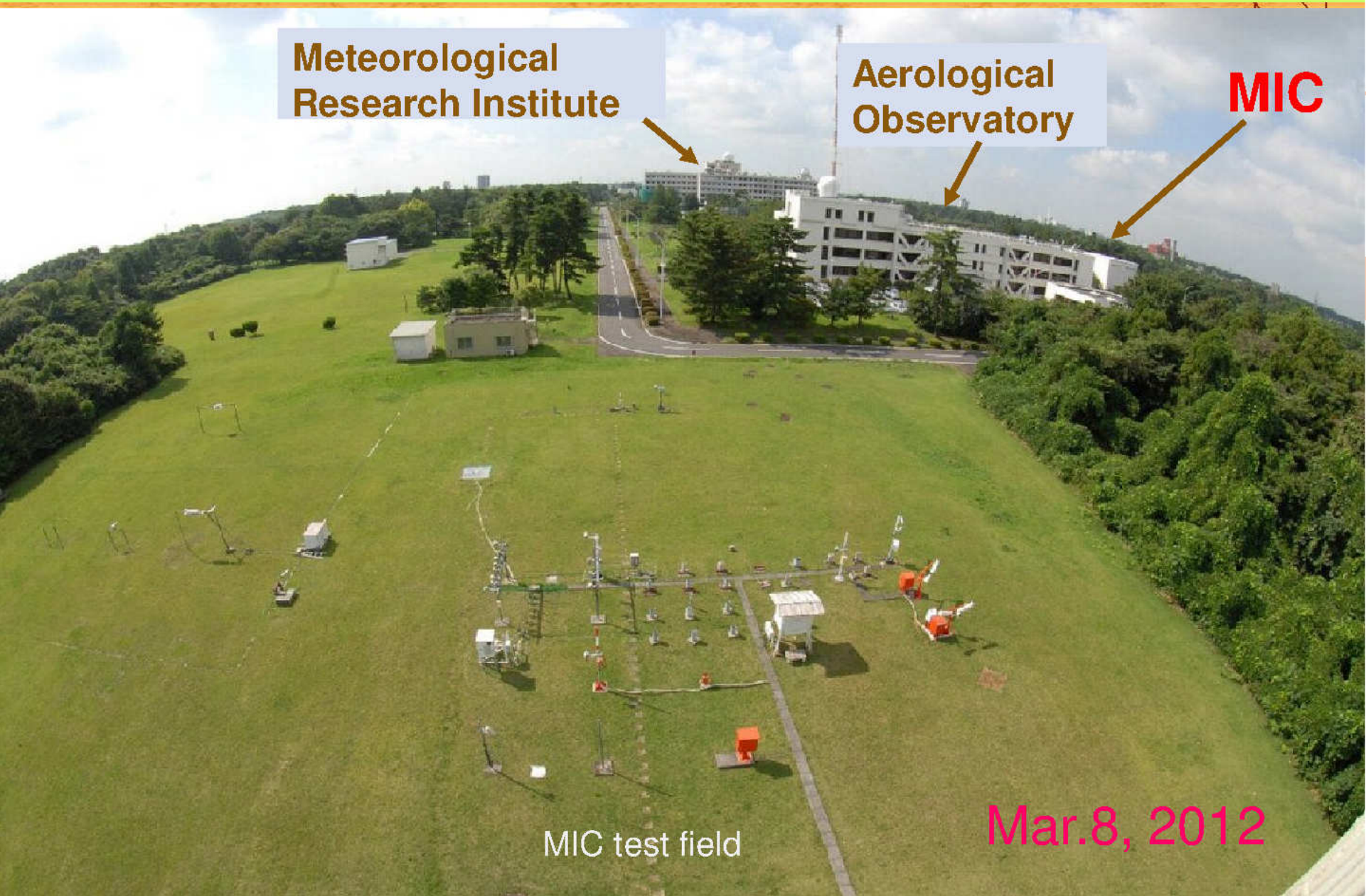
Services of MIC (Meteorological Instruments Center)



Services of MIC

1. Quality assurance of meteorological instruments

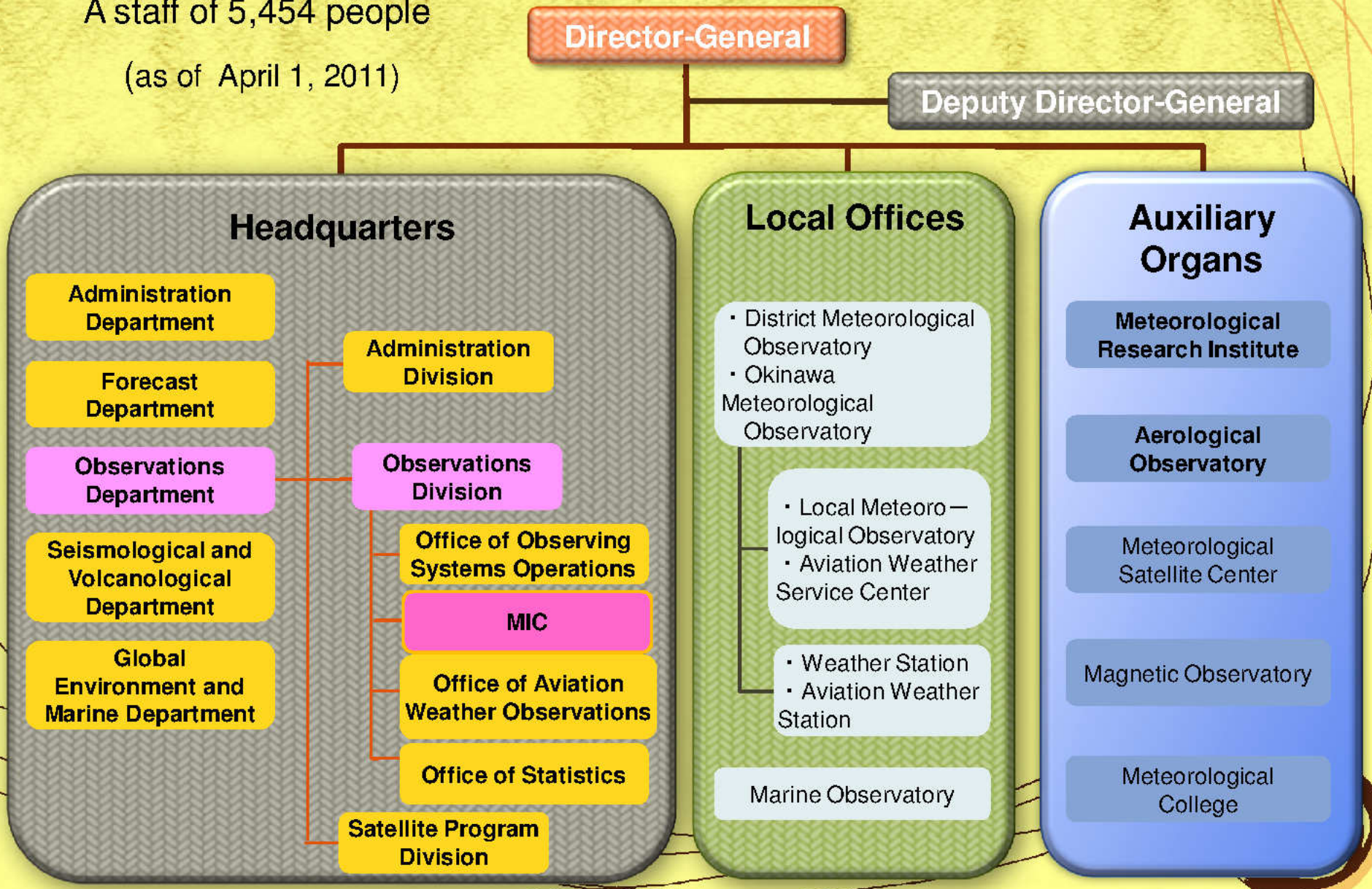
2. Research and Improvement

3. WMO RIC （Regional Instrument Center) Tsukuba

Organizational structure of JMA

A staff of 5,454 people

(as of April 1, 2011)



1. Quality assurance of meteorological instruments

1） MIC inspects JMA's meteorological instruments to maintain high-precision meteorological observations.

- **main points**
  - inspection of meteorological instruments
  - portable AWS

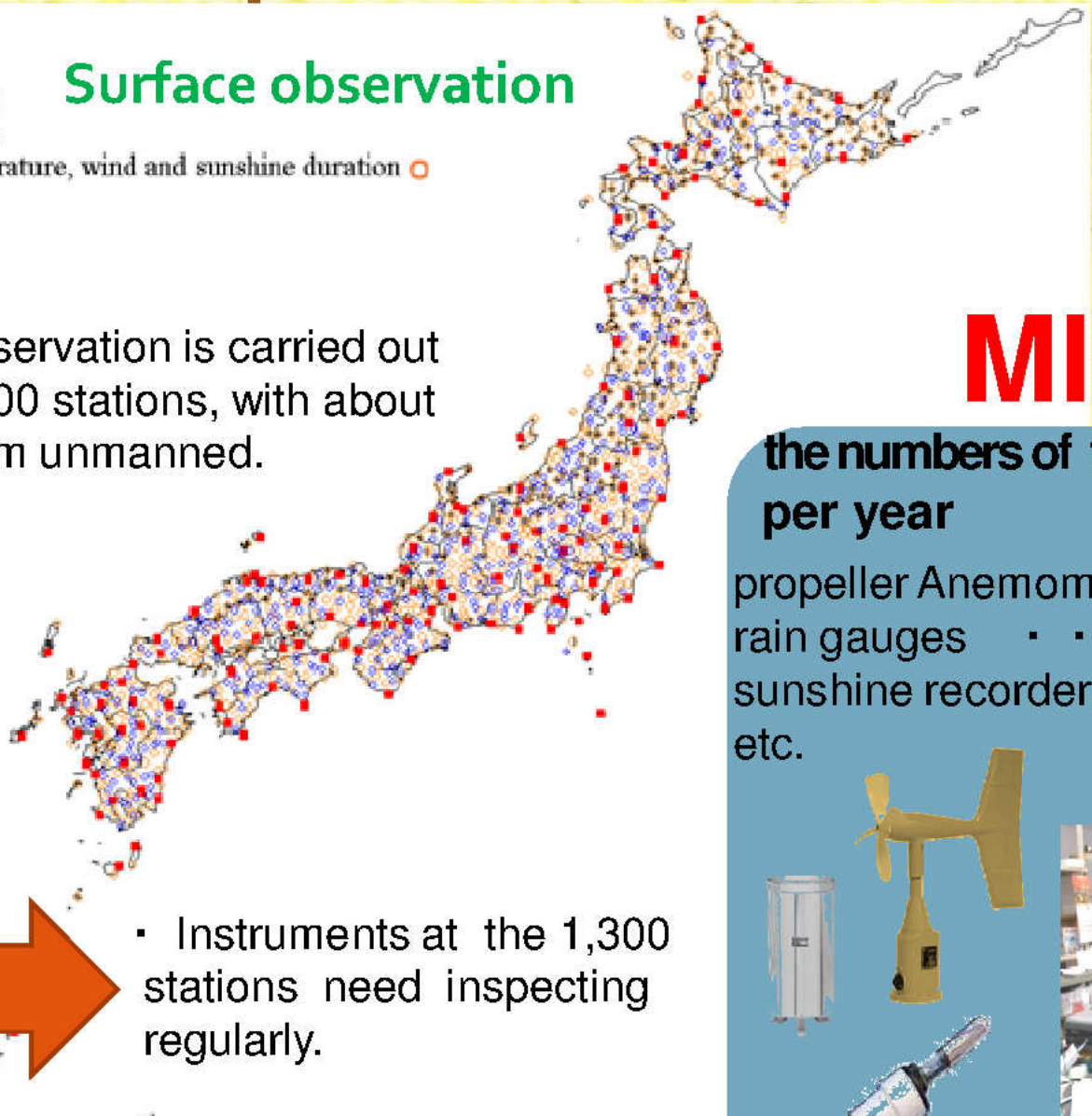
2） MIC maintains meteorological standards and traceability system.

- **main points**
  - standards of JMA
  - calibration chambers
  - wind tunnel
  - traceability system

MIC inspects JMA's instruments

Surface observation

Manned stations: ■
Unmanned stations:
- rainfall, temperature, wind and sunshine duration ○
- rainfall ○
- snowfall +



・Surface observation is carried out at about 1,300 stations, with about 1,200 of them unmanned.

・Instruments at the 1,300 stations need inspecting regularly.

MIC

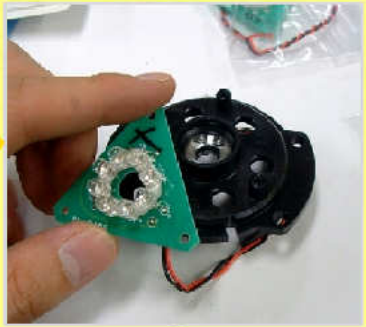
the numbers of the inspection per year

propeller Anemometers ・・ 340
rain gauges ・・・・・・・ 300
sunshine recorders ・・・ 280
etc.

Total 1,200

How to inspect a propeller anemometer

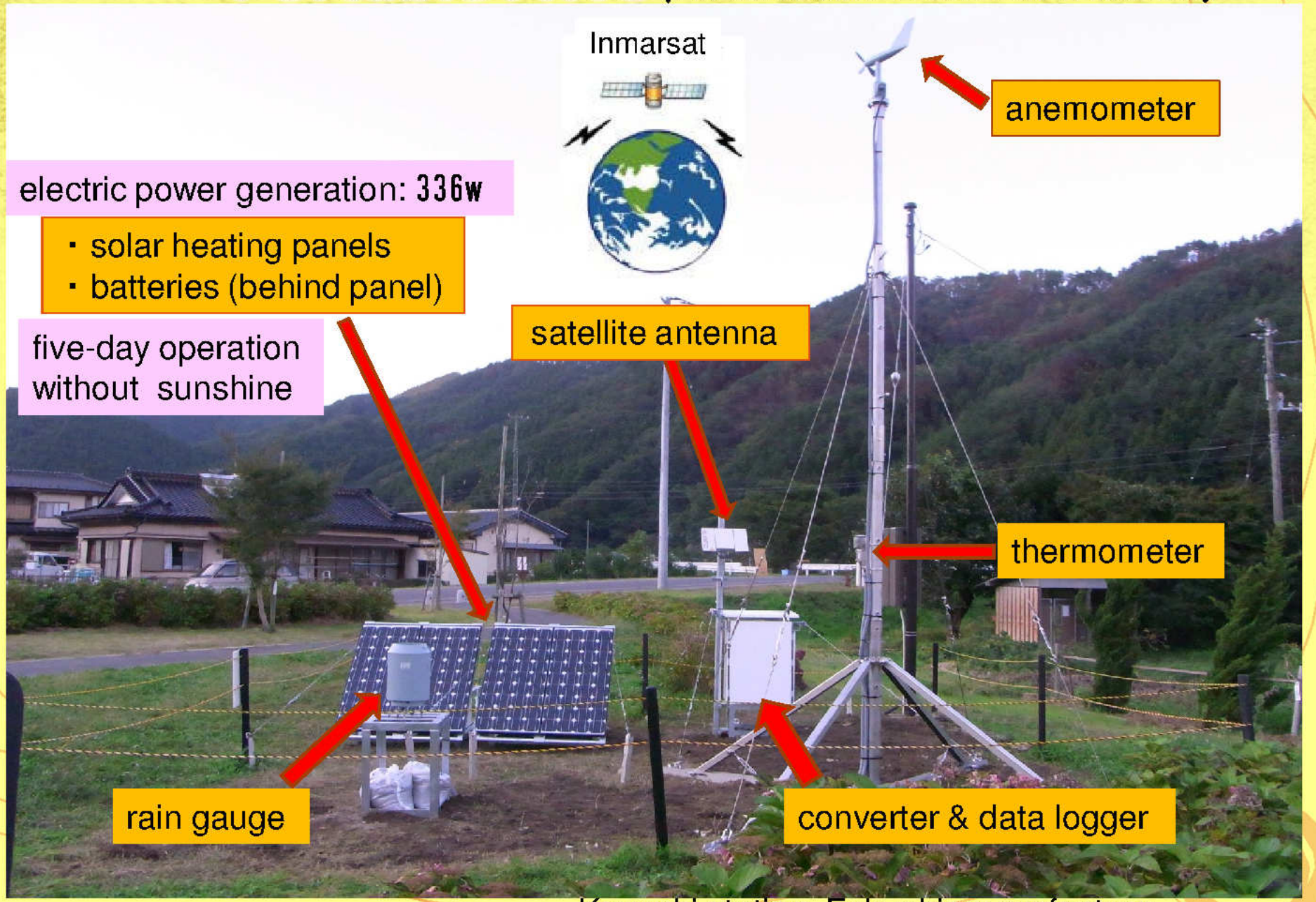
disassemble → replace parts (assemble) → → inspect



parts

A propeller anemometer (FF-12A type)

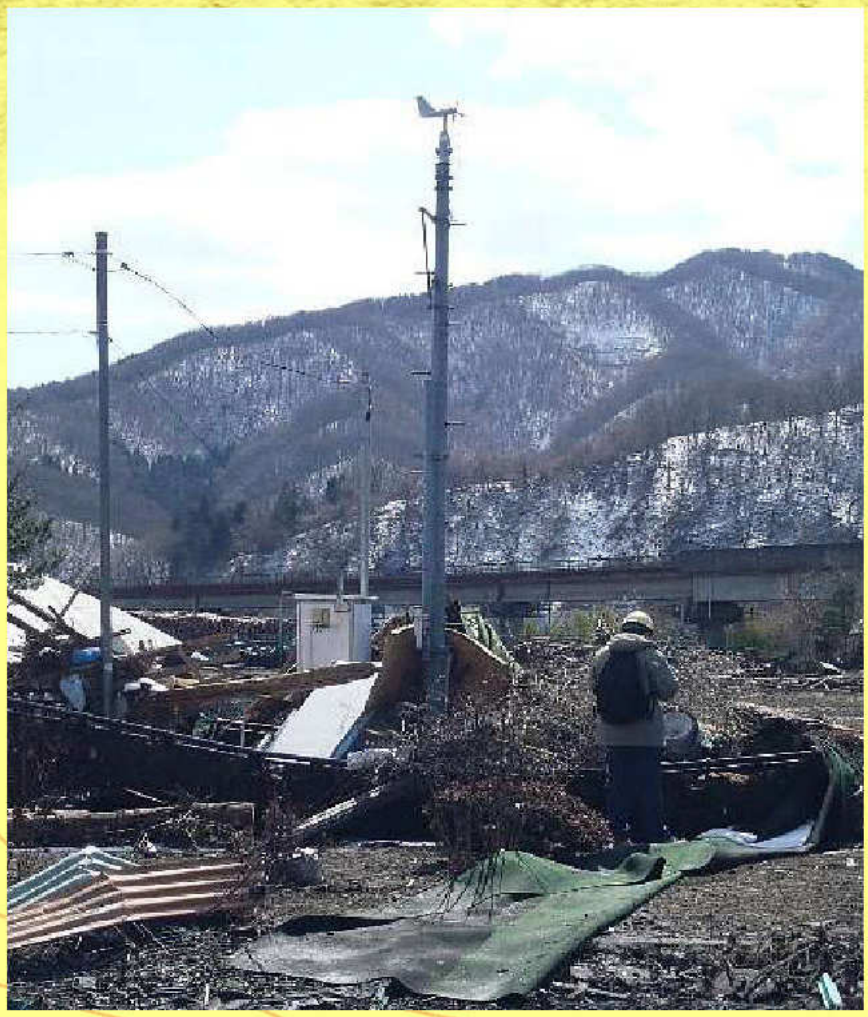
Portable AWS (Automatic Weather Station)



Kozuchi station, Fukushima prefecture

Portable AWS at Kamaishi station in Iwate prefecture

After the Great East Japan Earthquake on Mar.11, 2011, JMA set up 12 portable AWSs in the Tohoku district (MIC set up four of them).



Kamaishi station, Iwate prefecture attacked by the tsunami on Mar.11,2011.

A portable AWS fixed at the new site 1 km northwest of the original site on Apr.27,2011.

Standards of JMA

Thermometer standard

Platinum resistance thermometer sensor and alternating current bridge

Hygrometer standard

Dew point meter (electronic cooling type) and platinum resistance thermometer

Barometer standard

Air piston gauge type

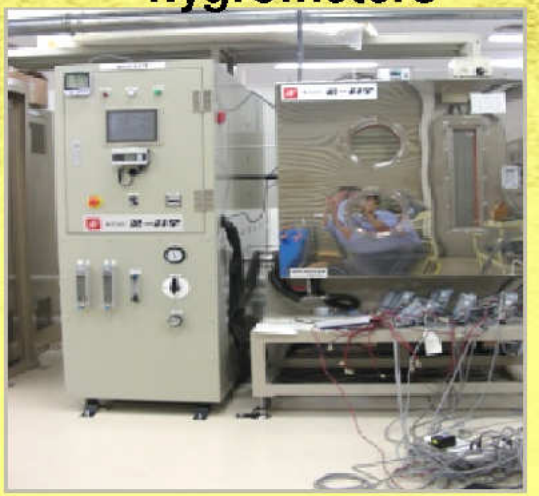
Calibration Chambers

A chamber for calibrating thermometers

liquid bath type
Range: - 85 ~ +50℃

air chamber type
Range: -40 ~ +50℃

A chamber for calibrating hygrometers



wet and dry air mixing type
Range: 15 ~ 95%RH

wet and dry air mixing type
Range: 10 ~ 95%RH, -10 ~ +50℃

A chamber for calibrating barometers

Range: 4 ~ 1050 hPa

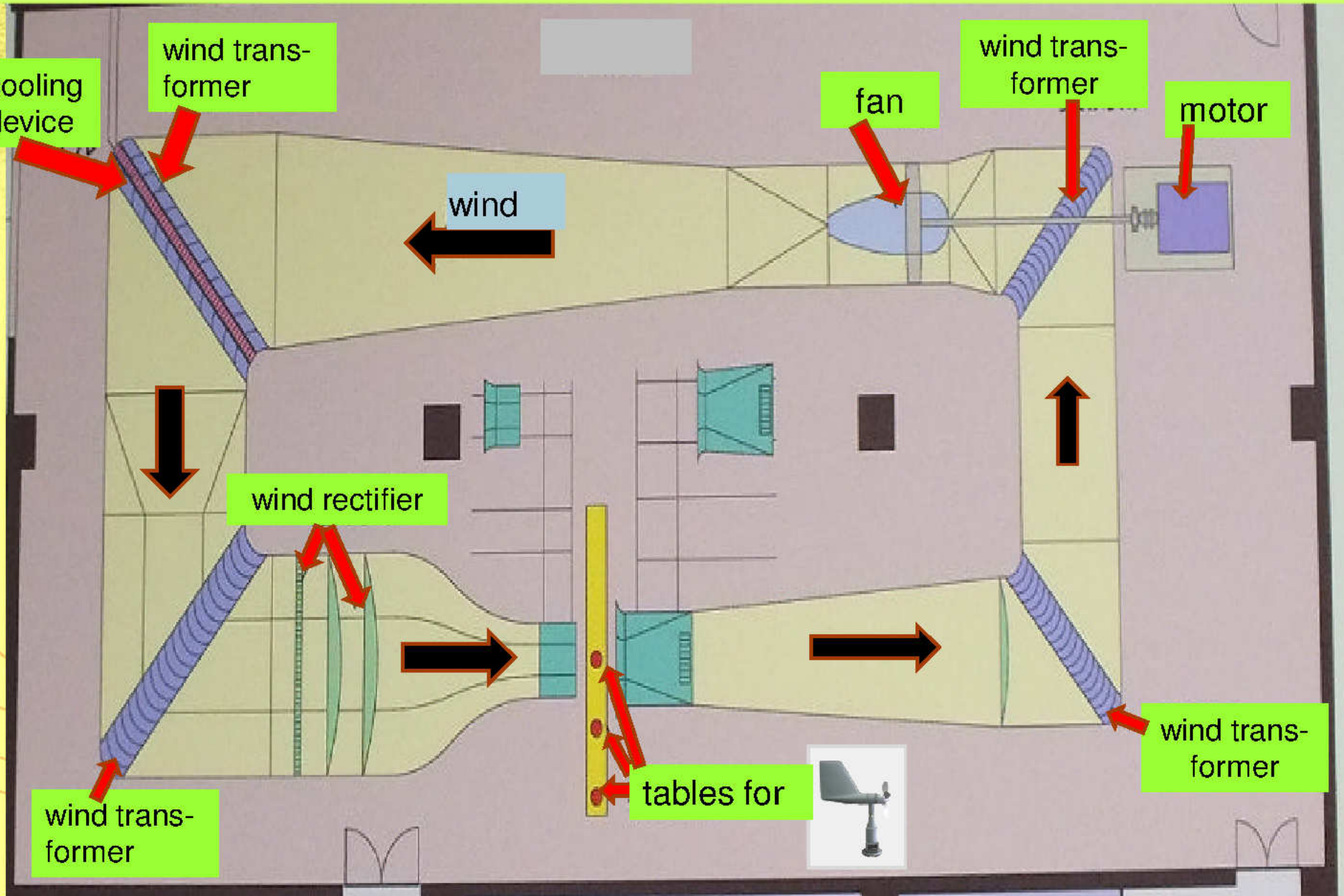
Wind tunnel

Specifications

wind speed ： 0.35～108m/s

length of the tunnel: 58.4m

Wind tunnel room (top view)

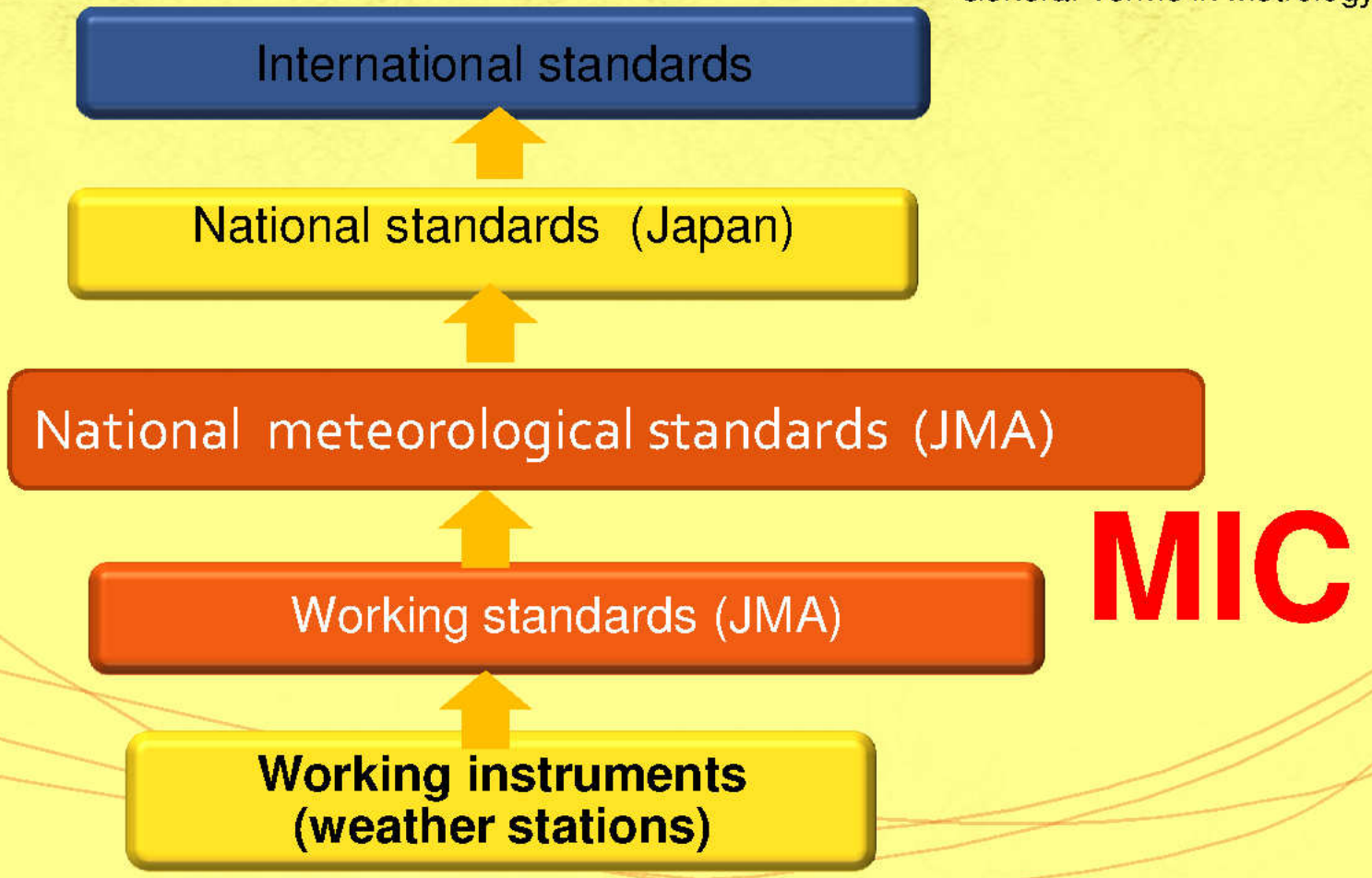


JMA's traceability system

Traceability is defined※ as

"property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties."

【※The International Vocabulary of Basic and General Terms in Metrology (VIM), 1993】



2. Research and Improvement

In order to make most suitable observation

- Improvement of meteorological instruments
- Research on site environment and methods of observation

Summary of research and improvement in recent years

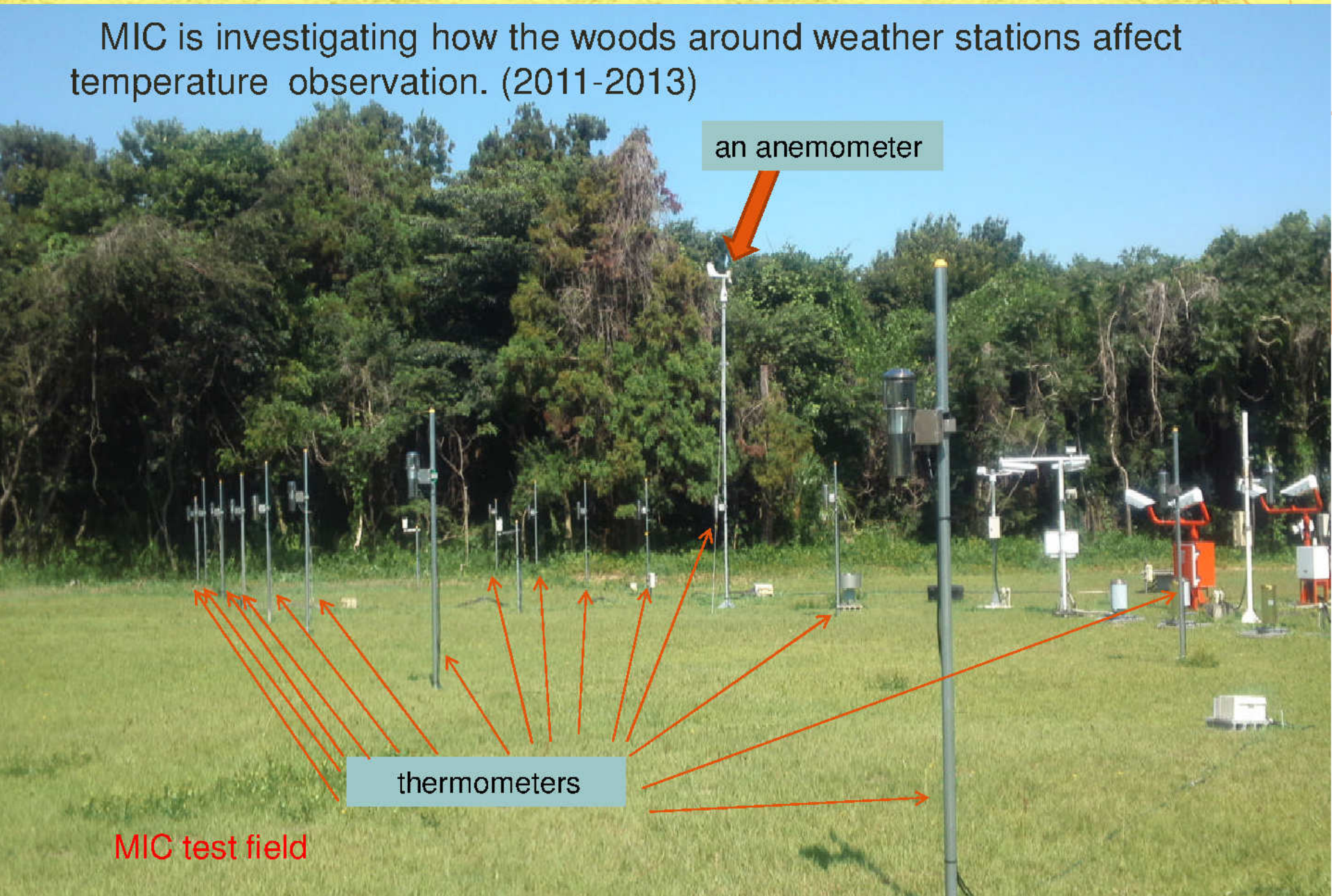
2009 : Test of capacitive hygrometer with warmed probe
: Intercomparison of thermometer screens/shields
（We gave a poster session presentation at TECO-2010.）

2010 : Field experiment on the effects of a nearby asphalt road on temperature
（We gave a presentation at AMS 92nd annual meeting on Jan.25,2012.）
: Research on instruments of the next generation system on surface measurement

2011 : Study of new amount-of-cloud judging algorithm
: Research on the influence on temperature observation by change of the site environment (2011～2013)

Research and Improvement

MIC is investigating how the woods around weather stations affect temperature observation. (2011-2013)



3.WMO RIC Tsukuba

MIC became one of WMO RICs of the region Ⅱ in 1996.

Main activities

- MIC helps members of the region Ⅱ calibrate their national meteorological standards.

- MIC helps members of the region Ⅱ train their instruments specialists.

WMO Regional Instrument Centers (RICs)

Training workshop at Tsukuba (1998)

RIC-Tsukuba and WMO held the workshop for "training instrument specialists in RAII and improvement of instrument maintenance and calibration technique" inviting the trainees from 16 members in RA II (Nov. 1998).

Practicing during the above training workshop

4 members of Oman Met Department visited RIC-Tsukuba on Feb. 27, 2012.

Thank you