

**ÄIKESE SAGEDUSJAOTUS  
EESTIS 2005–2007  
TÕRAVERE DETEKTORI  
ANDMETE PÕHJAL**

**SVEN-ERIK ENNO  
TÜ GEOGRAAFIA OSAKOND**

**25.03.2008**

# **TÕRAVERE ÄIKESEDETEKTORI ANDMED**

- **Ajavahemik: 2005. jaanuar – 2007. oktoober**
- **Piirkond: 57,5 – 59,9 kraadi N ja 21,0 – 28,5 kraadi E**
- **Kokku olemas andmed 121105 välgulöögi kohta (110319 pilv-maa, 10786 pilvesisest)**

0709.est - Notepad

FileEditFormatViewHelp

|        |             |         |         |       |   |      |     |    |   |
|--------|-------------|---------|---------|-------|---|------|-----|----|---|
| 070901 | 001207.9658 | 59.6807 | 25.7554 | 50.0  | 1 | 0.3  | 87  | 10 | G |
| 070901 | 001512.2654 | 59.2557 | 21.1503 | 17.3  | 1 | 4.7  | 113 | 3  | C |
| 070901 | 001512.3263 | 59.2159 | 21.1046 | 7.2   | 1 | 3.5  | 175 | 3  | G |
| 070901 | 001512.3315 | 59.2873 | 21.2305 | 57.0  | 2 | 1.0  | 168 | 4  | G |
| 070901 | 002018.8834 | 59.2527 | 21.1441 | 29.4  | 1 | 1.7  | 107 | 3  | C |
| 070901 | 002018.8864 | 59.2469 | 21.1052 | 8.3   | 1 | 0.5  | 157 | 5  | C |
| 070901 | 002018.9486 | 59.2574 | 21.1028 | 24.8  | 1 | 0.3  | 155 | 9  | G |
| 070901 | 002018.9487 | 59.3579 | 21.0291 | -10.1 | 1 | 1.5  | 45  | 3  | C |
| 070901 | 003508.9743 | 59.1823 | 22.8287 | -16.9 | 1 | 0.4  | 162 | 7  | G |
| 070901 | 004106.4868 | 59.2041 | 22.9485 | 50.4  | 1 | 0.4  | 176 | 9  | G |
| 070901 | 005034.6283 | 59.7867 | 27.4185 | -39.1 | 3 | 1.9  | 139 | 8  | G |
| 070901 | 005508.9901 | 59.1656 | 21.3627 | 92.2  | 1 | 0.7  | 160 | 9  | G |
| 070901 | 005919.5192 | 59.4523 | 23.2496 | 58.0  | 1 | 0.5  | 37  | 14 | C |
| 070901 | 012732.5695 | 59.8028 | 27.8758 | -53.7 | 1 | 0.7  | 97  | 7  | G |
| 070901 | 013102.8036 | 59.3777 | 23.0948 | 17.8  | 1 | 0.4  | 180 | 5  | G |
| 070901 | 013102.8071 | 59.3134 | 23.0584 | 17.6  | 1 | 4.0  | 130 | 3  | C |
| 070901 | 013528.6676 | 59.7992 | 27.9247 | 28.7  | 1 | 5.1  | 97  | 4  | C |
| 070901 | 014018.3807 | 59.4004 | 22.0107 | 76.1  | 1 | 0.5  | 30  | 8  | C |
| 070901 | 014018.3809 | 59.8268 | 21.8769 | -52.5 | 1 | 2.3  | 130 | 3  | C |
| 070901 | 014039.0259 | 59.3610 | 23.0685 | 92.7  | 2 | 0.7  | 157 | 9  | G |
| 070901 | 014039.1041 | 59.3389 | 23.1916 | 11.8  | 1 | 1.0  | 137 | 4  | C |
| 070901 | 014335.0045 | 59.0725 | 22.0478 | -14.1 | 1 | 1.0  | 30  | 3  | G |
| 070901 | 014534.0106 | 59.3934 | 22.1762 | 19.4  | 2 | 0.4  | 174 | 9  | G |
| 070901 | 014700.8637 | 59.3626 | 22.2187 | -14.6 | 1 | 0.5  | 156 | 6  | G |
| 070901 | 014752.4479 | 59.4059 | 22.7995 | 18.2  | 1 | 2.1  | 114 | 3  | G |
| 070901 | 014752.4480 | 59.6792 | 22.6725 | -17.2 | 1 | 0.9  | 123 | 3  | G |
| 070901 | 014752.5149 | 59.3652 | 23.0314 | 43.3  | 1 | 0.3  | 174 | 14 | G |
| 070901 | 014752.5150 | 59.3726 | 23.0115 | -18.6 | 1 | 1.5  | 121 | 4  | C |
| 070901 | 014804.7561 | 59.7746 | 28.0576 | -21.9 | 1 | 2.3  | 67  | 5  | G |
| 070901 | 014913.8499 | 59.3910 | 22.3575 | -52.0 | 1 | 0.3  | 175 | 12 | G |
| 070901 | 015017.5634 | 59.7668 | 28.1115 | -37.3 | 3 | 0.6  | 108 | 8  | G |
| 070901 | 015017.6093 | 59.7848 | 28.1124 | 17.0  | 1 | 0.7  | 104 | 6  | C |
| 070901 | 021801.1495 | 59.7289 | 28.3516 | -7.8  | 1 | 1.4  | 90  | 3  | G |
| 070901 | 022109.0087 | 59.7134 | 28.3586 | -24.9 | 2 | 0.7  | 107 | 7  | G |
| 070901 | 025119.2173 | 59.7153 | 26.3293 | -26.6 | 1 | 3.3  | 28  | 2  | G |
| 070901 | 025419.4362 | 59.7572 | 26.4068 | 5.0   | 1 | 0.6  | 90  | 3  | G |
| 070901 | 042802.2984 | 59.5879 | 27.7301 | -17.9 | 1 | 0.6  | 107 | 7  | G |
| 070901 | 044401.0934 | 59.6305 | 28.0205 | 0.0   | 2 | 13.0 | 85  | 3  | G |
| 070901 | 044401.1015 | 59.6373 | 27.9499 | 31.5  | 1 | 3.1  | 131 | 3  | C |
| 070901 | 050539.5039 | 59.6149 | 27.8527 | -7.1  | 3 | 1.1  | 92  | 3  | G |
| 070901 | 051251.1361 | 59.5959 | 27.9200 | -5.8  | 1 | 1.1  | 92  | 3  | G |
| 070901 | 051916.2012 | 59.5777 | 27.9805 | -26.3 | 1 | 1.7  | 76  | 9  | G |
| 070901 | 052216.9654 | 59.4840 | 27.1145 | 0.0   | 1 | 5.4  | 98  | 3  | C |
| 070901 | 052217.1309 | 59.5789 | 27.9664 | 16.4  | 1 | 0.6  | 109 | 8  | G |
| 070901 | 213316.5453 | 59.5741 | 23.8409 | -7.1  | 1 | 0.5  | 41  | 5  | G |
| 070901 | 213524.8633 | 59.5798 | 23.8850 | -10.8 | 4 | 0.5  | 42  | 5  | G |
| 070901 | 213701.8919 | 59.5814 | 23.8706 | -23.3 | 1 | 2.1  | 84  | 3  | G |
| 070901 | 215645.8467 | 59.7666 | 23.9201 | 36.5  | 1 | 0.3  | 2   | 11 | G |
| 070901 | 220748.9481 | 59.4788 | 24.3998 | 90.2  | 2 | 1.1  | 144 | 6  | G |
| 070901 | 220749.1519 | 59.5312 | 24.4435 | -17.9 | 1 | 0.5  | 43  | 4  | C |
| 070901 | 221230.9108 | 59.5932 | 24.1127 | 55.4  | 1 | 4.3  | 112 | 3  | C |

# ÄIKESEDETEKTORI ANDMED TÖÖTLEMATA KUJUL

start

Windows M...

My Music

2007

DICT.EXE

Microsoft Po...

0709.est - ...

ET

2:49 PM

# DETEKTORI ANDMETE TÖÖTLUS

- Andmete hoidmine ja lihtsamad arvutused *MS Excelis* (selline andmehulk käib tegelikult juba üle jõu) ja *MS Accessis*
- Andmete ruumiline analüüs, kaartide koostamine, interpoleerimine: *Idrisi32*, *ArcGIS*

## Layer Properties

General Source Selection Display Symbology Fields Definition Query Labels Joins &amp; Relates

Show:

## Features

## Categories

## Quantities

Graduated colors

Graduated symbols

Proportional symbols

## Charts

## Multiple Attributes

Draw quantities using color to show values.

Import...

Fields

Value:

Kellaaeg

Normalization:

none

Classification

Manual

Classes:

24

Classify...

Color Ramp:



| Symbol | Range                       | Label                       |
|--------|-----------------------------|-----------------------------|
| ◇      | 24838.207200 - 9999.999999  | 24838.207200 - 9999.999999  |
| ●      | 10000.000000 - 19999.999999 | 10000.000000 - 19999.999999 |
| ●      | 20000.000000 - 29999.999999 | 20000.000000 - 29999.999999 |
| ●      | 30000.000000 - 39999.999999 | 30000.000000 - 39999.999999 |
| ●      | 40000.000000 - 49999.999999 | 40000.000000 - 49999.999999 |
| ●      | 50000.000000 - 59999.999999 | 50000.000000 - 59999.999999 |
| ●      | 60000.000000 - 69999.999999 | 60000.000000 - 69999.999999 |
| ●      | 70000.000000 - 79999.999999 | 70000.000000 - 79999.999999 |

☐ Show class ranges using feature values

Advanced

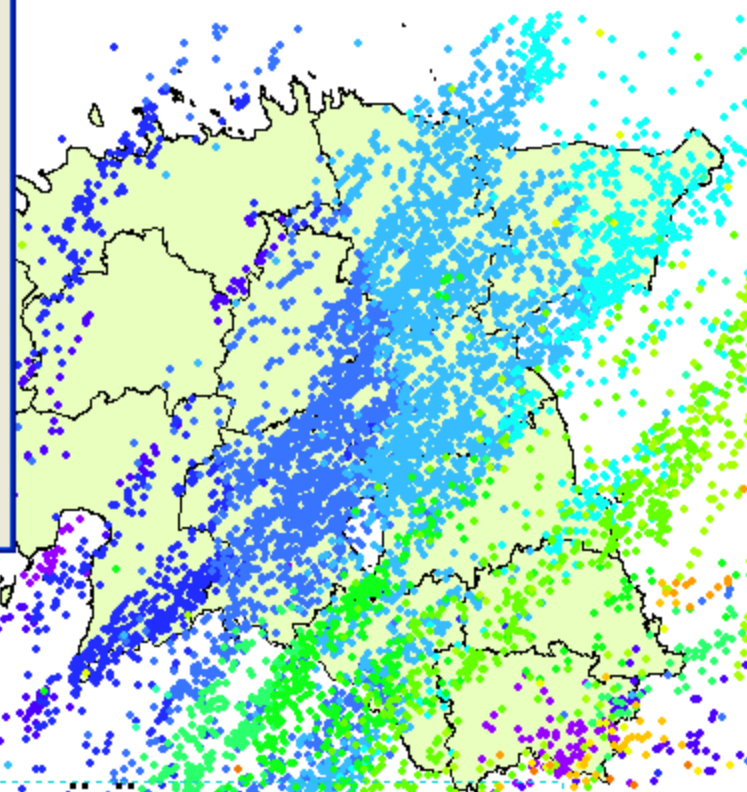
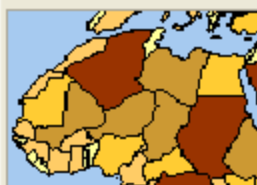
OK

Cancel

Apply



12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27



VÄLGULÖÖGID 26.05.2007

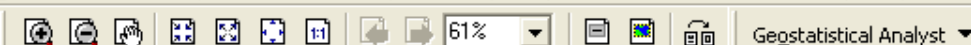
110000.000000 -  
120000.000000 -  
130000.000000 -  
140000.000000 -  
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160000.000000 -  
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180000.000000 -  
190000.000000 -  
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6

Display Source Selection

Drawing





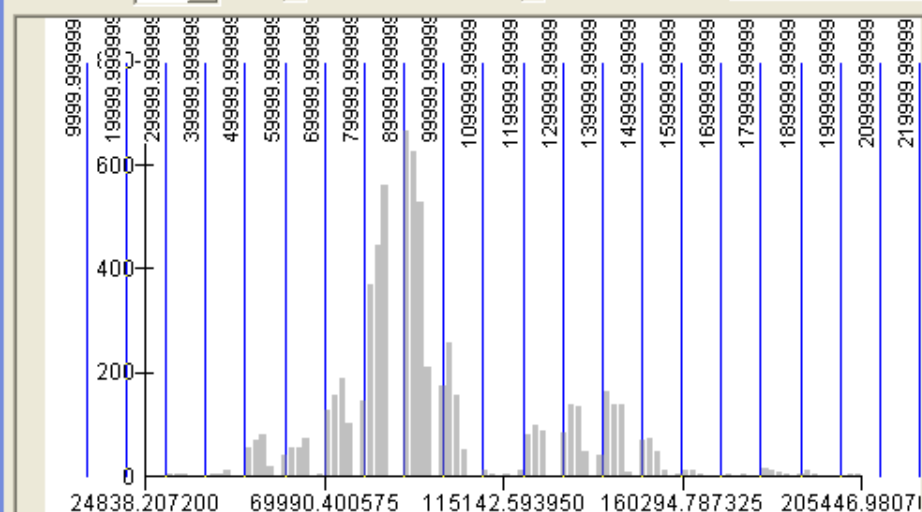
## Classification

Classification  
Method: Manual  
Classes: 24  
Data Exclusion  
Exclusion ... Sampling ...

## Classification Statistics

Count: 6691  
Minimum: 24838.207200  
Maximum: 205446.980700  
Sum: 653378371.381801  
Mean: 97650.331995  
Median: 92001.807400  
Standard Deviation: 25639.458857

Columns: 100 ☐ Show Std. Dev. ☐ Show Mean

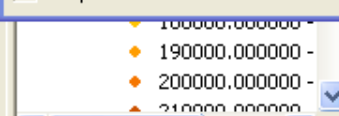


## Break Values

9999.999999  
19999.999999  
29999.999999  
39999.999999  
49999.999999  
59999.999999  
69999.999999  
79999.999999  
89999.999999  
99999.999999  
109999.999999  
119999.999999  
129999.999999  
139999.999999  
149999.999999

OK

Cancel

☐ Snap breaks to data values

Display Source Selection

Drawing Mouse Selection Annotation Text Line Area Image Symbol Color Font Size Style Weight Color Font Size Style Weight

VÄLGULOODID 26.05.2007

## Data Exclusion Properties

Query Legend

Exclude clause:

"FID"  
"ID"  
"Kuupäev"  
"Kellaaeg"  
"y"  
"x"

= < > Like  
> > = And  
< < = Or  
\_ % ( ) Not

Is

Get Unique Values

Go To:

SELECT \* FROM Detektor\_2005\_2007\_Select WHERE:

"Kuupäev" <> 70526 OR "Kellaaeg" < 000000 OR "Kellaaeg"  
> 240000 OR "Liik" = 'C'

Clear

Verify

Help

Load...

Save...

OK

Cancel



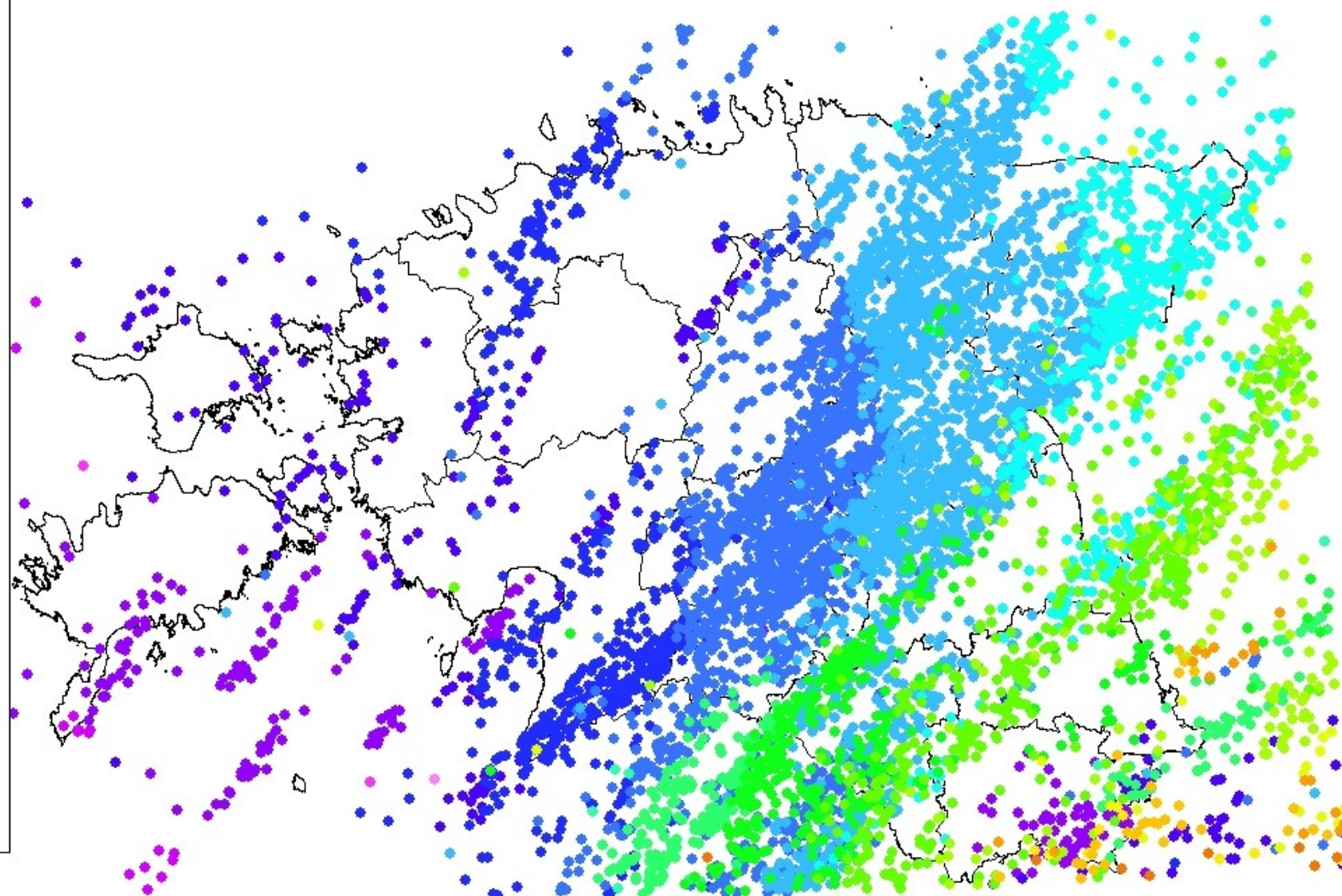
# TULEMUSED





Kellaaeg UTC

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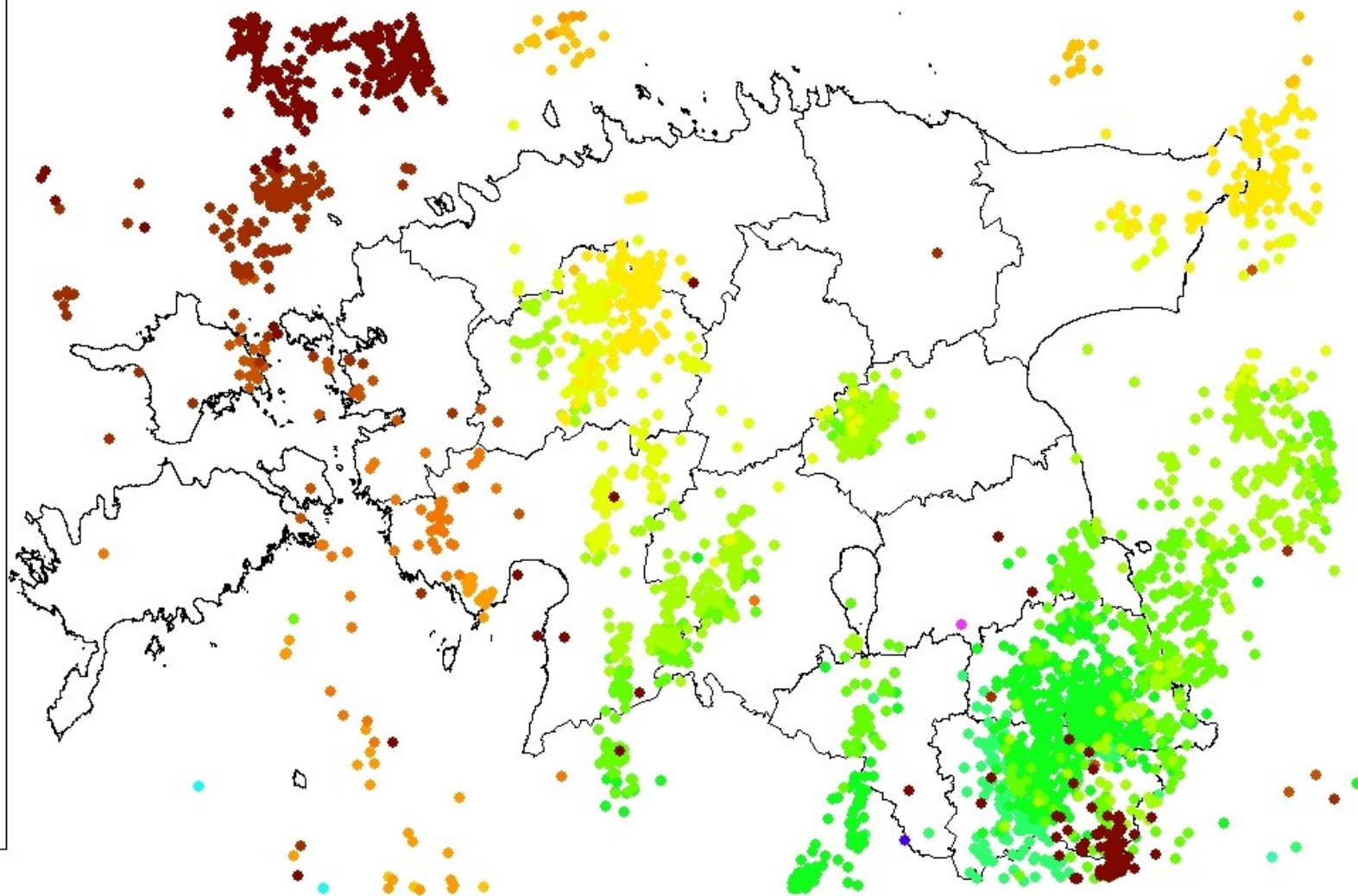


Pilv-maa välgulöögid 26. mail 2007



Kellaaeg UTC

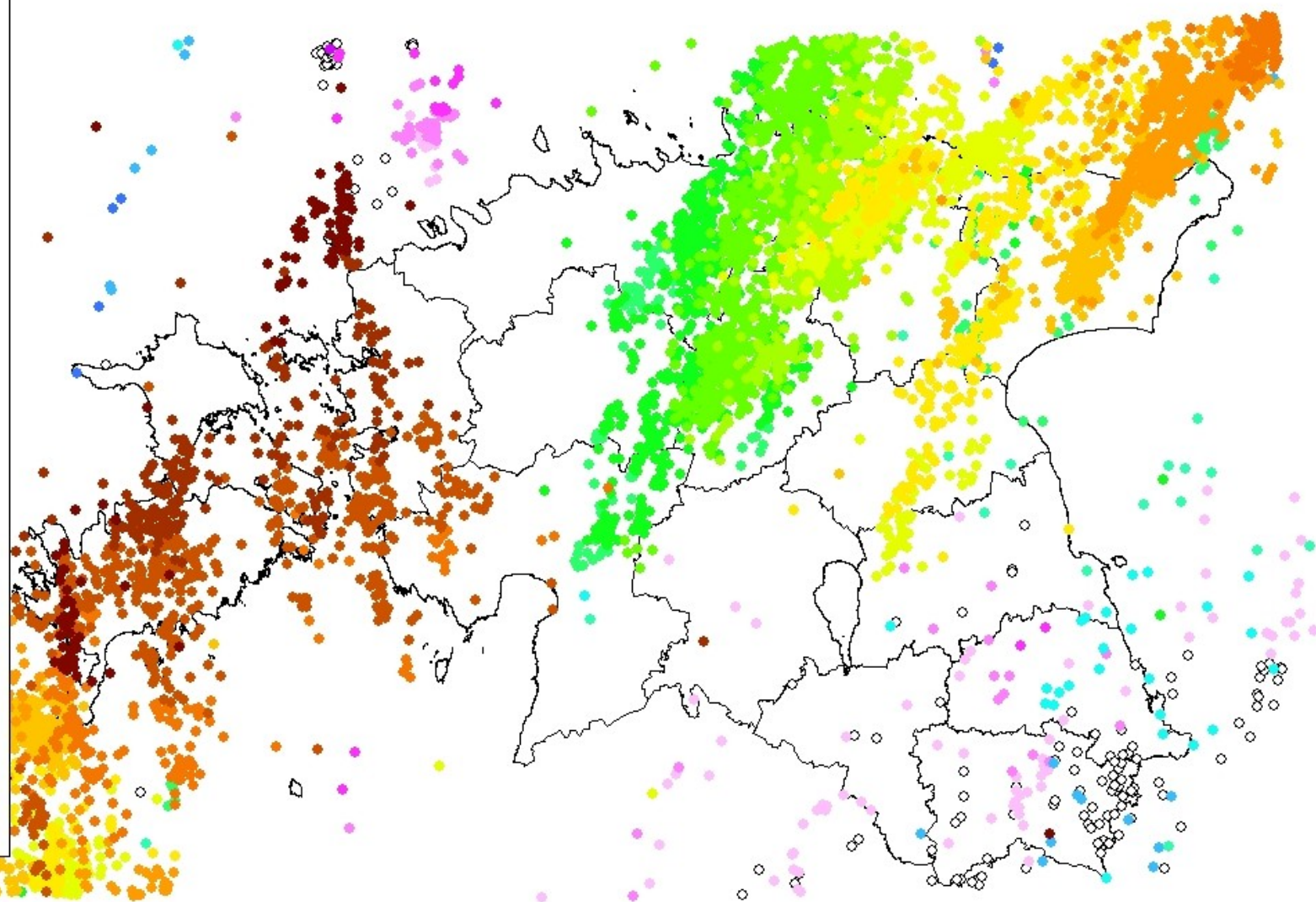
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Pilv-maa välgulöögid 27. mail 2007

Kellaaeg UTC

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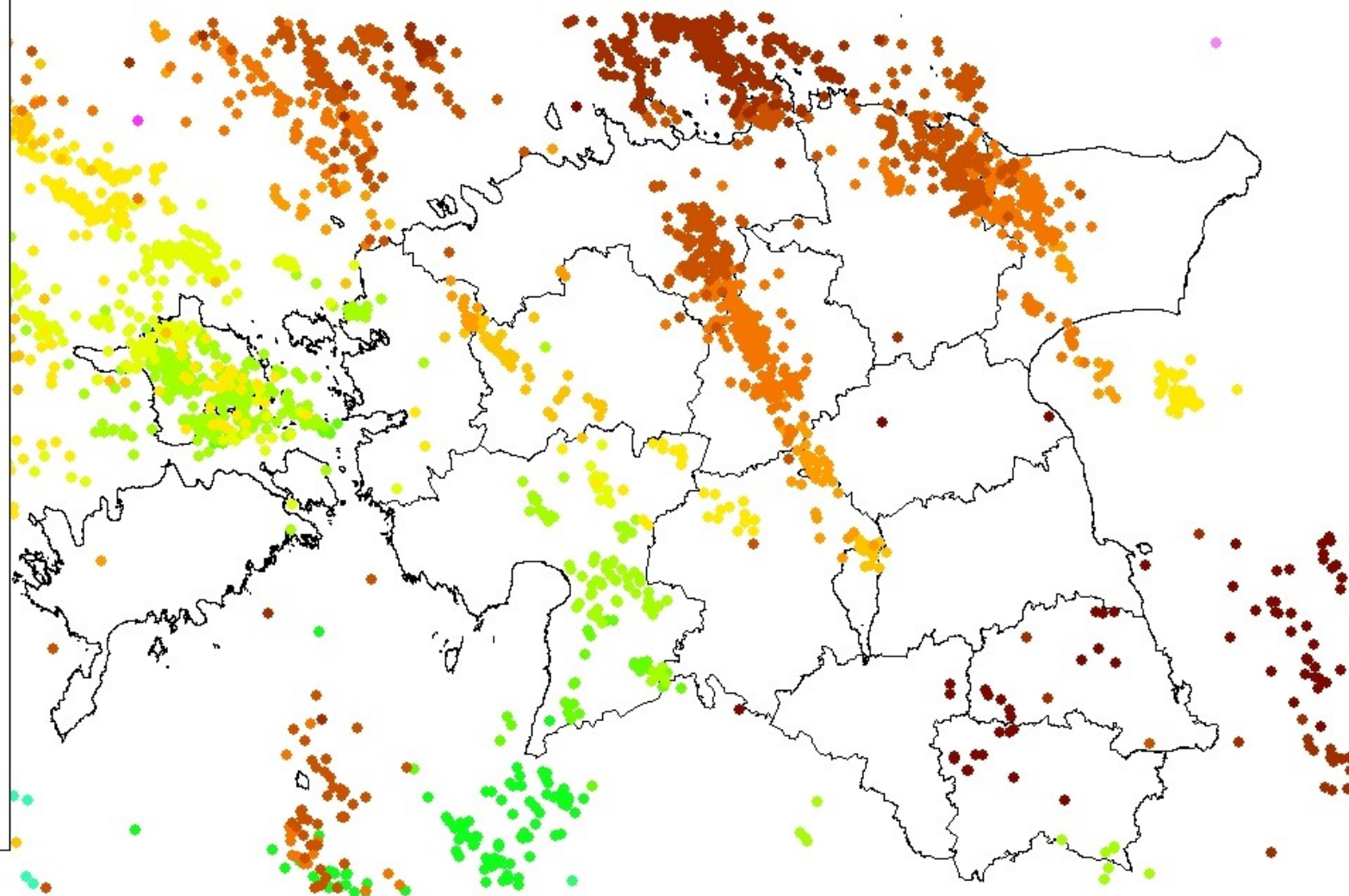


Pilv-maa välgulöögid 28. mail 2007



Kellaaeg UTC

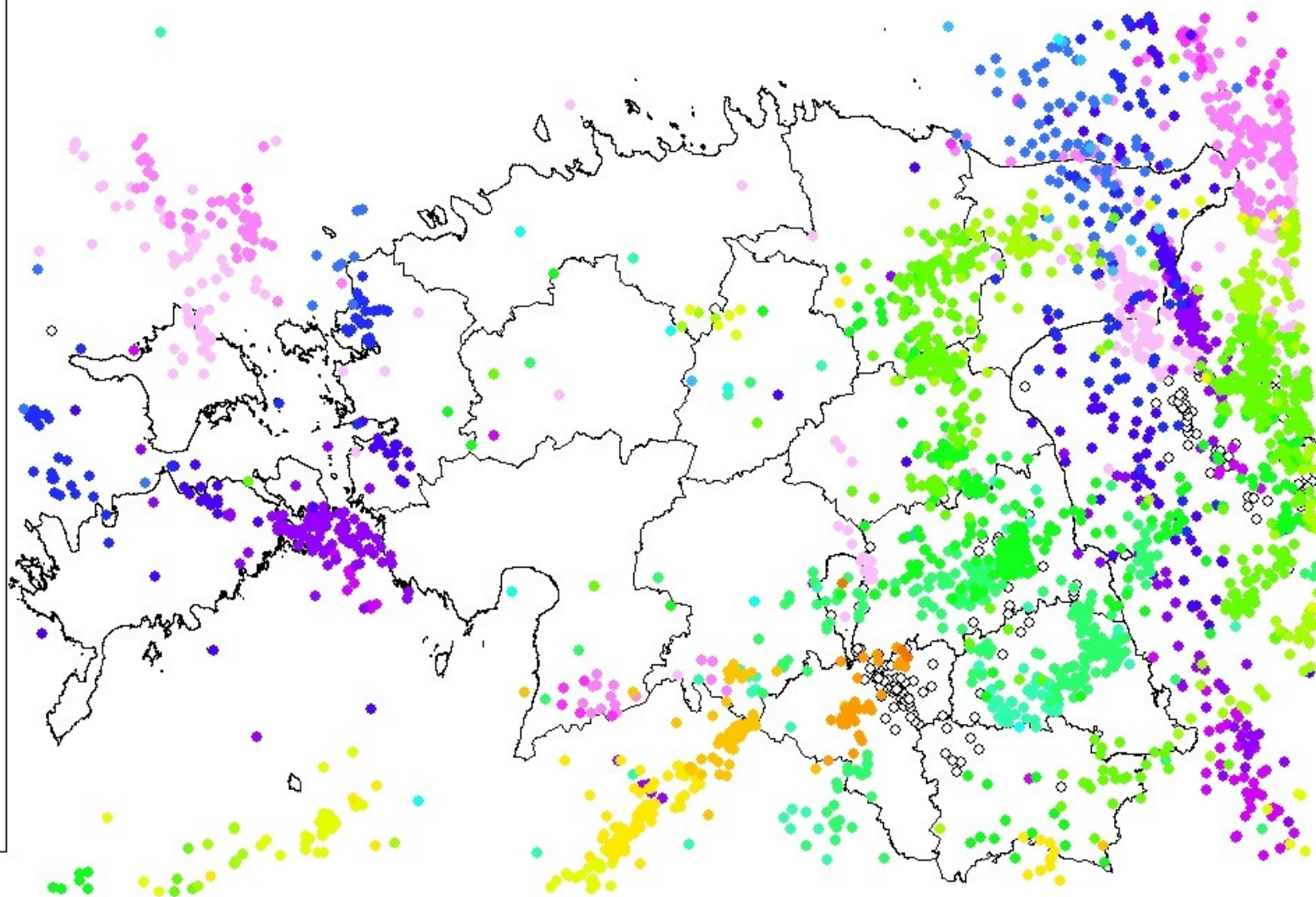
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Pilv-maa välgulöögid 29. mail 2007

Kellaaeg UTC

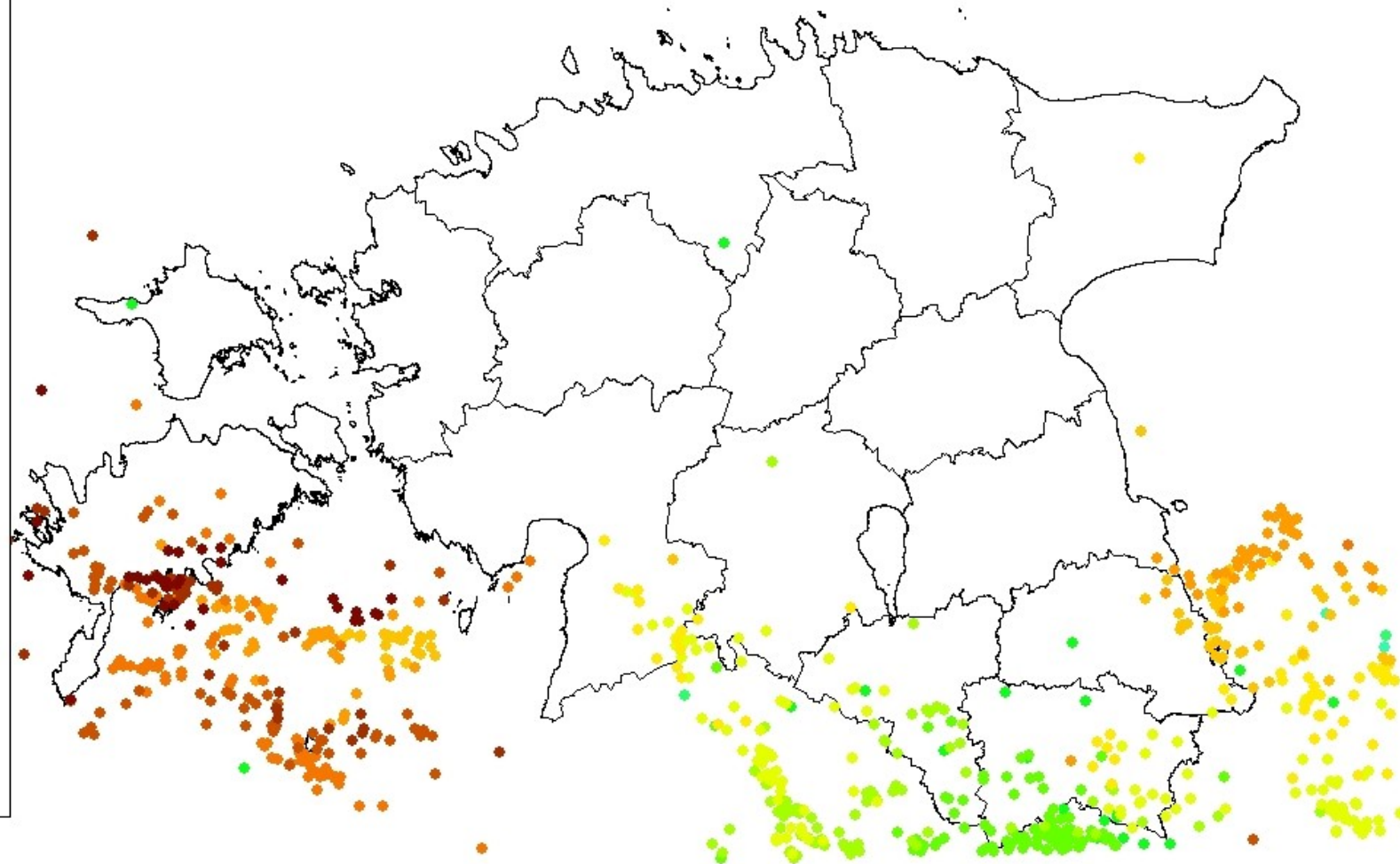
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Pilv-maa välgulöögid 30. mail 2007

Kellaaeg UTC

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Pilv-maa välgulöögid 31. mail 2007

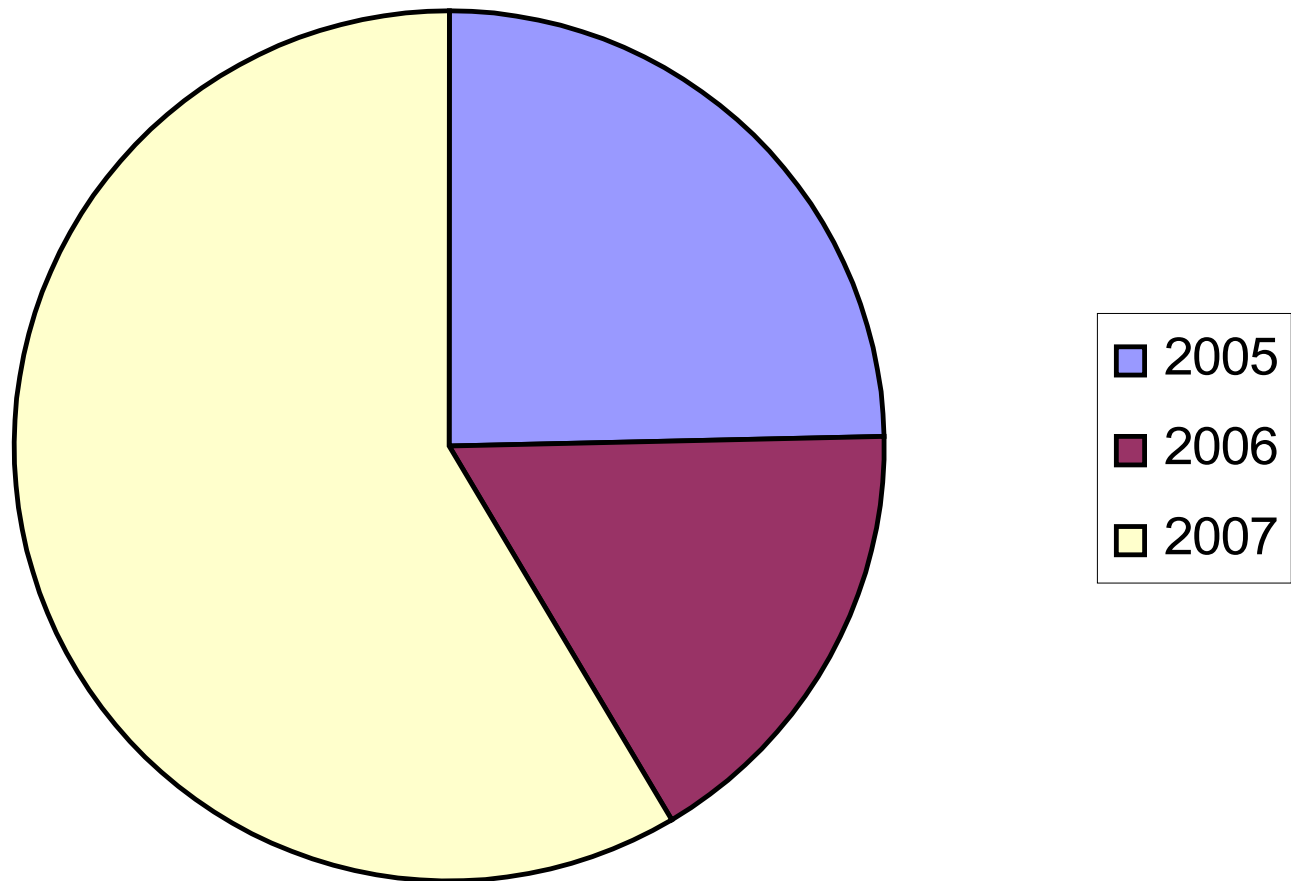


# VÄLGULÖÖKIDE ARV

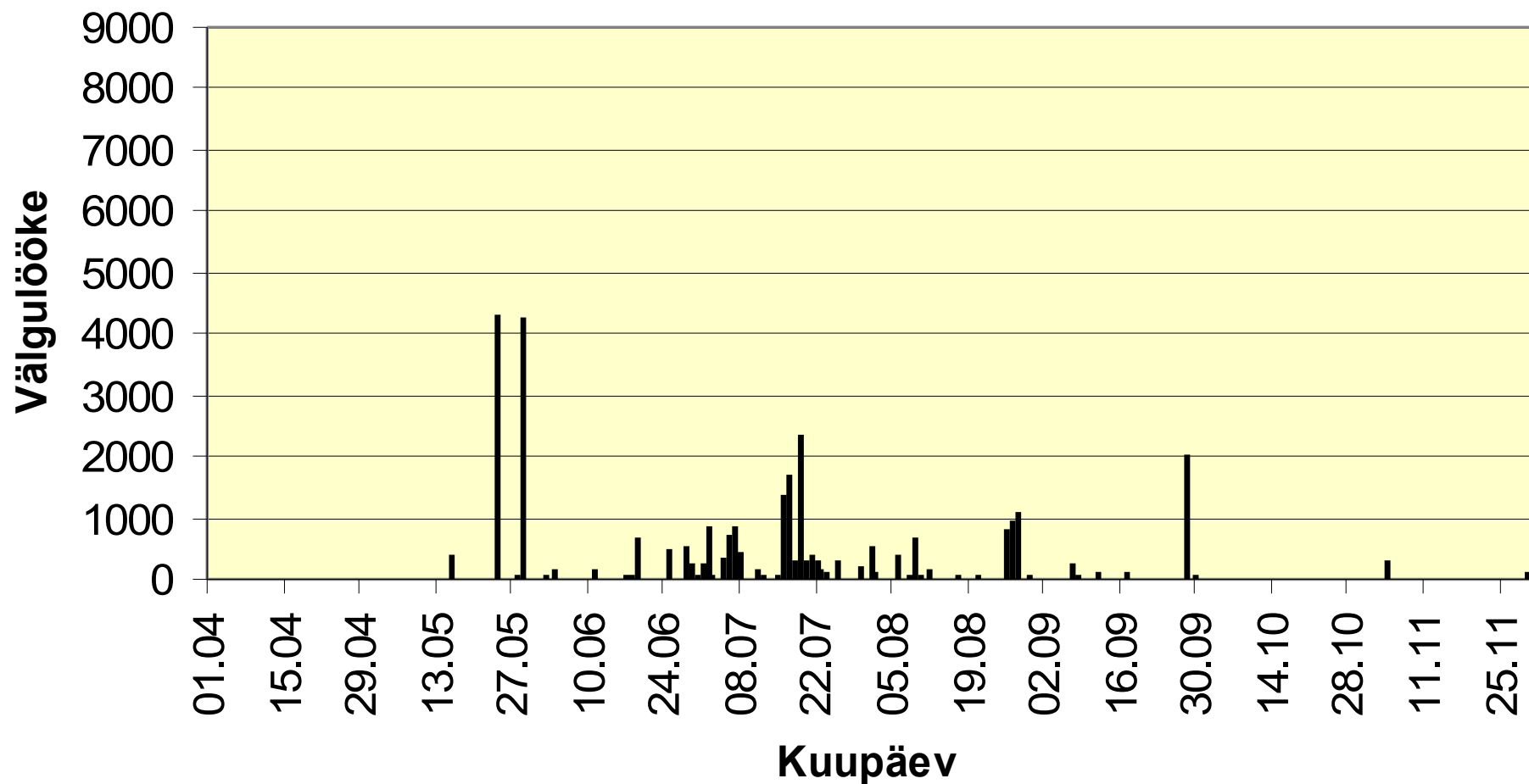
## AASTATE KAUPA

|             | 2005       | 2006       | 2007       |
|-------------|------------|------------|------------|
| Välke kokku | 29984      | 20278      | 70843      |
| Äike sep1+  | 144        | 105        | 113        |
| Äike sep10+ | 61         | 51         | 69         |
| Maks        | 4287       | 6586       | 8067       |
| Maks päev   | 24.05.2005 | 01.10.2006 | 28.05.2007 |

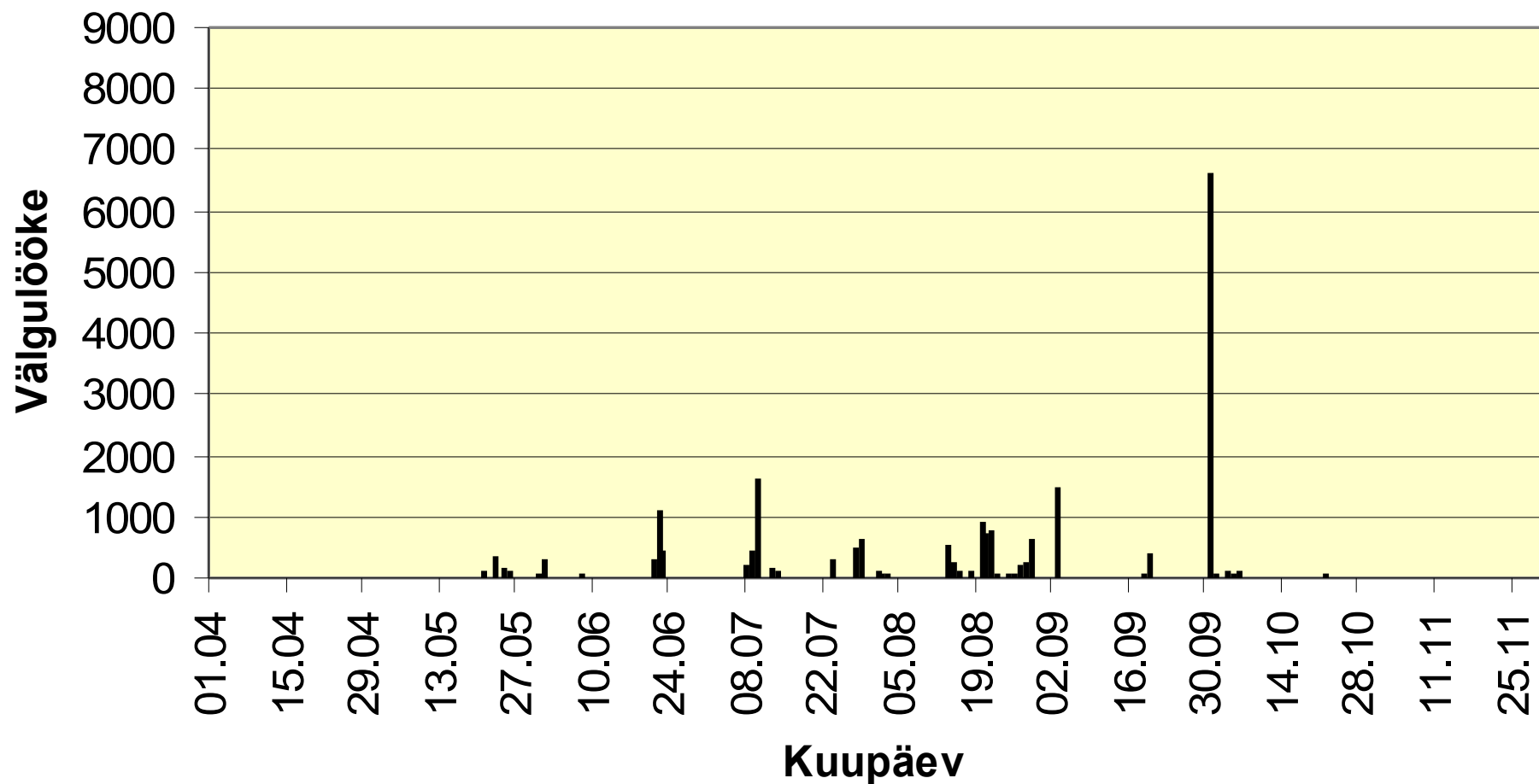
# Välgulööke 2005 - 2007



## Välgulöögid kuupäevade kaupa 2005

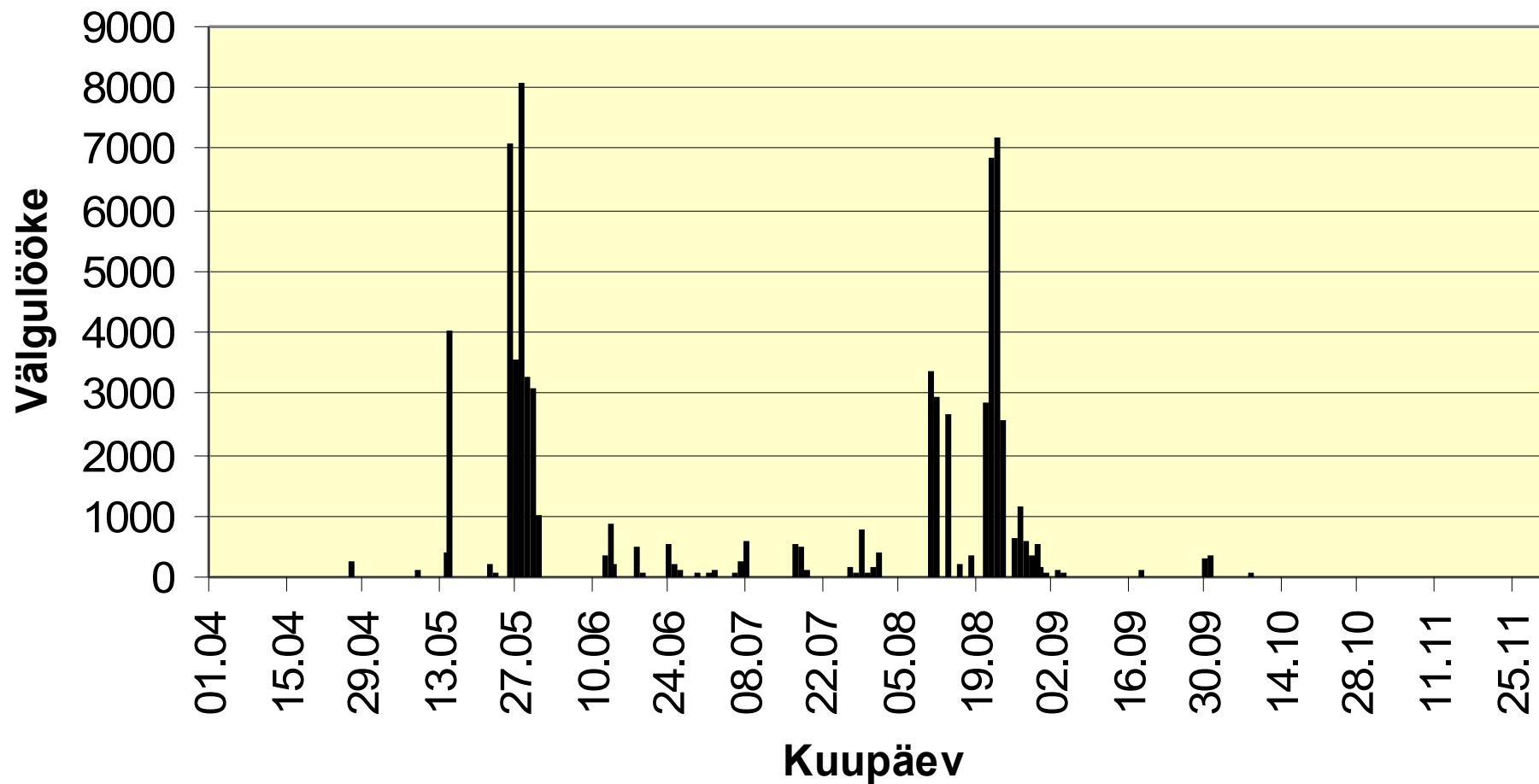


## Välgulöögid kuupäevade kaupa 2006

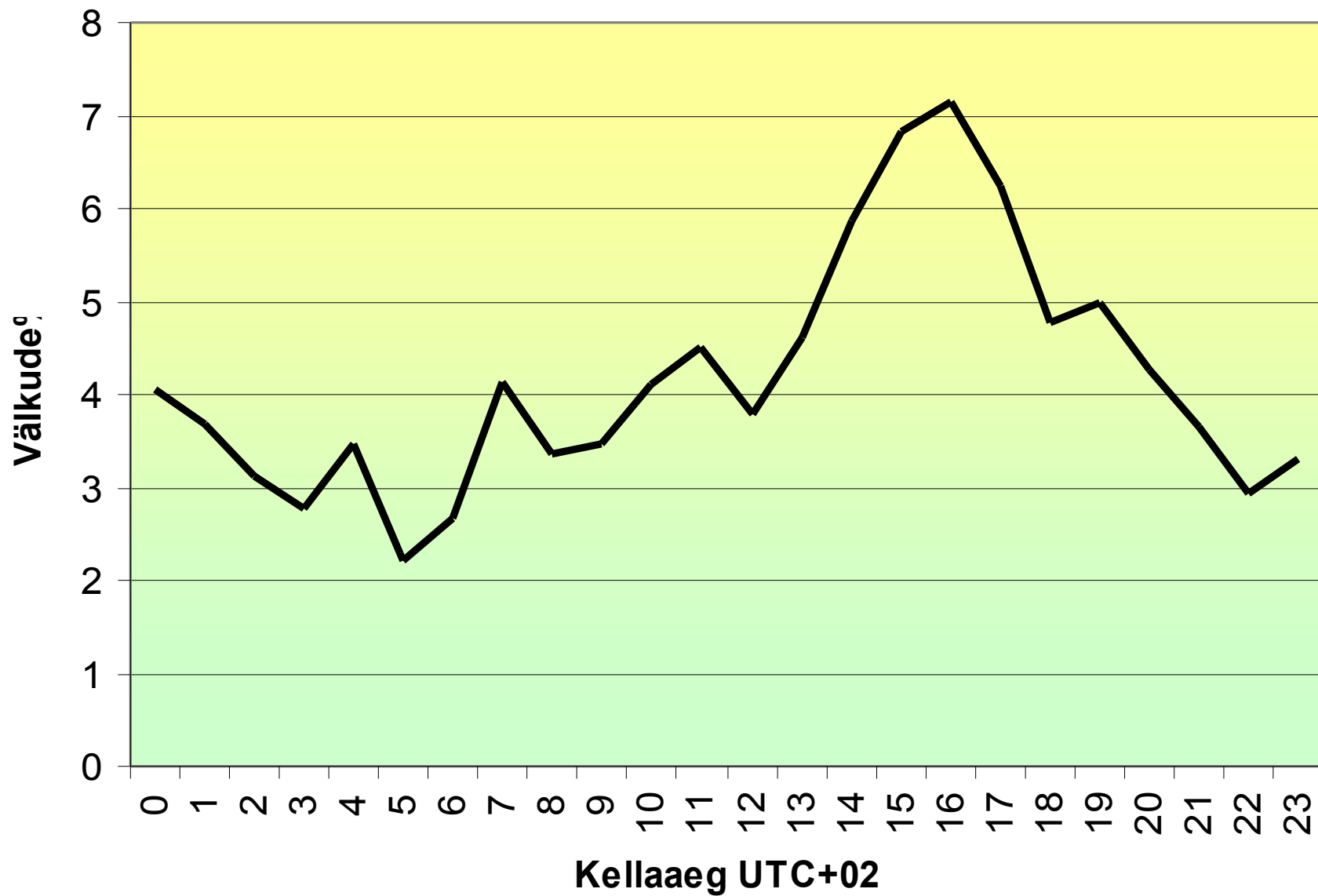




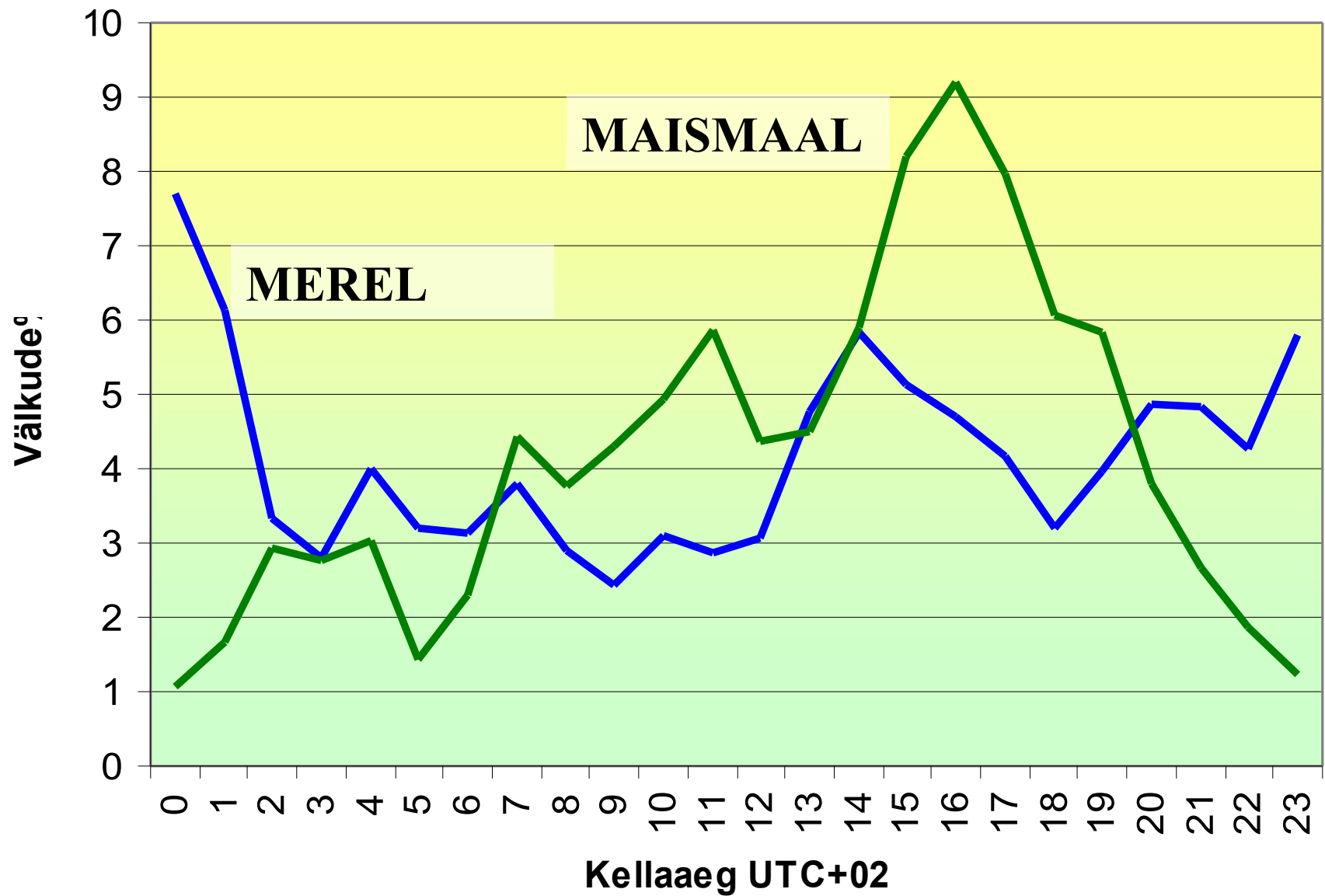
## Välgulöögid kuupäevade kaupa 2007



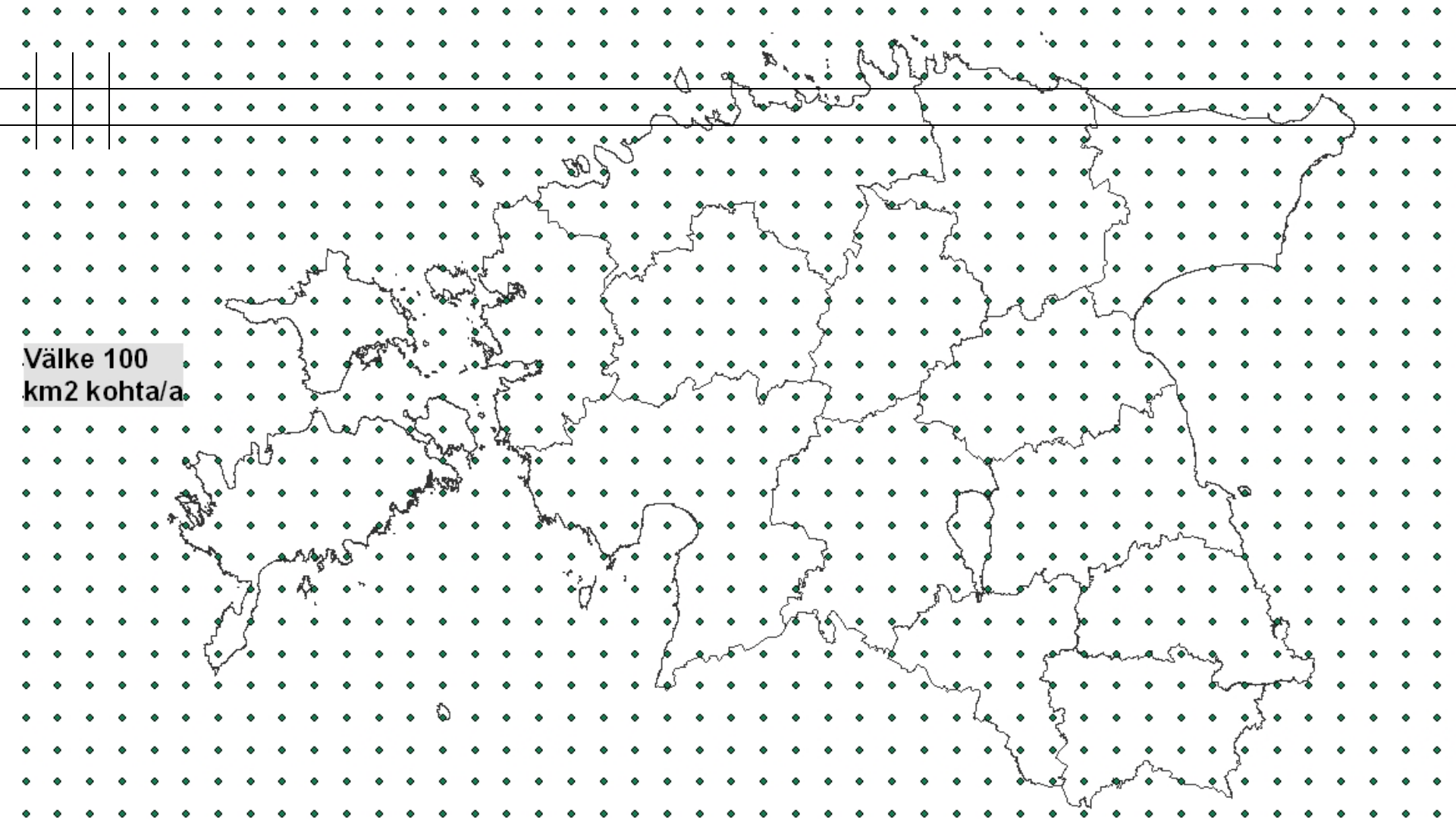
## Välkude osakaal ööpäeva lõikes



## Välkude osakaal ööpäeva lõikes

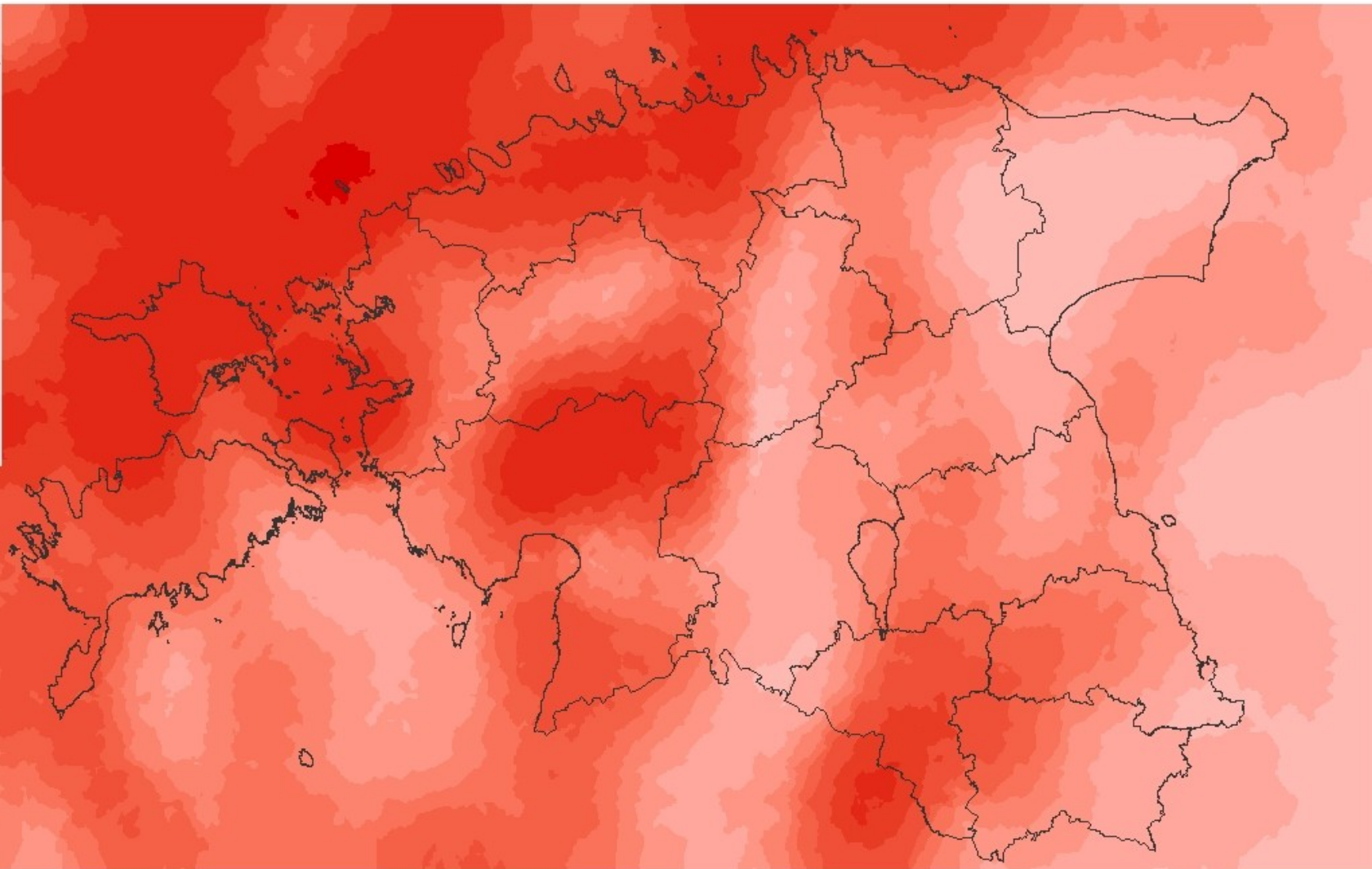
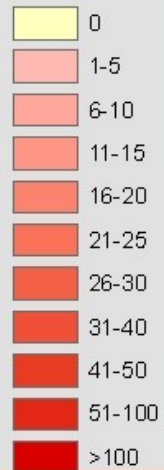


# UURING 1170 VÕRGUPUNKTIGA, IGA PUNKT 10 x 10 km RUUDU KESKMEKS



# August 2007

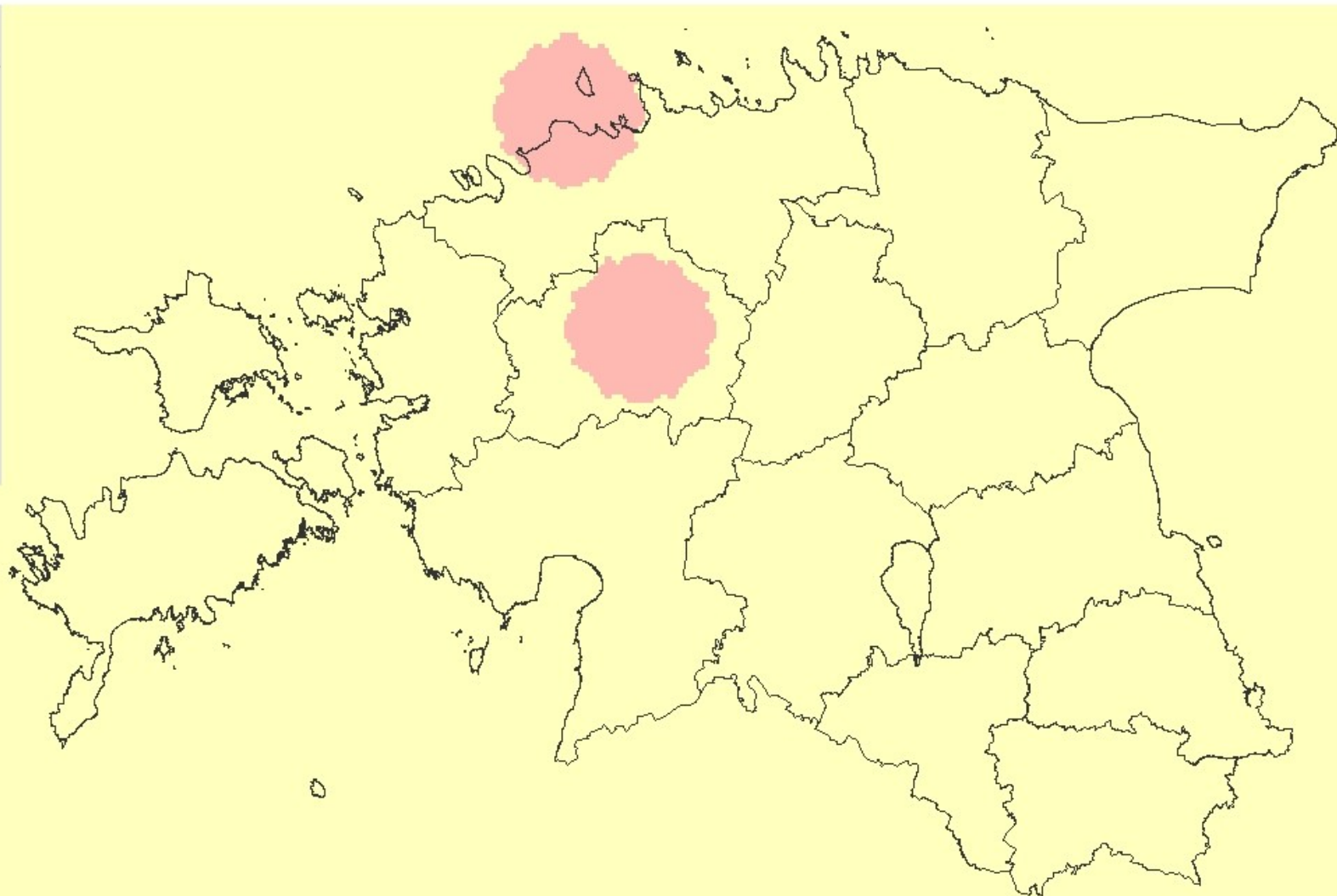
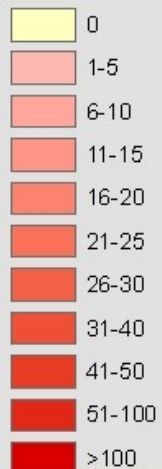
Välke 100  
km<sup>2</sup> kohta





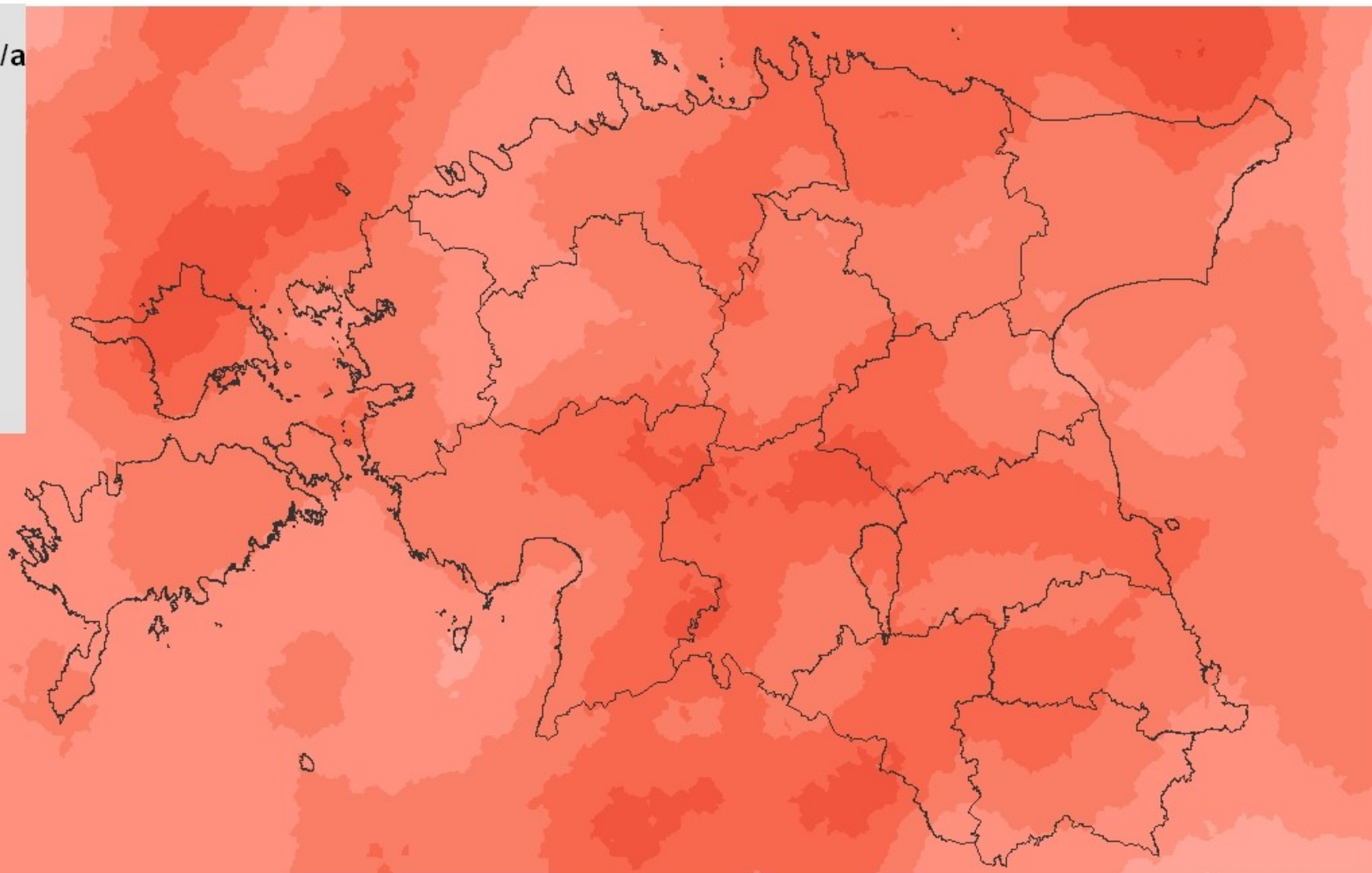
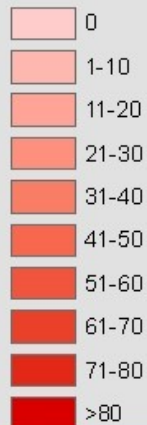
# Jaanuar 2007

Välke 100  
km<sup>2</sup> kohta



# Jaanuar 2005 - oktoober 2007

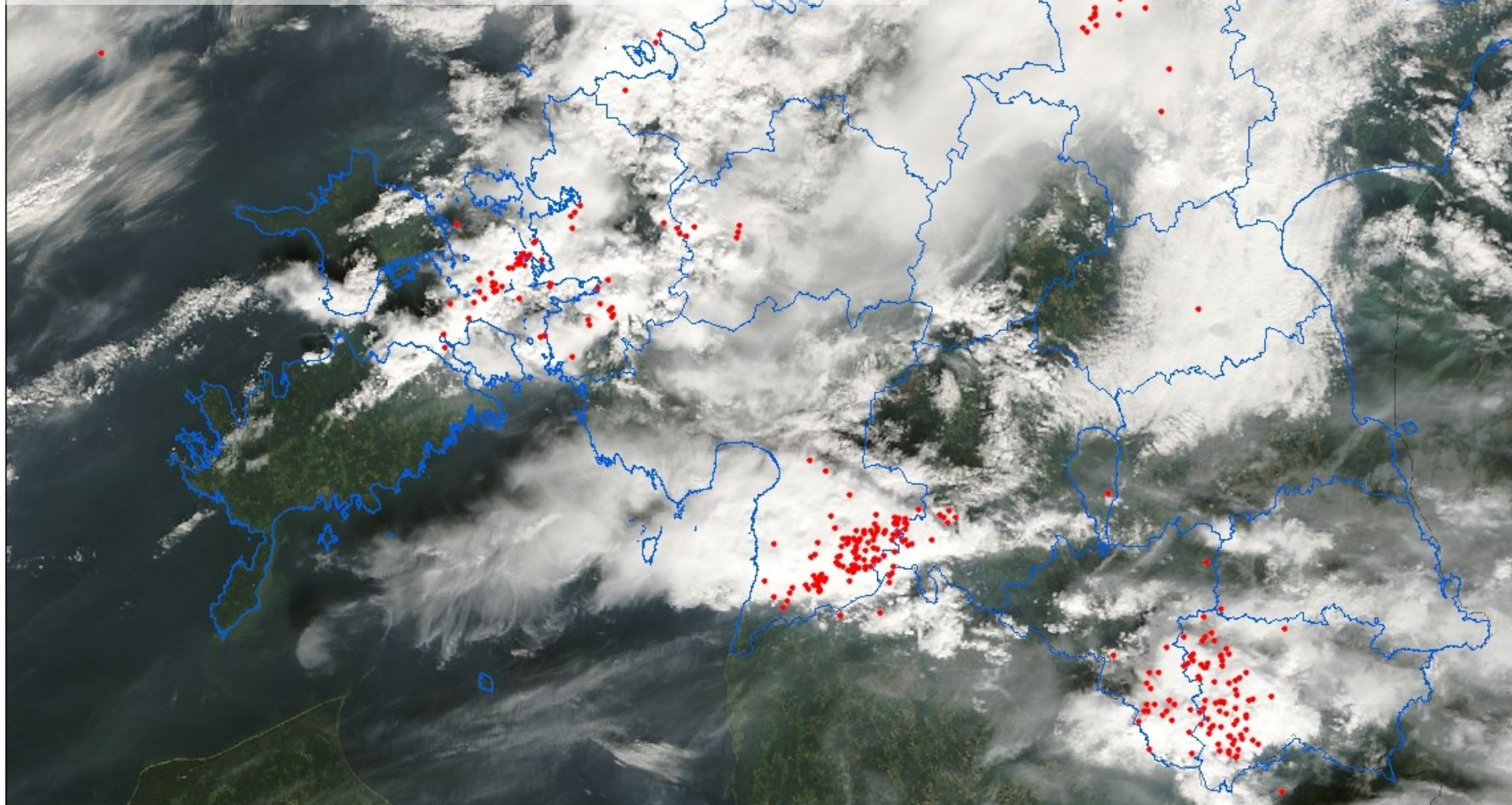
Välke 100  
km<sup>2</sup> kohta/a



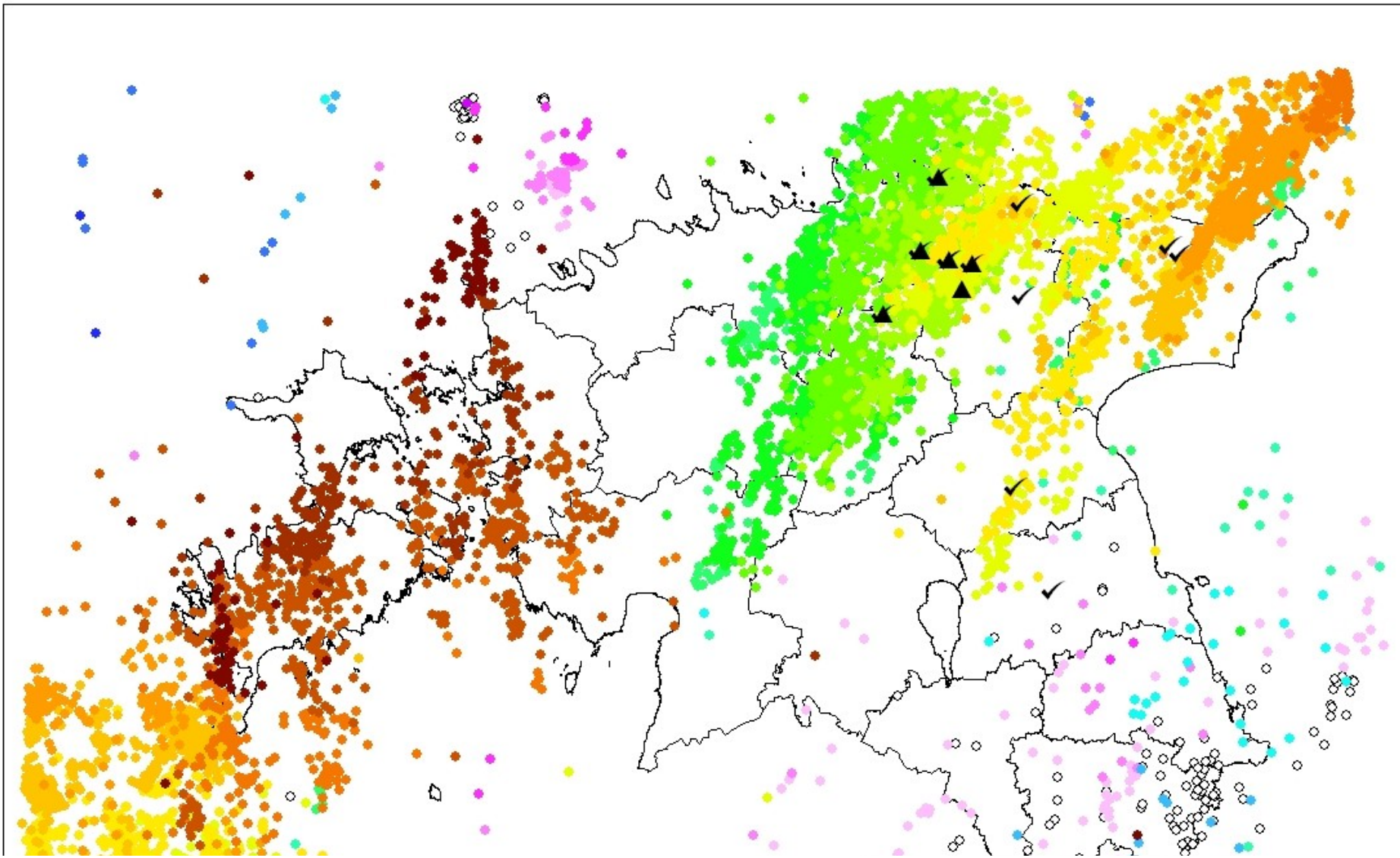


**ANDMETE KOMBINEERIMINE:**

**ÄIKESEDETEKTOR JA  
SATELLIIDI MODIS PILVEFOTO  
22.08.2007 11.30 – 12.30 (UTC+02h)**







**ANDMETE KOMBINEERIMINE: ÄIKESEDETEKTOR JA EESTI  
ÄIKESEVAATLEJATE VÕRGU RAHE- JA TORMIVAATLUSED  
28.05.2007**

# **TÄNAN TÄHELEPANU EEST!**

**SVEN-ERIK ENNO  
TÜ GEOGRAAFIA  
OSAKOND**

**seenno@ut.ee**