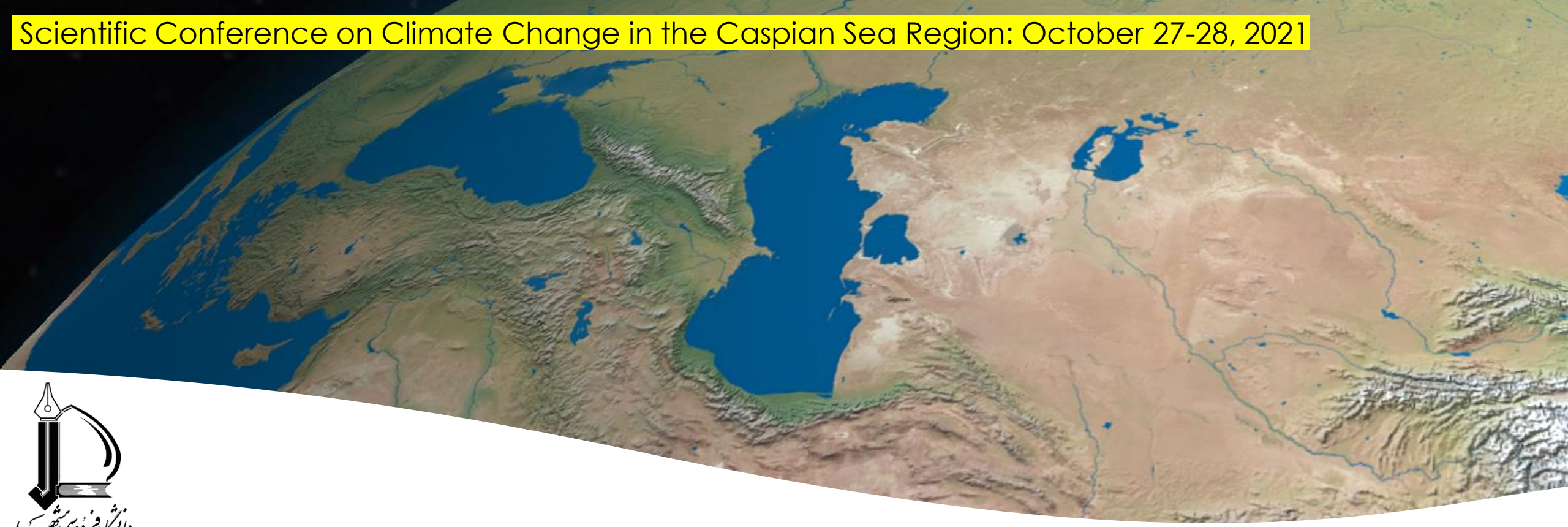
Scientific Conference on Climate Change in the Caspian Sea Region: October 27-28, 2021



Projected changes in precipitation intensity in the southern coast of the Caspian Sea using a CMIP6 multi-model ensemble

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Precipitation is one of the key climate variables and any changes in the characteristics of it (intensity and frequency) is very important.

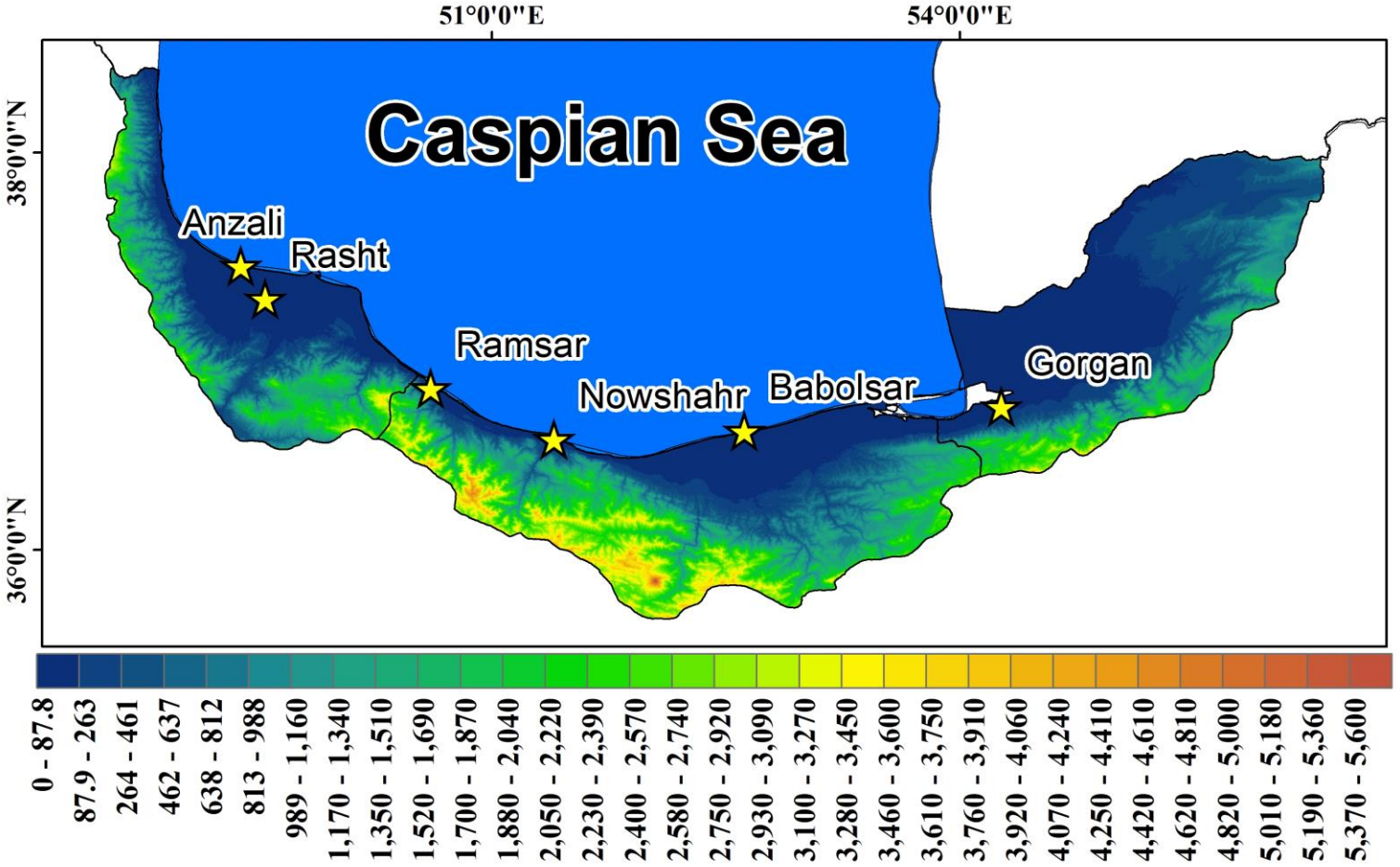
Increasing the frequency of extreme precipitation events may have major impacts: floods, soil erosion and water resources.

The purpose of this study

To project precipitation by using Simple Daily Intensity Index (SDII) on the southern coast of the Caspian Sea.

Study area

The study area is the southern coast of the Caspian Sea in Iran. This region includes three provinces of Golestan, Mazandaran, and Gilan.

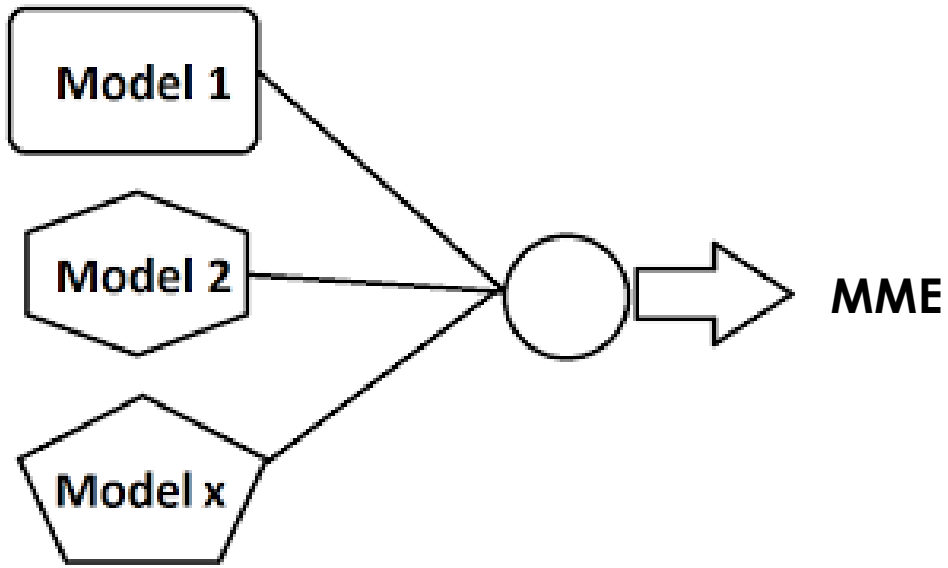


Information of the Five CMIP6 Bias-Correction models used in this study

Model	Institute	Resolution	Variant Label	Source Type	Realm
GFDL-ESM4	Geophysical Fluid Dynamics Laboratory (GFDL)	0.5°×0.5°	r1i1p1f1	AOGCM	atmos
IPSL-CM6A-LR	Institute Pierre-Simon Laplace (IPSL)				
MPI-ESM1-2-HR	Max Planck Institute Earth System Model				
MRI-ESM2-0	Meteorological Research Institute (MRI)				
UKESM1-0-LL	Met Office Hadley Centre				

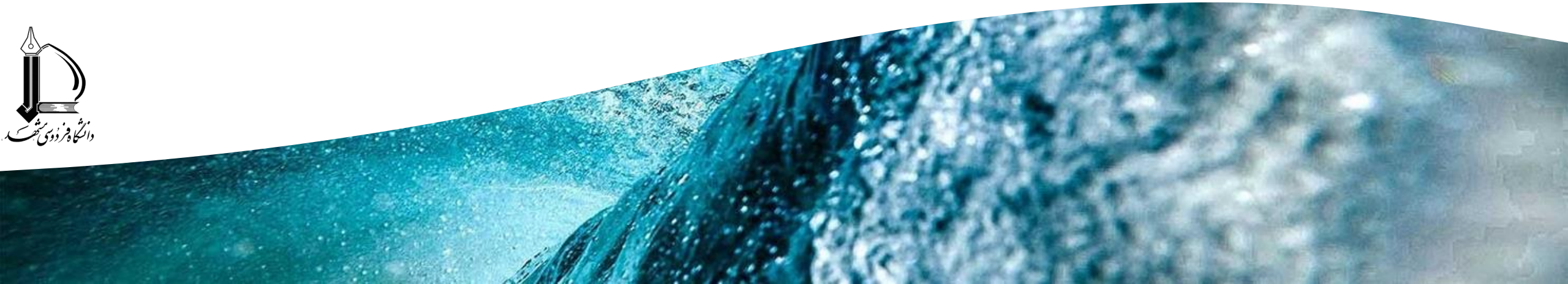
Multi Models Ensemble (MME)

The independence weighted mean (IWM) method was applied to generate the Multi Models Ensemble (MME).



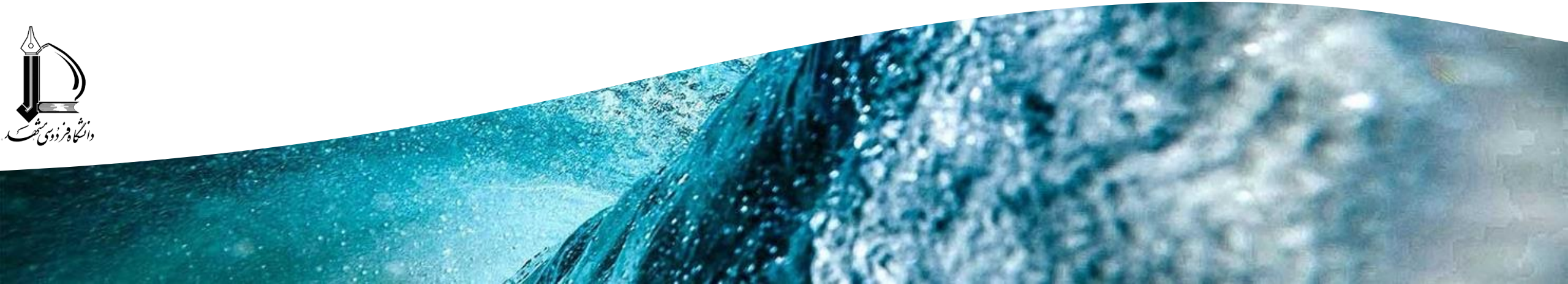
Selected Shared Socioeconomic Pathways (SSP) scenario

scenario		Narrative	Challenges
SSP1	**2.6**	Sustainability – Taking the Green Road	Low for mitigation and adaptation
SSP3	**7.0**	Regional Rivalry – A Rocky Road	High for mitigation and adaptation
SSP5	**8.5**	Fossil-fueled Development – Taking the Highway	High for mitigation, low for adaptation

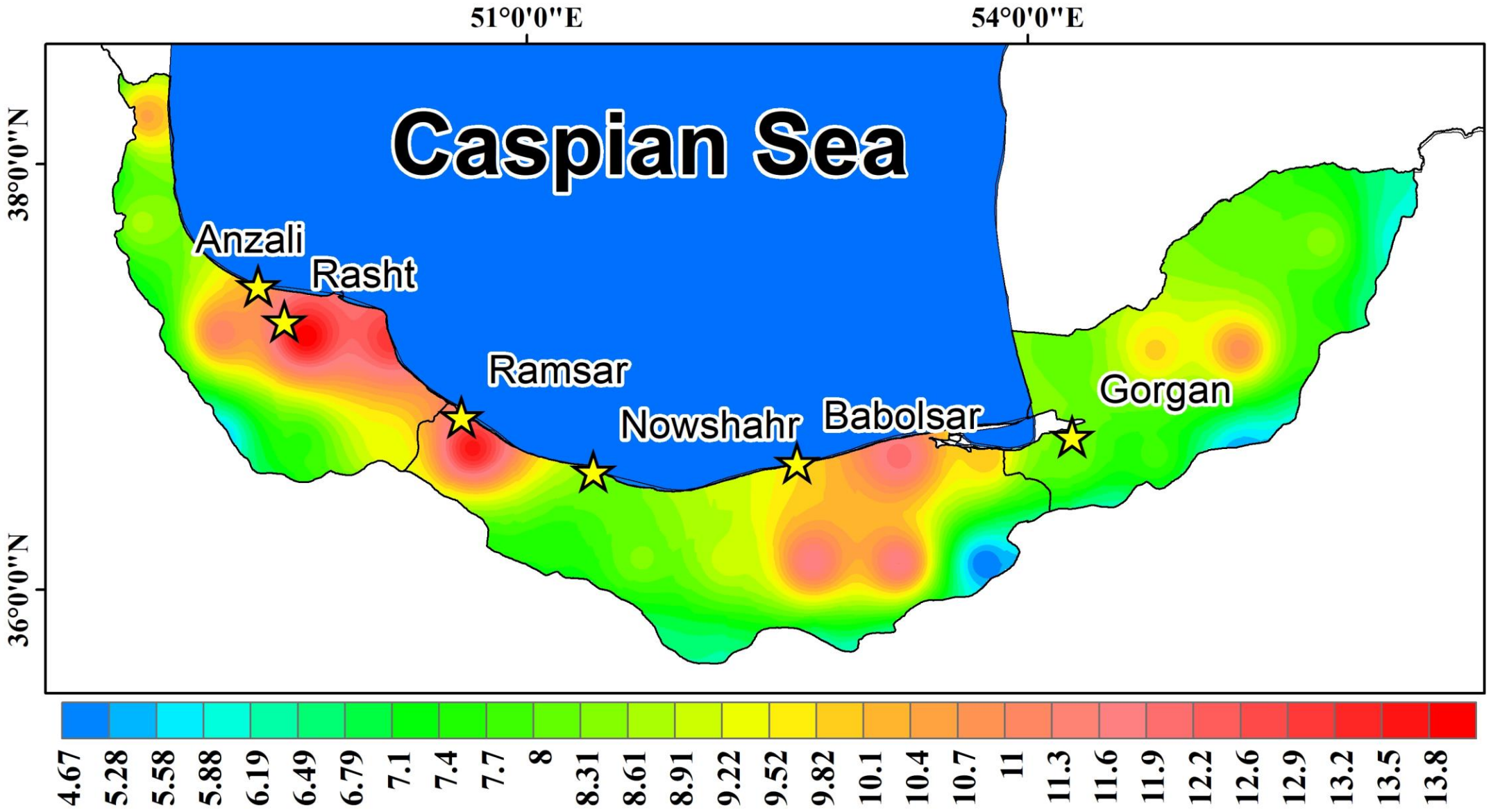


Simple Daily Intensity Index (SDII)

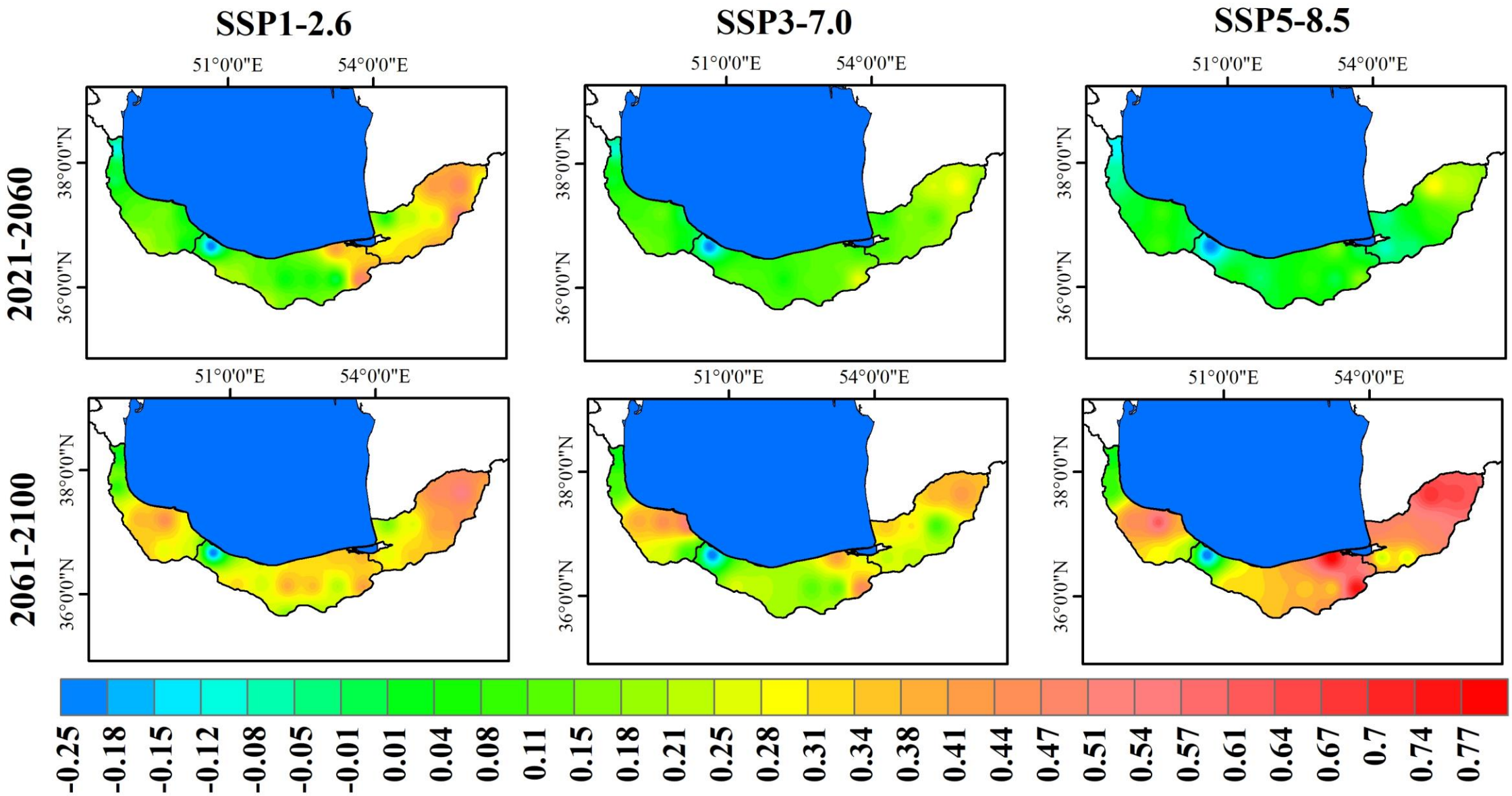
Short name	Long name	Definition	Plain language description	Units
SDII	Daily PR intensity	Annual total PR divided by the number of wet days (when total PR >= 1.0 mm)	Average daily wet-day rainfall intensity	mm/day



Historical variability intensity of daily precipitation (SDII) based on CMIP6-MME



Projection of intensity of daily precipitation (SDII) based on CMIP6-MME



Thank you!

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