

EO 4 Ecosystem Accounting 2022

Estimating Ecological Condition Using Spatial and Temporal Approaches

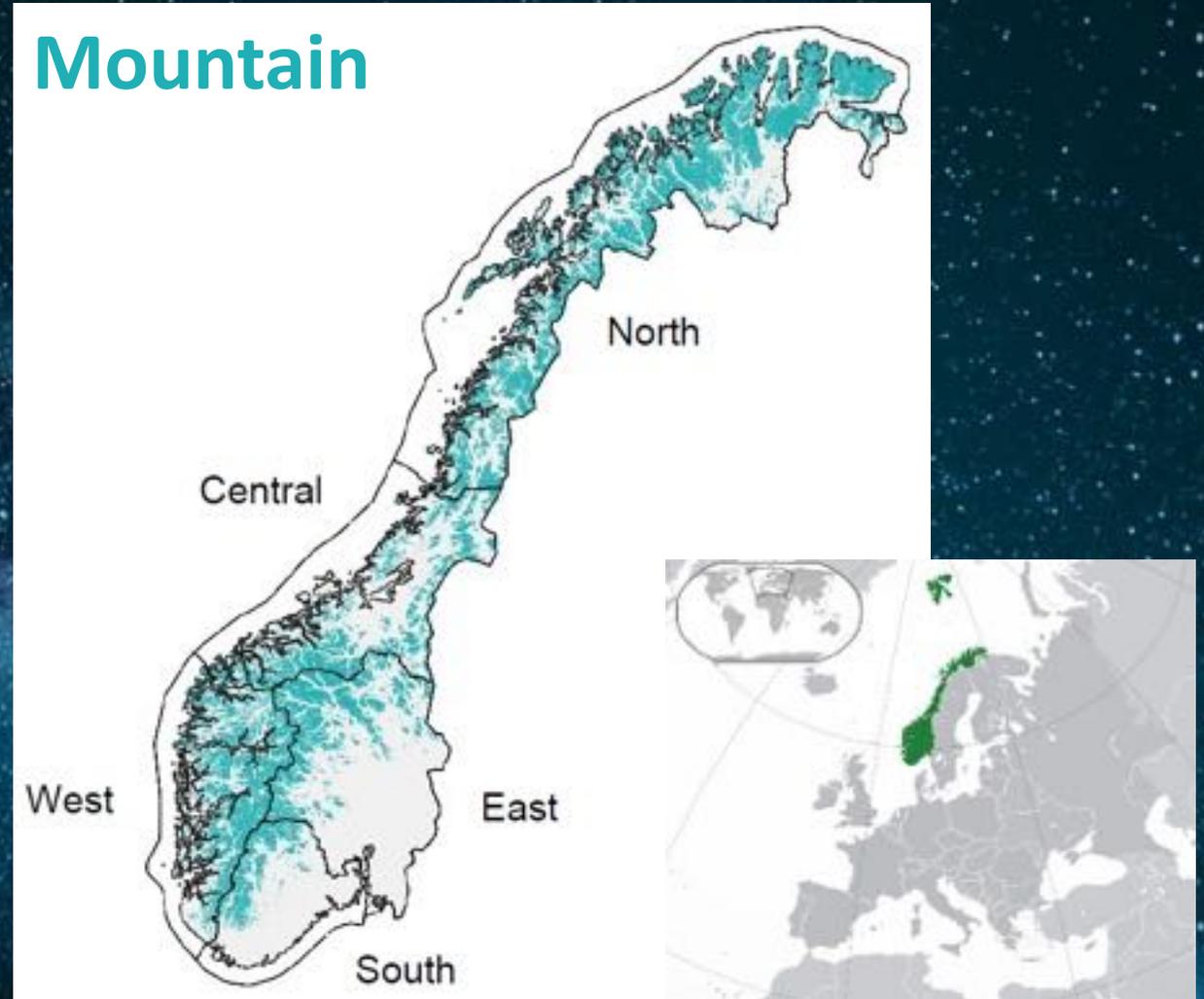
Joachim Töpper (joachim.topper@nina.no), Tessa Bargmann,
Simon Jakobsson, Zander Venter

Norwegian Institute for Nature Research

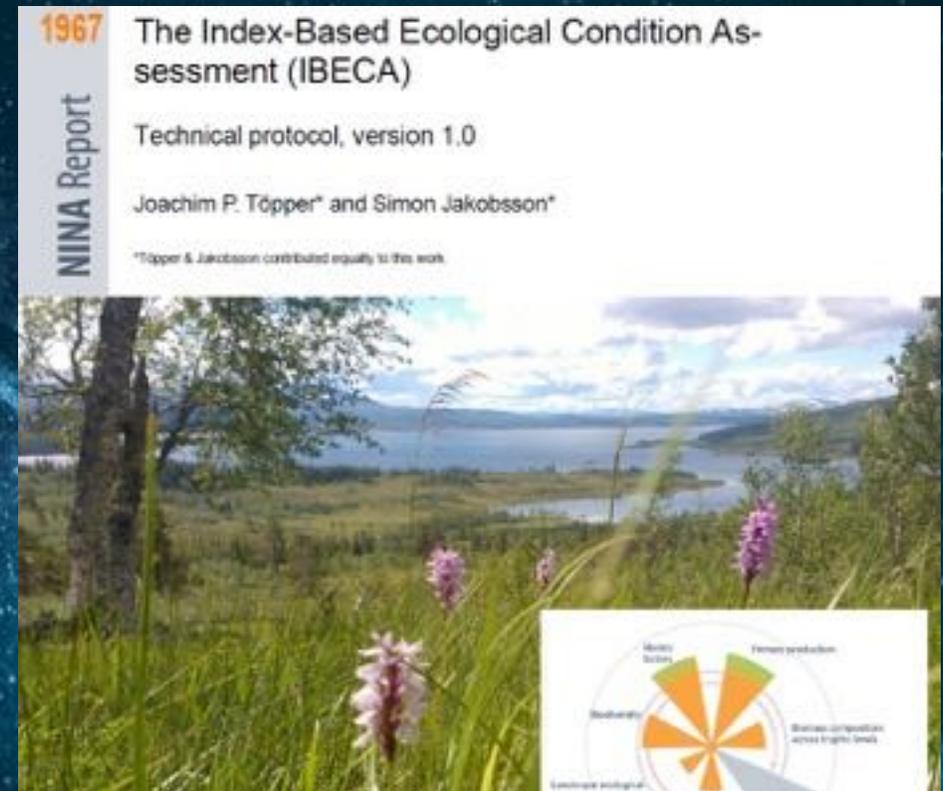
Nov. 30th 2022



The two major ecosystems in Norway



IBECA – Index-Based Ecological Condition Assessment



 ninanor.github.io/IBECA
github.com/NINAnor/IBECA

Indicator data

Forest

NDVI (upper lv*)
NDVI (lower lv*)
Ellenberg N (upper lv*)
Ellenberg N (lower lv*)
Ellenberg F (upper lv*)
Ellenberg F (lower lv*)
Large cervids (upper lv*)
Large carnivores
Absence of alien species
Bilberry cover
Rowan-aspen-goat willow
Dead wood total
Coarse woody debris
Biologically old forest
Area without technical infrastructure
Nature Index for forests

Mountain

NDVI (upper)
NDVI (lower)
Reindeer
Small rodents
Willow grouse
Ptarmigan
Arctic fox
Wolverine
Golden eagle
Absence of alien species
Area without technical infrastructure
Connectivity
Nature Index for mountains (mod.)
Ellenberg N (upper)
Ellenberg N (lower)
Ellenberg L (upper)
Ellenberg L (lower)
Vegetation heat requirement
Area of glaciers
Snow depth
Snow cover duration
Winter rain

Indicator data

Forest

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Indicator design

Forest

Spatial approach:

- Protected areas
- Random forest distribution model for NDVI
- Prediction for entire country (pNDVI)
- Difference to empirical NDVI (dNDVI)

Scaling to 0, 0.6 & 1 defined via reference distribution

Mountain

Temporal approach:

- NDVI~time models for time slopes for every pixel
- Reference slope distribution via randomized years in models

Scaling to 0, 0.6 & 1 defined via reference distribution



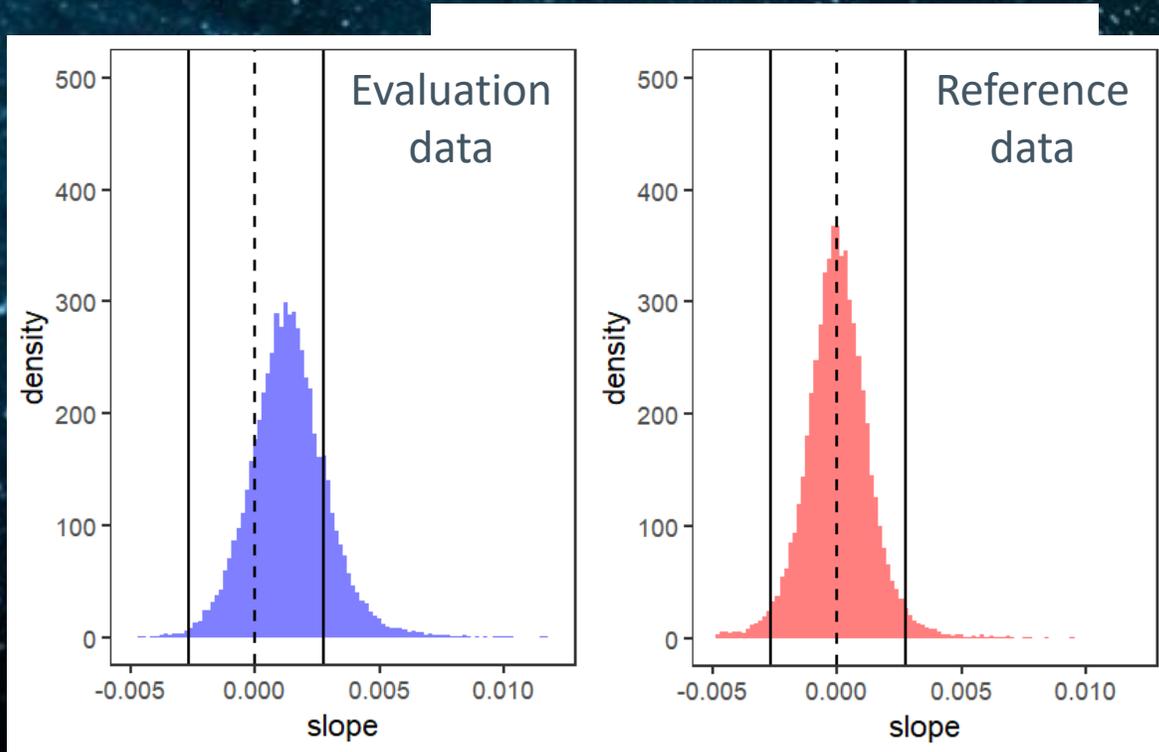
Google Earth Engine



MODIS

Midwests Simulation Imaging Spectrometers

Indicator design



Scaling to 0, 0.6 & 1
defined via reference
distribution

Mountain

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Scaling to 0, 0.6 & 1
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Google Earth Engine



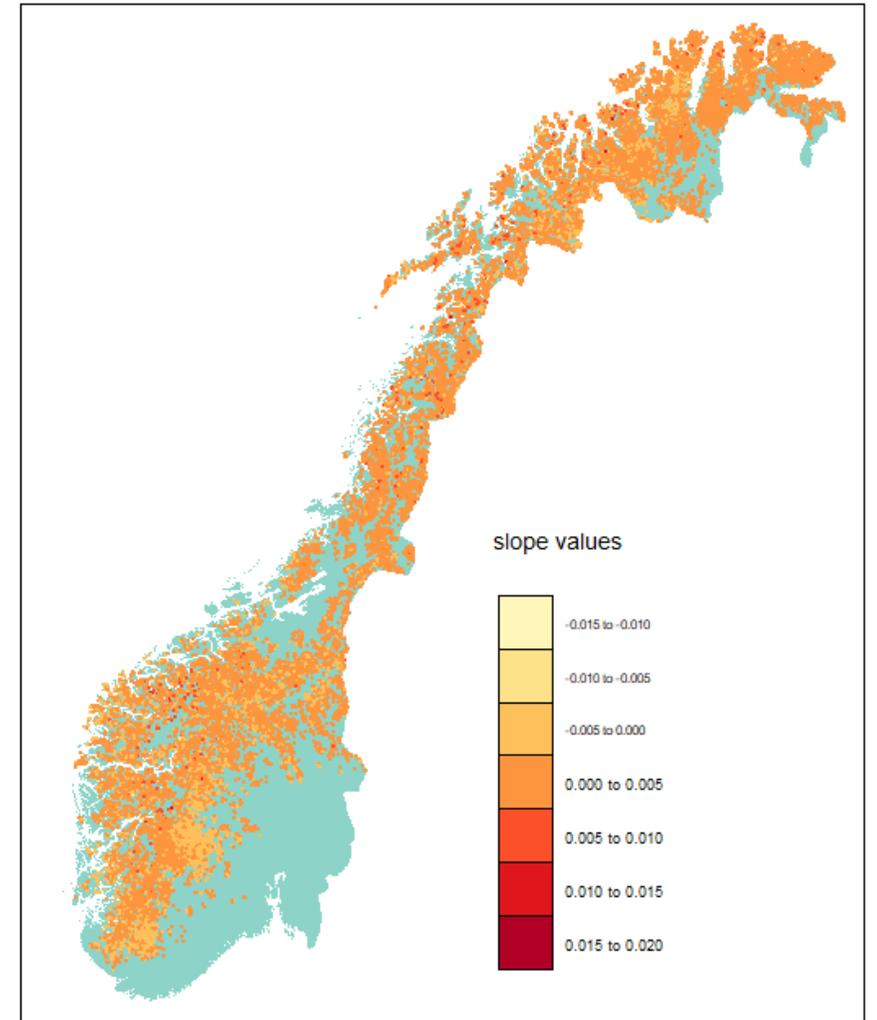
MODIS
Moderate Resolution Imaging Spectroradiometer

Forest – NDVI deviation

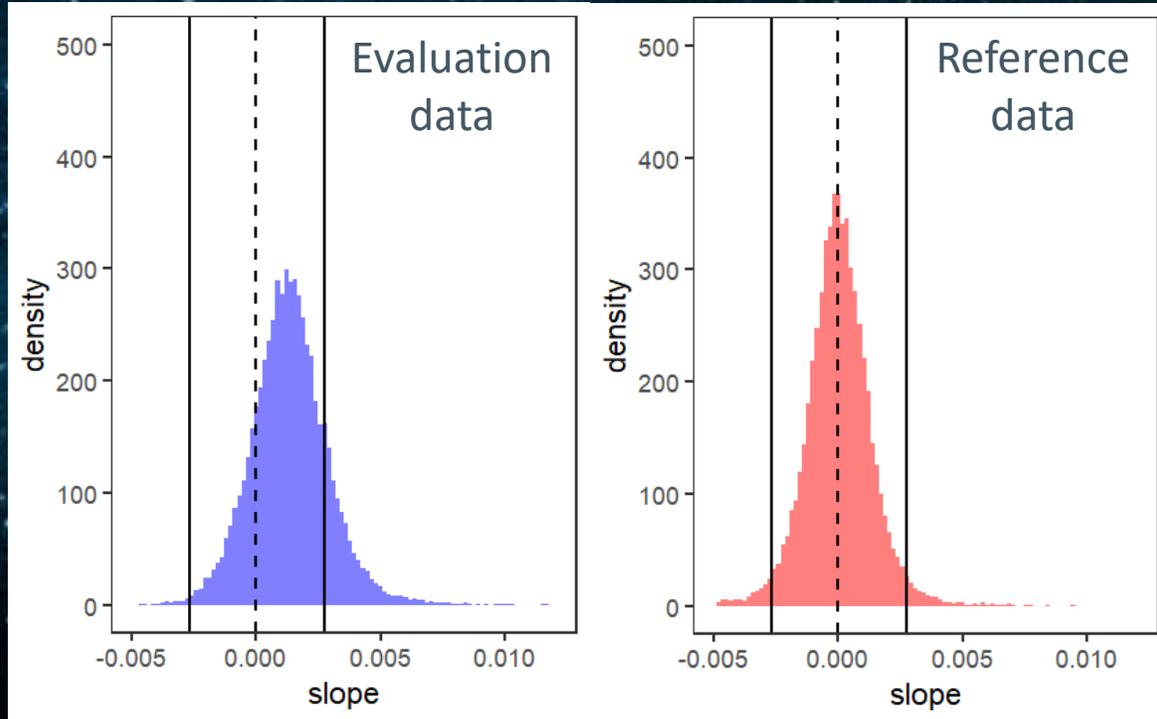


Mountain – NDVI slopes

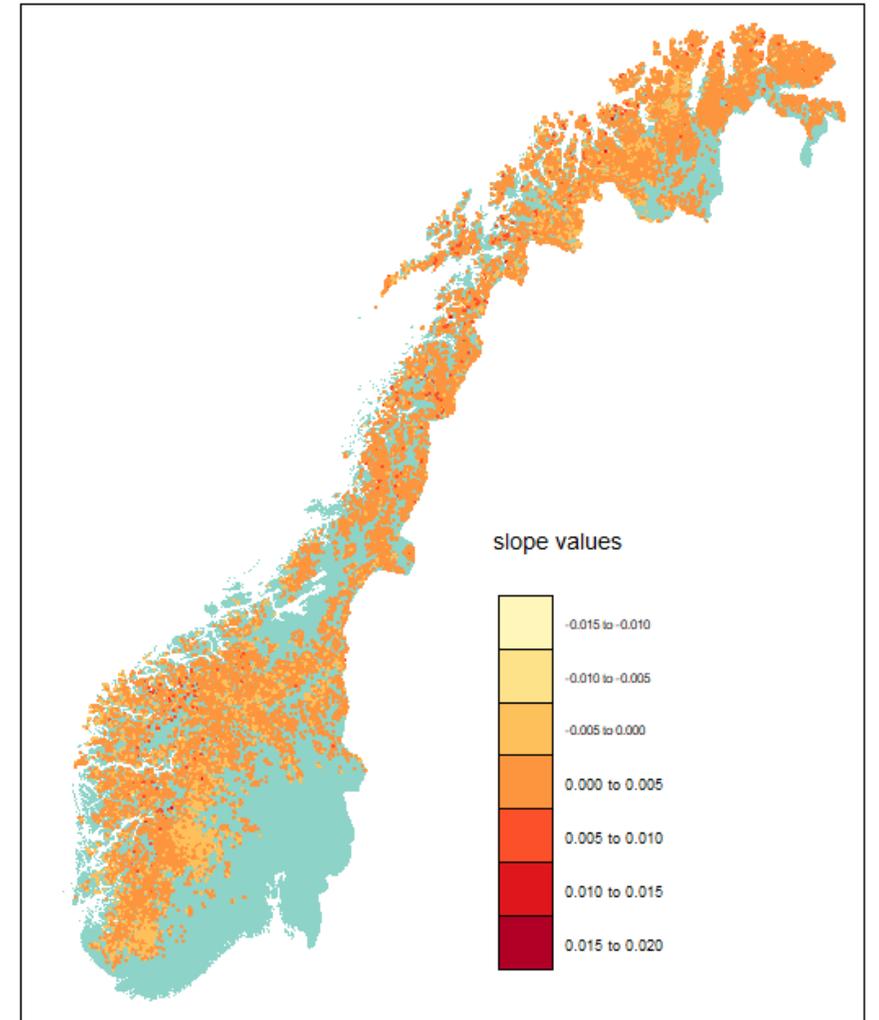
NDVI slopes, mountain



Mountain – NDVI slopes

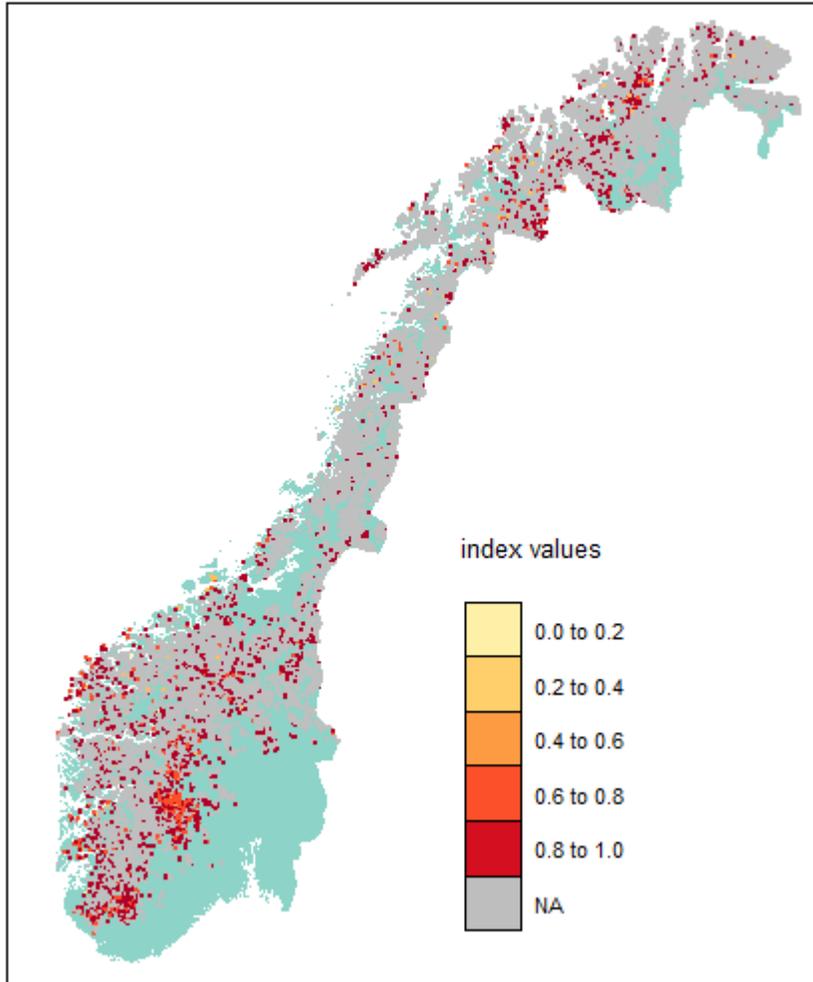


NDVI slopes, mountain

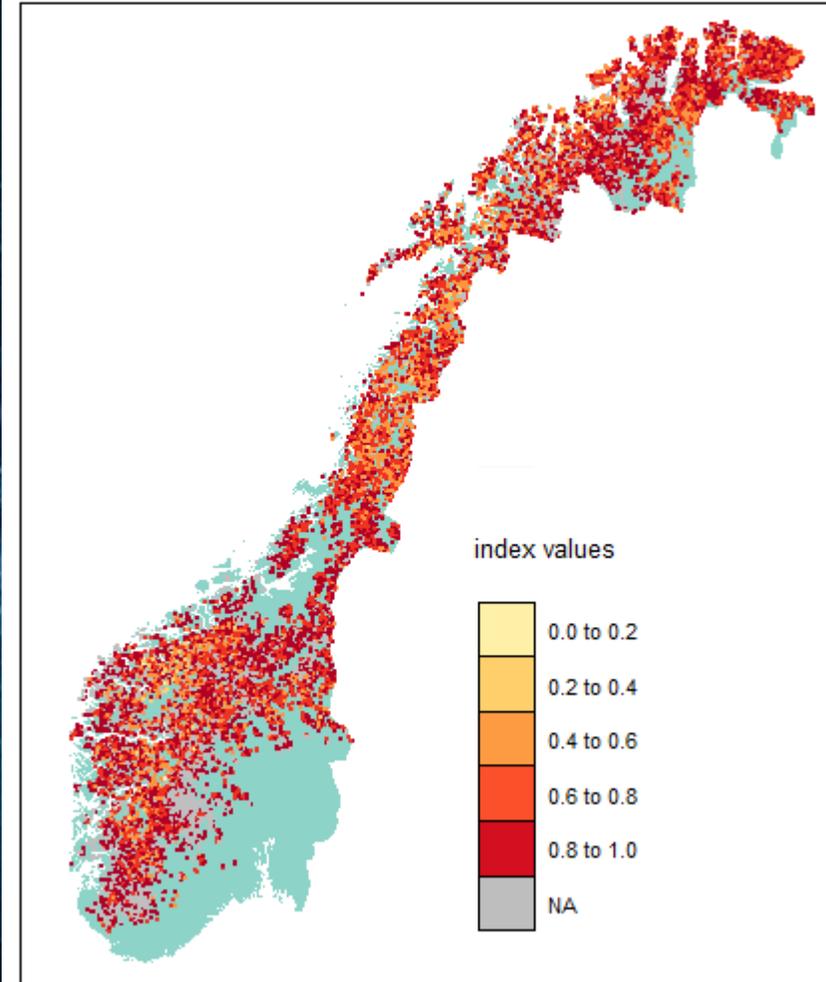


Mountain – NDVI slopes scaled

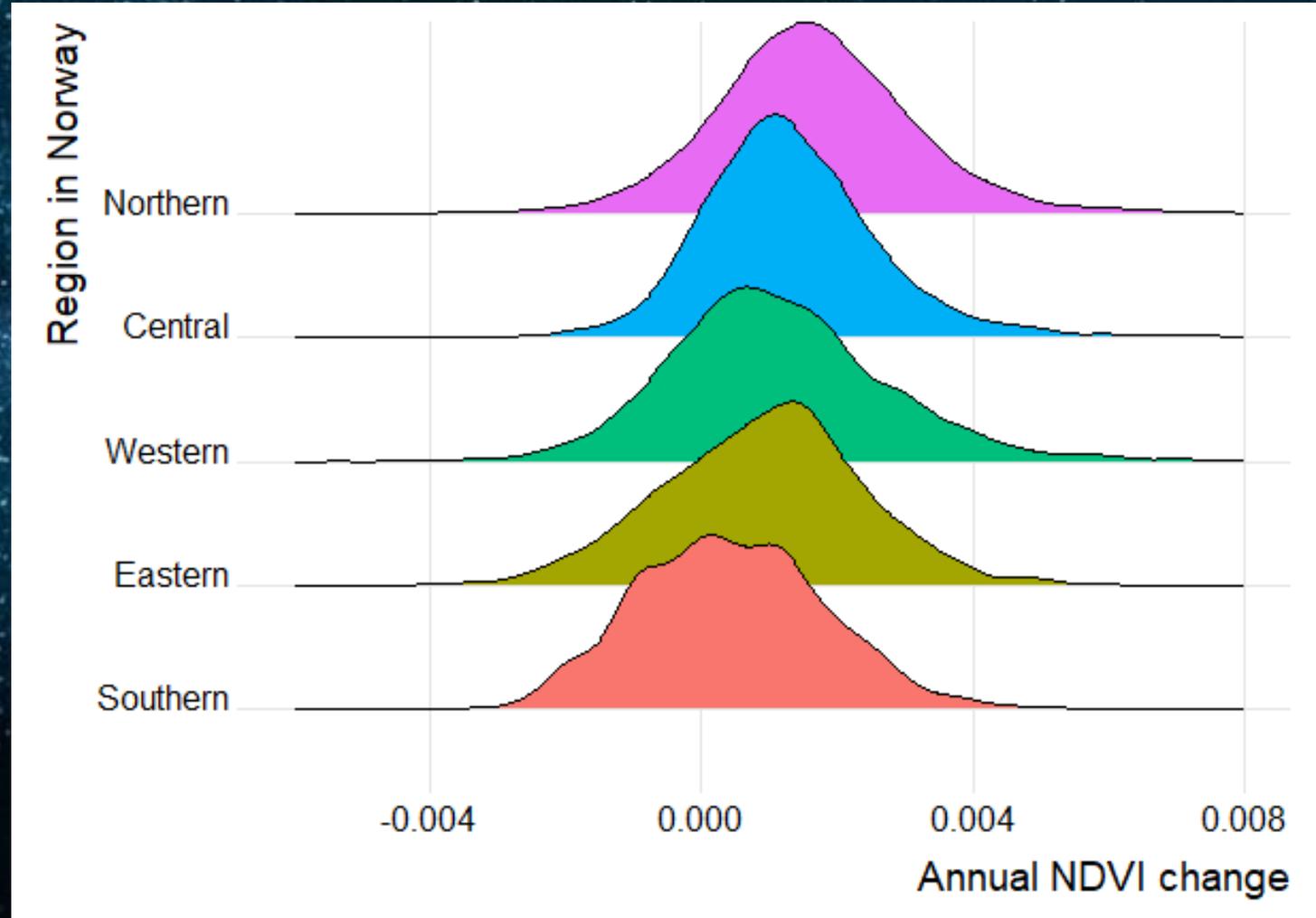
NDVI scaled (lower), mountain



NDVI scaled (upper), mountain

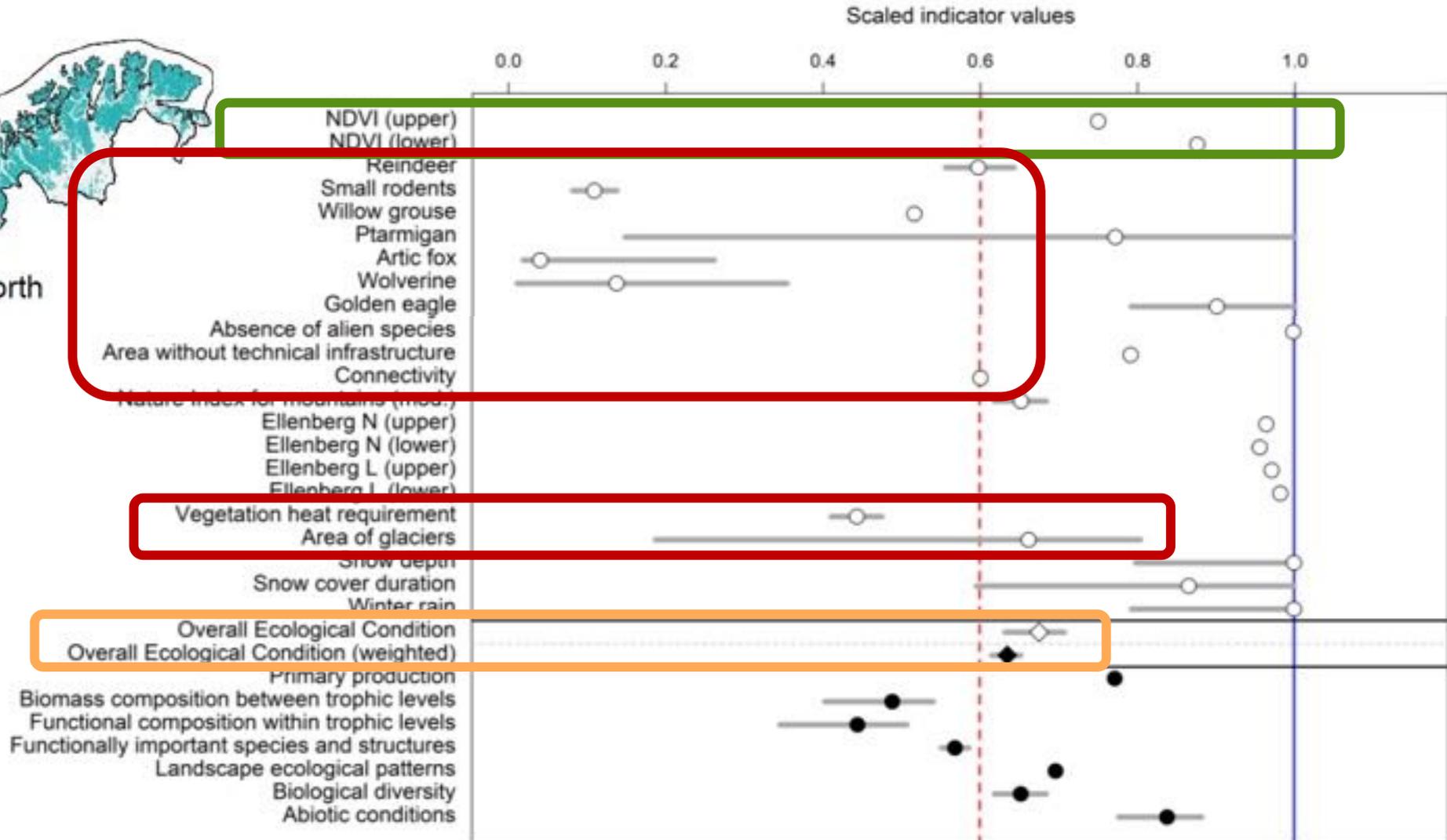
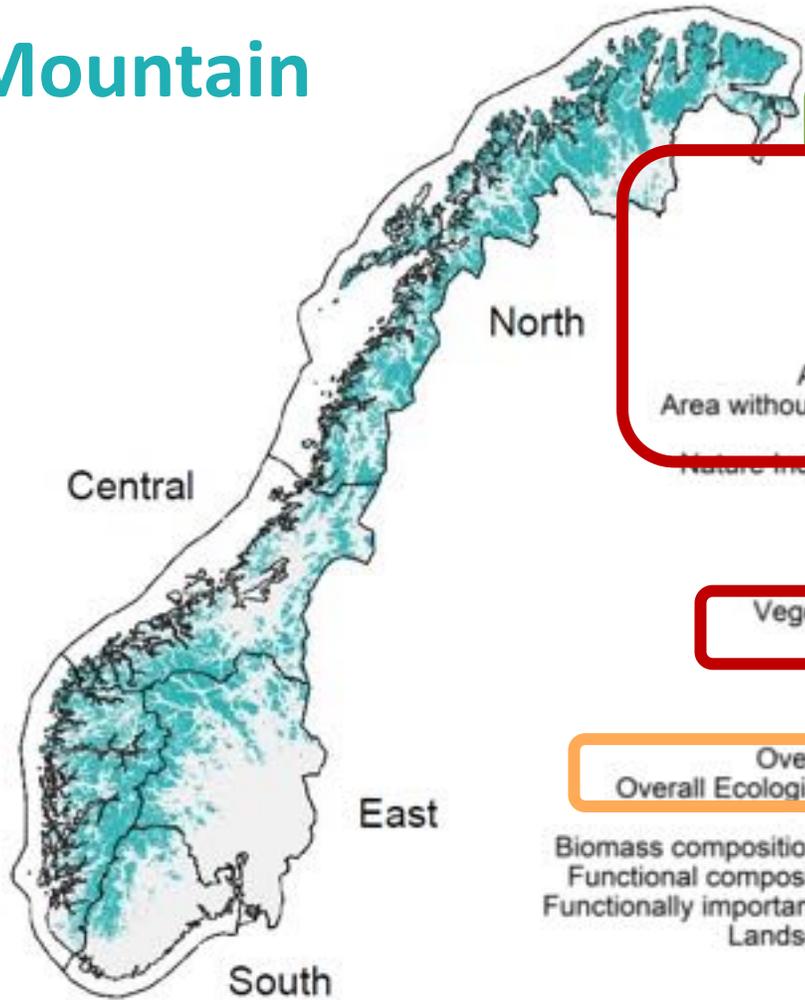


Mountain – NDVI slopes by region



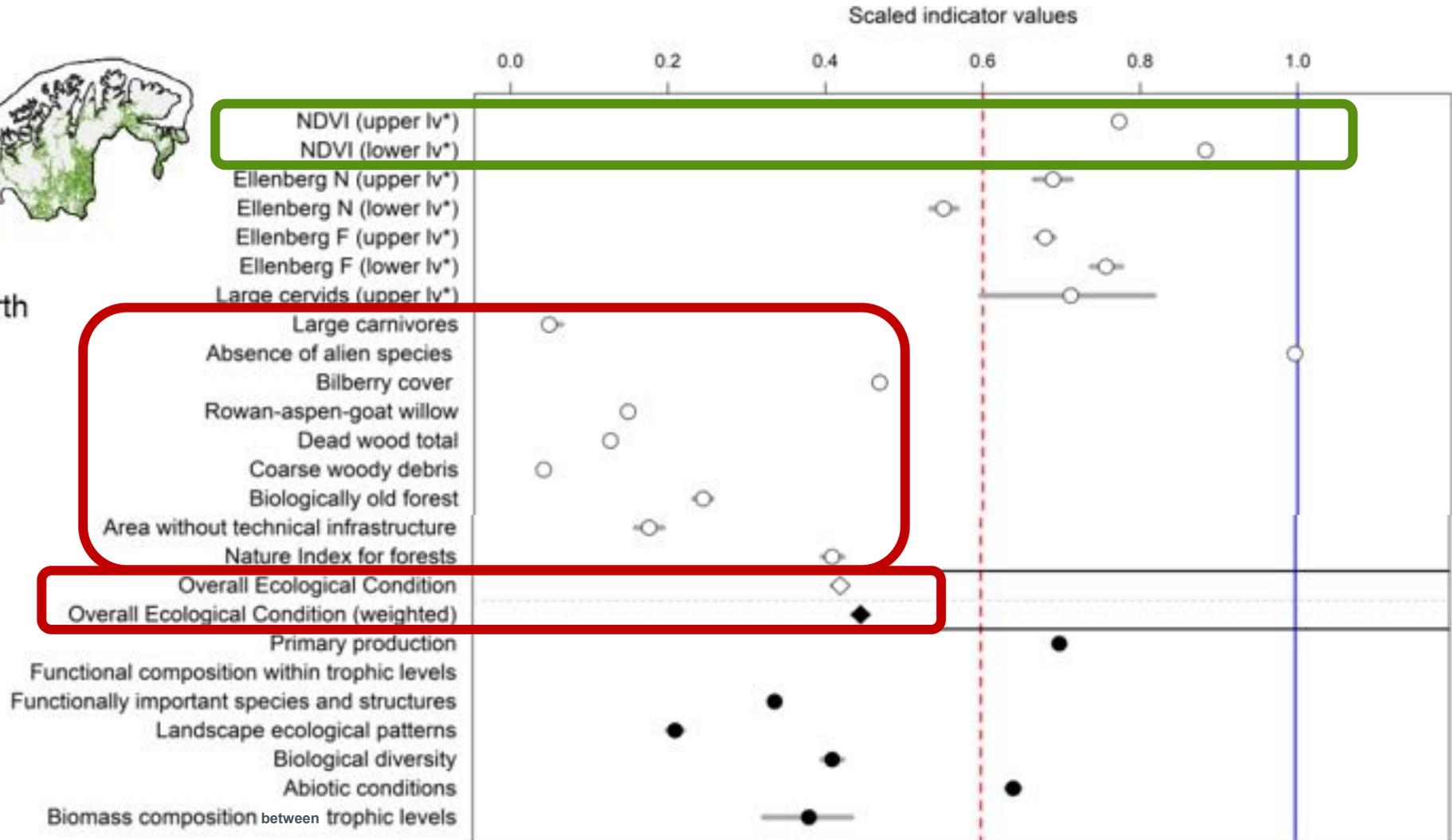
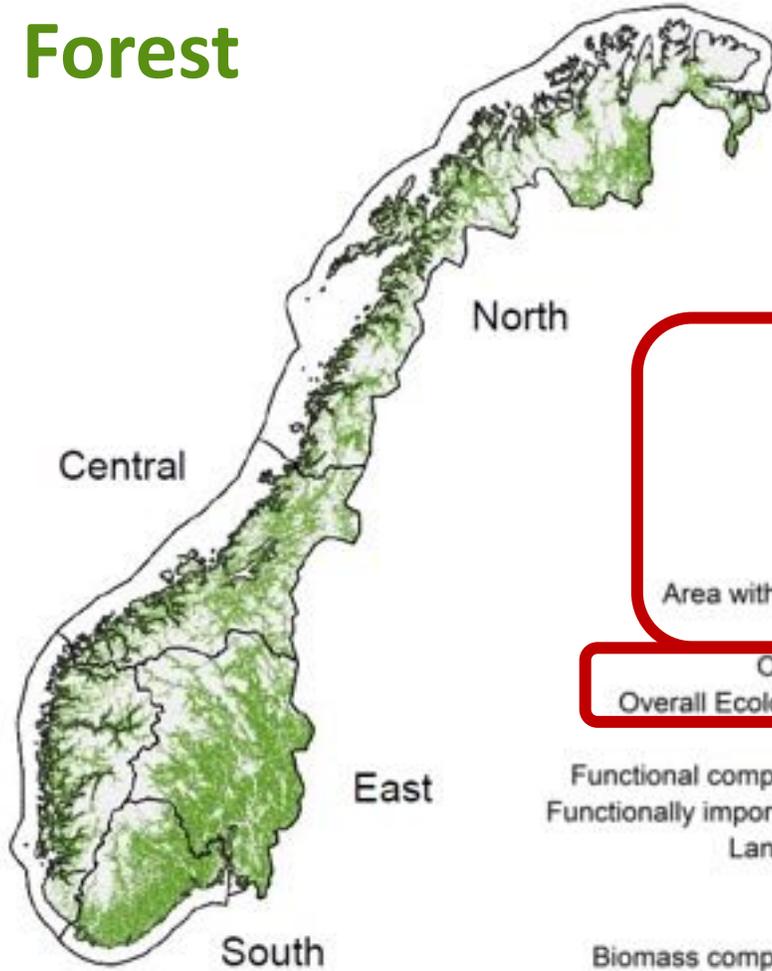
Overall verdict

Mountain

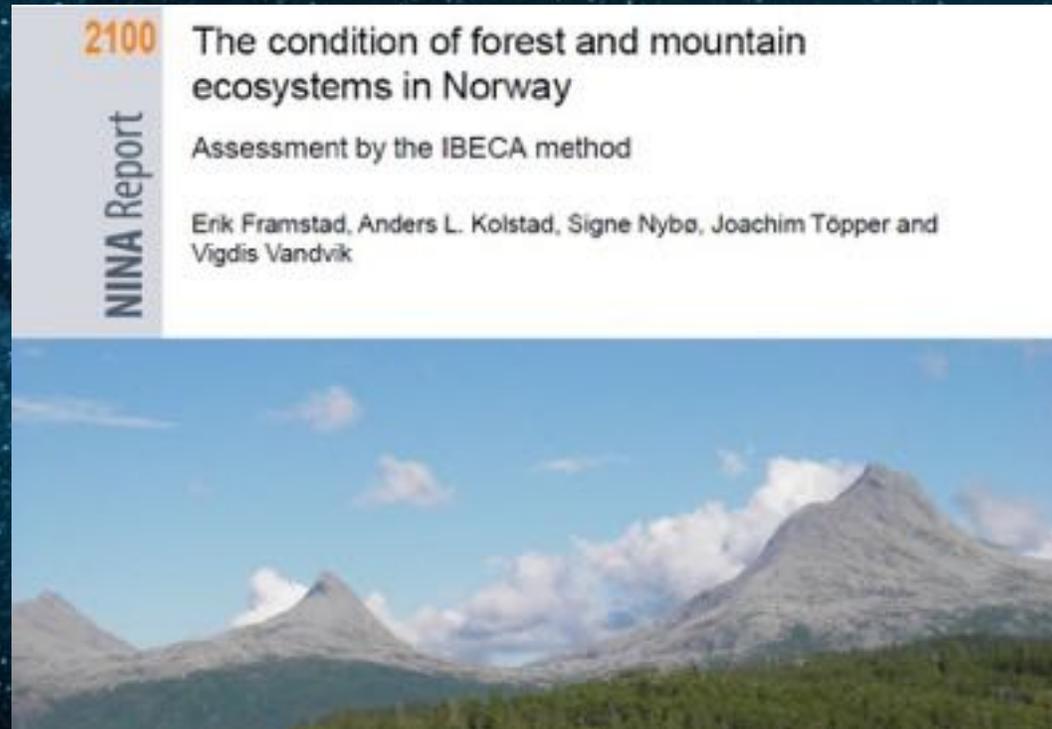


Overall verdict

Forest



Full assessments available at



<https://www.nina.no/english/Ecosystems/Assessment-system-for-ecological-condition>



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Thanks for
your attention

