

**Kingdom of Morocco**  
**The National Meteorological**  
**Service of Morocco (DMN)**

# **Regional Instrument Centers: towards new roles for even better measures**

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*08-11 October 2018*

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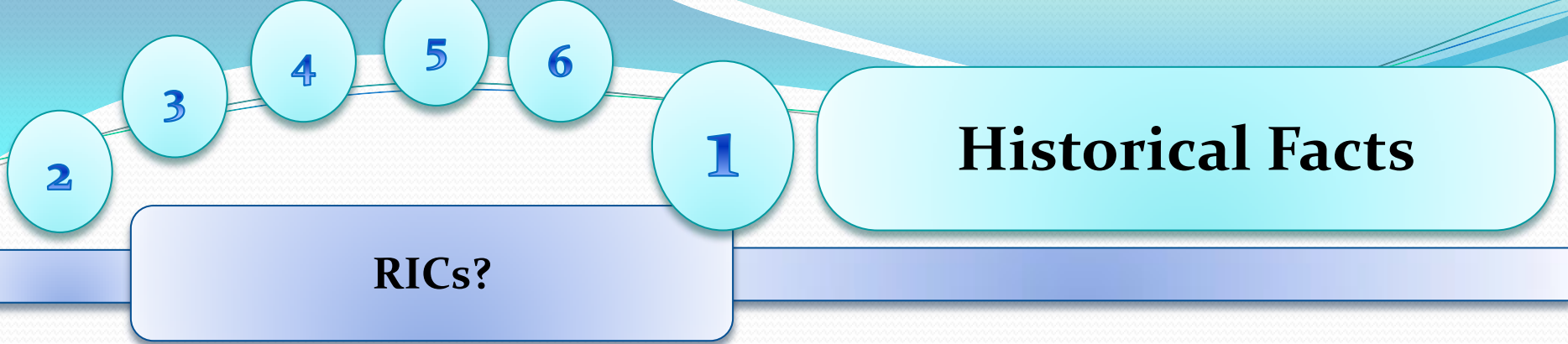
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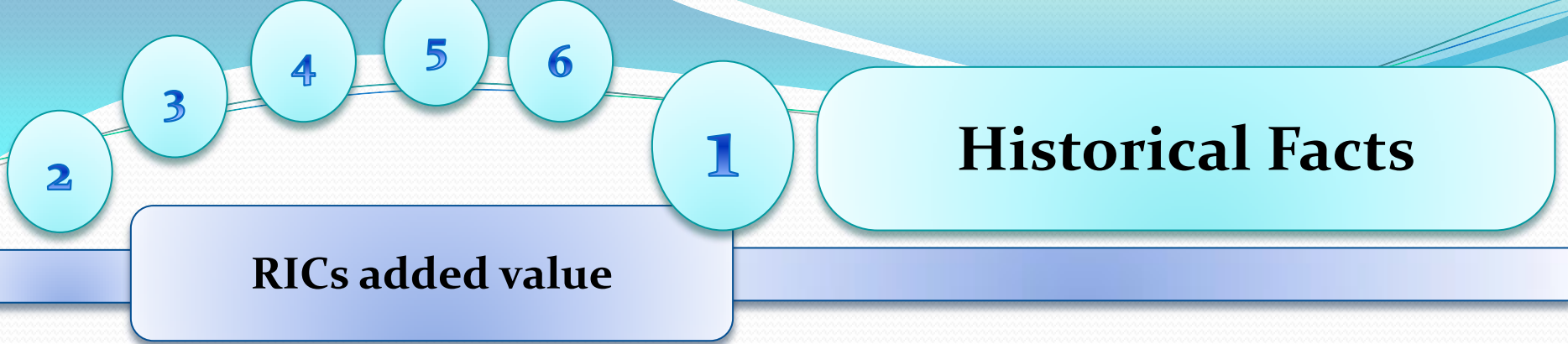
- ❑ The Regional Instrument Centers (RICs) are regional bodies whose main mission is to **maintain high quality meteorological standard instruments** and to provide the necessary support to the member countries of the regional association.
- ❑ RICs **are levers** that normally have to pull up the capacities of these countries in the fields related to metrology and associated capacity building activities.
- ❑ The general terms of reference of RICs were established as recommended by **CIMO-IX** held in early 1985, and updated by **CIMO-XIV** in 2006.



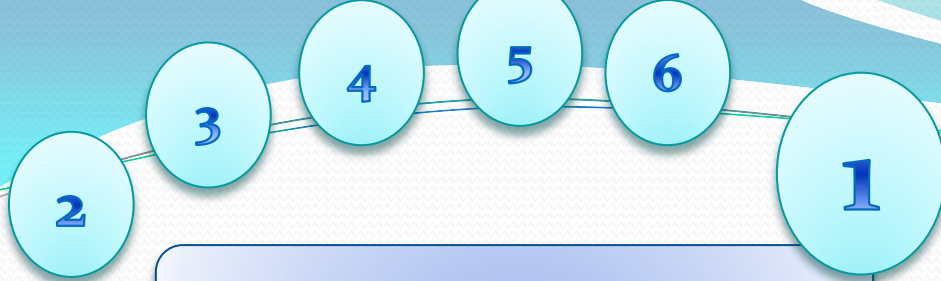
# Historical Facts

## Why RICs are needed?

- ❑ Regular calibration and Maintenance of meteorological instruments to meet the increasing needs for high-quality meteorological and hydrological data,
- ❑ Building the hierarchy of the traceability of measurements to the International System of Units (SI) standards,
- ❑ Standardization of meteorological and related environmental instruments,
- ❑ International instrument comparisons and evaluations in support of worldwide data compatibility and homogeneity,
- ❑ Training instrument experts .



- ❑ Since their creation in the early 1990s in the last century, RICs have been able to prove that they were a **reliable and an indispensable** organ for the introduction and the promotion, within the NMHSs, of a **new culture** related to the quality assurance of measures and the compliance with standards applied in metrology.
- ❑ The role of RICs has been **widely recognized** over time by the regional associations (RA) and by the various programs of the World Meteorological Organization: WIGOS, GEOSS, DRRA...
- ❑ This recognition have been highlighted during the **CIMO-XIV in 2006** while introducing the new ToRs of RICs.



# Historical Facts

## Important dates

- 1985 • CIMO-IX: Establishment of RICs
- 2005 • First Assessment Report
- 2006 • CIMO-XIV : RICs with Full and Basic Capabilities
- 2010 • CIMO XV: Adoption of the Auto-evaluation Scheme
- 2014 • CIMO XVI: Communication and reporting tools
- 2018 • New ToRs  
• Procedure for designation and evaluation of RICs



- ❑ Instrumentation and traceability **were given a low priority** by Most of the NMHS surveyed . This has led to a **lack of staff and resources** for instrument calibration and their traceability,
- ❑ There was a clear divide between the less developed laboratories which have people and time, and the more developed laboratories which have state-of-the-art instruments, but few staff,
- ❑ Developed RICs have expended considerable resources on automating calibration processes using electronic instruments and standards,
- ❑ Lower staffing levels imply that the manual calibration of instruments is avoided in developed RICs. *(Gorman, TECO 2006)*





The conclusions of this report were too simple but very relevant:

- “Few of the RICs are capable of carrying out calibrations to the level of uncertainty recommended by the CIMO Guide”,
- “The level of a RIC is quite related to the richness of the country. The RICs of most rich countries are certified and accredited” .

(Jerome Duvernoy, 2006).

 Adoption by CIMO-XIV (2006) of two categories of RICs by defining RICs with full capabilities and others with basic capabilities.<sup>8</sup>





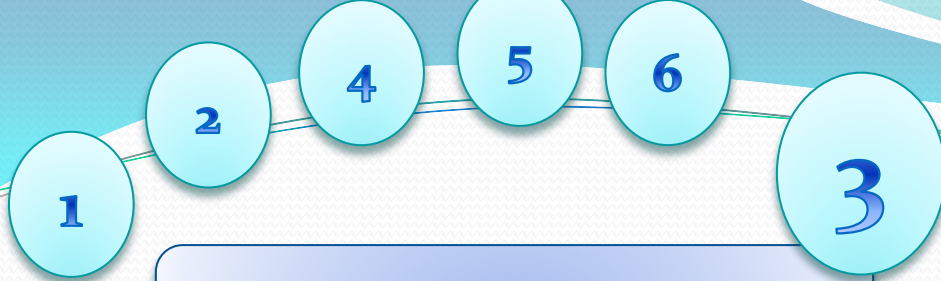
- ❑ to be assessed regularly by a recognized authority at least **each 5 years**
- ❑ to make regular use of the **Auto-Evaluation Scheme** developed by CIMO and communicate the results to Members
- ❑ to develop **websites** to improve communication with the Members
- ❑ to provide, in annual basis, information on their capabilities and the services they provide including the CMC;
- ❑ to organize regular inter-laboratory comparison, preferably within their Region and results to be published on RICs websites.
- ❑ to apply as far as possible international standards applicable for calibration laboratories, such as ISO 17025



## Monitoring the functioning of RICs

### Monitoring Tools and Functions

- ❑ 75% of the RICs (11 among 15 RICs) are publishing regularly their annual report on their capabilities and operation conducted during the past year;
- ❑ 60% of the RICs submitted their reports and evaluation schemes;
- ❑ Regular ILCs are conducted mainly in RA IV, RA II and RA V (50%);
- ❑ 40% of the RICs are reporting that they had participated to ILCs;
- ❑ RICs of developing countries encountered several technical and administrative constraints that prevent their effective participation to the ILCs organized;
- ❑ 20% of the RICs are accredited ISO 17025 and 20% had launched the process of certification.



# Monitoring the functioning of RICs

## Auto Evaluation Scheme



ISFR MANIAI

[Back to Evaluation Scheme](#)

[Back to User Manual](#)

EVALUATION SCHEME DIRECTORY

### Objectives

This evaluation scheme is based  
 The aim is to measure differences  
 Then, it has been developed to he  
 This evaluation scheme can be us

### Background

This tools is usefull for every NMH  
 User must have basic knowledge

### Overview

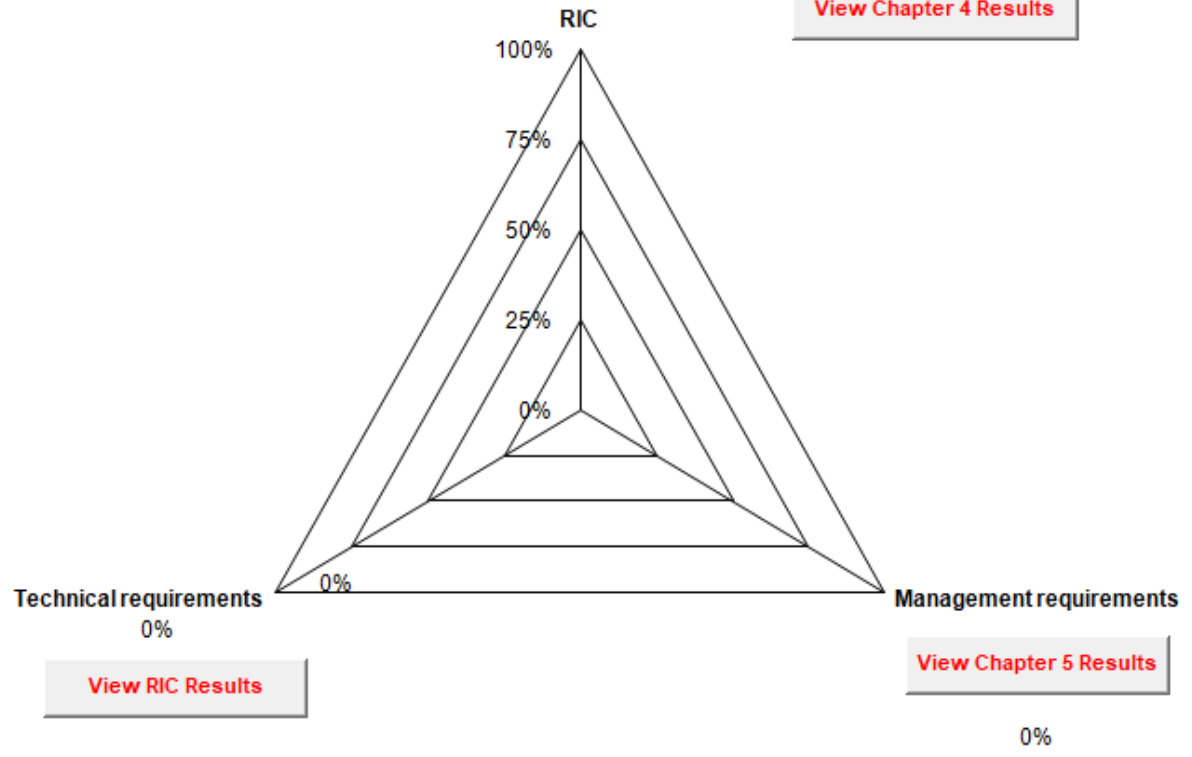
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### Evaluation Scheme

### Global Results



[View Chapter 4 Results](#)



[View Chapter 5 Results](#)

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# Monitoring the functioning of RICs

## The WEB SITE

WEATHER CLIMATE WATER

Home

WWW > IMOP > Regional Instrument Centres


**RI**  
(Informa  
P

**Address:** 1-2 Nagamine Tsukuba Ibaraki 305-005  
**Website:** <http://www.jma.go.jp/jma/jma-eng/jma>  
**Contact person:** Kouichi NAKASHIMA  
**Email:** [kouichi.nakashima@met.kishou.go.jp](mailto:kouichi.nakashima@met.kishou.go.jp); [ric](mailto:ric)  
**Tel:** +81 298 51 4123  
**Fax:** +81 298 51 1670  
**Calibration capabilities:** [Temperature](#), [Relative H](#)

**Specific Info**

Instrument Undergoing Calibration	Calibration Range	Refer
Contact Type Thermometer	-40 to 50 °C	Plati ther 16 Tripl cell

WEATHER CLIMATE WATER  
TEMPS CLIMAT EAU

 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  
 Tél: +41 (0) 22 730 81 11  
 Fax: +41 (0) 22 730 81 81  
[wmo@wmo.int](mailto:wmo@wmo.int) – [www.wmo.int](http://www.wmo.int)

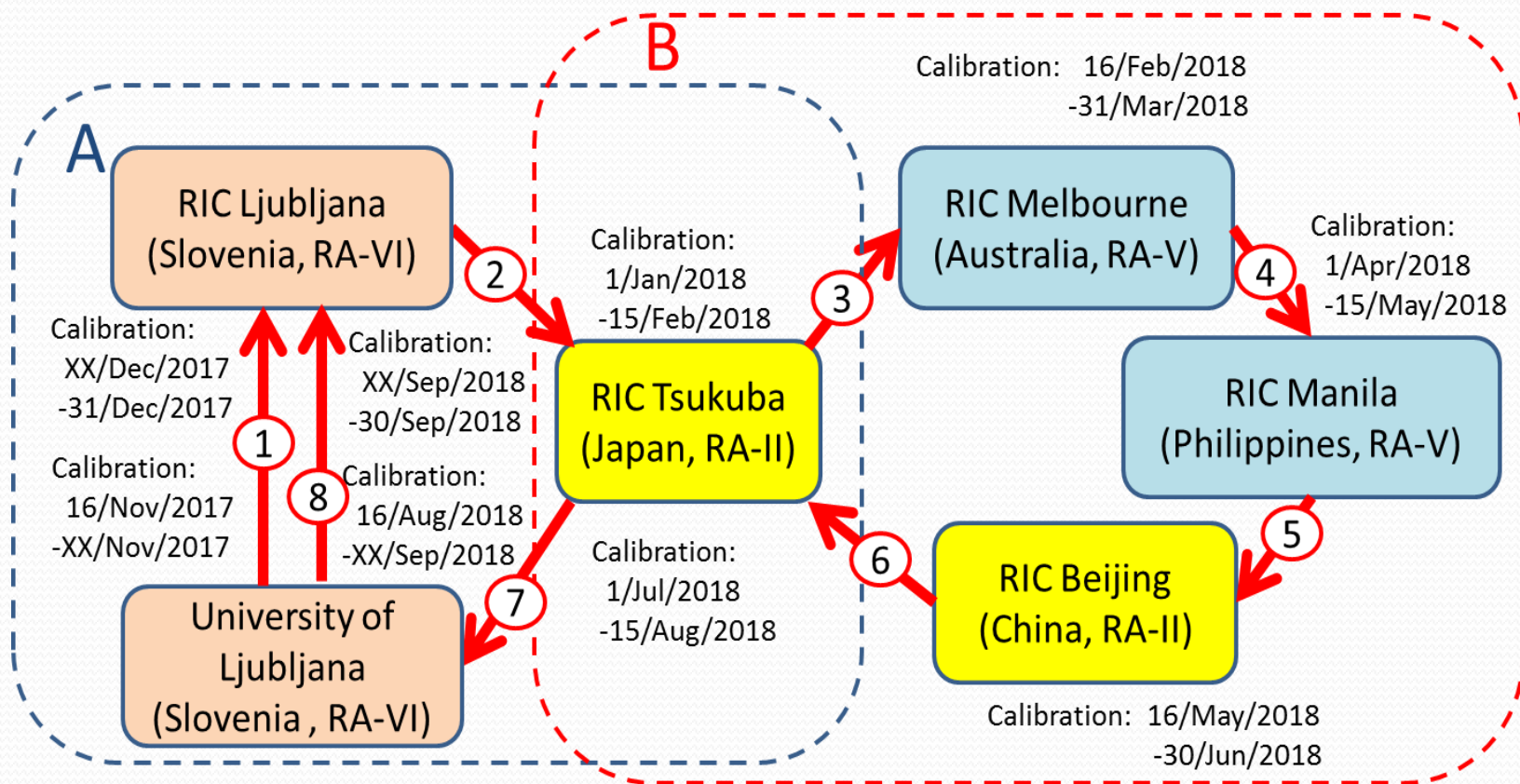
**Form for  
 Regular Reporting of Regional Instrument Centres**  
 (please expand the cells as required to properly reflect your activities)  
 Terms of Reference for Regional Instrument Centres (RICs) are available under:  
<https://www.wmo.int/pages/prog/www/IMOP/instrument-reg-centres.html>

**Regional instrument Centre - General Information**

Name of RIC	RIC Tsukuba
RIC's website	<a href="http://www.jma.go.jp/jma/jma-eng/jma-center/ric/RIC_HP.html">http://www.jma.go.jp/jma/jma-eng/jma-center/ric/RIC_HP.html</a>
Institute hosting RIC	Japan Meteorological Agency
City	Tsukuba
Country	Japan
Regional Association	Region II

# Monitoring the functioning of RICs

## Inter laboratory Comparison



*Route plan of the last ILC conducted between RA II, V and VI ,*

*Source ET-OPMET Docs, 2017*





- ❑ RICs is called to play an important role in WIGOS in order to ensure the quality of observations,
- ❑ CIMO XVI (2014) noted that RA have emphasized in their Regional **WIGOS Implementation Plans** the need to strengthen RICs to ensure their full functionality and to enhance the support they provide to Members especially for those that do not have calibration laboratories.
- ❑ CIMO XVI stressed that traceability of observations to international standards is essential for the full potential of WIGOS to be achieved.

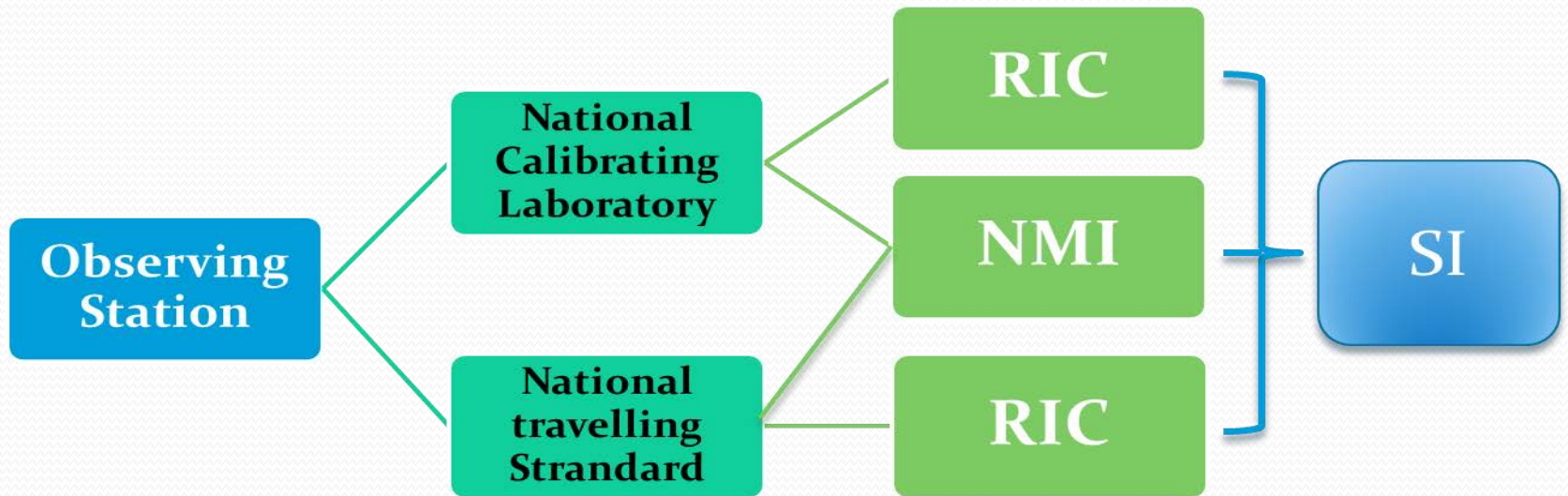


- ❑ Many NMHSs were not aware of the existence of RICs and the services they provide.
- ❑ The nature of calibrating services that RIC could provide to NMHSs that do not have a calibration laboratory is not established.
- ❑ A survey conducted in the RA II (Asia) shown that there are still instruments in use that have not been calibrated and that almost 25% of NMHS didn't have calibration laboratories (IOM N°122). The situation could be worst for RA I and III.
- ❑ NMHSs not having a calibration laboratory should use travelling standards (available at reasonable prices), to do on-site verifications.





- The calibrating strategy developed by CIMO could help, once adopted, in the implementation of traceability projects world wide and therefore contributing to achieving one of the main goals of the WIGOS.



- A successful example of this proposal is given by the project conducted in the western Balkans under the supervision of the RIC of Slovenia (RA VI).

# New roles of RICs in the face of new challenges

## The Challenges

### Global Scale

- Big Data and crowding sources (*opportunity and threat*)
- Minamata convention (2020)
- Fit for Purpose (*agile, innovative and informative*)

### Regional Level

- **WIGOS:**
- collaborative projects,
- optimization of observing networks,
- ILCs,
- E-training,
- WMO calibration strategy

### National Level

- Massive transition to automation
- New technologies offered in the market
- Openness to partner's and third parties' networks

# New roles of RICs in the face of new challenges

## Expected new roles

- Characterize the traceability that can be achieved from emerging alternative technologies
- Develop and promote the implementation of good measurement practices

**Traceability and Best Measurement Practices**

**Standards and Guidance Materials**

- Develop, and provide effective access to, standards and guidance material

- ILCs
- E-training
- workshops

**Coordination and collaboration Between RICs**

**Continuous technological intelligence**

- To address issues related to the traceability of new technologies



## New roles of RICs in the face of new challenges

### New Roles for RICs

- ❑ The RRR (or ToRs) should be reviewed based on the new challenges and the evolving requirements of customers and users;
- ❑ RICs should be more agile to address calibration issues of non conventional instruments that are in use in partner's and third parties' networks;
- ❑ RIC should address issues related to new measurements being integrated into the WIGOS framework (for example, water and atmospheric chemistry, marine meteorology, satellite radiances...);



## New roles of RICs in the face of new challenges

### New Roles for RICs

- ❑ RIC should also consider traceability of emerging or cheapest technologies in use in third party observing networks, or where traceability is impracticable (for example, cheapest rain gages PANGEA, crowd sourcing, camera imagery);
- ❑ RIC should develop, and provide effective access to, standards, good practices and guidance material for such instruments and observing methods;
- ❑ Coordination and collaborative mechanisms should be implemented to enhance effective exchange between RICs.

**Thank you for your  
attention**