Response to comments by Anonymous Referees # 1 and # 2

We would like to sincerely thank both reviewers for their second reading of our manuscript and for their helpful suggestions. We appreciate that the paper is neither the easiest nor the most straightforward to read, and we are grateful for the reviewers' willingness to stay with us throughout the process. In this second round of revisions the reviewers' comments were very closely aligned, so we thought it best to address them jointly rather than providing separate responses. Here we repeat the comments of Reviewer #1 in red and the comments of Reviewer #2 in violet, followed by our answers in black and the modifications to the manuscript in blue. Finally, we would like to point out that, in addition to the revisions prompted by the reviewers, we have changed "convective heat fluxes" to "advective heat fluxes" throughout the manuscript.

Yours sincerely,
The Authors

Comments on the snow redistribution

Reviwer #1

Major comments

The purpose behind the inclusion of the snow distribution part remains unclear to me. The last revision improved the discussion and methods to highlight the key limitations of the snow redistribution method, which is greatly appreciated. As a reviewer and reader, I understand the reasons why the simplified method was used and believe it is entirely appropriate so long as limitations are mentioned (as they now are).

However, this approach is not evaluated, analyzed or discussed as part of the model results. The snow redistribution, effectively, is introduced in the methods as a new modeling approach but at no time in section 4, the results, is the snow redistribution evaluated, or discussed as a potential factor in the results, nor is a snow specific metric evaluated. Discussion on it in section five is limited to a theoretical perspective. How big of a role is this snow redistribution playing in polar regions relative to the surface/subsurface runoff and diffusive fluxes? Is it having any impact? Is snow redistribution included in figure 5? If this is not the case, then no figure includes snow redistribution information. If figure 5 DOES include the snow redistribution, it should be explicitly mentioned. Even if it is included in figure 5, the problem remains that it may (or may not, it is not clear to the reader) be very small relative to the other lateral water fluxes and may (or may not) have a visible signal in the figure.

As mentioned in my initial review, I strongly believe that the snow redistribution section should be either removed entirely, or additional results/analysis that can be used to understand the magnitude/impact of snow redistribution needs to be included. As it currently stands, a method is presented with no corresponding analysis, weakening an otherwise strong paper that I look forward to seeing published.

Minor comments

Line 821: " as well as the wind-driven redistribution of snow". The model does represent snow redistribution, but explicitly does not represent wind-driven redistribution.

Reviwer #2

Snow redistribution consistency: There is still a lack of internal consistency. In Fig. 2, snow redistribution is categorized as wind-driven lateral transport, whereas both the manuscript text and your response state that wind effects are not included in the scheme. This contradiction should be resolved so that the figure and text are fully aligned. Role of snow redistribution: It remains unclear why this process is included in the methods, given that no dedicated results or analysis are presented. I appreciate the expanded discussion of its limitations; however, I encourage the authors to either i) include a brief evaluation of its effects in the results, ii) more clearly justify its inclusion as part of the modeling framework and adjust its emphasis accordingly, or iii) remove this component from the manuscript and defer it to future work.

Reply

We appreciate the reviewers' thoughtful comments regarding the representation of snow redistribution in our model and its role in the results. We agree that the inclusion of this process should be clearly stated and, where relevant, linked to the analysis. To address these concerns, we have made specific revisions to the manuscript. First, the caption of Fig. 5 now explicitly states that the total subgrid-scale lateral flux includes snow redistribution:

Effects of the lateral water transport on terrestrial water storage, latent heat flux and subgrid-scale temperature variability
Shown is the total subgrid-scale lateral flux as the sum of surface runoff, lateral drainage, diffusive fluxes, and snow redistribution for a simulation in which micro- and macro-scale transport processes are enabled (a), a simulation in which only the micro-scale transport is active (b) and a simulation that only accounts for the macro-scale lateral fluxes (c; one these scales diffusive fluxes and snow redistribution are not simulated).

When describing why cold regions exhibit larger lateral fluxes, we now clarify that an additional minor effect stems from snow redistribution, which shifts water from relative elevations to depressions during the cold season:

In contrast, the flat areas in the cold regions often feature larger lateral fluxes, since here the ground is predominantly frozen, at least during the snowmelt season, and water can not percolate deep into the soil but is forced to run off laterally within a comparatively shallow layer close to the surface. In case of the micro-scale fluxes another minor effect stems from the redistribution of snow, which already shifts water from relative elevations to the depressions during the cold season (see sec. 4).

, and also acknowledge that the snow redistribution contributes to the higher terrestrial water storage:

Additionally, snow redistribution further increases total water storage, as the preferential accumulation of snow in small-scale depressions delays the moment when the grid cell becomes completely snow-free.

Secondly, we now address the issue of classification – as wind-driven or not – in the following way: In reality snow-redistribution is primarily driven by wind, thus we maintain the classification as a wind-driven process in Fig. 2, but clarify that the model is not capable of representing this process explicitly and merely approximates its net effects. More specifically, in the caption of Fig. 2 we now state:

Overview of the five lateral transport processes that are included in T-REX, grouped by the transported quantity, the underlying mechanisms and the scales at which the exchange is assumed to have a notable effect on the physical state of the land surface. Concerning the redistribution of snow, it should be noted that, in reality, wind is the dominant force responsible for the movement across the land surface. However, due to structural limitations of our land-surface model, wind speed and direction cannot be taken into consideration, and the scheme merely parameterizes the bulk effect of primarily wind-driven snow redistribution between small-scale topographic features (see sec. 2.3.3).

Furthermore, we changed the corresponding phrasing in the abstract:

... as well as the redistribution of snow between small-scale topographic features.

, and in the discussion section (previously line 821) to:

... as well as a parameterized snow-redistribution component that approximates the net effect of wind-driven snow transport.

Nonetheless, we understand that the above does not necessarily satisfy the reviewers' request for either providing a dedicated analysis of the snow-redistribution effect, or, alternatively, basing the analysis on simulations in which these effects are excluded. Concerning the first alternative, while we acknowledge that a detailed subgrid-scale analysis of snow redistribution effects could be valuable, our test case focuses on large-scale, integrated hydrological fluxes rather than the partitioning of individual flux components (neither do we discuss surface vs. below-ground fluxes nor runoff vs. diffusive fluxes separately).

Furthermore, there is a particular issue connected to the snow redistribution scheme, which means that its effects may not simply be determined by comparing simulations with and without the scheme running and results in the second option, i.e. turning the scheme off, not necessarily being a valid approach. The core point is that, almost independent of how much snow is moved between small-scale elevations and depressions, the snow redistribution has very little effect on the results presented in Fig. 5. Specifically, the majority of snowmelt water converges toward small-scale depressions regardless of whether snow redistribution is active, either as drifting snow (active) or as snowmelt runoff (disabled). Thus, the total volume of lateral fluxes remains largely unchanged (see Fig. RspF-1 a, b below) and the snow redistribution primarily affects the timing of lateral fluxes rather than their overall magnitude. Furthermore, the maximum subgrid-scale temperature variability is also little affected by the snow redistribution (Fig. RspF-1 g,h), since it is primarily governed by water availability during the summer months. Admittedly, the snow-transport has some minor effects on the terrestrial water storage and on the latent heat flux – that is a reduced latent heat flux and enhanced TWS (Fig. RspF-1 c - f) – but these effects may be an artefact of our experimental setup, where energy is not conserved in the simulations. With prescribed near-surface air temperatures, a more uneven snow cover slows melt, leaving more snow on the ground for longer (hence higher TWS) and reducing the latent-heat flux. In fully coupled simulations, however, a patchier snow cover would lower surface albedo, increase absorbed sw radiation, raise near-surface temperatures, and could thereby accelerate overall melt – an interaction not captured in the present setup.

This leads to the important question of why we would prefer to retain the snow-redistribution scheme (as an option) and include it in the simulations for the present manuscript even though it has only a modest immediate effect on the variables shown in Fig. 5. Here, we would argue that assuming no lateral redistribution of snow would be an even stronger simplification of reality. Such a simplification can be expected to produce physically less plausible sub-grid effects on temperatures and turbulent fluxes during spring, potentially with notable consequences when land-atmosphere feedbacks are being accounted for. Consequently, although the scheme's direct impact on the grid-cell-mean fluxes analysed in this study is limited, we believe its inclusion to be justified for consistency with the model's sub-grid-scale parameterizations and presenting the best (readily) available option for fully coupled simulations. In summary, we acknowledge the value of a more detailed analysis of the snow-redistribution effect, but respectfully argue such analysis to be beyond the study's immediate scope on large-scale, integrated responses and that the approach is appropriate given the constraints of current land surface models. With the exception of the above-mentioned modifications, we would, therefore, prefer to leave the results section of the manuscript largely unchanged and merely include the following statement on the relative importance of the scheme in the discussion section:

It is important to emphasize that while the representation of snow redistribution is a key process for capturing subgrid-scale hydrological and energy dynamics in certain regions, its omission or inclusion has only minor impacts on the overall patterns and magnitudes of the integrated fluxes and state variables presented in Fig. 5. This is because, regardless of whether snow redistribution is active or not, the majority of snowmelt water ultimately converges toward small-scale depressions – either through drifting snow or surface and subsurface runoff. Consequently, enabling or disabling snow redistribution primarily affects the timing of lateral fluxes, rather than their overall magnitude or system-scale impact. A key exception occurs during the

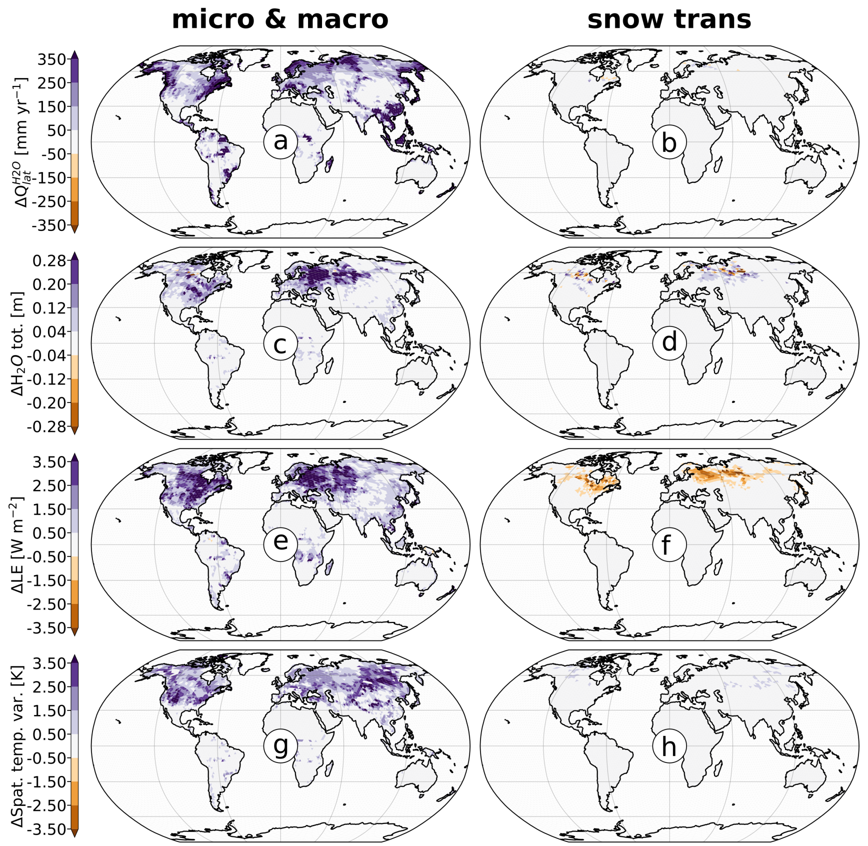

Figure RspF-1. Effects of snow redistribution on terrestrial water storage, latent heat flux and subgrid-scale temperature variability Shown is the total subgrid-scale lateral flux as the sum of surface runoff, lateral drainage, diffusive fluxes, and snow redistribution for a simulation in which all transport processes are active (a) and only the lateral fluxes resulting from enabling the snow-redistribution scheme (b). d,e,f, show the resulting impacts on the total terrestrial water storage. g,h,i show the impact on the grid-cell mean latent heat flux, while j,k,l show the change in the maximum spatial (subgrid-scale) temperature variability.

snowmelt season, when the subgrid-scale distribution of the snow cover influences the spatial pattern of surface energy fluxes and temperatures, as energy is required to melt snow in areas where it accumulates – either on small-scale elevations or in depressions. However, this spatial variability does not change the grid-cell mean fluxes shown in Fig. 5 substantially. Importantly, is also does not significantly alter the maximum subgrid-scale temperature variability, since this is primarily governed by water availability during the summer months.

Finally, we recognize that the decision to retain or remove the snow-redistribution scheme from the simulations is, to some extent, a matter of perspective and editorial preference, and ultimately rests with the reviewers (and the editor). In this response we have presented the scientific arguments that guided our modelling choices and clarified the scheme's limited impact on the integrated variables examined in the manuscript; we hope that these arguments are convincing, but should the reviewers feel that the scheme should be omitted, we are prepared to follow that recommendation and revise the manuscript accordingly.

Variable table

Reviwer #2

Variable table: While it is appropriate that the full variable table is included in the appendix, it remains quite long and difficult to follow, especially because the same symbols are used to represent different variables in different contexts. I recommend ensuring that each variable is uniquely defined to avoid ambiguity.

Reviwer #1

Appendix Table: I agree with the second reviewer's suggestion that the variables can frequently become unclear. The appendix table does offer some help, however it will not solve this issue for most readers and is a rather long/overwhelming table (highlighting the issue of the large number of variables and subscript/superscript combinations clouding easy understanding). An abbreviated version of the appendix table in the main text, or some other method of simplifying or explaining the notation (fewer sub/superscript combinations), would be immensely helpful.

Reply

We greatly appreciate the reviewers suggestions for improving the clarity and consistency of our variable definitions. To address these comments we have introduced a stricter notation:

- Superscripts are now used *only* to denote tiles (or combinations of tiles).
- Subscripts specify the variable details and, where appropriate, the below-ground level.
- All hydrological fluxes are denoted by a leading q, whereas all (lateral) energy fluxes start with ϕ.
- Connectivities are now labeled with a leading Λ and circles with a o. Furthermore, we now use Θ to refer to heat capacities, freeing the symbol c for cover fractions so that f now exclusively refers to lag factors.

In addition, each section now begins with a concise summary table that lists the key variables. In these tables the tile-related superscripts are omitted and the subscripts are dropped when referring to layers and otherwise summarized to the extent possible, providing a compact overview without sacrificing precision:

Table 1. Types of connectivities considered by T-REX (note that superscripts referring to the connected tile pair are dropped).

Variable	**Description**
$\Lambda_{ctc}, \Lambda_{ctc*}$	Direct contact connectivity between tiles; $*$ weighted version accounting for fractional cover of siblings
$\Lambda_{hfp,mic,srf}$	Connectivity due to micro-scale, hydrological flow paths at the surface
$\Lambda_{hfp,mac,srf}$	Connectivity due to macro-scale, hydrological flow paths at the surface
$\Lambda_{hfp,mic,blg}$	Connectivity due to micro-scale, hydrological flow paths below-ground
$\Lambda_{hfp,mac,blg}$	Connectivity due to macro-scale, hydrological flow paths below-ground

Table 2. Key variables used to describe the spatial relationship between connected tiles

Variable	**Description**
$A^{\text{type}}, A_*^{\text{type}}$	Characteristic areas and area approximation. Type is o (outer), i (inner), or c (inner and middle tile combined)
c	Cover fraction
$d^{\text{interface}}$	Center-to-center distances. Interface can be i,o (inner-outer tiles) or m,o (middle-outer tiles)
$h, \Delta h$	Surface elevation of tile and elevation difference between two tiles
$l^{\text{interface}}$	Interface lengths between tiles. Interface can be i,o (inner-outer) or m,o (middle-outer)
m, m_{scale}	Effective slope and scale-dependent slope components, where scale can be mic (micro) or mac (macro)
o^{type}	Circles approximating tile shapes. Type can be i (inner tile) or a (inner and outer tiles combined)
r^{type}	Radii of circles. Type can be i (inner tile) or a (inner and outer tile combined)
t^{type}	Tile types. Type can be o (outer), i (inner), or m (middle)
Λ_{ctc+}	Modified connectivity accounting for positive elevation offset.
z, z^*	Vertical position relative to local surface and relative to a shared reference surface height

Table 3. Key variables in Section 2.3 (note that superscripts referring to tiles and subscripts referring to layers have been dropped)

Variable	**Description**
$c_{pnd,max}$	Maximum pond fraction
$f_{\text{scale,domain}}$	Lag factors. Scale can be micro (mic) or macro (mac), domain surface (srf) or below-ground (blg)
$\Lambda_{hfp*,\text{scale,domain}}$	Weighted hydrological connectivity. Scale: mic or mac; domain: srf or blg
p_{domain}	Fraction of runoff received by specific sibling tile. Domain can be srf or blg
q_B	Bottom drainage rate
q_D	Suction-driven, lateral water flux
q_U	Depression storage rate
q_I	Infiltration
$q_{I,cap}$	Infiltration capacity, as limited by soil hydrologic conductivity
q_P	Precipitation
$q_{I,pot,\text{domain}}$	Potential infiltration (limited by available water); domain: sl (entire surface) or pnd (depressions)
$q_{R,\text{domain}}, q^*_{R,\text{domain}}$	Runoff flux and lagged runoff flux from a tile. Domain can be srf or blg
$q_{R,srf,\text{component}}$	Surface runoff. Components: h (Horton), d (Dunne), sl , or pnd
$q_S, \Delta q_S^{\text{interface}}$	Snow deposition flux, and shift from higher to lower tile (interface= h,l)
q_X	Soil moisture restoration flux
$V_{L,\text{domain}}$	Intermediary reservoirs storing runoff. Domain can be srf or blg
$V_{sfc}, V_{sfc,max}, \Delta V_{sfc}$	Surface depression storage: Current (V_{sfc}), maximum ($V_{sfc,max}$), change (ΔV_{sfc})
θ, θ_{upd}	Soil moisture and updated soil moisture
$\theta_{fc}, \theta_{sat}$	Field capacity and soil porosity
$\tau_{ret,mac,\text{domain}}$	Assumed macro-scale retention time (input). Domain can be srf or blg
τ_{domain}	Average retention for runoff. Domain can be srf or blg
v_{domain}	Assumed flow velocities (input). Domain can be srf or blg
ρ_w	Density of liquid water

Table 4. Key variables in Section 2.4 (note that superscripts referring to tiles and subscripts referring to layers have been dropped)

Variable	**Description**
ΔT	Temperature difference between two tiles
$h_{\text{component}}$	Depth/thickness of water within depression storage. Component can be wtr (liquid water) or ice (ice)
λ	Average soil heat conductivity between tiles
ϕ_{type}	Heat flux between tiles. Type can be C (conductive) or A (advective)
$\Theta_{soil,1}$, $\Theta^*_{soil,1}$	Volumetric heat capacity of top soil layer (*adjusted for water content in surface reservoir)
Θ_{ice}, Θ_w	Volumetric heat capacity of ice and liquid water
q_W	Volume flux of water between tiles

Finally we provide one appendix table that lists all variables as they appear in the text ordered alphabetically, with the idea being that readers can easily look up any specific variable they encounter in the text:

Table 5: Comprehensive overview of T-REX variables in alphabetical order

Variable	Definition	Sec.
A^i, A^o	Characteristic areas of inner (i) and outer (o) tiles	2.2
A^c_*, A^o_*	Approximated area of combined inner and middle tiles and outer tile	2.2
c^h,c^i,c^l,c^m,c^o,c^s,c^t	Cover fraction of tiles h, i, l, m, o, s, t	2.1
c^l_{rel}	Relative cover fraction of lower elevation tile l	2.3
c^t_{pnd}	Current pond fraction on tile t (varies with surface water storage)	2.3
$c^d_{pnd,max}$, $c^s_{pnd,max}$	Maximum pond fraction on depression tile d and sibling s	2.3
$d^{i,o}$, $d^{m,o}$	Center-to-center distances: inner-outer (i, o) and middle-outer (m, o) tiles	2.2
$\Delta h^{h,l}_{snw}$	Difference in snow surface elevation between tiles h and l	2.3
$\Delta h^{t,s}$	Difference in surface elevation between tiles t and s	2.2
$\Delta\psi^{t,s}_{i*}$	Matric potential difference between tiles t and s	2.3
$\Delta q^{h,l}_S$	Change in snow deposition flux from higher (h) to lower (l) tile	2.3
Δt	Time step length	2.3
$\Delta T^{t,s}_{i*}$	Temperature difference between tiles t and s on layer $i*$	2.4
ΔV^s_{sfc}	Change in surface depression storage on sibling s	2.3
Δz_{i*}	Thickness of layer $i*$ on the refined vertical grid	2.3
f^t_l	Average lag factor for tile t (with l = srf or blg)	2.3
$f^{t,s}_{mac,l}$	Macro-scale lag factor between tiles t and s (with l = srf or blg)	2.3
$f^{t,s}_{mic,l}$	Micro-scale lag factor between tiles t and s (with l = srf or blg)	2.3
h^s, h^t	Surface elevation of tiles s and t	2.2
h_{ice}	Thickness of ice in surface depression storage	2.4
h_{wtr}	Depth of surface water	2.4
k_b	Hydraulic conductivity of the soil layer containing bedrock interface	2.3
k^t_i	Hydraulic conductivity of layer i on tile t	2.3
$k^{t,s}_{i*}$	Geometric mean hydraulic conductivity of interfacing layers ($i*$) between tiles t and s	2.3
k_{rock}	Saturation hydraulic conductivity of (fractured) bedrock	2.3
$l^{i,o}$, $l^{m,o}$	Interface lengths between inner and outer tiles (i, o) and middle and outer tiles (m, o)	2.2
$\Lambda^{t,s}_{ctc}$	Direct contact connectivity between tiles t and s	2.1
$\Lambda^{t,s}_{ctc+}$, $\Lambda^{s,t}_{ctc+}$	Modified connectivity accounting for positive elevation offset between tiles t-s and s-t	2.2
$\Lambda^{t,s}_{ctc*}$, $\Lambda^{i,o}_{ctc*}$, $\Lambda^{m,o}_{ctc*}$	Weighted direct contact connectivity between tiles t and s, i and o and m and o	2.1
$\Lambda^{t,s}_{hfp,micro,blg}$	Micro-scale below-ground hydrological flow path connectivity between tiles t and s	2.1
$\Lambda^{t,s}_{hfp,micro,srf}$	Micro-scale surface hydrological flow path connectivity between tiles t and s	2.1
$\Lambda^{t,s}_{hfp,macro,blg}$	Macro-scale below-ground hydrological flow path connectivity between tiles t and s	2.1

Variable	Definition	Sec.
$\Lambda^{t,s}_{hfp,macro,srf}$	Macro-scale surface hydrological flow path connectivity between tiles t and s	2.1
$\Lambda^{t,s}_{hfp*,mac,l}$	Weighted macro-scale connectivity between tiles t and s (with l = srf or blg)	2.3
$\Lambda^{t,s}_{hfp*,mic,l}$	Weighted micro-scale connectivity between tiles t and s (with l = srf or blg)	2.3
$\lambda^{t,s}_{i*}$	Average soil heat conductivity between tiles t and s on layer $i*$	2.4
m^t	Effective slope of tile t	2.2
m^t_{mac}	Macro-scale slope of tile t	2.2
$m^{t,s}_{mic}$	Micro-scale slope between tiles t and s	2.2
o^i, o^a	Circles approximating shapes of inner (i) and combined areas of inner and outer tile (a)	2.2
$p^{t,s}_l$	Fraction of runoff received by sibling s from tile t (with l = srf or blg)	2.3
$\phi^{t,s}_{A,i*}$	Advective heat flux between tiles t and s at layer $i*$	2.4
$\phi^{t,s}_{C,i*}$	Conductive heat flux between tiles t and s at layer $i*$	2.4
$q^t_{B,i}$	Bottom drainage flux from layer i on tile t	2.3
$q^{t,s}_{D,i*}$	Suction-driven water flux between tiles t and s at layer $i*$	2.3
$q^{d,e}_{D,i*}$	Ingress water flux into soil section in elevation (e) from depression (d) at layer $i*$	2.3
q_I	Infiltration	2.3
$q^t_{I,cap}$	Infiltration capacity on tile t as limited by hydraulic conductivity	2.3
q_P	Precipitation flux	2.3
$q^t_{I,pot,pnd}$	Potential infiltration as limited by available water below inundated areas on tile t	2.3
$q^t_{I,pot,sl}$	Potential infiltration as limited by available water across tile area on tile t	2.3
q^t_R	Runoff flux on tile t	2.3
$q^t_{R,blg,i}$	Subsurface runoff from layer i on tile t	2.3
$q^{t,*}_{R,blg,i}$	Lagged, below-ground runoff outflow from layer i on tile t	2.3
$q^{t,s,*}_{R,l}$	Lateral runoff flux to sibling s from tile t (with l = srf or blg)	2.3
$q^t_{R,srf}$	Surface runoff flux from tile t	2.3
$q^t_{R,srf,d}$	Dunne-type overland flow on tile t	2.3
$q^t_{R,srf,h}$	Horton overland flow on tile t	2.3
$q^t_{R,srf,pnd}$	Ponding overflow runoff on tile t	2.3
$q^t_{R,srf,sl}$	Surface runoff across tile area on tile t (excluding ponding overflow)	2.3
$q^{t,*}_{R,srf}$	Lagged, surface runoff outflow on tile t	2.3
q_S	Snow deposition flux	2.3
q^t_U	Depression storage flux on tile t	2.3
$q^{t,s}_{W,i*}$	Volume flux of water between tiles t and s at layer $i*$	2.4
$q^t_{X,i}$	Soil moisture restoration flux for layer i on tile t (from runoff reservoir back into soil)	2.3

Variable	Definition	Sec.
r^i, r^a	Radii of circles o^i and o^a	2.2
ρ_{snw}	Density of snow	2.3
ρ_w	Density of liquid water	2.3
τ_l^t	Retention time for tile t (with l = srf or blg)	2.3
$\tau_{ret,mac,l}$	Macro-scale retention time (with l = srf or blg)	2.3
$\theta_{fc,i}^t$	Soil field capacity on layer i of tile t	2.3
$\theta_i^s, \theta_{upd,i}^s$	Soil moisture (updated) on layer i (native grid) of sibling tile s	2.3
$\theta_{i*}^s, \theta_{upd,i*}^s$	Soil moisture (updated) on layer $i*$ (refined vertical grid) of sibling tile s	2.3
$\theta_i^t, \theta_{upd,i}^t$	Soil moisture and updated soil moisture on layer i of tile t	2.3
$\theta_{sat,i}^t$	Soil porosity on layer i of tile t	2.3
Θ_{ice}	Volumetric heat capacity of ice	2.4
$\Theta_{soil,1}$, $\Theta_{soil,1}^*$	Volumetric and modified volumetric heat capacity of top soil layer	2.4
Θ_w	Volumetric heat capacity of water	2.4
t^o, t^i, t^m	Outer, inner, and middle tiles	2.2
$V_{L,blg,i}^t$	Below-ground runoff intermediary reservoir for layer i on tile t	2.3
$V_{L,srf}^t$	Surface runoff intermediary reservoir on tile t	2.3
V_{sfc}^s	Surface depression storage on sibling s	2.3
$V_{sfc,max}^s$	Maximum surface depression storage on sibling s	2.3
v_{blg}	Below-ground lateral flow velocity	2.3
v_{srf}	Surface lateral flow velocity	2.3
z_p^*	Distance to shared reference surface for point p (calculations using refined vertical grid)	2.2
z_p^s, z_p^t	Distance to local surface for point p in sibling s and tile t	2.2