

All Updated GSFLOW Budget Components

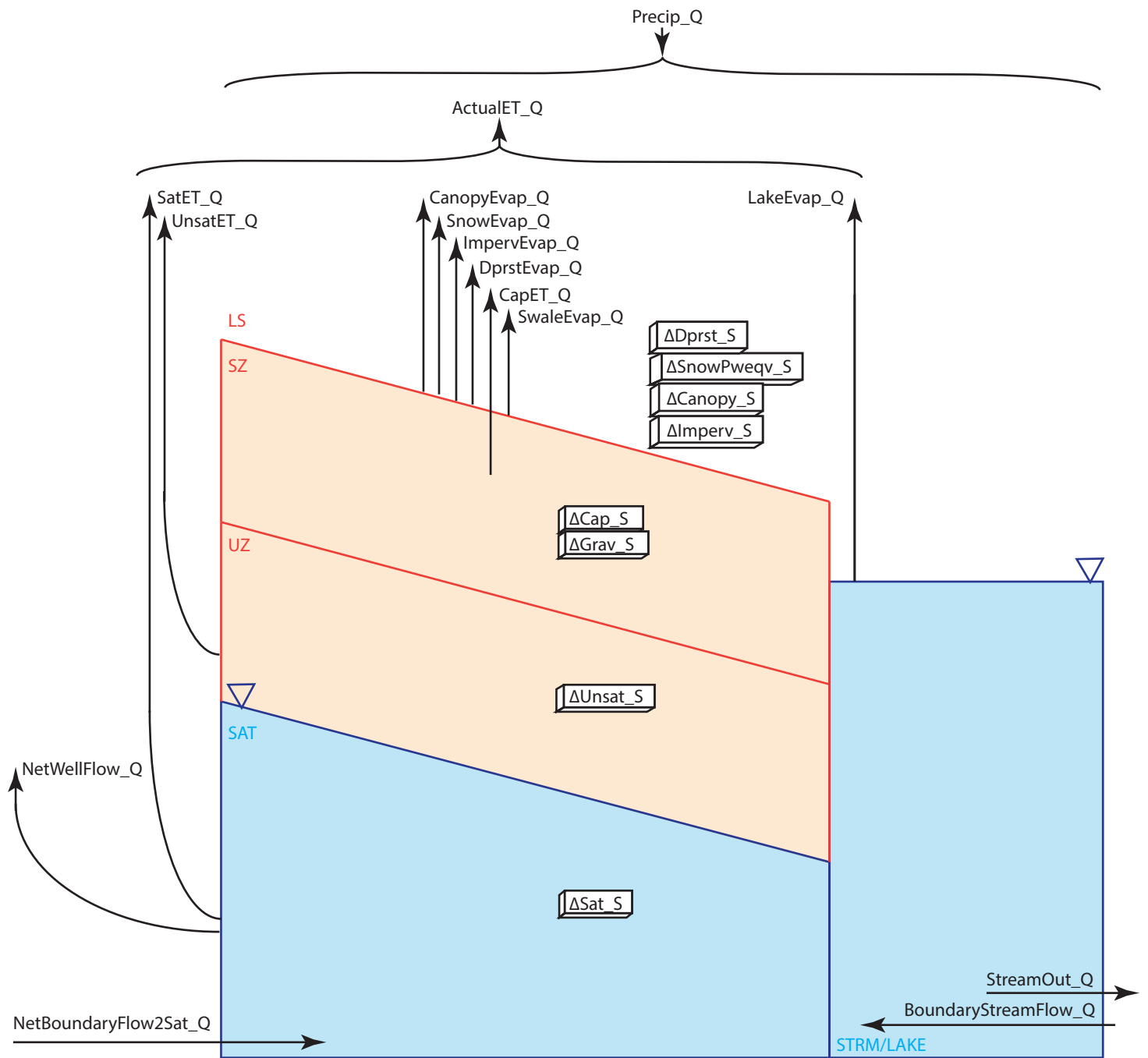
LS = Land Surface

SZ = Soil Zone

UZ = Unsaturated Zone

SAT = Groundwater

STRM/LAKE = Streams and Lakes



Basin Budget

$$\Delta \text{Storage} = \Delta \text{Dprst_S} + \Delta \text{SnowPweqv_S} + \Delta \text{Canopy_S} + \Delta \text{Imperv_S} + \Delta \text{Cap_S} + \Delta \text{Grav_S} + \Delta \text{Unsat_S} + \Delta \text{Sat_S}$$

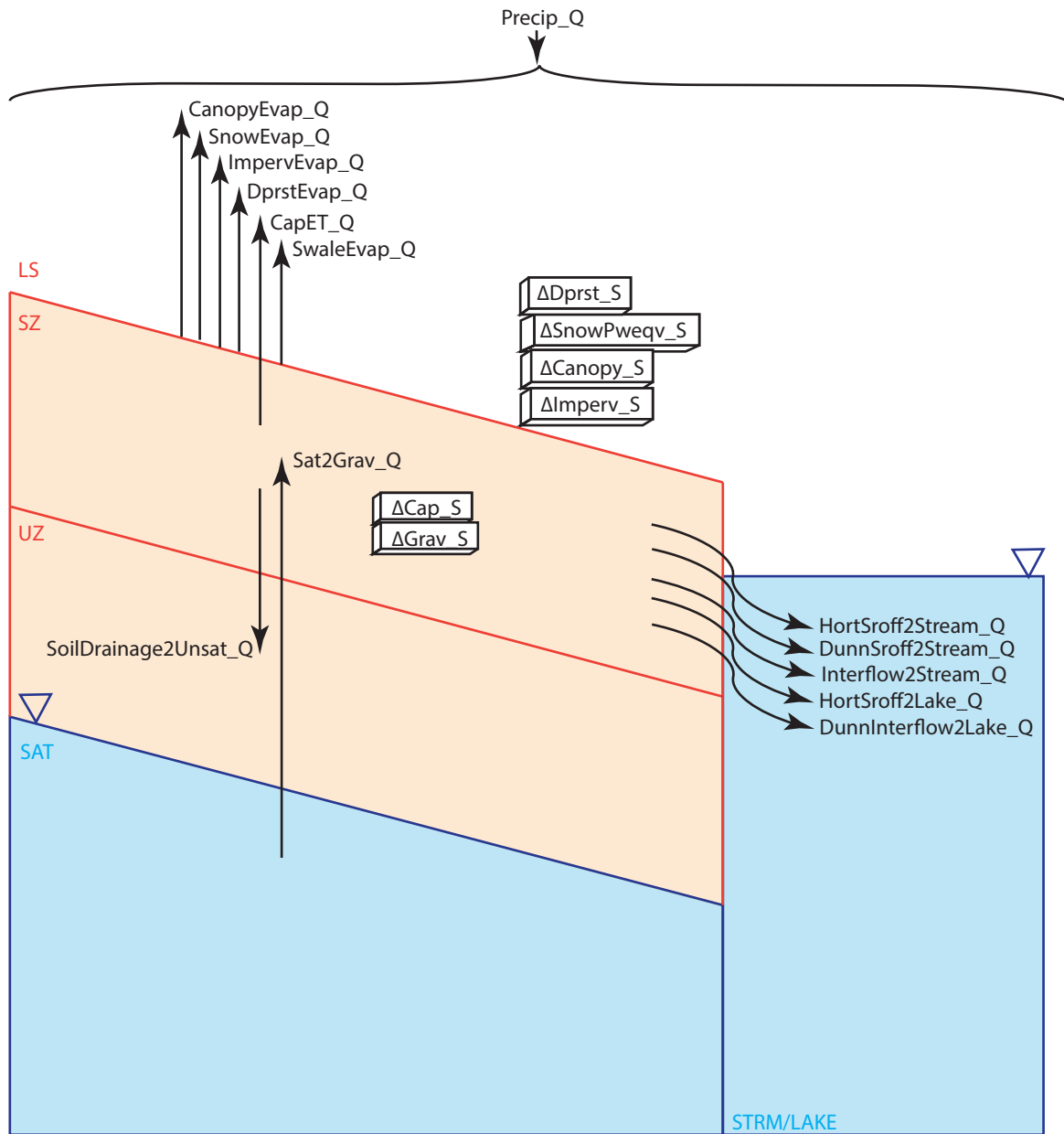
$$\text{In} = \text{Precip_Q} + \text{NetBoundaryFlow2Sat_Q} + \text{BoundaryStreamFlow_Q}$$

$$\text{Out} = \text{StreamOut_Q} + \text{ActualET_Q} + \text{NetWellFlow_Q}$$

$$\text{ActualET_Q} = \text{SatET_Q} + \text{UnsatET_Q} + \text{CanopyEvap_Q} + \text{SnowEvap_Q} + \text{ImpervEvap_Q} + \text{DprstEvap_Q} + \text{CapET_Q} + \text{SwaleEvap_Q} + \text{LakeEvap_Q}$$

$$\text{Error} = \text{Storage Change} - \text{In} + \text{Out}$$

****Note:** Terms denoted with the “Δ” symbol (e.g., ΔCap_S) are change-in-storage terms that are not GSFLOW output variables but have been calculated externally in the *gsflowAnalysis.xlsx* utility using storage terms output from GSFLOW. Similarly, ActualET_Q is calculated externally in the *gsflowAnalysis.xlsx* utility as the sum of ET and Evap terms.



HRU Budget

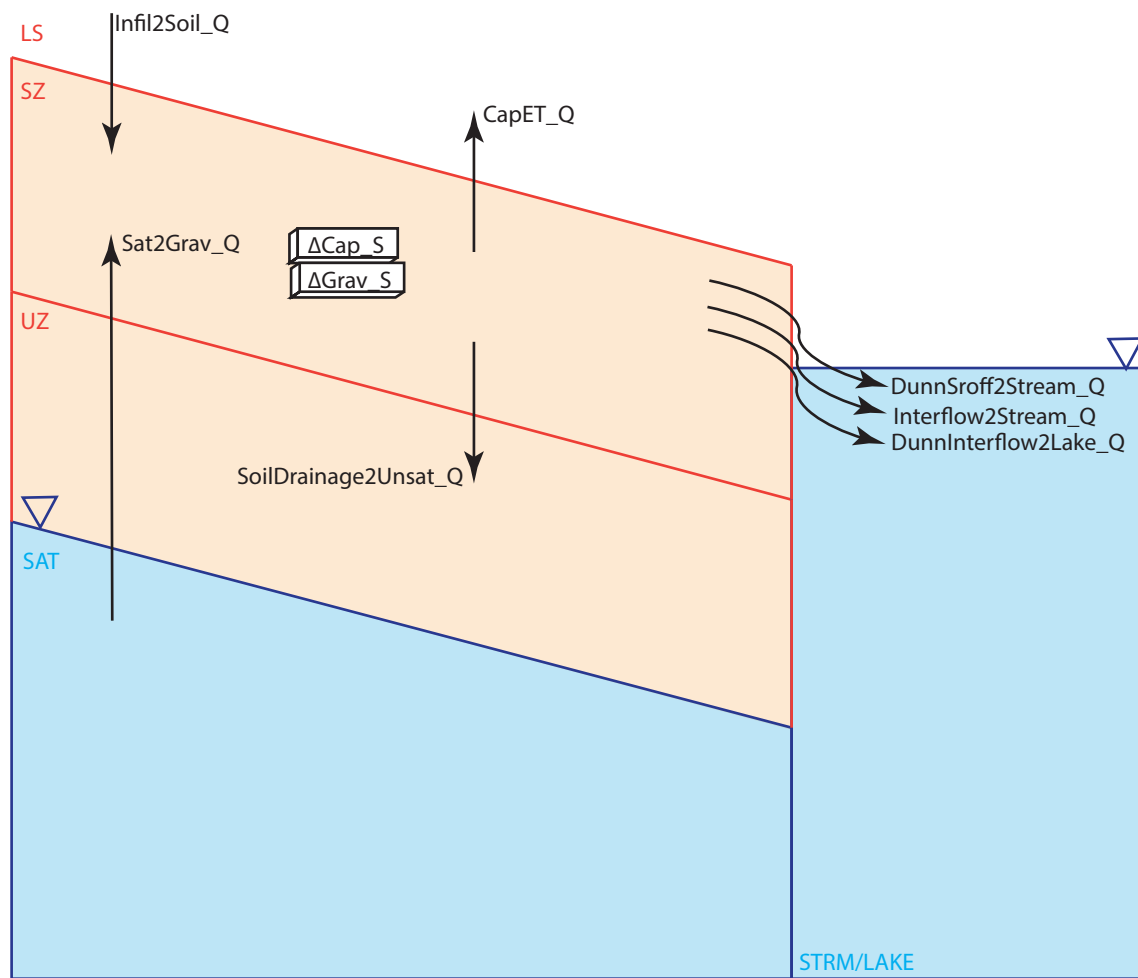
ΔStorage = $\Delta Dprst_S + \Delta SnowPweqv_S + \Delta Canopy_S + \Delta Imperv_S + \Delta Cap_S + \Delta Grav_S$

In = $Precip_Q + Sat2Grav_Q$

Out = $CanopyEvap_Q + SnowEvap_Q + ImpervEvap_Q + DprstEvap_Q + CapET_Q + SwaleEvap_Q + SoilDrainage2Unsat_Q + Horticroff2Stream_Q + DunnSroff2Stream_Q + Interflow2Stream_Q + Horticroff2Lake_Q + DunnInterflow2Lake_Q$

Error = $\Delta Storage - In + Out$

****Note:** Terms denoted with the “Δ” symbol (e.g., ΔCap_S) are change-in-storage terms that are not GSFLOW output variables but have been calculated externally in the *gsflowAnalysis.xlsx* utility using storage terms output from GSFLOW.



Soil-Zone Budget

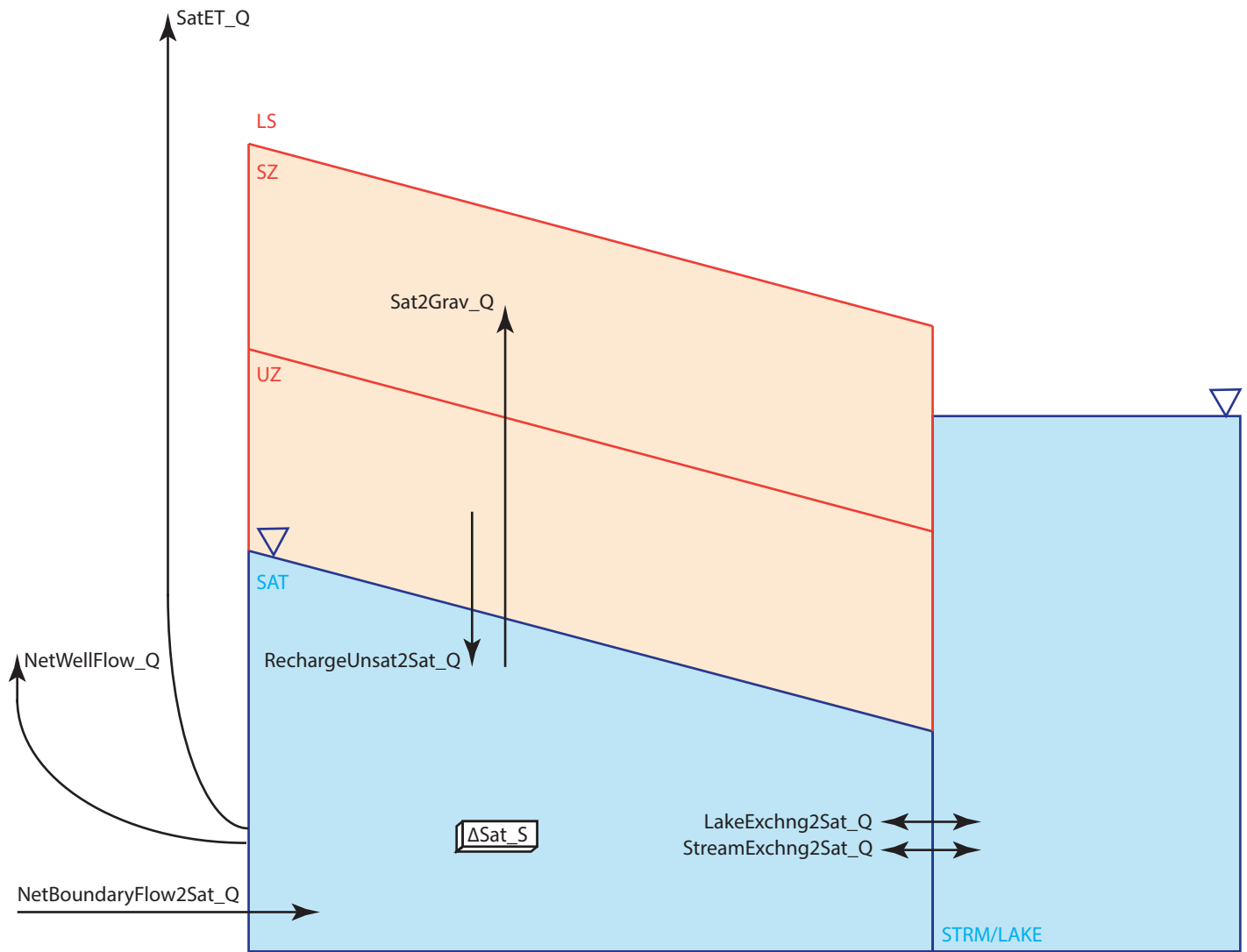
$$\Delta \text{Storage} = \Delta \text{Cap_S} + \Delta \text{Grav_S}$$

$$\text{In} = \text{Sat2Grav_Q} + \text{Infil2Soil_Q}$$

$$\text{Out} = \text{DunnSroff2Stream_Q} + \text{Interflow2Stream_Q} + \text{DunnInterflow2Lake_Q} + \text{CapET_Q} + \text{SoilDrainage2Unsat_Q}$$

$$\text{Error} = \Delta \text{Storage} - \text{In} + \text{Out}$$

****Note:** Terms denoted with the “Δ” symbol (e.g., ΔCap_S) are change-in-storage terms that are not GSFLOW output variables but have been calculated externally in the *gsflowAnalysis.xlsx* utility using storage terms output from GSFLOW.



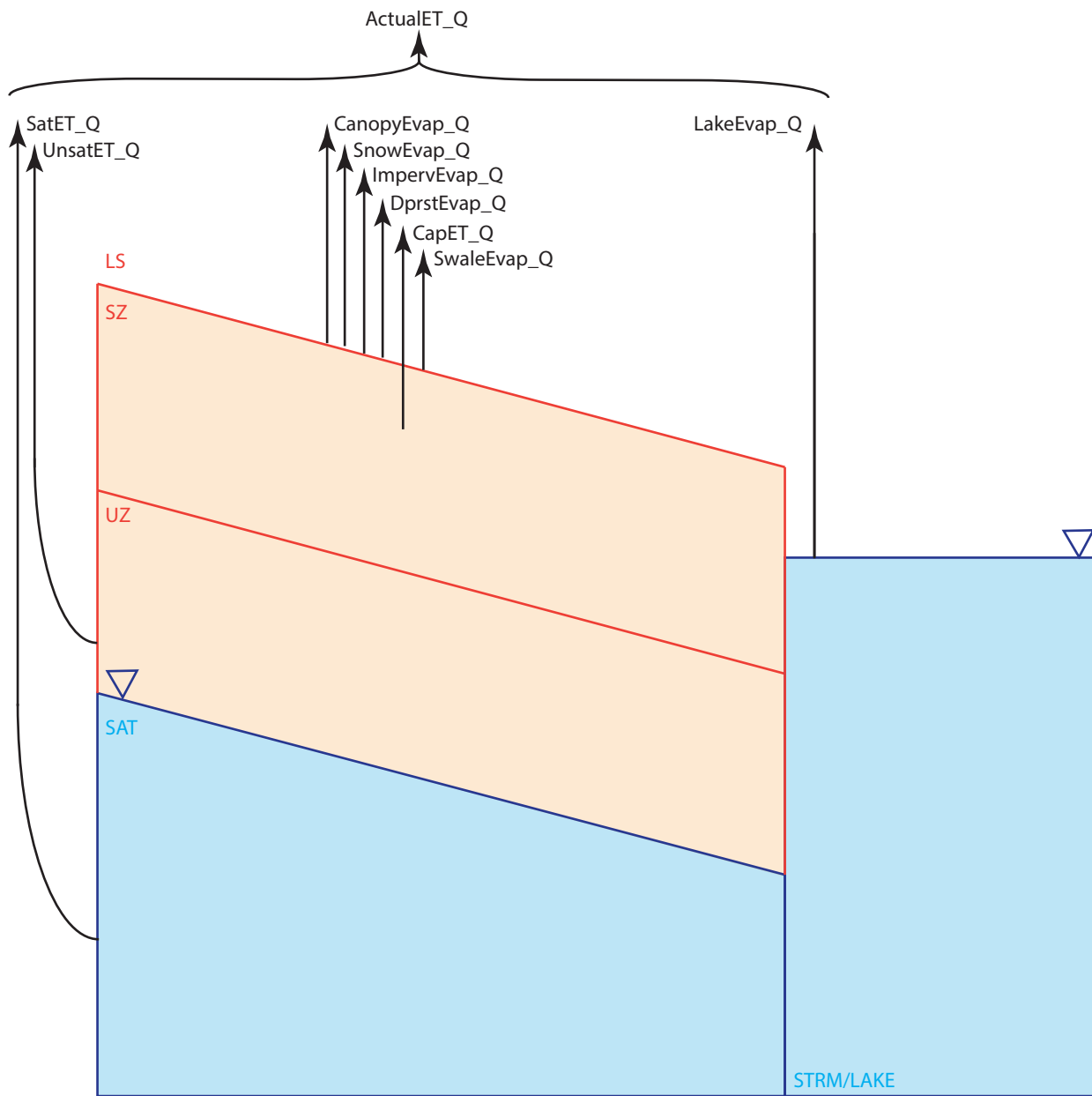
Saturated-Zone Budget

In = $\text{RechargeUnsat2Sat_Q} + \text{NetBoundaryFlow2Sat_Q} + \text{LakeExchng2Sat_Q} + \text{StreamExchng2Sat_Q}$

Out = $\text{Sat2Grav_Q} + \text{SatET_Q} + \text{NetWellFlow_Q}$

Error = $\Delta\text{Sat_S} - \text{In} + \text{Out}$

****Note:** Terms denoted with the "Δ" symbol (e.g., $\Delta\text{Sat_S}$) are change-in-storage terms that are not GSFLOW output variables but have been calculated externally in the *gsflowAnalysis.xlsx* utility using storage terms output from GSFLOW.



Evapotranspiration Budget

$$\mathbf{ActualET_Q} = \mathbf{SatET_Q} + \mathbf{UnsatET_Q} + \mathbf{CanopyEvap_Q} + \mathbf{SnowEvap_Q} + \mathbf{ImpervEvap_Q} + \mathbf{DprstEvap_Q} + \mathbf{CapET_Q} + \mathbf{SwaleEvap_Q} + \mathbf{LakeEvap_Q}$$

****Note:** *ActualET_Q* is not a GSFLOW output variable but has been calculated externally in the *gsflowAnalysis.xlsx* utility as the sum of *ET* and *Evap* terms output from GSFLOW.