

# Forest Potential

End seminar

Ås, 24 NOV - 2022







# Overview – ForestPotential

- Project period: Jan. 2018 – Dec. 2022
- Budget: 10 + 6 mill
- NMBU
  - Erik Næsset
  - Terje Gobakken
  - Ida Marielle Mienna
  - Hans Ole Ørka
  - Eirik Næsset Ramtvedt
  - Jaime Candelas Bielza
  - Victor Strimbu
  - Claire Devos
  - Marie-Claude Jutras-Perreault
  - Kari Klanderud
  - Lennart Noordermeer
  - Ole Martin Bollandsås
  - Maarit Kallio
  - Hans Fredrik Hoen
- UBC
  - Nicolas Coops
- Cicero
  - Asbjørn Aaheim
  - Taoyuan Wei
- NTNU
  - Gunnar Austrheim
  - James Speed
- FMI
  - Jari Liski
- Glommen-Mjøsen
  - Geir Korsvold
  - Vegard Lien
- Viken Skog
  - Svein Dyslund
- Idaho
  - Jan Eitel



# In addition

- **Field workers «Norge på langs»**
- (2008) John Gunnar Dokk
- (2008) Nadja Stumberg
- (2008) Roar Økseter
- (2008, 2012, 2018, 2022) **Vegard Lien**
- (2012) Maxim Galashevskiy
- (2012) Ronny Steen
- (2018) Ida Marielle Mienna
- (2018) Ingegjerd Meyer
- (2018) Inger Elisabeth Hilstad
- (2018) Kenneth Simensen
- (2020) Adriana Calabrese
- (2020, 2021) Claire Celine Devos
- (2021) Hanne Petlund
- (2021) Olav With Aasgård
- (2022) Chiara Zabeo
- (2022) Haakon Kristiansen
- (2022) Sara Emilie Aarskog



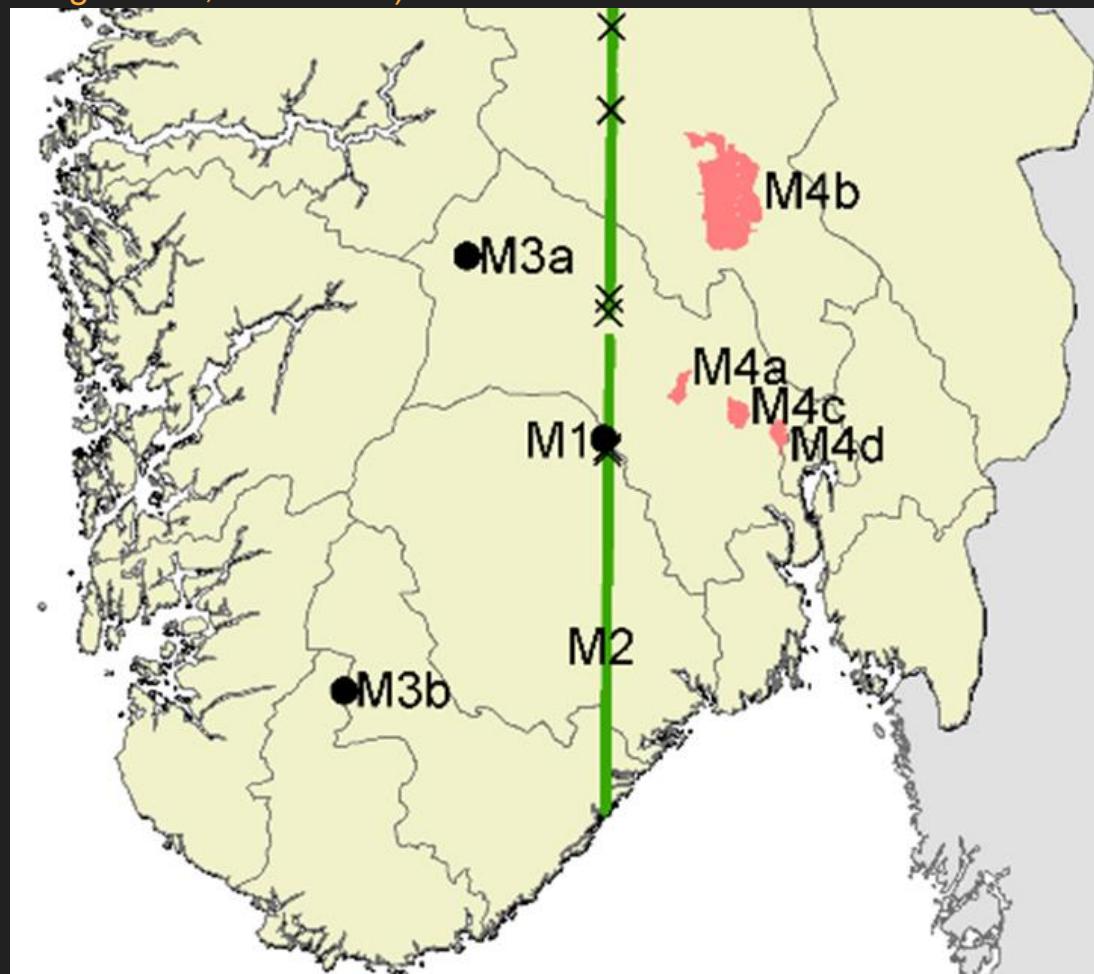
# Three main research topics

- Dynamics in the treeline ecotone
  - Climate and herbivory
  - Monitoring using RS
- Changes in forest productivity
  - Site index estimation using RS
- Effects of changing forest resources
  - Economic opportunities
  - Mitigation potential (albedo, carbon uptake)



# Data

- Treeline
  - Field (2500 pioneer trees, latitudinal gradient, timeseries)
  - Herbivory
  - ALS
  - Optical
- Forest inventories
  - Field ~800 plots
  - ALS
- National forest inventory





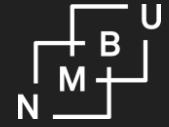
# Tasks and deliverables

WP3	T3.1	Task	Analyze resilience of trees/shrubs
WP3	T3.2	Task	Biomass estimation
WP3	D3.1a	Deliverable	Paper. Resilience of tree and shrub expansion due to grazing
WP3	D3.1b	Deliverable	Paper. Relationship between tree and shrub growth, herbivore resilience...
WP3	D3.1c	Deliverable	Paper. Mapping and estimating aboveground vegetation biomass in an alpine treeline ecotone
WP4	T4.1	Task	Analyze effects of climate and herbivory on mortality, recruitment and growth
WP4	D4.1	Deliverable	Paper. Empirical evidence of the effects of climate and herbivory
WP4	D4.2	Deliverable	Provide fieldbased estimates of change in treeline for comparison in T5.3
WP5	T5.1	Task	Compare tree detection UAV/LiDAR
WP5	T5.2	Task	Implement tree line monitoring, M1
WP5	T5.3	Task	Estimate and compare T5.2 and field
WP5	D5.2a	Deliverable	Paper. Comparing 3D Point Cloud Data from Laser Scanning and Digital Aerial Photogrammetry for Height Estimation of Small Trees
WP5	D5.2b	Deliverable	Paper. A model-dependent method to monitor subtle changes...
WP5	D5.2c	Deliverable	Paper. Monitoring tree occupancy and height in the Norwegian alpine treeline (submitted)
WP6	T6.1	Task	Test accuracy of height-differential site index using bi-temporal field and LIDAR
WP6	T6.2	Task	Analyze differences between direct pred of lifespan SI, and indir height diff
WP6	T6.3	Task	Test change- and tree species classification
WP6	D6.1a	Deliverable	Paper. Direct and indirect estimation of SI using bi-temporal LiDAR
WP6	D6.1b	Deliverable	Paper. Area-based estimation of SI over large areas
WP7	T7.1	Task	Update Gaya-J
WP7	D7.1	Deliverable	Software tool
WP7	T7.2	Task	Perform analyses using Gaya-J and GRACE
WP7	D7.2	Deliverable	Results from scenario analyses
WP7	D7.3a	Deliverable	Paper. Scenario analyses using GAYA
WP7	D7.3b	Deliverable	Paper. Economic analyses using GRACE



# Publications

- 12 peer review papers promised
  - 10 peer review published
  - 1 awaiting decision
  - 5 manuscripts in process
- 2 PhD-thesis
- 2 pop. sci. published
- 2 PostDoc
- 6 Master thesis
  - 2019 (3), 2023 (3)
- 1 PhD exchange to UBC, Canada



# Agenda

- 09:25 Tree dynamics in the boreal-alpine ecotone
  - Treeline dynamics, biomass estimation
- 10:45 Break
- 11:00 Cont.
  - Treeline monitoring
- 11:45 Changes in forest productivity
  - Site index from bi-temporal ALS
- 12:15 Lunch
  - Vitenparken



# Agenda

- 13:45 Effects of changing forest resources
  - Simulator for forest development. Economic impact of changes in forest area
- 14:30 What happens if the forest migrate into the alpine zone?
  - Soil carbon and albedo
- 15:05 Break
- 15:15 Treeline research at the Natural history museum
  - Anders Bryn
- 15:40 Discussion
- 16:00 End