archeospec

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Contents

Dataset

This report includes the signatures for 30 files. A completed listing can be found at the end of the document.

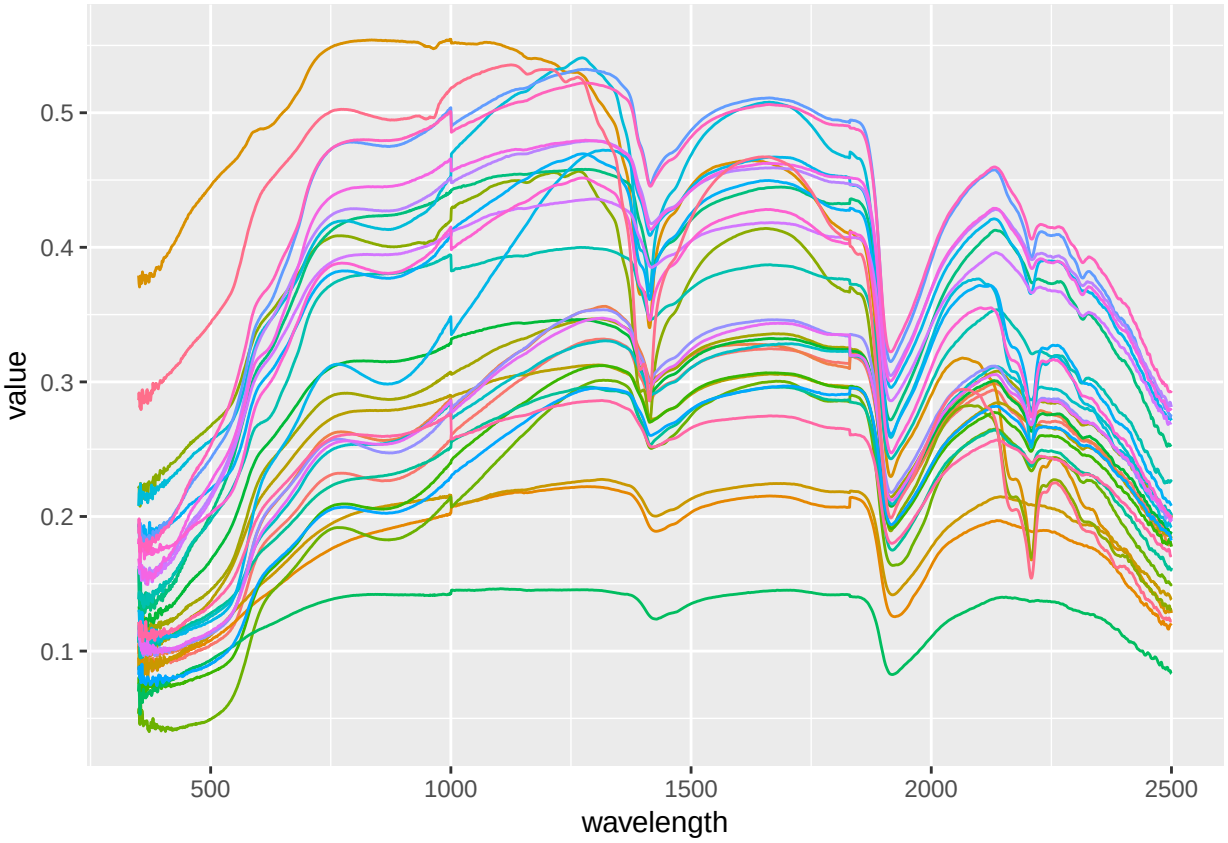
Parameters

The following parameters have been used:

- Unmixing Technique: VCA algorithm with 5 endmembers
- Clustering Technique: Kmeans algorithm with k=5
- No wavelength ranges have been cleaned at the beggining of the signature
- No wavelength ranges have been cleaned at the end of the signature
- No smoothing has been performed

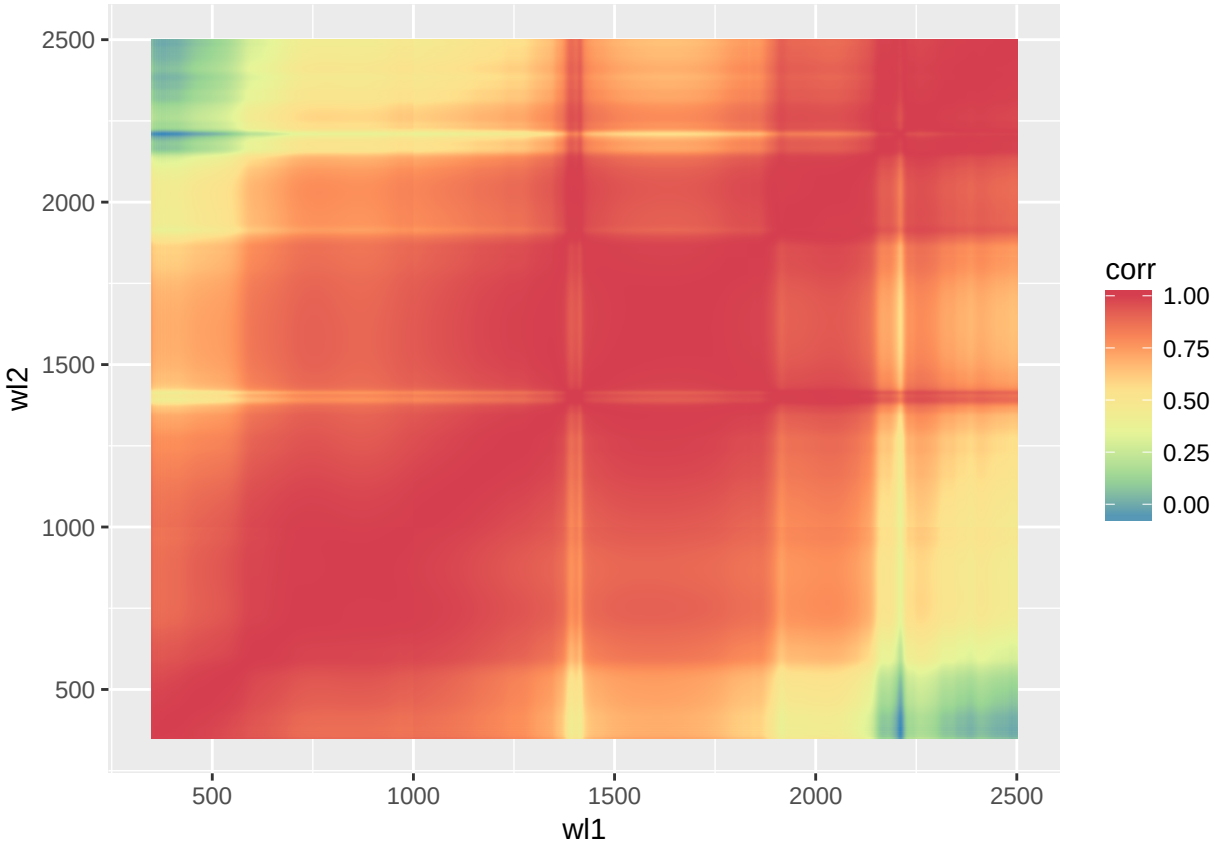
Visualization

The following figure shows the representation of every signature in the dataset. Colors are assigned at random.



Intracorrelation

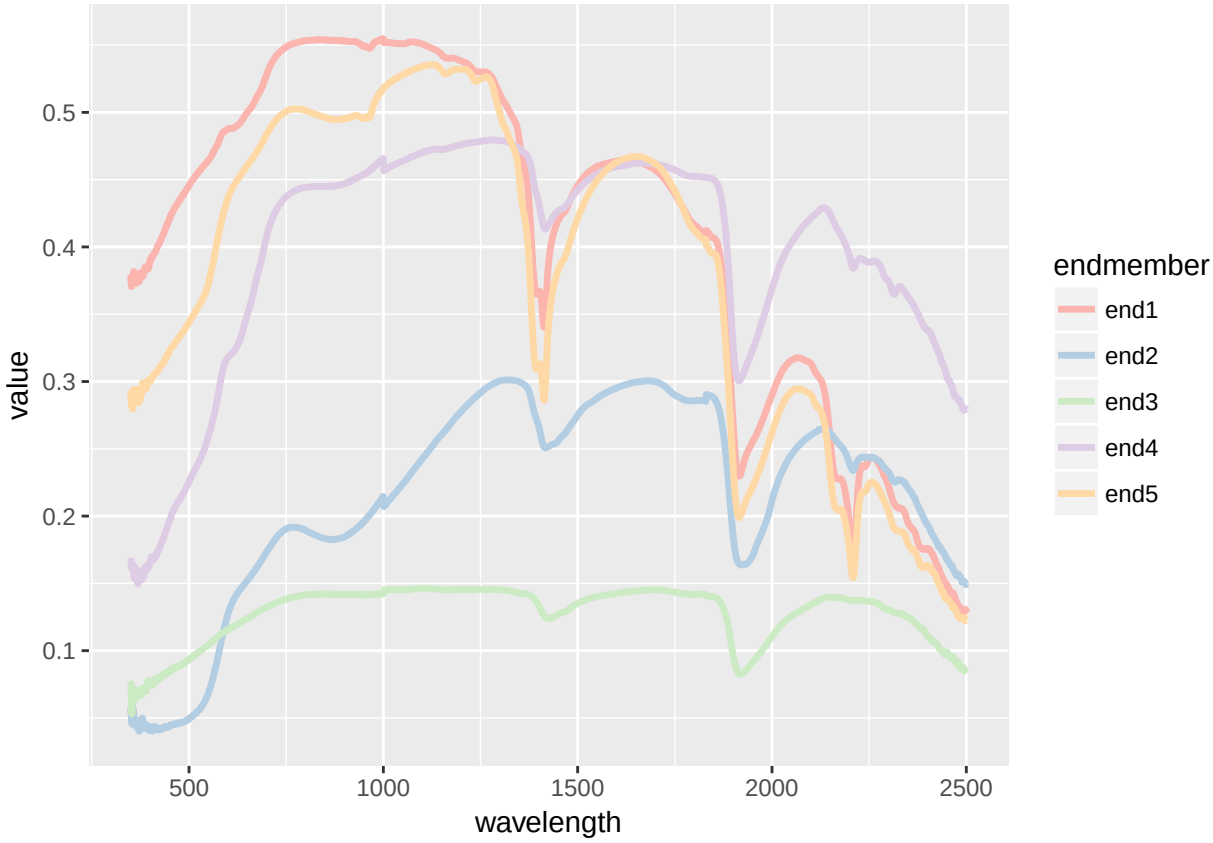
The following figure measures the intracorrelation for each pair of wavelengths.



Unmixing (VCA)

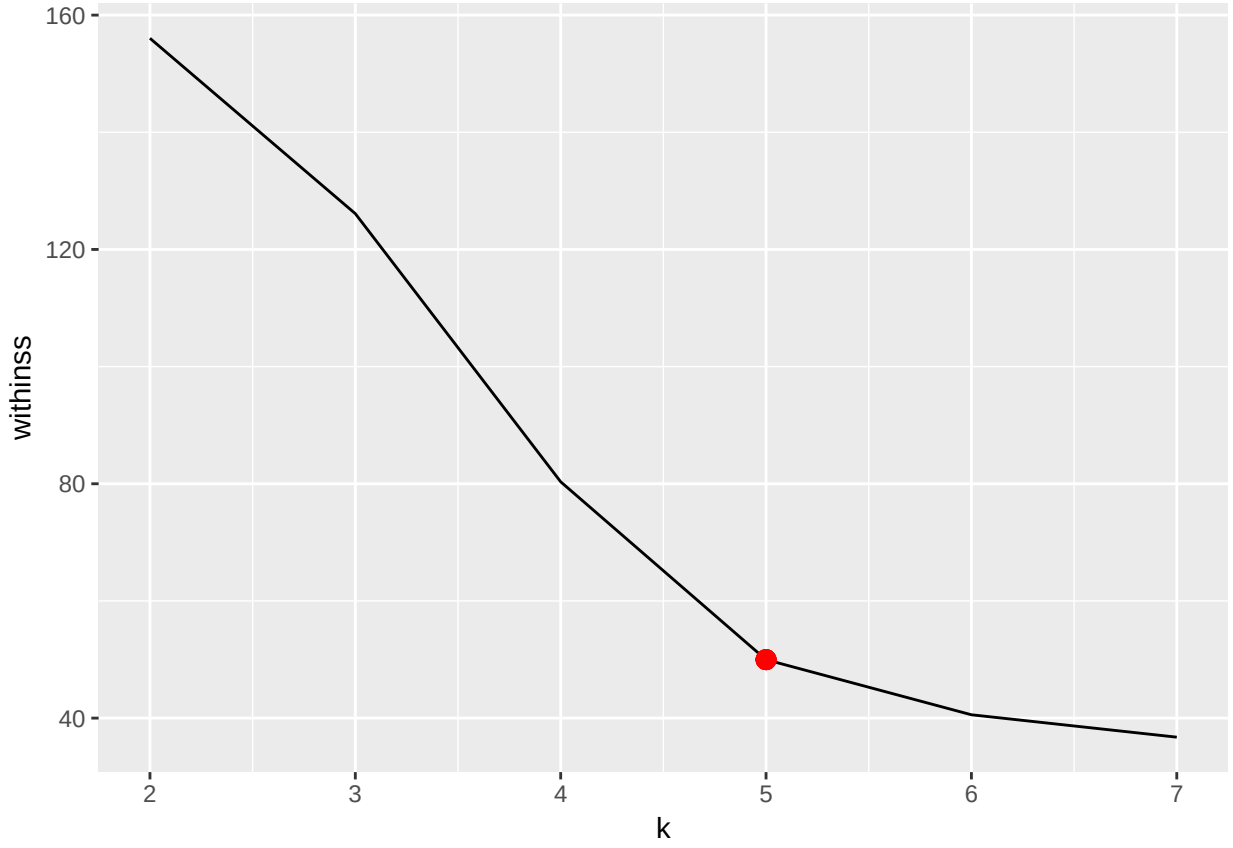
The following table and figure show the 5 endmembers selected by the VCA algorithm.

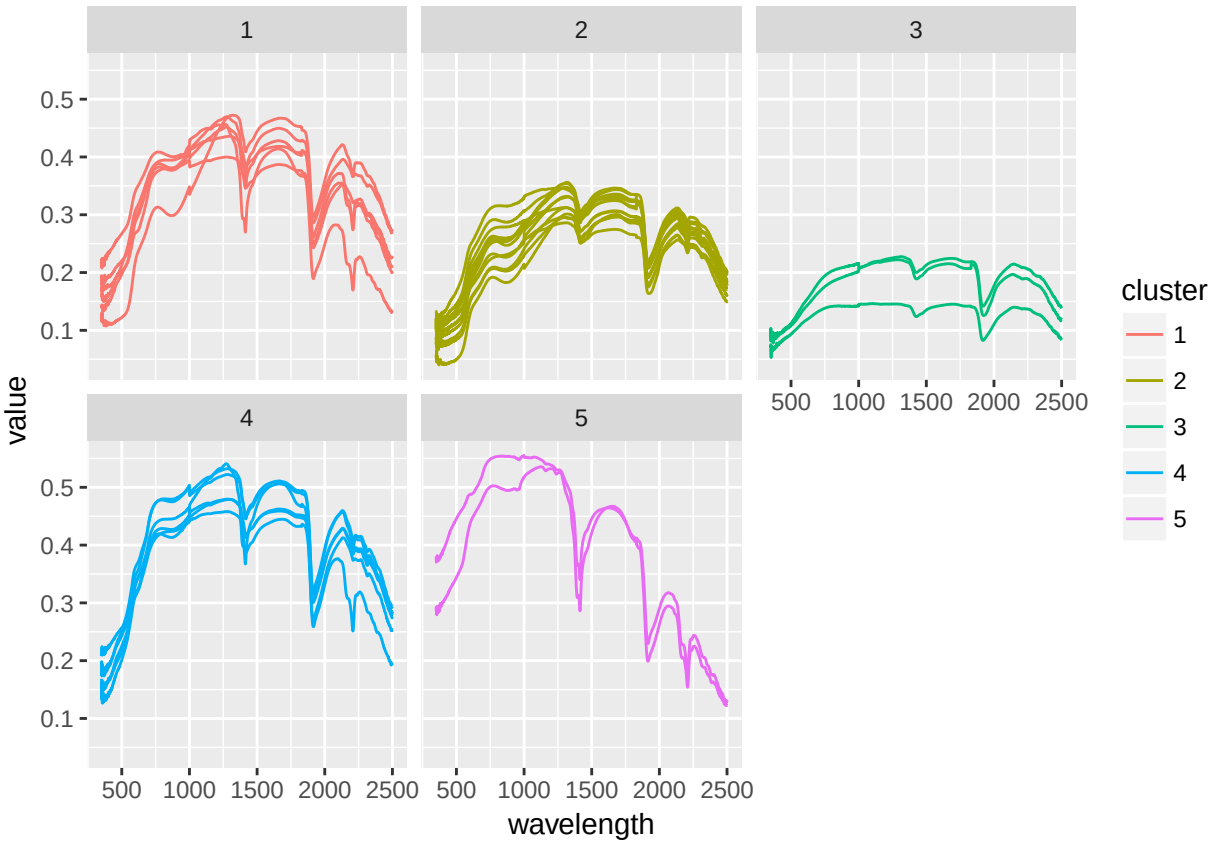
endmember	file
end1	signature0003.asd
end2	signature0008.asd
end3	signature0011.asd
end4	signature0025.asd
end5	signature0029.asd



Clustering (kmeans)

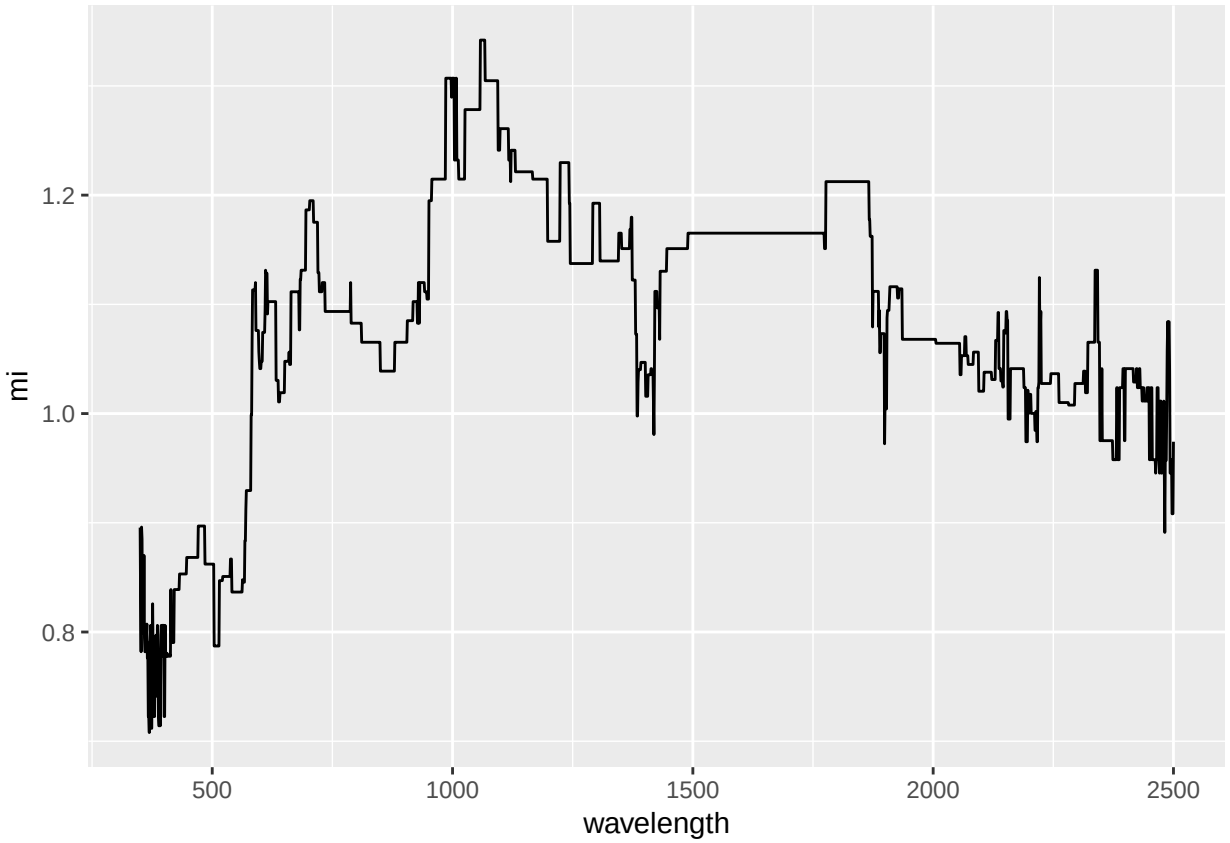
The following figure shows the error of the kmeans algorithm for incresing values of k, measured as the distance within clusters. The red dot represent the selected k value. The next figure shows the graphical representation of the dataset classified by the corresponding cluster assigned by kmeans.




1
2
3
4
5
value
0.5
0.4
0.3
0.2
0.1
500
1000
1500
2000
2500
wavelength
cluster
1
2
3
4
5

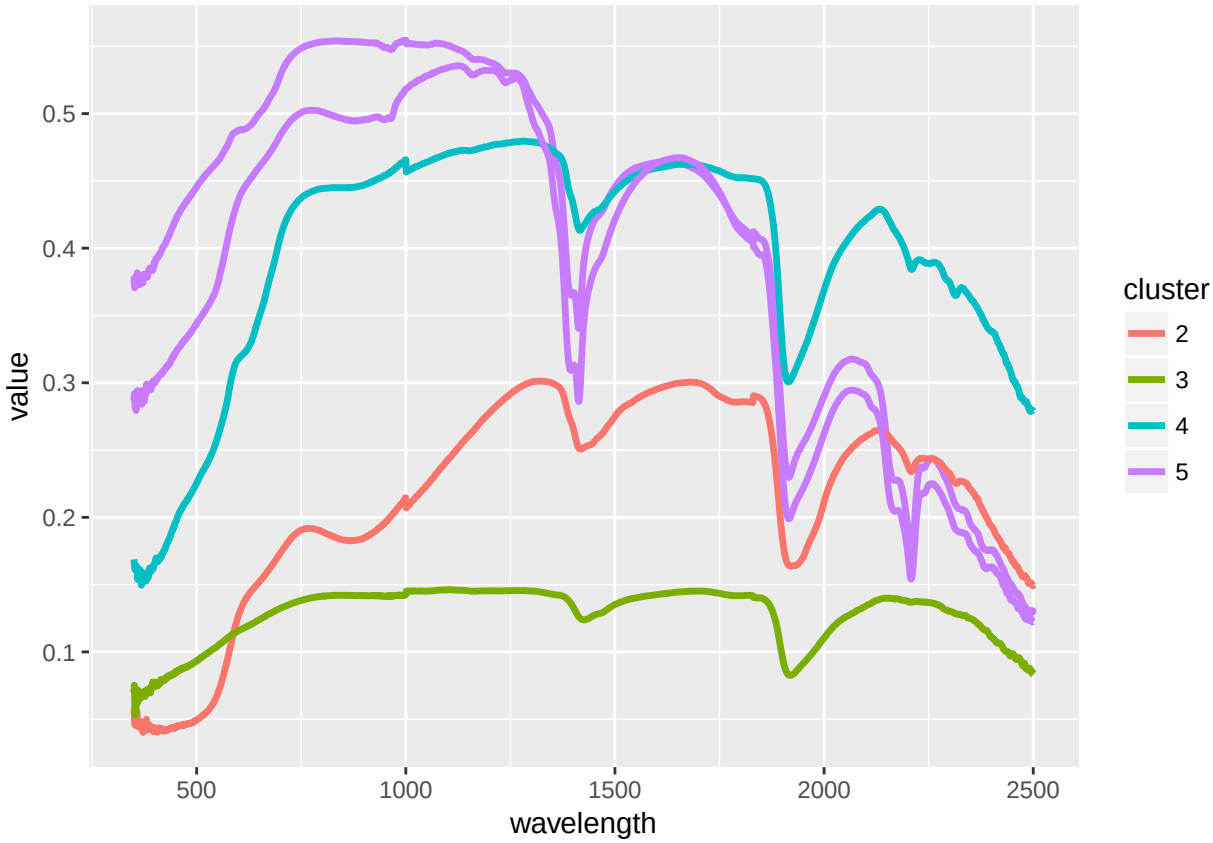
Mutual Information

The following figure shows the mutual information for each wavelength and the assigned cluster as the averaged value for all the samples in the dataset.



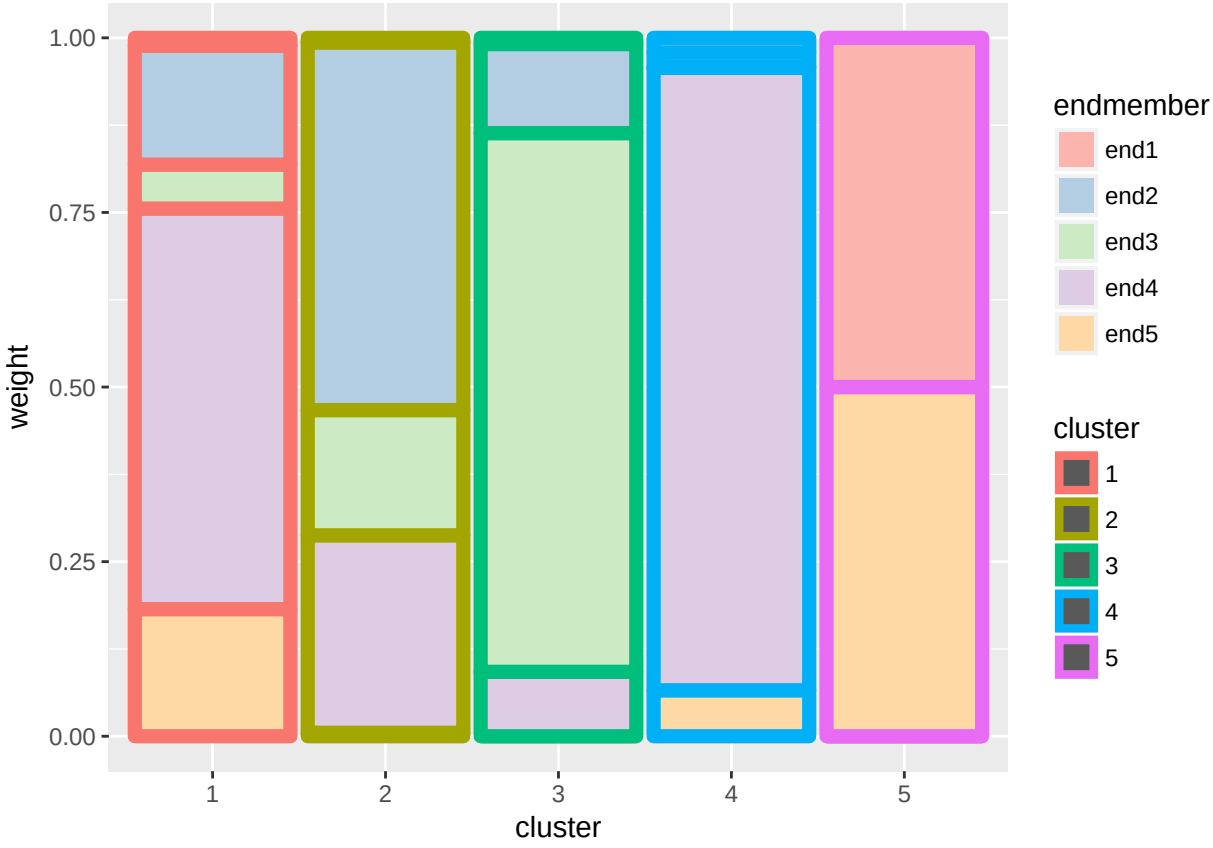
Endmember classification

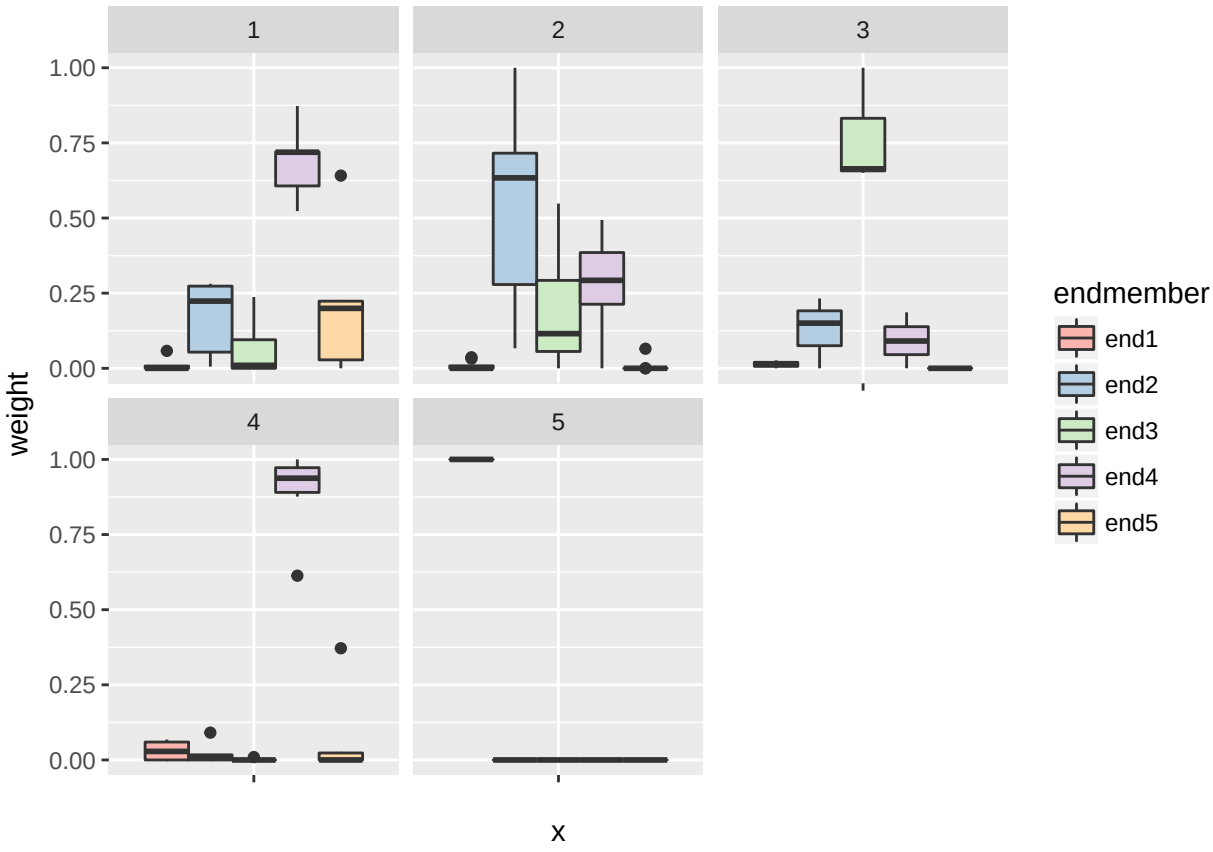
The next figure shows the correspondence between endmembers and clusters, note that kmeans can assign more than one ensemble to the same cluster, leaving some clusters unrepresented.



Endmember weights by cluster

The next two figures show the average mixture for each cluster among all endmembers. In the barplot Each column represents a single cluster and averages the weights of the contained signatures. The different colored segments of the bar represent the weight proportion for each endmember. The boxplot is analogous, with each box representing the distribution of weight for a particular endmember, separated in an individual plot for each cluster.

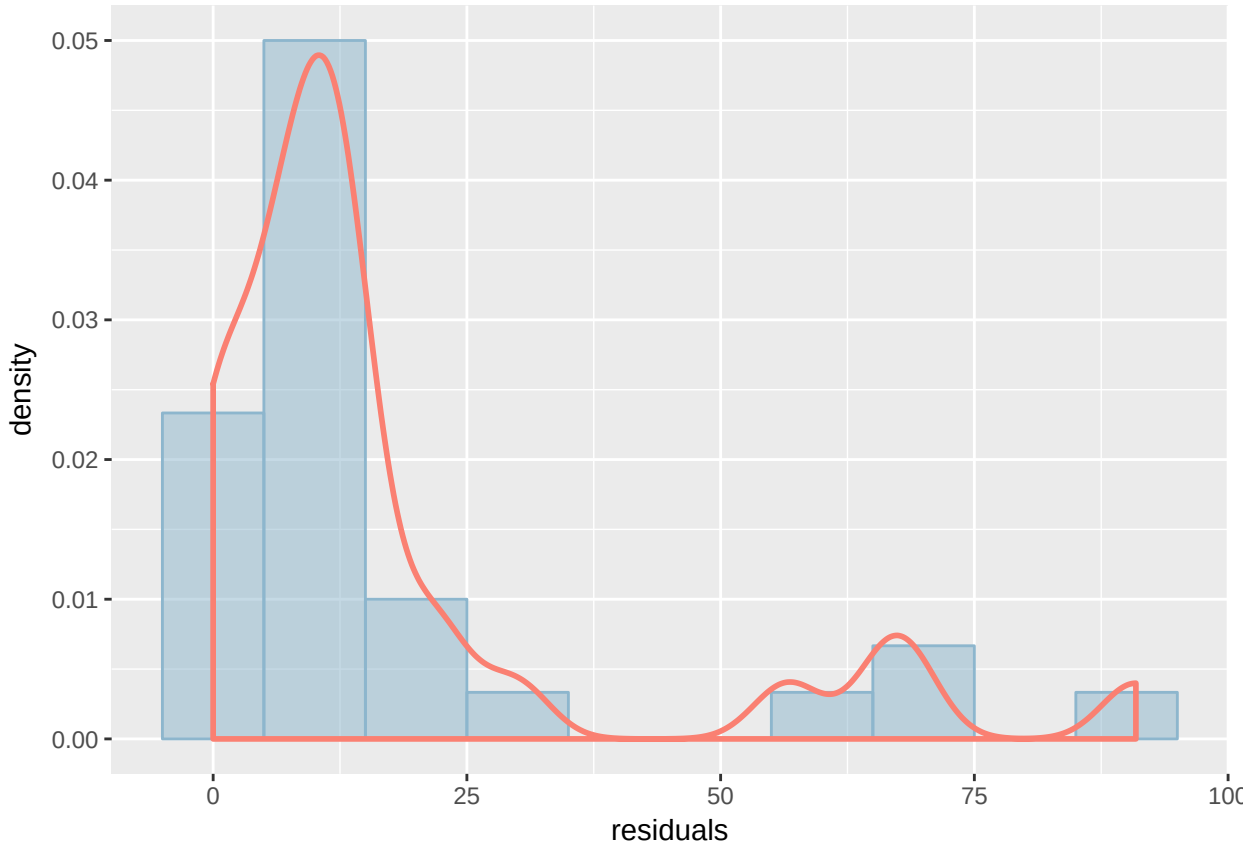



1
2
3
4
5
1.00
0.75
0.50
0.25
0.00
weight
x
endmember
end1
end2
end3
end4
end5

Residual values

The following table and figure show the distribution of the residual component from the the unmixing process. The distribution includes all endmembers and signatures in the dataset.

Min.	1st Qu.	Median	Mean	3rd Qu.	Max.
0	5.57367	11.19026	17.87403	15.36463	90.91626



Summary table

The following table contains the summary of the whole experiment, showing the assigned cluster, distribution of weights and residuals for each signature in the dataset.

file	end1	end2	end3	end4	end5	residual
signature0000.asd	0.0000000	0.7157892	0.0559447	0.2282660	0.0000000	13.825199
signature0001.asd	0.0366876	0.6335927	0.0652428	0.2644770	0.0000000	11.413561
signature0002.asd	0.0265451	0.2323334	0.6503251	0.0907964	0.0000000	8.222421
signature0003.asd	1.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.000000
signature0004.asd	0.0000000	0.1502678	0.6635819	0.1861503	0.0000000	8.751437
signature0005.asd	0.0000000	0.1631596	0.4055986	0.4312418	0.0000000	4.998100
signature0006.asd	0.0091941	0.2786621	0.2519967	0.4601472	0.0000000	8.066054
signature0007.asd	0.0579847	0.2810929	0.0197757	0.0000000	0.6411468	5.528295
signature0008.asd	0.0000000	1.0000000	0.0000000	0.0000000	0.0000000	0.000000
signature0009.asd	0.0000000	0.8100564	0.0579576	0.1319860	0.0000000	13.252974
signature0010.asd	0.0000000	0.0814909	0.3599426	0.4935190	0.0650475	4.726662
signature0011.asd	0.0000000	0.0000000	1.0000000	0.0000000	0.0000000	0.000000
signature0012.asd	0.0000000	0.0908787	0.0095528	0.8762890	0.0232795	10.219058
signature0013.asd	0.0321961	0.4621345	0.2925113	0.2131580	0.0000000	11.742499
signature0014.asd	0.0101597	0.0055754	0.2371468	0.7189659	0.0281522	5.709792
signature0015.asd	0.0000000	0.5448543	0.1278279	0.3273179	0.0000000	21.150645
signature0016.asd	0.0000000	0.0151772	0.0000000	0.6131241	0.3716987	56.618861
signature0017.asd	0.0000000	0.2800001	0.0000000	0.7199999	0.0000000	90.916263
signature0018.asd	0.0000000	0.1936850	0.0000000	0.6068407	0.1994743	29.796054
signature0019.asd	0.0000000	0.7467447	0.1152909	0.1379644	0.0000000	22.518683
signature0020.asd	0.0679330	0.0000000	0.0000000	0.9320670	0.0000000	66.081422
signature0021.asd	0.0072624	0.6997735	0.0003838	0.2925803	0.0000000	12.766003
signature0022.asd	0.0000000	0.0177327	0.0000000	0.9822673	0.0000000	10.966960
signature0023.asd	0.0000000	0.0071792	0.1201629	0.8726579	0.0000000	15.866981
signature0024.asd	0.0000000	0.6408956	0.0492656	0.3098389	0.0000000	11.950758
signature0025.asd	0.0000000	0.0000000	0.0000000	1.0000000	0.0000000	0.000000
signature0026.asd	0.0000000	0.2535623	0.0000000	0.5230085	0.2234292	13.857586
signature0027.asd	0.0569214	0.0000000	0.0000000	0.9430786	0.0000000	68.700590
signature0028.asd	0.0000000	0.0666677	0.5481296	0.3852026	0.0000000	8.574018
signature0029.asd	0.0000000	0.0000000	0.0000000	0.0000000	1.0000000	0.000000

About archeospec

This report has been generated automatically using the archeospec package version 1.0.0.