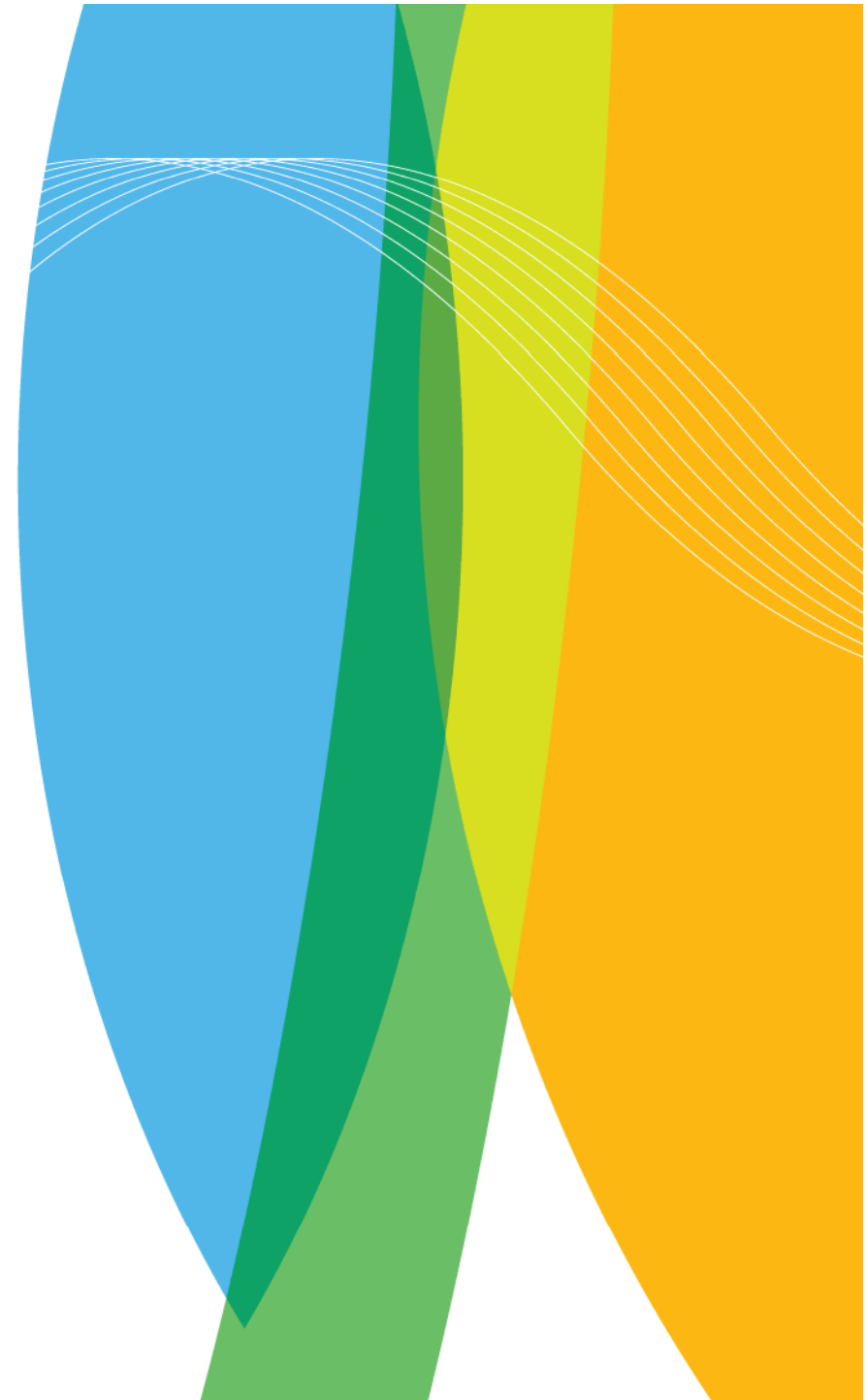




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The Finnish Meteorological Institute

Information systems





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Finnish Meteorological Institute –
Cutting-edge expertise in
European atmospheric know-how



Technical Services

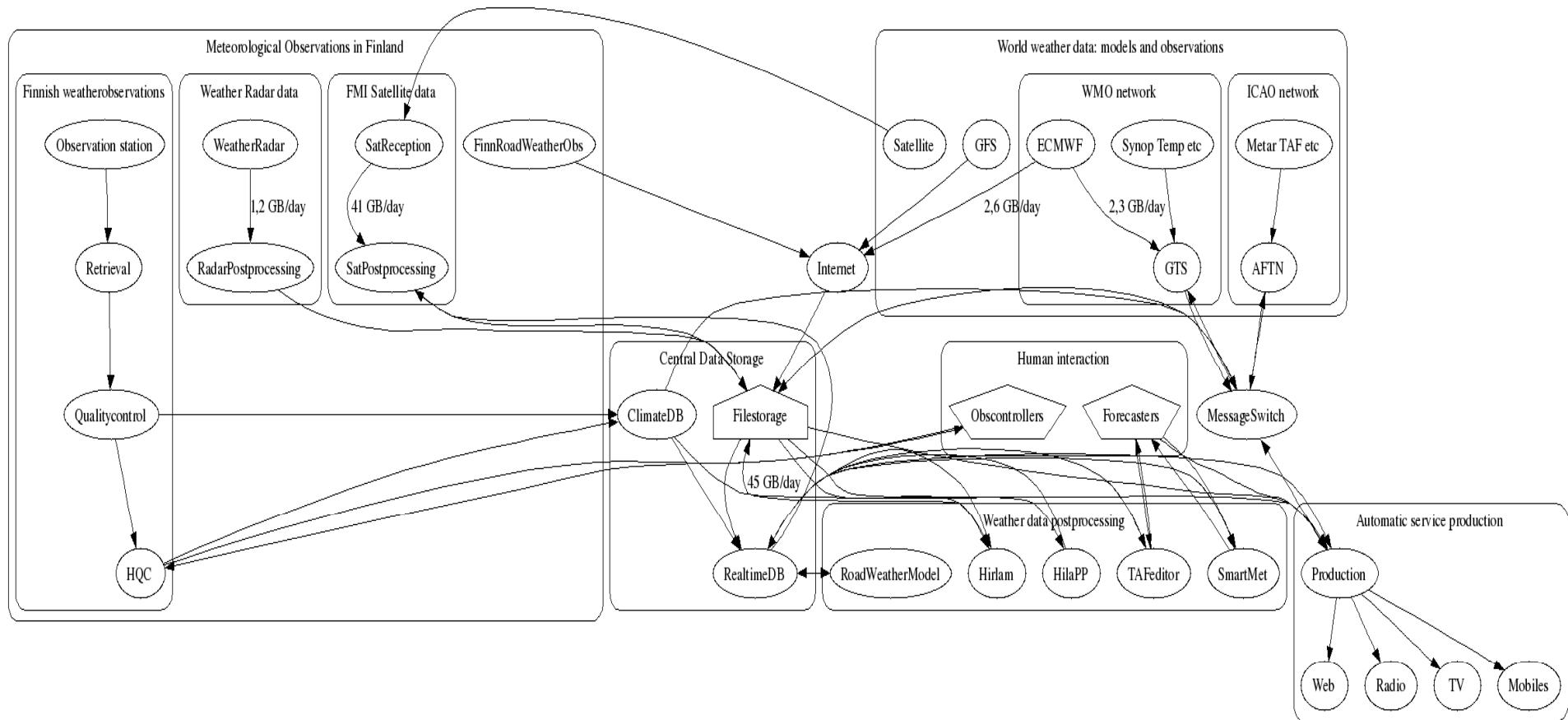
Own supercomputer

- The most powerful of its class in the Nordic countries (in 2006)
- 24h operation & monitoring
- Enables fast HIRLAM runs; increasing resolution
- Joint models: FMI-Institute of Marine Research-Finnish Environment Institute



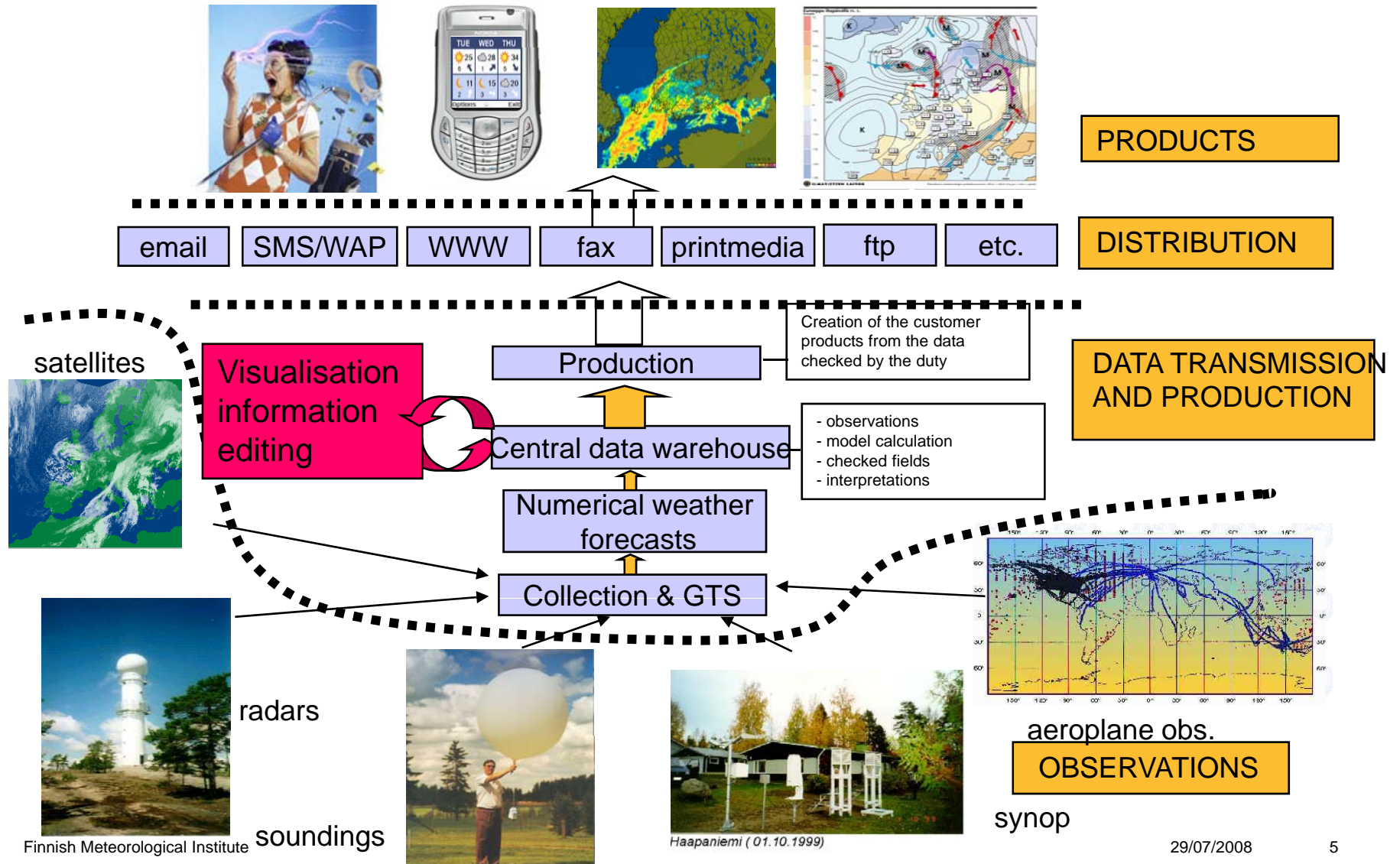


Operational information flow



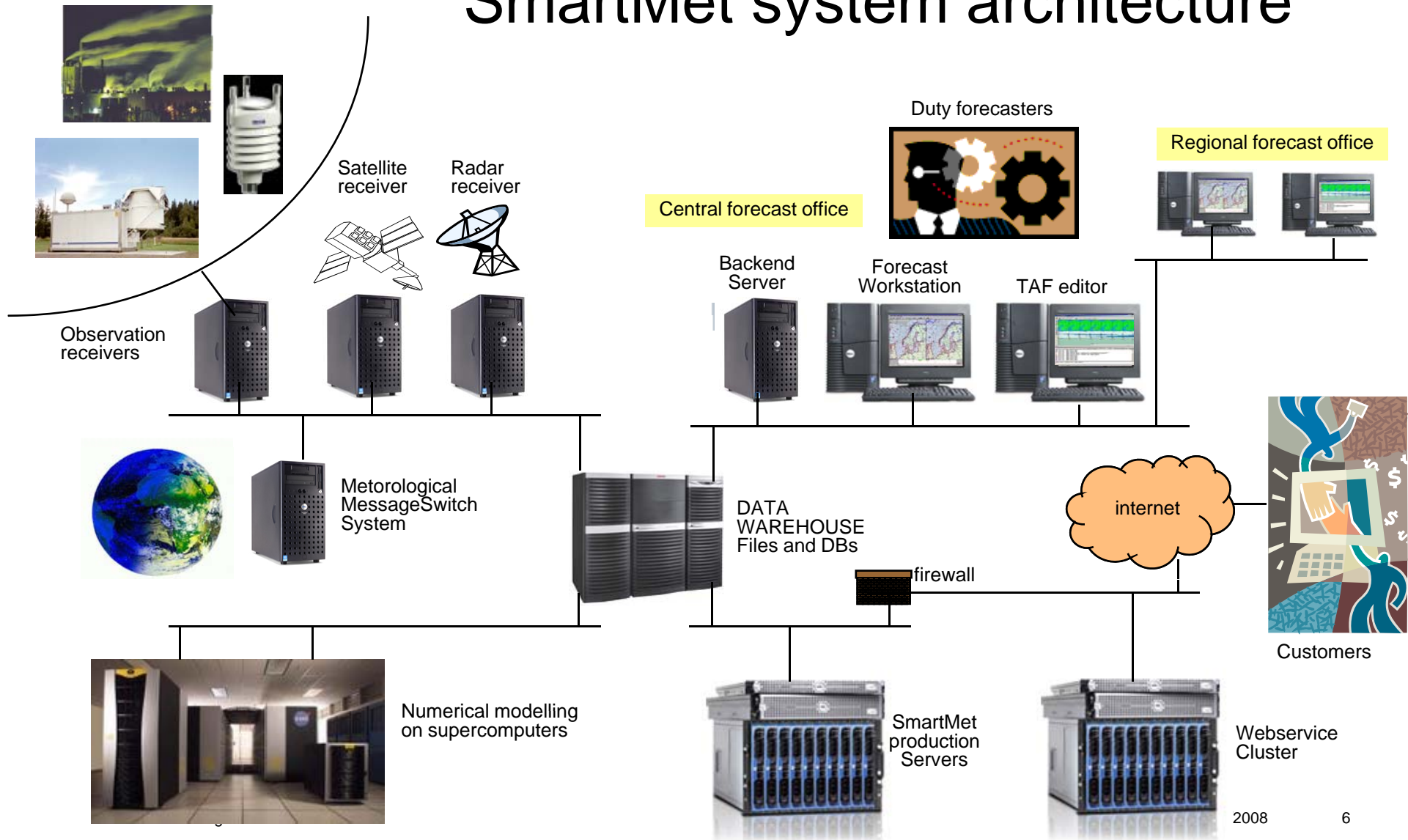


SmartMet weather service process





SmartMet system architecture



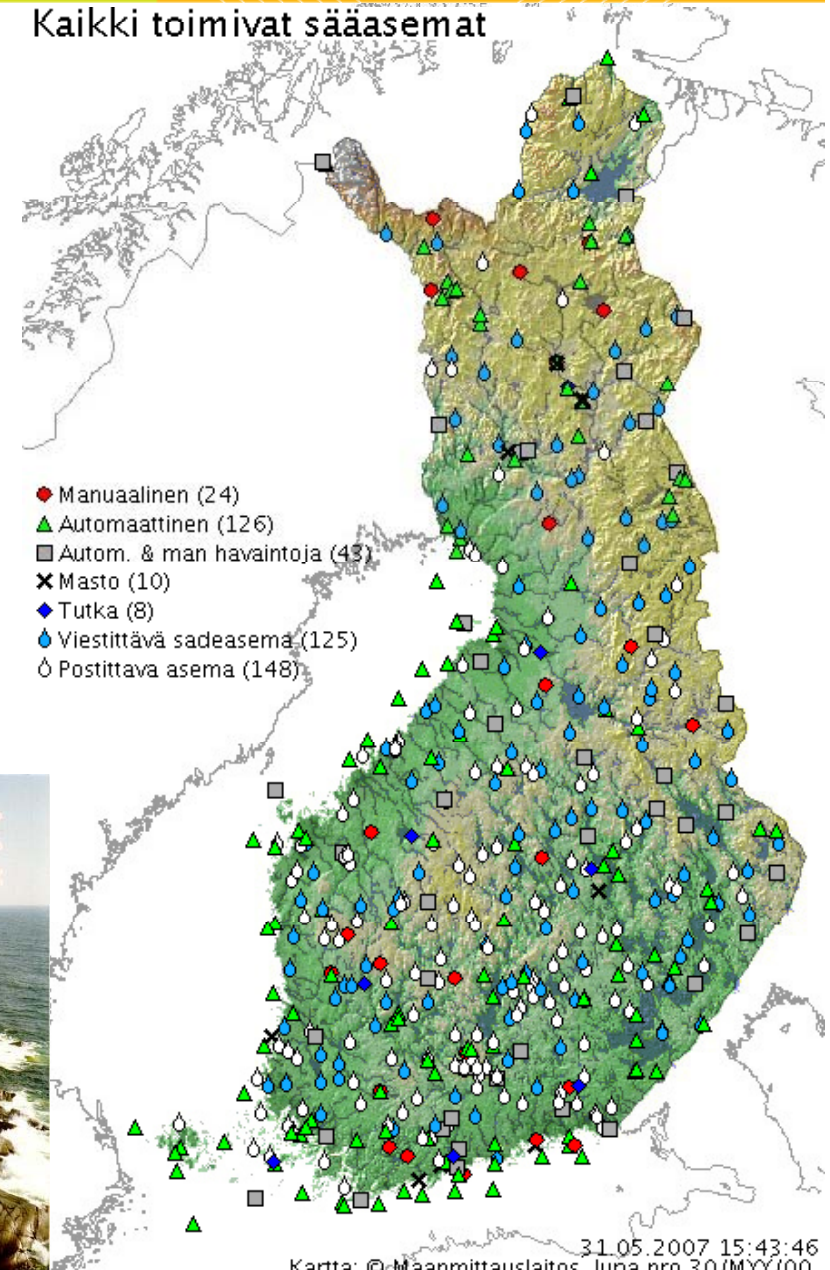


Kaikki toimivat sääasemat

Technical Services

Operative stations, in total ca.	550
Sounding stations	3
Weather radars	8
Antennas for lightning location	8
Air quality stations	30
Surface observation stations	180
Rainfall measurement sites	400

Automation	91%
Target for 2010	>95%





Technical Services

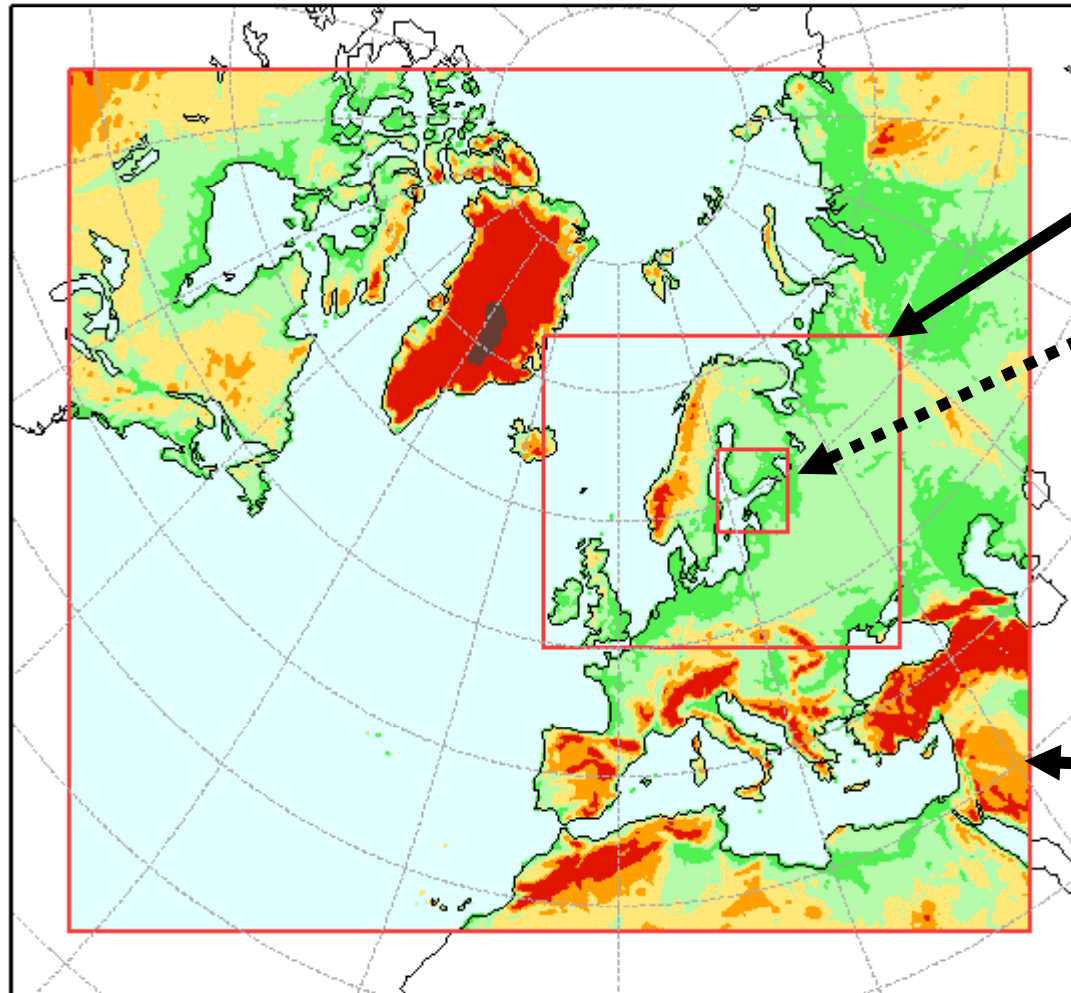
Weather radar network

- Monitoring of snow and rain
- Finland in the vanguard of European weather radar know-how
- The radar in Vimpeli completed the weather radar network
- Availability of radar data ~ 99%





HIRLAM areas at FMI
RCR > MBE > AROME



MBE HIRLAM
Grid size 9 km

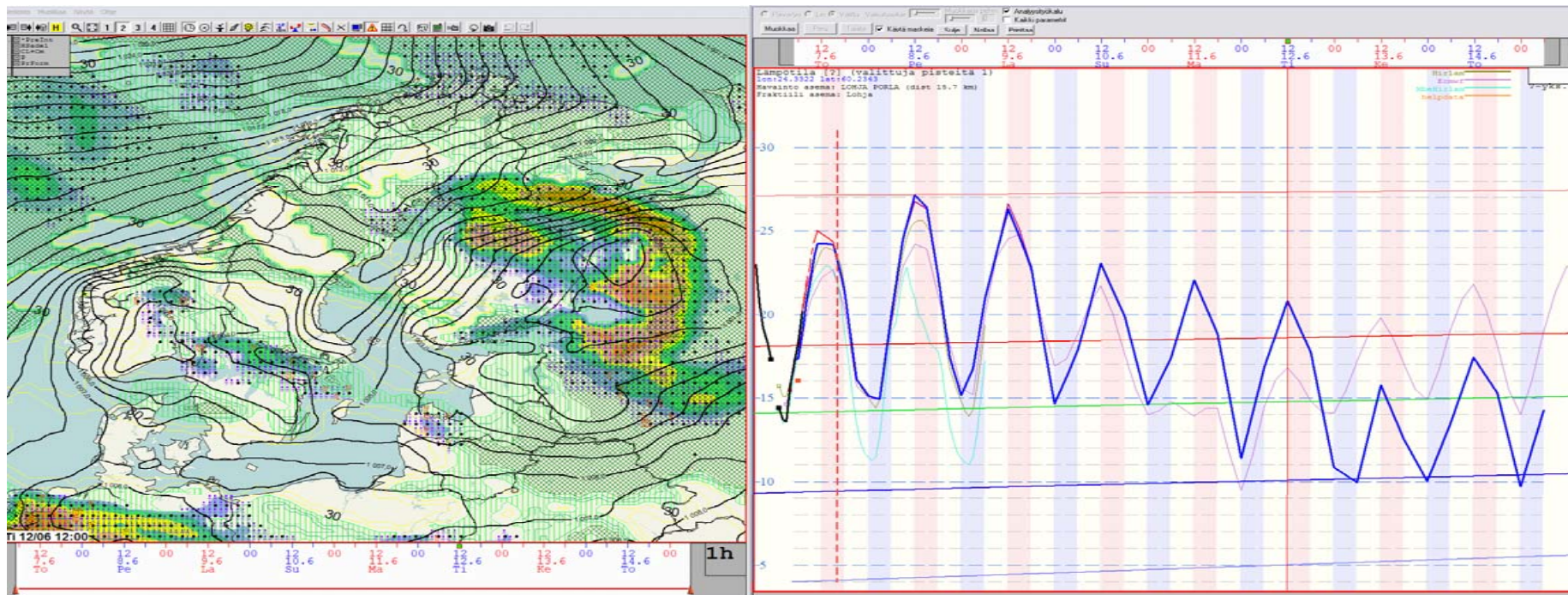
Arome
Gridsize 2,5 km

RCR HIRLAM
Grid size 16 km



What is SmartMet?

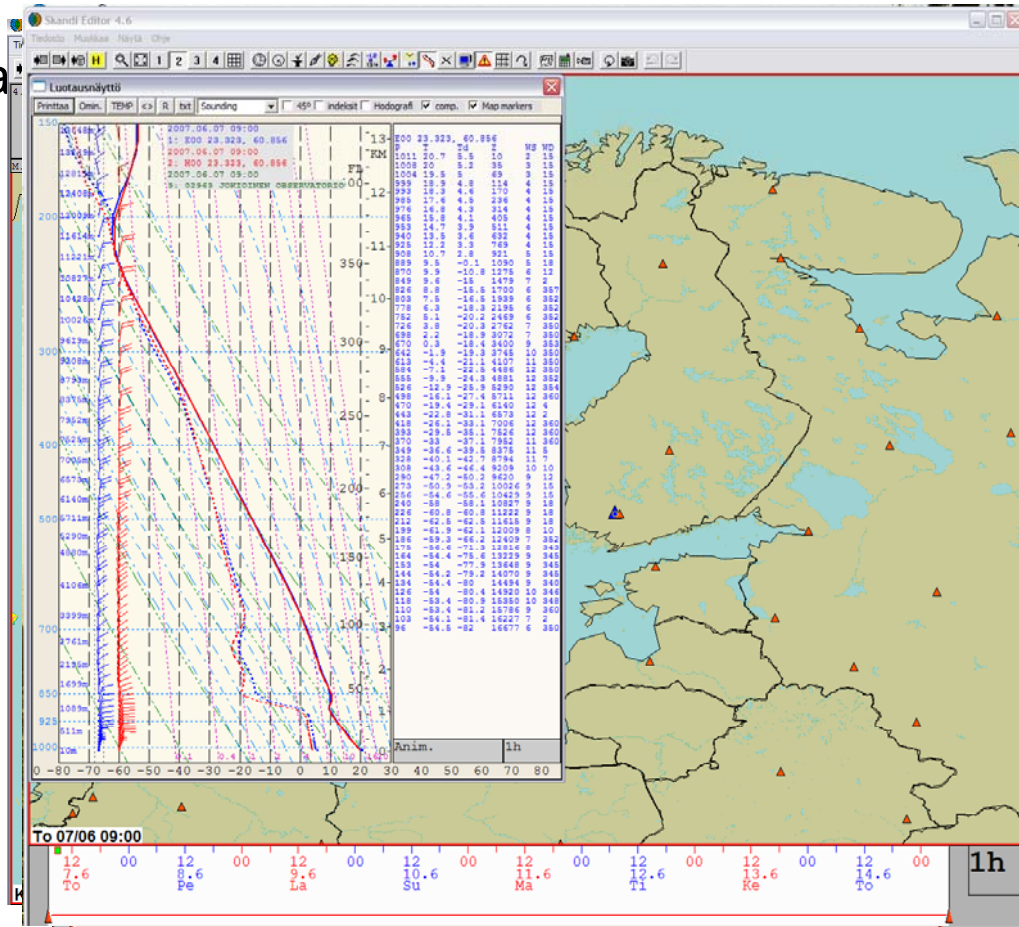
A software tool for visualizing and editing meteorological data





Input data

- Model data: all grid formatted data
- Satellite data
- Weather radar data
- Observation data
- Lightning detection network data
- Data from radio soundings





Visualization configurations

- Freely and simultaneously select data from various sources onto the same map image and to interactively change the order of how the parameters are to be presented
- Interactively select the interval of the time step between 5 minutes - 48 hours when the model data will be automatically interpolated into that time interval
- Interactively select the presentation form of parameters



Visualization something special

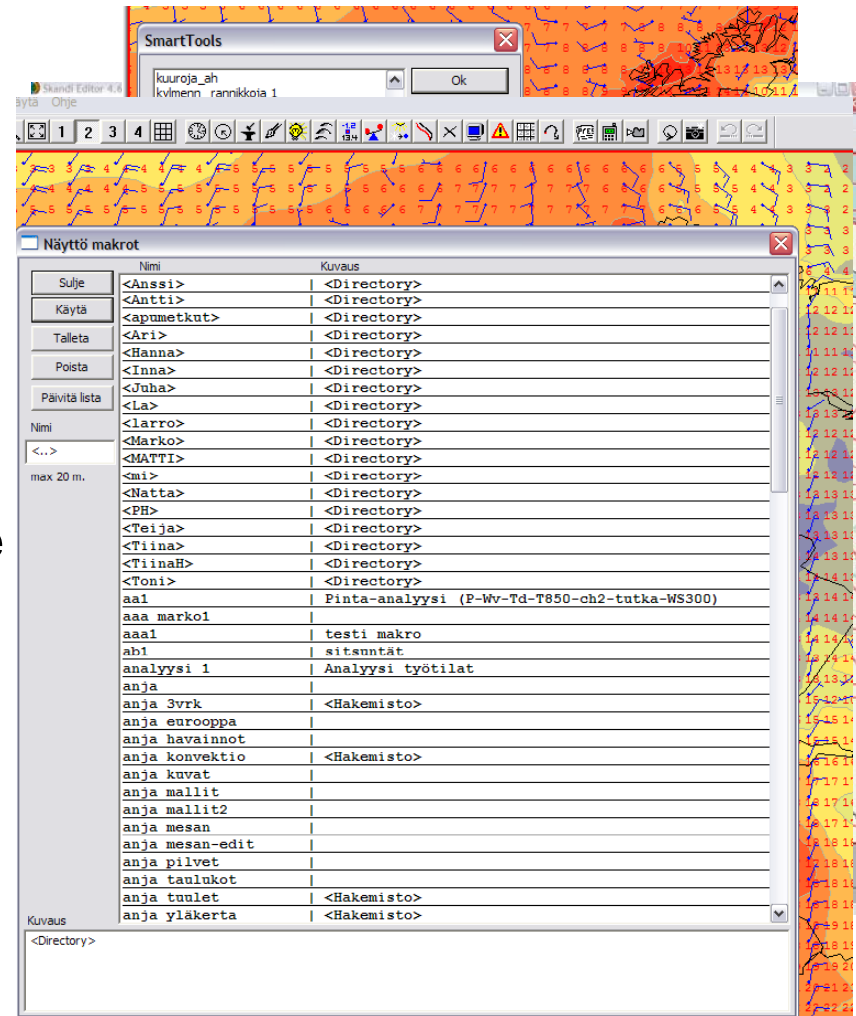
- Interactively create vertical cross sections of various parameters from point A to point B
- Simultaneously inspect observations on the map and on a table so that the observation in the table selected by the mouse appears highlighted on the map
- Interactively create assorted parameter lists from observations into tables

Nr	WmoID	Name	T	Td	dd	ff(ms)	ww	rr	N	h	Nh	V	SD	PPPP	a	ppp	Tmin	Tmax	Tq	Lon	Lat
1	10379	Potsdam	28.9	16.9	100	4.0	-	2	-	3	6	3	25000	-	1016.6	8	-0.7	-	-	13.067	52.3
2	10393	Lindenbergl	28.5	17.3	110	4.0	-	2	-	4	7	4	20000	-	1016.7	8	-0.7	-	-	14.117	52.2
3	10396	Manschnow	28.4	19.4	70	3.0	-	-	-	-	-	-	17000	-	1017.3	8	-0.6	-	-	14.550	52.5
4	02603	BROEN	28.4	15.9	90	3.0	-	2	-	-	-	-	-	-	-	-	-	-	-	12.667	56.8
5	12300	Gorzow Wilk	28.4	17.3	130	3.0	-	2	-	3	6	3	15000	-	1017.4	8	-0.5	-	-	15.283	52.7
6	12250	Torun	28.1	10.3	100	4.0	-	2	-	1	6	1	30000	-	1019.3	8	-0.2	-	-	18.583	53.0
7	10389	Alexanderplatz	28.0	17.5	-	-	-	-	-	-	-	-	-	-	1017.5	8	-0.5	-	-	13.417	52.5
8	02413	BKA I I MGN	27.8	10.1	90	2.0	-	2	-	-	-	-	-	-	-	-	-	-	-	12.883	60.6
9	10381	Berlini-Dahlem	27.7	17.1	80	4.0	-	2	-	1	6	1	23000	-	1016.9	8	-0.4	-	-	13.300	52.4
10	10253	Luechow	27.7	15.1	110	3.0	-	-	-	-	-	-	10000	-	1017.8	8	-0.6	-	-	11.133	52.9
11	12330	Poznan	27.7	13.2	110	6.0	-	2	-	2	7	2	20000	-	1018.1	0	-0.1	-	-	16.850	52.4
12	10361	Magdeburg	27.7	16.8	100	3.0	-	2	-	6	5	5	16000	-	1016.4	8	-0.6	-	-	11.600	52.1
13	12230	Pila	27.7	14.0	130	5.0	-	2	-	2	7	2	25000	-	1018.6	8	-0.2	-	-	16.750	53.1
14	10385	Berlini-Schoenefeld	27.7	18.8	60	4.0	-	2	-	1	5	1	17000	-	1016.9	8	-0.6	-	-	13.517	52.3
15	10365	Genthin	27.6	16.6	70	4.0	-	-	-	-	-	-	14000	-	1017.1	8	-0.6	-	-	12.167	52.3
16	12205	Szczecin	27.5	18.5	120	6.0	-	2	-	2	5	2	20000	-	1018.3	6	-0.1	-	-	14.617	53.4
17	10382	Berlini-Tegel	27.5	18.8	90	3.0	-	2	-	1	6	1	20000	-	1016.9	8	-0.5	-	-	13.317	52.5
18	012	Kavopihä block	27.4	6.0	210	1.0	-	-	-	-	-	-	-	-	1022.4	-	-0.6	-	-	24.940	60.1
19	12185	Ketrzyn	27.4	11.8	100	3.0	-	2	-	3	6	2	35000	-	1020.2	8	-0.3	-	-	21.367	54.0
20	02321	AELVDALEN	27.4	9.3	130	2.0	3.0	2	0.0	-	9	-	29000	-	1022.9	7	-2.6	-	-	14.033	61.2
21	02343	TORPSHAMMAR	27.4	11.1	270	2.0	3.0	2	0.0	-	9	-	35000	-	1022.0	7	-2.3	-	-	16.283	62.5
22	10291	Angermuende	27.4	18.9	90	3.0	-	2	-	1	6	1	18000	-	1017.6	8	-0.3	-	-	14.000	53.0
23	12270	Miawa	27.3	9.2	90	1.0	-	2	-	3	7	2	35000	-	1019.4	8	-0.5	-	-	20.350	53.1
24	12160	Elblag	27.3	13.6	100	2.0	-	2	-	5	6	4	40000	-	1020.2	8	-0.3	-	-	19.433	54.1
25	02337	NORRHOG	27.2	3.6	320	2.0	-	2	-	-	-	-	-	-	-	-	-	-	-	15.667	62.2
26	02513	GOTEBORG	27.1	-	60	3.0	4.0	2	0.0	-	-	-	30000	-	1023.1	8	-0.6	-	-	12.000	57.7
27	10359	Gardelegen	27.1	14.9	60	4.0	-	2	-	3	6	2	17000	-	1017.3	8	-0.3	-	-	11.400	52.5
28	02411	ARVKA	27.1	9.9	170	2.0	2.0	2	0.0	-	9	-	30000	-	1024.4	7	-1.1	-	-	12.633	59.6
29	02319	BOERTNAN	27.0	2.2	280	3.0	5.0	2	0.0	-	-	-	30000	-	-	-	-	-	-	13.850	62.7
30	10261	Seehausen	27.0	15.8	110	4.0	-	2	-	2	6	2	25000	-	1017.7	8	-0.5	-	-	11.733	52.9
31	10384	Berlini-Tempelhof	26.9	19.1	70	3.0	-	2	-	1	5	1	27000	-	1017.1	8	-0.6	-	-	13.400	52.4
32	12235	Chojnice	26.8	11.3	160	3.0	-	2	-	3	5	3	25000	-	1019.4	8	-0.2	-	-	17.550	53.7
33	12295	Bialystok	26.8	10.5	190	2.0	-	2	-	5	6	2	30000	-	1019.2	8	-0.7	-	-	23.167	53.1
34	02602	HUNNESTORP	26.8	12.0	270	1.0	-	2	-	-	-	-	-	-	-	-	-	-	-	12.933	56.3
35	12272	Olaszyn	26.8	11.7	10	3.0	-	2	-	3	7	3	35000	-	1019.6	8	-0.5	-	-	20.417	53.7
36	06391	ARCEN AWS	26.8	18.8	50	5.0	-	-	-	-	-	-	-	-	-	-	-	-	-	6.200	51.5
37	10264	Marnitz	26.8	16.9	50	4.0	-	2	-	1	6	1	20000	-	1017.8	8	-0.5	-	-	11.933	53.3
38	12210	Resko	26.8	18.4	120	2.0	-	-	-	-	-	-	-	-	1018.6	7	-0.3	-	-	15.417	53.7
39	10267	Kyritz	26.8	16.6	110	3.0	-	-	-	-	-	-	21000	-	1017.2	8	-0.6	-	-	12.417	52.9
40	12215	Szczecinek	26.7	15.9	130	4.0	-	-	0.0	-	-	-	-	-	1020.1	7	-0.3	-	-	16.683	53.7
41	12310	Slubice	26.7	17.7	60	2.0	-	2	-	4	6	4	20000	-	1016.7	8	-0.5	-	-	14.600	52.3
42	10270	Neuruppin	26.6	18.3	50	3.0	-	2	-	1	6	1	20000	-	1017.7	8	-0.4	-	-	12.817	52.9
43	10404	KALKAR	26.6	16.7	30	3.0	-	2	-	3	5	1	10000	-	1016.1	8	-0.8	-	-	6.267	51.7
44	10235	Soltau	26.6	15.4	90	3.0	-	-	-	-	3	10000	-	1017.5	6	-0.4	-	-	9.833	53.0	
45	12360	Plock	26.6	9.0	120	4.0	-	0	-	2	7	1	50	-	1019.2	8	-0.4	-	-	19.733	52.5



Visualization **unique**

- Interactively create trajectories
- Visualize self-derived meteorological fields
- Visualize the differences between the observations and the model output
- Store display macros and print settings (every user shall have his/hers own settings that can be shared between other users)

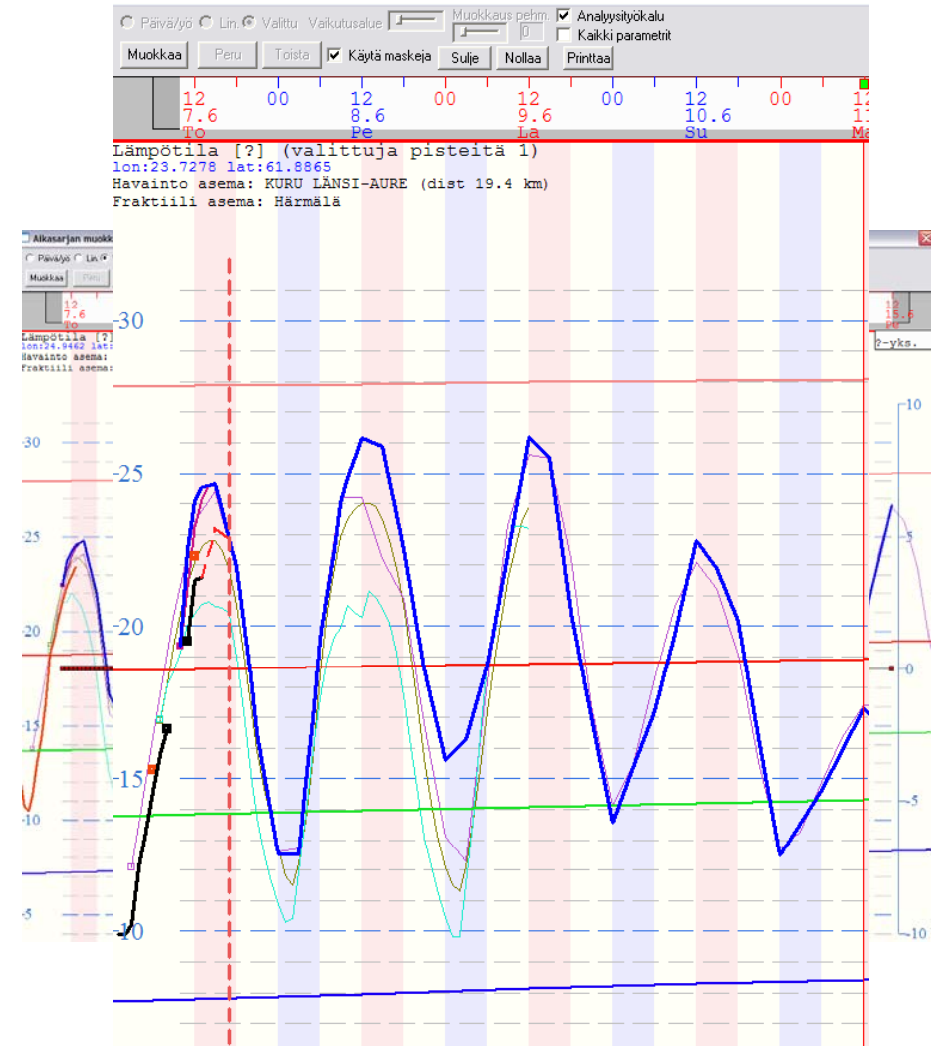




Editing tool **modifying**

SmartMet enables a user to

- select the forecast model when loading the data
- modify time series
 - e.g. modify directly the parameters of single points (cities) and the tool will spread the changes time and space wise to all grid points
 - e.g. using analysis tool even out like the difference of the observed and forecasted temperature in a given time window

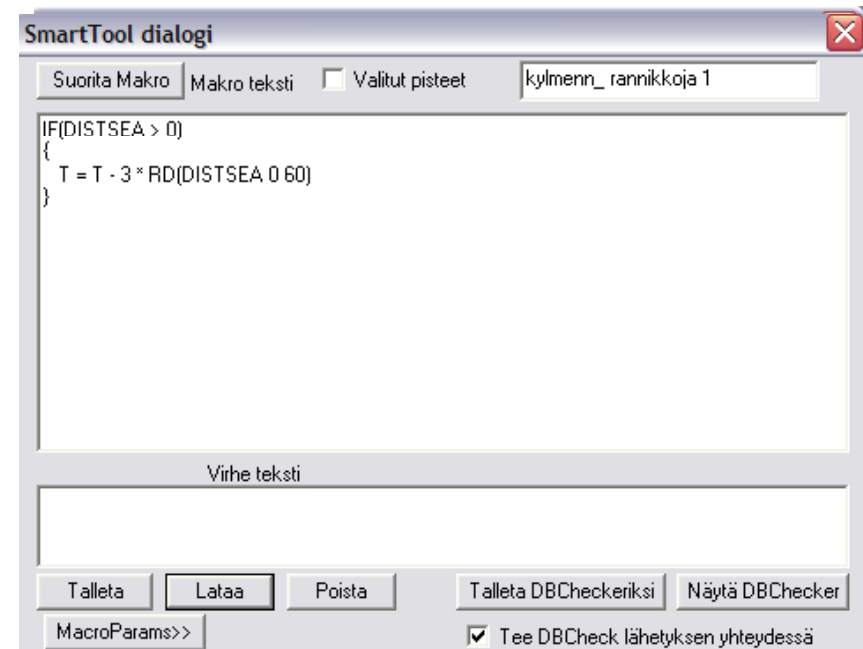




Editing tool **SmartTool**

SmartTool is a module to

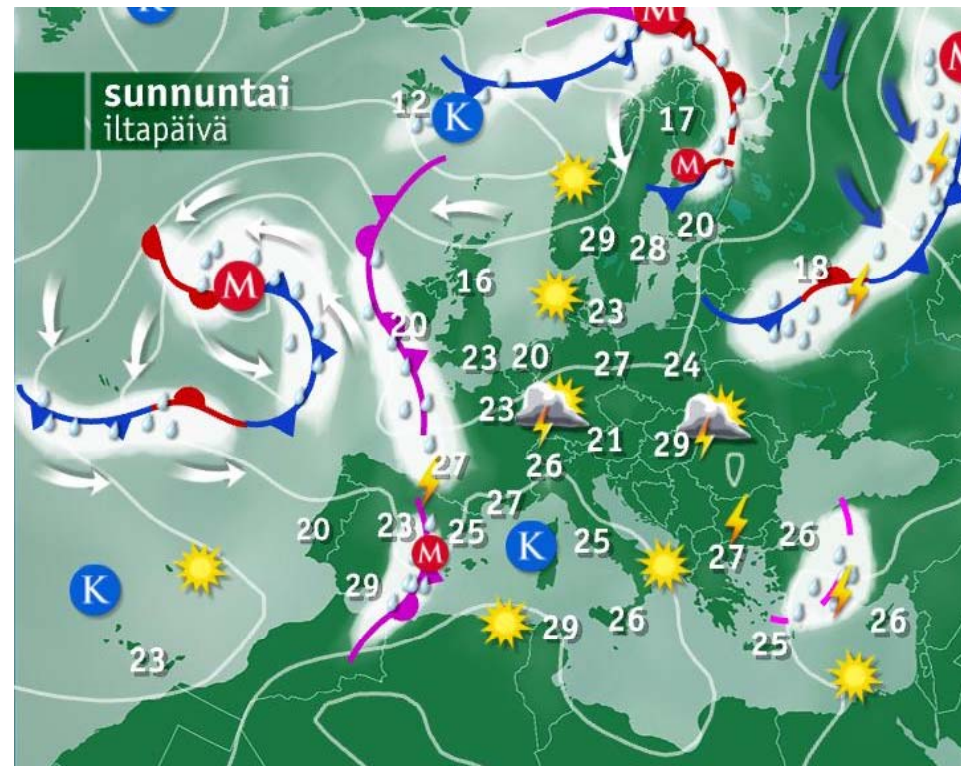
- create mathematical/meteorological equations (using own equation language) that can be used for modifying the forecast
- create linked chains that can be used to bring the interdependent parameters in a meteorological balance (e.g. change in precipitation type will affect visibility)
- use mask for limiting the area (meteorological and geographical) of modifications





Why SmartMet weather forecast production

- Modular thinking to forecast production
- Parameter-specific check and fixing by meteorologist
- Possible to create tailor made weather forecast to large number of customers simultaneously
- A number of the customers is not a limit





Product examples

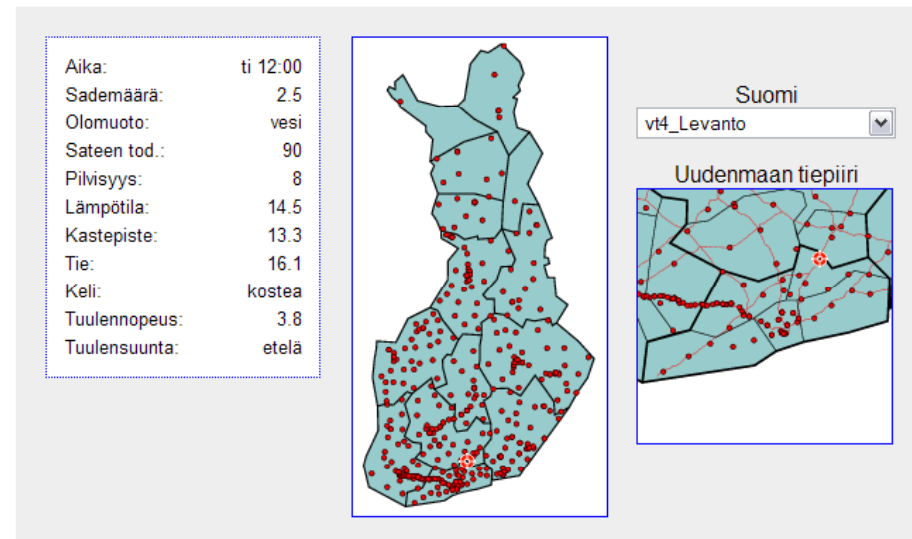
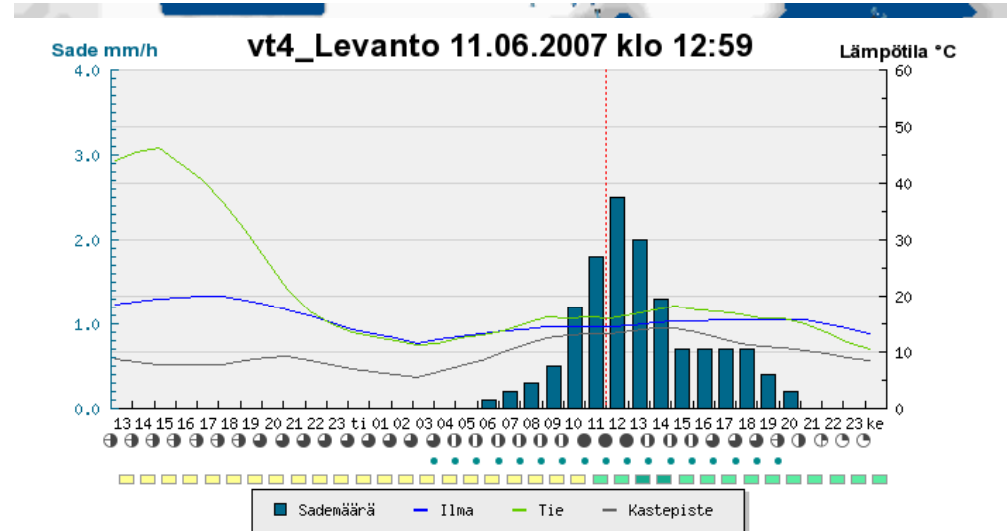
Media

- TV
- radio
- newspaper
- Web

B to B customers

- maritime transport
- trade market
- road traffic

Mobile phone service





Our Mobile Channels

SMS

WAP

MMS

APPLICATIONS

