CSU – RAMS

Comprehensive Analysis File Variable List

This document contains the full list of output variables as they appear in the native HDF5 output analysis files. Included are the name, units, and description of the variables. Note that not all of the listed variable are available from every simulation. Variables are not output unless the particular physics schemes they are associated with are turned on in the simulations via user choices in the RAMSIN namelist.

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RAMS Variables (prior to REVU post-processing)			
ASCII Name	**dimensions**	**units**	**Description**
GRID AND TOPOGRAPHY			
GLAT	nx,ny	deg	Latitude
GLON	nx,ny	deg	Longitude
TOPT	nx,ny	m	topography height
TOPZO	nx,ny	m	topographic roughness length

DYNAMICS & THERMODYNAMICS			
PI	nx,ny,nz	J/(kg*K)	PI = Exner function * Cp, where (Cp=1004 J/kg/K in RAMS) Exner-function = T/Θ = (p/p00)^(Rd/Cp)
UP	nx,ny,nz	m/s	Past U (zonal) wind component
VP	nx,ny,nz	m/s	Past V (meridional) wind component
WP	nx,ny,nz	m/s	Past W (vertical) wind component
PP	nx,ny,nz	J/(kg*K)	Past perturbation Exner function (PI-prime)
UC	nx,ny,nz	m/s	Current U wind component
VC	nx,ny,nz	m/s	Current V wind component
WC	nx,ny,nz	m/s	Current W wind component
PC	nx,ny,nz	J/(kg*K)	Current perturbation Exner function (PI-prime)
THP	nx,ny,nz	K	Theta-IL, ice-liquid potential temperature (prognostic variable)
RTP	nx,ny,nz	kg/kg	Total water mixing ratio (water vapor + condensate) (prognostic variable)
THETA	nx,ny,nz	K	Theta, potential temperature
RV	nx,ny,nz	kg/kg	Water vapor mixing ratio
DN0	nx,ny,nz	kg/m^3	reference state air density

SURFACE FILE INPUT CHARACTERISTICS (Used by both LEAF & SIB)			
(LEAF always runs PATCH=1, which is water/ocean)			
SOIL_TEXT	nx,ny,nzg,np	#	dominant soil textural class
LEAF_CLASS	nx,ny,np	#	vegetation class
PATCH_AREA	nx,ny,np	fraction	patch fractional area

VEG_NDVIP	nx,ny,np	#	past NDVI (NDVI = Normalized Difference Vegetation Index)
VEG_NDVIC	nx,ny,np	#	current NDVI
VEG_NDVIF	nx,ny,np	#	future NDVI

SURFACE CHARACTERISTICS (LEAF3 / SIB) (Diagnostic for both)			
PATCH_ROUGH	nx,ny,np	m	net roughness
SOIL_ROUGH	nx,ny,np	m	soil roughness
VEG_FRACAREA	nx,ny,np	fraction	vegetation fractional area
VEG_LAI	nx,ny,np	m^2/m^2	green leaf area index
VEG_TAI	nx,ny,np	m^2/m^2	total leaf area index
VEG_ROUGH	nx,ny,np	m	vegetation roughness length
VEG_HEIGHT	nx,ny,np	m	vegetation / canopy height
VEG_ALBEDO	nx,ny,np	fraction	vegetation albedo

SURFACE CHARACTERISTICS (LEAF3 / SIB) (Prognostic for both)			
SOIL_WATER	nx,ny,nzg,np	m^3/m^3	volumetric soil moisture
SOIL_ENERGY	nx,ny,nzg,np	J/m^3	soil energy (used to compute soil temperature)
SFCWATER_NLEV	nx,ny,np	#	number of snow (or surface water) levels
SFCWATER_MASS	nx,ny,nzs,np	kg	surface water mass (snow + surface water)
SFCWATER_ENERGY	nx,ny,nzs,np	J/m^3	surface water energy (used to compute surface water temperature)
SFCWATER_DEPTH	nx,ny,nzs,np	m	surface water depth
USTAR	nx,ny,np	m/s	ustar
TSTAR	nx,ny,np	K	tstar
RSTAR	nx,ny,np	kg/kg	rstar
STOM_RESIST	nx,ny,np	s/m	leaf stomatal resistance
VEG_WATER	nx,ny,np	kg/m^2	vegetation moisture
VEG_TEMP	nx,ny,np	K	vegetation temperature
CAN_RVAP	nx,ny,np	kg/kg	canopy mixing ratio
CAN_TEMP	nx,ny,np	K	canopy temperature
GROUND_RSAT	nx,ny,np	kg/kg	saturation mixing ratio of the top soil/snow surface
GROUND_RVAP	nx,ny,np	kg/kg	Without snowcover, ground_rvap is the effective saturation mixing ratio of soil

SURFACE CHARACTERISTICS (SIB only)			
(CAS = Canopy Air Space)			
RCO2P	nz,nx,ny	mass fraction	CO2 concentration (divide by 1.51724e-6 to get CO2 in ppm) (1.51e-6 = 44(g/mol) / (29g/mol) / 1.e6) where CO2 molar mass = 44 g/mol and Air molar mass = 29g/mol
SNOW1	nx,ny,np	kg/m^2	vegetation snow
SNOW2	nx,ny,np	kg/m^2	ground surface snow
CAPAC1	nx,ny,np	kg/m^2	vegetation liquid store
CAPAC2	nx,ny,np	kg/m^2	ground surface liquid store
PCO2AP	nx,ny,np	Pa	canopy air space CO2 concentration
CO2FLX	nx,ny,np	mol/m^2/s	surface CO2 flux (CAS to first atmospheric level) a.k.a. Net Ecosystem Exchange (NEE)
SFCSWA	nx,ny,np	fraction	surface albedo
UPLWRF	nx,ny,np	W/m^2	surface longwave upward radiation
ASSIMN	nx,ny,np	umol/m^2/s	uptake of CO2 by canopy plants
RESPG	nx,ny,np	umol/m^2/s	ground respiration flux
RSTFAC1	nx,ny,np	# (0->1)	leaf-surface humidity resistance stress
RSTFAC2	nx,ny,np	# (0->1)	soil moisture resistance stress
RSTFAC3	nx,ny,np	# (0->1)	temperature resistance stress
ECT	nx,ny,np	W/m^2	transpiration flux
ECI	nx,ny,np	W/m^2	canopy interception flux
EGI	nx,ny,np	W/m^2	ground interception flux
EGS	nx,ny,np	W/m^2	ground surface layer evaporation
HC	nx,ny,np	W/m^2	canopy (veg) sensible heat flux
HG	nx,ny,np	W/m^2	ground surface sensible heat flux
RA	nx,ny,np	s/m	CAS to lowest atmos layer aerodynamic resistance
RB	nx,ny,np	s/m	leaf surface to CAS aerodynamic resistance
RC	nx,ny,np	s/m	total canopy resistance
RD	nx,ny,np	s/m	ground to CAS aerodynamic resistance
ROFF	nx,ny,np	mm	water runoff (surface and subsurface)

GREEN	**nx,ny,np**	**fraction**	**greenness fraction**
APAR	**nx,ny,np**	**fraction**	**absorbed fraction of photosynthetically active radiation**
VENTMF	**nx,ny,np**	**kg/m^2/s**	**ventilation mass flux**
PCO2C	**nx,ny,np**	**Pa**	**leaf chloroplast CO2 concentration**
PCO2I	**nx,ny,np**	**Pa**	**leaf internal CO2 concentration**
PCO2S	**nx,ny,np**	**Pa**	**leaf surface CO2 concentration**
PCO2M	**nx,ny,np**	**Pa**	**lowest atmospheric level CO2 concentration**
EA	**nx,ny,np**	**hPa**	**canopy water vapor pressure**
EM	**nx,ny,np**	**hPa**	**reference level vapor pressure**
RHA	**nx,ny,np**	**fraction**	**CAS relative humidity**
RADVBC	**nx,ny,np**	**W/m^2**	**visible direct radiation**
RADVDC	**nx,ny,np**	**W/m^2**	**visible diffuse radiation**
RADNBC	**nx,ny,np**	**W/m^2**	**near infrared direct radiation**
RADNDC	**nx,ny,np**	**W/m^2**	**near infrared diffuse radiation**
PSY	**nx,ny,np**	**hPa/deg**	**psychrometric constant**

HYDROMETEOR MIXING RATIOS, NUMBER CONCENTRATION, ENERGY			
SBM = Spectral Bin Model, mixr = mixing ratio			
RCP	**nx,ny,nz**	**kg/kg**	**cloud mixing ratio**
RDP	**nx,ny,nz**	**kg/kg**	**drizzle mixing ratio**
RRP	**nx,ny,nz**	**kg/kg**	**rain mixing ratio**
RPP	**nx,ny,nz**	**kg/kg**	**pristine ice mixing ratio**
RSP	**nx,ny,nz**	**kg/kg**	**snow mixing ratio**
RAP	**nx,ny,nz**	**kg/kg**	**aggregates mixing ratio**
RGP	**nx,ny,nz**	**kg/kg**	**graupel mixing ratio**
RHP	**nx,ny,nz**	**kg/kg**	**hail mixing ratio**
RIPP	**nx,ny,nz**	**kg/kg**	**plates mixing ratio (SBM only)**
RICP	**nx,ny,nz**	**kg/kg**	**columns mixing ratio (SBM only)**
RIDP	**nx,ny,nz**	**kg/kg**	**dendrite mixing ratio (SBM only)**
CCP	**nx,ny,nz**	**#/kg**	**cloud droplet number concentration**
CDP	**nx,ny,nz**	**#/kg**	**drizzle droplet number concentration**
CRP	**nx,ny,nz**	**#/kg**	**rain drop number concentration**
CPP	**nx,ny,nz**	**#/kg**	**pristine ice particle number concentration**

CSP	**nx,ny,nz**	**#/kg**	**snow particle number concentration**
CAP	**nx,ny,nz**	**#/kg**	**aggregates number concentration**
CGP	**nx,ny,nz**	**#/kg**	**graupel particle number concentration**
CHP	**nx,ny,nz**	**#/kg**	**hailstone number concentration**
CIPP	**nx,ny,nz**	**#/kg**	**plates number concentration (SBM only)**
CICP	**nx,ny,nz**	**#/kg**	**columns number concentration (SBM only)**
CIDP	**nx,ny,nz**	**#/kg**	**dendrites number concentration (SBM only)**
Q2	**nx,ny,nz**	**J/kg**	**rain internal energy**
Q6	**nx,ny,nz**	**J/kg**	**graupel internal energy**
Q7	**nx,ny,nz**	**J/kg**	**hail internal energy**
FFCD	**nx,ny,nz,nkr**	**kg/kg**	**cloud mixing ratio distribution (SBM only) (d(mixr)/dln(r))**
FFIP	**nx,ny,nz,nkr**	**kg/kg**	**plates mixing ratio distribution (SBM only) (d(mixr)/dln(r))**
FFIC	**nx,ny,nz,nkr**	**kg/kg**	**columns mixing ratio distribution (SBM only) (d(mixr)/dln(r))**
FFID	**nx,ny,nz,nkr**	**kg/kg**	**dendrites mixing ratio distribution (SBM only) (d(mixr)/dln(r))**
FFSN	**nx,ny,nz,nkr**	**kg/kg**	**aggregates mixing ratio distribution (SBM only) (d(mixr)/dln(r))**
FFGL	**nx,ny,nz,nkr**	**kg/kg**	**graupel mixing ratio distribution (SBM only) (d(mixr)/dln(r))**
FFHL	**nx,ny,nz,nkr**	**kg/kg**	**hail mixing ratio distribution (SBM only) (d(mixr)/dln(r))**

AEROSOLS MASS MIXING RATIOS AND NUMBER CONCENTRATION			
CCCNP	**nx,ny,nz**	**#/kg**	**ccn number concentration**
GCCNP	**nx,ny,nz**	**#/kg**	**gccn number concentration**
MD1NP	**nx,ny,nz**	**#/kg**	**sub-micron dust number concentration**
MD2NP	**nx,ny,nz**	**#/kg**	**super-micron dust number concentration**

SALT_FILM_NP	**nx,ny,nz**	**#/kg**	**sea-salt film drop number concentration**
SALT_JET_NP	**nx,ny,nz**	**#/kg**	**sea-salt jet drop number concentration**
SALT_SPUM_NP	**nx,ny,nz**	**#/kg**	**sea-salt spume drop number concentration**
REGEN_AERO1_NP	**nx,ny,nz**	**#/kg**	**sub-micron regenerated aerosol number concentration**
REGEN_AERO2_NP	**nx,ny,nz**	**#/kg**	**super-micron regenerated aerosol number concentration**
CCCMP	**nx,ny,nz**	**kg/kg**	**ccn mass mixing ratio**
GCCMP	**nx,ny,nz**	**kg/kg**	**gccn mass mixing ratio**
MD1MP	**nx,ny,nz**	**kg/kg**	**sub-micron dust mass mixing ratio**
MD2MP	**nx,ny,nz**	**kg/kg**	**super-micron dust mass mixing ratio**
SALT_FILM_MP	**nx,ny,nz**	**kg/kg**	**sea-salt film drop mass mixing ratio**
SALT_JET_MP	**nx,ny,nz**	**kg/kg**	**sea-salt jet drop mass mixing ratio**
SALT_SPUM_MP	**nx,ny,nz**	**kg/kg**	**sea-salt spume drop mass mixing ratio**
REGEN_AERO1_MP	**nx,ny,nz**	**kg/kg**	**sub-micron regenerated aerosol mass mixing ratio**
REGEN_AERO2_MP	**nx,ny,nz**	**kg/kg**	**super-micron regenerated aerosol mass mixing ratio**
CIFNP	**nx,ny,nz**	**#/kg**	**ice nuclei number concentration (Meyers/DeMott-limited schemes)**
RIFNP	**nx,ny,nz**	**kg/kg**	**ice nuclei mass concentration (SBM CNT scheme)**
FNCN	**nx,ny,nz,nkr**	**kg/kg**	**ccn mass mixing ratio distribution (SBM-only) (d(mixr)/dln(r))**
FFIN	**nx,ny,nz,nkr**	**kg/kg**	**ccn mass mixing ratio distribution (SBM only) (d(mixr)/dln(r))**

AEROSOLS TRACKING			
IFNNUCP	**nx,ny,nz**	**#/kg**	**ice nuclei already nucleated**
IMMERCP	**nx,ny,nz**	**#/kg**	**ice nuclei within cloud droplets**
IMMERDP	**nx,ny,nz**	**#/kg**	**ice nuclei within drizzle droplets**

IMMERRP	**nx,ny,nz**	**#/kg**	**ice nuclei within rain droplets**
CNMCP	**nx,ny,nz**	**kg/kg**	**total aerosol mass within cloud droplets**
CNMDP	**nx,ny,nz**	**kg/kg**	**total aerosol mass within dizzle**
CNMRP	**nx,ny,nz**	**kg/kg**	**total aerosol mass within rain**
CNMPP	**nx,ny,nz**	**kg/kg**	**total aerosol mass within pristine ice**
CNMSP	**nx,ny,nz**	**kg/kg**	**total aerosol mass within snow**
CNMAP	**nx,ny,nz**	**kg/kg**	**total aerosol mass within aggregates**
CNMGP	**nx,ny,nz**	**kg/kg**	**total aerosol mass within graupel**
CNMHP	**nx,ny,nz**	**kg/kg**	**total aerosol mass within hail**
DNMCP	**nx,ny,nz**	**kg/kg**	**total dust mass within cloud droplets**
DNMDP	**nx,ny,nz**	**kg/kg**	**total dust mass within dizzle**
DNMRP	**nx,ny,nz**	**kg/kg**	**total dust mass within rain**
DNMPP	**nx,ny,nz**	**kg/kg**	**total dust mass within pristine ice**
DNMSP	**nx,ny,nz**	**kg/kg**	**total dust mass within snow**
DNMAP	**nx,ny,nz**	**kg/kg**	**total dust mass within aggregates**
DNMGP	**nx,ny,nz**	**kg/kg**	**total dust mass within graupel**
DNMHP	**nx,ny,nz**	**kg/kg**	**total dust mass within hail**
DINCP	**nx,ny,nz**	**kg/kg**	**dust mass within cloud droplets via ice nucleation**
DINDP	**nx,ny,nz**	**kg/kg**	**dust mass within dizzle via ice nucleation**
DINRP	**nx,ny,nz**	**kg/kg**	**dust mass within rain via ice nucleation**
DINPP	**nx,ny,nz**	**kg/kg**	**dust mass within pristine ice via ice nucleation**
DINSP	**nx,ny,nz**	**kg/kg**	**dust mass within snow via ice nucleation**
DINAP	**nx,ny,nz**	**kg/kg**	**dust mass within aggregates via ice nucleation**
DINGP	**nx,ny,nz**	**kg/kg**	**dust mass within graupel via ice nucleation**
DINHP	**nx,ny,nz**	**kg/kg**	**dust mass within hail via ice nucleation**
SNMCP	**nx,ny,nz**	**kg/kg**	**total soluble aerosol mass within cloud droplets**
SNMDP	**nx,ny,nz**	**kg/kg**	**total soluble aerosol mass within dizzle**
SNMRP	**nx,ny,nz**	**kg/kg**	**total soluble aerosol mass**

			within rain
SNMPP	nx,ny,nz	kg/kg	total soluble aerosol mass within pristine ice
SNMSP	nx,ny,nz	kg/kg	total soluble aerosol mass within snow
SNMAP	nx,ny,nz	kg/kg	total soluble aerosol mass within aggregates
SNMGP	nx,ny,nz	kg/kg	total soluble aerosol mass within graupel
SNMHP	nx,ny,nz	kg/kg	total soluble aerosol mass within hail

PRECIPITATION			
PCPVR	nx,ny,nz	kg/m^2/s	rain precipitation rate (3D)
PCPVP	nx,ny,nz	kg/m^2/s	pristine ice precipitation rate (3D)
PCPVS	nx,ny,nz	kg/m^2/s	snow precipitation rate (3D)
PCPVA	nx,ny,nz	kg/m^2/s	aggregates precipitation rate (3D)
PCPVG	nx,ny,nz	kg/m^2/s	graupel precipitation rate (3D)
PCPVH	nx,ny,nz	kg/m^2/s	hail precipitation rate (3D)
PCPVD	nx,ny,nz	kg/m^2/s	drizzle precipitation rate (3D)
PCPVIP	nx,ny,nz	kg/m^2/s	plates precipitation rate (3D; SBM only)
PCPVIC	nx,ny,nz	kg/m^2/s	columns precipitation rate (3D; SBM only)
PCPVID	nx,ny,nz	kg/m^2/s	dendrites precipitation rate (3D; SBM only)
PCPRR	nx,ny	kg/m^2/s	surface rain precipitation rate
PCPRP	nx,ny	kg/m^2/s	surface pristine ice precipitation rate
PCPRS	nx,ny	kg/m^2/s	surface snow precipitation rate
PCPRA	nx,ny	kg/m^2/s	surface aggregates precipitation rate
PCPRG	nx,ny	kg/m^2/s	surface graupel precipitation rate
PCPRH	nx,ny	kg/m^2/s	surface hail precipitation rate
PCPRD	nx,ny	kg/m^2/s	surface drizzle precipitation rate
PCPRIP	nx,ny	kg/m^2/s	surface plates precipitation rate (SBM only)
PCPRIC	nx,ny	kg/m^2/s	surface columns precipitation rate (SBM only)
PCPRID	nx,ny	kg/m^2/s	surface dendrites precipitation

			rate (SBM only)
ACCPR	**nx,ny**	**kg/m^2**	**accumulated rain over the course of the simulation**
ACCPP	**nx,ny**	**kg/m^2**	**accumulated pristine ice over the course of the simulation**
ACCPS	**nx,ny**	**kg/m^2**	**accumulated snow over the course of the simulation**
ACCPA	**nx,ny**	**kg/m^2**	**accumulated aggregates over the course of the simulation**
ACCPG	**nx,ny**	**kg/m^2**	**accumulated graupel over the course of the simulation**
ACCPH	**nx,ny**	**kg/m^2**	**accumulated hail over the course of the simulation**
ACCPD	**nx,ny**	**kg/m^2**	**accumulated drizzle over the course of the simulation**
ACCPIP	**nx,ny**	**kg/m^2**	**accumulated plates over the course of the simulation (SBM only)**
ACCPIC	**nx,ny**	**kg/m^2**	**accumulated columns over the course of the simulation (SBM only)**
ACCPID	**nx,ny**	**kg/m^2**	**accumulated dendrites over the course of the simulation (SBM only)**
PCPG	**nx,ny**	**kg/m^2**	**microphysics precipitation per timestep (for water, kg/m^2 = mm), Used by LEAF/SIB surface models**
QPCPG	**nx,ny**	**J/m^2**	**microphysics precipitation energy per timestep, Used by LEAF surface model**
DPCPG	**nx,ny**	**m**	**microphysics precipitation depth per timestep, Used by LEAF surface model**
ACCPDUST	**nx,ny**	**kg/m^2**	**surface accumulated mass of aerosols identified as dust**
ACCPAERO	**nx,ny**	**kg/m^2**	**Total surface accumulated mass of aerosols**
PCPRDUST	**nx,ny**	**kg/m^2/s**	**surface accumulation rate of aerosols identified as dust**
PCPRAERO	**nx,ny**	**kg/m^2/s**	**Total surface accumulation rate of aerosols**

RADIATION			
FTHRD	nx,ny,nz	K/s	radiative heating rate
BEXT	nx,ny,nz	km	visibility
SWUP	nx,ny,nz	W/m^2	upwelling shortwave radiation
SWDN	nx,ny,nz	W/m^2	downwelling shortwave radiation
LWUP	nx,ny,nz	W/m^2	upwelling longwave radiation
LWDN	nx,ny,nz	W/m^2	downwelling longwave radiation
RSHORT	nx,ny	W/m^2	surface downwelling shortwave radiation
RLONG	nx,ny	W/m^2	surface downwelling longwave radiation
RLONGUP	nx,ny	W/m^2	surface upwelling longwave radiation
ALBEDT	nx,ny	fraction	surface albedo
COSZ	nx,ny	unitless	cosine of the solar zenith angle

TURBULENCE AND FLUXES			
TKEP	nx,ny,nz	m^2/s^2	turbulent kinetic energy (from Mellor-Yamada and Deardorf schemes only)
HKH	nx,ny,nz	m^2/s	horizontal eddy diffusivity coefficient for heat for scalar quantities (un-density weighted)
VKH	nx,ny,nz	m^2/s	vertical eddy diffusivity coefficient for heat for scalar quantities (un-density weighted)
RHKM	nx,ny,nz	m^2/s	horizontal eddy diffusivity coefficient for momentum
RVKM	nx,ny,nz	m^2/s	vertical eddy diffusivity coefficient for momentum
RVKH	nx,ny,nz	m^2/s	vertical eddy diffusivity coefficient for heat for scalar quantities
SFLUX_U	nx,ny	Pascals	surface U-momentum flux
SFLUX_V	nx,ny	Pascals	surface V-momentum flux
SFLUX_W	nx,ny	Pascals	surface W-momentum flux
SFLUX_T	nx,ny	(K*kg) / (m^2*s)	surface temperature flux (multiply by Cp [~1004 J/(kg*K)] to get surface

			sensible heat flux in W/m^2)
SFLUX_R	**nx,ny**	**kg / (m^2*s)**	**surface moisture flux (multiply by Lv [~2.5e6 J/kg] to get surface latent heat flux in W/m^2)**

CUMULUS PARAMETERIZATION FIELDS			
THSRC	**nx,ny,nz**	**K/sec**	**convective parameterization heating rate**
RTSRC	**nx,ny,nz**	**kg/kg/sec**	**convective parameterization moistenting rate**
ACONPR	**nx,ny**	**kg/m^2**	**convective parameterization total accumulated precipitation**
CONPRR	**nx,ny**	**kg/m^2/sec**	**convective parameterization preciptation rate**
RCSRC	**nx,ny,nz**	**kg/kg/sec**	**convective cloud water mixing ratio tendency (KF scheme only)**
RRSRC	**nx,ny,nz**	**kg/kg/sec**	**convective rain mixing ratio tendency (KF scheme only)**
RPSRC	**nx,ny,nz**	**kg/kg/sec**	**convective pristine ice mixing ratio tendency (KF scheme only)**
RSSRC	**nx,ny,nz**	**kg/kg/sec**	**convective snow mixing ratio tendency (KF scheme only)**
W0AVG	**nx,ny,nz**	**m/s**	**a running mean average of vertical velocity (KF scheme only)**
W0AVGLT	**nx,ny,nz**	**m/s**	**a running mean average of the horizontal components of the contravariant vertical velocity (KF scheme only)**
NCA	**nx,ny**	**m/s**	**integer counter keeping track of number of timesteps that convective tendencies maintained (KF scheme only)**
CONVGO	**nx,ny**	**m/s**	**integer which keeps track if pre-convection checks satisfied (KF scheme only)**

BUDGET VARIABLES for IMBUDGET >=1			
All budgets are accumulated values unless otherwise noted as being instantaneous values. Accumulated budgets are summed each timestep between output file writes and then reset.			
LATHEATVAP	nx,ny,nz	dΘ or dT	instantaneous change in (T or Θ) a due to vapor diffusion and cloud & ice nucleation
LATHEATFRZ	nx,ny,nz	dΘ or dT	instantaneous change in (T or Θ) due to collision-coalescence and melting routines
WP_BUOY_THETA	nx,ny,nz	m/s	instantaneous vertical velocity contribution from Theta-V buoyancy computation
WP_BUOY_COND	nx,ny,nz	m/s	instantaneous vertical velocity contribution from condensate loading
WP_ADVDIF	nx,ny,nz	m/s	instantaneous vertical velocity contribution by the combination of both advection and diffusion
LATHEATVAPT	nx,ny,nz	dΘ or dT	change in (T or Θ) due to vapor diffusion and cloud & ice nucleation
LATHEATFRZT	nx,ny,nz	dΘ or dT	change in (T or Θ) due to collision-coalescence and melting routines
NUCCLDRT	nx,ny,nz	kg/kg	nucleation of cloud and drizzle water mixing ratio
NUCICERT	nx,ny,nz	kg/kg	nucleation of pristine ice mixing ratio from all nucleation mechanisms
VAPLIQT	nx,ny,nz	kg/kg	vapor deposition summed for all liquid hydrometeor species (this can be + or - depending on growth or evaporation)
VAPICET	nx,ny,nz	kg/kg	vapor deposition summed for all ice hydrometeor species (this can be + or - depending on growth or evaporation)
MELTICET	nx,ny,nz	kg/kg	melting of all ice species in melting routine (these are the category mass transfers due to melting)

CLD2RAINT	**nx,ny,nz**	**kg/kg**	**cloud water transferred to rain via collection**
RIMECLDT	**nx,ny,nz**	**kg/kg**	**cloud water collected by all ice species (rcx values; see mic_coll.f90) (mass transfer from cloud)**
RAIN2ICET	**nx,ny,nz**	**kg/kg**	**rain water collected by ice species (rcx values; see mic_coll.f90) (mass transfer from rain)**
ICE2RAINT	**nx,ny,nz**	**kg/kg**	**ice melting due to collection of rain (rcy values; see mic_coll.f90) (mass transfer ice to rain)**
AGGREGATET	**nx,ny,nz**	**kg/kg**	**ice amount transferred to aggregates via collection**

BUDGET VARIABLES for IMBUDGET >=2			
All budgets are accumulated values unless otherwise noted as being instantaneous values. Accumulated budgets are summed each timestep between output file writes and then reset.			
INUCHOMRT	**nx,ny,nz**	**kg/kg**	**homogeneous droplet freezing ice nucleation**
INUCCONTRT	**nx,ny,nz**	**kg/kg**	**contact freezing ice nucleation**
INUCIFNRT	**nx,ny,nz**	**kg/kg**	**condensation/immersion freezing ice nucleation from ice nuclei**
INUCHAZRT	**nx,ny,nz**	**kg/kg**	**haze droplet nucleation tied to aerosol concentration**
VAPCLDT	**nx,ny,nz**	**kg/kg**	**vapor diffusion / evaporation on cloud droplets**
VAPRAINT	**nx,ny,nz**	**kg/kg**	**vapor diffusion / evaporation on rain**
VAPPRIST	**nx,ny,nz**	**kg/kg**	**vapor diffusion / evaporation on pristine ice**
VAPSNOWT	**nx,ny,nz**	**kg/kg**	**vapor diffusion / evaporation on snow**
VAPAGGRT	**nx,ny,nz**	**kg/kg**	**vapor diffusion / evaporation on aggregates**
VAPGRAUT	**nx,ny,nz**	**kg/kg**	**vapor diffusion / evaporation on graupel**
VAPHAILT	**nx,ny,nz**	**kg/kg**	**vapor diffusion / evaporation on hail**
VAPDRIZT	**nx,ny,nz**	**kg/kg**	**vapor diffusion / evaporation on**

			drizzle droplets
MELTPRIST	nx,ny,nz	kg/kg	mass transfer from pristine ice due to melting
MELTSNOWT	nx,ny,nz	kg/kg	mass transfer from snow due to melting
MELTAGGRT	nx,ny,nz	kg/kg	mass transfer from aggregates due to melting
MELTGRAUT	nx,ny,nz	kg/kg	mass transfer from graupel due to melting
MELTHAILT	nx,ny,nz	kg/kg	mass transfer from hail due to melting
RIMECLDSNOWT	nx,ny,nz	kg/kg	mass transfer from cloud due to riming by snow
RIMECLDAGGRT	nx,ny,nz	kg/kg	mass transfer from cloud due to riming by aggregates
RIMECLDGRAUT	nx,ny,nz	kg/kg	mass transfer from cloud due to riming by graupel
RIMECLDHAILT	nx,ny,nz	kg/kg	mass transfer from cloud due to riming by hail
RAIN2PRT	nx,ny,nz	kg/kg	mass transfer from rain due to collisions with pristine ice
RAIN2SNT	nx,ny,nz	kg/kg	mass transfer from rain due to collisions with snow
RAIN2AGT	nx,ny,nz	kg/kg	mass transfer from rain due to collisions with aggregates
RAIN2GRT	nx,ny,nz	kg/kg	mass transfer from rain due to collisions with graupel
RAIN2HAT	nx,ny,nz	kg/kg	mass transfer from rain due to collisions with hail
AGGRSELFPRIST	nx,ny,nz	kg/kg	mass transfer to aggregates due to pristine ice self-collection
AGGRSELFSNOWT	nx,ny,nz	kg/kg	mass transfer to aggregates due to snow self-collection
AGGRPRISSNOWT	nx,ny,nz	kg/kg	mass transfer to aggregates due to pristine ice / snow collisions

BUDGET VARIABLES for IMBUDGET >=3			
All budgets are accumulated values unless otherwise noted as being instantaneous values. Accumulated budgets are summed each timestep between output file writes and then reset.			
DUST1CLDRT	nx,ny,nz	kg/kg	nucleation of cloud droplet mixing ratio from dust mode 1
DUST2CLDRT	nx,ny,nz	kg/kg	nucleation of cloud droplet mixing ratio from dust mode 2

DUST1DRZRT	**nx,ny,nz**	**kg/kg**	**nucleation of drizzle droplet mixing ratio from dust mode 1**
DUST2DRZRT	**nx,ny,nz**	**kg/kg**	**nucleation of drizzle droplet mixing ratio from dust mode 2**

CUSTOM TRACER VARIABLES			
TRACERP001	**nx,ny,nz**	**mixing ratio units needed**	**customizable by the user**
TRACERP002, etc…			