Supplementary Material

The supplementary material provides further information on soil textural properties and modeling concept and governing equations. Soil textural properties were collected in the field by Roberts et. al. (2010). A schematic overview of the modeling inputs and governing equations is provided for the soil moisture balance model used in the paper to give a more comprehensive overview of the structure.

S1 Soil textural properties

Soil samples of each site were collected in the field and soil textures analyzed in the lab, during site installation at COPR and AIRS by Roberts et al. (2010). We used these values in our SMBM and include them as a Monte Carlo variation to account for natural variability in soil properties (Table S1).

Site	Depth	Texture	% Sand	% Clay	% Silt	Porosity	FC	WP
COPR	10 cm	Clay Loam	28	30	42	0.71	0.4	0.13
	20 cm	Clay Loam	24	37	39	0.66	0.48	0.15
	50 cm	Clay Loam	24	36	40		0.47	0.22
AIRS	15 cm	Loam	39	17	44	0.34	0.28	0.07
	23 cm	Loam	38	16	45	0.39	0.3	0.07
	46 cm	Loam	39	17	4045		0.28	0.07

Table S1

[caption] Table S1: Soil textural properties for the coastal (COPR) and inland (AIRS) site. Soil samples were taken at the time of site installation and soil textural properties analyzed in the lab.

S2 Model concept and governing equations

The model concept is illustrated in Figure S1, including input data and key input parameter estimates. Water availability is defined through Total Available Water (TAW) and Readily Available Water (RAW). The model concept is illustrated in Figure S1, including input data and key input parameter estimates. Water availability is defined through Total Available Water (TAW) and Readily Available Water (RAW). The model expresses water content as soil moisture deficit (SMD). At field capacity, the moisture deficit is zero. As water is lost through evapotranspiration, SMD increases and soil moisture stress is induced when SMD = RAW. If SMD > RAW, the moisture deficit is high enough to limit AET to less than PET and AET starts to decrease relative to the remaining water in the root zone. If evaporative demands and moisture deficit can be met by precipitation, any remaining water is lost through drainage. Initial depletion (SMDi-1) can be estimated from measured soil water content through:

$$SMD_{i-1} = 1000 * (\theta_{fc} - \theta_{i-1}) * Z_r$$

where θi-1 is the average soil water content for the effective root zone. More detailed information can be found in Chapter 8 of Allen et.al. (1998).

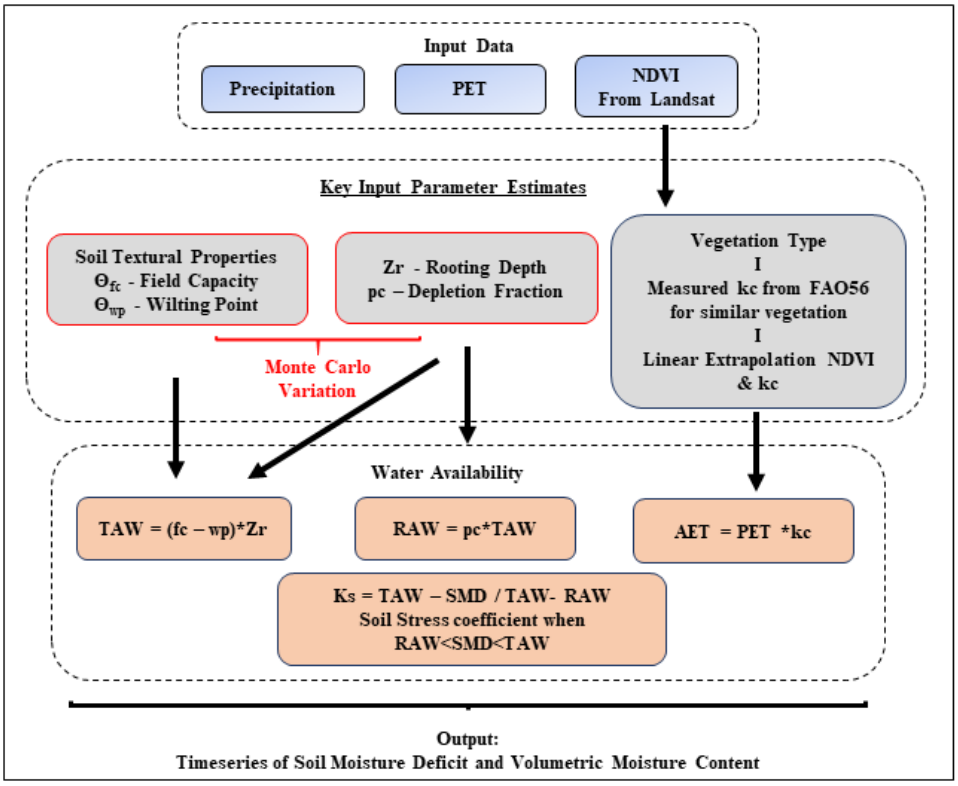

Figure S1

[caption] Figure S1: SMBM concept including input data and key parameter estimates, which can be based on field measurements or estimates. The model includes a Monte Carlo variation to account for variability in parameter estimates.