

# STATUS AND RESULTS OF THE EUVN DENSIFICATION ACTION

**EUVN\_DA WORKING GROUP:**

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# EUVN\_DA FACTS

- CONTINENTAL HOMOGENEOUS GPS/LEVELLING DATABASE (QUALITY SELECTION FROM THE NATIONAL NETWORKS!)
- SUPPORTS THE REALIZATION OF AN ACCURATE HEIGHT REFERENCE SURFACE (FITTED GEOID)
- CLOSE COOPERATION WITH THE COMPUTING CENTRE OF THE EUROPEAN GEOID (IfE, Hannover)

## EUREF

- PROVIDE CONTROL POINTS FOR THE SELECTION OF THE BEST CONTINENTAL GEOID VERSION,
- RECEIVE THE MOST APPROPRIATE GEOID SOLUTION FOR **HEIGHTING** AND FOR THE **INVESTIGATION** OF THE LEVELING NETWORK(S)

# DATA COLLECTION

## LEVELING

- INDEPENDENT NATIONAL CAMPAIGNS
- VARIOUS OBSERVATION EPOCHS

**GEOPOTENTIAL DIFFERENCES  
ARE COLLECTED**

**BECOMING PART OF THE ACTUAL  
UENL ADJUSTMENTS**

## GPS

**DERIVED COORDINATES  
ARE COLLECTED**

**FUTURE COMMON ADJUSTMENT?  
(SINEX ? )**

# PRODUCTS OF EUVN\_DA

## OFFICIAL PRODUCT

HIGH QUALITY, HOMOGENOUS, CONTINENTAL SET  
OF REFERENCE GPS/LEVELING POINTS

FREELY AVAILABLE FOR

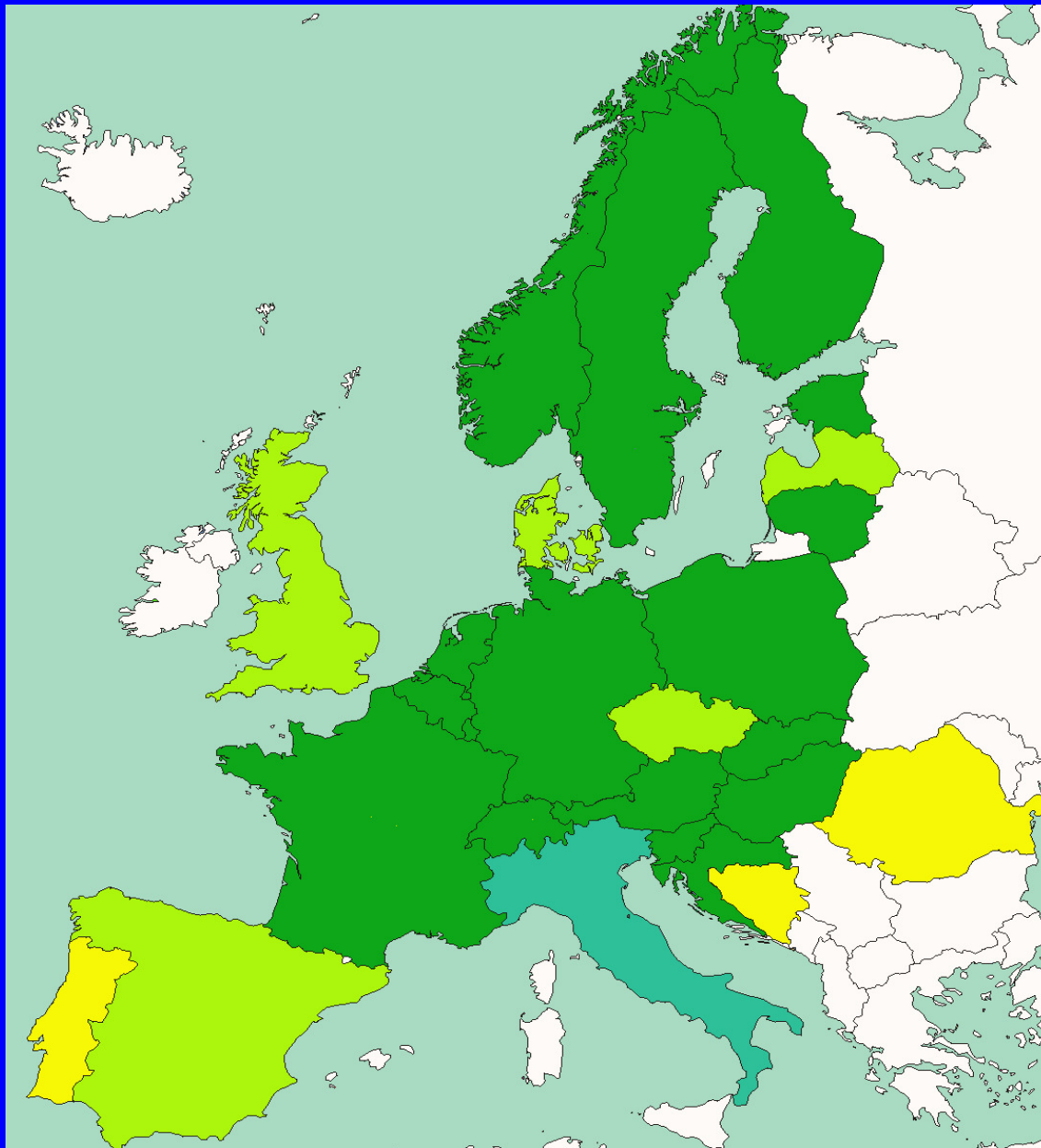
- DATA PROVIDERS
- NON-COMMERCIAL AND SCIENTIFIC USERS





## ‘PILOT’ PRODUCT

ACCURATE CONTINENTAL HEIGHT REFERENCE  
SURFACE FOR THE PRACTICE

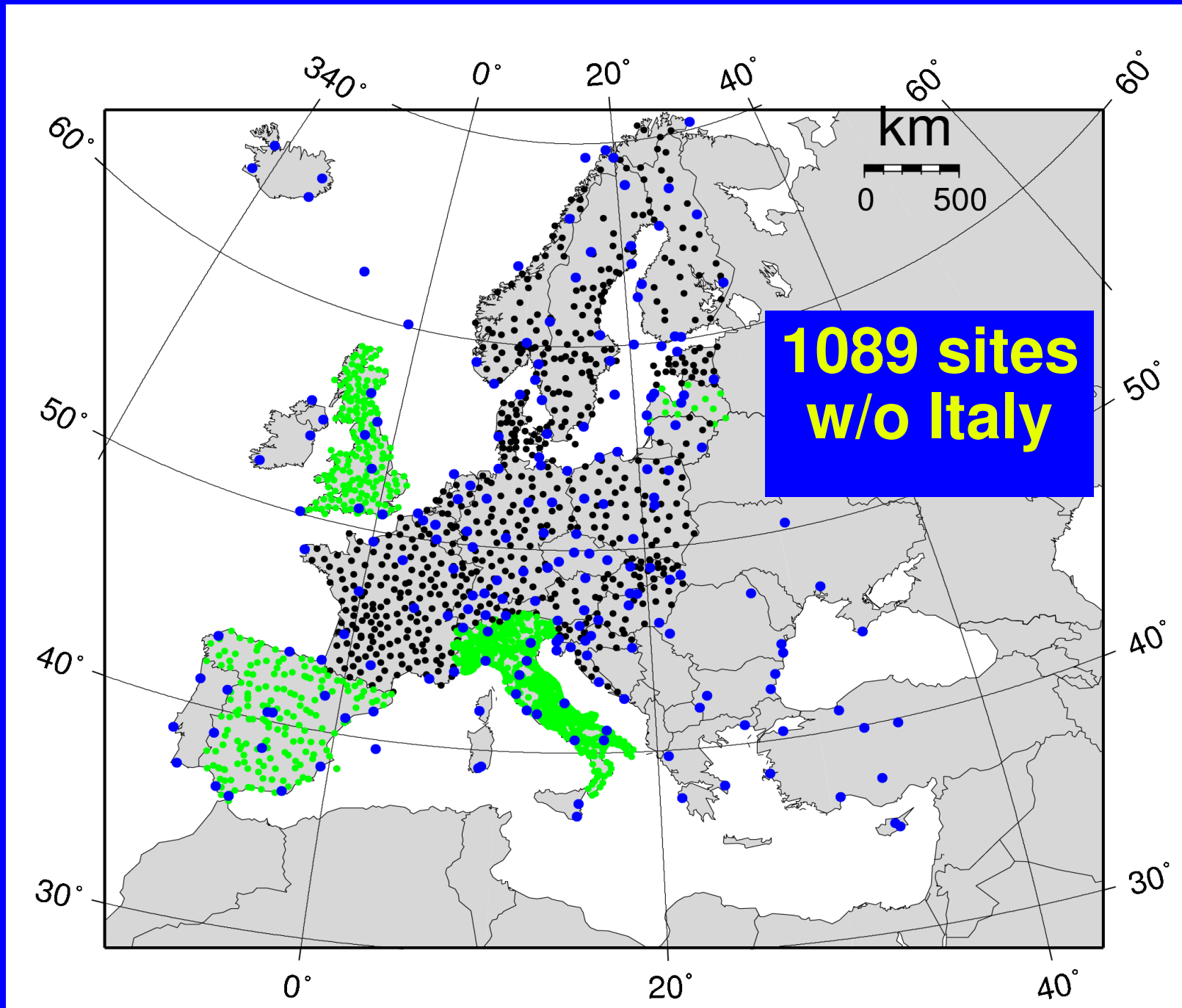
DEVELOPMENT IS IN PROGRESS

# PARTICIPATION – JUNE 2006



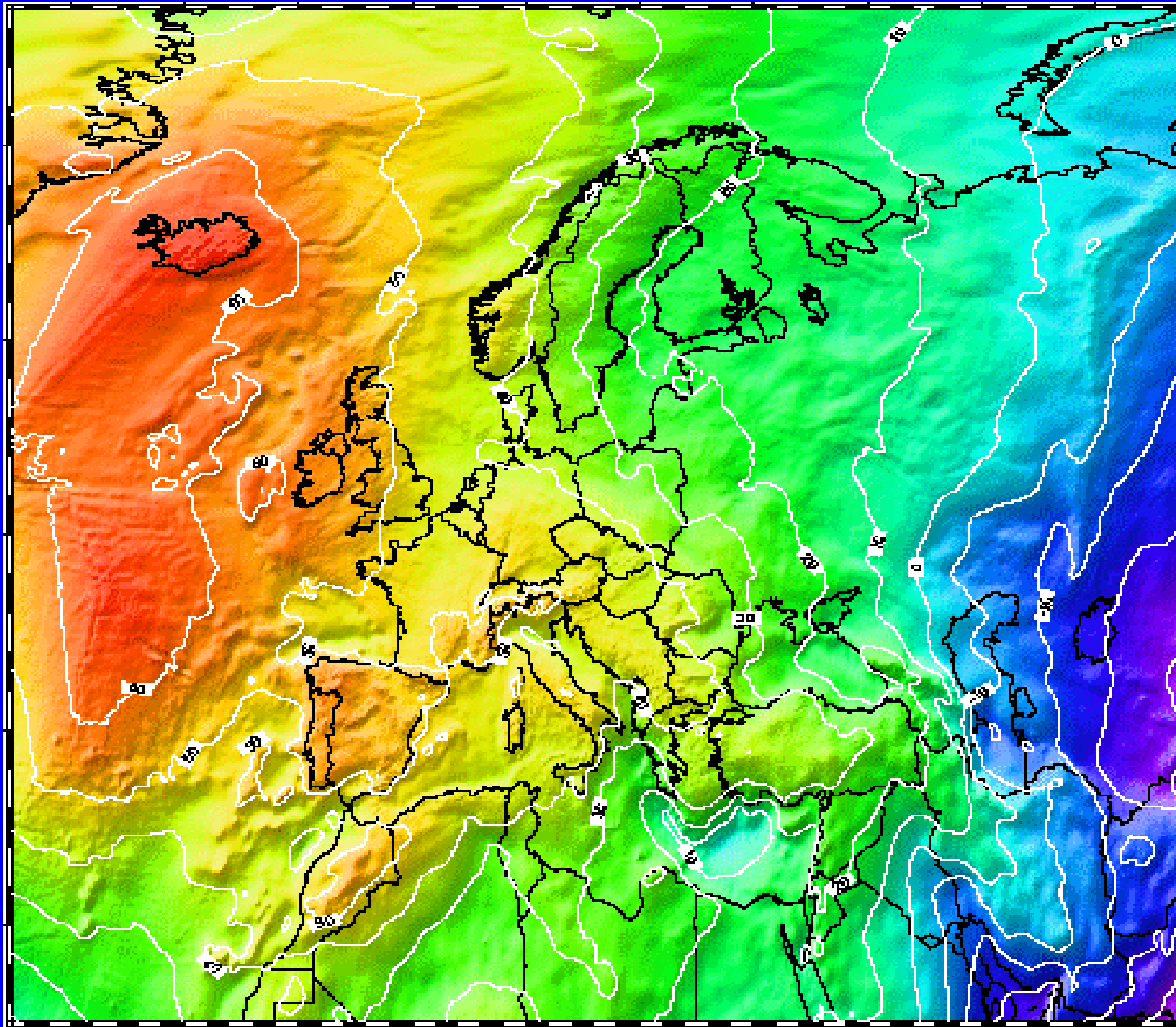
-  DATA SUBMITTED AND CHECK IS IN PROGRESS
-  DATA INCOMPLETE OR UNDER PREPARATION
-  NO GEOPOTENTIAL DIFFERENCE WILL BE AVAILABLE
-  READINESS EXPRESSED TO COOPERATE

# EUVN\_DA POINT DISTRIBUTION

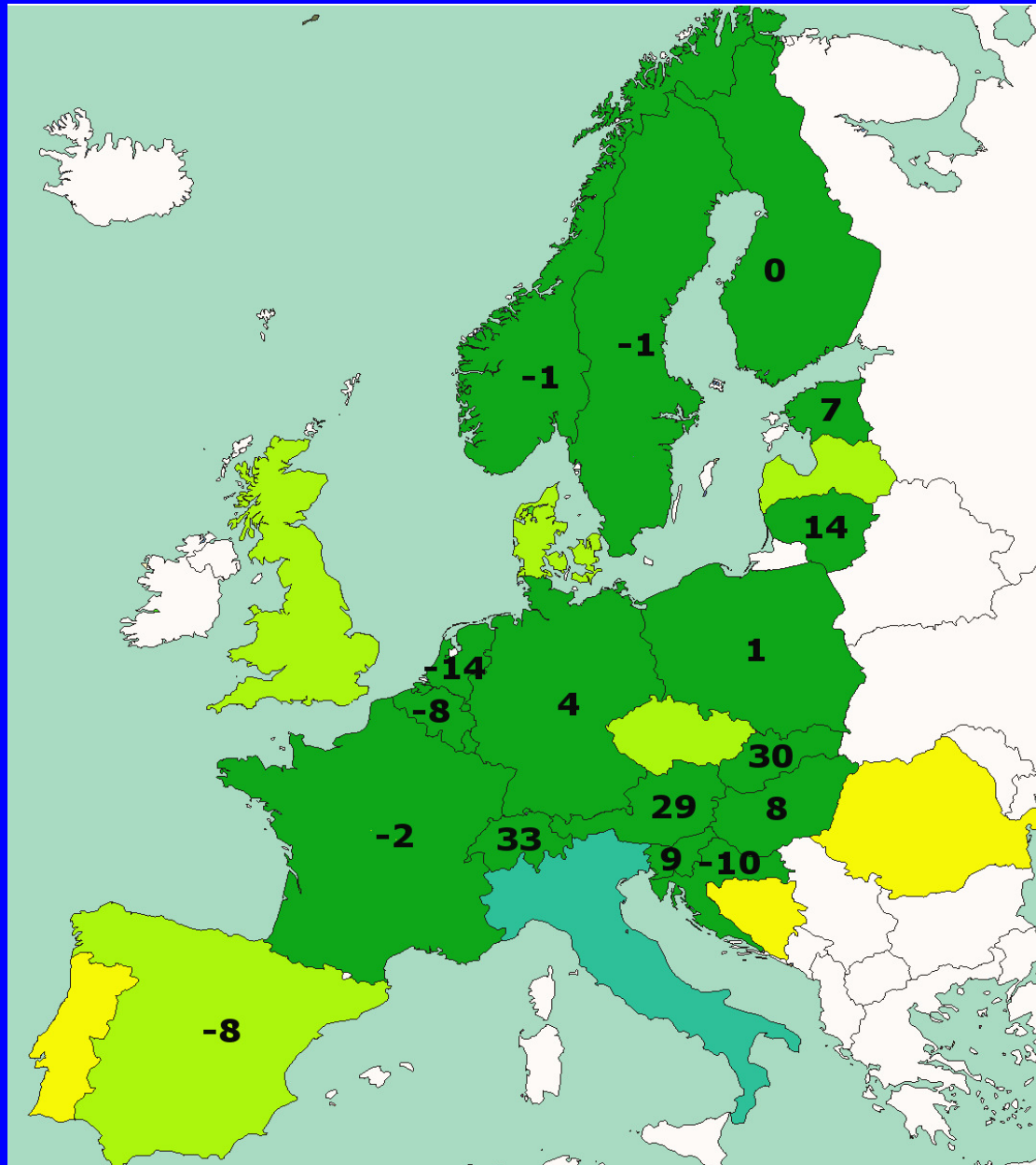


# THE EUROPEAN GEOID

(H.Denker – IfE, Hannover)



# EUVN\_DA vs. EGG97

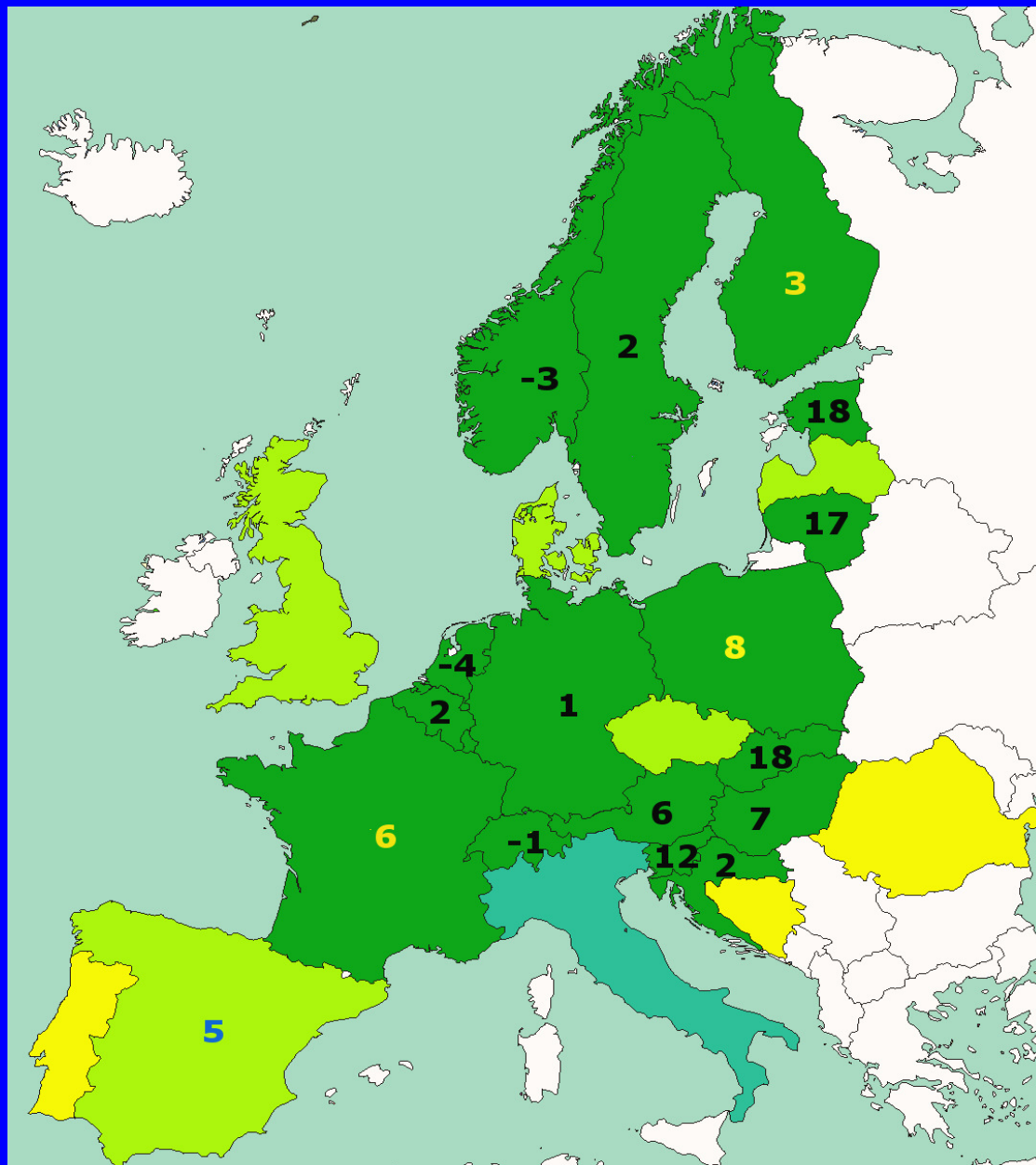


AVERAGED OFFSETS OF  
EUVN\_DA GPS/LEVELING  
AND THE EGG97 GEOID  
UNIT [CM]

ALPINE REGION !



# EUVN\_DA vs. EGG03C



AVERAGED OFFSETS OF  
EUVN\_DA GPS/LEVELING  
AND THE EGG03C GEOID  
EGM96 -> GRACE03C  
UNIT [CM]

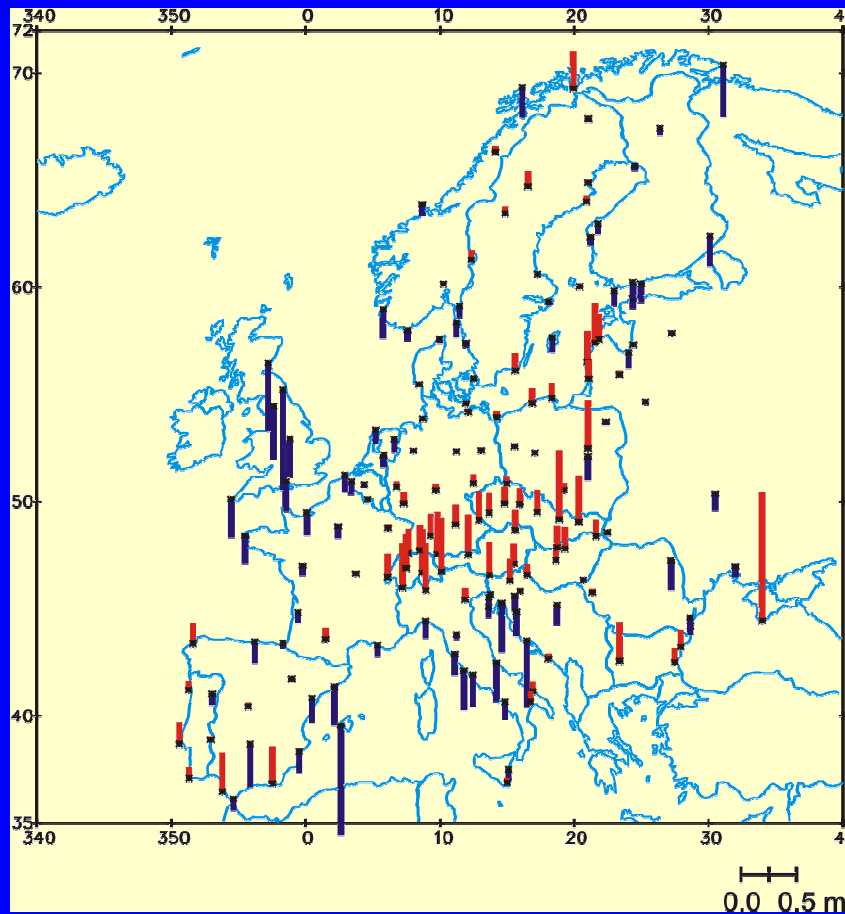
THE ZERO DEGREE TERM  
35 CM WAS APPLIED !

# STATISTICS OF THE COMPARISON with EGGyy

		RMS [cm]		MAX-MIN range	
	# of pts	EGG97	EGG03C2	EGG97	EGG03C2
Austria	17	11	6	33	21
Croatia	20	20	15	80	56
France	180	12	8	70	50
Germany	75	10	4	46	15
Great Br.	189	15	10	100	105
Hungary	20	9	5	40	20
Netherland	15	6	4	20	11
Norway	63	17	11	81	59
Poland	62	9	4	44	15
Slovakia	28	17	13	57	49
Slovenia	12	13	10	45	35
Spain	177	10	10	69	53
Sweden	84	12	6	54	38
Switzerland	20	10	6	31	23

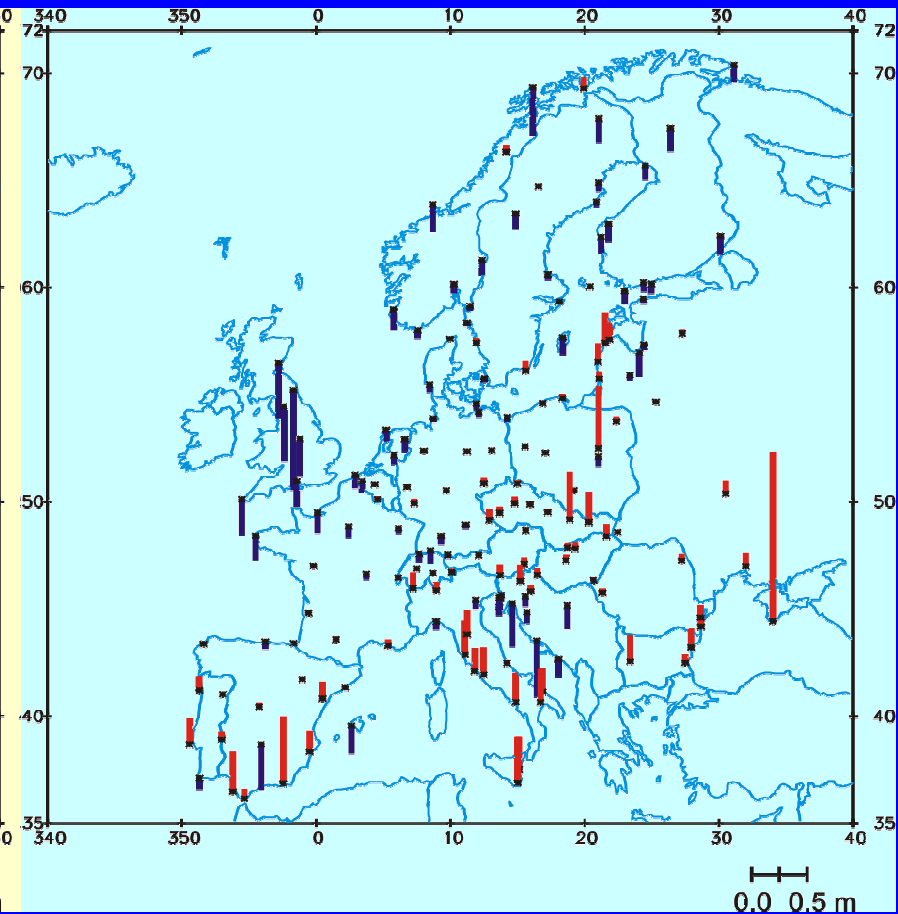
# EUVN (166 stations) EGG COMPARISON

$$\zeta_{GPS} - \zeta_{grav.} \quad (\text{after bias fit})$$



**EGG97**

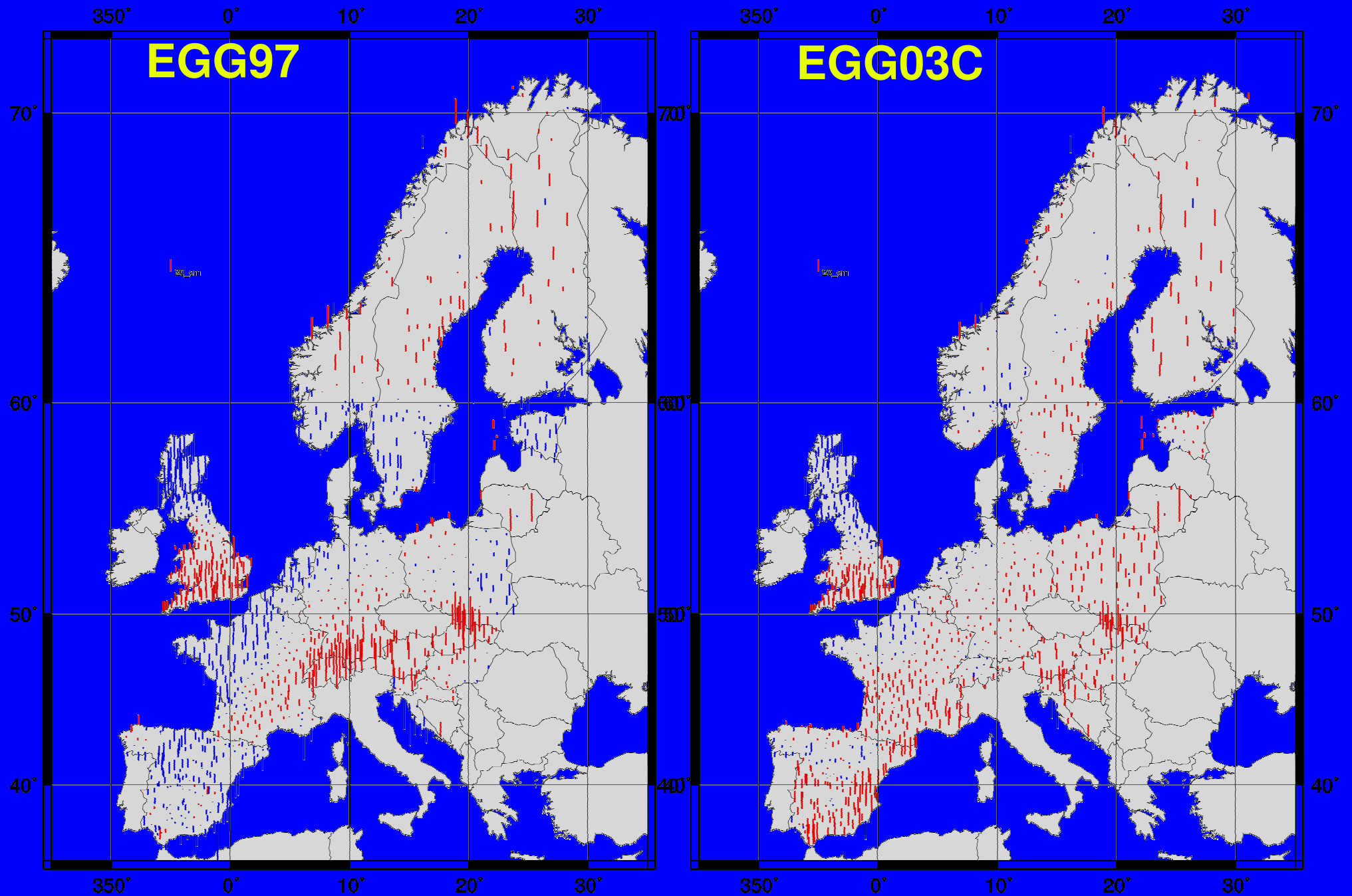
Rms:  $\pm 0.26$  m; Min: -1.04 m; Max: +1.22 m



**EIGEN-GRACE02S**

Rms:  $\pm 0.23$  m; Min: -0.95 m; Max: +1.60 m

# EUVN\_DA EGGyy COMPARISON



# TASKS AND SCHEDULE by the end of 2006

- DATA VALIDATION PER COUNTRY
  - LEVELLING INFORMATION CONSISTENCY (UELN DC)
  - COMPARISON WITH EGG SOLUTIONS (FOMI SGO, IfE)
- INCLUSION OF EUVN\_DA BENCHMARKS  
into the UELN ADJUSTMENTS (UELN DC)
- WEB PAGE
- DRAFT REPORT (based on the available data)

# **FURTHER ACTIONS EXPECTED**

- **DATA CHECK AND VALIDATION (ITERATIONS)**
  - **REVISION OF SOME DATA MAY NEED**
  - **LOCAL GEOID VALUES MAY BE REQUESTED**  
(e.g.Croatia)
- **SPEED UP THE SUBMISSION OF THE MISSING DATA**
- **AVAILABILITY OF THE GPS SOLUTIONS IN SINEX**

# SPECIAL THANKS TO THE DATA PROVIDERS

● Austria	N.Höggerl	BEV
● Belgium	P.Voet	NGI
● Croatia	B.Barisic	HGI
● Estonia	K.Kollo	Maa amet
● Finland	M.Ollikainen	FGI
● France	F.&H.Duguenne	IGN
● Germany	M.Sacher	BKG
● Great Britain	C.Fane	OS
● Hungary	G.Virág	FÖMI
● Italy	M.Pierozzi	IGM

# SPECIAL THANKS TO THE DATA PROVIDERS

● Lithuania	E.Parseulinas	VTU
● Netherland	A.Kösters	Rijkswaterstaat
● Norway	O.Vestol	SK
● Poland	W.Graszka	GUGIK
● Slovakia	K.Leitmanova	GKU
● Slovenia	K.Medved	SMA
● Spain	R.Quiros Donate	IGN
● Sweden	M.Lilje	LM
● Switzerland	U.Marti	Swisstopo