

TITLE:

SnowModel Pan-Arctic Data, 1979-2009.

AUTHORS:

PI, Glen E. Liston
Co-PI, Christopher A. Hiemstra
Co-PI, Matthew Sturm

PI CONTACT INFORMATION:

Glen E. Liston
Cooperative Institute for Research in the Atmosphere (CIRA)
Colorado State University
Fort Collins, CO 80523-1375
Email: liston@cira.colostate.edu
Voice: (970) 491-8220
FAX: (970) 491-8241

CONTACT INFORMATION FOR DATA QUESTIONS:

Glen E. Liston (see above)

FUNDING SOURCE AND GRANT NUMBER:

NSF Grant 0629279

DATA SET OVERVIEW:

See manuscript, The Changing Cryosphere: Pan-Arctic Snow Trends (1979-2009), by Liston and Hiemstra, J. Climate.

DATA FORMAT:

The simulation domain is $nx=725$, $ny=725$, $nt=10958$ (the number of days in 30 years). Each output data block/file (one block for each variable) is $nx*ny*nt*4_byte_words$ in size (23,039,195,000 bytes, or ~23 Gb). The output files are direct access, binary, with little endian byte order, with the data written out in x, then y, then t order (they are GrADS files: <http://www.iges.org/grads/>), one file for each variable. You can think of this data block as being layers of the 2-D spatial domain stacked on top of each other in time. Undefined values (oceans, glaciers, and ice sheets) are set to -9999.0.

There are 16 variables each with their own output file (xxxx.gdat) and the associated GrADS control (text) file (xxxx.ctl):

c Daily Averaged

tair(i,j) 10-m air temperature (degrees C)
rhxx(i,j) 10-m relative humidity (%)
wspd(i,j) 10-m wind speed (m/s)
qsix(i,j) incoming shortwave radiation (W/m2)

qlix(i,j) incoming longwave radiation (W/m²)
 qlx(i,j) outgoing longwave radiation (W/m²)
 albd(i,j) albedo (0-1)

c Summed over 24 hours.

prec(i,j) total precipitation (mm/day)
 rpre(i,j) rain precipitation (mm/day)
 spre(i,j) solid precipitation (snowfall) (mm/day)
 smlt(i,j) total melt per day (from the energy balance) (mm/day)
 ssub(i,j) sublimation (static-surface)(mm/day)
 roff(i,j) total water in the snowpack (includes smlt, rain,
 canopy unload, glacier melt etc) (mm/day)

c End of day.

snod(i,j) snow depth (m)
 sden(i,j) snow density (kg/m³)
 swed(i,j) snow water equivalent depth (m)

The topography and vegetation file (topo_veg_panarctic_10-km.gdat and .ctl) are also GrADS binary files, with an associated control file.

The MicroMet (mm) meteorological input file (panarc.mm.1979-2009.dat) is a text file with the following format:

year (yyyy)	mo (mm)	dy (dd)	hr (hh.hh)	stn_id (number)	easting (m)	northing (m)	elevation (m)	Tair (C)	RH (%)	speed (m/s)	dir (deg)	precip (mm/dt)
2												
2002	10	1	3.00	101	426340.0	4411238.0	3598.0	0.92	57.77	4.80	238.29	-9999.00
2002	10	1	3.00	102	426300.0	4411111.0	410.0	-3.02	78.77	-9999.00	-9999.00	-9999.00
2												
2002	10	1	6.00	101	426340.0	4411238.0	3598.0	0.92	57.77	4.80	238.29	-9999.00
2002	10	1	6.00	102	426300.0	4411111.0	410.0	-3.02	78.77	-9999.00	-9999.00	-9999.00
...												

Where the '2' indicates there are two stations to be used during the next time step (two lines of data with different station id's follow).

REFERENCES:

This dataset is described in the paper: Liston, G. E., and C. A. Hiemstra, submitted in February 2011: The Changing Cryosphere: Pan-Arctic Snow Trends (1979-2009). Journal of Climate, in review.