

Supplementary Table S1: Summary of General Linear Mixed Models (LMMs) for Non Rainfall Water Inputs (NRWI) during dry, wet soil periods and for the total study period, as a function of cover type (well developed cyanobacterial crusts and bare soil), and NRWI event.

| | Dry period | | Wet Period | | Total Study Period | |
|-----------------------------|------------|---------|------------|---------|--------------------|---------|
| | F | p Value | F | p Value | F | p Value |
| Cover type (Fixed) | 21.70 | 0.00 | 297.47 | 0.00 | 180.47 | 0.00 |
| NRWI event (Random) | 9.93 | 0.00 | 62.01 | 0.00 | 21.72 | 0.00 |
| Cover * NRWI event (Random) | 1.62 | 0.15 | 0.14 | 1.00 | 0.28 | 1.00 |

Supplementary Table S2: Summary of General Linear Mixed Models (LMMs) for soil moisture decrease rate, as a function of cover type (well developed cyanobacterial crusts and bare soil), and drying event at the two study sites (El Cautivo and Las Amoladeras).

| | El Cautivo | | Las Amoladeras | |
|-------------------------------|------------|---------|----------------|---------|
| | F | p Value | F | p Value |
| Cover type (Fixed) | 20.26 | 0.00 | 4.79 | 0.09 |
| Drying event (Random) | 37.81 | 0.00 | 4.59 | 0.08 |
| Cover * Drying event (Random) | 0.66 | 0.70 | 0.84 | 0.51 |