Sentinel 2 activities at VTT 2015-2016

Eija Parmes

8.9.2016 IAP

VTT main activities on Sentinel-2 images

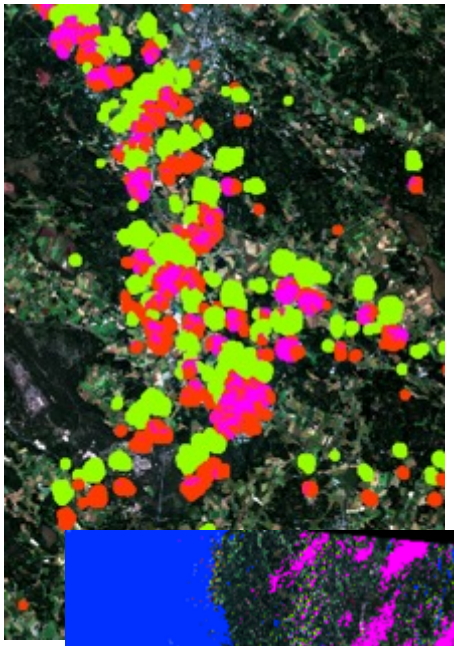
Software development

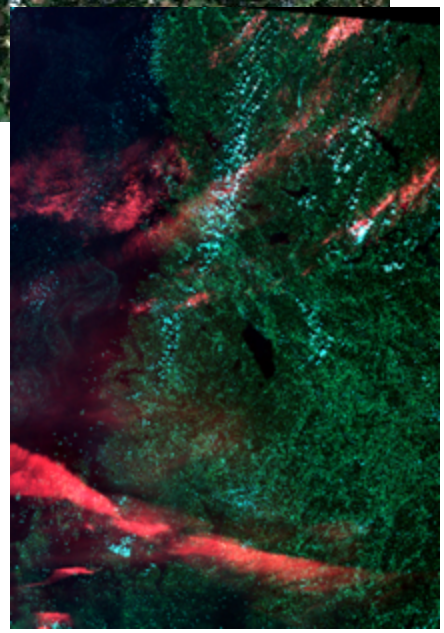
- Automatic cloud and shadow detection (FP7 SEN3APP)

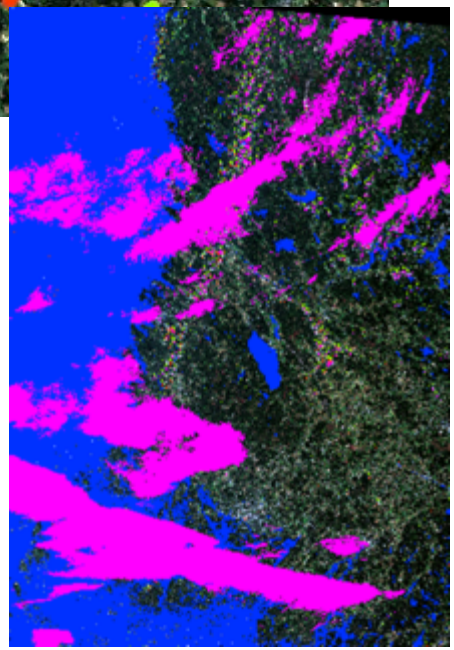
Application projects from Ministry of agriculture and forestry

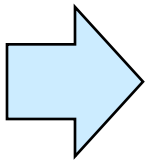
- MMM Change monitoring
- MMM Shrub intensity in seedling stands

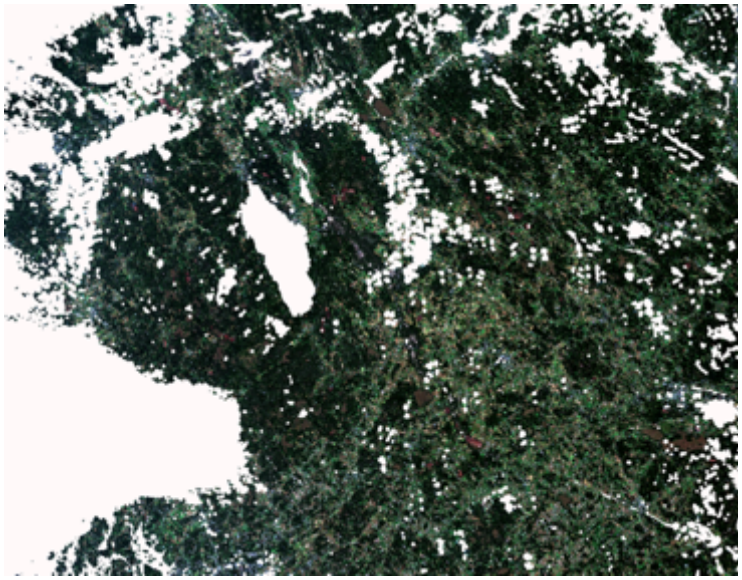
Detection of cumulus and cirrus clouds and shadows



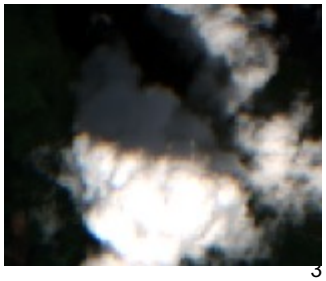






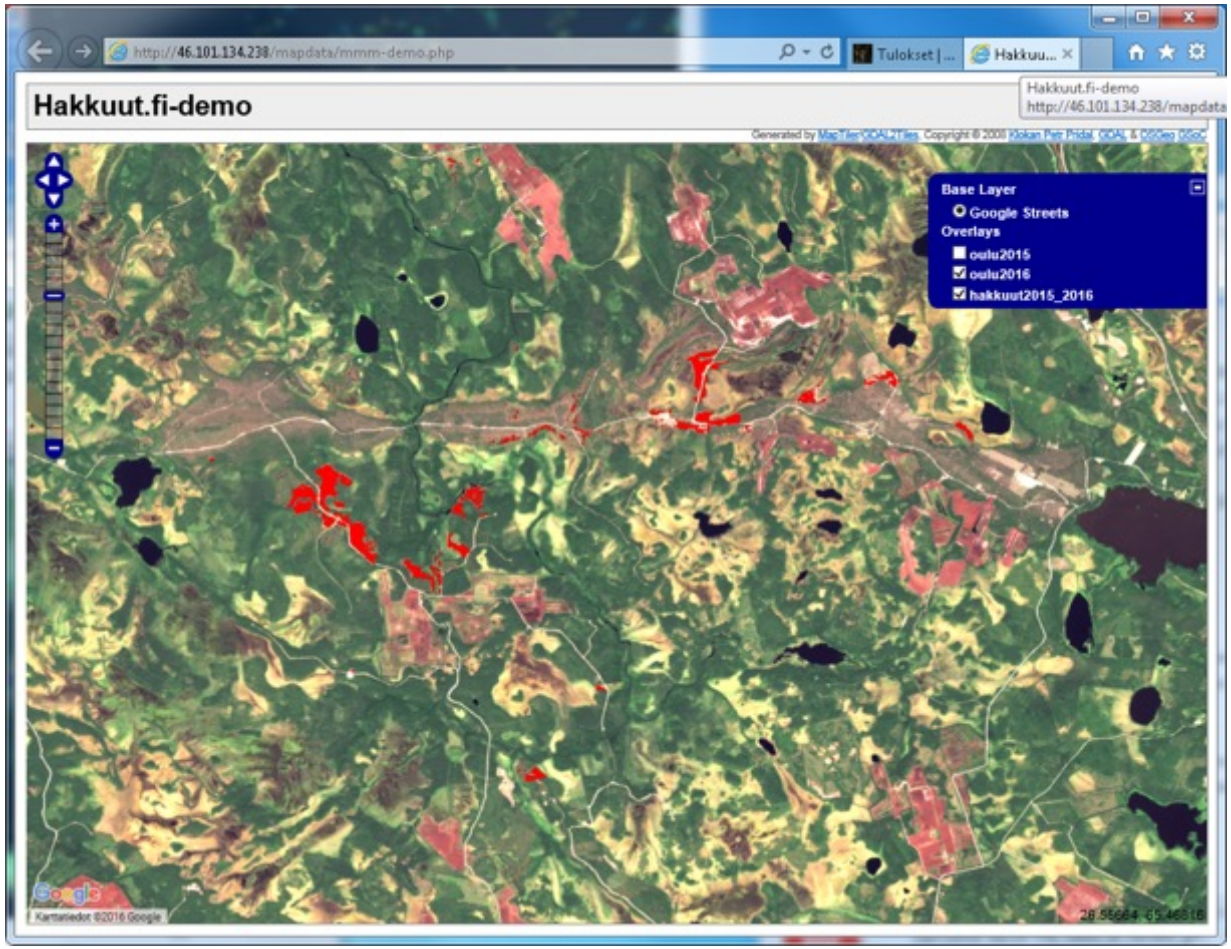


The result is the mask for removal of cloud, shadow and water areas before analysis and classification of forest areas.
Problems with some shorelines and shadows, shadows on clouds, and thinnest clouds



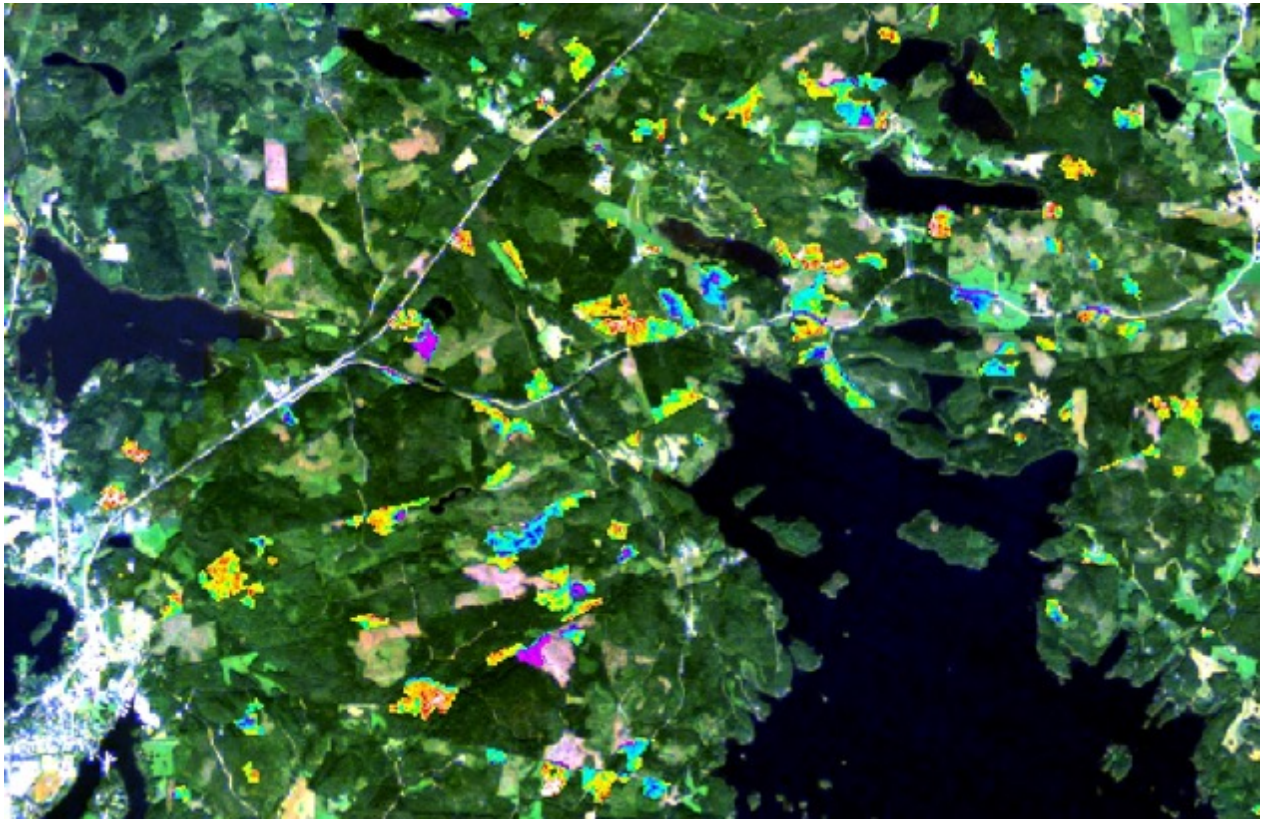
MMM Change monitoring

- See page http://www.hakkuut.fi
- VTT, Satellio, Metsäkeskus, Luke, SYKE
- Demo http://46.101.134.238/mapdata/mmm-demo.php



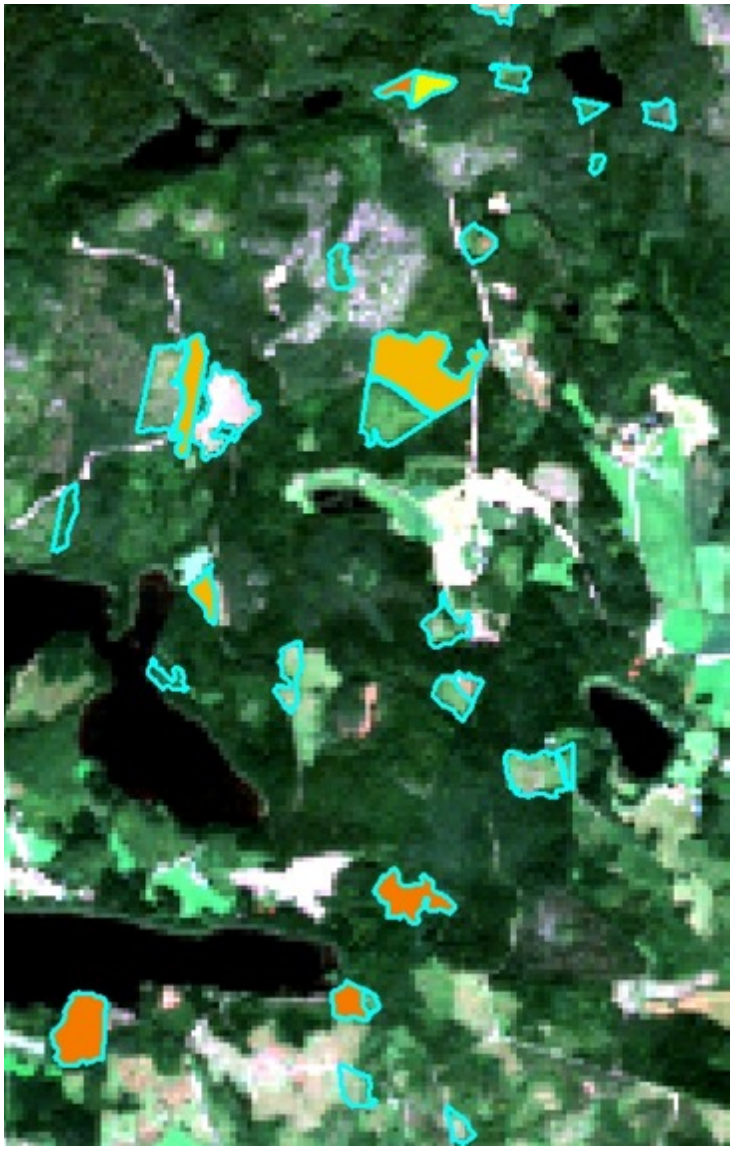
MMM Shrub intensity in seedling stands

- Seedling stands from Metsäkeskus
- Shrub classes from Sentinel-2 based on vegetation indices, shrub height and shrub intensity
- Results will be compared to lidar and aerial image based shrub detection from UEF, HY, FGI and LUKE later this year

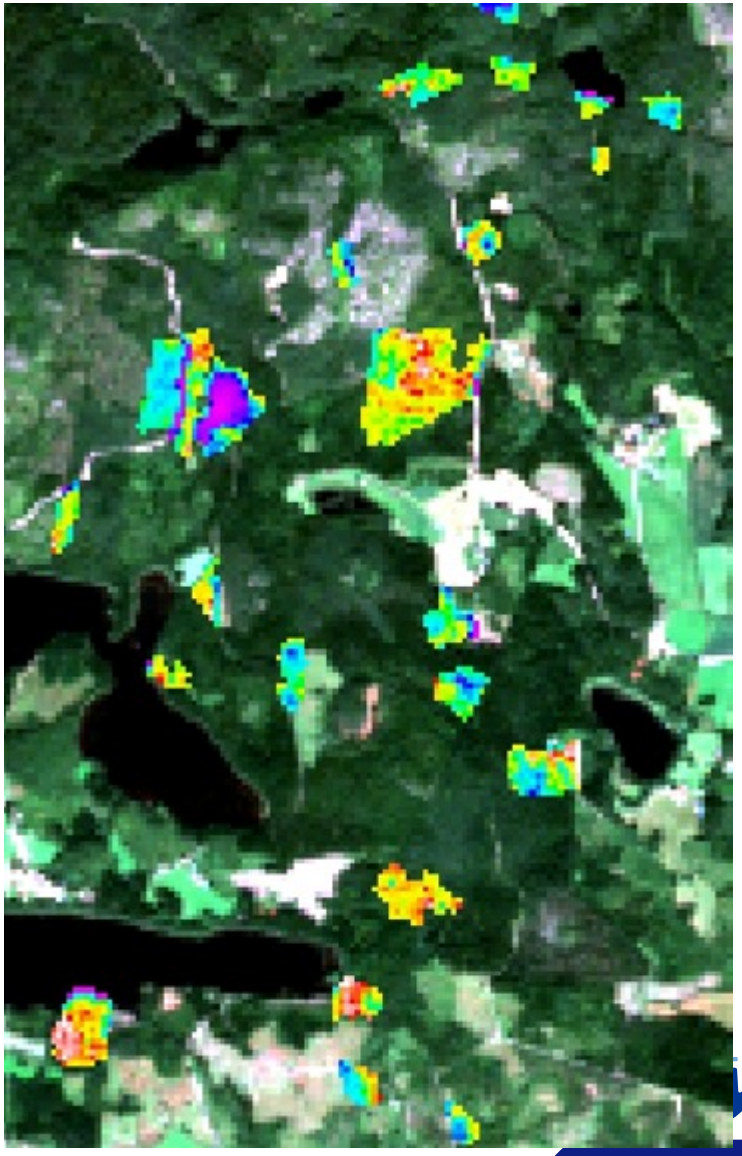


Shrub intensity from reference and Sentinel-2

red: 5000 – 10 000 deciduous stem count



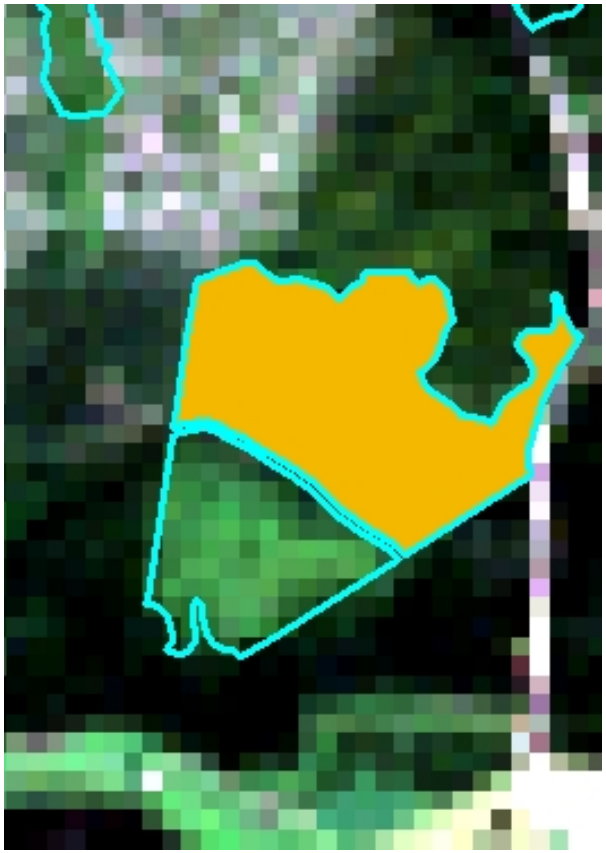
Sentinel-2 NIR/R



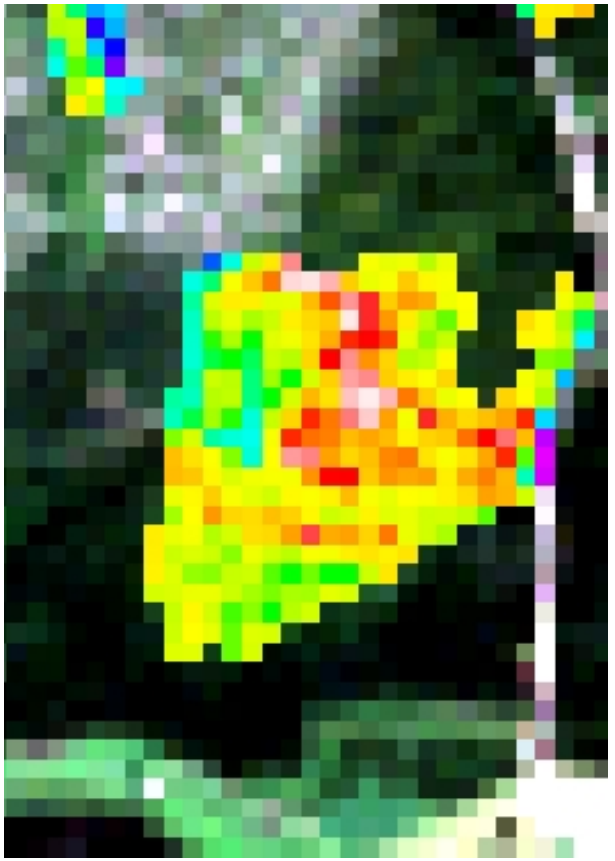
Shrub intensity from reference and Sentinel-2

Sentinel-2 natural color

Orange: 3700 – 4300 Deciduous stem count



Sentinel-2 NIR/R



Sentinel-2 process at VTT

- Sentinel-2 zip-files from FinHub or ESA S2 PreOpsHub, script to download.
- Em_unpack or SNAP (ESA's sentinel toolbox with UI) to create 10 m, 20 m and 60 m images in own UTM projections. Now images cover hundreds of kilometers by side, in next months to get also in 100 km x 100 km tiles.
- Level 1C TOA, Top of Atmosphere Reflectance, orthorectified, DEM?, GCP's from GRI Global Reference Image by image matching.
- Visual geometric comparison to NLS Topographic database1: 10 000 objects
- Detection and masking out of cumulus and cirrus clouds and shadows. Aerosol density calculation. Atmospheric correction by em_radio or SNAP to create Level 2A BOA Bottom of Atmosphere reflectance
- Mosaicking to combine cloud free areas for exploitation