

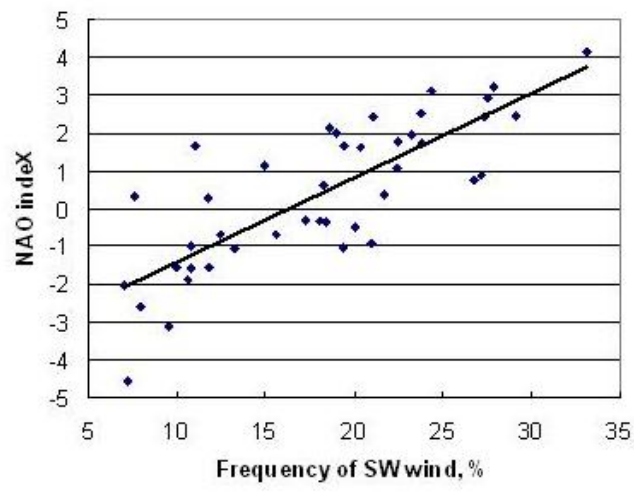
# **Project progress report WP2**

**University of Tartu**

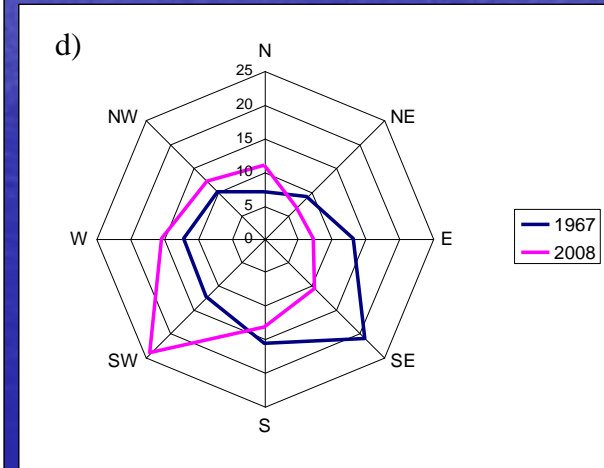
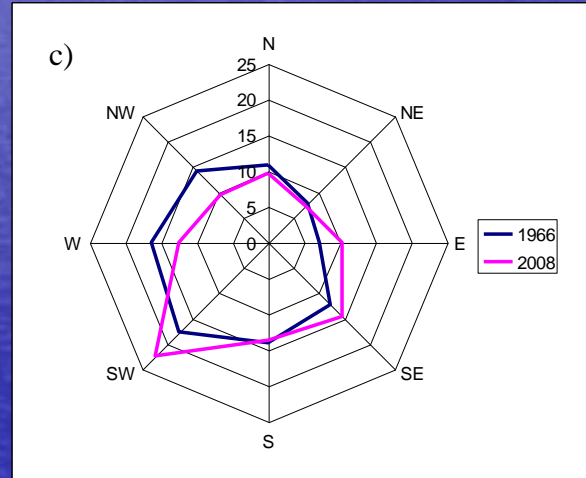
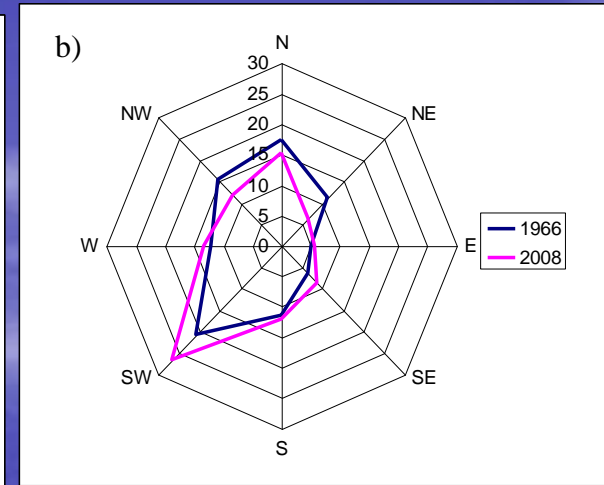
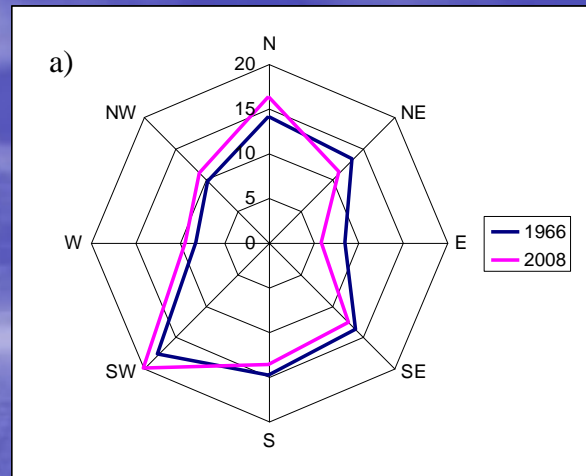
**Estonian wind data statistically analysed (and model corrected at measurement site), scientific paper accepted;**

**Wind modelling by WAsP in final stage for Estonia, to be done for Latvia (wind data input needed a.s.a.p.)**

# Wind analysis



Frequency of SW winds in Vilsandi during winter and winter NAO index according to Li & Wang (2003) ( $r = 0.80$ )

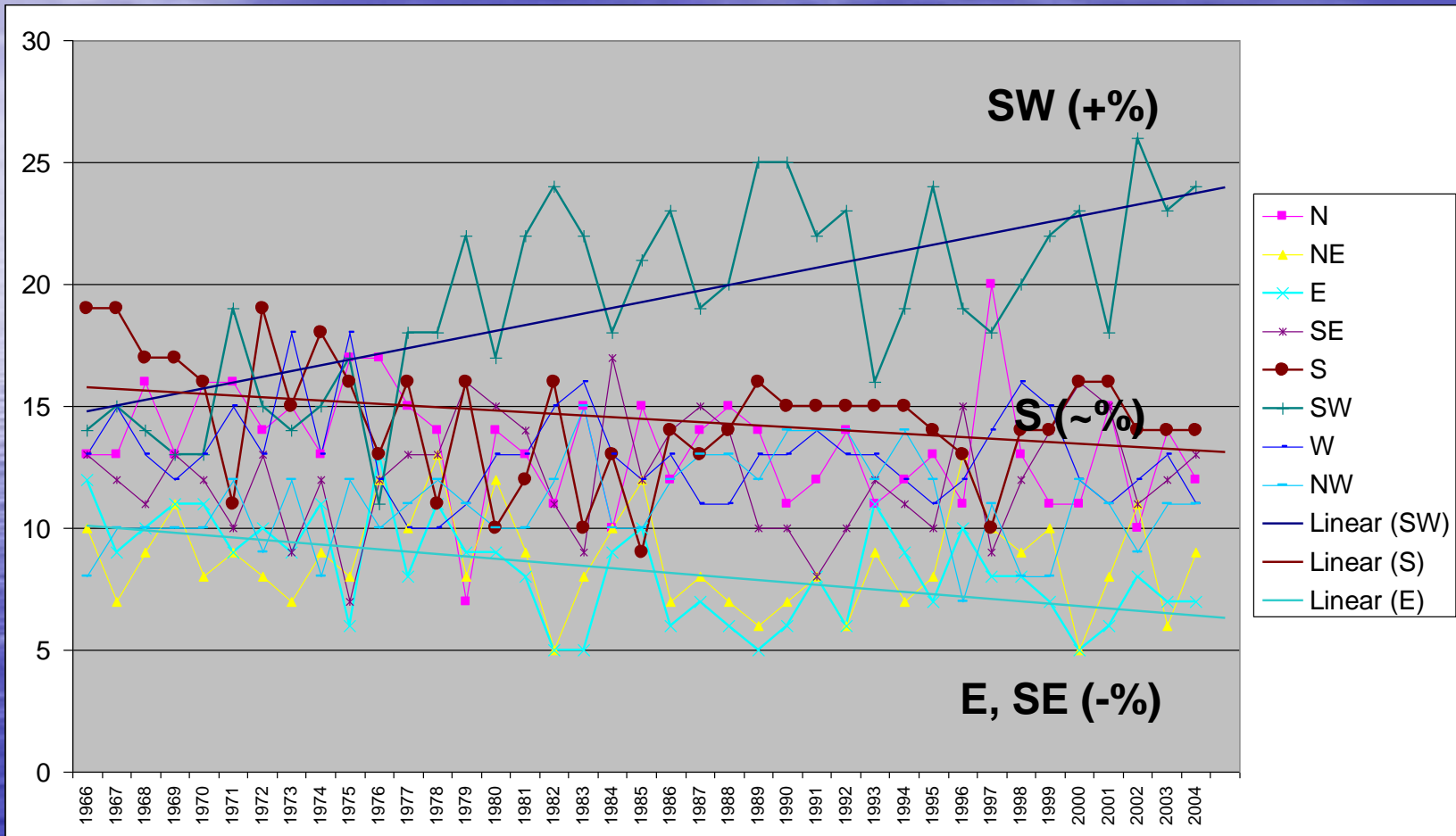


Seasonal wind roses in Vilsandi from 1966 to 2008 according to the linear trend.

**a) spring, b) summer, c) autumn, d) winter**

Jaagus, J. and Kull, A. Changes in surface wind directions in Estonia during 1966-2008 and their relationships with large-scale atmospheric circulation.

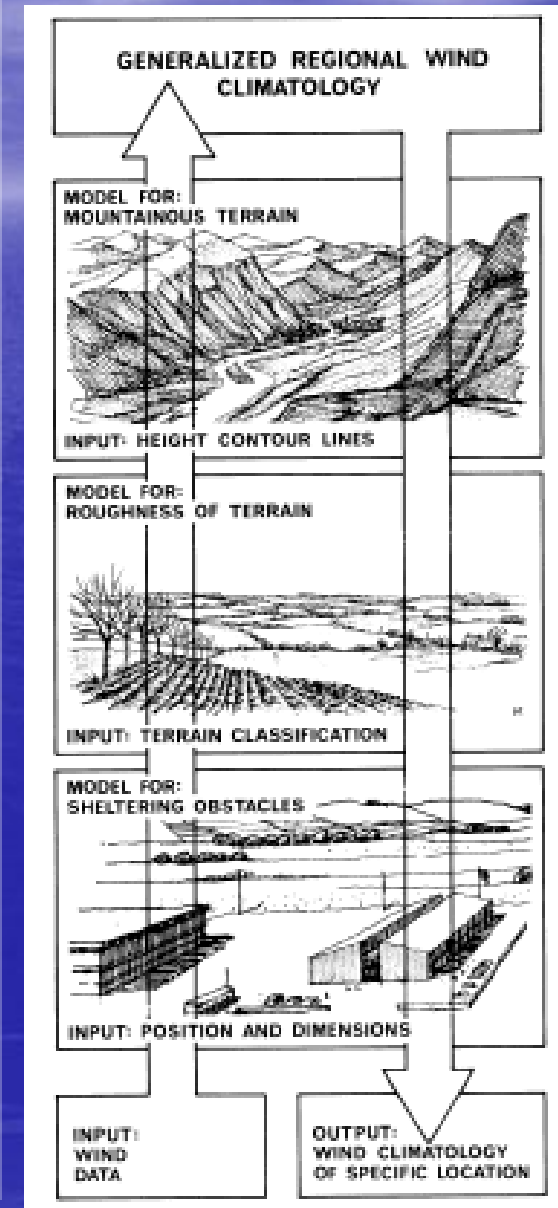
# Wind direction changes in Vilsandi



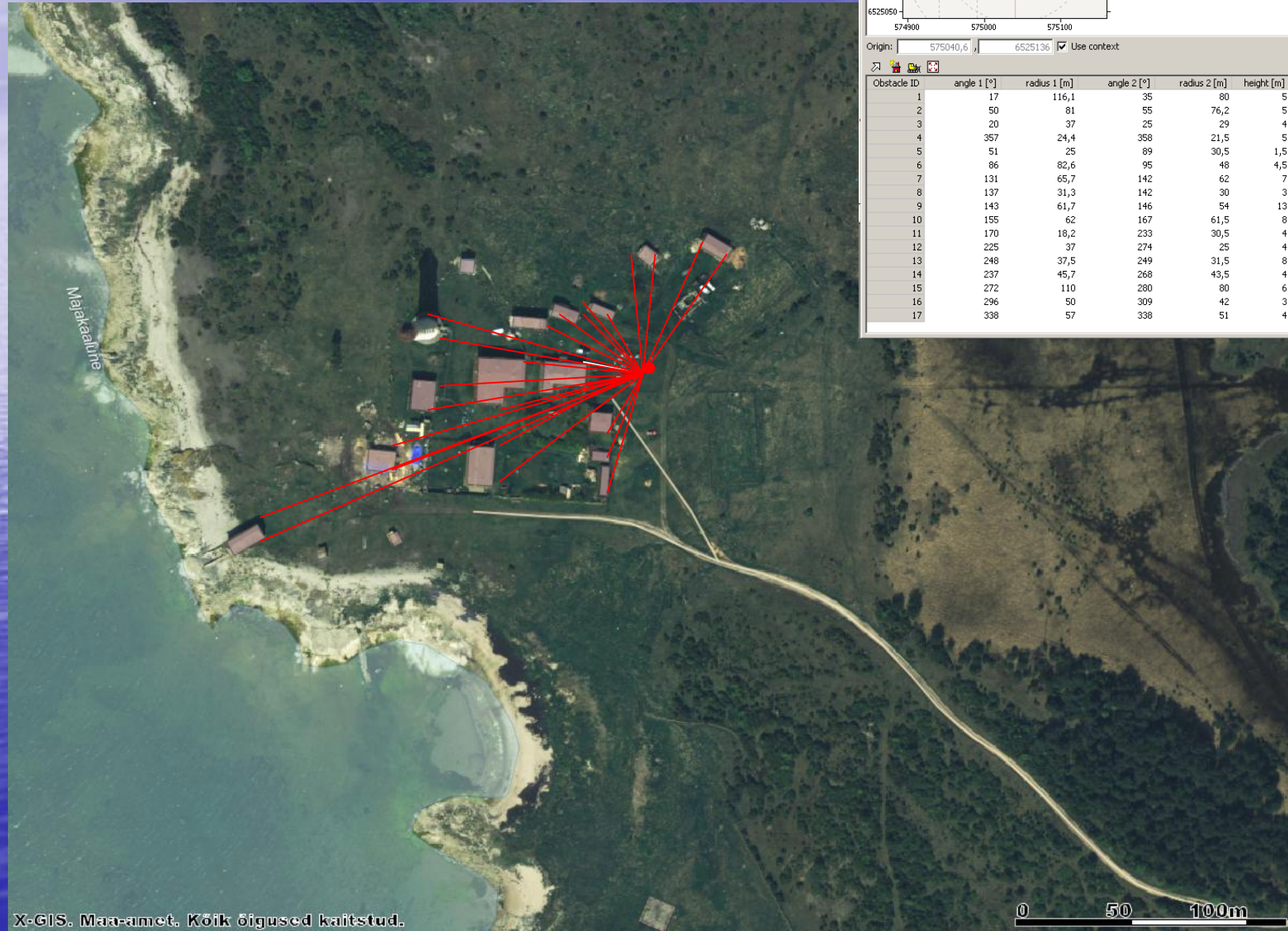
- Clear trends in wind direction

# Wind modelling by WAsP

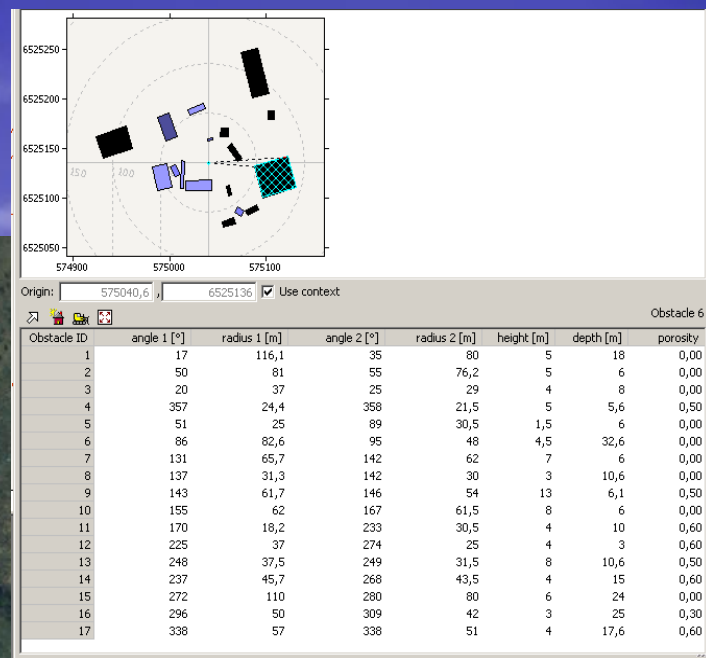
- Current status
  - WAsP methodology established
  - Mapping obstacles
    - All required input maps for obstacles ready (EST, LAT)
  - Orography
    - Finished in EST, started in Latvia
  - Roughness
    - Done in Estonia, started in Latvia (Ainaži)
  - Data
    - **Ready for processing in EST**
    - **Needed for Latvian part**
    - Kihnu high-level measurement from Eesti Energia (9 months) applied, initial agreement



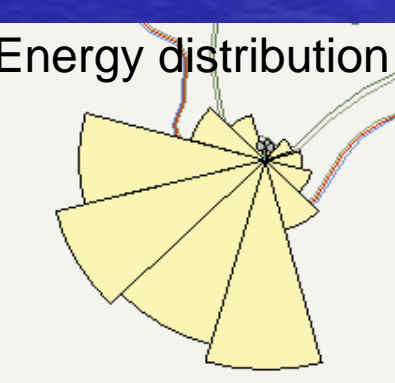
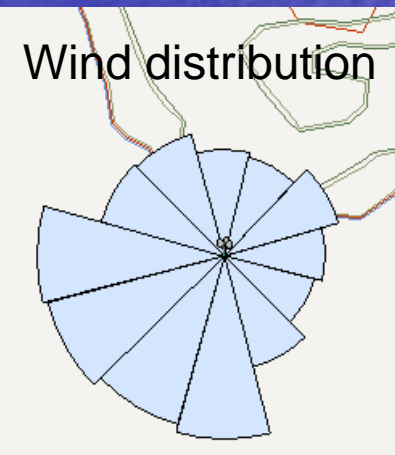
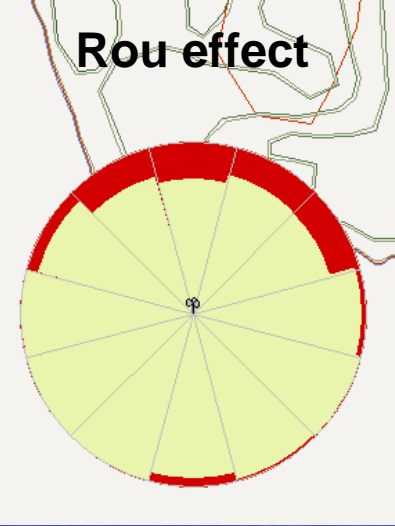
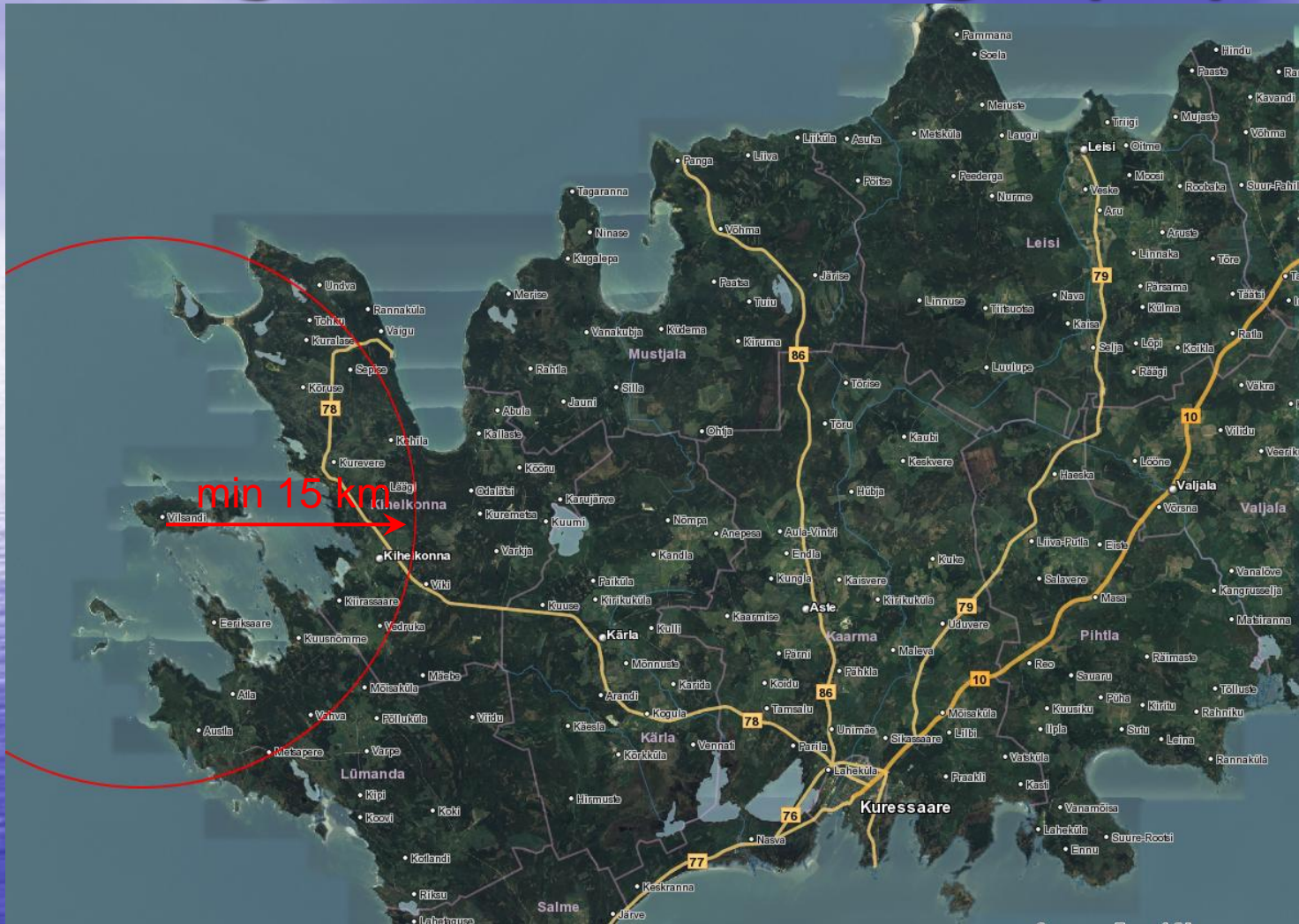
# Mapping obstacles



X-GIS. Maa-amet. Kõik õigused kaitstud.

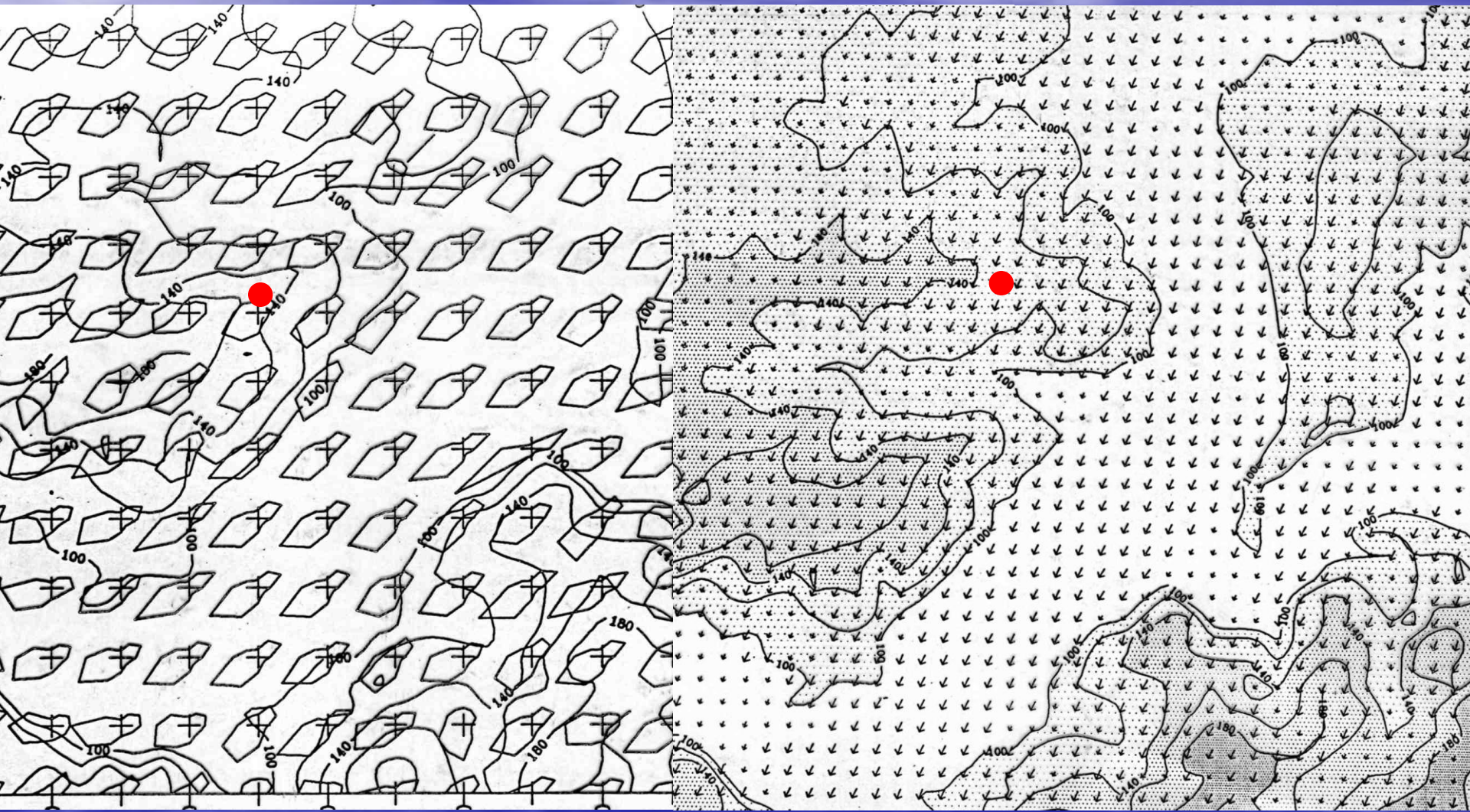


# Roughness and orography



Very detailed 15 km around measurement site (1:10000, 1: 25000), more general in distant areas (1:50000)

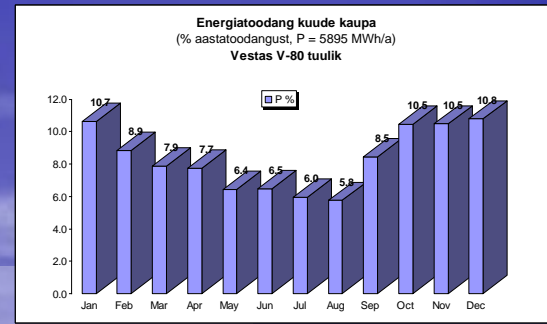
# Wind field modelling by WAsP



# Production forecast

- All Estonian stations:
  - ready for mass calculation
  - mean annual fields calculated, cross-validation possible when Latvian data available
- All Latvian stations
  - Data analysis to be started a.s.a.p. **time series are missing, will be solved in Oct. 2011**
  - Mapping obstacles, oro and roughness since July (Latvian maps 1:10 000 and 1:50 000 available)

# Output maps for WP4



## Mean monthly wind speed

- January 10m a.g.l.; 100m a.g.l.
- February 10m a.g.l.; 100m a.g.l.
- March 10m a.g.l.; 100m a.g.l.
- April 10m a.g.l.; 100m a.g.l.
- May 10m a.g.l.; 100m a.g.l.
- June 10m a.g.l.; 100m a.g.l.
- July 10m a.g.l.; 100m a.g.l.
- August 10m a.g.l.; 100m a.g.l.
- September 10m a.g.l.; 100m a.g.l.
- October 10m a.g.l.; 100m a.g.l.
- November 10m a.g.l.; 100m a.g.l.
- December 10m a.g.l.; 100m a.g.l.
  
- Mean annual wind speed 10m a.g.l.; 100m a.g.l.
- Mean annual energy density 10m a.g.l.; 100m a.g.l.

# Conclusions

- WAsP processing is in schedule for Estonian part
- Latvian meteorological data (wind speed and direction time series are needed a.s.a.p), in RP3 delivery for WP4 still possible