IST climatology

Introduction

The climate data presented here are based on the satellite level 2 AASTI (version 2) data set produced by DMI (dk)/MET (no). This is a climate record of ice and snow surface temperatures (IST) calculated from radiation data in the CLARA-A2 climate data record made available by the Climate SAF [make "Climate SAF" like to https://www.cmsaf.eu/EN/Home/home_node.html].

The Surface temperatrure algorithms applied to the radiationa data, the cloud mask applied and other methodilogies applied are more or less identical to the OSISAF IST product (OSI-205) [make "OSI-205" like to http://www.osi-saf.org/?q=content/sst-products].

The IST climatology covers the period 1982-2015 and it covers Antarctic and Greenland ice caps, as well as sea is on the Northern and Southern hemispheres.

Data from approximately 10 different AVHRR sensors from NOAA and Metop satellites are included in the the data set. Data from these sensors are not inter-calibrated, so artificial biasses may affect trends shown in the plots. However, temporal analysis against data from 4 long term automatic weather stations indicate that such artificial trends do not change the overall picture of the presented climatology

We expect to have a new and intercalibrated climatology ready at this site sometime in 2022. Untill then please explore these data and do not hesitate ask for clarification or to report irregularities.

(A complete scientific documentation is under preparation)

Data description

All data is in satellite level 3 based on the AASTI level 2 swath data. The plots are based on monthly mean surface temperatures, monthly sea ice fractions (fraction of time with sea ice) and a ice-cap (Greenland and Antarcitca)/water (including sea ice) mask. These three variables are dimensioned spatially in a 160 x 1440 (latitude x longitude) grid from 50 degrees in latitude and up for the northern hemisphere and -50 degrees and down in latitude for the southern hemisphere.

Calculating annual mean. An annual mean is calculated as the mean of the 12 monthly means (month approximated to have the same length).

Distinguising between sea ice and land ice. To distinguise between sea and land ice an ice-cap (greenland and antarcitca)/water (including sea ice) mask is a applied to the data.

Linear regression analysis. To analyse the development in temperatures over time, a linear regression fit of the temperatures in each spatial point has been performed. From this analysis the trends, p-values and correlation coefficients are displayed.

Plot descriptions

Plot filtering. When plotting sea ice data on maps a filter considering sea ice fraction is applied. For a point in space to be plotted there must have been sea ice more than 15 % of the time in 10 years or more.

Mean temperature maps (upper left corner)

These maps display the mean of the annueal or monthly mean ice surface temperature across the full period.

Statistics (upper right corner)

Click on the picture to switch the image in display.

Standard deviation. These maps display the standard deviation of the annual or monthly mean IST across the full period.

p-value of trend significance test. These maps display the resulting p-values from the linear regression analysis with the null hypothesis that the slope/trend is equal to zero.

Correlation coefficient. These maps display the Pearson product-moment correlation coefficient, which is a result from the linear regression analysis.

Trends (lower left corner)

These maps display the trends from the linear regression analysis.

Mean temperature graphs (lower right corner)

These graphs show the spatial mean of the monthly or annual mean ice surface temperature versus time. A linear fit is also seen plotted with its the slope shown as "Tendency".