averaged years based on the standard deviation	$Bio-4 = SD\{Tavg_1, \dots, Tavg_{12}\} \times 100$	%
Bio-5 Tmax in the hottest month	The maximum monthly temperature over an average span of years	$Bio-5 = \max(\{Tmax_1, \dots, Tmax_{12}\})$	°C
Bio-6 Tmin in the coldest month	The minimum monthly temperature over an average span of years	$Bio-6 = \min(\{Tmin_1, \dots, Tmin_{12}\})$	°C
Bio-7 Annual temperature range	Temperature variation over a given period	$Bio-7 = Bio-5 - Bio-6$	°C
Bio-8 Mean temperature of wettest quarter	The average temperature over the consecutive 3 months has the highest precipitation in a year	$Q_{max} = max\left(\sum_{i=1}^{i=3} Rainfall_i, \sum_{i=2}^{i=4} Rainfall_i \dots, \sum_{i=11}^{i=1} Rainfall_i, \sum_{i=12}^{i=2} Rainfall_i\right)$ $Bio-8 = \frac{\sum_{i=1}^{i=3} Tavg_i}{3}$, based on the three selected months of Q_{max}	°C
Bio-9 Mean temperature of driest quarter	The average temperature over the consecutive 3 months has the least precipitation in a year	$Q_{min} = min\left(\sum_{i=1}^{i=3} Rainfall_i, \sum_{i=2}^{i=4} Rainfall_i \dots, \sum_{i=11}^{i=1} Rainfall_i, \sum_{i=12}^{i=2} Rainfall_i\right)$ $Bio-9 = \frac{\sum_{i=1}^{i=3} Tavg_i}{3}$, based on the three selected months of Q_{min}	°C

Name	Description	Equation	Unit
Bio-10 Mean temperature of warmest quarter	The average temperature over the consecutive 3 months has been the highest in the year	$Q_{max} = max\begin{pmatrix}\sum_{i=1}^{i=3} Tavg_i \\ \sum_{i=2}^{i=4} Tavg_i \\ \cdots, \\ \sum_{i=11}^{i=1} Tavg_i \\ \sum_{i=12}^{i=2} Tavg_i\end{pmatrix}$ $Bio-10 = \frac{\sum_{i=1}^{i=3} Tavg_i}{3}$, based on the three selected months of Q_{max}	°C
Bio-11 Mean temperature of coldest quarter	The average temperature over the consecutive 3 months has been the lowest in the year	$Q_{min} = min\begin{pmatrix}\sum_{i=1}^{i=3} Tavg_i \\ \sum_{i=2}^{i=4} Tavg_i \\ \cdots, \\ \sum_{i=11}^{i=1} Tavg_i \\ \sum_{i=12}^{i=2} Tavg_i\end{pmatrix}$ $Bio-11 = \frac{\sum_{i=1}^{i=3} Tavg_i}{3}$, based on the three selected months of Q_{min}	°C