	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1	**WRF-Hydro V5 Output Variable Matrix**																		
2		**OutputFile**	**Variable Name**	**Long Name**	**Description**	**Units**	**IO_Config Outputs_0**	**IO_ConfigO utputs_1**	**IO_ConfigO utputs_2**	**IO_ConfigO utputs_3**	**IO_ConfigO utputs_4**	**IO_ConfigO utputs_5**	**IO_ConfigO utputs_6**	**Min**	**Max**	**Scale**	**Offset**	**Fill**	**Special Notes**
3	**Streamflow output at all channel reaches/cells**	**CHRTOUT_DOMAIN**	time	valid output time	Valid output time	minutes since 1970-01-01 00:00:00 UTC	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	
4		**CHRTOUT_DOMAIN**	reference_time	model initialization time	Model initialization time	minutes since 1970-01-01 00:00:00 UTC	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	
5		**CHRTOUT_DOMAIN**	feature_id	Reach ID	Unique reach or channel cell ID	-	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	
6		**CHRTOUT_DOMAIN**	latitude	Feature latitude	Station latitude	decimal degrees	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	
7		**CHRTOUT_DOMAIN**	longitude	Feature Longitude	Station longitude	decimal degrees	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	
8		**CHRTOUT_DOMAIN**	order	Streamflow order	Strahler stream order for output reach or cell	-	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	
9		**CHRTOUT_DOMAIN**	elevation	Feature Elevation	Elevation for output reach or cell	m	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	
10		**CHRTOUT_DOMAIN**	streamflow	River Flow	Streamflow	m3 s-1	Yes	Yes	Yes	Yes	Yes	Yes	Yes	0	500000	0.01	0	-9999	
11		**CHRTOUT_DOMAIN**	nudge	Amount of stream flow alteration	Streamflow nudge value (only if nudging DA is active)	m3 s-1	No	No	No	No	No	No	No	-500000	500000	0.01	0	-9999	Values only when nudging DA is active
12		**CHRTOUT_DOMAIN**	q_lateral	Runoff into channel reach	Lateral flow into channel reach or cell	m3 s-1	Yes	No	No	No	No	Yes	Yes	0	500000	0.1	0	-9999	
13		**CHRTOUT_DOMAIN**	velocity	River Velocity	Channel velocity	m s-1	Yes	Yes	Yes	Yes	Yes	Yes	Yes	0	500000	0.01	0	-9999	
14		**CHRTOUT_DOMAIN**	head	River Stage	River stage (gridded channel only)	m	Yes	No	No	No	No	No	No	0	500000	0.01	0	-9999	
15		**CHRTOUT_DOMAIN**	qSfcLatRunoff	Runoff from terrain routing	Flux from terrain routing	m3 s-1	No	No	No	No	No	No	No	0	500000	0.001	0	-9999	Only available for UDMP_OPT=1
16		**CHRTOUT_DOMAIN**	qBucket	Flux from gw bucket	Flux from groundwater buckets	m3 s-1	No	No	No	No	No	No	No	0	500000	0.001	0	-9999	Only available for UDMP_OPT=1
17		**CHRTOUT_DOMAIN**	qBtmVertRunoff	Runoff from bottom of soil to bucket	Flux from bottom of soil column into groundwater buckets	m3	No	No	No	No	No	No	No	0	500000	0.001	0	-9999	Only available for UDMP_OPT=1
18		**CHRTOUT_DOMAIN**	AccSfcLatRunoff	Accumulated runoff from terrain routing	Accumulated flux from terrain routing	m3	No	No	No	No	No	No	No	0	500000	0.01	0	-9999	Only available for UDMP_OPT=1
19		**CHRTOUT_DOMAIN**	accBucket	Accumulated runoff from gw bucket	Accumulated flux from groundwater buckets	m3	No	No	No	No	No	No	No	0	500000	0.01	0	-9999	Only available for UDMP_OPT=1
20	**Streamflow on the 2D high resolution routing grid**	**CHRTOUT_GRID**	time	valid output time	Valid output time	minutes since 1970-01-01 00:00:00 UTC	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	Only active with gridded channel routing
21		**CHRTOUT_GRID**	reference_time	model initialization time	Model initialization time	minutes since 1970-01-01 00:00:00 UTC	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	Only active with gridded channel routing
22		**CHRTOUT_GRID**	x	x coordinate of projection	x coordinate (in native projection)	native projection units	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	Only active with gridded channel routing
23		**CHRTOUT_GRID**	y	y coordinate of projection	y coordinate (in native projection)	native projection units	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	Only active with gridded channel routing
24		**CHRTOUT_GRID**	Index	Stream cell index value	Stream cell index value	-	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	Only active with gridded channel routing
25		**CHRTOUT_GRID**	streamflow	River Flow	Streamflow	m3 s-1	Yes	Yes	Yes	Yes	Yes	Yes	Yes	0	500000	0.1	0	-9999	Only active with gridded channel routing
26	**Streamflow output at forecast points or gage reaches/cells**	**CHANOBS_DOMAIN**	time	valid output time	Valid output time	minutes since 1970-01-01 00:00:00 UTC	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	
27		**CHANOBS_DOMAIN**	reference_time	model initialization time	Model initialization time	minutes since 1970-01-01 00:00:00 UTC	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	
28		**CHANOBS_DOMAIN**	feature_id	Reach ID	Unique reach or channel cell ID	-	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	
29		**CHANOBS_DOMAIN**	latitude	Feature latitude	Station latitude	decimal degrees	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	
30		**CHANOBS_DOMAIN**	longitude	Feature longitude	Station longitude	decimal degrees	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	
31		**CHANOBS_DOMAIN**	order	Streamflow Order	Strahler stream order for output reach or cell	-	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	
32		**CHANOBS_DOMAIN**	elevation	Feature Elevation	Elevation for output reach or cell	m	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	
33		**CHANOBS_DOMAIN**	streamflow	River Flow	Streamflow	m3 s-1	Yes	Yes	Yes	Yes	Yes	Yes	Yes	0	500000	0.01	0	-9999	
34	**Terrain routing variables on the 2D high resolution routing grid**	**RTOUT_DOMAIN**	time	valid output time	Valid output time	minutes since 1970-01-01 00:00:00 UTC	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	
35		**RTOUT_DOMAIN**	reference_time	model initialization time	Model initialization time	minutes since 1970-01-01 00:00:00 UTC	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	
36		**RTOUT_DOMAIN**	x	x coordinate of projection	x coordinate (in native projection)	native projection units	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	
37		**RTOUT_DOMAIN**	y	y coordinate of projection	x coordinate (in native projection)	native projection units	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	
38		**RTOUT_DOMAIN**	SOIL_M	volumetric soil moisture	Volumetric soil moisture	m3 m-3	Yes	No	No	No	No	No	No	0	1	0.01	0	-9999	
39		**RTOUT_DOMAIN**	zwattablrt	water table depth	Depth to saturated layers (=2m when no saturation; =0 when fully saturated)	m	Yes	Yes	Yes	Yes	Yes	Yes	Yes	0	10	0.1	0	-9999	
40		**RTOUT_DOMAIN**	sfcheadsubrt	surface head	Instantaneous value of depth of ponded water on surface	mm	Yes	Yes	Yes	Yes	Yes	Yes	Yes	0	1000000	1	0	-9999	
41		**RTOUT_DOMAIN**	QSTRMVOLRT	channel inflow	Accumulated depth of stream channel inflow	mm	Yes	No	No	No	No	No	No	0	1000	1	0	-9999	
42		**RTOUT_DOMAIN**	QBDRYRT	accumulated value of the boundary flux	Accumulated flow volume routed outside of the domain from the boundary cells	mm	Yes	No	No	No	No	No	No	0	1000	1	0	-9999	
43	**Lake output variables**	**LAKEOUT_DOMAIN**	time	valid output time	Valid output time	minutes since 1970-01-01 00:00:00 UTC	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	
44		**LAKEOUT_DOMAIN**	reference_time	model initialization time	Model initialization time	minutes since 1970-01-01 00:00:00 UTC	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
2		OutputFile	Variable Name	Long Name	Description	Units	IO_Config Outputs_0	IO_ConfigO utputs_1	IO_ConfigO utputs_2	IO_ConfigO utputs_3	IO_ConfigO utputs_4	IO_ConfigO utputs_5	IO_ConfigO utputs_6	Min	Max	Scale	Offset	Fill	Special Notes
45		LAKEOUT_DOMAIN	feature_id	Lake COMMON ID	Unique lake ID	-	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	
46		LAKEOUT_DOMAIN	latitude	Lake latitude	Lake latitude	decimal degrees	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	
47		LAKEOUT_DOMAIN	longitude	Lake longitude	Lake longitude	decimal degrees	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	
48		LAKEOUT_DOMAIN	water_sfc_elev	Water Surface Elevation	Water surface elevation above sea level	m	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	
49		LAKEOUT_DOMAIN	inflow	Lake Inflow	Total inflow into waterbody	m3 s-1	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-10000	10000	0.01	0	-9999	
50		LAKEOUT_DOMAIN	outflow	Lake Outflow	Outflow from waterbody outlet	m3 s-1	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-10000	10000	0.01	0	-9999	
51	**Ground water output variables**	GWOUT_DOMAIN	time	valid output time	Valid output time	minutes since 1970-01-01 00:00:00 UTC	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	
52		GWOUT_DOMAIN	reference_time	model initialization time	Model initialization time	minutes since 1970-01-01 00:00:00 UTC	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	
53		GWOUT_DOMAIN	feature_id	Groundwater Bucket ID	Unique groundwater bucket ID	-	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	
54		GWOUT_DOMAIN	inflow	Bucket Inflow	Total groundwater bucket inflow	m3 s-1	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-10000	10000	0.01	0	-9999	
55		GWOUT_DOMAIN	outflow	Bucket Outflow	Total groundwater bucket outflow	m3 s-1	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-10000	10000	0.01	0	-9999	
56		GWOUT_DOMAIN	depth	Bucket Depth	Groundwater bucket water level	mm	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-10000	10000	0.1	0	-9999	
57	**Land surface model output**	LDASOUT_DOMAIN	time	valid output time	Valid output time	minutes since 1970-01-01 00:00:00 UTC	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	
58		LDASOUT_DOMAIN	reference_time	model initialization time	Model initialization time	minutes since 1970-01-01 00:00:00 UTC	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	
59		LDASOUT_DOMAIN	x	x coordinate of projection	x coordinate (in native projection)	native projection units	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	
60		LDASOUT_DOMAIN	y	y coordinate of projection	x coordinate (in native projection)	native projection units	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	
61		LDASOUT_DOMAIN	IVGTYP	Dominant vegetation category	Dominant vegetation category	category	Yes	No	No	No	No	No	No	0	100	1	0	-9999	
62		LDASOUT_DOMAIN	ISLTYP	Dominant soil category	Dominant soil category	category	Yes	No	No	No	No	No	No	0	100	1	0	-9999	
63		LDASOUT_DOMAIN	FVEG	Green Vegetation Fraction	Fraction of surface covered by vegetation	fraction	Yes	No	No	No	No	No	No	0	1	0.01	0	-9999	
64		LDASOUT_DOMAIN	LAI	Leaf area index	Leaf area index	m2 m-2	Yes	No	No	No	No	No	No	0	20	0.1	0	-9999	
65		LDASOUT_DOMAIN	SAI	Stem area index	Stem area index	m2 m-2	Yes	No	No	No	No	No	No	0	20	0.1	0	-9999	
66		LDASOUT_DOMAIN	SWFORC	Shortwave forcing	Shortwave radiation forcing	W m-2	Yes	No	No	No	No	No	No	-1000	3000	0.1	0	-9999	
67		LDASOUT_DOMAIN	COSZ	Cosine of zenith angle	Cosine of zenith angle	-	Yes	No	No	No	No	No	No	-1	1	0.01	0	-9999	
68		LDASOUT_DOMAIN	LWFORC	Longwave forcing	Longwave radiation forcing	W m-2	Yes	No	No	No	No	No	No	-1500	1500	0.1	0	-9999	
69		LDASOUT_DOMAIN	RAINRATE	Precipitation rate	Precipitation in model timestep	mm s-1	Yes	No	No	No	No	No	No	0	100	0.000001	0	-9999	
70		LDASOUT_DOMAIN	EMISS	Grid emissivity	Emissivity: grid-average	-	Yes	No	No	No	No	No	No	0	1	0.01	0	-9999	
71		LDASOUT_DOMAIN	FSA	Total absorbed SW radiation	Total absorbed SW radiation	W m-2	Yes	No	No	Yes	No	Yes	Yes	-1500	1500	0.1	0	-9999	
72		LDASOUT_DOMAIN	FIRA	Total net LW radiation to atmosphere	Total net LW radiation (+ to atmosphere)	W m-2	Yes	No	No	Yes	No	Yes	Yes	-1500	1500	0.1	0	-9999	
73		LDASOUT_DOMAIN	GRDFLX	Heat flux into the soil	Ground heat flux: grid-average (+ to soil)	W m-2	Yes	No	No	Yes	No	No	Yes	-1500	1500	0.1	0	-9999	
74		LDASOUT_DOMAIN	HFX	Total sensible heat to the atmosphere	Sensible heat flux: grid-average (+ to atmosphere)	W m-2	Yes	No	No	Yes	No	Yes	Yes	-1500	1500	0.1	0	-9999	
75		LDASOUT_DOMAIN	LH	Total latent heat to the atmosphere	Latent heat flux: grid-average (+ to atmosphere)	W m-2	Yes	No	No	Yes	No	Yes	Yes	-1500	1500	0.1	0	-9999	
76		LDASOUT_DOMAIN	ECAN	Canopy water evaporation rate	Canopy water evaporation rate	kg m-2 s-1	Yes	No	No	No	No	No	No	-100	100	0.000001	0	-9999	
77		LDASOUT_DOMAIN	EDIR	Direct from soil evaporation rate	Direct soil evaporation rate	kg m-2 s-1	Yes	No	No	No	No	No	No	-100	100	0.000001	0	-9999	
78		LDASOUT_DOMAIN	ALBEDO	Surface albedo	Total-grid surface albedo	-	Yes	No	No	No	No	No	No	0	1	0.01	0	-9999	
79		LDASOUT_DOMAIN	ETRAN	Transpiration rate	Transpiration rate	kg m-2 s-1	Yes	No	No	No	No	No	No	-100	100	0.000001	0	-9999	
80		LDASOUT_DOMAIN	UGDRNOFF	Accumulated underground runoff	Underground runoff: accumulated	mm	Yes	No	No	Yes	Yes	Yes	Yes	-100	100000	0.01	0	-9999	
81		LDASOUT_DOMAIN	SFCRNOFF	Accumulated surface runoff	Surface runoff: accumulated	mm	Yes	No	No	No	Yes	Yes	Yes	0	100000	0.001	0	-9999	
82		LDASOUT_DOMAIN	CANLIQ	Canopy liquid water content	Canopy liquid water content	mm	Yes	No	No	No	No	No	No	-5	30000	0.01	0	-9999	
83		LDASOUT_DOMAIN	CANICE	Canopy ice water content	Canopy ice water content	mm	Yes	No	No	No	No	No	No	-5	30000	0.01	0	-9999	
84		LDASOUT_DOMAIN	ZWT	Depth to the water table	Depth to water table	m	Yes	No	No	No	No	No	No	0	10	0.00001	0	-9999	
85		LDASOUT_DOMAIN	WA	Water in aquifer	Water in aquifer relative to reference level	kg m-2	Yes	No	No	No	No	No	No	0	10000	0.01	0	-9999	
86		LDASOUT_DOMAIN	WT	Water in aquifer and saturated soil	Water in aquifer and saturated soil	kg m-2	Yes	No	No	No	No	No	No	0	10000	0.01	0	-9999	
87		LDASOUT_DOMAIN	ACCPRCP	Accumulated precip	Accumulated precipitation	mm	Yes	No	No	No	No	No	No	0	1000000	0.01	0	-9999	
88		LDASOUT_DOMAIN	ACCECAN	Accumulated canopy water	Accumulated canopy evaporation	mm	Yes	No	No	Yes	No	No	Yes	-100	1000000	0.01	0	-9999	

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
2		OutputFile	Variable Name	Long Name	Description	Units	IO_Config Outputs_0	IO_ConfigO utputs_1	IO_ConfigO utputs_2	IO_ConfigO utputs_3	IO_ConfigO utputs_4	IO_ConfigO utputs_5	IO_ConfigO utputs_6	Min	Max	Scale	Offset	Fill	Special Notes
89		LDASOUT_DOMAIN	ACCEDIR	Accumulated direct soil evap	Accumulated direct soil evaporation	mm	Yes	No	No	Yes	No	No	Yes	-100	1000000	0.01	0	-9999	
90		LDASOUT_DOMAIN	ACCETRAN	Accumulated transpiration	Accumulated transpiration	mm	Yes	No	No	Yes	No	No	Yes	-100	1000000	0.01	0	-9999	
91		LDASOUT_DOMAIN	SAV	Solar radiative heat flux aborbed by vegetation	Solar radiation absorbed: vegetation canopy	W m-2	Yes	No	No	No	No	No	No	-1500	1500	0.1	0	-9999	
92		LDASOUT_DOMAIN	TR	Transpiration heat	Transpiration heat flux	W m-2	Yes	No	No	No	No	No	No	-1500	1500	0.1	0	-9999	
93		LDASOUT_DOMAIN	EVC	Canopy evap heat	Latent heat flux: leaf to canopy air	W m-2	Yes	No	No	No	No	No	No	-1500	1500	0.1	0	-9999	
94		LDASOUT_DOMAIN	IRC	Canopy net LW rad	Net emitted LW radiation: canopy	W m-2	Yes	No	No	No	No	No	No	-1500	1500	0.1	0	-9999	
95		LDASOUT_DOMAIN	SHC	Canopy sensible heat	Sensible heat flux: leaf to canopy air	W m-2	Yes	No	No	No	No	No	No	-1500	1500	0.1	0	-9999	
96		LDASOUT_DOMAIN	IRG	Ground net LW rad	Net emitted LW radiation: below-canopy ground	W m-2	Yes	No	No	No	No	No	No	-1500	1500	0.1	0	-9999	
97		LDASOUT_DOMAIN	SHG	Ground sensible heat	Sensible heat flux: below-canopy ground to canopy air	W m-2	Yes	No	No	No	No	No	No	-1500	1500	0.1	0	-9999	
98		LDASOUT_DOMAIN	EVG	Ground evap heat	Latent heat flux: below-canopy ground to canopy air	W m-2	Yes	No	No	No	No	No	No	-1500	1500	0.1	0	-9999	
99		LDASOUT_DOMAIN	GHV	Ground heat flux + to soil vegetated	Ground heat flux: vegetated fraction (+ to soil)	W m-2	Yes	No	No	No	No	No	No	-1500	1500	0.1	0	-9999	
100		LDASOUT_DOMAIN	SAG	Solar radiative heat flux absorved by ground	Solar radiation absorbed: ground surface	W m-2	Yes	No	No	No	No	No	No	-1500	1500	0.1	0	-9999	
101		LDASOUT_DOMAIN	IRB	Net LW rad to atm bare	Net emitted LW radiation: bare ground	W m-2	Yes	No	No	No	No	No	No	-1500	1500	0.1	0	-9999	
102		LDASOUT_DOMAIN	SHB	Sensible heat atm bare	Sensible heat flux: bare ground to atmosphere	W m-2	Yes	No	No	No	No	No	No	-1500	1500	0.1	0	-9999	
103		LDASOUT_DOMAIN	EVB	Evaporation heat to atm bare	Latent heat flux: bare ground to atmosphere	W m-2	Yes	No	No	No	No	No	No	-1500	1500	0.1	0	-9999	
104		LDASOUT_DOMAIN	GHB	Ground heat flux + to soil bare	Ground heat flux: bare ground fraction (+ to soil)	W m-2	Yes	No	No	No	No	No	No	-1500	1500	0.1	0	-9999	
105		LDASOUT_DOMAIN	TRAD	Surface radiative temperature	Surface radiative temperature: grid	K	Yes	No	No	Yes	No	Yes	Yes	0	400	0.1	0	-9999	
106		LDASOUT_DOMAIN	TG	Ground temperature	Ground temperature: grid-average	K	Yes	No	No	No	No	No	No	0	400	0.1	0	-9999	
107		LDASOUT_DOMAIN	TV	Vegetation temperature	Vegetation leaf temperature	K	Yes	No	No	No	No	No	No	0	400	0.1	0	-9999	
108		LDASOUT_DOMAIN	TAH	Canopy air temperature	Canopy air temperature	K	Yes	No	No	No	No	No	No	0	400	0.1	0	-9999	
109		LDASOUT_DOMAIN	TGV	Ground surface Temp vegetated	Ground temperature: vegetated ground	K	Yes	No	No	No	No	No	No	0	400	0.1	0	-9999	
110		LDASOUT_DOMAIN	TGB	Ground surface Temp bare	Ground temperature: bare ground	K	Yes	No	No	No	No	No	No	0	400	0.1	0	-9999	
111		LDASOUT_DOMAIN	T2MV	2m Air Temp vegetated	Air temperature @ 2m: vegetated ground	K	Yes	No	No	No	No	No	No	0	400	0.1	0	-9999	
112		LDASOUT_DOMAIN	T2MB	2m Air Temp bare	Air temperature @ 2m: bare ground	K	Yes	No	No	No	No	No	No	0	400	0.1	0	-9999	
113		LDASOUT_DOMAIN	Q2MV	2m mixing ratio vegetated	Mixing ratio @ 2m: vegetated ground	kg/kg	Yes	No	No	No	No	No	No	0	1	0.0001	0	-9999	
114		LDASOUT_DOMAIN	Q2MB	2m mixing ratio bare	Mixing ratio @ 2m: bare ground	kg/kg	Yes	No	No	No	No	No	No	0	1	0.0001	0	-9999	
115		LDASOUT_DOMAIN	EAH	Canopy air vapor pressure	Canopy air vapor pressure	Pa	Yes	No	No	No	No	No	No	-1000	100000	0.1	0	-9999	
116		LDASOUT_DOMAIN	FWET	Wetted or snowed fraction of canopy	Fraction of canopy covered by liquid or frozen water	fraction	Yes	No	No	No	No	No	No	0	1	0.01	0	-9999	
117		LDASOUT_DOMAIN	ZSNSO_SN	Snow layer depths from snow surface	Snow and soil interface depths (from snow surface)	m	Yes	No	No	No	No	No	No	-100	100	0.00001	0	-9999	
118		LDASOUT_DOMAIN	SNICE	Snow layer ice	Snow layer ice	mm	Yes	No	No	No	No	No	No	0	100000	0.01	0	-9999	
119		LDASOUT_DOMAIN	SNLIQ	Snow layer liquid water	Snow layer liquid water	mm	Yes	No	No	Yes	No	No	Yes	0	100000	0.01	0	-9999	
120		LDASOUT_DOMAIN	SOIL_T	soil temperature	Soil temperature	K	Yes	No	No	Yes	No	No	Yes	0	400	0.1	0	-9999	
121		LDASOUT_DOMAIN	SOIL_W	liquid volumetric soil moisture	Volumetric soil moisture: liquid	m3 m-3	Yes	No	No	No	No	Yes	Yes	0	1	0.01	0	-9999	
122		LDASOUT_DOMAIN	SNOW_T	snow temperature	Snow temperature	K	Yes	No	No	No	No	No	No	0	400	0.1	0	-9999	
123		LDASOUT_DOMAIN	SOIL_M	volumetric soil moisture	Volumetric soil moisture	m3 m-3	Yes	No	No	Yes	No	Yes	Yes	0	1	0.01	0	-9999	
124		LDASOUT_DOMAIN	SNOWH	Snow depth	Snow depth	m	Yes	Yes	Yes	Yes	No	Yes	Yes	0	100	0.0001	0	-9999	
125		LDASOUT_DOMAIN	SNEQV	Snow water equivalent	Snow water equivalent	kg m-2	Yes	Yes	Yes	Yes	Yes	Yes	Yes	0	100000	0.1	0	-9999	
126		LDASOUT_DOMAIN	QSNOW	Snowfall rate	Snowfall rate at ground surface	mm s-1	Yes	No	No	No	No	No	No	0	100	0.000001	0	-9999	
127		LDASOUT_DOMAIN	ISNOW	Number of snow layers	Number of active snow layers	count	Yes	No	No	Yes	No	No	Yes	0	10	1	0	-9999	
128		LDASOUT_DOMAIN	FSNO	Snow-cover fraction on the ground	Fraction of surface covered by snow	fraction	Yes	Yes	Yes	Yes	No	Yes	Yes	0	1	0.001	0	-9999	
129		LDASOUT_DOMAIN	ACSNOW	accumulated snow fall	Accumulated snow fall	mm	Yes	No	No	No	No	No	No	0	100000	0.01	0	-9999	
130		LDASOUT_DOMAIN	ACSNOM	accumulated melting water out of snow bottom	Accumulated melting water out of snow bottom	mm	Yes	No	No	Yes	Yes	No	Yes	0	100000	0.01	0	-9999	
131		LDASOUT_DOMAIN	CM	Momentum drag coefficient	Exchange coefficient: grid-average	-	Yes	No	No	No	No	No	No	-5	5	0.00001	0	-9999	

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
2		OutputFile	Variable Name	Long Name	Description	Units	IO_Config Outputs_0	IO_ConfigO utputs_1	IO_ConfigO utputs_2	IO_ConfigO utputs_3	IO_ConfigO utputs_4	IO_ConfigO utputs_5	IO_ConfigO utputs_6	Min	Max	Scale	Offset	Fill	Special Notes
132		LDASOUT_DOMAIN	CH	Sensible heat exchange coefficient	Exchange coefficient: grid-average	-	Yes	No	No	No	No	No	No	-5	5	0.00001	0	-9999	
133		LDASOUT_DOMAIN	CHV	Exchange coefficient vegetated	Exchange coefficient: vegetation-atmosphere	m s-1	Yes	No	No	No	No	No	No	-5	5	0.00001	0	-9999	
134		LDASOUT_DOMAIN	CHB	Exchange coefficient bare	Exchange coefficient: bare ground	m s-1	Yes	No	No	No	No	No	No	-5	5	0.00001	0	-9999	
135		LDASOUT_DOMAIN	CHLEAF	Exchange coefficient leaf	Exchange coefficient: leaf surface	m s-1	Yes	No	No	No	No	No	No	-5	5	0.00001	0	-9999	
136		LDASOUT_DOMAIN	CHUC	Exchange coefficient bare	Exchange coefficient: below-canopy	m s-1	Yes	No	No	No	No	No	No	-5	5	0.00001	0	-9999	
137		LDASOUT_DOMAIN	CHV2	Exchange coefficient 2-meter vegetated	Exchange coefficient: vegetation-atmosphere @ 2-meters	m s-1	Yes	No	No	No	No	No	No	-5	5	0.00001	0	-9999	
138		LDASOUT_DOMAIN	CHB2	Exchange coefficient 2-meter bare	Exchange coefficient: bare ground @ 2-meters	m s-1	Yes	No	No	No	No	No	No	-5	5	0.00001	0	-9999	
139		LDASOUT_DOMAIN	LFMASS	Leaf mass	Leaf carbon mass	g C m-2	Yes	No	No	No	No	No	No	0	1000	0.01	0	-9999	
140		LDASOUT_DOMAIN	RTMASS	Mass of fine roots	Root carbon mass	g C m-2	Yes	No	No	No	No	No	No	0	1000	0.01	0	-9999	
141		LDASOUT_DOMAIN	STMASS	Stem mass	Stem carbon mass	g C m-2	Yes	No	No	No	No	No	No	0	1000	0.01	0	-9999	
142		LDASOUT_DOMAIN	WOOD	Mass of wood and woody roots	Wood and woody roots carbon mass	g C m-2	Yes	No	No	No	No	No	No	0	1000	0.01	0	-9999	
143		LDASOUT_DOMAIN	STBLCP	Stable carbon in deep soil	Stable carbon in deep soil	g C m-2	Yes	No	No	No	No	No	No	0	5000	0.01	0	-9999	
144		LDASOUT_DOMAIN	FASTCP	Short-lived carbon in shallow soil	Short-lived carbon in shallow soil	g C m-2	Yes	No	No	No	No	No	No	0	5000	0.01	0	-9999	
145		LDASOUT_DOMAIN	NEE	Net ecosystem exchange	Net ecosystem exchange	g m-2 s-1 CO2	Yes	No	No	No	No	No	No	0	1000	0.01	0	-9999	
146		LDASOUT_DOMAIN	GPP	Net instantaneous assimilation	Net instantaneous carbon assimilation	g m-2 s-1 C	Yes	No	No	No	No	No	No	0	1000	0.01	0	-9999	
147		LDASOUT_DOMAIN	NPP	Net primary productivity	Net primary productivity	g m-2 s-1 C	Yes	No	No	No	No	No	No	0	1000	0.01	0	-9999	
148		LDASOUT_DOMAIN	PSN	Total photosynthesis	Total photosynthesis	umol CO2 m-2 s-1	Yes	No	No	No	No	No	No	0	1000	0.01	0	-9999	
149		LDASOUT_DOMAIN	APAR	Photosynthesis active energy by canopy	Absorbed photosynthetically active radiation	W m-2	Yes	No	No	No	No	No	No	0	1000	0.01	0	-9999	
150		LDASOUT_DOMAIN	ACCET	Accumulated total ET	Accumulated total evapotranspiration	mm	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-1000	1000000	0.01	0	-9999	
151		LDASOUT_DOMAIN	CANWAT	Total canopy water (liquid + ice)	Total canopy water (liquid + ice)	mm	Yes	No	No	Yes	Yes	No	Yes	-5	30000	0.01	0	-9999	
152		LDASOUT_DOMAIN	SOILICE	fraction of soil moisture that is ice	Fraction of soil moisture that is ice	fraction	Yes	No	No	Yes	No	No	Yes	0	1	0.01	0	-9999	
153		LDASOUT_DOMAIN	SOILSAT_TOP	fraction of soil saturation, top 2 layers	Fraction of soil saturation, top 2 layers	fraction	Yes	Yes	Yes	Yes	Yes	No	Yes	0	1	0.001	0	-9999	
154		LDASOUT_DOMAIN	SOILSAT	fraction of soil saturation, column integrated	Fraction of soil saturation, column integrated	fraction	Yes	No	No	No	Yes	No	Yes	0	1	0.001	0	-9999	
155		LDASOUT_DOMAIN	SNOWT_AVG	average snow temperature (by layer mass)	Average snow temperature (by layer mass)	K	Yes	Yes	Yes	Yes	No	No	Yes	0	400	0.1	0	-9999	
156	Land surface diagnostic output	LSMOUT_DOMAIN	time	valid output time	Valid output time	minutes since 1970-01-01 00:00:00 UTC	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	
157		LSMOUT_DOMAIN	reference_time	model initialization time	Model initialization time	minutes since 1970-01-01 00:00:00 UTC	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	
158		LSMOUT_DOMAIN	x	x coordinate of projection	x coordinate (in native projection)	native projection units	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	
159		LSMOUT_DOMAIN	y	y coordinate of projection	x coordinate (in native projection)	native projection units	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	
160		LSMOUT_DOMAIN	stc1	Soil temperature in the top layer	Soil temperature in the top layer	K	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	Diagnostics only; no scale/offset/compression
161		LSMOUT_DOMAIN	smc1	Soil moisture in the top layer	Volumetric soil moisture in the top layer	m3 m-3	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	Diagnostics only; no scale/offset/compression
162		LSMOUT_DOMAIN	sh2ox1	Volumetric soil moisture in the top layer	Liquid water in the top layer	m3 m-3	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	Diagnostics only; no scale/offset/compression
163		LSMOUT_DOMAIN	stc2	Soil temperature in the second layer	Soil temperature in the second layer	K	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	Diagnostics only; no scale/offset/compression
164		LSMOUT_DOMAIN	smc2	Soil moisture in the second layer	Volumetric soil moisture in the second layer	m3 m-3	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	Diagnostics only; no scale/offset/compression
165		LSMOUT_DOMAIN	sh2ox2	Volumetric soil moisture in the second layer	Liquid water in the second layer	m3 m-3	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	Diagnostics only; no scale/offset/compression
166		LSMOUT_DOMAIN	stc3	Soil temperature in the third layer	Soil temperature in the third layer	K	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	Diagnostics only; no scale/offset/compression
167		LSMOUT_DOMAIN	smc3	Soil moisture in the third layer	Volumetric soil moisture in the third layer	m3 m-3	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	Diagnostics only; no scale/offset/compression
168		LSMOUT_DOMAIN	sh2ox3	Volumetric soil moisture in the third layer	Liquid water in the third layer	m3 m-3	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	Diagnostics only; no scale/offset/compression
169		LSMOUT_DOMAIN	stc4	Soil temperature in the fourth layer	Soil temperature in the bottom layer	K	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	Diagnostics only; no scale/offset/compression
170		LSMOUT_DOMAIN	smc4	Soil moisture content in the fourth layer	Volumetric soil moisture in the bottom layer	m3 m-3	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	Diagnostics only; no scale/offset/compression
171		LSMOUT_DOMAIN	sh2ox4	Volumetric soil moisture in the fourth layer	Liquid water in the bottom layer	m3 m-3	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	Diagnostics only; no scale/offset/compression
172		LSMOUT_DOMAIN	infxsrt	Infiltration excess	Infiltration excess (from LSM)	mm	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	Diagnostics only; no scale/offset/compression
173		LSMOUT_DOMAIN	sfcheadrt	Surface head	Surface head (from HYDRO)	mm	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	Diagnostics only; no scale/offset/compression