

EUVN Densification Action: completion of a continental GPS/leveling network

TWG REPORT

EUVN_DA WORKING GROUP:

**KENYERES, A. - SACHER, M.
IHDE, J. - DENKER, H. - MARTI, U.**

EUREF2009 Symposium, 26 May, Florence, Italy

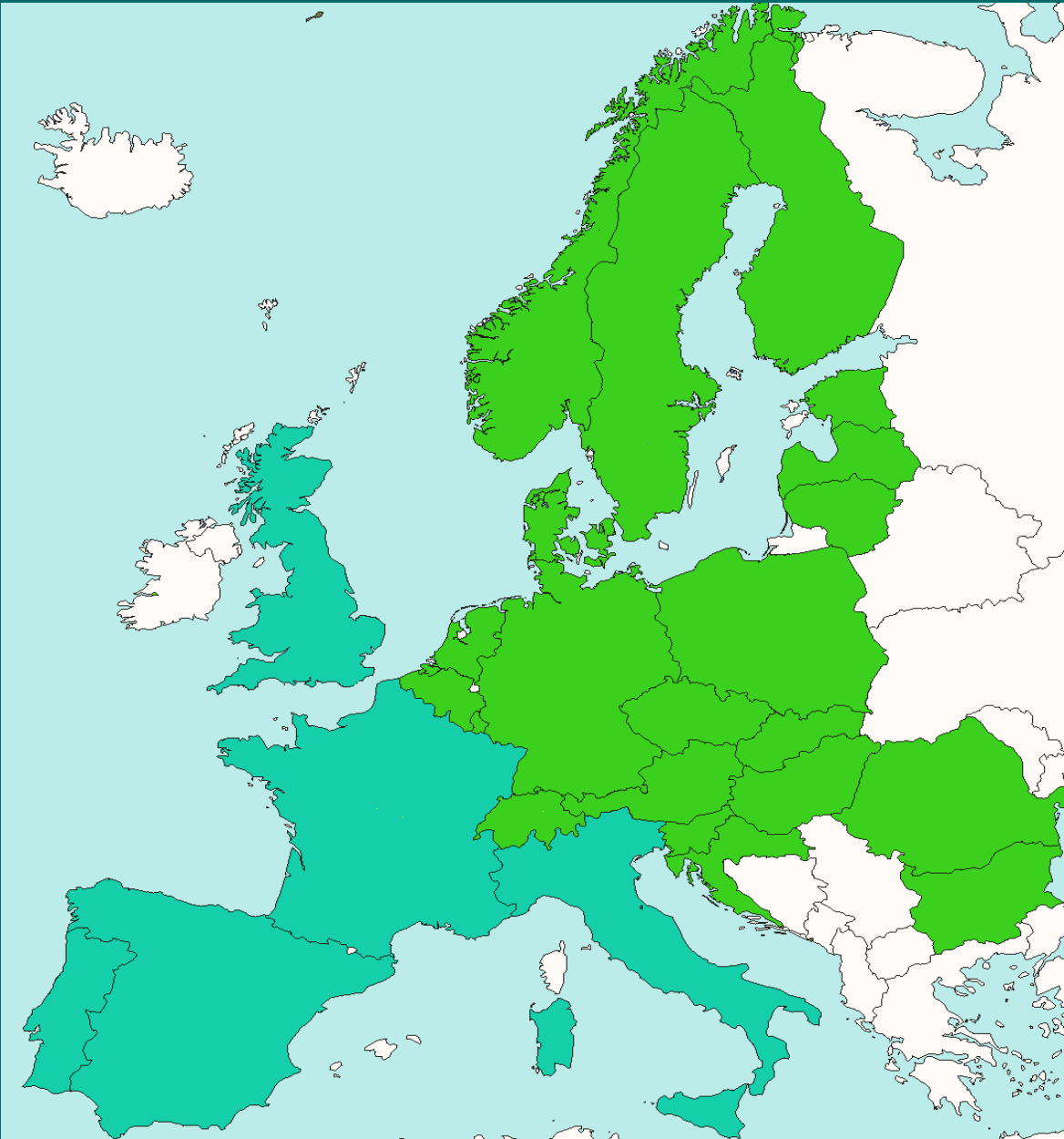
OUTLINE

- HISTORICAL OVERVIEW
- FINAL STATUS
- RELATION TO EVRS2007

HANDLING OF THE PERMANENT TIDE

- RESULTS AND EXPLOITATION OF THE DATABASE

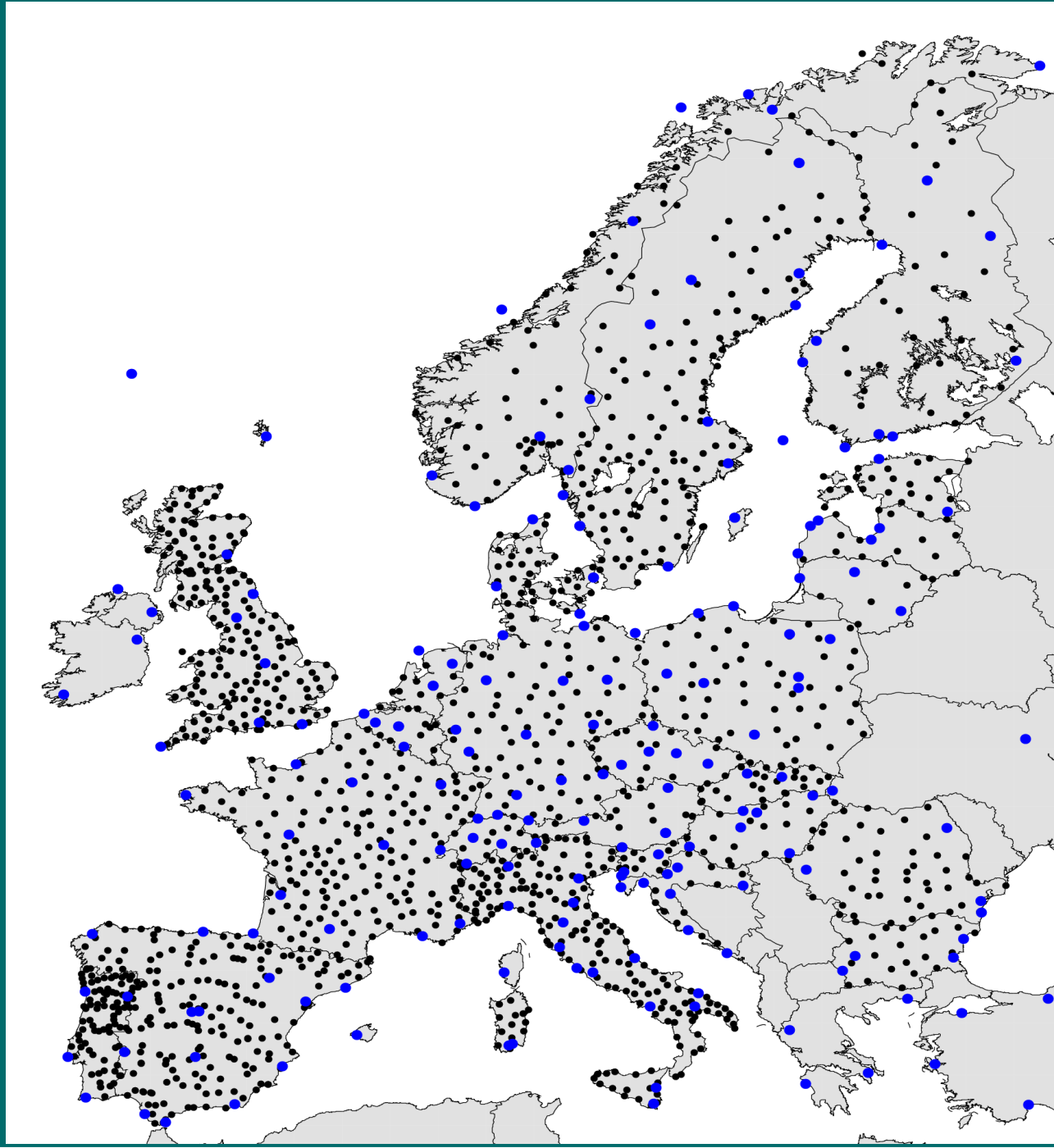
PARTICIPATION



**DATA CORRESPONDS TO THE
HIGHEST REQUIREMENTS**

**SHORTER GPS
OBSERVATION SESSIONS
BUT DENSER NETWORK AND
NO DIRECT CONNECTION TO
UELN (EXCEPT FRANCE)**

EUVN_DA POINT DISTRIBUTION



STATUS OF EUVN_DA

PROJECT TERMINATION POSTPONED IN 2008

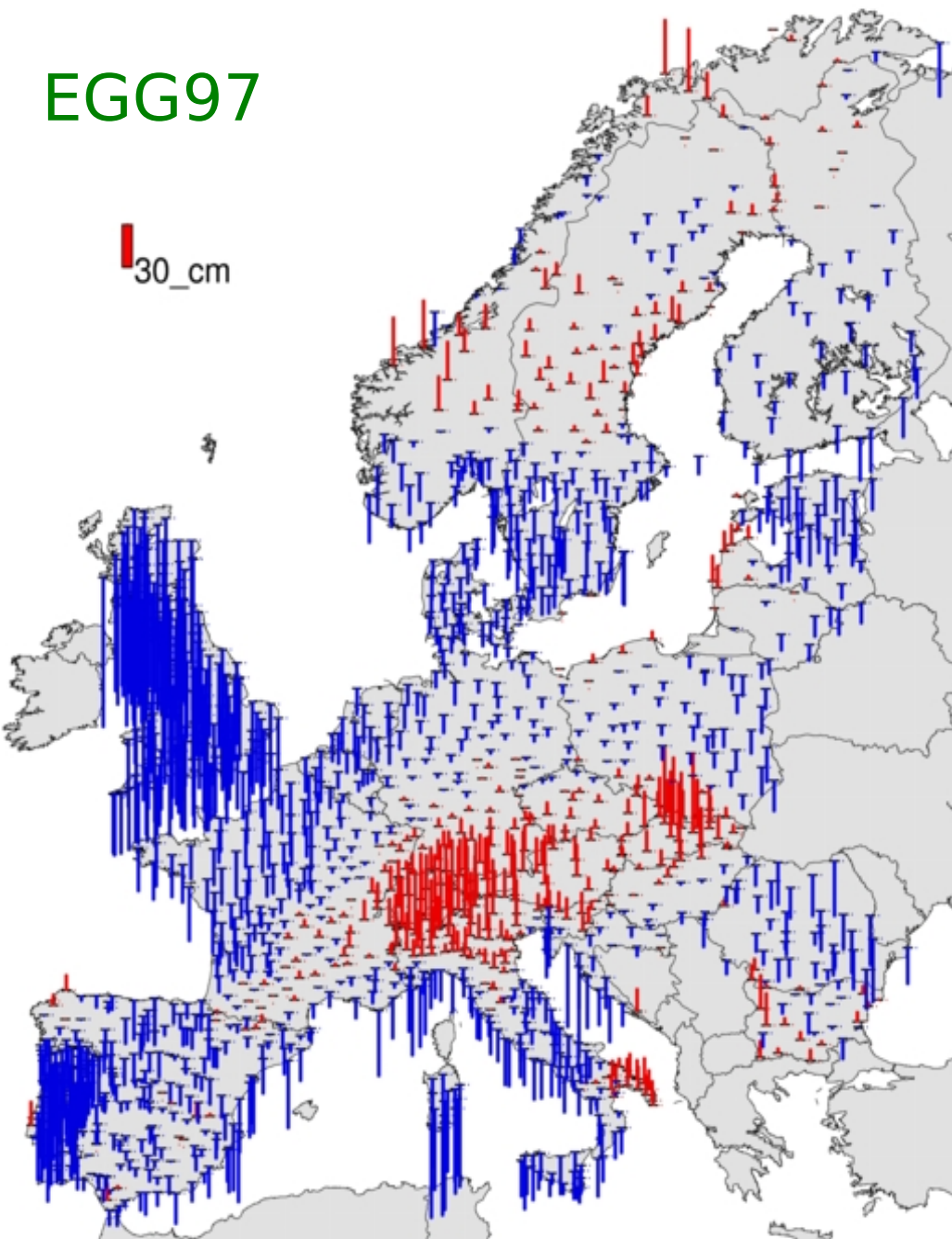
REASONS:

- WAITING FOR THE ACCEPTANCE OF **EVRF2007**
 - NEW UELN ADJUSTMENT, THE EUVN_DA PART SCHEDULED LATER
 - DIFFERENT HANDLING OF THE PERMANENT TIDE (LEVELING, GPS, GEOID)
- UPDATED EUROPEAN GEOID SOLUTION EGG2008
- COUNTRY-SPECIFIC PROBLEMS

EUVN_DA EGG97 COMPARISON

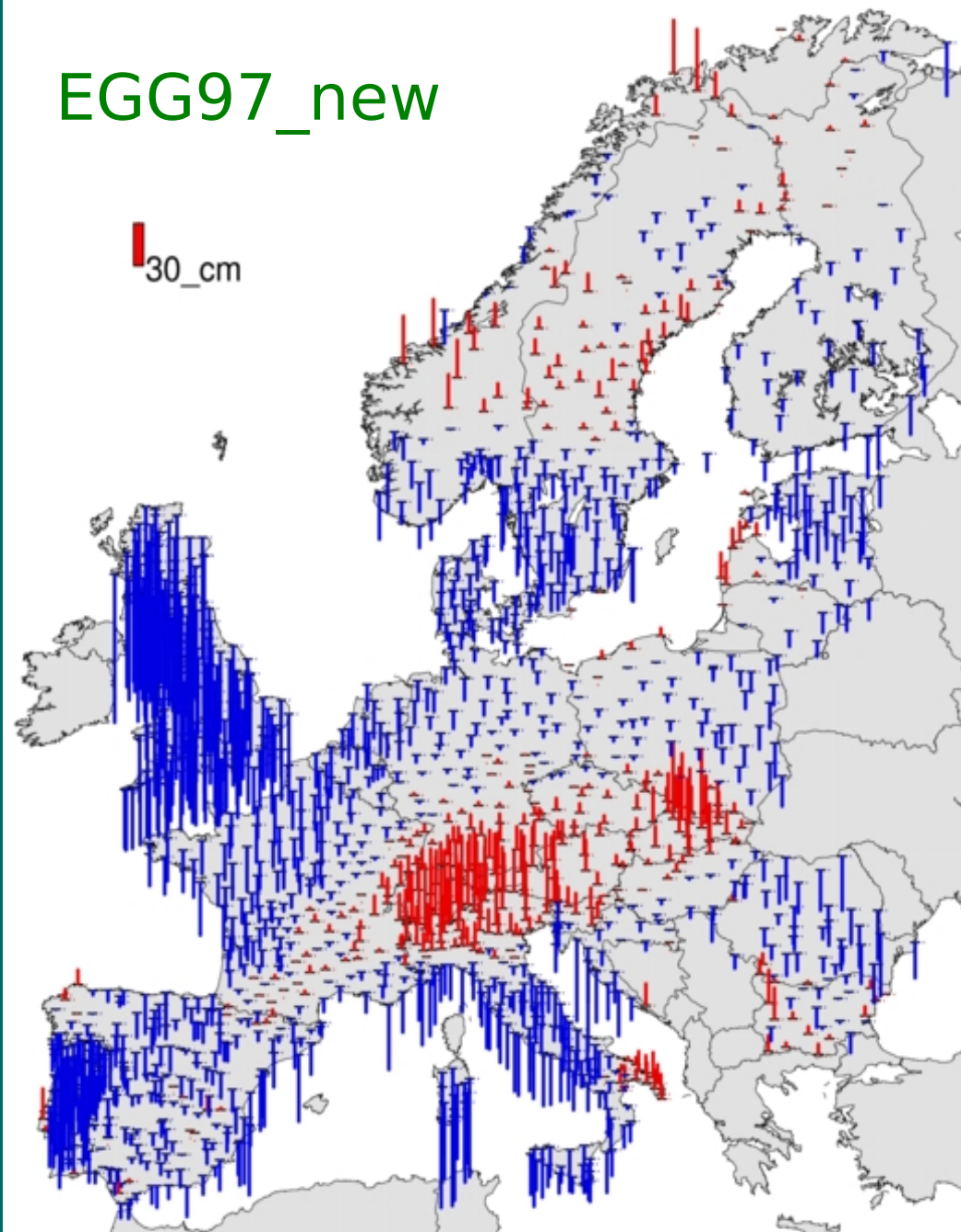
EGG97

30_cm



EGG97_new

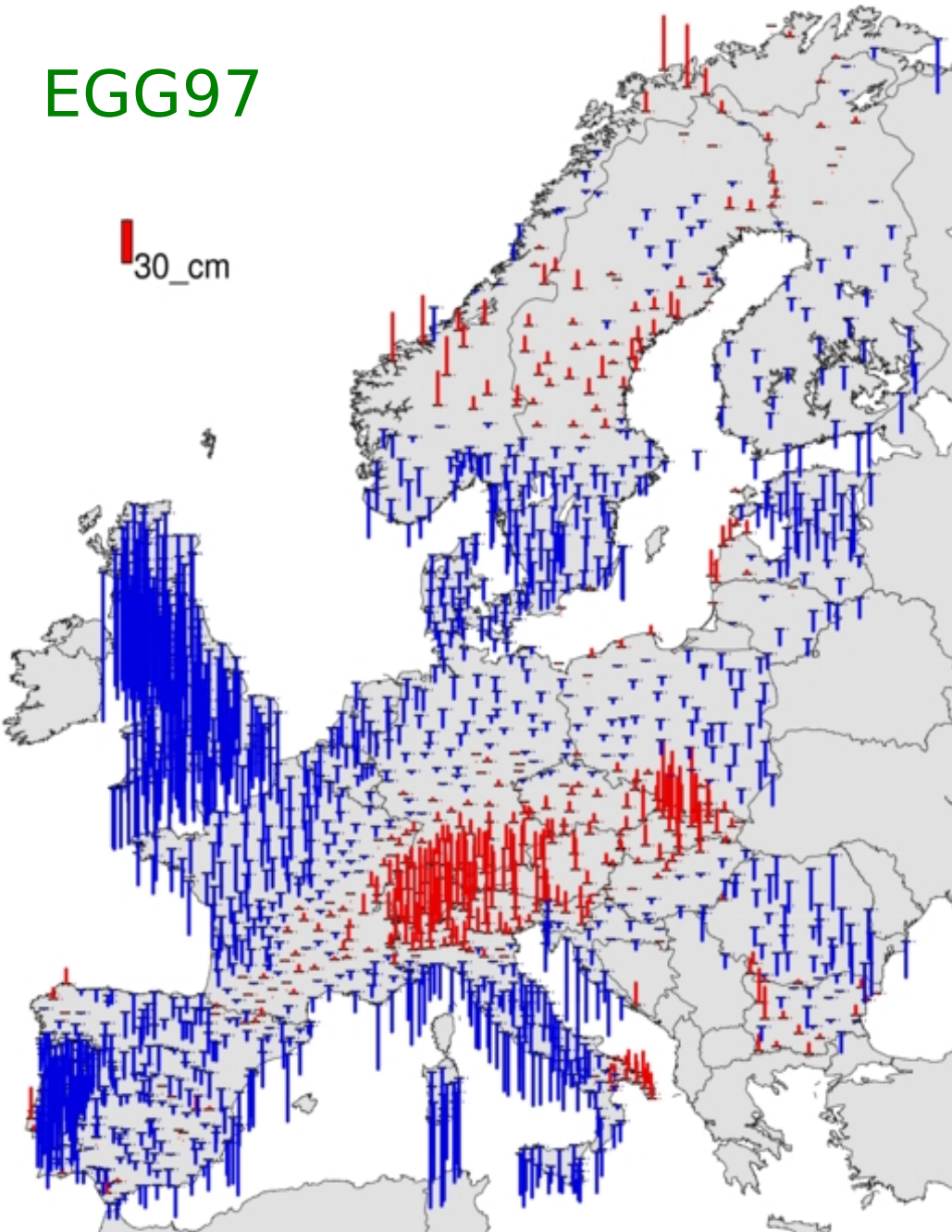
30_cm



EUVN_DA EGGyy COMPARISON

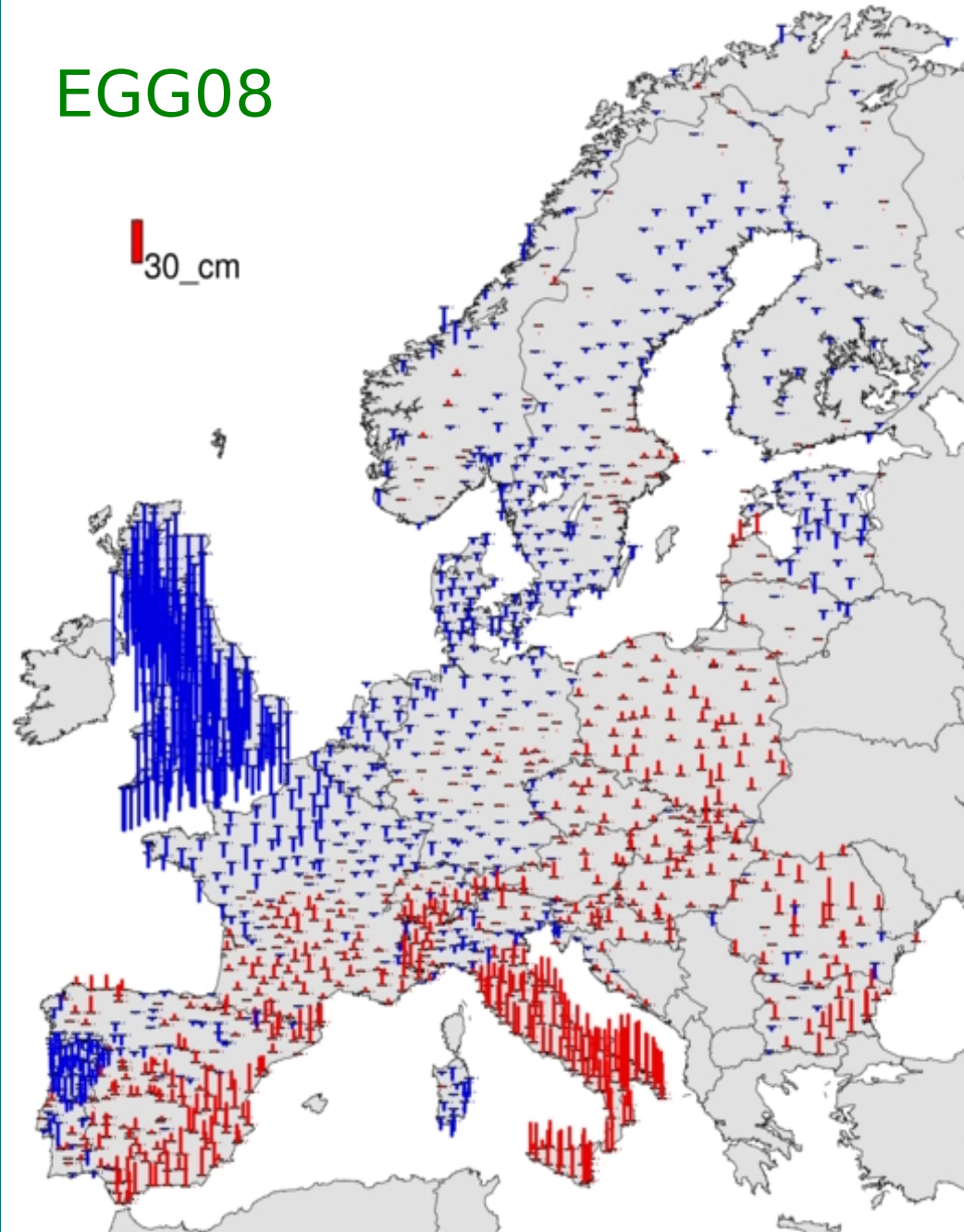
EGG97

30_cm



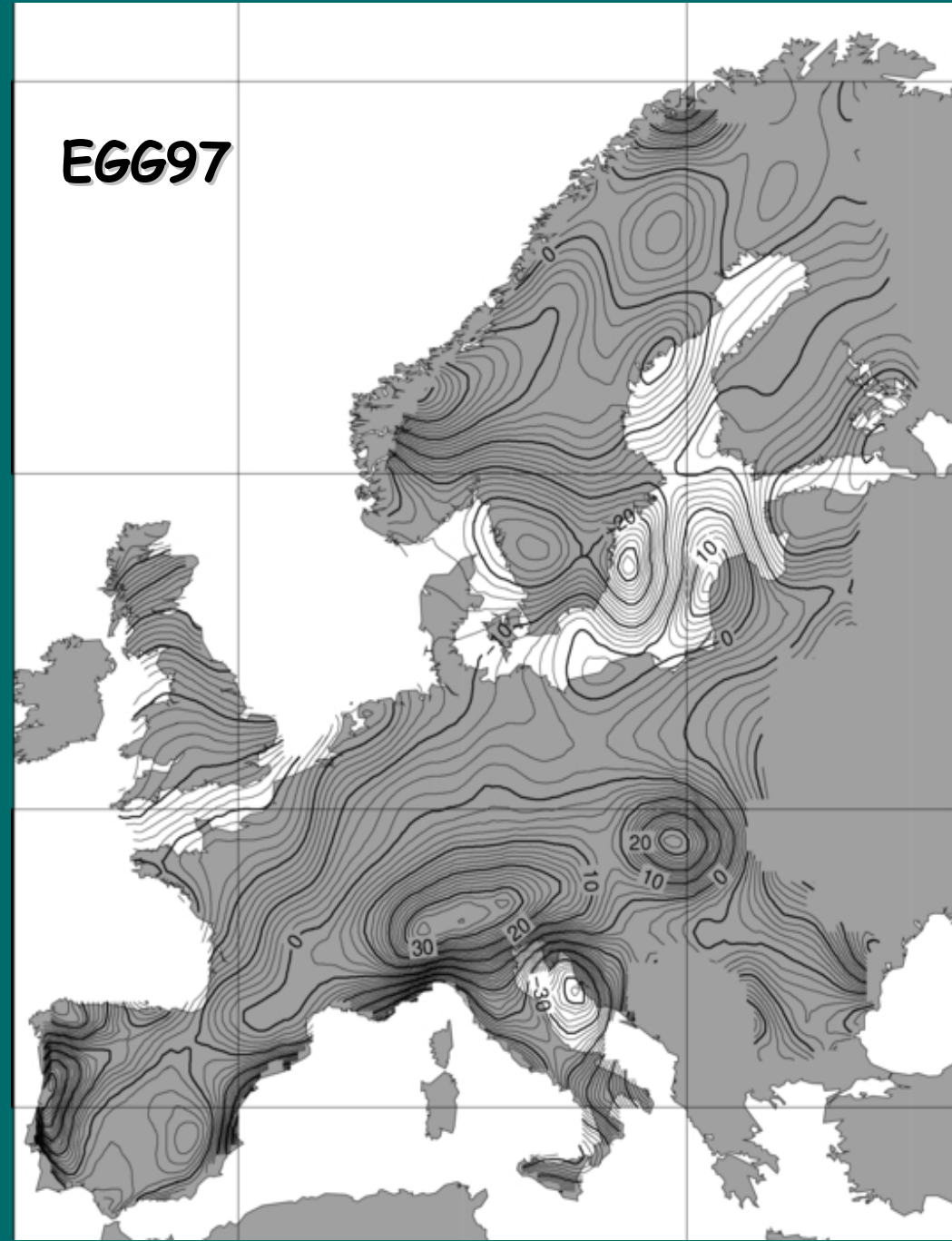
EGG08

30_cm

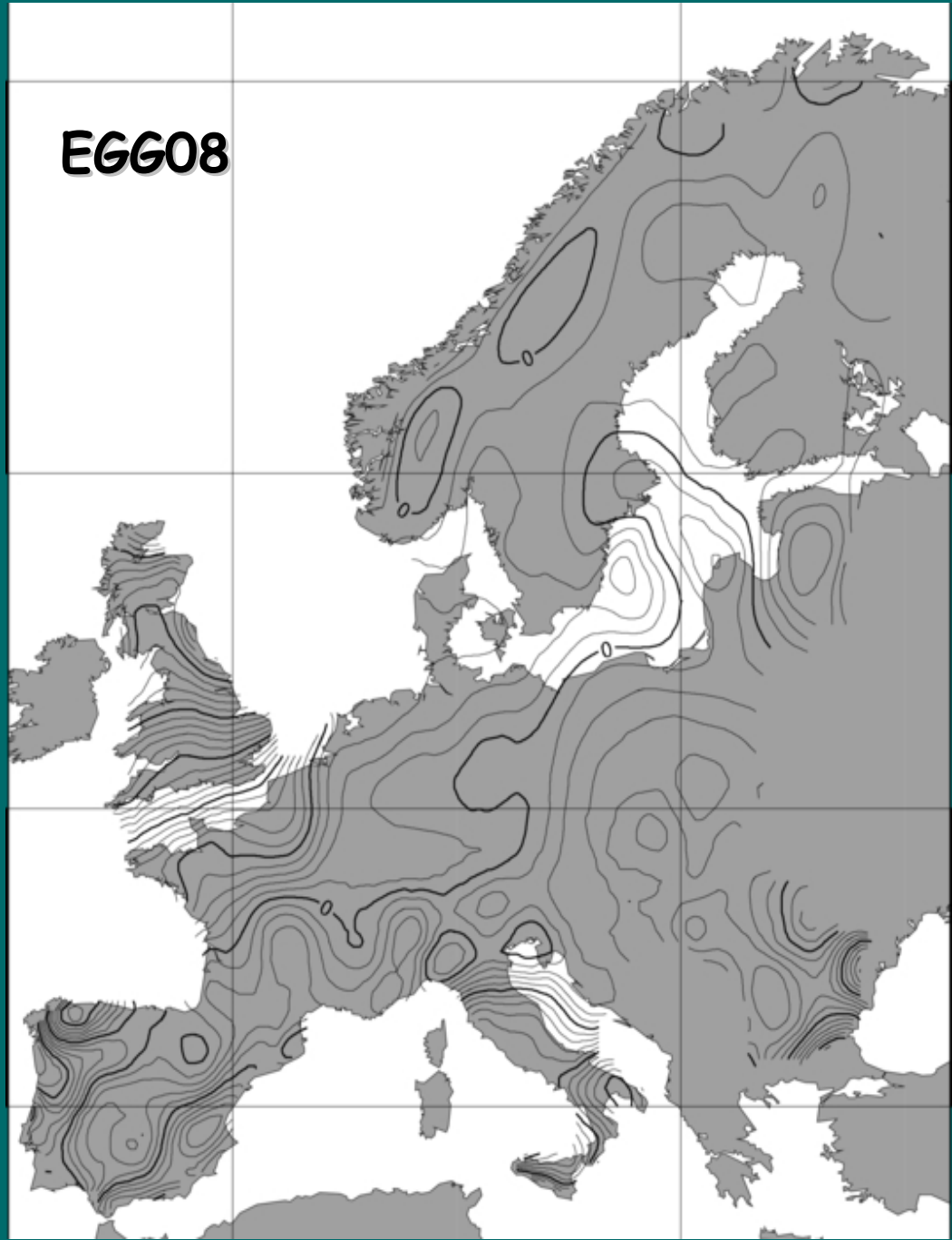


EUVN_DA EGGyy COMPARISON

EGG97

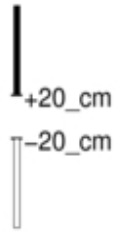


EGG08

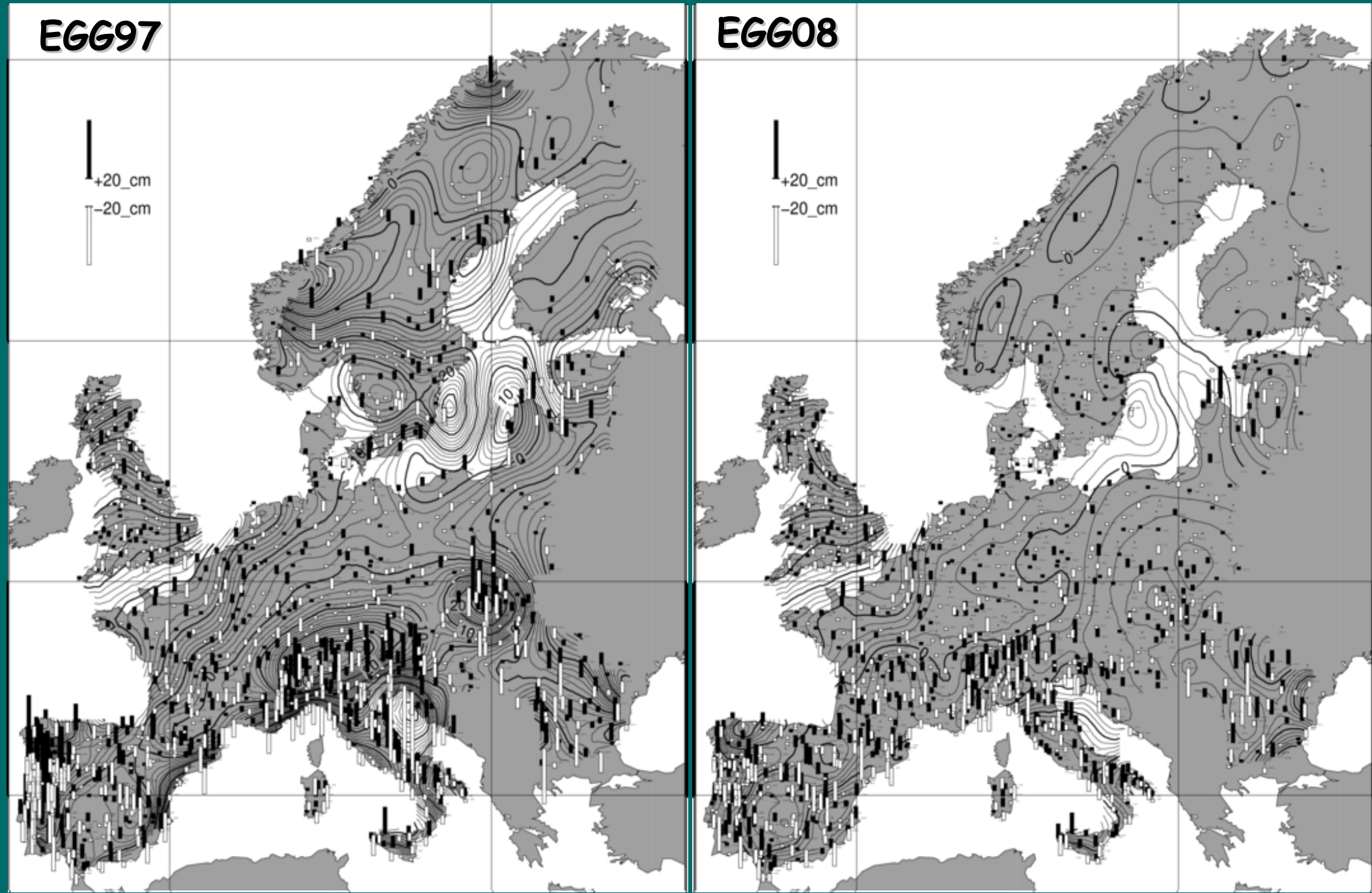
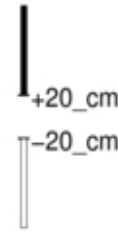


EUVN_DA EGGyy COMPARISON

EGG97



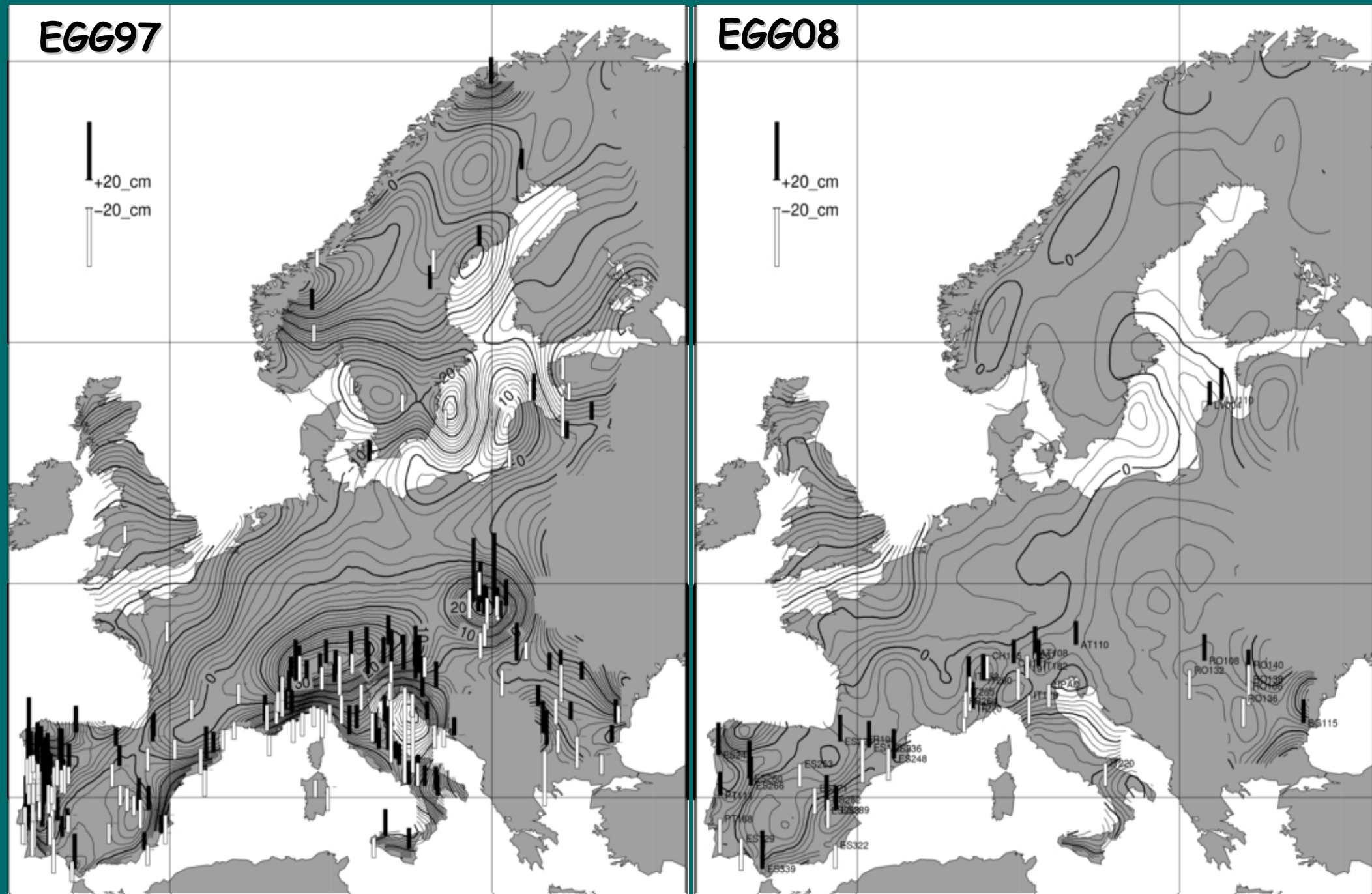
EGG08



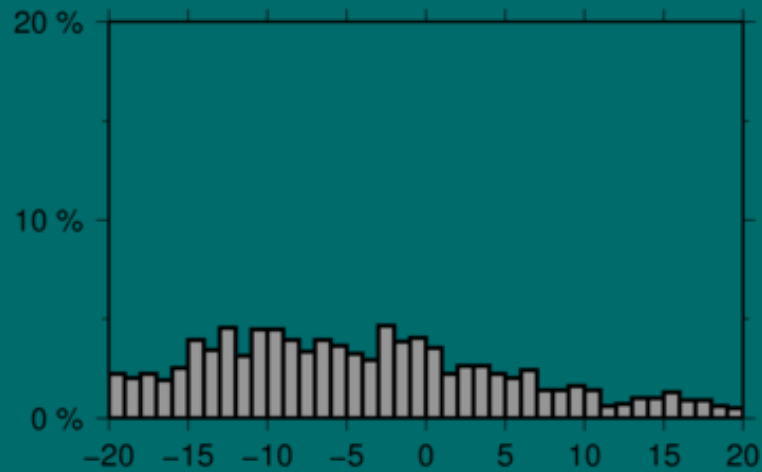
EUVN_DA / EGGyy $\Delta N > 7$ CM

EGG97

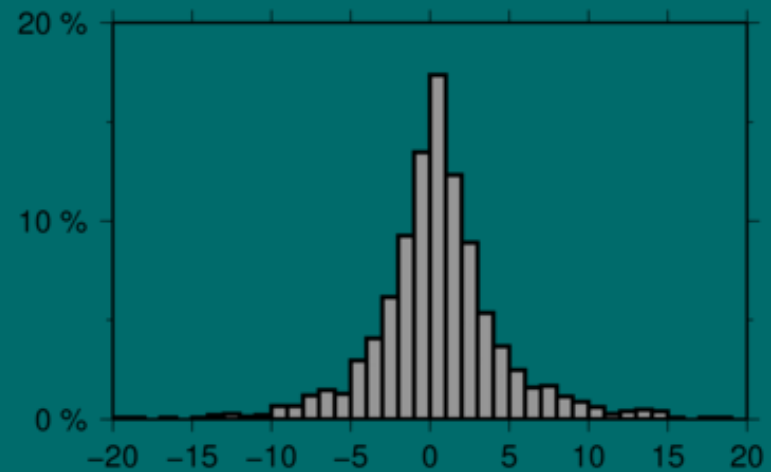
EGG08



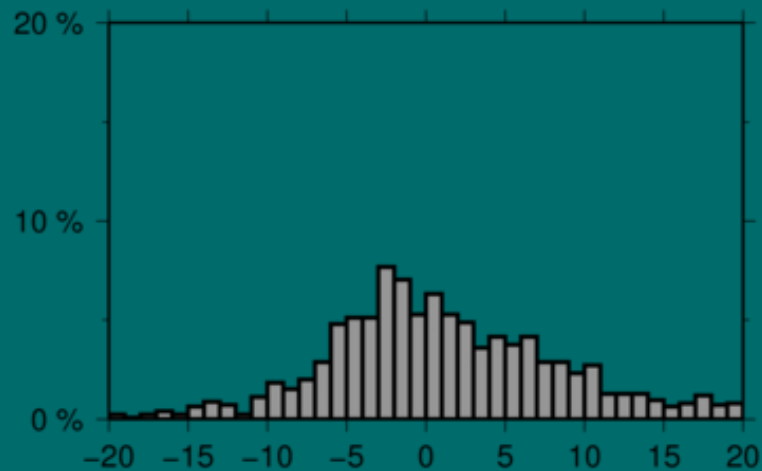
HISTOGRAMMS OF THE DIFFERENCES



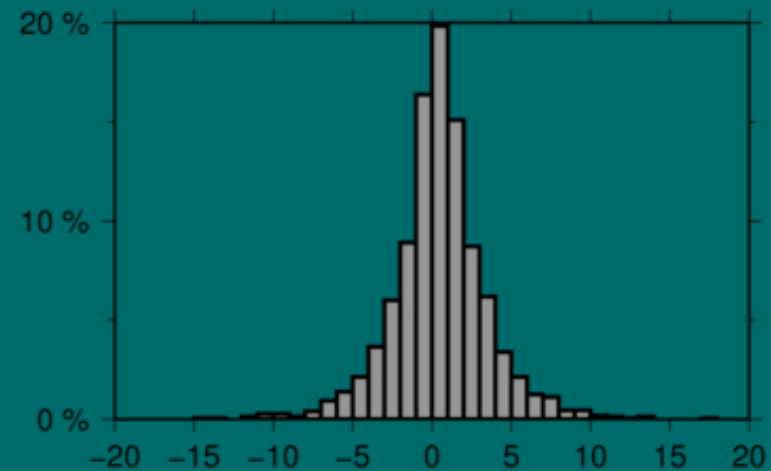
EUVN_DA-EGG97 differences



EUVN_DA-EGG97 fit residuals



EUVN_DA-EGG08 differences



EUVN_DA-EGG08 fit residuals

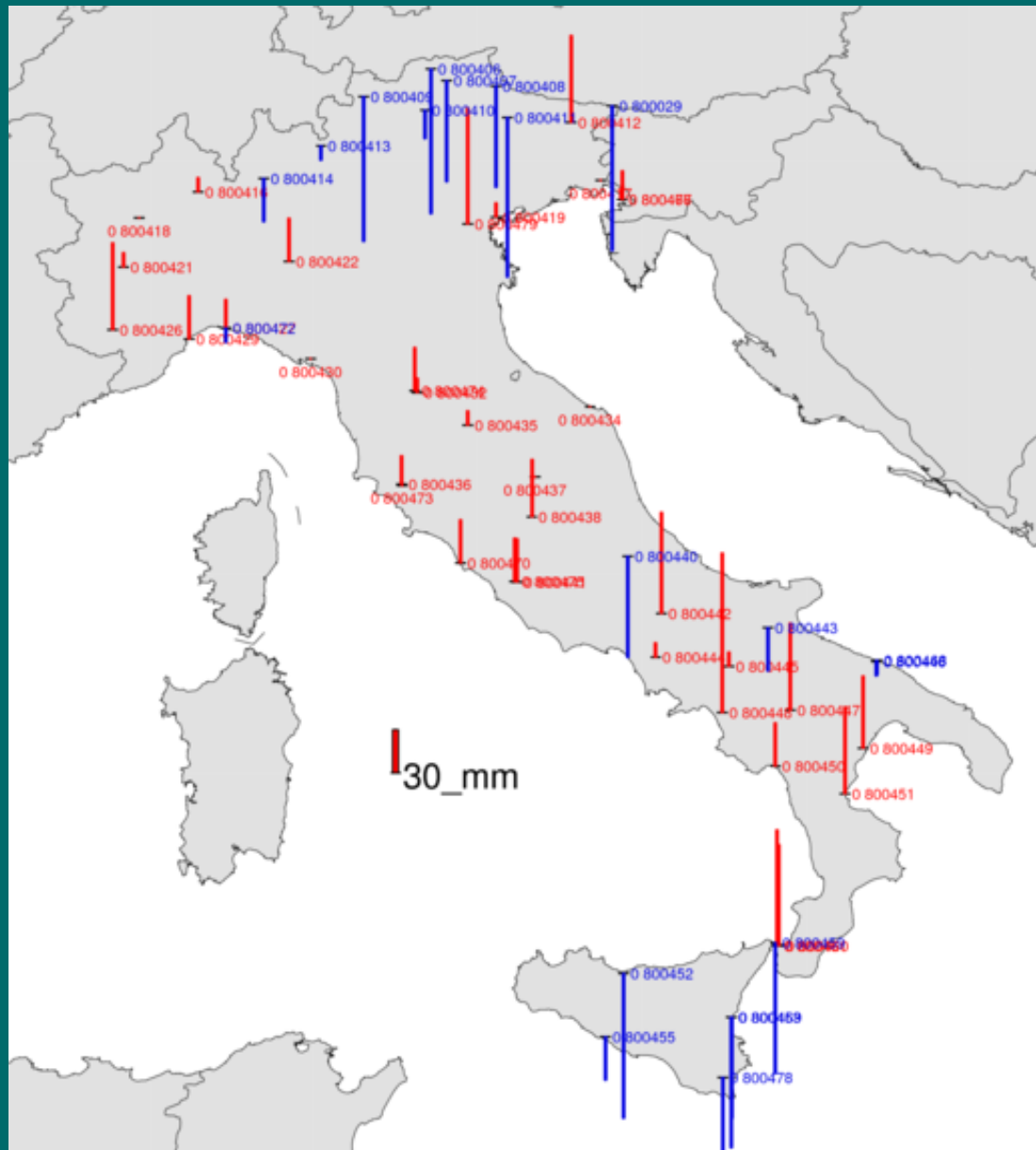
SKELETONS IN THE CUPBOARD ...

- **UK**
 - EUROTUNNEL CONNECTION SHOULD BE FINALIZED
 - TILT IN THE UK LEVELING NETWORK (?)
- **FRANCE** – TILT IN THE HEIGHT NETWORK
- **SPAIN** – OLD DATA, SOON UPDATED
- **BALKANS** – WEAK GEOID DATABASE
- **ITALY** – HIGH DISCREPANCY

ITALY

- ~200 EUVN_DA BENCHMARKS (NO DIRECT LEVELING CONNECTION TO UELN !)
- NATIONAL HEIGHTS TO EVRS2007 BY TRANSFORMATION
- UNREALISTIC HIGH TRANSFORMATION RESIDUALS
- DEEP INSPECTION OF THE IGN'S LEVELING NETWORK WOULD NEEDED
- GPS MEASUREMENTS AT SELECTED UELN MARKERS?

TRANSFORMATION RESIDUALS AT THE UELN SITES



EUVN_DA / EGG08 DIFFERENCES OVER ITALY



DATA AVAILABILITY

- THE 1ST VERSION OF THE EUVN_DA DATABASE IS FINALIZED
- FINAL REPORT IS PREPARED
- THE EUVN_DA DATABASE WILL BE AVAILABLE FROM THE EVRS WEBSITE. REGISTERED, ACADEMIC USERS, WILL GET FREE ACCESS TO THE DATABASE
- THE EUVN_DA DATABASE WILL BE PERIODICALLY UPDATED AND MAINTAINED.

SUMMARY

- WITH SOME DELAY THE MISSION OF EUVN_DA IS **COMPLETED** SUCCESSFULLY.
- 25 COUNTRIES; 1505 GPS/LEVELING POINTS
- SKELETONS IN THE CUPBOARD ...
- SIGNIFICANT IMPROVEMENT IN THE EGG - EUVN_DA COMPARISONS (EGG97 → EGG08)
- THE ACCURATE HEIGHT REFERENCE SURFACE WILL BE CREATED IN COOPERATION WITH EGGP
- DATA POLICY: AFTER PUBLICATION OF RESULTS THE DATABASE WILL BE AVAILABLE (PASSWORD PROTECTION) FOR RESEARCH PURPOSES
- ACKNOWLEDGEMENT OF THE DATA PROVIDERS

SPECIAL THANKS TO THE DATA PROVIDERS

• Austria	N.H [^] ggerl	BEV
• Belgium	P.Voet	NG
• Bulgaria	I. Georgiev	BAS
• Croatia	B.Barisic	HGI
• Czech Rep.	J.Reznicek	CVUT
• Denmark	K.Engsager	Space C.
• Estonia	K.Kollo	Maa amet
• Finland	P.H [%] okli	FGI
• France	F.&H.Duguenne	IGN
• Germany	M.Sacher	BKG
• Great Britain	C.Fane	OS
• Hungary	G.Virag	F÷MI
• Italy	F.Cauli	IGM

SPECIAL THANKS TO THE DATA PROVIDERS

• Latvia	J.Kaminskis	LGIA
• Lithuania	E.Parseulinas	VTU
• Netherland	A.Kosters	RWS
• Norway	O.Vestol	SK
• Poland	W.Graszka	GUGIK
• Portugal	M.Vasconcelos	IGEO
• Romania	T.Rus	ANCPI
• Slovakia	B.Droscak	GKU
• Slovenia	K.Medved	SMA
• Spain	R.Quiros Donate	IGN Spain
• Sweden	M.Lilje	LM
• Switzerland	U.Marti	Swisstopo