Supplementary Table S1 Root mean squared error (RMSE) and mean bias error (MBE) of the observed and interpolated fluxes (mg C-CO2 m-2 s-1). Period of interpolation: 22 July to 10 August (20 days); values in parentheses for 2014: 16 June to 20 August (66 days).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Year | Group | Ecosystem respiration | | Gross primary production | |
|  |  | RMSE | MBE | RMSE | MBE |
| 2013 | D\_Carex | 0.009 | 0.00004 | 0.025 | -0.035 |
|  | D\_CarexEriophorum | 0.007 | -0.002 | 0.013 | -0.001 |
|  | D\_Eriophorumshrub | 0.01 | 0.00005 | 0.026 | -0.029 |
|  | C\_CarexShrub | 0.008 | 0.00002 | 0.016 | -0.035 |
|  | C\_Eriophorum | 0.006 | -0.00001 | 0.017 | -0.027 |
|  | C\_EriophorumShrub | 0.007 | 0.000002 | 0.014 | -0.034 |
| 2014 | D\_wet (EriophorumShrub) | 0.003 (0.007) | -0.0002 (-0.00004) | 0.032 (0.03) | -0.008 (-0.055) |
|  | D\_dry (CarexEriophorum) | 0.008 (0.009) | 0.003 (-0.00006) | 0.02 (0.022) | 0.003 (-0.054) |
|  | C\_wet (EriophorumShrub) | 0.01 (0.01) | -0.004 (-0.00002) | 0.013 (0.023) | 0.003 (-0.044) |
|  | C\_dry (CarexShrub) | 0.012 (0.011) | 0.001 (0.0002) | 0.023 (0.03) | 0.002 (-0.091) |

Supplementary Figure S1 Logarithmic relations between photosynthetically active radiation (PAR) and gross primary production (GPP) by transect (columns) and year (rows). Data points are only from August when vegetation activity was high enough to minimize seasonality.

Supplementary Figure S2 The total aboveground dry biomass (mean ± standard deviation) of standing dead and living plants, measured in 2003 (*N* = 20) and 2013 (*N* = 4). Weights of dry biomass were not separated by species. Dead: standing dead materials, largely from *Carex* sp. and *Eriophorum angustifolium*; stem: stems, mainly from shrubs; leaf: green leaves of all species.