



# **GGSP: Geodetic Contribution to the Galileo System**

**W. Söhne, G. Gendt, M. Rothacher**



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# GGSP Prototype Consortium



# GFZ

POTSDAM



**ESOC**  
OPERATIONS  
CENTRE  
FOR THE  
EUROPEAN  
SPACE AGENCY



Natural Resources  
Canada

Ressources naturelles  
Canada



# GGSP Prototype Team



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- **6<sup>th</sup> Framework Programme of the EC**
  - **“Community activities in the field of research, technological development and demonstration”**
  - **2002-2006**
  - **17500 million Euro**
- **Thematic area “Aeronautics and Space”, 1075 million Euro**
- **Topic “Galileo – development of multisectoral systems, equipment, tools and user equipment”**



# Background



- **6<sup>th</sup> Framework Programme of the EC**
- **Galileo 6FP 2nd Call in June 2004**
  - **66.9 million Euro**
  - **Area 2 “Mission definition and implementation”**
  - **Call 2420 “Implementation of Galileo Geodetic Service Provider Prototype”**



# Background



## **Statement of Work (SoW):**

**“ (...) In order to benefit from this extensive level of existing expertise in the geodetic community, Galileo will refer to an external entity called the GGSP for a number of geodetic functions.”**

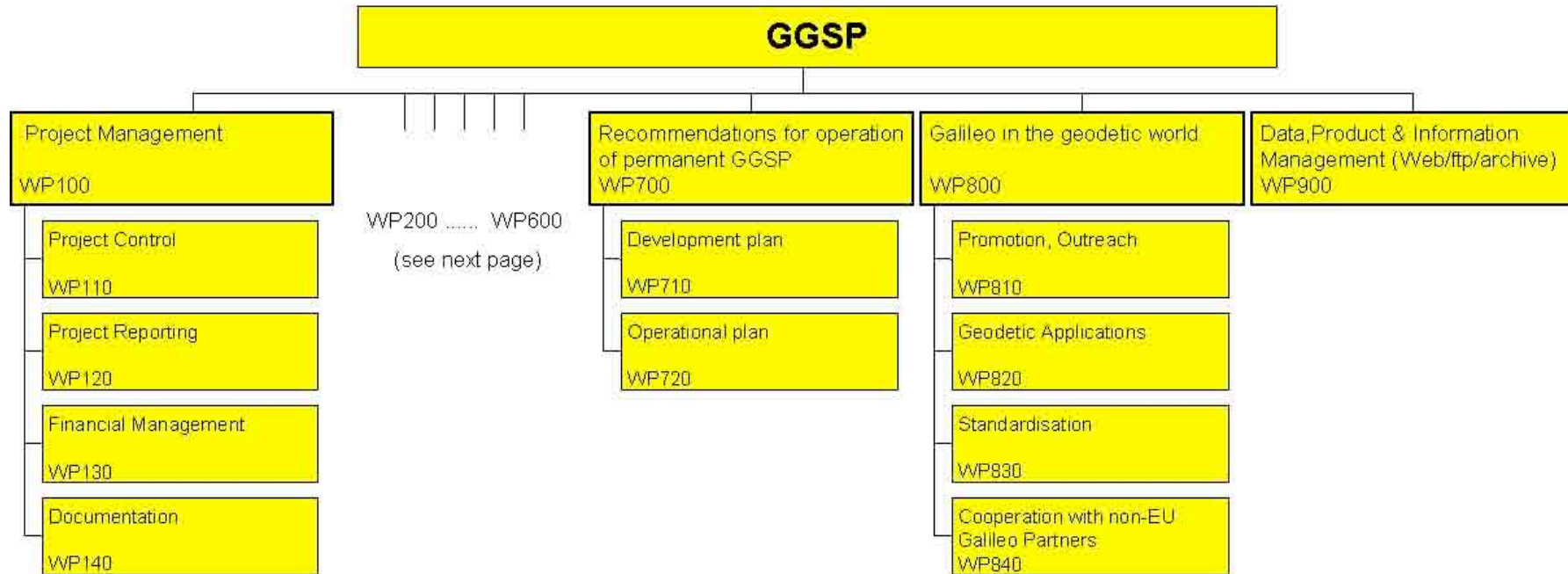


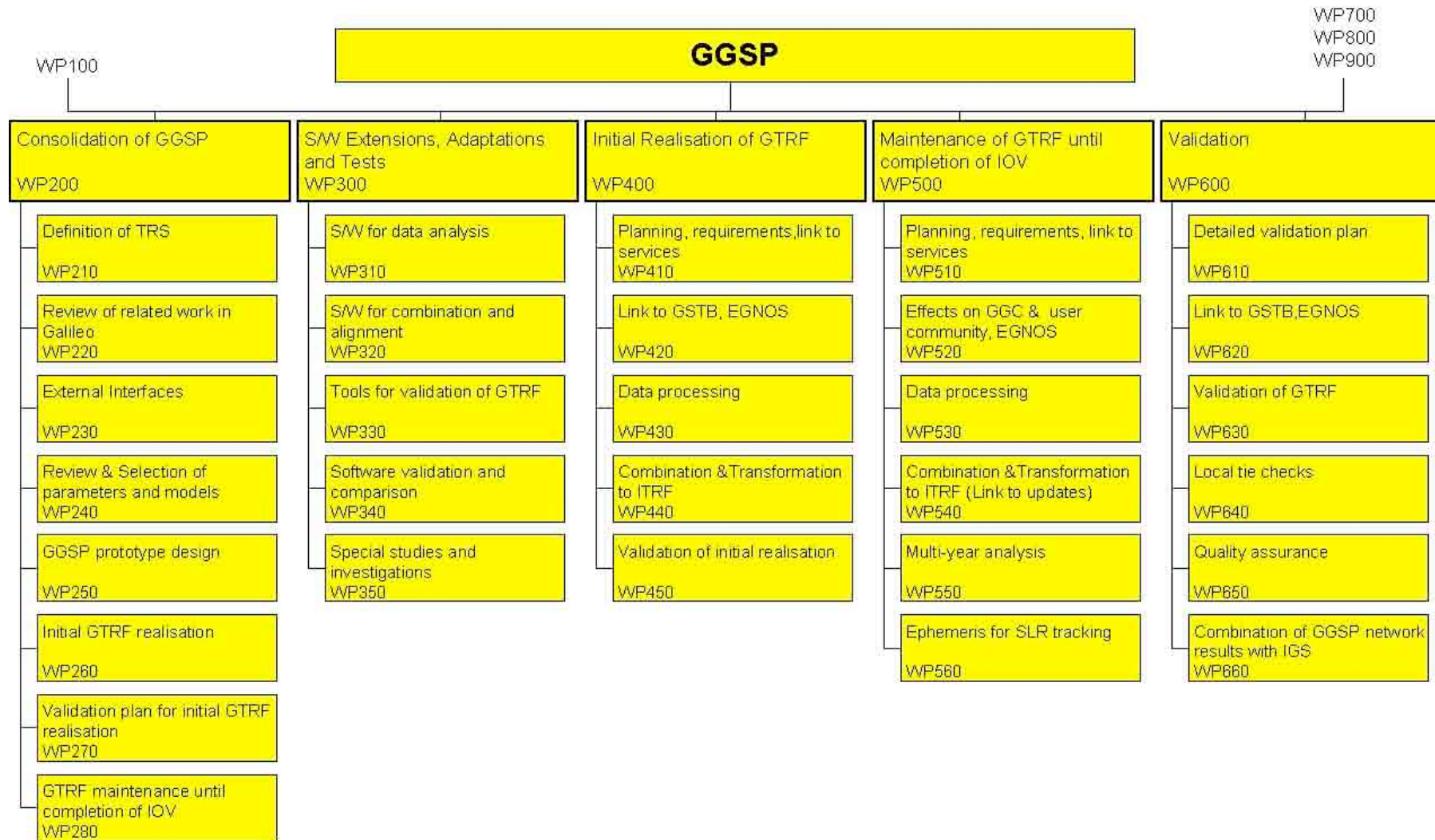
# Background

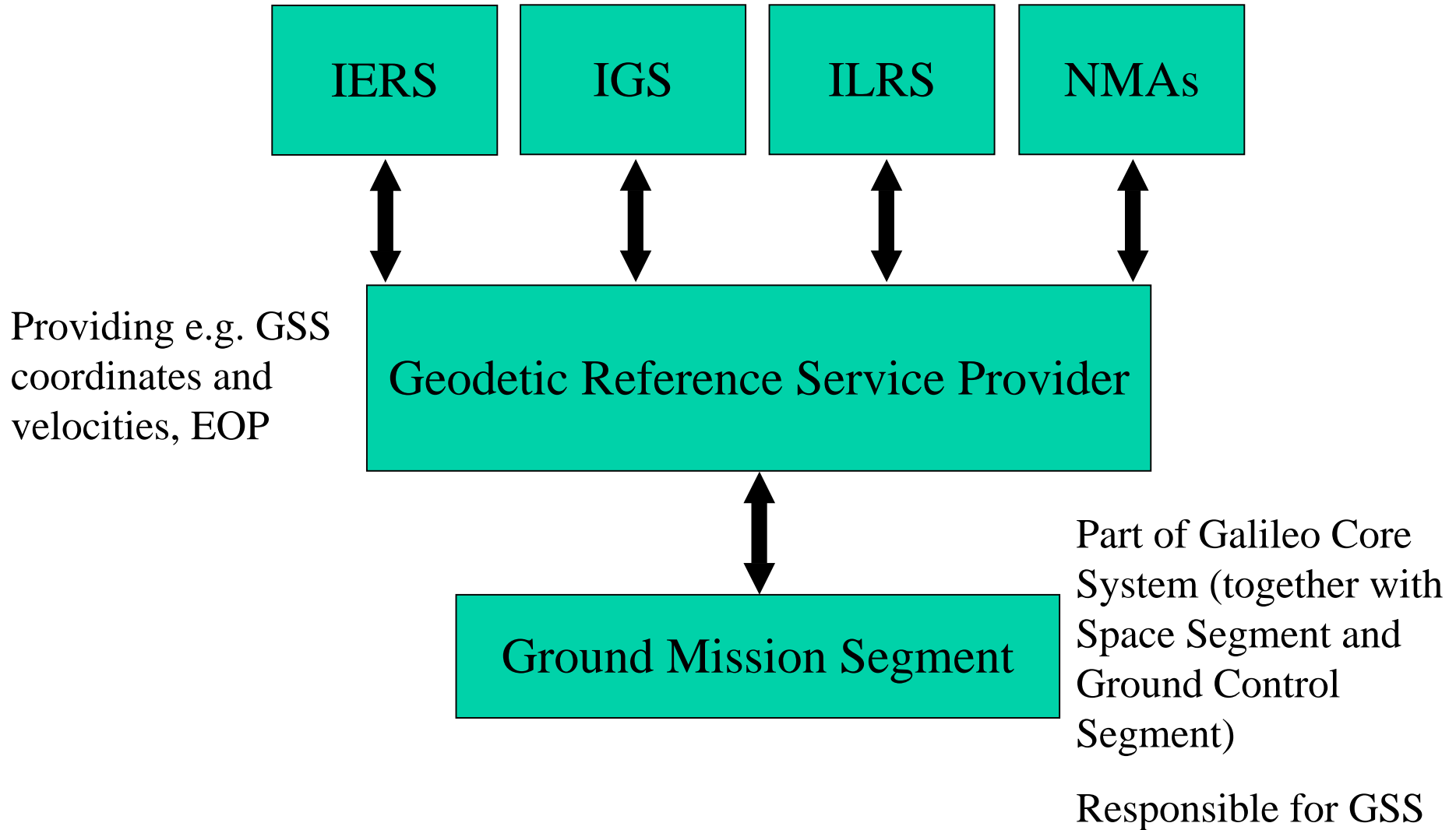


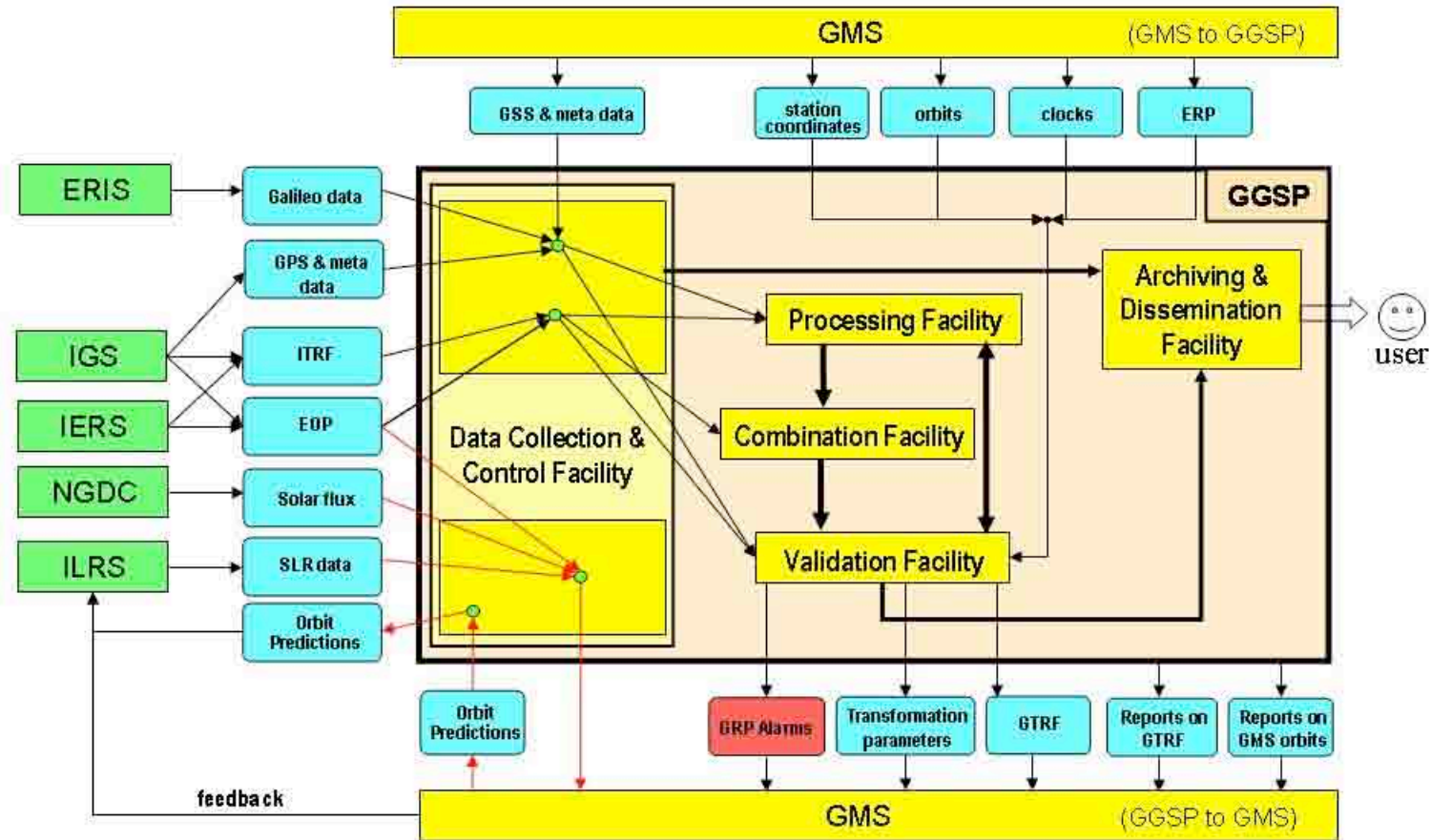
- **Development of Galileo Terrestrial Reference Frame and establishment of service with products and information for potential users**
- **Main actions of GGSP Prototype:**
  - **GTRF Definition**
  - **GTRF Realization**
  - **GTRF Maintenance**
  - **GTRF to IERS Link**
  - **Galileo to ILRS Link**
- **Contract with Galileo Joint Undertaking**
- **Start (“Kick-Off”) July 2005**









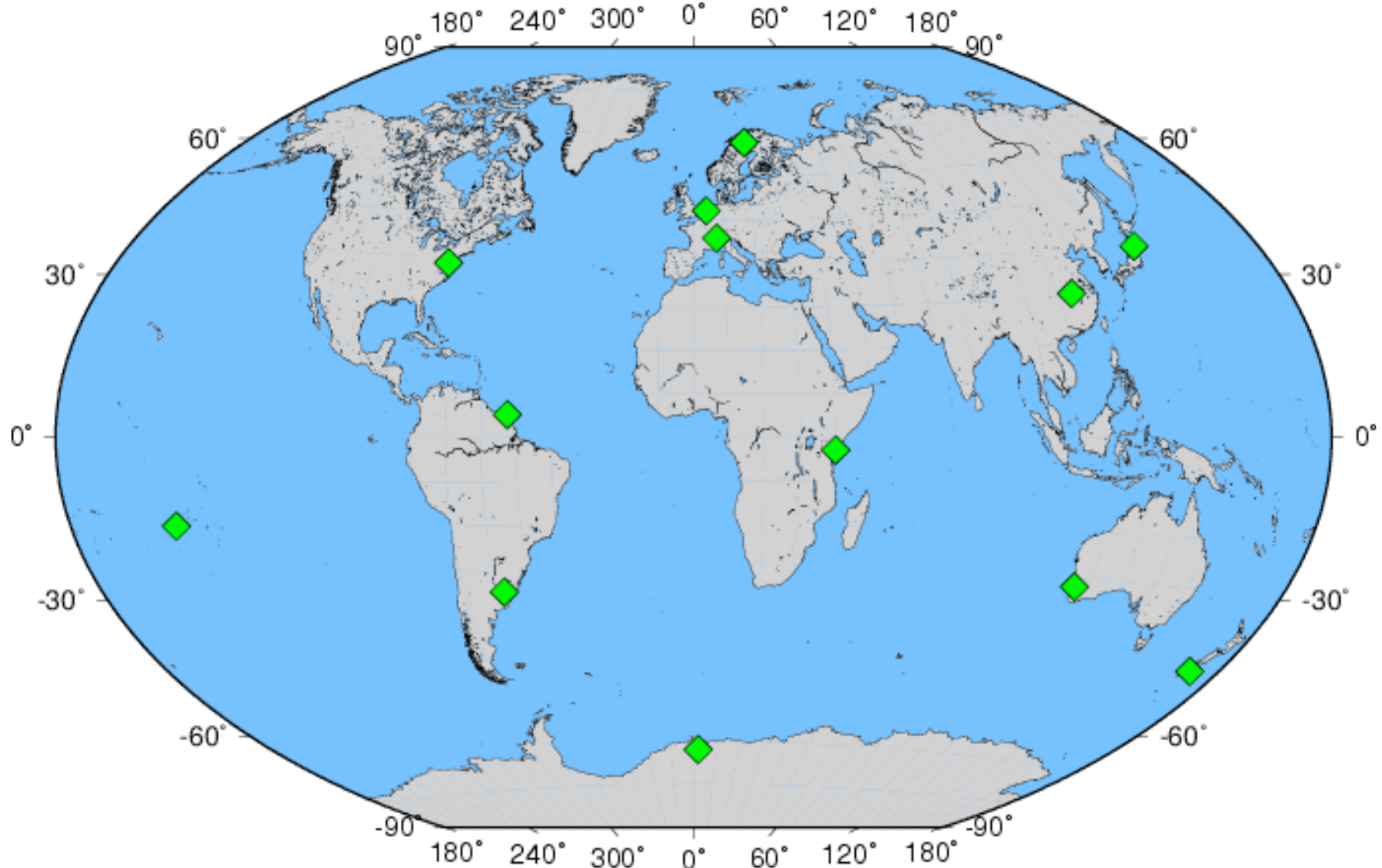


- **Core network for GTRF realization: Galileo Sensor Stations (GSS)**
- **Additional sites to fill gaps, e.g. from IGS**
- **Galileo Terrestrial Reference Frame to be consistent within 3 cm (2 sigma) to ITRF**
- **Final distribution of Galileo Sensor Stations (GSS) still under examination**
- **First stage of GTRF realization with GPS only**

## ➤ Galileo Sensor Station (GSS)

- The Galileo Sensor Station is in charge of obtaining the Signal In Space observables for Navigation and Integrity
- Various requirements concerning e.g. receivers, clocks, network, power supply etc.
- Planned GSS: 18 for IOV + 22 for FOC
- 5 at TT&C/ULS/GSS, 4 at ULS/GSS, 31 at GSS

## GSTB-V2 site distribution



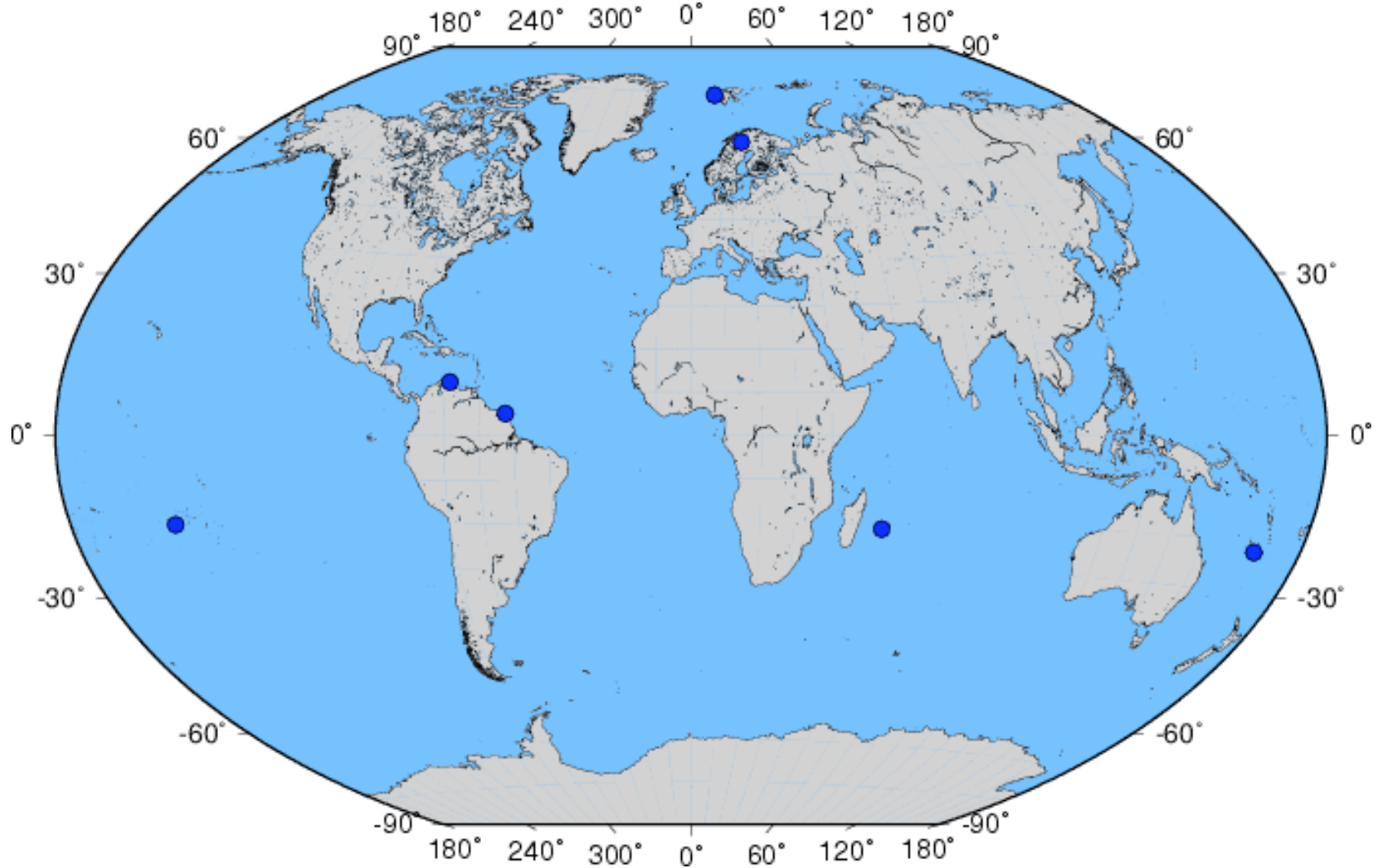
**GSTB stations only used for testing of interfaces etc.**



# GTRF

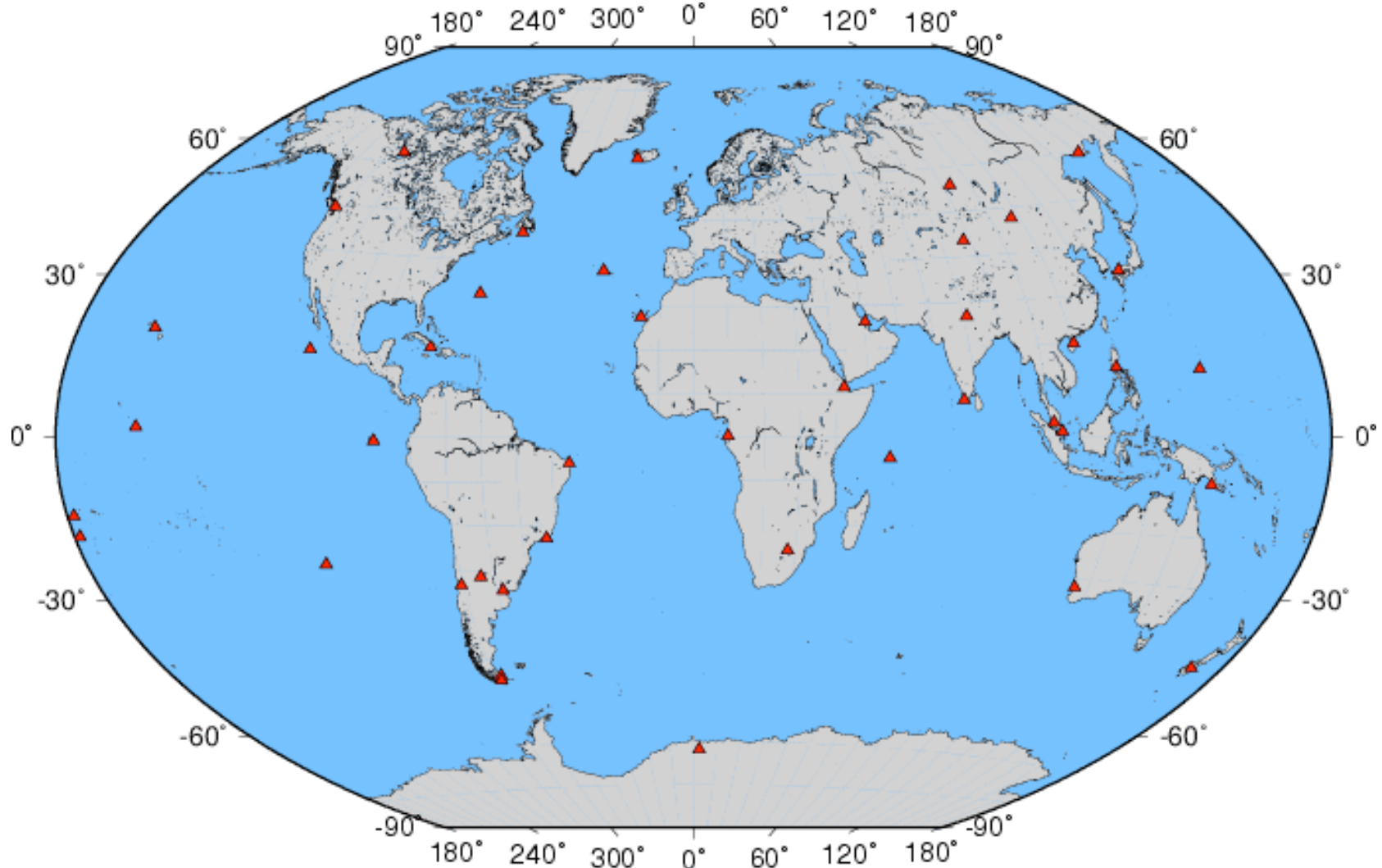


## Uplink Stations (ULS)



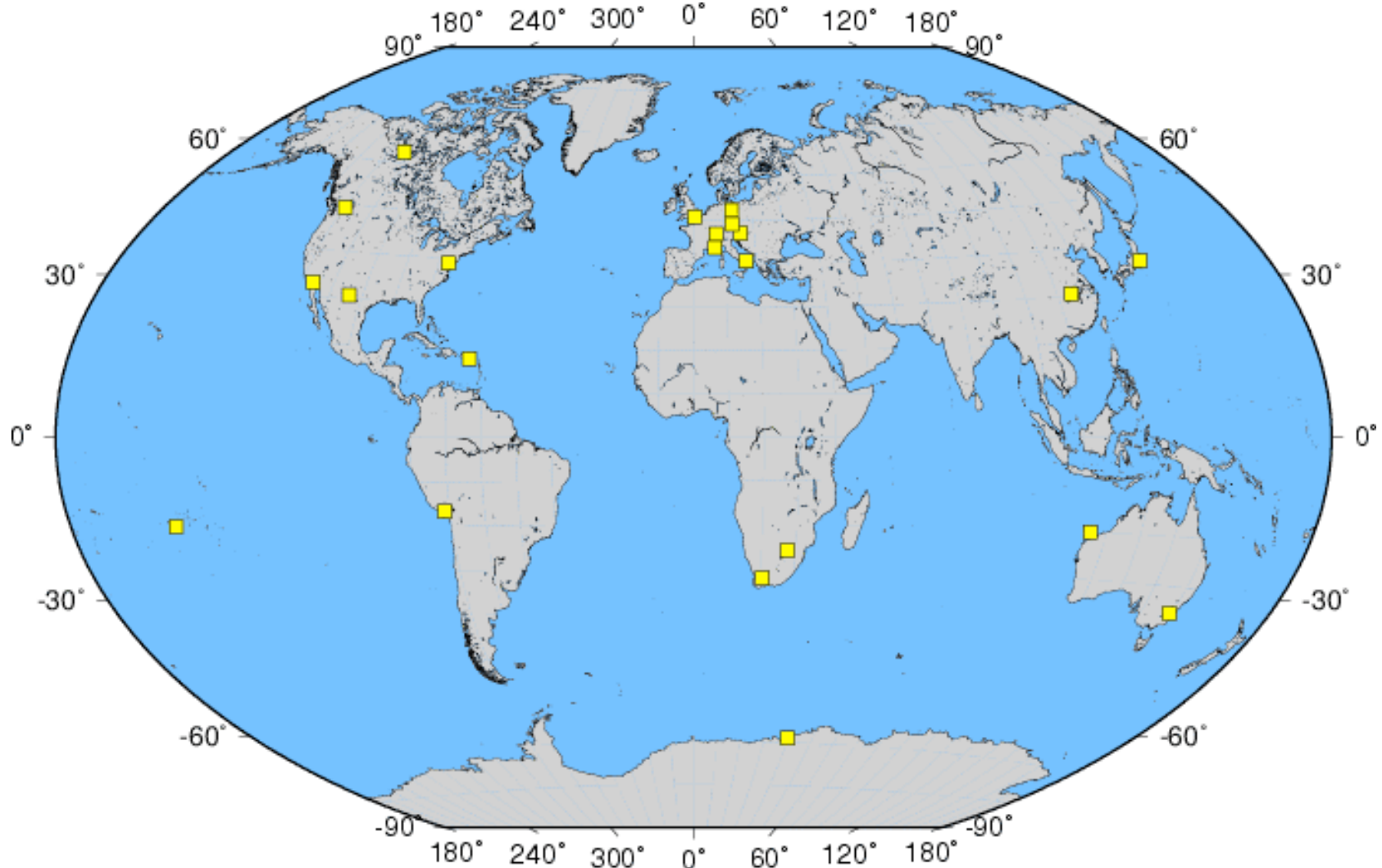


## Potential Galileo Sensor Stations (GSS)



## Number and distribution of GSS still in construction

## SLR Stations (ILRS)



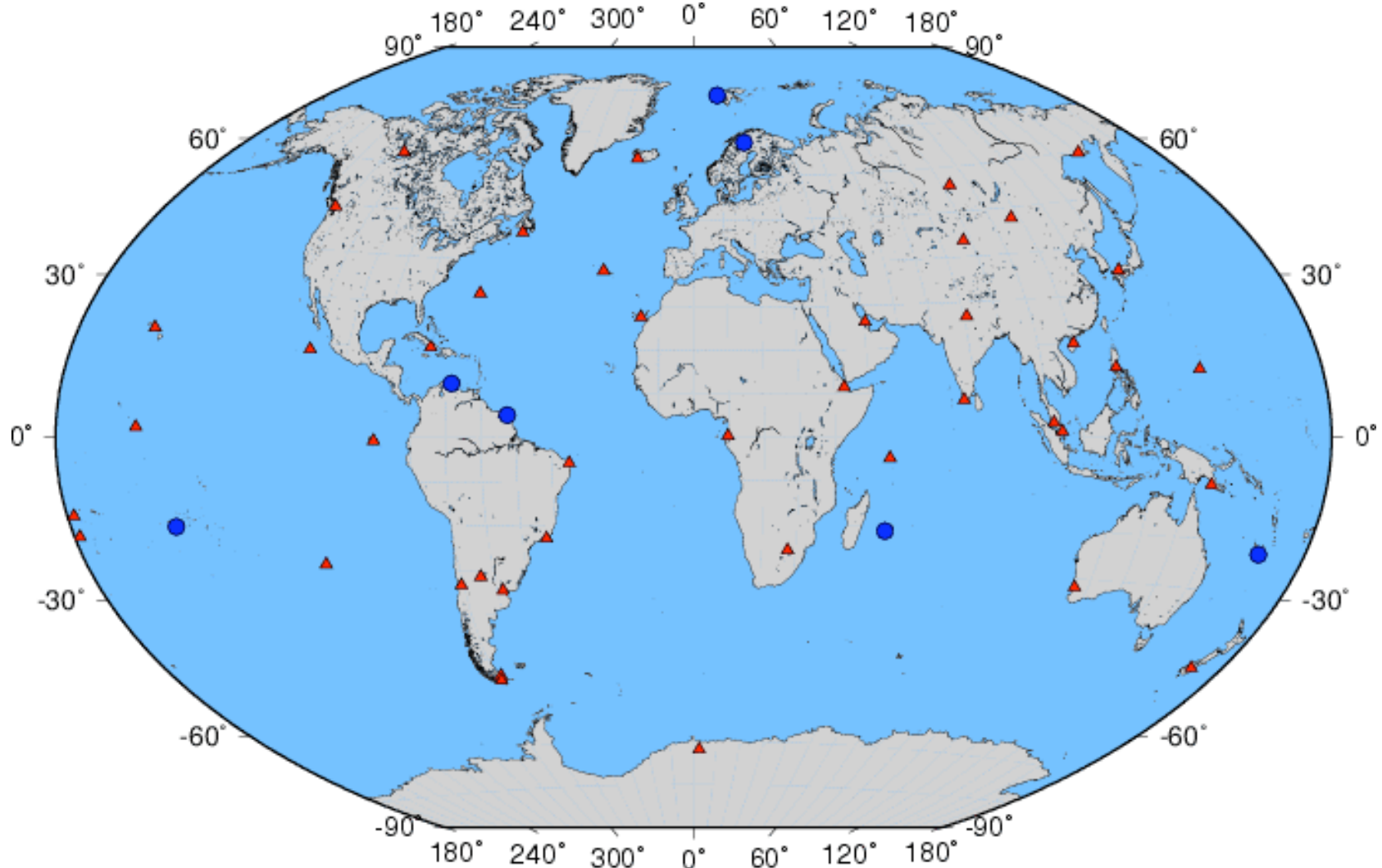
**Only stations co-located (at least) with GPS**



# GTRF



## ULS + GSS



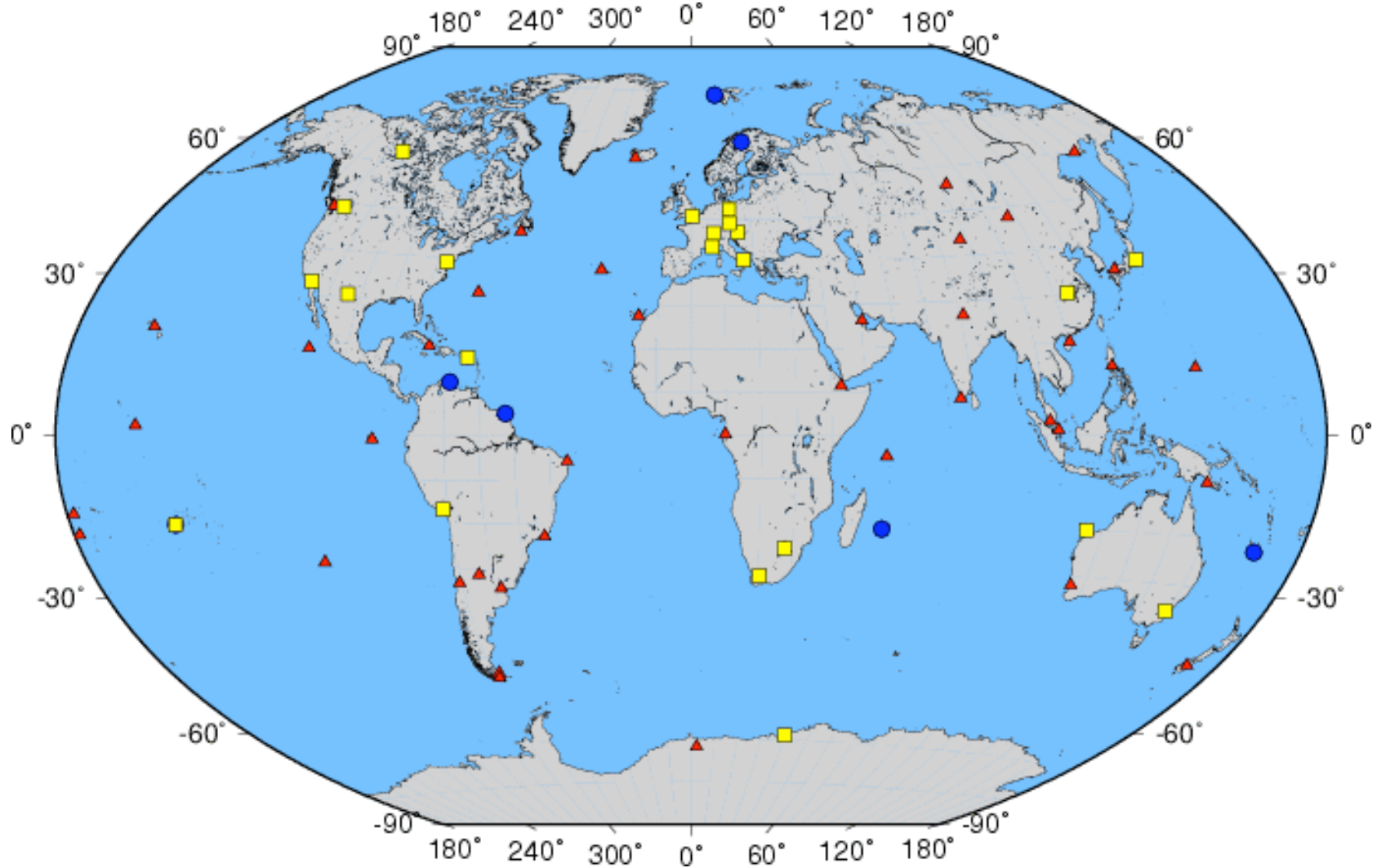
**GSS not available for initial realization replaced by nearby IGS**



# GTRF



## ULS + GSS + ILRS

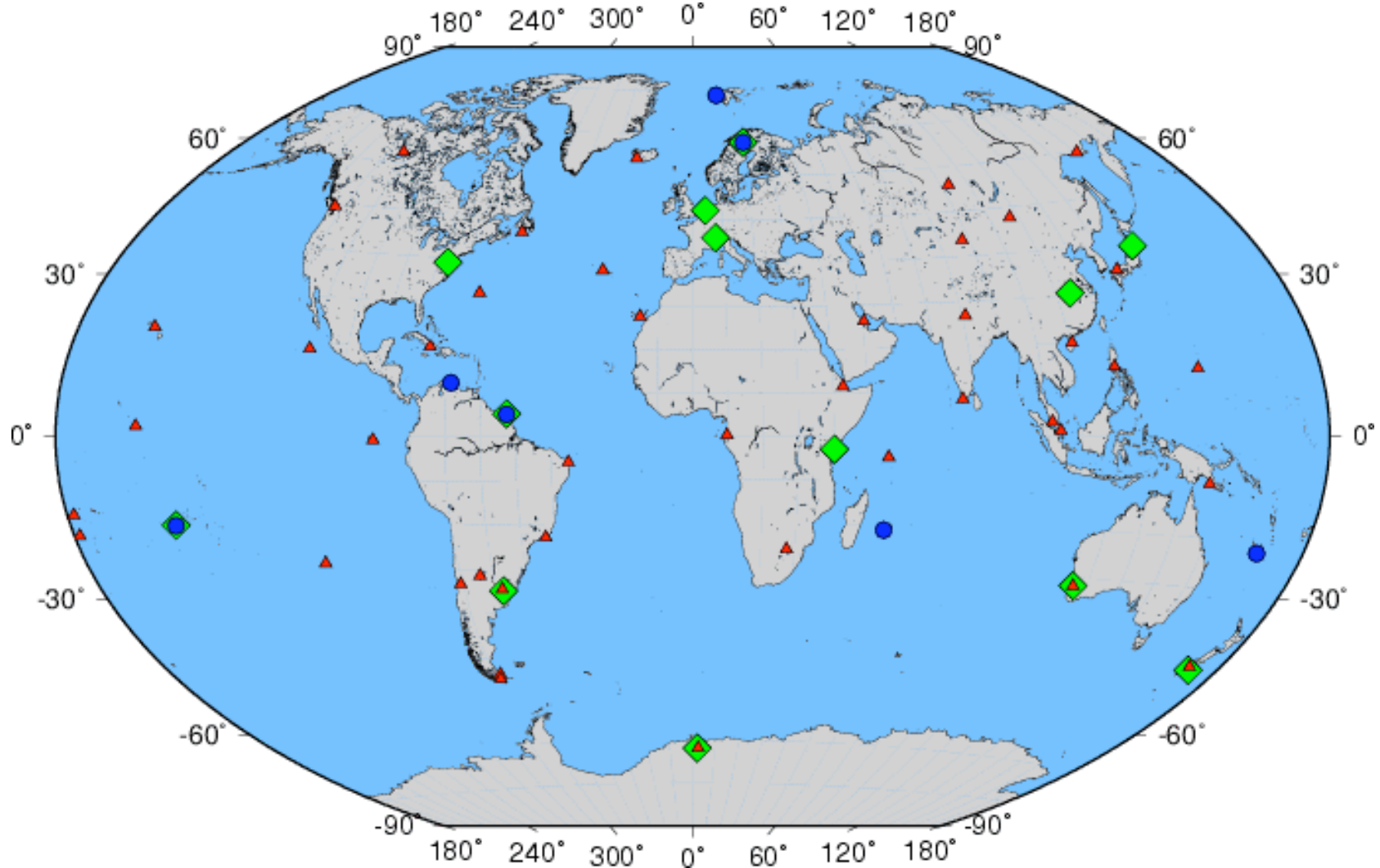


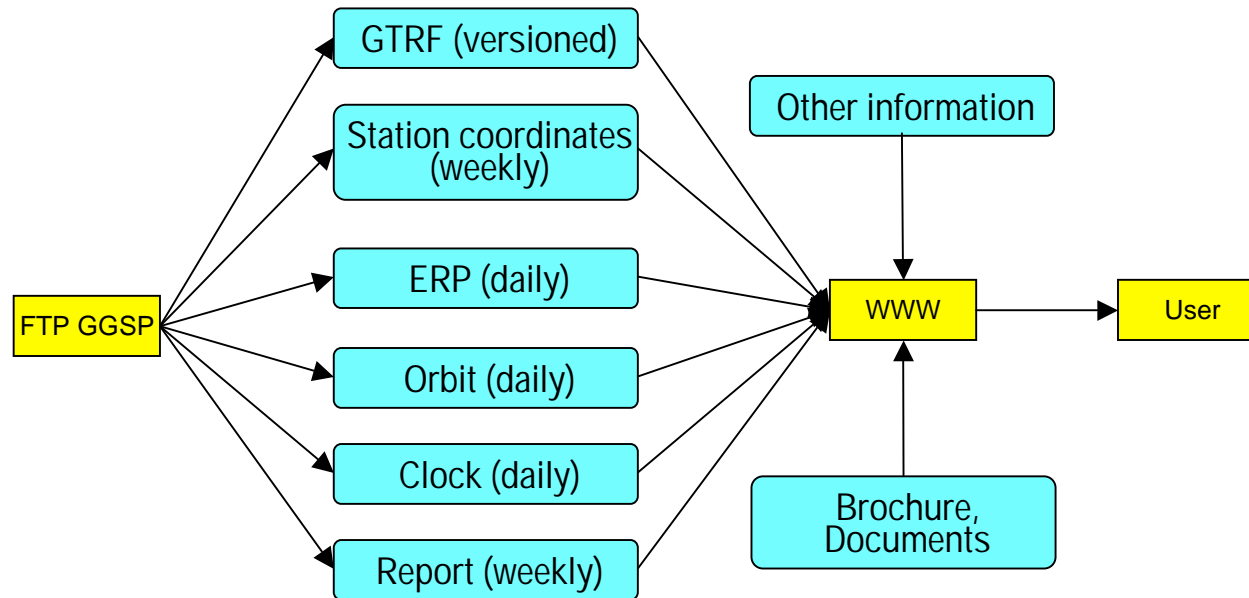


# GTRF



## GSTB + ULS + GSS







# GGSP Products



GGSP - The Galileo Geodetic Service Provider Prototype - Microsoft Internet Explorer

Datei Bearbeiten Ansicht Favoriten Extras ?

Zurück Suchen Favoriten Wechsell zu Links

Adresse [http://ggsp.gfz-potsdam.de/ggsp\\_home.html](http://ggsp.gfz-potsdam.de/ggsp_home.html)

Home | Project | Objectives | Architecture | GTRF | Users | Consortium | Download | Contact | Impressum || ISDC Portal

### The Galileo Geodetic Service Provider Prototype

The establishment of the Galileo Reference Service Provider (GRSP) is a project funded within the sixth framework programme of the European Union. Call number 2420 of the second call for proposals asked for the "Implementation of Galileo Geodetic Service Provider Prototype". The target of the Galileo Geodetic Service Provider (GGSP) is the development of the Galileo Terrestrial Reference Frame (GTRF) and the establishment of a service with data, products and information for the potential Galileo users.

The project started in July 2005 and will finish probably at the end of 2008.

This portal is to inform the public about the progress of the project. In a later stage it will offer a variety of information in different specifications. In order to get project related documents or products in future please use the GGSP areas of the ISDC portal.

Home | Project | Objectives | Architecture | GTRF | Users | Consortium | Download | Contact | Impressum || ISDC Portal

- <http://ggsp.gfz-potsdam.de> (preliminary)
- <http://www.ggsp.eu> (submitted)

2006				2007									2008						2009																
7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6
						24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53



GSTB-V2

IOV

Start of GSS  
implementation

GSS pre-operational  
phase

- **T<sub>1</sub>: CDE phase 1 Kick-Off (December 2004)**





# Summary



- **GGSP Prototype consortium is a team of experts in the fields of GNSS, analysis and reference frames**
- **GGSP will initialize and maintain the Galileo Terrestrial Reference Frame**
- **GGSP will establish a prototype of a service with products for potential users**
- **Use of Galileo data of GSS at an early stage no finally decided**



Thank you for your attention!