

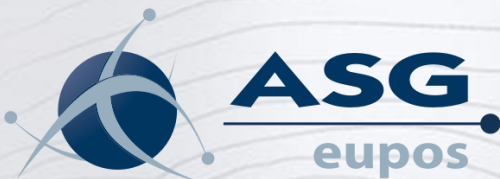


# ASG-EUPOS reference system

## Last year activities and future plans

**Szymon Wajda**

*prime specialist*



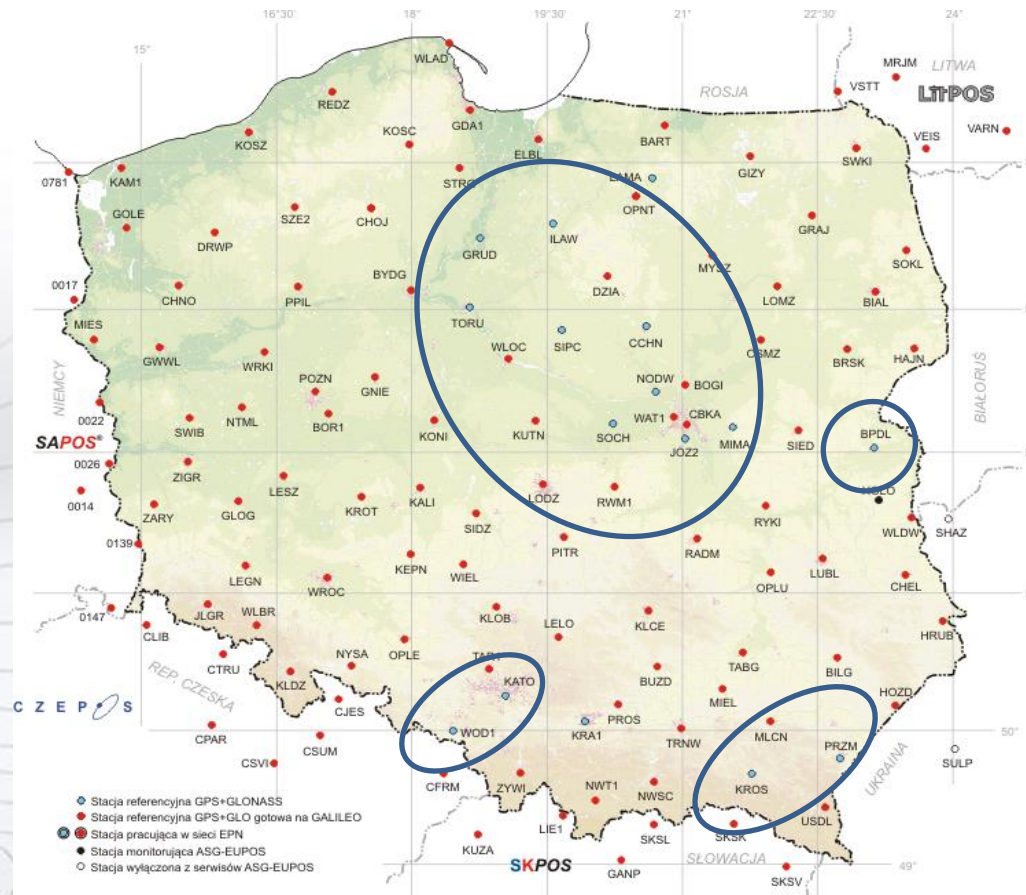


- ✓ **Last year activities**
- ✓ **Future steps**
- ✓ **Galileo and Beidou**
- ✓ **Conclusions**



## Tasks accomplished in 2019:

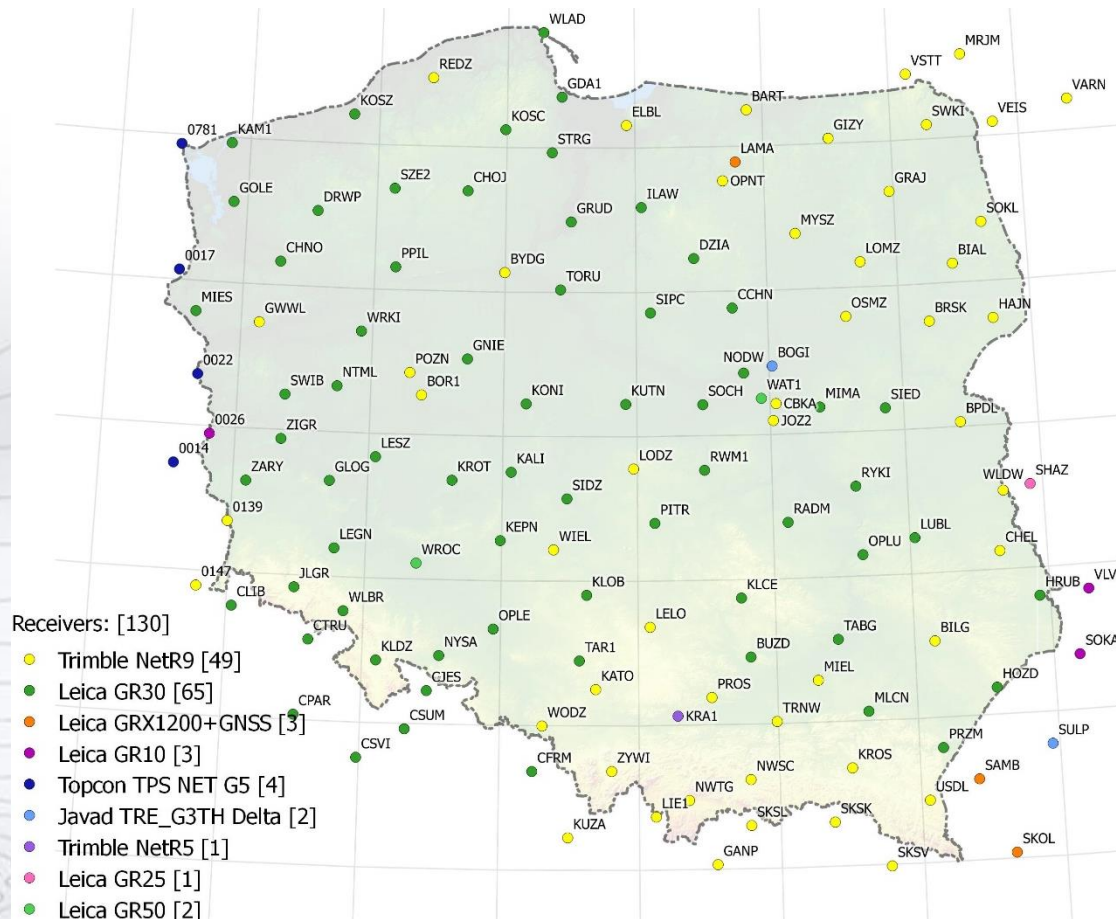
- 12 reference stations with Trimble NetR5 (GR) exchanged with Trimble NetR9 (GREC)
- 13 Antennas with individual chamber calibration (GREC)





## Tasks accomplished in 2018:

- 36 Leica GR10 was upgraded to Leica GR30 (GREC)
- 22 Trimble NetR9 (GRE) was „upgraded” to Leica GR30 (GREC)
- Upgrade Trimble Pivot Platform to RTX Network processing (GREC)



# ASG-EUPOS system



**Curent status of ASG-EUPOS network:**  
**GUGiK has prepared hardware and software for calculation of network correction data from GPS, GLONASS, Galileo and Beidou.**





## Unfortunately Trimble NetR9 will not be able to track all Beidou III signals.

### Tracking and data formats

- The Alloy receiver can now track the new signals that are part of the third generation of Beidou satellites (B1C and B2A). B1C is on frequency 1575.42 MHz and B2A is on frequency 1176.45 MHz. The Beidou tracking option is required for this improvement. If you already have the Beidou upgrade for the Alloy receiver, please contact support (RTNS\_Support@trimble.com) to get a new key to track the Beidou Gen 3 B1C signal. B2A is already supported.

See table below for details.

Frequency	BDS Gen II	BDS Gen III	Receiver
B1I	✓	✓	NetR9/Alloy
B1C		✓	Alloy
B2I	✓		NetR9/Alloy
B2A		✓	Alloy
B3I	✓	✓	NetR9/Alloy

**NOTE** – Due to CPU limitations, NetR9 is unable to track B1C and B2A signals.

**NOTE** – The NetR9 receiver also supports B1I, B2I, and B3I signals.



# ASG-EUPOS system



**Curent status of ASG-EUPOS network:  
Since January 2019 we are providing new correction data  
streams:**

**RTN4G\_VRS\_RTCM32  
RTN4G\_VRS\_CMRx**

**and after user's feedback in March 2019 we have added:**

**RTN3G\_VRS\_RTCM32**

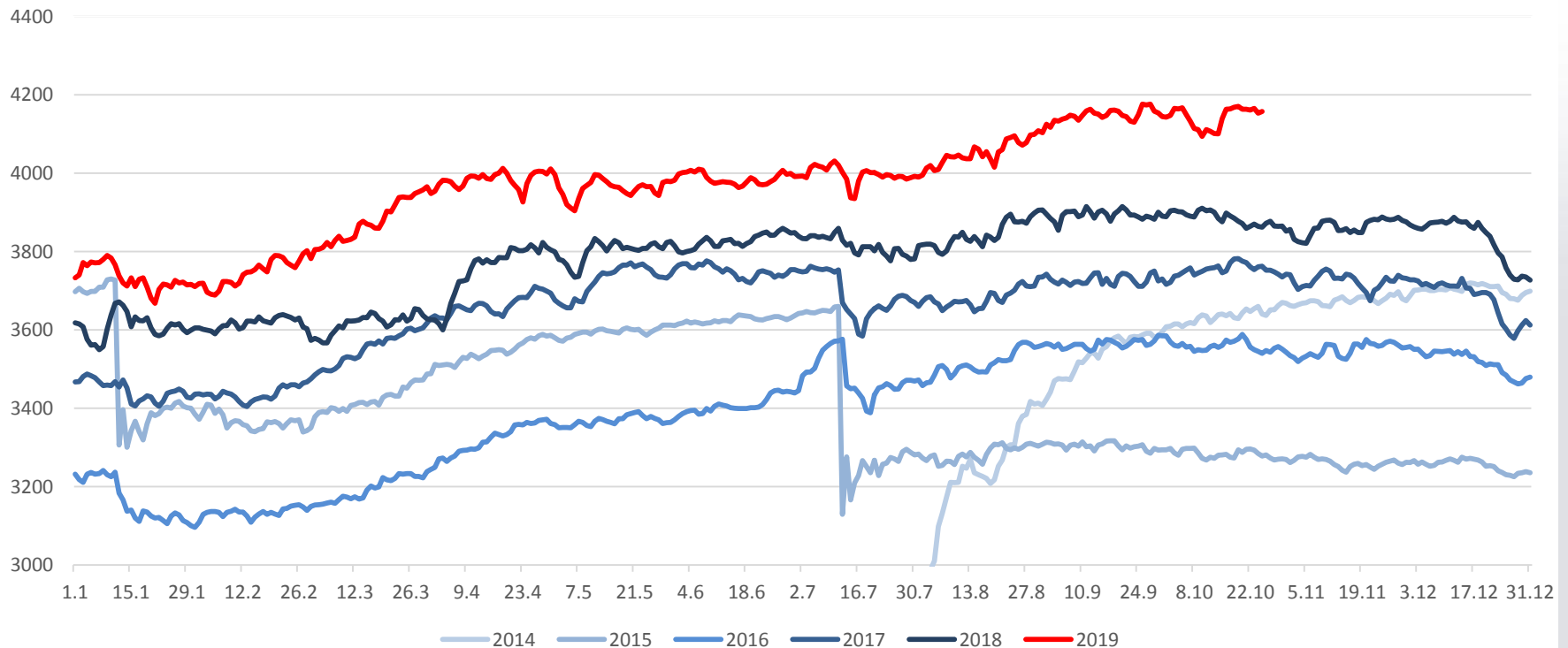
**Some problems with initialization time and getting fixed  
position. Under investigation**



Number of active users is still growing:

- ✓ In reference to 2018 we have 300 active subscriptions more
- ✓ In reference to 2015 we have 1000 active subscriptions more

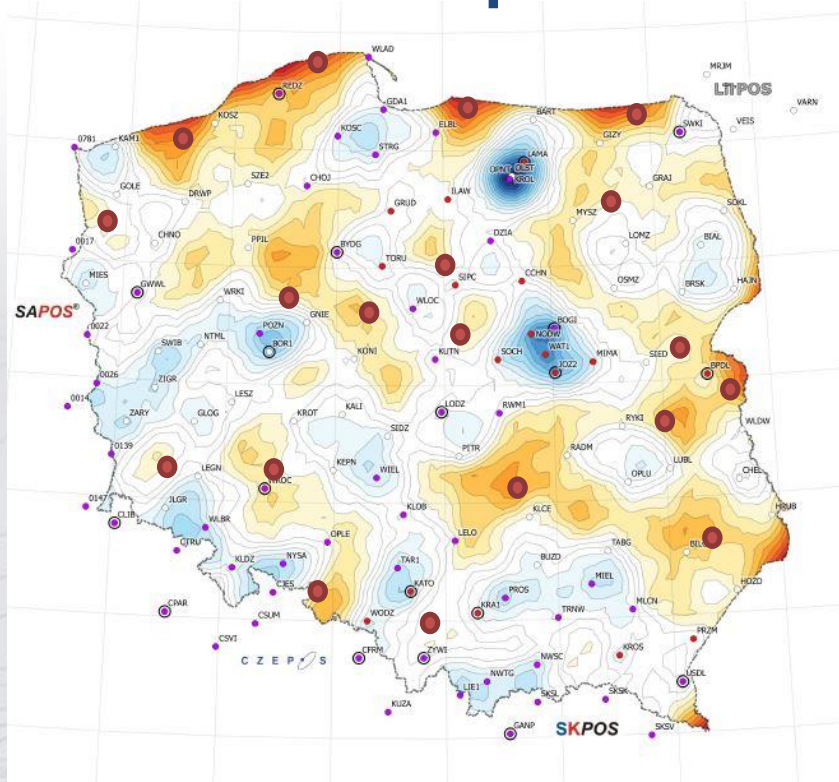
Number of active subscriptions year to year



# Future plans



- ✓ **Densification of the network in places where distances between stations are the highest.**
- ✓ **In 2018 new 19 sites were chosen and formally prepared for installation**
- ✓ **Installation is planned for 2020**

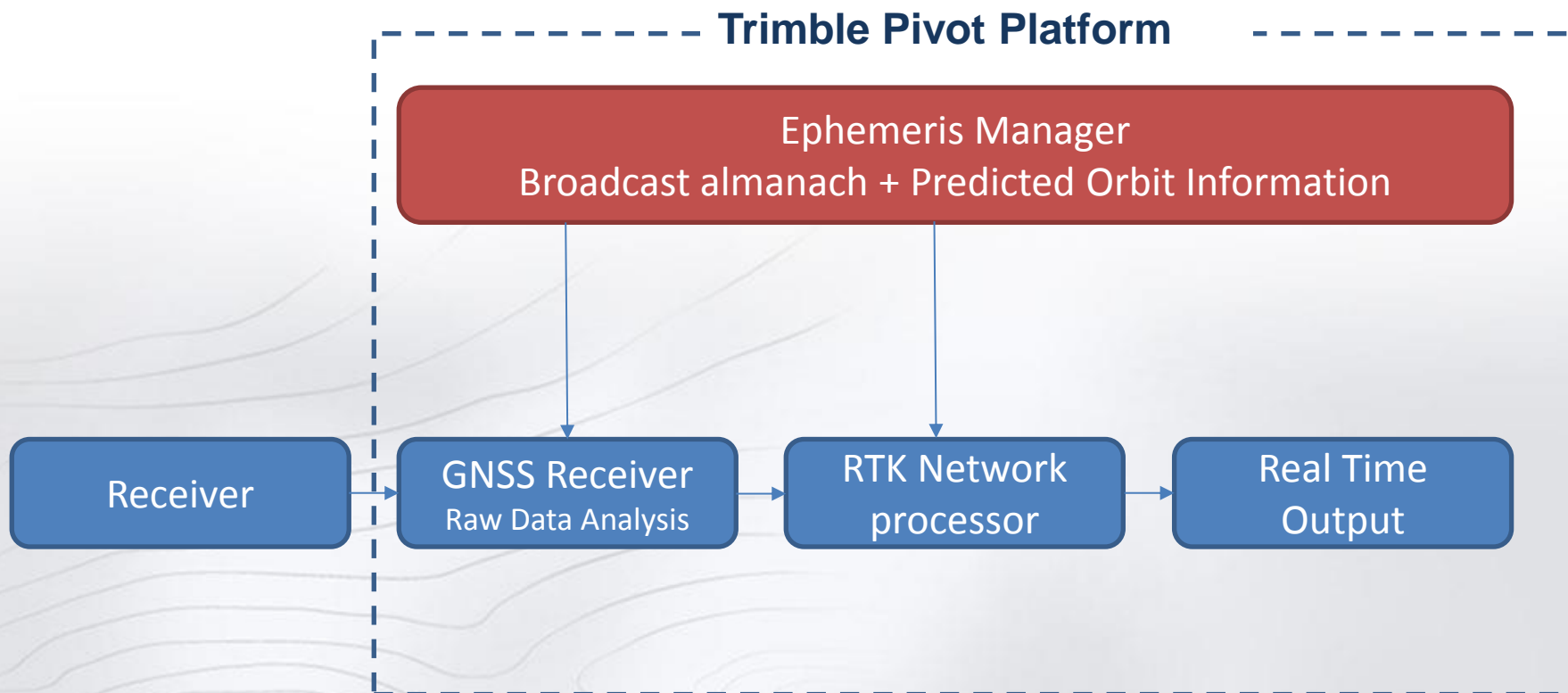


# Future plans

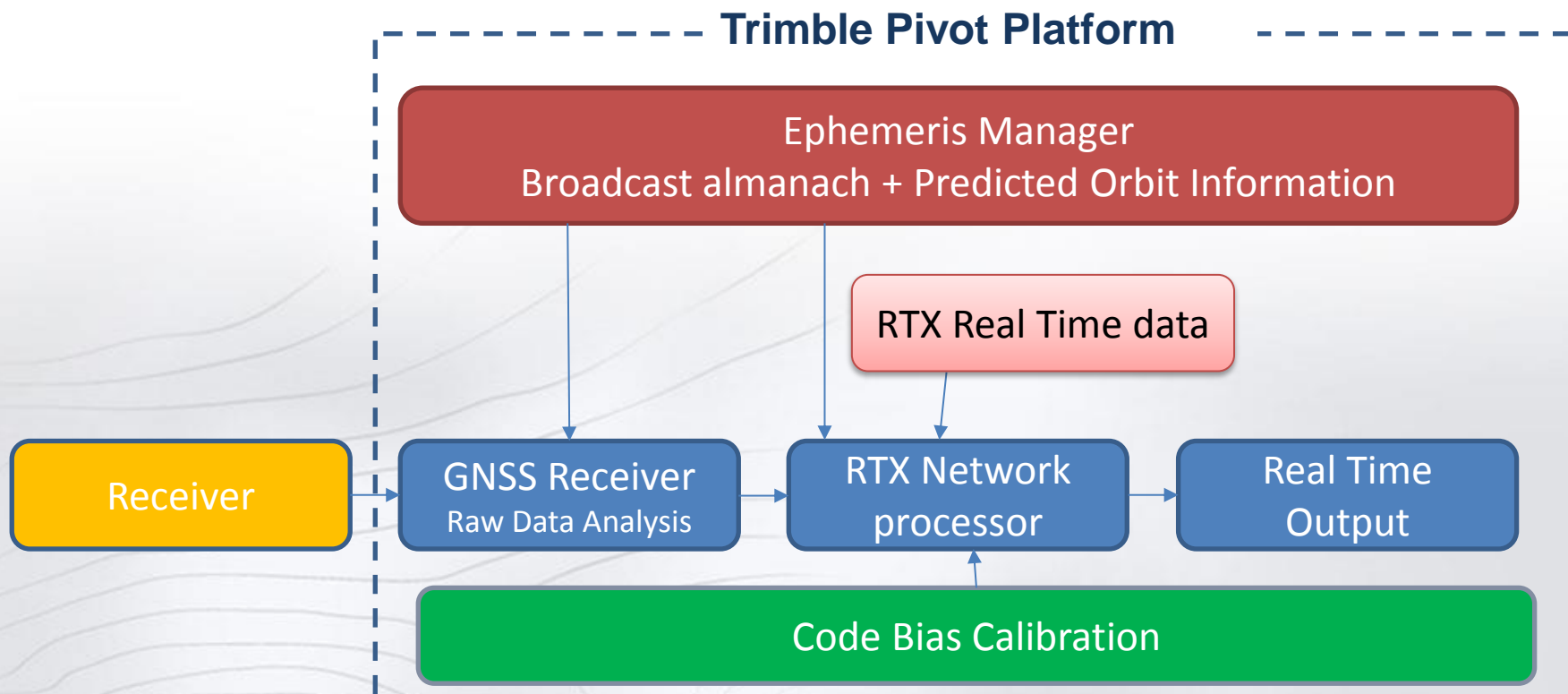


- ✓ **Exchange the hardware in MC:**
  - **One set of network hardware (switches and router) to Katowice MC**
  - **New servers dedicated for Trimble databases**
  - **Upgrade of data storage array (increase the capacity)**
  - **Reorganization in MC (removal of old servers)**
  - **Maintenance contract for network hardware**

- ✓ **Trimble Pivot Platform data flow**
- ✓ **Network RTK solution (only GR):**



- ✓ **Trimble Pivot Platform data flow**
- ✓ **Network RTK solution (GREC):**



# Galileo and Beidou implementation

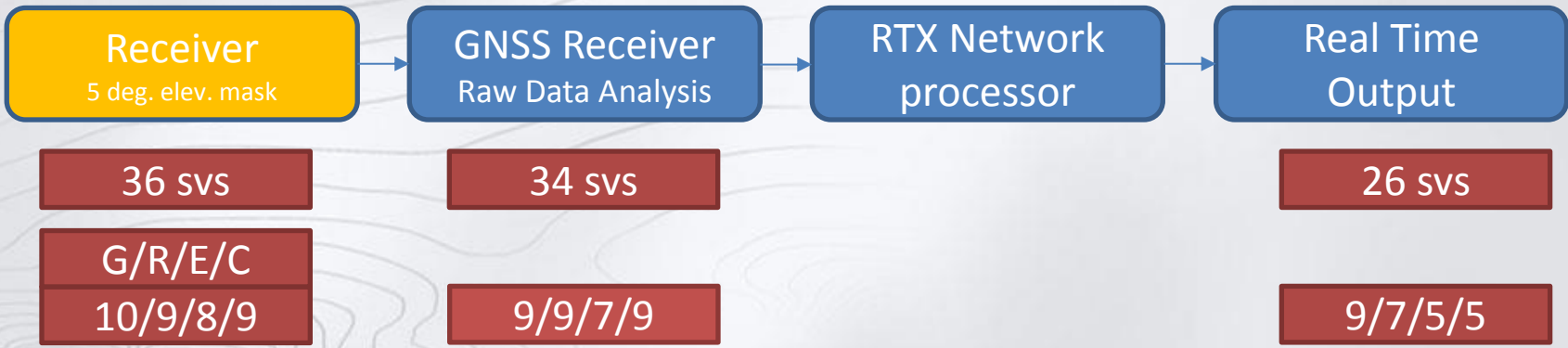
✓ Number of satellites decrease on each level of dataflow specially for Galileo and Beidou

## Satellites - General Information

	Tracked		Constellation	
	#	Satellites	#	Satellites
GPS	10	2, 3, 4, 6, 7, 9, 16, 22, 23, 26	31	1, 2, 3, 5...17, 19...32 Unhealthy: 4 Ignore Health: 1...32
GLONASS	9	5, 6, 7, 9, 15, 16, 21, 22, 23	24	1, 2, 3, 5...24 Unhealthy: 4 Ignore Health: 1...24
Galileo	8	3, 5, 8, 13, 15, 24, 25, 31	23	1...5, 7, 8, 9, 11, 12, 13, 19 Unhealthy: 14, 15 Ignore Health: 1...36
QZSS	0		4	193, 194, 195, 199 Ignore Health: 193, 194, 19 Disabled: 196, 197, 198, 20
BeiDou	9	5, 7, 9...12, 19, 21, 22	28	1...14, 16, 19...30 Unhealthy: 17 Ignore Health: 1...30
SBAS	0			

Sat	El [°]	Az [°]	CAP1:EI/BI/S1	L2/L2C/L2CA	L5/E5A-E5B	E6/B3	SNR
C02	5	109	-	-	-	-	-
C05	20	132	-/-/-/641	-	-/-/-/-/641	-/-/641	-
C07	23	62	-/-/-/6581	-	-/-/-/-/6576	-/-6576	-
C09	15	71	-/-/-/828	-	-/-/-/-/828	-/-828	-
C10	26	91	-/-/-/829	-	-/-/-/-/829	-/-829	-
C11	16	314	-/-/-/829	-	-/-/-/-/829	-/-829	-
C12	10	238	-/-/-/815	-	-/-/-/-/815	-/-815	-
C19	32	105	-/-/-/21748	-	-	-/-21748	-
C21	36	291	-/-/-/6299	-	-	-/-6294	-
C22	85	48	-/-/-/14900	-	-	-/-14900	-
C34	18	288	-	-	-	-	-
C36	48	128	-	-	-	-	-
E03	81	314	-/-/13784	-	-/13784/13784/13784	-	-
E05	39	82	-/-/21585	-	-/21585/21585/21585	-	-
E08	29	272	-/-/5154	-	-/5817/5817/5817	-	-
E13	30	300	-/-/6043	-	-/7051/7051/7052	-	-
E15	33	238	-/-/15895	-	-/15895/15895/15895	-	-
E24	32	70	-/-/6048	-	-/7033/7034/7034	-	-
E25	27	130	-/-/2586	-	-/2586/2586/2586	-	-
E26	1	342	-	-	-	-	-
E31	8	23	-/-/251	-	-/9092/9092/9092	-	-
G02	29	307	3609	3609	-	-	29
G03	29	123	19871	19871/21092	-	-	33/4
G04	56	258	7256	7256/8243	-	-	41/5
G06	49	254	9291	9291/10301	-	-	43/5
G07	35	186	4749	4434/4784	-	-	35/4
G09	82	288	10727	10727/11231	-	-	50/5
G16	16	76	1089	824	-	-	18
G22	10	126	134	134	-	-	19
G23	61	68	14857	14857	-	-	41
G26	15	48	5176	5176/5923	-	-	22/3
G29	0	359	-	-	-	-	-
G30	5	201	94	87/90	-	-	15/3
ins	0	0	0	0	-	-	-

Login	Dela	Ref St.	# Sat	GPS Satellites	GLN Satellites	GAL Satellites	BDS Satellites
gugik/aw	0.0	WODT	26	G02, G03, G06, G07, G09, G16, G22, G23, G26	R05, R07, R15, R16, R21, R2...	E03, E05, E08, E24, E25	C05, C07, C09, C10, C11





- ✓ **ASG-EUPOS is modernized to track and generate Network RTK correction data from Galileo and Beidou**
- ✓ **Trimble NetR9 receivers does not fully support Beidou III**
- ✓ **Densification and modernization of ASG-EUPOS will be continued**
- ✓ **First feedback from users of 4GNSS correction data streams is low number of satellites and sometimes long time to first fix**



*Thank for your attention ...*

[www.eupos.org](http://www.eupos.org)

[www.asgeupos.pl](http://www.asgeupos.pl)

[www.gugik.gov.pl](http://www.gugik.gov.pl)

**Contact:**

Head Office of Geodesy and Cartography  
Department of Geodesy, Cartography and  
Geographic Information Systems

Wspolna 2 Str., 00-926 Warsaw, Poland

Phone +4822 6618265

+4822 6618038

E-mail [biuro.eupos@gugik.gov.pl](mailto:biuro.eupos@gugik.gov.pl)