

1. NDVI dataset 2000-2016

Normalized difference vegetation index (NDVI) is strongly related to plant biomass and changes in NDVI can be used to extract seasonal changes (phenophases) and plant productivity. The NDVI dataset is based on the MODIS Terra products MOD09A1 and MOD09Q1, both with 8-day temporal composites. Clouds and clouds shadows are removed and missing data interpolated, see Karlsen et al. (2014). *Remote Sensing* for details.

NDVI data every 8-days from doy-of-year (DOY) 121 (1 May) to DOY 265 (22 September), every year from 2000 to 2016.

File name: ndvi_year_doy

DOY is first day in 8-days period.

Values:

-999: Unvegetated (16 years median summer NDVI (doy 209) below 0.15). Included all ice-free areas north of 80°N

-1000: sea, mask from S250 data

-1001: Glacier, mask from S250 data

Pixel size: 231.65635681

Columns and Rows: 1900 x 1856

16 bit signed integer

WGS_1984_UTM_Zone_33N

Known errors: The dataset works best in lowland areas in western Svalbard. At higher altitudes (areas with very short season) and in moss tundra (as large parts of Edgeøya and Barentsøya) the smoothing methods used create outliers and must be interpret with care. MODIS data from DOY 161-169 and 169-177 for the year 2001 lack. For these periods a simple weighted linear interpolation methods is used, and these two periods must be used with care/not used. NDVI values are scaled from -1000 to +1000, a few pixels with values higher than 1000 occurs due to the interpolation method used, hence, maximum NDVI value from this dataset should not be used as the interpolation method used influence the peak value.



Fig. NDVI data from brown areas, other are masked out (unvegetated areas is shown as grey and has value -999, sea has value -1000, and glacier has value -1001 in the dataset)

2. Onset of the growing season

Maps generated from the NDVI dataset. Onset of the growing season correspond with onset of flowering of *Salix polaris*. Known errors are the same as in the 8-days NDVI dataset it is based on. In moss-tundra dominated areas, the onset is probably more related to timing of snowmelt due to weak/non-response from vascular plants.

Values:

1: Sea, extracted from S250 data

7: Glacier, extracted from S250 data

10: Unvegetated. Defined as 16 years median summer NDVI below 0.15, and included all ice-free areas north of 80°N

100-210: DOY in onset of the growing season.

3. Maximum NDVI

Maximum NDVI indicate annual plant biomass. Extracted from the MODIS product MOD09Q1.

Columns and Rows: 1900 x 1900 (slightly larger than the two other products)

NDVI scaled from -10000 to + 10000

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