Variation in consumptive water use and water use efficiency across terrestrial ecosystem in the Lower Mekong Basin

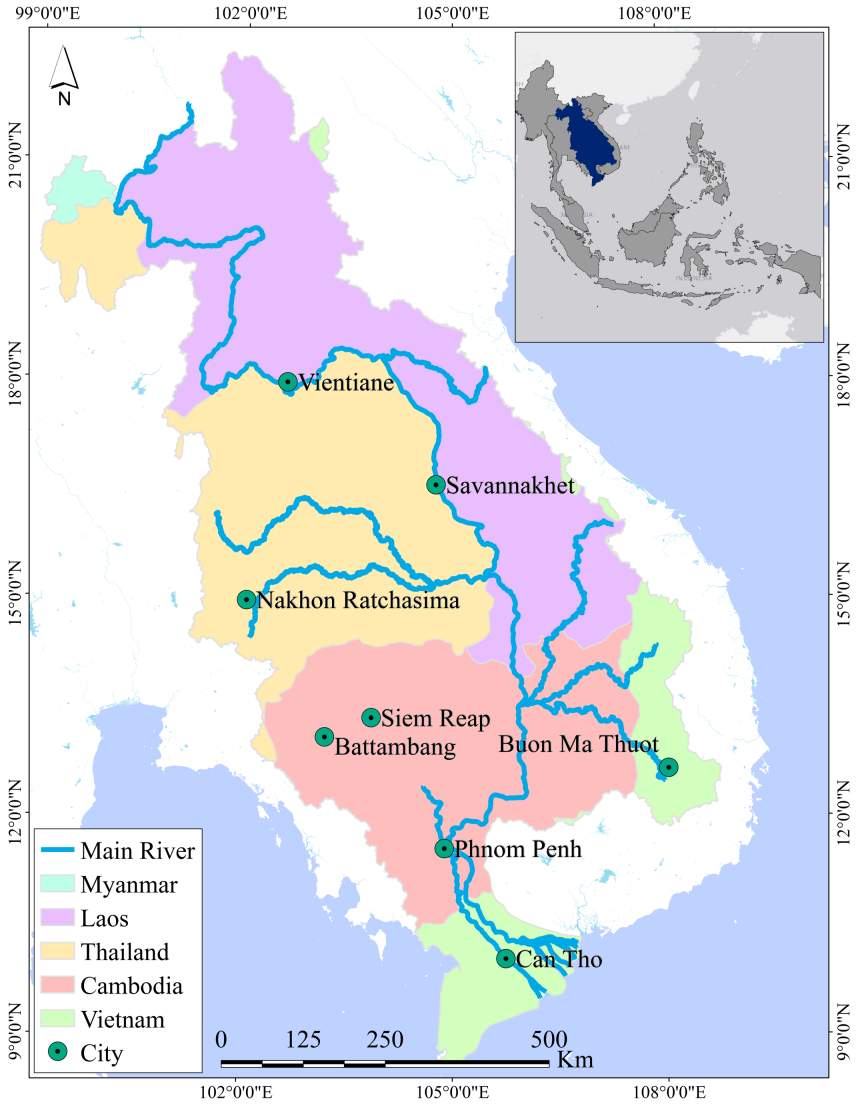
Yubin Li (PhD Candidate)

School of Geographical Sciences and Urban Planning

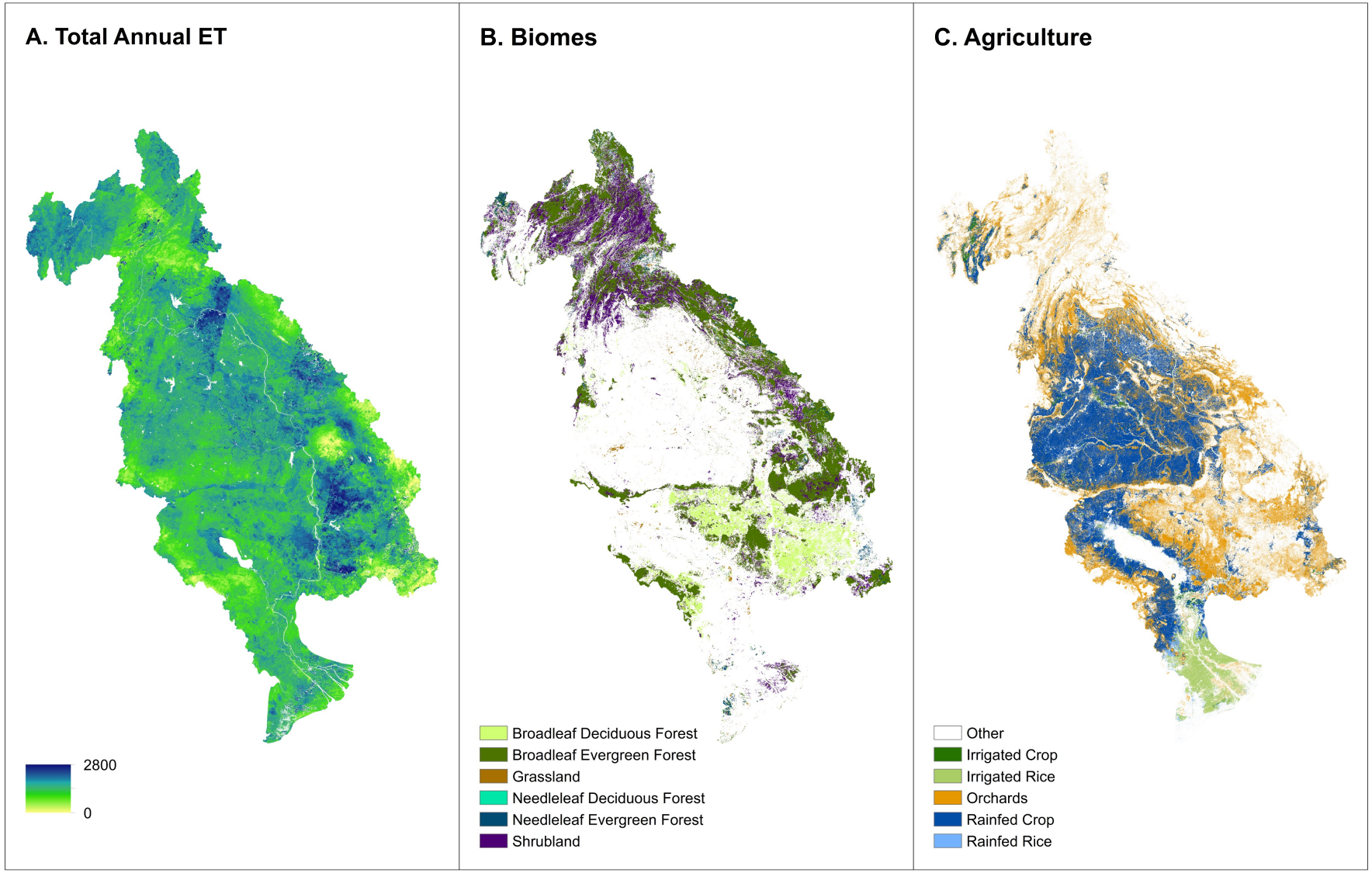
Arizona State University

Research Questions

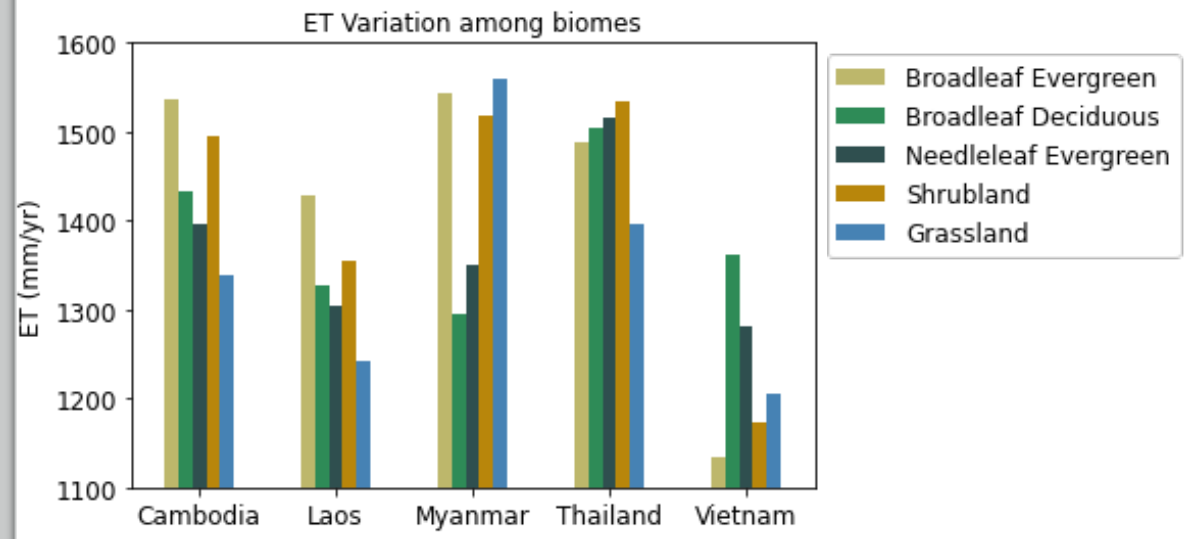
- How does consumptive water use vary in the LMB? What are the factors that drive the variation?
- How does water use efficiency vary considering the seasonality? What are the factors that WUE vary within a single biome?



Landsat and ECOSTRESS ET



Consumptive Water Use Variation



Terrestrial water use in each country

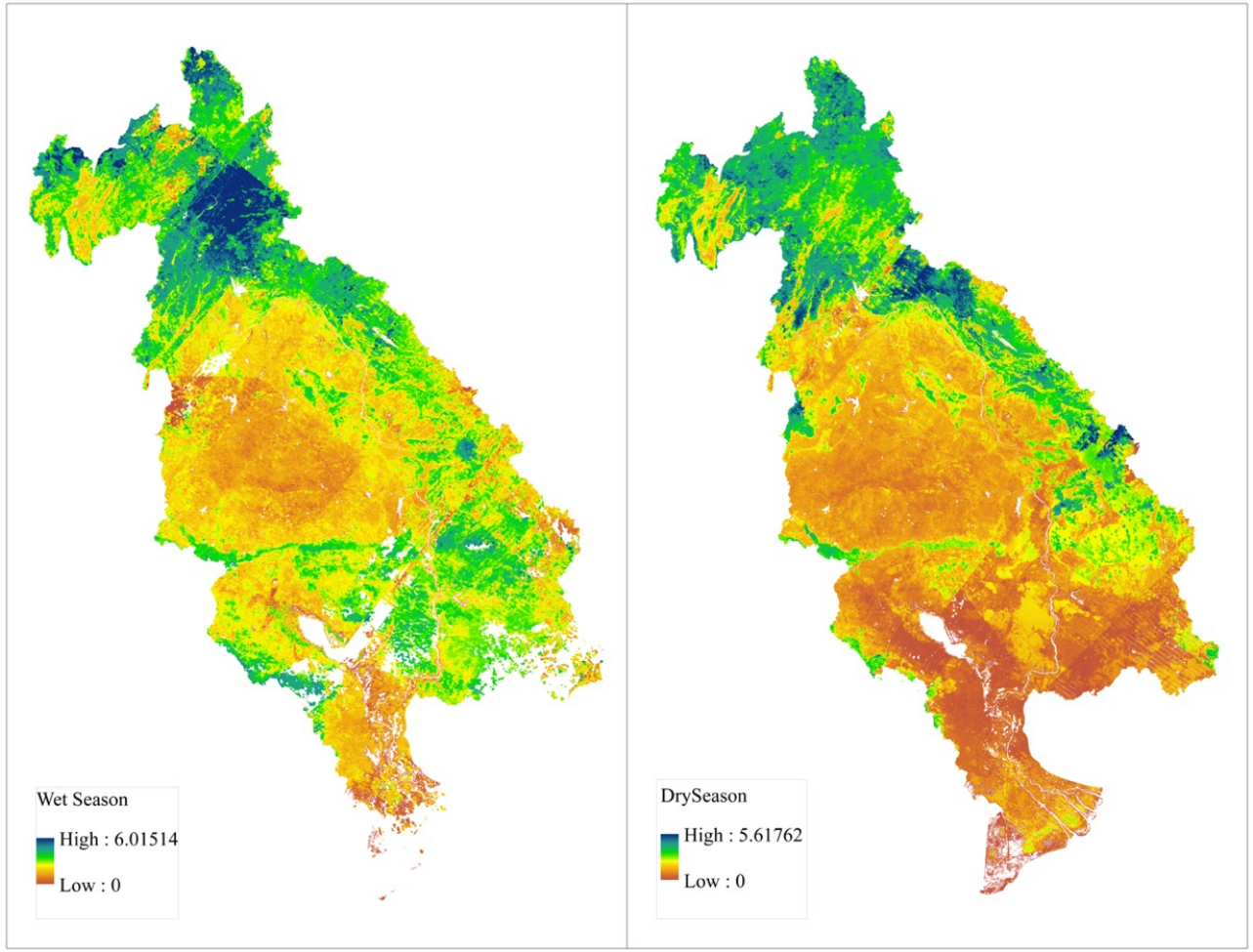
Biomes	ET vs. Elevation	
	Slope	R^2
Broadleaf Evergreen	1.48	0.61
Broadleaf Deciduous	2.62	0.32
Needleleaf Evergreen	1.18	0.72
Shrubland	1.61	0.65
Grassland	2.61	0.35

Consumptive water use and elevation

Consumptive water use variation in biomes and climate zones – ANOVA test

	df	Sum of Squares	Mean Squares	F value	Significance
Biomes	4	2.49e+09	6.21e+08	5977	***
Climate Zones	4	1.41e+10	3.51e+09	33,798	***
Biomes x Climate Zones	13	1.61e+09	1.24e+08	1192	***
Residuals	2,390,472	2.48e+11	1.04e+05		

ECOSTRESS WUE in wet/dry season



WUE variation across biomes and climate zones – ANOVA test

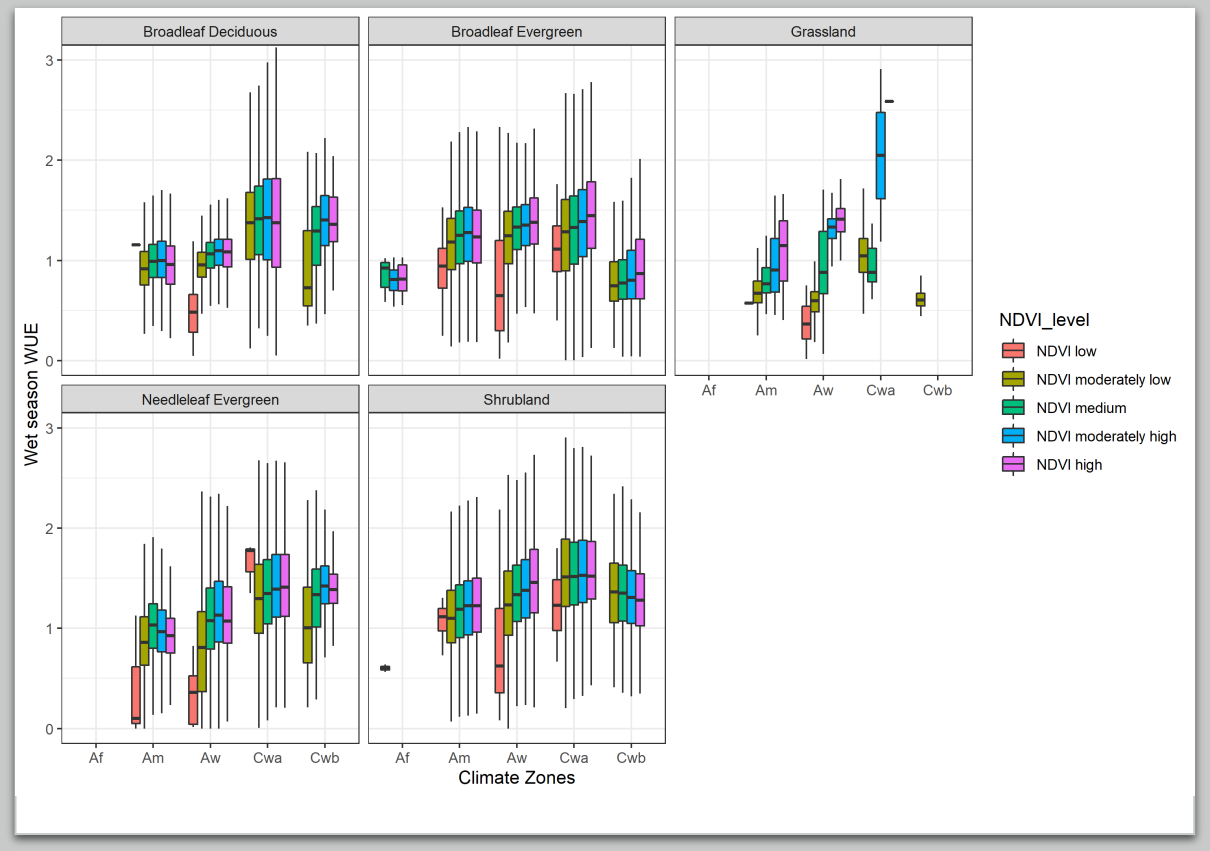
Dry Season WUE

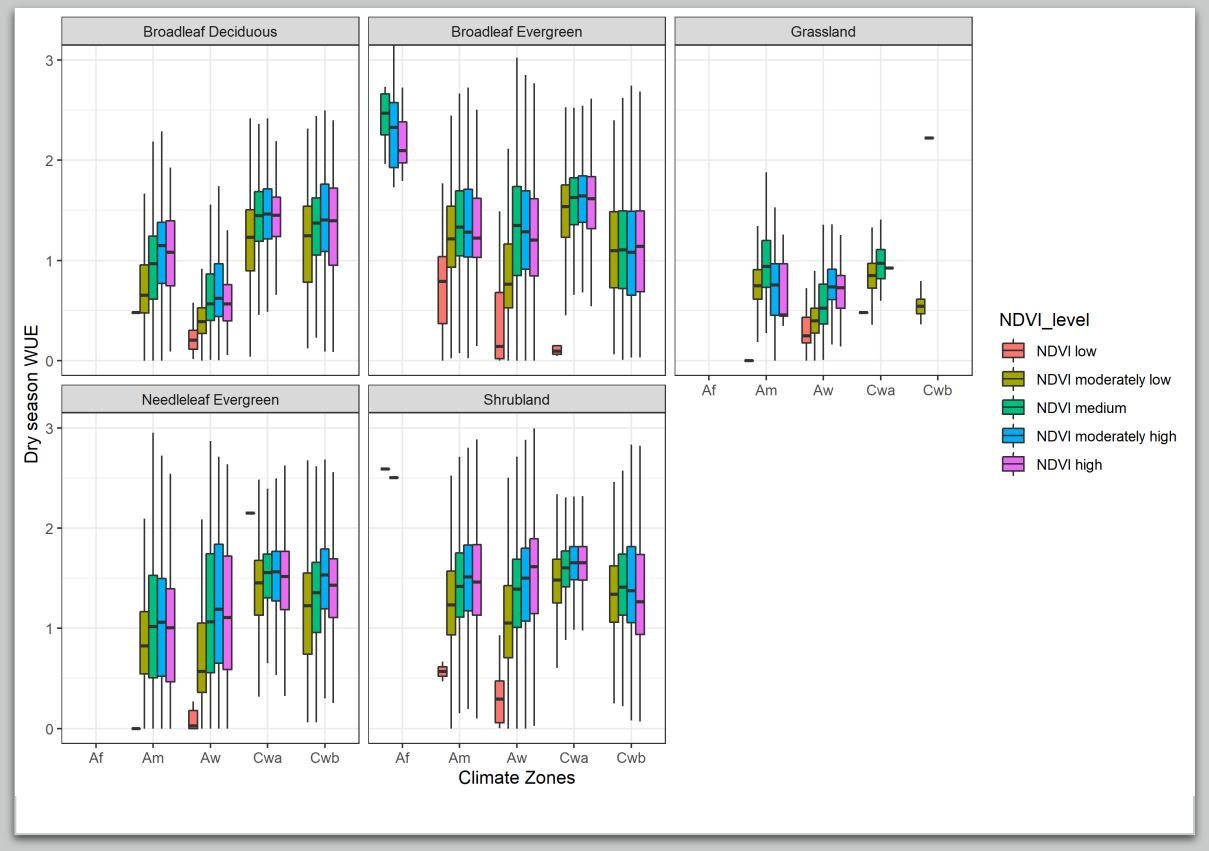
	Degree of freedom	Sum of squares	Mean squares	F value	p value
Biomes	4	264,131	66,033	332,682	***
Climate Zones	4	44,663	11,166	56,255	***
Biomes x Climate Zones	13	5,633	433	2,183	***
Residuals	2,379,980	472,393	0		

Wet Season WUE

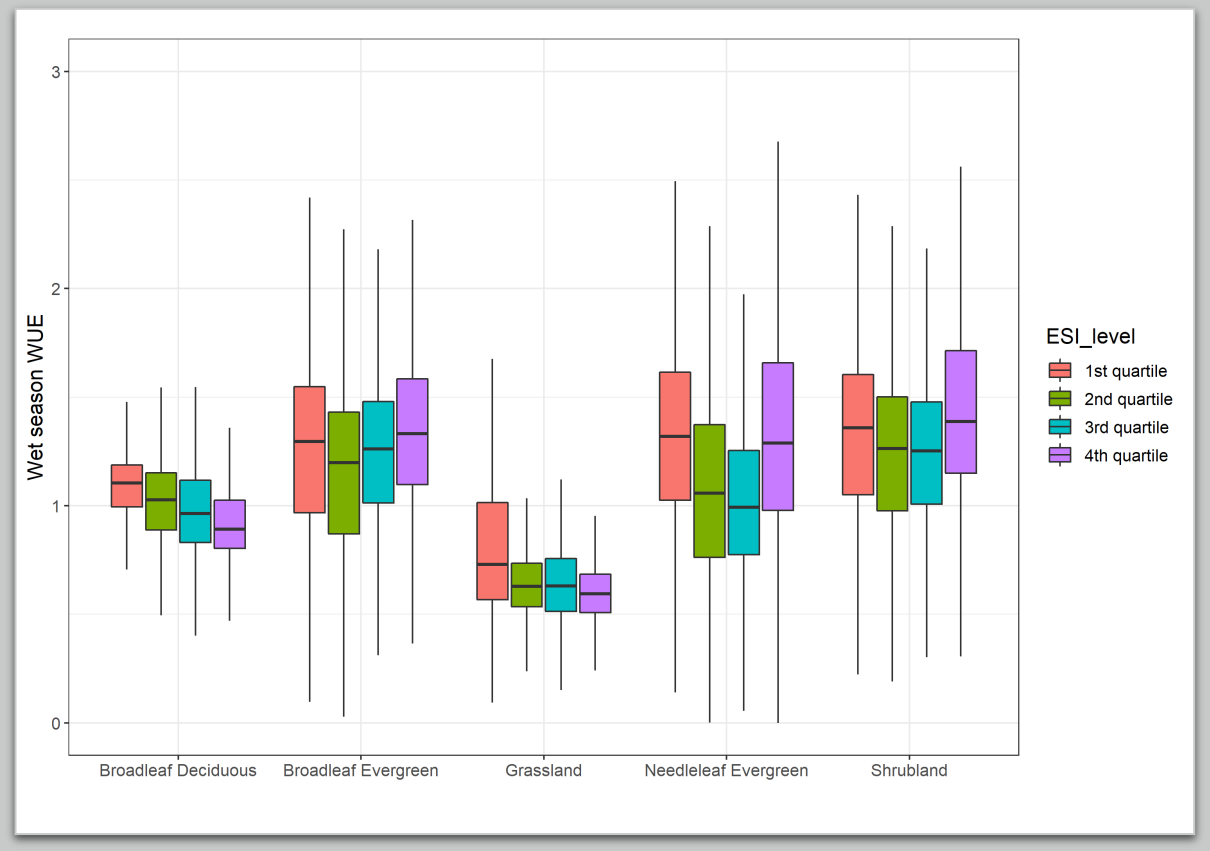
	Degree of freedom	Sum of squares	Mean squares	F value	p value
Biomes	4	47,353	11,838	56,958	***
Climate Zones	4	19,213	4,803	23,110	***
Biomes x Climate Zones	13	6,213	478	2,299	***
Residuals	2,123,465	441,349	0		

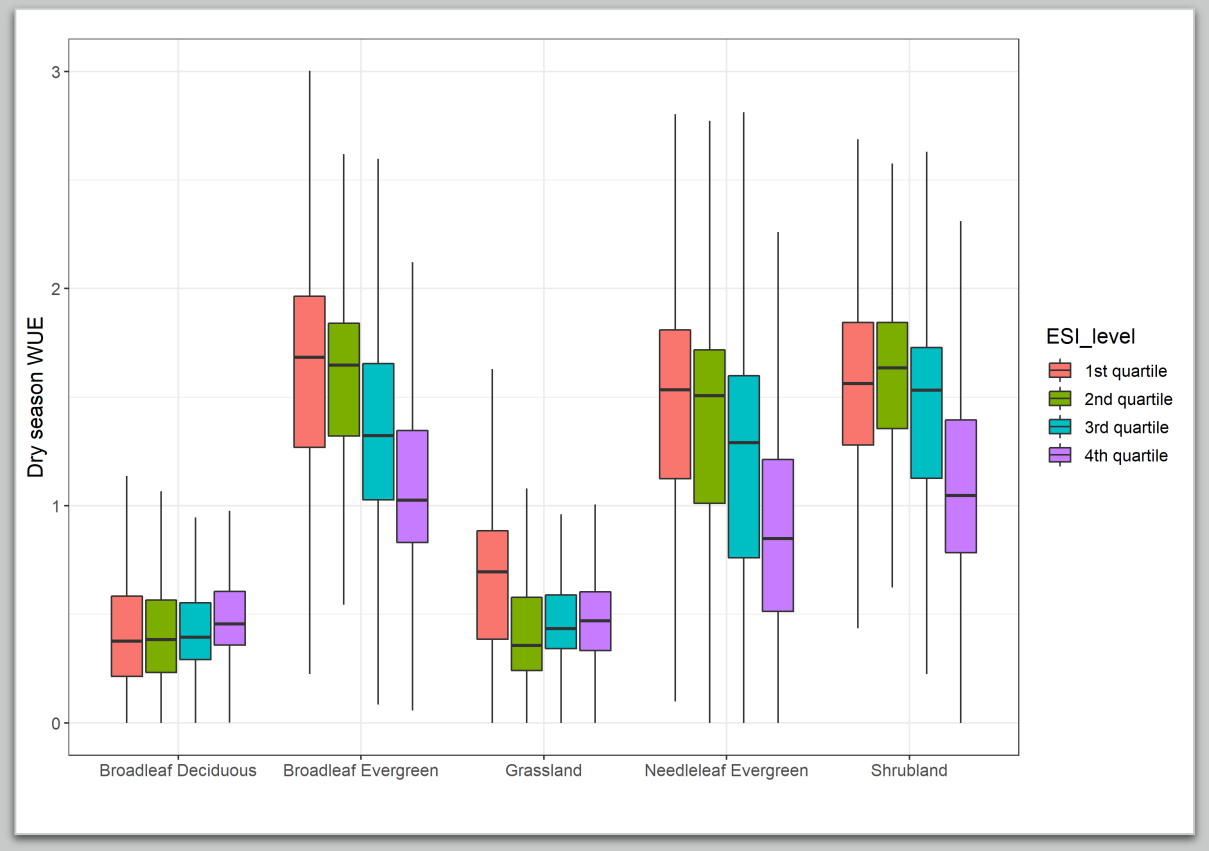
WUE variation within a single biome at different NDVI level (considering climate zones)





WUE variation within a single biome at different drought levels





Thank you