

Availability of (almost) analysis ready satellite image mosaics

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Finnish Geospatial
Research and
Education Hub

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Introduction

- Collection of more or less easily available image mosaics that might be useful
- SYKE: Sentinel-2 reflectance and image indices, Landsat, Corine-mosaics
- FMI: Sentinel-1 SAR, also -2/-3
- Some international
- Some are available at CSC
- Mosaics based on Finnish Geospatial Programme ("Paikkatietoalusta") available at National Satellite Data Centre of FMI



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Sentinel-2 reflectance mosaics

- Sentinel-2 Global Mosaic service
 - 2017 – 2021, 3rd quarter
 - Resampled to 10 m pixel
 - Metadata: <https://ckan.ymparisto.fi/dataset/sentinel-2-satellite-image-mosaics-s2gm-sentinel-2-satelliittikuvamosaiikki-s2gm>
- Timo P. Pitkänen (timo.p.pitkanen@luke.fi) has produced summer 2020 +/- 1 year



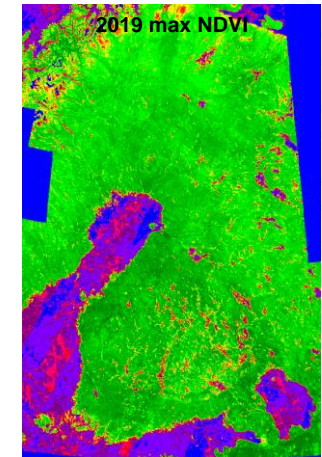
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Sentinel-2 image index

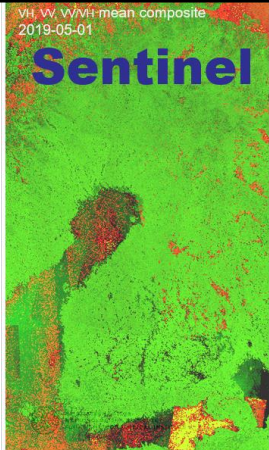
- Image indices
 - $NDVI = (B8 - B4) / (B8 + B4)$
 - $NDTI = (B11 - B12) / (B11 + B12)$
 - $NDMI = (B8 - B11) / (B8 + B11)$
 - $NDBI = ((B11 - B8) / (B11 + B8)) - ((B8 - B4) / (B8 + B4))$
 - $NDSI = (B3 - B11) / (B3 + B11)$
 - Mosaicking based on maximum NDVI
- Years 2016-2021
 - 13 mosaics per growing season, early April to late October
- Meta-image: day of image acquisition



- Metadata: <https://ckan.ymparisto.fi/dataset/sentinel-2-image-index-mosaics-s2ind-sentinel-2-kuvamosaiikit-s2ind>



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Sentinel 1 mosaics


- 11-day mosaics starting every month on 1st, 11th and 21st which means for each pixel 1 to 3 measurement are possible
- min, max, mean and standard deviation at 20m resolution
- based on Sentinel 1 Ground Range Detected observations from IW VV and VH ascending orbits
- produced on 2nd, 12th and 22nd day of each month

<https://ckan.ymparisto.fi/dataset/sentinel-1-sar-image-mosaic-s1sar-sentinel-1-sar-kuvamosaiikki-s1sar>

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Finnish Meteorological Institute

- Sentinel-2
 - 10-day mosaics starting every month on 1st, 11th and 21st
 - S-2 tiles from Mosaic-hub combined as cogs, 2018 until now
- Sentinel-3
- More information
 - Mikko Strahlendorff - mikko.strahlendorff@fmi.fi
 - Presentation "Analysis Ready Data for Finland"
 - <https://docs.google.com/presentation/d/1hU0CRYx3Asfik2rJT9iE-JB8hdNCloteatTWeyzA/edit?usp=sharing>



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Older reflectance mosaics

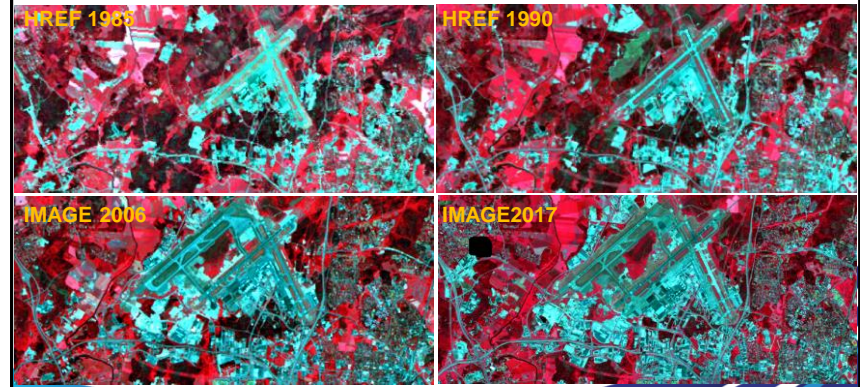
- Landsat
 - Href: Landsat-4/5 reflectance mosaics, (about) 1985, 1990 & 1995
 - "Handmade" by Blom-Kartta
 - Hind: yearly Landsat-4/5 image index mosaics 1985-2011
 - NDVI, NDTI, NDMI, NDSI, NDBI
 - Mosaicking based on maximum NDVI
- Corine image mosaics
 - IMAGE2000: Landsat-7 ETM+, 1999-2002
 - IMAGE2006: IRS LISS, Spot, 2005-2007
 - IMAGE2012: IRS LISS, Spot, RapidEye, 2011-13
 - IMAGE2017: Sentinel-2, 2016-2017



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Href & Image20xx



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Copernicus Land Monitoring Service: High Resolution Vegetation Phenology and Productivity

HR-VPP products

Sentinel-2 UTM
Tile grid 10m

Sentinel 2 A/B
Level 1C

Basic Vegetation
Indices
(NDVI, FAPAR,
PPI, LAI)

Seasonal
Trajectories
(PPI)

Phenological and
Productivity
Parameters
(2 seasons)

EPSG:3035
HRL LAEA grid 10m

Seasonal
Trajectories
(PPI)

Phenological and
Productivity
Parameters
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EPSG:3035
HRL LAEA grid 100m

Seasonal
Trajectories
(PPI)

Phenological and
Productivity
Parameters
(2 seasons)

<https://land.copernicus.eu/pan-european/biophysical-parameters/high-resolution-vegetation-phenology-and-productivity>

Sentinel-1

- Sentinel-1 Global Backscatter model 2016-2017
- Bauer-Marschallinger et.al. The normalised Sentinel-1 Global Backscatter Model, mapping Earth's land surface with C-band microwaves, Scientific Data (2021) 8:277 <https://doi.org/10.1038/s41597-021-01059-7>
- <https://sentinels.copernicus.eu/web/sentinel/missions/sentinel-1/sentinel-1-global-backscatter-model>
- Global interferometric coherence and backscatter 1.12.2019 - 30.11.2020
- KelIndorfer et.al. Global seasonal Sentinel-1 interferometric coherence and backscatter data set, Scientific Data (2022) 9:73 <https://doi.org/10.1038/s41597-022-01189-6>

S Y K E

Available at CSC

- Sentinel1 SAR mosaics
 - 10/2019 ->, 3 mosaics per month
- Sentinel2 index mosaics
 - 2018 ->, 2 mosaics per month, only during vegetation period, NDVI, NDBI, NDMI, NDTI, META.
- Historical Landsat satellite image mosaics
 - 1985, 1990, 1995
- Historical Landsat NDVI mosaics
 - 1984-2011
- Landsat
 - 30 m x 30 m 1999-2002 Latuviitta / Jukka Rahkonen



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Conclusions


- There are plenty of data available
 - Where to find and get to use?
 - Suitability?
- Questions:
 - What mosaics should be available at CSC?
 - Do you produce mosaics / data yourself that could be useful for someone else?
- Comments & Feedback: markus.torma@syke.fi



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Thank you for your attention!



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