**The following files contain soil volumetric water content (H2O%v/v) data for the CO2\*precipitation manipulation experiment for 2009-2011:**

‘2009\_driFACE\_soil\_moisture\_ringmeans.csv’

‘2010\_driFACE\_soil\_moisture\_ringmeans.csv’

‘2011\_driFACE\_soil\_moisture\_ringmeans.csv’

**The .csv files contain the following columns:**

A: Obs: observation number

B: H2O: precipitation treatment (RP=reduced precipitation, CP=control precipitation)

C: ring: treatment plot

D: DOY: Julian date, or day of year

E: CO2: CO2 treatment (amb=ambient CO2; ele=elevated CO2)

F: block: Experimental replicate

G: true\_ten: Calibrated soil moisture data for the given DOY at 5-15 cm soil depth

H: true\_twenty: Calibrated soil moisture data for the given DOY at 15-25 cm soil depth

I: true\_thirty: Calibrated soil moisture data for the given DOY at 25-35 cm soil depth

J: true\_forty: Calibrated soil moisture data for the given DOY at 35-45 cm soil depth

K: true\_fifty: Calibrated soil moisture data for the given DOY at 45-55 cm soil depth

L: true\_sixty: Calibrated soil moisture data for the given DOY at 55-65 cm soil depth

M: true\_seventy: Calibrated soil moisture data for the given DOY at 65-75 cm soil depth

N: start\_ten: Calibrated soil moisture data for the first measurement day of the season at 5-15 cm soil depth

O: start\_twenty: Calibrated soil moisture data for the first measurement day of the season at 15-25 cm soil depth

P: start\_thirty: Calibrated soil moisture data for the first measurement day of the season at 25-35 cm soil depth

Q: start\_forty: Calibrated soil moisture data for the first measurement day of the season at 35-45 cm soil depth

R: start\_fifty: Calibrated soil moisture data for the first measurement day of the season at 45-55 cm soil depth

S: start\_sixty: Calibrated soil moisture data for the first measurement day of the season at 55-65 cm soil depth

T: start\_seventy: Calibrated soil moisture data for the first measurement day of the season at 65-75 cm soil depth

**Ring mean soil moisture data are analyzed via ANCOVA in the SAS files:**

‘2009\_Soil\_Moisture\_driFACE\_ANCOVA.sas’

‘2010\_Soil\_Moisture\_driFACE\_ANCOVA.sas’

‘2011\_Soil\_Moisture\_driFACE\_ANCOVA.sas’

In these files, mixed-model, repeated measures ANCOVAs are run on soil moisture data for each depth category. CO2, precipitation, DOY and their interactions are treated as fixed effects, starting soil moisture at the beginning of the season is treated as a covariate, and block and the block\*CO2 interaction are treated as random effects.

Model-corrected treatment means (lsmeans) for ambient CO2, reduced precipitation treatment are plotted as the response surface in Figure 1I-K, while the color of the surface represents the % effect of elevated [CO2] on soil moisture. ANCOVA test results are presented in Table S6.