WEATHER CLIMATE WATER
TEMPS CLIMAT EAU

WIGOS Technical Systems (OSCAR/Surface and WDQMS) and Regional WIGOS Centers (RWCs)

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Organisation météorologique mondiale

Outline

- OSCAR/Surface;
- *“What is WIGOS?”*
- WIGOS Data Quality Monitoring System (WDQMS);
- *“What does WIGOS deliver?”*
- Introduction to Regional WIGOS Centers;
- Summary and conclusions.

OSCAR/Surface

("What are the WIGOS observing stations?")

Implementation layer of the *WIGOS Metadata Standard*: **Modern, electronic, searchable inventory of metadata for all observing stations/platforms under WIGOS**

- OSCAR/Surface has replaced *WMO Pub. 9, Volume A*, but it also includes information from similar inventories for other (non-GOS) components of WIGOS;
- Developed jointly by WMO and **MeteoSwiss**, with the Swiss government providing the major part of the funding;
- Operational since May 2016;
- Extremely important information resource for WMO and all its Members!

TOKYO (Japan)

in WMO Region I

Last updated: 2019-03-05 by Tahara Yoshihiko

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Filter

By pro

Co-sponsored components

Station charact

Name:

Station alias:

Date established:

Station type:

Station class(es):

Class	From	To
HU/FC (Hurricane, tropical cyclone or typhoon forecast centre)	2016-04-29	
TI/WA/FC (Tidal wave forecast centre)	2016-04-29	

WIGOS Station Identifier(s):

WIGOS Station Identifier	Primary
0-20000-0-47662	☑

WMO region: II - Asia

Country / Territory: > Japan

Coordinates: > 35.6916666667°N, 139.7511111111°E, 25.2m

Time zone:

Supervising organization: > JMA

Station URL:

Other link (URL):

Site description: > The station was originally registered based on WMO Pub 9 Vol A information containing these observation remarks: AUT*;CLIMAT(C);HU/FC;PH;RBCN;RBSN(S);SEISMO;SOLRA;TI/WA/FC;TIDE;VOLCANO (see code table A for explanations). These remarks imply the following additional observations that could not be registered automatically: Phenological observations; Seismological observations; Solar radiation measurements; Volcanic eruption observations.

Climate zone:

Predominant surface cover:

Surface roughness:

Topography or bathymetry:

OSCAR/Surface; support for uptake

- Training the WMO Members in populating, editing and using OSCAR/Surface is a major priority for 2016-2019 financial period; **So far, training has been delivered** in
  - RA I (English);
  - RA III (Spanish);
  - RA IV (Spanish and English);
  - RA V (English);
  - RA VI (English);

  - *Plans for 2019: RA-I (French); RA-II (tentatively two events),….*

The OSCAR/Surface webinar

- Monthly webinar with varying topic, since Sept 2018
- Audience are OSCAR/Surface Focal Points and Users;
- **Always held on the first Monday of the month at 11 UTC; you are all invited to participate!**
- Hosted one the WMO Webex platform;
- More info and past recordings available on the OSCAR/Surface Resources Portal calendar and announcements forum;
- Feel free to suggest topics to be highlighted.

The OSCAR/Surface API (Application Programming Interface) (I – Status)

- Release 1.4.1 (September 2018) first version of API;
  - Manual upload only;
  - Based on 1.0RC9 WMD schema;
- Release 1.4.2 (October 2018) brought additional features;
  - Authentication token;
  - Upload to proper REST API endpoint;
  - XML download.

The OSCAR/Surface API (II - Use cases)

- Synchronize OSCAR/Surface with a local database;
  - For countries with existing station database;
  - Integrate into data warehouse workflow;
- Upload list of stations to OSCAR/Surface
  - Initial seeding;
  - Import stations from Excel lists and similar;
  - One-time action;
- Interactive and semi-automatic batch changes
  - Adding lists of new observing stations;
  - Make batch corrections, e.g. of observing schedules;

API documentation

- The OSCAR/Surface Resources Portal;
- Formal model and XML schema are on http://schemas.wmo.int;
- Current version: 1.0RC9 (http://schemas.wmo.int/wmdr/1.0RC9/);
- Codelist entries for XML elements are important
  - http://test.wmocodes.info/wmdr/;
  - More code lists on gdrive;
- OSCAR/Surface User Manual *(coming soon).*

The WIGOS Data Quality Monitoring System ("How is WIGOS performing?")

- One of the five priority areas of WIGOS Pre-operational phase: Describes how well WIGOS is functioning
- **Real-time monitoring** of performance
  - data **availability** (implemented) and **quality** (under development),
  - searchable by region, country, station type, period, etc.
  - for all WIGOS components (GOS, GAW, WHOS, GCW, GCOS),
- **Incident management component** for mitigation of issues
- Current/recent activities:
  - **Pilot project on NWP-based** monitoring: ECMWF, NCEP, DWD, JMA;
  - Web display tool now being developed in pre-operational mode by ECMWF.

The three major functions of WDQMS

WIGOS Quality Monitoring Function:

- Automatically generates monitoring outputs, e.g. as by-product of NWP data assimilation;
- The frequency, content and format of the monitoring reports depend on the observing system;
- Monitoring reports contain results by observing system and by variable;

WIGOS Evaluation (and reporting) Function:

- It takes the Quality Monitoring reports, from one or more contributing centres,
- Extracts the baseline information from OSCAR/Surface on schedules of international exchange;
- Generates routine performance "reports" for:
  - data availability and quality against the baseline and/or specific targets for each observing system;
  - non real time trends in network performance, e.g. over a month for GOS elements (rolling averages).

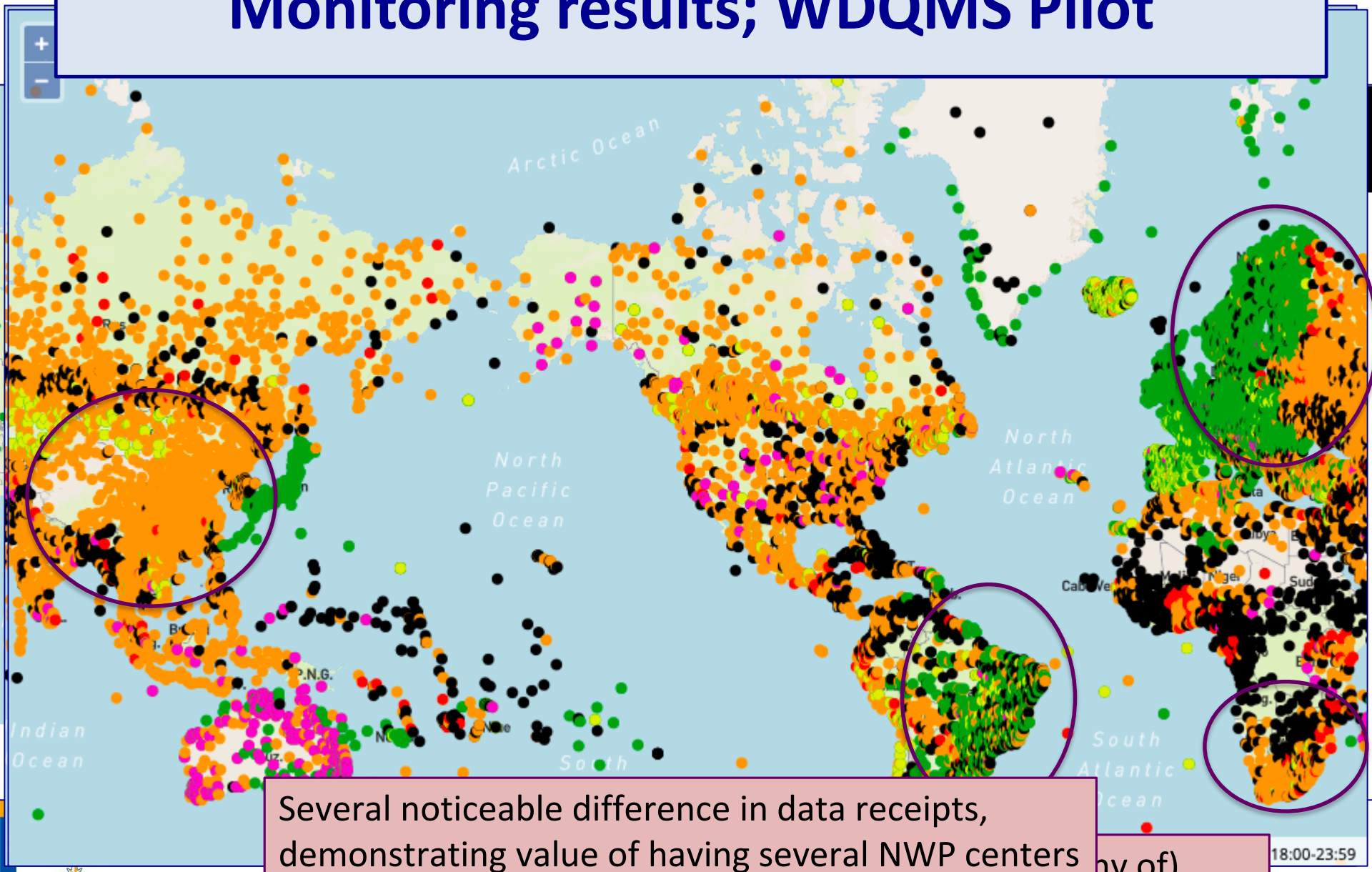
WIGOS Incident Management Function:

The issues raised by the Evaluation function as Incidents, will be undertaken through an incident ticket system requesting the data suppliers to respond; It requires a clear communication with the supplier, but also the users of the data to ensure they take suitable precautions with the source.

WDQMS Pilot project with Global NWP Centres

- Four NWP centers, ECMWF, NCEP, JMA, DWD, are providing monitoring **output in real time (every six hours)** to WMO Secretariat;
- Started with **surface** pressure, now including also surface humidity, wind, temperature and **upper air** soundings;
- Simple ASCII files in commonly agreed format contain the following information for each individual observing station:
  - Observation received within operational data cut-off (yes/no);
  - Observation used in assimilation (yes/no);
  - If not used, why not (flag);
  - Observation minus background residual (numerical value).
- The Task Team on WDQMS and NWP centres are **working to expand** the monitoring to other observation types (marine, aircraft, climate).

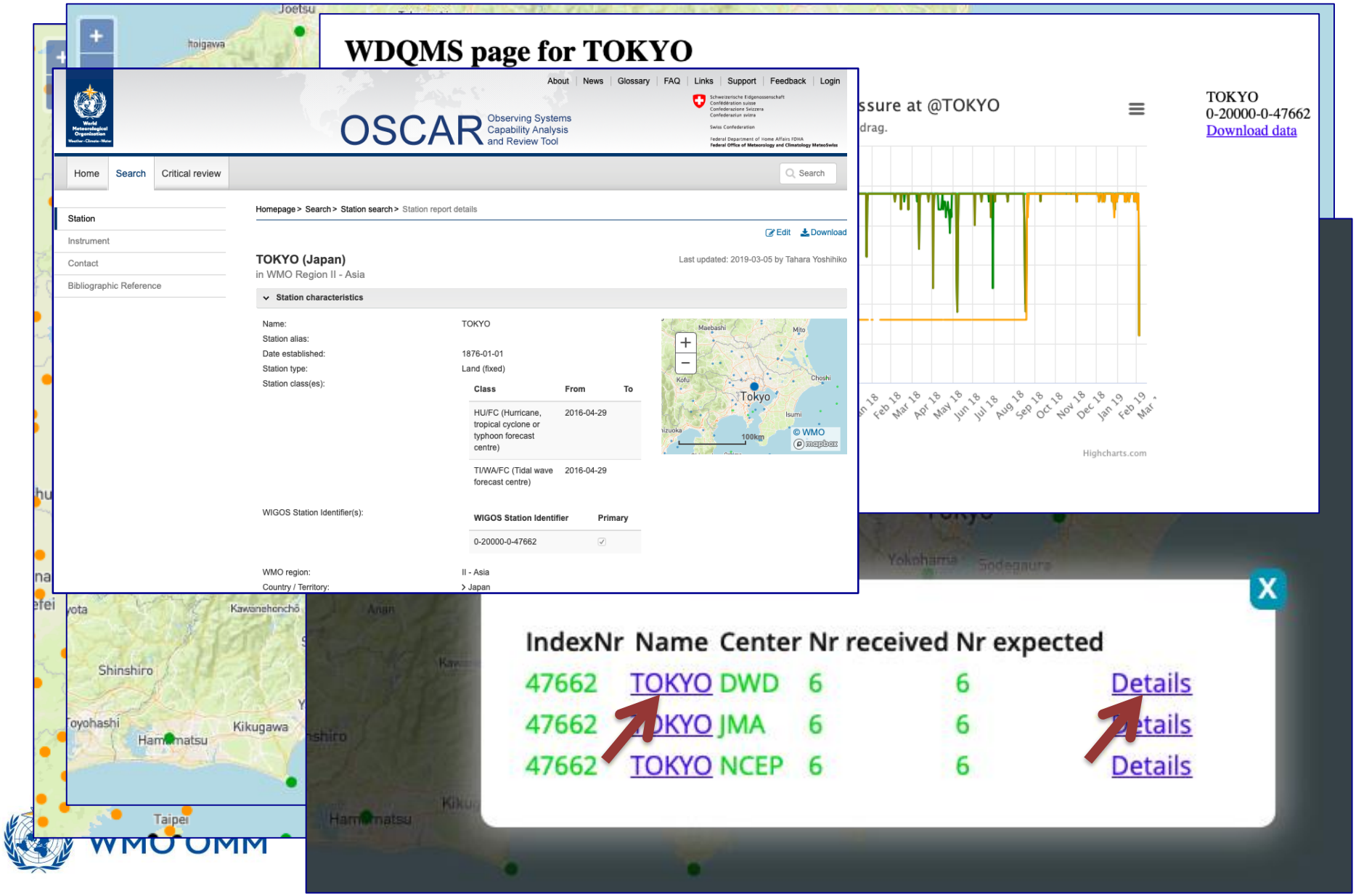
Monitoring results; WDQMS Pilot



Several noticeable difference in data receipts, demonstrating value of having several NWP centers involved in monitoring work

ny of)
19, 18 UTC

Monitoring example; WDQMS Pilot



Regional WIGOS Centers (RWC)

- **Why?**
  - Many WMO Members requesting support from Secretariat for national implementation efforts
  - Can be addressed more efficiently and effectively at regional level
- **What?**
  - Initial role of RWC will be to support national WIGOS Implementation efforts, in particular as concerns
    - **OSCAR/Surface; input and updating of metadata, QC**
    - **WDQMS; monitoring and coordination of mitigation efforts**
- **How?**
  - Per ICG-WIGOS: To be decided by the WMO Regions – perhaps aligned with existing cultural, linguistic and/or political groupings
  - **The lack of activity in most Regions on the subject of RWCs is currently the most important risk factor for WIGOS!**

RWCs in context

- Regional WIGOS Centres (RWCs) will **play a critical role** in advancing operation of WIGOS.
- **Regions differences need to be taken into account** in establishing and operating RWCs addressing specific needs and circumstances of the respective Region.
- The overall **purpose** of the RWCs is to **provide support and assistance to WMO Members and Regions** for national and regional WIGOS implementation efforts.
- They will work closely with:
  - WMO Regional Office;
  - Existing WMO Centers (GISCs, RICs, RRCs, RMICs);
  - RTCs;
  - RA II MG, RA-II WG WIS-WIGOS;
  - Members;
  - WMO Secretariat (WIGOS PO).

Two mandatory functions of RWCs:

- Regional WIGOS **metadata** management;
  - Work with data providers to facilitate collecting, updating and providing quality control of WIGOS metadata in ***OSCAR/Surface***;

- Regional WIGOS performance **monitoring and incident management** (WIGOS Data Quality Monitoring System);
  - Follow-up with data providers in case of data availability or data quality issues ***(WDQMS)***.

Optional Functions

- Assistance with the **coordination** of regional/sub-regional and national WIGOS projects;
- Assistance with regional and national **observing network** management;
- Calibration support;
- Support for regional **capacity development** activities, including training.

Implementation Options

- Each RA (i.e. Members of the Region) must decide on its own way to address specific needs, priorities, challenges and available technical and human resources of the Region;

- Member or group of Members can establish RWC in sub-region, taking into account the natural geographic / linguistic / economic conditions/circumstances of the sub region.

Regional WIGOS Centers; current status

- **Region I**: Many indications of national interest; limited national resources. RWC pilot to be initiated in East Africa on DFID (UK) project funding, centered in Kenya and Tanzania; South Africa and Morocco have both indicated interest in submitting proposals;
- **Region II** *(this meeting)*: Will be done on a sub-regional basis; *China has formally addressed P/RA-II to request approval of RWC in pilot mode in Beijing; Japan has done the same for Tokyo;* indications of interest also from Saudi Arabia, India and Russia; This meeting will also be the first informal RWC coordination meeting between these four Members; ICG-WIGOS recommended establishment of a global RWC coordination mechanism;
- **Region III**: Plans for Virtual RWC maturing, decision to be made at RA-III-17 later this month; Region VI used as model.

Regional WIGOS Centers; current status

- **Region IV**: No clear path yet; CMO has express strong interest in playing a role; Canada, USA may be willing to help;
- **Region V**: Indications of interest from Australia, Fiji, Indonesia, Singapore; formal decision made by RA-V-17 in October 2018 to encourage Australia and Singapore to submit proposal to P-RA-V, and encouraging Fiji, Indonesia to join;
- **Region VI**: successful RWC operating in pilot mode at DWD thanks to EUTMETNET engagement*;* tentative plans for RWCs also in Belarus and/or Russia (Russian-speaking countries in RA-II and RA-VI) and Croatia (specifcally for marine observing systems).

"Establishing a Regional WIGOS Centre in pilot mode" (Annex to Decision 30, EC-69)

1. Introduction
2. Rationale for the project and its relevance to WMO
3. Project description
4. Resourcing
5. Implementation stages
6. Risk assessment/management
7. Governance, management and execution
8. Monitoring and evaluation

Annex 1 - Concept note on establishment of WMO Regional WIGOS Centres

Annex 2 - Application template for a RWC candidate

Technical Guidelines for RWCs on the WDQMS for surface land stations of the GOS

1. Functions of a WDQMS for surface-based system of GOS
2. WDQMS Quality Monitoring Practices
3. Data quality monitoring and evaluation
4. Incident Management Procedure
   - 4.1 Responsibilities
   - 4.2 Steps of the Incident Management Procedure
     - 4.2.1 Issue Identification (A)
     - 4.2.2 Issue Raised as Incident (Process Initiation) (B)
     - 4.2.3 Receipt Confirmation (C)
     - 4.2.4 Action Proposal (D)
     - 4.2.5 Incident Status (E)
     - 4.2.6 Confirmation of Successful Incident Rectification (F)
     - 4.2.7 Incident Escalation Procedures
5. Quality Performance Reports

Technical Guidelines for RWCs on the WDQMS for surface land stations of the GOS

- Annex 1: WDQMS performance targets
- Annex 2: WDQMS priority levels
- Annex 3: high level description of potential causes of incidents and corresponding actions to be taken on NMHS/operator side
- Annex 4: accuracy, trueness and precision of measurement methods and results (ISO 5725) and NWP short-term forecasts as reference in the procedure for measuring accuracy, trueness and precision
- Annex 5a: file format for exchanging information on land surface observations from global NWP centres (as of 08.12.2017)
- Annex 5b: file format for exchanging information on upper-air land observations from global NWP centres (as of 08.12.2017)
- Annex 6: example of an incident management system ticket

Summary and Conclusions

- WIGOS Pre-operational Phase 80% completed; main **technical systems implemented**/under implementation;
- OSCAR/Surface uptake is improving; M2M interface ready for testing;
- WDQMS already providing powerful diagnostics of the workings of WIGOS/WIS and the compliance of WMO Members with WMO regulatory and guidance material;
- **Regional WIGOS Centers are a key element** in supporting Members in the implementation of WIGOS and in improving the overall performance of WIGOS;
- RA-II has very strong RWC capabilities; coordination of efforts to be discussed during this Workshop.