

Supplementary information for ‘Uncertainties in long-term ensemble estimates of contextual evapotranspiration over Southern France’

Samuel Mwangi^{1,2*}, Albert Olioso^{1*}, Jordi Etchanchu³, Kanishka Mallick^{4,2}, Aolin Jia⁴, Jérôme Demarty³, Nesrine Farhani³, Emmanuelle Sarrazin², Philippe Gamet², Jean-Louis Roujean², Gilles Boulet^{2,5*}

¹Unité de Recherche Ecologie des Forêts Méditerranéennes, INRAE, Avignon, France

²Université de Toulouse, CESBIO, CNES/CNRS/IRD/UPS/INRAE, Toulouse, France

³UMR HSM, IRD-CNRS-Université de Montpellier, Montpellier, France

⁴~~IAS, D-USYS, ETH Zürich, Switzerland~~~~Unit ENVISION, LIST, Belvaux, Luxembourg~~

⁵Indo-French Cell for Water Sciences (IFCWS), IISc, Bangalore, India

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Correspondence to: Samuel Mwangi (samuel.mwangi@inrae.fr); Albert Olioso (albert.olioso@inrae.fr)

1) Performance and similarity assessment of the EVASPA estimates (similar to section 4.2 but including VIIRS LST data)

Table S 1: Global performance of daily evapotranspiration based on the average of all EVASPA ensemble members (as in Table 2, but including VIIRS-based estimates).

	Interpolated daily ET estimates							non-interpolated daily ET estimates						
	RMSD [mm/d]	Willmott's D [-]	Bias [mm/d]	MAE [mm/d]	uncertainty (median)			RMSD [mm/ d]	Willmott's D [-]	Bias [mm/d]	MAE [mm/d]	uncertainty (median)		
					SD [mm/d]	CV [-]	QCD [-]					SD [mm/d]	CV [-]	QCD [-]
Aurade	0.93	0.83	0.10	0.68	0.42	0.30	0.21	1.18	0.80	0.23	0.90	0.48	0.25	0.18
Bilos	0.83	0.86	-0.17	0.62	0.43	0.34	0.23	1.08	0.81	-0.09	0.82	0.52	0.28	0.20
Coussoul	1.01	0.63	0.62	0.72	0.47	0.41	0.28	1.19	0.57	0.77	0.93	0.56	0.38	0.26
Fontblanche	0.94	0.58	-0.19	0.75	0.39	0.41	0.27	1.06	0.52	-0.01	0.85	0.43	0.36	0.24
Lamasquere	1.04	0.71	-0.41	0.70	0.40	0.44	0.30	1.27	0.62	-0.37	0.88	0.49	0.38	0.26
LeBray	0.74	0.85	-0.11	0.57	0.43	0.36	0.25	0.88	0.83	0.06	0.68	0.49	0.30	0.21
Puechabon	0.87	0.84	0.45	0.67	0.43	0.26	0.18	1.09	0.81	0.59	0.85	0.49	0.23	0.16
Toulouse	1.10	0.55	-0.70	0.79	0.40	0.68	0.47	1.35	0.42	-0.67	0.97	0.47	0.64	0.44
Croplands	0.99	0.78	-0.16	0.69	0.41	0.36	0.25	1.22	0.74	-0.07	0.89	0.49	0.31	0.21
Forests	0.87	0.80	-0.02	0.67	0.42	0.34	0.23	1.06	0.76	0.18	0.83	0.48	0.28	0.20
Grasslands	1.07	0.50	-0.27	0.78	0.43	0.51	0.35	1.28	0.40	-0.13	0.96	0.52	0.45	0.31
Winter	0.52	0.54	-0.14	0.38	0.16	0.36	0.25	0.59	0.49	-0.07	0.47	0.18	0.31	0.22
Spring	1.01	0.71	-0.22	0.78	0.54	0.35	0.24	1.23	0.64	-0.11	0.95	0.59	0.32	0.22
Summer	1.32	0.59	0.06	1.05	0.73	0.32	0.22	1.52	0.57	0.21	1.22	0.74	0.33	0.23
Autumn	0.70	0.65	-0.05	0.53	0.32	0.35	0.24	0.83	0.60	0.07	0.65	0.36	0.32	0.22
All sites and seasons combined	0.94	0.78	-0.09	0.69	0.41	0.35	0.24	1.15	0.73	0.04	0.87	0.49	0.32	0.22

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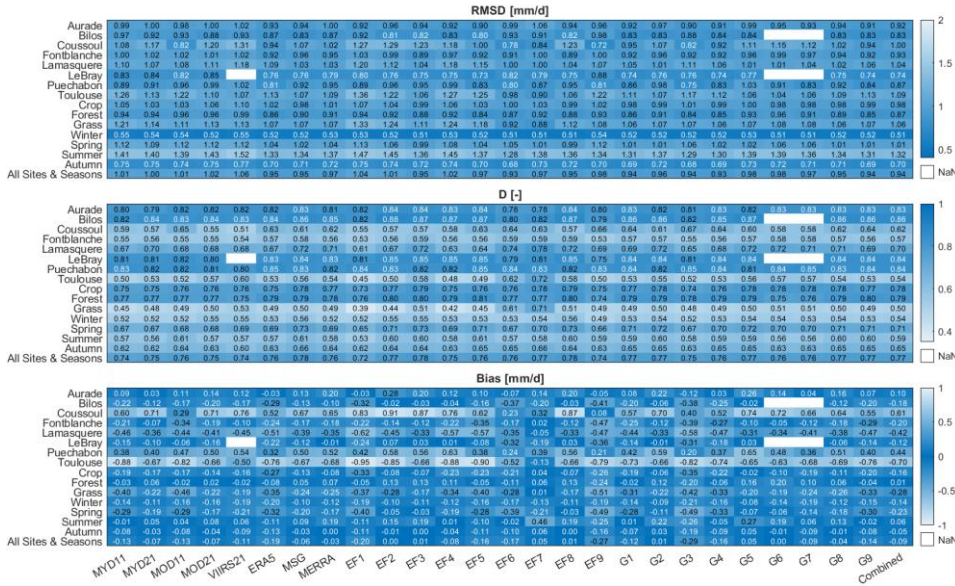


Figure S 1: As in Figure 5, but including VIIRS-based *set** estimates.

** EVASPA model / set construction:*

- *LSTs example: the MYD11 set is constructed taking MYD11 LST/E as the unique LST dataset used together with the 3 radiation datasets, 9 EF and 9 G methods for 243 estimates.*
- *Radiation example: the ERA5 set is constructed taking ERA5 as the unique radiation dataset used together with the 4 LSTs (or 5 LSTs here, including VIIRS), 9 EF and 9 G methods for 324 (or 405 here, including VIIRS-based) ET estimates.*
- *EFs example: the EF1 set is constructed taking EF1 as the unique EF method used together with the 4 LSTs (or 5 LSTs here, including VIIRS), 3 radiation datasets, and 9 G methods for 108 (or 135 here, including VIIRS-based) estimates.*
- *G example: the G1 set is constructed taking G1 as the unique G flux method used together with the 4 LSTs (or 5 LSTs here, including VIIRS), 3 radiation datasets, and 9 EF methods for 108 (or 135 here, including VIIRS-based) estimates.*

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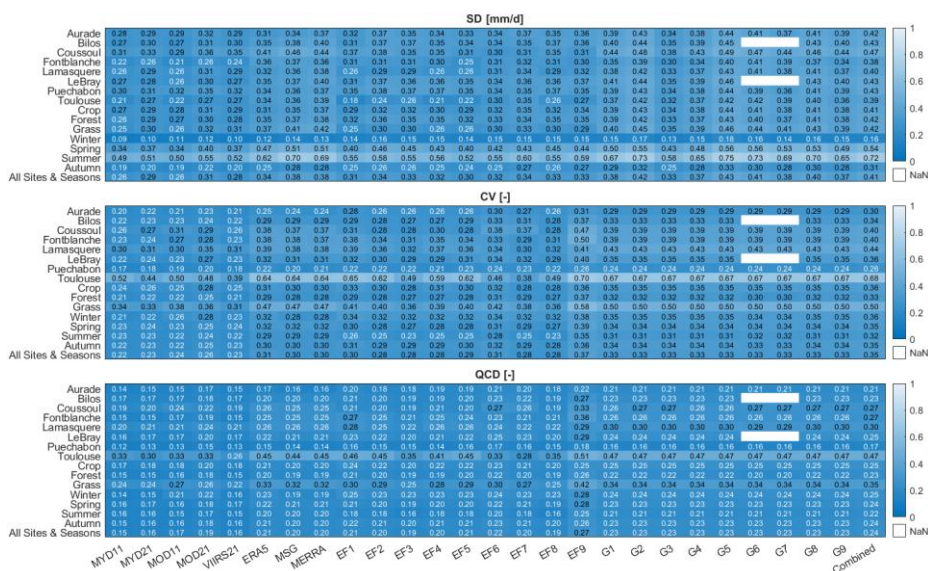


Figure S 2: As in Figure 6, but including VIIRS-based set* estimates.

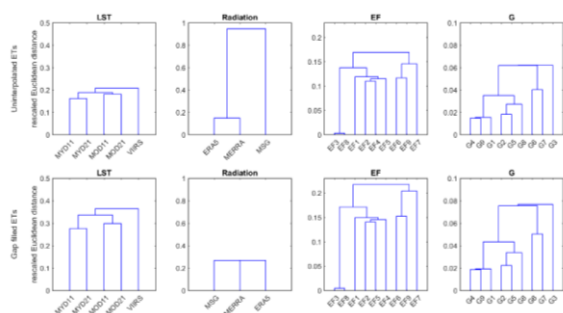
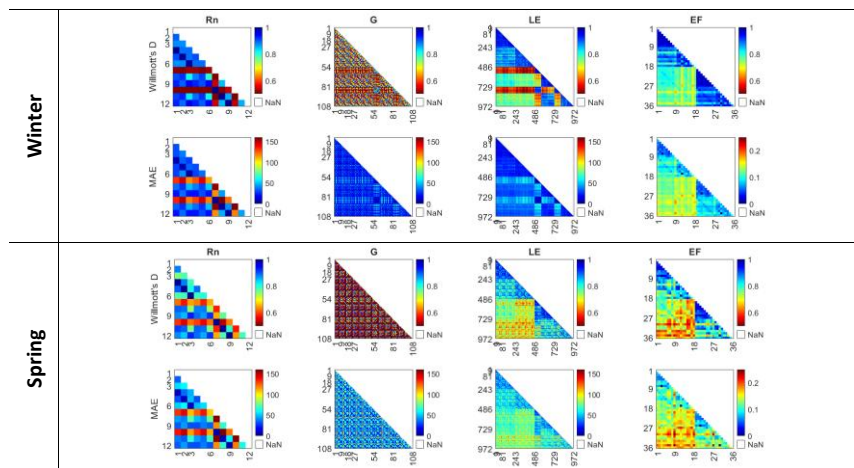
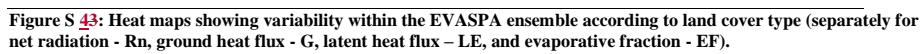


Figure S 32: As in Figure 78, but including VIIRS-based estimates.

2.1) Heatmaps between distinct/individual ensemble members



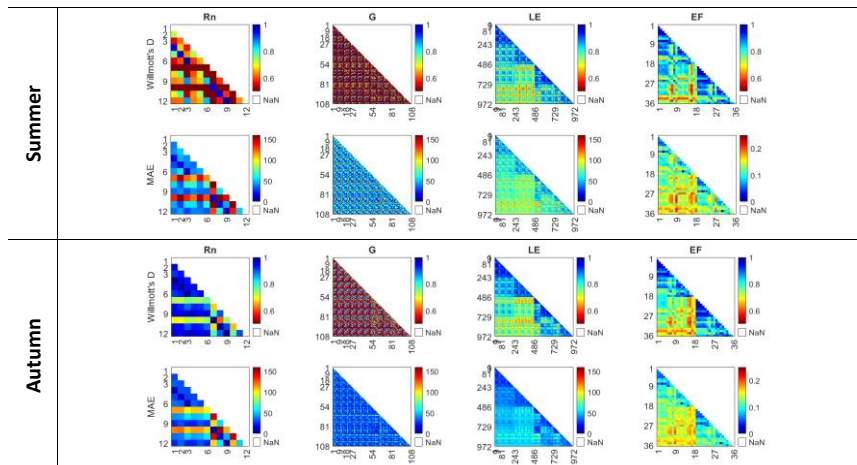


Figure S 54: Heat maps showing variability within the EVASPA ensemble per season (separately for Rn, G, LE and EF).

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2.2) Standard deviation bar graphs of the specific uncertainty introduced by selecting different member combinations of LST-Radiation-EF-G over the 2004-2024 simulation period: according to land cover types

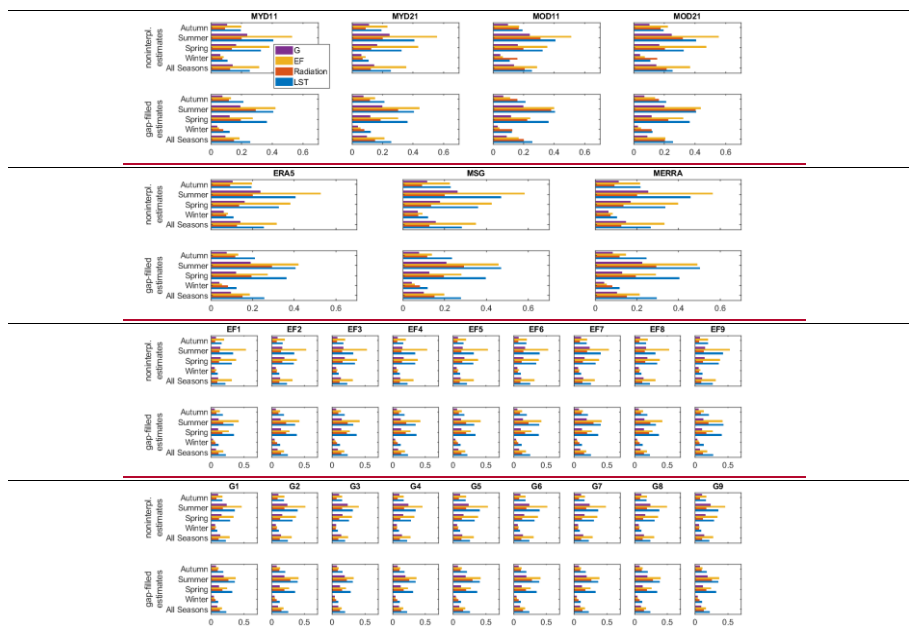


Figure S 6: As in Figure 12, but for Croplands – Auradé and Lamasquère.

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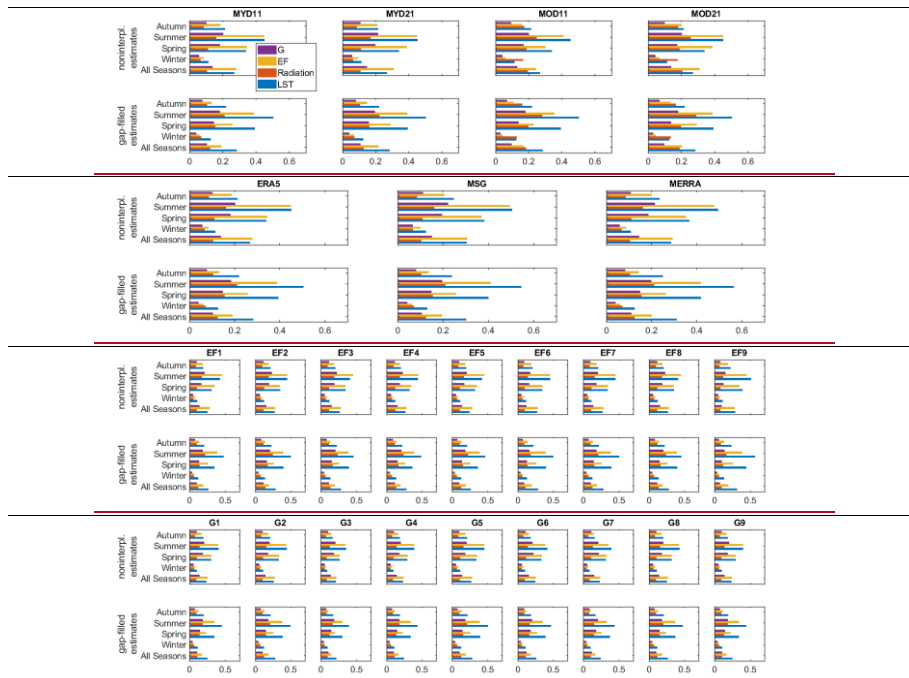


Figure S.7: As in Figure 12, but for Forests – Bilos, Le Bray, Fontblanche, Puechabon.

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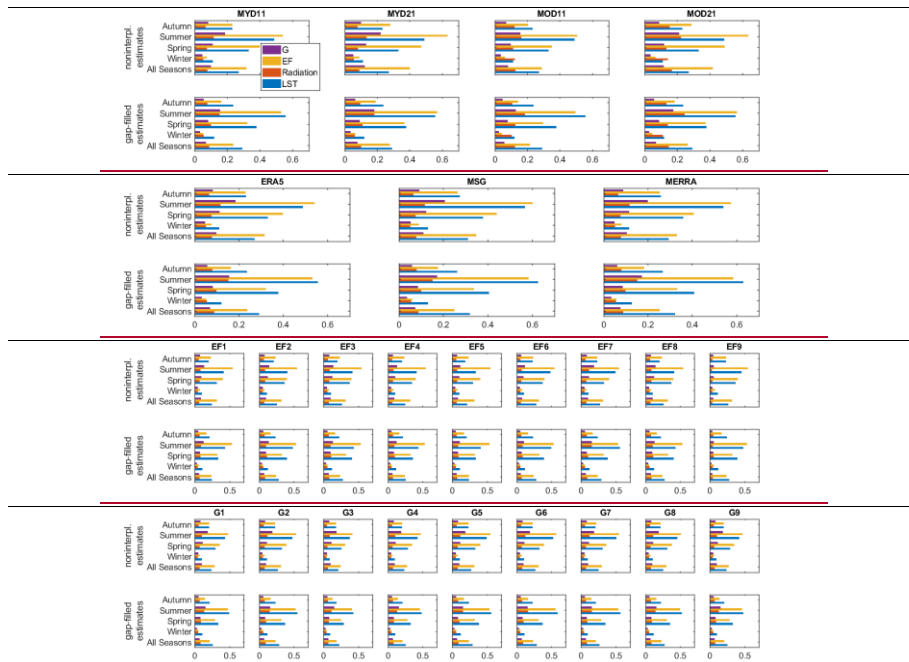


Figure S 8: As in Figure 12, but for Grasslands: Coussoul, Toulouse.

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