



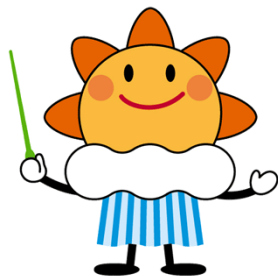
Automated Meteorological Data Acquisition System (AMeDAS) in Japan and field experiments to determine the effects of its observation environment

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URL(RIC-Tsukuba): http://www.jma.go.jp/jma/jma-eng/jma-center/ric/RIC_HP.html

Outline

1) AMeDAS

(Automated Meteorological Data Acquisition System)

- Brief History
- Stations
- Appearance and instruments
- Network
- Data Acquisition
- Progress of AMeDAS Center System
- Quality Control
- Maintenance
- Siting and Exposure

2) Field and Laboratory Experiments

- To assess the effect of observation environment on the measurement.

1) AMeDAS : Brief History

Nov.1974 AMeDAS became operational.

Nov.1979 Measurement of snow-depth started.

Apr.1983 Data Acquisition System replaced.

Feb.1993 Data Acquisition System replaced.

Feb.2001 Data Acquisition System replaced.

Mar.2003 Data interval of AWS changed from every 1-hour to every 10-minutes.

Mar.2008 Data Acquisition System replaced.

**Mar.2015 Data Acquisition System replaced.
(current system)**

1974 - 1993
JMA-74 type



1989 - 2009
JMA-89 type



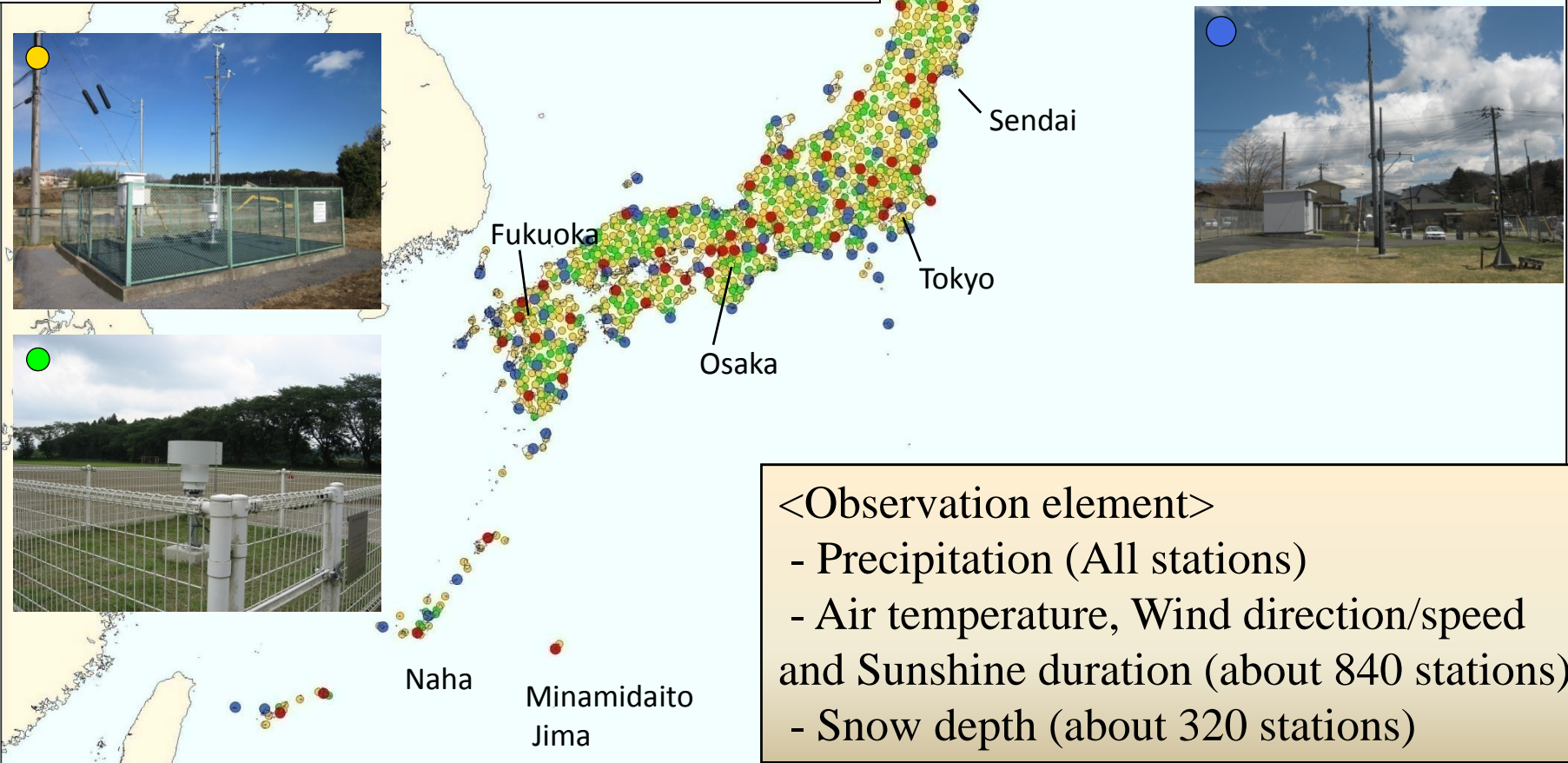
2005 -
JMA-04B type



1) AMeDAS : Stations

● Meteorological Observatory	61	} About 1,300 Stations
● Special Automatic Weather Station	95	
● Automatic Weather Station	773	
● Automatic Precipitation Gauge Station	361	

Stations are located at average intervals of 17km



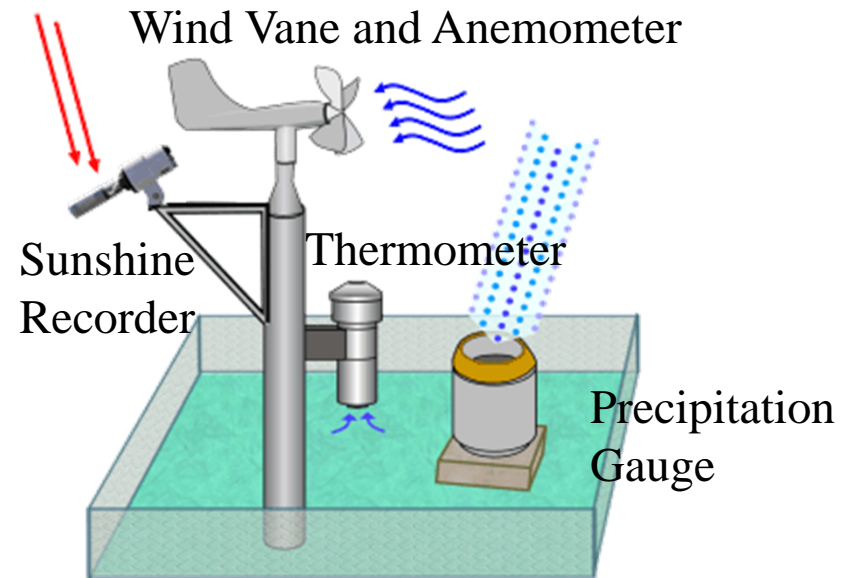
<Observation element>

- Precipitation (All stations)
- Air temperature, Wind direction/speed and Sunshine duration (about 840 stations)
- Snow depth (about 320 stations)

1) AMeDAS : Appearance and instruments



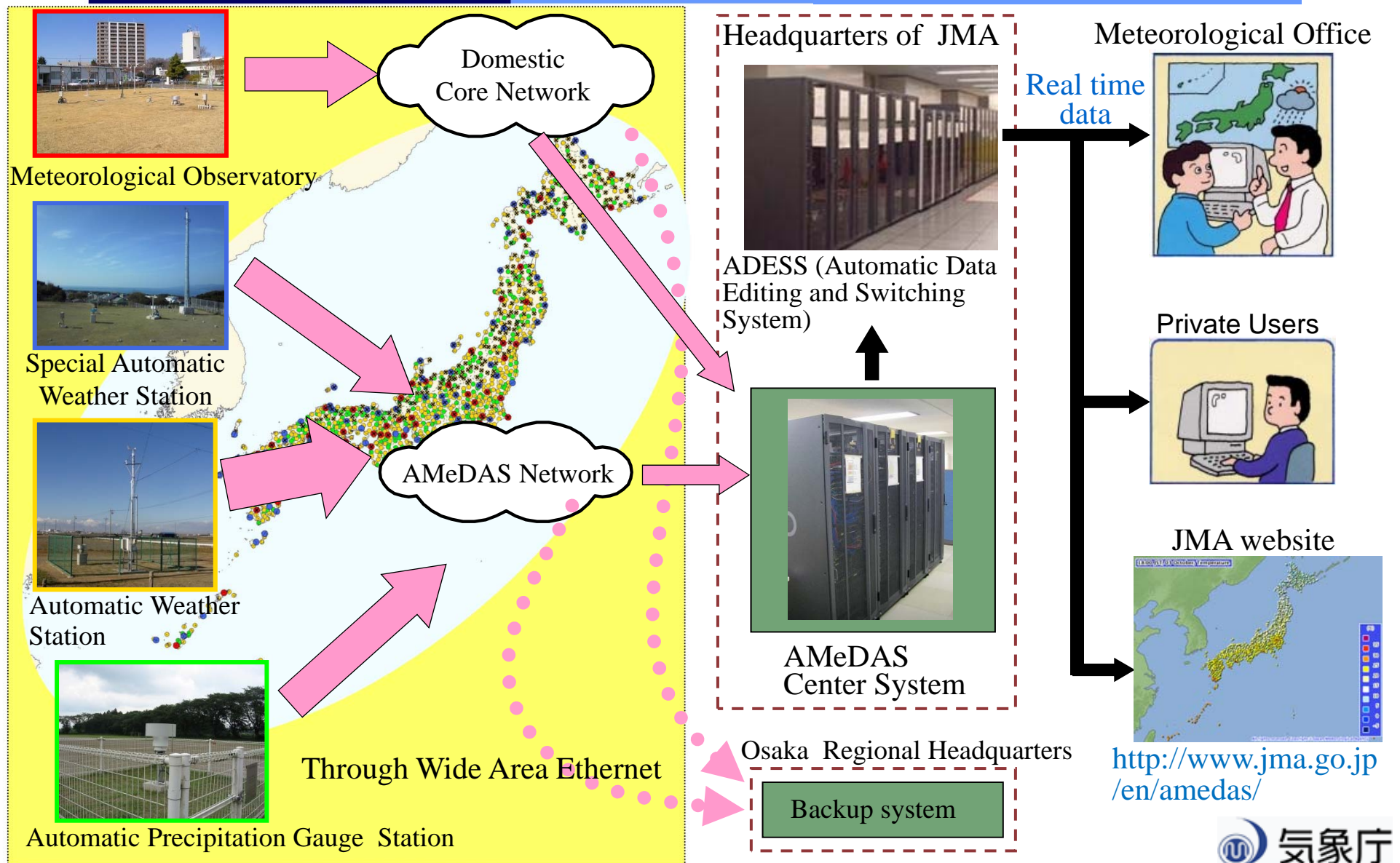
**First Generation
(1974)**



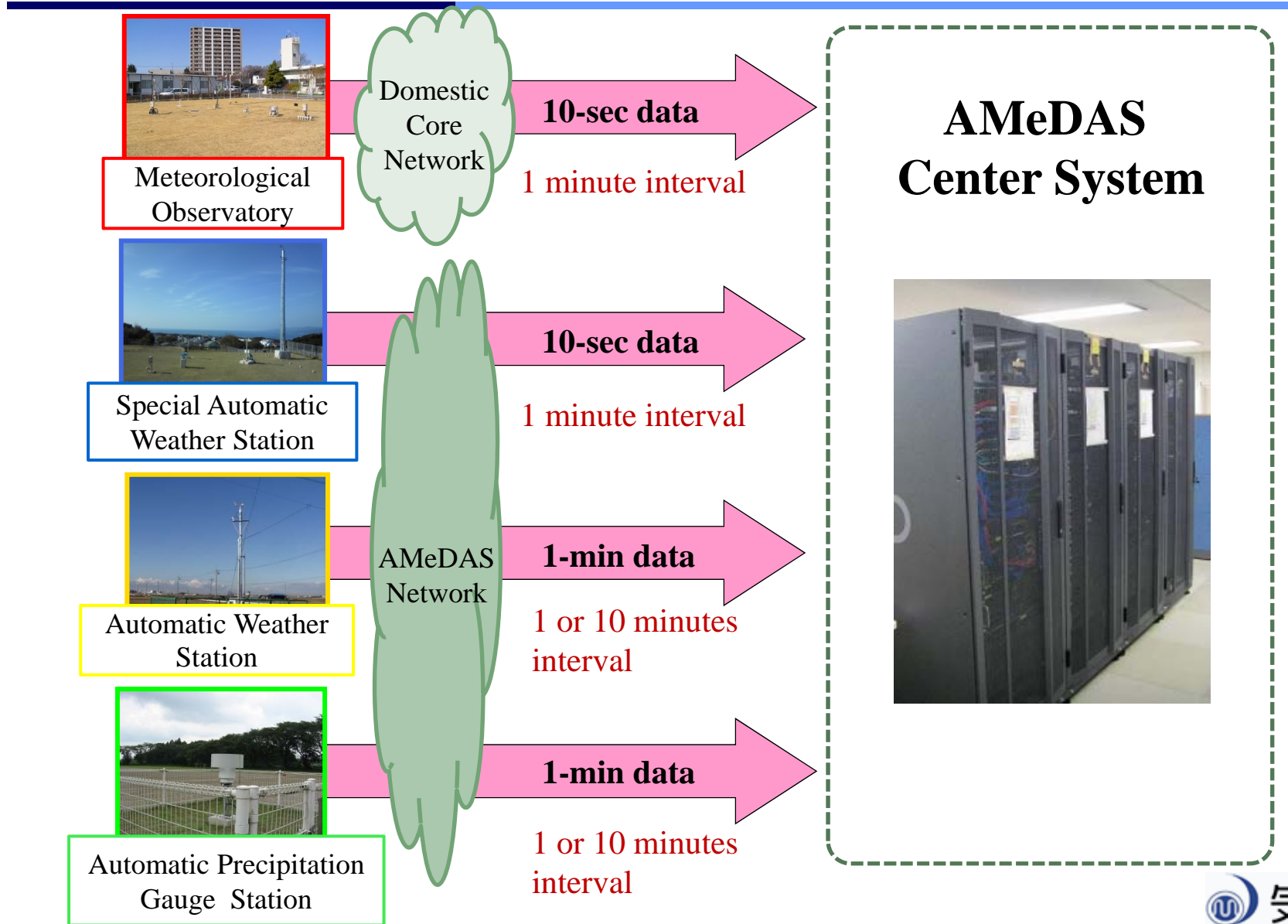
**Present (2005-)
(JMA-04B type)**



1) AMeDAS : Networks



1) AMeDAS : Data Acquisition



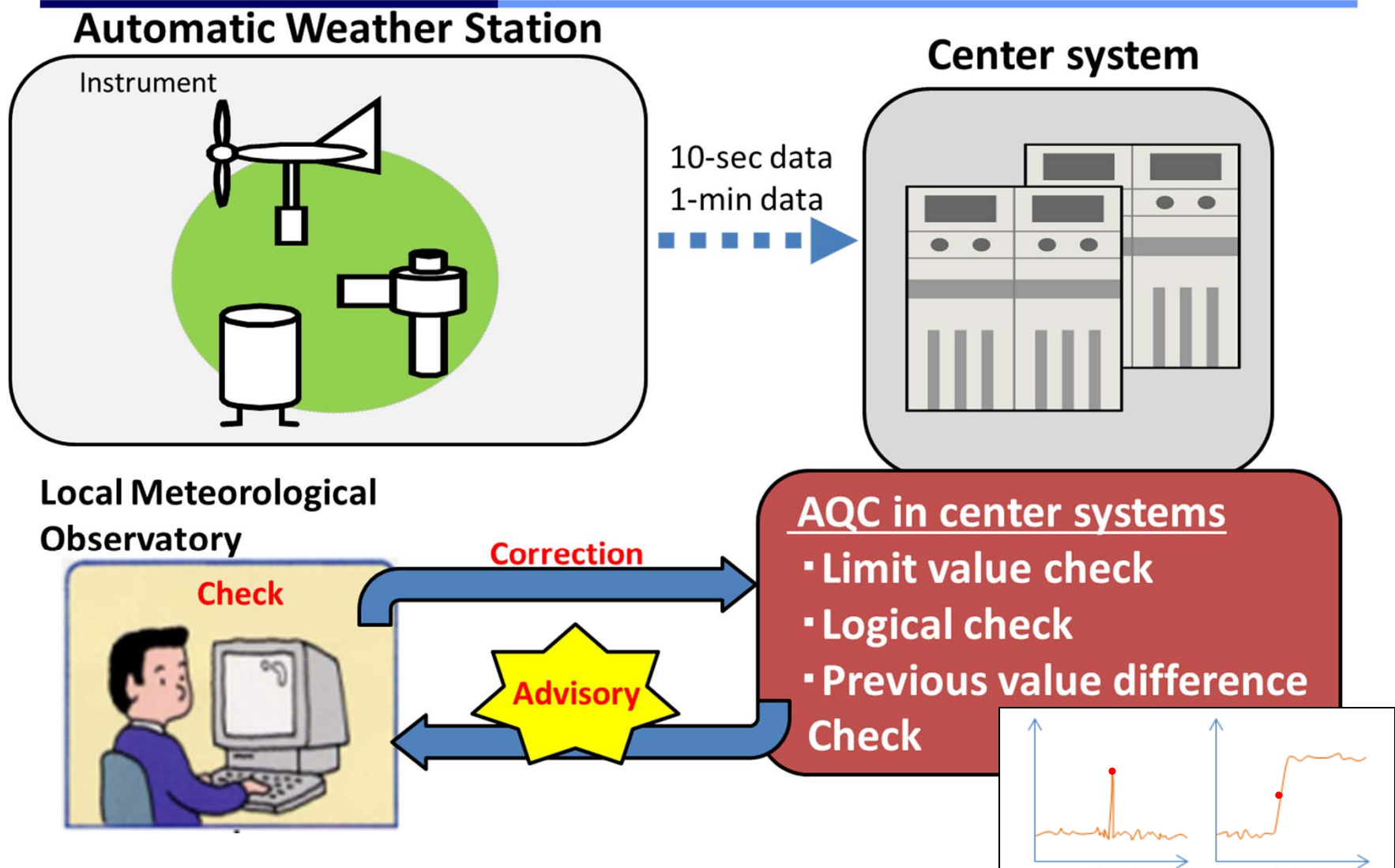
1) AMeDAS : Progress of AMeDAS Center System



Old Center System (1974)

Current Center System (2015)

1) AMeDAS : Quality Control



Long-term statistical data which JMA has are also used for AQC.

1) AMeDAS : Maintenance

JMA regularly maintains AWS in order to keep the quality of observation data.

Maintenance and inspection



Anemometer

Propeller responding properly to winds?

Any damage?

Clean?
Spider's web?

Heater working properly?



Precipitation Gauge



Shelter & Thermometer

Fan working properly?

Rust or dirt inside the shelter?

1) AMeDAS : Siting and Exposure

Issues and efforts in maintenance

Mowing is necessary.

Difficult to visit AWS frequently.

JMA installed monitoring cameras at the stations.

Easier to check grass growth from camera images.

AWS administrators schedule timely mowing.



2) Field and Laboratory Experiments



Fig.1 A boundary hedge around the observation field of an AWS in Japan

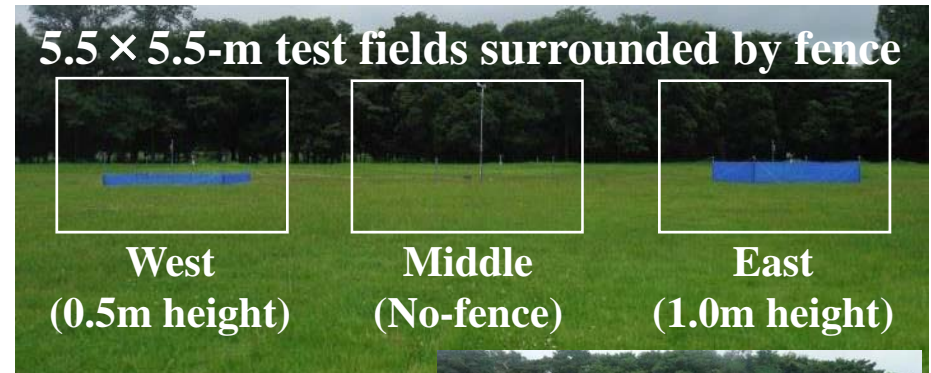


Fig.2 Field Experiment

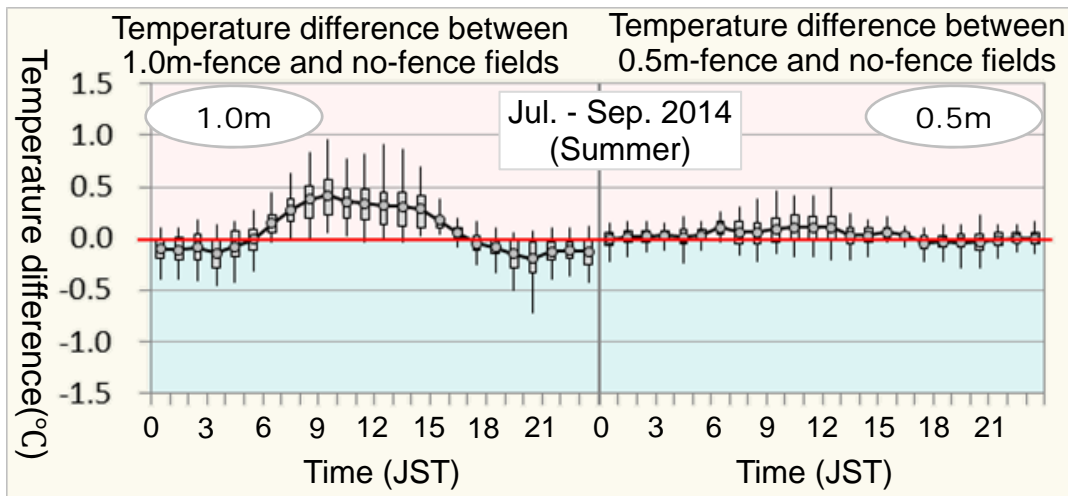
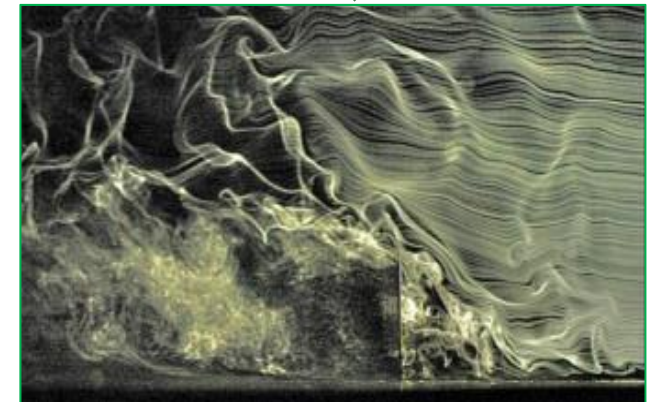


Fig.4 Temperature difference between the fields “with a fence”(1.0m and 0.5m) and “without a fence”

Summary

- JMA began operating AMeDAS in 1974 and has sustained its operation over 40 years.
- JMA has about 1300 AWSs. AMeDAS provides real-time data for weather forecasting and warnings.
- AMeDAS Center System plays a key role in the data management including collection, calculation, quality control, and dissemination of the data.
- JMA achieves high density and high quality AWS observations, by regular maintenance of the equipment and the observation environment.

**I hope our experience will be of some help to
the development of your AWS network.**

Thank you for your attention!



“Harerun”, the mascot of JMA

