GSRN Lead Centre Introduction

GUO Jianxia & Zhang Xuefen

Meteorological Observation Center, CMA

guo_jianxia@163.com

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Outline

1. Background
2. Structure of GSRN LC
3. Responsibility and progress
4. Expect to learn from GRUAN

1. Background

GCOS:

- **2015: GCOS proposed the idea of GSRN**

  The reference component of the tiered system for surface observations, similar to GRUAN for upper air

- **2020: INFCOM endorsed the decision of GSRN**

  Decisions:

  - The implementation of GSRN and its task team (TT-GSRN)
  - The establishment of a ***lead centre***

  Benefits to Members:

  - GSRN aims at providing sustained surface reference observations for a subset of GCOS relevant ECVs

- **Mar 2021: Call for offering to host a lead centre**

INFCOM Decision: "*It calls for the establishment of a **lead centre** sufficiently resourced and empowered to manage the rollout of such a global network and an oversight group, comprising a broad range of scientific and technical experts that will provide guidance on the development of the GSRN and ensure integration with relevant activities.*"

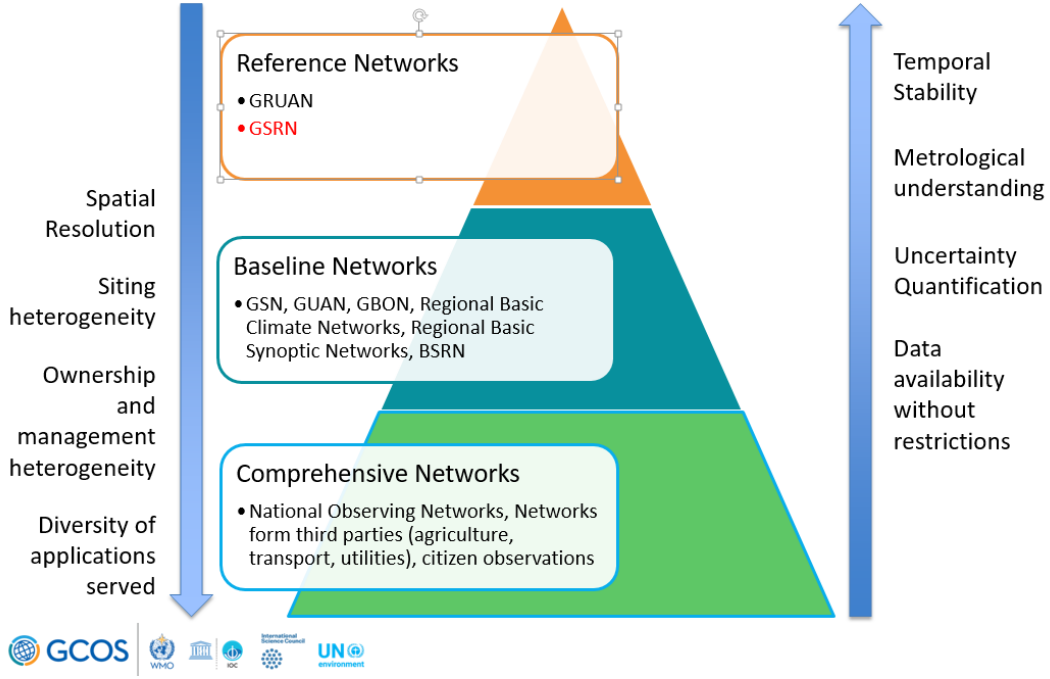


Diagram Courtesy of Caterina

The Establishment of LC

I. Found of LC

- **November 2021**：China Meteorological Administration was offered the role of GSRN Lead Centre.

WMO OMM

World Meteorological Organization
Organisation météorologique mondiale
Organización Meteorológica Mundial
Всемирная метеорологическая организация
المنظمة العالمية للأرصاد الجوية
世界气象组织

Secrétariat
7 bis, avenue de la Paix – Case postale 2300
CH 1211 Genève 2 – Suisse
Tel.: +41 (0) 22 730 81 11
Fax: +41 (0) 22 730 81 81
wmo@wmo.int – public.wmo.int

Our ref.: 27084/2021/I/GCOS/GSRN

Mr Guotai Zhuang
Permanent Representative of China with WMO
China Meteorological Administration (CMA)
46, Zhongguancun Nandajie
BEIJING 100081
China

18 November 2021

Subject: GCOS Surface Reference Network Lead Center

Action required: Confirmation of representative for the GSRN LC

Dear Mr Zhuang,

I am pleased to inform you that China Meteorological Administration (CMA) has been selected to host the Lead Center of the Global Climate Observing System (GCOS) Surface Reference Network (GSRN).

The GSRN Task Team (GSRN TT) was established in February 2021 and it works under the leadership of the GCOS Steering Committee and the Infrastructure Commission (INFCOM) Standing Committee on Ea
in close collaboration with Standing C
Traceability (SC-MINT). The GSRN TT

The success of the implen
on the establishment of a Lead Centr
March 2021. Through a process of ev
Lead Center should be hosted by CM
Committee Chair, Professor Han Doln

The next step will be for r
contribute to the implementation pla
would appreciate it if you could confi
Center.

I would like to thank you f

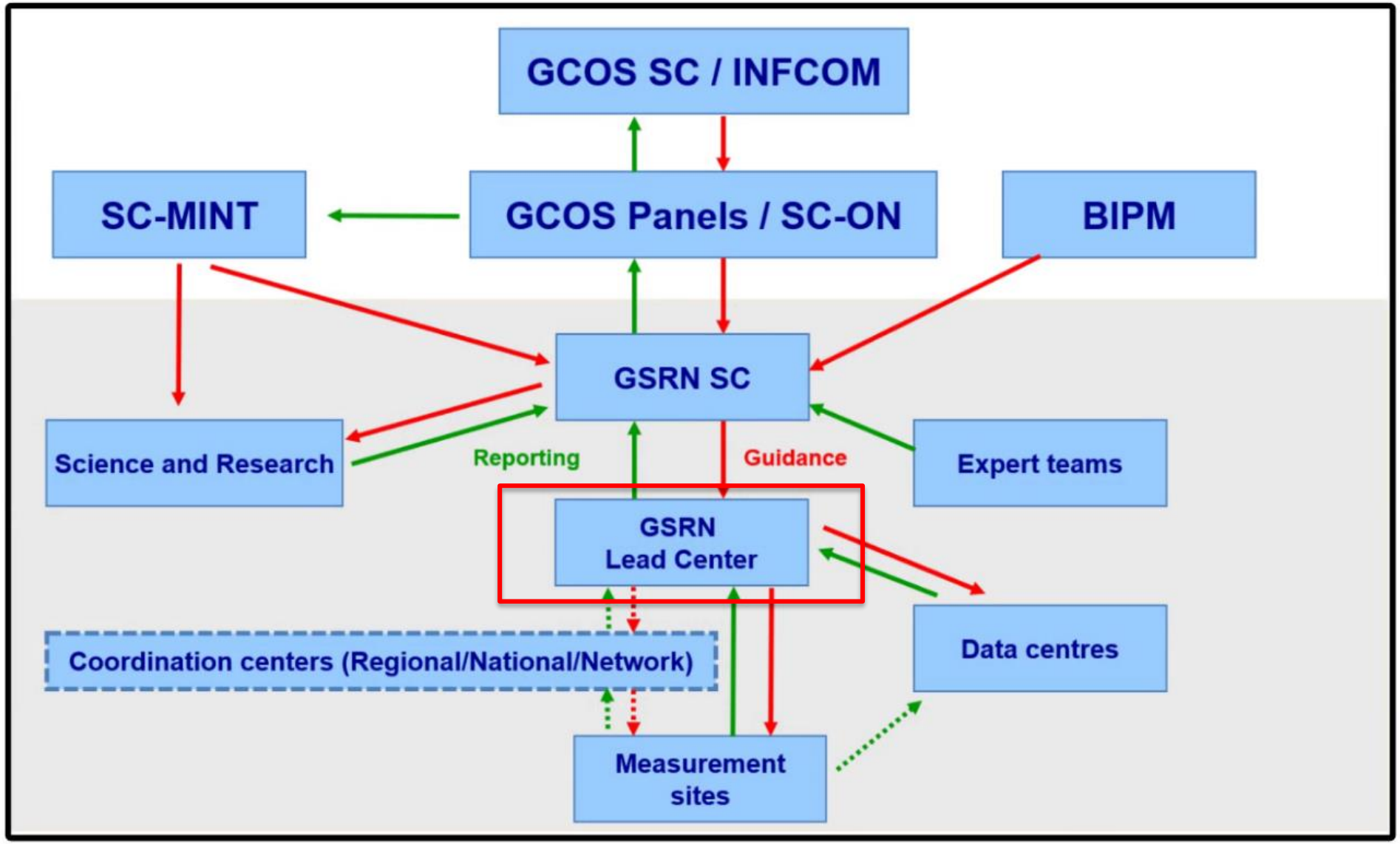
II. Preparation Phase

- **May 2022:** The Kick off meeting was successfully held.

III. Implementation Phase

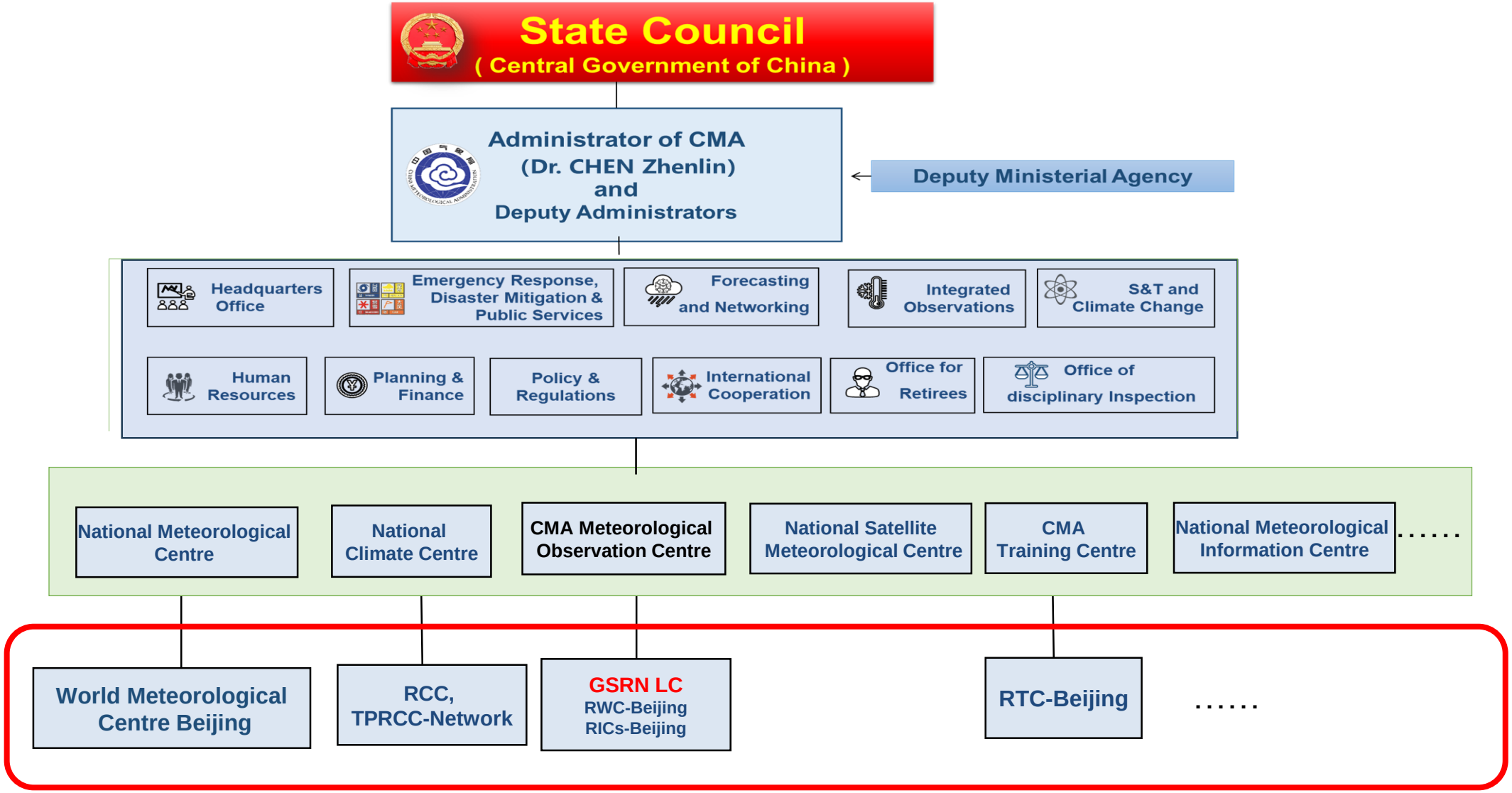
- **The end of 2022:** The work plan finalized.
- **2023:** Logo Design, Portal, System and the Product

2. GSRN LC in the structure of GSRN



*as currently approved by TT-GSRN only

The GSRN Lead Center in CMA



Structure of LC

WMO

CMA

SG1

SG2

SG3

SG4

SG5

SG6

SG7

INFCOM/
SC-MINT/
GSRN-TT

LC Management Group

Manage Coordinate Oversight

Directors and division heads from relevant departments and institutions of CMA

LC Expert Team

Cooperate with GSRN TT in

establishing common procedures and standards across the GSRN

5 experts in TT and 19 experts in Subgroups

LC Task Team -> LC Office

- Selection and Certifications
- Network Management and Monitoring
- Data Management and Evaluation
- Capacity Development (with TT)

Lead Center

GSRN Certified Sites

GSRN Data Centers

Lead in Coordination:

Department of Integrated Observations

In collaboration with Department of Forecasting and Networking, Human Resources, Planning &Finance, International Cooperation

Lead in Operation:

CMA Meteorological Observation Center

In collaboration with NCC, NMIC, CMA Training Centre

Contributors of the LC in CMA

	Name
1	Dr. WANG Jiankai
2	Ms. ZHANG Nan
3	Dr. LI Xiang
4	Dr. GUO Jianxia
5	Mr. ZHANG Ming
6	Ms. GUO Wei
7	Dr. QIN Shiguang
8	Dr. ZHAO Xu
9	Dr. REN yuyu(Ms.)
10	Dr. WANG Pengling
11	Ms. SHI Lijuan
12	Ms. KANG Jiaqi
13	Ms. WANG Jia
14	Dr. LIU Yiming
15	Dr. Dongdong Chen(Ms.)
16	Dr. CUI Xiai (Ms.)
17	Ms.CAO Lijuan
18	Ms. WANG Ying
19	Mr. HU Xing

3. Responsibility and progress
ToR of LC

1. Internal reporting, responsibilities, and guidance

- Report to the GSRN Steering Committee
- Oversight of the GSRN operations
- Regularly evaluate the operational status
- Provide administrative and technical support

2. Coordination of the network in collaboration with Members, GSRN-SC and GCOS Secretariat

- Coordinate national contributions to the network
- Establish common procedures and standards across the GSRN
- Coordinate with the data user community

3. Data management

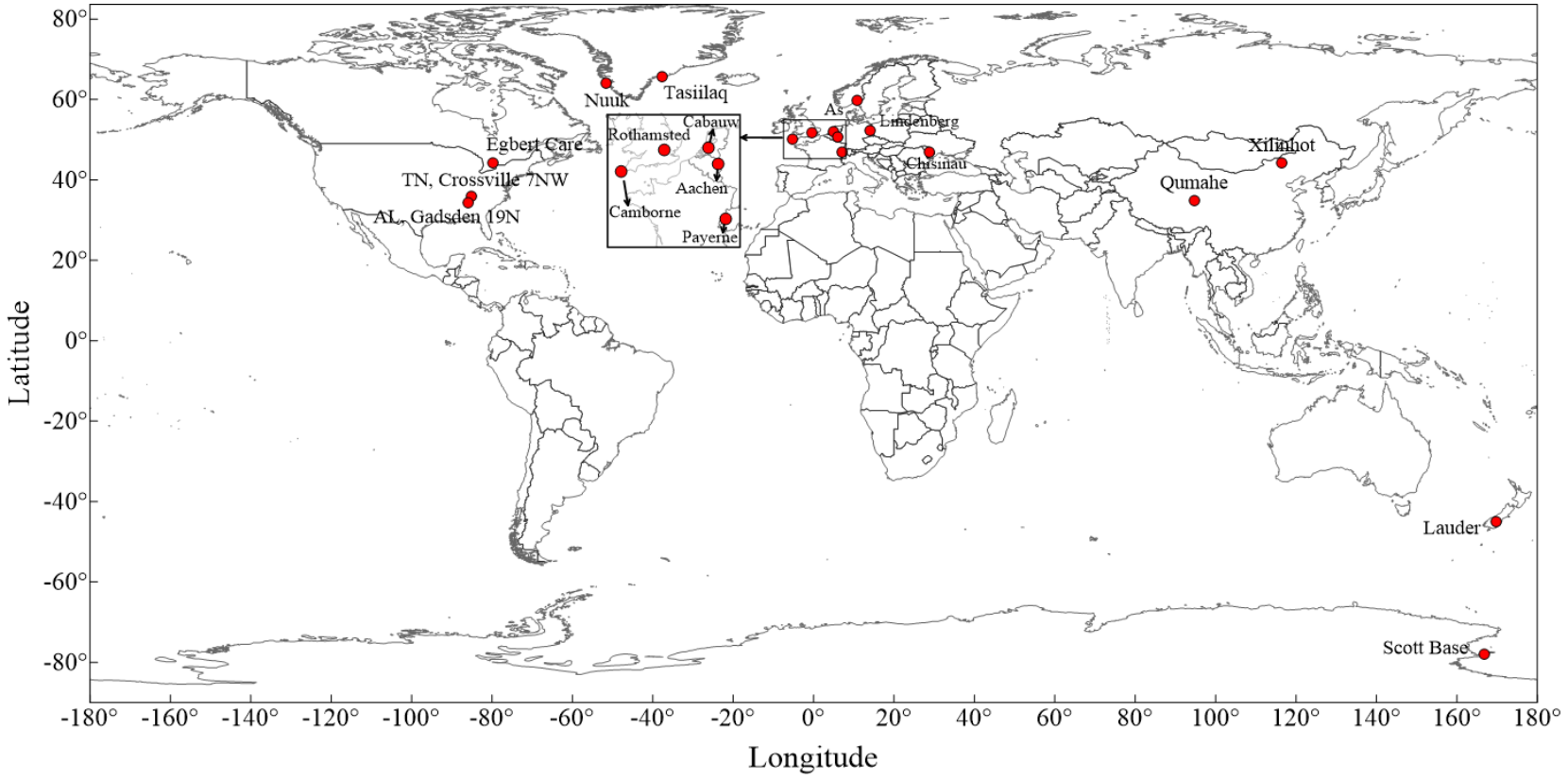
- Establish systems to monitor station performance and perform QA/QC, including feedback to stations having potential problems

4. Training, education, development and research

Timetable of Main activities

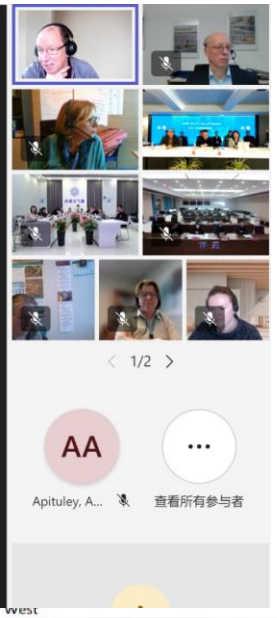
May 2022	Official Kick-off of GSRN Lead Centre
Q2-Q3 2022	Establish the Lead Centre Structure
Before INFCOM-2	Establish common procedures and standards across the GSRN (with TT)
Post INFCOM-2	Selection and certification of the GSRN pilot stations (with TT)
February 2024	Kick-off meeting with station contacts on the 5th of February (with TT)
2024	Capacity Development: develop operational system, data exchange, software development, technical training, scientific experiment……
Long-Term	Ensure sustained reference quality observations, with full traceability and fully quantified uncertainty

GSRN (Pilot) – Map and List of Country



GSRN Ref No.	Station Name	Country
01	Egbert CARE	CANADA
02	TN, Crossville 7NW	USA
03	AL, Gadsden 19N	USA
04	Cabauw	THE NETHERLANDS
05	Chisinau	Republic of Moldova
06	As	NORWAY
07	Aachen	Germany
08	Lindenberg	Germany
09	Camborne	UK
10	Rothamsted	UK
11	Qumahe	China
12	Xilinhot	China
13	Payerne	Switzerland
14	Scott Base	New Zealand
15	Lauder	New Zealand
16	Nuuk	Denmark
17	Tasiilag	Denmark

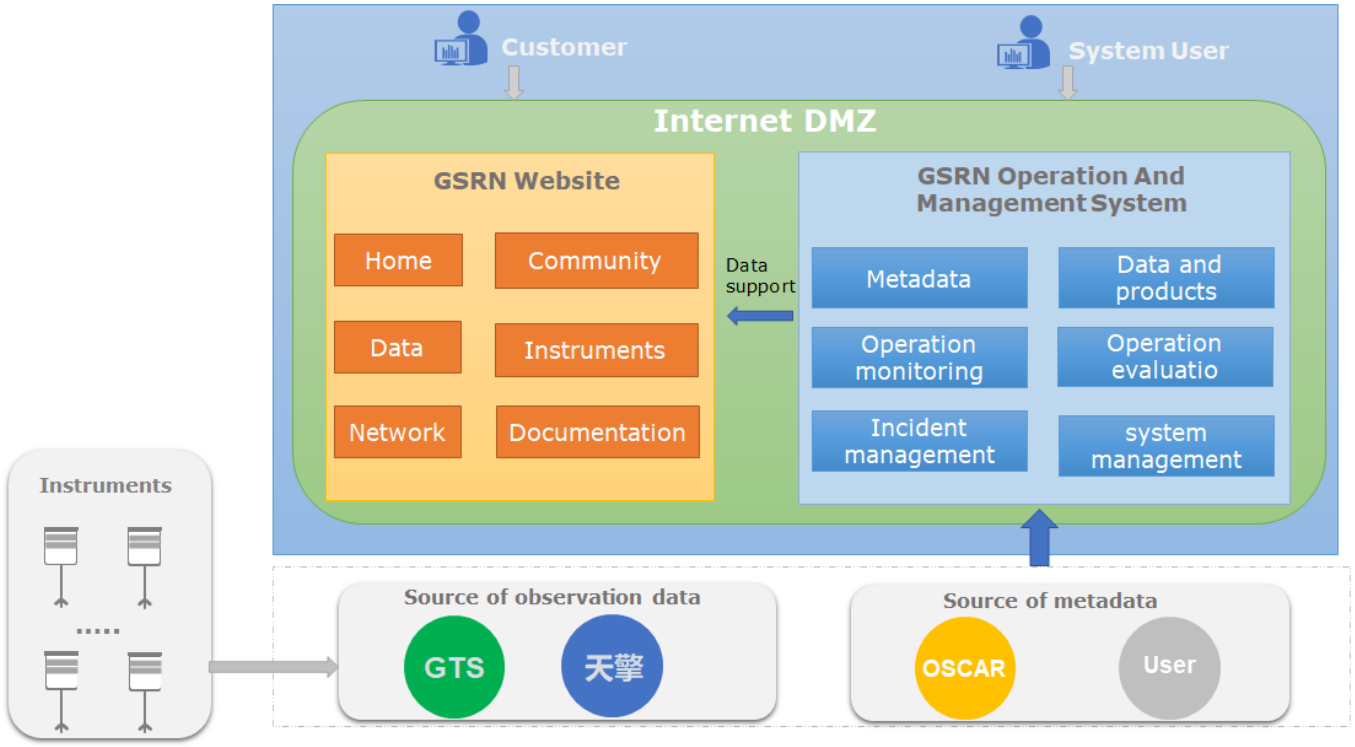
GSRN(PILOT) Kick-off meeting with station contacts



Work in progress

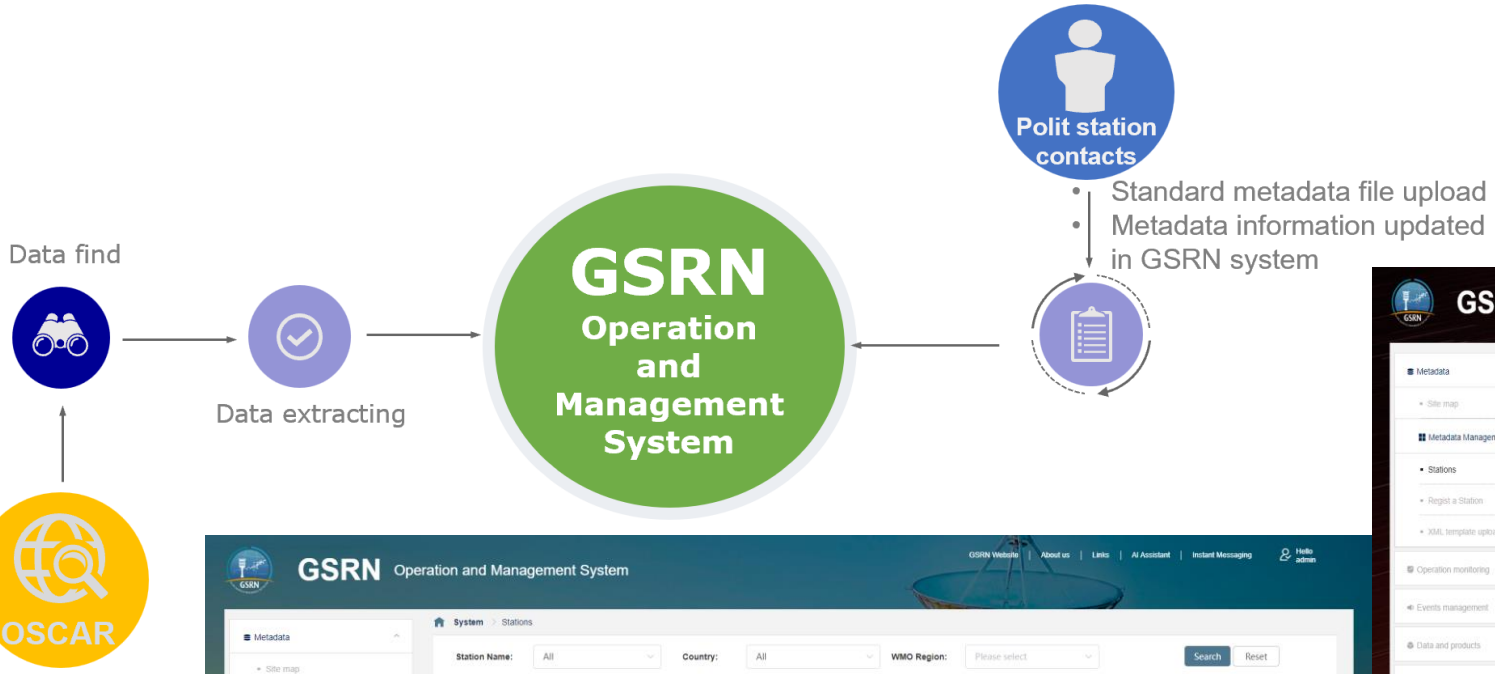
1. Design the operating system framework and develop the main functions;
2. Design and develop the metadata database, and invite Xilin Hot site to test and check the functions;
3. Observation data experimental transmission with New Zealand;
4. Prepare the technical methods and processing flow of observation data quality control;
5. Develop observation products and carry out uncertain research experiments;
6. Prepare a technical exchange meeting and training course with the pilot stations.

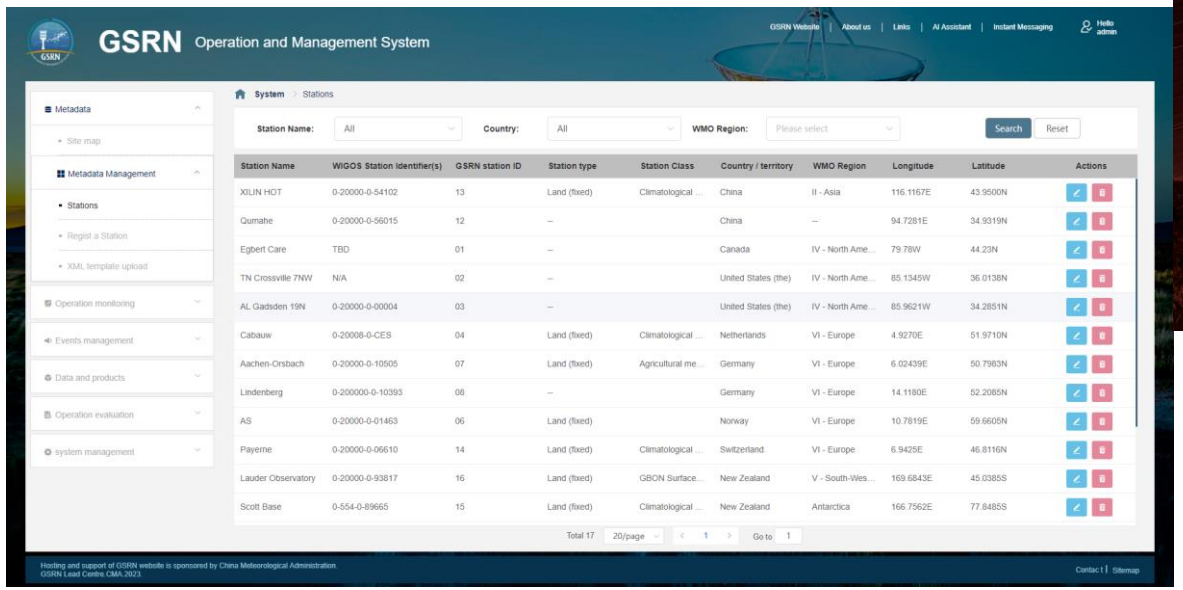
Design and develop the GSRN operational management system

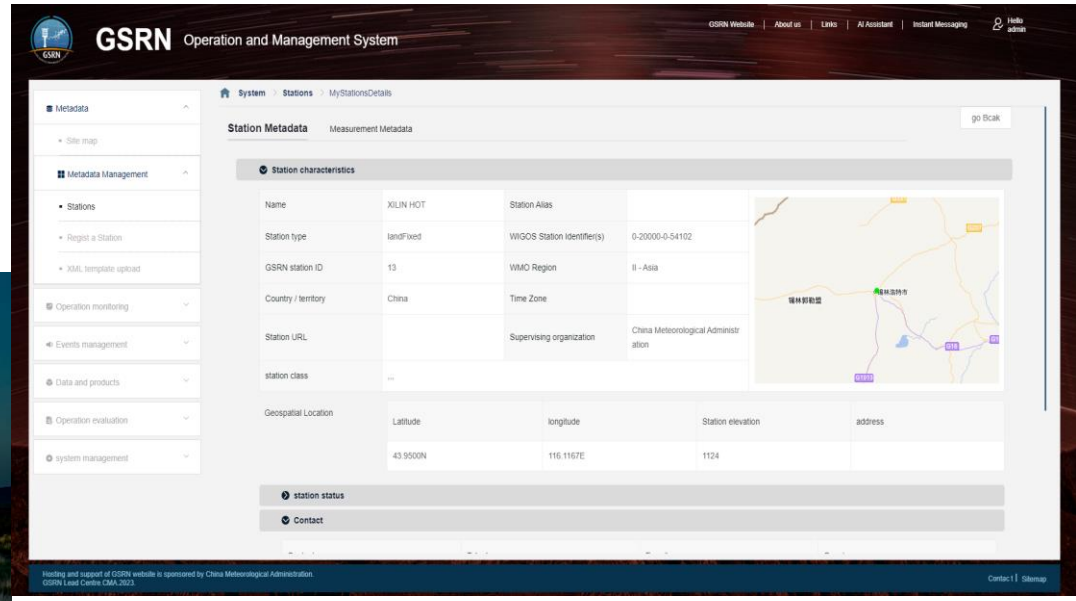


- **Primary Design on GSRN Operational Management System- 6 modules.**
  - Metadata Management
  - Operational Monitoring
  - Incident Management
  - Data and Products
  - Operational Evaluation
  - System Management
- **Data source includes GTS , WIS2.0 and OSCAR, Portal…**
- **Browser/Server via Internet**

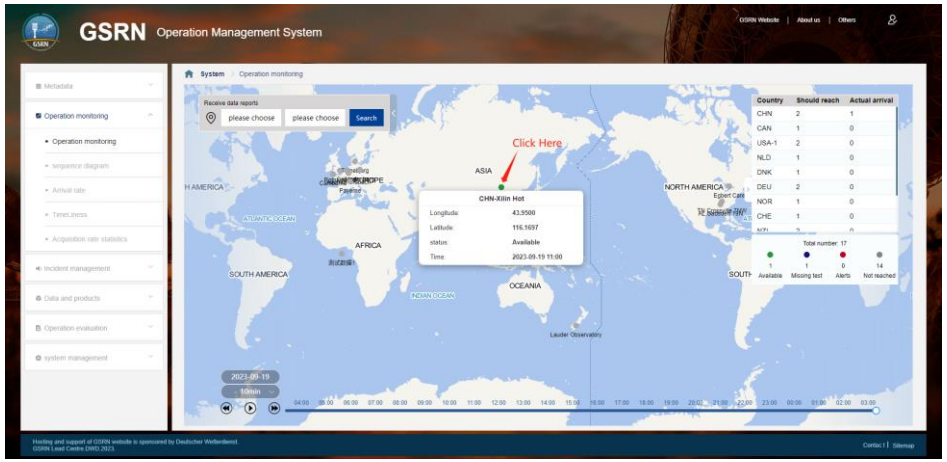
Station level metadata acquisition, update and management



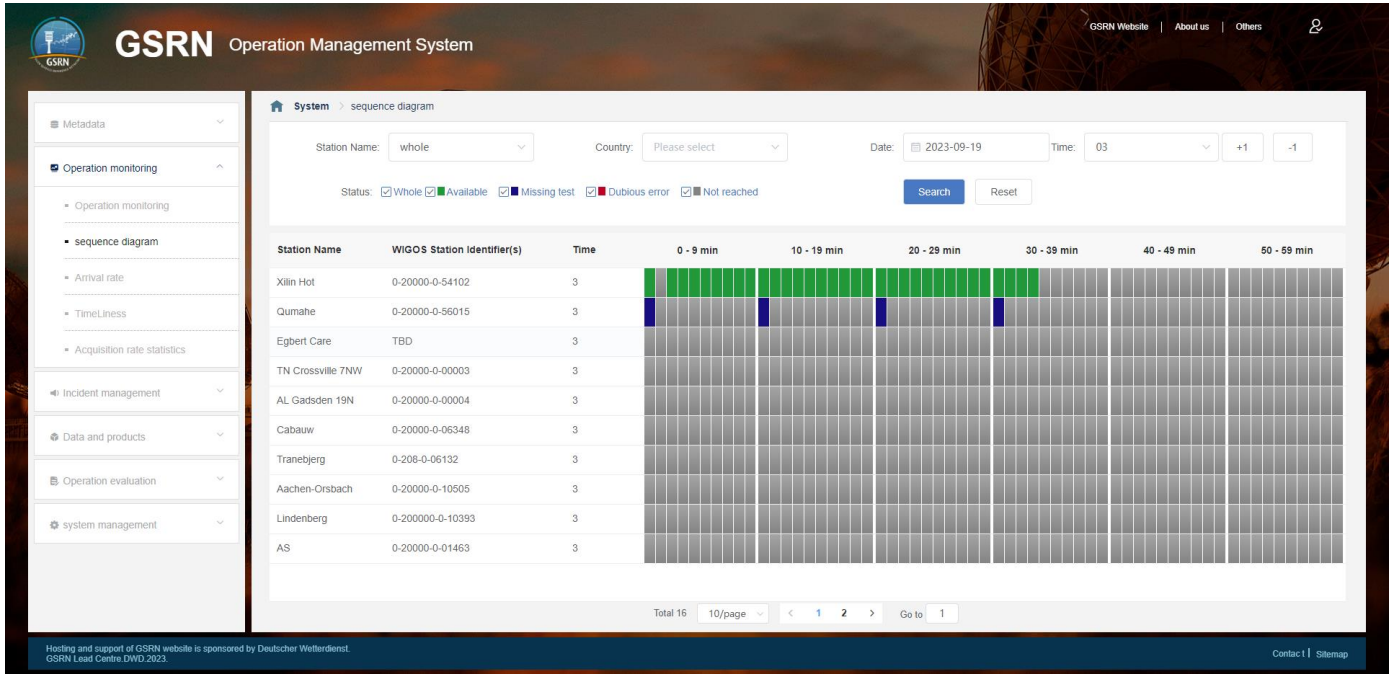




Operational status monitoring



Click the station



Data process, transmission routing and protocol

Real-time Observation Data

Mandatory variable (MV)

Precipitation

Temperature

Associated quantities of influence (AQI) for MV

Relative humidity

Wind

Global & Reflected solar radiation

... ...

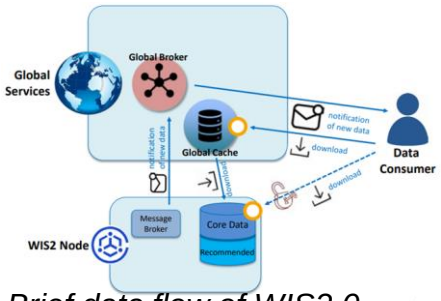
- *Realtime raw data supporting BUFR format in WIS2.*
- *History raw data supporting CSV / BUFR*

Trans. routing & protocol

GTS (FTP)

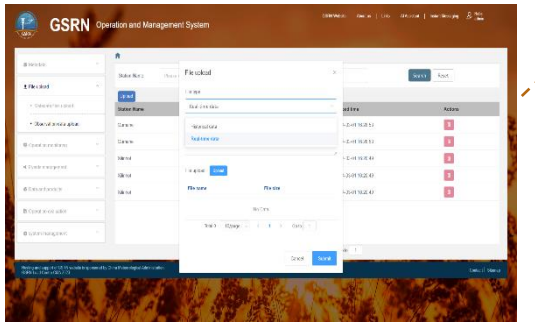
GTS

WIS2.0 (http(s))



Brief data flow of WIS2.0

GSRN portal (http(s))

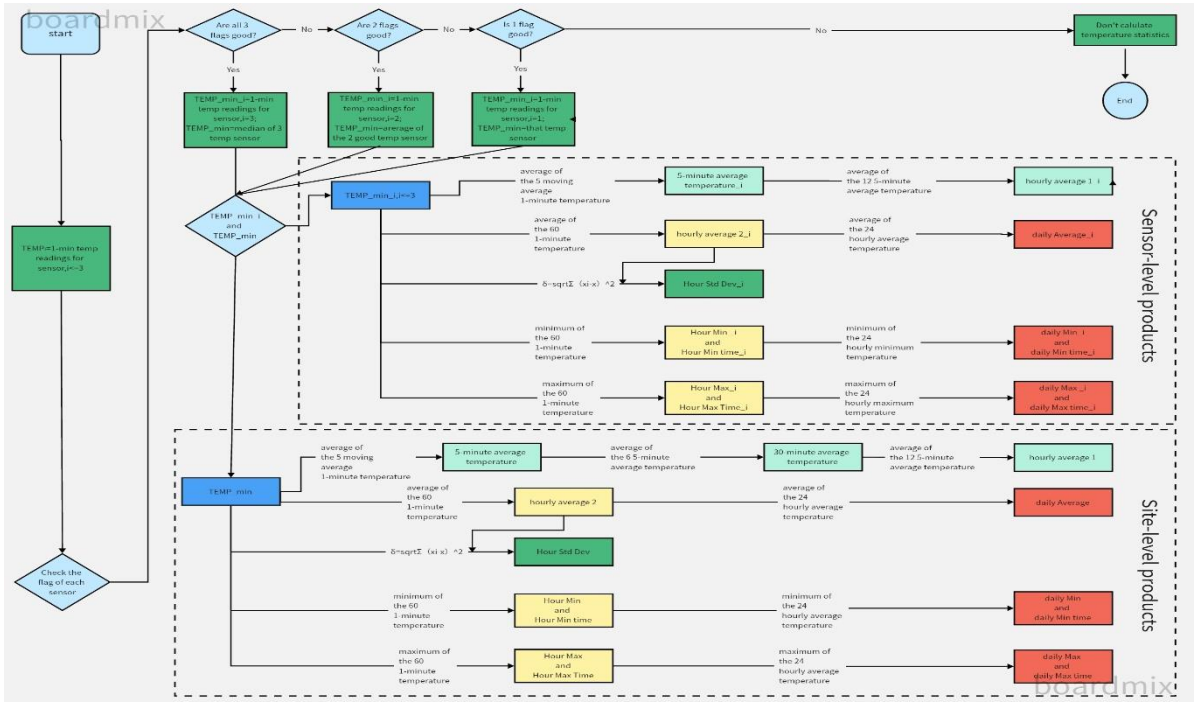


GCOS
GLOBAL CLIMATE OBSERVING SYSTEM

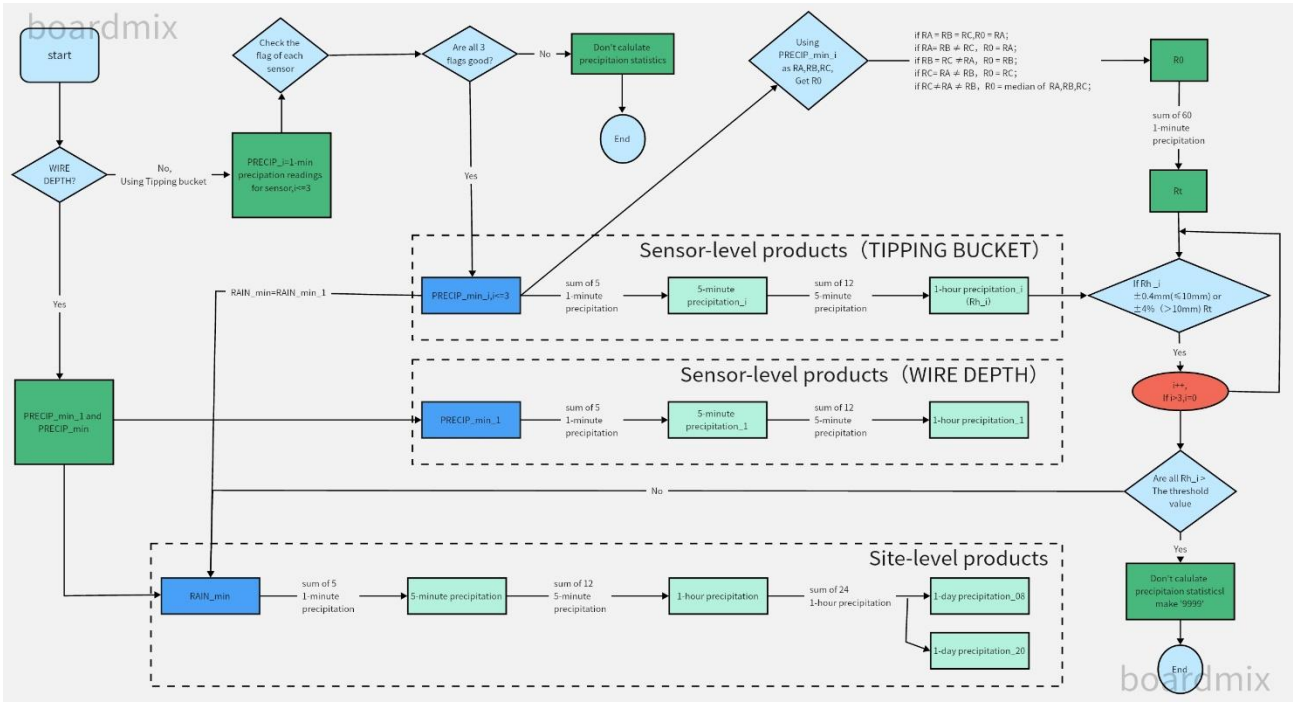
GSRN
GCOS SURFACE REFERENCE NETWORK

GSRN-LC

Data products processing flow for air temperature and precipitation

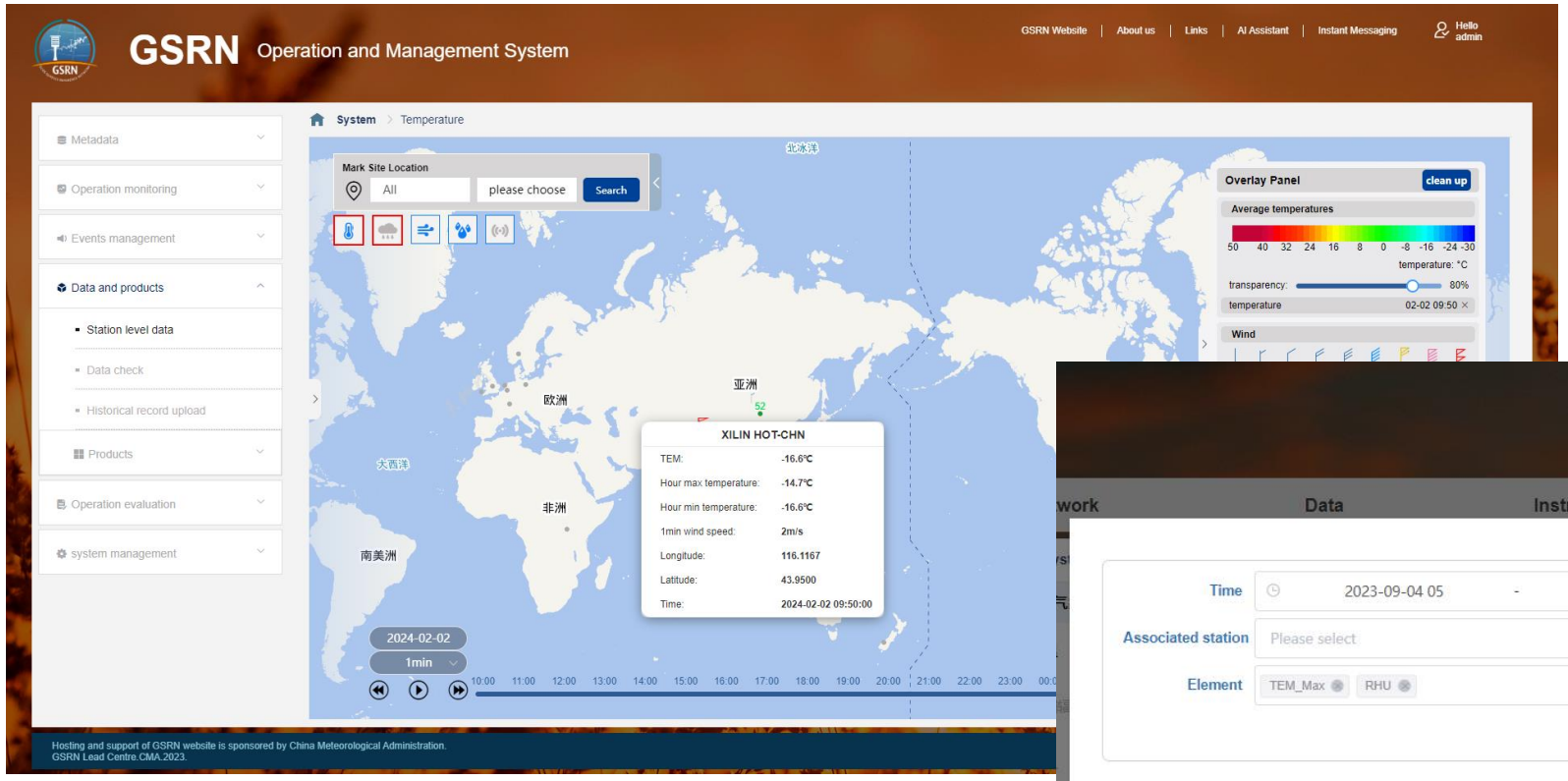


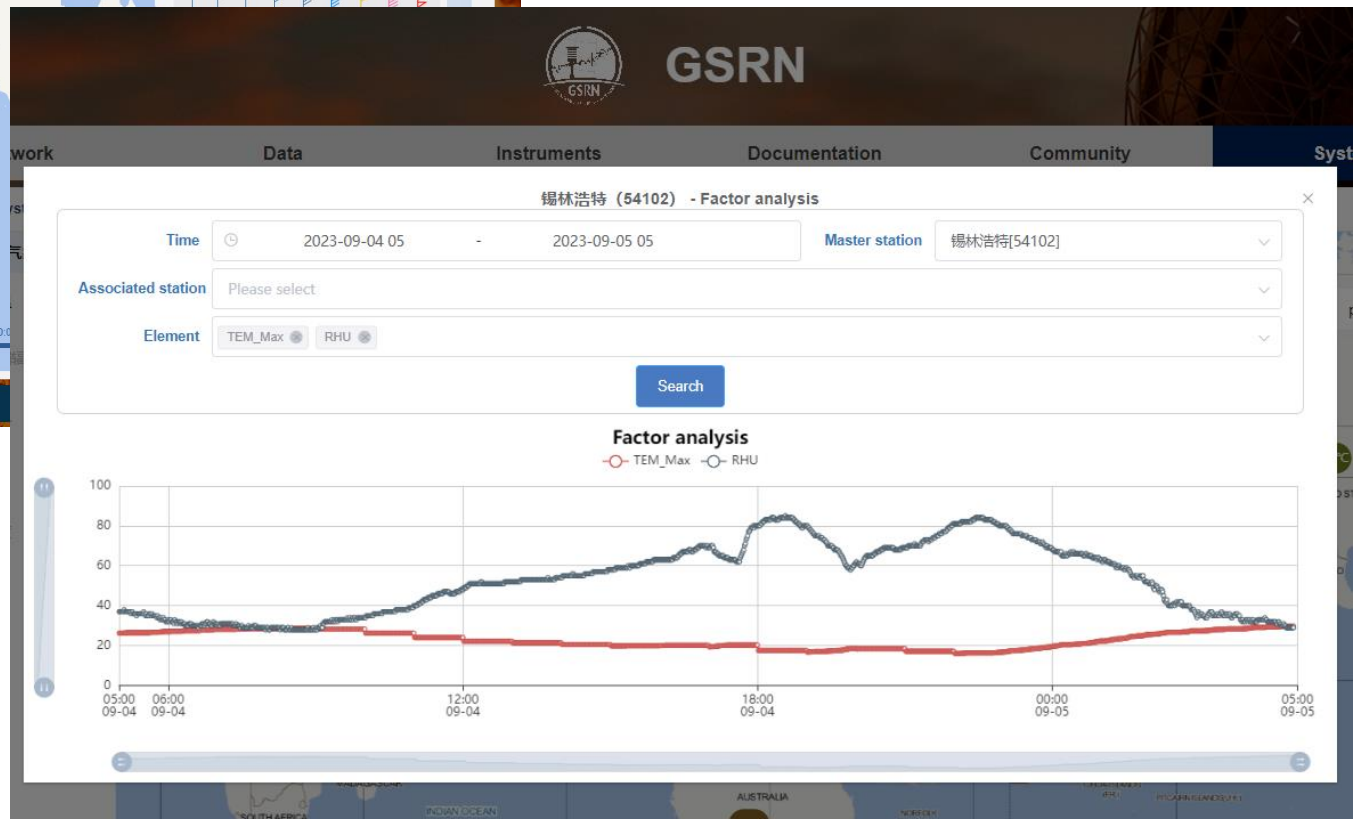
Data products processing flow for minutely air temperature



Data products processing flow for minutely precipitation

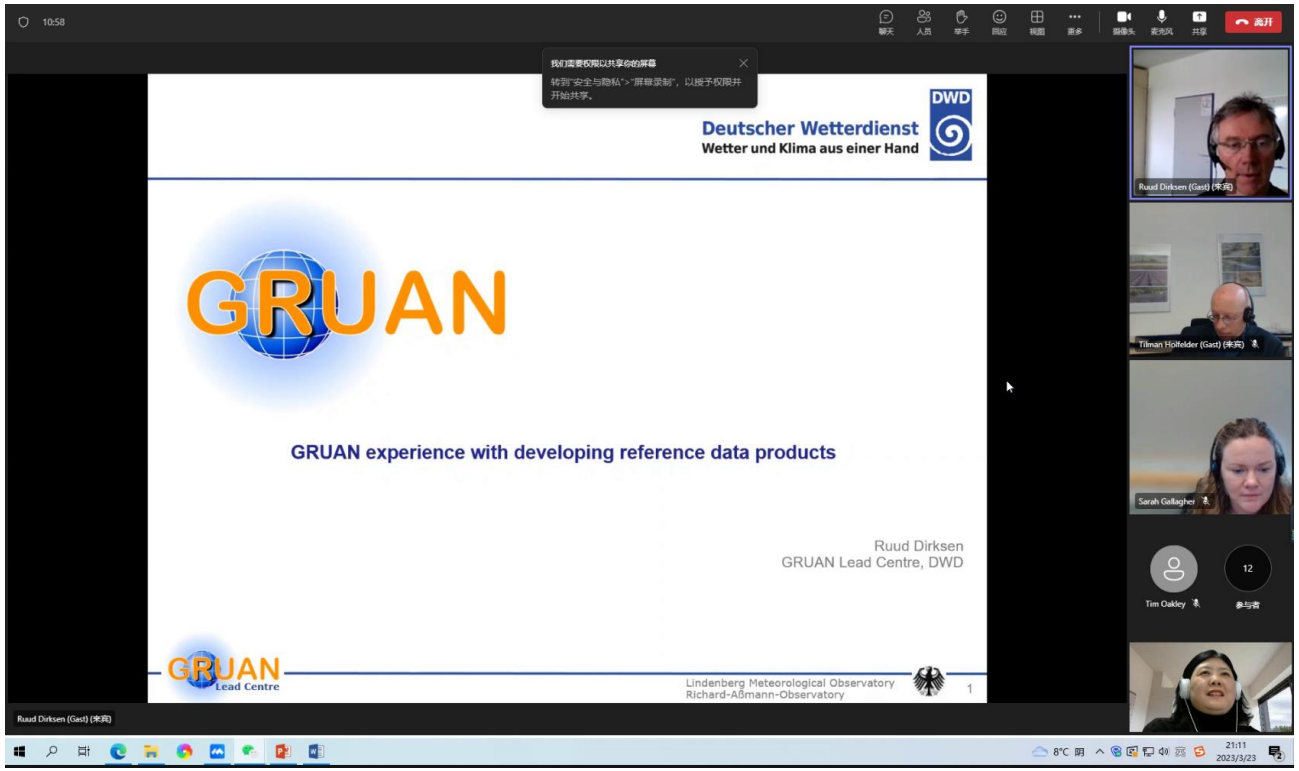
Display and analysis of data products





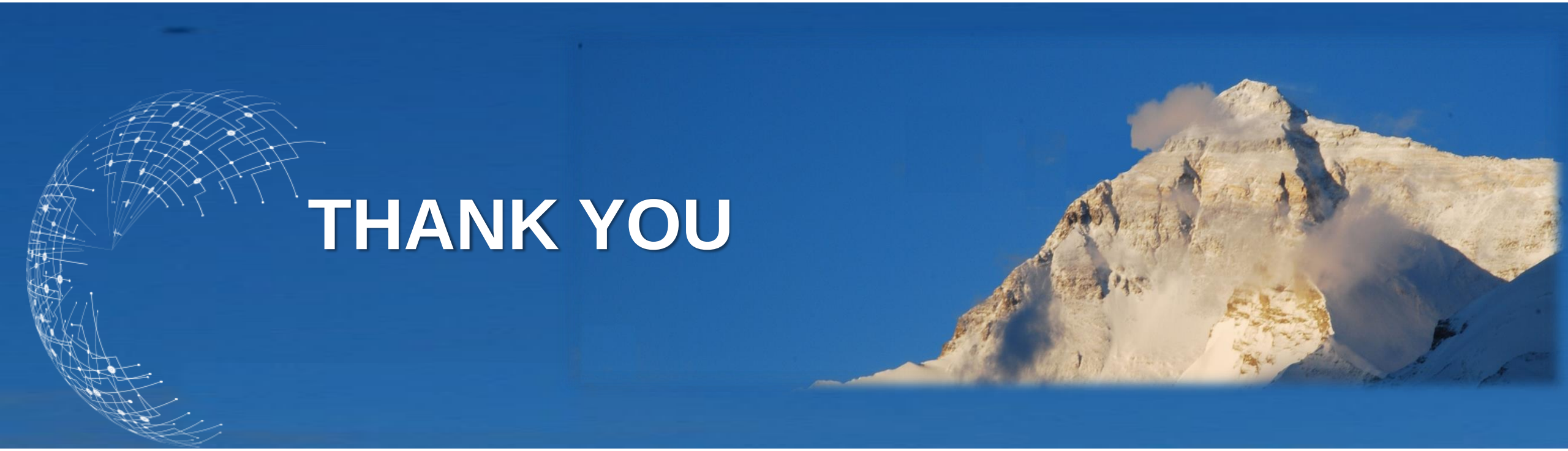
4. Expect to Learn from the GRUAN Lead Center

- GRUAN LC advanced management, operation mechanism;
- GRUAN advanced data processing, transmission technic;
- GRUAN advanced quality management experience;
- GRUAN advanced technical of data quality control, product development, uncertainty calculation etc.



Many thanks to Ruud, share the experience of GRUAN LC with us on March 23,2023, Give us a lot of inspiration

Expect deeper cooperation with GRUAN LC in the future

- More frequent and in-depth technical exchanges and communication are expected with the implementation of GRUAN and GSRN in Lindenberg and Xilin hot. Field exchanges.
- Looking forward to the opportunity to conduct joint experiments and research.

THANK YOU