# Helsinki Testbed 2005-2007

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



Jani Poutiainen FMI - edited by Laura Rontu, 20.1.2005 http://www.fmi.fi/testbed A definition for "testbed" (Dabberdt et al. 2004):

"A testbed is a working relationship in a quasi-operational framework among measurement specialists, forecasters, researchers, private-sector, and government agencies aimed at solving operational and practical regional [insert phenomenon or forecast challenge] problems with a strong connection to the end-users. Outcomes from a testbed are more effective observing systems, better use of data in forecasts, improved services, products, and economic/public safety benefits. Testbeds accelerate the translation of R&D findings into better operations, services, and decision-making. A successful testbed requires physical assets as well as long-term commitments and partnerships."

- → Largely application and economy driven definition does not explicitly refer to
- Meteorological and other <u>research</u>
- <u>Development of systems and methods</u>
- Measurement systems integration
- Evolution of data processing and management architectures
- Development of data accessing and visualisation
- Increasing the knowledge of information processes and development of dynamic process logic
- $\rightarrow$  In practise, "testbed" may be realized in broader perspective

## **Draft research plan**

- Water phase: rain/snow/mixed
- Visibility
  - Fog and precipitation phase and intensity
- Inversion height and strength
- Air quality model
- Sea breeze
- Sensitivity tests with LAM
- Road surface radiation balance model



## **Measurement periods and themes:**

- (May 2005 test of communications)
- August 2005
  - Nowcasting by extrapolation
  - World Championships in Athletics
  - No database yet, limited remote sensing instrumentation
- November 2005
  - Snow/rain
- January-February 2006
  - Inversions
- May 2006
  - Sea breeze, fog
- August 2006
  - Convection

### All stations except Finnish Road Administration (plan on 9.12.2004):



## FMI's automatic sites for Helsinki testbed & comparison:



Suggested Unibase masts; 44 pcs. (plan on 24.11.2004)



Ceilometers: - FMI's CT25K - Plus Vaisala's CL31 (Nurmijärvi, Loviisa, Lahti, Mäntsälä, Hki Vallila)

Present weather sensors:

Weighing rain gauges (Nurmijärvi, Loviisa, Lahti, Mäntsälä, Nummi-Pusula, Hki Kaisaniemi)



#### **Precipitation stations:**

IL kuukausittain (121) IL havainnoittain (126) ▲ SYKE kuukausittain (37) ▲ SYKE havainnoittain (5)



A

Precipitation stations: Intense area ~ 9 pcs. Larger area ~ 30 pcs.

28.10.2004 09:09:10 Kaţtta: © Maanmittauslaitos, lupa nro 30/MYY/00

#### Surface WXT510 & standalone loggers; mainly Helsinki area:

Helsinki Hernesaari Helsinki Bulevardi Helsinki vdinkeskusta Helsinki Eläintarha Helsinki Harju Helsinki Pitäjänmäki Helsinki Vallila Vantaa Tikkurila Helsinki Olympiastadion Espoo Leppävaara Helsinki Itä-Pakila Vantaa Pakkala Vantaa Asola Helsinki Tapulikaupunki Sipoo, Östersundom Kirkkonummi Sundsberg Vantaa Riipilä mäki Vantaa Riipilä laakso Vantaa Vantaalaakso Nummi-Pusula, Loukku Santahamina

testbed heat island testbed testbed testbed

Total

21 pcs.





## Remote sensing:

- •3D composite of FMI 4 Doppler C-band radars •Estonian radar in Tallinn
- •C-band dual polarimetric radar (Vaisala-HU)
- •Lightning location
- •RASS + mobile wind profiler
- •Meteosat 8 Seviri (15 min)
- •NOAA
- •Ceilometers CT25K & CL31





## Other considered data sources:

Soundings (Jokioinen, Vaisala, Tallinn)
GTS transmitted surface and remote sensing observations
Other masts (Kivenlahti, Loviisa, Kumpula etc.)
Air quality data (Helsinki metropolitan area council YTV)

Newspaper weather mapsHirlam forecast fieldsSatRepsSAFs



## Helsinki Testbed structure (Mika Salkola / Vaisala)

