Bundesamt für
Kartographie und Geodäsie

New challenges regarding weather forecasting from GNSS-data

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De Bilt, 28.11.2017

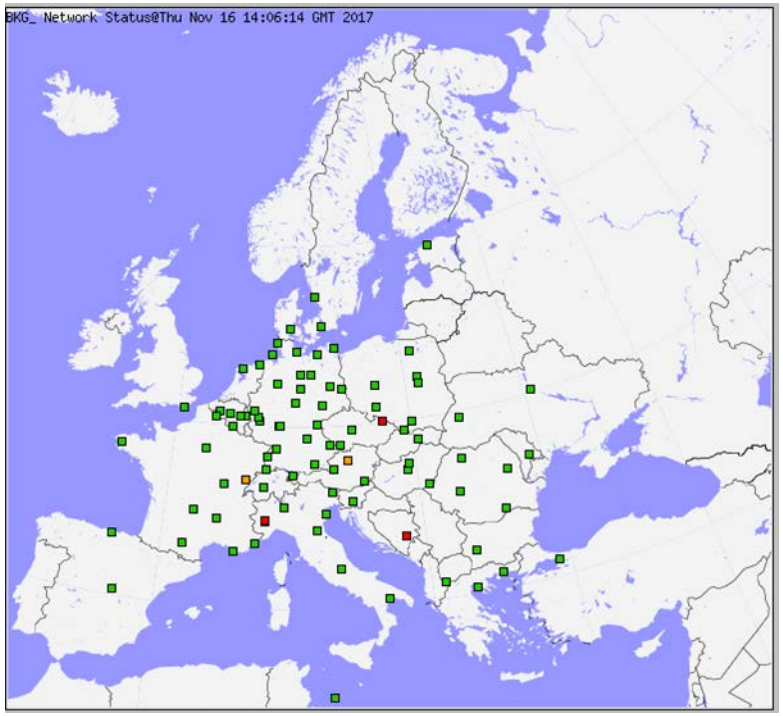
Outlines

1. Contribution of BKG to the E-GVAP
2. Information Technology Center Bund (ITZBund)
3. New challenges
4. Data processing concept

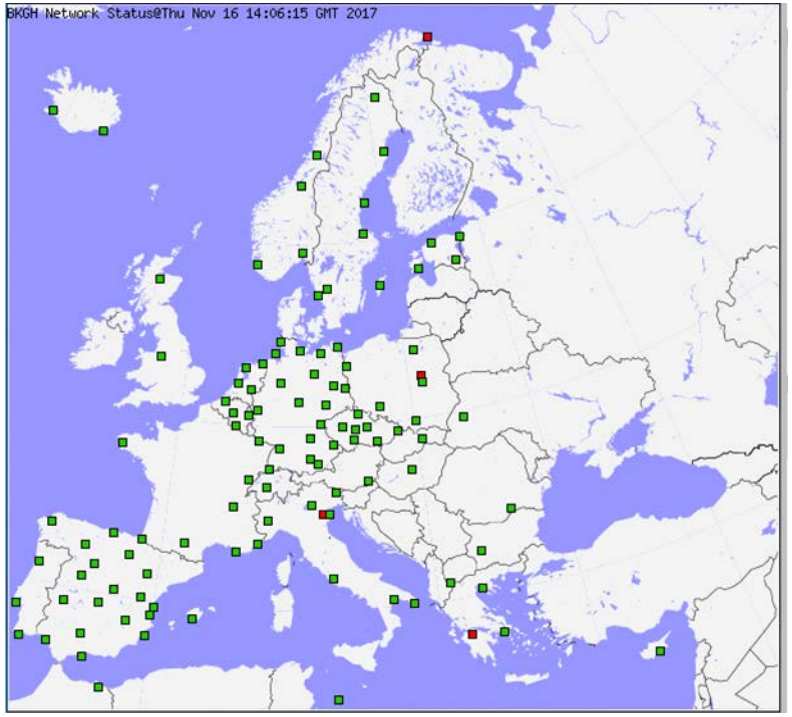
Contribution of BKG to the E-GVAP

	Arrival time window of Observations
	No Data or before **11/14 14h**
	between **11/16 11h** and **11/16 14h**
	between **11/16 08h** and **11/16 11h**
	between **11/16 08h** and **11/14 14h**

bkg_: 2002
~100 stations



bkgh: 2009
~120 stations



bkg_

Data processing starts at the beginning of every full hour

Observation window: 4 hours
(sliding window)

Download: 15 Minutes

Parameter estimation including ultra-rapid orbits of the IGS

BSW (v. 5.2)

bkgh

Data processing starts at the minute 12 of every full hour

Observation window: 4 hours
(sliding window)

Data used: 15 min. 1 Hz RINEX files stored from real-time streams

Parameter estimation including ultra-rapid orbits of the IGS

Completeness 1.4.14-31.10.17: 96.9 %

BSW (v. 5.0)

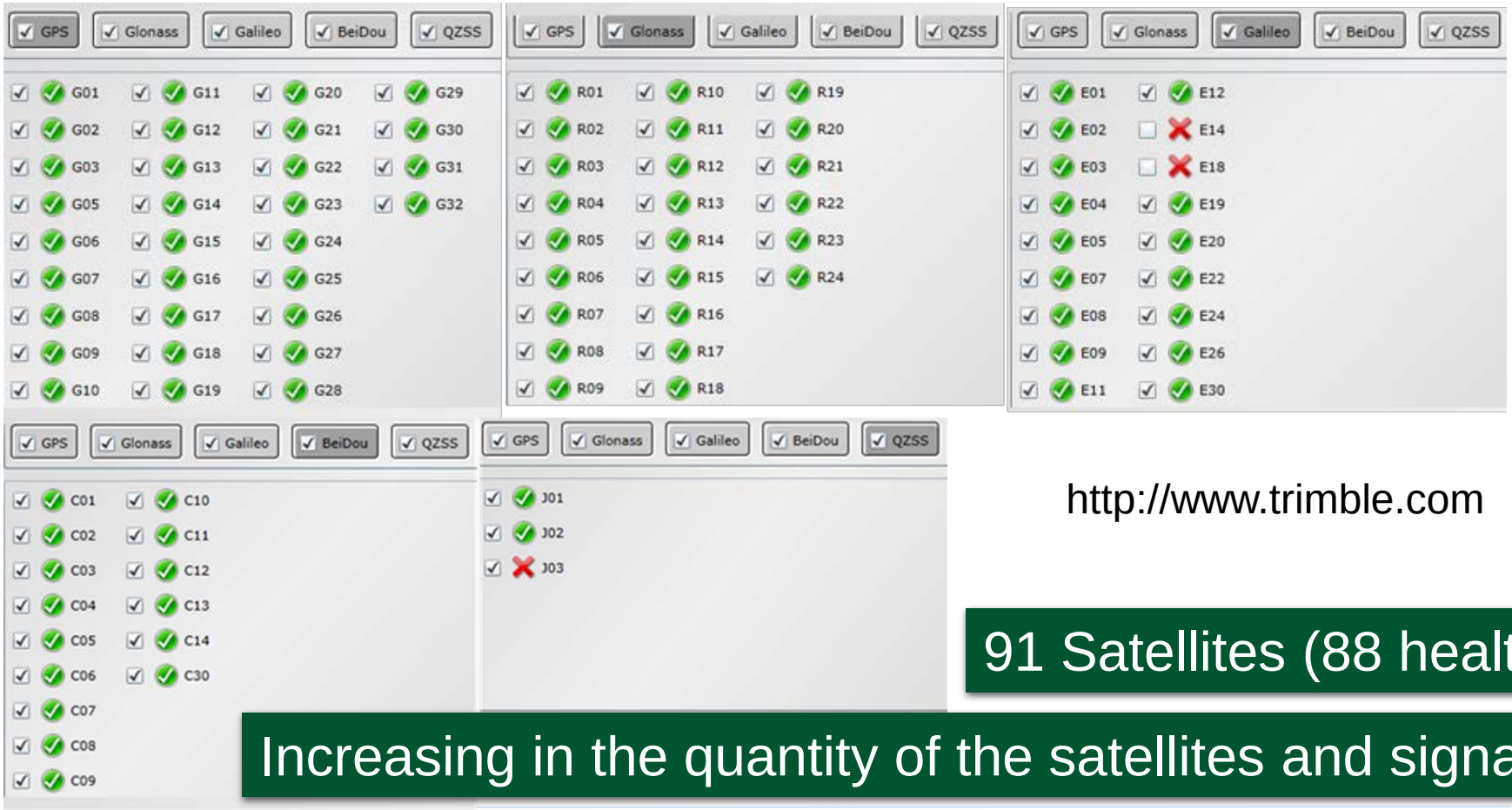
The Information Technology Center Bund (ITZBund)

- Centralization process against cyber attacks,
- Agreement with one or two IT service providers,
- Consolidation of ITs and data centers of the German Federal Agencies until 2022.

What happens regarding the E-GVAP

- All technical procedures and processes are to be moved until mid of 2018,
- 'bkg_' one of the first processes / products to be migrated,
- 'bkgh' very likely to be stopped by mid of 2018.

Number of satellites on 28.11.2017



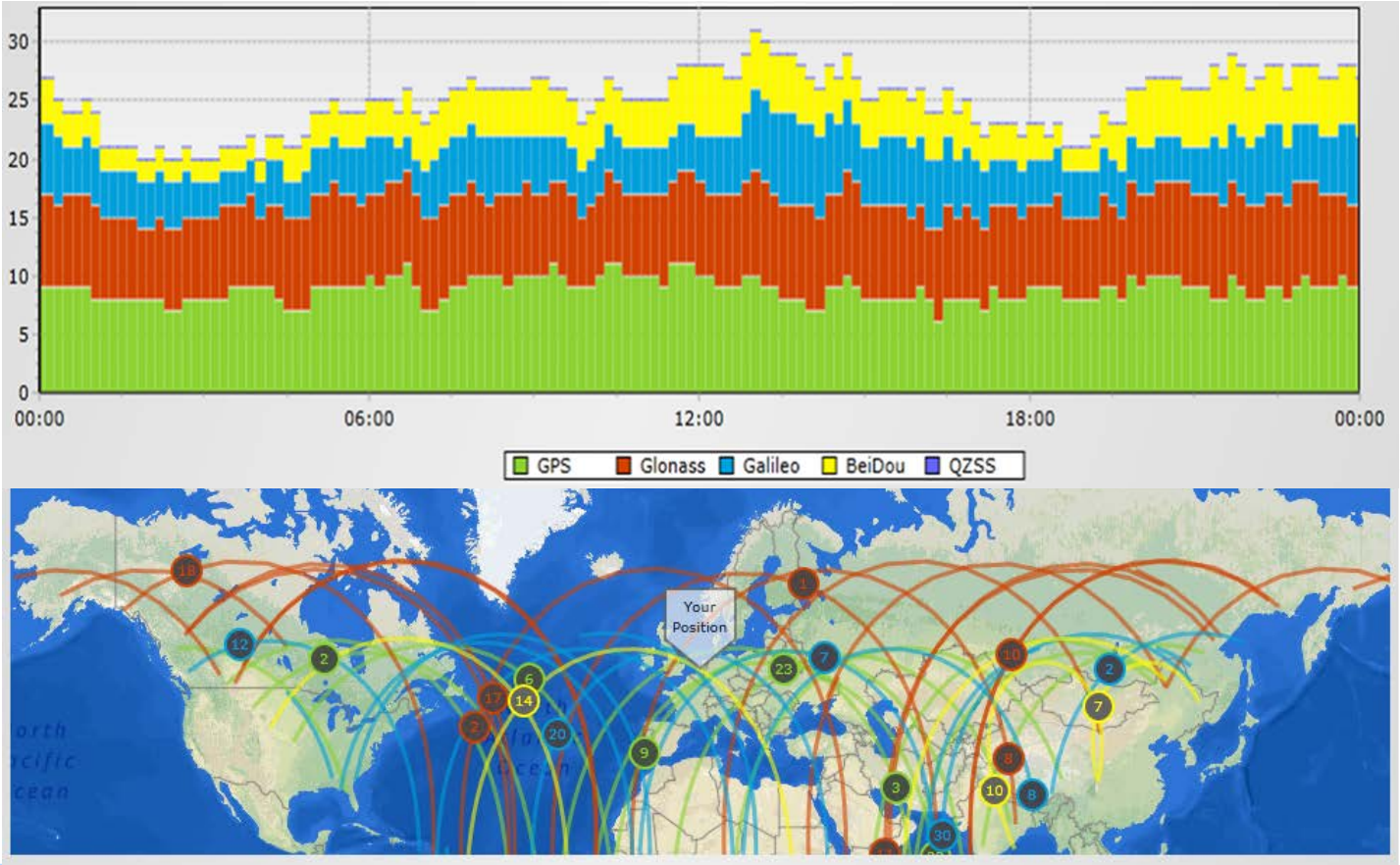
http://www.trimble.com

91 Satellites (88 healty)

Increasing in the quantity of the satellites and signals

Satellites over De Bilt on 28.11.2017

http://www.trimble.com



New signals

A list of frequency types

GNSS	Frequency				
GPS	L1	L2	L5		
GLONASS	G1	G2	G3		
GALILEO	E1	E5a	E5b	E5	E6
BEIDOU	B1	B2	B3		
SBAS	L1	L5			
QZSS	L1	L1	L5	LEX(6)	

More, more, and more

benefit and detriment?

- Accuracy
- Increasing of unknown parameters (more satellites, more signals, and more stations)
- Extending the duration of the data processing (disadvantage for weather forecasting)

Compensation the detriment

To relieve this burden

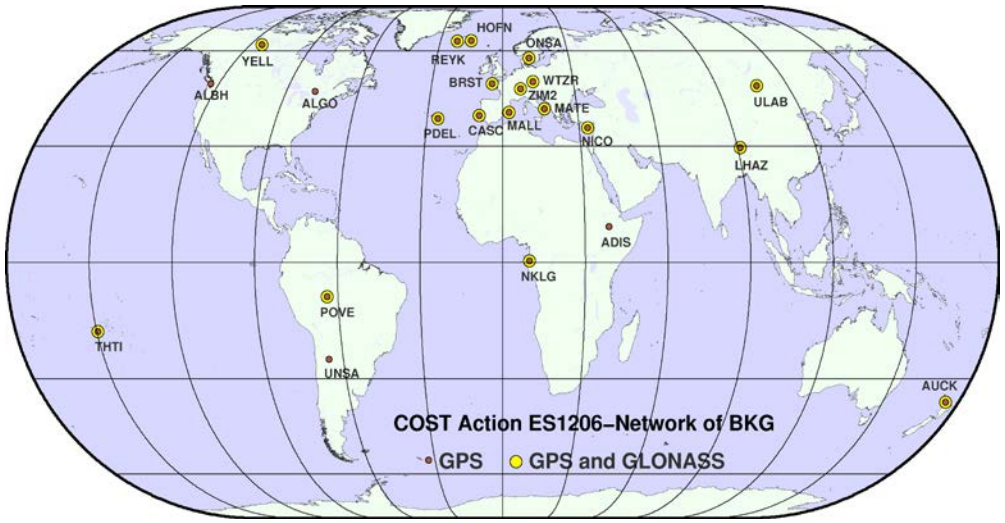
How this effect can be compensated?

- NRT, RT
- Network / single point positioning

Which concept is suitable

- Classical, SSR, OSR, Integrator

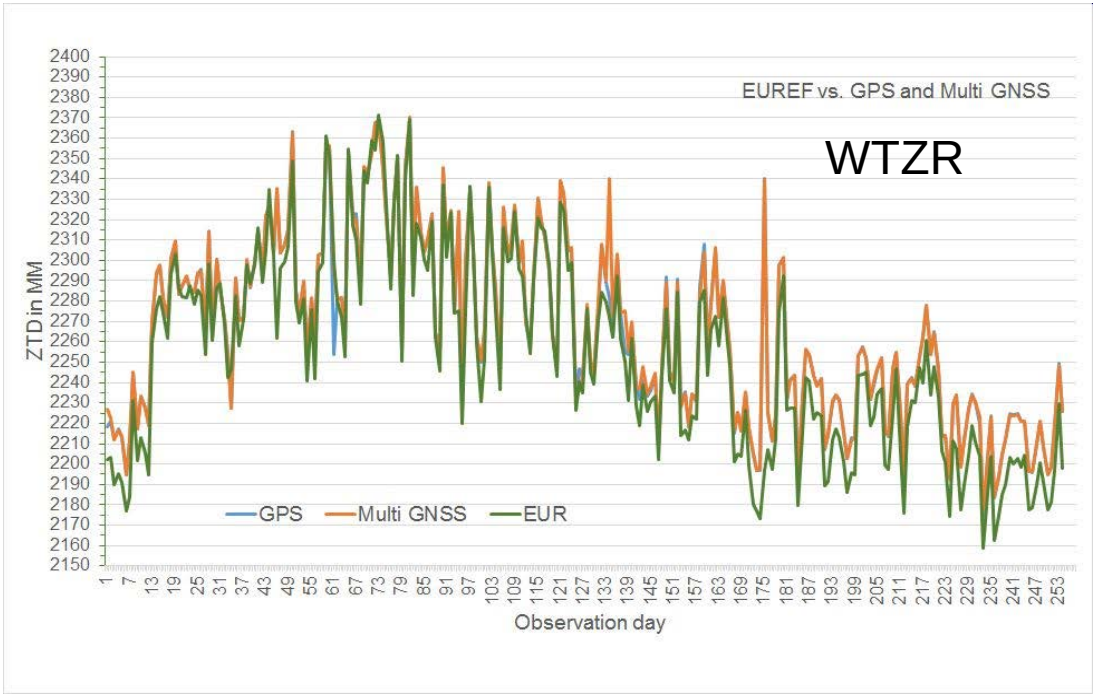
COST demonstration campaign



22 mount points (19 stations GPS+GLONASS)

- Data processing with BNC,
- PPP solutions were created in 5-minute intervals,
- Real-time state variables from the IGS03 products.

EUREF/BKG vs. GNSS and GPS-only



A random value for each day at 15:30

WTZR	STD (mm)
BKG-GPS	11,4
BKG-GNSS	12,9

Conclusion - NRT vs. RT

- NRT is still more accurate
- Towards ‚Nowcasting' the data-related NRT evaluation tends to reach its limits – processing time
- Single point evaluation by PPP allows almost unlimited increase in the number of stations

Favourite subject in the silly season

Daily ~ 170 000

Tabloid newspaper

Headline from 21-June-2012

Never has it been so often wrong

Who still believes to weather news?

Credibility of forecasting?

Thank you very much for your attention!

Contact

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