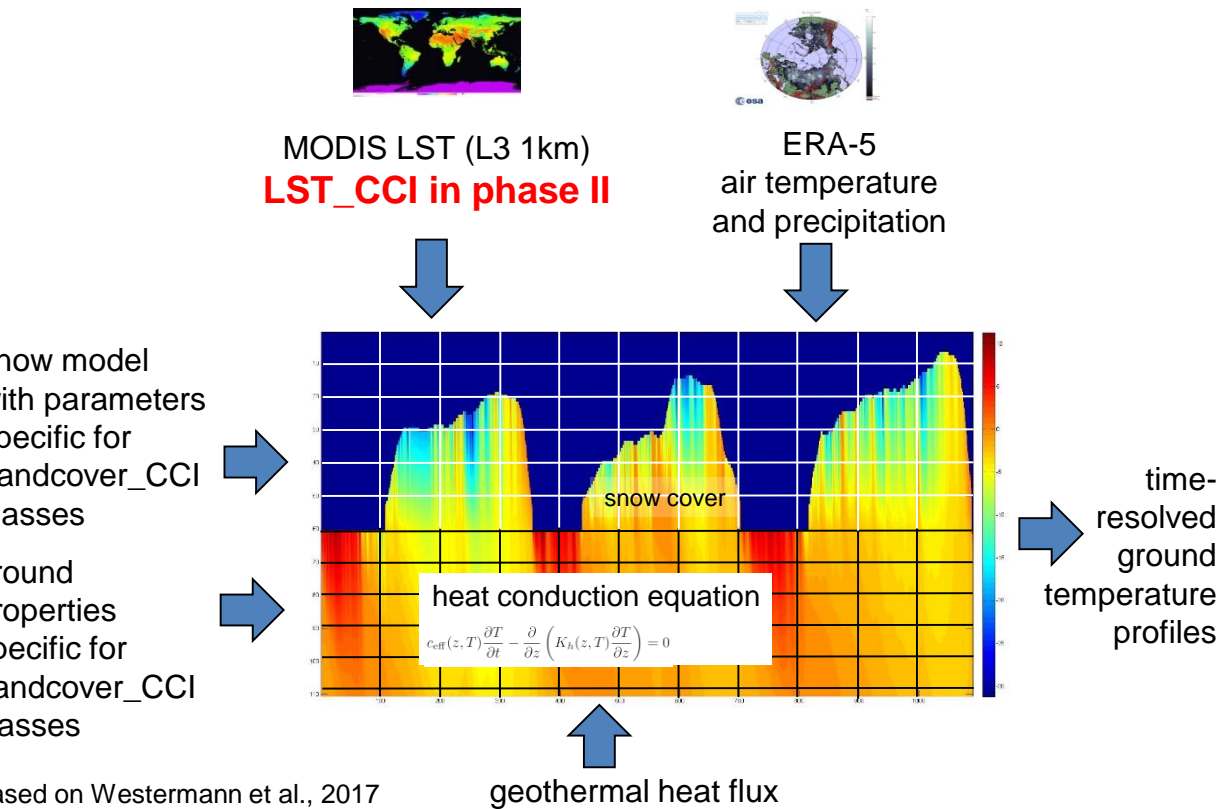




# Using LST\_CCI data in the Permafrost\_CCI project

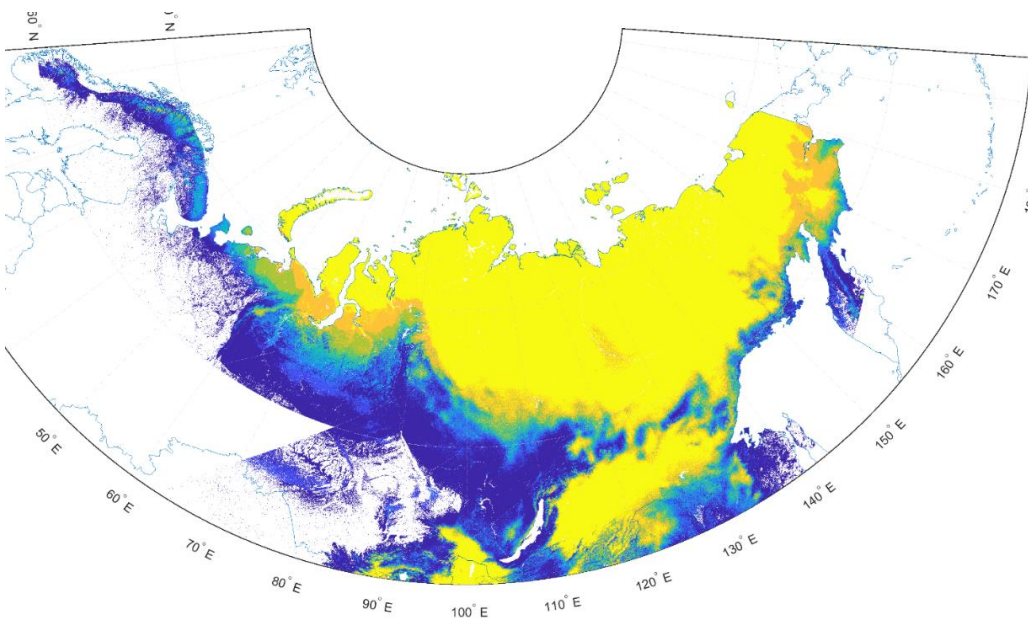
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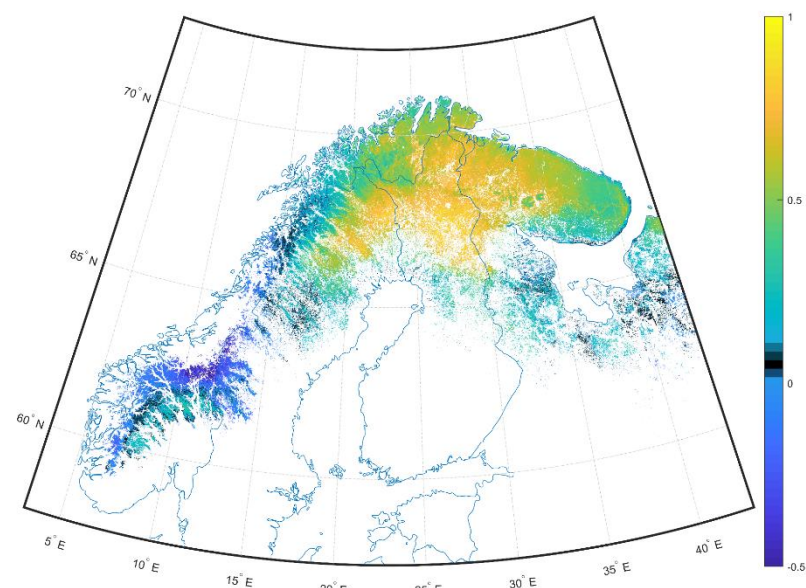


The Permafrost\_CCI processing chain uses time series of remotely sensed LST to force the ground thermal model CryoGrid which computes time-resolved ground temperature profiles. In phase II of the project, we will replace MODIS L3 LST by global LST\_CCI 0.01° products, in particular the MODIS-based products TERRA\_MODIS\_L3C\_0.01 and AQUA\_MODIS\_L3C\_0.01, as well as the Sentinel-3 based products SENTINEL3A\_SLSTR\_L3C\_0.01 and SENTINEL3B\_SLSTR\_L3C\_0.01. Consistency over (multi-)decadal time periods is a critical prerequisite for use in Permafrost\_CCI. In the light of the planned decommissioning of MODIS Terra/Aqua, it is important to ensure consistency between between MODIS- and Sentinel-3 based LST data sets.

## Example maps generated from Permafrost\_CCI products in phase I (calculated with MODIS L3 LST)



Near-surface permafrost extent (fraction per pixel) for Eurasia in the year 1998; numbers from 0 (no permafrost) to 1 (continuous permafrost).



Change in ground temperature (in unit Kelvin) at 2m depth between the time slices 2005-2009 and 2013-2017 for Scandinavia.

### References:

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- Westermann, S., Peter, M., Langer, M., Schwamborn, G., Schirmer, L., Eitzmüller, B., & Boike, J. (2017). Transient modeling of the ground thermal conditions using satellite data in the Lena River delta, Siberia. The Cryosphere, 11(3), 1441-1463.