

nstep time step number

kpatch tile index

itypveg vegetation type

itypwat water type

itypprc precipitation type

isoicol color class for soil albedos

snl number of snow layers

frac_veg_nosno fraction of vegetation not covered by snow

frac_veg_nosno_alb fraction of vegetation not covered by snow

imelt flag for melting (=1), freezing (=2), not=0(new)

lakpoi flag for lakpoint (true=lake point)

do_capsnow flag to indicate snow capping (true=do snow capping)

present whether PFT is present in the current patch

lat latitude of the patch

lon longitude of the patch

dtime model timestep

zi interface level below a "z" level (m)

dz layer depth (m)

z layer thickness (m)

bsw Clapp and Hornberger "b"

watsat volumetric soil water at saturation (porosity)

hksat hydraulic conductivity at saturation (mm H₂O /s)

sucsat minimum soil suction (mm)

csol heat capacity, soil solids (J/m³/Kelvin)

tkmg thermal conductivity, soil minerals [W/m-K] (new)

tkdry thermal conductivity, dry soil (W/m/Kelvin)

tksatu thermal conductivity, saturated soil [W/m-K] (new)

rootfr fraction of roots in each soil layer

rootr effective fraction of roots in each layer

begwb water mass at the beginning of the time step

endwb water mass at the end of the time step

forc.t atmospheric temperature (K)

forc.u atmospheric wind speed in east direction (m/s)

forc.v atmospheric wind speed in north direction (m/s)

forc.q atmospheric specific humidity (kg/kg)

forc.hgt atmospheric reference height (m)

forc.hgt.u observational height of wind [m]

forc.hgt.v observational height of temperature [m]

forc.hgt.q observational height of humidity [m] (new)

forc.pbot atmospheric pressure (Pa)

forc.th atmospheric potential temperature (Kelvin)

forc.vp atmospheric vapor pressure (Pa)

forc.rho density (kg/m**3)

forc.lwrad downward infrared (longwave) radiation (W/m**2)

forc.solad direct beam radiation (vis=forc.sols , nir=forc.soll)

forc.solai diffuse radiation (vis=forc.solsd, nir=forc.solld)

forc.ch heat/moisture exchange coefficient

forc.rain rain rate [mm/s]

forc.snow snow rate [mm/s]

rssun sunlit stomatal resistance (s/m)

rssha shaded stomatal resistance (s/m)
psnsun sunlit leaf photosynthesis ($\mu\text{mol CO}_2 / \text{m}^2 / \text{s}$)
psnsha shaded leaf photosynthesis ($\mu\text{mol CO}_2 / \text{m}^2 / \text{s}$)
laisun sunlit leaf area
laisha shaded leaf area
sabg solar radiation absorbed by ground (W / m^2)
sabv solar radiation absorbed by vegetation (W / m^2)
fsa solar radiation absorbed (total) (W / m^2)
taux wind stress: e-w ($\text{kg} / \text{m} / \text{s}^2$)
tauy wind stress: n-s ($\text{kg} / \text{m} / \text{s}^2$)
eflx_lwrad_out emitted infrared (longwave) radiation (W / m^2)
eflx_lwrad_net net infrared (longwave) rad (W / m^2) [+ = to atm]
eflx_sh_tot total sensible heat flux (W / m^2) [+ to atm]
eflx_sh_veg sensible heat flux from leaves (W / m^2) [+ to atm]
eflx_sh_grnd sensible heat flux from ground (W / m^2) [+ to atm]
eflx_lh_tot total latent heat flux (W / m^2) [+ to atm]
eflx_soil_grnd soil heat flux (W / m^2) [+ = into soil]
t_veg vegetation temperature (Kelvin)
t_grnd ground temperature (Kelvin)
t_rad radiative temperature (Kelvin)
t_ref2m 2 m height surface air temperature (Kelvin)
t_soisno soil temperature (Kelvin)
qflx_infl infiltration ($\text{mm H}_2\text{O} / \text{s}$)
qflx_surf surface runoff ($\text{mm H}_2\text{O} / \text{s}$)
qflx_drain sub-surface runoff ($\text{mm H}_2\text{O} / \text{s}$)

qflx_top_soil net water input into soil from top (mm/s)

qflx_evap_soi soil evaporation (mm H₂O/s) (+ = to atm)

qflx_evap_veg vegetation evaporation (mm H₂O/s) (+ = to atm)

qflx_tran_veg vegetation transpiration (mm H₂O/s) (+ = to atm)

qflx_snomelt snow melt (mm H₂O /s)

qflx_evap_tot $qflx_evap_soi + qflx_evap_veg + qflx_tran_veg$

qflx_rain_grnd rain on ground after interception (mm H₂O/s) [+]

qflx_evap_grnd ground surface evaporation rate (mm H₂O/s) [+]

qflx_dew_grnd ground surface dew formation (mm H₂O /s) [+]

qflx_sub_snow sublimation rate from snow pack (mm H₂O /s) [+]

qflx_dew_snow surface dew added to snow pack (mm H₂O /s) [+]

qflx_snowcap excess precipitation due to snow capping (mm H₂O /s) [+]

qflx_qrgwl $qflx_surf$ at glaciers, wetlands, lakes

h2osno snow water (mm H₂O)

h2ocan canopy water (mm H₂O)

h2osoi_liq liquid water (kg/m²)

h2osoi_ice ice lens (kg/m²)

h2osoi_vol volumetric soil water ($0_i = h2osoi_vol_i = watsat$) [m³/m³]

snowdp snow height (m)

snowage non dimensional snow age [-]

h2osno_old snow mass for previous time step (kg/m²) (new)

frac_sno fraction of ground covered by snow (0 to 1)

frac_iceold fraction of ice relative to the total water (new)

eff_porosity effective porosity = porosity - vol_ice

parsun average absorbed PAR for sunlit leaves (W/m^{**2})

albgrd ground albedo (direct)

albgrl ground albedo (diffuse)

fabd flux absorbed by veg per unit direct flux

fabl flux absorbed by veg per unit diffuse flux

ftdd down direct flux below veg per unit dir flx

ftdl down diffuse flux below veg per unit dir flx

ftil down diffuse flux below veg per unit dif flx

fsun sunlit fraction of canopy

surfalb instantaneous all-wave surface albedo

snoalb instantaneous all-wave snow albedo

hbot canopy bottom (m)

htop canopy top (m)

tlai one-sided leaf area index, no burying by snow

tsai one-sided stem area index, no burying by snow

elai one-sided leaf area index with burying by snow

esai one-sided stem area index with burying by snow

fwet fraction of canopy that is wet (0 to 1)

fdry fraction of foliage that is green and dry [-] (new)

annpsn annual photosynthesis ($\mu\text{mol CO}_2 / \text{m}^2$)

annpsnpot annual potential photosynthesis (same units)

wf soil water as frac. of whc for top 0.5 m

z0mr ratio of momentum roughness length to canopy top height [-]

z0m momentum roughness length [m]

displar ratio of displacement height to canopy top height [-]

displa displacement height [m]

dleaf leaf dimension [m]

xl pft_varcon leaf/stem orientation index

rho1 pft_varcon leaf reflectance : 1=vis, 2=nir

rhos pft_varcon stem reflectance : 1=vis, 2=nir

taul pft_varcon leaf transmittance: 1=vis, 2=nir

taus pft_varcon stem transmittance: 1=vis, 2=nir

qe25 quantum efficiency at 25c (umol co2 / umol photon)

vcmx25 maximum rate of carboxylation at 25c (umol co2/m**2/s)

mp slope for conductance-to-photosynthesis relationship

c3psn photosynthetic pathway: 0. = c4, 1. = c3

totfsa solar absorbed solar radiation [W/m2]

toteflx_lwrad_net net longwave radiation [W/m2]

toteflx_lh_tot total latent heat flux [W/m2]

toteflx_sh_tot total sensible heat flux [W/m2]

toteflx_soil_grnd ground heat flux [W/m2]

toqflx_snomelt snowmelt heat flux [W/m2]

totrain accumulation of rain [mm]

totsnow accumulation of snow [mm]

totqflx_evap total evaporation [mm]

totqflx_surf surface runoff [mm]

totqflx_drain subsurface runoff [mm]

totqflx_ecanop interception evaporation [W/m2]

totqflx_tran_veg Total vegetation transpiration

totqflx_evap_grnd Total ground surface evaporation

totqflx_sub_snow Total sublimation rate from snow pack

acond aerodynamic conductance

soilmtc_prev Total column soil moisture for the prev.timestep

h2osno_prev Total column snow water equivalent for the prev.timestep