Current works of the Expert Group Geodesy of EuroGeographics

Members of ExGG

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- ToR and Work Plan of ExGG with status June 2004 were agreed with HO of EG in Aug. 2004
- ExGG Letter to Members of EG Sept. 2004
- GA of EG 17 – 20 October 2004 in Athens, Greece
- Revision of ISO 19111 Spatial referencing by Coordinates - comments
- New projects with close connection to ExGG are in preparation (request for cm accuracy):
  - EuroBoundaries, Chair Heinz König (Not SABE!)
  - GEORAIL
- Work plan activities

GA of EG 17 – 20 October 2004 in Athens, (47 member organisations)

Strategic goals EG

By December 2007 EuroGeographics will have achieved the following:

G1 – The NMCA's will be recognised as the leading suppliers of pan European and cross border reference information

- Coordinate reference system data and information shall prepared for operational use as **spatial reference of topographic reference information, cadastral and thematic information**
- …

G2 - We will have defined specifications of ISO/TC 211, CEN287 and OGC standards **that will be recognised as the de facto (industry) standards for reference information to support interoperability and underpin the ESDI**

Work Plan - ExGG projects

The ExGG has four core projects, integrated in the activities defined in the ToR and directly related with the before mentioned group of Products (data and services):

(1) Catalog of geodetic products

(2) European Vertical Reference System (EVRS) Implementation

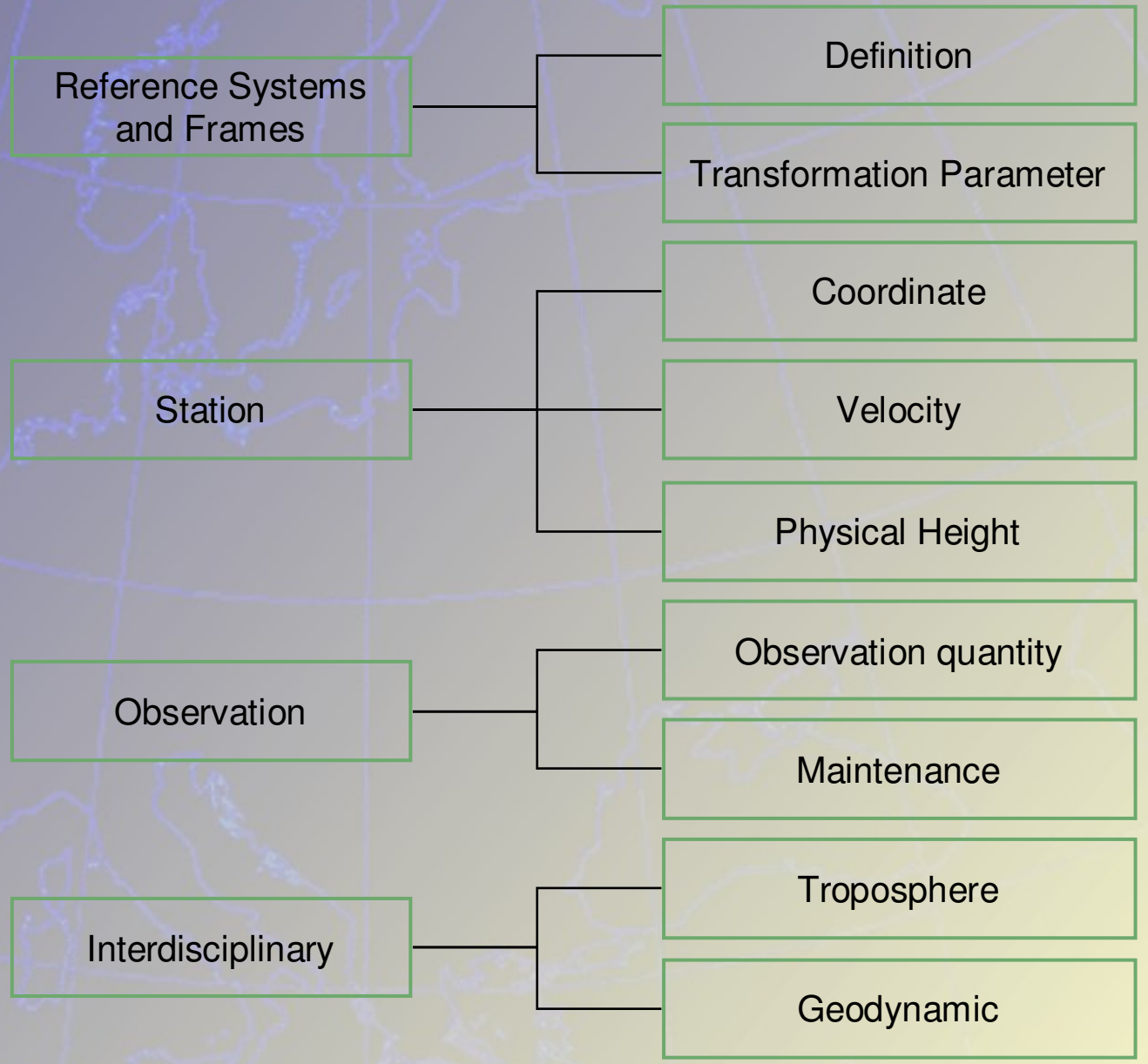
(3) Real Time GNSS Service / Densification of EPN

(4) Information system for European Coordinate Reference Systems (CRS-EU).

Certification/Validation is part of product definition, standardisation/classification, registration

(1) Catalog of geodetic products

Catalogue Basic Structure



Reference Systems and Frames					
No.	Product	Accuracy	User Profile	Updates	Availability
	Definition				
1	Definition of a Coordinate Reference System for Europe, the ETRS89	cm	all	-	public
	Transformation Parameter				
2	Transformation between ETRF and ITRF	cm	all	Some years	public
3	CRS – Transformation between National Coordinate System and ETRS89	cm - dm	all	-	public
4	CRS – Transformation between National Height system and EVRS	cm - dm	all	-	public

Station								
No.	Product	Accuracy	User Profile	Latency	Geodetic Technique	Updates	Availability	Reference Frame
	Coordinates							
5	Weekly coordinates of EPN stations in the ITRF provided in SINEX files	0.5 - 1.5 cm	cm	3 weeks	GNSS	weekly	public	ITRF
6	Multi-year solution of EPN stations provided by recent ITRF realization, e.g. ITRF2000	0.5 - 1.5 cm	cm	some years	combined	some years	public	ITRF
7	Station coordinates of adopted EUREF Campaign with classification A, B or C	1 - 5 cm	cm	some years	GNSS	-	public	ETRF

Observation						
No.	Product	User Profile	Latency	Geodetic Technique	Updates	Availability
	Observation Quantity					
15	Real-time observations disseminated through the Internet using the NTRIP protocol	dm	real-time	GNSS	real-time	public
16	Hourly observation files of EPN stations available at EUREF data centers	cm	5 – 15 min	GNSS	Hourly	public
17	Daily observation files of EPN stations available at EUREF data centers	cm	30 min	GNSS	daily	public
	Maintenance					
18	Maintenance information of EPN stations available at the EPN central bureau	all	-	GNSS	-	public

Interdisciplinary					
No.	Product	Latency	Geodetic Technique	Updates	Availability
	Troposphere				
16	Hourly troposphere parameter for EPN stations	hourly	GNSS	hourly	public
17	Weekly troposphere parameter for EPN stations	3 weeks	GNSS	hourly	public
	Geodynamic				
18	Inconsistencies from time series		GNSS	weekly	public

(2) European Vertical Reference System (EVRS) Implementation

Follow up actions from the EVRS WS April 2004	**Communication package** **Print of the proceedings** **EVRS convetion definition and requirements/definition of realization**

(3) NTRIP, guidelines for the densification of the EPN

Stimulate NMA's support and usage of Ntrip within and beyond EUREF	**Spread information on Ntrip**
	Promote providing real-time GNSS data via Ntrip protocol
	Stimulate usage of Ntrip for real-time GIS positioning and navigation
	Help setting up Ntrip network of Broadcasters for real-time dissemination of GNSS data
	Keep track of Ntrip activities continent-wide
	Organize European Ntrip Workshop
	Help extending services towards integration of EGNOS (and GALILEO)

(4) Information system for geodetic CRS, transformation parameters CRS-EU

Preparation of information for describing European and national height reference systems and extension of the CRS data base	Preparation of information for describing European and national height reference systems
	Letter to NMA's
	Extension of the CRS data base by height information
	Concept for geoid information
	On-line transformation

CRS-EU home page

- available with new address

  http://crs.bkg.bund.de/crs-eu

- existing address http://crs.ifag.de
  will be forwarded to new address for some time

Status Countries (1)

Status: 04-Nov-2004

Country	ID	Position		Height	
		CRS-Description	Transformation to ETRS89	CRS-Description	Transformation to EVRF2000
Albania	AL	released	no	enquired	
Austria	AT	released	released	released	released
Belgium	BE	released	released	released	released
Bosnia / Hercegovina	BA	no	no	existing	existing
Bulgaria	BG	no	no	released	released
Croatia	HR	released	released	existing	existing
Cyprus	CY	no	no		
Czech Republic	CZ	released	released	existing	existing
Denmark	DK	released	released	released	released
Estonia	EE	released	released	released	released
Finland	FI	released	released	existing	existing
France	FR	released	released	released	released
Germany	DE	released	released	released	released
Gibraltar	GI	released	released		
Great Britain	GB	released	released	released	released
Greece	GR	released	no	existing	no UELN
Hungary	HU	existing	existing	released	released
Iceland	IS	no	no	no levelling network	

Status Countries (2)

Country	ID	Position		Height	
		CRS-Description	Transformation to ETRS89	CRS-Description	Transformation to EVRF2000
Ireland	IE	released	released	released	no UELN
Italy	IT	released	released	existing	existing
Latvia	LV	released	released	existing	existing
Lithuania	LT	released	released	existing	existing
Luxembourg	LU	released	released	released	no UELN
Macedonia	MK	no	no		
Malta	MT	no	no	enquired	
Netherlands	NL	released	released	released	released
Northern Ireland	NI	released	released	existing	no UELN
Norway	NO	released	released	released	released
Poland	PL	released	released	existing	existing
Portugal	PT	released	released	released	released
Romania	RO	no	no	existing	existing
Russia	RU	no	no	existing	no UELN
Slovak Republic	SK	released	released	existing	existing
Slovenia	SI	released	released	released	released
Spain	ES	released	released	released	released
Sweden	SE	released	released	released	released
Switzerland	CH	released	released	released	released
Turkey	TR	released	released	released	no UELN
Ukraine	UA	no	no	existing	no UELN

Content – future

- step by step completion of information for the countries depending on their response / assistance
- step by step realisation of single point online transformation of different CRS for test and verification purposes
- generally information about CRS, coordinates, transformations, map projections etc.

Further actions

- Revision ISO 19111
- EuroBoundaries, Georail
- public relations, flyer
- Training, education

Transformation parameters from national height reference systems to EVRF2000

Country	Verification by the country	identical points	Parameters			RMS	residual deviations	
		number + kind	translation in cm	incl. in latitude in cm / 100km	incl. in longitude in cm / 100km	in cm	min in cm	max in cm
AT	x	114 UELN	- 35.6	- 2.8	- 2.8	3.1	-6.1	+6.1
BA/HR		40 UELN	- 34.5	- 0.3	- 0.9	0.7	-1.0	+1.4
BE		4 EUVN	- 231.1	- 0.8		0.2	-0.2	+0.2
BG	x	36 UELN	+ 18.2	+ 0.1	- 0.2	0.2	-0.6	+0.4
CH (LN02)	x	225 UELN	- 24.5	- 10.2	- 1.6	3.3	-8.6	+9.4
CZ		53 UELN	+ 11.6	+ 1.7		1.4	-3.5	+2.8
DE (DHHN92)	x	443 UELN	+ 1.4	- 0.1		0.2	-0.7	+0.6
DE (DHHN85)	x	363 UELN	+ 1.7	- 0.1	+ 0.1	0.4	-2.6	+1.3
DE (SNN76)	x	73 UELN	+ 15.7	+ 0.4	+ 0.3	0.4	-1.1	+0.8
DK	x	707 UELN	+ 1.1	+ 0.1	+ 0.5	0.3	-0.9	+0.8
EE	x	36 UELN	+ 13.3	- 0.7	+ 0.2	0.3	-0.5	+0.5
ES	x	70 UELN	- 48.6	- 0.2	+ 0.3	1.0	?	?
FI		7 EUVN	+ 22.0			0.3	-0.3	+0.8
FR	x	8 EUVN	- 48.6			0.5	-0.4	+1.0
GB	x	5 EUVN	+ 8.1	- 2.7	- 1.1	1.9	-1.2	+2.2
HU	x	36 UELN	+ 13.7	+ 0.4	- 0.1	0.3	?	?
IT		9 EUVN	- 35.3	+ 0.2	+ 0.3	0.7	-0.6	+1.1
LT		46 UELN	+ 10.2		+ 0.1	0.2	-0.2	+0.3
LV		123 UELN	+ 10.5		+ 0.2	0.7	-2.0	+2.2
NL	x	757 UELN	- 0.5			0.2	-2.1	+0.4
NO	x	117 UELN	- 0.1	- 0.5	+ 1.7	3.7	-7.6	+7.0
PL		98 UELN	+ 16.0	+ 0.5		0.5	-2.0	+0.9
PT	x	5 EUVN	- 31.5			1.3	-1.4	+2.1
RO		46 UELN	+ 2.8	+ 0.1	+ 0.1	0.2	-0.5	+0.9
SE		21 EUVN+Tide G	+ 1.0	- 0.6		1.1	-2.3	+2.0
SI	x	9 UELN	- 41.1	- 1.6	+ 0.4	0.3	-0.4	+0.4
SK		3 EUVN	+ 12.2	+ 1.0		0.2	-0.1	+0.1

Members of ExGG:	Responsibility
Zuheir Altamini	
Elmar Brockmann	CRS-EU, Georail
Heinz Habrich	products, dens.
Björn Geirr Harsson	
Johannes Ihde	chair, CRS-EU, 19111, EVRS
Ambrus Kenyeres	EVRS proc.
Claude Luzet	HO
Jaakko Mäkinen	EVRS proc.
Jaroslav Simek	Secretary
Günter Stangl	EuroBoundaries
Joao AgriaTorres	certification, 19111
Georg Weber	NTRIP, dens.
Marijan Marjanovic	publ. relation

Nomonated:

Dimitrios Delikaraoglou	Greece
Edmandas Sleiteris	Lithuania
Maria Ovdii	Moldova
Klobušiak, Matej	Slovak Republic
Yavuz Selim ŞENGÜN	Turkey

		projection	projection
	te	Note: A system can never contain the same kind of system	Delete note if it is not useful
	te	This coordinate system type is arbitrary selected	Delete it
	te	The term datum is also used in connection with time	Extend the definition by time
	te	A coordinate reference system has an origin orientation and scale	Delete reference
	te	For description of a position in a coordinate system sometimes thousands of measurements necessary in dependence of accuracy	Delete “of measurements or”
	te	The engineering CRS is not unambiguous defined. It is a CRS with an engineering datum but the type of coordinate system is not defined.	Delete 4.21 or add definitions for all possible types of coordinate systems e.g. engineering projected coordinate reference system or engineering affine coordinate reference system
	te	The geocentric CRS is not unambiguous defined. A geocentric CRS can be a geographic CRS and a projected CRS	Delete 4.24 or combine it with possible other types of CRS
	te	The geographic CRS is not unambiguous defined. A geographic CRS can be geocentric, the type of datum is missing.	Delete 4.28 or combine it with possible other CRS and datum types
	te	A pixel has nothing to do with a coordinate system or CRS	Delete it or define the relationship to CRS

	te	The engineering CRS is not unambiguous defined. It is a CRS with an engineering datum but the type of coordinate system is not defined.	Delete 4.21 or add definitions for all possible types of coordinate systems e.g. engineering projected coordinate reference system or engineering affine coordinate reference system
	te	The geocentric CRS is not unambiguous defined. A geocentric CRS can be a geographic CRS and a projected CRS	Delete 4.24 or combine it with possible other types of CRS
	te	The geographic CRS is not unambiguous defined. A geographic CRS can be geocentric, the type of datum is missing.	Delete 4.28 or combine it with possible other CRS and datum types
	te	A pixel has nothing to do with a coordinate system or CRS	Delete it or define the relationship to CRS
	ge	New class of reference system	Change the title of 19111: Spatial referencing by coordinates and time
	te	No definition of temporal reference system, it's a explanation of a relationship of a measurement	Editing committee shall find a definition comparable with coordinate reference system
	te	No definition	
	ge	Vertical coordinate reference system is a new class of CRS. We need complementary CRS	Define horizontal CRS and spatial CRS
	ge	Clause 6 is completely new. It is far away from any geodetic content. The standard needs no wrong explanation of science geodesy.	Remove clause 6 and put a changed, correct version in an annex

Content – near future

- step by step realisation of providing verification data for transformation in position (7-Parameter-Helmert-Transformation) and height by some fictive points of the transformation area
  - Position

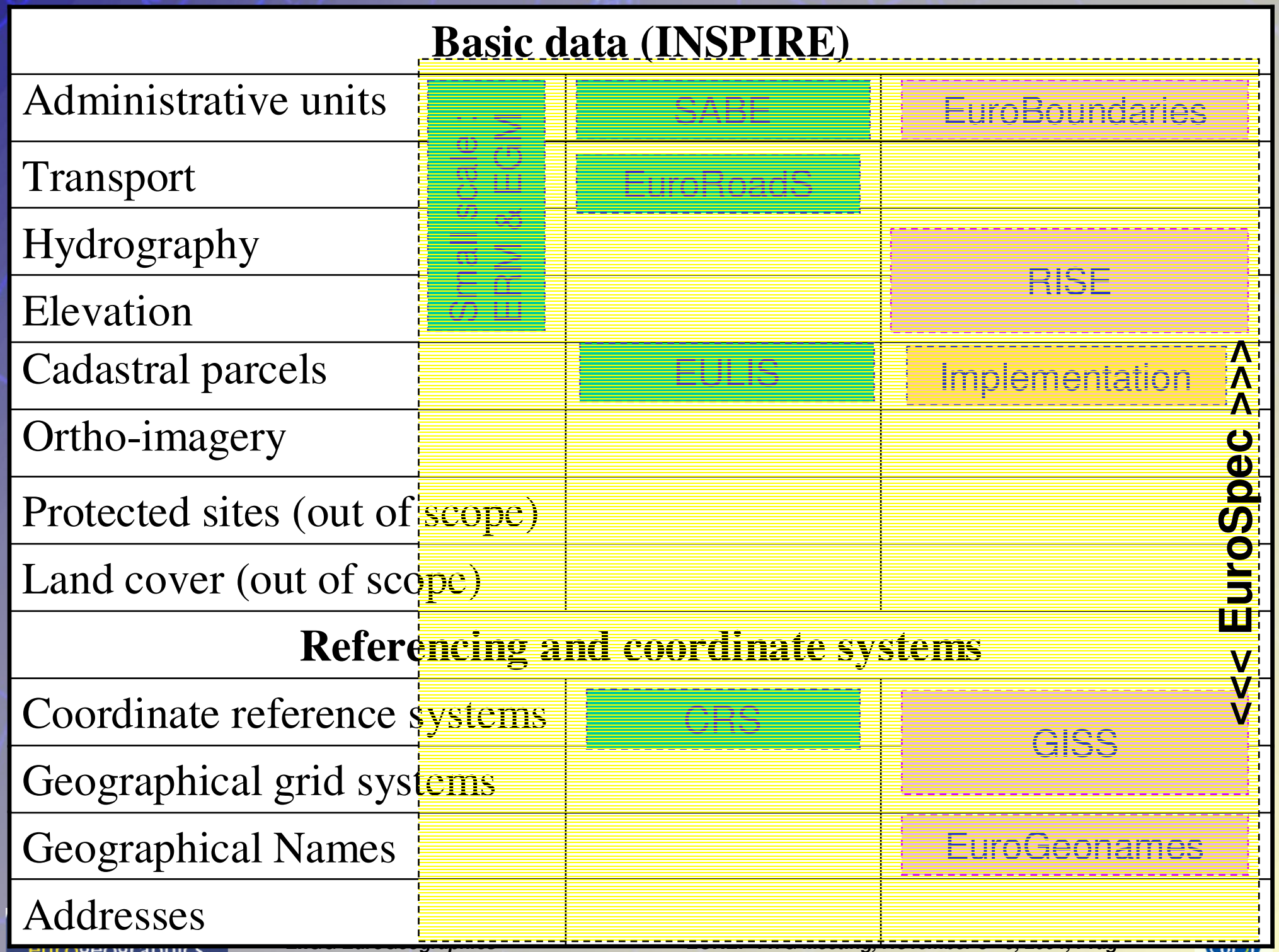
Poland (PL) - Testdata for Validation of Transformation

fictive points of transformation area

PL_42/58 (DMS)		ETRS89 (DMS)	
Lat	Lon	Lat	Lon
53 49 36.1200	14 45 58.3200	53 49 34.84	14 45 51.44
49 33 20.8800	22 23 58.5600	49 33 19.89	22 23 52.44

Next steps for standardization and validation of geodetic products

Develop the quality evaluation process in the frame of the ISO 19114 and related standards	Identify the products available for certification
	Define the product specification or user requirement for each product
	Concretize the items for the quality evaluation process for each product
	Determine how data quality evaluation information is reported


Basic data (INSPIRE)
Administrative units
Transport
Hydrography
Elevation
Cadastral parcels
Ortho-imagery
Protected sites (out of scope)
Land cover (out of scope)
Referencing and coordinate systems
Coordinate reference systems
Geographical grid systems
Geographical Names
Addresses
EuroGlobalMap
SABE
EuroRoadS
EULIS
CRS
RISE
Implementation
GISS
EuroGeonames
EuroSpec

Station								
No.	Product	Accuracy	User Profile	Latency	Geodetic Technique	Updates	Availability	Reference Frame
	Velocity							
9	ITRF velocities from ITRF realization	1 – 2 mm /year	cm	some years	combined	some years	Public	ITRF
10	ITRF velocities from special projects							ITRF
11	ETRF velocities from special projects							ETRF
	Physical Height							
12	Definition of a Height Reference System for Europe, the EVRS							

EuroBoundaries

- The main project's objective is to create 'EuroBoundaries', the Definitive European National Boundaries, as a database. This would cover at least the EU, ideally the whole European continent (40+ countries).
- The 'EuroBoundaries' DB would be of the highest available accuracy, the target being an accuracy of 1 meter or better. However, resolution requirements must be flexible in terms of accuracy, in order to be consistent with actual data availability.
- The boundary data model shall include the boundary marks, the boundary line and topographic features associated with the boundary. Each point or segment would be attributed ('metadated'), in terms of providing information about the source of the data, the estimated accuracy, the time-stamp, a unique identifier, status (disputed, jointly defined, …).
- All features and objects will be given ETRS89 co-ordinates, and possibly other co-ordinates in the official national system(s).

Letter to 41 of 47 members of EG Sept. 2004

Contents/Respond:

- Terms of reference and a working plan (information)
- Asking to confirm the present memberships of ExGG
- Inviting the EG members to nominate new ExGG members

  Nomination of:

Dimitrios Delikaraoglou	Greece
Edmandas Sleiteris	Lithuania
Maria Ovdii	Moldova
Klobušiak, Matej	Slovak Republic
Yavuz Selim ŞENGÜN	Turkey

- Provide missing information for CRS-EU meta data base and confirmation of existing data

  Two answers

Overivew of INSPIRE & pan-European datasets

			Coordinate reference systems	Geographic grid systems	Geographical names	Administrative units	Transport network	Hydrography	Protected sites	Elevation	Identifies of properties	Addresses, postcodes	Cadastral parcels	Land cover	orthophoto ima
			1	2	3	4	5	6	7	1	2	2a	3	4	5
Data producers	**Product**	**Scale**	**Annex I**							**Annex II**					
Visualization - mapping															
Stopwatch Maps	WorldInfo	1:1,000,000	x		x	x	x	x		x					
Europa Technologies	Global Insight Plus	1:1,000,000	x		x	x	x	x							
ALLM Geodata	Global Gazatteer				x	x				x	x	x			
Multipurpose - analysis															
Bartholomew	Europe Premium	1:1,000,000	x		x	x	x	x		x				x	
EuroGeographics	EuroRegionalMap	1:250,000	x		x	x	x	x							
EuroGeographics	EuroGlobalMap	1:1,000,000	x		x	x	x	x		x					
Geo Strategies	Road Maps	1:500,000	x		x	x	x	x		x	x	x			
AA	Automaps (limited use)	1:1,000,000	x		x		x				x	x			
Specific - routing															
Navteq	Road data	1:5,000	x		x		x	x		x	x	x			
TeleAtlas	MultiNet	1:10,000	x		x	x	x	x			x	x		x	
AND	Roadnetwork Europe	1:250,000	x		x	x	x	x			x	x			
Specific - thematic maps															
EuroGeographics	SABE	1:100,000	x			x									
Macon	Europe Map set	1:50,000 ?	x		x	x	x	x		x	x	x			
Geodan	NUTS3	1:50,000	x		x	x		x							
Geodan	2-digit postcodes	1:250,000	x			x		x							
Geoplan	2-digit postcodes	1:1,000,000	x								x	x			
UNECE	SALB	1:1,000,000	x			x									
Specific - water catchment															
JRC	CCM	1:250,000	x			x		x							

Comments to revised ISO 19111 from IAG (liaison)

ge	The version of ISO/DIS 19111 from 2004-08-02 ISO/TC 211 N1676 includes more than 100 general and technical changes against the valid standard ISO 19111	Change level DIS to CD
ge	4 clauses or annexes are removed or added	Change level DIS to CD
ge	The scope is extended to spatio-temporal referencing and top merged spatial-temporal reference systems. This new item has an extent of an new work item.	Change level DIS to CD, change the title of the standard 19111
ge	The selection of different types of coordinate reference systems (CRS) is arbitrary. E.g. a geocentric CRS can be a geographic CRS and a projected CRS	Remove all new types of definition of CRS or find an general model and decision for selection of CRS
ge	Several definitions of sub types of coordinate systems are added without any foundation and mathematical background. There are infinite possibilities for the definition of coordinate systems. The selected one are not consistent.	Remove the definitions
te	There is no affine coordinate system, only affine map projection	Change affine coordinate system in affine map projection
te	Note: A system can never contain the same kind of system	Delete note if it is not useful
te	This coordinate system type is arbitrary selected	Delete it
te	The term datum is also used in connection with time	Extend the definition by time