Session 2.5

Observation for 2030 Vision

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Japan Meteorological Agency

A Safe, Resilient and Dynamic Society

JMA is now working with this slogan for JMA Vision 2030. The vision aims to …

Appropriate response to extreme weather

Municipalities/ Disaster Prevention Authorities

Residents

Tourists and Visitors

Provide highly accurate meteorological information and data to various independent bodies to enable appropriate disaster mitigation efforts

Vitality in everyday living for all

Improve quality of life and convenience by providing information for various situations in daily living

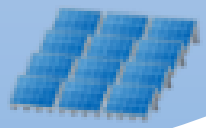
Innovation in economic activity and elsewhere

Production/Distribution/ Delivery

Agriculture

Transport

Utilities/Infrastructure

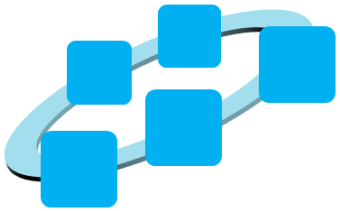


Improve productivity and providing a range of services based on the combination of weather information with various types of big data and advanced technology

Areas of focus for observation & data usage

Operation/improvement of JMA's basic observation network

Integrated usage of observation data collected by various bodies

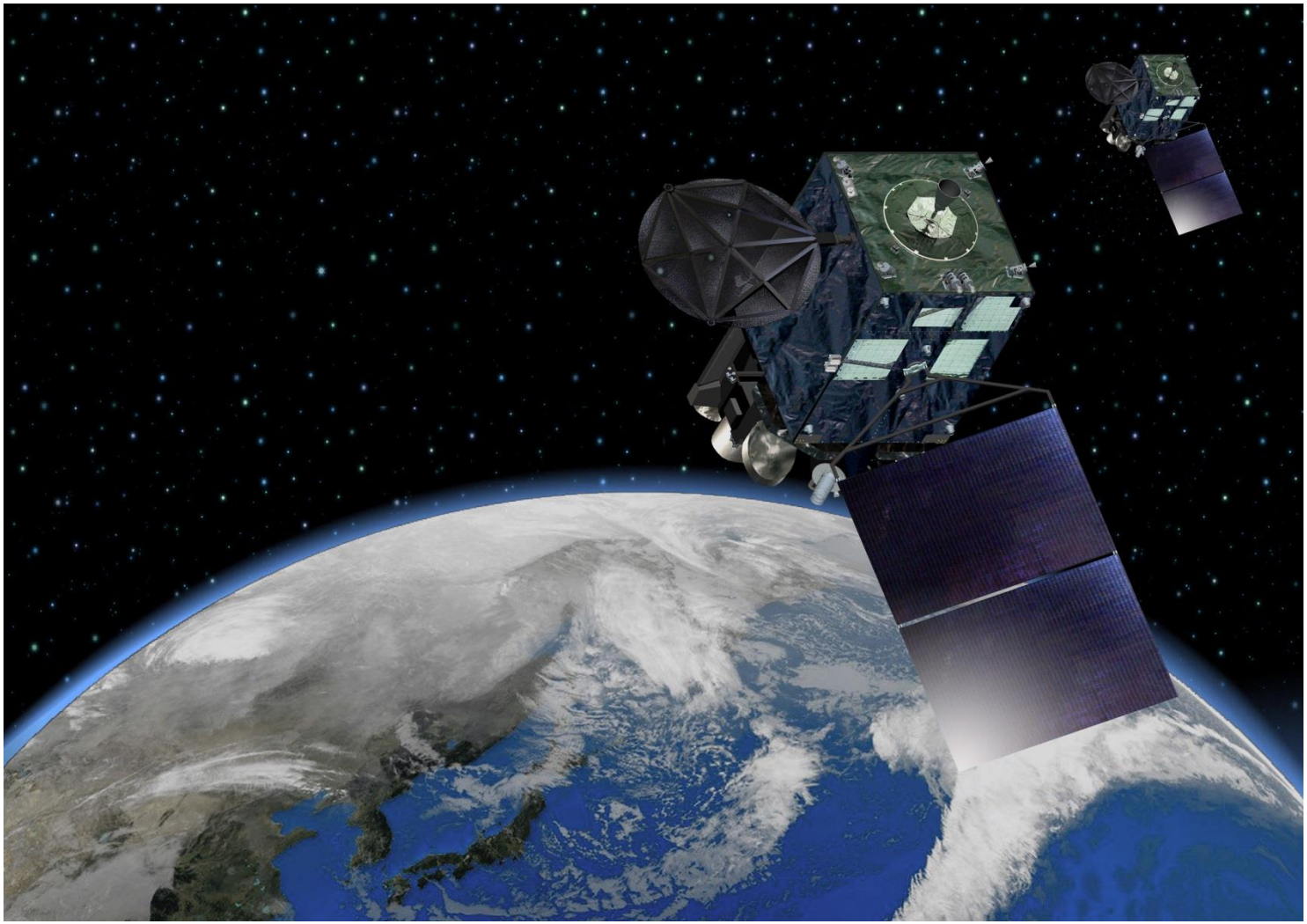


Now we are going to highlight the operation and improvement of JMA's basic observation network.

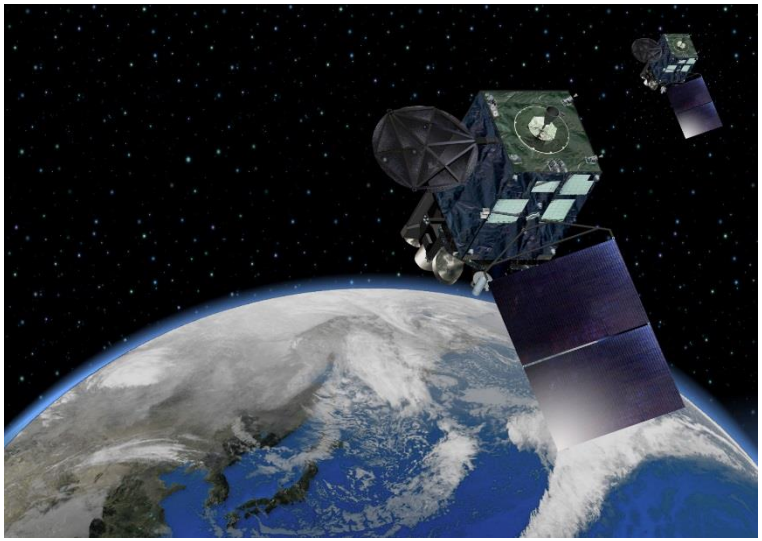
High-frequency & High-resolution

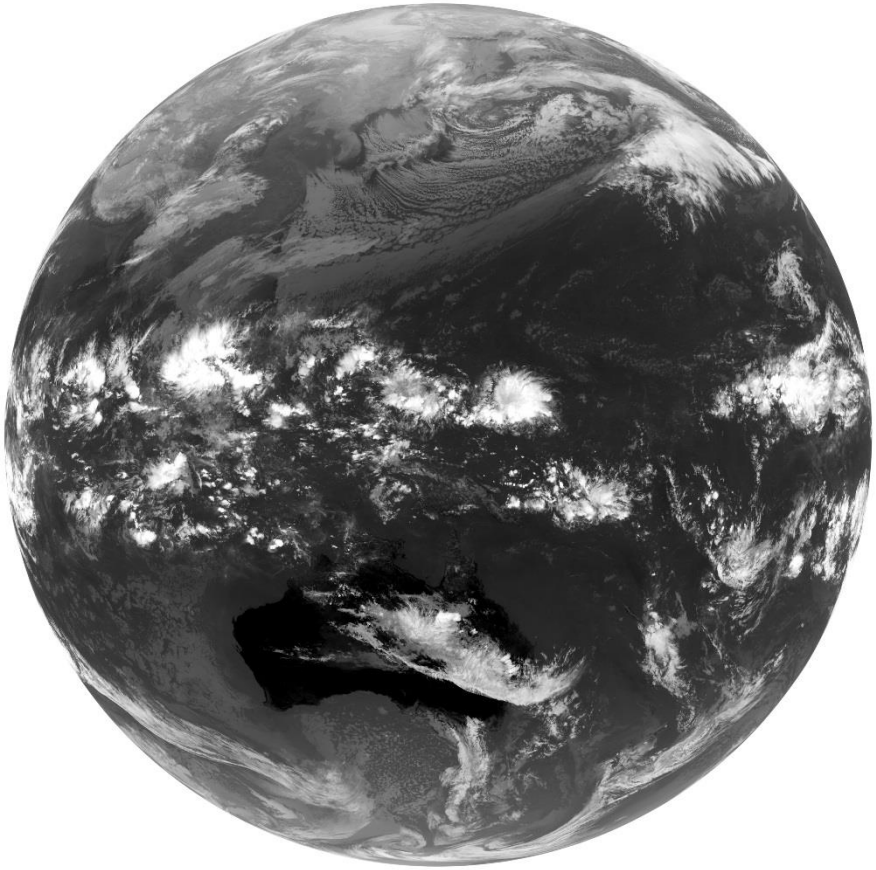
JMA’s future plans involve focus on high-frequency, high-resolution three-dimensional monitoring using advanced equipment.

JMA works to enhance radar and satellite observation via methods enabling the acquisition of detailed observation data with focus on specific regions.



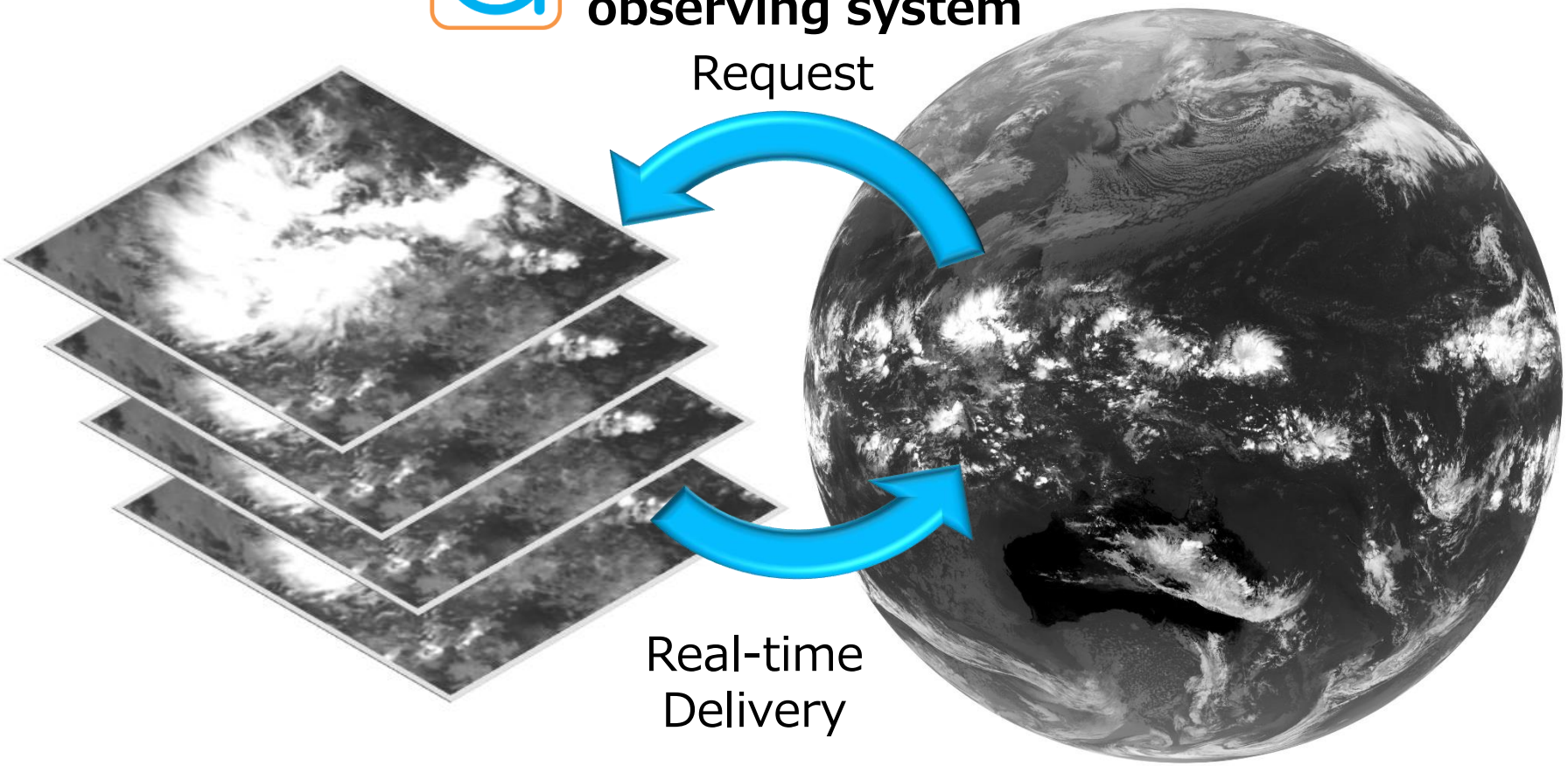
The first such initiative is the HimawariRequest service introduced in early 2018.



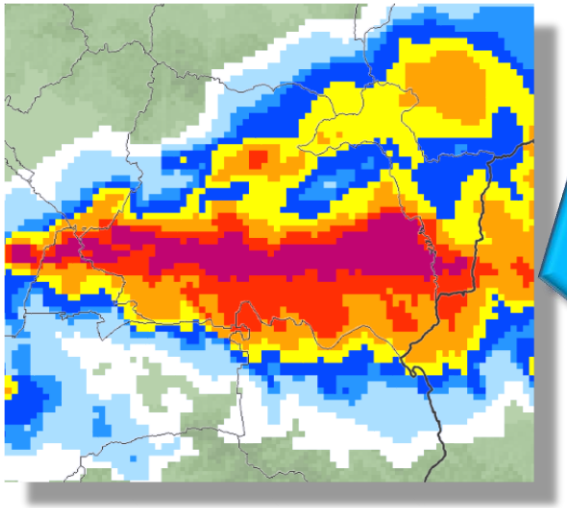


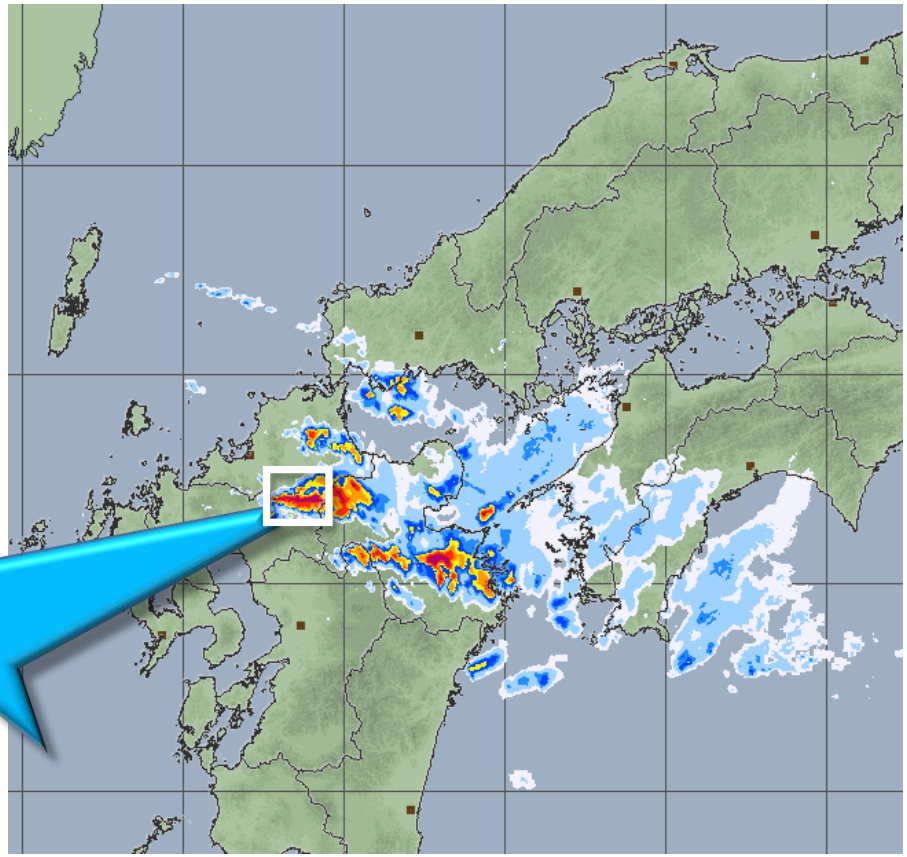
Under this initiative, Himawari-8/9 is the world's first geostationary meteorological satellite to provide high-resolution full-disk images …

On-demand observing system



and rapidly updated regional images simultaneously based on requests from users in Asia/Pacific regions.





JMA is also in the process of upgrading its operational radars to enable high-resolution observation of certain regions …

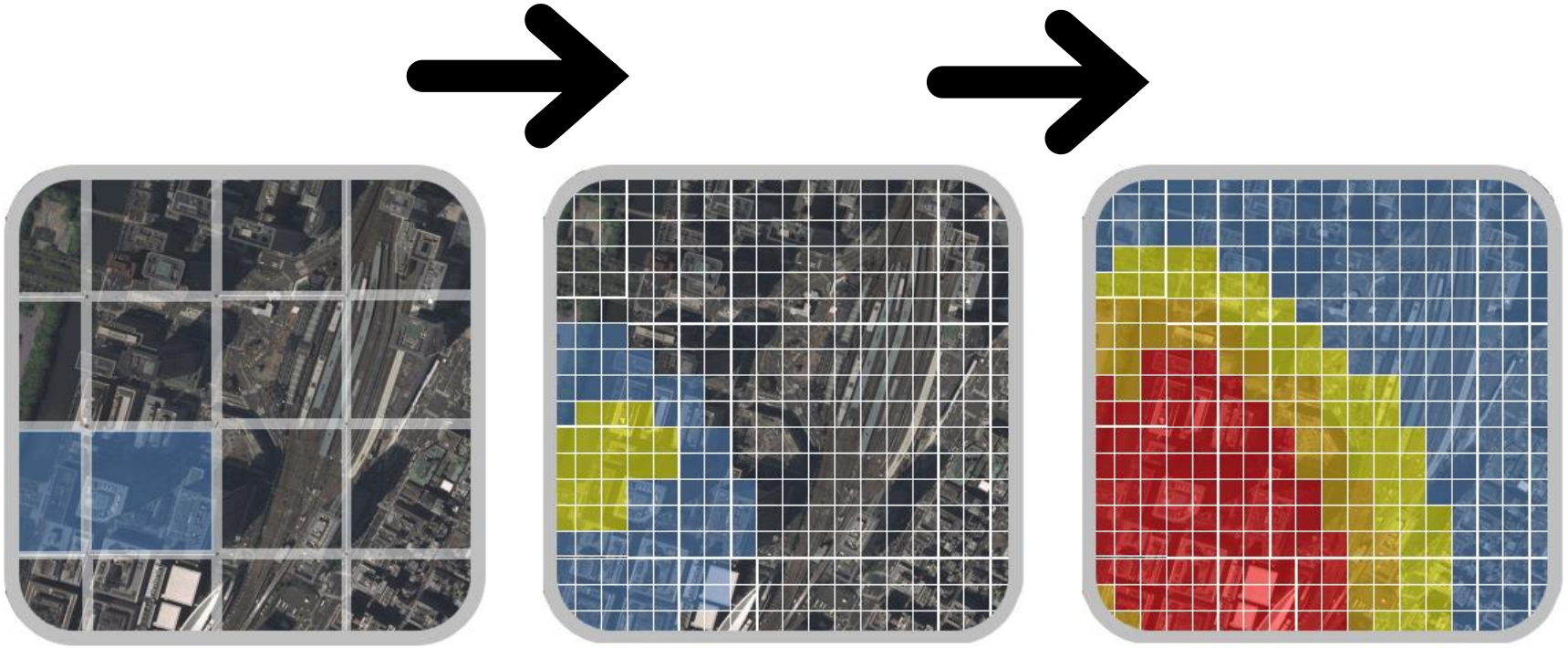
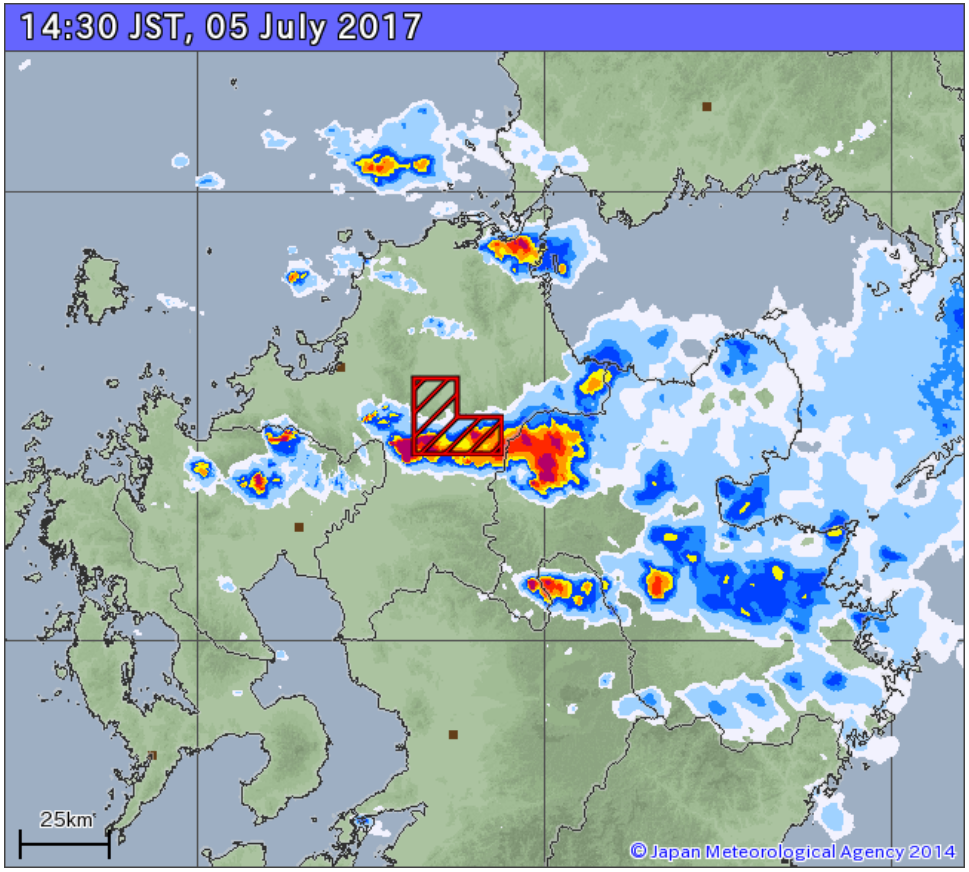


Photo: Geospatial Information Authority of Japan

and provide analysis data with a spatial resolution of 50 m around the radar site.

On-demand
observing system



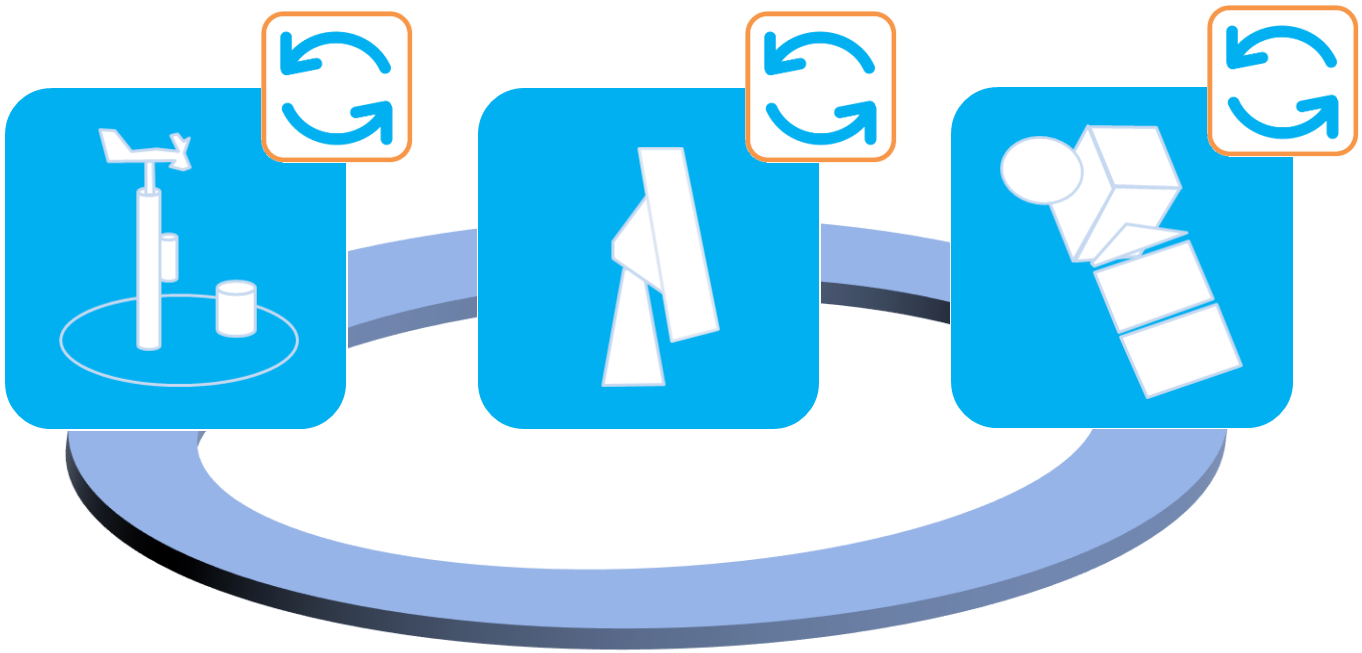
Once the upgrade is complete, synchronized radars in the relevant area will enable more flexible observation.

Technological development is also expected to support on-demand surface observation. In situations where mobile phones are used to provide observation data …

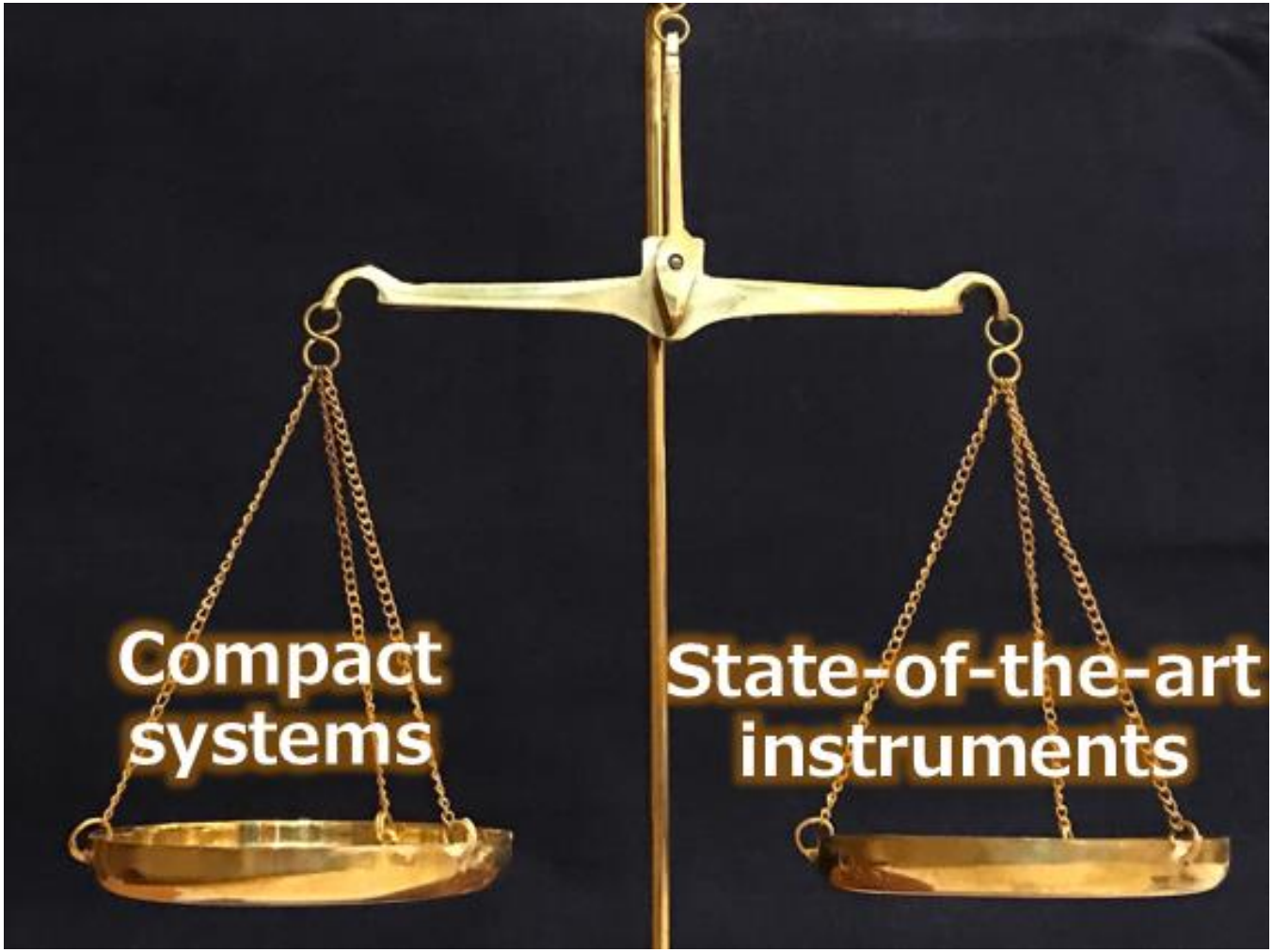
On-demand
observing system

and receive weather information, for example, it may be possible to introduce a mechanism by which the frequency of observation varies depending on the information received.

Integrated
On-demand
observing system



Synergistic benefits are also anticipated from integrative operation of land-based instruments, radar and satellites. Such operation is expected to support …



a favorable balance between the introduction of high-resolution state-of-the-art observation instruments and the implementation of compact observation systems.

Areas of focus for observation & data usage

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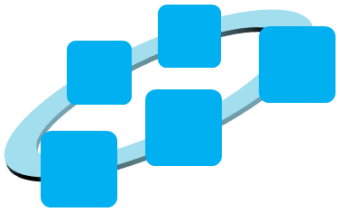
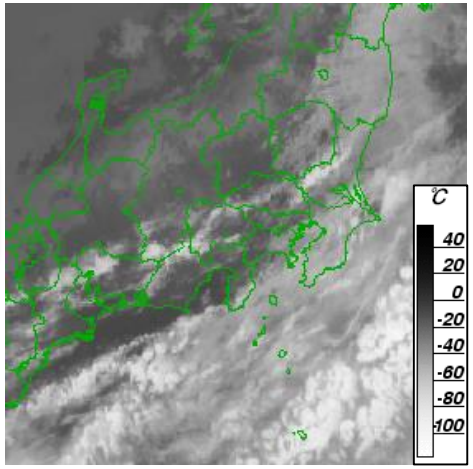


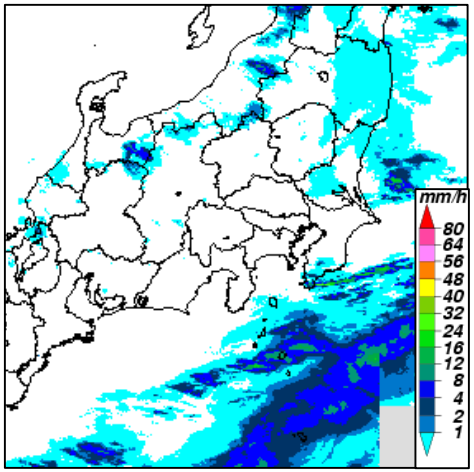
Another area we are focusing on is the integrated usage of observation data collected by various bodies.

Weather Analysis Map

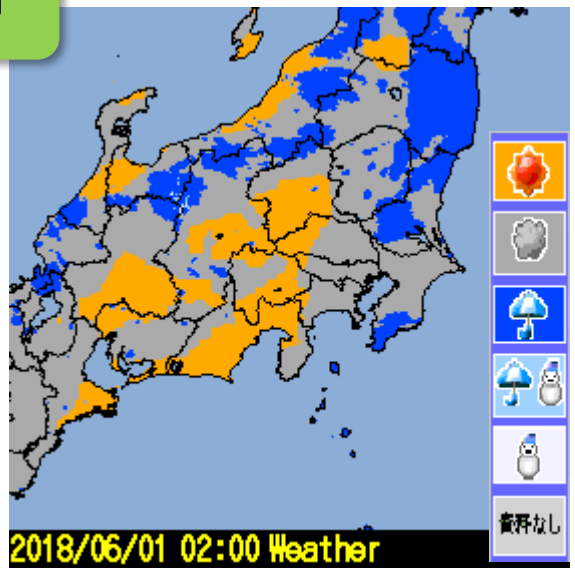
Satellite



Radar
&
Surface



Weather



JMA's Weather analysis map integrates several observation networks such as surface, radar and satellite observations to obtain a two-dimensional analysis of the weather.

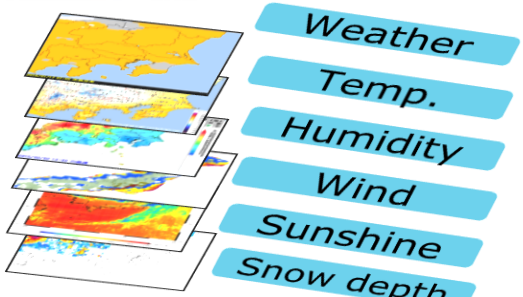
2030 Vision: Goal Focus

Meteorological Nowcasts

1-hr. prediction updated every 5 or 10 min.

Severe storm alert

Providing accurate predictions of extreme phenomena such as heavy rain, lightning and wind up to an hour in advance



Detailed real-time analysis of current weather conditions

Accurate, well-timed and actionable

Prediction Lineup from Nowcast to 100 years ahead

100 years	Global warming
Months	Seasonal climates
Weeks	Extreme weather
Days	Typhoons
Hours	Heavy rain
1 hour	Nowcast

to urge immediate evacuation and improve daily living

In the 2030 vision, meteorological nowcasts will be developed to provide accurate predictions of extreme phenomena and detailed real-time analysis.

2030 Vision: Goal Focus

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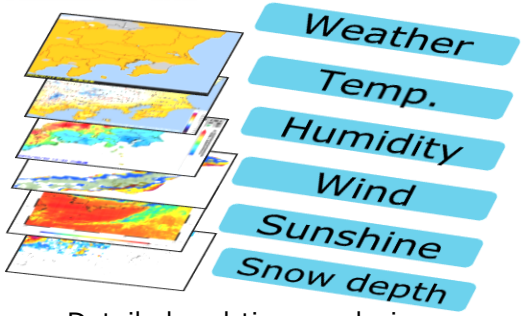
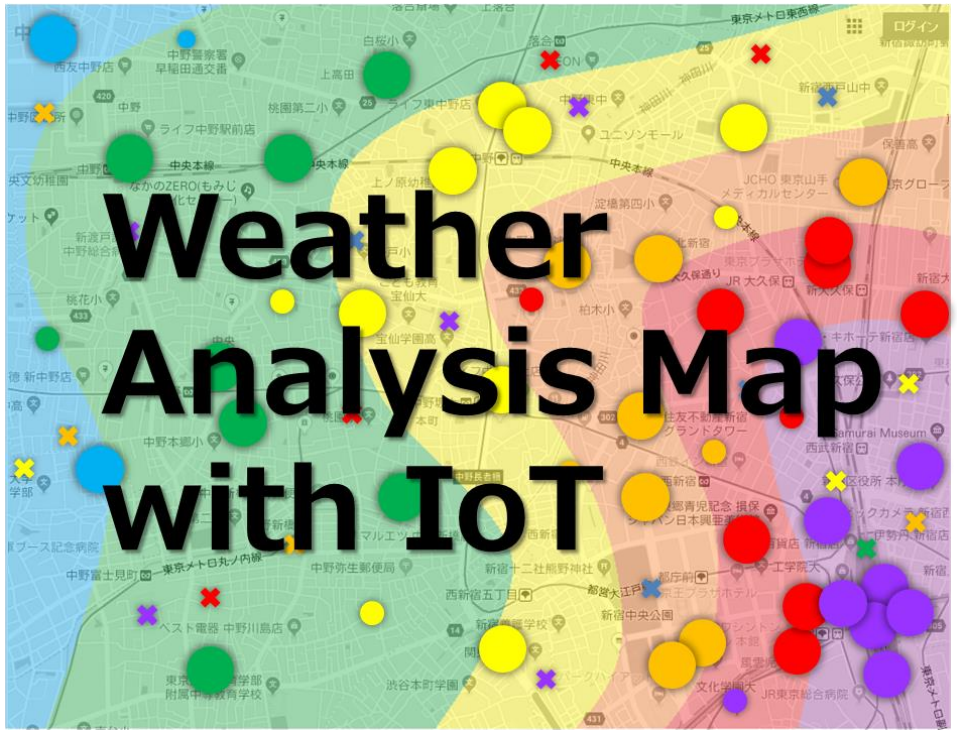


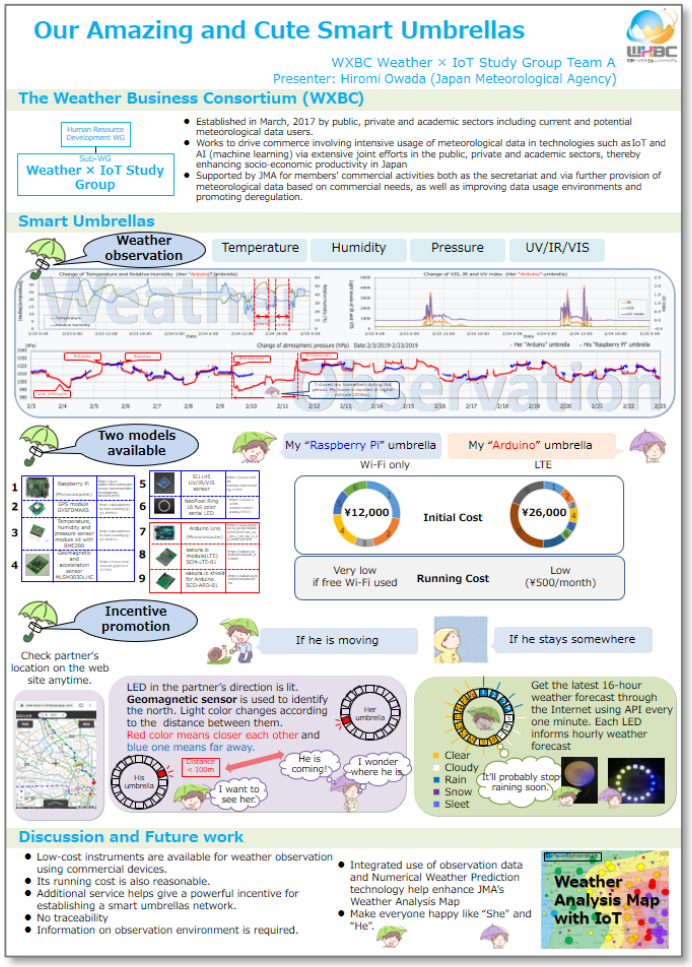
Detailed real-time analysis of current weather conditions

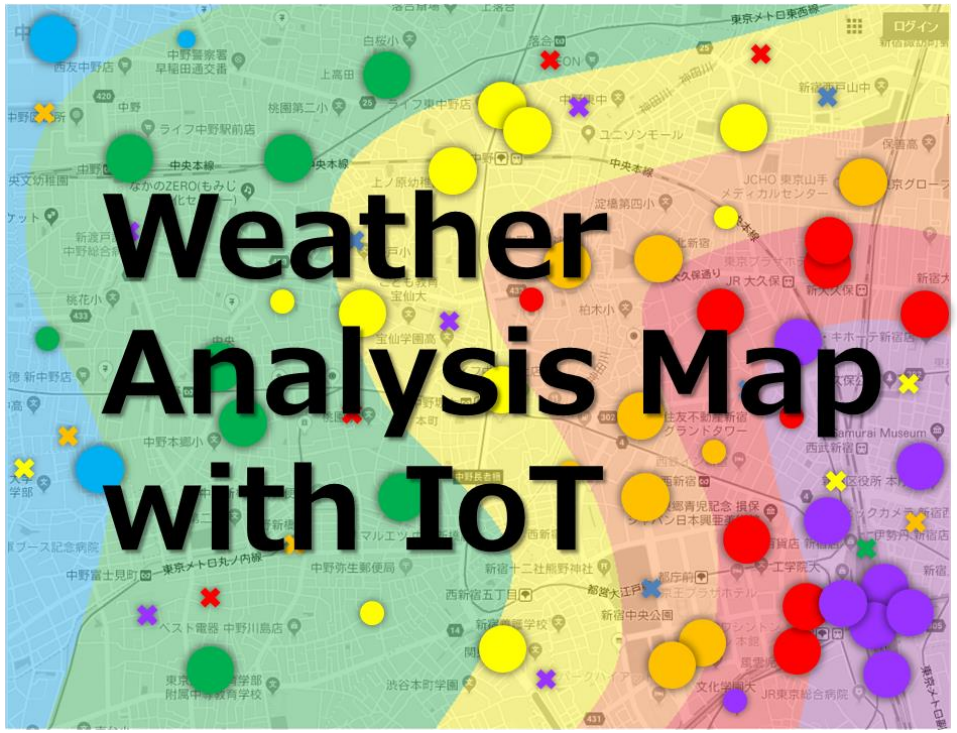
Accurate, well-timed and actionable



The weather analysis map will be conjoined with Internet of Things (IoT) supported by low-cost instruments.

Weather analysis map with IoT





As you probably viewed, Ms. Owada of JMA presents one poster about “Smart Umbrellas” in this conference hall.

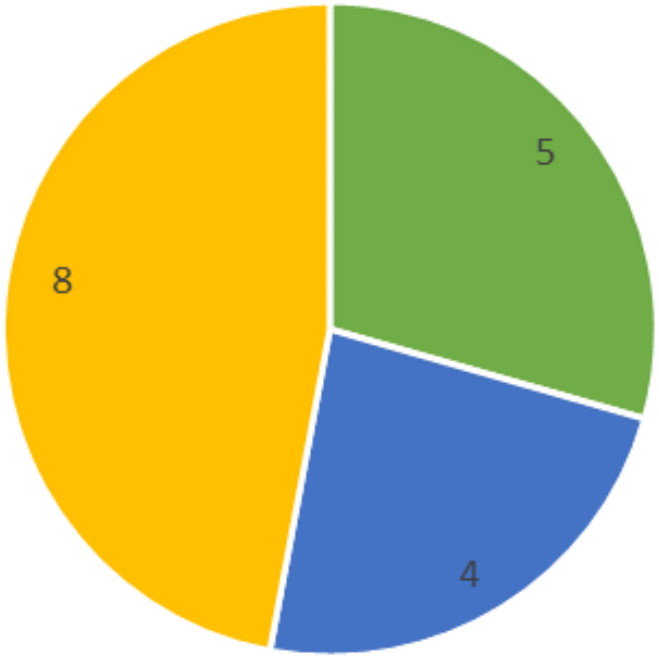
Weather analysis map with IoT

Discussion and Future work

- Low-cost instruments are available for weather observation using commercial devices.
- Its running cost is also reasonable.
- Additional service helps give a powerful incentive for establishing a smart umbrellas network.
- No traceability
- Information on observation environment is required.

As she described in the poster, IoT and low-cost instruments have great promise. However, we have to give traceability and seek information on observation environment.

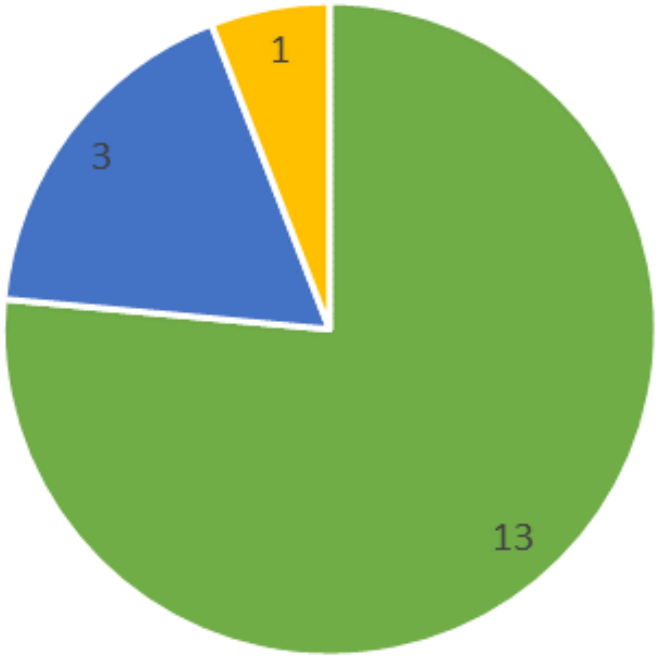
Q2.5-1 Does your organization introduce low-cost meteorological instruments?



- 1. Yes
- 2. We have a plan to introduce
- 3. No

Let’s introduce pre-workshop survey results. Half of NMHSs introduced or had plans to introduce low-cost instruments.

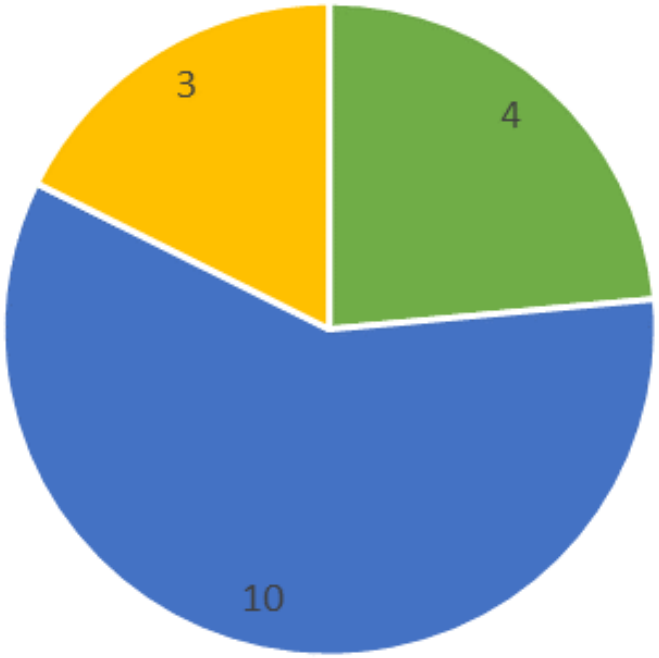
Q2.5-2 Who should carry out calibration of low-cost meteorological instruments?



- 1. National Meteorological and Hydrological Service (NMHS)
- 2. National Metrology Institute (NMI)
- 3. Meteorological instrument manufacturers

More than three quarters of NMHSs indicated that NMHS should carry out calibration of low-cost instruments.

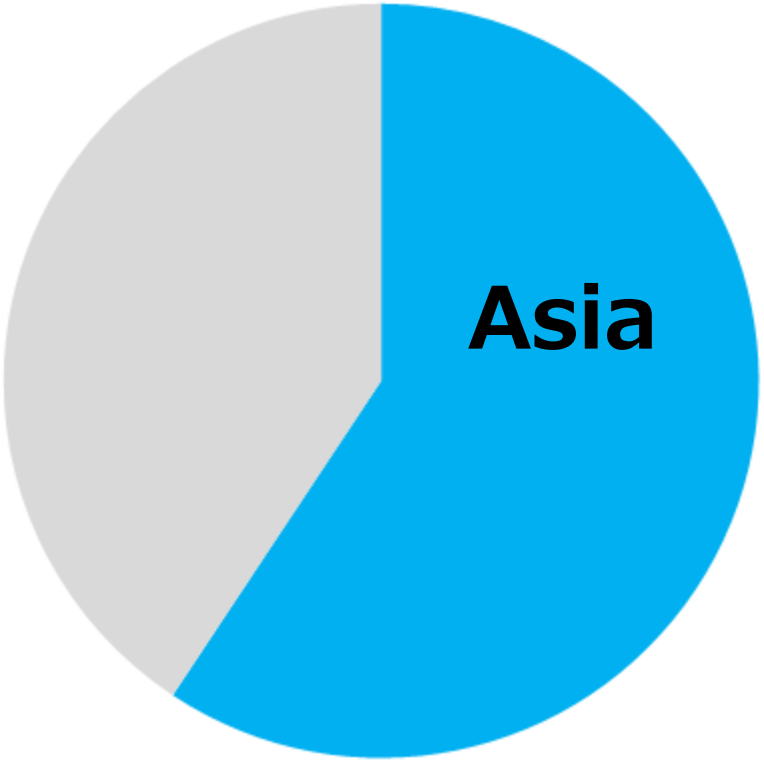
Q2.5-3 Does your organization have staff who conduct surveys and analyzes of new meteorological instruments?



1. Yes
2. Need human resource development
3. No

However, more than three quarters of NMHSs might be faced with a lack of skilled staff to prepare for new instruments.

Population



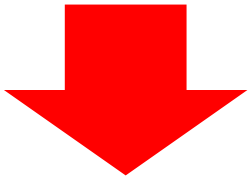
Asia's new data sources

Let's remember this chart. The large population in Asia suggests potentiality to obtain a magical effect from new data sources; billions of mobile phones in the region!

Great promise?

A large amount of new data

Great confusion?



Do you think a large amount of new data will have great promise? Or the new data bring great confusion?

Whichever it may be true, we are facing great waves of new data. We should recognize such great waves and prepare for them.

Discuss to have a vision with new data sources

It is time to discuss to have a vision with new data sources.

Thank you for your kind attention