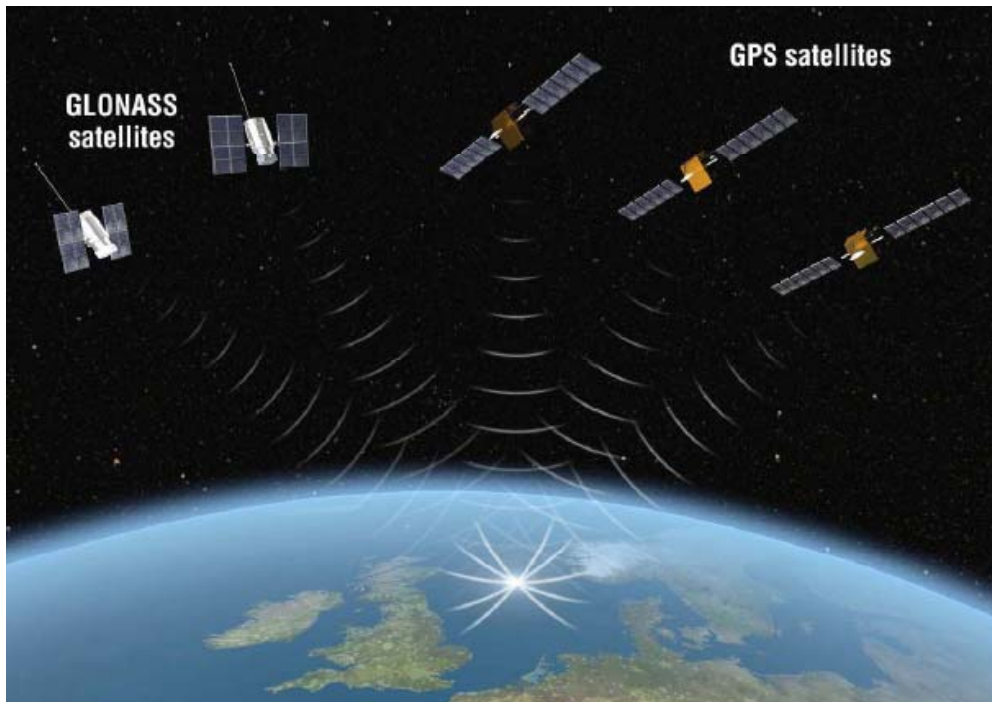




Fugro SeaSTAR<sup>®</sup>

## Real-time GPS and GLONASS processing: the G2 service

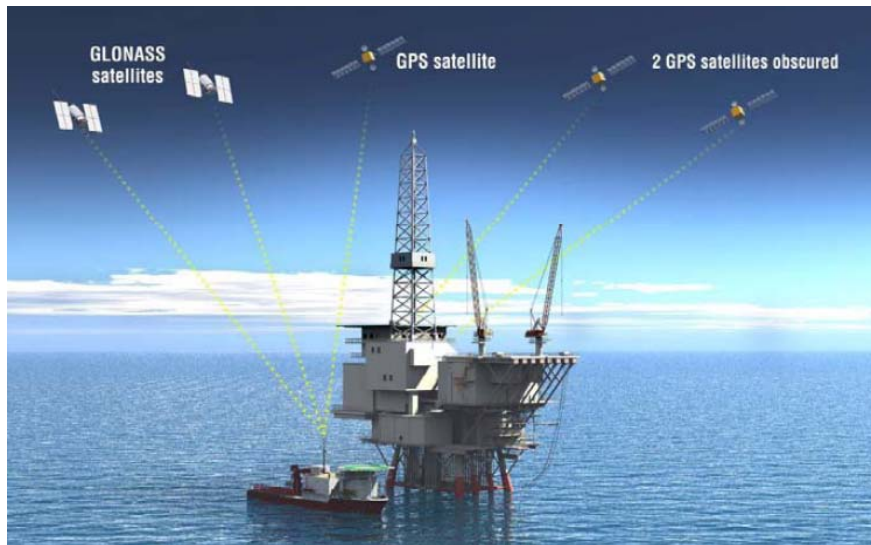


J. Tegedor, L. Agrotis  
F. Pereira, R. Zandbergen  
T. Melgard, E. Vigen

IGS Workshop 2010  
Newcastle  
29 Jun 2010

What is G2?

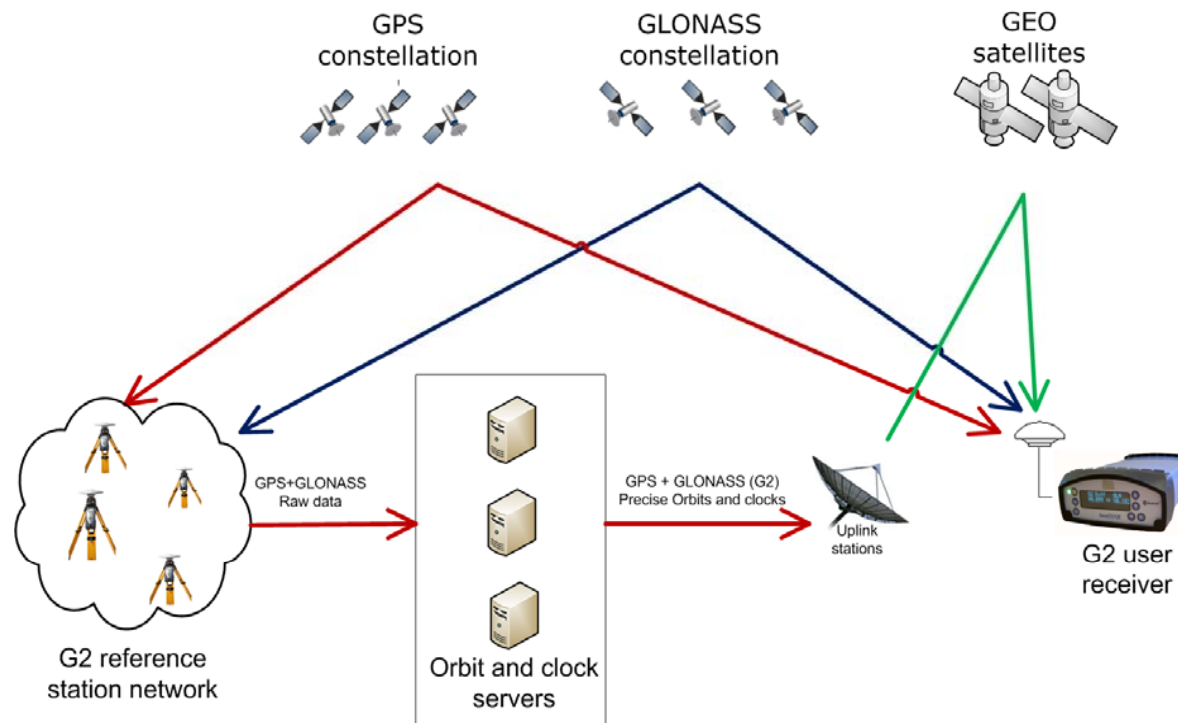
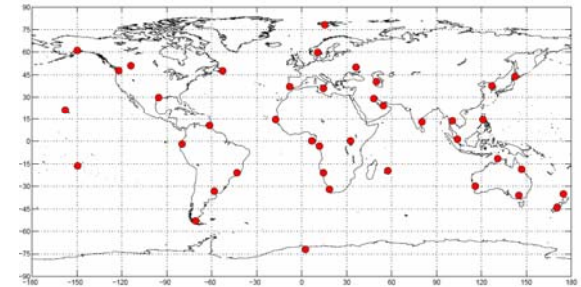
- Commercial augmentation system designed to provide worldwide high accuracy positioning using both GPS and GLONASS
- System developed by Fugro Seastar in cooperation with ESA/ESOC
  - Fugro expertise in real-time navigation
  - ESA/ESOC expertise in high accuracy GNSS processing



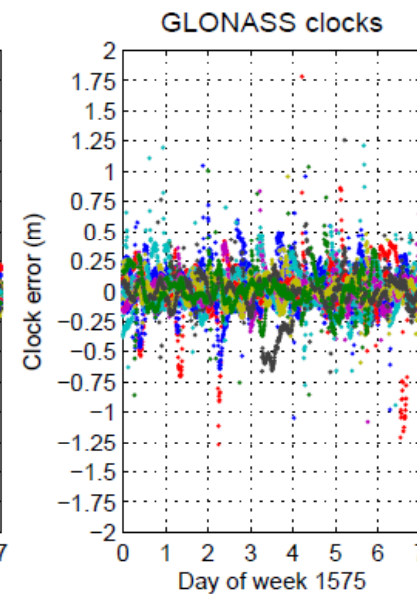
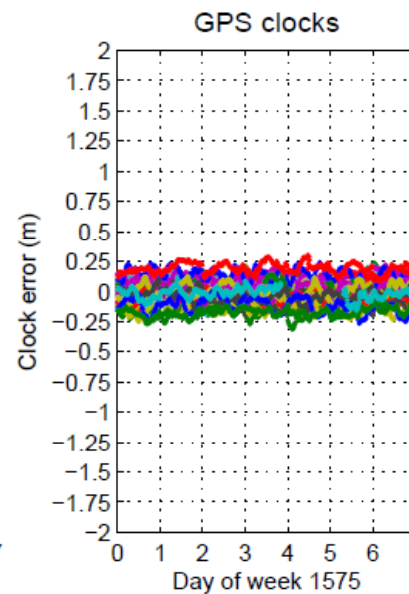
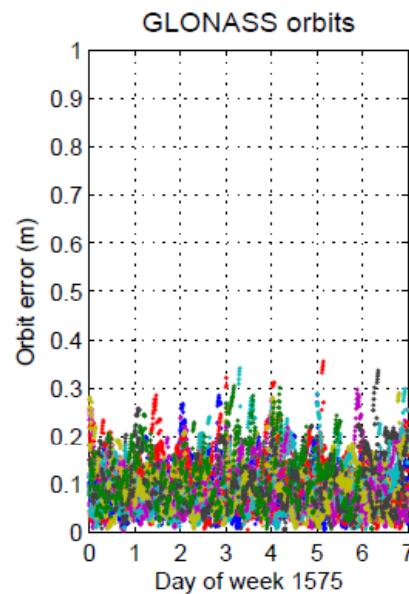
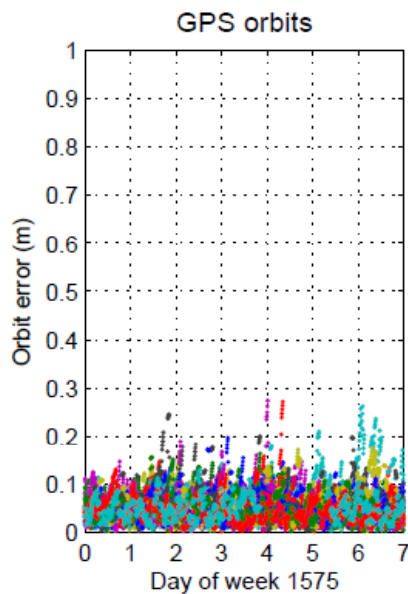
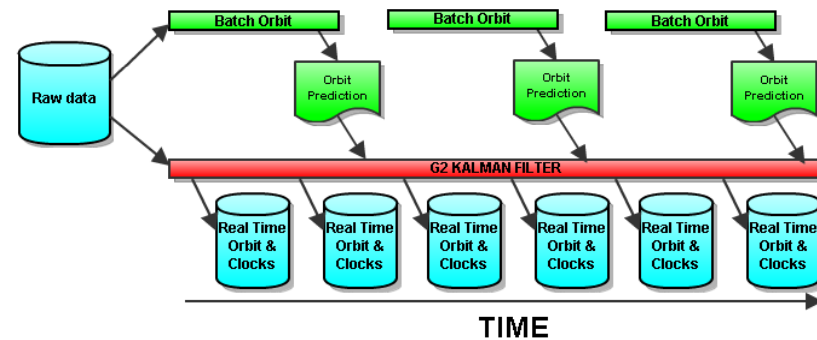
- System fully operational since 2009
- High availability and robustness
- More than 50 satellites used for precise positioning!

## System elements:

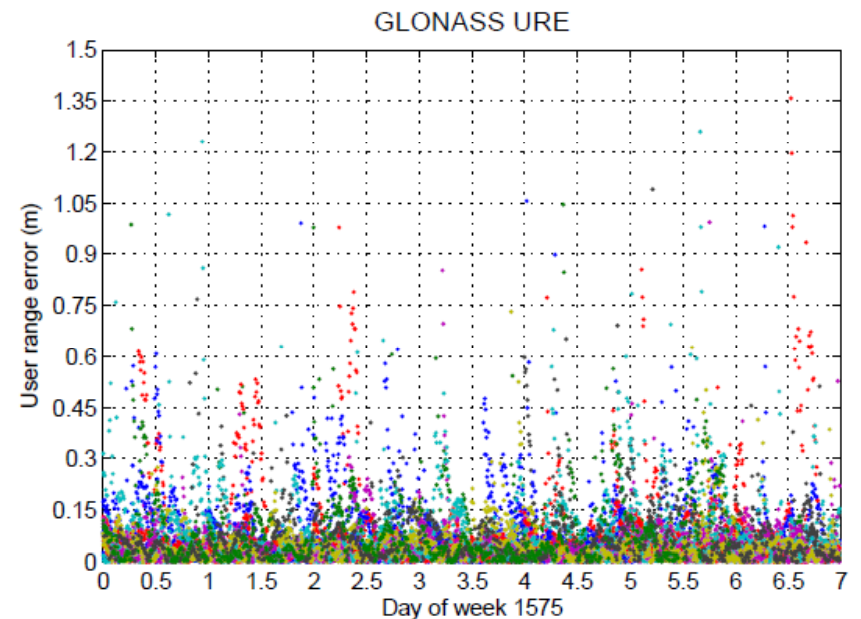
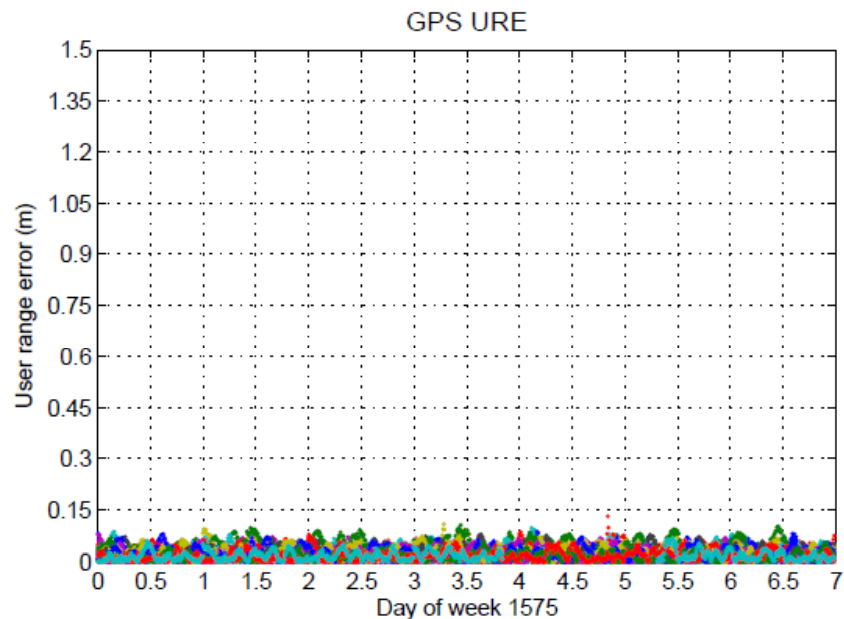
- Dedicated dual-frequency reference station network
- Orbit & Clock processing servers
- Uplink stations
- Signal broadcast over 10 geostationary satellites
- G2 user receiver: combines GPS, GLONASS and G2 corrections



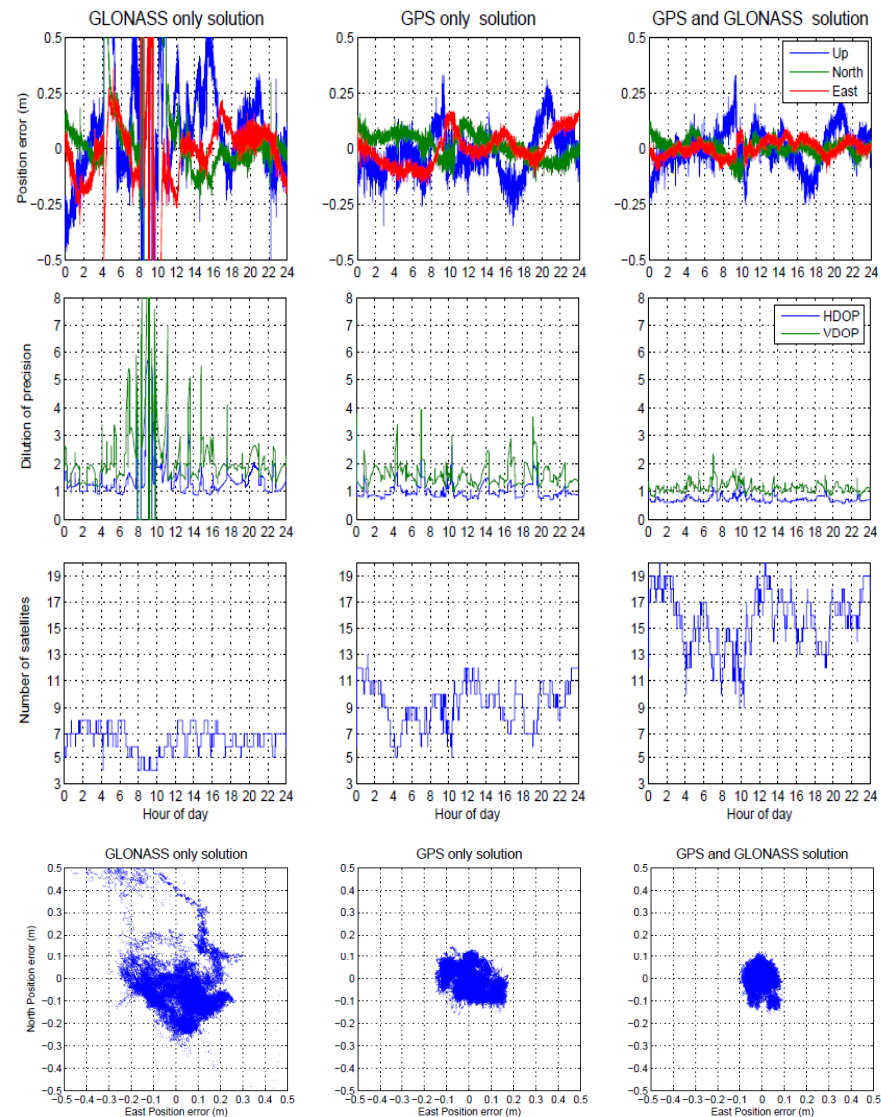
- G2 corrections are the result of:
  - Batch orbit process
  - Real-time Kalman Filter
- Accuracy of real-time G2 orbit and clocks (compared against ESA IGS final products):



- From the user standpoint, the accuracy of both orbit and clock in the range domain is determining the final position accuracy (URE=user range error)
- User range error of G2 real-time orbit-clocks compared with ESA IGS final products:



- Real-time system performance for a G2 receiver located at Oslo (6<sup>th</sup> June 2010):
  - The accuracy of GLONASS only kinematic PPP solution is remarkable, despite of lack of coverage some parts of the day
  - GPS and GLONASS combined offers the best possible solution, due to enhanced geometry and satellite visibility
- Horizontal accuracy GPS and GLONASS 95% < 10 cm





**Thank you for your attention!**

**For further information, please visit:**

**<http://www.fugroseastar.no>**