ARCTIC SYSTEM REANALYSIS (ASR) INTERIM
A 30 km Resolution Dataset

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Abstract

❑ The decade long (2000-2010) Arctic System Reanalysis (ASR) project is nearing completion. The ASR, which can be viewed as a blend of modeling and observations, will provide ultimately a high resolution description in space (10-km) and time (3-hr) of the atmosphere-sea ice-land surface system of the Arctic. The ASR will permit reconstructions of the Arctic system's state, thereby serving as a state-of-the-art synthesis tool for assessing Arctic climate variability and monitoring Arctic change. The final ASR results will be available for download from the NCAR DSS server and NOAA ESRL will provide online analyses of ASR fields.

❑ The first generation ASR (ASR-Interim) dataset has been produced and spans the years 2000-2008 at 30-km resolution Here, we present some aspects and results from the ASR-Interim. We strongly encourage feedback and suggestions from research community for the ASR 10-km final run.
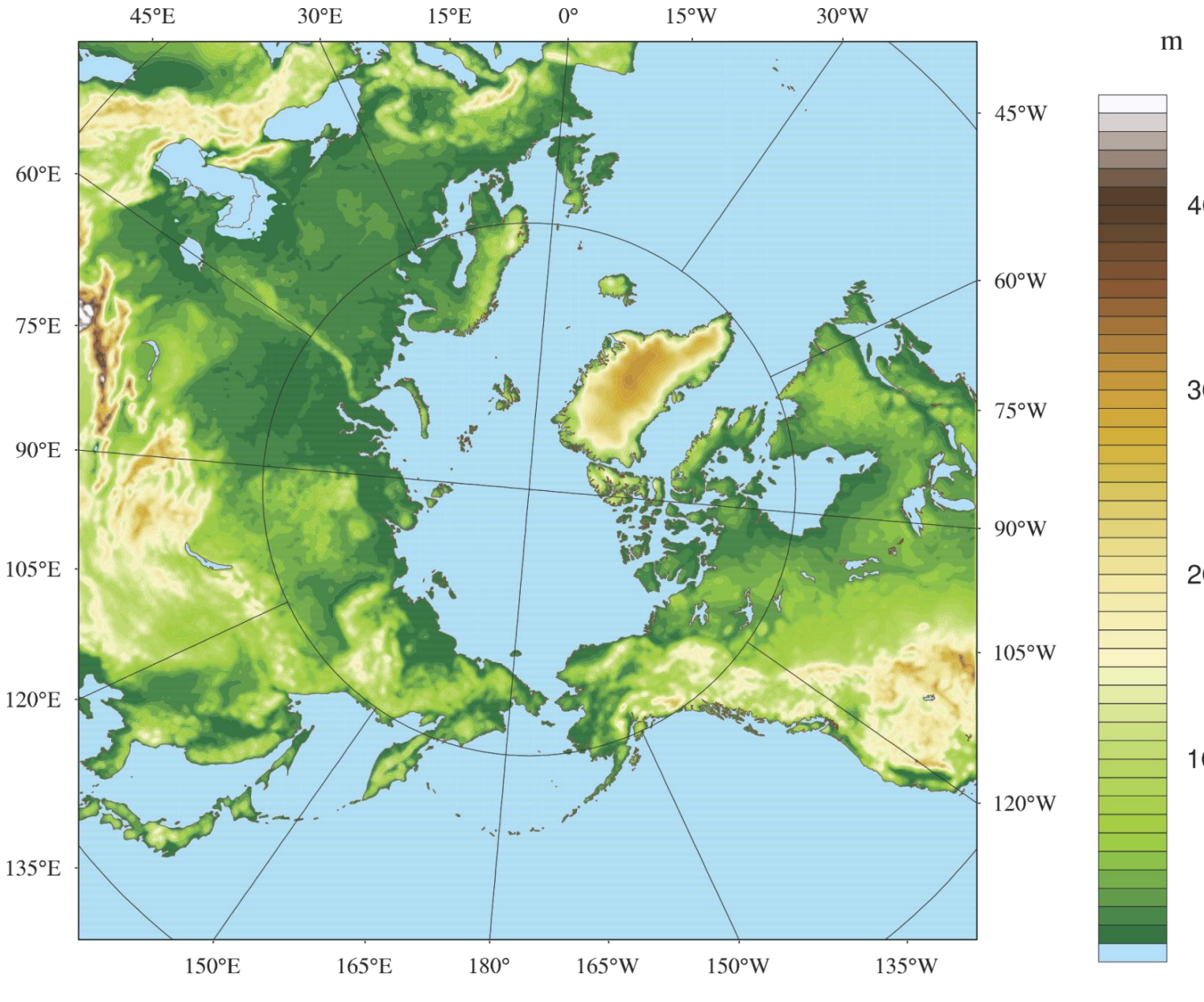
ASR-Interim Output Data

❑ Time: 2000-01-01:00 to 2008-12-31:21, every 3 hours
❑ Levels: 40 pressure levels, 10 soil levels
❑ Grid information:
- 30 km, 361 x 361 Grids
- Polar stereographic projection; Center at North Pole
❑ Variables (see lists of variables on the right) :
- 13 surface variables
- 69 forecast surface variables
- 15 upper-air and soil variables
- 16 upper-air and soil variables
❑ Data Format: NetCDF
❑ Data Size:
- About 1.64 TB per year
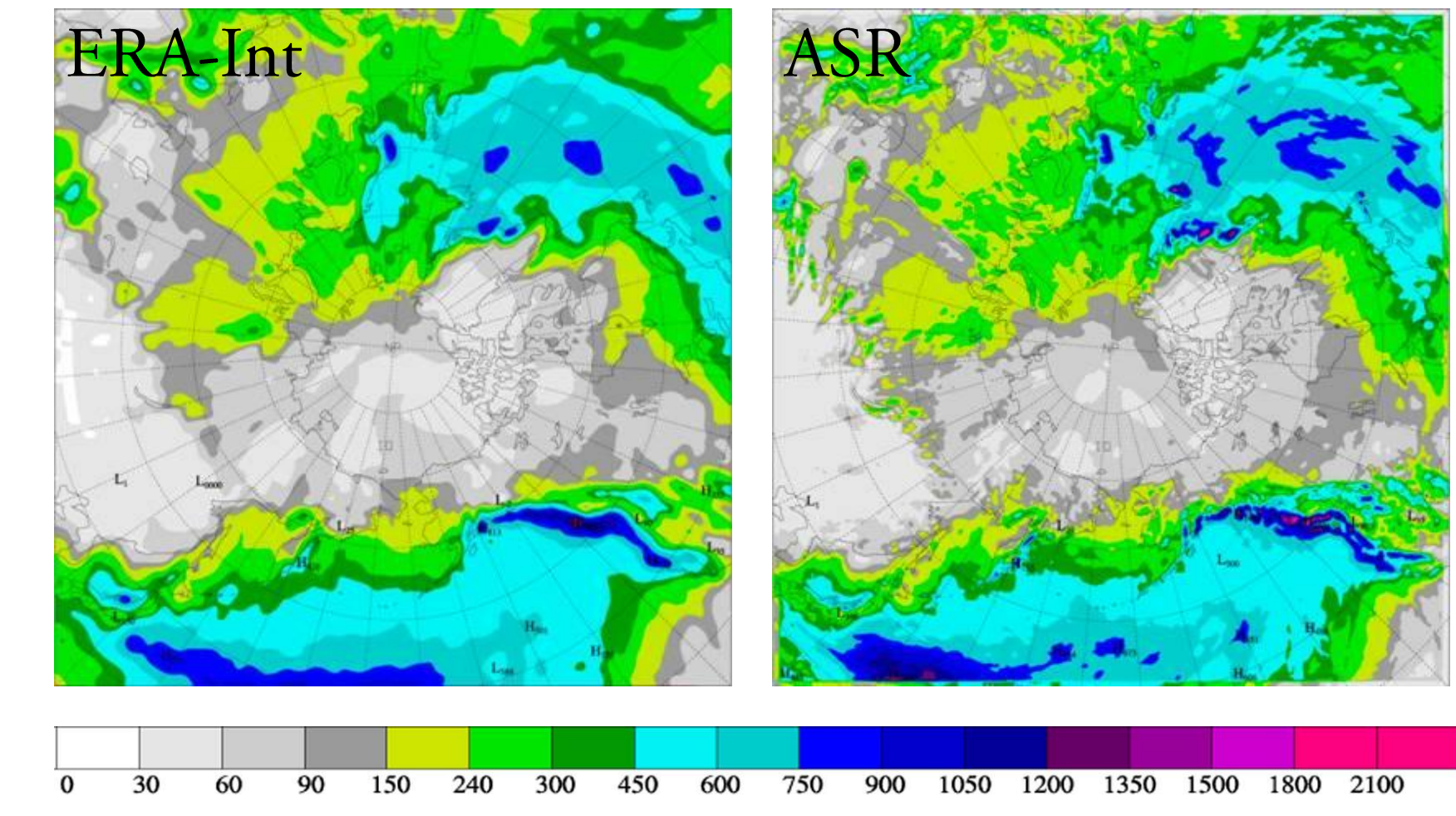- About 15 TB for 9 years all variables

If you are interested in the ASR-Interim dataset or have any suggestions and comments. Please contact:

Dr. David H. Bromwich (bromwich.1@osu.edu)
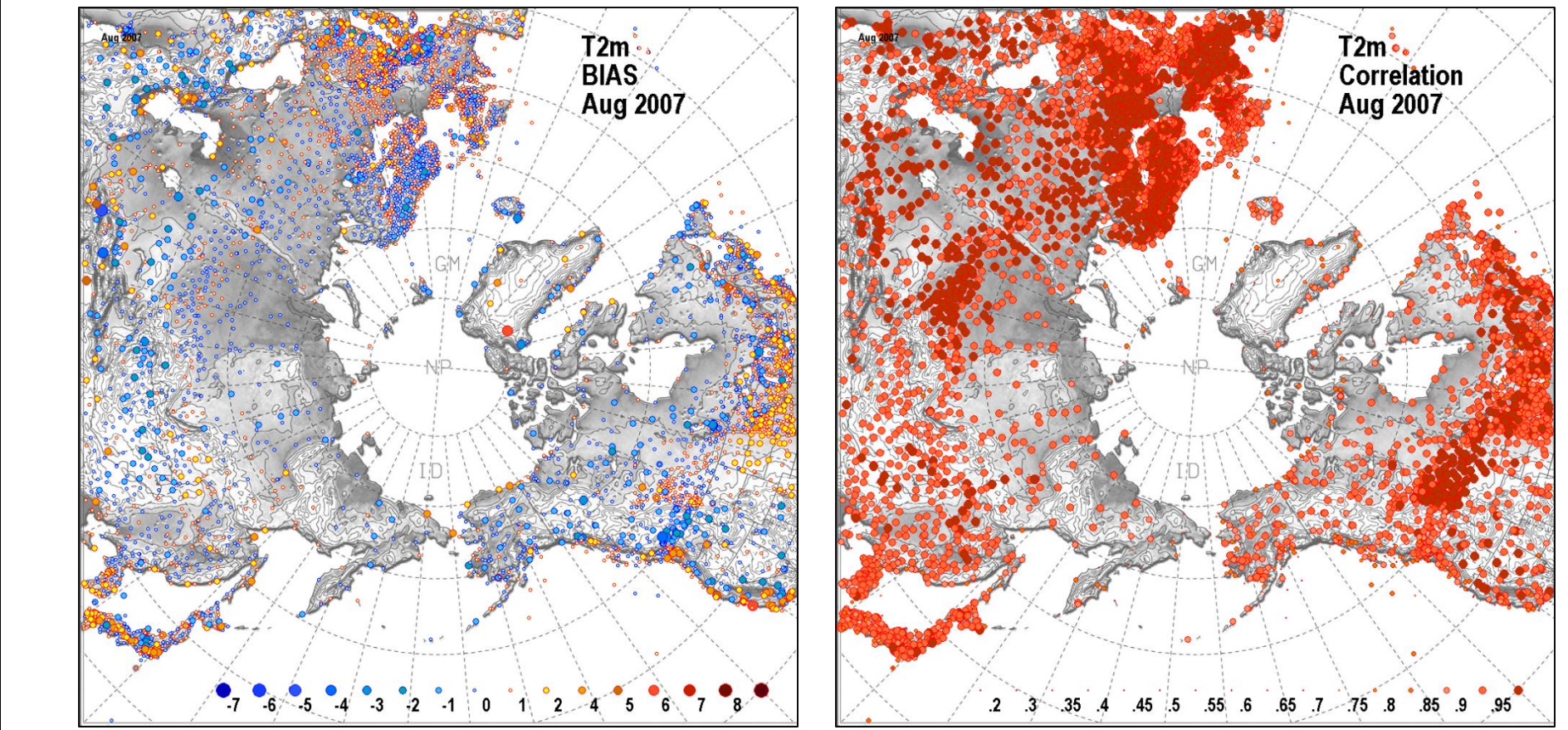 – ASR Project Lead PI
Dr. Sheng-Hung Wang (wang.446@osu.edu)

ASR Domain

Surface Variables

land-sea mask	
sea ice flag	
vegetation fraction	
terrain height	m
soil temperature at lower boundary	K
sea surface temperature	K
surface skin temperature	K
temperature at 2m	K
potential temperature at 2m	K
specific humidity at 2m	kg kg^{-1}
surface pressure	Pa
x-wind component at 10m	m s^{-1}
y-wind component at 10m	m s^{-1}

Precipitation: 2008 DJF total between ERA-Int and ASR

Temperature at 2m: August 2007, ASR vs Stations

Upper-air and Soil Variables

geopotential height	m
temperature	K
relative humidity	%
x-wind component	m s^{-1}
y-wind component	m s^{-1}
z-wind component	m s^{-1}
cloud water mixing ratio	kg kg^{-1}
graupel mixing ratio	kg kg^{-1}
ice mixing ratio	kg kg^{-1}
rain water mixing ratio	kg kg^{-1}
snow mixing ratio	kg kg^{-1}
water vapor mixing ratio	kg kg^{-1}
soil temperature	K
soil moisture	m^3 m^{-3}
soil liquid water	m^3 m^{-3}

Forecast Upper-air and Soil Variables

geopotential height	m
temperature	K
relative humidity	%
x-wind component	m s^{-1}
y-wind component	m s^{-1}
z-wind component	m s^{-1}
cloud fraction	
cloud water mixing ratio	kg kg^{-1}
graupel mixing ratio	kg kg^{-1}
ice mixing ratio	kg kg^{-1}
rain water mixing ratio	kg kg^{-1}
snow mixing ratio	kg kg^{-1}
water vapor mixing ratio	kg kg^{-1}
soil temperature	K
soil moisture	m^3 m^{-3}
soil liquid water	m^3 m^{-3}

Forecast Surface Variables

sea level pressure	hPa	fraction of frozen precipitation		accum. up longwave flux at top	W m^{-2}
sea surface temperature	K	surface emissivity		accum. up shortwave flux at bottom	W m^{-2}
surface pressure	Pa	surface evaporation	kg m^{-2}	accum. up shortwave flux at top	W m^{-2}
surface skin temperature	K	surface runoff	mm	downward long wave flux at ground surface	W m^{-2}
temperature at 2m	K	underground runoff	mm	downward short wave flux at ground surface	W m^{-2}
potential temperature at 2m	K	accum. ground heat flux	W m^{-2}	instant. down clear sky longwave flux at bottom	W m-2
specific humidity at 2m	kg kg^{-1}	accum. upward heat flux at the surface	W m^{-2}	instant. down clear sky longwave flux at top	W m-2
x-wind component at 10m	m s^{-1}	accum. upward latent heat flux at the surface	W m^{-2}	instant. down clear sky shortwave flux at bottom	W m-2
y-wind component at 10m	m s^{-1}	upward heat flux at the surface	W m^{-2}	instant. down clear sky shortwave flux at top	W m-2
albedo		upward moisture flux at the surface	W m^{-2}	instant. down longwave flux at bottom	W m-2
sea ice flag		accum. down clear sky longwave flux at bottom	W m^{-2}	instant. down longwave flux at top	W m-2
snow coverage flag		accum. down clear sky longwave flux at top	W m^{-2}	instant. down shortwave flux at bottom	W m^{-2}
pbl height	m	accum. down clear sky shortwave flux at bottom	W m^{-2}	instant. down shortwave flux at top	W m^{-2}
ground heat flux	W m-2	accum. down clear sky shortwave flux at top	W m^{-2}	instant. up clear sky longwave flux at bottom	W m^{-2}
latent heat flux at the surface	W m^{-2}	accum. down longwave flux at bottom	W m^{-2}	instant. up clear sky longwave flux at top	W m^{-2}
canopy water	kg m-2	accum. down longwave flux at top	W m^{-2}	instant. up clear sky shortwave flux at bottom	W m^{-2}
accum. total cumulus precipitation	mm	accum. down shortwave flux at bottom	W m^{-2}	instant. up clear sky shortwave flux at top	W m^{-2}
accum. total grid scale graupel	mm	accum. down shortwave flux at top	W m^{-2}	instant. up longwave flux at bottom	W m^{-2}
accum. total grid scale precipitation	mm	accum. up clear sky longwave flux at bottom	W m^{-2}	instant. up longwave flux at top	W m^{-2}
accum. total grid scale snow and ice	mm	accum. up clear sky longwave flux at top	W m^{-2}	instant. up shortwave flux at bottom	W m^{-2}
snow phase change heat flux	W m^{-2}	accum. up clear sky shortwave flux at bottom	W m^{-2}	instant. up shortwave flux at top	W m^{-2}
snow water equivalent	kg m^{-2}	accum. up clear sky shortwave flux at top	W m^{-2}	net short wave flux at ground surface	W m^{-2}
physical snow depth	m	accum. up longwave flux at bottom	W m^{-2}	toa outgoing long wave	W m^{-2}