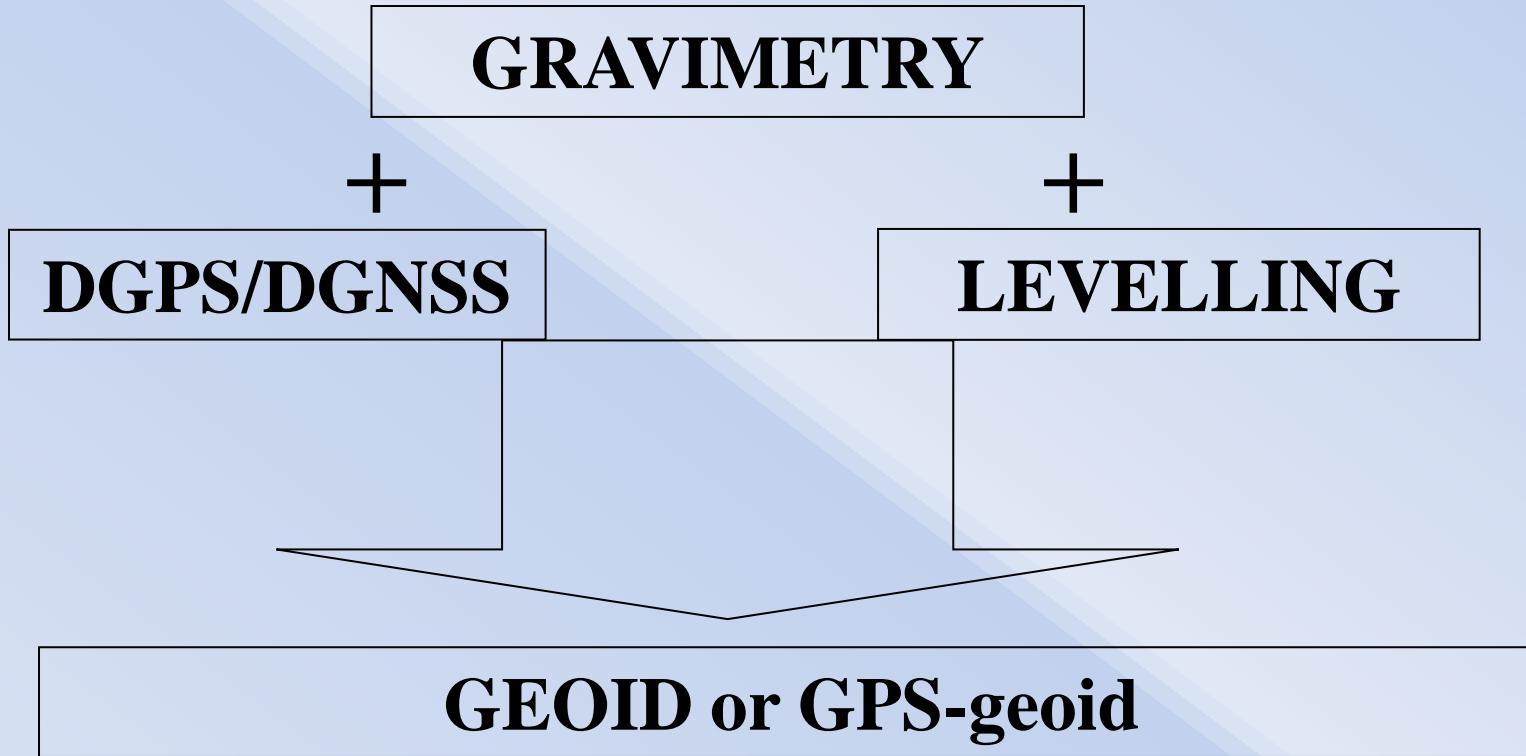




Cross-section of Latvia geoids models on latitude 57 and status report

Jānis Kaminskis

Gravimetry in 21 century



Gravimetry in 21 century

Equipment

-CG – 3 since 1998 to 2005 from Danish – Baltic sector programme

-now new CG- 5 two instruments

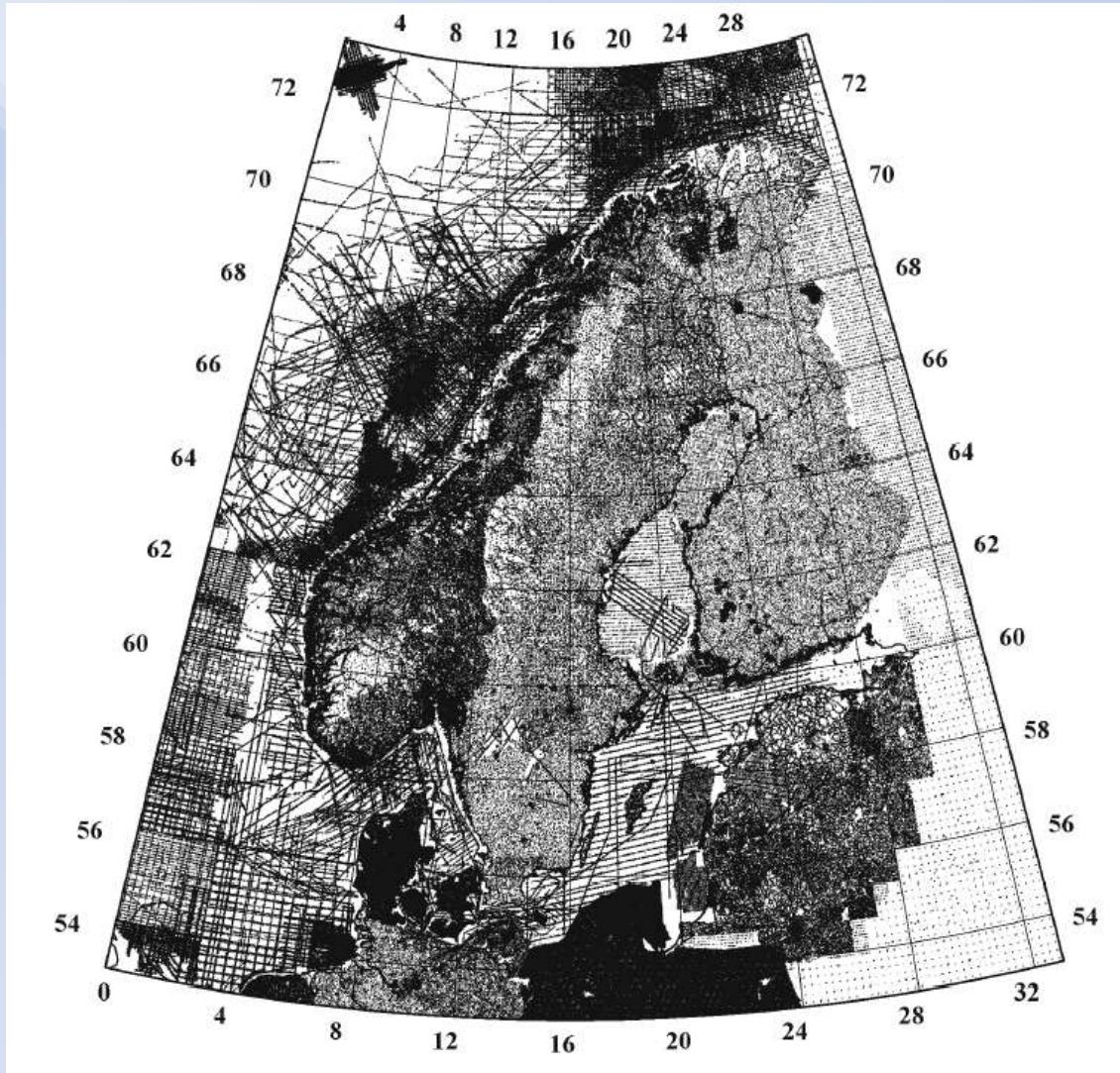
-Old – two

http://www.fid-tech.com/eng/technol/data/instr_making/1.463.html

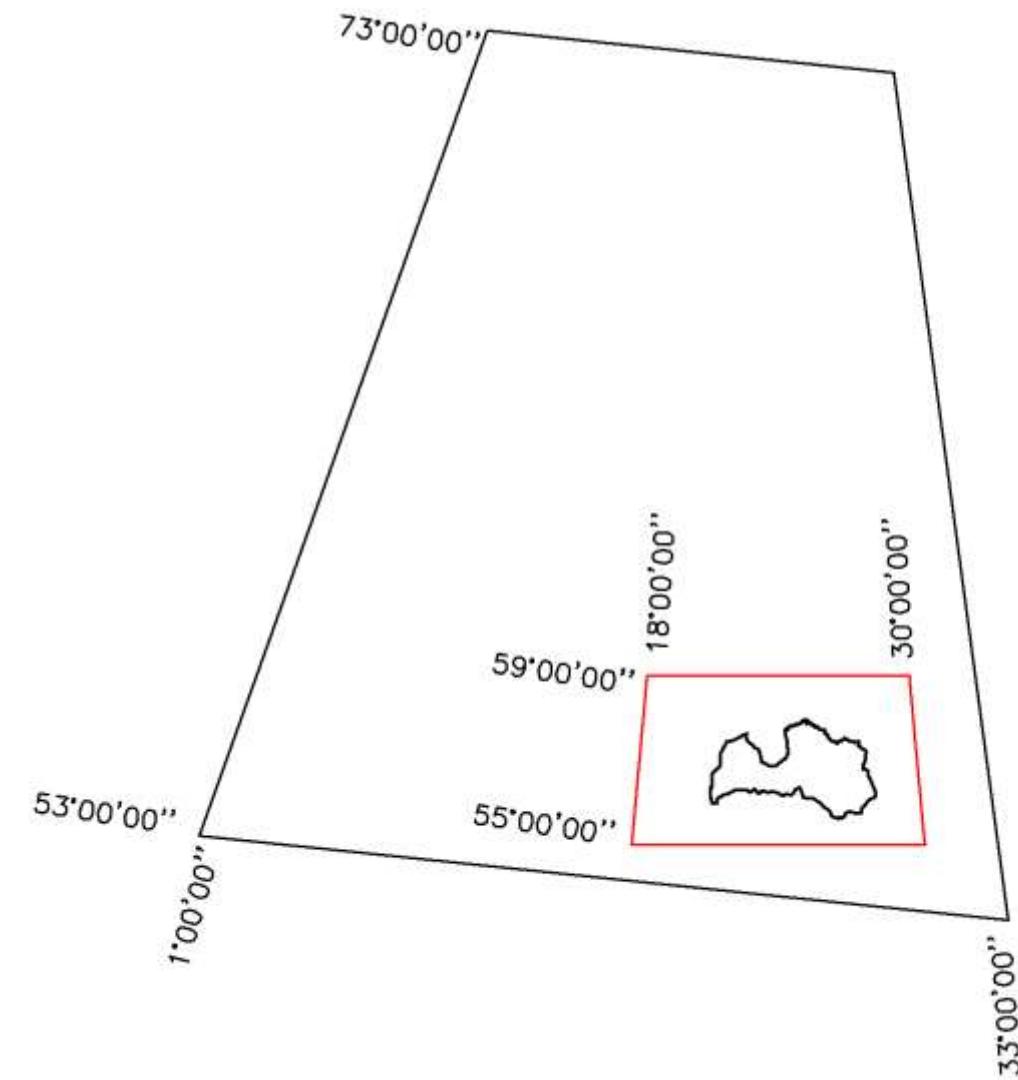
+ levelling going on

P.S. What to do with requirements from ICAO (aviation)?

Gravimetry in 21 century



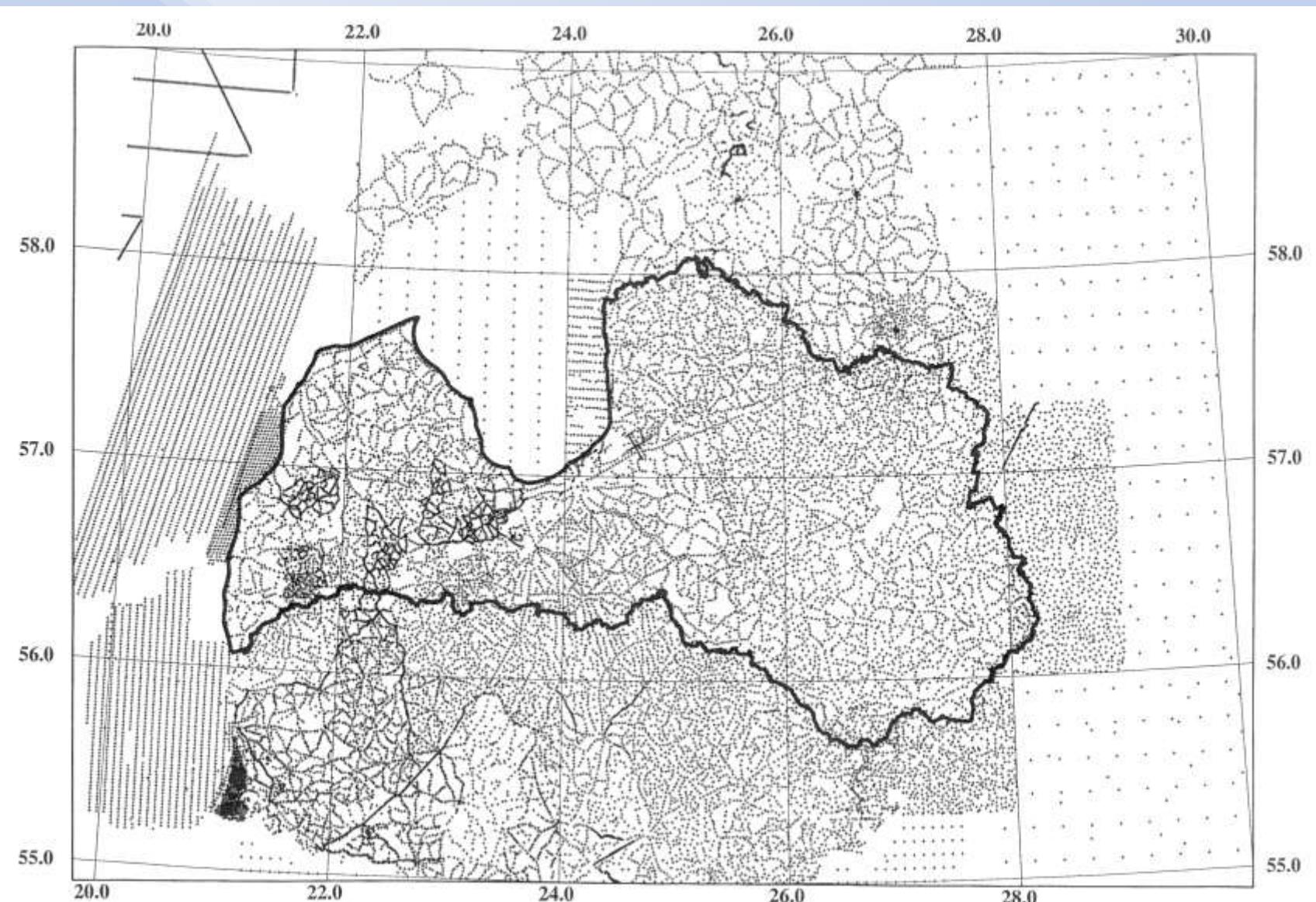
Gravimetry in 21 century Latvia area



Gravimetry in 21 century

Latvia area

27 566



Gravimetry in 21 century Latvia area



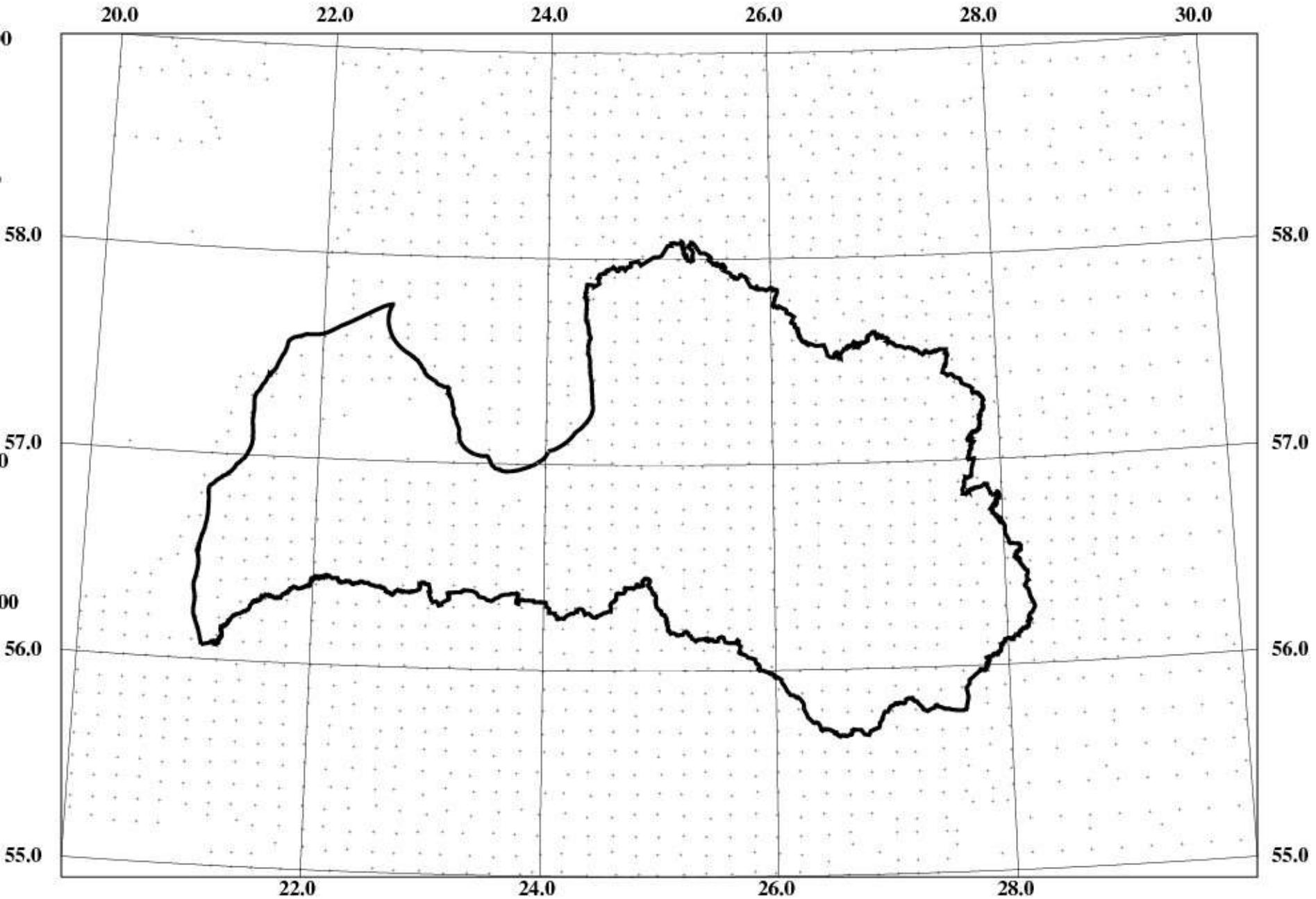
Gravimetry in 21 century

Latvia area

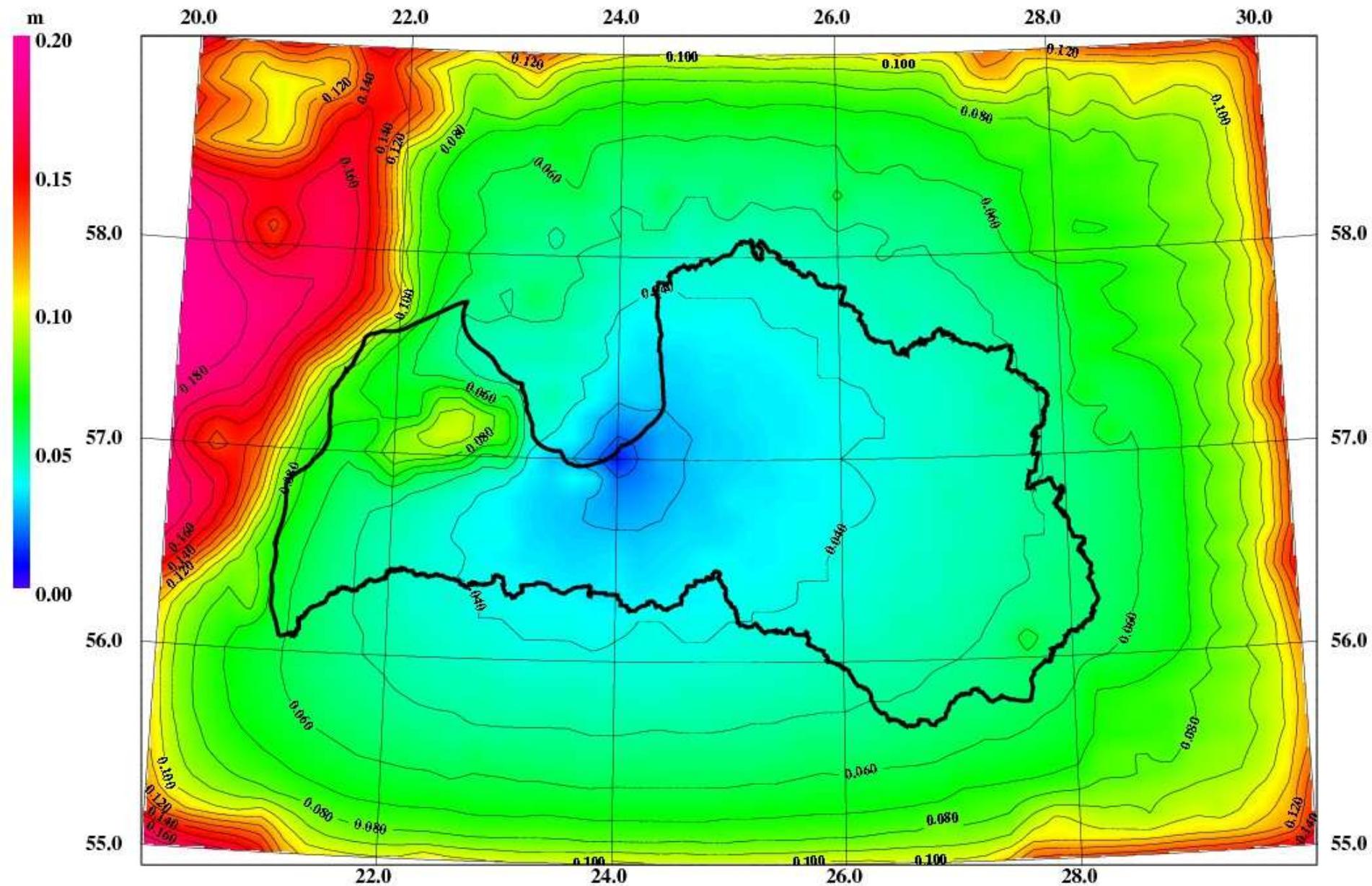
On Usmas lake



Simulation of error propagations



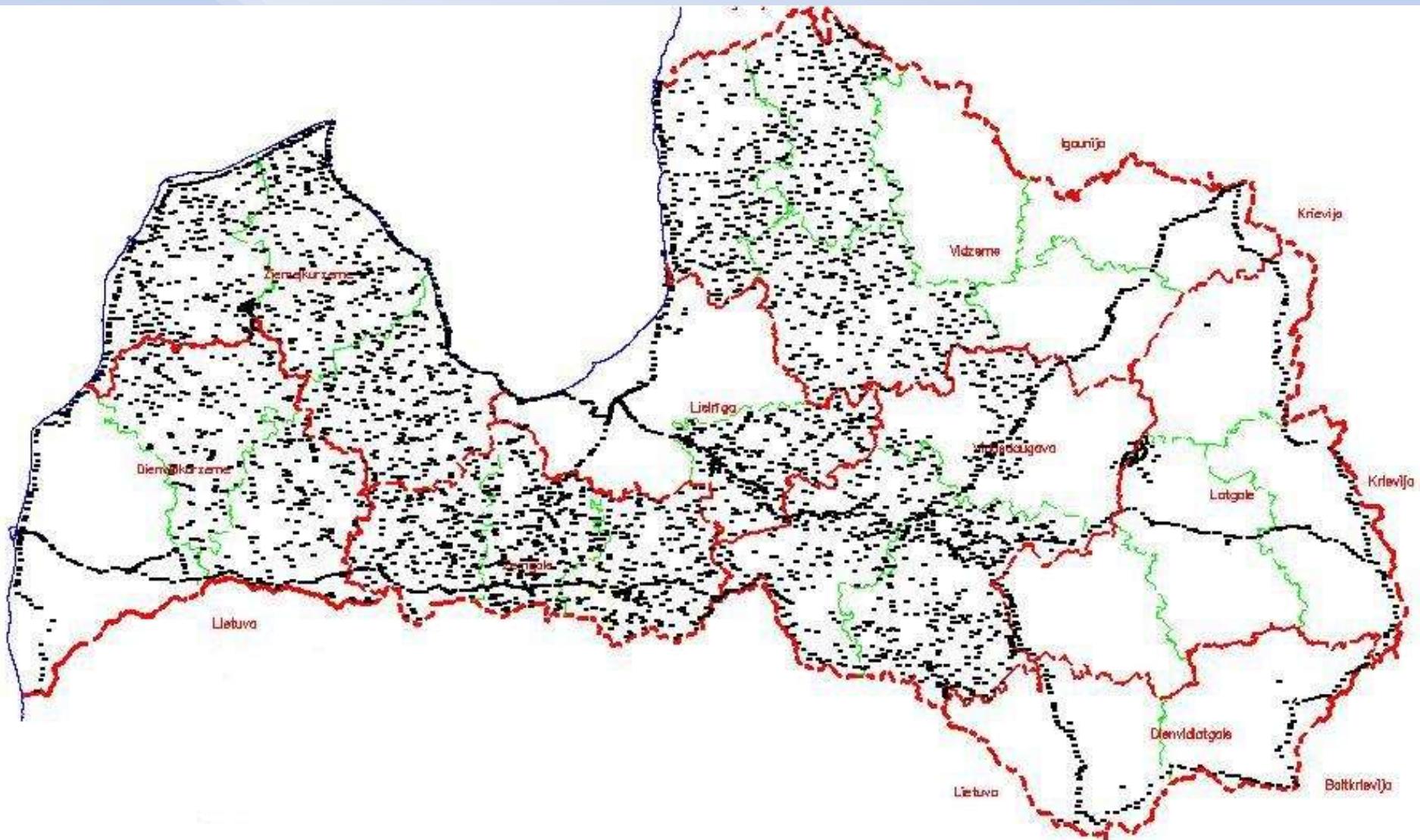
Simulation of error propagations; c.i. 1cm

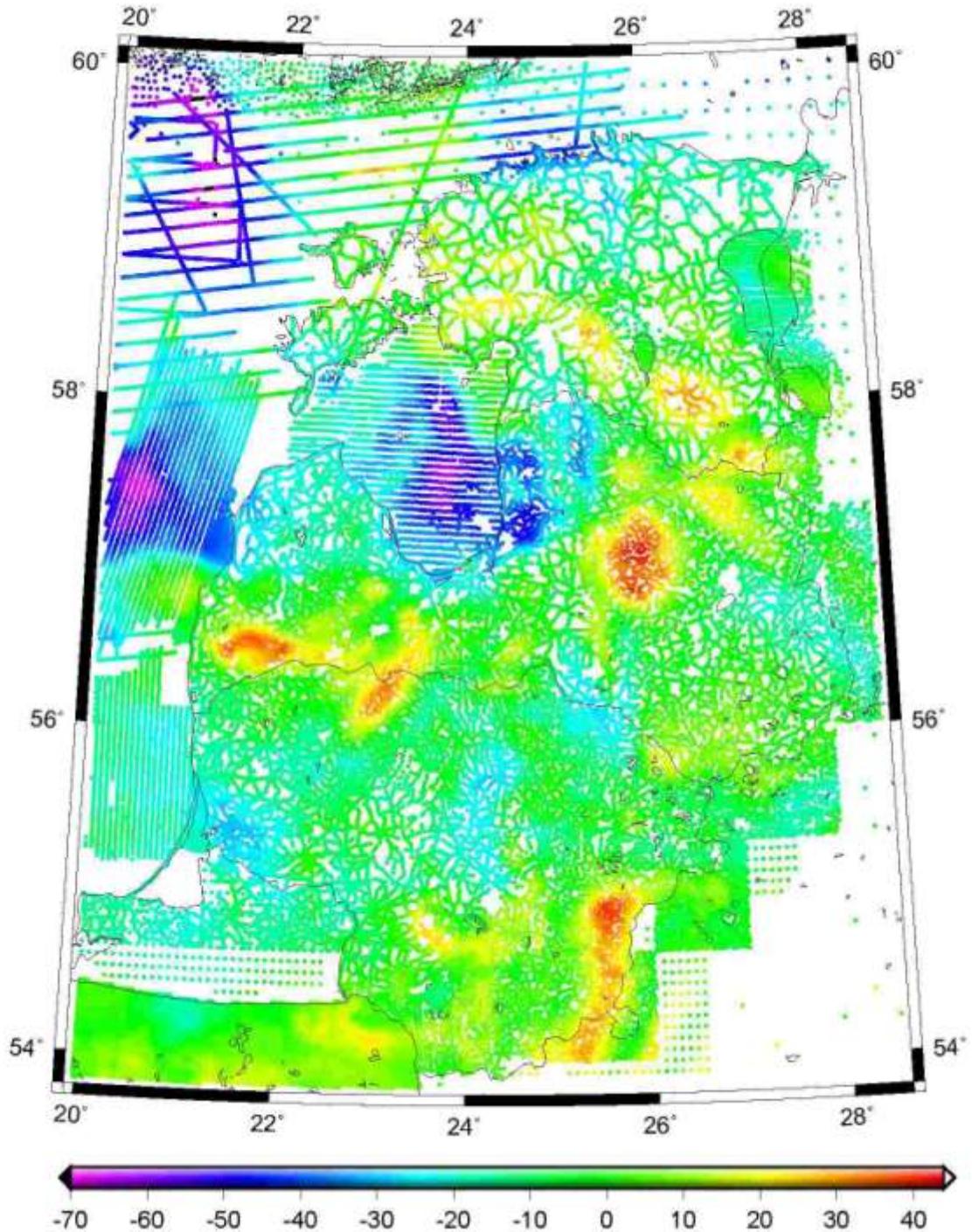


Gravimetry in 21 century

Latvia area

~ 4 000 new





Free air
anomalies

-73 mGal to +44
mGal;
mean value -7 mGal

300 000 km²

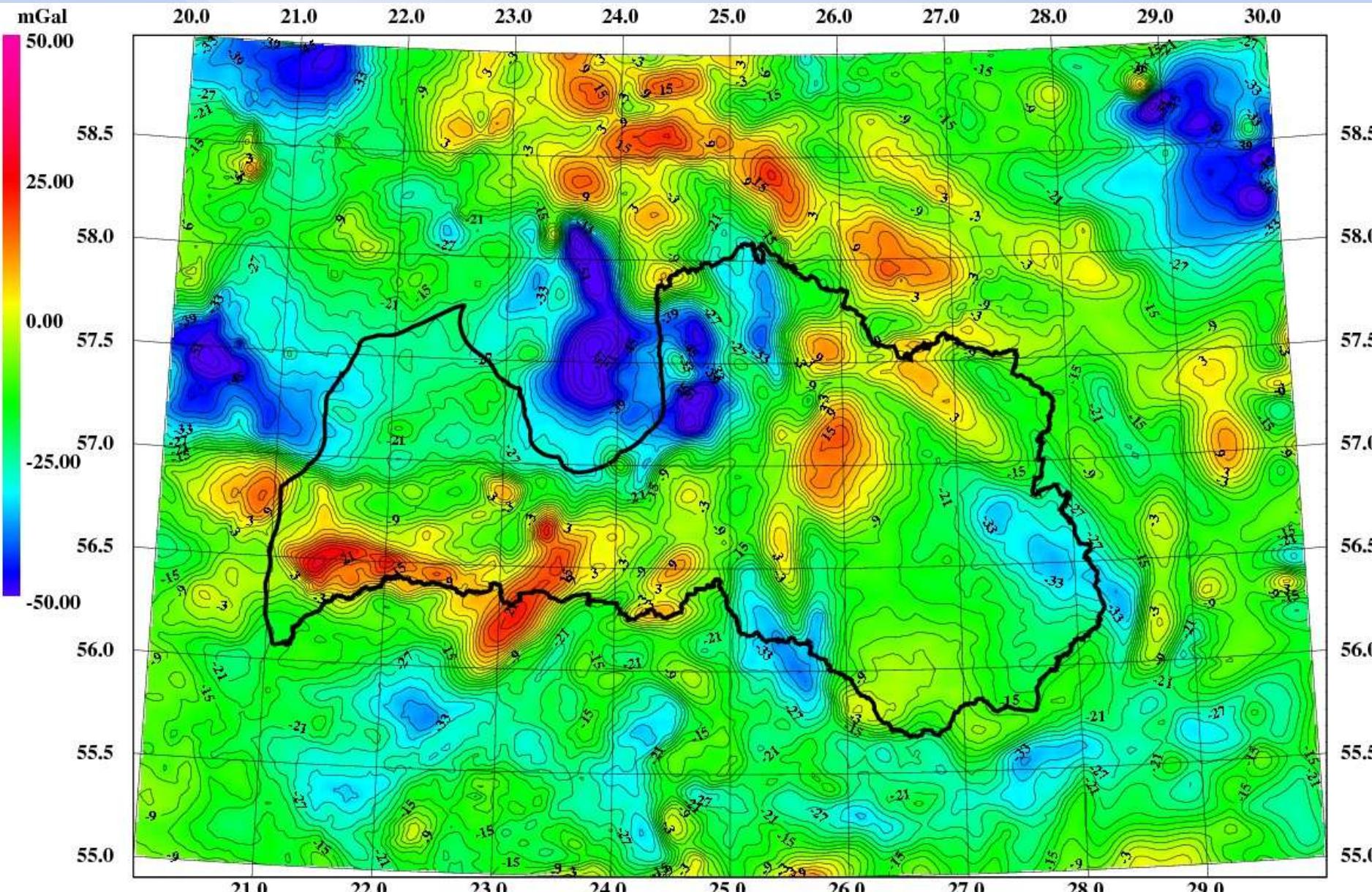
http://www.gece.ttu.ee/~artu/ETF7356/Ellmann_etal_EGM08_validation_final.pdf

Geoid & quasi-geoid

$$\begin{aligned}\zeta - N[m] &= H_P - H_P^* \approx \\ &\approx -\frac{g_P - \gamma_0 + 0.1967[mgal/m]H}{\gamma_0} H = \\ &= -\frac{\Delta g_B}{\gamma_0} H = -(\Delta g_B)[Gal](H)[km]\end{aligned}$$

Bouguer anomalies

-50 mGal to +50 mGal; c.i. 3 mGal



Geoid & quasi-geoid

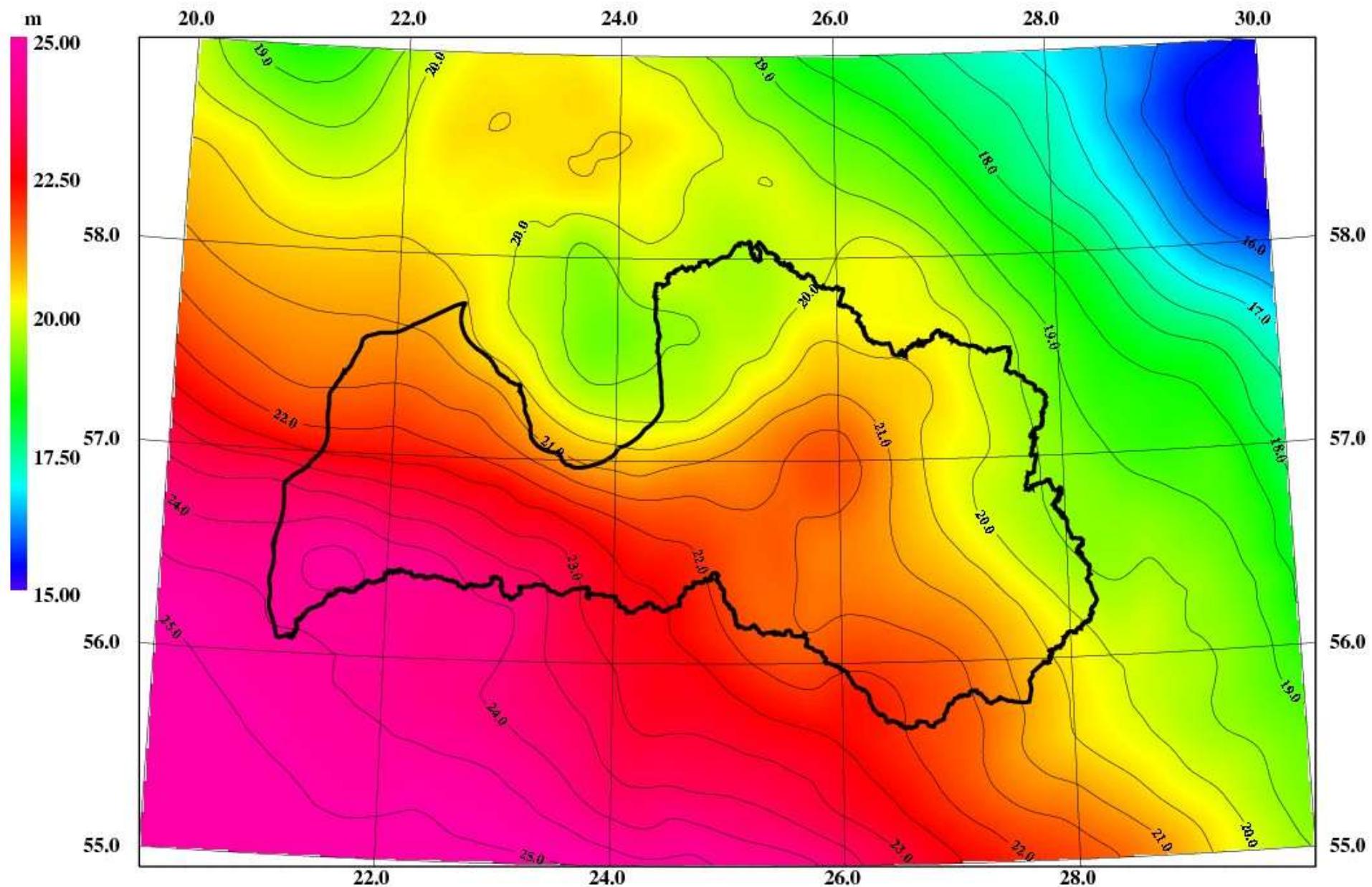
$$Difference[m] = -(\Delta g_B)[Gal](H)[km]$$

$$30mGal = 0,03Gal$$

$$Starp.\bar{t}ba = -0,03 * 0,3 = -0,009m = -9mm$$

$$Starp.\bar{t}ba = -0,03 * 0,03 = -0,0009m = -0,9mm$$

GPS-geoid LV'98; k.i. 50cm

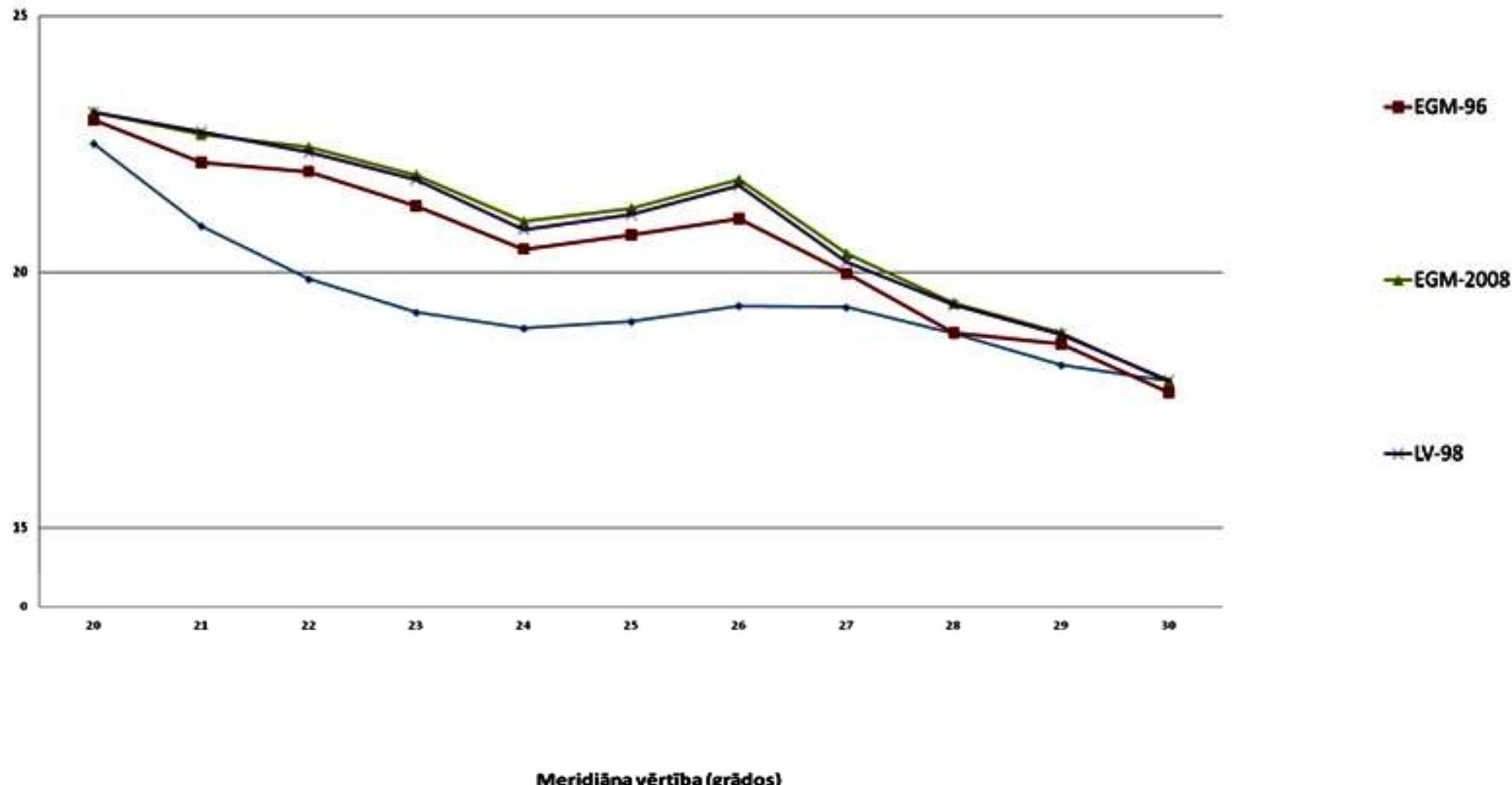


Cross-section of Latvian geoid models on 57 with step 1°; [m]

	20	21	22	23	24	25	26	27	28	29	30
WGS-84	22,5	20,89	19,85	19,2	18,89	19,02	19,33	19,3	18,79	18,17	17,86
EGM-96	22,96	22,13	21,95	21,28	20,44	20,71	21,03	19,96	18,8	18,59	17,64
EGM-2008	23,12	22,69	22,43	21,89	20,98	21,24	21,8	20,35	19,39	18,81	17,84
LV'98	23,12	22,73	22,33	21,8	20,83	21,12	21,69	20,2	19,36	18,78	17,88

Cross-section of Latvian geoid models on 57° with step 1°; [m]

→ WGS-84

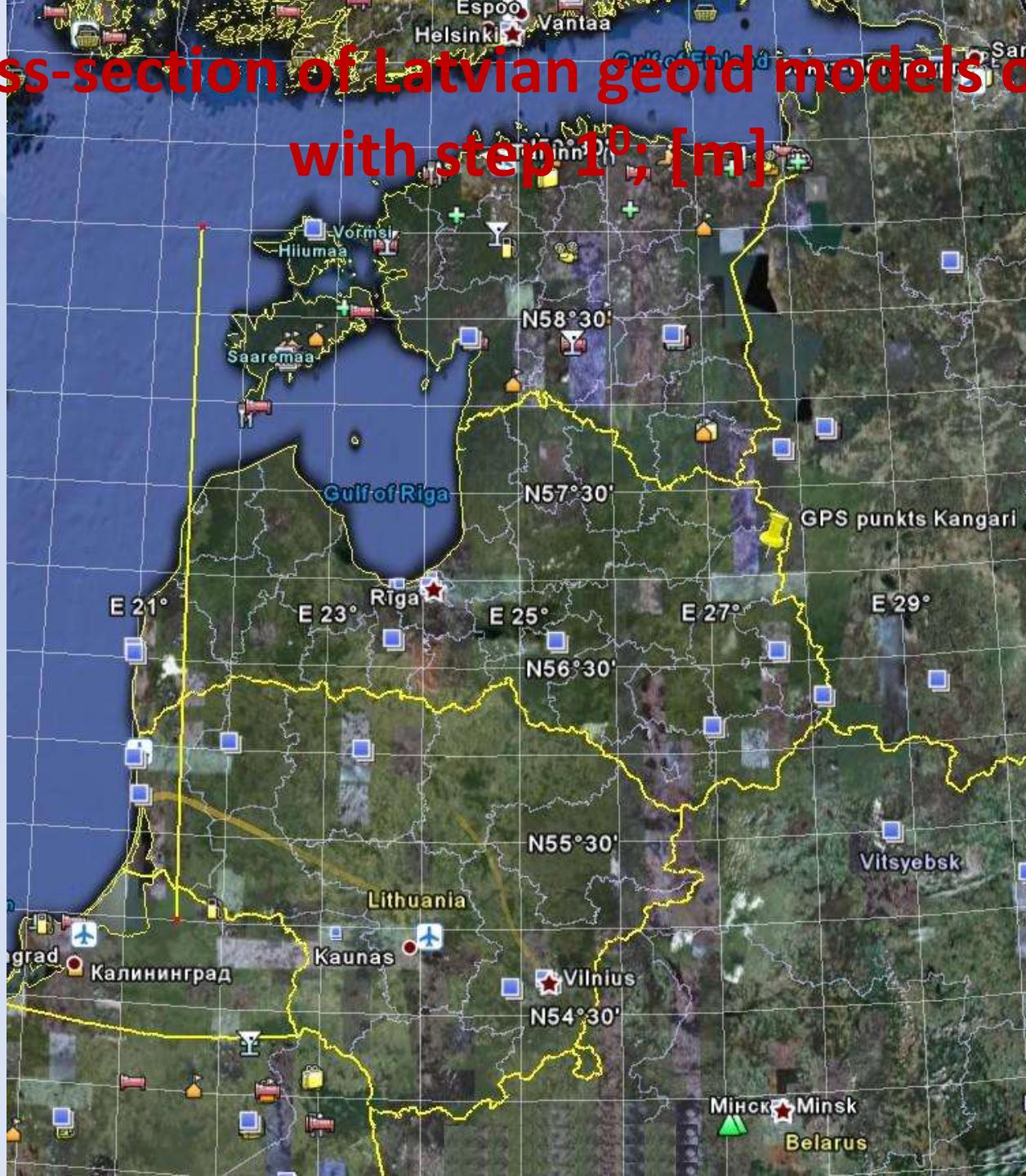


Meridiāna vērtība (grādos)

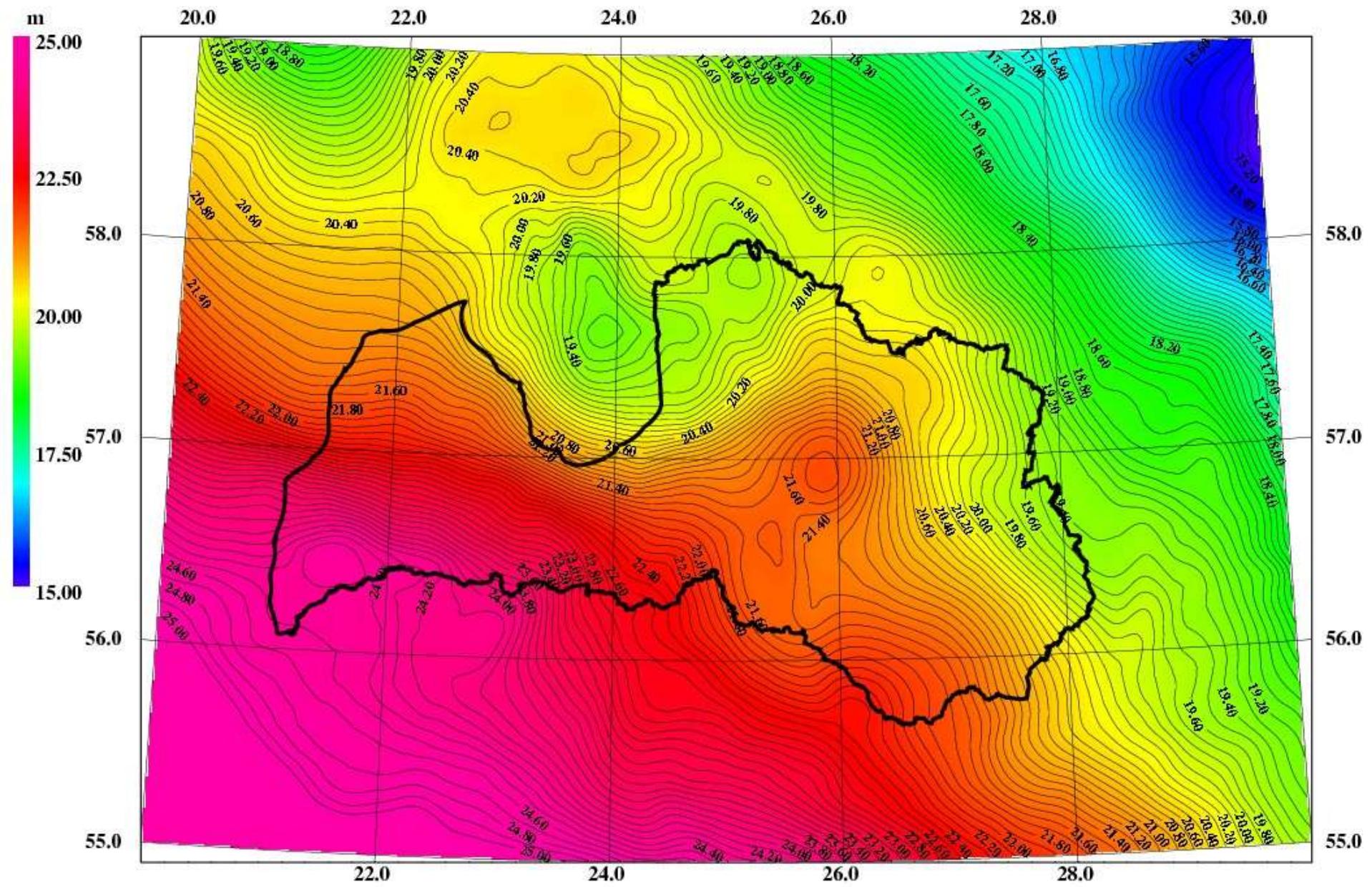
Cross-section of Latvian geoid models on 57 with step 1° ; [m]

- ❖ Latitude 57 – “Aldaris” latitude
- ❖ Different times. One real beer
- ❖ Brewery in RIGA since 1865

Cross-section of Latvian geoid models on 57 with step 1°; [m]



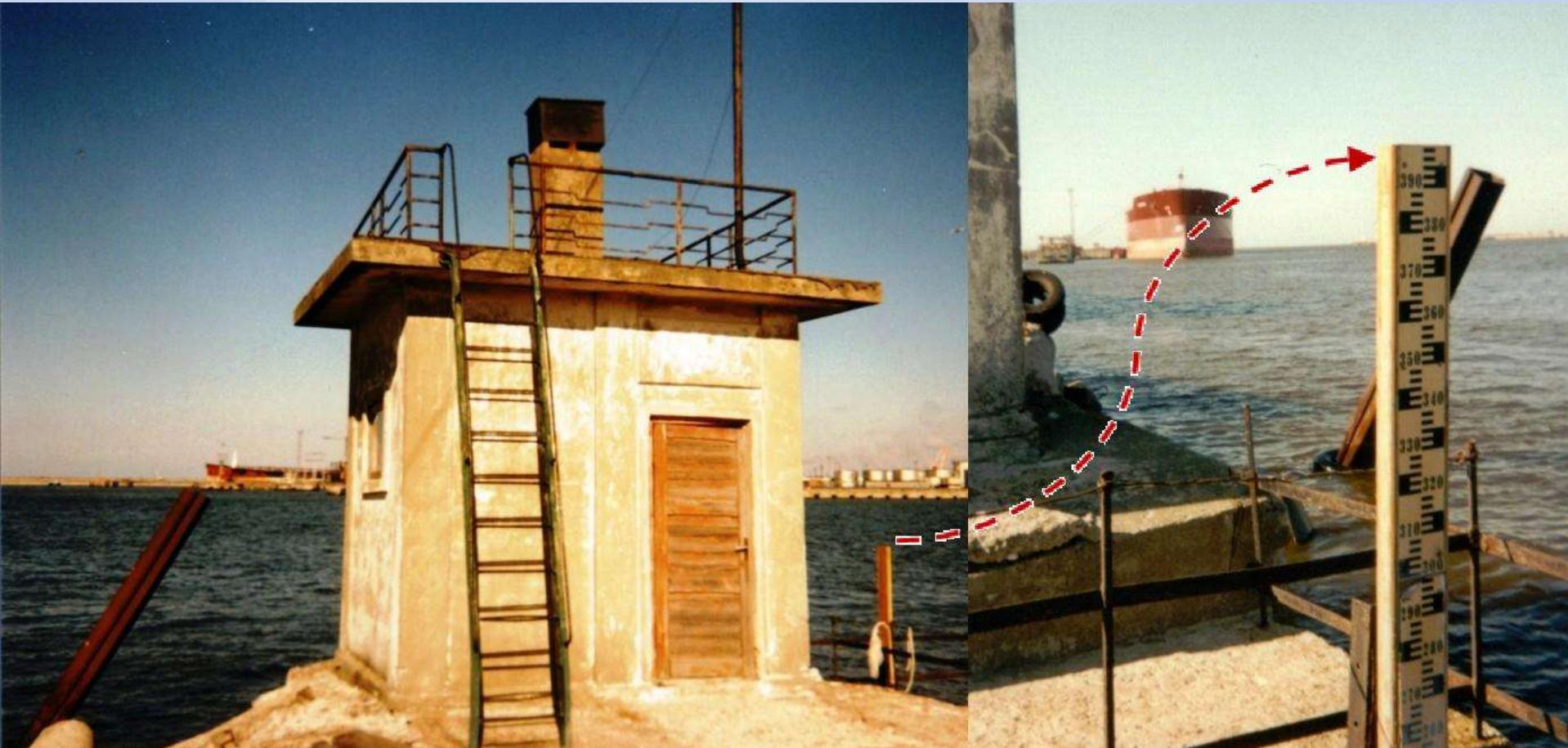
LV'98; k.i. 10cm



$$H_{levelling} = h_{GPS} - N_{GPS-geoids}$$

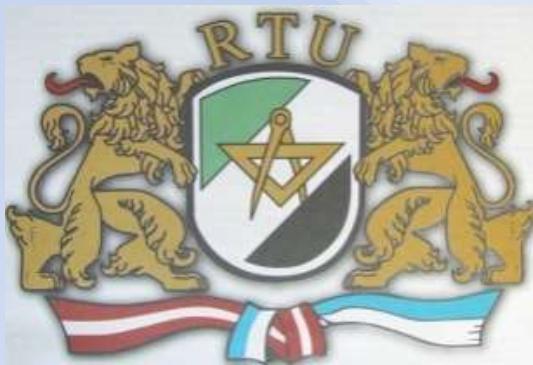


BSL 1997 & EUVN'97



Ventspils = LV03

Questions ? Discussions ?



janis.kaminskis@rtu.lv

*Thank
You!*

2010.03.11.



janis.kaminskis@lgia.gov.lv

GEOID WG