GEO EUROPEAN PROJECTS' WORKSHOP-7

Barcelona
15-16 April 2013

GROUP ON EARTH OBSERVATIONS

ZAPÁS

Assessment and Monitoring of Forest Resources in the Framework of the EU-Russia Space Dialogue

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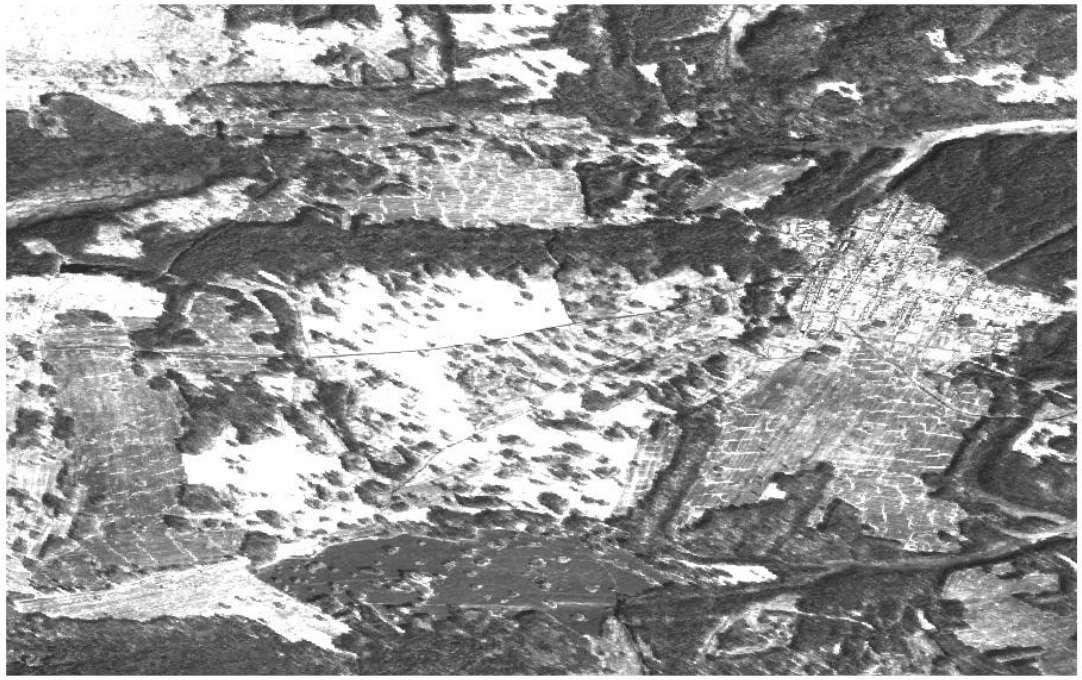
GeoViQua GRUMETS UAB CREAF MIRAMON

Monitoring & Assessment Needs: Forest area loss

- About 50% of Russian forests have been inventoried more than 25 years ago
- There are no **practically applicable methods** for updating growing stock volume in obsolete forest inventories (particularly for remote territories) We have to know GSV!

Reforestation

In post-Soviet Russia, more than 40 million hectares of arable land was abandoned within 20 years (Rosstat 2010).



RESURS-DK1

Panchromatic image

GEPW-7
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ZAPÁS

Assessment and Monitoring of Forest Resources in the Framework of the EU-Russia Space Dialogue

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Programmatic Context

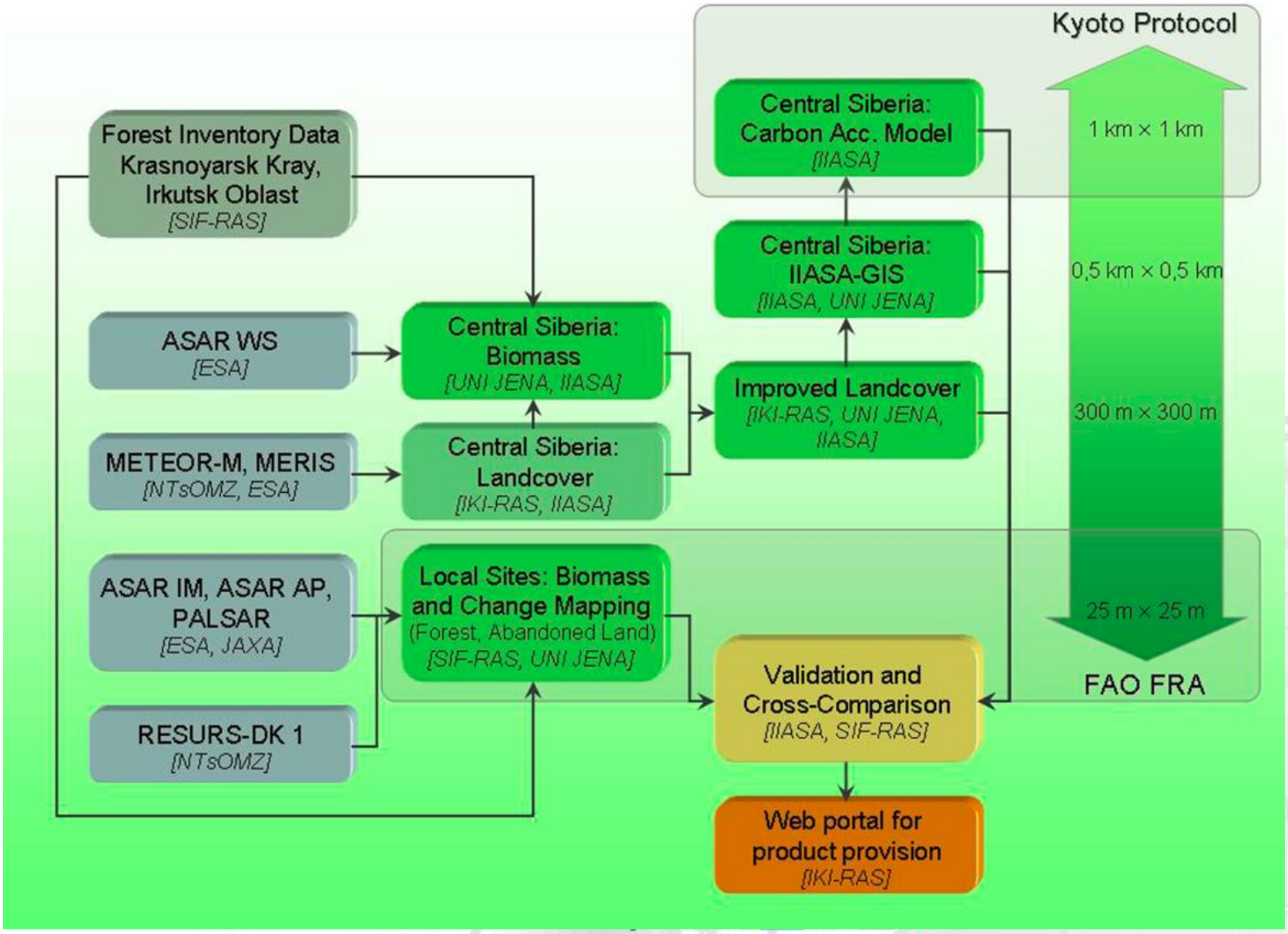
FP7 Cooperation Work Programme “Space”

Activity: 9.3 Cross-cutting activities
Area 9.3.2: International Cooperation
SPA.2010.3.2-01 EU-Russia Cooperation in GMES

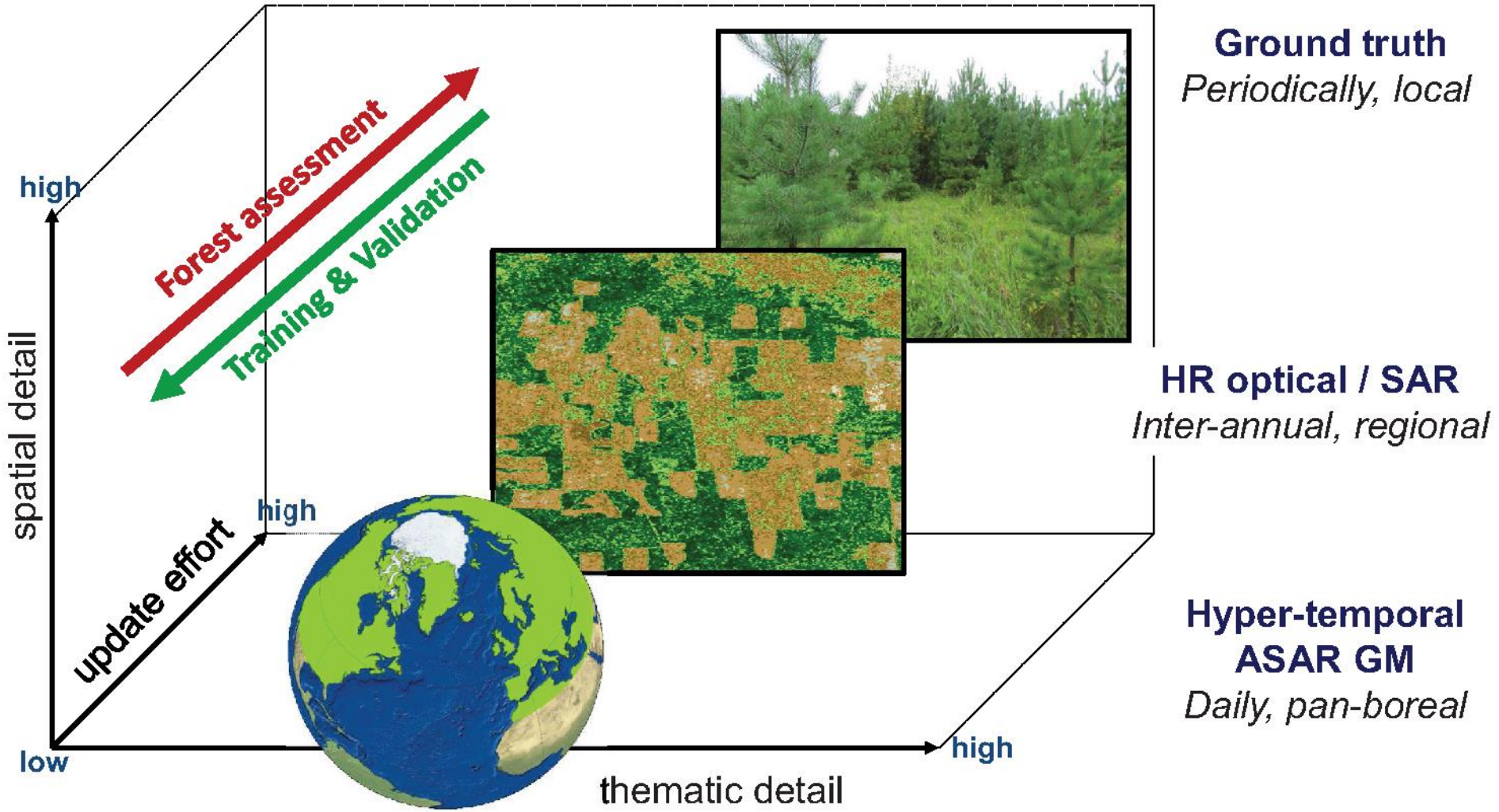
- **Continuation** of EC- and GMES-cooperation activities with Russia since FP4 1994-`98
- Joint and **synergistic exploration** of EO data provided by ESA and ROSCOSMOS
- Exchange of methodological **know-how** in processing Earth Observation data

Team & Study area

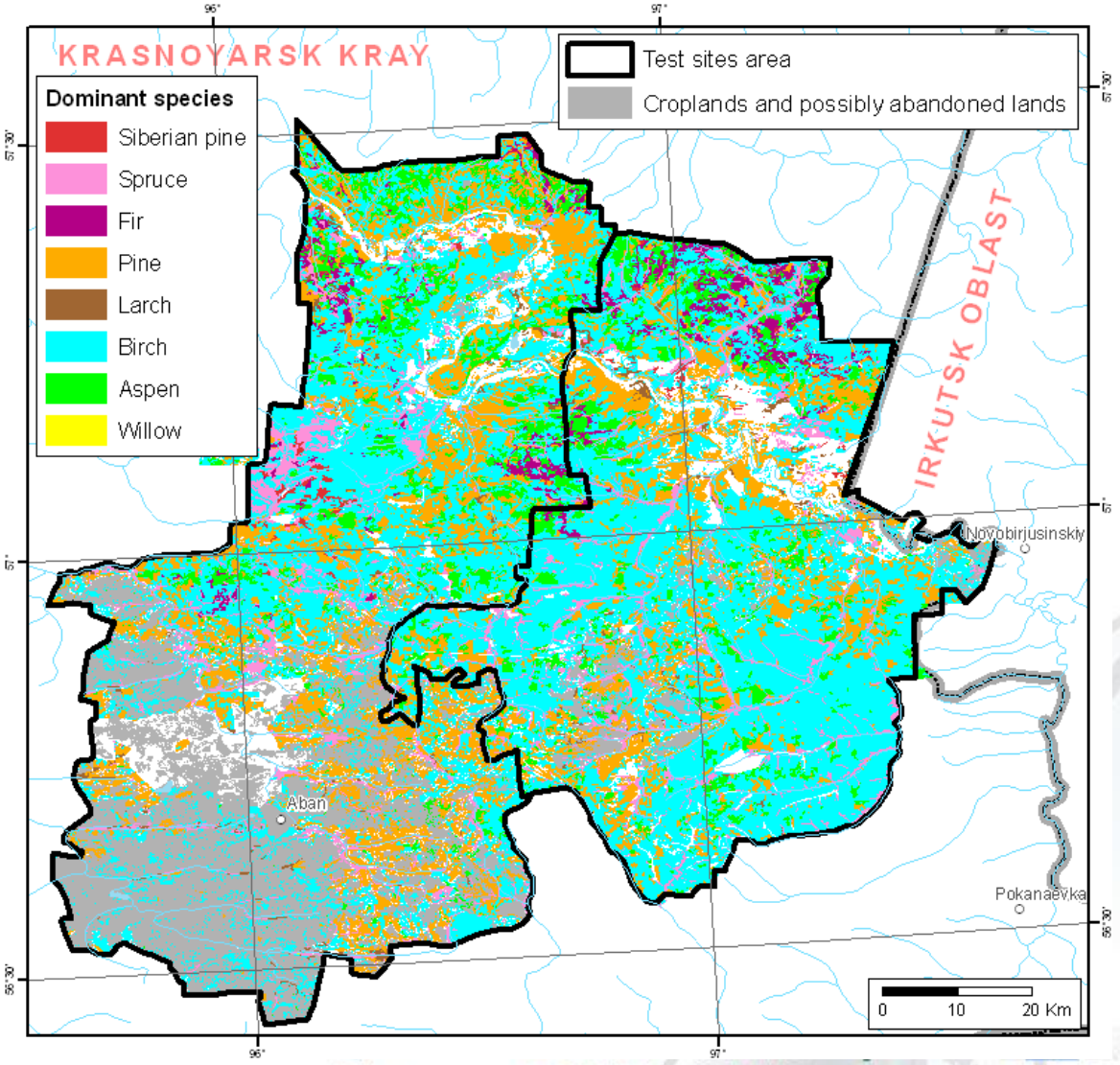
Source: SIB-ESS-C Web Portal http://www.sibessc.uni-jena.de


Kyoto Protocol
Forest Inventory Data Krasnoyarsk Kray, Irkutsk Oblast
[SIF-RAS]
ASAR WS
[ESA]
METEOR-M, MERIS
[NTsOMZ, ESA]
ASAR IM, ASAR AP, PALSAR
[ESA, JAXA]
RESURS-DK 1
[NTsOMZ]
Central Siberia: Biomass
[UNI JENA, IIASA]
Central Siberia: Landcover
[IKI-RAS, IIASA]
Local Sites: Biomass and Change Mapping
(Forest, Abandoned Land)
[SIF-RAS, UNI JENA]
Central Siberia: Carbon Acc. Model
[IIASA]
Central Siberia: IIASA-GIS
[IIASA, UNI JENA]
Improved Landcover
[IKI-RAS, UNI JENA, IIASA]
Validation and Cross-Comparison
[IIASA, SIF-RAS]
Web portal for product provision
[IKI-RAS]
1 km × 1 km
0,5 km × 0,5 km
300 m × 300 m
25 m × 25 m
FAO FRA

Integrated concepts for forest resource assessment



Forest Inventory - Species composition



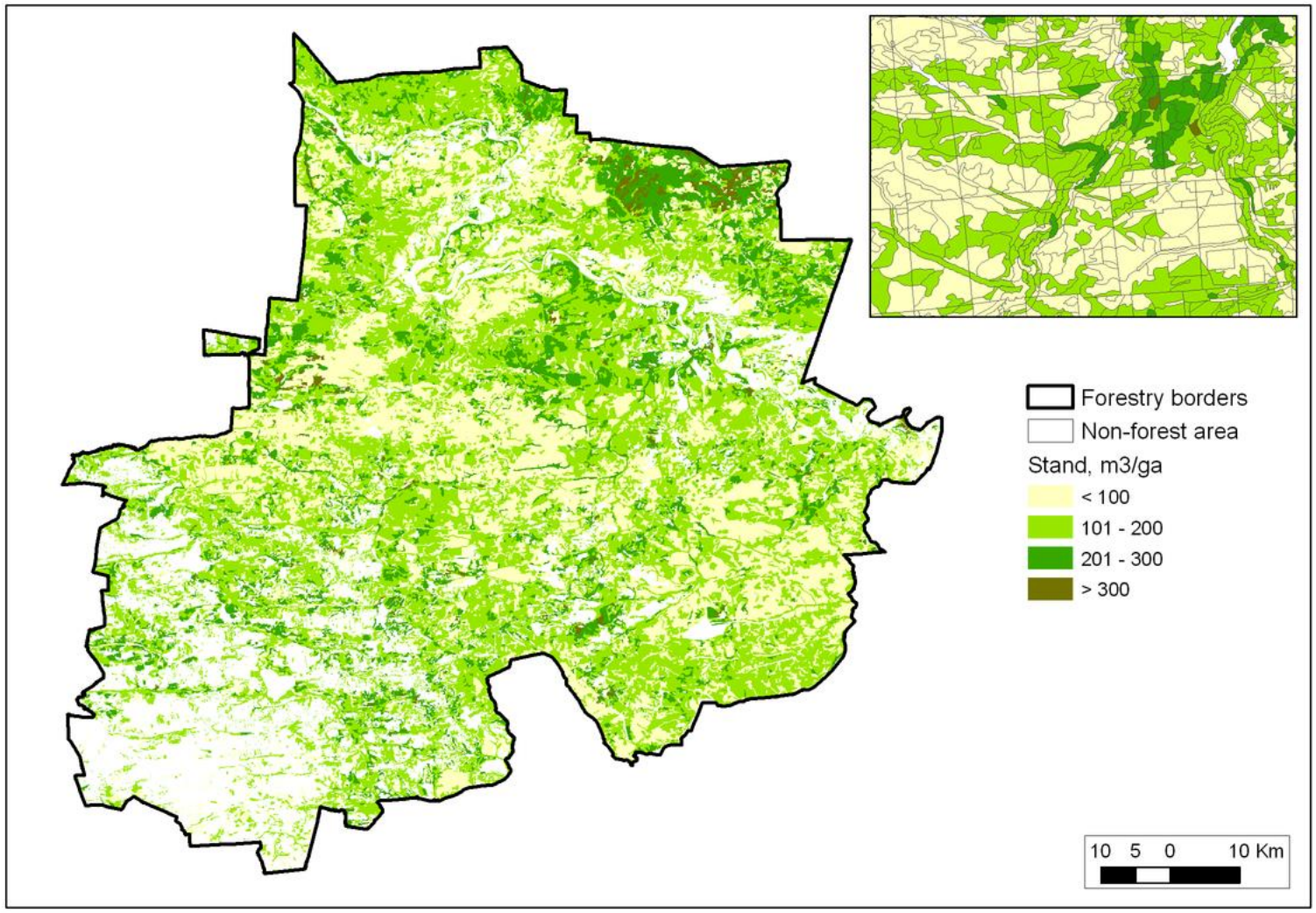
Abanskoe

Landcover type	Stands	Area, ha
Birch	15979	197703
Pine	8673	115511
Spruce	2571	35659
Aspen	2036	35858
Fir	440	7902
Larch	406	5468
Siberian pine	125	2432
Willow	10	73
TOTAL	**30240**	**400606**
Other landcover types	1989	22153

Dolgomostovskoe

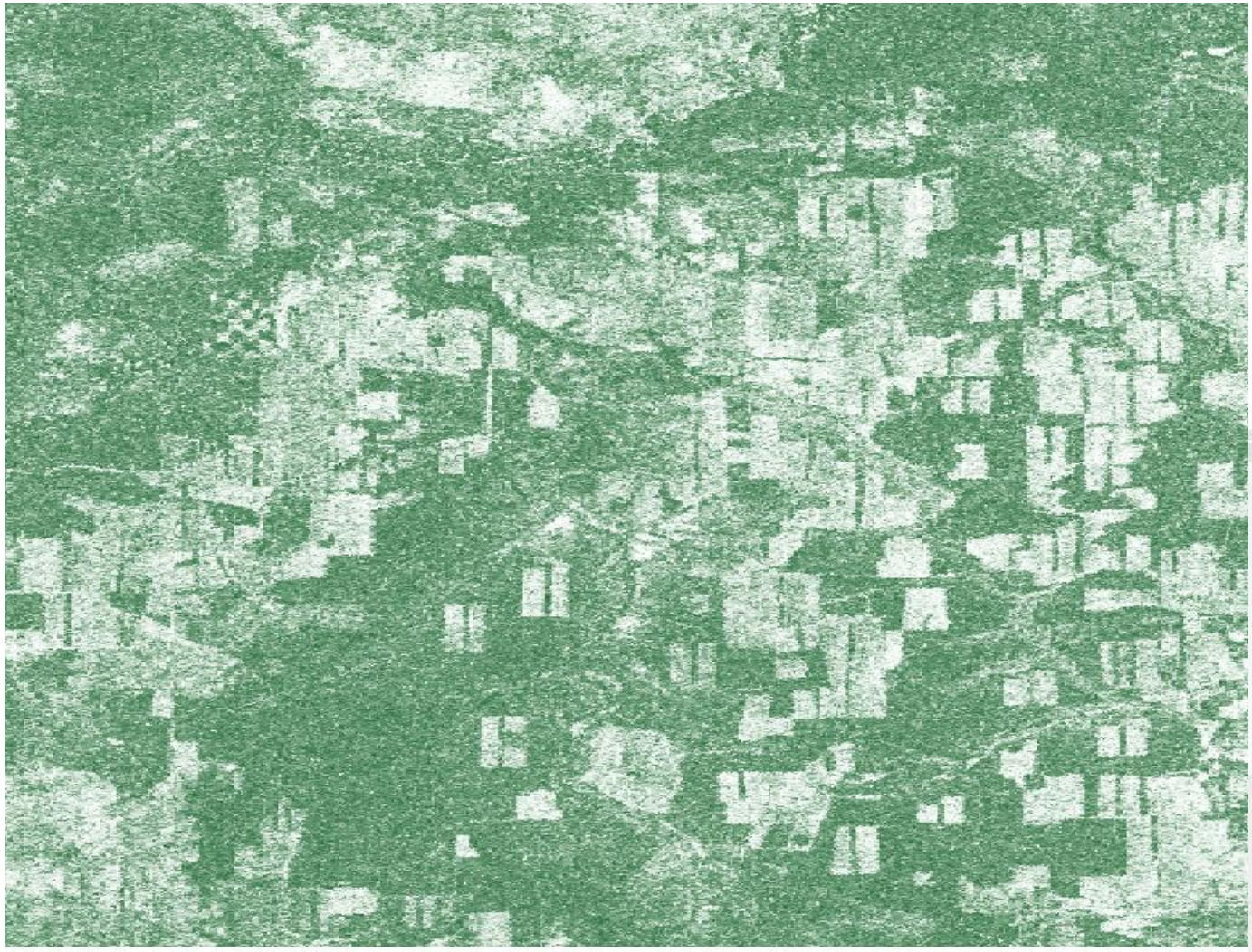
Landcover type	Stands	Area, ha
Birch	6944	173608
Pine	2909	53742
Aspen	1048	26837
Spruce	1250	22655
Fir	435	10069
Larch	140	2578
Siberian pine	92	1352
Willow	6	23
TOTAL	**12824**	**290865**
Other landcover types	442	14661

Forest Inventory - Relative stock volume

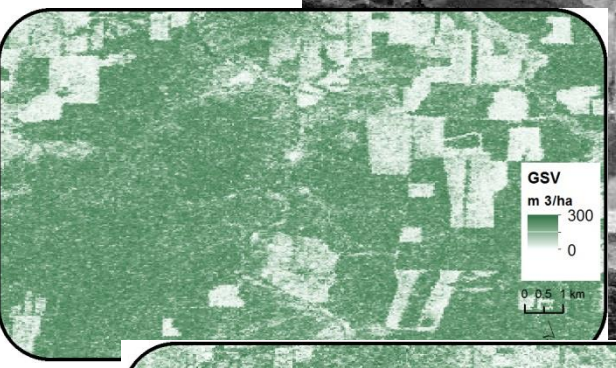


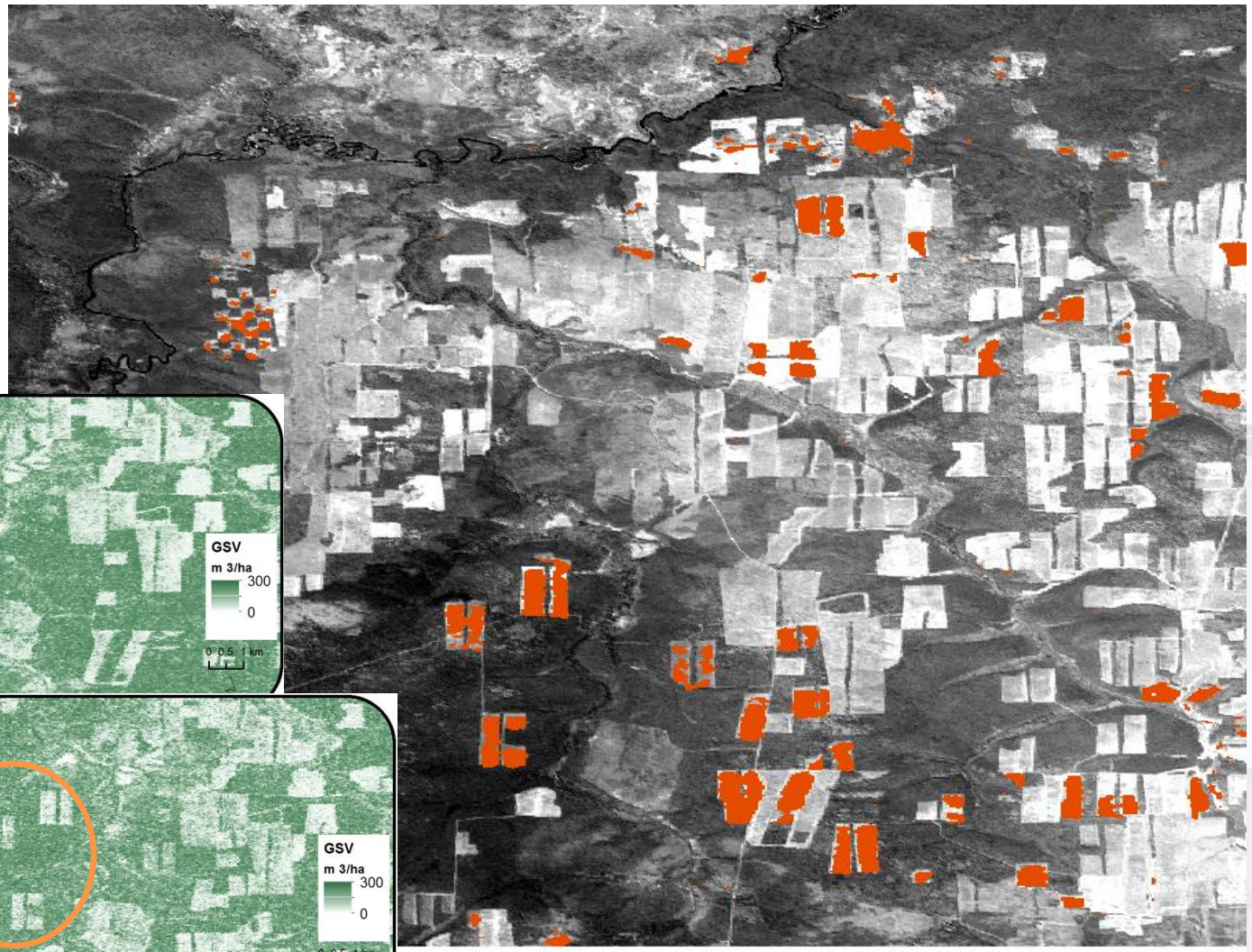
RESURS DK1 – Reference Data

ALOS PALSAR – Biomass Maps (2007-2010)

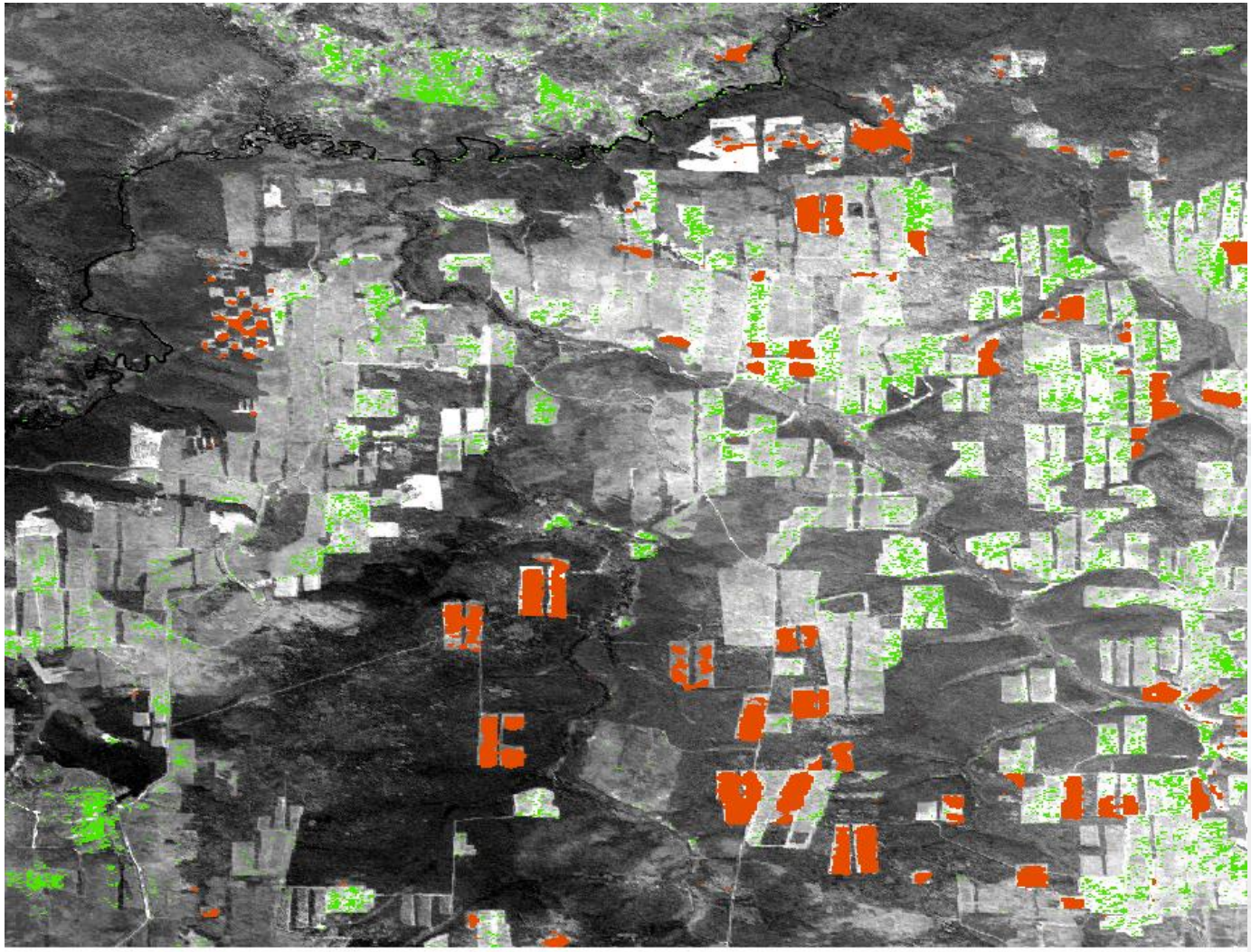


Deforestation Maps

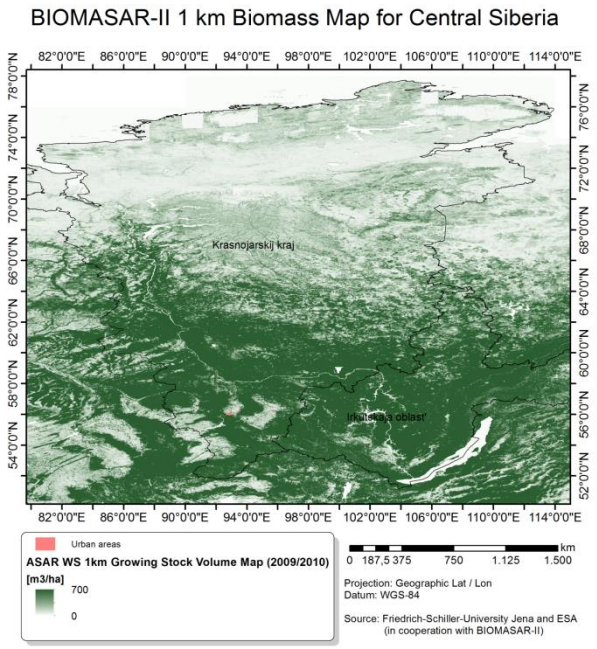




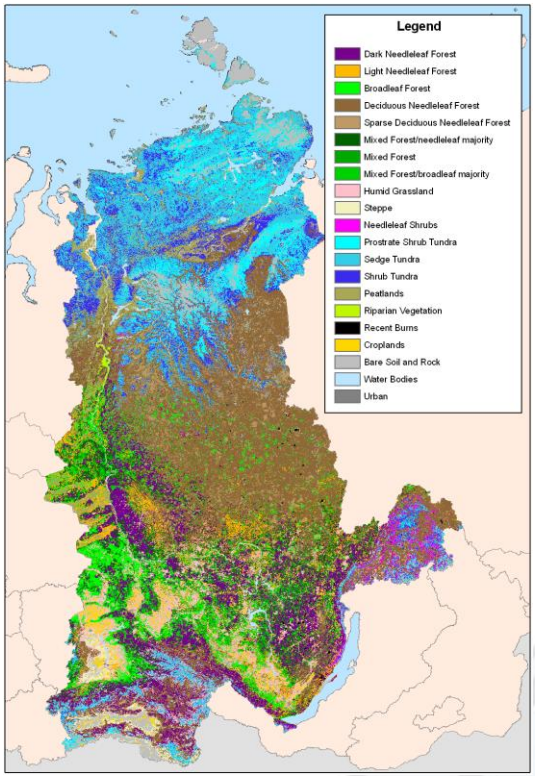
Reforestation Maps



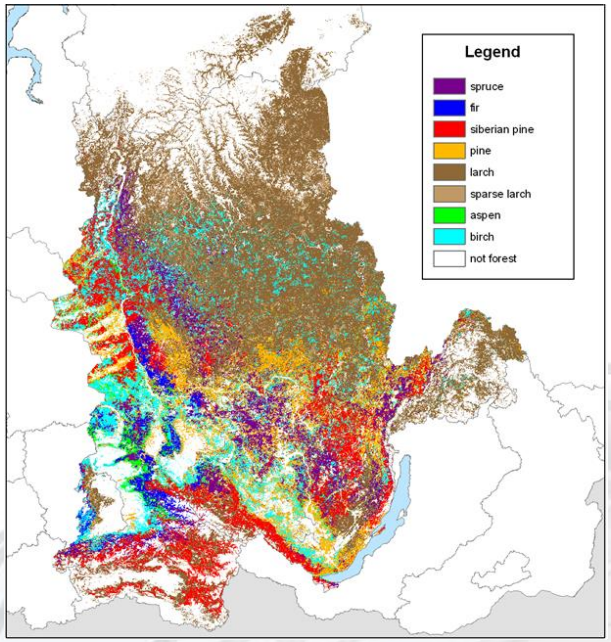
Improved Biomass, LC, and Species Maps for Siberia



Biomass



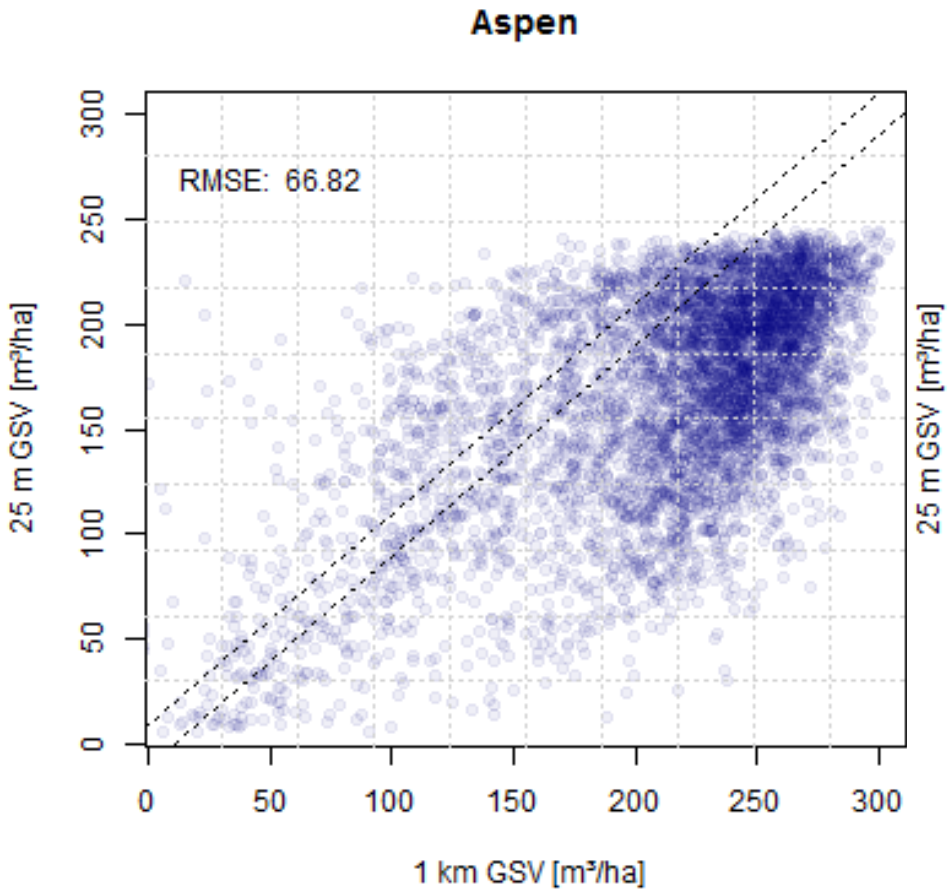
Land Cover

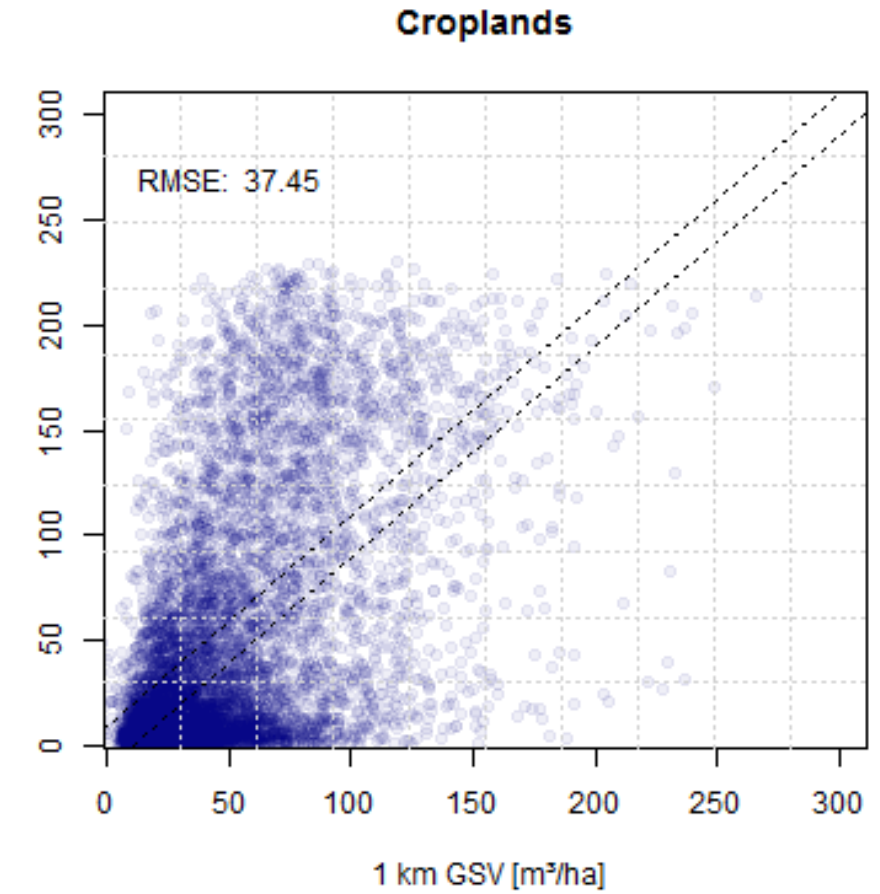


Species

Data online zapas.uni-jena.de

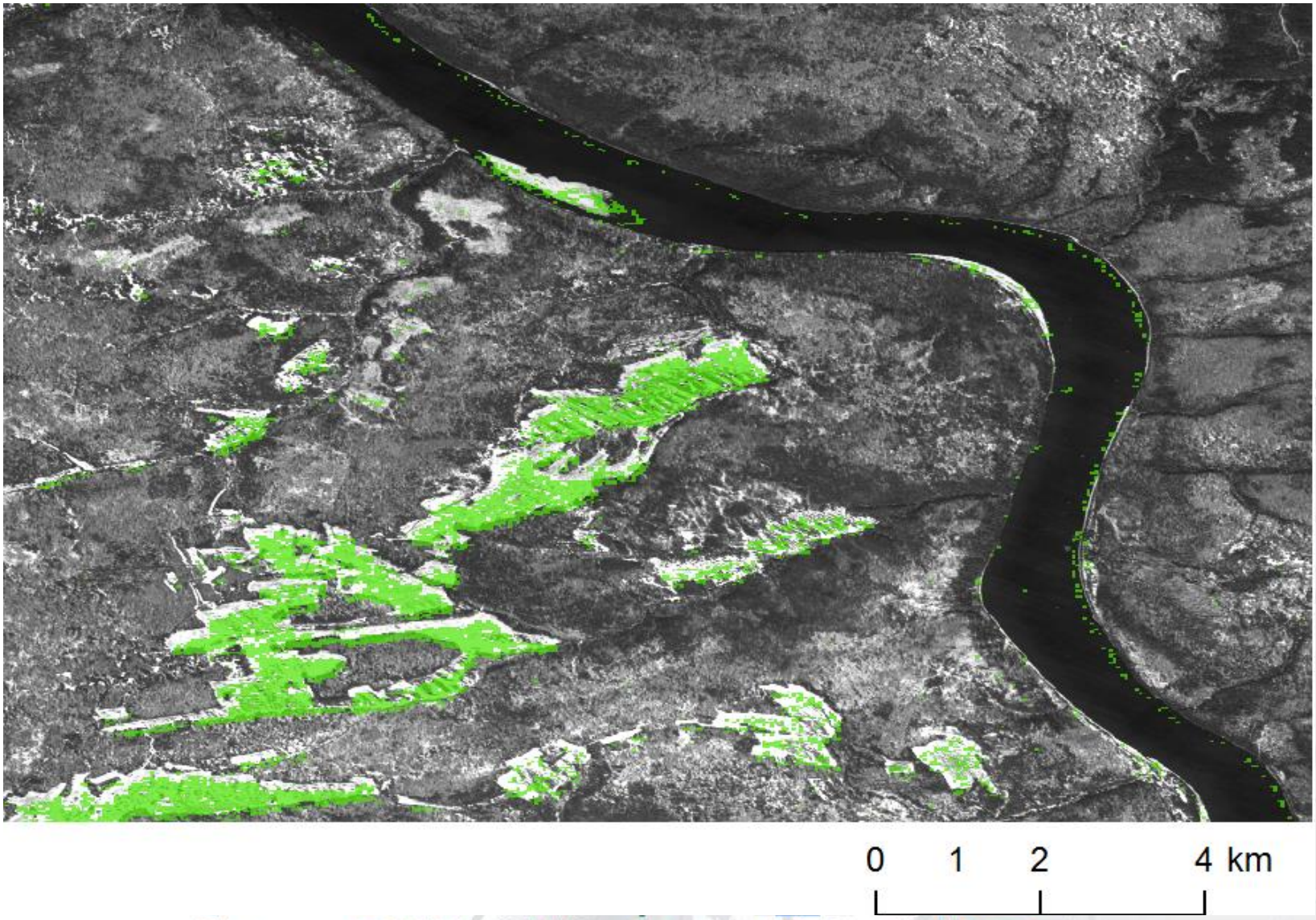
Product comparison & cross validation



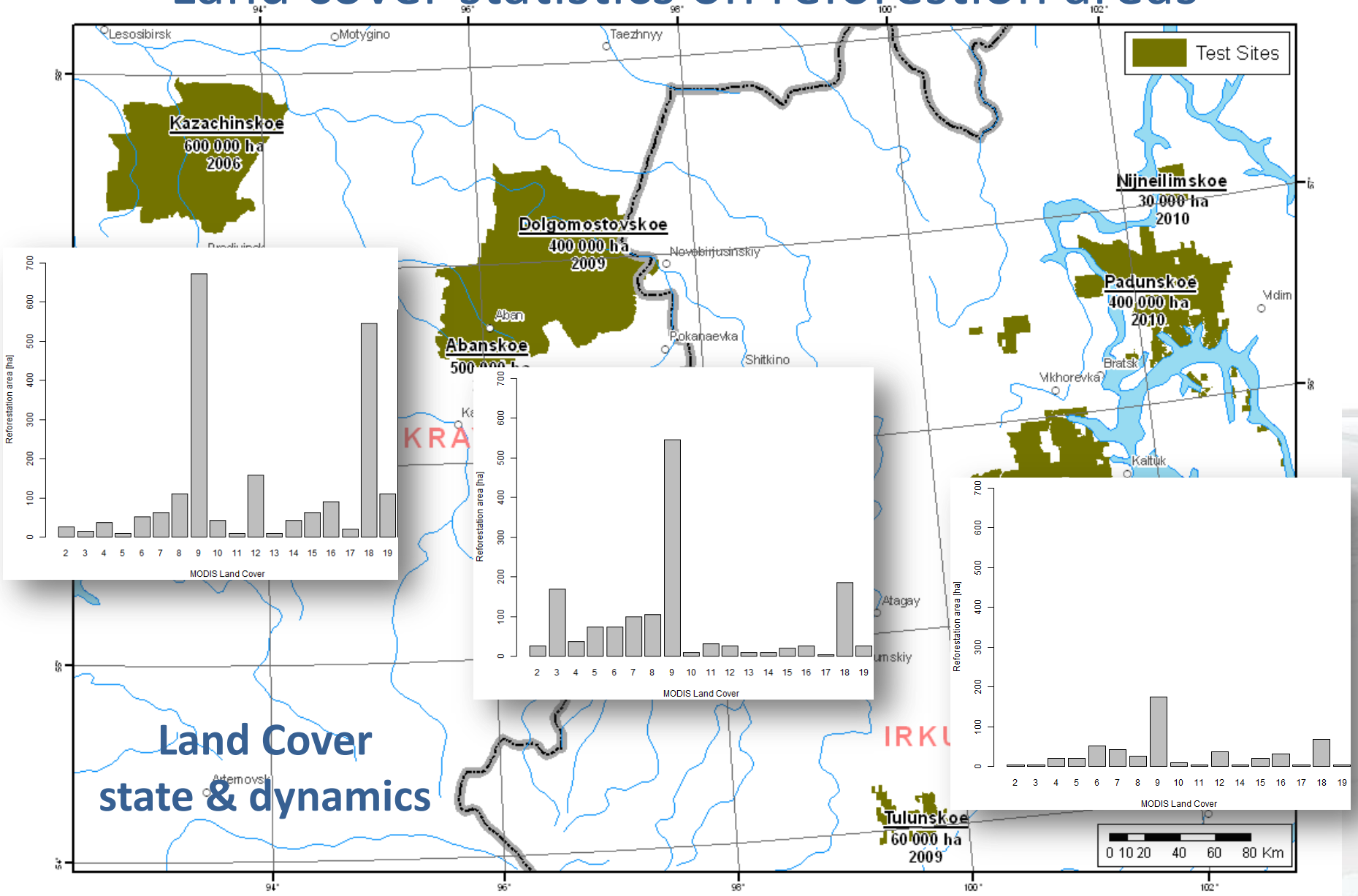


Mapping abandoned lands reforestation

Mapping abandoned lands reforestation

- 

Land cover statistics on reforestion areas

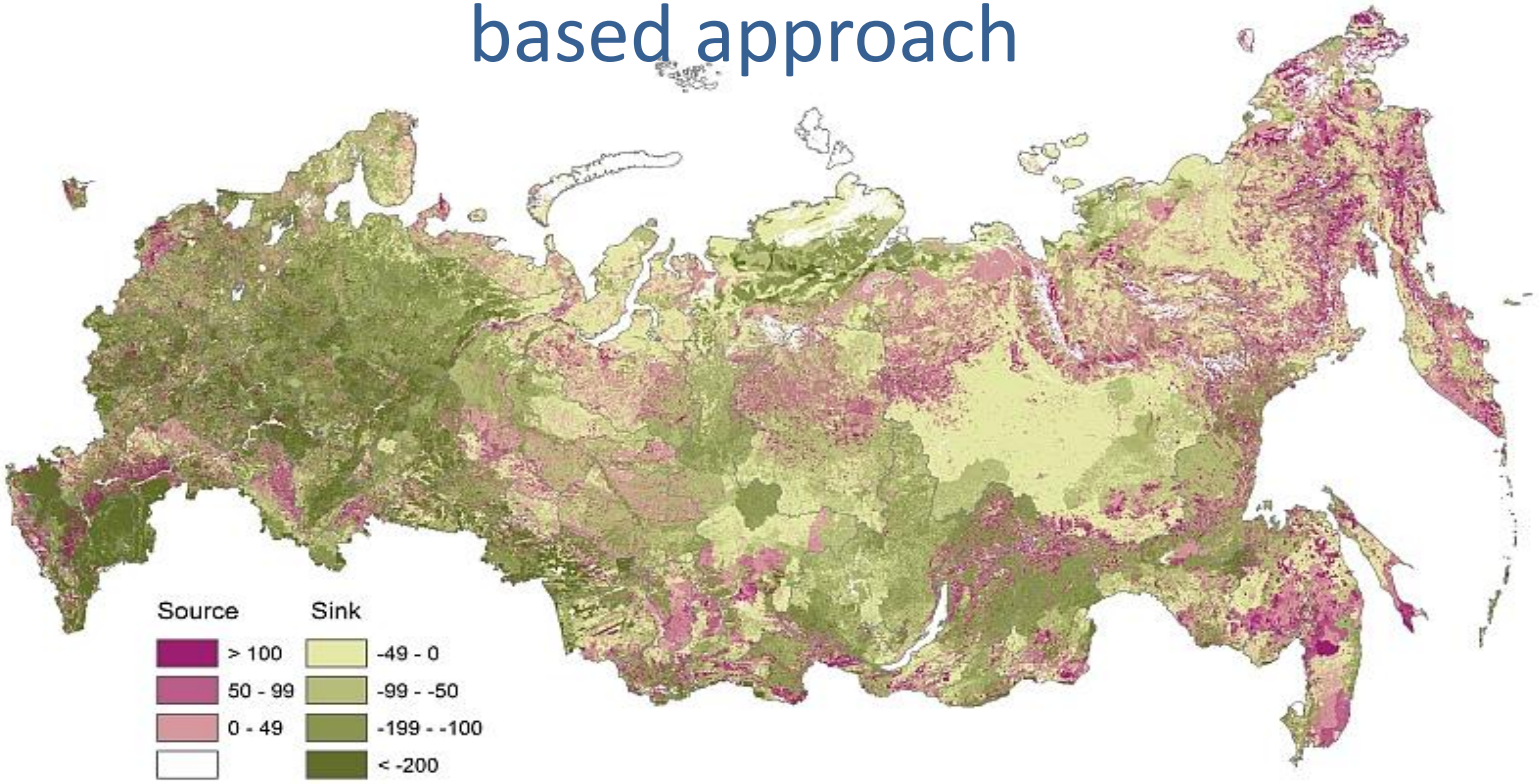


Land Cover state & dynamics

Towards the Verified Full Carbon Account of Russian Forests

- There are no practically applicable methods for updating growing stock volume in obsolete forest inventories (particularly for remote territories) – we have to know GSV
- In a systems approach knowledge of GSV would allow us to halve current uncertainty of FCA

Full carbon account for Russia in 2009 – flux-based approach



All ecosystems of Russia in 2000-2010 served as a net carbon sink at 0.5-0.7 Pg per year

Uncertainty ~30% of this sink

~90% was provided by forests

Shvidenko et al. 2011

Summary

- **Joint exploitation of new (optical and radar) EO data**
  - There is little practical knowledge about the synergistic use of ESA and ROSCOSMOS data.
- **Analysis of up- and down-scaling effects of integrated data sets and products**
  - The comparability and possibility of combining EO forest products is still lacking.
- **Realization of cross-validation approaches**
  - Validation of biomass maps is mainly limited by the availability of inventory and in-situ data.

ZAPÁS links to current GEO tasks

- **SB-02 Global Land Cover**
  - Improve the use radar time-series products to characterize land-cover dynamics
  - Address cutting-edge technological issues related to global land cover/change

ZAPÁS links to current GEO tasks

- **SB-03 Global Forest Observation**
  - Supporting the GEO ForestCarbon Tracking (FCT) initiative.
  - Support the development of national forest information systems (e.g. GFOI)
  - Technical support on REDD+ MRV

ZAPÁS links to current GEO tasks

- **CL-02 Global Carbon Observation and Analysis**
  - Improve the resolution and accuracy of carbon budgets
- **EC-01 Global Ecosystem Monitoring**
  - develop monitoring techniques to assess changes
    - ecosystem extent
    - Condition
    - Structure
    - function, and composition

Thank you for your attention!

http://sibessc.uni-jena.de **http://zapas.uni-jena.de**