Measurements of plant and soil characteristics in the vicinity of tundra flux measurements

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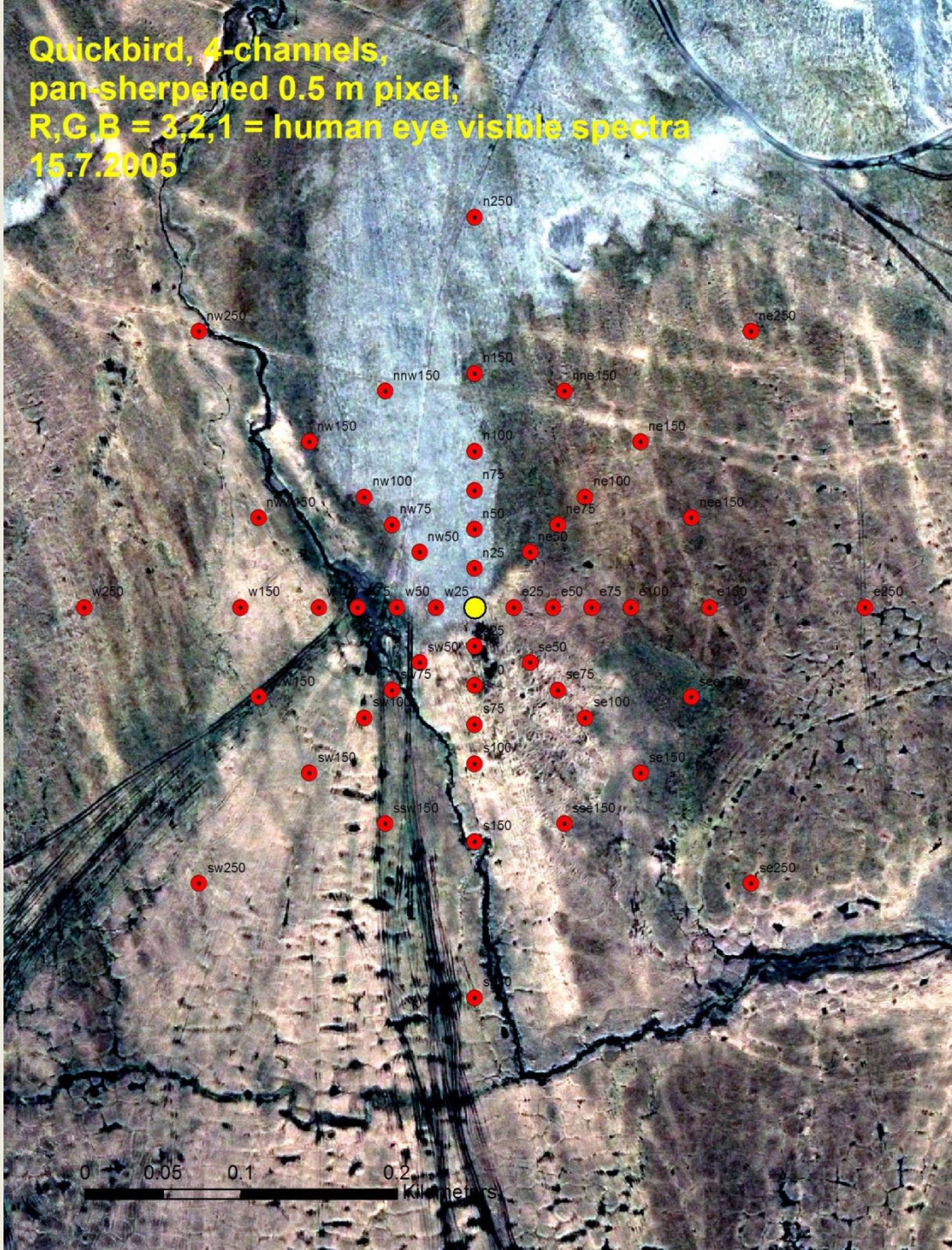
Experimental setup

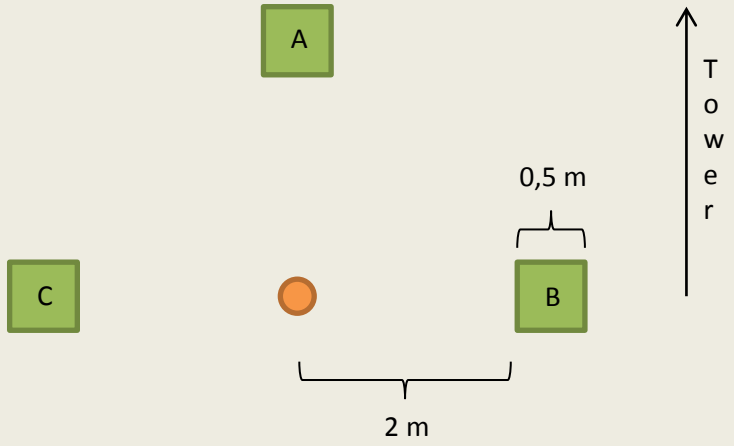
- Vegetation and soil survey in July 2012
- We established 5 or 6 sample plots to 8 different cardinal points (N, E, S, W, NE, SE, SW, NW)
  - Distances from the tower 25, 50, 75, 100, 150 and 250 m
- Also 8 additional sample plots between the cardinal points
  - Distance 150 m
- Altogether 54 sample plots with three sub-plots

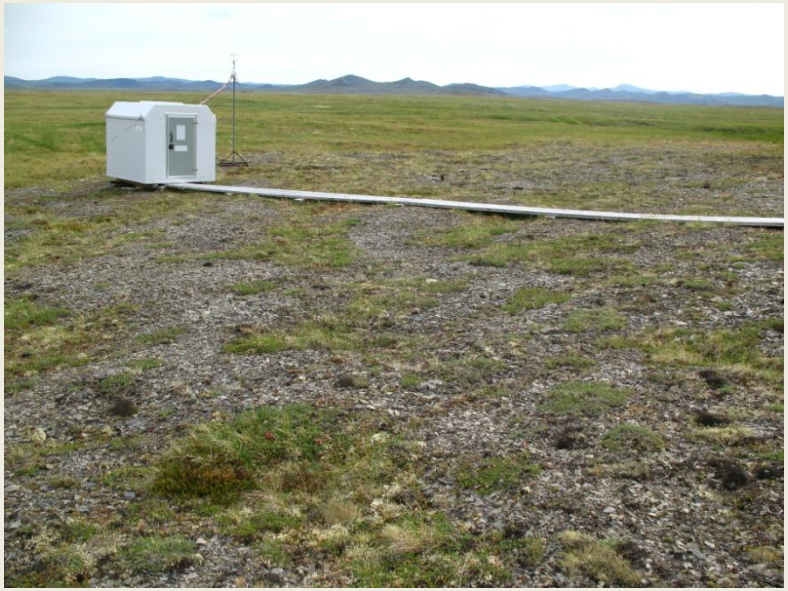
Location of the study plots & satellite data

- Two high resolution satellite images: Quickbird (15.7.2005) and WorldView-2 (12.8.2012)
- Landsat images (30 pixel size) form the following dates: 31.7.2006, 19.9.2010, 4.7.2011
- Digital elevation model in 25 pixel size form the region



Experimental setup:





Coverage and height of different plant functional types (N=54)

Plant species list

LAI (N=34)

Depth of active layer (N=29)
Water content (N=29)
Bulk density (N=29)
Organic matter % (N=29)

Results: Vegetational classes

1. PEATLANDS
   1.1 Fen
      1.1.1 Dry fen
      1.1.2 Wet fen
   1.2 Bog

2. MOORLANDS/HEATHS
   2.1 Tundra heath
      2.1.1 Lichen tundra heath
      2.1.2 Shrub-moss tundra heath
      2.1.3 Dwarf birch tundra heath
   2.2 Tussock tundra

3. MEADOWS
   3.1 Grass meadow
   3.2 Willow meadow

4. STONY, NON-VEGETATED AREAS

5. WATER

Vegetational class distribution, studied plots

%	
18.9	DRY FEN
17.0	BOG
17.0	STONY, NON-VEGETATED AREAS WITH LICHEN TUNDRA HEATH PATCHES
11.3	TUSSOCK TUNDRA
5.6	LICHEN TUNDRA HEATH
5.6	SHRUB-MOSS TUNDRA HEAT
3.8	WET FEN
3.8	GRASS MEADOW
3.8	STONY, WITH GRASS MEADOW PATCHES
3.8	BOG-TUNDRA HEATH TRANSITION
3.8	BOG-DRY FEN TRANSITION
1.9	DWARF BIRCH TUNDRA HEATH
1.9	WILLOW MEADOW
1.9	"WATER"

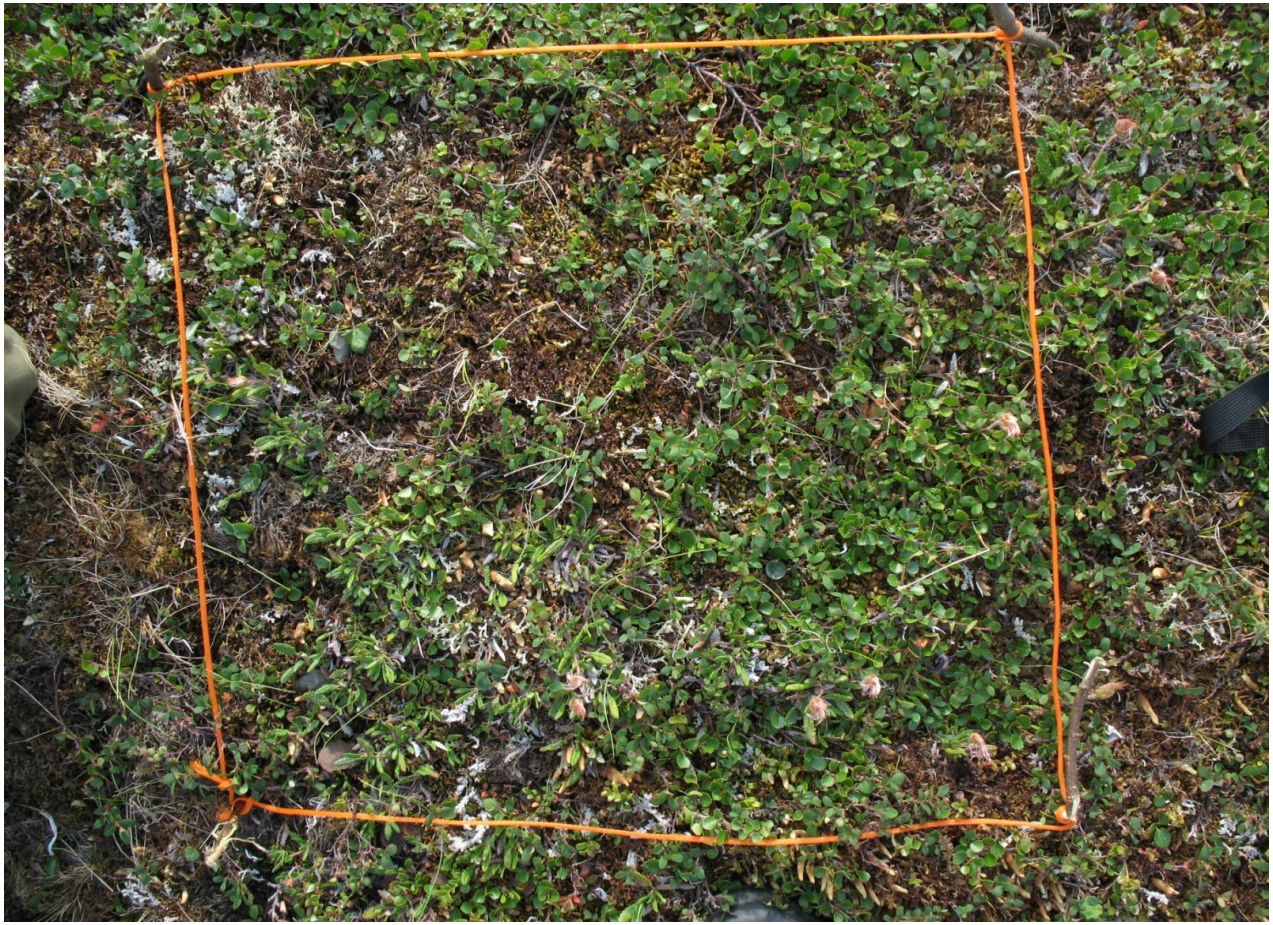
Fens

Wet fen

Bogs

Stony, non-vegetated areas with lichen tundra heath batches

Shrub-moss tundra heath



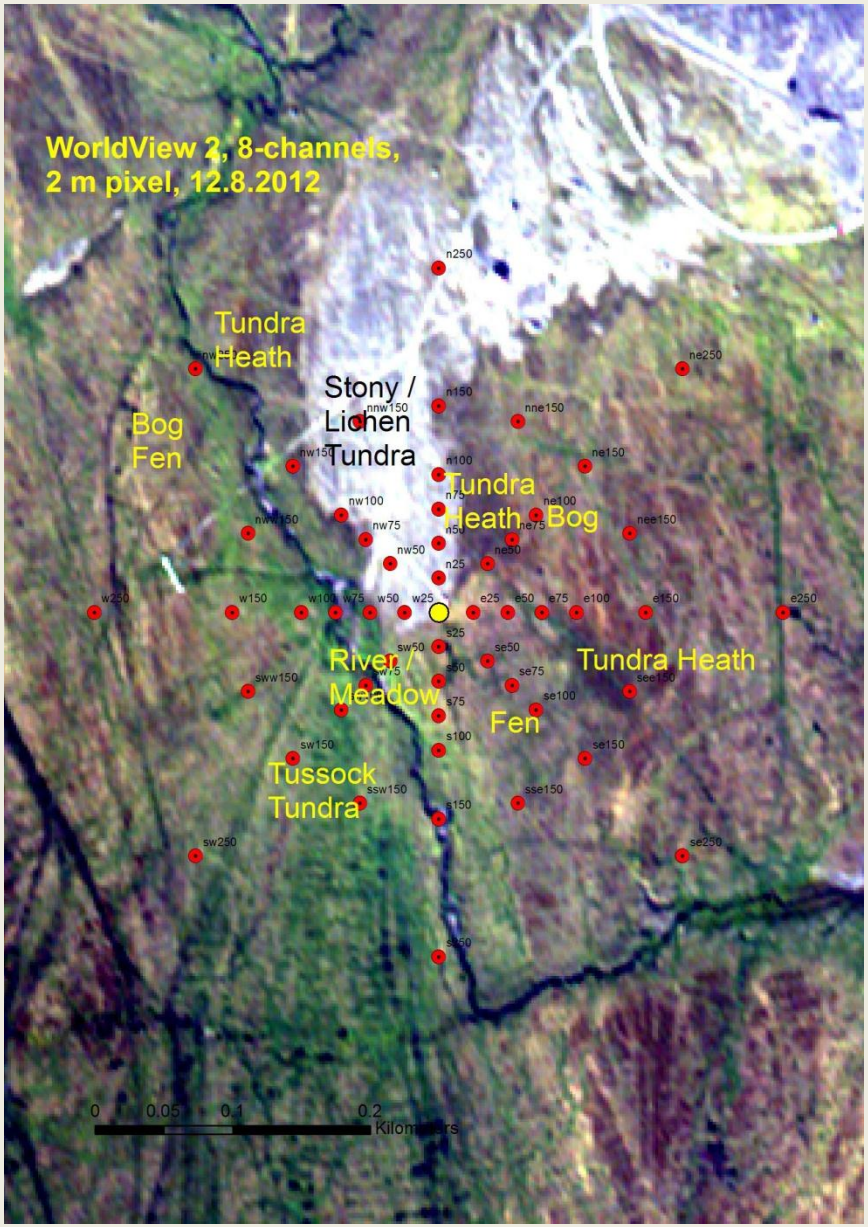
Dwarf birch tundra heath

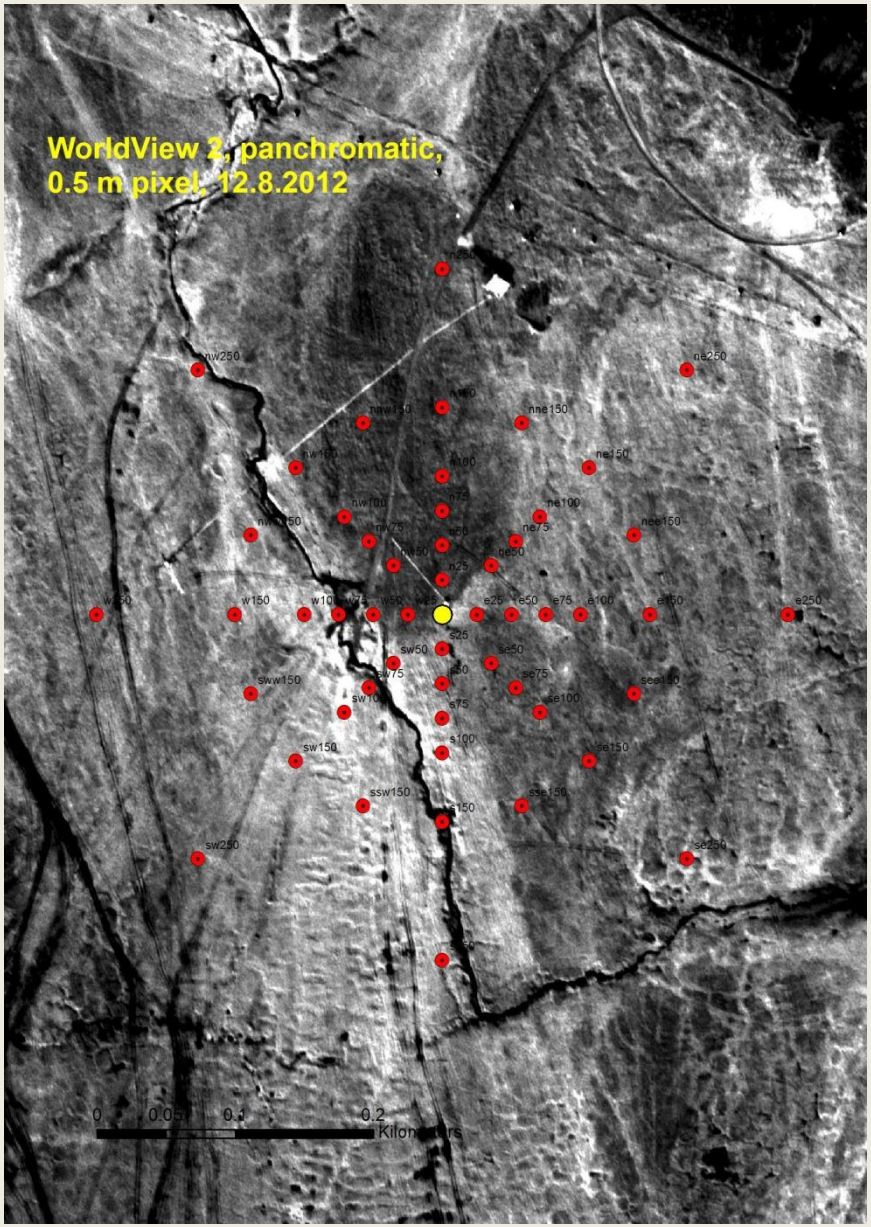
Tussock tundra

Grass meadow

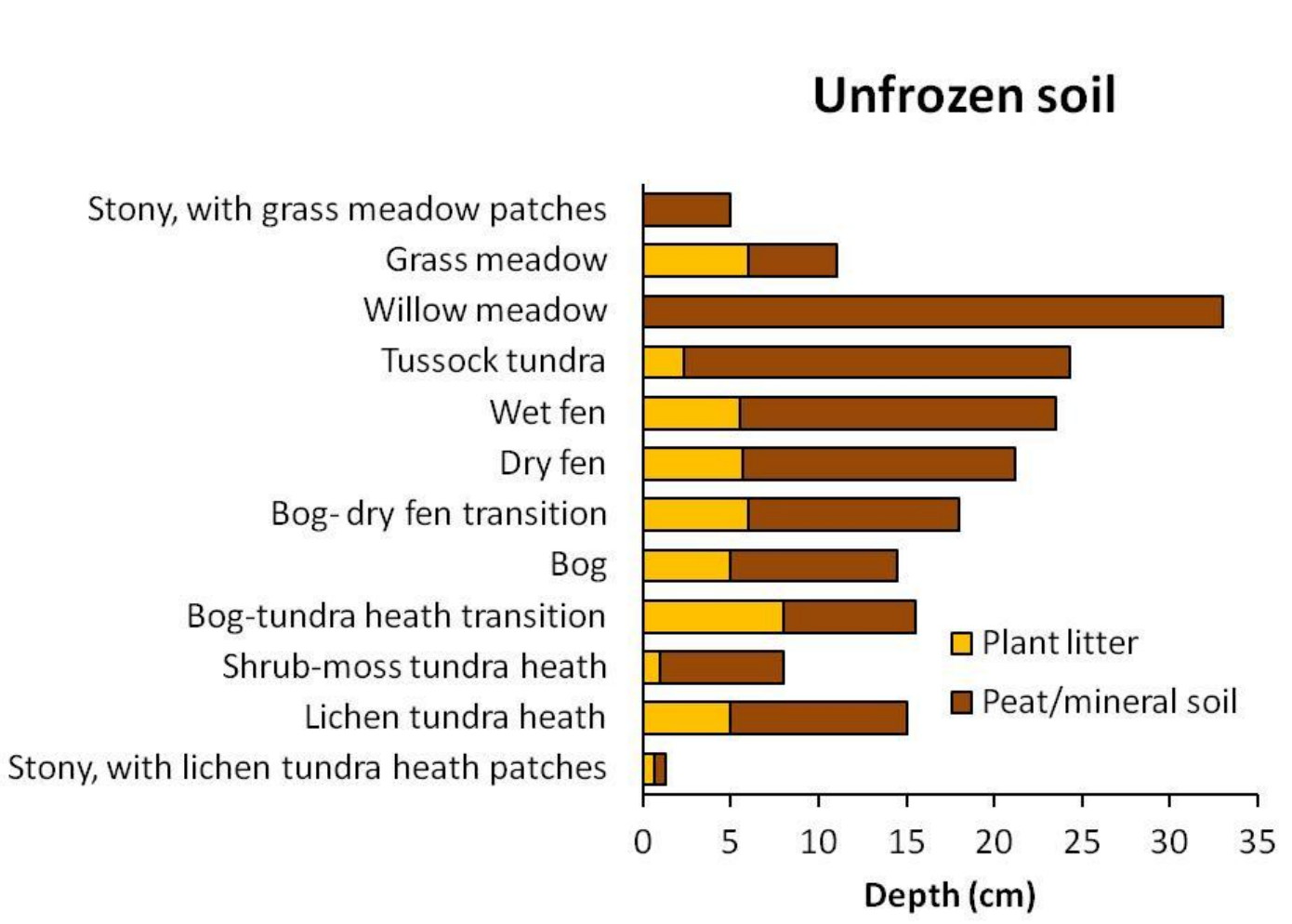
Willow meadow

Vegetational class distribution, images 12.8.2012



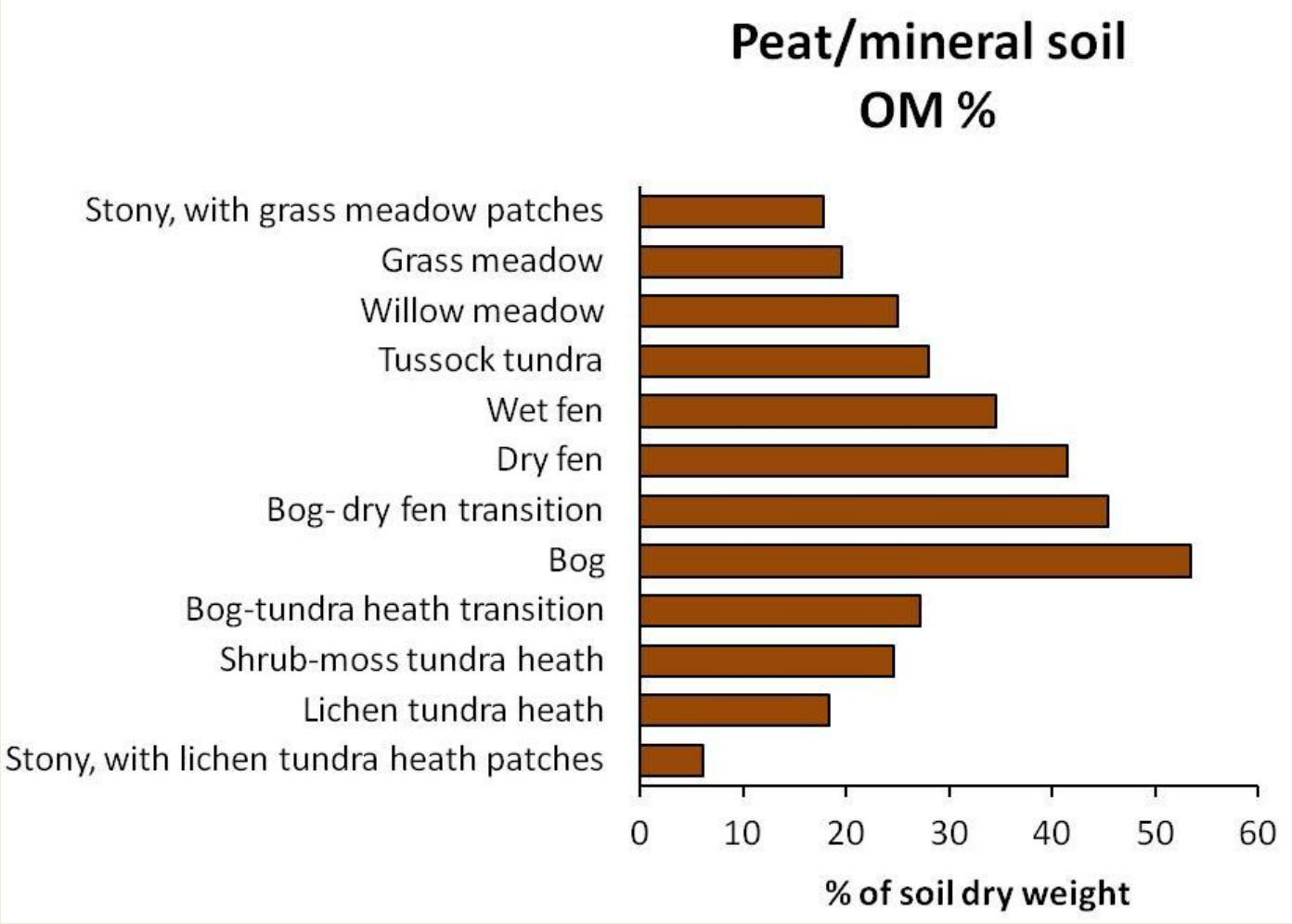


Results: Soil sampling



Unfrozen soil, the active layer, until the permafrost or (bed)rock

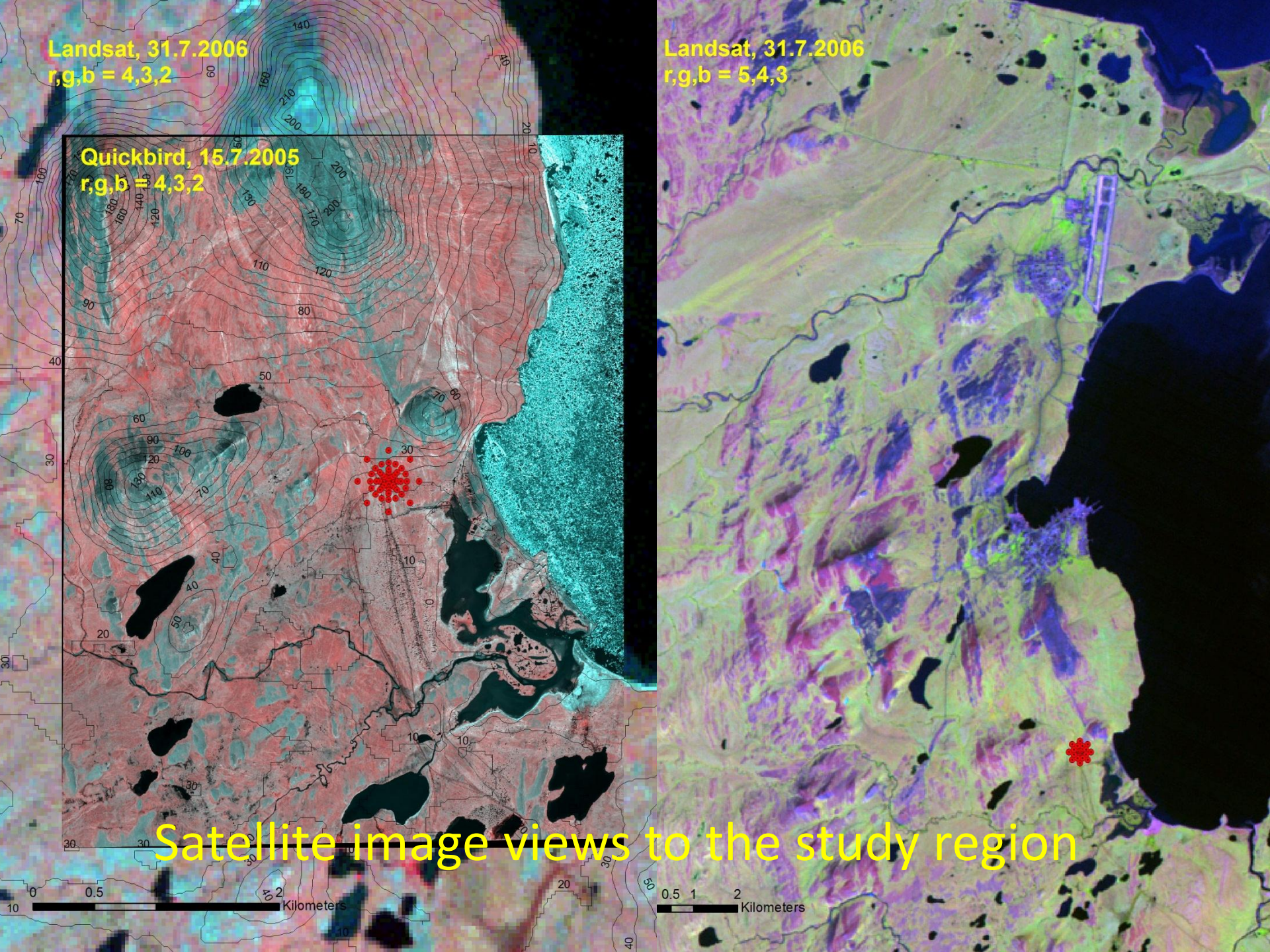
Results: Soil sampling



Soil organic content, % of dry weight

Some preliminary discussion and future plans

- The vegetation seems to be relatively nicely distributed along the sampling lines
- Soil sampling consistent with the vegetational types
- More thorough vegetation and soil survey nearby the experimetal site still needed to build a good model to explain the fluxes
- We are going to produce satellite image based vegetation type and land cover classification for area just nearby the measurement towers based on high resolution satellite images (takes some time)
- To understand, how well flux study site present the vegetation types in the region and to uspscale flux measurements to landscape level, we should get more field verification data, and also from areas some kilometers away from the measurement site



Satellite image views to the study region

Thanks for your attention