

Ecography

**ECOG-00711**

Spasojevic, M. J., Copeland, S. and Suding, K. N. 2014. Using functional diversity patterns to explore metacommunity dynamics: a framework for understanding local and regional influences on community structure. – Ecography doi: 10.1111/ecog.00711

**Supplementary material**

## Appendix 1

Table A1. Description of site characteristics. Geographic location (latitude and longitude), site area, isolation and gamma-species richness for each of the 17 sites sampled in this study.

Geographic isolation was calculated as the area (km<sup>2</sup>) of non-alpine habitat within 5 km and 10 km radii of each site.

| Site Number | Latitude | Longitude | Site area km <sup>2</sup> | 5km isolation | 10km isolation | Species richness |
|-------------|----------|-----------|---------------------------|---------------|----------------|------------------|
| 1           | 38.9982  | -106.0922 | 2.13                      | 68.9          | 256.8          | 49               |
| 2           | 37.3805  | -106.4802 | 3.36                      | 76.0          | 235.9          | 59               |
| 3           | 37.8767  | -105.0121 | 1.00                      | 74.5          | 197.4          | 39               |
| 4           | 39.6950  | -105.8974 | 1.06                      | 29.5          | 214.1          | 45               |
| 5           | 39.8109  | -105.7012 | 0.71                      | 45.8          | 164.1          | 50               |
| 6           | 40.1590  | -105.5910 | 2.30                      | 64.1          | 220.3          | 39               |
| 7           | 40.5792  | -105.7246 | 4.32                      | 63.8          | 194.6          | 48               |
| 8           | 40.0575  | -105.5916 | 7.62                      | 55.4          | 236.0          | 67               |
| 9           | 37.9179  | -106.9361 | 0.47                      | 59.2          | 209.6          | 34               |
| 10          | 39.1460  | -106.6534 | 2.06                      | 47.6          | 226.2          | 47               |
| 11          | 39.5025  | -105.7843 | 0.86                      | 68.7          | 274.3          | 47               |
| 12          | 39.5516  | -106.1908 | 0.65                      | 65.3          | 228.3          | 46               |
| 13          | 39.7982  | -105.7634 | 2.22                      | 48.2          | 239.2          | 56               |
| 14          | 39.6566  | -105.8004 | 0.76                      | 34.7          | 173.0          | 45               |
| 15          | 39.4074  | -105.9789 | 1.01                      | 44.9          | 307.4          | 64               |
| 16          | 39.1623  | -106.4414 | 0.49                      | 49.9          | 285.9          | 49               |
| 17          | 38.8442  | -106.2692 | 0.76                      | 62.8          | 293.8          | 50               |

Table A2. Species mean trait values for the 107 species found in our dataset

| Species Name   | Mean Height (cm) | Mean Stomatal Conductance (mmol/m <sup>2</sup> /sec) | Mean Chlorophyll Content (μmol/m <sup>2</sup> ) | Mean Leaf Area (cm <sup>2</sup> ) | Mean SLA (g/cm <sup>2</sup> ) |
|--|------------------|--|---|-----------------------------------|-------------------------------|
| <i>Achillea lanulosa</i> ssp. <i>alpicola</i>        | 19.66            | 293.49   | 197.15  | 5.39                              | 127.24                        |
| <i>Acomastylis rossii</i>                            | 12.46            | 199.89   | 540.91  | 7.45                              | 95.68                         |
| <i>Agoseris aurantica</i>                            | 11.48            | 124.17   | 519.46  | 10.21                             | 35.49                         |
| <i>Allium geayeri</i>                                | 5.62             | 85.07  | 72.70   | 1.18                              | 19.86                         |
| <i>Angelica grayi</i>                                | 36.57            | 306.88   | 297.95  | 13.61                             | 119.72                        |
| <i>Antennaria alpina</i>                             | 7.81             | 199.08   | 333.08  | 0.33                              | 158.42                        |
| <i>Aquilegia coerulea</i> var. <i>coerulea</i>       | 30.72            | 149.77   | 447.24  | 35.34                             | 47.09                         |
| <i>Arctostaphylos uva-ursi</i>                       | 7.34             | 177.77   | 225.11  | 0.64                              | 231.90                        |
| <i>Arenaria fendleri</i> var. <i>tweedyi</i>         | 10.26            | 217.94   | 207.25  | 0.33                              | 173.09                        |
| <i>Arnica cordifolia</i>                             | 19.60            | 73.59  | 279.72  | 13.40                             | 45.61                         |
| <i>Arnica latifolia</i>                              | 16.23            | 175.70   | 422.65  | 14.71                             | 41.17                         |
| <i>Arnica mollis</i>                                 | 26.60            | 134.90   | 365.83  | 8.14                              | 240.66                        |
| <i>Artemisia pattersonii</i>                         | 7.82             | 64.40  | 365.00  | 1.12                              | 30.85                         |
| <i>Artemisia scopulorum</i>                          | 16.01            | 239.30   | 246.46  | 2.98                              | 154.24                        |
| <i>Polygonum bistortoides</i>                        | 31.73            | 273.57   | 521.49  | 12.97                             | 142.46                        |
| <i>Polygonum vivipara</i>                            | 4.43             | 249.83   | 615.55  | 3.40                              | 57.82                         |
| <i>Calamagrostis purpurascens</i>                    | 17.20            | 160.28   | 599.27  | 3.33                              | 124.19                        |
| <i>Calamagrostis canadensis</i>                      | 16.20            | 157.46   | 491.22  | 7.78                              | 31.63                         |
| <i>Caltha leptosepala</i>                            | 10.08            | 114.19   | 552.15  | 17.89                             | 84.07                         |
| <i>Campanula parryi</i>                              | 15.05            | 204.75   | 573.16  | 1.01                              | 118.58                        |
| <i>Carex albonigra</i>                               | 12.30            | 184.53   | 412.84  | 6.16                              | 52.72                         |
| <i>Carex aquatilis</i> ssp. <i>stans</i>             | 24.40            | 34.34  | 607.94  | 6.98                              | 146.53                        |
| <i>Carex breviar</i>                                 | 8.40             | 48.06  | 269.12  | 0.97                              | 88.14                         |
| <i>Carex ebenea</i>                                  | 16.00            | 94.30  | 307.63  | 4.77                              | 179.36                        |
| <i>Carex foenea</i>                                  | 14.47            | 60.01  | 220.12  | 2.74                              | 120.04                        |
| <i>Carex nova</i>                                    | 25.40            | 150.32   | 404.71  | 6.33                              | 211.16                        |
| <i>Carex rupestris</i> ssp. <i>drummondiana</i>      | 5.82             | 333.08   | 543.19  | 1.18                              | 112.92                        |
| <i>Carex scopulorum</i> var. <i>scopulorum</i>       | 27.93            | 180.70   | 500.34  | 5.64                              | 140.63                        |
| <i>Castilleja occidentalis</i>                       | 12.10            | 366.05   | 285.65  | 1.61                              | 157.15                        |
| <i>Cerastium arvense</i> s. lat.                     | 7.88             | 175.33   | 233.30  | 0.35                              | 129.42                        |
| <i>Chamerion angustifolium</i>                       | 24.32            | 214.83   | 367.23  | 6.46                              | 193.63                        |
| <i>Chionophila jamesii</i>                           | 12.86            | 123.49   | 627.56  | 3.60                              | 145.54                        |
| <i>Danthonia intermedia</i>                          | 13.00            | 218.27   | 640.85  | 1.15                              | 86.79                         |
| <i>Deschampsia cespitosa</i>                         | 50.82            | 207.12   | 226.33  | 5.23                              | 29.22                         |
| <i>Dodecatheon pulchellum</i>                        | 11.23            | 159.06   | 372.54  | 4.08                              | 41.06                         |
| <i>Draba aurea</i>                                   | 4.75             | 92.10  | 328.22  | 0.34                              | 31.99                         |
| <i>Draba streptocarpa</i> var. <i>streptocarpa</i>   | 2.50             | 93.03  | 78.94   | 0.12                              | 30.09                         |
| <i>Dryas octopetala</i>                              | 2.33             | 50.67  | 430.25  | 0.80                              | 39.78                         |
| <i>Elymus scriberneri</i>                            | 16.71            | 58.83  | 722.57  | 4.13                              | 44.02                         |
| <i>Erigeron melanocephalus</i>                       | 8.28             | 191.48   | 483.23  | 1.24                              | 201.63                        |
| <i>Erigeron peregrinus</i> ssp. <i>callianthemus</i> | 30.64            | 117.90   | 329.44  | 12.74                             | 117.28                        |
| <i>Erigeron pinnatisectus</i>                        | 5.22             | 195.28   | 198.79  | 0.99                              | 25.54                         |
| <i>Erigeron simplex</i>                              | 9.77             | 205.77   | 541.46  | 1.00                              | 171.72                        |
| <i>Eritrichium aretioides</i>                        | 2.46             | 367.03   | 116.47  | 0.08                              | 31.01                         |
| <i>Erysimum capitatum</i>                            | 9.42             | 124.10   | 560.58  | 1.37                              | 31.51                         |
| <i>Festuca brachyphylla</i>                          | 7.00             | 210.29   | 442.27  | 0.29                              | 180.27                        |
| <i>Frasera speciosa</i>                              | 12.54            | 92.10  | 547.62  | 47.33                             | 88.38                         |
| <i>Gentianoides algida</i>                           | 11.00            | 70.30  | 286.32  | 3.23                              | 37.90                         |
| <i>Heuchera parvifolia</i>                           | 17.18            | 108.57   | 695.97  | 3.11                              | 73.50                         |

|                                    |       |        |        |       |        |
|------------------------------------|-------|--------|--------|-------|--------|
| Hieracium gracile                  | 15.35 | 171.29 | 437.39 | 3.94  | 216.33 |
| Tetraneuris acaulis                | 4.88  | 89.32  | 585.17 | 1.21  | 23.22  |
| Hymenoxys grandiflora              | 13.35 | 117.40 | 284.47 | 3.45  | 70.73  |
| Juncus drummondii                  | 19.20 | 114.01 | 667.81 | 1.18  | 117.27 |
| Kobresia myosuroides               | 7.74  | 178.90 | 339.55 | 0.48  | 43.25  |
| Lewisia pygmaea var. pygmaea       | 2.59  | 108.00 | 375.15 | 1.22  | 133.87 |
| Ligusticum tenuifolium             | 29.92 | 174.18 | 250.61 | 23.52 | 159.62 |
| Lloydia serotina                   | 10.51 | 151.83 | 120.55 | 1.62  | 88.12  |
| Luzula parviflora                  | 42.00 | 138.44 | 204.84 | 8.44  | 301.10 |
| Luzula spicata ssp. saximontana    | 12.18 | 136.65 | 179.94 | 1.20  | 172.62 |
| Mertensia ciliata                  | 62.60 | 348.78 | 320.31 | 11.71 | 237.73 |
| Mertensia lanceolata               | 15.74 | 179.90 | 678.50 | 3.52  | 139.22 |
| Minuartia obtusiloba               | 2.68  | 214.94 | 52.32  | 0.05  | 332.03 |
| Oreoxis alpina ssp. alpina         | 3.84  | 189.90 | 310.44 | 0.94  | 29.00  |
| Paronychia pulvinata               | 1.94  | 47.30  | 332.90 | 0.06  | 36.16  |
| Pedicularis groenlandica           | 18.48 | 180.10 | 176.01 | 4.94  | 80.97  |
| Pedicularis parryi                 | 13.28 | 294.23 | 87.22  | 3.34  | 99.38  |
| Pedicularis racemosa ssp. alba     | 22.60 | 212.24 | 283.52 | 2.40  | 188.51 |
| Pentaphylloides floribunda         | 19.62 | 156.37 | 746.95 | 1.00  | 46.48  |
| Phleum alpinum                     | 25.40 | 80.56  | 331.93 | 4.31  | 160.76 |
| Phleum pratense                    | 26.14 | 65.47  | 278.34 | 6.49  | 185.92 |
| Phlox sibirica ssp. pulvinata      | 1.54  | 192.70 | 137.59 | 0.14  | 35.07  |
| Poa alpina                         | 13.12 | 174.21 | 447.05 | 1.14  | 203.89 |
| Poa epilys                         | 52.02 | 155.05 | 696.84 | 1.18  | 143.26 |
| Poa glauca var. rupicola           | 15.86 | 145.10 | 473.97 | 0.55  | 39.20  |
| Poa spp.                           | 30.80 | 30.64  | 334.24 | 2.31  | 180.28 |
| Polemonium pulcherrimum            | 11.75 | 92.90  | 246.81 | 0.91  | 672.13 |
| Polemonium viscosum                | 8.36  | 313.77 | 342.29 | 2.98  | 20.18  |
| Potentilla concinna                | 2.66  | 63.50  | 465.83 | 1.17  | 93.44  |
| Potentilla diversifolia            | 20.57 | 200.91 | 672.02 | 9.34  | 136.46 |
| Potentilla nivea                   | 3.68  | 119.90 | 562.85 | 2.94  | 80.50  |
| Primula angustifolia               | 2.20  | 103.93 | 615.47 | 6.49  | 29.46  |
| Pseudocymopterus montanus          | 17.85 | 127.93 | 231.95 | 15.19 | 68.81  |
| Ranunculus adoneus                 | 9.57  | 288.60 | 458.50 | 3.83  | 114.74 |
| Rhodiola integrifolia              | 10.84 | 112.87 | 402.13 | 0.84  | 25.07  |
| Ribes montigenum                   | 54.50 | 285.86 | 339.28 | 4.78  | 272.77 |
| Salix arctica sp. petraea          | 3.51  | 127.10 | 423.91 | 2.71  | 123.79 |
| Saxifraga rhomboidea               | 12.16 | 123.87 | 365.53 | 3.92  | 135.42 |
| Sedum lanceolatum                  | 3.11  | 143.15 | 64.66  | 0.18  | 202.37 |
| Senecio crocatus                   | 17.60 | 151.28 | 461.17 | 4.51  | 27.75  |
| Senecio triangularis               | 49.80 | 330.14 | 340.01 | 20.17 | 237.25 |
| Senecio canus                      | 9.42  | 97.67  | 822.35 | 2.62  | 26.90  |
| Sibbaldia procumbens               | 4.36  | 133.91 | 385.76 | 4.37  | 171.37 |
| Silene acaulis ssp. subacaulescens | 1.48  | 99.32  | 40.07  | 0.10  | 41.80  |
| Solidago spathulata                | 11.94 | 156.23 | 493.85 | 5.91  | 150.69 |
| Taraxacum officinale               | 17.25 | 148.50 | 366.95 | 13.33 | 235.61 |
| Thlaspi montanum var. montanum     | 4.68  | 59.20  | 284.12 | 0.46  | 97.79  |
| Tonestus pygmaeus                  | 2.58  | 165.10 | 592.31 | 0.95  | 47.91  |
| Trifolium dasyphyllum              | 4.60  | 160.03 | 434.51 | 1.15  | 40.72  |
| Trifolium nanum                    | 2.22  | 174.12 | 680.87 | 1.05  | 42.38  |
| Trifolium parryi ssp. parryi       | 8.08  | 172.28 | 684.47 | 5.18  | 137.30 |
| Trisetum spicatum s. lat.          | 15.25 | 133.18 | 342.82 | 1.16  | 128.19 |
| Trollius laxus                     | 17.80 | 121.34 | 335.99 | 27.58 | 130.46 |
| Vaccinium cespitosum               | 9.95  | 140.76 | 227.58 | 1.76  | 66.93  |
| Veronica wormskjoldii              | 14.80 | 121.12 | 296.40 | 1.88  | 56.29  |
| Viola adunca                       | 2.98  | 126.23 | 355.48 | 1.58  | 122.49 |

*Zigadenus elegans*

16.18

76.27

758.31

12.12

28.96