Table C.1 - Non-calibrated parameters for Baker Creek MESH modelling

Name	Description	Unit	Land-cover^	Value	Scenario(s)	Rationale	Source(s)
ZBLD	Height for aggregating surface roughness	m		40			Spence and Hedstrom, 2018
FCAN	Annual max fraction of the grid cell occupied by the land cover	--	NL	0.2078	1, 1-P	Coniferous hillslope landcover	
			BL	0.0075		Deciduous hillslope landcover	
			G	0.1592		Wetlands and peatlands	
			U	0.6255		Water and bedrock	
			NL	1	2, 3, 2-P	Needleleaf landcover type	
			BL	1		Broadleaf landcover type	
			WL	1		Grass landcover type	
			PL	1		Grass landcover type	
			W	1		Barren landcover type	
			BR	1		Barren landcover type	
QA50	Reference value of shortwave radiation used in calculation of stomatal resistance of the vegetation canopy	W m-2	NL	30	1, 2, 3, 1-P, 2-P	QA50, VPDA, VPDB, PSGA, and PSGB are part of the same equation as RSMN; therefore, only calibrating RSMN	Verseghy, 2012
			BL	40			
			G	30	1, 1-P		
			WL	30	2, 3, 2-P		
			PL	30			
VPDA	Vapour pressure deficit coefficient "A" (calc. stomatal resistance of canopy)	--	NL	0.65	1, 2, 3, 1-P, 2-P		
			BL	0.5			
			G	0.5	1, 1-P		
			WL	0.5	2, 3, 2-P		
			PL	0.5			
VPDB	Vapour pressure deficit coefficient "B" (calc. stomatal resistance of canopy)	--	NL	1.05	1, 2, 3, 1-P, 2-P		
			BL	0.6			
			G	1	1, 1-P		
			WL	1	2, 3, 2-P		
			PL	1			
PSGA	Soil moisture suction coefficient "A") (calc. stomatal resistance of canopy)	--	NL	100	1, 2, 3, 1-P, 2-P		
			BL	100			
			G	100	1, 1-P		
			WL	100	2, 3, 2-P		
			PL	100			
PSGB	Soil moisture suction coefficient "B") (calc. stomatal resistance of canopy)	--	NL	5	1, 2, 3, 1-P, 2-P		
			BL	5			
			G	5	1, 1-P		
			WL	5	2, 3, 2-P		
			PL	5			
DRN, XDRAIN	Drainage index - controls water seepage from bottom of soil column (fraction from 0-1)	--	All	1	1, 1-P		
			NL, BL, BR	1	2, 3, 2-P		
			WL, PL, W	0.25	2, 3, 2-P		
FARE	Active fraction of grid cell	--		1	1, 2, 3, 1-P, 2-P		University of Saskatchewan, 2019
DD, DDEN	Estaimated drainage density of the GRU	km km-2	All	0.0036	1, 1-P		
			NL, WL, W	2	2, 3, 2-P		
			BL, PL, BR	0.0036	2, 3, 2-P		
XSLP, XSLOPE	Est. avg. slope of GRU; see "Notes on Interflow" doc (wiki)	--	All	0.06	1	0.06 is the estimated. avg. slope of the land based on slope analysis and then zonal raster statistics in QGIS	
			NL, BL, BR	0.06	2, 3	Based on slope analysis and then zonal raster statistics in QGIS	
			WL, PL	0.005			
			W	0.002			
WFCI, KS, KSAT	Saturated surface soil conductivity	m s-1	BR	1.00E-09	2, 3	See Dingman Figure 7.9 - between unfractured and fractured rock	Dingman, 2015
MID	Set the mosaic tile ID > 0	--	All	1	1, 2, 3, 1-P, 2-P		
SAND - Layer 1		%	All	0	1, 1-P	Ranges for each layer are the areal weighted average by landcover type of the Scenario 2 soil texture ranges; soil layers are 0-0.15m, 0.15-0.4m, 0.4m-1.1m, and 1.1-4.1m depth.	Guan, Spence, & Westbrook, 2010; Guan, Westbrook, & Spence, 2010; Spence and Hedstrom 2018; and Dingman, 2015
CLAY - Layer 1		%	All	39.92	1, 1-P		
ORGM - Layer 1		%	All	60.08	1, 1-P		
ORGM - Layer 2				39.6265			
ORGM - Layer 3				10.07			
ORGM - Layer 4				0			
SAND - Layer 1	Percent content of sand in the mineral soil; -2=organic soil, -3=rock	%	NL	-2	2, 3, 2-P		Guan, Spence, & Westbrook, 2010; Guan, Westbrook, & Spence, 2010; Spence and Hedstrom 2018; and Dingman, 2015
SAND - Layer 1			BL	-2			
SAND - Layer 1			WL	-2			
SAND - Layer 1			PL	-2			
SAND - Layer 1			W	-2			
SAND - Layer 1			BR	-3			
SAND - Layer 2			WL	-2			
SAND - Layer 2			PL	-2			
SAND - Layer 2			W	-2			
SAND - Layer 2			BR	-3			
SAND - Layer 3			PL	-2			
SAND - Layer 3			BR	-3			
SAND - Layer 4			PL	-3			
SAND - Layer 4			BR	-3			

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Name	Description	Unit	Land-cover^	Value	Scenario(s)	Rationale	Source(s)
CLAY - Layer 1	Percent content of clay in the mineral soil	%	NL	0	2, 3, 2-P		Guan, Spence, & Westbrook, 2010; Guan, Westbrook, & Spence, 2010; Spence and Hedstrom 2018; Dingman, 2015
CLAY - Layer 1			BL	0			
CLAY - Layer 1			WL	0		Wetland: 0.2-0.6m peat over impervious lacustrine clay	
CLAY - Layer 1			PL	0			
CLAY - Layer 1			W	0			
CLAY - Layer 1			BR	0			
CLAY - Layer 2			WL	0		Wetland: 0.2-0.6m peat over impervious lacustrine clay	
CLAY - Layer 2			PL	0			
CLAY - Layer 2			W	0			
CLAY - Layer 2			BR	0			
CLAY - Layer 3			PL	0			
CLAY - Layer 3			BR	0			
CLAY - Layer 4			PL	0			
CLAY - Layer 4			BR	0			
ORGM - Layer 1	Percent content of organic matter in the mineral soil; if sand=-2, 1.0=fibric, 2.0=hemic, 3.0=sapric	%	NL	1	2, 3, 2-P		Guan, Spence, & Westbrook, 2010; Guan, Westbrook, & Spence, 2010; Spence and Hedstrom 2018; and Dingman, 2015
ORGM - Layer 1			BL	1			
ORGM - Layer 1			WL	1		Wetland: 0.2-0.6m peat over impervious lacustrine clay	
ORGM - Layer 1			PL	1		Peatland: 1.2m peat overlying bedrock	
ORGM - Layer 1			W	1			
ORGM - Layer 1			BR	0			
ORGM - Layer 2			NL	5			
ORGM - Layer 2			BL	5			
ORGM - Layer 2			WL	2		Wetland: 0.2-0.6m peat over impervious lacustrine clay	
ORGM - Layer 2			PL	2		Peatland: 1.2m peat overlying bedrock	
ORGM - Layer 2			W	2			
ORGM - Layer 2			BR	0			
ORGM - Layer 3			NL	0			
ORGM - Layer 3			BL	0			
ORGM - Layer 3			WL	0		Wetland: 0.2-0.6m peat over impervious lacustrine clay	
ORGM - Layer 3			PL	3		Peatland: 1.2m peat overlying bedrock	
ORGM - Layer 3			W	0			
ORGM - Layer 3			BR	0			
ORGM - Layer 4			NL	0			
ORGM - Layer 4			BL	0			
ORGM - Layer 4			WL	0		Wetland: 0.2-0.6m peat over impervious lacustrine clay	
ORGM - Layer 4			PL	0		Peatland: 1.2m peat overlying bedrock	
ORGM - Layer 4			W	0			
ORGM - Layer 4			BR	0			
TBAR - Layer 1	Temperature of the soil layer	deg C	All	4.5	1, 1-P		Spence and Hedstrom, 2018; Morse et al, 2016
			NL, BL	5.438	2, 3, 2-P		
			WL, W	4.052			
			PL	7.552			
			BR	9.261			
TBAR - Layer 2			All	5.5	1, 1-P		
			NL	4	2, 3, 2-P		
			BL	1			
			WL	2.821			
			PL	6.134			
			W	2.821			
			BR	10.591			
TBAR - Layer 3			All	4.5	1, 1-P		
			NL	2	2, 3, 2-P		
			BL	0.5			
			WL	0.5			
			PL	2.5			
			W	0.5			
			BR	8			
TBAR - Layer 4			All	0	1, 1-P		
			NL	-0.5	2, 3, 2-P		
			BL	-0.5			
			WL	-0.5			
			PL	-0.5			
			W	-0.5			
			BR	2			
TCAN	Air temperature of the canopy	deg C	All	3.565	1, 2, 3, 1-P, 2-P		Spence and Hedstrom, 2018
TSNO	Temp. of the snow mass present on the ground surface; 0.0 if none	deg C	All	0	1, 2, 3, 1-P, 2-P		
TPND	Temp. of the liquid water stored on the ground surface; 0.0 if none	deg C	All	4.784	1, 2, 3, 1-P, 2-P		

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Name	Description	Unit	Land-cover^	Value	Scenario(s)	Rationale	Source(s)
THLQ - Layer 1	Volumetric liquid water content stored in the soil	m3 m-3	All	0.4308	1, 1-P		Spence and Hedstrom, 2018; Morse et al, 2016
			NL	0.2498	2, 3, 2-P		
			BL	0.2498			
			WL	0.5888			
			PL	0.726			
			W	1			
			BR	0.01			
THLQ - Layer 2			All	0.5513	1, 1-P		
			NL	0.3657	2, 3, 2-P		
			BL	0.3657			
			WL	0.7637			
			PL	0.8246			
			W	1			
			BR	0.01			
THLQ - Layer 3			All	0.5513	1, 1-P		
			NL	0.3657	2, 3, 2-P		
			BL	0.3657			
			WL	0.7637			
			PL	0.8246			
			W	0.7637			
			BR	0.01			
THLQ - Layer 4			All	0.5513	1, 1-P		
			NL	0.3657	2, 3, 2-P		
			BL	0.3657			
			WL	0.3657			
			PL	0.3657			
			W	0.3657			
			BR	0.01			
THIC - Layer 1	Volumetric frozen water content stored in the soil	m3 m-3	All	0	1, 2, 3, 1-P, 2-P	Will start the model when soil is unfrozen	
THIC - Layer 2			All	0	1, 2, 3, 1-P, 2-P		
THIC - Layer 3			All	0	1, 2, 3, 1-P, 2-P		
THIC - Layer 4			All	0	1, 2, 3, 1-P, 2-P		
ZPND	Depth of liquid water stored on the ground surface	m	All	0	1, 2, 3, 1-P, 2-P	Will start when no ponding/recent rain events	
RCAN	Liquid water component of precip. held on the veg. canopy	kg m-2	All	0	1, 2, 3, 1-P, 2-P		
SCAN	Frozen water component of precip. held on the veg. canopy	kg m-2	All	0	1, 2, 3, 1-P, 2-P	Will start the model when soil is unfrozen	
SNO	Snow mass present on the ground surface	kg m-2	All	0	1, 2, 3, 1-P, 2-P		
ALBS	Albedo of the snow mass present on the ground surface; 0.0 is no such mass exists	--	All	0.2	1, 2, 3, 1-P, 2-P		
RHOS	Density of the snow mass present on the ground surface; 0.0 if no such mass exists	kg m-3	All	100	1, 2, 3, 1-P, 2-P		
GRO	Set to 0.0 before leaf-out; 1.0 when fully-leafed; or estimate the growth index with a fraction if in between	--	All	1	1, 2, 3, 1-P, 2-P		
Cmin	PDMROF Minimum storage capacity	m	All	0	1-P, 2-P		
K1	PDMROF Time constant for the first linear reservoir	hr	All	0	1-P, 2-P		
K2	PDMROF Time constant for the second linear reservoir	hr	All	0	1-P, 2-P		

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