

APPENDIX A. Summary table of the grassland plant communities in the Sougeal marsh.

Occurrence and cover rate percentages were derived from 2017 surveys. Classes

description : M – Mesophilic; MH – Meso-Hygrophilic; H – Hygrophilic.

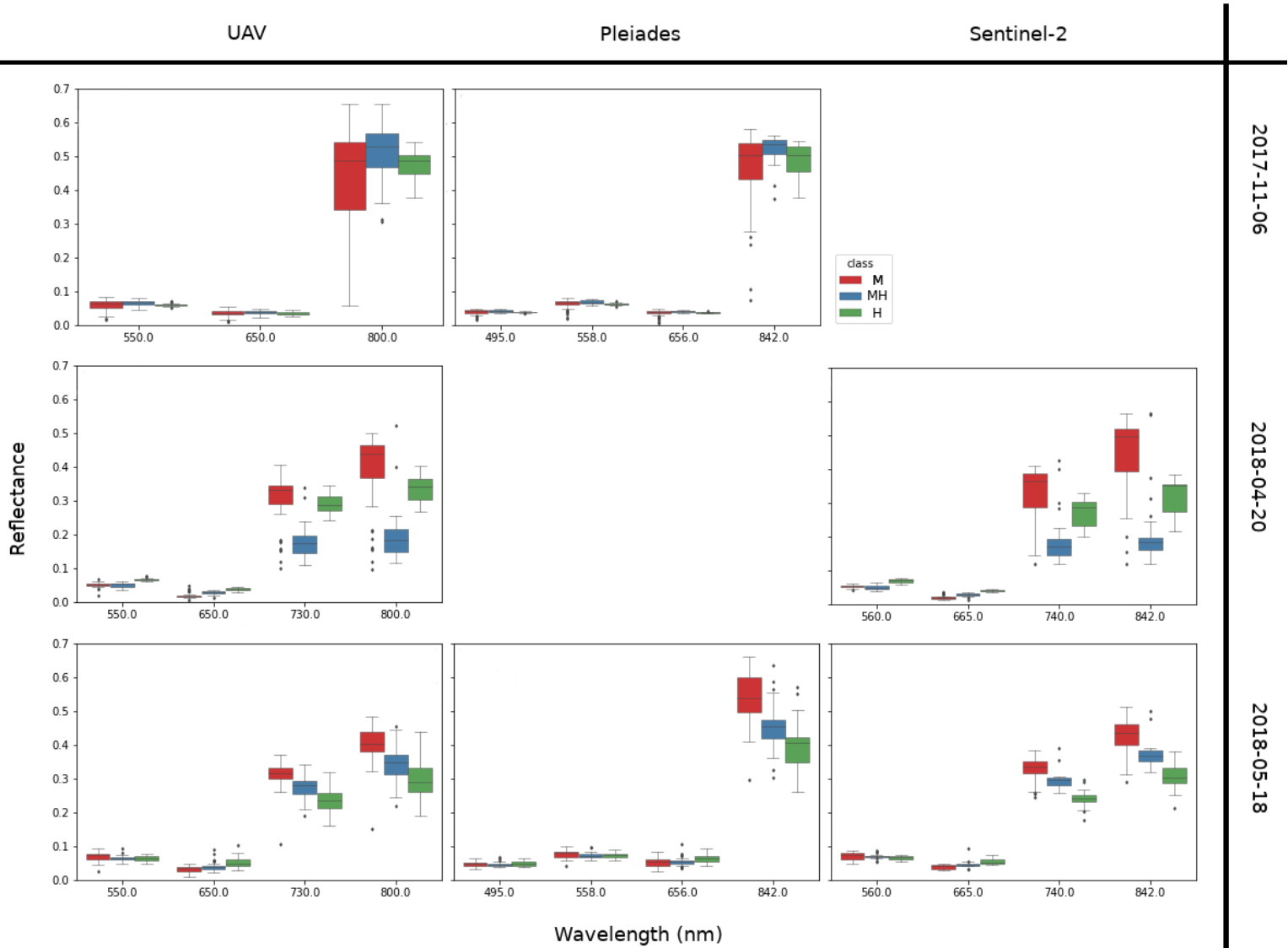
Species names	Abreviate d name	Occurrence (%)				Cover rate (%)			
		M	MH 1	MH 2	H	M	MH 1	MH 2	H
Lolium perenne	Lper	100	44	6		21	2		
Agrostis stolonifera	Asto	100	100	97	64	33	34	14	8
Poa trivialis	Ptri	93	89	50	9	22	17	2	
Rumex crispus	Rcri	65	61	65	18	1	2	2	
Taraxacum officinale	Toff	60	22	9		2	1		
Carex arvense	Carv	58	50	29		2	2	1	
Ranunculus sardous	Rsar	28	6	21					
Cerastium fontanum	Cfon	19							
Holcus lanatus	Hlan	19				1			
Alopecurus pratensis	Apra	16				1			
Deschampsia cespitosa	Dces	16		3					
Bidens cernua	Bcer	12							
Trifolium repens	Trep	77	83	74	27	5	4	3	
Carex hirta	Chir	60	72	56		2	3	2	
Juncus articulatus	Jart	7	56	56			2	3	
Leotodon automnalis	Laut		11						
Eleocharis acicularis	Eaci	2	78	97	27		13	35	1
Ranunculus repens	Rrep	74	89	91	36	4	9	8	1
Alopecurus geniculatus	Agen	7	39	88	55		2	8	9
Ranunculus flammula	Rfla	2	67	85	45		2	2	1
Cardamine pratense	Cpra	21	78	82	27		1	2	
Eleocharis palustris	Epal		17	74	27		1	3	1
Oenanthe fistulosa	Ofis	5	33	53			1	1	
Potentilla anserina	Pans	23	33	47	18	1	1	1	1
Trifolium fragiferum	Tfra	5	22	35			1	2	
Myosotis scorpioides	Mscu		17	32	18		1	1	
Rorripa sylvestris	Rsyl			15					
Ranuculus peltatus	Rpel			15					
Glyceria fluitans	Gflu		33	53	100		1	3	69
Galium palustre	Gpal		11	47	91		1	2	2
Polygonum amphibium	Pamp	2	39	76	91		1	1	3
Veronica scutellata	Vscu		11	15	73				1

Lemna minor	Lmin		11	6	45			1
Hydrocotyle vulgaris	Hvul			29	36		1	1
Mentha pulegium	Mpul			15	18			
Phleum pratense	Phleum	2	22	9	9		1	
Achillea ptarmica	Apta		12	12				
Plantago major	Pmaj	2	6	9				
Stellaria palustris	Spal			9				
Apium nodiflorum	Anod			6				
Lotus uliginosus	Luli			6				
Ludwigia palustris	Lpal			3				
Phleum pratense	Ppra			3				
Callitriche sp.	Casp	7	6					
Poa annua	Pann	7	6					
Juncus bufonius	Jbuf		6					
Polygonum aviculare	Pavi		6					
Elytrigia repens	Erep	7						
Potentilla repens	Prep	7						
Rumex obtusifolius	Robt	5						
Festuca arundinacea	Faru	2						
Urtica dioica	Udio	2						

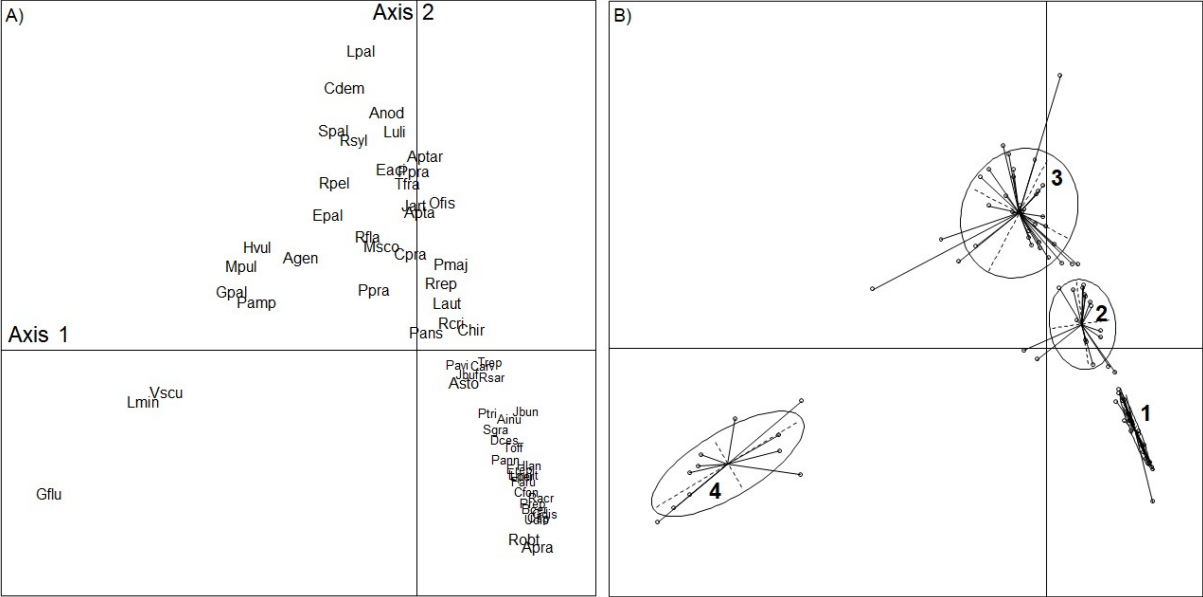
APPENDIX B. Random forest selected hyperparameters by random search optimization.

Hyperparameter names	Selected modality
Number of estimator	300
Bootstrap	False
Criterion	Gini
Maximum depth	None
Maximum features	2
Minimum samples leaf	5
Minimum samples split	7
Minimum weight fraction leaf	0
Minimum impurity decrease	0
Maximum impurty split	None
Maximum leaf nodes	None
Scikit Learn random state	1

APPENDIX C. Habitats endmembers extracted from UAV, Pleiades and Sentinel-2 imagery at each acquisition date.



APPENDIX D. Correspondence Analysis (Greenacre, 2010), Axis 1&2 explained 35.3% of total variance. A) species factorial map; B) plot factorial map - a classification was done on plots in 2017 to define the habitat groups (1-4).



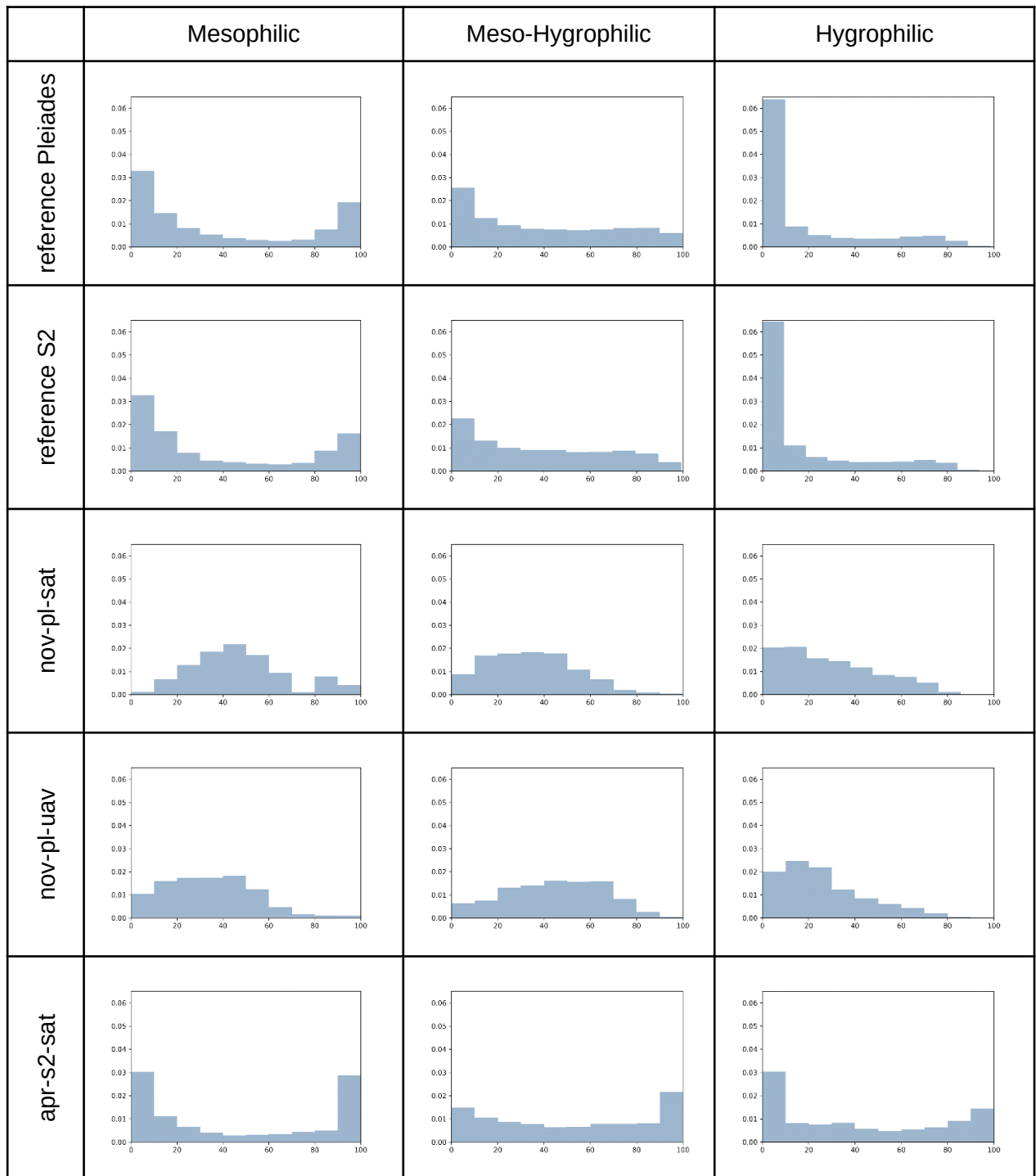
APPENDIX E. Mean confusion matrix between the RF classification of four plant communities derived from UAV imagery (columns) and field plots (lines). Classes description : M – Mesophilic; MH – Meso-Hygrophilic; H – Hygrophilic; BS - Bare soils; Ud – Urtica dioica and W – Water. PA : Producer’s accuracy, UA: User’s accuracy.

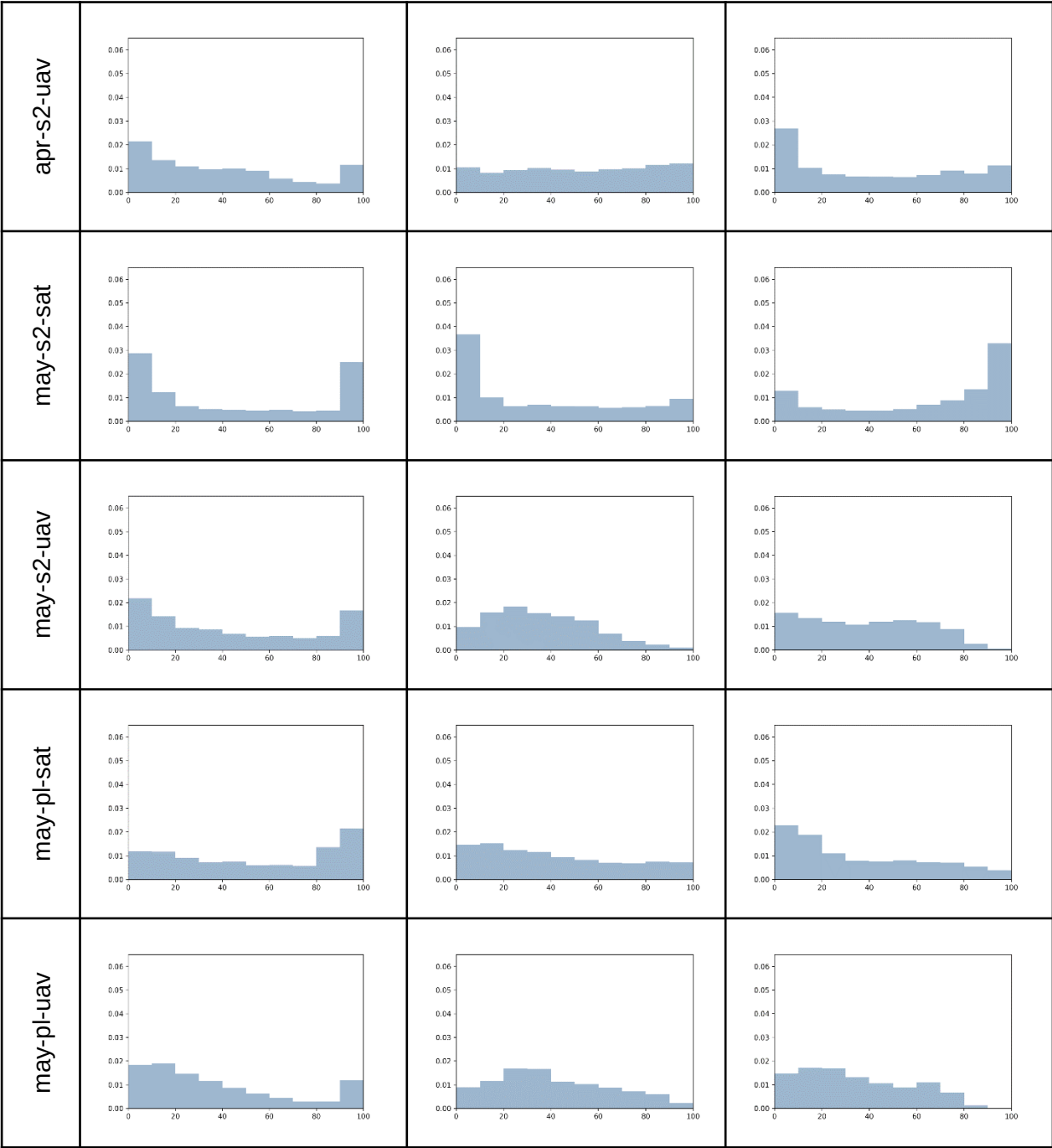
Reference	Class name	Classification							PA	UA
		M	MH 1	MH 2	H	Bs	Ud	W		
	M	32.5	1.6	1.7	0.1	0.1	0.	0.	0.92	0.89
	MH 1	1.4	7.4	4.8	0.5				0.64	0.53
	MH 2	1.1	2.3	23.7	1.4				0.75	0.83
	H		0.2	1.4	8.4				0.80	0.88
	Bs					2.7	0.	0.90	0.97	0.98
	Ud	0.3					3.7	1.0	0.90	0.99
	W							3.9	0.86	1.00

APPENDIX F. Table of the relative importance of features computed by the RF algorithm.

Feature names	Features importance (Gini score)
2018-04-20_UAV_ndwi_green	0.0870
2018-04-20_UAV_red	0.0839
2018-04-20_UAV_ndvi_red-edge	0.0836
2018-04-20_UAV_ndv	0.0770
2018-04-20_UAV_nir	0.0758
2018-04-20_UAV_green	0.0664
2018-04-20_UAV_red-edge	0.0628
2018-05-18_UAV_red-edge	0.0556
2018-05-18_UAV_nir	0.0461
2018-05-18_UAV_ndwi_green	0.0433
2017-11-06_UAV_nir	0.0383
2017-11-06_UAV_red-edge	0.0342
2018-05-18_UAV_ndvi	0.0325
2017-11-06_UAV_ndwi_green	0.0322
2018-05-18_UAV_ndvi_red-edge	0.0316
2018-05-18_UAV_green	0.0302
2018-05-18_UAV_red	0.0300
2017-11-06_UAV_red	0.0245
2017-11-06_UAV_ndvi	0.0234
2017-11-06_UAV_green	0.0230
2017-11-06_UAV_ndvi_red-edge	0.0176

APPENDIX G. Table of histograms of plant communities abundances maps - generated by each unmixing processes. X-axis : abundances (0 to 100%). Y-axis : relative occurrences (0 to 0.6).





APPENDIX H. Scatter plots of UAV versus Satellite measurements with and without DA for the green spectral band: A) Pleiades at 2017-11-06 ; B) Pleiades at 2018-05-20 ; C) Sentinel-2 at 2018-04-19 ; and C) Sentinel-2 at 2018-05-19.

