1) Introduction

This document provides an initial README and data description for the HUMID dataset. The HUMID data are provided in daily netCDF files. netCDF files are self-describing and can be accessed using a variety of tools. See the Scientific Data paper for more details (https://doi.org/10.1038/s41597-024-04086-2). A useful blog post describing the WRF spherical Earth projection for GIS applications and reprojections is found here: https://fabienmaussion.info/2018/01/06/wrf-projection/

Table 1 (below Section 2, Known Issues) provides an overview of the variables in the HUMID dataset, while section 3 provides an example of the full HUMID file metadata.

2) Known Issues

1) Currently we have found that Table 2 of the Scientific Data paper incorrectly lists the projection as Mercator, it should be Lambert Conformal.

2) We have also found that the global attributes of the files did not update correctly. The final HUMID dataset is subset from a larger grid described in Table 2 of the paper (again using the Lambert Conformal projection). Rather than 3600 latitude grid points, we have subsetted the grid from latitude grid point 300 to grid point 3200, resulting in a latitude dimension of 2901 grid points. The center grid point is (1450.5, 2304) with a center latitude of 38.4309 N. The coordinate variables **lat** and **lon** in the files are correct.

Table 1. Summary of HUMID variables.

Variable Name in HUMID	Short Variable Name	Plain language description
FRC_URB2D	Urban fraction	Urban fraction (0-1) for the grid cell
HGT	topographic height	height of surface
ISLTYP	soil category	The dominant soil type category for a grid cell. See Noah-MP SOILPARM.TBL.
IVGTYP	land cover category	The dominant land cover category for a grid cell using MODIS IGBP classification in the Noah-MP MPTABLE.TBL.
LU_INDEX	land use category	The dominant land use category for a grid cell from the NLCD classification table. This is like IVGTYP just using a different classification scheme.
Lambert_Conformal	lambert conformal	Grid information can be found in the metadata. See known issues for correct grid specifications

		for the subset. These values apply to the full grid.
Times	Times	Character string of the time stamp
URB_CAT	urban category	Dominant urban category for a grid cell using low, medium, and high-density classification from NLCD.
hfx	sensible heat flux	Daily mean sensible heat to atmosphere
lat	latitude	latitude coordinate variable
lh	latent heat flux	Daily mean latent heat to atmosphere
lon	longitude	longitude coordinate variable
lwforc	daily mean longwave forcing	Daily mean downward longwave forcing at the surface
q2	daily mean specific humidity	Daily mean specific humidity for a grid cell estimated at 2 m above ground
q2_max	daily max specific humidity	Daily maximum specific humidity for a grid cell estimated at 2 m above ground
q2_min	daily min specific humidity	Daily minimum specific humidity for a grid cell estimated at 2 m above ground
q2_urb2d	daily mean urban specific humidity	Daily mean specific humidity for a grid cell estimated at 2 m above ground for urban grid cells only
q2_urb2d_max	daily max urban specific humidity	Daily maximum specific humidity for a grid cell estimated at 2 m above ground for urban grid cells only
q2_urb2d_min	daily min urban specific humidity	Daily minimum specific humidity for a grid cell estimated at 2 m above ground for urban grid cells only
rainrate	rainfall rate	Daily mean precipitation rate
swforc	daily mean shortwave forcing	Daily mean downward shortwave forcing at the surface
t2_max_BC	2 m bias corrected daily max temperature	Daily maximum 2 m estimated air temperature after bias correction
t2_max_raw	2 m daily max temperature	Daily maximum 2 m estimated air temperature without bias correction
t2_min_BC	2 m bias corrected daily min temperature	Daily minimum 2 m estimated air temperature after bias correction
t2_min_raw	2 m daily min temperature	Daily minimum 2 m estimated air temperature without bias correction
t2_raw	2 m daily mean temperature	Daily mean 2 m estimated air temperature without bias correction

tb_urb2d	daily mean urban temperature	Daily mean urban building temperature from the single layer urban model
tb_urb2d_max	daily max urban temperature	Daily maximum urban building temperature from the single layer urban model
tb_urb2d_min	daily min urban temperature	Daily minimum urban building temperature from the single layer urban model
tc_urb2d	daily mean urban canopy temperature	Daily mean urban canopy temperature at some intermediate height in the urban canopy. This temperature could be a useful temperature for human exposure in urban areas over other temperatures provided.
tc_urb2d_max	daily max urban canopy temperature	Daily maximum urban canopy temperature at some intermediate height in the urban canopy. This temperature could be a useful temperature for human exposure in urban areas over other temperatures provided.
tc_urb2d_min	daily min urban canopy temperature	Daily minimum urban canopy temperature at some intermediate height in the urban canopy. This temperature could be a useful temperature for human exposure in urban areas over other temperatures provided.
tg	daily mean ground temperature	Daily mean ground temperature within the first soil layer (0-10 cm depth)
tg_max	daily max ground temperature	Daily maximum ground temperature within the first soil layer (0-10 cm depth)
tg_min	daily min ground temperature	Daily minimum ground temperature within the first soil layer (0-10 cm depth)
tg_urb2d	daily mean urban road temperature	Daily mean ground temperature within the first soil layer (0-10 cm depth) for the urban road category from the urban model
tg_urb2d_max	daily max urban road temperature	Daily mean ground temperature within the first soil layer (0-10 cm depth) for the urban road category from the urban model
tg_urb2d_min	daily min urban road temperature	Daily minimum ground temperature within the first soil layer (0-10 cm depth) for the urban road category from the urban model
time	time coordinate variable	number of days since 1981-01-01 00:00:00 UTC
tr_urb2d	daily mean urban radiative temperature	Daily mean urban radiative temperature using emissivity assumptions given within the urban model parameter table

tr_urb2d_max	daily max urban radiative temperature	Daily maximum urban radiative temperature using emissivity assumptions given within the urban model parameter table
tr_urb2d_min	daily min urban radiative temperature	Daily minimum urban radiative temperature using emissivity assumptions given within the urban model parameter table
trad	daily mean radiative temperature	Daily mean surface radiative temperature
trad_max	daily mean radiative temperature	Daily maximum surface radiative temperature
trad_min	daily mean radiative temperature	Daily minimum surface radiative temperature
tsk	daily mean skin temperature	Daily mean surface skin temperature weighted using all surfaces in a grid cell. If there is a non-zero urban fraction, the skin temperature is a combination of natural and urban surfaces
tsk_max	daily max skin temperature	Daily maximum surface skin temperature weighted using all surfaces in a grid cell. If there is a non-zero urban fraction, the skin temperature is a combination of natural and urban surfaces
tsk_min	daily min skin temperature	Daily minimum surface skin temperature weighted using all surfaces in a grid cell. If there is a non-zero urban fraction, the skin temperature is a combination of natural and urban surfaces
wspd	daily mean wind speed	Daily mean wind speed estimated at 10 m height above ground

3. Full HUMID file header and variable descriptions

Below is an example of the netCDF header information. We have added additional variable descriptions in blue text which are not found in the netCDF files themselves.

```
netcdf conus_HUMID_19810101 {
dimensions:
        Time = UNLIMITED ; // (1 currently)
        lat = 2901 ;
        lon = 4608 ;
```

DateStrLen = 19 ;
variables:
float FRC_URB2D(Time, lat, lon) ; Urban fraction (0-1) for the grid cell
FRC_URB2D:MemoryOrder = "XY " ;
FRC_URB2D:FieldType = 104 ;
FRC_URB2D:units = "unitless" ;
FRC_URB2D:stagger = "M" ;
FRC_URB2D:sr_y = 1 ;
FRC_URB2D:description = "urban fraction" ;
FRC_URB2D:sr_x = 1 ;
FRC_URB2D:_FillValue = -9999.f ;
float HGT(Time, lat, lon) ;
HGT:MemoryOrder = "XY " ;
HGT:FieldType = 104 ;
HGT:units = "meters MSL" ;
HGT:stagger = "M" ;
HGT:sr_y = 1 ;
HGT:description = "Topography height" ;
HGT:sr_x = 1 ;
HGT:_FillValue = -9999.f ;
int ISLTYP(Time, lat, lon) ; The dominant soil type category for a grid cell. See Noah-MP SOILPARM.TBL
ISLTYP:MemoryOrder = "XY " ;
ISLTYP:FieldType = 104 ;
ISLTYP:units = "category" ;
ISLTYP:stagger = "M" ;
ISLTYP:grid_mapping = "lambert_conformal_conic" ;
ISLTYP:sr_y = 1 ;
ISLTYP:description = "Dominant category" ;
ISLTYP:sr_x = 1 ;
ISLTYP:_FillValue = -9999.f ;
int IVGTYP(Time, lat, lon) ; The dominant land cover category for a grid cell using MODIS IGBP classification in the Noah-MP MPTABLE.TBL
IVGTYP:MemoryOrder = "XY " ;
IVGTYP:FieldType = 104 ;
IVGTYP:units = "category" ;
IVGTYP:stagger = "M" ;
IVGTYP:grid_mapping = "lambert_conformal_conic" ;
IVGTYP:sr_y = 1 ;
IVGTYP:description = "Dominant category" ;
IVGTYP:sr_x = 1 ;
IVGTYP:_FillValue = -9999.f ;

float LU_INDEX(Time, lat, lon) ; The dominant land use category for a grid cell from the NLCD classification table. This is like IVGTYP, just using a different classification scheme.

LU_INDEX:MemoryOrder = "XY " ;
LU_INDEX:FieldType = 104 ;
LU_INDEX:units = "category" ;
LU_INDEX:stagger = "M" ;
LU_INDEX:sr_y = 1 ;
LU_INDEX:description = "Dominant category" ;
LU_INDEX:sr_x = 1 ;
LU_INDEX:_FillValue = -9999.f ;

int Lambert_Conformal ; Grid information can be found in the metadata. See known issues for correct grid specifications for the subset. These values apply to the full grid.

Lambert_Conformal:grid_mapping_name = "lambert_conformal_conic" ;
Lambert_Conformal:hemisphere = "N" ;
Lambert_Conformal:scale_lat_1 = 30. ;
Lambert_Conformal:scale_lat_2 = 60. ;
Lambert_Conformal:lat_pin = 40.00001 ;
Lambert_Conformal:lon_pin = -97. ;
Lambert_Conformal:x_pin = 2304. ;
Lambert_Conformal:lon_orient = -97. ;
Lambert_Conformal:d_km = 1. ;
Lambert_Conformal:r_km = 6371.2 ;
Lambert_Conformal:nx = 4608. ;
Lambert_Conformal:ny = 2901.f ;
Lambert_Conformal:y_pin = 1450.5f ;

char Times(Time, DateStrLen) ;

Times:_FillValue = "Å" ;

float URB_CAT(Time, lat, lon) ; Dominant urban category for a grid cell using low, medium, and high-density classification from NLCD.

URB_CAT:MemoryOrder = "XY " ;
URB_CAT:FieldType = 104 ;
URB_CAT:units = "unitless" ;
URB_CAT:stagger = "M" ;
URB_CAT:sr_y = 1 ;
URB_CAT:description = "Dominant Urban Category" ;
URB_CAT:sr_x = 1 ;
URB_CAT:_FillValue = -9999.f ;

float hfx(Time, lat, lon) ;

hfx:MemoryOrder = "XY" ;
hfx:description = "Daily mean sensible heat to atmosphere" ;
hfx:units = "W m{-2}" ;
hfx:stagger = "-" ;
hfx:_FillValue = -9999.f ;

float lat(lat, lon) ;
lat:_FillValue = -9999.f ;
lat:units = "degrees_north" ;
lat:long_name = "latitude coordinate" ;
lat:standard_name = "latitude" ;
float lh(Time, lat, lon) ;
lh:MemoryOrder = "XY" ;
lh:description = "Daily mean latent heat to atmosphere" ;
lh:units = "W m{-2}" ;
lh:stagger = "-" ;
lh:_FillValue = -9999.f ;
float lon(lat, lon) ;
lon:_FillValue = -9999.f ;
lon:units = "degrees_east" ;
lon:long_name = "longitude coordinate" ;
lon:standard_name = "longitude" ;
float lwforc(Time, lat, lon) ; Daily mean downward longwave forcing at the surface
lwforc:MemoryOrder = "XY" ;
lwforc:description = "Daily mean longwave forcing" ;
lwforc:units = "W m{-2}" ;
lwforc:stagger = "-" ;
lwforc:_FillValue = -9999.f ;
float q2(Time, lat, lon) ; Daily mean specific humidity for a grid cell estimated at 2 m above ground
q2:MemoryOrder = "XY" ;
q2:description = "Daily mean veg and urban weighted 2-m diagnostic spec. humidity" ;
q2:units = "kg/kg" ;
q2:stagger = "-" ;
q2:_FillValue = -9999.f ;
float q2_max(Time, lat, lon) ; Daily maximum specific humidity for a grid cell estimated at 2 m above ground
q2_max:MemoryOrder = "XY" ;
q2_max:description = "Daily maximum veg and urban weighted 2-m diagnostic spec. humidity" ;
q2_max:units = "kg/kg" ;
q2_max:stagger = "-" ;
q2_max:_FillValue = -9999.f ;
float q2_min(Time, lat, lon) ; Daily minimum specific humidity for a grid cell estimated at 2 m above ground
q2_min:MemoryOrder = "XY" ;
q2_min:description = "Daily minimum veg and urban weighted 2-m diagnostic spec. humidity" ;
q2_min:units = "kg/kg" ;

q2_min:stagger = "-" ;
q2_min:_FillValue = -9999.f ;
float q2_urb2d(Time, lat, lon) ; Daily mean specific humidity for a grid cell estimated at 2 m above ground for urban grid cells only
q2_urb2d:MemoryOrder = "XY" ;
q2_urb2d:description = "Daily mean urban 2-m diagnostic spec. humidity" ;
q2_urb2d:units = "kg/kg" ;
q2_urb2d:stagger = "-" ;
q2_urb2d:_FillValue = -9999.f ;
float q2_urb2d_max(Time, lat, lon) ; Daily maximum specific humidity for a grid cell estimated at 2 m above ground for urban grid cells only
q2_urb2d_max:MemoryOrder = "XY" ;
q2_urb2d_max:description = "Daily maximum urban 2-m diagnostic spec. humidity" ;
q2_urb2d_max:units = "kg/kg" ;
q2_urb2d_max:stagger = "-" ;
q2_urb2d_max:_FillValue = -9999.f ;
float q2_urb2d_min(Time, lat, lon) ; Daily minimum specific humidity for a grid cell estimated at 2 m above ground for urban grid cells only
q2_urb2d_min:MemoryOrder = "XY" ;
q2_urb2d_min:description = "Daily minimum urban 2-m diagnostic spec. humidity" ;
q2_urb2d_min:units = "kg/kg" ;
q2_urb2d_min:stagger = "-" ;
q2_urb2d_min:_FillValue = -9999.f ;
float rainrate(Time, lat, lon) ;
rainrate:MemoryOrder = "XY" ;
rainrate:description = "Daily mean precipitation rate" ;
rainrate:units = "kg m{-2} s{-1}" ;
rainrate:stagger = "-" ;
rainrate:_FillValue = -9999.f ;
float swforc(Time, lat, lon) ; Daily mean downward shortwave forcing at the surface
swforc:MemoryOrder = "XY" ;
swforc:description = "Daily mean shortwave forcing" ;
swforc:units = "W m{-2}" ;
swforc:stagger = "-" ;
swforc:_FillValue = -9999.f ;
float t2_max_BC(Time, lat, lon) ; Daily maximum 2 m estimated air temperature after bias correction
t2_max_BC:_FillValue = -9999.f ;
t2_max_BC:long_name = "Maximum Temperature Adjust" ;
t2_max_BC:units = "K" ;
t2_max_BC:grid_mapping = "Lambert_Conformal" ;
t2_max_BC:coordinates = "lat lon" ;

float t2_max_raw(Time, lat, lon) ; Daily maximum 2 m estimated air temperature without bias correction
t2_max_raw:_FillValue = -9999.f ;
t2_max_raw:long_name = "Unadjusted Temperature Maximum" ;
t2_max_raw:units = "K" ;
t2_max_raw:grid_mapping = "Lambert_Conformal" ;
t2_max_raw:coordinates = "lat lon" ;
float t2_min_BC(Time, lat, lon) ; Daily minimum 2 m estimated air temperature after bias correction
t2_min_BC:_FillValue = -9999.f ;
t2_min_BC:long_name = "Minimum Temperature Adjust" ;
t2_min_BC:units = "K" ;
t2_min_BC:grid_mapping = "Lambert_Conformal" ;
t2_min_BC:coordinates = "lat lon" ;
float t2_min_raw(Time, lat, lon) ; Daily minimum 2 m estimated air temperature without bias correction
t2_min_raw:_FillValue = -9999.f ;
t2_min_raw:units = "K" ;
t2_min_raw:long_name = "Unadjusted Temperature Minimum" ;
t2_min_raw:grid_mapping = "Lambert_Conformal" ;
t2_min_raw:coordinates = "lat lon" ;
float t2_raw(Time, lat, lon) ; Daily mean 2 m estimated air temperature without bias correction
t2_raw:MemoryOrder = "XY" ;
t2_raw:description = "Daily mean veg and urban weighted 2-m diagnostic temperature" ;
t2_raw:units = "K" ;
t2_raw:stagger = "-" ;
t2_raw:_FillValue = -9999.f ;
float tb_urb2d(Time, lat, lon) ; Daily mean urban building temperature from the single layer urban model
tb_urb2d:MemoryOrder = "XY" ;
tb_urb2d:description = "Daily mean urban building temperature" ;
tb_urb2d:units = "K" ;
tb_urb2d:stagger = "-" ;
tb_urb2d:_FillValue = -9999.f ;
float tb_urb2d_max(Time, lat, lon) ; Daily maximum urban building temperature from the single layer urban model
tb_urb2d_max:MemoryOrder = "XY" ;
tb_urb2d_max:description = "Daily maximum urban buliding temperature" ;
tb_urb2d_max:units = "K" ;
tb_urb2d_max:stagger = "-" ;
tb_urb2d_max:_FillValue = -9999.f ;

float tb_urb2d_min(Time, lat, lon) ; Daily minimum urban building temperature from the single layer urban model

tb_urb2d_min:MemoryOrder = "XY" ;
tb_urb2d_min:description = "Daily minimum urban buliding temperature" ;
tb_urb2d_min:units = "K" ;
tb_urb2d_min:stagger = "-" ;
tb_urb2d_min:_FillValue = -9999.f ;

float tc_urb2d(Time, lat, lon) ; Daily mean urban canopy temperature at some intermediate height in the urban canopy. This temperature could be a useful temperature for human exposure in urban areas over other temperatures provided.

tc_urb2d:MemoryOrder = "XY" ;
tc_urb2d:description = "Daily mean urban canopy temperature" ;
tc_urb2d:units = "K" ;
tc_urb2d:stagger = "-" ;
tc_urb2d:_FillValue = -127.f ;

float tc_urb2d_max(Time, lat, lon) ; Daily maximum urban canopy temperature at some intermediate height in the urban canopy. This temperature could be a useful temperature for human exposure in urban areas over other temperatures provided.

tc_urb2d_max:MemoryOrder = "XY" ;
tc_urb2d_max:description = "Daily maximum urban canopy temperature" ;
tc_urb2d_max:units = "K" ;
tc_urb2d_max:stagger = "-" ;
tc_urb2d_max:_FillValue = -127.f ;

float tc_urb2d_min(Time, lat, lon) ; Daily minimum urban canopy temperature at some intermediate height in the urban canopy. This temperature could be a useful temperature for human exposure in urban areas over other temperatures provided.

tc_urb2d_min:MemoryOrder = "XY" ;
tc_urb2d_min:description = "Daily minimum urban canopy temperature" ;
tc_urb2d_min:units = "K" ;
tc_urb2d_min:stagger = "-" ;
tc_urb2d_min:_FillValue = -127.f ;

float tg(Time, lat, lon) ; Daily mean ground temperature within the first soil layer (0-10 cm depth)

tg:MemoryOrder = "XY" ;
tg:description = "Daily mean ground temperature" ;
tg:units = "K" ;
tg:stagger = "-" ;
tg:_FillValue = -9999.f ;

float tg_max(Time, lat, lon) ; Daily maximum ground temperature within the first soil layer (0-10 cm depth)

tg_max:MemoryOrder = "XY" ;
tg_max:description = "Daily maximum ground temperature" ;
tg_max:units = "K" ;
tg_max:stagger = "-" ;

tg_max:_FillValue = -9999.f ;
float tg_min(Time, lat, lon) ; Daily minimum ground temperature within the first soil layer (0-10 cm depth)
tg_min:MemoryOrder = "XY" ;
tg_min:description = "Daily minimum ground temperature" ;
tg_min:units = "K" ;
tg_min:stagger = "-" ;
tg_min:_FillValue = -9999.f ;
float tg_urb2d(Time, lat, lon) ; Daily mean ground temperature within the first soil layer (0-10 cm depth) for the urban road category from the urban model.
tg_urb2d:MemoryOrder = "XY" ;
tg_urb2d:description = "Daily mean urban road temperature" ;
tg_urb2d:units = "K" ;
tg_urb2d:stagger = "-" ;
tg_urb2d:_FillValue = -9999.f ;
float tg_urb2d_max(Time, lat, lon) ; Daily maximum ground temperature within the first soil layer (0-10 cm depth) for the urban road category from the urban model.
tg_urb2d_max:MemoryOrder = "XY" ;
tg_urb2d_max:description = "Daily maximum urban road temperature" ;
tg_urb2d_max:units = "K" ;
tg_urb2d_max:stagger = "-" ;
tg_urb2d_max:_FillValue = -9999.f ;
float tg_urb2d_min(Time, lat, lon) ; Daily minimum ground temperature within the first soil layer (0-10 cm depth) for the urban road category from the urban model.
tg_urb2d_min:MemoryOrder = "XY" ;
tg_urb2d_min:description = "Daily minimum urban road temperature" ;
tg_urb2d_min:units = "K" ;
tg_urb2d_min:stagger = "-" ;
tg_urb2d_min:_FillValue = -9999.f ;
float time(Time) ;
time:units = "days since 1981-01-01 00:00:00" ;
time:calendar = "standard" ;
float tr_urb2d(Time, lat, lon) ; Daily mean urban radiative temperature using emissivity assumptions given within the urban model parameter table
tr_urb2d:MemoryOrder = "XY" ;
tr_urb2d:description = "Daily mean urban radiative temperature" ;
tr_urb2d:units = "K" ;
tr_urb2d:stagger = "-" ;
tr_urb2d:_FillValue = -9999.f ;
float tr_urb2d_max(Time, lat, lon) ; Daily maximum urban radiative temperature using emissivity assumptions given within the urban model parameter table
tr_urb2d_max:MemoryOrder = "XY" ;
tr_urb2d_max:description = "Daily maximum urban radiative temperature" ;
tr_urb2d_max:units = "K" ;

tr_urb2d_max:stagger = "-" ;
tr_urb2d_max:_FillValue = -9999.f ;
float tr_urb2d_min(Time, lat, lon) ; Daily minimum urban radiative temperature using emissivity assumptions given within the urban model parameter table
tr_urb2d_min:MemoryOrder = "XY" ;
tr_urb2d_min:description = "Daily minimum urban radiative temperature" ;
tr_urb2d_min:units = "K" ;
tr_urb2d_min:stagger = "-" ;
tr_urb2d_min:_FillValue = -9999.f ;
float trad(Time, lat, lon) ; Daily mean surface radiative temperature
trad:MemoryOrder = "XY" ;
trad:description = "Daily mean surface radiative temperature" ;
trad:units = "K" ;
trad:stagger = "-" ;
trad:_FillValue = -9999.f ;
float trad_max(Time, lat, lon) ; Daily maximum surface radiative temperature
trad_max:MemoryOrder = "XY" ;
trad_max:description = "Daily maximum surface radiative temperature" ;
trad_max:units = "K" ;
trad_max:stagger = "-" ;
trad_max:_FillValue = -9999.f ;
float trad_min(Time, lat, lon) ; Daily minimum surface radiative temperature
trad_min:MemoryOrder = "XY" ;
trad_min:description = "Daily minimum surface radiative temperature" ;
trad_min:units = "K" ;
trad_min:stagger = "-" ;
trad_min:_FillValue = -9999.f ;
float tsk(Time, lat, lon) ; Daily mean surface skin temperature weighted using all surfaces in a grid cell. If there is a non-zero urban fraction, the skin temperature is a combination of natural and urban surfaces
tsk:MemoryOrder = "XY" ;
tsk:description = "Daily mean surface skin temperature (urban weighted)" ;
tsk:units = "K" ;
tsk:stagger = "-" ;
tsk:_FillValue = -9999.f ;
float tsk_max(Time, lat, lon) ; Daily maximum surface skin temperature weighted using all surfaces in a grid cell. If there is a non-zero urban fraction, the skin temperature is a combination of natural and urban surfaces
tsk_max:MemoryOrder = "XY" ;
tsk_max:description = "Daily maximum surface skin temperature (urban weighted)" ;
tsk_max:units = "K" ;
tsk_max:stagger = "-" ;
tsk_max:_FillValue = -9999.f ;

float tsk_min(Time, lat, lon) ; Daily minimum surface skin temperature weighted using all surfaces in a grid cell. If there is a non-zero urban fraction, the skin temperature is a combination of natural and urban surfaces

tsk_min:MemoryOrder = "XY" ;

tsk_min:description = "Daily minimum surface skin temperature (urban weighted)" ;

tsk_min:units = "K" ;

tsk_min:stagger = "-" ;

tsk_min:_FillValue = -9999.f ;

float wspd(Time, lat, lon) ; Daily mean wind speed estimated at 10 m height above ground

wspd:MemoryOrder = "XY" ;

wspd:description = "Daily mean wind speed" ;

wspd:units = "m s{-1}" ;

wspd:stagger = "-" ;

wspd:_FillValue = -9999.f ;

// global attributes:

:SIMULATION_START_DATE = "0000-00-00_00:00:00" ;

:WEST-EAST_GRID_DIMENSION = 4609 ;

:SOUTH-NORTH_GRID_DIMENSION = 3841 ;

:BOTTOM-TOP_GRID_DIMENSION = 0 ;

:WEST-EAST_PATCH_START_UNSTAG = 1 ;

:WEST-EAST_PATCH_END_UNSTAG = 4608 ;

:WEST-EAST_PATCH_START_STAG = 1 ;

:WEST-EAST_PATCH_END_STAG = 4609 ;

:SOUTH-NORTH_PATCH_START_UNSTAG = 1 ;

:SOUTH-NORTH_PATCH_END_UNSTAG = 3840 ;

:SOUTH-NORTH_PATCH_START_STAG = 1 ;

:SOUTH-NORTH_PATCH_END_STAG = 3841 ;

:GRIDTYPE = "C" ;

:DX = 1000.f ;

:DY = 1000.f ;

:DYN_OPT = 2 ;

:CEN_LAT = 40.00001f ;

:CEN_LON = -97.f ;

:TRUELAT1 = 30.f ;

:TRUELAT2 = 60.f ;

:MOAD_CEN_LAT = 40.00001f ;

:STAND_LON = -97.f ;

:POLE_LAT = 90.f ;

:POLE_LON = 0.f ;

:corner_lats = 20.07781f, 52.87278f, 52.87278f, 20.07781f, 20.07671f, 52.87075f, 52.87075f, 20.07671f, 20.07371f, 52.87693f, 52.87693f, 20.07371f, 20.07259f, 52.87489f, 52.87489f, 20.07259f ;
:corner_lons = -118.1045f, -133.5073f, -60.49268f, -75.89551f, -118.1089f, -133.5142f, -60.48578f, -75.89114f, -118.1033f, -133.5107f, -60.48929f, -75.8967f, -118.1077f, -133.5176f, -60.48242f, -75.89233f ;
:MAP_PROJ = 1 ;
:MMINLU = "USGS" ;
:NUM_LAND_CAT = 96 ;
:ISWATER = 16 ;
:ISLAKE = -1 ;
:ISICE = 24 ;
:ISURBAN = 1 ;
:ISOILWATER = 14 ;
:grid_id = 1 ;
:parent_id = 1 ;
:i_parent_start = 1 ;
:j_parent_start = 1 ;
:i_parent_end = 4609 ;
:j_parent_end = 3841 ;
:parent_grid_ratio = 1 ;
:sr_x = 1 ;
:sr_y = 1 ;
:FLAG_MF_XY = 1 ;
:FLAG_LAI12M = 1 ;
:FLAG_LAKE_DEPTH = 1 ;
:nco_openmp_thread_number = 1 ;
:NCO = "netCDF Operators version 5.1.9 (Homepage = http://nco.sf.net, Code = http://github.com/nco/nco, Citation = 10.1016/j.envsoft.2008.03.004)" ;
:TITLE = "OUTPUT FROM GEOGRID V4.0.1" ;
:history = "Thu Feb 15 15:17:11 2024: ncks -4 -L 1 conus_HUMID_19810101.nc4 -O conus_HUMID_19810101.nc4\nThu Apr 25 17:57:28 2019: ncatted -a description,URB_CAT,o,c,Dominant Urban Category geo_em.d01.nlcd2001.nc" ;
}