**List of Tables**

Table S1(a). Spectral slopes of Sentinel-1 BSC for the grassland region in Grand Mesa, CO in 2017.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Date** | **Spectral Slope** | | | | | | | |
| **90-180 m** | | | | **180-900 m** | | | |
| **VV** | | **VH** | | **VV** | | **VH** | |
| **Lx** | **Ly** | **Lx** | **Ly** | **Lx** | **Ly** | **Lx** | **Ly** |
| 24Feb2017 | -5.80 | -3.26 | -5.46 | -3.64 | -1.33 | -1.09 | -1.23 | -1.23 |
| 20Mar2017 | -5.13 | -3.71 | -5.96 | -3.93 | -1.40 | -0.80 | -1.07 | -0.77 |
| 25Apr2017 | -5.16 | -3.93 | -5.50 | -4.08 | -1.55 | -0.75 | -1.45 | -0.54 |
| 31May2017 | -4.55 | -3.55 | -5.83 | -3.97 | -1.58 | -1.75 | -1.48 | -1.42 |
| 24Jun2017 | -5.88 | -2.97 | -5.12 | -3.66 | -1.22 | -0.85 | -1.15 | -1.30 |

Table S1(b). Spectral slopes of Sentinel-1 BSC for the mixed land cover region in Grand Mesa, CO in 2017.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Date** | **Spectral Slope** | | | | | | | |
| **90-250 m** | | | | **250-1500 m** | | | |
| **VV** | | **VH** | | **VV** | | **VH** | |
| **Lx** | **Ly** | **Lx** | **Ly** | **Lx** | **Ly** | **Lx** | **Ly** |
| 24Feb2017 | -3.55 | -2.99 | -3.85 | -2.98 | -1.22 | -1.04 | -1.45 | -1.36 |
| 20Mar2017 | -3.77 | -3.21 | -3.53 | -3.30 | -1.37 | -0.85 | -1.70 | -1.29 |
| 25Apr2017 | -3.98 | -3.42 | -4.11 | -3.35 | -1.72 | -1.02 | -1.81 | -1.04 |
| 31May2017 | -3.78 | -2.85 | -3.83 | -3.19 | -1.18 | -1.18 | -1.37 | -1.27 |
| 24Jun2017 | -3.72 | -3.02 | -3.80 | -2.90 | -1.36 | -0.80 | -1.58 | -1.28 |

Table S1(c). Spectral slopes of Sentinel-1BSC for the forest region in Grand Mesa, CO in 2017.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Date** | **Spectral Slope** | | | | | | | |
| **90-250 m** | | | | **250-1500 m** | | | |
| **VV** | | **VH** | | **VV** | | **VH** | |
| **Lx** | **Ly** | **Lx** | **Ly** | **Lx** | **Ly** | **Lx** | **Ly** |
| 24Feb2017 | -3.74 | -3.10 | -3.86 | -3.12 | -1.28 | -1.13 | -1.46 | -1.44 |
| 20Mar2017 | -3.94 | -3.47 | -3.52 | -3.46 | -1.31 | -0.98 | -1.66 | -1.60 |
| 25Apr2017 | -4.02 | -3.29 | -4.11 | -3.30 | -1.73 | -1.11 | -1.82 | -1.25 |
| 31May2017 | -3.82 | -2.99 | -3.93 | -3.32 | -1.12 | -1.24 | -1.35 | -1.30 |
| 24Jun2017 | -3.76 | -3.09 | -3.86 | -2.94 | -1.32 | -0.93 | -1.59 | -1.42 |

Table S1(d). Spectral slopes of UAVSAR BSC (HV polarization) for Grand Mesa, CO in 2017.

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Date** | **|Spectral Slope|** | | | | | | | | | | | |
| **30-180 m** | | | | | | **180-900 m** | | | | | |
| **Grassland** | | **Mixed** | | **Forest** | | **Grassland** | | **Mixed** | | **Forest** | |
| **Lx** | **Ly** | **Lx** | **Ly** | **Lx** | **Ly** | **Lx** | **Ly** | **Lx** | **Ly** | **Lx** | **Ly** |
| 06Feb2017 | -2.46 | -2.38 | -2.76 | -2.76 | -2.67 | -2.84 | -1.32 | -0.94 | -1.64 | -1.18 | -1.65 | -1.48 |
| 25Feb2017 | -2.46 | -2.36 | -2.74 | -2.74 | -2.71 | -2.85 | -1.28 | -1.08 | -1.59 | -1.04 | -1.62 | -1.47 |
| 08Mar2017 | -2.41 | -2.25 | -2.72 | -2.79 | -2.66 | -2.82 | -1.03 | -1.19 | -1.71 | -1.23 | -1.72 | -1.47 |
| 31Mar2017 | -2.34 | -2.22 | -2.81 | -2.83 | -2.71 | -2.87 | -1.10 | -0.97 | -1.64 | -1.10 | -1.58 | -1.31 |

Table S2(a). Spectral slopes of Sentinel-1BSC for grassland in Grand Mesa, CO in 2018.

.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Date** | **Slope** | | | | | | | |
| **90-180 m** | | | | **180-900 m** | | | |
| **VV** | | **VH** | | **VV** | | **VH** | |
| **Lx** | **Ly** | **Lx** | **Ly** | **Lx** | **Ly** | **Lx** | **Ly** |
| 09Dec2017 | -1.94 | -1.58 | -1.78 | -1.40 | -0.87 | -0.72 | -0.69 | -0.60 |
| 02Jan2018 | -1.75 | -1.65 | -1.66 | -1.56 | -0.89 | -0.79 | -0.63 | -0.67 |
| 07Feb2018 | -1.83 | -1.61 | -1.70 | -1.58 | -0.94 | -0.77 | -0.92 | -0.81 |
| 03Mar2018 | -1.69 | -1.29 | -1.83 | -1.43 | -0.92 | -0.88 | -0.96 | -0.90 |
| 20Apr2018 | -1.96 | -1.70 | -1.77 | -1.60 | -1.06 | -1.06 | -0.91 | -0.96 |
| 26May2018 | -1.83 | -1.61 | -1.95 | -1.71 | -0.88 | -0.82 | -1.06 | -1.27 |
| 19Jun2018 | -1.64 | -1.56 | -1.74 | -1.92 | -0.98 | -1.08 | -1.00 | -1.19 |

Table S2(b). Spectral slopes of Sentinel-1BSC for mixed land-cover in Grand Mesa, CO in 2018.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Date** | **Slope** | | | | | | | |
| **90-250 m** | | | | **250-1500m** | | | |
| **VV** | | **VH** | | **VV** | | **VH** | |
| **Lx** | **Ly** | **Lx** | **Ly** | **Lx** | **Ly** | **Lx** | **Ly** |
| 09Dec2017 | -1.86 | -1.81 | -1.84 | -1.84 | -1.46 | -1.12 | -1.68 | -1.18 |
| 02Jan2018 | -1.88 | -1.68 | -1.91 | -1.74 | -1.52 | -1.10 | -1.58 | -1.40 |
| 07Feb2018 | -1.77 | -1.68 | -1.76 | -1.76 | -1.22 | -1.02 | -1.59 | -1.18 |
| 03Mar2018 | -1.82 | -1.99 | -1.83 | -1.79 | -1.48 | -0.48 | -1.59 | -1.26 |
| 20Apr2018 | -1.74 | -1.59 | -1.75 | -1.89 | -1.13 | -0.99 | -1.53 | -0.77 |
| 26May2018 | -1.91 | -1.62 | -1.90 | -1.86 | -1.62 | -1.14 | -1.56 | -1.27 |
| 19Jun2018 | -1.97 | -1.68 | -1.93 | --1.91 | -1.49 | -1.15 | -1.55 | -1.34 |

Table S2(c). Spectral slopes of Sentinel-1BSC for forest in Grand Mesa, CO in 2018.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Date** | **Slope** | | | | | | | |
| **90-250 m** | | | | **250-1500 m** | | | |
| **VV** | | **VH** | | **VV** | | **VH** | |
| **Lx** | **Ly** | **Lx** | **Ly** | **Lx** | **Ly** | **Lx** | **Ly** |
| 09Dec2017 | -1.73 | -1.99 | -1.95 | -2.06 | -1.26 | -1.02 | -1.30 | -1.19 |
| 02Jan2018 | -1.79 | -2.01 | -1.95 | -2.25 | -1.38 | -1.25 | -1.27 | -1.13 |
| 07Feb2018 | -1.85 | -1.78 | -2.04 | -2.22 | -1.16 | -1.12 | -1.23 | -1.14 |
| 03Mar2018 | -2.05 | -1.85 | -2.08 | -2.15 | -0.82 | -0.71 | -1.46 | -1.19 |
| 20Apr2018 | -1.66 | -1.53 | -2.02 | -2.08 | -0.81 | -0.86 | -1.18 | -0.80 |
| 26May2018 | -1.83 | -1.96 | -1.87 | -1.79 | -1.34 | -1.10 | -1.09 | -1.08 |
| 19Jun2018 | -1.79 | -2.01 | -2.07 | -2.06 | -1.35 | -0.97 | -1.22 | -0.99 |

Table S3. Spectral slopes of Sentinel-1 BSC for the Swiss Alps in 2018.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Date** | **Spectral Slope** | | | | | | | |
| **90-360 m** | | | | **360-900 m** | | | |
| **VV** | | **VH** | | **VV** | | **VH** | |
| **Lx** | **Ly** | **Lx** | **Ly** | **Lx** | **Ly** | **Lx** | **Ly** |
| 30Jan2018 | -1.96 | -1.55 | -1.69 | -1.32 | -1.78 | -1.52 | -1.60 | -0.76 |
| 23Feb2018 | -2.00 | -1.52 | -1.70 | -1.30 | -1.85 | -1.64 | -1.37 | -0.99 |
| 31Mar2018 | -1.92 | -1.51 | -1.71 | -1.49 | -1.97 | -1.52 | -1.66 | -0.86 |
| 18May2018 | -2.27 | -2.16 | -1.87 | -1.88 | -1.78 | -1.28 | -1.16 | -0.86 |
| 05Jul2018 | -2.89 | -2.36 | -2.93 | -2.47 | -2.22 | -1.58 | -2.19 | -1.34 |
| 10Aug2018 | -3.21 | -2.59 | -3.19 | -2.54 | -2.47 | -1.97 | -2.53 | -2.05 |
| 03Sep2018 | -2.94 | -2.37 | -2.88 | -2.37 | -2.30 | -1.44 | -2.22 | -1.45 |
| 09Oct2018 | -2.93 | -2.39 | -2.95 | -2.46 | -2.23 | -1.44 | -2.22 | -1.66 |

Table S4. Spectral slopes of Sentinel-1 BSC in North Dakota during 2017-18.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Date** | **Spectral Slope** | | | | | | | |
| **90-360 m** | | | | **360-900 m** | | | |
| **VV** | | **VH** | | **VV** | | **VH** | |
| **Lx** | **Ly** | **Lx** | **Ly** | **Lx** | **Ly** | **Lx** | **Ly** |
| 17Oct2017 | -1.11 | -1.83 | -0.96 | -1.43 | -1.21 | -1.03 | -0.52 | -0.57 |
| 10Nov2017 | -1.20 | -1.90 | -1.08 | -1.74 | -1.05 | -0.79 | -0.46 | -0.47 |
| 16Dec2017 | -1.02 | -1.63 | -0.91 | -1.41 | -0.85 | -0.72 | -0.36 | -0.46 |
| 09Jan2018 | -1.23 | -1.84 | -1.13 | -1.58 | -0.86 | -0.71 | -0.44 | -0.52 |
| 14Feb2018 | -1.05 | -1.85 | -0.86 | -1.34 | -0.61 | -0.62 | -0.42 | -0.47 |
| 10Mar2018 | -1.02 | -1.88 | -0.86 | -1.34 | -0.70 | -0.59 | -0.38 | -0.59 |
| 15Apr2018 | -1.14 | -1.99 | -0.94 | -1.43 | -0.96 | -0.80 | -0.38 | -0.58 |
| 21May2018 | -1.19 | -1.90 | -1.02 | -1.55 | -1.16 | -1.03 | -0.80 | -1.00 |
| 14Jun2018 | -1.08 | -1.84 | -1.15 | -1.42 | -1.59 | -1.30 | -1.57 | -1.43 |
| 20Jul2018 | -1.28 | -1.93 | -1.12 | -1.69 | -1.83 | -1.40 | -1.83 | -1.37 |