

10TH ADVANCED TRAINING COURSE ON LAND REMOTE SENSING



Satellite Image Time Series for Forest Disturbance Monitoring in Slovenia

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→ THE EUROPEAN SPACE AGENCY



Anton Melik Geographical Institute

slovár -ja m (â) 1. knjiga, v kateri so besede razvrščene po abecedi in pojasnjene: slovar ima sto tisoč besed; izdati, sestavljati slovar; prevajati s slovarji; obsežen slovar / na koncu knjige je slovar seznam s tako razvrščenimi in pojasnjenimi besedami / enovlečni. enozvezkovni. narečni.

Fran Ramovš Institute of the Slovenian Language



France Stele Institute of Art History



Institute of Anthropological and Spatial Studies



Institute of Archaeology



Institute of Cultural History



Institute of Culture and Memory Studies



Institute of Ethnomusicology



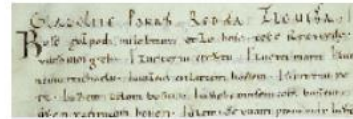
Institute of Musicology



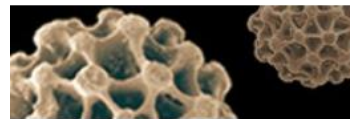
Institute of Philosophy



Institute of Slovenian Ethnology



Institute of Slovenian Literature and Literary Studies



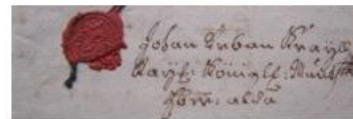
Ivan Rakovec Institute of Palaeontology



Jovan Hadži Institute of Biology



Karst Research Institute



Milko Kos Historical Institute

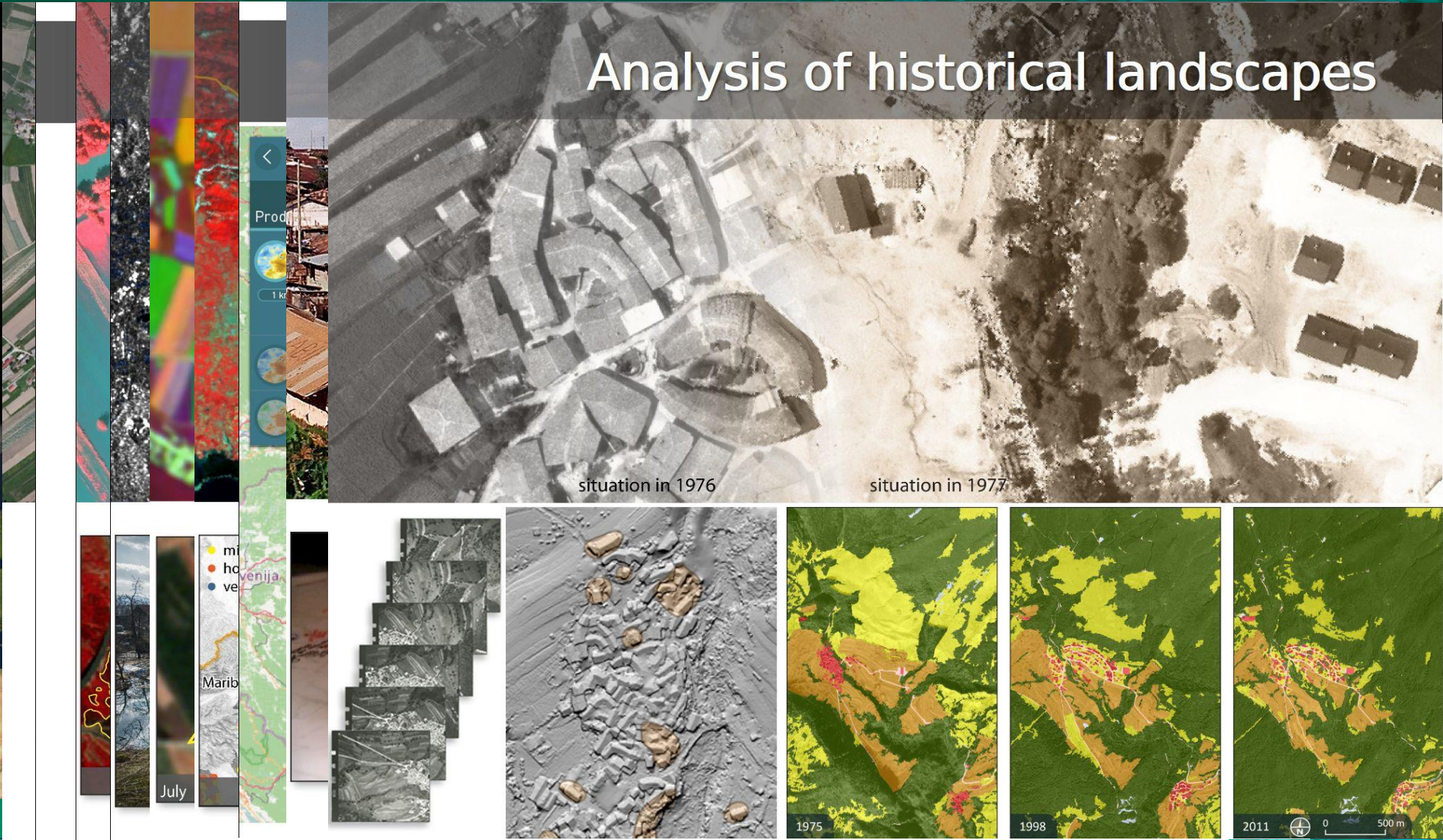


Slovenian Migration Institute



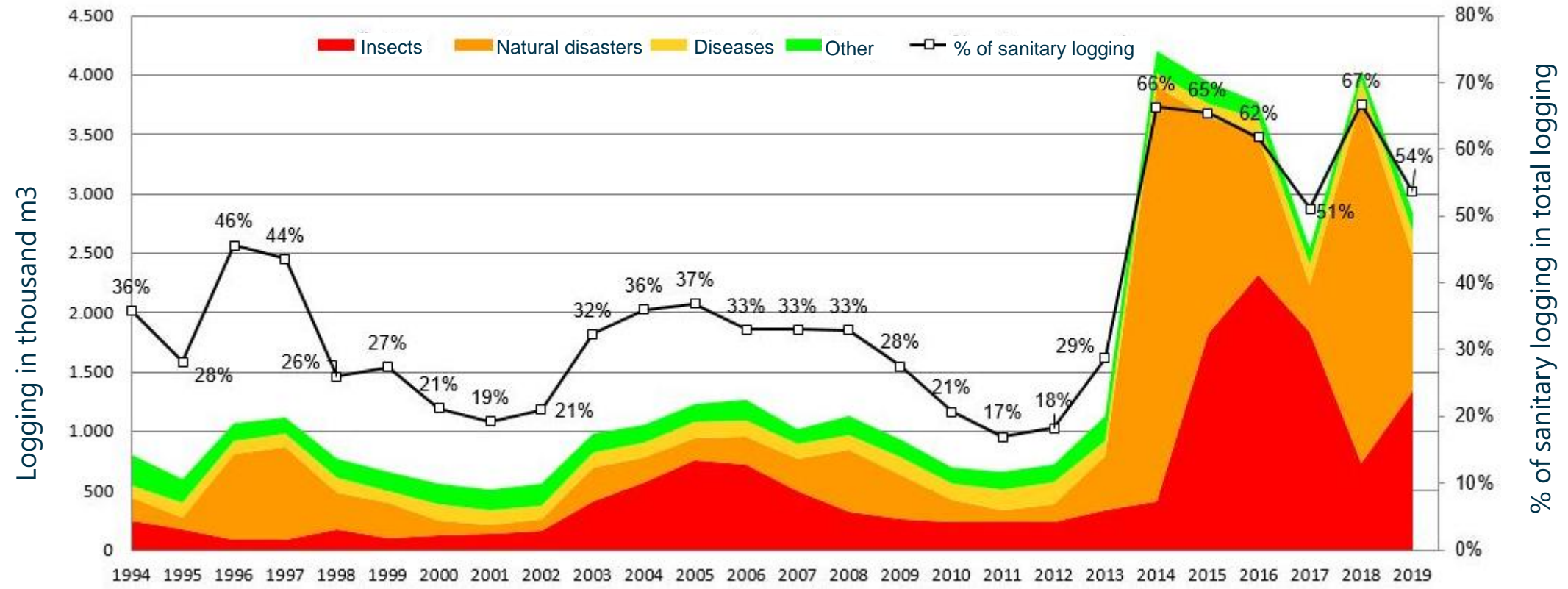
Sociomedical Institute

Analysis of historical landscapes



- Slovenia is a land of forests
- the forest grows up to an altitude of 1800 m
- 950 plant species, 71 tree species (10 conifers and 61 deciduous trees)
- beech, fir and spruce most widespread
- historic events on extensive exploitation of forest
- early beginnings of sustainable forest management (Hufnagel and Schollmayer concept) 130 years ago
- after WWII forest land is nationalised and under state management
- from 90s Slovenia is a country of private forests (77%, with 460 000 owners)
- forest management today - public forest services & private companies (wood workouts), raise of wood economic value

Logging for sanitary reasons in the period 1994-2019 (by cause of logging)



Source: Slovenia Forest Service. http://www.zgs.si/gozdovi_slovenije/o_gozdovih_slovenije/motnje_ki_ogrozajo_gozdove/index.html



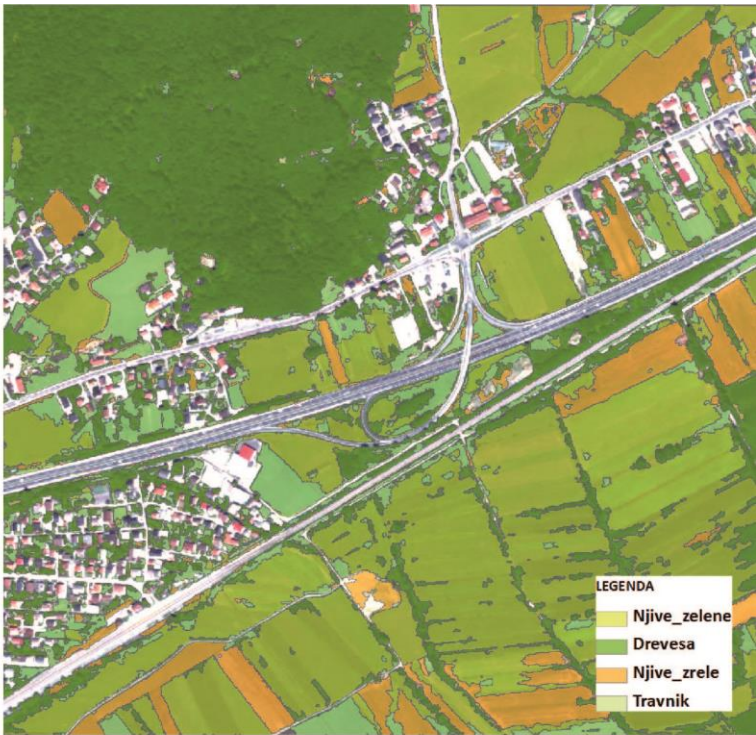
What about EO and monitoring?

Updating forest (boundary) layer with VHR data? (2010)

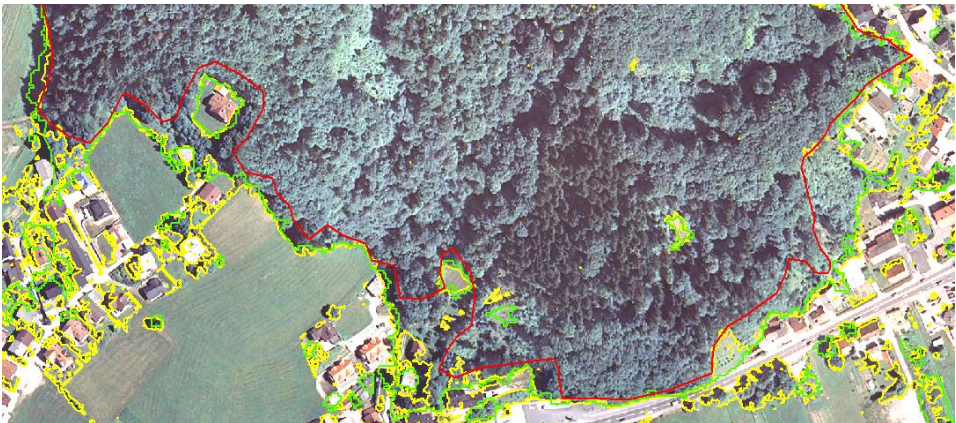


5400m x 5200m, D48/GK

1



2



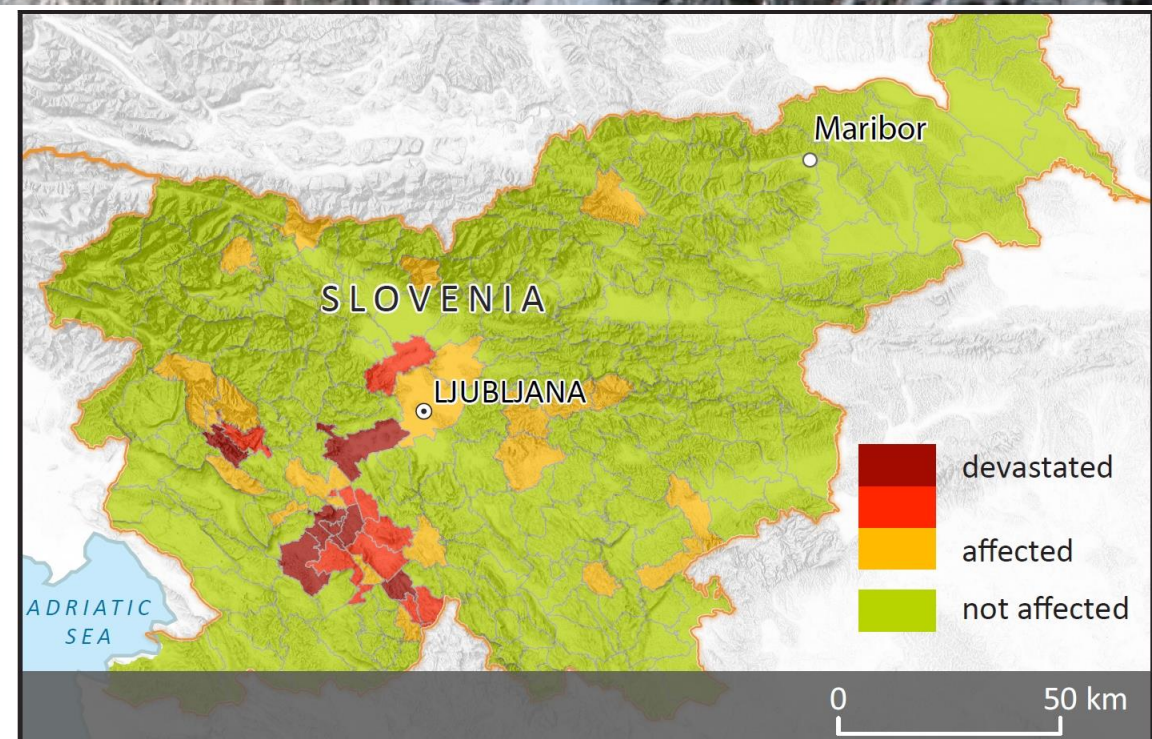
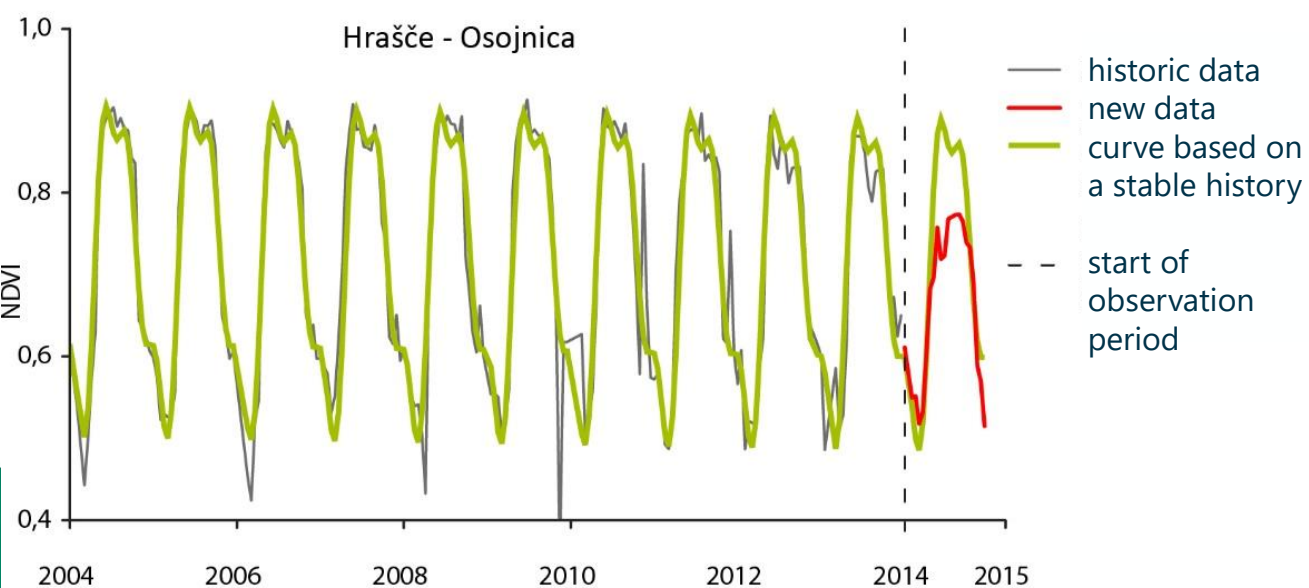
DTK 5

WorldView 2_2010

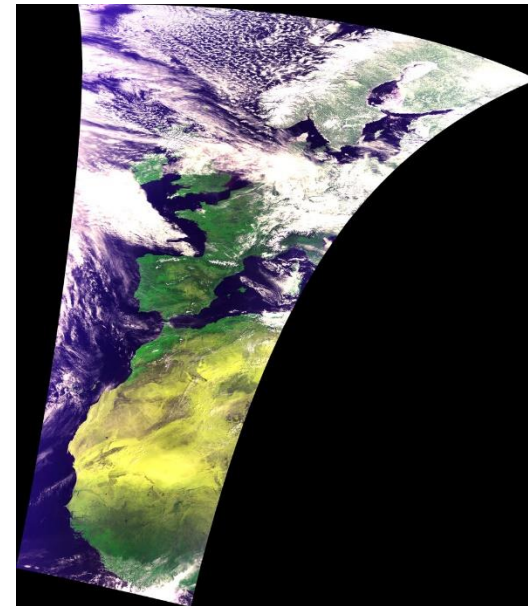
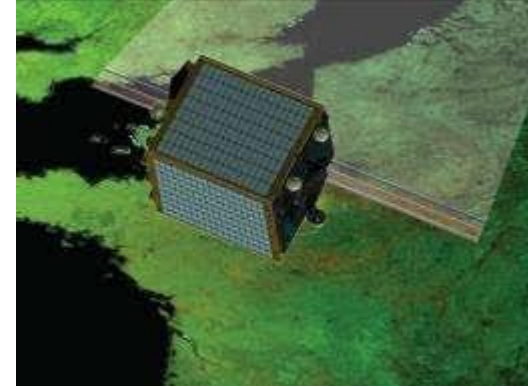
DOF_2011, 2006

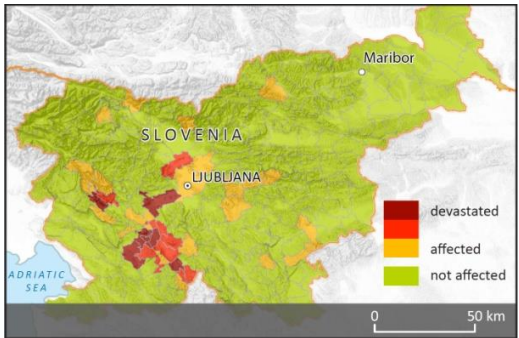
Outdated topographic maps!

Ice sleet damage mapping with MODIS time series and BFAST (2014)



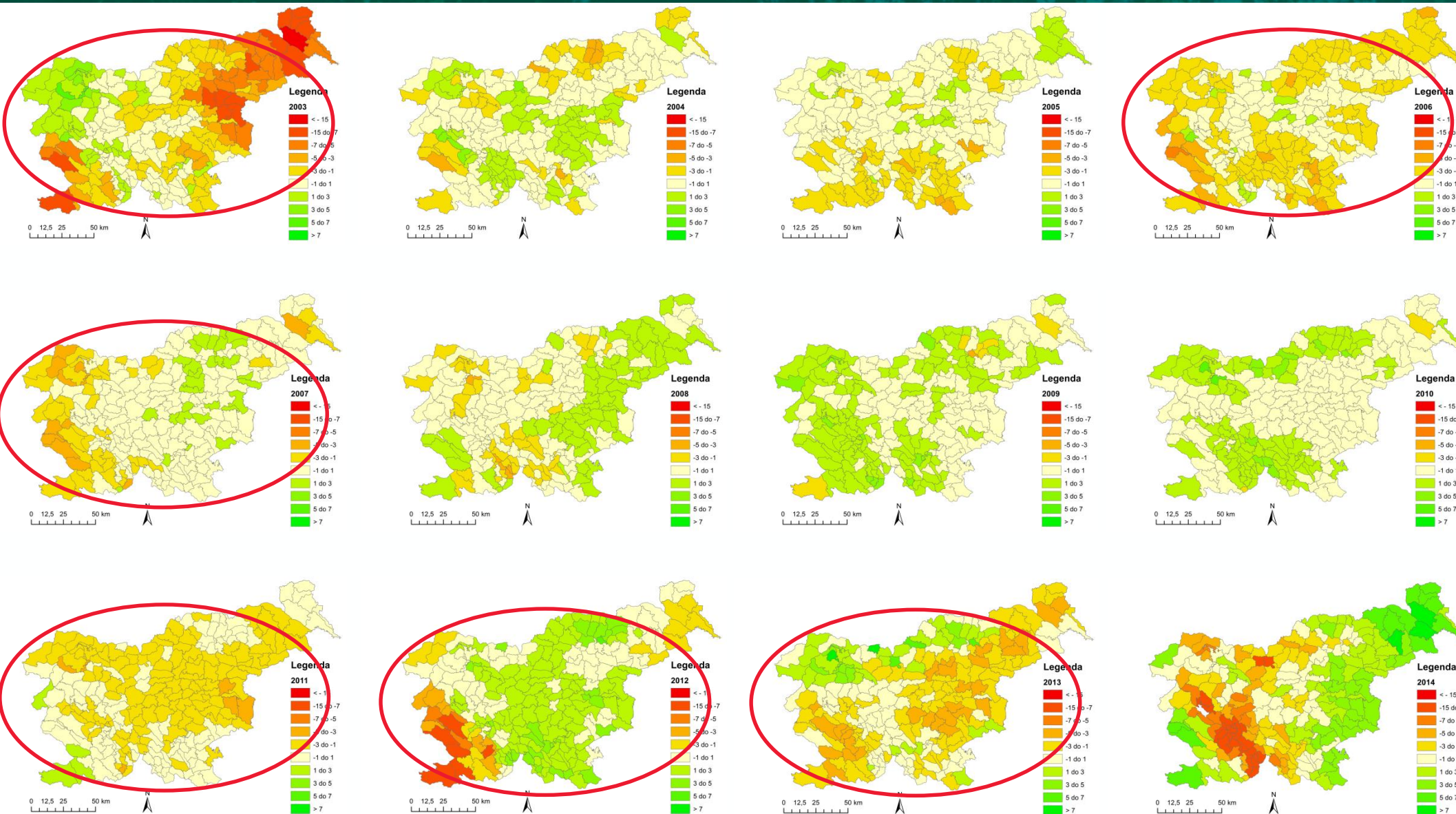
- PROBA-V mission
- SPOT-VGT → PROBA-V → Sentinel-3 at ~300 m, in B-R-NIR-SWIR
- 100 m resolution (central camera) initially not intended for exploitation within PROBA-V mission
- all-kind of insights into PROBA-V 100 m imagery
- radiometric and geometric characteristics
- impact of data pre-processing on PROBA-V vegetation products development
- capability of vegetation products for observation of disturbances in forest





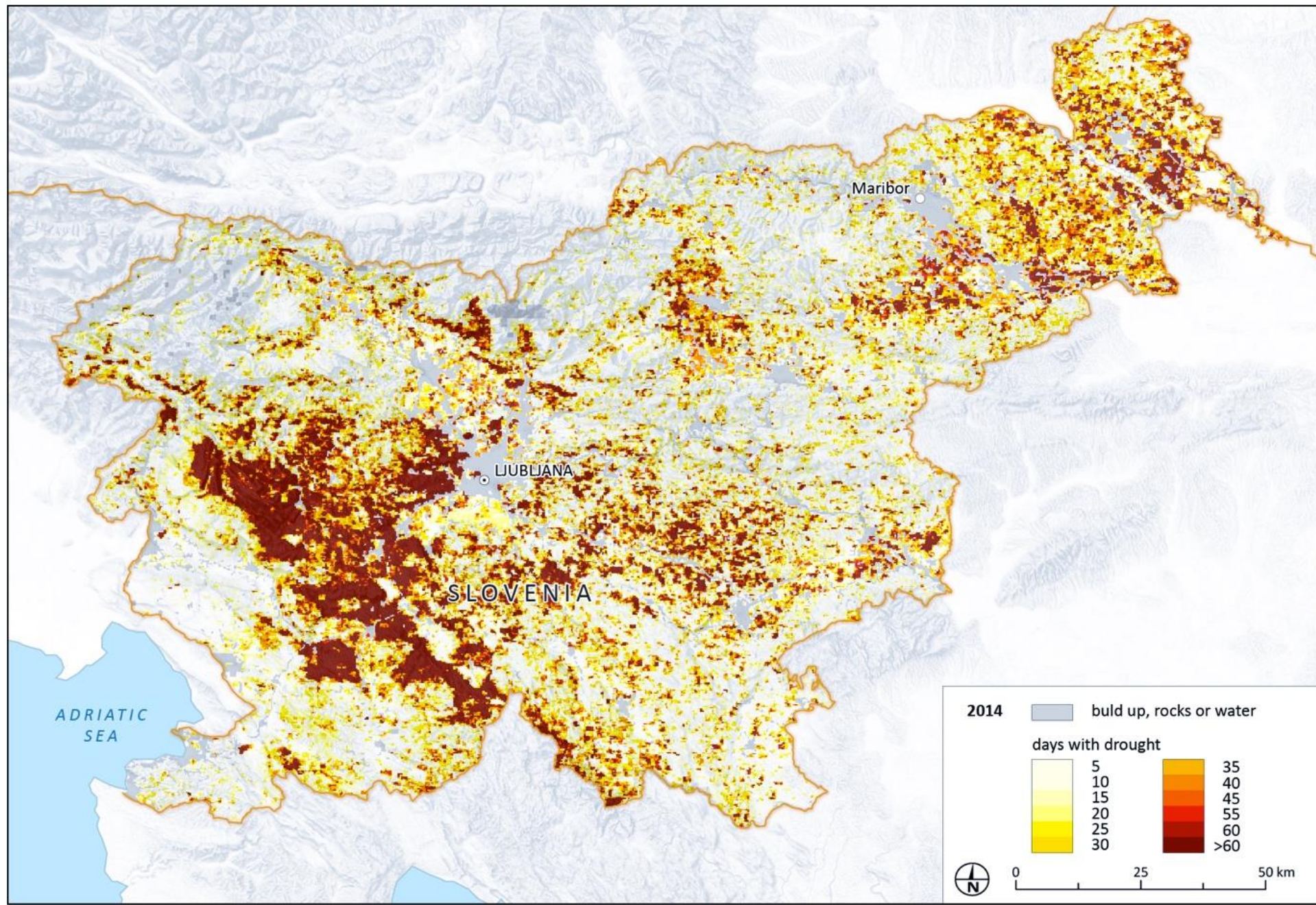
- assessment of radiometric pre-processing on VP development
- stability, complementarity, informative value

fAPAR annual differences in forest state (2003-2014)



Forest response
to drought
seasons?

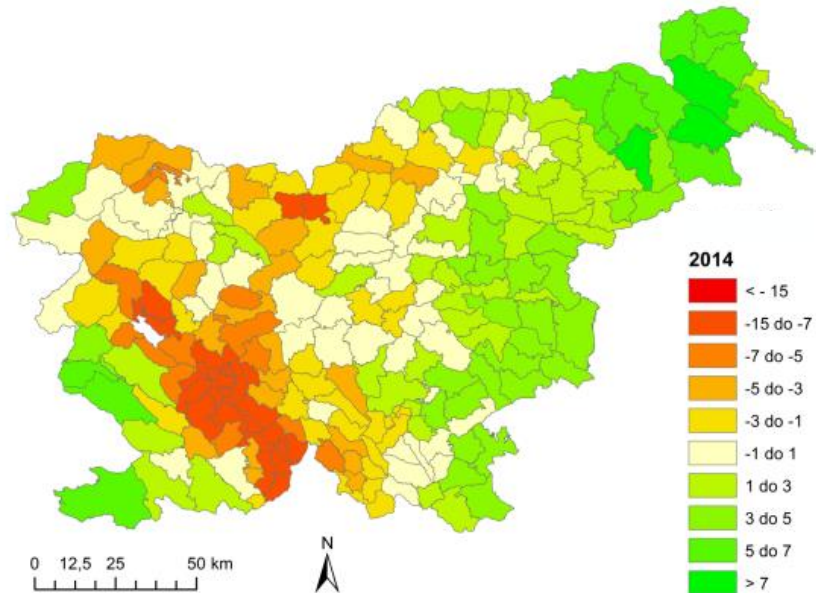
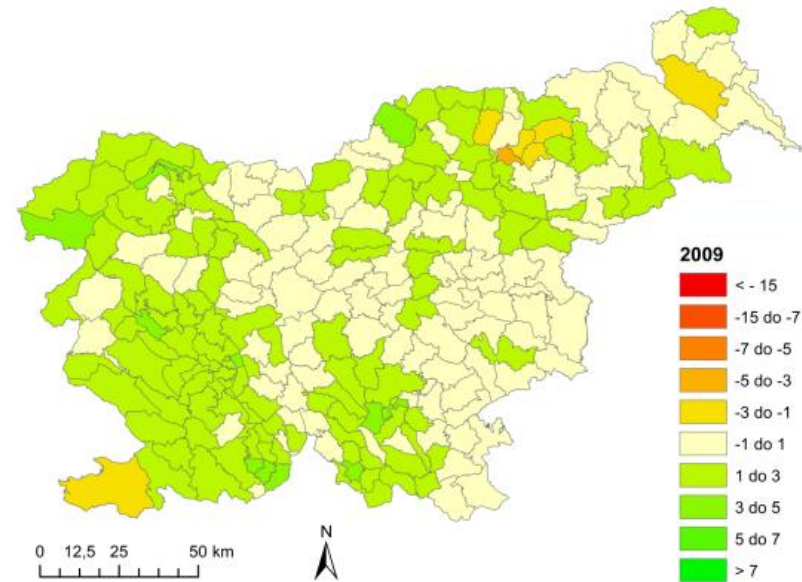
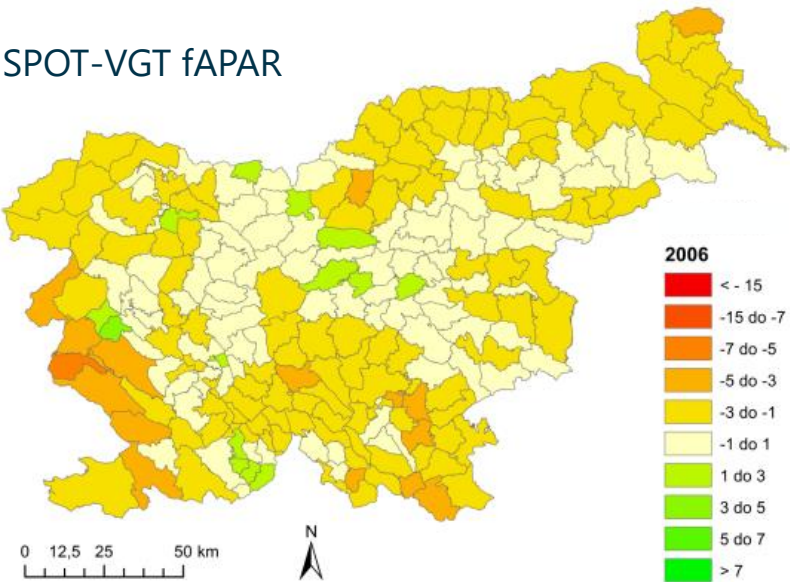
Days with drought from MODIS and MERIS time series and meteo ground stations 2006-2014



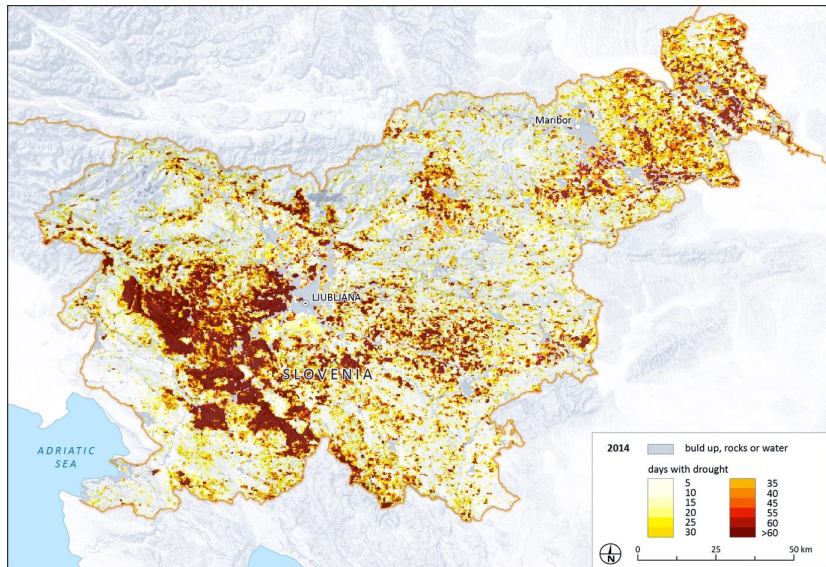
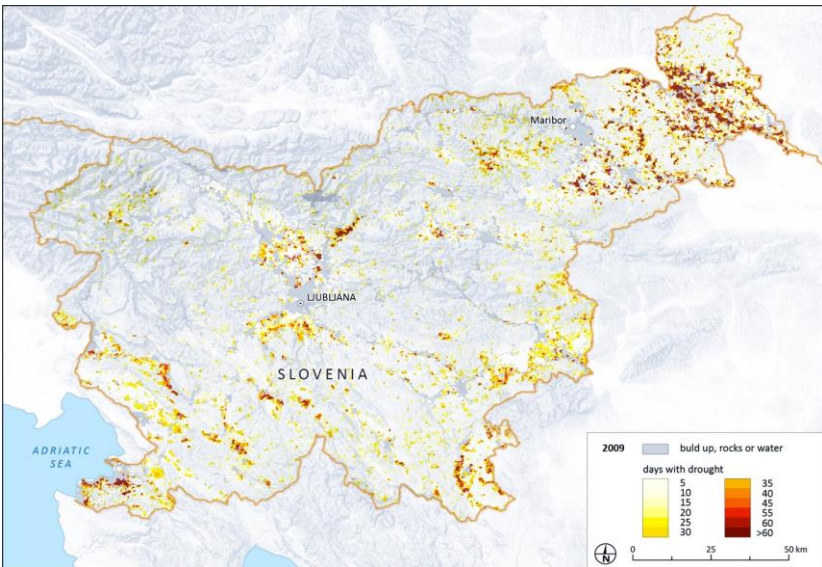
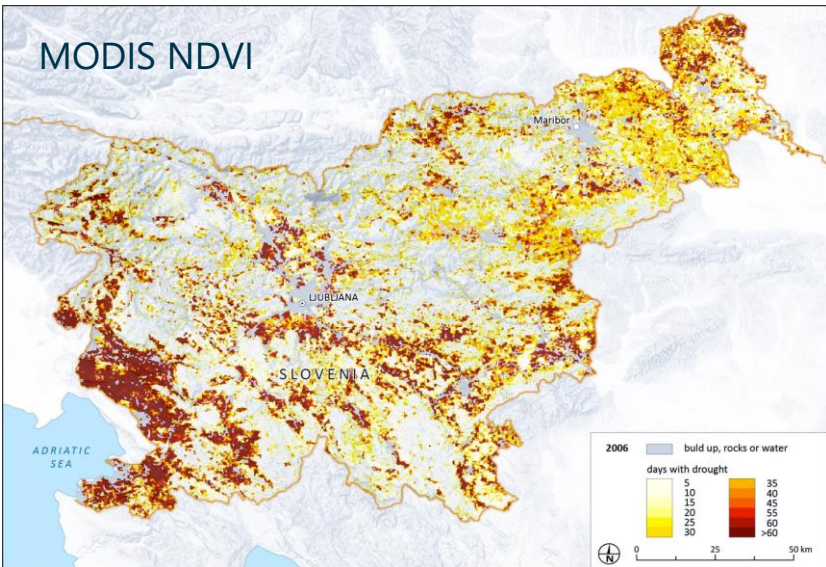
Detection of forest/vegetation growth anomalies



SPOT-VGT fAPAR

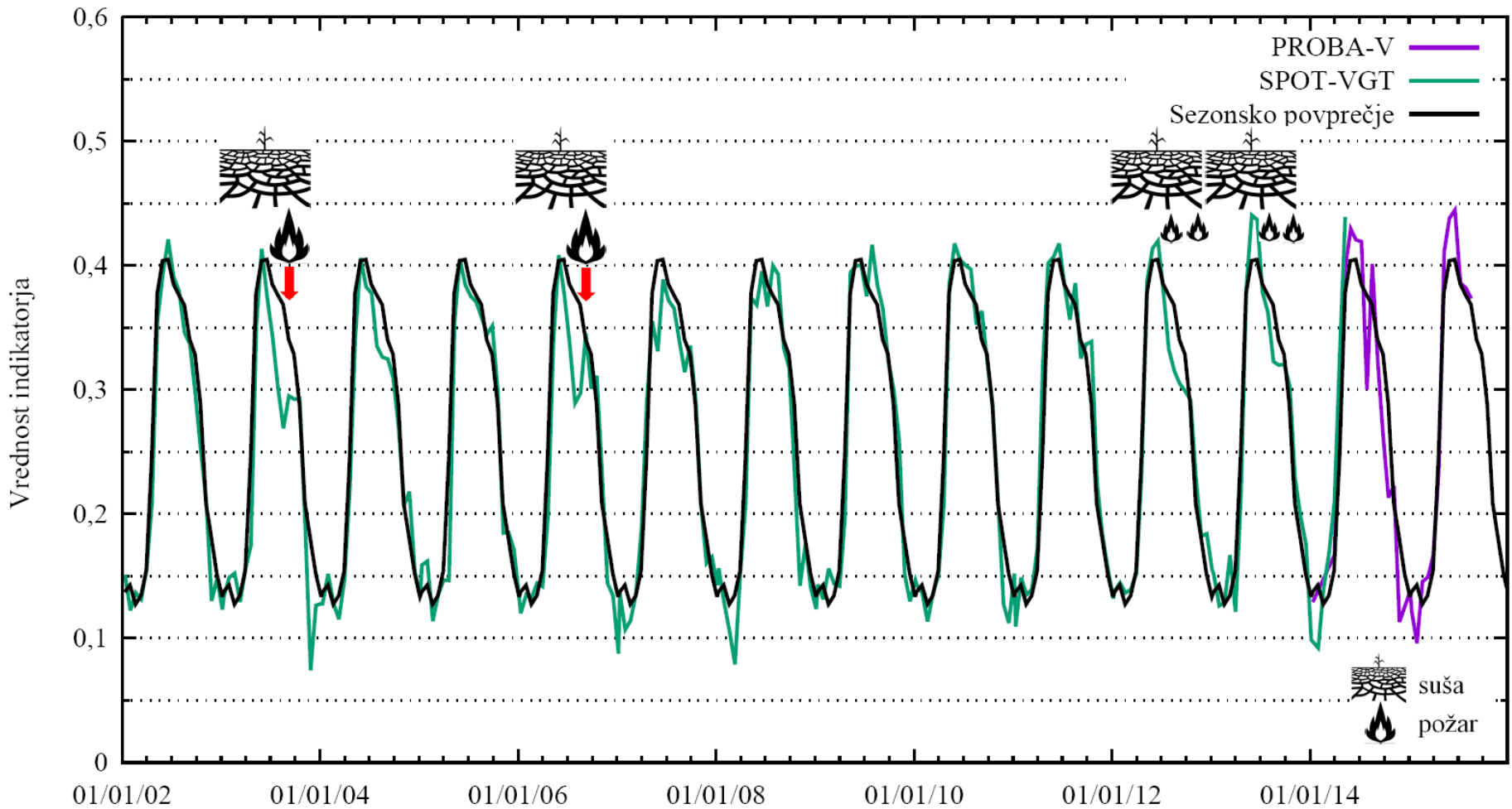


MODIS NDVI



Small area forest fires and regrowth?

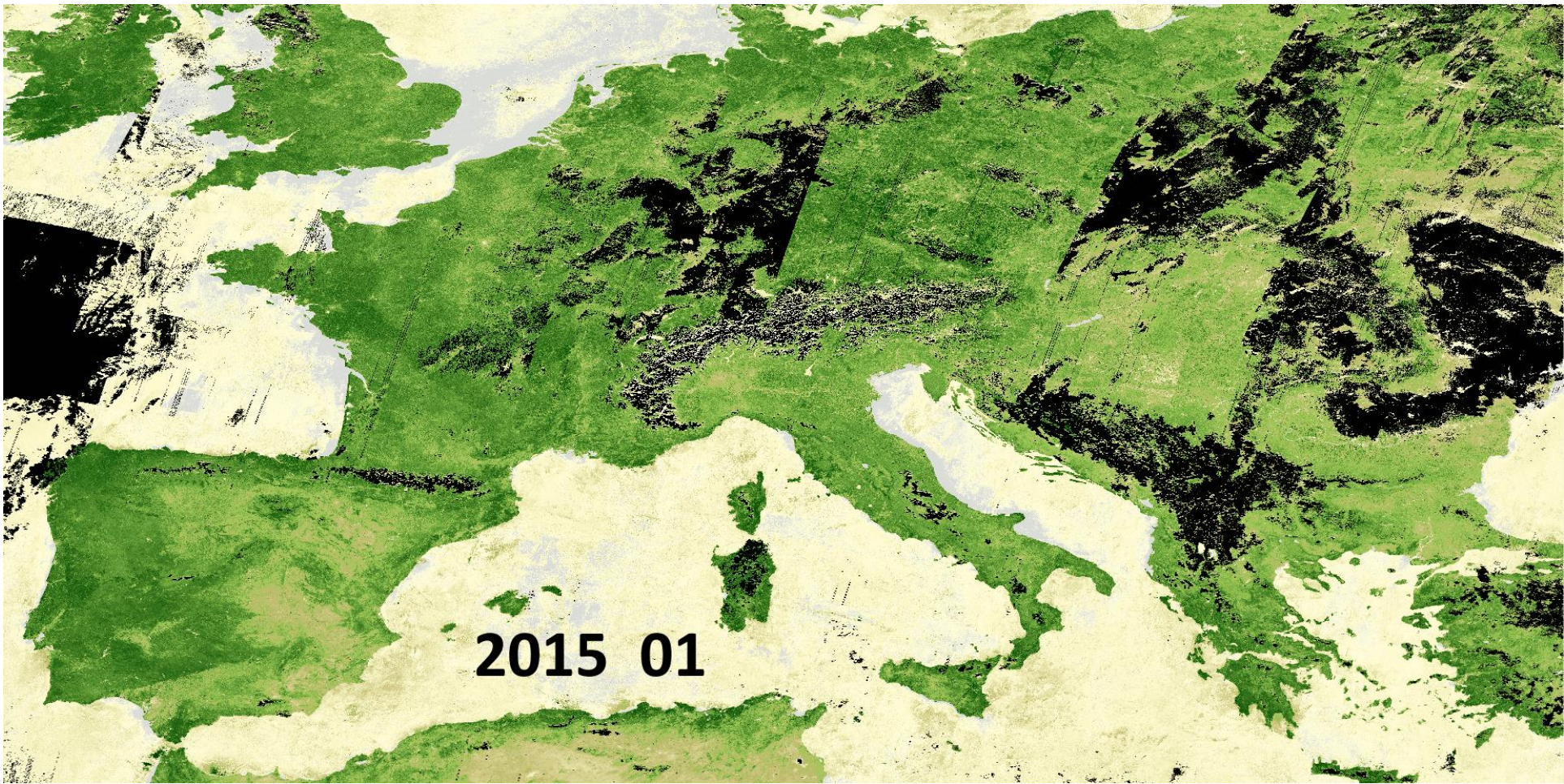
Indikator MSAVI GGE ID 224 - GGO: SEŽANA GGE: KRAS 1

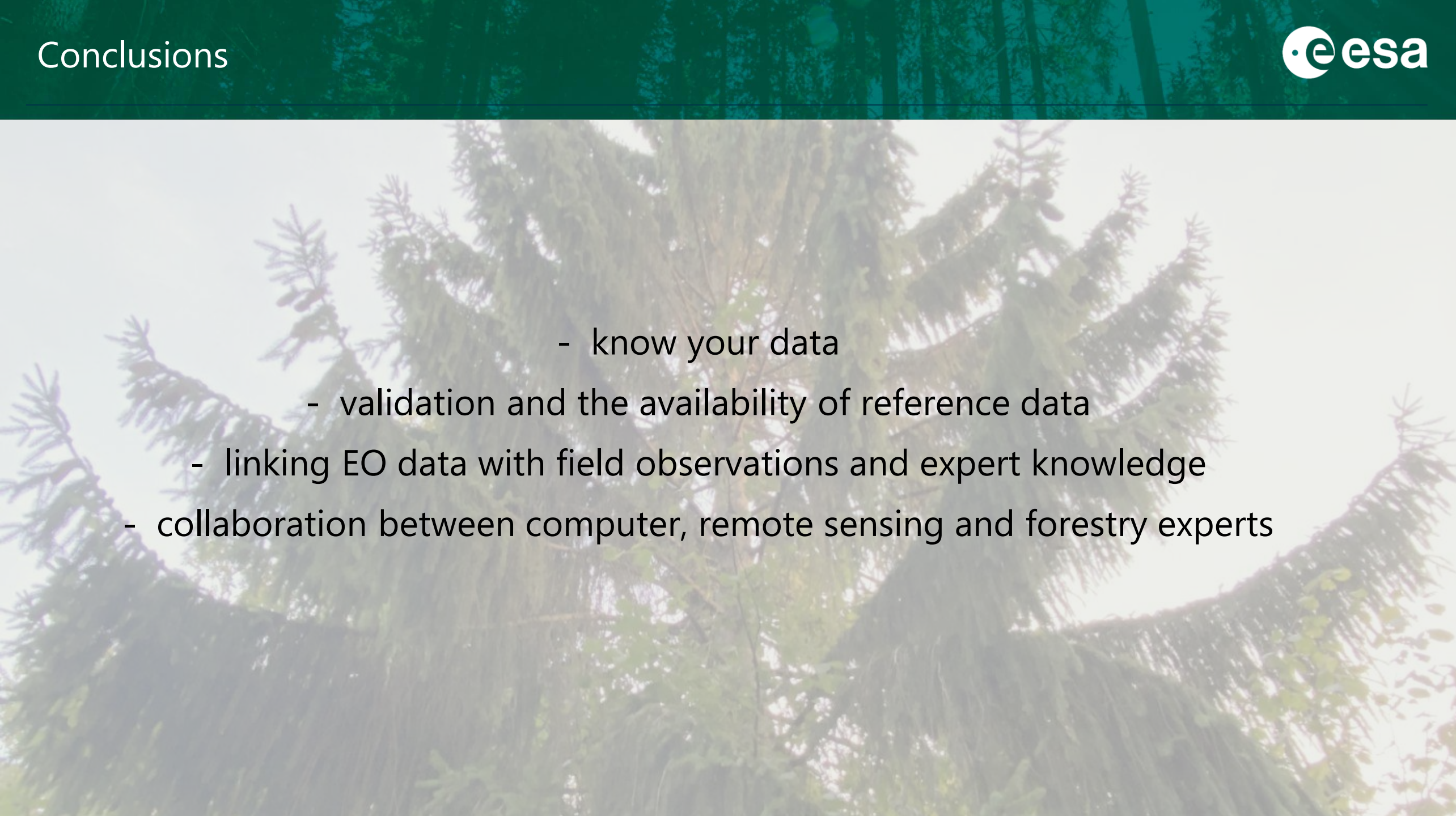


Drought in 2003, 2006,
2007, 2011, 2012, 2013

MSAVI: Modified Soil-
Adjusted Vegetation
Index

Monthly mosaic of PROBA-V NDVI composites: Europe



- 
- A low-angle photograph of a dense forest of tall evergreen trees, looking up towards the sky. The image is slightly faded and serves as a background for the text.
- know your data
 - validation and the availability of reference data
 - linking EO data with field observations and expert knowledge
 - collaboration between computer, remote sensing and forestry experts



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