WEATHER CLIMATE WATER
TEMPS CLIMAT EAU

INFCOM/SC-MINT and Regional Measurement-related Centres

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WMO OMM
World Meteorological Organization
Organisation météorologique mondiale

13 – 17 December 2021

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WMO Reform
(INFCOM; SC-MINT)

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WMO Reform

[WMO Cg-18](#) (Res. 7&8)

Past

Now

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Commission for Observation, Infrastructure and Information Systems – Infrastructure Commission (INFCOM)

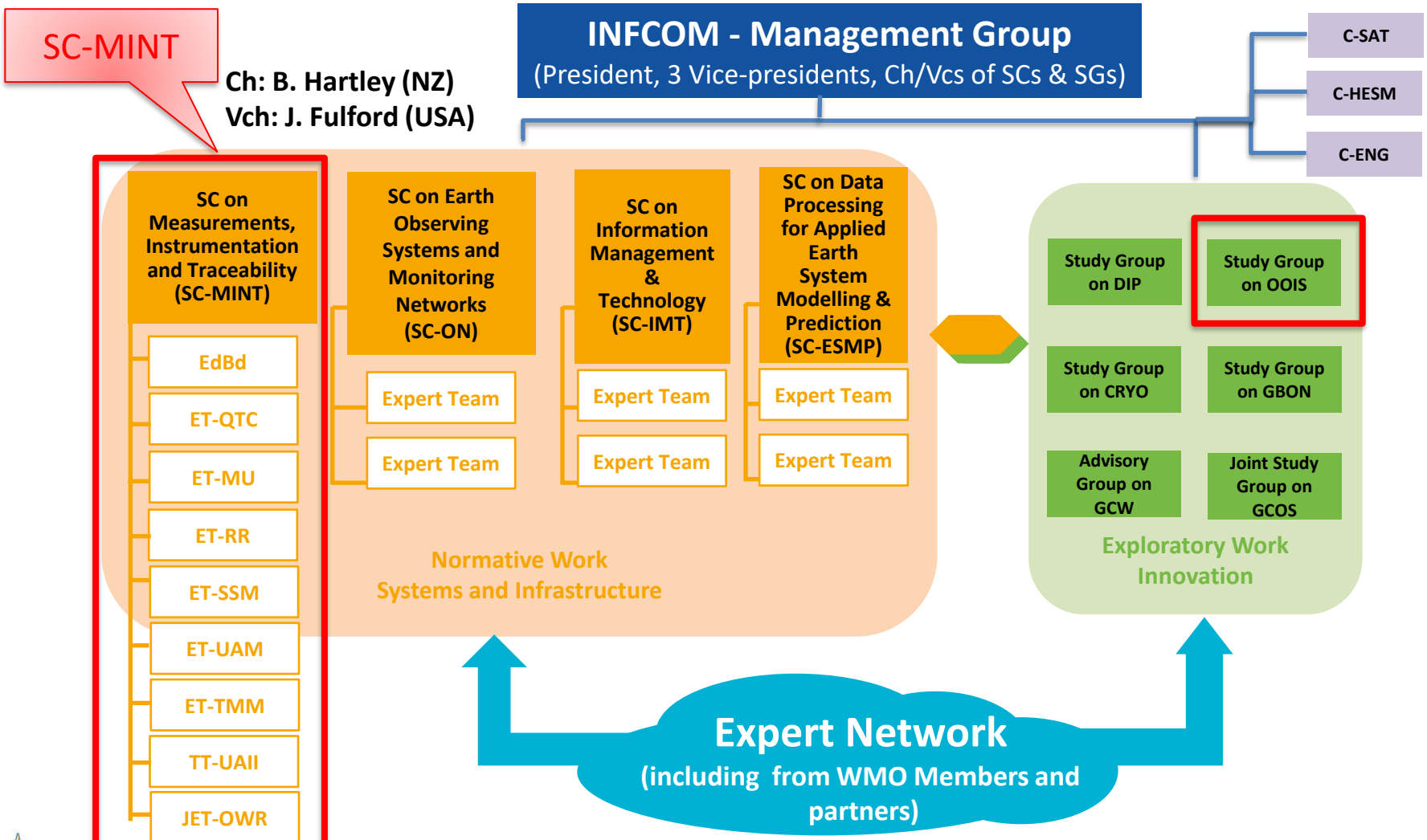
The Commission shall contribute to:

- the development and implementation of globally coordinated systems for acquiring, processing, transmitting, and disseminating Earth system observations, and related standards;
- the coordination of the production and use of standardized analysis and model forecast fields; and
- the development and implementation of sound data and information management practices for all WMO Programmes and their associated application and services areas.

The first session of the Infrastructure Commission (INFCOM-1) was organized in 3 parts:
Part I: Consultation in writing during April and May 2020.
Part II: Virtual Session from 9 to 13 November 2020.
Part III: Virtual Session from 12 to 16 April 2021.

Infrastructure Commission

P: M. Jean (Canada),
VPs: B. Forgan (Australia), S. Pecora (Italy), N. Pinardi (Italy)



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Standing Committee on Measurements, Instrumentation and Traceability (SC-MINT)

(INFCOM-1-d03)

Focus on the normative work and technical systems required to achieve Objective 2.1 of the WMO Strategic Plan:

"{to} **Optimize the acquisition of Earth system observation data through the WMO Integrated Global Observing System (WIGOS)**",

a) **Collaboration** (INFCOM, SERCOM, Research Board, Regional Association,…) to gather and review measurement requirements across all relevant technology streams;

b) **Innovation** and application of emerging technologies, techniques and integrated solutions in measurement;

c) **Effective standards**, regulatory and guidance material related to instrumentation and measurement practices;

d) **Traceability** of measurements to international standards;

e) **Characterizing the quality** of measurements from traditional and non-traditional data sources (Intercomparisons, etc..);

f) **Education and training** material in the field of environmental measurements;

g) **Compliance assessment** of WMO designated measurement-related centres;

h) **Engage** with other WMO structures and related international partner organizations.

Centres' related activities in ETs' workplans

ET-QTC (WP – no.):

1. Monitoring and assessment of RICs, RMICs and RRCs;
2. Strengthening quality management framework of RICs, RMICs and RRCs;
3. Streamline the concept of regional centres and promote their collaboration;
6. Implementation of the strategy for traceability assurance;
7. Training on quality, traceability and calibration.

ET-SSM, ET-UAM (WP – no.)**:**

2. Collaboration with ISO on the common WMO-ISO standards;
3. Updates of WMO-No. 8, and other guides, if appropriate;
4. Liaison with assigned MLCs.

ET-RR (WP – no.)**:**

2. Status of WSG and WISG;
3. Sustainability of WMO intercomparison frameworks (IPC, IPgC);
4. Modifications of Radiation References.

WMO Regional Measurement-related Centres

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Regional Measurement-related Centres (RIC, RMIC, RRC)

- **Key role in implementation of the WMO strategy for traceability assurance.**

- **Main functions:**
  - **assist Members in calibrating their national standards;**
  - **participate in, and/or organize, inter-laboratory comparisons;**
  - **participate, or assist, in the organization of workshops on calibration and maintenance;**
  - **provide advice on instrument performance;**
  - **make contribution to the quality of measurements.**

WMO Regional Instrument Centres

RA I

Algiers (Algeria)

Gaborone (Botswana)

Cairo (Egypt)

Nairobi (Kenya)

Casablanca (Morocco)

RA II

Beijing (China)*

Tsukuba (Japan)*

RA III

Buenos Aires (Argentina)

RA IV

Bridgetown (Barbados)

RA V

Melbourne (Australia)*

Manila (Philippines)

RA VI

Toulouse (France)

Hamburg/Oberschleissheim (Germany)*

Bratislava (Slovakia)*

Ljubljana (Slovenia)*

Ankara (Turkey)*

WMO/IOC Regional Marine Instrument Centres

RMIC for Asia-Pacific Region*

National Centre of Ocean Standards and Metrology (NCOSM), Ministry of Natural Resources of China, Tianjin China

RMIC for North and Central America

National Data Buoy Center, Mississippi, USA

* Accredited according to ISO/IEC 17025

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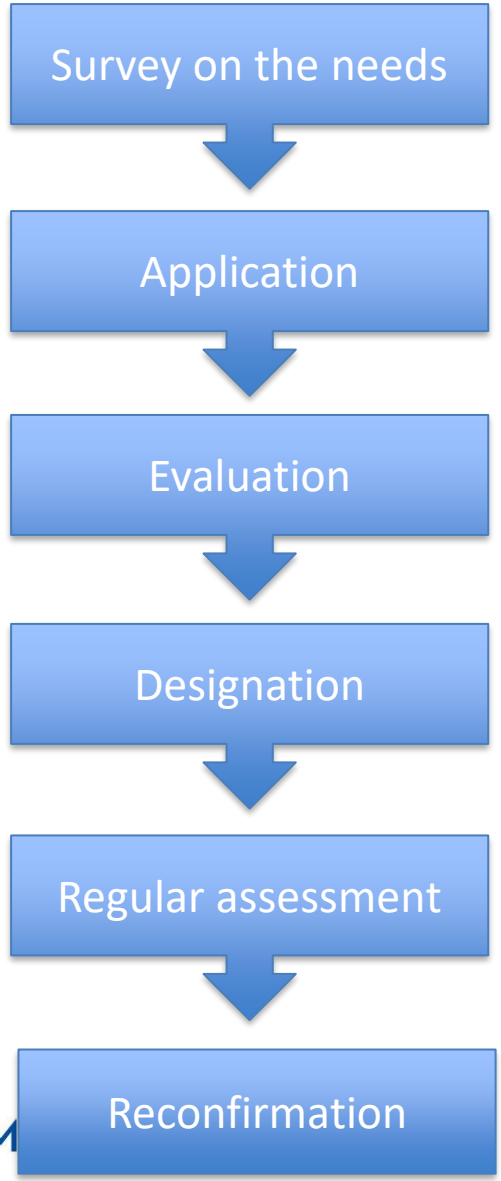
RIC and RMIC ToRs – comparison

(WMO-No. 8: Vol I, Ch 1, Annex 1.C and Vol III, Ch 4, Annex 4.A)

RIC (CIMO-17/Cg-18)	RMIC (JCOMM-III/Cg-16)
shall have the necessary facilities	must have, **or have access to**, the necessary facilities
traceability to SI	traceability to SI
competent staff	**qualified** staff with **the necessary experience**
shall **have** technical procedures	must **develop** its individual technical procedures
shall **have and maintain QMS, preferably according to the ISO/IEC 17025 standard**	must **develop its individual quality assurance procedures**
shall participate in, and/or organize ILC	must participate in, or organize, ILC
utilize the available resources and capabilities to **the Members' best interest**	utilize the resources and capabilities **of its region of interest according to the region's best interests**
apply ISO/IEC 17025 standard	apply ISO/IEC 17025 standard
assessment every **four** years	assessment every **five** years

Process for RIC designation, assessment and reconfirmation (Resolution 17 (EC-73))



RA & INFCOM
(Every 4 years)

PR to P-RA & P-INFCOM
(Letter, report, evaluation, certificates, …)

INFCOM
(Evaluation team)

RA
(Upon positive INFCOM recommendation)

INFCOM/Evaluation team
(Every year, RIC annual reports, evaluations schemes, …)

RA
(Prior to each Regular Congress, upon INFCOM positive assessment and PR letter)

WMO Radiation Centres

World Radiation Centres (WRC)

World Radiation Centre (WRC)
Davos, Switzerland

World Radiation Data Centre (WRDC)
St. Petersburg, Russian Federation

Regional Radiation Centres (RRC)

Region I (Africa)
- Cairo (Egypt)
- Khartoum (Sudan)
- Kinshasa (Dem. Rep. of the Congo)
- Lagos (Nigeria)
- Tamanrasset (Algeria)
- Tunis (Tunisia)

Region II (Asia)
- Pune (India)
- Tokyo (Japan)

Region III (South America)
- Buenos Aires (Argentina)
- Lima (Peru)
- Santiago (Chile)

Region IV (North and Central America)
- Toronto (Canada)
- Boulder (United States)
- Mexico City (Mexico)

Region V (South-West Pacific)
- Melbourne (Australia)

Region VI (Europe)
- Budapest (Hungary)
- Davos (Switzerland)
- St. Petersburg (Russian Federation)
- Norrköping (Sweden)
- Trappes/Carpentras (France)
- Uccle (Belgium)
- Lindenberg (Germany)

SC-MINT ~~Testbeds and~~ Lead Centres

Measurement entres

Testbeds

- WMO-SC-MINT Testbed for Cryosphere and Precipitation (Sodankylä, Finland)
- WMO-SC-MINT Testbed for GAW Observations of Reactive Gases and Aerosols (Hohenpeissenberg, Germany)
- WMO-SC-MINT Testbed, Lindenberg Meteorological Observatory - *Richard Assmann Observatory* (Lindenberg, Germany)
- WMO-SC-MINT Testbed for Doppler Light Detection and Ranging (LIDAR) Systems for Aviation Applications (Hong Kong, China)
- WMO-SC-MINT Testbed for Ground-based Remote Sensing Observations (Cabauw, the Netherlands)
- WMO-SC-MINT Testbed for Integration of 3D Weather Observation System (Boseong, Republic of Korea)
- WMO-SC-MINT Testbed for Meteorological, Radiation and Ozone Observations – Voeikov Main Geophysical Observatory (Saint Petersburg, Russian Federation)
- WMO-SC-MINT Testbed for Aerosols and Water Vapor Remote Sensing Instruments (Izana, Spain)
- WMO-SC-MINT Testbed for In Situ and Remote Sensing Synergistic Profiling (Payerne, Switzerland)

Lead Centres

- WMO-SC-MINT Lead Centre on Process-oriented Observations, Lindenberg Meteorological Observatory - *Richard Assmann Observatory* (Lindenberg, Germany)
- WMO-SC-MINT Lead Centre on Precipitation Intensity - *Benedetto Castelly* (Genova, Vigna di Valle and Monte Cimone, Italy)
- WMO-SC-MINT Lead Centre on Evaluation of Precipitation Measurement Accuracy (Chupungnyeong, Republic of Korea)

Regional WIGOS Centres

Regional WIGOS Centres (RWC)

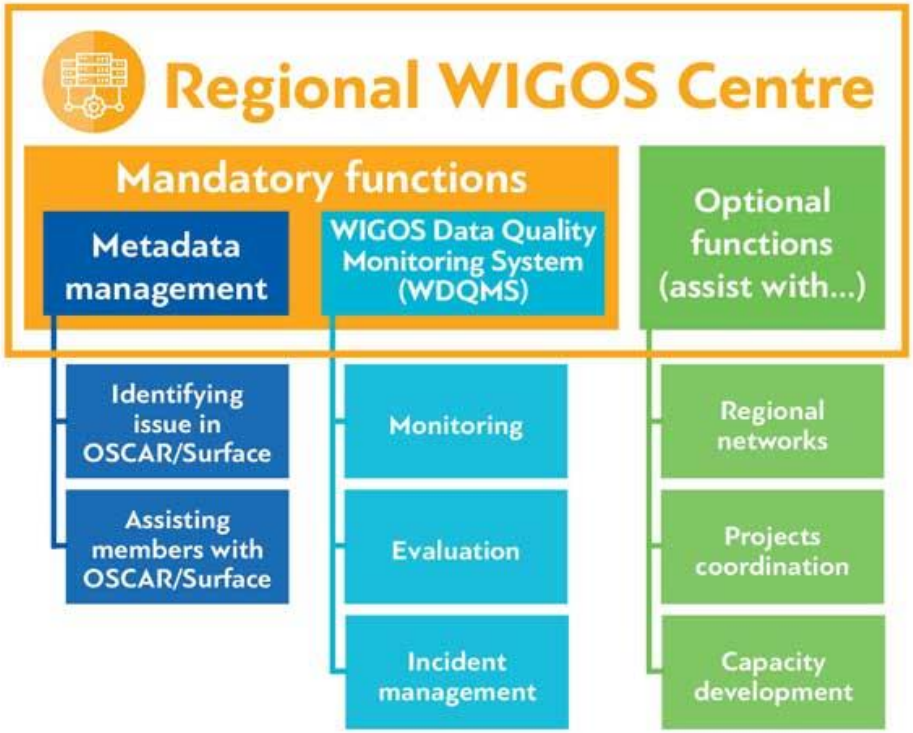
Region I (Africa)
Kenya and Tanzania (pilot mode)
South Africa (pilot mode)
Morocco (application endorsed)

Region II (Asia)
China (operational)
Japan (operational)

Region III (South America)
Argentina (pilot mode)
Brazil (pilot mode)

Region V (South-West Pacific)
Indonesia (pilot mode)
Singapore (pilot mode)
Fiji (application endorsed)

Region VI (Europe)
RWC EUMETNET (pilot mode, monitoring function)



WMO Publications under SC-MINT

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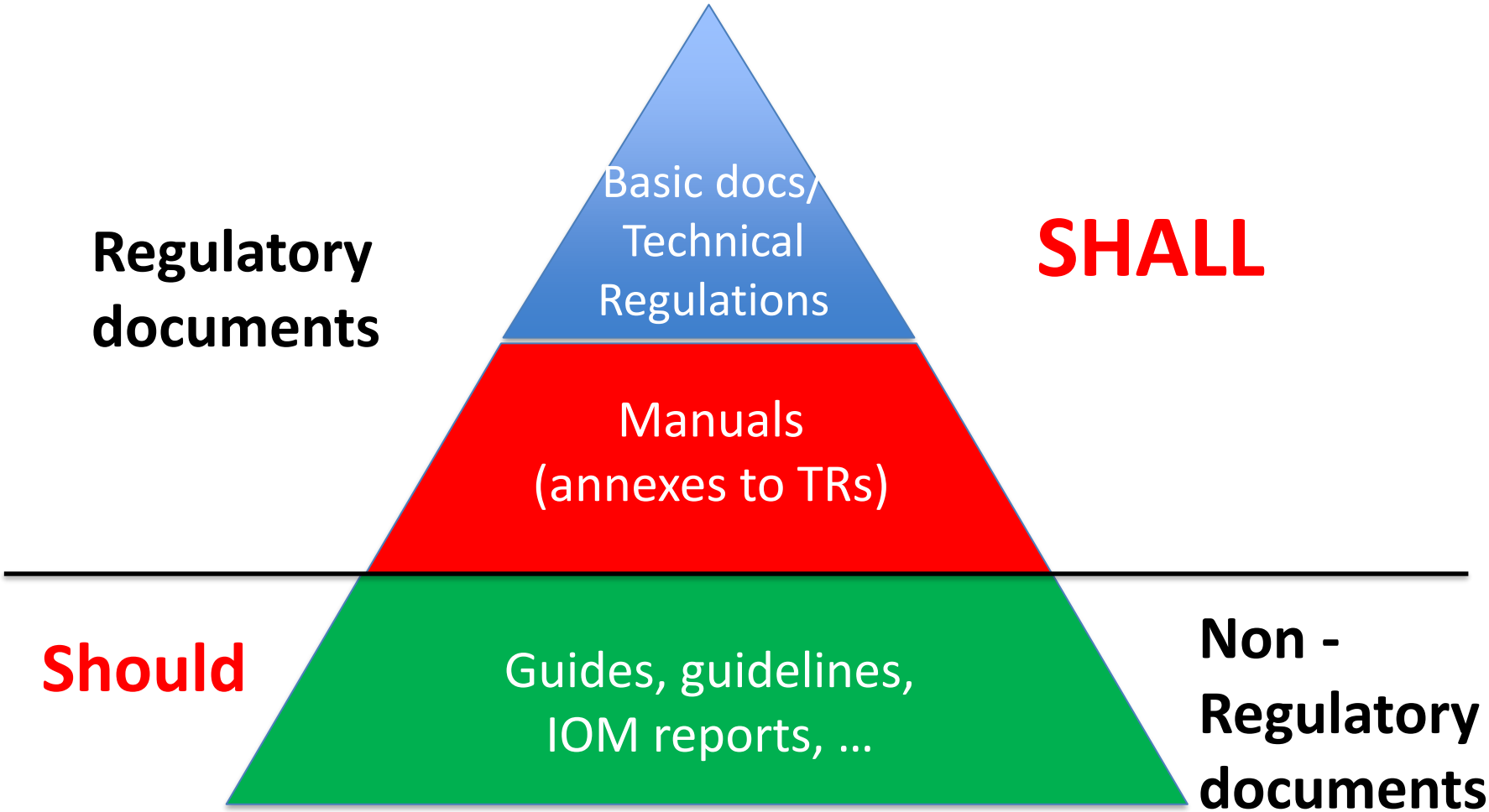
WMO Publications:



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WMO publications under SC-MINT

- **International Cloud Atlas (ICA) - Manual on the Observation of Clouds and Other Meteors (WMO-No. 407)**

- **Guide to Instruments and Methods of Observation (WMO-No. 8)**

- 1st edition in 1954 (12 chapters);
- 2018 edition: 5 Volumes (40 chapters, more than 1500 pages);

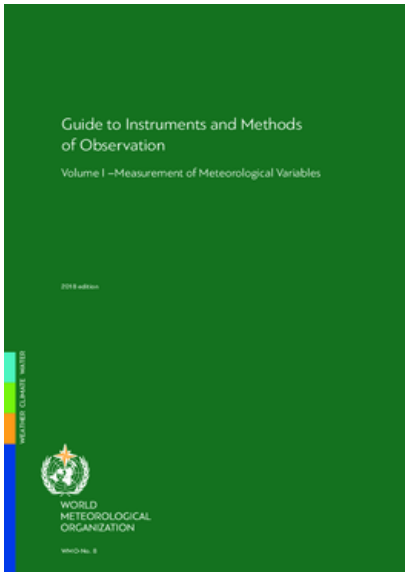
Volume I: Measurement of Meteorological Variables

Volume II: Measurement of Cryospheric Variables

Volume III: Observing Systems

Volume IV: Space-based Observations

Volume V: Quality Assurance and Management of Observing Systems



Volume: Measurement of Marine Meteorological and Oceanographic Variables (underway)

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WMO publications under SC-MINT

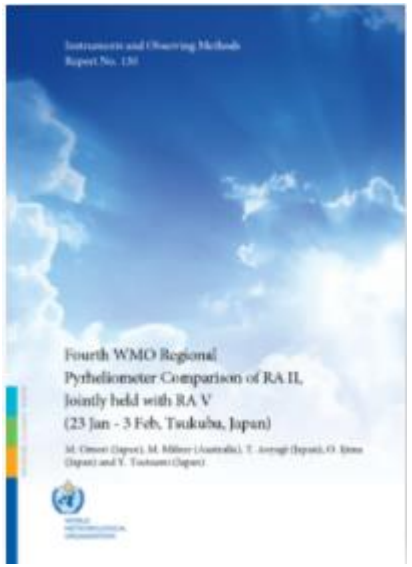
❑ Common WMO/ISO standards (annexes in WMO-No. 8)

1) **SITING CLASSIFICATIONS FOR SURFACE OBSERVING STATIONS ON LAND** *(Volume I, Chapter 1,), (ISO 9289:2014(E)).*

2) **GROUND-BASED REMOTE-SENSING OF WIND BY HETERODYNE PULSED DOPPLER LIDAR** *(Volume III, Chapter 5),* (ISO *28902-2:2017(E)).*

3) **WEATHER RADARS – PART 1: SYSTEM PERFORMANCE AND OPERATION** *(Volume III, Chapter 7),* (ISO 19916-1 *:2019(E)).*

❑ Instruments and Observing Methods (IOM) Reports



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Future (envisaged) priorities and events

Envisaged SC-MINT priorites

- Support to GBON, SOFF and Data policy;
- Increased compliance - *Audit* and certification of WMO Measurement-related Centres
- Environmental Sustainability of Observations
- Tiered Network Approach - criteria
- Emerging technologies - Evolution of Global Observing Systems
- Updated measurement-related regulatory and guidance publications (e.g., WMO-No. 8)

Some Coming Events

- WMO Interlaboratory Comparison for RA – I
  - started in October 2021, until Summer 2022
- WMO Interlaboratory Comparison for RA – III
  - to start in March 2022, until late 2022
- WMO Online Training Workshops on QTC and on Automation
  - Spring/Summer 2022
- WMO Upper-air Instrument Intercomparison

  lab campaign early 2022, field campaign Aug/Sept 2022 (Lindenberg, Germany)
- BIPM/WMO Metrology for Climate Action Workshop 2022

  26-30 September 2022 – planned as online event
- TECO-2022 & MTWE-2022

  10-14 October 2022 (Paris, France)
- INFCOM – 2, November 2022 (TBC)

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Thank you

Gracias

Merci

Спасибо

谢谢

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