

Supplementary material to the paper Wells AF et al. Vegetation classification for northwestern Arctic Alaska using an EcoVeg approach: tussock tundra and low and tall willow groups and alliances. Vegetation Classification and Survey. DOI: 10.3897/VCS.65469

Supplementary material 3. Results of the Partana analysis for Arctic low and tall willow and tussock tundra Associations by Group, Ecological Land Survey Legacy Database (ELD) Arctic Plant Association Classification, Alaska.

Partana analysis calculates the mean object-to-cluster similarity, mean cluster-to-cluster similarity, and the overall mean within cluster to between-cluster similarity (Roberts 2020). Similarity here refers to plant species composition. In the following tables we present the mean cluster-to-cluster similarity and the overall mean within cluster to between-cluster similarity for Partana analyses conducted for each arctic low and tall willow and tussock tundra USNVC Group.

In this analysis the clusters are plant associations. The plant associations are sorted first by alliance and then alphabetically therein. The overall mean within cluster to between-cluster similarity is presented at the bottom of the table. This metric is a measure of the strength of the overall clustering, and is similar in concept to the average silhouette width for the overall clustering in a silhouette diagram described in supplementary material 2. The greater the overall mean within cluster to between-cluster similarity, the greater the distinctness of each of the clusters and the stronger the overall clustering.

The matrix displays the mean cluster-to-cluster similarity for each plant association. The mean cluster-to-cluster similarities of each of the plant associations to themselves are in the gray boxes along the diagonal. Strong clusters are more similar to themselves than they are to any other cluster, and the higher the value relative to the other clusters the stronger the cluster fidelity. The values off diagonal are the mean cluster-to-cluster similarity of each cluster to each of the other plant associations. The higher the value the more similar a given plant association is to another plant association. In general, the plant associations are more similar to other plant associations within the same alliance than they are to plant associations in other alliances. This is illustrated in the matrix by the bold outlines around the plant associations within the same alliance.

Literature Cited

Roberts DW (2020) optpart: Optimal Partitioning of Similarity Relations. R package version 3.0-3. <https://cran.r-project.org/web/packages/optpart/index.html>

Supplementary material 3A. Partana analysis for Associations in the Arctic Low Shrub Tundra Group (G897). Plant Association codes are explained in Supplementary material 6.

Plant Association	<i>salpul1/carbig</i>	<i>salpul1/petfri</i>	<i>salgla/dryint/carbig</i>	<i>salgla/dryint/rhyrug</i>	<i>salric1/arcrub1</i>	<i>salric1/equarv-fesalt</i>	<i>salric1/equarv-petfri</i>	<i>betnan-salgla/vacvit/carbig</i>	<i>betnan-salgla/vacvit/sauang</i>	<i>betnan-salpul1/petfri</i>
<i>salpul1/carbig</i>	0.51	0.46	0.22	0.13	0.10	0.17	0.10	0.30	0.18	0.38
<i>salpul1/petfri</i>	0.46	0.59	0.10	0.06	0.08	0.12	0.11	0.15	0.08	0.32
<i>salgla/dryint/carbig</i>	0.22	0.10	0.53	0.45	0.21	0.25	0.14	0.43	0.35	0.14
<i>salgla/dryint/rhyrug</i>	0.13	0.06	0.45	0.47	0.20	0.24	0.09	0.34	0.32	0.09
<i>salric1/arcrub1</i>	0.10	0.08	0.21	0.20	0.46	0.36	0.44	0.12	0.10	0.04
<i>salric1/equarv-fesalt</i>	0.17	0.12	0.25	0.24	0.36	0.44	0.37	0.17	0.14	0.10
<i>salric1/equarv-petfri</i>	0.10	0.11	0.14	0.09	0.44	0.37	0.53	0.08	0.04	0.06
<i>betnan-salgla/vacvit/carbig</i>	0.30	0.15	0.43	0.34	0.12	0.17	0.08	0.58	0.50	0.36
<i>betnan-salgla/vacvit/sauang</i>	0.18	0.08	0.35	0.32	0.10	0.14	0.04	0.50	0.49	0.34
<i>betnan-salpul1/petfri</i>	0.38	0.32	0.14	0.09	0.04	0.10	0.06	0.36	0.34	0.62

Within to Between Cluster Ratio = 2.61

Associations within the same Alliance

Supplementary material 3B. Partana analysis for Associations in the Arctic Herbaceous Tussock Tundra Group Proposed (G899p). Plant Association codes are explained in Supplementary material 6.

Plant Association	alnfru/betnan/erivag	betnan-leddec/erivag	leddec/erivag	betnan-salpul1/erivag	salpul1/erivag	erivag/leddec-vacvit	erivag/vaculi/sphag	erivag/dryint
alnfru/betnan/erivag	0.58	0.48	0.41	0.44	0.32	0.38	0.33	0.19
betnan-leddec/erivag	0.48	0.59	0.51	0.52	0.42	0.48	0.38	0.25
leddec/erivag	0.41	0.51	0.54	0.42	0.40	0.50	0.37	0.25
betnan-salpul1/erivag	0.44	0.52	0.42	0.59	0.51	0.43	0.38	0.31
salpul1/erivag	0.32	0.42	0.40	0.51	0.59	0.44	0.36	0.38
erivag/leddec-vacvit	0.38	0.48	0.50	0.43	0.44	0.54	0.44	0.32
erivag/vaculi/sphag	0.33	0.38	0.37	0.38	0.36	0.44	0.52	0.30
erivag/dryint	0.19	0.25	0.25	0.31	0.38	0.32	0.30	0.48

Within to Between Cluster Ratio = 1.36

Associations within the same Alliance

Supplementary material 3C. Partana analysis for Associations in the North American Arctic Wet Shrubland Group (G830). Plant Association codes are explained in Supplementary material 6.

Plant Association	<i>betnan-salpul1/caraqu1- eriang1</i>	<i>salpul1/caraqu1-eriang1</i>	<i>salpul1/caraqu1-eriang1-saxhir</i>	<i>salpul1/caraqu1-eriang1/sphag</i>	<i>salpul1/eriang1</i>	<i>salric1/caraqu1-eriang1</i>	<i>salric1/equvar</i>
<i>betnan-salpul1/caraqu1-eriang1</i>	0.51	0.34	0.40	0.42	0.36	0.20	0.12
<i>salpul1/caraqu1-eriang1</i>	0.34	0.56	0.50	0.50	0.55	0.22	0.13
<i>salpul1/caraqu1-eriang1-saxhir</i>	0.40	0.50	0.53	0.54	0.49	0.32	0.20
<i>salpul1/caraqu1-eriang1/sphag</i>	0.42	0.50	0.54	0.54	0.49	0.25	0.14
<i>salpul1/eriang1</i>	0.36	0.55	0.49	0.49	0.60	0.21	0.12
<i>salric1/caraqu1-eriang1</i>	0.20	0.22	0.32	0.25	0.21	0.53	0.42
<i>salric1/equvar</i>	0.12	0.13	0.20	0.14	0.12	0.42	0.55

Within to Between Cluster Ratio = 1.73

Associations within the same Alliance

Supplementary material 3D. Partana analysis for Associations in the Arctic Gravel Floodplain Vegetation Group (G616). Plant Association codes are explained in Supplementary material 6.

Plant Association	<i>salala/epilat</i>	<i>salala/equarv</i>	<i>salala/astsib</i>	<i>salhas-salala/equvar</i>	<i>salgla/arcrub1</i>	<i>salala/chrpib</i>	<i>salnip1-salala/arcrub1</i>
<i>salala/epilat</i>	0.31	0.14	0.19	0.13	0.02	0.22	0.14
<i>salala/equarv</i>	0.14	0.55	0.47	0.22	0.09	0.32	0.22
<i>salala/astsib</i>	0.19	0.47	0.50	0.27	0.08	0.35	0.24
<i>salhas-salala/equvar</i>	0.13	0.22	0.27	0.50	0.22	0.23	0.25
<i>salgla/arcrub1</i>	0.02	0.09	0.08	0.22	0.40	0.09	0.17
<i>salala/chrpib</i>	0.22	0.32	0.35	0.23	0.09	0.44	0.27
<i>salnip1-salala/arcrub1</i>	0.14	0.22	0.24	0.25	0.17	0.27	0.40

Within to Between Cluster Ratio = 2.12

Associations within the same Alliance