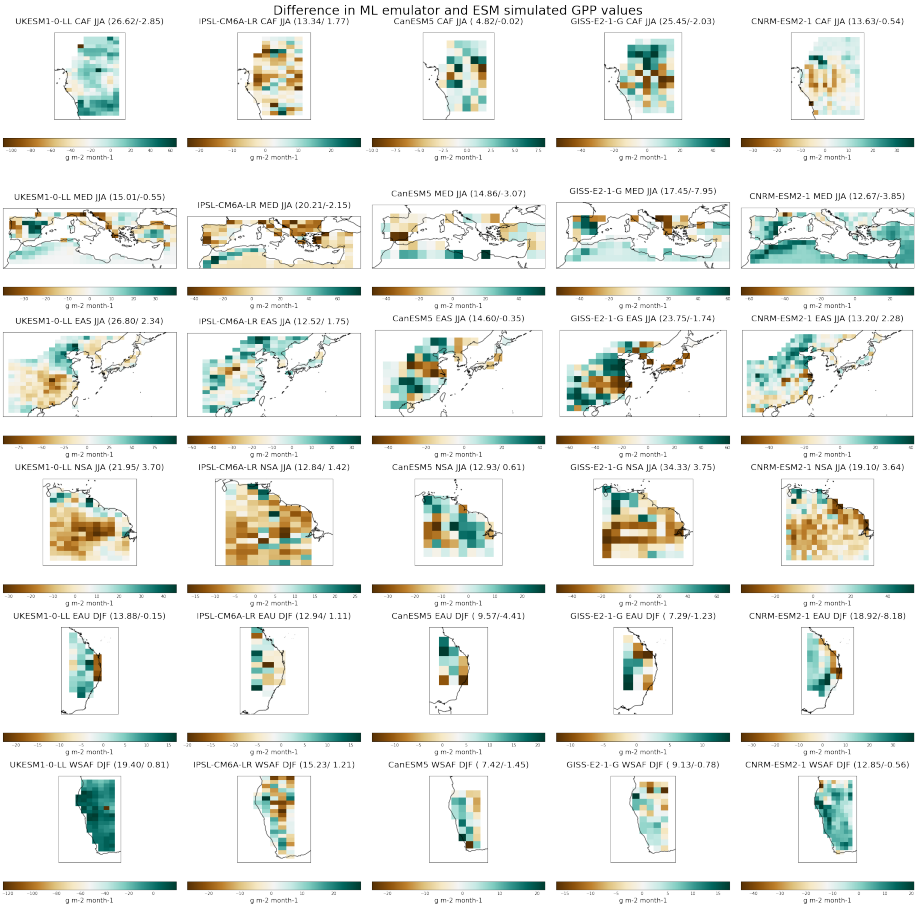
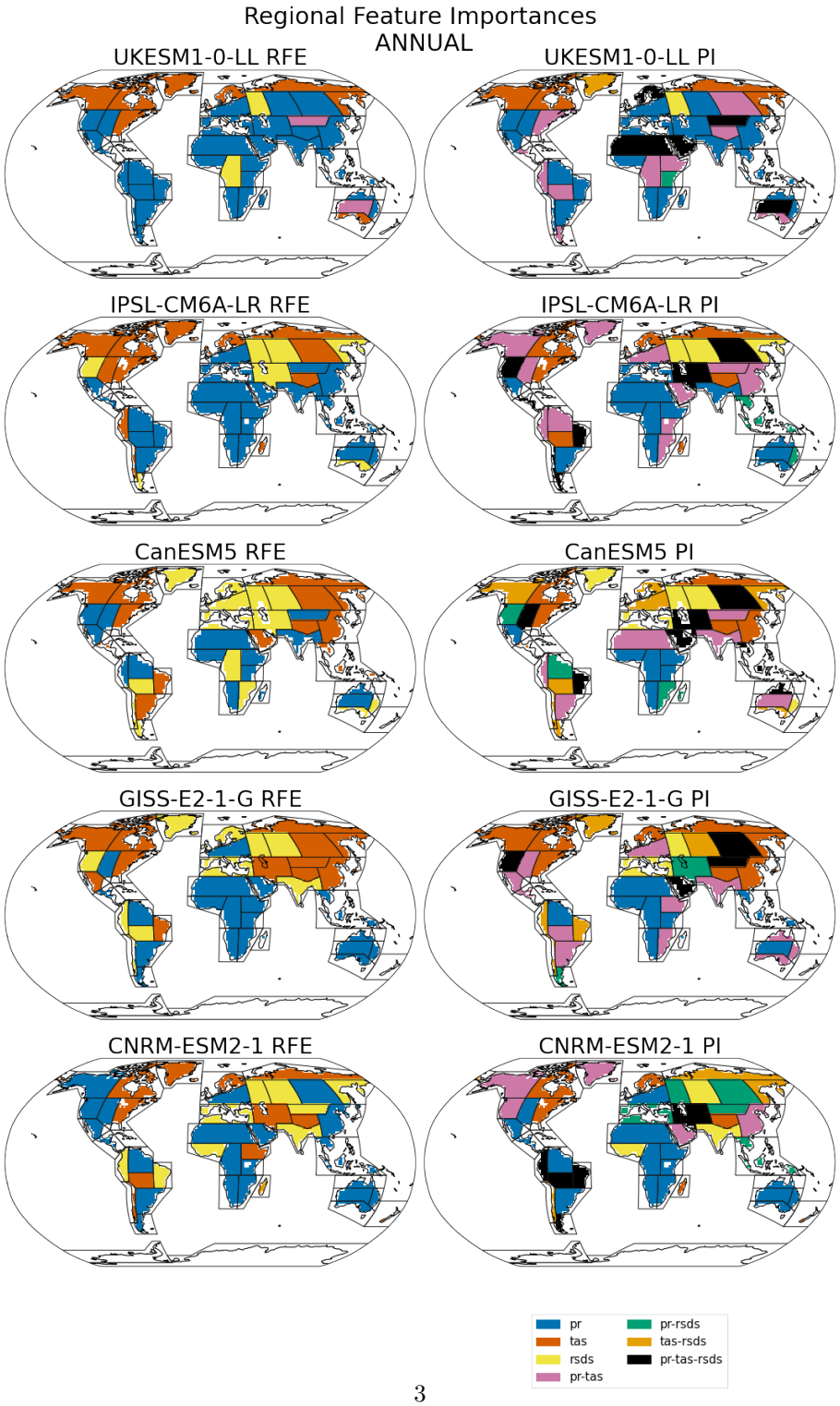
Evaluating Vegetation Modelling in Earth System Models with Machine Learning Approaches (Supplementary Figures for submission to the Journal of Advances in Modeling Earth Systems (JAMES))

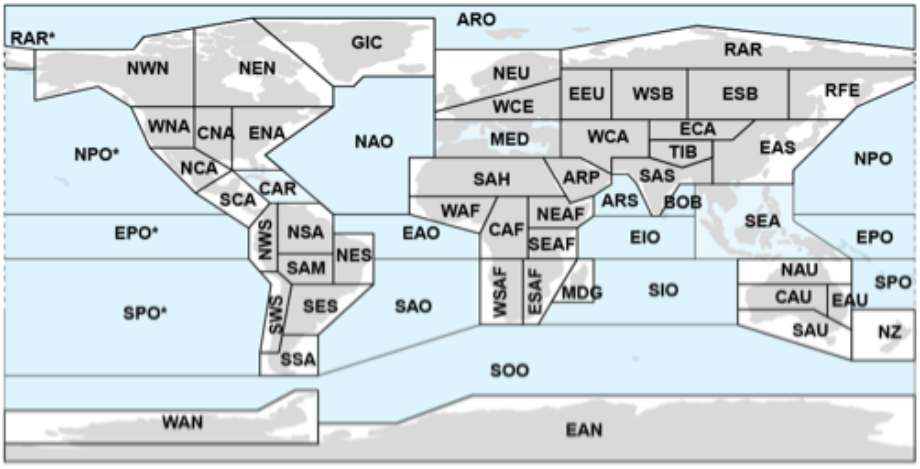
Ranjini Swaminathan Tristan Quaife Richard Allan



S1: Gross Primary Productivity values estimate by the ML emulator for a selection of IPCC regions. Every column shows the difference between the ML emulator output and the GPP simulated by a given ESM. The RMSE error is shown at the top of each region alongwith the difference in area averaged mean between the ML emulator estimates and the ESM sumlated values. All units are in g/m2/month.

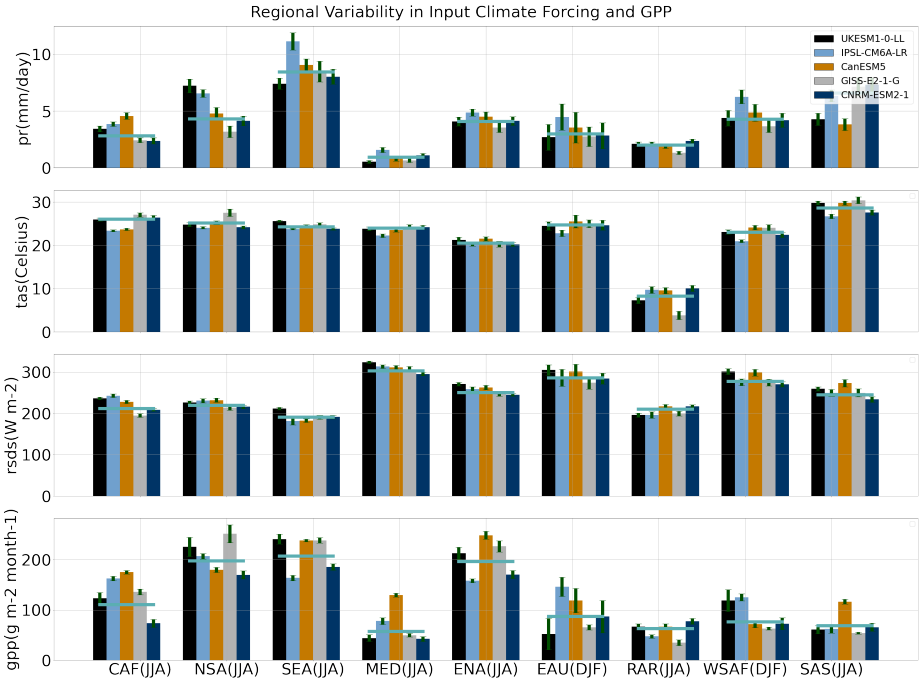


S2: Annual feature importance from two methods - Recursive Feature elimination and Permutation Invariance for IPCC regions.



1	GIC	Greenland/Iceland	21	SAH	Sahara	40	NAU	N.Australia
2	NWN	N.W.North-America	22	WAF	Western-Africa	41	CAU	C.Australia
3	NEN	N.E.North-America	23	CAF	Central-Africa	42	EAU	E.Australia
4	WNA	W.North-America	24	NEAF	N.Eastern-Africa	43	SAU	S.Australia
5	CNA	C.North-America	25	SEAF	S.Eastern-Africa	44	NZ	New-Zealand
6	ENA	E.North-America	26	WSAF	W.Southern-Africa	45	EAN	E.Antarctica
7	NCA	N.Central-America	27	ESAF	E.Southern-Africa	46	WAN	W.Antarctica
8	SCA	S.Central-America	28	MDG	Madagascar	47	ARO	Arctic-Ocean
9	CAR	Caribbean	29	RAR	Russian-Arctic	48	NPO	N.Pacific-Ocean
10	NWS	N.W.South-America	30	WSB	W.Siberia	49	EPO	Equatorial.Pacific-Ocean
11	NSA	N.South-America	31	ESB	E.Siberia	50	SPO	S.Pacific-Ocean
12	NES	N.E.South-America	32	RFE	Russian-Far-East	51	NAO	N.Atlantic-Ocean
13	SAM	South-American-Monsoon	33	WCA	W.C.Asia	52	EAO	Equatorial.Atlantic-Ocean
14	SWS	S.W.South-America	34	ECA	E.C.Asia	53	SAO	S.Atlantic-Ocean
15	SES	S.E.South-America	35	TIB	Tibetan-Plateau	54	ARS	Arabian-Sea
16	SSA	S.South-America	36	EAS	E.Asia	55	BOB	Bay-of-Bengal
17	NEU	N.Europe	37	ARP	Arabian-Peninsula	56	EIO	Equatorial.Indic-Ocean
18	WCE	Western&Central-Europe	38	SAS	S.Asia	57	SIO	S.Indic-Ocean
19	EEU	E.Europe	39	SEA	S.E.Asia	58	SOO	Southern-Ocean
20	MED	Mediterranean						

S3: IPCC AR 6 reference regions and their acronyms.



S4: A comparison of means and standard deviations of the climate variables or input forcings considered important for GPP. Each row shows the mean and standard deviation for a single variable with colored bars representing individual models grouped by regions. Vertical lines overlayed on the colored bars shows the standard deviation and the horizontal line shows the multimodel mean.