

Using ALOS/PALSAR backscatter to estimate forest biomass: case study in Western Siberia

Project objectives

- Check capability of ALOS/PALSAR for forest biomass estimation in Western Siberia.
- Provide independent verification data for C- inventories.
- Implementation of the FCMS research project of Japan.

Results

L-band backscatter is sensitive to forest/non-forest cover.

PALSAR signal in HV polariz. mode performs better ($r > 0.7$) than HH ($r \sim 0.5$).

Both (HH and HV) work well for assessment of low wooden biomass. Curves arrive to saturation at ~ 60 tons/ha.

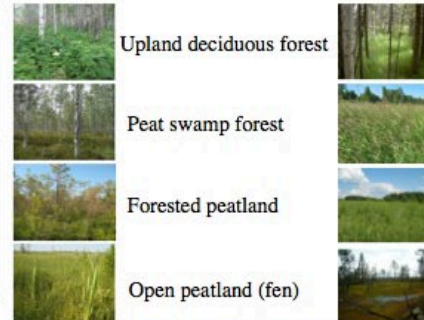
There are no specific signal values attributed to Peat swamp forests (it causes uncertainty in biomass estimates).

Projected research:

- PALSAR-based land cover classification and change analysis
- Carbon tracking

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Mixed (conifer./deciduous) forest

Wet grassland (reed bush)

Dry grassland (meadow)

Ridge-hollow-pool patterned mire (considered as non-forested)

ALOS PALSAR data used

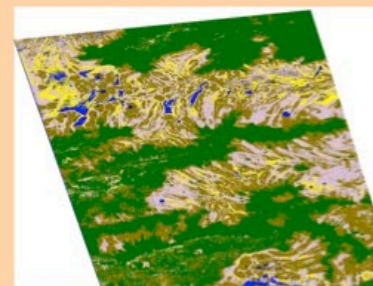
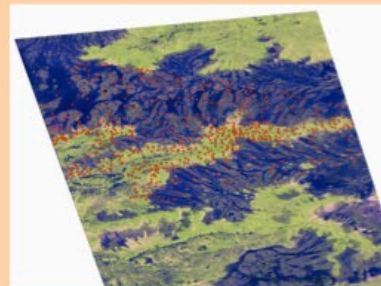
2007, 2008 summer acquisitions
Observation pass: 508/509
Center frame: 1130
FBD polarization mode
34.3° inc. angle, ~ 20 m resolution
Ortho-rectified and slope corrected at JAXA.
6 scenes in total

Other data sources

A: LANDSAT TM
2006/09/09, p152 r020
B: National Forest Inventory
C: Local expertise

Standardized forestry methodology provide the data over homogeneous inventory units (elements of forest):

- Land category
- Species composition
- Trunk diameter, cm
- Height of stand, m
- Basal area ($m^2/ha-1$)
- Growing stock ($m^3/ha-1$)
- Relative stocking
- Bonitat (site index), etc.



ALOS/PALSAR: 2007/07/16
with ground observation points

Red: LHH
Green: LHV
Blue: LHH/HV ratio

• biomass reference plots

- Forest
- Forested peatlands
- Non-forested (open) peatlands
- Other non-forest classes, incl. agriculture
- Open water

Accuracy - 0.88 (110 validation points)

1. RGB color composites of prototype areas

2. Forest/Non-forest mapping

