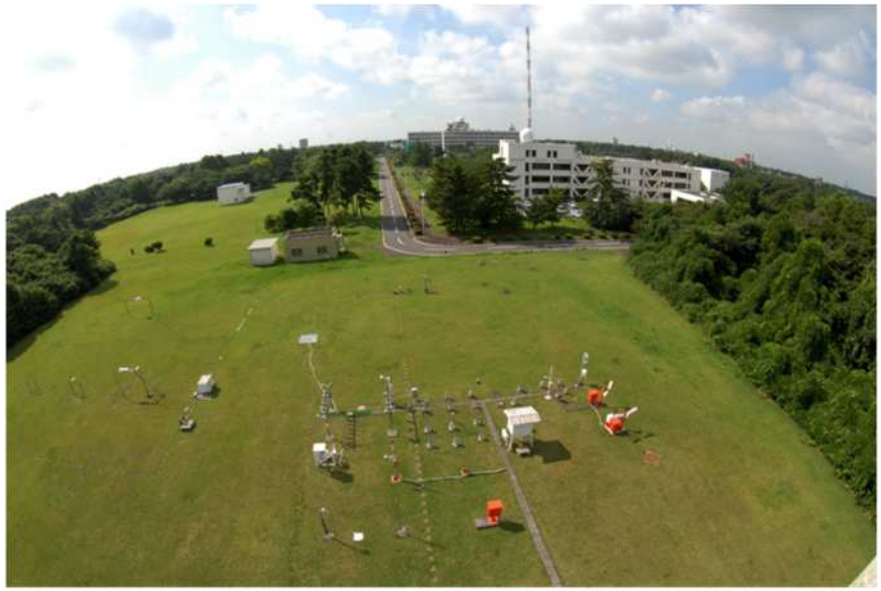
Recent Activities on Traceability and Inspection of Meteorological Instruments in Japan



Yukihiro Nomura
Kenshi Umehara

Meteorological Instrument Center
WMO/Regional Instrument Centre
(RIC) Tsukuba

Japan Meteorological Agency (JMA)

Website: http://www.jma.go.jp/jma/jma-eng/jma-center/ric/RIC_HP.html
Email: ric-tsukuba@met.kishou.go.jp

Contents

- Overview of the activities of Meteorological Instrument Center (MIC)

  1) Quality Assurance of Meteorological Instruments

  2) Research and Development (R&D)

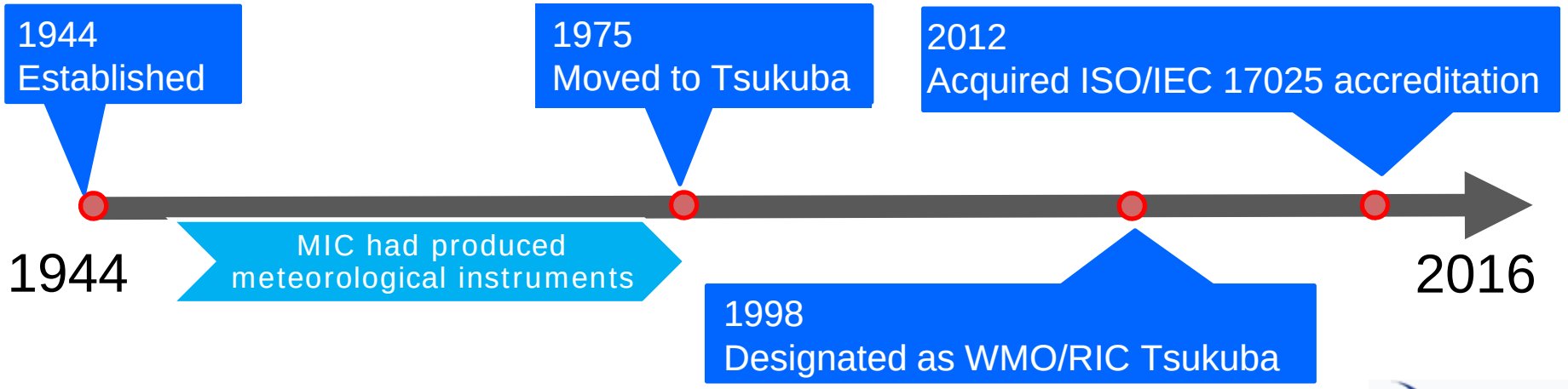
  3) International Activities as WMO/RIC Tsukuba

Development of MIC

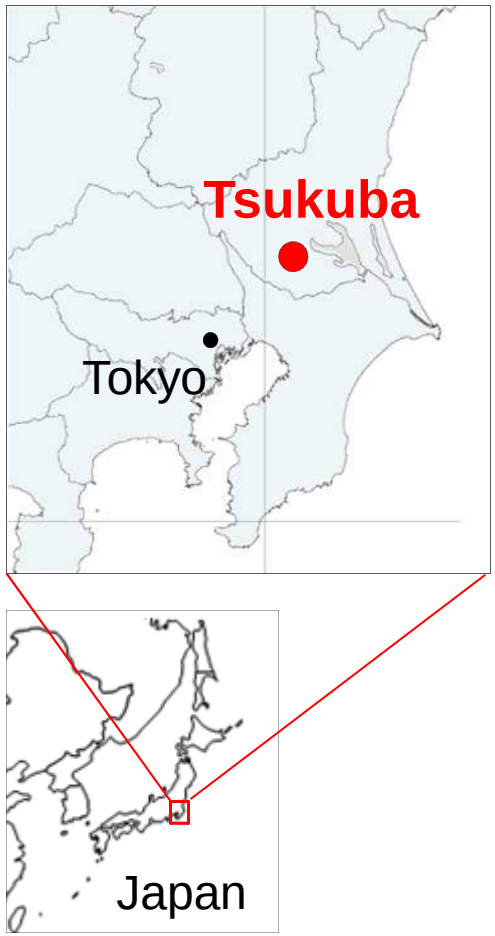
A unique institution responsible for development of the meteorological instrumentation of JMA

Former MIC, 1956

Present MIC, 2016



Location of MIC

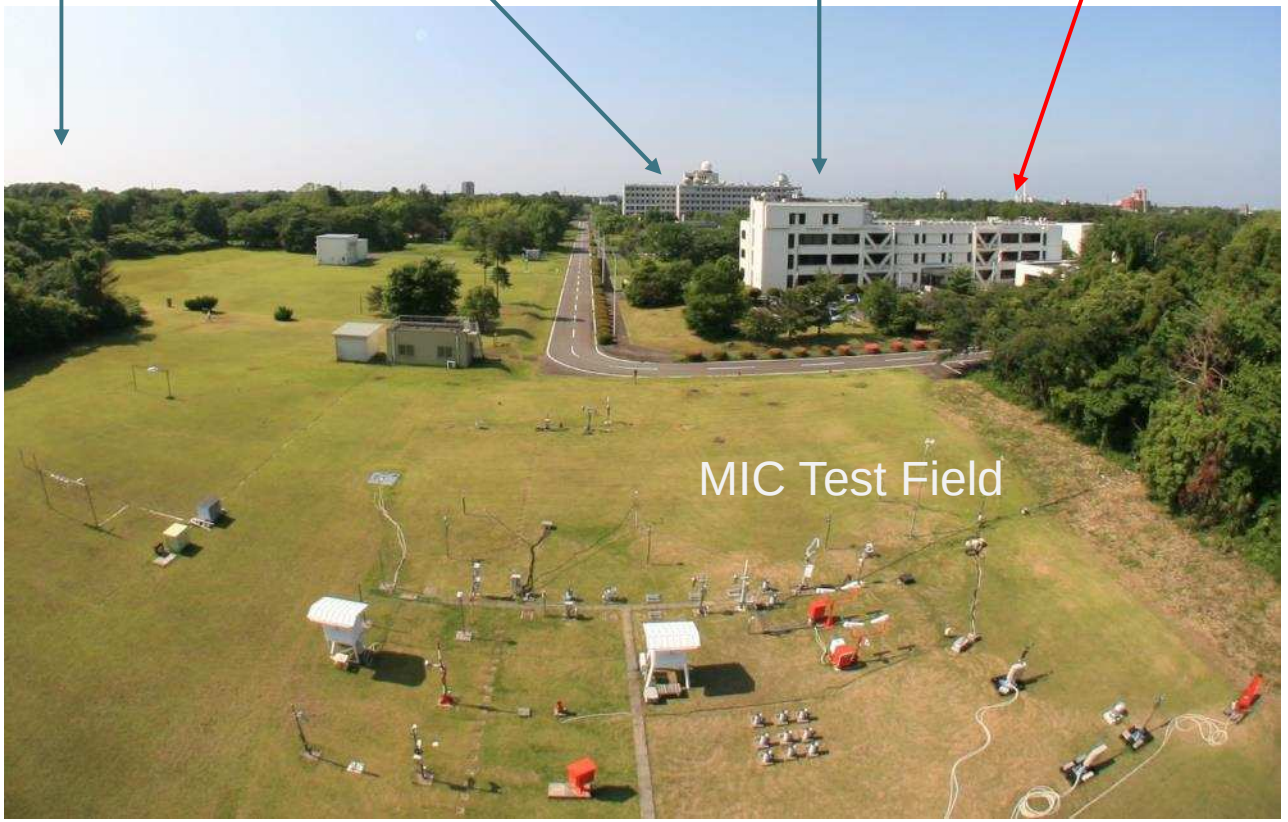


AIST
NMIJ

Meteorological
Research
Institute

Aerological
Observatory
GRUAN
WMO/RRC Tokyo

MIC
WMO/RIC Tsukuba



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Main Services of MIC

- **Quality Assurance of Meteorological Instruments**

  To inspect meteorological equipment and to maintain standard instruments and their traceability, to ensure high-precision meteorological observations in Japan.

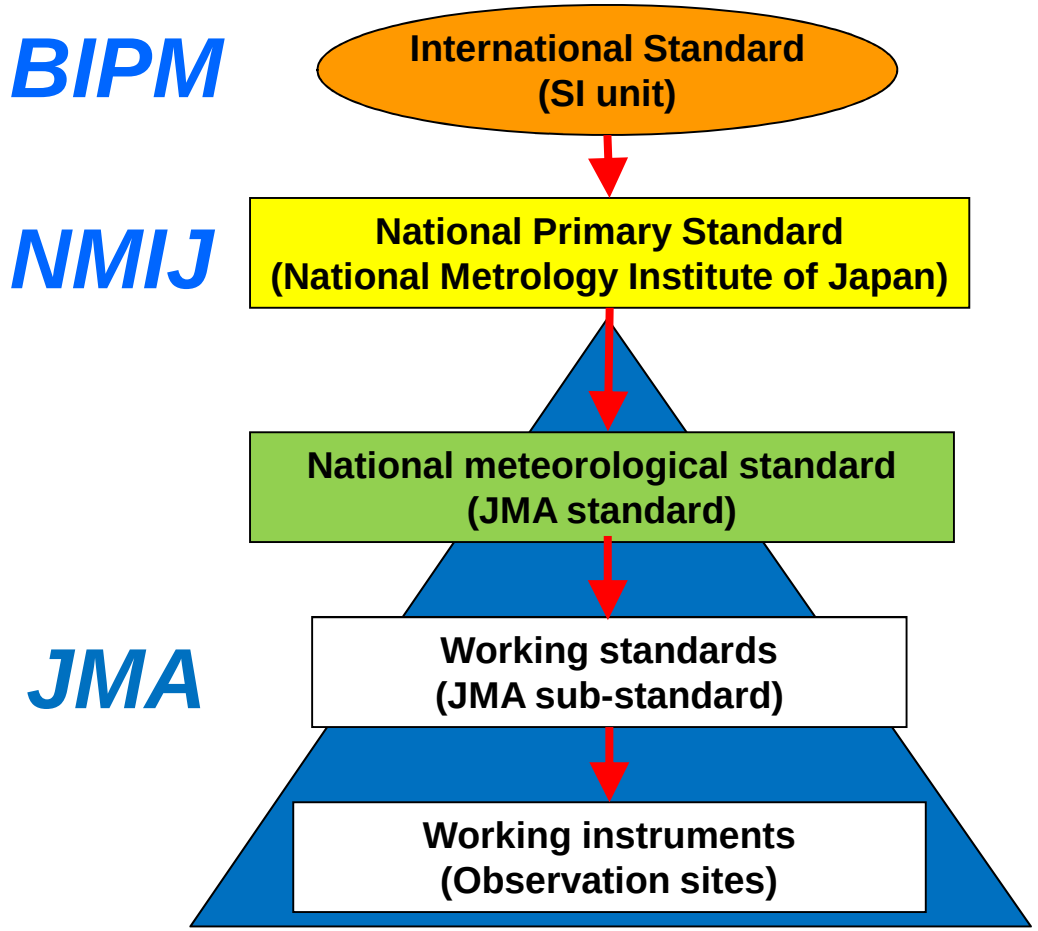
- **Research and Development (R&D)**

  To carry out research and development of instruments and suitable methods and environment for observation.

- **Responsibilities as WMO/RIC Tsukuba**

  To assist Members of RA II (Asia) through calibration and comparison with meteorological instruments, and to conduct training for the Members for fostering specialists in the instrument.

Traceability of Meteorological Instruments in Japan




Certificate of Accreditation

Japan Meteorological Agency

IAJapan hereby accredits the following laboratory as a calibration laboratory based on the Measurement Law as it meets the requirements of relevant international standards. This laboratory also meets the requirements for Mutual Recognition Arrangements (MRA) of ILAC and APLAC.

Accreditation No.
JCSS0295
Name of Laboratory
Meteorological Instruments Center,
Japan Meteorological Agency
Address of Laboratory
Nagamine 1-2, Tsukuba City, Ibaraki, 305-0052, Japan
Accreditation Scope
Temperature, Pressure, Humidity (as attached)
Accreditation Criterion
ISO/IEC 17025:2005

Date of Initial Accreditation : 2012-08-30
Latest Date of Issue : 2013-09-05

Ichiro Fujima
Chief Executive, IAJapan
National Institute of Technology and Evaluation

JMA is accredited to ISO/IEC17025

- Temperature
- Pressure
- Humidity

In Japan, the Meteorological Service Act requires all meteorological instruments used for public to meet certain technical and performance standards.

Calibration Equipment of MIC

Temperature

Humidity

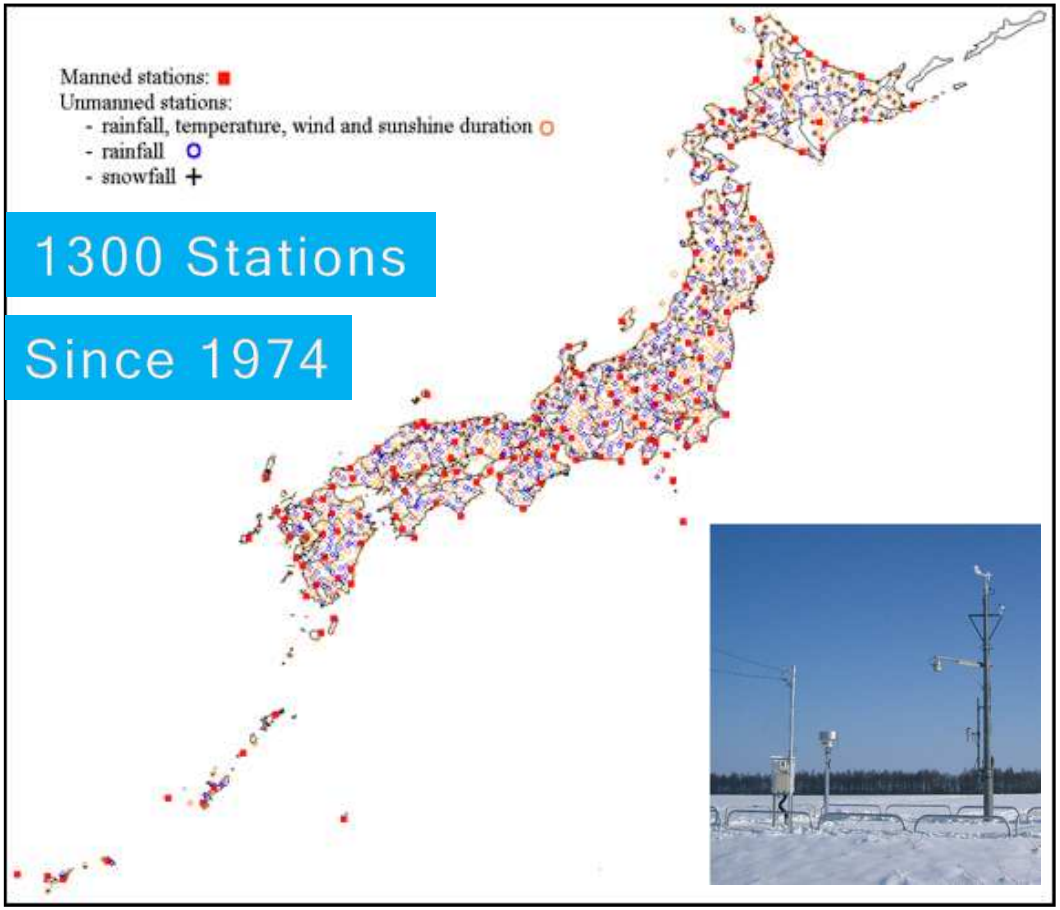
Rain Gauge

Wind

Pressure

Maintenance and Inspection of Instruments in JMA

AWS Network of JMA (AMeDaS)



Site maintenance (once a year)

Overhaul at MIC (every 5 years)

MIC inspects about 1,600 units of instrument per year

Investigation and Experimentation on Observation Methods and Instruments

In order to make more suitable observation

- Study of site environment and methods of observation
- Improvement of meteorological instruments

Summary of study and improvement in recent years	
2014	Research on environmental conditions with low hedges around observation fields
	Study of substitutes for Assmann aspiration psychrometer
2015	Research on environmental conditions with low hedges around observation field
	Technical study of Assmann aspiration psychrometer
	Study of improvement of the lower part of shelters/screens
2016	Study of substitutes for Assmann aspiration psychrometer
	Study of weighing precipitation gauges and disdrometers for Dual- polarization radar
	Wind tunnel and field test of some sonic anemometers
	Field test of some shelters/screens

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Field experiments to determine the effect of boundary fences on temperature observation

Fig.1 A boundary hedge around the observation field of an automated weather station in Japan

Fig.2 Field Experiment

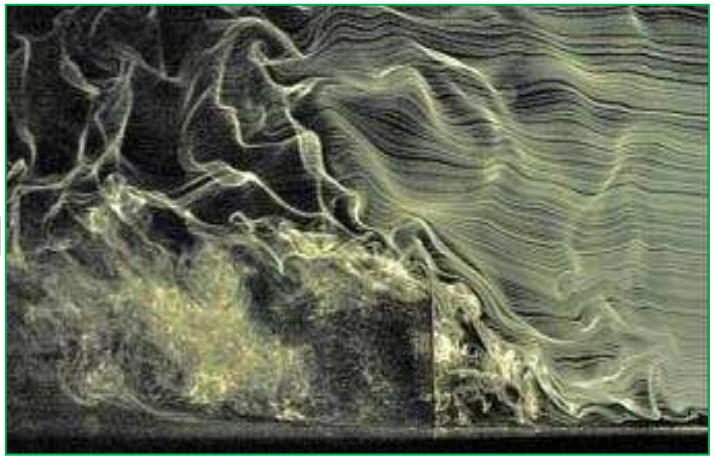

Fig.3 Wind Tunnel Experiment
(Visualization of flow over a fence)

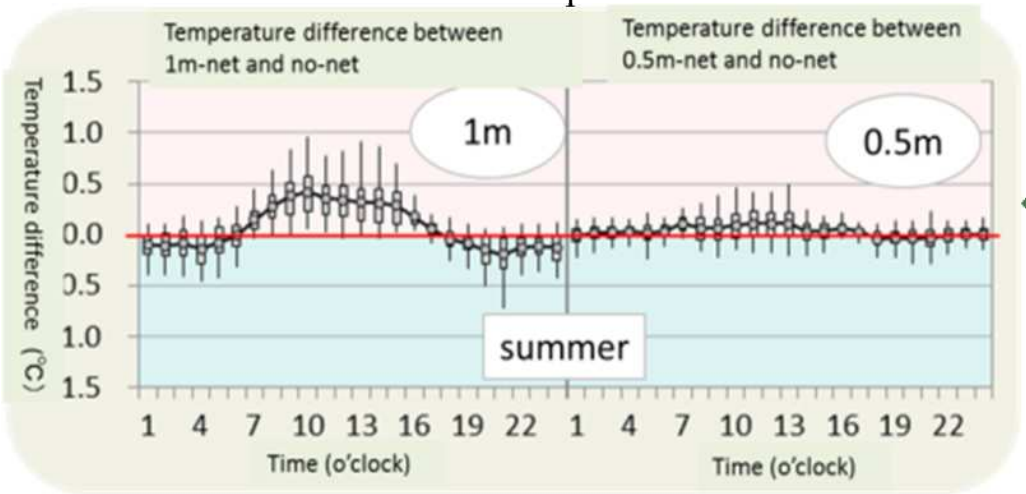

Fig.4 Temperature difference between the fields with four-face nets (1 m and 0.5 m) and the no-net field (no net)

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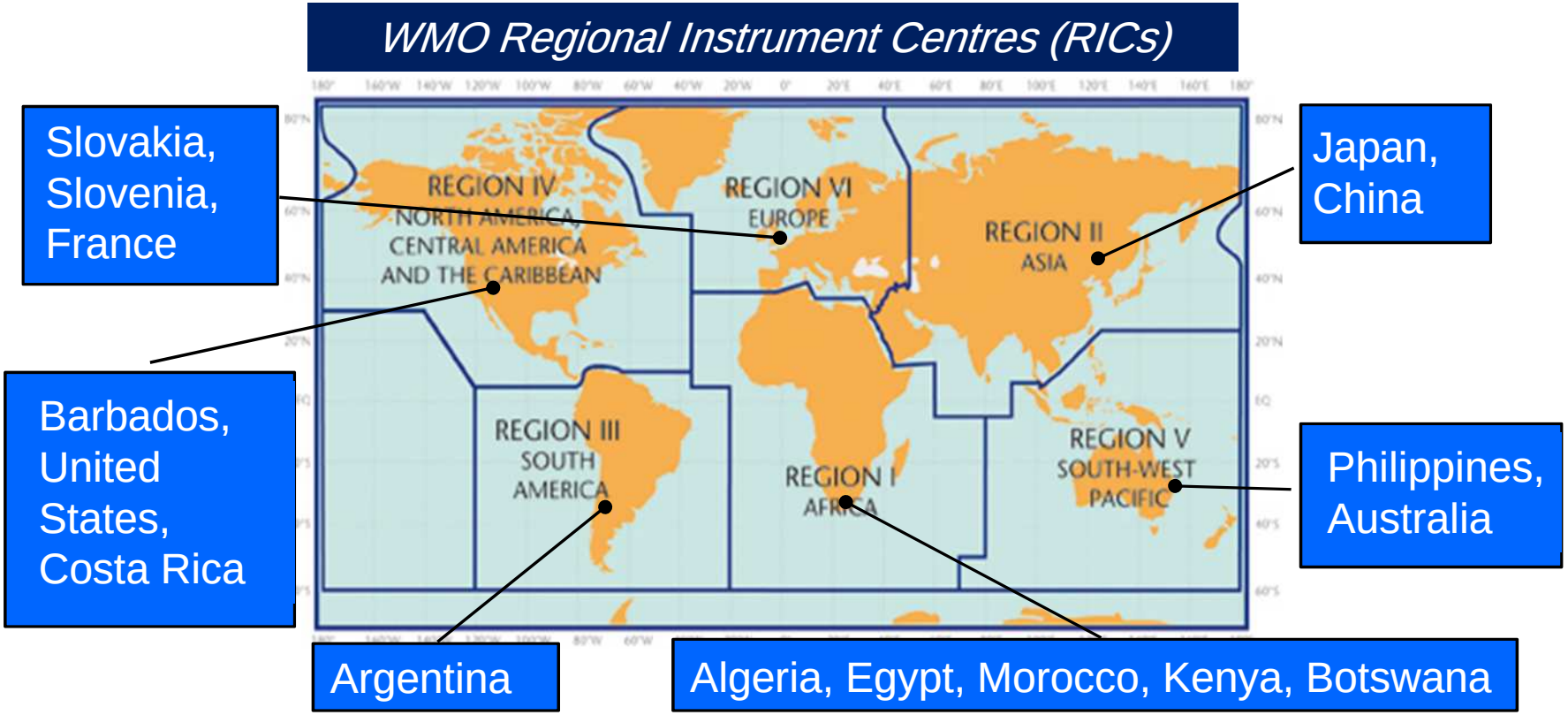
MIC as RIC Tsukuba of WMO



RIC Tsukuba is working:

- To assist Members of the RA II (Asia) through calibration and comparison with meteorological instruments.
- To develop instrument specialists in the Member countries.

Activity History of RIC Tsukuba

1998:
Designated as RIC Tsukuba
JMA/WMO workshop

2010:
Calibration using travelling
pressure standard in Thailand

2012:
JMA/WMO workshop

1998 — 2016

Month/year	Country/region	Standard instruments calibrated
Mar 2000	Thailand	Barometer, thermometer
Oct 2001	Republic of Korea	Anemometer
Aug 2006	Philippines	Pyranometer
Apr 2007	Thailand	Barometer, thermometer
Dec 2007	Hong Kong, China	Barometer
Jun 2010	Thailand	Barometer, thermometer, anemometer
Feb 2012	Sultanate of Oman	Barometer, thermometer, hygrometer
Nov 2012	Indonesia	Barometer, thermometer, hygrometer

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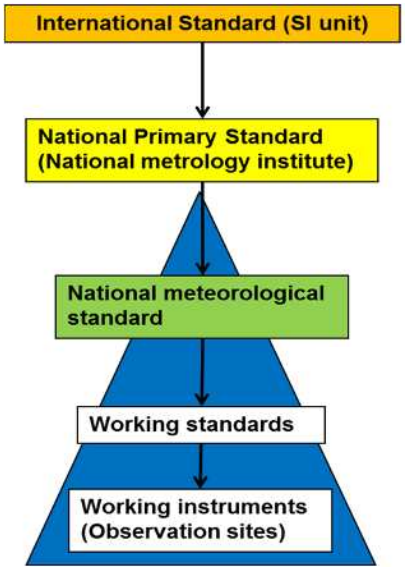
Technical Cooperation and Capacity Development to Establish International Traceability

For improving the quality of meteorological data

Training for Bangladesh staff (Bangladesh, Nov,. 2013)

BIPM



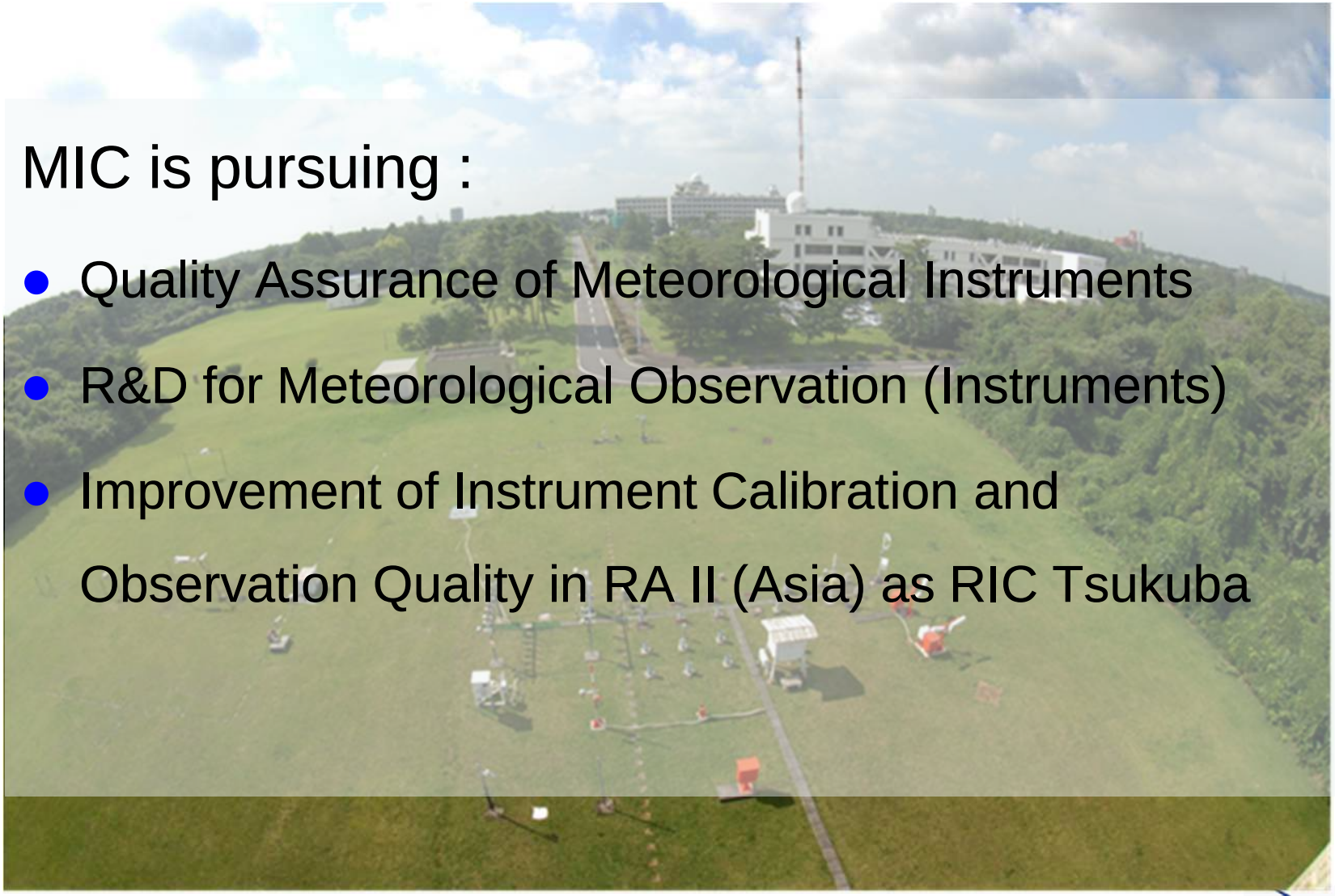
NMHSs

Training for Mozambique staff (RIC Tsukuba, Feb., 2016)

Training for 10 Pacific Island Countries staff (Fiji, Nov., 2015)

Training for Sri Lanka staff (RIC Tsukuba, Feb., 2016)

Summary



MIC is pursuing :

- Quality Assurance of Meteorological Instruments
- R&D for Meteorological Observation (Instruments)
- Improvement of Instrument Calibration and Observation Quality in RA II (Asia) as RIC Tsukuba

We are happy to collaborate with WMO Members to ensure the sustained and high-quality meteorological observation.

Please visit RIC Tsukuba and talk with us.

Thank you for your attention