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FINNISH METEOROLOGICAL INSTITUTE

UbiCasting - UbiQuitous Weather Services

HTB - Phase II

The 2nd Helsinki Testbed Workshop

April 12 2007

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Finnish Meteorological Institute

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Motivation

- Sensitivity to severe weather has increased
- Deutsche Bank estimation: ”80% of all business is “exposured” to weather phenomenon
- Due to the unavailability of “fresh” analysis/predicted weather data at local scales (eg. city), weather-sensitive, short-term (business/public) operations are not fully supported by meteorological services
- Exposure to severe weather is increasing due to the climate change
- Overall wealth is increasing - Everybody have more to loose!
- State-of-the-art usage of weather products make proactive measures possible


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HTB-II-2007+: ***UbiCasting***

Objectives:

- **To build a pilot for an automated production system for** *weather*, *road weather* **and** *air quality* **services in city scales**
- **This pilot will be based on** *existing technologies* **and to their novel coupling and interoperability scaled down to city-scale (Helsinki TestBed)**
- **The piloted services are to be based on ubiquitous availability through modern channels like mobile phones and web**
- **The targeted end-users of UbiCasting services are both in public and private sector (eg. Transport, logistics, industry, public authorities)**

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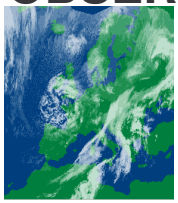
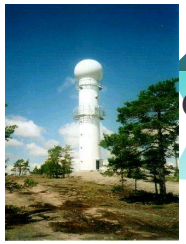
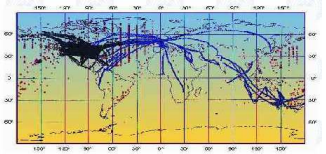
FMI's current value-chain is based on high-level automatization

OBSERVATIONS

Observations

Real-time data base

Manual editing

Numerical Prediction Models

Production

Basic Products

Production

Commercial products

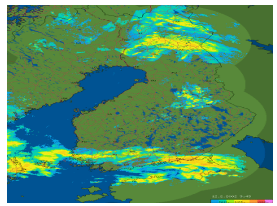
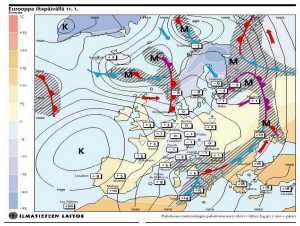
cellular | WWW

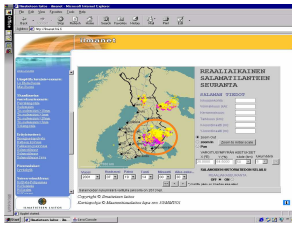
ftp | E-mail

fax | TV

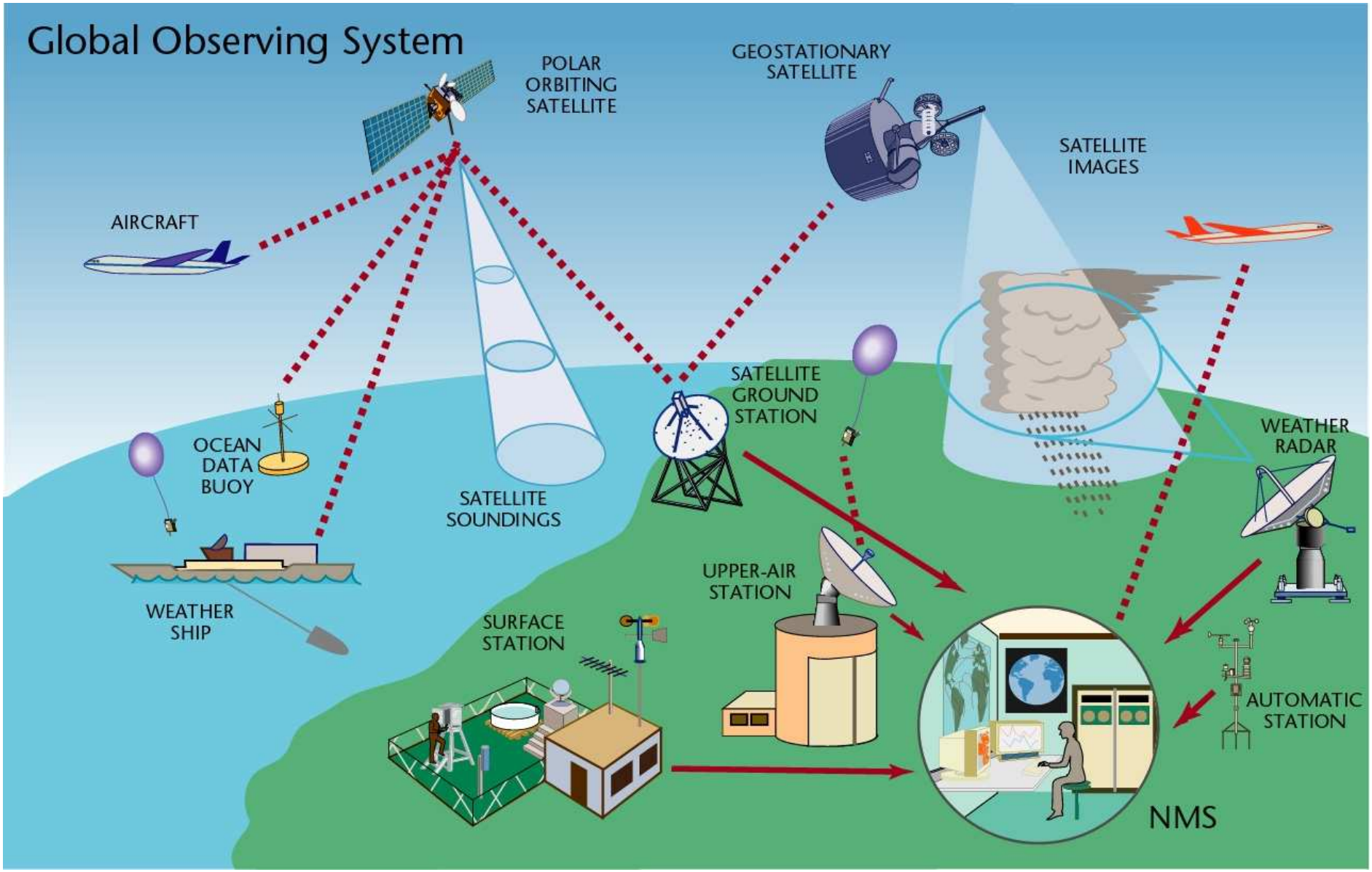
newspapers | Radio

PRODUCTS



Weather is often "imported"
International collaboration is essential



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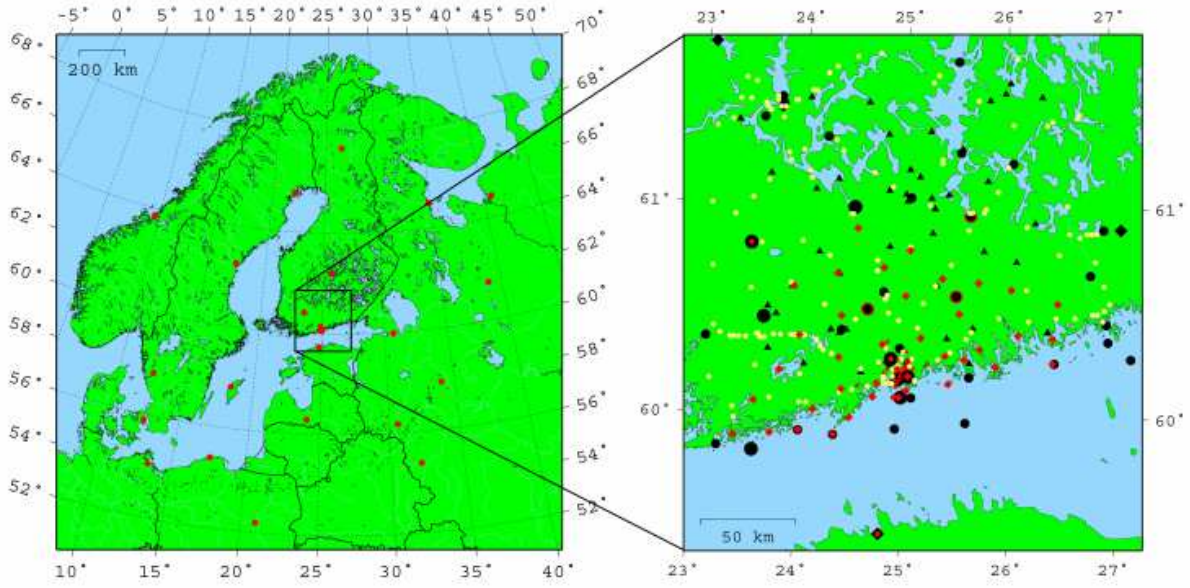
Helsinki Testbed 2005-2007 (HTB)

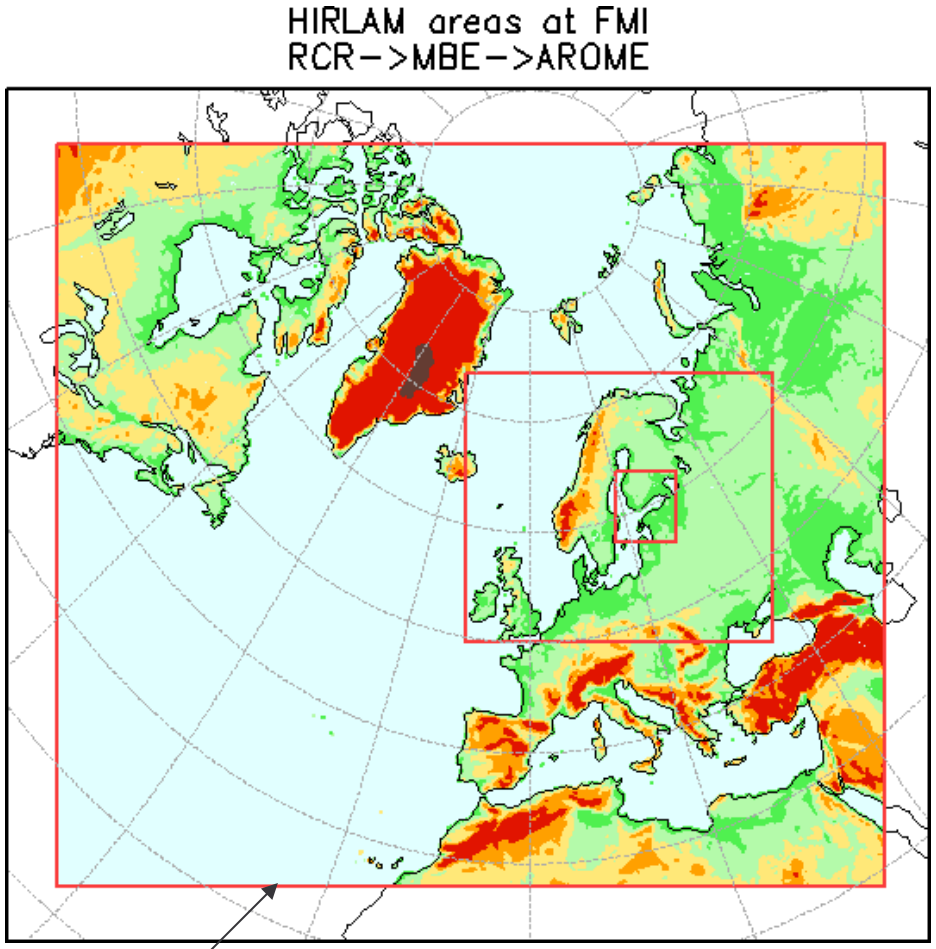
- Mesoscale weather research
- Forecast and dispersion models development and verification
- Information systems and technology integration
- End-user product development and demonstration
- Data distribution for public and research community



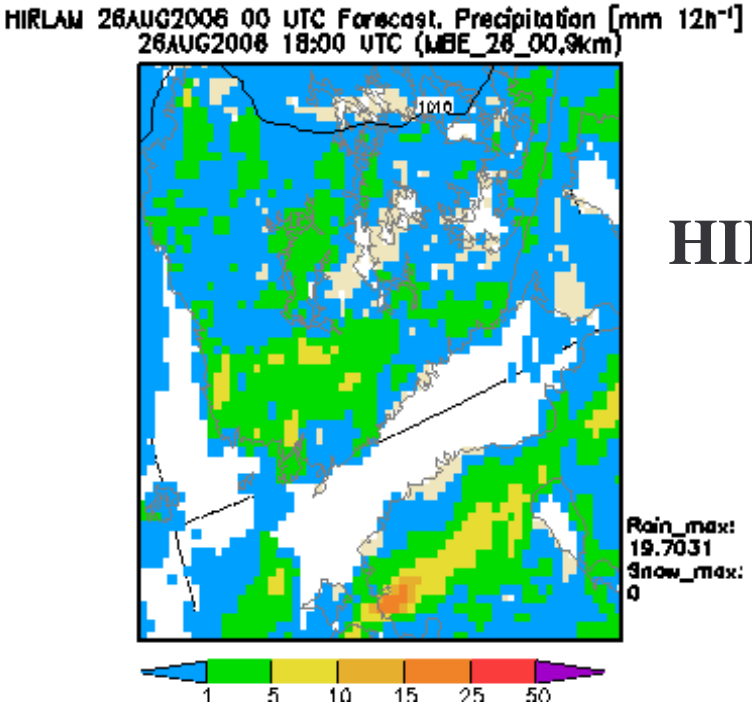
VAISALA
TEKES
NOKIA
Finnish Road Enterprise
STUK
YTV
unibase
FINNISH ROAD ADMINISTRATION

Numerical Weather Prediction at FMI

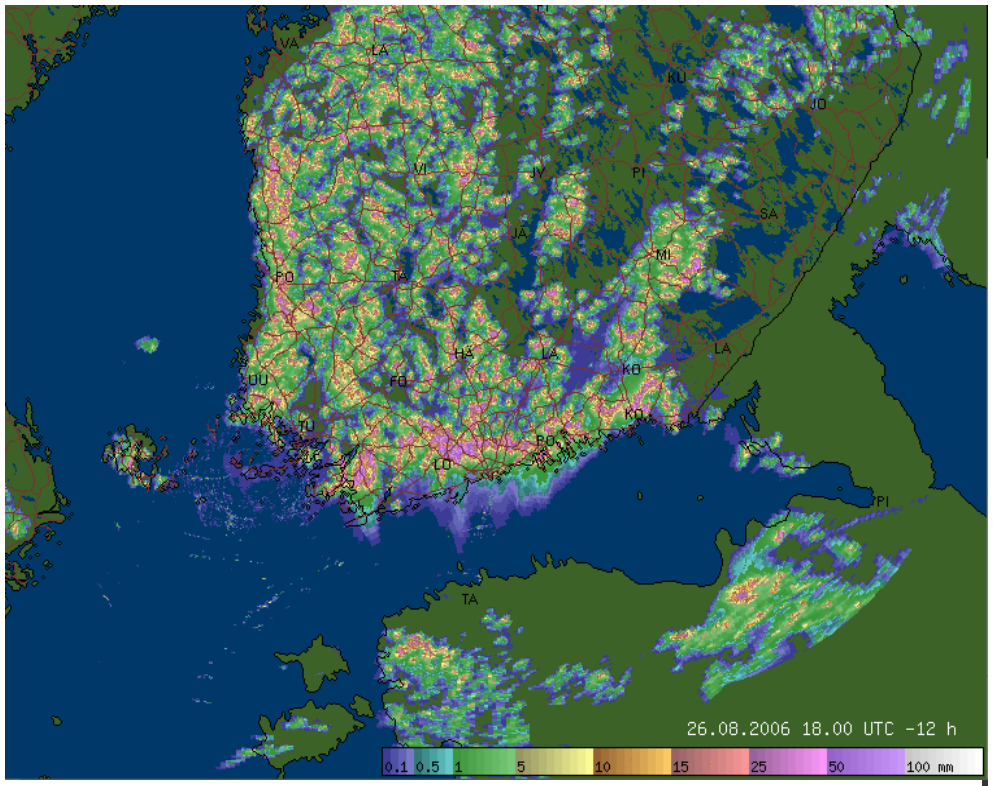
- **RCR: Hirlam Regular Cycle with the Reference system**
  - dh = 0.15° ~ 17 km
  - 60 tasoa pystysuunnassa (1000 – 10 hPa)
  - dt = 6 min
- **MBE: Hirlam Meso BEta**
  - dh = 0.08° ~ 9 km
  - 40 tasoa pystysuunnassa (1000 – 10 hPa)
  - dt = 3 min
- **AROME: Meso-gamma model**
  - dh = 2.5 km
  - 40 tasoa
  - dt = 1 min

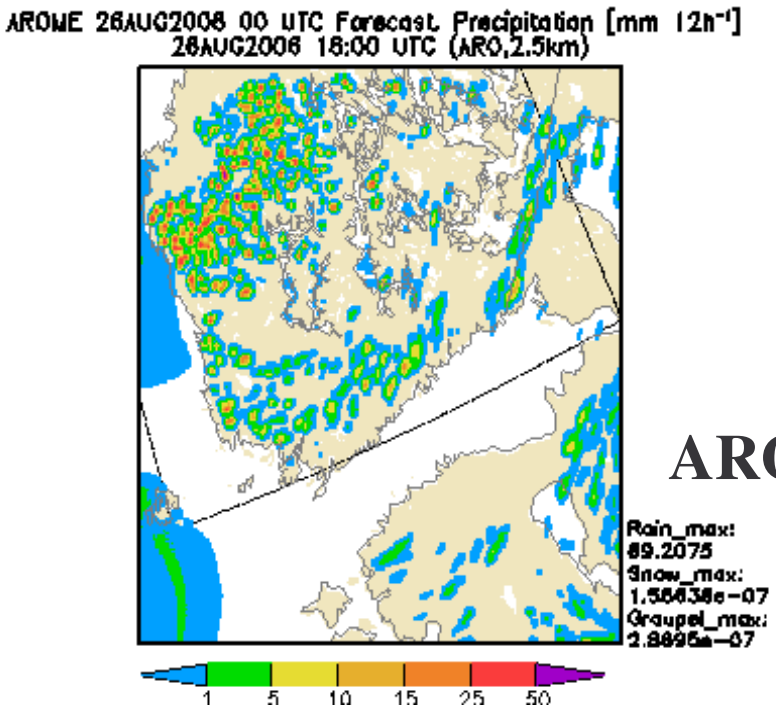


Preoperational AROME test suite at FMI



HIRLAM – MBE

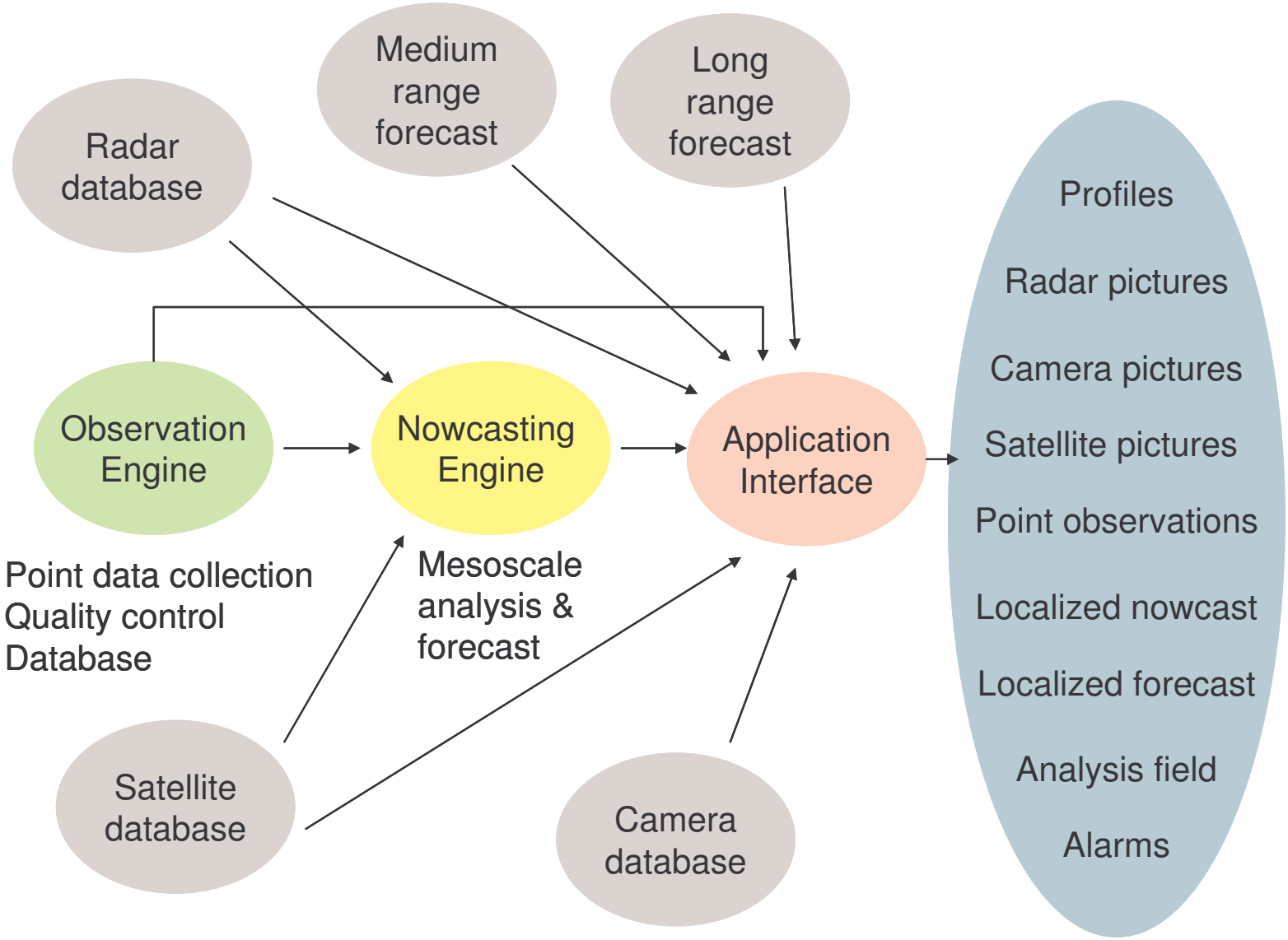


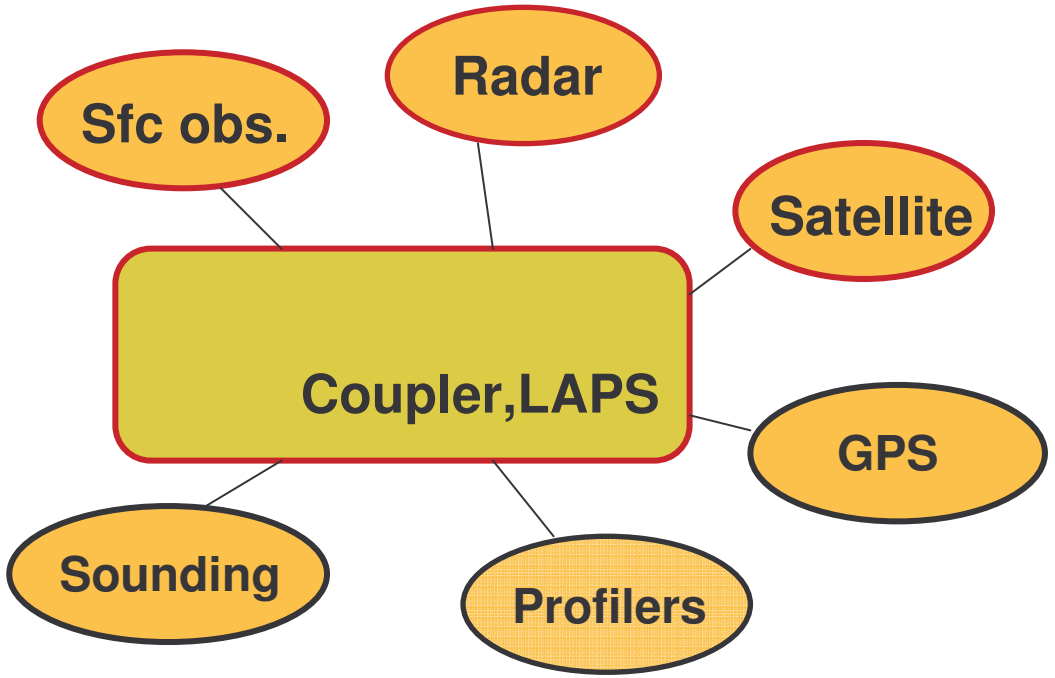


AROME

12-h accumulated precipitation
18 UTC 26.8.2006

Architecture & implementation




Radar
Sfc obs.
Satellite
Coupler,LAPS
GPS
Sounding
Profilers

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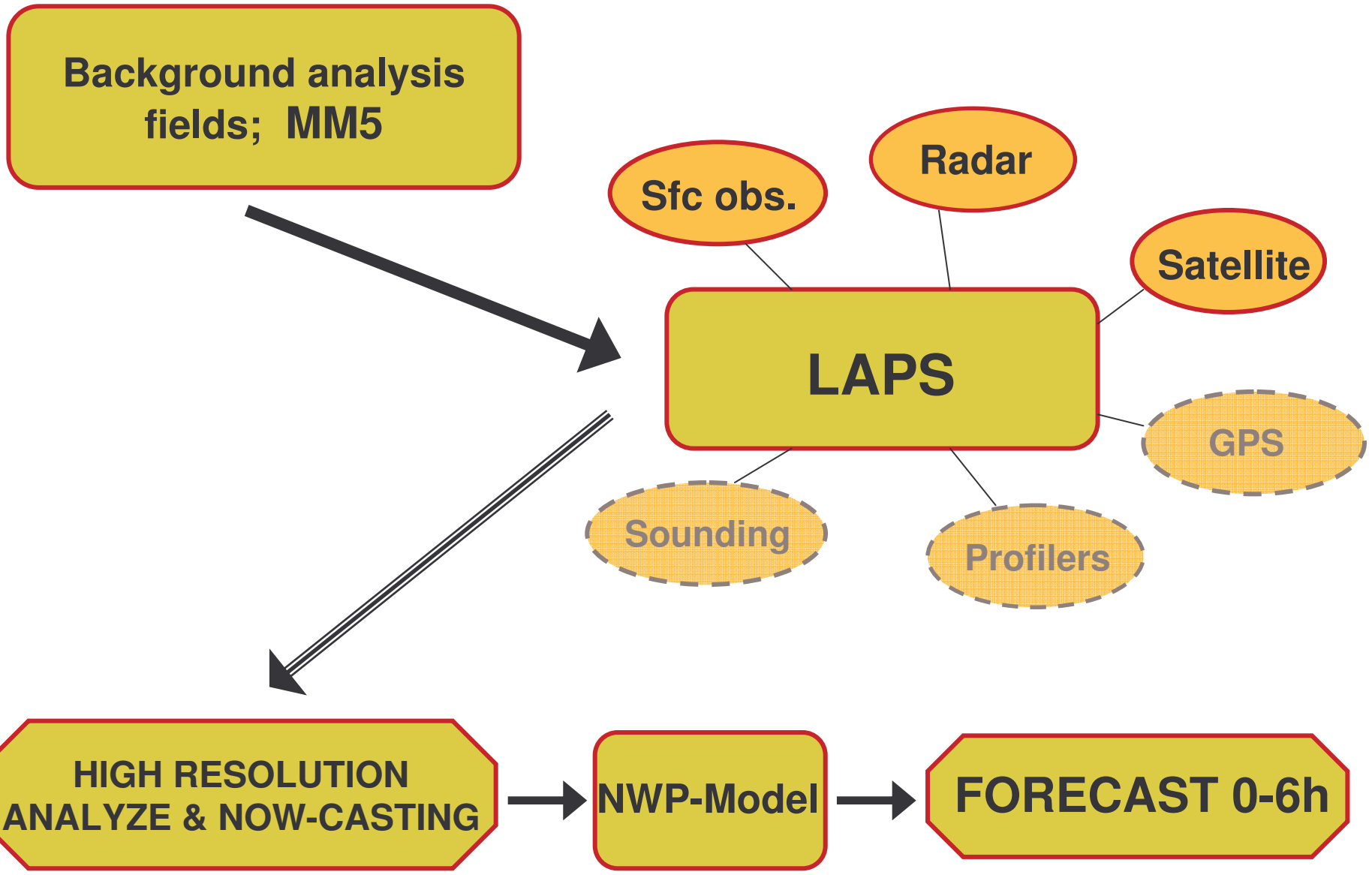

Concept for Now-Casting Engine (NCE)

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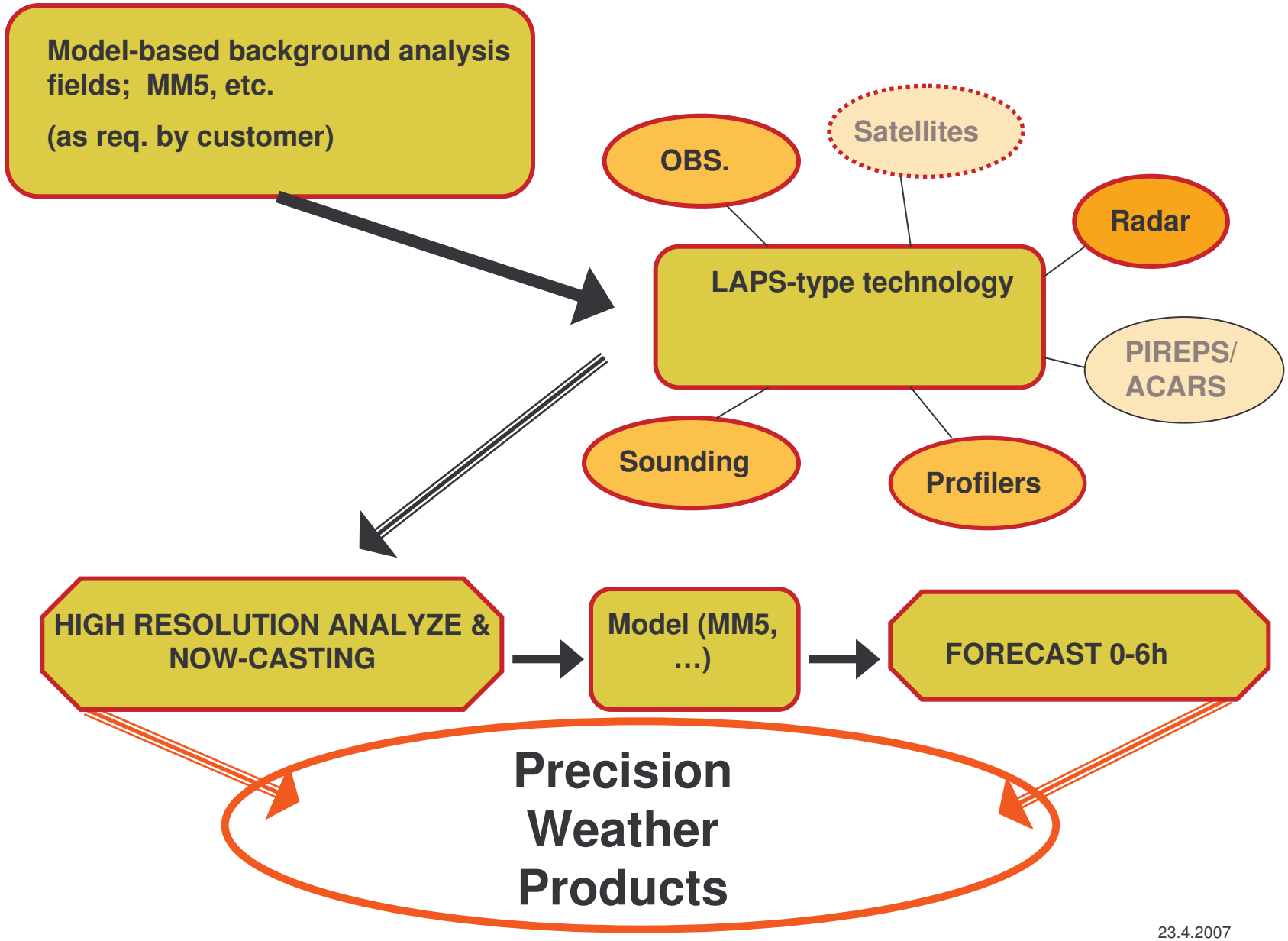

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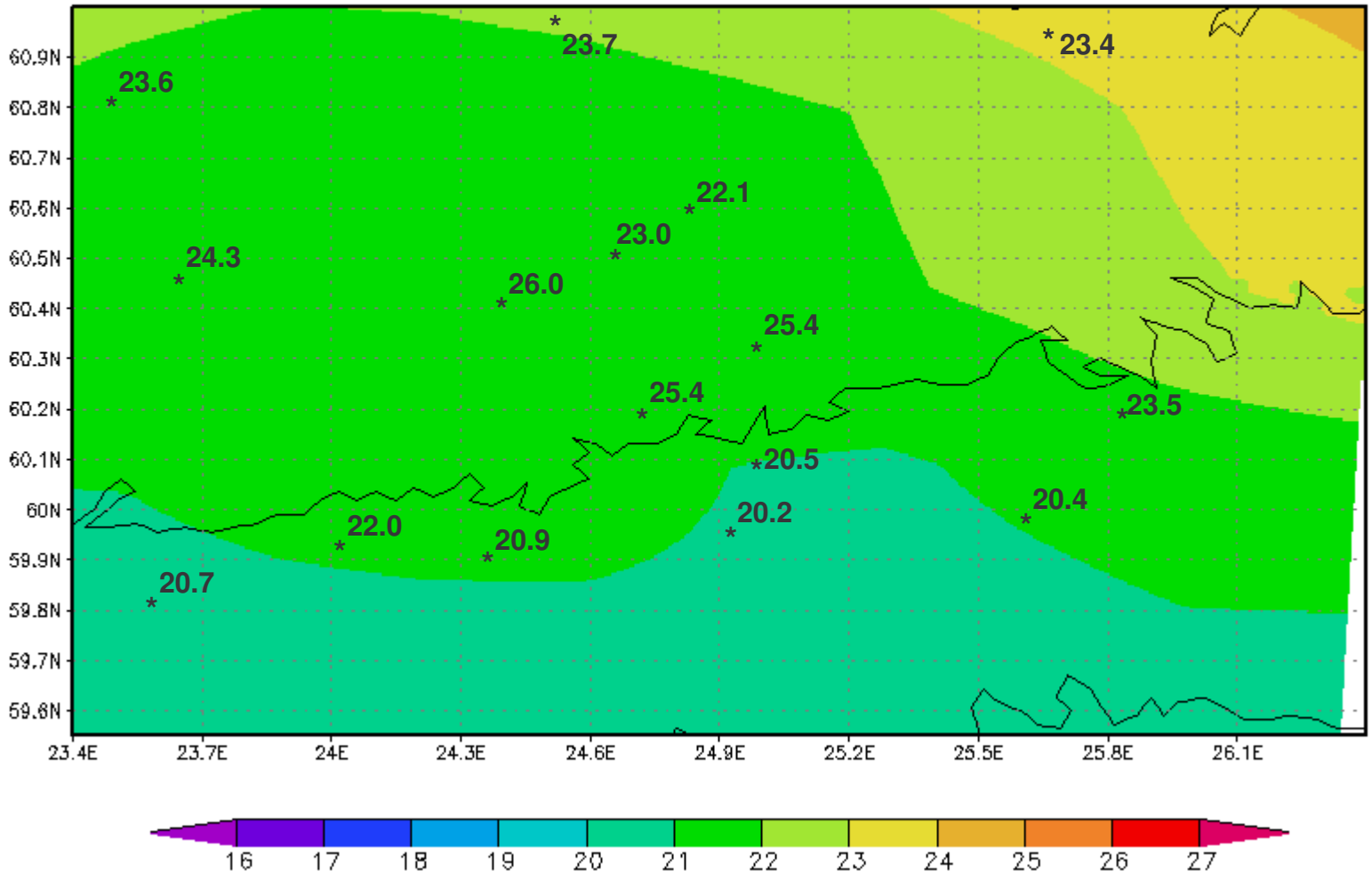
MM5 analysis: Temperature at 9 m height, with 1 km resolution

Verification: The figures, within the plot, are measurements from certain stations which are not included in the LAPS analysis



09 Aug 2005,15 UTC

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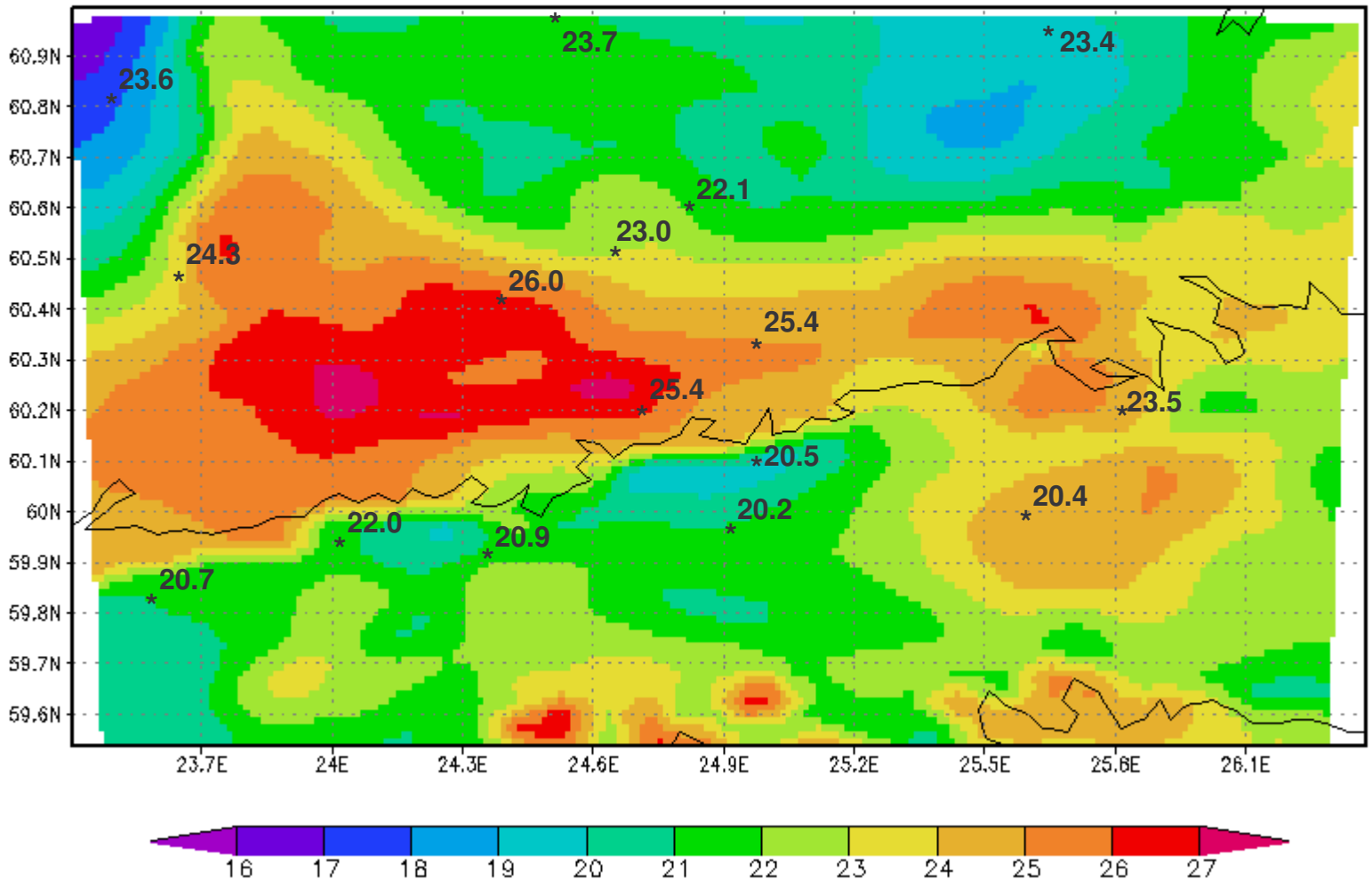
LAPS/MM5 analysis: Temperature at 9 m height, with 3 km resolution

Verification: The figures, within the plot, are measurements from certain stations which are not included in the LAPS analysis



09 Aug 2005,15 UTC

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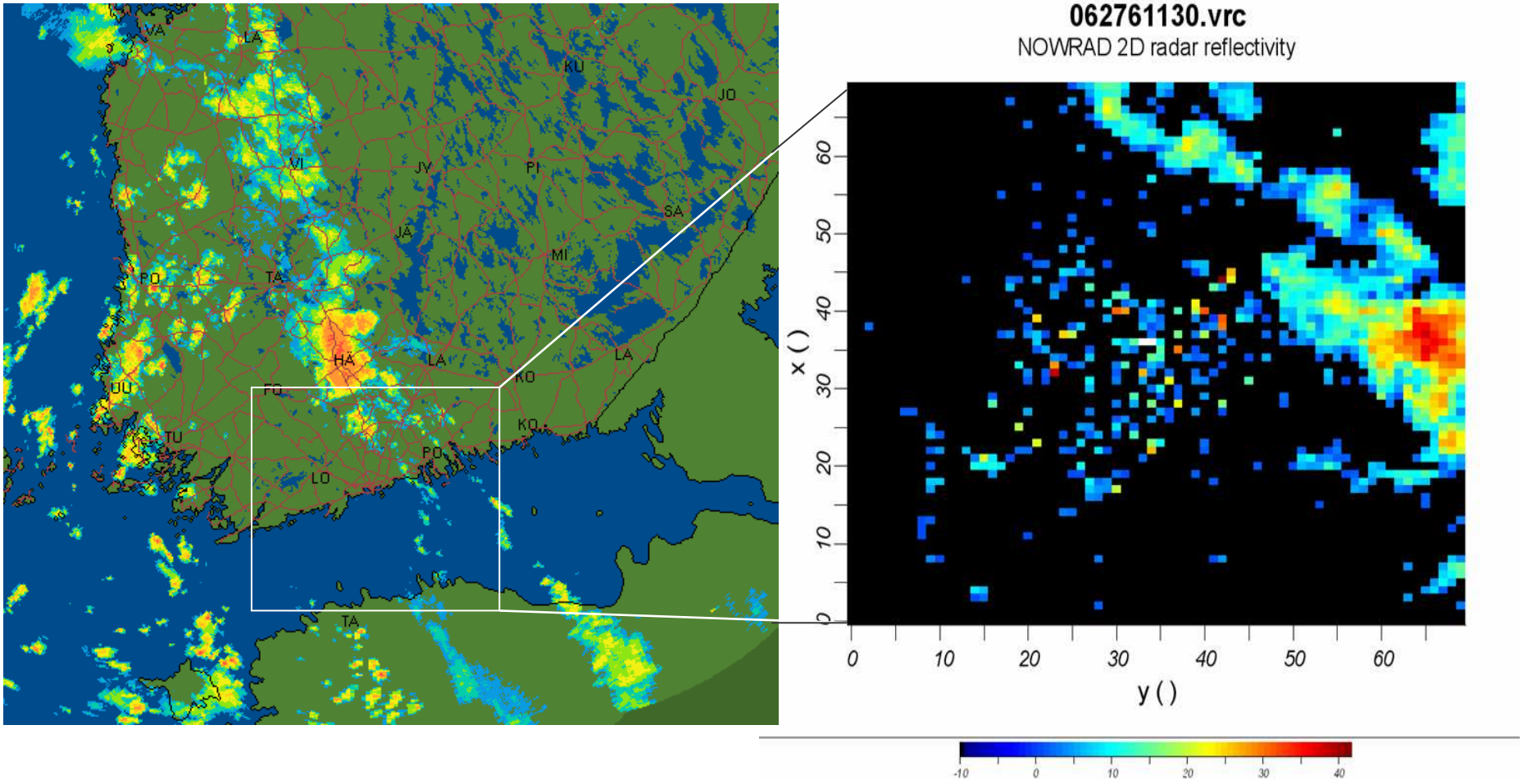
Simple plot with LAPS-inbuilt tool showing radar reflectivity 1130 UTC 03 October 2006 and radar composite picture



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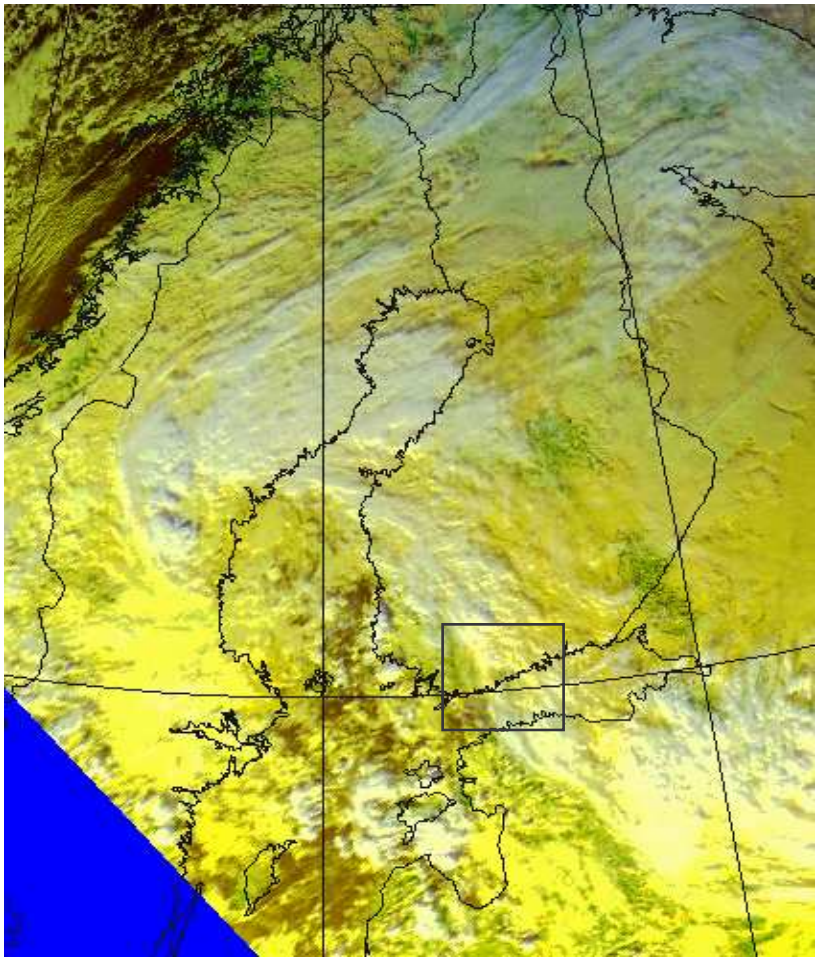
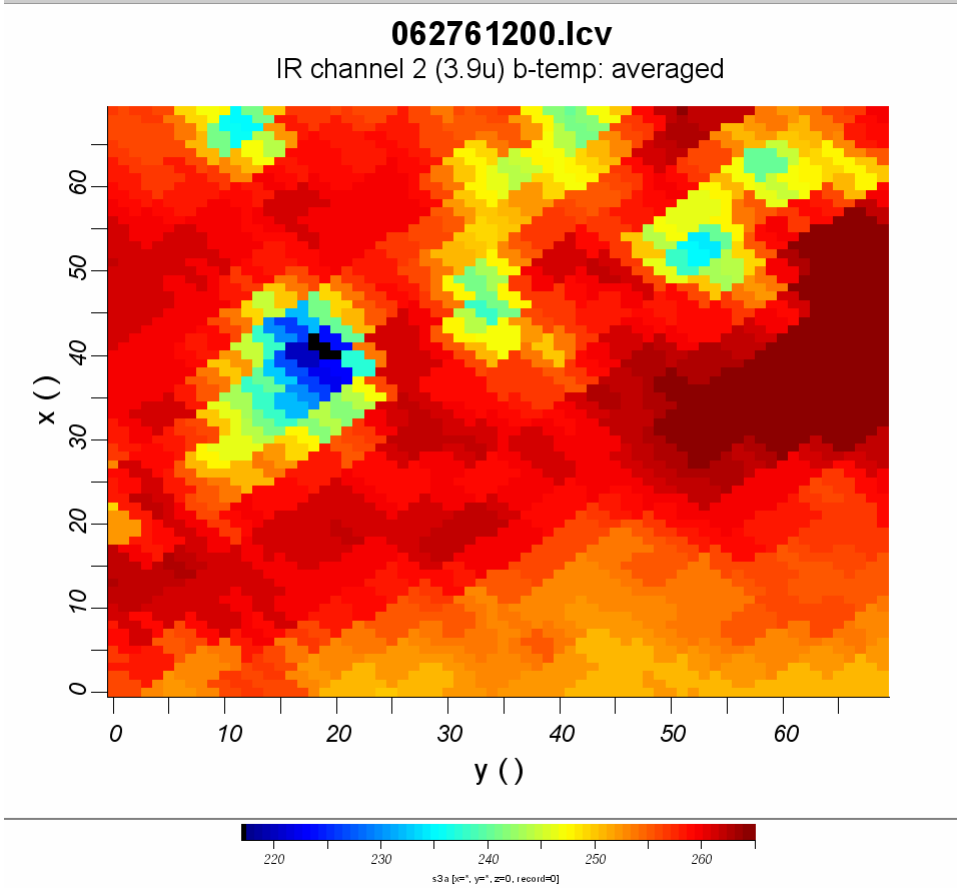
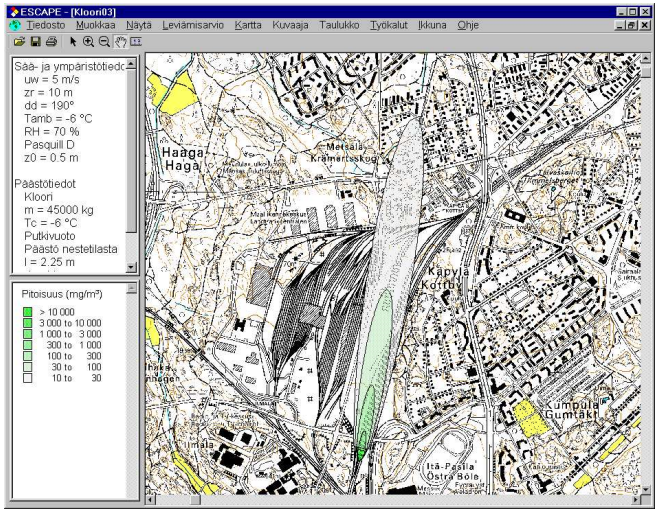
First satellite output from LAPS showing temperature of cloud (right picture)

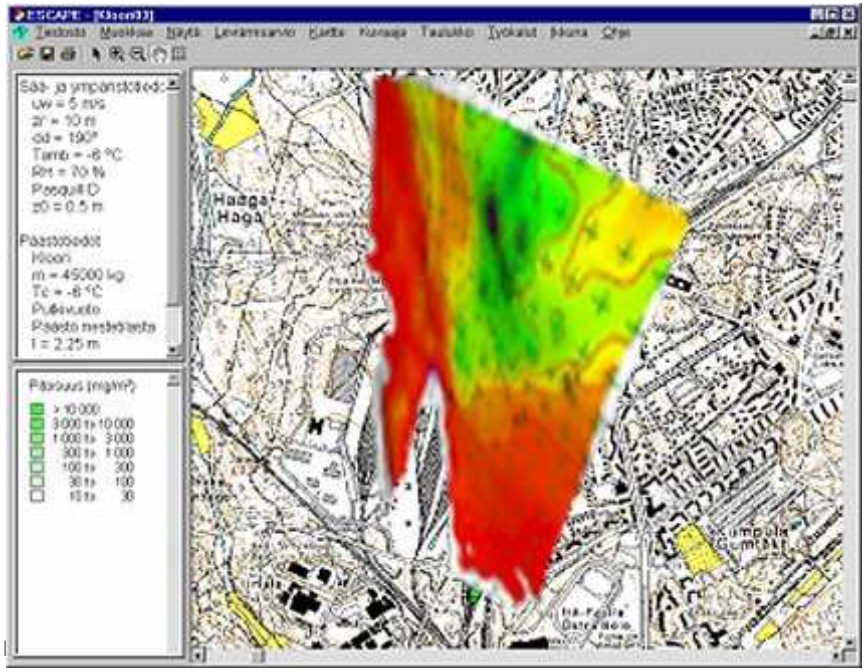


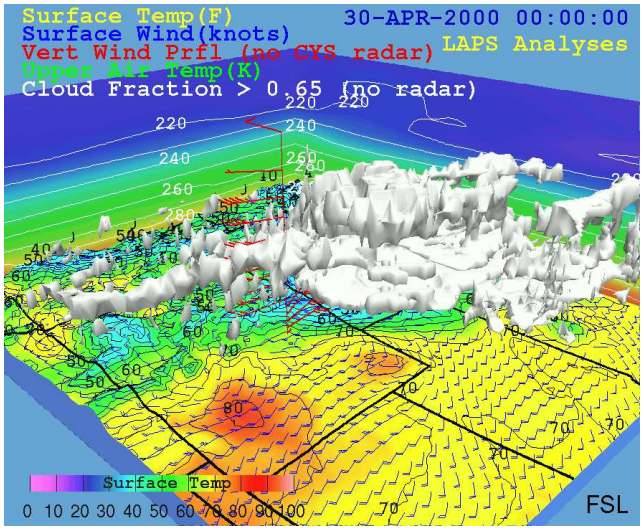
NOAA satellite image with LAPS domain inside



Estimation and forecasting of airborn dispersion







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VAISALA

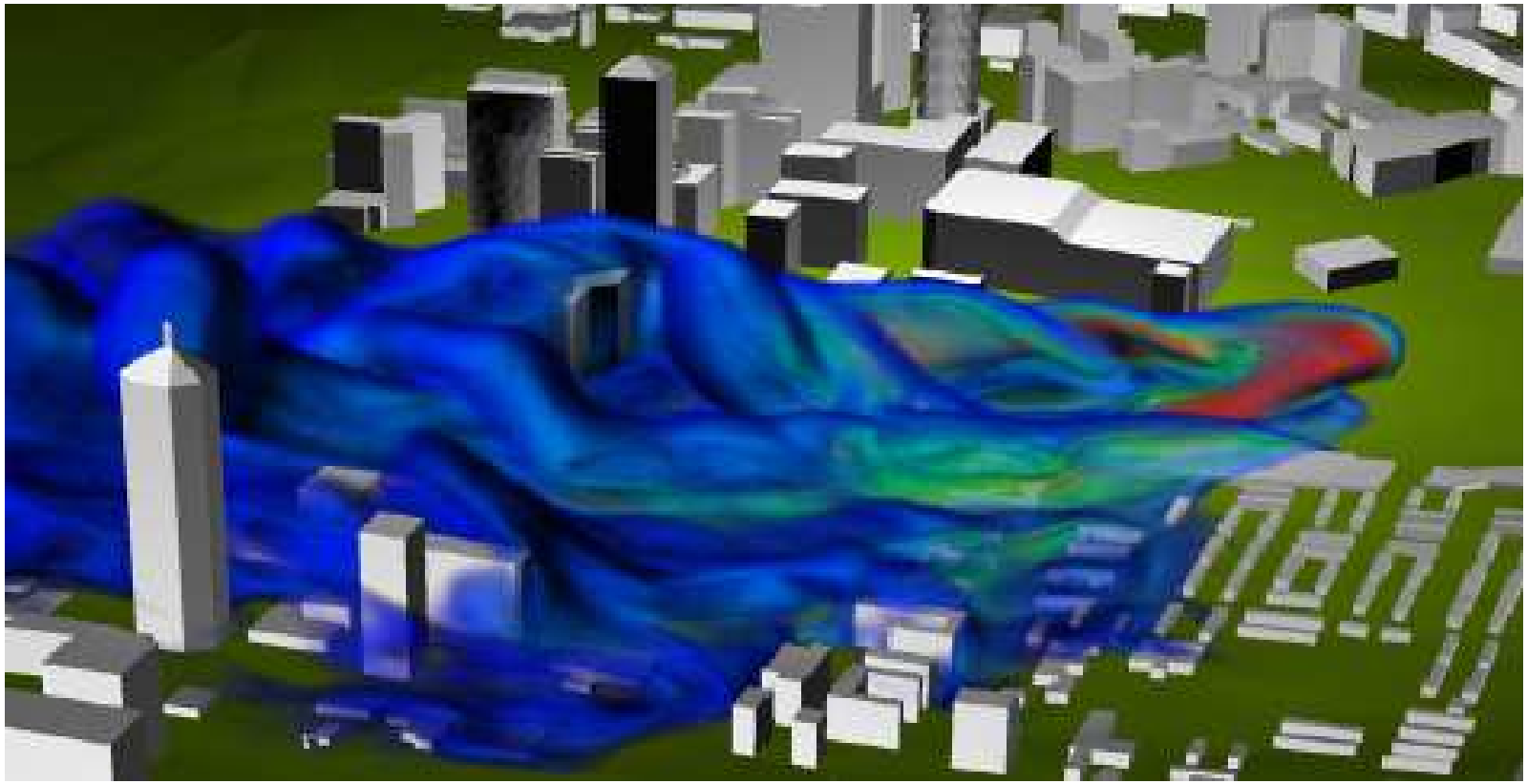

Figure 2. AHPCRC–CAU researchers have developed tools to conduct a fine-scale dispersion simulation that includes weather conditions, thermal effects, and buoyancy.

Lähde: http://www.ahpcrc.org/publications/archives/v12n4/Story1/

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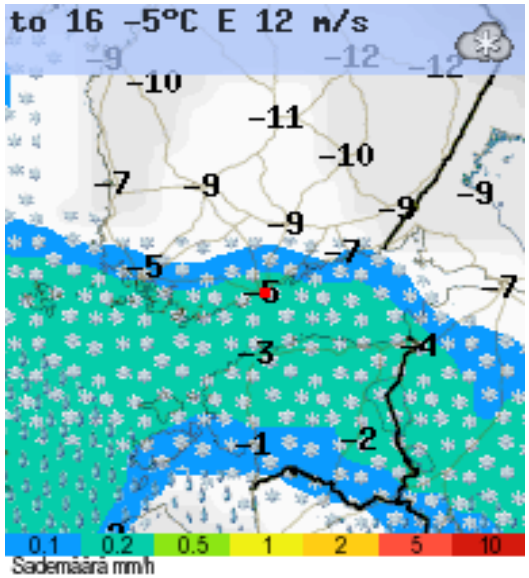
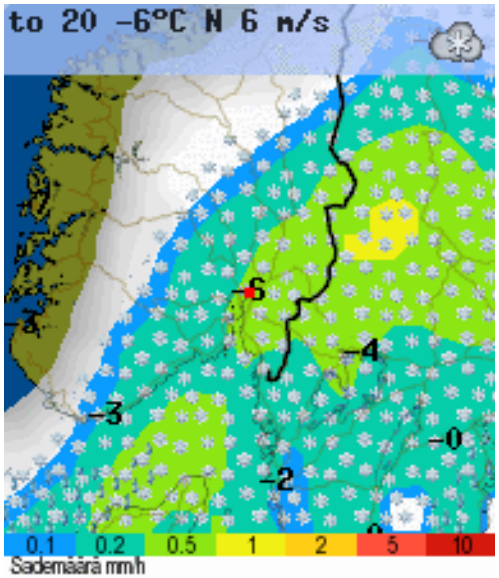
SmartMet
High-end precision products

Weatherman 3G-Service



Location:
Helsinki
Helsinki
Product:
Weather 8h
Area:
Normal
Language:
English
Submit



Location:
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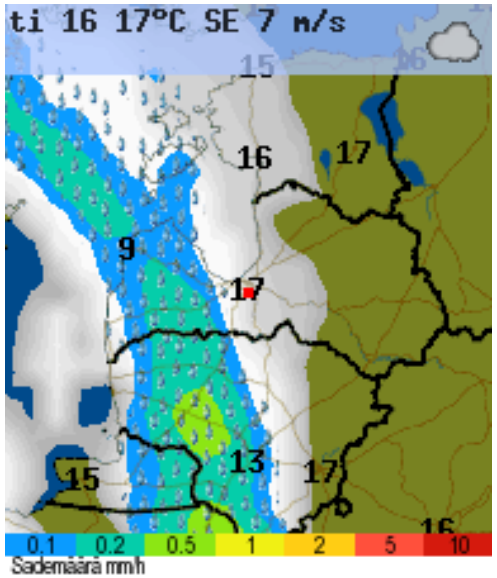
Helsinki
Product:
Weather 8h
Area:
Normal
Language:
English
Submit



Location:
Riga
Helsinki
Product:
Weather 8h
Area:
Normal
Language:
English
Submit

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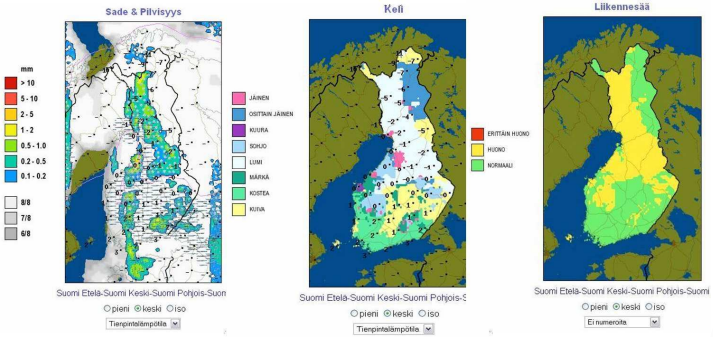
Uusia sää/keli-palveluita tieliikenteelle

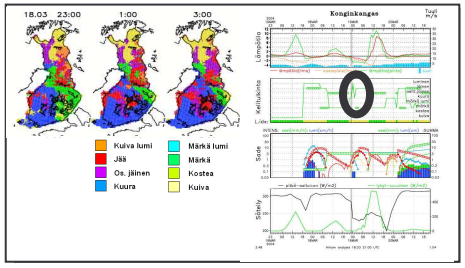
Sääpäivystys

Destia, Kelikeskus

Sää/kelipalvelut tienkäyttäjille

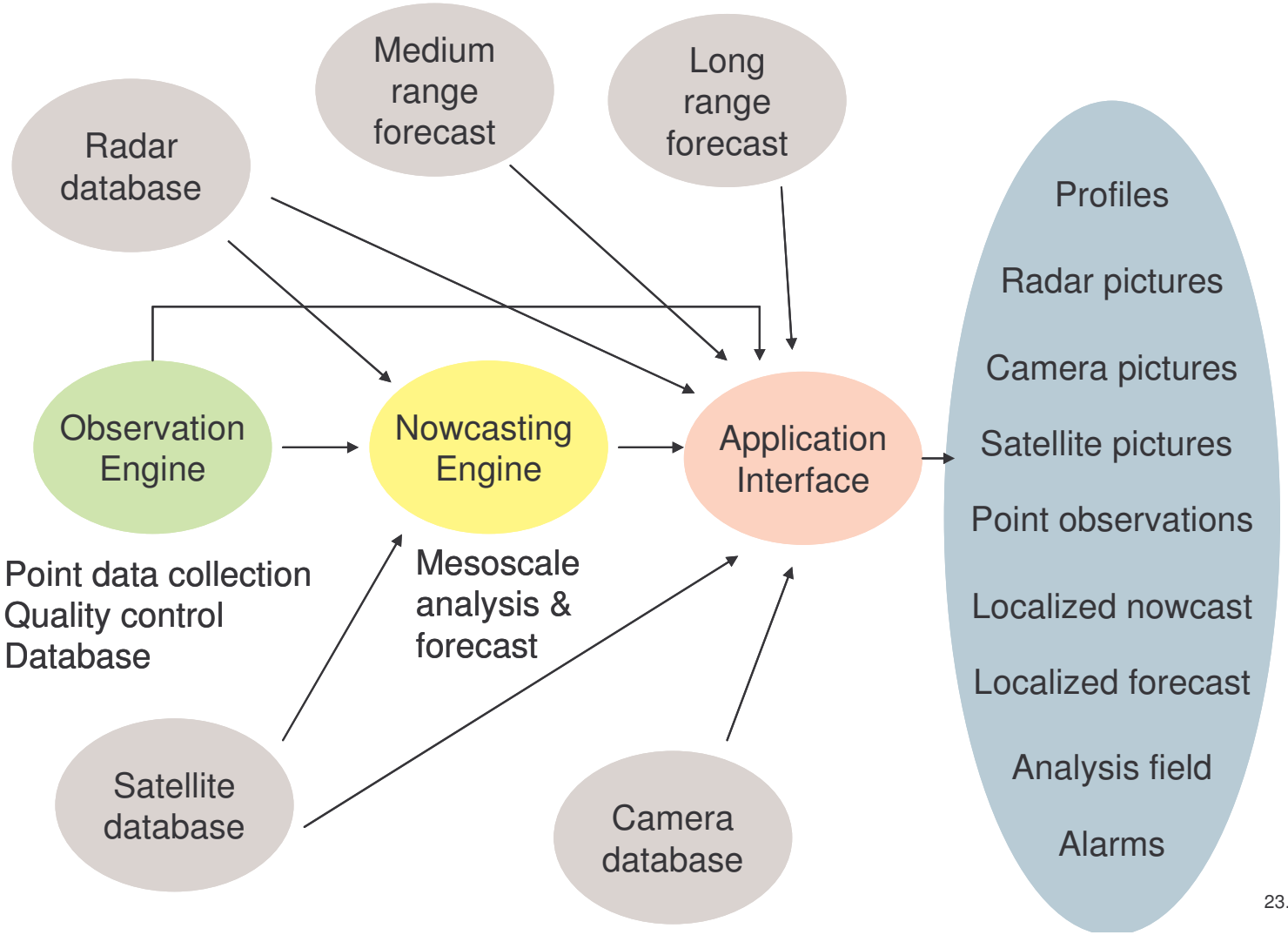


Palvelut Kunnossapitäjille



VTT:

"Good data is available - the trick is to know how to use it"



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HTB-II-2007+: ***UbiCasting***

- **This initiative originates from enterprise-side: Common goals with public-players and enterprise players are clear**
- **The coupling of air-quality with operative weather production system to deliver ubiquitous services is truly novel and will among other products produce new type of information content for all types of customers**
- **Within the road-weather is based on the close co-operation with commercial operators**
- **Number of other key-players have expressed their interest, and their inputs are to be involved**
- **International aspects:**
  - Joint professorship between FMI, HU, and Vaisala
  - Enhanced international collaboration
- **In the long-term this project *will* produce competitive advantages for Finnish enterprises**

HTB-II-2007+: *UbiCasting*

- **The work is just starting, and therefore we have more questions than answers**
- **Ongoing HTB-project provides a lot of guidance**
- **This project will secure current HTB-network management and maintenance, and hopefully the available services**
- **We like to continue these "HTB User Forums" also in the future, and the next**
- **Open workshop is designed to take place by the end of 2007**
- **Other promotions, educational meetings, public presentations, pilots, etc. are also planned**
- **Customer orientation:**
  - Business
  - Public
  - Scientific
- **In case of questions, comments, suggestions, please contact:**

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