National Snow and Ice Data Center

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Global satellite-derived snow data sets at NSIDC

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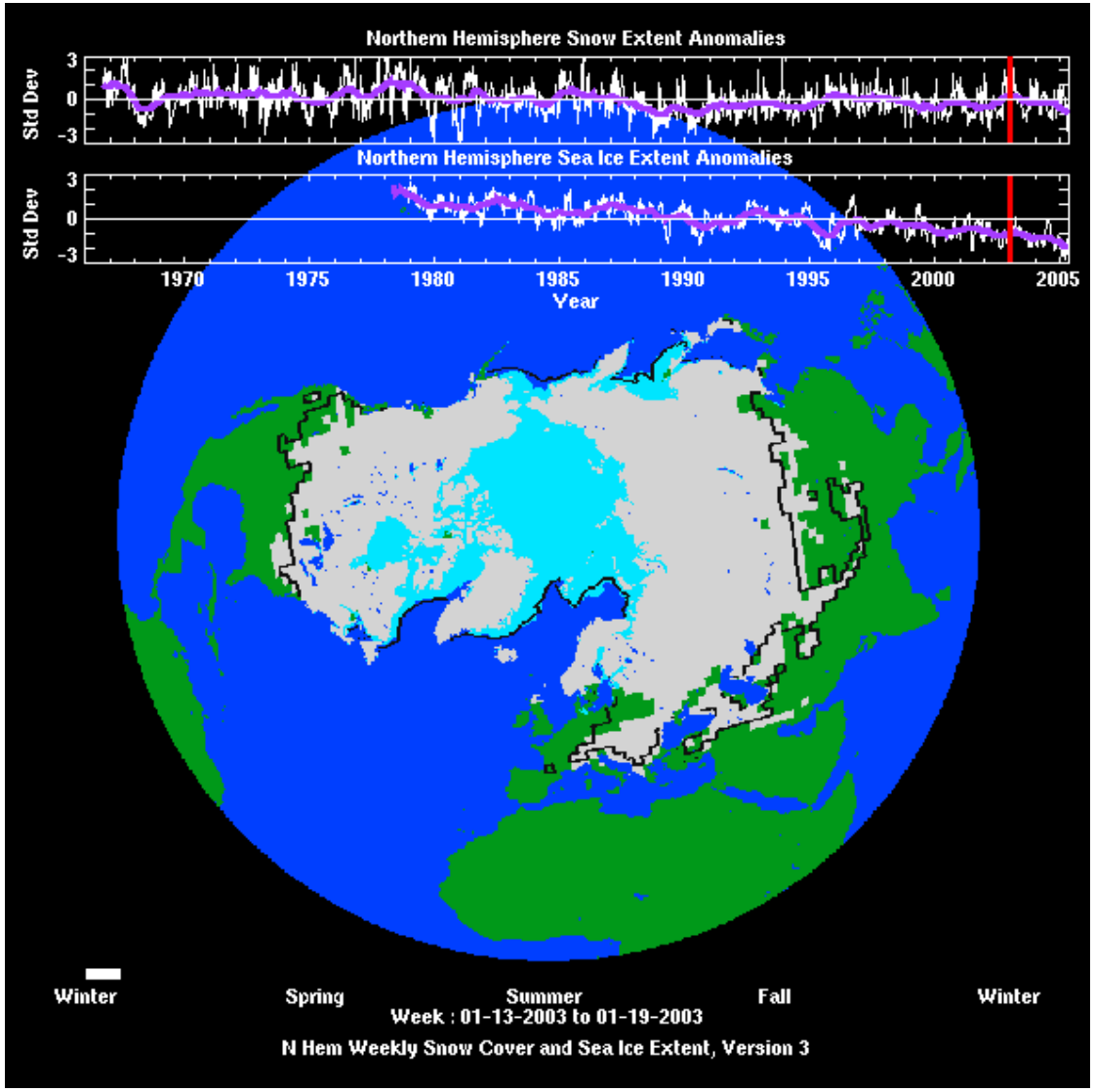
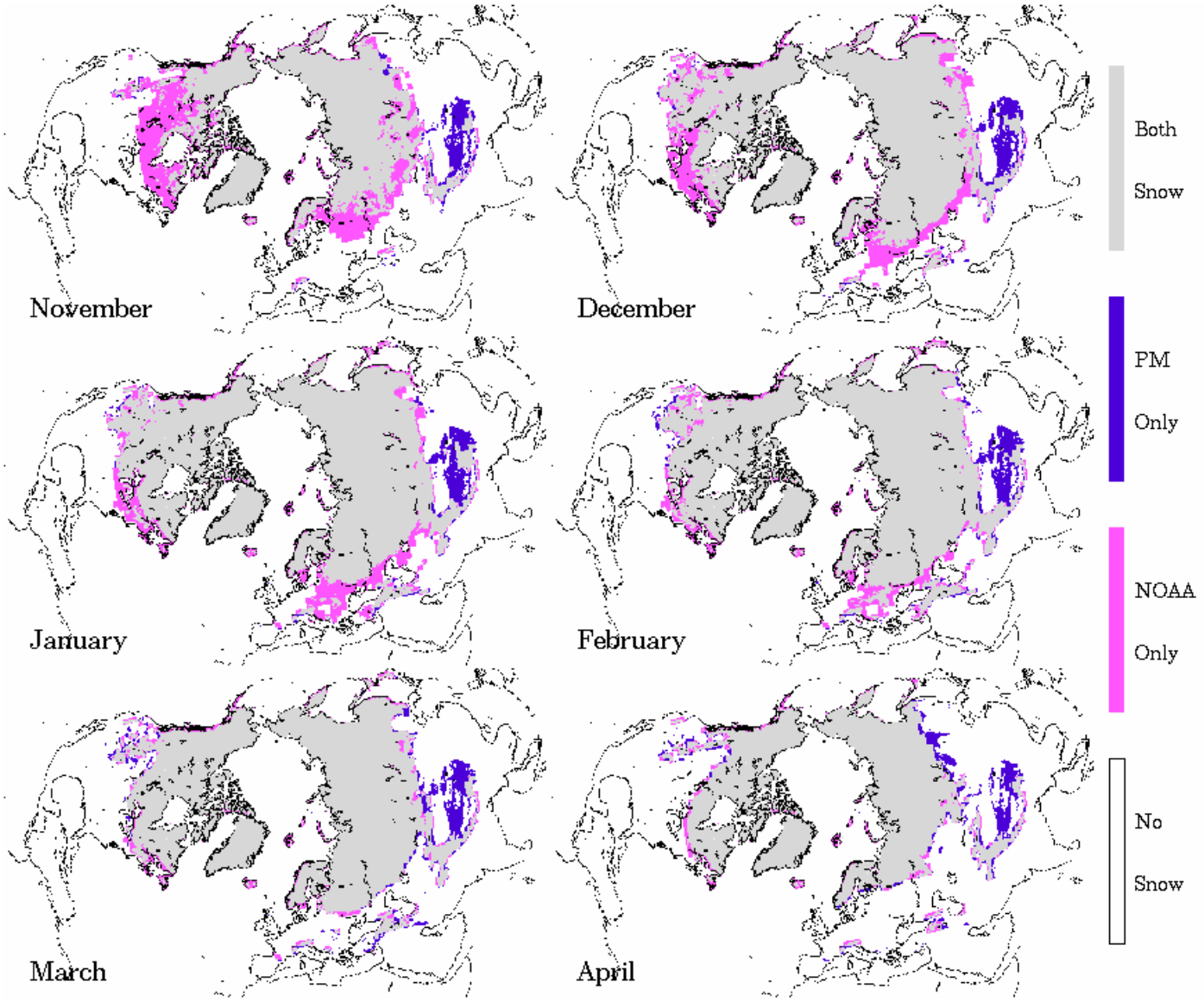
Gridded Snow Data Sets at NSIDC



Northern Hemisphere Weekly EASE-Grid Snow Cover and Sea Ice Extent

- 25 km (~0.25-degree) Equal-Area Scalable Earth Grid (EASE-Grid)
- Snow cover regridded from NOAA weekly snow maps (AVHRR, GOES)
- Sea ice derived from daily passive microwave-derived sea ice concentrations
- 1966-1978: snow cover only
- 1978-2005: both snow cover and sea ice extent

http://nsidc.org/data/nsidc-0046.html



Monthly snow extent climatology for NOAA and passive microwave data (50% or more of the weeks in the particular month over the period of record classified as snow covered). Note typical microwave "undermeasure" in fall and early winter.

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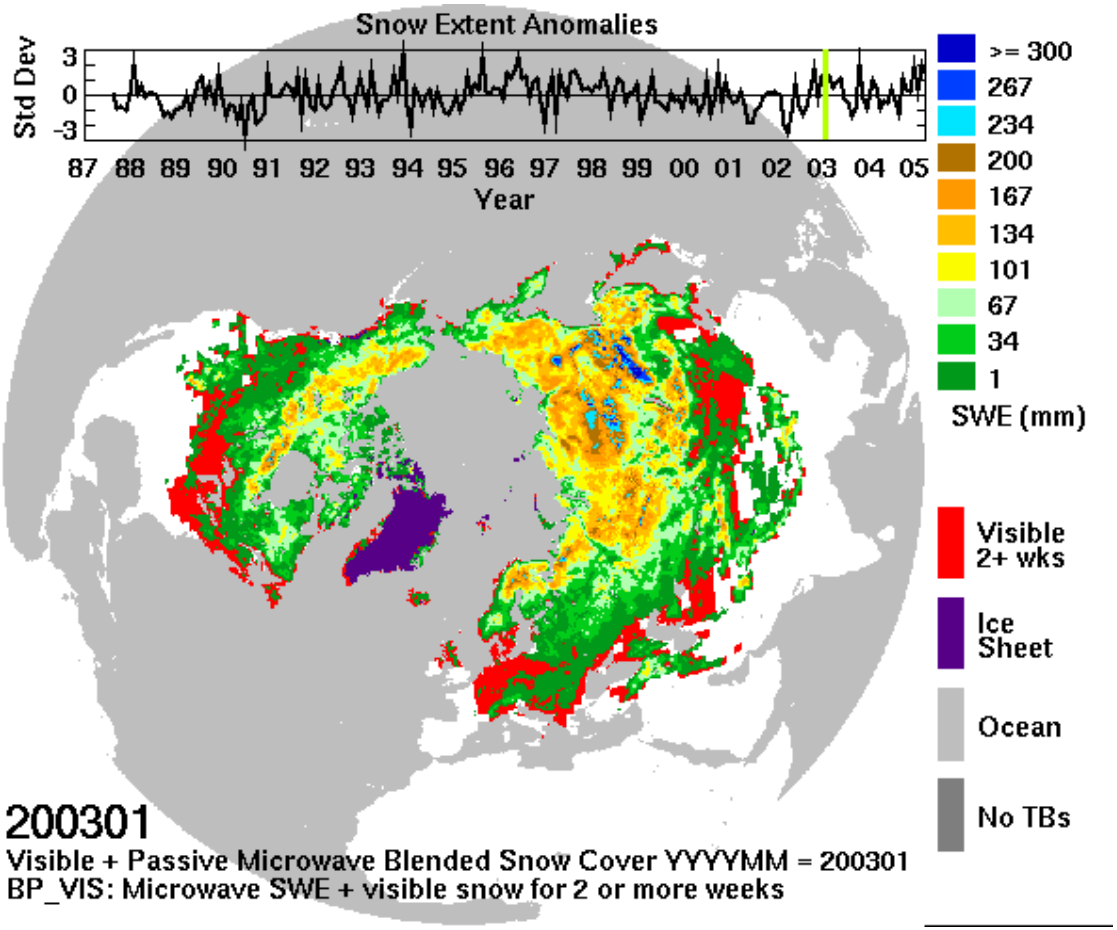
Gridded Snow Data Sets at NSIDC



Global Monthly EASE-Grid Snow Water Equivalent (SWE) Climatology

- 25 km (~0.25-degree) Equal-Area Scalable Earth Grid (EASE-Grid)
- "global" (S. Hem. Snow limited to Andes and NZ)
- SWE derived from satellite passive microwave sensors
- Enhanced with frequency of additional "visible" snow cover because passive microwave typically "undermeasures"
- 1978-1987: SMMR
- 1987-2005: SSM/I
- Next version will include satellite "intercalibration" and Tibet atmospheric correction

http://nsidc.org/data/nsidc-0271.html

Questions I have for your community:

1. Both snow data sets (weekly snow cover and monthly SWE) are currently available (FTP) as flat, binary array files. I understand this is not desirable for the modelling community. If I reformat as netCDF-CF, how to slice/dice the data?

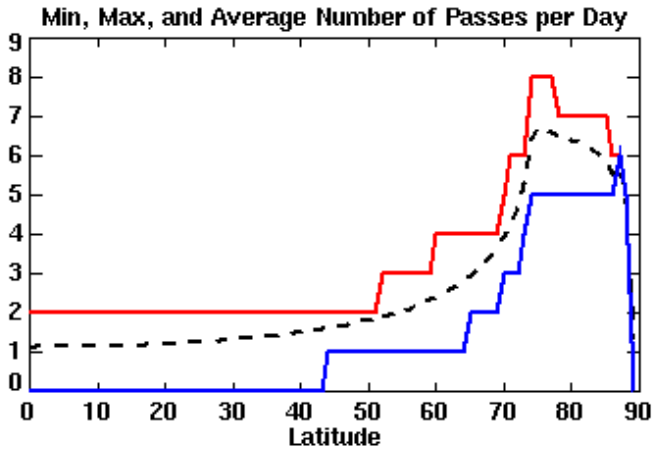
    - All January data, through time? Straight time series (by year or appropriately-sized chunk)? What is "appropriately-sized" in your community?
    - Who would be a good person to talk to about these questions?

2. If you were to use these data, how would you go about doing it? Tell me (***brodzik@nsidc.org***) about how this would look, it will help me either modify new versions of these data, or propose different combinations for distribution.

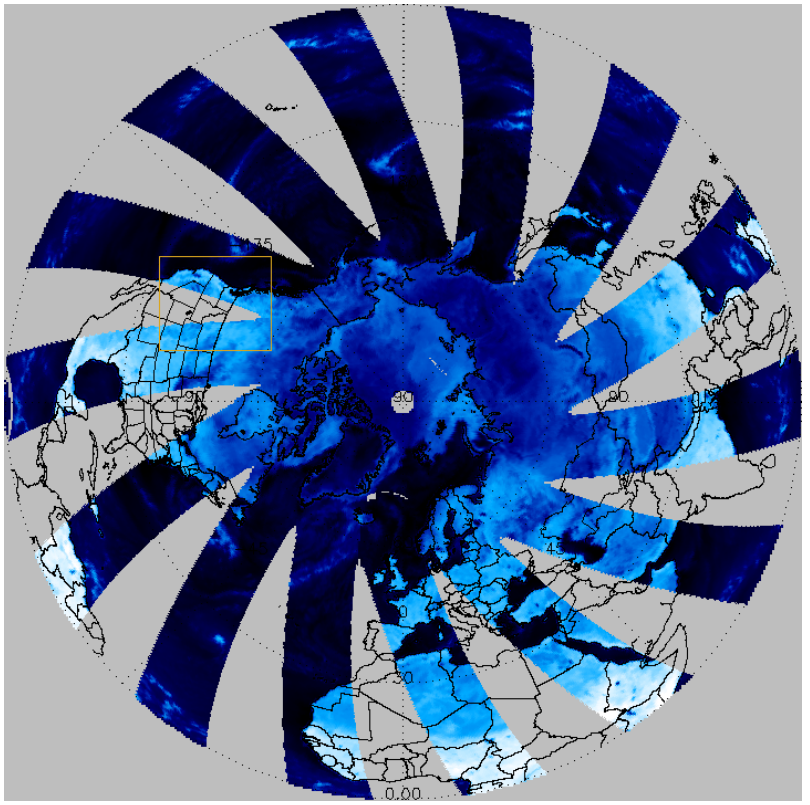
Thank you!

Challenge: Missing Data

- This is an example of a daily TB map for the northern hemisphere. You can see large areas that are not observed by daily satellite passes.



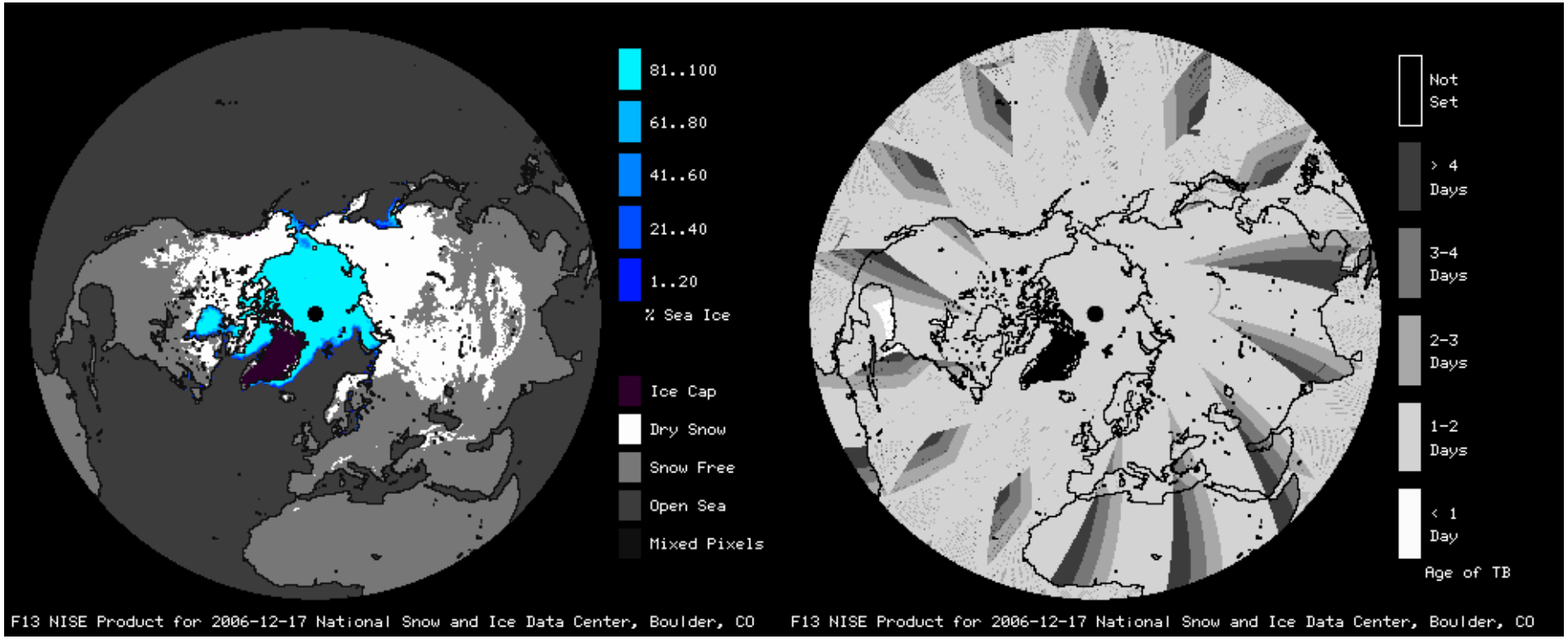
Number of satellite overpasses per day vs. latitude. This shows that higher latitudes have regular coverage while mid and low latitudes are observed less frequently.



Northern hemisphere
37GHz Horiz. Ascending image

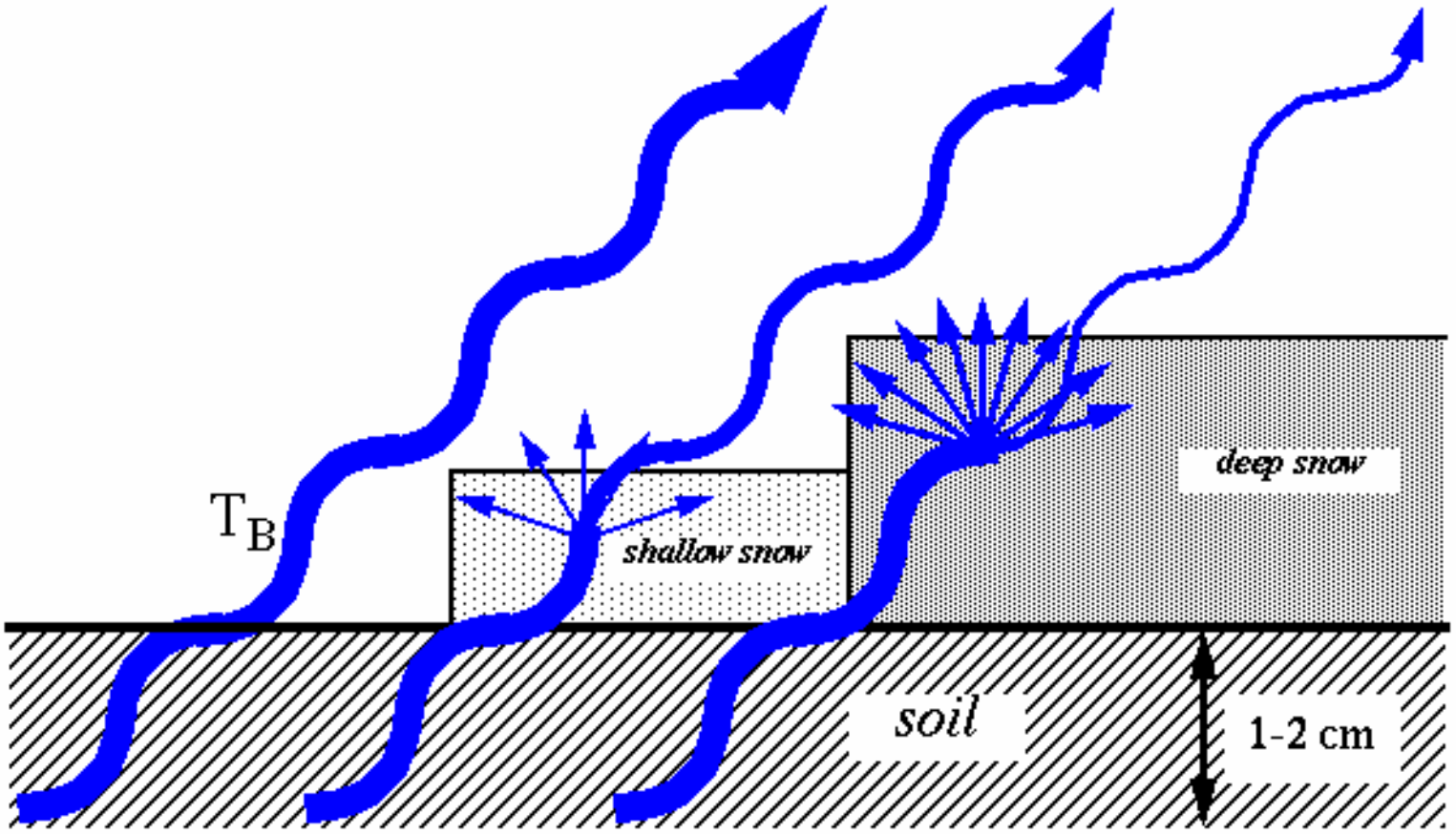
Previous Solutions

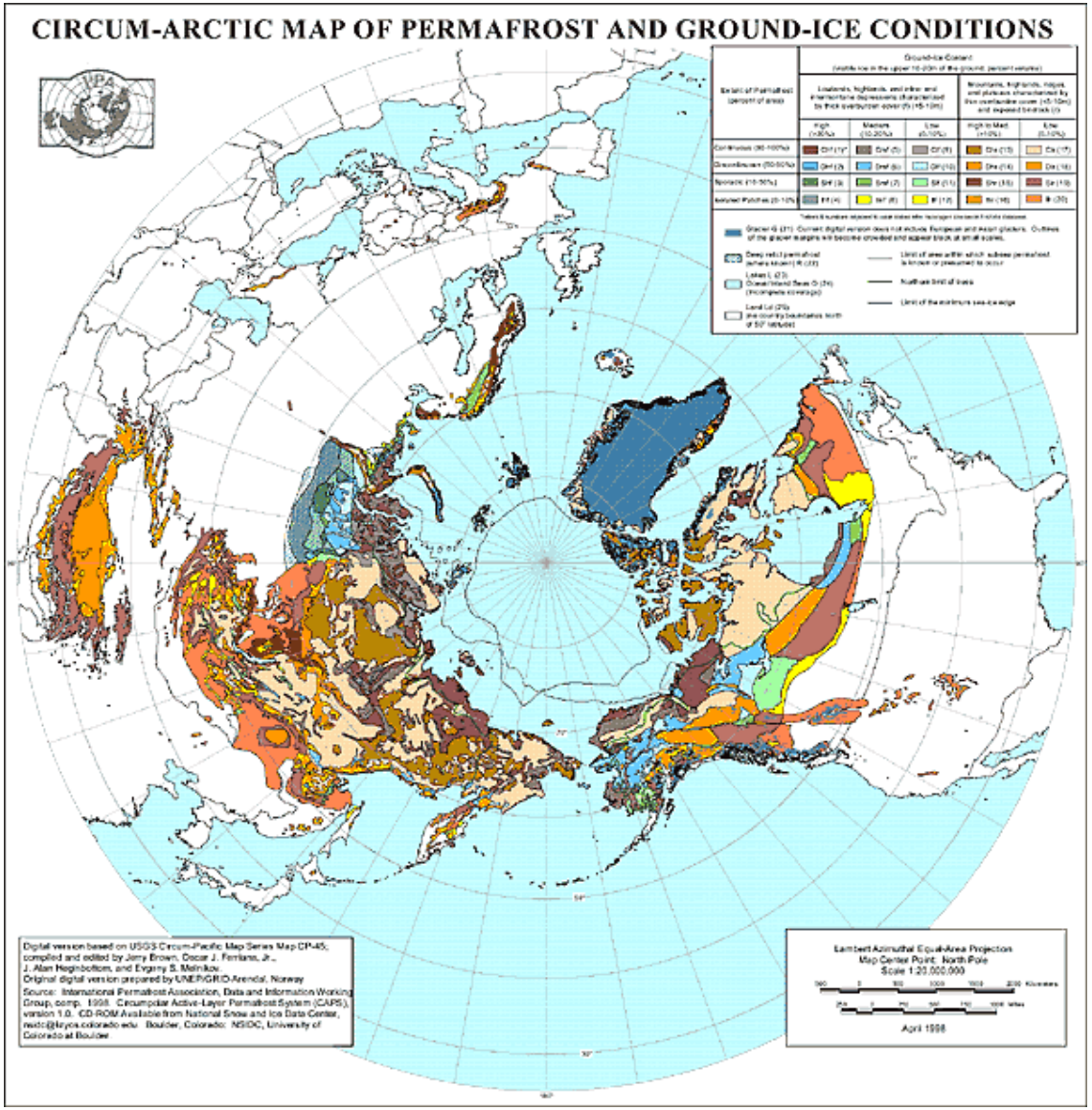
- compositing (last-in)



Passive Microwave Remote Sensing of Snow

- Radiation emitted from the soil is scattered by the snow cover
- Scattering increases in proportion to amount (mass) of snow
- Brightness temperature decrease, negative spectral gradient




CIRCUM-ARCTIC MAP OF PERMAFROST AND GROUND-ICE CONDITIONS
Digital version based on USGS Circum-Pacific Map Series Map CP-45;
compiled and edited by Jerry Brown, Oscar J. Ferrians, Jr.,
J. Alan Heginbottom, and Evgeny S. Melnikov.
Original digital version prepared by UNEP/GRID-Arendal, Norway
Source: International Permafrost Association, Data and Information Working
Group, comp. 1998. Circumpolar Active-Layer Permafrost System (CAPS),
version 1.0. CD-ROM Available from National Snow and Ice Data Center,
nsidc@kryos.colorado.edu Boulder, Colorado: NSIDC, University of
Colorado at Boulder
Lambert Azimuthal Equal-Area Projection
Map Center Point: North Pole
Scale 1:20,000,000
April 1998