K&C Initiative, Extension Phase 2009-2011:

Mapping and monitoring of forests in Sweden using ALOS

PALSAR data

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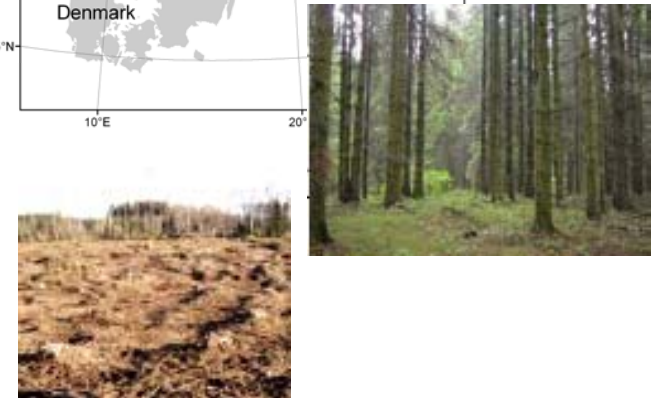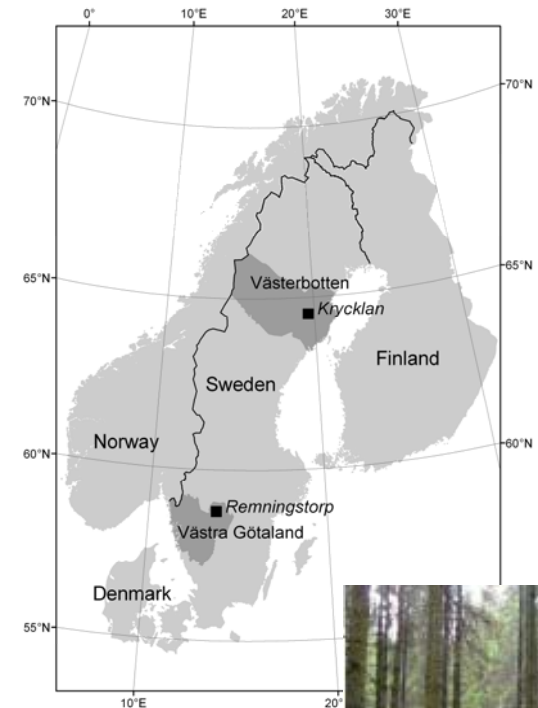# Introduction

Project objective:

To further develop and evaluate methods for large-scale mapping and monitoring of clear-cuts and possibly also stem volume or biomass for the entire Sweden using ALOS PALSAR data

Background:

L-band SAR data has potential for detection of forest cover changes and biomass, in particular HV-polarization

Project region:

Sweden

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Project plan

- The objective will be achieved by refining the developed methodology and algorithms in Phase 1 and by performing a scientific evaluation of clear-cut detection and possibly biomass estimation of Sweden

- The project will involve analysis covering different forest types (i.e. from boreal to hemi-boreal forests)

- The differences in weather conditions, topography and forest properties make it especially important to develop a robust methodology for future operational use

- The methods and algorithms that will be developed also aim to demonstrate the large-scale forestry monitoring goals of the JAXA's ALOS Kyoto & Carbon Initiative

- The proposed project will last until 23rd of January 2011 and funding will be sought for from the Swedish National Space Board

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Definition of deliverables

- The deliverable will be a clear-cut map (and possibly also a biomass map) covering the entire Sweden with an estimate of the product accuracy

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Time schedule (final delivery no later than Dec. 2011?)

- Refinements of the developed methodology in Phase 1 (2009)

- Refinements of the developed processing chain in Phase 1 (2009)

- Adaptation of processing chain from regional to national scale mapping (2010)

- Up-scaling and testing of methodology for change detection (and biomass estimation) (2010)

- Production of clear-cut (and biomass) map(s) (2010-2011)

- Final delivery of the product(s) with a written report to JAXA (Dec. 2011?)

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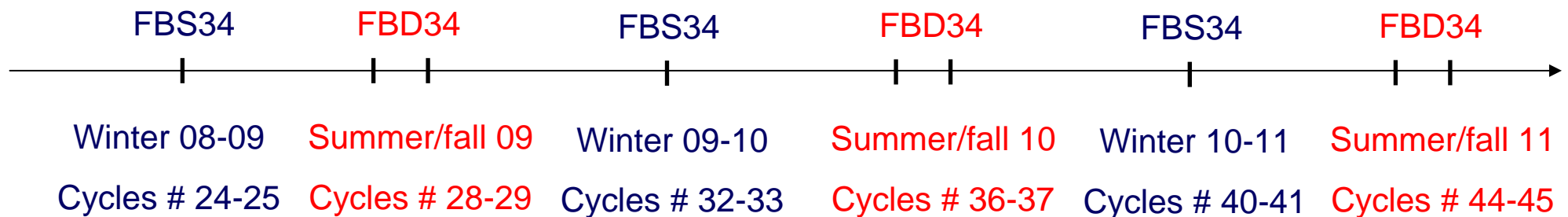Leif Eriksson and Lars Ulander, Chalmers University of Technology, Sweden

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PALSAR data requirements

- FBS 34 HH (2 cycles per year)

- FBD 34 HH/HV (2 cycles per year, first 2 cycles)

- All RSPs covering Sweden (51 tracks) → increase temporal frequency of measurements

- Spatial resolution: 50 x 50 m^2 is fine. Processing level: SLR data strips

- ScanSAR data for biomass estimation (1-3 years)?

FBS34	FBD34	FBS34	FBD34	FBS34	FBD34
Winter 08-09	Summer/fall 09	Winter 09-10	Summer/fall 10	Winter 10-11	Summer/fall 11
Cycles # 24-25	Cycles # 28-29	Cycles # 32-33	Cycles # 36-37	Cycles # 40-41	Cycles # 44-45

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