



Biomasse und Waldstrukturen auf Fernerkundungsdaten

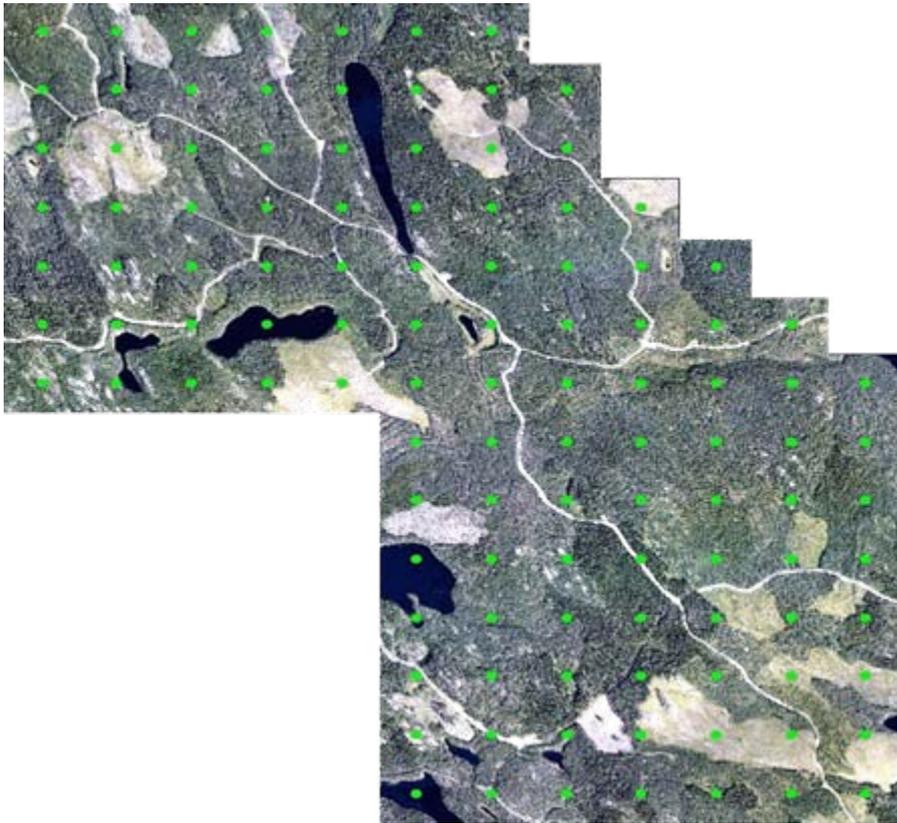
von

Konstantin Olschofsky

www.worldforestry.de

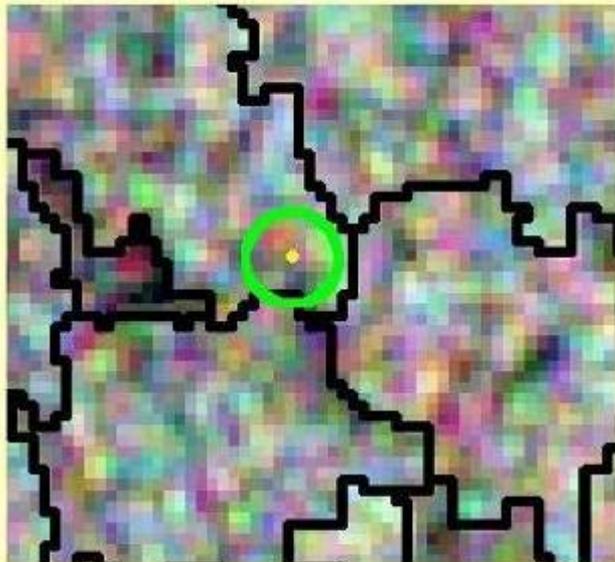


Kombinierte Inventur:

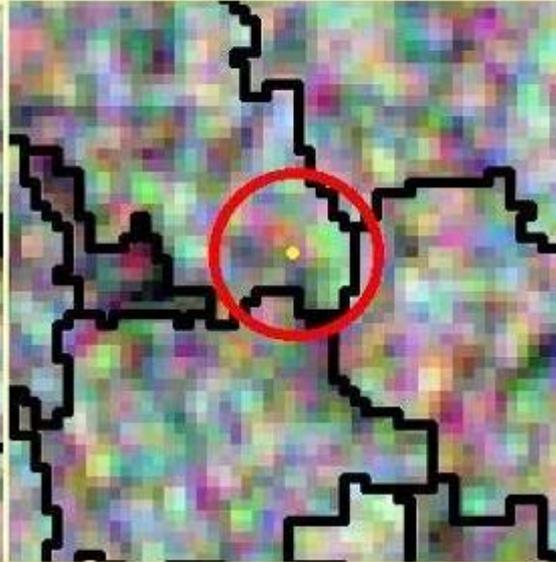




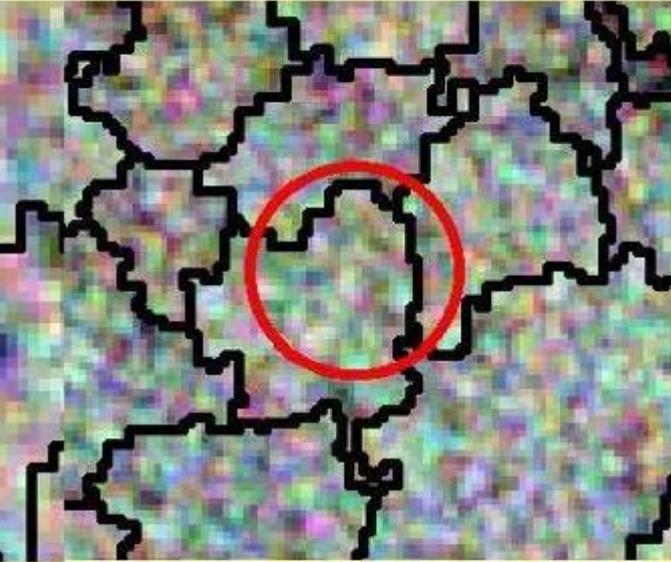
- Strukturen am Stichprobenpunkt



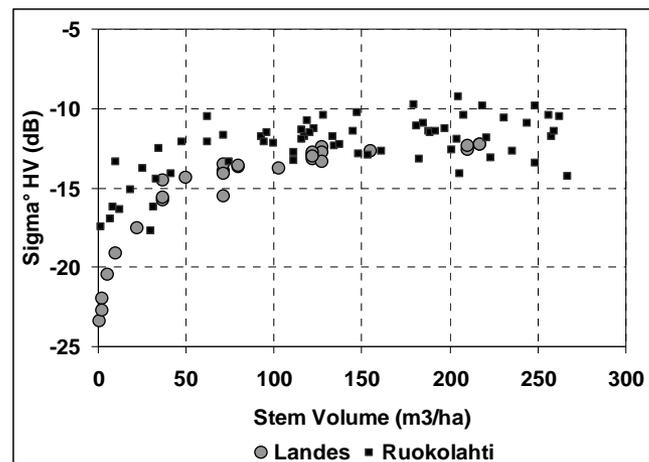
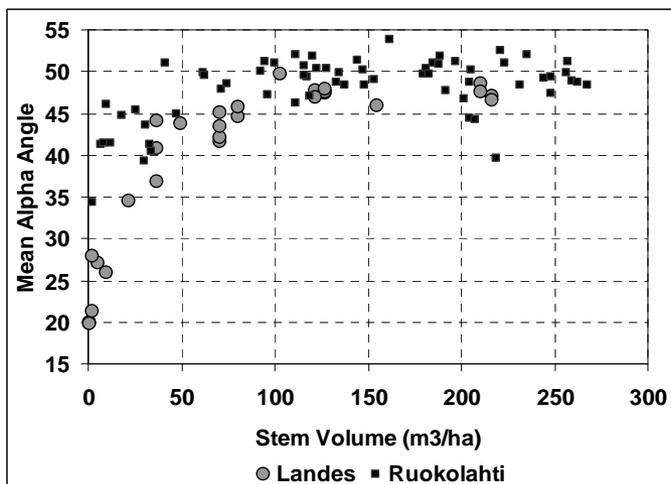
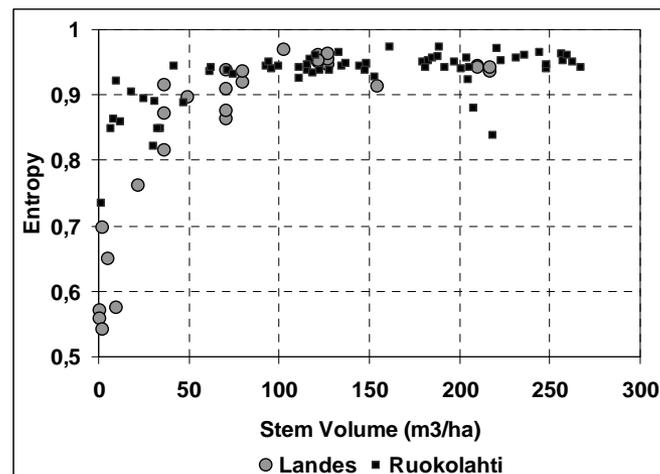
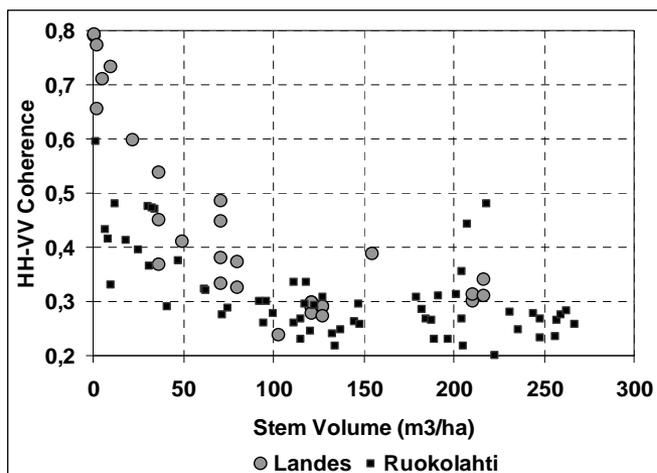
Field plot with 8.5m radius
and large segments



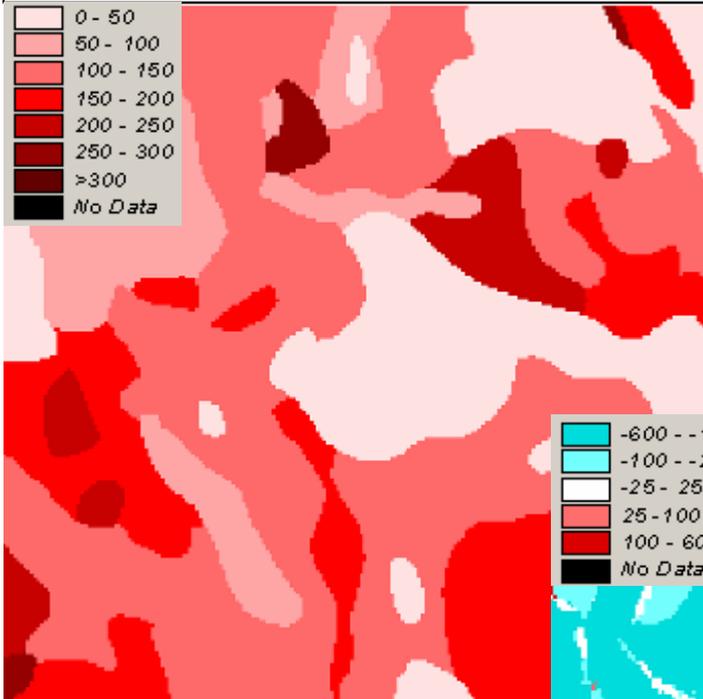
Field plot with 15m radius
and large segments



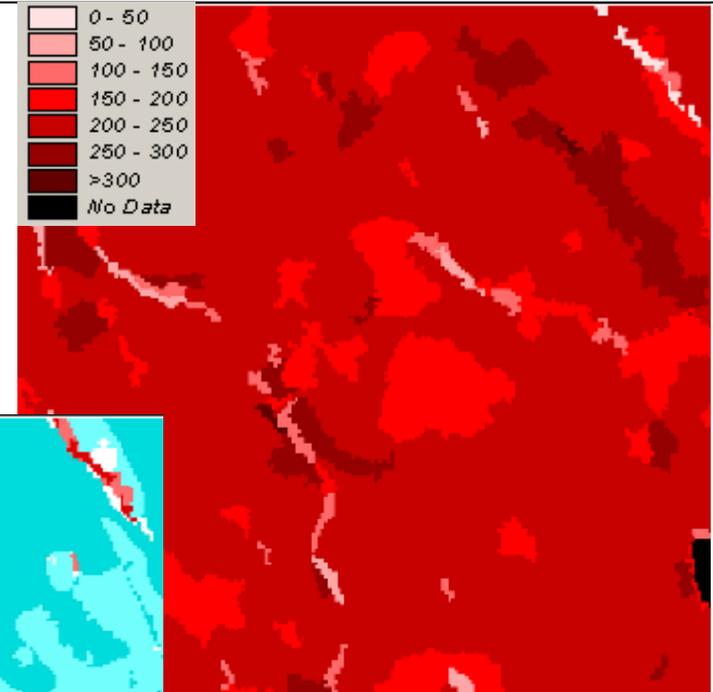
Field plot with 15m radius
and smaller segments



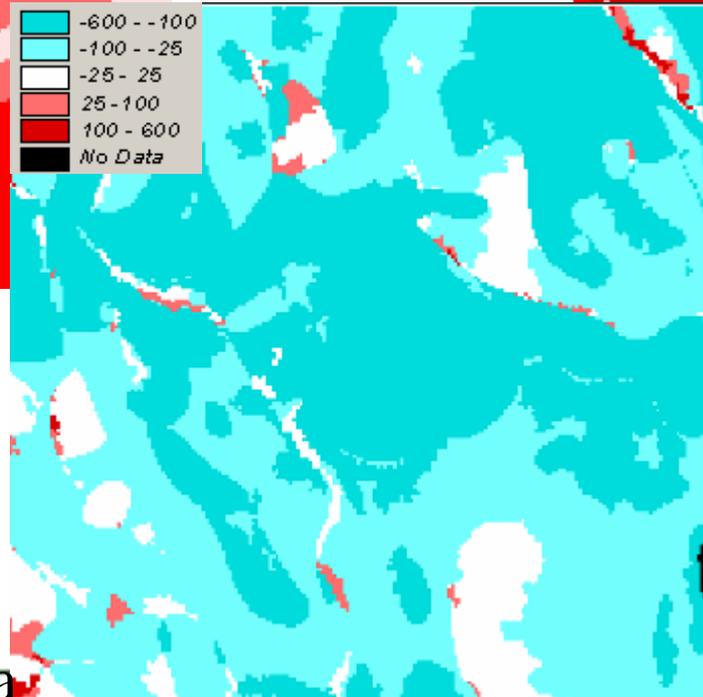
Vergleich der Vorratsverteilung auf der Basis des Bestandes Gis und der aus L-HV 2000 abgeleiteten Biomasse (Formel 35)



Vorrat aus dem Bestandes GIS

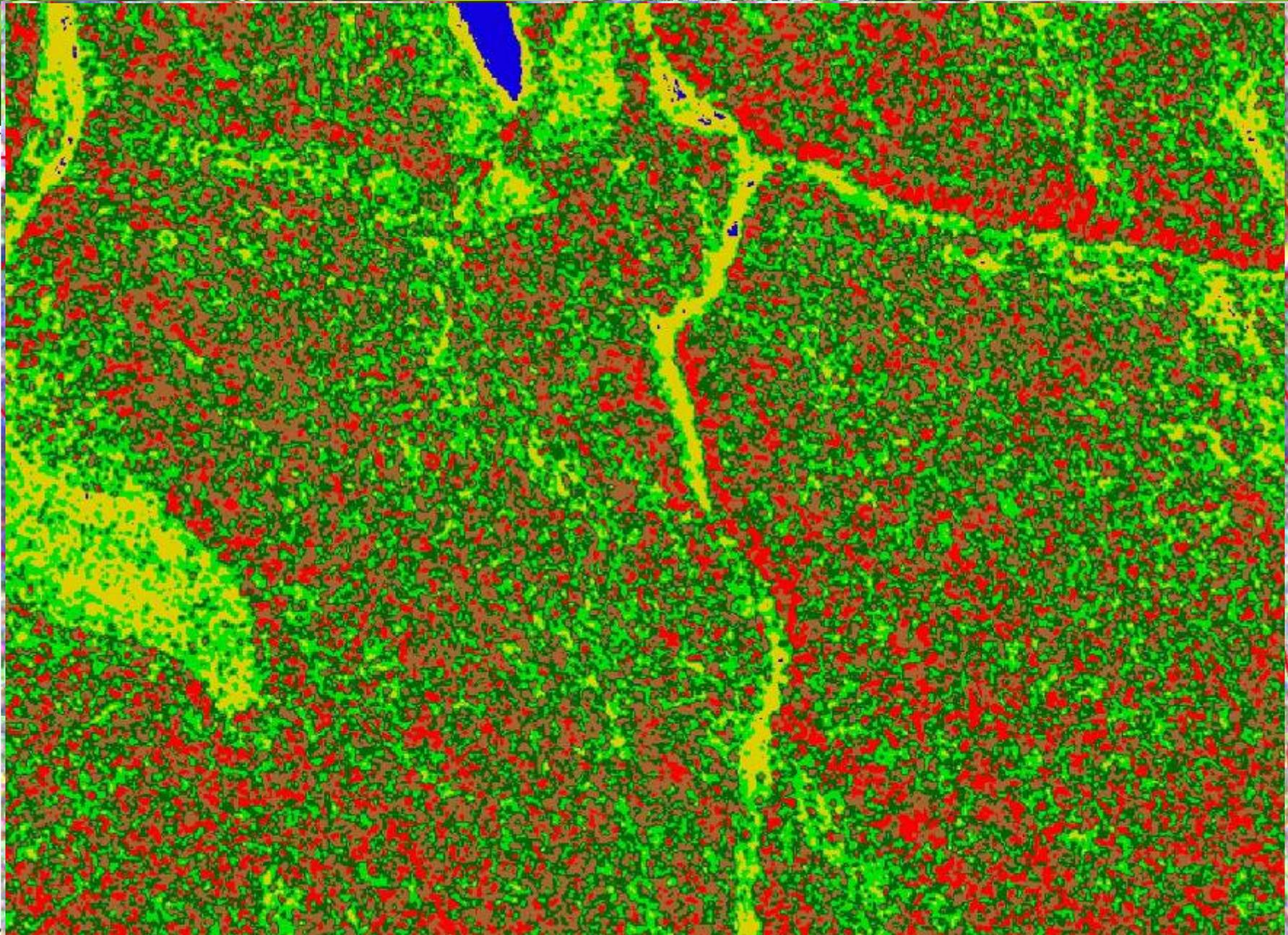


Vorrat aus der Inversion
LHV 2000 nach Formel 35



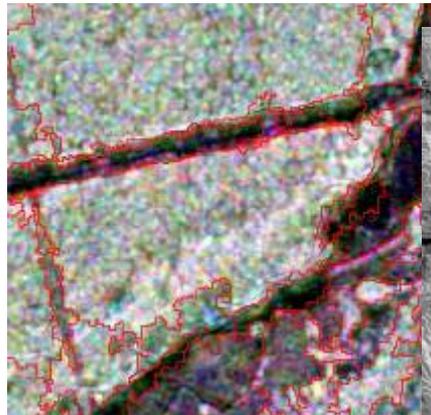
Vorratsdifferenzen GIS-INV35

RMSE = 118,71 fm/ha

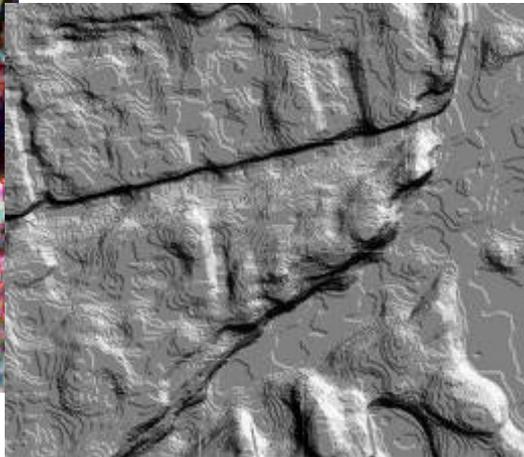




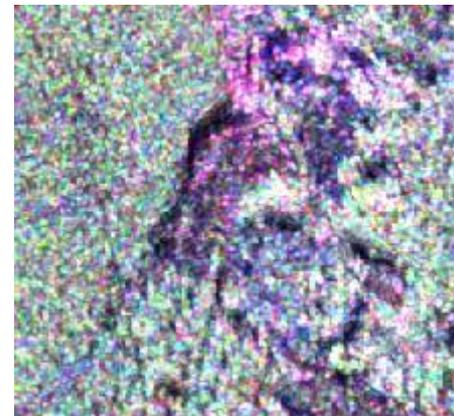
- Stand delineation with segmentation
- Detection of forest edges from DEM
- Detection of homogeneous and heterogonous stands
- Gap detection



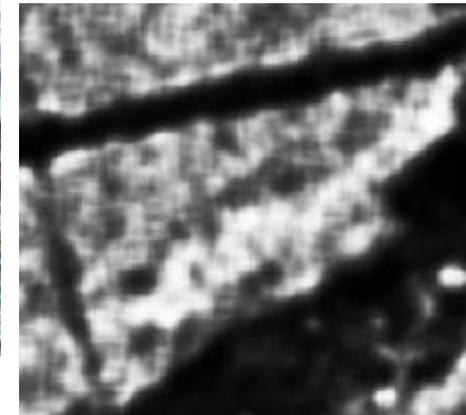
Segments



Digital Elevation Modell

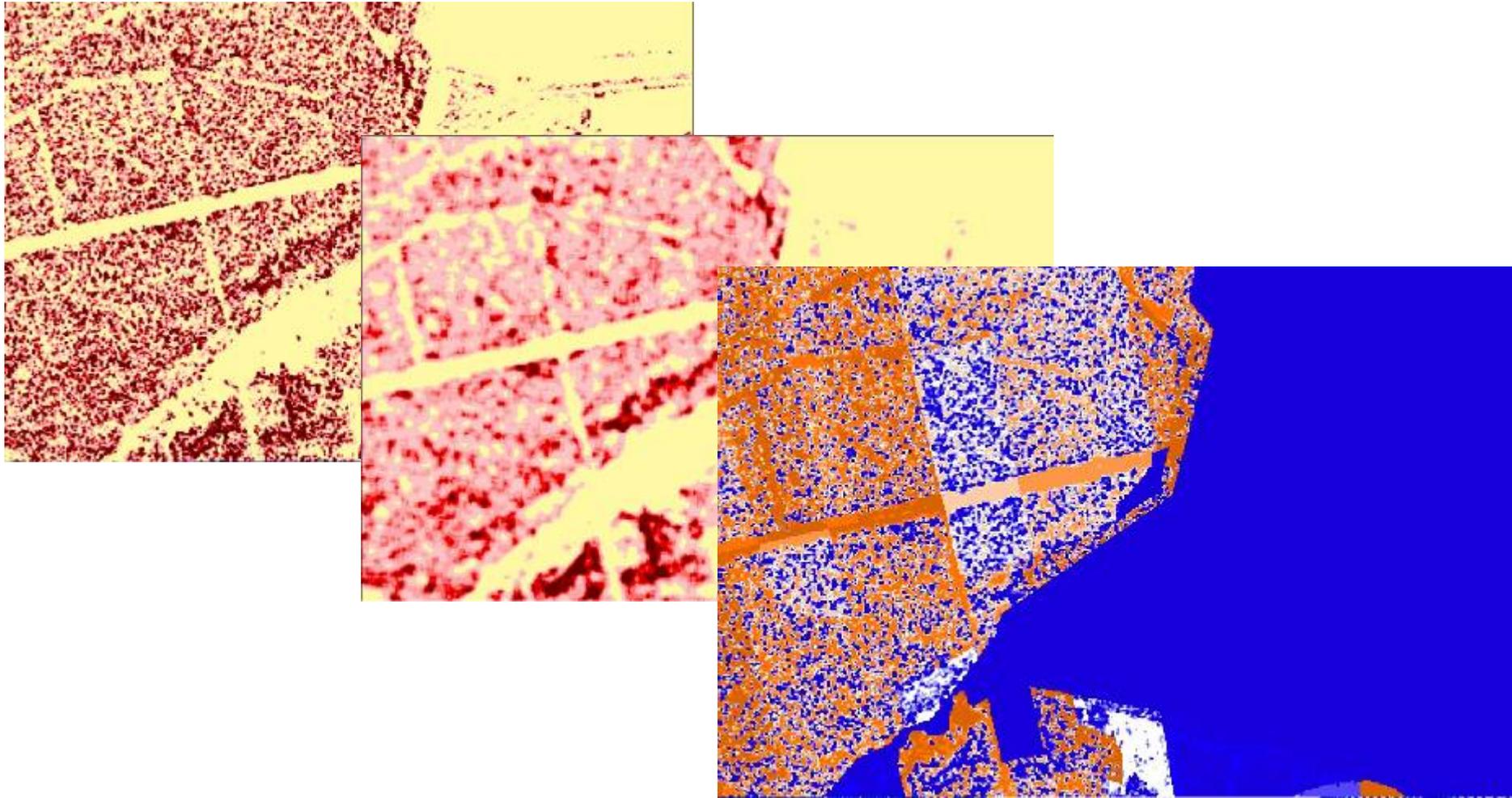


Homogeneity

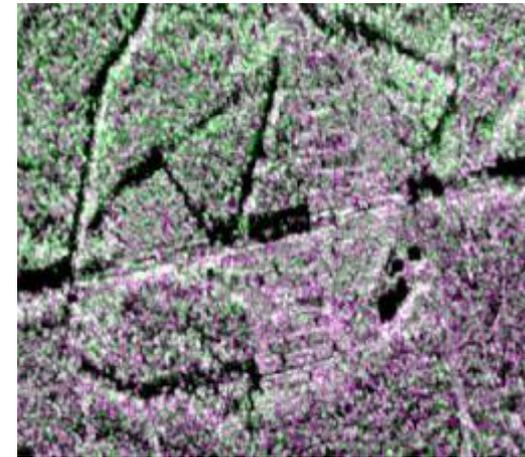
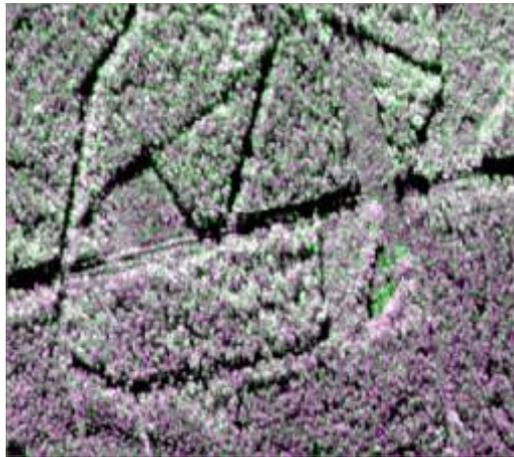
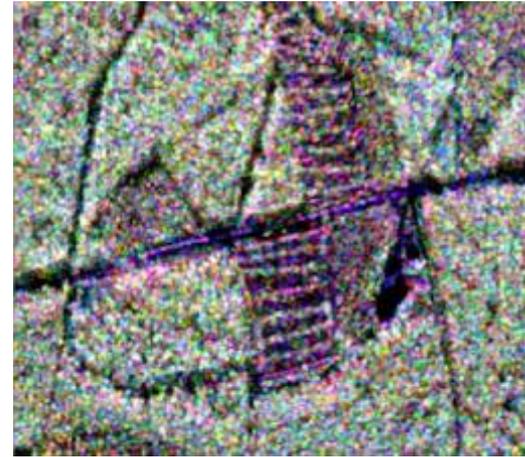
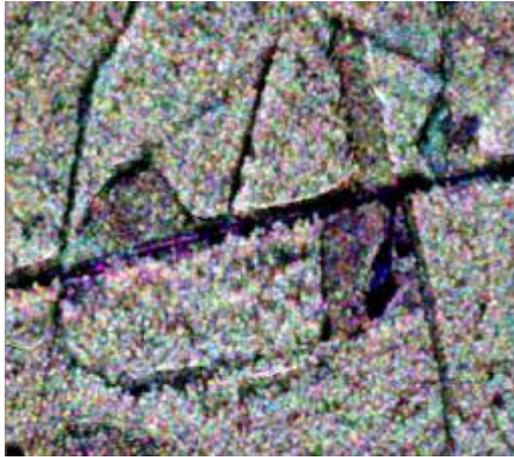


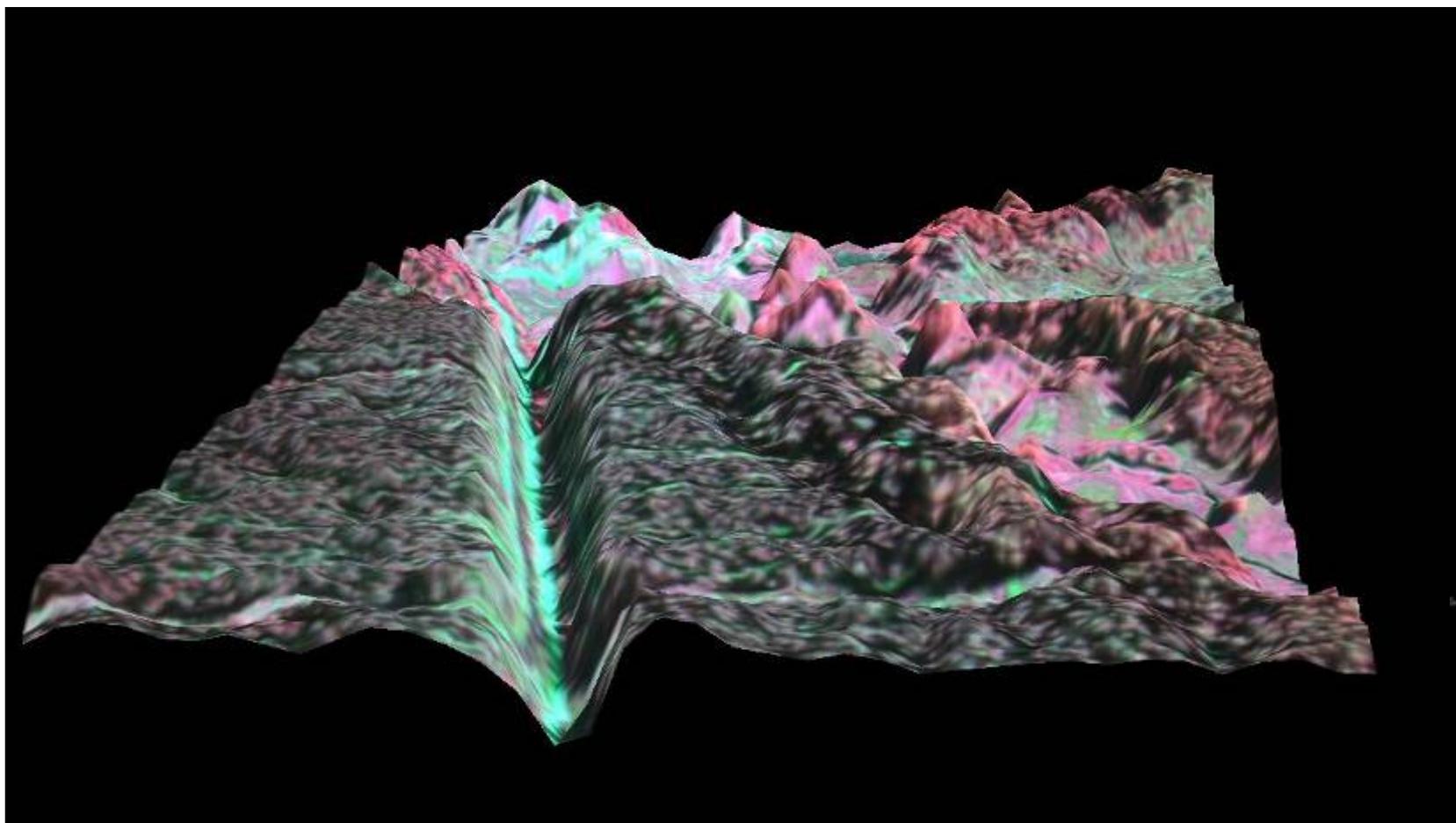
Mapping of local biomass distribution

- Relationship between stand biomass and radar signal
- Biomass inversion on stands, segments and filtered images



Monitoring of afforestation, deforestation and reforestation







Stratifizierte Biomasse Schätzung (RMSE %)

(mittlerer Vorrat 175 fm/ha)

Lineare theoretische Modell 72%

lokal angepasstes lineares Modell 68%

nach Filterung und Glättung 60%

mit Bestandeseinteilung GIS 43%

Strukturparametern 34%

durch Reduktion der Auflösung

z. B. Vergleich Luftbild – Landsat von 66% zu 51%



Schlussfolgerungen:

- Strukturen sind lokal spezifisch und erhöhen Schätzgenauigkeiten der Biomassen
- Reduktionen der Auflösung verringern den Anteil an Artefakten und Verbessern die Merkmalsextraktion
- Strukturanalysen ermöglichen differenziertes Monitoring und Management
- ➔ Bedarf der Anpassung terrestrischer Inventurverfahren und Methoden zu Ableitung forstlicher Kenngrößen auf Fernerkundungsdaten