

Output Variables from the WRF-Hydro Modeling System V3.0

Channel Point Output (CHRTOUT)

Variable	Units	Description
Latitude	n/a	For non-NWM output only; station latitude
Longitude	n/a	For non-NWM output only; station longitude
Streamflow	m ³ /s	River flow
Head	m	For gridded channel routing only; river stage
Station_id	Int(Long)	Station ID
Time	seconds	Valid output time
Q_lateral	m ³ /s	Runoff into channel reach
Velocity	m/s	River velocity

Routing Grid Output (RTOUT)

Variable	Units	Description
SOIL_M	m ³ /m ³	Volumetric soil moisture
ZWATTLRT	m	Depth to saturated layers (=2m when no saturation, =0m when fully saturated)
QSTRMVOLRT	mm	Accumulated depth of stream channel inflow
SFCHEADSUBRT	mm	Instantaneous value of depth of ponded water on surface
QBDYRT	mm?	Accumulated flow volume routed outside of the domain from the boundary cells?

NoahMP Land Surface Model Output (LDASOUT_MP)

Variable	Fullvar	Units	Description
ACSNOM	float ACSNOM(Time, south_north, west_east)	mm	Accumulated melting water out of snow bottom
ACSNOW	float ACSNOW(Time, south_north, west_east)	mm	Accumulated snow fall
ALBEDO	float ALBEDO(Time, south_north, west_east)	-	Total-grid surface albedo
APAR	float APAR(Time, south_north, west_east)	W/m ²	Absorbed photosynthetically active radiation
CANICE	float CANICE(Time, south_north, west_east)	mm	Canopy ice water content
CANLIQ	float CANLIQ(Time, south_north, west_east)	mm	Canopy liquid water content
CH	float CH(Time, south_north, west_east)	m/s	Exchange coefficient: grid-average
CHB	float CHB(Time, south_north, west_east)	m/s	Exchange coefficient: bare ground

CHB2	float CHB2(Time, south_north, west_east)	m/s	Exchange coefficient: bare ground @ 2-meters
CHLEAF	float CHLEAF(Time, south_north, west_east)	m/s	Exchange coefficient: leaf surface
CHUC	float CHUC(Time, south_north, west_east)	m/s	Exchange coefficient: below-canopy
CHV	float CHV(Time, south_north, west_east)	m/s	Exchange coefficient: vegetation-atmosphere
CHV2	float CHV2(Time, south_north, west_east)	m/s	Exchange coefficient: vegetation-atmosphere @ 2-meters
CM	float CM(Time, south_north, west_east)	m/s	Exchange coefficient: grid-average
COSZ	float COSZ(Time, south_north, west_east)	-	Cosine of zenith angle
EAH	float EAH(Time, south_north, west_east)	Pa	Canopy air vapor pressure
ECAN	float ECAN(Time, south_north, west_east)	kg/m ² /s	Canopy water evaporation rate
EDIR	float EDIR(Time, south_north, west_east)	kg/m ² /s	Direct soil evaporation rate
EMISS	float EMISS(Time, south_north, west_east)	-	Emissivity: grid-average
ETRAN	float ETRAN(Time, south_north, west_east)	kg/m ² /s	Transpiration rate
EVB	float EVB(Time, south_north, west_east)	W/m ²	Latent heat flux: bare ground to atmosphere
EVC	float EVC(Time, south_north, west_east)	W/m ²	Latent heat flux: leaf to canopy air
EVG	float EVG(Time, south_north, west_east)	W/m ²	Latent heat flux: below-canopy ground to canopy air
FASTCP	float FASTCP(Time, south_north, west_east)	g/m ²	Short-lived carbon in shallow soil
FIRA	float FIRA(Time, south_north, west_east)	W/m ²	Total net LW radiation (+ to atmosphere)
FSA	float FSA(Time, south_north, west_east)	W/m ²	Total absorbed SW radiation
FSNO	float FSNO(Time, south_north, west_east)	-	Fraction of surface covered by snow
FVEG	float FVEG(Time, south_north, west_east)	-	Fraction of surface covered by vegetation
FWET	float FWET(Time, south_north, west_east)	fraction	Fraction of canopy covered by liquid or frozen water
GHB	float GHB(Time, south_north, west_east)	W/m ²	Ground heat flux: bare ground fraction (+ to soil)
GHV	float GHV(Time, south_north, west_east)	W/m ²	Ground heat flux: vegetated fraction (+ to soil)
GPP	float GPP(Time, south_north, west_east)	g Carbon/m ² /s	Net instantaneous carbon assimilation

GRDFLX	float GRDFLX(Time, south_north, west_east)	W/m ²	Ground heat flux: grid-average (+ to soil)
HFX	float HFX(Time, south_north, west_east)	W/m ²	Sensible heat flux: grid-average (+ to atmosphere)
IRB	float IRB(Time, south_north, west_east)	W/m ²	Net emitted LW radiation: bare ground
IRC	float IRC(Time, south_north, west_east)	W/m ²	Net emitted LW radiation: canopy
IRG	float IRG(Time, south_north, west_east)	W/m ²	Net emitted LW radiation: below-canopy ground
ISLTYP	int ISLTYP(Time, south_north, west_east)	category	Dominant soil category
ISNOW	int ISNOW(Time, south_north, west_east)	count	Number of active snow layers
IVGTYP	int IVGTYP(Time, south_north, west_east)	category	Dominant vegetation category
LAI	float LAI(Time, south_north, west_east)	m ² /m ²	Leaf area index
LFMASS	float LFMASS(Time, south_north, west_east)	g Carbon/m ²	Leaf carbon mass
LH	float LH(Time, south_north, west_east)	W/m ²	Latent heat flux: grid-average (+ to atmosphere)
LWFORC	float LWFORC(Time, south_north, west_east)	W/m ²	Longwave radiation forcing
NEE	float NEE(Time, south_north, west_east)	g Carbon/m ² /s	Net ecosystem exchange
NPP	float NPP(Time, south_north, west_east)	g Carbon/m ² /s	Net primary productivity
PSN	float PSN(Time, south_north, west_east)	umol CO ₂ /m ² /s	Total photosynthesis
Q2MB	float Q2MB(Time, south_north, west_east)	kg/kg	Mixing ratio @ 2m: bare ground
Q2MV	float Q2MV(Time, south_north, west_east)	kg/kg	Mixing ratio @ 2m: vegetated ground
QSNOW	float QSNOW(Time, south_north, west_east)	mm/s	Snowfall rate at ground surface
RAINRATE	float RAINRATE(Time, south_north, west_east)	mm	Precipitation in model timestep
RTMASS	float RTMASS(Time, south_north, west_east)	g C/m ²	Root carbon mass
SAG	float SAG(Time, south_north, west_east)	W/m ²	Solar radiation absorbed: ground surface
SAI	float SAI(Time, south_north, west_east)	m ² /m ²	Stem area index
SAV	float SAV(Time, south_north, west_east)	W/m ²	Solar radiation absorbed: vegetation canopy
SFCRNOFF	float SFCRNOFF(Time, south_north, west_east)	mm	Surface runoff: accumulated
SHB	float SHB(Time, south_north, west_east)	W/m ²	Sensible heat flux: bare ground to atmosphere

SHC	float SHC(Time, south_north, west_east)	W/m ²	Sensible heat flux: leaf to canopy air
SHG	float SHG(Time, south_north, west_east)	W/m ²	Sensible heat flux: below-canopy ground to canopy air
SNEQV	float SNEQV(Time, south_north, west_east)	kg/m ²	Snow water equivalent
SNICE	float SNICE(Time, south_north, snow_layers, west_east)	mm	Snow layer ice
SNLIQ	float SNLIQ(Time, south_north, snow_layers, west_east)	mm	Snow layer liquid water
SNOW_T	float SNOW_T(Time, south_north, snow_layers, west_east)	K	Snow temperature
SNOWH	float SNOWH(Time, south_north, west_east)	m	Snow depth
SOIL_M	float SOIL_M(Time, south_north, soil_layers_stag, west_east)	m ³ /m ³	Volumetric soil moisture
SOIL_T	float SOIL_T(Time, south_north, soil_layers_stag, west_east)	K	Soil temperature
SOIL_W	float SOIL_W(Time, south_north, soil_layers_stag, west_east)	m ³ /m ³	Volumetric soil moisture: liquid
STBLCP	float STBLCP(Time, south_north, west_east)	g Carbon/m ²	Stable carbon in deep soil
STMAS	float STMAS(Time, south_north, west_east)	g Carbon/m ²	Stem carbon mass
SWFORC	float SWFORC(Time, south_north, west_east)	W/m ²	Shortwave radiation forcing
T2MB	float T2MB(Time, south_north, west_east)	K	Air temperature @ 2m: bare ground
T2MV	float T2MV(Time, south_north, west_east)	K	Air temperature @ 2m: vegetated ground
TAH	float TAH(Time, south_north, west_east)	K	Canopy air temperature
TG	float TG(Time, south_north, west_east)	K	Ground temperature: grid-average
TGB	float TGB(Time, south_north, west_east)	K	Ground temperature: bare ground
TGV	float TGV(Time, south_north, west_east)	K	Ground temperature: vegetated ground
TR	float TR(Time, south_north, west_east)	W/m ²	Transpiration heat flux
TRAD	float TRAD(Time, south_north, west_east)	K	Surface radiative temperature: grid
TV	float TV(Time, south_north, west_east)	K	Vegetation leaf temperature
UGDRNOF F	float UGDRNOFF(Time, south_north, west_east)	mm	Underground runoff: accumulated
WA	float WA(Time, south_north, west_east)	kg/m ²	Water in aquifer relative to reference level
WOOD	float WOOD(Time, south_north, west_east)	g Carbon/m ²	Wood and woody roots carbon mass

WT	float WT(Time, south_north, west_east)	kg/m ²	Water in aquifer and saturated soil
ZSNSO_SN	float ZSNSO_SN(Time, south_north, snow_layers, west_east)	m	Snow and soil interface depths (from snow surface)
ZWT	float ZWT(Time, south_north, west_east)	m	Depth to water table